

# Variable Pre-wetting System

Installation and Operations Manual



# Table of Contents

<b>1</b>	<b>Features</b>	<b>3</b>
<b>2</b>	<b>Functional Purpose</b>	<b>4</b>
<b>3</b>	<b>Specifications</b>	<b>5</b>
3.1	Power Unit	5
3.2	Spray Bar	5
3.3	Cables	6
3.4	Tank Kits	6
3.5	Plumbing Kits	6
<b>4</b>	<b>System Installation</b>	<b>7</b>
4.1	Tank Kits	7
4.2	Power Unit	8
4.3	Dedicated Valve Pre-wet	9
4.4	Return Oil Pre-wet With Built In Manifold	10
4.5	Spray Bar	11
4.6	Plumbing Kits	14
<b>5</b>	<b>Calibration</b>	<b>21</b>
5.1	Automatic Calibration Using CS-440 Rexroth Controller	21
<b>6</b>	<b>Spare Parts</b>	<b>23</b>
<b>7</b>	<b>Troubleshooting</b>	<b>38</b>
<b>8</b>	<b>Maintenance</b>	<b>39</b>
<b>9</b>	<b>Warranty Policy</b>	<b>40</b>
<b>10</b>	<b>Limitations On Warranty</b>	<b>41</b>

Bosch Rexroth Canada Corp. reserves the right to revise this information at any time and for any reason and reserves the right to make changes at any time, without notice or obligation, to any of the information contained in this piece of literature. Please check for updates at: [www.boschrexroth.ca/compu-spread](http://www.boschrexroth.ca/compu-spread)

# 1 Features

## **Variable Control**

Is available with either of the units outlined here. By using a proportional control valve we can adjust the liquid output from a range of 0 to 100 percent flow. We also utilize a flow meter to calibrate the exact amount of liquid output. This unit will provide an exact ratio of liquid to solid within its operating range.

## **Hypro Roller Pumps**

Are highly versatile and used for spraying or transferring lots of corrosive fluids that are non-abrasive. These pumps contain rollers that revolve inside the pump housing to force the spray solution through the outlet to the nozzles. The pumps are self-priming and should never be run dry. They have good clearances for long life and great wear capabilities.

## **The Spray Bar**

Is designed to withstand corrosive materials and to deliver the liquid accurately at a consistent low pressure. Large orifices and strainers minimize the potential for clogging.

## **The Pump Unit**

Is assembled with weather resistant components and fasteners. The pump enclosure is manufactured out of stainless steel. Care was taken to ensure that in the event of maintenance that all components are accessible and may be serviced with minimal effort.

## **Relief Valve**

Is inserted into the main pressure line. This is in case the pressure rises to an unsafe level. The unit will open limiting the pressure to a safe level. This will protect the system against any unwanted breaks in lines and prolong the life of the unit.

## 2 Functional Purpose

The Compu-Spread, Pre-wetting System (CS-PWS) is used as a deicing system for Winter Road Maintenance Spreaders. This Pre-wetting System achieves a consistent ratio of liquid to solid. The user, at the point of Installation and calibration can adjust this ratio. The design of this system will allow 0.5 to 10 gallons per minute at a pressure of 30 PSI max. To be sprayed directly onto the material as it is spread from the truck. The Spray Bar supplied with this system will apply large liquid droplets that minimize drift in turbulent air and maximize the usage of the chemical. Proper adjustment and knowledge of the liquid used is imperative in the correct operation of the unit.

Note: Pre-wet power units are designed to be durable and reliable; however they do operate in harsh environments and require regular maintenance to continue performing at peak efficiencies.

As well the material they are required to handle may have a severe effect on the performance and reliability of the unit. Pre-wet solutions are for the most part inherently corrosive and must be handled with care. Slight leakage within the power unit may cause damage over the long term and should be addressed as soon as possible to restore proper performance.

The pre-wet material itself may also be a factor effecting power unit performance, in that viscosity can increase sharply with temperature drop, and material may precipitate or crystallize out of solution. Please follow the manufacturer's recommendations with regards to material storage and handling. Materials that exhibit sharp increases in viscosity may cause back pressure that exceeds the operating pressure of the Pre-wet System leading in some cases to pump or hose failure.

Pre-wet materials are constantly changing and new products appear regularly on the market. If in doubt as to the suitability of a specific material to work with your power unit, please consult with your dealer, or contact Bosch Rexroth Canada directly.

Bosch Rexroth Canada warrants the power unit to be free of defects in workmanship and materials, but cannot be responsible for damage caused by improper application or selection of inappropriate Pre-wet materials.

## 3 Specifications

The main features of the Pre-wetting System are the design of the Power Unit, Spray bar assemblies and Pre-wetting System Controllers. To support these main components Compu-Spread, has in its supply a line of 75-gallon (US) tank kits and associated plumbing kits.

### 3.1 Power Unit

The design of the power unit includes the following:

	Geroler Style Hydraulic Motor
Displacement	.79 in <sup>3</sup> /r
Max. Flow	5.5 GPM
Max. Pressure	2030 PSI
Max. Speed	1562 RPM

	Roller Style Liquid Pump
Displacement	1.15 in <sup>3</sup> /r
Max. Flow	= 9 GPM or 34 LPM
Max. Pressure	= 150 PSI
Max. Speed	= 1800 RPM
Max. Fluid Temp	140 Degree F

- 14x12.5x6.25 stainless steel enclosure
- Hose barb fittings for customer connection to liquids
- Weather tight connector for electrical connection

### 3.2 Spray Bar

A Standard Sequential 3 Nozzle Spray Bar is designed to maximize fluid output without atomizing liquid. The sequential design allows only the center unit to spray at low application rates and as the rates increase two additional nozzles open to keep with good spray patterns.

### **3.3 Cables**

There are cables available to connect both controller options we offer. There are also extender cables. They include the following features:

- Weather tight connectors
- Scuff resistant cables

### **3.4 Tank Kits**

There are two styles of Liquid tank kits. A tailgate mounted kit and a V-body fender mounted kit, which can be ordered as a single or double kit. They include the following features:

- 75 gallon (US) capacity
- Polyethylene construction
- 1 ½" tank bung on each side to make it left or right application
- Threaded clean out lid
- Rugged steel constructed frames
- Vacuum protection vent
- Pressure protection vent

### **3.5 Plumbing Kits**

There are several options in plumbing kits: a kit for the single style tanks, a kit for the double style and two different prefill options. They include the following features:

- Easy release cam lever couplers
- Non-corrosive line shut off valves
- Non-corrosive fittings and hoses

## 4 System Installation

### 4.1 Tank Kits

#### Part #210610, CS-PWS-RES-75G-TG-05-KIT

Tailgate kit c/w mounting hardware and 75 gallon tank (plumbing kits not included). Simply hang the 4" mounting channel over the top edge of the truck body tailgate and tighten down the 5/8 x 3" hex head bolts to lock it into place. On the bottom of the mounting portion of the tank frame, you will find two 3/4" holes drilled through the 6" channel. These can be used for shackles and chains or bolt through mounting.



#### Part # 210611, CS-PWS-RES-75G-VBF-SINGLE-05-KIT

The above style of tank kits can be mounted directly to the V-Body Hopper's decking plate or the truck's fenders. You will find five 9/16" holes drilled through the bottom of the tank frame.

## 4.2 Power Unit

### V-Body Application

Using the 5/16" holes provided on the back cover of the enclosure, mount the power unit in a safe and central location on the Spreader, preferably close to the front of the Spreader.



### Tailgate Application

Using the 5/16" holes provided on the back cover of the enclosure, mount the power unit on the mounting plate provided on the tank cradle.



See attached Pump General Assembly drawing at the back of the manual for complete layout of the power unit connections.

