

# National Child Passenger Safety Certification Training Program

# Instructor Manual



April 2007 (R10/10)

**NAME:** \_\_\_\_\_

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April 2007

The National Highway Traffic Safety Administration, in cooperation with the National Child Passenger Safety Board and Safe Kids Worldwide, is pleased to provide the enclosed Instructor Manual of the revised edition of the National Child Passenger Safety Certification Training Curriculum. Use this manual for classes starting on or after June 1, 2007. Until then, the present curriculum should continue to be used.

Please carefully review the entire Instructor Manual and CD resources before teaching the course. The curriculum and testing procedures are significantly different than the previous edition. While content is the same, the organization and manner of teaching the content have been revised. Classroom content now focuses on "need to know" information parents and caregivers need to hear curbside from technicians. Most "nice to know" information from the previous edition is now provided in the appendix as resources for technicians.

The revised curriculum is framed with a "Learn, Practice, Explain" paradigm, so rather than serving as an installation service, technicians are equipped to explain installation procedures to parents and caregivers and empower them to confidently install and re-install child restraints as needed.

There is a new assessment tool that does not involve computerized scoring. The assessment includes several skill-testing exercises and a series of open book tests so students become acquainted with using their manuals as an ongoing resource. This course assessment includes both hands-on skills and written pieces. There are three written quizzes. The quizzes are timed and open workbook. Students must get a total of at least 42 out of the 50 questions correct to pass the course.

The Instructor CD includes resources to assist you with teaching the revised curriculum and assessing student learning. Also, please visit the National Child Passenger Safety Board website at [www.cpsboard.org](http://www.cpsboard.org) where you will find Lifesavers 2007 presentations that further explain the revisions, PDF versions of the Student Manual and other materials to assist you. Remember: You have many other resources available to you - including your state CPS coordinator, training coordinator, the NHTSA Regional CPS Program Manager and other instructors in the field - as you work to improve children's safety by developing and maintaining technicians in your state.



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# Introduction

This educational program provides the basic technical skills and knowledge of the correct use and installation of child restraints (CRs) and safety belts that are necessary to conduct CRS inspection stations and community education. Successful completion of the education program will result in certification and these competent technicians will be valuable resources in their communities.

Each chapter now focuses on a single topic. This will eliminate topic duplication in several chapters. An effort has been made to concentrate on the “need to know” information necessary to assist parents and caregivers in the proper selection, use, and installation of the child restraint and to know when to appropriately move to safety belts once booster seats are outgrown. Information relative to children with special health care needs is found throughout the course. The background information, or “nice to know” supporting documentation has been placed in the appendix and should be used as a resource. Additional resources, such as pages from the LATCH manual that will assist the technician candidates during the classroom hands-on exercises/worksheets have been included in the appendix.

## **The Outside Consultant Role**

An outside curriculum design specialist worked along side the curriculum committee to question and help develop chapter focal points. An evaluation specialist reviewed literacy levels and helped reduce language levels to reach a larger audience without sacrificing quality. Assessment tools were designed and evaluated to be sure “need to know” information was included in the hands-on and written testing segments. Feedback from the CPS community (more outside consultants) were used to evaluate the first revision. Two pilot classes were conducted to determine course length, content and evaluation sufficiency.

## **New Design Features**

The technician manual is designed as a workbook.

- Technician candidates will complete worksheets throughout the course. The worksheets will assist in assessing the technician candidate’s grasp of the information taught, and will provide the opportunity to practice their skills and explain important CPS concepts

and best practice recommendations. A note section has been added for comments and to record questions.

- The Technician can personalize their workbook to meet their information needs during and after the class.

Technicians are encouraged to regularly use the workbook upon completion of the class. They will take a timed final exam using their workbooks as a resource. Instructors will be provided with an answer key to correct the test. Instructors will immediately assign a technician number to all candidates who have successfully completed the course. Instructors will have increased responsibilities and under no circumstances should any answer be modified or changed by a member of the instructor team or another person to help a student pass the course. Any person who knowingly allows test altering to occur and does not take immediate action is at risk of certification sanctions.

The following outline highlights the limited focus for each chapter in the revised curriculum. It also includes a brief list of new information or activities. This list is not meant to be a complete overview of each chapter, but to draw attention to the significant changes in the format, additional exercises and activities, and the specific subject matter of each chapter.

## **Learn, Practice, Explain**

- **This chapter explains the role of the child passenger safety technician and gives information on how to help parents provide safe transportation for their child.**
- Students will be expected to learn the information, practice the information, and explain what they learned to others.

## **Basics of Injury Prevention and Crash Dynamics**

- **This chapter is an introduction to injury prevention and crash dynamics and provides basic information to be shared curbside.**
- In an effort to be “evergreen”, the curriculum does not provide injury statistics but rather provides resources that can be used to assist technicians in obtaining current data. Resources are provided to assist in obtaining current misuse rates.
- Students will participate in an activity to learn the factors that can be taken before, during, and after a crash to minimize or prevent injury.

## **Who Makes the Rules?**

- **The functions of NHTSA are discussed as they relate to occupant protection, as well as the Federal Motor Vehicle Safety Standards (FMVSS) 208, 213, and 225.**



## Safety Belt Systems with Pre-Crash Locking Features

- **Pre-crash locking latchplates and retractors are identified and demonstrated.**
- Demonstration is a significant portion of this chapter. It is recommended that this chapter be taught in the vehicle.
- Not all locking latchplates look the same. There is no longer a distinction between regular/heavy duty or lightweight/cinching latchplates. All are categorized as a locking latchplate.
- Recommend reading the vehicle manual for every installation and to show parents where the information is located in the manual.
- When installing a CR, the weight from an adult hand should allow the seat to be tightened enough— Remember, 1 inch of movement is allowed.
- Workbook activities are provided to allow students to review pre-crash locking latchplates and retractors.
- Final activity allows students practice in identifying the pre-crash locking latchplates and retractors in the vehicle.

## Safety Belt Systems without Pre-Crash Locking Features

- **Latchplates and retractors without pre-crash locking features are identified and demonstrated. Use of a locking clip/lock-off, belt shortening clip and flipping/twisting the buckle stalk are also identified as the four accepted and additional CR installation steps to secure a CR.**
- Demonstration is a significant portion of this chapter. It is recommended that this chapter be taught in the vehicle.
- A workbook activity asks students to determine what additional CR installation steps are needed for the scenarios provided.
- Students will identify the latchplates and retractors in the vehicle as well as practice using a locking clip.
- A workbook activity that matches latchplate and retractor terms to definitions is provided to assist students in learning the parts and how they function.

## Vehicle LATCH: Lower Anchors and Tethers for Children

- **This chapter focuses on LATCH and tethers.**
- Students will locate LATCH features in the vehicle.
- A role-play activity is provided to allow students to practice talking with parents to determine whether their vehicle is equipped with LATCH, how to have a tether anchor installed, and the maximum weight allowed for the lower anchors.

- Common LATCH misuses are identified.
- The instructor demonstrates quickly what a correct LATCH installation looks like.

## Other Vehicle Occupant Protection Systems

- **Automatic safety belts and air bags are discussed in this chapter.**
- Air Bag Active Suppression (On-Off Switches) and Air Bag Passive Suppression (air bag turned off under certain conditions) are discussed.
- An activity is provided to allow students to practice finding air bag information and locations by reading the vehicle manual and looking for labels.

## Introduction to Restraints

- **The types of child restraints are discussed along with an introduction to the parts of a child restraint and their functions.**
- NHTSA's Four Steps of occupant protection are introduced, (rear-facing, forward facing, booster, and seat belt).
- There is also an activity to practice using owner's manuals determine the recall status.
- An activity to promote critical thinking is included in this chapter.

## Rear-Facing Child Restraints

- **This chapter discusses selecting, securing and installing rear facing CRs. (NHTSA's 4 Steps — Step 1)**
- The chapter is based on the four steps of correct use — Selection, Direction, Location, and Installation.
- Children with Special Health Needs are addressed — low birth weight, premature infants, breathing problems, and the use of carbeds.
- Selection, harnessing, and installation errors are addressed.
- A hands-on activity is provided for students to practice selecting the appropriate restraint, securing the child in the restraint, and installing the restraint in the vehicle.
- An activity is also provided to allow students to practice communicating best practice and tough choices.
- Slides are provided to practice identifying misuse.

## Children in Forward-Facing Child Restraints

- **This chapter discusses selecting, securing and installing forward facing CRs. (NHTSA's 4 Steps — Step 2)**

- The chapter is based on the four steps of correct use — Selection, Direction, Location, and Installation.
- Children with Special Health Needs are addressed — Upright vests and harnesses, modified vest, large medical seats, specialized child restraints for children in casts.
- Selection, harnessing, and installation errors are addressed.
- An activity is also provided to allow students to practice communicating best practice and tough choices.
- Slides are provided to practice identifying misuse.
- A hands-on activity is provided for students to practice selecting the appropriate restraint, securing the child in the restraint, and installing the restraint in the vehicle.

## Children in Booster Seats

- **This chapter discusses selecting, securing and installing booster seats. (NHTSA’s 4 Steps — Step 3)**
- A hands-on activity is provided for students to practice the proper use of a booster seat and to explain the proper placement of the lap and shoulder belt.

## Kids in Safety Belts

- **This chapter discusses the appropriate use of a seat belt. (NHTSA’s 4 Steps — Step 4)**
- Misuse of safety belts and the consequences of misuse are discussed.

## Child Passenger Safety in Other Vehicles/Modes of Transportation

- **This chapter discusses how vehicle design (pick-up truck, school bus, airplane, and emergency vehicles) affects CR selection and use.**
- Recommendations are made for securing a child restraint in an ambulance.
- A workbook activity asks students to determine vehicle designs that affect the selection of child restraints and to determine what child restraints are available.
- An activity allows students to practice communicating best practice.

## In the Field

- **Students will participate in a “where does everyone sit safely?” exercise to determine the safest locations in vehicles for all occupants**
- Communication skills will be addressed and a video activity will show effective communication skills and describes what a certified CPS Technician does.
- Key issues to consider when planning an event or setting up an inspection station will be discussed.

## The Appendix

Many “nice to know” pieces of information are found in the Appendix. The Appendix will also be used extensively for Instructor Candidates to assure basic knowledge of both “need to know” and “nice to know” information relative to CPS.

Also included in the Appendix are two information sheets:

- **Using Your New Skills** provides examples to assist newly certified technicians to build community partners and develop CPS programs. It also includes resources for the new technician
- **CPS Inspections and Check Up Events** is adapted from NHTSA’s “A Guide to Implementing CPS Inspection Stations.” This has been included to provide students with information pertaining to policies and procedures that should be implemented and followed to help assure that each child leaves the event safer than when he/she came in while making safety the number one priority for staff as well as participants .

## Curriculum Updates and Policy Clarifications

Updates and corrections to the Instructor Manual, policy and procedures, as well as supplemental information that may change more frequently, such as the “Planning and Logistics Guide”, are available for download from the Instructors’ restricted access area on the cpsboard.org website. Instructors can gain access to this site through the “Instructor Downloads (CPS Board)” action item in their Safe Kids CPS Certification program profiles.

Instructors will be notified through emails and/or the “CPS Express” CPS Certification newsletter whenever updates or corrections are available. It is very important that all Instructors regularly check to be sure that their contact information in their online profiles is correct and up-to-date in order to be assured of receiving these alerts as well as other important certification information.

We thank you for your continued commitment to educating parents and caregivers on the importance of the safe transportation of their children, and we look forward to continuing to work with you in the future.

# Acknowledgements

This National Highway Traffic Safety Administration revised curriculum would not have been possible without the assistance of a substantial number of talented people from across the country. We are greatly indebted to those who gave so much of their time, knowledge, and expertise to help bring you this revised training program.

The foundation of this curriculum was provided by the exemplary dedication, expertise and passion provided by both past and present members of the all-volunteer National Child Passenger Safety Board, particularly the Curriculum Committee. Literally, without their energetic involvement, this curriculum would not be the first class training program that it is today.

Special appreciation is extended to all the dedicated technicians and instructors who volunteered their time to assist in the review.

Generous appreciation is extended to the two pilot sites for their willingness to conduct pilot classes.

Special thanks to the consultants who provided professional guidance as we developed this curriculum and assessment tools, and to those who developed the design and layout of this document.

And finally, thank you to all of the past, present and future technicians for your dedication and enthusiasm in helping keep our children safe on the roads.

Following are the names of those who provided assistance. If anyone has been left out, please accept our apologies and know that we appreciate your work.

## **Present Board Members:**

Kristen Allen	Robert F. Dallas	Artie J. Martin	Thomas J. Vilt
Sharon Bilbrey	Carole S. Guzzetta	Michele Mount	Lorrie Walker
Janet B. Brooks	Lori Haskett	Tim Murphy	Eleanor J. Walters
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Emilie B. K. Crown	Mike James	Wanda Vazquez	

## Past Board Members:

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Vicky Cassabaum, RN	Jeanne Johnson	Angela Osterhuber
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## Curriculum Reviewers

AAA Public Affairs	Children's Hospital of Philadelphia	Deborah Gardner	Kelly Hurst
Kelley Adams	Dory Collette	Ruby Gatling	Bernadette Jamele
Kathy Aldridge	T. Glen Cooper	Susie Girten	Mike James
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Georgeanne Blumling	Lynne Dees	Jennifer Harbison	Kathryn Kruger
Diana Bonilla	Raymond Delaney	Barbi Harris	Virginia Lancaster
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Angie Bowles	Kenneth Demmers	Marcia Hayes	Deborah Lejeune
Joseph Boyd Tong	H. Joel Dishroon	Cindy Hearrell	Kiki Luna
Tana Bradshaw	Carol Drehobl	Kim Herrmann	Jon Lupo
Robert Brasky	Jacque Dukehart	Tracey Hewitt	Patricia Maag
John Brock	Donald Dupray	Suzanne Hill	Karen Macauley
Karen Brock	Sandra Elliott	Charles Hirata	Betty Mason
Torine Brooks	Julie Ely	Nichole Hodges	Fran Mayko
Skip Brownell	Sue Emery	Bonnie Hoffer	Nancy McClenny-Walters
Jessica Butterfield	Tawna Foutch-Findley	Sandy Holt	Regina McCurdy
Jerry Wayne Campbell	Werner Freitag	Holt Productions	Christine McIntyre
Maricruz Cantu	Vera Fullaway	Courtney Hood	Susan McLain
Child Restraint Manufacturers	Ruth Gardner	Jennifer Huebner	Sue McLain

Beth McMillan	Lisa Pardi	Deborah Salvano	Sedley Tomlinson
Meetings Management	Kelly Parker	Michael Schmidt	Rebecca Turpin
Harvey Meshel	Anne Patton-Jerzewski	Deborah Schroeder	Cindy Tuttle
Sue Miller Smith	Jennifer Pavey	Sue Shiver Morrow	Vehicle Manufacturers
Lori Minor	Linda Pfafman	Delora Shedrick	Beth Washington
Rick Moore	Clare Pfothauer	Margaret Sirtak	Michael Whitehurst
Michael “Chris” Morris	Photographic Design Group	Dwayne Smith	Marcy Wieties
Therese Moseley	Riley Hospital for Children	April Sorace	Andrew Williams
Betsey Mowery	Julie Robbins	Deborah Stewart	Janice Williams
Sharon Munns	Mary Ann Robinson	Pam Stottman	Janet Williams
Ces Murphy	Janelle Rose	Andrea Swanson	Norraine Wingfield
Timothy Murphy	Romana Ruiz-Villasensor	Judith Talty	Sara Woo
Keisha Nicholson	Melanie Sadek	Holly Terry	John Yannaccone
Amy Norenberg		Teresa Thomas	Kim Yeager
Angela Osterhuber		Stephanie Tombrello	

### **Pilot Sites:**

#### **Arizona:**

Florin Bohatir  
 Bridget Doherty  
 Arnie Cuellar  
 Matthew Nelson  
 Steve Petrey

#### **Florida:**

Robin Butler  
 Greg Kirby  
 Philip Miller

### **Professional Guidance:**

Westover Consultants, Inc., Bethesda, MD  
 University of North Carolina Highway Safety Research Center  
 The Tevebaugh Group, Inc. / [www.eInstruction.com](http://www.eInstruction.com)

### **Cover Photographs:**

Safe Kids North Carolina / North Carolina Department of Insurance  
 University of North Carolina Highway Safety Research Center





# Blueprint For Teaching National Child Passenger Safety Certification Training Classes

## **Check for curriculum updates and policy clarifications**

- Updates and corrections to the Instructor Manual and policies and procedures are made available for download from the Instructors’ restricted access area on the cpsboard.org website.
- Instructors can gain access to this site through the “Instructor Downloads (CPS Board)” action item in their Safe Kids CPS Certification program profiles.

## **Focus on instructor preparation — practice as if you were an instructor candidate no matter how many times you teach these classes**

- Study the slides, the student notes and the instructor notes
- Study all activities and assessments in advance
- Review the contents of the Instructor CD carefully and follow instructions. Video clips are available for some of the slides. Read the instructions for the slides and videos and be sure the videos will work with the computer and projector that will be used in class.
- Study materials in appendix and resources throughout the manual
- Plan to teach as much of the class in vehicles as is possible in order to increase hands-on time
- Refer to “Recipe for Successful Instructor Candidates and Mentors” (Page xix) to review the roles and responsibilities of Instructor Candidates and Mentors.

## **Have sufficient child restraints, equipment, aftermarket products, and vehicles on hand throughout the course**

- Provide new and old child restraints for student use during class
- Arrange for a variety of vehicles to be on hand for activities and training
- Be sure to have vehicle and child restraint instruction/owner manuals available
- Be sure to have sufficient supplies of locking/shortening clips, pool noodles, and other equipment needed for instruction and demonstration

## **Guidelines for Teaching**

- This curriculum provides all the core teaching materials needed to convey the information to students. Be sure to cover everything in the lesson plan, but do not add to the content unless necessary for further explanation.
- Resist the urge to say “the way we used to teach this was...” This will only confuse the students and throw the schedule off track.

## **Supplemental Materials**

The provided materials should be used in their original form and may not be changed by instructors without the express written consent of the National Highway Traffic Safety Administration.

There may be limited occasions when approved supplemental information may be used, such as providing state or local passenger safety resources, data or legislative updates. If you feel the need to provide supplemental materials then the items must be: clearly identified as supplemental; must reflect up-to-date factual information and must not conflict with any standardized course information. In addition, students must be informed that they will not be quizzed on the supplemental information.

It is suggested that you use supplemental materials as the foundation of a post-class update shortly after the certification class. This will keep you in touch with your students and enable you to enhance their skills and knowledge after they have had some experience in the field.

## **Assessments**

### **Understanding the Assessments**

- The new assessment tools do not involve computerized scoring.
- The assessment includes several skill-testing exercises and an open book test
- Course assessment includes hands-on skills and written pieces.
- There are three written quizzes.
  - Quizzes are timed and open book—Be sure to stress to the students that they will have to have a good grasp on the content. The written quizzes are open book, but they are not easy.

- Students must get a total of at least 42 out of the 50 questions correct to pass the course.
- There are three hands-on skills tests
  - Students must pass all three
  - They have 3 attempts to pass each one.
- Should a student not pass a hands-on skills test, not participate in the check up event, or get an overall written score of less than 42 (85%):
  - The student will have to retake the course.
  - There are no quiz retakes.
- If there are two passes (skills tests and check up) and at least 42 of 50 correct on the quizzes, the student will be processed as a technician.
- In addition to this immediate processing, the lead instructor will be able to print out and provide wallet cards for the new technicians, if desired and if a computer with internet access and a printer are available.

## **Guidelines for Assessments**

- Do not provide answers in any form or allow a student to change their answers once submitted
- Do not share the exams in any form with non-students
- Do not alter any tests or hands-on skills evaluations
- Do help students become familiar with their workbook-remind them that they will use it regularly during and after the class.

## **Guidelines for Check Up Events**

All events must include a safe environment for the students and families. A clear traffic pattern should be established and no vehicle should move without a “walk around” to be sure there are no kids or adults in harms way.

To successfully pass the certification course, all technician candidates must actively participate in a CPS checkup event. Any student who is not able to attend the event should be marked as having failed that section.

Under emergency circumstances, when an individual is not able to attend the event, the Lead Instructor (LI) may schedule a make up checkup event. This must be arranged prior to the original event and include supervision and feedback from a certified instructor who is on the team. The make up event must take place within 2 weeks of the original event. Again, this is an accommodation for EMERGENCIES only. Failure to successfully complete the make up event will result in a failing grade.

All efforts should be made to conduct the check up at the end of class. However, if you have a weather emergency—severe weather that could produce unsafe conditions for holding a

clinic —please reschedule the event as soon as possible. Any technician who does not attend that (or another LI-approved) event will receive a failing grade. Students should, under the supervision of a certified instructor, properly and appropriately educate parents/caregivers. The instructor will provide the LI with the student's grade so it can be entered into the online system.

- The event should be a minimum of 2 hours (excluding set up and break down).
- The checkup event may be open to the public or appointment-based. If by appointment, allow 45 minutes per seat
- A fitting or inspection station may be used as a site.
- A 5:1 technician candidate-instructor ratio is strongly recommended.
- A standardized check list should be used. An instructor must oversee work and approve the education and installation before the family leaves the event.
- It is strongly recommended that technician candidates work in groups of no more than 4 to allow active participation without stressing the parent/caregiver.
- When a car drives off, the team will carefully fill out/review the paperwork and discuss any themes, ideas or lessons from that check up with the instructor.
- At the end of the event, the lead instructor should log into the CPS online system and enter hands on and written grades for the course.
  - Enter grades for all technician candidates on the course roster.
  - All technician candidates with passing hands-on and written grades will be certified and the course will be finalized.
  - After the grades are processed, the lead instructor and/or course administrator will have the ability to print wallet cards for all newly certified technicians.
  - Students can receive their new technician numbers at the discretion of the instructor- either verbally or by written notification.

## **Reasonable Accommodations**

The following guidelines are intended to assist in meeting the Americans with Disabilities Act and apply to certification and recertification:

- Clearly indicate the vigorous physical requirements of this training program when providing a course description to participants. Potential participants should be told to contact the host agency or administrator if they have any doubts about their ability to fulfill course requirements. Certification is dependent upon satisfactory completion of all course components.
- Instructors should ask at the beginning of class if anyone has any special needs with regard to meeting the requirements for completion of the Standardized Course. (Participants should be asked to respond to an Instructor during break time instead of asking for a show of hands.)

- For those participants who have difficulty with reading, the written test may be given orally. If possible, this should be determined prior to the time that the written test is given so that reasonable accommodations can be made. During an oral exam, the instructor should read the question exactly as written and with a consistent tone of voice. During a written or oral exam, a term not related to technical content (such as frayed) may be defined to help the participant understand the question, but not in a way that would indicate the correct answer.
- If individuals are physically unable to install a child safety seat (due to size, disability, or illness) they should be permitted to verbally guide an instructor in correctly installing the CRS. Verbal instructions should be clear, concise, and include an explanation for decisions(s) and/or action(s). This procedure should not indicate inadequacy of the technician's skills as they should always have the parent or caregiver present when checking child safety seats and the parent or caregiver should always be the last one to install or make any changes to the seat.





## Recipe for Successful Instructor Candidates & Mentors

By Janelle Rose, Executive Director, Program Professionals, Inc., and  
the Sit Safe Child Passenger Safety Program

A mentor is a trusted coach. Successful mentors have a true and sincere commitment to the professional and personal development of the Instructor Candidate.

In addition to excellent technical skills and good presentation, classroom and instructor skills, a good mentor possesses all of the interpersonal skills being evaluated in the instructor candidate. These include patience, understanding, responsiveness and a positive attitude.

A mentoring relationship is one in which a person with greater experience, expertise and wisdom teaches, guides, directs and counsels another to develop, both personally and professionally. The mentor serves as a tutor to help the candidate sharpen their CPS skills, offering insight, perspective, and knowledge that is useful to him or her.

The relationship begins well before the first pre-class meeting and continues throughout the 32-hour course, hopefully well beyond that! The goal is to provide a teaching/classroom environment that the candidate can learn and benefit from.

An effective mentor:

- Sets high performance expectations
- Offers challenging ideas
- Builds self-confidence
- Guides through example
- Offers encouragement
- Motivates
- Is a good communicator
- Shows respect
- Encourages and models professional behavior
- Understands the importance of empowering the candidate
- Is available as needed (and as required) to provide assistance, advice and support
- Allows the candidate to make decisions and have independence

Tips for success:

- **Preparation and firm expectations** are key to the success of a mentor/instructor candidate relationship. The pre-class meetings will provide this critical element.
- The candidate must be aware of each skill-set being evaluated and be familiar with the **evaluation tools** that will be used to complete this process. (Candidates should be encouraged to download and review all paperwork from the CPS Certification Web site so that they are completely familiar with all requirements.)



- A **feedback session** after each module is a significant part of the process. The candidate must expect and be prepared for these important sessions, which allow debriefing and sharing of thoughts, perceived successes and areas of concern.
  - These meetings provide an opportunity for the mentor to give respectful and **constructive feedback**. The immediate feedback allows the candidate to feel good about his or her successes and gain a sense of confidence and comfort, knowing they are doing well. It also gives him or her a chance to make adjustments before teaching their next module or leading the next hands-on experience.
  - These sessions can help reduce the stress level and provide a more comfortable teaching environment, too!
  - These interactions should follow a specific outline, be brief, positive, constructive and informal.
- Mentors must recognize the ethical responsibilities inherent in the mentor/instructor candidate relationship. They should be willing to share **honest comments**, which may include criticism. Though this can be uncomfortable, it's a necessary step in the process and will help candidates become better instructors.
- **Involving the entire instructor team** can enhance the learning experience for the candidate. Each instructor has the potential to provide mentoring in some way, so he or she should be included when possible/practical. Team members are able to provide advice, support and encouragement -- and build a sense of camaraderie, which is positive for the entire team.
- An instructor candidate needs to be **comfortable sharing** his or her own concerns and asking questions without the fear of being ridiculed or judged. Working as a team and having open communication throughout the course helps to insure this. A good mentor is approachable!
- As with all classes, there should be a **day-end meeting** to debrief, discuss the candidate's progress, student progress, the day's successes, needed improvements, etc. Class set-ups, agenda assignment reviews for the next day, and any last minute issues should be handled before leaving the classroom at the end of each day. The instructor candidate should be included in these daily sessions - as he or she is an important part of the team.

The last step in the process involves a **Final Feedback Session** at which time each session's results are tabulated and reviewed with the candidate, and final recommendations made. This session is a formality and should involve no surprises. The candidate should already have a clear understanding and awareness of his or her progress from receiving feedback after each session, as well as at the end of each day. The final meeting is to let the candidate know if he or she has met the minimum requirements, and have what he or she needs to teach the program as a certified instructor!

























- The National Child Passenger Safety Certification Program certifies individuals as child passenger safety technicians (CPSTs) and instructors.
- Tens of thousands of individuals have been certified since the program began in 1997.
- CPSTs and instructors put their knowledge to work through a variety of activities, including child safety seat checks in which parents and caregivers receive education and help with the proper installation and use of CR and seat belts.

NHTSA: National Highway Traffic Safety Administration

- <http://www.nhtsa.gov>.
- CPS information.
- CPS recalls.
- Curriculum updates.

National CPS Board:

- <http://www.cpsboard.org>.
- Latest certification manuals.
- Committee information.

Certifying body—Safe Kids Worldwide:

- <http://www.safekids.org/certification>.
- Policies and procedures available online, including recertification and instructor candidacy information.
- Latest certification manuals.
- Frequently Asked Questions.
- Links and resources.
- Directory of nationally certified CPSTs and instructors.
- Communication with technicians (CPS Express, Tech Update).

## CLASSROOM NOTES:

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## INSTRUCTOR NOTES:

- Encourage students to visit these sites for more information.

**NHTSA's Diversity Position:**

The United States is a Nation of people with different ethnic, cultural, and religious backgrounds. NHTSA recognizes the need for a broad range of traffic safety programs and partnerships that reflect the rich diversity of America's communities and ensure that everyone benefits from the Agency's lifesaving work. Given that traffic safety problems affect some communities more than others, NHTSA is committed to working with diverse national and community-based partners to create, implement, evaluate, and market culturally specific programs and materials.

These efforts will help raise greater awareness within diverse communities about the importance of traffic safety.

Some cultural differences to be considered:

- In some Hispanic and Latino communities, the car seat is blessed before it can be used.
- Some African American and Hispanics feel more comfortable holding a child on their lap in vehicles.
- Some minorities will not seek advice from a public authority such as a police officer.
- Some Arab American communities do not allow the mother to be spoken to if the father is present.
- Think about the diversity within your own community.
- Identify your strategy for reaching your community.
- What are your challenges? What are potential solutions?

**Diversity and CPS**

- Respect differences in attitude, behaviors, and the needs of each caregiver
- Become familiar with NHTSA's position on diversity
- Remember that diversity includes gender, cultural, age, religious, as well as, community differences

**INSTRUCTOR NOTES:**

- Review NHTSA's position on diversity.
- Point out that diversity refers not only to cultural or racial differences, but also to differences in learning and communication styles.
- Point out the need for students to be aware of the different ethnic groups in their community.
- Share examples of cultural diversity successes and failures. (Example: Don't hold a checkup at a police station if the community is fearful of the police.)

**CLASSROOM NOTES:**


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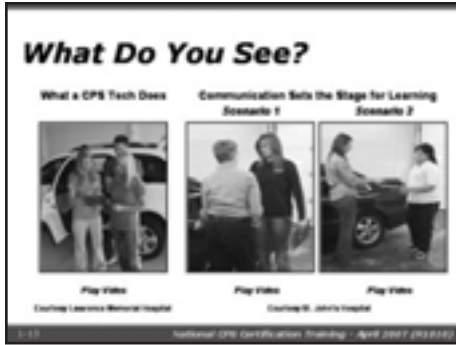
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- In the other two videos you will also see examples of good and bad communication skills. After viewing each of these videos, the class will discuss the communication skills used by the technicians in each scenario.

Instructions: After viewing each video, the class will discuss the communication skills used by the technicians in each video. Please write your notes below:

- Scenario 1:
- Scenario 2:
- How well do I communicate? Do I really listen to others?
- What is my strategy for effective communication?

CLASSROOM NOTES:

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INSTRUCTOR NOTES:

**Show the Abbey video 8 minutes**

Instructions:

- Explain to the class that the video will provide a good overview of what a technician does.
- Do not discuss the video at this time since you will discuss it fully in Chapter 14.
- Also mention that the other two video clips that follow will show good and bad examples of a technician as well.

**What Do You See? 10 minutes**

Instructions: After showing each video, use the following questions to lead discussion. This discussion should help the class practice good communication skills.

- Did the technician respond in a positive manner to the caregiver?
- Did the technician communicate well with the caregiver?











**Chapter Review**

Instructions: On the basis of this chapter, please answer the questions below.

1. The role of a CPST is to: \_\_\_\_\_
2. What are two things you need to know about a child before you can help a parent/caregiver with CPS?
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
3. What are two effective communication techniques?
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
4. Tough choices are made by: \_\_\_\_\_
5. What is a best practice? \_\_\_\_\_

**Chapter Review**

- What is the role of a CPST?
- What do you need to know before you can help a parent?
- What are two effective ways to communicate with parents?
- What is a best practice?
- What are tough choices and who makes them?

**Food for thought:**

- Do I understand the role of a CPST?
- How will I make tough choices?
- How will I handle questions that I don't know the answers to? How will I get those answers?
- My questions for this chapter: \_\_\_\_\_

**INSTRUCTOR NOTES:**

**Chapter Review — 5 minutes**

Activity instructions: Instruct students to answer the questions on their worksheet.

1. *The role of a CPST is to:*

**Answer:** Educate and determine attitudes, behaviors, and needs of caregivers.

2. *What do you need to know about a child before you can help a parent/caregiver with CPS?*

**CLASSROOM NOTES:**

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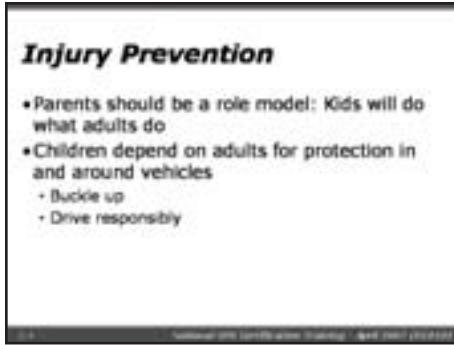
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- Drivers who buckle up are more likely to have child passengers who are buckled up. Many studies have confirmed this fact.
- Our goal as CPST is to educate children and caregivers to make buckling up a habit for life.
- We should also share other safety information to make sure children are safe in, under and around vehicles, even when not on the road. Avoiding vehicle backovers, being locked in a trunk, and children being caught in power windows, require on-going education, supervision and attention.

Key message:

- Children may not *hear* what you say, but they will *do* what you do!
- Caregivers must buckle up!
- Children must be taught not to play in, under or around vehicles.

#### CLASSROOM NOTES:

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#### INSTRUCTOR NOTES:

- The bottom line is: Avoiding a crash is the *best* prevention.
- Remind student's to share the dangers of backover incidents with parents and caregivers.







- Non-use of CRs/safety belts remain a problem.
- As a technician you can help educate your community about CR and seat belt use.
- Misuse rates vary from 73% to over 90%.
- Correct selection, installation, and use of a CR can sometimes be difficult.
- Review educational materials (videos, brochures, handouts, etc.) every year to be sure you are providing accurate and current information.
- By understanding correct use of CRs and seat belt systems, it is easy to see misuse and offer education to correct it.
- It is harder to change the views and actions of those not using restraint systems.
- An example of changing people's actions might be to have the parent/caregiver move a child to the rear seat of the car. That behavior may conflict with parents'/caregivers' desires or beliefs. They may want to see the baby easily or to believe that their child is ready to "graduate" to seat belts and front-seat riding.
- Your job as a technician is to educate parents/caregivers about correct installation and how to avoid future misuse.

**What Are the Challenges to Crash Survival?**

1. Nonuse
2. Misuse
3. Outdated or incorrect educational materials
4. Changing behavior

Where can you get current information about misuse of CRs locally? Statewide? Nationally?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

## INSTRUCTOR NOTES:

- Provide students with resources for finding out current misuse rates in their community and across the nation.

### Examples:

- Children's Hospital of Philadelphia  
<http://www.CHOP.edu/car seat>

## CLASSROOM NOTES:

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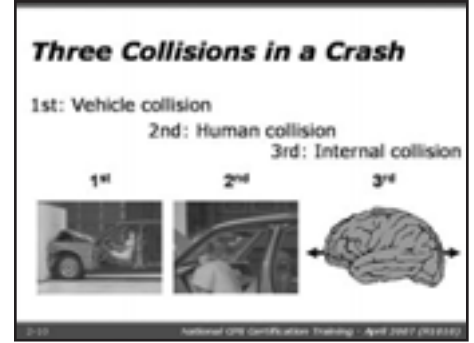




There are three collisions in a crash.

The **first collision** is the vehicle collision.

- The vehicle begins stopping as it collides with another object.
- The time from crash to full stop in a 30-mph crash is about one-tenth of a second.
- As the vehicle slows, the front of the vehicle crushes, taking some of the energy of the crash.



The **second collision** is the human collision.

- In the human collision, the occupant continues to move toward the point of impact at the same speed even though the vehicle begins to stop once impact occurs.
- The occupant will begin to stop once he or she connects with an outside force.
- An unrestrained occupant will hit the inside of the vehicle, such as a window or other object in the path of motion.
- As that individual collides with the vehicle interior, he or she slows down from 30 mph to a stop in a few hundredths of a second, with only the body to absorb the energy of the crash
- For a restrained occupant, however, the outside force will be met by a seat belt or the harness of a CR.

The **third collision** is the internal collision.

- In the internal collision, the occupant’s internal organs move toward the point of impact and hit other organs, bones, and the skull.
- Even though the body may appear uninjured, the liver, spleen, heart, or other organs may be torn, bruised, and/or caused to bleed.
- Impacts to the head may cause “closed head injuries” resulting from the soft tissue of the brain hitting the skull or being torn as the skull fractures.

Any of these injuries may be hard to see immediately, yet they can be deadly.

**INSTRUCTOR NOTES:**

Make the following points:

- People may be disturbed by the second photo. This picture shows a 2-year-old child who was thrown out an open window during a side impact crash.
- This child and her sister were killed in Fairfax County, VA. Her sister hit the inside of the vehicle and was thrown out the same window onto the roadway because she was unrestrained.

**CLASSROOM NOTES:**

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There are many common myths in our communities about CR and restraint use. It is helpful to be familiar with these as you will encounter them curbside.

### Common Myths

**1. *“It is better to be thrown out. The car might burn or I might drown. I don’t want to be trapped in my belt.”***

Response:

- You are four times more likely to be killed if you are thrown from the vehicle.
- Less than one half of one percent of all crashes involves fire or water. It is generally better to be restrained during the crash so you are more likely to be conscious, uninjured, and able to escape.

**2. *“I can hold my baby in a crash.”***

Response:

- The forces (weight x speed) in a crash are so great that it is impossible for any person to hold onto a baby’s body.
- If the adult is also unrestrained, it is likely he or she will crush the child.

**3. *“Restraints are uncomfortable for me and my child.”***

Response:

- People who get in the habit of buckling up find it uncomfortable to ride without them.
- It is a lot more uncomfortable to be injured.

**4. *“I am a good driver, so I won’t get into a crash.”***

Response:

- You can never predict or control what other drivers will do, or how the weather may have changed the roadway.

**5. *“I’m only going down the street to the store. I always buckle up when I drive on the highway.”***

Response:

- Most crashes happen close to home.
- Roads and streets are more hazardous than highways because traffic is usually going two ways and there are many intersections and distractions.
- Major highways are less hazardous because they have one-way traffic, good signs, lighting at intersections, and gradual curves.
- They are also more likely to have guard rails and break-away poles that help minimize incidents or crashes that do occur.

### Common Myths

Discuss myths found in your workbook









### Functions of NHTSA

- Education
- Enforcement (two kinds)
- Research
- Regulations
- Compliance testing
- Defect investigation

#### Education:

- NHTSA provides a variety of traffic safety training programs.
- NHTSA produces brochures, posters, statistics, and fact sheets that you can get from [www.nhtsa.gov](http://www.nhtsa.gov).
- Ten regional offices work closely with State and local agencies in carrying out safety programs.

#### Enforcement:

- There are two types of enforcement:
  - NHTSA provides funding to promote occupant protection by working with the law enforcement community and media campaigns such as *Click It or Ticket*.
  - It enforces its standards by selecting certain products on the market to see if they meet Federal standards.

#### Research:

- NHTSA conducts and/or funds research to demonstrate and evaluate programs related to traffic safety.

#### Regulations:

- NHTSA sets performance and some design standards.
- This class focuses on NHTSA's involvement with seat belts, air bags, CRs, and other occupant protection systems.

#### Compliance testing:

- NHTSA does not certify CRs before they go to market.
- Vehicle and CR manufacturers self-certify their products as meeting NHTSA performance standards.
- This means that products are sold on the basis of manufacturer testing and assurances.
- NHTSA requires all manufacturers to label their products in accordance with these regulations and randomly tests these products.

#### Defect investigation and recalls:

- NHTSA tests products that have been reported by the public or manufacturer to have a potential problem.
- If a real problem is identified, a recall of the product may follow.
- Manufacturers can issue a recall before involving the Government if a problem is known to them. This information is made available by NHTSA and is referred to in the field as the Recall List.







FMVSS = Federal Motor Vehicle Safety Standards; see Glossary

LATCH = Lower Anchors and Tethers for CHildren

FMVSS 208:

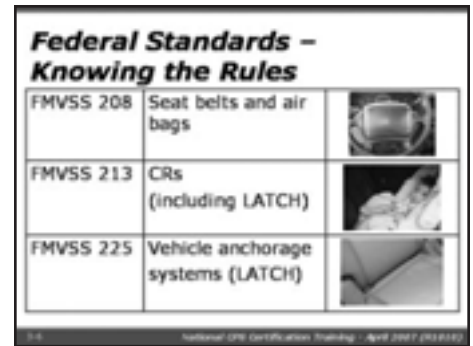
- This standard regulates seat belts and frontal air bags.
- Beginning with 1996 vehicle models, all passenger seat belt systems must lock to secure CRs. (Driver belt systems do not need to lock because CR will never be installed in this position.)

FMVSS 213:

- This rule provides CR performance standards for children up to 65 pounds.
- Some of these standards include:
  - Crashworthiness (how a CR holds up in a crash)
  - Labeling and instructions
  - Flammability
  - Buckle release pressure
- NHTSA randomly tests CRs on a vehicle bench seat in a 30 mph frontal crash involving crash test dummies.
- LATCH-on CRs have two parts:
  - Top tether reduces forward movement (excursion).
  - Lower anchors replace seat belts for installation.

FMVSS 225:

- LATCH-in vehicle has two parts
  - Top tether anchorage points (required in three seating positions in vehicles with two or more seating positions except on school buses)
  - Lower anchorages in or near seat bight (the base/crack of the seat; required in two seating positions)
- Standard provides requirements for the location and strength of child restraint anchorage systems for light duty passenger vehicles manufactured after September 2002. Additional Information about FMVSS's related to CPS can be found in the Appendix.



## INSTRUCTOR NOTES:

- Explain to students that this is a **basic overview** of the key CR-related Government regulation of

## CLASSROOM NOTES:

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CLASSROOM NOTES:

- Shoulder belt-positioning devices
- Belt-tightening tools

4. *Who do you report a product defect to?*

- NHTSA
- CR Manufacturer

5. *What is NHTSA's Web site address?*

<http://www.nhtsa.gov>

6. *Where can you find the most updated recall list?*

<http://www.nhtsa.gov>

OR

<http://www-odi.nhtsa.dot.gov/cars/problems/recalls/childseat.cfm>

7. *What is the basis of a recall?*

Product non-compliance is when a product does not conform to safety standards. An example such as flammability standard not met or a seat utilizes an assembly where a variation in the components resulted in the potential for a buckle to release. This does not conform to dynamic testing requirements of FMVSS 213.

- Detected defect is when an error is found with part of a safety seat. An example would be that a base is defective and should not be used with the carrier. The carrier may be used with a seat belt until the base is repaired or replaced according to the manufacturers' corrective action. Emphasize that manufacturer's corrective action needs to be followed. Many seats are crashworthy even when a repair is needed.





## CLASSROOM NOTES:

### Materials needed for chapter:

- Large laminated number cards for vehicle identification.
- Keys for each demonstration vehicle (keys should be labeled for return to owner).
- Grid with seat belt systems for each demonstration vehicle and teaching team member.
- Two forward-facing CRs or one per instructor team.
- Two workbook forms: Identifying Pre-Crash Locking Latchplates; Retractors.
- Sample owner's manuals.
- Multiple vehicles with pre-crash locking seat belts.

### Trainer Tips:

- Cover as much of this chapter outdoors as possible, depending on weather, class size, etc.
- There will be a series of demonstrations in this chapter. Be prepared for each activity.
- If class size exceeds available learning resources, ask students to alternate in hands-on activities.
- Prepare hands-on activity instructions and assign instructors or technician assistants to designated vehicles; rotate student groups through demonstration vehicles. Demonstration is a significant portion of this chapter, so it must be fully organized well before related activities begins.
- Instructors and technician assistants **MUST** know all vehicle seat belt systems in all available vehicles, in all seating positions, prior to this exercise. Note vehicles that have pre-crash locking features. Remember that the driver seating position does not have pre-crash locking ability *in most vehicles*. This may be needed for comparison for students having difficulty understanding the concept.
- You may want to combine activities in this and the next chapter.

### Appendix Materials: None.

















### Securing a CR With a Pre-Crash Locking Latchplate

- Determine latchplate type
- Place belt through correct CR belt path and buckle
- Apply weight in CR and pull webbing at the belt path to tighten lap belt
- Check for tight installation

- Before installing a CR, technicians must know what type of seat belt system they will use in the parent/caregiver-selected vehicle seating position.
- Up to five different seat belt systems may appear in one vehicle.
- When helping a parent/caregiver curbside, Technicians must teach parents/caregivers to read the vehicle owner's manual to be sure:
  - the desired seating position is approved for CR use
  - where to find approved LATCH positions
  - that airbags do not interfere with the CR or child occupant
- Show the parent/caregiver where to find child passenger safety information in the manual.
- You will be asked throughout the course to check the owner's manual for many things!
- Check the seat belt latchplate for lockability. Ask yourself, can this latchplate lock the CR at all times? No one knows when a crash might occur.
- Seat belts must stay in a locked position when buckled around the CR. Remember, for a correct CR installation, the seat belt must lock at one of two places. The latchplate is the first place you can easily check.
- To ensure a tight CR fit, pass the seat belt through the CR seat belt path and buckle it. Apply weight into the seat with your hand while tightening the seat belt. Involve the parent/caregiver in the installation at all times.
- We recommend that you learn to talk parents/caregivers through the installation of their CR systems as you stand outside the car and guide them in a step-by-step process.
- To test for a tight installation of the CR:
  - Hold the tightened and locked CR at the belt path.
  - Push and pull the CR, with a moderate force—front to back, and side to side.
  - CR should not move more than 1 inch at the belt path.
- Never use two seat belt systems to secure a CR.

### CLASSROOM NOTES:

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### INSTRUCTOR NOTES:

Make the following points:

- Avoid using your knee in the seat. The weight from an adult hand should allow the seat to be tightened enough.
- We recommend using the weaker hand so as not to use more force than is necessary.





- You have already learned how retractors store seat belt webbing until needed.
- In some vehicles the retractor, and not the latchplate, provides the pre-crash locking part needed to keep a CR in place at all times.
- The two retractors that we study in this chapter can function in a pre-crash locking position.
- Being able to see how each retractor type is different will require you to check the seat belt system to see if it can be used in a pre-crash locked position.
- Remember that Technicians must teach parents/caregivers to read the vehicle owner's manual to be sure the desired seating position is approved for CR use and if it is a LATCH position.
- Automatic locking retractors (ALR) are generally easy to use with CRs. Once the seat belt is passed through the CR belt path and buckled, the seat belt can only get shorter (and hold the CR tighter) once pressure is applied to the CR.
- Once again, check to be sure that you have a pre-crash locking retractor by pulling the seat belt out of the retractor **slowly and gently**.
- Some seat belts with ALR may appear to have no locking ability if they are tested when the seat belt is extended just a very short distance (less than 12 to 18 inches) from the retractor casing. That 12- to 18-inch space is known as the dead zone.
- To check to see if the retractor will lock, pull it out 24 to 36 inches, allow a small amount of webbing (3 to 6 inches) to go back on the retractor, and then gently pull on the webbing. If no webbing comes out, then the retractor is an ALR type.
- The true test of seat belt system pre-crash locking is to pull firmly up and out on the lap part of the buckled seat belt. The belt should not lengthen.
- No one can predict when a crash might occur, so a CR must be properly installed and remain tightly secured at all times to prepare for a crash or sudden stop.

#### Automatic Locking Retractors (ALR)

- Can be found in:
  - Lap belt only or
  - Lap/shoulder belt
- Test if you have an ALR
- Pull the webbing out slowly and gently
- See if once you stop, the seat belt can only get shorter

### INSTRUCTOR NOTES:

- Only talk about only the two retractor types that can provide pre-crash locking.
- The other type is separated out to avoid confusion and is discussed in the next chapter.
- Technicians should be aware that some vehicles have up to five different seat belt systems in one vehicle alone.
- Once outside, remember to demonstrate the dead zone on an ALR retractor.

### CLASSROOM NOTES:

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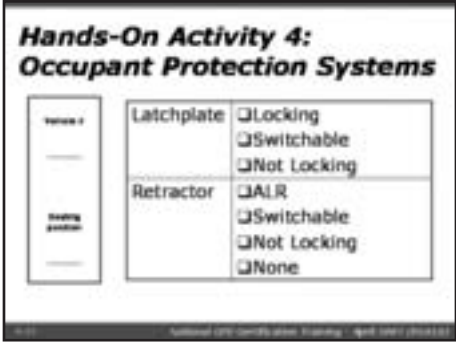












**Activity 4: Occupant Protection Systems**

Instructions: When you go outside, the vehicles should be numbered and certain seating locations will be marked.

- Identify the seat belt latchplate and retractor for the assigned vehicle and seating location. You will do this on two vehicles.
- This is not a test right now, but you will be tested on this later in the course.

Vehicle # _____	Latchplate: <input type="checkbox"/> Locking <input type="checkbox"/> Switchable <input type="checkbox"/> Not Locking
Seating position _____	Retractor: <input type="checkbox"/> ALR <input type="checkbox"/> Switchable <input type="checkbox"/> Not Locking <input type="checkbox"/> None

Vehicle # _____	Latchplate: <input type="checkbox"/> Locking <input type="checkbox"/> Switchable <input type="checkbox"/> Not Locking
Seating position _____	Retractor: <input type="checkbox"/> ALR <input type="checkbox"/> Switchable <input type="checkbox"/> Not Locking <input type="checkbox"/> None

Vehicle # _____	Latchplate: <input type="checkbox"/> Locking <input type="checkbox"/> Switchable <input type="checkbox"/> Not Locking
Seating position _____	Retractor: <input type="checkbox"/> ALR <input type="checkbox"/> Switchable <input type="checkbox"/> Not Locking <input type="checkbox"/> None







## CLASSROOM NOTES:

### Activities total time: 35 minutes.

- Activity 1: Identifying Latchplates and Retractors (outside)—10 minutes.
- Demonstration: How to Use a Locking Clip (inside)—5 minutes.
- Demonstration: Belt-Shortening Clip—5 minutes.
- Activity 2: How to Use a Belt-Shortening Clip (inside)—5 minutes.
- Activity 3: What Would You Do to Provide a Pre-Crash Locked Seat belt—10 minutes.

