



Kansas RTAP Fact Sheet

A Service of The University of Kansas Transportation Center for Rural Transit Providers

Corrosion and Wear in Securement Devices

Where to look for corrosion and wear, and how and why to avoid it

By Anne Lowder

Corrosion and debris can damage the L-Track on your transit vehicle and keep the wheelchair securement components from locking into place. This article will stress the need to be diligent about inspecting and maintaining your L-Track and Wheelchair Tie-Down and Occupant Restraint Systems (WTORS).

What to look for

The L-Track installed in your vehicle is constructed from aluminum alloy to help protect it from corrosion but it can still corrode when day-to-day environmental conditions such as rain, snow, ice, mud de-icing chemicals and road salt get into and around the L-Track.

The track metal is especially prone to corrosion at the points where the track makes contact with and is bolted to the bus floor. Q'Straint recommends that the gaps between the track and flooring be caulked to prevent moisture from being trapped in these areas. Trapped moisture and moist debris such as leaves lead to corrosion of the track and track bolts.

The L-Track should be inspected for debris and corrosion as part of the daily pre-trip inspection. In addition, the L-Track should be inspected quarterly for deterioration (wear) of the metal around the edges of the track holes and corrosion of the track and track bolts. The bolts that secure the track to the floor are inserted in 4-inch increments. Each bolt should be checked to make sure it is tight. Replace corroded bolts with replacement parts certified by the manufacturer.



MAINTENANCE TIPS FOR SECUREMENT EQUIPMENT

The photo above shows an older retractable strap with an S-hook that has rusted into place in the track. To help avoid damage like this:

- Always keep securement belts and retractors clean and off the floor by using a storage device such as Q'Straint's wall pouch. One storage device per wheelchair location is recommended.
- All systems and components should be regularly inspected and cleaned.
- Clean belts periodically with mild soap and water. After cleaning, fully extend the belts (and position them to prevent water from entering retractors) until completely dry. Take care to prevent contamination of the belts with polishes, oils or other chemicals (particularly battery acid).
- Occasionally lubricate tie-down buckles at the hinges, being careful not to contaminate the belts.
- Clean bolt threads and re-install permanent thread locker when replacing bolt.
- Frayed, contaminated or damaged belts should be replaced.
- Broken and worn components should be replaced.
- Systems or components (including those permanently secured to floor or wall) suspected to have been in use during a vehicle impact from which the vehicle has been towed, should be replaced.

Adapted from Q'Straint Installation Instructions: Vehicle Anchorages and Accessories for 4-Point Wheelchair Securement Systems, 2009.

It is important to not secure a wheelchair to a corroded or a damaged L-Track. Q'Straint instructor Chris Yarber stated at a recent national training event:

"Do not use a damaged L-Track but replace it immediately. A damaged track could fail during an incident."

Check for free movement

The L-Track has several securement location options (holes) to be able to accommodate wheelchairs of different sizes and designs. The securement device locks into one of these holes and needs to move freely along the track before locking into place. Check for free movement by testing the plunger portion of the retractor securement device to make sure it can securely lock in place at each hole. If the fitting becomes stuck as you move it along the L-track or the plunger does not lock into place, inspect the track to determine why. Possible reasons that the fitting will not secure are: corrosion of the L-Track, wear around holes into which the plunger locks, and debris in the track.

Look for fastener corrosion

The retractor component of your securement system is constructed from hardened steel and coated in zinc for maximum corrosion resistance. However, environmental conditions (the same as with the L-Track) can damage the retractor.

Also, leaving the retractor in the L-Track instead of storing it properly in its storage pouch (ideally mounted on the bus wall) can create situations where the retractor can be damaged. To illustrate, Chris Yarber told a Q'Straint class of a situation where a boarding wheelchair rolled over a retractor that was locked into the L-Track instead of being stored properly in its pouch. The weight of the wheelchair bent the pin on the retractor that secures the lap and shoulder belt. Maintenance staff used a vice to bend the pin back into place. The retractor then failed during an incident, creating an injury. Q'Straint was sued but not found liable because the transit agency had not followed manufactured-provided best practices in maintenance, inspection, and storage of the equipment, and had used damaged equipment to secure a wheelchair and wheelchair occupant.



Photos by Kansas RTAP / A. Lowder

These are examples of poor maintenance. At left, a securement device has rusted into place because it had not been checked periodically for free movement. At right, accumulated moisture has caused corrosion at the end of the track. Debris is also visible in the track. In the event of an incident, the securement device might fail, endangering the passenger in the secured wheelchair, and others in the vicinity.

Document your inspection

It is important to document inspection and maintenance procedures you perform on of the Wheelchair Tie-Down and Occupant Restraint Systems (WTORS) in your vehicles. Q'Straint recommends that WTORS on all vehicles not only be inspected during a pre-trip inspection but also have a complete Q'Straint WTORS Evaluation Report done on a quarterly basis. Instructions, webinars, and reporting documents for the WTORS Evaluation Report can be found on Q'Straint website: http://www.qstraint.com/en_na/training/fleet-evaluation.

In sum

Proper inspection and maintenance of your L-Track, securement devices, and straps will help prevent damaged equipment that could lead to an unsafe wheelchair restraint system. For safety and liability reasons, make sure all your transit vehicles' WTORS are well maintained.

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Sources

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- Q'Straint. Installation Instructions: Vehicle Anchorages and Accessories for 4-Point Wheelchair Securement Systems. 2009. Pg 13. Accessed November 13, 2014. <http://cdnll.discounttramps.com/images/art/Q5-1150.pdf>