



User Instructions Manual

skyTECH Universal E-Launcher

SKY-EL-00U

Skyline Ziplines Ltd.

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Revision History

Revision	Sections Affected	Changes	Date
0.0	-	Original Publication	05 May 2021
1.0	1.0, 4.0	Updated SKU's, revised description of parts, updated description of features	20 June 2024





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Warnings and Important Notices

You will find on this page, and throughout this user instructions manual, many warnings and important notices that must be considered seriously when operating this system. It is imperative to understand the meaning of the warnings and potential hazards.



It is the responsibility of the operator to document and maintain a product use, inspection and maintenance logbook. Skyline Ziplines supplies inspection criteria and guidelines, forms and log sheets specific to all manufactured systems and equipment. It is the responsibility of the operator to follow all guidelines, intervals, and criteria set forth by these documents.



WARNING: This product is designed for zip line operations only. The operator(s) must read and understand the instructions in this manual before using this product. Manufacturer's instructions must be followed for the proper use and maintenance of the system and provided equipment. Alterations or misuse of this equipment, or failure to follow instructions, may result in serious injury or death.



This document does not replace a complete training necessary for the use of this product. Knowledge by the user of all appropriate techniques and risks is required.



This manual contains information and instructions specific to the skyTECH™ Universal E-Launcher and associated equipment manufactured by Skyline Ziplines Ltd. Make sure this User Instructions Manual is the latest version available. Contact Skyline Ziplines to obtain the latest document revisions, important Updates and other notices.



Products and systems manufactured by Skyline Ziplines are intended for use by professionals trained and experienced in the use, inspection, and maintenance of these products, or for use by persons under the direct visual surveillance of competent and responsible persons.



Before using this equipment, record the product identification information from the ID label in the inspection and maintenance log at the end of this document. Make sure this User Instructions Manual is readily available with the product. Contact Skyline Ziplines Ltd to obtain additional copies of this manual.

1.0 Description

1.1 Applications

The skyTECH™ Universal E-Launcher is to be used as a trolley retention and release device for zipline amusement rides.

1.2 Standards

Refer to local, provincial/state and federal laws and regulations pertaining to the installation and use of this type of equipment.

1.3 Description of skyTECH Universal E-Launcher

1.3.1 skyTECH™ Universal E-Launcher Features

- Designed for use with skyTECH™ Turbine Trolleys and other trolleys that are similar size to the Turbine Trolley.
- CNC Machined Aluminum and Acetal Copolymer Body
- Stainless Steel Hardware
- Spring-loaded Retention Flaps
- Integrates with skyTECH™ Safe Launch System
- 2"-Stroke, 50-lbf Actuator Utilizes 12/24V Power
- SKU: SKY-EL-00U

1.3.2 skyTECH™ Universal E-Launcher Clamp Set

*User must request/ensure to have the correct clamp size to fit their cable. See below.

Product Codes:

- 1/2" Cable Clamp: SKY-LS-13-A1
- 5/8" Cable Clamp: SKY-LS-13-A2
- 3/4" Cable Clamp: SKY-LS-13-A3
- 7/8" Cable Clamp: SKY-LS-13-A4

2.0 Limitations

Consider the following application limitations before using this equipment:

2.1 Capacity and Working Load Limit

- Not to be used in operations exceeding 300 lbs. patron weight
- Not to be used in operations with launch angles greater than 40%

2.2 Environmental Hazards

Use of this equipment in areas with environmental hazards may require additional precautions to prevent injury to the user or damage to the equipment. Hazards may include, but are not limited to: heat, chemicals, corrosive environments, electrical fields and wires, gases and sharp edges.

2.3 Sharp Edges

Avoid using where the zip line equipment or other system components will be in contact with, or abrade against unprotected sharp edges

2.4 Training

SkyTECH™ Universal E-Launcher must only be installed and used by persons trained in their correct application and use (See Section 5)



3.0 System Requirements

3.1 Compatibility of Components

Skyline equipment is designed for use with the Skyline approved components and subsystems only. Substitution or replacements made with non-approved components or subsystems may jeopardize compatibility of equipment and may affect the safety and reliability of the complete system.

