

Operation and Owner's Manual

For

Spectrum Sports Intl

Auto-Belay

Safety System




Important Safety Information Inside





**Attention! Read this manual before operating
the product.**

INTRODUCTION

WARNING!

 Spectrum Sports Intl will not warranty or stand behind any Auto-Belay safety system that we have manufactured that does not use genuine and/or authorized replacement parts and/or cable. Any work and/or service that is performed on any Spectrum Sports Intl Auto-Belay safety systems that is not performed by an authorized Spectrum Sports Intl employee, voids any and all claims to any manufacturer's liability.

 Read and understand this manual before installing and/or operating the product.

 Serious injury or death may result if failure to comply with the information in this manual.

SPECTRUM
SPORTS  INT'L

3785 N. HWY 91 | Hyde Park | Utah 84318 | 888.563.0163

Auto-Belay Operations/Owners Manual

Products: AB-32/AB-40/ AB-75

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Revision

Spectrum Sports Intl may make periodic additions, deletions, and modifications to this manual. These updates will, in the judgment of SPECTRUM SPORTS INTL, add to the quality of services offered. This manual must be kept up to date, and should reflect all updates currently in use.



Please check the web site for updates and/or safety issues regarding your Auto-Belay Safety System

www.spectrumsports.com or www.auto-belay.com

Receipt and Acknowledgment for the Auto-Belay Safety System

This Owner/Operations Manual is an important document intended to help you become acquainted with the Auto-Belay Safety Systems.



Please read the following statement; respond to Spectrum Sports Intl in writing with any questions or if the intent of this document is unclear. You should not operate the products mentioned in this manual if you do not fully understand how to operate them safely!

As owner/operator, I have received and read my copy of the Spectrum Sports Intl Auto-Belay, Operations Manual. I understand that the information outlined in this manual is subject to change at the sole discretion of Spectrum Sports Intl at any time. It is further understood that as an owner/operator of the Auto-Belay Safety System I have the responsibility to ensure that the correct and latest version of the manual is being used.

As an owner of the Auto-Belay Safety System or authorized representative, it is my responsibility to keep this manual current with any changes that are made by Spectrum Sports Intl. In addition, if there is anything about the product and/or this manual that is unclear or not understood, it is my responsibility to seek clarification and not use the product until the issue is understood.



Unless informed in writing, Spectrum Sports Intl assumes that the customer understands the AUTO-BELAY SAFETY SYSTEM and that there are no questions regarding the product, the contents of this document, and/or use of the product or how to operate this product.

It is the customer's sole responsibility to clarify any question or concern with Spectrum Sports Intl before use and/or operation.



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THE AUTO-BELAY SAFETY SYSTEM

The AUTO-BELAY SAFETY SYSTEM

Product Manual Overview

This manual is an introduction to the AUTO-BELAY SAFETY SYSTEM and its operation. The purpose of this manual is to provide a compilation of information that will assist you in proper and safe operation. This manual is designed to aid in educating you and your associates.

Certifications / Standards

Spectrum Sports Intl has the following certifications or meet/exceed the following industry standards.



ASTM Requirements for Owner/Operator Responsibilities:

“Owner/operators of amusement rides or devices shall have an inspection program consistent with the inspections outlined in Practice F 853 & Practice F 770. Inspection documents deemed appropriate by the owner/operator to be maintained in the ride file shall be filed in accordance with the procedures outlined in Practice F 770 and Practice F 853. The owner/operator of an amusement ride or device shall promptly notify the manufacturer of an incident, failure, or malfunction which, in his judgment, seriously affects the continued proper operation of the ride or device and is information of which the manufacturer should be aware.”

(Ref: ASTM International Standards on Amusement Rides and Devices: 7th Edition, Sections: 5.2.1-5.2.3)

ACCIDENT REPORTING

Spectrum Sports Intl requires that any and all accidents are reported within 48hrs from the time of the accident. We need the name of the injured, place of the accident, incident report, the route the accident happened on, employee's name, daily inspection report/checklist. More info may be required at a later time. Email or fax a report to: sales@spectrumsports.com or 435-792-3884.

PRODUCT SPECS

Height limits for each Auto-Belay Safety System			
<u>Product</u>	0'- 32'	0'- 40'	0'- 75'
AB32			
AB40			
AB75			

AB32 Spec:

GENERATION 4

Size: 9'3" Long, 12" wide and 17" deep

Weight: 180 lbs

Mounting Height: Typically ground level, remote location okay

Climbing Range: 10'-33'

Maximum climbers weight: 250 lbs

Color: Black powder coated finish

Design: Dual cylinder-open design

Body Material: Steel

Cylinders: 39" X 1 ½" 2500 PSI (Qty 2)

Weather proof hydraulic breather caps (Qty2)

Pulleys: 6" sealed bearing, nylon (Qty 9) for ¼" cable

Oil: ISO 32

Upper Pulley Cart: 8 sealed bearing

Air Pressure: 85 – 95 PSI operations pressure

Hoses: 2000 PSI

Fittings: #10, o-ring with face seals

Hardware: grade 8 on pulleys, grade 5 on assemblies

Oil Filtration System: Yes, inline screen

Oil Containment System: available at additional cost

Oil Site Glass: mounted for clear inspections

Pressure Gauge: 0- 150 PSI

Breather Cap: low profile

1" quick connections pins: on both Auto-Belay cylinders

Easy 4 bolt mounting system

AB40 Spec:

GENERATION 4

Size: 9'3" Long, 14" wide and 17" deep
 Weight: 180 lbs
 Mounting Height: Typically ground level, remote location okay
 Climbing Range: 10'-40'
 Maximum climbers weight: 250 lbs
 Color: Black powder coated finish
 Design: Dual cylinder-open design
 Body Material: Steel
 Cylinders: 39" X 1 1/2" 2500 PSI (Qty 2)
 Weather proof hydraulic breather caps (Qty2)
 Pulleys: 6" sealed bearing, nylon (Qty 9) for 1/4" cable
 Oil: ISO 32
 Upper Pulley Cart: 8 sealed bearing
 Air Pressure: 95 – 105 PSI operations pressure
 Hoses: 2000 PSI
 Fittings: #10, o-ring with face seals
 Hardware: grade 8 on pulleys, grade 5 on assemblies
 Oil Filtration System: Yes, inline screen
 Oil Containment System: available at additional cost
 Oil Site Glass: mounted for clear inspections
 Pressure Gauge: 0- 150 PSI
 Breather Cap: low profile
 1" quick connections pins: on both Auto-Belay cylinders
 Easy 4 bolt mounting system

AB75 Spec:

GENERATION 4

Size: 9'3" Long, 24" wide and 17" deep
 Weight: 370 lbs
 Mounting Height: ground level, remote location okay
 Climbing Range: 10'- 75'
 Maximum climbers weight: 250 lbs
 Color: Black powder coated finish
 Design: Dual cylinder-open design
 Body Material: Steel
 Cylinders: 39" X 1 1/2" 2500 PSI (Qty 2)
 Pulleys: 6" sealed bearing, nylon, fits 10.5 mm rope (Qty 9)
 Oil: ISO 32 w/blue dye
 Upper Pulley Cart: 8 sealed bearing
 Air Pressure: 105 – 110 PSI operations pressure (depends on routing)
 Hoses: 2000 PSI
 Fittings: #10, o-ring with face seals

Hardware: grade 8 on pulleys, grade 5 on assemblies
 Oil Filtration System: Yes, inline screen
 Oil Containment System: available at additional cost
 Oil Site Glass: mounted for clear inspections
 Pressure Gauge: 0- 160 PSI
 Breather Cap: low profile
 1" quick connections pins: on both Auto-Belay cylinders
 Easy 4 bolt mounting system

Auto-Belay Sticker Package



Weight limits for the Auto-Belay Safety System

Spectrum Sports Intl has tested the weight range to be between 40 lbs/18 kgs and 250 lbs/113 kgs.

Weight Limits	
MIN	MAX
40 lbs	250 lbs
18 kg	113 kg

How the Auto-Belay Works:

“Belaying” is a climbing term that describes the process of taking up slack in a climber’s safety line as they ascend, and then safely lowering the climber when they either fall or wish to descend. This process is managed by a “Belay Partner” in traditional rock climbing. The term “Auto-Belay” is used to describe a device that replaces the “Belay Partner” with a mechanical apparatus.

The Spectrum Sports Intl AUTO-BELAY SAFETY SYSTEM is an air/oil hydraulic apparatus. As a climber ascends, air pressure works upon the device in a manner that collects any slack in the climber’s safety line. When the climber descends, oil flow thru the device is restricted in a manner that safely slows the rate of descent. Four generations of design evolution, 3rd party engineering, and millions of safe cycles worldwide have proven that the Spectrum Sport Intl Auto-Belay is the safest and most reliable on the market.

INSPECTIONS

INSPECTIONS

Inspections of the **AUTO-BELAY SAFETY SYSTEM** must occur on a **daily/weekly/quarterly/yearly** basis to ensure continued, safe operation.

Quick Reference Check List

Inspect this:	Daily	Weekly	3 Month	12 Month
Cable has tension on it (No slack)	X			
Cable Crimps	X			
Cable for any broken wires, twists, kinks, or flat spots	X			
Air Pressure	X			
Oil level	X			
*Proper priming of Auto-Belay (see below)	X			
Cable tracks in the pulley's correctly	X			
Carabineer	X			
Quick Link	X			
Harness Stitching	X			
Swivel	X			
Pulley's for wear or damage		X		
Hydraulic Hoses		X		
Visual Inspection		X		
Auto-Belay mounting bolts			X	
Davit Mounts/Hardware/pulleys			X	
Cable Replacement				X
Hardware replacement				X
Connection Hardware				X

Priming of the Auto-Belay:

Before each use of the Auto-Belay you must do the following: With one operator on the front of the wall using a rope, manually extend the cable to the top of the wall while a second person inspects the retraction of the cable to ensure there is **NO SLACK** behind the wall. Ensure that all pulleys turn when the cable is in motion and that cable drag is minimal.

