

Owner's Handbook Service Booklet



OWNER'S HANDBOOK

735i

U.S. and Canadian models only

Some equipment shown in this manual will pertain only to one model.



Bayerische Motoren Werke AG Munich

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Warning: Use unleaded gasoline only. Fuels containing up to and including 10% ethanol or other oxygenates (e. g. ethers and ketones), or up to and including 3% methanol **plus** an equivalent amount of co-solvent **only**, will not void the applicable warranties.

However, driveability-, starting-, and stalling problems may result from use of such fuels, especially under certain environmental conditions such as high ambient temperatures and high altitudes.

Some fuel suppliers sell fuels containing alcohol or other oxygenates without disclosing this information to the consumer. If starting-, stalling- or driveability difficulties occur, and are suspected to result from the fuel being used, it is recommended that you switch to a fuel known to contain no alcohol or other oxygenates. Check with the service station operator to determine if the fuel contains alcohol or other oxygenates.

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Dear BMW owner,

Congratulations on taking delivery of your new BMW.

In choosing a BMW, you have acquired an ultra-modern automobile of advanced design which will not only provide you with BMW's proverbial 'Sheer Driving Pleasure' but also offer that perfect blend of performance, comfort and safety that enables you to enjoy journeys relaxed, whatever the traffic conditions. Satisfying the driver's needs and wishes as fully as possible with an automobile that has only modest needs of its own – this ideal becomes reality in the latest BMW models.

We recommend you study this Owner's Handbook in detail, as this is the only sure way to become thoroughly familiar with your new BMW from the very start – something that is certainly in your own interest and ours.

We wish you many safe, pleasant journeys,

Sincerely
BAYERISCHE MOTOREN WERKE
Aktiengesellschaft

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In the interests of continuing technical development we reserve the right to modify designs, equipment and accessories. Dimensions, weights and performance data quoted in this handbook are to the tolerances laid down by German Industrial Standard (DIN).

No claims based on data, statements, descriptions or illustrations from this handbook will be entertained.

Errors and omissions excepted.

Please note that any discrepancies between your own car and the details given in this handbook may be due to the equipment specification offered on a particular model or the items ordered with the car.

The service requirements and procedures described in this handbook were in effect at the time of printing – errors and omissions excluded.

We reserve the right to make reasonable modifications to these service requirements and procedures from time to time.

Any modification to the car and its equipment may result in an improper function or reduce safety and value.

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BMW driving – at a glance 1



Front seat
Cockpit
Instrument panel
Heating and ventilation
Before you start
Refilling
At a glance

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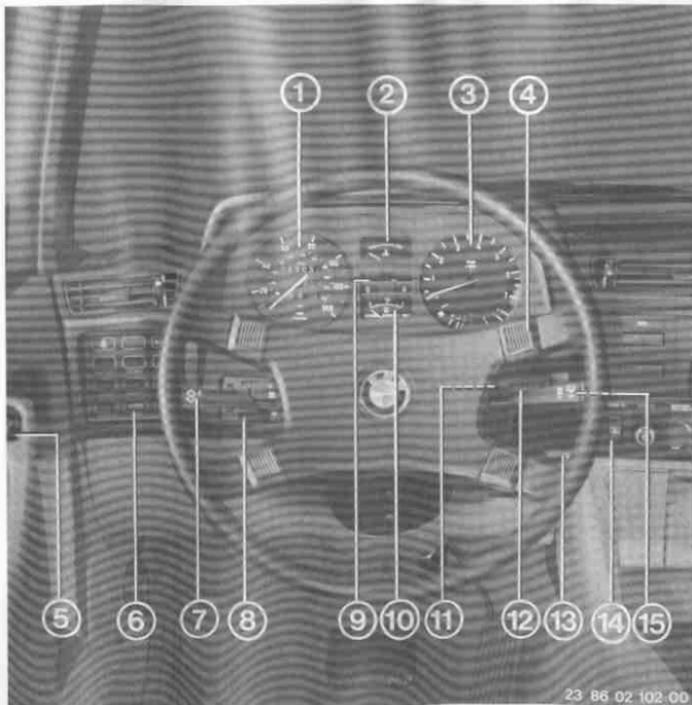
1-08 BMW Driving - At a glance

**Front seats**

- 1 - Headrest
- 2 - Safety belt buckle
- 3 - Electric seat adjustment
- 4 - Steering column extension lock lever

Cockpit

- 1 – Speedometer with odometer and trip odometer
- 2 – Coolant temperature gauge
- 3 – Tachometer with fuel consumption indicator
- 4 – Horn
- 5 – Control switch for electric door mirrors
- 6 – Check control
- 7 – Steering column lever for turn indicators, low/high headlight beams and headlight flashing
- 8 – Headlight switch
- 9 – Service Indicator
- 10 – Fuel gauge with low fuel warning light
- 11 – Ignition/starter switch
- 12 – Fog light switch
- 13 – Cruise control lever
- 14 – Pushbutton for heated rear window
- 15 – Windshield wiper/washer lever



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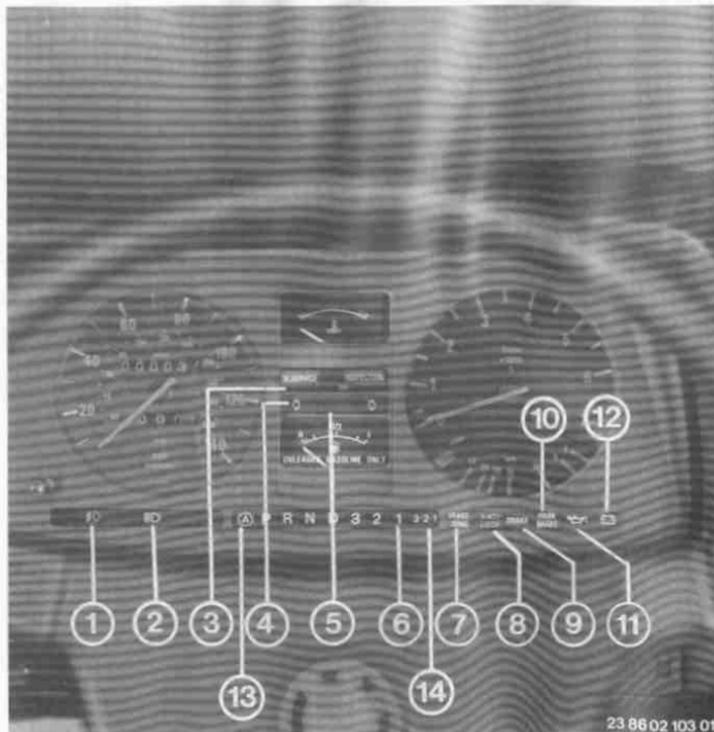
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1-10 BMW Driving – At a glance



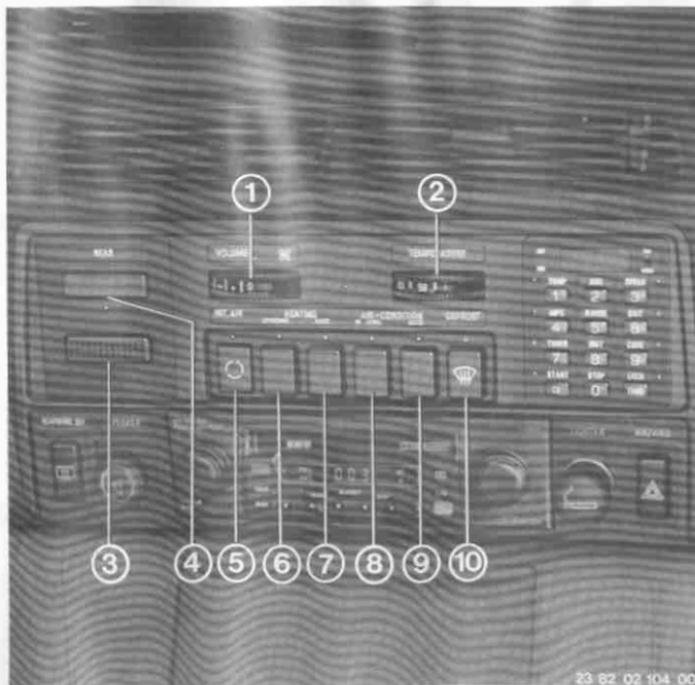
Instrument panel

- 1 – Fog light telltale (green)
 - 2 – Headlight high beam telltale (blue)
 - 3 – Service Indicator (green-yellow-red)
 - 4 – Turn indicator telltale (green)
 - 5 – Central warning light (yellow)
 - 6 – Automatic transmission selector lever indicator (white, red, green)
 - 7 – Brake lining wear telltale (red)
 - 8 – Antilock brake system telltale (yellow)
 - 9 – Brake fluid level, system and reservoir pressure warning light (red)
 - 10 – Parking brake telltale (red)
 - 11 – Oil pressure warning light (red)
 - 12 – Battery charge telltale (red)
- Additional items on automatic-transmission models with electronic-hydraulic control:
- 13 – Electronic shift indicator (yellow)
 - 14 – Direct shift program (yellow)

Heating and ventilation

- 1 – Airflow volume (knurled wheel)
- 2 – Temperature (knurled wheel)
- 3 – Temperature sensor
- 4 – Pushbutton – rear-seat air distribution
- 5 – Pushbutton – recirculating air
- 6 – Pushbutton – upper and lower air distribution without air conditioning
- 7 – Pushbutton – automatic air distribution without air conditioning
- 8 – Pushbutton – upper, center and lower air distribution with air conditioning
- 9 – Pushbutton – automatic air distribution with air conditioning
- 10 – Pushbutton for defrosting windows

Each pushbutton has its own indicator light.



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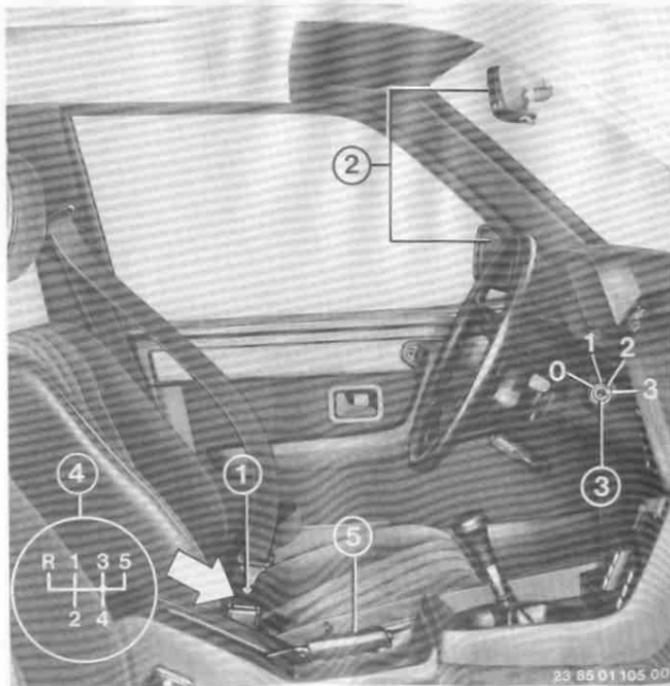
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**Before you start**

- 1 – Adjust seat position, put safetybelt on.
- 2 – Check inside and door mirror settings and adjust if necessary.
- 3 – Ignition/starter switch positions:
 - 0 = Off
 - 1 = Radio
 - 2 = Ignition
 The brake fluid warning light comes on.
 3 = Start position; brake lining wear telltale is checked.
- 4 – Shift pattern on gear lever
- 5 – Release the parking brake before driving.

Automatic transmission selector lever positions:

- P = Park
- R = Reverse
- N = Neutral
- D = Drive (automatic gear selection)
- 3 = Direct drive
- 2 = Hill climbing and engine braking
- 1 = Hill climbing and engine braking

Additional program switch on automatic-transmission models with electronic-hydraulic control. Switch positions:

- E = Economy program
- S = Sports program
- 3-2-1 = Direct shift program

Filling the fuel tank

The fuel gauge in the instrument cluster shows the amount of fuel in the tank when the ignition is switched on. If the needle is in the red zone and the yellow low fuel warning light comes on, you should add fuel as soon as possible, although the remaining fuel in the tank should be sufficient for about 30 miles or 50 km depending on driving style.

If the yellow low fuel warning light remains on continuously, fill up with fuel at the very earliest opportunity or else the tank may run dry.

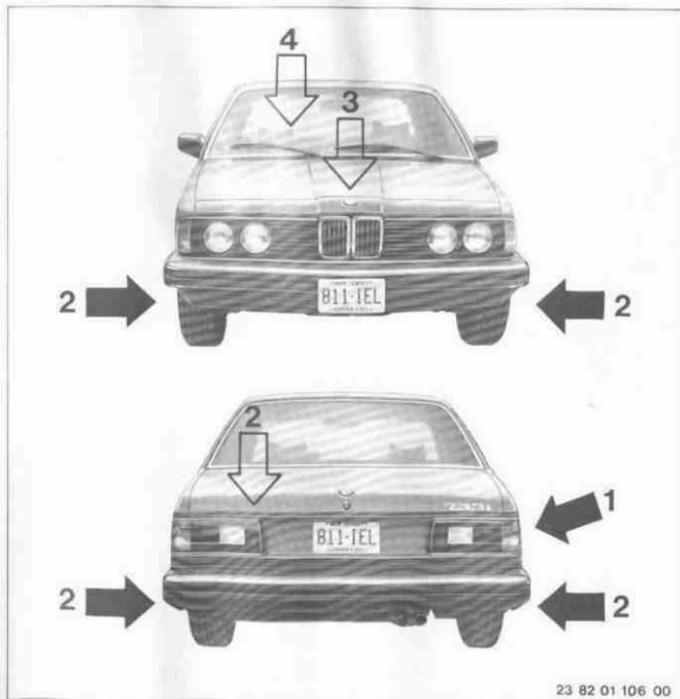
1 – Fuel filler cap

Items to check regularly:

- 2 – Tire pressures, front and rear (including the spare tire). For correct tire pressures see page 1-15
- 3 – Engine oil level,
Coolant level,
Windshield washer fluid level,
Automatic transmission fluid level,
Power steering circuit oil level

Before continuing your journey, clean:

- 4 – Windshield,
and if necessary the side and back windows, headlights, rear lights and license plates.



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1-14 BMW Driving – At a glance

At a glance

Filling capacities		Notes
Fuel tank	22.5 US gal/85 liters/ 18.7 Imp. gal	Unleaded gasoline (87 AKI or 91 RON)
Cooling system including heater circuit	12.7 US quarts/12 liters/ 21.1 Imp. pints	For details, see page 4-13
Tank for windshield washer	3.2 US quarts/3 liters/ 5.3 Imp. pints	For details, see page 2-10
Engine oil	5.3 US quarts/5 liter/8.8 Imp. pints + 0.8 US quarts/0.75 liters/1.3 Imp. pints if oil filter is changed	Reputable 4-stroke HD engine oil, rated SE or higher For oil grades, see page 4-11
Manual transmission	1.7 US quarts/1.6 liters/2.8 Imp. pints	Reputable non-hypoid gearbox oil, SAE 80, specification MIL-L-2105 or API-GL 4, alternatively single-grade HD engine oil (mineral oil based) SAE 20/30/40, specification API-SE or SF (Contact your BMW dealer for details).
Automatic transmission	For oil change: app. 3.2 US quarts, 3 liters, 5.3 Imp. pints	Use only reputable automatic transmission fluids of Dexron formulation. For oil grades, see page 6-16
Rear axle	2.0 US quarts/1.9 liters/3.3 Imp. pints	Reputable hypoid gear oil SAE 90 (GL-5)
Power steering	Permanently filled, no drain plug	For oil grades, see page 6-17

Spark plugs

Bosch WR 9 LS

Electrode gap

0.027 + 0.004 in (0.7 + 0.1 mm)

Valve clearances

With engine cold, inlet and exhaust valves 0.012 in or 0.30 mm.

Warning:

Digital Motor Electronics

This is a high-output ignition system, and any contact with live components when the engine is running could cause a severe or even fatal electric shock.

V-belts

Alternator and water pump

12.5 x 1055

Power steering pump

9.5 x 912

Air conditioning compressor

12.5 x 850

For your own safety - check tire pressures regularly

Tire pressures in bars (psi) when cold (ambient temperature). On warm tires the pressure can rise for about 0.3 bar (app. 4 psi). Changes in temperature vary the tire pressure (10°C/18°F = 0.1 bar/1.5 psi).

BMW model	Radial-ply tubeless tires				
735i	205/70 HR 14 93 H	2.2 (32)	2.2 (32)	2.3 (33)	2.5 (36)
	205/70 SR 14 93Q M+S				
	220/55 VR 390 TR	2.2 (32)	2.2 (32)	2.3 (33)	2.5 (36)
	220/55 HR 390 93H M+S TR				

Your vehicle is equipped with tires which not only meet US standards, but also European standards. We recommend the **exclusive use of BMW-approved tires**.

The speed rating code letters indicate the maximum permissible road speeds for summer tires (subject to legal limits):

SR = up to 110 mile/h (180 km/h)

HR = up to 130 mile/h (210 km/h)

VR = over 130 mile/h (210 km/h)

Permissible maximum speeds for winter tires

SR winter tires, speed category Q - 100 mile/h (160 km/h)

HR winter tires, speed category T - 118 mile/h (190 km/h)

HR winter tires, speed category H - 130 mile/h (210 km/h)

Use only snow chains according to SAE J 1232 classification "S". The snow chains may be used on drive wheels (rear) by twos only.

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1-16 BMW Driving – At a glance

In this section of the handbook, we describe in brief the main items you need to know when driving your BMW.

More detailed information of interest to you is given in **Section 2**.

Section 3 deals with the vital topic of using the seat belts and with other steps you can take to enhance your safety and that of your passengers.

Section 4, provides interesting facts concerning economical driving, disc brakes, tires and driving in cold weather. This section also includes instructions for checking the various fluid levels on the vehicle regularly.

Section 5 not only deals with the best methods of maintaining your BMW, but also gives details of some of the minor repairs and adjustments you may be able to perform yourself.

Section 6 will be of interest to the owner or driver wishing to study the performance and equipment specification of his or her BMW in full detail.

Section 7 deals with technical features. To function reliably over a lengthy period, correct maintenance is essential. The section headed "BMW SERVICE" describes the work to be carried out on your BMW as part of the BMW Maintenance System.

We are sure that all this information will prove of interest to you.

BMW operating instructions – in general



- Keys, locks
- Manufacturer's plate
- Seats
- Switches, instruments and controls
- Service Indicator
- Check-Control
- Manual transmission
- Automatic transmission
- Car radio
- Sliding sun roof
- Heating and ventilation
- On-board computer
- Starting instructions

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2-02 Keys, locks

Before you start – all you need to know

Four keys are supplied with your new BMW:

- 1 - Master key with battery-powered light. Press the button to switch on the light. Replace the battery when the light decreases in intensity and to prevent the risk of acid escaping.
- 2 - Duplicate master key.

- 3 - Key for doors, fuel filler cap and ignition; does not fit luggage compartment or glove box and does not open the electromechanical locking system.
- 4 - Spare master key with extra-small head, to be kept in a wallet or safe place.
- 5 - Key number on self-adhesive label. The key number is required by your BMW dealer in order to obtain a duplicate key; keep in safe place to avoid theft.

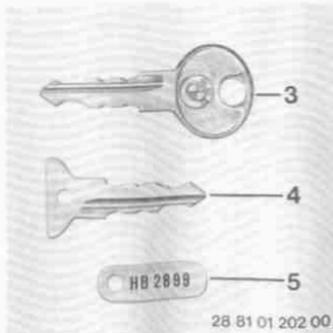
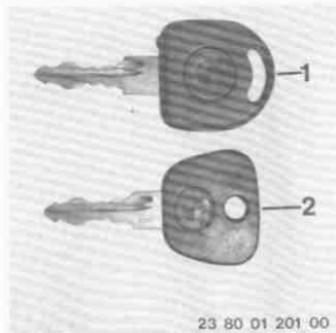
The master keys fit all the locks on your BMW, but the other key (3) only fits the two front doors and the ignition/starter switch.

You can therefore lock valuables or luggage in the luggage compartment or glove box out of sight, and still hand a key to a workshop or hotel porter so that the car can be driven.

Keep the small-headed master key where it is easily accessible if the other two master keys are lost or unobtainable.

To open a door from the outside, lift up the handle.

The heated driver's door lock is switched on when the driver's door handle is raised.



Central locking system

Whenever a door lock or the luggage compartment lock is operated or the safety catch button on the driver's door is pressed down, the doors, luggage compartment lid and fuel filler flap locks are all operated at the same time. However, the doors can still be unlocked from inside the car.

After an accident or hard bump the central locking system opens automatically. Reactivating follows the next operation.

By turning the **driver's door key** further to the right (clockwise) to a horizontal position, the central locking system activates an electromechanical locking system to further thwart theft.

Note: The locking device can only be operated with the master key. Do not engage this system with passengers being in the car.

When the driver's door is open, its lock button cannot be pressed in or turned by the key. This is a safeguard against locking yourself out of the car accidentally.

The luggage compartment can be locked separately with the master key, by inserting the key, turning it to the right and pulling it out in that position. After this, the luggage compartment can only be re-opened with the master key. This is useful when the luggage is to remain locked up at all times. The luggage compartment is to lock again after opening the electromechanical locking system.

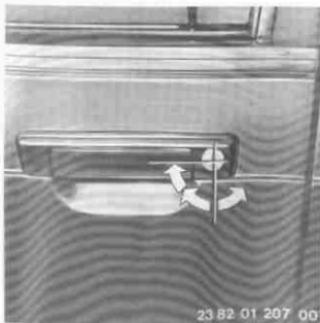
Each of the rear doors has a **childproof safety catch** which can be engaged when the door is open.

Lever up = door can be opened from the outside or inside.

Lever down = door can be opened from the outside but **not from the inside**.

Important note:

Children left in the car could lock the doors accidentally from the inside. To avoid this, make a point of removing the ignition key and taking it with you, so that the doors can always be opened from the outside.



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2-04 Engine compartment, fuel filler flap

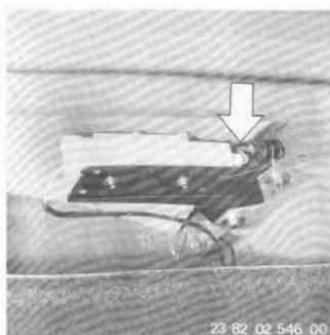
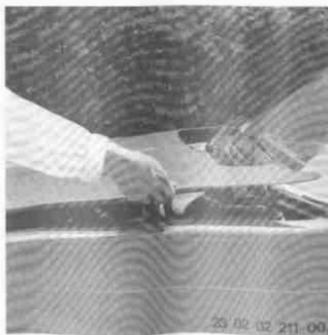
The **hood** is opened from inside the car by pulling the lever on the left side.

A built-in mechanism makes it easy to open and raise the hood from the outside after *release*.

Warning: make sure that the release lever is still in the opening position before closing the hood. After closing the hood, lock it by pushing the lever forwards.

The **fuel filler flap** can be opened if the central locking system should fail by pressing back the locking rod, accessible through the trunk.

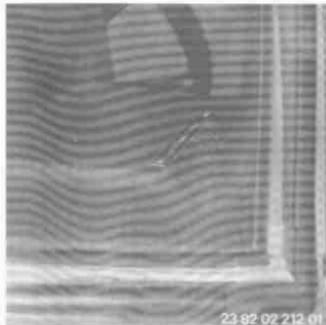
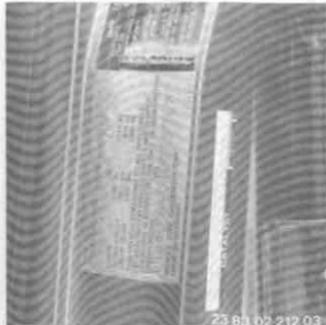
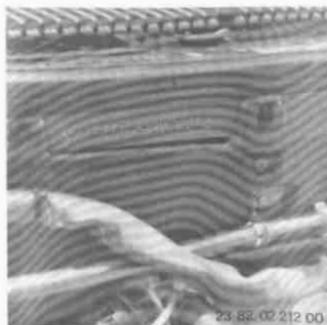
The side trim must be removed to provide access to the lock bar.



The manufacturer's plate and chassis number can be used to check the identity of your car against your registration and licensing certificates.

Compare these entries with the references stamped on the vehicle if a mistake has been made. The chassis number is used as a basis for all inquiries, examination of records, warranty or other claims. You should therefore be familiar with its location. The chassis number is stamped into the engine compartment, on the right hand side of the heater bulkhead looking forward, and also on an adhesive label located inside the left front door opening.

Vehicle Identification Number. The official vehicle identification number for registration and title purposes is stamped on a metal strip that is fastened to the instrument panel adjacent to the left side of the windshield.



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2-06 Front seats, headrests

The **electric front-seat adjustment** is operated by the panel of pushbutton switches.

- 1 - raise/lower seat back angle
- 2 - move seat forward/backward
- 3 - raise/lower headrest
- 4 - raise/lower rear end of seat
- 5 - raise/lower front end of seat

If a **driver's seat with memory** is installed, three seat positions can be programmed and selected with the ignition key at position 2. (The three positions could be used, for example, by other persons driving the car regularly, or if you prefer different seated positions for town and main-road driving.)

There is a recessed contact (6) for programming and a pushbutton (7) for selecting each programme.

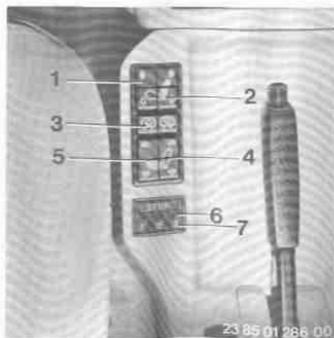
Programming: select the desired seat position at the pushbutton panel. Press the contact in with the tip of a ball-point pen. While the programme is being memorised, the green LED will flash briefly.

Selecting programme before engine is started: press the appropriate pushbutton (1, 2 or 3) briefly. The green LED will come on until the programmed seat position has been reached.

Selecting programme after engine has been started: keep the appropriate pushbutton pressed in until the final seat position has been reached and the green LED goes out.

The stop button can be used to interrupt the memorised position adjustment immediately at any point.

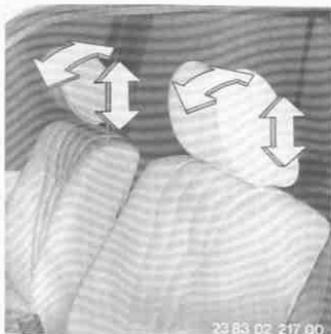
The red LED comes on to indicate malfunctions. If the position memory fails to operate, the electric front-seat adjustment can still be operated at the pushbutton panel.



The front-seat **headrests** are operated by **pushbuttons** on the center console, when the ignition switch is in position 2.

Their angle is varied by tilting the headrests forward or backward manually.

The **rear-seat headrests** are also adjustable for height and angle.



BMW sports seat

To reposition the front seats in relation to the steering wheel, pull up the lever at the front of the seat base and slide the seat to the desired position. Release the lever and make sure that the seat has engaged in its locking catches.

The front seat backs can be varied in angle by pulling up the lever on the outside of each seat, at the back.

Press down the lever shown to alter the inclination of the seat.

The front-seats' headrests can be varied in height by pulling them upward or pushing them downward. Their angle is varied by tilting the headrests forward or backward.

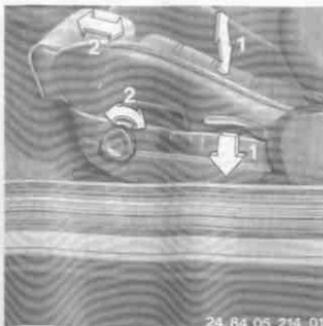


Press down the lever (1) shown to alter the height of the seat.

Rotate the knob (2) shown to move the front edge of the seat forward or backward.

Automatic inertia-lock lap and diagonal seat belts are standard equipment for the front seats and the left and right rear seats. The seat in the middle is equipped with a lap belt.

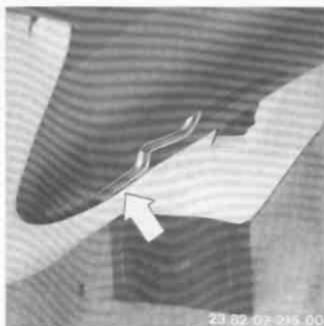
Please consult the section of this handbook headed "SAFETY" for full details of how to operate the front seat belts and also the automatic lap and diagonal belts for the rear seats.



A reminder in the Check-Control gives you a visual warning signal "FASTEN SEAT BELTS" and will be actuated for a time of about 6 sec. when the ignition is switched on. At the same time a warning gong will sound. The gong will not sound, when the driver's belt is put on before switching on the ignition.

After pulling out the clamp lever, the steering wheel can be extended or retracted to any desired position in relation to the seat. Secure the steering column in its new position by tightening with the clamp lever again. See Section 3.

Warning: Do not adjust the steering wheel position while the vehicle is in motion. This constitutes an accident risk.



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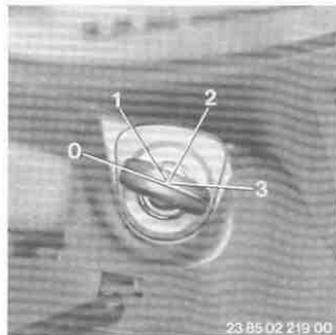
2-08 Ignition/starter switch, headlight switch

The **ignition/starter switch**, in the right steering column surround, is combined with the steering lock.

0 - Steering locked. The key can **only** be inserted and removed in this position.

All items of electrical equipment are switched off, except for the following, which remain operational: hazard warning flashers, cigarette lighter, interior light, side lights, parking lights, luggage and engine compartment light.

To release the steering lock it may be necessary to turn the steering wheel slightly.



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To lock the steering, pull out the key and turn the steering wheel to left or right until you hear the lock.

1 - Steering unlocked. Radio, on-board computer, flashing turn indicators, horn and windshield wipers can be operated.

SRS-telltale see section 3.

2 - Ignition switched on. All other items of electrical equipment can be operated.

In this key position the red brake fluid warning light comes on. This serves for checking the function of the light. Normally, the BRAKE light should extinguish as soon as the engine is running.

3 - Starter motor operated. As soon as the engine starts, release the ignition key. It will spring back to position **2**. When the key is turned to this position the brake lining telltale is checked.

Warning

Never run the engine in an enclosed space. The exhaust contains carbon monoxide, which although colorless and odorless is extremely toxic.

Never pull out the ignition key when the car is moving, or the steering lock will engage (the steering may need to be turned only slightly) and render the car uncontrollable.

Always remove the ignition key and take it with you when leaving the car unattended. Make sure that the steering lock has engaged.

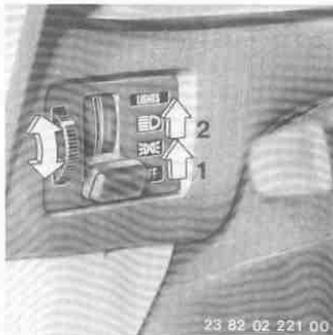
The **headlight switch** has two positions:

Position 1: Sidelights including parking lights

Position 2: Headlights, side marker lights, parking lights

If the ignition key is turned to position **1** or **0** with the headlights on, they will go out, but the parking and sidelights will remain lit.

The intensity of the **instrument, ashtray and control symbol lighting** can be varied by turning the knurled wheel.



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The lever at the left of the steering column controls the flashing turn indicators and the headlights (high or low beam) after the headlight switch has been turned on. It can be operated with the fingers of the left hand, without having to remove the hand from the steering wheel rim. The **headlight high beam setting** (lever pushed forward) is indicated by a blue telltale on the instrument panel. To **flash the headlights**, pull the lever back toward the steering wheel rim.

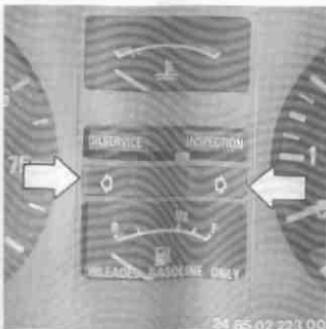
Move the lever up to signal a right turn or down to signal a left turn.

A green telltale on the instrument panel will flash and a ticking sound will be heard in the same rhythm as the turn indicators light up, to confirm that the turn signal is being displayed.



When you return the steering wheel to the straight-ahead position, the turn indicator lever will automatically cancel. However, if the turn was only slight, you may have to return the lever by hand.

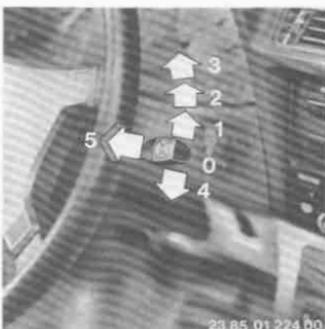
To display a turn signal for a short period only – when changing lanes, passing or pulling away from the road side etc. – you need only to press the turn indicator lever slightly away from its rest position, without allowing it to engage. When released, the lever will immediately return even if the steering wheel is not turned.



The **wipe-wash lever** is on the right of the steering column, and has the following switch positions:

- 0 – Wipers off
- 1 – Intermittent wipe
- 2 – Normal wiper speed
- 3 – Fast wiper speed
- 4 – Single wipe
- 5 – Automatic wash-wipe system

In the intermittent wipe position, the wipers perform a single movement at brief intervals. This means that the driver needs not to turn the wipers on and off repeatedly in light rain, snow etc. Select wiper position 3 only in heavy rain or snow.



2-10 Washer fluid tank, jets

Intensive-cleanser can be sprayed on to the windscreen before washing takes place by pressing the end of the lever. The remainder of the windscreen wash cycle then takes place automatically.

The **intensive-cleanser** is frost-resistant down to app. -27°C (-17°F) and is kept in a separate tank. The fluid is available from your BMW dealer.

The fluid tank holds approx. 1.1 US quart/ 1 liter/1.8 Imp. pints.

Warning: do not run the automatic washer if the fluid tank is empty.

The **washer fluid tank** holds approx. 3.2 US quarts/3 liters/5.3 Imp. pints and is located at the front right of the engine compartment.

Warning: do not run the automatic windshield washer if the fluid tank is empty.

The picture below shows the positions of the **windshield washer jets**. If the stream of water fails to strike the center of the area covered by the wiper on that side, the jet can be carefully repositioned with a fine needle to redirect the water stream.

The windshield washer jet heating comes on automatically at ignition switch position 2.



The **reading lamps** at the right and left of the rear passenger compartment can be operated separately when the side-, park- or headlights are switched on.

To turn on the **fog lights** flip up the fog light switch.

Whenever the front fog lights are in use, a green telltale on the instrument panel comes on.

Please note national regulations with regard to the use of fog lights.

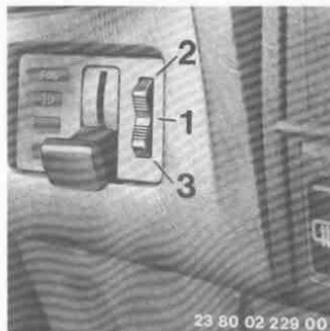
The **automatic interior light** is switched on by lifting the driver's door handle. The interior light remains on for about 6 seconds after the doors have been closed, but goes out when the ignition is switched on.

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

Position 1: light is on only when a door is open

Position 2: light permanently on.

Position 3: light permanently off.



