

MODULE 5 • Air Bags

Module Agenda: 30 Minutes

Topic	Suggested Timing
1. Introduction	2
2. Purpose and Function of Air Bags	2
3. Air Bags for Frontal Impacts	6
4. Air Bags for Side Impact	4
5. Inflatable Seat Belts	2
6. Practice Activity: Locate Front and Side Air Bag Information in Owner's Manuals & Vehicles	10
7. Best Practices on Air Bags for Caregivers	2
8. Progress Check and Summary	2
TOTAL	30 Minutes

Module Purpose

The purpose of this module is to explore various aspects of air bags including types and locations in the vehicle, when and how they function, and related warnings and markings. Emphasis is placed on front passenger air bag systems and how they work with car seats and booster seats.

Module Objectives

- Describe the purpose and function of air bags.
- Identify features, warnings, and markings related to air bags for frontal and side impacts.
- Identify features of inflatable seat belts.
- Locate air bag information in owner's manuals and vehicles.
- Explain best practices about air bags to caregivers.

Special Media, Materials, and Resources

- Owner's manuals from participant vehicles, including sections for front passenger air bags
- Additional owner's manuals available for use on the NCPSB website at www.cpsboard.org to ensure all types of passenger air bags are represented in the practice activity.
- Vehicles

Video Titles and Times

None

Activities

- Practice Activity: Locate Front and Side Air Bag Information in Owner's Manuals and Vehicles
- Progress Check: Explain Best Practices About Air Bags to Caregivers
- Final Progress Check

Preparation

- Remember to define terms and concepts, check for understanding, and encourage questions from participants.
- Prepare to conduct the activity and progress checks.
- Ask that participants bring their vehicle owner's manuals to class. (Instructors should label the manuals to encourage their return.) You can also download and use additional owner's manuals available on the NCPSTB website for the first practice activity.
- Review and be familiar with the information provided in the sample owner's manuals for the front air and side air bag identification activity.
- Make arrangements in advance to have a variety of vehicles with different types of air bag systems and owner's manuals. The activity is conducted outside with vehicles.
- Instructors and Technician Assistants should review all vehicle air bag systems, including the location of warnings and markings, in all available vehicles prior to this module.

1. Introduction



Display PPT 5-1.



Present module purpose.

We need to understand occupant protection systems and air bags before learning about car seats and booster seats.

- The purpose of this module is to explore various aspects of air bags including types and locations in the vehicle, when and how they function, and related warnings and markings.
- Emphasis is placed on front passenger air bag systems and how they work with car seats and booster seats.



Display PPT 5-2.



Present module objectives.

As a result of this module, you will be able to:

- Describe the purpose and function of air bags.
- Identify features, warnings, and markings related to air bags for frontal and side impacts.
- Identify features of inflatable seat belts.
- Locate air bag information in owner's manuals and vehicles.
- Explain best practices about air bags to caregivers.



Reference TG page 5-1.



Present definition and examples of automatic crash protection.

This module focuses on **automatic crash protection** systems that do **NOT** require an occupant to take any action to be protected.

- Automatic crash protection includes many safety features that are built into the vehicle that do **NOT** require occupants to do anything to be protected. In other words, **NO** occupant action is required.
- Many people are unaware of the automatic systems in a vehicle, particularly all of the air bags that are designed to protect them in a crash.
- Examples of automatic protection systems are laminated windshields, instrument panel padding, door trim padding, and air bags that open (deploy) when the vehicle determines there has been a crash.

[INSTRUCTOR NOTE]

[Remind participants they will be helping caregivers find air bags in their vehicles.]

2. Purpose and Function of Air Bags



Reference TG
page 5-1.



Display PPT 5-3.



Present definition, considerations, and guidelines about air bags.

What is an air bag?

- An **air bag** is a vehicle safety device made up of a flexible fabric envelope designed to rapidly deploy (open) when the vehicle determines there has been a crash.
- The purpose of an air bag is to reduce the occupant's speed during a collision and reduce the possibility of injury.

Air bags can be:

- Found in most vehicles on the road today. Every vehicle should be checked for air bags. The owner's manual should be reviewed for locations and specific instructions for the air bags in that vehicle.
- Almost anywhere in a vehicle. Proper positioning and use of car seats, booster seats, and seat belts are needed to prevent injury when a crash occurs and an air bag suddenly opens.



Display PPT 5-4.



Review how air bags work.

An air bag can only deploy once and **MUST** be replaced after a crash.

