

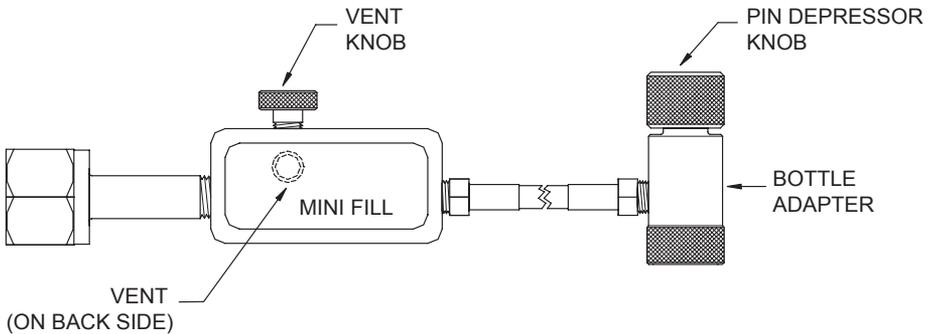
# Air Venturi

Proudly Made in the USA

## MINI CO<sub>2</sub> FILL STATION **SAFETY FIRST!**

UNITED STATES PATENT NUMBER 6,263,927,B1

**THESE FILL STATIONS MUST ONLY BE USED IN AREAS WITH ADEQUATE VENTILATION!!**



### Referenced Documents:

- **ASTMF2856-11 available at [WWW.ASTM.ORG](http://WWW.ASTM.ORG)**
- CGA G-6.3, Carbon Dioxide Cylinder Filling and Handling Procedures
- CGA C-6 – 2005 Standards for visual inspection of steel compressed gas cylinders
- CGA C-6.1 – 2006 Standards for visual inspection of high pressure aluminum compressed gas cylinders
- CGA G-6.8 – 2007 transfilling and safe handling of small carbon dioxide cylinders
- CFR 49 Parts 100 to 185
- TB-14 Torque Guidelines for Sealing CGA Valve Outlet Connections

**ALWAYS WEAR HEAVY GLOVES AND EYE PROTECTION WHILE FILLING CYLINDERS.**

**ALWAYS HAVE THE MSDS AT THE LOCATION THAT THE FILLING TAKES PLACE.**

**ALWAYS READ AND UNDERSTAND ALL FILL STATION INSTRUCTIONS. INSURE THAT THERE IS PROPER VENTILATION IN THE FILLING AREA.**

216-292-2570

WARNING POSTERS SHOULD BE POSTED NEAR THE FILLING OPERATION

APPROPRIATE WARNING SIGNS SHOULD BE PLACED AT THE ENTRANCE TO CONFINED AREAS WHERE HIGH CONCENTRATIONS OF CARBON DIOXIDE GAS CAN ACCUMULATE

## SETTING UP THE FILL STATION

Before you even remove the safety cap on the bulk cylinder, the bulk cylinder **MUST** be solidly secured to a post or wall bracket. If the cylinder were to be knocked over, the valve could be broken off, and the cylinder “Launched”.

Your fill station is equipped with a standard “CGA 320” fitting on the input side. This fitting will connect to any standard CO<sub>2</sub> bulk tank in the United States. Please note that the threads are right –handed, and that a sealing washer (included) is required.

**The bulk supply tank you connect to must be equipped with an internal “dip tube” because it is necessary to dispense the liquid CO<sub>2</sub> from the bottom of the bulk supply tank. YOU WILL NOT BE ABLE TO DISPENSE A COMPLETE FILL FROM A NON DIP TUBE TANK!**

On the backside of the fill station is a vent port.

- ▲ **For safety reasons, this port must be directed away from the operator and bystanders.**

This port is equipped with 1/8 NPT threads so that if desired, a vent hose or muffler may be attached.

Do not over tighten the vent knob as this may damage the seal. Only turn the knob enough to stop the release of gas.

