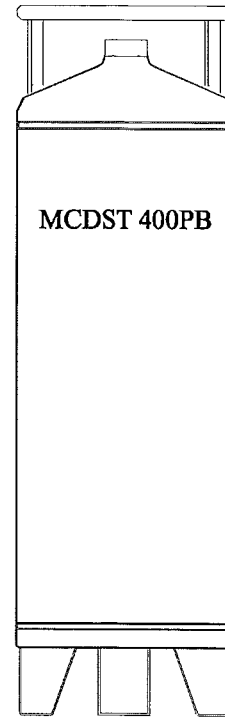


# BULK CARBON DIOXIDE SUPPLY SYSTEMS MVE MODEL MCDST 400PB

Place this chapter in the Beverage section of  
the *Equipment Manual*.

**MANUFACTURED  
FOR  
McDONALD'S®  
BY  
MVE, INC.  
3505 COUNTY ROAD 42 WEST  
BURNSVILLE, MN 55306-3803  
TELEPHONE: 952-882-5000  
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## WARRANTY

MVE, Inc. (MVE) warrants to McDonald's Restaurants (the Purchaser) the MCDST bulk CO<sub>2</sub> system equipment for one (1) year from MVE invoice date, that said equipment shall be free from any defects in workmanship and materials. MVE will also maintain the vacuum and ensure the reliability of the MCDST system for 5 years from MVE invoice date.

Purchaser agrees that as a pre-condition to any MVE liability thereunder, Purchaser or its appointed agents shall fully inspect all goods immediately upon delivery and shall give MVE written notice of any claim or purported defect within ten (10) days after discovery of such defect. As a further pre-condition to any MVE liability thereunder, both part replacement and labor must be supplied by an approved MVE service company. MVE may elect to repair or replace such equipment or any defective component or part thereof which proves to be defective, or to refund the purchase price paid by the original Purchaser. Alterations or repair by others or operation of such equipment in a manner inconsistent with MVE accepted practices and all operating instructions, unless preauthorized in writing by MVE, shall void this Warranty. MVE shall not be liable for defects caused by the effects of normal wear and tear, erosion, corrosion, fire, explosion, misuse, or unauthorized modification.

MVE's sole and exclusive liability under this Warranty is to the Purchaser and shall not exceed the lesser of the cost of repair, cost of

replacement, or refund of the net purchase price paid by the original Purchaser. MVE is not liable for any losses, damages, or costs of delays, including incidental or consequential damages. MVE specifically makes no warranties or guarantees, expressed or implied, including the warranties of merchantability or fitness for a particular purpose or use, other than those warranties expressed herein.

## WARRANTY CLAIMS PROCEDURE

1. All warranty claims must be previously authorized by:

MVE, Inc.

Telephone/electronic approval may be obtained by contacting Technical Services at:

Telephone: 800-253-1769

952-882-5000

Facsimile: 952-882-5185

or by writing to the Technical Services Manager at:

MVE, Inc.

3505 County Road 42 West  
Burnsville, MN 55306-3803 USA

2. Authorization must be obtained from MVE prior to shipment of any equipment to our facilities.

## **IMPORTANT SAFETY PRECAUTIONS**

**WARNING: THIS TANK HOLDS AND DISPENSES CARBON DIOXIDE (CO<sub>2</sub>) GAS AND MUST BE VENTED OUTDOORS. AVOID BREATHING OR CONTACT WITH CO<sub>2</sub> LIQUID OR GAS. CO<sub>2</sub> IS HEAVIER THAN AIR AND DISPLACES OXYGEN AND WILL NOT SUPPORT LIFE.**

CO<sub>2</sub> is a colorless gas with a slight pungent odor.

Exposure to low concentrations of CO<sub>2</sub> can cause:

- Rapid Suffocation
- Increased respiration or heart rate
- Dizziness, headaches or nausea

Exposure to concentrations of 10% or more can cause unconsciousness or death.

## **FIRST AID**

### **If inhaled:**

- Move individual to fresh air immediately
- If not breathing, give artificial respiration
- If breathing is difficult, give oxygen
- Call physician / paramedics

### **In case of frostbite:**

- Obtain immediate medical attention

### **SPILL OR LEAK PROCEDURES:**

- Evacuate all personnel immediately from affected areas
- Ventilate area of leak before entering
- Carbon Dioxide is heavier than air and displaces oxygen and will collect in low or confined areas

## **INTRODUCTION**

The MCDST 400PB Bulk Carbon Dioxide (CO<sub>2</sub>) system for McDonald's restaurants is designed for the storage and continuous supply of CO<sub>2</sub> for beverage carbonation. The MCDST system consists of one low pressure bulk CO<sub>2</sub> tank which holds 400 pounds of liquid CO<sub>2</sub>, an outside fill box, and interconnecting fill and vent lines.

**WARNING: THE MCDST 400PB BULK CO<sub>2</sub> SYSTEM MUST BE VENTED OUTDOORS. CO<sub>2</sub> IS HEAVIER THAN AIR AND DOES NOT SUPPORT LIFE. HIGHEST CONCENTRATIONS OF CO<sub>2</sub> WILL ACCUMULATE IN LOW AREAS AND CAN CAUSE UNCONSCIOUSNESS AND DEATH.**

## **THE MCDST BULK CO<sub>2</sub> TANK**

The tank is a double-walled, vacuum insulated container, similar to a Thermos bottle. CO<sub>2</sub> is stored as a liquid in the inner vessel of the tank. As CO<sub>2</sub> is needed for the beverage system, gas is withdrawn from the top of the tank and dispensed to the drink system.

