SPECIALTY HAULAGE SOLUTIONS FOR CONSTRUCTION AND MINING

PRODUCT INFORMATION BULLETIN

SUCTION LOADING STATION

Applicable to:

The B-4Z Berkeley water pump and covers:

- Operations
- Troubleshotting
- Installation
- Commissioning
- Schedule of Inspections & Maintenance Parts
- Recommended Support Parts

B-4Z Splined Shaft, CW
302430

PRODUCT INFORMATION BULLETIN
Suction Loading Station

Contents

DESCRIPTION

This document outlines the operation procedures, commissioning, schedule of inspection and maintenance, and support parts for the B4Z Suction Loading Station. If you have any questions, concerns, or issues regarding this system, contact Mega Product Support at US Toll free: 1-800-345-8889 or Direct: 1-505-345-2661.

OPERATIONS

SUCTION LOAD STATION WITH B4Z PUMP

1. Place vehicle as close to the water source as possible.

2. Secure the vehicle by applying all parking brakes, setting wheel chocks, and making the unit safe for operation.

3. Remove suction hose from storage tubes and assemble.

NOTE

Ensure that all gaskets on the coupling joints are present, in good condition, clean, and free from distortion and damage. Presence of dirt and debris on the gasket or coupling will decrease or prevent pump priming or loading by allowing air leakage.

4. Suction Hoses – Immerse in pond or water supply.

NOTE

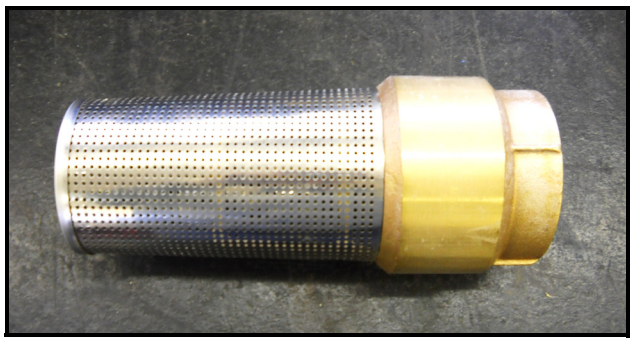
The suction loading pump has a maximum vertical lift capability of 8-10 feet. Attempting to pump water into the tank from a reservoir that is more than 8-10 feet below the pump station will result in reduced suction loading performance.

5. Ensure water pump and suction hoses are full of water before operating pump.

CAUTION

Operating the water pump in a dry sump will result in shaft seal damage.

6. Submerge hose end with the foot valve into the water source.



Typical Inlet Foot Valve (Check Valve)

NOTE

The removal/absence of foot valve will not allow pump to be or stay primed and will reduce performance of the pump. Ensure that it is installed on the water source end of the pump and not submerged in mud or silt.

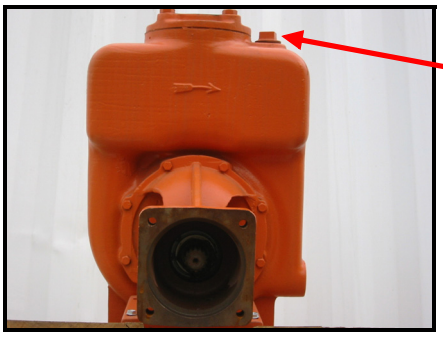
7. Connect assembled suction hose to suction load pump ensuring all connections are air tight and secure.

STEPS CONTINUE ON NEXT PAGE

PRODUCT INFORMATION BULLETIN

Suction Loading Station

8. If the pump is dry, (no water inside the volute case or loading hoses) remove the 1 inch plug from the top of the pump and fill it full of water.



CAUTION

Do not operate suction loading pump when volute case contains no water. Operating suction loading pump without water will damage shaft and shaft seal

NOTE

Suction loading pump and loading hoses must be full of water before filling operation is to begin. It may be necessary to disconnect loading hoses and fill them separately before priming is complete.

9. Activate the suction loading pump by pulling the handle on the diverter valve out and away from the valve.

10. Start chassis engine.

11. At LOW IDLE turn SYSTEM/POWER switch ON.

12. **(DiSCS Only)** AUX2 - ON

13. Turn PUMP Switch – ON

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

14. Increase engine RPM to HIGH IDLE.

When unit is full of water

15. Reduce engine RPM to LOW IDLE.

16. PUMP Switch – OFF

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

17. **(DiSCS Only)** AUX2 - OFF

18. SYSTEM/POWER Switch - OFF.

19. Turn engine OFF.

20. Return the diverter valve handle to the discharge pump operating position.

21. Disconnect, drain and stow suction hoses.

AFTER OPERATIONS

These procedures are used to perform a walk-around inspection after using MEGA water tank systems. This inspection is in addition to and does not replace the vehicle manufacturer's inspection requirements.

1. Vehicle parking brake – ON

2. Cab Control Switches – SET OFF

3. Chocks – As Required

4. Water Cannon – CHECKED & SECURED

5. Vehicle Hydraulic Tank - CHECKED

6. Tank Lines and Hoses – SECURED

7. Tank Drain Petcocks – As Required.

8. Spray Heads – SECURED & SET

9. (**If Equipped**) Heat Exchanger – CHECKED FOR SECURITY AND LEAKS

10. Water Pump – CHECKED for damage, and volute case drain valve SET as required.

11. Hose Reel – CHECKED

12. Solenoid Control Box – CHECKED

PRODUCT INFORMATION BULLETIN

Suction Loading Station

TROUBLESHOOTING

This troubleshooting guide to assist in locating the root cause of a failure or performance issue with the Suction Loading Station. If following these steps does not resolve your issue, contact Mega Product Support immediately at: US Toll free: 1-800-345-8889 or Direct: 1-505-345-2661

Suction Loading Pump does not prime.