Note: The suction strainer is equipped with a 50-mesh strainer designed MAINLY for Liquid Calcium Chloride. The use of a more viscose material such as "Magic" or "Ice Ban" through this power unit requires appropriate filtration before it is loaded into the on board tanks. Viscosity is the thickness of the liquid that offers resistance to flow due to the existence of internal friction within the fluid. If the viscosity is too high or there is dirt in the liquid it would results in the suction strainer blockage. Regular cleaning of the suction strainer is essential to prevent the blockage.

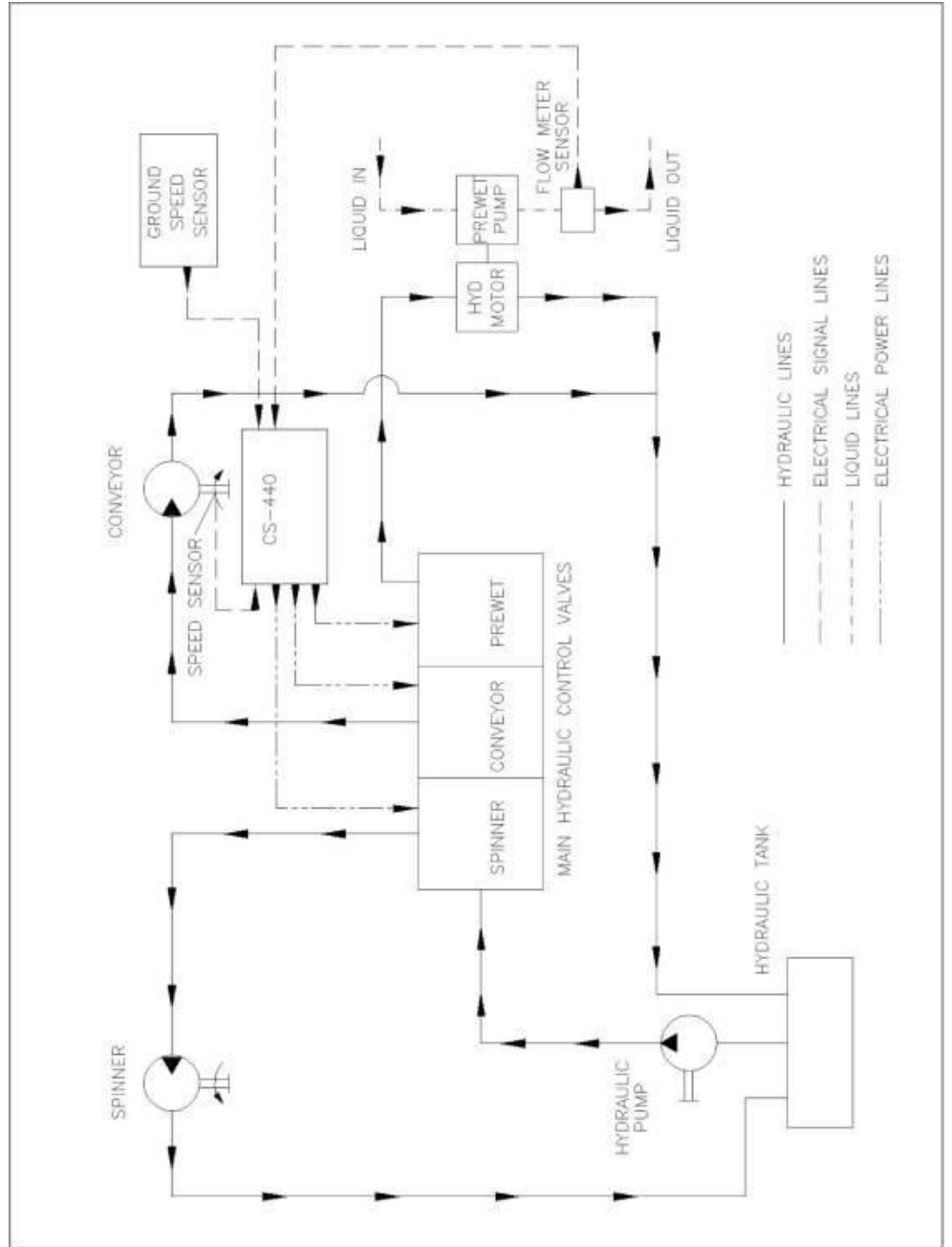
**Caution:** We assume no responsibility for any damage to the power unit pump tubing and/or housing due to highly viscose material selection and/or contamination.

### Hydraulic Connection

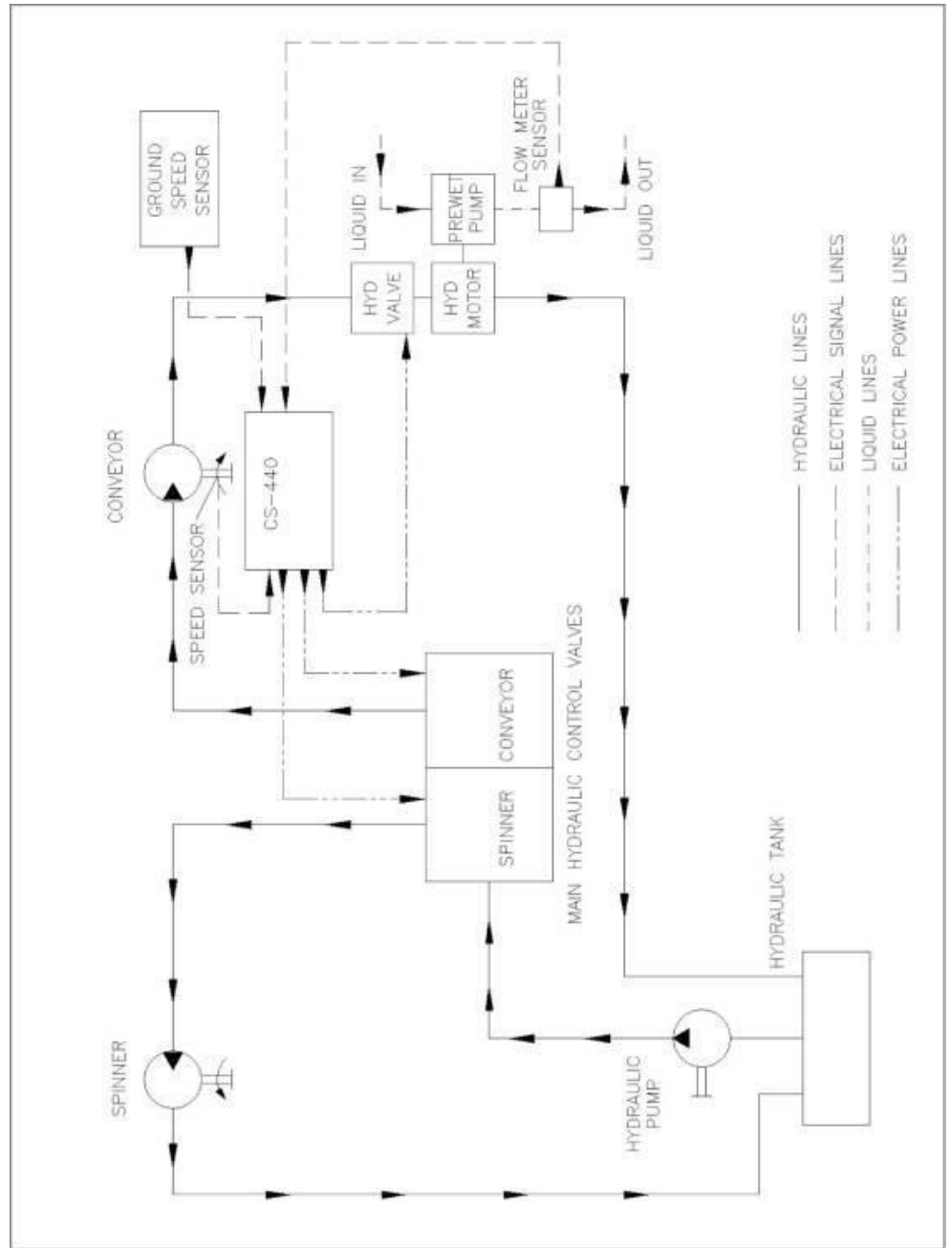
Plumb the unit according to the type of Pre-wet unit you have. A drawing can be found in the back of this manual.



