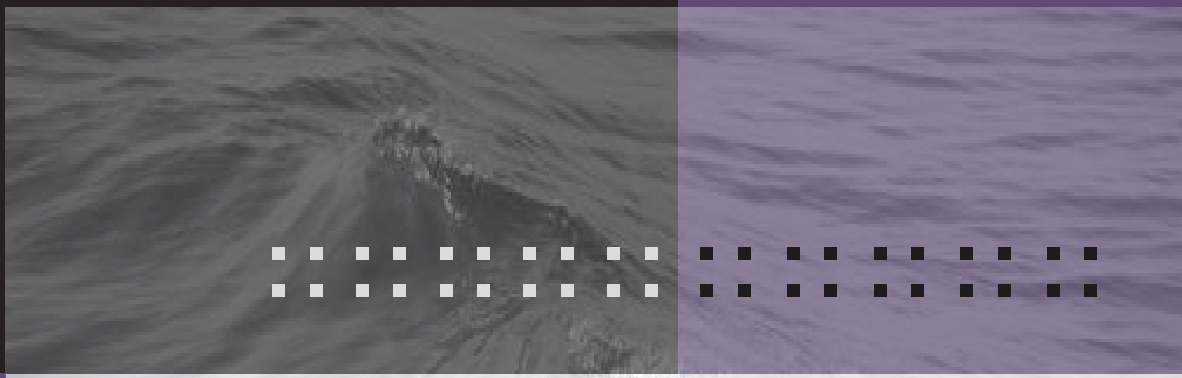
Operation Manual

RESCUE SOLUTIONS INTERNATIONAL INC.





ALM
ASSAULT LAUNCHER MAX

RGES
RUNNING GEAR ENTANGLEMENT SYSTEM

"The Global Leader in intrinsically safe line-throwing equipment"

Warnings

This equipment is intended to be used by rescue professionals trained in the use of similar equipment. Misuse of this equipment may cause bodily injury or death. Manufacturer disclaims all liability resulting from the use of this equipment in any manner other than that prescribed by the Manufacturer.

The Assault Launcher Max (ALM) is extremely powerful and propels a Projectile at high speed. It is NOT a firearm, but the same precautions should be used. If misused, this equipment could cause serious bodily injury or death. Handle all components with the appropriate care.

DO NOT deploy the ALM directly at any person or property. Always aim beyond a victim in the water when performing training or an actual rescue. When testing or training with the ALM, make sure that no persons or property are in the vicinity of the target.

The ALM requires proper training and servicing. If you are not familiar with this equipment or are unwilling to follow the recommendations as outlined in this Operation Manual, then you should not operate this equipment. The user must follow recommended servicing and maintenance guidelines to ensure the long-term integrity and safety of the ALM.

Loads imposed on Climbing Grappling Hooks should never exceed the marked rating. Any Grappling Hooks certified for climbing must be removed from service if any signs of damage or deformity are visible.

It is the responsibility of the purchaser of any Grappling Hooks certified for climbing to establish a program which provides for regular examination of each Grappling Hook for deformation or invisible fractures using a magnetic particle test or other similar test. Any Grappling Hook which shows hidden fractures as a result of such a test should be immediately removed from service. The frequency of this examination is at the discretion of the purchaser, and should be based upon the use of the grappling hook. It is the purchaser's responsibility to ensure that all Grappling Hooks certified for climbing are maintained in a manner which makes them suitable for their intended use.

If you are uncertain about the proper usage, care, maintenance, or any other aspect of this equipment, contact Rescue Solutions International, Inc. for FREE technical support directly at 778-532-7600 or by e-mail at info@resqmax.ca.

Service

Any service or maintenance other than items described in this Manual (refer to page 30) must be performed by a technician certified by the Manufacturer to perform such work. It is the purchaser's responsibility to register the product with the Manufacturer. Failure to complete warranty registration will void the warranty. For your convenience, a Service & Maintenance Record is provided on page 34 of this manual. It is the purchaser's responsibility to enter the date of purchase on the Service & Maintenance Record and to ensure that servicing is done in accordance with the Manufacturer's recommendations. Rescue Solutions International, Inc. offers FREE technical support.
Call 778-532-7600or e-mail at info@resqmax.ca.

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Purpose of the Assault Launcher Max (ALM)

The ALM is a new generation tactical line-throwing appliance fueled by compressed air, specifically designed to deploy:

- a line only
- a grappling hook and climbing line
- a grappling hook and ascending ladder
- RGES entanglement payload

The ALM comes completely assembled and ready for operation, except for filling with compressed air. Adequate training in all aspects of the use of this equipment is essential in order to familiarize yourself with its safe operation and capabilities.

Review all instructions in this ALM Operation Manual and accompanying Training CD prior to first use.

Applications

Some applications of the ALM include:

- line deployment to establish a messenger or load line
- ship to ship line deployment
- ship to shore line deployment
- vessel stopping
- retrieval of mooring lines
- deployment of spill containment booms
- deployment of grappling hook and climbing line
- deployment of grappling hook and ascending ladder

Performance Range

The range of the ALM varies depending on:

- type and weight of line used
- type of projectile and/or accessories used
- volume and pressure of air in the Projectile at time of deployment

In special circumstances, additional distances may be achieved by using the equipment at higher pressures. There is a significant safety margin engineered into each unit permitting safe operation of the units at pressures equal to 120% of rated service pressure on a case-by-case basis.

Safety Features

The Launcher Safety Assembly automatically engages each time a projectile is inserted, preventing accidental launch of a Projectile. An audible "Click" is heard as the Projectile engages, signaling that the Projectile is safely engaged with the Launcher Mechanism.

A Pressure Relief Assembly is installed in the nozzle of each Projectile. Its purpose is to prevent any unsafe pressure build-up in a filled Projectile, whether in the Launcher or not, if exposed to extreme heat, such as from a fire. This Pressure Relief Assembly will rupture if the air pressure goes over a safe limit. The Pressure Relief Assembly is not reusable and must be replaced if it should ever fail.

A second Pressure Relief Assembly is installed on the Launcher Mechanism and is active at all times when the Mechanism is pressurized. A spare Pressure Relief Assembly is provided with each ALM.

Note:

When installed in the Launcher, the Projectile Nozzle Valve should remain closed at all times except immediately prior to discharge.

Multi-Shot Capacity

Our patented Nozzle Valve Assembly permits any number of Projectiles to be pre-charged and stored with each unit, allowing deployment of multiple Projectiles in rapid succession. Properly maintained Projectiles will hold a charge for one year or longer.

Fueled by Compressed Air

The ONLY intended fuel for this system is compressed air, which is non-flammable and non-combustible.

Note:

This equipment is **NOT** oxygen safe! Never use a compressed air mixture that includes an elevated level of oxygen.

CAUTION: The use of any other compressed gas, either flammable and/or combustible (including nitrox or other oxygen-enhanced mixtures), may result in a spontaneous explosion causing severe injuries or death.

ALM Launcher #540

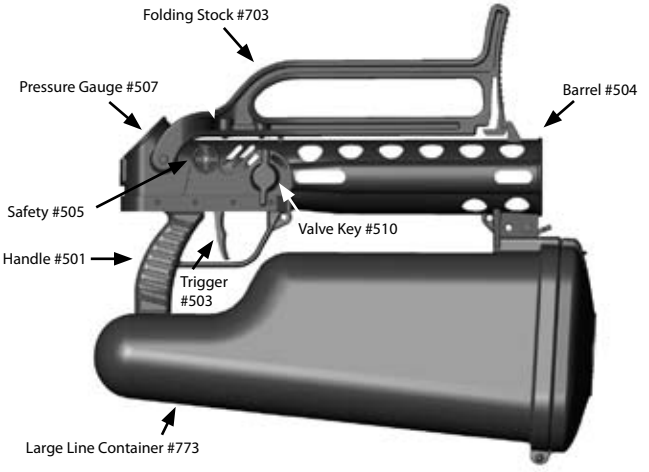


Figure 1 - Launcher, right side view

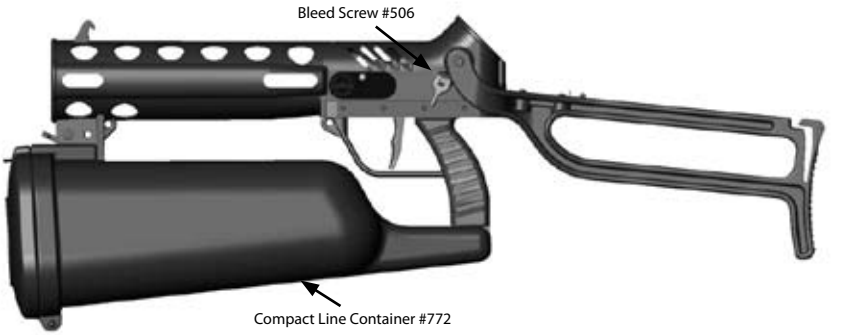


Figure 2 - Launcher, left side view

Line Containers #772 and #773

The Line Container for the ALM is selected according to the length and diameter of the Line used. Some line options require the Large Line Container (Fig. 1) while others may utilize the Compact Line Container (Fig. 2).

Folding Stock #703

The Folding Stock enhances the operator's ability to aim the Projectile more accurately (Fig. 2). When in the folded position the Folding Stock becomes a convenient carrying handle (Fig. 1).

Note:

The Figures in this manual show the ALM in a dark grey color rather than its actual black color. This has been done for clarity of illustration. All ALM units are black.

Streamline Filler Hose Assembly #91x-S

The Streamline Filler Hose Assembly (Fig. 3) is used to deliver compressed air from an air compressor, a SCBA tank or a SCUBA tank to the Projectile. This provides the "charge" for the Projectile. Please ensure that your Streamline Filler Hose is equipped with proper fitting for your source of compressed air. A complete list of available adapters is outlined below. Multiple fittings may be supplied with each ALM to permit charging from multiple air sources if required.