The tank is equipped with a final line regulator that supplies CO<sub>2</sub> gas at the required pressure (90-115 psi) to the drink system for carbonation. The inner vessel is protected from over pressurization by primary (300 psi) and secondary (450 psi) relief valves that are vented to the outside fill box.

The internal pressure building system keeps the tank at normal operating pressure (125 -150 psi) during periods of high gas use. Tank pressure can be as high as 300 psi after filling but will return to normal within a few days.

The MCDST 400PB bulk CO<sub>2</sub> tank also has a CO<sub>2</sub> regulator (60-65 psi) to supply CO<sub>2</sub> gas to the bulk syrup system. This regulator supplies CO<sub>2</sub> to the bulk syrup system to support three functions:

1. Pressurizing the bulk syrup tanks
2. Sanitizing the bulk syrup tanks, and
3. Supplying pressure to the CO<sub>2</sub> fill box for making bulk syrup deliveries

### **CO<sub>2</sub> FILL BOX**

The MCDST bulk CO<sub>2</sub> tank is connected to a lockable outside fill box with a fill and vent hose. The fill box allows the tank to be refilled on a regular basis - usually every 2-3 weeks - from outside the store by a CO<sub>2</sub> delivery company. The delivery takes 5-10 minutes and does not

require access into the store or any interruption to store operations.

The fill box also houses two separate vent connections for the vent lines from the bulk CO<sub>2</sub> tank and the bulk syrup tanks. This allows both systems to be safely vented outdoors.

### **FILL AND VENT LINES**

The bulk CO<sub>2</sub> tank is connected to the outside fill box with flexible fill and vent lines. The fill line is connected to the fill valve on the tank and allows the tank to be refilled. The vent line is connected to the safety relief devices on the tank and ensure that any CO<sub>2</sub> gas vented from the tank will be expelled outside the store.

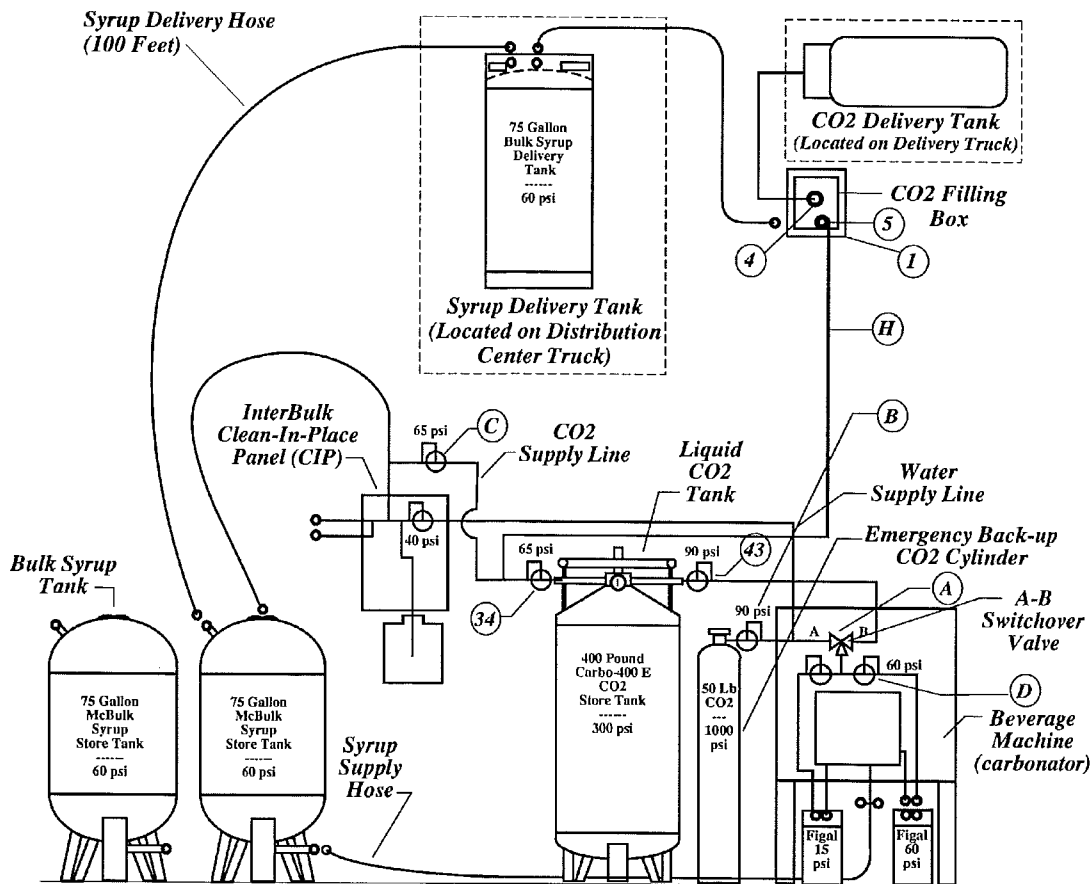
## **MCDST 400PB BULK CO<sub>2</sub> SYSTEM OPERATING FACTS AND SET UP AND CLOSE PROCEDURES**

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**TO ENSURE PROPER AND SAFE OPERATION OF THIS SYSTEM, THE MCDST TANK SHOULD BE INSPECTED DAILY BEFORE STORE OPENING FOR PROPER CONTENTS AND PRESSURE GAUGE READINGS, AND ABNORMAL FROST AS DESCRIBED BELOW. *SEE PAGE 6 FOR DIAGRAM.***