Approved Trolleys

- skyTECH™ Turbine Trolley*
- Petzl Tandem Trolley
- Robertson Harness SR71-B
- Headrush Impact Trolley
- Contact Skyline Ziplines for any questions regarding trolley compatibility

*Intended Primary Use With the Turbine Trolley

3.2 Compatibility of Linear Actuators

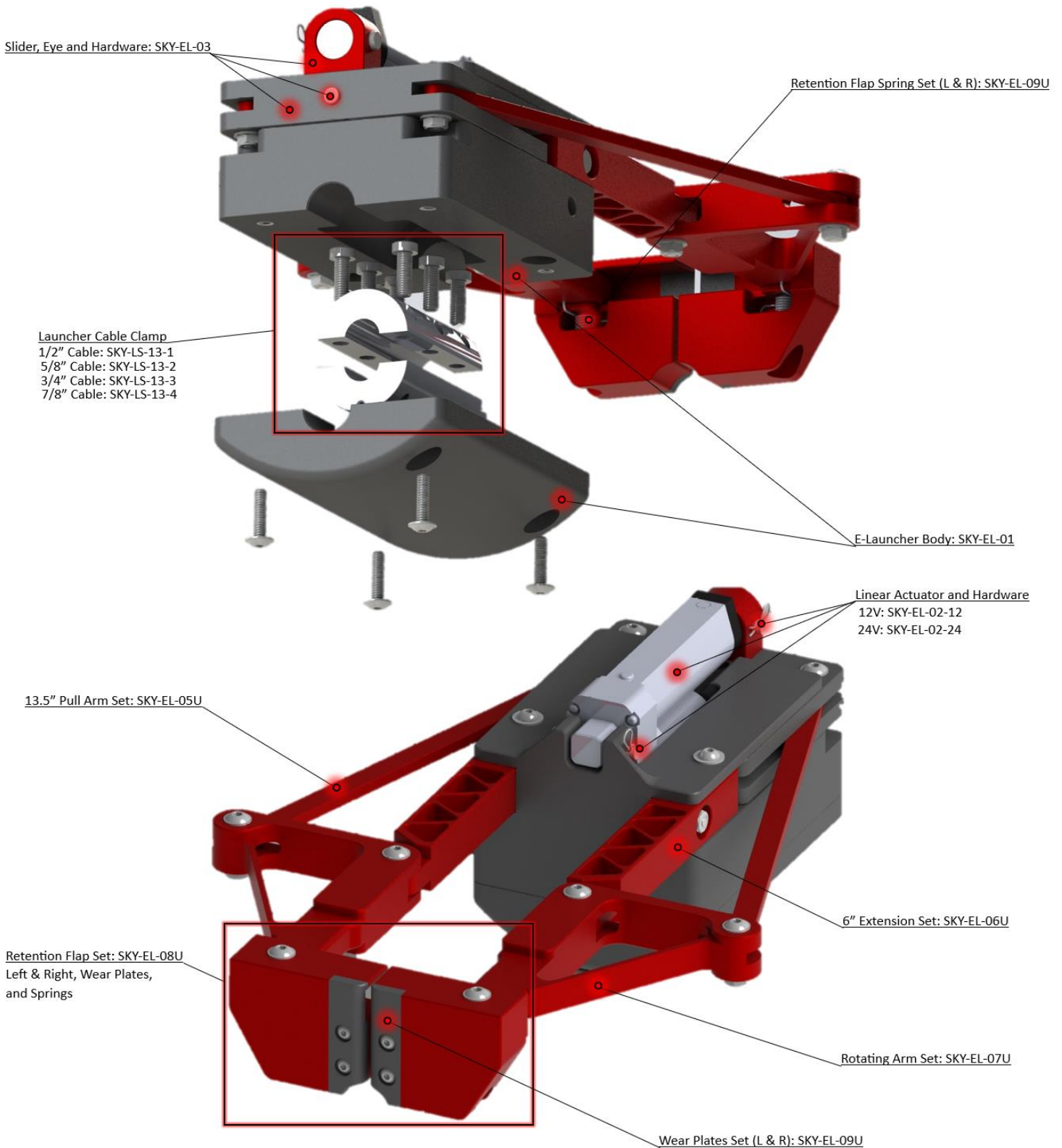
The skyTECH™ Universal E-Launcher is designed for and compatible with only one model of linear actuator, the Progressive Automations Mini Linear Actuator PA-14-2-50. You must source the correct version to accommodate your system's power supply (12V or 24V). Please contact Skyline Ziplines for any questions regarding linear actuators.

3.3 Making Connections

Use only connectors that are suitable to each application. Ensure all connectors are compatible in size, shape, and strength. Do not use equipment that is not compatible. Ensure all connectors are fully closed and locked.

