

Trailer Chains for Towing ***“The Ties that Bind”***



**This document may have been updated
Be sure to download the latest version!**

Updated: November 4, 2025

PLEASE NOTE

This document may have been updated with new information, changes, or corrections.

Be sure to visit my presentation web site and download the latest version of this document. It could make an important difference in your work!

<http://aviation.derosaweb.net/presentations>

Thank you, John

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My Back Story

My story begins driving back from Utah in 2013. I was traveling at 60+ miles an hour in a highway construction area in downtown Omaha, Nebraska. I suddenly felt my glider trailer doing a rather wild dance. What is going on?

I looked in my rearview mirror and saw my trailer was moving violently side to side. It took me a second or two to realize that my trailer's coupler had
COME OFF THE TOW BALL!! Holy @\$%!

Steer straight! Let off on the gas! NO BRAKING! Slowly pulled over.

I was very lucky that day. I was lucky that the trailer didn't completely disconnect from the tow vehicle. I was lucky the trailer didn't topple end-over-end or pull the vehicle (and me) into the guardrail. I was lucky that my glider wasn't destroyed. I was lucky that I wasn't hurt. I was so very lucky that innocent nearby drivers or passengers weren't injured ... or worse.

I was very lucky that day. What saved me from disaster that day in Omaha were the stout chains and other strong towing equipment that connected my vehicle to my trailer.

So, how good are YOUR chains?

Don't Let This Happen To You



Trailer Accidents Video: <https://www.youtube.com/watch?v=iCDt4tjxp-E>

Don't Let This Happen To You



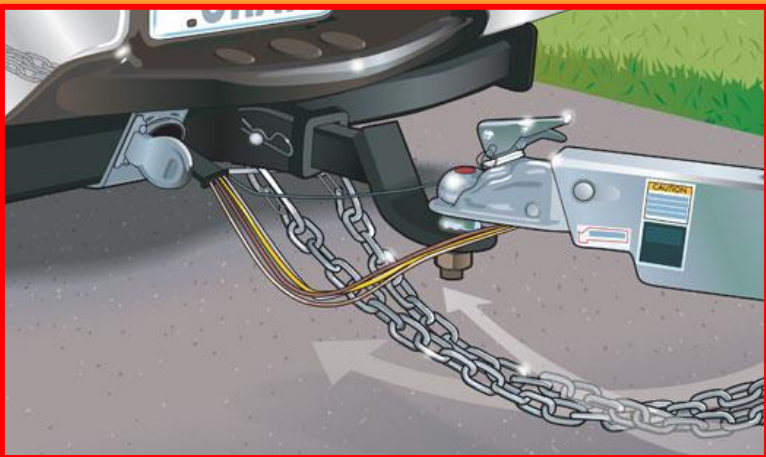
Trailer Accidents Video: <https://www.youtube.com/watch?v=iCDt4tjxp-E>

Don't Let This Happen To You



Trailer Accidents Video: <https://www.youtube.com/watch?v=iCDt4tjxp-E>

ALWAYS CROSS YOUR CHAINS!!



Chains must be **“crossed over”** each other under the coupler between the trailer and the vehicle.

If the trailer's coupler were to disconnect from the vehicle's ball the crossed chains will capture the trailer's coupler/tongue and prevent it from dropping to the ground.

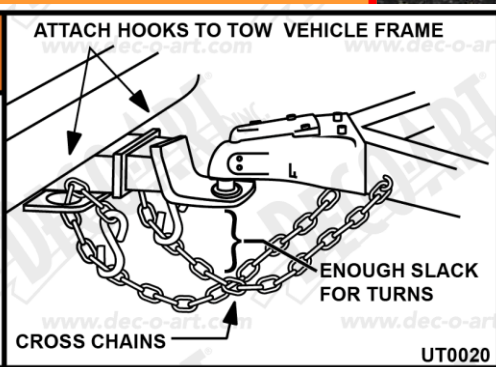
If the coupler/tongue were to **drop to the ground**, it can **catch a gap** in the roadway and the trailer **WILL stop very rapidly** and **WILL break the chains!**

⚠ WARNING

ALWAYS use safety chains. Chains hold trailer if connection fails. You must:

1. CROSS chains underneath coupler.
2. ALLOW slack for trailer to turn.
3. ATTACH chain hooks securely to tow vehicle frame.

