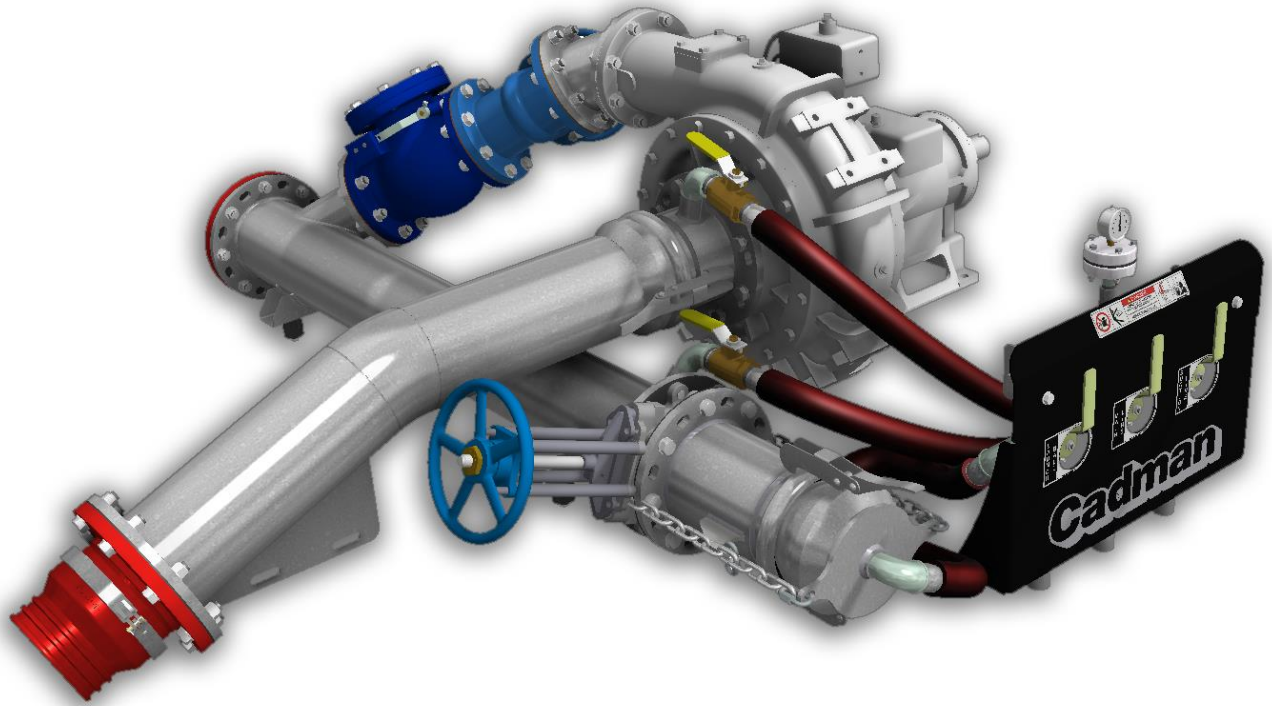


# 6 IN. BALL LAUNCHER Pumper's Trailer Mounted



**OPERATOR'S PARTS and MAINTENANCE MANUAL  
2014 EDITION**

**Cadman**  
**POWER EQUIPMENT**

*Limited*

AGRICULTURAL MACHINERY & IRRIGATION EQUIPMENT

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**BL-MAN-6PT**

