

DjICS 2000 Calibration and Programming Manual

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INTRODUCTION

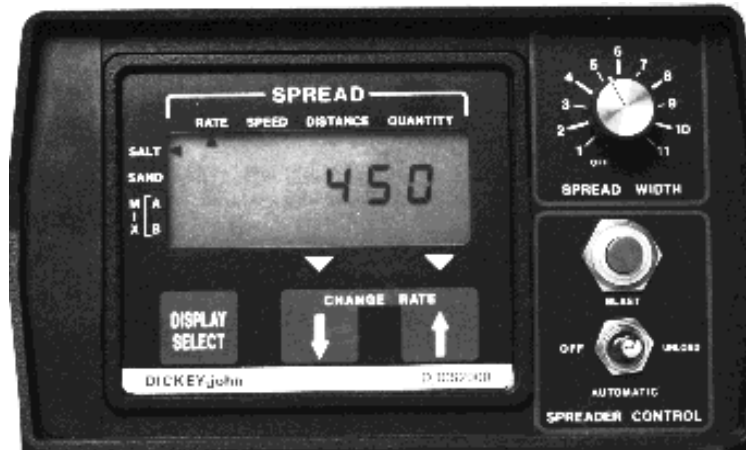


Figure 1. DjICS 2000 Console

This manual contains information regarding programming, installation and troubleshooting the Dj ICS2000. It is recommended that you become familiar with the operation of the control by reading the OPERATOR'S MANUAL prior to calibrating and programming the unit.

For programming convenience the Dj ICS2000 has two separate modes of parameter programming, the Calibrate Mode and the Program Mode. The Calibrate Mode parameters provide the ICS2000 console information in regard to your spreader hydraulic system and spreader vehicle. The Program Mode allows you to enter application rate parameters and to reset the DISTANCE (miles/kilometers) and QUANTITY (tons/metric tons) data which has been accumulated.

Both the Calibrate and Program Modes have a six digit code lock number which prevents unauthorized changing of calibration and programming values. Unless otherwise specified the code lock number will be 000321. If a security problem arises call DICKET-john Customer Service (1-800-637-3302 U.S. or 1-800-252-3363 IL) for instructions on entering new code lock numbers. If a different code lock number is required, enter the new value here:

CODE LOCK NUMBER

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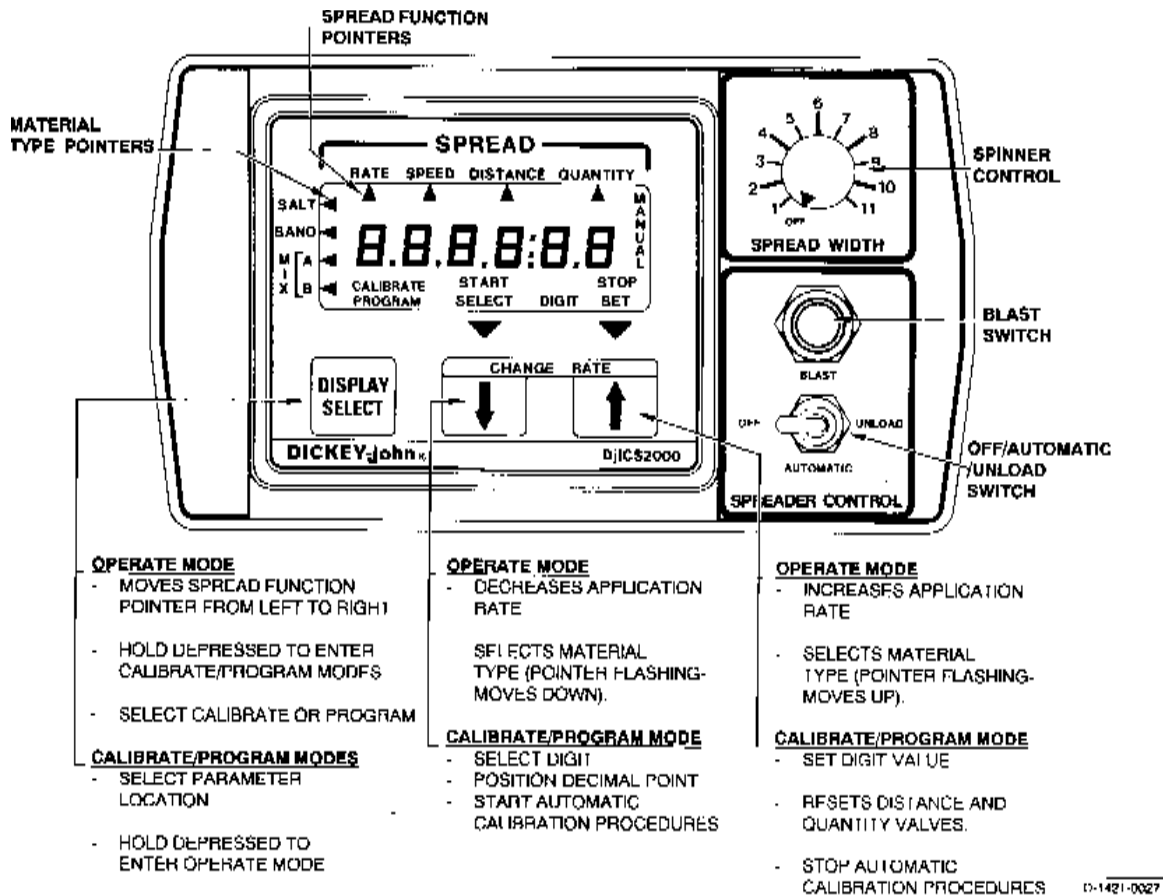


Figure 2

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DISPLAY MESSAGES

CALIBRATE - Displayed when entering and during the Calibrate Mode.

PROGRAM - Displayed when entering and during the Program Mode.

START - Displayed (flashing) when the () touch switch is used to start a calibration procedure.

STOP - Displayed (flashing) when the () touch switch is used to stop a calibration procedure.

SELECT-DIGIT-SET - These messages are shown together flashing and indicate that the () touch switch selects the digit location and the () touch switch sets the value of the selected digit. NOTE: Selected digit is flashing.

MANUAL - Displayed in the Manual Mode.

SPREAD FUNCTION POINTERS - Located across the top of the display and indicates the Spread Function that is displayed.

MATERIAL TYPE POINTERS - Located on the left side of the display and indicates the Material Type.

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NOTES

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CALIBRATE MODE

The Console Display identifies the parameter you may program. The following are the display parameters (constants) and their meanings.

id. no. - Truck Identification Number.

MATERIAL TYPE - Selects the Material Type locations to be active. Set YES to materials you will be spreading, set NO to materials you will not be spreading.

NOTE: You may use four different materials or you may use the same material with four different gate height settings.

SPr.AdJ - Adjusts speed of conveyor/auger in preparation for precision calibration procedure.

SPr.Con - A reference number giving the ICS2000 information regarding conveyor/auger material output. This value is determined automatically by the precision calibration procedure, or may be entered manually if this value is known (procedure described in more detail in the following pages).

NOTE: You will have a Spreader Constant for each Material you will be spreading.

SPEEd - The SPEED constant is a number that matches the Ground Speed Sensor to the console. This number is determined by the console when the spreader vehicle is driven over a measured course (procedure described in more detail in the following pages). If this value is known, it may be manually entered.

NOTE: With certain two-speed axle applications you may see SPd. Hi and SPd. Lo.

HYd.AdJ - The Hydraulic Adjust is a procedure that adjusts the response of the control system to the spreader hydraulic system (procedure described in more detail in the following pages).

tYPE - This type number is a factory entered model number that can only be displayed. Type has no programming function.

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ENTERING CALIBRATE MODE

Step 1. To enter the Calibrate Mode, press and hold the DISPLAY SELECT touch switch for approximately 3 seconds. The message CALIBRATE or PROGRAM will appear on the display. Momentarily pressing the DISPLAY SELECT touch switch will cause the two messages to be alternately displayed.

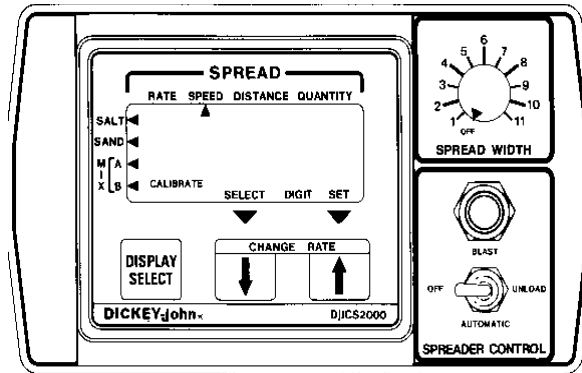
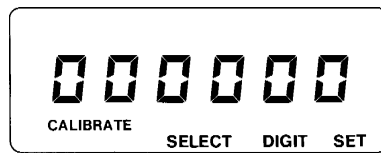


Figure 3

Step 2. With the CALIBRATE message displayed (as shown above), press one of the CHANGE RATE touch switches. Six zero's will be displayed as shown below:



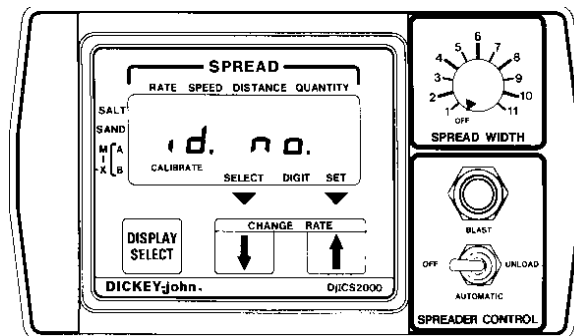
D-1421-0028

Figure 4

Enter the Calibrate Mode Code lock number using the Digit Select () and Digit Set () touch switches.