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2-12 Instrument cluster, service indicator, fuel injection control unit

The **instrument panel** contains the speedometer and tachometer and also the fuel gauge, a coolant temperature gauge and warning or telltale for:

- 1 – Fog light telltale (green)
- 2 – Headlight high beam telltale (blue)
- 3 – Service indicator (green-yellow-red)
- 4 – Turn indicator telltale (green)
- 5 – Central warning light for Check Control (yellow)
- 6 – Automatic transmission selector lever indicator (white, red, green)
- 7 – Brake lining wear telltale (red)
- 8 – Antilock brake system telltale (yellow)
- 9 – Brake fluid warning light (red)
- 10 – Parking brake telltale (red)
- 11 – Oil pressure warning light (red)
- 12 – Battery charge telltale (red)

Additional lights on automatic transmission cars with electronic-hydraulic control:

- 13 – Electronic shift control (yellow)
- 14 – Direct shift program (yellow)

On cars with automatic transmission, the **selector lever position** is displayed on the instrument panel by a series of lights.

These lights are wired in an anti-glare circuit: their intensity can be adjusted at the knurled disc next to the main light switch when this is on. They remain on until the ignition key is turned back to position 1 or 0.

The **Service Indicator** tells you when routine maintenance is due on your car, and operates when the ignition key is turned to position 2 or further.

The **green** light-emitting diodes go out when the engine is started.

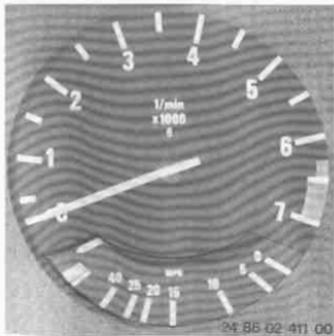
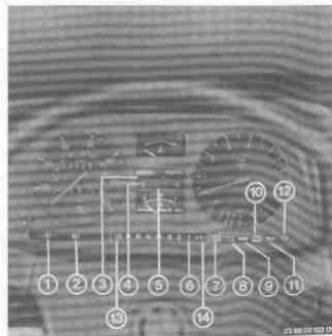
The **yellow** light-emitting diode, together with the inscriptions "OIL SERVICE" or "IN-

SPECTION", come on when servicing work is due. They may come on as the car is being driven. The red light-emitting diodes will come on when servicing work is over due. All are cancelled by the BMW dealer when the necessary maintenance work has been performed.

(For further information see the "SERVICE" section of this handbook.)

The **fuel injection control unit** incorporates a cutout to limit maximum engine speed. This takes effect when the needle of the tachometer reaches the red warning zone.

Engine speeds in the broader red zone on the tachometer will also have adverse effects on the life of the engine. Avoid these excessive engine speeds in any portion of the red warning zone, particularly when driving downhill or in lower gears.



US model

The outer scale of the speedometer is calibrated in miles per hour. The inner scale is calibrated in kilometers per hour.

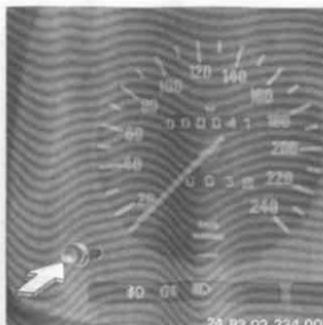
The speedometer contains an odometer to show the total number of miles the car has covered.

The smaller window in the speedometer dial is the **trip odometer**, which is used to record journeys up to 999.9 miles and can be reset to zero by pressing the knob.

**Canadian version**

In this version the scale of the speedometer is calibrated in kilometers per hour.

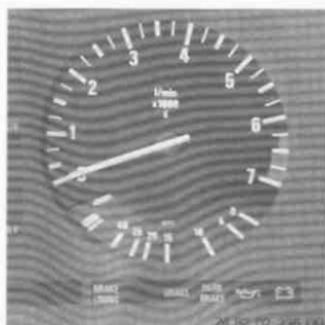
The odometer registers the distance in kilometers.



The **fuel consumption indicator needle** in the lower part of the tachometer dial moves across from maximum to the zero reading (from zero to maximum in Canada only) when the engine is started.

Above app. 13 mile/h (20 km/h), you can read the fuel consumption corresponding to your style of driving at any speed, and take steps to improve fuel economy if necessary. See "DRIVING HINTS".

Below app. 13 mile/h (20 km/h), the indicator will tend towards the zero (in Canada to the maximum) reading as speed is reduced, and will come to rest there when the car is stopped.



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2-14 Coolant temperature gauge, fuel gauge

The **coolant temperature gauge** has two colored zones at the extremes of its scale.

BLUE: engine has not reached normal operating temperature. Drive only at moderate road and engine speeds.

RED, Warning light comes on: engine overheated. Pull over to a safe area out of the mainstream of traffic and stop engine immediately. Allow system to cool down until temperature gauge indicator is approx. in the middle of the scale.

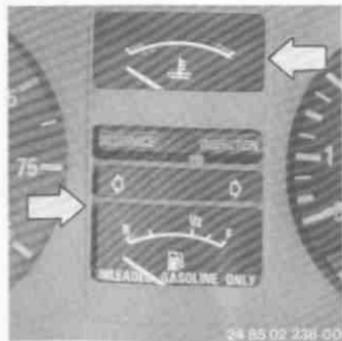
Warning: Allow the engine to cool (needle of coolant temperature gauge in center of white zone) before unscrewing the tank cap. Allow time for excess pressure to escape, then unscrew further and remove.

Search for cause of overheating - see also "MINOR REPAIRS".

Normal operating temperature is between the two colored zones. The needle may tend to reach the red zone when the ambient temperature - and/or the engine load is very high.

The **fuel gauge** in the instrument cluster shows the amount of fuel in the tank when the ignition is switched on. If the needle is in the red zone and the yellow low fuel warning light comes on, you should add fuel as soon as possible, although the remaining fuel in the tank should be sufficient for about 30 miles or 50 km depending on driving style.

If the telltale remains on continuously, fill up with fuel at the very earliest opportunity or else the tank may run dry.



The "Check-Control" includes function-monitoring lights for:

- Fasten-seat-belts
- spare lights
- Brake (stop) lights
- Rear lights
- License plate lights
- Low beam
- Engine oil
- Coolant
- Washer fluid
- blank
- operation
- operation
- operation
- operation
- level
- level
- level

When the ignition key is turned to 1 or beyond, any reduction in engine oil, coolant or windshield washer fluid level is indicated by the inscription panel being illuminated, and the appropriate warning light coming on.

With the ignition key turned to 2 or beyond, the **central indicator light CHECK** on the instrument panel will flash. At that same time, all Check-Control inscriptions light up, together with the "Brake lights" warning light. If the engine is started and the car's lights turned on, any malfunction can be identified immediately by means of the appropriate warning and indicating lights.

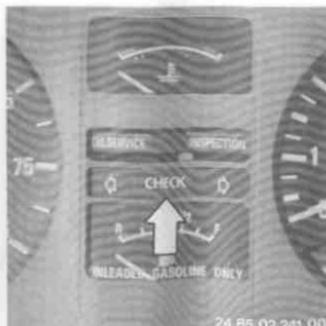
If the brake pedal is depressed, the central indicator light, the "Brake lights" warning light and all Check-Control inscriptions should go out if the corresponding systems are in proper working order.

When the car is being driven, any malfunction of the monitored systems are indicated by the central indicator light beginning to flash. At that same time, all the Check-Control inscriptions in the panel will light up, and the warning lights for the faulty systems. When the **CHECK key** is pressed, all the warning lights will come on, but when released only those indicating a genuine system malfunction will remain on, and the central indicator light will go out. The Check-Control inscription lighting goes out after a certain delay.

If the engine oil level is too low, this indication remains stored in the Check-Control until oil is added.

Any other system fault indication is cancelled by turning the ignition key to 0, but will be detected again when the ignition key is turned to 1 or beyond.

Lighting equipment defects are displayed again whenever the lights are switched on.



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2-16 Mirror

The electrically heated remote-control **outside mirror** can be repositioned horizontally and vertically by means of the mirror switch, to suit the driver's seated position.

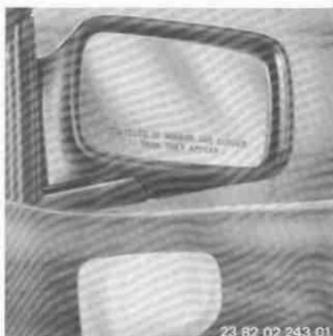
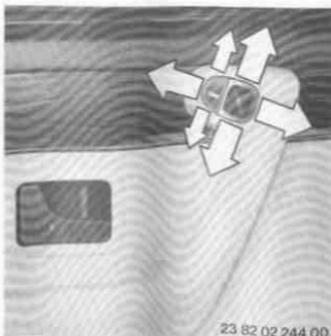
The same switch is used to adjust the mirror on the other door by first moving the changeover switch.

The mirror can also be repositioned manually by moving the glass.

A temperature sensor mounted to the back of the mirror automatically controls heating. If the temperature of the mirror glass drops below 59°F (10°C), the temperature sensor will close the circuit allowing a metallized heating element on the back of the mirror to heat the mirror glass to 122°F (50°C). After reaching this temperature the temperature sensor will open, breaking the circuit to the heating element. The heating procedure will be repeated each time the mirror glass temperature drops below 59°F (10°C).

Your car is equipped with an outside mirror on the right hand side. Please take into consideration that the glass of the mirror is convex. **The objects you see in the mirror are closer than they appear.**

The glass of the aspherical wide-angle mirror, if fitted, is divided to improve the range of the rearward view and eradicate the "blind spot" at the rear of the car. The outer section is convex and reflects an enlarged (but slightly distorted) rear-view area. The inner section reflects the normal rear-view area.



Please remember to adjust the **door and interior mirrors** to suit your driving position.

The interior mirror can be moved to the antiglare position by means of the small lever.

When the roller sun blind (option) is retracted, the view in the inside mirror is adversely affected.

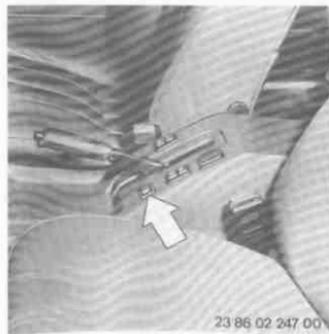
Note national regulations in this respect, and fit a second door mirror if required.

Each sun visor can be swung around to cover the upper part of the front side window if the sun is entering from that angle.

When the passenger's sun visor is swung down, its **make-up mirror** lights up if the sidelights or headlights are switched on.

The **electric window lifts** are operated from the pushbuttons on the center of the dashboard for the front windows and on the center console for the rear windows, when the ignition switch is in position 2.

There are additional switches on the rear doors to operate these windows separately, but the rear door switches can be isolated with the single button, for instance to prevent children from trapping their fingers in the windows.



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2-18 Automatic circuit breaker, horns, rear light

An **automatic circuit breaker** and a fuse protect the electric window motors by tripping in the event of a fault or overload.

The electric windows are not operational when the ignition key is removed, to prevent children left in the car from operating the windows and perhaps injuring themselves.

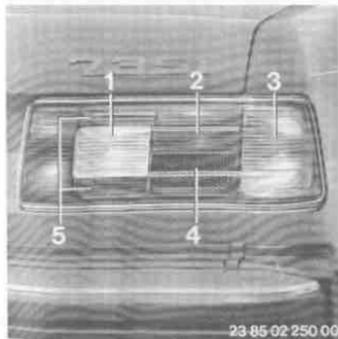
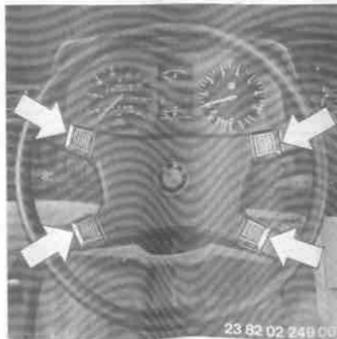
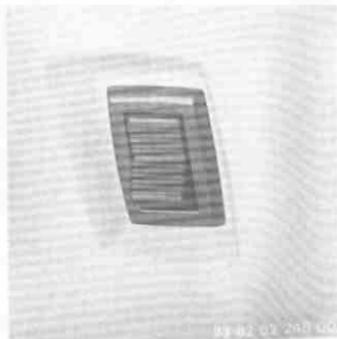
For manual operation of the windows in an emergency, see **Section 5**.

On cars with Supplementary Restraint System the automatic circuit breaker switch is fitted to the center console.

The **electric horns** are sounded by pressing one of the horn buttons in the steering wheel spokes.

The **rear lights** are arranged as follows:

- | | |
|------------------------------|----------|
| 1 - Reversing (backup) light | (white) |
| 2 - Brake (stop) light | (red) |
| 3 - Flashing turn indicator | (yellow) |
| 4 - Rear light | (red) |
| 5 - Reflector | (red) |



The **luggage compartment light** operates when the lid is raised.

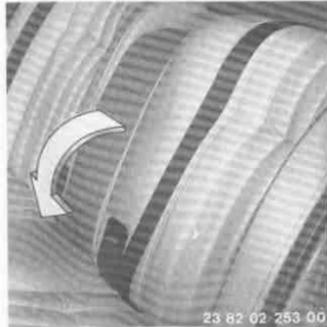
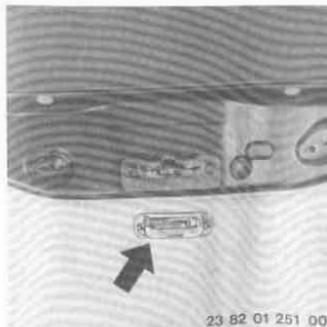
The **engine compartment light** operates when the head light switch is on and the hood opened.

The lockable **glove box** is opened by pulling the recessed handle, and closed by pushing the lid up firmly.

When the glove box lid is open, the glove box light will come on and the **rechargeable flashlight** can be reached. The flashlight has a **built-in-overload device** and can thus remain plugged in at all times so that it is fully charged whenever needed.

Warning: Do not plug the lamp in while switched on.

The rear seat is equipped with a **center armrest** which can be swung out of the seat back cushion by pulling the upper end.



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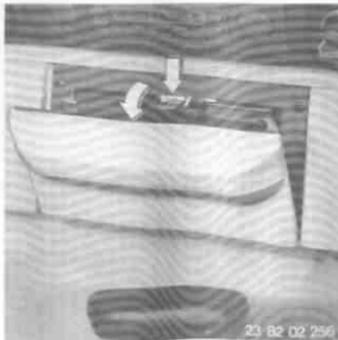
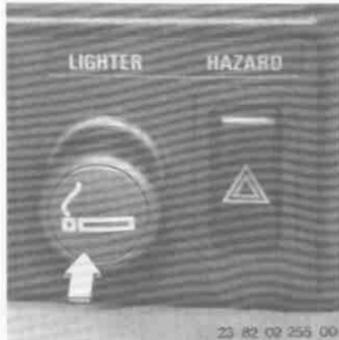
2-20 Lighter, ashtrays

To use the **lighter**, press in the knob. When the heating element has become sufficiently hot, the knob will pop out and the lighter can then be removed from its socket.

The power **socket** can also be used to plug in a hand lamp, electric shaver or similar appliance rated at not more than 200 Watts, 12 Volts. Make sure that the socket is not damaged by attempting to insert plugs of the wrong pattern.

To clean the **ashtray** open the flap, press down the leaf spring and pull the whole assembly up.

To empty the **ashtrays** on the rear doors, open them and pull the whole assembly up.

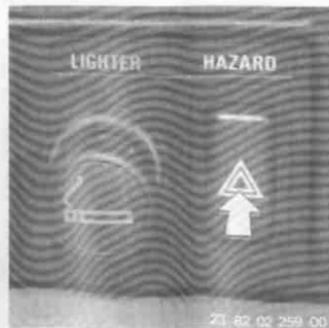


When the **heated rear window** is switched on, the yellow telltale in the pushbutton comes on.

The **hazard warning flashers** are operated by the pushbutton with the 'triangle' symbol; its red telltale flashes rhythmically when the hazard warning system is in use.

When the car's lights are turned on, a locating bulb is illuminating the pushbutton.

On **highline models**:
press latch to open coin-box.



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2-22 Electric front seat heating

The **electric front seat heating** (Canada model only) can be switched on by means of pushbuttons.

Switch ●● - seat warms up

Switch ● - seat kept warm.

Best results are achieved if the seat is warmed up for about 5 minutes and then kept warm.

The green telltale in the pushbutton lights up when the seat heating is switched on.



The **parking brake** operates on the rear wheels. To stop the vehicle and prevent it from moving pull the parking brake lever up. To release the lever, pull it up slightly, press in the knob and push the lever down.

When the parking brake is applied the red "PARK BRAKE" telltale in the instrument cluster will come on. This is also a simple way of checking that the telltale bulb is working.

A useful hint: to avoid noise from its ratchet when applying the parking brake, press the knob in as the lever is pulled.

Manual transmission

The correct positions of the gear lever for the various ratios of the manual gearbox are shown in the **shift pattern diagram** below. All gears have synchromesh.

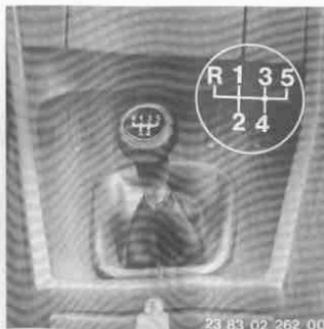
The fifth gear is an economy gear, reducing engine speed and noise level as compared with fourth gear while maintaining road speed, and may contribute to fuel consumption reduction.

To engage reverse gear (only when the car is standing still), press the gear lever over to the left until slight resistance is overcome, then forwards.

The backup lights will come on when reverse gear is selected and the ignition is switched on.

Note:

If you are not familiar with the 5-speed gearbox be aware of the following: When disengaging any gear, the gear lever automatically slips back into neutral position between 3rd and 4th gears.



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2-24 Automatic transmission selector lever positions

Automatic transmission

The following **selector lever positions** are available to suit various driving requirements and road or traffic situations:

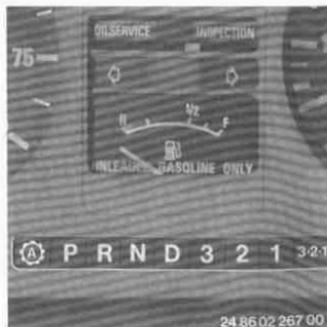
P R N D 3 2 1

The position of the lever is shown by the indicating lights on the instrument panel.

For engine starting, move selector lever to position P or N.

With the **electronic-hydraulic transmission** the following 3 shift programs can be selected in addition at the **program switch**:

E (Economy)
S (Sports)
3 - 2 - 1 (Direct)

**P = Park**

Select only when the car is standing still.

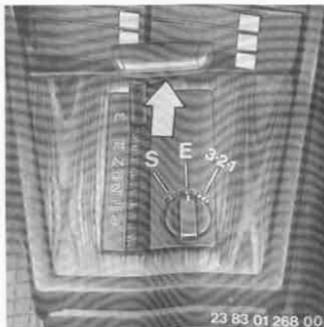
The transmission is locked in this position as an additional precaution against rolling away. Press the release catch under the selector lever handle before engaging this position.

R = Reverse

Select only with the car standing still and the engine idling. First pull up the release catch below the lever handle. Wait for reverse to engage (slight jerk) before accelerating.

N = Neutral

There is no connection between the engine and the transmission. Select this position during **prolonged periods of idling** (for instance in traffic jams). Apply the foot brake to prevent unintentional rolling of the car.



To avoid increased clutch-plate wear, this position should be selected when the car is in motion only when absolutely necessary, e.g. in a skid.

At short stops, for example when waiting at traffic signals, the drive position should be left in engagement.

D = Drive (automatic gear selection)

This is the position for all normal driving. The car starts in 1st gear, and shifts up automatically into 2nd and 3rd, and further into the 4th gear.

At short stops, for example when waiting at traffic signals, the drive position may be left in engagement. Apply the foot brake to prevent unintentional rolling of the car.

The shift points are chosen for maximum economy. In the 4th speed range, the converter **lockup clutch** engages automatically, depending on speed, and thus creates a mechanical link between the engine and transmission.

The 4th speed range is designed as an overdrive, to reduce engine speed, engine noise and fuel consumption once a steady road speed has been achieved. However, the car reaches its top speed and can maintain it generally in the 3rd speed range.

If the kick-down is operated in 3rd gear (accelerator pedal depressed beyond the normal full-throttle point), the transmission will not shift up to 4th gear even if the selector lever is in D. The car can then be accelerated in 3rd gear up to its maximum speed. 4th gear will engage when the accelerator pedal is eased back sufficiently.

If the accelerator pedal is again depressed to the kick-down position or the selector lever is moved from D to 3, the transmission will shift down from 4th to 3rd gear immediately, regardless of road speed.

3 = Direct drive position

Should under certain driving conditions in city- or highway driving gear changing between the range 4-3-4 occur, shift to this position. Automatic shifting will be limited to the gear 1 to 3 and reverse.

2 = Hill-climbing and engine braking

This position may suit the driver better on mountain roads or very long uphill and downhill gradients. It makes better use of full engine performance and the engine's braking effect.

1 = Steep hill climbing and engine braking

This position is provided for the rare occasions on which the driver prefers to remain in 1st gear, for instance on very steep uphill or downhill gradients.

Positions 2 and 1 can be selected at any speed, after releasing the safety catch under the handle. However, the transmission will shift down into 2nd and 1st gear at the following speed of app. 140 and 75 km/h (87 and 47 mile/h).

Note that once 2 or 1 have been selected, the transmission does not shift up to a higher gear, even if this means that the engine may overspeed.

Important: after selecting any speed range from neutral, wait for the transmission to engage especially at low temperatures (slight jerk and drop in engine speed) before accelerating.

The car tends to crawl if the engine is running at idle speed and a drive ratio is engaged.

Before leaving the car with the engine running, first select P or N at the selector lever and apply the handbrake.

Kick down

After the full-throttle position has been reached, the accelerator pedal on automatic-transmission cars can be depressed further by overcoming a detent.

This will enable maximum acceleration to be obtained immediately by selection of lower gears.

Up to certain speed range (at any speed in 4th gear), the next-lower ratio is selected to provide improved acceleration. The next upward shift does not take place until a much higher engine speed has been reached (in 3rd gear, not until the accelerator is eased back).

For towing away, low-starting and starting with a flat battery, see **Section 5**.

Program switch for electronic-hydraulic transmission

E = Economy program

Once the car has been started this program can be selected for low-consumption motoring. The converter lockup clutch engages automatically in 3rd and 4th gear.

S = Sports program

This is the program for an enthusiastic driving style. The gear shift points are delayed to make full use of the car's power reserves. The converter lockup clutch engages automatically in 3rd gear. 4th gear is locked out of use.

A slightly higher petrol consumption is to be taken in consideration.

3-2-1 = Direct shift program

This program is for single-gear driving (3rd gear if D is selected). The gear selected is also used for pulling away. For example, if the selector lever is in position 1 for tackling steep gradients or when towing a trailer, no undesirable gear shifts will be made. The same applies to driving on icy roads in winter: with the selector lever in position 3, you will be able to pull away smoothly, and no gear shifts will be effected. The **yellow telltale lamp**  in the combined instrument display indicates that this program is selected.

The **yellow telltale lamp**  for the shift electronics goes out when the engine is started. See **Section 5** if this lamp should come on during a journey.

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2-26 Automatic cruise control

Automatic cruise control

For additional driving comfort your BMW is equipped with an **automatic cruise control** system.

This system allows adjustment for a constant cruising speed in the speed range above **28 mph or 45 km/h**.

The automatic cruising speed control system is activated and controlled by a lever at the right side of the steering wheel column.

The control lever has four switch positions. The following functions are activated in the individual switch positions.

"CONST" (Constant)

Cruising speed will be set, held and memorized. By holding the lever in this position your BMW accelerates without using the accelerator pedal. After releasing the lever the achieved speed will be maintained and also "memorized".

The cruising speed control is automatically switched off in any operation when using the footbrake, or the clutch, by moving the gear selector lever from D to N, or if the deceleration rate exceeds $1.5 \text{ m (4.9 ft)/s}^2$, for instance on a steep hill.

"RESUME"

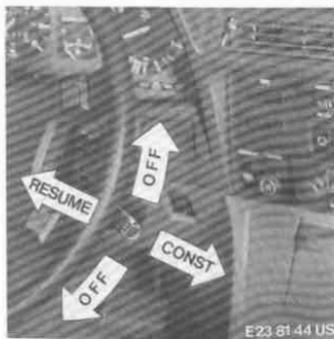
The last "memorized" speed will be resumed.

"OFF"

By moving the control lever either in a downward or upward direction the cruise control can be switched off in any driving and operating condition. The last memorized speed can always be resumed by moving the lever to "RESUME". The "memorized" speed is cancelled by switching off the ignition.

Warning:**Never use the automatic cruise control if:**

- you are in heavy traffic
- the road is winding and where a constant speed cannot be maintained
- the road surface is slippery - **rain, snow, ice**
- the road surface consists of a loose driving surface - **gravel, dirt, sand**



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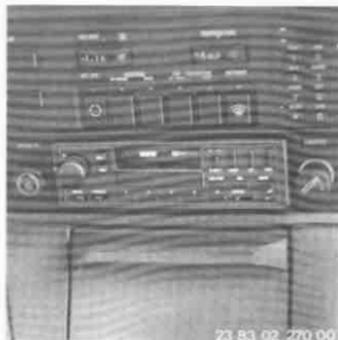
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2-28 Car radio

If your BMW is equipped with a radio, you will receive an owner's instruction manual with the car's documents; this contains full details of **how to operate your car radio**.

The front-to-rear fader control distributes the sound between the front and rear speakers. While the balance between the left and right speakers is set at the radio.



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To ensure that your listening pleasure is unaffected by local reception problems, please study the following general remarks on broadcasting techniques and the possible disturbances caused by natural geographical features, man-made structures, etc.

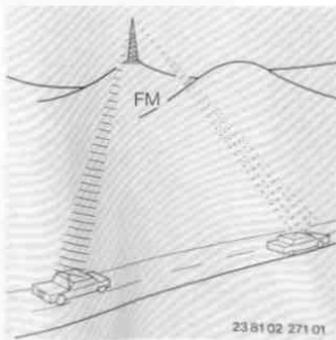
The strength of the signal received by your car radio antenna, and thus the quality of the sound emerging from the loudspeakers, depends on the position of the receiver and the height and direction of the antenna. These factors are relatively easy to take into account on a home radio receiver, but for a mobile radio set such as that in a car certain concessions have to be made. The position of the receiver is constantly changing and it is impossible to keep the antenna aligned with the direction of signal transmission. Other disturbance factors are high-tension overhead wires, poor or missing interference suppression on other vehicles, buildings or natural obstacles. Even if your car radio is perfectly tuned and your car equipped with proper interference suppression, these unavoidable noises or a deterioration in sound quality are often quite severe.

For the best reception quality, pull the antenna out fully. For radio reception the bottom telescopic section must always be fully extended. Regular care and attention of the antenna is also important.

Climatic effects: fog, rain or snow can interfere with good radio reception.

Strong sunlight interferes with medium wave reception. This waveband can be best heard after dark, when the ionosphere reflects more of the transmitted signal back to earth.

Fluttering noise is caused by signal fade, when the line-of-sight link between transmitter and receiver is blocked by large buildings or geographical features. A similar effect is sometimes heard when driving along a tree-lined road.

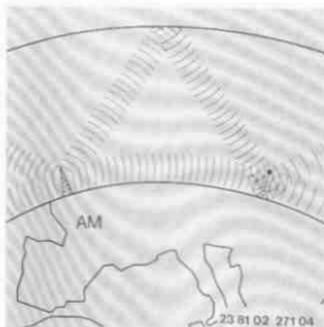
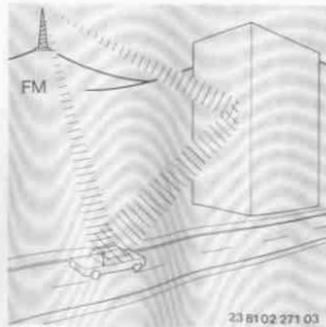
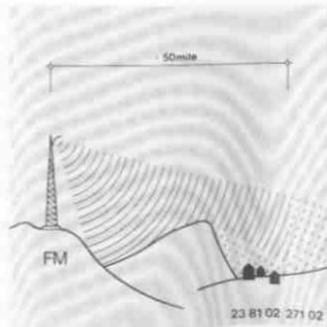


23 81 02 271 01

Continuous high level of background noise: this normally indicates that the edge of the transmitter's zone has been reached, or the car has been driven into a "shadow" where no direct signals are received. The only remedy is to retune to a more powerful station.

Hissing, sizzling and splashing noises: disturbance in this category occurs when reflected signals are picked up by the car radio a fraction of a second after the main signal, for instance from large buildings nearby. The sound level also fluctuates repeatedly.

Severe fade: this is a phenomenon more often encountered on AM, and accompanied by distortion. It is caused by the superimposing of ground waves and airborne signals at the reception point.



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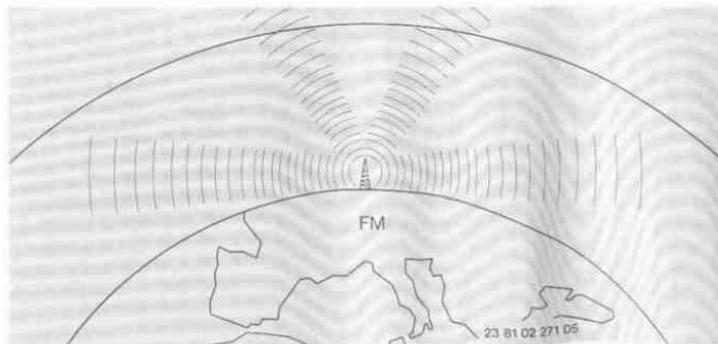
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2-30 Car radio

The hints below are intended to help you select the most suitable waveband for in-car listening.

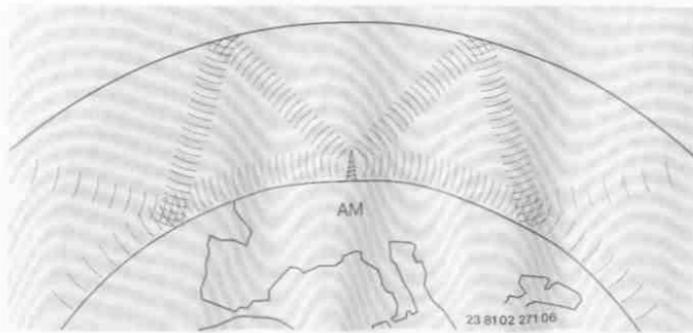
The **FM** transmission system offers far better sound quality than **AM**. However, reception is limited to only a few stations at a time, since the radio waves are emitted in a **straight line** from the transmitter tower and thus cover an area not more than about 50 miles (80 km) in radius. As the distance from the transmitter to the receiver increases, background noise becomes more of a problem, and finally the station can no longer be heard and is displaced by a more powerful one which the car is approaching. These too are natural factors which can only be avoided by retuning to a stronger signal.

Stereo, if transmitted in your area, can only be received on FM. As you move away from the transmitter, interference becomes noticeable more rapidly than on mono transmissions. In this case, switch to mono reception or tune to another station giving reliable stereo reception.



AM provides a larger or, in some cases, exceptionally wide reception range, since the signals are not only dispersed as ground waves, which cling to the curvature of the earth, but also as space waves, which are reflected off a layer in the ionosphere and bounce back to earth.

There are physical reasons why the quality of AM reception is not as good as on FM. However, long distance reception is good, particularly at night, so that a large number of stations can be received, though the station density is such that mutual interference often occurs.



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2-32 General notes on cassette replay

BMW cassette radios with tape auto-reverse can play the tape in either direction, so that the cassette does not have to be removed, turned over and inserted again to play the second side. At the end of the tape, the cassette player switches over automatically to the second track.

The cassette players can replay ferrous oxide, chrome dioxide and ferrochrome tape grades satisfactorily.

We recommend the use of **C 60 cassettes** in BMW cassette radios; these play for 2 x 30 minutes, and ensure satisfactory operation in car radios, where a certain amount of vibration is often encountered.

To avoid poor tape transport and possible tape damage or breakage, always keep tapes inside the car in the **proper boxes or holders**, which have devices to **lock the spools**.

At extremely high or low outside temperatures, for example below -10°C ($+14^{\circ}\text{F}$) or above $+40^{\circ}\text{C}$ ($+104^{\circ}\text{F}$), do not leave cassettes in a parked car, or they may distort and fail to operate reliably when next played.

In addition, protect all cassettes against direct sunlight and dust and exposure to magnetic sources.

If the cassette is ejected during play, this is normally a sign that the tape transport is not running smoothly and freely. Do not merely push the cassette back in, but remove it and investigate the cause of the trouble.

If a loop of tape has formed, it can be taken up by turning one of the spools with a suitable object such as a ballpoint pen.

If a cassette cannot be played right through without this form of interruption occurring, insert it into the slot and immediately wind it completely through from one end to the other, so that the tape is wound on to the spool uniformly and at the correct tension.

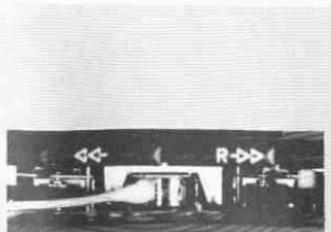
The replay quality of cassettes deteriorates in the course of time as a result of unavoidable deposits of dirt and dust. The replay head inside the cassette player should therefore be cleaned at intervals of about 100 hours of operation.

For **replay head cleaning**, remove the cassette from the slot, insert the BMW cleaning cassette supplied with your car. Follow the instructions included in the cleaning cassette kit. Never use a sharp tool or hard object.

After about 1000 hours of operation, the cassette player should be examined by a qualified radio mechanic and overhauled if necessary.



23 82 01 271 07



23 82 01 271 08

The sliding/vent sun roof is electrically operated by pressing the rear pushbutton = lowering or opening (sliding back), pressing the front button = raising the rear end of the panel or closing the roof (sliding, forwards).

Sliding and elevating operations are separated by an electrical changeover switch. After the roof has been slid shut, the drive motor will cut out automatically. If the roof is to be raised at its rear end immediately after sliding closed, the switch must be pressed a second time. The same applies when changing over from lowering to sliding open.

Before leaving the car, switch off the electric sliding roof mechanism by taking out the ignition key. This will prevent children left in the car from tampering with the controls and possibly incurring injury. If the electrical system should fail, the steel-panel sliding roof can be closed manually. See **Section 5**.



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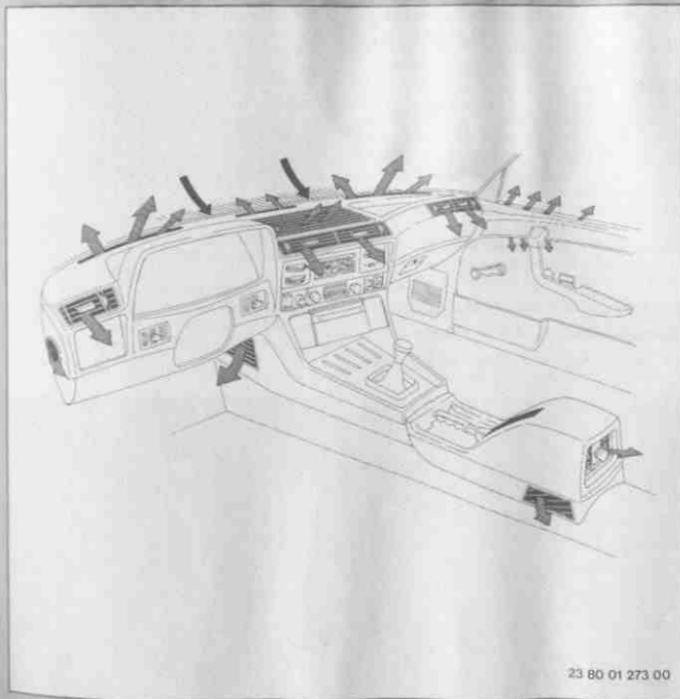
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Heating and ventilation

Heater and ventilation
system
Air conditioning
Air distribution



23 80 01 273 00

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2-36 Automatic climate control

The **automatic climate control** regulates the desired temperature inside the car and controls airflow volume and distribution automatically in accordance with climatic and ambient conditions. Normally speaking no manual resetting of the controls will be necessary. However, the automatic system can always be overridden to obtain specific settings as desired by the driver or passengers.