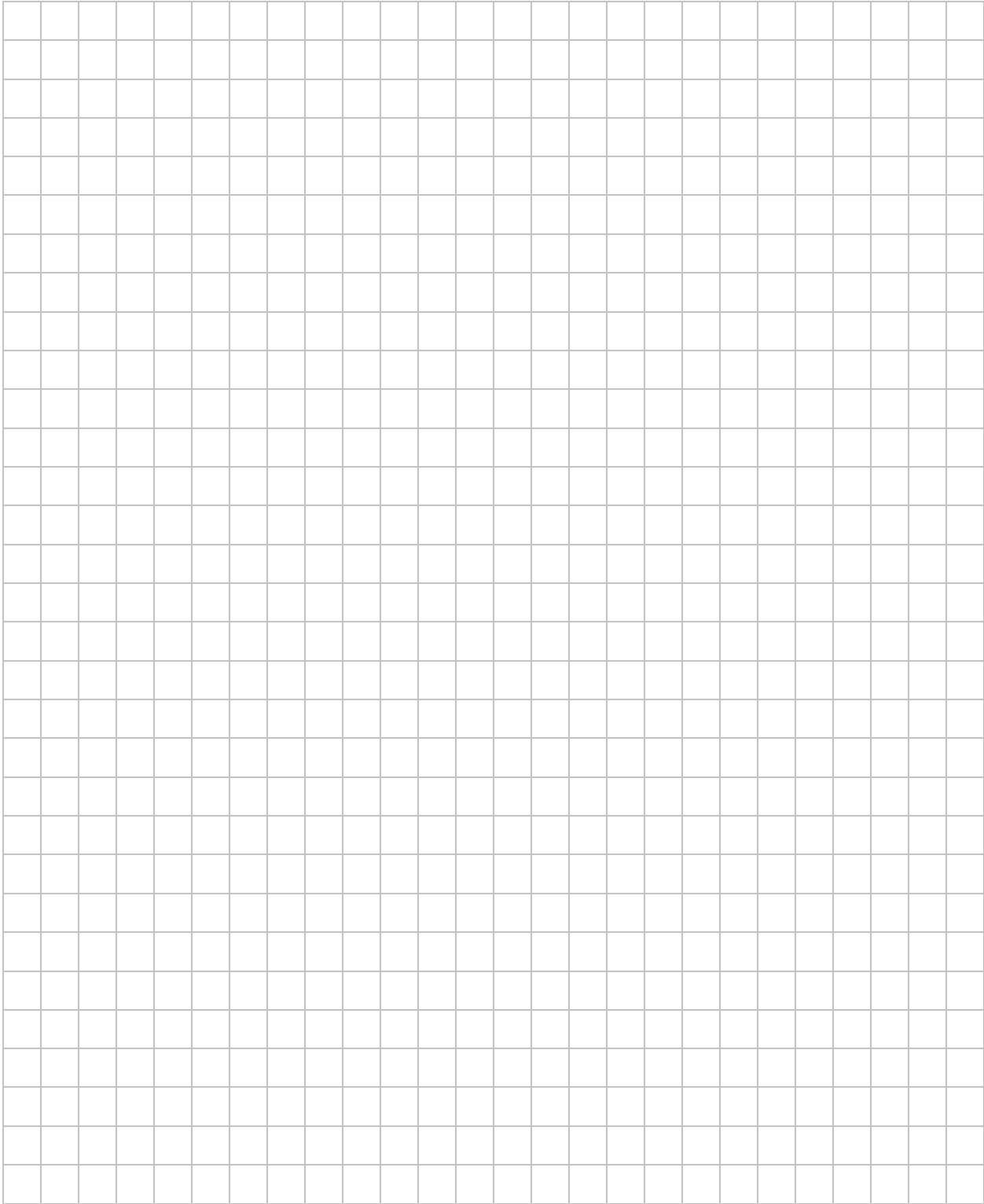




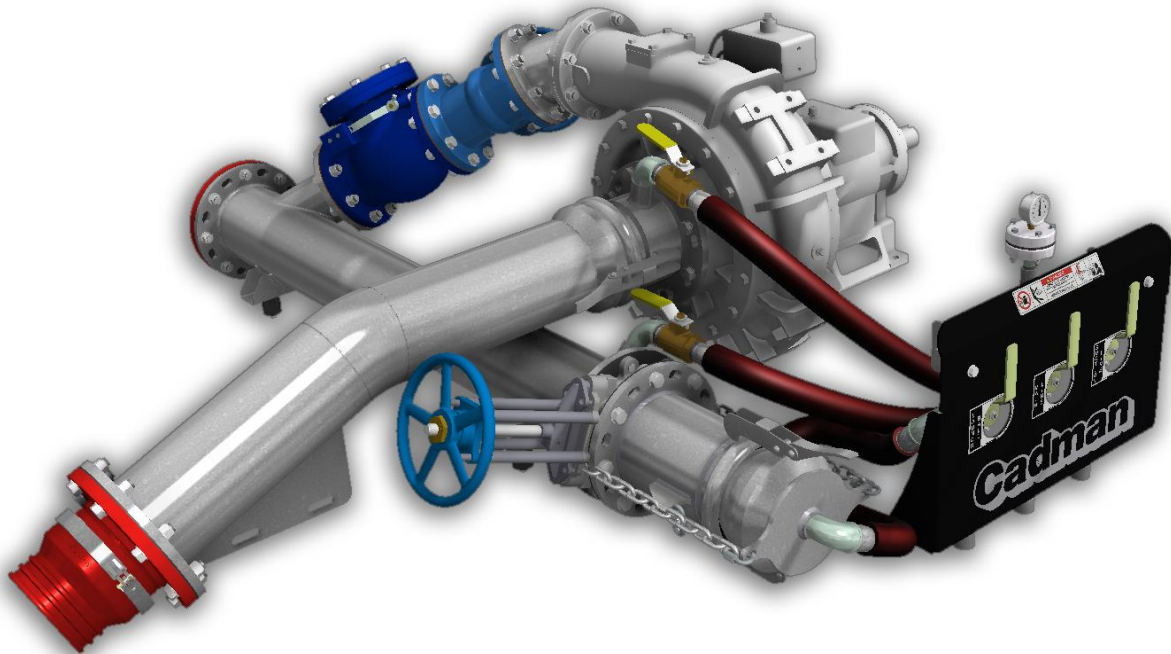
Title	<b>BL-MAN-6PT</b>	Creation	10-March-2006 <i>by</i> Ivon LeBlanc	Revision	10-August-2014 <i>by</i> Ivon LeBlanc
	<b>Clean-out Ball Launcher - 6 IN.</b>				

