

tensioners

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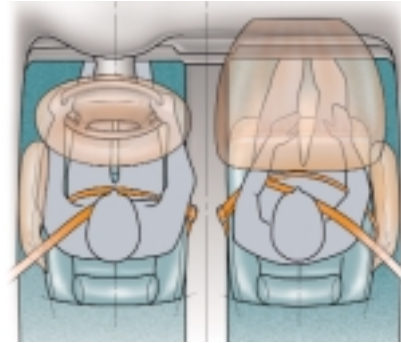
seat belts

UNDERSTANDING  
YOUR CAR'S SAFETY  
FEATURES

THE INFORMATION IN THIS BOOKLET IS INTENDED TO BE SUPPLEMENTARY TO THAT PROVIDED IN THE OWNER'S MANUAL. IT WAS PREPARED TO ANSWER YOUR QUESTIONS ABOUT AIRBAGS AND OTHER SAFETY EQUIPMENT IN YOUR CAR.

PLEASE TAKE A FEW MOMENTS TO READ IT, BECAUSE WE BELIEVE THE MORE YOU KNOW ABOUT HOW YOUR SAFETY EQUIPMENT WORKS, THE SAFER YOU AND YOUR PASSENGERS WILL BE.

## WHAT ARE YOUR RISKS?



Front airbags help protect both front-seat occupants in a frontal collision, while side airbags help protect either the driver or the front passenger in a side impact.

**d**id you know that, in Canada alone, someone is injured in an auto accident every 2.3 minutes? \*

While some accidents can't be avoided, you can greatly reduce your chance of being injured in an accident by always wearing a seat belt.

A properly worn seat belt is your first line of defense in all types of collisions, including front, side and rear impacts, and rollovers.

Airbags can also contribute to your safety. As part of your vehicle's occupant protection system, airbags are designed to work with, not replace, seat belts. So even with airbags, be sure you and everyone else in your car always buckle up.

## HOW A CAR IS DESIGNED TO PROTECT YOU IN A CRASH



A car's strong metal framework forms a "safety cage" around the passenger compartment.



Crush zones are designed to crumple and absorb energy in a frontal or rear-end collision.



Seat belts help restrain occupants and keep them in position in a crash.



Front airbags provide extra protection for front-seat occupants' heads and chests.



A collapsible steering column, smooth or recessed controls, and energy-absorbing materials help reduce crash injuries.



Side airbags provide a cushion to help protect the driver's or front passenger's upper torso.



To help automobile occupants survive the tremendous forces of a crash, vehicle designers have developed numerous safety features.

Built-in safety features include a strong metal framework that forms a "safety cage" around the occupants; front and rear "crush zones," which help absorb crash energy; a collapsible steering column, which can reduce driver injuries; and energy-absorbing materials throughout the passenger compartment.

Seat belts have proven to be the single most effective device in reducing crash injuries and fatalities. When properly worn, seat belts help keep you from striking interior parts of the car. They also keep you connected to the car so you can take advantage of the car's built-in energy absorption, and so you will not be ejected during a collision.

Some cars also have seat belt tensioners that automatically tighten the front seat belts to further restrain occupants in a moderate-to-severe frontal collision.

Front airbags, which are part of your car's Supplemental Restraint System (SRS), are designed to help protect front-seat occupants' heads and chests in frontal collisions. And some car models now also have side airbags for added upper-torso protection during a side impact.

HOW YOU CAN BE HURT  
IN A FRONTAL CRASH



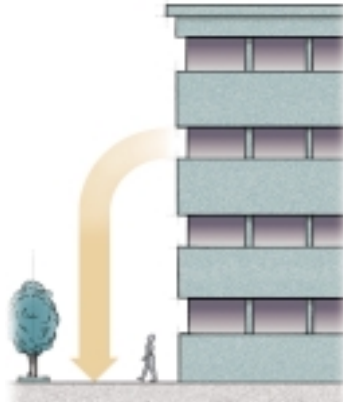
In a 48 kph head-on crash into a barrier, a car stops in about 1/10th of a second — less than the blink of an eye. What happens to an occupant during this time?



Without a seat belt or an airbag, the occupant will continue forward at 48 kph until they strike the car's interior, and potentially suffer very serious injuries.



However, if the occupant is wearing a seat belt, the belt will restrain them and reduce the chance of injury. A front airbag can further reduce the risk of injury to their head and chest.



