Safety Chains and Cables

Train Mountain Rules of the Road
Rule 6. "SAFETY CHAINS OR DRAWBARS REQUIRED BETWEEN ALL CARS. Some grades are more than a mile long. This rule prevents runaway cars."

No further criteria is provided. However, if one thinks about it, this rule contains enough information for an individual engineer or builder to determine what type and strength of SAFETY CHAINS OR DRAWBARS will be required for each individual train.

Each train is different. Therefore, the common sense rule of will the SAFETY CHAIN or DRAWBAR being used prevent runaway cars? After all, that is the actual goal the rule.

If one has a long and/or heavy train, the common sense rule will require much heaver and stronger equipment than that needed for a short light train. For example, take what is strong enough for a passenger train with a six car consist of passenger cars hauling eighteen 250 pound adults, and compare that to what is strong enough for one person on a speeder pulling one flat car with an ice chest. The requirement is that there are no runaway cars. Different consists require different solutions.

One must ask about each car connection on their train, "If my coupler fails, will the SAFETY CHAIN at this point hold the entire load that was being held by the failed coupler?"

In the real world, there is no such thing as absolute safety, but we are able to accomplish reasonable safety. This what we must strive for - reasonable safety. Or, as applied to SAFETY CHAINS, using common sense. Ask yourself this question, "To the best of my knowledge, I do believe my SAFETY CHAINS will prevent me from having runaway cars?"

Example of a Drawbar

This is an example of one type of DRAWBAR. This particular setup features a DRAWBAR connection that pivots both up, down and sideways.

DRAWBARS are generally very reliable and do not require a SAFETY CHAIN backup.

Caveat: The weak points in a DRAWBAR setup are the BOLTS holding the DRAWBAR to the car or locomotive, and thus require regular inspection.

Note, in the image, the BOLT holding the DRAWBAR into the COUPLER POCKET on the right is loose. This must be repaired before this consist is placed back in service.

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Examples of Safety Chains and Cables

This example shows 3/16" WELDED LINK CHAIN, with 1/4" QUICKLINKS. Because the QUICKLINK is the weakest point, using the larger size makes this a good combination for heavy loads. It is **recommended** that the CHAIN be **no less than 3/16" WELDED LINK CHAIN**.

This example shows a SAFETY CABLE with a QUICKLINK and MOUNTING BRACKETS. This setup is one of the most popular at Train Mountain, and these parts are sold in the Train Mountain Company Store.

THIS TYPE OF CHAIN IS UNACCEPTABLE

Decorative chain like this is **UNACCEPTABLE**. Small size chain and any chain that does not have welded links is generally unacceptable.

Examples of Safety Cable Failures

The top example shows a failure of the QUICKLINK. Most likely this was caused by the QUICKLINK not being screwed closed securely.

The bottom example shows a failure of the CABLE CRIMP. This was most likely caused by either a defective crimp when the cable was manufactured, or more likely, by exceeding the design strength of the CABLE CRIMP.

Any Safety Cable is only as strong as its weakest point. The CRIMP and the QUICKLINK are the weakest point when using cables.

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Examples of Safety Chain Connection Points

This example shows a WELDED EYEBOLT on the locomotive on the right, and a TAB welded to the car on the left.

Note: The SAFETY CHAIN in this example is twisted. This is commonly done to effectively shorten a CHAIN which is too long for a particular connection. A CHAIN is too long when it hangs down low enough to catch on something, e.g., a switch point or frog.

This example shows a CONNECTION BRACKET which is BOLTED to the car.

Note: In this example the BOLT goes through the CONNECTION BRACKET into the COUPLER POCKET through the COUPLER then out the top of the COUPLER POCKET where it is secured by a NUT.

Caveat: If the NUT comes loose or the BOLT fails, both the COUPLER and the SAFETY CHAIN connection are lost. Thus, it is imperative that these connections be inspected regularly.

This example Shows a CONNECTION BRACKET which is both BOLTED and WELDED to the car.

Note: Like the above example the BOLT goes through the CONNECTION BRACKET and also holds the COUPLER into the COUPLER POCKET.

But unlike the above example, the CONNECTION BRACKET for the SAFETY CHAIN is also WELDED to the car. Thus if the BOLT fails and the COUPLER comes loose, the SAFETY CHAIN connection is still intact.

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This example shows a CONNECTION BRACKET which is BOLTED to a locomotive.

This type of connection has a history of being strong and dependable.

Caveat: The weak point in this type of setup is the BOLT and NUT. The BOLT and NUT must be checked regularly to ensure they are properly tightened and in good condition.

Also observe that the unconnected cable end is secured to a point high enough to prevent it falling down and catching on something that just might ruin your day.

This example shows a safety cable on the last car of a consist that is not in use, and it has the quicklink on the free end secured to the car.

Note: It is imperative that the FREE END of the SAFETY CHAIN or CABLE be secured so that it cannot accidently catch on something. Just hooking the QUICKLINK is not enough. The QUICKLINK must be both hooked and screwed close as in the image.

This example shows what can happen when the free end of an unused safety cable or chain is not properly secured.

Depending on the speed of the train at the time, there are many scenarios as to the extent of any damage that may occur when a safety chain or cable becomes accidently jammed into a track part.

Anyone who has had this happen will confirm that it can ruin your day. That it would have been well worth spending the small amount of time needed to properly secure the free end of the safety cable or chain.