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## Clean-out Ball Launcher System



*Figure 1 – Typical 6 Inch Clean-out Ball Launcher (Contractor's Trailer)*

*img-01136.png*

This system is intended to purge and clean the fluid distribution mainline by using **LOW** pressure air pushing a purge ball or foam bullet (see Figure 3). This allows for continued spreading while the supply line is being emptied, eliminating the risk of “ponding” of fluid in the field when supply line is disassembled. This in turn will ease the strain and hardship of moving the equipment by eliminating the extra weight of the fluid.

### Safety Note



This symbol, the **safety-alert symbol**, indicates a hazard. When you come across this **safety-alert symbol** in this manual, make certain you fully understand and abide by the given instructions or warnings.



## Exercise Extreme Caution When Working With Compressed Air!

Cadman recommends using a clean-out ball or bullet every time the mainline is purged with air. Using a clean-out ball or bullet minimizes the chance of air being trapped in the fluid (see *Figure 2 below*) and creating an “Air-Fluid-Air” danger.

“Air-Fluid-Air” danger occurs when a clean-out ball or bullet is not used, allowing compressed air to mix with the fluid in the mainline. If air needs to be vented (*to clear a plugged mainline etc.*) the condition illustrated in Figure 2 is likely to occur.

As air is vented at the pump, trapped higher pressure air causes the fluid to move toward the vent. As the pressure drops at the pump (vented) end, the fluid accelerates, pushed along by the trapped air. When the air ahead of the moving fluid is completely expelled, the fast moving fluid will impact the fittings and pump equipment with GREAT force (*often measured in TONS!*). This impact can be very violent, creating conditions which can damage or explode the pumping equipment, putting the operator and spectators in danger of serious injury or death.

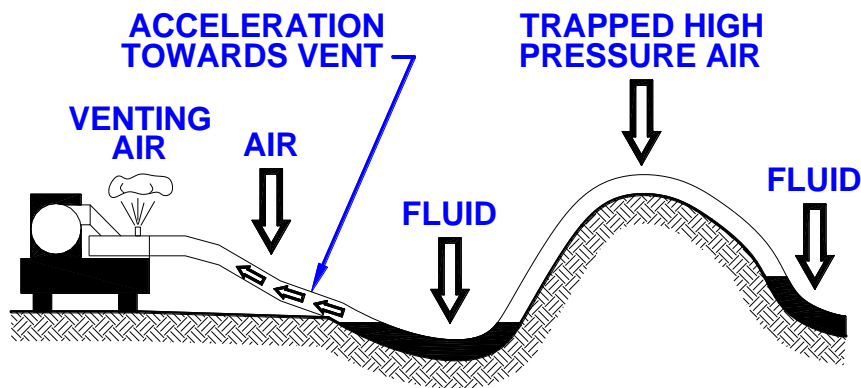


Figure 2 - Air-Fluid-Air Danger

img-00025.wmf

### OPERATOR NOTE

This graphic is exaggerated.

Small inclines to the landscape can cause the same effect. The ball launcher should be set-up on the high side of the field where possible.

If this is not possible take extra care when using the clean-out system.

**THINK  
SAFETY  
FIRST**

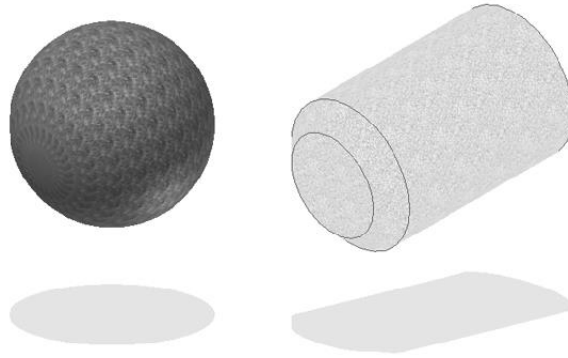


Contained pressure systems will seek equilibrium (balance). When an imbalance exists, movement will occur to restore balance.

**Definitions**

**Clean-out Ball:**

A device used to purge or clean the mainline of a fluid distribution system. This device can take the form of a ball or bullet. See Figure 3.



*Figure 3 - Clean-out Ball and Bullet*

*img-00016.gif*

**Important Note**

Things to keep in mind while using the Clean-out Ball Launcher System are:

- The hose is a high volume “Receiver Tank” containing a large amount of fluid. Be sure to allow enough spreading area to properly distribute the hose contents.