1. Inspect the hose 'Foot' (the check valve attached to the immersed end of the hose sections) for:
   - Clean screen. If screen is plugged, clean as required.
   - Check valve proper operation. If check valve does not hold water. Repair or replace as required.
   - Placement in holding pond. If the Foot valve has settled into the sand or silt on the bottom of the pond, the ability for the valve to pass water is greatly diminished, reducing the volume of water it can lift. Correct condition as required.

   NOTE

   The Foot Valve is required in order to ensure that water remains in suction hoses during priming.

2. Inspect for air leaks in the inlet hose assemblies.
   - Each connector has a gasket, ensure the gaskets are serviceable and intact. Inspect each connector for damage that may allow air to be pulled into pump inlet.
   - Ensure Foot valve is fully submerged in water at least 20 inches (0.5 meters).
   - Inspect suction hose assemblies for damage including collapse, dry rot, cracking, punctures, or holes, and kinks and obstructions. Replace as required.

3. Inspect water pump check valve for wear, condition and damage. The "Clack" and gasket must be intact for volute to hold water while priming. Replace as required.

4. Inspect and ensure water pump volute case and hoses are full of water. Correct as required.

5. Inspect water pump shaft mechanical seal for leaks or damage. Repair or replace as required.

Suction Loading Pump fills the tank slowly.

The performance of the Suction Loading Station diminishes with lifting height, discharge height, and altitude as follows:

- The higher in elevation the unit is operating, the lower the flow rate will be and the more vertical lift is required. Consequently, performance will be reduced.
- The shorter the vertical displacement is between the water source and the pump station, the better the suction loading station will perform.
- If the pump outlet is filling the tank from near the bottom of the tank, performance will decrease as the water level within the tank increases.

NOTE

The maximum performance of this pumping station with a minimum lift distance and at sea level in elevation is approximately 450 gallons per minute.

1. Ensure the water pump shaft rotates the correct direction, as identified by the casting on the volute case.

2. Ensure the water pump RPM is set to correct specifications (2,200 ± 50 RPM at engine high idle).

3. Ensure the diversion valve is set for suction loading.

4. Ensure the Foot Valve and inlet screen are free from debris and in operational condition.

5. Ensure there are no air leaks in the inlet hoses or connections.

6. Ensure inlet hoses are serviceable and free from damage, kinks, and holes.

7. Ensure the Foot is submerged at least 20 inches (0.5 meters) below the surface of the water.

8. Ensure the impeller is not plugged with debris and is defect free.

9. Repair, replace or adjust as required.

PRODUCT INFORMATION BULLETIN
Suction Loading Station

INSTALLATION
PREPARATION
1. Drain the water tank.

2. Clean rear area of tank where work is to be performed.

3. If possible park the machine on a small incline to allow water to drain to the rear sump.

4. Remove water pump sump clean-out cover and fully drain the tank.

5. Make the unit safe for maintenance and perform lock-out-tag out.

6. Open shipping container and familiarize yourself with kit contents.
   a. Suction hose – 2 per unit

   b. Suction hose foot valve – 1 per unit

   c. 2-piece storage tubes – 2 per unit

   d. Storage tube mount brackets – 2 per unit (long and short)

   e. Suction pump station – 1 per unit

   f. Suction pump support tear pad and support channel – 2 per unit (right and left)