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Crossed chains shown holding the disconnected coupler off the ground

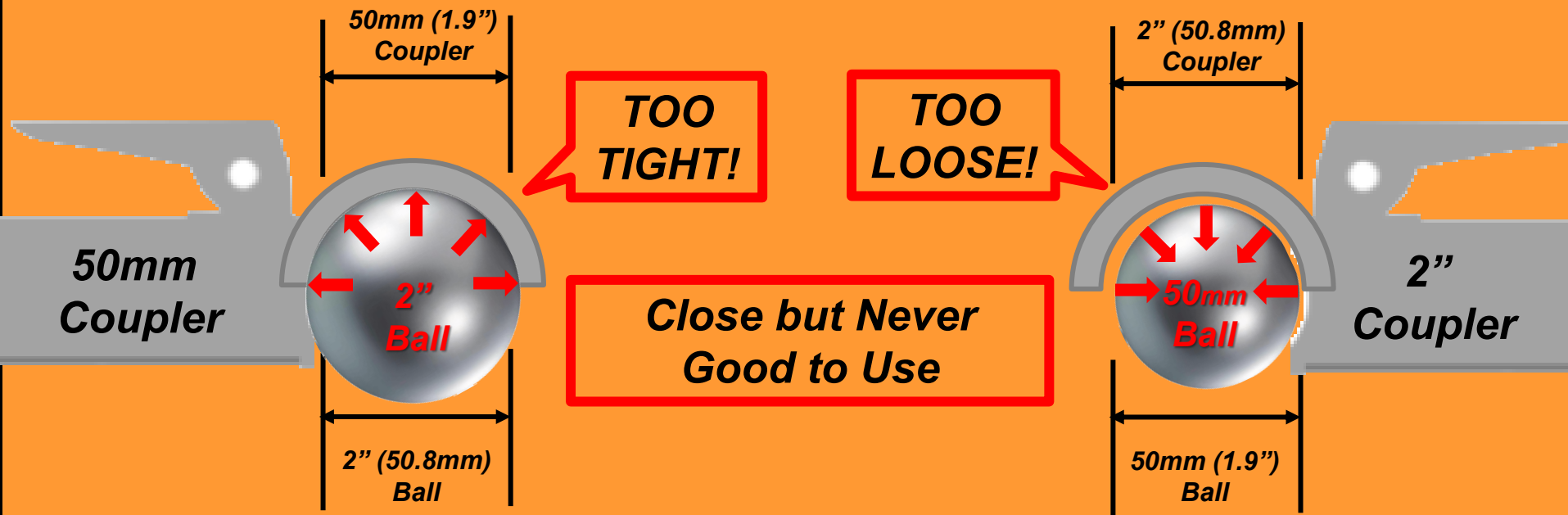


Source: <https://nationaltrailerparts.com/2020/02/07/safety-chains>

Video: https://www.youtube.com/results?search_query=trailer+chains+crossed

Warning About Mismatched Sizes of Couplers and Balls!

NEVER mix 50mm and 2" equipment



50mm Coupler on a 2" Ball
Difference: +0.8mm TOO TIGHT!
Friction can unscrew the ball from the ball mount and/or jam the ball into the coupler

2" Coupler on a 50mm Ball
Difference: -0.8mm TOO LOOSE!
The coupler could release the ball

Assumptions for this Presentation

As part of this presentation I will assume that your trailer and vehicle is already equipped with the following minimum requirements

The following topics WILL NOT be discussed in this presentation

- 1) Trailer safety and licensing compliance for your jurisdiction
- 2) Vehicle towing capacity/hitch/receiver for your trailer's weight
- 3) Ball mounts with the appropriate "drop" for your trailer
- 4) Ball sizing for your trailer's coupler (2", 50mm, etc)
- 5) Trailer properly sized coupler (2", 50mm, etc)
- 6) Trailer braking mechanisms (electric or mechanical)
- 7) Vehicle and trailer lighting and wiring connections *

If you do not have all of these items in place, or to the incorrect capacity, or you are unsure if you do, you should contact your local trailer accessory dealer and make things right!

