Your Measure of Safety

U.S. Department of Transportation

National Highway Traffic Safety Administration



Air Bags and On-Off Switches

Information For an Informed Decision

www.safercar.gov www.nhtsa.gov

Keeping the Benefits for the Many and Reducing the Risks for the Few

DOT HS 811 264

A ir bags are proven, effective safety devices. From their introduction in the late 1980s through November 1, 1997, air bags have saved about 2,620 people. The number of people saved increases each year as air bags become more common on America's roads.

However, the number of lives saved is not the whole story. Air bags are particularly effective in preventing life-threatening and debilitating head and chest injuries. A study of real-world crashes conducted by the National Highway Traffic Safety Administration found that the combination of seat belts and air bags is 75 percent effective in preventing serious head injuries and 66 percent effective in preventing serious chest injuries. That means 75 of every 100 people who would have suffered serious head injuries in crashes, and 66 out of 100 people who would have suffered chest injuries were spared that fate because they wore seat belts and had air bags.

For some people, these life-saving and injury-preventing benefits come at the cost of a less severe injury caused by the air bag itself. Most air bag injuries are minor cuts, bruises, or abrasions and are far less serious than the skull fractures and brain injuries that air bags prevent. However, 87 people have been killed by air bags as of November 1, 1997. These deaths are tragic but rare events -- there have been about 1,800,000 air bag deployments as of that same date.

The one factor that is common to all who died is NOT their height, weight, sex, or age. Rather, it is the fact that they were too close to the air bags when they started to deploy. For some, this occurred because they were sitting too close to the air bags. More often this occurred because they were not restrained by seat belts or child safety seats and were thrown forward during precrash braking.

The vast majority of people can avoid being too close and can minimize the risk of serious air bag injury by making simple changes in behavior. Shorter drivers can adjust their seating position. Front-seat adult passengers can sit a safe distance from their air bags. Infants and children 12 and under should sit in the back seat. And everyone can buckle up. The limited number of people who may not be able to make these changes may benefit from having the opportunity to turn off their air bags when necessary.

Beginning January 19, 1998, consumers could choose to have an on-off switch installed for the air bags in their vehicles if they were, or a user of their vehicle was, in one of the risk groups listed below. The following information provides the facts you need about air bags so you can make the appropriate decision for you and anyone else who is in a risk group.

What is an on-off switch?

An on-off switch allows an air bag to be turned on and off. The on-off switch can be installed for the driver, passenger, or both. To limit misuse, a key must be used to operate the on-off switch. When the air bag is turned off, a light comes on. There is a message on or near the light saying "DRIVER AIR BAG OFF" or "PASSENGER AIR BAG OFF." The air bag will remain off until the key is used to turn it back on.

What steps can you take to reduce air bag risk without buying an on-off switch?

- Always place an infant in a rearfacing infant seat in the back seat.
- Always transport children 1 to 12 years old in the back seat and use appropriate child restraints.
- Always buckle your seat belt.
- Keep 10 inches between the center of the air bag cover and your breastbone.

The vast majority of people don't need an on-off switch. Almost everyone over age 12 is much safer with air bags than without them. This includes short people, tall people, older people, pregnant women — in fact, all people, male or female, who buckle their seat belts and who can sit far enough back from their air bag. Ideally, you should sit with at least 10 inches between the center of your breastbone and the cover of your air bag. The nearer you can come to achieving the 10-inch distance, the lower your risk of being injured by the air bag and the higher your chance of being saved by the air bag. If you can get back almost 10 inches, the air bag will still help you in a crash.

Who should consider installing an on-off switch?

- People who <u>must</u> transport infants riding in rear-facing infant seats in the front passenger seat.
- People who <u>must</u> transport children ages 1 to 12 in the front passenger seat.
- Drivers who <u>cannot</u> change their customary driving position and keep 10 inches between the center of the steering wheel and the center of the breastbone.
- People whose doctors say that, due to their medical condition, the air bag poses a special risk that <u>outweighs</u> the risk of hitting their heads, necks, or chests in crashes if the air bags are turned off.

If you cannot certify that you are, or any user of your vehicle is, in one of these groups, you are not eligible for an onoff switch. Turning off your air bag will not benefit you or the other users of your vehicle. Instead, it will increase the risk that you and the other users will suffer a head, neck or chest injury by violently striking the steering wheel or dashboard in a moderate to severe crash.