Ø 6” hose contains approximately 1 ½ US Gallons per foot

Ø 8” hose contains approximately 2 ⅔ US Gallons per foot

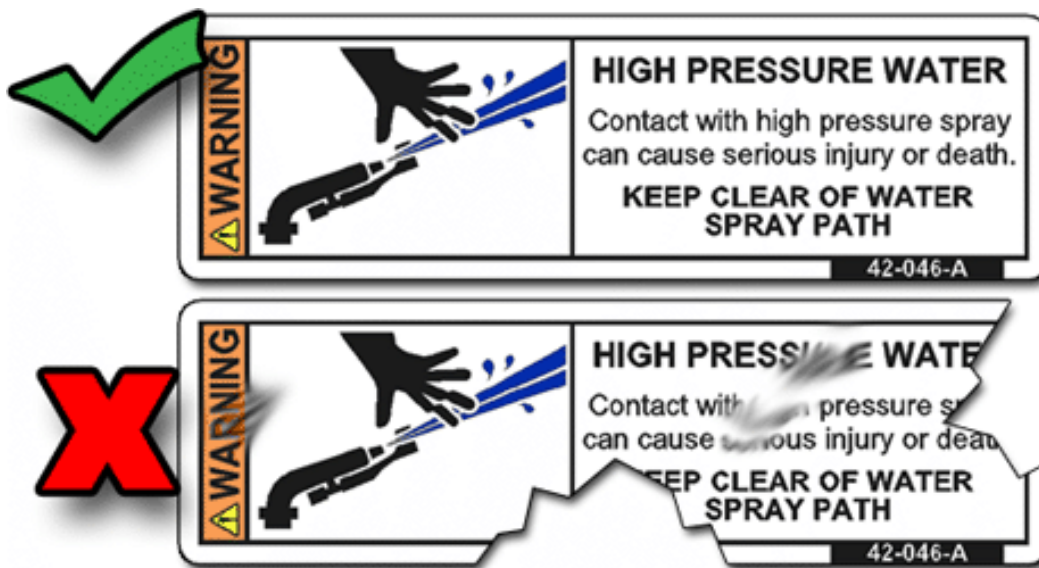
	660	1320	1980	2640	3300	3960	4620	5280	5940	6600	Feet
Ø 6”	969	1939	2908	3877	4847	5816	6785	7755	8724	9693	US Gal
Ø 8”	1723	3447	5170	6893	8616	10340	12063	13786	15509	17233	US Gal

- Hose couplings must be maintained and in good working order. Check for broken or damaged couplings and replace where necessary.
- Air pressure should be kept to the lowest level required to complete the clean-out process. Excess pressure will result in equipment damage and may result in personal injury or death.

## Safety Decals

The safety decals on this machine are intended to warn the operator of potential hazards. It is important that these decals are properly maintained.

- keep all safety decals legible (remove dirt or debris)
- replace any damaged or illegible decals
- replace any missing decals
- if applicable, include the current safety decal specified by **Cadman Power Equipment Limited** on any components installed during repair