### 4.3 Dedicated Valve Pre-wet



### 4.4 Return Oil Pre-wet with Built-in Manifold



## **4.5 Spray Bar**

Standard 3 Nozzle Spray Bar, Part#194844, CS-PWS-SB-3 TIP

There are several possible choices as to where to mount the spray bar. One choice would be to mount it to the hopper gate. This would allow the spray bar to move up or down with the gate to allow for a proportionate spray pattern when the gate is adjusted to different heights. It is also a safe location, as the material moving on the conveyor would not normally come into contact with the spray bar.

Another choice would be to mount it on the conveyor frame just before the material drops to the spinner. The advantage to this would be that the liquid would not have the chance to dry or evaporate before it hits the road. Also the liquid would be less likely to sit on the conveyor table and cause corrosion. The location of mounting will vary extremely depending on the style of the spreader body being used. Mount the Spray Bar at the designated height according to the apron width and the gate setting. Check spray pattern and adjust as necessary to achieve the desired pattern.



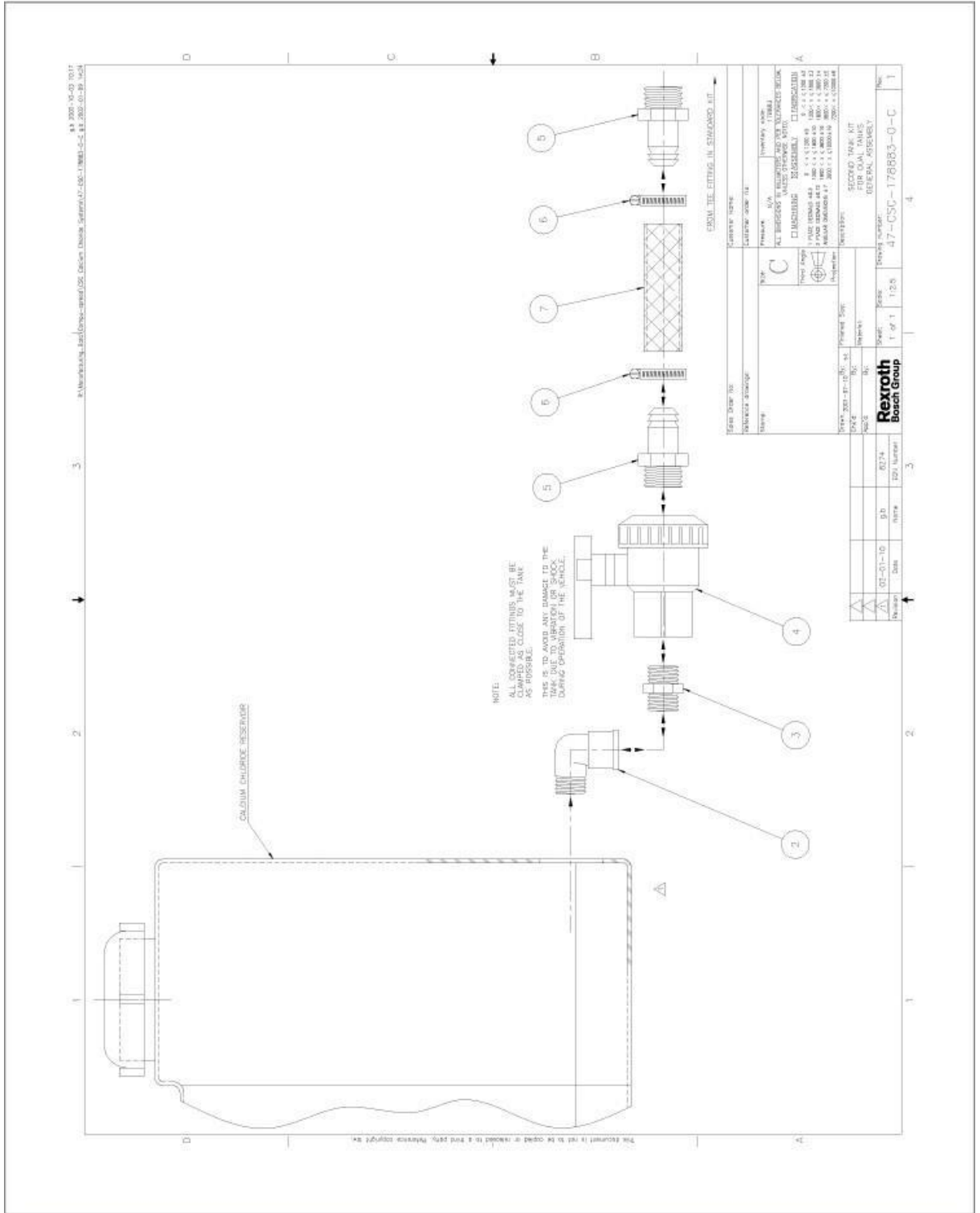
## Spray Bar 194844 CS-PWS-SB-3 TIP HIGH FLOW

Bill Level	Part Number	Description	Quantity	Balloon Number
1.....	018171	HS-010 HOSE CLAMP	7.000 EA	6
1.....	144955	CS-PWS-SB-VB-NOZZLE TKS	1.000 EA	4
1.....	162830	CS-PWS-RES-PK-HOSE 3/4	3.000 IN	9
1.....	162833	CS-PWS-RES-PK-HB075	2.000 EA	12
1.....	167236	CS-PWS-RES-PK-CLEAR HOS	12.000 IN	8
1.....	177238	18720-112-785-NYB	1.000 EA	2
1.....	177240	QJ111-3/4	3.000 EA	7
1.....	189827	CS-PWS-RES-PK-1205-07 C	1.000 EA	
1.....	193033	CS-PWS-SB-NOZZLE BODY S	1.000 EA	3
1.....	193034	CS-PWS-SB-NOZZLE TKSS 3	2.000 EA	10
1.....	194959	CS-PWS-SB-3 TIP SPRAY B	1.000 EA	1
1.....	194960	CS-PWS-SB-NOZZLE BODY D	1.000 EA	11
1.....	242672	CS-PWS-SB-NOZZLE BODY C	3.000 EA	5
1.....	242673	CS-PWS-SB-NOZZLE CAP GA	3.000 EA	5.1