The controls, switches and interior temperature sensor are arranged as follows:

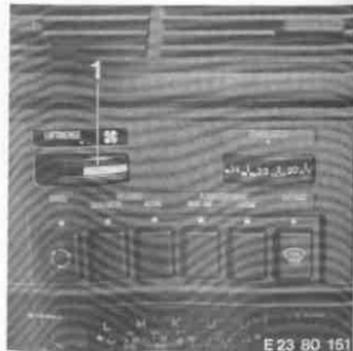
- 1 - Airflow volume (knurled wheel)
- 2 - Temperature (knurled wheel)
- 3 - Temperature sensor
- 4 - Pushbutton - rear-seat air distribution
- 5 - Pushbutton - recirculating air
- 6 - Pushbutton - upper and lower air distribution without air conditioning
- 7 - Pushbutton - automatic air distribution without air conditioning
- 8 - Pushbutton - upper, center and lower air distribution with air conditioning
- 9 - Pushbutton - automatic air distribution with air conditioning.
- 10 - Pushbutton for defrosting windows

Each pushbutton has its own telltale.

Knurled wheel for airflow volume (1)

- 0 - Fresh air, heater and air conditioner switched off
- Slight ram air intake, low blower speed
- Moderate ram air intake, low blower speed
- Maximum ram air intake, low blower speed

When the knurled wheel is turned to the wedge-pattern marking, the blower speed is controlled automatically in relation to the required heating or cooling output in order to improve airflow through the car and ensure that the necessary volume of air is present. The knurled wheel can be turned further to the right as far as maximum blower speed (right-hand limit) if it is felt that a more powerful airflow is needed.



Knurled wheel for temperature (2)

An interior temperature between 16 and 28°C (60 and 82°F) can be selected. The scale should be regarded as an approximate guide when obtaining a pleasant temperature inside the car.

Temperature is regulated electronically by a sensor behind a perforated cover for the car's interior and an outside temperature sensor in the intake airflow at the fan. After starting, the desired setting is obtained as rapidly as possible; it is increased slightly by the outside temperature sensor in cold weather, and reduced slightly in hot weather.

The automatic temperature control system is out of action at the limit positions ("16" and "28") and when the "DEFROST" button is pressed.

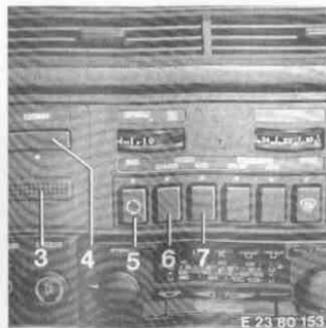
**Interior temperature sensor (3)**

This is located behind the perforated panel.

"REAR" (rear seat area) (4) pushbutton

Pressing the button opens the air outlet to the rear seat area unless the "DEFROST" button has been pressed or the knurled-wheel airflow control is at "0".

For optimum response to weather condition, various functions can be selected with the pushbuttons. Apart from the rear-seat area button, only one button (one program) can be selected at a time.



We recommend the following choice of programs:

"INT AIR" (5)

This is ideal if an objectional odor enters the car. It switches the air conditioning over to the air already inside the car, with only a slight proportion of fresh air, so that impure or objectionable air (exhaust, smoke etc.) cannot enter in any significant quantity. Air distribution is as with the automatic program. The air conditioning is switched on to improve the quality of the air (moisture extraction).

When the recirculated air setting is selected, or the controls reset to a fresh-air program, interior temperature may vary for a short period, but it is not normally necessary to reset the temperature control manually.

"HEATING UP/DOWN" (6)

For use in cool or cold weather when no outside airflow is required.

The air conditioning system remains switched off. Most of the airflow is distributed to the footwells.

"HEATING AUTO" (7)

For cool and fairly cold weather, when the air conditioning is not needed.

The air conditioning remains switched off. Air distribution is controlled automatically so that in cold weather the heated air is supplied mainly to the footwells, and air emerges from the outlet grilles if the weather is warmer.

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2-38 Automatic climate control

"AIR-CONDITION BI-LEVEL" (8)

For rapid cooling of the car's interior in hot weather.

Above 5°C (41°F) (sensor at evaporator) the air conditioning operates all the time. The air is cooled, dried and heated according to ambient temperature conditions. All the front air outlets are open, so that this program enables the front footwells to be cooled as well.

"AIR-CONDITION AUTO" (9)

This is the generally recommended setting, particularly in cool to warm weather and when atmospheric humidity is high.

Above 5°C (41°F) the air conditioning operates all the time. The air is cooled, dried, heated according to the ambient temperature and distributed automatically. This program prevents the windows from steaming up in almost all driving conditions. If it is to operate effectively, however, not all the air outlet grilles should be closed at the same time.

"DEFROST" (10)

For maximum window defrosting and drying steamed-up windows.

The air is heated to maximum temperature automatically, the blower runs at high speed and air emerges only from the defrosting outlets. At temperatures above 5°C (41°F), the air is dried by the air conditioning system, which is run as required.

Important notes:

1. The air conditioning operates only when the engine is running.

For maximum cooling effect when using recirculating air, only a slight amount of fresh air is permitted to enter.

When the "INT. AIR", "ECONOMY UP/DOWN" or "ECONOMY AUTO" and "AIR-CONDITION AUTO" programs are in operation, the blower is switched off at low outside temperatures initially (unless the blower control is at its maximum setting) until the engine coolant has warmed up slightly. To prevent unpleasant drafts, the ram air is diverted to the windshield.

When an automatic program with automatic ventilation control is being used, a pleasantly stratified temperature pattern inside the car can be obtained by adjusting the air outlet grilles, so that the head area is cool and the footwells warm.

2. The air conditioning must be run at least once a month for a short period by switching it on at program button 5, 8, 9 or 10. This is important in the cold season of the year particularly, to prevent the compressor shaft seal from drying out and allowing refrigerant to leak out.
3. If any malfunction of the air conditioning is noted – for instance no cool air output after switching on – the system should be switched off at once and the car taken without delay to a service station for air conditioning repairs.
4. Condensation which forms at the evaporator is discharged underneath the car. Depending on humidity, up to 2 liters (3.5 Imp. pints, 2.1 US quarts) of water may form per hour.



Air extraction

Stale air leaves the car's interior through slots below the rear window and emerges at openings in the rear roof pillars.



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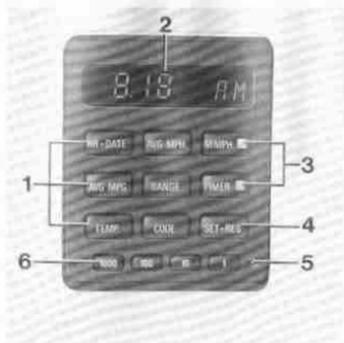
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2-40 On-board computer

ON-BOARD COMPUTER

The on-board computer can supply the following information for safe and economical driving:

- Time or date HR-DATE
- Average speed AVG MPH
- Speed limit warning M MPH
- Average fuel consumption AVG MPG
- Range on remaining fuel RANGE
- Stopwatch TIMER
- Outside (ambient) temperature TEMP.
- Vehicle immobilization for anti-theft protection CODE



- 1 - Information buttons (rows 1-3)
- 2 - Digital display
- 3 - Light-emitting diodes (LEDs)
- 4 - "Start-Stop" button
- 5 - Changeover contact
- 6 - Four numerical input buttons (raw 4)

The computer is ready for use at ignition key position 1 and beyond.

For safety reasons, always input information before beginning a trip or with the vehicle at a standstill.

Press the appropriate "information button" to obtain the following displays:

- Average speed
- Average fuel consumption
- Range on remaining fuel
- Outside temperature

The selected information display will remain on until another display button is pressed.

After pressing one of the information buttons, press the SET-RES button (4) to reset the computer to begin recomputing

- Average speed
- Average fuel consumption
- To start and stop the stopwatch function

The entering of numerical inputs for:

- Time/Date
- Speed limit warning
- Vehicle immobilization for anti-theft protection

are described on the following pages.

Press the appropriate information button to obtain a new information display.

By pressing the turn signal lever in the direction shown in the figure below, the display will change to the next function.

Press the turn signal lever consecutively until the desired function is displayed.

As an added feature for diplomats and foreign travel, the information can be displayed in U.S., Imperial (British), or metric units of measure and language. To change the units of measure and language, press the AVG MPG button and then press the changeover contact (5) with the tip of a ball point pen. Each time the changeover contact is subsequently pressed, the units of measure and language will change and will be shown on the display. (During the changeover, the measuring units for fuel consumption appropriate to the country are displayed.)

If the power supply to the on-board computer is interrupted during electrical repairs, e.g. changing a battery, all data stored is erased from the memory and the units of measure and language will change to the metric automatically.

When the supply voltage is restored, the units of measure should first be selected, then the time, date, and if desired, the speed limit programmed as outlined on the following pages.

Should the display indicate AAAA or PPPP, contact your dealer.



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2-42 On-board computer

Input and informations displays


Use these buttons to program the digits in the display as outlined on the charts below. The memory will not, however, accept unattainable inputs such as a 13th month, etc.

When a digit is entered, the previous digit stored in the memory is erased. Digits can be changed individually and in any order. When a button is pressed (or after each half second if the button is held in), the corresponding display digit increases by one digit.

Function	Input: press buttons in the sequence shown below	Information display: Press button shown below for display of function desired	Notes: Programming information and display description
Change of language and units of measure	<input type="checkbox"/> AVG MPG <input checked="" type="radio"/> Changeover contact (5)	According to input	Before the vehicle is used for the first time or if the power supply has been interrupted, the first display will be in metric units of measurement (... UHR). Press changeover contact once for US (MPG). Press changeover contact twice for Imp. (M/G). Press changeover contact thrice for metric units (L/100).
Time - initial input (or after electrical repairs)	<input checked="" type="radio"/> Changeover contact (5) <input checked="" type="radio"/> Changeover contact (5)		Before the vehicle is used for the first time, and after a break in the power supply, ---- UHR appears in the display. Input the time with the display showing 0000 UHR. The clock starts to run as soon as the dot between the hours and minutes appears.
Country-specific initial time input AM/PM	<input checked="" type="checkbox"/> AVG MPG <input type="radio"/> <input type="checkbox"/> HR-DATE <input type="radio"/> <input type="checkbox"/> 1000 <input checked="" type="radio"/>		The display shows 1200 AM. Press the 1000 button twice to alter display from AM to PM; if the time has already been input, press AVG MPG to obtain the display in another language. Then press the changeover contact and blend in the time display by pressing the HR-DATE button. The change to AM/PM is automatic.

Function	Input: press buttons in the sequence shown below	Information display: Press button shown below for display of function desired	Notes: Programming information and display description
Date	<p>Day (Month) Month (Day)</p>		Input of the date on a new vehicle (or after electrical repairs) is only possible after the clock has been set and the display shows "0000 DATE". For correction of an error, follow procedures outlined under "correction (Time and Date)" below. The date function begins to operate when the dot appears between month and day. To obtain the date from a different information display, press the HR-DATE button twice. Note: The metric display only is in the sequence (day) (month).
- Correction (time and date)	<p>Hours Min.</p>		Press the HR-DATE button for corrections only if other than the desired display is shown. Press the changeover contact to erase the dot (between month and day or between hours and minutes). Input the correction. Press the changeover contact to restart the function and the dot will reappear.
Average speed			Press buttons in sequence shown anytime to begin recomputing average speed. However, if during a trip the average speed is already displayed, it is only necessary to press SET-RES.
Speed limit warning			If the input speed limit is exceeded, the LED flashes and a gong sounds. Press the information button again to switch off the speed limit warning: the LED will go out, but the speed value in the memory is retained. When changing to a different language/unit of measurement the memory is erased.

2-44 On-board computer

Function	Input: press buttons in the sequence shown below	Information display: Press button shown below for display of function desired	Notes: Programming information and display description
Average fuel consumption	 		Press buttons in sequence shown anytime to begin recomputing average fuel consumption. However if during a trip the average fuel consumption is already displayed, it is only necessary to press SET-RES.
Range	-		A plus sign (+) before the value displayed indicates a full fuel tank and a range higher than that displayed.
Stopwatch - Start	 → 	-	Press timer button for stopwatch function. Press SET-RES to start stopwatch. When stopwatch is running, the LED lights up.
- Stop-watch display	-		If the stopwatch is running (LED lit) and another display is shown, press time button to display stopwatch.
- Stop	 → 	-	When other than stopwatch displayed, press buttons as shown to stop. If stopwatch displayed, press SET-RES to stop.

Function	Input: press buttons in the sequence shown below	Information display: Press button shown below for display of function desired	Notes: Programming information and display description
Ambient temperature	-		When the temperature drops to 37 F (+3 °C), a gong sounds. The temperature is automatically displayed for 8 seconds if a display other than temperature has been selected.
Anti-theft protection - to active and immobilize car	Ignition key to 1      Ignition key to D	-	Follow sequence shown and enter any "code" from 0000 to 9999. Turn ignition to position 2 to cancel. In case of error, repeat sequence. Memorise the code number!
- to cancel	Ignition key to 1 or 2     (Input code numbers)  or start engine	-	Warning: if 3 incorrect inputs are made consecutively, or 3 attempts are made to start the engine, a horn sounds for 30 seconds.

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Further information on the on-board computer

(Changes in information programs are only possible after pressing the relevant information button).

HR-DATE

Dual function button. The time and date are displayed alternately by pressing the button. After initial connection to the power supply, 4 flashing segments will appear in place of the time or date display. Inputs can be made after pressing the changeover contact (5) with a ball-point pen (0000 AM/PM display).

To correct the time or date, press the changeover contact (5) until the dot (between the hour and minutes or month and day) disappears. After the correct time/date has been set, press the changeover contact (5) again to restart the clock/day counter. The dot will then reappear.

The clock can be set to accuracy of 1 second by pressing the changeover contact (5) when a radio time signal is heard.

The date display disregards leap-years and must be corrected manually as appropriate. When changing to a different language, the time and date displays are altered accordingly.

AVG MPH

The current average speed is displayed when the button is pressed. Press SET-RES to restart the average speed calculation anytime, e.g. before starting a new trip.

M MPH

New speed limit values can be input or displayed. Press the button again to set the speed limit warning; the red LED will light up. If the input speed limit is exceeded a gong will sound and the red LED will flash.

The gong will sound again if the difference between input limit speed and actual travel speed was greater than 3.1 mph (5 km/h) at least once since the gong first sounded. To cancel the speed limit warning, press the button again; the red LED will go out. The memory is erased when changing over to a different language/unit of measurement.

AVG MPG

Current average consumption is displayed when the button is pressed. Press SET-RES to restart the average fuel consumption calculation anytime, e.g. before starting a new trip.

The on-board computer can be switched to a different language/unit of measurement by pressing this button and then the changeover contact.

RANGE

By pressing this button, the estimated distance which can still be covered with the fuel remaining in the tank is displayed. Below a range of 15 km (9.3 miles), a flashing four-segment display indicates that more fuel is urgently required.

The on-board computer only registers the addition of fuel in ignition key positions 1 and 0, and when at least 5 litres (8.8 pints) of fuel are added.

A plus sign (+) before the display indicates that the car has a greater range than that indicated, as a result of "overfilling" the tank.

TIMER

The stopwatch is started and stopped by pressing the SET-RES button. The red LED lights up to show that the stopwatch is running. Travel, standstill and parked times are all measured. The display shows either the running time or the time at which the stopwatch was last stopped.

The maximum time which can be measured is 99 hours 59 minutes. The time display shows seconds and tenths of a second for the first minute, then minutes and seconds, and hours and minutes after the first hour.

TEMP.

At ignition key position 1 and beyond, the outside (ambient) temperature is displayed when the button is pressed. At a temperature below 37°F (+3°C), a warning gong sounds. At the same time, the temperature function is selected automatically; the temperature is displayed and the ambient temperature flashes for 8 seconds.

The warning gong sounds again if the temperature has increased to 43°F (+6°C) at least once since the last warning signal, and again dropped below 37°F (+3°C).

CODE

When the code function is selected at ignition position 1, 4 segments flash in the display. A code number between 0000 and 9999 can now be input. Turn the ignition key to 2 to cancel the code. Turn the key to 0 to store the code number in the memory and activate the system; when an attempt is now made to start, the starter motor will turn but the engine will not start.

Memorize the code number!

To start the car or cancel the code, turn ignition key to position 1 or 2. The display will show code and 4 flashing segments. Input the code. The correct code will be automatically cancelled by starting the engine or pressing the SET-RES button. (Note: If neither of these two steps are performed, the code will be retained in the memory for anti-theft protection).

Warning: If 3 incorrect codes are input consecutively, or 3 unsuccessful attempts are made to start the engine, a horn will sound for 30 seconds.

SET-RES

Press the button to SET-RESET:

- Average speed calculation
 - Average fuel consumption calculation;
- press to START/STOP:
- Stopwatch

If a code has been input to immobilize the car, the actual time will appear when the correct code number is input and the SET-RES button pressed.

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Original BMW Accessories

for even greater driving pleasure

Please remember that some of the accessories named here are not available for certain models or are already fitted as standard.

BMW Car Radio

BMW radios meet even the highest demands when built into your car with original BMW installation kits and designed especially to match the interior and fittings of your BMW. Our radios are acoustically matched to our interiors.

BMW Floor Mats

Our four-piece Super Plush Mats are color-matched to BMW interiors. They blend perfectly with vehicle carpeting. Carpet heel pads help to protect high wear areas. Mats are cut to exact specifications and then backed with a layer of vinyl and finally with an industrial grade anti-skid foam.

Deluxe Koko Mats are also available. They utilize the same backing material as the Super Plush and include a standard style carpet heel pad.

BMW Gear Shift Lever Knob.

Beautifully finished in wood or leather with the BMW logo or shift pattern.

Additional Original BMW Accessories

Luggage carrier, lockable ski rack, sport steering wheel, coaxial speakers, wheel trim rings, warning triangle, lockable gas cap, mud flaps, paints - sprays and touch-up, foglights, foglight guard brackets, foglight lens guards, Bilstein shocks, front and rear spoilers and auxiliary lighting are available from your BMW dealer.

Perfection to the very last detail also applies to BMW accessories. **Original BMW Accessories** meet exactly the same standards as **Original BMW parts**. These accessories have to pass all the tests in and on a BMW before they are supplied to you.

Break-in – but how?

The engine of your BMW has not been governed in any way, therefore there is no artificial restriction on its performance even when new. It is up to you to ensure that the full operating life and potential economy are later achieved, and this is best done by adhering closely to the following **break-in rules**.

For the first 1,200 miles (app. 2,000 km), drive at varying engine and road speeds, but do not exceed two-thirds of the permitted road speed in each gear. Do not use full throttle or the kick-down position of the accelerator pedal at all during this period.

It can be just as damaging to permit the engine to 'lug' at low speed as to exceed the quoted engine speed limits. Try to keep engine speeds above 1500/rpm, and shift to a lower gear when necessary, particularly on gradients.

The range of the speed limiting fuel injection control cut-out starts at the narrow red warning zone and must not be reached even on long downhill stretches or in the lower gears.

Running the engine in the wide red warning zone is detrimental to the service life of the car and should be avoided at all costs. Remember that the break-in rules apply to other mechanical assemblies such as the gearbox or rear axle, and not just to the engine.

Should any such assembly be replaced at a later stage in the car's life, the break-in procedure must be repeated.

Hints on brake pads' break-in:

As a means of achieving uniform wear patterns and a good friction coefficient on new pads, avoid repeated violent brake applications, especially from high speeds, during the first 300 miles (app. 500 km), and also avoid prolonged severe loads such as may occur when descending lengthy mountain passes. During the break-in period, refrain from subjecting the brakes to any form of endurance testing.

Brake pads, discs and drums require the distance stated above and the quoted operating conditions in order to seat properly and give smooth results and freedom from premature wear later in the car's life.

Since the parking brake operates on an entirely separate brake system with its own drums, it must also be seated correctly.

If road surface, weather and traffic conditions permit, it is possible to achieve the desired effect by applying the parking brake lightly at about 25 mph (40 km/h), until definite resistance is felt. The lever

should then be pulled up to the next notch and the car driven for about another 1300 ft (400 m) before the brake is completely released. This procedure will enable the brake to operate at maximum efficiency.

During the pre-delivery check or inspection your BMW dealer will seat the brake linings correctly.

You can repeat the process yourself, provided that due care is exercised, at three-month intervals or whenever parking brake action becomes less effective.

Break-in procedure for tires:

The production methods used in the tire industry result in brand-new tires having less than their designed adhesion at the road surface. Until maximum adhesion is available, and as a means of obtaining the proper wear pattern, you are recommended to drive with restraint for the first 200 miles (app. 300 km).

During the break-in period, a degree of **stiffness** may be noticed at the gear shift, in the steering and other controls and mechanical assemblies. This will disappear after a short period of use and should be regarded as part of the normal break-in process.

After 1200 miles (app. 2000 km) have been covered, you can **gradually increase** your road speeds to the **specified cruising and top speeds** of your car, assuming that general road and traffic conditions make such speeds possible.

Notes:

Obey your local and state maximum speed limits.

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Before and after starting

Always check first that the gear lever is in neutral before operating the starter.

Automatic transmission cars can only be started with the selector lever at **P** or **N**.

The fuel injection engine of your BMW is equipped with automatic cold-starting and warming-up systems.

Cold-start mixture enrichment

During a cold start and until the engine reaches its normal operating temperature it must be supplied with a richer than usual fuel-air mixture. A solenoid valve controlled by the ignition and starting current injects a quantity of extra fuel (governed by coolant temperature) into the intake manifold. The period of time during which this device operates is controlled by engine temperature in order to prevent flooding the spark plugs. It is therefore incorrect to operate the starter repeatedly for brief intervals. The correct starting routine is to run the starter uninterrupted (max. app. 20 seconds) until the engine starts.

To start the engine turn the ignition key clockwise to position **3** and hold it there until the engine starts (but not longer than 20 seconds). When the key is released it will return automatically to position **2**. The engine may run at a faster than usual idle speed while warming up.

If the starter has to be operated a second time, the ignition key must first be turned back from **2** to **1**. This interlock has been deliberately introduced to help ensure that the starter gear does not come into contact with the flywheel gear before the engine has ceased to revolve.

In very cold weather the first attempt to start the engine should not last too long (max. app. 20 seconds) in order to limit battery discharge. If a second attempt is necessary, wait a short while (about 20 to 30 seconds), and then operate the starter again for a similar period.

Turn off as many items of electrical equipment as possible to reduce the load on the battery, and on manual gearbox cars depress the clutch pedal.

For cold starts, do not depress the accelerator pedal.

After the engine has been started the **warning lights for battery charge, and oil pressure should go out.**

Preparing to drive away with automatic transmission:

With the engine idling, the selector lever can be moved from **P** or **N** to **D**, **3**, **2**, **1** or **R**. **The brakes should be kept applied.**

Wait until a slight jerk indicates gear engagement before accelerating.

Stopping the car with automatic transmission:

When the car has been stopped with the brakes, or before it is driven away, it will

tend to creep forward on a flat surface when a gear is engaged. Keep the foot brake applied lightly to prevent this.

To stop the engine, turn the ignition key back to position **1**.

Always keep the luggage compartment lid closed when on the move. This will prevent toxic exhaust gas from being drawn back into the car's interior. If you are carrying bulky items and cannot close the lid, it is a good precaution to close all the windows including the sliding roof if equipped and run the fresh air or heater blower at medium to high speed.

Reductions in exhaust emissions and fuel consumption and the quality of the fuel used all influence the running characteristics of the engine.

Varying operating conditions are largely compensated by the measuring and control functions of the car's electronic system and by the high design and production standards of individual components. Individual systems such as electronic ignition and fuel-injection are also important in this respect.

Unusual engine and drive characteristics, for example when accelerating from a low engine speed, when combustion recommences after the overrun fuel shutoff has operated or at a low engine idle speed, are design features resulting from the compromise between demands for lower fuel consumption, ecologically more acceptable motoring and greater ride comfort, and not a sign that the vehicle needs attention.

BMW Safety: and what to do



- Driver's seat
- Seat belts
- Supplementary Restraint System (SRS)
- Check-Control
- Warning lights
- Brake fluid
- Heated rear window
- Wiper blades
- Tires
- Tread wear indicator

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Think of yourself – and others

For your personal safety and that of your passengers, please note the following recommendations:

Before driving, all windows around the car and the outside mirrors should be clean, so that good vision is assured in all directions. In addition, make sure that the headlights and other outside light lenses are clean – so that you can see and be seen better.

CAUTION! Do not put packages on the flat area behind the rear seat, as they may obscure vision and may become dangerous projectiles in the event of a sudden stop.

Adjust the driver's seat and if necessary its height and inclination, so that you can reach all the pedals without stretching your legs too much. Adjust the seat back angle, so that you can grip the upper rim of the steering wheel with the arms outstretched but without having to lean forwards. In this position you should be able to hold the two sides of the steering wheel with the arms slightly bent.

Back muscles and discs obtain most relief with the seat in this position. This guarantees effortless driving and easy reach of the controls.

On long journeys, when not all the controls need continual operation, the seat back angle can be slightly increased, thereby further reducing the strain on the body muscles. Ideally, the driver's head

should be on a line forming an extension to his spinal column.

Position the driver's seat correctly for a non-tiring driving position, and good all-round vision. Easy access to all controls must be assured.

Varying the seating position may help to reduce fatigue on long trips.

The most suitable driving position is normally with the arms slightly bent.

WARNING: Do not adjust seat and steering column position while driving – this constitutes an accident risk.

Remember to swing down the sun visors to shield both driver and passengers from direct sunlight or glare.

Head restraints can only offer proper protection if positioned behind the head, not behind the neck.

The seat belts can only protect you and your passengers if they are worn for every journey, even relatively short trips in town.

Automatic (inertia-lock) seat belts with lap and diagonal straps are standard equipment for the front and rear seats of your BMW.

They ensure safety and freedom of movement and don't need any adjustment.

The upper loops through which the front seat belts pass are attached to their uppermost mountings when the car leaves the factory. Persons of smaller stature can ask the BMW authorised service station to reposition these loops at alternative mountings, which are 50 mm (2 in) lower.

To fasten seat belts grasp the belt tongue and pull the belt across the chest and lap. Be sure the belts are not twisted.



Insert the belt tongue into the buckle (located on the inner side of the seat frame) and push down until it is securely locked with an audible click.

The belt is designed to be used by only one person, it is not intended for children under six years old. A reputable child restraint seat is recommended.

Although the seat belts automatically adjust to the correct length, particular care is none the less needed to prevent any slack from remaining in the lap strap, which should be fed through into the shoulder section until taut.

The automatic reels release or retract the shoulder strap in response to normal body movements, so that the wearer need not feel trapped or hampered provided that he moves relatively slowly.

During a journey, the lap strap may tend to slacken and should be tightened at intervals by pulling up the shoulder strap.

To release the belt, push in the red square marked "PRESS" pushbutton.

To store the belt, move the belt tongue to its stowed position on the door post.

Make sure that it fully retracts on the inertia reel.

If you should be unfortunate enough to be involved in an accident, the seat belts may be subjected to unusually high loadings and stretch beyond permissible limits. In this case, they must be replaced together with their fastenings as a safety precaution.

The two locking actions of the seat belts are tested as follows:

1. By pulling the belt rapidly out of its reel with the car standing still.
2. By applying the brakes with the upper part of the body pressing against the belt.

In both cases the automatic reel must lock and prevent the belt from being pulled out further.

3-04 Supplementary Restraint System (SRS)

After a period of extensive testing the Supplementary Restraint System (SRS) is offered by BMW as an additional safety device.

The SRS does not replace the fastening of the seat belts.

The Supplementary Restraint System which consists of an Airbag, the gas generator, the crash sensors and the control unit, is designed to supplement the three-point seatbelt and to provide additional protection for the driver in the event of a serious frontal accident.

A diagnostic system continually monitors the readiness of the squib, sensors and wiring integrity of the SRS. Monitoring begins when the ignition key is turned to position 1 (and further) and continues when the car is being driven.

If the key is turned to position 1 and left in that position, the SRS telltale in the Check-Control should illuminate for about 6 seconds and then go out.

The SRS indicator telltale should also illuminate for about 6 seconds following the engine start.

If the telltale does not light when it should or does not go out after about 6 seconds or comes on while driving or if it flutters, the system is not ready to operate during an accident; in this event have the system tested by an authorized BMW dealer as soon as possible.



In connection with the seat belt the SRS offers the best preconditions for the protection of the body in case of a serious accident.

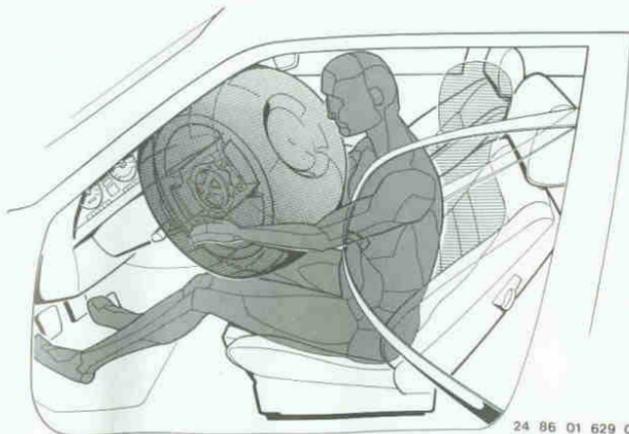
An occupant of an automobile who is not restrained during an accident will continue to move forward at the vehicle's speed until striking the car interior. No person is strong enough to resist impact forces by propping his body with his arms. The forces involved in only a 30 mph/48 km/h accident are equivalent to those involved in a fall from 80 feet. It is always necessary to wear a seatbelt because only a correctly worn seatbelt can provide a measure of protection from these large impact forces – forces that can come from any direction.

Seatbelts also provide additional protection against loss of control during manoeuvres done in order to avoid accidents.

However, during frontal collision (only frontal collisions) which are usually the most severe, the airbag supplies additional protection by cushioning the driver from the steering wheel. The airbag supplements the restraining function of the seatbelt and cannot develop its maximum protection potential unless the seatbelt is used. The airbag is mounted under the

cover in the center of the steering wheel and is designed to inflate in a fraction of a second during collisions equivalent to 12 mph/20 km/h and faster frontal impacts into solid objects.

There is also a knee bolster under the dashboard to help the seatbelt restrain the lower portion of the driver.



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3-06 Check-Control, warning lights

The **Check-Control** confirms the function of the controlled systems. It monitors before and during a journey.

Any malfunction detected by the Check-Control is displayed each time the engine is started, and stored in the system's memory. Have these faults rectified without delay in the interests of reliability and safety.

The Check-Control inscription lighting will illuminate if there is a malfunction when the car is initially started. The lighting will automatically go out after a delay or after acknowledging the appropriate warning signal. (Stepping on the footbrake.)

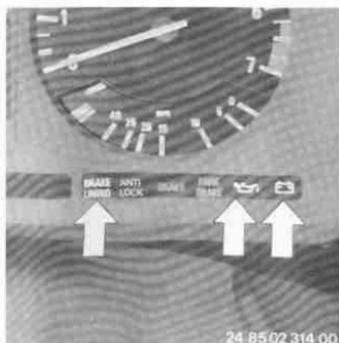
A reminder in the Check-Control shows a visual warning signal "FASTEN SEAT BELTS" and will be actuated for a time of about 6 sec. when the Ignition is switched on. At the same time a warning gong will sound. The gong will not sound, when the driver's belt is put on before switching on the ignition.

Also, the gong is actuated when the ignition key is left in the lock and the driver's door is opened.

Be very careful when **starting the engine inside a garage** or other enclosed space: do not inhale the exhaust gas, which contains odorless and invisible monoxide and is therefore highly toxic. Always open the garage door before starting the engine.

After the engine has been started, the **battery charge, oil pressure and brake pad wear warning lights** will go out.

If they remain on, or go out but come on again during the journey, refer to the instructions in **Section 5**.

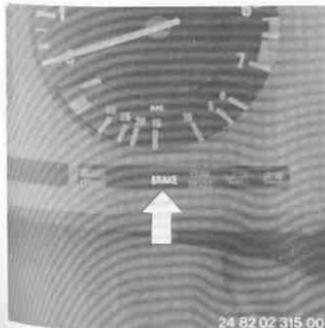


The brake fluid warning light also goes out after the engine has been started. If it remains on, this indicates loss of brake fluid from the reservoir, and in addition loss of pressure from the power steering circuit or the brake-system pressure reservoir.

If the light comes on suddenly during a journey, refer to **Section 5**.

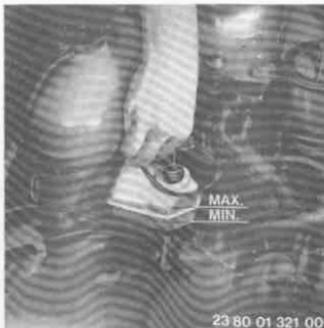
The **antilock braking system (ABS)** further increases active road safety.

The yellow **ANTI LOCK telltale** goes out after the engine has been started. If a fault develops in the ABS, the telltale will come on during the journey. The antilock system is then out of action, but the normal braking system remains fully operational.



Brake fluid is hygroscopic by nature, that is to say it will tend to absorb moisture from the atmosphere over a period. In order to ensure that the brake system remains fully operational, the brake fluid must be replaced once a year.

The reservoir should be filled to the upper "MAX" mark.



The electric heating elements on the rear window ensure unrestricted vision to the rear and help to prevent or remove fogging or ice build-up in freezing conditions.

When cleaning the inside of the rear window, avoid abrasive substances or solvents which might damage the electrodeposited heating elements.

Do not obstruct rearward vision with large objects placed on the shelf below the rear window, and remember that these could fly forward during a collision and cause injury.

Free movement of the pedals must not be obstructed by loose mats or objects lying in the driver's footwell, since these could slide under the pedals and restrict their movement.

Do not neglect the wiper blades. If they leave streaks or unwiped areas, they may affect your view of the road. **Wiper blades should be replaced at least twice a year.**

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3-08 Tires, tread wear indicator

The **radial-ply tires** approved by the factory for your BMW have been carefully selected for optimum road safety and the desired high level of ride comfort. Only radial-ply tires of the same make and tread pattern must be used on all four road wheels.

The condition of the tires and **maintenance of the correct tire pressures** will not only affect tire life but also play a great part in assuring safe driving under all conditions.

Before any lengthy journey, and regularly (at least once a week), **tire pressures should be checked**. Do not forget to keep the spare tire at the correct pressure too, allowing approx. 4 lb/in² or 0.3 bar more than the pressure required when the car is fully laden.

The specified tire pressures are shown on page 1-15 of this handbook. Using lower pressures than those specified will not improve the already high level of ride comfort. On the contrary, it will endanger driving safety since the tire's ability to withstand heat build-up when driving fast will be reduced, the sidewalls will tend to overheat due to greater flexing, rolling resistance will be increased and thus tire wear encouraged. Excessive tire pressures also affect ride comfort and safety too. They produce excessive stresses on the fabric carcass of the tire, increase tread tension and thus encourage premature wear.

Tire failure is frequently caused by running at the wrong pressures.

The valves should be protected against dust and dirt by screw-on caps. Dirt entering the valves can often lead to gradual loss of pressure.

At high speeds, tires have to withstand enormous loads, particularly during hot weather and when a full load is being carried (passengers and luggage). Note that the specified increased pressures must be adhered to and the **permissible gross weight** not exceeded.

