

**Q'STRAIT®**

# **Installation Instructions**

# **QER-4000®**

## **Electrical Retractor**



**Covers all Electrical Retractors for front wheelchair tie-downs**

PLEASE LEAVE THESE INSTRUCTIONS IN THE VEHICLE OR SEND THEM ON WITH THE OWNER OPERATOR.



# QER-4000®

## ELECTRICAL RETRACTOR INSTALLATION INSTRUCTIONS



This document is a comprehensive product installation instruction; care must be taken to always be aware of your surroundings when installing this product. The Electrical Retractors are designed and tested to be used in the front positions ONLY within the Q'Strait four point securment systems.

Please read, follow, and understand these instructions completely and report any deviations to your supervisor or your nearest Q'Strait office. Contact information is posted on back page of this document.



**READ ALL INSTRUCTIONS THOROUGHLY  
PRIOR TO INSTALLATION**

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# GENERAL INFORMATION

Q'Straint introduces QER-4000, the world's first 4m front electrical locking retractor for the easy securement of wheelchairs in vehicles.

Q'Straint's QER-4000 4-Point wheelchair & occupant securement systems, when used as recommended, provide the safest means of transportation for wheelchair passengers unable to transfer from their wheelchairs when traveling in motor vehicles. Each component has been designed, engineered and tested to work as one comprehensive system.

- **4m Webbing** - Allows the safe and easy securement to the wheelchair, to take place on flat ground as opposed to on a ramp.
- **Zinc Casing** - Durable casing to protect webbing and ensure product longevity.
- **Extra Lateral Strength Bar** - Provides superior resilience and strength.
- **Compatible With All 12 Volt Vehicles** - The Electric Retractor is easily integrated into the vehicle's electrical system. *Please carefully read, follow, and understand the electrical requirements, recommendations, warnings, and fail-safe system requirements.*
- **Minimum Tensile Strength of 3,300 lbs** - Exceeds industry standards by up to 20%.
- **One Bolt Installation** - Ensures a quick and straightforward installation as only one bolt is required to safely secure the unit to the vehicle floor. (Any other applications different from the above should be reviewed with Q'Straint applications engineering). Contact information is posted on back page of this document.
- **Successfully Undergoes 50,000 Cycle Testing Operations** - Surpasses automotive seatbelt standards.

## PRODUCT DESCRIPTION

This product is designed for use as a front tie-down **ONLY** and is operated using a switched and fused 12 VDC power supply. All systems require application of 12 VDC to the Electric Retractors through a relay that is energized by a momentary electrical switch. Voltage to the Electric Retractors can only be initiated through activation of this one switch. All systems require a second switch that de-energizes the relay, removing voltage to the Electric Retractors. When correctly fitted and wired this product will restrain a maximum of 15kN (3,300lbs) frontal rebound force and can be locked and unlocked as follows:

- o Power on = retractor free, freewheeling webbing in and out.
- o Power off = retractor locked webbing will not come out, but it will self retract.

# WARNINGS, NOTES AND IMPORTANT INFORMATION

**This guide is provided to assist with the installation of securement system components into vehicles' floors and walls. If you have any questions or problems relating to your installation, please contact your nearest Q'Straint office.**

- An experienced technician should always perform the installation, inspection, and maintenance.
- Installers and users should not attempt to repair, adjust, make any alterations, or modify this system in any way without prior written approval from Q'Straint.
- Do not install the system components into unsound materials such as corroded metal, wood, plastic or fibreglass panels without suitable reinforcement.
- Protect the webbing around sharp corners and edges as applicable.
- Prevent contamination of belt webbing from oil, gases, polishes and chemicals, in particular battery acid.
- When fitted into the vehicles electrical system, this product must be suitably fused, switched & grounded. As well as the proper protection of the wires from dirt moisture, and vandalism.
- The Electrical Retractors are tested in a configuration similar to that recommended for installation. The installer is responsible for ensuring that the installation meets all applicable regulations, any deviation from this recommendation is the responsibility of the installer.
- Operation instructions for this product must be incorporated into the vehicles own user instructions.



***If in doubt about the method of installation in the vehicle, contact your nearest Q'Straint office.***

## COMPLIANCE WITH REGULATIONS AND STANDARDS

This product complies with the regulatory requirements within: Americans with Disabilities Act (ADA) - 49 Code of Federal Regulations (CFR) Part 38; "Accessibility Specifications for Transportation Vehicles" – Subpart B - Buses, Vans and Systems. Also covered by CSA Z605 – D409.