Why Some People Are at Risk

How do air bag deaths occur?

Air bags are designed to save lives and prevent injuries by cushioning occupants as they move forward in a front-end crash. By providing a cushion, an air bag keeps the occupant's head, neck, and chest from hitting the steering wheel or dashboard. To perform well, an air bag must deploy quickly and forcefully. The force is greatest in the first 2 to 3 inches after the air bag bursts through its cover and begins to inflate. Those 2 to 3 inches are the "risk zone." The force decreases as the air bag inflates farther.

An occupant who is very close to or on top of the air bag when it begins to inflate can be hit with enough force to suffer serious injury or death. However, an occupant who is properly restrained and sits 10 inches away from the air bag cover will contact the air bag only after it has completely or almost completely inflated. The air bag will then cushion and protect the person from hitting the hard surfaces in the vehicle.

Do children and adults both face risk?

Yes, children and adults face the risk of air bag injury or death if they are positioned too close to the air bags or fail to use proper restraints. As of November 1, 1997, NHTSA has confirmed that 49 young children have died, all on the passenger side. Thirty-eight adults have died—35 drivers and 3 passengers.

What were the specific circumstances of the children's deaths?

Almost all of the 49 children who died were improperly restrained or positioned. Twelve were infants under age 1 who were riding in rear-facing infant seats in front of the passenger air bags. When placed in the front seat, a rear-facing infant seat places an infant's head within a very few inches of the passenger air bag. In this position, an infant is almost certain to be injured if the air bag deploys. Rear-facing infant seats must ALWAYS be placed in the back seat.

The other 37 children ranged in age from 1 to 9; most were 7 or under. Twenty-nine of them were totally unrestrained. This includes 4 children who were sitting on the laps of other occupants. The remaining 8 children included some who were riding with their shoulder belts behind them and some who were wearing lap and shoulder belts, but who also should have been in booster seats because of their small size and weight. Booster seat use could have improved shoulder belt fit and performance. These various factors allowed the 37 children to get too close to the air bags when they began to inflate.

What were the specific circumstances of the adults' fatalities?

Most of the adults who were killed by air bags were not properly restrained. Eighteen of the 35 drivers and 2 of the 3 passengers were totally unbelted. Two of the drivers who were belted had medical conditions that caused them to slump over the steering wheel immediately before the crash. A few of the drivers did not use their seat belts correctly and the others are believed to have been sitting too close to the steering wheels.

Reducing the Risk

What is the safest way to ride in front of an air bag?

First, move the seat back and buckle up every time, every trip. The lap belt needs to fit over your hips, not your abdomen, and the shoulder belt should lie on your chest and over your shoulder. Remove any slack from the belt. In a crash, seat belts stretch and slow down your movement toward the steering wheel or dashboard. Moving back and properly using seat belts give the air bag a chance to inflate before you move forward in a crash far enough to contact the air bag.

How do I best protect children?

Never place a rear-facing infant seat in the front seat if the air bag is turned on. Always secure a rear-facing seat in the back seat. Children 12 and under should ride in the back seat. While almost all of the children killed by air bags were 7 or younger, a few older children have been killed. Accordingly, age 12 is recommended to provide a margin of safety. There are instances when children must sit in the front, because the vehicle has no rear seat, there are too many children for all to ride in the back, or a child has a medical condition that requires monitoring. If children must sit in the font seat, they should use the seat belts and/or child restraint appropriate for their weight or size (see the table at the end of this brochure) and sit against the back of the vehicle seat. The vehicle seat should be moved as far back from the air bag as practical. Make sure the child's shoulder belt stays on. If adult seat belts do not fit properly, use a booster seat. Also, children must never ride on the laps of other passengers.

What should teenagers and adults do to be safest on the passenger side?

Always wear seat belts. This reduces the distance that they can move forward during a crash. Move the seat toward the rear. The distance between a passenger's chest and the dashboard where the air bag is stored is usually more than 10 inches, even with the passenger seat all the way forward. But more distance is safer.

CAUTION

If you allow children to ride in the front seat while unrestrained or improperly restrained, and especially if you sit with a child on your lap, **you are putting them at serious risk, with or without an air bag**. Turning off the air bag is not the safe answer. It would eliminate air bag risk, but not the likelihood that in a crash an unrestrained child would fly through the air and strike the dashboard or windshield, or be crushed by your body.