   g. Pump station discharge tube to tank - 1 per unit

   h. Pump station discharge pipe clamp coupling (Dresser coupling) - 1 per unit

   i. Diversion Valve – 1 per unit

   j. Hydraulic return manifold – 1 per unit

   k. Complete hose assemblies – 5 per unit

   l. 50% assembled hose assemblies – 3 per unit

   m. Hardware package – 1 per unit

7. Locate and position all tools, jacks, clamps, buckets, grinders and welding equipment.

8. Protect existing hose and wiring on the rear of the tank from welding damage.

9. Perform a risk assessment and team briefing.

PRODUCT INFORMATION BULLETIN
Suction Loading Station

MODIFICATION

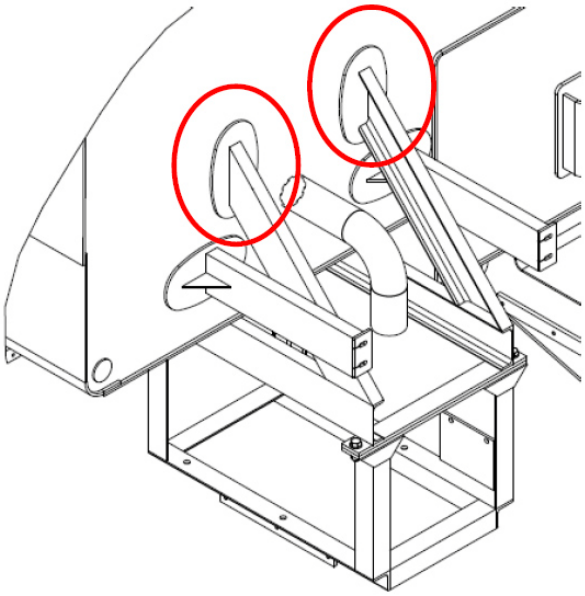
Pump Station

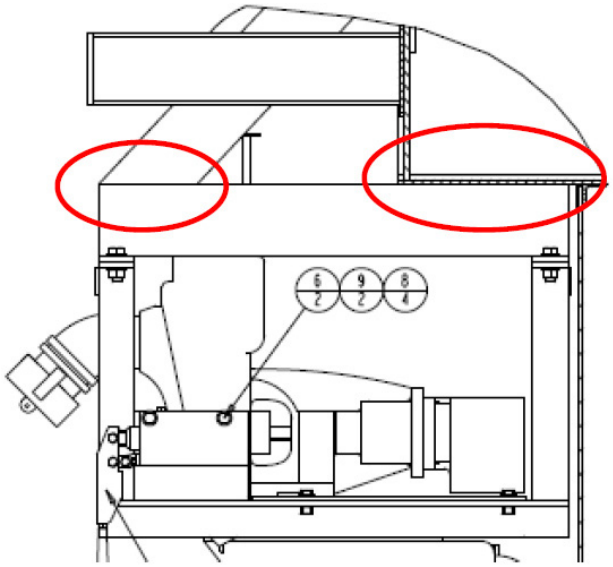
1. Position pump station in preparation for jacking/hoisting. Rig station for selected means of positioning under left rear of the water tanker.

2. 2. Locate tank weld areas for pump station and pump station support brackets.

3. 3. Grind paint off applicable tank areas and components to be installed.

4. 4. Grind paint off pump station and pump station applicable weld areas. See drawing 048855 sheet 1 of 2 for reference dimensions.





5. Lift/hoist pump station into mounting position a. Reference drawing 048855 for location dimensions.

6. Tac weld station horizontal C-channels to lower tank skin.

7. Position station upper C-channel supports (items 4 and 8 on drawing 048855 sheet 1 of 2) to tear plates (Item 1 on drawing 048855 (sheet 1 of 2), Center channel on plate and tac weld into position.

8. Position tear pad and channel assembly on horizontal pump station mounting channels (Item 5 on drawing 048855 sheet 1 of 2) and tac weld into place.

9. Locate discharge pipe elbow assembly on station to determine where to cut access into the rear of the tank. Ensure proper gap and alignment is obtained between discharge elbow assembly and discharge pipe on suction pump outlet, 0.5 inch or 13 mm is recommended between the outlet of the pump station and the inlet of the elbow assembly.

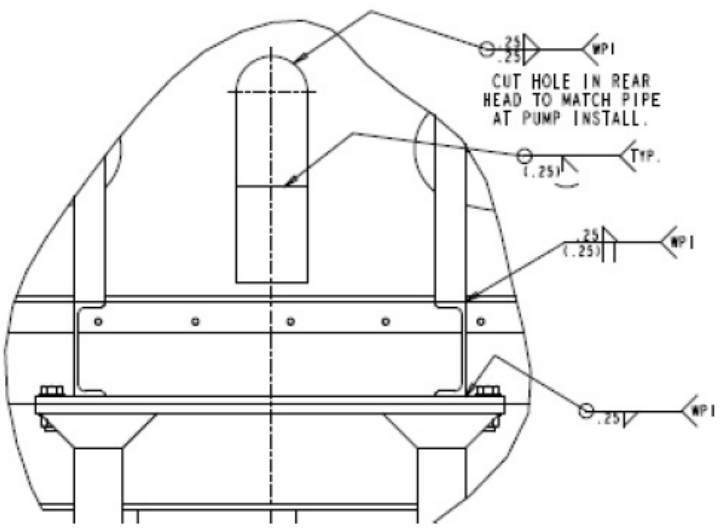
10. Cut hole in rear bulkhead for discharge pipe.

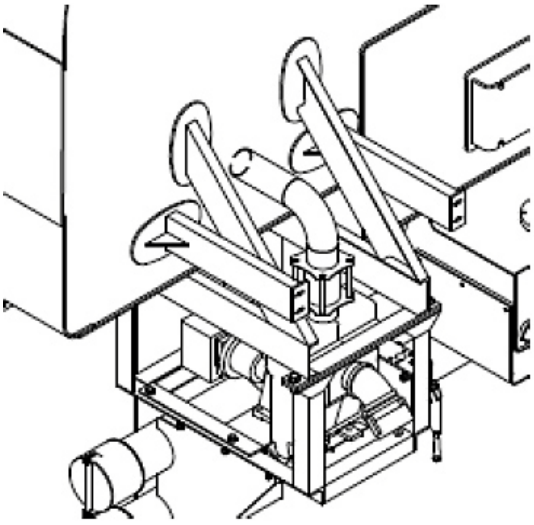
11. Install Dresser coupling (Item 5 on drawing 04856 sheet 1 of 2) before welding discharge pipe to rear bulkhead. If pipe is welded before coupling is installed the pump station must be lowered for installation of coupling.

PRODUCT INFORMATION BULLETIN

Suction Loading Station

12. Tac weld discharge tube elbow assembly in place to rear tank bulkhead.





13. Assemble 2 piece storage tubes and weld out. Storage tubes were cut for shipping purposes. a. Assemble and align for straightness, prepare tube sections for welding, weld sleeve to inserted tube section.

