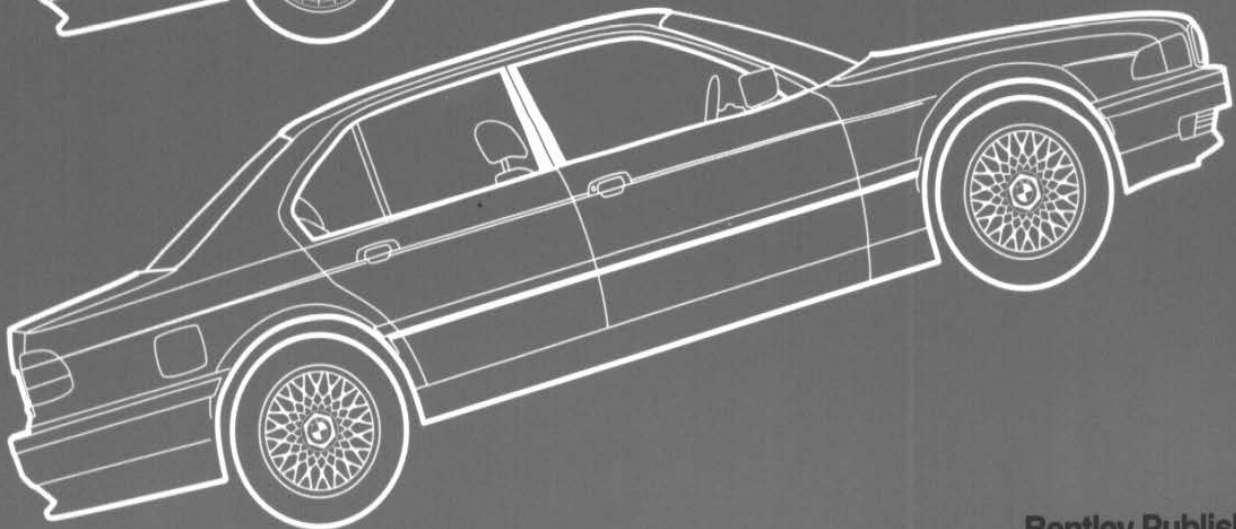
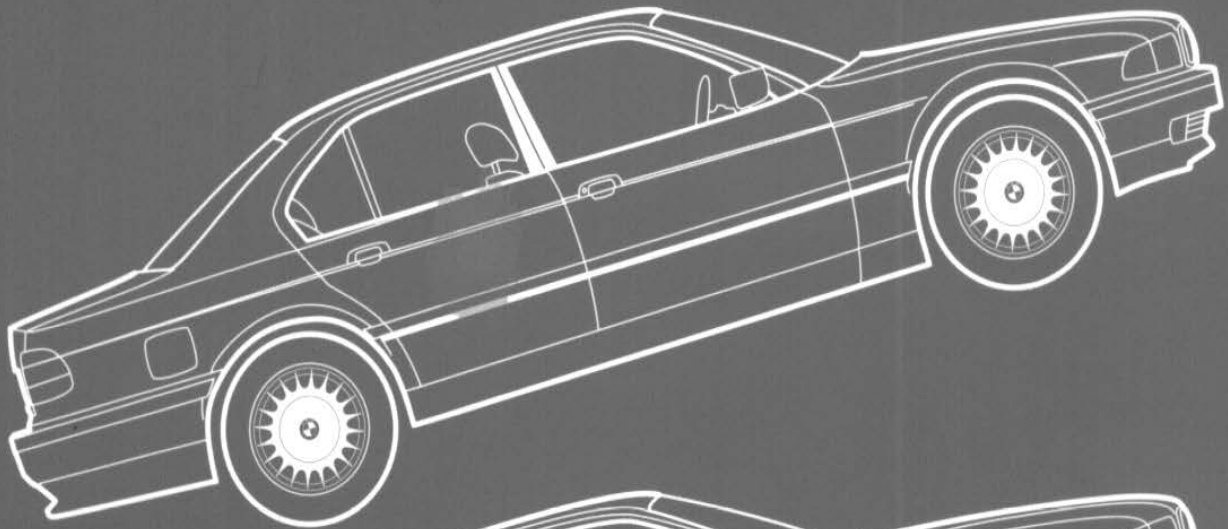