Press the DISPLAY SELECT touch switch. If the Calibrate Mode Code lock number is correct continue as follows, if it is incorrect the console will return to the OPERATE MODE.

id. no. (Truck Identification Number)

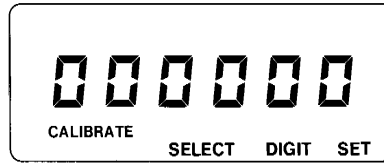


D-1421-0011

Figure 5

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Step 1. The display message is id. no. Press one of the CHANGE RATE touch switches, six digits will be displayed as shown below.



D-1421-0028

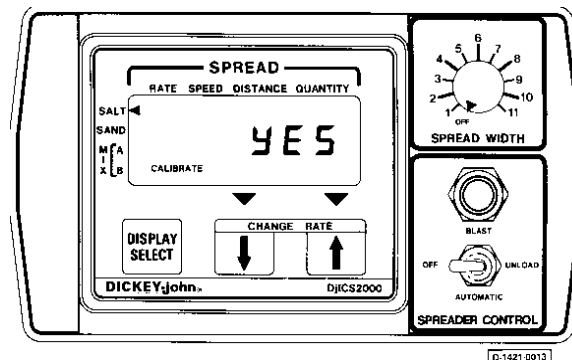
Figure 6

The Truck Identification Number has no effect on the operation of the control system. This number will be printed to identify the printout when the optional printer is utilized.

An identification number of up to six digits can be assigned to your truck and entered using the DIGIT SELECT and DIGIT SET touch switches.

To advance to the next function press the DISPLAY SELECT touch switch.

MATERIAL TYPE



D-1421-0013

Figure 7

Step 1. The display message is YES or NO (flashing) and the material pointer is pointing to SALT.

Press the CHANGE RATE touch switch and note that each time the switch is pressed the display changes from YES to NO or NO to YES.

Setting the display to YES enables the Material Type (location of pointer) and allows operator access to this location in the OPERATE Mode.

Setting the display to NO disables the Material Type (location of pointer) and will not allow operator access to this location in the OPERATE Mode. Set the display as desired. Press the DISPLAY SELECT touch switch.

Step 2. The display is YES or NO (flashing) and the Material Pointer has moved to the next Material Location (SAND). Set to YES or NO.

Step 3. Using the same procedure as described for SAND in Step 2, enable or disable MIX A and MIX B.

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After setting the display for MIX B, pressing the DISPLAY SELECT advances the console to the MANUAL location.

Step 4. The word message MANUAL, shown on the right side of the display, is the location pointer.

The display shows YES or NO (flashing). Setting the display to YES enables the Manual Mode and allows the operator to access it in the OPERATE mode. Setting to NO disables the Manual Mode option. Set this position to NO unless you have need to override (See Appendix B for MANUAL OVERRIDE).

Press the DISPLAY SELECT touch switch. The display will show SPr.AdJ

SPREADER CONSTANT

The SPr.AdJ display is the beginning of a procedure to determine the Spreader Constant of the first Material Type enabled. First Material Type is indicated by the location of the Material Type Pointer.

The Spreader constant is a number that tells the console the amount of material that is discharged from the spreader at a particular feed gate setting. It is the ratio between the amount of material discharged through the gate and the Application Rate Sensor Output (pulses per pound/kilogram).

This Spreader Constant, if known can be entered manually using the front panel touch switches. However, for best accuracy, the Spreader Constant may be determined automatically by performing the Precision Calibration Procedure.

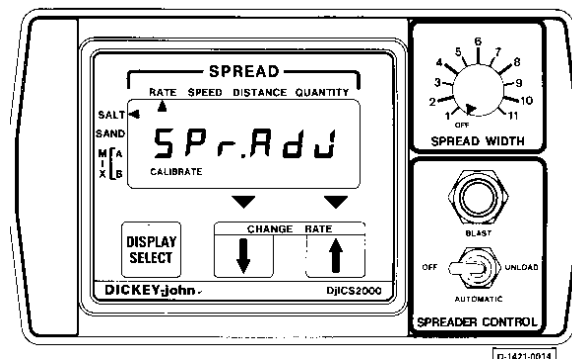


Figure 8

Manually Entering a Spreader Constant (See Appendix D for information on determining spreader constant).

Step 1. With SPr.AdJ showing on the display, press the DISPLAY SELECT touch switch. The display will show 6 zeros with the START word message flashing.

Press the DISPLAY SELECT touch switch again. The display will show SPr.Con (Spreader Constant).

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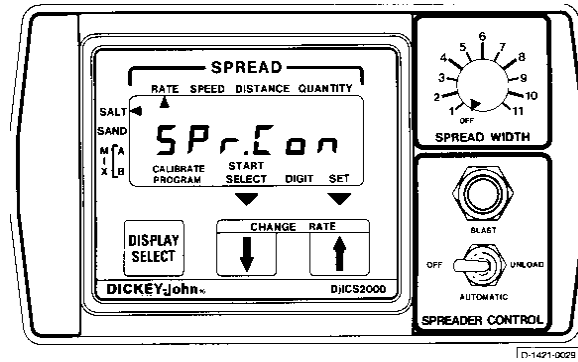


Figure 9

Step 2. Press either of the CHANGE RATE touch switches. The display will show a 6-digit number.

Using the Digit Select and Digit Set touch switches, set the display to your known spreader constant value.

PRECISION CALIBRATION PROCEDURE

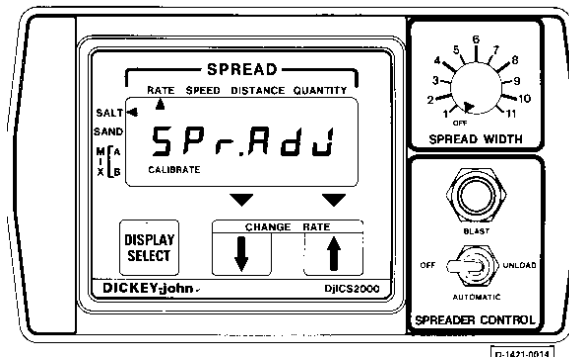


Figure 10

Step 1. SPPr.Adj (Spreader Adjust) is used to adjust the speed of the conveyor/auger. The conveyor/auger speed should be close to normal operating speed.

Load vehicle hopper with material that will be spread when the Material Type Pointer is in the location displayed. NOTE: Load enough material to provide a uniform material flow during the calibration sequence. Adjust gate height to the proper setting.

Set SPREAD WIDTH control to OFF. Start vehicle engine, engage hydraulic system and increase RPMs to normal operating range.

Step 2. Press the touch switch to increase conveyor/ auger speed. Press the touch switch to decrease conveyor/auger speed. Set speed to provide a normal discharge rate.

NOTE: Run conveyor/auger long enough to load spinners and achieve a uniform flow pattern. If possible move spinners out of the way.

Press the DISPLAY SELECT touch switch to go to the next display screen. Your conveyor/auger will stop.

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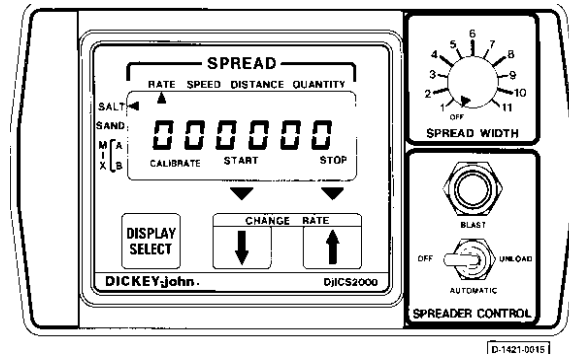


Figure 11

- Step 3. You are now ready to do the actual catch test. You will require the following tools to perform this procedure.
- a. A scale measuring in pounds (kilograms).
 - b. A container to catch material (wheel barrow, canvas, etc.).

IMPORTANT: This size of the container and scale should be large enough to catch and weigh a good representative sample. The larger the sample the better the accuracy.

- Step 4. Position the container under the conveyor/auger. Make certain it is positioned to catch all the material coming out of the conveyor/auger.
- Step 5. At the console (display shown above), press the touch switch directly below the “flashing” START message.

Your conveyor/auger will begin running (at the speed set in Step 2) and material will fall into the container. The display will begin counting seconds. This counting is for reference only and has nothing to do with the accuracy of the calibration.

When the container is full of material (or you have caught a manageable amount of material), press the console touch switch directly below the “flashing” STOP message on the display screen.