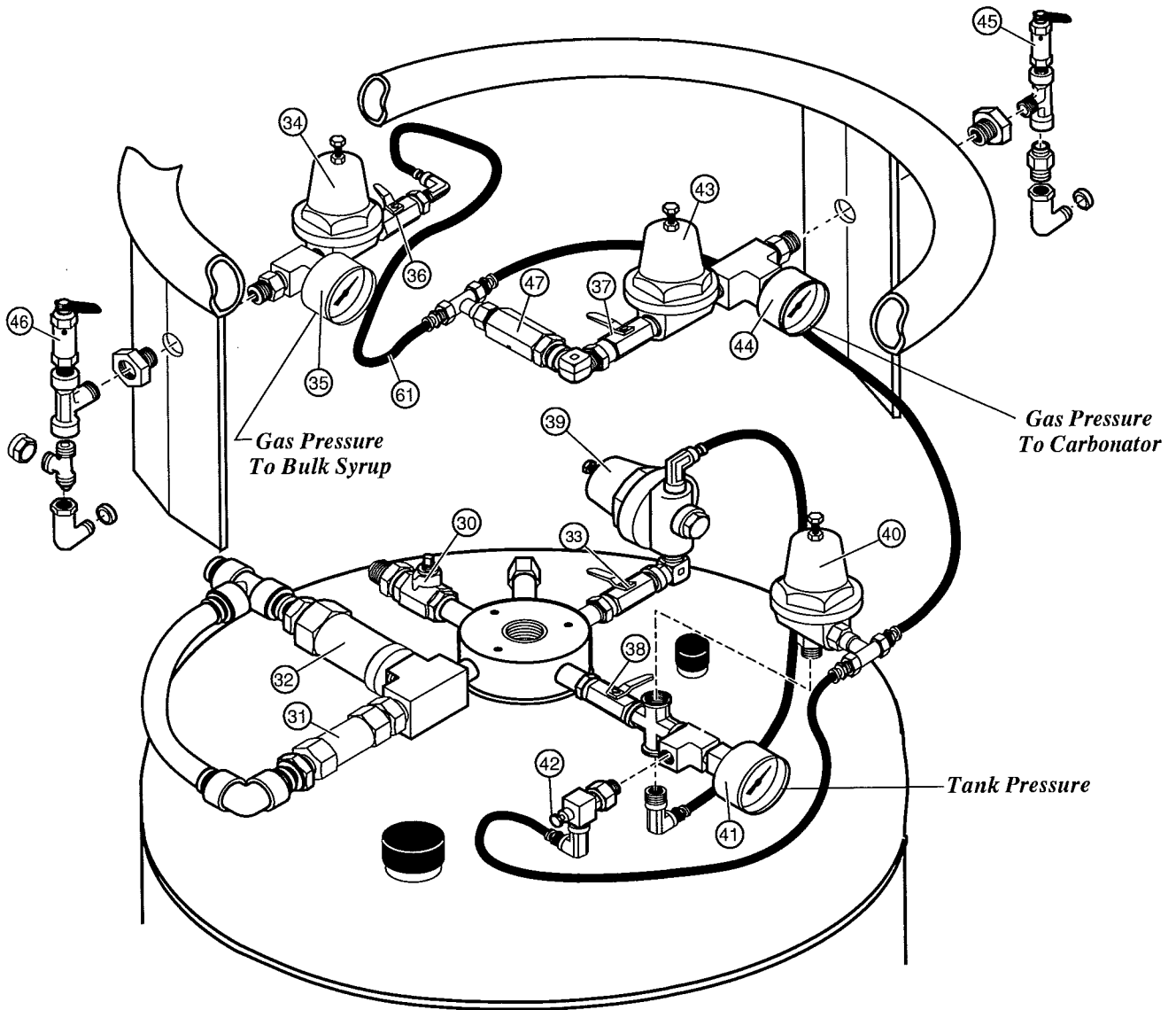
1. Normal tank pressure (# 41 p.6) should be 125-150 psi.
2. Tank pressure (#41 p.6) may be as high as 300 psi after a CO<sub>2</sub> delivery.
3. CO<sub>2</sub> gas pressure gauges should read 90-115 psi for the Carbonator (#44 p.6) and 60-65 psi for syrup(#35 p.6) .
4. Frost on the tank is normal during periods of CO<sub>2</sub> use (i.e. peak rush periods)
5. Frost on the tank in the morning, before drinks are served, indicates a potential leak in the beverage system. Contact your local service agent for repair.
6. A full bulk CO<sub>2</sub> tank holds 400 lbs. of CO<sub>2</sub>. The amount of CO<sub>2</sub> in your tank is displayed on the contents gauge (#22 p.9). A typical store uses 75-100 lbs. per week.
7. Never let the tank pressure (#41 p.6) drop below 61 psi or the liquid CO<sub>2</sub> will turn to dry ice and the tank will not be able to dispense gas.
8. See trouble-shooting section for additional information on potential tank problems.

## MCDONALD'S BEVERAGE SYSTEM LAYOUT



Item No.	Description	Function
A	CO <sub>2</sub> "A-B" Switch-over Valve	Selects CO <sub>2</sub> from cylinder (A) or bulk (B)
B	High Pressure Regulator (set at 90 psi)	Controls CO <sub>2</sub> pressure from cylinder
C	Second Regulator (set at 60 psi) in line to bulk syrup tanks	Double regulates CO <sub>2</sub> gas pressure to bulk syrup system to protect bulk syrup tanks from overpressurization
D	Regulator (set at 60 psi)	Controls CO <sub>2</sub> pressure to 5 gals or BIB.
H	Pressure line to two-pin connector in fill box (65 psi)	Supplies CO <sub>2</sub> gas to fill box to pressurize transfer line for bulk syrup deliveries
1	CO <sub>2</sub> Fill Box	Houses the fill connection and vents
4	CO <sub>2</sub> Fill Connector	Liquid CO <sub>2</sub> filling connection
5	2 - Pin Connector	Pressure Source for syrup delivery
34	Syrup Pressure Regulator (65 psi)	Regulates CO <sub>2</sub> gas pressure to the syrup system
43	Carbonator Pressure Regulator (90 psi)	Regulates CO <sub>2</sub> gas pressure to the Carbonator