The following steps need to be completed before the Auto-Belay safety system is used (each time).

Check the air pressure to confirm that it is within the safe operating range (Consult the sticker on the side of your Auto-Belay system).

Check the cable to ensure that it can travel thru the pulleys without restriction.

Check the oil-site for fluid.


Pull on the cable (front side of the wall) and make sure that the cable retracts itself, do this several times, in the meantime making sure that the cable has an elastic feel.


While standing on the front side of the wall (the side that is for climbing), hold on to the cable, raise it above your head, then pull it to the ground (priming the Auto-Belay safety system). Do this multiple times.


Once you have primed the system, hook onto the Auto-Belay safety system (wearing a climbing harness) and climb up 5', then let go, allowing the Auto-Belay safety system to lower you to the ground.

Continue to climb up the wall 5' at a time, and allow the system to lower you down. Repeat until you have reached the top.

Once you have ensured that the Auto-Belay Safety System is operating properly you may now allow clients to climb.

 **Remember, fluid levels should be checked when all Auto-Belay routes are anchored to the bottom of the wall** (meaning that the carabineer-end of the cable must be in the "start climbing" position). If any questions, please call SPECTRUM SPORTS INTL.

 **For proper and safe Auto-Belay function, it is important that the Auto-Belay is properly pressurized.**

 **Daily Inspections:** Please note that these inspection guidelines are a minimum. Take caution and ensure that any and all working parts and safety related products are thoroughly inspected and that all bolts are secure before use. As a means of properly maintaining the AUTO-BELAY SAFETY SYSTEM and ensuring proper safety for the climber, a daily inspection is required. The following routine should be adhered to daily. Figure 1.0 is a sample. You may download an actual inspection sheet from the website www.spectrumsports.com.

Weekly Inspections:

Weekly inspections are intended to be more in-depth than daily inspections. On the Auto-Belay, no component will fail without first revealing warning signs due to wear or damage. In conjunction with the daily inspections, the weekly inspections should be sufficient to find any potential problem well before failure becomes imminent. Figure 2.0 is a sample. You may download an actual inspection sheet from the website www.spectrumsports.com.

3 Month Inspections:

3 month inspections are intended to be more in-depth than Weekly inspections. On the Auto-Belay, no component will fail without first revealing warning signs due to wear or damage. In conjunction with the weekly inspections, the 3 month inspections should be sufficient to find any potential problem well before failure becomes imminent. Figure 3.0 is a sample. You may download an actual inspection sheet from the website www.spectrumsports.com.

12 Month Inspections:

12 month inspections are intended to be more in-depth than 3 month inspections, and include mandatory parts' replacement. On the Auto-Belay, no component will fail without first revealing warning signs due to wear or damage. In conjunction with the 3 month inspections, the 12 month inspections should be sufficient to find any potential problem well before failure becomes imminent. Figure 4.0 is a sample. You may download an actual inspection sheet from the website www.spectrumsports.com.

Figure 1.0

CLIMBING ROUTES					Daily Inspection Check list				
1	2	3	4	5	Cable Inspections				
6	7	8	9	10	Verify that the cables are up to date on their certification. Check every inch of cable for the following: Broken wires, "bird-caging", twists, kinks, or flat spots greater than 1/2 the diameter of a single strand. If any apply, replace immediately.				
(Check off applicable route after each step.)									
1	2	3	4	5	Cable Termination Inspections				
6	7	8	9	10	Ensure that cable ends are secure and termination points are secure. Lift up the hose on the climbing end of the cable to inspect the crimped ends				
1	2	3	4	5	Pulley Cart				
6	7	8	9	10	Ensure that the pulley cart is free from debris and any particles from wall surface. Check to ensure that the pulley cart is not obstructed in any way. Check bearing wheels for proper contact				
1	2	3	4	5	Cable Slack				
6	7	8	9	10	Ensure there is NO slack in front or behind the climbing structure/wall. There should always be tension on the cable!!				
1	2	3	4	5	Air Pressure				
6	7	8	9	10	(Write in the air pressure in the square to the left NOT a check mark!)				
					Look at the sticker on the side of the AB tank to ensure proper air pressure for each AB system				
1	2	3	4	5	Hydraulic Fluid				
6	7	8	9	10	Hydraulic fluid level should be visible in oil eye/lens. ISO 32 fluid is required; the following name brand fluids are available: MOBILE DTE-24, TEXACO RANDO-32, and CHEVRON AW-32.				
1	2	3	4	5	Attachment Hardware				
6	7	8	9	10	Carabineer – If the auto-locking Carabineer is not locking positively or if it is sticking open, replace immediately. Swivel- Needs to spin freely without sticking. Quick Link - Must be tighter than "finger tight".				
1	2	3	4	5	Auto - Belay Priming				
6	7	8	9	10	Ensure that the Auto-Belay has been properly primed. (See page 8 "Priming of the Auto-Belay")				
Comments:									
Operator:									
Date:									
Questions call; 888-563-0163 Spectrum Sports Int'l, www.spectrumsports.com									

Figure 2.0

CLIMBING ROUTES					Weekly Inspection Check list				
1	2	3	4	5	Cable Inspections				
6	7	8	9	10	Verify that the cables are up to date on their certification. Check every inch of cable for the following: Broken wires, "bird-caging", twists, kinks, or flat spots greater than 1/2 the diameter of a single strand. If any apply, replace immediately.				
(Check off applicable route after each step.)									
1	2	3	4	5	Cable Termination Inspections				
6	7	8	9	10	Ensure that cable ends are secure and termination points are secure. Lift up the hose on the climbing end of the cable to inspect the crimped ends				
1	2	3	4	5	Pulley Cart				
6	7	8	9	10	Ensure that the Pulley cart is free from debris and any particles from wall surface. Check to ensure that the pulley cart is not obstructed in any way. Check bearing wheels for proper contact.				
1	2	3	4	5	Cable Slack				
6	7	8	9	10	Ensure there is NO slack in front or behind the climbing structure/wall. There should always be tension on the cable!!				
1	2	3	4	5	Air Pressure				
6	7	8	9	10	(Write in the air pressure in the square to the left NOT a check mark!)				
					Look at the sticker on the side of the AB tank to ensure proper air pressure for each AB system				
1	2	3	4	5	Hydraulic Fluid				
6	7	8	9	10	Hydraulic fluid level should be visible in oil eye/lens. ISO 32 fluid is required; the following name brand fluids are available: MOBILE DTE-24, TEXACO RANDO-32, and CHEVRON AW-				
1	2	3	4	5	Attachment Hardware				
6	7	8	9	10	Carabineer – If the auto-locking Carabineer is not locking positively or if it is sticking open, replace immediately. Swivel- Needs to spin freely without sticking. Quick Link - Must be tighter than "finger tight".				
1	2	3	4	5	Pulley Wear and Inspection				
6	7	8	9	10	Inspect pulleys for excessive wear, cracks or splits. This is accomplished by rotating the pulley and inspecting the groove for wear depth. The pulleys should not wiggle side-to-side during operation. Replace if any damage is present.				
1	2	3	4	5	Hydraulic Cylinders				
6	7	8	9	10	Inspect for any oil leakage around fittings, site gauge, hoses, plugs, and oil containment systems. Some seepage is expected during normal use. Check for pitting and abrasions. Tighten and document any alterations to the system.				
1	2	3	4	5	Visual Inspection				
6	7	8	9	10	Visually inspect all structural components: Wall frame, davits, trailer, etc for damage or cracking.				
1	2	3	4	5	Auto - Belay Priming				
6	7	8	9	10	Ensure that the Auto-Belay has been properly primed. (See page 8 "Priming of the Auto-Belay")				
Comments:									
Operator									
Date									
Questions call: 888-563-0163 Spectrum Sports Int'l, www.spectrumsports.com									

Figure 3.0

CLIMBING ROUTES					3 Month Inspection Check list				
1	2	3	4	5	Cable Inspections				
6	7	8	9	10	Verify that the cables are up to date on their certification. Check every inch of cable for the following: Broken wires, "bird-caging", twists, kinks, or flat spots greater than 1/2 the diameter of a single strand. If any apply, replace immediately.				
(Check off applicable route after each step.)									
1	2	3	4	5	Cable Termination Inspections				
6	7	8	9	10	Ensure that cable ends are secure and terminations points are secure/lift up the hose on the CABLE to inspect the Crimped ends				
1	2	3	4	5	Pulley Cart				
6	7	8	9	10	Ensure that the pulley cart is free from debris and any particles from wall surface. Check to ensure that the pulley chart is not obstructed in any way. Check bearing wheels for proper contact				
1	2	3	4	5	Cable Slack				
6	7	8	9	10	Ensure there is NO slack in front or behind the climbing structure/wall. There should always be tension on the cable!!				
1	2	3	4	5	Air Pressure				
6	7	8	9	10	(Write in the air pressure in the square to the left NOT a check mark!) Look at the sticker on the side of the AB tank to ensure proper air pressure for each AB system				
1	2	3	4	5	Hydraulic Fluid				
6	7	8	9	10	Hydraulic Fluid level should be visible in oil eye/lens. ISO 32 fluid is required; the following name brand fluid is available: MOBILE DTE-24, TEXACO RANDO-32, and CHEVRON AW-32.				
1	2	3	4	5	Attachment Hardware				
6	7	8	9	10	Carabiner – If the auto-locking Carabiner is not locking positively or if it is sticking open, replace immediately. Swivel- Needs to spin freely without sticking. Quick Link - Must be tighter than "finger tight".				
1	2	3	4	5	Pulley Wear and Inspection				
6	7	8	9	10	Inspect pulleys for excessive wear, cracks or splits. This is accomplished by rotating the pulley and inspecting the groove for wear depth. The pulleys should not wiggle side-to-side during operation. Replace if any damage is present.				
1	2	3	4	5	Hydraulic Cylinders				
6	7	8	9	10	Inspect for any oil leakage, around fittings, site gauge, hoses, Plugs, and oil containments systems. Some seepage is expected during normal use. Check for pitting and abrasions. Tighten and document any alternations to the system.				
1	2	3	4	5	Visual Inspection				
6	7	8	9	10	Vissually inspect all structural components: Wall frame, davits, trailer, etc for damage or cracking.				
1	2	3	4	5	Mounting Hardware				
6	7	8	9	10	Inspect all mounting hardware on the Auto-Belay and the davits.				
1	2	3	4	5	Oil Containment System				
6	7	8	9	10	Inspect all fittings and check for leaks. Document the amount of fluid in each bottle. Refer to owners manual for more information.				
1	2	3	4	5	Auto - Belay Priming				
6	7	8	9	10	Ensure that the Auto-Belay has been properly primed. (See page 8 "Priming of the Auto-Belay")				
Comments:									
Operator									
Date									
Questions call;					888-563-0163 Spectrum Sports Int'l, www.spectrumsports.com				

Figure 4.0

CLIMBING ROUTES					12 Month Inspection Check list				
1	2	3	4	5	Cable Inspections				
6	7	8	9	10	⚠ Cable must be replaced with certified Spectrum Sports Intl cable. Check every inch of cable for the following: Broken wires, "bird-caging", twists, frays, kinks, or flat spots greater than 1/2 the diameter of a single strand. If any apply, replace immediately.				
(Check off applicable route after each step.)									
1	2	3	4	5	Cable Termination Inspections				
6	7	8	9	10	Ensure that cable ends are secure and terminations points are secure/lift up the hose on the CABLE to inspect the Crimped ends				
1	2	3	4	5	Pulley Cart				
6	7	8	9	10	Ensure that the pulley cart is free from debris and any particles from wall surface. Check to ensure that the pulley chart is not obstructed in any way. Check bearing wheels for proper				
1	2	3	4	5	Cable Slack				
6	7	8	9	10	Ensure there is NO slack in front or behind the climbing structure/wall. There should always be tension on the cable!!				
1	2	3	4	5	Air Pressure				
6	7	8	9	10	(Write in the air pressure in the square to the left NOT a check mark!)				
					Look at the sticker on the side of the AB tank to ensure proper air pressure for each AB system.				
1	2	3	4	5	Hydraulic Fluid				
6	7	8	9	10	Hydraulic Fluid level should be visible in oil eye/lens. ISO 32 fluid is required; the following name brand fluid is available: MOBILE DTE-24, TEXACO RANDO-32, and CHEVRON AW-32.				
1	2	3	4	5	Attachment Hardware				
6	7	8	9	10	Carabiner – If the auto-locking Carabiner is not locking positively or if it is sticking open, replace immediately. Swivel- Needs to spin freely without sticking. Quick Link - Replace annually. Must be tighter than "finger tight".				
1	2	3	4	5	Pulley Wear and Inspection				
6	7	8	9	10	Inspect pulleys for excessive wear, cracks or splits. This is accomplished by rotating the pulley and inspecting the groove for wear depth. The pulleys should not wiggle side-to-side during operation. Replace if any damage is present.				
1	2	3	4	5	Hydraulic Cylinders				
6	7	8	9	10	Inspect for any oil leakage, around fittings, site gauge, hoses, Plugs, and oil containments systems. Some seepage is expected during normal use. Check for pitting and abrasions. Tighten and document any alternations to the system.				
1	2	3	4	5	Visual Inspection				
6	7	8	9	10	Vissually inspect all structural components: Wall frame, davits, trailer, etc for damage or				
1	2	3	4	5	Mounting Hardware				
6	7	8	9	10	Inspect all mounting hardware on the Auto-Belay and the davits.				
1	2	3	4	5	Oil Containment System				
6	7	8	9	10	Inspect all fittings and check for leaks. Document the amount of fluid in each bottle. Refer to owners manual for more information.				
1	2	3	4	5	Pulley Hardware				
6	7	8	9	10	All pulley bolts and applicable Nylock nuts must be replaced.				
1	2	3	4	5	Auto - Belay Priming				
6	7	8	9	10	Ensure that the Auto-Belay has been properly primed. (See page 8 "Priming of the Auto-Belay")				
Comments:									
Operator:									
Date:									
Questions call;					888-563-0163 Spectrum Sports Int'l, www.spectrumsports.com				

Wear Items:

The following items are wear items. Along with suggested guidelines for replacement, it is up to you, the operator, to monitor and determine how much use and wear they receive. When in doubt, replace it! Safety First!!!

Carabineers – It is well known that equipment deteriorates progressively with use. It is difficult to give a precise lifetime because it depends on the environment where it is being used. Surface damage, corrosive wear, mechanical wear, or impairment of the mechanical function of the product is easily observed.

Swivels – Again, the same warning for the Carabineers applies to the swivels.

Pulleys – Replace when worn.

Quick Link – Annually at a minimum, or when other inspection techniques require changes.

Cables – Annually at a minimum, or when other inspection techniques require changes.

Auto-Belay Cylinder seals – Replace when you start to see excessive oil leakage.

Hardware (pulley hardware) – Bolts, and Nylock nuts must be replaced every 12 months.

Air Pressure:

The current Auto-Belay Safety System Generation 4+ requires air in the tank to operate properly. Confirm that your Auto-Belay Safety System has the correct amount of air pressure. See chart below for details.

These are standard air pressures, depending on the installation and the cable route; more air pressure may be required.

Recommend Air Pressures				
Product	85 PSI	95 PSI	105 PSI	110 PSI
AB32				
AB40				
AB75				

Hydraulic Fluid Specs:

The oil lens should have a blue tinted fluid visible. Maximum fluid in the AB system is 9 quarts. If no fluid is visible, add the following if needed: **ISO 32 fluid is required**. The following name brand fluid is available to be used in the Auto-Belay Safety System:



INSTALLATION

INSTALLATION



Installation must be performed by Authorized Personnel. All installation guidelines from Spectrum Sports Intl must be followed to ensure proper and safe operation of the Auto-Belay.

The AUTO-BELAY SAFETY SYSTEM may be installed into either an appropriate steel structure (perhaps the wall steel framework), or into a concrete floor with appropriately rated epoxy chemical anchors and/or mechanical anchor bolts. If the Auto -Belay is mounted to the floor (concrete), it needs at least 4 inches imbed in 3000 psi concrete. The Auto-Belay needs to be located where a daily inspection can be performed. Typically the installation is directly behind the wall from the climbing surface, about 6 to 8 inches off the ground. Alterations may be made by SPECTRUM SPORTS INTL employees as necessary. Any and all deviations in location of the Auto-Belay must be performed by a SPECTRUM SPORTS INTL employee or under their supervision.

When installing the Auto-Belay Safety System into a climbing structure, use the following hardware as a minimum. We recommend using four ½”-13 Grade 5 bolts with 8 washers (one at each end of the bolt) and eight Nylock nuts per Auto-Belay. Use a bolt long enough that there is a minimum of 3-4 threads protruding past the Nylock nuts. Torque nuts to 55 ft. lbs, and annually check the torque thereafter.

Under normal operations, the AUTO-BELAY SAFETY SYSTEM applies a maximum transient force of 400 lbs. (upward direction) to the structure. In the event of an Auto-Belay failure (i.e. The Auto-Belay fails to take up the cable and the climber falls a short distance), the maximum up-force can be as high as 2000 lbs. The Auto-Belay connection structure should be able to withstand the 2000 lb. failure load with the same consideration given in UBC Allowable Stress Design – Alternate Basic Load Combinations (Section 1612.3.2, 1997 Uniform Building Code). The fatigue load is 400 lbs. of up-force.

For attachment of the AUTO-BELAY SAFETY SYSTEM to a steel framework, the framework should be sufficient to withstand the following design loads. The framework should use the mounting holes on the AUTO-BELAY SAFETY SYSTEM as indicated on the AUTO-BELAY SAFETY SYSTEM drawings.



The Auto-Belay Safety System was designed to operate in the vertical position. Installing the Auto-Belay Safety System other than vertical will limit the ability to operate properly.

Load	Magnitude	Direction
Normal Design Load	400 lbs.	Upward
Failure Design Load	2000 lbs.	Upward

Auto-Belay Mounts:

Spectrum Sports Intl has different options to install/mount the Auto-Belay Safety System to a structure. You can choose which one works the best for your application. If you need to install the Auto-Belay Safety system in a manner that is not shown in this manual, we highly recommend that you contact Spectrum Sports Intl for direction. www.spectrumsports.com/installationmanuals

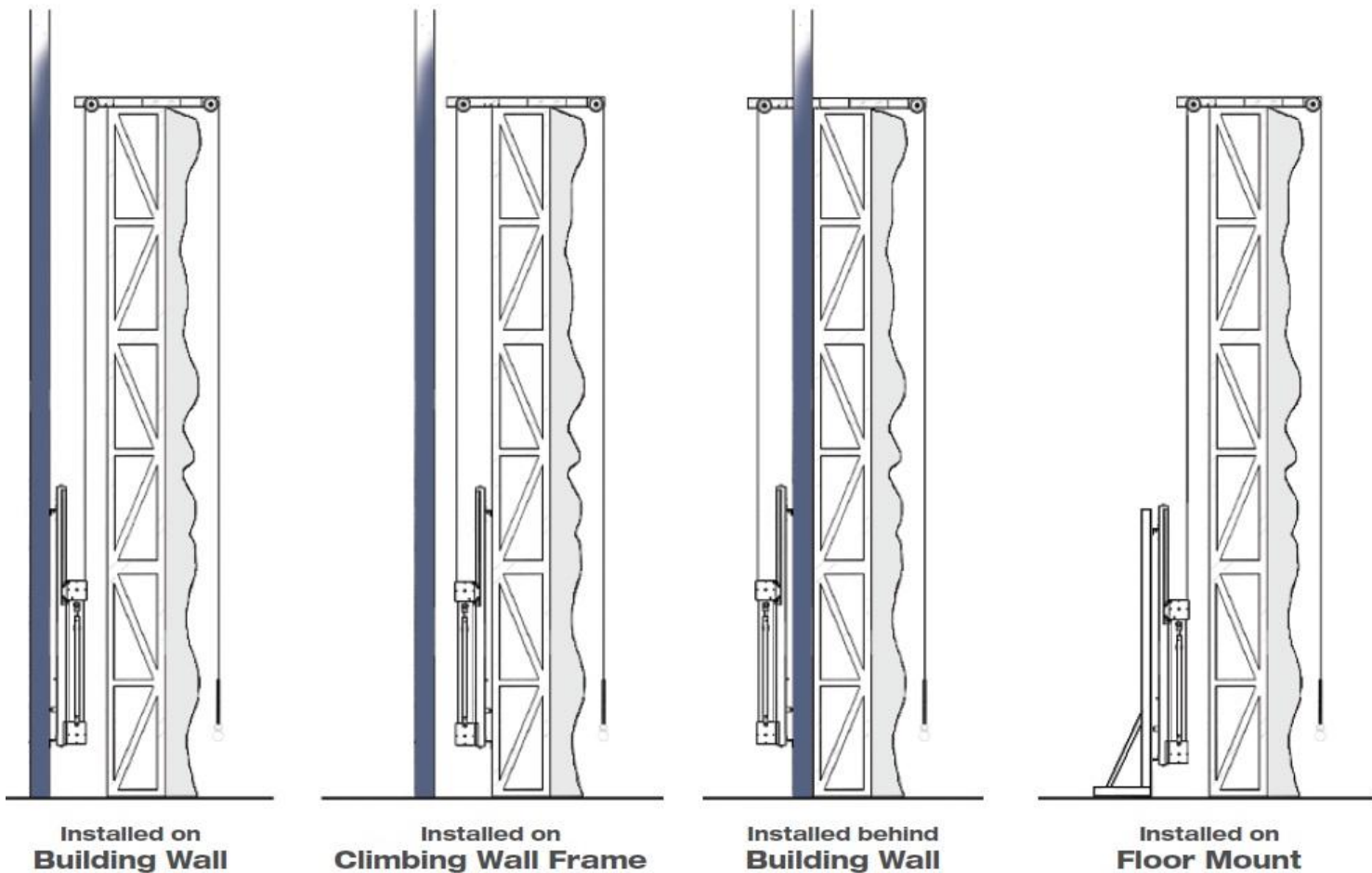
Installation Examples:

Existing Wall Mount

Climbing Structure Mount

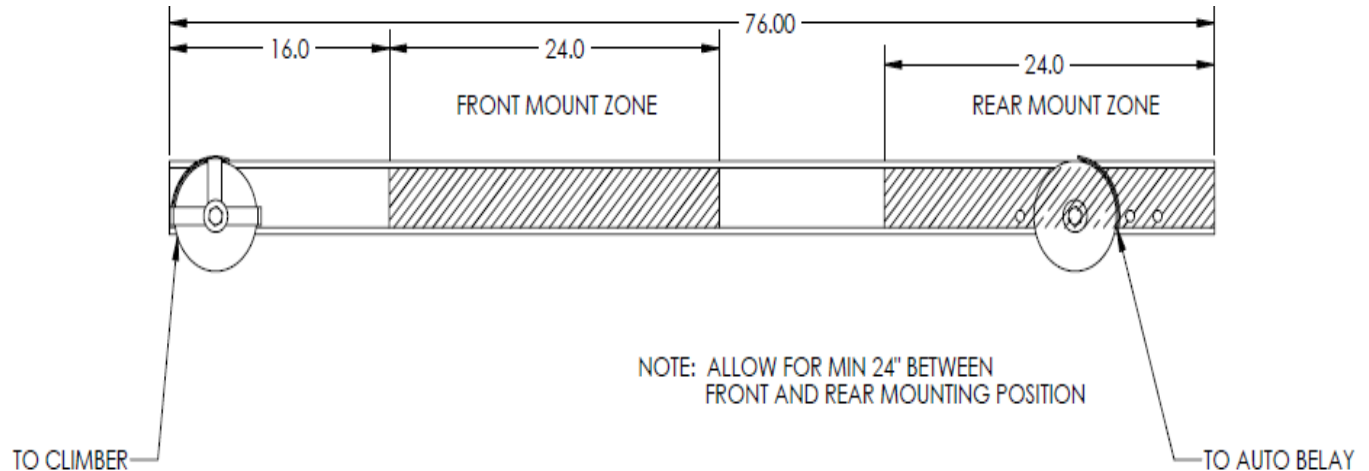
Remote Room Mount

Floor Mount (mounting the system to a free standing engineered structure)



Davit Installation:

A "Davit" is a steel support arm that aligns the cable from the Auto-Belay Safety System to the front of the climbing surface to the climber. The Davit is installed at the top of the climbing structure with one pulley on the front side of the structure and the second pulley on the back side of the climbing structure, the Davit must be installed so that the pulley blocks of the Auto-Belay and the rear pulley on the davit are in a plumb line. The cable should not rub against anything behind the rock climbing wall. This will prevent the cable from wearing prematurely, and ensure that the AUTO-BELAY SAFETY SYSTEM operates properly. Please call Spectrum Sports Intl for answers to any questions regarding davit alignment. www.spectrumsports.com/installationmanuals



We offer Engineered Davits that will accommodate most climbing wall installations. Please call if you have questions on the installation. The Davit must be secured to a solid surface, generally steel or cement, being welded, bolted or with the use of appropriately rated epoxy chemical anchors and anchor bolts.


Structural Approval:

The AUTO-BELAY SAFETY SYSTEM is basically the same safety device as that used on our standard amusement related products. However, rather than using a stand-alone trailer or stationary back-support for stabilization, the AUTO-BELAY SAFETY SYSTEM must be properly installed within the structure of the climbing structure itself or through concrete anchors. Before installation of the AUTO-BELAY SAFETY SYSTEM, please make sure that you understand the installation for this product. In addition, before public use of the AUTO-BELAY SAFETY SYSTEM, you should have received an Engineering Certificate and/or approval specific to your structure and in compliance with any local government agency or governing body. Spectrum Sports Intl highly advises that each site and/or installation have an engineering stamp of approval by a certified structural engineer before the wall can be used for climbing. It is the responsibility of the customer/wall owner to ensure that this is done; however, if requested, Spectrum Sports Intl can provide a seal of approval depending upon the state for a competitively priced fee.

CABLE INSPECTION

CABLE INSPECTION

Cable Inspection Techniques:

 A rigorous inspection routine is not only recommended, but required. Proper inspection will eliminate the chance of using a wire rope beyond its useful life. The inspection routine listed, is the procedure that should be followed rigorously. This inspection method is visual and adheres to the applicable standards published in the United States.

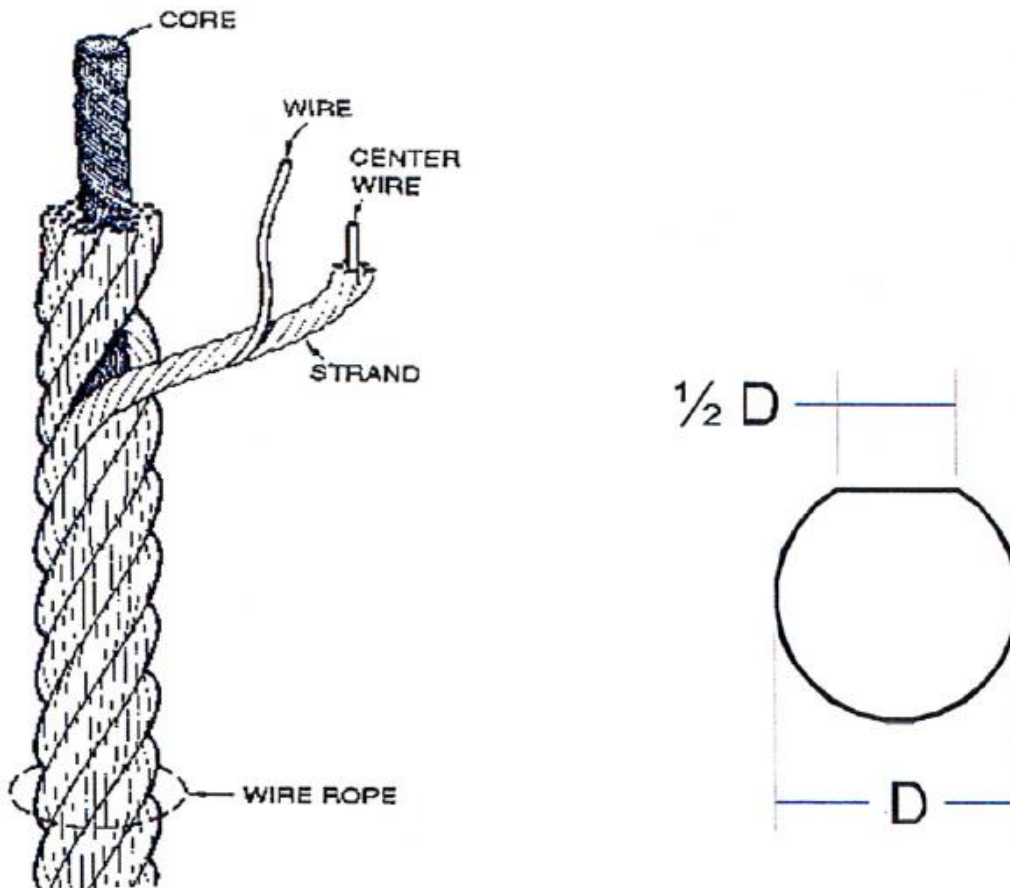


Figure 5.0 - Single Wire Inspection Criteria for the Auto-Belay Wire Ropes.



Replace the cable if any of the following conditions are true:

(Refer to Figure 5.0)

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 as shown in Figure 5.0.
2. If there is a single broken wire in any strand.
3. If there are 50,000 or more cycles on the route.
4. If the cables have been on a climbing tower for 1 year (12 months).
5. If there are any twists, kinks, flat spots, or bird-caging.

Wire Rope Inspection Criteria recommended by various agencies and Manufacturers, Governing agencies in the United States have published guidelines pertaining to wire rope use, maintenance, inspection, and general specifications. Further, most wire rope manufacturers have additional guidelines for the use, maintenance and inspection of their cables. These guidelines and codes set precedence for the industry standard methods of use, maintenance and inspection of wire ropes. Deviation from these recommendations would be viewed as questionable by most engineers with experience in the industry.

To justify the inspection method recommended by Spectrum Sports Intl, the most noted codes and guidelines have been obtained and read by SAE Inc. engineers. The codes obtained by SAE Inc. engineers include:

- a. **ASME (American Society of Mechanical Engineers) International Publication**
ASME/B30.5c – Mobile and Locomotive Cranes, 1998, ISBN#: 0791822753
 This code is a revision of the ASME/ANSI B30.5-1989. It applies specifically to applications similar to the Space Shot™ ride.
- b. **Wire Rope Technical Board**
Wire Rope Users Manual, Third Edition, 1993
 This test gives a summary compilation of the recommended practices for wire rope use in general applications.
- c. **OSHA Wire Rope Excerpts** – General Standards, Vol. 37, Number 202, Oct. 1972.
 This general standard is a compilation of the ASME/ANSI standards that exist now as the ASME/B30.XX series. These are the forerunner to current standards.
- d. **Leeschen Wire Rope Company**
 “Wire rope Inspection”, Report #107. This report gives guidelines to the inspection methods appropriate to identify wire rope damage.

Each of these codes specifies, in general, the same criteria for inspection of wire ropes. Additional ASME codes specify inspection criteria for additional applications including, but not limited to personnel hoist (elevators), overhead cranes, material hoist, etc. The ASME code governing Mobile and Locomotive Cranes is very stringent. It is the most stringent code that has any applicability to the Auto-Belay. The highlights of the inspection guidelines/codes listed above are included in the next table of this document to set a comparison reference for SPECTRUM SPORTS INTL guidelines. Note that the inspection procedures outlined in the referenced codes are all visual inspections.

Comparison of Wire Rope Inspection Criteria

Inspection Criteria Requiring Rope Replacement	ASME/B30.5c Cranes	Wire Rope Users Guide, 3 rd Edition
Length of Wire Rope Service	No specifications given.	No specifications given.
Abrasion	1/3 diameter worn on any wire. (see figure below)	1/3 diameter worn on any wire, see specific governing code.
Rope Stretch	No specifications given.	When the rate of stretch increases after initial break-in period.
Reduction in Rope Diameter	1/48" on cables ¼" diameter	When accompanied with significant rope stretch; otherwise not specific.
Corrosion	Not specific	If accompanied by metal pitting; if rust exists.
Kinks, Twists, Crushing	Any – replace wire rope.	Any – replace unless cable is repairable.
“Bird Caging”	Any defect – replace unless defect can be removed	Any defect – replace unless defect can be removed
Heat/Electrical	Any – replace wire rope.	If wires are fused or discolored.
Broken Strands	Rotation resistant ropes: 2 wires in 6 rope diameters – and 4 wires in 30 rope diameters. New criteria: 4 broken wires in one lay-length and 2 broken wires within 1 strand within 1 lay-length	See Specific Code
Damaged End Attachments	If non-repairable, replace wire rope	See specific code
Non-destructive	None specified	None specified

The ASME/B30.5 inspection criterion is very specific on the visual inspections required. The code is specifically designed to allow an inspector to accurately infer the status of the wire rope core from a thorough inspection of the wire ropes broken wires in a strand, abrasion of the wires in the strands, and the change in the diameter of the overall rope. The inspection criterion requires a thorough visual inspection of the rope.

The number of broken strands is a key aspect of all of the ASME codes. A summary of the ASME code allowable broken strands is included here due to the primary role it plays in determining the integrity of the rope core.

ASME Code governing when to replace Wire Rope - Based on number of Broken Wires

ASME Standard	Equipment Connection	Number of Broken Wires In Running Ropes		Number of Broken Wires In Standing Ropes	
		<u>In One</u> Rope Lay	<u>In One</u> Strand	<u>In One</u> Rope Lay	<u>In One</u> Strand
ASME/B30.2	Overhead & Gantry Cranes	12**	4	Not Specified	
ASME/B30.4	Portal, Tower & Pillar Cranes	6**	3	3	2
ASME/B30.5	Crawler, Locomotive & Truck Cranes: Retirement criteria based on number of broken wires rev B. Rotation Resistant Rope found in length of rope equal to 6x rope diameter – 2 broken wires maximum; and 30x rope diameter – 4 broken wires maximum.				
ASME/B30.5	Running Rope	6**	3	3	2
ASME/B30.6	Derricks	6**	3	3	2
ASME/B30.7	Base Mounted Drum Hoists	6**	3	3	2
ASME/B30.8	Floating Cranes & Derricks	6**	3	3	2
ASME/B30.16	Overhead Hoists	12**	4	Not Specified	
ANSI/A10.4	Personnel Hoists	6**	3	2**	2
ANSI/A10.5	Material Hoists	6**	Not Specified	Not Specified	

**Also remove for 1 valley break.



Cable Replacement Options:

On-Site Service: Spectrum Sports Intl has offered the option of On-Site Service for over a decade. Our service truck circles the entire country twice each year, and is fully equipped. This option may include cable replacement, parts replacement, inspection, and any other maintenance needs pertaining to the customers' request. To be put on the On-Site Service schedule, visit our website at www.spectrumsports.com, then fill out, and submit the request form, or call (888)563-0163.

Self Installation: Customers who wish to install cables on their own product, have the option of ordering certified cable, with both ends crimped, straight from our facility. Included, are specific instructions to properly install the cable on a Spectrum Sports Intl Auto-Belay. (Appendix F)

OPERATING/USING THE AUTO-BELAY

OPERATING/USING THE AUTO-BELAY

Once you understand how the Auto-Belay works, and how to inspect it you need to understand how to operate it. Follow the steps below to ensure safe usage of the Auto-Belay system.



ATTENTION!

Make sure you read and understand this section thoroughly prior to use!

- Step 1.** Complete the daily checklist. Confirm that the cable has tension on it.
2. Before someone climbs, instruct the climber regarding the proper protocol to follow during and after climbing. This includes the following: When a climber has finished climbing (reaches the top, falls, or cannot support themselves while climbing), inform them to grab hold of the red hose on the cable and “sit” in the harness with their feet toward the climbing structure. This will allow the Auto-Belay to slowly descend the climber. Inform the climber to land on their feet. Feet First!!!
 3. Confirm the climbing harness is on properly and secure.
 4. Unhook the Auto-Belay cable from the static/locked position and hook it to the climbing harness. Be sure that you hear the carabineer click into locked position! Double check the tension on the cable (pulling down and feeling the up-pull).
 5. Instruct the climber on how to climb, meanwhile; paying attention to the tension on the cable.



If slack occurs at anytime during the climb, STOP CLIMBING UP and slowly climb down. DO NOT LET GO and fall with slack in the cable. Serious injury may occur.

6. Once the climber has descended and is standing on the ground, unhook them from the Auto-Belay Safety System. Once they are “OFF” the Auto- Belay safety system, remove the climbing safety harness from them. Do NOT ALLOW THEM TO CLIMB ON THE TOWER WITHOUT A HARNESS AND SECURED INTO THE AUTO-BELAY Safety System.
7. Remove the person from the “Climbing Zone”.

TROUBLE SHOOTING

TROUBLE SHOOTING

Trouble Shooting Guide for the AUTO-BELAY SAFETY SYSTEM

Problem:

The Auto-Belay cable will not retract:

Check the air pressure in the tank.

If there is NO air pressure: charge tank to the appropriate psi, and then check for air leaks by using soapy water.

If there is air pressure: Check cable routing to ensure there is no cable obstructions.

Check pulleys and the pulley cart to ensure the pulleys are turning freely and that the cable pulley cart is free from obstructions. Ensure the ram alignment is true.

With proper air pressure, does the tracking pulley cart seem to stop at a point and not track

If NO, call Spectrum Sports Intl – 888.563.0163

If YES, check bearing for proper turning/tightness or if track is clear of debris.

There is grinding or loud rubbing noise:

Cable is rubbing somewhere. Determine where the cable is rubbing and call SPECTRUM SPORTS INTL for directions.

Hydraulic oil is leaking. Hydraulic oil shoots out when a climber descends:

Locate the source of the leak (i.e. shaft-end of cylinder, brass breather vent of cylinder, hydraulic hose and/or fitting, or tank).

If origin is from the cylinder-end where chrome shaft goes in and out, then the seals are worn. Call Spectrum Sports Intl to order parts and installation instructions.

If origin is from the cylinder-end with brass colored breather vent, please note that small amounts are normal for the purpose of lubricating the sliding cylinder head. However, large amounts can mean a torn seal, excessive wear or some other abnormality. Please contact SPECTRUM SPORTS INTL for details.

AUTO-BELAY SAFETY SYSTEM will not hold air pressure?

With soapy water, check all fittings for proper seal, or air leaks.

If air is leaking from fittings, tighten fitting and check again. If problem continues, call for assistance.

If air is leaking from air gauge or Schrader valve, tighten and re-check. If continues, call for assistance.

My air pressure is a little low. How do I add air to the unit?

On the side of the Auto-Belay, just below the pressure gauge, is a Schrader valve. This valve is similar to what you would see when you add air to tires on an automobile. Simply add air to this unit in the same manner you would to a car tire. Using an air chuck, connected to an external air source, add air until the gauge reads between the ranges specified for the unit.

The oil level is no longer registering in the sight glass. How do I add oil?

Step 1. Make sure the air pressure is let out of the tank.

Step 2. Remove the cap at the very top of the tank with a 7/8" socket or wrench.

Step 3. Use a funnel to add the oil. (see manual for oil specs)

Step 4. You should add one quart of oil after the oil becomes visible in the sight glass.

Step 5. Replace the cap at the top of the belay tank and add air pressure until the proper pressure is achieved.

Step 6. Prime the Auto-Belay Safety System

*Should you encounter a problem not listed and need assistance, please call: Spectrum Sports Intl (888)563-0163

PRODUCT WARRANTY

PRODUCT WARRANTY

(The warranty is established from the date of invoice.)

Product Warranty: 90 Days. Wear and Tear parts are not included under this warranty. Warranty is only extended to the original owner. After 90 days per the following:

Steel Frame – Life Time on upper pulley cart and Belay tank. Does not include any frame damage due to improper installation or damage due to misuse.

Powder Coating – 90 Days. Does not include any blemish due to normal wear and/or abusive use. Warranty is limited.

Hydraulic Cylinder(s) – 90 days per manufacturer specifications. Does not include normal wear and tear. Void if determined that any other Hydraulic Fluid, other than what has been specified by manufacturer, has been used. If questions, please call SPECTRUM SPORTS INTL.

Cable (SPECTRUM SPORTSINTL Certified) – 90 Days

Climbing Surface- 90 days. On climbing surfaces it is not unusual to have cracks and air pockets in the part. This is normal and repair of this is not covered under this warranty

Steel Trailer and Steel Tower Uppers- 1 year on welds and structure. Any cracks in the steel must be reported to Spectrum Sports Intl immediately, we will determine if the crack is structural or operator error is step up.

Handholds, Banners, Timers, and other misc parts- 90 Days. Wear and Tear is not included under this warranty.

General warranty conditions do NOT include shipping costs to Spectrum Sports Intl.

On items that can be shipped by US Postal and/or overnight parcel carriers, SPECTRUM SPORTS INTL will pay for the same class or rate of service on return shipment as it was received from customer. Spectrum Sports Intl uses fabricators, distributors and/or service agents local to customer for steel, fiberglass, and hydraulic parts to determine cause and/or repair of this particular part. Should it be determined that the defect is due to abuse or misuse, any and all warranty rights or responsibilities are void. Spectrum Sports Intl reserves the right to void warranty service on any modification to product done by customer. Spectrum Sports Intl is in no way responsible for lost revenue or income while product is not in operation due to warranty or any other problems due to installation and/or operations. Please refer to Appendix I for the Limited Warranty Acknowledgement.

Spectrum Sports Intl : Limited Warranty, Limited Remedy and Liability Release

(It is important to read all of the components of this manual and form).

Limited Warranty:

Spectrum Sports Intl warranties and obligations set forth below are in lieu of any other express warranties or obligations of Spectrum Sports Intl, its distributors, or resellers/retailers. The warranties and limitations extend are only for the person who originally purchased the product.

Per the warranty section of this manual, Spectrum Sports Intl for a period of 90-days or life time, depending upon the item or stated claim (see Warranty section) from date of purchase will at manufacturer's option, repair or replace at no charge, and Spectrum Sports Intl AUTO-BELAY SAFETY SYSTEM which breaks or is defective in materials or workmanship. Damage due to misuse, abuse or modification is excluded – as is normal wear (such as indicated in the warranty section), dings, scratches, seal wear, cable wear, pulley wear, etc.

Any modifications to any part of the Spectrum Sports Intl product or modifications of any of the third party products that are included with the product, will forfeit any warranty claim. The product must be in the original form from the manufacture.

Cleaning and Maintenance:

Under no circumstances should the unit be serviced by any unqualified person(s). Any work to the steel frame, hydraulic Auto-Belay or cable/roping should be performed by and experienced person in the field of service who is certified, bonded, etc., to perform the work. It is the owners' responsibility to ask for such certification and/or bonding verification. Cleaning of the unit should be similar to an automobile (i.e. car wash with spray washers and mild detergents). Any person(s) who work on the Auto-Belay and are not authorized and/or not trained by SPECTRUM SPORTS INTL, will take 100% responsibility and liability on the product.

Limitation of Remedy:

During the period of warranty, SPECTRUM SPORTS INTL will do everything we can to answer and resolve any questions or concerns on the products we sell. SPECTRUM SPORTS INTL has the right to evaluate if a product is under warranty. To obtain repair or replacement parts, call or fax Spectrum Sports Intl customer service for a return authorization number. Include the following information: name, address, date of purchase, address where product is located, office phone or mobile phone (if at an event), and your product model and serial number. At your expense, ship or deliver the product to SPECTRUM SPORTS INTL: 3785 N. HWY 91-Hyde Park-Utah-84318. Replaced or repaired items will be shipped back to you at no cost and will be shipped in the same manner as it was received (i.e. overnight, ground, etc.). For items that must be received before the defective part is sent to SPECTRUM SPORTS INTL it is REQUIRED that a valid credit card be charged for the warranty item before SPECTRUM SPORTS INTL will ship. Once SPECTRUM SPORTS INTL receives the old part, a credit will be issued back to the credit card.

Release of Liability:

I understand and am aware that the use of climbing walls with Auto-Belays is a hazardous activity. I understand that I am solely responsible for safe operation, daily inspection and maintenance and customer adherence to the rules. I understand that rock climbing involves a risk of injury to any and all parts of my body and the customers who use this product. I HEREBY AGREE TO FREELY AND EXPRESSLY ASSUME AND ACCEPT ANY AND ALL RISKS OF INJURY OR DEATH TO THE USER OF THIS EQUIPMENT.

I will agree that I will release Spectrum Sports Intl its manufacturer, its distributors and retailers from any and all responsibility or liability for injuries or damages to the user of the climbing products I am purchasing, or to any other person. I agree not to make a claim against or sue Spectrum Sports Intl, its manufacturers, its distributors or retailers for injuries or damages relating to use of the equipment, other than such claims as are allowed by the limited warranty set forth above.

Agreement:

I understand how to operate the climbing product safely. This means that I do understand, but not necessarily limited to, how the Auto-Belay works on the climbing products, how to perform daily safety inspections, the rules, and in general manage crowd and staffing operational issues.

Acknowledgement:

I have carefully read this limited warranty, limited remedy, and release of liability and fully understand its contents. I am aware that this is a release of liability and a contract between me and Spectrum Sports Intl and its manufacturers, distributors and retailers.

Limited Liability Warranty

Equipment manufactured by Spectrum Sports Intl, 3785 N. HWY 91, Hyde Park UT 84318, is warranted free from defect in material and workmanship for a period of 90 days from the date of purchase. Equipment not manufactured by Spectrum Sports Intl is covered to the extent of warranty provided by the original manufacturer and this warranty does not cover any equipment, new or used, purchased from anyone other than Spectrum Sports, Intl. All replacement parts shall be covered under warranty for a period of 90 days from date of purchase. SPECTRUM SPORTS, INTL MAKES NO OTHER REPRESENTATION OF WARRANTY OF ANY OTHER KIND, EXPRESSED OR IMPLIED, WITH RESPECT TO THE GOODS SOLD HEREUNDER, WHETHER AS TO MERCHANTABILITY, FITNESS FOR PURPOSE, OR OTHERWISE.

Spectrum Sports, Intl sole obligation under this warranty shall be to repair or replace any part or parts which, to Spectrum Sports, Intl satisfaction, prove to be defective upon prepaid return to Spectrum Sports Intl 3785 N. HWY 91, Hyde Park UT 84318. In such a case, once the necessary repair(s) has/have been made or a replacement part secured, Spectrum Sports Intl will pay the cost to return the item back to the customer. This obligation does not, however, include labor to install replacement parts, nor does it cover any failure due to accident, abuse, neglect, or use in disregard of instructions furnished by Spectrum Sports Intl. SPECTRUM SPORTS INTL SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER.

All claims in regard to the parts or equipment must be made within two (2) days after Purchaser learns of the facts upon which the claim is based. Authorization must be obtained from Spectrum Sports Intl prior to returning any equipment, components, or parts. This warranty is voided by failure to comply with these notice requirements.

Production output is dependent on feed stock, input, and many other variables beyond the control of Spectrum Sports Intl; therefore, Spectrum Sports Intl makes no guarantees expressed or implied as to production performance.



Warranty Notice

The warranty on Spectrum Sports Intl equipment remains valid only when genuine Spectrum Sports Intl replacement parts are employed. If anyone other than SPECTRUM SPORTS INTL authorized service technicians perform work or modify/repair any part of the product, it will VOID the warranty and any clause to our Liability. If purchaser defaults in making payment for any parts or equipment, this warranty shall be void and shall not apply to such parts and equipment. No late payment or cure of default in payment shall extend the warranty period provided herein.

Spectrum Sports Intl is not responsible for damage to any associated instruments, equipment or apparatus nor will Spectrum Sports Intl be held liable for loss of profit or other special damages for any reason. The Buyer, their employees, agents and successors in interest assume all risks and liabilities for the operation, use and/or misuse of the product(s) described herein and agree to indemnify, hold harmless and defend the seller from any and all claims and actions arising from any cause whatsoever, including sellers negligence for personal injury incurred in connection with the use of said product(s) and any and all damages proximately resulting therefore.



CAUTION:

Only technically qualified individuals who have fully read and understand the provided instructions should operate the equipment. The equipment should be operated only in accordance with these instructions. The operator should follow all of the warnings and cautions set forth in the manual and the operator should follow and employ all applicable standard laboratory safety procedures.

Conclusion:


This owner/operator manual has been written to assist in the proper installation and operation of the AUTO-BELAY SAFETY SYSTEM. SPECTRUM SPORTS INTL has tried in its best effort to address relative issues; however, there will be additional information learned or situations that occur that we are unaware of at this time. Please, do not hesitate to call with any technical questions. Remember, there may be questions, issues and/or concerns that may arise through the use of this product that are not listed or addressed in this manual, please keep us informed. It is the responsibility of the owner/operator of this product to contact SPECTRUM SPORTS INTL if any questions arise. As with any amusement/safety device, physical harm may occur and operators and participants must realize that this product is a physical activity and that proper care should be taken to ensure safety. Please exercise good common sense, and judgment while operating the AUTO-BELAY SAFETY SYSTEM.

It is the customer's sole responsibility to clarify any question or concern with Spectrum Sports Intl before use and/or operation.

APPENDICES

Appendix A

The following form is the AUTO-BELAY SAFETY SYSTEM order form for replacement or accessory needs. Please refer to the attached parts list if ordering a replacement item or for warranty questions.

Contact:	Phone:	Fax:	Email:				
SHIP TO:		BILL TO:					
Payment Type: COD CC PO#		Name on CC:					
Shipping: Ground 2Day 3Day Overnight		Card Type:	Exp:				
Shipping Acct #:		Card #:	CVC:				
Item Description	Price	Qty	Total	Item Description	Price	Qty	Total
Belay Tank Weldment	\$1,290		\$	Auto-Belay Sticker	\$7.00		\$
Carriage Weldment	\$450.00		\$	Cable Replacement Sticker	Free		\$
Cylinder (Specify Serial #)	\$275.00		\$	Air Pressure Sticker	Free		\$
Belay Hose	\$130.00		\$	2" x 5/8" - 11nc Bolt	\$5.00		\$
Bottom Cylinder Spacer	\$3.00		\$	4.5" Pulley Bolt	\$6.00		\$
Cylinder Cart Spacer	\$3.00		\$	5" Pulley Bolt	\$7.00		\$
Cable Spacer	\$3.00		\$	6" Pulley Bolt	\$8.00		\$
Strainer	\$89.00		\$	7" Pulley Bolt	\$9.00		\$
Check Valve	\$240.00		\$	8" Pulley Bolt	\$10.00		\$
Sight Glass	\$15.00		\$	8 1/2" Auto-Zip Pulley Bolt	\$10.00		\$
Tee Fitting	\$85.00		\$	3 1/2" Auto-Zip Pulley Bolt	\$5.00		\$
Sealed Bearing	\$5.00		\$	Nylock Nut 3/4	\$2.00		\$
Shrader Valve	\$10.00		\$	Nylock Nut 5/8x11 (For bolts)	\$2.00		\$
Moisture-proof Breather	\$6.00		\$	Nylock Nut 1/4x20nc	\$1.00		\$
Pressure Guage	\$30.00		\$	5/8" Lock Washer	\$1.00		\$
Pulley (6 inch)	\$22.00		\$	Pin Clip	\$1.00		\$
Swivel	\$60.00		\$	6" Cylinder Pin	\$12.00		\$
Carabineer (Trple Auto-Lockin	\$22.00		\$	Cylinder Pin	\$6.00		\$
Quick Link	\$6.00		\$	1539 & 1539-1 Seal Kits	\$45.00		\$
Flow Control	\$54.00		\$	2039 2" Zip Seal Kit	\$45.00		\$
Flow Control Elbow	\$6.00		\$	Sweeco Seal kit (One Seal)	\$12.00		\$
Auto-Zip Pulley	\$69.00		\$	Lin Act Seal Kit	\$30.00		\$
Owner's Manual	\$25.00		\$	Lin Act Gland Kit	\$85.00		\$
Oil Containment System	\$35.00		\$				\$
			\$				\$
			\$				\$
			\$				\$
			\$				\$
			\$				\$
Certified Cable w/ both ends crimped: 24' - \$195.00; 32' - \$235.00; Zip \$395.00 (uncertified: \$230.00)							
Specify Length _____							\$
Extreme Engineering Cables:							
Specify Length _____							\$
Cost of Goods	\$	Shipping & Handling			\$		
Discount	\$	COD Charge (\$15)			\$		
UT Sales Tax (6.37%)	\$	Total Due:			\$		
				3785 N. Hwy. 91 ~ Hyde Park, UT 84318 PH: 888.563.0163 ~ FX: 435.792.3884			
* Prices are subject to change, please call and get the most updated pricing for any parts that you may need.							

Appendix B

Changing an Auto-Belay Cylinder



This procedure is for the Generation 4 Auto-Belay design with 4" x 4" tank installed on climbing structure. Two people are recommended.

Tools Required:

Two adjustable wrenches capable to open to 1 ½" or; two - 1 1/2" and one 1 1/8" open end wrenches.

Air chuck.

7/8" open end wrench

9/16" open wrench

ISO 32 oil; the following name brand fluid is available:

Mobile DTE – 24, Texaco RANDO – 32, and Chevron AW – 32

Rags to absorb oil

Directions:


1. Pull cable/rope all the way down to bottom of wall panel to fully retract cylinders (3) to force oil from the cylinder tube.
2. Depressurize the Auto-Belay tank (1) **entirely**. Depress the center of the Schrader valve (15) with a Schrader valve air chuck.
3. Use the wrench to remove 1" nut (5) from 1" bolt (7). Remove 1" bolt (7) on bottom pulley bracket. Keep the spacer (20) from between cylinders on 32' Auto-Belays to put it back on later.
4. Remove breather (18) from old cylinder and install it on the new cylinder.
5. Use the wrench to remove hose (11) and check valve (20) from cylinder that you are replacing. Loosen hose fitting then check valve (20), repeat this until the check valve is removed. Now it takes two people, one person to hold a CLEAN rag over the check valve (20) to keep oil from escaping. Oil can be replaced afterwards. The second person can do the next steps while the other person holds a rag over the check valve.
6. At the top of cylinder (rod end) remove bottom clip from pin so pin may be pulled out. Keep any spacer (19) to reinstall as you put new cylinder on.
7. Cylinder may now be removed.
8. Work backwards from here repeat steps 5 thru 3 to attach new cylinder.
9. Once everything is in place add air to the Auto-Belay tank until the pressure gauge reads 90 psi. The procedure is the same for 24' and 32' walls.
10. Purge the air out of cylinders by repeatedly pulling the rope down and then allow it to rise by hand until resistance is felt throughout the entire down stroke. Now check oil level.
11. If oil needs to be added to make oil visible in oil lens, repeat step 2. Remove fill plug at top of tank with a 7/8" wrench or a 5/16" Allen wrench. Add oil then tighten fill plug and repeat step 9. Check oil level again. Repeat if necessary to assure that oil level is in the middle of sight gauge/oil eye.



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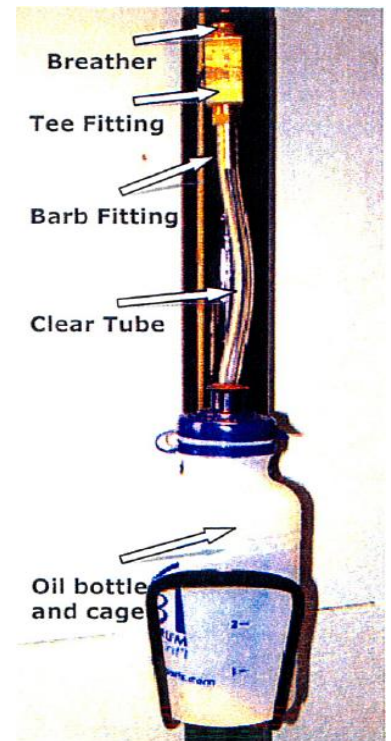
Appendix C

Oil Collection Kit Installation

 You will need an adjustable wrench to complete this installation.

1. Remove the old breather from the cylinder. It will be installed later.
2. Thread in the tee fitting and tighten until the fitting is parallel to the belay cylinder. (See Picture)
3. Thread and tighten the breather into top of the tee fitting.
4. Thread and tighten the barb fitting into the bottom of the tee fitting.
5. Push one end of the clear tube on the barb fitting.
6. Measure 10 ½" down from the tee fitting to the top of the bottle cage and attach with two zip ties. Make sure the ties cross over the mounting plate of the cage before tightening the zip ties.
7. Place the other end of the clear tube into the opening of the bottle.

Make a note of the oil level by checking it frequently to determine if repairs are needed to belay cylinders. For example, if you notice some oil in the bottle, write the date on the bottle at the oil level so you can monitor it from then on. Call SPECTRUM SPORTS INTL with questions if you are concerned about the oil you see in the bottle.



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Appendix D

Seal Kit Replacement

Occasionally the seals in the Auto-Belay Cylinders will have to be replaced. The most common problem found with leaky cylinders is found on the piston side of the rod. Typically if this problem is found early and fixed before excessive use, the other seals will stay in good working condition. Thus it is important to monitor all belays on a daily basis. Oil Containment Kits are a cheap and effective way to monitor and contain oil leakage. Oil kept clean can be reused in the belay.

Tools:

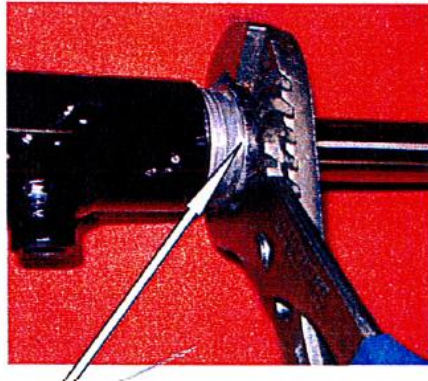
- 1 ½" Spanner wrench with 1/8" teeth (or a pair of channel locks)
- Small flat blade screwdrivers
- Small Pick
- Clean rags

Note: All work on cylinders should be done in a clean and contaminant free area.

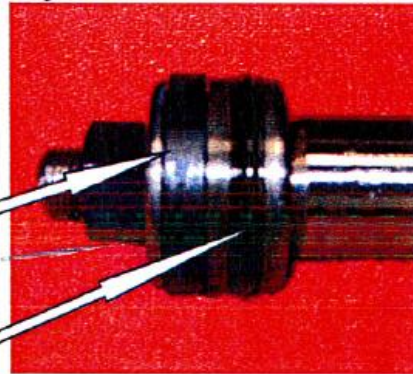
Directions:

1. Start by taking off the head of the cylinder. If you do not have a spanner wrench, then a pair of channel locks will do the job. After unscrewing the head, carefully pull it out making sure not to excessively drag the seals on the threads. Remove the entire rod.
2. Carefully remove the seal on the piston side of the rod. Taking note of the seal placement, use a pick to pry up the seal while the screwdriver circles the perimeter of the piston, lifting the seal to the ridge as it goes. Remove the wear ring.

Picture 1



Picture 2



Picture 1 displays the "Head"; Picture 2 displays the "Wear Ring" (left) and the "crown seal" (right)

3. Clean and lube seals and head with ISO 32 oil. Replace wear ring with new one. Gently and slowly walk the crown seal up the piston end until it falls into place. Make sure it seats properly.

Note: In many cases (if caught early), this is the only seal you will have to replace. If the other seals need to be replaced, do so in the same manner. Take note of seal placement and make sure everything is clean and well lubed. More tools may be necessary if you choose to replace all seals.



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Appendix E

⚠️ Cable Replacement: Both Ends Terminated

Spectrum Sports Intl cannot be held liable for injuries sustained from changing out cable(s). The customer will have to use their better judgment and have the ability to perform this task safely. Two people are recommended.

Tools: Two 15/16" open-end wrenches or two adjustable wrenches

Two 7/16" open-end wrenches

Air chuck

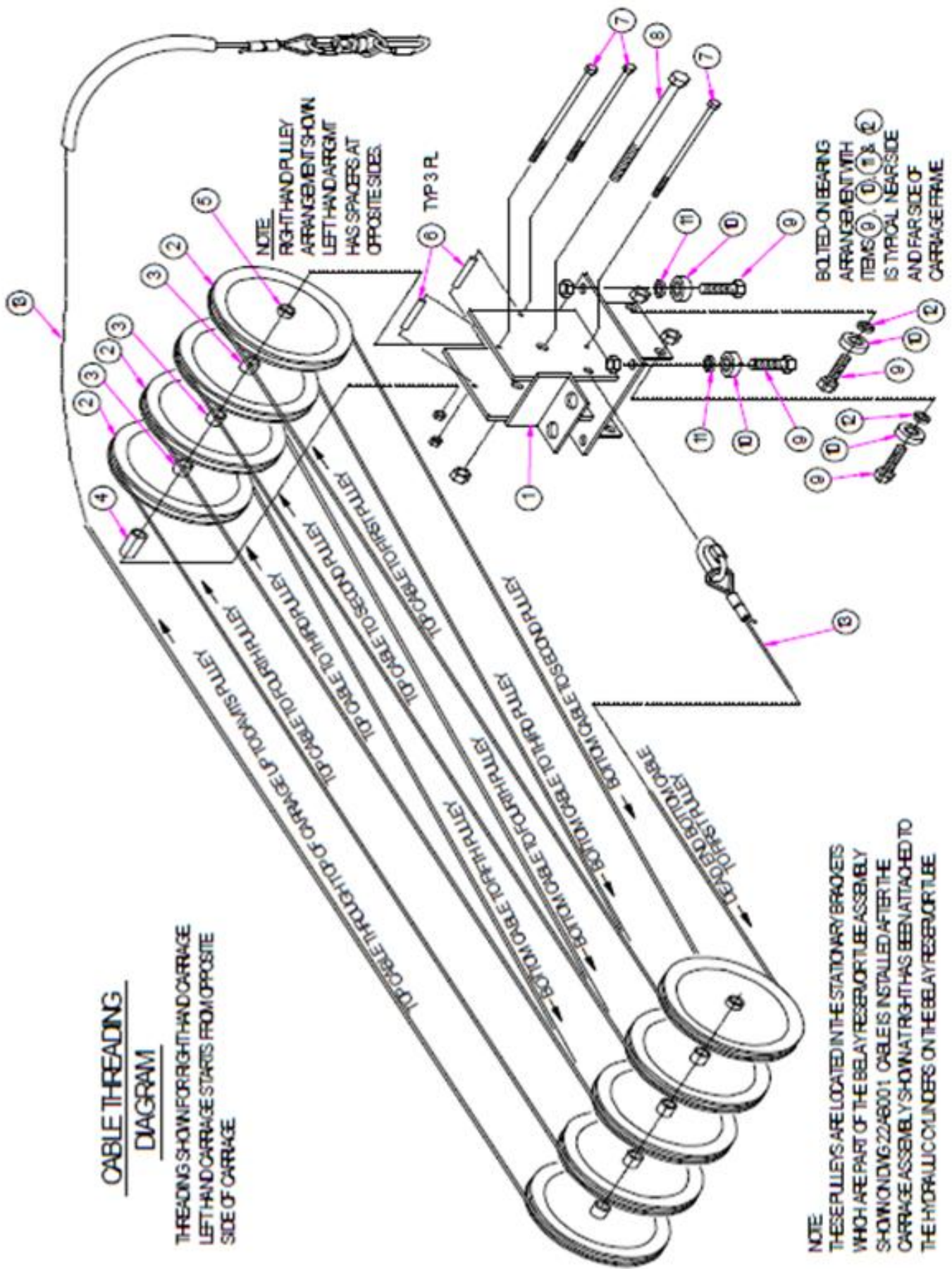
One 5/8" open-end wrench

Replacement Cable

6' ladder if changing one of the middle routes

30-40 minutes per cable change out

1. To change cable(s) let all of the air pressure out of the Auto-Belay tank. To depressurize the Auto-Belay(s), attach an air chuck onto Schrader valve (#15). Pull the cable with the red hose towards the bottom of the climbing tower so the cylinders are compressed completely. This will put the pulley cart (#2) closer to the bottom pulleys.
2. Make note of which side the cable enters the Auto-Belay pulley cart and the side it terminates to and how the cable is routed from pulley to pulley. Use a piece of tape to mark each side of the pulley cart.
3. Use the 5/8 open-end wrenches to open the quick link so the cable end can be removed. The quick link can remain attached to the pulley cart (#2).
4. If the cable end does not fit between the pulleys and the top of the Auto-Belay tank, the pulley assemblies have to be disassembled. Start by removing the 1/4" nuts from the 1/4" bolts (#8) with the 7/16 wrench from the pulley cart and the bottom pulley assembly. Keep hardware and spacers (#10) together.
5. Now remove the 5/8" nut from the 5/8" bolt (#9) using 15/16 wrenches or adjustable wrenches, from pulley cart and bottom pulley assembly. Take care not to lose the spacer (#5) and spacers (#4 and #3), while removing all pulleys.
6. Now use the 15/16 wrenches to loosen the 5/8" nut from the 5/8" bolt of the bottom pulley on the davit at the top of the wall, enough to remove cable. The upper pulley on the davit will need to be removed entirely to remove cable. A stepladder may be required if you are replacing a cable on a middle route. Once the top pulley is removed, you can then remove the old cable entirely.
7. When replacing the cable, take care not to kink or pinch cable by pulling on it when there is a loop in the cable.
8. Lay the new cable out on the ground first, to remove loops and have the red hose at the bottom of the wall.
9. Start feeding the end of the cable through the top pulley mount on the davit and then place pulleys grove on cable and finish remounting the pulley. Do the same to the second pulley on the davit. Tighten the 5/8" nuts to 5/8" bolts.
10. Now pull enough cable to reach pulley cart. Make sure the cable doesn't go underneath or behind a steel wall support while doing this.
11. **This is where two people are required.** Have cable enter the pulley cart (the side that is marked with tape). Pull cable to bottom pulley area, place cable on pulley and start 5/8" bolt thru the side plate. Place the correct spacer (#4) on the 5/8" bolt; put pulley with cable on the bolt. Pull cable towards the pulley cart. Start the 5/8" bolt, place spacer (#5) on bolt, place cable on pulley, place pulley on bolt. Repeat these steps using the correct spacers until cable ends at the quick link. Place and tighten 5/8" nuts onto 5/8" bolts. Replace all 1/4" bolts (#7) and 1/4" nuts and spacers (#6), to keep cable on pulleys. Refer closely to assembly diagram.
12. Make sure you attach terminated cable end onto quick link and tighten quick link with wrench.
13. Reattach carabineer, swivel and quick link to cable with the red hose that is on the outside of the climbing wall. Attach carabineer to wall.
14. You now can re-pressurize the Auto-Belay to the recommended air pressure. Add air slowly to the Auto-Belay tank so that the cylinders don't rapidly extend and cause the cable to jam in a pulley.



**CABLE THREADING
DIAGRAM**

THREADING SHOW FOR RIGHT HAND CARRIAGE
LEFT HAND CARRIAGE STARTS FROM OPPOSITE
SIDE OF CARRIAGE

NOTE
THESE ROLLERS ARE LOCATED IN THE STATIONARY BRACKETS
WHICH ARE PART OF THE BELAY RESERVOIR TUBE ASSEMBLY
SHOWING ON Dwg 22A8001. CABLE IS INSTALLED AFTER THE
CARRIAGE ASSEMBLY SHOWING AT RIGHT HAS BEEN ATTACHED TO
THE HYDRAULIC CYLINDERS ON THE BELAY RESERVOIR TUBE