

ACCESSORIES AND BODY, CAB

Restraints - Tightening Torques - Z4

AIRBAG MODULES

72 12 AIRBAG MODULES

TIGHTENING TORQUE SPECIFICATION - AIRBAG MODULES

		Type	Thread	Tightening specification	Measure
1AZ	Passenger airbag module to instrument panel	E89		Hexagon nut with flange, self-locking	8 Nm
2AZ	Knee airbag module - to support tube	E89			8 Nm
3AZ	Side airbag to backrest frame	E89			6.5 Nm

SEAT BELTS

72 11 SEAT BELTS

TIGHTENING TORQUE SPECIFICATION - SEAT BELTS

		Type	Thread	Tightening specification	Measure
Seat belt, front:					
1AZ	Retractor mechanism - to body	E89		Replace microencapsulated screws	36 Nm
2AZ	Anchor fitting, belt - to front seat	E89		Replace microencapsulated screws	44 Nm
3AZ	Belt deflection fitting - to B-pillar, top	E89		Replace microencapsulated screws	90 Nm
4AZ	Belt strap deflector - to body	E89			4 Nm
5AZ	Belt tensioner - to front seat	E89		Replace microencapsulated screws	38 Nm

SEAT BELTS

72 11 SEAT BELTS

TIGHTENING TORQUE SPECIFICATION - SEAT BELTS

				Tightening	
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		Type	Thread	specification	Measure
1AZ	Seat belt, Automatic reel, Lower strap, Anchor fitting, Belt tensioner to body	E36/E31/E38/E39/E46/E52/E53/E83		Replace screws	31 Nm
	Seat belt on B-pillar	All, except E53		Replace screws	31 Nm
	Seat belt/belt tensioner to seat, on Touring also to rear seat backrest	All, except E52/E53		Replace screws	48 Nm
2AZ	Screws for seatbelt height adjustment on body	All		Replace screws	22 Nm
3AZ	Seat belt to seat Install bolt with bolt cement.	E31		Replace screws	47 Nm
4AZ	Seat belt to backrest	E31		Replace screws	24 Nm
5AZ	Headrest to backrest	E31			24 Nm
6AZ	Seat belt at belt height adjustment (reversing clip)	All		Replace screws	31 Nm
7AZ	Tension relief between roller sun blind bracket and backrest lock bracket	E39/2			24 Nm
8AZ	Retaining angle, belt tensioner to seat rail	E46/E83		Replace screws	24 Nm
9AZ	Slide bar to body	E46		Replace screws	44 Nm
10AZ	Counter-support plate to body, B- and C-pillars	E53			39 Nm
11AZ	Seat belt to seat (end fitting)	All		Replace screws	45 Nm
12AZ	Screw of seatbelt height adjuster to counter-support plate	E53		Replace screws	31 Nm
13AZ	Belt tensioner to seat	E83		Replace screws	45 Nm
		E52/E53		Replace screws	31 Nm

14AZ	Inertial reel unit to body/B-pillar	E53/E83		Replace screws	31 Nm
15AZ	Automatic reel on rear seat backrest	E53		Replace screws	45 Nm
		E83		Replace screws	35 Nm
16AZ	Belt guide to front seat (sash guide to head restraint clip)	E46 Convertible		Replace screws	8 Nm
17AZ	Automatic reel to front seat backrest	E46 Convertible		Replace screws	39 Nm
18AZ	Coupling gearing to centering pin	E46 Convertible			2.5 Nm
19AZ	Corner hoop to side panel, inner (B-pillar)	E53/E83			3 ± 0.5 Nm
20AZ	Upper belt loop to body	E83		Replace screws	31 Nm
21AZ	Automatic reel to body	E83		Replace screws	31 Nm

GENERAL INFORMATION

Passive Safety System

INTRODUCTION TO PASSIVE SAFETY

Model: All with Passive Safety Systems

Production: All

INTRODUCTION

History of BMW Safety Systems

BMW has a long history of being at the forefront of passenger safety technology. Before the introduction of airbag systems, seatbelts provided the primary restraint for protection of the occupants during an impact. Three point seatbelts provided the greatest level of occupant safety at that time.

Many other safety innovations were already in use before airbag systems were introduced. Energy absorbing body structures with "crumple zones" uphold the integrity of the passenger safety cell. Some of the other features are "breakaway" engine and transmission mountings, collapsible steering column, door mounted impact beams and a hood that is designed to fold on impact rather than penetrate the windshield.

There are many other safety innovations which are transparent to the driver, but are crucial to providing a safe environment for the vehicle occupants.

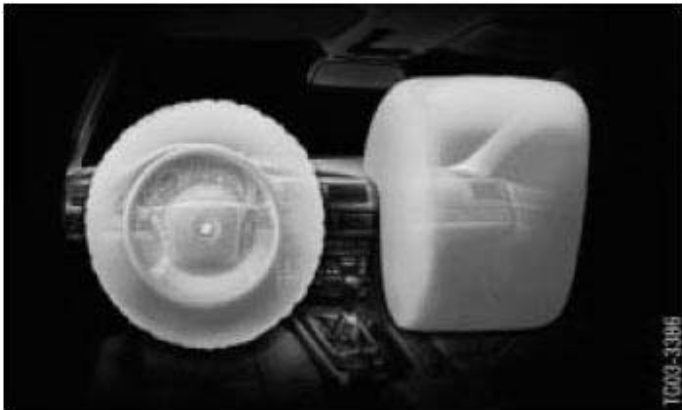


Fig. 1: Identifying History Of BMW Safety Systems
Courtesy of BMW OF NORTH AMERICA, INC.

Since 1986, when BMW first introduced the Supplementary Restraint System (SRS) to their US model line, BMW has continuously improved the level of occupant protection.

The driver's side airbag was standard on all US production models from 1986. Later, the passenger side airbag became standard on the 1992 models.

These first systems were made by Cipro and Siemens and consisted of mechanical crash sensors located on the inner fenders. An airbag was mounted on the steering wheel and a control unit containing a mechanical safing sensor was located in the passenger compartment. The vehicle wiring harness was modified to accommodate these systems.

Later versions included a standard passenger side airbag from 9/91 production. These system were designated Siemens 2C. These systems were replaced by ZAE.

Beginning with the 1994 model year, the ZAE system was introduced on US models. The E31, E34, E36 and E38 all used the ZAE I system. ZAE I used crash sensors which were integral to the control unit and eliminated the mechanical fender mounted sensors on previous models. Also the passenger seat occupancy detection system (SBE) was introduced at this time. ZAE 2 was introduced later and now included the detection of rear impacts.

The Multiple Restraint System (MRS) addressed the need for side impact protection. Starting with the E39, door mounted side airbags were added on the front driver and passenger side. The MRS system also utilized side impact sensors which were externally mounted near the b-pillar. In combination with the MRS control unit, the side impact sensors allowed the MRS system to differentiate between front, rear and side impacts.



Fig. 2: Identifying Multiple Restraint (MRS) System
Courtesy of BMW OF NORTH AMERICA, INC.

Subsequent versions of MRS introduced new technology and enhancements to MRS I. MRSII utilized the new head protection system (HPS) and also the new Safety Battery Terminal.

MRS III has new features including the 2-stage airbag and the rear head protection system. Also, the MRS III control unit was now connected to the K-bus for diagnosis, improved crash signalling and for the fuel pump cut-off feature.

The only changes to MRS IV were improved software and triggering algorithms. It was introduced in 4/01 production on the E46 and E53 and later phased into E38 and E39.

The latest version of MRS is the MRS4RD system. The "RD" designation indicates a redesign over the previous MRSIV system. Numerous modifications include additional crash sensors mounted in the front of the vehicle and pressure sensors mounted in the front doors. Also, the new passenger seat occupancy detection system (OC-3) which is capable of determining the approximate size of the occupant based on weight distribution. To accommodate these changes, the MRS control unit was increased to 75 pins from the previous 50 pin control

unit.

E83 with MRS4RD



Fig. 3: Identifying Latest Version Of MRS MRS4RD System
Courtesy of BMW OF NORTH AMERICA, INC.

The introduction of the E65 brought about a new era in passive safety technology.

The new passive safety system on the E65 was a departure from the MRS philosophy. Instead of having the triggering electronics located centrally in the MRS module. The new method was to decentralize the triggering electronics by locating the trigger circuits in the satellite sensors which are closer to potential impact points.

The new system is referred to as the Intelligent Safety and Information System (ISIS). ISIS consists of a series of satellites connected by an optical bus network called *byte-flight*. The *byteflight* network was specifically designed a high speed network for use on safety related systems.

E65 ISIS System Overview

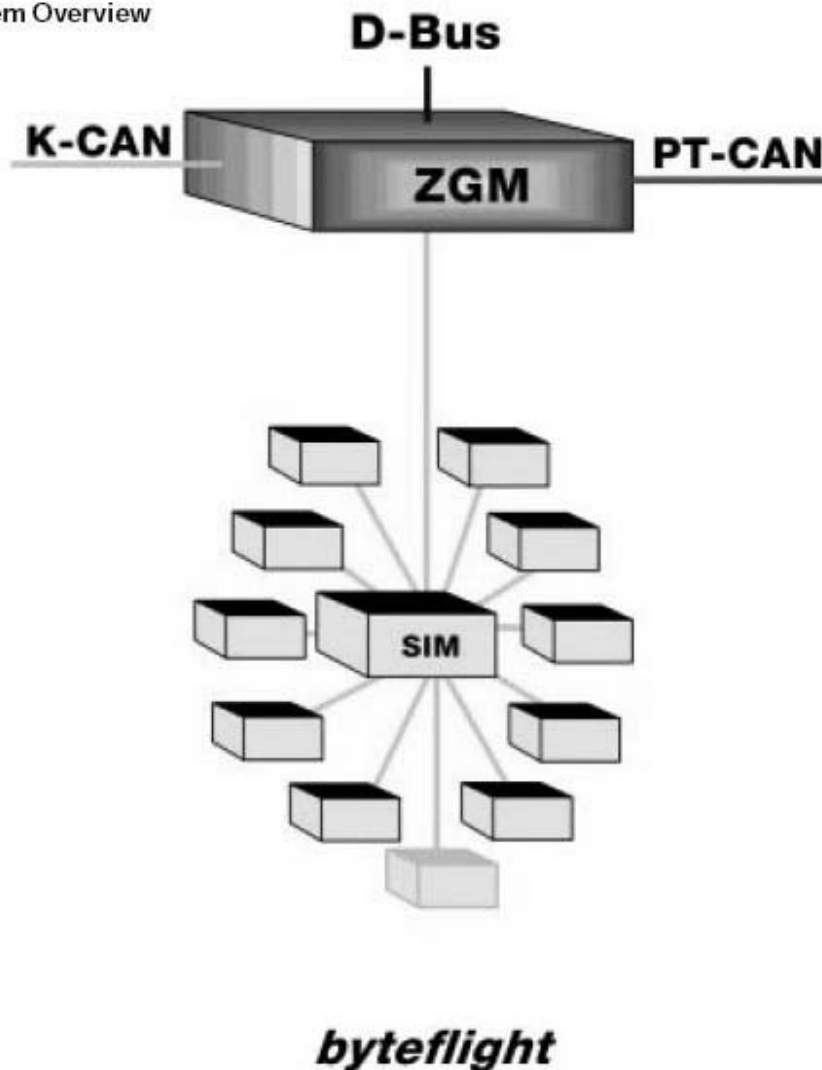
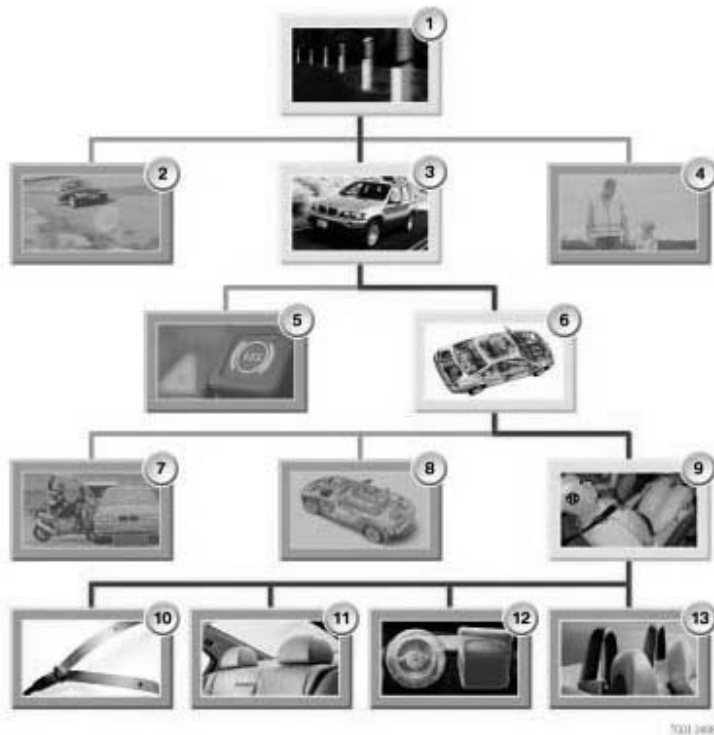


Fig. 4: Identifying E65 (ISIS) System Overview
Courtesy of BMW OF NORTH AMERICA, INC.

The ISIS concept was also adopted on the new Advanced Safety Electronic (ASE) systems which was introduced on the E85. The ASE system is also used on the new E60, E63 and E64 vehicles. ASE is similar in design to ISIS, and uses the byteflight fiber optic network. However the total number of satellites is reduced as compared to ISIS.