### Materials needed for chapter:

- Sample owner's manual sections.
- Lengths of seat belt webbing (one 24- to 36-inch piece per student).
- Locking clips (one per student).
- Belt-shortening clips (one per student team).
- CR with short belt path (for belt-shortening CR installation demonstration).
- Seat belt simulator or vehicle seat with lap-only and lap-shoulder belt options.
- Vehicle with lap-shoulder seat belts with ELR and sliding latchplate.
- Vehicle with lap-only seat belt with sewn-on latchplate and ELR. *If such equipment is not available, learn by doing the following:* Fully extend a manual lap-only belt with latchplate at the end or ALR with clip, keeping the fully extended webbing from going back into the retractor.

### Teaching Tips:

- While all seat belts are designed to lock in a crash, this chapter looks at seat belt systems that require the user to use an approved additional step to secure a CR to provide the pre-crash locking feature. This chapter is best taught in the vehicles. Before teaching this chapter, be sure to complete the pre-chapter activities.











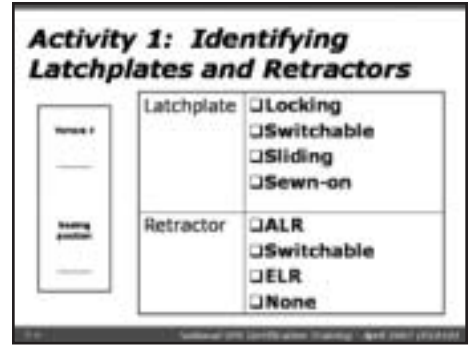




### Activity 1: Identifying Latchplates and Retractors

Instructions: By this time, you have learned all the different types of retractors and latchplates in the classroom. Now you will have a chance to see them in vehicles.

- Your instructor team will demonstrate how each latchplate or retractor without pre-crash locking features works.
- You will inspect two or three vehicles and figure out the latchplate and retractor type for a certain seating position in a specific vehicle.
- Write the vehicle number and seating location to the left of the box for each vehicle.
- This is not a test right now, but you will be tested on this later in the course.



<b>Vehicle #</b> _____	<b>Latchplate:</b> <input type="checkbox"/> Locking <input type="checkbox"/> Switchable <input type="checkbox"/> Sliding <input type="checkbox"/> Sewn-on
<b>Seating position</b> _____	<b>Retractor:</b> <input type="checkbox"/> ALR <input type="checkbox"/> Switchable <input type="checkbox"/> ELR <input type="checkbox"/> None

<b>Vehicle #</b> _____	<b>Latchplate:</b> <input type="checkbox"/> Locking <input type="checkbox"/> Switchable <input type="checkbox"/> Sliding <input type="checkbox"/> Sewn-on
<b>Seating position</b> _____	<b>Retractor:</b> <input type="checkbox"/> ALR <input type="checkbox"/> Switchable <input type="checkbox"/> ELR <input type="checkbox"/> None

<b>Vehicle #</b> _____	<b>Latchplate:</b> <input type="checkbox"/> Locking <input type="checkbox"/> Switchable <input type="checkbox"/> Sliding <input type="checkbox"/> Sewn-on
<b>Seating position</b> _____	<b>Retractor:</b> <input type="checkbox"/> ALR <input type="checkbox"/> Switchable <input type="checkbox"/> ELR <input type="checkbox"/> None



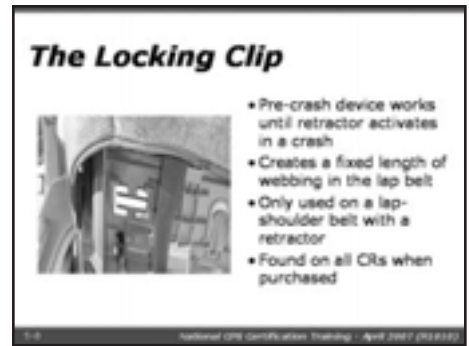






Locking clips are used only on seat belts as recommended by the vehicle manufacturer

- A locking clip clamps the tightened vehicle lap and shoulder belt together at the latchplate to make the lap belt a fixed length.
- It is the fixed length lap belt that locks a CR in place.
- Locking clips or lock-offs are used on lap and shoulder belts that have a sliding latchplate (no pre-crash lockability) and an ELR (no pre-crash lockability).
- Locking clips come on the CR from the factory.
- They can be permanently attached to the CR (lock-off) or can be separately stored on the CR for removal and use by the consumer. Either a lock-off or locking clip is safe to use. They perform the same function.
- A locking clip makes the seat belt lock pre-crash, so the CR does not move more than 1 inch side-to-side or front-to-back at the belt path.
- Locking clips should be placed according to the manufacturer instructions. Unless instructed otherwise, place the locking clip about 1 inch from the buckle
- Properly installed locking clips may bend or come off in a crash—that is OK because the ELR will take over for it at that point.
- Incorrect placement of the locking clip can lead to too much slack in the seat belt in a crash and can result in serious injury to child.



## INSTRUCTOR NOTES:

- Show locking clip locations on CR. Show built-in lock-off on a newer seat.
- Explain the need to place the locking clip about 1 inch from the buckle.
- Explain about the required fixed length of webbing needed to secure a CR.
- Explain that students will test to see that the lap belt is at a fixed length by giving a firm pull on the lap portion of the seat belt once the locking clip has been added and the seat belt is re-buckled.
- If showing the locking clip installed on the lap-shoulder belt without a CR, give a firm pull upward on the lap portion of the belt to show how it does not change in length.

## CLASSROOM NOTES:

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## Lap-Shoulder Belt Only—How to Use a Locking Clip

### Instructions:

- Watch as your instructor demonstrates how to put a locking clip on a lap-shoulder seat belt on the demonstration seat.
- When you go outside, your instructor will show you how the locking clip works in vehicles where the lap-shoulder seat belt needs an additional step to lock pre-crash.
- Installing the locking clip is easier if two people are involved, but remember that it is possible to do this alone.
- While one person applies weight on the seat, the other person buckles and tightens the lap-shoulder seat belt.
- Pinch and hold the two tightened seat belt parts together, unbuckle the belt and place the locking clip **near the latchplate**.
- It does not matter how the locking clip is attached. There is no up or down for the prongs, as long as all four locking clip prongs are visible.
- Apply pressure on the seat and re-buckle the seat belt. It may be hard to re-buckle because now the lap part of the seat belt, the part that goes through the CR, is locked tight at a fixed length.
- Test the pre-crash locking mode by firmly pulling up on the lap portion of the seat belt.
- You will learn how to test the CR to be sure it moves no more than 1 inch side-to-side or front-to-back later in the course.
- With practice, placing the locking clip on the lap-shoulder seat belt can be done in a few minutes.



## INSTRUCTOR NOTES:

### Demonstration: Lap-Shoulder Belt Only—How to Use a Locking Clip

Instructions: Remember that this chapter is looking at vehicle hardware and equipment only. CR installation is covered later and in greater detail in the individual CR chapters. This is a demonstration opportunity.

- Using a real vehicle if possible or a demonstration seat belt system, show students how the locking clip creates a fixed length of webbing in the lap portion of the seat belt.
- You will show locking clip use in a vehicle with a CR when you go outside at the end of the chapter.

## CLASSROOM NOTES:

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- The belt-shortening clip takes the place of the retractor, as all the webbing is pulled out of the casing and shortened with the belt-shortening clip.
- Belt-shortening clips can be purchased from auto dealers (approximate cost is \$7 to \$14).
- Use belt-shortening clips as a last resort. Carefully assess all other alternatives before using this clip.
- Frequently, this type of seat belt is found in the front seat of an older car with a motorized shoulder belt and a separate lap belt.

- Often you can move a CR to a back seat location, but in some vans and school buses there will be no other seating position.
- There are times when only a belt-shortening clip will provide pre-crash locking lap belts because neither the lap belt nor the latchplate locks.

**Demonstration: Belt-Shortening Clip**

Your instructor will demonstrate how you should use a belt-shortening clip, as follows:

- Pull the lap belt (on an ELR) fully out of the casing, fit the seat belt to the CR size, then pinch and lock off the extra webbing with the belt shortening clip. This clip is strong and durable and actually takes the place of the retractor in a crash.
- While the stronger belt-shortening clip could be used in place of a regular locking clip (that comes free with a CR), the regular locking clip never takes the place of the belt-shortening clip to lock off webbing.
- The belt shortening clip also has one extra doubling of webbing to ensure that the seat belt never slips.
- Incorrect use of the belt-shortening clip can result in serious injury or death.

**CLASSROOM NOTES:**

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**INSTRUCTOR NOTES:**

**Demonstration: Belt-Shortening Clip**

- Pass around a belt-shortening clip and a regular locking clip so students can see how similar both clips look.
- Stress the difference between the two clips frequently.
- Explain when you would use a belt-shortening clip.
- Again, make sure that the instructor team is comfortable with this application.



## CLASSROOM NOTES:

- There are some tips for getting a good fit during installation of the belt-shortening clip. If the CR must be installed in a vehicle front seat that has a motorized shoulder belt and a separate manual lap belt, follow the steps below.
  1. Unbuckle the shoulder portion of the belt.
  2. Place the CR on the vehicle seat and pass the seat belt through the CR at the belt path.
  3. Buckle the seat belt.
  4. Pull all excess webbing out of the retractor and pinch the extra webbing to make the lap portion of the seat belt as tight as possible.
  5. Once you have pinched the webbing together and the seat belt is tight, unbuckle the seat belt and place the belt-shortening clip close to the retractor.
  6. Demonstrate the special way to thread the webbing through the belt- shortening clip, remembering to double back that last piece of webbing to make the loop.
  7. Once the clip is on, re-buckle the belt and check tightness of CR side to side and front to back at the belt path.
  8. Move the vehicle seat forward until the belt is fully tightened.

**Activity objective:** Students will understand how to use and explain use of the belt-shortening clip.

### Play Video

Video demonstrates how to install a child restraint in the front seat of vehicle equipped with a door-mounted automatic shoulder belt and separate ELR lap belt. Note that this vehicle does not have a passenger-side front air bag.

Video courtesy of NHTSA.







**Problem Solving:  
Locking Latchplate Slips**

- Webbing loosens when firmly pulled up
- CR moves more than 1 inch
  - Flip the latchplate to change angle - **OR**
  - Twist the buckle stalk to shorten buckle webbing - **OR**
  - Use a locking clip if it is a lap and shoulder belt as a last resort
- Check for tightness

- Sometimes when a seat belt passes through the CR belt path as directed by the manufacturer, the latchplate will be positioned so that the pre-crash locking mechanism is tilted and does not hold the CR tightly.
- The seat belt is most probably not broken — just out of position (remember that the webbing and the latchplate must be flat).
- There are three approved steps to fix this condition.
  1. flip the latchplate over one time to shorten the seat belt slightly. This changes the locking angle. Always test the seat belt to be sure it remains locked tightly.
  2. Twist the buckle stalk if it is flexible.
  3. Use a locking clip on a lap-shoulder seat belt with a locking latchplate as a last resort after flipping the latchplate and twisting the anchor stalk first to keep the seat belt from pulling out.

- Tests done at the IMMI Child Division in September 1998 found that seat belt buckle stalks could be safely twisted for use with child restraints without taking away the strength set by the Federal standard. The buckle may be safely twisted as long as the vehicle manufacturer approves. IMMI is a seat belt manufacturing company. (See IMMI letter in Appendix for more details).
- Remember to check the vehicle owner’s manual to see if a different method to prevent the latchplate from slipping is recommended.
- It is important to remember to check the manufacturer’s instructions for both items, as some buckles cannot be twisted and some latchplates cannot be flipped.

CLASSROOM NOTES:

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INSTRUCTOR NOTES:

- Explain and then demonstrate the position that some latchplates take when they are placed at the belt path.
- Explain how this causes some seat belts to slip. By flipping the latchplate one time, it re-positions the seat belt so it and the latchplate can lie flat together or parallel. This now enables the seat belt to remain locked pre-crash.
- Show and remind students to check that the seat belt always remains locked by pulling up firmly on the lap belt.
- Sometimes you need to twist the buckle stalk if it is flexible to shorten it and allow the latchplate to come













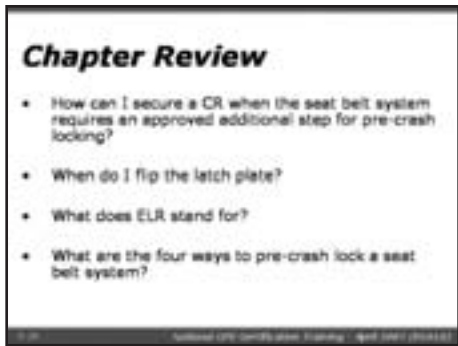












- How can I secure a CR when the seat belt system requires an approved additional step for pre-crash locking?
- When do I flip the latch plate?
- What does ELR stand for?
- What are the four ways to pre-crash lock a seat belt system?

**Types of Seat Belt Systems and Approved Additional Steps\* Needed to Pre-Crash Lock the Lap Belt**

Type of Seat Belt and Retractor	Type of Retractor			
	Emergency locking retractor	Automatic locking retractor	Switchable retractor	No retractor
Lap-shoulder belt with switchable latchplate	Switch latchplate to "car seat" position	N/A	N/A	N/A
Lap-shoulder belt with sliding latchplate	Locking clip	None	None	N/A
Lap-shoulder belt with locking latchplate	None**	None	None	N/A
Lap belt only with sewn latchplate	Belt shortening clip	None	None	N/A
Lap belt portion of Lap-shoulder belt with sewn latchplate	Belt shortening clip	None	None	N/A
Lap belt with locking latchplate	N/A	N/A	N/A	None

This is a general guide and does not apply to ALL latchplate-belt systems. Carefully read the vehicle owner's manual for more information.

\* N/A = Not applicable. Vehicles are not equipped with this combination of belt type, latchplate, and retractor. None = Lap belt can be pre-crash locked with no additional steps.

\*\* Some locking latchplates, when used to install child restraints, may fail to lock belts in place. Try flipping latchplate 180° or twisting the buckle stalk. If that doesn't work, in some cases, a locking clip may be used.

**CLASSROOM NOTES:**

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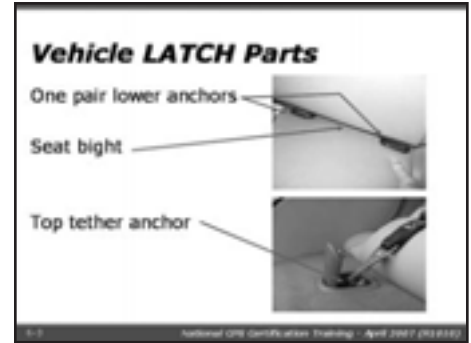
**INSTRUCTOR NOTES:**

- Review the content covered in this chapter.
- Refer students to the "Installation of Child Restraints with Different Types of Seat Belts" as an additional installation reference.





- Lower Anchors and Tethers for Children (LATCH) is a system used to make CR installation easier in vehicles.
- In LATCH use, both the CR and the vehicle must have LATCH parts that work together.
- Look in the owner's manual to know if a vehicle has LATCH and where each LATCH seating position is found.
- LATCH attaches the CR to the vehicle through anchor points installed in the vehicle and through anchor hooks attached to the CR.
- Each device, either LATCH or seat belt, secures the CR to the vehicle and offers protection established by the Federal safety standard.
- Each LATCH set in the vehicle is made up of two lower anchor bars and one top tether anchor. If there are lower anchors in a seating position, there is usually a top tether for that seating position.
- Convertibles, sports cars, and some very heavy trucks need not have top tether anchors. These vehicle anchors and hooks, when used together with a CR that also has LATCH attachments, create a system that holds the CR firmly against the vehicle seat when used properly.
- Most rear-facing CRs use the lower anchors only (no tether).
- You will learn about rear-facing tether use later in the course.
- Almost all cars, vans, SUVs, and some extended cab trucks made after 2002 have at least three top tethers and two lower anchor sets.
- A seating position with a top tether only and no lower anchors would not be called LATCH. That seating position would use the top tether and seat belt to secure a CR.
- Top tether anchors are sometimes called top straps in owner's manuals, and are frequently the last item discussed under the CR section (a useful tip if you are having trouble locating that term in the manual's index).
- A top tether holds the back of the CR firmly against the vehicle seat to make it more secure and reduce the amount of forward and side movement.
- A top tether can reduce the distance that the child's head moves forward by 4-6 inches and can thus lessen the risk of head injuries in a crash. In many vehicles, especially those with small back seats, this provides more protection for child occupants.
- **You should remind parents to use top tethers whenever possible.**
- You may also find an approved integrated (or built in) CR in place of one of the LATCH positions required by NHTSA. These positions can be found in the owner's manual.
- If a lower anchor or top tether is hidden behind fabric or a cover in the vehicle, a symbol will identify the LATCH locations.



















































- Air bags can be almost anywhere in a vehicle, so proper positioning and use of restraints are needed to prevent injury when a crash happens and an air bag opens suddenly. Child occupants are at great risk for injury if they are not properly positioned to benefit from the air bags.
- Read the owner's manual very carefully and assume all air bags are fully active unless the owner's manual says something different. If there are any questions, advise the vehicle owner to contact the vehicle maker.
- Avoid having your body or other objects blocking the air bag. Occupants should always sit in an upright position, buckled into the seat belt.



#### Driver air bag:

- Generally opens in frontal crashes
- Found in the steering wheel

#### Front seat passenger air bags:

- Generally open in crashes that occur in the front of the car
- Some cover middle and right front passenger seating positions, some only the right front seating position.
- Found in instrument panel

#### Side air bags:

- Generally open in crashes that occur on the side of the car
- Found in the door or the vehicle seat

#### Inflatable curtains:

- Generally open in crashes that occur on the side of the car or when the car rolls over
- Cover one or more rows of seats
- Found above doors at the edge of the roof

#### Knee air bags:

- Generally open in crashes that occur in the front of the car
- Found under steering columns or lower instrument panel



- Air bags offer powerful protection to people in the vehicle who are correctly seated and restrained. The air bag adds extra protection to the adult head and chest in a crash.
- Children who are seated in front of air bags are generally much shorter than adults and therefore must be securely restrained by shoulder belts to keep the head and shoulders back and away from the air bag.
- It is recommended that all children under 13 ride in a back seat to avoid contact with the front seat air bag system. They are almost always safer in the back seat.
- Using the air bag with a seat belt system allows the impact from the crash to spread over a very large part of the occupant's body. This helps occupants take less impact on a smaller part of the body.
- Air bags are released once and must be replaced after a crash.
- Air bags are released at different impact forces, which vary by model year of the vehicle and many other factors.
- Older vehicles may have more powerful air bags.
- All occupants must be properly positioned in front of the air bag and wearing their seat belt correctly to gain the best benefit from the air bag.
- Occupants must be prepared at all times for a crash.

#### **How Do Air Bags Protect People?**

- Spread the crash forces over a large part of the body
- Are used one time only; must be replaced after a crash
- Must be used with seat belt

#### **Key Point:**

- If there is no owner's manual present in the vehicle, a parent should contact the vehicle maker to obtain correct information about the vehicle's air bags. If this is not possible, then the best practice is to not put a CR near an active air bag.

#### **INSTRUCTOR NOTES:**

- Stress the need for students to understand that seat belts and air bags work together to provide protection to vehicle occupants.

#### **CLASSROOM NOTES:**

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Rear-facing infants must never ride in front of an active air bag. In this section, you will learn that some air bags:

- Can be shut off by the owner
- Can be disabled by a mechanic with written permission from the NHTSA. Vehicle owners who have permission to shut them off may have a hard time finding a garage or dealership to do it.
- May have a vehicle sensor that can tell when a CR is in the front seat.
- The owner’s manual can tell you if an air bag was present at the time the vehicle was made. Used vehicles may show a label when in fact the previous owner may have had the air bag shut off.



A vehicle owner may have an air bag on-off switch installed if:

- A rear-facing infant must be transported in the front seat.
- Children under 13 must be transported in the front seat.
- Drivers cannot change their driving position (10 inches from the air bag).
- There is an existing medical condition that would warrant deactivation.

To apply for an air bag on-off switch, the vehicle owner:

- Must read an informational brochure.
- Send a written request to NHTSA (visit <http://www.safercar.gov> and click on air bags under Equipment and Safety).

See Appendix for more information about the on/off switch application.

**INSTRUCTOR NOTES:**

Help students understand how important it is to know what the markings mean.

**CLASSROOM NOTES:**

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- Throughout the course you will have access to different kinds of child restraints.
- There are changes to new models, so what you see here may not be available next year or next month. Pay attention to labels and become familiar with how different seats look and adjust.
- Parts may be called different things by different manufacturers, such as a lock-off/built-in locking clip or splitter plate/connector.



Following are definitions we will be using for the different parts. We will go into more detail about them later.

- **Buckle:** Where the harness locks.
- **Harness:** The straps that keep the child in the CR and spread out the crash forces.
- **Retainer clip:** The plastic tie or clasp that holds the shoulder straps together over the child’s chest at armpit level.
- **Harness Adjuster:** This part is used to tighten or loosen the harness.
- **Harness Slots:** The part of the CR where the harnesses go through.
- **Labels:** Information affixed to the CR that is required by Federal standards.
- **Shell/Frame:** The molded plastic structure of the CR.
- **Seat Padding:** This covers the shell and/or frame.
- **Instruction Book/Storage Location:** both are required

**INSTRUCTOR NOTES:**

- Be sure students have access to a CR to follow along as you explain the different parts of the CR.
- This is a **show and tell** part of the class. Students should work in pairs/teams with a car seat on hand as you explain the parts and pieces.
- Do not go into full detail.
- Be brief. Stay simple.

**CLASSROOM NOTES:**

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Things to consider:

**Can I use my car seat after a crash?**

- What is NHTSA’s policy?
- What does the CR manufacturer say?

**I bought this seat at a garage sale. Is it safe to use?**

- Does parent/caregiver know crash history? If so, how has it been stored?
- Are all the parts in good working order?

**I don’t know why my kids have to ride on car seats. Why should they use them?**

- How do CRs provide protection?
- How effective are CRs?

**Can I use this head padding?**

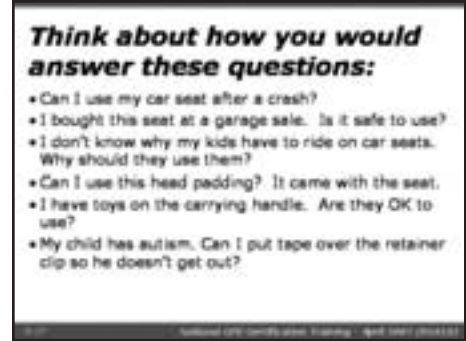
- Did it come with the CR?
- If it is approved by the CR manufacturer, yes.

**I have toys on the carrying handle. Are they OK to use?**

- Did they come with the seat?
- If not, has the CR manufacturer provided or expressly approved the toys as “matching”?

**My child has autism. Can I put tape over the retainer clip so he doesn’t get out?**

- Are you following CR manufacturer instructions?
- What are some other options that would provide the most protection?



**INSTRUCTOR NOTES:**

**CLASSROOM NOTES:**

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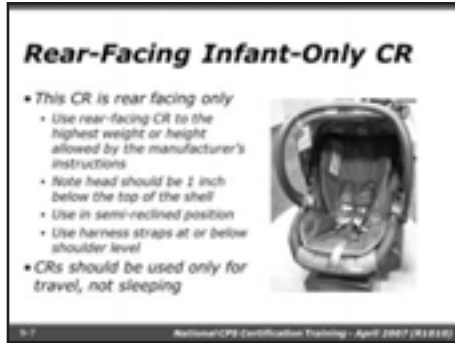












- The infant seat is designed to be used rear facing only.
- Many parents/caregivers may be tempted to place the infant seat forward facing to allow them to view their child more easily. This is a serious error and places the child at a significant risk of injury/death in the event of a crash.
- Parents need to understand why it is important for infants to always ride facing the rear.
- Some CR manufacturers recommend that infants under 5 pounds not be placed in their products. Always check the CR label for the starting weight. Some CRs say birth; others state a specific number of pounds.
- Do not use the rear-facing seat above the weight or height limits designated by the manufacturer. Once child outgrows seat move to a rear-facing convertible seat with a higher weight rating.
- The top of the child's head should be well contained within the shell (unless the manufacturer's instructions state otherwise) not less than 1 inch from top of shell.
- The harness needs to be snug and to hold the infant down in the seat so he/she does not slide up in a crash and suffer ejection from the car.
- CRs should be used only for travel. Sleeping children should be removed from their car seats in the home or at child care and placed in a crib that is free from pillows, blankets, stuffed animals, loose sheets, bumper pads, etc.

Appendix—American Academy of Pediatrics, “Car Safety Seats: A Guide for Families 2007”

Appendix—American Academy of Pediatrics’ Clinical Report, “Safe Transportation of Preterm and Low Birth Weight Infants at Hospital Discharge”

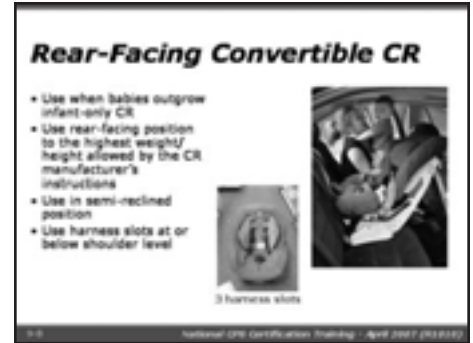
## INSTRUCTOR NOTES:

Point out the labels, including air bag label and weight/ height limits on the CRs.

- Point out that students should encourage parents/caregivers to use the rear-facing CR to the highest weight or height allowed by the CR manufacturer. This applies even if the child has reached 1 year of age and 20 pounds.
- Provide students with suggestions on ways to ease parents’ need to see the baby during driving. For example, babies sleep through the night without being under the parents’ watchful eye. If the CR is installed correctly, the baby should be fine.
- Refer students to the AAP Guidelines for Selecting Child Safety Seats.
- Refer to and discuss the “CRs should be used only for transporting children” Instructor Notes on the following page.



- Most new convertible CRs are approved for rear-facing use with up to 30- to 35-pound children and should be considered for infants whose weight and/or height have exceeded the limits of the rear-facing-only CR.
- *Always* check the CR manufacturer's instructions for upper and lower weight/ height limits.
- Parents may wonder if legs are at risk for injury. Children commonly sit with their legs crossed or resting on the back of the vehicle seat. Risk of injury to legs in a crash is low, and injuries to the lower extremity are usually less severe with fewer long-term complications than injuries to the head, neck, or spine, which occur more commonly when a child is seated in the forward-facing position.
- Because the rear-facing position is safest, children should ride rear facing as long as possible (but never exceed the manufacturer's weight and height limits).
- Older children with poor head control who are within height and weight requirements of a CR benefit from staying rear facing longer.



*[Instructor Notes continued from page 184]*

- Stress to students that CRs should only be used for transporting children.
  - When caregivers, new parents or parents-to-be attend a checkup event, technicians are in a great position to talk to them about safe sleep practices for their baby. While car seats are designed to hold sleeping babies during travel, many children are kept in their car seats long after travel is complete.
  - Since parents may feel comfortable with baby in the car seat, they may be tempted to leave the child harnessed but unattended. They may even loosen the harness (making it easy for baby to slouch or “submarine” into the webbing.) This can be dangerous.
  - Parents should break the “never wake a sleeping baby” rule. As recommended in the May 2009 American Academy of Pediatrics’ Clinical Report, “Safe Transportation of Preterm and Low Birth Weight Infants at Hospital Discharge,” parents/caregivers are “advised that the duration of time the infant is seated in a car safety seat should be minimized. Parents should be advised that car safety seats should be used only for travel.”
  - Sleeping children should be removed from their car seats in the home or at child care and placed in a crib that is free from pillows, blankets, stuffed animals, loose sheets, bumper pads, etc.
  - Car seats should be used for car travel—not for sleep in the home or daycare! Each child deserves his or her own sleeping space that offers a safe environment.
  - Refer students to [www.cribsforkids.com](http://www.cribsforkids.com) for additional information

## INSTRUCTOR NOTES:

- Stress the importance of following the CR manufacturer's instructions.
- Refer students to the AAP Clinical Report, “Safe Transportation of Preterm and Low Birth Weight Infants at Hospital Discharge” in the Appendix for additional information.

















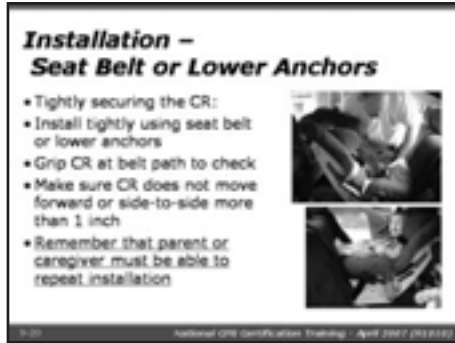












- CR must be installed with a seat belt or with lower anchors—usually not both. While the systems are different, they are equally safe.
- CRs have not been tested with both systems being used together. Some manufacturers allow this now or at may at some time in the future, so always be sure to read both the vehicle and CR instructions for help.
- General methods to obtain a tight installation:
  - Place CR on vehicle seat in the proper direction and at the correct recline angle.
  - Place the seat belt through the belt path as directed by the manufacturer.
  - Place hand in the CR to compress the vehicle seat cushion.
  - Buckle, tighten, and lock the seat belt or lower anchorage system.
  - Remember that the CR should not move forward or side-to-side for more than 1 inch.
- Be sure to check CRS installation for tightness before each use.
  - To test the installation, grip the CR at or near the belt path and pull on the CR. There should be no more than 1 inch of side-to-side or forward movement at the belt path.
- Many parents who mistakenly grab their rear-facing CR near the baby's head (instead of near the belt path) think the CR is not installed properly because it moves more when tested at this point.
- To reduce the risk of entanglement from unused seat belts, technicians should educate the caregiver to evaluate and note unused seat belts that may be within reach of a child. If possible, switch the retractor to ALR mode to lock the unused seat belt against the seat back. Refer to vehicle and CR owner's manuals for guidance.

## INSTRUCTOR NOTES:

- Using a vehicle seat or a dial-a-belt seat, demonstrate to the class how to attach a CR tightly to a vehicle seat.
- Inform students that to reduce the risk of entanglement from unused seat belts, technicians should educate the caregiver to evaluate and note unused seat belts that may be within reach of a child. If possible, switch the retractor to ALR mode to lock the unused seat belt against the seat back. Many vehicle and child restraint manufacturers provide guidance in their owner's manuals. As always, follow the child restraint and vehicle manufacturer instructions. This includes seating positions when LATCH is used, shoulder belts on booster seated children, as well as unused belts next to the CR.





















**Activity 2: Selection and Installation Hands-On**

- In small groups, you will select and install CRs by children's age/weight/height.
- A child (card with age, weight/height) will be assigned to your team.
- Select an appropriate CR for your child.
- Adjust harnesses to fit your child.
- Install a rear-facing infant only CR (with or without a base) or a rear-facing convertible CR in a vehicle using:
  - Lap belt only
  - Lap and shoulder belt
  - Lower anchors
- Repeat the CR selection, harness adjustment, and 3 installations for the type of CR (rear-facing infant only or rear-facing convertible) not chosen the first time.

**Activity 2: Selection and Installation**

**Instructions:** In small groups, you will select and install CRs by children's age/weight/height. A child (card with age, weight/height) will be assigned to your team.

Each group should:

- Select an appropriate CR for your child.
- Adjust harnesses to fit your child.
- Install a rear-facing infant only CR (with or without a base) or a rear-facing convertible CR in a vehicle using:
  - Lap belt only
  - Lap and shoulder belt
  - Lower anchors
- Repeat the CR selection, harness adjustment, and 3 installations for the type of CR (rear-facing infant only or rear-facing convertible) not chosen the first time.

Table for worksheet installation exercise – RF

Seat to Install	How does the belt lock?	Instructor Initials
Infant only without a base	Retractor: Latchplate: How does it pre-crash lock?	
Infant only with a base	Retractor: Latchplate: How does it pre-crash lock?	
RF convertible	Retractor: Latchplate: How does it pre-crash lock?	

**CLASSROOM NOTES:**

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**INSTRUCTOR NOTES:**

**Activity 2: Selection and installation — 30 min**

**Instructions:**

- “Refer to instructions in Student Notes above.”

**Materials:**

- “Child cards.”
- Rear-facing infant and convertible CRs for each team.























**CLASSROOM NOTES:**

put different stress on the CR in a crash and may hurt CR performance.

*Should I use a tether on my rear-facing convertible seat?*

**Answer:** A rear-facing child restraint should never be tethered unless recommended by the CR manufacturer.

*I want to see my baby. May I turn him around?*

**Answer:** AAP and NHTSA recommendation:

**AAP:**

Children should face the rear of the vehicle until they are at least 1 year of age and weigh at least 20 lb to decrease the risk of cervical spine injury in the event of a crash. Infants who weigh 20 lb before 1 year of age should ride rear facing in a convertible seat or infant seat approved for higher weights until at least 1 year of age. If a car safety seat accommodates children rear facing to higher weights, for optimal protection, the child should remain rear facing until reaching the maximum weight for the car safety seat, as long as the top of the head is below the top of the seat back.

**NHTSA's Step 1:**

For the best possible protection keep babies in the back seat, in rear-facing child safety seats, as long as possible up to the height or weight limit of the particular seat. At a minimum, keep babies rear-facing until an age 1 and at least 20 pounds.

**Activity objective:** For students to understand how to explain tough choices and best practices.





















**CLASSROOM NOTES:**

- CR with harness adjuster: metal slide.
- CR with harness adjuster: front adjustment.
- Forward-facing convertible— Sit N’ Stroll— photo.
- Forward-facing convertible— combo and forward facing only with rigid LATCH.
- Forward-facing convertible— combo and forward facing only with flexible LATCH.
- Forward-facing convertible— combo and forward facing only with tether.
- Forward-facing convertible— combo and forward facing only to higher weight limits.
- Aftermarket or non-regulated products/ other—padding, etc.
- NHTSA recall list.
- Child passenger checklist (Checkup Form to be used at checkup event associated with class).
- Vehicle with integrated seat.
- Safety vests.
- LATCH/Tether Manual.
- Child cards.
- Role play cards for Optional Activity 3.
- Seat belt simulation or belt Demonstration Seat.

**Appendix Materials:**

- Transporting Children with Special Health Care Needs































**Activity 1: Harness Adjustments**

- Child's back and bottom flat in CR
- Correct harness slots and crotch strap slot
- Harness snug (pinch test)
- Retainer clip at armpit level
- Use to highest weight and height limits



10-14 National CPS Certification Training, April 2007 (R10/10)

- Bulky clothing can interfere with proper harness fit. Avoid bulky clothing or padding behind child's head or back or under buttocks. Bulky jackets can be put on backwards (over child's arms and torso) after harness is secured. Place blankets over and around child after harness is snug.
- Children should sit with:
  - Back and bottom flat against CR seat back.
  - Harness placed through proper slots.
  - Harness straps placed over shoulders and buckled at the crotch.

- A snug harness lies flat and passes the pinch test. Tighten harness straps snugly.

**Activity 1: Harness Adjustments Height and Weight Limits**

**Instructions:**

**Part 1:** Harness adjustment for height.

- You will be placed in a small group.
- Your group will work with a forward-facing CR and doll and will move the harness to a different, higher harness slot. Adjust the harness to loosen and tighten.
- Adjust the seat's harness so it fits the doll.
- Look at the location of the harness adjustments. Is it in the front or on the back of the CR? Is it easy to use (width of CR, comfort/color, easy to install in vehicle)?
- Always use the manufacturer's instruction manual.

**CLASSROOM NOTES:**

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**INSTRUCTOR NOTES:**

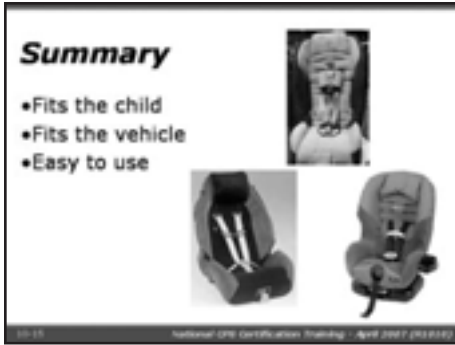
**Activity 1: Harness Adjustments — 10 minutes**

**Instructions:** Students will work in small groups.

**Activities:** Harness adjustment for height; Identify maximum height and weight limits. Identify Reinforced slots.

- Students will review labels to identify height and weight limits.
- Each group will work with a forward-facing CR and doll and will move the harness to a different, higher harness slot. Adjust the harness to loosen and tighten.





- The seat should be correct for the child’s age, size, physical development, and behavioral needs. Try before you buy is always a good plan.
- Fits the child:
  - Appropriate for weight and height of child.
  - Harness straps at or above the shoulders.
- Once parents have selected a CR that fits their child, they should try it in their vehicle to make sure they can install it securely. Check:
  - Vehicle seat type and size (contoured, bench, captain).
  - Whether it works with seat belt or LATCH system.
- The seat should be easy to use with respect to:
  - Front versus back harness adjustment.
  - Ease of use with seat belt or LATCH system.

CLASSROOM NOTES:

INSTRUCTOR NOTES:

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**Activity 4: Selection and Installation**

**Instructions:**

- Team members will select a CR, adjust it properly, and then install it in a vehicle correctly.
- Then, working in student teams, you will become caregivers of a child with a specific age, weight, height, or special need.
- You will select the correct CR for the child, adjust the harness straps and angle, and determine the belt path.
- Then your team will work together to install your CR.

**Activity 4 : Selection and Installation Outside Practice - Hands-On**

Using the information on "your child":

- Set up the CR so it is correct for the child, (harness, angle, lower anchors, etc.)
- Install a forward-facing convertible CR and forward-facing-only CR in vehicles
- You will also find one scenario with a CR misuse and you will diagnose what the misuse is.

Table for worksheet installation exercise – FF

Seat to Install	How does the belt lock?	Instructor Initials
FF convertible	Retractor: Latchplate: How does it pre-crash lock?	
FF with harness	Retractor: Latchplate: How does it pre-crash lock?	
Students choice - _____	Retractor: Latchplate: How does it pre-crash lock?	

- One misuse scenario will be setup by the instructors. Use the basic checklist below to record any misuses found.

CR HARNESSING:	Circle	CR INSTALLATION:	Circle
Type harness/shield best for age/size of child ....	Y N na	CR installed in active front/side air bag position	Y N na
All parts present & good condition .....	Y N na	Overall, best seating position being used .....	Y N na
Straps around frame/shell & thru slots correctly .	Y N na	Correct front/rear-facing position .....	Y N na
Straps & harness/shield fit correctly .....	Y N na	Correct recline angle used .....	Y N na
Retainer clip positioned correctly .....	Y N na	Seat belt routed correctly .....	Y N na
Harness adjustment mechanism locked .....	Y N na	Seat belt locked .....	Y N na
Harness snug enough .....	Y N na	Lower LATCH attached correctly .....	Y N na
		Tether installed and used correctly .....	Y N na
		Installation tight enough (No more than 1") .....	Y N na















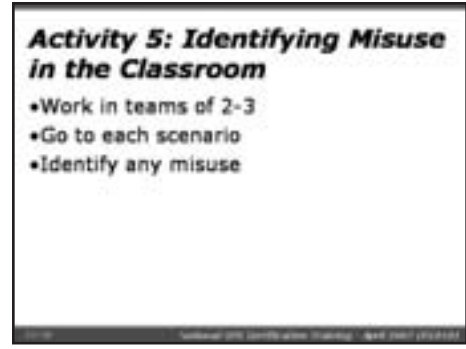


**Misuse Activity (in the classroom)—25 minutes**

In this activity, you will examine scenarios in the classroom. For each scenario, work in teams of 2-3 to identify any misuse.

Carefully look at the provided information regarding child’s age and weight and check CR labels.

Teams will take notes about what they find in their workbooks and then class will review the scenarios as a group.



**What did you find?**

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_
- 8. \_\_\_\_\_

Use the sample checklist below to record your answers for at least one of the scenarios.

Scenario # \_\_\_\_\_

CR SELECTION:	Circle	CR USE:	Circle
RESTRAINT USED:		Type harness/shield best for age/size of child ....	Y N na
<input type="checkbox"/> Rear-facing only <input type="checkbox"/> Convertible		All parts present & good condition .....	Y N na
<input type="checkbox"/> FF w/ harness <input type="checkbox"/> Harness/Vest		Straps around frame/shell & thru slots correctly .	Y N na
<input type="checkbox"/> Shield booster <input type="checkbox"/> Belt position booster		Straps & harness/shield fit correctly .....	Y N na
Type of restraint best for age/size of child ....	Y N na	Retainer clip positioned correctly .....	Y N na
CR Mfg Info:		Harness adjustment mechanism locked .....	Y N na
Mod Name: _____		Harness snug enough .....	Y N na
Mod #: _____		Correct front/rear-facing position .....	Y N na
Mfg Date: _____		Correct recline angle used .....	Y N na
Under Recall: .....	Y N na		

**INSTRUCTOR NOTES:**

**Team time: 15–20 minutes**

**Review time: 8–10 minutes**

- Set up 5-8 scenarios in the classroom for students to identify misuse in small teams.
- Use cards to show students the age and weight of the child. Include CR information so they can check for recalls, time permitting.
- Modifications can be made depending on seats available.

**CLASSROOM NOTES:**

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CLASSROOM NOTES:

**Answer:** Location, direction, tightness (there should be no more than 1 inch of side-to-side or forward movement at the belt path).

4. *How do you find the correct belt path?*

**Answer:** Follow the CR instructions. Locate the correct belt path arrow or label on the CR.

5. *How tightly should a CR be installed?*

**Answer:** To test the installation, grab the CR at or near the belt path and pull on the seat. There should be no more than 1 inch of side-to-side or forward movement at the belt path.

6. *What type of CR may be considered for a child who weighs more than 65 pounds and who has a behavior problem that makes a booster seat a bad choice?*

**Answer:** A forward-facing-only seat with a higher harness weight rating or a vest.

7. *What is the benefit of using a tether?*

**Answer:** A tether reduces the forward movement and rotation of the CR. It also provides more stability during the CR installation.

**Remember, you have one more activity after the chapter review.**

































































- The occupant restraint standards are the same as for passenger cars.
- Some regular-cab and extended-cab pickup trucks with frontal passenger air bags have on-off switches for the frontal passenger air bag.
- CRs are crash tested on forward facing vehicle seats and cannot be secured on a pickup truck’s side facing jump seat.
- Limited rear bench seats may not allow enough space between front and rear seating areas to achieve the correct recline angle for a rear-facing car seat.
- According to CR manufacturers, a CR must have 80% of the base supported by the vehicle seat with no more than a 20% hangover on the front edge of the vehicle seat.
- Cargo areas are not designed for passenger seating under any circumstances.



**INSTRUCTOR NOTES:**

- Refer to vehicle manufacturer manual for additional CR requirements and airbag information.
- Children and adults can be easily thrown from cargo areas at relatively slow speeds as a result of a sharp turn.

**CLASSROOM NOTES:**

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**CLASSROOM NOTES:**

- Write ideas on the white/chalk board/flipchart,
- Discuss if the seat belt system is appropriate for the selected seat/person or CR selected.

**Materials:** workbook, whiteboard or chalkboard

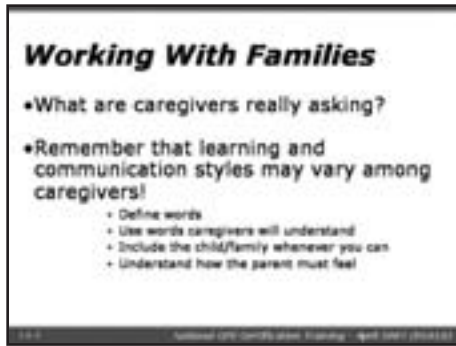
**Time:** 20 minutes (10 minutes for each scenario)

**Activity 1A: Where can everyone sit safely?**

**Answers:**

- Parent #2: Front passenger
- 2 month old: Rear passenger (may swap with 3 year old)
- 3 year old: Rear center (may swap with 2 month old)
- 7 year old: Rear driver (NEED Lap-Shoulder belt system for BPB)





Many CPS words may be confusing to the caregiver. For example:

- “Baby seat” may mean convertible seat to the parent/caregiver.
- “Infant seat” may mean infant carrier to the parent/caregiver.
- CPS may mean child protective services or child passenger safety.

Use words caregivers can understand:

- Some parents/caregivers may not understand the words that technicians use. For example, which makes more sense to the parent/caregiver: “Retractor” or “the part that winds up and stores the seatbelt”?
- Speak in simple terms.
- As a technician, your goal is to help the parent/caregiver use the seat the right way every time.

Include the family:

- When caregivers and children are left out of the process of education, they cannot learn. An important part of the CPST’s role is to decide what caregivers are really asking when they request information and help.
- Use the caregiver’s name, and use the children’s names.

What are they really asking?

- When they ask: “Which car seat is escape-proof?” But mean: “My child can get out of the car seat himself.”
- When they ask: “When can I turn him around?” But mean: “I want to see my child. Why is it safer to face the back?”

Look for information about the vehicle or children that can help you understand what the family may need, so you can communicate better:

- Who is in charge? The parent/caregiver or the child?
- Financial concerns: Old vehicle, old car seats.



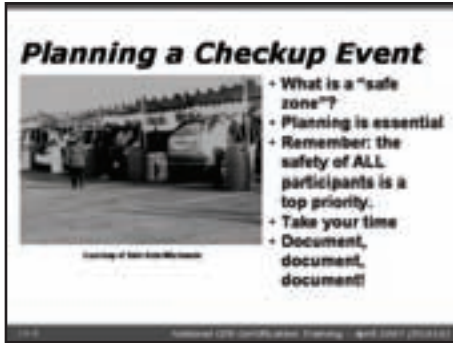












### Activity 3: Planning a checkup event

- The main purpose for conducting a CPS checkup event is to provide a public service to educate and provide needed hands-on assistance to parents and other caregivers.
  - Teams of checkers work with and teach parents/caregivers the basics of correct selection, use and installation of CRs and the proper fit and use of seat belts.
  - Checkup events also provide opportunities to detect unsafe child restraints (recalled, damaged, missing parts or labels/instructions, etc.).
- Course Instructors will be reviewing important information about the end-of-class checkup event you must actively participate in to be eligible for certification as a CPS technician
  - First, it is important to understand how checkup events are planned and operated. Note also that many of the details for setting up and operating a permanent inspection station are similar as those for a “parking lot” event.
  - See “Map It Out” worksheet in the appendix as an example of a diagram to sketch your checkup event traffic flow.

Planning and Operating a Checkup Event—The following are several key issues to consider when planning an event or setting up an inspection station. Additional details may be found in the appendix under “Using Your New Skills” and “CPS Inspections and Checkup Events”.

- Do not wait until the last minute to plan your event!
- Who is your target audience?
- How many families do you expect at the event?
- How much time should be allocated per child seat?.
- Determine who the event coordinator will be. Each event needs a designated event coordinator.
- Conduct a pre-site visit.
- At the event:
  - Physical Environment:
  - Staffing:
- Educate the caregiver by fully involving the caregiver in the checkup
- Have adequate supplies

### What to expect during the end-of-class checkup event

Be sure you understand

- What will be the time allocations per child seat?

- Who will be the event coordinator?
- Which checkup form will be used and how to use it?
- Who will be responsible for reviewing the work of each checkup team?
- Where will supplies—forms, clipboards, recall lists, LATCH manual, CR manufacturers’ instructions, educational materials for caregivers, etc.—be available for technicians

Remember that the safety of all participants is a top priority

- Promote one way traffic flow
- Turn off all vehicle motors
- Watch small children as parents may be distracted
- Walk around every car before starting the engine to be sure there are no children or materials around near or under the vehicle
- Announce “car moving” and guide car to exit

Take your time with conducting the checkup and documentation.

- Ask for help if you need it
- Read instructions and labels
- Fully involve the parent/caregiver in the event
  - Remember the Learn, Practice, Explain teaching method
  - By the end of the checkup, the parent/caregiver should feel confident and competent in their abilities
- Document, document, document
  - Everything you do
  - Advice you give the parent/caregiver
  - Choices the parent/caregiver makes, especially advice the parent/caregiver chooses not to follow
- Due to the sensitive nature of adjusting a child’s harness at the crotch, it is advisable to have the parent adjust the child’s harness under the supervision of the certified technician.
- There will be an event wrap up to talk about what you saw and what you learned.

For more details, refer to “Using Your New Skills” and “CPS Inspections and Checkup Events” in the Appendix.

## CLASSROOM NOTES:

## INSTRUCTOR NOTES:

### Discuss the end-of-class checkup event

Explain to students that there are recommendations for policies and procedures for conducting CPS programs and events. Refer students to “Using Your New Skills” and “CPS Inspections and Checkup Events” in the Appendix. Also refer students to any State-specific policies or procedures for conducting CPS events or setting up programs or services such as CPS Inspection Stations.

