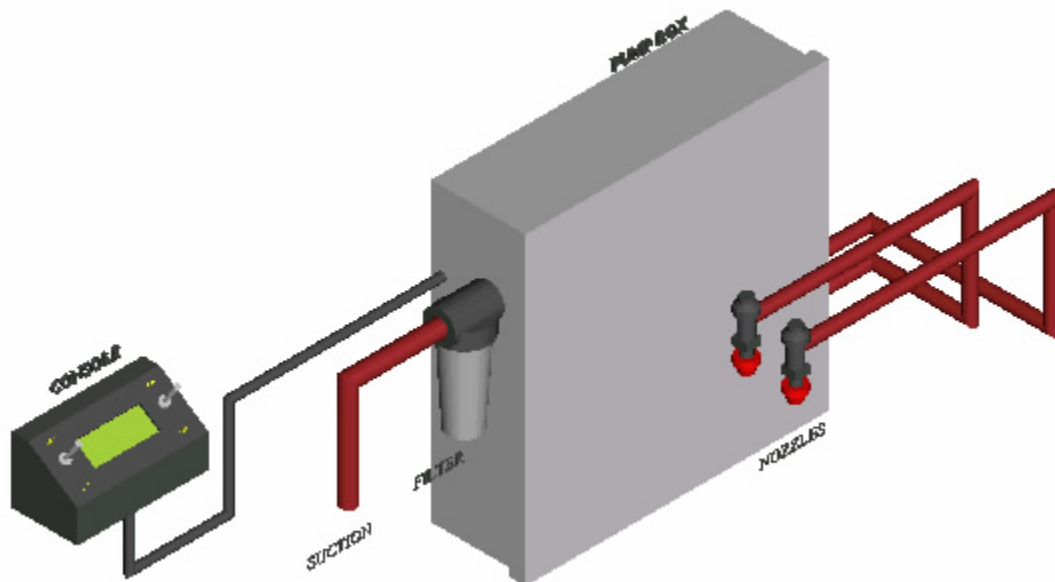


Accu-Cast

2071 “Control-Flow” Liquid Pre-wet System

Installation and Operation Manual



LIMITED WARRANTY

ACCU-CAST warrants electronic products of its own manufacture to be free from defects in material and workmanship for a period of two years from the date of shipment or delivery. All other parts of our own manufacture are warranted for a period of one year. This warranty does not cover damage or failure resulting from neglect, misuse, accident, lack of maintenance, improper installation, redesign of assemblies or any other cause beyond the control of **ACCU-CAST**.

Warning:

In the past it has been found that from time to time people have drilled holes in our control consoles for the purpose of mounting radio microphones and other such items. As a result of this we have had drill filings and in some cases the actual mounting screws interfering with electronic components. The above actions will void the warranty.

The obligation of **ACCU-CAST** under this warranty is expressly limited to replacement or repair of parts shown to be defective by our inspection. All other damage and claims, statutory or otherwise, are expressly waived by the purchaser **ACCU-CAST** is not responsible for consequential damages or contingent liabilities arising out of failure of any product or component part.

The defective part must be returned freight prepaid to the manufacturer within 30 days after discovery of the defect. Permission to return a part for inspection must be granted in writing by a **ACCU-CAST** representative. Any returned part must be accompanied by a **ACCU-CAST** warranty claim number. **ACCU-CAST** will furnish without charge, f.o.b. our shop, a replacement for any part of **ACCU-CAST** manufacture found to be defective. **ACCU-CAST** will make final determination as to whether repair or replacement will be made. If a replacement part is supplied, it will be of equal or superior quality, but may be of more current design.

Components supplied by **ACCU-CAST** that are of other manufacture shall be subject to the warranty of the manufacturer.

Labour for replacement of faulty parts, that is necessarily replaced in a shop other than at **ACCU-CAST** will be paid at a rate not exceeding 75% of the normal retail labour rate charged by that shop. **ACCU-CAST** will determine the maximum amount of time that will be paid for this replacement using industry standards as a guideline.

Repair work carried out by **ACCU-CAST** will be warranted for a period not to exceed 30 days, provided such repairs are carried out in a manner recommended by **ACCU-CAST** and NOT as a "temporary repair" or "patch job".

ACCU-CAST 2071 “control-flow” PRE-WET SYSTEM

The **ACCU-CAST 2071 “control-flow”** Pre-Wet System is an “On-Board” system designed to apply a controlled amount of de-icing liquid such as calcium chloride or magnesium chloride to aggregate materials such as sand and/or salt as they are being applied to the roadway.