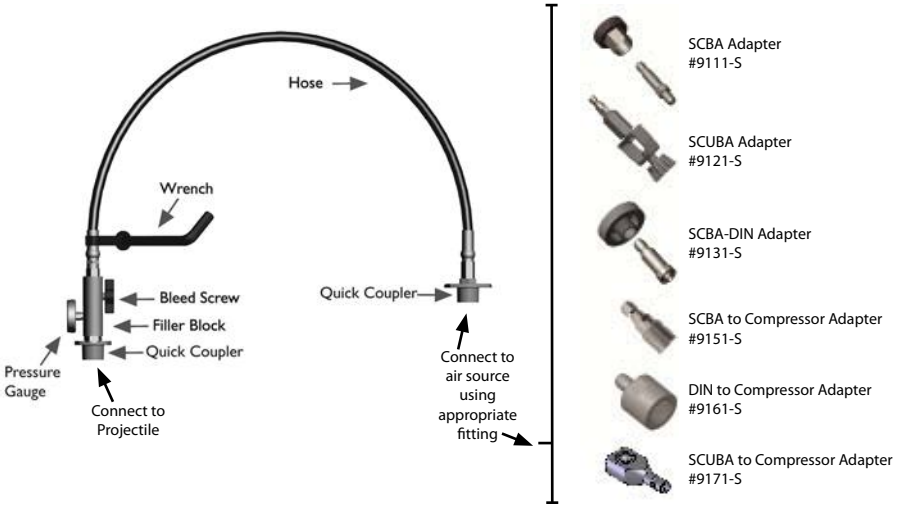


Figure 3 - Streamline Filler Hose Assembly

ALM Tool Kit #991

The ALM Tool Kit (Fig. 4)provides all the tools needed for operational maintenance of the ALM.



Figure 4 - ALM Tool Kit

Line Projectiles #300-S, #305-S, #306-S, #308-S, and #310-S

Line Projectile #300-S (Fig. 5a) and **#310-S** (Fig. 5c) will deploy a variety of lines over a range of distances depending on the service pressure and the type of line used. The Projectile Protector is intended to protect the Projectile Cylinder from damage on contact. If the Protector shows signs of damage after use it must be removed, the Projectile Cylinder must be inspected, and the Projectile Protector must be replaced. The Standard Line Projectile #300-S has a service pressure of 3,000 psi / 207 Bar; the HP Projectile #310-S has a service pressure of 4,500 psi / 310 Bar.

Note:

If the Projectile shows signs of damage it must be removed from service immediately.

Red Training Projectile #305-S (Fig. 5b) is designed for training or for repeated use when deploying a line from the launch point to a hard surface as "ship-to-ship" line deployment. The factory installed protective cover is manufactured from a low-recoil high-density urethane material providing protection for the projectile and reducing projectile "bounce" on contact.

Luminescent Training Projectile #306-S (Fig. 5b) has factory installed luminescent protective cover which combines the best features of high initial brightness and long afterglow for visibility during nighttime use. The pigments used respond quickly to excitation by daylight, incandescent light, fluorescent, or ultraviolet light. This excitation process can be repeated indefinitely.

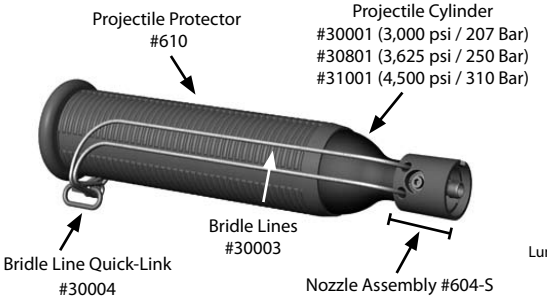


Figure 5a - Line Projectile #300-S / #308-S



Figure 5b - Training Projectiles #305-S / #306-S



Figure 5c - HP Projectile #310-S

Climbing Grappling Hook #750

The Climbing Grappling Hook is manufactured from titanium to provide the best balance between strength and weight (Fig. 6). This Grappling Hook is used to establish a climbing line, a tactical ladder, or to recover mooring lines, and is certified for climbing by the Manufacturer. Loads imposed on the hook should never exceed the design rating. Each hook is treated with EFEX Sound Signature Reducer.

Design Rating:
Ultimate Strength of 2,200 lbs / 1,000 kg.
Recommended loads not to exceed 730 lbs / 330 kg.



Figure 6 - Climbing Grappling Hook #750

Note:

Custom Grappling Hooks are available on a special order basis.

Climbing Line and Tactical Ladder Options

In addition to the Climbing Line and Tactical Ladder options shown, customized Climbing Lines and Tactical Ladders are available to suit specific applications.

Any line type may be combined with any projectile option.

Part #	Description	Minimum Break Load		Weight per Length		Length	
		lbs	kg	lbs	kg	ft	m
801	7mm Nylon/Spectra Climbing Line	5780	2622	3.96	1.8	165	50
802	5.5mm Nylon/Spectra Climbing Line	3200	1194	2.60	1.2	330	100
815	8.4mm Dynamic Climbing Line	3442	1565	7.0	3.2	230	70
744	50ft / 15m Tactical Ladder	4,800	2180	5.9	2.7	50	15
746	65ft / 20m Tactical Ladder	4,800	2180	8.0	3.6	65	20

☆ *Custom line options and ladder lengths to meet user requirements are also available.*

Tactical Ladder #744 and #746

Lightweight, durable, and acoustically covert. Constructed of high-tensity nylon webbing with rigid fiberglass rungs at 12 in/30 cm intervals, these Tactical Ladders are available in 50 ft / 15m or 65 ft / 20m lengths which can be fully deployed vertically (Fig. 7).

Side members have a combined breaking strength of 4,800 lbs / 2,180 kg. The bottom, or tail, of each parallel side rail of the Tactical Ladder forms a loop to allow a tag line to be attached if required by the user.



Figure 7 - Tactical Ladder

NOTE: Custom lengths available.

Kit Carry Bag #906

The Kit Carry Bag is made from 1000-denier Cordura fabric, with two external zippered pockets, one internal zippered pocket, and a weatherproof membrane over the entire footprint (Fig. 8a).



Figure 8a - Kit Carry Bag #906

Pelican Transport/Storage Case #909

This unbreakable, watertight, dust-proof, chemical resistant, and corrosion-proof case comes with a lifetime guarantee. When equipped with an extending handle and rollers, this case is used for transport and storage of the ALM (Fig. 8b).



Figure 8b - Pelican Transport/Storage Case #908

Extending the Folding Stock

To extend the Folding Stock from the collapsed position to the firing position, follow these steps:

1. Push down at the butt of the Folding Stock and apply pressure with your thumb. This will release the Folding Stock from the sighting hook (Fig. 9a - Step 1).
2. Rotate the Folding Stock to the rear of the Launcher (Fig. 9a - Step 2). The Stock Catch Plate will automatically engage and lock the Folding Stock in the extended position.



Figure 9a - Extending Folding Stock

Collapsing the Folding Stock

To collapse the Folding Stock for use as a handle, follow these steps:

1. Pull back on the Stock Catch Plate with your thumb to disengage the catch (Fig. 9b - Step 1).
2. Fold the Folding Stock over the top of the Launcher (Fig. 9b - Step 2).
3. Engage the butt of the Folding Stock with the sighting hook on the front of the Launcher (Fig. 9b - Step 3).

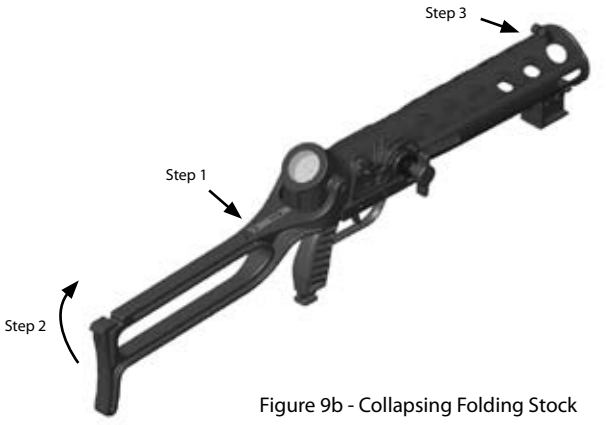


Figure 9b - Collapsing Folding Stock

Connecting the Launcher to the Line Container

To connect the Launcher to the Line Container, follow these steps:

1. Place the inverted "T" bracket (on the bottom of the Launcher at the front) on top of the Line Container just behind the inverted "T" groove on the upper portion of the front of the Line Container (Fig. 10a - Step 1).

2. Position the bottom of the Handle so that notches on the Handle will engage with the flange at the rear of the Line Container (Fig. 10a - Step 2).

3. Slide the Launcher forward inside both the front and rear grooves of the Line Container simultaneously. Push firmly forward until the Line Container Catch on the Launcher automatically engages in the locking hole in the Line Container (Fig. 10a - Step 3).



Figure 10a - Connecting Launcher to Line Container

Disconnecting the Launcher from the Line Container

Note:

If there is line in the Line Container it is first necessary to disconnect the "live end" from the Bridle Lines and the "dead end" from the Launcher Eyelet in order to disconnect the Line Container from the Launcher.

To disconnect the Launcher from the Line Container, follow these steps:

1. Push down on the Line Container Catch, located at the front of the Launcher just below the launcher barrel opening (Fig. 10b - Step 1).

2. Slide the Launcher back and out of the grooves on the Line Container (Fig. 10b - Step 2).



Figure 10b - Disconnecting Launcher from Line Container

Operating the Safety Push Knob

The Safety Push Knob is located on the same side of the Launcher as the Valve Key, and directly above the Trigger.

This Safety Push Knob is at rest when protruding slightly from the side of the Launcher housing (Fig. 11a).

The Safety Assembly engages automatically each time that a Projectile is inserted into the Launcher. An audible "Click" indicates that the Safety Assembly has engaged and the Safety is **ON.**

Press the Safety Push Knob to the **OFF** position immediately before firing the Launcher. When the safety is in the **OFF** position the Safety Push Knob remains recessed inside the cavity about ¼"/ 6 mm (Fig. 11b).

After firing the Launcher, the Safety Assembly will reset itself to accept the next Projectile. When a new Projectile is loaded, the Trigger will automatically move forward and the Safety will engage to **ON** position.



Figure 11a - Safety Engaged - **ON**



Figure 11b - Safety Disengaged - **OFF**

Note:

If the Trigger is moved forward manually prior to another Projectile being inserted, it is necessary to press the Safety Push Knob to release the Safety internally, prior inserting another Projectile.

Resetting the Safety

If the Safety Push Knob has been pressed to the **OFF** position – and for any reason it becomes necessary to reset the Safety without firing the Launcher – apply forward pressure on the arm of the Safety Push Knob and rotate the Safety Push Knob clockwise. A rotation of only a few degrees is required (Fig. 11c). The Safety Push Knob will return to its rest position, protruding slightly from the side of the Launcher housing – indicating that the Safety Assembly has been re-engaged and the Safety is in the **ON** position (Fig. 11a).