Fully Integrated Road Safety Technology (F.I.R.S.T.)

The BMW FIRST safety concept incorporates the environmental considerations (traffic, road conditions), the vehicle (active and passive safety), and the people involved. During the design process, all of these things are taken into to consideration to create a safe environment for the passengers as well as considering the durability of the vehicle during an impact to comply with federal law and insurance regulations.



Index	Explanation	Index	Explanation
1	Traffic Conditions	8	Vehicle Protection
2	Environment	9	Occupant Protection
3	Vehicle	10	Seat Belt
4	People	11	Head Restraints
5	Active Safety	12	Airbag
6	Passive Safety	13	Rollover Protection
7	Partner Protection		

Fig. 5: Identifying Fully Integrated Road Safety Technology (F.I.R.S.T.) System
 Courtesy of BMW OF NORTH AMERICA, INC.

F.I.R.S.T. is the cornerstone behind BMW's safety philosophy. This technology consists of *active* and *passive* safety features designed to help the driver avoid accidents as well as protect the occupants in the event of an unavoidable accident.



Fig. 6: Identifying F.I.R.S.T. Cornerstone Behind BMW'S Safety Philosophy
Courtesy of BMW OF NORTH AMERICA, INC.

Active Safety features are designed to help the driver avoid accidents. In other words these features allow the driver to actively avoid potentially dangerous situations. These features consist of consist of a responsive engine, stable suspension, precise steering and excellent all around vision. Systems such as Dynamic Stability Control (DSC) and ABS also help the driver retain precise control of the vehicle.

Traffic and adverse environmental conditions can be offset by systems such as RLS (rain sensing wiper control), X-Drive, climate control with mist sensor and driving lights etc.

Other features which are "transparent" to the driver include the multi-function steering wheel which allows the driver to control the cruise control and audio systems while still focusing on the road. The seating position and location of switches and controls are also taken into consideration during the design process. The new HUD also allows the driver to access important driving information while maintaining concentration.

Passive Safety features provide vehicle occupant protection when an accident cannot be avoided. Today's BMW Passive Safety systems consist of the following features:

- Energy absorbing body structures
- Seatbelts with Automatic tensioners and force limiters
- Dual front airbags with 2-stage deployment
- Head Protection Systems (front as well as rear on some models)
- Side Impact Airbags (standard) and Rear Side Airbags (optional)
- Active Knee Protection Airbags (On some models)
- Battery Safety Terminal
- Active Head Restraints (on some models)
- Rollover Protection on Convertibles (E36, E46 and E64) and fixed rollover bars on the Z3 and Z8 and Z4.

Energy Absorbing Body Structures

One of the first considerations in designing a safe vehicle is the body and chassis design. It is vital to protect the passenger in the event of an impact. This is accomplished by maintaining the integrity of the "passenger cell" during an accident.

The main consideration during an impact is to avoid transferring crash energy to the vehicle occupants. By adding energy absorbing crash elements to the vehicle, this energy transfer is reduced considerably.

Passenger Safety Cell E60



Fig. 7: Identifying Passenger Safety Cell E60 And Energy Absorbing Body Structures System
Courtesy of BMW OF NORTH AMERICA, INC.

In addition to having energy absorbing structures in the front and rear of the vehicle, there are also side impact protection structures in the doors. These structures not only help prevent impact intrusion into the safety cell, but also allow the door to be opened after most impacts.

Engine Support Arm showing "Crumple Zone"



Fig. 8: Identifying Engine Support Arm System (1 Of 2)
Courtesy of BMW OF NORTH AMERICA, INC.

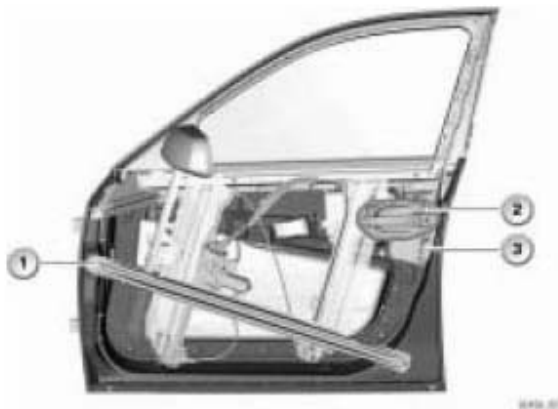


Fig. 9: Identifying Engine Support Arm System (2 Of 2)
Courtesy of BMW OF NORTH AMERICA, INC.

SMART Airbags

Front driver and passenger airbags have been in use with single stage activation since 1986. Once an impact is detected, the airbags are triggered with one specific level of deployment force.

From 1999, BMW developed the SMART airbag which is designed to deploy in 2 stages.

There are 4 triggering thresholds which are dependent upon the severity of impact detected, the status of the seatbelts and whether the passenger seat is occupied.

Driver's side SMART Airbag (Rear view)



Fig. 10: Identifying Driver Side SMART Airbag System
Courtesy of BMW OF NORTH AMERICA, INC.

Passenger side SMART Airbag (Rear view)



Fig. 11: Identifying Passenger Side SMART Airbag System
Courtesy of BMW OF NORTH AMERICA, INC.

The two stage airbags are used for both the front driver and front passenger which allows for a softer cushioning effect when the bags are triggered at lighter impacts.

The 2-stage airbags also employ the "cold-gas" inflation method which differs from the previous single stage airbags. The gas generators contain an inert gas mixture which is released when the airbags are triggered.

Also, the cold gas inflation method was incorporated into the side airbags and the ITS assemblies.

Side Airbags

Since the introduction of MRS, side airbags have been standard equipment. Rear airbags on some vehicles are part of an option package.

Side airbags are designed to prevent injury to the thorax (chest) region of the occupants.

Side Airbag with Inert Gas Inflation (Rear view)

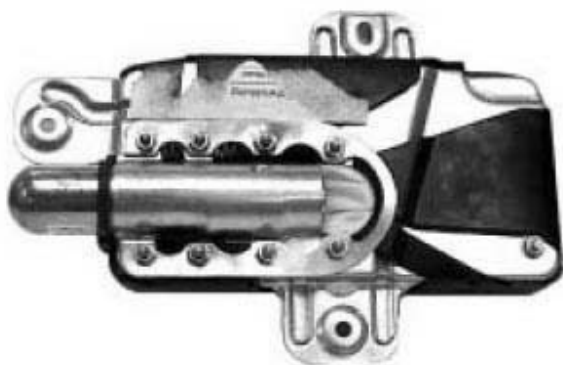


Fig. 12: Identifying Side Airbag With Inert Gas Inflation System
Courtesy of BMW OF NORTH AMERICA, INC.

Seatbelts

Of all of the safety innovations brought forth by the automotive industry, the safety belt is universally recognized as the single most effective safety device. Specifically, the 3-point safety belt provides passengers

with safety as well as comfort.

The effectiveness of the 3-point seat belt depends upon the correct positioning of the safety belt on the body.

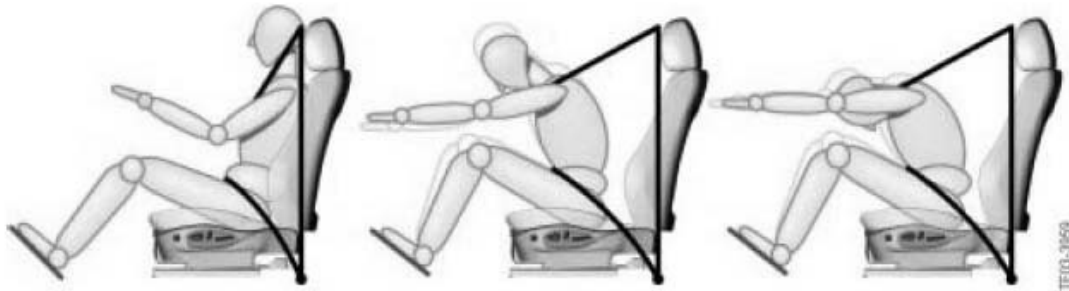


Fig. 13: Identifying Seat Belt Depends Correct Position Of Safety Belt On Body
Courtesy of BMW OF NORTH AMERICA, INC.

BMW safety belt systems use an upper anchor point which is height adjustable. In addition, the tensioning mechanisms allow the belt to remain relatively slack to increase comfort while driving.

The seat belt tensioning device is designed to remove slack in the seatbelt during an impact. This increases the effectiveness of the seatbelt and reduces the bio-mechanical load on the passenger.

There are 4 different belt tensioning systems which have been in use on BMW vehicles.

The 4 systems are as follows:

- Pyrotechnic automatic tensioners/end fitting tensioners
- Mechanical seat belt tensioners
- Pyrotechnic seat belt tensioners
- SGS (Seat Integrated Belt System)

More information on the seat belt tensioning systems will be covered in the forthcoming training modules.



Fig. 14: Identifying Mechanical Seat Belt Tensioners
Courtesy of BMW OF NORTH AMERICA, INC.

Battery Safety Terminal

The Battery Safety Terminal (BST) is designed to minimize the risk of short circuits in severe accidents. The BST protects the B+ cable from the battery to the starter and generator by disconnecting the main connections via a pyrotechnic device.

The rest of the power distribution circuits are protected by various fuses etc. This allows those circuits to remain available for SOS calls, power window and lock operation.

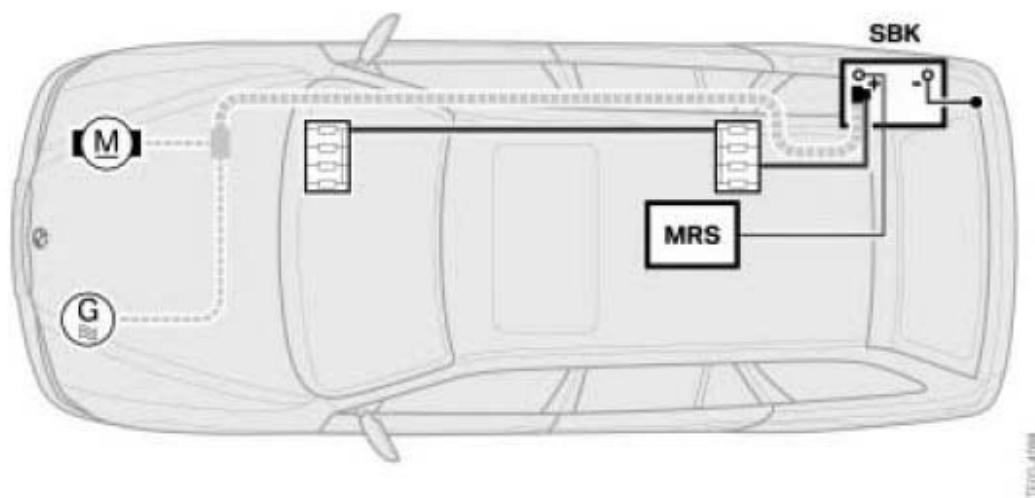


Fig. 15: Identifying Battery Safety Terminal
Courtesy of BMW OF NORTH AMERICA, INC.

The BST assembly is bolted to the positive battery terminal. It consists of a conventional battery terminal and a contact sleeve attached to the surface of the terminal. The sleeve houses an igniter pellet which contains a small amount of solid propellant.

Upon impact, the propellant is ignited which separates the battery cable from the positive terminal of the battery.

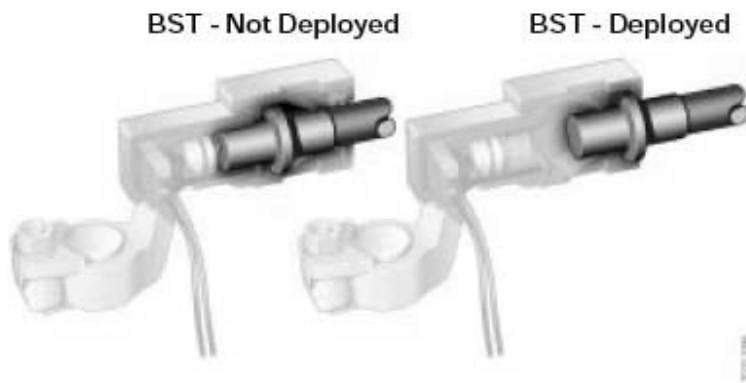


Fig. 16: Identifying BST - Not Deployed
Courtesy of BMW OF NORTH AMERICA, INC.

Once the BST is deployed, it must be replaced. Depending upon application, the entire B+ cable must be replaced or there are repair kits available on some models.

Head Protection System

Head injuries account for a large portion of overall accident statistics. To address this statistic BMW added the Head Protection System to complement the side airbags already in use. HPS was developed by BMW to offer increased occupant protection during a side impact and lower the instance of head injuries.

The original HPS, introduced on the E38, consisted of an Inflatable Tubular Structure (ITS) which was mounted in the headliner between the A and B pillars.

The ITS assembly consists of a woven fabric tube containing an inner tube of polyurethane. A gas generator is used to inflate the ITS assembly. When deployed, the ITS increases in diameter and overall length decreases by approximately 100mm. This causes the ITS assembly to emerge from the headliner trim.



Fig. 17: Identifying Head Protection System
Courtesy of BMW OF NORTH AMERICA, INC.

The ITS is designed as a sealed unit, unlike an airbag which deflates immediately. The ITS assembly deflates as the gas cools over a period of time, which allows the ITS to remain inflated in the event of secondary impacts.

