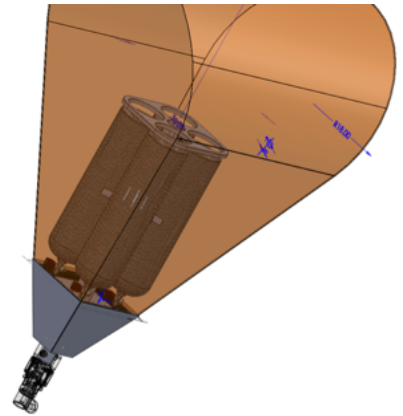
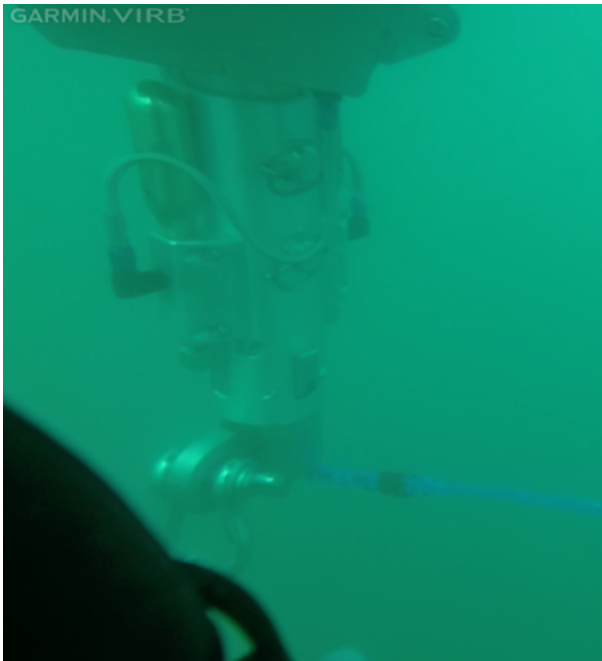
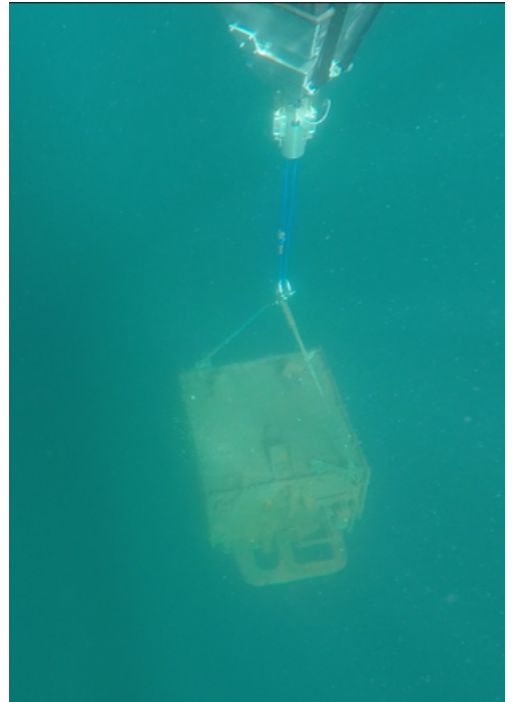
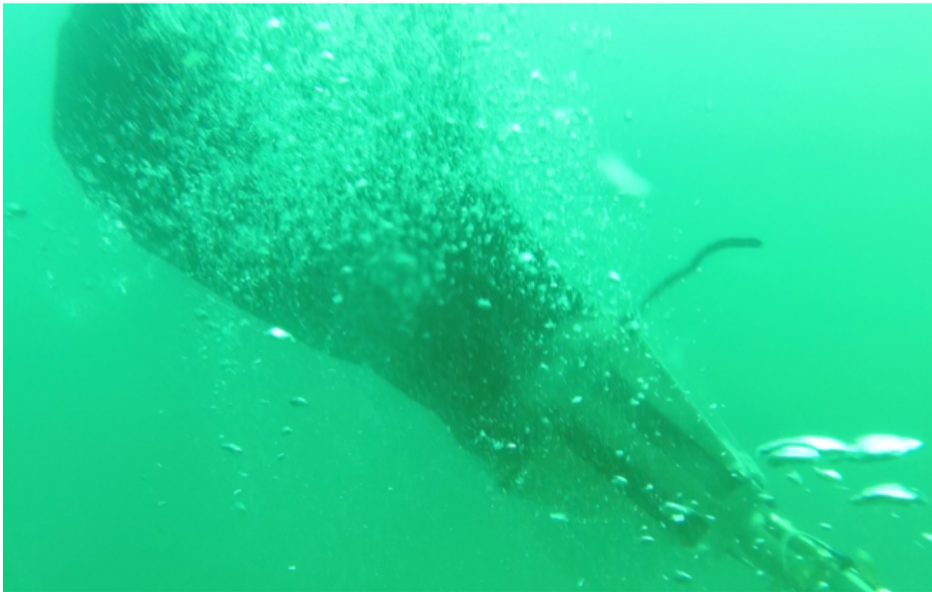
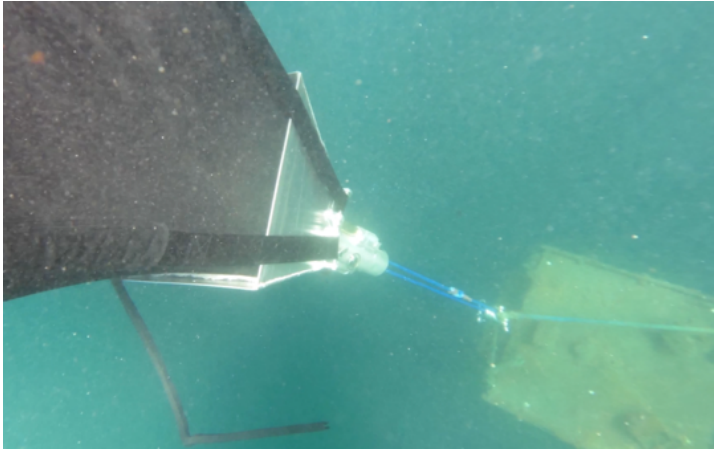