*Figure 4 - Replace Decals*

*img-00131-A.png*

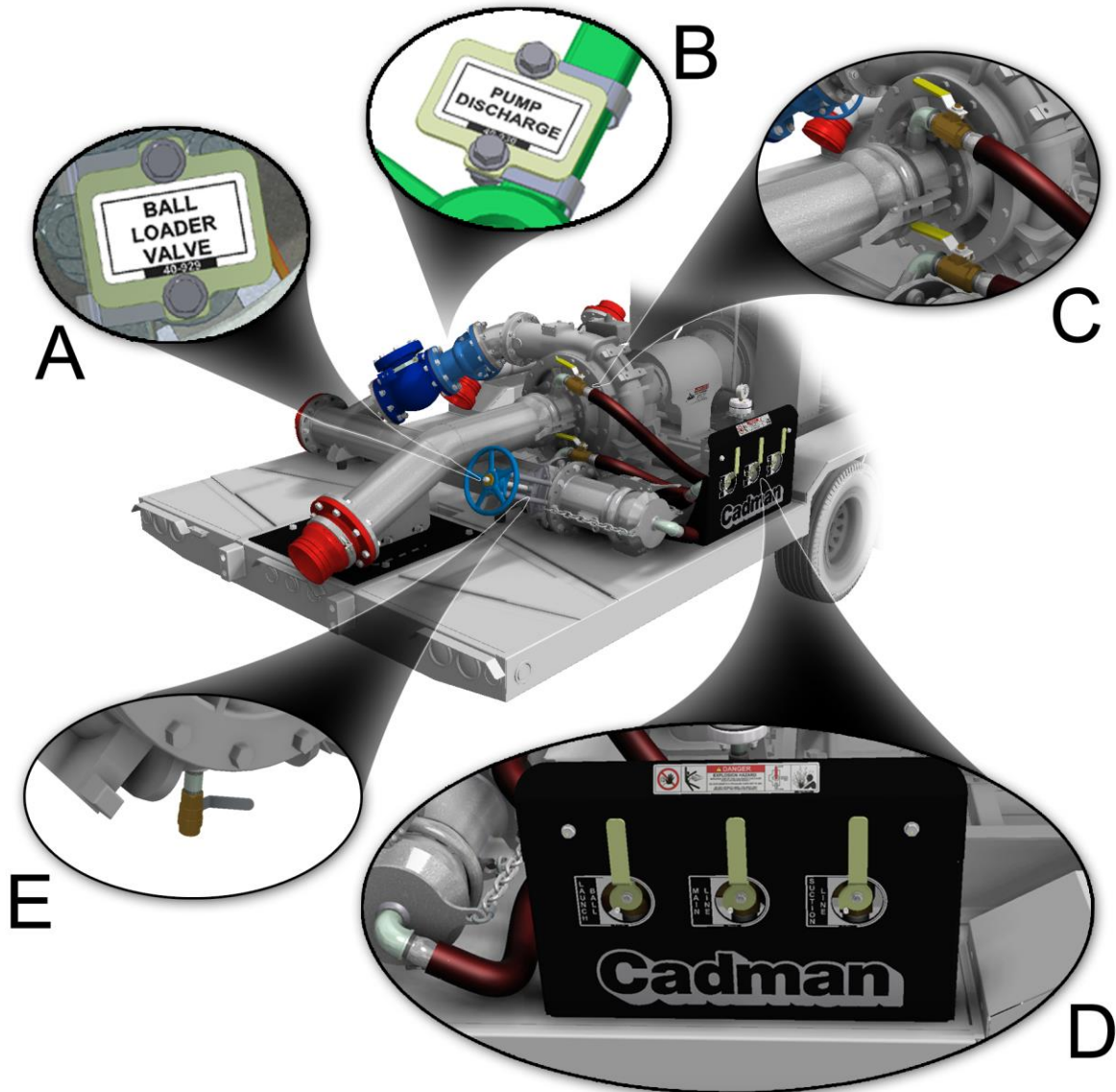
To obtain the required replacement safety decals contact **Cadman Power Equipment Limited**. Re-install all decals in the proper location on the machine. For part numbers and locations please refer to the Assembly drawing of this manual.



## Clean-out Ball Launcher Operation

If the clean-out ball was inserted during the initial set-up (**preferred**), complete the following instructions skipping steps 4 through 5.

In the event the clean-out ball was not loaded into the launcher during initial set-up on site, complete the following instructions to purge the supply line.



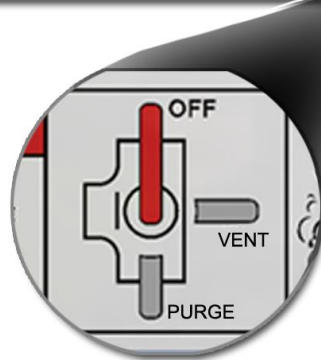
*Figure 5 - Clean-out Ball Launcher Valve Layout*

*img-01135.png*

A) Ball Loader Valve  
B) Pump Discharge

C) Shut-off Valves  
D) Manifold Control Valves

E) Pump Drain



*Figure 6 – Valve Instruction and Warning Label*

*img-01137.png*



**DO NOT stand near the ball launcher cap while system is pressurized. Failure to stay clear or opening ball launcher cap while under pressure can result in serious injury or death.**

## Step 1

Reduce engine speed to idle. Turn off the Submersible Pump (if equipped) at the valve bank.

Open ball valves to allow air into system (see Figure 5 – item C).

### Direct Drive Pump

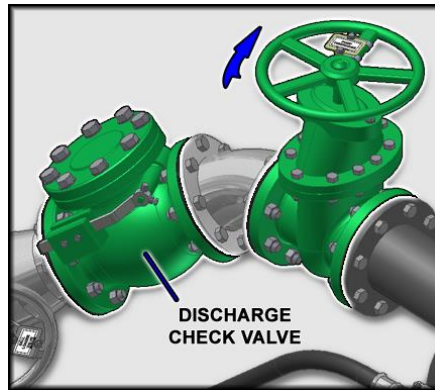
If the main pump is direct drive (no clutch), turn the **SUCTION LINE** valve to the vent position (see Figure 6), then open the ball valve at the bottom on the pump casing (see Figure 5 - item E), allowing the pump contents to drain and preventing heating of the fluid in the pump and potential seal damage. Once the pump is drained close the drain valve (see Figure 5 - item E).