For your own safety – check tire pressures regularly.

Check general tire condition, too, as often as possible and look for localized damage, foreign bodies in the treads, tread wear and remaining tread depth.

Although the law in some countries may accept **tread depths** as low as 0.06 in or 1.6 mm it is recommended to replace tires when the treads have worn down to 0.12 in or 3 mm. Sudden and highly dangerous aquaplaning may occur at high speeds when water is covering the road surface, despite the fact that the depth of water does not appear dangerous if the vehicle is operated with tires of sufficient tread.

If you cannot avoid driving over an obstruction, such as a curb or a severe bump in the road, approach it carefully and at moderate speed to minimize the chance of damaging the tires.

Tread wear indicators

Your BMW is fitted with steel-belted radial tires, which incorporate built-in tread wear indicators. These are molded into the bottom of the tread grooves and will appear as approx. 1/2" (13 mm) wide bands when the depth of the tread becomes 0.06 in. (1.6 mm). The indicators help you to visually determine when your tires have been worn down so far that they need replacing. If they appear in two or more adjacent grooves, tire replacement due to tread wear is recommended.

BMW driving hints – economy



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- Driving
- Economy
- Checking oil levels
- Checking coolant
- Battery
- Disc brakes
- Tires
- Winter operation
- Ski rack

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On your way

Your BMW is designed to operate with unleaded fuel with an anti-knock index of 87 AKI. This designation is comparable to Research Octane Number 91 RON.

Traveling in foreign countries

Prior to using your BMW in a foreign country, check to ascertain if fuel of the required octane level is available to avoid engine damage.

Should unleaded fuel not be available in the foreign country in which you are traveling or intend to travel be aware that the use of leaded gasoline will render the oxygen sensor and catalytic converter of your BMW inoperative. As a result, the vehicle will not meet the emission requirements of the US and Canada and maximum fuel economy will not be obtained. It will, therefore, be necessary upon your return to the US or Canada for the fuel system to be purged of the leaded fuel and both the oxygen sensor and catalytic converter to be replaced in order for the vehicle to be legally operated in the US and Canada.

Your car's **fuel economy** is mainly dependent on your style of driving. High-speed driving, acceleration to the limit in all gears, violent cornering and sudden braking all take their toll, not only in terms of heavy fuel and oil consumption, but also faster wear of brakes, tires and all the engine parts.

After driving for a while in dense city traffic or bumper to bumper, we recommend letting your engine **"take a deep breath"** by

covering the next mile or two at engine speeds of 3000 rpm. This will help eliminate any carbon build-up in the cylinders.

Observance of the **prescribed tire pressures** does not only influence tire life but also handling, fuel consumption etc. Make it a habit before starting any long journey, and in any case at least every two weeks, to check tire pressures. You will find a list of correct pressures on the driver's door pillar and on page 1-15 of this handbook.

It is not recommended to allow the engine to warm up at idling speed. Drive away at moderate engine speeds immediately after starting. However, if the outside temperature is exceptionally low the engine should be allowed to run at increased idle speed for about half a minute, to ensure proper circulation of the engine oil. Never run a cold engine at high speeds or its useful working life will be seriously reduced.

When **declutching**, always push the clutch pedal down fully; never drive with the foot resting on the pedal.

Drivers of cars with automatic transmission should operate both accelerator and brake pedal **with the right foot only**.

The **brake booster servo** on your BMW operates **hydraulically**, so that the necessary oil pressure in the pressure reservoir is present only when the hydraulic pump is driven by the engine. When the car is moved with the engine off and the pressure reservoir empty, for instance when being towed, a much higher pedal pressure than usual will be needed to produce the anticipated braking effect.

Reductions in exhaust emissions and fuel consumption and the quality of the fuel used all influence the running characteristics of the engine.

Varying operating conditions are largely compensated by the measuring and control functions of the car's electronic system and by the high design and production standards of individual components. Individual systems such as electronic ignition and fuel-injection are also important in this respect.

Unusual engine and drive characteristics, for example when accelerating from a low engine speed, when combustion recommences after the overrun fuel shutoff has operated or at a low engine idle speed, are design features resulting from the compromise between demands for lower fuel consumption, ecologically more acceptable motoring and greater ride comfort, and not a sign that the vehicle needs attention.

CAUTION!

Do not drive with your foot resting on the brake pedal. "Riding" the brakes may result in abnormally high temperatures, lining wear and possible brake failure.

The **economy of your BMW depends to a large extent on your driving style**. Driving economically means watching the traffic well ahead and adapting to the conditions. Driving economically does not necessarily mean driving slowly.

Refer to the following pages for suggestions and explanations on economical driving.

The 'Ten Commandments' for energy-conscious driving

1. Do not warm up the engine to operating temperature at idle speed, and never leave the engine to idle for long periods.

Driving your car away immediately after starting is the quickest way of warming up the cold engine to its normal operating temperature. And the right operating temperature means greater fuel economy. Switch off the engine when you stop for a prolonged period. Only three minutes at idle speed cost as much as $\frac{3}{4}$ mile (1 km) on the open road.

2. Do not drive up to maximum speed in 1st gear – use it only for starting off.

First gear consumes more fuel than any other gear at a given road speed. Full-throttle acceleration results in unnecessarily high fuel consumption.

3. Shift up to a higher gear as soon as conditions permit and try to drive in the higher and more economical 3rd, 4th or 5th gear.

Example: Driving at a steady 31 mile/h (50 km/h) in 2nd instead of 4th gear consumes up to 100% more fuel.

It can still be as much as 30% more if you use 3rd gear instead of 4th at the same speed. BMW engines have such excellent torque that they can be driven without hesitation at low speeds in high gears, e.g. at 31 mile/h (50 km/h) in town traffic.

4. Adopt a moderate driving style and avoid extremes.

Do not accelerate when you can see that you will have to brake in the next few moments. Drive smoothly and steadily. Try to keep off the brakes and avoid traffic jams whenever possible.

5. Avoid driving at full throttle for long periods.

The maximum power potential of a car is one of its most important safety reserves. However, if you always use maximum power on busy main roads, you will be constantly braking from maximum speeds. That costs energy. Steady average speeds help save fuel, nerves and wear and costs only very little extra time.

6. Check tire pressures regularly.

If the tire inflation pressure is less than specified, rolling resistance is increased and your fuel consumption too.

7. Do not carry unnecessary weight (ballast) or use a roof rack.

Every bit of extra weight wastes energy. Do not carry your 'weekend luggage' with you all the time. A roof rack increases air resistance and fuel consumption. Remove roof or ski racks immediately after use.

8. Plan your journeys in advance if possible.

Every traffic jam and every unnecessary, tiresome search for a parking space costs energy. You should plan to avoid rush hour traffic and times when there is a lack of parking spaces in city centers. You can often miss traffic jams by starting your journey half an hour earlier or later.

9. Have your car serviced regularly and the necessary adjustments for maximum fuel economy performed.

An ideal fuel-air mixture and optimum utilization of fuel depend on the condition of the air cleaner, spark plugs, valves, fuel injection system and the ignition system. Regular servicing can produce a fuel saving of up to 10%. That means that the average driver would use 33 Imp., 40 US gal (150 liters) less fuel over the year if his car were always set up and adjusted correctly.

10. Check your car's fuel consumption regularly and accurately.

Only if you know your own car's fuel consumption can you compare it with the car maker's specifications and empirical values. And it is only possible to keep a check on your method of driving and have minor engine adjustments performed when necessary if you record the fuel consumption.



4-04 Economy

We would like to give you a few additional and useful tips:

Commandments 1-5:

More skilfull driving pays off where it is needed most: under difficult conditions.

Let us start at a common point: A medium-size BMW car consumes about 7 liters/40,3 mile/imp. (100 km) gal or 33,6 mile/US gal) at a steady 37 mile/h (60 km/h). But in town traffic we average only 12,5 mile/h (20 km/h) and usually consume twice as much in the process. It is in this area therefore that we can adopt new ways of behaving and observe some relatively simple driving rules. The simplest basic rule here is always to drive in the highest possible gear or, put another way, use the lowest engine speed at all times. You will have to change gear a little more often, but the fuel saving is considerable.

While you drive, be conscious of the next gear shift or braking decision. Do not accelerate when you can see that you will have to brake a few moments later. Cars which move forwards in a series of jerks not only hinder the smooth flow of traffic, but are also constantly wasting energy.

Sensible use of engineering excellence

One very good psychological precondition for staying cool and composed at the wheel is a car which makes it just as easy to accelerate as to give way. Cars which make one drive considerably, offer safety reserves that enable them to be maneuvered with agility and speed in traffic whenever the need arises, and help their driver in many situations in which one suddenly requires the power and safety potential of a BMW. As we said, when you have the power to accelerate, it costs only a smile to hold back and give way.

The instruments show you the way to economy

The fuel consumption indicator dial in the tachometer indicates fuel consumption. Low consumption is encouraged of you shift to a higher gear at the earliest practical moment when accelerating.

It is clear to see how important it is to change gear at the earliest practical moment. BMW drivers have the advantage of possessing an engine which develops high torque over a wide rpm range and thus allows up-shifts to be made very early without sacrificing either safety or comfort.

Our recommendation: Watch your tachometer. Note the most favorable torque range so that you always change to the next gear at the ideal shift point.



Thoughtfulness reduces the burden on you and your tank

The graph below illustrates how different fuel consumptions can be achieved at the same average speed when two different driving styles are employed.

The graph plots the driving methods of two drivers: Driver A (solid line) and driver B (broken line).

Driver B accelerates fully in 1st and 2nd gears between the first and second set of traffic lights and arrives at the lights earlier than driver A, but must brake hard because the traffic lights are "red". Driver A on the other hand does not use full throttle through the gears and shifts up to 3rd gear. He sees that the lights are at red,

reduces his speed and can then drive through the intersection in 2nd gear without braking because the lights change to green as he arrives.

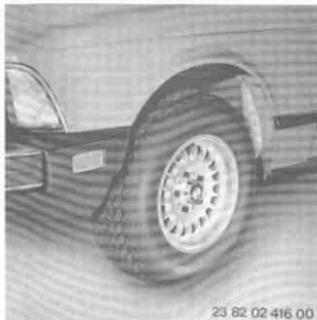
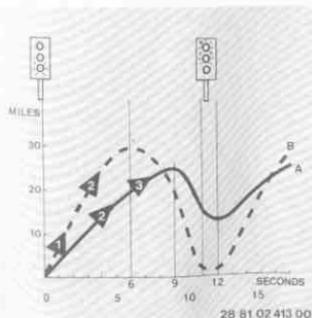
A high average is better than high speed

When one looks at the speed diagram of a car that has been driven at the maximum speed at every opportunity on a busy main road, one notices the following:

The extreme fluctuations clearly demonstrate that it can be far better to travel at a steady average speed which matches the general flow of traffic. That saves a lot of nerves and a lot of energy as well. Every time the car is braked heavily the brake discs unnecessarily convert valuable energy into heat.

Commandment 6:

Driving with the tires under-inflated reduces their useful life and increases the risk of tire damage: the tire is flexed and deformed excessively and thus becomes too hot. Its rolling resistance is also increased, more engine power is required and fuel consumption is accordingly higher. Check tire pressures regularly, at not more than 14-day intervals.



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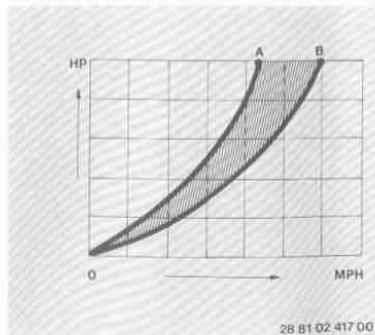
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Commandment 7:

Energy – disappearing?

The graph below shows the power which must be expended to overcome air resistance as vehicle speed rises. A segment is shown (see shaded area) because car shapes vary and therefore have a lower or higher air resistance to overcome.

- A = Higher air resistance
(high drag coefficient)
- B = Lower air resistance
(low drag coefficient)



Commandment 9:

A united effort to reach a common target: may we ask for your undivided attention?

The automobile industry, in Europe in particular, has progressively reduced fuel consumption over the past decades while satisfying greatly increased customer requirements. Its extraordinarily intensive investment and research programs are directed at improving the results obtained up to now while maintaining or even surpassing present safety and comfort requirements. But that in itself is not enough. As we have to save energy now with the existing car population and existing technology, we ask all car users to make their contribution – in addition to the efforts of the government and the industry.

BMW engine technology makes it easy for you to adopt a reasonable approach

The best prerequisite for a new economical way of driving is the ultimate in engines – as offered by BMW. A power unit that delivers high torque at the lowest possible engine speeds.

In this respect a BMW offers you maximum efficiency. The special characteristic of all BMW cars is their ability to accelerate smoothly at high rpm as well as giving you plenty of smooth high end power.

A BMW responds with smooth power delivery

The effect of a very high torque at very low rpm can be demonstrated.

The BMW can be driven smoothly, comfortably and safely in high gears, i.e. the economic 3rd–5th gears, at low speeds.

It will accelerate quickly when required and, because the engine is not under load, consumes very little fuel even when compared with smaller cars.

The engine is supplied with dust-free air by way of the air cleaner. If the air cleaner is very dirty, the engine will be starved of fresh, clean air and the result will be an increase in fuel consumption.

Fouled or worn spark plugs reduce engine power and waste fuel. Checking them regularly also contributes to the economic use of energy.

Your BMW dealer can perform the fuel injection system service not only to provide you with optimum economy but also to ensure that the exhaust remains clean and the environment is protected.



Commandment 10:

Having faith is good, checking is better

The secret of energy-conscious driving is knowing exactly what your car consumes. Only if you establish what the effects of different driving styles are on consumption and what readjustments can do for the engine you will act and react with greater awareness in future. Keep a constant check on how much fuel you use.

Preconditions for fuel consumption measurement

1. The engine must be broken in.
2. Fill the tank (completely full).
3. The car should be perfectly level when you fill up.
4. Get rid of air pockets in the tank by rocking the car.

'Observe' - Measuring the consumption

After finishing your journey, fill the tank again (completely full).

This is how you calculate your consumption in miles per gallon (or liters per 100 km):

$$\frac{\text{Distance covered in miles}}{\text{Fuel consumed in gallons}} = \text{Fuel consumption in miles per gallon}$$

or

$$\frac{\text{Fuel consumed in liters} \times 100}{\text{Distance covered in km}} = \text{Fuel consumption in liters per 100 km}$$

Please observe the specifications regarding grades of fuel and engine oil.

MAINTENANCE SERVICES SHOULD BE PERFORMED BY YOUR AUTHORIZED BMW DEALER OR ANY OTHER QUALIFIED AUTOMOTIVE SERVICE OR REPAIR ESTABLISHMENT WHICH IS COMPETENT TO PROVIDE SUCH SERVICES AND WHICH CAN BE RELIED UPON TO USE PROPER PARTS AND PRACTICES

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4-10 Engine oil consumption, checking oil level

Engine oil consumption, like fuel consumption, depends on the way in which the car is driven and the operating conditions.

We recommend that you check engine oil level regularly, for instance whenever you buy fuel. If necessary, add fresh oil to the filler on the engine's rocker cover. Do not fill beyond the upper mark on the dipstick.

The most accurate oil level reading will be obtained with the car standing on a level surface and the oil cold (before the engine is started), or after allowing the oil to drain back into the sump for a short period (if the engine has already been run).

Make sure that the loop handle of the dipstick points towards the front of the car and that the dipstick is inserted fully into the tube on the engine block.

The quantity of oil represented by the space between the two marks on the dipstick is app. 1.1 US quarts, 1.75 Imp. pints (1 liter).

Adding too much oil serves no useful purpose and may even harm the engine. Since this excess oil will tend to be burned off within a short time, it may create the impression that oil consumption is heavier than usual.

The best procedure is to add fresh oil only when the level has dropped almost to the lower mark on the dipstick. However do not allow the level to fall below the minimum-level mark.

Our engines are designed to require **no oil additives** if one of today's highly advanced brand-name lubricating oils is used. Using additives could cause engine damage. The same applies to the oil for the manual gearbox or automatic transmission, final drive and power steering.



Description of maintenance routines

Engine Oil Specifications

Change engine oil at least twice a year before and after the winter.

Although API SE grade oils are approved for use in your BMW, API SF grades are **highly recommended** due to their increased oxidation stability, wear protection, and detergent properties. The increased level of protection available by the use of SF grade oil will help you to attain the maximum amount of engine service engineered into your BMW.

Total oil content

5.3 US quarts / 5 liters / 8.8 Imp pints + 0.8 US quarts / 0.75 liter / 1.3 Imp pints if filter is changed.

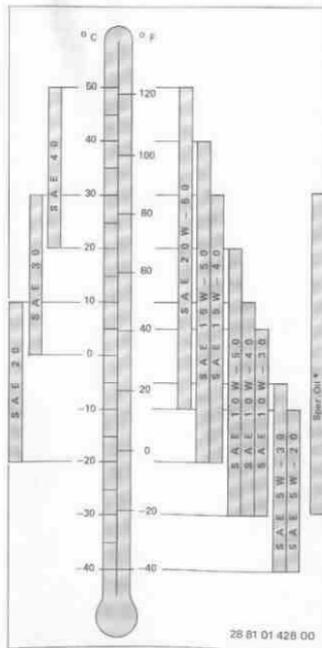
Oil level: not higher than upper (maximum) dipstick mark.

To change oil: with engine warm, unscrew the oil drain plug (19 mm wrench) at the bottom right of the sump. Allow the old oil to drain out fully, then replace and tighten the drain plug. Replace the oil filter whenever the oil is changed.

The chart indicates the SAE grades to be used depending on the predominant air temperature.

The temperature limits set by the SAE grades may be exceeded (above or below) for a short period.

Heavy duty engine oil may be used in the manual gearbox if the car is driven in extremely cold climates. Contact your BMW dealer for details.



* Special oils individually approved by BMW (low friction lubricants). Contact your BMW dealer for details.

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4-12 Oil level check in power steering, brake fluid

Check oil (ATF) level in the automatic transmission regularly, e.g. when engine oil level is checked.

The car should be standing on a flat, level surface, with the parking brake applied. The engine should be at **normal operating temperature** (80°C/176°F). Select P or N at the transmission selector lever, and allow the engine to idle.

Pull out the transmission dipstick, wipe with a **lint-free** cloth and push back in to measure the oil level. It should be between the two dipstick marks.

The quantity of oil represented by the distance between the two dipstick marks when the transmission is at normal operating temperature is app. 0.45 Imp. pint/0.30 US quart/0.25 liter.

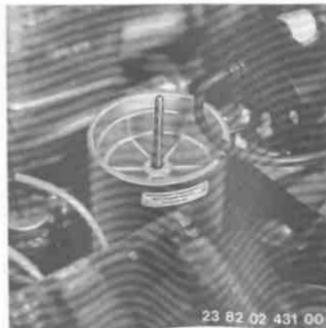
Oil grades: see Section 6.



Check oil level for the power steering and brake hydraulics.

With the engine stopped, remove the wing nut and take off the fluid reservoir cover. Apply the foot brake several times until the oil level ceases to rise or the pedal becomes noticeably more difficult to press down; about 10 brake applications will be necessary. The oil level must rise to app. 0.4 in (10 mm) below the upper rim of the reservoir. Correct if necessary by adding more oil of the correct grade (see Section 6).

Attach the cover to the reservoir and tighten the wing nut. Make sure that the cover is correctly seated, and that there are no leaks in the power steering circuit.



The transparent reservoirs for the **brake and clutch hydraulic fluid** are in the engine compartment on the left, and enables the fluid level to be checked without removing the cap.

If the fluid level in the brake reservoir should fall, an electrical signal device will cause the red "Brake" warning lamp in the instrument cluster to come on.

Brake fluid is hygroscopic, that means it gradually absorbs moisture from the atmosphere. In order to ensure that the brakes remain fully operational, the **brake fluid must be replaced once a year.**

Brake fluid level in reservoir: up to the "MAX" mark.

Use only DOT 4 brake fluid.



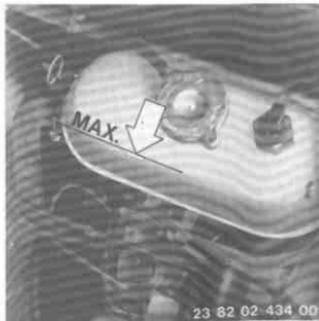
The transparent coolant tank permits coolant level to be checked without removing the cap.

Warning

Open the tank cap only when the engine has cooled down and the coolant needle is on the lower third of the scale, or else hot water or steam may escape and cause scalding.

Turn the cap slightly counterclockwise to allow excess pressure to escape, then remove completely.

Add water up to the mark on the tank and screw on the cap clockwise.



Overfilling will dilute the additives in the coolant, which will escape through the overflow pipe and no longer possess the correct antifreeze and corrosion inhibitor concentration.

Apart from regular checks on coolant level, antifreeze concentration (at least 50% = -35°F = -37°C year round) and the condition of hoses and hose clamps, we recommend that the cooling system be drained and refilled every two years. At the same time, check that the filler cap seals properly and that the pressure relief and vacuum equalizing valves are in good working condition.

The cooling system including heater circuit holds approx. 12.7 US quarts/12 liters/21. Imp. pints.

The fluid of the cooling system needs no further addition agent. Use only factory approved fluid to prevent damage.

In cold weather, the windshield washer system can be kept fully operational by adding windshield washer antifreeze in the proportions recommended by the manufacturer.

Check operation of the system at regular intervals.

4-14 Battery acid level, battery removing

Your BMW's battery is maintenance free to DIN standard 43539 Part 2 and the electrolyte added initially should normally last for the life of the battery. If the level is too low in any of the cells, for instance after spending long periods in a hot climate, top up with distilled water (not acid).

Take off the cover and unscrew the 6 cell plugs. The acid level should be about 0.2 in or 5 mm above the upper edges of the plates or at the mark visible in the filler opening, depending on battery type.

Keep the upper part of the battery clean and dry.



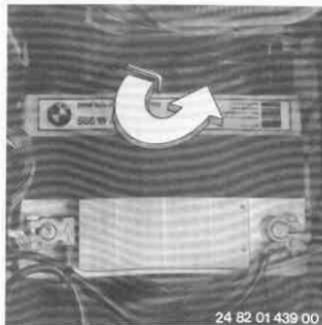
24 82 01 437 00

To remove or install the battery, loosen or tighten the toggle screw with retaining bar.

Important notes:

1. Acid or lead oxide from the battery terminals must never be allowed to contact the eyes, skin or clothing. Rinse off immediately with clean water, and consult a physician if necessary.
2. Never short-circuit the battery poles; this will cause severe overheating and could lead to the battery case bursting.
3. When the cell plugs have been removed, never bring an open flame near the battery or cause any sparks in the vicinity. This could lead to an explosion.
4. Never detach the battery leads when the engine is running, or else an over-voltage will occur and damage the car's electronic equipment beyond repair.
5. To recharge the battery without removing it from the car, the engine must be stopped and both battery leads disconnected.
6. Disconnect the negative lead from the battery before attempting any work on the car's electrical system, to avoid the risk of a short-circuit.

7. If the vehicle is to be laid up out of use for a fairly long period (see **Section 5**) remove the battery, have it charged and store in a cool place with no risk of frost damage. The battery must be re-charged after not more than 6 months or it will discharge completely and cannot then be re-used on the vehicle.
8. To remove the battery, first disconnect the negative lead, then the positive lead. Unscrew the battery retaining bar. When installing, first secure the battery with the retaining bar, then connect the positive lead and finally the negative lead.



24 82 01 439 00

Useful information on disc brakes

Your BMW is equipped with power brakes to reduce the required pedal effort utilizing a hydraulically operated brake booster servo. The necessary hydraulic pressure to operate the brake booster is generated only while the engine is running. Should the engine stop for any reason, several brake applications with power assist will still be available due to a reserve designed into the system.

When the vehicle is moved with the engine stopped and the power assist reserve exhausted, for example, when towing, a higher pedal pressure will be needed to produce an equivalent braking torque.

The engine's pumping loss due to operating the engine with closed throttle and frictional loss, can be utilized effectively to brake the vehicle by selecting a lower gear up to the rpm limit of the engine. This technique is commonly referred to as "engine braking".

Warning:

Never coast with the clutch pedal depressed, the shift lever in neutral, or the ignition switched off.

To assure proper seating of the brake pads to the discs to maximize braking effectiveness, it is essential to observe the break-in instructions for the braking system of a new vehicle or whenever new brake discs and/or pads are installed. See operating instructions, break-in rules.

BMW brake components, wheels and tires have been carefully selected and engineered to provide a high degree of control under severe and diverse operating conditions. It is, therefore, recommended that BMW replacement parts be used and brake components, wheels and tires not be altered to maintain the carefully balanced braking and handling characteristics designed into your vehicle.

A disc brake system offers optimum braking efficiency, smooth response, and a high load capacity. The high temperatures which occur during brake applications, e. g. on mountain passes when driving quickly, necessitate a maximum degree of cooling which is provided by the air flow generated by the peripheral speed of the brake discs and wheel design. Altering vehicle design could inhibit air flow and impair braking effectiveness.

A slight rust film may develop on any disc brake equipped vehicle parked for an extended period of time. The rust film will be substantially less or non-existent on the brake disc surface protected by the brake pads; therefore, after such periods of extended parking, the driver may notice a slight pulsation during braking. This pulsation will disappear as the brakes are

again used. Slightly heavier than normal applications during braking will accelerate the rust removal process.

Your BMW is equipped with corundum coated brake pads. This slight abrasive coating helps the brake pads remove minor surface rust on the discs during break-in for approximately 200 miles (300 km). During such time, a higher than normal "disc-brake squeal" (a very high pitched noise) may be apparent.

Keeping your disc brakes in trim

In wet conditions or during rainfall it is advisable to apply the brakes briefly with light pedal pressure every few miles. The heat generated in this way keeps the discs and pads dry for a certain period.

Before you park the car after driving through the rain, and especially if salt has been spread on the roads, lightly brake the car to standstill so that the brake discs remain dry and cannot corrode easily.

The most effective braking action is achieved not with locked wheels, but when the wheels are still just turning. Locking the wheels can be dangerous, as locked front wheels can no longer be steered, and locked rear wheels cause the car to slide sideways or spin.

If brake disc corrosion is advanced and the brake pads are dirty (glazed brake area, blocked drain grooves), the discs and pads should be inspected, cleaned or repaired.

The brake system of your BMW should be checked regularly before and after winter, possibly in conjunction with the prescribed inspection work.

Important: Always have the brake fluid changed every year.

We recommend you to consult a BMW dealer or any other qualified service and repair establishment without delay in the event of any faults occurring in the brake system.

All you should know about tires

The factory-approved **radial-ply tires** have been chosen to suit your BMW and provide both optimum road safety and the desired level of ride comfort.

The condition of the tires and maintenance of the **specified tire pressures** are vital factors affecting **tire life** and also **road safety** to a very high degree.

Tire pressures

Incorrect tire pressures are a frequent cause of complaints concerning tires. Furthermore, they may seriously affect the roadholding of your BMW.

Check tire pressures at regular intervals and before starting fairly long journeys, but at **least every two weeks**. Do not forget to check the spare tire as well: it should be kept at app. 0.3 bar (3-4 lb/in²) above the specified pressure for a fully-loaded vehicle.

The correct tire pressures for your car are shown on page 1-15.

If tire pressures are lower than specified, this will adversely affect road safety by reducing lateral locating force. The increased degree of tire sidewall flexing will

lead to excessive heat build-up and thus introduce an **element of risk into high-speed driving**. Fuel consumption will be increased by the tire's greater rolling resistance, and **tread wear will be more rapid**.

If tire pressures are too high, ride comfort will suffer, the tire may lack grip and tread wear will again be rapid and uneven.

The tire valves are provided with **screw dust caps** to keep out dirt. If dirt enters the valve, a slow leak may result.

Tires have to withstand very severe loads at high speeds, particularly in hot weather and at the maximum weight limit for your car. Remember to increase tire pressures if loads are high, and not to exceed the **gross weight limit**.

**For your own safety:
check tire pressures regularly!**

Tire treads - tire damage

Check the condition of the tires frequently: look for damage, stones and nails, premature wear and overall tread pattern depth.

The **tire tread** is regarded as acceptable by law in many countries if only 1 mm (0.04 in) deep, but it is advisable to renew tires when the tread depth has worn to 3 mm (0.12 in). Below this depth, there is a serious risk of aquaplaning at even moderately high speeds and when the roads are apparently not too wet. If the tire wear is down to 1.6 mm (0.063 in)

tread depth, a wear indicator will become visible at the base of the tread pattern as a reminder that the legal limit of tire wear is approaching.

Always match your road speed to the condition of your tires - particularly the remaining tread depth - and to weather conditions.

Tire tread wear on the front wheels tends (for design reasons) to be slightly more rapid on the outer shoulders of the tire, whereas on the rear wheels it is concentrated more on the inner shoulders and the center of the tread. For this reason, the best and most consistent roadholding and grip are obtained if the tires are **not** interchanged between the front and rear wheels, although overall tire life may then be slightly reduced.

On the other hand, we recommend that front and rear wheel alignment be checked once a year and whenever new tires are fitted. Any exceptional rates of tire wear imply that wheel alignment is incorrect; this should be checked and repaired.

Tires must never have their treads recut, because of the risk of damaging the tire carcass.

Any **foreign body** (nail or similar sharp object) penetrating the tire may cause a slow puncture which will be recognized by the need to correct the tire pressure more frequently. In this event the tire should be checked and either repaired or replaced as soon as possible by your BMW dealer or a specialized tire workshop.

4-18 Tires

Drive at a moderate speed over poor road surfaces and approach unavoidable obstructions, such as a curb or severe bump in the road, with care so that the inner structure of the tire does not suffer damage invisible to you.

Take care not to bump the **tire sidewalls** when parking or driving onto loading ramps, car lifts etc.

Avoid overloading your BMW – especially on vacation trips. Overloading the vehicle can also exceed the tire's permitted load capacity and thus cause **premature** or subsequent damage.

Tire damage can be extremely dangerous for both yourself and other road users.

Replacing tires

Only tires of the same type and construction must be fitted on all four wheels. A mixture of cross (bias)-ply and radial-ply tires should not be used as it will alter the vehicle's handling properties.

Furthermore, in order to maintain the good ride and handling properties of your BMW all tires should be of the same make and tread pattern.

BMW does not approve the use of remolded or retreaded tires owing to the possibility of differences in the tire carcasses and their sometimes very advanced signs of aging, which can have a detrimental effect on their durability and under certain circumstances, the car's handling and safety.

Before undertaking any change to the tires on your car, please consult a BMW dealer concerning the practical value, legal position and factory recommendations.

A knowledge of tire and rim markings will help you make the right choice of tire. The following tire size designations are possible:

195/70 HR 14 89 H or
195/70 SR 14 89 T M + S***

195/70 H R 14 89 H

Tire width in mm _____
 Cross sectional ratio in % _____
 Speed rating code letter _____
 Type code letter for radial _____
 Rim diameter in inch* _____
 (on TR-tires in mm) _____
 Load rating code** _____
 Speed rating code letter** _____

The speed rating code letters indicate the maximum permissible road speeds for summer tires (subject to legal limits):

SR = up to 110 mile/h (180 km/h)
 HR = up to 130 mile/h (210 km/h)
 VR = over 130 mile/h (210 km/h)

* 1 inch = 25.4 mm

** only on SR and HR tires, but not on VR tires

*** M + S = mud and snow

We recommend the **exclusive use of BMW-approved tires.**

Important: When replacing or changing tubeless tires, always replace the rubber valve as a safety precaution.

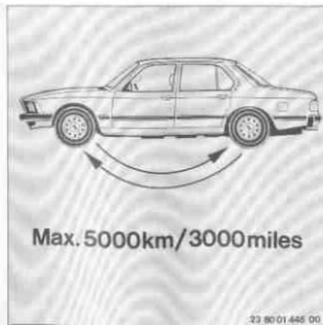
If, as a means of prolonging tire life, you wish to have the wheels rotated please bear the following in mind:

Due to the design principles of the front and rear axles and taking into account load and operating conditions, the front tires reach their wear limit first on the shoulders and the rear tires in the center of the tread. The higher the stresses (load, acceleration, lateral forces), the more wear will take place.

Changing the wheels from front to rear on the same side can in certain conditions have only a negligible effect on the service life whereas the handling and braking as well as the roadholding may be adversely affected.

If so desired the spare tire can also be put into use. In this case one must remember that this tire, possibly new, must be broken in and will at first not have the same degree of adhesion. Rotating the wheels round must be done on the same side and at short intervals app. 3000 miles (max. 5000 km). During the following period a difference in roadholding and straight driving (possibly brakes pulling to one side, smaller contact surface of rear wheels on the road) must be allowed for.

In the interests of your safety and optimum driving conditions we recommend that the wheels are not rotated because the increase in service life is negligible. With non-standard wheels and tires the wheels should definitely not be rotated.



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Operating your BMW in winter

The winter months often bring with them severe changes in the weather, and you must not only adopt a correspondingly careful attitude to driving but also take a few precautions to ensure that your BMW comes through the winter months reliably and without breakdowns.

On winter roads, traction is often very poor, and the driver must remember that braking distances are much greater than usual in many situations.

Before the cold season of the year commences, you are recommended to take your car to a BMW dealer or any other qualified service establishment, for the necessary winter preparations to be carried out.

In addition note the **engine oil specifications** for winter operation.

Do not wait until the next routine oil change to fill the engine with wintergrade oil if the weather turns cold suddenly.

Apart from checking oil levels during a BMW inspection, no special winter operating precautions are needed on the manual gearbox/automatic transmission, power steering, and hydraulic brake system.

The coolant on your BMW already contains a **long-term antifreeze and corrosion inhibitor**. The concentration must be kept at 50% all the year round. This will provide antifreeze protection down to app. -34°F (-37°C).

Use only reputable brand ethylene glycol antifreeze with corrosion inhibitors that are compatible with aluminium radiators.

Replace the coolant every 2 years. Check antifreeze concentration before and during the cold season. At the same time, inspect the cooling system for leaks and any coolant hoses which may have become porous or brittle.

Engine temperature is regulated by the coolant thermostat according to outside temperature and engine load. For this reason, **no radiator cover should be fitted** or the radiator grille blocked off.

The engine will only start reliably if the **battery** is fully charged. Remember, though, that a cold battery is less efficient, yet the demands made on it are more severe than in warm weather, with less driving after dark.

To prevent **rubber seals** on doors and lids from freezing, treat them with a rubber care product or silicone spray.

The car's paintwork, as well as **chrome plating or polished metal parts**, should be protected before and during the winter months with suitable bodywork care products.

Have your BMW's brakes checked as a precaution before and after each winter driving period. This work can usually be combined with whatever maintenance routine happens to fall due.

Winter tires

If **winter tires** (radial ply tires with special winter tread pattern) are installed, they must in the interests of good directional stability and steering control be of the same make and tread pattern **on all four wheels**.

Your BMW dealer will be glad to advise you on selecting the right winter tire for the anticipated operating conditions.

Also observe the specified **tire inflation pressures** and have the wheels balanced whenever you change a tire or wheel.

Always adhere strictly to the maximum road speeds specified for your winter tires.

When tread depth has worn to less than 0.16 in (4 mm), tires become much less effective in winter, and should be replaced as a safety precaution.

Use only snow chains according to SAE J 1232 classification "S". The snow chains may be used on drive wheels (rear) only.

Warning:

Even if your local speed limit for cars with snow chains is higher, or there is no official speed limit, do not exceed 31 mile/h (50 km/h).