This guide is provided to assist with the installation of securement system components into vehicles' floors and walls. If you have any questions or problems relating to your installation, please contact your nearest Q'Straint office.

## ELECTRICAL REQUIREMENTS

- 12VDC 1.5 amps.
- The 12VDC **MUST** to be tied into the vehicles electrical systems, (see Electrical Fail-Safe Systems Requirements).
- When the vehicle is stopped and the parking brake is applied, then 12VDC is applied to the Electric Retractors (see Electrical Fail-Safe Systems Requirements).
- The two wire connectors need to be placed near the Electric Retractors and properly secured, covered, and protected from the elements and vandalism.



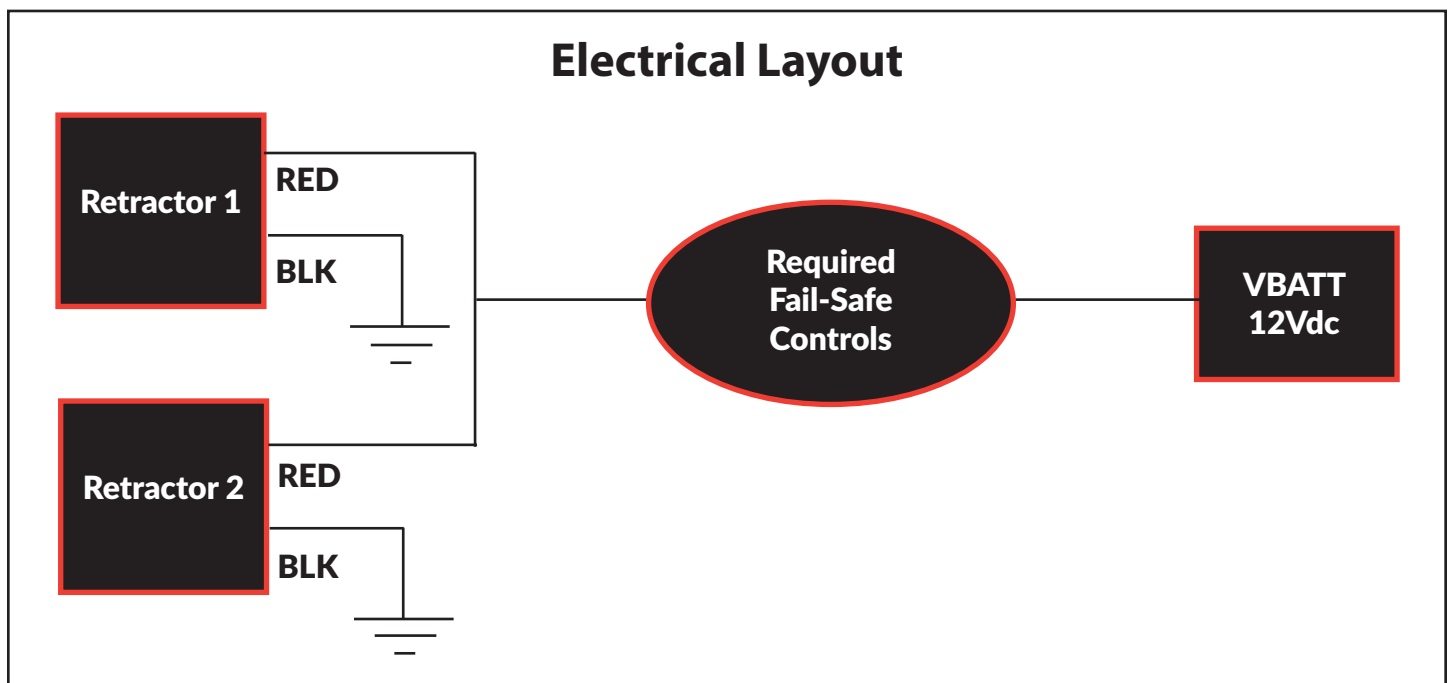
***The Electrical Retractors MUST be tied into the vehicle electrical systems, (see Electrical Fail-Safe Systems Requirements on next page).***

# ELECTRICAL RETRACTOR FAIL-SAFE SYSTEM REQUIREMENTS

All systems require application of 12 VDC to the Electric Retractors through a relay that is energized by a momentary electrical switch. Voltage to the Electric Retractors can only be initiated through activation of this one switch. All systems require a second switch that de-energizes the relay, removing voltage to the Electric Retractors.