# BMW 7 Series

## Service Manual

735i, 735iL, 740i, 740iL, 750iL  
1988, 1989, 1990, 1991, 1992, 1993, 1994



Bentley Publishers

Foreword.....	v
Warnings and Cautions .....	vii
Index .....	back of book

## **0** General Data and Maintenance

010	General
020	Maintenance

## **1** Engine

100	Engine-General	120	Ignition System
110	Engine Removal and Installation	121	Battery, Starter, Alternator
113	Cylinder Head Removal and Installation	130	Fuel Injection
116	Cylinder Head and Valvetrain	160	Fuel Tank and Fuel Pump
117	Camshaft Timing Chain	170	Radiator and Cooling System
119	Lubrication System	180	Exhaust System

## **2** Transmission

200	Transmission-General	240	Automatic Transmission
210	Clutch	250	Gearshift Linkage
230	Manual Transmission	260	Driveshaft

## **3** Suspension, Steering and Brakes

300	Suspension, Steering and Brakes-General	330	Rear Suspension
310	Front Suspension	331	Final Drive
320	Steering and Wheel Alignment	340	Brakes
		370	Integrated Suspension Systems

## **4** Body

400	Body-General	411	Doors
410	Fenders, Engine Hood	412	Trunk Lid

## **5** Body Equipment

510	Exterior Trim, Bumpers	520	Seats
512	Door Windows	540	Sunroof
513	Interior Trim		
515	Central Locking		

## **6** Electrical System

600	Electrical System-General	620	Instruments
610	Electrical Component Locations	630	Exterior Lighting
611	Wipers and Washers	640	Heating and Air Conditioning
612	Switches and Electrical Accessories	650	Radio

## **7** Equipment and Accessories

720	Seat Belts
721	Airbag System (SRS)

## Electrical Wiring Diagrams

# **BMW 7 Series**



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**WARNING—Important Safety Notice**

Do not use this manual unless you are familiar with basic automotive repair procedures and safe workshop practices. This manual illustrates the workshop procedures required for most service work. It is not a substitute for full and up-to-date information from the vehicle manufacturer or for proper training as an automotive technician. Note that it is not possible for us to anticipate all of the ways or conditions under which vehicles may be serviced or to provide cautions as to all of the possible hazards that may result.

The vehicle manufacturer will continue to issue service information updates and parts retrofits after the editorial closing of this manual. Some of these updates and retrofits will apply to procedures and specifications in this manual. We regret that we cannot supply updates to purchasers of this manual.

We have endeavored to ensure the accuracy of the information in this manual. Please note, however, that considering the vast quantity and the complexity of the service information involved, we cannot warrant the accuracy or completeness of the information contained in this manual.

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Your common sense and good judgment are crucial to safe and successful service work. Read procedures through before starting them. Think about whether the condition of your car, your level of mechanical skill, or your level of reading comprehension might result in or contribute in some way to an occurrence which might cause you injury, damage your car, or result in an unsafe repair. If you have doubts for these or other reasons about your ability to perform safe repair work on your car, have the work done at an authorized BMW dealer or other qualified shop.

Part numbers listed in this manual are for identification purposes only, not for ordering. Always check with your authorized BMW dealer to verify part numbers and availability before beginning service work that may require new parts.

Before attempting any work on your BMW, read the warnings and cautions on pages vii and viii, and any warning or caution that accompanies a procedure in the service manual. Review the warnings and cautions on pages vii and viii each time you prepare to work on your BMW.

Special tools required to perform certain service operations are identified in the manual and are recommended for use. Use of tools other than those recommended in this service manual may be detrimental to the car's safe operation as well as the safety of the person servicing the car.

Copies of this manual may be purchased from most automotive accessories and parts dealers specializing in BMW automobiles, from selected booksellers, or directly from the publisher.

The publisher encourages comments from the reader of this manual. These communications have been and will be carefully considered in the preparation of this and other manuals. Please write to Robert Bentley, Inc., Publishers using contact information at the top of this page.

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Foreword.....	v
Warnings and Cautions.....	vii
Index.....	back of book

## 0 General Data and Maintenance

010	General
020	Maintenance

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## Electrical Wiring Diagrams

# Foreword

This service manual covers 1988 through 1994 BMW 7 Series models, and is specifically designed to cover only those models built for sale in the United States.