In cold weather we recommend carrying the following items in case of emergency:

- a quantity of **sand** for traction on ice-covered slopes
- a **shovel** to extricate the car from snowdrifts
- a **plank** to act as a support for the car's jack
- a **brush and ice scraper** to clean the windows and body panels if they are covered with snow or ice.

Winter driving hints

When planning a fairly long journey in winter, allow plenty of time in case severe weather conditions and bad roads are encountered. Local papers, radio and TV, the telephone service and the automobile clubs provide a source of information on local road conditions, and whether certain mountain passes are open to traffic.

Before starting the journey, remove ice and snow from the windows, outside mirrors and light lenses. After a heavy fall of snow, remove snow from the roof, engine and luggage compartments to prevent it from blowing off and obscuring your vi-

sion. Clear snow from the air entry grilles for the heater/ventilating system below the windshield, so that airflow is not impeded.

Before getting into the car, try to remove slush, snow and ice from your shoes to avoid the risk of slipping off the pedals.

Driving when wearing ski boots is definitely not recommended, as it is then difficult to operate the pedals sensitively or to avoid touching the wrong pedal accidentally.

After starting a cold engine, particularly at temperatures below +5° F (-15° C), the gear shift may be stiff and the car's suspension may not respond smoothly for the first few minutes of a journey, and other items of equipment may prove noisier in operation. This is unavoidable while the oil is still thick and viscous.

When driving on slippery surfaces, depress the accelerator smoothly and slowly, and shift up to a higher gear quite early to avoid the use of high engine speeds. Keep a particularly large safety margin between your car and the one in front. Select the next-lower gear when conditions permit before reaching an uphill or downhill gradient.

To improve traction on icy or snow-covered roads and in hilly country when the car is otherwise unladen, approx. 110 lb (50 kg) of ballast can be carried in the luggage compartment. Make sure that the ballast is secure and cannot slip.

4-22 Cold-weather operation

When **braking** on surfaces providing poor traction, particularly on hills, always try to prevent the wheels from locking, since locked wheels cannot be steered. If the wheels lock, release the brake pedal momentarily and then depress it again. This braking principle not only enables you to bring the car to a halt on an icy surface, but may even prove sufficient to help you steer round an obstacle.

If the car is **immobilized** in deep snow, sand or soft ground, pack some form of material under the rear wheels to provide extra grip before the car digs itself in too far. If no other material is available, use the car's floor mats. If possible, obtain help to push the car back on to a firm surface. With a degree of skill, the car can be rocked out of the holes caused by spinning rear wheels; use a light throttle opening and select a forward gear and reverse in rapid succession, but avoid spinning the wheels, or the car will sink in deeper still. The parking brake can be applied lightly to prevent one rear wheel from spinning; remember to release it afterwards.

Snow chains are permitted on the rear (driven) wheels by twos only. They increase driving safety on snow and ice, enable the car to climb hills without slipping and reduce braking distances. The driver must, however, accustom himself to the car's changed handling characteristics. Remove the snow chains as soon as possible, as on clear roads they wear out very rapidly.

During a break in the journey, or when filling the tank, remove **built-up snow and ice from inside the wheel arches**, to ensure that the steering and suspension movements are not impeded.

When **parking your BMW**, prevent it from rolling away by selecting 1st gear or reverse as appropriate, or moving the automatic transmission selector to P. Apply the parking brake if parked on a slope. To prevent the parking brake linings from freezing to the drums in cold weather, use the parking brake to bring the car to a standstill from a slow speed, so that the linings and drums are dried by the heat thus generated.

Always keep the luggage compartment lid closed when on the move. This will prevent toxic exhaust gas from being drawn back into the car's interior. If you are carrying bulky items and cannot close the lid, it is a good precaution to close all the windows including the sliding roof if equipped, and run the fresh air or heater blower at medium to high speed.

If a closed car is driven in a **thunderstorm**, the occupants are inside a "Faraday cage", and protected against being struck directly by lightning. However, driving through a thunderstorm can still be dangerous: lightning can cause a brilliant flash of light and a loud detonation and startle the driver and the other occupants, with the likelihood of losing control, particularly on a wet road. Furthermore, the car's electronic equipment could be damaged or put out of action, and the tires could also suffer damage.

You are recommended to drive with great caution in thunderstorms, to keep away from roads passing over the tops of hills or across wide, flat areas, and if necessary to wait until the thunderstorm is over. Switch off the radio and retract the aerial. Close the windows and do not touch metal parts within the car.

Should a car be struck by lightning, it must always be examined by a competent repair shop for signs of damage, particularly to the tires.

To ensure the lowest possible roof loads and optimum drag characteristics, use only BMW-tested and -approved luggage and ski racks. When installing a **roof rack**, make sure that the mountings fit securely to the roof and are located as far apart as possible.

The roof load must be evenly distributed and not too large. Always stow the heaviest items at the bottom.

Make sure that luggage on the roof is tightly and properly secured, so that there is no danger of it shifting or even coming free during the journey. Consider the danger to other road-users.

Drive smoothly, avoiding jerky starts and sharp braking, and do not take corners and bends too fast.

Luggage on the roof increases the frontal area of the car, leading to higher fuel consumption and roof stresses.

It is recommended to take the luggage rack off the car when not needed.

Please comply with applicable state laws.

The **ski rack** (accessory) should be loaded so that the tail ends of the ski point forwards. Put only one pair of skis in each holder, with poles in the luggage compartment. Check all holders regularly.

Ski racks to match your car can be obtained from your BMW dealer.

4-24



BMW vehicle care – minor repairs



General care of the car
Long term storage
Wheel-changing
Starting difficulties
Coolant temperature
Brakes
Check-Control
Minor repairs
Towing, starting with
a dead battery
Windshield wipers
Manual operation of electric
equipment
Fuses
Bulb-changing
Trouble-shooting

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Care and maintenance

Your brand-new BMW is a splendid sight. Whether it stays that way, perhaps even for many years, depends on you, and on the care you are prepared to take.

Since the car's paintwork is exposed to so many potential environmental hazards, automobile manufacturers and paint suppliers are constantly working on further improvements to the strength and durability of modern paints.

The composition of the paints used by BMW, and the manner in which they are applied are to the very latest technical standards in this specialized field.

The manufacturer has used careful design techniques and the latest production methods for the body and other components to ensure that general upkeep of the car is simplified. The materials used were thoroughly tested in laboratories and under practical conditions before being approved, and are constantly being improved or updated as technical standards develop. This is BMW quality down to the last detail.

The high-gloss paint finish is not only chosen to appeal to owner's personal

tastes as far as the color is concerned, but also to provide maximum protection. It consists of **several layers** for reliable corrosion-proofing; the body cavities are not only primer-coated by the cathaphoretic dip process, but also coated with materials specially developed for this purpose in lengthy tests. The entire underside of the floor pan is given a sprayed-on, resilient PVC coating, followed by complete wax-based undersealing.

Every 12 months, during the **Annual Check**, have the body including the underside of the floor pan examined by the BMW dealer. Full details are given in **Section 7**.

It is always more pleasant to drive a clean, well-kept car, but it is equally true to say that regular care and maintenance can make a big contribution to safety and to your car's resale value.

The points to watch are listed below.

A large number of external influences can affect the quality and appearance of your car's paintwork, some of them purely local in origin. They govern the amount of care the paintwork will need and how often it should be attended to.

Road dust and dirt, the airborne deposits encountered in industrial areas such as fly ash, lime and soot, even tar stains, dead insects, bird droppings and the stains left when the car is parked under trees all contain various chemicals which, if allowed to remain on for a long time, can damage the paintwork in the form of spots, blisters, corrosion, flaking paint-

work and similar. The car should therefore be washed as often as necessary.

In **industrial areas**, the horizontal panels of the body in particular may suffer from deposits of fly ash, lime, oily soot or substances containing sulphur dioxide ("acid rain"), as well as other less easily identified deposits. Only regular care of the paintwork can avoid damage in such circumstances.

In **coastal regions** the high salt content and humidity of the atmosphere greatly increases the risk of body panel corrosion.

In the case of **mechanical damage** caused by sand, road salt, grit etc., the paint surface may be damaged or penetrated, and corrosion may then spread across the panel under the paint.

If you choose to look after the car yourself, your BMW dealer can supply you with conveniently-sized packs of all the correct car-care products.

What you should know about paintwork care:

To protect the car from the start against gradual deterioration of the paintwork in areas of high atmospheric pollution or where "natural" substances in the air could damage the paint finish (industrial zones, railways, sap and resin from trees, pollen, bird droppings), it is important to **wash the car once a week**. In severe cases, wash the car whenever the paint finish appears to be dirty.

Remove spilled fuel, oil, grease or brake fluid **at once**, as these substances can attack the paint or change its color.

Bird droppings should also be removed **without delay**, or they will damage the paintwork.

A new BMW can be put through an automatic car wash, or washed by hand, as soon as it begins to be used on the roads.

Dead insects should be soaked and wiped off **before** the main car wash.

Washing the car should be delayed if the engine hood is still hot, or if the car has been parked or is still standing in strong sunlight, or else spots may form on the paint surface.

When using an **automatic car wash**, try to choose one without excessive brush pressure, and an ample supply of rinsing water. Most modern car washes satisfy these requirements. However, the areas not fully reached by the automatic system – door sills, panel folds and seams on doors and lids etc. – should be cleaned by hand.

During the cold season of the year in particular, it is advisable for the car to be washed more frequently, since the heavy dirt deposits and salt from wet roads are more difficult to remove and will damage the entire car if left on too long.

When the car is washed, take the opportunity to clean the interior and luggage compartment with a vacuum cleaner.

If you wash the car by hand, first soften the dirt deposits on the paint with a fine water spray, and rinse them off. Do not spray water directly into the air inlets or outlets of the heating/ventilation system.

After spraying down, wash the upper part of the body starting with the roof with a sponge, or similar item, using plenty of cold or lukewarm water. Rinse out the sponge frequently.

Wash the lower part of the body and the wheels last, if possible keeping a separate sponge just for these areas.

After washing, rinse the car again thoroughly with a hose and dry it with a clean chamois leather to prevent discolored spots where the water was not removed.

To protect the paintwork, a paint-care product can be added to the water used for washing the car.

If washing with water alone is insufficient, a car shampoo or similar cleanser can be used in the concentration stated on the pack. After this, rinse with plenty of water.

Note: After washing, the brakes may be wet and therefore less effective in action. Apply them briefly to dry the discs.

Any localized dirt patches or other contamination of the paint surface can best be seen after the car has been washed. Remove them as soon as possible. Eliminate tar stains with a special tar remover.

Polish the paintwork at these points to restore its appearance and protect it.

5-04 Care of the car

Please use only **paint-care products** containing Carnauba or synthetic waxes, and comply with the instructions on the packs.

It is quite easy to decide when the car's paintwork needs polishing or preservative treatment: water no longer forms large round droplets and tends to roll off the surface. Depending on use of the car, this may arise after some 3 to 4 months. It is recommended to carry out the necessary protective treatment as soon as it becomes necessary.

If the paintwork tends to lose its high gloss as a result of insufficient care, a suitable **polish** must be applied. **Paint cleaner** is needed if the finish is weathered. An abrasive **polishing compound** or **paint restorer** should only be used in very severe or obstinate cases. Remember that all polishes, cleaners or paint restorers act by removing a layer of paint and exposing paint which is still in good condition. Only if the new paint surface is most carefully protected will the overall brilliance of your car's paintwork be regained.

After care of the car's paintwork, remove traces of the products used from the windows with a suitable glass cleaner.

Minor paint damage can be touched in with either a paint spray aerosol or a paint stick, which is used like a brush. The correct paint colour designation is on an adhesive label close to the manufacturer's plate.

Damage caused by flying stones, scratches etc. must be touched in without delay, to prevent rust from forming.

If damaged areas of paintwork have already started to rust, use the wire brush to clean them up, and apply rust converter (protect the eyes and skin). Allow a few minutes for this to take effect, then rinse off with water and dry thoroughly. Apply the primer and allow to dry, then apply the top coat. After a few days, polish the repaired area and apply a paint preservative.

More extensive paint damage should be professionally repaired in accordance with the manufacturer's instructions. The BMW Service Organisation knows and will apply the full repair procedure to ensure a permanent repair of good appearance.

Another important note:

If a tarpaulin or similar sheet is used to protect the car against the weather, moisture condensate may collect (particularly in the case of plastic sheet) and cause the plasticisers to diffuse out of the paint. There is also a severe risk of scratching the paint surface, it is far better to protect your BMW against ultraviolet rays from bright sunlight and against rainfall etc. by giving it the full body care treatment described above. Ideally, in countries where the sun is extremely hot and powerful, a canvas sunsheet should be stretched above the car.

Please remember . . .

Other parts on your BMW also benefit from proper care: the engine compartment, the wheel arches, the wheels, chromium-plated items etc.

Annual cleaning and protection or treatment of the engine, engine compartment, underbody, axles and other mechanical assemblies can be carried out by your BMW dealer. This not only reduces the risk of serious corrosion to a minimum, but also avoids short-circuits caused by accumulated oil and dirt, and reveals leaks before they become severe. This treatment is particularly important at the end of the winter season.

Chromium-plated and polished metal parts – bumpers, trim strips, wheel trims etc. – should be cleaned regularly with water, to which a car shampoo can be added if required. Do not neglect this treatment in winter if salt is spread on the roads.

The car's **radio antenna** should be kept clean to ensure good reception, and can be given a coating of special antenna grease to protect it from the weather.

Important: this treatment is particularly advisable on motor-driven antennas.

Alloy wheels should be treated with a special wheel-rim cleanser, particularly during the winter months. Do not use aggressive-action products containing acids, strong alkalis or abrasives. Alloy

wheels should not be cleaned with a steam jet at a temperature higher than 140°F or 60°C.

The **inside surfaces of windows (and mirror glasses)** can be cleaned with a glass cleaner. Never clean mirror glasses with polishing pastes or abrasive (quartz) cleansers.

Plastic components, leatherette upholstery, roof linings, light lenses and items sprayed matt black should be cleaned with water to which a car shampoo may be added. Do not allow the roof lining to become wet right through. If necessary, apply a plastic cleaner to plastic components. Never use solvents such as nitro thinners, fuel etc.

Rubber components should only be cleaned with water or treated with a rubber cleanser or silicone spray.

To clean the **insides of the windows** we recommend a 1 : 1 mixture of water and vinegar.

Clean the **wiper blades** with soapy water. The wiper blades should be replaced twice a year, before and after the cold season.

Care of upholstery fabric

The **cloth** used by BMW is notable for hard wear, good heat transmission, freedom from slip, a soft and attractive surface and easy care.

If certain areas of the seat acquire an unwanted gloss as a result of heat, friction and moisture, they should be brushed "against the pile" with a slightly moistened brush.

The pile of velour material tends to lie flat in use: as with many furnishing fabrics and clothing materials, this is unavoidable and does not detract from its quality.

Fluff and loose threads or abraded leather particles on upholstery fabrics are best removed with a suitable lint brush. Clean off stains or large dirty marks at once with lukewarm water, car-interior cleaner, stain remover. Afterwards, brush the fabric to restore the pile.

5-06 Care of the car

The **upholstery leather** used by BMW on its cars is a high-grade natural product treated by the latest processes. If carefully looked after, it will retain its high quality for many years.

Regular cleaning and general care is essential, since dust and road dirt penetrate the pores and creases and cause the surface to wear away and become brittle.

Clean the leather surfaces with a slightly moist cotton or woolen cloth, but do not soak the leather right through at the seams. Dry the leather and rub it with a clean, soft cloth.

Very dirty areas on leather upholstery can be cleaned with a mild detergent (suitable for woollens) containing no brightening agents. Use 2 tablespoons to one liter of water.

Unightly bald patches or minor surface damage can be rectified with leather spray lacquer.

If the car is parked for a long time in bright sunlight, it is advisable to cover the seats and the head rest, to prevent bleaching of the colours.

Water-buffalo hide

For regular care, use only the specially-formulated leather spray* in accordance with the instructions provided.

Always wipe off drops of water immediately, and avoid wetting the hide severely with wet clothing or when cleaning.

To clean severely dirty areas, a mild detergent (for woollens etc.) without brightener can be used (2 tablespoons to 1 litre of water).

Since water-buffalo hide is left with a natural finish, there may be slight differences in the color at various points. Other natural features such as old scars, insect bites and creases must be regarded as typical features, as well as a degree of "patina" on various hides. Note that while still new, water-buffalo hide can slightly discolor light clothing when wet.

Stains on the interior trim upholstery – except for real or imitation leather – should be removed with a commercial foam spray. Brush down fabric surfaces afterwards. Rub plastic trim with a stiff sponge.

Wear patches on corduroy or velour fabrics are caused by pressure during frequent use, and should be brushed 'against the pile' with a slightly moist brush.

Seat belts should only be cleaned with a weak soap and water solution without removal from the car. Never attempt chemical or dry cleaning or else the fabric of the belts may be damaged.

Never allow **automatic** (inertia-lock) **seat belts** to retract while they are still wet. Clean the seat belts if they become dirty or muddy, as dirt penetrating the reel mechanisms could prevent them from locking or keeping the belts taut and thus constitute a safety risk.

To clean the fairvelours-roof lining thoroughly, use a chamois cloth and lukewarm water or mild soap-suds. Use Synclean* for removing difficult stains.

It is recommended that a greater area around the stain should be cleaned to avoid leaving rings. Oily and greasy stains have to be removed with liquid stain remover.

Worn patches as a result of friction and pressure should be brushed against the pile with a moist brush.

* Obtainable from BMW dealers

Storage out of use

If the car is to be laid up out of use for more than three months, we recommend that the following maintenance work be performed by a BMW dealer or at any qualified workshop in order to prevent deterioration during the storage period.

1. Wash the body and the underside of the car, clean the interior and finally polish the paintwork and clean chrome-plated parts. Clean rubber seals on lids and doors and rub them with talcum or glycerin. If necessary, have the undercoating checked or repaired in accordance with BMW factory recommendations.
2. Change the engine oil and replace the oil filter element while the engine is at normal operating temperature. As an additional anti-corrosion measure, a corrosion inhibitor, can be added to the engine oil with the gasoline as specified by the supplier.
3. Check coolant level and concentration, and top up if necessary.
4. Check acid level in battery cells and top up with distilled water if necessary.
5. Drain the windshield washer fluid tank and lines.

6. The fuel tank should be filled, to prevent corrosion caused by moisture condensate.
7. Increase tire pressures to 4 bars or 60 psi.

Immediately before the car is taken out of use, while driving apply the foot brake and the parking brake until warm, so that the pads and linings are dry and the brake discs and drums will not corrode.

Store the car in a dry, well-ventilated space. Engage reverse gear. Do not apply the parking brake. If necessary, chock a wheel to prevent rolling away.

Disconnect the negative lead from the battery, if there is any risk of frost, remove the battery and store in a warmer place. The battery must be recharged at least every 6 months or it will become unsuitable for further use.

The air conditioning must be run briefly at least once a month, this is particularly important in the cold season of the year, or else the compressor shaft seals may dry out and permit refrigerant to leak. The engine should run for this purpose until it reaches its normal operating temperature (coolant thermometer needle approximately midway between the two colored zones). This will avoid condensate formation and the risk of internal engine corrosion. If the car is not equipped with air conditioning, do not run the engine during the storage period.

Warning:

If the engine needs to be run for the above reasons, do so only in a well ventilated space to avoid exhaust fumes.

Restoring car to use

First recharge the battery, or replace it if necessary. The following maintenance work should then be carried out.

1. Change the engine oil and the oil filter element while the engine is at normal operating temperature.
2. Refill the windshield washer fluid tank, including antifreeze if necessary.
3. Restore tire pressures to the correct values.

5-08 Wheel changing

What to do if . . .

If your car should develop a fault, there are certain steps you can take yourself if beyond reach of a service station.

Flat tires are fortunately a rare event nowadays. Should you have the misfortune to suffer a puncture, drive the car away from the main traffic stream and apply the brake. Comply with local regulations concerning the protection of broken-down vehicles by switching on the hazard warning flashers and setting up a warning triangle, flashing signal lamp etc. at a sufficient distance away from the car.

The **spare tire** is located in a recess under the carpet on the right of the luggage compartment.



23 82 02 519 00

The **jack and wheel stud wrench** are housed in a compartment on the right side of the luggage compartment. The jack can be lifted out after removing the wing nut. To prevent noise when the jack is stored in the luggage compartment again, it must be retracted fully and secured with the wing nut in its original position.

Warning: place the wheel chock behind the opposite rear wheel to prevent the car from rolling back when it is raised on the jack (this is necessary on account of the parking brake design).



23 82 02 520 00

If **lockable wheel studs** are in use, take off the end cap, insert the key fully into the lock (slot parallel with oval cutout), give the key a quarter-turn in either direction and remove it together with the locking section of the stud. To attach, proceed in the opposite order. Before pulling out the key, check that the sleeve is against the shoulder on the wheel stud. **As the key is removed, the sleeve must be pressed against the sleeve.** Attach the plastic end cap.

To ensure that the lockable wheel studs can always be unscrewed when necessary (for instance in the workshop), we suggest that a key be kept in the car's toolkit.



28 83 01 523 01

Pull on the handbrake.

Loosen the wheel studs before lifting the car. Pull off the hub cap. On alloy wheels, press out the hub cap by hand from the front after removing the wheel. On TR wheels, take out the badge after releasing the spring.

Attach the jack to one of the **four pickup points** provided on the body (the one nearest the punctured wheel) and jack up the car until the wheel is well clear of the ground.

Warning: never work underneath a jacked-up vehicle.

Unscrew the wheel studs and change the wheels. To fit the spare wheel, insert the centering pin into one of the holes, put the wheel on to the pin, screw in one wheel stud, then remove the centering pin. Screw in the remaining wheel studs and tighten them uniformly.

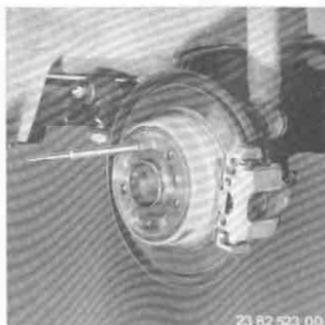
Lower the car from the jack, tighten the wheel studs finally in a crosswise pattern (first one stud, then the other on the opposite side of the hub) and have the tightening torques checked at the earliest opportunity (110 Nm/81 ft/lb with a calibrated torque wrench). If a new wheel rim (or the spare wheel) is installed for the first time, have tightening torques of studs checked after app. 600 miles (1000 km).

Have the flat tire repaired and rebalanced as soon as possible.

Tire repairs should always be entrusted to a BMW dealer or a specialist tire dealer capable of examining the tire to determine the full extent of possibly concealed damage.

Important: when removing or replacing tubeless tires, the rubber valve must also be replaced as a safety precaution.

The **toolkit** is in a rack under the luggage compartment lid which swings down when the retaining screw is undone.



5-10 Starting difficulties, coolant temperature

Starting difficulties

If the starter does not operate when the ignition key is turned to position 3:

Check battery by switching on the headlights, then attempting to operate the starter again.

1. If the headlights slowly go dim, the battery is dead or defective. Have the battery recharged or replaced. Push or tow-start the car (manual gearbox) or connect the dead battery to the battery (12 Volts) in another vehicle with jumper leads as described in 'Starting with a dead battery'. See page 5-14.

Cars with automatic transmissions cannot be low-started or push-started. Start the engine in an emergency with jumper cables from a second battery. See "Starting with a dead battery". See page 5-14.

When low-starting the car, select third gear, switch on the ignition and keep the clutch pedal down. Release the clutch pedal smoothly when the car is moving at a steady pace.

2. If the lights go out suddenly, examine the cable connections at the battery and starter for signs of poor contact, and tighten firmly.
3. If the lights remain at the same intensity, have the system checked (there is a problem in the starter circuit).

Engine does not start although starter motor is operating correctly:

If the correct starting instructions were followed and there is sufficient fuel in the tank, the fault may lie in the ignition system or in the fuel supply.

1. Check that the spark plug wires are properly attached to the spark plugs and that all cables at the coil, distributor and connecting plugs are secured lightly. The problem could also be due to water entering the engine compartment when the car was washed.
2. Unscrew and remove the spark plugs and clean and dry them if necessary. Check the electrode gaps. Insert and tighten the spark plugs and attach the leads.
3. If this also proves ineffective, inspect the complete ignition system or have it examined by a BMW dealer or any other qualified service facility.

Warning: Digital Motor Electronics

This is a high-performance ignition system, and any contact with live components when the engine is running could lead to a fatal electric shock.

4. Check that fuel is supplied at starting speed. To confirm this, compress the fuel hose to the cold-start valve firmly between the fingers. Run the starter; a considerable build-up of pressure should be detected.

If no fuel is being supplied, check the corresponding fuse (for the fuel pump). If it is intact, consult a service station.

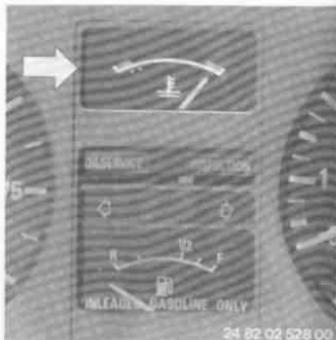
The fuel lines for the fuel injection system do not have to be bled, as this takes place automatically by way of the fuel delivery pump when the starter is operated.

Note:

When attempting any repair or checking procedure make sure there is no loose or hanging clothing and avoid contacting the electrical system or rotating fans and belts.

If coolant temperature is too high:

1. Allow the engine to cool down until the needle of the temperature gauge is midway in the normal-temperature zone. Check coolant level if necessary and open the cooling system carefully.



Warning:

Open the tank cap only when the engine has cooled down and the coolant needle is on the lower third of the scale, or else hot water or steam may escape and cause **scalding**.

Turn the cap slightly counterclockwise to allow excess pressure to escape, then remove completely.

1. Never add water if the cooling system is still hot and coolant has been lost: allow the engine to cool down first until a hand can be placed on the engine block.
2. If coolant is lost, examine the filler cap, all hoses and hose clamps and the radiator for signs of leakage.
3. Check condition of V-belt and either tighten or replace if necessary.
4. If necessary, have the cooling system flushed.

Brake system problems

If the **red brake and steering hydraulics warning light** comes on after starting the engine or during the journey:

1. Loss of brake fluid is indicated by increased pedal travel.
2. Greater pedal effort is needed if loss of reservoir pressure has put the brake booster servo out of action.
3. The power steering becomes stiff to turn if system pressure loss has deprived the steering of its power assistance.

4. Increased pedal pressure and stiff power steering indicate that the hydraulic pump is out of action, possibly as a result of a broken V-belt.

If the **ANTI LOCK warning light** comes on when the car is in motion at normal driving speeds, this indicates that the antilock braking system has developed a fault and is out of action. Although the antilock braking effect is then lost, normal brake applications can still be made.

We recommend you have all problems in the brake system examined and repaired immediately.

If one circuit of the hydraulic dual-circuit brake system should fail, pedal travel will immediately increase. Increased pedal effort will be needed to obtain the equivalent braking effect. Although the car can still be braked satisfactorily with only one circuit in operation, a service workshop should none the less be consulted immediately.

A spreader spring in each brake caliper increases the **brake pedal effort** required when the **minimum brake pad thickness** is reached.

Minimum brake pad thickness is also indicated by means of a **red brake lining wear telltale** in the instrument cluster. As a check this light comes on in ignition key position 3 when the engine is started.

When the warning light comes on have the brake pads inspected without delay.

If the **red battery charge telltale** comes on during a journey, have the car checked as

soon as possible to determine the cause of the problem or else the battery may eventually discharge completely.

If the **red oil pressure warning light** comes on while driving, pull off the road to a safe stop and declutch or select neutral immediately and switch off the ignition. If the engine oil level appears to be incorrect, do not drive the vehicle. Operating the vehicle with low or no oil pressure will cause severe engine damage.

When the warning light comes on briefly at idle speed this should cause no alarm provided that it goes off when the accelerator is pressed down.

Possible problem in the power steering:**Steering stiff to turn towards right and left lock whining noise audible:**

Too little oil in system. Check level and if necessary inspect the power steering circuit for leaks or damage.

Loose V-belt. Adjust to correct tension. If belt is damaged, replace it.

If the problem remains, have the power steering system inspected.

A slightly higher effort is needed to turn the steering wheel when the power steering is defective.

5-12 Check-Control, service indicator

Faults recorded by the **Check-Control** system can be corrected as follows:

- **Brake (stop) light operation:** Replace the appropriate electrical fuse or spherical brake light bulb.
- **Rear light-operation:** Replace the appropriate electrical fuse or the bulb.
- **License-plate-light-operation:** Replace the appropriate electrical fuse or the bulb.
- **Low beam-operation:** Replace the appropriate electrical fuse or the sealed beam.
- **Engine oil level:** Check level and if necessary add fresh oil at the earliest opportunity.
- **Coolant-level:** Check level and fill up if necessary. Afterwards check the concentration of the long life antifreeze and corrosion inhibitor.
- **Washer fluid level:** Top up the windshield washer fluid tank and if necessary restore the concentration of the antifreeze.

If the **Service Indicator** is displaying an illogical reading, for instance the green and red LEDs at the same time, or if there is no display, consult a BMW dealer.

If the speedometer, tachometer or coolant temperature gauge should develop a fault, the Service Indicator will probably cease to operate correctly as well, since it depends on correct speed, distance and temperature readings. The fault must be located and rectified by a BMW service station.



Tow-starting

Switch on the ignition, select 3rd gear and disengage the clutch.

Switch on the hazard warning flashers if required by law.

When the car is moving at a fair speed, engage the clutch. After the engine has started, declutch again and allow the engine to idle. Switch off the hazard warning flashers when no longer needed. The cause of poor starting should be investigated and put right by the nearest BMW service station.

Tow starts – BMW automatic models

The design of the automatic transmission makes it **impossible** to start the engine by pushing or towing the car. If the battery is dead use jumper leads from another vehicle as described on page 5-14.

Towing away – BMW automatic models

If the car has to be towed away, the ignition switch must be put to position 1 and the selector lever must be at **N** = neutral.

Towing speed should not exceed 30 mph or 50 km/h and the towing distance should be limited to 25–30 miles or 40–50 km. To tow an automatic transmission car more than 30 miles or 50 km add 1.05 US quart/1 liter/1.8 Imp. pints of ATF (automatic transmission fluid) to the contents of the transmission, or remove the drive shaft. After the car has been repaired, do not forget to reduce the fluid level in the transmission to normal.

Towing facilities

Towing eyes are situated at the left and right front side and at the left back side.

Use only **nylon tow-ropes** or straps which are sufficiently resilient to protect both vehicles against sudden jerking. Steel wire cables or tow-bars are not suitable.

Towing away

If the vehicle has to be towed away, turn the ignition key to position 1 so that the brake lights and turn indicators operate and the horn and wipers can be used.

Switch on the hazard warning flashers if required by law.

If the electrical system is out of action, the towed car must be identified (for instance by a notice or by placing the warning

triangle in the rear window) so that following vehicles are warned.

In case of engine failure and when the car is being towed, the power assistance for the brakes and steering is no longer effective. Increased effort will be required to operate the affected systems.

If you wish to assist another driver by towing his vehicle with your BMW, make quite sure that the broken-down vehicle's weight does not exceed that of your own car.

PLEASE COMPLY WITH APPLICABLE STATE TOWING LAWS.



5-14 Starting with a dead battery, Jump starting

Starting with a dead battery

If the battery is run down, the engine can still be started by running jumper cables to the battery from a second vehicle.

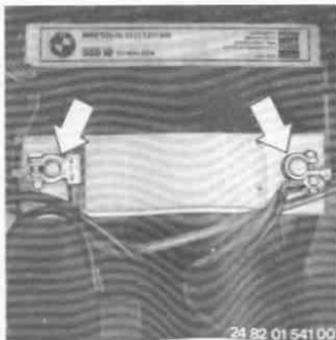
1. Check that the other vehicle has a 12-volt electrical system and a battery of approximately the same capacity in A/h.
2. The dead battery has to remain connected.
3. Do not allow the two vehicles to touch one another, or a short circuit may result.

4. First connect the positive terminals of the car's batteries together. Then connect the second jumper cable to the negative post of the second car's battery and to some part of the ground connection or engine block of your car, as far away from the battery as possible.

Caution! If connections deviate from that described in the foregoing, damage to both charging systems or even serious personal injury could result.

5. Run the other car's engine at a steady 2,000 rpm or so and then start your engine in the usual manner.

Before disconnecting the jumper cables make certain that engine is at idle speed, switch headlight, blower and rear window defroster on to avoid damage to car's electronics. Carefully disconnect the jumper cables, starting with the negative terminal.



To remove a **wiper blade**, swing the arm away from the windshield. Press the retaining spring and pull the blade from the arm.

CAUTION!

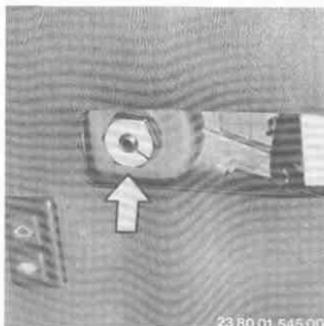
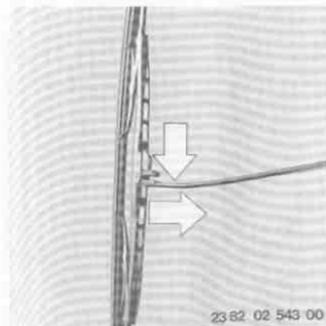
Do not manually move the wiper arms across the windshield because you may damage the wiper arms or pivots.

The complete **wiper arm** can be pulled off after folding up the plastic cap and loosening the retaining nut (13 mm wrench).

If the electric motor drive of the **sliding sun roof** should fail, the roof can be operated manually as follows.

(Using tools supplied in the luggage compartment lid.)

- Remove protection cap.
- Loosen nut with spark plug wrench and adjust sliding roof with an allen key to desired position.



5-16 Manual operation

The fuel filler flap can be opened if the central locking system should fail by pressing back the locking rod, accessible through the trunk.

If there is a fault in the electrical system, **the windows can be opened by hand** in an emergency.

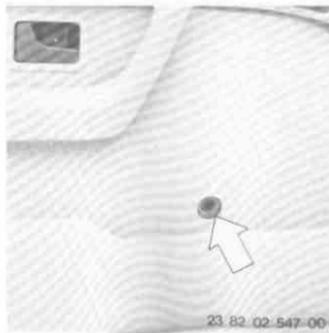
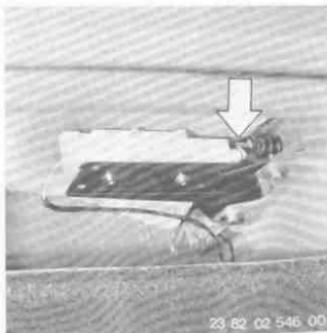
The necessary tools (adapter, allen key, handle, spark plug wrench and bar) are included in the car's toolkit.

1. Remove the sealing cap from the side trim.
2. Attach handle (from screwdriver) to allen key and fit to adapter.
3. Turn the allen screw clockwise until it cannot be moved any further.

4. Place the spark plug (1) wrench on the hexagon and turn in the required direction with the bar.

5. Unscrew the allen screw counterclockwise by app. 2 turns. This will retain the glass in the position chosen.

The window may be opened and closed by hand as often as necessary until repaired.



If any electrical equipment on your car should fail, first check the fuses.

The fuse box with spare fuses, pincers and relays is located on the left wheel arch inside the engine compartment and is protected against moisture.

A blown fuse can be identified by the melted metal strip inside the fuse holders. Pull the blown fuse out with the pincers (arrow), trace and rectify the cause of the failure, then insert a new fuse of the correct rating.

A terminal board in the engine compartment close to the fuse box provides connections from terminal 15 and 30.