14. Mount storage tube brackets on the sump assembly (048855-01) and pump station (048855-02)

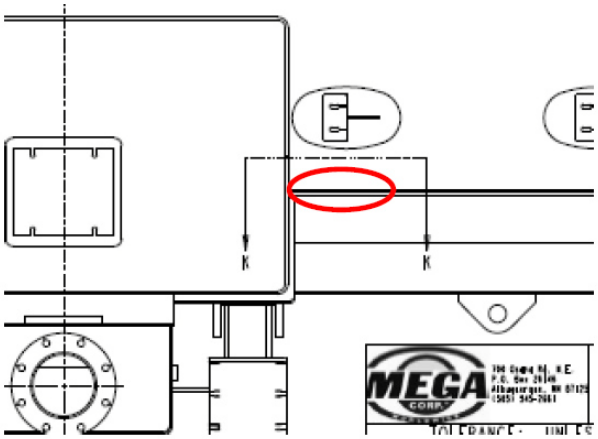
15. Test fit storage tubes on storage tube brackets. Check for fit and alignment.

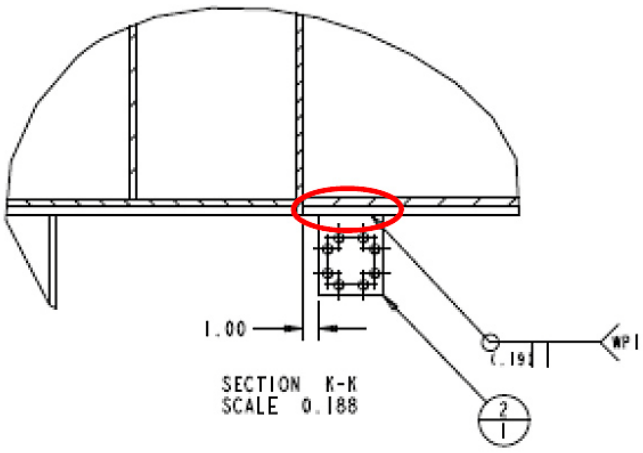
16. Position storage tubes on brackets and weld out. Reference drawing 048862 for location dimensions.

17. Once satisfied with fit-up of the entire station, weld out.

18. Position and tighten Dresser coupling on suction loading station discharge pipe.

19. Position and weld hydraulic return manifold mounting plate to bottom skin of tank on the right side as referenced to on drawing 048855 sheet 1 of 2, item 2.





20. Prepare recently welded areas for prime and paint.

21. Prime and paint newly welded areas.

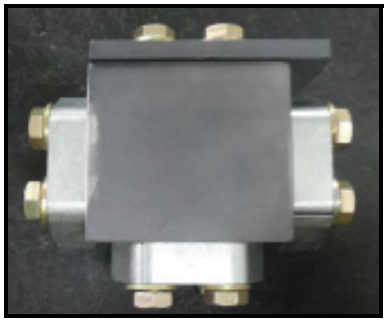
PRODUCT INFORMATION BULLETIN

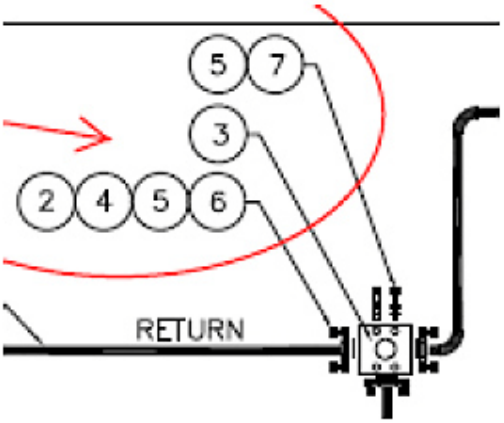
Suction Loading Station

Hydraulics

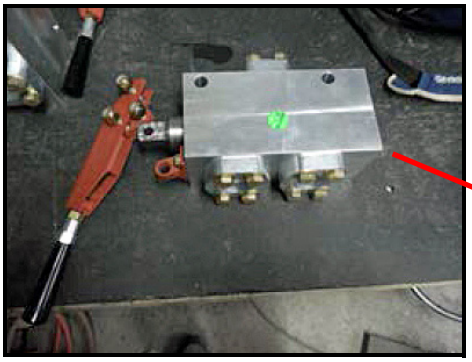
1. Remove all existing hydraulic hoses from lower water tank rear manifold to the discharge pump drive motor

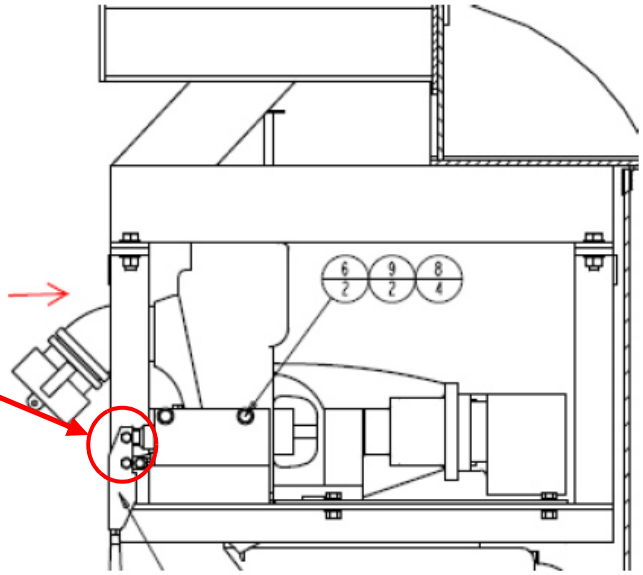
2. Mount hydraulic return manifold to mounting plate. Item 3 on drawing 048863 sheet 1 of 2.





