



Maintenance and Safety Directive

Reference: Auto-Belay cable and hardware replacement schedule

Introduction:

Due to several unfortunate accidents in the climbing wall industry that have been caused by climbing cables (wire rope) and related hardware issues, Spectrum Sports, Int'l. is issuing this M&SD to inform owners and operators of their responsibility to maintain cables and hardware for safety reasons. It should be noted that Spectrum Sports, Int'l. customers have not had a cable/hardware failure to this date; we want it to stay this way. *It should be noted that the issues/accidents have not been a fault of engineering and manufacturing, but have been a result of inadequate inspection and maintenance. It is absolutely necessary to do daily inspections and regular maintenance to prevent accidents!*

This Directive is being sent to each jurisdiction so that the jurisdiction inspectors will know the requirements for the inspection of cables and hardware and require that they be replaced per this Directive. This is for all Spectrum Sports Int'l. climbing walls, mobile and/or stationary models. It is also being sent to insurance providers so they will know what to expect of their customers.

Background:

Spectrum uses ¼ inch class 6 x 37 cables (wire rope) with a 4500 lb minimum rated static strength. With a 250 lb climber, the safety factor is 18. Quasi-static testing of the each spool of cable has given results of actual strength 4500 lbs to 6500 lbs and impulse testing has given results of 3900 to 5000 lbs. The pulleys diameter provides a (D/d) of 23 which fall within the Wire Rope Corporation of America listed minimum (D/d) for 6 x 37 rope range of 20-26.

Even though the cable has a good safety factor and is within the accepted ranges, it is continually being flexed under load as it moves around the pulleys. The flexing causes fatigue in the wires that make up the cable. In addition, moisture and dirt are pulled into the cable bundles and center core of the cable. This contamination causes corrosion that reduces the life of the cable. As the cable is used it wears the wires so they become damaged. The fatigue, corrosion and wear make the cable a component that has a limited time life or in other words, the cable only lasts for a limited time. It must be inspected carefully on a regular basis and replaced a minimum annually, whether the cable looks bad or not.

Spectrum has cycle tested the cable and has found that the cable put on SSI products will cycle an average of over 40,000 climbs before any failure occurs. Giving it some safety factor, it should be replaced at 35,000 to 40,000 climbs. If you are doing a lot of climbs, then the cables should be replaced more often than the required 12 calendar months. The cable and hardware should be replaced if the cable ever sees 40,000 climbs. **Safety should be the first consideration!**

It should also be noted that all cable is not manufactured to the same standard. It is not recommended that you run down to the local hardware store and buy whatever ¼ inch cable they carry. Spectrum buys a specific class of cable, tests each lot to assure that the cable meets engineering requirements stated on the cable manufactures Certificate of Conformance and then makes-up the cables to meet engineering requirements.

The ends of the cable are terminated with 2 each F6-Oval 1-1/4 zinc coated Copper swage sleeve connector using the correct swaging crimper and go-no-go gages. A critical inspection point is at the junction of the cable to the swaged sleeve.

The hardware associated with the cable – pulleys, pulley bolts, quick links, swivels, carabineers, bolts, pulley cart bearings, etc –are also subject to fatigue and wear and thus become time life components. Failure to do the inspection and replacement may result in a failure, which in turn results in injury or the death of a customer. **If we don't take care of safety, insurance will become so costly that no one will be able to afford climbing walls.**

Action:

Regardless of ownership we have taken steps to inform state inspectors, insurers and/or new or old operator/owners of any of our climbing wall products of the following mandated actions:

1. **NEW SPECTRUM POLICY:** A warning sticker will be placed upon each new Auto-Belay device that is installed on a wall or sold to a customer stating "IT IS MANDATORY THAT EACH CABLE IS REPLACED WITH A CERTIFIED SPECTRUM SPORTS CABLE EVERY 12 CALANDER MONTHS FROM DATE OF PURCHASE. REFER TO YOUR OWNERS MANUAL".
2. **MAINTENANCE AND SAFETY DIRECTIVE: M&SD-1001: Reference:** Auto-Belay cable and hardware replacement schedule has been developed and will be sent to all of SSI's customers/Spectrum wall owners along with 3 or 4 each of the warning stickers. The warning sticker shall be attached by the customer to the Auto-Belays in a prominent place as a reminder to wall owners to replace the cables and hardware.
3. **REPLACEMENT PARTS:** Cables will be serialized starting August 1, 2003 and will have a Serialized Certificate of Conformance accompanying each cable. This means that each cable on all customer owned Spectrum climbing walls will have Serial Number tags by August 1, 2004. Any wall after August 1, 2004 that does not have serialized cables will be in violation of Spectrum Safety requirements and should be taken out of service.
4. **WALL OWNERS/OPERATORS SHALL DO ONE OF THE FOLLOWING:**