4.0 Nomenclature and Assembly

4.1 Description of Parts





4.2 Procedure for Assembling Universal E-Launcher

Tools Required: (2) 7/16" Sockets, (2) Socket Wrenches, (1) 5/32" Allen Wrench

- 4.2.1 Remove lower body by removing the 1/4" x 1" bolts with the 5/32" allen wrench.
- 4.2.2 Remove bolts from cable clamp module using 5/32" allen wrench.
- 4.2.3 Install cable clamp module on cable with longer half on the bottom with excess facing downhill. Ensure bolts are level horizontally.
- 4.2.4 Evenly tighten all six bolts with a torque of 15Nm.
- 4.2.5 Place linear actuator (SKY-EL-02) into body upper and line up square end of actuator between the ears on body-upper. Thread the wire through the hole leading it to the outside of the body.
- 4.2.6 Fasten actuator to body-upper using the 1/4" x 1-3/4" clevis pin and hairpin to connect the square end of the actuator to the ears of the body.
- 4.2.7 Install the slider eye into the slider using the 3/16"x1" pin and retaining ring with the rounded side of the slider's slot contacting the slider eye.
- 4.2.8 Then slide the assembly into the back of the body-upper, fitting the round plunger end of actuator into the slider eye.
- 4.2.9 Secure the actuator in place in the slider eye using the 1/4"x 1-1/2" clevis pin and hairpin.
- 4.2.10 Install 6in. extensions (SKY-EL-06U) on either side of body-upper with counterbores facing outwards.
- 4.2.11 Thread 1/4" x 1-3/4" bolts through 6" extensions into body until snug and 1/4" x 4-3/4" hex head bolt through the body. Fasten 4-3/4" bolt with one washer on nut end and tighten. Torque all three bolts to 8Nm.
- 4.2.12 Mount the rotating arms (SKY-EL-07U) onto the end of the 6" extensions using 1/4" x 1-1/4" bolt, washer and nut. Torque to 8Nm.
- 4.2.13 Install both 13.5" pull arms (SKY-EL-05U) between slider and rotating arms using 1/4" x 1-1/4" bolts, washers and nuts on both ends of pull arm. Torque the connection between the extension and pull arms to 8Nm and the connection to the slider to 7Nm.
- 4.2.14 Place retention flap springs (SKY-EL-10U) in small cavity below main cavity of retention flaps (SKY-EL-08U) with 180-degree bent leg facing flap's rounded cutaway and 90-degree leg facing out and up. Then slide the 90-degree leg into small hole on rotating arm before swiveling it into place.
- 4.2.15 Insert 1/4" x 1-3/4" bolt through the flap, rotating arm and center of spring and fasten with washer and nylon-insert nut. Torque to 8Nm.
- 4.2.16 Repeat steps 4.2.14 and 4.2.15 with the other flap with mirrored components before testing spring functionality to ensure correct installation.
- 4.2.17 Place body-upper assembly on top of the cable clamp and body-lower on the bottom. Then connect the two body sections using four 1/4" x 1" bolts. Torque to 8Nm.
- 4.2.18 Wire the linear actuator leads to appropriate Safe Launch lead, ensuring the positive and negative terminals are connected properly.
- 4.2.19 Check that actuating motion functions properly.

5.0 Standard Operating Procedures



The following operating procedures outline only the necessary steps required to complete each process. The procedures do not consider additional safety requirements and additional safety considerations that should be considered for each site. Please consult a qualified person and/or your site-specific manual to ensure all necessary steps are taken to guarantee safety in your operations.

