# Walking Beam Plunger Pumps

***Proudly Manufactured in the United States of America***

**MODELS WB4 & WB8**

**Sidewinder's Walking Beam Pumps** are designed specifically for operation on a beam pumped oil well. They are positive displacement type pumps powered by direct connection to the movement of the larger site pump, via a provided steel cable or other customer provided means. The upstroke of the beam pump generates a downstroke on the Sidewinder WB4 or WB8 pump, then on the beam pump's downstroke, the Sidewinder pump performs the suction part of its cycle as it returns to its non-pumping position. Sidewinder's Walking Beam Pump mechanism is based off of our standard pneumatic pump line, and is mounted to a metal base that supports the pump and provides a female NPT connection for the suction feed line. The pump utilizes uniseal plunger seals that are oil lubricated and easy to access when replacement is necessary.

## SUGGESTED INSTALLATION & OPERATING INSTRUCTIONS

*See Parts List (page 2), Setup Diagram (page 4), & Mounting Instructions (page 6)*

1) THE SITE'S BEAM PUMP MUST BE OFF, NOT MOVING BEFORE ANY CONNECTIONS TO IT ARE ATTEMPTED!!!

2)When installing pump, manufacturer recommends the use of 316SS tubing rated for the maximum discharge pressure of the specific pump model being used. DO NOT USE poly tubing, copper tubing, or seamed tubing as a discharge line. Use of incorrect material may result in discharge line failure leading to personal injury, death, and/or compromise to the injection objectives. For Safety Purposes and Good Engineering Practice, manufacturer recommends placement of a properly sized Pressure Relief Valve (PRV) / Pressure Safety Valve (PSV) on the pump discharge line at the pump, with the relief line plumbed back to the chemical tank (#7).

3) Install pump setting gauge (#3) onto chemical tank (#1), with an isolation ball valve (#2) between tank and gauge.

4) Install pump with suction filter (#4) with a second isolation ball valve (#2) between pump and pump setting gauge (#3).

5) Connect discharge line to the ¼ inch NPT discharge check valve. For good safety practice, an in-line check valve (Sidewinder part number LC-4S) (#7) should be installed on the discharge line at the injection point.

6) Open bleeder valve (#20 on the Pump Breakdown) until air is removed from the pump chamber. Isolate pump setting gauge (#3) from tank. Allow the pump arm to move up and down. Then follow the directions on the pump setting gauge to determine flow rate.

7) Adjust output of the pump by limiting the pump stroke length, utilizing (#154 screw & #141 locking nut) the stroke length screw. Turn the screw counter-clockwise to decrease the stroke length, and clockwise to increase the stroke length.

8) Reset the isolation ball valves (#2) so the pump takes chemicals direct from tank (#1) as intended.

## PUMP REPAIR OR EMERGENCY SHUTDOWN INSTRUCTIONS

1) To perform repairs to the pump or to the pump setting gauge, disconnect the pump arm (#144), close both isolation ball valves (#2) between tank (#1) & gauge (#3). Remove component(s) to be repaired. After repair, reinstall component(s). Open the isolation ball valve (#2) between tank (#1) and gauge (#3), check for leaks. Open isolation ball valve (#2) between pump and gauge (#3), check for leaks. Perform steps 5 thru 7 above.