If a car crashes head-on into a solid barrier at 48 kph, an unbelted occupant without an airbag will strike the interior of the car with a force equal to falling out of a third-story window onto pavement.



If your car collides head-on with a solid barrier at 48 kph, it will come to a stop almost instantly. Since you and any passengers you are carrying are moving as fast as the car, you will continue forward at 48 kph until you are stopped by something.

If you are not stopped by a seat belt or an airbag, you will strike the interior of the car with a force equivalent to falling out of a third-story window and landing face-first on pavement. However, if you are wearing a seat belt and your front airbag deploys, the belt will restrain you and reduce the chance of injury, and the airbag will provide additional protection for your head and chest.

HOW FRONT AIRBAGS  
HELP PROTECT YOU



When sensors detect a moderate-to-severe frontal impact, the airbags instantly inflate to help protect the heads and chests of front-seat occupants.



After inflating, the airbags immediately deflate so they won't interfere with the driver's visibility or ability to steer or operate other controls.





When a car with front airbags is in a frontal collision, sensors detect the crash and assess its severity.

If the sensors detect a rate of deceleration that is high enough to cause severe injuries, they signal the control unit to instantly inflate the airbags.

While your seat belt helps restrain your torso and slow down your forward movement, the airbag supplements

your seat belt in two ways: It helps further restrain your upper body and slow you down, and it provides a cushion between your head and chest and interior vehicle parts.

After inflating, the airbags immediately deflate. The entire process takes place in a fraction of a second — so fast that many people involved in frontal collisions say they did not realize their airbag had deployed until they saw the deflated bag lying in front of them.

## DUAL-THRESHOLD & DUAL-STAGE FRONT AIRBAGS



As you know, car safety equipment is continually being refined to improve occupant protection.

Two airbag refinements that have been introduced recently are dual-stage and dual-threshold front airbags. Both are intended to help reduce the chance of airbag-caused injuries in low-speed collisions.

**Dual-threshold airbags** have two deployment thresholds: One for a belted occupant and the other for an unbelted occupant.

If the occupant's seat belt is *not* latched, the airbag will deploy at the same threshold (or level of crash severity) as a conventional airbag.

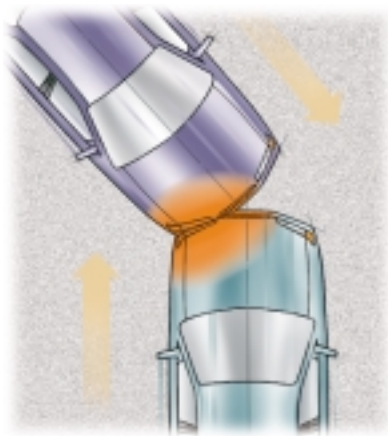
But if the seat belt *is latched* — as it should be — the airbag will deploy at a slightly higher threshold because, in this situation, the seat belt will provide adequate protection and the airbag would not add any extra help.

**Dual-stage airbags** have inflators with two stages that can be ignited separately or together, depending on crash severity.

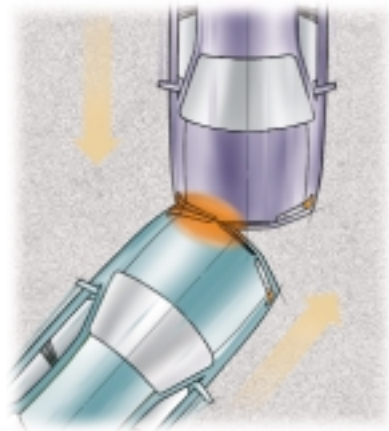
In a more severe crash, both stages will ignite together. The airbag will inflate rapidly to provide immediate protection, and the inflation force will be the same as with a conventional airbag.

In a less severe crash, one stage will ignite first, then the second will ignite a split-second later. As a result, the airbag provides protection for a somewhat longer time and with a little less inflation force.

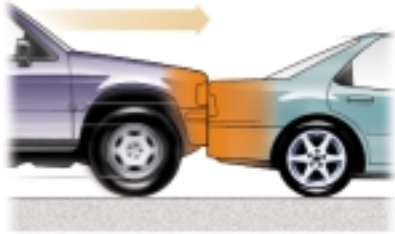
WHEN FRONT AIRBAGS  
CAN AND CANNOT HELP



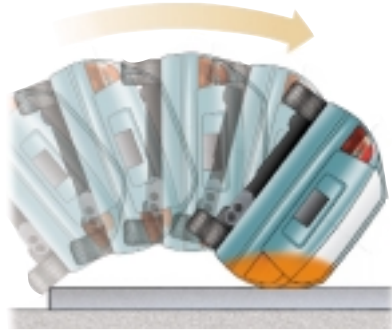
Front airbags can be helpful in a moderate-to-severe frontal collision with another vehicle or a stationary object.



