



TECH UPDATE

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Seat Check Smarts: Labeling of LATCH Anchors in Vehicles

Finding LATCH anchors in the back seat can be a challenge. Labels are not always there to help you. FMVSS 225 does not require tether anchors to be labeled. But many vehicle manufacturers do label



more than is required by the rule. In 2008, an industry working group on LATCH agreed to start voluntarily labeling tether anchors.

FMVSS 225 requires lower anchors to be labeled only if they are not visible in the vehicle. When they are hidden in the seat bight, there must be a label on the seat. It is usually a button or circle on the lower seatback that may or may not have a child seat symbol on it. The LATCH lower anchor should be directly below this symbol, in between the cushions. Some vehicle manufacturers may choose to label the anchors even when they are visible.



At a car seat check, be careful when looking for these anchors. There may be sharp debris in the gap between the cushions. Technicians have reported getting cuts on their hand and even getting poked with sharp objects while looking for lower anchors.



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Recent Research: Child Shoulder Belt Fit During Turns

Researchers from Sweden studied child shoulder belt fit and the effect of the child's movement during turns. They observed 16 children between the ages of 4-12 riding in the right second-row seat of a vehicle driven on a closed test track. A specially trained driver drove at about 30 mph and made sharp left turns that tended to make the child lean toward the center of the vehicle. Maximum lateral acceleration averaged near 0.9 *g*. In-vehicle cameras recorded the child's movement. Shorter children were tested in backless or high back boosters. Taller children were tested in backless boosters or lap+shoulder belts. The seat belt slipped off the shoulder in 1 of 5 turns, and movement patterns changed with age and restraint type. Among shorter children, the shoulder belt slipped off during most turns when seated on a backless booster as the child moved toward the center of the vehicle. But the belt stayed on the shoulder when seated on the high back booster. Among taller children, the shoulder belt shifted outboard but did not come off the shoulder in half of the turns.



**Example of Good
Shoulder Belt Fit**

Take home message: Vehicle turns can make the seat belt slide off the shoulder. A high back booster may help keep the belt on the shoulder.

Reference: Bohman, K. et al. Kinematics and shoulder belt position of child rear seat passengers during vehicle maneuvers. *Ann Adv Automot Med* 2011; 55: 15-26.

Recent Research: Which Kids are Following the Most Recent CPS Guidelines?

Researchers at the University of Michigan analyzed data collected during the National Survey of the Use of Booster Seats from 2007 to 2009. Restraint use was observed for 21,476 children age 12 and below. The authors calculated how many children are following the latest CPS guidelines updated in 2011. They also checked to see if use rates varied between different ethnic groups.



**Example of
Premature
Transition to
Seat Belt**

The study found that older kids are less likely to be in a child seat and more likely to be unrestrained. Older kids also sit in the front seat more often. Unrestrained drivers were 23 times more likely to have their kids unrestrained. Also, having four or more kids in the car increased the rate of unrestrained kids.

No matter what the child's age, minority children are less likely to be in an age-appropriate restraint compared to white kids. Among kids from 0 to 3 years old, rear-facing car seat use was lowest among minority groups. Even among whites, only 17% were rear facing. More minority children aged 4 and 5 years were prematurely put in seat belts compared to white children.

Overall, only a small proportion of US child passengers use an age-appropriate restraint. Many are at risk by sitting in the front seat. The differences in child restraint use by race/ethnicity show that community-based public education campaigns do not reach all parents. Many parents do not know about new child safety seat laws. The authors suggest tailoring child passenger safety programs to address the motivations of parents from various cultural and socioeconomic backgrounds.

Take home message: CPSTs need to educate families about best practice recommendations. Different families may need different approaches.

Reference: Macy ML, Freed GL. Child passenger safety practices in the U.S.: Disparities in light of updated recommendations. *Amer Journal Prev Med*. 2012; 43(3): 272-281.

New Product Update: Britax Frontier 90

The Britax Frontier 90 is an updated version of the combination seat. The biggest change is a unique seat belt installation system called 'CLICKTIGHT'. The seat can be used in forward-facing harness mode for kids from 25 to 90 lbs and 30 to 58 inches tall. Booster mode is for kids 40 to 120 lbs and 45 to 62 inches tall. The head restraint and harness shoulder height easily adjust using a no-threads system. The seatback has a reclined position that can be used in harness mode only.

The CLICKTIGHT system tightens and locks the seat belt without having to switch or lock the seat belt retractor. To access the CLICKTIGHT belt path, squeeze the release levers at the bottom of the seatback. This allows part of the seat to fold upward. Then you route lap and shoulder belts over the armrests and under the seat opening. After you remove seat belt slack, close the compartment. The closing click tells you the seat is securely installed.

You can use the CLICKTIGHT system to tighten the LATCH strap as well. LATCH can be used to position the Frontier in booster mode. Britax states that the vehicle seat belt (not LATCH) should be used to install the Frontier for kids over 40 lbs in harness mode. You must also use the V-style top tether for kids weighing over 65 lbs in harness mode, although it is recommended for all harness use.



Step 1: Squeeze Release Levers



Step 2: Seatback Opens Upward



Step 3: Route Seat Belt Over Armrests and Under Opening



Step 4: Buckle, Remove Slack and Close with a Click & TIGHT

Focus on Testing: How FMVSS 201 Affects Child Passenger Safety

Federal Motor Vehicle Safety Standard 201 includes requirements for which vehicle interior parts need to be padded and the type of padding used. The original intent was to pad areas where adults were likely to hit their heads in a crash. The test procedure involves launching an adult crash dummy head towards different vehicle components and measuring the head acceleration. This test procedure has led to padding in areas like instrument panels, pillars next to windows, back surfaces of seats and the upper portions of doors. Some vehicle manufacturers use energy-absorbing structures rather than foam padding to meet the requirements.

Example of Adult Head Contact Area



While these requirements were designed to protect adults, they can provide additional protection for any vehicle occupants, including children, who might contact these vehicle parts during a crash. Some newer data has shown that children sometimes hit their heads on parts of the vehicle that do not currently require padding, such as the door below the armrest. Future versions of FMVSS 201 may consider requiring more parts of the vehicle to be padded based on these new research findings.

Regulatory Review: Booster Seat Laws

Many CPSTs have helped get better child passenger safety laws passed in their states. Some have learned that the legislative process can be frustrating. Now 48 states have booster laws. A recent study by the Insurance Institute for Highway Safety shows that improved CPS laws are worth the effort.

Researchers used police crash reports from 5 states: Missouri, North Carolina, Pennsylvania, Wisconsin, and Wyoming. They studied crashes for the two years before the new booster law and compared them to crashes for the two years after the booster law. For children who were now affected by the law because of their age, the rate of booster or harnessed restraint used increased almost by a factor of 3. After booster laws passed, the rate of rear seat use increased by 6%. The increased rates of proper restraint and rear seating had a positive effect on injury: injury rate was 5% lower and the rate of fatal or incapacitating injuries was 17% lower.

Take Home Message: This study shows that booster laws have a positive effect on children. They increase booster seat use and reduce the risk of Injury.

Reference: Eichelberger AH, Chouinard AO, Jermakian JS. Effect of booster seat laws on injury risk among children in crashes. *Traffic Inj Prev* 2012; 13(6):631-9.



Seat Check Smarts: Understanding Recline Indicators

CPSTs already know about recline indicators or level lines on rear-facing child restraints. Most infant carriers have multiple base positions that help achieve the correct recline angle. Depending on the child restraint, the correct angle can range from 30 to 45 degrees from vertical.

However, several newer CRs have more than one correct angle, which varies with the age or size of the child. For rear-facing restraints, some have different angles for use with smaller and larger children. Usually, the level lines or angles for heavier or older children allow a more upright position. These children have more neck control and are less likely to have breathing issues in an upright position.

Also, some convertible seats have different level indicators for rear- and forward-facing use. Some new model CRs have 9 or more different recline adjustment positions. Several new convertible and combination CRs have more than one recline option when used forward facing as well. Many combination seats allow a reclined position when used in harness mode, but require the most upright position when used in booster mode.

To date, none of the products recommend use of pool noodles or towels with forward-facing mode to achieve the correct angle. The product should have enough adjustability to set the correct forward-facing angle. As always, reading the labels and instructions with the caregiver should help clarify which angle to use with the child.



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Technician Spotlight

This month, we talked to Ray Peachey, who is the CPS Training Coordinator for Massachusetts.

1) How long have you been a CPS Tech?

13.5 yrs

2) Where do you do most of your car seat checks?

All over the state at permanent fitting stations, hospitals, and vehicle dealerships.

3) What prompted you to take the training?

I was a safety officer for my police dept and figured it would enhance my job.

4) What is your favorite CPS resource?

I like the CPS list serve.

5) What is your favorite installation hint?

Being able to put the seatback down, install the child seat and then bring the seatback back up.

6) What is the worst weather you've ever experienced at a carseat check?

Hot, humid, and raining.

7) What do you think is the best new feature among recent new child restraint products?

Higher allowable weights.

Another Teachable Moment



A caregiver decided that the LATCH straps weren't enough to secure the child restraint, so they attached all three rear seat belts too.

Submitted by Kim Martin, CPST-I, Gainesville, GA.

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HELP!

Help with Our Next Issue

Do you have ideas for our next issue? Email us at CPSTechUpdate@umich.edu with suggestions for columns. These could include:

- Pictures of unusual child seat installations for the 'Another Teachable Moment' article
- Pictures of adorable properly restrained kids (will need photo release to use)
- Name and email of a CPS technician who you would like to see interviewed
- Research you heard about on the news
- New product features
- Issues that have come up at seat checks



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