**2) In event of an emergency the following steps are to be done in the following order**

**i) Disconnect the line that moves the pump arm (#144).**

**ii) Close isolation ball valve (#2) between pump setting gauge (#3) and chemical tank (#1)**

**iii) Close isolation ball valve (#2) between pump and pump setting gauge (#3)**

| ITEM NO. | PART NO | DESCRIPTION | WB4 QTY. | WB8 QTY. |
|---|---|---|---|---|
| 7 | 7-42-X-WB | 1/4" PLUNGER ASSEMBLY, WB PUMPS | 1 | - |
| 7 | 7-82-X-WB | 1/2" PLUNGER ASSEMBLY, WB PUMPS | - | 1 |
| 7A | 7A-42 | LOCKNUT, MOUNTING TUBE | 1 | 1 |
| 12 | 12-WB4-SA-X | 1/4" PUMP & MT TUBE ASSY - WB | 1 | - |
| 12 | 12-WB8-SA-X | 1/2" PUMP & MT TUBE ASSY - WB | - | 1 |
| 13A | 13A-42 | VENT PLUG | 1 | 1 |
| 14 | 14-42 | LUBE BODY | 1 | 1 |
| 14A | 14A-42 | LUBE BODY O-RING | 1 | 1 |
| 15 | 15-42 | LUBE BODY NIPPLE, 1/8 MNPT X 2.5L | 1 | 1 |
| 17 | 17-42 | MOUNTING TUBE O-RING | 1 | 1 |
| 18 | 18-42-XX | PLUNGER SEAL, 1/4" SHAFT, TYPE: VARIOUS MATERIALS | 1 | - |
| 18 | 18-82-XX | PLUNGER SEAL, 1/2" SHAFT, TYPE: VARIOUS MATERIALS | - | 1 |
| 20 | 20-42-X | BLEED PLUG, W 1/4" BARBED HOSE CONNECTION | 1 | 1 |
| 22 | 22-42-X-X | SUCTION CHECK ASSEMBLY, 1/4" NPT | 1 | - |
| 22 | 22-82-X-X | SUCTION CHECK ASSEMBLY, 1/2" NPT | - | 1 |
| 23 | 23-42-X-X-X | DISCHARGE CHECK ASSEMBLY, 1/4" NPT | 1 | 1 |
| 92 | 92-42 | 2 OZ. LUBE BOTTLE, FILLED | 1 | 1 |
| 99 | 99-42 | SERIAL NUMBER TAG, VARIOUS MODELS | 1 | 1 |
| 99A | 99A-42 | SCREW NAIL | 4 | 4 |
| 141 | 141-42 | STROKE ADJUSTER LOCKNUT | 1 | 1 |
| 143 | 143-42 | CLEVIS PIN, 1/4" X .75L, 18-8 SS | 2 | 2 |
| 143A | 143A-42 | COTTER PIN, 3/32" X 1/2", 18-8 SS | 4 | 4 |
| 144 | 144-42 | HANDLE, WALKING BEAM PUMP | 1 | 1 |
| 145 | 145-42 | COUNTERWEIGHT, WALKING BEAM PUMPS | 2 | 2 |
| 145B | 145B-42 | CLEVIS PIN, 1/4 Dia. X 2-3/8L, 18-8 SS | 1 | 1 |
| 146 | 146-42 | WIRE ROPE CLAMP | 2 | 2 |
| 147 | 147-42 | PUMP CABLE, 1/8" COATED | 1 | 1 |
| 148 | 148-42 | 1" C-CLAMP, POWDER COATED IRON | 1 | 1 |
| 150 | 150-42 | TURNBUCKLE | 1 | 1 |
| 151 | 151-42 | COLD SHUT CONNECTING LINK | 1 | 1 |
| 152 | 152-42 | LINK, WALKING BEAM PUMP (MODELS WB-4 & WB-8) | 1 | 1 |
| 153 | 153-42 | CLEVIS PIN, 1/4 Dia. X 1-1/2L, 18-8 SS | 1 | 1 |
| 154 | 154-42 | STROKE ADJUSTER SCREW | 1 | 1 |
| 155 | 155-42 | YOKE, WALKING BEAM PUMP (MODELS WB-4 & WB-8) | 1 | 1 |
| 156 | 156-42 | BASE BUSHING, WALKING BEAM PUMP | 1 | - |
| 157 | 157-42 | MOUNTING BASE, WALKING BEAM PUMP | 1 | 1 |

**THEORECTICAL FLUID VOLUME PUMPED**

*Numbers are approximate. To insure accurate flow rates,*
*Sidewinder recommends installation of a Pump Setting Gauge.*