In addition to these manual controls, the Electric Retractor installation shall be equipped with fail-safes that help to prevent them from being released while the vehicle is moving. One or more of the following examples are required, and must be used:

1. An electric timer that cuts the voltage to the Electric Retractors may be used within a two (2) minute window of their activation.
2. A tailgate, door, or ramp switch that removes voltage to the retractors when the tailgate or ramp door is closed and the ramp is stowed.
3. A parking brake switch that removes the voltage to the retractors when the parking brake is released.
4. A transmission switch that removes the voltage to the retractors when the transmission is out of park.
5. **Note:** A warning light that illuminates when the 12 volts is applied to the Electric Retractors. (This is not a failsafe, only a visual warning).



## System Checklist

Each Q'Straint system and its components are designed and engineered as a complete, integrated securement system to provide wheelchair passengers with maximum transportation safety.

In general, the following parts make a complete wheelchair / passenger securement system. Please verify to ensure all parts are included. If anything is missing, contact your nearest Q'Straint office or distributor.

- |   |   |
|---|---|
| <input type="checkbox"/> Wheelchair Tie-down Retractors (4)                 | <input type="checkbox"/> Installation Instructions (1)    |
| <input type="checkbox"/> Occupant Restraint Lap Belt* (1)                   | <input type="checkbox"/> Driver/Operator Instructions (1) |
| <input type="checkbox"/> Occupant Shoulder Belt* (1)<br>& Mounting Hardware | <input type="checkbox"/> In-Vehicle Instruction Label (1) |
|   | <input type="checkbox"/> Warranty Registration Card (1)   |

\*Occupant Restraint may be a Combination Lap/Shoulder belt.

# WHEELCHAIR OR MOBILITY DEVICE LOCATION RECOMMENDATIONS

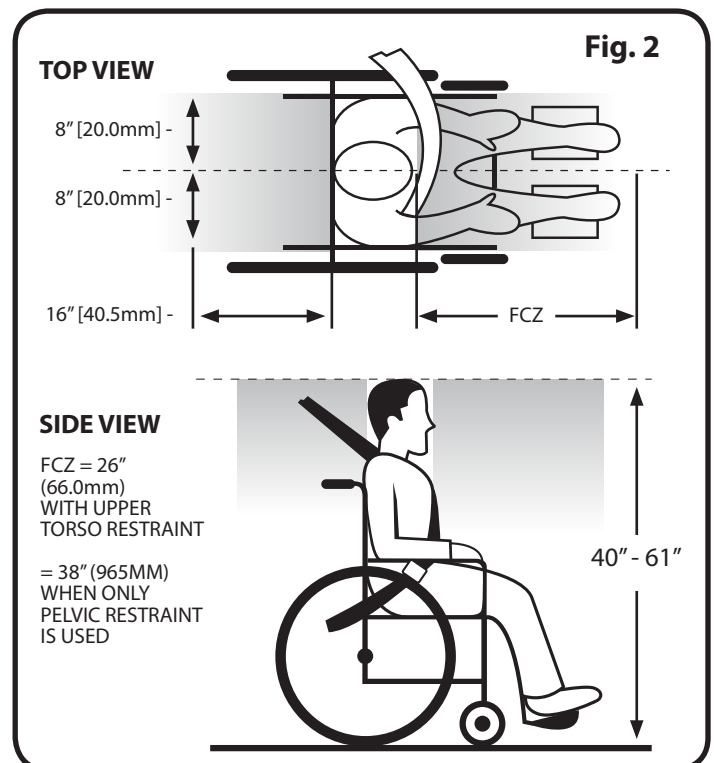
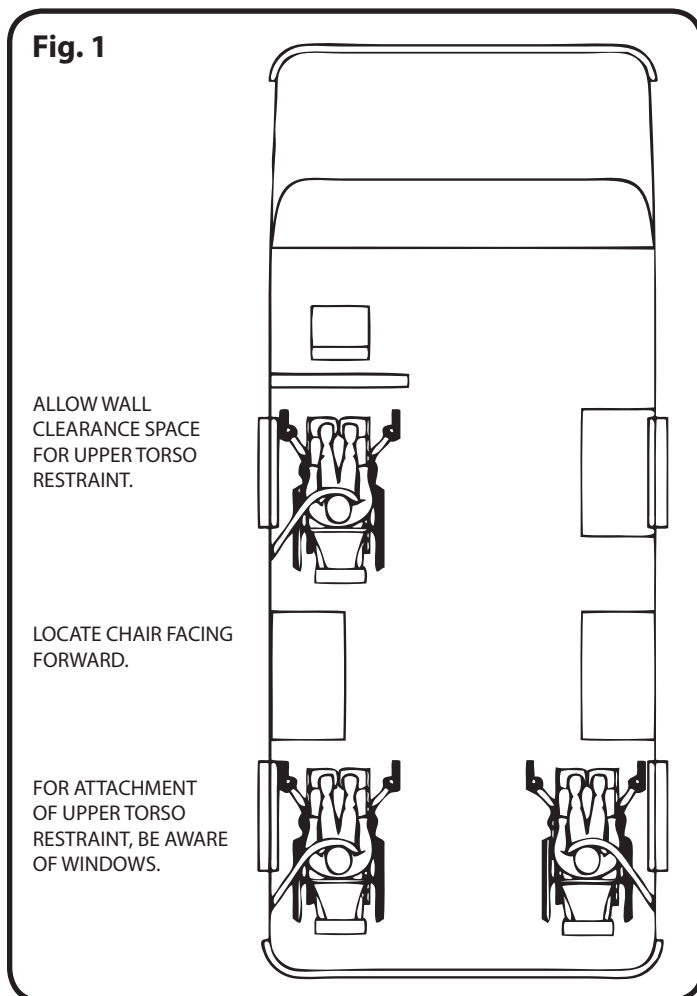