### Clutch Driven Pump

Disengage the clutch to stop Main Pump rotation.

## Step 2

Close the Pump Discharge Valve (see Figure 5 item B).



*Figure 7 - Pump Discharge Valve – Close Wedge Gate Valve*

*img-00147.png*

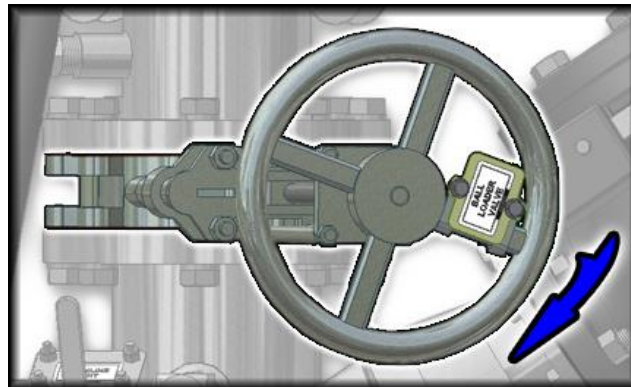
*Cadman Power Equipment Limited recommends installing a discharge check valve on the pump, protecting the pump from exposure to pressurized air.*



**Failure to properly close valve will result in pump damage and can cause serious injury or death. Pump can freely rotate under air pressure acting like a turbine. This will result in damage to the pump and may cause the pump to break apart, putting the operator at risk of serious injury or death.**

## Step 3

Verify the Ball Loader Valve (see Figure 5 item A) is in the closed position.



*Figure 8 - Ball Loader Valve – Close Knife Gate Valve*

*img-00148.png*

### Step 4

Turn ball valve labeled “**LAUNCH BALL**” to the **VENT** (see Figure 6) **BEFORE** attempting to load clean-out ball.

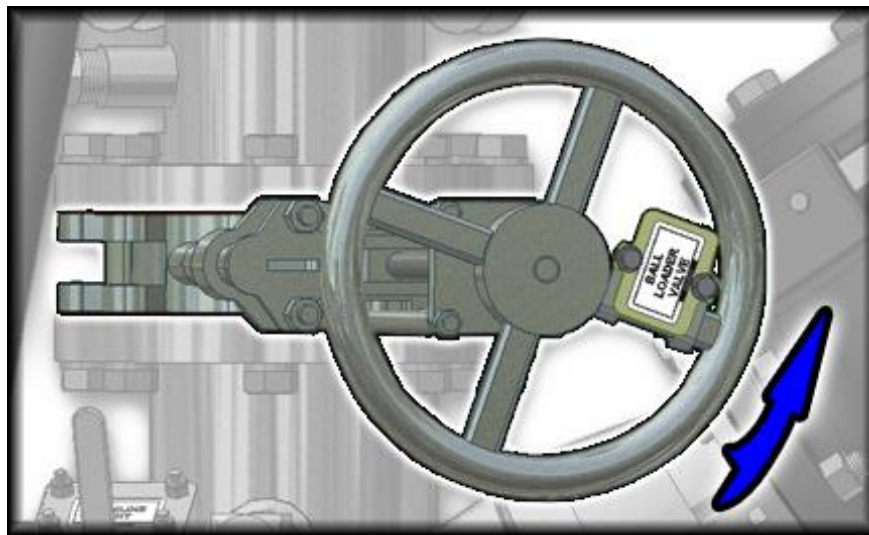


*Figure 9 – Launch Ball Valve – Turn to VENT Position*

*img-01138.png*

### Step 5

Remove Clean-out Ball Loader cap, insert the clean-out ball and **recap** the loader. Open Ball Loader Valve completely (see Figure 5 item A).



*Figure 10 - Ball Loader Valve – Open Knife Gate Valve*

*img-00151.png*

### Step 6

Turn ball valve labeled “**Launch Ball**” to purge position (see Figure 6).



*Figure 11 - Launch Ball Valve – Turn to PURGE Position*

*img-01139.png*

### Step 7

Turn on compressor. Set engine to operate at 1200 – 1500 rpm.

### Step 8

Verify that ball has entered the mainline. Tap the hose and it should have a hollow sound. Do the following in the sequence stated; Turn ball valve labeled “**MAIN LINE**” to **PURGE** (see Figure 5 item D and Figure 6) to divert air to mainline tube, turn ball valve labeled “**LAUNCH BALL**” to the **OFF** position (see Figure 5 item D and Figure 6). Completely close the Ball Loader Valve **IMMEDIATELY!** (see Figure 5 item A)



**Failure to properly close Ball Loader Valve may cause equipment damage with the potential for serious injury or death. In the event of flow reversal, the Ball Loader Valve helps protect the operator from a burst hazard.**

### Step 9

Continue adding air until the Clean-out Ball is past the halfway point in the mainline. Cycle the compressor on and off to add air intermittently until the ball exits the hose. This ensures minimal air pressure remains when the line clears.