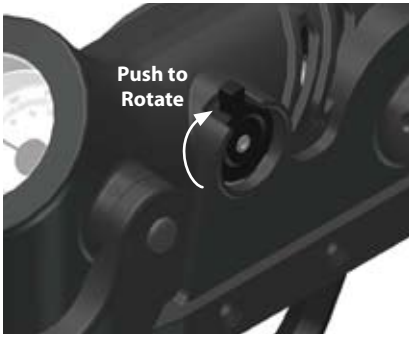


Figure 11c - Reset Safety

Note:

For maritime applications, the Safety can be reset by applying forward pressure on the arm of the Safety Push Knob. This arm provides for easy use if the end-user is wearing gloves.

Loading the Line Projectile in the Launcher

To load the Line Projectile in the Launcher and connect the Bridle Lines, follow these steps:

Note:

If you do not get the Nozzle Protector lined up properly the Nozzle will not be able to slide into the Mechanism. An audible "Click" indicates the Safety Assembly is engaged and the Safety is ON.

1. Pull the Quick-Link connecting the two Bridle Lines in order to center the Bridle Lines evenly on the left and right sides of the Projectile (Fig. 12b).

2. Ensure that the Safety Assembly is disengaged by pressing the Safety Push Knob.

3. Insert the Line Projectile into the Launcher with the "V" groove in the Nozzle Protector upward while keeping the Bridle Lines tight and uncrossed along each side of the Projectile. Rotate the Projectile as necessary until you feel the "V" groove engage with the Mechanism (Fig. 12a) and apply pressure to the Projectile. An audible "Click" will signal that the Projectile is properly inserted in the Mechanism with the Safety Assembly engaged and the Safety in the **ON** position.

4. Connect the Quick-Link holding the loops in the Bridle Line to the loop in the "live end" of the line – protruding through the notch on the Line Container Door. Use care not to disengage the Cut-Away Pin which fastens the Line Container Door closed (Fig. 22, pg. 23).



Figure 12a - Align "V" Groove

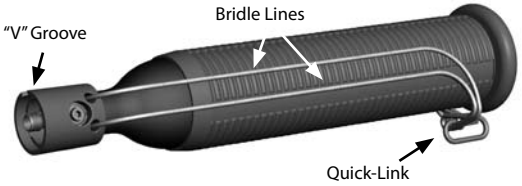


Figure 12b - Line Projectile with Bridle Lines

Operating the Nozzle Valve to Pressurize the Launcher

The Valve in the Nozzle of each Projectile is to be opened using the Valve Key attached to the Launcher housing.

The Valve Key is spring-loaded and by default its resting position is "NOT Engaged."

The Valve Key is NOT engaged with the Nozzle Valve when fully extended (Fig. 13a).

The Valve Key is engaged with the Nozzle Valve when fully depressed (Fig. 13b).

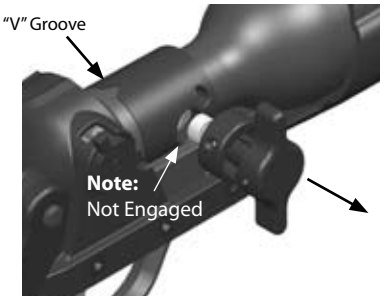


Figure 13a - Valve Key NOT Engaged

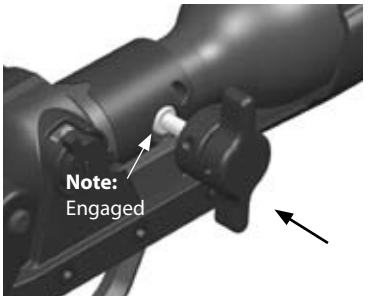


Figure 13b - Valve Key Engaged

Note:

When installed in the Launcher, a charged Projectile will have the Nozzle Valve in the vertical CLOSED position.

Opening the Nozzle Valve in the Launcher

To open the Nozzle Valve in the Launcher, follow these steps:

1. Press the Valve Key all the way in while in the vertical position, so that the Valve Key makes contact with the Nozzle Valve (Fig. 14 - Step 1). **Maintain constant pressure.**
2. While maintaining contact with the Nozzle Valve, rotate the Valve Key 90º in a clockwise direction (Fig. 14 - Step 2). After rotating full 90º, release the Valve Key allowing it to extend fully and disengage from the Nozzle Valve (Fig. 13a).

Note:

Some initial resistance may be experienced when trying to turn the Valve Key. However, once the Key begins to rotate it will turn easily. Be certain to rotate the Valve Key clockwise full 90º.

Closing the Nozzle Valve in the Launcher

To close the Nozzle valve in the Launcher, follow these steps:

1. Press the Valve Key all the way in while in the horizontal position, so that the Valve Key makes contact with the Nozzle Valve (Fig. 15 - Step 1). **Maintain constant pressure.**
2. While maintaining contact with the Nozzle Valve, rotate the Valve Key 90º in a counter-clockwise direction (Fig. 15 - Step 2). After rotating full 90º, release the Valve Key allowing it to extend fully and disengage from the Nozzle Valve (Fig. 13a).

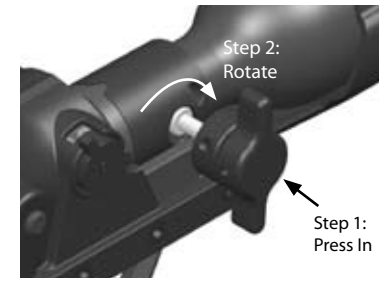


Figure 14 - Opening Nozzle Valve

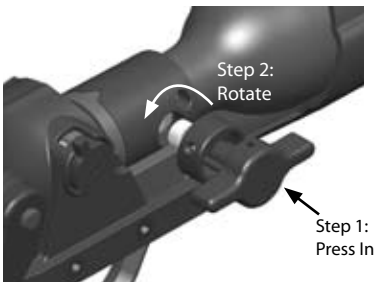


Figure 15 - Closing Nozzle Valve

Operating the Launcher Bleed Screw

Each Launcher is equipped with the Bleed Screw – located near the ALM label on the Launcher (Fig. 16a). The Bleed Screw Handle swivels over the Bleed Screw Bolt to permit the Bleed Screw to be turned without interfering with the Folding Stock.

The first purpose of the Bleed Screw is:

- to permit the operator, if necessary, to reduce the operating pressure of the Projectile prior to discharge, following these steps:

    1. Open the Nozzle Valve to pressurize the Launcher (Fig. 14, pg. 15).
    2. Rotate the Bleed Screw Handle in a counter-clockwise direction until you hear air escaping.
    3. Monitor the Pressure Gauge until the desired operating pressure is achieved.
    4. Rotate the Bleed Screw Handle in a clockwise direction to stop the escape of air.

The second purpose of the Bleed Screw is:

- to permit the operator to bleed off the pressure in the Mechanism in order to remove a charged Projectile, following these steps:

    1. Close the Nozzle Valve in the Launcher (Fig. 15, pg. 15).
    2. Rotate the Bleed Screw Handle in a counter-clockwise direction until you hear air escaping.
    3. Monitor the Pressure Gauge until the reading is at "0".
    4. Rotate the Bleed Screw Handle in a clockwise direction to tighten.
    5. The Projectile may now be removed by pressing the Safety Push Knob and pulling the Trigger.

Note:

There is a small nylon insert pressed into the threaded end of the Bleed Screw which seals the mechanism when the Bleed Screw is tightened. If the Bleed Screw is removed entirely, for maintenance or any other reason, ensure that the nylon insert remains fixed to the Bleed Screw prior to returning the ResQmax unit to service (Fig. 16b).



Figure 16a - Open/Close Bleed Screw



Figure 16b - Nylon Tipped Bleed Screw

Using the Line Projectile

A black Projectile Protector (Fig. 17a) is recommended when deploying a Line with the ALM. Each Line Projectile is supplied with a Projectile Protector slipped over the Projectile Cylinder.

NOTE: The Projectile Protector can not be used with the Grappling Hook.

The Protector may be removed to inspect the Projectile Cylinder for damage and can be reinstalled. If the Protector shows any sign of damage, it should be removed immediately and the Projectile Cylinder should be inspected.



Figure 17a - Projectile Protector

The covers for the Training Projectiles are made of high-density urethane (Fig. 17b) and absorb the shock of impact when landing on a hard surface. These covers are factory installed. To remove the Training Projectile cover it may be necessary to cut it completely off the Cylinder.



Figure 17b - Damaged Training Projectile Cover

A Projectile Cylinder with minor scratches to the paint (Fig. 17c - Note 1) may be returned to service.

However, if the Projectile Cylinder surface shows any signs of deformation (indentation or deflection) (Fig. 17c - Note 2), the Projectile Cylinder must be removed permanently from service.

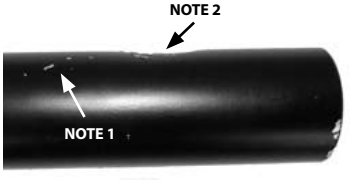


Figure 17c - Damaged Projectile

Note:

Any damage to the Projectile Protector may indicate damage to the Projectile Cylinder. If the Protector is damaged the Projectile Cylinder must be visually inspected for damage. Damaged Protectors should be replaced to protect the Projectile Cylinder.

Note:

If the Projectile Cylinder sustains any visible damage from contact with a hard surface, it must be removed from service.

Protecting the Cylinder/Projectile

All practice deployments not using the Training Projectile SHOULD BE INTO WATER.
If deployed into water, the Projectile can be used over again hundreds of times.
Use caution when pulling the Projectile back to avoid damaging it. Always wash in fresh water.
Remove all water from inside Projectile Cylinder and allow to dry before storage or refilling.
Remove the Nozzle Assembly from the Projectile after each deployment and shake out any water present. Rinse the Projectile with fresh water inside and out, and allow to dry prior charging the Projectile for storage.

Filling the Projectile

To properly fill the Projectile you need a source of compressed air that is capable at least of reaching the service pressure of the Projectile. The Standard Line Projectile #300-S has a service pressure of 3,000 psi / 207 Bar; the HP Projectile #310-S has a service pressure of 4,500 psi / 310 Bar. The Streamline Filler Hose Assembly is required to recharge the Projectiles with compressed air. It consists of a Filler Block**,** that includes a Pressure Gauge and Bleed Screw, and the Filler Hose connecting the compressed air source.