Using the air bag with the seat belt allows the crash forces to spread over a large part of the occupant's body instead of concentrating the crash forces on a smaller part of the body.

- Air bags do **NOT** deploy in every crash.

- Seat belts also provide protection in crashes that do **NOT** deploy air bags, such as rear impacts, some rollovers, sudden stops, or less severe crashes. Use your seat belt whether or not there is an active air bag.

Important considerations related to air bags include to:

- Never put a rear-facing car seat in front of an active frontal air bag.
- Avoid leaning against an air bag's opening or putting other objects in front of an air bag's opening.
- Always sit in an upright position, correctly buckled into the seat belt.
- Read the owner's manual carefully. It has information about air bags and instructions for their use.
- Assume all air bags are fully active unless the owner's manual says differently.

[INSTRUCTOR NOTE]

[Be sure to point out labels in vehicles and instructions in owner's manuals that show air bag information, location, and warnings during the upcoming sections. Each vehicle manufacturer places labels in different positions and may call their air bag systems something different.]

3. Air Bags for Frontal Impacts



Reference TG
page 5-2.



Display PPT 5-5.



Describe air bags for frontal impacts.

First, let's look at the types of air bags for crashes that occur in the front of the vehicle.

- The driver and front passenger air bags offer powerful protection to front seat occupants who are correctly seated and restrained.
- Frontal crash air bags work with seat belts to protect front seat occupants. The air bags add extra protection to the adult head and chest in a crash.

There are several kinds of air bags for frontal crashes:

- Driver air bags are found in the steering wheel.
- Front seat passenger air bags are found in the instrument panel, over the glove box. While some passenger air bags cover both the middle and right front passenger seating positions, others only cover the right front seating position.
- Knee air bags may be present in the vehicle.



Reference TG
page 5-3.



Display PPT 5-6.



Introduce three types of passenger air bags that deploy in front crashes.

Passenger air bags can be classified as one of three types:

1. Air bags that are always on or active in the vehicle.
2. Air bags that can be turned on and off using a manual switch.
3. Air bags that are automatically turned on and off by the vehicle based on the occupant seated in the front passenger seat.

For the purposes of installing a car seat or booster seat, the important distinction is whether the air bag will always be **OFF** in the presence of seat.

[INSTRUCTOR NOTE]

[These types of air bags will **NOT** be referred to as “Advanced Air Bags.” Also, automatic on/off systems will **NOT** be referred to as “Suppression” systems.]



Display PPT 5-7.



Describe best practices for air bags always on or active.

Many vehicles, especially those made before the 2004 model year, have passenger air bags that are always on or active in the vehicle. The passenger air bag in these vehicles **CANNOT** be turned off in the presence of a car seat or booster seat. In such vehicles, the following best practices apply.

- **NEVER** place a rear-facing car seat in the front passenger seat. If the passenger air bag deploys in a crash, the child may be severely injured or killed by the force of the air bag.

- If a forward-facing child must sit in the front passenger seat, move the vehicle seat as far back from the air bag as possible and make sure the child is seated in an appropriate car seat or booster seat. Instruct the child **NOT** to lean forward in the seat toward the air bag.
- Statistics show that children are safer in the rear seat. It is strongly recommended that all children under 13 travel in the rear seat (AAP, 2007).



Reference TG
page 5-4.



Display PPT 5-8.



Describe best practices for air bags turned on and off using a manual switch.

Some vehicles, especially those without a back seat such as some pickup trucks, or with a very small back seat, may be equipped with a manual switch to turn the passenger air bag on and off. In these vehicles, the following best practices apply.

- Caregivers must check the owner's manual to understand the proper operation of the on/off switch in their vehicle. Most are operated by the vehicle's ignition key.
- If a forward-facing child must sit in the front passenger seat, the switch must be in the "off" position. A light near the on/off switch will be lit whenever the passenger air bag has been turned off.

Forgetting to turn the switch back "on" for adult passengers is a common error made by drivers of these vehicles.



Display PPT 5-9.



Describe best practices for air bags that automatically turn on and off with an occupant in front passenger seat.

Since the 2004 model year, most vehicles have been equipped with systems that automatically turn the passenger air bag on and off. Vehicle manufacturers use a variety of methods to detect the front occupant, but the following best practices apply for every vehicle with an automatic on/off system.

- Caregivers need to understand the specific systems and indicators installed in their vehicle. Remind them to check their owner's manual.

- Caregivers should always assume the air bag is “on” if they are not sure. **NEVER** place a rear-facing car seat in a seating position with an active front air bag unless the vehicle owner’s manual allows it.