* For more details on trailer wiring see my presentation:
<http://aviation.derosaweb.net/presentations/#trailerwiring>

Introduction

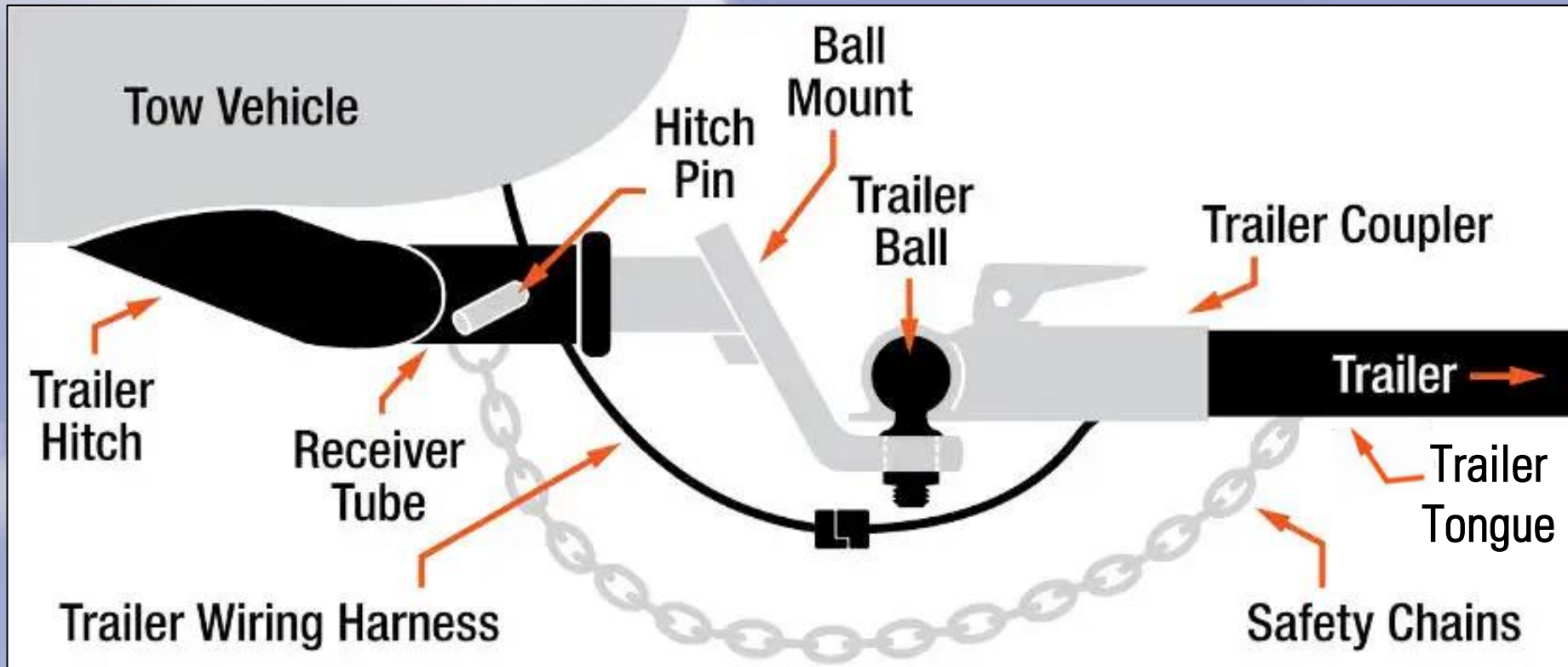
You just purchased a glider that you are so very proud of. It cost you many months of your hard-earned money. The trailer it came in is now attached to a vehicle that also cost you many months of hard-earned money.

These two rather valuable pieces of property are connected to one another with possibly the cheapest, weakest, rustiest, hardware possible. Does this make any sense at all?

Of course, the answer is obviously “no”. Maybe you truly have connected the vehicle and trailer with what you believe is a safe and robust assemblage of components. Are you sure?

By taking some time, and the advice of this presentation, you will make sure that your next “soaring safari” ends up as happily as you felt when you bought that glider in the first place.

Trailer/Vehicle Components and Nomenclature



NOTE: Every State in the U.S.A. requires chains to be used on all trailers! See a later slide for trailer regulations per US State (with links)

“Chains are Only as Strong as the Weakest Link”



Lousy Chains That I have Seen That GREATLY Worry Me



Trailer Chains

“Chains are Only as Strong as the Weakest Link”

Let's start with the basics - your chains. The act of your trailer becoming detached from your vehicle will exert a TREMENDOUS impact force on your chains as they become taut in an emergency.

