



1

Objectives

Explore best practice surrounding:

- Rear Facing:** Touching front seatbacks, using load legs
- Forward facing:** Tethering in pickups, energy management
- Booster:** Vehicle occupant protection systems, elevation

2

Rear-Facing

- Interaction with seat ahead
- Load Legs

Copyright University of Michigan

3

Rear-Facing & Seatback Interaction

FORWARD-FACING

It only takes 1/4-inch of stretch before a young child's spinal cord is at risk of rupturing.

REAR-FACING

FORWARD-FACING

Credit: Ohio State University

4

Evenflo: RF-Only CRs Must Not Touch

- If you are unable to use the center rear seating position and have to install this child restraint directly **behind a front vehicle seat**, ensure that there is at least **38 mm (1.5 inches)** of space between any part of the child restraint and the vehicle seat that is closest to the child's head. This space may be necessary for the child restraint to properly perform in certain types of crashes.

From LiteMax/SafeMax OM

5

Evenflo: RF-Only CRs Must Not Touch

WHY?

An Evenflo Blog Post Explains:

"We require 1.5 in. of space between the infant car seat and the **front vehicle seat** so that in the event of a rear-impact crash, the infant car seat will have the opportunity to rotate away from the front vehicle seat, providing clearance if the **front seat back deforms**."

6

Evenflo: RF-Only CRs Must Not Touch

Remember, applies to:

- RF-only models
- Outboard positions
- 2nd Row

DOESN'T apply to:

- Convertible/All-in-1
- Center position
- 3rd Row



Is it okay if my rear-facing convertible car seat touches the back of the vehicle seat in front of it?

Evenflo permits contact between front vehicle seats and its rear-facing convertible or all-in-one car seats. However, the car seat should not be wedged in and should be installed in accordance with both the car seat instructions and the vehicle owner's manual. Unlike its convertible seats, however, Evenflo does require 1.5 inches of clearance between a front vehicle seat and any of its rear-facing only infant car seats.

From Evenflo FAQ

7

Consumer Reports Testing



Since 2014, Consumer Reports has conducted tests using its proprietary rig and procedure, which includes a mock seatback.

A test rig used by Consumer Reports for testing child safety seats. This image has been altered by Consumer Reports to conceal the identity of the company that performed the test. Consumer Reports

8

Consumer Reports Recommendations

Based on its testing, Consumer Reports recommends using a convertible CR after age 1.

AGE (YEARS)	REAR-FACING INFANT	CONVERTIBLE REAR-FACING	CONVERTIBLE FORWARD-FACING	BELT-POSITIONING BOOSTER
0	Recommended	Transition	Transition	Transition
1	Transition	Recommended	Transition	Transition
2	Transition	Recommended	Recommended	Transition
3	Transition	Recommended	Recommended	Transition
4	Transition	Recommended	Recommended	Recommended
5	Transition	Recommended	Recommended	Recommended
6	Transition	Recommended	Recommended	Recommended
7	Transition	Recommended	Recommended	Recommended
8	Transition	Recommended	Recommended	Recommended
9	Transition	Recommended	Recommended	Recommended
10	Transition	Recommended	Recommended	Recommended
11	Transition	Recommended	Recommended	Recommended

9

Consumer Reports Recommendations

Based on its testing, Consumer Reports recommends using a convertible CR after age 1.

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3	Transition	Recommended	Recommended	Transition
4	Transition	Recommended	Recommended	Recommended
5	Transition	Recommended	Recommended	Recommended
6	Transition	Recommended	Recommended	Recommended
7	Transition	Recommended	Recommended	Recommended
8	Transition	Recommended	Recommended	Recommended
9	Transition	Recommended	Recommended	Recommended
10	Transition	Recommended	Recommended	Recommended
11	Transition	Recommended	Recommended	Recommended

10

Consumer Reports Recommendations

Concern: Head strikes for the 1-yo dummy happen more in tests of RF-only CR compared to a convertible.


Why?: Consumer reports credits convertible's longer length and different shape of CR shell for fewer head strikes.

