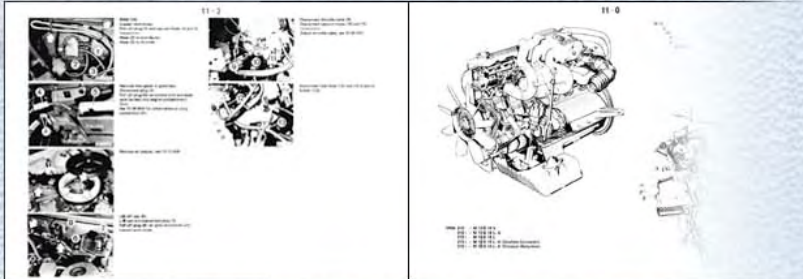




# E30



## Reparaturanleitung Repair Manual



## **Important notes on using this CD**

**The documents on this CD are to be used to perform professional maintenance and repair work on unmodified, standard production BMW vehicles.**

**In order to carry out the above-mentioned work, full training as a motor vehicle technician is required, plus regular advanced training at BMW Service training centres.**

**Whenever reference in the documents is made to the use of special tools, expendable materials and manufacturers' descriptions, this corresponds to up to date information at the time the documentation was produced.**

**Progressive technology e.g. the use of modern materials or environmental requirements can lead to variations between these repair instructions and the improved products currently on the market.**

**The special tools, expendable materials and manufacturers' descriptions that are essential to repair BMW vehicles professionally must be used in accordance with the latest standards, which can be obtained from BMW Service.**

**You are asked to appreciate that no claims can be entertained on the basis of the data, illustrations or descriptions.**

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# Introduction

This repair manual microfiche is to assist you in performing the necessary maintenance and repair work expertly and correctly. It must be placed at the disposal of shop foremen and mechanics, and will complement the practical and theoretical training offered by our Service Training Centre.

Since 1985 models there are two repair manuals.

- Repair manual to models
- Repair manual to construction groups

The Construction Group Repair Manual consists of Groups 11, 12, 13, 23, 24 and 33.

It is independent of models and describes repairing procedures on removed components and provides testing instructions and troubleshooting tables.

A Model Repair Manual ('3' Series, '5' Series, '6' Series or '7' Series) contains all construction groups. The descriptions in the above mentioned construction groups refer chiefly to removing and installing or replacing procedures.

There are technical data and nominal value microfiches for specifications and adjusting values.

Application of this repair manual microfiche is in reference to a standard production car free from accident damage and not subsequently modified in any way.

The construction group system has been adopted from the flat rate manual.

The job numbers used in the text are meant for use as cross reference. They will frequently contain job procedures, which must not be used for extension of the flat rates. They are only provided to make finding of repair procedures easier.

The individual page numbering, for example 32 – 6, means:

32 - main group  
6 - page number

The special tools essential for correct repair work are summarized on the special tool microfiche, Order No. 01 99 9 699 422. Their use is illustrated in the descriptions of the various repair jobs.

The removal work is described for each repair job in this manual. If installation does not take place in the reverse order of work, an "Installation" note is provided.

In addition to the improvements supplied to you regularly in the form of "Service Information", you are recommended to consult the parts microfiches for additional illustrated data.

**BAYERISCHE MOTOREN WERKE AG**  
**SERVICE DIVISION**

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## General Information

### PRECAUTIONS FOR WORKING WITH PARTS CONTAINING ASBESTOS

Inhaling asbestos dust could impair health. Conform with these safety precautions when working with asbestos parts.

- Only work outdoors or in well ventilated rooms.
- Only use manually operated or slow running equipment, with dust extracting equipment if necessary! Only operate fast running equipment with dust extracting attachments.
- Moisten parts prior to machining whenever possible.
- Never blow out brake and clutch parts.
- Moisten dust, fill in containers which can be sealed perfectly and scrap in a manner which prevents danger.
- Asbestos waste and scrapped parts must be collected in perfectly sealed containers marked accordingly and then eliminated without danger for human beings or the environment.

## General Information

### **Important When Disconnecting Battery!**

**Unscrew** ground lead on the ground connection point when **disconnecting** a battery. **Disconnection** will cancel the fault memories of control units. Consequently first read **fault memories** with the tester and print out faults when applicable.