The **ACCU-CAST 2071 “control-flow”** Pre-Wet System offers 10 programmable application rates for sand, and 10 separate, programmable application rates for salt. The operator will select the application rate (1 - 10), and the material being applied (sand or salt). The **ACCU-CAST 2071 “control-flow”** Pre-Wet System then applies liquid based on the conveyor speed. If you do not use a “closed loop” or computer control system for the application of sand or salt now, our system will still apply liquid at a rate based on the speed of the conveyor, and will always be in proportion to the granular material being applied. One switch will start and stop the Liquid System. When the Liquid System is not required, it does not in any way interfere with normal sand/salt operations.

Liquid is applied through a brass gear pump that is in turn driven by a hydraulic motor, all of which are mounted in a weatherproof fiberglass box. The pump and motor combination is controlled electronically from the speed of the conveyor. The liquid is sprayed at the granular material in the discharge chute as the material falls to the spinner.

System includes electronic control, conveyor feed back sensor (if required), pump system, nozzles, wiring harness. System DOES NOT include liquid tanks or labour to install. Contact **ACCU-CAST** for prices on tanks and/or labor to suite your requirements.

Because of the variety of “Vee” hoppers, side dump boxes, Duo-dumps, and “U” bodies available on today’s equipment, we only stock tanks for “Vee” hoppers and Viking combination spreaders.

Systems are FOB Calgary, AB and delivery is approximately 8 weeks after receipt of your order.

Call **ACCU-CAST** at 1-800-363-0091 if you have any further questions.

ACCU-CAST 2071 INSTALLATION INSTRUCTIONS

Please read these instructions completely before beginning the installation of your ACCU-CAST 2071 Liquid Pre-wet system, as there are certain requirements that may void your warranty if they are not met.

The **ACCU-CAST** 2071 pre wet system was designed to work with existing sanding systems as an add on, as well as with the full line of new PHE “**ACCU-CAST**” systems to supply a predetermined amount of liquid to the sand or salt before it is spread onto the road surface.

To begin installation of your new **ACCU-CAST** 2071 Kit to your existing sanding system, first locate a suitable location and fabricate mounting pads for the chosen tanks, keeping in mind that they should preferably end up higher than the pump. **If you are using side mounted “vee” hopper tanks supplied by ACCU-CAST Take note that the bottom fittings have an internal step and the threads in them do not pass all the way through. Therefore if the mating fitting is over tightened, it will result in a cracked tank that will have to be sent back to the manufacturer for proper repair. This will not be covered under warranty.**

Next you will have to find a suitable location and fabricate a bracket for the mounting saddle in preparation for the pump box, keeping in mind that ideally it should be lower than the liquid tanks to allow for easy priming of the pump. (Immediately behind the cab on the drivers side or on the fender of the sand hopper works well). Place the box complete with mounting saddle against the bracket and mark the location to prepare for welding or bolting into place. Remove the box and permanently fasten the saddle in place. Put the box back into its saddle and install and tighten the mounting bolts.

Locate and mount the 2071 control console Part # 2071A in a convenient position in the cab. This is most easily done by mounting the bottom cover to a bracket and then placing the console on it and installing the screws.

Route the electrical harness securely from the pump box to the console and plug it in. **As well there are two wires coming from the 9 pin plug on the back of the console that must be run separately to the master switch in the sander console and ground (or other switched 12 volt supply (RED) and a good ground (BLACK).** In the harness there is a 3-pin cannon plug that has to be connected to an extension that goes to the conveyor speed sensor. This sensor is required only if you are installing on a system that does not already have a sensor. If you have an existing sensor you need only tap in to the signal pulse and hook it to the white wire that goes to pin I in the military plug, or pin 3 in the Cannon plug. The hot and ground in the Cannon plug are not required in this case.

As stated above, if your truck has a computerized sanding system such as the **ACCU-CAST** 5100 it will already have a sensor on the conveyor, and all you will have to do is tap into the signal in the wire at the sensor or sander control console. However **if you have a manual or ground speed oriented system you will have to install a conveyor speed sensor between the drive motor and the gear box.** This sensor will plug directly into the Cannon plug in the supplied harness. To install this sensor you must first remove the drive motor from the gearbox on the conveyor drive. Install the spacer block / sprocket housing with the male pilot facing the gearbox. Place the new drive coupler complete with sprocket, spacer and snap-ring into the gearbox so that the sprocket is centered in the block. Install the sensor into the hole provided in the block and check for clearance to the sprocket (min. .040” max. .080”) and install the retaining bolt. Place

the female pilot washer into the shoulder provided and then re-install the drive motor using longer bolts as required.

