Service Training

Reference Guide 810103

Volkswagen Airbag and Safety Systems Reference Guide

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Always check Technical Bulletins and the latest electronic repair information for information that may supersede any information included in this booklet.

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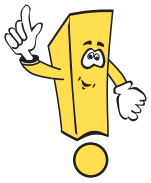
This Self-Study Program provides information regarding the design and function of new models.
This Self-Study Program is not a Repair Manual.

This information will not be updated.
For maintenance and repair procedures, always refer to the latest electronic service information.

Note



Important!

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Introduction to Volkswagen Airbag and Safety Systems

After completing this course you will be able to:

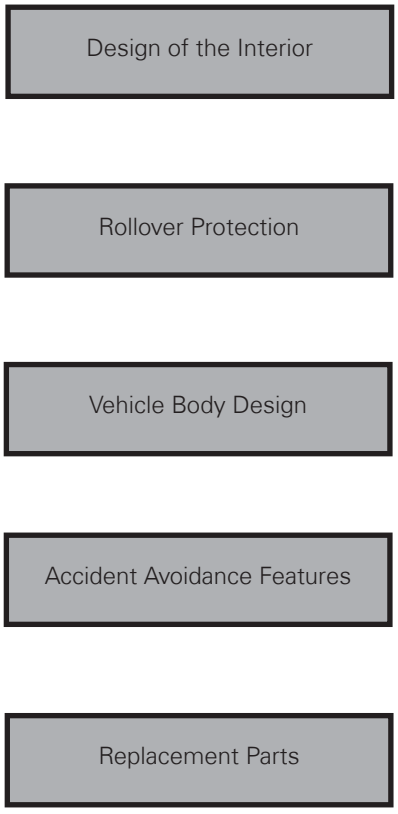
- Recognize that occupant safety is integrated throughout the vehicle, and practice caution when performing repairs
- Identify the conditions that cause the airbag to deploy
- Handle airbags and pyrotechnic seat belts according to safety rules and precautions
- Recognize the special tools used with airbag and safety systems
- Recognize the special procedural steps for performing a repair involving an airbag

Introduction

Safety Related Components

When it comes to safety, airbags and seatbelts aren't the only components involved. Safety is integrated throughout Volkswagen vehicles.

- Instrument panels are made with materials to reduce the risk of injury in a crash, such as soft textures and padding
- Steering columns and the lower portions of instrument panels are designed to absorb energy and control the position of occupants during a crash
- Door panels have special designs, materials, and crush elements that help reduce the chance of injury to the occupant
- Seat cushions and head restraints are also engineered to position occupants and reduce injuries

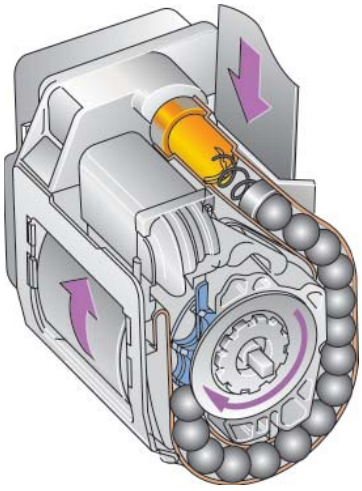


Airbag and Pyrotechnic Systems

Volkswagen has always been innovative with its occupant safety systems. It began offering seat belts in the early 1960's.

Today's Volkswagen safety systems are much more advanced, including driver and passenger front airbags, side airbags, side curtain airbags and pyrotechnic safety belts.

As you proceed through this guide, you will learn about how these systems work, and the things you need to know to work safely with these components.



Airbag and Pyrotechnic Systems

ACM Inputs

Airbag and pyrotechnic devices deploy only in certain instances.

The deployment of an airbag or pyrotechnic device depends on the vehicle deceleration, acceleration or pressure change caused by the crash and registered by the Airbag Control Module (ACM).

If the measured value is below the reference value programmed into the ACM, the airbags or pyrotechnic devices will not be deployed.

