

HEAD RUSH TECHNOLOGIES WHITE PAPER

SEQUENCED CONNECTOR SOLUTIONS FOR COMMERCIAL CLIMBING GYMS

Commercial climbing gyms may be seeking additional measures to increase the safe use of their TRUBLUE Auto Belay devices. A sequenced connector system increases the safe use of auto belays by reducing the risk of connecting an auto belay's safety line to the wrong part of a climber's harness.

CHALLENGES WITH CONNECTIONS BETWEEN CLIMBERS AND AUTO BELAYS IN COMMERCIAL CLIMBING GYMS

Climbing gyms using auto belays must ensure a secure connection between the climber's harness and the auto belay connector. Minimizing user errors in this connection helps prevent premature disconnection at height or accidental release of the webbing connector. Such mistakes can cause falls, injuries, or equipment damage, leading to downtime and potential rescues.

Commercial climbing gyms (CCGs) typically use auto belay webbings with auto-locking carabiners, requiring EN-certified harnesses with designated connection points. While these carabiners are safe, they demand proper training for optimal use. CCGs should provide thorough orientations, as recommended in TRUBLUE manuals, to ensure safe auto belay use. However, an even more secure system can further reduce user errors in certain environments.

HISTORY OF SEQUENCED CONNECTOR USAGE

Family entertainment centers (FECs) and fun climb gyms use sequenced connectors to prevent connection errors on their auto belay attractions. These two-part systems include a main connector on the auto belay webbing and proprietary links attached to harnesses and wall anchors. Sequenced connectors ensure the auto belay remains attached to either the harness or wall, preventing disconnection without a secure transfer. FECs can implement these systems by equipping their harness fleet with proprietary links.

Using sequenced connectors has allowed FECs to operate their climbing elements with fewer floor staff managing connections, reduced downtime from uncontrolled retraction of safety lines, and increased safe use by preventing disconnecting at height.

SEQUENCED CONNECTOR POTENTIAL IN CCGS


Sequenced connectors can also benefit CCGs, where climbers are more experienced but use a wider variety of harnesses, increasing the risk of connection errors when climbing alone. However, implementing sequenced connectors in CCGs is more complex than in FECs due to this harness variety and limitations on how the proprietary links can be installed and removed.

POTENTIAL TRU-CLIP IMPLEMENTATION STRATEGIES FOR CCGS


Most proprietary links used in sequenced connectors are NOT specifically designed to be installed and removed often. For instance, the set screw used in the TRU-CLIP Connector Key Links is only allowed to be used once; therefore, each removal and reinstallation of a Key Link requires a new set screw. Below are descriptions of appropriate strategies to help facilities successfully incorporate a TRU-CLIP Connector system without installing, removing, and replacing links frequently.

Key Links on Fleet Harnesses


NOTE: When equipping a full fleet of harnesses with Key Links, ensure users are taught the basics of tying in for traditional top-rope climbing, including how to handle the Key Link and the need to keep it below the knot.

MOST PREFERRED		
Photo	Pros	Cons
	<ul style="list-style-type: none"> • Very short length – connector doesn't interfere with climbers' head • Harness condition can be checked regularly • No variations in attachment of Key Link between users • Decreased chance of losing Key Links 	<ul style="list-style-type: none"> • Cost • Very short length – there may be less room for climbers to manipulate Key Link and TRU-CLIP Connector together in some circumstances. • Climbers don't get to use their personally owned harness
<p>Equipment used in this strategy:</p> <ul style="list-style-type: none"> • TRU-CLIP Key Link 		

Climber Owned Harnesses with Pin-Locking Carabiner with Key Link

PREFERRED		
Photos	Pros	Cons
	<ul style="list-style-type: none"> • Short length – connector doesn't interfere with climbers' head • Pin-locking carabiner is installed by facility staff to ensure connection to appropriate place on customer's harness • Easy for staff to install and remove • Difficult for climber to remove • Extra length for manipulating Key Link • Harness familiarity 	<ul style="list-style-type: none"> • Requires staff to inspect and install equipment on a variety of harnesses • Key Links could be more easily lost • Key Link to Carabiner connection may be slightly less flexible
<p>Equipment used in this strategy:</p> <ul style="list-style-type: none"> • TRU-CLIP Key Link • Petzl Am'D Pin-Lock • Petzl CAPTIV 		

Climber Owned Harnesses with Pin-Locking Carabiner, Sling, and Key Link

EFFECTIVE		
Photos	Pros	Cons
	<ul style="list-style-type: none"> • Pin-locking carabiner is installed by facility staff to ensure connection to appropriate place on customer’s harness • Easy for staff to install and remove • Difficult for climber to remove • Good length for manipulating Key Link 	<ul style="list-style-type: none"> • Requires staff to inspect and install equipment on a variety of harnesses • Key Links could be more easily lost • Sling condition needs to be inspected regularly
<p>Equipment used in this strategy:</p> <ul style="list-style-type: none"> • TRU-CLIP Key Link • Petzl Cutaway Sling for CANYON GUIDE harness • Petzl Am’D Pin-Lock • Petzl CAPTIV 		

CAUTIONS ABOUT FLEET EQUIPMENT

Inspection

These strategies require facility staff to thoroughly inspect gear before each use. Additionally, it is a good idea to inspect the harness that the Key Link is being installed on to ensure that the climber’s equipment is in good condition to be used in the facility.

Instruction and Orientation

The TRUBLUE and TRU-CLIP Connector and Key Link Manuals require that users of this equipment be instructed on the safe use of the auto belay equipment. It is recommended that the facility staff conduct this instruction and orientation as part of the process of setting up a climber’s harness with a Key Link.

TRUBLUE and TRU-CLIP Connector and Key Link Manuals can be found online at the Head Rush Technologies website: <https://headrushtech.com/product-resources/product-manuals>

Repeated Key Link Installation and Removal

The Key Links are not designed to be installed and removed from mounting points repeatedly. The TRU-CLIP Connector and Key Link Manual states:



CAUTION

Key Link installation and removal should be infrequent. Key Links should NOT be installed and removed repeatedly due to the thread locking patch on the Key Link Pin and Set Screws. Key Link Pin Set Screws should be replaced after every removal.

Repeated Key Link removal and installation is not a supported method to allow climbers to use their own harness with the TRU-CLIP Connector system and may create additional risks to CCG customers and users.

RECOMMENDED PRODUCTS

These are recommended products for implementing a sequenced connector system, though a facility may find a more suitable replacement product for their situation.

Product	Key Element of Product	Manufacturer	Manufacturer ID Number
Petzl Cutaway Sling for CANYON GUIDE harness	<ul style="list-style-type: none"> • CE EN 566 certified • Short 13cm length 	Petzl	C086EA00
Am'D PIN-LOCK	<ul style="list-style-type: none"> • CE EN 362 and CE EN 12275 certified • Unique pin lock feature 	Petzl	M34A PL (individual)
CAPTIV (positioning bar)	<ul style="list-style-type: none"> • Works with Am'D PIN-LOCK 	Petzl	M093BA00 (individual)

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