The display screen will be as follows:

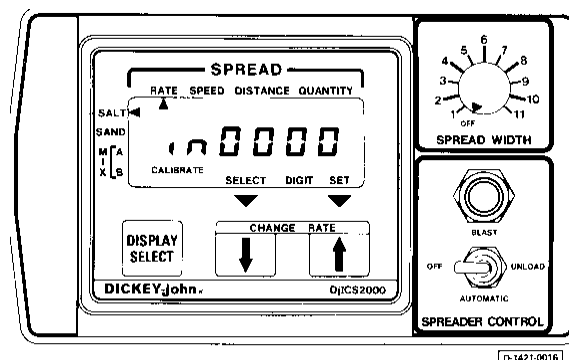


Figure 12

- Step 6. Weigh the material which you have caught in the container.

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Enter this weight in pounds (kilograms) using the DIGIT SELECT (touch switch directly below "flashing" SELECT message) and DIGIT SET (touch switch directly below "flashing" SET message) touch switches.

Press the DISPLAY SELECT touch switch. You have now completed the determination of the spreader constant for the first enabled Material Type (indicated by the location of the Material Type Pointer).

Step 7. The display screen shows SPr.Con (Spreader Constant).

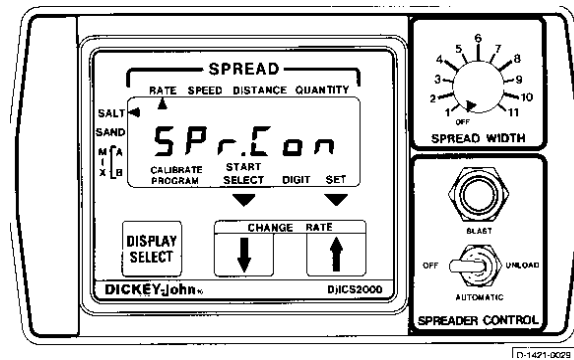


Figure 13

Press either of the CHANGE RATE touch switches. The display will show a number that has been calculated by the console for the calibration procedure you have just completed. Record this number for future reference in the CALIBRATION DATA RECORDS sheet at the back of this manual.

Press the DISPLAY SELECT touch switch to go to the next display screen.

IMPORTANT: If only one Material Type is enabled, the display will show SPEED. If more than one Material type is enabled (up to four materials, - Salt, Sand, Mix A, and Mix B) the display will show SPr.AdJ with the Material Type Pointer at the next enabled material location.

Repeat Step 1 through Step 7 to determine the Spreader Constant for each enabled material. After the last Material Type Spreader Constant is determined, the display will show SPEED.

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SPEED CALIBRATION

The SPEED CALIBRATION CONSTANT is a number that matches the ground speed sensor to the control system. This number is determined by driving the vehicle over a measured course while performing the calibration procedure. NOTE: On some vehicles equipped with a two-speed axle, the speed calibration must be performed in both the Hi-speed and Lo-speed axle settings. The console display will show Spd.Hi and Spd.LO as an alternate to SPEEd (see Appendix F for more detail).

IMPORTANT: The SPEEd constant has two entry locations: (1) Manually entering a known value and, (2) performing the calibration procedure. The manual entry location is the first entered (see Step 1) and is identified by SPEEd shown in the display along with the flashing word messages SELECT DIGIT SET across the bottom. This entry method is used to enter a known value or an average that is obtained by performing the calibration procedure several times. Pressing the DISPLAY SELECT touch switch again advances to the second location (see Step 2) and it is identified by SPEEd shown in the display along with the word messages START (flashing) and STOP.

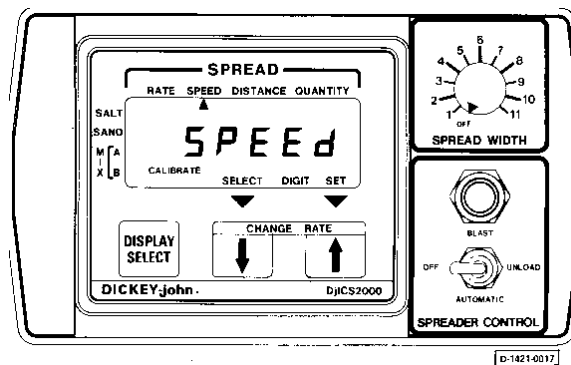


Figure 14

Step 1. To manually enter a known speed constant value or an average in the first SPEED entry location (shown above), press one of the CHANGE RATE touch switches. The display will show six digits. Enter the speed constant value using the DIGIT SELECT and DIGIT SET touch switches.

Press the DISPLAY SELECT touch switch to advance to the location where the speed calibration can be performed. If you have entered a speed constant value, press the DISPLAY SELECT touch switch twice to advance to the HYd.AdJ (Hydraulic Adjust) calibration procedure.

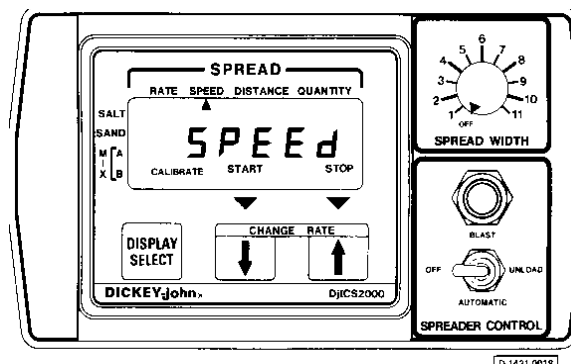


Figure 15

Step 2. The above illustration shows the display screen at the start of the speed calibration procedure. To perform this calibration proceed as follows:

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- a. Drive to a measured one mile (kilometer) course (preferably on level ground). Mark the start and finish so it will be plainly visible from the cab as you drive past.
- b. With the display indicating the same as the illustration above, drive up to the start of the course at a minimum of 5 MPH (8 Kph) and press the START touch switch (the touch switch directly below the flashing START message). NOTE: The 6-digit display should go to zero, then start counting up as you are moving. The STOP word message is flashing
- c. Continue to drive the measured course and when even with the finish marker press the STOP touch switch (the touch switch directly below the flashing STOP message).

The Speed Calibration number is displayed on the console's readout. Record this number for future reference in the CALIBRATION DATA RECORDS Sheet at the back of this manual.

Press the DISPLAY SELECT touch switch to advance to the HYd.AdJ procedure.

HYd.AdJ (Hydraulic Adjust) CALIBRATION

The HYd.AdJ (Hydraulic Adjust) calibration procedure adjusts the response of the control system to the spreaders hydraulic and mechanical systems. This number can be entered manually or through an automatic procedure. It is recommended that the initial number be determined through the automatic procedure and then fine tuned using the manual method. The entry method is selected by the position of the SPREADER CONTROL switch. In the OFF position the manual entry is selected and identified by SELECT DIGIT SET word messages flashing on the display. In the AUTOMATIC position the automatic procedure is selected and identified by START word message flashing.

- Step 1. Place the SPREADER CONTROL in the AUTOMATIC position (display should be as shown). Start vehicle engine. Engage hydraulic system.

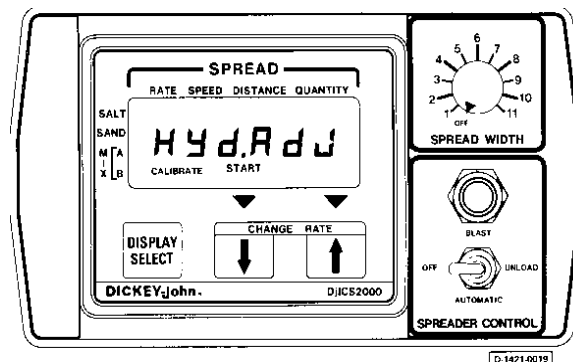


Figure 16

- Step 2. Increase vehicle engine RPM to normal operating range (approximately 2000 RPMs). For best results make certain hydraulics are at proper operating temperature.
- Step 3. Press the touch switch directly under the START (flashing) word message. IMPORTANT: Keep engine RPM in normal operating range during this procedure.

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During this automatic procedure which takes approximately 30 seconds the display will show a (square) and a number which changes during the procedure. When the procedure is completed the display will show "donE".

- Step 4. Set the SPREADER CONTROL switch to OFF. The number shown on the display is the Hydraulic Adjust constant. Record this number for reference. Minor direct adjustments may be desired from actual spreading operation observations. In general the number should be increased for a sluggish control response and decreased if the displayed application rate, during spreading, varies more than 5 percent when maintaining a STEADY speed.

Press the DISPLAY SELECT touch switch to advance to the next location.

tYPE

The display message is tYPE. This number depicts the type of control system for which the console is programmed. Consoles with like tYPE numbers can be used to replace each other, however, in general recalibration will be required.

To display the type number press one of the CHANGE RATE touch switches.

EXIT CALIBRATE MODE

You can exit the calibrate mode at any point by pressing and holding the DISPLAY SELECT touch switch for approximately 3 seconds .

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PROGRAM MODE

The Program Mode is used to access the Distance (miles/kilometers) and Quantity (tons/metric tons) data accumulated for presetting or resetting of the displayed value. Also in this mode the entry of the programmable application rates for each enabled material type are entered.

The Dj ICS2000 Ice Control System has the capabilities of being programmed for four different types (densities) of material. These locations are defined on the console as SALT, SAND, MIX A and MIX B. This list may be reduced as directed by the Material type (YES or NO) selections made in the CALIBRATE mode. For example, if the unit is calibrated to be used only for spreading SALT, only the SALT accumulators and programmable application rates would be accessible in the PROGRAM mode.