AGE (YEARS)	REAR-FACING INFANT	CONVERTIBLE REAR-FACING	CONVERTIBLE FORWARD-FACING	BELT-POSITIONING BOOSTER
0	Recommended	Transition	Transition	Transition
1	Transition	Recommended	Transition	Transition
2	Transition	Recommended	Recommended	Transition
3	Transition	Recommended	Recommended	Transition
4	Transition	Recommended	Recommended	Recommended
5	Transition	Recommended	Recommended	Recommended
6	Transition	Recommended	Recommended	Recommended
7	Transition	Recommended	Recommended	Recommended
8	Transition	Recommended	Recommended	Recommended
9	Transition	Recommended	Recommended	Recommended
10	Transition	Recommended	Recommended	Recommended
11	Transition	Recommended	Recommended	Recommended

11

Dorel: RF CRs Must Touch Vehicle Seat

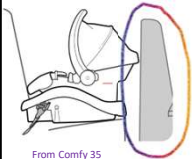
Why? Dorel concluded from testing that RF CRs installed touching the front seat structure reduced the head injury criteria compared to installation with a pre-test gap.



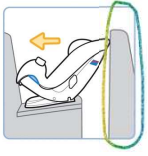
12

Dorel: RF CRs Must Touch Vehicle Seat

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In manuals since Dec. 2023

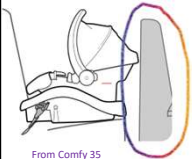


From Comfy 35 From Grow and Go

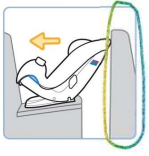
13

Dorel: RF CRs Must Touch Vehicle Seat

Why? Dorel concluded from testing that RF CRs installed touching the front seat structure reduced the head injury criteria compared to installation with a pre-test gap.



In manuals since Dec. 2023
However, RETROACTIVE to all unexpired CRs in use.



From Comfy 35 From Grow and Go

14

Dorel: RF CRs Must Touch Vehicle Seat

All Dorel Brands:

- Cosco
- Safety 1st
- Maxi-Cosi

In manuals since Dec. 2023
However, RETROACTIVE to all unexpired CRs in use.

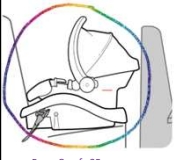



From Comfy 35 From Grow and Go

15


Dorel: RF CRs Must Touch Vehicle Seat

Any RF installation



RF-only

Convertible or All-in-One



From Comfy 35 From Grow and Go

16

Dorel: RF CRs Must Touch Vehicle Seat

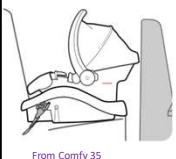

Outboard vehicle seats ONLY

When using the passenger or driver-side locations, the car seat **MUST** be touching the back of the vehicle seat in front of it, or be as close as possible.

Place Car Seat Rear-Facing in Back Seat

The car seat base **MUST** be flat on the vehicle seat. **MUST** be touching the back of the vehicle seat in front of it, or be as close as possible.

When using the passenger or driver-side locations, the car seat

From Comfy 35 From Grow and Go

17

Dorel: RF CRs Must Touch Vehicle Seat

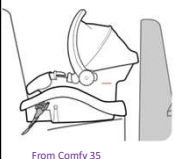

Applies to touching front row, second row, etc.

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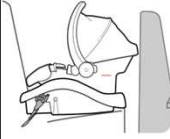



From Comfy 35 From Grow and Go

18

Dorel: RF CRs Must Touch Vehicle Seat

Get as close as possible



When using the passenger or driver-side locations, the car seat **MUST** be touching the back of the vehicle seat in front of it, **or be as close as possible.**

Place Car Seat Rear-Facing in Back Seat

The car seat base **MUST** be flat on the vehicle seat. **MUST** be touching the back of the vehicle seat in front of it, **or be as close as possible.**

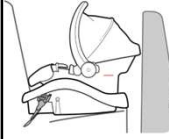
When using the passenger or driver-side locations, the car seat

From Comfy 65 From Grow and Go

19

Dorel: RF CRs Must Touch Vehicle Seat

Ensure CR not lifted off seat cushion!



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From Comfy 35 From Grow and Go

20

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When using the passenger or driver-side locations, the car seat

From Comfy 35 From Grow and Go

21

What Does Touching Mean?



Assume it means only gentle/light contact that:

- Doesn't push hard
- Doesn't change child angle
- Doesn't hold the CR off cushion

If in doubt, use the "sheet of paper test."

22

What Does Touching NOT Mean?




Don't say:

- "Wedging"
- "Bracing"
- "Pressing"

23

What About Other Companies?



Must touch: Dorel
Must not touch: Evenflo
May touch, if necessary: Others

24

What About Other Companies?



Must touch: Dorel
Must not touch: Evenflo
May touch, if necessary: Others

Except babyark requires a 3" gap

Always check instructions!