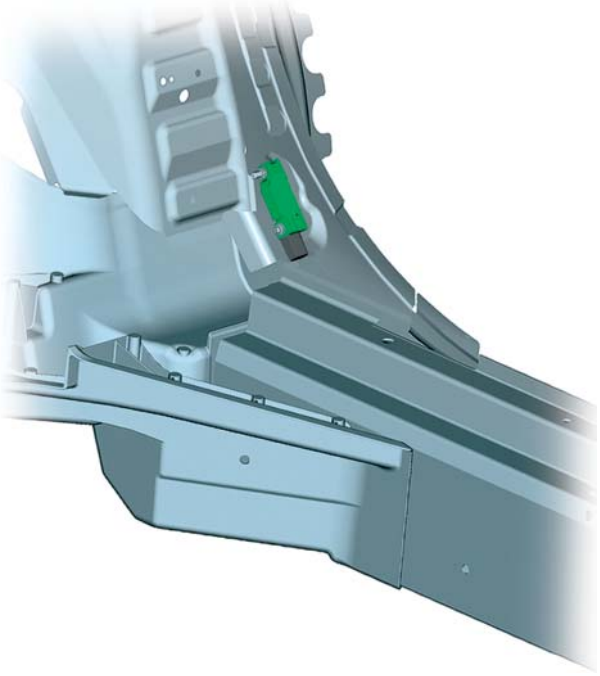
Vehicle damage or lack of vehicle damage is not necessarily an indication of whether or not the airbag or a pyrotechnic device should or should not have been deployed.

What happens in a Crash

There are sensors located in the vehicle that detect a change in velocity in a crash, and send that information to the ACM.

The ACM receives the sensor information and determines what type of crash it is.

The ACM sends a signal to pre-tension the seat belts and then deploys the airbags that are needed for that situation.