ENTERING PROGRAM MODE

- Step 1. To enter the Program Mode, press and hold the DISPLAY SELECT touch switch for approximately 3 seconds. The message CALIBRATE or PROGRAM will appear on the display. Momentarily pressing the DISPLAY SELECT touch switch will cause the two messages to be alternately displayed.

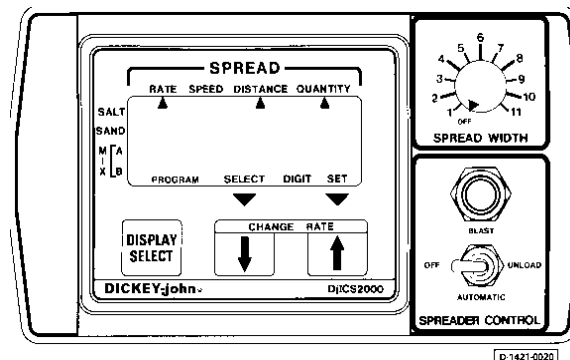


Figure 17

- Step 2. With the PROGRAM message displayed (as shown above), press one of the CHANGE RATE touch switches. Six zeros will be displayed as shown below.

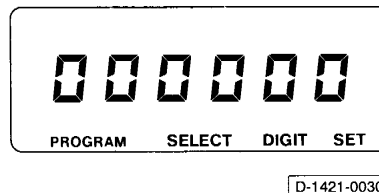


Figure 18

Enter the Program Mode Code lock number using the Digit Select () and Digit Set () touch switches.

Press the DISPLAY SELECT touch switch. If the Program Mode Code lock number is correct continue with the following procedures, if it is incorrect the console will return to the OPERATE MODE.

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SPREAD DISTANCE AND QUANTITY ACCUMULATORS

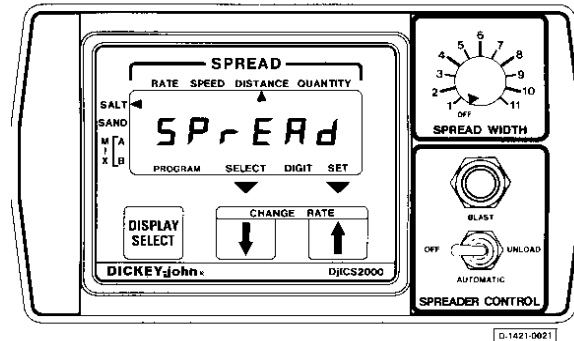


Figure 19

Step 1. The above illustration shows the display and word messages encountered when the program mode is entered. SELECT DIGIT SET word messages are flashing.

IMPORTANT: The following description assumes that all four Material Types are calibrate enabled. If a Material Type is not calibrate enabled it will be skipped in the Program Mode

Note that the pointer next to SALT and the pointer under DISTANCE is turned on. This denotes the SALT - DISTANCE data is accessible by pressing one of the CHANGE RATE touch switches. The display will show the following.

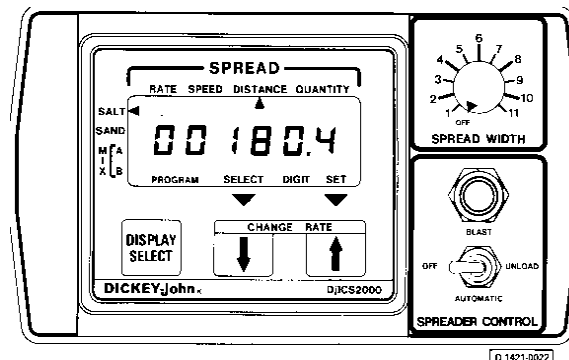


Figure 20

Step 2. The SALT - DISTANCE value is shown in the 6-digit display. This value is the spread distance in miles (kilometers) since the accumulators were last reset.

To reset the value to zero, press and hold the () touch switch (directly below the flashing word message SET) for approximately 3 seconds. NOTE: This value can also be preset to a value using the DIGIT SELECT and DIGIT SET touch switches.

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Press the DISPLAY SELECT touch switch. The display will advance to the SALT - QUANTITY data accumulators.

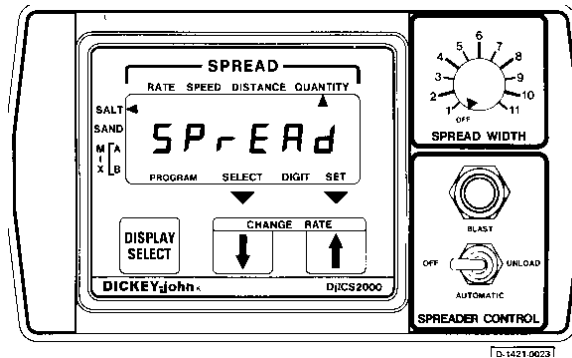


Figure 21

Step 3. Note that the pointer next to SALT and the pointer under QUANTITY is turned on. This denotes that the SALT - QUANTITY data is accessible by pressing one of the CHANGE RATE touch switches. The display will show the following:

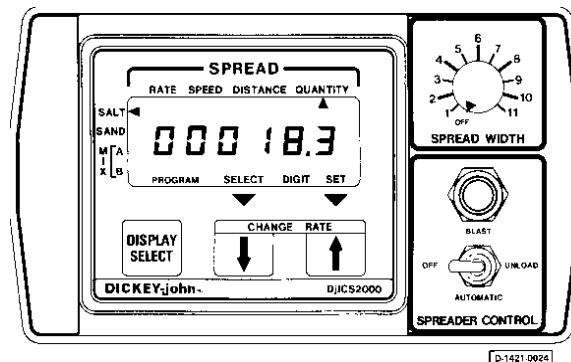


Figure 22

Step 4. The SALT - QUANTITY value is shown in the 6-digit display. This value is the spread quantity in tons (metric tons) since the accumulated data was last reset.

To reset the value to zero, press and hold the () touch switch (directly below the flashing word message SET) for approximately 3 seconds. NOTE: This value can also be preset to a value using the DIGIT SELECT and DIGIT SET touch switches.

Press the DISPLAY SELECT touch switch. The display will advance to the SAND - DISTANCE data accumulator.

Step 5. The SAND, MIX A and MIX B DISTANCE and QUANTITY data accumulators are addressed and reset using the same procedure described for the SALT accumulators in Steps 1 through 4 above. The only difference in the above display illustrations is the location of the Material Type Pointer.

Step 6. After the last QUANTITY data accumulator is displayed and the DISPLAY SELECT touch switch is pressed, the display will show Apr 1.

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PROGRAMMING APPLICATION RATES

Each Material type (SALT, SAND, MIX A and MIX B) contains six programmable application rate locations and a BLAST application rate.

There are two ways the six locations can be programmed: (1) Multiple Application Rates and (2) Incremental Application Rate. Each method provides a different selection of Application Rates in the Operate Mode.

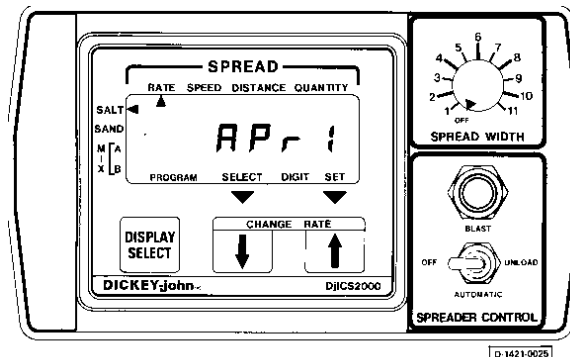
MULTIPLE APPLICATION RATES

OPERATOR SELECTABLE APr RATES	PROGRAM ENTERED VALUES						
	APr 1	APr 2	APr 3	APr 4	APr 5	APr 6	BLAST
1 Selectable	0200	0000	XXXX	XXXX	XXXX	XXXX	1500
2 Selectable	0200	0400	0000	XXXX	XXXX	XXXX	1500
3 Selectable	0200	0400	0600	0000	XXXX	XXXX	1500
4 Selectable	0200	0400	0600	0800	0000	XXXX	1500
5 Selectable	0200	0400	0600	0800	1000	0000	1500
6 Selectable	0200	0400	0600	0800	1000	1200	1500

The above chart shows locations and typical values which could be entered to limit the available application rate changes in the Operate mode. Note that zeros are the limiting entry. For example, if a single application rate is desired in the operate mode, then the desired application rate is entered in location APr 1 and zeros are entered in location APr 2. The values in APr 3 through APr 6 are ignored.

Enter the lowest application rate value in APr 1 and progress to the highest value in APr 6. Following this entry procedure will result in the arrows on the CHANGE RATE touch switches indicating in the correct direction. Enter the BLAST Application Rate in the BLAST location. The BLAST application rate is the value the control system regulates to when the BLAST switch is pressed.

Step 1. With the display showing APr 1, Material Pointer to the correct Material Type and the Spread Pointer to RATE, as illustrated below, you are ready to enter the application rate for location APr 1 SALT.



D-1421-0025

Figure 23

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Step 2. Press either of the CHANGE RATE (,) touch switches, the display (shown below) will show the application rate currently programmed in this location.