### Step 10

Turn off compressor. Reduce engine speed to idle.



### Step 11

Turn ball valve labeled “**MAIN LINE**” to the VENT position (see Figure 6) to relieve remaining air pressure completely **before** uncoupling the mainline hose.



*Figure 12 – Main Line Valve – Turn to VENT Position*

*img-01141.png*

### Step 12

Retrieve ball.

### Step 13

Uncouple mainline hose **ONLY** after **ALL** air pressure has been released.



#### **WARNING**

**An air pressure of only 5 psi generates a force of over 140 lbs on a 6 inch mainline!**

## Clean-out Suction Line

To clean-out the suction line of the pumping unit complete the following steps.

### Step 1

Reduce engine speed to idle. Turn off the Submersible Pump (if equipped) at the valve bank.

#### Direct Drive Pump (no clutch)

**IMPORTANT:** Prior to extended clean-out operations, you **must** drain the pump of fluid. Open the ball valve at the bottom of the pump casing (see Figure 5 item E), allowing the contents to drain. Once all fluid has been drained close the ball valve. This will prevent the heating of the fluid in the pump and potential seal damage.

#### Clutch Driven Pump

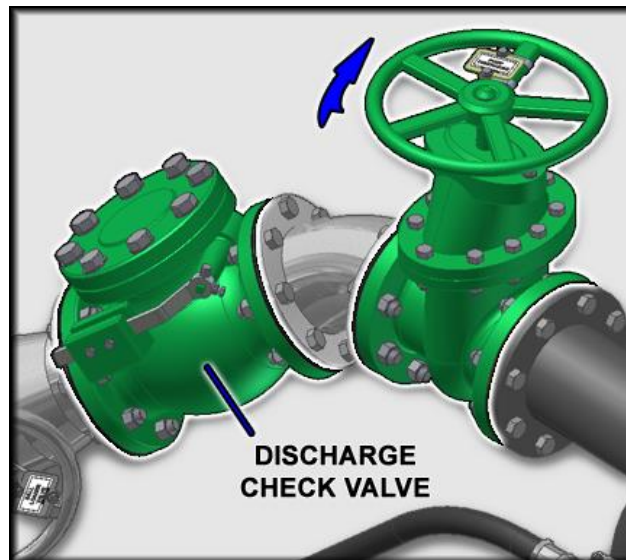
Disengage the clutch to stop Main Pump rotation.

### Step 2

Close the Pump Discharge Valve (see Figure 5 item B) at pump discharge.



**Failure to properly close valve will result in pump damage and can cause serious injury or death. Pump can freely rotate under air pressure acting like a turbine. This will result in damage to the pump and may cause the pump to break apart, putting the operator at risk of serious injury or death.**



*Figure 13 - Pump Discharge Valve – Close Wedge Gate Valve*

*img-00147.png*

### Step 3

Turn ball valve labeled “**SUCTION LINE**” to the **PURGE** (see Figure 5 item D) to divert air to suction line.



*Figure 14 - Suction Line – Turn to PURGE Position*

*img-01142.png*

### Step 4

Turn on compressor. Set engine to operate at 1200 – 1500 rpm.

### Step 5

Allow time for liquid to be purged from suction line.

### Step 6

Turn off compressor. Reduce engine speed to idle.



### Step 7

Turn ball valve labeled “**SUCTION LINE**” to vent position (see Figure 6) to allow all air pressure to be released **before** uncoupling the suction hose.



*Figure 15 – Suction Line – Turn to VENT Position*

*img-01143.png*

### Step 8

Uncouple suction line hose **ONLY** after **ALL** air pressure has been released.



#### **WARNING**

**An air pressure of only 5 psi generates a force of over 140 lbs on a 6 inch mainline!**

## Required Maintenance

Prevention of mechanical failure is the goal of any good maintenance schedule. The secret to preventing unwanted down time is to adhere to a maintenance schedule suited to the way you use the equipment. Your maintenance schedule should include the following minimum requirements:



**Maintenance must be done ONLY when the machine is shut down and is in a non-loaded condition. This means that no fluid is being pumped through the system. All system pressure must be discharged prior to any maintenance operation is performed.**

### Each Use


Maintenance Item	Figure	Procedure
Visually inspect equipment	N / A	Walk around the unit and inspect for loose, missing or damaged items. Check the condition of the ball loader plug, hoses and valves. Replace missing or damaged items and tighten loosened items.
Check knife gate valve for leaks	Figure 16	Leakage may occur around the valve gland. Tighten all gland nuts by a quarter turn to stop the leakage. Repeat until leakage has stopped.  <b>DO NOT over tighten these gland nuts. By over tightening you will damage the valve seal.</b>
Check for leaks	N / A	Tighten all joints where leaks appear. Replace any damaged gaskets where required.