Combat Recovery Neutralization, Exploitation (CRNE) Lift Balloon

Strategos Technology Transference





Combat Recovery Neutralization, Exploitation (CRNE) Lift Balloon

Strategos Technology Transference

CRNE General Description & Specifications	4
Berry Amendment Compliant Textiles and Hardware	6
CRNE Setup and Use Guide	7
1. System Preparation	7
2. Re-fire reset procedure	8
3. Test inflation	11
Rigging for Use	13
4. Lift Capacity Charts	13
5. Rigging and Installation of Cylinders	14
6. Charging the Air System	15
7. Deflating the bag and packing system for deployment	16
ATAC Setup and Use guide	17
1. Background	17
2. System Preparation and Rigging	17
3. Shuttle rigging	18

CRNE General Description & Specifications

1. LIFT BAG MATERIAL AND CAPACITIES

- 1.1. Lift Bag Capacity: 2600 pounds (1179 kg)
- 1.2. Fabric: 1000 denier Cordura Overbag with lightweight waterproof inner bag.
- 1.3. Webbing: 2" Heavy Duty SCUBA webbing. 6000 lbs per inch.
- 1.4. Dump valve: Apex and USIA valves.
- 1.5. Color: Overbag is Black Cordura, chassis and is hard anodized aluminum (black)

2. DIMENSIONS

2.1.1. Inflated

2.1.1.1. Height: 7' Length: 6' Width: 4'

2.1.2. Rigged Dimensions

2.1.2.1. Length: 54" Height: 17" Width: 17"

3. WEIGHTS

- 3.1.1. Bare System: 36 pounds
- 3.1.2. System including regulators and air valves: 51.2 pounds
- 3.1.3. Deployment Bag: 4.3 pounds
- 3.1.4. Each bottle used: 43.2 pounds empty, 50 pounds full
- 3.1.5. Fully mission capable configuration 106 - 256 pounds

4. INTEGRATED DEPLOYMENT AND STORAGE BAG (REMOVABLE)

- 4.1. Designed to protect and organize the lift bag while in storage and during deployment
 - 4.1.1. Holds all four bottles in a ready-to-use state in smallest possible footprint
 - 4.1.2. Top and front are mesh and held on by Velcro fasteners to allow system to "break away" while inflating
 - 4.1.3. Keeps the un-inflated system small and manageable and allowing two people to easily manipulate and handle the full system.

4.1.4. Has four quality handles integrated into design.

5. INFLATION AND ACTUATION MECHANISMS

- 5.1. Manual Lanyard Pull Actuation
- 5.2. Optional Automatic Tow Actuated Coupler (ATAC) Pneumatic actuation
- 5.3. System configurable for single, double, triple or quad HP100 (3300 psi) aluminum cylinders to accommodate different weights at different depths.