The On-Off Switch Decision

Vehicle owners and lessees can obtain an on-off switch for one or both of their air bags only if they can certify that they are, or a user of their vehicle is, in one of the four risk groups listed below.

Two risk groups have a high enough risk that they would <u>definitely</u> be better off with an on-off switch:

- Infants in rear-facing infant seats. A rear-facing infant seat must never be placed in the front seat unless the air bag is turned off.
- Drivers or passengers with unusual medical conditions. These are people who have been advised by a physician that an air bag poses a special risk to them because of their condition. However, they should not turn off their air bag unless their physician also has advised them that this risk is greater

than what may happen if they do turn off their air bag. Without an air bag, even a belted occupant could hit his (her) head, neck, or chest in a crash.

Two other risk groups <u>may</u> <u>be</u> better off with an air bag on-off switch:

• **Children 1 to 12.** Children in this age group can be transported safely in the front seat if they are properly belted, they do not lean forward, and their seat is moved all the way back. The vast majority of all fatally injured children in this age range were <u>completely</u> <u>unrestrained</u>. But children sometimes sit or lean far forward and may slip

A national conference of physicians considered all medical conditions commonly cited as possible justifications for turning off air bags. The physicians did not recommend turning off air bags for people with pacemakers, supplemental oxygen, eyeglasses, median sternotomy, angina, chronic obstructive pulmonary disease, emphysema, asthma, breast reconstruction, mastectomy, scoliosis (if the person can be positioned properly), previous back or neck surgery, previous facial reconstructive surgery or facial injury, hyperacusis, tinnitus, advanced age, osteogenesis imperfecta, osteoporosis and arthritis (if the person can sit at a safe distance from the air bag), previous ophthalmologic surgery, Down syndrome and atlantoaxial instability (if the person can reliably sit properly aligned), or pregnancy. The physicians recommended turning off the air bag if a safe sitting distance or position cannot be maintained by a driver because of scoliosis or achondroplasia, or by a passenger because of scoliosis or Down syndrome and atlantoaxial instability. The physicians also noted that a passenger air bag might have to be turned off if an infant or child has a medical condition and must ride in front so that the child can be monitored.

To obtain a copy of the recommendations, go to the NHTSA Web site: **www.safercar.gov.**

Then click on the air bag photo on the left. At the next screen, scroll down and click "Person's Medical Conditions" on the left menu. At the bottom of the next screen, click the link "Download the Full Conference Report in MS Word." out of their shoulder belts, putting themselves at risk. The simple act of leaning far forward to change the radio station can momentarily place even a belted child in danger. If a driver must transport a child in the front seat, the vehicle owner is eligible for an on-off switch for the passenger air bag. Since air bag performance differs from vehicle model to vehicle model, the vehicle owner may wish to consult the vehicle manufacturer for additional advice.

• Drivers who cannot get back 10 inches. Very few drivers are unable to site so their breastbones are 10 inches away from their air bags. If, despite your best efforts, you cannot maintain a distance of 10 inches, you may wish to consult your dealer or vehicle manufacturer for advice or modifications to help you move back.

Since the risk zone is the first 2 to 3 inches from the air bag cover, sitting back 10 inches provides a clear margin of safety. While getting back at least 10 inches is desirable, if you can get back almost 10 inches, the air bag is unlikely to seriously injure you in a crash and you probably don't need an onoff switch. If you cannot get back almost 10 inches from the air bag cover, you may wish to consider an on-off switch. Since air bag performance differs among vehicle models, you may wish to consult your vehicle manufacturer for additional advice.

What if you, or a user of your vehicle is, not in one of the listed risk groups?

You are not at risk and do not need an on-off switch. This includes short people, tall people, older people, pregnant women — in fact, all people, male or female over 12 who buckle the seat belts and who can sit with 10 inches from the center of their breastbones to where the air bags are stored. You will have the full benefit of your air bag and will minimize the risk of violently striking the steering wheel and dashboard in a moderate to severe crash.

How do I get an on-off switch?