Begin by attaching the end of the Streamline Filler Hose Assembly, equipped with the proper adapter (Fig. 3, pg. 8), to your compressed air source.

Next, check in which position is the Valve Key on the Projectile to be filled:
If the Valve Key is in line with the flow of air, then the Valve is **OPEN** (Fig. 18a).

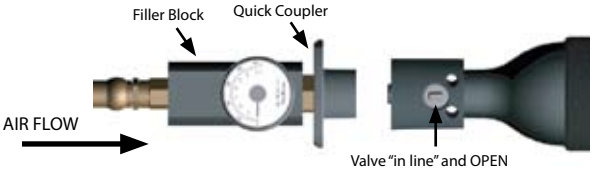


Figure 18a - Nozzle Valve OPEN

If the Valve Key is perpendicular to the flow of air, then the Valve is **CLOSED** (Fig. 18b).

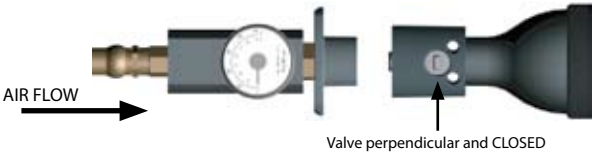


Figure 18b - Nozzle Valve CLOSED

To charge the Projectile, follow these steps:

1. Connect the appropriate Filler Hose Adapter to the associated Air Supply.

2. Connect the Filler Hose to the Filler Hose Adapter by retracting the spring-loaded Quick Coupler on the end of the Streamline Filler Hose opposite from the Filler Block end (Fig. 3, pg. 8).

3. Retract the spring-loaded Quick Coupler on the Streamline Filler Hose Assembly closest to the Filler Block (Fig. 18c) and insert the neck of the Quick Coupler inside the Nozzle Protector to connect the Filler Hose to the Nozzle (Fig. 18d).

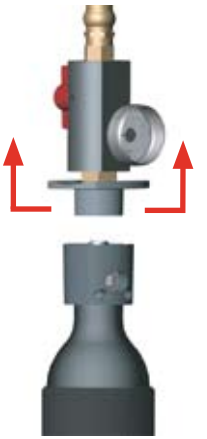


Figure 18c - Retract Collar

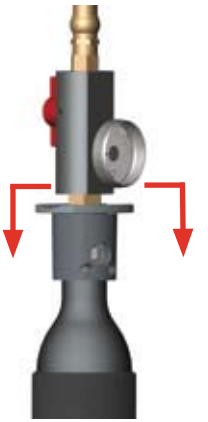


Figure 18d - Attach Filler Hose

Note:

Use **Compressed Air Only.** The use of any flammable or combustible compressed gases, especially at high pressures, may result in a spontaneous explosion causing severe injuries or death.

Note:

The operating/ service pressure of the Projectile should only be exceeded in response to a life-threatening emergency and under no circumstances should it be exceeded by more than 20%. Ignoring this advice may cause an accident that could result in bodily injury or death.

4. Ensure that the red Bleed Screw on the Filler Block is closed by turning it in a clockwise direction (Fig. 18h).

5. Ensure that the Nozzle Valve is in the **OPEN** position - with the Nozzle Valve "in line" with the flow of air (Fig. 18e).

6. Open the air-supply and **SLOWLY** fill the Projectile to the desired pressure. (If you hear air escaping, the Bottle O-ring or an O-ring in the Nozzle is damaged and needs to be replaced (Fig. 26, pg. 28).)

7. When the desired pressure has been reached, **FIRST close the valve on the Air Supply and then close the Nozzle Valve on the Projectile**. Disregard of this sequence will result in damage to the Nozzle Valve O-rings!

8. Remove the Filler Hose Wrench from the Streamline Filler Hose Assembly and close the Nozzle Valve by rotating the Nozzle Valve 90° (Fig. 18f).

9. Ensure that the Nozzle Valve is in **CLOSED** position, perpendicular to the flow of air (Fig. 18g). Always replace the Filler Hose Wrench back in the retainer on the Filler Hose.

10. Next, locate the drain port adjacent to the red Bleed Screw on the Filler Block (Fig. 18h).

11. Point the drain hole down and away from the operator and open the Bleed Screw, draining pressure from the Filler Hose Assembly.

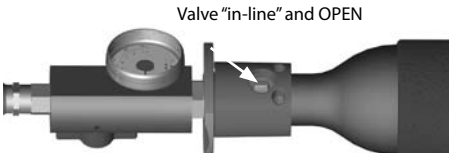


Figure 18e - Nozzle Valve OPEN

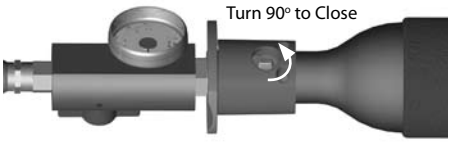


Figure18f - Rotate the Nozzle Valve

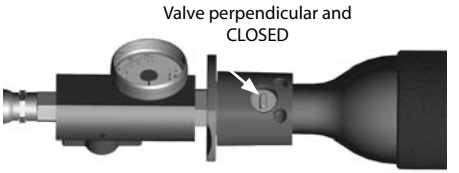


Figure 18g - Nozzle Valve CLOSED

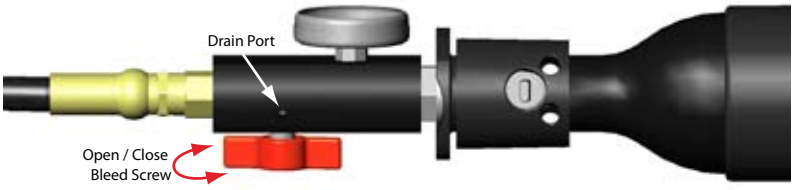


Figure 18h - Bleed Air from Filler Hose with Bleed Screw

Note:

Attempting to fill the Projectile with the Nozzle Valve CLOSED will result in damage to, or loss of, the Face O-ring on the Nozzle Plug. This O-ring then must be replaced prior to further proceeding (Fig. 26b, page 28).

Note:

As the air will heat during the charging process, the Manufacturer recommends that the Projectile to be charged to the service pressure + 15%. As the air cools over time, the Projectile's pressure will be reduced to approximate the service pressure.

12. Retract the spring-loaded Quick Coupler on the Streamline Filler Hose Assembly (Fig. 18j) and detach the Filler Hose Assembly from the Nozzle (Fig. 18k).

13. Store the charged Projectile in safe location.



Figure 18j - Retract Quick Coupler Collar

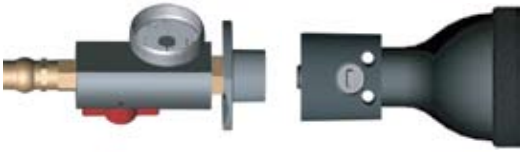


Figure 18k - Disconnect Hose from Nozzle

Storing the Projectiles

The Projectiles that are charged and ready for use should be stored in a constant-temperature environment and protected from the elements. The charged Projectiles should be so marked.

The pressure level of the stored Projectiles should be checked periodically to verify that the desired service/operating pressure is being maintained.

CAUTION: If the Projectiles are subjected to extreme heat, the pressure could rise sufficiently to rupture the Pressure Relief Assembly allowing the air to escape and temporarily preventing use of the equipment. Refer to page 32 for instructions on removing and replacing the Pressure Relief Assembly.

Checking Projectile Pressure

All stored Projectiles should be checked on a regular basis to ensure that the service pressure is maintained. To check the Projectile pressure, follow these steps:

1. Load the Projectile into the Launcher (refer to page 14).
2. Using the Valve Key on the Launcher, engage the Nozzle Valve on the Projectile and turn clockwise 90º to the OPEN position (refer to page 15).
3. Confirm the Projectile pressure using the reading on the Pressure Gauge. (If there is too much pressure, refer to page 16 for directions on how to relieve pressure.)
4. Using the Valve Key on the Launcher, engage the Nozzle Valve on the Projectile and turn counter-clockwise 90º to the CLOSED position (refer to page 15).
5. Rotate the Launcher Bleed Screw to release the air from the Mechanism. The Pressure Gauge must read "0" (refer to page 16).
6. Disengage the Safety Assembly by pressing the Safety Push Knob (refer to page 13).
7. Pull the Trigger to release the Projectile into your hand or the ground. Return the Projectile to storage or charge as necessary.

Note:

Repeated pressure checks of a Projectile will result in a gradual drop of pressure. It will be necessary to top it up using the procedure as described on Page 18. This is also a good opportunity to have a practice launch.

Removing a Charged Projectile from the Launcher

If you wish to remove a charged Projectile from Launcher without firing, follow these steps:

With NO pressure indicated on the Launcher Pressure Gauge:

1. Disengage the Safety Assembly by pressing the Safety Push Knob.
2. Pull the Trigger to release the Projectile into your hand or the ground.

With pressure indicated on the Launcher Pressure Gauge:

If you have the Launcher ready to fire and have pushed in the Safety Push Knob but change your mind about firing for some reason OR if you are handed a Launcher with pressure indicated on the Pressure Gauge, follow these steps:

1. Use your thumb to reengage the Safety by rotating the arm of the Safety Push Knob a few degrees in a clockwise direction, making the Safety Push Knob spring out (refer to page 13)
2. Using the Valve Key on the Launcher, engage the Nozzle Valve on the Projectile and turn counter-clockwise 90º to the CLOSED position (refer to page 15).
3. Rotate the Launcher Bleed Screw to release the air from the Mechanism. The Pressure Gauge must read "0" (refer to page 16).
4. Disengage the Safety Assembly by pressing the Safety Push Knob (refer to page 13).
5. Pull the Trigger to release the Projectile into your hand or the ground.

Note:

If the Pressure Gauge on the Launcher does not show "0" pressure, turn the Bleed Screw in a counter-clockwise direction and allow the pressure from the Mechanism to escape before attempting to remove the Projectile.

Packing the Climbing Line

All lines used with the ALM may be repacked in the field by hand as necessary, without a use of any special equipment. Each Line has a dedicated "dead end" and "live end" (Fig. 23, pg. 25).

The "dead end" of the line is formed by a loop with a snap shackle attached. This "dead end" is intended to be attached to the Launcher before and during deployment. The line may be secured to any fixed point prior to or after firing - to secure one end of the line while the Launcher is being prepared for the next shot. This "dead end" does not travel.