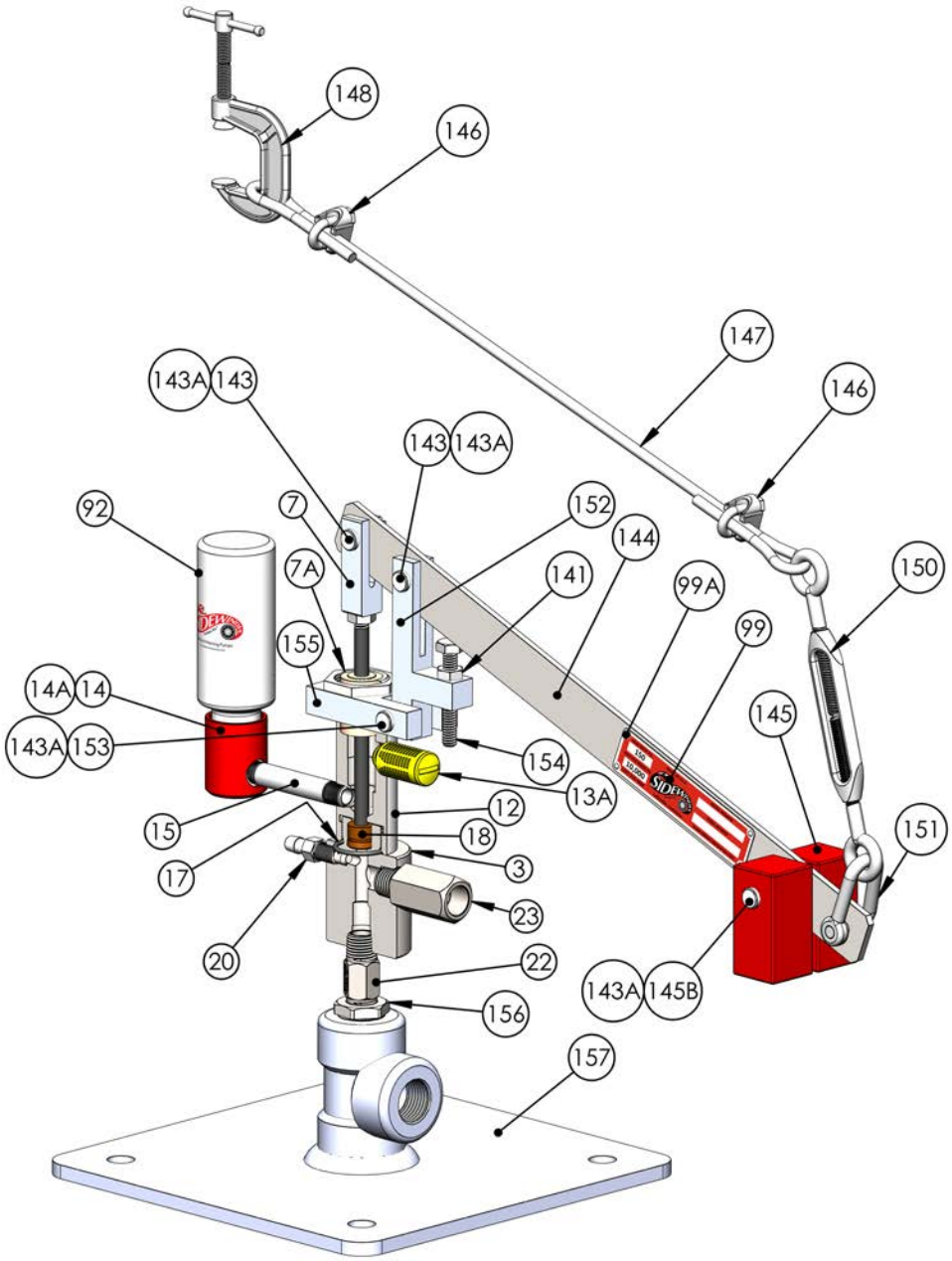
**1/4" Plungers: Quarts/Day = 1.5 x Strokes/Min**

**1/2" Plungers: Quarts/Day = 6.0 x Strokes/Min**

At high pump rates, the volume per stroke will be slightly lower.

**Rule of Thumb**

1/4" Plunger, 1 spm = 1.5 Qt/Day; 1/2" Plunger, 1spm= 6 Qt/Day




ITEM 7 - SEE SELECTION "A" ON SHEET 3 OF 6
ITEMS 12 & 20 - SEE SELECTION "D" ON SHEET 3 OF 6
ITEM 18 - SEE SELECTION "C" ON SHEET 3 OF 6
ITEM 22 - FIRST "X" SEE SELECTION "D" ON SHEET 3 OF 6
SECOND "X" SEE SELECTION "E" AND CHOOSE "4" IF CERAMIC CHECK BALL IS DESIRED
ITEM 23 - FIRST "X" SEE SELECTION "D" ON SHEET 3 OF 6, SECOND "X" SEE SELECTION "C",
THIRD "X" SEE SELECTION "E" AND CHOOSE "4" IF CERAMIC CHECK BALL IS DESIRED.