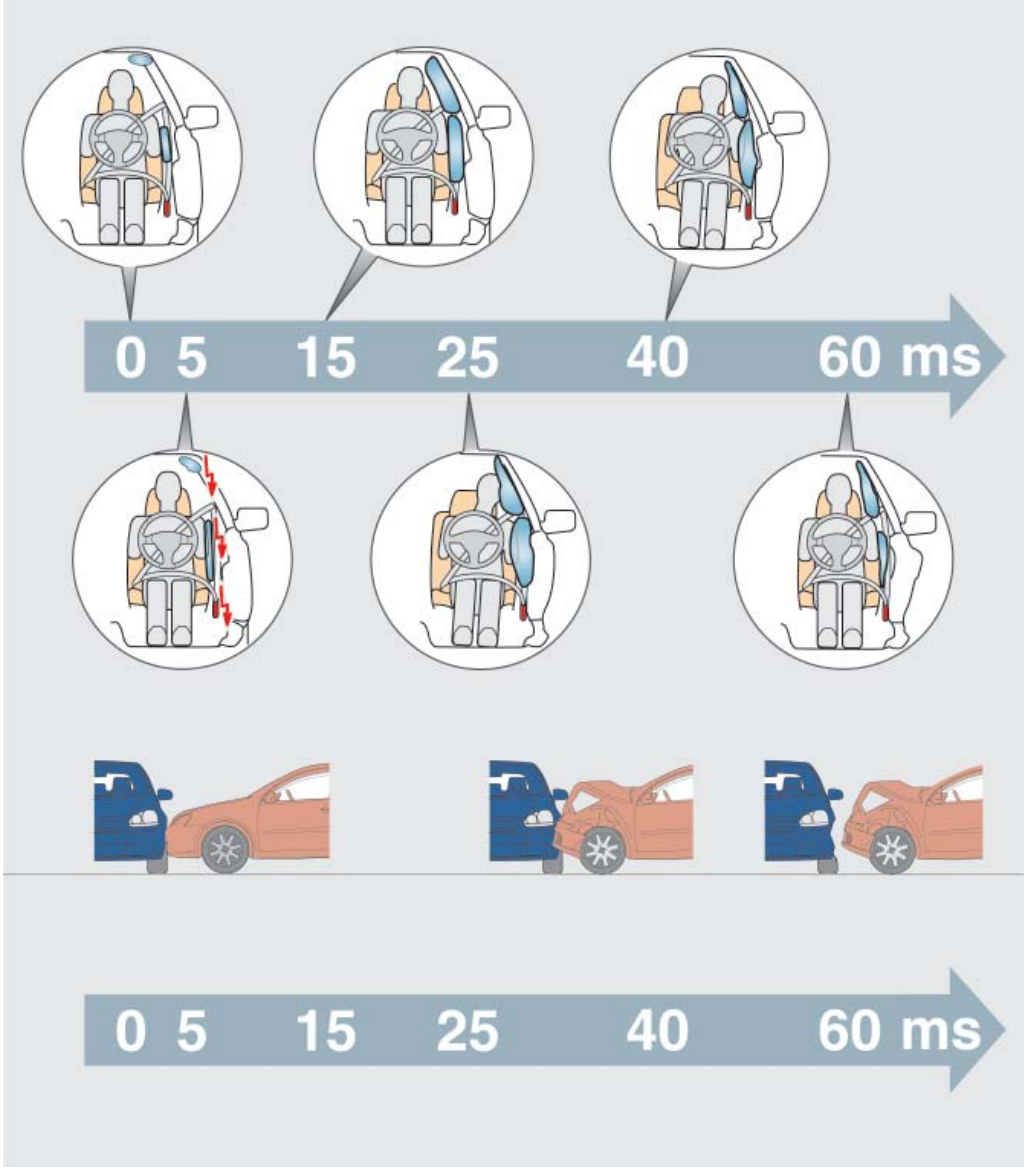
Airbag and Pyrotechnic Systems

Front Crash Sequence

The time that passes between a braking vehicle going into a crash and the deployment of the airbags is very short.

For example, a vehicle going 35 mph into a rigid wall has about 150 milliseconds to complete the activation of all the safety features. That is about as long as it takes you to blink your eyes.

The driver doesn't have any time to react. This is why it is called a "passive" restraint system. The ACM, seatbelts, and airbags function on their own to protect the occupants.



Passive Occupant Detection System

Now that you know about how a vehicle will activate an airbag, let's look at how it knows when to turn it off.