### **Important With Connected Battery!**

**Working on components, electric lead connections, etc. could cause faults in the fault memories of concerned control units. If a repair job in the repair manual specifies disconnection of the battery, always conform with this in the interest of safety.**

### **Windshield Wipers (Wiper Motor)!**

**Intermittent wiping and wiper speed 1 are switched off by a protector in case of failure. The protector remains active even after eliminating the fault. It can be cancelled by turning the ignition off (terminals 15 and R) for 3 minutes.**

### **Windshield Wipers (Wiper Contact Pressure Motor)!**

**This wiper contact pressure motor is switched off by a protector in case of failure. The protector remains active even after eliminating the fault. To cancel the protector,**

- a) **disconnect the battery for 30 seconds (caution: all fault memories are cancelled!)**  
or
- b) **operate car for automatic cancellation.**

## GENERAL INFORMATION

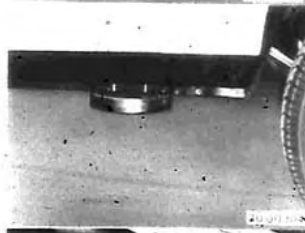
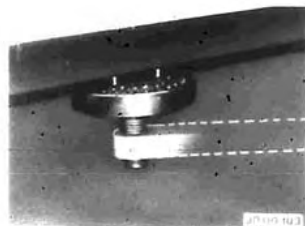
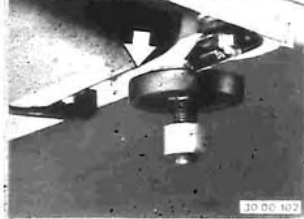
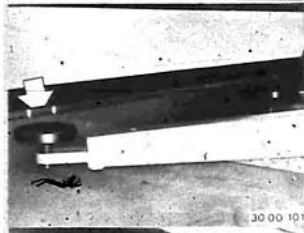
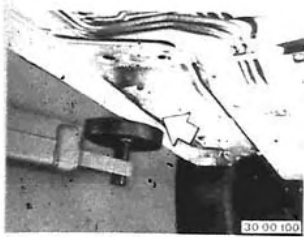
## LIFTING CAR WITH A CAR HOIST

Before driving a car on the platform, make sure that there is sufficient space (clearance) between the hoist and car (if applicable, spoiler or splash guard, etc.).

Car hoists must conform with local and national legislative measures concerning accident prevention and maintenance. Arms of a car hoist must always be applied only on the reinforced points of the frame members. Make sure that the underside is not damaged.

**Front:**  
Apply rubber block of lifting arm on the front perpendicular reinforcement of the frame member, which is also provided for application of the car's jack.

**Rear:**  
Apply rubber block of lifting arm on the rear perpendicular reinforcement of the frame member, which is also provided for application of the car's jack. Make sure that the underside of the fuel tank is not damaged.



## LIFTING CAR WITH A GARAGE JACK

A garage jack may also be only applied for lifting the car on the same take-up points described for the car hoist. A suitable liner (rubber, wood or plastic) must be used between the jack and car to avoid damage to the undercoating, frame members or floor plate.

## Front Take-up Point

## Rear Take-up Point

**Caution!**  
Don't damage the fuel tank.



## TOWING

Always conform with local and national legislative measures concerning the towing of vehicles as applicable.

Turn the ignition key to position "1" to unlock the steering wheel and be able to use the turn signals, horn and possibly windshield wipers.

Since the brake booster only works with the engine running, greater force will be required on the brake pedal of cars with a brake booster when the "engine is stopped".

The towing cable should be elastic to protect the towing and towed vehicles. Consequently only use plastic fiber cables or cables with elastic links.

*Cars with Automatic Transmission*

Selector lever in "N"

Max. towing speed:  
50 km/h (30 mph).

Max. towing distance:  
40 to 50 km (25 to 30 miles).

If the car has to be towed further than 50 km (30 miles) add an extra liter (2 pints) of ATF than the specified oil volume for automatics or remove the propeller shaft. After repairing the car it is absolutely essential to correct the ATF volume to the specified amount.

*Important!*

Cars with four driven wheels (325 IX) can be towed, if all 4 wheels are on the road or on the towing vehicle. Towing with one axle lifted is permitted only when the rear propeller shaft is removed with the front axle lifted, or the front propeller shaft with the rear axle lifted, since otherwise the central lock would be damaged. Never run the engine of a car on which a propeller shaft has been removed!