If you are eligible, you must fill out a NHTSA request form. Forms are available at State motor vehicle offices and may be available at automobile dealers and repair shops. You may also get one by calling the NHTSA Hotline or visiting the NHTSA Web site. On the form, you must indicate which air bag(s) you want equipped with an on-off switch, certify that you have read this information brochure, certify that you are, or a user of your vehicle is, a member of a risk group listed above, and identify the group. Then send this form to NHTSA. Upon approval of your request, the agency will send you a letter authorizing an automobile dealer or repair shop to install an air bag on-off switch in your vehicle.

Should a pregnant woman get an on-off switch?

NO, not unless she is a member of a risk group. Pregnant women should follow the same advice as other adults: buckle up and stay back from the air bag. The lap belt should be positioned low on the abdomen, below the fetus, with the shoulder belt worn normally. Pull any slack out of the belt. Just as for everyone else, the greatest danger to a pregnant woman comes from slamming her head, neck or chest on the steering wheel in a crash. When crashes occur, the fetus can be injured by striking the lower rim of the steering wheel or from crash forces concentrated in the area where a seat belt crosses the mother's abdomen. By helping to restrain the upper chest, the seat belt will keep a pregnant woman as far as possible from the steering wheel. The air bag will spread out the crash forces that would otherwise be concentrated by the seat belt.

On-Off Switch Precautions

If I turn off my air bag for someone at risk, what precautions should I take for others?

Since the air bag will not automatically turn itself back on after you turn it off with an on-off switch, you must remember to turn it on when someone who is not at risk is sitting in that seat. Every on-off switch has a light to remind you when the air bag is turned off.

If I turn off my air bag, will my seat belts provide enough protection?

Air bags increase the protection you can get from seat belts alone. If the air bag is turned off, you lose this extra protection.

In some newer vehicles, turning off your air bag may have additional consequences. These vehicles have seat belts that were specially designed to work together with air bags. If the crash forces become too great, these new seat belts "give" or yield to avoid concentrating too much force on your chest. The air bag prevents you from moving too far forward after the seat belts give. Without the air bag to cushion this forward movement, the chance of the occupant hitting the vehicle interior is increased. Ask your vehicle manufacturer whether your seat belts were specially designed to work with an air bag. If they were, your dealer or repair shop will provide you information about the effects that turning off your air bag will have on the performance of the belts. Ask your dealer or repair shop to show you this information before you decide whether to have an on-off switch installed.

How Air Bags Work

Air bags are designed to keep your head, neck, and chest from slamming into the dash, steering wheel, or windshield in a front-end crash. They are not designed to inflate in rearend or rollover crashes or in most side crashes. Generally, air bags are designed to deploy in a crash that is equivalent to a vehicle crashing into a solid wall at 8 to 14 miles per hour. Air bags most often deploy when a vehicle collides with another vehicle or with a solid object like a tree.

Air bags inflate when a sensor detects a front-end crash. The sensor sends a signal to start a chemical reaction that inflates the air bag with harmless nitrogen gas. All this happens faster than the blink of an eye. Air bags have vents, so they deflate immediately after cushioning you. They cannot smother you and they don't restrict your movement. The "smoke" you may have seen in a vehicle after an air bag demonstration is the nontoxic starch or talc that is used to lubricate the air bag.

Are all air bags the same?

No. Air bags differ in design and performance. There are differences in the crash speeds that trigger air bag deployment, the speed and force of deployment, the size and shape of air bags, and the manner in which they unfold and inflate. That is why you should contact your vehicle manufacturer if you want specific information about the air bags in your particular vehicle.

See For Yourself

Visit the NHTSA Web site at: **www.safercar.gov** and click on the air bag photo. A video shows how air bags are protecting the properly belted dummies. For more information, call the DOT Vehicle Safety Hotline at: **1-800-424-9393**.



Future Air Bags

Do I need an on-off switch if I buy a vehicle with depowered air bags?

Many manufacturers began installing depowered air bags beginning with their model year 1998 vehicles. They are called "depowered" because they deploy with less force than current air bags. They will reduce the risk of air bag-related injuries. However, even with depowered air bags, rear-facing child seats still should never be placed in the front seat and children are still safest in the back seat. Contact your vehicle manufacturer for further information.

Will on-off switches be necessary in the future?