- ▲ **ALL HOSE, FITTINGS, AND MUFFLERS MUST HAVE A MINIMUM WORKING PRESSURE OF 3000 PSI. Do not use a bronze sintered muffler!!**
- ▲ **Never operate the Fill Station unless a bottle is attached to the fill adapter on the end of the fill hose. Operating the Fill Station without a bottle attached will cause the fill hose to “whip”. Injury may result!!**

## OPERATION 1: CHECKING OUT THE BOTTLE

Conduct a valve twist test to determine if the valve is securely attached to the cylinder. Any cylinders which have valves that can be twisted by hand, or which show signs of the valve having been partially removed, must not be filled. The owners of such cylinders should be warned to have the valve repaired by the manufacturer or its authorized representative, prior to using the cylinder or attaching it to a marker.

Valve twist test, n – a test done by hand where as the user grasp the valve with one hand and the bottle with the other and attempts to turn the valve by hand in a counter- clockwise direction( left). If the valve does move, the valve and bottle should not be filled and should be repaired and /or serviced by the manufacturer or its authorized representative. If the valve does not move then the valve passes the test and may be filled provided it passes all other



Look for a rotation indication mark between tank and bottle. Ensure line matches between two pieces. IF THE LINE DOES NOT MATCH DO NOT FILL THE CYLINDER.

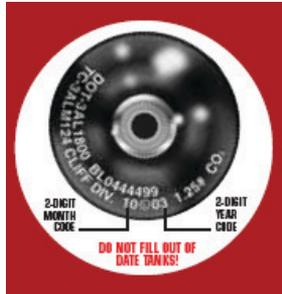


If no line is present place a non removable, non etching marking between the valve and bottle for future checks. A paint pen is a good item to use to apply the rotation indication mark.

## **VISUALLY INSPECT THE CYLINDER CONDITION BEFORE EACH FILL.**

Cylinders must be stamped on the shoulder with a DOT (Department of Transportation) and potentially a TC (Transport Canada) mark, working pressure, manufacturer's code or name, serial number, hydrostatic test date and rated CO<sub>2</sub> capacity. If no stamping is present or stamping has been altered or non legible, do not use the cylinder.

Re-qualification period for CO<sub>2</sub> cylinders used in paintball is five (5) years for 3AL aluminum and 3A and 3AA steel bottles. There is no maximum life for a 3AL, 3A, and 3AA cylinders as long as the cylinder passes visual and hydrostatic inspections.



DOT – 3AL 1800 M4625 04^03 8 oz CO2 A051391

### **This cylinder lay line of data breaks down like this:**

- DOT – Department of Transportation (a Federal Agency)
- 3AL – the specification standard the cylinder conforms to
- 1800 – the working pressure rating of the cylinder
- M4625 – the manufacturer of the cylinder
- 04^03 – The hydrostatic test date of the cylinder
- The first two digits are the month
- The ^ is the testing agency mark
- The last two digits are the year
- The above date would be valid to use until April 1, 2008
- 8oz CO<sub>2</sub> – The amount of CO<sub>2</sub> the cylinder is rated to hold
- A051391 – The serial number of the tank

The pressure rating stamped on the cylinder must be at least 1800 psi.

Cylinders should be in good condition: free of stickers, dents, scrapes, bulges, obvious corrosion, pits, evidence of fire damage and leaks.

Cylinders having valves without a rupture disk or pressure relief mechanism must not be filled.

Pressure relief or rupture disk assembly should be tight, and all pressure relief passages should be clear of obstructions.



## **OPERATION 2: HOOKING UP!**

▲ **Never operate the Fill Station unless a bottle is attached to the fill adapter on the end of the fill hose. Operating the Fill Station without a bottle attached will cause the fill hose to “whip”. Injury may result!!**

### **REFER TO THE INSTRUCTION CHART ON PAGE 8**

#### **Step one: Attachment.**

- Put the sealing washer (supplied) into the CGA fitting and attach the fill station to the bulk tank, secure with a wrench. **LEAVE THE BULK TANK OFF.**
- Turn the vent knob on the fill station clockwise to the off position.
- Turn the knob on the bottle fill adapter counterclockwise, off position, until it stops.
- Screw the bottle into the bottle fill adapter.
- Turn the knob on the bottle fill adapter clockwise, on position, to depress the pin in the bottle to open the bottle valve.