The spray nozzles must now be mounted into the chute/s so that they are aimed directly at the sand that is coming off the end of the conveyor. Once this is done and the liquid tanks are mounted you can begin running the hoses from the tank/s to the pump box and from the pump box to the nozzles.

Fill the tanks with chemical (or water if the temperature allows) for testing. Start the truck engine and run the conveyor at full speed. Remove the rear access cover to expose the 4 programming buttons. Press all four buttons while moving the toggle switch from off to salt (up).

The display will read

PUMP CALIBRATION
MAX PULSES 0000

Observe the display, after several minutes the pulse number will begin to increase and the pump/motor will begin to turn. Watch the nozzles. After a few minutes when the pulses get to 50 or 60 the pump should prime and fluid will begin to spray from the nozzles. if it does not, and you can hear the pump running, you will have to check the liquid plumbing to be sure there are no restrictions and all valves are open. If the pump is not running, you will have to check the wiring and electrical connections. If your pump is a long way from the tanks or if it is mounted above the tanks it may be helpful to remove the checks from the nozzles until the initial priming has been accomplished. If you are still having problems getting the pump to prime you will have to check the suction side of the pump i.e. the plumbing from the tanks to the pump box for possible air leaks such as loose or missing clamps which would prohibit the pumps from priming. Do not run the pump longer than necessary at high speed if it has not primed.

Providing the pump primes properly you can sit back and watch the pulses increase on the display to somewhere around 200. Now the computer will mark the max, the display will change to minimum pulses and will begin to decrease the pulses until it reaches the required minimum at which time it will save the settings and shut down. This whole sequence may take up to 10 or 12 minutes.

Remove and discard the temporary calibration jumper from the board

This little jumper is located on the board in the console just behind the “left” button it is black in color and about ¼ x 3/32” you can remove it easily by pulling it directly up with a pair of needle nose pliers.

Once the above steps have been completed you can proceed to the conveyor setup. For this setup you need to know how many pulses per motor revolution are put out by the conveyor sensor. The sensor that PHE supplies puts out 13 pulses per motor revolution. The sensor that is built in to the Parker motors is 30 pulses per rev. Some other sensors that we have tested put out 10 pulses per rev. If you are using a sensor other than the one that PHE supplies with the PHE 2070 system you will have to find out how many pulses per rev it puts out. You will also have to find out what the ratio of the conveyor gearbox is (this is commonly 25 or 50 to 1). When you have the above information you can perform the following calculation to find out how many rotations of the conveyor shaft are equal to 10,000 pulses.

$$\frac{10,000}{\text{Pulses/Rev times Gear box ratio}} \text{Typically } \frac{10,000}{13 \text{ times } 25} \text{ or } 30.77$$

Knowing this number you can now put a load of Sand or Salt on the truck, weigh it at the local scale, drive it back to the pile and run the conveyor (with the gate set at the normal position for this product) for the required revolutions of the conveyor shaft (30.77 in the above example). At the end of the above count,

stop the conveyor and re-weigh the truck. The difference between the two weights is the amount of material put off for 10,000 pulses which is the calibration number required to be entered into the Parameter Setup on page # 10 of this manual.

If you are using an **ACCU-CAST** 5100 computer sanding system your computer calibration number is based on 20,000 pulses so you can simply divide this number by 2 to get the 10,000 pulse figure.

For the purpose of determining proper percentages of chemical to sand we offer the following suggested numbers which may vary in different locations and for which Prairie Hydraulic Equipment Ltd accepts no responsibility for accuracy, errors or omissions in any way.

Weight of Magnesium Chloride per cubic inch = .046 lb.

Weight of Magnesium Chloride per liter = 1.285 kg.

Weight of sand per cubic inch = .061 lb. Approx. (this number varies greatly according to grade and moisture content).

1 KG = 2.2 lb.

1 litre = 61 cu. In.

1 litre of Mag. Chloride = 2.83 lb.