- a. **NO MATTER THE AGE OF THE CABLE:** The owner or operator should replace the cable (wire rope) if any of the following conditions are true:
 1. If any of the individual wires in a strand have a flat spot of more than $\frac{1}{2}$ the diameter of the smallest wire.
 2. If there is a single broken wire in any strand.
 3. If there are 40,000 or more climbing cycles on a wall.
 4. If the cables have been on the wall for 12 calendar months.
 5. If there are any twists, frays, or kinks.
 6. If there is any signs of corrosion on strands or individual wires.
 - b. **WALLS LESS THAN 12 CALENDAR MONTHS OLD:** Inspect the cables and hardware prior to each day's use of the wall. The inspection should include a careful visual inspection of the entire cable and hardware, and a physical inspection by wrapping a rag around the cable and sliding it full length of the cable in both directions to determine if a wire strand is broken. If any single wire strand is broken, the cables should be replaced before further use. **Record the inspection in the walls daily maintenance and safety log.** Change the cable and hardware with Spectrum Certified parts when the wall is 12 calendar months old.
 - c. **CABLES HAVE BEEN CHANGED LESS THAN 12 CALENDAR MONTHS AGO:** Inspect the cables and hardware prior to each day's use of the wall. The inspection should include a careful visual inspection of the entire cable and a physical inspection by wrapping a rag around the cable and sliding it full length of the cable in both directions to determine if a wire strand is broken. If any single wire strand is broken, the cables should be replaced before further use. **Record the inspection in the walls daily maintenance and safety log.** Change the cable and hardware with Spectrum Certified parts when the wall is 12 calendar months old.
 - d. **CABLES HAVE BEEN IN SERVICE FOR 12 OR MORE CALENDAR MONTHS:** The wall should be removed from service and the cables and hardware **shall** be replaced with Spectrum certified parts before any further use of the climbing walls. No exceptions! Use of cables and hardware after 12 calendar months is a violation of Spectrum's maintenance and safety standards.
 - e. **CABLES THAT HAVE BEEN REPLACED WITH NON-APPROVED CABLE:** The wall should be removed from service and the cables and hardware shall be replaced with Spectrum certified parts before any further use of the climbing wall. No exceptions! Use of cables and hardware after 12 calendar months is a violation of Spectrum's maintenance and safety standards. No exceptions!
 - f. **WALLS THAT HAVE CONSISTENT HEAVY USAGE:** If the wall has a lot of usage every day for most of the year, it will possibly go over 40,000 climbs in a year. Also, if the cables are exposed to high humidity (particularly close to a salty environment) they may experience excess corrosion and/or stress corrosion of the single wire strands. **Any sign of corrosion requires that the cables be replaced with Spectrum certified parts.** Safety is the key issue!
5. **REPLACING OF PARTS:** Customers may do their own work on their walls if they have the proper tools and equipment or they may have Spectrum trained and certified service personnel do the replacement and annual inspection. Authorized parts (serialized cables) and service should be ordered from Spectrum's Service Manager:

Kevin Bethers, Service Manager
Spectrum Sports, Int'l.
435-792-3883
Email: Kevin@spectrumsports.com

RECEIVED

APR - 1 2004

March 19, 2004

**Attention ALL Spectrum Sports
Climbing Wall Owners;**

Enclosed is a copy of the Maintenance and Safety Directive, M&SD-1002 and a Change of Owner/Operator Form. Please read through this very carefully and follow the requirements. If you have sold your climbing wall, please fill out the change of owner form and return it to Spectrum Sports. To purchase carabineers for \$19 each, please call us at our toll free number 888-563-0163.



