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Foreword

Service to Volkswagen owners is a top priority of the Volkswagen organization and has always included the continuing development and introduction of new and expanded services. In line with this purpose, Robert Bentley, Inc., in cooperation with Volkswagen of America, Inc., has introduced this Volkswagen Jetta, Golf, GTI, Cabrio Service Manual.

This manual covers Volkswagen Jetta, Golf, GTI, GLX, Cabrio, TDI and special editions for the model years 1993 through early 1999. This manual was created specifically to cover only those models built for sale in the United States and Canada.

Volkswagen and most aftermarket parts suppliers specializing in Volkswagens refer to the Jettas, Golfs, GTIs and Cabrios covered by this manual as the A3 models. The code "A3" is Volkswagen's internal code for the basic platform shared by all of the cars covered by this manual. When ordering parts, especially body parts, knowing the A3 code may be helpful.

For the Volkswagen owner with basic mechanical skills and for independent auto*service professionals, this manual includes the specifications and procedures that were available in an authorized Volkswagen dealer service department as this manual went to press. The Volkswagen owner with no intention of working on his or her car will find that owning and referring to this manual will make it possible to be better informed and to more knowledgeably discuss repairs with a professional automotive technician. The aim throughout has been clarity and completeness, with step-by-step procedures and accurate specifications.

The Volkswagen owner intending to do maintenance and repair should have screwdrivers, a set of metric wrenches and sockets, and metric hex wrenches, since these basic hand tools are needed for most of the work described in this manual. Most procedures will also require a torque wrench to ensure that fasteners are tightened properly and in accordance with specifications. In some cases, the text refers to special tools that are recommended or required to accomplish adjustments or repairs. These tools are identified by their Volkswagen special tool number and illustrated. A thorough pre-reading of each procedure is recommended to determine in advance the need for particular tools and for essential replacement parts such as gaskets.

Some of the information in this manual applies only to cars of a particular model year or range of years. For example, "1993 m.y." refers to the 1993 model year. The model year does not necessarily match the calendar year in which the car was manufactured or sold. To be sure of the model year of a particular car, check the vehicle identification number (VIN) on the car. Technical changes made in production within a model year are identified in this manual by listing the VIN for the first car produced with this change.

The VIN is a unique sequence of 17 characters assigned by Volkswagen to identify each individual car. 3VWBA21HXPM005678 is an example. Each of the 17 letters and numbers indicates certain facts about the car and its manufacture. VINs used to distinguish information in this manual may refer only to the last eleven digits—the characters 1HXPM005678 in the example above.

Your Volkswagen's VIN can be found on a plate mounted on the top of the instrument panel, on the driver's side where the number can be seen through the windshield. The 10th character is the model year code. The letters "I", "O", "Q" and "U" are not used for model year designation, for example, "P" for 1993 m.y., "R" for 1994 m.y., etc. This manual covers Volkswagen "A3" Jetta, Golf, GTI, GLX, Cabrio, TDI and special editions for the model years 1993 through early 1999. The table below explains some of the various codes in the VIN numbers of models covered by this manual.

3	V	W	R	A	8	1	H	X	R	M	1	2	3	4	5	6
Manufacturer Information			Body	Engine Type	Restraint Type	Body Type		Check Digit	Model Year	Factory	Sequential Chassis No.					
3VW-Mexican Passenger car WVW-German passenger car			Depends on model year		0-Seatbelts, active front 2-Seatbelts, passive front 6-Airbag front & side driver/pass. 8-Airbag front only driver/pass	1H-Golf or Jetta 1E-Cabrio			P-1993 R-1994 S-1995 T-1996 V-1997 W-1998 X-1999	M- Puebla, Mexico K-Osnabruk, Germany W-Wolfsburg, Germany	000001-Begin production 999999-End production					

We have endeavored to insure the accuracy of the information in this manual. When the vast array of data presented in the manual is taken into account, however, no claim to infallibility can be made. We therefore cannot be responsible for the result of any errors that may have crept into the text. The Publisher encourages comments from the readers of this manual with regard to errors, and also, suggestions for improvement in the presentation of the technical material. These communications have been and will be carefully considered in the preparation of this and other manuals. Please write or e-mail to Robert Bentley, Inc., at the address at the beginning of this manual.

Volkswagen offers extensive warranties, especially on components of the fuel delivery and emission control systems. Therefore, before deciding to repair a Volkswagen that may be covered wholly or in part by any warranties issued by Volkswagen of America, Inc., consult your authorized Volkswagen dealer. You may find that the dealer can make the repair either free or at minimum cost. Regardless of its age, or whether it is under warranty, your Volkswagen is both an easy car to service and 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 Volkswagen technician is ready to do the job for you.

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

WARNING—

- 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 Volkswagen dealer service department, or other qualified shop.
- Volkswagen is constantly improving its cars. Sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, before starting any major jobs or repairs to components on which passenger safety may depend, consult your authorized Volkswagen dealer about Technical Bulletins that may have been issued since the editorial closing of this manual.
- 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.
- Friction materials such as brake or clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.
- 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.
- 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.
- Most cars covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is inflated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious injury.
- To prevent personal injury or airbag system failure, **only factory trained Volkswagen service technicians** should test, disassemble or service the airbag system.
- Disconnect the power supply before working on the airbag system, or when doing repairs that require removing airbag system components. Disconnect the battery negative (-) terminal and cover the battery.

continued on next page

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

WARNING (continued) —

- On airbag-equipped cars, never apply stickers or any other type of covering on the steering wheel. Do not let chemical cleaners, oil or grease come into contact with vinyl covering of the airbag unit.
- Never open or otherwise attempt to repair airbag system parts. Always use new parts. Never leave airbag parts or the partially disassembled airbag system unattended.
- Never use a test light to conduct electrical tests on the airbag system. The system must only be tested by trained Volkswagen Service technicians using the Volkswagen VAG 1551 Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the car.
- Do not expose the airbag unit to temperatures above 194°F (90°C), even for brief periods. Keep clear of heat sources such as hot plates, soldering irons, heat lamps and welding equipment.
- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.
- Greases, lubricants and other automotive chemicals contain toxic substances, many of which are absorbed directly through the skin. Read manufacturer's instructions and warnings carefully. Use hand and eye protection. Avoid direct skin contact.

CAUTION—

- 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 Volkswagen dealer or other qualified shop. We especially urge you to consult an authorized Volkswagen dealer before beginning repairs on any car that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen of America.
- Volkswagen offers extensive warranties, especially on components of fuel delivery and emission control systems. Therefore, before deciding to repair a Volkswagen that may still be covered wholly or in part by any warranties issued by Volkswagen United States, Inc., consult your authorized Volkswagen dealer. You may find that he can make the repair for free, or at minimal cost.
- Volkswagen part numbers listed in this manual are for identification purposes only, not for ordering. Always check with your authorized Volkswagen dealer to verify part numbers and availability before beginning service work that may require new parts.
- 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 Volkswagen specifications. Makeshift 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. Consult local ordinances that govern the disposal of wastes.
- 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.
- Connect and disconnect a battery charger only with the battery charger switched off.
- 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.
- 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.

0 Maintenance Program

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