3. Install diverter valve on pump station.





4. Install fully assembled hoses. Use drawing 048863 for hose references and locations.

5. Temporarily install partially assembled hoses with uncrimped ends.

6. Position and index uncrimped hose ends to match manifolds.

7. Mark uncrimped hose ends and remove hoses.

8. Crimp hose ends onto appropriate hoses.

9. Ensure O-rings are in place on fittings before installing.

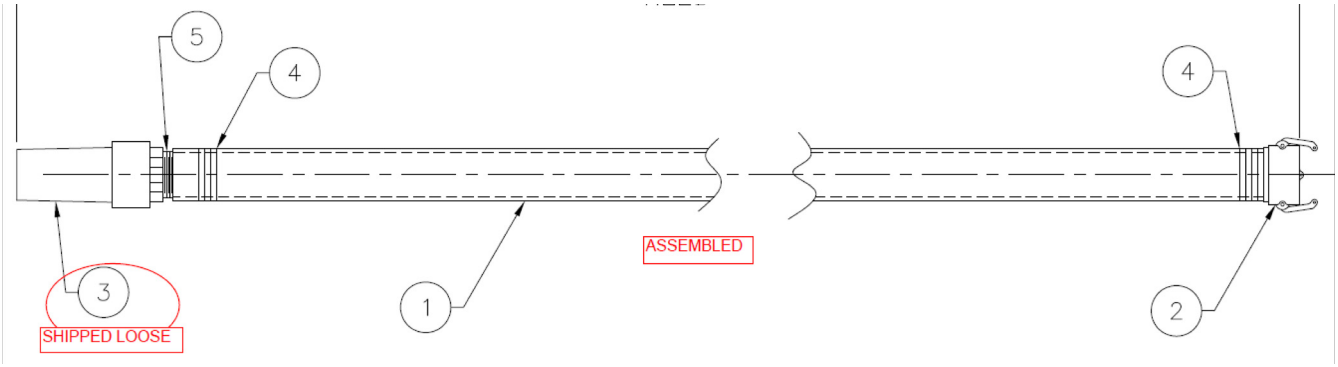
PRODUCT INFORMATION BULLETIN
Suction Loading Station

10. Install and secure all hoses.

11. Service chassis hydraulic system.

Suction Hoses

1. Install foot valve on suction hose. Use liquid pipe sealant on pipe threads.



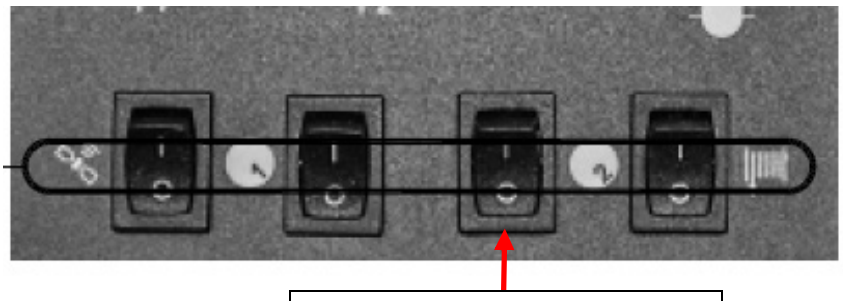
2. Stow hoses in the storage tubes.

CONFIGURATION OF CAB CONTROL SWITCH BOX FOR SUCTION LOADING STATION (DiSCS ONLY)

Every DiSCS Gen 1.5 system is given a specific 10 digit line code (found in the Installation Drawing Package) that determines what options that specific tank has available. Existing can control systems must be configured to work with the suction loading station.

Switch Installation

Remove the blank AUX2 cover switch and replace it with the supplied black on/off switch (Mega Part No. 306968). The AUX2 switch is located in the second row of switches from the top, as shown below:



AUX2
Add Switch (Mega Part Number 306968)

The following is the procedure for replacement of a switch in the Gen. 1.5 main switch box.

CAUTION

This procedure must be followed to reduce the potential for damage to the box and components contained in the box. Failure to follow this procedure may result in component damage and spray system malfunction.

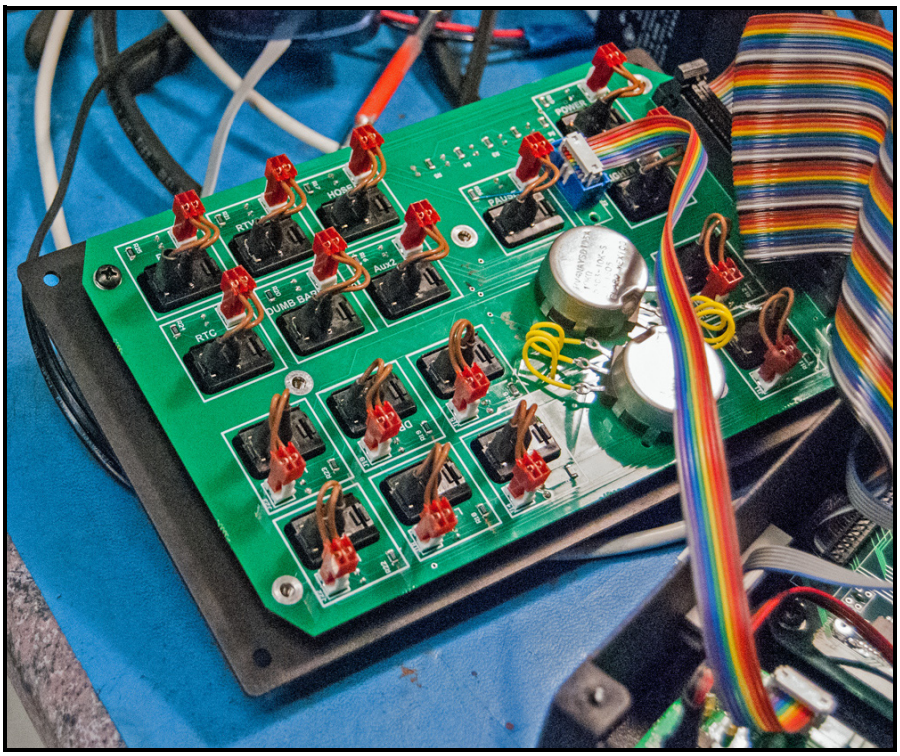
1. Secure unit. Ensure unit is safe for service.