Choose chains that are STRONGER than the total weight of your trailer. I personally like to use chains that are twice as strong as required.

Attach safety chains to the trailer and vehicle in a way that is stronger than the chain. Also, all the other parts, hooks/connections/hitch/etc, must also be as strong as the chain.

Choosing Trailer Chain

Chains come in many different strength ratings which can all look similar. Shown here are chains rated from 800 to 6600 lbs. Again, always choose a chain that is stronger than what your glider weighs. I personally like to use chains that are rated twice as strong as required.



Use of Chains Versus Safety Cables

While convenient these coiled cables have the same issue as chains that are too long.

Reason: If the coupler comes off the ball the extra length of the cable increases the impact force which can break the connection between the vehicle and the trailer

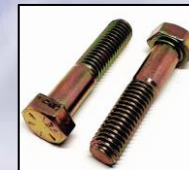
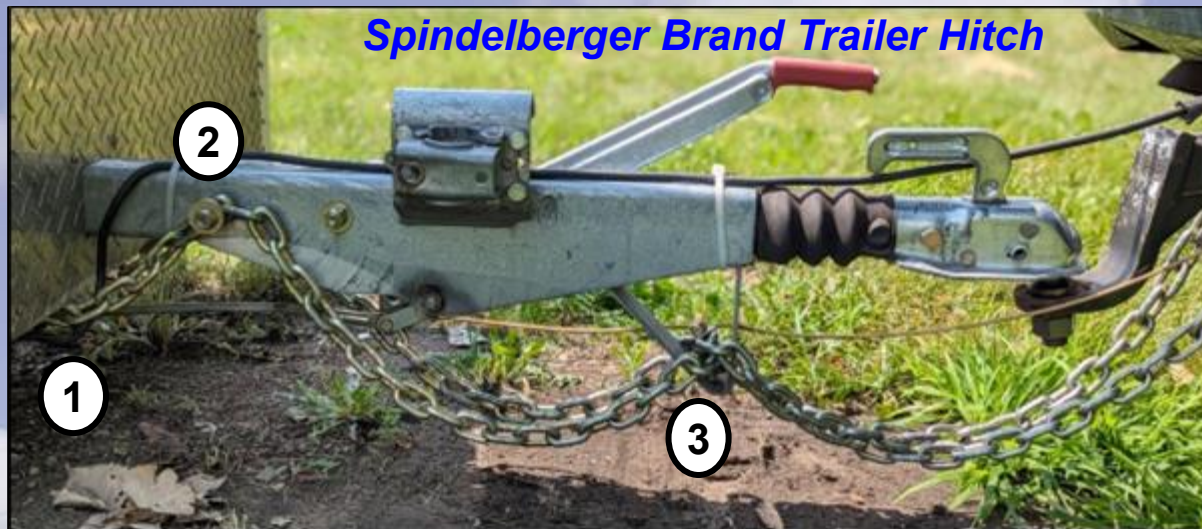
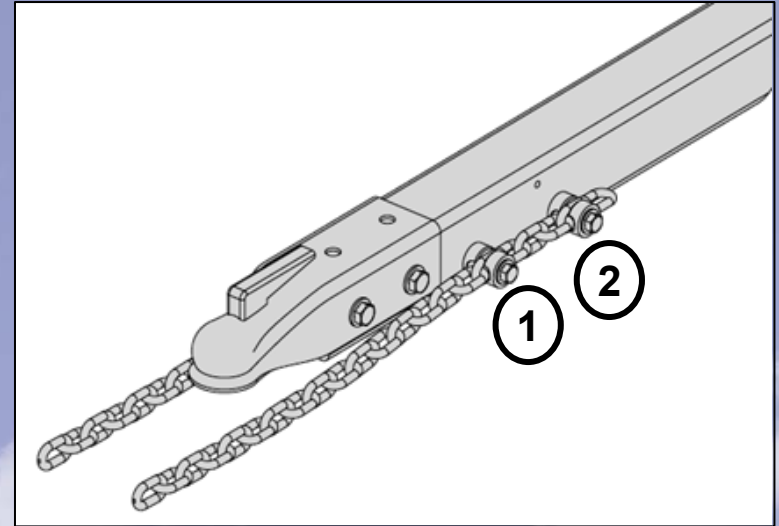


<https://pacifictrailers.com/blogs/boat-trailer-tips-advice/safety-chains-vs-safety-cables>

Attaching Chains to Your Trailer

Many trailers have the chains attached in only one place. I believe that attaching chains to the trailer in more than one location is the best plan.