*The following are recommendations for the layout of designated Wheelchair Locations:*

- **TIE-DOWNS SHOULD ONLY BE INSTALLED SO WHEELCHAIR PASSENGERS ARE FORWARD FACING.**  
Note: Wheelchair passengers may face rearward when in compliance with ADA.
- Wheelchair Locations should be situated as close to the accessible entrance as practical with an unobstructed path to each location (if multiple locations are provided).
- Ensure there is sufficient space to allow driver/attendant the ability to move around Wheelchair Location, and to properly secure wheelchair passengers.
- Check for wall clearance, allowing space for installation of floor anchorages and shoulder belt (Figure 1).
- Wheelchair passenger Frontal Clear Zone (FCZ) requirements (Figure 2) are based on potential movements of the passenger during a crash.
- Recommended distances between anchorage points and vehicle interior components are necessary to prevent wheelchair passenger injuries within the designated FCZ.

To reduce the possibility of head and chest injuries to wheelchair passengers, vehicle interior components should not be located in the designated Wheelchair Location unless they comply with impact requirements of FMVSS 201 or equivalent.

## FLOOR ANCHORAGE INSTALLATION



**Recommended Frontal Clear Zones (FCZ):**

Seated Head Height (SHT) ranges from 40" (1,016mm) for a 6-year old child to 61" (1,550mm) for a tall adult.

*Note: We strongly recommend the use of lap and shoulder belts to reduce the possibility of head and chest impacts with vehicles components. FCZ may not be achievable with wheelchair-seated drivers.*

# FLOOR ANCHORAGE INSTALLATION

The following instructions are for Q'Straint's most common floor anchorages. If the floor anchorage received is not included in these instructions, contact Customer Satisfaction at your nearest Q'Straint office or visit our website at [www.qstraint.com/support](http://www.qstraint.com/support) to download additional instructions.