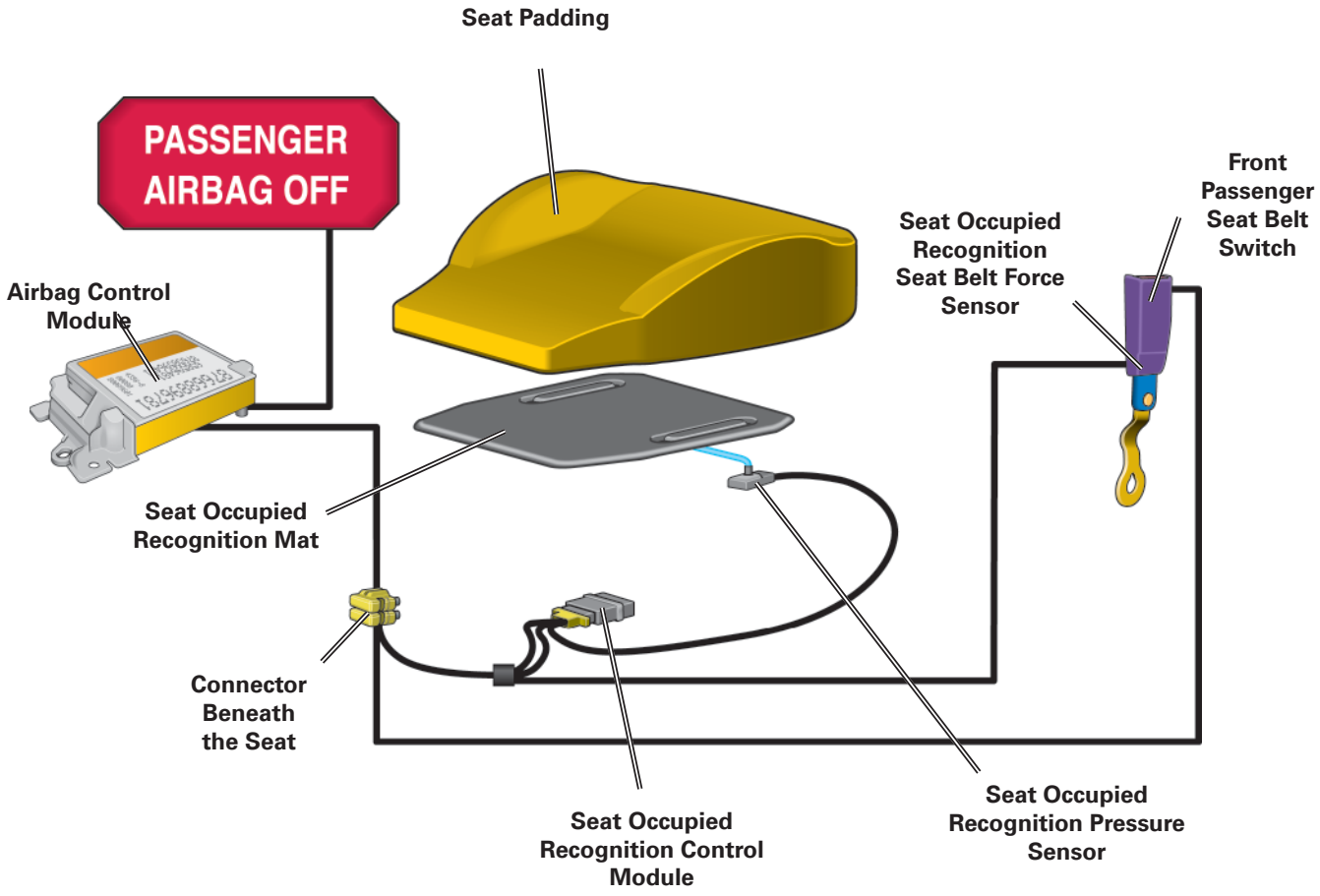
It is a requirement that the front passenger airbag be turned off for an infant in a child seat.

In most Volkswagen vehicles, there is a mat under the seat cushion that sends fluid through a transfer hose to a sensor. (The 2011 Jetta and 2012 Passat introduced an electromagnetic system).

The sensor converts the pressure into an electrical signal that is sent to the Seat Occupied Recognition Control Module.

Also, the seat belt buckle measures tension on the seat belt and sends that information to the Seat Occupied Recognition Control Module.

The control module uses those signals to determine the weight of the occupant and sends a signal to the ACM about whether or not to deploy the passenger airbag.



Airbag and Pyrotechnic Systems

Precautions

There are certain precautions that you should always take when working on an airbag system.

Refer to the repair manual for the latest warnings and cautions as well as other important information on airbags and pyrotechnic devices.

Empty pockets of pencils, pens, cigerettes, and other items that could fall out.

Disconnect the battery ground (GND) strap before working on the airbag or pyrotechnic seat belts.

Wear O.S.H.A approved safety goggles with a minimum ANSI rating of ANSI Z87_1_1968 and ANSI Z87_1_1989. Flying material released during an inadverent deployment can damage eyesight or cause blindness.

Electrostatically discharge yourself before handling an airbag or pyrotechnic safety belt. Do this by touching a suitable metal part, such as a door jam striker pin or ground point.

When Working on Vehicles

There are quite a few things a Technician needs to know when working on vehicles with Airbags and pyrotechnic seatbelts.

Never open or attempt to repair an airbag module or pyrotechnic safety belts.

Do not install airbag components or pyrotechnic safety belts that have been dropped or show signs of damage.

Never use a (nine volt) battery saver. Using a battery battery saver can cause an airbag or safety belt pretensioner to deploy.

Never use a digital volt ohmeter or self powered test light when working on an airbag or pyrotechnic safety belt system.

Using the wrong diagnostic tools can cause and airbag or safety belt pretensioner to deploy.

Use only approved Volkswagen diagnostic tools on airbag and pyrotechnic safety belt systems.

Working on the Vehicle

Never use impact tools to remove or install pyrotechnic safety belts.

Do not hammer in the area of pyrotechnic safety belts, the airbag control module or crash sensors.

See ElsaWeb for the location of sensors that trigger safety belts and airbags.

Do not use grease, cleaning solutions, solvents or similar substances on safety belts or airbag covers.

Do not appy stickers or badges to airbag covers.

Do not use salvage parts when repairing a safety belt or airbag system.

Never turn the ignition to the ON position while reaching through the steering wheel spokes. The airbag could deploy and cause serious injury.

Do not disable any safety systems on the vehicle

Always wash your hands and face with mild soap and water after working on a vehicle in which the airbags and other pyrotechnic deveices have been deployed, especially before eating.

Also:
Do not let the particles and dust released from an airbag or pyrotechnic safety belt get into your eyes or into any cuts or scratches. If contact does occur, flush eyes with water and wash exposed skin with soap and water.

Special Handling

On the following pages you will learn some of the special handling rules to follow for airbags and pyrotechnic seatbelts

All airbags and pyrotechnic safety belts of a vehicle scheduled to be scrapped must be deployed using Airbag Deployment Device J-44210

Always read the instruction booklet and view the supplemental video for Airbag Deployment Device J-44210 and heed all warnings before using the device.

Undeployed airbags and pyrotechnic safety belts are considered hazardous material. When disposing of an undeployed airbag or pyrotechnic safety belt that is either defective or expired, use the appropriate repair information and Airbag Deployment Device J-44210.

Never deploy airbags or pyrotechnic safety belts in the vehicle.

If airbag or pyrotechnic safety belt cannot be safely deployed or removed from the vehicle, contact the Volkswagen Dealer Technician's Helpline (800) 678-2389.

Make sure your dealer complies with federal, state and local regulations for explosive substances.

Deployed airbags and pyrotechnic safety belts can be disposed of as normal scrap.

Special Handling

Shipment of active, undeployed airbag gas generators and pyrotechnic safety belt retractors must be in accordance with the regulations published in the latest edition of the Code of Federal Regulations #49 (49 CFR)

Shipment must be initiated and received by certified individuals. The penalties for noncompliance are severe. Civil penalties range from $250 to $27,500 per violation, per day. Criminal penalties, for willfully violating the regulations, range from $250,000 for individuals and $500,000 for corporations

Special Handling

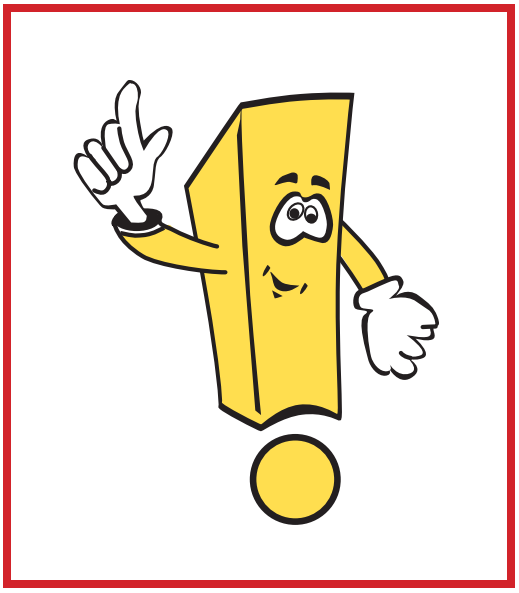
Special Procedures

Now that you have learned about safe handling, lets proceed to learn about the special procedures to follow for airbags or pyrotechnic seatbelt systems.

If airbags and pyrotechnic safety belts did not deploy, it's not necessary to replace and component unless the MIL indicates a malfunction

Register replacement of any airbag components with the Volkswagen Group of America, LLC. Refer to ElsaWeb for the latest registration procedures.

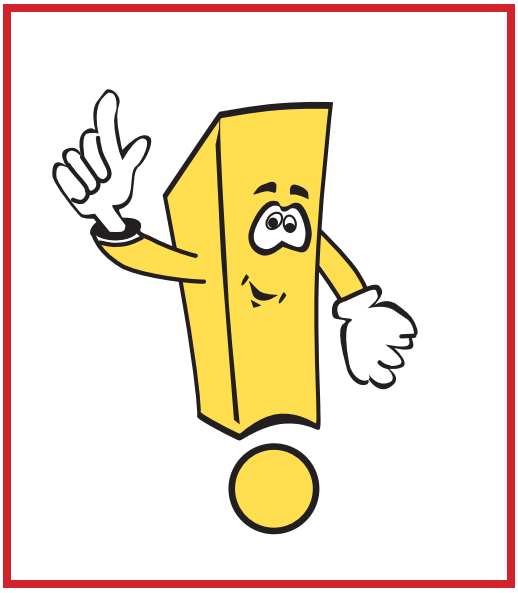
Report any triggered airbag incident, as soon as possible, to the Product Liaison Office and the Volkswagen Group of America. The report should include: VIN, mileage, approximate estimated cost of repair, description of accident and location of vehicle.



Special Handling

Refer to the latest repair information in ElsaWeb to determine which components have to be replaced in the event of airbag and pyrotechnic safety belt deployment.

Inspect pyrotechnic safety belts even if the airbag(s) did not deploy.



Special Tools

Airbag Deployment Device J-44210

State and federal law requires airbags and seat belt tensioners to be deployed before being discarding.

The J-44210 Deployment Fixtures assists certified technicians on the deployment of Volkswagen driver, passenger, side-impact airbags and seatbelt tensioners for the purpose of disposal.

The fixture functions as a platform to which airbags and tensioners can be attached for deployment. It incorporates a plastic tank that must be filled with water prior to use. It also includes the necessary bolts and brackets to properly attach the airbag/tensioners.

It is important that the technicians is familiar with all procedures to attach and deploy airbags using this device. Additional information regarding these procedures can be found on Servicenet in the J44210 Instruction Booklet.

VAS 5056

The VAS 5056 simulates the resistance of the airbag. It can also simulate a short circuit when the button on the tester is pushed. The tester comes with adapter harnesses to fit all airbag and pyrotechnic safety belt igniter connectors.

For example, for the DTC Passenger's side airbag igniter 1-N131-Too High, a technician can connect the VAS 5056 to the igniter wiring harness and monitor the value blocks on the VAS 5051 or 5052. When the technician pushes the button on the tester, the value block should change from Too High to Too Low. If this happens the technician has verified the wiring harness to the airbag is not the cause of the DTC.

Repair Steps

When you do a repair that involves an airbag, you need to follow special procedures.

Define the Problem

Make sure you have all the information you need

Verify and Analyze

Observe the vehicle's condition. Note special equipment. Do not disturb or make any adjustments, such as moving the seats.

Locate the Problem

Use VAS Scan Tool retrieve DTCs

Repair the Problem

Always follow repair manual cautions and warnings.
Do not erase DTCs until after the repair.

Conduct a Quality Check

Inspect and make sure all trim has been replaced correctly.

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Knowledge Assessment

An on-line Knowledge Assessment (exam) is available for this Self-Study Program.

The Knowledge Assessment may or may not be required for Certification.

You can find this Knowledge Assessment at:

www.vwwebsource.com

For Assistance, please call:

Volkswagen Academy

Certification Program Headquarters

1-877-791-4838

(8:00 a.m. to 8:00 p.m. EST)

Or, E-mail:

concierge@volkswagenacademy.com

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