Given the above values, if you take the sand application rate in KG/KM times the liquid application rate in % divided by 1.285 you will get your theoretical liquid output in liters per kilometer

Example:

Sand application rate – 500 KG/KM

Liquid application – 5% by weight.

500 times .05 = 25 kg. ÷ 1.285 = 20 liters per kilometer.

Some of our latest systems are calibrated in liters per 100 kilograms in which case the math is as follows:

Sand application rate – 500 KG/KM

Liquid application - 5 liters per kilogram.

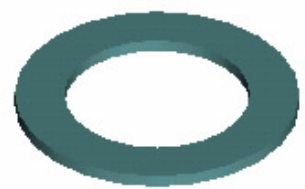
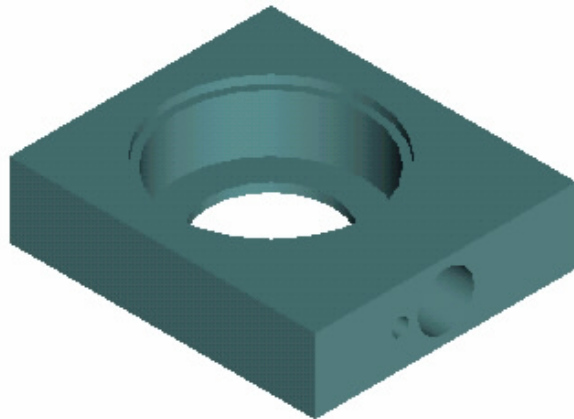
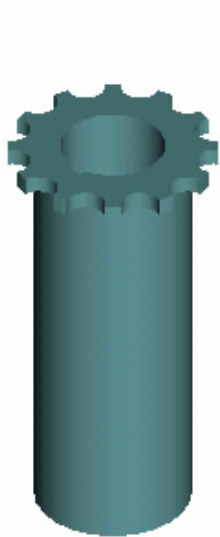
5 X 5 = 25 liters per kilometer

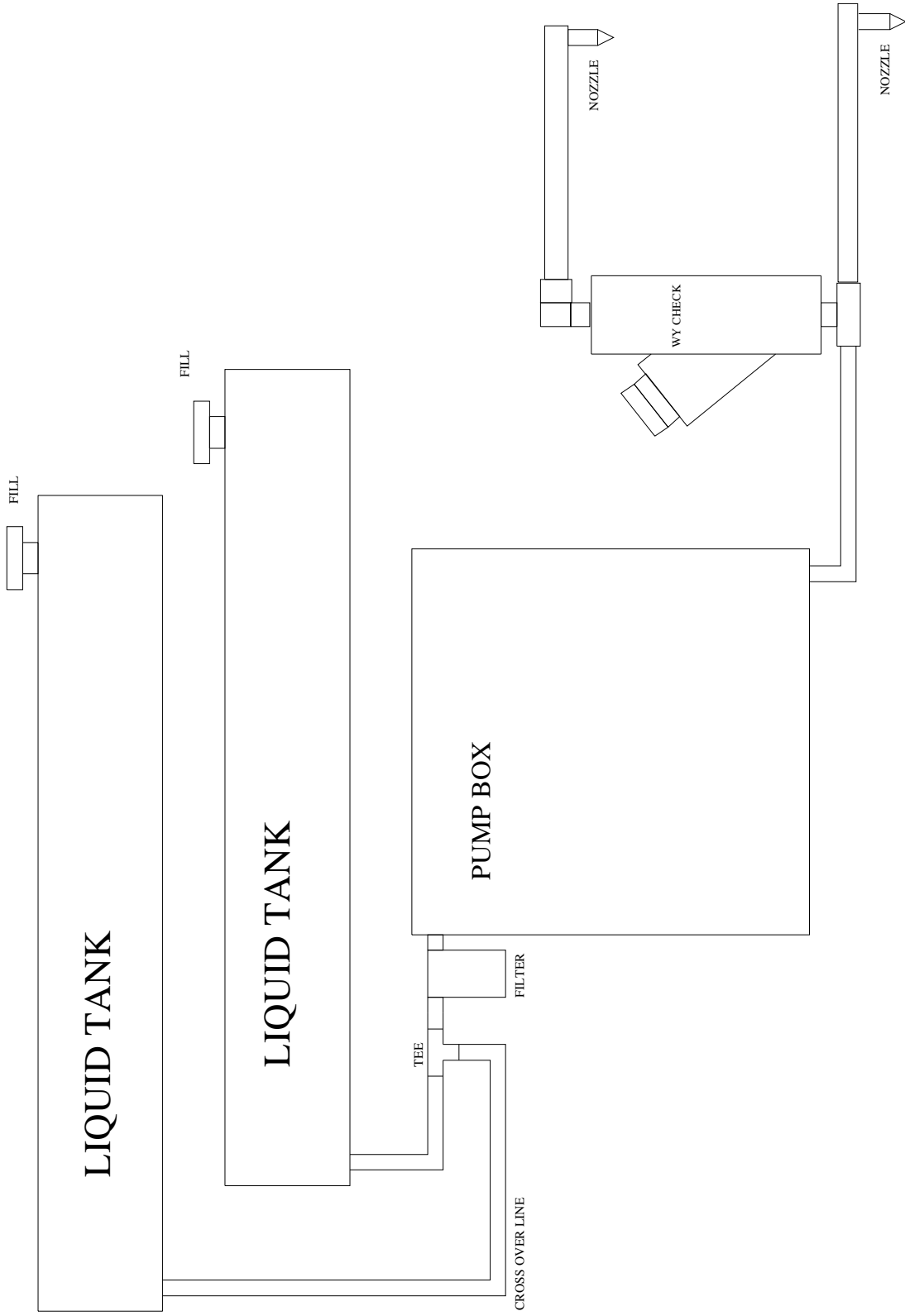
For absolutely accurate applications you can use these numbers to tweak your calibration number until you get the desired results. (To increase output by a percentage, raise the calibration number by that percentage).