## Plumbing Kit 178882 CS-PWS-RES-PLUMBING KIT

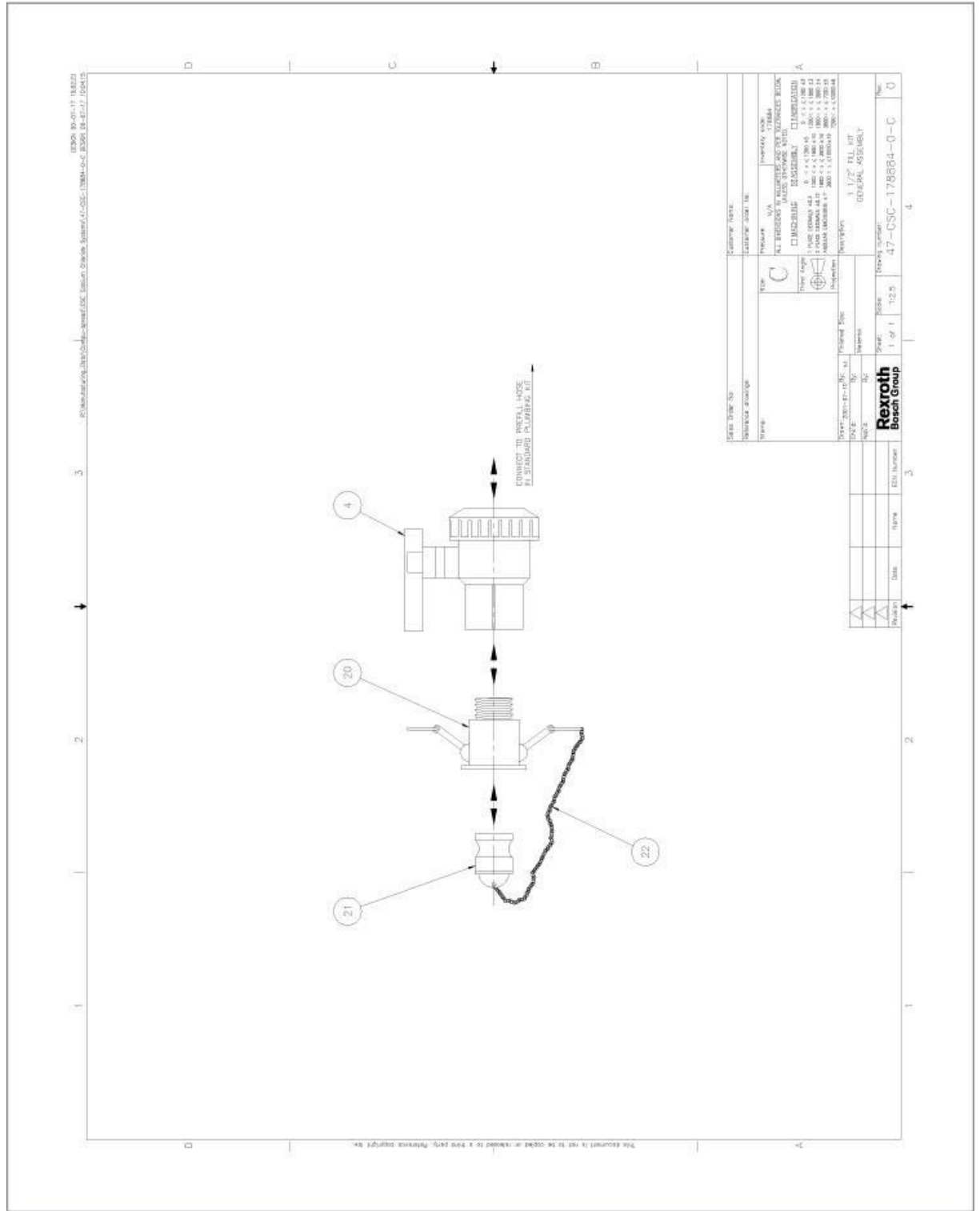
Bill Level	Part Number	Description	Quantity	Balloon Number
1.....	018170	HS-006 HOSE CLAMP	1.000 EA	17
1.....	018171	HS-010 HOSE CLAMP	8.000 EA	13
1.....	018173	HS-024 HOSE CLAMP	6.000 EA	6
1.....	153289	CS-PWS-RES-PK-HB075X050	1.000 EA	16
1.....	153290	CS-PWS-RES-PK-TT34	1.000 EA	15
1.....	162806	CS-PWS-PU-AA124A-3/4-PP	1.000 EA	20
1.....	162833	CS-PWS-RES-PK-HB075	5.000 EA	12
1.....	167236	CS-PWS-RES-PK-CLEAR HOS	180.000 IN	14
1.....	167831	CS-PWS-RES-PK-SE112PP	1.000 EA	2
1.....	167833	CS-PWS-RES-PK-M1120P	1.000 EA	3
1.....	167834	CS-PWS-RES-PK-BALL VALV	1.000 EA	4
1.....	167835	CS-PWS-RES-PK-HB1.5 IMB	3.000 EA	5
1.....	167838	CS-PWS-RES-PK-TT112PP-T	1.000 EA	9
1.....	167842	CS-PWS-RES-PK-CLEAR HOS	120.000 IN	7
1.....	167847	CS-PWS-RES-PK-RB1123PP	1.000 EA	11
1.....	170281	CS-PWS-RES-PK-1 1/2IN P	1.000 EA	8
1.....	171134	CS-PWS-RES-PK-CLEAR HOS	60.000 IN	18
1.....	178860	CS-PWS-RES-PK-VMM0012	1.000 EA	10
1.....	178865	CS-PWS-RES-PK-RELIEF 23	1.000 EA	19





## Plumbing Kit 178883 CS-PWS-RES-PLUMBING KIT

Bill Level	Part Number	Description	Quantity	Balloon Number
1.....	018173	HS-024 HOSE CLAMP	2.000 EA	6
1.....	167831	CS-PWS-RES-PK-SE112PP	1.000 EA	2
1.....	167833	CS-PWS-RES-PK-M1120P	1.000 EA	3
1.....	167834	CS-PWS-RES-PK-BALL VALV	1.000 EA	4
1.....	167835	CS-PWS-RES-PK-HB1.5 IMB	2.000 EA	5
1.....	167842	CS-PWS-RES-PK-CLEAR HOS	60.000 IN	7



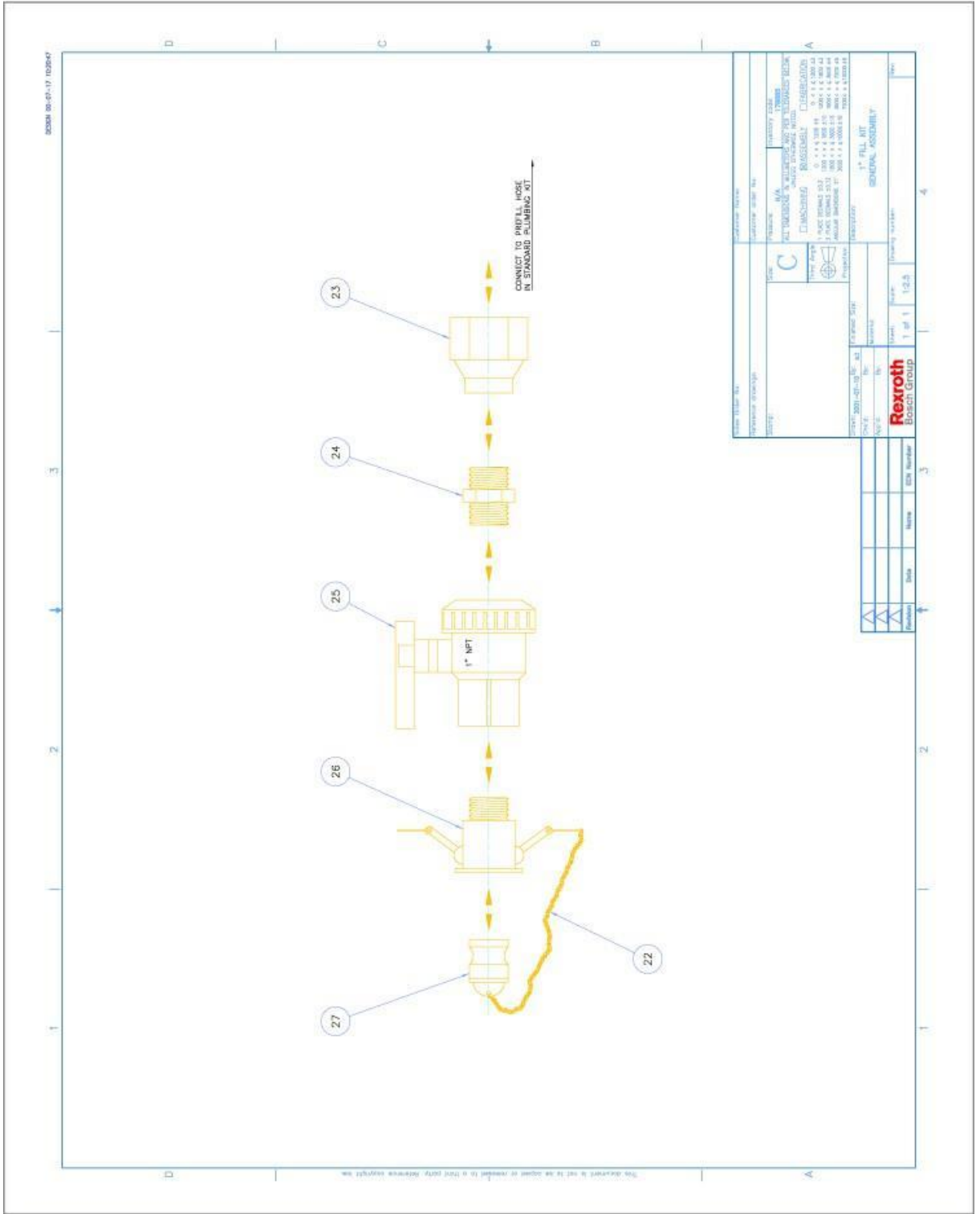
See Data Sheet  
 Reference Drawing: 47-535-178834-0-C  
 1/2" FL. KIT