23 85 05 549 01

Never replace blown fuses with wire or attempt to repair them in any way (fire hazard).

Fuse ratings in Amperes, equipment supplied

- | | | | |
|-----------|---|-----------|---|
| 1 - 15A | Left high beam, right low beam | 15 - | Without connection |
| 2 - 15A | Right high beam, left low beam | 16 - 30A | Blower, air conditioner |
| 3 - 15A | Auxiliary fan 196°F (91°C) | 17 - 7.5A | Backup light, power outside mirrors, mirror heating, fasten seat belt light, washer jets heating |
| 4 - 15A | Turn signal | 18 - 30A | Auxiliary fan 210°F (99°C) |
| 5 - 25A | Windshield wiper and washer | 19 - 25A | Power sliding roof, heated seat |
| 6 - 7.5A | Brake light, cruise control | 20 - 25A | Rear window defroster |
| 7 - 15A | Horn | 21 - 7.5A | Interior lights, radio, glove box, luggage compartment light, rechargeable flashlight, seat belt buzzer, on-board computer, radio memory, clock |
| 8 - | Without connection | 22 - 7.5A | Left side lights |
| 9 - 15A | Diagnostic plug | 23 - 7.5A | Right side lights, engine compartment light, license plate lights, instrument panel lights, make-up mirror light |
| 10 - 7.5A | Instruments, on-board computer, check-control | 24 - 15A | Hazard warning flashers, open door gong |
| 11 - 15A | Main and aux. fuel pump | 25 - | Without connection |
| 12 - 7.5A | Radio | 26 - 30A | Seat adjustment, power windows |
| 13 - 7.5A | Left low beam | 27 - 25A | Central locking system, door lock heating, anti-theft protection, on-board computer |
| 14 - 7.5A | Right low beam | 28 - 25A | Cigarette lighters, power antenna |
| | | 29 - 7.5A | Left fog light |
| | | 30 - 7.5A | Right fog light |

5-18 Bulb-changing

When **changing bulbs** or performing any other minor jobs on the electrical system, avoid short circuits by leaving the item concerned switched off or disconnecting the negative lead at the battery.

When replacing bulbs always use a clean cloth to keep the glass free of sediments.

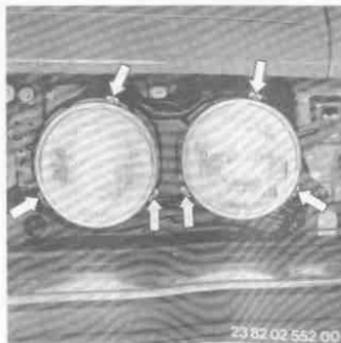
When replacing headlight inserts make sure that the beam alignment screws are not twisted.

The headlight inserts for the **low beams** are in the two outer lamps.

To change headlight inserts, first disconnect battery (-) ground cable. Remove ornamental grilles. Loosen the three screws on the clamping ring and pull back the cable connector.

The headlight inserts for the **high beams** - i.e. the inner lamps - must be replaced in the same way.

As **correct headlight adjustment** is of particular importance in view of traffic safety, the headlights should be adjusted by a specialist workshop using the proper beam-setting equipment.



The side marker lights, parking light and front turning lamps are housed in the front plastic lenses. Unscrew the Philips head screws holding the plastic lens, and remove lens. The 21/5 W spherical bulb must be pressed in slightly and turned to remove.

Rear light:

Open the luggage compartment, unscrew the four knurled nuts in the openings of the rear lining panel using the spark-plug wrench and lift off the lens assembly. Remove the blown bulb from its holder.

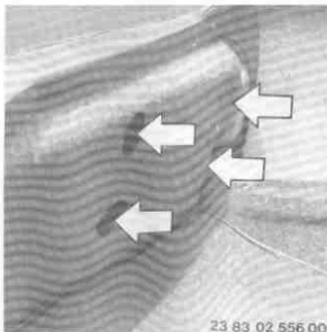
Remove the defective bulb from its holder and insert the new bulb.

Turn indicator – 21 Watt spherical bulb.

Rear and parking light – 5 Watt spherical bulb.

Brake (stop) light – 21 Watt spherical bulb.

Reversing (backup) light – 21 Watt spherical bulb.



5-20 License plate lights, rear side marker, interior light

License plate lights:

Remove the two Philips head screws and take off the lens frame with rubber seal. The contact blades for the 5 Watt tubular type bulb must make good spring contact and the metal surfaces must be clean. If necessary, clean and bend in the contact blades.

Rear side marker:

A rear side marker light is installed on both sides of your car. The side marker lights are equipped with 4 Watt bulbs. To replace, loosen screws and remove plastic lens.

Interior light:

After pulling out the interior light assembly the two 10 Watt tubular type bulbs become accessible.

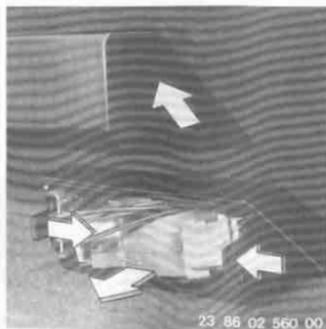
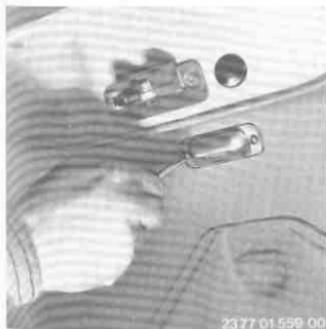


Luggage compartment light, engine compartment light:

Remove the two Philips head screws, take off the plastic lens and replace the 5 Watt tubular type bulb.

Center brake (stop) light:

Pull off the rear cover (arrow). To remove the reflector press latches and pull assembly back. Replace 21 Watt bulb.



5-22 Minor repairs

Minor repairs	Cause	for add. information see
Engine will not start	Battery is dead, battery terminal clamps loose, selector lever (automatic transmission) not in N or P	page 5-14
Starter runs but engine will not start	Fuel tank empty, loose ignition leads (no spark at plugs), engine flooded (mixture too rich)	page 5-10
Engine starts but immediately stalls	Vacuum hoses loose or leaking; fuel injection pipes loose	page 5-10
Oil pressure warning light comes on	Engine oil level too low, oil leak; oil filter blocked or leaking	page 5-11
Coolant temperature reading too high	Coolant level too low; V-belt loose or defective	page 5-10
Battery charge telltale comes on	V-belt loose or defective, alternator or regulator cable connections loose	page 5-11
Brake lining wear telltale comes on	Brake pads have reached wear limit	page 5-11
Brake and steering hydraulics light comes on	Loss of brake fluid or system pressure; one brake circuit has failed; V-belt loose or defective	page 5-11
Central indicator light flashing	A system fault has developed; trace with Check-Control	page 2-15

Minor repairs	Cause	for add. information see
ABS warning light comes on	Antilock braking system has developed a fault and is out of action	page 5-11
Electronic shift control telltale comes on	Electronic shift control circuit has failed. The transmission selects 3rd gear irrespective of the selector lever position. If you need to continue your journey, you can still pull away and drive the car normally.	Consult nearest BMW service station (avoid high engine loads)

Warning:

When there is the danger of coming in contact with cables, when doing repair and maintenance work, especially in the engine compartment, always disconnect the battery.

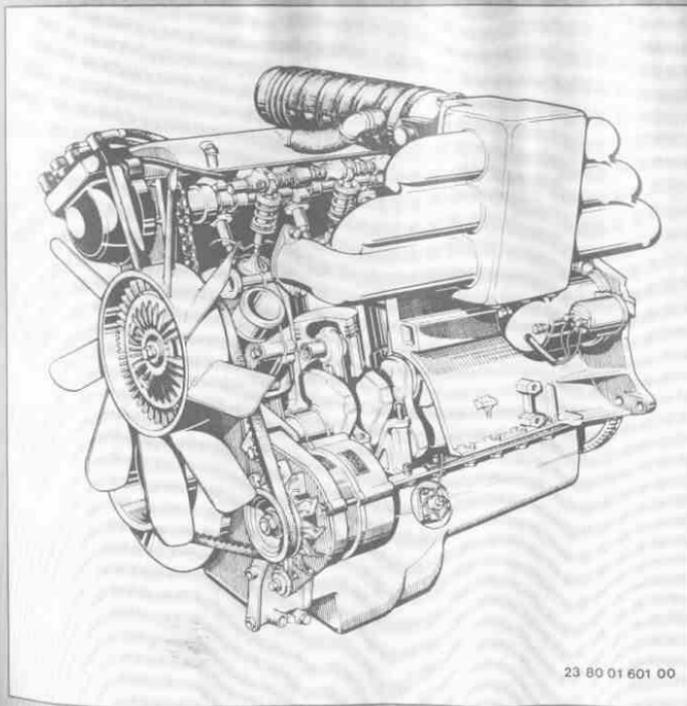
Improper treatment of parts installed and materials used in the vehicle can endanger your personal safety. If you are not familiar with the pertinent safety rules, ask your BMW-dealer to perform the necessary work.

Digital Motor Electronics

This is a high-performance ignition system, and any contact with ignition components when the engine is running is **highly dangerous**.

5-24

BMW technical specifications and information



23 80 01 601 00

- Engine
- Clutch and transmission
- Performance data
- Dimensions and weights
- Body dimensions
- Graphs
- Electrical system
- Heating and ventilation
- Wheels and tires
- Brakes
- Stopping distances
- Body
- Suspension
- Oil grades for automatic transmission and power steering
- Emission control system
- Oxygen sensor
- Fuel injection system
- Catalytic converter
- Evaporative emission control system
- Automatic transmission
- Power steering
- Air-Conditioning
- Antilock brake system (ABS)
- Supplementary Restraint System (SRS)

6-02 Engine

Specifications

ENGINE

Design

Six-cylinder, four-stroke inline, water cooled, with single overhead camshaft and inclined valves in triple-hemisphere swirl-action combustion chambers designed to suit the mixture preparation.

Installation

Over front axle, inclined, with three-point location: at front, close to center of gravity, with two rubber mountings attached direct to the front axle beam. Rear of engine flange-mounted to gearbox, with rubber mounting on gearbox crossmember.

Cylinder block

Special grey cast-iron

Cylinder head

Light alloy, with pressed-in valve seat rings and guides.

Crankshaft

Forged steel, heat-treated.
All main bearings with 2 oil supply openings.

Connecting rods and pistons

Forged steel rods; replaceable three-layer bearings. Piston offset in relation to piston centerline.

Valves

Overhead; inclined in inverted V arrangement. Valve clearance adjustment by means of eccentrics in rockers.

Valve gear

Light alloy rockers with chill-cast pads and overhead camshaft driven by a roller chain with automatic oil-damped chain tensioner and backlash prevention.

Valve clearances

Inlet and exhaust 0.012 in or 0.30 mm, measured with engine stopped and cold (max. coolant temperature 35°C or 95°F).

Lubrication

Pressurized oil circuit with full flow oil filter and pressure regulation valve in filtered oil circuit.

Oil filter

Full flow filter with paper element and pressure relief valve;

Engine breather

Crankcase and valve cover linked by passage in block and connected to the intake manifold by rubber hose.

Air cleaner

One filter element in intake air silencer.

Fuel delivery

Two electric fuel pumps (pre-fuel pump in fuel tank and system fuel pump). Delivery rate 34.3 US gal/h, 130 l/h, 28.6 imp. gal/h.

Fuel filter

Main fuel filter as throwaway cartridge element in feed line, fine-mesh strainer at immersed tank level indicator at the pre-delivery pump.

COOLING SYSTEM**Radiator**

Cross-flow grilled tube with compensating tank; automatic transmission cars with additional transmission oil cooler in right water box of radiator, Pressure and vacuum relief valve in filler cap on compensating tank.

Fan

9-bladed, with viscous coupling. Auxiliary electric fan (two speeds) controlled by air conditioner switch (1st stage) and thermo switch (2nd stage).

Coolant thermostat

Thermostatic control of engine coolant circuit feed line, with compensation for engine load and outside temperature changes (BMW system).

Opening starts:

$176^{\circ} \pm 3 - 4^{\circ}\text{F}$ or $80^{\circ} \pm 1.5^{\circ}\text{C}$

CLUTCH

Hydraulically operated single dry plate clutch with torsional vibration damper and automatic wear compensation (manual gearbox); fluid coupling with torque converter (automatic transmission).

TRANSMISSION**a) Manual gearbox**

Five speed with Borg-Warner synchromesh on all forward gears; 1 reverse gear.

b) Automatic transmission

ZF 4 HP 22

Converter lockup clutch in 3rd gear above 22°C (68°F) transmission oil temperature and a road speed of approx. 85 km/h (53 mile/h).

Transmission ratios

	Manual gearbox	Automatic
1st	3.83	2.48
2nd	2.20	1.48
3rd	1.40	1.00
4th	1.00	0.73
5th	0.81	-
Reverse	3.46	2.09

DRIVE SHAFT

Two-section drive shaft, centered at front with joint disc in guide journal, with universal joints at rear and needle roller bearing at center. Resilient center bearing mounting.

REAR AXLE

Hypoid bevel, running in taper roller bearings.

Ratio 3.46 : 1

Drive to rear wheels

Double universal-joint half-shafts at left and right with maintenance-free constant velocity joints.

Steering

ZF ball and nut, power-assisted

Steering box ratio 15.7 : 1

Overall ratio 18.2 : 1

Safety steering column

with universal joint and resilient disc joint.

Track rod: three-section,

6-04 Performance data

Displacement - effective	209.0 in ³	3428 cm ³
Max. output at engine speed	182 hp 5400 rpm	136 kW
Max. torque at engine speed	213 ft/lb 4000 rpm	290 Nm
Max. permissible engine speed	6200 rpm	
Max. continuous engine speed	6000 rpm	
Cylinder	6	
Compression ratio	8.0:1	
Stroke/bore	3.38/3.62 in	86/92 mm

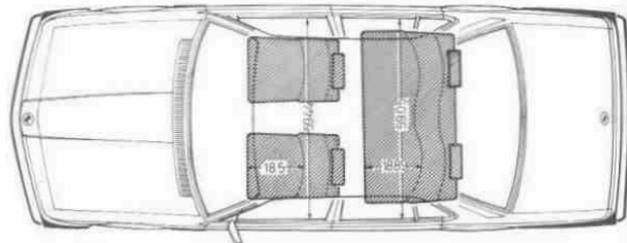
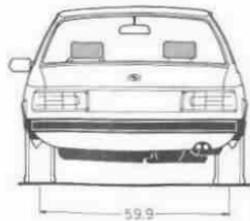
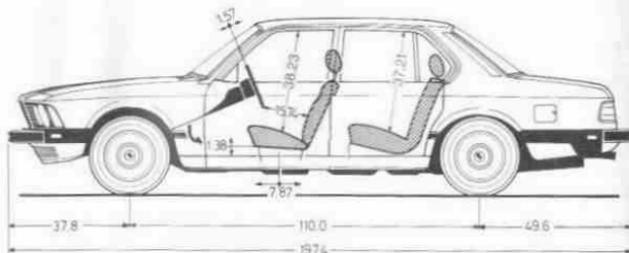
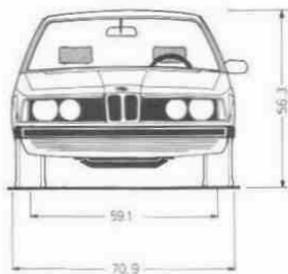
Dimensions and weights

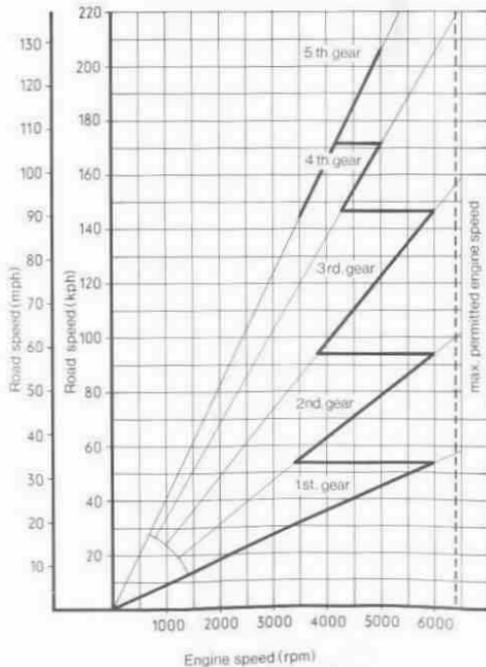
Length	197.4 in or 5014 mm
Width	70.9 in or 1800 mm
Height (unloaded)	56.3 in or 1430 mm
Wheelbase	110.0 in or 2795 mm
Ground clearance (loaded)	5.2 in or 132 mm
Front overhang	37.8 in or 960 mm
Rear overhang	49.6 in or 1259 mm
Front track	59.1 in or 1502 mm
Rear track	59.9 in or 1524 mm
Min. turning circle (wheels)	34.1 ft or 10.6 m
Min. turning circle (overall)	38.7 ft or 11.8 m
Unloaded weight (ready for road, tank full) (according to FMVSS 110)	3540 lb or 1606 kg*
Permissible gross weight	4575 lb or 2076 kg*
Permissible front axle load	2230 lb or 1011 kg
Permissible rear axle load	2470 lb or 1120 kg
Maximum vehicle load	1035 lb or 470 kg
Permissible roof load	220.5 lb or 100 kg

* For automatic transmission models add 20 kg/44 lb.

6-06 Body dimensions

Body dimensions (in inches)



Road speed/engine speed – BMW 735i

Performance data

Top speed – manual gearbox	126 mph or 202 km/h	
Top speed – automatic transmission	122 mph or 196 km/h	

Acceleration

0 – 50 mph / 0 – 80 km/h	6.0	7.5* sec
Standing start 1/4 mile in	16.4	17.3* sec

* Automatic model

Electrical System

Battery 12 Volt, 75 Amp/h

Spark plugs

Bosch WR 9 LS

Spark plug gap 0.027 + 0.004 in or
0.7 + 0.1 mm

Firing order 1-5-3-6-2-4

Warning:

Digital Motor Electronics

This is a high-performance ignition system, and it is highly dangerous to touch any ignition-components when the engine is running.

Alternator 14 V 80 A

Starter Bosch GF 12 V
1.5 kW

Headlights

High beams:

2 halogen sealed beam units

Low beams:

2 halogen sealed beam units.

Power socket on center console

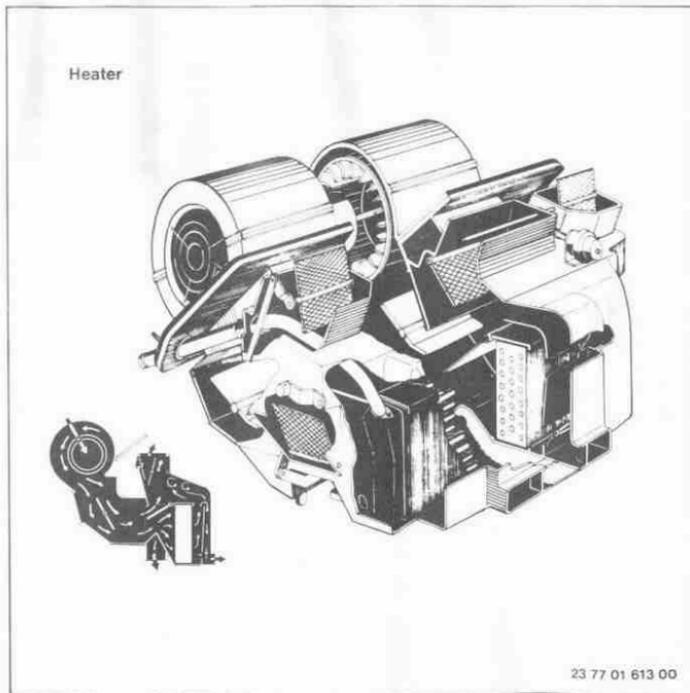
Can be used to connect hand lamp, electric shaver or other items with a rating not exceeding 200 Watts, 12 Volts, and equipped with a standardized plug.

Heating and ventilation

Air-blending fresh air heater with electro-pneumatically controlled water slide valve, 4-channel radial blower and triple-flow circulator tube aluminium heater matrix. Temperature control flap controlled by cable; demisting and front and rear footwell supply flaps electropneumatically controlled by vacuum valves.

Air distribution through integrated ducting with outlets for windshield demisting, side window demisting and front door heating, front and rear footwell outlets and front air outlet grills.

Stale air is extracted through slots below the rear window and openings in the rear roof pillars.



6-10 Wheels and tires

The following BMW wheels and tire sizes are approved:

Radial-ply tubeless tires	Pressed-steel wheels	Rim offset (dished depth)	Cast light alloy wheels	Rim offset (dished depth)
205/70 HR 14 93H			6 1/2 J x 14 H 2	0.87 in (22 mm)
205/70 SR 14 93Q M+S	6 1/2 J x 14 H 2	0.98 in (25 mm)	6 1/2 J x 14 H 2	0.87 in (22 mm)
220/55 VR 390 TR	165 TR 390	0.87 in (22 mm)	165 TR 390	0.87 in (22 mm)
220/55 HR 390 93H M+S TR	165 TR 390	0.87 in (22 mm)	165 TR 390	0.87 in (22 mm)

Use only snow chains according to SAE J 1232 classification "S". The snow chains may be used on drive wheels (rear) by twos only. We recommend the **exclusive use of BMW-approved tires**.

Before undertaking any **technical modifications** to your car, please consult a BMW dealer (quoting the chassis number), concerning the practical value, legal position and factory attitude to such modifications.

Any unauthorized modifications to your car may void your warranty. (See your warranty booklet.)

Diagonally-split dual circuit brake system

Hydraulic brakes with booster servo operated by hydraulic pressure supplied from pump for steering and brake hydraulics. Transparent brake fluid reservoir with electrical level sensor for brake warning light.

Front brakes

Four-piston, fixed caliper disc brakes with automatic pad wear compensation; pad wear warning sensor in left caliper.

Ventilated discs.

Rear brakes

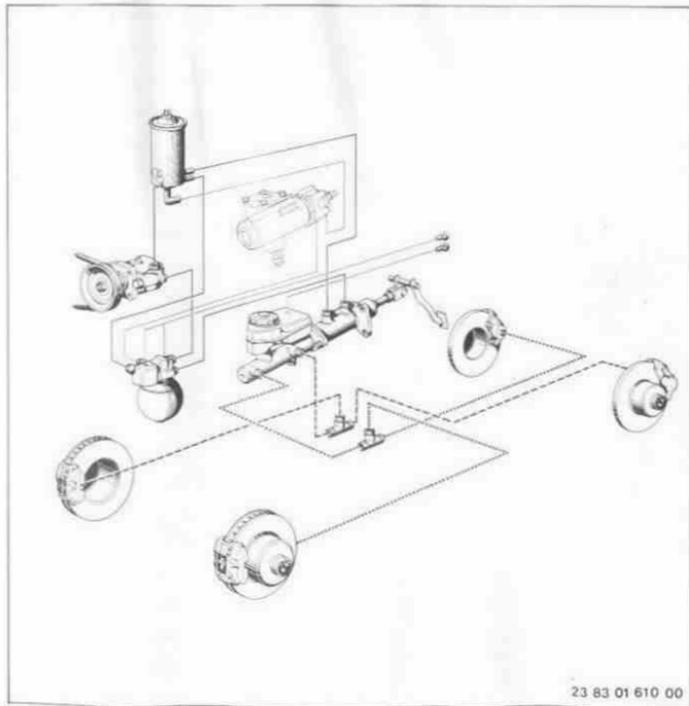
One-piston fixed caliper disc brakes with automatic pad wear compensation and pad wear warning sensor in right caliper.

Parking brake

Acting mechanically on rear wheels. Drums integrated into rear brake discs.

Manual wear compensation at brake shoe adjuster.

2 brake force regulators (1 for each rear brake); changeover pressure 40 bar (gauge).



23 83 01 610 00

6-12 Stopping distances

Stopping distances

The total stopping distance is made up of reaction time (92 ft covered in one second at 62 mile/h), the time taken for the brakes to respond and the actual distance needed to bring the car to a halt.

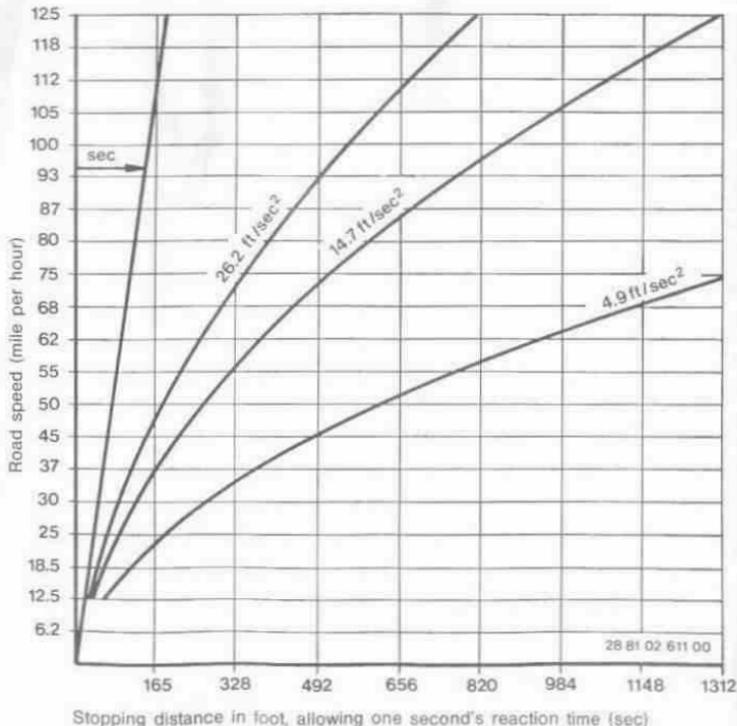
Even the best brakes can only stop the car under average driving conditions at the rate permitted by grip between the tire and the road. On sheet ice, for instance, as the diagram shows, the maximum retardation rate of the vehicle cannot exceed approx. 4.9 ft/sec^2 .

This means that the vehicle loses speed in one second only at this slow rate of 4.9 ft/sec , equal to 3.36 mile/h . If you had been driving at 33.6 mile/h under such conditions, you would need 10 seconds of actual braking time to halt the car, and would cover almost 328 ft in that time, as the diagram shows. The lowest curve, marked 4.9 ft/sec^2 , shows stopping distance referred to road speed under such conditions.

The uppermost line, on the other hand 26.2 ft/sec^2 represents the shortest stopping distance which can normally be achieved under the most favorable road grip conditions.

The center line 14.7 ft/sec^2 applies to roads with a surface providing good grip, even when wet, and thus attempts to indicate typical average stopping distances. These values can be taken as a guide for normal driving on dry roads.

Stopping distances related to road speed and brake retardation



Note that the values may vary for the better or worse according to the efficiency of your brakes, tire condition and tread depth and the nature of the road surface.

The stopping distances all include a constant element "s" for the driver's initial reaction time.

Optimum braking is not achieved with locked wheels, but with wheels that are still rotating. Locked wheels are dangerous because the front wheels, if locked, can no longer be steered and the rear wheels can tend to break away or skid when locked.

BODY

Load-bearing all steel bodyshell welded to floor pan to yield an exceptionally torsionally rigid unit.

Safety passenger compartment with integral roll hoop; impact-absorbing front and rear body sections with controlled deformation behavior.

Four doors, hinged at front; engine compartment lid hinged at front.

Windows

Tinted glass all around with dark green border on top of windshield, heated rear window.

Luggage compartment capacity app. 480 liters/16.9 ft³ by VDA-approved method.



23 81 01 612 00

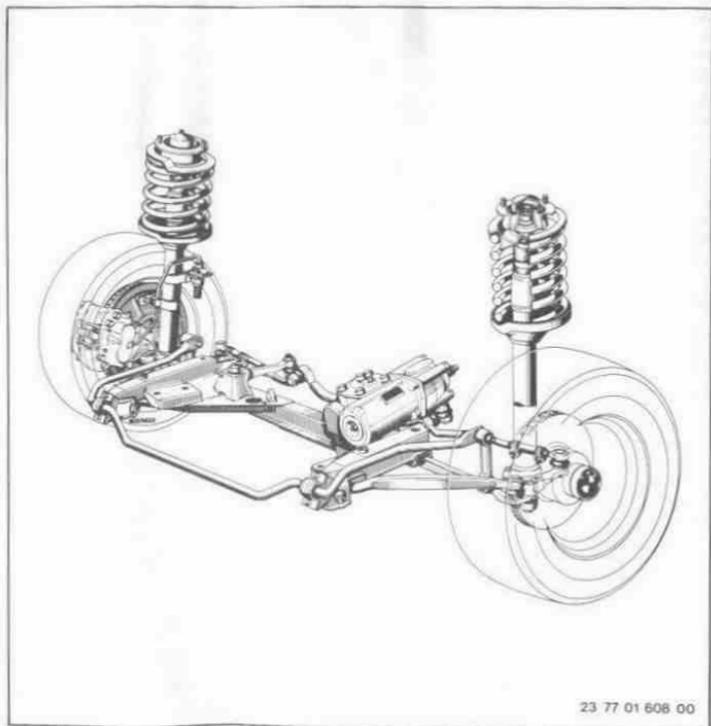
6-14 Suspension

SUSPENSION

Front suspension

Double-pivot, spring strut independent suspension with anti-dive control. Lower wishbones, trailing links and spring struts with double-acting telescopic hydraulic dampers; offset castor angle and lateral force equalization. High-mounted coil springs off-center in relation to strut axes, with rubber auxiliary springs. Total travel at wheel 208 mm (8.19 in). Torsion-bar stabilizer (anti-roll bar) in maintenance-free rubber bushings.

Toe-in*	0.5	+1.0 -0.5	mm
	(0.02)	+0.04 -0.02	in)
equivalent	4.5°	+9° -4.5°	
Camber angle*	0°	± 30°	
Castor angle*	9°	± 30°	
Kingpin inclination*	11° 35'	± 30'	
Toe-out on turns at 20° inside wheel lock	-1° 40'	± 30'	
Max. wheel lock*			
Inner wheel			43°
Outer wheel			33°



*In normal load position: car with full tank and 2 x 68 kg (2 x 150 lb) on front seats, 1 x 68 kg (1 x 150 lb) on rear seats and 21 kg (45 lb) in luggage compartment.

Rear suspension

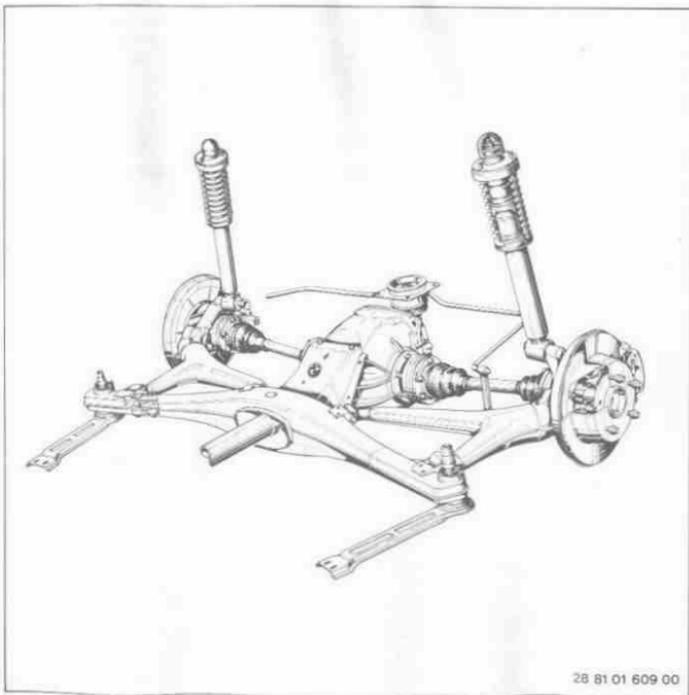
Independent, with semi-trailing arms, maintenance-free rubber bushings and anti-squat control. Delta box-section member for trailing links and final drive bolted to bodyshell at three points through rubber mountings with longitudinal compliance.

Spring/damper struts with double-acting telescopic hydraulic dampers, coil springs and rubber auxiliary springs; total wheel travel 9.21 in (234 mm).

Toe-in* 2 ± 0.8 mm
(0.08 ± 0.031 in)

equivalent to $18' \pm 10'$

Camber angle* $-2^{\circ} 10' \pm 30'$



28 81 01 609 00

*In normal load position: car with full tank and 2 x 68 kg (2 x 150 lb) on front seats, 1 x 68 kg (1 x 150 lb) on rear seats and 21 kg (46 lb) in luggage compartment.

6-16 Oil grades for automatic transmission

Approved oil grades for automatic transmission

If travelling in a foreign country, use the following approved fluids for automatic transmission.

Use only reputable brand automatic transmission fluid of Dexron® formulation which possesses the proper frictional characteristics to be used in your BMW automatic transmission.