#### **Step two: Purging/ Venting the bottle.**

- Purge off the residual CO<sub>2</sub> in the bottle. It is necessary to do this because you must decrease the pressure in the bottle for the transfer from the bulk tank to take place. Invert (turn the bottle upside down) the bottle so that the valve is at the bottom.
- Turn the knob on the bottle fill adapter clockwise to depress the valve pin.
- Turn on the vent knob open (counterclockwise) and vent until gas ceases to be exhausted.
- Close the vent knob.

**NOTE: If your bottle is new, or warm to the touch, you need to add 1-2 ounces of CO<sub>2</sub> to the bottle prior to step 2. Go to step 4 and follow this step and add only 1-2 ounces of CO<sub>2</sub>. Now go to step two to continue.**

### **Step three: Weighing.**

▲ CO<sub>2</sub> should only be filled by weight, never pressure.

Use an accurate scale; never guess the weight of a cylinder. It is recommended the scale have an accuracy of 2 ounces or less, a tare function is helpful.

- If using a hanging scale hang the bottle from the scale (If your scale has a tare weight function use that function now).

#### **If not using a hanging scale.**

- Turn the knob on the bottle fill adapter counterclockwise.
- Remove the bottle from the bottle fill adapter.
- Weigh the bottle to get its tare weight, make a note of the bottles empty (tare) weight. (If your scale has a tare weight function use that function now)

▲ The label on the bottle or neck of the bottle will indicate the bottles contents capacity usually in ounces. This is the amount of CO<sub>2</sub> the bottle is rated to be filled. **DO NOT EXCEED THE BOTTLES RATED CAPACITY!** If you are using a scale without a tare function you need to add the bottles contents capacity to the tare (empty) weight. Example after purging the bottle weighs 16 ounces and the bottles capacity is 20 ounces you will fill to 36 ounces. If your scale has a tare function fill to 20 ounces.

### **Step four: Filling.**

- If necessary screw the bottle back into the bottle fill adapter.
- Turn the knob on the bottle fill adapter clockwise to open the pin valve.
- Turn the knob counter clockwise on the bulk tank slowly and stop turning when you hear the flow of CO<sub>2</sub> starting to fill the bottle.
- If using a hanging scale fill to bottles rated capacity.

### **Step five: Disconnecting.**

- Turn the knob on the bottle fill adapter counterclockwise to allow the pin valve in the bottle to close
- Vent any CO<sub>2</sub> that may be trapped in the hose by turning the vent knob counterclockwise to the open position.

## **Step six: Final weighing.**

- ▲ CO<sub>2</sub> should only be filled by weight, never pressure.
- ▲ The label on the bottle or neck of the bottle will indicate the bottles contents capacity usually in ounces.  
This is the amount of CO<sub>2</sub> the bottle is rated to be filled. **DO NOT EXCEED THE BOTTLES RATED CAPACITY!**

Use an accurate scale; never guess the weight of a cylinder. It is recommended that the scale have an accuracy of 2 ounces or less. A TARE FUNCTION is helpful.

- Re-weigh the bottle to make sure the weight is correct and **NEVER** overfill a cylinder.
  - If the bottle is overfilled re-attach the cylinder to the bottle adaptor and vent off some CO<sub>2</sub>. Vent for approximately 3-5 seconds.
  - **WEIGH THE BOTTLE AGAIN.**
    - ▲ ***THIS IS THE MOST IMPORTANT STEP IN THE WHOLE OPERATION!  
DO NOT OMIT IT!!!***
  - Follow step five to remove and re-weigh the bottle.
  - Unscrew the bottle from the bottle fill adapter.
- ▲ ***Never operate the Fill Station unless a bottle is attached to the fill adapter on the end of the fill hose. Operating the Fill Station without a bottle attached will cause the fill hose to “whip”. Injury may result!!***

## **Maintenance**

An item that wants occasional lubing is the “O” Ring in the Universal Fill Adapter. On at least a daily basis, apply a couple of drops of oil to the depressor pin in the UFA, in order to keep this “O” Ring lubricated. Liquid CO<sub>2</sub> behaves like a solvent, and tends to wash away oils, so if you fill a large number of bottles per day, you may want to perform this operation two or three times daily.