Part No.	47-535-178834-0-C
Order No.	47-535-178834-0-C
Material	Aluminum
Weight	0.50 kg
Volume	0.0001 m³
Surface Area	0.0100 m²
Notes	1/2" FL. KIT REF. ASSEMBLY

**Rexroth**  
 Bosch Group

## Plumbing Kit 178884 CS-PWS-RES-PLUMBING KIT

Bill Level	Part Number	Description	Quantity	Balloon Number
1.....	155856	CS-PWS-RES-PK-PLUG CHAI	12.000 IN	22
1.....	167220	CS-PWS-RES-PK-CAM COUPL	1.000 EA	21
1.....	167834	CS-PWS-RES-PK-BALL VALV	1.000 EA	4
1.....	169515	CS-PWS-RES-PK-CAM COUPL	1.000 EA	20



Name: 3101-01-01-01		Description: 1" FILL KIT	
Reference: 3101-01-01-01		Reference: 3101-01-01-01	
Material: 3101-01-01-01		Material: 3101-01-01-01	
Quantity: 1		Quantity: 1	
Unit: 1		Unit: 1	
Drawing: 3101-01-01-01		Drawing: 3101-01-01-01	
Revision: 1		Revision: 1	
Date: 31.05.2006		Date: 31.05.2006	
Author: Rexroth		Author: Rexroth	
Checked: Rexroth		Checked: Rexroth	
Approved: Rexroth		Approved: Rexroth	
Project: 3101-01-01-01		Project: 3101-01-01-01	
Drawing No: 3101-01-01-01		Drawing No: 3101-01-01-01	
Title: 1" FILL KIT		Title: 1" FILL KIT	
Description: GENERAL ASSEMBLY		Description: GENERAL ASSEMBLY	
Material: 3101-01-01-01		Material: 3101-01-01-01	
Quantity: 1		Quantity: 1	
Unit: 1		Unit: 1	
Drawing: 3101-01-01-01		Drawing: 3101-01-01-01	
Revision: 1		Revision: 1	
Date: 31.05.2006		Date: 31.05.2006	
Author: Rexroth		Author: Rexroth	
Checked: Rexroth		Checked: Rexroth	
Approved: Rexroth		Approved: Rexroth	
Project: 3101-01-01-01		Project: 3101-01-01-01	
Drawing No: 3101-01-01-01		Drawing No: 3101-01-01-01	
Title: 1" FILL KIT		Title: 1" FILL KIT	
Description: GENERAL ASSEMBLY		Description: GENERAL ASSEMBLY	

## Plumbing Kit 178885 CS-PWS-RES-PLUMBING KIT

Bill Level	Part Number	Description	Quantity	Balloon Number
1.....	147975	CS-PWS-RES-PK-BALL VALV	1.000 EA	25
1.....	147976	CS-PWS-RES-PK-CAM COUPL	1.000 EA	26
1.....	147977	CS-PWS-RES-PK-CAM COUPL	1.000 EA	27
1.....	153260	CS-PWS-RES-PK-M1000	1.000 EA	24
1.....	155856	CS-PWS-RES-PK-PLUG CHAI	12.000 IN	22
1.....	178861	CS-PWS-RES-PK-RC150-100	1.000 EA	23

## 5 Calibration

### 5.1 Automatic Calibration Using CS-440 Rexroth Controller

Load the LIQUID TANKS with the material to be calibrated.

Insert the programming key, select “MATERIAL SETUP”, select desired MATERIAL A and press Enter, the following screen will appear.

▶ LIQUID 1  
0010 0020 0030 ltr  
0040 0050 0060/  
0070 0080 0090 ton  
  
00400 – pulses/ltr

SYSTEM WILL RUN!

▶ START

Use the down navigation button to move the cursor to “RUN CALIBRATION” and press the enter button. The following screen will appear:

**Note:** The screen message is a warning that the system will run during the calibration process, make sure all personnel is clear of moving parts. Operate the truck engine at 1500 RPM to ensure good hydraulic oil flow.

Liquid will be discharging from the spray bar during the calibration process, a means of collecting this material will be necessary.

SYSTEM RUNNING!

SELECT NORMAL RATE.  
CHECK THE MATERIAL  
BEING SPREAD

Use the down navigation button to move the cursor to “START” and press the enter button. The screen to the left will appear.

ENTER MATERIAL WT

▶ 0000 Liter or Gallon

ACCEPT VALUE

Set the Pre-wet application rate button to 3. The system will now be running and material is discharging from the vehicle. Allow the system to run until the CALIBRATED catch pail is almost full. Press the enter button to stop the calibration process. The screen to the left will appear.

▶ LIQUID 1  
0010 0020 0030 ltr  
0040 0050 0060/  
0070 0080 0090 ton

00400 – pulses/ltr

Check the volume in the CALIBRATED catch pail and enter this value into the controller. Press the Enter button and using the right/left navigation arrows move the cursor under the number to be changed. Using the Up/Down navigational arrow, enter the volume of the material. Once the proper volume has been entered, press the Enter button. Using the Down navigational arrow, move the cursor to “ACCEPT VALUE”. Press the Enter button again to confirm acceptance of the weight value, the screen will return to the starting screen.

**Note:** The “pulses/ltr” number now reflects the value calculated from the results of the calibration process. Repeat this process for all liquids to be calibrated.



## Parts List for Part # 209588 CS-PWS-PUH-013

Balloon Number	Part Number	Description	Unit Meas	Ext Qty
	237248	RIVET-5/32-SSBODY-SS MANDREL	EA	4
	214443	CS-SCB-OF-ENCL-A04-TUBE3-ASSEMBLY	EA	2
	151914	HHCS-5/16-18-UNCX3/4-SS	EA	4
	151614	LW-5/16-SS	EA	4
	114882	BHLN-6-S	EA	2
	100833	SNE-6-6-S	EA	1
	100669	STC-6-6-S	EA	1
1	209519	CS-PWS-PUH-ENCL-013	EA	1
2	209472	CS-PWS-PU-FLOW METER-02 c/w CONNECTOR	EA	1
3	184254	CS-PWS-PUH-ENCL-MNTG-BRKT-03	EA	1
4	180036	RUBBER GROMMET RB-23	EA	2
5	153290	CS-PWS-RES-PK-TT34	EA	1
6	181134	CS-PWS-PUH-PUMP-4001N ROLLER	EA	1
7	178865	CS-PWS-RES-PK-RELIEF 23120-34-PP	EA	1
8	177851	151G0031 MOTOR	EA	1
9	171924	CS-PWS-PU-COUPLER	EA	2
9.1	171925	CS-PWS-PU-COUPLER SLEEVE	EA	1
10	179068	CS-PWS-RES-PK-HB050X075	EA	2
12	209677	CS-PWS-RES-PK-T34	EA	1
13	174289	772-1611 FASTENER	EA	1
14.1	170062	NUTPLATE-14	EA	1
14.2	171610	R-440-3/8 SEALING SCREW	EA	4
14.3	167479	066-8516-000 FLANGED PLUG MOUNTING	EA	1
15	180542	CS-PWS-PUH-ENCL-05.1-LID SEAL	EA	1
16	167236	CS-PWS-RES-PK-CLEAR HOSE 3/4 INCH I.D.	IN	28
18	187455	CS-PWS-RES-PK-EL3434PP	EA	3
20	100704	STE-6-6-S	EA	1
21	162833	CS-PWS-RES-PK-HB075	EA	2
22	100574	BU-6-6-S	EA	2
23	169111	HHCS-1/4-28-UNFX3/4-SS	EA	3