6. AVAILABLE PACKAGING

- 6.1. Pelican-Hardigg hard sided transportation Case
- 6.2. 1000 Denier Fabric Carrying Bag

7. ATTACHMENT SYSTEM

- 7.1. 1" Stainless Steel pin capturing up to 3/4" Amsteel Blue line or lift strap.
- 7.2. Attachment to ATAC system through same 1" pin and machined lifting eye.

8. ASSOCIATED EQUIPMENT

- 8.1. Included Tool Kit
- 8.2. Operation and Repair Manual
- 8.3. Four HP100 Aluminum Luxfer bottles with valves.

9. MAXIMUM OPERATING CAPACITY AND DEPTH

- 9.1. 2112 lbs at 375' Feet Sea Water
- 9.2. 2600 lbs @ 300' FSW

10. WARRANTY

- 10.1. 1 Year for all parts and labor

11. REPLACES

- 11.1. U.S. Navy MARK II MOD 1 Floatation Bladder - NSN 1H-8465-00-992-6689CRNE
Fabric Specifications

Berry Amendment Compliant Textiles and Hardware

Hardware:

2" Side Release Buckles
#5618

Stealth Warrior Duraflex
National Molding Corp. 5 Dubon Court Farmingdale, NY 11735

Rubber handles
1" polyethylene molded
Gerald Schwartz Inc. GA

Fabric:

Waterproof Interior Liner
LCT-1915
Black, 400Denier nylon packcloth
M1 W/6.75 oz urethane coating
Weight 10.75 oz
Lamcotec 152 Bethany Rd. P.O. Box 279 Monson, MA 01057

Cordura
1000 Denier w/ 1.25 oz urethane coating
102625-BK-59/60in
DUCRBC 144 Railroad Ave., Ste. 219 Edmonds WA 98020

Weight belt webbing 2"
989N 2BK
Nylon
PK Supply corp. 6406 South 196th St. Kent, WA 98032

Thread:

T70 nylon

Anefil Nylon

Twisted multifilament

All components used comply with Title 10 United States Code [U.S.C.] §2533a.

CRNE Setup and Use Guide

12. System Preparation

12.1. Set system on even ground (preferably padded) with “front” side up. Front side is the face that has engraved depth/bottle needed chart and Inflation Valve Assembly (IVA) actuator.



12.2. Safety Pin Inspection

12.2.1. Is Safety Pin in?

12.2.1.1. No... The system has been fired, and needs to be reset.

12.2.1.1.1. Follow Section 2 “Re-Fire Reset Procedure”



12.2.1.2. Yes... the system is ready to be rigged and is already prepped.

12.2.1.2.1. Skip to Section 3 “Test Inflation”

13. Re-fire reset procedure

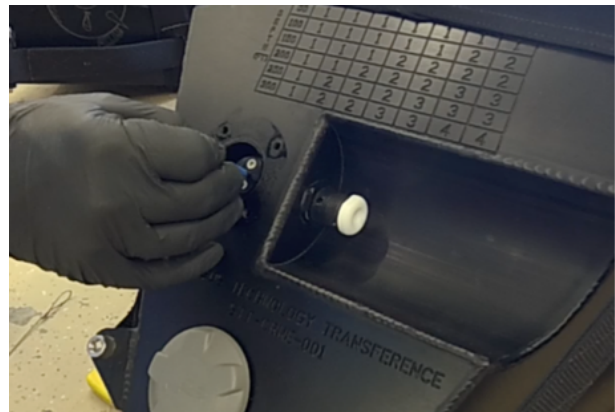
13.1. Tools and parts needed for this procedure are as follows, and are included in the included Maintenance Tool Kit

13.1.1. Safety Pin, Manual Pull Lanyard, 3/16 allen wrench, re-fire reset tool, silicone grease



13.2. Remove "Valve Access" cover.

13.2.1. Using 3/16 Allen head wrench loosen and remove all four screws retaining cover. Set aside



13.3.Using 1/16" reset tool push through hole in Strike Plate of IVA until tool bottoms out.

13.3.1.Feed lanyard back into IVA Actuator Body to reset pin.

13.3.1.1.Ball will need to be put into a recess in the pin and pushed into IVA body



13.3.1.1.1.Sometimes it simply pushes in

13.3.1.1.2.Other times it needs to be assisted by using the reset tool or allen wrench through the wire guide

13.3.1.1.3.If you accidentally push the pin without the lanyard captured, you may have to remove the lanyard guide (white plastic) and pull pin back out with needle nose pliers.