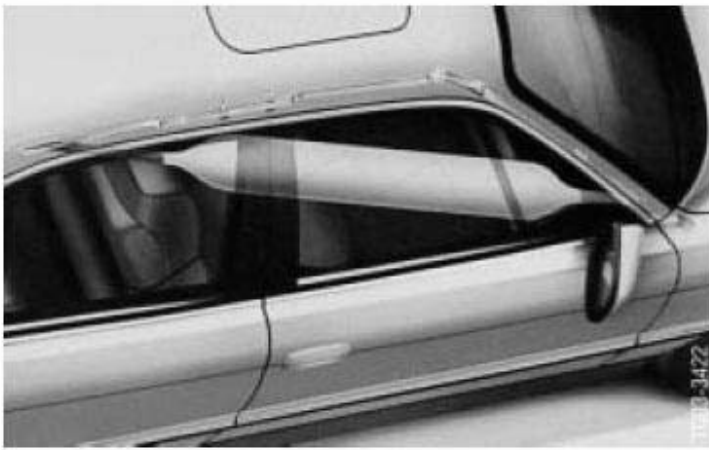


Fig. 18: Identifying ITS Assembly Deflates Gas Cools
Courtesy of BMW OF NORTH AMERICA, INC.

Rear HPS was introduced later as part of a special rear side airbag option on the E38 and E39. The rear HPS does not use a conventional ITS assembly, but rather an "cushion" type airbag located in the C-pillar. A vehicle with rear HPS can be identified by observing "HPS" in the C-pillar cover.

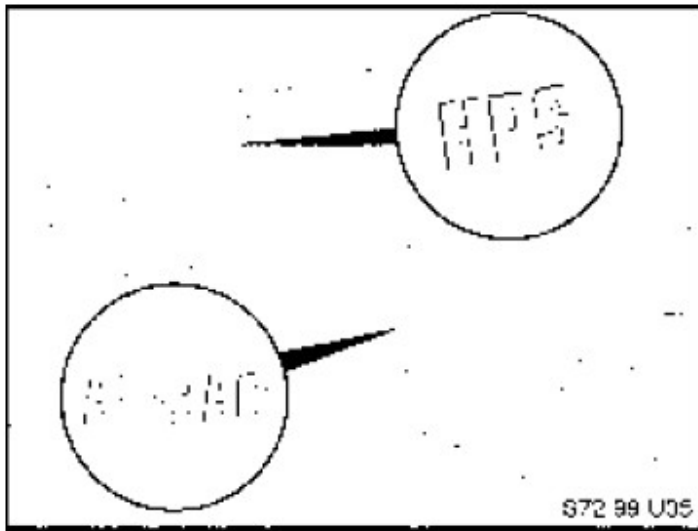


Fig. 19: Identifying Vehicle With Rear HPS Identified By Observing In C-Pillar Cover
Courtesy of BMW OF NORTH AMERICA, INC.

The Head Protection System was further developed to increase the level of occupant protection. The Advanced Head Protection System was introduced on the E65. It consists of a modified ITS which is now extended by a curtain. There are 2 versions of AHPS available. The first, AHPS I, extends from the A-pillar to the B-pillar and protects the front passengers.

The second version, AHPS II, is part of an option for rear passenger head protection. The AHPS II extends for the A-pillar to the C-pillar to protect front and rear passengers simultaneously. The advantages of AHPS include protection from glass splinters and protruding objects as well as optimized coverage for occupants of all sizes.

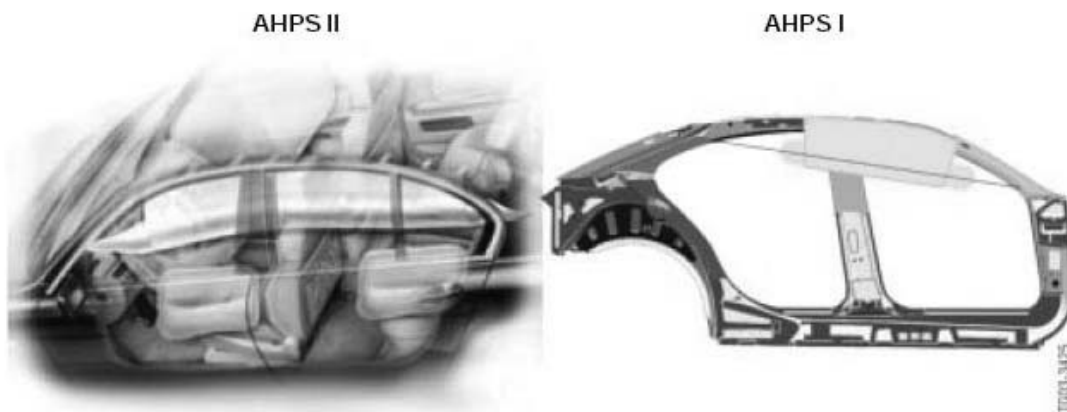


Fig. 20: Identifying AHPS II And AHPS I Part
Courtesy of BMW OF NORTH AMERICA, INC.

Active Knee Protection

The Active Knee Protection consists of a knee airbag located on the front driver and passenger sides of the vehicle. The knee airbag prevent the driver from sliding under the seat belt during an impact. This effect is

known as "submarining". This effect is counteracted by the knee airbag and initiates a controlled forward shift of the upper body.

This increases the effect of the seatbelt and the airbag.

The knee airbag is available on the E65, E85 and E63/64.

E65 Driver's Side Knee Airbag



Fig. 21: Identifying E65 Driver Side Knee Airbag System
Courtesy of BMW OF NORTH AMERICA, INC.

E65 Passenger Side Knee Airbag

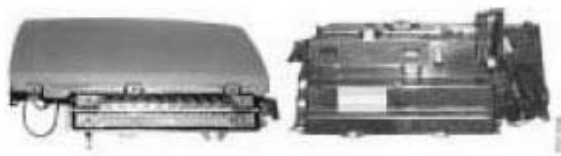


Fig. 22: Identifying E65 Passenger Side Knee Airbag System
Courtesy of BMW OF NORTH AMERICA, INC.

Active Head Restraint System (AKS)

In a rear end collision, the risk for cervical vertebrae injuries (whiplash) is high. To prevent this, the objective would be to position the head as close as possible to the headrest. This prevents excessive rearward motion.

On the E65/E66 and E60, the basic seat option only allows for a fixed position between the backrest and head and eliminates the need for the AKS. However, on vehicles equipped with the multi-function seat option, the adjustability of the headrest and backrest allows for the possibility of a large gap between the headrest and the occupants head.

For this reason AKS was developed. The AKS is located in the backrest of the multifunction seat. It is deployed by a pyrotechnic device, similar to an airbag.

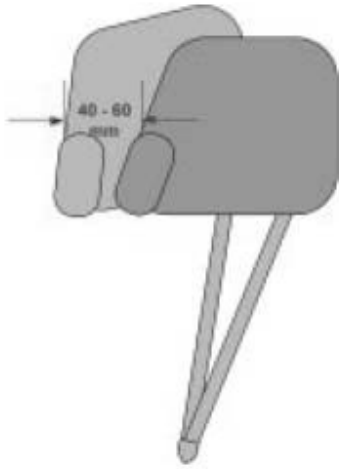


Fig. 23: Identifying Active Head Restraint (AKS) System
 Courtesy of BMW OF NORTH AMERICA, INC.

Rollover Protection Systems

In order to protect the passengers of a convertible in the event of a rollover, BMW has developed the Rollover Protection System (RPS). Convertible models with RPS include the E36, E46 and E64. BMW roadsters use fixed steel rollover bars, these vehicle include the E52 (Z8), E36/7 (Z3), and the E85 (Z4).

The RPS consists of a set of automatically deployable rollbars which are triggered when the vehicle exceeds certain criteria. This criteria is based on the amount of tilt which is monitored by a rollover sensor.

When an impending rollover is detected, the rollover bars lock into place to provide the necessary head clearance to protect the occupants.

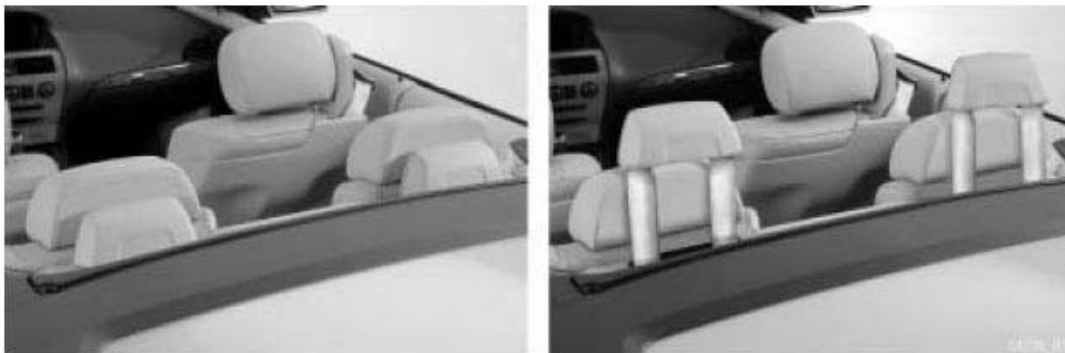


Fig. 24: Identifying Rollover Protection (RPS) Systems
 Courtesy of BMW OF NORTH AMERICA, INC.

Also, the rollover bars can be deployed by the diagnostic equipment for testing. There is also a reset procedure for each model which is done manually. This allows the bars to be reset in the event of an erroneous deployment.



Fig. 25: Identifying Rollover Bars
Courtesy of BMW OF NORTH AMERICA, INC.

Summary of BMW Passive Safety Systems

	3 Series				Z4	5 Series				7 Series				6 Series	8 Series	SAV AWD			
	E30	E36	E46	E90/91	E85	E28	E34	E39	E60/E61	E23	E32	E38	E65/66	E24	E63/E64	E31	E52	E53	E83
Cipro	x					x				x				x					
Siemens 2A	x													x					
Siemens 2B		x					x				x					x			
Siemens 2C		x 9/93					x				x					x			
ZAE		x					x					x				x			
ZAE II		x					x					x				x			
MRS		x						x 3/96				x 3/96							
MRSII			x					x 9/97				x 5/97							
MRSIII			x 3/99					x 3/99				x 3/99					x	x	
MRSIV			x 4/01					x 8/01				x 8/01						x 4/01	
MRS 4RD																			x
MRS 5				x															
ISIS													x						
ASE					x				x						x				

Fig. 26: Identifying Summary Of BMW Passive Safety Systems
Courtesy of BMW OF NORTH AMERICA, INC.

ACCESSORIES AND BODY, CAB

Restraints - Z4

GENERAL

64 00 000 INFORMATION ON USING CLEANING AGENT/PAINTS (PERSONAL PROTECTION EQUIPMENT)

WARNING: Use of cleaning agents/paints not compliant with instructions can cause serious injuries or burns!
Handling cleaning agents/paints can trigger allergic skin and respiratory reactions!

IMPORTANT: Observe following instructions:

- Store cleaning agents/paints only in a secure cabinet.
- Keep cleaning agents/paints away from naked flames and other sources of ignition.
- Protect cleaning agents/paints from high temperatures and direct sunlight.
- Always keep an eye bath on hand, change the water regularly (once a month).

IMPORTANT: Observe following instructions before use:

- Manufacturer's instructions (on container/packaging)
- Hazard warnings (on container/packaging)
- Manufacturer's instructions on package insert
- Material safety data sheet of manufacturer
- Product information in EPC
- National market regulations

IMPORTANT: Observe following instructions during use:

- Do not eat, drink or smoke while working with these products.
- Avoid direct contact with skin and eyes.
- Wear personal protective clothing/equipment.
- Ensure that all enclosed areas are well ventilated or extract fumes directly.
- Immediately change working clothes soiled with cleaning agent/paint.
- After finishing work, wash your hands and apply protective skin cream.

IMPORTANT: Follow hazard warnings and wear personal protection equipment!

First Aid:

- If product comes in contact with eyes, immediately flush with running water for about 10 - 15 minutes. Seek the advice of eye specialist.
- In the event of skin contact and where applicable an allergic skin reaction, clean the affected areas immediately with soap and water and then apply silicone-free skin cream. Seek advice of physician.
- If an adhesive product is swallowed, rinse mouth/parts of mouth thoroughly with running water. Drink 1-2 glasses of water. Do not induce vomiting. Consult a doctor.
- After inhaling vapors ensure ample supply of fresh air. Keep calm, keep respiratory tracks clear and call doctor.

Recycling

Dispose of cleaning agents/paints in a professional manner!

Observe national/country-specific disposal regulations.

72 12 ... PROCEDURE AFTER AIRBAG TRIGGERING AS RESULT OF AN ACCIDENT

Check and/or replace following components after airbag triggering:

Satellites (control unit + sensor)

- Components
 - Satellite, A-/B-pillar, left/right
 - Satellite, front door
 - Satellite, rear seat
 - Satellite, driver's/front passenger seat
 - Satellite, vehicle center
- Procedure
 - Inspect visually for mechanical damage
 - Read fault memory
 - Disconnect battery and observe waiting period
 - Rectify faults
 - Connect battery and observe waiting period (at least 10 seconds)
 - Delete fault memory
 - Turn off ignition and wait at least 2 minutes (no consumers may be switched on during this period such as e.g. inside lights, radio, etc.)
 - Switch on ignition (wait at least 10 seconds)
 - Clear fault memory and if necessary rectify faults

Cables and plugs

- Components and procedure
 - Check cables and plugs for damage, replace if necessary.
(e. g. corrosion, correct engagement, bent pin)

Belt system

- Components
 - Retractor mechanism
 - Belt buckle tensioner
 - Seatbelt height adjustment
 - Anchor fitting tensioner
- Procedure
 - Check components, replace if necessary

Seats

- Components
 - Seat
 - Airbag module
 - Active head restraint
- Procedure
 - Check seats (function check of seat mechanism), replace if necessary
 - Check seat screw/bolt connections
 - Replace gas generator, active head restraint system

If the severity of the impact has not caused any other damage to the seat, only the triggered gas generator needs to be replaced.