But airbags are not designed to inflate in a minor frontal collision because seat belts and the car's built-in occupant protection features offer adequate protection.



Front airbags also cannot be helpful, and are not designed to inflate, if your car is hit in the rear.



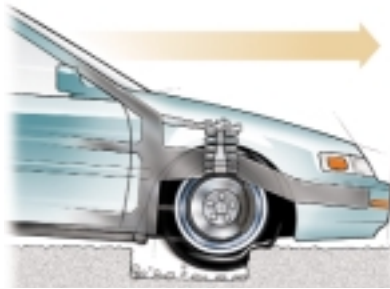
Front airbags usually cannot be helpful and they rarely deploy in rollovers.



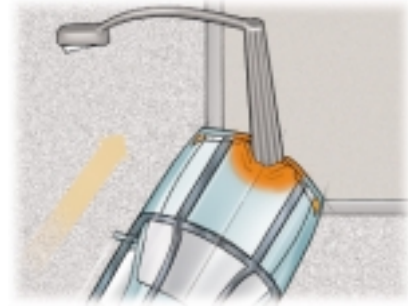
Front airbags have a simple but very important role to play in occupant protection: To help protect the heads and chests of the driver and a front-seat passenger in a moderate-to-severe frontal collision.

However, frontal airbags cannot be helpful in any other type of collision, including minor frontal impacts, side and rear impacts, or rollovers. If the airbags deployed in one of these situations, they would only cause additional replacement expense, and they may even cause additional injuries.

## SPECIAL IMPACT SITUATIONS



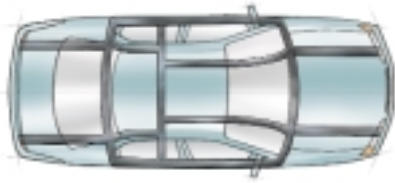
If a wheel drops into a deep pothole, or you strike a hard, raised object such as a curb or speed bump, a brief high rate of deceleration may cause the front airbags to deploy.



Crashing head-on into a pole or tree is less likely to cause airbag deployment than if you strike the object off-center near the car's strong metal framework.



When a car underrides another vehicle at relatively low speed, the impact usually involves only crushable body parts, and the front airbags rarely deploy.



The framework of a passenger vehicle is made of strong, rigid metal to provide a “safety cage” around the occupants and a sturdy platform for the drive train and other components. Frontal collisions involving rigid parts can produce high rates of deceleration and front airbag deployment.



You should be aware of three special situations in which your front airbags might or might not inflate: Hitting a pothole or a raised object, crashing into a pole or tree, and underriding another vehicle.

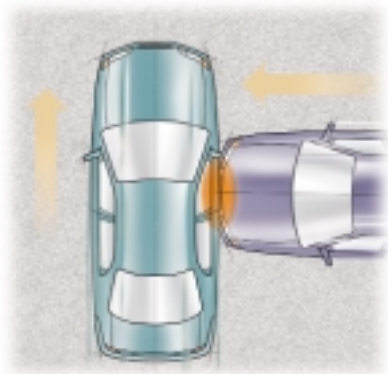
To understand why front airbags deploy in some situations and not in others, it helps to know more about the structure of a car.

Generally speaking, cars have hard, rigid structural parts which are surrounded by relatively soft, crushable parts, such as the bumper, fenders, hood and radiator.

When a frontal impact is limited to crushable parts, the rate of deceleration is usually too low to cause front-airbag deployment.

However, when an impact involves harder structural parts, the rate of deceleration is more likely to be high enough for the airbags to deploy.

## HOW SIDE AIRBAGS HELP PROTECT YOU

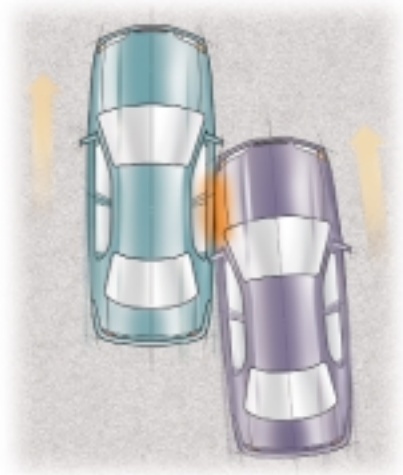


If your car has side airbags, and it is struck in the driver's or front passenger's side, sensors will detect the impact and assess its severity.