13.3.1.1.3.1.With guide out, it is simplest to just re-install lanyard and push pin with the needle nose pliers.

13.3.1.1.3.2.Re-install lanyard guide and hand tighten

13.4. Insert Safety Pin into IVA Actuator Body.



13.4.1. Test pull the Manual Pull Lanyard against the safety pin. Manual Pull Lanyard should not be able to be pulled free.



13.5. Inspect O-ring on back side of Valve Access cover for damage. If necessary, replace O-ring from spare parts kit.

13.5.1. Using silicone grease, coat the bolts and o-ring lightly before re-installing

13.5.2. Torque bolts to 60 in/lbs (tightly snug... do not over-tighten) and wipe away all excess silicone if necessary.



14. Test inflation

14.1. Zip waterproof access zipper all the way closed and secure velcro flap.

14.2. Remove cap from C7 External Inflation Deflation Valve (EIDV) and ensure the valve is closed. The valve is a one-way check valve that allows inflation without allowing deflation

14.2.1. Ensure valve is closed by depressing spring post with finger, and turning it clockwise 1/4 turn.

14.2.2. Valve should depress and come back to the top, stopping the flow of escaping air.



14.3. Thread the EIDV valve adapter hose onto EIDV valve.

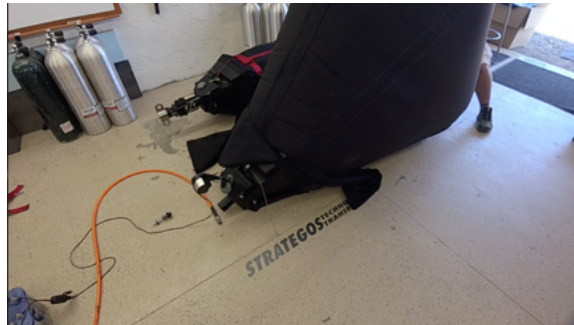


14.4. Hook adapter hose up to foot pump or shop air line on the inflation port.



14.5. Inflate system until overpressure valves begin venting.

14.6. Inspect bag to ensure there are no rips, tears or chafing on the fabric that would affect utility of the system and that there is no air escaping.



14.7. At operating pressure, ensure that the overpressure valves are functioning.

14.7.1. Loosen each valve one at a time by turning counter-clockwise while pressurized and ensure that they are properly venting then re-tighten each.

14.8. At operating pressure, secure the pump and listen for air leaks. After a short period, the overpressure valves will stop venting and the system should be air tight.

14.9. Ensure all five overpressure valves are tightened all the way clockwise before securing test

14.10. Remove EIDV hose adapter from valve and make sure valve is closed by pushing in and turning clockwise.

14.11. Replace cap on EIDV valve.

14.12. Unzip main zipper all the way at completion of test inflation to facilitate deflation.

Rigging for Use

15. Lift Capacity Charts

The CRNE system is designed for modularity regarding the number of bottles needed for a particular lift. The following chart is machined into the front face indicating maximum depths or weights of a given bottle configuration.

WET WEIGHT (lbs)

D E P T H (ft)		0-750	1000	1250	1500	1750	2000	2250
	50	1	1	1	1	1	1	1
	100	1	1	1	1	1	2	2
	150	1	1	1	2	2	2	2
	200	1	1	2	2	2	3	3
	250	1	2	2	2	3	3	3
	300	1	2	2	3	3	4	4

As an example of use case, if you have a 600 pound weight, you can read in green here that it falls into the 0-750 pound column, and one bottle will lift that all the way from 300 Feet of Seawater (FSW)

WET WEIGHT (lbs)

D E P T H (ft)		0-750	1000	1250	1500	1750	2000	2250
	50	1	1	1	1	1	1	1
	100	1	1	1	1	1	2	2
	150	1	1	1	2	2	2	2
	200	1	1	2	2	2	3	3
	250	1	2	2	2	3	3	3
	300	1	2	2	3	3	4	4

WET WEIGHT (lbs)

D E P T H (ft)		0-750	1000	1250	1500	1750	2000	2250
	50	1	1	1	1	1	1	1
	100	1	1	1	1	1	2	2
	150	1	1	1	2	2	2	2
	200	1	1	2	2	2	3	3
	250	1	2	2	2	3	3	3
	300	1	2	2	3	3	4	4

A 1500 pound lift is more complex, requiring only a single bottle down to 100 FSW (shown in green), two bottles down to 250 FSW (shown in orange) and three bottles to recover the weight from 300 FSW (blue).