Front Towing Eyes

Rear Towing Eye

## 00-1

BMW MAINTENANCE SYSTEM 00 00 009 Pre-delivery inspection	General Information					Important Information!
	Repair Manual	Technical Data	Nominal Values	Operating Fluids	Owner's Manual	
Call faults in diagnosis system.						See operating instructions for BMW diagnosis system.
Brief test.						Connect BMW Service Tester.
Check / correct engine oil level.				Gr. 11		Use approved oil.
S 14 Engine: replace spark plugs.	Gr. 12	Gr. 12				
325 IX: Check / correct adjustment of throttle valve drive (not applicable since introduction of M 1.1).	Gr. 13		Gr. 13			
Check fuel pipes, tank and hoses for correct routing, condition and leaks.						Visual inspection.
Check / correct hydraulic fluid level in supply tank for brakes and clutch.				Gr. 34		Use approved brake fluid.
Check connections and lines of brake system for leaks, correct location and damage.						Visual inspection.
Check rim size, tire size and type as well as tire inflation pressure (including spare wheel).		Gr. 36		SI Gr. 36		
Check wheel bolts for specified tightening torque.		Gr. 36				
SI = Service Information						

00-2

BMW MAINTENANCE SYSTEM 00 00 009 Pre-delivery Inspection	General Information					Important Information!
	Repair Manual	Technical Data	Nominal Values	Operating Fluids	Owner's Manual	
Check / correct level and antifreeze concentration of washing fluid in supply tank for windshield and headlights(if installed in car: check / correct level of intensive cleaning fluid in supply tank).					+	
Check operation of windshield wipers/washer and aiming of spray nozzles; remove protective sleeves on wiper blades.					+	
Check acid level and charge of battery (as applicable, in trunk or underneath rear seat), correcting with distilled water when necessary. Charge battery when necessary.				Gr. 61 00	+	
Check lights: headlights/front fog lamps, parking lights, turn signals, tail lights, backup lights, rear fog lights, license plate lights, passenger compartment lights, glove box light, engine compartment light and trunk light.					+	
Check horns, headlight flasher and hazard warning lights.					+	
Check instrument and sign lights.					+	
Check control and warning lights in instrument cluster (ABS, airbag control lamp, etc.) and Check Control.					+	
Check heating, ventilating and blower.	Gr. 64					
Check operation of headlight cleaners and central locks.	Gr. 63				+	
Insert and check operation of cigar lighters.						

00 - 3

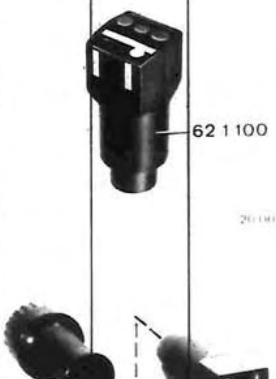
BMW MAINTENANCE SYSTEM 00 00 009 Pre-delivery Inspection	General Information					Important Information!
	Repair Manual	Technical Data	Nominal Values	Operating Fluids	Owner's Manual	
Check operation of other special equipment.						
Initialize sender of remote control system.						
Check data plate, vehicle identification and engine numbers.						
Compare ordered car equipment against delivered car equipment.						
Tune in radio station and check shielding with engine running while switching all electric equipment on and off.						
Mount hub caps, if applicable wheel ornamental rings and tailpipe extension.						
Place tools in toolbox and secure jack and wheel bolt wrench.						
Paste label for BMW Emergency Service on lid of toolbox.						
Place owner's manual/service booklet, list of BMW service stations and BMW emergency service stations, spare keys and key case in glove box.						
Stamp and insert service booklet.						