## SIDEWINDER PNEUMATIC PUMP MODEL NUMBER CHART

WB [A] – [B] [C] [D] – [E]

MODEL SELECTION — MATERIAL SELECTION — OPTIONS

| | | |
|---|---|---|
| **A** | **PLUNGER** | 4 » 1/4" Dia. 8 » 1/2" Dia. |
| **B** | **PLUNGER MATERIAL** | 0 » 17-4 SS (*Standard*)<br>2 » 316 SS<br>3 » 440C SS |
| **C** | **PLUNGER PACKING** | 0 » Teflon Composite Uniseal (*Standard*)<br>1 » Techno Uniseal - Polyimide<br>2 » Viton O-Ring<br>3 » Buna O-Ring<br>4 » Teflon Uniseal<br>4A » Teflon Uniseal w/Aflas O-Ring Insert<br>4B » Teflon Uniseal w/Buna O-Ring Insert<br>4V » Teflon Uniseal w/Viton O-Ring Insert<br>5 » Chemraz O-Ring<br>6 » Hitec O-Ring (*Aflas*)<br>7 » Virgin Teflon O-Ring<br>8 » Polyblend Uniseal<br>8V » Polyblend Uniseal w / Viton Insert<br>9 » Special (*Customer Specified*)<br>EP » ERP O-Ring<br>V » Viton EPT Z-lip / Teflon Carbon Uniseal |
| **D** | **CHECK VALVE AND PUMP CHAMBER MATERIAL** | 2 » 316 SS (*Standard*)<br>5 » Hastelloy<br>6 » Titanium |
| **E** | **OPTIONS** | 4 » Ceramic Check Valve Balls<br>9 » Consult Factory |

**THEORECTICAL FLUID VOLUME PUMPED**

*Numbers are approximate. To insure accurate flow rates,*
*Sidewinder recommends installation of a Pump Setting Gauge.*

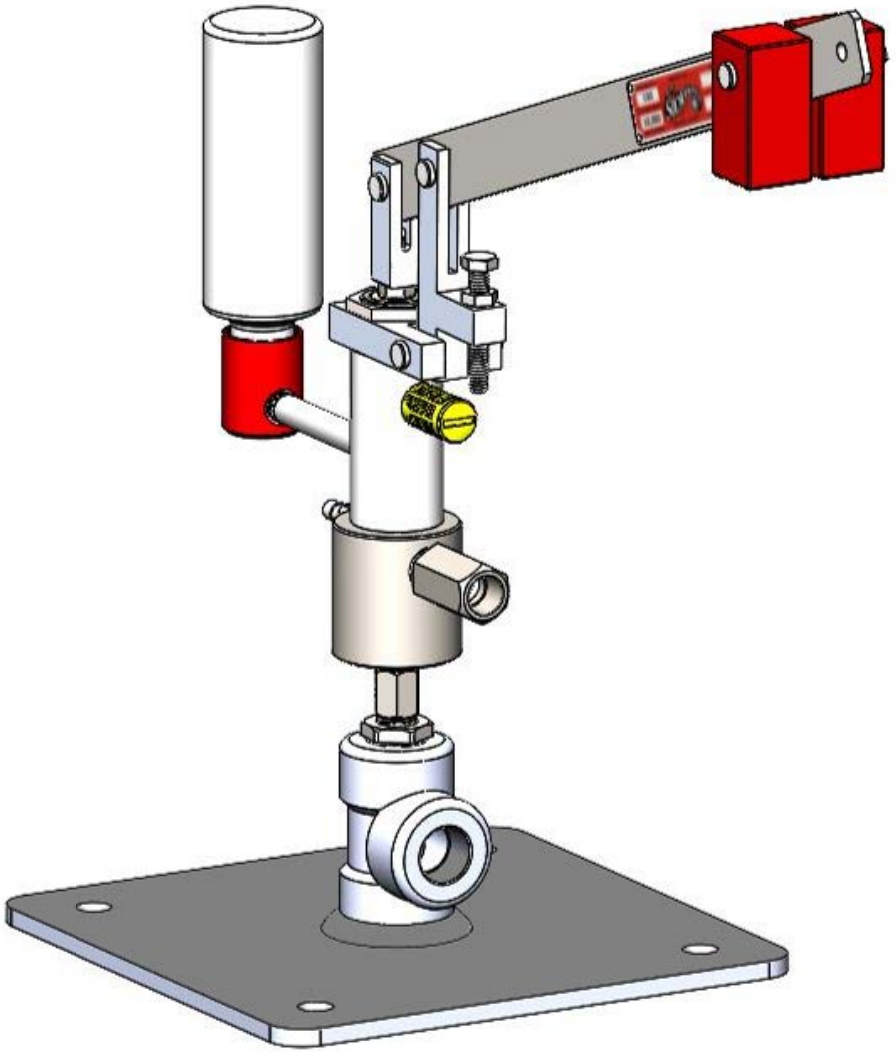
**1/4" Plungers: Quarts/Day = 1.5 x Strokes/Min**

**1/2" Plungers: Quarts/Day = 6.0 x Strokes/Min**

At high pump rates, the volume per stroke will be slightly lower.