Attaching chains in multiple places increases redundancy so if one bolt breaks then the others can help to save the day!



Used strong bolts to attach chains
(grade 8 or stronger)

Sources: <https://mechanicalelements.com/how-to-attach-safety-chains>
<https://mechanicalelements.com/improving-safety-chains-attach-connections>

Connecting Chains to Your Vehicle's Hitch

CHAINS MUST NEVER DRAG ON THE GROUND!!

You should always use safety chains with hooks **that have spring latches**. This helps prevent the hook from departing the vehicle on rough roads.



Connecting Chains to Your Vehicle's Hitch

There are times where the vehicle's hitch's "loops" are too small to allow your chains to fit through.

In that case the use of strong quick links or shackles can be used to allow room for the chain to fit through.



TERRIBLE! Snap Link
Maximum 350 lbs.

BETTER! Quick Links
Maximum 3,250 lbs.

BEST! Shackles
Maximum 6,000 lbs.



Proper Length of the Chains

To prevent damage to the chains they should be a **minimum of 5" above the ground.**

Chains should be **just long enough without** the chains becoming taut during sharp turns.

NEVER allow the chains to drag on the ground.



See the next slides on the **right** and **wrong** ways to shorten chains which are too long

Sources: <https://mechanicalelements.com/ways-to-shorten-a-chain/>
<https://www.youtube.com/watch?v=QMeqZFDfCaI>

Shortening Chains – The **WRONG!** Ways

Hanging the Chains

Reason: If the coupler comes off the ball the extra length of the chain increases the disconnect impact force which can break the connection between the vehicle and the trailer



Twisting the Chains

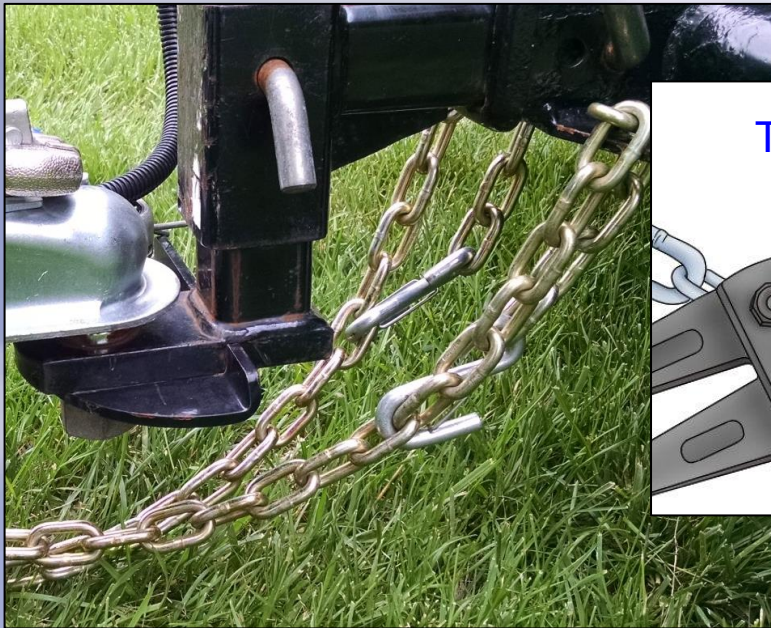
Reason: Twisting weakens the chains. See the link below.



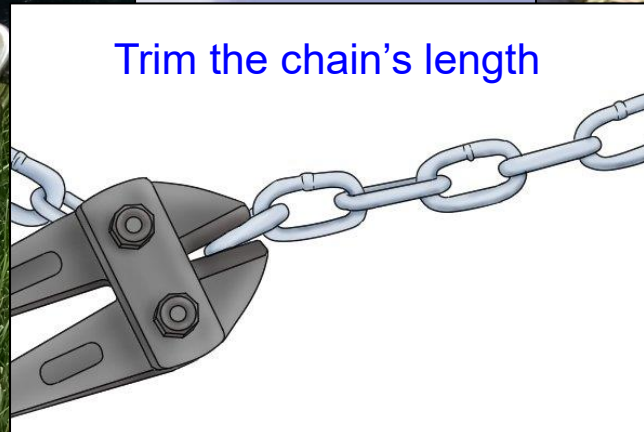
Source: <https://mechanicalelements.com/twisting-safety-chains/>

Shortening Chains – The **RIGHT!** Ways

Loop the chain through the hitch and hooked onto itself



Take up the chain's slack with a Double Clevis



Sources: <https://mechanicalelements.com/ways-to-shorten-a-chain/>
<https://mechanicalelements.com/twisting-safety-chains/>

NEVER WELD CHAINS TO THE TRAILER!