April 2011

# DANGER!



**IF YOU ARE USING A REFILLABLE CO<sub>2</sub> CYLINDER TO POWER YOUR PAINTBALL MARKER YOU MAY BE AT RISK OF CAUSING SERIOUS INJURY OR DEATH TO YOURSELF OR OTHERS!**

If your valve has been removed, replaced or if any of the following have occurred:

- The valve unit was replaced or altered after purchase
- An anti-siphon device was installed
- The valve unit was removed from the cylinder for any reason
- Any modification was done to your Refillable CO<sub>2</sub> Cylinder!

**YOU ARE AT RISK REGARDLESS IF YOU PURCHASED A NEW OR USED REFILLABLE CO<sub>2</sub> CYLINDER!**

The valve is intended to be permanently attached to the CO<sub>2</sub> cylinder. However, there have been numerous reported incidents causing serious injuries or death that were caused by a player unknowingly unscrewing the valve from the CO<sub>2</sub> cylinder. This actually occurs when the player thinks the entire cylinder is being unscrewed from the paintball marker.

## **DON'T TAKE A CHANCE!**

**IMMEDIATELY BRING YOUR REFILLABLE CO<sub>2</sub> CYLINDER TO A "C5" *CERTIFIED AIRSMITH* FOR INSPECTION OR CONTACT THE MANUFACTURER FOR A LOCATION WHERE THIS INSPECTION CAN BE COMPLETED.**

**216-292-2570**

# ALWAYS BE SAFE! NEVER OVERFILL CO<sub>2</sub> TANKS!

## ALWAYS CHECK THE TEST DATE OF ANY CO<sub>2</sub> TANK

- CO<sub>2</sub> tanks must be **RETESTED** every five years.
- **NEVER** refill an out-of-date CO<sub>2</sub> tank.
- Filling out of date tanks may result in government fines, severe injury, or death.



## ALWAYS HAVE A QUALIFIED INDIVIDUAL CHECK OR REPLACE YOUR SAFETY PLUG

- Check that each burst disk has at least **ONE PRESSURE RELIEF HOLE** in the side or top of burst disk,
- The burst disk is a precision pressure sensitive device.
- **NEVER TAMPER** with the **BURST DISK**. It can alter the safety release operation of the device.



## ALWAYS USE A SCALE TO VERIFY FILLING WEIGHT OF ANY CO<sub>2</sub> TANK

- Always use an accurate **SCALE** when filling a CO<sub>2</sub> tank.
- **NEVER** overfill a CO<sub>2</sub> tank.
- It's safer to **UNDERFILL** than to **OVERFILL**.



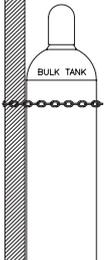
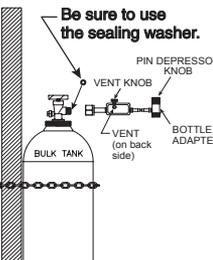
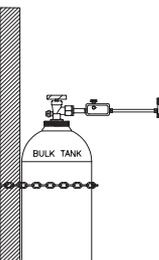
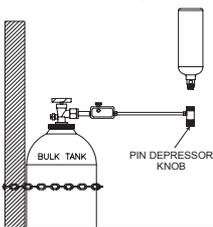
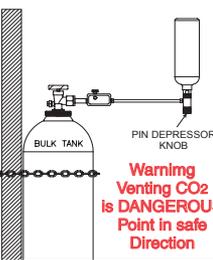
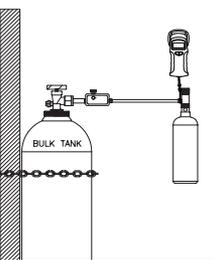
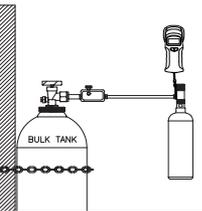
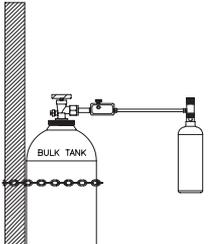
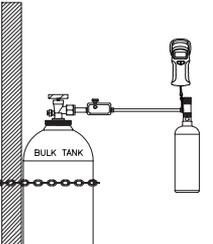
# BE SAFE!

