CRNE Setup and Use Guide

12. System Preparation

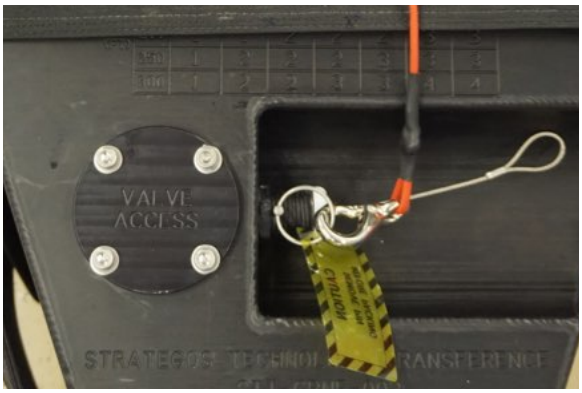
12.1. Set system on even ground (preferably padded) with “front” side up. Front side is the face that has engraved depth/bottle needed chart and Inflation Valve Assembly (IVA) actuator.

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

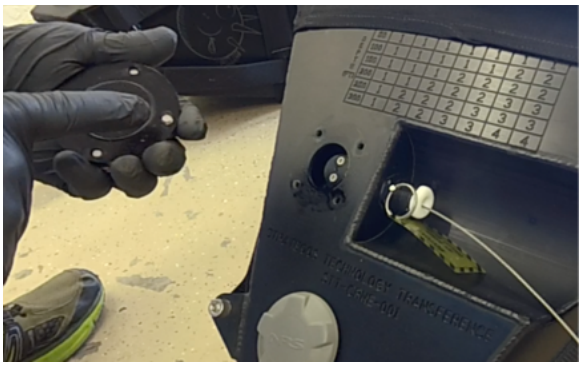
13.4. Insert Safety Pin into IVA Actuator Body.

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.

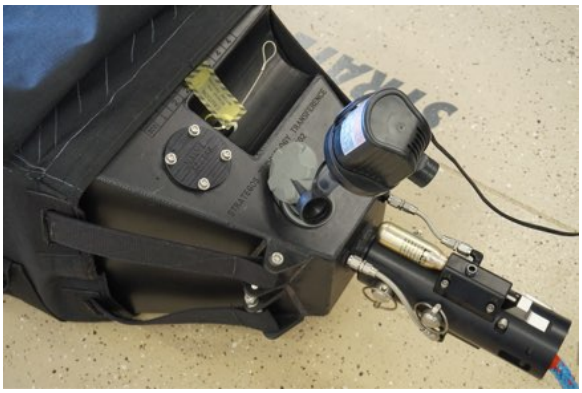
14.2. Remove cap from C7 External Inflation Deflation Valve (EIDV) and ensure the valve is closed. The valve is a one-way check valve that allows inflation without allowing deflation

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)

DEPTH (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)

DEPTH (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)

DEPTH (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, pen 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.**