2. Locate replacement switch (Mega Part No. 306968).

PRODUCT INFORMATION BULLETIN

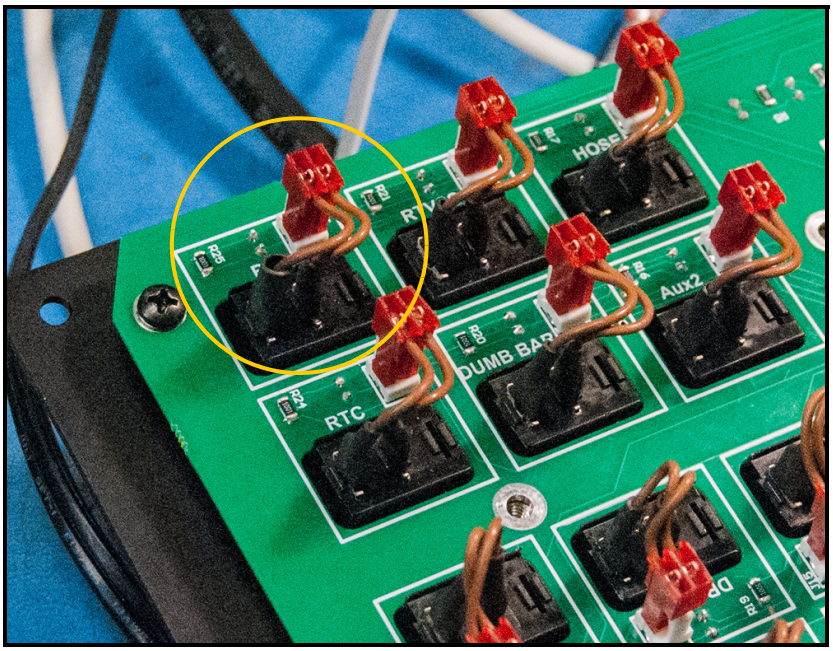
Suction Loading Station

3. Using a Phillips head screwdriver, remove the four (4) box cover screws. Lift off the cover.



4. Remove cover plate where the new switch will be installed.

5. Install replacement switch. Place switch in position and press firmly to seat switch on cover plate. Reconnect switch to the circuit board.



PRODUCT INFORMATION BULLETIN

Suction Loading Station

DIP Switch Configuration

6. Before replacing the Master Switch Box cover, the Tank Configuration DIP Switches must be set for compatibility with Suction Loading. Switches 3, 4, and 5 of the Master Board Tank Configuration DIP Switches control the Pump Coil Voltage setting. If these switches are set incorrectly, the hoist valve solenoid coil will fail, causing the hoist valve to not operate. **Change the DIP switch configuration from C to G as shown below. Switch 3 must be OFF, and Switches 4 and 5 must be ON.**

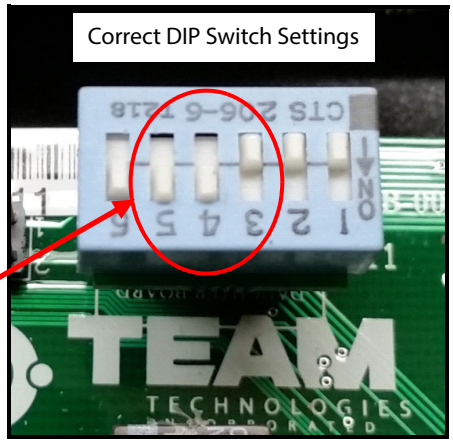
CHARACTER 9

PUMP COIL VOLTAGE, WITHOUT SUCTION LOAD OPTION

A–SW3 OFF/SW4 OFF/SW5 OFF, VALVE LIMITED TO ABOUT 5V RMS
B–SW3 ON/SW4 OFF/SW5 OFF, VALVE LIMITED TO ABOUT 1.93A RMS
C–SW3 OFF/SW4 ON/SW5 OFF, VALVE LIMITED TO ABOUT 0.8A RMS
D–SW3 ON/SW4 ON/SW5 OFF, 24V

PUMP COIL VOLTAGE, WITH SUCTION LOAD OPTION

E–SW3 OFF/SW4 OFF/SW5 ON, VALVE LIMITED TO ABOUT 5V RMS
F–SW3 ON/SW4 OFF/SW5 ON, VALVE LIMITED TO ABOUT 1.93A RMS
G–SW3 OFF/SW4 ON/SW5 ON, VALVE LIMITED TO ABOUT 0.8A RMS
H–SW3 ON/SW4 ON/SW5 ON, 24V



7. Carefully place cover plate on the Master Switch Box. Ensure ribbon cable and other wiring is not pinched under cover.

8. Install four (4) cover plate screws.

PRODUCT INFORMATION BULLETIN

Suction Loading Station

WATER PUMP TUNING

1. Clean water pump shaft and install reflective tape.

2. Ready a hand-held or install a photo tachometer to sense water pump shaft speed.

3. Start up vehicle.

4. In order to commission the suction loading station, normal operation procedures must be followed to set up the suction loading station. Follow the procedures outlined in "Operations" to set up and activate the suction loading station.