External feature: The triggered head restraint is folded forwards and engaged.

The repair work can be carried out in the car with the rear panel removed. The entire system can be pushed back into its original position and the new gas generator installed.

The gas generator can be replaced up to 5 times.

- Replace airbag module and, if necessary, seat cover with padding

Driver's airbag

- Components
 - Airbag module
 - Steering Wheel
 - Steering column (if damaged)
- Procedure
 - Replace faulty components
 - Replace steering wheel

Front-passenger airbag

- Components
 - Airbag module
 - Trim, instrument panel
 - Supporting tube (if damaged)
- Procedure
 - Check components; replace if necessary

Side airbag, front/rear

- Components
 - Airbag module
 - Door panel
 - Door in white
 - Seat
- Procedure
 - Check components; replace if necessary

Head airbag

- Components
 - Airbag module
 - Trim, A-pillar
 - Roofliner
 - Trim, B-pillar (if damaged)
 - Trim, C-pillar (if damaged)
 - Connection/mounting (on side frame)
- Procedure

- Check components; replace if necessary

Knee airbag

- Components
 - Panel (driver's side)
 - Lower section of glovebox
 - Active knee protector (driver's and passenger sides)
- Procedure
 - Replace faulty components

Passive knee protector

- Components
 - Trim panels (driver's side)
 - Glovebox incl. knee protector (passenger side)
- Procedure
 - Replace faulty components
 - Check fastening elements

72 SAFETY PRECAUTIONS AND GENERAL INFORMATION

Notes on safety

- **SAFETY REGULATIONS** for handling airbag modules, airbag components and pyrotechnical seat belt tensioners
- **NOTES ON SCRAPPING** vehicles with gas generators
- **DEACTIVATION/ACTIVATION PYROTECHNICAL COMPONENTS**

Handling electrical and electronic equipment

- **UNLOCKING/LOCKING AIRBAG PLUG CONNECTIONS**
- Repairing airbag lines
- Handling optical fibres

Check

- **CHECK SEAT BELT**
- **CHECK LIST FOR SEAT BELT**

Airbag system

- Functional description and checking, refer to Diagnosis system
- **DEACTIVATING AIRBAGS**
- **PROCEDURE AFTER AIRBAG DEPLOYMENT** .

72 00 ... SAFETY REGULATIONS FOR HANDLING COMPONENTS WITH GAS GENERATORS

It is essential to comply with the regulations as specified in the law relating to the use of explosives when working on airbag units and seat belt tensioners.

Airbags, seat belt tensioners etc. are pyrotechnical objects. Pyrotechnical objects are assigned to different danger classes on the basis of the quantity of propellant that they contain. The assignment can be ascertained from the identification marking on the product:

IMPORTANT: Failure to comply with the warning notices and repair instructions for gas generator components can cause accidental deployment and result in injury and vehicle damage!

This applies in particular to the following components:

- Airbag modules (driver's/front passenger airbags, side airbags)
- Buckle/belt tensioner
- Head airbag
- Active knee protection
- Active head restraint
- Safety battery terminal

1. Regulations

The regulations quoted in the following refer to the Federal Republic of Germany.

In all other countries, the relevant legislation and regulations must be observed in each case. Country-specific legal regulations that go beyond this information or court decisions based thereon must be followed in each case or given precedence over these regulations.

The following components used by BMW:

- Pyrotechnical restraint systems are subject to danger class PT1
- Gas generators are pyrotechnical objects belonging to danger class T1.

Handling, transporting and storing non-fired gas generators are subject to the "Explosive Materials Act" (law relating to the use of explosives dated 13/09/1976).

The relevant trade supervisory authority must be notified at least 2 weeks before pyrotechnical objects are handled for the first time. Here the relevant authority must be notified in writing of the person responsible (e.g. dealership owner, holder of general power of attorney or if necessary workshop supervisor). A certificate of

qualification, i.e. specific training, is not required for the person responsible.

2. Disassembly and assembly

- Inspection, testing and installation work may only be carried out by expert trained personnel in BMW Service.
- Work on components of the airbag system should only ever be carried out with the battery disconnected, the negative terminal post covered and the plug connection of the cable leading to the gas generator disconnected. If only the battery is disconnected, the following prescribed waiting period must be observed without fail:
 - 30 minutes for vehicles up to 9/93;
 - 1 minute for vehicles from 9/93
- In the event of breaks in work, a component with a gas generator that has been removed must be secured against access by other persons.
- Individual components must never be repaired. Instead, always replace them.
- Do not treat airbag system components with cleaning agents or grease.
- Components of the airbag system must not be exposed to temperatures in excess of 75 °C.
- Airbag system components, including electronic diagnostic components, which have been dropped from heights in excess of 0.5 m must not be reinstalled in the vehicles.
- Before installing, subject components such as housing, connector pins etc. (including electronic diagnostic components) to a visual inspection for damage and replace if necessary.
- Airbag system components may only be electrically tested while they are installed and only with the BMW ISTA.
- **Danger of injury:** The airbag module may only be set down with the airbag itself facing upwards. Otherwise the generator will be thrown upwards if it is fired.
- Do not point the firing pellet of a gas generator at other persons.
- Components with gas generators must not be fired while they are removed. They must be disposed of by special disposal companies or returned to BMW in the packaging of the new components.
- When carrying out straightening and welding work with an electric welder:
 - Disconnect battery
 - Cover negative terminal (post)
- Avoid all contact with the skin when removing a fired airbag module wear gloves. Wash with water after contact with the skin.

3. Transport

- Components with gas generators must be sent off in the packaging of the new components.

4. Storage

- Observe the regulations of the relevant trade supervisory authority and the applicable national regulations.

SEAT BELTS

72 11 ... CHECKING AUTOMATIC SAFETY BELT

General considerations when checking seat belts:

The seat belts must be checked after an accident.

For the check, you should start by trying to get information on which seats in the car involved in the accident were occupied. If this is not possible, check all the seat belts in the car and replace them if necessary.

In the event of deformations on the car, you must subject the components of the restraint system affected in this area such as e.g.

- Seat Belts
- Anchor fitting tensioner
- Seatbelt height adjustment
- Belt buckle tensioner
- Triggering sensors
- etc.

to a function check and a visual inspection.

If you are in any doubt as to the unimpaired functional capability of restraint system components, these components must be replaced in the interests of safety!

If a seat belt has to be replaced following an accident (e.g. in the event of a frontal and/or side impact with permanently deformed impact dampers/deformation elements or crossmembers), the complete seat belt must be replaced! The complete seat belt comprises:

- Top belt
- Lower strap
- Anchor fitting tensioner
- Seat belt buckle (buckle tensioner)
- Seatbelt height adjustment
- Retaining screws of all components

The following must also be checked and if necessary replaced:

- Seatbelt mountings on the car body
- Seatbelt mountings on the seat
- Seat runners
- Seat structure (frame, etc.)

Alignment tests on the seat and the seat runners are not permitted!

The following explanations and the **CHECKLIST** for the automatic safety belt can provide help.

An unusable seat belt or a seat belt worn in a serious accident should be destroyed immediately after removal to guarantee that it can not be used again.

Checking automatic reel and seat belt strap:

The automatic reel has two independent activation systems for seat-belt locking.

The first activation system locks the automatic reel when driving quickly around curves, driving in tight curves, on extreme inclinations (vehicle rolls over) and during sharp braking or impact.

To check, the seat backrest must be placed in the upright position and both hands held in a supporting position close to the steering wheel. The brakes are then applied fully while driving on a dry surface and at a road speed equal to twice that of walking speed.

The seat belt must lock.

The second activation system provides additional safety and is controlled by inertia mass.

If the reel locks when the strap is pulled out suddenly, this system is also OK.

In addition, the automatic electric reel (EMA) must eliminate belt slack.

Check whether an attempt was made to eliminate belt slack:

- Enter, close doors and latch seat belt buckle contact
- EMA eliminates belt slack

If belt slack was not eliminated, the procedure described below must be followed:

- Allow vehicle to assume complete sleep mode and repeat the function test.
- All doors must be closed!
- EMA, left, must be installed and connected correctly.
- Work through all fault memory entries before the function test is carried out again.

Replace defective or actuated automatic electric reels.

Automatic reel does not require servicing and must not be opened.

Precondition for complete, problem-free retraction of straps:

- the straps must not be twisted!
- the straps must not be damaged!

When placed to one side, the straps of the front seats must retract fully.

With the straps in the rear seat bench, a small remaining loop is acceptable due to increased friction between the strap and the rear seat bench cover if:

- this remaining loop is fully retracted when the strap is reguided.

Belt straps should only be cleaned with a lukewarm soap solution or a commercial laundry detergent.

Belt straps must never be cleaned chemically or dyed.

The automatic reel and strap must be replaced in the event of:

1. creases
2. unravelling
3. pinches
4. cracks and tears
5. traces of melting
6. traces of wear on casing of seat belt tongue or on reversing clip.

Checking lower strap (belt buckle tensioner):

To fasten a seat belt, the tongue should insert easily and with a loud click in the lock.

When the "Red button" is pressed, the tongue must be ejected from the lock under spring pressure.

If the lock cover is missing or damaged, the lower strap must be replaced.

Replace the triggered belt buckle tensioner including the complete seat belt with seatbelt height adjustment and retaining screws and check the

- Seatbelt mountings on the car body
- Seatbelt mountings on the seat
- Seat runners
- Seat structure

Criteria for a triggered mechanical belt buckle tensioner:

- very low position of seatbelt buckle (comparisons with new part).

Criteria for a triggered pyrotechnical belt buckle tensioner:

- very low position of seatbelt buckle (comparisons with new part).
- Airbag warning lamp permanently lit: read out airbag system fault memory.

The belt buckle tensioners can be triggered under certain circumstances even when the seat is not occupied. If it is definite that the belt system was not used (seat was not occupied), there is no need to replace the

- upper strap
- attachment parts (belt height adjustment, screws)
- seatbelt mountings on the car body
- Seatbelt mountings on the seat
- Seat runners

after a check.

Checking anchor fitting tensioner:

Replace the triggered anchor fitting tensioner including the complete seat belt with seatbelt height adjustment, lower strap and retaining screws and check the

- Seatbelt mountings on the car body
- Seatbelt mountings on the seat
- Seat runners
- Seat structure

Criteria for a triggered anchor fitting tensioner:

- A triggered anchor fitting tensioner can be recognized from the wrapped belt strap around the shaft.
- Airbag warning lamp permanently lit: read out airbag system fault memory.

72 11 ... INSPECTION LIST FOR AUTOMATIC SEAT BELT

AUTOMATIC SEAT BELT INSPECTION LIST

Was the automatic seat belt with lower strap replaced after an accident, e.g. frontal and/or oblique impact in which the impact absorbers/deformation elements were permanently deformed? (only while seat belt was fastened)	No	Replace complete automatic seat belt The following must also be checked and replaced, if necessary: seatbelt mountings on the car body seatbelt mountings on the seat seat runners.
Yes		
Does seat belt lock when pulled out suddenly?	No	Replace automatic seat belt (upper strap).
Yes		
Does the automatic electric reel eliminate the belt slack?	No	Replace automatic seat belt (upper strap).
Yes		
		Automatic reel is loose -

Can the strap be pulled out without jamming?	No	tighten reel. If fault persists: Return spring broken - replace automatic seat belt (upper strap).
Yes		
Does the strap on the front seat belts retract automatically? Does the strap on the rear seat belts retract automatically, a small remaining loop is acceptable if this remaining loop is fully retracted when the strap is readjusted.	No	Automatic reel is loose - tighten reel. Excessive friction in belt guides - replace automatic seat belt (upper strap). Return spring broken - replace automatic seat belt (upper strap).
Yes		
Does automatic reel make a squeaking noise when belt is fastened or unfastened?	Yes	Excessive friction in belt guides - replace automatic seat belt (upper strap). Reel is loose - tighten reel. Return spring broken - replace automatic seat belt (upper strap).
No		

AUTOMATIC SEAT BELT INSPECTION LIST

Is the plastic casing on the latch free from damage in the area of the belt opening?	No	Replace complete automatic seat belt
Yes		
Is the fully extended strap free from pinches, burn marks, tears and cuts, folding and unravelling?	No	Replace complete automatic seat belt
Yes		
When the belt is fastened, is the belt tongue ejected by spring force from the buckle when the "red button" is pressed?	No	Replace complete automatic seat belt
Yes		
Does fastened seat belt lock when stopping vehicle quickly on a dry road at a road speed twice as fast as walking speed?	No	Replace complete automatic seat belt
Yes		
Is fully pulled-out belt free of serious dirt and other marks?	No	If dirt and marks cannot be removed with commercially available mild-action detergent, the

		automatic seat belt (upper strap) must be replaced.
Yes		
In the case of seat-integrated seat belts, is front tongue of reclining mechanism or seat rail free of deformation?	No	Replace both damaged parts and complete automatic-reel seat belt. The following must also be checked and replaced, if necessary: seatbelt mountings on the car body seatbelt mountings on the seat seat runners.
Yes		
The automatic seat belt is O.K.!		

72 11 041 REMOVING AND INSTALLING OR REPLACING FRONT LEFT OR RIGHT LOWER BELT FITTING (SEAT BELT PRETENSIONER)

Necessary preliminary tasks

- Remove **FRONT SEAT**

WARNING: Read and comply with **SAFETY REGULATIONS** for handling airbag modules and pyrotechnical belt pretensioners.
Improper handling can lead to triggering of the pyrotechnical seat belt pretensioner or side airbag, resulting in injuries.

Switch off ignition!

Installation:

- Microencapsulated screws (Loctite) must be replaced and may **not** be reused
- Screw connection must be completed within 20 minutes (start of curing)
- Microencapsulated screws must not be retightened
- Clean thread of nut beforehand in event of repeated use

Unfasten plug connection (1) and disconnect.

Unlock plug connection (3) and pull all plugs out of plug housing (2).

Disconnect all cable ties.

Removing wiring harness.

Installation:

- Replace cable tie.
- Wires must not be under tension

- Plugs are coded and must be reinstalled in the correct sequence in the plug housing

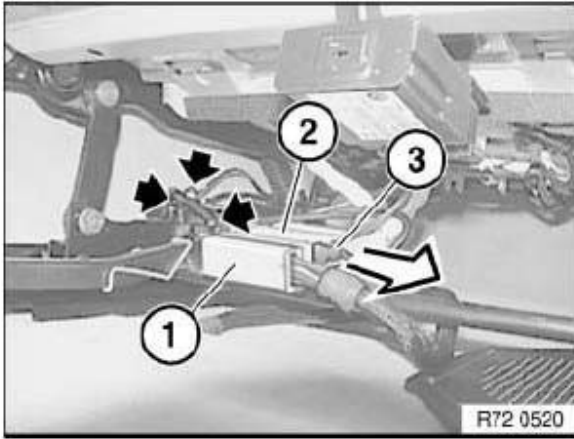


Fig. 1: Identifying Plug Connection And Plug Housing
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

Tightening torque **72 11 5AZ** .

Remove belt pretensioner (3).

Installation:

Replace screw (1).

Belt tensioner (3) is secured through recess (2) to retaining bracket.

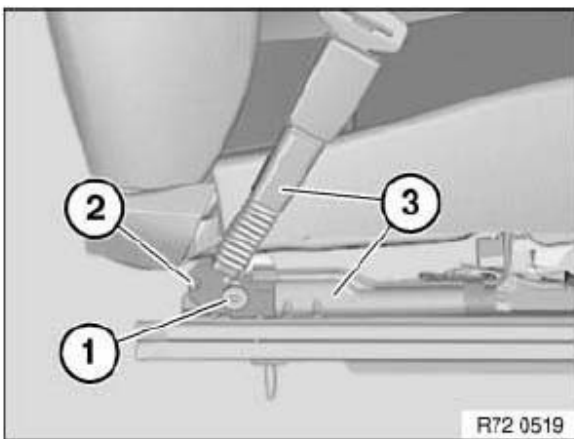


Fig. 2: Identifying Belt Tensioner On Recess And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

72 11 033 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT SEAT BELT

Necessary preliminary tasks

- Remove REAR SIDE TRIM PANEL

Installation:

- Microencapsulated screws (Loctite) must be replaced and may **not** be reused
- Screw connection must be completed within 20 minutes (start of curing)
- Microencapsulated screws must **not** be retightened
- Clean thread of nut beforehand in event of repeated use

Move seat fully upwards.

Unlock release tab (2) for belt anchor fitting trim (1) with plastic wedge.

Simultaneously unclip trim (1) in direction of arrow.

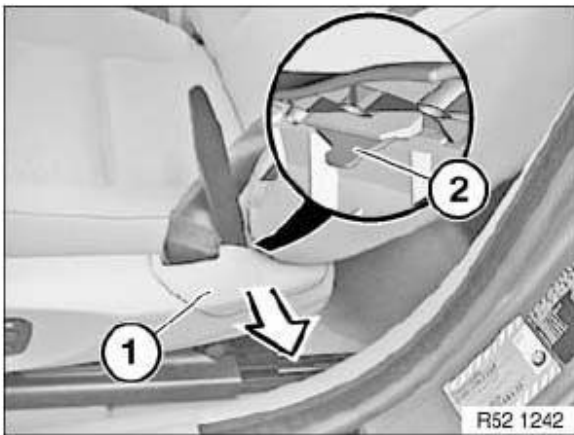


Fig. 3: Removing Belt Anchor Fitting Trim Release Tab Using Plastic Wedge
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

Tightening torque 72 11 02AZ .

Remove hook (2) for lower belt guide.

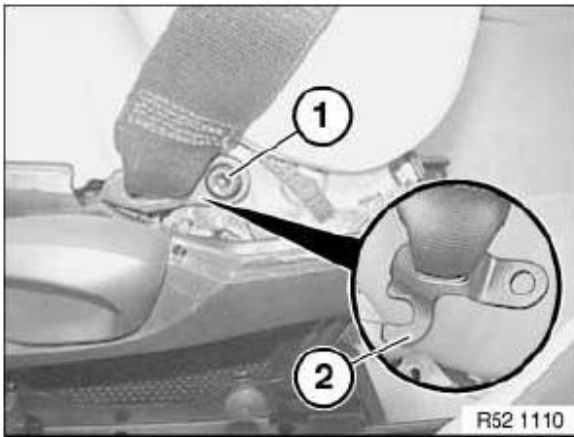


Fig. 4: Identifying Lower Belt Guide Hook And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

Tightening torque **72 11 03AZ** .

Remove deflection fitting (2).

Installation:

Deflection fitting (2) is coded against incorrect installation.

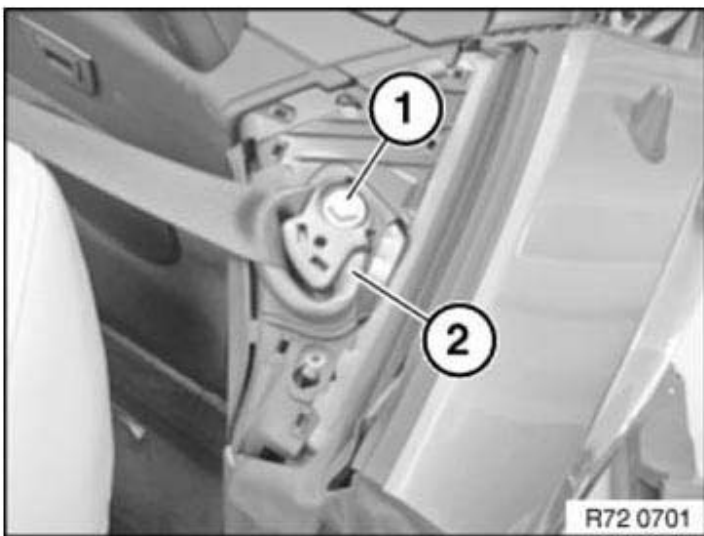


Fig. 5: Identifying Deflection Fitting With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

Tightening torque **72 12 01AZ** .

US only:

Unlock plug connection (3) and disconnect.

Remove inertia reel unit (2).

Installation:

Inertia reel unit (2) is coded against incorrect installation.

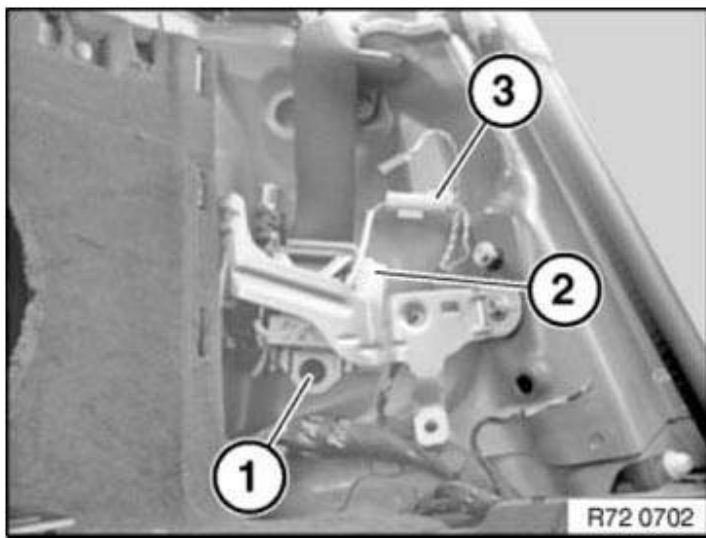


Fig. 6: Identifying Inertia Reel Unit With Plug Connection And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

72 SAFETY PRECAUTIONS AND GENERAL INFORMATION

Notes on safety

- **SAFETY REGULATIONS** for handling airbag modules, airbag components and pyrotechnical seat belt tensioners
- **NOTES ON SCRAPPING** vehicles with gas generators
- **DEACTIVATION/ACTIVATION PYROTECHNICAL COMPONENTS**

Handling electrical and electronic equipment

- **UNLOCKING/LOCKING AIRBAG PLUG CONNECTIONS**
- Repairing airbag lines
- Handling optical fibres

Check

- CHECK SEAT BELT
- CHECK LIST FOR SEAT BELT

Airbag system

- Functional description and checking, refer to Diagnosis system
- DEACTIVATING AIRBAGS
- PROCEDURE AFTER AIRBAG DEPLOYMENT .

7212 AIRBAG GENERATOR/AIRBAG UNIT FOR PASS

72 12 ... DEACTIVATING FRONT PASSENGER AIRBAGS WITH KEY-OPERATED SWITCH

WARNING: The responsibility for deactivation/activation rests with the customer. Depending on the occupation of the front passenger seat, the front passenger and side airbags must be (de-)activated in accordance with the Owner's Handbook.

The passenger airbag can only be deactivated in accordance with the following instructions if the vehicle is equipped with a suitable key-operated switch!

The key-operated switch can be retrofitted if it is missing and has been ordered as an optional extra.

Key-operated switch:

- Optional extra SA 5DA for MINI
- Optional extra SA 470 for BMW

E83 up to 09/2004 only:

see Deactivation of airbags

E83 from 09/2004 only:

Deactivation via key-operated switch, see following work steps

R50/R53 up to 04/2004 only:

see Deactivation of airbags

R50/R53 from 04/2004 only:

Deactivation via key-operated switch, see following work steps

The following airbags are deactivated simultaneously with the key-operated switch (1):

- Passenger airbag
- Side airbag (passenger side)
- If necessary, knee airbag in US models (passenger side)

The airbags can only be deactivated/reactivated while the vehicle is stationary and with the door open.

IMPORTANT: The head airbag remains active.

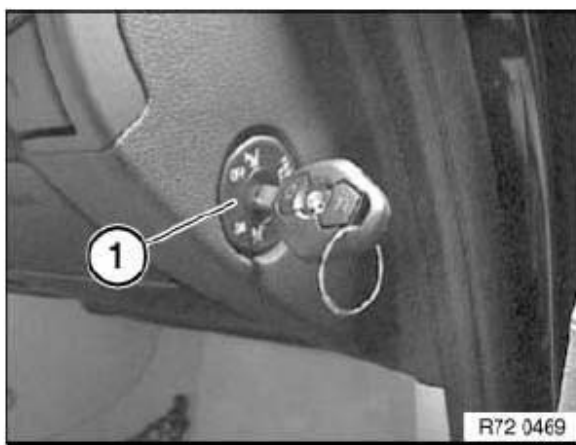


Fig. 7: Identifying Key-Operated Switch
Courtesy of BMW OF NORTH AMERICA, INC.

Deactivation

1. Turn key-operated switch with ignition key to "OFF" position.

Deactivatable airbags on passenger side out of operation.

Head airbag on passenger side remains active.

All airbags on driver side remain active.

Activation

- 2 Turn key-operated switch with ignition key to "ON" position.

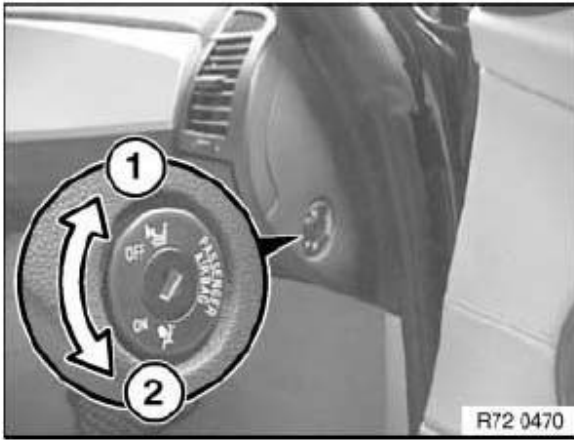


Fig. 8: Identifying Key-Operated Switch ON And OFF Position
 Courtesy of BMW OF NORTH AMERICA, INC.

All the airbags in the vehicle are activated and are triggered in appropriate situations.

Warning lamp

When the ignition key is turned in the ignition lock, the function of the airbag system is checked and the warning lamp in the center console lights up for several seconds.

1. The warning lamp is permanently lit when the passenger airbags are **deactivated**
2. The warning lamp goes out after a few seconds when the passenger airbags are **activated**

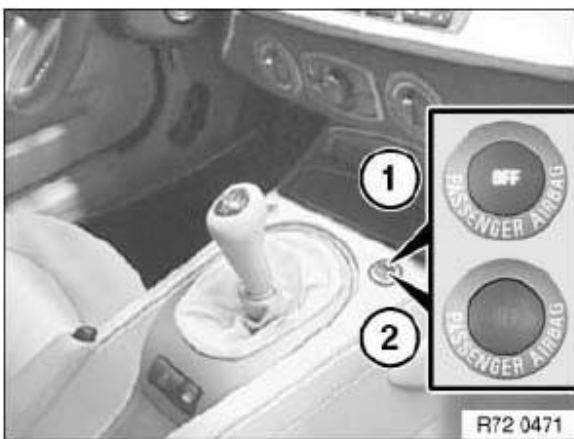


Fig. 9: Identifying Warning Lamp
 Courtesy of BMW OF NORTH AMERICA, INC.

72 12 ... NOTES ON SCRAPPING VEHICLES WITH GAS GENERATORS (AIRBAG SYSTEM)

The gas generator is a pyrotechnical component and is for the most part permanently mounted on the following components:

- Airbag module
 - Driver's/passenger airbag
 - Side airbag
 - Head airbag
 - Knee airbag
- Automatic electric reel
- Belt end fitting tensioner
- Belt buckle tensioner
- Safety battery terminal
- Active head restraint

In accordance with accident prevention regulations and specific national regulations, gas generators must be rendered unusable before they are scrapped. This is necessary because pyrotechnical objects can cause injury if improperly activated (e.g. scrapping with flame cutters).

With vehicles which are scheduled for scrapping, it is always essential prior to draining and further stripping work to ensure that all the gas generators **in the vehicle** are fired. The fired gas generators can then be scrapped together with the vehicle.

Gas generators that have not fired constitute a hazard (also to the environment)!

Firing failure:

If correct firing is not possible, the relevant components must be removed and disposed of by special waste disposal companies!

Comply with **SAFETY REGULATIONS** for handling airbag system components.

If a triggering operation has failed:

- Disconnect the triggering device from the battery and
- Wait a few minutes before approaching the vehicle

The components of an airbag system must always be disposed of. Such components must not be sold on as used parts.

Firing:

Triggering of the gas generators may only be carried out by expert personnel and under the supervision of a responsible person. Other standard accident prevention regulations (safety goggles, ear defenders etc.) must also be observed.

The gas generators must be fired from the outside in this vehicle which has been earmarked for scrapping. In this process

- the doors must be closed
- the rear lid must be open
- the side windows must be open and
- the sunroof must be open

To fire the gas generators, use the firing device with the appropriate cables (follow instructions).

WARNING: Once gas generators have been fired, observe a ventilation period of 10 minutes with the doors opened. Only then is it permitted to continue work inside the vehicle.
Wear protective goggles and protective gloves when handling a fired gas generator!
The burning of solid fuel will heat up the airbag unit - danger of burning hands!

Wash skin with water after contact with fired gas generators!

72 12 ... PROCEDURE AFTER AIRBAG TRIGGERING AS RESULT OF AN ACCIDENT

Check and/or replace following components after airbag triggering:

Satellites (control unit + sensor)

- Components
 - Satellite, A-/B-pillar, left/right
 - Satellite, front door
 - Satellite, rear seat
 - Satellite, driver's/front passenger seat
 - Satellite, vehicle center
- Procedure
 - Inspect visually for mechanical damage
 - Read fault memory
 - Disconnect battery and observe waiting period
 - Rectify faults
 - Connect battery and observe waiting period (at least 10 seconds)
 - Delete fault memory
 - Turn off ignition and wait at least 2 minutes (no consumers may be switched on during this period such as e.g. inside lights, radio, etc.)
 - Switch on ignition (wait at least 10 seconds)
 - Clear fault memory and if necessary rectify faults

Cables and plugs

- Components and procedure
 - Check cables and plugs for damage, replace if necessary.
(e. g. corrosion, correct engagement, bent pin)

Belt system

- Components
 - Retractor mechanism
 - Belt buckle tensioner
 - Seatbelt height adjustment
 - Anchor fitting tensioner
- Procedure
 - Check components, replace if necessary

Seats

- Components
 - Seat
 - Airbag module
 - Active head restraint
- Procedure
 - Check seats (function check of seat mechanism), replace if necessary
- Check seat screw/bolt connections
- Replace gas generator, active head restraint system

If the severity of the impact has not caused any other damage to the seat, only the triggered gas generator needs to be replaced.

External feature: The triggered head restraint is folded forwards and engaged.

The repair work can be carried out in the car with the rear panel removed. The entire system can be pushed back into its original position and the new gas generator installed.

The gas generator can be replaced up to 5 times.

- Replace airbag module and, if necessary, seat cover with padding

Driver's airbag

- Components
 - Airbag module

- Steering Wheel
- Steering column (if damaged)
- Procedure
 - Replace faulty components
 - Replace steering wheel

Front-passenger airbag

- Components
 - Airbag module
 - Trim, instrument panel
 - Supporting tube (if damaged)
- Procedure
 - Check components; replace if necessary

Side airbag, front/rear

- Components
 - Airbag module
 - Door panel
 - Door in white
 - Seat
- Procedure
 - Check components; replace if necessary

Head airbag

- Components
 - Airbag module
 - Trim, A-pillar
 - Roofliner
 - Trim, B-pillar (if damaged)
 - Trim, C-pillar (if damaged)
 - Connection/mounting (on side frame)
- Procedure
 - Check components; replace if necessary

Knee airbag

- Components

- Panel (driver's side)
- Lower section of glovebox
- Active knee protector (driver's and passenger sides)
- Procedure
 - Replace faulty components

Passive knee protector

- Components
 - Trim panels (driver's side)
 - Glovebox incl. knee protector (passenger side)
- Procedure
 - Replace faulty components
 - Check fastening elements

72 12 050 REMOVE AND INSTALL SIDE AIRBAG

WARNING: Observe **SAFETY REGULATIONS** for handling airbag modules and pyrotechnical seat belt pretensioners.
 Follow instructions for **UNLOCKING AND LOCKING AIRBAG PLUG CONNECTIONS** .
 Incorrect handling can cause airbags to trigger, resulting in serious injuries.

IMPORTANT: Operations on pyrotechnical devices may only be carried out by authorized experts.
 Improper, unauthorized operations may result in serious dangers.
 Unauthorized persons are strictly prohibited from performing any operations on this system.

Necessary preliminary tasks

- Clamp off **BATTERY NEGATIVE LEAD**
- Remove rear panel on front seat
- Remove front seat

IMPORTANT: Make sure airbag wiring harness is exactly routed when installed.

Detach cable tie.

Release airbag wiring harness (2) from cable holders on seat mechanism.

Raise release clip (3) and pull plug (4) out of plug housing (1).

NOTE: If necessary, release yellow plug housing (1) from holder on seat mechanism.

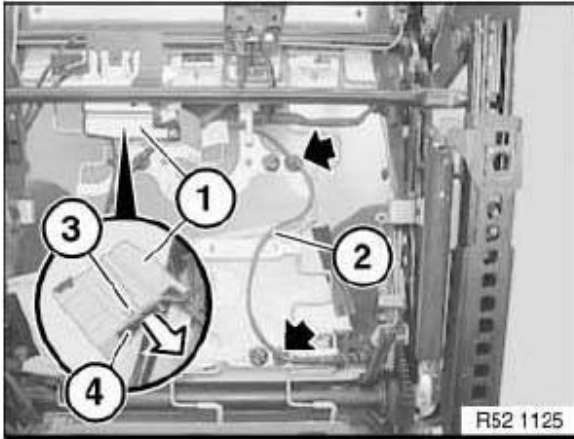


Fig. 10: Pulling Plug From Plug Housing
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip cable tie (1) from seat mechanism.

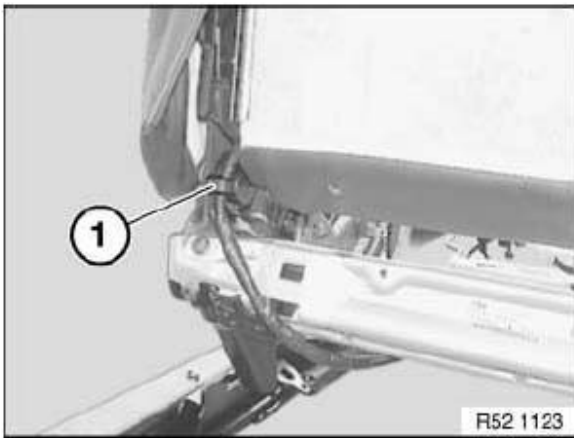


Fig. 11: Identifying Seat Mechanism Cable Tie
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nuts (1).

Installation:

Replace nuts.

Tightening torques **72 12 03AZ** .

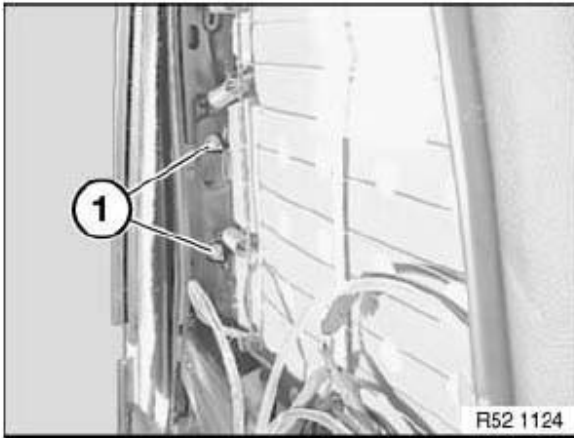


Fig. 12: Identifying Nuts

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Feed the wiring harness carefully through the seat and backrest mechanism as the edges of the frame can be sharp.

Installation:

Make sure wiring harness is correctly laid.

Pull airbag module (2) with threaded pins out of backrest frame.

Feed out airbag module (2) between padding (1) and inner bag (3).

Installation:

Pull inner bag (3) fully over airbag module (2) and threaded pins.

Insert threaded pins into backrest frame and secure with new nuts.

No inner bag material is permitted to project through the hole in the inner frame.

Install nuts and tighten down.

Tightening torques **72 12 03AZ** .

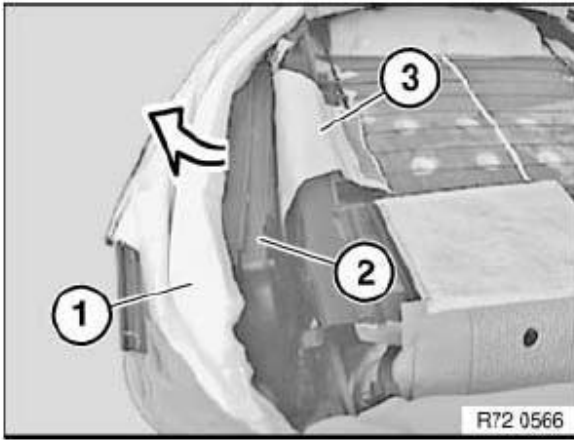


Fig. 13: Removing Airbag Module Between Padding And Inner Bag
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Feed out wiring harness (2) of airbag module (1) through seat and backrest mechanism (3) carefully on account of sharp edges.

Installation:

Make sure wiring harness is correctly laid.

Engage backrest cover (3) in backrest frame and **ASSEMBLE** front seat.

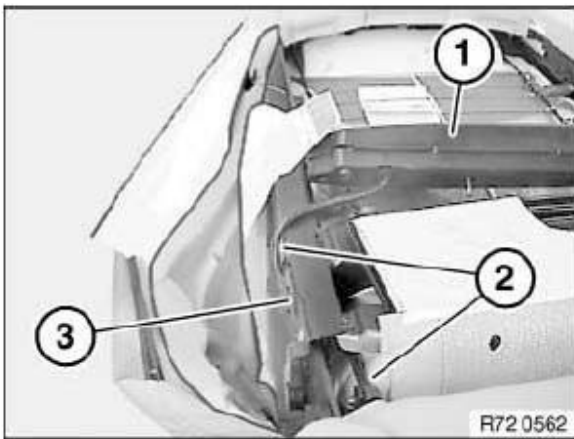


Fig. 14: Identifying Airbag Module With Wiring Harness And Backrest Mechanism
 Courtesy of BMW OF NORTH AMERICA, INC.

72 12 000 REMOVING AND INSTALLING OR REPLACING AIRBAG MODULE ON PASSENGER SIDE

WARNING: Read and comply with **SAFETY REGULATIONS** for handling airbag

modules and pyrotechnical belt pretensioners.
Incorrect handling can activate airbag and cause injury.

IMPORTANT: Operations on pyrotechnical devices may only be carried out by authorized experts.
Improper, unauthorized operations may result in serious dangers.
Unauthorized persons are strictly prohibited from performing any operations on this system.

Necessary preliminary tasks

- Clamp off **BATTERY NEGATIVE LEAD**
- Remove **RIGHT GLOVEBOX WITH HOUSING**

Disconnect plug connection (1).

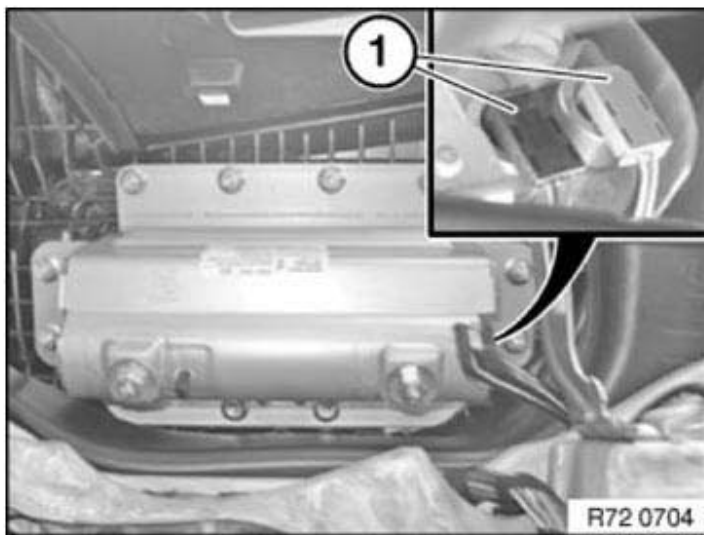


Fig. 15: Identifying Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Secure airbag module (1) on passenger side against falling out.