SPECTRUM
sports inc

87 East 200 North
Hyrum, UT 84319
Phone: 888-563-0163
Fax: 435-245-0454



Maintenance and Safety Directive

Reference: Carabiners

Introduction:

PETZL has recently issued a safety bulletin on carabiners. They have outlined the correct use of carabiners for rock climbing, commercial climbing, climbing in gyms, on mobile walls and amusement parks. Petzl's direction should be followed by all climbers. Spectrum Sports is mandating that the following be done immediately to prevent any possible accidents.

Background:

Original directive was sent by Hank Moon, Technical Information Manager, Petzl America. Portions of the directive are quoted below.

Subject: IMPORTANT SAFETY BULLETIN ON CARABINERS

Please read carefully and take note of the following:

The best method to attach a belay rope to a climbing harness is to tie the rope directly to the harness using a rethreaded figure 8 knot. However, Petzl understands that from a practical perspective, there are times when locking carabiners may be used as a more expedient means of attachment, especially in commercial climbing operations. When locking carabiners are used to attach a belay rope to a climber's seat harness, it is very important to remember that:

- Two (2) locking carabiners must be used with gates opposed and locked; Never use a single carabiner to attach a belay rope to a harness.
- This attachment method may be used only for top rope climbing. With no slack in the rope. For lead climbing, the rope must be tied directly to the harness with the rethreaded figure 8 knot as shown on the harness label, and in the technical notice which comes with each harness.

This information is found in Petzl harness and carabiner technical notices. Petzl technical notices are available in pdf format on Petzl's website at www.petzl.com.

It is your responsibility to ensure that the technical information that comes with every Petzl product reaches the user of the product(s). In addition, we ask that you forward the information in this letter to all of your customers who may use locking carabiners to tie into a harness as

described above, especially commercial climbing operations such as gyms, mobile walls, and amusement parks.

Thank you for your attention to this matter and please do not hesitate to contact Petzl Customer Sales & Support (877-807-3805) with any questions.

Best Regards

Hank Moon
Technical Information Manager
Petzl America

SSI Action:

Regardless of ownership we have taken steps to inform state inspectors and/or new or old operator/owners of any of our climbing wall types of the following mandated actions:

1. **NEW SPECTRUM POLICY:** All stationary or mobile climbing walls using Auto-Belays shall have a Swivel on each belay cable that will accommodate two (2) carabiners. Two (2) locking carabiners shall be used on belay cables with gates opposed and locked into the climbers harness; **Never** use a single carabiner to attach a belay rope or cable to a climbers harness.
2. **MAINTENANCE AND SAFETY DIRECTIVE: M&SD-1002, Reference:** CARABINERS has been developed and will be sent to all of SSI's customer/Spectrum wall owners.
3. **ADDITIONAL CARABINER:** Carabiners may be obtained from SSI immediately (1-435-245-3128).
4. Spectrum shall notify all wall owners, operators, and governmental agency by this directive.

OWNER/OPERATOR ACTION:

1. **WALL OWNER/OPERATOR SHALL DO THE FOLLOWING:** Immediately install a second carabiner through the gold end of the swivel with gates opposed (two (2) carabiners on each belay cable) and ensure that both carabiners with gates opposed are hooked into the climber's harness correctly and locked before allowing any person to climb the wall.
2. SSI recognizes that it may take a little time to comply with this policy since you may not have extra carabiners on hand. By April 30, 2004 all owner/operators shall comply. No wall shall be used after April 30, 2004 without two (2) carabiners at the end of each cable. (call to order carabiners: 1-435-245-3128)

For service question contact :

Kevin Bethers, Service Manager
Spectrum Sports, Inc.
1-435-245-3128
Email: Kevin@spectrumsports.com



Maintenance and Safety Directive

Reference: Petzl Harness and Carabineer and SSI Quick Harness

Introduction:

PETZL has recently issued a safety bulletin on Carabineers in use with the seat style harness. They have outlined the correct use for rock climbing, commercial climbing, climbing in gyms, on mobile walls and amusement parks. Petzl's direction should be followed by all climbers. Spectrum Sports is mandating that the following be done immediately to prevent any possible accidents.

Background:

Original directive was sent by Hank Moon, Technical Information Manager, Petzl America. Portions of the directive are quoted below.