When checking the calibration of a system it is important to remember the following facts. The system will begin putting out liquid at its minimum rate as soon as it receives a conveyor signal and the minimum output of your **ACCU-CAST** 2071 liquid system is 1.5 liters per minute, while maximum output is 30 liters per minute. This means that at speeds and output rates that are below the minimum capabilities of the system application rates will be high and at speeds and output rates that are above the capability of the system actual rates will be low.

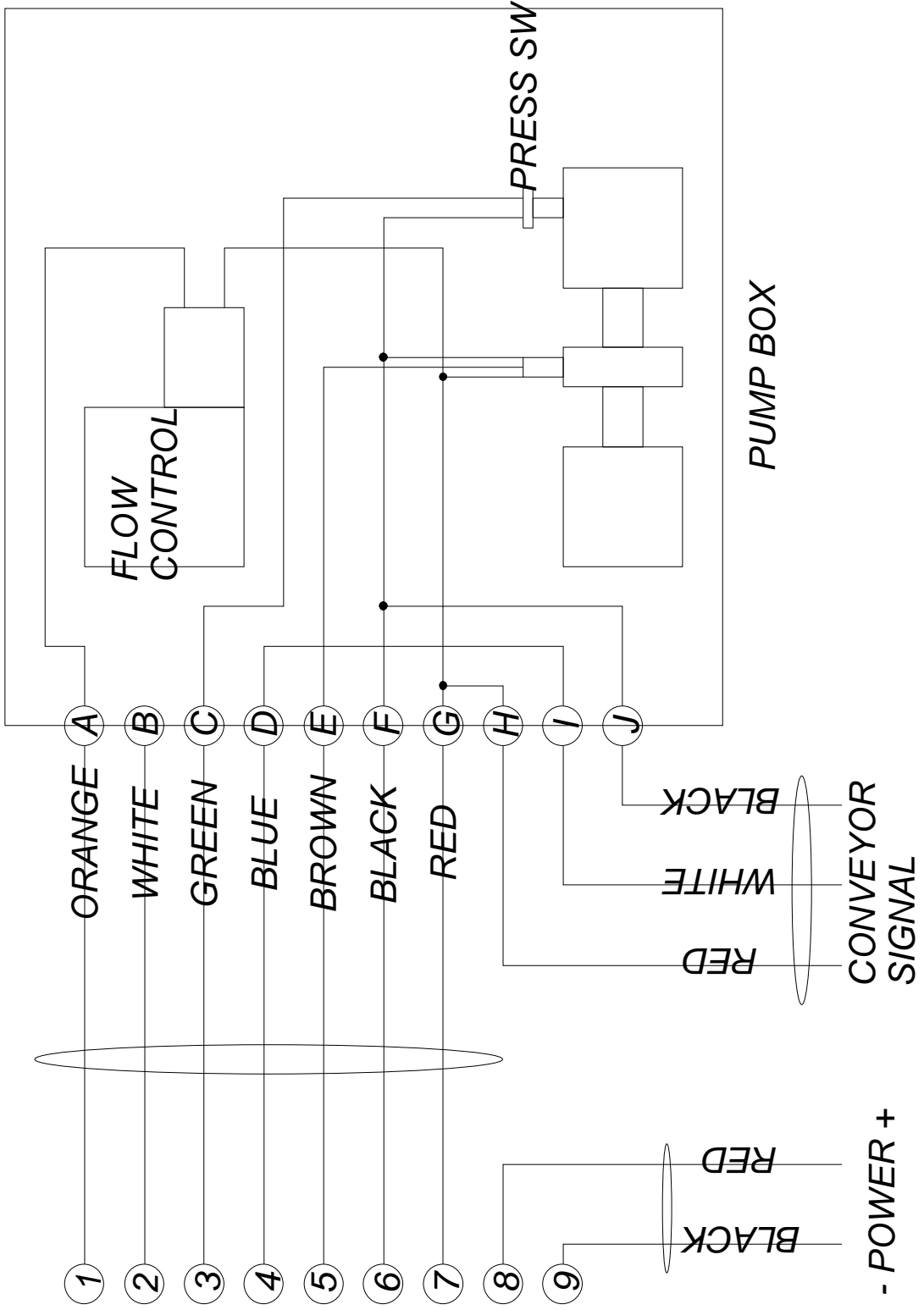
This completes the installation of the **ACCU-CAST** 2071 liquid pre wet system. If you have any problems or if there is anything else that we may help you with, please do not hesitate to contact us at 403-279-2070, 1-800-363-0091, or Fax 403-236-2658. Or email us at prairie@prairiehydraulic.com

SPROCKET COUPLER, SENSOR BLOCK AND PILOT WASHER





PHE 2071 CONTROL FLOW LIQUID PRE WET SYSTEM PLUMBING



ACCU-CAST 2071 PRE WET LIQUID SYSTEM PROGRAMMING INSTRUCTIONS

Initialization

A new system at the time of factory testing must be initialized and calibrated to match the console to the pump assembly. Jumper must be in place on board (as supplied from the factory). Once this is done the jumper is to be permanently removed disabling the parameter.

Open the back cover on the console to expose the 4 programming buttons.

Depress all 4 buttons while powering up the console to Sand mode (toggle down). The following message will appear.

LOAD FACTORY
PARAMETERS

After a few seconds the display will change to the following message:

PARAMETERS
LOADED

Depress all 4 buttons again while powering up the console to Salt mode (toggle up). The following message will appear.

CALIBRATION MAX.
PULSES 0000

This is an automatic calibration mode that will take about 6 min. to complete. After 2 or 3 min. you will notice the pulse number starting to increase and the pump will begin to run. The speed will continue to increase until the pulse count reaches 220 at which time the MAX. on the display will change to MIN. and the speed will begin to decrease to a minimum of approx. 5 pulses. The display will now read:

CALIBRATION
COMPLETE

The jumper can now be permanently removed from the board.

Remove and discard the temporary calibration jumper from the board

This little jumper is located on the board in the console just behind the “left” button it is black in color and about ¼ x 3/32” you can remove it easily by pulling it directly up with a pair of needle nose pliers.

Programming

To start programming, power the unit off and remove the rear cover plate. This will provide access to four switches referred to as keys. The keys are designed to be operated with the operator facing the LCD display, and reaching over the top of the control head placing four

fingers in the access port at the rear. With the rate switch at 1 and all 4 keys pressed, power the unit on to sand or salt then release the 4 keys, the following message will appear:

PROGRAMMING MODE
ANY KEY TO START

Press any key and observe the following message:

LT UP DN RT
KEY CODES ABOVE

Press RT and observe the following message.

CONVEYOR BASE
COUNTS = 10,000

Use UP and DN to toggle between 10,000 and 1,000
(This is used for high range calibration numbers in the next parameters i.e. a calibration number of 2000 on a 10,000 base now becomes 200 on a 1,000 base.)

Press RT and observe the following message.

SAND SETUP
600 KG / 10,000

Use UP or DN to increase or decrease the calibration number for SAND. (This is the number determined from page # 5 of this manual)

Press RT and observe the following message.

SALT SETUP
500 KG / 10,000

Use UP or DN to increase or decrease the calibration number for SALT.

Press RT and observe the following message.

LOW PRESS. TIME
OUT 5 SECONDS

This is adjustable between 1 and 10 seconds. The purpose of this parameter is to provide a delay in the low pressure shut down to allow for air bubbles in the suction caused from the liquid slopping in the tanks or other such temporary losses of pressure.

Press RT and observe the following message.

SAND RATE SETUP
RATE # 01 = 01.0%

From this point pressing the RT and LT buttons will move you ahead and back through all 10 sand rates and also all 10 salt rates. Pressing the UP and DN buttons will increase or decrease the values for each rate.

When you are satisfied that all of the above parameters are incremented as required, pressing RT one more time after SALT RATE #10 Will bring up the following message:

RT KEY TO SAVE
PARAMETER SET UP

Press the RT key while on this screen and all of the above settings will be saved and will now be available to the operator as rates 1 – 10 for either sand or salt.

If you are not happy with the settings pressing the left button will back you through all of the parameters again.

Note:

It should be remembered that when the system is calibrated it is accurate only at the settings that the sander was calibrated with, i.e. gate setting.

This completes the calibration of your new **ACCU-CAST 2071** “control-flow” Pre-wet system. It is generally a good idea to check on the accuracy of your calibration once or twice per year. This can easily be accomplished by placing the nozzles into a pail that is tied in a convenient location on the truck and then driving over a measured course at a given rate i.e. 2 km at 5% liquid for 200 kg / km sand rate. The following arithmetic will work out how much liquid you should end up with in your pail. $(200 \text{ kg} \times .05 \text{ liquid rate} \times 2\text{km} \div 1.285 \text{ kg / litre} = 15.56 \text{ litre}.$

If the above test indicates that your system is not calibrated correctly you should go into the parameters above and change the calibration number by the same percentage as your error. In the above example if your pail has 14 litres in it, this is an error of approximately 10% so you would increase your calibration number by 10%.

For your convenience the following charts list the liquid outputs for several representative rates and at 3 different road speeds. This will give you a good understanding of the capabilities of your system.

ACCU-CAST 2071 LIQUID PRE-WET SYSTEM OUTPUT RATES PER APPLICATION RATES AND SPEEDS

**L / MIN @ 30
KM / HR**

KG / KM @	0.50%	1.50%	2%	3%	5%	7%	10%	12%	15%	30%
50	0.1	0.3	0.4	0.6	1	1.4	2	2.4	3	6
125	0.25	0.75	1	1.5	2.5	3.5	5	6	7.5	15
250	0.5	1.5	2	3	5	7	10	12	15	30
600	1.2	3.6	4.8	7.2	12	16.8	24	28.8	36	72
855	1.7	5.1	6.8	10.2	17	23.8	34	40.8	51	102

**L / MIN @ 40
KM / HR**

KG / KM @	0.50%	1.50%	2%	3%	5%	8%	10%	12%	15%	30%
50	0.13	0.39	0.52	0.78	1.3	2.08	2.6	3.12	3.9	7.8
100	0.26	0.78	1.04	1.56	2.6	4.16	5.2	6.24	7.8	15.6
195	0.5	1.5	2	3	5	8	10	12	15	30
300	0.75	2.25	3	4.5	7.5	12	15	18	22.5	45
600	1.5	4.5	6	9	15	24	30	36	45	90
855	2.22	6.66	8.88	13.32	22.2	35.52	44.4	53.28	66.6	133.2

L / MIN @ 60

KM / HR	0.50%	1.50%	2%	3%	5%	7%	10%	12%	15%	30%
50	0.2	0.6	0.8	1.2	2	2.8	4	4.8	6	12
125	0.5	1.5	2	3	5	7	10	12	15	30
250	1	3	4	6	10	14	20	24	30	60
600	2.4	7.2	9.6	14.4	24	33.6	48	57.6	72	144
855	3.4	10.3	13.7	20.52	34.2	47.9	68.4	82	102.6	205

WITHIN RANGE
 OUT OF RANGE

Note

:
 These rates are proportionate to the amount of sand or salt that is being applied therefore no attempt is made to refer to the number of lanes covered the actual coverage for two lanes would be half that for one lane.

WHEN OUT OF RANGE LIQUID WILL STILL BE APPLIED.
BELOW RANGE APPLICATION WILL BE HEAVY.
ABOVE RANGE APPLICATION WILL BE LIGHT.