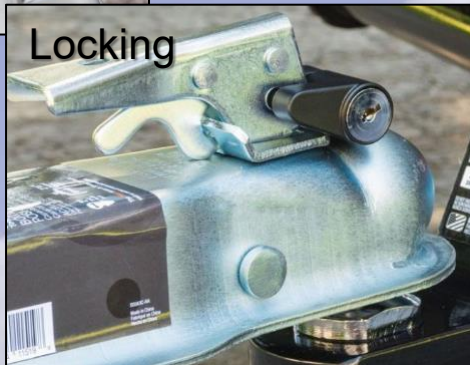
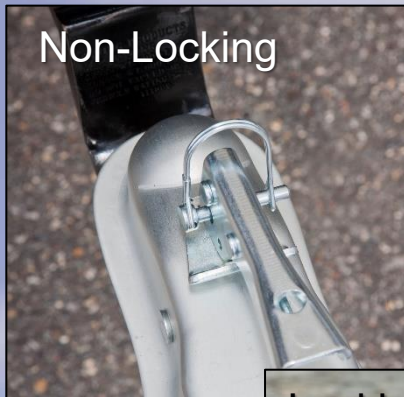
Reason: The process of welding applies high heat to the chains which greatly weakens them



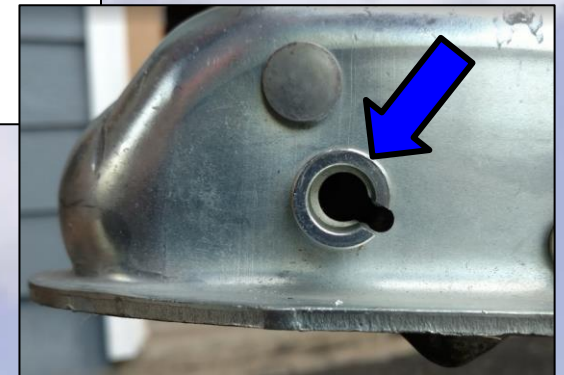
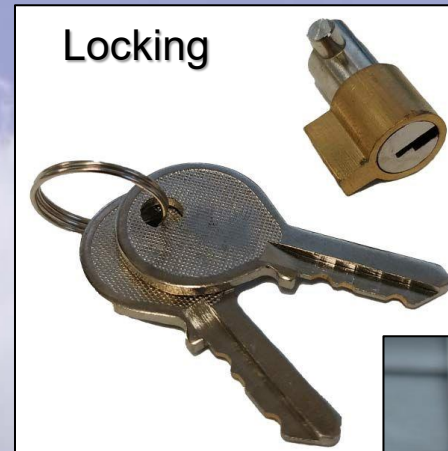
Locking the Coupler

You must always prevent the coupler from opening for **safety** and to prevent an accident.

Capturing Pin for a
Standard US Coupler



Lock for a Cobra Trailer
Al-Ko Coupler



<https://wingsandwheels.com/cobra-coupler-lock-keys.html>

Trailing Regulations Per Each US State

☐ Alabama

<https://alison.legislature.state.al.us/code-of-alabama?section=32-9-1>

☐ Alaska

<http://www.touchngo.com/lglcntr/akstats/aac/title13/chapter004/section275.htm>

☐ Arizona

<https://www.azleg.gov/viewDocument/?docName=https://www.azleg.gov/ars/28/00981.htm>

☐ Arkansas

<https://law.justia.com/codes/arkansas/2010/title-27/subtitle-3/chapter-35/subchapter-1/27-35-111/>

☐ California

<http://codes.findlaw.com/ca/vehicle-code/veh-sect-29004.html>
<http://www.eyershitch.com/california-towing-laws.html>