Manufacturers have developed so-called "smart" or "advanced" air bags that may be able to tailor deployment based on crash severity, occupant size and position, or seat belt use. These bags should eliminate the risks produced by earlier air bag designs.

What Restraint Is Right for Your Child?

Weight or size of your child	Proper type of restraint (Put your child in back seat if possible)
Children less than 20 pounds,* or less than one year	Rear-facing infant seat (secured to the vehicle by the seat belts and/ or LATCH system)
Children from about 20 to 40 pounds,* and at least one year old	Forward-facing child seat (secured to the vehicle by the seat belts and/ or LATCH system)
Children more than 40 pounds*	Booster seat, plus <u>both</u> portions of a lap/ shoulder belt (<i>except only the lap portion</i> <i>is used with some booster seats equipped</i> with front shield)
 Children who meet both criteria below: 1) Their sitting height is high enough so that they can, without the aid of a booster seat, wear the shoulder belt comfortably across their shoulder and secure the lap belt across their pelvis; <u>and</u> 	Both portions of a lap/shoulder belt
 Their legs are long enough to bend over the front of the seat when their backs are against the vehicle seat back 	

*To determine whether a particular restraint is appropriate for your child, see restraint manufacturer's recommendations concerning the weight of children who may safely use the restraint

BUCKLING UP AND GETTING INTO THE CORRECT POSITION

How do I stay safe when I'm driving?

Since the risk zone for driver air bags is the first 2 to 3 inches of inflation, placing yourself 10 inches* from your driver air bag provides you with a clear margin of safety. This distance is measured from the center of the steering wheel to your breastbone. If you now sit less than 10 inches away, you can change your driving position in several ways:

- Move your seat to the rear as far as you can while still reaching the pedals comfortably.
- Slightly recline the back of the seat. Although vehicle designs vary, many drivers can achieve the 10-inch distance, even with the driver seat all the way forward, simply by reclining the back of the seat somewhat. If reclining the back of your seat makes it hard to see the road, raise yourself by using a firm, non-slippery cushion, or raise the seat if your vehicle has that feature.
- If your steering wheel is adjustable, tilt it downward. This points the air bag toward your chest instead of your he**ad and neck**.

*See the title page of this brochure for a 10-inch ruler. Place the 10-inch ruler between your breastbone and the center of the air bag cover to check your distance.

Remember to:



Use Seat Belts



Move Seat Rearward

Are air bags the reason the back seat is the safest place for children?

NO The back seat has always been safer, even before there were air bags. NHTSA conducted a study of children who died in crashes in the front and back seats of vehicles, very few of which had passenger air bags. The study concluded that placing children in the back reduces the risk of death in a crash by 27 percent, whether or not a child is restrained.

Remember to:



Recline Back of Seat

Tilt Wheel Down

Wrong: Unbelted and too close



Correct: Belted and 10 inches or more away



Will following these safety tips guarantee that I will be safe in a crash?

There is no guarantee of safety in a crash, with or without an air bag. However, most of the people killed by air bags would not have been seriously injured if they had followed these safety tips.



U.S. Department of Transportation

National Highway Traffic Safety Administration 1200 New Jersey Avenue SE. NPO-411 (W-51) Washington, DC 20590

Official Business Penalty for Private Use \$300

Your Measure of Safety

This brochure is 10 inches tall. Place it between your breastbone and the air bag cover to check your distance.



Request for Air Bag On-Off Switch

Vehicle Owner or Lessee Instructions: Read the National Highway Traffic Safety Administration (NHTSA) information brochure, *Air Bags & On-Off Switches: Information for an Informed Decision.* If you want authorization for your driver air bag, passenger air bag, or both, fill out Parts A, B, E, and F completely, fill out Parts C and D as appropriate, and send this form to:

National Highway Traffic Safety Administration Attention: Air Bag Switch Requests (W-51) 1200 New Jersey Avenue SE. Washington, DC 20590-1000 For faster response due to mail delays throughout the government sector, fax request to:

FAX: 202-493-2833

- Please print.
- <u>Please note</u>: Incomplete forms will be returned to the owner or lessee.
- If you need a copy of the brochure or have any questions about how to fill out this form, call the NHTSA Hotline at 1-888-DASH-2-DOT (1-888-327-4236).