Display PPT 5-10.

Since not all vehicles have the same system, it is important that the caregiver understands what the indicators in their vehicle mean.

- Caregivers must ensure that the air bag is “off” for the child sizes and conditions listed in the owner’s manual. For all other occupants, the air bag should be turned “on.”
- Just because a vehicle is new, do **NOT** assume the passenger air bag will have an automatic on/off system. Some newer vehicles have air bags that are always “on,” just like in older vehicles.
- Automatic on/off systems can misclassify occupants in the front seat under certain conditions – carefully check all warnings in the owner’s manual.



Reference TG page 5-4.



Display PPT 5-11.



Describe location of warnings and markings for air bags that deploy in front crashes.

It is important to be knowledgeable about the typical locations of air bag warnings and markings in the vehicle.

- For air bags that deploy in frontal crashes, the warning label will always be located on the sun visor and you will typically find additional markings on or near the cover of the air bag.



Display PPT 5-12.

- Always check the vehicle owner’s manual to find more information about air bags for front crashes, as each vehicle manufacturer places labels in different positions and may use different terms.
- Examples of acronyms for front air bags are:

SRS = Supplemental Restraint System.

SIR = Supplemental Inflatable Restraint.



Ask questions and respond to comments.

Q. What questions do you have about front passenger air bags or air bags that deploy in front crashes?



Conclude topic.

Now that you are familiar with front air bags, we are going to discuss air bags that are used in side impacts.

4. Air Bags for Side Impact



Reference TG page 5-5.



Display PPT 5-13.



Present information about how side air bags work and the locations in the vehicle.

Air bags that deploy for side crashes or rollovers are designed to fill the space between the occupant and the door and/or window. Side air bags:

- May be found in both the front and rear rows of vehicles.
- Are **NOT** required in all vehicles, unlike front air bags. Owner's manuals refer to optional equipment by saying "if equipped." Check the vehicle to be sure if it has a side air bag in this case.
- Are generally smaller than front air bags.

When side air bags are present, they can be found in various places such as in the door, inside the vehicle seat (seat back or under the seat) or in the roof ("inflatable curtains" or "canopies").



Display PPT 5-14.

The front center air bag is found in the right (inside) side of the driver's seat. Front center air bags:

- Open from the right side of the driver's seat and deploy forward, between the seat and the center console.
- Are labeled, when present, on the right side of the seat.

Many vehicle manufacturers follow industry standards to minimize the risk of injury from all types of side air bags.

- Usually, children may sit near side air bags without risk of injury.

- Check the vehicle owner's manual to be sure. The owner's manual will always warn if a car seat or booster seat **CANNOT** be installed next to a side air bag. Typically, the vehicle owner's manual does not include information if putting a car seat next to the side air bag is acceptable.
- The owner's manual for the car seat or booster seat must also allow use near a side air bag.
- If either of the owner's manuals forbids using a car seat or booster seat next to the side air bag, put it in a different seating position in the vehicle.



Reference TG
page 5-6.



Display PPT 5-15.



Describe locations of warnings and markings for air bags that deploy in side crashes.

Warning labels for air bags that deploy in side crashes may be found almost anywhere in the vehicle, including:

- In the door opening.
- On the end of the instrument panel.
- Near the air bag.

Caregivers should be shown any warning labels in the vehicle and should be familiar with the specific warnings.

- These labels are **NOT** regulated by NHTSA, so they all look different.
- Examples are shown in your TG.



Display PPT 5-16.

Like front air bags, side impact air bags usually have a label or marking to show where the air bag comes out in a crash.

These can be found:

- On the side of the seat
- Near the edge of the roof
- On the opening or the side of the door

Always check the vehicle owner's manual to find more information about air bags for side crashes.

Examples of acronyms for side air bags are:

SABIC = Side Air Bag Inflatable Curtain.
SAB = Side Air Bag.



Ask question and respond to comments.

Q. What questions do you have about air bags for side impacts?

5. Inflatable Seat Belts



Reference TG
page 5-6.



Display PPT 5-17.



Present information about inflatable seat belts

Another type of air bag system is an inflatable seat belt. Important points to know are that an inflatable seat belt:

- Generally opens in frontal, side, and rollover crashes.
- Is located in the shoulder portion of the lap-and-shoulder seat belt. The lap portion of the belt is separate webbing that does **NOT** inflate in a crash.
- Has two retractors and a sewn-on latchplate. The lap belt has a switchable retractor to secure a car seat.
- Spreads belt loads over a greater area of the chest than standard seat belts and provides additional head and neck support during a crash.