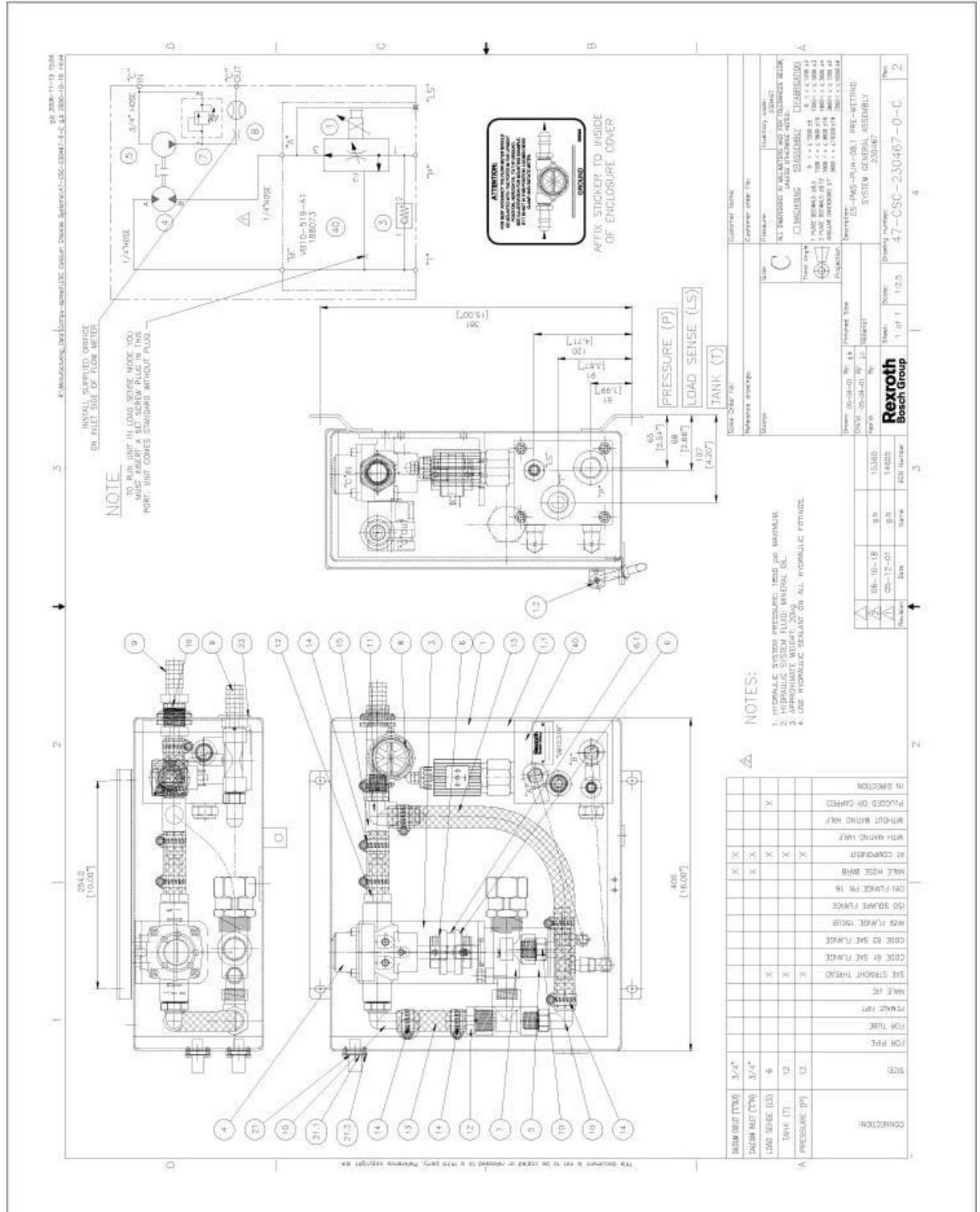


Balloon Number	Part Number	Description	Unit Meas	Ext Qty
24	018171	HS-010 HOSE CLAMP	EA	8
25	209892	CS-PWS-PU-FLOW METER WARNING LABEL	EA	1

**Note:** Please put flow meter sticker item 209892 on inside of cas.

Hose lengths to be:

- 3 1/2 IN 1X
- 5 IN 1X
- 6 1/2 IN 1X
- 12 1/4 IN 1X



## Parts List for Part # 230467 CS-PWS-PUH-08.1

Balloon Number	Part Number	Description	Unit Meas	Ext Qty
	243681	4/3000-PU23-10A6A6/215	EA	1
	243680	4/3000-PU23-10A6H6/260	EA	1
	237248	RIVET-5/32-SSBODY-SS MANDREL	EA	4
	209677	CS-PWS-RES-PK-T34	EA	1
	153403	HHCS-1/4-28-UNFX3/4-GR.5	EA	3
	153290	CS-PWS-RES-PK-TT34	EA	1
1	231477	CS-PWS-PUH-ENCL-08.1	EA	1
1.1	231478	CS-PWS-PUH-ENCL-08.1-LID SEAL	EA	1
1.2	174289	772-1611 FASTENER	EA	1
3	184254	CS-PWS-PUH-ENCL-MNTG-BRKT-03	EA	1
4	181134	CS-PWS-PUH-PUMP-4001N ROLLER	EA	1
5	177851	151G0031 MOTOR	EA	1
6	171924	CS-PWS-PU-COUPLER	EA	2
6.1	171925	CS-PWS-PU-COUPLER SLEEVE	EA	1
7	178865	CS-PWS-RES-PK-RELIEF 23120-34-PP	EA	1
8	209472	CS-PWS-PU-FLOW METER-02 c/w CONNECTOR	EA	1
9	179068	CS-PWS-RES-PK-HB050X075	EA	1
10	187455	CS-PWS-RES-PK-EL3434PP	EA	3
11	191329	CS-PWS-RES-PK-EL1234P	EA	1
12	162833	CS-PWS-RES-PK-HB075	EA	4
13	167236	CS-PWS-RES-PK-CLEAR HOSE 3/4 INCH I.D.	IN	38
14	018171	HS-010 HOSE CLAMP	EA	10
16	231249	CS-PWS-RES-PK-TF34-P-B 3/4 INCH	EA	1
17	100705	STE-6-8-S	EA	2
18	100704	STE-6-6-S	EA	1
19	100833	SNE-6-6-S	EA	1
20	100669	STC-6-6-S	EA	1
21	167479	066-8516-000 FLANGED PLUG MOUNTING	EA	2
21.1	170062	NUTPLATE-14	EA	2
21.2	171610	R-440-3/8 SEALING SCREW	EA	8

Balloon Number	Part Number	Description	Unit Meas	Ext Qty
22	199007	CS-PWS-PUH-WIRING HARNESS-08	EA	1
23	180036	RUBBER GROMMET RB-23	EA	1
24	209892	CS-PWS-PU-FLOW METER WARNING LABEL	EA	1
28	151614	LW-5/16-SS	EA	8
28.1	151914	HHCS-5/16-18-UNCX3/4-SS	EA	8
40	188073	VB10.519.A1	EA	1