Table 1 - Required Maintenance - Each Use

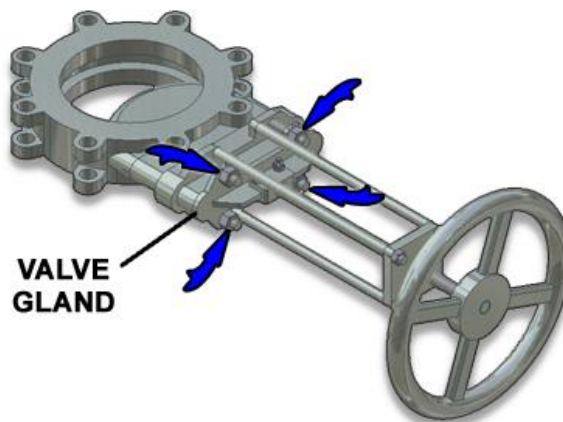


Figure 16 - Knife Gate Valve

img-00158.png

## Before Storing



You **MUST** properly empty and flush your Clean-out Ball Launching System before storing the unit for more than one day. Failure to properly clean out the system could result in the unit being plugged with sediment.

Maintenance Item	Figure	Procedure
Clean the system	N / A	Flush with water prior to storage of the unit. This will remove sediment and prevent clogging the unit. Wash down the exterior to remove any dirt and debris.
Drain unit	Figure 17	Before storing the system must be drained. Open all valves to allow the water to drain from the unit.
Lubricate Knife Gate Valve	N / A	Lubricate the center screw with acceptable grease. (see "Lubricants")

Table 2 – Required Maintenance - Before Storing

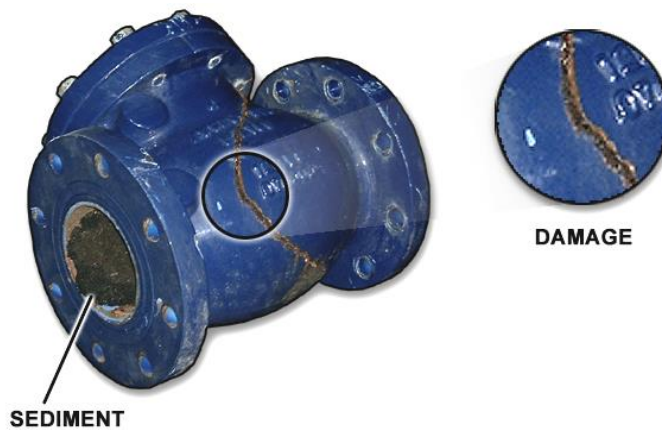


Figure 17 - Valve Damage (result of improper storage)

*img-00159.png*

## ATTENTION

Failure to remove all liquid from the clean-out ball launcher will result in extensive damage to your equipment. Before storing the unit, open all the valves.

**NOTE:**

Proper storage of the **Cadman Clean-out Ball Launcher** will greatly prolong the operational life of the unit.

## Lubricants

**Grease:** Any good grade multi-purpose, waterproof grease is compatible with the greasing requirements of your **Cadman Clean-out Ball Launcher**.



## Useful Information

### LENGTH

<b>1 FOOT</b> = 12	Inches	<b>1 METER</b> = 39.37	Inches
<b>1 ROD</b> = 0.3048	Meter	<b>1 MILE</b> = 3.2808	Feet

### AREA

<b>1 SQUARE FOOT</b> = 144	Square Inches
= 0.0929	Square Meters
<b>1 SQUARE YARD</b> = 1296	Square Inches
= 0.8361	Square Meters
<b>1 SQUARE METER</b> = 1549.4	Square Inches
= 10.764	Square Feet
<b>1 ACRE</b> = 43560	Square Feet
= 4047	Square Meters
= 0.4047	Hectare
<b>1 HECTARE</b> = 107642.62	Square Feet
= 10000	Square Meters
= 2.47105	Acres
<b>1 SQUARE MILE</b> = 640	Acres
= 259	Hectares

### VOLUME

<b>1 GALLON ( US )</b> = 0.8327	Imperial Gallons
= 231	Cubic Inches
= 0.1337	Cubic Feet
= 8.345	Pounds
<b>1 CUBIC FOOT</b> = 1728	Cubic Inches
= 7.48	Gallons ( US )
= 62.4	Pounds
= 28.32	Liters
<b>1 ACRE INCH</b> = 27154	Gallons ( US )
= 254	Cubic Meters / Hectare

**AREA OF A CIRCLE** = Diameter x Diameter x 0.7854

**CYLINDER VOLUME (US GAL.)** = Diameter (ft.) x Diameter (ft.) x Length (ft.) x 5.8748