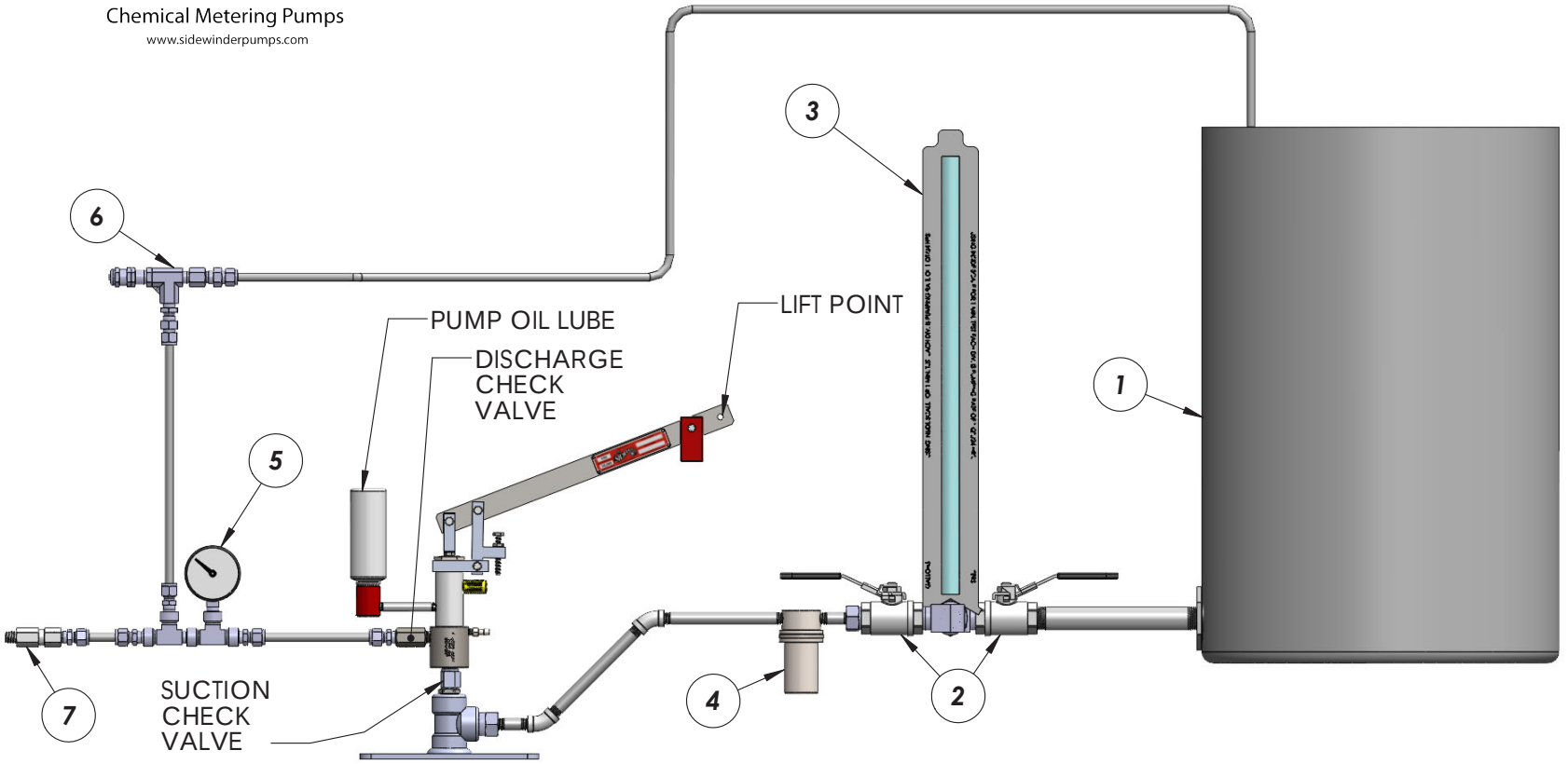
**Rule of Thumb**

1/4" Plunger, 1 spm = 1.5 Qt/Day; 1/2" Plunger, 1spm= 6 Qt/Day



Chemical Metering Pumps
www.sidewinderpumps.com

# Suggested Pump Installation and System Set up




LEGEND

1) CHEMICAL SUPPLY DRUM / TANK
2) BALL VALVES - ISOLATION VALVES FOR SUPPLY TANK
3) PUMP SETTING GAUGE
4) IN-LINE SUCTION FILTER
5) PUMP DISCHARGE PRESSURE GAUGE
6) RELIEF VALVE (SET AT 10% OVER M.O.P.)
7) IN-LINE DISCHARGE CHECK VALVE (AT POINT OF ENTRY)