5. Turn the Cab Control PUMP switch ON.

CAUTION

Engaging/disengaging the water pump above LOW IDLE will result in water pump component damage and reduced service life.

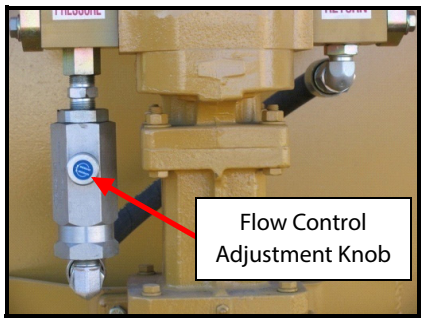
6. Operate vehicle at HIGH IDLE. Note water pump RPM. Water pump RPM should be set to:

B3Z PUMP: 2,200 ± 50 RPM

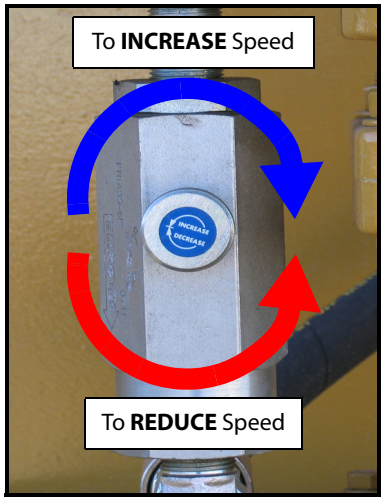
CAUTION

Water pump RPM must not exceed the above specifications with engine at high idle. Failure to ensure water pump speed is at or below specifications will result in reduced spray system component service life.

7. If water pump RPM is to out of the specified range, adjust the water pump hydraulic drive motor flow control valve to obtain specified RPM.



Typically, the label on the knob refers to the amount of oil being bypassed, **not** motor speed. By turning the adjustment knob **CLOCKWISE (BLUE ARROW)** the oil being bypassed is *reduced*, *increasing* the speed of the pump. By turning the adjustment knob **COUNTER-CLOCKWISE (RED ARROW)** the oil being bypassed is *increased*, *reducing* the speed of the water pump.



⚠ WARNING

Do not place your hand or tools within pump bell while pump is rotating and/or pressure held within the motor supply hose. Refer to the Operator and Maintenance Manual for the procedures to operate and maintain the pump. Failure to follow proper procedures will result in serious personal injury.

NOTE

The flow control valve can control as much as 35 gpm or about 700 RPM.

PRODUCT INFORMATION BULLETIN

Suction Loading Station

8. Once specified RPM is obtained, tighten flow control jam nut.

9. Follow normal After Operations procedures (In the "Operations" section) to shut down the Suction Loading Station.

10. Cab Control Pump Switch - OFF.

CAUTION

Engaging/disengaging the water pump above LOW IDLE will result in water pump component damage and reduced service life.

11. Cab Control SYSTEM/POWER Switch – OFF.

12. Shutdown vehicle.

13. Remove photo tachometer, hydraulic gauges, and water pressure gauge.

PRODUCT INFORMATION BULLETIN

Suction Loading Station

SCHEDULED MAINTENANCE INSPECTIONS

This section establishes scheduled maintenance inspections of the installed Suction Loading Station at the designated frequencies. Performing these inspections will identify potential system discrepancies and allow preventative maintenance to be performed before a component or system is rendered totally inoperative.

Systems operated in extremely low quality water environments may require more frequent inspections.

STEP	B4Z WATER PUMP, SUCTION LOADING	150 HRS (WEEKLY)	250 HRS (BI-WEEKLY)	500 HRS (MONTHLY)	1,000 HRS (QUARTERLY)	5,000 HRS (ANNUALLY)	MANHOURS PER INSPECTION	TOTAL ANNUAL MANHOURS
1	Check Suction Loading Station mounting and frame for cracks, damage and security. Repair, replace or adjust as required.	X					0.3	15.6
2	Check shaft seals for excessive lubricant leakage. Lubricate water pump with a manual grease gun only. When lubricating the drive motor side shaft bearing and the impeller end bearing, apply 16 to 20 squirts (injections) of grease (2 fl. oz. or 60 cc) to each. Adjust, repair or replace as required.		X				0.3	6
3	Check water pump and drive motor for leaks, excessive vibration/noise leaks and evidence of excessive heating. Repair as required.	X					0.3	6
4	Check shaft mechanical seal for excessive water leakage and overheating. Replace mechanical seal and wear sleeve as required.	X					0.3	15.6
5	Check water pump inlet and discharge piping and couplings for security, leakage, and damage. Repair as required.		X				0.2	2
6	Check suction loading storage tubes, hose assemblies, check valve foot, gaskets, quick release levers and clamps for security, damage, overall condition. Repair or replace as required.		X				0.3	6
7	Check diverter valve for smooth operation, leaks and security. Repair as required.		X				0.2	2
8	Remove and inspect suction loading station inlet check valve for damage, function and security. Replace as required.				X		1.5	6
								59.2 Total

PRODUCT INFORMATION BULLETIN

Suction Loading Station

RECOMMENDED SUPPORT PARTS

In the table below is a listing of recommended support parts that should be made available in the supply warehouse. Once parts are issued from warehouse stock, ensure that the depleted quantities are replenished in order to keep the recommended support parts package at 100%.

Several support parts are designated as a "**Quick Change Component**" (**QCC**) and should be used to minimize repair time of an operational Suction Loading Station. Broken assemblies can be repaired by maintenance repair facilities and later returned to the supply warehouse as a serviceable part.