Remind students that they must stay for and actively participate in the end-of-class checkup event in order to be eligible for certification as a CPS technician

Be sure participants understand:

- Who has been invited to the course checkup event and how they were recruited. Are they from a local daycare center, library, community group, etc?
- How many families can be expected at the event?
- How will registration be handled?
- What will be the time allocations per child seat?
- Who will be the event coordinator?
- Which checkup form will be used and how to use it?
- Who will be responsible for reviewing the work of each checkup team?
- Where will supplies—forms, clipboards, recall lists, LATCH manual, CR manufacturers’ instructions, educational materials for caregivers, etc.—be available for technicians

Be sure to have a wrap up following the end-of-class checkup

- For all involved to talk about what they saw, what they learned and how it could have been a better event.
- To remind class participants about what to expect following class:
  - When grades will be entered online and processed as CPSTs











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## **National Child Passenger Safety Resources<sup>1</sup>**

April 2007 (R10/10)

### **AAA Foundation for Traffic Safety**

607 14th Street NW  
Suite 201  
Washington, DC 20005  
202-638-5944  
info@aaafoundation.org  
www.aaafoundation.org

AAA Foundation for Traffic Safety is a not-for-profit, publicly-supported charitable educational and research organization that funds research projects designed to discover the causes of traffic crashes, prevent them, and minimize injuries when they do occur. This research is then used to develop educational materials for drivers, pedestrians, bicyclists and other road users.

### **American Academy of Pediatrics**

Publications Department  
141 Northwest Point Boulevard  
Elk Grove Village, IL 60007-1098  
800-433-9016  
847-434-4000  
www.aap.org

The AAP's child passenger safety information includes policy statements relevant to recommendations for transporting children safely. Pamphlets on safety seat use, restraint choice available. Produce a shopping guide for children with special transportation needs and an annual car seat shopping guide.

### **Automotive Safety Program, Riley Hospital for Children**

575 West Drive, Room 004  
Indianapolis, IN 46202  
317-274-2977  
www.preventinjury.org

The Automotive Safety Program provides general consumer information for the State of Indiana. In addition, information is available for transporting children with special needs including ambulance transport safety.

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<sup>1</sup>Please note that this list is not meant to be all inclusive.

**Children's Hospital of Philadelphia**

Center for Injury Research and Prevention  
3535 Market Street, Suite 1150  
Philadelphia, PA 19104  
267-426-6092  
[www.research.chop.edu/programs/injury/](http://www.research.chop.edu/programs/injury/)  
[www.research.chop.edu/programs/carseat/](http://www.research.chop.edu/programs/carseat/)

The Center for Injury Research and Prevention at the Children's Hospital of Philadelphia (CHOP) is a comprehensive pediatric trauma research facility at The Children's Hospital of Philadelphia dedicated to addressing injury, the leading cause of death for children and adolescents.

CHOP maintains the "Keeping Kids Safe During Crashes: Every Child Deserves a Safe Ride" web site that includes videos and other useful information on installing and using child safety seats and on seat belt use for older children and quick tips to help you review the information and links to other online resources.

Partners for Child Passenger Safety now has a Spanish version of their "Keeping Kids Safe" site on their *Cómo mantener a los niños fuera de peligro durante los choques: Todos los niños merecen viajar seguros* site.

**Continuing Education Credits (CEUs) to Maintain Certification**

Refer to the "National Child Passenger Safety Board" and "Safe Kids Worldwide CPS Certification Program" listings below.

**Federal Aviation Administration (FAA) Child Safety on Airplanes**

U.S. Department of Transportation  
Federal Aviation Administration  
800 Independence Ave. SW  
Washington, DC 20591  
1-866-835-5322  
[www.faa.gov/passengers/fly\\_children/crs/](http://www.faa.gov/passengers/fly_children/crs/)

Provides information and guidance for travelers with children. Downloadable brochure that caregivers may take with them when they travel. Additional information concerning travel tips, screening procedures, and traveling with children with disabilities may go to [www.tsa.gov/travelers/airtravel/children](http://www.tsa.gov/travelers/airtravel/children).

**Insurance Institute for Highway Safety**

Communications Dept.  
1005 N. Glebe Rd.  
Arlington, VA 22201  
703-247-1500  
[www.hwysafety.org](http://www.hwysafety.org)

Distributes the newsletter "Status Report", and produces low-cost videos on a variety of highway safety topics. Produce fact sheets and lists of state seat belt and child passenger safety laws.

**National Association for Pupil Transportation**

NAPT Foundation  
111 Scooter Lane  
Hicksville, New York 11801  
516-579-1620  
[www.napt.org](http://www.napt.org)

A nonprofit group committed to enhancing the safety of children transported by school buses. Provides resources to inform local communities about the benefits of school bus transportation, conducts research regarding safer school buses and provides additional training and educational opportunities for pupil transportation professionals.

**National Center for the Safe Transportation of Children with Special Health Care Needs**

Riley Hospital for Children  
575 West Drive, Room 004  
Indianapolis, IN 46202  
800-755-0912  
[www.preventinjury.org/NationalCenter.asp](http://www.preventinjury.org/NationalCenter.asp)

The National Center for the Safe Transportation of Children with Special Health Care Needs is funded by the National Highway Traffic Safety Administration and is based at the Riley Hospital for Children Automotive Safety Program.

The National Center for the Safe Transportation of Children with Special Health Care Needs serves as a resource for families, health care professionals, transportation providers, and child passenger safety advocates. The National Center has a toll-free hot line (Monday – Friday, 8:00 a.m. – 5 p.m. EST) staffed by child passenger safety technicians who are experienced in resolving issues associated with the transportation of children with special health care needs.

**National Child Passenger Safety Board**

1025 Connecticut Avenue N.W., Suite 1200  
Washington, D.C. 20036-5405  
202-296-6263  
[www.cpsboard.org](http://www.cpsboard.org)

The mission of the National Child Passenger Safety Board (NCPSB) is to maintain the quality and integrity of the National Standardized Child Passenger Safety Training Program. This program is used to train and certify child passenger safety (CPS) technicians and instructors. The Board works collaboratively with the National Highway Traffic Safety Administration and with the CPS Certifying Body. The Board channels insight from their representative organizations to NHTSA and the Certifying Body.

The Web site of the NCPSB provides CPS Technicians with a variety of continuing education materials including *Tech Update*. *Tech Update* is an electronic newsletter published by the National Highway Traffic Safety Administration and the National Child Passenger Safety Board for certified Child Passenger Safety Technicians and Instructors. Technicians may qualify for up to 1 CEU per certification cycle for reading the Tech Update.

Individuals can sign up to be notified via e-mail whenever Tech Update is published or any significant announcements or updates to the CPS Board website are made. To read sign up for the CPS Board e-mail list, visit [www.cpsboard.org/elist.htm](http://www.cpsboard.org/elist.htm).

### **National Highway Traffic Safety Administration**

Washington, DC 20590  
Auto Safety Hotline: 888-327-4236  
[www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)

Federal agency with primary responsibility for establishing and enforcing motor vehicle safety standards. NHTSA establishes and promotes national and state highway safety related programs and materials including child passenger safety. Pamphlets, technical reports; program manuals, recall lists, etc. are available through NHTSA.

Visitors to the NHTSA child passenger safety page can find information related to:

- Find a Child Safety Seat Inspection Station - Search NHTSA's Child Safety Seat Inspection Station Locator for Inspection Stations in your State or zip Code.
- Keeping Kids Safe Inside and Out - Addresses safety in and around vehicles for children. [www.nhtsa.gov](http://www.nhtsa.gov)
- [www.safercar.gov](http://www.safercar.gov) for information on vehicle safety such as Buying a Safer car, crash rating reports, air bags, rollover prevention, and NHTSA safety standards and regulations.

### **National Safety Council**

1121 Spring Lake Drive  
Itasca, IL 60143-3201  
630-285-1121  
[info@nsc.org](mailto:info@nsc.org)  
[www.nsc.org](http://www.nsc.org)

Safety belt tips and other important information on how to protect yourself and your family on the road.

### **Safe Kids Worldwide**

1301 Pennsylvania Ave., NW  
Suite 1000  
Washington, DC 20004-1707  
202-662-0600  
[www.safekids.org](http://www.safekids.org)  
<http://cert.safekids.org>

Safe Kids Worldwide is the certifying body for the National Standardized Child Passenger Safety Certification Training Program and manages the online system for registration and other certification processes. Parents and other caregivers can find a Certified Child Passenger Safety Technician in their state or zip code by using the Safe Kids Child Passenger Safety Contact Locator.

For information on policies & procedures related to class scheduling, participant registration, certification, and recertification - as well as frequently asked questions and answers - visit the

Safe Kids CPS Certification web site. Recertification information available through the "Resources" section includes:

- Personal Re-certification Log
- Re-certification flow chart
- Verified Inspection Activity Worksheet
- Tips on How to Get CEUs
- Putting Together a Successful Tech Update

Also included are links to CEU opportunities including

- Examples of scientific articles
- Safe Ride News LATCH Manual quiz
- SafetyBeltSafe USA car seat manufacturer instructions quiz
- CPS Board's Tech Update
- [www.SafeKidsWebinars.org](http://www.SafeKidsWebinars.org)
- [www.cpsboard.org](http://www.cpsboard.org) online presentations
- [www.buckleupnc.org/training/index.cfm](http://www.buckleupnc.org/training/index.cfm) online videos from NC CPS Conference

### **Safe Ride News Publications, Inc.**

PO Box 38  
Edmonds, WA 98020  
Phone: 800-403-1424 / 425-640-5710 • Fax: 425-640-5417  
[www.saferideneews.com](http://www.saferideneews.com)

Publisher of a national CPS quarterly (by subscription) newsletter and the LATCH Manual which is updated every 2 years. Technical updates and fact sheets related to child passenger, pedestrian, and bicycle safety are also available.

### **SafetyBeltSafe U.S.A.**

PO Box 553  
Altadena, CA 91001  
310-222-6860  
[www.carseat.org](http://www.carseat.org)  
Safe Ride Helpline: 800-745-SAFE  
Spanish Helpline: 800-747-SANO

SafetyBeltSafe U.S.A (SBS USA) produces pamphlets in multiple languages, flyers on correct use of safety seats, training courses, child restraint recall list, and other materials available for download and/or purchase. Technician and Instructors can subscribe to their CPS Tech Access Package which includes; internet access to new child restraint instructions, internet access to a printable version of the SBS USA List of Recalls and Replacement Parts for Child Restraints, SafetyBeltSafe News bi-monthly newsletter on child passenger safety and advocacy, Child Restraint Manufacturers' Instructions with Summary Sheets CD, and Safe Ride News newsletter subscription.

### **Tech Update**

Refer to the "National Child Passenger Safety Board" listing above.





## Child Restraint and Vehicle Manufacturer Contacts

### Child Restraint Manufacturer Contacts

**Angel Guard Products**

c/o Mercury Distributing  
7001 Wooster Pike  
Medina, OH 44256  
800-815-6330  
330-723-5928  
www.angel-guard.com

**BESI**

9445 Sutton Place  
Hamilton, OH 45011  
800-543-8222  
513-874-0232  
www.besi-inc.com

**Columbia Medical  
Manufacturing**

13577 Larwin Circle  
Santa Fe Springs, CA 90670  
800-454-6612  
www.columbiamedical.com

**Evenflo**

1801 Commerce Dr  
Piqua, OH 45356  
800-233-5921  
www.evenflo.com

**Harmony Juvenile Products**

1600 53rd St  
North Bergen, NJ 07047  
877-306-1001  
www.harmonyjuvenile.com

**KIDSEmbrace**

3940 Laurel Canyon Blvd.,  
Suite #1172  
Studio City, CA 91604  
866-947-3287  
kidsembrace.com

**Mercedes-Benz USA**

Accessories, P.O. Box 350  
Montvale, NJ 07645  
www.mbusa.com

**Baby Trend**

1607 S. Campus Ave  
Ontario, CA 91761  
800-328-7363  
www.babytrend.com

**Britax Child Safety**

(Britax, Fisher Price)  
13501 South Ridge Dr  
Charlotte, NC 28273  
888-427-4829  
704-409-1700  
www.britaxusa.com

**Combi USA**

1962 Highway 160 West  
Suite 100  
Fort Mill, SC 29708  
800-992-6624  
www.combi-intl.com

**E-Z-ON Products**

605 Commerce Way West  
Jupiter, FL 33458  
800-323-6598  
www.ezonpro.com

**Jané USA**

P.O. Box 410007  
San Francisco, CA 94141  
866-355-2630  
www.janeusa.com

**Learning Curve**

(Compass, The First Years)  
1111 West 22nd St, Ste 320  
Oak Brook, IL 60523  
630-573-7200  
www.learningcurve.com

**Merritt Manufacturing**

PO Box 17152  
Indianapolis, IN 46217  
317-409-0148  
www.eztether.com

**Bergeron Health Care**

15 South Second St  
Dolgeville, New York 13329  
800-371-2778  
315-429-8407  
www.adaptivemall.com

**Chicco**

1826 William Penn Way  
Lancaster, PA 17601  
877-424-4226  
717-735-6200  
www.chiccousa.com

**Dorel Juvenile Group**

(Cosco, Eddie Bauer, Maxi  
Cosi, Safety 1st)  
2525 State St  
Columbus, IN 47201  
800-457-5276 (sales)  
800-544-1108 (service)  
www.djgusa.com

**Graco Children's Products**

150 Oaklands Blvd  
Exton, PA 19341  
800-345-4109  
888-224-6549  
www.gracobaby.com

**Jeffco Fibres**

(LaRoche Brothers)  
451 Quarry St.  
Fall River, MA 02722  
508-673-1001  
www.jeffcofibres.com

**Magna Aftermarket of  
America (clek)**

600 Wilshire Dr  
Troy, MI 48084  
866-656-2462  
www.magnaclek.com

**Mia Moda**

1 Meridian Blvd  
Wyomissing, PA 19610  
1-866-642-6632  
www.miamodainc.com

## Child Restraint Manufacturer Contacts

### Orbit Baby

5437 Central Ave, Ste 10  
Newark, CA 94560  
877-672-2229  
www.orbitbaby.com

### Peg Perego U.S.A.

3625 Independence Dr.  
Fort Wayne, IN 46808  
800-671-1701  
www.perego.com

### Porsche Cars Of North America

980 Hammond Drive  
Suite 1000  
Atlanta, Georgia 30328  
800-545-8039  
www.porsche.com

### ProRider

Children-N-Safety Program  
7818 S 212th St #106  
Kent, WA 98032  
800-642-3123  
www.prorider.com/nonprofit

### Q'Straint

5553 Ravenswood Road, #110  
Ft. Lauderdale, FL 33312  
800-987-9987  
www.qstraint.com

### Recaro

3275 Lapeer Rd West  
Auburn Hills, MI 48326  
248-364-3818  
www.recaro.com

### Safe Traffic System

3343 W Eastwood Ave  
Chicago, IL 60625  
847-329-8111  
www.safetrafficsystem.com

### Safeguard / IMMI

18881 US 31 North  
PO Box 408  
Westfield, IN 46074  
800-586-7839  
www.safeguardseat.com

### Safety Angel / Safe Start

P.O. Box 740151  
Boynton Beach, FL 33474  
888-743-3798  
www.safetyangel.com

### Sammons Preston Rolyan

1000 Remington Blvd  
Bolingbrook, IL 60440  
800-323-5547  
www.sammonspreston.com

### Serenity Safety Products

75 W Baseline Rd #29  
Gilbert, AZ 85233  
800-536-0676  
serenitysafetyproducts.com

### Snug Seat

12801 E. Independence Blvd  
Stallings, NC 28105  
800-336-7684  
www.snugseat.com

### Sunshine Kids Juvenile Products

3104 142nd Ave South, #105  
Sumner, WA 98390  
888-336-7909  
www.skjp.com

### Team-Tex America

(Nania, Car Seat Specialty)  
PO Box 3194  
Rock Hill, SC 29732  
877-912-1313

### Teutonia USA

150 Oaklands Blvd.  
Exton, PA 19341  
877-838-8664  
www.teutoniausa.com

### Triple Play Products

(Safeline Kids)  
904 Main St, Suite 330  
Hopkins, MN 55343  
800-829-1625  
www.tripleplayproducts.com

### Volvo Cars of North America

Seven Volvo Dr  
Rockleigh, NJ 07647  
800-458-1552  
www.volvocars.com/us

## Vehicle Manufacturer Contacts

### Manufacturer

Acura  
Audi  
Bentley  
BMW  
Buick  
Cadillac

### Customer Service

800-382-2238  
800-822-2834  
800-236-8539  
800-831-1117  
800-521-7300  
800-458-8006

### Web site

www.acura.com  
www.audiusa.com  
www.bentley.com  
www.bmwusa.com  
www.buick.com  
www.cadillac.com

## Vehicle Manufacturer Contacts

<b>Manufacturer</b>	<b>Customer Service</b>	<b>Web site</b>
Chevrolet	800-222-1020	<a href="http://www.chevrolet.com">www.chevrolet.com</a>
Chrysler - DaimlerChrysler	800-992-1997	<a href="http://www.chrysler.com">www.chrysler.com</a>
Daewoo	877-362-1234	<a href="http://www.daewoous.com">www.daewoous.com</a>
Dodge - DaimlerChrysler	800-992-1997	<a href="http://www.dodge.com">www.dodge.com</a>
Ferrari	201-816-2600	<a href="http://www.ferrariusa.com">www.ferrariusa.com</a>
Ford	800-392-3673	<a href="http://www.ford.com">www.ford.com</a>
GMC	800-462-8782	<a href="http://www.gmc.com">www.gmc.com</a>
Hummer (H2) -GMC	800-732-5493	<a href="http://www.hummer.com">www.hummer.com</a>
Honda	800-999-1009	<a href="http://www.hondacars.com">www.hondacars.com</a>
Hyundai	800-633-5151	<a href="http://www.hyundaiusa.com">www.hyundaiusa.com</a>
Infiniti	800-662-6200	<a href="http://www.infiniti-usa.com">www.infiniti-usa.com</a>
Isuzu	800-255-6727	<a href="http://www.isuzu.com">www.isuzu.com</a>
Jaguar	800-452-4827	<a href="http://www.jaguar.com">www.jaguar.com</a>
Jeep/Eagle-DaimlerChrysler	800-992-1997	<a href="http://www.jeep.com">www.jeep.com</a>
Kia Motors	800-333-4542	<a href="http://www.kia.com">www.kia.com</a>
Land Rover	800-637-6837	<a href="http://www.landrover.com">www.landrover.com</a>
Lexus	800-255-3987	<a href="http://www.lexus.com">www.lexus.com</a>
Maserati	201-816-2600	<a href="http://www.maserati.com">www.maserati.com</a>
Mazda	800-222-5500	<a href="http://www.mazdausa.com">www.mazdausa.com</a>
Mercedes_Benz	800-367-6372	<a href="http://www.mbusa.com">www.mbusa.com</a>
Mini	866-275-6464	<a href="http://www.miniusa.com">www.miniusa.com</a>
Mitsubishi	800-222-0037	<a href="http://www.mitsucars.com">www.mitsucars.com</a>
Nissan	800-647-7261	<a href="http://www.nissan-na.com">www.nissan-na.com</a>
Oldsmobile-GMC	800-442-6537	<a href="http://www.oldsmobile.com">www.oldsmobile.com</a>
Plymouth-DaimlerChrysler	800-992-1997	<a href="http://www.daimlerchrysler.com">www.daimlerchrysler.com</a>
Pontiac-GMC	800-762-2737	<a href="http://www.pontiac.com">www.pontiac.com</a>
Porsche	800-545-8039	<a href="http://www.porsche.com">www.porsche.com</a>
Rolls-Royce	877-300-8803	<a href="http://www.rollsroyce.com">www.rollsroyce.com</a>
Saab	800-955-9007	<a href="http://www.saabusa.com">www.saabusa.com</a>
Saturn	800-553-6000	<a href="http://www.saturn.com">www.saturn.com</a>
Subaru	800-782-2783	<a href="http://www.subaru.com">www.subaru.com</a>
Suzuki-GMC	800-934-0934	<a href="http://www.suzuki.com">www.suzuki.com</a>
Toyota	800-331-4331	<a href="http://www.toyota.com">www.toyota.com</a>
Volkswagen	800-822-8987	<a href="http://www.vw.com">www.vw.com</a>
Volvo	800-458-1552	<a href="http://www.volvocars.com">www.volvocars.com</a>



**CHILD SAFETY SEAT REGISTRATION FORM  
FOR YOUR CHILD'S CONTINUED SAFETY**

Although child safety seats undergo testing and evaluation, it is possible that your child seat could be recalled. In case of a recall it is important that the manufacturer be able to contact you as soon as possible so that your seat can be corrected.

All child safety seats manufactured since March 1993 have a registration form so that owners can provide their names/addresses to the manufacturer. In case of a safety recall, the manufacturer can use that information to send recall letters to owners. Also, child safety seat manufacturers have agreed to maintain owner names/addresses for child safety seats manufactured before March 1993, so they can notify those consumers in the event of a future safety recall. However, in order for the manufacturer to know which child safety seat you own, all of the information on the lower half of this page must be provided.

If you would like the National Highway Traffic Safety Administration (NHTSA) to give your name and address to the manufacturer of your child safety seat, so that you can be notified of any future safety recalls regarding your child safety seat, fill out this form. Please type or print clearly, sign and mail this postage-paid, pre-addressed form.

If you have any questions, or need help with any child safety seat or motor vehicle safety issue, call the U.S. Department of Transportation's toll-free Auto Safety Hotline at 1-800-424-9393 (Washington DC AREA RESIDENTS, 202-366-0123).

Your Name: \_\_\_\_\_ Telephone \_\_\_\_\_

Your Street Address \_\_\_\_\_

City: \_\_\_\_\_, State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

**IMPORTANT: The following information is essential and can be found on labels on your child seat.**

**Child Seat Manufacturer:** \_\_\_\_\_

**Child Seat Model Name & Number:** \_\_\_\_\_

**Child Seat Date of Manufacture:** \_\_\_\_\_


**I AUTHORIZE NHTSA TO PROVIDE A COPY OF THIS REPORT TO THE CHILD SAFETY SEAT MANUFACTURER.**

**SIGNATURE:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

The Privacy Act of 1974 - Public Law 93-579, As Amended: This information is requested pursuant to the authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond to this questionnaire. Your response may be used to assist the NHTSA in determining whether a manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administration enforcement or litigation against a manufacturer, your response, or statistical summary thereof, may be used in support of the agency's action.

Send this form to:  
NHTSA  
Auto Safety Hotline, NAD-40  
Room 2318  
400 Seventh Street, SW  
Washington, DC 20590



 <p><b>U.S. Department of Transportation</b> National Highway Traffic Safety Administration</p>	<p><b>Child Safety Seat Questionnaire</b> To report a complaint, defect or incident</p> <p><b>VEHICLE SAFETY HOTLINE</b> Nationwide: 1-888-327-4236 / DC Metro area: 202-366-0123 To submit by Fax: 202-366-3171</p>		<p><b>FOR AGENCY USE ONLY</b></p>	
	<p><b>OWNER INFORMATION (Type or Print)</b></p> <p>NAME and ADDRESS</p>		Date Received	od-or ____ rt-dt ____ od-rt ____ up-ltr ____
		Reference No.		
		DAY TIME TELEPHONE NO. (AREA CODE)		
<p>Do you authorize NHTSA to provide a copy of this information to the manufacturer of your Child Safety Seat? <input type="checkbox"/> YES <input type="checkbox"/> NO                  In the absence of an authorization, NHTSA WILL NOT provide your name and address to the vehicle manufacturer.</p>				
<p><b>CHILD INFORMATION</b></p>				
Any Special Information		Age	Height/Length	Weight
<p><b>CHILD SAFETY SEAT INFORMATION (As identified on the manufacturing label on the seat)</b></p>				
Seat Manufacturer		Date Manufactured	Seat Name and Model Number	
Type of Child Safety Seat <input type="checkbox"/> Infant <input type="checkbox"/> Booster <input type="checkbox"/> Integrated <input type="checkbox"/> Convertible <input type="checkbox"/> Other				
Failed Part. Describe Failure Below. <input type="checkbox"/> Base <input type="checkbox"/> Harness/Buckle <input type="checkbox"/> Shell <input type="checkbox"/> Handle <input type="checkbox"/> Material Padding <input type="checkbox"/> LATCH Connector <input type="checkbox"/> Tether <input type="checkbox"/> Other				
Seat Was: <input type="checkbox"/> Purchased <input type="checkbox"/> New <input type="checkbox"/> Used <input type="checkbox"/> Obtained through loaner program <input type="checkbox"/> Gift <input type="checkbox"/> Borrowed Date ____/____/____		Purchased From: _____ City _____ State _____		Installed in Vehicle by the: <input type="checkbox"/> Vehicle Safety Belt <input type="checkbox"/> LATCH System (vehicle information required)
<p><b>VEHICLE INFORMATION</b></p>				
Make of Vehicle		Model of Vehicle	Year of Vehicle	
<p><b>INCIDENT INFORMATION (If applicable)</b></p>				
Crash? <input type="checkbox"/> Yes <input type="checkbox"/> No	Number of Injured		Number of Fatalities	Police Report Filed <input type="checkbox"/> Yes <input type="checkbox"/> No
Child Seat Location: <input type="checkbox"/> Front <input type="checkbox"/> Right <input type="checkbox"/> Rear <input type="checkbox"/> Left <input type="checkbox"/> Center		Safety Belt System Used <input type="checkbox"/> Lap <input type="checkbox"/> Shoulder <input type="checkbox"/> Both		Facing Direction: <input type="checkbox"/> Forward <input type="checkbox"/> Rear
<p><b>DESCRIBE INCIDENT/DEFECT IN DETAIL (Please explain how the Child Seat failed)</b></p>				
<p><i>CONTINUE ON BACK IF NEEDED</i></p>				
<p><b>The Privacy Act of 1974—Public Law 93-579</b> This information is requested pursuant to authority vested in Chapter 301 of Title 49 of the United States Code. You are under no obligation to respond to this questionnaire. Your response may be used to assist the NHTSA in determining whether a manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administrative enforcement or litigation against a manufacturer, your response, or a statistical summary thereof, may be used in support of the agency's action.</p>				

HS Form 350C (April 2005)

Fold to show Return Address (no stamp needed). Fasten with tape or staple and mail.

**Narrative Description (Continued):**

[Large empty rectangular box for narrative description]

Fold here

U.S. Department  
of Transportation

**National Highway  
Traffic Safety  
Administration**

400 Seventh St., S.W.  
Washington, D.C. 20590

Official Business  
Penalty for Private Use \$300



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO 73173 WASHINGTON, D.C.

POSTAGE WILL BE PAID BY NATL. HWY. TRAFFIC SAFETY ADMIN.

**U.S. Department of Transportation  
National Highway Traffic Safety Administration  
Office of Defects Investigation (NVS-216)  
400 7th Street, S.W.  
Washington, DC 20590**



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# Quick Reference Guide to Federal Motor Vehicle Safety Standards and Regulations

DOT HS 805 878 - Revised March 2004

## Foreword

The National Highway Traffic Safety Administration (NHTSA) has a legislative mandate under Title 49 of the United States Code, Chapter 301, Motor Vehicle Safety, to issue Federal Motor Vehicle Safety Standards (FMVSS) and Regulations to which manufacturers of motor vehicles and items of motor vehicle equipment must conform and certify compliance. FMVSS 209, Seat Belt Assemblies, was the first standard to become effective on March 1, 1967. A number of FMVSS became effective for vehicles manufactured on and after January 1, 1968. Subsequently, other FMVSS have been issued. For instance, NHTSA has issued seven new FMVSS and has amended six FMVSS and two consumer information regulations and requirements since this booklet was revised in March 1999. New standards and amendments to existing standards are published in the Federal Register.

These Federal safety standards are regulations written in terms of minimum safety performance requirements for motor vehicles or items of motor vehicle equipment. These requirements are specified in such a manner that the public is protected against unreasonable risk of crashes occurring as a result of the design, construction, or performance of motor vehicles and is also protected against unreasonable risk of death or injury in the event crashes do occur.

This booklet lists the Federal Motor Vehicle Safety Standards that were in effect as of October 2003, and provides a brief summary of each safety standard. It also provides similar information on other Federal consumer information regulations and requirements.

## Title 49: Chapter V - National Highway Traffic Safety Administration, Department of Transportation

<b>Part 571 Federal Motor Vehicle Safety Standards</b>	
<b>Subpart B</b>	<b>Federal Motor Vehicle Safety Standards 571.101– 571.500</b>
Standard No. 101:	Controls and Displays
Standard No. 102:	Transmission Shift Lever Sequence, Starter Interlock, and Transmission Braking Effect
Standard No. 103:	Windshield Defrosting and Defogging Systems
Standard No. 104:	Windshield Wiping and Washing Systems
Standard No. 105:	Hydraulic and Electric Brake Systems
Standard No. 106:	Brake Hoses
Standard No. 107:	[Reserved]
Standard No. 108:	Lamps, Reflective Devices, and Associated Equipment
Standard No. 109:	New Pneumatic Bias Ply and Certain Specialty Tires*
Standard No. 110:	Tire Selection and Rims for Motor Vehicles*
Standard No. 111:	Rearview Mirrors
Standard No. 112:	[Reserved]
Standard No. 113:	Hood Latch System
Standard No. 114:	Theft Protection
Standard No. 115:	[Reserved] Requirements moved to Part 565—Vehicle Identification Number

<b>Part 571 Federal Motor Vehicle Safety Standards</b>	
<b>Subpart B</b>	<b>Federal Motor Vehicle Safety Standards 571.101– 571.500</b>
Standard No. 116:	Motor Vehicle Brake Fluids
Standard No. 117:	Retreaded Pneumatic Tires
Standard No. 118:	Power-Operated Window, Partition, and Roof Panel Systems
Standard No. 119:	New Pneumatic Tires for Vehicles Other Than Passenger Cars*
Standard No. 120:	Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars
Standard No. 121:	Air Brake Systems
Standard No. 122:	Motorcycle Brake Systems
Standard No. 123:	Motorcycle Controls and Displays
Standard No. 124:	Accelerator Control Systems
Standard No. 125:	Warning Devices
Standard No. 129:	New Non-Pneumatic Tires for Passenger Cars—New Temporary Spare Non-Pneumatic Tires for Use on Passenger Cars
Standard No. 131:	School Bus Pedestrian Safety Devices
Standard No. 135:	Light Vehicle Brake Systems*
Standard No. 138:	Tire Pressure Monitoring Systems**
Standard No. 139:	New Pneumatic Radial Tires for Light Vehicles**
Standard No. 201:	Occupant Protection in Interior Impact
Standard No. 202:	Head Restraints
Standard No. 203:	Impact Protection for the Driver from the Steering Control System
Standard No. 204:	Steering Control Rearward Displacement
Standard No. 205:	Glazing Materials
Standard No. 206:	Door Locks and Door Retention Components
Standard No. 207:	Seating Systems
Standard No. 208:	Occupant Crash Protection*
Standard No. 209:	Seat Belt Assemblies
Standard No. 210:	Seat Belt Assembly Anchorages
Standard No. 211:	[Reserved]
Standard No. 212:	Windshield Mounting
Standard No. 213:	Child Restraint Systems
Standard No. 214:	Side Impact Protection
Standard No. 215:	[Reserved]
Standard No. 216:	Roof Crush Resistance
Standard No. 217:	Bus Emergency Exits and Window Retention and Release
Standard No. 218:	Motorcycle Helmets

<b>Part 571 Federal Motor Vehicle Safety Standards</b>	
<b>Subpart B</b>	<b>Federal Motor Vehicle Safety Standards 571.101– 571.500</b>
Standard No. 219:	Windshield Zone Intrusion
Standard No. 220:	School Bus Rollover Protection
Standard No. 221:	School Bus Body Joint Strength
Standard No. 222:	School Bus Passenger Seating and Crash Protection
Standard No. 223:	Rear Impact Guards
Standard No. 224:	Rear Impact Protection
Standard No. 225:	Child Restraint Anchorage Systems**
Standard No. 301:	Fuel System Integrity
Standard No. 302:	Flammability of Interior Materials
Standard No. 303:	Fuel System Integrity of Compressed Natural Gas Vehicles
Standard No. 304:	Compressed Natural Gas Fuel Container Integrity
Standard No. 305:	Electric-Powered Vehicles: Electrolyte Spillage and Electric Shock Protection**
Standard No. 401:	Interior Trunk Release**
Standard No. 402:	(Reserved)
Standard No. 403:	Platform Lift Systems for Motor Vehicles**
Standard No. 404:	Platform Lift Installations in Motor Vehicles**
Standard No. 500:	Low Speed Vehicles

<b>Part 531 - Part 595</b>	
<b>Subpart B -</b>	<b>Other Regulations Relating To Transportation</b>
Part 531:	Passenger Automobile Average Fuel Economy Standards
Part 533:	Light Truck Fuel Economy Standards
Part 541:	Federal Motor Vehicle Theft Prevention Standard
Part 555:	Temporary Exemptions from Motor Vehicle Safety and Bumper Standards
Part 557:	Petitions for Hearings on Notification and Remedy of Defects
Part 564:	Replaceable Light Source Information
Part 565:	Vehicle Identification Number Requirements
Part 566:	Manufacturer Identification
Part 567:	Certification
Part 568:	Vehicles Manufactured in Two or More Stages
Part 569:	Regrooved Tires
Part 570:	Vehicle In Use Inspection Standards
Part 572:	Anthropomorphic Test Devices
Part 573:	Defect and Noncompliance Reports
Part 574:	Tire Identification and Record Keeping
Part 575:	Consumer Information Regulations
Part 577:	Defect and Noncompliance Notification
Part 579:	Defect and Noncompliance Responsibility
Part 580:	Odometer Disclosure Requirements
Part 581:	Bumper Standard
Part 582:	Insurance Cost Information Regulation
Part 583:	Automobile Parts Content Labeling
Part 591:	Importation of Vehicles and Equipment Subject to Federal Safety, Bumper, and Theft Prevention Standards
Part 595:	Retrofit On-Off Switches for Air Bags Subpart B —Retrofit On-Off Switches for Air Bags Subpart C —Vehicle Modifications to Accommodate People With Disabilities

## **Federal Motor Vehicle Safety Standard No. 213**

### **Highlights of the Regulation for Child Restraint Systems**

- Covers all types of systems (infant carriers, child seats, harnesses, and car beds) that restrain children under 65 pounds in motor vehicles.
- Requires that child restraint systems pass a 30 mph frontal sled test, which simulates a crash.
- Specifies maximum rotation during crash test for rear-facing child restraints.
- Specifies limits on child dummy measurements for forward-facing child restraints:
  - Head injury criteria (potential brain injury resulting from abrupt deceleration)
  - Head excursion (distance dummy head travels forward)
  - Force on chest
  - Knee excursion
- Requires that restraints not break during dynamic tests.
- Requires that child restraints retain a child dummy within the confines of the restraint during crash tests.
- Specifies padding requirements around the head of child restraints for use by children weighing 22 pounds or less. Flame-retardant fabric required.
- Requires that safety seats pass the 30 mph test secured with vehicle lap belt or lower LATCH attachments only as well as a more stringent test for forward-facing restraints with a tether anchored. Exceptions: child harnesses and products for children with special needs may be tested with top tether straps anchored. Boosters are tested with a vehicle lap-shoulder belt.
- Specifies the amount of force needed to open buckles on child restraints, so that toddlers cannot unbuckle themselves but adults can easily open the buckle. (Before crash test, minimum force is nine lbs. and maximum is 14 lbs.; after crash test, maximum is 16 lbs.)
- Requires permanent, visible labels on the restraint with the following information: certification that it conforms to standards for use in motor vehicles, basic instructions for correct installation, name and address of manufacturer/distributor, and date made. Air bag warning label required for rear-facing restraints. The restraint must have a designated location for storing the instruction booklet or sheet. An additional label may be present to state certification for use in aircraft.
- Permits child restraint systems to be designed as an integral part of motor vehicle seats.
- Requires that the manufacturer include a registration card with the child restraint and notify consumers of product recalls.
- As of September 1, 2002, child restraints and vehicle were required to provide LATCH attachments (FMVSS 213) and anchors (FMVSS 225). Refer to #622 for a summary of these requirements.

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#91 (8-17-05)

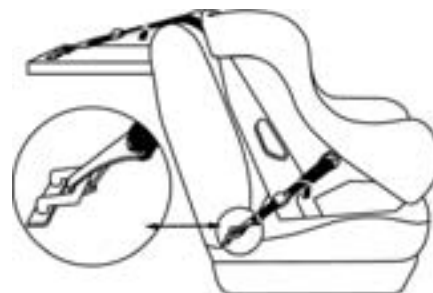


## **LATCH\* Requirements**

### **Summary of Changes to Federal Regulations (FMVSS 213 and 225)**

#### **Vehicle Requirements:**

- ◆ User-ready top tether strap anchorage hardware (such as a ring, bar, bracket, or webbing loop) for three rear seating positions were available in most passenger vehicles beginning with model year 2000 and were required in all cars, minivans, and pick-up trucks by model year 2001.
- ◆ Lower anchors for child restraints, each consisting of two rigid bars 6 mm in diameter and 25-50 mm long, are present in the vehicle seat bight (the crack between the seat back and seat cushion) in specified seating positions in all cars, minivans, and pick-up trucks made after September 1, 2002 (model year 2003), and in many made before that date.
- ◆ Requirements apply to all passenger cars, trucks, and multipurpose passenger vehicles under 8500 lbs.; also apply to buses under 10,000 lbs.
- ◆ Current belt lockability requirement remains effective until September 1, 2012, so child restraints without new hardware can be attached with regular vehicle belts. After that date, only vehicle belts in seating positions without lower anchorage systems must meet lockability requirement (capable of securing a child restraint without added equipment, such as a locking clip).



#### **Vehicle Exceptions:**

- ◆ No tether anchorage hardware is required for convertible cars or school buses.
- ◆ A built-in child restraint can replace the required anchorage system in one rear seating position.
- ◆ At least one front seating position must have the required anchorage system if the vehicle has an air bag cut-off switch and has either no rear seat or a rear seat too small for a rear-facing child restraint.

#### **Child Restraint Requirements:**

- ◆ The head excursion limit (maximum distance the head can travel forward in crash tests) has been reduced by nearly four inches to 28 inches. In order to meet the new requirement, most forward-facing child restraints made after September 1, 1999, are equipped with a top tether strap. They also must meet the previous head excursion requirement without using the tether strap.
- ◆ Lower attachment hardware (a hook, buckle, or other type of connector) is required on new child restraints made since September 1, 2002, and is available on many models made before then. Webbing-based attachments must be adjustable.

#### **Child Restraint Exceptions:**

- ◆ Belt-positioning boosters, car beds, and harnesses are not required to have a tether strap or lower attachment hardware. However, lower attachment hardware is required on combination seats (forward-facing restraints with a removable harness that convert to boosters).
- ◆ Rear-facing child restraints are not required to have a tether strap. If a rear-facing restraint has a detachable base, only the base must have lower attachment hardware.

#### **\*LATCH (Lower Anchors and Tethers for Children)**

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#622 (8-17-05)





## Child Crash Test Dummies

Crash test dummies are full-scale replicas of human beings, weighted and articulated to simulate the behavior of a human body, and instrumented to record as much data as possible on accident variables such as speed of impact, crushing force, bending, folding, or torque of the body, and deceleration rates during a collision.

 <p style="text-align: center;">CRABI 12-Month Old</p>	<p>Features:</p> <ul style="list-style-type: none"> <li>• Designed for RF CRS position in front of a passenger front air bag</li> <li>• Weighs 22 lbs.</li> <li>• Standing height 29"; sitting height 19"</li> <li>• Instrumentation: 34 measurements are evaluated</li> </ul>
 <p style="text-align: center;">HYBRID III 3-Year Old</p>	<p>Features:</p> <ul style="list-style-type: none"> <li>• Designed for FF CRS positioned in front of a passenger front air bag</li> <li>• Intended to be used properly restrained on a CRS as well as out-of-position with air bags</li> <li>• Weighs 34 lbs.</li> <li>• Standing height 37"; sitting height 22 "</li> <li>• Instrumentation: 50 measurements are evaluated</li> </ul>
 <p style="text-align: center;">Q3 3-Year Old</p>	<p>Features:</p> <ul style="list-style-type: none"> <li>• Q3 is used primarily for frontal tests</li> <li>• It will need further work to optimize its performance to evaluate side impacts</li> </ul>
 <p style="text-align: center;">HYBRID III 6-Year Old</p>	<p>Features:</p> <ul style="list-style-type: none"> <li>• Scaled down version of Hybrid III 50th percentile male dummy</li> <li>• Designed for backless and high-back BPB's</li> <li>• Weighs 52 lbs</li> <li>• Standing height 45"; sitting height 25"</li> <li>• Instrumentation: 48 measurements are evaluated</li> </ul>
 <p style="text-align: center;">HYBRID III 10-Year Old</p>	<p>Features:</p> <ul style="list-style-type: none"> <li>• Developed as a result of CR manufacturers claiming safe performance beyond what is tested under FMVSS 213 (CRS for children weighing 65 lbs. or less)</li> <li>• Weighs 76 lbs.</li> <li>• Standing height 4'6"</li> <li>• 5 seating configurations are tested (2 BPB, 3 non BPB)</li> <li>• 3 non BPB (upright, slouched, belt misuse)</li> </ul>

*Adapted from NHTSA, VRTC Pedestrian and Applied Biomechanics Division, February 2, 2007*





## INGERSOLL RAND CHILD RESTRAINTS

### SUBJECT:

Determine the effect of twist (rotation) on the strength of vehicle restraint seat belt webbing.

### INTRODUCTION:

There are times that the vehicle restraint buckle is twisted (rotated) to shorten its length in order to achieve an improved installation of a child restraint seat. A concern has been expressed that the twist may adversely effect the strength of the webbing.

### PURPOSE:

Conduct a series of tests to determine the strength of the vehicle webbing in the twisted condition.

### REQUIREMENTS:

FMVSS - S4.4 (b) 3 indicates that the structure's components in the seat belt assembly (Type 2) which are common to pelvic and upper torso restraints shall withstand a force not less than 3000 pounds (1360 kgs).

ECE R16 Section 7.5.2 indicates that a buckle or the adjusting device used as a common part of a three-point belt shall be tested to 1470 daN (3304 pounds).

### TEST PROCEDURE:

A typical vehicle restraint webbing meeting the specifications of FMVSS 209 S4.2 was used in the test. The webbing is rated at 6000 pounds strength. Three samples were tested at each condition in accordance with FMVSS 209 S5.1 (b). Tests were conducted on plain and treated webbing. The treated samples were soaked in apple juice or Coca Cola for 6 hours, then dried for 24 hours.

### TEST RESULTS:

The values recorded are the average of three tests at each condition.

TENSILE STRENGTH OF WEBBING IN POUNDS

	No Twist	½ Twist	1 Twist	1 ½ Twists	2 Twists
PLAIN	6496	6466	6343	6168	5944
APPLE JUICE	6685	6442	6118	5989	5942
COCA COLA	6690	6364	6255	6018	5855

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### CONCLUSIONS:

The test results show some reduction in strength when twisted. Treated webbing showed slightly more reduction in strength on a  $\frac{1}{4}$  basis than untreated webbing. The average reduction in strength (plain and treated) with one twist was 5.8% and at two twists was 10.7%.

The tensile strength of the plain and treated webbing at the worst condition of two twists is still well above the requirements in FMVSS 209 and ECE 16. In fact, the average tensile strength of the two twist samples (plain and treated) of 5913 pounds is nearly twice the requirements of FMVSS 209.

Since the expected loading on the vehicle belts when used with child restraint seats is even lower, the strength factor of safety for the webbing will be even higher than twice the regulation requirements.

Based on the test results, there should not be a concern about the strength of the vehicle webbing when the buckles are twisted to improve the fit of a child restraint seat.

*Jerry Thompson*

Jerry Thompson  
Engineering Manager  
NHTSA Child Division  
September 28, 1998

After review and analysis of the IMMI data by the SAE Child Restraint Sub-Committee, an agreement of no more than 3 complete (360 degree) twists of the safety belt buckle as the maximum allowed was reached in 2006.

**Types of Seat Belt Systems and Approved Additional Steps\*  
Needed to Pre-Crash Lock the Lap Belt**

Type of Seat Belt and Retractor	Type of Retractor			
	Emergency locking retractor	Automatic locking retractor	Switchable retractor	No retractor
Lap-shoulder belt with switchable latchplate	Switch latchplate to "car seat" position	N/A	N/A	N/A
Lap-shoulder belt with sliding latchplate	Locking clip	None	None	N/A
Lap-shoulder belt with locking latchplate	None**	None	None	N/A
Lap belt only with sewn latchplate	Belt shortening clip	None	None	N/A
Lap belt portion of Lap-shoulder belt with sewn latchplate	Belt shortening clip	None	None	N/A
Lap belt with locking latchplate	N/A	N/A	N/A	None

This is a general guide and does not apply to ALL latchplate-belt systems. Carefully read the vehicle owner's manual for more information.

\* N/A = Not applicable. Vehicles are not equipped with this combination of belt type, latchplate, and retractor. None = Lap belt can be pre-crash locked with no additional steps.

\*\* Some locking latchplates, when used to install child restraints, may fail to lock belts in place. Try flipping latchplate 180° or twisting the buckle stalk. If that doesn't work, in some cases, a locking clip may be used.

CPSB 01/2008



**INSTALLATION OF CHILD RESTRAINTS (CRs) WITH DIFFERENT TYPES OF SEAT BELTS  
For Training Purposes Only... Not Intended for Distribution to General Public as Educational Material**

Revised: April 2007

Vehicles manufactured on or after September 1, 1995 (1996 model year) must be equipped with belt systems that secure child restraints (CRs) without the need for locking clips or other additional hardware. Check the vehicle owner's manual, as well as labels on belt webbing, for instructions for installation of child restraints. Note also that LATCH (Lower Anchors and Tethers for Children) hardware is required on most CRs and vehicles manufactured after September 1, 2002. Using the LATCH systems may or may not make the installation easier and/or more secure than installing the CR with the available safety belt.

TYPE OF BELT	CHARACTERISTICS / HOW TO LOCK	COMMENTS ON USE WITH CHILD RESTRAINTS (CRs)
<b>LAP ONLY BELTS: WITH PRE-CRASH LOCKING FEATURES</b>		
Locking Latchplate with No Retractor	Insert latch plate in buckle and pull on free end to tighten. Belt stays locked as long as belt webbing and latch plate are parallel. Tilt latch plate to release webbing to loosen.	Latch plate must be at correct angle to stay locked. If belt will not stay tight when buckled and reasonable force applied, 1) flip latch plate upside down before buckling, or 2) shorten buckle end of belt by twisting belt webbing as much as needed to correct the latch plate angle.
Sewn Latchplate and Automatic Locking Retractor (ALR)	Pull belt from retractor. Will automatically lock after webbing retracts about a quarter inch. Remains locked and cannot lengthen belt until webbing rewinds completely into retractor.	Pull enough webbing out of the retractor to fit through/around CR before allowing retractor to lock. Buckle belt and push CR into the vehicle seat while pushing excess belt webbing back into the retractor while belt "ratchets" down. Check to be sure belt remains long enough to stay locked with child in CR.
Sewn Latchplate and Switchable ELR/ALR Combination Retractor	Works as ELR for use by adults. Converts to ALR for use with CSS. Converts back to ELR for use by adults and larger children.	Most switch when belt is fully extended to engage the ALR. Other types convert by flipping a switch on the retractor (check owner's manual). Route belt through CR and buckle, switch retractor to ALR and use like ALR above.
<b>LAP ONLY BELTS: WITHOUT PRE-CRASH LOCKING FEATURES</b>		
Sewn Latchplate and Emergency Locking Retractor (ELR)	Belt webbing moves freely in and out of the retractor during normal driving. Belt locks only if there is sudden movement of the vehicle. Belt will <u>not</u> lock when webbing is pulled on sharply (vehicle sensitive ELR). All ELRs are vehicle sensitive. Some ELR belts also lock when there is sudden movement of the belt itself (belt sensitive ELR). Tug sharply on the belt webbing to test.	<b>BELT SHORTENING CLIP MUST BE USED TO KEEP LAP BELT TIGHT.</b> ELR retractors not stay locked during normal driving conditions. Solutions: 1) Move to another position, 2) Use belt-shortening clip from Ford or Toyota or other vehicle manufacturer to shorten belt enough to stay tight around CR when fully extended. May need more than one clip. Difficult and inconvenient to use, 3) Replace with manually adjusting belt for long term use.  NOTE: Belt sensitive ELR may be confused with ALR unless belt is pulled <u>very gently</u> in and out of the retractor.
<b>LAP AND SHOULDER (L/S) COMBINATION BELTS: POTENTIALLY WITHOUT PRE-CRASH LOCKING FEATURES</b>		
Separate Lap and Shoulder Belts	Lap and shoulder belts are two different belts with separate buckles or latch plates that interlock before buckling.	Determine what type of lap belt is present. Can be used with child restraint if lap belt is not ELR. If lap belt is ELR, use ELR lap belt fixes noted above. (Most often found on older cars.)
L/S Belts With Sewn-on (Fixed) Latch Plates	Lap and shoulder portions each have their own retractors with each belt sewn onto one latch plate.	Determine what type of lap belt is present. Can be used with CR if lap belt is not ELR. If lap belt appears to be ELR, check to see if it will convert to ALR; if lap belt is in fact ELR, use ELR lap belt fixes noted above.
<b>LAP AND SHOULDER (L/S) COMBINATION BELTS: WITH PRE-CRASH LOCKING FEATURES</b>		
Continuous Loop L/S Belt With Locking Latch Plate	One piece of webbing passes through a latch plate to form both the lap and shoulder portions of the belt. Belt webbing is threaded through and around a locking bar in the latch plate or other locking mechanism that holds lap portion tight when lap belt is parallel to latch plate.	Thread lap belt through belt routing location (shoulder portion will follow lap belt), then pull on shoulder belt to tighten. Check to see that lap belt does not loosen due to improper angle of latch plate. If belt will not stay tight when CR is pulled on: 1) flip latch plate upside down before buckling, 2) shorten buckle end of belt by twisting belt webbing - using no more than 3 twists - to correct the latch plate angle, or 3) use a locking clip.

**INSTALLATION OF CHILD RESTRAINTS (CRs) WITH DIFFERENT TYPES OF SEAT BELTS**  
**For Training Purposes Only ... Not Intended for Distribution to General Public as Educational Material**

TYPE OF BELT	CHARACTERISTICS / HOW TO LOCK	COMMENTS ON USE WITH CHILD RESTRAINTS (CRs)
Continuous Loop L/S Belt With Switchable Latch Plate	Switch on latch plate converts it from a free-sliding to a locking latch plate.	Note: Some latchplates have a switch that converts it from a free-sliding to a locking latch plate. Follow vehicle owner's manual for instructions on switching latch plate from free-sliding to locking.
Continuous Loop Lap/Shoulder Belt With Sliding Latch Plate and Switchable Retractor	Works as ELR for use by adults. Can be converted to ALR for installing CRs.	Most switch when belt is fully extended to engage the ALR. Other types convert by flipping a switch on the retractor (check owner's manual). Route belt through CR, buckle, then switch retractor to ALR. Push CR into vehicle seat while pushing belt back into retractor. May need to reinstall with less force applied or use locking clip if tension on shoulder belt pulls too hard and tilts the CR enough to put it off of the vehicle cushion on one side.
<b>LAP AND SHOULDER COMBINATION BELTS: WITHOUT PRE-CRASH LOCKING FEATURES</b>		
Continuous Loop Lap/Shoulder Belt With Free-Sliding Latch Plate and ELR Retractor	Belt webbing threaded through slot in latch plate. Webbing can be pulled back and forth through latch plate after being buckled. Allows lap portion to loosen after CR is buckled in.	<b>LOCKING CLIP MUST BE USED TO KEEP LAP BELT TIGHT.</b> Standard locking or belt-shortening clip can be used. Route belt through correct path, buckle and tighten. Grasp and hold both portions of webbing directly behind latch plate & unbuckle. Thread locking clip on belt as close to latch plate as possible (within 1 inch) & re-buckle. Should be relatively difficult to re-buckle if belt is made tight enough.
<b>AUTOMATIC RESTRAINTS</b>		
Automatic Shoulder Belt with Knee Bolster	Shoulder belt is fixed to the door. Belt closes over occupant when door is closed. No lap belt is provided. Knee bolster (padded lower dashboard) stops forward movement.	<b>CANNOT BE USED TO INSTALL CR.</b> No lap belt is provided. Must be installed in rear seat.
Automatic Shoulder Belt with Manual Lap Belt	Shoulder belt is fixed to the door or on a motorized track above door frame. Belt closes over occupant when door is closed or ignition is turned on. Lap belt must also be used, but must be fastened manually.	<b>MAY NOT BE ABLE TO USE AS IS.</b> Shoulder belt must be disconnected. Majority of lap belts are on non-pre-crash locking emergency locking retractor. Check owner's manual for model specific information. If lap belt is ELR: 1) Install CR in rear seat; 2) Check to see if auxiliary locking lap belt is available from dealer, or 3) Use belt-shortening clip.
Automatic Lap and Shoulder Belt	Lap and shoulder belts are both on retractors inside door. Occupant slides under belts when getting in and both belts close over occupant when door is closed. Primarily on General Motors vehicles.	<b>DO NOT USE AS IS.</b> Lap belt cannot be threaded through CR with door open plus the lap belts are on emergency locking retractors. Options are to: 1) Install CR in rear seat, or 2) Have auxiliary lap belt designed for use with CR installed by dealer (free part and service for GM vehicles through local dealers).
Air Bags (Supplemental Restraint Systems)	Inflates instantly in frontal crashes over 12-15 mph. Positions covered by air bags have manual lap/shoulder belts. Owners can petition NHTSA to receive permission for a dealer to install an on/off switch. Petitions are generally granted only when use of front seat to transport children is absolutely necessary.	<b>DO NOT INSTALL REAR-FACING CRs IN AN AIR BAG EQUIPPED POSITION. MUST USE REAR SEAT FOR CHILD UNDER 20 LBS. AND LESS THAN A YEAR OLD. INSTALL FRONT-FACING CRs IN AN AIR BAG POSITION ONLY IF ABSOLUTELY NECESSARY.</b> For front-facing CRs, check owner's manual for recommendations for specific vehicles. May be allowed by vehicle manufacturer for front-facing CRs, but use with extreme caution and move the vehicle seat back as far as possible. Air bag equipped vehicles have manual belts. If installation of CR is allowed, refer to "Lap/Shoulder Belt Combinations" section above for comments on use.

How tight is tight enough? Child restraints should be installed so that there is no more than one inch of movement front to back and side to side when tested at the belt path. A secure installation can be achieved without causing damage to the vehicle or CR and without using brute force.



## Frequently Asked Questions About LATCH and Tethers

### **Frequently Asked Questions About LATCH\***

*\*Adapted with permission from SRN Publications, "Tethering Child Restraints Including LATCH," Spring 2001 edition.*

#### **Can new LATCH equipped child restraints still be used in older model vehicles without LATCH?**

Yes. New child restraints are required to have both safety belt and LATCH options for installation in the vehicle. If the vehicle does not have upper (tether) anchors, it is beneficial to have them installed so that the child restraint can be tethered.

#### **Can two CR lower attachments be installed on a single vehicle lower anchor?**

No, attaching two child restraints to a single lower anchor point could cause the anchor to fail in a crash.

#### **Is installation with the LATCH anchors always better than with the safety belt?**

Not always. If a tight anchorage can be obtained with the safety belt, then there is no need to use LATCH. For example, with only one child in the rear seat, placing the child restraint in the center rear securely installed with a tight safety belt – and tether, if available for the CR – would be very protective.

#### **Can the two inner LATCH anchors from the outboard seating positions be used to install a LATCH-equipped child restraint in the center seat?**

Unless a vehicle has a set of LATCH anchors specifically for the center position, the safety belt in that position should be used in most cases. In some vehicles, the inner anchors for the outboard positions will be spaced too far apart to be used as anchors. There is some concern that widely spaced anchors may create forces on some flexible CR attachments that could affect the integrity of the system. If anchors were spaced too close together, access would be very difficult and restraint might be less effective. Some vehicle instructions specifically state that the center rear seating position should not be used to anchor a child restraint using the LATCH lower anchors. Other vehicle owner's manuals may indicate, however, that LATCH-equipped child restraints with webbing-mounted (flexible) attachments can be used with inboard anchors spaced from 280 mm (11 inches) to 500 mm (19.7 inches) apart. Child restraint manufacturers may specify the minimum and maximum vehicle anchor spacing appropriate for installation of their LATCH CRs; however, some do not specify.

NOTE: Use of the inboard LATCH anchors would mean that no LATCH restraints could be installed in the outboard seating positions. Child restraints with rigid attachment systems will fit only with the standard (280 mm or 11 inches) spacing. Therefore, it is unlikely that such CRs would fit in the center position of vehicles unless a separate set of LATCH anchors had been installed there or the distance between the two inboard bars is also 280 mm.

#### **Can vehicles be retrofitted with lower LATCH anchors?**

Currently, only certain VW models (1999-2001) can have lower anchors retrofitted into rear outboard seating positions. These vehicles were designed with this in mind. VW provides a

kit for this purpose. Also, Audi reports that a retrofit kit may be forthcoming for 1999-2001 models.

**Can child restraints be retrofitted with flexible lower LATCH attachments?**

Several child restraint manufacturers provide flexible lower attachment kits that can be used in the belt paths of certain older model child restraints.

**Does it matter in which direction the child restraint tether hook is attached to the vehicle tether anchor?**

Yes, in some cases the vehicle owner's manual specifies the exact direction the tether hook must be attached (e.g., Ford Windstar). A one-half twist (180 degrees) in the tether strap may be permissible if necessary to position the hook correctly. Always check for specific child restraint and vehicle instructions prior to installation.

**How can I achieve the 45 degree recline angle with a rear-facing LATCH child restraint?**

CRs with flexible LATCH attachments can have their angle adjusted in the same way as with CRs installed with a safety belt (using rolled towels or "noodles"). Rigid LATCH seats, when available, will not be adjustable that way. New designs will have to consider the angle. Remember that the recline 45 degree angle is a MAXIMUM, and necessary only during the first few months, until the baby's neck strength is developed enough to hold the head up.

**Should the LATCH system be used to attach a combination child restraint/ belt-positioning booster (BPB) when it is being used as a BPB?**

LATCH is for CRs that have harnesses or harness/shields to restrain the child. Belt-positioning boosters do not have harnesses, so they are not, strictly speaking, child restraints. The safety belts that hold the child in place are the actual restraint system. The BPB positions the child so the lap and shoulder belts fit the child better. When a combination CR/BPB with a tether or complete LATCH system is used with its harness, use of the tether and lower LATCH anchors are appropriate. When this type of restraint is used as a BPB, however, there are questions as to whether to use tether straps and/or lower anchors to hold the device in place in the vehicle.

This issue is currently under discussion. Testing is being done by vehicle and child restraint manufacturers as well as regulators. The best practice recommendation at this time is to follow the CR instructions, if they deal with the issue at all. Some CR manufacturers suggest using the tether, while others advise against it.

The use of lower LATCH anchors on a BPB raises larger questions than the use of the tether. The concern is the effect of a firmly anchored booster base on the occupant, who will slide forward somewhat while being restrained by the lap and shoulder belt. This motion might cause submarining and potential injury. This concern should not apply to vehicles with built-in BPBs, which are designed specifically to provide effective restraint in those particular vehicles.

**Must LATCH anchors be replaced after use in a crash?**

Vehicle owners should tell insurance adjusters and collision repair shops if LATCH anchors were in use during a crash. If so, the anchors should be inspected for damage. In a severe crash, the anchors may become bent, in which case they must be replaced. This repair

should be a normal aspect of repairing the vehicle. Service manuals should include information on how to repair or replace them. In some cases, this is only a matter of bolting a new part into place. In others, an entire seat must be replaced, which will cost more.

**Is it ever appropriate to install a CR using both the LATCH anchors and the safety belt?**

The two systems duplicate the same function. It should be unnecessary to use both. The system that provides the tightest, most secure installation for the CR should be used. In a few cases, this may be the safety belt, rather than the LATCH anchors.

***Frequently Asked Questions About Using Tethers\****

*\*Adapted with permission from SRN Publications, "Tethering Child Restraints Including LATCH," Spring 2001 edition.*

**If a child restraint comes with a standard tether, must the tether always be used?**

All U.S. forward-facing child restraints made since Sept. 1, 1999, must meet a stringent federal requirement which allows approximately 4 inches less head excursion than previously. Most CRs use a tether in order to meet this requirement. A CR with a tether must also meet the previously required test without the tether. In Canada, forward-facing CRs have been required to meet the stricter head excursion criteria for many years (Appendix B - "Tethering Child Restraints, Spring 2001 edition). Best practice is to always use a tether if it is available for a forward-facing CR, because less head excursion means less risk of injury. However, installation with a safety belt alone will provide a fairly good level of protection, if the safety belt holds the CR in place tightly.

**Can a tether strap kit made for one restraint be used on a different restraint?**

No, the kits are not interchangeable. Even if parts look the same, it is best practice to always use the parts supplied by the manufacturer for its own products.

**Can two tethers be hooked to the same anchor?**

No. Each tether must have its own anchor. The tether anchor is intended to withstand potential crash forces of just one child restraint in a crash.

**Is it possible to tighten a tether strap too much?**

A tether strap on a forward-facing CR cannot be tightened too much. It should be as snug as possible, without excessive force being applied. Compressing the vehicle seat padding will reduce motion in a crash. However, if helping a consumer install a CR in their vehicle, be careful not to tighten the safety belt and tether enough to damage the upholstery. A Canadian study found that even a slightly loose tether was better than no tether in all tested cases, although a tighter tether is certainly preferable. Harness straps of some CRs can get pinched and be very difficult to adjust when the CR has been very tightly installed and tethered. If necessary, loosen the tether strap to adjust the harness straps, then retighten the tether strap. If the restraint has straps on a retractor or the harness straps must be adjusted frequently; the tether strap could be adjusted slightly less tightly. For rear-facing tethers, tightening is slightly different. The angle at which the baby reclines is an important factor. An infant needs a reclined seat because his or her head control is poor. If the CR is tethered

toward the rear of the vehicle (TRV) remove the slack but do not pull the seat too upright. If a rear-facing CR is tethered below and forward (toward front of vehicle - TFV), the tether should be tight. However, it should not pull the CR down to farther than 45 degrees from the vertical. Too much of a recline angle could cause the child to slide out head first in a serious crash.

**Can a tether cause neck injury?**

There have been no known instances of neck injury related to the use of a tether. In fact, the study cited in the question above showed that all measurements relating to potential neck injury were lower with a tether than without it. This is because the tether secures the CR – and the child – more tightly to the vehicle, allowing the child’s body to “ride down” the crash with the vehicle as it crushes and absorbs crash energy. Without a tether there may be more potential of higher forces on the neck when the CR suddenly stops moving forward.

**Can a tether cause injury to other passengers in the vehicle?**

There are no known cases of this. It is possible, however, that a loose, unsecured tether could injure the child or another passenger. Unused tethers should always be stored securely (or removed if the manufacturer so directs).

**Where is the tether stowed when it is not being used?**

For convertible seats with tethers for forward-facing use only, the tether must be stowed or stored for the rear-facing position. If the manufacturer recommends removing the tether when it is not in use, it is important to replace the tether correctly when needed later. Some CRs have a special location to store the tether strap. For restraints without this feature, the tether strap should be tied up close to the restraint when not in use. One CR has a plastic storage clip on which the tether strap can be hooked. In this case, make sure the strap is adjusted to its shortest length before attaching it. If not, the tether hardware would be left dangling loosely. In rare cases, heavy anchor hardware comes attached to the tether strap. Remove any anchor hardware before storing the strap on the restraint.

**Can tether anchors be used to attach safety belts or harness systems for adults or larger children?**

No, vehicle upper (tether) anchors and the lower anchors are designed and tested to withstand only those loads imposed by restraints for children weighing up to about 50-60 pounds. See current LATCH Manual for information (available from Safe Ride News Publications).

**Should a tether anchor be replaced after a crash?**

The tether anchor should be examined for damage after it has been used in a crash, as with any other part of the vehicle. Be sure to inform the insurance adjuster and collision repair shop that they need to check the anchor. If it is bent or the sheet metal into which it is installed has been damaged, it should be replaced. In many cases, if the tether anchor is damaged, other parts of the vehicle will also have suffered considerable damage. The entire vehicle may be totaled.

## Chrysler

U.S. 800-992-1997 www.dcaanswers.com

Canada: English 800-465-2001 French 800-387-9983 www.daimlerchrysler.ca

- **Maximum weights for lower anchors:** The LATCH system may be used to restrain children up to 48 pounds in weight if the forward-facing CR is correctly installed with the tether as well as lower anchors.
  - **Maximum weight for tether anchor:** The tether strap may be used to restrain children up to 48 pounds if the forward-facing CR is correctly installed with the safety belt as well as the tether.
  - **Lower anchor use with non-standard bars in center position:** Use of inner bars for center installation is possible in some models if CR instructions allow; see specific listings.
  - **Tether anchor installation program:** DaimlerChrysler dealers will install tether anchors in certain older model year Chrysler Group vehicles free of charge. Please have the dealer refer to Technical Service Bulletin 23-08-00 Revision A for details on this policy.
  - **Recall:** DaimlerChrysler cars, light trucks, and SUVs from June 1999 - October 2000. Some vehicles owner's manuals do not have tether anchor usage instructions as required by FMVSS 225. All owners on record were mailed an addendum to their owner's manual. The second edition of owner's manuals was corrected. Contact DaimlerChrysler for more information.
- Canadian Recall:** LHS and New Yorker vehicles manufactured from 4/1/94 - 11/11/94. Tether anchorage covered during production. Contact dealer. May affect U.S. vehicles as well.

**KEY:** LATCH - Factory-installed lower and upper anchors  
None - No Factory-installed or retrofit hardware available  
Weld Nut/Hole - For use with upper anchor retrofit  
MY - Model year  
CR - Child restraint

### Vehicles with one or two rows of seats – Chrysler

MODEL	BODY	YEAR	SECOND ROW		NOTES
			CENTER	OUTBOARD	
300M	4D	98-99	04519077AB	04519077AB	(3) TA points in rear filler panel
		00-01	Tether anchor	(2) Tether anchors	(3) TAs in rear filler panel
		02-03	LATCH w/ TA in rear filler panel	(2) LATCH w/ TAs in rear filler panel	Use two outboard LATCH positions or single center position, not all three at one time.
300C	4D	04-05	LATCH w/ TA in rear filler panel	(2) LATCH w/ TA in rear filler panel	Use two outboard LATCH positions or single center position, not all three at one time.
C1RRUS	4D	95-99	04519077AB	04519077AB	(3) TA points in rear filler panel

## Vehicles with one or two rows of seats – Chrysler

MODEL	BODY	YEAR	SECOND ROW			NOTES
			CENTER	OUTBOARD		
CONCORDE	4D	93-99	04519077AB	04519077AB	(3) TA points in rear filler panel	
		00-01	Tether anchor	(2) Tether anchors	Use two outboard LATCH positions or single center position; not all three at one time.	
		02-03	LATCH w/ TA in rear filler panel	(2) LATCH w/ TAs in rear filler panel		
CONQUEST	2D	87-89	MB597261	MB597261	(3) TA points in rear filler panel	
CROSSFIRE	Sports Coupe	04-05	N/A	N/A	<b>Front Seat:</b> LATCH Front passenger seat equipped with air bag on/off switch.	
	Convert	05	N/A	N/A	<b>Front Seat:</b> LATCH Front passenger seat equipped with air bag on/off switch.	
5TH AVENUE	4D	89	04519077AB	04519077AB	(3) TA points in rear filler panel	
IMPERIAL	4D	90-93	04519071AB	04519071AB	(3) TA points in rear filler panel	
LEBARON	Convert.	87-95	N/A	None		
	Coupe	87-93	04519077AB	04519077AB	(3) TA points in rear filler panel	
	4D	89-94	04519071AB	04519071AB		
LEBARON GTS	4D	85-89	04519076AB	05003422AB		
	4D	94-97	04519077AB	05017645AA		
LHS		98-99	04519077AB	04519077AB	(3) TA points in rear filler panel	
		00-01	Tether anchor	(2) Tether anchors	(3) TA points in rear filler panel	
NEW YORKER	4D	93-96	04519077AB		<b>Canadian Recall</b> (may affect U.S. vehicles as well) - LHS and New Yorker vehicles manufactured from 4/1/94 - 11/11/94. Tether anchorage covered during production. Contact dealer.	
NEW YORKER 5TH AVENUE	4D	90-93	04519071AB	04519077AB		
NEW YORKER /LANDAU	4D	89-93	04519073AB	04519072AB		
PACIFICA	4D	05	TA on lower back of seat	(2) LATCH w/ TAs on lower back of seat	<b>5-Passenger seating; Second-row center position can be used with flexible LATCH child seat</b>	
	SUV					
	SUV (3-rows)	04-05	NA	(2) LATCH w/ TAs on lower back of seat	<b>6 passenger seating; 3<sup>rd</sup> Row:</b> has one tether anchor on driver side, back of seat.	

CHRYSLER

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Vehicles with one or two rows of seats – Chrysler

MODEL	BODY	YEAR	SECOND ROW		NOTES
			CENTER	OUTBOARD	
PROWLER (MY-02 Prowler is Chrysler brand; other years are Plymouth)	2D Convert.	02	N/A	N/A	Front Seat: Tether anchor Front passenger seat equipped with air bag on/off switch.
		01-05	LATCH w/ TA on back of seat	(2) LATCH w/ TAs on back of seat	Use two outboard LATCH positions or single center position at one time, not all three at one time. One of the lower anchors is longer than the others and can be used for either the passenger side or center position.
PT CRUISER	2D Convert	05	N/A	(2) LATCH w/TAs behind seat	(3) TA points in rear filler panel
		95-99	MB597261	MB612814	(3) TAs in rear filler panel
	4D	00	Tether anchor	(2) Tether anchors	(3) TAs in rear filler panel
		01-03	LATCH w/ TA in rear filler panel	(2) LATCH w/ TAs in rear filler panel	Use two outboard LATCH positions or single center position at one time, not all three at one time.
		04-05	TA in rear filler panel	(2) LATCH w/ TAs in rear filler panel	<b>Center position can be used with flexible LATCH child seat</b>
SEBRING	2D Convert.	96-00	N/A	None	(2) TAs on body structure behind seat
		01-02	N/A	(2) Tether anchors	(2) TAs on body structure behind seat
		03-05	N/A	(2) LATCH w/ TAs	(2) TAs on body structure behind seat

Vehicles with three or more rows of seats - Chrysler

MODEL	YEAR	SECOND ROW		THIRD ROW		NOTES
		CENTER	OUTBOARD	CENTER	OUTBOARD	
TOWN & COUNTRY Van	90-95	N/A	05017529AA	05017529AA	05017529AA	(5) TA points located on floor.
	96-00	N/A	04864118AB	05018506AA	05018506AA	

Vehicles with three or more rows of seats - Chrysler

MODEL Body	YEAR	SECOND ROW		THIRD ROW		NOTES
		CENTER	OUTBOARD	CENTER	OUTBOARD	
TOWN & COUNTRY Van	01	N/A	(2) LATCH w/ TAs on lower back of seat	LATCH w/ TAs on lower back of seat	(2) LATCH w/ TAs on lower back of seat	Use two outboard LATCH positions or single center position, not all three at one time.  MY-01 Owner's Manual: For captain's chairs, tilt seat backwards two clicks before using LATCH, (possibly to make anchors more visible.) This is not in MY-02 and later manuals.  <b>Non Stow-and-Go seating</b>
				Tether anchor on lower back of seat	None	
	02-05	N/A	(2) LATCH w/ TAs on lower back of seat	Tether anchor on lower back of seat	None	Stow-and-Go seating
VOYAGER Van  (Models prior to MY-01 listed under Plymouth brand.)	05	N/A	(2) LATCH w/ TAs on lower back of seat	LATCH w/ TA on lower back of seat	None	Stow-and-Go seating
	01	N/A	(2) LATCH w/ TAs on lower back of seat	LATCH w/ TAs on lower back of seat	(2) LATCH w/ TAs on lower back of seat	Use two outboard LATCH positions or single center position at one time, not all three at one time.  <b>Non Stow-and-Go seating</b>
				Tether anchor on lower back of seat	None	
	02-05	N/A	(2) LATCH w/ TAs on lower back of seat	Tether anchor on lower back of seat	None	Stow-and-Go seating
05	N/A	(2) LATCH w/ TAs on lower back of seat	LATCH w/ TA on lower back of seat	None	Stow-and-Go seating	
PACIFICA SUV	04-05	N/A	(2) LATCH w/ TAs on lower back of seat	N/A	(1) Tether anchor on driver side back of seat	<b>6-passenger seating</b>

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# Request for Air Bag On-Off Switch

OMB No. 2127-0588  
Expiration Date: 02/28/07

**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  
400 Seventh Street, SW  
Washington, DC 20590-1000

For faster response due to mail delays throughout the government sector fax to  
FAX: 202-493-2833

- Please print.
- Please note: 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

First	Middle	Last		
Street Address (Residence)		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 Number (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.)

<input type="checkbox"/>	<p><b>Medical condition.</b> The driver has a medical condition which, according to his or her physician:</p> <ul style="list-style-type: none"> <li>• Causes the driver air bag to pose a special risk for the driver; and</li> <li>• 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.</li> </ul>
<input type="checkbox"/>	<p><b>Distance from driver air bag.</b> 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.</p>

HS Form 603

**OVER**

### 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.)

<input type="checkbox"/>	<b>Infant.</b> I transport an infant (less than 1 year old) who must ride in the front seat because: <ul style="list-style-type: none"><li>• My vehicle has no rear seat;</li><li>• My vehicle has a rear seat too small to accommodate a rear-facing infant seat; or</li><li>• 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.</li></ul>
<input type="checkbox"/>	<b>Child age 1 to 12.</b> A child age 1 to 12 must ride in the front seat because: <ul style="list-style-type: none"><li>• My vehicle has no rear seat;</li><li>• 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</li><li>• 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.</li></ul>
<input type="checkbox"/>	<b>Medical condition.</b> A passenger has a medical condition which, according to his or her physician: <ul style="list-style-type: none"><li>• Causes the passenger air bag to pose a special risk for the passenger; and</li><li>• 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.</li></ul>

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

<input type="checkbox"/>	<b>Information brochure.</b> I certify that I have read the NHTSA information brochure, <i>Air Bags &amp; 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.
<input type="checkbox"/>	<b>Loss of air bag protection.</b> 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.
<input type="checkbox"/>	<b>Waiver.</b> 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.

**National Highway Traffic Safety Administration**  
**Frequently Asked Questions About Side-Impact Air Bags (SABs)**  
April 15, 2005

**1. What are side-impact air bags (SABs) and where are they located?**

Side-impact air bags (SABs) are inflatable devices that are designed to help protect your head and/or chest in the event of a serious crash involving the side of your vehicle. There are three main types of SABs: chest (or torso) SABs, head SABs and head/chest combination (or "combo") SABs.

Chest (or torso) SABs are mounted in the side of the seat or in the door and are designed to help protect an adult's chest in a serious side-impact crash.



Seat-mounted SAB



Door-mounted SAB

Head SABs are usually mounted in the roof rail above the side windows and are designed to help protect an adult's head in a side-impact crash. There are two types of head SABs: curtain SABs and tubular SABs. Typically, curtain SABs help protect both front and rear occupants in a side-impact crash; some may also provide protection from ejection if your car rolls over after being struck on the side.



Tubular SAB  
(with a door-mounted chest SAB)



Curtain SAB

Head/chest combination ("combo") SABs are usually mounted in the side of the seat and are typically larger than chest (or torso) SABs. Combo SABs are designed to help protect both the head and chest of an adult.



Combination (or "combo") SAB

All photos courtesy of the Insurance Institute for Highway Safety

Consult your owner's manual or vehicle manufacturer for specific information on your vehicle's side air bag system.

**2. How do SABs work?**

SABs inflate in a fraction of a second and are designed to help keep your head and/or chest from being hit by hard objects both inside and outside your vehicle in serious side-impact crashes. Sensors determine whether a crash is severe enough to inflate the SABs. Unlike frontal air bags, some of the side curtain air bags may stay inflated for several seconds during a crash for additional protection in the event of a rollover.

**3. Can a vehicle have both front and side air bags?**

Yes, some vehicles are equipped with both front and side air bags. Frontal air bags have been standard equipment in all passenger cars since model year 1998 and all SUV's, pickups and vans since model year 1999. SABs are being offered as standard or optional equipment on many new passenger vehicles.

**4. What are the benefits of SABs?**

SABs can provide significant safety benefits to adults in side impact crashes. NHTSA estimates that if all the vehicles on U.S. roads were equipped with head protection SABs, 700 to 1,000 lives would be saved per year in side impact crashes. NHTSA also estimates that, in side-impact crashes involving at least one fatality, nearly 60 percent of those killed have suffered brain injuries.

**5. Does the Federal government regulate SABs?**

Unlike front air bags, SABs are not required by NHTSA. Because they are not required safety equipment, the federal government does not mandate that vehicles be equipped with SABs. NHTSA has recently proposed an upgrade to the federal standard for side impact protection. The standard establishes occupant protection performance requirements, but does not mandate particular technologies to meet those requirements. Manufacturers may meet this upgraded rule with various types of innovative head, chest, and pelvis protection systems, such as SABs.

**6. What has been done to minimize risks from SABs?**

A group of experts representing the automotive and insurance industries and known as the Technical Working Group (TWG) has developed voluntary SAB testing procedures to minimize the potential risk of SAB-related injuries for occupants, especially children, who are seated very close to a deploying SAB (called "out-of-position").

Manufacturers now report to the government if the SABs in a given vehicle model have met the voluntary TWG out-of-position testing procedures. NHTSA provides this information to consumers in our "Buying a Safer Car" brochure and at our [www.safercar.gov](http://www.safercar.gov) Website. Vehicles whose SABs meet all the voluntary guidelines are designated with an "M" for Meets requirement in the column labeled "SAB Out of Position Testing" in the Available Features chart for each vehicle at [www.safercar.gov](http://www.safercar.gov). If your vehicle does not have an "M," you should check your owner's manual or contact the vehicle manufacturer for their recommendation on where your child should be seated in that vehicle.

Although out-of-position testing procedures are very good at identifying "aggressive" SABs and are intended to minimize risks to children and small adults seated next to them, they are not intended to replicate all possible scenarios.

**7. How do I know if my SABs were designed to minimize risks to children?**

Prior to the development of the recommended TWG performance guidelines for SABs (see #6 above), many chest (torso) and head/chest combination (combo) SABs showed a potential for serious or fatal injury to children seated very close to the deployment of the bag. However,

very few cars sold in the U.S. have these types of SABs in the rear seating positions. The first head SABs were introduced in model year 1998, but did not become widely available until recently. NHTSA has not seen any indication that current roof-mounted head SABs pose a risk to children. Many roof-mounted SABs now extend rearward to include the second and even the third row seating positions.

Vehicles that meet the voluntary TWG guidelines will have an "M" for Meets requirement in the column labeled "SAB Out of Position Testing" in the Available Features chart of each vehicle's page at [www.safercar.gov](http://www.safercar.gov). If your vehicle does not have an "M," you should check your owner's manual or contact the vehicle manufacturer to find out whether your car's SABs are safe for children.

The best way to find out what type of SAB your vehicle has is to look in your owner's manual or to check with your dealer. NHTSA also provides this information in a searchable SAB database at [www.safercar.gov](http://www.safercar.gov). Currently only model year 2004 and 2005 information is available. Earlier model year information, 1997-2003, will be available shortly.

This information also is available at [www.safercar.gov](http://www.safercar.gov) by viewing an individual vehicle's Available Features chart.

#### **8. What are NHTSA's recommendations regarding child passenger safety and SABs?**

All air bags (frontal or side) are supplemental safety devices and are intended to work best in combination with safety belts. Therefore, even with SABs that meet TWG testing procedures (see #6 above), make sure that:

- ALL children use a safety restraint appropriate for their age and size (this could be a safety seat, booster seat or adult safety belt).
- Children aged 12 and younger are safest sitting in the rear seat properly restrained.
- NEVER place a rear-facing infant seat in the front seat of a vehicle with a front passenger air bag.
- To minimize injury risks, NHTSA recommends that children not lean or rest against chest-only or head/chest combination SABs.
- NHTSA has not seen any indication of risks to children from current roof-mounted head SABs.

#### **9. What is the real world experience with children and SABs?**

NHTSA crash investigators actively seek out cases where SABs have deployed in crashes. So far, 92 cases have been investigated; of these only 6 involve children. There have been no moderate or serious injuries to children from SAB deployments, and only one minor injury - a skin laceration from an SAB cover. This small number of cases involves a limited number of vehicles with SABs and may not be representative of the variety of SAB systems currently available. NHTSA continues to closely monitor the real world performance of SABs involving children and adults.

#### **10. Did NHTSA issue a Consumer Advisory warning against seating children near SABs?**

Yes. In 1999, prior to the establishment of the TWG voluntary guidelines, NHTSA issued a Consumer Advisory warning consumers not to seat children next to activated SABs. At that time nearly all of the SABs in the rear seat were chest (torso) or head/chest combination SABs. However, the information provided in this Web page supercedes the 1999 Consumer Advisory and reflects the agency's most current understanding regarding the protection provided by SABs and any potential risk to children seated near them. NHTSA is monitoring the new SAB technologies and will continue to provide consumers with additional updates as more information becomes available.

**11. What do I do if my car has pre-TWG SABs?**

Consult your owner's manual or call your vehicle manufacturer for their recommendation on where your child should be seated in your vehicle.

**12. How can I contact my vehicle manufacturer for information on children and SABs?**

<i>Contact your vehicle manufacturer using the information below:</i>	
Acura:	800-382-2238
Aston Martin:	949-349-6260
Audi:	800-822-2834
BMW:	800-831-1117
Buick:	800-521-7300
Cadillac:	800-458-8006
Chevrolet:	800-222-1020
DaimlerChrysler:	800-992-1997
Ford:	800-392-FORD / (800-392-3673)
General Motors:	800-462-8782
Hyundai:	800-633-5151
Honda:	800-999-1099
Hummer:	866-486-6376
Infiniti:	800-NISSAN1 / (800-647-7261)
Isuzu:	800-255-6727
Jaguar:	800-4JAGUAR / (800-452-4827)
Kia:	800-333-4kia / (800-333-4542)
Land Rover:	800-637-6837
Lincoln/Mercury:	800-521-4140
Mazda:	800-222-5500
Mercedes-Benz:	800-367-6372
Mini:	800-ASK-MINI / (800-275-6464)
Mitsubishi:	888-648-7820
Nissan:	800-NISSAN1 / (800-647-7261)
Oldsmobile:	800-442-6537
Pontiac:	800-762-2737
Saturn:	800-553-6000
Subaru:	800-SUBARU-3 / (800-782-2783)
Suzuki:	800-934-0934
Volvo:	800-458-1552
VW:	800-822-8987

## **Compilation of Child Passenger Safety Checklist Forms**

- Safe Kids Worldwide Child Passenger Safety Checklist
- City of Livermore Child Safety Seat Checklist
- Child Passenger Checklist for use at St. John's Hospital, Springfield
- NC Child Passenger Safety Inspection Checklist





# CHILD PASSENGER SAFETY CHECKLIST

**INSTRUCTIONS:** Use blue, black ink or #2 pencil only. Do not write in the margins. Submit only originals to SKW. Fill in boxes, one letter per box: **1 2 M A P L E S T** Fill in circles like this: ● Not: ⊗

Driver's First Name				Driver's Last Name			
Street Address				City			
Telephone Number		E-mail Address		State		ZIP	
Vehicle Make/Manufacturer				Vehicle Model		Vehicle Year	
<small>(e.g., Chevy, Pontiac, Nissan, Honda, etc.)</small>				<small>(e.g., Silverado, Grand Am, Altima, Civic, Seville, Dakota, Malibu, Blazer, etc.)</small>			
How did you hear about this event?						I would like to make a contribution to my local Safe Kids coalition.	
<input type="radio"/> Flier	<input type="radio"/> Web	<input type="radio"/> Newspaper	<input type="radio"/> Drove by event	<input type="radio"/> Y	<input type="radio"/> N		
<input type="radio"/> TV	<input type="radio"/> Radio	<input type="radio"/> Friend/relative	<input type="radio"/> Other				

Add your own waiver in this text box.

Signature: X Date (MM/DD/YYYY):      /      /     

**CHILD NUMBER 1**  
 First Name:      Age:      years      Months DOB (MM/DD/YYYY):      /      /     

**Official Use Only - See Guide on Other Side**

<p><b>About the child &amp; CSS/restraint</b></p> <p>1. Wt: <u>    </u> lbs HT (in inches): <u>    </u> <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</p> <p>2. Child present? <input type="radio"/> Y <input type="radio"/> N</p> <p>3. Expectant mom? <input type="radio"/> Y <input type="radio"/> N</p> <p>4. Seat history known? <input type="radio"/> Y <input type="radio"/> N</p> <p>5. CSS involved in crash? <input type="radio"/> Y <input type="radio"/> N</p> <p>6. CSS checked before? <input type="radio"/> Y <input type="radio"/> N</p> <p>7. If Yes, how many times? <u>    </u></p> <p>8. Child location in vehicle:</p> <table style="width: 100%; text-align: center;"> <tr> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Front Row</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Back Row</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Optional Rear Row</td> </tr> </table> <p><small>X to indicate arrival location; M for new location</small></p> <p>9. Driver wears safety belt? <input type="radio"/> Y <input type="radio"/> N</p> <p><b>If seat arrives uninstalled go to question #20</b> →</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Front Row	<input type="checkbox"/>	<input type="checkbox"/>	Back Row	<input type="checkbox"/>	<input type="checkbox"/>	Optional Rear Row	<p><b>Check CSS/Restraint as it arrives</b></p> <p>10. CSS/restraint type (see key):  <input type="radio"/> IO <input type="radio"/> BPB <input type="radio"/> Other  <input type="radio"/> IO Base <input type="radio"/> Lap Belt <input type="radio"/> None  <input type="radio"/> RF CONV <input type="radio"/> L/S Belt  <input type="radio"/> FF/Harness <input type="radio"/> Vest/car bed</p> <p>11. Child safely near airbag? <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</p> <p>12. CSS correct direction? <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</p> <p>13. Harness correct? <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</p> <p>14. Seat belt locked/tight/correct? <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</p> <p>15. Lower Anchors correct? <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</p> <p>16. Tether correct? <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</p> <p>17. CSS Mtg: <u>    </u></p> <p>18. CSS Model Number: <u>    </u></p> <p>19. CSS Mtg Date (MM/DD/YYYY): <u>    </u> / <u>    </u> / <u>    </u></p> <p>20. Labels missing? <input type="radio"/> Y <input type="radio"/> N</p> <p>21. Seat recalled? <input type="radio"/> Y <input type="radio"/> N</p>	<p><b>Installation</b></p> <p>22. Replace CSS at event? <input type="radio"/> Y <input type="radio"/> N</p> <p><b>Uninstalled or New CSS</b></p> <p>23. Seat provided by <input type="radio"/> Parent <input type="radio"/> Coalition</p> <p>24. CSS Mtg: <u>    </u></p> <p>25. CSS Model Number: <u>    </u></p> <p>26. CSS Mtg Date (MM/DD/YYYY): <u>    </u> / <u>    </u> / <u>    </u></p> <p>27. CSS type (see key):  <input type="radio"/> IO <input type="radio"/> FF/Harness  <input type="radio"/> RF CONV <input type="radio"/> BPB</p> <p>28. Registration Card sent? <input type="radio"/> Y <input type="radio"/> N</p> <p>29. Parent installed CSS? <input type="radio"/> Y <input type="radio"/> N</p> <p>30. Parent adjusted? <input type="radio"/> Y <input type="radio"/> N</p> <p>31. All corrections made? <input type="radio"/> Y <input type="radio"/> N</p> <p>Parent initials: <u>    </u></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Front Row									
<input type="checkbox"/>	<input type="checkbox"/>	Back Row									
<input type="checkbox"/>	<input type="checkbox"/>	Optional Rear Row									
Tech name (Please Print): <u>    </u> Tech cert. #: <u>    </u> Senior Checker name (Please Print): <u>    </u>											
<input type="radio"/> No Mouse <input type="radio"/> Education Materials Provided <input type="radio"/> CSS Arrived Uninstalled <input type="radio"/> Contributors Collected <input type="radio"/> Child Arrived Unrestrained <input type="radio"/> Recall Information Provided <input type="radio"/> Voucher Given		Comments: <u>    </u>									
Coalition #: <u>    </u> Inspector Station # (if applicable): <u>    </u>		11/06									

**CHILD NUMBER 2**

First Name           Age:  Years  Months DOB (MM/DD/YYYY)  /  /

**Official Use Only - See Guide Below**

<b>About the child &amp; CSS/restraint</b> 1. Wt: <input type="text"/> <input type="text"/> Ft (in inches) <input type="text"/> <input type="text"/> 2. Child present? <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA 3. Expectant mom? <input type="radio"/> <input type="radio"/> <input type="radio"/> 4. Seat history known? <input type="radio"/> <input type="radio"/> <input type="radio"/> 5. CSS involved in crash? <input type="radio"/> <input type="radio"/> <input type="radio"/> 6. CSS checked before? <input type="radio"/> <input type="radio"/> <input type="radio"/> 7. If Yes, how many times? _____ 8. Child location in vehicle: <input type="checkbox"/> <input type="checkbox"/> Front Row <input type="checkbox"/> <input type="checkbox"/> Back Row <input type="checkbox"/> <input type="checkbox"/> Optional Rear Row X to indicate arrival location, M for new location 9. Driver wears safety belt? <input type="radio"/> Y <input type="radio"/> N If seat arrives uninstalled go to question #20 →		<b>Check CSS/restraint as it arrives</b> 10. CSS/restraint type (see key) <input type="radio"/> IO <input type="radio"/> BFB <input type="radio"/> Other <input type="radio"/> IO Base <input type="radio"/> Lap Belt <input type="radio"/> None <input type="radio"/> RF CONV <input type="radio"/> L/S Belt <input type="radio"/> FF/Harness <input type="radio"/> Vest/car bed 11. Child safely near airbag? <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA 12. CSS correct direction? <input type="radio"/> <input type="radio"/> <input type="radio"/> 13. Harness correct? <input type="radio"/> <input type="radio"/> <input type="radio"/> 14. Seat belt locked/tight/correct? <input type="radio"/> <input type="radio"/> <input type="radio"/> 15. Lower Anchors correct? <input type="radio"/> <input type="radio"/> <input type="radio"/> 16. Tether correct? <input type="radio"/> <input type="radio"/> <input type="radio"/> 17. CSS Mtg: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 18. CSS Model Number: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 19. CSS Mtg Date (MM/DD/YYYY): <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> <input type="text"/> 20. Labels missing? <input type="radio"/> Y <input type="radio"/> N 21. Seat recalled? <input type="radio"/> <input type="radio"/>		<b>Installation</b> 22. Replace CSS at event? <input type="radio"/> Y <input type="radio"/> N <b>Uninstalled or New CSS</b> 23. Seat provided by: <input type="radio"/> Parent <input type="radio"/> Coalition 24. CSS Mtg: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 25. CSS Model Number: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 26. CSS Mtg Date (MM/DD/YYYY): <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> <input type="text"/> 27. CSS type (see key): <input type="radio"/> IO <input type="radio"/> FF/Harness <input type="radio"/> RF CONV <input type="radio"/> BFB 28. Registration Card sent? <input type="radio"/> Y <input type="radio"/> N 29. Parent installed CSS? <input type="radio"/> <input type="radio"/> <input type="radio"/> 30. Parent adjusted? <input type="radio"/> <input type="radio"/> <input type="radio"/> 31. All corrections made? <input type="radio"/> <input type="radio"/> <input type="radio"/> Parent initials <input type="text"/>	
Tech name (Please Print) _____ Tech cert. # <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		Senior Checker name (Please Print) _____			
<input type="radio"/> No Mouse <input type="radio"/> CSS Arrived Uninstalled <input type="radio"/> Child Arrived Unrestrained <input type="radio"/> Voucher Given		<input type="radio"/> Education Materials Provided <input type="radio"/> Contributions Collected <input type="radio"/> Recall Information Provided			
<b>Key to CSS Type</b> IO = Infant only IO Base = Infant only with base RF CONV = Rear-facing convertible FF/harness = Forward-facing with harness (FF only or FF/CONV) BFB = Belt-positioning booster L/S belt = Lap/shoulder belt		<b>Resources</b> Safe Kids Worldwide and Safe Kids Certification - <a href="http://usa.safekids.org">usa.safekids.org</a> CPS Board - <a href="http://www.cpsboard.org">www.cpsboard.org</a> NHTSA hotline <a href="http://www.nhtsa.dot.gov">www.nhtsa.dot.gov</a> 888-327-4236 Children's Hospital of Philadelphia - <a href="http://www.chop.edu/carseat">www.chop.edu/carseat</a> Latest edition LATCH Manual - <a href="http://www.saferchildren.com">www.saferchildren.com</a> For CSS manufacturer's instructions <a href="http://www.carseat.org">www.carseat.org</a>			
<b>Direction</b>	<ul style="list-style-type: none"> <li>Infants less than 1 year and 20 pounds must ride semi-reclined in a rear-facing position to protect the spine and neck.</li> <li>It is recommended that infants and toddlers ride rear-facing in a convertible infant/toddler seat up to 35 pounds or the maximum weight specified by the manufacturer.</li> </ul>				
<b>Location</b>	<ul style="list-style-type: none"> <li>All children under age 13 should ride in a back seat.</li> <li>If a child must ride in the front seat, then the child with a full harness or properly adjusted shoulder belt seated in the correct forward facing and upright position should sit there.</li> <li>Move the vehicle seat back as far away from the airbag as possible.</li> <li>If the vehicle has side airbags or outlets, check the vehicle owner's manual and child restraint manual for instructions.</li> <li>For older children sitting in safety belts next to side airbags, remind them to sit straight up and avoid resting their heads on a window or structural part of the vehicle.</li> </ul>				
<b>Harness</b>	<ul style="list-style-type: none"> <li>Infant seat harness straps should pass through the slots at or below the rear-facing baby's shoulders.</li> <li>Toddler seat harness straps should pass through the slots at or above the forward-facing toddler's shoulders. Read seat instructions.</li> <li>A toddler is too large for a harness when the shoulders are above the top harness slots, or exceeds weight.</li> <li>Harness straps must lay flat on the chest and over the hips. Harness straps must pass the "pinch" test when the buckled straps are pinched at the shoulder, there should be no slack or extra webbing.</li> <li>The harness retainer clip must sit at the child's armpit level, and the straps must be threaded properly through the clip.</li> </ul>				
<b>Belt-Positioning Booster Seats</b>	<ul style="list-style-type: none"> <li>Boosters are used only with lap/shoulder safety belts. Must do not allow for a pre-crash locked safety belt.</li> <li>Special products, such as vests and Y harnesses used with a booster base, must be used according to manufacturer's instructions and the vehicle owner's manual.</li> </ul>				
<b>Installation</b>	<ul style="list-style-type: none"> <li>Do not use LATCH and safety belts together.</li> <li>Never install a rear-facing car seat in front of an airbag that cannot be turned off. Newer "smart" airbags may automatically deactivate, but follow vehicle manufacturer's instructions completely.</li> <li>Safety belts must pass through the car seat exactly where the manufacturer directs.</li> <li>The car seat must not move more than 1 inch side to side or front to back when grasped at the belt path.</li> <li>Use the tether as directed by the manufacturer and the vehicle owner's manual.</li> <li>LATCH anchors are used only if both the vehicle and the car seat are equipped.</li> <li>Check vehicle manufacturer's manual to identify designated LATCH and tether locations. Follow manufacturer's instructions.</li> <li>Tethers are never attached to the lower anchor bars.</li> <li>Use tethers on rear-facing car seats only if the manufacturer so directs.</li> <li>Vehicles made after 1996 should meet federal safety belt lockability requirements, no locking clip should be needed.</li> <li>Test vehicle safety belts by buckling the safety belt and pulling slightly upward on the lap belt.</li> <li>Tethers may be used in some vehicles to under 48 pounds and in others to 60 pounds. Older children who ride in harnessed seats will require special arrangements. Check with vehicle manufacturer.</li> </ul>				
<b>Child Ready for Safety Belt</b>	<ul style="list-style-type: none"> <li>With the child's back and bottom against vehicle seat back, the knees should bend naturally at vehicle seat edge.</li> <li>When the safety belt is buckled, the lap belt fits low on the hips, and the shoulder belt rests between neck and shoulder on the collarbone. The shoulder belt is never placed under the arm or behind the back.</li> <li>Optionally, the child's feet should touch the floor.</li> </ul>				
This list is not exhaustive and should not be relied upon in place of the NHTSA 32-hour standardized curriculum.					



# CITY OF LIVERMORE Child Safety Seat Checklist

*Technicians: Have parent put child in seat to record restraint use before making corrections.*

Location: _____ Date: _____ Seat Installed: With Child <input type="checkbox"/> Without Child <input type="checkbox"/> New Install <input type="checkbox"/> Make of Seat Britax <input type="checkbox"/> Century <input type="checkbox"/> Cosco <input type="checkbox"/> Evenflo <input type="checkbox"/> Fisher-Price <input type="checkbox"/> Graco <input type="checkbox"/> Other <input type="checkbox"/> Make of Seat _____ Model Name & Number: _____ Mfg. Date: _____ Seat Recalled? Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <input type="checkbox"/> Seat Has Advisory Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <input type="checkbox"/> Parents Informed?: Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Recall Repaired?: Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <input type="checkbox"/> N/A <input type="checkbox"/> Meets FMVSS 213?: Yes <input type="checkbox"/> No <input type="checkbox"/> Seat Involved in crash? Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <input type="checkbox"/> <b>Latch plate:</b> Locking <input type="checkbox"/> Sliding <input type="checkbox"/> Switchable <input type="checkbox"/> Sewn on <input type="checkbox"/> <b>Retractor:</b> ELR <input type="checkbox"/> ALR <input type="checkbox"/> Switchable <input type="checkbox"/> None <input type="checkbox"/>	Mark an "F" where found Mark an "M" if moved Mark an "I" where installed D = Driver <table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; font-weight: bold;">D</td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table>	D								
D										

Rear Facing Child Safety Seats	Forward Facing Child Safety Seats	Booster Seats
Rear Facing Only <input type="checkbox"/> Convertible <input type="checkbox"/>	5 Pt <input type="checkbox"/> 5 Pt HBB <input type="checkbox"/> Tray Shield <input type="checkbox"/> T-Shield <input type="checkbox"/>	High Back <input type="checkbox"/> Backless <input type="checkbox"/> Shield <input type="checkbox"/>
Y N N/A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Child within maker's height/weight range <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat is best choice for child <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat is in a NON air bag position <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat faces rear of vehicle <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat at best reclined angle for child <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Carrier handle down <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat free of added cushioning <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Infant free of heavy clothing <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Harness comes from at or below infant's shoulders <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Harness lies flat and is free from fraying or tears <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Harness is snug <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Harness complete, attached and locked correctly ( double back ) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Retainer clip is present <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Retainer clip is threaded correctly and at armpit level <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Crotch strap adjusted properly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Buckle mechanism appears to open and lock properly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Vehicle belt routed properly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Vehicle belt secures seat tightly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat belt locked properly (locking clip, switchable retractor, etc.) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Locking clip / Lock off used correctly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Latch system used correctly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <u>Britax Only</u> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Tether strap on and anchored correctly	Y N N/A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Child within maker's height/weight range <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat is best choice for child <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat is in a NON air bag position <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat faces forward <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat in upright position <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat free of added cushioning <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Child free of heavy clothing <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Harness in upper slots or in reinforced position above shoulders <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Harness lies flat and is free from fraying or tears <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Harness is snug <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Harness complete, attached and locked correctly (double back) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Retainer clip is present <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Retainer clip is threaded correctly and at armpit level <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Crotch strap adjusted properly (if adjustable) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Buckle mechanism appears to open and lock properly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Vehicle belt routed properly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Vehicle belt secures seat tightly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat belt locked properly (locking clip, switchable retractor, etc.) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Locking clip / Lock off used correctly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Latch system used correctly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Tether strap on and anchored correctly	Y N N/A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Child within maker's height/weight range <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat is best choice for child <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Seat is in a NON air bag position or vehicle seat in full retracted position <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Child has head protection <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Lap/Shoulder belt fits child properly <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Shield removed from booster  <b>Vehicle Seat Belt</b> Y N N/A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Child sits all the way back against the auto seat <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Child's knees bend comfortably at the edge of the auto seat <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Lap belt is as low as possible and is touching the thighs. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Shoulder belt is between neck and shoulder <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Can the child stay seated like this for the whole trip  <b>Other Child Restraints</b> Y N N/A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Child within maker's height/weight range <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Restraint used according to manufacturer's instructions

Technician: Check the boxes discussed with Parent/ Care giver		
<input type="checkbox"/> All corrections made, seat properly installed before leaving <input type="checkbox"/> Findings discussed with parents <input type="checkbox"/> Discussed turn around /graduation time <input type="checkbox"/> Information given on Air Bags and other safety issues	<b>Replacement seat provided</b> Yes <input type="checkbox"/> No <input type="checkbox"/> Voucher <input type="checkbox"/>  Make _____ Model _____ MFG. Date _____	<b>Technician Information</b> Technician's Name and Number _____  Senior Checker's Name and Number _____
Materials Used		
<input type="checkbox"/> Swim noodle <input type="checkbox"/> Grip liner <input type="checkbox"/> Locking Clip added		

**CITY OF LIVERMORE  
CHILD PASSENGER RESTRAINT (CAR SEAT) SYSTEM  
CHECK AND INSPECTION PROGRAM  
WAIVER, HOLD HARMLESS AND INDEMNIFICATION AGREEMENT**

*Please read, sign and date*

I, the undersigned, will hold harmless the City of Livermore, its officials, employees, agents and volunteers and waive any claim on my behalf, on behalf of any child for which I am a parent or guardian, or for any child who may be in my custody or care, and on behalf of my heirs, representatives and assigns against the City of Livermore, its officials, agents and volunteers for illness, death, injury, debts, damage to property, or other harm arising from the City of Livermore's Child Passenger Restraint (car seat) Check and Inspection Program, and I will assume all responsibility for the use of my Child Passenger Restraint (car seat) before, during and after the check and inspection.

\_\_\_\_\_ (Signature) \_\_\_\_\_ (Print or type name)

If the person availing himself/herself of the check and inspection does not read and understand English, the waiver may be read to the person, and verified that it is understood.

I, the undersigned, read the above waiver and indemnification agreement to the person who's name and signature appear above.  
\_\_\_\_\_ indicated to me in the affirmative that he or she understood the waiver, and agrees to its terms.

\_\_\_\_\_ (Signature) \_\_\_\_\_ (Print or type name)

*Please complete the following*

Parent / Care Giver:	Relationship to child, if not parent:
Address:	City, State, Zip code:
Phone Number:	Child's Name:
Expectant Mom: Yes <input type="checkbox"/> No <input type="checkbox"/> Child's Age and Size: Years: _____ Months: _____ Child's Weight: _____ Child's Height: _____	
Any Medical Concerns ? ie: Breathing problems, Pre-mature birth etc.	
Are there other children do you regularly transport? _____	
Vehicle Information: Year: _____ Make: _____ Model: _____ Tether anchors: Yes <input type="checkbox"/> No <input type="checkbox"/> Latch equipped: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is the Vehicle Owner's Manual Available ? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Air Bag - Driver Side Yes <input type="checkbox"/> No <input type="checkbox"/> Passenger Side Yes <input type="checkbox"/> No <input type="checkbox"/> Side Yes <input type="checkbox"/> No <input type="checkbox"/> Other _____	
Air Bag - Disabled: Yes <input type="checkbox"/> No <input type="checkbox"/> On / Off Switch: Yes <input type="checkbox"/> No <input type="checkbox"/>	
How did you find out about this event or service ? _____	

**For Official Use Only: Checker/Technician Comments:**


Revised 3/13/03

**Instructions for using the Child Passenger Checklist deemed appropriate for  
use at St. John's Hospital, Springfield  
Revised: March 20, 2006**

The purposes of the Child Passenger Checklist form are to:

- 1) Provide guidance to any Child Passenger Safety (CPS) Technician, regardless of experience, to insure that a complete inspection of the child restraint device (CRD) is made and
- 2) Provide a means for the CPS technician to document and, if necessary to do so at a later date, reconstruct the services provided, including:
  - a) That all aspects of correct restraint use, including type of restraint selected, harness/shield adjustment, and CRD installation are evaluated
  - b) That this evaluation is based on information contained in the CRD manufacturer's instructions
  - c) That the results of this evaluation have been communicated to the parent and that the technician has taught the care giver how to use and (as is applicable) how to install the CRD in the vehicle
  - d) That the caregiver understands the scope and intent of the services provided and that the care giver was taught and understands how to use and install the CRD and
  - e) That the caregiver made the final decision on how to use and install the CRD.
- 3) The purpose of this form is NOT to serve as an educational tool for the caregiver. Brochures, fact sheets or other educational material or referrals to additional sources of technical information must be provided to the caregiver. **St. John's** employees must use the standardized fact sheets provided by Safe Ride News. The title of each sheet provided must be documented.
- 4) Important notes about this form are that:
  - a) This form should be used to assess the restraint use for only one child. COMPLETE ONE FORM PER CHILD and
  - b) COMPLETE A FORM FOR EACH CHILD IN THE VEHICLE – even those who are in a seat belt rather than a CRD.
  - c) The use/nonuse and correct/incorrect use of restraints by all vehicle occupants should be assessed and concerns or suggestions communicated to the driver and/or occupants as is deemed appropriate.
  - d) Except for items skipped as directed, none of the items on the form should be left blank. ALL OF THE ITEMS ON THE FORM SHOULD BE COMPLETE AS IS APPROPRIATE OR MARKED AS "UNKNOWN" OR "NOT APPLICABLE." This is to help assure that the CPS technician is providing a complete assessment and to document that all pertinent aspects of the situation have been addressed. Only complete the sections that pertain to the situation. For example, if the child is in a rear-facing infant only seat, there is no need to provide information in any other section since this information is not applicable.
  - e) Most items can be answered by checking the appropriate box. If an item is marked as "N" for incorrect use, the technician must correct the error if possible. If the situation is not correctable due to lack of proper equipment or materials being available, the technician must provide appropriate advice and or arrange for alternate transportation or restraint. If the restraint is determined to be totally unsafe, another restraint should be provided. Any **St. John's** CPS technician should contact the **St. John's** Trauma Prevention Education Coordinator at the provided telephone numbers to provide another restraint or to seek a solution.

**Parental/Care Giver Consent:**

Sections to be filled out by the parent, driver or other caregiver are surrounded by heavy double-lined borders. These include sections titled Driver Information, Vehicle Information, Child Information and Important Information. The area that contains the parental/caregiver consent and information about the child and vehicle should be filled out by the person whom you are providing the service for and whom you will be interacting with. The consent should be complete and signed before checking the restraints in the vehicle. If the caregiver refuses to sign the consent form, do not provide the service. Obtaining signed consent is an important part of the complete documentation needed for liability protection.

**Safety Seat Information:**

1. Check the appropriate box to indicate the type of restraint that the child is in upon arrival.
2. Child restraint manufacturing information can be found on the FMVSS 213 required labels. Sometimes, this information is on the back or bottom of the restraint and can not be read unless the CRD is removed. This item can be skipped and returned to later. **Do not remove the CRD to locate the model and manufacturing date information until after you have had a chance to 1) check the positioning and snugness of the harness on the child and 2) check the routing of the seatbelt used to install it and the snugness of the installation.**
3. Once the appropriate labels are located, record the information in the designated areas on the checklist. Please note that if the model name cannot be found, this information is not required as long as the model number is present.
4. Using the information on the labels and through conversation with the participant, determine the following:
  - a) **Is the safety seat instruction manual present?**
  - b) **Is the owner of the seat the original owner?**
  - c) **Has the seat been involved in a crash?**
  - d) **Is the seat FMVSS Certified?**
  - e) **Has the seat been recalled?**
  - f) **Was the participant informed of the recall?**

**Safety Seat Location:**

5. Indicate, using the appropriate symbols, the location of the safety seat upon arrival and if the seat was moved to a different seating location.
6. Mark the appropriate boxes to indicate the presence of airbags in the driver, passenger and side locations. If present, the exact location of side airbags must be noted.

**Safety Belt Type:**

7. Indicate the type of retractor present at the safety seat location. Automatic Locking Retractor is designated as ALR, and Emergency Locking Retractor is designated as ELR. Other choices are a switchable retractor or none if there is no retractor present.
8. Indicate the type of latch plate present at the safety seat location. These include Locking, Lightweight Locking, Sliding, Fixed and Switchable.
9. Indicate the type of restraint system present at the safety seat location. These include lap belt, lap/shoulder belt, LATCH and other.

**Program/Technician Information:**

Use this section to record information about the event and the CPS Technician(s) responsible for the inspection as follows. Remember that a **CRS Checkup (individual or group event) is intended as an educational service, not an installation service for families.** Parents and other caregivers should be active, learning participants in the process and leave with the knowledge and skills to use and install their own CRS for the safe transportation of their own children.

10. Write in the date and the site of the inspection.
11. At least one Technician must print his/her name and then sign to attest to the fact that the proper installation and proper use of the child restraint system, including seatbelts, has been taught to the parent or other care giver. A second line is provided for a second Technician participating in the inspection or for a senior checker to attest that he/she agrees with the assessment and parental education provided.
12. If the program provided a restraint for the participant, indicate the manufacturer, name, model number, manufacturing date and the type of seat provided.
13. Use the "Comments" section to list in detail any problems that were encountered, corrections that were made, and/or recommendations that were given to the parent. Be especially sure to document instances where the parent or caregiver has chosen not to follow the advice you have provided. If additional space is needed continue attach an addendum sheet. Take the time to document whatever needs to be documented.

**Page 2 Child Passenger Checklist (continued)****Rear Facing Child Safety Seats**

Using best practice guidelines provided to you in the 32 hour standardized technician curriculum manual, indicate the type of seat the child arrived in and answer the listed questions.

- **Is the child seated near an airbag?** By indicating "no", you are indicating that the CRS is not in front of an airbag. If you indicate "yes" immediate action must be taken to place the child and the CRS in a seating position without an active airbag. Discuss this situation with the parents to prevent the infant from leaving in this high risk seating position.

**Forward Facing Child Safety Seats**

Using best practice guidelines provided to you in the 32 hour standardized technician curriculum manual, indicate the type of seat the child arrived in and answer the listed questions.

- **Is the child seated near an airbag?** By indicating "no", you are indicating that the CRS is not in front of an airbag or that the seat is as far from the airbag as possible.

**Belt Positioning Booster**

Using best practice guidelines provided to you in the 32 hour standardized technician curriculum manual, indicate the type of seat the child arrived in and answer the listed questions. Please note that a belt-positioning booster may only be used with a lap AND shoulder belt system.

- **Is the child seated near an airbag?** By indicating "no", you are indicating that the CRS is not in front of an airbag or that the seat is as far from the airbag as possible.

**Vehicle Seat Belt**

Using best practice guidelines provided to you in the 32 hour standardized technician curriculum manual, indicate the type of seat the child arrived in and answer the listed questions. Please note that upper body protection (lap and shoulder belt) is the best practice guideline for children riding in the vehicle seat belt. This may require a child to sit in a front seating position with the seat as far from the airbag as possible.





# Child Passenger Checklist

<b>Driver Information:</b> Name: _____ Address: _____ _____ Phone: (____) _____ - _____	<b>Relationship with Child:</b> <input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Other Family <input type="checkbox"/> Other	<b>How often is seat moved?</b> <input type="checkbox"/> Once/week <input type="checkbox"/> Once/month <input type="checkbox"/> Infrequently <input type="checkbox"/> Never
Is the Child: <input type="checkbox"/> with you today <input type="checkbox"/> not with you today		
<b>Vehicle Information:</b> Year: _____ Make: _____ Model: _____ Is the vehicle instruction manual present? <input type="checkbox"/> yes <input type="checkbox"/> no		
<b>Child Information:</b> Name: _____ <input type="checkbox"/> Male <input type="checkbox"/> Female <b>OR</b> <input type="checkbox"/> Unborn    Expectant Parent Due Date: _____ Age: _____ Years/months/weeks/days    Height/Length: _____    Weight: _____ <small>(circle one)</small>		
Does the child have any medical concerns? <input type="checkbox"/> yes <input type="checkbox"/> no <small>(i.e. breathing problems, premature birth, etc) If yes, please describe:</small>		
<b>Important Information:</b> I understand and agree that: the sole purpose of this program is to help reduce the incidence of the improper installation of child safety seats; that this inspection is being provided as a free service to me; that this program cannot fully evaluate the quality, safety, or condition of the car safety seat, the car safety seat provided or any component of my vehicle, including the seats or safety belts; and that this program cannot guarantee my child's safety in a vehicle collision. However, I understand that a properly used child safety seat can reduce fatal injury and that it is important to read both the vehicle and car seat instruction manuals. I understand that this service is provided for informational purposes only, and I have the final decision on how the car seat and the child will leave this site. For these reasons, I hereby release the organizers, sponsors, any program participants or volunteers from any present or future liability for any injuries or damages that may result from a vehicle collision or otherwise.		
Participant's Signature: _____		Date: ____/____/____
PARTICIPANTS STOP HERE! DO NOT CONTINUE UNTIL WAIVER HAS BEEN SIGNED!		

## Safety Seat Information:

<b>Type of Seat:</b> <input type="checkbox"/> Infant <input type="checkbox"/> Convertible <input type="checkbox"/> Forward Facing only <input type="checkbox"/> High Back Booster only <input type="checkbox"/> Other Booster <input type="checkbox"/> Vest <input type="checkbox"/> Integrated <input type="checkbox"/> No seat being used	Make: _____ Name: _____ Model #: _____ Date of Manufacture: ____ / ____ / ____ <small>(month) (day) (year)</small>	Is the safety seat instruction manual present? <input type="checkbox"/> yes <input type="checkbox"/> no Is the owner of the seat the original owner? <input type="checkbox"/> yes <input type="checkbox"/> no Has the seat been involved in a crash? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Unknown Is the seat FMVSS Certified? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Unknown Has the seat been recalled? <input type="checkbox"/> yes <input type="checkbox"/> no Was participant informed of recall? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> N/A
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<b>Safety Seat Location:</b> (if seat was moved) X = initial position    M = final position <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> </tr> <tr> <td>Driver</td> <td></td> <td></td> <td></td> </tr> </table>					Driver				<b>Safety Belt Type:</b> Type of Restraint System <input type="checkbox"/> Lap belt <input type="checkbox"/> Lap/Shoulder belt <input type="checkbox"/> LATCH <input type="checkbox"/> Other <input type="checkbox"/> Parent educated regarding type, function and proper use of restraint system.
Driver									
Driver Side Front Airbag <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> disabled <input type="checkbox"/> On/Off switch present Passenger Side Front Airbag <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> disabled <input type="checkbox"/> On/Off switch present Side Airbags Present <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> disabled <input type="checkbox"/> On/Off switch present Location of side air bags:	Type of Retractor <input type="checkbox"/> ALR <input type="checkbox"/> ELR <input type="checkbox"/> Switchable <input type="checkbox"/> None <input type="checkbox"/> Parent educated regarding type, function and proper use of retractor								
	Type of Latch Plate or LATCH Attachment <input type="checkbox"/> Locking <input type="checkbox"/> Lightweight Locking <input type="checkbox"/> Sliding <input type="checkbox"/> Fixed <input type="checkbox"/> Switchable <input type="checkbox"/> push on attachment <input type="checkbox"/> Rigid attachment <input type="checkbox"/> Parent educated regarding type, function and proper use of latch plate.								
Date of Inspection: ____ / ____ / ____    Site of Inspection: _____ Inspected by: Name: _____ Signature: _____ Technician # _____ Senior Checker Name: _____ Signature: _____ Technician # _____ Materials Used: <input type="checkbox"/> swim noodle # _____ <input type="checkbox"/> tightly rolled towel # _____ <input type="checkbox"/> locking clip <input type="checkbox"/> other _____ Print/Educational Materials provided: _____	<b>Replacement Seat Provided? If so:</b> Manufacturer: _____ Name: _____ Model #: _____ Mfg. Date: _____ Circle type:    infant    convertible    booster								

## Child Passenger Checklist (continued)

Technicians: Record restraint use as child arrived. "Y" = Yes, "N" = No, "N/A" = Not applicable, "C" = problem corrected. Record all changes made.

<b>Rear Facing Child Safety Seats</b>				<input type="checkbox"/> Rear facing only	<input type="checkbox"/> Convertible	<input type="checkbox"/> 5 pt harness	<input type="checkbox"/> 3 pt harness	
<b>Y</b>	<b>N</b>	<b>N/A</b>	<b>C</b>					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the child seated near an airbag?	<input type="checkbox"/>	Instructed parent to never place rear-facing infant in front of an airbag.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child within manufacturer's recommended weight/height range				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child seat installed rear facing	<input type="checkbox"/>	Instructed parent that infant should ride rear facing as long as possible (at least until 1 year and 20 pounds).		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child seat at appropriate angle according to manufacturer's guidelines	<input type="checkbox"/>	Instructed parent to install seat at appropriate angle.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto base used				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Carrier handle down per manufacturer's instructions.	<input type="checkbox"/>	Informed parent of proper handle placement during travel per manufacturer's instructions.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child seat free of added cushioning.	<input type="checkbox"/>	Instructed parents to avoid added cushioning in safety seat.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Infant free of heavy clothing	<input type="checkbox"/>	Instructed parent to avoid heavy clothing on child while in seat.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness straps come from at or below infant's shoulders.	<input type="checkbox"/>	Instructed parents regarding proper level of harness straps for rear-facing child.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness straps lie flat and are not twisted.	<input type="checkbox"/>	Instructed parents to avoid twisted harness straps.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness straps are snug.	<input type="checkbox"/>	Instructed parent to tighten harness straps so that straps are snug.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness is complete and attached to seat according to manufacturer's instructions.				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness retainer clip is present (if required)	<input type="checkbox"/>	Informed parent of purpose of retainer clip and its action in a crash.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness retainer clip is threaded correctly.	<input type="checkbox"/>	Informed parent of proper threading path for harness retainer clip.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness retainer clip is at armpit level.	<input type="checkbox"/>	Informed parent to always place retainer clip at armpit level on the infant.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Belt routed correctly	<input type="checkbox"/>	Informed parent of proper belt path for rear-facing seat.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Belt holding seat tightly in vehicle.	<input type="checkbox"/>	Instructed parent to secure seat so that it is snug at the belt path.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Belt in locking mode	<input type="checkbox"/> Locking Clip	<input type="checkbox"/> Switched Retractor	<input type="checkbox"/> Locking Latch Plate	<input type="checkbox"/> LATCH
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Locking clip used correctly (if required)				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LATCH used correctly				
<b>Forward Facing Child Safety Seats</b>				<input type="checkbox"/> 5 pt harness	<input type="checkbox"/> T-Shield	<input type="checkbox"/> Tray Shield	<input type="checkbox"/> Integrated	
<b>Y</b>	<b>N</b>	<b>N/A</b>	<b>C</b>					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child within manufacturer's recommended weight/height range				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the child seated near an airbag?	<input type="checkbox"/>	Instructed parent regarding vehicle manufacturer's recommendation for airbag use.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child Seat Installed Forward-facing	<input type="checkbox"/>	Instructed parent that child must be 1 year old and weigh 20 pounds to ride forward facing.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child Seat Upright	<input type="checkbox"/>	Instructed parent that seat should be upright for forward facing children.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child Seat free of added cushioning	<input type="checkbox"/>	Instructed parent to avoid added cushioning in safety seat.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child free of heavy clothing	<input type="checkbox"/>	Instructed parent to avoid heavy clothing on child while in seat.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness straps come from at or above child's shoulders	<input type="checkbox"/>	Instructed parents regarding proper level of harness straps for forward facing child.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness straps lie flat and are not twisted	<input type="checkbox"/>	Instructed parents to avoid twisted harness straps.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness straps are snug.	<input type="checkbox"/>	Instructed parent to tighten harness straps so that one finger fits under the strap.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness is complete and attached to seat according to manufacturer's instructions.				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness Retainer Clip is present (if required)	<input type="checkbox"/>	Informed parent of purpose of retainer clip and its action in a crash.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness Retainer Clip is threaded correctly	<input type="checkbox"/>	Informed parent of proper threading path according to manufacturer's instructions.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness Retainer Clip is at armpit level	<input type="checkbox"/>	Informed parent to always place retainer clip at armpit level on the child.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Belt routed correctly	<input type="checkbox"/>	Informed parent of proper belt path for forward-facing seat.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Belt holding seat tightly in vehicle	<input type="checkbox"/>	Instructed parent to secure seat so that straps are snug.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Belt in locking mode	<input type="checkbox"/> Locking Clip	<input type="checkbox"/> Switched Retractor	<input type="checkbox"/> locking latch plate	<input type="checkbox"/> LATCH
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Locking Clip used correctly (if needed)				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tether used correctly (if available)	<input type="checkbox"/>	Instructed parents on purpose and use of tether according to manufacturer's instructions		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LATCH used correctly				
<b>Belt Positioning Booster</b>				<input type="checkbox"/> High Back Booster	<input type="checkbox"/> Backless Booster (without shield)			
<b>Y</b>	<b>N</b>	<b>N/A</b>	<b>C</b>					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child NOT in front of Airbag or seat is as far from airbag as possible	<input type="checkbox"/>	Instructed parent regarding vehicle manufacturer's recommendation for airbag use.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child within manufacturer's recommended weight/height range	<input type="checkbox"/>	Instructed parent on proper use of Belt Positioning Booster.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Safety belt routed correctly according to manufacturer's instructions.	<input type="checkbox"/>	Instructed parent of proper belt path.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lap AND shoulder belts fit child properly	<input type="checkbox"/>	Instructed parent of proper seat belt fit (across shoulder and low on the hips)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If backless booster: Child has a head restraint in this seating position.	<input type="checkbox"/>	Instructed parent of importance of head restraint.		
<b>Vehicle Seat Belt</b>								
<b>Y</b>	<b>N</b>	<b>N/A</b>	<b>C</b>					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child NOT in front of Airbag or seat is as far from airbag as possible	<input type="checkbox"/>	Instructed parent regarding vehicle manufacturer's recommendation for airbag use.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child sits all the way back against vehicle seat.				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child's knee's bend comfortably at the edge of the vehicle seat.				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lap AND shoulder belts fit child properly	<input type="checkbox"/>	Instructed parent of proper seat belt fit (across shoulder and low on the hips)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Child has a head restraint in this seating position.	<input type="checkbox"/>	Instructed parent of importance of head restraint.		
Comments: _____								
_____								

**PARENTAL/CARE GIVER CONSENT:** I understand and agree that the sole purpose of this program is to help reduce the incidence of the improper installation and/or use of child restraints (CR's) and safety belts; that this inspection is being provided as a free service to me; that this program and/or service cannot fully evaluate the quality, safety, or condition of any CR or vehicle safety belt inspected; and that this program cannot guarantee my child's safety in a vehicle collision. However, I do understand that the CR installation and use assistance and recommendations given to me by the program participants will help to reduce, but will not eliminate, the chance of my child being killed or seriously injured in a vehicle collision. For these reasons, I choose to participate in this program and release the program and program participants from any present or future liability for any injuries or damages that may result from a vehicle collision or otherwise.

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
 Signature: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Child: Present?  Yes  No / Age:  Unborn  Years = \_\_\_\_\_ Months = \_\_\_\_\_  ? / Weight: \_\_\_\_ lbs.  ?  
 Ethnicity:  White/Caucasian  Black/African American  Latino/Hispanic  Native American  Other: \_\_\_\_\_  
 Vehicle: Year: \_\_\_\_ Make: \_\_\_\_\_ Model: \_\_\_\_\_ Style: \_\_\_\_\_

C\* = Correct I\*\* = Incorrect and must correct error if possible or provide appropriate advice ? = Unknown, provide advice na = Not applicable

1. **RESTRAINT USED:**  Rear-facing only  Harness/Vest  Lap belt only . . . . . [Skip to # 28]  
 (Skip & return to model info if  Convertible  Shield booster  Lap & shoulder belt only . . . . . [Skip to # 28]  
 must remove CR to find label)  Front-facing only with harness/shield  Belt position booster  Other = \_\_\_\_\_
2. CR Mfg: \_\_\_\_\_ ? (Note additional errors under #41) C\* I\*\*
3. Mod Name: \_\_\_\_\_ ? 6. Recalled, OR >10 yrs. old, OR crash involved . . . N Y ?
4. Mod #: \_\_\_\_\_ ? 7. Full instructions & labels & registered with mfg. . . Y N ?
5. Mfg Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ ? 8. Type of restraint best for age/size of child . . . . . Y N ?

- CR HARNESS USE:** (Note additional errors under #41) C\* I\*\*
9. Type harness/shield/belt best for age/size of child . Y N
  10. All parts present & good condition . . . . . Y N
  11. Straps around frame/shell & thru slots correctly . . . Y N na
  12. Straps & harness/shield fit correctly . . . . . Y N na
  13. Retainer clip positioned correctly . . . . . Y N na
  14. Harness adjustment mechanism locked . . . . . Y N na
  15. Lap and shoulder belts for BPB fit correctly . . . . . Y N na
  16. Harness/shield/belts for BPB snug enough . . . . . Y N na
  17. All harnessing errors corrected . . . . . Y N na
- CR INSTALLATION:** (Note additional errors under #41)
18. CR installed in active front/side air bag position . . N Y na
  19. Overall, best seating position being used . . . . . Y N
  20. Correct front/rear-facing position . . . . . Y N
  21. Correct recline angle used . . . . . Y N na
  22. Seat belt routed correctly . . . . . Y N na
  23. Seat belt locked ("No" for BPB belt is "ok") OK Y N na
  24. Lower LATCH attached correctly . . . . . Y N na
  25. Tether installed and used correctly . . . . . Y N na
  26. Installation tight enough (No more than 1") . . . . . Y N na
  27. All installation errors corrected . . . . . Y N na
- FOR CHILDREN IN SAFETY BELTS ONLY:** (Skip to #34 if in CR)
28. Child seated in active front/side air bag position . . N Y
  29. Legs bend over edge of cushion at knees . . . . . Y N
  30. Lap belt touching thighs and snug . . . . . Y N
  31. Shoulder belt properly positioned and snug . . . . . Y N na
  32. Non-certified belt adjuster in use . . . . . N Y
  33. Fit/positioning errors corrected . . . . . Y N na
- AFTERMARKET PRODUCTS:**
34. Inappropriate aftermarket products in use . . . . . N Y

**CR/CHILD POSITION IN VEHICLE:**

11	12	13
21	22	23
31	32	33
41	42	43
99 = Other		

35. At arrival: # \_\_\_\_ na  
 36. Moved to: # \_\_\_\_ na  
 37. Installed in: # \_\_\_\_ na

**PROGRAM / TECHNICIAN INFORMATION:**

38. Site of Inspection \_\_\_\_\_  
 39. Proper use of the restraint system has been demonstrated and taught to the care giver. . . Y N  
 40. Print Name: \_\_\_\_\_ Sign: \_\_\_\_\_  
 Print Name: \_\_\_\_\_ Sign: \_\_\_\_\_

41. Other errors / Comments / Recommendations / Corrections Made: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_ (continue on back of this form)

**CARE GIVER ACKNOWLEDGMENT:** The correct use of my restraint system has been clearly explained, demonstrated and taught to me.

42. Signature: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_





# Child Passenger Safety





## A PARENT'S PRIMER

When you're an expectant mother, it's important to always wear your seat belt to protect you and your unborn child. Wear the lap belt across your hips and below your belly with the shoulder belt across your chest (between your breasts). Once your baby is born, follow these important safety steps.

### GROWING UP SAFE: It's a four-step process.

As children grow, how they sit in your car, truck or SUV should change.

Save your child from injury or death by observing all four steps:

- 1 REAR-FACING SEATS**  For the best possible protection keep infants in the back seat, in rear-facing child safety seats, as long as possible up to the height or weight limit of the particular seat. At a minimum, keep infants rear-facing until a minimum of age 1 **and** at least 20 pounds.
- 2 FORWARD-FACING SEATS**  When children outgrow their rear-facing seats (at a minimum age 1 **and** at least 20 pounds) they should ride in forward-facing child safety seats, in the back seat, until they reach the upper weight or height limit of the particular seat (usually around age 4 and 40 pounds).
- 3 BOOSTER SEATS**  Once children outgrow their forward-facing seats (usually around age 4 and 40 pounds), they should ride in booster seats, in the back seat, until the vehicle seat belts fit properly. Seat belts fit properly when the lap belt lays across the upper thighs and the shoulder belt fits across the chest (usually at age 8 or when they are 4'9" tall).
- 4 SEAT BELTS**  When children outgrow their booster seats, (usually at age 8 or when they are 4'9" tall) they can use the adult seat belt in the back seat, if it fits properly (lap belt lays across the upper thighs and the shoulder belt fits across the chest).

## Get Help!

### ON THE WEB

Go to [www.nhtsa.gov](http://www.nhtsa.gov) and choose Child Safety Seat Information from the menu or click on the child passenger safety icon. The site includes child safety seat installation tips, product ratings, recalls, and other useful information.

### BY PHONE

For more information about child safety seats, booster seats, inspection/fitting stations in your area, seat belts, air bags, and

other highway safety issues, call the DOT Vehicle Safety Hotline at: 1-888-327-4236.

### NEAR YOU

A certified child passenger safety technician can check your installation and answer questions. To find a technician or an inspection station near you, go to [www.nhtsa.gov](http://www.nhtsa.gov), click on the child passenger safety icon, and then click on the Fitting/Inspection Station link or go to [www.seatcheck.org](http://www.seatcheck.org).

**REMEMBER: All children under 13 should ride in the back seat.**

Always read the child restraint instructions and the vehicle owner's manual.



March 2007







## Rear Facing Quotables: Guiding Parents to Keep Children Rear-facing Longer

Prepared by the National Child  
Passenger Safety Board  
May 2010

"Children should face the rear of the vehicle until they are at least 1 year of age and weigh at least 20 pounds to decrease risk of cervical spine injury in the event of a crash. Infants who weigh 20 pounds before 1 year of age should ride rear facing in a convertible seat or infant seat approved for higher weights until at least 1 year of age. If a car seat accommodates children rear facing to higher weights, for optimal protection, the child should remain rear facing until reaching the maximum weight for the car safety seat, as long as the top of the head is below the top of the seat back."

- *American Academy of Pediatrics, Selecting and Using the Most Appropriate Car Safety Seats for Growing Children: Guidelines for Counseling Parents, PEDIATRICS Vol. 109 No.3 March 2002, pp. 550-553.*

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"For the best possible protection keep infants in the back seat, in rear-facing child safety seats, as long as possible up to the height or weight limit of the particular seat. At a minimum, keep infants rear-facing until a minimum of age 1 and at least 20 pounds."

- *National Highway Traffic Safety Administration, Growing Up Safe: It's a four step process. (publication: 4 Steps Flyer)*

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"Use a rear-facing car seat to at least age 1 and 20 pounds. Use your rear-facing car seat longer if the seat has higher weight and height limits."

- *Safe Kids Worldwide (<http://www.usa.safekids.org/skbu/cps/index.html>; 6-18-2009)*

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"Infants should ride rear-facing as long as possible until they reach the upper weight limits of their rear-facing convertible seat, usually around 30-35 pounds. At a very minimum, they should ride rear-facing until they are one year old and 20 pounds."

- *AAA (<http://www.aaa.com/carseat> "Stage 1: Rear-Facing")*

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"Keep your baby's car safety seat rear facing in the back seat of your vehicle until your baby is at least 1 year old and weighs at least 20 pounds. It is preferable to wait even longer, until the baby reaches the highest weight or height allowed by the manufacturer of the seat."

- *Hagen JF, Shaw JS, Duncan PM, eds. 2008. Bright Futures: Guidelines for Health Supervision of Infants, Children and Adolescents, Third Edition. Elk Grove Village, IL: American Academy of Pediatrics.*





# AMERICAN ACADEMY OF PEDIATRICS

Committee on Injury and Poison Prevention

## Selecting and Using the Most Appropriate Car Safety Seats for Growing Children: Guidelines for Counseling Parents

**ABSTRACT.** Despite the existence of laws in all 50 states requiring the use of car safety seats or child restraint devices for young children, more children are still killed as passengers in car crashes than from any other type of injury. Pediatricians and other health care professionals need to provide up-to-date, appropriate information for parents regarding car safety seat choices and proper use. Although the American Academy of Pediatrics is not a testing or standard-setting organization, this policy statement discusses the Academy's current recommendations based on the peer-reviewed literature available at the time of publication and sets forth some of the factors that parents should consider before selecting and using a car safety seat.

**ABBREVIATIONS.** AAP, American Academy of Pediatrics, NHTSA, National Highway Traffic Safety Administration.

### INTRODUCTION

In 2000, 539 children younger than 5 years died while riding in motor vehicles; almost half were unrestrained,<sup>1</sup> and many others were restrained improperly.<sup>2</sup> Many parents want to know which car safety seat is best for their child. An appropriate car safety seat is the right size for the child, fits the vehicle's seats and seat belt systems, and is easy for parents to use properly. In addition, it must meet all applicable federal safety standards.

Pediatricians also need to be aware that the child occupant protection laws in their states may not reflect the safest way to transport a child. Parents should be counseled to follow the American Academy of Pediatrics (AAP) recommendations for best child passenger restraint, and pediatricians should advocate to improve their state laws to provide better child protection.

### AAP RECOMMENDATIONS

#### Seat Selection

1. Children should face the rear of the vehicle until they are at least 1 year of age **and** weigh at least 20 lb to decrease the risk of cervical spine injury in the event of a crash. Infants who weigh 20 lb before 1 year of age should ride rear facing in a convertible seat or infant seat approved for higher weights until at least 1 year of age.<sup>3,4</sup> If a car safety seat accommodates children rear facing to higher

weights, for optimal protection, the child should remain rear facing until reaching the maximum weight for the car safety seat, as long as the top of the head is below the top of the seat back.<sup>3</sup>

2. Premature and small infants should not be placed in car safety seats with shields, abdominal pads, or arm rests that could directly contact an infant's face or neck during an impact and injure the child.<sup>5</sup>
3. For optimal protection, pediatricians should counsel parents of most children (those who weigh more than 12 lb at 4 months of age) to encourage use of a convertible car safety seat that will accommodate them rear facing at higher weights.
4. A convertible car safety seat is positioned semi-reclined and rear facing for a child until at least 1 year of age **and** at least 20 lb. The seat is positioned upright and forward facing for an older and heavier child who weighs up to 40 lb and may be used as long as the child fits well (eg, tops of ears below the top of the car safety seat back and shoulders below the seat strap slots).<sup>6</sup>
5. A forward-facing seat, a combination seat, or a belt-positioning booster seat should be used when the child has outgrown a convertible safety seat but is too small to use the vehicle's safety belts. Vehicle safety belts should not be used until the shoulder belt can be positioned across the chest with the lap belt low and snug across the thighs<sup>7,8</sup>; the child should fit against the vehicle's seat back with his or her feet hanging down when the legs are bent at the knees. A belt-positioning booster seat should be used until the vehicle safety belt fits well.
6. Many new vehicles are equipped with integrated (built-in) car safety seats that are designed for forward-facing riders who are at least 1 year of age **and** weigh at least 20 lb. All younger infants should be positioned rear facing in separate car safety seats until they are at least 1 year of age **and** weigh at least 20 lb. When purchasing a new vehicle, parents should consider selecting a vehicle with an optional integrated car safety seat. Some integrated seats convert to booster seats for older children.<sup>9</sup>
7. On the basis of Federal Motor Vehicle Safety Standards established by the National Highway Traffic Safety Administration (NHTSA), shield boosters have not been certified by their manufacturers for use by children who weigh more than 40 lb.<sup>3,10</sup> In current models, the shield can be removed and the restraint can be used with a lap and shoulder

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.  
PEDIATRICS (ISSN 0031 4005). Copyright © 2002 by the American Academy of Pediatrics.

belt as a belt-positioning booster seat for children who are too heavy or tall to fit in a seat with a full harness.

Children who weigh 40 lb or less are best protected in a seat with a full harness.<sup>3,11</sup> Significant injuries to the head, spine, abdomen, and extremities of children in shield boosters have been documented in crash investigations resulting from ejection, excessive head excursion, and shield contact.<sup>11-14</sup> Although boosters with shields may meet current Federal Motor Vehicle Safety Standards for use by children who weigh 30 to 40 lb, on the basis of current published peer-reviewed literature, the AAP does not recommend their use.

8. A number of aftermarket add-on devices claim to solve the problem of poorly fitting seat belts; however, these products may actually interfere with proper lap and shoulder harness fit by positioning the lap belt too high on the abdomen and allowing too much slack in the shoulder harness, placing it too low across the shoulder.<sup>15</sup> Until performance requirements are developed by the NHTSA for aftermarket devices, these products should not be used.
9. Children with special health care needs should have access to appropriate restraint systems.<sup>16,17</sup> Specific information is available in the AAP policy statement "Transporting Children with Special Health Care Needs"<sup>17</sup> and "Safe Transportation of Children With Special Needs: A Guide for Families."<sup>18</sup>

#### Installation in Vehicle

1. A rear-facing car safety seat must not be placed in the front passenger seat of any vehicle equipped with an air bag on the front passenger side. Death or serious injury to an infant can occur from the impact of the air bag against the back of the car safety seat.<sup>3,19</sup>
2. Parents should be advised that the rear vehicle seat is the safest place for children of any age to ride. Any front-seat, front-facing passengers should ride properly restrained and positioned as far back as possible from the front air bag on the passenger side.<sup>19</sup>
3. Parents should be instructed to read the vehicle owner's manual and child restraint device instructions carefully. When the car safety seat is installed in the car, it should be tested for a safe, snug fit in the vehicle to avoid potentially life-threatening incompatibility problems between the design of the car safety seat, vehicle seat, and seat belt system.

Lower Anchors and Tethers for Children (LATCH) is a new standardized car safety seat attachment system that will simplify car safety seat installation and enhance safety. Most new vehicles and car safety seats will be equipped with this system by September 2002.

4. Infants should ride at approximately a 45° angle to prevent slumping and airway obstruction. If the vehicle seat slopes so that the infant's head flops forward, the car safety seat should be positioned back at an approximately 45° tilt according

to the manufacturer's instructions. Some car safety seats have built-in features that allow adjustment of the angle. For car safety seats that do not adjust, a firm roll of cloth, a solid-core Styrofoam roll, or a tightly-rolled newspaper can be wedged under the car safety seat below the infant's feet to achieve this angle.<sup>20</sup>

5. Experience with the interaction of vehicle side air bags and car safety seats is limited. To date, no crash studies have established that a child properly restrained in a car safety seat is at risk from current side air bag impact.<sup>3</sup> Laboratory simulations have indicated, however, that unrestrained and out-of-position children are at risk of serious injury from a deploying side air bag.<sup>21</sup> Because children cannot be depended on to remain in position at all times and until additional research and experience is acquired, parents should be counseled about the potential risks and benefits of having side air bags. Parents should consider placing children and car safety seats away from all air bags, choosing a vehicle without side air bags in the rear seat, or deactivating side air bags in rear seats if children are transported in adjacent positions. They may also refer to the vehicle owner's manual for recommendations specific to their vehicle.

#### Placement of Child in Seat

1. In rear-facing car safety seats for infants, shoulder harnesses usually should be placed in the slots at or below the infant's shoulders, the harness should be snug, and the car safety seat's retainer clip should be positioned at the level of the infant's armpit, not on the abdomen or in the neck area (see manufacturers' instructions for details).
2. In forward-facing car safety seats for older children, the shoulder strap should be at or above the child's shoulders, the harness should be snug, and the retainer clip should be positioned level with the child's armpits. This seat should be used until the child reaches the top weight limit of the seat or the tops of his or her ears reach the top of the car safety seat back (see manufacturers' instructions for details).
3. A child should never be left unattended in a car safety seat in or out of the car.

#### SUMMARY

Existing products provide effective restraint for children riding in motor vehicles and minimize risk of death and injury during car crashes if used appropriately. Parents look to pediatricians for up-to-date, accurate information on selecting and properly using car safety seats. New products that address gaps in restraint protection are continually being developed. Manufacturers should be encouraged to develop car safety seats that accommodate children rear facing to 4 years of age (45 lb). It is important that pediatricians keep abreast of innovations in child passenger safety.<sup>21</sup> The use of the AAP materials, including "Car Safety Seats: A Guide for Families,"<sup>9</sup> the "One-Minute Car Seat Safety Check-Up,"<sup>23</sup> and "Safe Transportation of Children With Special Needs: A

Fig 1. Car safety seats: selecting the appropriate type.

The safest place in a vehicle for all children is the rear seat. Never place a rear-facing infant seat in the front seat of a vehicle with a activated passenger-side air bag.



5b: 1-5 years old, 20-40 lbs, 29-31 inches tall

10b: 1-2 years old, 10-20 lbs, 29-31 inches tall

21b: 2-5 years old, 20-40 lbs, 29-31 inches tall

31b: 3-5 years old, 30-40 lbs, 31-36 inches tall

41b: 4-5 years old, 40-50 lbs, 36-42 inches tall

51b: 5-12 years old, 50-100 lbs, 42-57 inches tall

61b: 6-12 years old, 60-120 lbs, 48-57 inches tall

Source: National Highway Traffic Safety Administration

Guide for Families<sup>18</sup> can assist the physician in providing specific advice for patients. The information in Fig 1 in this statement will also aid in selecting the appropriate type of restraint. Additional consultation for detailed technical information can be obtained from certified child passenger safety technicians identified by state on the NHTSA Web site (<http://www.nhtsa.dot.gov/people/injury/childps/contacts/index.cfm>). This information will help parents ensure that their children are transported as safely as possible.

COMMITTEE ON INJURY AND POISON PREVENTION,  
2001–2002

Marilyn J. Bull, MD, Chairperson  
Phyllis Agran, MD, MPH  
Victor Garcia, MD  
H. Garry Gardner, MD  
Danielle Laraque, MD  
Susan H. Pollack, MD  
Gary A. Smith, MD, DrPH  
Milton Tenenbein, MD  
Joseph Wright, MD, MPH

LIAISONS

Ruth A. Brenner, MD, MPH  
National Institute of Child Health and Human  
Development  
Stephanie Bryn, MPH  
Health Resources and Service  
Administration/Maternal and Child Health Bureau  
Richard A. Schieber, MD, MPH  
Centers for Disease Control and Prevention  
Alexander Sinclair  
National Highway Traffic Safety Administration  
Deborah Tinsworth  
US Consumer Product Safety Commission  
Lynn Warda, MD  
Canadian Paediatric Society

CONSULTANT

Murray L. Katcher, MD, PhD

STAFF

Heather Newland

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# AMERICAN ACADEMY OF PEDIATRICS

Committee on Injury and Poison Prevention

## Safe Transportation of Newborns at Hospital Discharge

**ABSTRACT.** All hospitals should set policies that require the discharge of every newborn in a car safety seat that is appropriate for the infant's maturity and medical condition. Discharge policies for newborns should include a parent education component, regular review of educational materials, and periodic in-service education for responsible staff. Appropriate child restraint systems should become a benefit of coverage by Medicaid, managed care organizations, and other third-party insurers.

**ABBREVIATIONS.** FMVSS, Federal Motor Vehicle Safety Standard; AAP, American Academy of Pediatrics; NHTSA, National Highway Traffic Safety Administration.

All newborns discharged from hospitals should be transported home in car safety seats that meet Federal Motor Vehicle Safety Standard (FMVSS) 213 and that are selected to meet the specific transportation needs of healthy newborns, premature infants, or infants with special health care needs.

In 1996, 1780 children (newborns to 14 years of age) were killed, and 305 000 were injured as occupants in motor vehicles.<sup>1</sup> Of the fatalities, 60% were unrestrained. The fatality rate for infants was higher than any other age group, 4.4/100 000.<sup>2</sup> In 1996, 653 children (newborns through 4 years of age) were killed as occupants in motor vehicles. Of these fatalities, 52% were unrestrained.

The American Academy of Pediatrics (AAP) has made major contributions to child passenger safety, including contributions to the passage of legislation in all 50 states that requires the use of car safety seats or child restraint devices for infants and young children. Assuring that newborns are restrained properly when riding for the first time establishes the pattern for continued compliance with a measure that can save their lives or prevent serious injury. Correctly used car safety seats are 71% effective in preventing fatalities attributable to car crashes and 67% effective in preventing injury that requires hospitalization. With 100% correct use, about 53 000 injuries and 500 deaths could be prevented each year in the United States among children from birth to 4 years of age.<sup>3</sup>

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.  
PEDIATRICS (ISSN 0031 4005). Copyright © 1999 by the American Academy of Pediatrics.

### RECOMMENDATIONS

1. In conjunction with their medical staff, all hospitals with services for newborns should develop policies for the discharge of newborns in car safety seats that are crash tested and meet the FMVSS 213. These policies should be developed in consultation with a car seat expert who has successfully completed the National Highway Traffic Safety Administration (NHTSA) 4-day course.<sup>4</sup> Although the resources of hospitals and patients vary greatly, at discharge *every* newborn should be properly restrained in a car safety seat.
2. Pediatricians should work with these hospitals in establishing hospital policies that clearly define staff roles for each required task. Also, pediatricians should reinforce the need for compliance with these policies with both hospital staff and parents/guardians. Hospital policies related to newborns should include the following:
  - Methods by which expectant parents will be informed, before delivery, of the importance of using car safety seats and potential problems with vehicle incompatibility. Parents should be advised through prenatal classes, their obstetrical provider, or pediatric prenatal visits to obtain a car safety seat, properly secure it in their vehicle, and resolve compatibility issues before delivery. This is especially important because physicians frequently discharge infants after only a short hospital stay.
  - Designation of an individual responsible for implementing hospital policies and procedures related to discharge of newborns in car safety seats that are used properly. Hospital policy also should include designation of an individual or team specifically trained to assess the needs of infants with special health care needs with regard to the selection of the most appropriate child safety seat.<sup>5-8</sup> Hospitals should develop a policy to ensure provision of a period of observation in a car safety seat before hospital discharge for each infant born at <37 weeks' gestation to monitor for possible apnea, bradycardia, or oxygen desaturation.<sup>5</sup> Provision for periodic in-service education of staff responsible for parent and guardian education on correct use of car safety seats. Those responsible for training other hospital staff and parents and guardians should have successfully completed the NHTSA 4-day course.<sup>4</sup>

- Provision of regular periodic review by a designated person who has completed the NHTSA 4-day course of all materials distributed to parents and guardians of newborns about proper car safety seat use. Hospitals should ensure that information is current, relevant, and accurate, with date of publication or revision noted.<sup>9</sup>
- Provisions to make available an appropriate car safety seat by sale, short-term loan, or donation to parents before discharge if the parents are unable to provide their own. Hospitals should consider giving a low-cost infant car seat, which can also be used for generic instruction, to parents at discharge as a gift.
- Assessment of the degree of compliance with the policies and procedures on discharge in child safety seats in routine quality assurance surveillance by hospital staff. Hospital staffs should take appropriate actions to correct deficiencies when present.

Admission orders for newborns should include an order written by a physician for parent instruction about use of child safety seats. This should be included as a part of standard admission orders to ensure its completion before discharge.

Discharge policies for newborns should include the following:

- Determination of the most appropriate car safety seat for each newborn according to maturity and medical condition by a designated hospital employee.
- Provision of information and training for parents and guardians should be presented before discharge on the generic issues related to correct use of car safety seats. Hands-on teaching including “return demonstration” should be a part of this instruction. The installation of a specific car seat in a specific car must be the parent’s responsibility. Resources to address these issues are available from the AAP.<sup>10,11</sup>
- A period of observation in a car safety seat before hospital discharge should be provided to each infant born at <37 weeks’ gestation to monitor for possible apnea, bradycardia, or oxygen desaturation.<sup>5</sup>
- Pediatricians with other child health and safety advocates should work for coverage of appropriate child restraint systems as a benefit of coverage by Medicaid, managed care organizations, and other third-party insurers. Until that time, hospitals are encouraged to have a giveaway or loan program for parents who cannot afford to purchase a car seat.

COMMITTEE ON INJURY AND POISON PREVENTION,  
1999–2000

Marilyn Bull, MD, Chairperson  
Phyllis Agran, MD, MPH  
Danielle Laraque, MD  
Susan H. Pollack, MD  
Gary A. Smith, MD, DrPH  
Howard R. Spivak, MD  
Milton Tenenbein, MD  
Susan B. Tully, MD

LIAISON REPRESENTATIVES

Ruth A. Brenner, MD, MPH  
National Institute of Child Health and Human  
Development  
Stephanie Bryn, MPH  
Maternal and Child Health Bureau  
Cheryl Neverman, MS  
National Highway Traffic Safety Administration  
Richard A. Schieber, MD, MPH  
Centers for Disease Control and Prevention  
Richard Stanwick, MD  
Canadian Paediatric Society  
Deborah Tinsworth  
US Consumer Product Safety Commission  
William P. Tully, MD  
Pediatric Orthopaedic Society of North America

SECTION LIAISON

Victor Garcia, MD  
Section on Surgery

CONSULTANT

Murray L. Katcher, MD, PhD

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## Safe Transportation of Preterm and Low Birth Weight Infants at Hospital Discharge

Guidance for the Clinician in Rendering  
Pediatric Care

Marilyn J. Bull, MD, William A. Engle, MD, the Committee on Injury, Violence, and Poison  
Prevention and the Committee on Fetus and Newborn

### ABSTRACT

Safe transportation of preterm and low birth weight infants requires special considerations. Both physiologic immaturity and low birth weight must be taken into account to properly position such infants. This clinical report provides guidelines for pediatricians and other caregivers who counsel parents of preterm and low birth weight infants about car safety seats. *Pediatrics* 2009;123:1424–1429

### INTRODUCTION

Improved survival rates and earlier discharge of preterm (<37 weeks' gestation at birth) and low birth weight (<2500 g at birth) infants have increased the number of small infants who are being transported in private vehicles. Car safety seats that are used correctly are 71% effective in preventing fatalities attributable to passenger car crashes in infants.<sup>1</sup> To ensure that preterm and low birth weight infants are transported safely, the proper selection and use of car safety seats or car beds are necessary.

Federal Motor Vehicle Safety Standard (FMVSS) 213, which establishes design and dynamic performance requirements for child-restraint systems, applies to children weighing up to 65 lb. However, the standard has no minimum weight limit and does not address the relative hypotonia and risk of airway obstruction in preterm or low birth weight infants. Most rear-facing car safety seats are designated by the manufacturer for use by infants weighing more than 4 or 5 lb, with some designated for use from birth regardless of weight.

Infant dummies as small as 3.3 lb have been shown to be satisfactorily restrained in standard rear-facing car safety seats during crash tests.<sup>2,3</sup> Test dummies, however, cannot replicate the airway and tone variables that occur in preterm infants, and there is no information on restraint of infants who weigh less than 3.3 lb (1.5 kg).

Rear-facing car safety seats provide the best protection in a frontal crash, because the forces are transferred from the back of the restraint to the infant's back, the strongest part of an infant's body. The restraint also supports the infant's head. Severe tensile forces on the neck in flexion are also prevented by use of rear-facing car safety seats.<sup>4</sup>

The long-term experience and documented protective value of car safety seats make them the preferred choice for travel for all infants who can maintain cardiorespiratory stability in the semireclined position.<sup>4</sup> A car bed that meets FMVSS 213 may be indicated for infants who manifest apnea, bradycardia, or low oxygen saturation when positioned semireclined in a car safety seat.<sup>2,5</sup> Of note, some preterm and term infants positioned in car beds and car safety seats seem to have similar rates of apnea, bradycardia, and oxygen desaturation.<sup>6,7</sup>

A car bed is designed to accommodate an infant in a fully reclined position and is oriented in the vehicle seat perpendicular to the direction of travel. An infant is secured in the car bed with an internal harness, and the car bed is secured to the vehicle with the vehicle's seat belt. Car beds, like car safety seats, have specific weight requirements designated by the manufacturer and, like car safety seats, should be used according to manufacturer recommendations.

The size of the infant, especially for those born preterm, is an important consideration when selecting a car safety seat or car bed.<sup>2,8</sup> Weight, length, neurologic maturation, and associated medical conditions (especially bronchopulmonary dysplasia) all influence the potential risk of respiratory compromise for infants in seating devices.<sup>6,9</sup>

Preterm infants are subject to an increased risk of oxygen desaturation, apnea, and/or bradycardia,<sup>10</sup> especially when placed in a semireclined position in car safety seats.<sup>5,11–13</sup> Furthermore, frequent cardiorespiratory events and

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#### Key Words

safe transportation, preterm, premature, low birth weight, car safety seats, car beds

#### Abbreviation

FMVSS—Federal Motor Vehicle Safety Standard

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intermittent hypoxia may adversely affect later neurodevelopment, psychosocial behavior, and academic achievement.<sup>14,15</sup> In 1 study, mental development in preterm infants with 5 or more cardiorespiratory events during 210 hours or more of cardiorespiratory monitoring was associated with a lower mental development index on the Bayley Scales of Infant Development (95.8 vs 100.4;  $P = .04$ )<sup>14</sup>; physical developmental indices were not different (94.4 vs 91.7;  $P = .37$ ). It is unclear whether the association of cardiorespiratory events and lower mental development reflects an underlying abnormality or a negative consequence of the events. It is rational, if practical, to attempt to reduce the frequency and severity of cardiorespiratory events experienced by preterm infants seated in car safety seats to minimize potential neurodevelopmental sequelae. Therefore, car safety seat monitoring in the infant's own car safety seat before discharge from the hospital should be considered for all infants less than 37 weeks' gestation at birth to determine if physiologic maturity and stable cardiorespiratory function are present, as recommended in the American Academy of Pediatrics publication *Guidelines for Perinatal Care*.<sup>16</sup> Because information is limited about the severity and frequency of adverse outcomes in preterm infants who experience cardiorespiratory events, including those events that occur while in car safety seats, additional research is needed.<sup>17</sup>

Many infants are discharged from the hospital with cardiac/apnea monitors, supplemental oxygen, and, occasionally, portable ventilators, suction machines, batteries, and other equipment. These objects are heavy and could cause injury if they were to hit the child or another vehicle occupant in the event of a sudden stop or crash. Although there is no commercially available securement system for portable medical equipment, restraint is recommended.<sup>18</sup>

No data are available to establish a specific age or neurodevelopmental status at which an infant with respiratory compromise who was discharged from the hospital in a car bed can safely transition to a semireclined car safety seat. Before discontinuing use of a car bed, the physician can consider arranging for a follow-up study to determine when the infant can travel semireclined without apnea, bradycardia, or oxygen desaturation. The time to perform the test may vary depending on the rate of growth and neurologic maturation of the infant and the infant's respiratory status and should be determined by the treating physician.

Car safety seats are used frequently for positioning infants for purposes other than travel. Potential detrimental effects of excessive use of infant seating devices, including exacerbation of gastroesophageal reflux and potentiation of plagiocephaly, have been documented.<sup>19,20</sup> Use of car safety seats for purposes other than travel also may increase the risk of adverse cardiorespiratory and other adverse medical events.

#### CLINICAL IMPLICATIONS

Several important considerations for transportation of preterm and low birth weight infants at risk for recurrent

oxygen desaturation, apnea, or bradycardia include the following.

1. The increased frequency of oxygen desaturation and episodes of apnea or bradycardia while sitting in car safety seats suggests that preterm infants should have a period of observation in a car safety seat, preferably their own, before hospital discharge. This period of observation should be performed with the infant carefully positioned for optimal restraint and the car safety seat placed at an angle that is approved for use in the vehicle. A period of observation for a minimum of 90 to 120 minutes or the duration of travel, whichever is longer, is suggested.<sup>5,6,11,21</sup>
2. Hospital staff who are trained in positioning infants properly in the car safety seat and in detecting apnea, bradycardia, and oxygen desaturation should conduct the car safety seat observation.
3. Hospitals should develop protocols to include car safety seat observation before discharge for infants born at less than 37 weeks' gestation.<sup>22</sup> Some hospital protocols include car safety seat observations for infants at risk of obstructive apnea, bradycardia, or oxygen desaturation other than those born at less than 37 weeks' gestation. Examples include infants with hypotonia (eg, Down syndrome or congenital neuromuscular disorders), infants with micrognathia (Pierre Robin sequence), and infants who have undergone congenital heart surgery.<sup>9</sup>
4. Families should be taught by trained hospital staff how to position the infant properly in the car safety seat.
5. The duration of time the infant is seated in a car safety seat should be minimized. Parents should be advised that car safety seats should be used only for travel.
6. A conventional car safety seat that allows for proper positioning of the preterm infant should be selected if a semiupright position can be maintained safely by the infant. Better observation of the infant may be possible when the child is in a rear-facing car safety seat adjacent to an adult rather than in a car bed. In addition, the protection provided by a rear-facing car safety seat is better documented than the protection provided by car beds.<sup>4</sup>
7. If events documented on cardiorespiratory monitoring in a car safety seat are deemed significant by the treating physician or the hospital policy, interventions to reduce the frequency of desaturation and episodes of apnea and bradycardia are recommended (eg, use of car bed; supplemental oxygen; continued hospitalization or further medical assessment). If a car bed is considered, a similar period of cardiorespiratory monitoring while the infant is in the car bed should be performed before discharge.
8. Infants with documented oxygen desaturation, apnea, or bradycardia in a semiupright position should travel in a supine or prone position in an FMVSS 213-approved car bed after an observation period



that is free of such events as described in point 1 above. This may need to be revised as new evidence becomes available from future research. Specific information regarding currently available car beds can be obtained from several resources.<sup>23</sup>

9. Before transitioning from a car bed, a period of observation of an infant for apnea, bradycardia, and oxygen desaturation in the infant's own semireclined car safety seat should be considered. The study can be performed as a home oxypneumocardiogram, as an outpatient polysomnogram, or as an observed outpatient clinical evaluation performed similarly to that described in point 1 above.
10. Infants at risk of respiratory compromise in car safety seats may be at similar risk with use of other upright equipment, including infant swings, infant seats, backpacks, slings, and infant carriers. Consideration should also be given to limiting the use of these devices until the child's respiratory status in a semireclined position is stable.<sup>24</sup>
11. Infants for whom home cardiac and apnea monitors are prescribed should use this monitoring equipment during travel and have portable, self-contained power available for at least twice the duration of the expected transport time.
12. Commercially available securement systems for portable medical equipment such as monitors are not available; therefore, this equipment should be wedged on the floor or under the vehicle seat to minimize the risk of it becoming a dangerous projectile in the event of a crash or sudden stop.<sup>2,8</sup>

Proper positioning of preterm and low birth weight infants in car safety seats is important for minimizing the risk of respiratory compromise. Specific national guidance for selecting car safety seats and positioning preterm and low birth weight infants includes the following.

1. Infants should ride facing the rear as long as possible and to the highest weight and length allowed by the manufacturer of the seat for greatest protection.<sup>25-27</sup> By the time infants weigh 20 lb or reach the top length allowed by the manufacturer of the seat, they should ride facing the rear in infant seats or convertible car safety seats approved for rear-facing use at higher weights and lengths. Most convertible car safety seats are approved for rear-facing use up to 30 to 35 lb and 36 in. Parents of infants born preterm may benefit from specific counseling about this concept.
2. Infant-only car safety seats with 3-point or 5-point harness systems or convertible car safety seats with 5-point harness systems provide optimum comfort, fit, and positioning for the preterm or low birth weight infant. A small infant should not be placed in a car safety seat with a shield, abdominal pad, or arm rest because of potential breathing difficulty behind the shield or injury to an infant's face and neck during a sudden stop or crash.<sup>2,21</sup>
3. Car safety seats with the shortest distances from the crotch strap to the seat back should be selected to reduce



**FIGURE 1**  
Car safety seat with a small cloth between crotch strap and infant, retainer clip positioned at the midpoint of the infant's chest, and blanket rolls on both sides of the infant.

the potential for the infant to slip forward feet-first under the harness (ie, "submarining"). Some car safety seats have crotch-to-seat back distances as short as 5.5 in, which may accommodate some preterm or low birth weight infants well. A small rolled diaper or blanket between the crotch strap and the infant may be added to reduce the risk of submarining (Fig 1) in smaller infants. A car safety seat with multiple harness-strap slots provides more choice and may be more suitable for small but rapidly growing infants. Ideally, car safety seats with harness straps that can be positioned at or below the shoulders should be selected.<sup>21</sup>

4. The infant should be properly positioned in the car safety seat, with buttocks and back flat against the back of the car safety seat. The harness must be snug, and the car safety seat's retainer clip should be positioned at the midpoint of the infant's chest, not on the abdomen or in front of the neck (Fig 1).
5. Some car safety seats come with head-support systems as standard equipment. Many head-support systems, however, are sold as aftermarket products and may decrease the safety provided by the seat and harness system, because they introduce slack into harness straps. Only products that come with the seat or are sold by the manufacturer for use with their specific seat should be used. Most very small infants require positioning support in addition to the head support that comes with the seat. Blanket rolls may be placed on both sides of the infant to provide lateral support for the head and trunk (Fig 1).
6. The rear-facing car safety seat should be reclined approximately 45° or as directed by the instructions



FIGURE 2  
Seat with tightly rolled towel to recline seat halfway back at a 45° angle.

provided with the car safety seat. If the vehicle seat slopes and the seat is too upright, the infant's head may fall forward. A lightweight, noncompressible object, such as a tightly rolled blanket or pool "noodle," may be placed under the car safety seat to achieve the appropriate angle. Some car safety seats have built-in angle indicators and angle adjusters to assist with achieving the proper angle (Fig 2).

7. A rear-facing car safety seat should never be placed in the front passenger seat of any vehicle equipped with a passenger-side front air bag because of risk of death or serious injury from the impact of the air bag. In some vehicles without rear seating positions, the air bag can be deactivated when the front seat is used for a child passenger. The back seat is the safest place for all children to travel.<sup>28,29</sup>
8. Infants riding in the rear seat may be more difficult to observe, and whenever possible, parents should arrange for an adult to be seated in the rear seat adjacent to the infant. In the event of a monitor alarm, if a second caregiver is not available, the driver may need to come safely to a stop and assess the infant.
9. An infant should never be left unattended in a car safety seat inside or out of the car.

#### RESEARCH IMPLICATIONS

1. Studies are needed to gather more information on the severity and frequency of adverse outcomes in preterm infants who experience cardiorespiratory events, including those events that occur while in car safety seats.

2. Studies need to be conducted to determine the risk factors associated with cardiorespiratory events among preterm and low birth weight infants and criteria that indicate neurodevelopmental and physiologic maturity required for an infant to be positioned upright without respiratory compromise.
3. Studies should be designed to assess the correlation of car safety seat monitoring performed in the hospital, while stationary in the car, and while traveling.
4. Methods should be developed to better determine the relative protection provided by rear-facing car safety seats and car beds.
5. Design of car safety seats should be encouraged to specifically meet the positioning and transportation needs of preterm and low birth weight infants.
6. Methods should be developed to better secure heavy medical equipment, such as monitors and oxygen, in vehicles.
7. The efficacy of various protocols for car safety seat monitoring and car safety seats for different patient populations of at-risk infants needs to be determined.

#### SUMMARY

Proper selection and use of car safety seats or car beds are important for ensuring that preterm and low birth weight infants are transported as safely as possible.

The increased frequency of oxygen desaturation or episodes of apnea or bradycardia experienced by preterm and low birth weight infants positioned semireclined in car safety seats may expose them to increased risk of cardiorespiratory events and adverse neurodevelopmental outcomes.

It is suggested that preterm infants should have a period of observation of 90 to 120 minutes (or longer, if time for travel home will exceed this amount) in a car safety seat before hospital discharge. Educating parents about the proper positioning of preterm and low birth weight infants in car safety seats is important for minimizing the risk of respiratory compromise. Providing observation and avoiding extended periods in car safety seats for vulnerable infants and using car seats only for travel should also minimize risk of adverse events.

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James Whitcomb Riley Hospital  
For Children  
HOSPITAL DISCHARGE PROTOCOL ESSENTIALS

PURPOSE

Promote safe transportation of high-risk infants.

INCLUSION CRITERIA

1. Discharge/transfer in a child safety seat and
2. High-risk infants:
  - a. Less than 37 weeks gestational age at birth, or
  - b. Other medical conditions which place the infant at high risk for apnea or oxygen desaturation.

INSTRUCTION

1. Medical personnel should discuss child safety seat choices with the family and recommend guidelines regarding distances from the crotch strap to seat back (5 ½ inches) and from lower harness strap to seat bottom (10 inches). Examples of appropriate child safety seats for infants should also be communicated (see AAP Family Shopping Guide and information sheet). Medical personnel should discuss and demonstrate additions of rolls along the torso of the infant and behind the crotch strap. In addition, a small roll under the child safety seat base may be needed to provide optimal positioning of the seat to minimize forward slumping of the infant.
2. When an infant is to be discharged within the next seven days, an observation period in the INFANT'S PERSONAL child safety seat should be performed to monitor for possible apnea, bradycardia or oxygen desaturation. This will require the family to bring in their infant's safety seat and placement of the child in the safety seat while continuous apnea, bradycardia and oxygen saturation monitoring are used. In the event that a personal car seat is not available, monitoring in an approved car safety seat is acceptable.
3. It would be optimal to perform the observation period 1 to 7 days prior to discharge/transfer.
4. The observation period should begin after a greater than 1 hour interval from the last feeding. **Duration of observation period:** 60 minutes or estimated travel time, whichever is the longer period of time.

INTERPRETATION GUIDELINES

1. No apnea (>20 second cessation of respiratory effort), bradycardia (<80 beats per minute) or oxygen desaturation (SaO<sub>2</sub> < 88%) during the observation period is considered a PASS.
2. If the infant develops apnea, bradycardia or oxygen desaturation (as defined in 1 above) the observation is considered a FAILURE.
3. In the event of apnea, bradycardia, and/or oxygen desaturation, clinical stimulation, repositioning, oxygen and other appropriate interventions should be performed and documented on the CAR SEAT MONITORING DATA FORM (to be placed in the chart). Verbal

communication of significant events are to be reported to the attending neonatal faculty or fellow.

#### CLINICAL RESPONSE GUIDELINES

1. If the patient fails the observation period, the following response may be considered:  
Retesting in a completely supine or prone position in a car bed that meets or exceeds federal safety standards.
2. If the patient fails in a supine positioning or prone positioning, consideration should be given to other medical evaluation and intervention (i.e. Oxypneumocardiogram, polysomnogram, oxygen, methylxanthines, cisapride, etc.).
3. If the patient fails the observation period, the parents should be counseled to avoid the use of other upright positioning equipment including infant swings, infant seats, and infant carriers.
4. These are guidelines for child safety seat use; the recommendation of the physician may vary from these guidelines depending on individual circumstances and the physician's discretion.

#### DOCUMENTATION

Documentation of PASS or FAIL should be made in chart and reported to the physician.

#### CAR SEAT MONITORING-GUIDELINES FOR PHYSICIANS

Indications for car seat monitoring:

1. <37 weeks gestational age at birth
2. Infants at risk of apnea or oxygen desaturation

MD responsibilities:

1. Identify patient for monitoring prior to discharge (preferably 1-2 week prior)
2. Explain monitoring to families and request they bring in their baby's personal car seat or give permission to order car seat from hospital
3. Write order for car seat monitoring
  - \*Nurses will contact families by letter, at bedside, or phone. Will need MD support so patient discharges are not delayed.
4. Interpret results of monitoring, make recommendations, and sign Car Seat Monitoring Data Form in bedside chart (Discharge Planning Section).
  - \*Marilyn Bull, M.D. and William Engle, M.D. are consultants if questions arise.
5. Parents may wish to forego car seat monitoring or go home in a car seat other than the one in which the baby was tested. If this occurs, this decision should be documented in the chart.

#### FOLLOW UP FOR INFANTS WHO REQUIRE FLAT POSITIONING

Physicians may wish to consider scheduling a follow up home oxypneumocardiogram to be performed within several months with the infant positioned in the family's upright car seat to determine if it is no longer necessary for the infant to be positioned flat.

FOR MORE INFORMATION, CONTACT:

1. Marilyn J. Bull, M.D., Medical Director, Automotive Safety for Children, Riley Hospital for Children, 702 Barnhill Drive, Room 1603, Indianapolis, IN 46202-5225, (317) 274-4955 OR (317) 274-2977 (regarding use of car safety seats, development of hospital systems to provide car safety seats)

2. William A. Engle, M.D., Associate Professor of Pediatrics, Section of Neonatal/Perinatal Medicine, Riley Research 208, 702 Barnhill Drive, Indianapolis, IN 46202-5225, (317) 274-4719 (regarding technical questions relating to monitoring of infants)

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# AMERICAN ACADEMY OF PEDIATRICS

Committee on Injury and Poison Prevention

## Transporting Children With Special Health Care Needs

**ABSTRACT.** Children with special health care needs should have access to proper resources for safe transportation. This statement reviews important considerations for transporting children with special health care needs and provides current guidelines for the protection of children with specific health care needs, including those with a tracheostomy, a spica cast, challenging behaviors, or muscle tone abnormalities as well as those transported in wheelchairs.

ABBREVIATION. FMVSS, Federal Motor Vehicle Safety Standard.

All children, including those with special health care needs, should have access to proper resources for safe transportation. Families and health care professionals should be informed of basic guidelines for selecting restraints, positioning children into them, and securing these restraints in all types of vehicles, primarily the family vehicle and school bus.<sup>1</sup> Parents should be informed of the resources available for proper restraint of children with special health care needs during travel<sup>2</sup> and thereby avoid use of substandard products, makeshift restraint systems, or unsafe methods of securement in motor vehicles.

Federal Motor Vehicle Safety Standard (FMVSS) 213, which regulates design and performance of child restraint systems, does not recognize that children with special needs may require the use of special occupant restraint systems.<sup>3</sup> The standard also does not regulate specific design and performance criteria for occupant protection devices that can provide safe seating for children with disabilities. Crash testing of car safety seats that meet FMVSS 213 has been done with test dummies representing children without special medical problems that would affect restraint use in motor vehicles. The biomechanical effects of a crash on test dummies representative of children with special medical needs in any restraint system have not been studied. Further research is needed, including development of such test dummies by the National Highway Traffic Safety Administration to address these concerns.

Children with special needs should not be exempt from the requirements of each state's laws regarding child restraint and seat belt use. Pediatricians can serve as resources for information to legislators, policy makers, and law enforcement professionals, as

well as school officials who may be unaware of the importance and availability of occupant protection systems for children with special needs.

### IMPORTANT CONSIDERATIONS

1. The rear seat is the safest place for all children, and rear-facing car safety seats must never be placed in the front seat of a vehicle that has a front passenger air bag. The impact of a deploying air bag can severely injure or kill an infant or small child. Children may also be at risk of injury if they are out of position or lie against the door of a vehicle with a side air bag.
2. For a child with special health care needs who requires frequent observation during travel and for whom no adult is available to accompany the child in the back seat, an air bag on/off switch should be considered for the vehicle.
3. Instructions provided by the manufacturer of the vehicle and the manufacturer of the car safety seat must be followed.
4. Plans for procurement of the most appropriate restraint and training for the proper use of the device and its installation in the vehicle should be incorporated into hospital discharge planning for all children with special needs.<sup>4</sup> Any child with a medical problem should have a special care plan that includes what to do during transport if a medical emergency occurs.
5. Parents, health care professionals, and educators should be encouraged to incorporate a child's special transportation needs into the individual education plan developed with the school.
6. There have been rapid changes in development and availability of resources for safer transportation of children with special needs. The current version of the American Academy of Pediatrics' "Car Seat Shopping Guide for Children With Special Needs" should be a helpful reference for health care professionals, parents, and school transportation providers.<sup>5</sup>
7. For additional information on transporting newborns or premature infants and children with special needs on school buses, refer to the appropriate policy statements by the American Academy of Pediatrics.<sup>6,7</sup>

### GUIDELINES FOR PROTECTION

Although research has been limited, current information suggests the following guidelines be adhered to when selecting an appropriate occupant protection system and positioning a child with special needs properly.

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.  
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### General: Infants and Young Children

1. The child restraint system should meet FMVSS 213.<sup>3</sup> Standard child restraint devices may be used for many children with special health care needs, and, whenever possible, a standard child restraint is the preferable choice. Use of a "special" child restraint system for a child with health care needs often may be postponed until a child exceeds the physical limitations of a car safety seat.
2. Car restraint systems should not be modified or used in a manner other than that specified by the manufacturer unless the modified restraint system has been crash tested and has met all applicable Federal Motor Vehicle Safety Standards approved by the National Highway Traffic Safety Administration.
3. Infant-only car safety seats with capacity to recline are useful for infants with many medical problems, especially respiratory conditions. Some convertible car safety seats also can be used in the rear-facing position for children up to a weight of 13.5 kg (30 lb). These restraints may be especially useful for children with poor head and neck control.
4. If the child's head drops forward while in a rear-facing car safety seat because the position of the seat is too upright, a roll of cloth can be wedged in the vehicle seat crease and under the car safety seat base at the child's feet, so that the child reclines at no more than a 45° angle or as specified in the manufacturer's instructions (Fig 1).
5. Premature and small infants should not be placed in car safety seats with a harness-tray/shield combination or an armrest that could directly contact the infant's neck or face during an impact.<sup>4,7,8</sup>
6. Car safety seats with five-point harnesses anchored at both shoulders, both hips, and between the legs, can be adjusted to provide good upper torso support for many children with special needs.

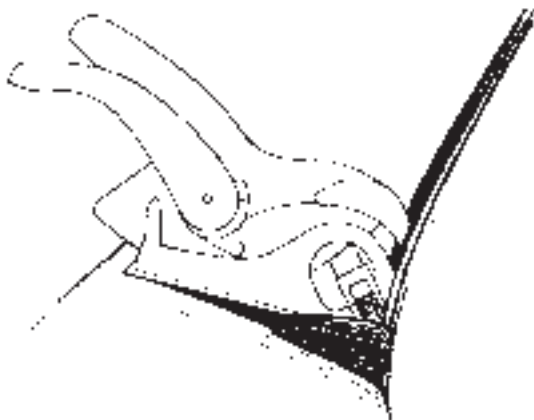


Fig 1. Rear-facing seat with wedge to recline seat at a 45° tilt.

### General: Older Children and Adolescents

1. When a child has outgrown a car safety seat, other choices are available for proper and secure occupant restraint. Some systems provide for full support for the child's head, neck, and back and accommodate children up to 47.2 kg (105 lb). Others, such as the conventional E-Z-On Vest (E-Z-On Products, Jupiter, FL), can be used to provide additional trunk support for a child who already has stable neck control. Tethers, additional lap seat belts, or appropriate tie-down systems are required for some of these devices and should be a consideration for selection and proper use (Fig 2).
2. Some older children with disabilities can be transported in a special needs belt-positioning booster or a conventional belt-positioning booster for trunk support. The booster seats help to position the shoulder and lap belt across the child's chest and pelvis.
3. Conventional lap-shoulder belt systems may also be useful in providing for chest restraint of some children with special needs. Lap-shoulder belts should be used properly. Lap belts should be low and flat across the child's hips, and the shoulder belt should be snug across the chest. If a lap belt lies on the child's abdomen or if a shoulder belt rests on a child's neck, use of a belt-positioning booster seat will help assure proper placement of the belts. The shoulder belt should never be placed underneath the child's arm(s) or behind the child's back.

### TRACHEOSTOMIES

Infants and children with a tracheostomy should not use child restraint systems with a harness-tray/shield combination or an armrest. On sudden impact, the child could fall forward causing the tracheostomy to contact the shield or armrest, possibly resulting in injury and a blocked airway.<sup>9</sup> A rear-facing car safety seat with a three-point harness or a

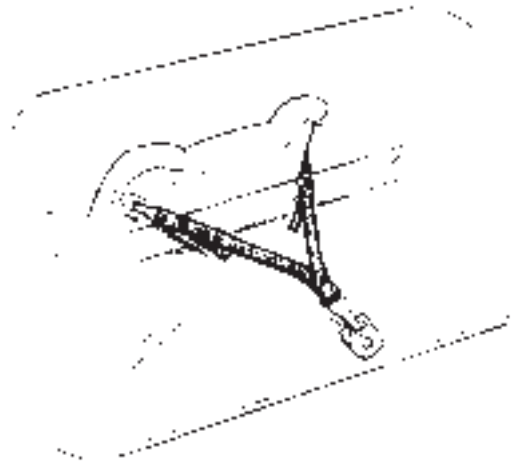


Fig 2. Large child forward-facing safety seat with tether anchored to vehicle.

car safety seat with a five-point harness should be selected for children with a tracheostomy.

#### MUSCLE TONE ABNORMALITIES

1. For toddlers with poor head control, a convertible car safety seat approved by the manufacturer for use in a semireclining position when facing forward may be beneficial.
2. Crotch rolls, made with a rolled towel or a diaper, may be added between the child's legs and the crotch strap to keep the hips against the back of the seat and prevent the child from slumping forward in the seat. This modification should be used for any child who cannot maintain appropriate posture.
3. Lateral support may be provided with rolled blankets, towels, or foam rolls (Fig 3).
4. Soft padding that does not alter the function of the harness may be positioned behind the neck and on either side of the head to promote anatomic alignment. However, padding should never be placed behind or under the child in the seat.<sup>10</sup> Soft padding (such as blankets, pillows, or soft foam) compresses on impact and can prevent harness straps from maintaining a secure, tight fit on a child's body (Fig 3).
5. A foam roll or rolled blanket may be placed under a child's knees to inhibit hypertonicity or opisthotonic posturing (Fig 3).

#### PRONE AND SUPINE POSITIONING OF INFANTS

Infants who must lie prone after surgical repair of myelomeningocele or infants who must lie prone to maintain an open airway, such as those with Pierre Robin sequence, may require a restraint that allows prone positioning.<sup>5,11,12</sup>

#### SPICA CASTS

1. For children with spica casts, a specially modified convertible car safety seat, the Spelcast (Snug Seat, Inc, Matthews, NC), has cut-away sides and seat



Fig 3. Child in convertible car seat with soft padding behind the neck, on either side of the head and along the sides to promote anatomic alignment. Foam roll or rolled blanket may be placed under knees to inhibit hypertonicity.



Fig 4. Child with spica cast seated in modified seat with cut-away sides and seat bottom.

bottom that provide room for a comfortable and snug fit into the restraint system (Fig 4). This seat fits infants up to a weight of 9.0 kg (20 lb) (rear-facing position) and toddlers who weigh up to 18.0 kg (40 lb) (front-facing position).

2. Many older toddlers and preschool and school-aged children in body or hip spica casts have limited resources available for safe transport in motor vehicles. One resource, the modified E-Z-On Vest, has performed satisfactorily during dynamic crash testing with a test dummy weighted to 47.2 kg (105 lb) and is available commercially. Two sets of seat belts routed through the vest are used to secure the child at the child's side against the vehicle seat. An ancillary belt loops around the casted leg or legs at the knees and is routed through the other seat belt (Fig 5). When it is not possible to fit a child onto a vehicle seat, use of an ambulance for transport is recommended. For lateral positioning on the vehicle seat (eg, as required by a car bed restraint or the modified E-Z-On Vest), position the child's head as far as possible from the side of the vehicle (Fig 6).

#### CHALLENGING BEHAVIOR

1. Older children with hyperactivity, autism, or emotional problems may require a safety restraint

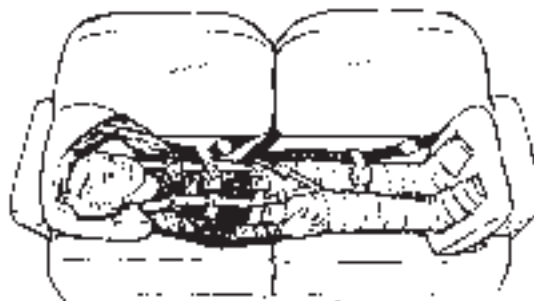


Fig 5. Child with modified E-Z-On Vest (E-Z-On Products, Inc, Jupiter, FL).

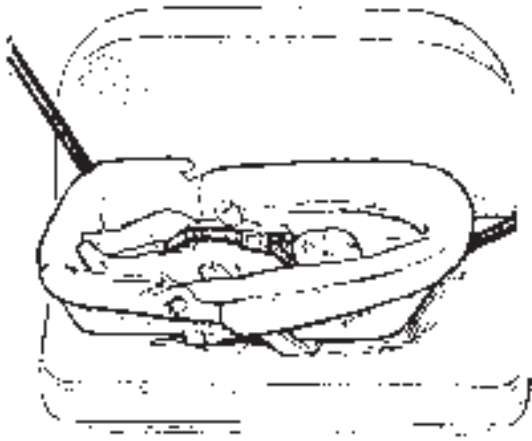


Fig 6. Infant positioned supine in the Ultra Dream Ride car bed (Cosco, Columbus, IN).

that is less likely to be unbuckled by the child. High back booster seats with internal harnesses that have seat belts routed underneath the seat base may be helpful in reducing the child's likelihood of unbuckling the restraint during travel. Large child car safety seats with a 5-point harness may be required for children weighing over 40 lb who cannot be restrained in a belt positioning booster seat with only a lap/shoulder harness.

2. Vests with rear back closure also may be helpful for use with children who have behavioral problems that may interfere with safe travel.<sup>5</sup>

#### WHEELCHAIR TRANSPORTATION

Any child who can assist with transfer or be "reasonably" moved from a wheelchair, stroller, or special seating device to the original manufacturer's forward-facing vehicle seat equipped with dynamically-tested occupant restraints or be "reasonably" moved to a child restraint system complying with FMVSS 213 requirement should be so transferred for transportation. The unoccupied wheelchair also should be secured adequately in the vehicle to prevent it from becoming a dangerous projectile in the event of a sudden stop or crash.<sup>13</sup>

Occupied wheelchair(s) should be secured in a forward-facing position. Any occupied wheelchair should be secured with four-point tie-down devices. Lap boards or metal or plastic trays attached to the wheelchair or to adaptive equipment should be removed and secured separately for transport. An occupant restraint system that has been tested at 30 mph and 20G force conditions and that includes upper torso restraint (ie, shoulder harness) and lower torso restraint (ie, a lap belt over the pelvis) should be provided for each wheelchair-seated occupant.<sup>14</sup> Head bands should not be used to restrain the child's head separately from the torso.

#### EQUIPMENT TRANSPORTATION

1. When a child with special needs is in transit, ancillary pieces of medical equipment (eg, walkers, crutches, oxygen tanks, monitors) should be

secured on the vehicle floor; underneath a vehicle seat or wheelchair; or to the bus seat, bus floor, or bus wall below the window line so that they do not become a projectile during a crash and strike an occupant.

2. Electrical equipment for use during transit should have portable self-contained power for twice the expected duration of the trip. For improved safety, lead acid batteries or electrically powered wheelchairs or other mobile seating devices and respiratory systems should be converted, when possible, to gel-cell or dry-cell batteries. To house and protect batteries during everyday use, transportation, and collision, the use of external battery boxes is recommended.

#### RESOURCE AVAILABILITY

The National Easter Seal Society (800-221-6827) can assist identifying local community resources for procurement of specific restraint systems.<sup>5</sup>

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Pediatric Orthopaedic Society of North America

#### SECTION LIAISON

Victor Garcia, MD  
Section on Surgery

#### CONSULTANT

Murray L. Katcher, MD, PhD

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# Guideline for the Safe Transportation of Pre-school Age Children in School Buses

National Highway Traffic Safety Administration  
February 1999

## Introduction

School age children transported in school buses are safer than children transported in motor vehicles of any other type. Large school buses provide protection because of their size and weight. Further, they must meet minimum Federal motor vehicle safety standards (FMVSSs) mandating compartmentalized seating, improved emergency exits, stronger roof structures and fuel systems, and better bus body joint strength.

As more pre-school age children are transported to school programs, often in school buses, the public is increasingly asking the National Highway Traffic Safety Administration (NHTSA) about how to safely transport them. To help answer these questions, NHTSA conducted crash testing of pre-school age size dummies in school bus seats. The test results showed that pre-school age children in school buses are safest when transported in child safety restraint systems (CSRSs) that meets FMVSS 213, Child Restraint Systems, and are correctly attached to the seats.

Based on its research, NHTSA recommends pre-school age children transported in school buses always be transported in properly secured CSRSs. In partial response to questions from school (and child care) transportation offices, this Guideline seeks to assist school and other transportation managers in developing and implementing policies and procedures for the transportation of pre-school age children in school buses.

Note: The proper installation of CSRSs necessitates that a school bus seat have safety belts or other means of securing the CSRS to the seat. NHTSA recommends that lap belts or anchorages designed to meet FMVSS 225, Tether Anchorages and Child Restraint Anchorage Systems, be voluntarily installed to secure CSRSs in large school buses.

## **RECOMMENDATIONS FOR THE TRANSPORTATION OF PRE-SCHOOL AGE CHILDREN IN SCHOOL BUSES**

When pre-school age children are transported in a school bus, NHTSA recommends these guidelines be followed:

- (1) Each child should be transported in a Child Safety Restraint System (suitable for the child's weight and age) that meets applicable Federal Motor Vehicle Safety Standards (FMVSSs).

(2) Each child should be properly secured in the Child Safety Restraint System.

(3) The Child Safety Restraint System should be properly secured to the school bus seat, using anchorages that meet FMVSSs.

### **Child Safety Restraint System Defined**

A Child Safety Restraint System is any device (except a passenger system lap seat belt or lap/shoulder seat belt), designed for use in a motor vehicle to restrain, seat, or position a child who weighs less than 50 pounds.

## **Child Safety Restraint Systems Guideline**

### **1. Child Safety Restraint System Specifications**

The provider of the CSRS should ensure:

Each pre-school age child to be transported has a CSRS appropriate for the child's weight, height, and age.

Each CSRS meets all applicable FMVSSs (look for the manufacturer's certification on the label attached to the system).

Each CSRS has been registered with the CSRS's manufacturer to facilitate any recalls the manufacturer might conduct.

If the CSRS is the subject of a recall, any necessary repairs or modifications have been made to the manufacturer's specifications.

Each CSRS is maintained as recommended by its manufacturer, including disposal of any CSRS that has been involved in a crash.

### **2. Proper Securement**

The transportation provider should ensure:

The CSRS is used and secured correctly in the school bus.

Each child is secured in CSRSs according to manufacturer's instructions.

All CSRS attachment hardware and anchorage systems meet FMVSS 210, Seat Belt Assembly Anchorages or FMVSS 225, Tether Anchorages and Child Restraint Anchorage Systems.



School bus seats designated for CSRSs meet FMVSS 225, or include lap belts that meet FMVSS 209, Seat Belt Assemblies, and anchors that meet FMVSS 210 (designed to secure adult passengers or CSRS).

Personnel responsible for securing CSRSs onto school bus seats and children into CSRSs are properly trained and all personnel involved with CSRSs are provided up-to-date information and training.

When transported in the school bus, pre-school age children are supervised according to their developmental and functioning level.

### **3. School Bus Seats Designated for Child Safety Restraint Systems**

The transportation provider should ensure:

School-bus seats designated for CSRSs are located starting at the front of the vehicle to provide drivers with quick access to and a clear view of the CSRS occupants.

CSRS anchorages on school bus seats should meet all applicable FMVSSs.

When ordering new school buses, the maximum spacing specified under FMVSS No. 222, School Bus Passenger Seating and Crash Protection, (within 24 inches from the seating reference point) is recommended for seats designated for CSRSs to provide adequate space for the CSRSs.

The combined width of CSRS and/or other passengers on a single seat does not exceed the width of the seat.

If other students share seats with the CSRSs, the CSRSs are placed in window seating position.

### **4. Retrofitting School Buses**

The transportation provider should ensure:

Existing school bus seats should only be retrofitted with lap belts or child restraint anchorages as instructed by the school bus manufacturer.

When a school bus is retrofitted with a seat to allow for proper securement of a CSRS, instructions obtained from the school bus or seat manufacturer on how to install the seat and restraint systems should be followed.

When a school bus is retrofitted, the bus owner should ensure that seat spacing is sufficient for the CSRS to be used.

### **5. Evacuation**

The transportation provider should ensure:

The establishment of a written plan on evacuating pre-school age children and other passengers in CSRSs in the event of an emergency. This written plan should be provided to drivers, monitors, and emergency response personnel. The plan should explicitly state how children (both in and out of the CSRS) should be evacuated from the school bus.

Evacuation drills are practiced on a scheduled basis, at least as often as that required for the school system's school-aged children.

All personnel involved in transporting children are trained in evacuation and emergency procedures, including those in the written school bus evacuation plan.

All school buses carrying children in CSRSs carry safety belt cutters that are accessible only to the driver and any monitors.

CSRSs are not placed in school bus seats adjacent to emergency exits.

Local emergency response teams are provided copies of the written school bus evacuation plan, including evacuation of pre-school age children. Emergency response personnel should be invited to participate in evacuation drills.

## **6. Other Recommendations**

The school transportation provider should establish a policy on whether they or the child's guardian must supply a CSRS to be used on a school bus. School bus purchases should be based on the needs of a projected student population, taking into consideration projected ages, sizes, and other characteristics of the students, including any special needs, and whether pre-school age children or medically fragile students will be transported.

Specified procedures should be established for loading and unloading children in CSRSs.

Procedures should be established for the periodic maintenance, cleaning, and inspection for damage of CSRSs. Procedures should be established to train personnel involved in direct service delivery of infants, toddlers, and pre-school children on the physical day-to-day handling of these young children and means to handle potential exposure to contagious and communicable diseases.

When school bus procedures are established, it should be noted that some children in CSRSs may have special needs, including medical fragility, that must be addressed on a child-by-child basis.

## School Transportation Safety

Committee on School Health and Committee on Injury and Poison Prevention

**ABSTRACT.** The following policy statement is a revision of the American Academy of Pediatrics' 1985 statement entitled "School Bus Safety." It provides updated information regarding relevant federal regulations and outlines recommendations that can enhance community systems for addressing school bus safety education, awareness, and practices. Pediatricians can assist in this process by sharing these recommendations at both the community and state levels.

According to Special Report 222 of the Transportation Research Board of the National Research Council, in the United States approximately 400 000 school buses are used to transport 25 million children nearly 4 billion miles to and from school and school activities each year. Approximately 85% of these buses are the large, type I school buses that carry more than 16 passengers and are usually not equipped with lap belts. Children riding in small school buses built in accordance with federal safety standards, including lap belts, fared very well in 24 crashes investigated by the National Transportation Safety Board. Children riding in type I school buses fared less well; school bus safety records, however, are considerably better than the safety records for private vehicles.<sup>1</sup>

Given the high numbers of children transported and miles traveled annually, the levels of deaths and injuries to children as a result of school bus-related crashes are relatively low. Of the approximately 150 persons killed in school bus-related events each year, only 12% are passengers on the buses: 8% student passengers, 2% adult passengers, and 2% drivers. The remaining deaths are of occupants of other motor vehicles (55%), bicyclists (3%), and pedestrians (30%). Of the fatally injured pedestrians, 84% were school aged and 16% were adults. Seventy percent of the victims were struck by school buses. The majority of pedestrians killed were young children who were struck by their own school buses. The number of injuries from school bus-related events is estimated to be 19 000 per year, and most injuries are minor. Half of these injuries are sustained by school bus passengers. An estimated 4% of school bus-related injuries are sustained by pedestrians and are typically more severe.<sup>1</sup>

Public outcry and demands for change predictably surface when tragic crashes occur, even though the

frequency of on-board deaths and injuries on school buses remains lower than that of incidents outside of the buses. Expectations for school bus safety should be upheld not as a result of public reactions, but from an ongoing commitment from communities and states to assuring the safest ride possible for children on school buses. Because travel by school bus plays such a consistent and long-term role in the daily lives of children from preschool through high school, pediatricians can help by serving as resources, educators, consultants, and advocates for school bus safety.

The National Traffic and Motor Vehicle Safety Act of 1966 authorizes the Department of Transportation to issue minimum standards for new school buses manufactured for sale in the United States.<sup>2</sup> This act was amended in 1974,<sup>3</sup> and the National Highway Traffic Safety Administration (NHTSA) developed the current minimum performance standards for school buses manufactured after April 1, 1977.<sup>4</sup> In recent years, school bus safety in the United States again has been closely scrutinized. Although certain topics continue to be controversial, there is a strong consensus regarding most issues. The recommendations below are derived from several recent studies.<sup>1-4</sup>

### RECOMMENDATIONS

#### School Bus Safety

1. Many school systems provide for the transportation of preschool children. The use of child safety seats and other restraint systems on school buses for preschool children is recommended as a necessary practice to keep preschool children secured on the school bus seats. All restraint systems used during school bus transport should meet the requirements of Federal Motor Vehicle Safety Standard 213.<sup>4</sup> The American Academy of Pediatrics (AAP) recommends that school districts provide appropriate and federally approved child restraint systems for pre-kindergarten-aged children riding in school buses. Children with special needs and who are older than that age and require restraint should be evaluated individually to determine the most appropriate restraint that meets their needs for positioning during travel, regardless of their age, weight, and height. Further recommendations are outlined in the AAP policy statement on transportation of children with special needs.<sup>5</sup>

2. Compartmentalization, or keeping child passengers confined to a padded compartment in a crash, is the major principle by which school bus passengers are currently protected. In general, the higher the

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seat back and the closer the spacing between rows, the better the compartmentalization of passengers in a crash. Current provisions are for a seat back height of 20 in above a reference point (about 22 in measured from the seat surface). A study committee of the National Transportation Safety Board has issued a recommendation that the NHTSA revise Federal Motor Vehicle Safety Standard 222 (School Bus Safety and Interiors) to require that seat backs be 24 in above the reference point. Seat backs would be slightly more than 26 in from the seat surface.<sup>1</sup> The AAP supports this recommendation.

3. The issue of school bus safety has been linked frequently with concerns about whether school buses should be required to have safety belts for all passengers. It is estimated that the use of seat belts on large, type I buses may reduce deaths and injuries by 20%, with an assumption that use rates are only 50%.<sup>1</sup> Belt use rates can be significantly increased through education and monitoring, and, therefore, effectiveness estimates can be enhanced when all students consistently wear the belts correctly. An additional benefit of seat belt use in buses is that it reinforces seat belt use in private vehicles. Although the cost-effectiveness of seat belt use on school buses may remain controversial, the AAP recommends the installation of seat belts on all newly purchased school buses. School districts that provide seat belts on school buses must ensure the appropriate education of administrators, students, teachers, drivers, and parents in their use.

4. All school buses should be equipped with the following to prevent pedestrian injury: eight warning and loading lights (two flashing red and two flashing amber lights on both the front and back of the bus), stop signal arms, and a cross-view mirror system. The bus should meet all current recommendations for mirrors, including two large round mirrors that allow the driver to view more fully the front of the bus. Additionally, districts should consider installing strobe lights for use during reduced-visibility conditions, an external loudspeaker system to enable the driver to communicate with children outside of the bus, and loading and backing alarms or pulsating backup horns.<sup>8</sup> Electronic sensor systems are available but have not been evaluated adequately.<sup>1</sup>

5. It is recommended that school buses be equipped with brake retarder systems, which may be effective in reducing serious injuries and deaths attributable to sudden stops.

6. Mandatory state school bus inspections are recommended.

7. The state highway patrol (or other independent agency) should make detailed, unexpected, random school bus inspections in addition to regular annual school bus inspections.

8. All school buses, including private, for hire, and those for parochial schools, need to be in compliance with all federal regulations. Buses built before 1977 should be retired from use.

9. The use of wheelchairs is common for school bus transportation of children with disabilities. The AAP recommends that states adopt the requirements for

the use of wheelchairs on school buses outlined in the 1995 National Standards for School Buses.<sup>8</sup>

#### School Bus Driver Selection and Training

School bus drivers should meet the following requirements annually:

1. Maintain a valid commercial driver's license;
2. Be a minimum of 21 years of age;
3. Show proof of a yearly health examination, including vision and hearing assessments, which documents the absence of problems that may compromise driving and child supervision;
4. Maintain a satisfactory driving record as determined by the school district and successfully pass a review for a criminal record, including child sexual abuse and incidents or arrests for driving under the influence of alcohol or other drugs;
5. Attend a minimum of 6 hours of instruction and successfully complete a written or oral test covering driver duties, bus operating procedures, traffic and school bus laws and regulations, record keeping, emergency and crash-related procedures, first aid, basic appreciation of the developmental stages and needs of school-aged children, child supervision responsibilities, and transportation of passengers with special needs;
6. Pass a driving performance test and demonstrate safe loading and unloading procedures; and
7. Pass a test for illicit drugs and alcohol as required by the district; mandatory testing is recommended if it is not already required.

#### School Bus Passenger Instruction

Passengers of all ages need to be taught safe riding and pedestrian behavior, no matter how infrequently they ride the bus. Instruction should include safe pedestrian practices going to and from the bus stop, safe behavior while waiting at the bus stop, safe practices for boarding and disembarking from the bus, safe behavior on the bus, and procedures for emergency situations.

#### School Bus Passenger Supervision

Adult supervision on school buses should focus on ensuring that passengers stay seated, use seat belts when available, and keep arms and heads inside windows; assisting in handling emergencies; assisting passengers with special needs; and escorting children across busy roadways. These objectives can best be met by a second adult (other than the driver) serving as a monitor on the school bus.

#### School Bus Routes and Stops

Bus routes should avoid the need for the bus to back up, should minimize traffic disruptions, should provide good fields of vision at all stops, and should minimize the need for children to board or leave the bus on, or cross, a busy roadway. It is recommended that an adult supervise children who must cross a roadway after leaving a school bus.

### The Pediatrician's Role

Pediatricians can play important roles at the community, state, and national levels as child advocates and consultants to schools about transportation safety.

#### Community Level

1. Inquire about current policies relating to school transportation. Find out mechanisms for proposing needed changes, and serve as a resource to the decision-making body.

2. Inquire about and help develop local training programs for bus drivers. Participate in planning and arranging delivery of local training for bus drivers in areas relating to child development and behavior, child safety seat use and positioning needs, and safety belt use. Provide direction for the development of test materials to evaluate driver competency in these areas.

3. Share and promote the recommendations of this policy statement at local school district meetings.

4. Encourage the development and distribution of educational materials on school bus safety through the local school systems.

5. Serve as consultants to local transportation directors, state directors of school transportation, or school boards on the physical and emotional development of preschool children and assist in developing training materials for transportation providers.

#### State Level

1. Contact state directors of school transportation and request a copy of current state specifications for school buses. Compare this information with recommendations by National School Bus Safety Standards<sup>8</sup> and urge revisions of state specifications, if necessary, through appropriate decision-making channels at the state level.

2. Volunteer to serve on a writing committee for state specifications. Share information from AAP policy statements and recommendations by National School Bus Safety Standards.

3. Contact state departments of education and recommend the development of information on school bus safety for statewide distribution to elementary schools.

4. Serve as a resource and consultant to the state department of education regarding training of bus drivers in areas relating to child passenger safety and child development and behavior.

#### National Level

The AAP recommends that research be directed toward understanding how child restraint systems perform under dynamic conditions when secured on the school bus seat. This research would assist the NHTSA in assessing requirements for the dimensions of school bus seats (depth, height, and recline angles) to provide for the proper and secure restraint of preschool-aged children.

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Milton Tenenbein, MD

Canadian Paediatric Society

Deborah Tinsworth

US Consumer Product Safety Commission

#### SECTION LIAISON

James Griffith, MD

Section on Injury and Poison Prevention

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# AMERICAN ACADEMY OF PEDIATRICS

Committee on Injury and Poison Prevention

## Restraint Use on Aircraft

**ABSTRACT.** Occupant protection policies for children younger than 2 years on aircraft are inconsistent with all other national policies on safe transportation. Children younger than 2 years are not required to be restrained or secured on aircraft during takeoff, landing, and conditions of turbulence. They are permitted to be held on the lap of an adult. Preventable injuries and deaths have occurred in children younger than 2 years who were unrestrained in aircraft during survivable crashes and conditions of turbulence. The American Academy of Pediatrics recommends a mandatory federal requirement for restraint use for children on aircraft. The Academy further recommends that parents ensure that a seat is available for all children during aircraft transport and follow current recommendations for restraint use for all children. Physicians play a significant role in counseling families, advocating for public policy mandates, and encouraging technologic research that will improve protection of children in aircraft.

ABBREVIATIONS. AAP, American Academy of Pediatrics; CSSs, child safety seats; FAA, Federal Aviation Administration; NTSB, National Transportation Safety Board; CFR, Code of Federal Regulations; CAMI, Civil Aeromedical Institute; SAE, Society of Automotive Engineers.

### INTRODUCTION

Children younger than 2 years are the only occupants who, under current federal regulation, are not required to be restrained or secured on aircraft during takeoff, landing, and conditions of turbulence; even items such as coffee pots must be secured. This practice relating to nonrestraint of children on airplanes is inconsistent with all occupant protection recommendations of the American Academy of Pediatrics (AAP) in which priority has been placed on safe transportation of children. Many child safety seats (CSSs) used in motor vehicles are also approved for use on aircraft. The Federal Aviation Administration (FAA) has stated that proper use of an approved CSS for aircraft enhances child safety in the event of turbulence or a crash, and the FAA informs parents that a "safety seat can be the most important carry-on item of all."<sup>1</sup> The FAA strongly recommends but has not yet mandated that all children who fly, regardless of age, should be restrained in the appropriate CSS for their weight and size used in conjunction with the aircraft seat belt.

In a 1996 report to the President of the United

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.  
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States, the White House Commission on Aviation Safety and Security stated that it is inappropriate for infants to be afforded a lesser degree of protection than that for older passengers.<sup>2</sup> The Commission recommended that the FAA revise its regulations to require that all occupants be restrained in aircraft during takeoff, landing, and conditions of turbulence and that all infants and small children whose weight is less than 40 lb and whose height is less than 40 in be restrained in an aircraft-approved CSS. The Association of Flight Attendants and the National Transportation Safety Board (NTSB) have called for federal regulation requiring appropriate restraint use.<sup>3-5</sup> The NTSB has also called for the FAA to develop standards for CSS use in aircraft. The FAA has argued that a mandatory requirement for CSS use on aircraft will result in more injuries and deaths to infants and toddlers because parents would not be willing to buy a ticket to reserve a seat for the infant and would opt to travel by car instead<sup>6</sup>; however, no data support this argument.

### CURRENT POLICY FOR CHILDREN

Children younger than 2 years are currently allowed to be held in an adult's lap throughout a commercial aircraft flight, as stipulated by the US Code of Federal Regulations (CFR).<sup>7</sup> Alternatively, parents may choose to use a CSS certified under the Federal Motor Vehicle Safety Standards and Regulations for travel in aircraft and motor vehicles.<sup>8</sup> Airlines are required to accommodate the use of approved CSSs for young children with tickets; however, the child must occupy a window seat in a nonexit row. Although many airlines offer discounted rates for children younger than 2 years, these rates are often not advertised, and parents must ask to receive a reduced-rate ticket. If parents want to ensure that the child has a passenger seat in which the CSS can be used, they must purchase a ticket. If the child is held on the lap of an adult, no fare is charged for the child. Children 2 years and older are required to sit in their own passenger seat under the same regulations that apply to all other passengers.

In 1995, in the aftermath of serious and sometimes unexpected events of turbulence, the FAA issued a public advisory to airlines urging the use of seat belts at all times when passengers are seated.<sup>6</sup> Some airlines now comply, but the requirement does not apply to children younger than 2 years because they are not required to be restrained at any time during the flight.

## BACKGROUND

Approximately 25 000 commercial flights depart from and arrive at US airports daily.<sup>9</sup> Although it is estimated that 4.6 million children younger than 2 years fly on US domestic airlines annually, inaccuracies in the passenger manifest, which contains the names of all passengers as required by the US CFR, make it difficult to obtain precise numbers. The NTSB has issued safety recommendations that require standardized reporting of all passengers.<sup>10</sup>

The risk of death or serious injury in an aircraft is exceedingly small. Using data from 1990 forward not controlled for age, the risk of death was calculated at 1 in 8 million.<sup>11</sup> During 1996, there were 319 passenger fatalities and 77 serious injuries on US air carriers operating under the CFR. These data are not provided by year of age of passenger but include all scheduled and nonscheduled services on commercial and cargo carriers.<sup>12</sup> Analysis of aircraft crashes from 1976 through 1979 in which there were fatalities and survivors revealed that unrestrained infant passengers had a relative mortality risk of 5.9 (United States) and 9.6 (worldwide), compared with restrained adult passengers. It could not be determined whether the higher risk of mortality for infants was attributable to lack of restraint use, fragility of infants, or both.<sup>13</sup>

In a study comparing persons fatally injured in aircraft in 1980 and 1990, blunt injury (in particular, head injury) from deceleration forces was the most important threat to survival. Head injuries were listed as the immediate cause of death in 33% of those younger than 15 years.<sup>14</sup> As with other forms of transportation, effective restraint systems decrease the probability of head injury.

Turbulence is the leading cause of nonfatal injuries to aircraft passengers and flight attendants. From 1981 through 1997, there were 342 reports of turbulence affecting major airlines. Three passengers died, 80 had serious injuries, and 769 had minor injuries.<sup>15</sup>

A child on the lap of an adult cannot be effectively restrained in a motor vehicle or aircraft crash. A child who travels on the lap of another occupant or unrestrained in a motor vehicle has a substantially greater risk of injury and death, compared with a restrained child.<sup>16–18</sup> Hazards associated with the on-lap position are also well documented in aircraft crash investigations. Three children on the laps of adults were fatally injured and others nonfatally injured in the 1987 crash in Denver, CO, the 1989 crash in Sioux City, IA, and the 1994 crash in Charlotte, NC—which were all caused by turbulence.<sup>19–21</sup> The NTSB has reported 2 crashes in which CSSs were used and provided protection to children.<sup>3</sup>

## CERTIFICATION OF CSSs FOR USE ON AIRCRAFT

The FAA's Civil Aeromedical Institute (CAMI) has conducted studies on CSSs for use with aircraft seats. Crash testing of CSSs using child dummies in 1993 revealed that rear-facing CSSs performed well and could be installed with contemporary aircraft seat belts. However, 6 of the 8 tests with forward-facing CSSs resulted in Head Impact Criteria values of more

than 1000, which is the threshold for serious head impact in adults. Difficulty was encountered in securing some of the forward-facing CSSs to the aircraft seats. Moving the anchor points rearward resulted in improved performance of many CSSs; however, most aircraft have seats with poor belt anchor geometry.<sup>22</sup>

Certain restraints that are approved for use in motor vehicles are prohibited for use in aircraft (14 CFR 121.311).<sup>7</sup> When tested, vest and harness type systems allowed excessive forward body excursion, causing the test dummy to slide off of the front of the seat, potentially impacting the seat in front and resulting in injuries.<sup>22,23</sup> Shield type booster seats are incompatible with aircraft seats because of the seat-back breakover feature common on airplanes.

## POTENTIAL NEW TECHNOLOGY

Testing has shown that aircraft seat belts alone do not adequately protect a child younger than 3 years.<sup>22,23</sup> The CAMI has developed and fully tested a prototype aircraft seat insertion platform, which can be inserted under the CSS and secured to the aircraft seat with the seat belt. Seat belts attached to the platform are used to secure the CSS. The platform improves ease of installation and decreases the forward excursion of the CSS. A CSS designed for use in aircraft that could be used forward or rear facing is a second alternative. One such device is already approved and is being sold. A third alternative is modifying a certain number of passenger seats on each aircraft to accommodate and ensure adequate performance of CSSs. A relatively simple and low-cost modification has been successfully demonstrated at CAMI. The Society of Automotive Engineers (SAE) has recently adopted a performance standard for CSSs installed on airplane passenger seats.<sup>24</sup> The objective of this standard is to establish performance criteria for CSSs when installed in airplane seats. The methods of meeting the SAE standard and the pass/fail criteria are similar to those already imposed on CSSs by automotive regulations (49 CFR 571.213). Inclusion of the SAE standard in automotive regulations for CSSs should be considered.

A national symposium was held by the NTSB in 1999 to explore operation, design, regulations, and experience with CSSs nationally and internationally.<sup>25</sup> At this meeting, FAA Administrator Jane Garvey announced “. . . We [FAA] are committed to 2 things—mandating the use of child restraint systems in aircraft and assuring that children are accorded the same level of safety as are adults.” This statement clearly implies the FAA plans to move forward with regulatory actions mandating the use of effective CSSs in airplanes.

## ENFORCEMENT OF EXISTING RESTRAINT REQUIREMENTS FOR CHILDREN

The NTSB has documented events in which children 2 years and older have been transported on the lap of an adult. The NTSB has been concerned about the inadequacy and lack of enforcement of passenger protection regulations and has recommended that



the FAA implement measures for enforcing restraint regulation for children 2 years and older.<sup>26</sup>

#### RECOMMENDATIONS

Consistent with national policies requiring restraint use in all vehicles, the AAP recommends that regulations be promulgated to ensure that all passengers, including those younger than 2 years, are afforded optimal protection during all phases of commercial and general aircraft flights. The AAP believes that children should be afforded the same protection as other passengers and that restraint use in aircraft for children younger than 2 years should be mandatory during takeoff, landing, and conditions of turbulence and should be recommended as much as feasible during flight as it is for all other passengers.

Pediatricians, federal agencies, and airlines are encouraged to work together to accomplish the following:

1. Implement mandatory restraint use requirements using aircraft-approved restraint systems and discontinue the policy of allowing children younger than 2 years to be held on the lap of an adult on aircraft.
2. Enforce current requirements for children older than 2 years, some of whom travel unrestrained and without tickets.
3. Establish standards for appropriate restraint use in aircraft for all children. Amend the CFR<sup>7</sup> by adding a section on child restraint requirements on aircraft providing intrastate, interstate, or overseas transportation. Establish age and weight recommendations for use of CSSs similar to those for motor vehicles.
4. Provide information on current recommendations for the restraint of children younger than 4 years similar to AAP recommendations for restraint use in motor vehicles as follows<sup>27</sup>:
  - Children should be placed in a rear-facing CSS that is properly secured and installed until they are at least 1 year old *and* at least 20 lb in body weight.
  - A forward-facing seat labeled for use on aircraft should be used for children at least 1 year old and 20 to 40 lb in body weight. The AAP is aware of the problems found by the CAMI study with forward-facing seats but believes that these seats afford more protection to children than do seat belts alone, no restraint use, or being held on a lap. The CSS manufacturers label seats that fit and can be satisfactorily restrained to an aircraft seat.
  - According to the FAA, CSSs should not exceed 16 in wide for best fit in aircraft seats; this is especially important in small commuter aircraft.
  - Children who weigh more than 40 lb can be secured in the aircraft seat belt.<sup>28</sup>
5. Establish international standards through the International Civil Aviation Organization requiring that passengers on civil aircraft be restrained during takeoff and landing and when directed by the captain of the aircraft.
6. On all types of passenger aircraft, pursue technologic solutions for improving restraint systems for children who are inadequately protected by existing child restraints or seat belt systems.
7. Educate all airline personnel who have contact with families regarding the importance of, and the requirements for, age-appropriate restraint use on aircraft. This includes travel agents, reservation/gate agents, and cabin crew.
8. The airlines should make available to families CSSs that are compatible and effective in aircraft.
9. Encourage airlines to offer a discounted fare (or a rebate) for restrained children.

Pediatricians should convey the following information to parents:

1. All children should travel properly restrained on aircraft.
2. Similar to travel in motor vehicles, a child is best protected when properly restrained in a CSS appropriate for the age, weight, and height of the child, meeting standards for aircraft until the child weighs more than 40 lb and can use the aircraft seat belt. Child safety seat systems manufactured to US standards for aircraft use after February 26, 1985, bear the label: "This restraint is certified for use in motor vehicles and aircraft" in red letters.<sup>28</sup>
3. Families should explore options for ensuring that each child has an aircraft seat. Currently, to ensure that a child has a seat for the CSS, families must purchase a ticket and should specify a window seat next to the parent in a nonexit row for the CSS. However, it is suggested that parents ask the airline whether the purchase of a seat is required to use a CSS and consider asking for the information in writing. Parents should also ask and be advised about discounted fares and compare the benefits of various airlines. If no discounted or free fare is offered by any airline and it is not feasible to purchase a ticket, parents should select flights that are likely to have empty seats. Parents should inquire about the carrier's policy regarding use of empty seats. Parents who are traveling with CSSs should be reminded that they can request assistance from the airlines between connecting flights.
4. Parents can obtain additional information on safe air travel for children from the FAA (1-800-FAA-SURE and <http://www.faa.gov/>).

There is a need for accurate exposure data. Accurate passenger manifests should be generated to include all passengers on all flights. Standard reporting for all passenger injuries should be established and made available by age of passenger and restraint use. Epidemiologic studies and the evaluation of preventive measures may thus be conducted.

COMMITTEE ON INJURY AND POISON PREVENTION,  
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Danielle Laraque, MD  
Susan H. Pollack, MD

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 Health Resources and Service  
 Administration/Maternal and Child Health  
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 National Highway Traffic Safety  
 Administration  
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 Centers for Disease Control and Prevention  
 Lynn Warda, MD  
 Canadian Paediatric Society  
 Deborah Tinsworth  
 US Consumer Product Safety Commission

CONSULTANTS  
 Murray L. Katcher, MD, PhD  
 Van Gowdy  
 Howard R. Spivak, MD

STAFF  
 Heather Newland

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#### ERRATUM

In the policy statement "Human Embryo Research," published in the September issue of *Pediatrics* (2001;108:813-816), 2 errors occurred. In the first paragraph under "Introduction," the second sentence should read:

"Pluripotent stem cells are a specialized subpopulation of cells capable of developing into most (ectoderm, mesoderm, and endoderm), but not all, human tissue and may be derived from human embryos."

On the roster for the Committee on Bioethics, one of the liaison's credentials were listed erroneously. His name should read "Ernest F. Krug III, MDiv, MD, American Board of Pediatrics."

For Immediate Release

Release No. AOC 26-06, September 6, 2006, Contact: Alison Duquette, Phone: (202) 267-3883

## **FAA Approves New Child Safety Device Government Gives Parents More Options for Safe Air Travel with Children**

WASHINGTON, DC – Air travelers have a new option for securing their children on commercial flights now that the U.S. Department of Transportation’s Federal Aviation Administration (FAA) has approved a new type of child safety device, the AmSafe Aviation CARES.

CARES uses an additional belt and shoulder harness that goes around the seat back and attaches to the passenger lap belt to provide restraint for the upper part of the body. It is designed for children weighing between 22 and 44 pounds. The device provides a smaller and lighter alternative to using forward-facing child safety seats. CARES is not approved for use in motor vehicles.

“We want to provide parents with options so they can make the right decision for their children when they travel by air,” said FAA Administrator Marion C. Blakey. “We’re encouraging child seat manufacturers to design new types of devices that meet the FAA’s stringent standards.”

Unlike hard-backed child safety seats that are approved for use in airplanes and motor vehicles, CARES is designed and tested specifically for safe use in airplanes only. Previously, the FAA had allowed only airlines to provide these types of additional child safety devices, but no U.S. airlines presently provide them.

According to the FAA, the safest place for a child on an airplane is in an approved child safety device, not on a parents lap. The agency encourages but does not mandate the use of child safety devices on airplanes because of the increased safety risk to families who, if forced to purchase an extra airline ticket, might choose to drive. The risk to families is significantly greater on the roads than in airplanes, according to FAA and National Highway Traffic Safety Administration (NHTSA) statistics.

For additional information go to [www.faa.gov/passengers/fly\\_children](http://www.faa.gov/passengers/fly_children).



# THE DO'S AND DON'TS OF TRANSPORTING CHILDREN IN AN AMBULANCE



Approximately six million children are transported by emergency medical services (EMS) vehicles each year in the United States. There are risks of injury associated with transport that can be minimized. An

ambulance is NOT a standard passenger vehicle. Unlike the well-developed and publicized child passenger safety standards and guidelines, specifications for the safe transport of ill and injured children in ambulances are still under development. Standard automotive safety practices and techniques cannot be applied directly to EMS vehicle environments due to biomechanical and practical differences. Caution is encouraged in the application of passenger vehicle principles to ambulances and in the utilization of new and unproven products.

The Emergency Medical Services for Children (EMSC) Program supports efforts to improve the safety of pediatric patients being transported in EMS vehicles. Through an EMSC grant, the Division of Pediatric Emergency Medicine at Johns Hopkins Children's Center is working to fill critical knowledge gaps and developing standards for pediatric EMS transport safety. Project results should be available in the year 2000.

A national consensus committee, sponsored by the EMSC Program, is reviewing current EMS child transportation safety practices. The group, which includes representatives from EMS national organizations, Federal government agencies, and transportation safety engineers, is developing preliminary recommendations for EMS providers until scientific research is completed.

There are certain practices that can significantly decrease the likelihood of a crash, and in the event of a crash or near collision, can

significantly decrease the potential for injury. These practices are listed below. Importantly, as is mandated in several states, the NHTSA Emergency Vehicle Operating Course (EVOC), National Standard Curriculum or its equivalent is an integral part of this transport safety enhancement.

Pending research and consensus outcomes, the following guidelines for good practice should be observed when transporting children in EMS vehicles.

## DO's

- ✓ **DO** drive cautiously at safe speeds observing traffic laws.
- ✓ **DO** tightly secure all monitoring devices and other equipment.
- ✓ **DO** ensure available restraint systems are used by EMTs and other occupants, including the patient.
- ✓ **DO** transport children who are not patients, properly restrained, in an alternate passenger vehicle, whenever possible.
- ✓ **DO** encourage utilization of the DOT NHTSA Emergency Vehicle Operating Course (EVOC), National Standard Curriculum.

## DON'Ts

- ✗ **DO NOT** drive at unsafe high speeds with rapid acceleration, decelerations, and turns.
- ✗ **DO NOT** leave monitoring devices and other equipment unsecured in moving EMS vehicles.
- ✗ **DO NOT** allow parents, caregivers, EMTs or other passengers to be unrestrained during transport.
- ✗ **DO NOT** have the child/infant held in the parent, caregiver, or EMT's arms or lap during transport.
- ✗ **DO NOT** allow emergency vehicles to be operated by persons who have not completed the DOT EVOC or equivalent.



May 23, 2000





## **CRASH PROTECTION FOR CHILDREN IN AMBULANCES Recommendations and Procedures\***

Marilyn J. Bull, M.D., Kathleen Weber, Judith Talty, Miriam Manary

A joint project of the Indiana University School of Medicine and  
the University of Michigan Medical School and Transportation Research Institute

Safe transportation of children in ambulances presents special challenges for emergency medical service providers and child passenger safety advocates. Effective restraint is dependent not only on the child restraint equipment used but also on the platform to which it is attached. Although research concerning the ambulance crash environment is limited, fundamental principles of occupant restraint can still be used to develop useful and effective procedures in the field.

The federally funded Emergency Medical Services for Children (EMSC) Program acknowledges the special circumstances of ambulance transport and the gap that exists between occupant restraint practices in ambulances vs. other highway vehicles. In the near term, they have concentrated on crash prevention and the general concept of restraint of all occupants and equipment to minimize the risk of injury. They also recommend that children who are not ill or injured be transported in a vehicle other than the ambulance whenever possible.

### **Restraint Considerations in Ambulances**

Providing effective restraint for children in ambulances is a complex problem with many unique and unresolved issues. The occupant requiring transport may be acutely ill or injured, the vehicle has special characteristics for its function, and the crash environment and exposure are different from that of a family car. The ambulance environment is specifically designed for emergency treatment of passengers. Although there are variations in design, the patient compartment is typically equipped with a captain's chair that faces the rear of the ambulance, bench seats along one side of the ambulance, a cot, and storage for equipment and medical supplies. There are no forward-facing vehicle seats in the patient compartment upon which child restraints can be installed according to the manufacturers' instructions.

When determining the best restraint of a child in an ambulance, consideration must be given to the reason the child is being transported (patient vs. accompanying passenger), the medical stability of the patient, and the available locations where the child can be restrained. If not ill or injured, the child should be transported in another vehicle if at all possible, as recommended by EMSC. A police vehicle, however, is not usually a good alternative, because of the presence of prisoner screens, plastic seats, and special equipment that may compromise child restraint performance.

When transporting a child with an acute medical problem that requires constant monitoring, a current practice is to restrain the child directly to the cot with chest and hip

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\* The complete research paper is published in Association for the Advancement of Automotive Medicine, 45<sup>th</sup> Annual Proceedings, pp. 353-367. Barrington, IL, AAAM, 2001.

belts, even though this provides virtually no crash restraint, especially in the forward direction. Whenever possible, a restraint system designed specifically for a child should be used, but the difficult problem is determining the most appropriate restraint location and method of securement in the ambulance.

Rear-facing captain's chairs, or technician seats, can provide a good platform for some types of child restraints, and special instructions can be obtained from some child restraint manufacturers for installation of their convertible models (normal installation being either rear- or forward-facing) on an ambulance captain's chair. It is also becoming increasingly common to equip these technician seats with a built-in child restraint, suitable for use with an accompanying child or a less critical patient, but not a small infant. Use of this seat by a child, however, in either a portable or a built-in child restraint, precludes use of the captain's chair by an EMS technician.

Placement of a child restraint on a side bench seat is not recommended, because this usage applies the severity of a frontal impact to the less protected side-facing child. Such installations are specifically prohibited, with good reason, by all child restraint manufacturers.

Some types of child restraint systems can be attached to the ambulance cot. At present, most cots used in the field are anchored to the ambulance floor with a three-point "antler" positioning system along with a single friction clamp at the foot end that allows quick and easy loading of the patient. These cots do not have positive lock-in mechanisms, and they need only meet static loading requirements.

### **Research Methods and Results**

The objectives of this study were to determine the most effective and reliable means of restraining children on an ambulance cot and to develop recommended field procedures for emergency medical service providers. A series of crash tests at 30 mph was conducted using convertible child restraints, car beds, and harness systems tested with 3-year, infant, and 6-year size dummies. Belt configuration and backrest position were varied, and it was determined that a two-belt attachment with elevated cot backrest was the method with the least performance variability for securing either a convertible child restraint or a car bed. In addition, a new cot and slide-in track fastener system significantly improved restraint performance over the older antler systems previously tested.

The test sequences in Figures 1 and 2 illustrate acceptable crash performance for a convertible child restraint and a car bed. Each restraint is held to the cot by two pairs of belts, and the elevated backrest provides additional support. Installation details are provided under Recommendations.

Unfortunately, none of the harness configurations tested proved to be satisfactory for both ease of use and effective restraint. The test sequence in Figure 3 illustrates the excessive ramping, or the movement of the dummy up the backrest in the direction of the impact, observed in most tests. A confounding factor was the thick, soft, and loose cot cushion that compressed and shifted during impact, making the job of the harness all the more difficult. Guidelines for designing better harness systems are given under Recommendations.





## Using Your New Skills

Prepared by the National Child  
Passenger Safety Board

March 30, 2007

**Congratulations on completing the CPS certification course!  
Your journey has just begun!**

### Role After Class

- Do NOT go beyond what you have learned
- Improve your know-how by working with skilled technicians
- Recruit new technicians
- Keep updated
- It is better to work with a partner with more experience when possible.
- Keep updated on new CPS changes.
- Go to the CPS Certification Web site ([www.safekids.org/certification](http://www.safekids.org/certification)).

### Stay Updated in CPS

- Use national resources
- Learn about State/local CPS committees/ groups
- Read and discuss newsletters and studies
- Attend CPS workshops and activities
- Browse stores to become familiar with different seats, products, and equipment
- Ask your State CPS contact, instructor, and other technicians for new information
- Log into your **CPS online profile** to check your certification status, update your contact information, enter information needed for recertification, and place your information on the FIND A TECHNICIAN/INSTRUCTOR search engine.
  - If you do not have your username or password, please contact CPS Customer Service at 877-366-8154 or [cps.certification@safekids.org](mailto:cps.certification@safekids.org).
- If you are interested in becoming an instructor, please review “What Makes A Good Instructor and Mentor” in the Appendix and the Instructor Candidacy section at [www.safekids.org/certification](http://www.safekids.org/certification).

### Be Active and Educate Your Community

- Answer questions and make referrals
- Develop and provide community presentations
- Participate in health and safety fairs
- Provide current, culturally sensitive materials/information
- Set up an inspection station
- Hold a checkup event

**Getting Started**

- You don't need much to get started! This is your toolkit. In the future, you may choose to have a full-scale CRS checkup event. You may need more materials.
- NHTSA's "A Guide to Implementing Child Passenger Safety Inspection Stations" is available at <http://www.nhtsa.dot.gov/people/injury/childps/CPSInspectionStation/>.
- Start off learning how other technicians set up and run their events (e.g. scheduling, materials, traffic flow).
- Basic supplies
  - Child restraint instructions
  - Tether manual
  - Manufacturer contact information
  - CPS Workbook
  - Standard checklist
  - Updated recall list
  - Good communication skills
- The tether manual is available from Safe Ride News ([www.saferidenews.com](http://www.saferidenews.com)).
- CRS Manufacturer's Instruction CD is available from Safety Belt Safe ([carseatsafety.org](http://carseatsafety.org)).

**Online Resources\***

- American Automobile Association: [www.aaa.com/](http://www.aaa.com/).
  - American Academy of Pediatrics: <http://www.aap.org/>.
  - CPS Certification Program: [www.safekids.org/certification](http://www.safekids.org/certification).
  - Child restraint manufacturers:  
<http://www.nhtsa.dot.gov/people/injury/childps/csr2001/csrhtml/csManufacturers.html>.
  - Children's Hospital of Philadelphia: <http://www.chop.edu/>.
  - Insurance Institute for Highway Safety: [www.iihs.org](http://www.iihs.org).
  - National Center for Safe Transportation of Children With Special Needs:  
<http://www.preventinjury.org/index.asp>.
  - National CPS Board: [www.cpsboard.org](http://www.cpsboard.org).
  - National Highway Traffic Safety Administration: <http://www.nhtsa.dot.gov/>.
  - State CPS contacts: <http://www.nhtsa.dot.gov/CPS/Training/ContactList.cfm>.
  - Safe Kids Worldwide: [www.usa.safekids.org](http://www.usa.safekids.org).
  - Safe Ride News: [www.saferidenews.com](http://www.saferidenews.com).
  - SafetyBeltSafe: [www.carseat.org](http://www.carseat.org).
  - Vehicle manufacturers: <http://www.indexoftheweb.com/Automobile/Manufacturers.htm>.
- \*This list is not meant to be exhaustive. Refer to the websites and publications listed here for referral to additional sources of reliable information.*

**Children with Special Healthcare Needs and CRS**

- All children deserve to ride safely. Some children with certain medical conditions require special support for safe transportation. You need to know where to go to get more information if needed.
  - National Center for the Safe Transportation of Children With Special Healthcare Needs (575 West Drive, Room 004; Indianapolis, IN 46202)  
1-800-755-0912 Fax: 317-278-0399 [www.preventinjury.org/index.asp](http://www.preventinjury.org/index.asp)

- Safe Travel for All Children curriculum (2-day)
- Database of technicians who have taken a course on special needs transportation.

**Additional Training**

- Special needs: National Center for the Safe Transportation of Children With Special Healthcare Needs: <http://www.preventinjury.org/index.asp>.
- School buses: Contact your local school district for your pupil transportation director or State CPS training contact.
- Safe Native American Passengers (SNAP) training for transporting children: <http://www.nhtsa.dot.gov/CPS/Training/CPSCourses/pages/SNAP.html>.
- Child care provider: Course information available from your State CPS training contact.
- State CPS training contact: <http://www.nhtsa.dot.gov/CPS/Training/ContactList.cfm>.
- Tech Update: e-mailed to CPS-certified individuals and available at [www.cpsboard.org](http://www.cpsboard.org).
- CPS Express: e-mailed to CPS-certified individuals and available at [www.safekids.org/certification](http://www.safekids.org/certification) (Resources).
- National CPS Board: [www.cpsboard.org](http://www.cpsboard.org)
- National Association of State Directors of Pupil Transportation Services: [www.nasdpts.org](http://www.nasdpts.org).
- Lifesavers annual traffic safety conference: [www.Lifesaversconference.org](http://www.Lifesaversconference.org).

**National Certification And Liability**

- No cases have brought a CPST before a judge.
- As a CPST, you may have increased protection supported by “good Samaritan” or other liability protection laws in place in some jurisdictions.
- If a legal challenge occurs and you are practicing within the requirements of the certification, the CPST community will support you.
- It is important to use a checklist form correctly.
- You may buy individual liability insurance. Contact your homeowner or renter policy insurance provider for information.





## CPS INSPECTIONS AND CHECK UP EVENTS

Prepared by the National Child  
Passenger Safety Board  
April 2007<sup>1</sup>

### ***Introduction***

Child passenger safety (CPS) inspection stations (also known as “fitting stations”) are appearing in communities all across the United States. Although the concept of an inspection station for child safety seats is relatively new to this country, CPS professionals have been conducting such inspections for many years: every time a child safety seat is ‘checked’ by a CPS professional, a “CPS inspection” has occurred. The hard work and years of dedication by many CPS professionals has led to the successful expansion of CPS inspection stations in communities throughout the United States.

### ***Setting The Stage***

Whether the inspection station is held at an indoor or outdoor setting, it is important to remember that safety is the number one priority for staff and participants. And to the extent possible, all CPS inspection station facilities should be accessible to individuals with disabilities in accordance with the Americans with Disabilities Act (ADA).

### ***Indoor Setting***

An indoor setting provides many benefits, especially protection from the weather - rain, snow, sleet, wind, and hot and cold temperatures. However, there are still precautions that must be taken when setting up an indoor CPS inspection station:

- Designate where the vehicle(s) will wait in line prior to the inspection. Be sure to have the driver turn the engine off to prevent any accidental acceleration of the car. Have a clearly designated path for the vehicle to follow at the conclusion of the inspection - ideally the vehicles will enter in one side of the facility and exit from the other side to avoid driving in reverse.
- Check that there are no safety hazards anywhere in the vicinity.
- Make certain the location is safe for families. A designated waiting area should be made available for other family members/young children while the inspection takes place. Staff or a responsible volunteer should be assigned to the waiting area to insure that no child is lost or injured. If possible, clean, age-appropriate toys in good condition should be made available to occupy young children.

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<sup>1</sup> Adapted from “A Guide to Implementing CPS Inspection Stations” National Highway Safety Administration, DOT HS 809 627, December 2003. [www.nhtsa.dot.gov/people/injury/childps/CPSInspectionStation/index.html](http://www.nhtsa.dot.gov/people/injury/childps/CPSInspectionStation/index.html)

- Keep the area as clean as possible.
- Bathrooms should be easily accessible to the waiting area. Be sure they are clean and operational before each scheduled inspection event.
- Designate an area to keep equipment and a place where unsafe seats can be stored prior to destruction or other appropriate disposal.
- If the inspection locations is at a dealership, fire department or auto repair shop, be certain that ALL employees are notified that children will be in the area at various times.
- Have clearly written signs set up as appropriate.

### ***Outdoor Setting***

An outdoor setting provides unique advantages (usually more space) and disadvantages (i.e. traffic and weather considerations), for the operation of a CPS inspection station. In addition to the above safety considerations, the following precautions should be taken when hosting an outdoor inspection station:

- Be sure the inspection area can be set up out of the flow of routine traffic.
- Have clear Enter and Exit areas designated by signs and traffic cones.
- If there is not an indoor waiting area available, create a clearly defined 'safe area' with rope, tape and/or traffic cones.
- Be sure to have a traffic coordinator available to direct waiting vehicles safely in and out of the inspection site.
- The inspection teams should be set up at well-spaced and clearly marked designations.
- Be sure to have sufficient equipment available to staff at each inspection area in order to minimize the amount of foot-traffic around the inspection site.

### ***Staffing The CPS Inspection Station***

The experienced and certified CPS technician has a central role in conducting child safety seat inspections. However, there are other duties and responsibilities that are very important to the successful operation of an inspection station and must be handled efficiently and professionally. In an ideal situation, people would be assigned separate roles in operating the CPS inspection station, but in most cases, one person may have several roles to play.

### ***Coordinator***

The Coordinator is responsible for all the administrative needs essential to the smooth, efficient operation of a CPS inspection station. The duties of the Coordinator may include responding to calls from the public, scheduling and confirming inspection appointments, securing experienced and certified CPS technicians, ordering supplies, gathering the data collected from the inspection forms, filing the inspection forms, maintaining current education materials and a current child safety seat recall list. The Coordinator should always have access to the inspection station's written operating policies. The Coordinator may also be responsible for many of the marketing and publicity activities. The Coordinator does not have to be a certified CPS technician, but

should have some formal CPS training, be knowledgeable about current CPS issues and display a sincere commitment to promoting CPS initiatives within the community.

**Greeter**

Depending upon the level of activity at an inspection station, the coordinator may also serve as the “Greeter.” The Greeter helps to ensure the smooth operation of the inspection station. If there is waiting time involved, the Greeter can provide general CPS information, talk to the parent/caregiver about the inspection process, distribute the inspection form and direct vehicles to the next available CPS technicians.

**Scribe/Recorder**

Using the inspection station’s approved data collection form, the Scribe gathers information about the vehicle and its passengers from the vehicle driver, checks for child safety seat recalls, records information regarding seating positions, misuse, corrections made, seats installed and education information provided to the driver by the certified CPS technician. The Scribe insures that all forms are signed and dated by the driver, the certified CPS technician and the lead CPS technician, and deposits the completed form in the designated location. If a new child safety seat is installed, the Scribe also insures that the driver completes the manufacturer’s recall information card. (The coordinator may choose to mail the completed cards on behalf of the parents to insure that the cards reach the child safety seat manufacturers.)

**Certified CPS Technician**

It is recommended that experienced and certified CPS Technicians perform the actual seat inspections and installations. Certifications for all participating CPS Technicians must be current.

The Technician’s main role is as an educator. The Technician is responsible for the inspection of the child safety seat, demonstrating to the parent or caregiver how to properly install the seat and secure the child, and deciding whether or not to replace a seat. In addition, the Technician should also insure that any replaced seats are properly disposed of so as to prevent further use (unless used in a training course).

It is generally considered to be a good idea to identify additional certified CPS technicians and/or instructors who can serve as a “second pair of eyes” for reviewing the installation of child safety seats before the parent or caregiver leaves the inspection station and assure that the CPS checklist form is correctly completed.

**Traffic Coordinator**

Traffic Coordinators are typically law enforcement officials, as they usually have the expertise directing vehicles and insuring the public’s safety. This position is most appropriate to inspection stations held at outside locations. However, depending upon the volume of traffic, it could be necessary to have a traffic coordinator at any CPS inspection site.

**Role of the Parent/Caregiver**

Important Reminder: Although many people play significant roles in the operation of a CPS inspection station, the most critical role is that of the parent/caregiver. The knowledge gained from the CPS inspection experience is meant to empower the parent/caregiver to properly install

and use an appropriate child safety seat for his or her child. For this reason, the parent/caregiver should always have a “hands-on” role in the inspection process and should always be the last person to touch the child safety seat before the vehicle leaves the CPS inspection station.

### ***Outfitting The CPS Inspection Station***

#### **Equipment/Materials**

The following are basic supplies used to operate a CPS inspection station. Items marked with an asterisk\* are primarily used for outdoor settings.

- Current recall list
- Child safety seats for use as loaners or give-a-ways in the event that a seat must be replaced
- Manufacturers’ instructions
- CPS education materials
- List of nearby stores where new seats can be purchased if necessary
- Inspection forms
- Locking clips (regular and belt shortening)
- Clipboards
- Pens and pencils
- Foam swim ‘noodles,’ thin towels, slip guard (i.e. rubber shelf liner)
- Latex gloves
- First aid kits
- Anti-bacterial soap/lotion
- Waste receptacles
- Demo dolls for use when the child is not present to show correct use
- Tape
- Storage bins
- Traffic cones\*
- Barricades\*
- Chalk to mark lanes\*
- Tents\*

#### ***A Note About Liability Concerns***

The following considerations may provide some assistance in crafting a liability prevention protocol for the CPS inspection station. **However, it is advisable to consult with an attorney and insurance carrier knowledgeable and experienced in liability/risk-reduction issues for specific guidance.** If the CPS inspection station is part of a larger network of inspection stations, be sure that every station is following the same written procedures.

- **Provide Accurate and Current Information:** All information distributed at CPS inspection stations should come from credible sources and reflect current traffic safety issues and technologies. Contact the state occupant protection coordinator to determine what materials are recommended for distribution. There are also tools available to review and evaluate CPS materials:
  - NHTSA and the National Safety Belt Coalition (1997; revision in progress) – Is this child on the road to danger? Child passenger safety materials review and evaluation tool. Washington, DC: NHTSA. [Contact the NHTSA Regional Office, Appendix C]



- AAA Foundation for Traffic Safety (2002) – Seated for Safety Evaluation Tool. Newton, MA: Education Development Center, Inc., as prepared for AAA Foundation for Traffic Safety ([www.aaafoundation.org](http://www.aaafoundation.org)).
- **Teach Correct Installation and Use of Child Restraint Systems:** The most critical role at a CPS inspection is played by the parent/caregiver. Parents and caregivers that attend an inspection event want to be sure that their children are properly restrained and well protected. The objective of every CPS inspection service should be to teach parents and caregivers how to safely transport their children using the appropriate child safety seat or safety belt correctly. The inspection should include a one-on-one tutorial by a certified CPS technician that provides hands-on instruction on the proper use and installation of child restraints. **The parent/caregiver should always be the last person to touch the child safety seat before the vehicle leaves the CPS inspection station.**
- Certified CPS technicians should encourage parents to consult their vehicle owner’s manual and the child safety seat instructions to help answer specific questions. Technicians should check each seat for possible recalls using the most current recall list available. An updated recall list can always be downloaded from the NHTSA website [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov). Technical questions can also be referred to the Department of Transportation’s Auto Safety Hotline (1-888-DASH-2-DOT, or 1-888-327-4236).
- **Be Consistent with All Inspection Procedures:** Inspection station staff should be clear about their roles prior to each inspection event. The coordinator will insure that all roles are covered and that all necessary materials and equipment are readily accessible. When possible, a lead CPS technician should be responsible for quality control of the inspections conducted. The lead CPS technician should check each seat and review and approve each data collection form before a family leaves the inspection station. Consistent use of a standardized CPS checklist will help insure the quality of every CPS inspection. Most standardized checklists require that the parent/caregiver sign the form to acknowledge the advice, education and information they have received. Most standardized forms include a waiver/release of liability that has been carefully crafted by a knowledgeable attorney. Completed forms should be collected and retained by the coordinator.
- **Have a Clear Written Policy About Replacement Seats:** All staff should be aware of the written policy for replacing child safety seats and disposing of old, damaged or recalled seats. The policy should specify whether replacement seats would be provided without charge, with a requested donation or for a purchase price, and describe the process for disposing of damaged or unsafe seats. The coordinator should insure that there are a variety of child safety seats available as replacement seats. If a replacement seat is provided, the parent or caregiver should complete the product recall registration card before leaving the inspection station. The coordinator should mail all completed cards immediately so that, in the event of a recall, the child safety seat manufacturer can notify the parent or caregiver. If replacement seats are not supplied, it is advisable to provide an accurate list of community resources that offer child safety seats for families in need.
- **Make Safety a Priority:** The traffic coordinator should ensure that vehicles and people are able to move safely in and around the CPS inspection station. The safety of young children should be a top priority.

The sponsoring organization or site host may have additional considerations to insure that CPS inspections are conducted in a safe, consistent and professional manner. Be sure to communicate all requirements and procedures to every staff member (paid and volunteer) participating in CPS inspection activities.

**Liability Coverage:** There are several options for obtaining liability insurance to cover CPS inspection stations. Again, it is advisable to first consult the sponsoring organization to determine how liability protection will be addressed. The following are the most common types of coverage used by CPS inspection stations:

- **State Law:** Many states have a “Good Samaritan” law that may cover the type of services provided by the CPS inspection station. In addition, several states have enacted “CPS services immunity” laws to specifically cover certified CPS Technicians. Consult the state occupant protection coordinator to determine whether such laws exist in your state.
- **General Policy:** The activities of the CPS inspection station may be covered under the general insurance policy (or through an additional rider) of the sponsoring organization. Consult with the sponsoring organization about specific terms and conditions.
- **Special Policies for National Organizations:** Some national organizations that conduct a large amount of CPS inspections have secured special liability coverage for their members. If the CPS inspection station is being sponsored by a national organization, it may have liability protection under such a policy. Consult with the sponsoring organization about specific terms and conditions.



## MAP IT OUT CPS CHECK UP EVENTS

Prepared by the National Child  
Passenger Safety Board  
August 2010

- Design your safe checkup event by use a grid (such as the one included below) to draw a map of the physical environment to be sure you can fit it all in the space available and so you can explain it to your event volunteers.
- Draw the event location and the safety needs that must be in place for technicians, children and parent/caregivers. Personalize it to include:
  - Entrance and exit
  - Directional arrows to show traffic flow
  - Median curbs
  - Checkup lanes - you do not need to stay within the white lines at a shopping center, but be sure to have plenty of traffic cones to manage your traffic flow - put a circle for each traffic cone
  - Materials table
  - Registration location
  - Businesses (stores, gas stations, restaurants) relative to the event

**“Map It Out” Sample Grid**

The grid is a large rectangle with a smaller grid inside. The inner grid has 10 columns and 10 rows. The first row and the last row of the inner grid are not fully enclosed by vertical lines on the left and right sides. The first column of the inner grid is not fully enclosed by horizontal lines at the top and bottom. The grid is intended for mapping a route or area.

# Child Passenger Safety Glossary of Terms

**Active Protection:** Protection features that require action by the occupant. These features include lap belts, lap and shoulder belts, and child restraint systems.

**Anchor:** A common short alternative for anchorage; often used to refer specifically to the hardware installed at the anchorage, either factory-installed or in a retrofit shoulder-belt or tether kit.

**Anchorage:** See anchor.

**Anti-Rebound Bar:** Bars help control rebound and decrease the possibility of head contact. Rebound is the “bounce” after initial impact has occurred.

**Shield Booster:** A type of booster, as defined by FMVSS 213, that has a seating platform and a structure in front of the child for restraint, but which is subject to crash testing using only a lap belt and to the head excursion limit of only 813 mm.

**Belt-positioning booster seat (BPB):** A crash-tested device that raises the child so that the required lap and shoulder belts fit correctly. All BPBs act as pre-crash positioning devices and must be used with lap and shoulder belts. BPB models may have high backs, or be backless.

**Belt sensitive:** Refers to a type of emergency locking retractor, which locks when the belt is pulled quickly.

**Belt path:** The path that the manufacturer is required to create so that the safety belt passes around or through the CR. Some seats have multiple belt paths. For example, convertible car seats have one belt path for rear-facing use and a separate one for forward-facing use.

**Belt shortening clip:** A heavy duty clip intended for use to shorten lap belts around a child restraint. Not to be confused with the standard locking clip that comes with a child safety seat. Must be purchased or ordered from vehicle manufacturer.

**Buckle:** The locking mechanism of the vehicle belt or child safety seat. The latchplate fits (clicks) into the buckle, which must have a red button.

**Caregiver:** A person responsible for a child’s well-being and safety.

**CPS:** Child passenger safety

**Car bed:** a restraint, usually for small, premature, or medically fragile infants who should ride prone or supine. In most cases, the infant lies flat. The vehicle seat belt is used to anchor the car bed perpendicular to the direction of travel. The infant's head is placed toward the center of the vehicle and not next to the door. An internal harness secures the child in the car bed. Read instructions as there may be other methods of securing allowed for certain car beds.

**Car seat:** See Child Restraint

**Child restraint (CR), child restraint system (CRS), child restraint device (CRD):** A crash-tested device or system that is specially designed to provide infant/child crash protection. General term for systems including child safety seats, boosters, vests or car beds that meet FMVSS 213.

**Children with special transportation needs:** Children whose physical or behavioral conditions makes the use of particular, often specially designed, restraint systems necessary.

**Combination seat:** A type of forward-facing child restraint that is used with an internal harness system to secure a child. With removal of the internal harness, it is used as a belt-positioning booster (BPB).

**Compartmentalization:** Refers to the type of passive occupant protection seen in school buses, due to the narrow seat spacing and energy absorbent high back seats.

**CR:** See Child Restraint

**Convertible seat:** A child restraint that “converts” from rear-facing for infants and smaller children to forward-facing for older and larger children.

**Crash Dummies:** Full-scale replicas of human beings, weighted and articulated to simulate the behavior of a human body in a vehicle mishap, and instrumented to record as much data as possible on numerous variables during a collision.

**Crumple Zone:** The zone of a car that absorbs energy upon impact. The purpose of a crumple zone is to increase the amount of time it takes the car to come to a complete stop in comparison to object the car hits. By increasing the time it takes for the car to come to a stop after hitting an object, the force is spread over a longer period of time.

**Dead Zone:** This occurs when an automatic locking retractor does not lock until the belt is extended a certain length. Locking will not occur in the dead zones until this length has been reached.

**Detachable Base:** A separate base for a child restraint system that can be installed in the vehicle. The restraint (car seat) portion can be removed from the base, and used as an infant carrier.

**Emergency locking retractor (ELR):** A retractor on a safety belt system that locks in response to rapid deceleration of the vehicle. ELRs respond to rapid extraction of the belt or the sudden deceleration of the vehicle or both.

**Excursion:** The distance traveled by an occupant or test dummy in the direction of impact during a crash.

**Forward-facing:** A restraint that is intended for use only in the forward-facing position for a child at least age one and at least 20 pounds up to the specified limits of the seat, set by the manufacturer.

**Harness:** A system of straps that keep the child within the shell, distributes crash forces, and helps the child “ride down” the crash.

**Harness retainer clip:** A plastic tie or clasp that holds the shoulder straps together over the child’s chest at armpit level; a pre-crash positioning device intended to keep harness straps in position on the shoulders. It can also be referred to as a “chest clip.”

**Harness adjuster:** Used to tighten or loosen the harness the internal harness of a child restraint system.

**Harness slots:** The part of the CR where the harnesses pass through from the front to the back of the restraint. Seats come with at least one and as many as four sets of slots

**High Back Booster Seats:** see Belt Positioning Booster

**Infant-only seat:** A child restraint system designed for use only by a baby in a semi-reclined rear-facing position.

**Inspection Station:** A dedicated location staffed and stocked with equipment needed to regularly perform child restrain checks and installations.

**Integrated child seat:** A child-sized forward-facing restraint and/or BPB built into a vehicle seat. Some have a full harness. Others are belt-positioning boosters for use with lap and shoulder belts.

**Labels:** These are located on the seat, and indicate the following: 1) NHTSA certification of conformation to all applicable FMVSS 2) Weight and height guidelines for the specific seat 3) Basic outline of the installation procedures 4) Manufacturing data, including data of manufacture, the manufacturers name and address, and a model number 5) Air bag warning and 6) FAA certification for use in an aircraft.

**Learn, Practice, Explain:** The philosophy of the CPS curriculum promotes learning the latest in CPS, staying updated and active in the field, and teaching people how to safely transport children.

**LATCH:** Lower Anchors and Tethers for CHildren.

**Latch plate:** The part of the buckle mechanism that locks or connects into the buckle.

**Level Indicator:** Helps parents and caregivers identify the manufacturer’s recommended correct angle for rear-facing restraints.

**Lockability:** Refers to the ability of the latch plate to prevent the webbing to slide back through the latch plate, causing the belt to loosen.

**Lock-off:** A built-in belt-locking feature on the child restraint system that works with certain types of safety belts in a similar fashion as locking clips.

**Locking clip:** A flat H-shaped metal item intended to clip lap and shoulder belt webbing together at a free-sliding latch plate in order to prevent the webbing from sliding through. A pre-crash positioning device only. Not to be used as a belt shortening clip.

**Lower anchorage attachments:** A piece of belt webbing that anchors to the lower anchorage on the vehicle structure. It secures the CR to the vehicle. These attachments are used in place of the vehicle safety belt.

**Passive occupant protection:** Features of the vehicle that lessen the injury to the occupant without any action taken by the occupant.

**Rebound:** Reactive motion in the opposite direction after initial impact has occurred.

**Rear-facing:** Refers to the position where the child's child restraint is turned to face the rear of the vehicle. The rear-facing position supports the entire head, neck, and back; cradles and moves with the child to reduce stress to the neck and spinal cord in a crash.

**Recalls:** Voluntary or required actions taken to correct problems or deficiencies once products have been distributed or sold. Manufacturers must offer free repairs or replacement for products recalled for violations of safety standards.

**Recline Adjustor:** Allows convertible restraints to be reclined for rear-facing and semi-reclined or upright for forward-facing use.

**Registration card:** A postage-paid return card that comes with every child restraint; should be returned to the manufacturer so owners can be notified of any recalls.

**Retractor:** A mechanism that rolls up the webbing of the safety belt when it is not in use and takes up slack around the user.

**Retrofitted:** Installing, fitting, or adapting a device or system for use with something older. An example of this would be to retrofit seatbelts to a school bus without them.

**Ride Down:** Ride down is the extension of time when the forces are felt by the occupant during a crash. A quick change in speed is what causes injury.

**Safety belt:** The webbing, anchor, and buckle system that restrains the occupant in the vehicle. Also known as a seat belt.

**Seat Belt Syndrome:** Separation of the lumbar vertebrae and associated paralysis, due to the effects of a crash where only a lap belt was used.

**Seat bight:** The intersection between the bottom vehicle seat cushion and the back cushion.

**Seat Padding:** The cushioning attached to a child restraint, on which the child sits.

**Shell/frame:** The molded plastic structure of the CR. In some models, the shell is attached to or reinforced by a metal frame.

**“Smart” Air Bags:** An air bag system that will detect when a child is present and automatically deactivate the air bag or enable it to deploy safely. Manufacturers who do not



provide a qualifying smart system would be required to have new and more prominent air bag warning labels inside the vehicle. They would also be permitted to install cutoff switches so parents can deactivate the passenger-side air bag when a child is seated in front of it

**Snug safety belt or lower anchors:** Tight enough that the child restraint cannot move more than 1 inch in any direction from the belt path.

**Snug harness:** Harness straps do not allow any slack; It lies in a relatively straight line without sagging yet does not press into the child's shoulders making an indentation. You should not be able to pinch the webbing vertically.

**Special Needs:** Refers to children with medical or physical conditions that prevent them from traveling normally in a standard child restraint. Alternative options for a safe ride are available for children with special needs.

**Splitter Plate:** Metal plate that connects the two ends of the shoulder harnesses to a single piece of webbing used for adjustment.

**Technician:** A person who successfully completes the National Highway Traffic Safety Administration's (NHTSA) standardized child passenger safety certification program.

**Tether:** See Tether Strap

**Tether anchor:** The kit or installed hardware bracket used to secure the tether hook and strap at the designated anchor point in the vehicle. The tether strap and hook attach directly to the anchor bracket.

**Tether strap:** A piece of belt webbing that anchors the top of the CR to the vehicle structure. It keeps the restraint from tipping forward on impact and can provide an extra margin of protection. Can be optional or factory installed.

**Webbing:** The fabric of the safety belt that holds the occupant or a CR in place.



# Child Passenger Safety English-Spanish Translation of Terms

English	Spanish
4 Steps for Kids	4 Pasos para niños
Active protection	Protección activa
Acute exposure	Transferencia aguda
Additional Padding	Relleno adicional
Advanced air bag	Bolsa de aire moderna
Advocates	Defensores, Activistas
Advocacy skills	Destrezas de abogacía
Affordability	Cuando el precio está dentro de los medios del comprador, con el precio que usted puede pagar
After market products	Accesorios adicionales
Agreement form	Forma de común acuerdo
Air bags, “smart” air bags	Bolsas de aire, bolsas de aire “inteligentes”, bolsas de aire modernas
Air bag on-off switches	Interruptores para activar y desactivar las bolsas de aire
Air bag deployment	Despliegue de la bolsa de aire, cuando la bolsa de aire se infla
Aircraft	Avión
Aircraft safety issues	Asuntos sobre la seguridad de los aviones
Airway	Vía respiratoria
Anchor	Ancla
Anchor bracket	Soporte para el ancla
Anchor point	Punto de anclaje
Anchor strap	Correa del anclaje

<b>English</b>	<b>Spanish</b>
Anchorage system	Sistema de anclaje
Armpit level	Al nivel de la axila
Armrest	Apoyo para el brazo
As tightly as possible	Lo más apretado posible
Assessment tool	Instrumento de evaluación
Auto safety	Seguridad del auto
Auto Safety Hot Line	Línea de Información Sobre la Seguridad del Auto
Automatic Locking Retractor (ALR)	Retractor que se inmoviliza automáticamente
Automatic restraint system	Sistema de seguridad automático
Automobile manufacturer	Autoturero Fabricante de vehículos
Back support	Espaldar, apoyo para la espalda, respaldo
Backless booster	Asiento elevado “booster” sin espaldar, respaldo
Being thrown out of the car	Ser expulsado del vehículo
Belt path	Ruta o trayectoria del cinturón de seguridad
Belt-positioning “booster” seat, (BPB)	Asiento elevado “booster” con ajuste para el cinturón de seguridad
Belt pretensioner	Cinturón de seguridad con carrete retractable
Belt shortening clip	Sujetador (broche) para acortar el tejido del cinturón de seguridad
Bench seat	Asiento del vehículo tipo banco
Best practices	Prácticas modelo, criterio que se usa para hacer las cosas de una manera mejor
Bight	Donde se une el respaldo y el asiento
Blanket	Manta, frazada
Booster seat	Asiento elevado “booster”, asiento que eleva al niño
Bounty program	Programa de subvención
Brain injury	Lesión cerebral
Bucket seat	Asiento del vehículo tipo deportivo
Buckle	Hebilla
Buckle up	Abrocharse el cinturón
Built-in lock-off locking clips	Sujetadores (broches) incorporados sin cierre
Built-in locking clips	Sujetadores (broches) incorporados
Built into	Incorporado mobile manufac
Bumper	Parachoques, defensa amortiguador de choques

<b>English</b>	<b>Spanish</b>
C-Spine	Espina dorsal
Car bed	Asiento de seguridad tipo cama para infantes
Caregivers	Personas que cuidan niños
Cargo areas	Zonas de carga
Center front seat position	Posición central del asiento delantero
Check-up event	Evento en donde se revisan los asientos de seguridad para niños
Child Passenger Safety (CPS)	Seguridad del Niño Pasajero
Child Passenger Safety Programs	Programas sobre la Seguridad del Niño Pasajero
Child Passenger Safety Technician	Técnico en la Seguridad del Niño Pasajero
Child restraints, (CR)	Asientos de seguridad para niños, sistemas de seguridad para niños
Child Restraint (CR) anchorage	Sistema de anclaje para el asiento de seguridad
Child restraint crash tests	Pruebas de choque del asiento de seguridad para niños
Child restraint harness straps	Correas del arnés del asiento de seguridad para niños
Child restraint industry	Industria de asientos de seguridad para niños
Child restraint label	Etiqueta del asiento de seguridad para niños
Child restraint lower attachments	Conectores inferiores del asiento de seguridad
Child restraint manual	Manual para el uso del propietario del asiento de seguridad para niños
Child restraint systems (CRS)	Sistemas o asientos de seguridad para niños, sistemas de protección para niños
Child restraint system (CRS) checkups	Revisiones de los asientos de seguridad para niños
Child restraint system (CRS) checkups event	Evento en donde se revisan los asientos de seguridad para niños
Child safety	Seguridad del niño
Childhood injury	Lesión sostenida durante la niñez
Children with Special Health Needs	Niños con necesidades especiales de salud
Cinching	Ajustar, apretar
Collapsible steering columns	Columnas del volante plegables
Collar bone	Clavícula
Collision/collisions	Colisión, choque
Consumer Products Safety Commission	Comisión de Seguridad para Productos de Consumo

English	Spanish
Compartmentalization	Compartamentalización
Compatibility Issues	Asuntos sobre la compatibilidad
Compliance testing	Pruebas de cumplimiento
Community Outreach	Alcance Comunitario
Continuous loop belt	Cinturón que usa un sólo pedazo de tejido continuo para el cinturón de hombro y regazo/falda. Empieza en el punto de anclaje y el otro extremo termina en el retractor.
Conventional Child Restraint	Asiento de seguridad convencional para niños
Convertible restraints	Asientos de seguridad convertibles
Course overview	Resumen del curso
CPS	Seguridad del Niño Pasajero
Cracks	Rajaduras
Crash	Choque
Crash dynamics	Dinámica de choques
Crash forces	Fuerzas del choque
Crash phase	Etapas durante el choque
Crash sensor	Sensor de choques
Crash testing	Pruebas de choque simulado
Crushable frame	Estructura o, marco comprimible
Dashboard	Panel o, tablero de instrumentos
Dealerships	Distribuidores, concesionarios
Deceleration	Disminución de la velocidad, deceleración
Defect investigation form	Formulario para la investigación de defectos
Defect monitoring	Control de defectos
Department of Motor Vehicles (DMV)	Departamento de Vehículos de Motor
Department of Transportation (DOT)	Departamento de Transporte
Detachable base	Base removible
Devices	Mecanismos, aparatos
Dissecting Child Restraint Systems (CRS)	Analizar minuciosamente y desmontar (desarmar) los asientos de seguridad para niños
Driver	Conductor
Driver's air bag module	Módulo de la bolsa de aire para el conductor
Dual-stage air bag	Bolsa de aire con dos etapas de despliegue/inflado

<b>English</b>	<b>Spanish</b>
Dummy	Maniquí
Easter Seal Program: “Kids are Riding Safe Program” (KARS)	Programa de Easter Seal “Los niños viajan seguros”
Enforcement	Aplicación de la ley
Ejection	Expulsión
Emergency Medical Service (EMS)	Servicios de Emergencias Médicas
Emergency braking	Frenar de emergencia
Emergency locking retractor (ELR)	Retractor de cierre de emergencia
Energy management loops	Procedimiento utilizado en la manufacturación del tejido del cinturón para reforzar y controlar la energía
Energy management retractor	Retractor para controlar la energía
Environmental conditions	Condiciones ambientales
E-Z-On Vest	Chaleco “E-Z-On” (Fácil de Ponerse)
Fatal Analysis Reporting System (FARS)	Sistema de información de análisis fatales
Features	Accesorios o rasgos distintivos, características o accesorios adicionales
Federal Aviation Administration (FAA)	Administración Federal de Aviación
Federal Motor Vehicle Safety Standards (FMVSS)	Normas Federales de Seguridad para Vehículos de Motor
Federal Role	Función del gobierno federal
5 - Point harness	Arnés de 5 puntos
Flame retardant padding	Relleno resistente al fuego, relleno que retarda el fuego
Flexible latch system seat	Asiento de seguridad con sistema de anclaje flexible
Flexible 2-point lower attachment	Conexión inferior flexible de dos puntos
Forward-facing child restraint	Asiento de seguridad que se instala mirando hacia el frente
Forward-facing only child restraint	Asiento de seguridad que solamente se instala mirando hacia el frente
Frame	Estructura, marco
Fray	Deshilachar
Free-sliding latch plate	Placa de cierre deslizable
Friendly interior	Interior que provee protección adicional
Front air bags	Bolsas de aire delanteras
Front seat	Asiento delantero

<b>English</b>	<b>Spanish</b>
Front passenger seat	Asiento delantero del pasajero
Frontal crash	Choque frontal
Fuel system	Sistema de combustible
Guard rails	Barandas, rieles, barreras de seguridad
Guidelines	Guías, pautas, principios
Hand-me down seat	Asiento de segunda mano
Handouts	Materiales impresos, comunicados, folletos
Hands-on exercises	Ejercicios prácticos
Hardware	Piezas, partes, materiales
Harness	Arnés
Harness Adjuster Bar	Varilla para ajustar el arnés
Harness retainer clip	Retenedor del arnés, broche retentivo del arnés
Harness slots	Ranuras para el arnés
Harness snug	Arnés ajustado
Harness straps	Correas del arnés
Harness system	Sistema de arnés
Head excursion	Movimiento de la cabeza
Head Injury Criterion (HIC)	Criterios sobre lesión cerebral, criterios de traumatismo cerebral
Head restraint	Cabecera, respaldo para la cabeza
Heavy duty tape	Cinta engomada extra fuerte
High back booster seat	Asiento elevado “booster” con espaldar, respaldo
Highway	Carretera, autopista
Highway safety	Seguridad en las carreteras
Host variables	Variables humanas
Hot Line	Ver “Auto Safety Hot Line”, Línea Telefónica Gratuita
Household carrier	Portador para bebés de uso doméstico
Human collision	Colisión del cuerpo
Human error	Error humano
Improper installation in vehicles	Instalación incorrecta en los vehículos
Incompatibility	Incompatibilidad
Infants	Infantes, bebés
Inflatable curtain (IC)	Cortina inflable
Inflatable tubular air bags Injury	Bolsa de aire inflativa en forma de tubo Lesión



<b>English</b>	<b>Spanish</b>
Injury facts	Datos sobre las lesiones
Injury outcome	Consecuencias de las lesiones
Injury prevention	Prevención de lesiones
Integrated seat	Asiento integrado
Integrated child restraint	Asiento de seguridad integrado al asiento del vehículo
Intentional injuries,	Lesión intencional
Interactive discussion	Conversaciones interactiva
Interactive questioning	Interrogatorio interactivo, platica, diálogo
Internal harness	Arnés interno
Issues	Situaciones, asuntos, problemas
Jump seat	Asiento plegable
Juvenile Products Manufacturers Association (JPMA)	Asociación de Fabricantes de Productos para Niños
Knee bolster	Soporte para la rodilla
Knee excursion	Movimiento de la rodilla
Lap/Shoulder belt (L/S belt)	Cinturón de regazo y hombro
Label	Etiqueta
Lap belts	Cinturones de regazo/falda
Lap only belts	Cinturones de regazo solamente
Label requirements	Requisitos de la etiqueta
LATCH, Lower Anchors and Tethers for Children	Sistema de anclaje inferior superior LATCH
LATCH attachments	Conexiones para el sistema de anclaje LATCH
Latch plate	Placa de cierre
LATCH System	Sistema de anclaje LATCH
Lateral crash	Choque lateral
Law enforcement vehicle (LE vehicle)	Vehículo de la policía, patrulla de seguridad
Liability	Responsabilidad legal por daños y perjuicios, obligación legal
Light pickup truck	Camioneta de carga ligera, carga liviana
Lightweight locking latch plate	Placa de cierre de agarre liviano
Load limiter	Limitador de carga
Lobby	Procurar, promover la aprobación de una ley, cabildear
Locking bar	Barra de agarre

English	Spanish
Locking clip	Sujetador (broche) que se usa para fijar el cinturón de seguridad
Locking latch plate	Placa de cierre con agarre
Log sheet	Hoja de registro
Long-term disability	Discapacidad prolongada
Lower anchors	Anclas de la parte inferior
Manual adjusting lap belt	Cinturón de seguridad con ajuste manual
Manual lap belt	Cinturón de regazo manual
Manufacturer	Fabricante, manufacturador
Manufacturer's labels	Etiquetas del fabricante
Minivan	Mini-autobús "minivan"
Misuse	Uso incorrecto
Module Content	Contenido del Módulo
Motor vehicle crash (MVC)	Choque de vehículo motorizado
Motorized shoulder belt	Cinturón de hombro automático
National Academy of Sciences, (NAS)	Academia Nacional de las Ciencias Junta Directiva
National Child Passenger Safety Board (NCPSTB)	Nacional de Seguridad del Niño Pasajero
National Highway Traffic Safety Administration (NHTSA)	Administración Nacional de Seguridad del Tráfico en las Carreteras
National Safety Council (NSC)	Consejo Nacional de Seguridad
Newborn	Recién nacido
Newton's Law of Motion	Ley del Movimiento de Newton
Occupant ejections	Expulsión de los ocupantes
Occupant protection	Protección del ocupante
Occupant Protection Programs	Programas de Protección al Ocupante
Occupant Protection System (OPS)	Sistema de seguridad para el ocupante
On/off switch	Interruptor para activar o desactivar
Outboard position	Posición lateral en la parte trasera del vehículo (al lado de la puerta)
Outboard passenger seat	Asiento lateral para el pasajero en la parte trasera del vehículo
Outside force	Fuerza externa
Overhead infrared sensors	Sensores de rayos infrarrojos de techo
Overhead ultrasound sensors	Sensores de ultrasonido del techo

<b>English</b>	<b>Spanish</b>
Padding	Relleno
Parts	Partes, piezas
Passenger air bag	Bolsa de aire para el pasajero
Passenger vehicles	Vehículos de pasajeros
Passive protection	Protección pasiva
Pedestrian	Peatón
Peer	Individuo semejante, compañero
Performance standards	Normas de funcionamiento
Phases of a crash	Etapas (fases) de un choque
Physical environment variables	VARIABLES del ambiente físico
Pickup truck	Camioneta, camioneta de carga, camioneta extendida, camion tipo “pick up”
Post-crash phase	Etapas/fase después del choque
Pre-crash phase	Fase antes del choque
Pre-crash speed	Velocidad antes del choque
Pretensioner	Carrete retractable
Product life	Vida útil del producto
Prone	Acostado boca abajo
Ratchet	Mecanismo de engranaje, trinquete
Rear bench seats	Asientos traseros tipo banco
Rear- end crash	Choque trasero
Rear facing CR	Asiento de seguridad que se instala mirando hacia atrás
Rear seat position	Posición en el asiento trasero
Rear window	Ventana trasera
Rear-end collisions	Choques traseros
Rear-end impacts	Impactos traseros
Recalls	Productos con avisos de retiro del mercado a causa de defectos
Recline adjustment mechanism	Ajustador de inclinación
Recline angle	Angulo de inclinación
Recline indicator	Indicador de inclinación
Reclined position	Posición reclinada
Registration card	Tarjeta de inscripción, registro
Regular locking clip	Sujetador regular de metal

English	Spanish
Retainer	Retenedor
Retainer clip	Broche retenedor del arnés
Retainer snug	Arnés bien ajustado
Rescue workers	Personal de rescate
Research	Investigación, análisis
Restrained	Asegurado al sistema de seguridad
Restraint base	Base del asiento de seguridad
Restraining force	Fuerza limitadora
Restraining straps	Correas del sistema de seguridad
Restraint systems	Sistemas de seguridad
Retractor	Retractor
Retrofit lap belts	Cinturones de seguridad que se han añadido después
“Ride down”	Disminución de las fuerzas del choque, disminuir/amortiguar el impacto del choque
Rigid attachments	Conexiones rígidas, conectadores rígidos
Rigid Latch System Seat	Asiento de seguridad con sistema de anclaje rígido
Role	Papel, función
Role play exercises	Ejercicios de ensayo improvisados
Rollover	Vuelco, volcarse
Rotation	Vueltas
Routing	Ruta
Rubber mat	Tapete o alfombra de goma, hule, caucho
Safety	Seguridad
Safety belt	Cinturón de seguridad
Safety issues	Problemas de seguridad
Safety rationale	Fundamento de seguridad
Safety seat harness	Arnés del asiento de seguridad
Safety standards	Normas de seguridad
School bus seats	Asientos del autobús escolar
School buses	Autobuses escolares
Scribes	Escribientes, redactores
Seat	Asiento
Seat back	Respaldo/espaldar del asiento
Seat belt	Cinturón de seguridad

<b>English</b>	<b>Spanish</b>
Seat belt configuration	Tipo de cinturón de seguridad
Seat belt features	Atributos distintivos del cinturón de seguridad
Seat belt pretensioner	Carrete retractable del cinturón de seguridad
Seat belt system	Sistema de cinturones de seguridad
Seat bight	Recodo del asiento
Seat cushion contour	Contorno del asiento
Seat frame	Estructura, marco del asiento
Seat's padding	Relleno del asiento
Seat slope	Inclinación del asiento
Seat weight sensor	Sensor de peso dentro del asiento
Second hand child seat	Asiento de seguridad de segunda mano
Self-certify	Auto-certificar
Self-study module	Módulo de estudio independiente
Service Station	Estación de servicio
Sewn – on latch plate	Placa de cierre cosida
Shell	Armazón
Shield booster seat	Asiento elevado “booster” con escudo protector
Shoulder belt positioners Shoulder belts	Ajustadores para el cinturón de hombro Cinturones de hombro
Shoulder restraint	Cinturón de hombro
Side-facing jump seat	Asiento plegable lateral que mira hacia el interior del vehículo
Side-facing seat	Asiento plegable que miran hacia el lado
Side impact air bag (SIAB)	Bolsa de aire contra impacto lateral
Side impact crash	Choque lateral, con impacto por el lado
Side impact protection system (SIPS)	Sistema de seguridad contra impacto lateral
Side window	Ventana lateral
Skid	Patinazo
Slack in the seat belt	Cinturón de seguridad flojo
Sled testing	Prueba de trineo, mecanismo que se utiliza en pruebas de choques
Sliding latch plate	Placa de cierre deslizable o corrediza
Slight indentation	Hundimiento leve
Snugly	Bien ajustado
Special needs CRS	Sistema de seguridad para niños con necesidades especiales

<b>English</b>	<b>Spanish</b>
Spinal cord	Médula espinal, espina dorsal
Spine	Columna vertebral
Spins	Dar vueltas, girar
Splitter plate	Placa de separación
Standardization	Uniformación, normalización, estandarización
Standardized bench seat	Asiento estándar tipo banco
Standardized Child Passenger Safety Training Program	Programa Nacional Uniforme de Adiestramiento en Sistemas de Seguridad del Niño Pasajero
Standardized CR anchorage	Anclaje uniforme para el asiento de seguridad
Steering wheel	Volante, timón
Sun visor	Parasol, visera
Supine	Inclinado
Supplemental Inflatable Restraint (SIR)	Sistema de Seguridad Inflamable Suplementario
Supplemental Restraint System (SRS)	Sistema de Seguridad Suplementario
Swerves	Desviarse bruscamente de lado a lado
Switchable	Intercambiable
Switchable latch plates	Placas de cierre intercambiable
Switchable retractor	Retractor intercambiable
T-Shield	Escudo en forma de T
Test Criteria	Criterio de prueba
Tether	Correa de sujeción del sistema de anclaje LATCH
Tether anchor	Punto de conexión para la correa anclaje
Tether anchor strap	Correa del anclaje
Tether hook	Ganchos para la correa del sistema de LATCH
Tether strap kit	Conjunto de correas de sujeción para el sistema de anclaje LATCH
The retractor locks	El retractor se cierra, se agarra
Thread it through	Pasar a través
Three-point restraint	Cinturón de seguridad de tres puntos
To record	Anotar, documentar
Toddler	Niño pequeño
Top tether	Correa de sujeción en la parte superior del sistema de anclaje
Tough choices	Decisiones difíciles

<b>English</b>	<b>Spanish</b>
Traffic crashes	Choques automovilísticos
Traffic Injury Control	Programas de Control de Lesiones de Programs Tráfico
Trapped	Atrapado
Tray Shield	Protector tipo bandeja/charola
“TREAD Act”, Transportation Recall Enhancement, Accountability and Documentation Act	Acta de Documentación, Responsabilidad y Realce de Productos de Transportación con Aviso de Retiro del Mercado
Two-point seat belt	Cinturón de seguridad de dos puntos
Unintentional damage/injuries	Lesiones no - intencionales
Unrestrained occupants	Pasajeros que no utilizan el cinturón de seguridad
Unsurvivable crashes	Choques sin sobrevivientes
Up-to-date information	Información al día, actualizada
Upper tether anchorage	Anclaje de la parte superior
Upper thighs	Parte de arriba de los muslos
Upright forward-facing position	Posición vertical orientada hacia el frente
Upright position	Posición vertical, posición erguida
Upward	Hacia arriba
Vaults	Volteretas
Vehicle anchoring system	Sistema de anclaje del vehículo
Vehicle compatibility	Compatibilidad del vehículo
Vehicle design	Diseño del vehículo
Vehicle features	Características o accesorios distintivos del vehículo
Vehicle occupant protection system	Sistema de seguridad para los ocupantes del vehículo
Vehicle owner’s manual	Manual del vehículo para el propietario
Vehicle restraint systems	Sistemas de seguridad en los vehículos
Vehicle seat bight	Recodo del asiento del vehículo
Vehicle systems ID	Sistemas de identificación en los vehículos
Vouchers	Comprobantes
Waiver of liability of claim	Declaración de renuncia al derecho de reclamo
Warning labels	Etiquetas de advertencia, etiquetas con avisos
Warning lights	Luces de advertencia de emergencia
Warning systems	Sistemas de advertencia
Web site address	Dirección del sitio web
Webbing	Tejido del cinturón de seguridad

<b>English</b>	<b>Spanish</b>
Weight of the object struck	Peso del objeto golpeado
Weight of the occupant	Peso del ocupante
Whiplash	Lesión de Latigazo en el cuello
Windshield	Parabrisas



# Traducción de Términos de Español a Inglés Sobre la Seguridad del Niño Pasajero

Español	English
4 Pasos para niños	4 Steps for Kids
Abrocharse el cinturón	Buckle up
Academia Nacional de las Ciencias	National Academy of Sciences, (NAS)
Accesorios adicionales	After market products
Accesorios o rasgos distintivos, características accesorios adicionales	Features
Acostado boca abajo	Prone
Acta de Documentación, Responsabilidad y Realce de Productos de Transportación con Aviso de Retiro del Mercado	“TREAD Act”, Transportation Recall Enhancement, Accountability and Documentation Act
Administración Federal de Aviación	Federal Aviation Administration (FAA)
Administración Nacional de Seguridad del Tráfico en las Carreteras	National Highway Traffic Safety Administration (NHTSA)
Ajustador de inclinación	Recline adjustment mechanism
Ajustadores para el cinturón de hombro	Shoulder belt positioners

<b>Español</b>	<b>English</b>
Ajustar, apretar	Cinching
Al nivel de la axila	Armpit level
Alcance Comunitario Community	Outreach
Analizar minuciosamente y desmontar (desarmar) los asientos de seguridad para niños	Dissecting Child Restraint Systems (CRS)
Ancla	Anchor
Anclaje de la parte superior	Upper tether anchorage
Anclaje uniforme para el asiento de seguridad	Standardized CR anchorage
Anclas de la parte inferior	Lower anchors
Angulo de inclinación	Recline angle
Anotar, documentar	To record
Aplicación de la ley	Enforcement
Apoyo para el brazo	Armrest
Armazón	Shell
Arnés	Harness
Arnés ajustado	Harness snug
Arnés bien ajustado	Retainer snug
Arnés de 5 puntos	5 - Point harness
Arnés del asiento de seguridad	Safety seat harness
Arnés interno	Internal harness
Asegurado al sistema de seguridad	Restrained
Asiento	Seat
Asiento de seguridad con sistema de anclaje flexible	Flexible latch system seat
Asiento de seguridad con sistema de anclaje rígido	Rigid Latch System Seat
Asiento de seguridad convencional para niños	Conventional Child Restraint
Asiento de seguridad de segunda mano	Second hand child seat
Asiento de seguridad integrado al asiento del vehículo	Integrated child restraint
Asiento de seguridad que se instala mirando hacia atrás	Rear facing CR
Asiento de seguridad que se instala mirando hacia el frente	Forward-facing child restraint
Asiento de seguridad que solamente se instala mirando hacia el frente	Forward-facing only child restraint
Asiento de seguridad tipo cama para infantes	Car bed

<b>Español</b>	<b>English</b>
Asiento del vehículo tipo banco	Bench seat
Asiento del vehículo tipo deportivo	Bucket seat
Asiento delantero	Front seat
Asiento delantero del pasajero	Front passenger seat
Asiento elevado “booster” con ajuste para el cinturón de seguridad	Belt-positioning “booster” seat, (BPB)
Asiento elevado “booster” con escudo protector	Shield booster seat
Asiento elevado “booster” con espaldar, respaldo	High back booster seat
Asiento elevado “booster” sin espaldar, respaldo	Backless booster
Asiento elevado “booster”, asiento que eleva al niño	Booster seat
Asiento estándar tipo banco	Standardized bench seat
Asiento integrado	Integrated seat
Asiento lateral para el pasajero en la parte trasera del vehículo	Outboard passenger seat
Asiento plegable	Jump seat
Asiento plegable lateral que mira hacia el interior del vehículo	Side-facing jump seat
Asiento plegable que miran hacia el lado	Side-facing seat
Asientos de seguridad convertibles	Convertible restraints
Asientos de seguridad para niños, sistemas de seguridad para niños	Child restraints, (CR)
Asientos del autobús escolar	School bus seats
Asientos traseros tipo banco	Rear bench seats
Asociación de Fabricantes de Productos para Niños	Juvenile Products Manufacturers Association (JPMA)
Asuntos sobre la compatibilidad	Compatibility issues
Asuntos sobre la seguridad de los aviones	Aircraft safety issues
Atrapado	Trapped
Atributos distintivos del cinturón de seguridad	Seat belt features
Autobuses escolares	School buses
Auto-certificar	Self-certify
Avión	Aircraft
Barandas, rieles, barreras de seguridad	Guard rails
Barra de agarre	Locking bar
Base del asiento de seguridad	Restraint base
Base removible	Detachable base

<b>Español</b>	<b>English</b>
Bien ajustado	Snugly
Bolsa de aire con dos etapas de despliegue/inflado	Dual-stage air bag
Bolsa de aire contra impacto lateral	Side impact air bag (SIAB)
Bolsa de aire inflativa en forma de tubo	Inflatable tubular air bags
Bolsa de aire moderna	Advanced air bag
Bolsa de aire para el pasajero	Passenger air bag
Bolsas de aire delanteras	Front air bags
Bolsas de aire, bolsas de aire “inteligentes”, bolsas de aire modernas	Air bags, “smart” air bags
Broche retenedor del arnés	Retainer clip
Cabecera, respaldo para la cabeza	Head restraint
Camioneta de carga ligera, carga liviana	Light pickup truck
Camioneta, camioneta de carga, camioneta extendida, camion tipo “pick up”	Pickup truck
Características o accesorios distintivos del vehículo	Vehicle features
Carrete retractable	Pretensioner
Carrete retractable del cinturón de seguridad	Seat belt pretensioner
Carretera, autopista	Highway
Cinta engomada extra fuerte	Heavy duty tape
Cinturón de hombro	Shoulder restraint
Cinturón de hombro automático	Motorized shoulder belt
Cinturón de regazo manual	Manual lap belt
Cinturón de regazo y hombro	Lap/Shoulder belt (L/S belt)
Cinturón de seguridad	Safety belt
Cinturón de seguridad	Seat belt
Cinturón de seguridad con ajuste manual	Manual adjusting lap belt
Cinturón de seguridad con carrete retractable	Belt pretensioner
Cinturón de seguridad de dos puntos	Two-point seat belt
Cinturón de seguridad de tres puntos	Three-point restraint
Cinturón de seguridad flojo	Slack in the seat belt

Español	English
Cinturón que usa un sólo pedazo de tejido continuo para el cinturón de hombro y regazo/falda. Empieza en el punto de anclaje y el otro extremo termina en el retractor.	Continuous loop belt
Cinturones de hombro	Shoulder belts
Cinturones de regazo solamente	Lap only belts
Cinturones de regazo/falda	Lap belts
Cinturones de seguridad que se han añadido después	Retrofit lap belts
Clavícula	Collar bone
Colisión del cuerpo	Human collision
Colisión, choques	Collision/collisions
Columna vertebral	Spine
Columnas del volante plegables	Collapsible steering columns
Comisión de Seguridad para Productos de Consumo	Consumer Products Safety Commission
Compatibilidad del vehículo	Vehicle compatibility
Comprobantes	Vouchers
Condiciones ambientales	Environmental conditions
Conductor	Driver
Conectores inferiores del asiento de seguridad	Child restraint lower attachments
Conexión inferior flexible de dos puntos	Flexible 2-point lower attachment
Conexiones para el sistema de anclaje LATCH	LATCH attachments
Conexiones rígidas, conectores rígidos	Rigid attachments
Conjunto de correas de sujeción para el sistema de anclaje LATCH	Tether strap kit
Consecuencias de las lesiones	Injury outcome
Consejo Nacional de Seguridad	National Safety Council (NSC)
Contenido del Módulo	Module Content
Contorno del asiento	Seat cushion contour
Control de defectos	Defect monitoring
Conversaciones interactiva	Interactive discussion
Correa de sujeción del sistema de anclaje LATCH	Tether
Correa de sujeción en la parte superior del sistema de anclaje	Top tether

<b>Español</b>	<b>English</b>
Correa del anclaje	Anchor strap
Correa del anclaje	Tether anchor strap
Correas del arnés	Harness straps
Correas del arnés del asiento de seguridad para niños	Child restraint harness straps
Correas del sistema de seguridad	Restraining straps
Cortina inflable	Inflatable curtain (IC)
Criterio de prueba	Test Criteria
Criterios sobre lesión cerebral, criterios de traumatismo cerebral	Head Injury Criterion (HIC)
Cuando el precio está dentro de los medios del comprador, con el precio que usted puede pagar	Affordability
Chaleco “E-Z-On” (Fácil de Ponerse)	E-Z-On Vest
Choque	Crash
Choque de vehículo motorizado	Motor vehicle crash (MVC)
Choque frontal	Frontal crash
Choque lateral	Lateral crash
Choque lateral, con impacto por el lado	Side impact crash
Choque trasero	Rear- end crash
Choques automovilísticos	Traffic crashes
Choques sin sobrevivientes	Unsurvivable crashes
Choques traseros	Rear-end collisions
Dar vueltas, girar	Spins
Datos sobre las lesiones	Injury facts
Decisiones difíciles	Tough choices
Declaración de renuncia al derecho de reclamo	Waiver of liability of claim
Defensores, Activistas	Advocates
Departamento de Transporte	Department of Transportation (DOT)
Departamento de Vehículos de Motor Deshilachar	Department of Motor Vehicles (DMV)
Fray Despliegue de la bolsa de aire, cuando la bolsa de aire se infla	Air bag deployment
Destrezas de abogacía	Advocacy skills

<b>Español</b>	<b>English</b>
Desviarse bruscamente de lado a lado	Swerves
Dinámica de choques	Crash dynamics
Dirección del sitio web	Web site address
Discapacidad prolongada	Long-term disability
Diseño del vehículo	Vehicle design
Disminución de la velocidad, deceleración	Deceleration
Disminución de las fuerzas del choque, disminuir/amortiguar el impacto del choque	“Ride down”
Distribuidores, concesionarios	Dealerships
Donde se une el respaldo y el asiento	Bight
Ejercicios de ensayo improvisados	Role play exercises
Ejercicios prácticos	Hands-on exercises
El retractor se cierra, se agarra	The retractor locks
Error humano	Human error
Escribientes, redactores	Scribes
Escudo en forma de T	T-Shield
Espaldar, apoyo para la espalda, respaldo	Back support
Espina dorsal	C-Spine
Estación de servicio	Service station
Estructura o, marco comprimible	Crushable frame
Estructura, marco	Frame
Estructura, marco del asiento	Seat frame
Etapas durante el choque	Crash phase
Etapas/fase después del choque	Post-crash phase
Etapas (fases) de un choque	Phases of a crash
Etiqueta	Label
Etiqueta del asiento de seguridad para niños	Child restraint label
Etiquetas de advertencia, etiquetas con avisos	Warning labels
Etiquetas del fabricante	Manufacturer’s labels
Evento en donde se revisan los asientos de seguridad para niños	Check-up event
Evento en donde se revisan los asientos de seguridad para niños	Child restraint system (CRS) checkups event
Expulsión	Ejection
Expulsión de los ocupantes	Occupant ejections

<b>Español</b>	<b>English</b>
Fabricante de vehículos	Automobile manufacturer
Fabricante, manufacturador	Manufacturer
Fase antes del choque	Pre-crash phase
Forma de común acuerdo	Agreement form
Formulario para la investigación de defectos	Defect investigation form
Frenar de emergencia	Emergency braking
Fuerza externa	Outside force
Fuerza limitadora	Restraining force
Fuerzas del choque	Crash forces
Función del gobierno federal	Federal Role
Fundamento de seguridad	Safety rationale
Ganchos para la correa del sistema de LATCH	Tether hook
Guías, pautas, principios	Guidelines
Hacia arriba	Upward
Hebilla	Buckle
Hoja de registro	Log sheet
Hundimiento leve	Slight indentation
Impactos traseros	Rear-end impacts
Inclinación del asiento	Seat slope
Inclinado	Supine
Incompatibilidad	Incompatibility
Incorporado	Built into
Indicador de reclinación	Recline indicator
Individuo semejante, compañero	Peer
Industria de asientos de seguridad para niños	Child restraint industry
Infantes, bebés	Infants
Información al día, actualizada	Up-to-date information
Instalación incorrecta en los vehículos	Improper installation in vehicles
Instrumento de evaluación	Assessment tool
Intercambiable	Switchable
Interior que provee protección adicional	Friendly interior



<b>Español</b>	<b>English</b>
Interrogatorio interactivo, platica, diálogo	Interactive questioning
Interruptor para activar o desactivar	On/off switch
Interruptores para activar y desactivar las bolsas de aire	Air bag on-off switches
Investigación, análisis	Research
Junta Directiva Nacional de Seguridad del Niño Pasajero	National Child Passenger Safety Board (NCPSB)
Lesión	Injury
Lesión cerebral	Brain injury
Lesión de Latigazo en el cuello	Whiplash
Lesión intencional	Intentional injuries,
Lesión sostenida durante la niñez	Childhood injury
Lesiones no - intencionales	Unintentional damage/ injuries
Ley del Movimiento de Newton	Newton's Law of Motion
Limitador de carga	Load limiter
Línea de Información Sobre la Seguridad del Auto	Auto Safety Hot Line
Lo más apretado posible	As tightly as possible
Luces de advertencia de emergencia	Warning lights
Maniquí	Dummy
Manta, frazada	Blanket
Manual del vehículo para el propietario	Vehicle owner's manual
Manual para el uso del propietario del asiento de seguridad para niños	Child restraint manual
Materiales impresos, comunicados, folletos	Handouts
Mecanismo de engranaje, trinquete	Ratchet
Mecanismos, aparatos	Devices
Médula espinal, espina dorsal	Spinal cord
Mini-autobús "minivan"	Minivan
Módulo de estudio independiente	Self-study module
Módulo de la bolsa de aire para el conductor	Driver's air bag module
Movimiento de la cabeza	Head excursion
Movimiento de la rodilla	Knee excursion
Niño pequeño	Toddler

<b>Español</b>	<b>English</b>
Niños con necesidades especiales de salud	Children with special health needs
Normas de funcionamiento	Performance standards
Normas de seguridad	Safety standards
Normas Federales de Seguridad para Vehículos de Motor	Federal Motor Vehicle Safety Standards (FMVSS)
Panel o, tablero de instrumentos	Dashboard
Papel, función	Role
Parabrisas	Windshield
Parachoques, defensa amortiguador de choques	Bumper
Parasol, visera	Sun visor
Parte de arriba de los muslos	Upper thighs
Partes, piezas	Parts
Pasajeros que no utilizan el cinturón de seguridad	Unrestrained occupants
Pasar a través	Thread it through
Patinazo	Skid
Peatón	Pedestrian
Personal de rescate	Rescue workers
Personas que cuidan niños	Caregivers
Peso del objeto golpeado	Weight of the object struck
Peso del ocupante	Weight of the occupant
Piezas, partes, materiales	Hardware
Placa de cierre	Latch plate
Placa de cierre con agarre	Locking latch plate
Placa de cierre cosida	Sewn – on latch plate
Placa de cierre de agarre liviano	Lightweight locking latch plate
Placa de cierre deslizante	Free-sliding latch plate
Placa de cierre deslizante o corrediza	Sliding latch plate
Placa de separación	Splitter plate
Placas de cierre intercambiable	Switchable latch plates
Portador para bebés de uso doméstico	Household carrier
Posición central del asiento delantero	Center front seat position

<b>Español</b>	<b>English</b>
Posición en el asiento trasero	Rear seat position
Posición lateral en la parte trasera del vehículo (al lado de la puerta)	Outboard position
Posición reclinada	Reclined position
Posición vertical orientada hacia el frente	Upright forward-facing position
Posición vertical, posición erguida	Upright position
Prácticas modelo, criterio que se usa para hacer las cosas de una manera mejor	Best practices
Prevención de lesiones	Injury prevention
Problemas de seguridad	Safety issues
Procedimiento utilizado en la manufacturación del tejido del cinturón para reforzar y controlar la energía	Energy management loops
Procurar, promover la aprobación de una ley, cabildear	Lobby
Productos con avisos de retiro del mercado a causa de defectos	Recalls
Programa de Easter Seal “Los niños viajan seguros”	Easter Seal Program: “Kids are Riding Safe Program” (KARS)
Programa de subvención	Bounty program
Programa Nacional Uniforme de Adiestramiento en Sistemas de Seguridad del Niño Pasajero	Standardized Child Passenger Safety Training Program
Programas de Control de Lesiones de Tráfico	Traffic Injury Control Programs
Programas de Protección al Ocupante	Occupant Protection Programs
Programas sobre la Seguridad del Niño Pasajero	Child Passenger Safety Programs
Protección activa	Active protection
Protección del ocupante	Occupant protection
Protección pasiva	Passive protection
Protector tipo bandeja/charola	Tray Shield
Prueba de trineo, mecanismo que se utiliza en pruebas de choques	Sled testing
Pruebas de cumplimiento	Compliance testing
Pruebas de choque del asiento de seguridad para niños	Child restraint crash tests
Pruebas de choque simulado	Crash testing
Punto de anclaje	Anchor point

<b>Español</b>	<b>English</b>
Punto de conexión para la correa anclaje	Tether anchor
Rajaduras	Cracks
Ranuras para el arnés	Harness slots
Recién nacido	Newborn
Recodo del asiento	Seat bight
Recodo del asiento del vehículo	Vehicle seat bight
Relleno	Padding
Relleno adicional	Additional Padding
Relleno del asiento	Seat's padding
Relleno resistente al fuego, relleno que retarda el fuego	Flame retardant padding
Requisitos de la etiqueta	Label requirements
Respaldo/espaldar del asiento	Seat back
Responsabilidad legal por daños y perjuicios, obligación legal	Liability
Resumen del curso	Course overview
Retenedor	Retainer
Retainer Retenedor del arnés, broche retentivo del arnés	Harness retainer clip
Retractor	Retractor
Retractor de cierre de emergencia	Emergency locking retractor (ELR)
Retractor intercambiable	Switchable retractor
Retractor para controlar la energía	Energy management retractor
Retractor que se inmoviliza automáticamente	Automatic Locking Retractor (ALR)
Revisiones de los asientos de seguridad para niños	Child restraint system (CRS) checkups
Ruta	Routing
Ruta o trayectoria del cinturón de seguridad	Belt path
Seguridad	Safety
Seguridad del auto	Auto safety
Seguridad del niño	Child safety
Seguridad del Niño Pasajero	Child Passenger Safety (CPS)
Seguridad del Niño Pasajero	CPS
Seguridad en las carreteras	Highway safety

<b>Español</b>	<b>English</b>
Sensor de choques	Crash sensor
Sensor de peso dentro del asiento	Seat weight sensor
Sensores de rayos infrarrojos de techo	Overhead infrared sensors
Sensores de ultrasonido del techo	Overhead ultrasound sensors
Ser expulsado del vehículo	Being thrown out of the car
Servicios de Emergencias Médicas	Emergency Medical Service (EMS)
Sistema de anclaje	Anchorage system
Sistema de anclaje del vehículo	Vehicle anchoring system
Sistema de anclaje inferior superior LATCH	LATCH, Lower Anchors and Tethers for Children
Sistema de anclaje LATCH	LATCH System
Sistema de anclaje para el asiento de seguridad	Child Restraint (CR) anchorage
Sistema de arnés	Harness system
Sistema de cinturones de seguridad	Seat belt system
Sistema de combustible	Fuel system
Sistema de información de análisis fatales	Fatal Analysis Reporting System (FARS)
Sistema de seguridad automático	Automatic restraint system
Sistema de seguridad contra impacto lateral	Side impact protection system (SIPS)
Sistema de Seguridad Inflamable Suplementario	Supplemental Inflatable Restraint (SIR)
Sistema de seguridad para el ocupante	Occupant Protection System (OPS)
Sistema de seguridad para los ocupantes del vehículo	Vehicle occupant protection system
Sistema de seguridad para niños con necesidades especiales	Special needs CRS
Sistema de Seguridad Suplementario	Supplemental Restraint System (SRS)
Sistemas de advertencia	Warning systems
Sistemas de identificación en los vehículos	Vehicle systems ID

<b>Español</b>	<b>English</b>
Sistemas de seguridad	Restraint systems
Sistemas de seguridad en los vehículos	Vehicle restraint systems
Sistemas o asientos de seguridad para niños, sistemas de protección para niños	Child restraint systems (CRS)
Situaciones, asuntos, problemas	Issues
Soporte para el ancla	Anchor bracket
Soporte para la rodilla	Knee bolster
Sujetador (broche) para acortar el tejido del cinturón de seguridad	Belt shortening clip
Sujetador (broche) que se usa para fijar el cinturón de seguridad	Locking clip
Sujetador regular de clip metal	Regular locking
Sujetadores (broches) incorporados	Built-in locking clips
Sujetadores (broches) incorporados sin cierre	Built-in lock-off locking clips
Tapete o alfombra de goma, hule, caucho	Rubber mat
Tarjeta de inscripción, registro	Registration card
Técnico en la Seguridad del Niño Pasajero	Child Passenger Safety Technician
Tejido del cinturón de seguridad	Webbing
Tipo de cinturón de seguridad	Seat belt configuration
Transferencia aguda	Acute exposure
Uniformación, normalización, estandarización	Standardization
Uso incorrecto	Misuse
Variables del ambiente físico	Physical environment variables
Variables humanas	Host variables
Varilla para ajustar el arnés	Harness Adjuster Bar
Vehículo de la policía, patrulla de seguridad	Law enforcement vehicle (LE vehicle)
Vehículos de pasajeros	Passenger vehicles
Velocidad antes del choque	Pre-crash speed
Ventana lateral	Side window
Ventana trasera	Rear window
Vía respiratoria	Airway
Vida útil del producto	Product life
Volante, timón	Steering wheel

<b>Español</b>	<b>English</b>
Volteretas	Vaults
Vuelco, volcarse	Rollover
Vueltas	Rotation
Zonas de carga	Cargo areas





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