25

Let's Play: May touch? Must touch? Must not touch?



Safety 1st

26

Let's Play: May touch? Must touch? Must not touch?



Baby Jogger

Safety 1st



To Adjust Carry Handle
Squeeze both adjustment buttons on each side of the carry handle. Rotate up or down to desired location. Release buttons. Make sure both carry handle adjuster buttons are in the locked position.

Carry handle **MUST** be upright and locked when carrying and when installed in the vehicle.

27

Let's Play: May touch? Must touch? Must not touch?



Nuna

28

Let's Play: May touch? Must touch? Must not touch?



Safety 1st

29

Other Concerns?



30

Other Concerns? Vehicle Instructions!

- Vehicle OM may say to not contact the front seat

WARNING

Front passenger occupant classification system precautions

Do not recline the front passenger seatback so far that it touches a rear seat or a back wall. This may cause the "AIR BAG OFF" indicator light to be illuminated, which indicates that the SRS airbags for the front passenger will not activate in the event of a severe accident. If the seatback touches the rear seat or back wall, return the seatback to a position where it does not touch the rear seat or back wall. Keep the front passenger seat back as upright as possible when the vehicle is moving. Reclining the seatback excessively may lessen the effectiveness of the seat belt system.

If an adult sits in the front passenger seat, the "AIR BAG ON" indicator light is illuminated. If the "AIR BAG OFF" indicator is illuminated, ask the passenger to sit up straight, well back in the seat, feet on the floor, and with the seat belt worn correctly. If the "AIR BAG OFF" indicator still remains illuminated, either ask the passenger to move to the rear seat, or if that is not possible, move the front passenger seat fully rearward.

When it is unavoidable to install a forward-facing child restraint system on the front passenger seat, install the child restraint system on the front passenger seat in the proper order (r-1st, 5th).

Do not modify or remove the front seats.

Do not lock the front passenger seat or subject it to severe impact. Otherwise, the SRS warning light may come on to indicate a malfunction of the front passenger occupant classification system. In this case, contact your Toyota dealer immediately.

Vehicles with rear seats: Child restraint systems installed on the rear seat should not contact the front seatback.

Do not use a seat accessory, such as a cushion and seat cover, that covers the seat cushion surface.

Do not attach a commercial seatback table or other heavy item to the back of the front passenger seat.

Do not modify or replace the upholstery of the front seat.

From MY 2022 Toyota Tacoma

31

Other Concerns? Vehicle Instructions!

- Vehicle OM may say to not contact the front seat
- Contact might affect air bag activation sensors.

U.S. 800-331-4331 www.toyota.com **Toyota** Canada 888

Bullet Section: Bulleted guidance in this shaded area applies to all models of this brand (with exceptions noted). Also, ch


- Child weight limit—LATCH system** (for unexpired CRs made before 3/20/14) or factory-installed TA, used with a seat belt: Follow guidance from the CR manufacturer.
- Child weight limit—retrofitted TA, used with a seat belt:** Toyota has not provided a child weight limit for using retrofitted TAs (in owner's manuals or for this publication).
- Advanced air bag (AAB) suppression system:** AAB function **ON** is indicated by pressure force on the back or underside of the front seat. See owner's manual for details.
- Shoulder belt entanglement:** Toyota has not provided steps to reduce the risk.
- Seating position limitations:** Depending on the placement and size of a CR, adjacent seat belts or LAs may not be accessible or provide proper belt fit. If so, don't use the adjacent position for passengers, CRs, or booster users.
- Center position borrowing:** Some models without standard LATCH in the center have a note in the table (below) that says the inner bars of the outboard LATCH systems may be borrowed for CR installation in the center (if the CR manufacturer also consents); the note also provides the space between LAs. If no note is present, install a CR in the center using the seat belt (and tether, if appropriate).
- LATCH with booster seats:** MAY attach to LAs and/or TA. If allowed by the booster manufacturer and proper belt fit is maintained. If not secured, remove any unused booster seats from the passenger area.
- Head restraints:** Model-specific directions are found in many model notes in the table below.
- Split Seatbacks:** For CR/booster use, always set sections to be uniform in depth and angle.


Example from bullets section at beginning of Toyota's entry in 2023 LATCH Manual.

32

Other Concerns? Vehicle Instructions!

- Vehicle OM may say to not contact the front seat
- Contact might affect air bag activation sensors.
- Sliding a front seat back to touch a CR can negatively affect front seat belt fit!