Subject: IMPORTANT SAFETY BULLETIN ON CARABINEERS

Please read carefully and take note of the following:

The best method to attach a belay rope to a climbing harness is to tie the rope directly to the harness using a rethreaded figure 8 knot. However, Petzl understands that from a practical perspective, there are times when locking Carabineers may be used as a more expedient means of attachment, especially in commercial climbing operations. When locking Carabineers are used to attach a belay rope to a climber's seat harness, it is very important to remember that:

- Two (2) locking Carabineers must be used with gates opposed and locked; **Never** use a *single carabineer to attach a belay rope to a harness.*
- This attachment method may be used only for top rope climbing. With no slack in the rope. For lead climbing, the rope must be tied directly to the harness with the rethreaded figure 8 knot as shown on the harness label, and in the technical notice which comes with each harness.

This information is found in Petzl harness and carabineer technical notices. Petzl technical notices are available in pdf format on Petzl's website at www.petzl.com.

It is your responsibility to ensure that the technical information that comes with every Petzl product reaches the user of the product(s). In addition, we ask that you forward the information in this letter to all of your customers who may use locking Carabineers to tie into a harness as

described above, especially commercial climbing operations such as gyms, mobile walls, and amusement parks.

Thank you for your attention to this matter and please do not hesitate to contact Petzl Customer Sales & Support (877-807-3805) with any questions.

Hank Moon
Technical Information Manager
Petzl Americae

SSI Action:

Regardless of ownership we have taken steps to inform state inspectors and/or new or old operator/owners of any of our climbing wall types of the following mandated actions:

1. Current SPECTRUM POLICY if using SSI QUICK HARNESS: When using our SSI QUICK HARNESSES it is only necessary to use one carabiner if none of the equipment/hardware (swivels or carabineers) that are being used is PETZL.
2. SPECTRUM POLICY: When using the Petzl seat style harness all stationary or mobile climbing walls using Auto-Belays shall have a Swivel on each belay cable that will accommodate two (2) Carabineers. Two (2) locking Carabineers shall be used on belay cables with gates opposed and locked into the Petzl climbers harness; **Never** use a single carabiner to attach a belay rope or cable to a Petzl seat style harness.
3. MAINTENANCE AND SAFETY DIRECTIVE: M&SD-1002, **Reference:** Petzl Harness and Carabineers has been developed and will be sent to all of SSI's customer/Spectrum wall owners.
4. ADDITIONAL CARABINER: Carabineers may be obtained from SSI immediately (1-435-792-3883).
5. Spectrum shall notify all wall owners, operators, and governmental agency by this directive.

OWNER/OPERATOR ACTION:

1. **WALL OWNER/OPERATOR SHALL DO THE FOLLOWING WHEN USING A PETZL SEAT STYLE HARNESS:** Immediately install a second carabiner through the end of the swivel with gates opposed {two (2) Carabineers on each belay cable} and ensure that both Carabineers with gates opposed are hooked into the Petzl climber's harness correctly and locked before allowing any person to climb the wall.

NOTE: THIS DIRECTIVE DOES NOT APPLY TO ALL MAKES OF HARNESSES. ALWAYS FOLLOW MANUFACTURERS RECOMMENDATIONS.

For service question contact :

Kevin Bethers, Service Manager
Spectrum Sports, Int.
1-435-792-3883
Email: Kevin@spectrumsports.com



Maintenance and Safety Directive

Reference: Proper air pressure for Auto-Belays

Introduction:

We have made changes to the Auto-Belay technology over the years which requires a change in air pressure to operate safely. This will aid State Inspectors and wall customers who have updated their Auto-Belay systems or have misplaced their owner's manual.

Background:

It is important to first look for any pressure sticker that might be attached to the air/oil accumulator that would state the proper air pressure. This directive is for walls manufactured by Spectrum Sports Int'l, Spectrum Sports Inc., Action Amusement and Rebound Action Sports.

Action:

1. The proper pressure for climbing walls manufactured between 4/1998 and 4/1999 by Rebound Action Sports is 60-70 psi.
2. The proper pressure for climbing walls manufactured between 4/1999 and 3/2000 by Rebound Action Sports is 60-70 psi.
3. The proper pressure for climbing walls manufactured between 3/2000 and 11/2000 by Rebound Action Sports for a 24' wall is 75-85psi and for 32' walls 85-95psi.
4. The proper pressure for both 24' and 32' climbing walls manufacture from 11/00 till present is 85-95psi for both.