## Floor Anchorage Layout Recommendations

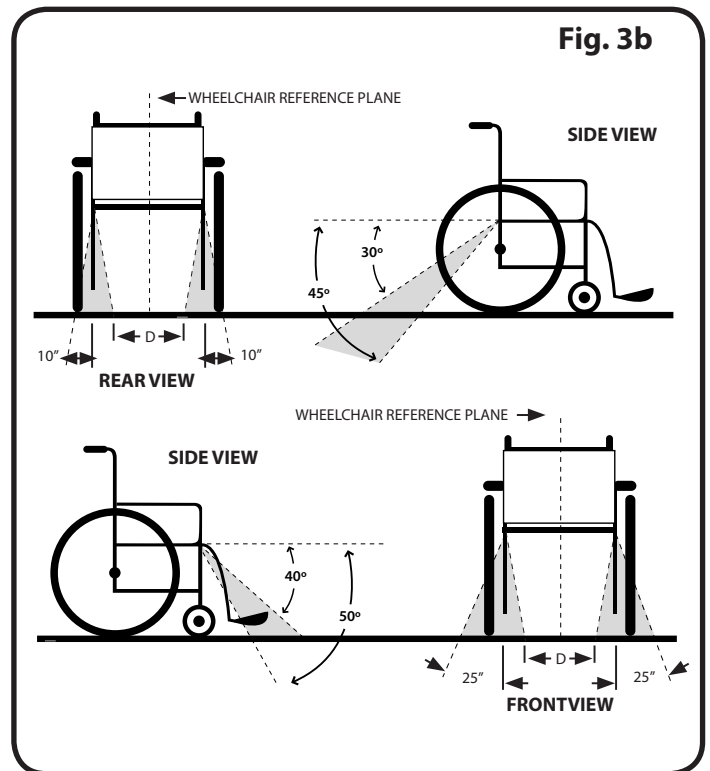
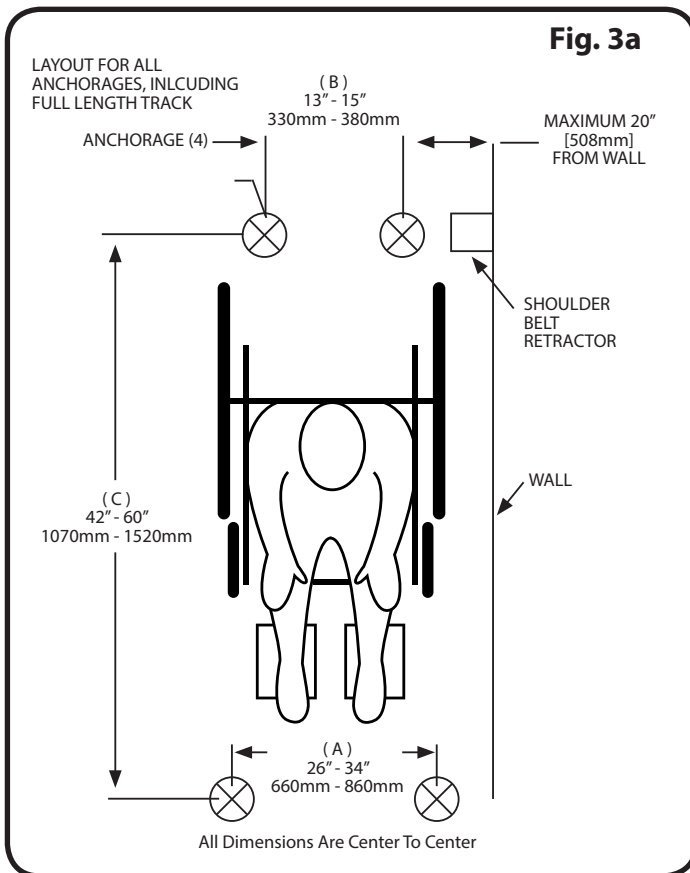
The following are the recommended best installation practices and distances (center-to-center) between floor anchorages (Figure 3a):

- (A) Front to Front = 26" - 34" (660 - 860mm)
- (B) Rear to Rear = 13" - 15" (330 - 380mm)
- (C) Front to Rear = 42" - 60" (1,070 - 1,520mm)\*

**Recommended distances are based on common wheelchair sizes. Exceptionally large or small wheelchairs may require anchorage spacing that differs from our recommendation. Consider optimal tie-down angles (Figure 3b) to determine exact placement of floor anchorages.**

### Other Items to consider when determining floor anchorage placement:

- Tie-downs should never pass through wheels of the wheelchair
- Tie-downs should have a clear path from floor anchorages to the wheelchair frame without infringing on any parts of the wheelchair (i.e. footrests)
- Optimal angle of tie-downs for crash protection and maximum stability of the wheelchair are illustrated (Figure 3b).