Hudson Center for Prenatal Vehicle Safety




Go to <https://hcvps.org> for resources on using seat belts while pregnant.

33

Other Concerns? Vehicle Instructions!

- Vehicle OM may say to not contact the front seat
- Contact might affect air bag activation sensors.
- Sliding a front seat back to touch a CR can negatively affect front seat belt fit!
- Easy Entry/Exit features can be problematic.



What is the Easy Entry and Exit* feature on my Ford?


The Easy Entry and Exit feature of selected Ford vehicles automatically moves the driver seat forward up to two inches when you switch the ignition OFF, allowing the driver to exit the vehicle. The driver seat will return to the previous position when you switch the ignition ON. You can enable or disable this feature through the Information Display of your vehicle. For instructions specific to your vehicle, refer to the Keys and Remotes Control section of your Owner's Manual.

34


Rear-Facing & Load Legs*

FORWARD-FACING


It only takes 1/4-inch of stretch before a young child's spinal cord is at risk of rupturing.



REAR-FACING



FORWARD-FACING



Credit: Ohio State University

35

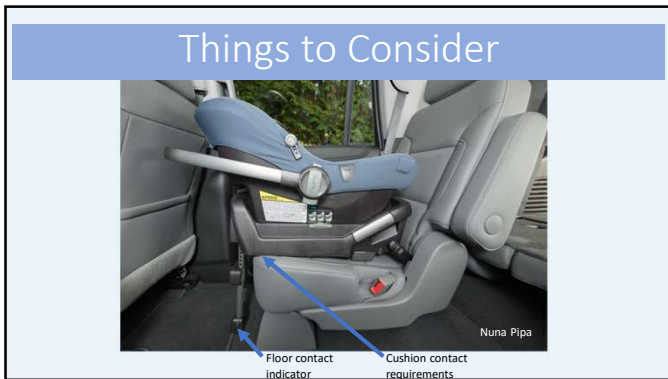
Load Leg, stability/support leg, foot prop



Whatever it's called in the manual, the basic idea is the same!

- BabyArk
- Clek
- CYBEX
- Dorel (Maxi-Cosi)
- Evenflo
- Graco
- Nuna
- Peg Perego
- UPPAbaby

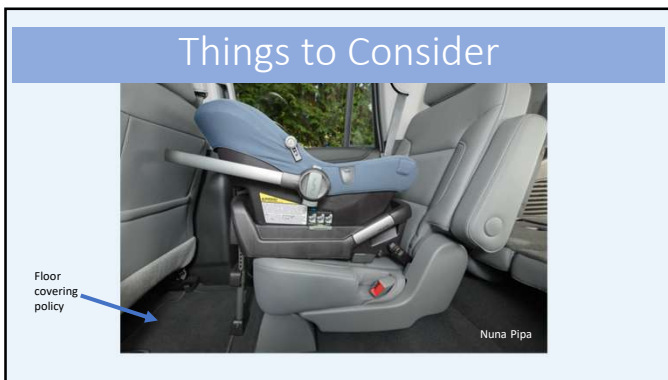
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37



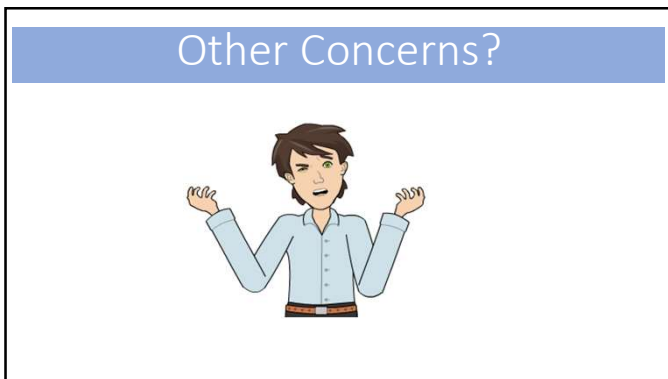
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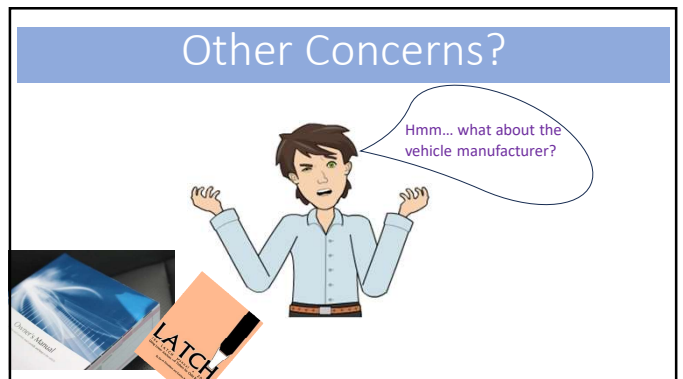
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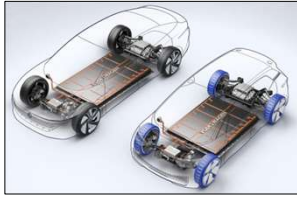
41