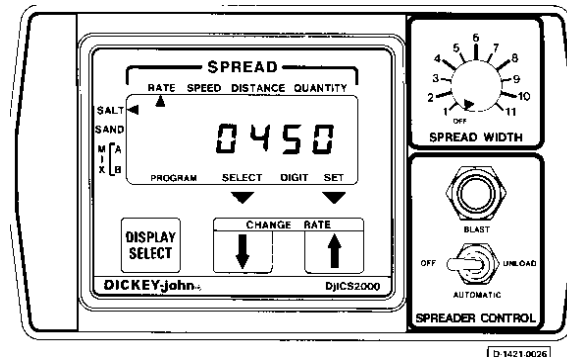


Figure 24

Note that the messages SELECT DIGIT SET are flashing. The touch switch directly below SELECT is used to select the digit to change and the touch switch directly below SET is used to set the digit value. Flashing digit is the one that will change.

Step 3. Use the SELECT DIGIT and DIGIT SET touch switches to set the 4-digit display to the desired application rate value.

Press the DISPLAY SELECT touch switch the display advances to show APr 2.

Step 4. If required enter desired application rates for APr 2 through APr 6 and bLAsT as described for APr 1 in Steps 2 and 3 above.

Step 5. Enter application rates for material types SAND, MIX A and MIX B using the above procedure. The only difference will be the location of the material type pointer.

Press and hold the DISPLAY SELECT touch switch to return to the OPERATE MODE.

Incremental Application Rate

Set location APr 1 to 9999, enter a desired maximum application rate in APr 2 and enter an increment value in APr 3. This allows the operator to select any application rate between zero and the maximum rate in multiples of the increment value. Values in APr 4 through APr 6 are ignored.

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NOTES

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INSTALLATION

A. PREPARING TO INSTALL THE CONTROL SYSTEM

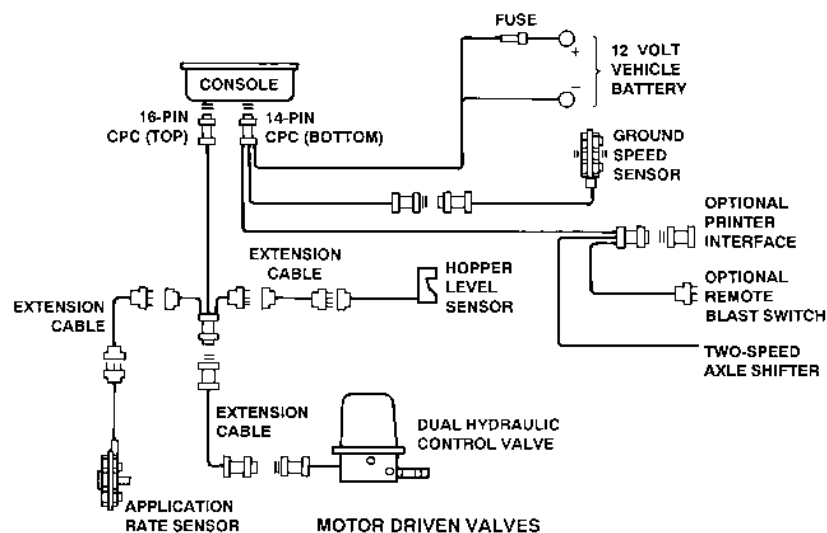
Step 1. Unpack and visually inspect the Control System Components for damage that may have occurred during shipping. If damage is found, file a claim with the carrier and notify your DICKY-john Dealer.

Check against your purchase invoice to make certain you have received all the console system components you purchased.

Step 2. It is recommended that you take time to thoroughly check your spreader and replace any defective parts that are creating unnecessary hydraulic pressure losses, such as worn hydraulic pumps, motors or kinked hydraulic lines. Check the conveyor or auger and make certain it runs smoothly without binding.

B. INSTALLING THE Dj ICS2000 SPREADER CONTROL SYSTEM

Refer to the following Harnessing Diagram for the connection relationship of the Control System Components. NOTE: The connectors on each of the system components are selected so that the component connector will only mate to the correct harness cable connector.



D 1421-3031

Figure 25

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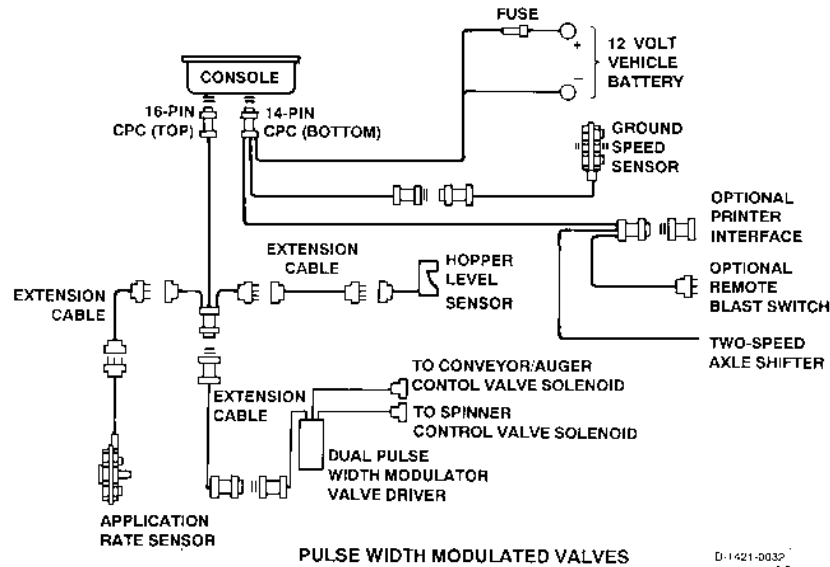


Figure 26

Refer to the following illustration for typical placement of the Control System Components in relationship to the Spreader System.

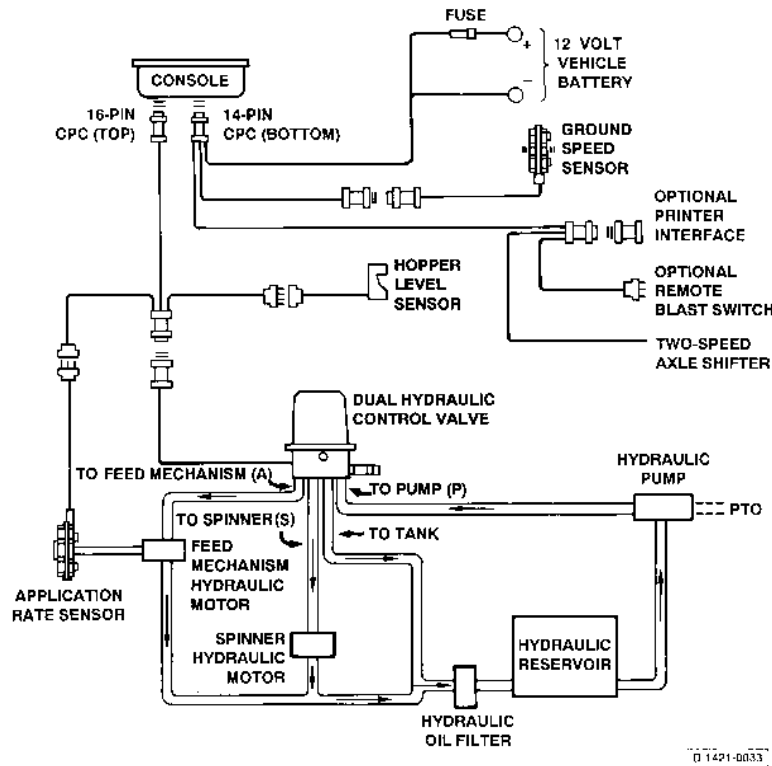


Figure 27

Refer to the Installation Instructions supplied with each Control System Component for detailed installation procedures.

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TROUBLESHOOTING

The Dj ICS2000 Ice Control System consists of five major components, each connected to a different area of a hydraulically driven Spreader Vehicle. Since each component performs a different function, the control system will react in different ways should any of the components fail. If all symptoms are known it is relatively easy to determine which component failed.

COMPONENT	CONNECTED TO	FUNCTION
Control Console	12 VDC vehicle battery and components of control system.	Compares vehicle ground speed to conveyor speed and positions the hydraulic control valve to provide the desired application rate.
Dual Hydraulic Control Valve Actuator	Conveyor/auger and spinner hydraulic control valves.	Regulates conveyor/ auger speed and spinner speed. Electrically controlled by the Control Console.
Vehicle Ground Speed Sensor	Vehicle mechanical speedometer or electronic speedometer.	Indicates vehicle ground speed to Control Console.
Application Rate Sensor	Conveyor/auger shaft or conveyor/auger hydraulic motor shaft.	Indicates conveyor/ auger speed to Control Console.
Hopper Level Sensor	Vehicle hopper.	Indicates low product level to Control Console.

If any of the Spreader components, such as the Hydraulic Pump or Hydraulic Motors are not operating properly, the Spreader may not perform to maximum capabilities and the Control System may appear to be at fault.