Check the car seat owner's manual to determine if the car seat or booster seat can be used with an inflatable seat belt.



Ask question and respond to comments.

Q. What questions do you have about types and locations of air bags?

6. Practice Activity: Locate Front and Side Air Bag Information in Owner's Manuals and Vehicles



Reference TG
page 5-7.



Conduct practice activity and debrief.

Now that we have learned about many different aspects and features of air bags, let's practice locating the information in two different owner's manuals and vehicles.

1. Work in small groups.
2. Using the owner's manuals provided, document the vehicle's air bag information.
3. In addition to information you find in the owner's manuals, locate and document missing or additional information from inside the vehicle.

[INSTRUCTOR NOTE]

[Give small groups 10 minutes for this practice activity.]

This activity should be completed using participant vehicles. Not all types of front and side impact air bags may be represented in participants' vehicles. Small groups will be completing the activity for two vehicles.

Walk around and provide assistance feedback, as needed, to participants as they complete the practice activity.]

7. Best Practices on Air Bags for Caregivers



Reference TG page 5-8.



Reinforce how to explain best practices to caregivers.

There are key questions to answer related to air bags.



Display PPT 5-18.

[INSTRUCTOR NOTE]

[Review the key questions related to air bags.]

Explain and demonstrate best practices to caregivers.

Caregivers need to understand how air bags can protect them, as well as how car seats and booster seats work when used near air bags.

- Follow both vehicle and car seat manufacturer instructions for proper installation and use of car seats and booster seats in the presence of air bags.

- Remind caregivers to look in each vehicle they use to transport children to know where all the air bags are located – even in rented vehicles. Air bags may work differently from air bags in their own vehicle.

Q. What remaining questions do you have about air bags and your role in explaining best practices to caregivers?

8. Progress Check and Summary



Reference TG
page 5-8.



Conduct progress
check.

Let's briefly review what we learned in Module 5 through a progress check. Write down correct responses in your TG.

1. What is the purpose of air bags?

Answer: The purpose of air bags is to help a passenger in the car reduce their speed in a collision without getting injured. The cushions are designed to deploy (open or inflate) rapidly when the vehicle determines there has been a crash.

2. What are the crash types in which air bags are designed to deploy?

Answer: Front crashes, side crashes, and rollover crashes

3. What are three types of passenger air bags?

Answer: Always on, manually switched on/off, and automatically switched on/off

4. What must you do with air bags after a crash?

Answer: Can only be deployed once and must be replaced after a crash



Conclude module.

This module addressed the various types of air bags. We need to understand air bags before installing car seats and booster seats in vehicles.

Now that you are more familiar with air bags, let's review the lower anchors and tethers for installing car seats and booster seats.

Quiz #1 on Modules 1 to 5

INTRODUCTION

Quiz #1 addresses knowledge and skills taught in Modules 1 to 5.

Time for Completion

The time limit for Quiz #1 is 30 minutes followed by a 15-minute class review.

ADMINISTRATION GUIDELINES

1. Have a quiz reading room ready. Offer to read the quiz to participants, encouraging them to take advantage of the option. This is not just for participants where English is not their primary language. Adult learners may score better having the quiz read to them while they read it themselves.
2. Review the instructions for Quiz #1 with the class prior to conducting it (below).
3. Collect the answer sheets and immediately score them in a private area. Do **NOT** announce scores or share them with any other participant.
4. The scoring Instructor must write the correct answer next to any incorrect answer in blue or red ink — **never pencil**.
5. Participants may keep their quizzes when they turn in their answer sheets for reference during the review. Collect all quizzes immediately following the review.
6. Instruct participants to clear their desks of writing materials prior to the review to prevent the copying of answer keys.
7. Review the correct answers for questions participants marked incorrectly.
8. In cases where a second version of a quiz is used, read both the questions being reviewed as well as the answer since the order of the questions and/or the answers differ between the two versions of each quiz.

PARTICIPANT INSTRUCTIONS

1. You have **30 minutes** to complete and turn in this quiz. Answers will be reviewed in class after the Instructors have scored all quizzes.
2. Review each question and write the correct answer on the answer sheet provided.
 - Remember to mark all answers on the answer sheet. We can only accept answers written on the answer sheet.
 - Each question is worth **2 points** with a total of **36 possible points**.
3. We encourage you to use your TG as a resource.
4. Let an Instructor know if you would like the quiz read to you. Many adult learners benefit from having quizzes read to them.