Initial filling and refilling of new and exchange transmissions; restoring

Designation	Supplier	Designation	Supplier
Agip Dexron II	Agip, München	D-21 103	Sofra, Paris/F
Antar Dexron II	Antar, Paris/F	D-20 600	Kompressol, Köln
Aral Getrieböl ATF 22	Aral, Bochum	D-20 749	Texaco, Hamburg
Aselol Dexron II	Aselol, Bern/CH	D-16 712	Shell Handel, Hamburg
Aselol Dexron II	Aselol, Bern/CH	D-20 137	MHG, Amberg
Autol Dexron	Autol, Hannover	D-20 383	Mobil, Hamburg
Automatic Transmission Fluid Dexron	Haberland, Döhlbergsh	D-20 112	Bucher, Lengenthal/CH
Avia Fluid ATF 77 Dexron	Avia, München	D-20 760	Motul, Auberwillers/F
Aviation ATF Dexron	Finka, Bremen	D-20 112	OMV, Wien/A
BayWa ATF Dexron	BayWa, München	D-20 739	ICPA, Dordrecht/NL
Bevolol Dexron II	Bevolol, Barendwijk/NL	D-20 727	WCG, Münster
BP Autran DX II	BP, Hamburg	D-20 335	Opal, Nantterre/F
Castrol TQ Dexron II	Castrol, Swindon/GB	D-20 180	Orvusma, Maarsse/NL
Castrol TQ Dexron II	Castrol, Swindon/GB	D-20 691	PAM, Aschaffenburg
Castrol TQ Dexron II	Castrol, Swindon/GB	D-20 366	Pennasol, Lehrte
Castrol TQ Dexron II	Castrol, Swindon/GB	D-20 354	Pennzol, Houston/USA
Castrol TQ Dexron II	Castrol, Swindon/GB	D-20 182	Neuling, Berlin
Castrol TQ Dexron II	Castrol, Swindon/GB	D-20 185	Polarol, Issoudon/F
Castrol TQ Dexron II	Castrol, Swindon/GB	D-20 583	Fuchs, Mannheim
Chevron Automatic Transmission Fluid	Chevron, Frankfurt	D-20 624	Käppler, Stuttgart
Dexron II	Deluxol, Rotterdam/NL	D-20 726	Shell, Hamburg
Dexron II	Deutzol Öl KG, Köln	D-20 137	Sun Oil, Antwerpen/B
Dexron II	Golden Fleece, Melbourne/AUS	D-20 352	HGK, Düsseldorf
Dexron II	Lebo, Nantterre/F	D-20 923	Texaco, Hamburg
Ducihama Fleetmatic C	Ducihama, West-Wickham/GB	D-20 901	Caltex, London/GB
Elan Automatic Dexron II	Elan, Wien/A	D-20 158	Caltex, London/GB
Elfmatic G 2	Elf, Paris/F	D-20 211	Total, Paris/F
Elimo Fluid Dexron	Ellar/Montan, Duisburg	D-20 112	Trek, Johannesburg/ZA
Esa Dexron ATF	Esa, Burgdorf/CH	D-20 356	Bösch & Bödeker, Bremen
Eso Automatic Transmission Fluid Dexron	Esso, Hamburg	D-21 065	Fiat, Tornio
Fanal ATF Dexron II	Fanal, Mühldheim	D-20 383	Valvoline, Hamburg
Fina Dexron II	Fina, Frankfurt	D-20 688	Vesdol Internat./GB
Fröpsol Getrieböl DXS Dexron C	Schindler, Hamburg	D-20 363	Vesdol Internat./GB
Gulf ATF Dexron II	Gulf, Rotterdam/NL	D-20 111	Vesdol Internat./GB
Gurmatic Dexron C	Marton, Nürnberg	D-20 760	Sauerstoffwerk, Münster
Homborg Getriebe Fluid	Homborg, Wuppertal	D-20 739	Wewag, Bocholt
Hansa Dexron	Ol Hansa, Hamburg	D-20 739	Winterhalp, Düsseldorf
HG Renofluid Dexron	Raffelsen, Hannover	D-20 739	Yacco, Caudebec les Elbeuf/F
		Hafa Transmatic 5 II	D-20 781
		Kompressol-Fluid-Matic D 52	D-20 739
		Ladosea Fluid II	D-20 112
		Mac Dexron II	D-20 137
		MHG Getrieböl Dexron	D-20 383
		Mobil ATF 220	D-20 104
		Motivon ATF Dexron II	D-21 121
		Motul Dexron II	D-21 159
		OMV Automatic Dexron II	D-20 768
		OK ATF Dexron	D-20 790
		OK Getrieböl ATF Dexron	D-20 739
		Opalfuid TA	D-20 728
		Orematic	D-20 726
		Pamatic Fluid Dexron II	D-20 739
		Pennasol Fluid Getrieböl Dexron	D-20 112
		Pennzol Hydris-Flo	D-20 122
		PN Fluid Getrieböl Dexron II	D-20 137
		Polefluid Dexron	D-20 356
		Renofluid Dexron	D-20 739
		Selectol Fluid Getrieböl Dexron	D-20 112
		Shell Dexron II	D-20 137
		Sunmatic 149	D-20 101
		SVG Getriebefluid ATF	D-20 790
		Texaco Texamatic Fluid 9226	D-20 112
		Texamatic Fluid Dexron II	D-20 139
		Texamatic Fluid Dexron II	D-20 329
		Texamatic Fluid Dexron II	D-20 576
		Total Dexron	D-20 356
		Trek Dexron II	D-20 530
		Turbo-Getrieböl ATF Dexron	D-20 383
		Tutela GI/A	D-20 752
		Valvoline Valvomatic ATF Type Dexron II	D-20 739
		Vesdol ATF Dexron II	D-20 816
		Vesdol ATF Dexron II	D-20 366
		Vesdol ATF Dexron II	D-20 808
		Westfalen-Getriebeflüssigkeit ATF Dexron	D-20 739
		Wewag Automatic Getrieböl ATF Dexron	D-20 739
		Wiolin ATF Dexron	D-20 383
		Yacco ATF Type II	D-20 806

Approved oil grades for power steering system

If travelling in a foreign country, use the following approved fluids for power steering systems.

Approved oil grades for power steering Initial filling, refilling

Designation	Supplier	
AGIP F 1 ATF Dexron	AGIP AG, München	B 11 279
Aral Oil P 319 Dexron C	Aral, Bochum	D-20 383
Avia Fluid ATF 77 Dexron	Avia Mineralöl, München	D-20 760
BP Autran DX II	BP, Hamburg	D-20 336
Caltex Texamatic Fluid Dexron II	Caltex Ltd., London/GB	D-20 139
Castrol TG Dexron II	Castrol, Swindon/GB	D-20 819
Esso ATF Dexron	Esso AG, Hamburg	D-20 277
Frontal Getriebeöl DXS Dexron C/D	Ölwerke Schindler, Hamburg	D-20 383
Shell ATF Dexron II	Deutsche Shell AG, Hamburg	D-20 137
Texamatic Fluid 9226	Deutsche Texaco, Hamburg	D-20 112
Veelool ATF Dexron II	Veelool GmbH, Hamburg	D-20 816

Use only reputable brand automatic transmission fluid of Dexron® formulation which possesses the proper frictional characteristics to be used in your BMW power steering system.

Restoring level only

Designation	Supplier	
AERO-Line Dexron	Prinz Schulte, Köln-Frechen	D-20 101
Antar Dexron II	Antar SA et C, Paris/F	D-20 600
Aral Getriebeöl ATF 22	Aral, Bochum	D-20 249
Autel Getriebeöl Dexron	Autol-Werke, Hannover	D-20 383
BayWa ATF Dexron	BayWa, München	D-20 739
Sevrol Dexron II	Sevrol, Beerswijk/NL	D-20 727
BP Autran G 3 P 770 810	BP, Hamburg	
Castrol TG Dexron II	Castrol, Swindon/GB	D-20 180
Chevron Automatic Transmission Fluid	Chevron, Frankfurt	D-20 824
Delvac Transmatic Fluid Dexron II	Delvac, Rotterdam/NL	D-20 720
Deutz Oil Dexron II	Deutz Oil GmbH, Köln	D-20 137
Duckhams ATF Dexron	Duckhams, London/GB	D-20 801
Elan Autromatic Dexron II	Elan, Wien/A	D-20 768
Elmatic G 2	Elf, Paris/F	D-20 211
ESA ATF Dexron	ESA, Bergdorf/CH	D-20 739
GI/A Dexron II	Fiat, Turin/I	D-20 782
Giromatic Dexron C	Martin, Nürnberg	D-20 383
Golden Flanco Dexron II	Golden Flanco, Melbourne/AUS	D-20 352
Gulf ATF Dexron II	Gulf, Rotterdam/NL	D-20 111
Hafa Transmatic B-D II	Sofra, Paris/F	D-20 781
Havi Dexron	Oil Hansa, Hamburg	D-20 739
Homburg Getriebe Fluid	Homburg, Wuppertal	D-20 739
Kompresol Fluid Matic D52	Kompresol, Köln	D-20 739
Mobil ATF 220	Mobil Oil AG, Hamburg	D-20 739
Mobil ATF 210 2P 721 005	Mobil Oil AG, Hamburg	D-20 104
Orvematic	Orvema, Maastricht/NL	D-20 725
GMV Autromatic Dexron II	GMV, Wien/A	D-20 768
Renoilfluid Dexron II	Fuchs, Mannheim	D-20 739
Shell Donax TF 3 P 731 113	Deutsche Shell AG, Hamburg	
Sunsomatic 149	Sun Oil Company, Antwerpen/B	D-20 101
Teboli Automatic Fluid	Oy Teboli, Helsinki/SP	D-20 111
Total Dexron	Total, Düsseldorf	D-20 356
Trek Dexron II	Trek, Johannesburg/ZA	D-20 630
Turbo Getriebeöl ATF, Dexron	Börsche & Bödeker, Bremen	D-20 383
Unit Matic Dexron II	Unit Resources/F	D-20 740
Válvoline Visumatic Type Dexron II	Válvoline, Hamburg	D-20 739
Veelool ATF Dexron II	Veelool, England	D-20 804
Veelool ATF Dexron R II	Veelool, England	D-20 366
Westfalen Getriebeölqualität ATF Dexron	Sauerstoffwerk Westfalen, Münster	D-20 739
Wielin ATF Dexron	Wielin, Düsseldorf	D-20 383

EMISSION CONTROL SYSTEM

Note:

Technical specifications and information regarding your BMW, including emission control components, are contained in this section. Some of the components described in the following descriptions are not part of the emission control systems and are referred to or depicted in connection with those systems solely for reference purposes. Those which are emission control system components are specifically listed in your Consumer Warranty Information booklet.

The Emission Control System contains the following components:

1. Bosch-Motronic system
2. Oxygen sensor for Lambda control
3. Catalytic converter
4. Evaporative emission Control system
5. Crankcase Emission Control System.

1. Digital Motor Electronic

Digital Motor Electronic is, in brief terms, a system based on microprocessor technology for the control of fuel injection and ignition timing on the automobile engine.

It incorporates further developments of two well-known existing systems, L-Jetronic fuel injection and all-electronic coil ignition.

The electronic control unit receives and processes various input values, such as engine speed, piston position, intake air flow, air and engine temperatures, throttle butterfly position, battery voltage and operations connected with engine starting. It compares a value based on these signals with a three-dimensional ignition timing and mixture data zone, and computes the optimum ignition timing and duration of fuel injection for all operating conditions.

The Digital Motor Electronic system also keeps exhaust emission levels to an absolute minimum by recording and processing all the relevant data and influencing factors.

The Digital Motor Electronic Control Unit is located in the dashboard above the glove box.

2. Lambda Control Oxygen Sensor

To reduce emission to a minimum it is necessary to operate the engine on a constant fuel/air mixture of 1:14. This ratio is called "stoichiometric ratio" or $\lambda = 1$ (Lambda).

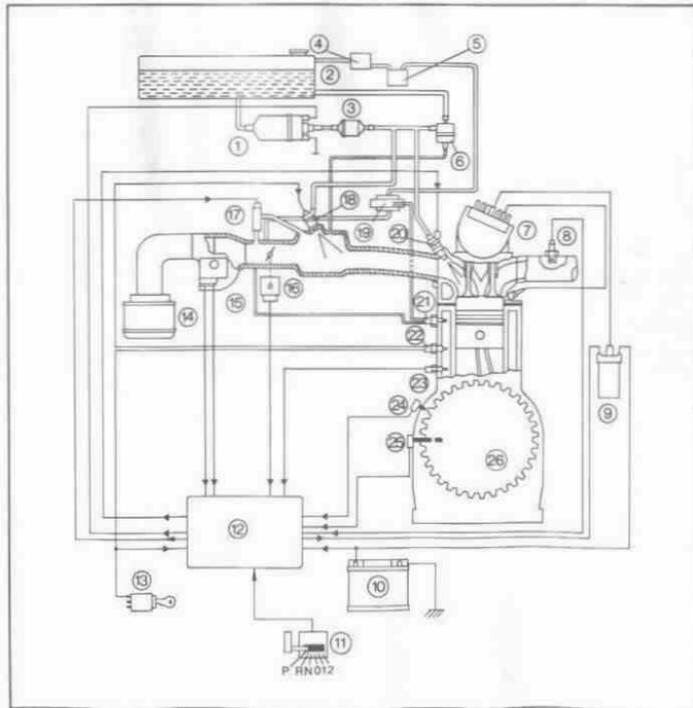
An oxygen sensor in the exhaust pipe compares the oxygen content in exhaust gas with that in the ambient air. The measured difference is transformed into a voltage signal and given to the electronic control unit of the fuel injection system. If the signal changes from a given value, the control unit modulates the injection time of injection valves and in this way readjusts the fuel/air ratio.

This oxygen sensor or lambda sensor is necessary for the most efficient use of catalytic converter.

After 50,000 miles or 80,000 km the oxygen sensor must be replaced.

Digital Motor Electronic

- 1 Fuel pump
- 2 Fuel tank
- 3 Fuel filter
- 4 Liquid-vapor separator
- 5 Carbon filter
- 6 Fuel pressure regulator
- 7 High voltage distributor
- 8 Oxygen sensor
- 9 Ignition coil
- 10 Battery
- 11 Gearshift lever position (automatic only)
- 12 Control unit
- 13 Ignition key
- 14 Air filter
- 15 Airflow meter
- 16 Throttle switch
- 17 Idle control unit
- 18 Cold start valve
- 19 Purge valve
- 20 Injection valve
- 21 Thermo switch
- 22 Thermo-time switch
- 23 Temp. sensor water
- 24 RPM-pickup
- 25 Reference-point pickup
- 26 Starter ring gear



3. Catalytic converter

The catalytic converter is integrated into the exhaust system and installed below the vehicle's floor in the area of the front seats.

The catalytic converter installed in your car is a 3-way type. That means it removes carbon monoxide (CO), unburned hydrocarbons (HC) and nitrogen oxides (NOx).

In this way, the catalytic converter finishes the burning process of fuel which has not been burned fully in the combustion chamber.

The catalytic converter is maintenance free.

However, the catalytic converter is designed to remove the pollutions of unleaded fuel. If fuel containing lead is used - only for a short period - the catalytic converter and oxygen sensor will be destroyed or rendered inoperable.

Fuel filler

The fuel filler neck is equipped with a leaded fuel restrictor and a check valve. The restrictor prevents the insertion of fuel filler nozzles not designed for lead free fuel.

The check valve prevents the fuel vapors to escape from the fuel tank.

4. Evaporative Emission Control System

This is a purge system consisting of a liquid-vapor separator, activated charcoal canister and purge lines and prevents gasoline vapors from escaping to the atmosphere.

An increased purging has been accomplished by connection of the system to the intake manifold.

When the vehicle is stopped and the engine is off, or while standing at a non level position, the gasoline vapors are collected in the liquid-vapor separator where part of them condenses and flows back to the fuel tank. The vapor continues to the charcoal canister where it is absorbed and retained until the engine is started again. Then, a suction effect causes a flow into the intake manifold and the gasoline vapor is burnt by the engine. The liquid-vapor separator is also capable of compensating for fuel expansion of a completely filled gasoline tank when ambient temperatures fluctuate about 80° F or 27° C. The system is maintenance-free.

Warning

The Emission Control System of your BMW 735i is designed to remove pollutants of unleaded fuel only.

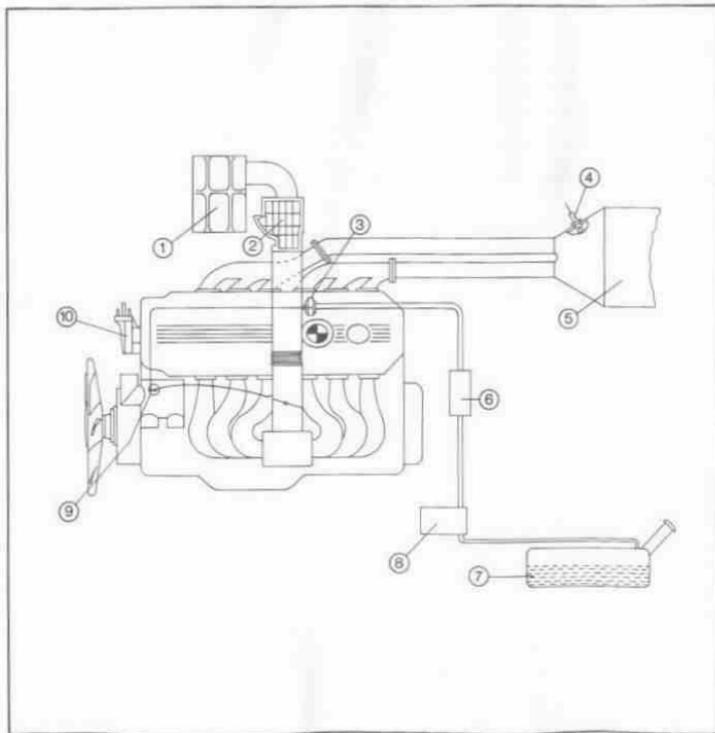
If leaded fuel is used – even only for a short period – the oxygen sensor and catalytic converter will be damaged and rendered inoperative.

To fulfil EPA Emission Standards the oxygen sensor and catalytic converter must be replaced after using fuel containing lead.

Never run the engine with one or more ignition cables disconnected or it will overheat and destroy the catalyst.

For a compression test the fuel injection system must be inoperative.

6-22 Exhaust emission control system

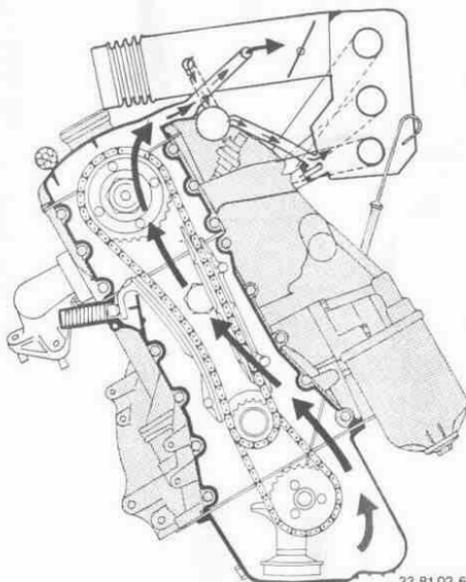
**Exhaust Emission Control System**

- 1 Air Filter
- 2 Air Flow Meter
- 3 Purge Valve
- 4 Oxygen Sensor
- 5 Three-Way Catalyst
- 6 Activated Carbon Filter
- 7 Fuel Tank
- 8 Liquid-Vapor Separator
- 9 Thermo Switch
- 10 High Voltage Distributor

5. Crankcase Emission Control System

This is a "sealed system" which does not permit the entry of fresh air into the crankcase and prevents the emission of blow-by to the atmosphere. The Crankcase Emission Control System is maintenance-free.

CRANKCASE EMISSION CONTROL SYSTEM



6-24 Automatic transmission

ZF 4 HP 22 automatic transmission

The ZF automatic transmission consists of a 4-speed epicyclic gearbox preceded by a torque converter. The **torque converter** provides the necessary torque multiplication when starting; beyond this torque multiplication speed, when engine and transmission speeds are approximately the same, it acts as a fluid coupling, and transmits the drive to the gearbox input shaft with no increase in torque. In 3rd gear a **converter lockup clutch** engages automatically above a transmission oil temperature of 20°C (68°F) and at a road speed of approx. 85 km/h (53 mile/h) to provide a rigid mechanical link between engine and transmission.

The **epicyclic gearbox** which follows the converter has a reverse gear and four forward gears. The gears are selected by hydraulically actuated **multi-plate clutches and freewheels**. These are resistant to wear and do not have to be adjusted.

Above about 8 km/h (5 miles/h) a **reverse gear selection interlock** prevents the driver from accidentally selecting reverse.

The three freewheels installed in the transmission enable power shifts to take place, that is to say there is no interruption of the flow of power to the wheels as a

gear shift is made. A low-loss oil pump is mounted in the front end cover of the transmission. It supplies oil to the converter, the control unit and the lubricating circuit. The gearbox output shaft carries the parking lock gearwheel, with which a pawl engages when "P" is selected, to prevent the vehicle from rolling away.

The **control unit** with selector valve, control pistons and pressure valves is accommodated in the base of the transmission housing. Gear shift points are dependent on a combination of road speed and accelerator pedal position. A **centrifugal governor** supplies impulses to indicate road speed.

Gears are changed automatically at pre-set points depending on the speed range selected at the lever.

If sudden acceleration and maximum engine power are required, the accelerator pedal can be pressed down fully beyond the normal full-throttle detent. When this "kick-down" facility is used, provided that the car is travelling below the maximum speed permitted for the lower gear, the transmission will shift at once to a lower gear and will not change up again until a much higher than usual speed has been reached (or not until the accelerator is eased back if in 3rd gear). If in 4th gear the transmission always kicks down to 3rd gear instantly.

ZF 4 HP 22 EH automatic transmission

On the electronic-hydraulic transmission, impulses corresponding with speed are obtained from a pulse wheel and speed sensor.

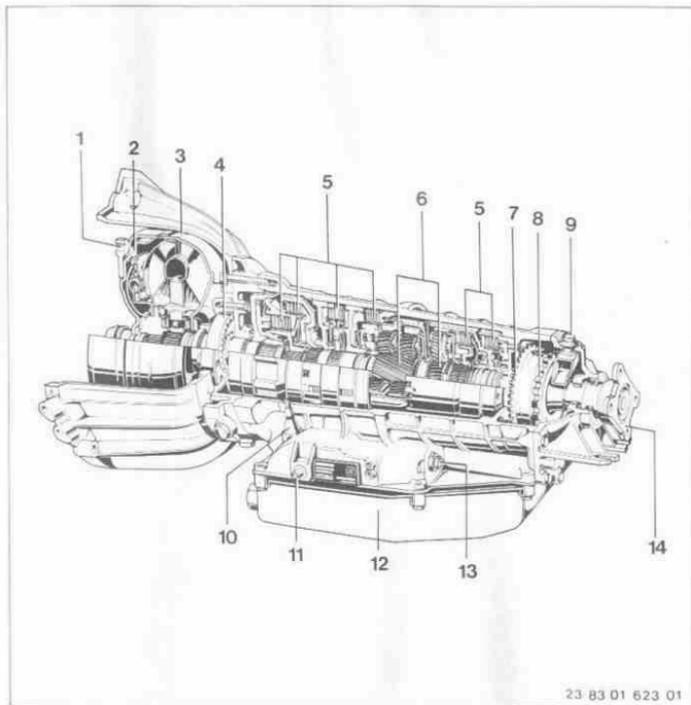
Operating-condition values measured at the engine and the transmission (see digital motor electronics) are supplied as input signals to the common control unit. This not only computes the ignition timing angle and duration of fuel injection for the engine, but also the shift points for the automatic transmission.

With the aid of the **program switch**, the most suitable of three programs stored in the control unit can be selected manually at any time.

A **safety circuit** ensures that the vehicle can still be driven in 3rd gear or reverse if the electronics should fail. A **shift-down interlock** prevents the driver from shifting down into 2nd gear at high speed if the electronics should fail to operate correctly.

ZF 4 HP 22 automatic transmission

- 1 - Connection to driving plate
- 2 - Converter lockup clutch
- 3 - Torque converter
- 4 - Oil pump
- 5 - Multiple disc clutches
- 6 - Epicyclic gear
- 7 - Centrifugal governor
- 8 - Parking lock gear
- 9 - Transmission ventilation
- 10 - Throttle cable
- 11 - Selector lever shaft
- 12 - Oil pan with control unit
- 13 - Plug
- 14 - Output flange



23 83 01 623 01

6-26 Automatic transmission

Selector lever position D, 1st gear

Clutches 4 and 11 are engaged. The front planet wheel carrier of gear train 9 bears against freewheel 15 when the engine is pulling, and is overrun when the engine is not pulling. Planet wheel set 10 rotates as a complete unit at the same time. In selector lever position 1 (1st gear), clutch 8 is also engaged to permit engine braking.

Selector lever position D, 2nd gear

Clutches 4, 6, 7 and 11 are engaged. Freewheel 15 is overrun. The hollow shaft with the sunwheel of planet wheel set 9 is stationary. Planet wheel set 10 rotates as a complete unit.

Selector lever position D, 3rd gear

Clutches 4, 5, 7 and 11 are engaged. Freewheels 15 and 16 are overrun. Planet wheel sets 9 and 10 rotate as a complete unit, with ratio 1:1.

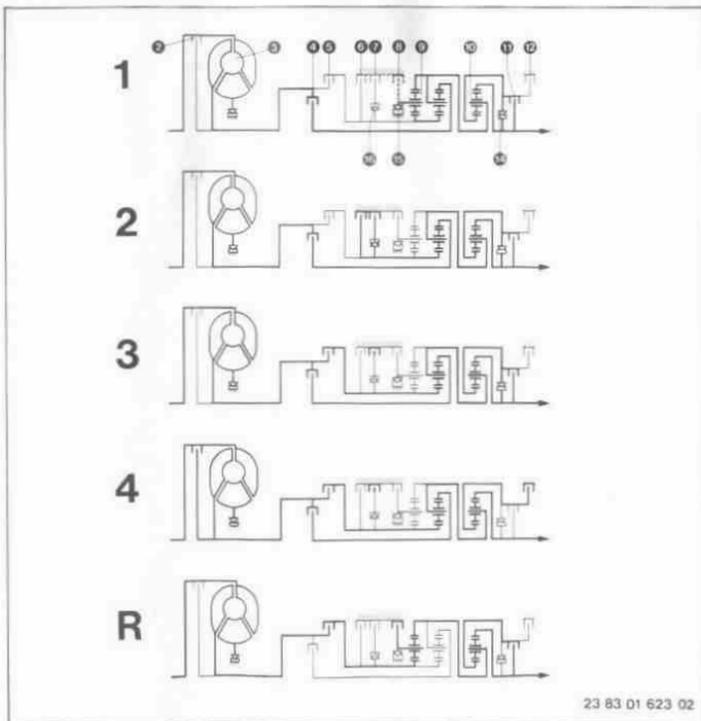
Selector lever position D, 4th gear

Clutches 4, 5, 7 and 12 are engaged. Freewheels 14, 15 and 16 are overrun. Planet wheel set 9 rotates as a complete unit. The hollow shaft with sun wheel of planet wheel set 10 is stationary. Torque converter 3 is bypassed above a certain road speed by **converter lock-up clutch 2**.

Selector lever position R (Reverse)

Clutches 5, 8 and 11 are engaged. Since the front planet wheel carrier of gear train 9 is prevented from turning, the output shaft is driven in the opposite direction.

Planet wheel set 10 rotates as a complete unit.



Power steering

Today's traffic often calls for vehicles to be positioned accurately in lanes or parked in confined spaces, particularly in our city centers. The driver has to turn the steering wheel almost from one full-lock position to the other, often two or three times in succession, at very slow speeds.

Furthermore, sudden hazards can occur on the roads which demand an immediate change of direction at high speed in order to avoid a collision. If one front wheel should then stray on to a soft shoulder, high lateral forces will suddenly confront the driver.

With power steering, the driver in both cases senses only the need for very slight extra effort, since the force he exerts at the steering wheel rim is automatically boosted by the hydraulic power assistance.

The hydraulic power support is effective independent of speed, i.e. at high speeds and when the steering force is low, the power assistance goes down, so that the driver feels he has more control and better road grip. When more steering effort is needed, at a high speed, the full power assistance then becomes available.

Power assistance thus not only makes driving effortless but also makes a major contribution towards road safety.

If this BMW is your first car equipped with power steering, please remember that it takes a little time to grow accustomed to the light action of the steering under normal driving conditions.

Construction:

The ZF ball and nut steering box contains control valves, actuating rams and also a complete mechanical steering gear assembly. Oil pressure for the power assistance is supplied by a ZF vane-type high pressure pump driven by V-belt from the engine. The oil reservoir and oil filter are connected to the pump.

The design of the steering gear assures that in the event of a hydraulic failure, or when the car's engine cannot be run and the car has to be towed away, full manual control is provided, although the steering then naturally calls for considerably more effort at the wheel rim.

Check oil level in the power steering reservoir during all engine oil level checks and maintenance work. Use only reputable automatic transmission fluids of Dexron formulation which possess the proper frictional characteristics.

Only the oils listed on page 6-17 must be used for initial filling of the power steering circuit, together with refilling (not more than 1/4 liter).

At every inspection the steering must be checked. This work, and all other attention which the power steering system requires, should always be entrusted to your BMW dealer or a qualified service station.

Disc-type limited-slip differential

In very unfavorable driving conditions the conventional form of differential may be unable to transmit torque to the road wheels without wheelslip occurring. The limited-slip differential greatly reduces the undesirable and possibly dangerous situation in which one driven wheel starts to spin.

In practice, this means that improved traction is provided when pulling away, accelerating and taking corners at speed in poor driving conditions.

At the same time, the car tends to spin around the vertical axis at the center of gravity at high power outputs and load reversals on slippery road surfaces. A good deal of skill is required to control a skid and extreme care must be taken especially when driving in an enthusiastic manner.

The locking action is produced by the friction of lined clutch discs, and depends on the load exerted: the differential gear shafts, thrust rings and symmetrically located inner discs tend to move apart and brake the wheel generating the greater accelerative force.

As disc friction takes effect increasingly, it hinders or entirely prevents wheelspin on that side of the car, so that the other wheel can grip and keep the car moving.

A major advantage of the limited-slip differential is that it operates automatically when needed, and does not have to be engaged by the driver.

Air conditioning

Your BMW can be fully air conditioned by a unit integrated into the standard heating and ventilation system. This enables the car's interior to be either raised or lowered in temperature.

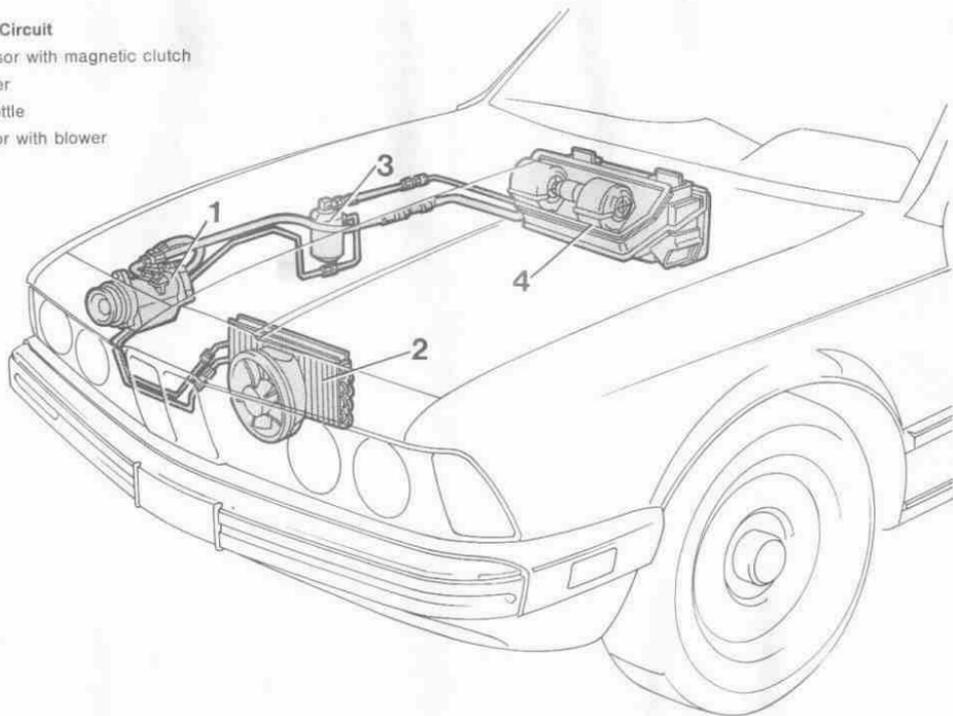
The air conditioning operates by the same principle as a domestic refrigerator. The refrigerant (Freon) is raised to a high pressure in the **compressor** and then passed in gas form to the **condenser**, which is located in front of the car's radiator. The air drawn in by the cooling fan and ram air which enters when the car is moving cool the Freon vapor which thus liquefies again. The liquid refrigerant then flows to the **evaporator**, passing through the dehumidifier flask on the way. This absorbs any traces of moisture which it still contains. In the evaporator the refrigerant is released through an expansion valve and vaporized again. The heat needed for this change of state is taken from the airflow round the unit which is produced by the blower. The gaseous refrigerant is then drawn into the compressor again and recompressed to start the circuit a second time.

The compressor is equipped with an electromagnetic clutch which cuts in or out as required. It is controlled by a thermostat switch on the evaporator.

The electric auxiliary fan starts automatically when the compressor cuts in and when refrigerant temperature reaches a certain upper limit.

Refrigerant Circuit

- 1 Compressor with magnetic clutch
- 2 Condenser
- 3 Drying bottle
- 4 Evaporator with blower



6-30 Antilock brake system (ABS)

Antilock brake system (ABS)

BMW's unceasing efforts to improve its car's active safety have led to the development of the antilock brake system (ABS).

Whenever a brake application is made, the ABS is required to satisfy two fundamental requirements:

- To maintain the car's stability on varying surfaces (asphalt, concrete, mud, wet roads, snow and ice)
- To ensure that the car can be steered and maneuvered under these adverse conditions.

These requirements must be seen in the light of certain essential accompanying factors.

Even ABS is unable to prevent the natural laws of physics from acting on the car. It cannot for instance avoid the consequences of braking when there is insufficient distance remaining to the car in front, when cornering limit speeds are exceeded or if there is a risk of aquaplaning (tires riding up on a cushion of water lying on the road surface). It remains the driver's task to judge speeds and brake applications correctly in such conditions.

The fact that the car may be equipped with ABS must never, despite the increased safety margins this system frequently affords, tempt the driver into taking risks which could affect his safety and that of other road users.

Driving a car equipped with ABS

After the engine has been started, the yellow **ANTILOCK warning light** on the instrument panel will go out.

The system itself is then in working order, but does not come into action until road speed exceeds approx. 8 km/h (5 mile/h). After this minimum speed limit has been passed, the ABS can prevent the wheels from locking when the driver applies the brakes. If the speed drops below approx. 3 km/h (2 mile/h), the ABS will cease to operate, so that in theory the wheels could lock at the very end of a brake application, though in practice this is not critical at such a slow speed. The ABS regulating cycle is repeated over and over again within fractions of a second. To inform the driver that his brake application has caused the ABS to come into action, a pulsating effect is noticed at the brake pedal, together with a characteristic noise. As a warning to watch out for surfaces on which the tires cannot grip well, a "chattering" sound is heard when the ABS is controlling the braking pressure; this reminds the driver to reduce speed to suit the poor road conditions.

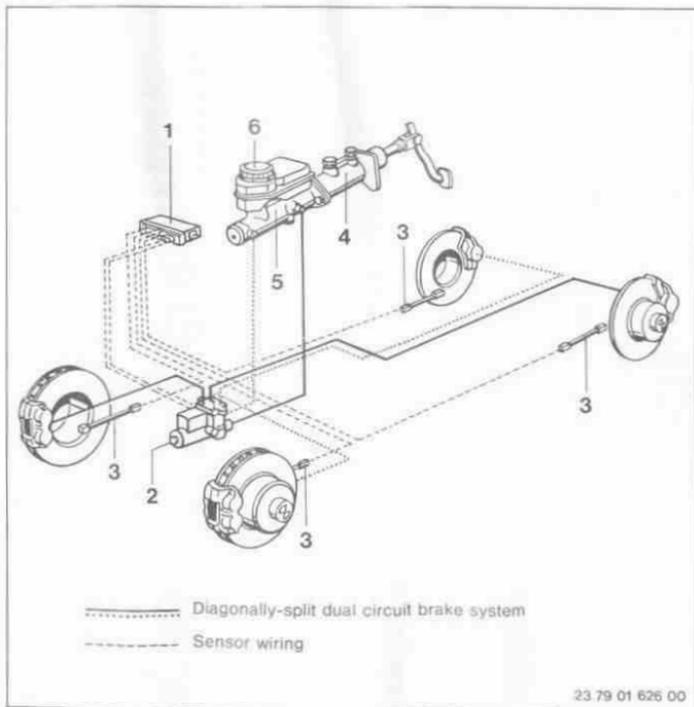
The ABS is capable of achieving the shortest possible braking distances in any given conditions (either in a straight line or when the steering wheel is turned, and on smooth asphalt, ice, wet roads etc.). The braking distance may be slightly longer on loose surfaces on top of a firm base, such as snow, since the skidding wheels of a conventionally-braked car tend to build up a buffer of the loose mate-

rial as they are forced through it. This may also be the case if snow chains are fitted. However, the benefits of greater stability and the fact that the car can be steered more than outweigh this occasional slight drawback.

The ABS control unit incorporates an electronic fail-safe monitoring system which checks that all components are in working order before a journey, and repeatedly when the car is in motion. Any malfunction is indicated by the yellow Antilock warning light on the instrument panel coming on. The brake system then operates conventionally and with precisely the same standards of performance as on cars not equipped with ABS.

Diagram of antilock braking system (ABS)

- 1 - Control unit
- 2 - Hydraulic assembly
- 3 - Speed sensors
- 4 - Brake servo
- 5 - Master cylinder
- 6 - Brake fluid reservoir



6-32 Antilock brake system (ABS)

Construction and operating principle

The basic factor governing any brake application is the friction between the tire contact patch and the road surface. To brake the vehicle, the tire must exert a frictional force on the road. A degree of slip occurs between tire and surface, so that the peripheral speed of the wheel and the value which would correspond with the car's actual road speed are not quite equal.