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COMMON PROBLEMS WITH SPREADER VEHICLE (Which have properly operating Control System):

SYMPTOMS	PROBABLE CAUSE	CORRECTIVE ACTION
Conveyor or Auger will not run in either OPERATE or UNLOAD Modes. Flashing Manual message on console display.	Hydraulic Pump OFF. Manual Valve closed. Hydraulic quick connector disconnected. Conveyor or Auger jammed. Relief valve operating at Low Pressure. Loss of hydraulic oil.	Engage pump. Open valve. Reconnect. Clear jam. Adjust or replace. Repair leak and fill with correct oil.
Conveyor or Auger will not reach maximum speed (Apr.Err message displayed and alarm sounds).	Faulty Hydraulic system. Conveyor or Auger binding. Relief valve set lower than specified, or defective relief. Material lumping and jamming conveyor. Engine RPM low due to using too high gear.	Repair Hydraulic System. Correct binding. Adjust to proper pressure or replace. Clear. Shift to lower gear and/or axle.
Inaccurate application more than 10% application rate error).	Material density has changed from original calibration. Feed gate setting changed. Ground speed input to Control System inaccurate. 1. Changed tire size. 2. Changed axle ratio.	Perform SPr.AdJ procedure for correct material weight. Set feed gate to position used during SPr.AdJ procedure. Perform Speed Calibration procedure.

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SYMPTOM 1: Control Console will not turn "ON".

PROBABLE CAUSE:

1. Blown fuse.
2. Battery connections.
3. Damaged power cable.
4. Control Console defective.

CORRECTIVE ACTION:

1. Check fuse. Fuse is located in positive battery lead. If blown, replace with a type AGC, 15 amp fuse.
2. Check the battery connections. Make sure there is no corrosion and that they are connected as described in the Installation Instructions.
3. Visually inspect power cable from rear of Console to battery. If damage is found, refer to Temporary Field Repair section in latter part of this manual and make repairs as described.
4. If no problem can be found with power connection or power cable, the control console may be at fault. Contact your Parts and Service Dealer or call DICKY-john for information (see numbers on back cover of manual).

SYMPTOM 2: "MANUAL" message displayed (flashing. Conveyor/ auger runs in "AUTO" with vehicle moving.

PROBABLE CAUSE:

1. Application Rate Sensor coupling to Conveyor Shaft slipping or disconnected.
2. Application Rate Sensor cable cut.
3. Application Rate Sensor defective.

CORRECTIVE ACTION:

1. Visually inspect the sensor to conveyor shaft coupling, if damaged, the coupling requires repair or replacement.
2. Visually inspect the cabling between the Application Rate Sensor and Console, if damage is found, repair as described in Temporary Field Repair (cable) section of this manual.
3. If no damage is found to the coupling or cabling, then the Application Rate Sensor is defective and requires replacement.

SYMPTOM 3: The Control Valve will not open in the AUTOMATIC Mode while moving. SPEED display shows zero. Control Valve functions normally in UNLOAD.

PROBABLE CAUSE:

1. Loss of Ground Speed input (Ground Speed Sensor or cabling defective.
2. Control Console defective.

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CORRECTIVE ACTION:

This symptom must be isolated to the ground speed sensor cabling, ground speed sensor or the control console.

1. Visually inspect the cabling between the ground speed sensor and control console for pinching, rubbing and cuts. If damage is found, repair the cable as described in Temporary Field Repair (cable) section of this manual.

If no damage to the cable is found proceed as follows:

2. To isolate between major components, use the substitution method. Replace one of the suspected components with a known good component. Then test operate the system, if the system performs correctly the failed component is the one that was replaced. If the system still does not perform correctly and the symptom remains unchanged then the problem is the component which was not replaced.

SYMPTOM 4: Console Application Rate display fluctuates above and below the programmed application rate while maintaining a steady speed (speed display steady).

PROBABLE CAUSE:

1. HYd.AdJ Constant too large.

CORRECTIVE ACTION:

1. Enter the CALIBRATE MODE and using the DISPLAY SELECT touch switch go to the location of the HYd.AdJ constant.

Depending on the magnitude of the fluctuation, decrease the value of the constant by 1 count or fine tune using 0.1 (tenth) units. Repeat this procedure until the control system operates to your satisfaction. NOTE: If you decrease the value too much you will observe Symptom 5.

SYMPTOM 5: Console Application Rate display is slow in responding to a change in ground speed, increment application rate change or it stabilizes at some indication other than the programmed application rate.

PROBABLE CAUSE:

1. HYd.AdJ constant too small.

CORRECTIVE ACTION:

1. Enter the CALIBRATE MODE and using the DISPLAY SELECT touch switch go to the location of the HYd.AdJ constant.

Increase the value of the constant by 1 count or fine tune using 0.1 (tenth) units. Repeat this procedure until the control system operates to your satisfaction. NOTE: If you increase the value too much you will observe Symptom 4.

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Temporary Field Repair (Cables)

If any system cable is damaged or cut, it can be repaired in the field. This type of repair is limited to cables only. Do not attempt to repair any wiring inside the Hydraulic Control Valve, the Ground Speed Sensor, or the Application Rate Sensor, as the seals will be broken and the warranty on the system will be void. Do not attempt to repair cable connectors.

The following method of repairing cables is only a temporary repair. Units with new cables or new extension cables must be ordered as soon as possible, otherwise chemicals can enter the repaired area and damage some of the components.

Always use rosin core solder for making cable repair. NEVER USE ACID CORE SOLDER!

The following illustrations show the recommended method of making cable repairs.

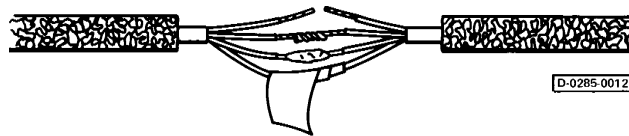


Figure 28

- Carefully cut away the black cable cover at the damaged area. Cut cable packing material. Strip about 1/2 inch of insulation from damaged lead(s). Do not cut away any of the wire strands.
- Use alcohol and clean about two inches of the black cable cover and the individual leads.
- Twist the two bare leads together (as shown) for each damaged lead, being careful to match wire colors, then solder the leads USING ONLY ROSIN CORE SOLDER. Tape over each repaired lead with vinyl electrical tape (DO NOT USE TOO MUCH TAPE).

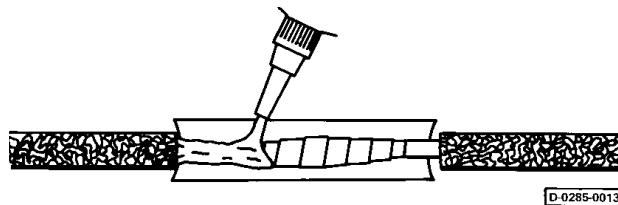


Figure 29

- Add a layer of vinyl electrical tape up to the black cable cover at each end of the repaired section. Make paper trough, as shown above, then apply silastic compound over the repaired section. Make sure you use enough silastic compound to fill in the ends of the black cable.

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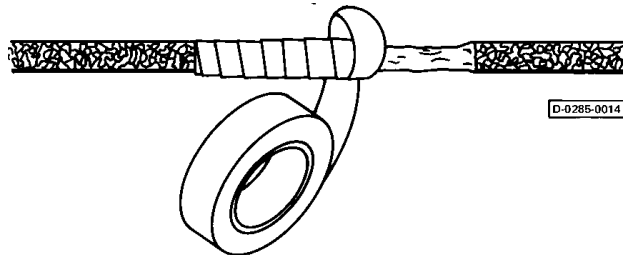


Figure 30

- Allow silastic compound to dry, then use vinyl electrical tape to completely cover the repaired area. Apply tape to at least two inches of each black cable end. Secure repaired cable in such a manner that it will not be damaged again.

NOTE: THIS IS ONLY A TEMPORARY REPAIR! REPLACE DAMAGED EXTENSION CABLE OR THE COMPLETE UNIT IF THE DAMAGED CABLE IS ATTACHED TO THE UNIT. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE SYSTEM SINCE ACTIVE CHEMICALS CAN CREEP UP THROUGH THE CABLE AND INTO ONE OR MORE OF THE SYSTEM UNITS .

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APPENDIX A

FINE TUNING OF APPLICATION RATE

If you find, over a period of time, that you have small (less than 10%) application rate errors and they are consistently under or consistently over, you may want to fine tune your control System as follows. NOTE: These small errors are normally the result of overall spreader variations.

These small consistent errors can be compensated for by adjusting the value of the SPREADER Constant by the same percentage.

Step 1. Determine the new Spreader Constant as follows:

$$\text{NEW SPREADER CONSTANT} = (\text{OLD SPREADER CONSTANT}) \frac{\text{Desired APR}}{\text{Actual APR}}$$

EXAMPLE: If your application rate was set at 300 lbs per mile and you found over a period of time that you were actually spreading 312 lbs per mile, you could adjust the spreader constant value using the above formula as follows:

$$\text{Old Spreader Constant} = 2.250$$

$$\text{New Spreader Constant} = (2.250) \frac{300}{312}$$

$$\text{New Spreader Constant} = 2.163$$

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NOTES

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APPENDIX B

MANUAL OVERRIDE

There are two methods that can be used to adjust the position of the control valve; one method involves removing the valve actuator cover and rotating the manual override mechanism by hand and the other method involves using the control system Manual mode to electrically adjust the valve position. The method used depends on the circumstances necessitating manual operation. If the Control Valve operates in the UNLOAD mode and will not open in the AUTO mode, then the Manual Mode Override procedure should be used. If the Control Valve will not open in either the UNLOAD mode or AUTO mode, then the Mechanical Adjustment of the valve must be used.

MANUAL Mode Override (Ground Speed Simulation)

- Step 1. Enter the CALIBRATE MODE and enable the Manual Mode (set display to YES). Return to OPERATE MODE.
- Step 2. Select Material Type to be spread. Set RATE display to Desired Application.

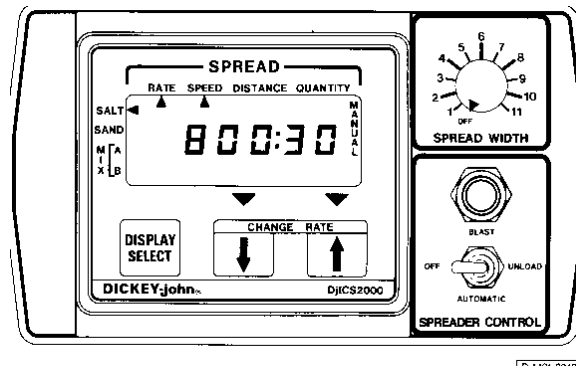


Figure 31

- Step 3. Momentarily press the DISPLAY SELECT touch switch until the MANUAL message is displayed as shown above.

Note that the Material type Pointer shows the selected material and the spread pointers are indicating RATE and SPEED. The selected application rate is shown in the left three digits of the 6-digit display and the SPEED, which must be maintained to achieve the application rate, is shown in the right two digits.

The SPEED display value can be increased or decreased in 5 MPH (kph) increments using the \downarrow and \uparrow touch switches.

- Step 4. To begin spreading, set the SPREADER CONTROL to AUTO and drive at the displayed SPEED value. To stop spreading set the SPREADER CONTROL to OFF.

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MECHANICAL VALVE ADJUSTMENT

- Step 1. Clean all dirt, etc. from valve cover and clamp.
- Step 2. Remove cover.

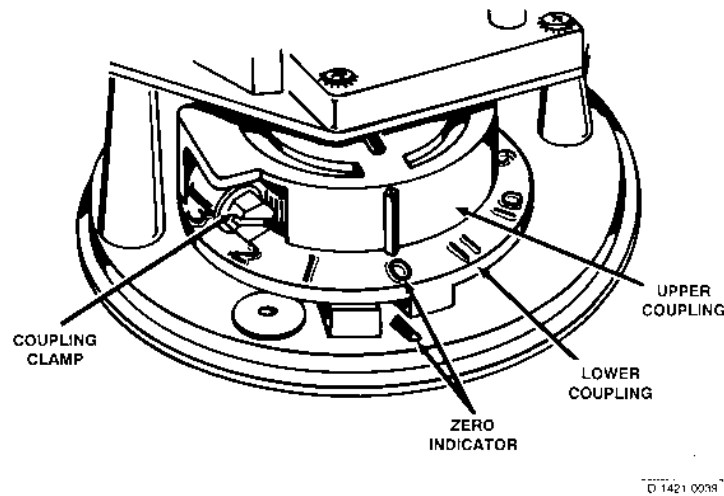


Figure 32

- Step 3. Refer to the above illustration showing the valve coupling. To manually adjust the valve, loosen the coupling clamp and rotate the lower part of the coupling. Rotating the coupling clockwise closes the valve; counterclockwise opens valve. When coupling hits stop, valve is completely open or closed.
- Step 4. Adjust valve position until approximate conveyor speed is obtained for speed and application rate desired. Tighten coupling clamp.
- Step 5. Set spinner speed using the above procedure.
- Step 6. Reinstall the gasket and cover, secure with clamp.

NOTE: ON-OFF System Control is provided by the tank return valve, if so equipped, or by engaging and disengaging the hydraulic drive input from the vehicle engine.

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APPENDIX C

CONVEYOR/AUGER OR SPINNER CREEP

- Step 1. Clean all dirt, etc. from valve cover and clamp.
- Step 2. Remove cover.

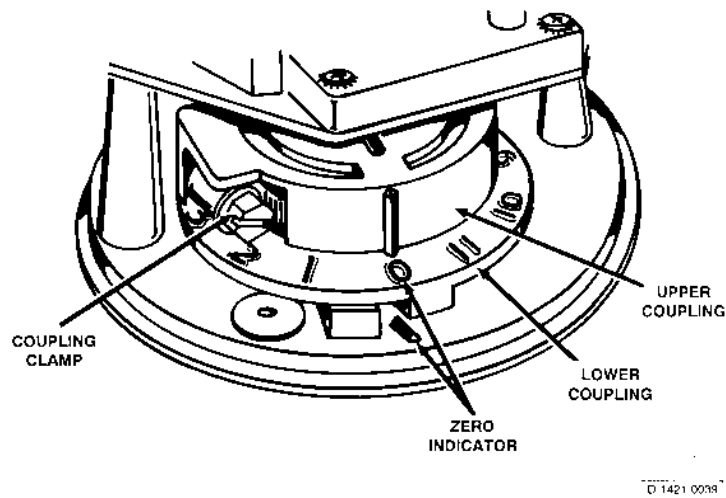


Figure 33

- Step 3. Refer to the above illustration and loosen the coupling clamp. Rotate the lower part of the coupling clockwise until the valve is closed and the creeping stops. Re-tighten coupling clamp. Re-Tighten coupling clamp.
- Step 4. Reinstall the gasket and cover, secure with clamp .

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APPENDIX D

DETERMINING SPREADER CONSTANT

The Spreader Constant in pulses per pound (kilogram) can be determined if you know the pounds (kilograms) discharged from your spreader per revolution of the final shaft. NOTE: A Spreader Constant will be required for each gate setting (V-Box only).

To find Spreader Constant:

- Step 1. Multiply the pulses (see NOTE 1) per revolution of the feedrate sensor times the gear ratio of the sensor shaft to the final shaft.

NOTES: 1. 360 pulses for Dj Sensor P/N 46436-017X
(Standard ICS2000 Sensor)
60 pulses for Dj Sensor P/N 10844-000X
900 pulses for Dj Sensor P/N 10837-00XX

2. Gear ratio is one if the sensor is mounted on the final shaft

- Step 2. Divide the result of Step 1 by the pounds (kilograms) discharged per revolution of the final shaft.

EXAMPLE:

- A. Dj Sensor P/N 46436-017X (360 pulses per revolution).
B. The sensor shaft makes 25 turns for each turn of the final shaft.
C. 50 pounds of material is discharged per revolution of the final shaft.

$$\text{Spreader Constant} = \frac{360 \times 25}{50} = 180$$

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APPENDIX E

A. REMOTE BLAST SWITCH

The Remote Blast Switch connects to a two conductor weather-pac connector located on the main harness. This switch is connected in parallel with the front panel BLAST switch.

The operation of the Remote Blast Switch is the same as described for the front panel BLAST switch in the OPERATOR'S MANUAL.

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APPENDIX F

SPEED CALIBRATION FOR TWO-SPEED AXLE

When ordering the control system the two speed axle program requirement should be specified. Even though you have a two speed axle, in most cases the difference in the speed input is already compensated for and you will not require the two speed axle calibration program.

The difference between the standard speed program and the two speed axle program is in the CALIBRATE Mode Speed Calibration Procedure and the connection of the yellow harness lead.

In the standard speed program the Speed Calibration will have one procedure and the display will show SPEED. The yellow harness lead does not require connecting and should be coiled and secured where it will not be damaged. Make certain the connector does not contact metal (ground).

In the two speed axle program the Speed Calibration will have two procedures. The display shows SPd.HI (high speed axle) for one and SPd.Lo (low speed axle) for the other. The yellow harness lead must be connected to a terminal on the two speed axle shifter switch where a voltage level change occurs between High Axle and Low Axle.

If you are not certain about the ground speed input to the console, after installation and speed calibration, drive the truck at a steady speed in low axle and note the console speed display reading. Shift to high speed axle and while maintaining a steady vehicle speed, again note the speed display reading.

If the speed display reading remains virtually unchanged, the two speed axle program is not required and the yellow harness lead does not require connecting.

NOTE: If your console has the two speed axle program, it can be used by performing the speed calibration in the SPd.HI location and ignoring the SPd.Lo location. Do not connect the yellow harness lead.

If the speed display reading drops by several MPH, the two speed axle program is required and the yellow harness lead must be connected to the two speed axle shifter switch.

IMPORTANT: If you require the two speed axle program and your console shows SPEED in the CALIBRATION Mode, then you must call DICKY-john Customer Service, telephone numbers are listed on inside back cover of this manual.

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TWO SPEED AXLE CALIBRATION PROCEDURE

The speed calibration procedure for the two speed axle program must be performed twice. Once in high axle and once in low axle. In the CALIBRATE Mode the calibrate procedure is as follows:

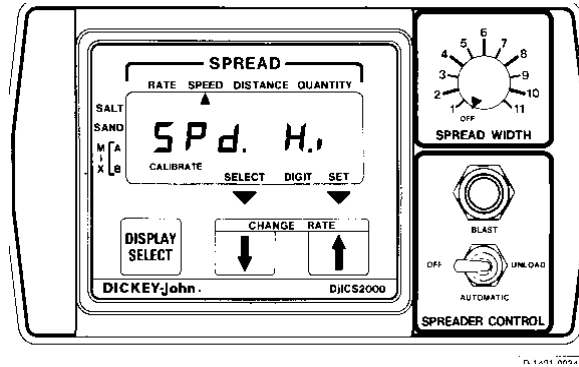


Figure 34

Step 1. To manually enter a known speed constant value or an average in the SPd.Hi entry location (shown above), press one of the CHANGE RATE touch switches. The display will show six digits. Enter the speed constant value using the DIGIT SELECT and DIGIT SET touch switches.