5. Rigging and Installation of Cylinders

- 5.1. Cylinder positions are numbered according to the order in which they are rigged into the system. **Do not alter the rigging order, or damage from the weight of the cylinders can occur to by the support post sitting on the unprotected bag with up to 100# of weight on it.**



- 5.2. Make sure all unused yokes are tight against their storage posts. This is a crucial step, as if they aren't tight against the storage yoke o-rings you will leak immediately when the first air valve is opened.
- 5.3. Using a bottle gauge, ensure that you have 3000-3300 PSI per bottle.
- 5.4. Remove the #1 1st stage yoke regulator from its storage post and pull it out from the unzipped bag.
- 5.5. Attach it to a full bottle, and orient the yoke regulator body until it points toward the bottle.



- 5.6. Loosen the straps all the way on the #1 mounting pads. The sides of the mounting post are labeled clearly.
- 5.7. Set the rigged bottle flat under the mounting post, routing the straps underneath it as you set it down gently. **Be aware that the waterproof integrity of the system is at risk here if you drop a bottle hard on the inner bladder or rig the whole assembly on a sharp work surface.**
- 5.8. One at a time, properly weave the mounting straps as per the numbering on the clamp itself as pictured, first through the bottom hole, then back through #2 etc.
- 5.9. Clamp down and wrap the tail back around and attach the velcro to itself.
- 5.10. Repeat processes 5.1-5.9 with additional bottles, following the labelling.

6. Charging the Air System

- 6.1. Once all the straps have been tightened and checked, open up the #1 bottle valve, you should hear no leaks and a resounding click as the inflation valve assembly sets into position.
- 6.2. If using additional bottles, open up the #2 bottle valve. No valve click will be heard as the poppet is already set against the pin.
- 6.3. Repeat until all valves are open and check for leaks.
- 6.4. System is ready for packing. Zip up the bag and Velcro the protective flap shut.

7. Deflating the bag and packing system for deployment

- 7.1. Remove lid off of EIDV valve by turning it counter-clockwise.
- 7.2. Depress and turn internal spring loaded valve with the tip of your finger a quarter turn counter-clockwise.
- 7.3. Screw the EIDV Valve adapter hose into EIDV.
- 7.4. Using a small vacuum pump or a shop vac, suck all the air out of the bag. Shake bag to ensure that all of the air is out of it, and it feels like it has a “suction” to the tanks and post.
- 7.5. Remove vacuum and quickly reset the valve by depressing valve and turning it 1/4 turn clockwise.
- 7.6. Re-install EIDV cap
- 7.7. Straighten out deployment bag system to prepare for packing starting from the front
- 7.8. Fasten the Velcro between the lid and the sides from the front, and as you pass the handling strap fasteners, attach the red handling strap system and snug it up to keep the system from opening the velcro back up.
- 7.9. Work your way up the sides attaching the Velcro and following up with fastening the red handling harness.
- 7.10. Carefully tuck and roll the lift bag by folding the sides and rolling the end to allow you to bundle it together in the end of the system.
- 7.11. Work the Velcro sides down until they meet the corner.
- 7.12. Attach handling strap over the end and cinch tight.
- 7.13. Velcro from the chassis base up the two sides, then ensure that all of the Velcro across the top is well fastened.
- 7.14. Snug down all 5 of the handle straps.
- 7.15. Attach Handling Strap lanyard to the Actuator Safety pull ring.
- 7.16. **System is ready to deploy.**

ATAC Setup and Use guide

1. Background

The Automatic Tow Actuated Coupler (ATAC) is designed to integrate with the CRNE system to allow a diver or ROV to attach only the shuttle, with the tow rope pre-rigged on it, to the weight... using the weight and the tow vehicle to tow the system down to the weight, automatically actuate and lift without any divers in the water.

The shuttle engaging with the ATAC Collar actuates the CRNE system pneumatically, and is dual-actuated for redundancy.

ATAC system is capable of carrying any load that the CRNE can lift, and has been weight tested for 2X the maximum capacity of the CRNE system's ability to lift.

2. System Preparation and Rigging

2.1. Shuttle Removal

- 2.1.1. Working close to the ground, or above a tabletop to prevent injury from dropping the 7# shuttle, use both thumbs and both index fingers to simultaneously push down on the lifting dogs and pull up on the actuation dogs to release the shuttle.