**Note:** Show .PS to design for DWGS to be issued.

Hose lengths to be:

- A. 3 INCH
- B. 3 1/4 INCH
- C. 4 1/2 INCH
- D. 12 1/2 INCH
- E. 15 INCH



## Parts List for Part # 221336 CS-PWS-PUH-014

Balloon Number	Part Number	Description	Unit Meas	Ext Qty
	251695	4/3000-PU23-10A6H6/265	EA	1
	251694	4/3000-PU23-10A6H6/225	EA	1
	246056	CS-PWS-PU-016-MOUNTING PLATE	EA	1
	237248	RIVET-5/32-SSBODY-SS MANDREL	EA	4
	221485	SHCS-3/8-16-UNCX1-1/4-SS-FLAT HEAD	EA	2
	221358	CS-PWS-PUH-PUMP-HALF COUPLING	EA	1
	221355	CS-PWS-PUH-PUMP-COUPLING SPIDER	EA	1
	221354	CS-PWS-PUH-PUMP-9960 MOUNTING ADAPTER	EA	1
	209892	CS-PWS-PU-FLOW METER WARNING LABEL	EA	1
	191329	CS-PWS-RES-PK-EL1234P	EA	1
	188210	HN-5/16-18-UNC-SS NYLOCK	EA	2
	179068	CS-PWS-RES-PK-HB050X075	EA	1
	151914	HHCS-5/16-18-UNCX3/4-SS	EA	2
	145554	SHCS-1/4-28-UNFX1/2-GR.8	EA	3
	114882	BHLN-6-S	EA	2
	100669	STC-6-6-S	EA	2
	100574	BU-6-6-S	EA	2
	033222	HN-3/8-16-SS NYLOCK	EA	2
1	209519	CS-PWS-PUH-ENCL-013	EA	1
2	209472	CS-PWS-PU-FLOW METER-02 c/w CONNECTOR	EA	1
4	180036	RUBBER GROMMET RB-23	EA	2
5	153290	CS-PWS-RES-PK-TT34	EA	1
6	221335	CS-PWS-PUH-PUMP-N993 GEAR	EA	1
7	178865	CS-PWS-RES-PK-RELIEF 23120-34-PP	EA	1
8	187455	CS-PWS-RES-PK-EL3434PP	EA	2
8	177851	151G0031 MOTOR	EA	1
10	177939	CS-PWS-RES-PK-AGA-1234P	EA	2
12	209677	CS-PWS-RES-PK-T34	EA	1
13	174289	772-1611 FASTENER	EA	1

Balloon Number	Part Number	Description	Unit Meas	Ext Qty
14.1	170062	NUTPLATE-14	EA	1
14.2	171610	R-440-3/8 SEALING SCREW	EA	4
14.3	167479	066-8516-000 FLANGED PLUG MOUNTING	EA	1
15	180542	CS-PWS-PUH-ENCL-05.1-LID SEAL	EA	1
16	167236	CS-PWS-RES-PK-CLEAR HOSE 3/4 INCH I.D.	IN	22
21	162833	CS-PWS-RES-PK-HB075	EA	1
24	018171	HS-010 HOSE CLAMP	EA	8

**Note:** Hose lengths:

A= 6-1/4 INCH

B= 4-3/4 INCH

C= 7-1/4 INCH

D= 12 INCH





## Parts List for Part # 221760 CS-PWS-PUH-015

Balloon Number	Part Number	Description	Unit Meas	Ext Qty
	237248	RIVET-5/32-SSBODY-SS MANDREL	EA	2
	227293	HS-016 HOSE CLAMP	EA	2
	227187	HHCS-1/2-13-UNCX2-SS	EA	2
	227077	CS-PWS-PU-MOTOR BRACKET - SO47-646	EA	1
	224253	PWS-PUH-015 TUBE 2	EA	1
	224252	PWS-PUH-015 TUBE 1	EA	1
	223936	CS-PWS-PU-FLOW METER-05 C/W CONNECTOR	EA	1
	223594	CS-PWS-RES-PK-RB1121PP	EA	2
	223592	RUBBER GROMMET RB-106	EA	1
	223591	RUBBER GROMMET RB-105	EA	1
	221958	CS-PWS-PUH-ENCL-015 SPACER	EA	2
	221956	CS-PWS-PUH-ENCL-015	EA	1
	220315	HN-1/2-13-SS NYLOCK	EA	2
	191333	CS-PWS-PUH-ENCL-09-LID SEAL	EA	1
	167237	CS-PWS-RES-PK-CLEAR HOSE 1 INCH I.D.	IN	17.5
	161530	CS-PWS-RES-PK-EL1010	EA	1
	153296	CS-PWS-RES-PK-HB100	EA	1
	136369	HHCS-3/8-16-UNCX1-SS	EA	4
	114883	BHLN-8-S	EA	2
	100834	SNE-8-8-S	EA	1
	100708	STE-8-10-S	EA	1
	100675	STC-8-10-S	EA	1
	100575	BU-8-8-S	EA	2
	033222	HN-3/8-16-SS NYLOCK	EA	8
	032535	HHCS-3/8-16-UNCX1-3/4-SS	EA	4
5.1	195619	36056 HALF COUPLING	EA	1
5.2	195623	36055 HALF COUPLING	EA	1
5.3	195624	35359 COUPLING INSERT	EA	1
6	206163	CS-PWS-PUH-PUMP-1502N ROLLER	EA	1
8	260928	275040A1110AAAA	EA	1

Balloon Number	Part Number	Description	Unit Meas	Ext Qty
13	174289	772-1611 FASTENER	EA	1
14.1	170062	NUTPLATE-14	EA	1
14.2	171610	R-440-3/8 SEALING SCREW	EA	4
14.3	167479	066-8516-000 FLANGED PLUG MOUNTING	EA	1
25	209892	CS-PWS-PU-FLOW METER WARNING LABEL	EA	1

**Note:** Send show .PS to design for drawings.



## Parts List for Part # 244469 CS-PWS-PUH-016

Balloon Number	Part Number	Description	Unit Meas	Ext Qty
	247275	NAMEPLATE - REXROTH - SS - 286mm X 63mm	EA	1
	246056	CS-PWS-PU-016-MOUNTING PLATE	EA	1
	246054	4/3000-PU23-10A6H6/370	EA	1
	246053	4/3000-PU23-10A6H6/230	EA	1
	221485	SHCS-3/8-16-UNCX1-1/4-SS-FLAT HEAD	EA	2
	209677	CS-PWS-RES-PK-T34	EA	1
	188210	HN-5/16-18-UNC-SS NYLOCK	EA	4
	187455	CS-PWS-RES-PK-EL3434PP	EA	1
	179067	CS-PWS-RES-PK-SE14	EA	1
	160415	#6-S.S. FLAT WASHER	EA	2
	160414	RIVET-1/8-SSBODY-SS MANDREL	EA	4
	153290	CS-PWS-RES-PK-TT34	EA	1
	151914	HHCS-5/16-18-UNCX3/4-SS	EA	8
	151614	LW-5/16-SS	EA	4
	145554	SHCS-1/4-28-UNFX1/2-GR.8	EA	3
	100704	STE-6-6-S	EA	3
	100669	STC-6-6-S	EA	1
1	172623	CS-PWS-PUH-ENCL-05	EA	1
1.1	180542	CS-PWS-PUH-ENCL-05.1-LID SEAL	EA	1
1.2	174289	772-1611 FASTENER	EA	1
4	221335	CS-PWS-PUH-PUMP-N993 GEAR	EA	1
4.1	221354	CS-PWS-PUH-PUMP-9960 MOUNTING ADAPTER	EA	1
4.2	221355	CS-PWS-PUH-PUMP-COUPLING SPIDER	EA	1
4.3	221358	CS-PWS-PUH-PUMP-HALF COUPLING	EA	1
5	177851	151G0031 MOTOR	EA	1
7	178865	CS-PWS-RES-PK-RELIEF 23120-34-PP	EA	1
9	179068	CS-PWS-RES-PK-HB050X075	EA	1
10	191329	CS-PWS-RES-PK-EL1234P	EA	1
12	162833	CS-PWS-RES-PK-HB075	EA	2