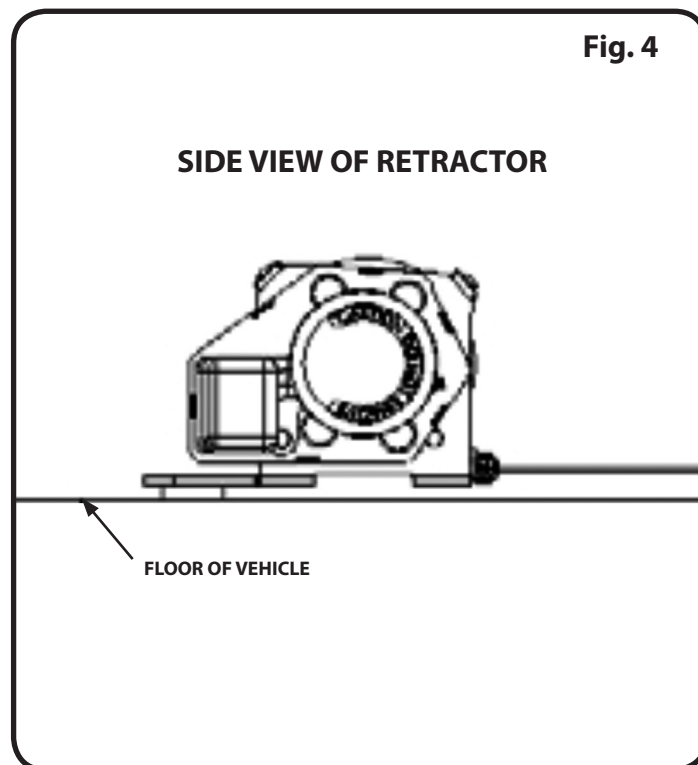


Preferred locations and angles of tie-downs from wheelchair securement points to vehicle anchor points. Front tie-downs should be angled out for lateral stability when possible. D=12" (305mm).





- **Before installing floor anchorages check with local transportation and regulatory authorities for minimum/maximum Wheelchair Location space and emergency exit requirements.**
- **Inspect underside of the vehicle floor and note utilities, frames, cross-members, fuel tanks or other possible obstructions before beginning installation.**
- **Recommended distance between the wall and the nearest rear floor anchorage should not exceed 20" (510mm). Greater distance from the wall may prevent proper shoulder belt use, increasing the risk of wheelchair passenger injury.**
- **Do not install anchorages or any system component into unsound materials such as corroded metal, wood, plastic or fiberglass panels without suitable reinforcement.**
- If not using Q'Straint provided hardware, use only minimum Grade 8 or hardware meeting SAE J429 or ASTM 574 specifications (depending on head style and drive), and coated for adequate protection against corrosion per ISO 7253 or ASTM B117.
- Electrical Retractors should be mounted so that it is clear of any obstructions and should not be in an area where it could be damaged due to moving passengers or any goods being carried within the vehicle.
- Q'Straint recommends that the Electrical Retractors are installed horizontally, in line with the plane of intended use of the wheelchairs final position (Figure 4).
- Electrical Retractors should not be mounted in a vertical plane as this can cause the webbing to jam or otherwise foul with the webbing guide causing it to lock or cause damage to the guide.
- Vehicle anchor points may require reinforcement. The installer or manufacturer is responsible for ensuring anchorages are installed into suitable floor and wall structures; floor and wall strength must meet applicable performance requirements outside the scope of this document. **Any modifications to the backing plate must only be made where necessary as smaller plate size reduces the floor load distribution. Always leave a minimum of 0.6" (15mm) adjacent the bolt hole in the plate.**