5.1 Standard Procedures for Operations

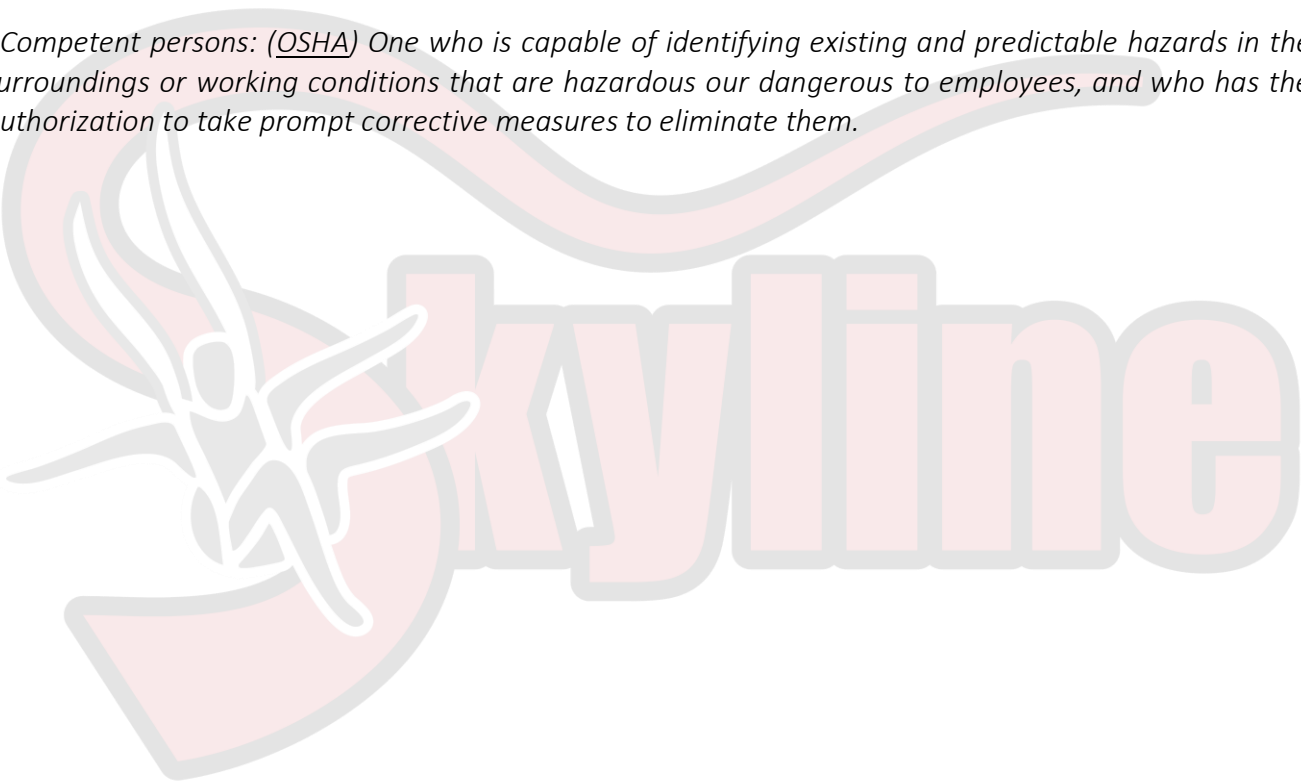
- 5.1.1 Take a trolley from the guest
- 5.1.2 Attach the trolley backup tether to the deck safety line.
- 5.1.3 Place the guest trolley on the cable in front of the E-Launcher
- 5.1.4 Push trolley through the retention flaps until they spring back closed, fully encapsulating the trolley.
- 5.1.5 Attach the Guest to the trolley and have them load their harness
- 5.1.6 Perform final check and radio protocol
- 5.1.7 Remove the trolley safety tether
- 5.1.8 Follow proper launch protocol on launch control panel, press the “Launch” button to release the trolley

6.0 Training

It is the responsibility of the buyer/user of this equipment to make sure that they understand these instructions, and are sufficiently trained in the correct use and care of this equipment. The user must be aware of the operating characteristics, application limits, and the consequences of improper use. Training must be done prior to use and user must be evaluated for his/her competence to use this equipment. Gaining an adequate education in proper techniques and methods of safety is your own responsibility. Training should be done under the supervision of competent persons.

It is recommended that Skyline Ziplines perform a manufacturer's training session to cover the material in this document, use with other equipment, and site specific training.

**Competent persons: (OSHA) One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are hazardous or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them.*



7.0 Inspection

7.1 Frequency

- 7.1.1 The skyTECH™ Universal E-Launcher must be formally inspected daily prior to initial use and recorded in the inspection log
- 7.1.2 The Universal E-Launcher must be informally inspected prior to each use for normal operation, orientation, and overall condition
- 7.1.3 The Universal E-Launcher must be inspected by the manufacturer or approved competent person(s) at least once a year (or more frequently if deemed necessary by the frequency and/or conditions of use). The results of this formal inspection must be recorded in the inspection and maintenance log at the end of this manual

7.2 Daily Pre-Use Inspection Process

The daily pre-use inspection process is included in Appendix A. The forms available in this manual may be used for operations and as a template for site specific forms. It is critical that every item presented on the provided form is inspected and documented.

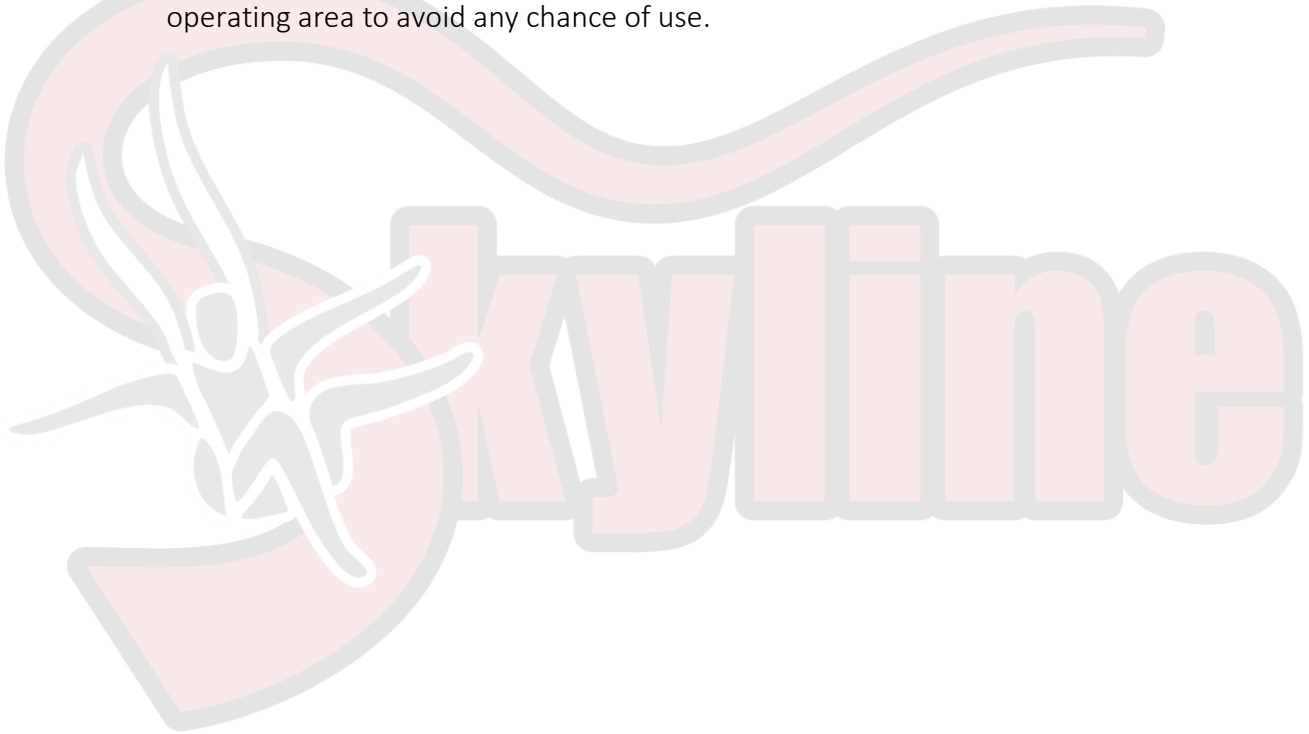
7.3 Documentation Process

Located in Appendix A is a sample Inspection form that Skyline Ziplines recommends using as a template. Located in Appendix B is a sample Maintenance form that Skyline Ziplines recommends using as a template. Located in Appendix C is a flowchart explaining the appropriate process for inspections, maintenance, and documentation. It is important to reference this flowchart for proper Quality Assurance documentation.

7.4 Lock Out, Tag Out

To ensure the highest standard of safety, it is required that all sites produce a Lock Out, Tag Out system. The system/process is designed to identify and prevent the use of all equipment identified through the inspection process as REJECTED (not suitable for use). Below is an example provided by Skyline Ziplines and is also included in the flowchart in Appendix C:

- 7.4.1 Item identified as rejected or failed during inspection by staff member
- 7.4.2 Failure/rejection is noted on inspection log
- 7.4.3 Item is marked with a tag with the following information:
 - 7.4.3.1 Name of staff member
 - 7.4.3.2 Date of inspection
 - 7.4.3.3 Reason for rejection
- 7.4.4 Item is placed in designated Lock Out, Tag Out area. This area must be removed from the operating area to avoid any chance of use.





8.0 Maintenance and Storage

8.1 Storage

Proper storage of equipment leads to longer equipment life and assurance of the integrity of the product. Follow the below guidelines for long term storage:

- Store the product in a cool, dry, and clean environment out of direct sunlight
- Avoid areas that vapors may exist
- Avoid stacking launchers on top of each other and metal to metal contact
- Thoroughly inspect all equipment after extended storage

8.2 Replacement Parts and Repairs

All replacement parts must be purchased through Skyline Ziplines Ltd. All equipment repairs must be performed by the following: Skyline Ziplines Ltd., an authorized contractor/vendor of Skyline Ziplines Ltd with approval, or trained and authorized onsite personnel.

8.3 Universal E-Launcher Maintenance – Replacing a Retention Flap and/or Spring

Tools Required: (1) 7/16" Socket, (1) Socket Wrench, (1) 5/32" Allen Wrench

- 8.3.1 Remove 1/4" x 1-3/4" bolt, washer, and nut holding retention flap to rotating arm.
- 8.3.2 Remove flap along with the spring.
- 8.3.3 Replace retention flap (SKY-EL-08U) and/or spring (SKY-EL-10U) with a respective designated right or left replacement part.
- 8.3.4 Insert 90-degree spring leg into small hole on bottom of rotating arm.
- 8.3.5 Insert end of rotating arm into retention flap, ensuring spring fits properly into the small cavity on the flap.
- 8.3.6 Insert 1/4" x 1-3/4" bolt through the flap, rotating arm, and spring.
- 8.3.7 Fasten and tighten bolt with 1/4" washer and locking nut. Torque to 8Nm.
- 8.3.8 Check that Universal E-Launcher flaps open and close and springs are functioning properly.
- 8.3.9 Inspect unit and record maintenance in log (Appendix B)

8.4 Universal E-Launcher Maintenance – Replacing Rotating Arms

Tools Required: (1) 7/16" Socket, (1) Socket Wrench, (1) 5/32" Allen Wrench

- 8.4.1 Unscrew and remove the two 1/4" x 1-1/4" screws that connect the arm to the 6" extension and the 13.5" pull arm.
- 8.4.2 Unscrew and remove the 1/4" x 1-3/4" screw that connects the arm to the retention flap.
- 8.4.3 Replace the arm and install a new arm (SKY-EL-07U) into retention flap, ensuring the spring is properly reinstalled.
- 8.4.4 Re-install the 1/4" x 1-3/4" into the retention flap, rotating arm, and spring. Fasten with a washer and locking nut. Torque to 8Nm.
- 8.4.5 Connect the rotating arm on the end of the extension and pull arm, re-installing the two 1/4" x 1-1/4" screws, washers, and nuts. Torque to 8Nm.
- 8.4.6 Check that the E-Launcher retention flaps open and close freely.
- 8.4.7 Inspect unit and record maintenance in log (Appendix B)

8.5 Universal E-Launcher Maintenance – Replacing Linear Actuator

Tools Required: None

- 8.5.1 **Disconnect or shut off all power** leading to the launch system as to avoid the possibility of electric shock.
- 8.5.2 Disconnect the wiring to the actuator.
- 8.5.3 Remove hairpin from 1/4" x 1-1/2" clevis pin and remove pin from slider eye.
- 8.5.4 Pull slider back, away from launcher body, freeing the actuator's piston end.
- 8.5.5 Remove hairpin from 1/4" x 1-3/4" clevis pin and remove it from the assembly.
- 8.5.6 Remove and replace the linear actuator with a new unit, running the wire through the designated hole on the launcher body.
- 8.5.7 Replace the 1/4" x 1-3/4" clevis pin and hairpin connecting the actuator to the body-upper.
- 8.5.8 Push the slider back into the body, lining up the actuator piston with the slider eye.
- 8.5.9 Re-place the 1/4" x 1-1/2" clevis pin and hairpin, securing the actuator in place.
- 8.5.10 Wire the actuator into the respective leads, ensuring the positive and negative leads are connected correctly.
- 8.5.11 Check that E-launcher teeth open and close freely.
- 8.5.12 Inspect unit and record maintenance in log (Appendix B)



9.0 Lifetime

The expected lifetime of a skyTECH Universal E-Launcher is two years. The actual lifetime depends on the intensity and the frequency of use as well as the environment. An exceptional circumstance might limit the product lifetime to a single use. A product that was not inspected at least once per year should be removed from service and replaced.

10.0 Incident and Failure Reporting

In the unfortunate situation that a Skyline Universal E-Launcher is involved in an incident or a failure, please notify Skyline Ziplines immediately so that prompt corrective measures can be taken by Skyline Ziplines. Product Safety Alerts are available at request and are sent out to all previous customers via email.

Complete information concerning the incident (date, location, details as to event and consequence, etc.) must be communicated to admin@skylineziplines.ca and/or called in to the office at 604-905-4149.

Skyline Ziplines will investigate the incident and if a product recall alert is required, shall notify all known customers and distributors who have purchased the product.



11.0 Warranty

Subject to the following limitations, terms, and conditions, Skyline Ziplines LTD warrants to the original purchaser of each Product that such Products when purchased new, are free of defects in materials and workmanship. This limited warranty may be exercised for a period of up to one year from the date of receipt. This limited warranty does not apply to normal wear and tear, nor to claimed defects, malfunctions or failures that result from abuse, neglect, improper assembly, improper maintenance, alteration, collision, crash, or misuse.

EXCEPT AS EXPRESSLY SET FORTH ABOVE, SKYLINE ZIPLINES LTD DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PURPOSE. SKYLINE ZIPLINES LTD'S RESPONSIBILITY FOR WARRANTY CLAIMS IS LIMITED TO, AT SKYLINE ZIPLINES LTD'S SOLE DISCRETION, REIMBURSEMENT OF THE ORIGINAL PURCHASE PRICE, REPAIR OF THE PRODUCT, OR REPLACEMENT OF THE PRODUCT WITH THE SAME OR SIMILAR PRODUCT. NOTWITHSTANDING anything in THESE TERMS to the contrary, SKYLINE ZIPLINES LTD SHALL NOT be responsible or held liable for punitive, indirect, incidental or consequential damages, including without limitation, liability for loss of use, loss of profits, loss of Product or business interruption however the same may be caused, including fault or negligence of SKYLINE ZIPLINES LTD.