Note:

It is okay to have a higher pressure than stated above to overcome any stiction that may result from wear. The air pressure is what controls the amount of up tension on the wire rope. The air pressure must be able to "take up" the wire rope during the entire climb of the wall. If you have questions about proper air pressure of a particular wall please contact us for assistance.

Kevin Bethers, Service Manager
Spectrum Sports Int'l
1-435-792-3883
Email: Kevin@spectrumsports.com



Maintenance and Safety Directive

Reference: Pulley Bolt replacement

Introduction:

Spectrum Sports Int'l. is issuing this M&SD, which is to inform owners and operators of their responsibility to replace all pulley bolts on all mobile and stationary climbing walls for safety reasons.

This Directive is being sent to each jurisdiction so that the jurisdiction inspectors will know the requirements for the inspection of pulley bolts and require that they be replaced per this Directive. This is for all Spectrum Sports Int'l. Climbing walls, mobile and/or stationary models purchased from May 1997 to Current.

Pulley Bolts:

All grade 8 bolts that secure a pulley or pulleys need to be changed annually. The number of bolts will depend on how many Auto-Belay devices are attached to the wall. For each Auto-Belay device there will be two (2) davit pulley bolts located at the top of the wall and two (2) Auto-Belay pulley bolts. This will be the same number of bolts even though the Auto-Belay device has changed over the years. Auto-Belays manufactured August 1997 through February 2000 will have a pulley box which houses the pulleys. Auto-Belay devices manufactured from March 2000 to date will have one bolt located on the Auto-Belay cart and the other at the bottom of the Auto-Belay tank. The number of new bolts required will depend on the number of routes on your climbing wall. If you have a 4 person climbing wall you will need to replace 16 pulley bolts; if you have a 3 person climbing wall there will be a total of 12 pulley bolts to replace. ***The bolts must be Grade 8 bolts!*** The nylock nut should be replaced at the same time. Please call Spectrum Sports Int'l for specific instruction on replacing the pulley bolts.

The hardware associated with the Climbing walls – pulleys, quick links, swivels, carabineers, bolts; pulley cart bearings, etc –are also subject to fatigue and wear and thus become time life components. Failure to do the inspection and replacement may result in a failure, which in turn results in injury or the death of a customer. ***If we don't take care of safety, insurance will become so costly that there will not be climbing walls.***

Action:

Regardless of ownership we have taken steps to inform state inspectors, insurers and/or new or old operator/owners of any of our climbing wall products of the following mandated actions:

1. **NEW SPECTRUM POLICY:** It is mandatory that each and every pulley bolt is replaced every 12 calendar months from date of purchase.
2. **MAINTENANCE AND SAFETY DIRECTIVE:** M&SD-1004, Pulley Bolt replacement has been developed and will be sent to all of SSI's customers/Spectrum wall owners.
3. **REPLACING OF PARTS:** Pulley bolts can be purchased directly from Spectrum Sports or you can call us for exact bolt specifications. Customers may do their own work on their walls if they have the proper tools and equipment or they may have Spectrum trained and certified service personnel do the replacement and annual inspection. Authorized parts and service should be ordered from Spectrum's Service Manager:

Kevin Bethers, Service Manager
Spectrum Sports Int'l.
1-435-792-3883
Email: Kevin@spectrumsports.com

Instructions for Replacing Pulley Bolts

Tools needed:

- (2) 15/16 wrenches

Time required:

- Minimum of 2 hours to replace pulley bolts

Directions:

1. Release all air pressure from Auto-Belay Units.
2. Replace pulley bolts and corresponding Nylock Nut.
3. Tighten to snug.
4. Add air to required pressure.
5. Cycle cable to make sure that all pulleys turn.

Hints:

- Use the new bolt to push out the old one or use a screwdriver to keep pulleys and spacers aligned.
- If the bolt head is between two auto-belays there is not enough room to extract the bolt. Remove the four mounting bolts for the auto-belay; slide the auto-belay to allow enough room to extract the bolt.
- The auto-belay mounting bolts require two 3/4-inch wrenches.
- The 1/2" Nylock Nuts must be replaced if they are removed and must be torqued to 80-ft. lbs.
- Spray nuts with WD-40 and allow to penetrate overnight.