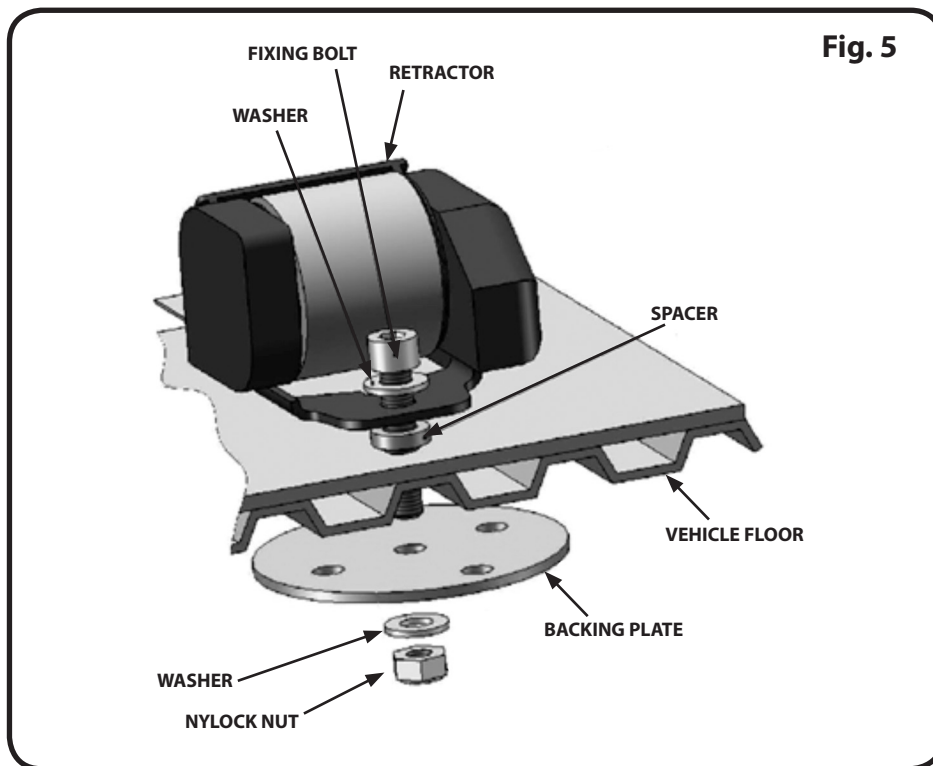
# ELECTRICAL RETRACTOR MOUNTING

1. Determine location of the Electrical Retractors (Figures 3a & 3b).  
(Note: If using PLI fitting as anchorage, follow steps 7 & 8 on the following page).
2. Use retractor as a template to mark center hole to be drilled.
3. Remove retractor and drill a clearance hole for a 3/8" (10mm) bolt through the floor.



**IMPORTANT: Remember to inspect underside of the vehicle floor and note utilities, frames, cross-members, fuel tanks or other possible obstructions before beginning installation.**

4. Clean out debris and pass 3/8" (10mm) bolt through retractor spacer and floor. Hardware stack up recommendations (Figure 5).
5. From underneath vehicle floor, place backing plate and washer over bolt. Sealant may be used between backing plate and floor if desired.\*
6. Securely fasten bolt and lock nut as shown (Figure 5), ensuring at least 2 – 3 threads are sticking out past the nut. **Recommended torque = 35 FT/LB (47 N.m.)**. To attain the proper product swivel, torque the hardware then back off ¼ turn check swivel. For proper swivel you should be able to rotate the retractor while under resistance.