To exercise rights under this limited warranty, Customer must return the affected Product to Skyline Ziplines LTD (unless otherwise instructed by Skyline Ziplines LTD) to:

SKYLINE ZIPLINES LTD
6-1006 LYNHAM ROAD
WHISTLER, BRITISH COLUMBIA, CANADA V8E 0S3

Skyline Ziplines LTD will use reasonable commercial efforts to return all product in a timely manner to the designated location and will be responsible for all shipping costs. Skyline Ziplines LTD reserves the right to modify this limited warranty at any time, in its sole discretion.



Appendix A – Inspection Form

*Sample files available upon request



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INSPECTION FORM I-17

skyTECH Universal E-Launcher



Inspection Information

Frequency: Daily Pre-Use

Models: Universal and Rocket E-Launchers (SKY-EL-01 and 02)

Performed By: Trained Staff Member

Manufacturer: Skyline Ziplines LTD.

Inspect all matching equipment in accordance with the inspect criteria listed below. At the bottom, record the equipment's disposition by marking the appropriate ID number. If the answer is YES to one or more of the following questions, the unit is deemed UNFIT for service.

1. Known Equipment History

- Has the unit been used by a person weighing more than 310 lbs?
- Has the unit received forces resulting from a fall or shock loading without a subsequent inspection?
- Has the unit been exposed to detrimental chemical products or an intensive source of heat?
- Has the unit not been formally inspected within the last year by a competent person?

2. Preliminary Observations

- Are any fasteners missing nuts, washers, retaining rings, or hairpins?
- Are any fasteners loose or backing out?
- Has the product undergone modifications or alterations not performed or authorized by the manufacturer?

3. Body Inspection

- Are there any visual indications of damage to the body, extensions, slider, arms, or retention flaps such as chips, bends, cracks, or excessive wear?
- If applicable; are any springs broken, missing, or not functioning effectively?

4. Operation Inspection

- Are there any problems with the E-Launcher opening and closing freely?

5. Auto Controls Inspection

- Are there any visual indications of damage to the actuator body and/or actuator piston?
- Are there any issues with the actuator's cycling operation?

Disposition - Circle all line numbers correlating with all units that have PASSED the inspection and are FIT for service

01 02 03 04 05 06 07 08 09 10

Failed Equipment - List all ID numbers for units deemed UNFIT for service. Consult the manual for proper Lock Out, Tag Out Protocol