SUCTION LOADING STATION PARTS GROUP		
PART DESCRIPTION	**PART NO.**	**QTY**
1. B4Z Suction Pump ** MTT Serial No. Specific Part (QCC)	302430	1
2. Mechanical Shaft Seal	302452	1
3. Shaft Kit	302485	1
4. Gasket, Clack Weight	300576	1
5. Clack Weight	300580	1
6. Clack Washer	300578	1
7. Bolt, Clack Weight	350143	1
8. Nut, Clack Weight	350025	1
9. Gasket, Outlet Flange	300582	1
10. Locknut, Impeller	302480	1
11. Gasket, Volute Case	300556	1
12. Slinger	300558	1
13. Wear Sleeve, Shaft	303952	1
14. Motor Coupling, Splined	301927	1
15. Impeller, 9 Inch	300575	1

PRODUCT INFORMATION BULLETIN

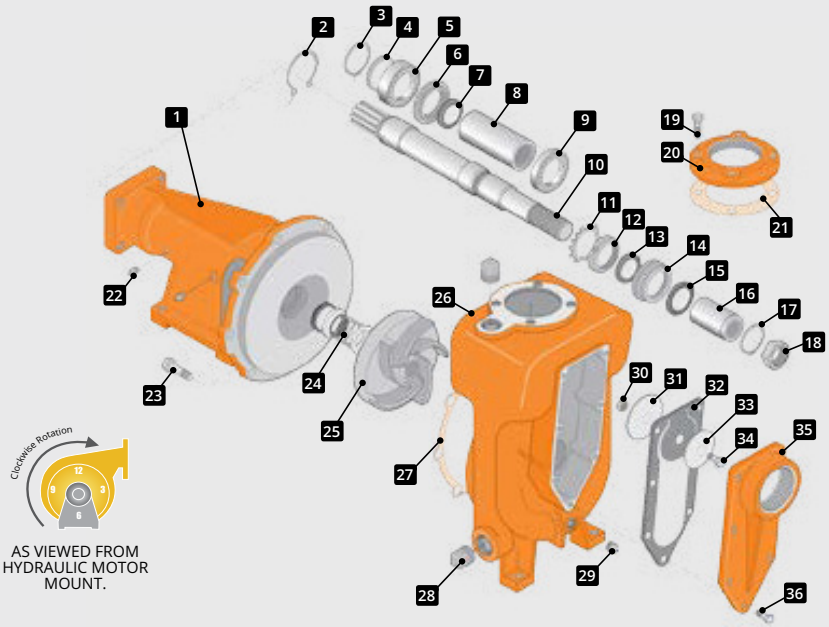
Suction Loading Station

ILLUSTRATED PARTS BREAKDOWN

Mega Water Pumps

Berkeley B-4Z Self Priming Water Pump
CW (Splined Shaft)-Part No. 302430

Berkeley standard open centrifugal water pump with direct motor mount. Mechanical shaft seal.
• Clockwise Rotation • Inlet 4 inch NPT • Outlet 4 inch NPT • 9 inch Impeller



ITEM	PART NO.	DESCRIPTION	QTY
	302430	Berkeley, B-4Z Water Pump-CW (Splined Shaft)	1
1	302004	Bracket	1
2	302483	*Retainer Ring	1
3	302482	*Retaining Ring	1
4	302009	*Thrust Washer	1
5	302450	*Bearing, Drive Side	1
6	302453	* Bearing Cap, Drive Side	1
7	302446	*Oil Seal, Motor Side	1
8	302448	*Spacer Sleeve	1
9	300384	*Bearing, Ball	1
10	302006	*Shaft, Spline	1
11	300379	*Washer, Lock, Impeller	1
12	300378	*Locknut	1
13	302447	**Oil Seal, Impeller Side	1
14	302451	*Bearing Cap, Impeller Side	1
15	300558	**Water Slinger	1
16	303952	*Wear Sleeve, Shaft	1
17	302484	*Retaining Ring	1
18	302480	Locknut, Impeller	1
19	350284	CS 5/8-11X1 3/4 inch	4

ITEM	PART NO.	DESCRIPTION	QTY
20	300581	Companion Flange	1
21	300582	Gasket, Companion Flange	1
22	300519	Fitting, Grease	2
23	350144	Cap Screw 3/8-16 X 0.85 inch	8
24	302452	**Mechanical Shaft Seal	1
25	300575	Impeller, 9 inch, CW	1
26	300556	Volute Case, B42	1
27	300385	Gasket, Case	1
28	350856	Plug, Pipe, 1 1/2 inch	2
29	350852	Plug, Pipe, 1/2 inch	1
30	350025	Nut, Hex	1
31	300580	Weight, Clack	1
32	300576	Check Value, Gasket	1
33	300578	Weight, Clack	1
34	350143	CS 3/8-16 X 3/4	1
35	300579	Suction, Cover	1
36	350146	CS 3/8-16 X 1 1/4	7
37	301927	†Coupling	1
38	302485	Shaft Kit	1

If illustration does not match your configuration please call product support at 505-345-2661 or 1-800-345-8889.

* These parts are included in the shaft kit. The shaft is not sold separately and is only sold as a shaft kit.

** Gasket and seals required for pump rebuild assembly.

† Replacement parts only. Parts sold seperately and not included with the water pump.

Order Parts either by calling Parts Sales at 1-800-345-8889 or by going online @ www.megacorpinc.com

PRODUCT INFORMATION BULLETIN
Suction Loading Station