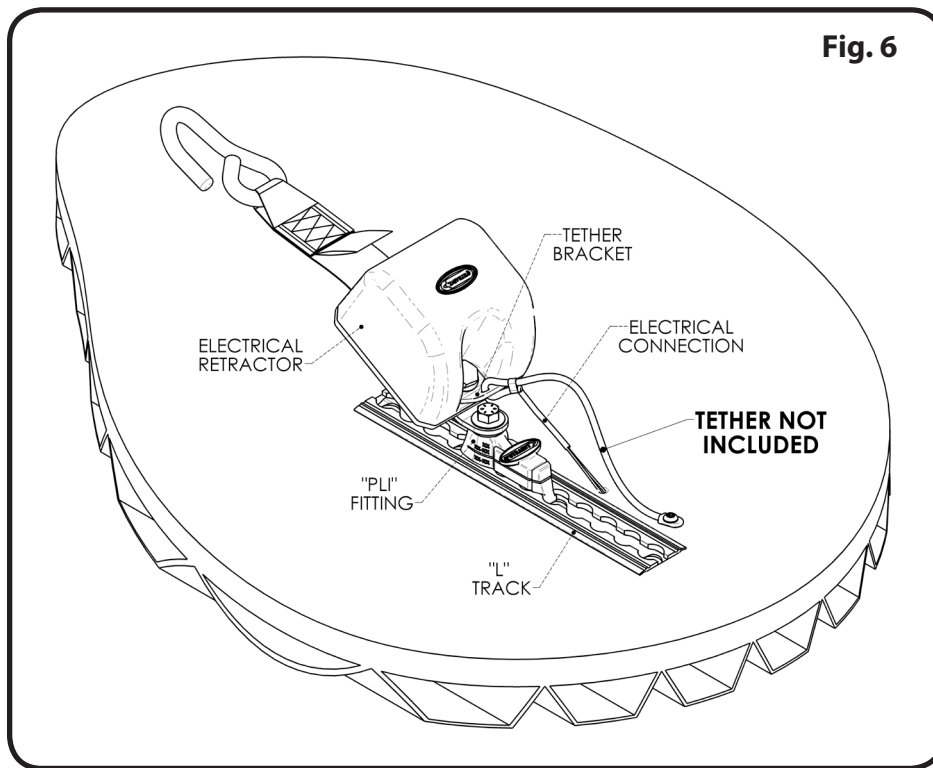


# ELECTRICAL RETRACTOR MOUNTING ON PLI

7. Attach retractors to L Track using as reference (Figures 3a & 3b).
8. Tether retractor to vehicle to prevent sudden removal and damage; tether length must be lesser that the length of the electrical connection harness (Figure 6). (Applies only when retractor is mounted on PLI fitting)



**IMPORTANT: Failure to tether retractor will void warranty.**  
**(Applies only when .retractor is mounted on PLI fitting)**





## WARNINGS

- Do not alter or modify the system or components in any way without first consulting Q'Straint.
- The system is a complete, integrated system. Do not interchange or substitute any components.
- Q'Straint systems and components have been tested in a configuration similar to that recommended in these instructions. Any deviation from these recommendations is the responsibility of the installer.
- Systems and components should only be installed by an experienced technician.
- Installer is responsible for ensuring that installation meets all applicable regulations and standards.
- Do not install anchorages or any system component into unsound materials such as corroded metal, wood, plastic or fiberglass panels without suitable reinforcement.
- Regulations and standards in some countries require installation of a shoulder belt to be considered a complete system.
- Verify with your local authorities for any specific local regulations, standards or requirements.
- All interior vehicle padding should comply with the requirements of FMVSS 201/302 and ISO 3795.
- Protect all webbing from contacting sharp corners and edges.
- If a head restraint is anchored to the vehicle, a vehicle anchored back restraint must be provided to minimize rearward deflection of the wheelchair seatback and thereby prevent injury.
- Airbags should be used only as a supplementary occupant restraint in combination with a wheelchair tie-down and belt type occupant restraint system compliant with requirements of SAE J2249 / ISO 10542.
- Airbags should be disconnected if the wheelchair passenger is positioned less than 7" (175mm) from the airbag module, or if any after-market device is installed so as to block or compromise deployment of the airbag.
- Report all potential damage and defects to your supervisor.
- Replace any systems or components (including floor and wall anchorages) that were used during a vehicle collision.
- In the event of any questions relating to the method of installation and/or use of wheelchair & occupant securement systems (or components), please consult your nearest Q'Straint office.
- Electric Retractors are designed to be used on a fixed mounted location only.
- Electric Retractors mounted on PLI fitting must be tethered to vehicle; failure to tether retractor will void warranty.

**IF YOU HAVE ANY QUESTIONS OR NEED ADDITIONAL INFORMATION  
PLEASE CONTACT YOUR NEAREST Q'STRAIN OFFICE**



## MAINTENANCE AND CARE

- **All systems and components should be regularly inspected, cleaned, and maintained.**
  - Clean webbing periodically with mild soap and water. After cleaning, fully extend the webbing (and position them to prevent water from entering retractors) until completely dry.
  - Occasionally lubricate occupant buckles at the hinges being careful not to contaminate the webbing.
  - Clean bolt threads and re-apply permanent thread locker if bolts are adjusted.
- **Prevent contamination of webbing from contact with oil, gases, polishes and chemicals, in particular, battery acid.**
- **Frayed, contaminated or damaged webbing should be replaced.**
- **Broken and worn components should be replaced.**
- **Replace any systems or components (including floor and wall anchorages) that were used during a vehicle collision.**

**IF YOU HAVE ANY QUESTIONS OR NEED ADDITIONAL INFORMATION  
PLEASE CONTACT YOUR NEAREST Q'STRAIT OFFICE**







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This guide contains current information at time of printing.  
Q'Straint reserves the right to modify systems, components or content without notice.



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