If the impact is moderate-to-severe, the side airbag on the impact side will inflate from the outer seat-back bolster to help protect the occupant's upper torso.





A sideswipe may result in extensive vehicle damage, but impact forces are usually not large enough for a side airbag to be helpful.



To help reduce the severity of upper-torso injuries to front-seat occupants during a side impact, some cars have side airbags as well as front airbags.

If your car is equipped with side airbags, and it is struck in the side with enough force, the driver's or front passenger's side airbag will instantly inflate, providing a cushion between the occupant and the impact.

Of course, side airbags are designed to inflate only when they can be helpful, and to not inflate when they cannot help. For example, a side airbag is not likely to inflate during a sideswipe, but one or both side airbags could inflate during a rollover.

## SIDE AIRBAG CUT-OFF SYSTEM



If sensors detect that the front passenger is a child or small adult, and the passenger has leaned into the side airbag's deployment path, the airbag will automatically turn off.

**SIDE  
AIRBAG**

**SIDE  
AIRBAG  
OFF**

When a side airbag is turned off, one of the instrument panel lights above will come on to alert you. Soon after the passenger sits up straight again, the light will go out and the airbag will automatically turn back on.



Although children should be properly restrained in a back seat whenever possible, in case a child must ride in front, the passenger's side airbag has a unique cut-off system. This system is designed to shut off the airbag if a child leans sideways and the child's head is in the airbag's deployment path.

How does the cut-off system work?

The front passenger's seat-back contains several rows of height sensors that can determine the occupant's height. The seat also has an occupant position sensor in the outer seat-back bolster.

If the sensors determine that the passenger is a child or a small adult, and the passenger has leaned into the side airbag's deployment path, the airbag will automatically be turned off. (The airbag may also shut off if a larger adult slouches and leans into the deployment path.)

If your passenger's side airbag is ever automatically turned off, a light on the instrument panel (saying either "Side Airbag" or "Side Airbag Off") will come on. This does not mean something is wrong. Only that you should ask your passenger to sit up properly so the side airbag can protect them if needed.

A few seconds after the passenger sits upright again, the airbag will automatically turn back on and the light on the instrument panel will go off.

## HOW TO PROTECT YOURSELF



Wearing a seat belt, and sitting upright, at least 25 cm (10 inches) back from the steering wheel or dashboard, reduces the chance of injuries caused by an inflating front or side airbag.



ou can get  
the maximum

protection offered by airbags  
by following a few simple rules.

First, always wear a seat belt. A seat belt is your best protection in any accident. A properly worn seat belt will also help keep front-seat occupants in a good position should the front airbags ever deploy.

To wear a seat belt properly, sit up, well back in your seat, with the lap portion of the belt pulled snugly across your hips and the shoulder portion resting against your chest and shoulder.

Before you drive away, it's very important to move the driver's seat as far back as you can while still allowing good control of the vehicle. (The National Highway Traffic Safety Administration and Transport Canada recommend at least 25 cm /10 inches between the centre of the steering wheel and your chest.)

If you have a front passenger, ask them to move their seat as far back as possible. Why?

To do their job, front airbags inflate with tremendous force. So while airbags can save your life and reduce the severity of injuries, they can also cause abrasions and bruises. And if you sit too close, or don't wear a seat belt, or don't sit in a proper position, an inflating front airbag can cause broken bones or more serious injuries.

Wearing a seat belt and sitting up properly will also help you and a front passenger get the most benefit from side airbags. Since the airbags must inflate with considerable force to be effective, sitting up straight and not leaning into the side airbag's deployment path reduces the possibility of being injured by the airbag in a side impact.

## HOW TO PROTECT CHILD PASSENGERS



To avoid the possibility of an infant being seriously injured or killed by an inflating front airbag, a rear-facing child seat should always be secured in the back seat, never in the front.



Toddlers and larger children are also safer when they are properly restrained in a back seat.



he National  
Highway Traffic

Safety Administration and  
Transport Canada both  
recommend that children age  
12 or under always ride in a  
back seat, not in the front.