- 2.1.2. Shuttle is set aside to rig to the tow rope

- 2.2. Using a small adjustable wrench remove the caps form the ATAC Actuation ports and stow them in the Spare Parts Kit for safekeeping.



2.3. Install CO2 cartridges. Using a finger with silicone grease, lubricate the threads and O-ring flat of a fresh CO2 cartridge

2.4. Screw the cartridge into the ATAC actuator body until it bottoms out.



2.5. Repeat for the other side.

2.6. With the short hose on top install the ATAC on the CRNE.

2.6.1. Hand tighten the hoses onto the connectors on the CRNE, being careful not to cross-thread the connectors.

2.7. With them hand tight install the 1" clevis pin and its locking ring

2.8. Adjust and tighten the hose ends with your adjustable wrench both at the CRNE and ensure that the hoses at the ATAC actuator bodies are snug as well.

Do not over-tighten!



3. Shuttle rigging

Tow line should be routed through the shuttle with the lift eyes facing away from the CRNE system. The tow line is pinned to the ATAC using the lower pin mount and shuttle is designed to accept a double thickness 5/8" Amsteel Blue line.

CRNE Parts and Accessories List

STT Part Number	Part Description	Quantity Per System
-----------------	------------------	---------------------

STT-CR-101 CHS	CRNE Chassis	1
STT-CR-102 42LB	Lift Bag	1
STT-CR-103 OPV	Relief/Dump Valves	5
STT-CR-104 LSA	CRNE Lifting Strap Assembly	1
STT-CR-105 BFL	Lift Bag Mounting Flange	1
STT-CR-106 LV	C7 Leaffield Valve Assembly	1
STT-CR-105 TM	Tank Mount	8
STT-CR-106 CS	Bottle Clamp Straps	8
STT-CR-107 RC	Refire Valve Cover	1
STT-CR-108 OR	Refire Valve Cover O-Ring	1
STT-CR-209 IVA	Inflation Valve Actuator	1
STT-CR-210 JN	IVA Jam Nut	1
STT-CR-211 JN-OR	IVA Jam Nut O-Ring	1
STT-CR-212 HA	-3 AN x 8.5" Hose Assembly	2
STT-CR-213 BH	-3 AN Bulkhead fittings	2
STT-CR-214 NT	-3 AN Fitting Nuts	2
STT-CR-215 CP	-3AN Caps	2
STT-CR-216 TEE	-3 AN Tee with 1/4 NPT leg	1
STT-CR-217-SP	IVA Safety Pin	1
STT-CR-218 LN	IVA Manual Pull Lanyard	1
STT-CR-319 -6NPT	-6 to 3/8" NPT Adapter	2

STT-CR-320 HA	-6 AN Hose Assembly	1
STT-CR-321 MN	Manifold	1
STT-CR-322 SWA	1/4 NPT to SCUBA Whip Adapter	4
STT-CR-323 FSH	1st stage hose (SCUBA Whip)	4
STT-CR-324 FSR	1st Stage Regulator (Yoke)	4
STT-CR-325 HP100	Luxfer HP100 SCUBA Bottles	4
STT-CR-326 BV	APEX Bottle Valves	4
STT-CR-327 OR	Yoke Stowage Post O-Ring	4
STT-AT-401 CL	ATAC Collar	1
STT-AT-402 AB	Actuator Body	2
STT-AT-403 CL	Actuator Pin	2
STT-AT-404 EC	Actuator Pin External Clip	2
STT-AT-405 IC	Actuator Pin Internal Clip	2
STT-AT-406 SP	Actuator Spring	2
STT-AT-407 ORS	Actuator Pin O-Ring (small)	2
STT-AT-408 ORL	CO2 O-Ring (Large)	2
STT-AT-409 LD	Lifting Dogs	2
STT-AT-410 AD	Actuation Dogs	2
STT-AT-411 DS	Lifting Dog Spring	2
STT-AT-412 CO	CO2 Cartridge	2
STT-AT-413 LP	1" Lifting Pin	2
STT-CR-501	Refire Reset Tool 1/16 Drill Blank	1
STT-CR-502	Refire Cover Tool 3/16" Allen Wrench	1
STT-CR-503	O-Ring Repair Kit	1
STT-CR-504	Silicone Grease	1
STT-CR-505	Zipper Wax	1
STT-CR-506	Leaffield (EIDV) Valve Adapter hose	1