☐ Colorado

<https://law.justia.com/codes/colorado/2016/title-42/regulation-of-vehicles-and-traffic/article-4/part-5/section-42-4-506/>

☐ Connecticut

<https://eregulations.ct.gov/eRegsPortal/Browse/RCSA?id=Title%2014|14-137|14-137-124|14-137-124>
<http://www.ct.gov/dmv/cwp/view.asp?a=804&q=244914>

State by State List Curtesy of Piet Barber - Please Advise Corrections

Trailing Regulations Per Each US State

❑ Delaware

<http://delcode.delaware.gov/title21/c043/sc01/index.shtm>

https://www.dmv.de.gov/services/vehicle_services/other/ve_other_general.shtml

[https://www.dmv.de.gov/forms/veh_serv_forms/pdfs/Vehicle Inspection Manual.pdf?022516](https://www.dmv.de.gov/forms/veh_serv_forms/pdfs/Vehicle_Inspection_Manual.pdf?022516)

❑ Florida

http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0300-0399/0316/Sections/0316.530.html

<https://www.law.cornell.edu/cfr/text/49/393.71>

❑ Georgia

<http://www.legis.ga.gov/Legislation/20152016/146112.pdf>

<http://www.legis.ga.gov/Legislation/20152016/153467.pdf>

https://www.boat-ed.com/georgia/studyGuide/Trailer-Safety-Chains/10101102_700139976/

❑ Hawaii

<http://hidot.hawaii.gov/highways/files/2017/12/Rules-Amending-Title-133-2-10-12-17.pdf>

❑ Idaho

<https://legislature.idaho.gov/statutesrules/idstat/title49/t49ch9/>

❑ Illinois

<https://www.ilga.gov/legislation/ilcs/fulltext.asp?DocName=062500050K15-107>

State by State List Curtesy of Piet Barber - Please Advise Corrections

Trailing Regulations Per Each US State

☐ Indiana

<http://codes.findlaw.com/in/title-9-motor-vehicles/in-code-sect-9-20-9-8.html>

☐ Iowa

<https://www.legis.iowa.gov/docs/iacode/2001/321/462.html>

☐ Kansas

<http://www.kscoplaw.com/vehcode/art19.html>

☐ Kentucky

<http://www.lrc.ky.gov/Statutes/chapter.aspx?id=38038>

☐ Louisiana

<https://law.justia.com/codes/louisiana/2011/rs/title32/rs32-384/>

☐ Maine

<http://legislature.maine.gov/legis/statutes/29-A/title29-Asec2385.html>

☐ Maryland

<http://mgaleg.maryland.gov/webmga/frmStatutesText.aspx?pid=&tab=subject5&tab=&ys=2017RS&article=gtr§ion=24-107&ext=html&session=2017RS>

☐ Massachusetts

<https://www.mass.gov/files/documents/2017/10/19/540cmr22.pdf>

☐ Michigan

[http://www.legislature.mi.gov/\(S\(ppmbfkxrptwij10eqkmype0f\)\)/mileg.aspx?page=GetObject&objectname=mcl-257-721](http://www.legislature.mi.gov/(S(ppmbfkxrptwij10eqkmype0f))/mileg.aspx?page=GetObject&objectname=mcl-257-721)

☐ Minnesota

<https://www.revisor.mn.gov/statutes/?id=169.82>

State by State List Curtesy of Piet Barber - Please Advise Corrections

Trailing Regulations Per Each US State

☐ Mississippi

<https://law.justia.com/codes/mississippi/2010/title-63/5/63-5-25>

☐ Missouri

<https://law.justia.com/codes/missouri/2005/t19/3070000170.html>

☐ Montana

http://leg.mt.gov/bills/mca/title_0610/chapter_0090/part_0020/section_0080/0610-0090-0020-0080.html

☐ Nebraska

<http://codes.findlaw.com/ne/chapter-60-motor-vehicles/ne-rev-st-sect-60-6-246.html>

☐ Nevada

<https://www.leg.state.nv.us/register/2004Register/R046-04A.pdf>

☐ New Hampshire

https://www.lawserver.com/law/state/new-hampshire/nh-statutes/new_hampshire_revised_statutes_266-63

☐ New Jersey

<http://codes.findlaw.com/nj/title-39-motor-vehicles-and-traffic-regulation/nj-st-sect-39-4-54.html>