One reason is that the  
passenger's front airbag can  
pose risks to infants and children.  
As a result, we urge you to follow  
these rules:

**Infants:** Never put a rear-facing child seat in the front seat of a car with front airbags. If the passenger's airbag inflates, it can hit the back of the child seat with enough force to kill or severely injure an infant.

**Toddlers:** Placing a forward-facing child seat in the front seat of an airbag-equipped car can also be hazardous. If the vehicle seat is too far forward, or the child's head is thrown forward during a collision, an inflating airbag can strike the child and possibly cause serious or fatal injuries.

If a toddler absolutely must ride in the front, move the vehicle seat as far to the rear as possible, secure the child seat to the vehicle, and strap the child in the child seat according to the child seat maker's instructions.

**Larger children:** A child who has outgrown child seats and boosters should also ride in back and wear a lap/shoulder belt. If the child slouches, scoots forward, leans forward or sideways, or puts the shoulder part of the belt behind their back, their chance of being injured in any kind of crash is greatly increased. A child who is out of position in the front seat could be seriously or fatally struck by an inflating front airbag.

The side airbag can also pose risks to larger children. If a child puts his arm or shoulder in the airbag's deployment path, the child could receive serious injuries if the airbag inflates.

If a larger child must sit in front, move the vehicle seat as far back as possible, ask the child to sit up straight, and make sure their seat belt is properly and securely fastened.

QUESTIONS ABOUT  
AIRBAGS AND OTHER  
SAFETY EQUIPMENT



**If an automobile appears badly damaged after a crash, does this mean that the front airbags or a side airbag should have deployed?**

Not necessarily. It is extremely difficult to accurately determine whether or not the front airbags or a side airbag should have deployed based only on visual damage.

After a frontal crash, extensive damage to crushable body parts often indicates that the car absorbed crash energy and reduced the rate of deceleration to a level where the front airbags would not have been needed or helpful.

Side impacts, particularly when both vehicles are moving in the same direction, can result in widespread superficial damage without triggering side-airbag deployment.





### Can airbags prevent all collision injuries?

Unfortunately, no safety system can provide complete protection.

Front airbags are designed to help save your life and reduce the severity of injuries to your head and chest during a frontal collision. Similarly, side airbags are designed to help reduce the severity of injuries to your upper torso during a side impact. But airbags cannot prevent all injuries.

In fact, contacting an inflating airbag can result in abrasions or bruises. Depending on the angle of impact and other factors, you can also get bumps, cuts or even broken bones from striking windows or other vehicle parts.

Of course, very severe collisions can cause more serious injuries, including fatal injuries — even when seat belts are properly worn and your airbags work as designed.



### After an airbag deploys, there is some smoke in the air. Is this harmful?

The “smoke” you may see is actually a powder from the surface of the airbag. Although the powder does not contain corn starch and is not harmful to most people, those with breathing problems may experience some difficulty breathing. If this is the case, get out of the car, or open the windows or doors, as soon as it is safe to do so.



**Is it possible for only one front airbag to deploy?**

In cars with conventional airbags, both airbags usually inflate at the same time. However, if a frontal collision is at the margin, or threshold, that determines whether or not the airbags will deploy, it is possible for only one airbag to deploy.

Single-airbag deployment can also occur in cars equipped with dual-threshold airbags, **if one front-seat occupant is wearing a seat belt and the other is not.**



**Will the front passenger's side airbag inflate if no one is sitting in the seat?**

Yes. If a side impact is severe enough, the passenger's side airbag will inflate, even if no passenger is riding in the front.



**Can both side airbags inflate at the same time?**

Normally, only the airbag on the side of the impact will inflate. However, both airbags might inflate if the car is struck on both sides during a multiple-car collision.



**Can the seat belt tensioners ever be activated by themselves, or are they activated only when the front airbags deploy?**

Front seat belt tensioners are designed to always deploy when the front airbags deploy. However, in some models the tensioners can be activated during a collision when the airbags would not be needed but when additional seat-belt tension can be helpful.

THIS BROCHURE INCLUDES BOTH GENERAL INFORMATION ABOUT  
OCCUPANT SAFETY AND MORE SPECIFIC INFORMATION ABOUT NEWER  
EQUIPMENT THAT MAY OR MAY NOT APPLY TO A GIVEN VEHICLE MAKE,  
YEAR, MODEL OR SEATING POSITION.