Balloon Number	Part Number	Description	Unit Meas	Ext Qty
13	167236	CS-PWS-RES-PK-CLEAR HOSE 3/4 INCH I.D.	IN	26
14	018171	HS-010 HOSE CLAMP	EA	8
16	181135	CS-PWS-RES-PK-PVCC-07	EA	1
16.1	180036	RUBBER GROMMET RB-23	EA	2
17	157814	CS-PWS-PU-PRESSURE SWITCH-02	EA	1
20	173630	CS-PWS-PUH-WIRING HARNESS-05	EA	1
21	170062	NUTPLATE-14	EA	1
21.1	171610	R-440-3/8 SEALING SCREW	EA	4
21.2	167479	066-8516-000 FLANGED PLUG MOUNTING	EA	1
40	201183	VB10.536.A1	EA	1

## 7 Troubleshooting

Symptoms	Probable Cause	Corrective Action
Does not prime	Undersized tubing Air Lock in Pump Liquid too viscous	Use the correct tubing, part number 173605 Break Line out by nozzle Check Liquid viscosity level
Does not attain required application rate	Improper calibration Vehicle speed too fast	Redo calibration Reduce Vehicle speed Check gate setting

Symptoms	Probable Cause and Corrective Action
No Liquid Discharge	<p>The rotating unit is turning in the wrong direction.</p> <p>Valves are closed or there is an obstruction in the inlet or outlet line.</p> <p>A strainer or filter is clogged.</p> <p>A bypass valve is open.</p> <p>There is an air leak somewhere in the inlet line. Air can come in through gaskets or valves above the fluid line.</p> <p>The pump is worn. The critical clearances have increased.</p> <p>Something is broken. Check the shaft, coupling, internal parts, etc.</p> <p>There is no oil flow to the pump.</p>
The pump is putting out a low capacity	<p>The pump's internal clearances have increased. It is time to change some parts.</p> <p>A strainer or filter is partially clogged.</p> <p>The speed is too low. Check the voltage.</p> <p>The tank vent is partially frozen shut.</p> <p>The inlet piping is damaged. Something ran over it.</p>
The pump loses its prime after running for a while	<p>The liquid supply is exhausted. Check the tank level; sometimes the float is stuck, giving an incorrect level reading.</p> <p>The liquid velocity has increased dramatically.</p> <p>An air leak has developed in the suction piping.</p>
Excessive noise and vibration	<p>Foundation or anchor bolts have come loose.</p> <p>The pump and driver are misaligned.</p> <p>The liquid viscosity is too high. The pump is starving. Check to see if the supply tank is empty.</p>

Symptoms	Probable Cause and Corrective Action
You are experiencing rapid pump wear	<p>There are abrasives in the liquid you are pumping causing erosion problems.</p> <p>There is some corrosion in one or more of the pump elements.</p> <p>There is a lack of lubrication - preventing maintenance at end of season.</p> <p>Too much misalignment.</p> <p>The pump is running dry.</p>

## 8 Maintenance

Item/Job	Actions
Pump Maintenance	Pre-wet units should be flushed out after each and every use. Pre-wetting materials are corrosive and can cause premature wear of parts. Use either water, washer fluid, RV fluid or a good bio degradable vegetable oil. Before storing units for summer clean and inspect all parts and apply a corrosion inhibitor to all moving parts.
Spray Nozzles	Remove and disassemble all nozzles and tips. Clean with proper solution and rinse thoroughly. Replace any broken or worn parts. Spray with a corrosion inhibitor and store.
Plumbing lines	Flush all lines clear with water to prevent any and replace any broken or damaged parts.

## 9 Warranty Policy

Bosch Rexroth Canada Corp. warrants all products manufactured and distributed by it, to be free from defects in material and workmanship under normal operating conditions and proper application in accordance with the specifications for operation as described in the appropriate Engineering Data Sheet or its equivalent for the periods as specified below.

### Compu-Spread®

- All hydraulic products including; Pre-wetting power units, manifold assemblies as manufactured by Bosch Rexroth Canada Corp., axial piston equipment, MP18 style stacking valves, all special in-line.
- Valves not part of a main assembly, valve assemblies (pneumatic and electrical), and all rebuilt products. Twelve (12) months after delivery date or six (6) months after the equipment is placed in service, whichever comes first, provided the products have been properly prepared for long term storage when applicable, i.e. greater than 3 months.
- Twelve (12) months after delivery date for all G.T.S. hardware.
- Twenty-four (24) months after delivery date or twelve (12) months after equipment is placed in service, whichever comes first, for CS 130 manual controllers, CS 230 microprocessors, CS-105 joystick consoles, and all Pre-wetting system controllers.
- Ninety (90) days after delivery date for ground speed and conveyor speed sensors, oil level and temperature sensors, electric cable assemblies, hydraulic motors, Pre-wetting tanks, metal fabricated equipment and tanks, and all other accessories not listed above.



## 10 Limitations on Warranty

This warranty is expressly in lieu of any other warranties expressed or implied, including any warranty of merchantability or fitness of use for a particular application.

Buyer's sole and exclusive remedy under this warranty shall be limited to the repair or exchange of warranted products at our option.

Equipment and accessories not of our manufacture are warranted to the extent of the warranty of the original manufacturer.

No special, incidental, consequential or other damage shall be recoverable. Bosch Rexroth Canada Corp. shall not be liable for consequential damages or contingent liabilities including, but not limited to, loss of life, personal injury, loss of crops, loss due to fire or water damage, loss of business income, downtime costs and trade or other commercial loss arising out of the failure of the product. Bosch Rexroth Canada Corp. will in no event be liable for any sum in excess of the price received by it for the product for which liability is claimed or associated.

No products shall be returned without prior authorization from Bosch Rexroth Canada Corp.

Buyer shall prepay all transportation charges for the return of such products to seller's factory or branch office location. There will be no acceptance of any charges for labour and/or parts incidental to the removal and remounting of products repaired or replaced under this warranty.

The above warranty does not cover conditions over which we, Bosch Rexroth Canada Corp., have no control, including without limitation, contamination, pressures in excess of recommended maximum, products damaged or subjected to accident, abuse or misuses after shipment from our factory, products altered or repaired by anyone other than Bosch Rexroth Canada Corp. personnel, Authorized Factory Service Center personnel or persons so designated in writing by Bosch Rexroth Canada Corp. prior to commencement of said work.

Bosch Rexroth Canada Corp. will not be held liable in case of requested pre-setting of any pressure-related components.

Systems should be started with 0 pressure and the pressure should be increased slowly to assure system function avoiding harm or damage to people and/or equipment.

Damage or failures which are not attributable to defects in materials and/or workmanship which are not considered by Bosch Rexroth Canada Corp. to be covered under warranty include, but are not limited to:

- Damages due to deterioration during periods of storage by the purchaser prior to installation and operation
- Damage of any kind from erosive or corrosive action of any gases, solids, liquids or hydraulic fluid
- Lack of or incorrect type of hydraulic fluid
- Contamination of the hydraulic fluid
- Damage attributable to accident, abuse, or neglect
- Stripped splines or keyways on drive shaft
- Incorrect mounting of external gears, pulley, etc.
- Operating beyond the recommended maximum speeds, pressure and temperatures. Use of the product in a manner or purpose for which it was not designed or intended by Bosch Rexroth Canada Corp.
- Repairs by unauthorized personnel
- Misalignment
- Tampering or destruction of the factory seal. Damage due to inappropriate fusing, over / under voltage application, static discharge, etc.

Notes: