



FLIGHTLINE FREE FALL DEVICE

Installation & Operation Manual

Model: FL150-20A



NOTE TO INSTALLERS

Always Read Instructions Before Use

Leave this Installation and Operation Manual attached to the FlightLine unit. The installation, operation, and maintenance manual contains information relating to the proper use of the FlightLine and includes all product registration and warranty information. This document may only be removed by the end user. Ensure that this Installation and Operation Manual is readily available to operators at all times.

Head Rush Technologies FlightLine Installation & Operation Manual
P/N 04070095205

U.S. Pat No's. 8,490,751; 8,851,235; 9,016,435 and D654,412 & corresponding patents/applications in the USA and in other countries worldwide.





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IMPORTANT SAFETY NOTICE

Free Fall is a Dangerous Activity

Read Before Installation & Operation

Failure by the installer or operator to heed any and all instructions, warnings, and cautions for the correct installation, operation, care, and maintenance of the FlightLine may result in serious injury or death.

Owners and operators of the FlightLine Free Fall Descent Device are responsible for the safety and supervision of any person using the FlightLine and are required to assure that proper installation and operation procedures are followed at all times. Proper installation requires careful design and planning using FlightLine and non-FlightLine components. Owners and operators are encouraged to seek the advice of their installer or a qualified engineering professional regarding the instructions in this manual.

These instructions must be made readily available to the operator at all times. Prior to installation and use, all owners, installers, and operators must have read and shown to have understood all instructions, labels, markings, and safety information pertaining to the installation, operation, care, and maintenance of the FlightLine system, its component parts, and all associated hardware. Failure to do so may result in equipment damage, serious injury, and death.

1. SAFETY INFORMATION

1.1 Symbols Used in this Manual

The following safety symbols are used throughout this manual to highlight potential danger to operators and equipment. One or more precautions may be associated with practices and procedures described within this manual. Failure to adhere to any precautions highlighted can result in equipment damage, serious injury, and/or death. Ensure that you read and understand all safety related procedures related to the working environment and the task you are undertaking.



DANGER

Indicates a hazardous situation exists that, if not avoided, will result in serious injury or death.



WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death.



CAUTION

Indicates a potentially hazardous situation that, if not avoided, may result in injury or equipment damage.



NOTE

Indicates an action that must be taken to ensure personal safety and prevent damage to property or equipment.

2. WARRANTY INFORMATION

2.1 Warranty Conditions

The FlightLine Free Fall Descent Device is warranted against factory defects in materials and workmanship excluding “Specific Field Replaceable Wear Parts” for a period of two (2) years from date of purchase.

This warranty applies only to the original purchaser, and is contingent upon the owner/operator maintaining and using the device in accordance with manufacturer’s instructions and the Operation Manual. This warranty is in lieu of all other warranties, express or implied.

The sole remedy for breach of this warranty, or for any claim in negligence or strict liability in tort, is the repair or replacement of any defective parts by Head Rush Technologies. Upon written notice, Head Rush Technologies will promptly repair or replace all defective items. Head Rush Technologies reserves the right to have any defective equipment returned to its facility, transportation pre-paid, for inspection before making a repair or replacement.

This warranty is null and void if device service obligations are not met, if parts other than genuine parts are used, or if any modifications or services have been performed on the device by anyone other than an authorized Head Rush Technologies servicing agent. This warranty does not cover any damages resulting from abuse to the device, damage in transit, or any other damage beyond the control of Head Rush Technologies. Head Rush Technologies makes no warranties in respect to trade accessories or component parts which are not made by Head Rush Technologies. Head Rush Technologies expressly excludes from this warranty the replacement of specific field replaceable wear parts, which include the nozzles, webbing line kits, carabiners, and/or any other accessories supplied with the product.

No person, agent, or distributor is authorized to give any warranty, other than the one herein expressed, on behalf of Head Rush Technologies, or to assume for it any liability pertaining to such products. Head Rush Technologies expressly disclaims any implied guarantee of merchantability, or claim as to whether the device is suited for a particular purpose. Purchaser agrees that Head Rush Technologies shall not be held liable to purchaser/operator for damages of any kind, including but not limited to, lost or projected profits, equipment down time, or any losses considered to be caused by non-operation or servicing/re-certification down time of the equipment.

2.2 Customer Responsibility

The following items are considered to be the responsibility of the customer.

- Installation.
- Normal maintenance, including daily/weekly/monthly and cycle related inspections.
- Normal replacement of service items.

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- Replacements required because of abuse, misuse, or incorrect operation of equipment by the installer or operator.
 - Field replaceable wear parts.
 - Normal deterioration due to use and exposure.

Strict adherence to the Installation and Operation Manual supplied, manufacturer's instructions, and advice given by authorized FlightLine service technicians is the responsibility of the buyer, installer, and operator.

3. SPECIFICATIONS

3.1 Introduction

FlightLine is a free fall descent device designed to provide an exhilarating free fall jump experience.

The design of the FlightLine device permits simple installation and removal and incorporates an advanced self-regulating staged brake system and automatic webbing line retraction. The patented braking mechanism offers jumpers an initial free fall followed by a consistent descent with a minimal variation in descent rate of both large and small users. To protect the longevity of the FlightLine device, installation, care, and use of the device must be carried out in accordance with the instructions in this manual.

3.2 Specifications

MODEL	FL150-20A FlightLine Free Fall Descent Device
DIMENSIONS	615 x 457 x 234 mm (24.2 x 18 x 9.2 in)
NET WEIGHT	59 kg (130 lbs)

STANDARD OVERHEAD CONFIGURATION 4.5 M RIPCORD

MIN. MOUNTING HEIGHT*	18.5 m (60 ft)
MAX. MOUNTING HEIGHT*	23 m (75 ft)
MIN. DISTANCE - NOZZLE TO PLATFORM	1.8 m (6 ft)
MAX. DISTANCE - NOZZLE TO PLATFORM	2.1 m (7 ft)

STANDARD OVERHEAD CONFIGURATION 6 M RIPCORD

MIN. MOUNTING HEIGHT*	20 m (65 ft)
MAX. MOUNTING HEIGHT*	24.5 m (80 ft)
MIN. DISTANCE - NOZZLE TO PLATFORM	1.8 m (6 ft)
MAX. DISTANCE - NOZZLE TO PLATFORM	2.1 m (7 ft)

JUMP OVER CONFIGURATION 4.5M RIPCORD

MIN. MOUNTING HEIGHT*	21 m (69 ft)
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MAX. MOUNTING HEIGHT*	23 m (75 ft)
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MAX. DISTANCE - NOZZLE TO PLATFORM	1.2 m (4 ft)
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JUMP OVER CONFIGURATION 6 M RIPCORD

MIN. MOUNTING HEIGHT*	23 m (75 ft)
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MAX. MOUNTING HEIGHT*	24.5 m (80 ft)
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MAX. DISTANCE - NOZZLE TO PLATFORM	1.2 m (4 ft)
---	--------------

** This distance is from the device nozzle to the landing surface and is dependent on the RipCord length. Mounting heights are subject to change at any time. See table in Section 6.4 for more information on mounting heights.*

MIN. USER WEIGHT	34 kg (75 lbs)
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MAX. USER WEIGHT	113 kg (250 lbs)
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4. OPERATING PRINCIPLES

4.1 General

The FlightLine assembly may be installed in either a Standard Configuration or Jump-Over Configuration with use of either a 4.5 m (15 ft) or 6 m (19 ft) RipCord - (Refer to Section 6 for further information on proper installation heights).

FlightLine performance relies on operators using the correct equipment and operating the system in accordance with the instructions contained within this manual.



WARNING

A full rescue plan should be in place before any FlightLine operation.



ENSURE CORRECT MOUNTING HEIGHT

Minimum and maximum mounting height will vary with RipCord length and mounting configuration. Always use the correct mounting height for site specific installation configuration and perform weight drop testing prior to human use and commissioning.



MANDATORY WEBBING INSPECTION

A visual inspection sufficient to evaluate the wear/integrity of the device's webbing must be completed upon every cycle. This may be performed from the ground if the webbing can be adequately observed. A more thorough webbing inspection must be performed at the device level to inspect 100% of the webbing length every 20 cycles. All webbing inspection should look for cuts, abrasion, discoloration, soft spots, etc. in reference to webbing wear tables.

5.3 Long Term Storage

If the FlightLine is to be placed into storage or left unused for longer than two weeks, ensure the unit is clean and dry and protected from the environment. Ensure the braking lines are fully retracted into the unit. Always store in a clean and dry environment, preferably in the original packaging.



SAVE PACKAGING FOR REUSE

Keep all FlightLine packaging for reuse when returning the FlightLine for annual recertification.



DO NOT STORE UNIT IN A WET CONDITION

After exposure to water or damp conditions, thoroughly clean and dry the FlightLine prior to storage. Ensure that the FlightLine unit is not left with a wet braking line retracted inside the casing as this will result in corrosion of the unit and deterioration of the braking line. In a clean and dry environment, remove the side covers and fully extend the wet line and allow to completely dry prior to storing the unit. Ensure that debris does not enter the unit and reattach the side covers prior to storing or using the unit.

When returning the FlightLine assembly to operation after a period of inactivity, always carry out a full inspection and operational check of all components in the assembly, including drop testing with the use of known weights.

5.4 Supplied

The following parts will be included in each kit:

1 x FlightLine Free Fall Descent Device of one of the following lengths:

- 4.5 m (P/N: 04051000201)
- 6.0 m (P/N: 04051000301)

1 x FlightLine Installation and Operation Manual (P/N:04070095201)

1 x Shipping Crate and Packing Foam (P/N:00020045401)

1 x Red Line Upper (P/N:04051008901)

1 x Blue Line Upper (P/N:04051000401)

For a list of replacement parts see Section 9.5.

5.5 Additional Parts Required

Additional lines and equipment may be required to install a FlightLine for individual installations. Hardware, fasteners, and accessories used for installation of FlightLine must meet or exceed required loads and specifications, and must be made of materials compatible with all-season outdoor use.

6. FLIGHTLINE INSTALLATION

6.1 General

The FlightLine unit is installed at the top of a tower platform either overhead or directly below the platform deck, enabling users to jump from a predetermined height before a braking system slows and gradually lowers them to the ground.

6.2 Safety Precautions



MANDATORY WEBBING INSPECTION

A visual inspection sufficient to evaluate the wear/integrity of the device's webbing must be completed upon every cycle. This may be performed from the ground if the webbing can be adequately observed. A more thorough webbing inspection must be performed at the device level to inspect 100% of the webbing length every 20 cycles. All webbing inspection should look for cuts, abrasion, discoloration, soft spots, etc. in reference to webbing wear tables.



ENSURE FULL WEBBING RETRACTION

Webbing must be fully retracted into the unit before every use. Operating a FlightLine that is not fully retracted may result in serious injury or death to participants.



PROPER DESIGN AND TESTING OF THE COMPLETE SYSTEM IS ALWAYS REQUIRED

Always follow the operation and maintenance instructions and proper industry and engineering practices. Failure to do so may result in serious injury or death to participants.



FAILURE TO CORRECTLY INSTALL OR MAINTAIN A FLIGHTLINE MAY RESULT IN SERIOUS INJURY OR DEATH TO PARTICIPANTS



ENSURE THE DESCENT PATH IS FREE AND CLEAR OF ALL OBJECTS & OBSTACLES WHICH MAY OBSTRUCT THE DESCENT OF THE JUMPER

Ensure platform structure including, but not limited to, supports, guy wires, ropes, etc. do not impinge upon the descent path.



ALL STRUCTURES, SUPPORTS, & ANCHORS MUST BE EVALUATED & DESIGNED ACCORDING TO PROPER INDUSTRY & ENGINEERING PRACTICES. QUESTIONS ABOUT STRUCTURES, SUPPORTS, & ANCHORS SHOULD BE REFERRED TO YOUR ENGINEER



USE OF THE FOLLOWING IS PROHIBITED

Mounting from a horizontal cable such as a zip line, unrated hardware, non-locking carabiners or other non-locking linkages, mounting using rope, slings, textiles, etc.



ALWAYS ENSURE THE CORRECT RIPCORD LENGTH IS USED

Minimum height increases as RipCord length increases. Always ensure the platform/mounting height satisfies the requirements (see mounting height table in Section 6.4).



DANGER

Always perform unmanned testing prior to commissioning or when returning the device to service from prolonged down time (including when returned from recertification). Never operate outside the limits of this manual.

Due to individual site configurations and their variables (prevailing winds, jump location, swing intensity, etc.), the safety/clearance envelope may need to be increased.

Prior to leaving the factory, every FlightLine device is individually performance tested. While the units are fully tested, certified, and free from defects, there are inherent risks involved with installation. These risks can include imperceptible shipping damage, improper anchor or site installation parameters, and other variables.

Upon receipt and initial installation of the FlightLine, Head Rush Technologies requires the operator to perform weighted (non-human) drop tests to ensure the unit is operating normally, was installed correctly, and no shipping or handling damage occurred.

6.3 FlightLine Installation Configurations

FlightLine may be mounted either directly overhead (Standard Configuration) or below the platform (Jump Over Configuration) for an even more psychologically challenging experience.

For both mounting configurations, FlightLine must be double-point mounted from two independent, rigid anchor points with a minimum strength of 20kN each. The narrow side of the device/flat face of the webbing should face the jumping direction. All connectors must be metallic and locking with a minimum strength of 20kN. The FlightLine nozzle must face down and be hung between 1.8 – 2.1 m (6 – 7 ft) above the platform deck for the Standard Configuration and a maximum of 1.2 m (4 ft) below the platform deck for the bottom of the nozzle in the “Jump Over” configuration. FlightLine may be directly bolted to the structure, but this increases the required structure minimum strength to 40kN (see Section 6.4 Mounting for more information).



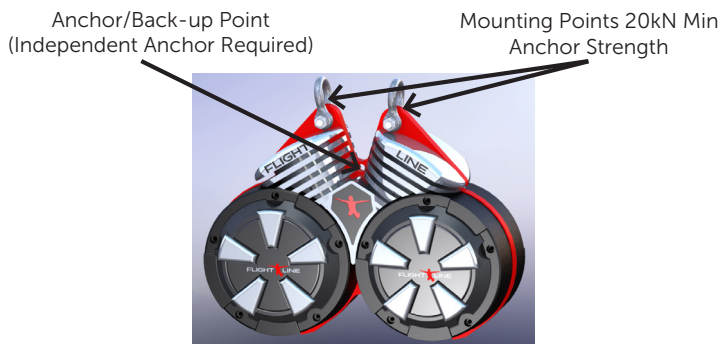
ENSURE PROPER ORIENTATION WHEN MOUNTING

The FlightLine should always be mounted so that the shorter webbing leg is closest to the descent path of the jumper. See Section 9.2 Troubleshooting for more information.



USE OF THE FOLLOWING IS PROHIBITED

Mounting from a horizontal cable such as a zip line, unrated hardware, non-locking carabiners or other non-locking linkages, mounting using rope, slings, textiles, etc.



The following diagrams illustrate the mounting possibilities, operational limits, and required clearances of the FlightLine. A minimum of 3 m (10 ft) diameter clearance is required around the launch platform and extends to a 10 m (33 ft) diameter clearance zone at the landing, centered under the device. A fall attenuation surface of at least 6 m (20 ft) square is required at the landing. Additional clearance may be required due to cross winds, structural configuration, etc. Always perform weighted non-human testing to help quantify additional clearance zone.

Care should be taken to distinguish the following terminology:

- Platform Height – distance from the ground to the platform surface.
- Mounting Height – distance from the ground to the nozzle (bottom of the unit, where the webbing exits the unit).



SAFE LANDING AREA

A protective fall attenuation surface must be used and centered below the landing point of the device, extending as required to adequately protect participants from injuries. It is recommended the surface meet ASTM F1292 specification for Impact Attenuation of Surfacing Materials for a critical fall height of 3ft (1m). A larger surface may be required in windy conditions.

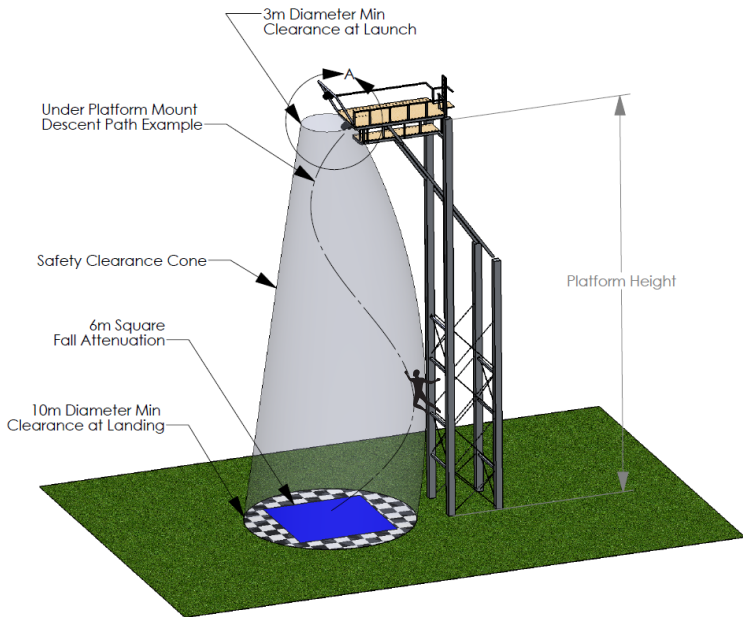


Figure 1: Tower Safety Envelope – Under Platform Mount

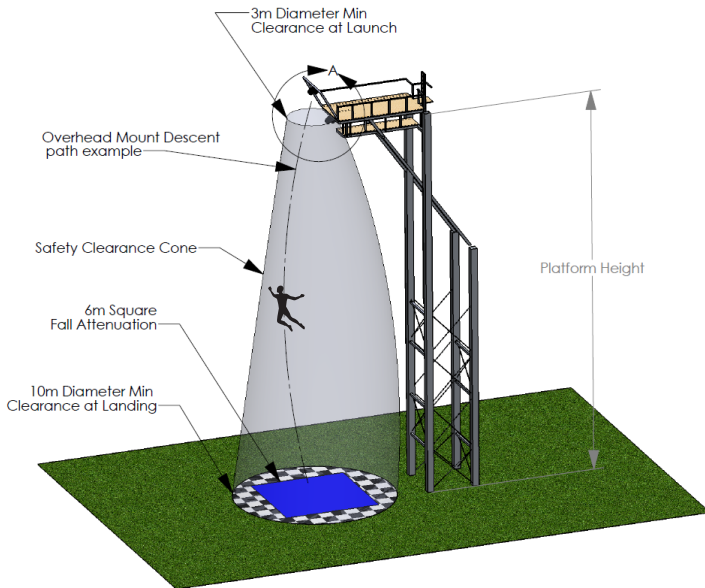


Figure 2: Tower Safety Envelope – Standard Over Platform Mount

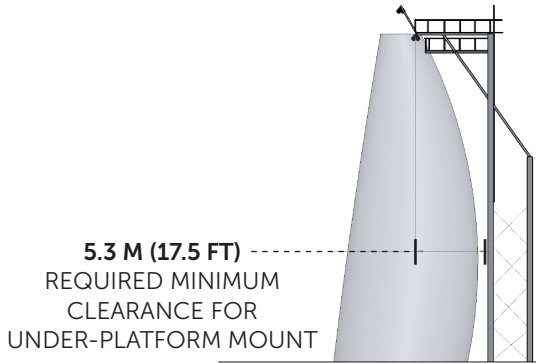


Figure 3: Platform Clearance



NOTE

Jumping on an Under-platform mount will result in an intensified S-curve swing for all jumpers. This swing should be taken into consideration when determining clearances.

6.4 Mounting

- Orientation – Nozzle down with the narrow side of unit/broad side of the webbing facing the jump direction. Unit should not be oriented 90 degrees so the broad side of the webbing is not facing the jump direction as this will increase webbing wear significantly.
- Redundancy – Use both mounting holes to independent legs (chain, cable, etc.) The structure or points must support 20kN minimum each. FlightLine may be directly bolted through the two primary mounting points to the structure, eliminating the independent requirement but increasing the required structure minimum strength to 40kN.



DO NOT MOUNT FULLY RIGID

FlightLine unit should always be hung vertically, not rigidly mounted. A fully rigid mount will result in excessive/premature webbing wear.

- Unit not to be mounted more than 1 m (3.2ft) from ledge of platform, additional webbing wear will occur and descent envelope will include much more swing.
- Unit may be mounted a maximum of 1.2 m (4 ft) below the platform deck for the “Jump Over” configuration.

- Height between the nozzle and the platform surface are to be within specifications. Refer to chart below.
- Correct mounting height per variant and configuration are to be ensured. Refer to chart below.

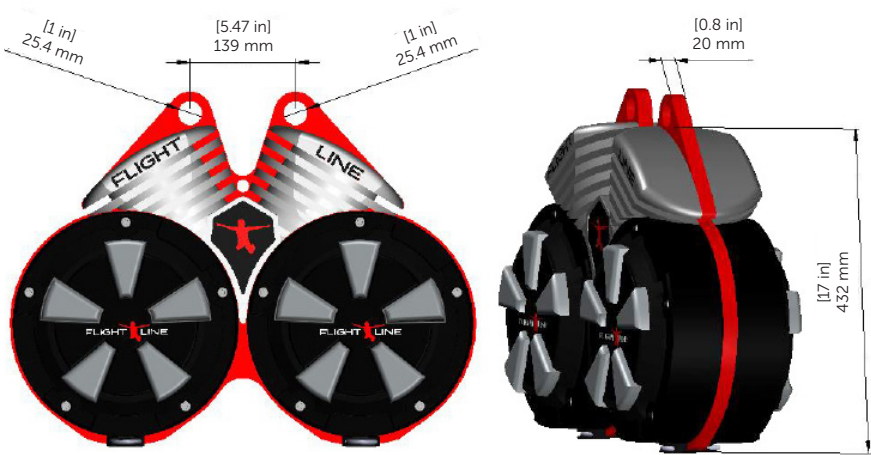
STANDARD MOUNTING CONFIGURATION

RipCord Length (m)c	Minimum Height*	Maximum Height*
4.5	18.5 m (60 ft)	23 m (75 ft)
6	20 m (65 ft)	24.5 m (80 ft)
Minimum Distance - Nozzle to Platform		1.8 m (6 ft)
Maximum Distance - Nozzle to Platform		2.1 m (7 ft)

JUMP OVER MOUNTING CONFIGURATION

RipCord Length (m)	Minimum Height*	Maximum Height*
4.5	21 m (69 ft)	23 m (75 ft)
6	23 m (75 ft)	24.5 m (80 ft)
Maximum Distance - Nozzle to Platform		1.2 m (4 ft)

* Height Measured from Nozzle to Ground



6.4.1 MOUNTING HARDWARE

All connectors, hooks, D-rings and shackles used to mount the FlightLine must meet a minimum breaking load of 10kN (2200 lbs) and be of compatible size, shape and strength for the mounting point to which they are attached.

6.5 Testing



DANGER

Always perform unmanned testing prior to commissioning or when returning the device to service from prolonged down time. Never operate outside the limits of this manual.

-
- Due to individual site configurations (as well as prevailing winds, jump location, etc.), the safety/clearance envelope may need to be increased. Additional webbing wear will occur and descent envelope will include much more swing.

Prior to leaving the factory, every FlightLine device is individually performance tested. While the units are fully tested, certified, and free from defects, there are inherent risks involved with installation. These risks can include imperceptible shipping damage, improper anchor or site installation parameters, and other variables.

Upon receipt and initial installation of the FlightLine, Head Rush Technologies requires the operator to perform weighted (non-human) drop tests to ensure the unit is operating normally, was installed correctly, and no shipping or handling damage occurred. The following testing and performance verification tests must be conducted before putting the FlightLine device into operation.



DANGER

This testing procedure should be conducted when the FlightLine is first commissioned and anytime it is returning to service from a non-operational period (including when returned from recertification).

7. OPERATION OF FLIGHTLINE

7.1 Safety Precautions



MANDATORY WEBBING INSPECTION

A visual inspection sufficient to evaluate the wear/integrity of the device's webbing must be completed upon every cycle. This may be performed from the ground if the webbing can be adequately observed. A more thorough webbing inspection must be performed at the device level to inspect 100% of the webbing length every 20 cycles. All webbing inspection should look for cuts, abrasion, discoloration, soft spots, etc. in reference to webbing wear tables.



ENSURE FULL WEBBING RETRACTION

Webbing must be fully retracted into the unit before every use. Operating a FlightLine that is not fully retracted may result in serious injury or death to participants.



ALWAYS CORRECTLY INSTALL, MAINTAIN, & OPERATE FLIGHTLINE

Failure to do so may result in serious injury or death to participants.



ENSURE THE DESCENT PATH IS FREE & CLEAR OF ALL OBJECTS & OBSTACLES WHICH MAY OBSTRUCT THE DESCENT OF THE USER

Ensure platform structure including, but not limited to, supports, guy wires, ropes, etc. do not impinge upon the descent path.



ENSURE ALL WEIGHT TESTING HAS BEEN COMPLETED & MOUNTING REQUIREMENTS VERIFIED PRIOR TO HUMAN USE

Follow procedure above to verify correct mounting and operation of the FlightLine.

7.2 FlightLine Operational Guidelines

FlightLine has been tested across a range of conditions and jumping methodologies and the following guidelines are required for all operational uses:

- One jumper at a time with a minimum interval of 150 seconds in between jumps.
- The strict weight range for FlightLine is 34–113 kg (75–250 lbs) with equipment on.
- Two operators are required for FlightLine – one at the launch platform and one on the ground near the landing zone.
 - The operator at the launch platform must ensure the webbing assembly is kept free and clear of the participant and other objects, especially snagging hazards. This necessitates holding the webbing clear

of obstacles while the participant jumps. This should be done in a way that eliminates any possible u contact with the webbing and allows the operator to release the webbing without impeding the user's descent.



NOTE

For Standard Jump Under Configurations platform guides may need to assist with the final portion of webbing retraction due to the heavy weight of the OPA/RipCord Assembly. If webbing still fails to retract when OPA/RipCord is lifted, refer to Section 7.4 Webbing Retraction Procedure.



NOTE

Platform guides and staff should be anchored in at all times with the use of approved fall protection equipment.

- The operator on the ground must “spot” the participant to ensure a safe landing. While the FlightLine arrival speed is less than 3m/s the experience can be disorienting for some which may result in landing off balance, falling over, landing on the back, etc.
- Exceptions to this rule apply to the first and last operators off the platform in order to facilitate group throughput. These operators must be staff of the facility and experienced with the FlightLine.
- Departure from the platform must be feet first only. Participants may jump face forward, backward, or sideways. However, no inverted jumping is permitted, including, but not limited to, diving or flipping. This requirement is to help ensure the webbing assembly does not become tangled with the participant and the participant arrives on the ground feet first.
- Participants must not run and jump or leap forward off the platform. A step off with minimal forward momentum is required to reduce swinging during descent.
- Participants should maintain a vertical orientation during descent to reduce swing and facilitate a feet first landing.
- Operator must ensure complete retraction of the webbing before every descent.
- Operators must ensure the webbing does not become twisted or tangled before every descent.
- Webbing retraction alone should never have to be assisted. Only when the weight of the OPA/RipCord assembly hinders full retraction should assistance be given while still maintaining reasonable tension. Always follow the retraction procedure below.
- The webbing **MUST NEVER BE FED INTO THE UNITS.**
- Facilities operating a Jump-Over Configuration will need a recovery hook or other methodology for retrieving the webbing from below the deck. An external apparatus must be kept free and clear of users, webbing and device. External recovery apparatus must be free of sharp or abrasive surfaces and be safely tethered and secured when not in use out of the jump area.

- The webbing assembly including the OPA and Activation Strip must be inspected daily and be retired immediately upon excessive abrasion or wear (Refer to Section 8.3).
- All inspection and maintenance guidelines provided with the FlightLine unit must be adhered to.
- A full body harness and helmet are REQUIRED.
- Participants with the following conditions **SHOULD NOT** use the FlightLine:
 - Heart or other medical conditions (injury, back problems, etc.)
 - Pregnancy.
 - Chronic panic attacks or other mental disorders.
 - Leg, foot, ankle, injuries, etc.
 - Other medical conditions or extenuating circumstances as determined by the operator.



NOTE

Participant eligibility and warnings should be posted as necessary or required by the local certifying body and acknowledged by every patron through waiver or contract agreement prior to riding the FlightLine.

- Participating in extreme activities such as riding the FlightLine can be nerve wracking and/or traumatizing for some people. Care must be taken by facilities, operators, and guides to treat all participants with respect and dignity, especially those in fragile states who may have declined participation. Head Rush Technologies is committed to the experience of these end users and to ensuring locations do all they can to facilitate the positive experiences of their clients.
- During operation, keep hands away from carabiners, harness, etc.
 - Users may hold webbing, but no further than 254mm (10") above carabiner connection.



PINCH HAZARD

Keeps fingers clear of carabiner and harness attachment point when descending. Loading may cause pinch.

- Always be aware of how the webbing will be tensioned depending on where the unit is mounted (if mounted underneath and behind, webbing may pull user around).
 - Facing direction of pull (i.e. stepping off backward for a unit mounted underneath and behind) will reduce rotation and swing and promote smooth braking.

- Clipping in front (waist) will tend to make off balance participants fall backwards while landing.
- Clipping in rear (dorsal point) will tend to make off balance participants fall forward while landing.

7.3 Operations

Owners and operators of the FlightLine device are responsible for the safety and supervision of any person using this equipment and are required by the manufacturer to read, understand, and follow all instructions in this Operator Manual regarding the correct installation and operation of the FlightLine device prior to any use.



UNSAFE OPERATION

Remove the FlightLine device from service immediately if there is any concern over its correct operation or user safety.

Do not return the FlightLine device to operational service until it has completed a recertification inspection and test by Head Rush Technologies.

7.3.1 OPERATOR TRAINING

All personnel involved with operation of the FlightLine device must use Personal Protective Equipment and be trained and deemed competent in the following aspects:

- Transportation and storage.
- Installation, use of attachment points, and attachment methods and hardware.
- User requirements and instruction.
- Personal safety while assisting jumpers during operations or during required inspections and/or servicing and maintenance of equipment.
- Inspection, cleaning, and scheduled servicing of the FlightLine device, its component parts, and associated attachment hardware.
- Operators (both platform and landing zone personnel) must be present during operation.
- Site safety and emergency rescue plan.

7.3.2 OPERATOR/USER INSTRUCTION



MANDATORY WEBBING INSPECTION

A visual inspection sufficient to evaluate the wear/integrity of the device's webbing must be completed upon every cycle. This may be performed from the ground if the webbing can be adequately observed. A more thorough webbing inspection must be performed at the device level to inspect 100% of the webbing length every 20 cycles. All webbing inspection should look for cuts, abrasion, discoloration, soft spots, etc. in reference to webbing wear tables.



ENSURE FULL WEBBING RETRACTION

Webbing must be fully retracted into the unit before every use. Operating a FlightLine that is not fully retracted may result in serious injury or death to participants.



NEVER DESCEND WITHOUT BEING CORRECTLY ATTACHED

Ensure that carabiners are attached to the harness manufacturer approved attachment point and the primary webbing connection point, the latch is fully closed, and the gate is engaged before use. Failure to do so can result in serious injury or death.



JUMPERS MUST MEET CRITERIA FOR USE

The FlightLine device should not be used by anyone who is/has:

- Weight over 113 kg (250 lbs).
- Weight under 34 kg (75 lbs).
- Pregnant.
- Any type of heart condition or heart-related issues, such as high blood pressure or heart disease.
- Any type of back, neck, spine, foot, ankle, or leg condition.
- A weak physical constitution or poor physical conditioning.
- Under the influence of drugs and/or alcohol.
- Any other physical, mental, or emotional condition that could be aggravated.
- Other conditions or extenuating circumstances as determined by the operator.

IF YOU HAVE ANY PHYSICAL OR MEDICAL CONDITIONS THAT MAY AFFECT YOUR ABILITY TO JUMP, CONSULT A MEDICAL PROFESSIONAL PRIOR TO PARTICIPATION.

USER CRITERIA MUST BE POSTED BY OPERATOR IN AN AREA WHERE IT IS VISIBLE TO ALL POTENTIAL USERS.

Prior to clipping in, all jumpers must be instructed in the proper use of the FlightLine device. Operators are to ensure all users are familiar with the site rescue plan in the event the user becomes distressed.

Prior to riding, the user and operator must be aware of, understand, and obey the following precautions:

- **Only one person may be on the device at a time.**
- Ensure that operators are anchored to the platform at all times. Jumpers must be anchored to the platform until attached to the FlightLine and ready to descend. No person should ever be on an elevated platform without Personal Protective Equipment.
- Visually inspect the webbing line, carabiner, connection point, the device, etc. to ensure that everything is in proper working order.

- DO NOT pull out any excess webbing line prior to descent. The webbing line must be fully retracted or under tension prior to operation. If the webbing fails to fully retract, follow the Reset procedure below.
- Ensure that the harness is correctly fitted and tightened.
- Ensure that the carabiner from the FlightLine line is connected to the designated manufacturer approved connection point on the harness and the primary webbing connection point, and that the gate is properly closed.
- Ensure the carabiner gate is facing away from the jumper.



RIPCORD SLACK MANAGEMENT

It is the guide's responsibility to never permit the webbing line to wrap around the legs, arms, neck, other body parts, loose clothing or equipment of the jumper before and during descent.

- Aside from initial RipCord slack management while patrons jump from the platform, operators should never grasp webbing during a jumper's descent (See Section 7.2 for more information).
- Prior to descent, ensure that the descent path and landing area are free of people and obstructions and the spotter is in place and ready.
- When ready to descend, the jumper should step straight down off platform. Do not jump away from the platform.
- Always descend feet first to better prepare for landing.
- Upon landing, guides/spotter is to unclip the carabiner from the harness and allow the device to take up any slack of the webbing and to create tension before releasing the webbing line to be retracted fully back into the FlightLine device. The weight of the OPA and RipCord assembly may require assistance to aid full recovery especially in jump under installations. A hook or line can be used to finish retracting the weight of these items to the jump deck.



USE AN APPROVED HARNESS

Always use a harness complying with the standards specified in this manual as well as any local, industry or regional safety regulations.

7.3.3 HARNESS

Ensure the harness is appropriate for use, in serviceable condition, and correctly fitted. Always follow the harness manufacturer's instructions for proper fit, care, and use.

Full-body harnesses and helmets are **REQUIRED**. Guidelines from harness manufacturers should be adhered to at all times.

Harnesses must meet applicable local or federal standards and must, at a minimum, comply with the following standards:

- EN 361 - Personal protective equipment for prevention of falls from a height – Full body harness.
- EN 12277 - Type A. Full Body Harness.
- EN 12277 - Type B. Small Full Body Harness.

7.3.4 CARABINER USE

Two self-closing, self-locking carabiners are supplied as an integral part of the webbing line. The carabiner must be checked and in serviceable condition before use. Ensure the carabiner is only loaded along the vertical direction.



NOTE

If the carabiner is damaged or unserviceable only a triple-locking carabiner may be used as a replacement carabiner for your FlightLine device. Replacement components are available from Head Rush Technologies or an authorized distributor.

To open the carabiner, push up, then rotate the gate collar and push the gate open toward the center of the carabiner.

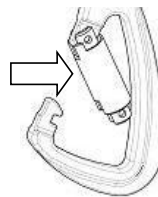
- Attach the carabiner to the correct anchor point on the harness with the latch facing away from the user.
- Allow the latch to snap shut, ensuring the collar has rotated back and is locked. Ensure that no clothing, webbing, or other objects are obstructing the gate or latch.
- Ensure the gate on the carabiner is secure and test to ensure it is latched.



STEP 1 - Slide



STEP 2 - Twist



STEP 3 - Depress



STEP 4 - Release

Figure 2: Carabiner Operation

7.3.5 CONNECTORS

All connectors and hardware used must conform to the requirements of:

- EN 362 - Types of connectors for personal protection.
- EN 12275 - Types of connectors for mountaineering.

7.4 Webbing Retraction Procedure



RESETTING THE WEBBING STACK

If the webbing does not retract entirely into the device, the webbing stack may need to be reset.

TO RESET THE WEBBING STACK, fully extend the webbing and allow it to slowly retract while maintaining constant tension. This will ensure the stack lays flat inside the drum with no dead space. Do this for both cores and any time poor retraction is suspected or incomplete retraction is noticed. Never manually feed webbing into the device.

If webbing still does not fully retract after (3) attempts of resetting the webbing stack, remove FlightLine from service and contact Head Rush Technologies.



NOTE

For Standard Jump Under Configurations platform guides may need to assist with the final portion of webbing retraction due to the heavy weight of the OPA/RipCord Assembly.

7.4.1 WEBBING RETRACTION TIPS

Proper webbing retraction is crucial, especially when using FlightLine near its maximum operating height. Fully extending the FlightLine webbing, then allowing it to freely retract without line tension, may cause improper webbing stacking, incomplete retraction, and accelerated webbing wear.

Always maintain tension on the line, especially after disconnecting a participant. This will ensure that webbing spools correctly inside the unit preventing voids or dead space from forming in the stack. Tension can be applied in three different ways:

1. An operator on the ground, after disconnecting a participant, can momentarily hold the line until the unit applies retraction tension. Then gently release the line to retract (using the weight of the RipCord/OPA assembly to maintain tension).
2. An operator adjacent to the device on the platform may gently hold the line to provide tension during retraction.
3. An operator on the ground may apply tension via a tag line attached to the end of the webbing for the first 3 m – 4.5 m (10 – 15 ft) of retraction so that the webbing is able to stack firmly and correctly.



ALWAYS FOLLOW CORRECT WEBBING RETRACTION PROCEDURE

Do not attempt to force feed webbing into the unit for any reason. Doing so could lead to a dangerous binding of the webbing which can abruptly shorten the life of the webbing and cause significant drag in the system, accelerating webbing wear and roller contamination.

A loose webbing stack from incorrect webbing retraction procedures can cause inconsistent and undesirable braking and proportionately large load changes to the jumper.

7.5 Operation During Extreme Weather Conditions

FlightLine equipment has been designed for use in a wide range of temperature and weather conditions. Extreme heat and cold weather will not alter the performance of the equipment, nor will operations in wet conditions; however, the following should be observed:



KEEP LINES DRY

When operating in freezing temperatures, it is of critical importance that all lines are kept dry. If lines become wet and subsequently freeze, normal retraction/extension may become limited, which may result in increased or dangerous rates of deceleration or an increased likelihood of reset failure. If lines become wet during operation, normal extension/retraction will become limited. Cease all operation in heavy rain that may impact proper reset or significantly impair operations.



FULLY EXTEND WEBBING TO ALLOW DRYING

When operating the FlightLine in wet conditions, the webbing lines must be fully extended and allowed to completely dry before placing FlightLine unit into storage in order to get the longest life from the lines. Do not store a wet webbing line retracted in the unit.



INSPECT LINE FREQUENTLY IN EXTREME WEATHER CONDITIONS

When operating in extreme wind, weather, temperature, humid conditions, and UV light exposure, increase line inspection frequency and replacement frequency. Under such conditions, the line must be replaced if any signs of deterioration are evident.



DO NOT OPERATE IN HIGH WINDS

Operating FlightLine in periods of high winds will result in increased swing that may force jumpers outside of the intended landing zone.

8. INSPECTION



MANDATORY WEBBING INSPECTION

A visual inspection sufficient to evaluate the wear/integrity of the device's webbing must be completed upon every cycle. This may be performed from the ground if the webbing can be adequately observed. A more thorough webbing inspection must be performed at the device level to inspect 100% of the webbing length every 20 cycles. All webbing inspection should look for cuts, abrasion, discoloration, soft spots, etc. in reference to webbing wear tables.

- Inspect the structure of the unit (especially mounting points) for damage – weekly.
- Inspect mounting structure and all connecting components (chain, carabiners, etc.) - weekly.
- Inspect the OPA and Activation Strip 2x per day
- Inspect the RipCord daily.
- A cycle count must be kept by staff throughout operation.

8.1 Daily Inspection

The FlightLine device must be inspected daily for correct operation and overall condition. The daily inspection may be completed with the unit in place or removed to a sturdy work table. See Daily inspection report in Section 8.2.

8.2 Inspection Procedure

Ensure adequate lighting and unrestricted access is available to permit a thorough inspection of all areas of the FlightLine device. This inspection should be completed either with the FlightLine device dismounted or by climbing to the location of the FlightLine device and anchoring in. You must be able to visually inspect the unit and the entire length of the webbing.

1. Clean any dust, dirt, or contamination off the casing and fittings with a clean cloth.



DO NOT USE SOLVENTS OR ABRASIVES

Clean with a cloth only. Do not use any cleaners, solvents, or abrasives on any part of the FlightLine device or its associated equipment.



NEVER APPLY TAPE TO THE WEBBING

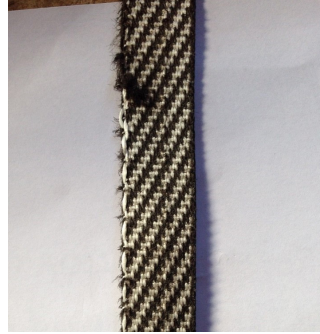
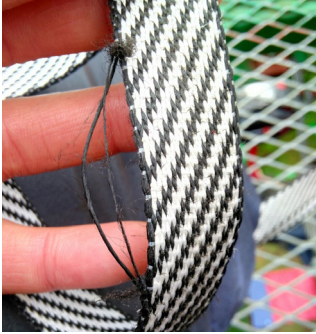
Never apply tape or anything that would cover any portion of the webbing and prevent complete inspections.

2. Visually inspect the casing, mounting holes, and plastic covers for wear, impact damage, cracking, deformation, and corrosion. Replace any damaged items or remove the FlightLine device from service until replaced.
3. Check that all safety labels are in place and in good condition, and check that the date on the certification label is current.

The image shows a white certification label with an orange border. At the top, the 'head rush technologies' logo is displayed in white on an orange background. Below the logo, there are four rows of text, each followed by a white rectangular input field with an orange border. The rows are: 'SERIAL NUMBER:', 'MANUFACTURE DATE:' (with slashes for day, month, and year), 'RE-CERTIFICATION DATE:' (with slashes for day, month, and year), and 'NEXT RE-CERT REQUIRED:' (with slashes for day, month, and year). Below these fields is a 'BY:' field. At the bottom of the label, the text 'LABEL P/N: 00070002-401' is printed in small letters.



4. Inspect the condition of the carabiner, checking for:
 - Wear and damage.
 - Correct operation of the locking mechanism.
 - If the carabiner gate does not fully close or automatically lock, clean it with mild soap and use a soft brush to remove debris until fully operational. If full functionality cannot be restored, replace the carabiner.
5. Slowly pull out the entire length of webbing from the unit. As webbing is withdrawn, inspect for:
 - Damage, cuts, or abrasion to the stitching.
 - Cutting, wear, and abrasion to the surface of the webbing.
 - Discoloration, fading, or chalking of the surface.
 - Heat and friction damage such as hard or shiny areas.
 - Contamination from dirt or chemicals.
 - Twisting, knotting, folding, or loosening of the weave.
 - Replace the webbing if any signs of wear or damage are present.
 - See the following Damaged webbing examples.



6. Inspect the exterior condition of the Overload Protection Assembly (OPA) for signs of excessive wear or damage, including holes, cuts, heavy abrasion, discoloration, brittleness, torn or loose stitches, etc., checking that:

- Activation strip and stitching is intact.



- Assembly is contained within the jacket.
- No excess threads are visible.
- OPA has not deployed.
- Replace the OPA and/or jacket if any signs of wear or damage are present.

-
7. Inspect the RipCord by feeling for broken elastic cord, stretching to its fully-extended length and ensuring outer tubular webbing is slack. If outer tubular webbing becomes taut upon full extension, immediately discontinue use of webbing assembly and replace.
 8. Allow the webbing to slowly retract into the housing, checking that the retraction action is strong and smooth. Ensure that the webbing line is fully retracted.
 9. Ensure that side covers are in place.
 10. Complete and file inspection documentation. Notify Head Rush Technologies immediately of any unusual or major maintenance required.
 11. Return the FlightLine device to service.



DAILY INSPECTION REPORT

WEBBING

- OPA activation strip is undamaged and shows no sign of activation.
- RipCord has been stretched to its full length and shows no signs of damage.
- OPA assembly is contained within jacket and jacket zipper is intact.
- Webbing has been pulled completely from unit and inspected for excessive wear that would be unsafe for use.
- Webbing is free of dirt and other contaminants.
- Webbing is fully retracted into unit.
- Cycle counter responds to full webbing extension and retraction.

UNIT

- Mounting points are undamaged and all mounting hardware is intact and accounted for.
- All links and carabiners are accounted for and operating properly.
- All safety labels are in place and in good condition.
- Recertification date is current.
- Webbing nozzles are free of excess debris and do not show excess wear.

CYCLE COUNT DISPLAYS:

DATE: _____

ADDITIONAL COMMENTS:

MAINTENANCE PERFORMED:

INSPECTED BY: _____ SIGNATURE: _____



8.3 Webbing Life

The lifespan of the **FlightLine Upper Webbings** will vary depending on the mounting configuration, device usage, and environmental conditions.

Webbing use may be tracked through cycle counter and proper inspection reporting. Please refer to the cycle counter tables for your particular installation and document your installation heights to help in controlling wear costs and conditions related to the webbing assemblies.

FlightLine Lower Webbings must be replaced when worn, or at a maximum of 5,000 cycles.

8.3.1 WEBBING FAILURE



REFER TO WEBBING FAILURE TABLE

Webbing in your FlightLine must be evaluated on a jump-to-jump basis. A detailed description of when a webbing should be taken out of service is included in the Failure Table below. **Webbing MUST be taken out of service by the time the webbing resembles the stage of wear shown in the Failure Table.** Continued use of webbing with wear at or beyond the designated stage of wear below, may result in serious injury or death.



MANDATORY WEBBING INSPECTION

A visual inspection sufficient to evaluate the wear/integrity of the device's webbing must be completed upon every cycle. This may be performed from the ground if the webbing can be adequately observed. A more thorough webbing inspection must be performed at the device level to inspect 100% of the webbing length every 20 cycles. All webbing inspection should look for cuts, abrasion, discoloration, soft spots, etc. in reference to webbing wear tables.

FAILURE TABLE

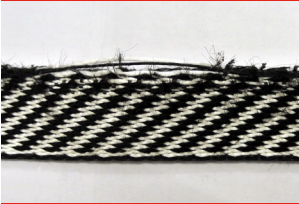


Wear Type	Point of Failure
EDGE WEAR	
	<p>Webbing MUST be replaced immediately when any edge stringing is visible. However, webbing should be removed from service when it is showing signs of Stage 3 edge wear shown in Table 2.</p>
FACE WEAR	
	<p>Webbing MUST be removed from service when it is showing signs of Stage 4 face wear shown in the Table 2.</p>
UV DAMAGE	
	<p>Webbing MUST be removed from service when it appears discolored from sun bleaching. Webbing should be removed when the webbing shows Stage 2 UV damage shown in the Table 3.</p>

Table 1: Failure Table

WEAR TABLES

Webbing pictures outlined in **red** in the tables below show webbing that **MUST** be taken out of service and replaced immediately to continue using your FlightLine. The **green** outlined photos show webbing that can be kept in operation.




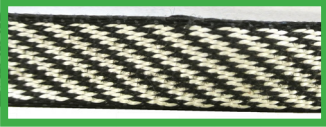



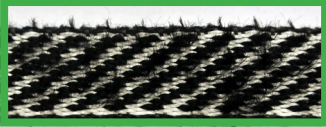




Degree of Wear	Edge Wear	Face Wear
NEW		
STAGE 1		
STAGE 2		
STAGE 3		
STAGE 4		
STAGE 5		

Table 2: Edge Wear & Face Wear

WEAR TABLES

Webbing pictures outlined in **red** in the tables below show webbing that **MUST** be taken out of service and replaced immediately to continue using your FlightLine. The **green** outlined photos show webbing that can be kept in operation.




Degree of Wear	UV Damage
NEW	
STAGE 1	
STAGE 2	

Table 3: UV Damage



MOLDY WEBBING

Any webbing showing signs of mold should be taken out of service.

TROUBLESHOOTING WEBBING WEAR

Symptoms	Potential Causes	Potential Solutions
WEBBING FACE WEAR, SIDE WEAR, JACKET WEAR, RIP CORD WEAR, & LOOP FAILURE	Jumpers are swinging excessively as they descend	Encourage jumpers to step off the platform rather than jumping out
	Jumpers are jumping from the wrong side of FlightLine	Position the FlightLine so that jumpers step out parallel to the narrow side of the unit
	Stainless steel nozzle insert is damaged	Inspect nozzle insert for burrs and other damage; if damage is found, replace nozzle
	FlightLine is mounted incorrectly	Ensure that the FlightLine is mounted according to Operator Manual; always mount FlightLine vertically with nozzles pointed down
	Foreign objects, including dirt and/or dust have introduced damage to webbing assembly	Cover the FlightLine when not in use; wipe the webbing with a dry cloth daily, after use
	Webbing assembly is rubbing on obstruction	Move the obstruction so that it does not interfere with FlightLine operation; ensure the webbing is not coming in contact with damaging surfaces while jumper is being clipped in
	Normal use of FlightLine	Parts and webbing wear over time with normal operation; replace webbing as necessary
UV FADED WEBBING	Sun is damaging webbing	Remove FlightLine at the end of day or cover unit and webbing after use
FLIGHTLINE JACKET IS DAMAGED	Jumpers are holding onto the device jacket as they jump	Coach jumpers to hold onto webbing below jacket
WEBBING IS MOLDY/ DISCOLORED	Webbing is not being dried after being used in wet conditions	Whenever using the FlightLine in wet conditions, take the unit down at the end of the day, extend the webbing in a sanitary environment, and allow webbing to dry outside of the unit

Table 4: Troubleshooting Webbing Failure

9. MAINTENANCE

- Recertification is Required Annually (starting from date of receipt of the device) or every 30,000 descents, whichever occurs sooner.
- FlightLine units must be returned to Head Rush Technologies for recertification.
- Replace wear items (webbing, carabiners, nozzle, etc.) immediately.
- **Only Head Rush Technologies is permitted to remove the casings of the FlightLine and/or service the core (internal workings). Authorized Service Centers are not permitted to service FlightLine units.**
- Contact Head Rush Technologies or your authorized distributor directly for any troubleshooting requests after you have referred to the Troubleshooting section in this manual.

9.1 Cycle Counter

Each FlightLine device is equipped with a digital cycle counter to help customers track the use of each unit. This count can be used to determine throughput, and when service may be needed. Refer to the following equation and tables to calculate your current cycle count. This will help to identify recommended service intervals that your FlightLine will encounter during the time of its use.



NOTE

Various jumping configurations and environmental conditions may effect service intervals.

1,000 Cycles	Upper Webbing Replacement
5,000 Cycles	Lower Webbing Replacement
30,000 Cycles	Unit Recertification

$$\frac{\text{Cycle Counter Read Out}}{\text{Ratio}} = \text{Total Actual \# of Cycles}$$

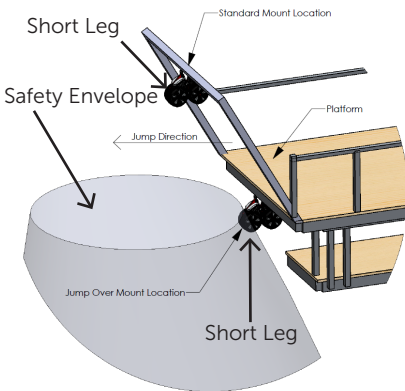
4.5m RipCord	
MOUNTING HEIGHT (FT)	RATIO
60	0.5855
61	0.5987
62	0.6119
63	0.6251
64	0.6383
65	0.6515
66	0.6647
67	0.6779
68	0.6911
69	0.7043
70	0.7175
71	0.7307
72	0.7439
73	0.7571
74	0.7703
75	0.7835

6m RipCord	
MOUNTING HEIGHT (FT)	RATIO
65	0.5855
66	0.5987
67	0.6119
68	0.6251
69	0.6383
70	0.6515
71	0.6647
72	0.6779
73	0.6911
74	0.7043
75	0.7175
76	0.7307
77	0.7439
78	0.7571
79	0.7703
80	0.7835

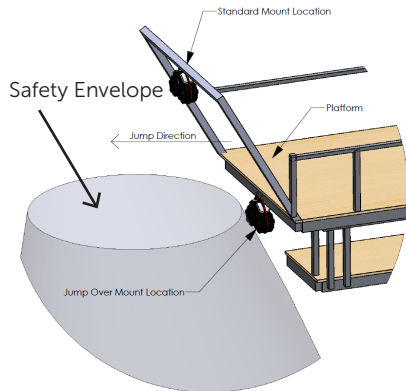
9.2 Troubleshooting

- Excessive webbing wear.
 - Check FlightLine orientation. Unit must be mounted so that the jumper is jumping facing the narrow side of the device and the flat face of the webbing. Applying excessive pressure to the edge instead of the face of the webbing will accelerate wear significantly.

Proper Orientation



Incorrect Orientation



- Failure to retract.
 - (Refer to Section 7.4 - Webbing Retraction Procedure) If webbing still does not retract, possible causes may be but are not limited to – A fatigued or broken retraction spring, colder than average weather conditions, windy conditions, twisting or binding of webbing at nozzle, heavily abraded webbing. (Refer to Section 8.3 – Webbing Wear) Contact Head Rush Technologies for further instruction.
- Excessive mounting point wear.
 - Ensure that jumpers are jumping in line with the unit. Jumping outside of the safety envelope will cause excessive unit jolting resulting in mounting point wear.
- Overload Protection Apparatus (OPA) deployment.
 - Discontinue use of unit and contact Head Rush Technologies immediately.
- Descent feels rough or harsh.
 - Webbing not retracted properly (See Section 7.4).
 - Jumper is not following proper jumping procedure.
 - *Jumping outside of permitted safety boundary.*
 - *Harness is improperly worn or fitted.*
 - *Clipped into improper connection point.*
 - *Below minimum weight.*
 - *Above maximum weight.*
 - *Not staying vertical during descent.*
 - Ambient temperatures too low (see Section 7.5).
- Noise coming from unit.
 - Webbing not properly retracted.
 - Retraction spring becoming audible due to changing weather conditions.
 - Damaged retraction spring.
 - Webbing Guide Band making contact with guide plates. This is normal on occasion and during load periods. It does not present a danger or risk to the unit or its operation. However, should the noise become constant and/or a significant detractor from the user experience, the unit can be sent for recertification to have the guide band re-centered and/or replaced.

9.3 Maintenance Records

- Each site must keep maintenance and operating records including at least the items below:
 - Record date of each inspection item.
 - Record/confirm daily inspection complete.

- Record the number of cycles for each day of operation.
- Record webbing replacement date and cycle count.
- Record any replacement of any items, including carabiner, connection links, etc.
- Record new installation heights along with weighted drop test times.

9.4 Webbing Line Replacement

If the upper webbing line shows signs of wear, damage, or contamination, it will need to be replaced. Replace the webbing line as follows:



DO NOT ALLOW THE WEBBING LINE OR DRUM LEAD TO RETRACT INTO THE HOUSING

With the nozzle removed, take care not to permit uncontrolled retraction of the drum lead or webbing line into the casing. Uncontrolled retraction will result in internal damage and require repair by the manufacturer.



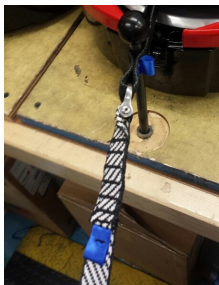
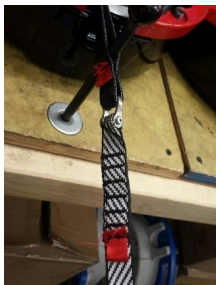
ENSURE CORRECT WEBBING LEG IS INSTALLED IN THE CORRECT CORE

The FlightLine utilizes staged braking to provide a smooth braking characteristic. Always ensure the correct length webbing/RipCord leg is installed in the correct core. The short webbing loop and main webbing are color coordinated, ensure webbing colors and leg lengths match the webbing being replaced.

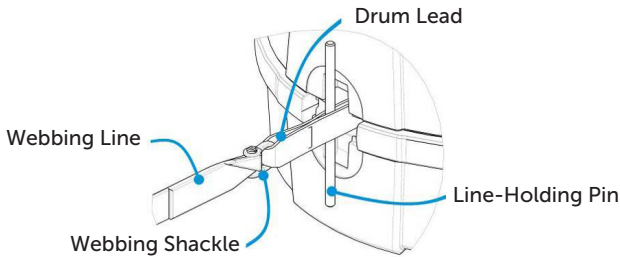
9.4.1 WEBBING LINE REPLACEMENT PROCEDURE

To replace the webbing line:

1. Remove the FlightLine device from service and place it securely on the work bench or complete in situ, if possible.
2. Remove the nozzle assembly.
3. While ensuring the unit is secured, pull out the webbing line until the end of the drum lead and the joining shackle are exposed. Notice that the ribbon color on the webbing corresponds to the ribbon color on the drum lead.



4. Locate the loop in the drum lead, approximately 150 mm (6 in) past the link. Place a suitable line-holder pin through the loop in the drum lead to prevent it from retracting back inside the casing.



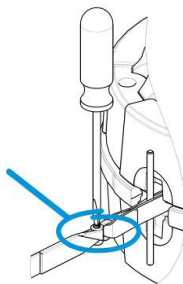
5. Unscrew the shackle pin.
6. Remove the webbing line and complete shackle assembly from the drum lead.
7. Fit the new shackle supplied with the line. Ensure the loop part of the shackle is fitted to the drum lead.



DO NOT ALLOW THE WEBBING LINE OR DRUM LEAD TO RETRACT INTO THE HOUSING

With the nozzle removed, take care not to permit uncontrolled retraction of the drum lead or webbing line into the casing. Uncontrolled retraction will result in internal damage and require repair by the manufacturer.

8. Fit the new webbing line, passing the threaded shackle pin through the loop as shown.



9. Tighten the shackle pin to 2 Nm (18 lb-in), ensuring the threads are fully engaged and the end of the pin is flush with the joining shackle as shown.
10. Remove the line-holder pin and allow the new webbing line to slowly retract until the drum lead and joining link are inside the casing. Ensure that the webbing line does not twist.



DO NOT ATTEMPT TO RE-TIGHTEN SHACKLE PIN

Once the shackle pin is tightened, it must not be loosened or re-tightened. This will break the locking compound and the shackle pin may become loose. The shackle pin must be replaced if this happens.



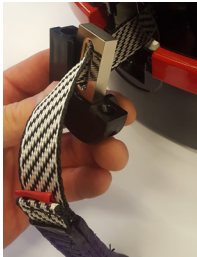
ENSURE PROPER RETRACTION

Ensure that the webbing line feeds squarely, and without twists, when retracting back into the device. Failure to do so may result in equipment failure, serious injury, or death.

11. Refit the nozzle assembly. See Section 9.4.2 Nozzle Reinstallation.
12. Slowly retract the webbing line into the casing, checking that the action is smooth and adequate spring resistance is felt.
13. Once the webbing line is fully retracted, pull out the webbing line a short distance using reasonable force and allow it to retract. Repeat two to three times to ensure webbing line is firmly wound onto the drum.
14. Return FlightLine to service and check for correct operation, including performing weighted drop testing.