00 - 4

## BMW MAINTENANCE SYSTEM

## 00 00 009 Pre-delivery Inspection

## General Information

Repair Manual	Technical Data	Nominal Values	Operating Fluids	Owner's Manual	Important Information!
<p>Check operation of engine, clutch, transmission, final drive, steering, foot and hand operated brakes. Cars with rear disc brakes: break in parking brake.</p> <p>Check function of speedometer with odometer and daily trip recorder, tachometer (Economy Control), clock, temperature and fuel gages.</p> <p>Check engine, transmission, steering, final drive, dust covers on drive shafts, fuel, clutch and brake systems for leaks.</p> <p>Remove seat and other protective covers.</p> <p>Reset the service indicator.</p> <p><i>Important!</i> The service indicator (SI) must be reset after completion of the pre-delivery inspection as follows. Switch off all electrical equipment. Turn on ignition; do not run engine. Plug SI-R* with adapter** for large (20-pin) diagnosis socket in diagnosis socket. Push in and hold recessed, red INSPECTION button - green lamp (function control) comes on. Red lamp also comes on after approx. 3 sec. and goes out after approx. 12 seconds. Release inspection button - green lamp goes out.</p> <p>Gradual introduction of new SI display with clock symbol and only one red diode light since January, 1985. Load and time memories are separated and resetting must be repeated to reset the time memory. The break before the second inspection reset must be at least 10 seconds long, but may be up to 17.5 hours after the first reset.</p> <p>Check Service Indicator Display: All five green diode lights must be on. Yellow and possibly red diode lights as well as INSPECTION sign should go out.</p>					
					
<p>* SI-R = Service Indicator Resetter, Order No. 62 1 100. ** Adapter, Order No. 62 1 140.</p>					

## 00-5

BMW MAINTENANCE SYSTEM 00 00 210 BMW Running-In Inspection at 2000 km (1200 mi.)	General Information					Important Information!
	Repair Manual	Technical Data	Nominal Values	Operating Fluids	Owner's Manual	
Call faults in diagnosis system.						
Brief test.						See operating instructions of BMW Service Tester.
Replace engine oil and oil filter at operating temperature.	Gr. 11			Gr. 11	+	Use approved oil.
325 IX: Remove / Install splash guard and check / correct adjustment of throttle valve drive (not applicable after introduction of M 1.1).	Gr. 13		Gr. 13			
Check / adjust valve clearance (excluding 324 d, td, S 14 and M 40 engines).	Gr. 11	Gr. 11				
Tighten nuts and bolts of steering, exhaust assembly, brakes and road wheels.		Gr. 18/32 34/36				Correct tightening torque.
Replace oil in manual transmission at operating temperature; check automatic transmission fluid level.	Gr. 23/24			Gr. 23/24	+	Use approved oil.
Replace oil in final drive at operating temperature.		Gr. 33		Gr. 33		Use approved oil.
325 IX: Replace oil in front axle final drive at operating temperature.	Gr. 31					
Replace oil in transfer box at operating temperature.	Gr. 27					
Final inspection with operating safety test, brakes, steering, control and warning lamps as well as check control reports.					+	

## 00-6

BMW MAINTENANCE SYSTEM 00 00 220 BMW Inspection I	General Information					Important Information!
	Repair Manual	Technical Data	Nominal Values	Operating Fluids	Owner's Manual	
Call faults in diagnosis system.						See operating instructions of BMW diagnosis system.
Brief test.						See operating instructions of BMW Service Tester.
Replace engine oil and oil filter at operating temperature.	Gr. 11	Gr. 11		Gr. 11		Use approved oil.
Check / adjust valve clearance (excluding diesels and M 40)	Gr. 11	Gr. 11				
Replace spark plugs.		Gr. 12				
Check coolant hoses for leaks; check / correct coolant level and concentration.				Gr. 17		Replace coolant every 2 years at latest.
Check tightness and condition of all drive belts, tightening when necessary or replacing with separate invoicing.	Gr. 12/32/64					
325 IX: Check / correct adjustment of throttle valve drive (not applicable after introduction of M 1.1).	Gr. 13		Gr. 13			
Air cleaner: replace air filter cartridge. Replace filter cartridge more frequently when car is operated in dusty regions.	Gr. 13					

BMW MAINTENANCE SYSTEM 00 00 220 BMW Inspection I	General Information					Important Information!
	Repair Manual	Technical Data	Nominal Values	Operating Fluids	Owner's Manual	
Check fuel pipes, tank and hoses for correct routing, condition and leaks. BMW Diesel Engine: Drain water trap (replacement intervals depending on country).	Gr. 13/16					
Check condition, routing, suspension and leakage of exhaust assembly.						
Check power steering for leaks; check / correct oil level.	Gr. 32			Gr. 32		Use approved oil.
Check / correct steering play. Check condition of tie rods and front axle joints. Check steering gear, steering linkage and coupling.	Gr. 32	Gr. 32				
Remove and install front and rear disc brake pads. Check total thickness. Replace pads when necessary. Check surface condition of brake discs. Check brake calliper dust covers for leaks. Lubricate centering pins of wheel rims with grease.	Gr. 34/36					Correct tightening torque for road wheel bolts.
Check connections and lines of brake system for leaks, damage and correct location (clean brake liners and drums and check for wear; check wheel brake cylinders and dust covers for leaks). Check movement of parking brake cables. Adjust parking brake.	Gr. 34					
Check / correct hydraulic fluid level in supply tank for brakes and clutch.	Gr. 34			Gr. 34		Use approved brake fluid. <i>Important!</i> Replace brake fluid every two years.