42

Check Vehicle Instructions

Carefully check instructions!



For instance, for electric vehicles.

43

Check Vehicle Instructions

One example: Ram pickup trucks

Ram trucks have a storage space. Current OMs prohibit load legs; see *LATCH Manual* for all models with this issue.



44

Check Vehicle Instructions

In **SOME** seating positions, instructions say **NO** to load legs.

- *Sometimes—but not always—* it is because under-floor storage doors are too weak.

45

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In **SOME** seating positions, instructions say **NO** to load legs.

- *Sometimes—but not always—* it is because under-floor storage doors are too weak.
 - However, some storage areas are **NOT** a problem, so don't jump to conclusions

46

Check Vehicle Instructions

In **SOME** seating positions, instructions say **NO** to load legs.

- *Sometimes—but not always—* it is because under-floor storage doors are too weak.
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 - Follow instructions

47

Check Vehicle Instructions

In **SOME** seating positions, instructions say **NO** to load legs.

- *Sometimes—but not always—* it is because under-floor storage doors are too weak.
 - However, some storage areas are **NOT** a problem, so don't jump to conclusions
 - Follow instructions
 - Not sure? Ask!

48

Vehicle Incompatibility





Some vehicles designed with a prominent center hump... ...and others have a sloping floor or other feature in the way.

49

Forward-Facing

- Tethering
- Energy-management tied to rigid LATCH





Image: IHS video

50

Tethering is very beneficial!



Tethering limits head excursion by at least 4-6 inches... and those inches matter!

51

Trucks evolve... but tethering still tricky!



Rivian



Canoo



Bollinger



Tesla

52

Ford F-Series Super/Crew cabs Owner's Manual Update MY 2019/2020



1. Route the vehicle tether loop between the head restraint posts, then route the child restraint tether strap through the loop, forward of the head restraint.
2. Hook the strap to the vehicle tether anchor loop in the adjacent seating position. If using the driver side, pass the strap behind the shoulder belt for the center seat. Always put the tether strap through the routing loop. The head restraint support post holds the child restraint tightly, but the head restraint post is not strong enough to hold the child restraint during a crash.
3. Tighten the tether strap according to the child restraint manufacturer's instructions.

Excerpt from 2019 manual.

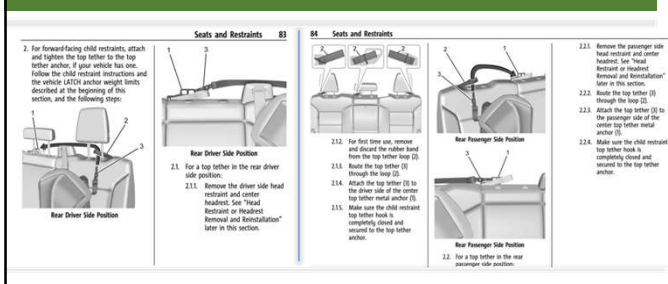
53

Ford F-Series Super/Crew cabs One CR or Installations in OB position



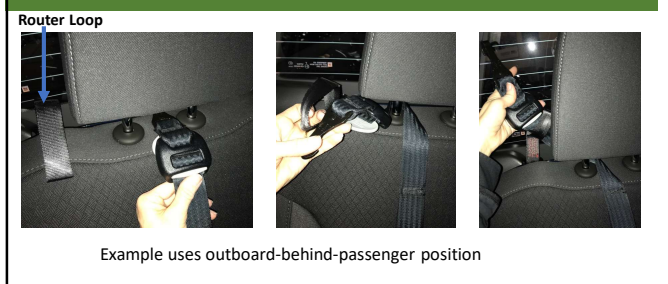

54

Chevy Silverado and GMC Sierra, since MY 2019
Double and Crew Cabs



61

Chevy Silverado and GMC Sierra, since MY 2019
Double and Crew Cabs



62

Chevy Silverado and GMC Sierra, since MY 2019
Double and Crew Cabs



63

Chevy Silverado and GMC Sierra, since MY 2019
Double and Crew Cabs



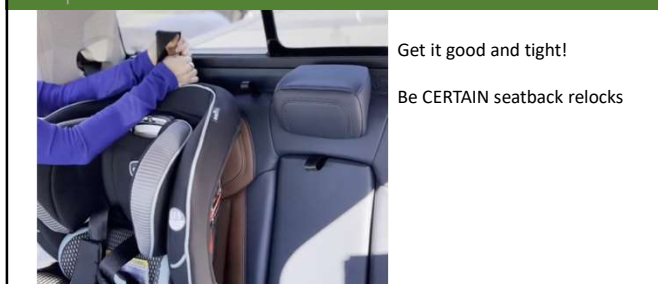
64

Direct Routing in a Pickup Truck
Example: 2024 Ford Maverick



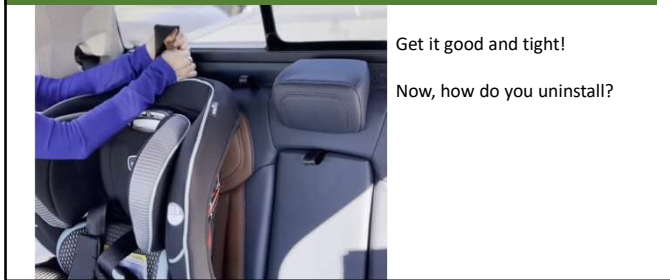
65

Direct Routing in a Pickup Truck
Example: 2024 Ford Maverick



66

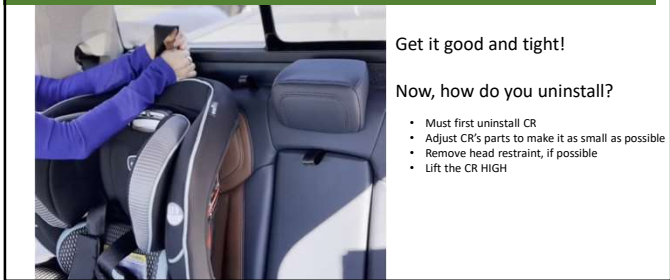
Direct Routing in a Pickup Truck
Example: 2024 Ford Maverick



Get it good and tight!
Now, how do you uninstall?

67

Direct Routing in a Pickup Truck
Example: 2024 Ford Maverick

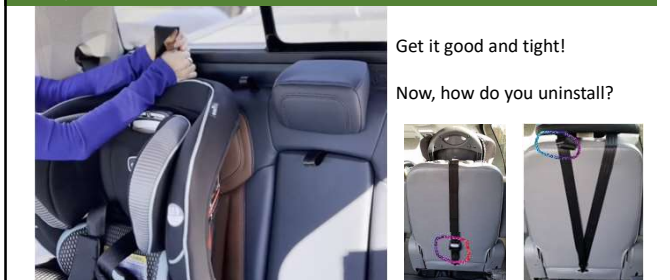


Get it good and tight!
Now, how do you uninstall?

- Must first uninstall CR
- Adjust CR's parts to make it as small as possible
- Remove head restraint, if possible
- Lift the CR HIGH

68

Direct Routing in a Pickup Truck
Example: 2024 Ford Maverick



Get it good and tight!
Now, how do you uninstall?

69

Forward-Facing
Energy-management tied to rigid LATCH

Image: IIHS Video

70

Clek Fooof manages energy using "crumple technology"

Foof's REACT (Rigid-LATCH Energy Absorbing Crumple Technology) is designed to work best with a forward-facing Rigid LATCH installation (which can be combined with vehicle seat belt when vehicle LATCH anchor limits are exceeded).

71

Foof is tested using both seat belt and LAs

Head Injury Criteria ¹		% below maximum allowed (must be below 1000)
TEST DUMMY CLASS	3	1000
1 Year Old	237	66% below
3 Year Old	413	59% below
6 Year Old	344	65% below

Chest Acceleration ²		% below maximum allowed (must be below 40 Gs)
TEST DUMMY CLASS	3	40 Gs
1 Year Old	42	30% below
3 Year Old	40	33% below
6 Year Old	38	37% below

72

babyark manages energy with metal coil



The most advanced shock-absorption system in any car seat.

The LATCH™ impact absorber steel coil is at the heart of the babyark™ Vehicle Anchor™ system and absorbency. The coil will help evenly disperse the force and forward momentum that will push your baby along sudden stops, reducing injury risk and car seats to bring the seat to rest safely and softly.


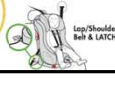


73

These CRs encourage simultaneous use

⚠ WARNING – DEATH or SERIOUS INJURY can occur (continued)

- Do NOT install by this method for a child weighing more than 35 lb (15.9 kg).
- For children over 35 lb (15.9 kg), LATCH and Vehicle Belt can be used in combination up to 65 lb (29.5 kg) in Forward-Facing Mode only.

Foot/F FF instructions after 35 pounds

3.2.1 Recommended installation - ACTV8™ Smart Base

Before you begin, check that the seating position you have chosen has lower anchors at the seat bight for that seating location. Location of some vehicle lower anchors will be identified by the LATCH Lower Anchor symbol.

Refer to vehicle owner's manual for seating locations which have the LATCH anchorage system.

Also check that your vehicle manufacturer allows the following by reading the vehicle owner's manual:

- Placing the support leg on the vehicle floor.
- Installation of a car seat with both LATCH and a vehicle seat belt at the same time.

babyark instructions after 15 pounds (so, for all FF installations)

74

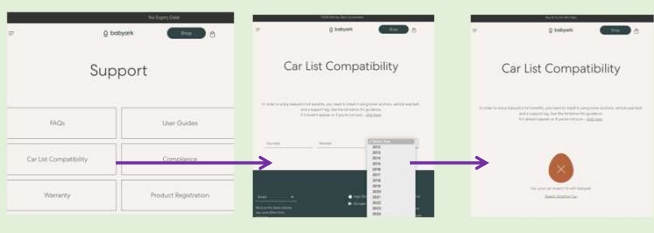
Babyark even has a CR/car compatibility tool



www.babyark.com

75

Babyark even has a CR/car compatibility tool



www.babyark.com


76

Other Concerns?



77

Other Concerns?



78

Very few say simultaneous use is okay

Recommendations for Attaching Child Safety Restraints for Children

Restraint Type	Combined Weight of Child and Child Restraint	Use Any Attachment Method as Indicated Below by X				
		LATCH (Lower Anchors and Top Tether Anchor)	LATCH (Lower Anchors Only)	Seatbelt and Top Tether Anchor	Seatbelt and LATCH (Lower Anchors and Top Tether Anchor)	Seatbelt Only
Rear facing child restraint	Up to 65 lb (29.5 kg)		X			X
Rear facing child restraint	Over 65 lb (29.5 kg)					X
Forward facing child restraint	Up to 65 lb (29.5 kg)	X		X	X	
Forward facing child restraint	Over 65 lb (29.5 kg)			X	X	

Example: 2016 Ford Explorer XM

79

Very few say simultaneous use is okay

6. Attach the LA Connectors

Learn whether the seat belt and LA attachment may be used simultaneously.

Only LATCH and seat belt attachment to install CR. LATCH is usually chosen. However, a few CR and vehicle manufacturers allow simultaneous use. From Canada, Transport Canada recommends using the LA attachment and seat belt perimeter. From Canada, more than 40% of CRs allow simultaneous use. If a manufacturer allows simultaneous use, the manufacturer's instructions will specify the correct use. A recent booster seat manufacturer's instructions specify that simultaneous use is not permitted. A 2021 study showed that 4% of CRs allow simultaneous use. For specific information, refer to the vehicle and CR manufacturer's instructions.

Vehicle manufacturers states the simultaneous use of LATCH and seat belt: The CR manufacturer's instructions generally recommend using the LATCH attachment and seat belt together. Some CR manufacturers' instructions in Appendix A further details. When a seat belt is used to secure a child in a booster seat that not all CR manufacturers allow the use of the LA attachment and seat belt. See Table A2 and the CR manufacturer's entries in Appendix A.

2017 research indicated that a small percentage of CRs allow simultaneous use. However, because of the limited number of CRs that allow simultaneous use, it is difficult to say whether they allow CRs to be installed using both systems simultaneously. See the current manual of vehicle guidance to consider when using CR that may be installed using both systems simultaneously. Contact the vehicle manufacturer's customer service department for advice. CRs allowing all vehicle manufacturers about using LATCH with boosters, and say that they allow the use of LATCH anchors to secure a CR regardless of whether the CR manufacturer's instructions allow for the child seat to be secured by the anchor.

CR manufacturer's instructions on the simultaneous use of LA attachments and seat belts: Three CR manufacturers (CRs) that allow both LA attachments may be used simultaneously for CR installation. A few other manufacturers reported conditional allowances, but that permission was based on past approvals. These allowances for use of a seat belt with other CRs are attached using the right-side connectors. CRs also allowed for the use of a seat belt to be developed by its manufacturer (CR) and CR. Although the design of most CRs is not designed to allow the use of both LA attachments and seat belts, some CR manufacturers allow the use of both LA attachments and seat belts together when the child is secured in the CR. See the CR manufacturer's entries in Appendix A for further details. When a seat belt is used to secure a child in a booster seat that not all CR manufacturers allow the use of the LA attachment and seat belt. See Table A2 and the CR manufacturer's entries in Appendix A.

In the LATCH Manual

- Chapter 3, p. 24
- Ford/Lincoln, Mercedes, Porsche allow it

80

More specify it is not okay

Jeep 2020 GRAND CHEROKEE OWNER'S MANUAL

WARNING! Never allow a child to put the shoulder belt under an arm or behind their back. It is a trap. The shoulder belt will not protect a child properly, which may result in serious injury or death. A child must always wear both the leg and shoulder portions of the seat belt correctly.

Recommendations for Attaching Child Restraints

Restraint Type	Combined Weight of the Child + Child Restraint	Use Any Attachment Method Shown With An "X" Below			
		LATCH - Lower Anchors Only	Seat Belt Only	LATCH - Lower Anchors + Top Tether Anchor	Seat Belt + Top Tether Anchor
Rear Facing Child Restraint	Up to 65 lb (29.5 kg)	X	X		
Rear Facing Child Restraint	More than 65 lb (29.5 kg)		X		
Forward Facing Child Restraint	Up to 65 lb (29.5 kg)			X	X
Forward Facing Child Restraint	More than 65 lb (29.5 kg)				X

81

More specify it is not okay


Jeep 2020 GRAND CHEROKEE OWNER'S MANUAL

Frequently Asked Questions About Installing Child Restraints With LATCH

Question	Answer	Reference
What is the weight limit for weight + weight + weight system for using the LATCH anchorage system to secure the child restraint?	65 lbs (29.5 kg)	Use the LATCH anchorage system only if the combined weight of the child and the child restraint is 65 lbs (29.5 kg). Use the seat belt and top tether anchor instead of the LATCH system if the combined weight is more than 65 lbs (29.5 kg).
Can the LATCH anchorage and the seat belt be used together to install a rear-facing or forward-facing child restraint?	No	Do not use the seat belt with LATCH. Use the LATCH anchorage system to install a rear-facing or forward-facing child restraint. If allowed by the booster seat manufacturer, use the booster seat anchor in the manual for more information.
Can a child seat be installed in the center position using the lower LATCH anchor anchorage from the outboard seating position?	No	Use the seat belt and tether anchor to "lock" a child seat in the center seating position.

82


What to do, what to do...?



83

Booster Seats

- Value of vehicle systems
- Value of elevation



84

As we know

Boosters properly position lap-shoulder belts ...

- ...over the sternum and clavicle, ...
- ... on the upper thighs (off soft tissue), ...
- ...and provide a comfortable seat depth for a child.

Photos © NHTSA

85

An important difference between children and adults—even of the same height!

- Kids have rounded hip bones
 - Prevent lap belt from staying low on hips

Photos © NHTSA

86

So, child's pelvic bone is less able to protect organs—and spine

Iliac spines do not harden until puberty

©2007 by the Children's Hospital of Philadelphia

87

Belt fit is very important

IIHS uses Jasper ATD to test and rate boosters for belt fit

88

But there is more to boosters than belt fit

ELEVATE child to take advantage of vehicle safety systems.

- Systems optimized for adult's stature
- Surface padding, tempered glass, side curtain air bags
- THIS is booster's side-impact protection.

89


Prevention of Submarining

Current attention on:

- Value of height
- Placement of belt (Under? Over?)
- Child Posture

90


AND—we know she should still be in a harness



Keep working to end premature transition to boosters!

91


AND—we know she should still be in a harness



Keep working to end premature transition to boosters!

Alert caregivers to booster minimums:
Weight
HEIGHT
AGE

92



Thank you!
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93