9.4.2 NOZZLE REINSTALLATION

1



Ensure webbing is free of twists when aligning nozzle insert

2



Join nozzle housing halves with nozzle insert

3



Press halves and nozzle insert into place

4



Insert alignment pin

5



Press alignment pin into place

9.5 Replacement Parts

- Webbing upper
 - Webbing Red Line Upper (P/N: 04051008901)
 - Webbing Blue Line Upper (P/N: 04051000401)
- Webbing lower
 - 6.0 Replacement RipCord (P/N: 04051000301)
 - 4.5 Replacement RipCord (P/N: 04051000201)
- Webbing – Full Replacements (both upper and lower)
 - 6.0 Replacements (P/N: 04040099101)
 - 4.5 Replacements (P/N: 04040074201)
- Nozzle Replacement Kit (P/N: 01160008801)
- FlightLine Side Cover w/ label (P/N: 04061000501)

9.6 OPA Inspection Instructions

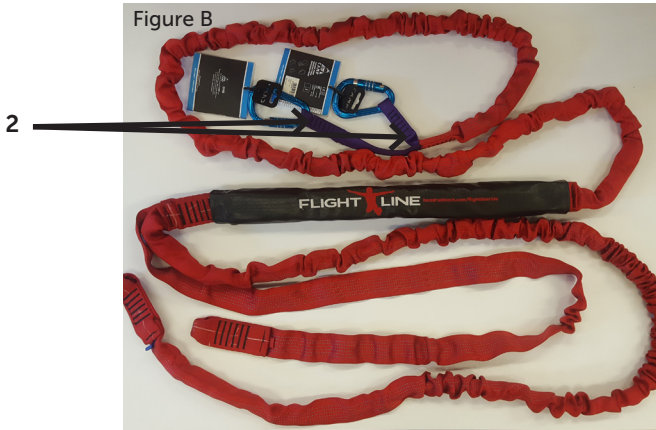
The Overload Protection Assembly (OPA) is a “stitch ripping device” integral to every FlightLine webbing. The OPA is designed to protect the jumper from high forces in the event the FlightLine device is misused or abused. In the case of an overload event, the OPA will deploy, pulling through the bottom of the jacket while “ripping” the zig-zag stitching on the two wings which absorbs energy to keep the jumper from experiencing excessive deceleration. Should the OPA deploy, immediately discontinue use of the FlightLine device, replace the webbing and contact Head Rush Technologies.

The following inspection procedure should be conducted at least weekly during regular service and before returning a unit to service. High use facilities and/or facilities operating in harsh environments (outdoor, wet, humid, prolonged direct sunlight, etc.) should increase the inspection frequency appropriately. After exposure to water or very damp conditions, remove the Jacket and allow the OPA to dry in order to prevent deterioration of the webbing. As well, extend the webbing line and allow it to dry in accordance with instructions in Section 7.5 of the manual. If webbing line and OPA both become wet AND freeze, normal extension and retraction will be hindered. Do not operate the FlightLine device in freezing conditions.

Inspect the major areas of the OPA, as described below, for signs of excessive wear or damage. Signs of wear/damage include, but are not limited to: holes, cuts, heavy abrasion, discoloration, brittleness, torn or loose stitches, etc. If worn, damaged or suspect immediately replace the FlightLine device webbing / OPA assembly.

The major parts of the OPA are as seen below.

- 1. Jacket
- 2. Primary and Secondary Clip-in Point
- 3. Auto-Locking Carabiners
- 4. Activation Strip
- 5. Wings
- 6. Primary Webbing Connection
- 7. Petzl Rings



1. **JACKET** – The OPA Jacket is a durable, tight fitting, removable cover, which protects the assembly from the elements. Prior to inspection, remove the Jacket and expose the OPA by unzipping the zipper. Ensure smooth operation of the zipper, positive traction of the strip and tight fit over the OPA to prevent slip during use. The Jacket should be oriented as shown in Figure B with the zipper closest to the clip in points when fully closed. The Wings should be folded as shown in Figure A so that the jacket may fit around the entire assembly. As well, the zipper and logos should be on the wide, flat sides of the OPA as shown in Figure D. Do not use tools to pull the zipper closed as this will cause damage. For a replacement Jacket, contact a Head Rush Technologies Authorized Distributor.

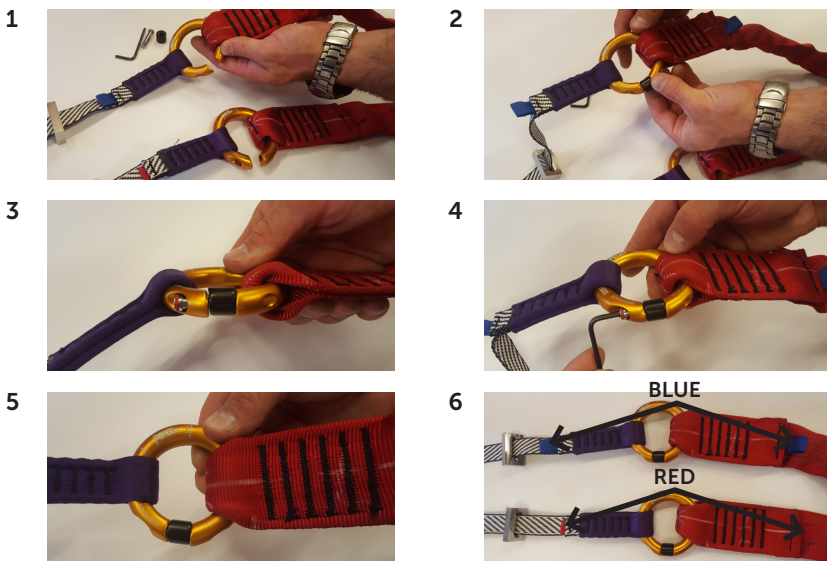


2. **PRIMARY & SECONDARY CLIP-IN POINTS** – Remove the carabiner and inspect the entire colored webbing particularly around the Primary and Secondary Clip-in points, including the bar tacks around the secondary clip-in point for signs of excessive wear and/or damage. Note- the Secondary Clip-In point should not be loaded, as per instructions in Section 7 of the manual.
3. **AUTO-LOCKING CARABINER** – Inspect the auto-locking carabiner for signs of damage and smooth operation, ensuring the gate fully closes and locks when released from the open position. Dirt and debris may hinder smooth operation of the gate and/or locking mechanism. The carabiner may be cleaned using mild soap and water, a cloth or nylon bristle brush and lubricated with a dry lubricant such as PTFE spray. For a replacement carabiner, please contact a Head Rush Technologies Authorized Distributor.
4. **ACTIVATION STRIP** – The activation strip is a short section of black webbing sewn across one wing of the OPA to protect the zig-zag stitching on the wings from repetitive loading and degradation during normal use. In the case of an overload event, the Activation Strip will rupture enabling the stitching on the wings to rip, absorb energy and limit peak loading. Inspect the activation strip and the two bar tacks on either side of the strip for damage, including rupture, thread pull out, looseness etc.
5. **WINGS** – Inspect the wing sections, including the zig-zag stitching and bar tacks for signs wear or damage. During normal operation, these sections will not be loaded and should remain entirely intact.
6. **PRIMARY WEBBING CONNECTION** – This is the joint at the top of the OPA that connects the OPA to the primary webbing and RipCord to the primary webbing. Inspect these connections and the webbing carefully for signs of excessive wear and/or damage.

7. **PETZL RINGS** – Ensure that Petzl rings are installed properly as detailed in the OPA webbing replacement instructions. Also verify that rings are free of damage or wear and that the gates are tightly closed.

9.6.1 OPA / LOWER WEBBING REPLACEMENT INSTRUCTIONS

The Overload Protection Assembly is secured to the upper FlightLine webbing with the use of two fall rated and approved Petzl Rings. Proper installation of these links is crucial for safety redundancy. Follow the following steps to install your new OPA assembly to the upper webbing assembly.



ALWAYS ENSURE WEBBING IS PROPERLY INSTALLED

Ensure that the lower webbing assembly legs are attached to the correct corresponding upper webbing legs. Upper and lower webbings are color coded (red and blue ribbons).



PROPERLY INSTALL GATE INSERT

Ensure that notch and gate insert aligns with the corresponding notch on the Petzl ring during installation. Also ensure that fastener is tight and secure.



NOTE

Ensure that webbing uppers are free twists when installing the lower assembly using the Petzl rings.

11. MANUFACTURER'S DETAILS

Replacement parts for the FlightLine and other related products can be purchased at store.headrushtech.com or from an Authorized Head Rush Technologies Distributor.

Return the FlightLine to the manufacturer at the address shown below for any replacement or unscheduled service or repairs.

ADDRESS

Head Rush Technologies
1835 38th Street, Suite C
Boulder, CO 80301
USA

CONTACT DETAILS

+1-720-565-6885
www.headrushtech.com
info@headrushtech.com





REGISTER YOUR DEVICE

Get automatic updates on recertification and product information – visit [*headrushtech.com/register*](http://headrushtech.com/register)

ANNUAL RECERTIFICATION IS REQUIRED

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