The "live end" of the line is formed by a loop with a Cut-Away Pin permanently attached and a length of a Line to act as a tether. This end is intended to be attached to the Bridle Lines of the Line Projectile and does travel with the Projectile towards the target. The Cut-Away Pin holds the door closed until the point of launching - and then automatically releases the door of the Line Container to allow the line to follow the Projectile without resistance.

Note:

The main Line and Bridle Lines should be inspected after each use for fraying or damage before storing for later use. Inspect the Line before packing and then pack as instructed in this packing section. Any damaged or frayed Line or Bridle Lines must be permanently removed from service.

To Pack the Climbing Line into the Line Container, follow these steps:

1. Disconnect the Line Container from the Launcher (refer to page 12) and hold it vertically with the Line Container Door open toward you.

2. Allow 12 inches / 30 cm of the "dead end" of the rope (fitted with the snap shackle) to hang freely outside of the right side of the Line Container (Fig. 19a) and begin dropping the line inside the Line Container.

3. Pull the Line from over your shoulder so that you can push it down into the Line Container hand over hand, using short strokes (Fig. 19b).

4. Allow the Line to 'fall' into the Line Container in a random, crisscross pattern to avoid any snarls when it is deployed. Periodically push the Line down into the Line Container more tightly to make more room.

5. When all of the line is packed inside the Line Container, close the Line Container Door – leave the "live end" of the rope and/or the tether through the notch on the left hand side of the door catch and the "dead end" of the rope through the notch on the right hand side (Fig. 23, pg. 25).

6. Use Cut-Away Pin to fasten the Line Container Door closed (Fig. 23, pg. 25).



Figure 19a - 'Dead end' on Right Side



Figure 19b - Pack Line into Container

Note:

DO NOT coil or loop the line, EVER! If you coil the line, you may build in tension that will cause snarls the next time you use it, resulting in poor performance during deployment.

Packing the RGES SF40

The RGES SF40 comes from the factory packed and ready for first use. The RGES SF40 fits into a large Line Container equipped with drainage holes. The "live end" of the RGES SF40 is identified by a tether equipped with a Cut-Away Pin. This end is intended to be attached to the Bridle Lines of the Projectile. The "dead end" of the RGES SF40 has an RGES Auto-Inflating Buoy attached to it. To prepare the RGES Auto-Inflating Buoy after each deployment into water, you will need to replace the CO_2 Cartridge and Soluble Bobbin. The RGES Auto-Inflating Buoy and the RGES SF40 should be rinsed and allowed to dry completely at completion of exercises and prior to repacking.

To prepare your Auto-Inflating Buoy, follow these steps:

1. Deflate the Buoy COMPLETELY by depressing the Air Valve located under the black cap of the oral fill tube (Fig. 20a) and letting the air out. Be sure to reattach the black cap propely on top of the oral fill tube to prevent migration of water into the Buoy and accidental drowning of the RGES SF40.

2. After each deployment rinse all components thoroughly in fresh water.

3. Allow all components to dry completely.

4. Unscrew the Bobbin Cap from the Auto-Inflator and remove the used yellow plastic Soluble Bobbin (Fig. 20b).

5. Align the grooves of new Soluble Bobbin with guides in the Auto-Inflator and slide the Bobbin into the Auto-Inflator with the white side of the Bobbin oriented towards the Bobbin Cap.
   Do this FIRST, before you replace the CO_2 cartridge.

6. Screw the Bobbin Cap back into place tightly. A green color inside the Bobbin Cap will indicate correct installation. A red color inside the Bobbin Cap will indicate incorrect installation (Fig. 20b).

7. Remove the used CO_2 Cartridge, turning it counter-clockwise.

8. Install new CO_2 Cartridge firmly into place, turning it clockwise.

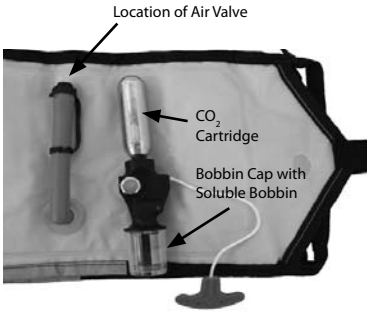


Figure 20a - Change CO_2 Cartridge and Soluble Bobbin after every use

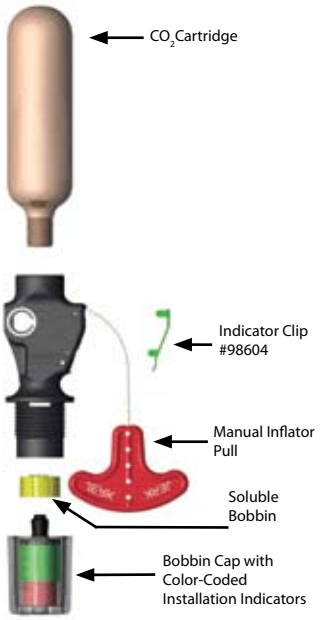


Figure 20b - Auto-Inflator #986

Note:

Once the air has been completely removed from the Buoy, reattach the black cap properly on top of oral fill tube.

Note:

Before replacing the Soluble Bobbin, make sure that the activator mechanism is thoroughly dry. A wet Bobbin could accidentally activate the Auto-Inflating Mechanism.

Once the CO_2 Cartridge and Bobbin are replaced, you are ready to pack the RGES SF40. To pack the RGES SF40 into the Line Container, follow these steps:

Note:

The RGES SF40 does not have a "dead end" to be fastened to the Launcher Eyelet.

1. Lay the RGES SF40 out on a flat surface, with the entire 12m / 40 ft length of the Net stretched out. Ensure that the RGES SF40 is not twisted and that the top line of the RGES SF40, with the tether and the Buoy, is on the right (Fig. 20a).

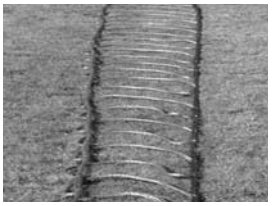


Figure 21a - Lay RGES SF40 out

2. Stand at the "dead end" of the RGES SF40, identified by the RGES Buoy, so that the whole length is straight ahead of you.

3. Hold the Line Container upright with the Container Door open and the hinged side of the Container on your right.



Figure 21b - Pack RGES Buoy

4. Pack the RGES Buoy by folding it in half (Fig. 21b) and rolling it tightly (Fig. 21c). Place the rolled-up Buoy into the cavity on the bottom of the Line Container.

5. Pull the Net towards you and start packing it into the Line Container. Allow the RGES SF40 to fold over itself, but keep the top line on your right (Fig. 21d). If the RGES SF40 gets twisted inside the Line Container, it may not "lay" correctly when it is deployed into the water.



Figure 21c - Roll Buoy Tightly

6. Pack the RGES SF40 firmly into the Line Container. Tap the bottom of the Line Container on the ground occasionally in order to consolidate the RGES SF40 fully inside the Line Container.

7. When the RGES SF40 is packed inside the Line Container, coil the tether on top (Fig. 21e).



Figure 21d - Keep Top Line on Right

8. When the RGES SF40 and the tether are packed inside the Line Container, close the Container Door – leave the "live end" of the tether with the Cut-Away Pin out through one of the notches in the Line Container Door.

9. Use Cut-Away Pin to fasten the Line Container Door closed (Fig. 23, pg. 25).



Figure 21e - Coil tether on top of RGES SF40

Packing the Tactical Ladder

1. To pack the Tactical Ladder, begin with the bottom rung of the Tactical Ladder and progressively pack rungs into the Line Container, ensuring the side rails do not twist (Fig. 22a).

2. When all rungs have been packed, close the Line Container Door - allowing fixed point of Ladder and tether to remain outside the Line Container Door for attachment to the Grappling Hook (Fig. 22b).

3. Use Cut-Away Pin to fasten the Line Container Door closed (Fig. 23).



Figure 22a - Start Packing with bottom rung first



Figure 22b - Leave the Tether out of the Line Container

Note:

The Tactical Ladder does not have a "dead end" to be fastened to the Launcher Eyelet.

Connecting the Lines

Each payload has a "live end" which travels with the Projectile. The "live end" has Cut-Away Pin secured on the end of the Payload or at the base of the leader or tether. The Cut-Away Pin holds the Line Container Door closed until deployment, automatically releasing the door of the Line Container to allow the line to follow the Projectile without resistance.
Climbing Lines and Ladders have a 5-6 foot leader or tether which will connect to the Grappling Hook. The end of the Payload which does not travel is called the "dead end". The "dead end" of the Climbing Line fastens to the Eyelet behind the inverted "T" bracket of the Launcher.
The "dead end" of the Tactical Ladder is packed inside the Line Container and therefore does not fasten to the Launcher Eyelet (Fig. 22).



Figure 22 - Tactical Ladder and RGES SF40 do not have a "dead end"

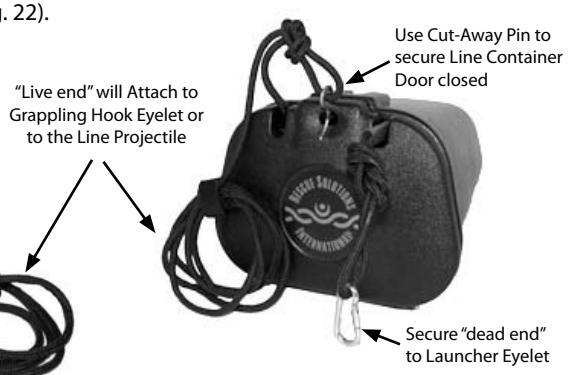


Figure 23 - Climbing Line "live and dead ends"

Note:

The security of the engagement point of the Grappling Hook is beyond the manufacturer's control. It is the responsibility of the purchaser and/or operator of the ALM to ensure that the Grappling Hook is properly fixed and safe for a human being to ascend. The first climber of any ascent team is responsible for lashing the Climbing Line to a fixed point. The Hook is intended to be ascended by a single climber per use.

Preparing the Climbing Grappling Hook for Deployment

The Climbing Grappling Hook is a light-weight titanium hook intended to be used for establishing a line, such as across a river or stream, for recovering a mooring line from the water, or for deploying and establishing a Climbing Line or Tactical Ladder. Tactical Ladders are equipped with a permanently fixed attachment tether. The Tactical Ladder tether and the Climbing Line Leader are intended to be connected directly to the Eyelet on the shaft of the Climbing Grappling Hook – ensuring a direct connection from the fixed point of the Hook to the Climber. **NOTE: The Climbing Grappling Hook can not be used with a Projectile Protector.**

To prepare the Climbing Grappling Hook for deployment, follow these steps:

1. Attach the "live end" of the Line to the Eyelet on the shaft of the Grappling Hook, using a Figure Eight or similar secure knot (Fig. 24a).



Figure 24a - Attach Line to Hook

2. Install the Grappling Hook over the end of the Projectile. Align the "V" groove of the Nozzle Protector at 90º to the Eyelet of the Grappling Hook to keep the Line oriented correctly (Fig. 24b).



Figure 24b - Attach Projectile to Hook

Note:

Align the "V" groove on the Nozzle Protector 90º to the Eyelet of the Grappling Hook. This will ensure that the lines will slide into the grooves on the side of the Launcher Barrel when the Projectile is engaged.

3. Run the Line along the side of the charged Projectile.

4. Fasten the Line to the neck of the Projectile with the Velcro strap provided (Fig. 24c).



Figure 24c - Attach Line to Projectile

5. Return the Line towards the Grappling Hook along the opposite side of the Projectile (Fig. 24d).

6. Together with the Line keep the Bridle Lines along the side of the Projectile in order to align with the grooves on each side of the Launcher Barrel (Fig. 24e).

7. Keeping the Lines along the side of the Projectile, insert the Projectile into the Launcher (refer to page 14). Ensure the Bridle Lines are centered to achieve a straight shot by pulling the Quick-Link.

8. Re-engage the Cut-Away Pin to fasten the Line Container Door closed.

9. Using the Quick-Link on the Bridle Lines, attach the Bridle Lines to the loop containing the Cut-Away Pin on the Line (Fig. 24f).

10. Connect the "dead end" to the Eyelet behind the inverted "T" bracket of the Launcher (Fig. 24f) .

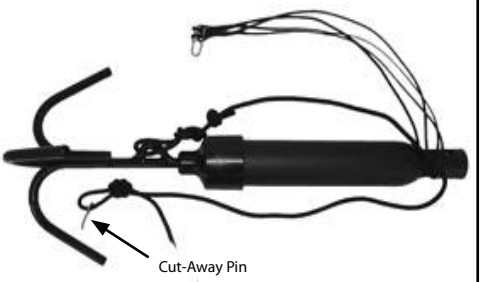


Figure 24d - Configure Lines along Sides of Projectile



Figure 24e - Align Line and Bridle Lines along each side of Projectile

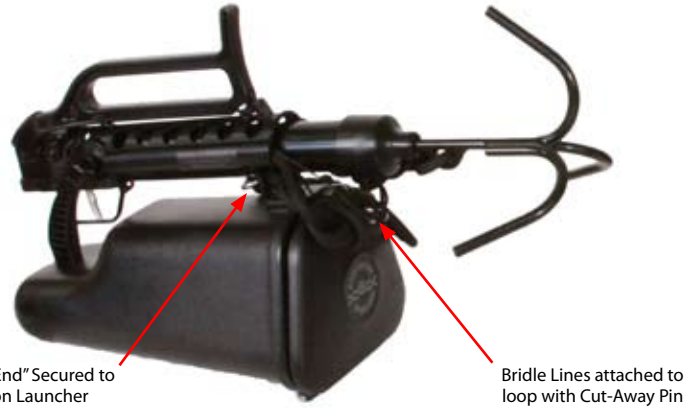


Figure 24f - Line and Climbing Grappling Hook Ready for Deployment

Note:

The length of the Line between the Eyelet and the Cut-Away Pin MUST be greater than the distance between the Eyelet and the Bridle Lines Quick-Link. The load of the Line MUST be borne by the Bridle Lines to insure accuracy during the deployment.

Deploying the ALM

Note:

Adequate training in all aspects of the use of this equipment is essential in order to familiarize yourself with its safe operation and capabilities - and to deploy it with accuracy.

1. Conduct a visual inspection to ensure that the Bridle Lines are properly connected to the "live end" of the Line and that the "dead end" of the Line is connected to the Eyelet on the Launcher if applicable (Fig. 23f, pg. 25).

2. Fully depress the Valve Key in the vertical position, and rotate the Valve Key 90º clockwise to the horizontal position. Release the Valve Key (Fig. 14, pg. 15).

3. Check the Pressure Gauge to verify pressure. (No pressure reading on the Pressure Gauge may indicate that you did not successfully open the Nozzle Valve or that your Projectile was not charged with air when loaded in the Launcher.)

4. Press the Safety Push Knob to put the Safety in **OFF** position (Fig. 11b, pg. 13).

5a. For **horizontal line deployment** hold the butt of the stock against your shoulder as you would a firearm, at a 35 degree angle aiming OVER the intended target (Fig. 25a).

CAUTION: The Climbing Lines and Tactical Ladders are intended for vertical deployment and are too short to deploy horizontally at full service pressure. A Climbing Line deployed horizontally at full service pressure will reach full extension in approximately one second and apply a concentrated force on the "dead end" of the payload - which may result in the loss of the Launcher equipment and injury to the operator. Use the Launcher Bleed Screw to reduce pressure to suit length of payload being used (refer to page 16).

5b. For maximum **vertical deployment** of a Climbing Line or Tactical Ladder and Grappling Hook hold the Stock of the Launcher against your shoulder and aim approximately 10 degrees clear of the intended target and at 80 degrees to a horizontal plane (Fig. 25b).

CAUTION: Once deployed, the Climbing Line and Grappling Hook assembly will descend toward the operator very quickly if the Grappling Hook does not engage at the target. Extreme care must be taken by the operator to avoid being hit by the Climbing Line or Tactical Ladder and Grappling Hook during its descent.

6. Using two fingers, squeeze the Trigger. Hold the ALM steady as the Projectile leaves the Launcher and the Climbing Line or Tactical Ladder is deployed.



Figure 25a - Angle for Horizontal Deployment



Figure 25b - Angle for Vertical Deployment

Non-Compliant Vessel Stopping

The RGES SF40 is designed to entangle propellers on engine(s) up to 300 Horsepower. The RGES SF40 should be launched just in front of the planing bow of the target vessel. When using the Standard Projectile, the stand-off distance between the pursuit vessel and the target vessel should be 10m / 33 ft. When using the HP Projectile, the stand-off distance should be 20m / 66 ft. The non-compliant boat's engine(s) will stop within a few seconds of hitting the RGES SF40. Generally, the target vessel will come to rest in about 2.5 boat lengths, as momentum will carry the boat forward depending on the weight and initial speed of the boat.

1. Follow instructions numbers 1 through 4 for "Deploying the ALM" on page 28.
2. The ideal position for deployment is parallel to, and slightly forward of, the target (Fig. 26) with a stand-off distance depending on the type of Projectile used.
3. Aim the ALM across the path of the target boat, with a loft of approximately 20 degrees. The objective is to allow enough arc for the RGES SF40 to fully deploy and to place the payload directly under the planing bow, so that the target vessel can not avoid it (Fig. 26).
4. When successfully deployed, the engine(s) of the target vessel will stop within a few seconds.
5. To retrieve the RGES SF40, untangle it from the propeller. Payload service life will vary depending on the size and speed of target vessel.
6. Rinse the RGES SF40, allow it to dry, and follow the packing instructions on pages 23 and 24.

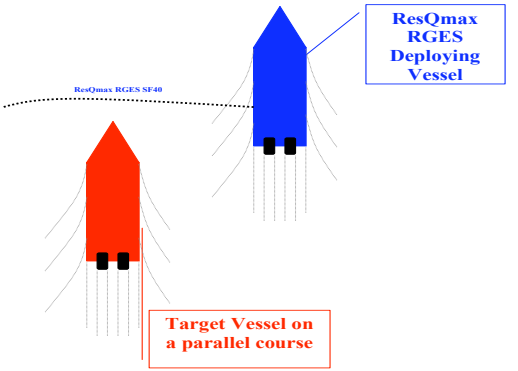


Figure 26 - Tactical Positioning for RGES SF40 Deployment

Note:

Inexpensive replacement Projectile Cylinders are readily available from the Manufacturer. **DO NOT USE a visibly damaged Projectile Cylinder!**

Care of the Projectile

The Projectile can be used over and over again if cared for properly. Any visible damage to the Projectile is cause for immediate replacement. **DO NOT ATTEMPT TO REFILL A DAMAGED CYLINDER**. This may cause an accident resulting in serious bodily injury or death (refer to page 17, section "Protecting the Cylinder/Projectile").

After use and before filling again to be stored, the Projectile Cylinder and the Nozzle Assembly should be separated and maintained. The Projectiles should not be filled until the steps below are taken. Regardless of whether the equipment was used in fresh or salt water, there will be residue in the cylinder that may give rise to corrosion if not thoroughly rinsed.

1. Unscrew the Nozzle Assembly from the Projectile Cylinder by turning it in a counter-clockwise direction (Fig. 27a).

2. Thoroughly flush both parts with fresh water, shake out excess water, and let air dry.

3. Inspect the Projectile Cylinder and the Nozzle for any damage or corrosion.

4. Once dried, lubricate the threads on the Nozzle Assembly with Corrosion Block and screw the Nozzle Assembly back into the Projectile Cylinder in a clockwise direction until hand tight (Fig. 27a). DO NOT OVERTIGHTEN.



Figure 27a - Cylinder and Nozzle Assembly



Figure 27b - Lubrication of Mechanism with Corrosion Block

DO NOT use any sealant or tape on the threads of the Nozzle. Corrosion Block can be used on any part of the Projectile. Each Projectile Cylinder is intended to have a maximum service life of five years from the date of manufacture and must be removed from service at that time or sooner if there is any visible evidence of damage. Each Projectile Cylinder is date stamped. It is the responsibility of the purchaser to ensure that the Projectile Cylinder is not used after the service life has expired.

Care of the Launcher

The Launcher has a stainless steel Mechanism. The Launcher should be rinsed after all maritime operations in order to keep corrosion to a minimum. Corrosion Block should be used as a lubricant on the Outer Ring of the Launcher Mechanism by reaching in through the vent holes on the Launcher (Fig. 27b). If a Projectile Cylinder containing residual water is pressurized and launched, the Mechanism O-ring can become dislodged. If there is an audible air leakage when the Projectile is loaded into the Launcher and the Valve Key is used to open the Projectile Valve to pressurize the system, check if the Launcher Bleed Screw is properly tightened (refer to page 16). If the Launcher Bleed Screw is closed and the leakage persists, the Mechanism O-ring should be checked and replaced if necessary; please contact the Manufacturer for instructions or service.

Replacing the O-rings in the Nozzle Valve

If the Projectile is unable to hold air, the O-rings on the Nozzle Plug in the Nozzle Valve may have become worn or damaged and it will be necessary to replace them. Only use the O-rings supplied by Rescue Solutions International, Inc. These O-rings are of a special composition and hardness and are specially selected for this purpose.

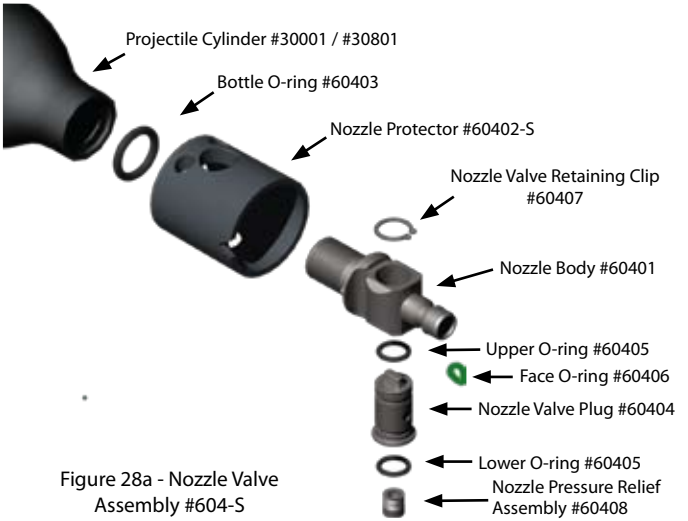


Figure 28a - Nozzle Valve Assembly #604-S



Figure 28b - Nozzle Valve Plug

Removing the Nozzle Valve Plug:

1. Remove the Nozzle Assembly from the Projectile by unscrewing it in a counter-clockwise direction.
2. Remove the Bottle O-ring from the Nozzle threads and slide the Nozzle Protector off of the Nozzle Body.
3. Remove the Nozzle Plug Retaining Clip from the Nozzle Valve Plug using Retaining Clip Pliers.
4. Push the Nozzle Valve Plug out of the Nozzle Body.

Servicing the Nozzle Valve Plug:

1. Remove and discard the Upper, Lower, and Face O-rings (Fig. 28b).
2. Remove and inspect the Pressure Relief Assembly - if it has not burst, it can be reinstalled.
3. Thoroughly clean the Nozzle Valve Plug as well as the bore of the Nozzle Body.
4. Install the Face O-ring on the Nozzle Plug pressing it into place inside the groove around the opening.
5. Install the Nozzle Plug Upper & Lower O-rings into place on the Plug.
6. Lubricate the new O-rings with petroleum jelly.
7. Lubricate the bore of the Nozzle and the Nozzle Plug with a light film of petroleum jelly.

Note:

The Nozzle Plug Face O-ring is easily identified by its blue/green color. No substitute O-ring will provide adequate service or performance.

Note:

The beveled surface of the neck of the Nozzle Body is subject to wear at the moment of launching. In normal conditions this part is suitable for 150 or more discharges. Carefully inspect this surface for excessive wear after each use. If there is any question regarding suitability of this part for continued use it must be removed from service and inspected by a qualified technician.



Reinstalling the Nozzle Valve Plug:

1. Orientate the Nozzle Valve Plug so that it is in an open position – with the Face O-ring on the Nozzle Valve Plug turned at 90° to the normal flow of air through the Nozzle (Fig. 29a).

2. Gently insert the lubricated Nozzle Valve Plug into the opening, taking care not to cut the O-rings against the edges of the opening in the Nozzle Body by rotating the Nozzle Valve Plug slightly from side to side as you insert. This will also assist in seating the O-rings properly.

3. Push the Nozzle Valve Plug until the "stop" side of the Nozzle Valve Plug prohibits the Plug from traveling any further through the opening in the Nozzle Body (Fig. 29a).

4. Once fully inserted, reinstall the Nozzle Valve Retaining Clip. (Replace the Retaining Clip if it shows any sign of damage.)

4. Reinstall the Pressure relief Assembly (Fig. 28a, pg. 31).

6. Slide the Nozzle Protector over the Nozzle Body – taking care to ensure that the aligning notch on the Nozzle Body is engaged with the matching shape on the Nozzle Protector (Fig. 29b).

7. Place the Bottle O-Ring around the threaded end of the Nozzle and screw the assembly back into the Projectile Cylinder.



Figure 29a - Reinstalling Nozzle Valve Plug



Figure 29b - Reinstalling Nozzle Protector

Replacing the Nozzle Pressure Relief Assembly

If the Projectile is left exposed to extreme temperatures while charged, the Pressure Relief Assembly may rupture and will need to be replaced.

1. Remove the Pressure Relief Assembly (Fig. 28a, pg. 31) by turning it counter-clockwise using T30 Torx wrench (Fig. 30 - supplied in the ALM Tool Kit).

2. Clean the opening and lightly lubricate with Corrosion Block.

3. Install a new Pressure Relief Assembly (Fig. 28a, pg. 31).



Figure 30 - Torx Wrench and Pressure Relief Assembly

This Line-throwing & Rescue Appliance may need to be depended on in variety of emergency situations. It is possible that in many of those situations a human life may depend on reliable operation and performance of this equipment.

In order to ensure that the equipment is at all times operationally ready, the Manufacturer recommends that the Purchaser takes the following actions:

- **Provide adequate and frequent training in the operation of this equipment in actual field conditions.**
- **Implement and maintain a program for the regular review of the equipment to ensure that it is intact and complete, the Projectiles are pressurized, and the equipment is ready in all regards for use to respond to an emergency situation.**

Wear on the components in this system is controlled by:

- **the number of uses.**
- **the storage conditions and care the unit receives by the end user.**

With good care and proper storage conditions the serviceability of the unit is predictable. However, if subjected to rough use, or if not kept clean and free from contaminants by the end user, the **need for service can be dramatically accelerated.**

Due to the high pressure of the compressed air used in this system the components of principal concern are the Projectiles, the Nozzle Valve Assembly, and the Launcher.

In order to observe recommended service intervals, it is imperative that the end user maintain a log tracking the number of uses of:

- **each Launcher firing,** and
- **each discharge of a Cylinder & Nozzle Assembly.**

The Manufacturer recommends that this equipment be serviced, by technicians trained and certified by the Manufacturer in the maintenance and repair of this equipment, at the earliest of the following events to occur:

For the Launcher:

- **the first indication that there is any problem with operation of the equipment,** or
- **when 300 shots have been logged,** or
- **three years from the date of purchase.**

For the Projectile:

- **the first indication of any physical external damage to the Cylinder,** or
- **at the 5th year anniversary of the date of Cylinder manufacture, as stamped on the neck of the Cylinder.**

For the Nozzle Valve Assy:

- **the first indication that there is any problem with the operation of the equipment that cannot be corrected by the replacements of the O-rings (see page 28),** or
- **when excessive wear becomes evident on the beveled surface of the Nozzle Body, (refer to page 28, margin),** or
- **when 150 shots have been logged on the Nozzle Valve Assembly.**

The internal Mechanism in this appliance is complex and any maintenance or repair other than that described in this manual should be performed by a technician trained by the Manufacturer in the repair of this equipment. Please contact your Rescue Solutions International, Inc. distribut tion or the Manufacturer by calling 778-532-7600 **or by e-mail at** info@resqmax.ca **.**

Note:

As with all equipment, lack of use can often cause more damage to the Launcher than regular or even excessive use. At a minimum, every Launcher should be inspected by a technician trained in the maintenance of this equipment at 36-month intervals.

Frequently Asked Questions

Q Why will the Projectile not engage when I push it into the Launcher?

A There are two possible reasons:
1. The "V" groove on the Nozzle Protector is not being properly aligned with the mechanism. Hold the "V" groove upward, slide the Projectile into the Launcher, and rotate gently (refer to page 14).

2. The Trigger has been manually moved forward since the last time the Projectile was removed – effectively leaving the Safety ON even though the Launcher is empty. Press the Safety Push Knob to release the Safety Assembly, and reinsert the Projectile as described in answer 1. above.

Q How can I tell if the Projectile has any air in it?

A If you have a Projectile with the Nozzle Valve closed and are not sure if it is charged, you can check this by loading it into the Launcher and opening the Nozzle Valve. If the Pressure Gauge shows pressure, then it is charged and you may proceed to shoot or close the Nozzle Valve and remove the Projectile. It is a good idea to develop a system to ensure that full and empty Projectiles are kept separately or marked with a label (refer to page 20).

Q How do I re-engage the Safety if I do not want to shoot after pushing in the Safety Button?

A Reset the Safety Assembly by applying pressure to the arm of the Safety Push Knob and rotate in a clockwise direction for a few degrees. The Safety Push Knob will "pop out" and reset the Safety to ON position (refer to page 13).

Q How do I adjust the range if I only want to shoot a short distance?

A The range can be adjusted by allowing some air to escape from the Projectile before shooting. Open the Nozzle Valve and allow the Mechanism to be pressurized. Carefully open the Bleed Screw until you hear the air slowly escaping. Watch the Pressure Gauge until the pressure has dropped to the level you require, and then tighten up the Bleed Screw and fire (refer to page16).

Q How do I know whether or not the Projectile's Nozzle Valve is open on a loaded Launcher?

A The Valve Key will only depress fully when the stem of the Valve Key is aligned with the stem of the Nozzle Valve. Depress the Valve Key in the vertical and horizontal positions. Which ever position permits the Valve Key to fully depress will represent the position of the Nozzle Valve. If horizontal, the Nozzle Valve is Open. If vertical, the Nozzle Valve is Closed (refer to page 15).

Q Why is the pressure in the Projectile lower when I load it in the Launcher than it was when I filled it?

A When you are filling the Projectile with air it will get warm. This causes the pressure to rise and you will reach your target pressure with the air in the Projectile at a temperature higher than ambient. Once the air in the Projectile has cooled down the air will contract and lower the pressure.

This problem is addressed by 3 steps:

1. While filling the Projectile, keep it partially submerged in cool fresh water in order to keep the Projectile temperature constant.
2. Fill the Projectile Cylinder VERY SLOWLY.
3. "Overfill" the Projectile by 200 psi /15 Bar to allow for the inevitable cooling of the air after filling (refer to page 18).

Q I installed the Projectile and opened the Nozzle Valve, and I hear hissing sound from inside the Launcher Housing – how do I stop this loss of air pressure?

A In order of probability, you need to do the following:

- Tighten the Launcher Bleed Screw (refer to page 16).
- Check the Mechanism O-ring for damage (refer to page 30).
- Check the Nozzle Valve O-rings for damage (refer to page 31).

If none of these steps solves the problem, please contact your Rescue Solutions International, Inc. distributor for assistance.

Q I accidentally tried to fire the Launcher without disengaging the Safety. I then tried to disengage the Safety but it seems "jammed."

A When you prepare to fire the Launcher, the Mechanism is under pressure. If you apply strong finger pressure against the Trigger prior to releasing the Safety, the air pressure in the Mechanism will maintain your finger pressure against the Safety - even after you remove fingers from trigger - preventing the Safety from disengaging.

To "free" the Safety and permit it to operate as intended:

- Push the Trigger forward to relieve pressure.
- DISENGAGE THE SAFETY.
- The Launcher is ready to deploy.

Q When I deploy the Projectile and Payload they only go a short distance and the Payload does not deploy all the way.

A Common causes include:

- Inadequate pressure in the Projectile (refer to page 21).
- Improperly packed Payload (refer to pages 22-25).
- Improperly configured Bridle Lines (refer to page 25).

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Service & Maintenance Record

For your protection, please ensure that this record is kept with your ALM and updated. When sending your ALM in for service, this record must be included.

Date of Purchase: _____

ResQmax Serial #: _____

Projectile Serial #: _____ Expiration Date: _____

Projectile Serial #: _____ Expiration Date: _____

Projectile Serial #: _____ Expiration Date: _____

Projectile Serial #: _____ Expiration Date: _____

Projectile Serial #: _____ Expiration Date: _____

	Service Location	Date	Signature of Certified Technician
Year 1			
Year 2			
Year 3			
Year 4			
Year 5			
Year 6			
Year 7			

Service Intervals

The service interval has been established based on the best data available to the Manufacturer regarding the amount of use the equipment will receive while in service. However, units subjected to more frequent use - such as training programs, demonstration equipment, and equipment used as a tool in commercial applications on a frequent or daily basis, or units subjected to rough use or severe climatic or environmental conditions may require more frequent service. Refer to Page 30 for more information on service intervals.

It is the responsibility of the end-user of each unit to determine a service interval consistent with the amount of use and conditions under which this equipment is used, and to develop an appropriate maintenance protocol. Failure to establish an appropriate service interval will void the warranty, and may result in an event causing serious injury or death.

Limited Warranty

Rescue Solutions International Inc. warrants to the original owner that if used, maintained, and stored according to the Manufacturer's recommendations, the ALM is free from defects in material and workmanship for twelve (12) months from the date of the sale.

THIS WARRANTY IS LIMITED TO THE REPAIR AND REPLACEMENT OF PARTS AS NECESSARY, AND ANY NECESSARY LABOR AND SERVICES REQUIRED TO REPAIR OR REPLACE ANY PARTS TO RENDER THE DEVICE FREE OF DEFECTS. THE SOLE OBLIGATION OF RESCUE SOLUTIONS INTERNATIONAL, INC. SHALL BE THE REPAIR OR REPLACEMENT OF THE ResQmax AND UNDER NO CIRCUMSTANCES SHALL RESCUE SOLUTIONS INTERNATIONAL, INC., ITS AGENTS, SUCCESSORS, OR ASSIGNS, BE LIABLE FOR ANY DIRECT, CONSEQUENTIAL, OR OTHER DAMAGES ARISING OUT OF ANY CLAIMED DEFECT IN THE DEVICE OR THE METHOD OF ITS USE. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHETHER RELATING TO FITNESS, MERCHANTABILITY, OR OTHERWISE.

Except as to the express warranty set forth above, the Manufacturer disclaims any and all warranties and representations relating to the product. This limited warranty shall be governed by the laws of the Province of British Columbia.

If you have a problem with your ALM, call 778-532-7600 within 90 days of discovery of the problem. You will be given instructions on where to send your ALM for repair or replacement. If the problem is covered by this warranty, Rescue Solutions International, Inc. will repair or replace your ALM, or otherwise notify you, within 30 days of receipt of the ALM.

Any actions for breach of warranty or breach of contract must be commenced within one year from the date of discovery of the breach.

Disclaimer

Rescue Solutions International, Inc. (RSI) has developed the ALM and all accessories in response to strong demand expressed by military, police and special forces teams worldwide. This product was created to fill an existing need as indicated by personnel and organizations whose members and employees knowingly and consciously are routinely engaged in very high risk and often life-threatening activities in the ordinary course of the performance of their duties.

RSI manufactures this equipment for use by, and at the discretion of, professionals aware of the risks associated with the use of this type of equipment, and who are properly trained in its use. This manual is intended only to educate the user in various aspects of this specific equipment. This manual does not undertake to teach, train, encourage, or condone any activities that may be associated with the use of this equipment. No equipment, brochure, manual, or other materials produced by RSI, nor the offer for sale or the sale itself of this equipment, is intended to induce any individual or organization to put personnel at personal risk.

RSI has no control over the training in the use of this equipment, the maintenance and servicing of this equipment, or the conditions under which this equipment is used. RSI disclaims any and all responsibility for any liability arising out of the use of this equipment, however caused.

TECHNICAL SPECIFICATIONS

ALM Launcher Part # 540		
Specification	Measurement	
Length (Folding Stock Closed)	16.8 in	42.5 cm
Length (Folding Stock Open)	28.7 in	72.9 cm
Height (Folding Stock Closed)	13.2 in	21.6 cm
Height (Folding Stock Open)	8.5 in	33.5 cm
Barrel Width	3.9 in	9.9 cm
Weight	4.4 lbs	2.0 kg
Launcher Housing	Aluminum	
Color	Black	
Shape	Irregular	
Internal Mechanism	Stainless Steel	

Filler Hose Assembly Part # 911-S; 912-S; 913-S		
Specification	Measurement	
Overall Length	42.8 in	108.6 cm
Hose Diameter	0.5 in	1.3 cm
Total Weight	2.2 lbs	1.0 kg
Overall Service Rating	5,000 psi	345 bar
Hose Material	Nylon and Aramid Fiber	
Hose Finish	Black Urethane	
Filler Block Material	6061-T6 Aluminum	
Filler Block Finish	Black Anodized	
Bleed Screw	Stainless Steel and Nylon	
Adapters (DIN, SCBA, SCUBA)	Stainless Steel	

Projectiles

Part #	Part Description	Length		Diameter		Weight		Service Pressure		Cover Material	Cover Color
		in	cm	in	cm	lbs	kg	psi	bar		
300-S	Standard Projectile	13.40	34.03	2.38	6.03	1.8	0.8	3,000	207	Polyethylene	Black
305-S 306-S	Training Projectile	13.72	34.85	2.28	5.79	1.9	0.9	3,000	207	High-Density Urethane	Red or Luminescent
310-S	HP Projectile	17.0	43.1	2.375	6.03	1.8	0.8	4,500	310	n/a	n/a

Projectiles Cylinders material: 6160-T6 Al with black powder-coat finish. Nozzle Assembly material: Stainless Steel.
Nozzle Protectors material: Glass-Filled Urethane. Color: Black

Grappling Hook

Part #	Material	Length		Width		Minimum Break Load		Weight	
		in	cm	in	cm	lbs	kg	lbs	kg
750	6AL-4V Grade 5 Titanium	12.0	30.5	Irregular		2,200	1,000	1.5	0.7

Safe working load: 730 lbs / 330 kg. Grappling Hook Nose Cone material: Glass-Filled Urethane.

Tactical Ladder Options

Part #	Material	Length		Width		Minimum Break Load		Weight per Length	
		ft	m	in	cm	lbs	kg	lbs	kgs
744	Nylon with Fiberglass Rungs	50	15	6.0	15.2	4,800	2,180	5.8	2.6
746	Nylon with Fiberglass Rungs	65	20	6.0	15.2	4,800	2,180	7.4	3.4

Safe working load: 730 lbs / 330 kgs. Fiberglass Rungs are covered with non-slip Neoprene jacket.
Line Containers material: Polyethylene with Stainless Steel hinges. Shape: Irregular. Color: Black.
Compact Line Container Weight: 1.8 lbs / 0.8 kg. Large Line Container Weight: 2.9 lbs / 1.3 kg.

Rope Options

Part #	Material	Diam.	Color	Minimum Break Load		Weight per Length		Length	
		mm		lbs	kg	lbs	kg	ft	m
801	HMPE & Nylon	7	Black	5,780	2622	4.3	2.0	165	50
802	HMPE & Nylon	5.5	Black	3,200	1,194	5.2	2.6	330	100
803L	Spectra	4	White	1,500	680	3.5	1.6	1,000	304
815	Nylon	8.4	Black	3,442	1,565	7.7	3.5	230	70
817	Nylon	11	Black	6,744	3,059	8.3	3.8	165	50

Line Containers material: Polyethylene with Stainless Steel hinges. Shape: Irregular. Color: Black.
Compact Line Container Weight: 1.8 lbs / 0.8 kg. Large Line Container Weight: 2.9 lbs / 1.3 kg.

Bags and Cases

Part #	Part Description	Length		Width		Height		Weight	
		in	cm	in	cm	in	cm	lbs	kg
908	Kit Bag	28.0	70.0	14.0	35.0	16.0	41.0	2.3	1.0

Kit Bag material: 1,000-Denier Cordura, waterproof Vinyl, and Nylon. Color: Black with reflective markings.

908	Pelican Case - Small	31.59	80.2	20.47	52.0	12.45	31.6	29.3	13.3
909	Pelican Case - Large	31.59	80.2	22.99	58.4	19.48	49.5	37.7	17.1

Pelican Cases material: Copolymer with Black finish.

**Please Note: All values are displayed as maximum, external measurements.*

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ALM ASSAULT LAUNCHER MAX

RGES RUNNING GEAR ENTANGLEMENT SYSTEM

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