☐ New Mexico

<https://law.justia.com/codes/new-mexico/2016/chapter-66/article-7/part-5/section-66-7-408/>

State by State List Curtesy of Piet Barber - Please Advise Corrections

Trailing Regulations Per Each US State

☐ New York

[https://govt.westlaw.com/nycrr/Document/I504e17f2cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/nycrr/Document/I504e17f2cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default))

☐ North Carolina

<http://codes.findlaw.com/nc/chapter-20-motor-vehicles/nc-gen-st-sect-20-123.html>

☐ North Dakota

<http://www.legis.nd.gov/cencode/t39c21.pdf>

☐ Ohio

<http://codes.ohio.gov/orc/4513.32>

☐ Oklahoma

<https://law.justia.com/codes/oklahoma/2014/title-47/section-47-12-405.1/>

☐ Oregon

<https://law.justia.com/codes/oregon/2015/volume-17/chapter-818/section-818.150>

☐ Pennsylvania

<http://codes.findlaw.com/pa/title-75-pacsa-vehicles/pa-csa-sect-75-4905.html>

☐ Rhode Island

<https://law.justia.com/codes/rhode-island/2012/title-31/chapter-31-25/>

☐ South Carolina

https://www.lawserver.com/law/state/south-carolina/sc-code/south_carolina_code_56-5-5150

State by State List Curtesy of Piet Barber - Please Advise Corrections

Trailing Regulations Per Each US State

☐ South Dakota

http://www.sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=32-19

☐ Tennessee

<https://law.justia.com/codes/tennessee/2010/title-55/chapter-7/part-1/55-7-114/>

☐ Texas

<http://www.statutes.legis.state.tx.us/Docs/TN/htm/TN.545.htm>

http://txrules.elaws.us/rule/title37_chapter21_sec.21.5

☐ Utah

<https://le.utah.gov/xcode/Title41/Chapter6A/41-6a-S1634.html>

☐ Vermont

<https://law.justia.com/codes/vermont/2016/title-23/chapter-13/section-1341/>

☐ Virginia

<https://law.lis.virginia.gov/vacode/title46.2/chapter10/section46.2-1118/>

☐ Washington

<https://app.leg.wa.gov/wac/default.aspx?cite=204-70-070>

☐ West Virginia

<http://www.wvlegislature.gov/WVCODE/ChapterEntire.cfm?chap=17c&art=17>

☐ Wisconsin

<https://docs.legis.wisconsin.gov/statutes/statutes/347/III/47>

State by State List Courtesy of Piet Barber - Please Advise Corrections

Trailing Regulations Per Each US State

☐ Wyoming

<https://law.justia.com/codes/wyoming/2016/title-31/>

☐ District of Columbia

<https://code.dccouncil.us/dc/council/code/titles/50>

State by State List Curtesy of Piet Barber - Please Advise Corrections

Internet Resources

❑ Videos

- <https://www.youtube.com/watch?v=QMeqZFDFCaI>
- <https://www.youtube.com/watch?v=iCDt4tjxp-E>

❑ Safety

- <https://pacifictrailers.com/blogs/boat-trailer-tips-advice/safety-chains-vs-safety-cables>

❑ Hardware Sources

- <https://www.etrailer.com/>

❑ Trailer Engineering Details

- <http://aviation.derosaweb.net/presentations/documents/Trailer-Engineering-Guide-for-Safety-Chain-Installation.pdf>

Trailer Wiring

For details See ...

<https://aviation.derosaweb.net/presentations/#trailerwiring>

Trailer Wiring & LED Conversion For Glider Pilots



Remember...

“Chains are Only as Strong as the Weakest Link”



Other Presentations

- Glider Electrical Wiring
- Transceiver Troubleshooting
- Oxygen Systems
- Working with Glider Air Lines
- Trailer Wiring & LED Lighting
- Trailer Towing & Chains
- Soaring Pilot Relief Systems
- Battery Testing
- Emergency Location Devices
- Survival Kits
- Bailing Out Successfully
- Spar Alignment Tool
- L'Hotellier Fittings
- Carbon Fiber Panels
- IGC Filename Decoding
- Blanik L-23 Strut Work
- Removing Painted Lettering
- Open Glider Network
- Instrument Knob Extensions
- Landing Gear Warning

<http://aviation.derosaweb.net/presentations>

Let me know of any comments!