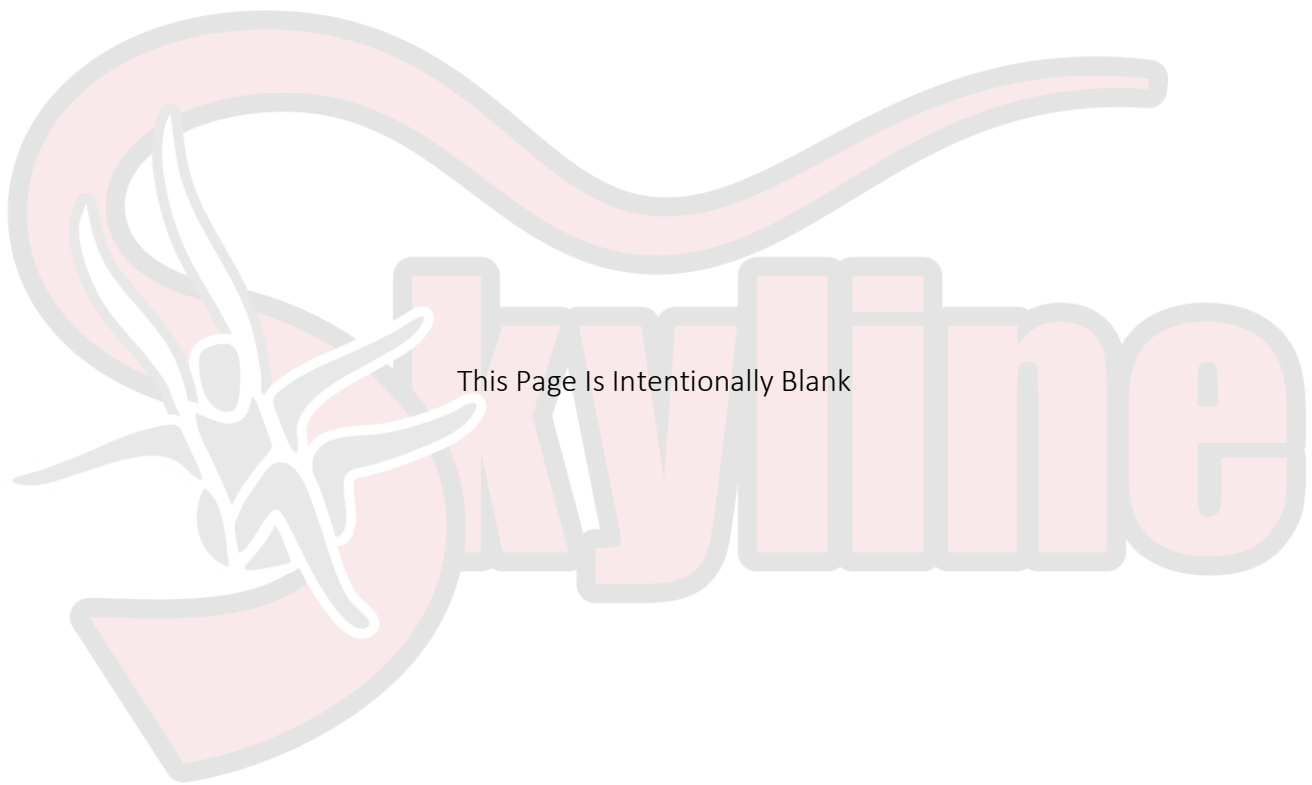
Notes/Comments

Inspected By: _____

Date: _____

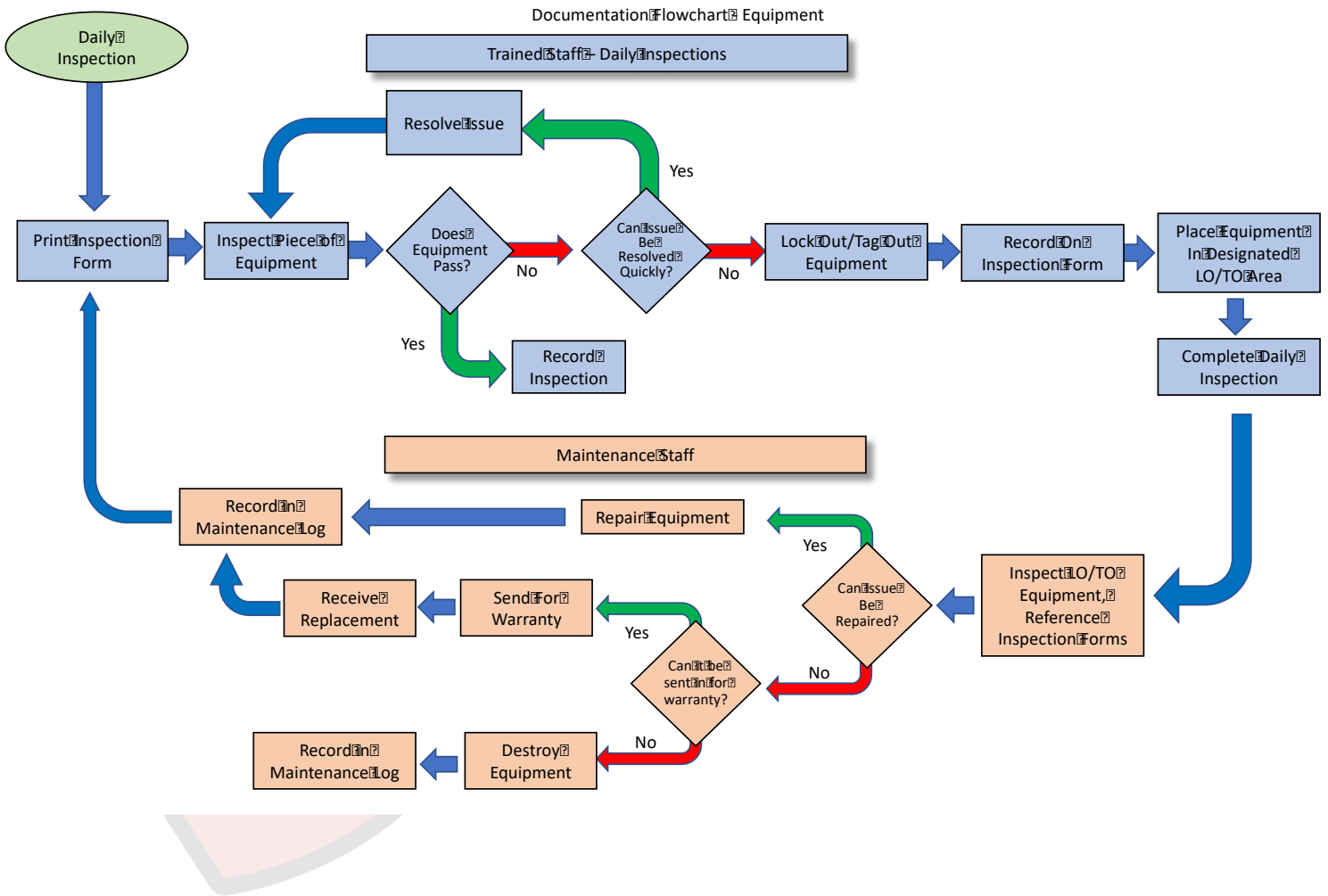
Appendix B – Maintenance Log

*Sample files available upon request



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Appendix C – Documentation Process Flowchart





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