Release nuts in marked area.

Installation:

Replace self-locking nuts.

Tightening torque **72 12 01AZ** .

Remove airbag module (1) on passenger side towards bottom.

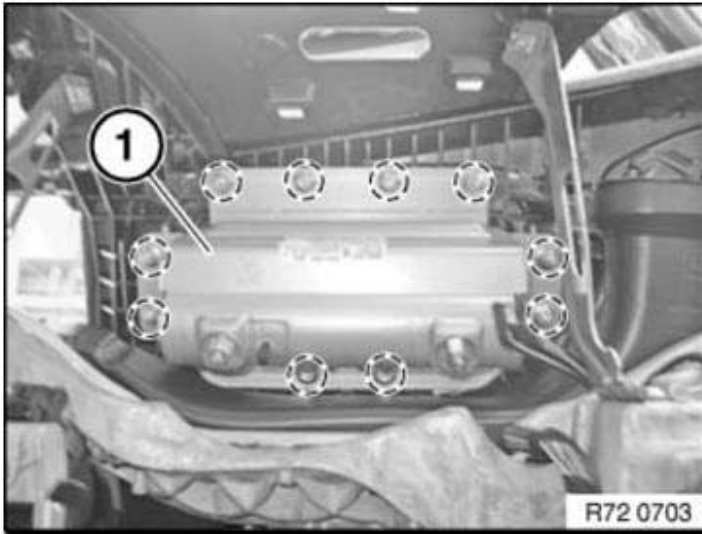


Fig. 16: Identifying Airbag Module
Courtesy of BMW OF NORTH AMERICA, INC.

72 12 004 REMOVING AND INSTALLING/REPLACING AIRBAG MODULE FOR DRIVER'S KNEE PROTECTION

WARNING: Read and comply with SAFETY REGULATIONS for handling airbag modules and pyrotechnical belt pretensioners.
Follow instructions for UNLOCKING AND LOCKING AIRBAG PLUG CONNECTIONS .
Incorrect handling can activate airbag and cause injury.

IMPORTANT: Operations on pyrotechnical devices may only be carried out by authorized experts.
Improper, unauthorized operations may result in serious dangers.
Unauthorized persons are strictly prohibited from performing any operations on this system.

Necessary preliminary tasks

- Remove TRIM PANEL FOR PEDAL ASSEMBLY

IMPORTANT: Secure airbag module against falling out.

Unscrew nuts (1).

Tightening torque 72 06 02AZ .

Feed airbag module out of instrument panel trim and unlock and disconnect PLUG CONNECTION behind.

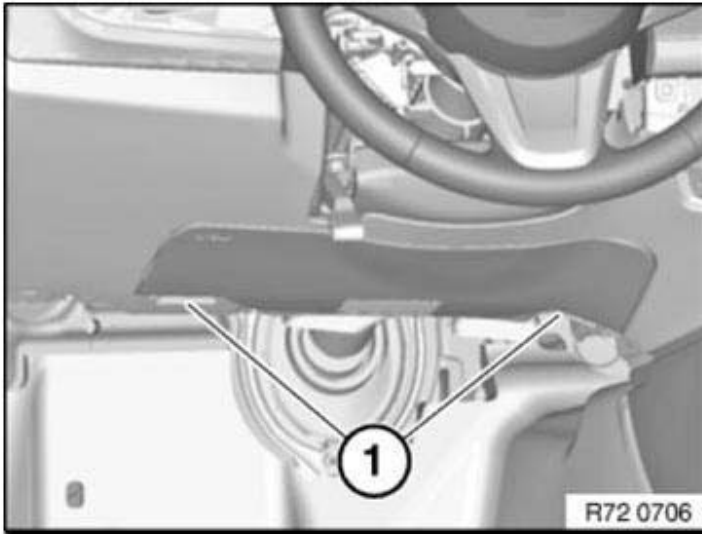


Fig. 17: Identifying Nuts
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure airbag module (1) is correctly seated in instrument panel trim.

Make sure lugs are correctly seated on threaded bolts.

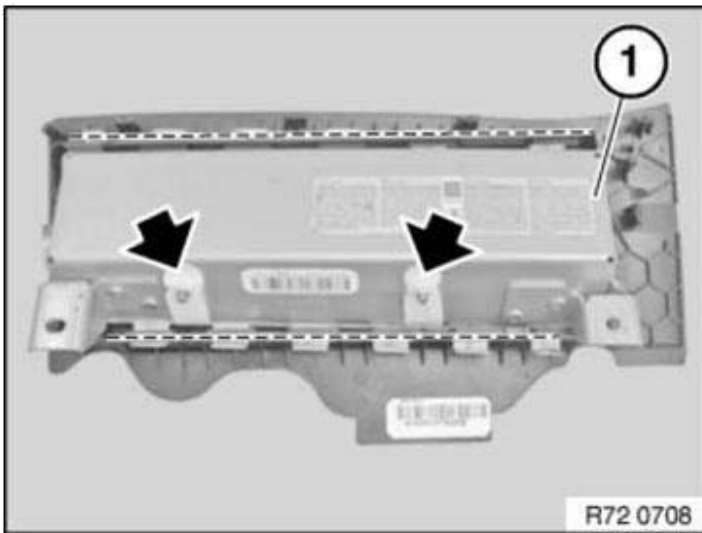


Fig. 18: Identifying Airbag Module With Lugs
 Courtesy of BMW OF NORTH AMERICA, INC.

72 12 006 REMOVING AND INSTALLING/REPLACING AIRBAG MODULE FOR PASSENGER'S KNEE PROTECTION

WARNING: Read and comply with SAFETY REGULATIONS for handling airbag modules and pyrotechnical belt pretensioners.
Follow instructions for UNLOCKING AND LOCKING AIRBAG PLUG CONNECTIONS .
Incorrect handling can activate airbag and cause injury.

IMPORTANT: Operations on pyrotechnical devices may only be carried out by authorized experts.
Improper, unauthorized operations may result in serious dangers.
Unauthorized persons are strictly prohibited from performing any operations on this system.

Necessary preliminary tasks

- Remove TRIM FOR INSTRUMENT PANEL , bottom right

IMPORTANT: Secure airbag module against falling out.

Unscrew nuts (1).

Tightening torque 72 06 02AZ .

Feed airbag module out of instrument panel trim and unlock and disconnect PLUG CONNECTION behind.

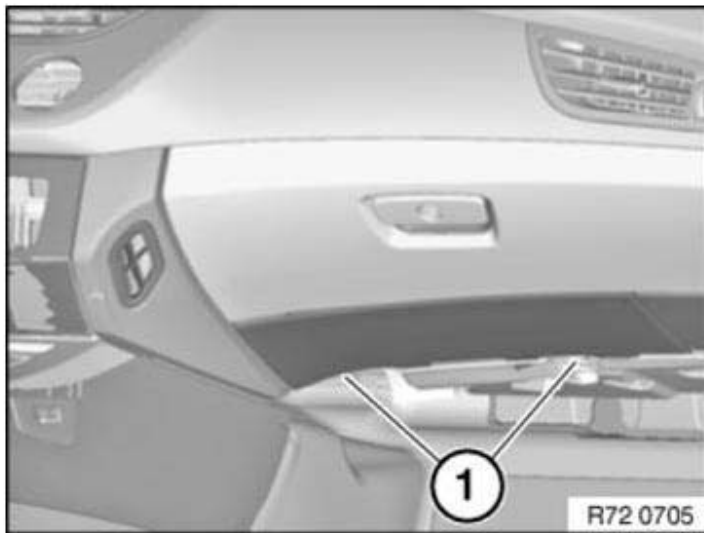


Fig. 19: Identifying Instrument Panel Trim Mounting Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure airbag module (1) is correctly seated in instrument panel trim.

Make sure lugs are correctly seated on threaded bolts.

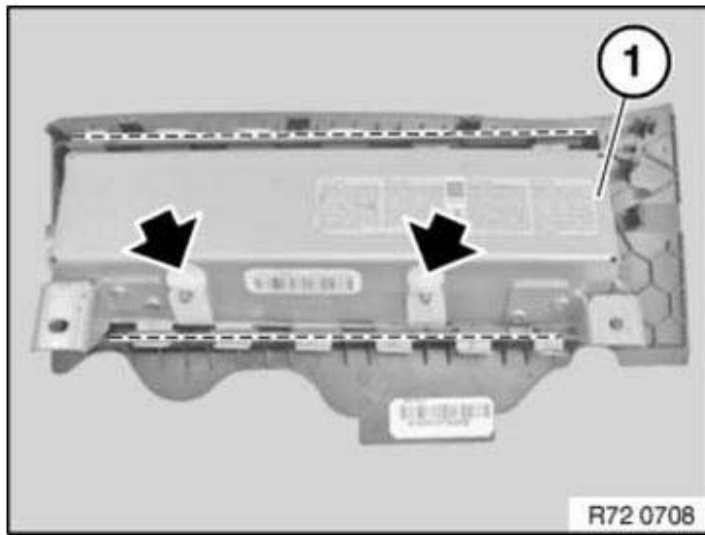


Fig. 20: Identifying Airbag Module With Lugs
Courtesy of BMW OF NORTH AMERICA, INC.

61 00 ... REPAIRING AIRBAG CABLES

IMPORTANT: Only repair those cables which show visible signs of damage. In the event of visible damage, make sure there is only one cable repair in effect after the repair work. If no visible damage can be identified, the entire cable must be replaced. When carrying out repairs to the airbag wiring harness, you must use the spare parts offered in the Electronic Parts Catalogue (EPC).

Safety regulations

Safety regulations for handling components of airbag system.

INSTRUCTIONS FOR DISCONNECTING AND CONNECTING BATTERY .

Procedure for cable repair

In event of visible damage

Expose cable at damaged areas. Cut through one cable after the other at an appropriate position and insulate cables no longer required in wiring harness with insulating tape, do not under any circumstances cut through both cables at the same time. Now, depending on the scope of work, unpin contacts either on airbag control unit/airbag module or on adapter plug. Cut off unpinned cables. Insulate cables remaining in wiring harness with insulating tape. Now pin in contacts of repair cable, assignment of repair cables is relevant. Lay repair lead in car parallel to existing airbag lead up to cutting point. Cut off excess length of repair lead. Twist open cables. Connect cables with connectors and shrink-fit hoses in Electronic Parts Catalogue (EPC), assignment of repair cables is relevant. Twist cables again, open length (twist) must not exceed 40 mm. Secure interface (shrink-fit

hoses) with insulating tape to prevent cables from twisting open.

Instructions for cutting off, insulating, crimping cables, installing and removing contacts:

CUTTING OFF AND INSULATING CABLES .

REPAIRING A PLUG CONNECTION USING CONNECTORS .

INSTALLING AND REMOVING CONTACTS .

72 SAFETY PRECAUTIONS AND GENERAL INFORMATION

Notes on safety

- **SAFETY REGULATIONS** for handling airbag modules, airbag components and pyrotechnical seat belt tensioners
- **NOTES ON SCRAPPING** vehicles with gas generators
- **DEACTIVATION/ACTIVATION PYROTECHNICAL COMPONENTS**

Handling electrical and electronic equipment

- **UNLOCKING/LOCKING AIRBAG PLUG CONNECTIONS**
- Repairing airbag lines
- Handling optical fibres

Check

- **CHECK SEAT BELT**
- **CHECK LIST FOR SEAT BELT**

Airbag system

- Functional description and checking, refer to Diagnosis system
- **DEACTIVATING AIRBAGS**
- **PROCEDURE AFTER AIRBAG DEPLOYMENT** .

72 00 ... SAFETY REGULATIONS FOR HANDLING COMPONENTS WITH GAS GENERATORS

It is essential to comply with the regulations as specified in the law relating to the use of explosives when working on airbag units and seat belt tensioners.

Airbags, seat belt tensioners etc. are pyrotechnical objects. Pyrotechnical objects are assigned to different danger classes on the basis of the quantity of propellant that they contain. The assignment can be ascertained from the identification marking on the product:

IMPORTANT: Failure to comply with the warning notices and repair instructions for gas generator components can cause accidental deployment and result in injury and vehicle damage!

This applies in particular to the following components:

- Airbag modules (driver's/front passenger airbags, side airbags)
- Buckle/belt tensioner
- Head airbag
- Active knee protection
- Active head restraint
- Safety battery terminal

1. Regulations

The regulations quoted in the following refer to the Federal Republic of Germany.

In all other countries, the relevant legislation and regulations must be observed in each case. Country-specific legal regulations that go beyond this information or court decisions based thereon must be followed in each case or given precedence over these regulations.

The following components used by BMW:

- Pyrotechnical restraint systems are subject to danger class PT1
- Gas generators are pyrotechnical objects belonging to danger class T1.

Handling, transporting and storing non-fired gas generators are subject to the "Explosive Materials Act" (law relating to the use of explosives dated 13/09/1976).

The relevant trade supervisory authority must be notified at least 2 weeks before pyrotechnical objects are handled for the first time. Here the relevant authority must be notified in writing of the person responsible (e.g. dealership owner, holder of general power of attorney or if necessary workshop supervisor). A certificate of qualification, i.e. specific training, is not required for the person responsible.