BMW and most accessories and parts sellers specializing in BMWs, refer to the 7 Series cars covered by this manual as the E32 model. "E32" is BMW's internal code for the basic platform shared by all of the cars covered by this manual. Except for the engine and a few other components, the models covered by this manual share many of same components such as suspension parts, body panels, and interior pieces. When ordering parts, especially body parts, knowing the E32 code may be helpful.

BMW also uses an internal code for the engines used in the 7 Series models. Consult the text in the **100 Engine-General** repair group of this manual for a complete listing of engine codes. Engine code information is primarily used internally by BMW, but may be helpful if you have access to BMW technical information.

For the BMW owner with basic mechanical skills, this manual gives detailed maintenance and repair information. In addition, the BMW owner who has no intention of working on his or her own car will find that owning and reading this manual will make it possible to be better informed and to discuss repairs more intelligently with a professional technician. This manual has been prepared from the repair information that BMW provides to its factory-trained technicians and has been developed primarily with the do-it-yourself BMW owner in mind. The aim throughout has been clarity and understanding with practical descriptions, step-by-step procedures, and accurate specifications.

The BMW owner intending to do maintenance and repair should have a set of tools including a set of metric wrenches and sockets, screwdrivers, a torque wrench, and feeler gauges, since these basic tools will be used to do the majority of the maintenance and repair procedures described in this manual. This manual includes detailed information on these basic tools and other tips for the beginner in the first section of the manual, entitled **010 General**. For some of the repairs described in this manual, BMW technicians use special tools. The text will note when a repair requires these special tools and, where possible, will recommend practical alternatives.

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BMW offers extensive warranties, especially on components of the fuel delivery and emissions control systems. Therefore, before deciding to repair a BMW that may still be covered wholly or in part by any warranties issued by BMW of North America, consult your authorized BMW dealer. You may find that he can make the repair either free or at minimum cost.

Regardless of its age and whether or not it is still protected by warranty, your BMW is an easy car to get serviced. So if at any time a repair is needed that you feel is too difficult to do yourself, a trained BMW technician is ready to do the job for you. Each authorized BMW dealer service department has made a significant investment in service and diagnostic test equipment, special tools, and BMW original parts. It is also the best source of the most up-to-date repair and service techniques, which includes factory training and technical literature. Servicing your BMW through an authorized BMW dealer will insure that your investment will be protected while maintaining the highest degree of service standards.

**Robert Bentley**



## Please read these warnings and cautions before proceeding with maintenance and repair work.

### WARNING—

- See also Cautions on page viii

- Some repairs may be beyond your capability. If you lack the skills, tools and equipment, or a suitable workplace for any procedure described in this manual, we suggest you leave such repairs to an authorized BMW dealer service department or other qualified shop.

- Do not re-use any fasteners that are worn or deformed in normal use. Many fasteners are designed to be used only once and become unreliable and may fail when used a second time. This includes, but is not limited to, nuts, bolts, washers, self-locking nuts or bolts, circlips and cotter pins. Always replace these fasteners with new parts.

- Never work under a lifted car unless it is solidly supported on stands designed for the purpose. Do not support a car on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a car that is supported solely by a jack. Never work under the car while the engine is running.

- If you are going to work under a car on the ground, make sure that the ground is level. Block the wheels to keep the car from rolling. Disconnect the battery negative (-) terminal (ground strap) to prevent others from starting the car while you are under it.

- Never run the engine unless the work area is well ventilated. Carbon monoxide kills.

- Finger rings, bracelets and other jewelry should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.

- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.

- Do not attempt to work on your car if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medication or any other substance that may keep you from being fully alert.

- Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the car. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

- Catch draining fuel, oil, or brake fluid in suitable containers. Do not use food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.

- Always observe good workshop practices. Wear goggles when you operate machine tools or work with battery acid. Gloves or other protective clothing should be worn whenever the job requires working with harmful substances.

- Greases, lubricants and other automotive chemicals contain toxic substances, many of which are absorbed directly through the skin. Read the manufacturer's instructions and warnings carefully. Use hand and eye protection. Avoid direct skin contact

- Disconnect the battery negative (-) terminal (Ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.