## 00-8


BMW MAINTENANCE SYSTEM 00 00 220 BMW Inspection I	General Information					Important Information!
	Repair Manual	Technical Data	Nominal Values	Operating Fluids	Owner's Manual	
<p>Check / correct tire inflation pressure (including spare wheel). Check condition of tires (if worn unevenly and customer approves, check and correct wheel alignment with separate invoicing).</p> <p>Check all gearboxes for leaks.</p> <p>Check lights: parking lights, turn signals, tail lights, stop lights, backup lights, rear fog lights, license plate lights, passenger compartment lights, glove box light, engine compartment light and trunk light.</p> <p>Check headlights and front fog lamps.</p> <p>Check horn, headlight flasher and hazard warning lights.</p> <p>Check instrument and sign lights.</p> <p>Check acid level in battery, correcting with distilled water if necessary.</p> <p>Check condition and operation of seat belts.</p> <p>Lubricate locks of doors, engine hood and trunk lid with oil or grease and check function.</p>				SI Gr. 36		Visual Inspection.
	Gr. 72			Gr. 61	+	
SI = Service Information						

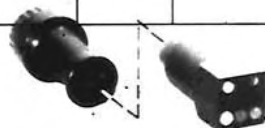
00-9

## BMW MAINTENANCE SYSTEM

00 00 220 BMW Inspection I

## General information

	Repair Manual	Technical Data	Nominal Values	Operating Fluids	Owner's Manual	Important Information!
<p>Check / correct level and antifreeze concentration of washing fluid in supply tank for windshield and headlights. If installed, check / correct level of intensive cleaning fluid in supply tank.</p> <p>Check windshield wiping/washing system (wiper blades and spray nozzle aiming).</p> <p>Final inspection with operating safety test: brakes (with rear disc brakes: break in parking brake), steering or power steering, clutch or automatic transmission, coil springs and shock absorbers (visual inspection), control and warning lamps in instrument cluster (ABS, airbag, etc.), check control, mirrors and heater blower. Check operation of power steering.</p> <p><i>Important!</i> Service Indicator (SI) must be reset after inspection! Switch off all electrical equipment. Turn on ignition – do not run engine. Use SI-R* with adapter** for large (20-pin) diagnosis socket and plug in diagnosis socket. Push in and hold recessed, red INSPECTION button – green lamp (function control) comes on. Red lamp also comes on after approx. 3 sec. and goes out after approx. 12 seconds. Release INSPECTION button – green lamp goes out.</p> <p>Gradual introduction of a new SI display with clock symbol and only one red diode light since January, 1986. A clock symbol lights up together with the INSPECTION sign to announce a time-dependent inspection interval and has no influence on the green diode lights. When load and time dependent inspections occur together, resetting must be repeated after 10 seconds to cancel the clock symbol and INSPECTION sign.</p> <p>Checking Service Indicator (SI): All five green diode lights must be on. Yellow and possibly red diode lights as well as INSPECTION sign should go out.</p> <p>* SI-R = Service Indicator Resetter, Order No. 62 1 100. ** Adapter, Order No. 62 1 140.</p>					<p>+</p> <p>+</p>	



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## 00-10

BMW MAINTENANCE SYSTEM 00 00 230 BMW Inspection II = Inspection I + Additional Jobs	General Information					Important Information!
	Repair Manual	Technical Data	Nominal Values	Operating Fluids	Owner's Manual	
Replace oil in rear axle final drive (325 iX; also transfer box and front axle final drive) and automatic transmission at operating temperature.	Gr. 23/24/33			Gr. 23/24/ 27/33		Use approved oil
Replace fuel filter.	Gr. 16					
Check clutch drive plate for wear.	Gr. 21					
Check play of front wheel bearings.	Gr. 31					
Rear disc brakes: check thickness of parking brake liners, replacing if necessary.	Gr. 34	Gr. 34				
Check condition of dust covers on output shafts and for leaks.						
Replace toothed drive belt (every second inspection II or every 4 years).	Gr. 11					