2. Disassembly and assembly

- Inspection, testing and installation work may only be carried out by expert trained personnel in BMW Service.
- Work on components of the airbag system should only ever be carried out with the battery disconnected, the negative terminal post covered and the plug connection of the cable leading to the gas generator disconnected. If only the battery is disconnected, the following prescribed waiting period must be observed without fail:
 - 30 minutes for vehicles up to 9/93;
 - 1 minute for vehicles from 9/93
- In the event of breaks in work, a component with a gas generator that has been removed must be secured

against access by other persons.

- Individual components must never be repaired. Instead, always replace them.
- Do not treat airbag system components with cleaning agents or grease.
- Components of the airbag system must not be exposed to temperatures in excess of 75 °C.
- Airbag system components, including electronic diagnostic components, which have been dropped from heights in excess of 0.5 m must not be reinstalled in the vehicles.
- Before installing, subject components such as housing, connector pins etc. (including electronic diagnostic components) to a visual inspection for damage and replace if necessary.
- Airbag system components may only be electrically tested while they are installed and only with the BMW ISTA.
- **Danger of injury:** The airbag module may only be set down with the airbag itself facing *upwards* . Otherwise the generator will be thrown upwards if it is fired.
- Do not point the firing pellet of a gas generator at other persons.
- Components with gas generators must not be fired while they are removed. They must be disposed of by special disposal companies or returned to BMW in the packaging of the new components.
- When carrying out straightening and welding work with an electric welder:
 - Disconnect battery
 - Cover negative terminal (post)
- Avoid all contact with the skin when removing a fired airbag module wear gloves. Wash with water after contact with the skin.

3. Transport

- Components with gas generators must be sent off in the packaging of the new components.

4. Storage

- Observe the regulations of the relevant trade supervisory authority and the applicable national regulations.

72 12 ... UNLOCKING/LOCKING AIRBAG PLUG CONNECTIONS

WARNING: READ AND COMPLY WITH safety regulations for handling airbag modules and pyrotechnical belt tensioners.

**IMPORTANT: An airbag plug connection must be replaced if it is damaged.
Sourcing reference for airbag repair instructions (with plug connection), refer to BMW Parts Service.**

Following versions of plug connections on airbag module/gas generator are possible:

- Airbag plug connection on gas generator/airbag module is offset by 90°
- Airbag plug connection on gas generator/airbag module is straight (3 versions)

Airbag plug connection on gas generator/airbag module offset by 90°

There are two ways of unlocking this airbag plug connection on the gas generator/airbag module:

Method 1:

Simultaneously pull cover (1) upwards at lugs on left and right (2).

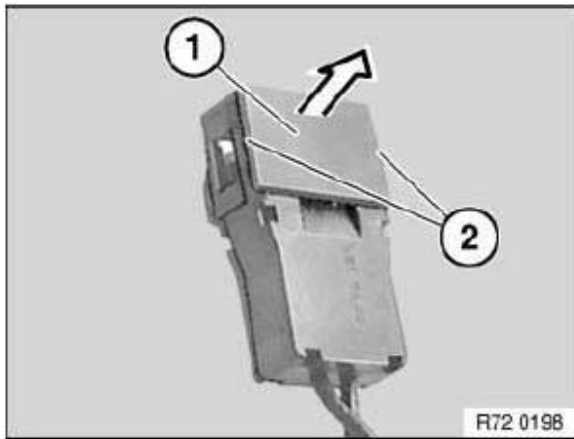


Fig. 21: Pulling Air Bag Plug Connection Cover Upwards
Courtesy of BMW OF NORTH AMERICA, INC.

Method 2:

Insert a narrow screwdriver into recess (1) in housing (2).

Carefully pry cover (3) off (4).

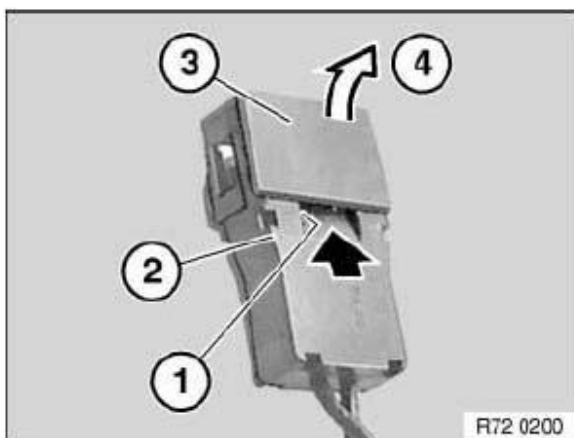


Fig. 22: Removing Air Bag Plug Connection Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Cover (1) is not positioned higher than housing (2).

The airbag plug connection is unlocked and can now be detached from the gas generator/airbag module.

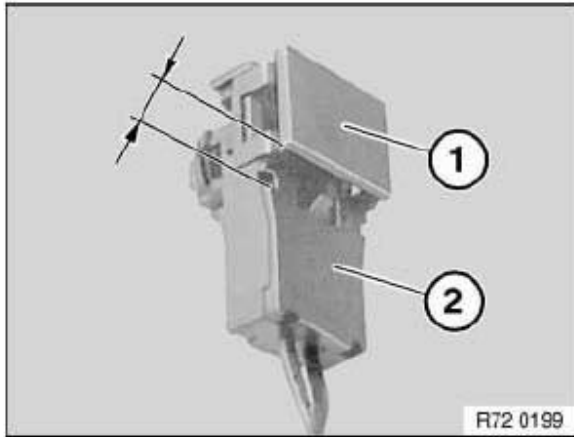


Fig. 23: Identifying Air Bag Plug Connection Cover And Housing
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

After attaching airbag plug connection to gas generator/airbag module, press cover (1) downwards until it rests flat on housing.

Check that it catches properly.

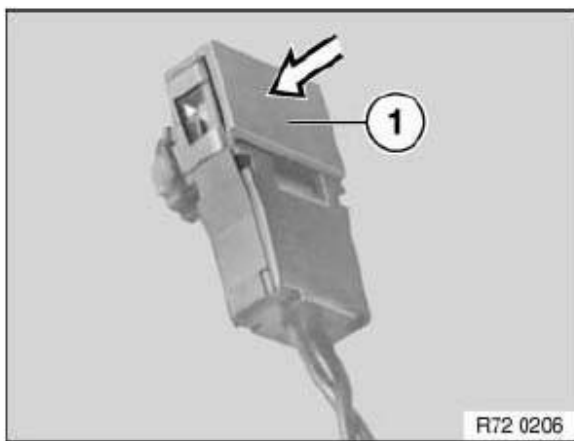


Fig. 24: Pressing Cover Downwards
Courtesy of BMW OF NORTH AMERICA, INC.

Airbag plug connection on gas generator/airbag module is straight (2 versions)

Version 1:

Press locking/unlocking plate (1) at edge (4).

Locking/unlocking plate (1) snaps upwards at opposite edge (3) and releases detent lug (2).

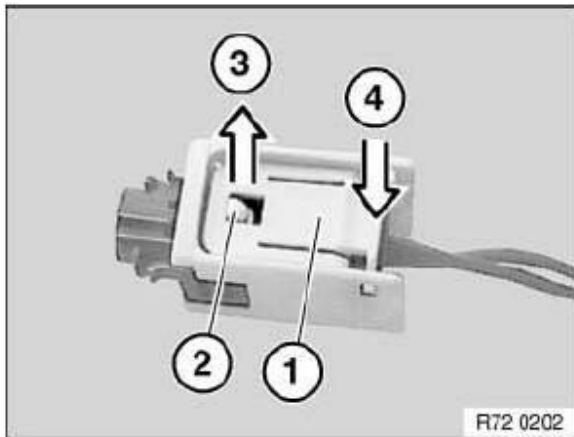


Fig. 25: Pressing Locking/Unlocking Plate At Edge
Courtesy of BMW OF NORTH AMERICA, INC.

The airbag plug connection is unlocked and can now be detached from the gas generator/airbag module.



Fig. 26: Identifying Airbag Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

After attaching airbag plug connection to gas generator/airbag module, check whether detent lug (2) is visible in opening of locking/unlocking plate (1).

Only if the detent lug (2) is visible will the airbag plug connection gas generator/airbag module be correctly engaged.

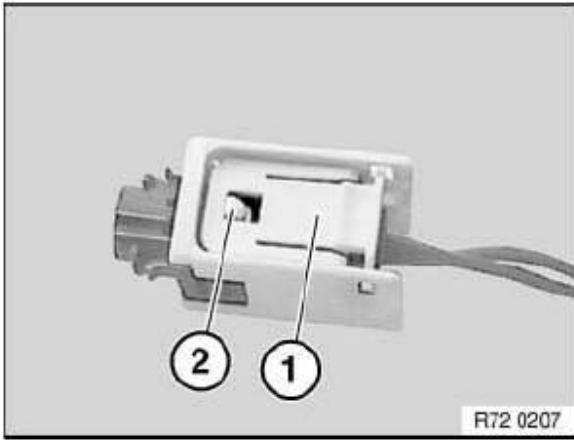


Fig. 27: Identifying Detent Lug And Locking/Unlocking Plate
Courtesy of BMW OF NORTH AMERICA, INC.

Version 2:

Press locking/unlocking plate (1) on edge (3) and pull plug (2) out of plug housing (4).

Installation:

Only if the detent lug is visible in opening (5) will the gas generator/airbag module plug connection be correctly engaged.

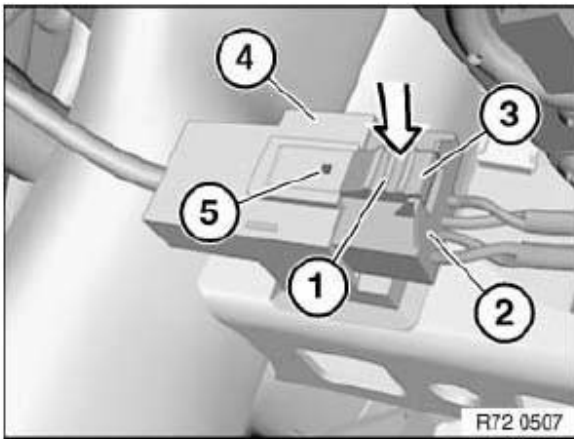


Fig. 28: Pressing Locking/Unlocking Plate On Edge
Courtesy of BMW OF NORTH AMERICA, INC.

Version 3:

Press lock button (1) and pull out plug (2) up to initial engagement position.

Detach plug (2) from firing pellet.

Installation:

Insert plug connection in initial engagement position in gas generator/airbag module and engage in final engagement position.

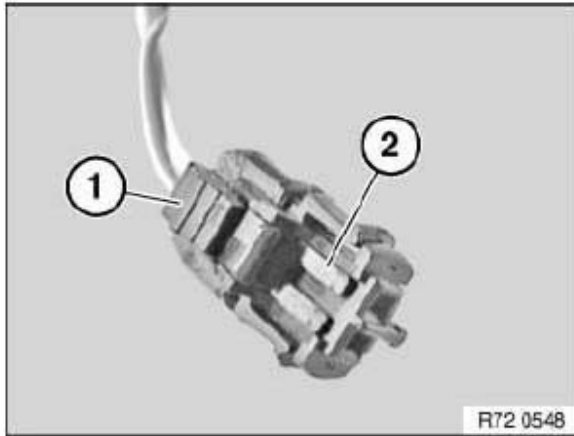


Fig. 29: Identifying Lock Button And Detent Plug
Courtesy of BMW OF NORTH AMERICA, INC.

Illustration of version 3 with gas generator:

- A. Initial engagement position
- B. Final engagement position
- 1. Lock button
- 2. Gas generator

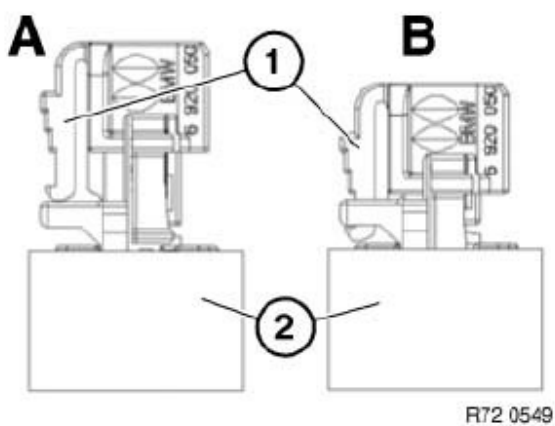


Fig. 30: Identifying Gas Generator With Lock Button
Courtesy of BMW OF NORTH AMERICA, INC.

Version 4 - Crash-active head restraint:

Press locking clip at edge and disconnect plug (1).

Installation:

Check for correct engagement.

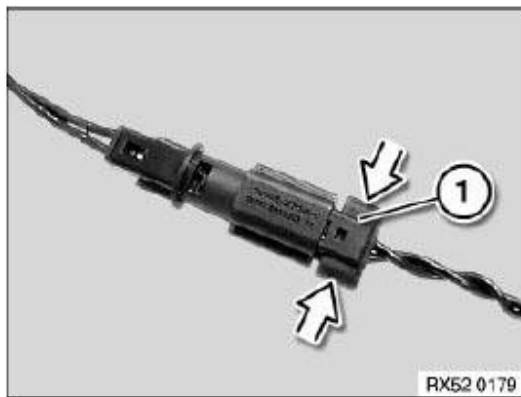


Fig. 31: Pressing Locking Clip At Edge
Courtesy of BMW OF NORTH AMERICA, INC.