Press the DISPLAY SELECT touch switch to advance to the location (shown below) where the speed calibration can be performed (proceed to Step 2).

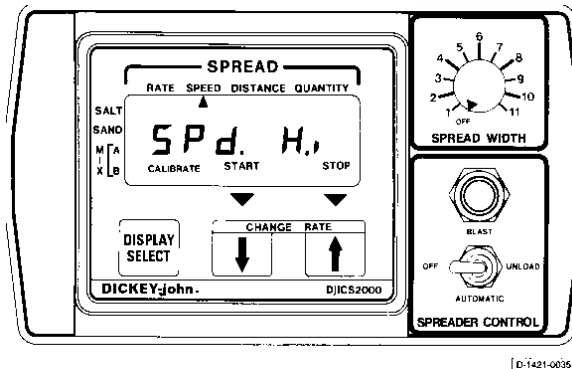


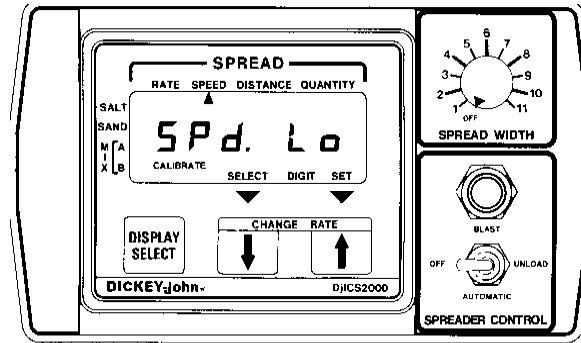
Figure 35

If you have entered a speed constant value, press the DISPLAY SELECT touch switch twice to advance to the SPd.Lo calibration procedure (proceed to Step 3).

Step 2. The above illustration shows the display screen at the start of the high axle speed calibration procedure. Refer to Step 2 of the SPEED CALIBRATION Procedure in the CALIBRATION MODE Section of this manual and drive the measured course in high axle as described.

Press the DISPLAY SELECT touch switch to advance to the SPd.Lo procedure.

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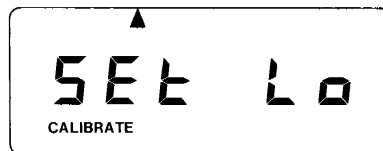
D-1421-0036

Figure 36

Step 3. To manually enter a known speed constant value or an average in the SPd.Lo entry location (shown above), press one of the CHANGE RATE touch switches. The display will show six digits. Enter the speed constant value using the DIGIT SELECT and DIGIT SET touch switches.

Press the DISPLAY SELECT touch switch to advance to the location (shown in Figure 38) where the speed calibration can be performed (proceed to Step 4).

NOTE: If you see SEt Lo on the display, it means set your two speed axle shift switch to Low Axle.

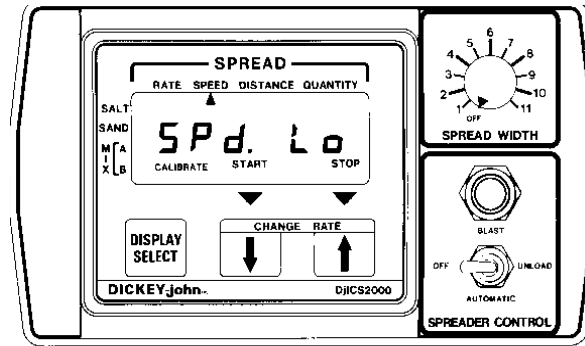


D-1421-0037

Figure 37

If you have entered a speed constant value, press the DISPLAY SELECT touch switch twice to advance to the HYd.AdJ (Hydraulic Adjust) calibration procedure.

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D-T421-06361

Figure 38

Step 4. The above illustration shows the display screen at the start of the low axle speed calibration procedure. Refer to Step 2 of the SPEED CALIBRATION Procedure in the CALIBRATE MODE Section of this manual and drive the measured course in low axle as described.

Press the DISPLAY SELECT touch switch to advance to the HYd.AdJ procedure.

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CALIBRATION DATA RECORD

TRUCK I.D. NUMBER _____ DATE _____

SPREADER CONSTANT INFORMATION

MATERIAL	ENABLED (YES or NO)	SPREADER CONSTANT	GATE HEIGHT (V-BOX ONLY)
Salt _____	_____	_____	_____
Sand _____	_____	_____	_____
MIX A _____	_____	_____	_____
MIX B _____	_____	_____	_____

SPEED CONSTANT

SPEED _____

SPd.Hi _____ (If required)

SPd.Lo _____ (If required)

HYDRAULIC ADJUST

HYd.AdJ _____

TYPE Number (Reference Only) _____

CALIBRATION DATA RECORD

TRUCK I.D. NUMBER _____ DATE _____

SPREADER CONSTANT INFORMATION

MATERIAL	ENABLED (YES or NO)	SPREADER CONSTANT	GATE HEIGHT (V-BOX ONLY)
Salt _____	_____	_____	_____
Sand _____	_____	_____	_____
MIX A _____	_____	_____	_____
MIX B _____	_____	_____	_____

SPEED CONSTANT

SPEED _____

SPd.Hi _____ (If required)

SPd.Lo _____ (If required)

HYDRAULIC ADJUST

HYd.AdJ _____

TYPE Number (Reference Only) _____

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CALIBRATION DATA RECORD

TRUCK I.D. NUMBER _____ DATE _____

SPREADER CONSTANT INFORMATION

MATERIAL	ENABLED (YES or NO)	SPREADER CONSTANT	GATE HEIGHT (V-BOX ONLY)
Salt _____	_____	_____	_____
Sand _____	_____	_____	_____
MIX A _____	_____	_____	_____
MIX B _____	_____	_____	_____

SPEED CONSTANT

SPEED _____

SPd.Hi _____ (If required)

SPd.Lo _____ (If required)

HYDRAULIC ADJUST

HYd.AdJ _____

TYPE Number (Reference Only) _____

CALIBRATION DATA RECORD

TRUCK I.D. NUMBER _____ DATE _____

SPREADER CONSTANT INFORMATION

MATERIAL	ENABLED (YES or NO)	SPREADER CONSTANT	GATE HEIGHT (V-BOX ONLY)
Salt _____	_____	_____	_____
Sand _____	_____	_____	_____
MIX A _____	_____	_____	_____
MIX B _____	_____	_____	_____

SPEED CONSTANT

SPEED _____

SPd.Hi _____ (If required)

SPd.Lo _____ (If required)

HYDRAULIC ADJUST

HYd.AdJ _____

TYPE Number (Reference Only) _____

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DjICS2000 PRINTER

An optional printer is available for use with the DjICS2000 Ice Control System that will provide the operator (Facility) a printout. This printout will contain the accumulated values for the CURRENT RUN and SEASON TOTALS for all active materials (Salt, Sand, Mix A and Mix B). The printer output format is as follows:

The DjICS2000 Console can be factory programmed to provide printouts as follows: The Print Heading, identified by NOTE 1, can be replaced with a custom heading. The printout can be in English, French Canadian, French, German or Italian.

The print heading contains 4 lines where the date, time, driver signature, and supervisor signature can be written. Also the Truck I.D. no. is printed

The CURRENT RUN portion of the printout contains four lines of printed data.

1. QUANTITY SPREAD- The quantity of material spread since the Current Run accumulators were reset. The printout value units are in tons (metric tons).
2. DISTANCE SPREAD- The Distance in Miles (Kilometers) the vehicle has travelled while spreading material since the Current Run accumulators were reset.
3. AVERAGE RATE - The Average Rate in pounds/mile (Kilograms/Kilometer) the vehicle has spread since the Current Run accumulators were reset.
4. RUN TIME- The elapsed time in hours and minutes that spreading has occurred since the Current Run accumulators were reset.

The CURRENT RUN accumulators are reset when the Printer is disconnected from the ICS2000 Harness.

The SEASON TOTALS portion of the printout contains the same type of information and units of measure as the Current Run data described above. The SEASON TOTALS will accumulate for a complete season (year) or until the accumulators are manually reset.

The SEASON TOTALS accumulators are RESET in the PROGRAM MODE as described in the CALIBRATION and PROGRAMMING Manual. NOTE: This procedure also resets the CURRENT RUN accumulators.

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PRINTER OPERATION

A short cable with a 9-pin connector is attached to the DjICS2000 Harness at the 14-pin (lower) connector. This 9-pin connector with a dummy jumper plug installed is the output for the printer.

Step 1. Turn the power switch on the DjICS200 Console to OFF.

Step 2. Remove the dummy plug from the printer connector on the DjICS2000 Harness.

Step 3. Connect The 9-pin printer cable connector to the DjICS2000 Harness connector (Where dummy plug was removed in Step 2).

Step 4. Turn DjICS2000 Console Power switch to ON. The display shows Print with the START Message flashing (shown below).