Part A. Name and Address	Telephone							
First	Middle		Last					
Street Address (Residence)	I	City		State	ZIP Code			

Part B. I own or lease the following vehicle (owners of multiple vehicles should consult the

additional instructions at the end of this form):

Make			Vehicle Identification Number17 digits (located on driver's side of dashboard near windshield and on certification label on driver's door frame)															
Model	Model Year																	

Part C. Switch for Driver Air Bag

I request authorization for the installation of an on-off switch for the driver air bag in my vehicle. I certify that I or another driver of my vehicle meets the criteria for the risk group checked below. (At least one box must be checked.)

Medical condition. The driver has a medical condition which, according to his or her physician:
 Causes the driver air bag to pose a special risk for the driver; and Makes the potential harm from the driver air bag in a crash greater than the potential harm from turning off that air bag and allowing the driver, even if belted, to hit the steering wheel, dashboard, or windshield in a crash.
Distance from driver air bag. Despite taking all reasonable steps to move back from the driver air bag, the driver is not able to maintain a 10-inch distance from the center of his or her breastbone to the center of the driver air bag cover.

Part D. Switch for Passenger Air Bag

I request authorization for the installation of an on-off switch for the passenger air bag in my vehicle. I certify that I or another passenger in my vehicle meets the criteria for the risk group checked below. (At least one box must be checked.)

Infant. I transport an infant (less than 1 year old) who must ride in the front seat because:
 My vehicle has no rear seat; My vehicle has a rear seat too small to accommodate a rear-facing infant seat; or The infant has a medical condition which, according to the infant's physician, makes it necessary for the infant to ride in the front seat so that the driver can constantly monitor the child's condition.
Child age 1 to 12. A child age 1 to 12 must ride in the front seat because:
 My vehicle has no rear seat; Although children ages 1 to 12 ride in the rear seat(s) whenever possible, children ages 1 to 12 sometimes must ride in the front because no space is available in the rear seat(s) of my vehicle; or The child has a medical condition which, according to the child's physician, makes it necessary for the child to ride in the front seat so that the driver can constantly monitor the child's condition.
Medical condition. A passenger has a medical condition which, according to his or her physician:
 Causes the passenger air bag to pose a special risk for the passenger; and Makes the potential harm from the passenger air bag in a crash greater than the potential harm from turning off that air bag and allowing the passenger, even if belted, to hit the dashboard, or windshield in a crash.

Part E. I make this request based on the following certification and understandings (check **each** box below after reading carefully):

Information brochure. I certify that I have read the NHTSA information brochure, <i>Air Bags & On-Off Switches: Information for an Informed Decision.</i> I understand that air bags should be turned off only for people at risk and turned back on for people not at risk.
Loss of air bag protection. I understand that turning off an air bag may have serious safety consequences. When an air bag is off, even belted people may hit their head, neck, or chest on the steering wheel, dashboard, or windshield in a moderate to serious crash. That possibility may be increased in some newer vehicles with seat belts that are specially designed to work with the air bag. Those belts, which are designed to reduce the concentration of crash forces on any single part of the body, typically allow the occupant to move farther forward in a crash than older belts. Without the air bag to cushion this forward movement, the chance of the occupant hitting the vehicle interior is increased.
Waiver. I understand that motor vehicle dealers and repair businesses may require me to sign a waiver of liability before they install an on-off switch.

Part F. Certification

I certify to the U.S. Department of Transportation that the information, certifications, and understandings given or indicated by me on this form are truthful, correct, and complete to the best of my knowledge and belief. I recognize that the statements I have made on this form concern a matter within the jurisdiction of a department of the United States and that making a false, fictitious, or fraudulent statement may render me subject to criminal prosecution under Title 18, United States Code, Section 1001.

Date	Signature of owner/lessee

Additional instructions and information for vehicle owners and lessees: An owner or lessee of multiple vehicles (e.g., a fleet owner) who wants an on-off switch for the same air bag (e.g., just the passenger air bag) in more than one vehicle and for the same reason does not need to submit a separate form for each vehicle. Instead, the owner or lessee may list the make, model, model year, and vehicle identification number for each of those vehicles and attach the list to a copy of this form. Each page of the list must be signed and dated by the owner or lessee. A list may also be attached to a single copy of this form if the owner or lessee wishes to request authorization for on-off switches for both air bags in multiple vehicles.

Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. That number appears above.