# Troubleshooting - Sidewinder Pneumatic Chemical Injection Pump

| Problem | Possible Cause | Action |
|---|---|---|
| Piston Not Stroking | • Lack of grease/lube | • Clean and lubricate power head and piston u-cup with Piston Grease #91-42. Clean plunger lube chamber and fill with Sidewinder Lube #92-42 on liquid lube models or with Sidewinder Grease #91-42 on grease lube models. Change piston and plunger seals if needed. |
| | • Plunger seal swollen | • Change to different seal material. |
| | • Stroke length adjuster screwed too far | • Back out on stroke adjuster to desired setting. |
| No fluid discharge with pump cycling and piston stroking | • Air or vapor in pump chamber | • Open bleeder valve (#20), purge until steady flow of fluid, then close bleeder valve. If ambiant temperature is close to vapor point of chemical, mount or situate pump on slight angle down from tank. |
| | • Fluid flow to pump blocked by plugged line, closed valve, extremely high viscosity or lack of fluid supply | • Provide free flow of fluid to pump suction. Fluid level in tank must be above level of bleeder valve (#20). |
| | • Suction or discharge check valve leaking | • Put pump setting gauge in test position to determine which valve is leaking. Fluid falling then rising in the gauge indicates suction check valve issue. Fluid level remaining constant in gauge indicates discharge check valve issue. |
| | • Discharge line plugged | • Clear or replace line. |
| | • Chemical filter clogged | • Replace or clean filter element. |
| Premature seal failure | • Chemical compatibility | • Check the plunger first. If plunger is scored or damaged, switch to more compatible material such as ceramic, and replace with the same seal material. |
| | | • If seal fails, change to different seal material. If plunger is okay, change seal material. |
| | • Abrasive material in chemical | • Install suction filter. |
| | • No seal lubricant or incorrect lube | • Use Sidewinder Lube #92-42 in liquid lube models, use Sidewinder Grease #91-42 in grease lube models. |
| Chemical leakage | • Damaged or leaking suction line, discharge line or seal failure | • Close air/gas supply isolation ball valve (#5) |
| | | • Close isolation ball valve (#8) between pump setting gauge (#9) and chemical tank (#7) |
| | | • Close Isolation ball valve (#8) between pump and pump setting gauge (#9) |
| | | • Close isolation ball valve (#8) between tee (#6) and exhaust collection point. |

**NOTE: When performing repairs, follow the suggested procedures as described in Pump Repair or Emergency Shut Down sectior**

**NOTE: In the event of an emergency shut down, follow the suggested procedures as described in the Pump Repair or Emergency Shut Down section of IOM**

**NOTE: Item numbers referenced are in the Suggested Pump Installation and System Setup Diagram and Pump Breakdown of IOM**

## PUMP MOUNTING INSTRUCTIONS

1) **Before making any connections to the site pump, the site pump must be turned OFF!** It should stop in its most upright stroke position.

2) Securely fasten your Sidewinder Walking Beam Pump directly underneath the beam pump's rocking beam. Four holes are provided in the pump base (#157) for secure mounting on the beam pump platform.

3) Connect the Sidewinder pump arm cable assembly to the main well pump's arm such that when the main pump is in its upmost position, the Sidewinder pump arm (#144) is in its upmost position. The Sidewinder Walking Beam Pump comes with the cable assembly already attached to the pump arm (#144). The cable assembly consists of (Lift cable (#147), (2) Cable clamps (#146), Turnbuckle (#150), and Cold Shut (#151). A C-Clamp (#148) is provided as one means of connecting the cable assembly to the large beam pump's arm. It should be connected as close as possible to the pivot point on the large pump beam and still provide at least 8-1/2" of possible movement on the pump arm (#144). The cable length should be adjusted to lift pump arm (#144) to its maximum height, but not past that height, as damage to the Sidewinder Pump will occur.

4) On the downstroke of the large beam pump, the cable will go down, allowing the counterbalance weight (#145) to pull the arm (#144) down and bring the chemical being pumped into the pump chamber. *Ensure that the cable is set up such that it can't catch or entangle with any surrounding equipment.*