Since the tire's contact patch is only about the size of a postcard, and moves round within approx. 6/1000 of a second at a speed of 100 km/h (62 mile/h), it is clearly able to transmit only a limited energy potential in the form of combined longitudinal and lateral forces. A reduced friction coefficient between tire tread and road surface cuts the energy transfer process still further. This explains why reaction at the steering wheel is still felt

on surfaces with marked variations in grip although the car is equipped with ABS.

If road conditions are exceptionally unfavourable, for instance wet sheet ice or deep water (aquaplaning), even an ABS-braked wheel may come to a standstill briefly, if friction at the tire is simply too low to turn the wheel against downward load and residual bearing friction.

This effect is of course more likely to occur when the wheels are turned well away from the straight-ahead position, since the force component acting round the periphery of the wheel is then insufficient to accelerate the wheel again.

The ABS consists primarily of the electronic control unit (1) and the hydraulic assembly (2) integrated into the car's conventional brake system. Speed sensors (3) on the front and rear wheels measure the speed of rotation and transmit corresponding signals to the electronic control unit. This converts the rotation pulses into wheel speed and peri-

pheral acceleration, compares these data with fixed input constants and transmits the appropriate electrical pulses as instructions to the hydraulic assembly. This in turn consists of a group of electromagnetic valves for the various wheel brakes and an electrically-driven return-flow pump, and is able to regulate braking pressure separately for each front wheel and for the two rear wheels together.

If a wheel fails to reach a peripheral speed equivalent to the car's road speed, or if the peripheral speed drops suddenly, this is an indication that the wheel is about to lock, whereupon the braking pressure regulating cycle begins.

Pressure regulation takes place independently of the force applied by the driver to the brake pedal; this means that an emergency full brake application can be made at any time without the driver having consciously to vary the braking effort repeatedly as with the often-recommended "cadence braking" method.

The **SRS** complement of the system consists of the airbag, a gas generator and the electronics needed to sense rapid deceleration, ignite the propellant that inflate the airbag and monitor readiness.

Sensors in the engine compartment at the right, left and center (mounted in the control unit) detect frontal deceleration severe enough to trigger the **SRS**.

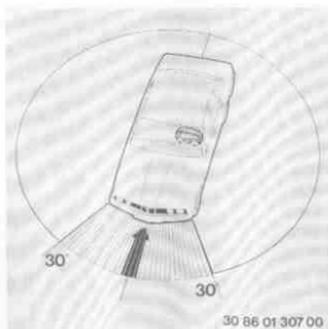
By design the **SRS** system only activates in frontal impacts with a speed of app. 12 mph (20 km/h) into a solid barrier or with a higher speed into a flexible barrier.

Lesser impacts and those from the side and rear will not deploy the airbag, and protection will only be provided by the seatbelts. The diagram illustrates the impact area where the **SRS** is designed to be activated.

Although it is highly unlikely that the **SRS** would activate in a non-accident situation – should it occur, the bag will deflate quickly, not obscure vision and will not interfere with the driver's ability to maintain control of the automobile.

During an impact of appr. 12 mph (20 km/h), a sudden, fairly loud inflation noise will be heard and a small quantity of smoke will be released, neither of which is injurious.

The gas generated by the propellant to inflate the airbag is filtered and cooled while entering the bag.



6-34 Supplementary Restraint System (SRS)

Vents allow the bag to instantly deflate while slowing forward body movement in order to prevent the bag from pushing the driver sharply rearward.

Sufficient electric charge is stored in a capacitor so that, should there be an electrical failure during an accident, including disconnection of the battery, the airbag will still activate.

The **SRS** can only be activated once. Only authorized **BMW** dealers should repair or replace the system. Tampering and improperly performed repairs can result in a failure of the system to operate or inadvertent activation. Only authorized **BMW** dealers should perform the necessary work. Do not affix any labels, decorations, badges etc. to the cover at the center of the steering wheel.

Should a **SRS** have to be scrapped, contact a **BMW** dealer for the safety precautions. If you sell your car, we urge you to inform the purchaser about the system and give him this **SRS** handbook supplement.

At the date specified on the label in the glovebox please have an authorized **BMW** dealer thoroughly inspect the entire **SRS**.

BMW Service – maintenance requirements



BMW Service
Pre-delivery Inspection
1,200 mile/2,000 km
Inspection
Engine oil service
Inspection I
Inspection II
Annual Check
Alphabetical index

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BMW Service

The BMW Maintenance System has been devised with the following objectives: maximize vehicle safety, reliability, and resale value by minimizing breakdowns resulting from wear, at minimum cost and inconvenience by computing maintenance intervals based upon the specific manner in which each individual vehicle is driven.

Maintenance intervals on motor vehicles have conventionally been specified based upon accumulated mileage.

Actually, the type of driving conditions has a major influence on routine maintenance requirements, distance traveled being only one of the significant factors. A vehicle driven for 50,000 miles or 80,000 km of short trips in the city with numerous cold starts, prolonged periods of idling, stop-and-go driving, and high engine speeds during acceleration requires more frequent maintenance intervals than a vehicle driven for 50,000 miles or 80,000 km for long trip distances at low engine speeds primarily at operating temperature.

The advanced technologies at BMW have led to the development of the unique BMW Service Indicator System which computes the actual optimum maintenance requirements based not only upon the accumulated mileage, but taking into account important factors such as engine coolant temperatures, high or low engine speeds, short or long trip driving, and

number of vehicle start. The maintenance interval may therefore be extended with considerable savings to its owner on vehicles subjected to light duty.

The maintenance interval will be optimized for vehicles subjected to severe duty.

A detailed list of all maintenance operations included in each of the elements of the BMW Maintenance System is found in subsequent pages in this section. These elements are as follows:

The performance of the pre-delivery inspection will be certified by your selling dealer on one of the following pages.

The "Break-In" or 1,200 mile/2,000 km inspection will be also certified in a similar manner as well as all subsequent maintenance performed.

The performance of certain subsequent required maintenance elements, as specified by the BMW limited warranty will be specified at intervals computed by the BMW Service Indicator as follows:

- Oil Service: Engine oil and filter changed with the engine at operating temperature. Additional "preventative maintenance" services are recommended but not required under the provisions of the BMW limited warranty.
- Inspection: Major vehicle maintenance as specified in the following pages under Inspection I.
- Inspection: Major vehicle maintenance as specified in the following pages under Inspection II.

- Oxygen Sensor Service: The oxygen sensor deteriorates strictly on a mileage basis and must therefore be replaced every 50,000 miles or 80,000 km to maximize vehicle fuel economy and minimize exhaust pollution. The replacement of the oxygen sensor is required under the terms of the applicable BMW emission system warranties.
- Annual Check: An annual inspection of the vehicle body is required under the terms of the BMW 6 year limited warranty - rust perforation. Additional services are recommended, including operations to maintain your vehicle's braking system at its maximum efficiency for safety and engine longevity.

For your convenience, you may also wish to have your BMW Dealer perform any necessary operations to fulfill any state inspection requirements in your area concurrent with the maintenance elements specified above or during other repairs.

BMW has applied the most modern technological advances not only to the design and production of your vehicle, but also to the computing of the optimum maintenance interval for your type of operation and driving style. Your BMW Dealer has made a substantial investment, in unique BMW special service tools to enable his BMW factory trained service-technicians to perform quality repairs on your BMW in a minimum of time. He looks forward to serving you every service need to help maximize your satisfaction with your BMW, its longevity, and resale value.

After each maintenance is performed, the Service Indicator is reset to cancel the indication in order to compute the next service interval.

Make quite sure that confirmation of maintenance work is always entered. You may need this for any warranty claims that become necessary, and later on as evidence that your car has been given the correct and regular maintenance that justifies its resale or trade-in value.

The **Service Indicator** consists of five green, one yellow and three red light-emitting diodes and the inscriptions "OIL-SERVICE" and "INSPECTION".

Whenever the ignition is switched on, **up to five green LEDs** will light up, depending on the amount of use the vehicle has had already since the last maintenance service and your driving style. As the number of illuminated green LEDs grows less, this is an indication that the next service is almost due and helps you to make the necessary arrangements on a timely basis.

The green LEDs go out when the engine is started.

If the **yellow light-emitting diode** and one of the inscriptions also come on with the ignition and remain on when the engine is started, the next maintenance service indicated is due immediately.

If the maintenance interval has been exceeded, the **red LEDs** will come on successively in addition to the yellow one to remind you of the urgent need for servicing. In the interests of road safety and reliability, you should **avoid driving your**

BMW when the red LED signals are showing, but have the essential maintenance work performed without delay.

The oil service or inspection indication on the service indicator must be cancelled and reset in order to enable it to compute the next service interval.

The green LEDs which then come on with the ignition show you the interval before the next inspection is due.

Due to the need for initial "Break-in", the service indicator is not reset at the 1,200 mile (2,000 km) inspection.



Service – all the way

High quality engineering inspires confidence. You need not examine or drive your BMW very far before you observe and feel the "Perfection in Detail" achieved by BMW engineers.

A highly engineered high quality automobile should be given expert attention and care to maximize your driving pleasure and vehicle longevity.

We recommend that you place all of the service needs of your BMW in the hands of your BMW dealer. Your BMW dealer has made a substantial investment in BMW special service tools to allow his factory-trained service technicians to perform high quality repairs in a minimum of time. He has also made a substantial investment in service and diagnostic equipment and

is kept abreast of the latest repair and service techniques by BMW in the form of technical literature and service training. BMW factory personnel work closely with the BMW dealer organization to maintain the highest service standards.

Your BMW dealer has also made a substantial investment in genuine BMW parts. BMW genuine replacement parts are designed by BMW engineers using the latest technology and design principles. They are manufactured to our high quality standards. Aesthetics, as well as function, are design criteria whether designing an obscure component within the hidden confines of a door, never to be seen by the vehicle owner, or to the designing of highly visible components in the engine or interior. The dedication to "Perfection in Detail" and continuous improvement by our design, production engineers, and quality control engineers, as well as BMW manufacturing personnel, are your assurances of BMW quality.

Only by supplying genuine parts and service of the highest quality can we expect to achieve our most important objective of selling you your next BMW. Just as a chain is only as strong as its weakest link, the performance and longevity of your BMW will depend upon the use of replacement parts which meet our exacting and demanding specifications.

We recommend that you insist upon only BMW genuine parts and service to maximize your driving pleasure and protect your investment. After all, who else knows your BMW better than BMW!

The service requirements and procedures described in this handbook were in effect at the time of printing – errors and omissions excluded.

We reserve the right to make reasonable modifications to these service requirements and procedures from time to time.

Service 7-05

Stock No. 10498 Trim code _____ Color code _____
 Model 735iA Year 86 Chassis No. _____ Date of first registration _____
 Engine No. _____ Name of owner _____ License plate No. _____
 Address of owner _____ Tel. No. - business _____
 Tel. No. - home _____

BMW Pre-Delivery Inspection Record	Record of Oxygen Sensor renewal (every 50,000 miles)		Record of add. annual Svc. check	Record of annual Brake fluid changes	Record of bi-annual Coolant changes	Record of annual Anti-Corrosion Inspection
	Date	Mileage	Date	Date	Date	Date
Performed by (Getting dealer Stamp with Logo) DEALER CODE: 56470  BAYSIDE BMW 217-07 NORTHERN BOULEVARD BAYSIDE, NY 11301 TELEPHONE: (718) 229-4400 Date <u>7/2/86</u> Mileage <u>1000</u> Dealer authorized Signature of Service Manager <u>[Signature]</u>						
Performed by (Getting dealer Stamp with Logo) DEALER CODE: 56470  BAYSIDE BMW 217-07 NORTHERN BOULEVARD BAYSIDE, NY 11301 TELEPHONE: (718) 229-4400 Date <u>7/2/86</u> Mileage <u>1000</u> Dealer authorized Signature <u>[Signature]</u>						

Validation required on appropriate page

Speedometer changed: Date _____ Mileage _____

Speedometer changed: Date _____ Mileage _____

7-06 Service

<p>BMW Engine Oil Service</p> <p><i>6006</i></p> <p>BAYSIDE BMW</p> <p>117-07 NORTHERN BOULEVARD BAYSIDE, NY 11361</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>	<p>BMW Inspection I</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>	<p>BMW Engine Oil Service</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>	<p>BMW Inspection II</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>
<p>BMW Engine Oil Service</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>	<p>BMW Inspection I</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>	<p>BMW Engine Oil Service</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>	<p>BMW Inspection II</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>
<p>BMW Engine Oil Service</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>	<p>BMW Inspection I</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>	<p>BMW Engine Oil Service</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>	<p>BMW Inspection II</p> <p><i>[Signature]</i></p> <p>Date / Stamp / Signature</p>

Pre-Delivery Inspection

Only operations that pertain to this vehicle will be performed.

CHECK CONDITION OF

- Upholstery
- Seat covers
- Door panels
- Floor carpet/lining
- Headliner
- Instrument panel cover
- Sun visors
- Center console

CHECK OPERATION OF

- Central locking
- Manual/electric seats
- Seat belts
- Ignition switch
- Digital clock (set to proper time)
- Program on-board computer and check operation of both stalk and computer
- Radio, Cassette: Antenna operation and speaker controls
- Electric windows front & rear
- Sun roof in all positions
- Check control

Warning Lights, Gauges, Buzzers

- Alternator
- Oil pressure
- Coolant temperature
- Oxygen sensor light (if applicable)
- Ignition key warning chime
- High beam indicator

- Seat belt light
- Fuel gauge
- ABS and SRS light

Lighting Equipment Operation (Internal)

- Instrument lights & dimmer
- Fog light indicator
- High beam flasher
- Interior light & delay system
- Turn signal indicators
- Hazard warning indicator
- Glove compartment light

Other Electrical Equipment Operation

- Rear window defroster switch
- Horn
- Cigarette lighter
- Windshield wipers function; adjustment – washer function
- Outside mirrors

Lighting Equipment Operation (External)

- Check headlight alignment, adjust if necessary
- Side marker, parking, tail and license plate lights
- Brake lights
- Turn signal lights
- Hazard warning lights
- Back-up lights
- Fog lights
- Under hood & trunk lights
- Dealer installed accessories

ENGINE

Engine cold

- Oil level – check for dilution, change oil & filter as necessary, check oil filter cap for proper sealing
- Coolant level – antifreeze protection level
- Check coolant hoses for leaks
- Battery level – refill if necessary
- Check windshield washer reservoir level and fluid antifreeze protection
- Check spark plugs – replace, clean and/or regap as necessary
- Engine fuel connections
- Engine coolant connections
- Reset service interval indicator

UNDERCARRIAGE & FUEL

- Fuel tank, lines, filler cap and filter securely mounted and leak free
- No damage to undercarriage
- Exhaust/mufflers secure

CLUTCH AND BRAKES

- Clutch and brake fluid level
- Inspect connections and brake lines for leaks, damage, or incorrect positioning

STEERING

- Inspect castellated nuts for presence of cotter pins
- Check power steering for leaks

Pre-Delivery Inspection

Only operations that pertain to this vehicle will be performed.

CHECK CONDITION OF

- Upholstery
- Seat covers
- Door panels
- Floor carpet/lining
- Headliner
- Instrument panel cover
- Sun visors
- Center console

CHECK OPERATION OF

- Central locking
- Manual/electric seats
- Seat belts
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Warning Lights, Gauges, Buzzers

- Alternator
- Oil pressure
- Coolant temperature
- Oxygen sensor light (if applicable)
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- High beam indicator

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- Fuel gauge
- ABS and SRS light

Lighting Equipment Operation (Internal)

- Instrument lights & dimmer
- Fog light indicator
- High beam flasher
- Interior light & delay system
- Turn signal indicators
- Hazard warning indicator
- Glove compartment light

Other Electrical Equipment Operation

- Rear window defroster switch
- Horn
- Cigarette lighter
- Windshield wipers function; adjustment - washer function
- Outside mirrors

Lighting Equipment Operation (External)

- Check headlight alignment, adjust if necessary
- Side marker, parking, tall and license plate lights
- Brake lights
- Turn signal lights
- Hazard warning lights
- Back-up lights
- Fog lights
- Under hood & trunk lights
- Dealer installed accessories

ENGINE

Engine cold

- Oil level - check for dilution, change oil & filter as necessary. Check oil filler cap for proper sealing
- Coolant level - antifreeze protection level
- Check coolant hoses for leaks
- Battery level - refill if necessary
- Check windshield washer reservoir level and fluid antifreeze protection
- Check spark plugs - replace, clean and/or regap as necessary
- Engine fuel connections
- Engine coolant connections
- Reset service interval indicator

UNDERCARRIAGE & FUEL

- Fuel tank, lines, filler cap and filter securely mounted and leak free
- No damage to undercarriage
- Exhaust/mufflers secure

CLUTCH AND BRAKES

- Clutch and brake fluid level
- Inspect connections and brake lines for leaks, damage, or incorrect positioning

STEERING

- Inspect castellated nuts for presence of cotter pins
- Check power steering for leaks

7-10 Service

WHEELS – TIRES

- Tire condition, including spare – verify correct size and type of tires and rims
- Tire pressure, including spare
- Installation of wheel hub trim caps and exhaust tailpipe trim
- Unpack and install tool kit
- Unpack and install jack/wrench

ROAD TEST**Check operation of:**

- Engine
- Clutch
- Transmission
- Rear axle
- Steering (wheel in center position)
- Foot and parking brakes (before and during road test)
- Check handling and wheel balance
- All instruments working
- Absence of rattles or squeaks
- Pre-burnish parking brake
- Heater and air conditioner function
- Cruise control operation, if equipped
- Radio/power antenna
- Cassette tape player
- Check idle rpm

AFTER ROAD TEST**Check that there are no leaks on:**

- Transmission
- Steering
- Clutch system
- Engine
- Rear axle
- Fuel system
- Brake system
- Half-shaft flexible boots
- Remove plastic seat covers

FINAL CHECKS (before delivery)**Engine**

- Oil level - check for dilution
- Coolant level
- Check fuel level

BODY

- Car cleaned and polished
- Interior cleaned
- Vehicle without scratches or damage
- Owner's handbook/warranty handbook
- Keys and key number label
- Factory invoice (monroney label)
- BMW national dealer list booklet
- Radio owner's handbook (if equipped)
- Tape unit cleaning cassette kit
- Attachment of adhesive label for BMW advice telephone number

Delivery to vehicle owner:

I hereby confirm that I have taken delivery of the

BMW

with chassis number
in good condition and working order.

The car was accompanied by:

- Owner's handbook/Warranty handbook
- List of BMW service stations
- Spare keys with key-number label
- Key wallet
- Tools complete with jack and wheel stud wrench
- Wrenches for manual operation of electric window lifts/sliding roof.

(Place, date)

(Signature of vehicle owner)

WHEELS – TIRES

- Tire condition, including spare – verify correct size and type of tires and rims
- Tire pressure, including spare
- Installation of wheel hub trim caps and exhaust tailpipe trim
- Unpack and install tool kit
- Unpack and install jack/wrench

ROAD TEST**Check operation of:**

- Engine
- Clutch
 - Transmission
- Rear axle
- Steering (wheel in center position)
- Foot and parking brakes (before and during road test)
- Check handling and wheel balance
- All instruments working
- Absence of rattles or squeaks
- Pre-burnish parking brake
- Heater and air conditioner function
- Cruise control operation, if equipped
- Radio/power antenna
- Cassette tape player
- Check idle rpm

AFTER ROAD TEST**Check that there are no leaks on:**

- Transmission
- Steering
- Clutch system
- Engine
- Rear axle
- Fuel system
- Brake system
- Half-shaft flexible boots
- Remove plastic seat covers

FINAL CHECKS (before delivery)**Engine**

- Oil level - check for dilution
- Coolant level
- Check fuel level

BODY

- Car cleaned and polished
- Interior cleaned
- Vehicle without scratches or damage
- Owner's handbook/warranty handbook
- Keys and key number label
- Factory invoice (monroney label)
- BMW national dealer list booklet
- Radio owner's handbook (if equipped)
- Tape unit cleaning cassette kit
- Attachment of adhesive label for BMW advice telephone number

(Place, date)

(Signature of Sales Manager)

1200 Mile (2,000 km) Inspection

Note: Only operations that pertain to your vehicle will be performed.

- Change engine oil and oil filter while engine is at normal operating temperature.
- Change oil in manual transmission only while at normal operating temperature.
- Check oil level in automatic transmission.
- Change oil in rear axle while at normal operating temperature.
- Check power steering oil level, add oil as required. Check for leaks.
- Check fluid level in reservoir for clutch and hydraulic brake system.
- Check windshield washer reservoir, level and fluid antifreeze protection. Correct if necessary.
- Check cooling system and all connections and heater hoses for leaks. Check coolant level and concentration; add coolant if necessary.
- Inspect and adjust valves.
- Retorque chassis nuts and bolts (see repair manual specifications for correct tightening torques); steering, brakes, and wheel bolts.

Please discuss the scheduling of the appointment and the charges for this service with your dealer as soon as possible to insure that this service is performed on a timely basis.

- Check condition, position, mountings and tightness of exhaust system.
- Examine brake lines and connections for leaks, damage or distortion.
- Check foot brake.
- Check the operation of the following items:
 - Lighting equipment: Headlights, parking, back-up, license plate, interior, glove box, engine and luggage compartment lights.
 - Headlights alignment, adjust if necessary.
 - Warning equipment: Turn signals, hazard warning flashers, brake lights, horns, headlight dimmer and flasher switch. Check control panel operation. ABS-, SRS light.

- Instrument lighting, control lighting, windshield wipers and washers (including jet position) heater and air conditioner blowers, rear window defroster.
- Check all tire pressures and adjust as necessary (including spare tire).
- Check brakes, steering, clutch or automatic transmission while driving in and out of service stall, pre-burnish parking brake according to specification (vehicles with rear disc brake only).

BMW Engine Oil Service

Required

- change oil and oil filter while engine is at normal operating temperature
- Reset Service Indicator

Additional recommended service (to be invoiced separately)

- Check Steering:
Steering box, steering linkage, joint disc, threaded connections, tightness and oil level
- Check brakes:
Brake pads and brake discs (remove and install wheels), check level of brake and clutch fluid in reservoir. Add fluid if required. (Note: Change brake fluid at least once a year.) Check handbrake and adjust parking brake cable. Check brake hoses and connections for leaks and distortion. Check all tires of condition, tread wear and pattern, pressures and adjust if necessary (including spare tire).
- Check lighting:
Headlights, parking, back-up, license plate, interior, glove box, engine and luggage compartment lights. Turn signal, hazard warning flashers, brake lights, horns, headlight dimmer and flasher switch. Check control panel operation, instrument lighting, control lighting, ABS-, SRS light.
- Headlights alignment: adjust if necessary.

Reminder:

Change brake fluid at least once annually (Use only DOT 4 brake fluid)
Change coolant every two years.

- Check windshield wipers and washers:
Adjust washer jet position if necessary, check level and antifreeze protection in fluid reservoir.
- Check intensive-cleanser level, add as required.
- Check seat belts:
Condition and correct operation.
- Clean cassette tape head, capstan, and pinch rollers every 50-100 hours of operation or earlier if quality of sound is impaired.
- Road test for vehicle operation and safety items.

Any other requested repairs and adjustments are to be invoiced separately.

BMW Inspection I

Note: Only operations that pertain to your vehicle will be performed.

- Change engine oil and oil filter while engine is at normal operating temperature.
 - Change automatic transmission strainer and fluid while at normal operating temperature. (Only in inspection I, not required during inspection II.)
 - Check manual transmission oil level. Add oil as required.
 - Check oil level in rear axle; add oil as required.
 - Visually check fuel tank, lines and connections for leaks.
 - Check steering gear or power steering for leaks and correct oil level. Add oil as required.
 - Check battery acid level and add distilled water as required.
 - Check level of brake and clutch fluid in reservoir. Add fluid if required. NOTE: Change brake fluid at least once a year.
 - Check cooling system and all connections and heater hoses for leaks. Check coolant level and concentration; add coolant if necessary.
- Important: Coolant must be drained completely and replaced every 2 years.
- Check windshield washer reservoir level and antifreeze protection.
 - Check wipers and washer system; wiper blades, washer jet position.
 - Apply grease to the bearing points and moving parts of the throttle butterfly linkage.
 - Check valve clearances. Adjust as necessary.
 - Check steering for absence of play in straight ahead position.
 - Check condition of suspension track rods, front axle joints, steering linkage and joint disc.
 - Check condition, position, and mounting of exhaust system. Examine for leaks.
- Remove and install front and rear disc/drum brake pads, check overall thickness and renew if necessary. Examine brake disc surfaces.
 - Check brake system connections and lines for leaks, damage and incorrect positioning.
 - Inspect wheel brake cylinders and dust boots for leaks. Check free movement of parking brake cables. Adjust parking brake if necessary. Grease wheel centering hubs, reinstall wheels.
 - Tighten A/C compressor mount bolts.
 - Check the operation of the following items:
 - Lighting equipment: Headlights, parking, back-up, license plate, interior, glove box, engine and luggage compartment lights.
 - Headlights alignment, adjust if necessary.
 - Warning equipment: Turn signals, hazard warning flashers, brake lights, horns, headlight dimmer and flasher switch. Check control panel operation.

- Instrument lighting: Control lighting, ABS- and SRS light, windshield wipers and washers (including jet positions and top off tank, heater and air conditioner blowers, rear window defroster).

- Check ground connection of SRS-front sensor screws to body.
- Check air conditioner for operation and proper freon charge.
- Check all tire pressures (including spare). Correct if necessary. Check condition of tires (condition [left/right]) tread wear and pattern; in case of uneven tread wear readjust wheel alignment if requested (to be invoiced separately).

Note: If desired, rotate all four road wheels as instructed and rebalance (invoiced separately).

- Tighten nuts and bolts of door locks and striker plates.
- Oil hinges of doors, hood and lid; grease hood and lid catches, door catches and striker plates. Check operation of each component.
- Check condition and function of the seat belts.
- Final inspection, road test with check of brakes, steering, clutch or automatic transmission and rear view mirrors. Pre-burnish parking brake according to specifications (vehicles with rear disc brakes only).
- Reset service indicator.

BMW Inspection II

Includes all items listed under Inspection I and the following additional checks and maintenance operations:

- Replace main fuel filter. Reduce interval if fuel contamination is encountered or prevalent. Recommended in California, required in all other states.
- Replace intake air cleaner filter element. Reduce replacement interval in dusty operating conditions.
- Check clutch driving plate for wear.
- Check and adjust drive belt tension.
- Replace spark plugs.
- Check front wheel bearing play.
- Change oil in standard transmission while at normal operating temperature.
- Rear disc brakes: Check thickness of parking brake linings.
- Half-shafts. Check flexible boots for leaks.
- Change oil in rear axle while at normal operating temperature.
- Check oil in automatic transmission (Only in inspection II).
- Change timing belt (every second inspection II or 4 years).

7-16 Service

BMW Annual Check

after every 11 to 13 months

Brake Fluid

- Renew brake fluid annually

- Check and adjust headlights and auxiliary driving lights.
Check Steering: Lock angle limits, threaded connections, power assistance.
Check operation of master cylinder and servo, and inspect for leaks.

Coolant

- Renew coolant every two years *

Anti-Corrosion Warranty Inspection

- Inspect body according to the terms of the BMW 6 year limited warranty-rust perforation.

Reminder only!**Oxygen Sensor Service**

Replace oxygen sensor every 50,000 Miles or 80,000 km.



* To be invoiced separately

Emission Control Maintenance Schedule

The maintenance schedule as shown below is required for the proper functioning of the emission control systems with optimum vehicle performance and fuel economy.

	P.D.I.	1200 miles	Oil Service	Insp. I	Oil Service	Insp. II
Basic Engine						
Intake and exhaust valves	M	IA		IA		IA
Drive belts						IA
Engine oil and filter	M	R	R	R	R	R
Fuel System						
Fuel system filter(s)	M					R*
Fuel cap, tank & connections ...	M					
Air filter	M					R
Ignition System						
Spark plugs	M					R
Emission Control Components						
Oxygen sensor	M	Replace at 50,000 miles or 80,000 km intervals				

Abbreviations

M – Maintenance and adjustments as part of the BMW Pre-Delivery Inspection (P.D.I.)

I – Inspect only

IA – Inspect and adjust as required

R – Replace part(s) or fluid listed

* – Recommended operations for proper functioning of the vehicle and its emission control systems, California only, required in all other states.

Oxygen Sensor Service: The oxygen sensor deteriorates strictly on a mileage basis and must therefore be replaced every 50,000 miles or 80,000 km to maximize vehicle fuel economy and minimize exhaust pollution. The replacement of the oxygen sensor is required under the terms of the applicable BMW emission system warranties.

Body – six-year limited anti-corrosion warranty against rust perforation

Extensive corrosion protection measures implemented by BMW now make it possible to offer a six-year limited anti-corrosion warranty against rust perforation on your vehicle provided that the vehicle is maintained in accordance with the provisions of this limited warranty as outlined in the BMW consumer warranty information.

The major degree of corrosion protection is due to the electrophoretic dip painting process which cathodically deposits paint particles on all body parts, attracting paint particles into the minutest cavities or seams. Body parts are designed to provide optimum corrosion protection.

During manufacture, exterior body parts receive an additional corrosion protection coat. Hood, trunk, doors and other body parts with metal folds are coated with PVC and sealed from the outside.

All floor panels receive a resilient coating of PVC for maximum protection against damage due to stones, etc.

Corrosion protection materials tested over many years are applied on the surfaces of cavities and the entire underside of the vehicle during and after assembly.

Requirements for maintaining the six-year limited anti-corrosion warranty are outlined in the BMW consumer warranty information.

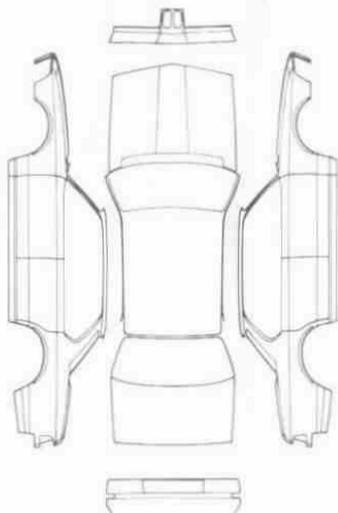
Restoring corrosion protection

Please take care that anti-corrosion material is replaced when your car is repaired after a body or chassis damage.

Underbody maintenance

The underbody has to be cleaned at least once a year, in spring, with plain water in order to remove mud, chemical sediments and other deposits. If those materials are not removed, corrosion (rust) will occur.

Your BMW dealer will do this anti-corrosion service for you.



Show damage location above with codes:

- | | | | |
|--------------------------|--|--------------------------|------------------|
| <input type="checkbox"/> | Stone damage | <input type="checkbox"/> | Dent |
| <input type="checkbox"/> | Scratch | <input type="checkbox"/> | Collision damage |
| <input type="checkbox"/> | Undercoating damage (explain in remarks) | | |

Body inspection after first year

Vehicle inspected and repaired if necessary to BMW standards required by BMW six year anti-corrosion warranty.

Yes No Partially*

* Remarks – explain (use repair order if necessary).

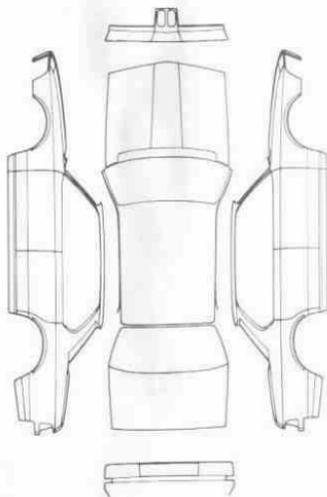
The undersigned herewith confirms that this inspection has been carried out by the above dealer and this dealer has given notification of any body repairs necessary.

Customer's
signature _____

Date _____

Performed by Dealer / Stamp with Code

Dealer authorized
Signature _____



Show damage location above with codes:

- Stone damage
- Dent
- Scratch
- Collision damage
- Undercoating damage (explain in remarks)

Body inspection after 2nd year

Vehicle inspected and repaired if necessary to BMW standards required by BMW six year anti-rust warranty

Yes No Partially*

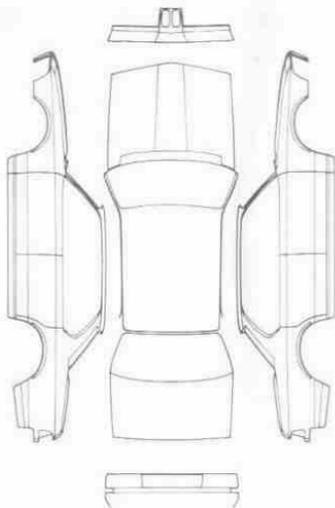
* Remarks – explain (use repair order if necessary)

The undersigned herewith confirms that this inspection has been carried out by the above dealer and this dealer has given notification of any body repairs necessary.

Customer's signature _____ Date _____

Performed by Dealer / Stamp with Code

Dealer authorized Signature _____



Show damage location above with codes:

- Stone damage Dent
 Scratch Collision damage
 Undercoating damage (explain in remarks)

Body inspection after 3rd year

Vehicle inspected and repaired if necessary to BMW standards required by BMW six year anti-corrosion warranty.

Yes No Partially*

* Remarks - explain (use repair order if necessary)

The undersigned herewith confirms that this inspection has been carried out by the above dealer and this dealer has given notification of any body repairs necessary.

Customer's signature _____ Date _____

Performed by Dealer / Stamp with Code

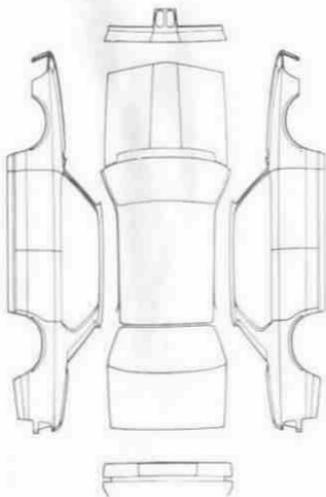
Dealer authorized Signature _____

Body inspection after 4th year

Vehicle inspected and repaired if necessary to BMW standards required by BMW six year anti-corrosion warranty

Yes No Partially*

* Remarks – explain (use repair order if necessary)



Show damage location above with codes:

- Stone damage Dent
 Scratch Collision damage
 Undercoating damage (explain in remarks)

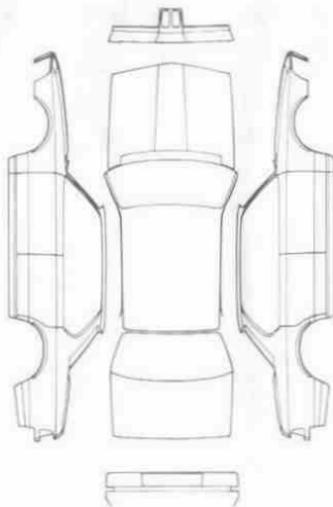
The undersigned herewith confirms that this inspection has been carried out by the above dealer and this dealer has given notification of any body repairs necessary.

Customer's signature _____ Date _____

Performed by Dealer / Stamp with Code

Dealer authorized
Signature _____

7-24 Service



Show damage location above with codes:

- Stone damage Dent
 Scratch Collision damage
 Undercoating damage (explain in remarks)

Body inspection after 5th year

Vehicle inspected and repaired if necessary to BMW standards required by BMW six year anti-corrosion warranty

Yes No Partially*

* Remarks – explain (use repair order if necessary)

The undersigned herewith confirms that this inspection has been carried out by the above dealer and this dealer has given notification of any body repairs necessary.

Customer's
signature _____

Date _____

Performed by Dealer / Stamp with Code

Dealer authorized
Signature _____

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