# MCDST 400PB PLUMBING SCHEMATIC

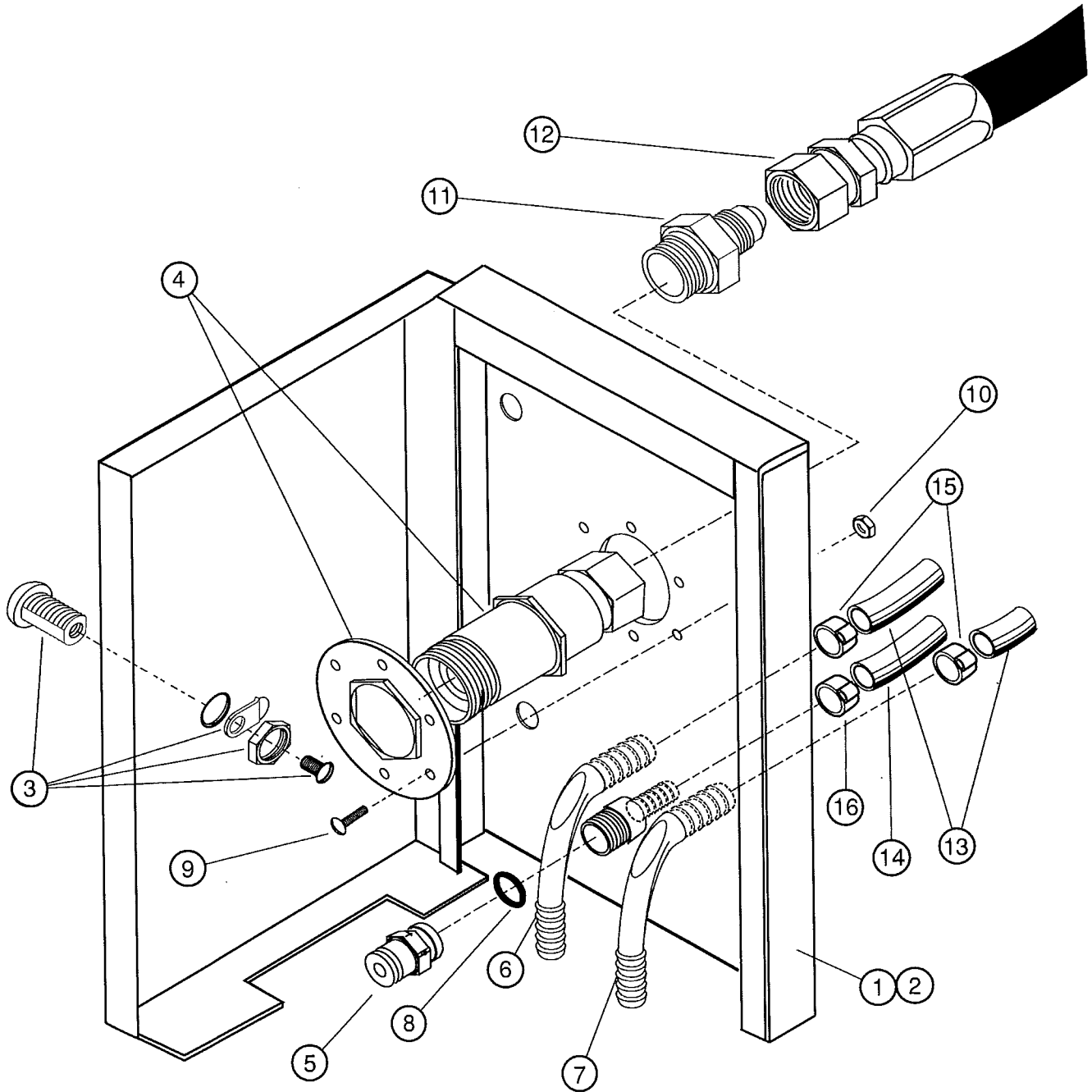


McDonald's MCDST 400 PB

## MCDST 400PB TANK PARTS IDENTIFICATION AND FUNCTION

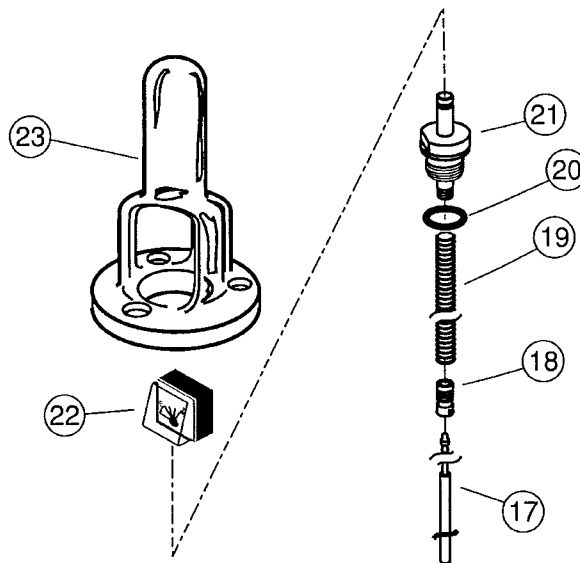
ITEM	PART NO.	DESCRIPTION	QTY	FUNCTION
-	10851731	MCDST 400PB Tank	1	Stores and Dispenses Carbon Dioxide
22	10591422	Liquid Level Indicator	1	Displays amount of CO <sub>2</sub> in tank
30	10804547	Liquid Fill Isolation Valve	1	Isolates tank pressure to CO <sub>2</sub> fill box
31	1812062	Secondary Relief Valve (450 psi)	1	Prevents tank pressure from exceeding 450 psi
32	1811252	Relief Valve (300 psi)	1	Safety valve that prevents tank pressure from exceeding 300 psi
33	1716162	Pressure Builder Isolation Valve (Liquid)	1	Isolates pressure builder for service
34	2111392	Syrup Pressure Regulator (65 psi)	1	Supplies pressure to bulk syrup
35	10919416	Syrup Pressure Gauge (0-160 psi)	1	Indicates gas pressure to syrup system
37	1716162	Isolation Valve to Carbonator	1	Shuts off gas supply to Carbonator
38	1716162	Gas Isolation Valve	1	Shuts off all gas supply out of CO <sub>2</sub> tank
39	2111282	Pressure Building Regulator (140 psi)	1	Maintains tank pressure
40	10784048	Shutdown regulator (70 psi)	1	Shuts off gas supply to final line regulators if line pressure drops below 70 psi
41	2015179	Tank Pressure Gauge (0-400 psi)	1	Indicates tank pressure
42	17-1788-9	Push Button Reset Valve	1	Allows gas to bypass shutdown regulator
43	10852311	Regulator to Carbonator (90 psi)	1	Regulates gas pressure to Carbonator
44	10919416	Pressure Gauge (0-160 psi)	1	Indicates gas pressure to the Carbonator
45	1811502	Relief Check Valve (130 psi)	1	Protects the beverage system
46	1811799	Syrup System Relief Valve (75 psi)	1	Protects bulk syrup tanks from over-pressurization
47	1716311	1/4" FPT Check Valve	1	Prevents water or syrup from entering bulk CO <sub>2</sub> tank

# MCDST 400PB FILL BOX ASSEMBLY





## MCDST 400PB FILL BOX & LIQUID LEVEL GAUGE COMPONENTS



ITEM	PART NO.	DESCRIPTION	QTY	FUNCTION
1	9722329	Complete surface mounted fill box	1	Houses connections to fill & vent bulk CO2 tank & pressurize bulk syrup delivery tanks
2	8506711	Outer Fill Box (shell only)	1	
3	4311129	Lock & Key	1	Locks fill box door
4	1312491	3/4" Male QC - Fill Connector	1	Connection for CO2 Delivery Hose to fill bulk CO2 tank
5	6511631	2-pin Connector	1	For syrup pressure line connection
6	1611851	Elbow 3/8" hose - vent	1	For CO2 tank vent line
7	1213511	Elbow 1/4" hose - vent	1	For Bulk Syrup tank vent line
8	4710619	O-Ring (2-pin)	1	Seals the 2-pin
9	2910151	Machine Screw	6	Secures fill fitting to fill box
10	2915131	Locknut	6	Secures fill fitting to fill box
11	1111182	Connector - 5/8" flare x 3/4" MPT (brass)	1	Connects fill hose to back of fill box
12	10967827	CO2 fill hose - 15 feet long	1	Connects tank to fill box for refilling
13	2811726	CO2 tank vent line - 15 feet long	1	Vents CO2 tank outdoors
14	2811616	Syrup tank vent line	1	Vents bulk syrup tanks outdoors
15	3411331	3/8" Hose clamp	2	Secures CO2 vent line to fill box
16	3411511	1/4" Hose clamp	2	Secures syrup vent line to fill box
17	9094129	Liquid Level Gauge Float assembly	1	Floats at CO2 liquid level
18	5411012	Adjusting Collar	1	Allows adjustment of spring
19	5411029	Spring	1	Holds float rod at zero point
20	2300059	O-ring	1	Seals gauge assembly
21	5410992	Level Gauge Plug	1	
22	10591422	Liquid Level Gauge	1	Displays contents of CO2 tank
23	5411486	Liquid Level Gauge Protector	1	Protects liquid level gauge

## TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
No CO <sub>2</sub> to the Carbonator, or carbonated drinks or water are flat.	Bulk CO <sub>2</sub> tank empty.	<ol style="list-style-type: none"> <li>1. Switch to emergency CO<sub>2</sub> gas cylinder.</li> <li>2. Call CO<sub>2</sub> supplier for delivery.</li> </ol>
	Isolation valve (#36 or 37 p.6) to final line regulator is closed.	<ol style="list-style-type: none"> <li>1. Open valve or valves as needed. Valve handles should be parallel with the line.</li> </ol>
	Tank pressure (#41 p.6) is low (110 psi or less).	<ol style="list-style-type: none"> <li>1. Switch to emergency CO<sub>2</sub> gas cylinder.</li> <li>2. Discontinue CO<sub>2</sub> use from the bulk tank to Carbonator.</li> <li>3. If tank pressure fails to rebuild see problem section for low tank pressure.</li> </ol>
	Pressure Building Regulator (#39 p.6.) not operating properly.	<ol style="list-style-type: none"> <li>1. Check isolation valves (#33 &amp; 38 p.6) to make sure lines are open. Valve handles should be parallel with the line.</li> <li>2. Regulator is set too low, is plugged, or faulty. Call CO<sub>2</sub> service agent.</li> </ol>
	CO <sub>2</sub> leak between tank and Carbonator or CO <sub>2</sub> fill box.	<ol style="list-style-type: none"> <li>1. See "Safety Precautions" p.3.</li> <li>2. Locate leak &amp; correct if possible.</li> <li>3. Call CO<sub>2</sub> service agent.</li> </ol>
	Shut-down regulator (#40 p.6) closed or activated, but tank pressure still above 110 psi	<ol style="list-style-type: none"> <li>1. Press push-button reset valve (#42 p.6) to reopen shut-down regulator</li> <li>2. Check for leaks in CO<sub>2</sub> plumbing and lines &amp; correct if possible.</li> <li>3. If regulator closes, switch to emergency CO<sub>2</sub> supply &amp; call CO<sub>2</sub> service agent</li> <li>4. NEVER tape or tie push-button reset valve in open position. This may cause the CO<sub>2</sub> to turn to dry ice</li> </ol>
	Unknown	<ol style="list-style-type: none"> <li>1. Call CO<sub>2</sub> service agent.</li> </ol>
Frost on the side of the tank.	A normal condition during or following CO <sub>2</sub> use.	NONE
	CO <sub>2</sub> leak in gas supply lines, beverage system, shake machine and/or CO <sub>2</sub> fill box. (Spiral or circular frost pattern appears on tank during extended periods when no CO <sub>2</sub> has been used.)	<ol style="list-style-type: none"> <li>1. Check for frost in the morning before any CO<sub>2</sub> has been used. If frost is present locate and correct leak. See "Safety Precautions"</li> <li>2. Call appropriate service agent if needed.</li> </ol>

## TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Frost on the top of the tank.	Normal condition during periods of CO <sub>2</sub> use.	NONE
	CO <sub>2</sub> leak from tank plumbing, CO <sub>2</sub> fill box, tank safety system and/or beverage system. (Frost is present after extended periods with no CO <sub>2</sub> use.)	<ol style="list-style-type: none"> <li>1. Check for frost in the morning prior to any CO<sub>2</sub> use &amp; other indicators, such as: high CO<sub>2</sub> usage, frost on sides of the tank, low tank pressure, etc. "See Safety Precautions"</li> <li>2. Locate &amp; correct leak if possible.</li> <li>3. Call appropriate service agent.</li> </ol>
High CO <sub>2</sub> usage.	Increase in beverage sales or use.	NONE
	Air/CO <sub>2</sub> switch on the beverage machine is set on "CO <sub>2</sub> ".	<ol style="list-style-type: none"> <li>1. Switch beverage machine switch back to "Air" if possible.</li> </ol>
	CO <sub>2</sub> leak in tank plumbing, CO <sub>2</sub> fill box, gas lines, shake machine, and/or beverage machine.	<ol style="list-style-type: none"> <li>1. See "Safety Precautions" p.3.</li> <li>2. Locate leak &amp; correct if possible.</li> <li>3. Call appropriate CO<sub>2</sub> or beverage equipment service agent.</li> </ol>
	Weak vacuum in tank insulation space. (Tank pressure is always high ).	<ol style="list-style-type: none"> <li>1. Check for other signs, such as: continuous tank frost or condensation &amp; high tank pressure.</li> <li>2. Call CO<sub>2</sub> supplier/service agent.</li> </ol>
	Error in CO <sub>2</sub> delivery or supplier invoice.	<ol style="list-style-type: none"> <li>1. Check CO<sub>2</sub> use pattern against supplier invoices.</li> <li>2. Call CO<sub>2</sub> supplier.</li> </ol>
CO <sub>2</sub> tank will not fill.	Brass fill connection in CO <sub>2</sub> fill box and/or on truck's delivery hose is faulty.	<ol style="list-style-type: none"> <li>1. Consult with CO<sub>2</sub> supplier &amp;/or service agent.</li> <li>2. Replace brass connection if needed.</li> </ol>
	CO <sub>2</sub> tank is already full.	NONE
	CO <sub>2</sub> fill valve (#30 p.6) is closed.	<ol style="list-style-type: none"> <li>1. Open CO<sub>2</sub> fill valve (#30 p.6).</li> </ol>
	Pressure differential between store tank and delivery tank is too small. (At start of fill, store tank pressure should be 125 - 150 psi and delivery tank should be 275 - 300 psi.)	<ol style="list-style-type: none"> <li>1. Ask driver to verify delivery tank pressure is at least 275 psi.</li> <li>2. Check store tank pressure (#41 p.6) to verify it is 125 -150 psi.</li> <li>3. Ask driver to vent store tank to lower pressure to complete fill.</li> <li>4. NEVER vent tank pressure to less than 150 psi.</li> </ol>
	Delivery tank is empty.	<ol style="list-style-type: none"> <li>1. Ask driver to make another delivery.</li> </ol>
	Truck delivery hose is obstructed, e.g. vehicle stopped on hose.	<ol style="list-style-type: none"> <li>1. Clear obstruction or wait until obstruction clears.</li> </ol>

## TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Routinely low tank pressure (#41 p.6 below 125 psi).	Bulk CO <sub>2</sub> tank empty.	<ol style="list-style-type: none"> <li>1. Switch to emergency CO<sub>2</sub> gas cylinder.</li> <li>2. Call CO<sub>2</sub> supplier for delivery.</li> </ol>
	Pressure control (pressure builder - #39 p.6) regulator operating at too low a pressure.	<ol style="list-style-type: none"> <li>1. Call CO<sub>2</sub> service agent.</li> </ol>
	CO <sub>2</sub> leak from tank plumbing, CO <sub>2</sub> fill box and/or tank safety system.	<ol style="list-style-type: none"> <li>1. See "Safety Precautions" p.3.</li> <li>2. Call CO<sub>2</sub> service agent.</li> </ol>
	Shut-down regulator (#40 p.6) closed	<ol style="list-style-type: none"> <li>1. Press push-button reset valve (#42 p.6) to reopen shut-down regulator</li> <li>2. Check for leaks in CO<sub>2</sub> plumbing and lines &amp; correct if possible.</li> <li>3. If regulator closes, switch to emergency CO<sub>2</sub> supply &amp; call CO<sub>2</sub> service agent</li> <li>4. NEVER tape or tie push-button reset valve in open position. This may cause the CO<sub>2</sub> to turn to dry ice</li> </ol>
	Unknown.	<ol style="list-style-type: none"> <li>5. Call CO<sub>2</sub> service agent.</li> </ol>
High tank pressure (#41 p.6) Routinely over 250 psi.	Normal condition for 1 or 2 days following a CO <sub>2</sub> delivery.	NONE
	Normal when little or no CO <sub>2</sub> is used.	NONE
	Pressure control (pressure builder) regulator operating at too high a pressure.	<ol style="list-style-type: none"> <li>1. Call CO<sub>2</sub> service agent.</li> </ol>
	Tank has a weak vacuum.	<ol style="list-style-type: none"> <li>1. Call CO<sub>2</sub> service agent.</li> </ol>
Evidence of gas leaking or sounds of hissing.	Normal for short periods of time from some regulators and relief valves.	<ol style="list-style-type: none"> <li>1. See "Safety Precautions" p.3.</li> <li>2. Observe leak, if it is not large and does not last long or occur frequently, no action needed.</li> <li>2. If above combined conditions do not exist, call CO<sub>2</sub> service agent. See "Safety Precautions" p.3.</li> </ol>
	Large leaks, leaks from elsewhere in the system, sustained leaks, or frequent leaks are <u>not</u> normal.	<ol style="list-style-type: none"> <li>1. See "Safety Precautions" p.3.</li> <li>2. Evacuate all personnel from affected areas and ventilate area of leak before returning.</li> <li>3. Call CO<sub>2</sub> service agent.</li> </ol>

## TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Carbonator pressure gauge (#44 p.6) and/or syrup pressure gauge (#35 p.6) are below 90 and 65 psi respectively	Carbonator regulator (#43 p.6) and/or syrup regulator (#34 p.6) intentionally set lower by beverage service agent.	NONE
	Carbonator regulator (#43 p. 6) and/or syrup regulator (#34 p. 6) not operating in proper pressure range.	1. Call CO <sub>2</sub> service agent.
	Carbonator pressure gauge (#44 p. 6) and/or syrup pressure gauge (#35 p.6) damaged or faulty.	1. Call CO <sub>2</sub> service agent.
	One or more of the causes listed in "no CO <sub>2</sub> " or "flat drinks" problem section.	1. See problem section above regarding "no CO <sub>2</sub> ", "flat drinks", etc. 2. Call CO <sub>2</sub> service agent.
Fill Box Door won't close, lock or open.	Wrong Key	1. Verify key is correct and retry, or order new key.
	Lock Dirty or Damaged	1. Clean and oil lock, and retry 2. Replace lock if necessary
Quick Coupler (#4 p.8) in CO <sub>2</sub> fill box leaks.	Particle of Ice or debris caught in fill valve poppet.	1. If driver is still on site, reconnect CO <sub>2</sub> delivery hose and disconnect. 2. If driver not available, carefully press poppet with dull instrument to try to reset. 3. If leak continues after line warms up, close the tank fill valve (#30 p.6) and call service agent.
	Coupler is defective, or sealing surface is worn due to normal wear and tear.	1. Contact CO <sub>2</sub> service agent to replace fitting.
Quick Coupler threads are worn or stripped.	Cross threading the coupler with the CO <sub>2</sub> delivery hose coupler.	1. Contact CO <sub>2</sub> service agent to replace fitting.
Two-Pin Connector (#5 p. 8) in fill box leaks.	Fitting is loose.	1. Tighten fitting.
	O-ring (#8 p.8) is missing or damaged  Poppet not properly sealed.	2. Close isolation valve to syrup side (#36 p.6) 3. Call CO <sub>2</sub> service agent for repair. 4. Reconnect two-pin disconnect to two-pin on fill box. 5. If fitting still leaks, close isolation valve to syrup side (#36 p.6) and call CO <sub>2</sub> service agent.

## TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
	Defective two-pin.	1. Close isolation valve to syrup side (#36 p.6) and call CO <sub>2</sub> service agent.
CO <sub>2</sub> is venting from fill box.	Normal during a CO <sub>2</sub> delivery, syrup delivery, or syrup sanitizing cycle.	NONE
	Normal for short periods of time if tank pressure is over 300 psi. If tank pressure is consistently over 300 psi, could be sign of a weak tank vacuum.	<ol style="list-style-type: none"> <li>1. NONE if short period of time.</li> <li>2. If the tank pressure is consistently over 300 psi see the section on excessive pressure. Contact your CO<sub>2</sub> service agent.</li> </ol>
	Quick Disconnect is defective.	1. Call CO <sub>2</sub> service agent for repair.
CO <sub>2</sub> is venting from fill box.	Two-pin connector leaks or is defective.	1. See section under two-pin connector for options.
No pressure at two pin connector	Isolation valve (#36 p.6) to syrup side closed	1. Verify valve is open and open if necessary.
	Shut down regulator (#40 p.6) closed.	<ol style="list-style-type: none"> <li>1. Check tank pressure gauge (#41 p.6) for pressure.</li> <li>2. If under 100 psi, contact CO<sub>2</sub> service agent. If over 100 psi, press push-button reset valve (#42 p.6) to reopen shut-down regulator</li> <li>3. Check for leaks in CO<sub>2</sub> plumbing and lines &amp; correct if possible.</li> <li>4. If regulator closes, switch to emergency CO<sub>2</sub> supply &amp; call CO<sub>2</sub> service agent</li> <li>5. NEVER tape or tie push-button reset valve in open position. This may cause the CO<sub>2</sub> to turn to dry ice</li> </ol>
	Bulk CO <sub>2</sub> tank empty.	<ol style="list-style-type: none"> <li>1. Check tank liquid level gauge (#22 p.9) for CO<sub>2</sub></li> <li>2. If low, call CO<sub>2</sub> supplier for fill.</li> </ol>

## ORDERING PARTS/SERVICE

For parts and service contact your local authorized MVE equipment service agent. To ensure prompt processing of your order, list each item separately, taking care to specify the quantity, the MVE part number, and the description of each item ordered.

To contact MVE for the names of local authorized service agents, technical support or information about parts, service, equipment, or procedures or to order parts, contact:

MVE, Inc.  
3505 County Road 42 West  
Burnsville, MN 55306-3803 USA  
Telephone: 800-253-1769  
952-882-5000  
Facsimile: 952-882-5185

## NON-SCHEDULED MAINTENANCE

1. MVE recommends that every owner of this equipment perform the recommended daily inspection checklist (page 4) to become familiar with the MCDST bulk CO<sub>2</sub> system and to recognize any potential equipment problems. Contact your local CO<sub>2</sub> service agent for repair if any abnormal situations arise.
2. MVE also recommends that a thorough preventative maintenance check is performed on the MCDST system by an authorized MVE service agent once every two years. This should be done to ensure safe and optimal performance of the system.
3. The MCDST bulk CO<sub>2</sub> tanks have no user serviceable parts. Call an authorized service agent for all work.

**NOTE:** Any attempt to service this equipment by any unauthorized person will void the warranty.

### Installation Information

Date System Installed: \_\_\_\_\_

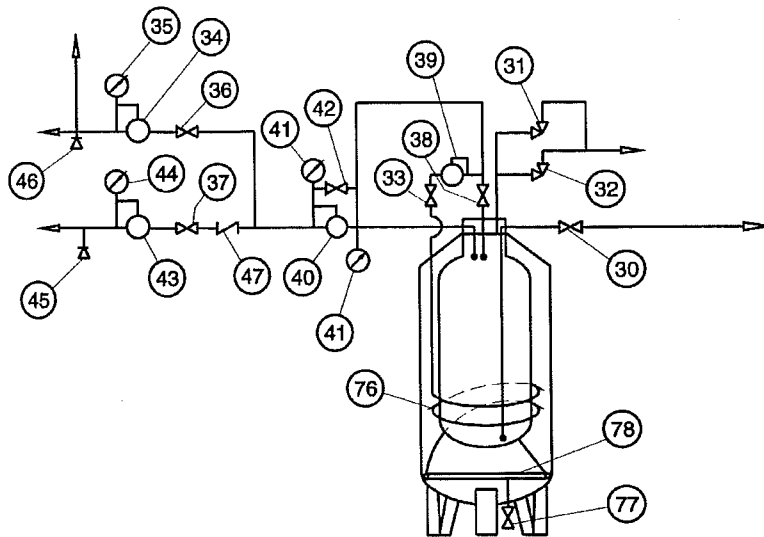
Installation Company: \_\_\_\_\_

Serial Number of Bulk CO<sub>2</sub> Tank (data plate on tank) \_\_\_\_\_

### Local Service Companies

	<u>Primary</u>	<u>Alternate</u>
Company Name:	_____	_____
Contact Person:	_____	_____
Address:	_____	
Telephone / Fax Numbers:	_____	

# MCDST 400PB FLOW SCHEMATIC



ITEM	DESCRIPTION	FUNCTION
30	Liquid Fill Isolation Valve	Isolates tank pressure to CO <sub>2</sub> fill box
31	Secondary Relief Valve (450 psi)	Prevents tank pressure from exceeding 450 psi
32	Relief Valve (300 psi)	Safety valve that prevents tank pressure from exceeding 300 psi
33	Pressure Builder Isolation Valve	Isolates pressure builder for service
34	Syrup Pressure Regulator (65 psi)	Supplies pressure to bulk syrup
35	Syrup Pressure Gauge (0-160 psi)	Indicates gas pressure to syrup system
37	Isolation Valve to Carbonator	Shuts off gas supply to Carbonator
38	Gas Isolation Valve	Shuts off all gas supply out of CO <sub>2</sub> tank
39	Pressure Building Regulator (140 psi)	Maintains tank pressure
40	Shutdown regulator (70 psi)	Shuts off gas supply to final line regulators if line pressure drops below 70 psi
41	Tank Pressure Gauge (0-400 psi)	Indicates tank pressure
42	Push Button Reset Valve	Allows gas to by-pass the shutdown regulator
43	Regulator to Carbonator (90 psi)	Regulates gas pressure to Carbonator
44	Pressure Gauge (0-160 psi)	Indicates gas pressure to the Carbonator
45	Relief Check Valve (130 psi)	Protects the beverage system
46	Syrup System Relief Valve (75 psi)	Protects bulk syrup tanks from over-pressurization
47	Check Valve	Prevents water from Carbonator from backing up into Bulk CO <sub>2</sub> tank
76	Pressure building Coil	Maintains tank pressure by converting liquid CO <sub>2</sub> into gas
77	Collection ring drain valve	Used to purge oil and residue from collection ring
78	Collection ring	Holds residue from CO <sub>2</sub> to prevent build-up in system

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 Phone: 800-253-1769 ♦ 952-882-5000 Fax: 952-882-5185