- Friction materials (such as brake pads or shoes or clutch discs) contain asbestos fibers or other friction materials. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing dust. Breathing any friction material dust can lead to serious diseases and may result in death.

- Batteries give off explosive hydrogen gas during charging. Keep sparks, lighted matches and open flame away from the top of the battery. If hydrogen gas escaping from the cap vents is ignited, it will ignite gas trapped in the cells and cause the battery to explode.

- Connect and disconnect battery cables, jumper cables or a battery charger only with the ignition switched off, to prevent sparks. Do not disconnect the battery while the engine is running.

- Do not quick-charge the battery (for boost starting) for longer than one minute. Wait at least one minute before boosting the battery a second time.

- Do not allow battery charging voltage to exceed 16.5 volts. If the battery begins producing gas or boiling violently, reduce the charging rate. Boosting a sulfated battery at a high charging rate can cause an explosion.

- The air conditioning system is filled with chemical refrigerant, which is hazardous. The A/C system should be serviced only by trained technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.

- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.

- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.

- Cars covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag(s) in the event of a frontal impact. The airbag(s) is inflated by an explosive device. Handled improperly or without adequate safeguards, can be accidentally activated and cause serious injury.

- The ignition system produces high voltages that can be fatal. Avoid contact with exposed terminals and use extreme care when working on a car with the engine running or the ignition switched on.

- Place jack stands only at locations specified by manufacturer. The vehicle lifting jack supplied with the vehicle is intended for tire changes only. A heavy duty floor jack should be used to lift vehicle before installing jack stands. See **010 General**.

- Battery acid (electrolyte) can cause severe burns. Flush contact area with water, seek medical attention.

- Aerosol cleaners and solvents may contain hazardous or deadly vapors and are highly flammable. Use only in a well ventilated area. Do not use on hot surfaces (engines, brakes, etc.).

- Do not remove coolant reservoir or radiator cap with the engine hot. Danger of burns and engine damage.

continued on next page  
vii

## Please read these warnings and cautions before proceeding with maintenance and repair work.

### CAUTION—

- See also Warnings on page vii
- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized BMW dealer or other qualified shop.
- BMW is constantly improving its cars and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only. Always check with your authorized BMW dealer parts department for the latest information.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly, do not attempt shortcuts. Use tools appropriate to the work and use only replacement parts meeting BMW specifications. Make-shift tools, parts and procedures will not make good repairs.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque specification listed.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond or lake. Dispose of in accordance with Federal, State and Local laws.
- The control module for the anti-lock brake system (ABS) cannot withstand temperatures from a paint-drying booth or a heat lamp in excess of 203°F (95°C) and should not be subjected to temperatures in excess of 185°F (85°C) for more than two hours.
- Before doing any electrical welding on cars equipped with ABS, disconnect the battery negative (-) terminal (ground strap) and the ABS control unit connector.
- On cars equipped with anti-theft radios, make sure you know the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered into the radio when power is restored, that radio may lock up and be rendered inoperable, even if the correct code is then entered.
- Always make sure ignition is off before disconnecting battery.
- Label battery cables before disconnecting. On some models, battery cables are not color coded.
- Disconnecting the battery may erase fault code(s) stored in control module memory. Using special BMW diagnostic equipment, check for fault codes prior to disconnecting the battery cables. If the Check Engine light is illuminated, see **100 Engine-General** for On-Board Diagnostics (OBD) fault code information. If any other system faults have been detected (indicated by an illuminated warning light), see an authorized BMW dealer.
- If a normal or rapid charger is used to charge battery, the battery must be disconnected and removed from the vehicle in order to avoid damaging paint and upholstery.
- Do not quick-charge the battery (for boost starting) for longer than one minute. Wait at least one minute before boosting the battery a second time.
- Connect and disconnect a battery charger only with the battery charger switched off.
- Sealed or "maintenance free" batteries should be slow-charged only, at an amperage rate that is approximately 10% of the battery's ampere-hour (Ah) rating.
- Do not allow battery charging voltage to exceed 16.5 volts. If the battery begins producing gas or boiling violently, reduce the charging rate. Boosting a sulfated battery at a high charging rate can cause an explosion.