# MINI CO<sub>2</sub> REFILL OPERATIONS

*Never operate the Fill Station unless a bottle is attached to the fill adapter on the end of the fill hose. Operating the Fill Station without a bottle attached will cause the fill hose to "whip". Injury may result!!*

## Safety Considerations

- ⚙ ALWAYS WEAR EYE PROTECTION WHEN WORKING WITH COMPRESSED AIR.
- ⚙ VENTING GAS CAN AND WILL ACCELERATE PARTICLES OF DIRT, ICE AND DEBRIS TO HIGH VELOCITIES.
- ⚙ KEEP ALL PERSONS WITHOUT EYE PROTECTION OUT OF THE IMMEDIATE AREA.
- ⚙ ALWAYS WEAR GLOVES TO PROTECT YOUR HANDS FROM EXTREME COLD.
- ⚙ ALWAYS INSPECT TANK FOR DAMAGE AND RUPTURE PLUG FOR BLEED HOLES BEFORE ATTEMPTING ANY FILL.
- ⚙ LOOK AT VALVE WHEN REMOVING CYLINDER, SEE STEP 4. STOP IF VALVE STARTS TO UNSCREW FROM THE CYLINDER. SCREW IT BACK ON AND TAKE TO A TRAINED PERSON FOR REPAIR.
- ⚙ THIS CHART IS TO BE USED IN CONJUNCTION WITH THE WRITTEN INSTRUCTIONS!

<p><b>1. Secure the Bulk CO<sub>2</sub> cylinder to a pillar or wall before removing the protective safety cap!!!</b></p> 	<p><b>2. Attach the Fill Station to the Bulk Cylinder. Install with the vent port pointing down.</b></p> <p>Be sure to use the sealing washer.</p> 	<p><b>3. Perform the valve twist test per instruction sheet.</b></p> 	<p><b>4. Inspect the bottle to be filled for visible damage, and check the bottle date!</b></p>  <p><b>* Must check rupture plug for bleed holes.</b></p>  <p><b>VALVE</b> → <b>CYLINDER</b></p> <p><b>! DANGER</b></p> <p>The cylinder can fly off with enough force to kill if the valve unscrews from the cylinder.</p> <ul style="list-style-type: none"> <li>❑ LOOK at valve when removing cylinder.</li> <li>❑ STOP if valve starts to unscrew from the cylinder. Screw it back on and take to a trained person for repair.</li> </ul>
<p><b>5. Close the vent knob.</b></p> <p>Turn the bottle to be filled upside down, and screw it into the fill adapter. If this is a new or empty bottle go to step 7. Add 1-2 ounces of CO<sub>2</sub>. Proceed with step 5.</p> 	<p><b>6. Turn the depressor knob on the fill adapter clockwise until it stops.</b></p> <p>Hold the bottle firmly and open the vent knob to vent all CO<sub>2</sub> from the bottle.</p>  <p><b>Warning Venting CO<sub>2</sub> is DANGEROUS Point in safe Direction</b></p>	<p><b>7. Hang the empty bottle from the Digital Scale, and then reset the scale to zero.</b></p> <p>If no TARE function you must make note of the bottles empty weight.</p> 	<p><b>8. Close the vent knob. Slowly open the bulk tank valve watching the scale fill the bottle to its rated capacity. Turn off the bulk tank valve</b></p> <p><b>Do not fill beyond the bottle's rated capacity!!!</b></p> 
<p><b>9. Close the Depressor Knob by turning counterclockwise at least 2 full turns. This should allow the bottle's pin valve to be fully closed.</b></p> 	<p><b>10. RE-WEIGH THE BOTTLE TO MAKE SURE YOU HAVE NOT OVER-FILLED! If over filled go to step 6 and vent off the over fill and weigh again!!</b></p> <p><b>This is the most important step!! DO NOT SKIP IT !!!</b></p> <p><b>Remove the bottle from the bottle adapter.</b></p> 		

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