

CS 440RC

Solid De-icer Controller Installation Manual



Table of Contents

1	Installation Recommendations	3
1.1	Step 1	3
1.2	Step 2	3
2	Typical CS-440RC System	5
3	CS-440RC Display and Operator Consoles	7
3.1	CS-440RC Mounting Bracket	7
3.2	Remote Mounting of the 440 Display Console	7
4	CS-440RC Wiring Layout	8
4.1	Connector Details	10
5	Mounting Details	11
5.1	Display Unit	11
5.2	Microcontroller	11
6	Peripheral Connections	12
6.1	Digital Input	12
6.2	Material Detection	13
6.3	Material Change/PPS	14
6.4	Liquid Pressure	14
6.5	Plow Indicator	14
6.6	Spare 1 Indicator	14
6.7	P-Float Indicator	15
6.8	Low Oil Indicator	15
6.9	Body Up Indicator	15
6.10	Gate Sensor and Cylinder	16
6.10.1	Gate Read Back Sensor	16
6.10.2	Gate Cylinder with Read Back	16
6.10.3	Sensor Wiring	16
6.11	Global Positioning System	18
6.12	Temperature Sensors	18
7	Anti-icing Mode	19
7.1	Simulated Anti-icing Mode	19
7.2	Multiple Boom Anti-icing	19

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1 Installation Recommendations

1.1 Step 1

Unpack all the supplied parts and check the packing list for completeness.

1.2 Step 2

Untie and layout all the cables supplied, to ensure proper lengths.

Note: Electromagnetic devices such as relays, magnetic switches and solenoids, can generate large negative voltage spikes. These large spikes are conducted into the vehicle's electrical system and may adversely affect all electronic devices including engine computers. It is strongly recommended that these electromagnetic devices be electrically suppressed. See warnings and instructions in Body Builder manuals.

1. Connect the Controller 12V power supply and the ground wire using a dedicated circuit only. (Connect to the disconnect switch, if available. Otherwise, connect directly to the battery.)
2. Connect 12V power and ground for all peripheral equipment such as GPS, Material Detection etc., to the same dedicated circuit only.
3. Connect unused inputs on the DIG IN cable to a good battery or chassis ground.

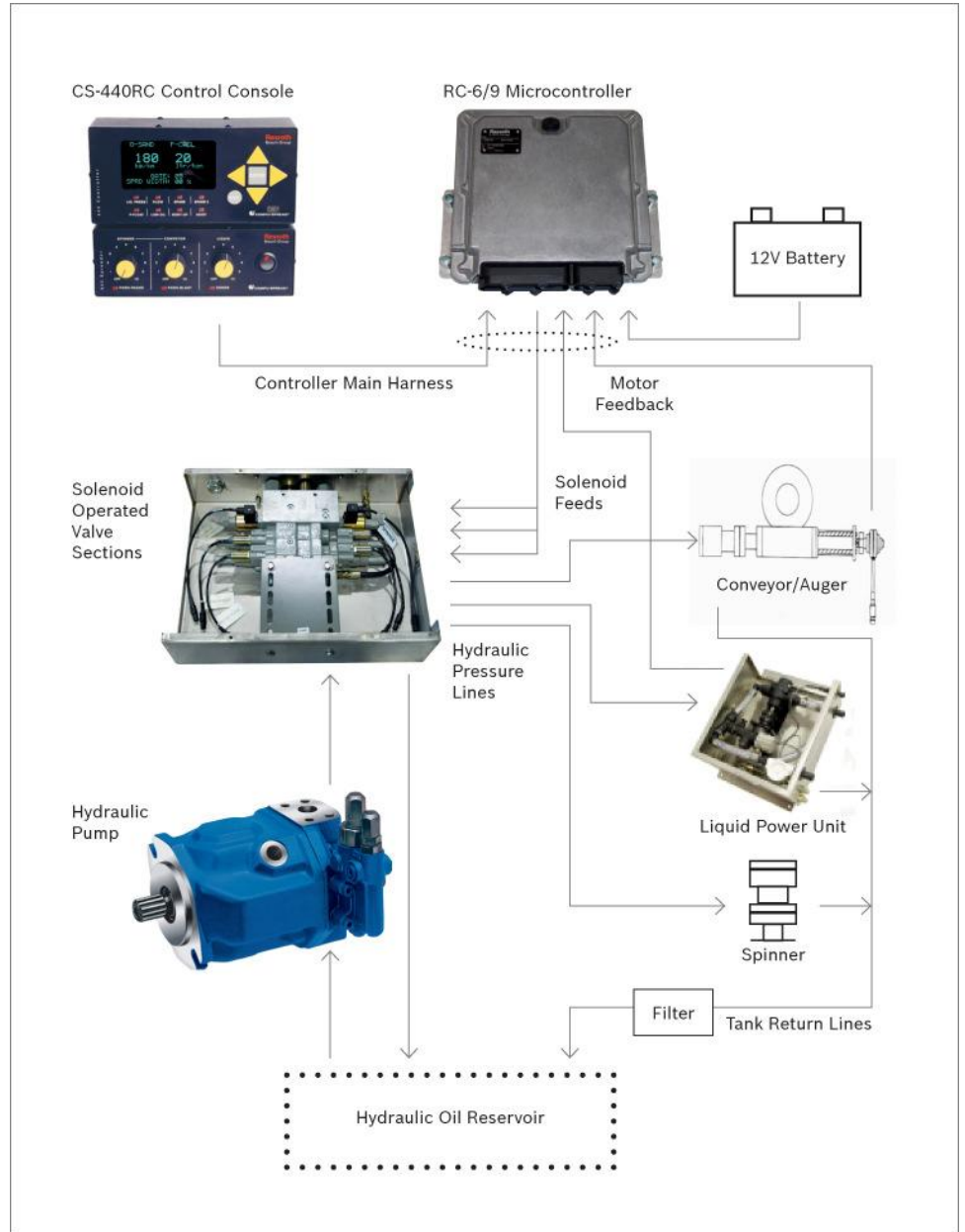
Note: Radio equipment precautions:

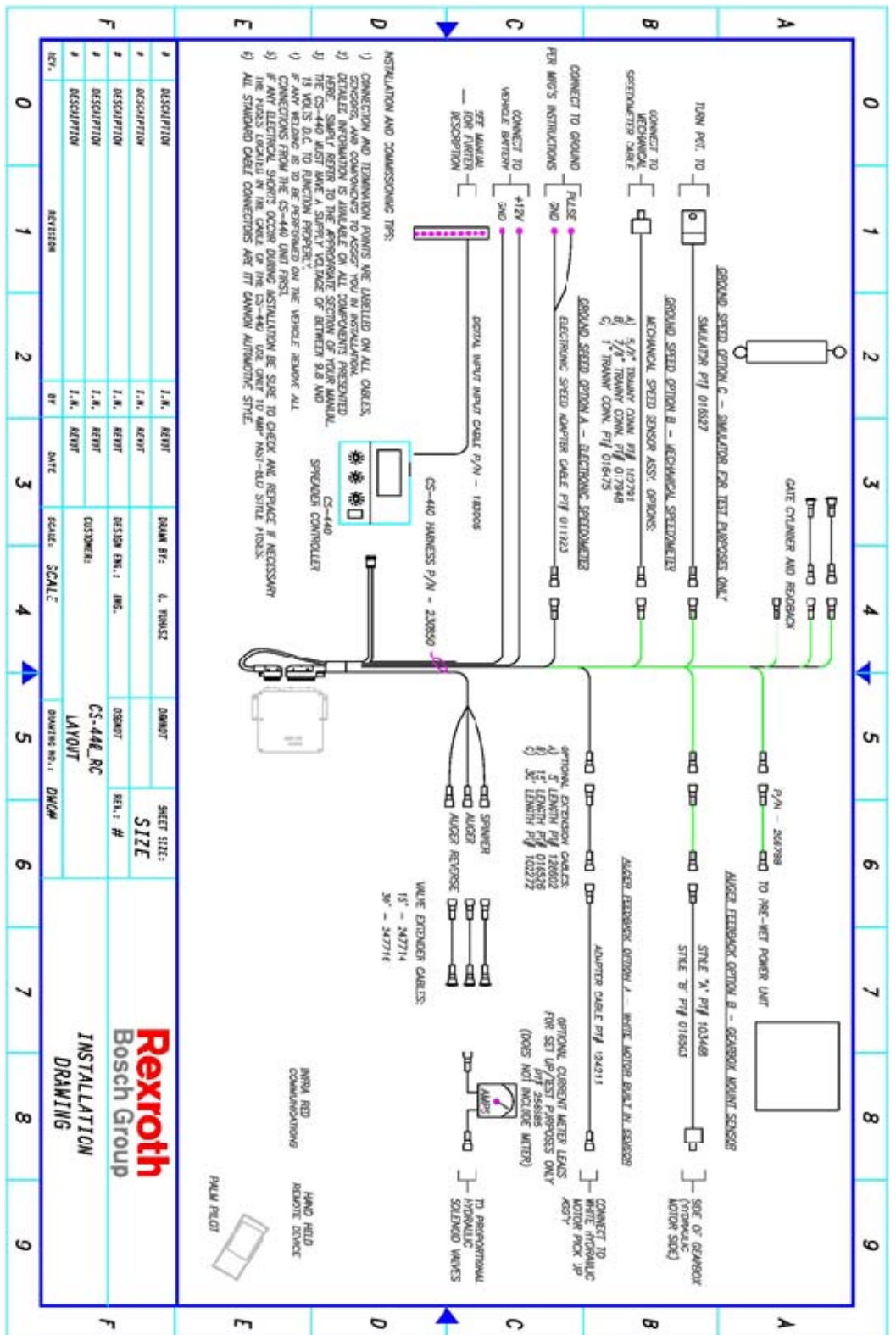
4. Ensure wiring for transmission devices such as radios, etc. are not attached to the controller or bundled with the controller wiring.
5. DO NOT mount radio equipment next to the spreader console. Keep sufficient space between electronic equipment.
6. DO NOT route the radio antenna wire within 3 ft (1m) of any controller wiring including auxiliary cables.
7. DO NOT operate radio equipment while using a ground speed simulator or calibrating the controller.
8. Follow all installation instruction provided by the radio manufacturer.
9. Make sure all mounting posts are properly grounded; a direct ground wire to the negative battery post is recommended. Floor mats and undercoating will interfere with proper grounding.
10. Disconnect the battery terminals before welding on a vehicle with electronic equipment.
11. Disconnect the negative battery terminal when wiring electronic devices.
12. Mount the consoles so that they do not interfere with vehicle controls or obstruct visibility.
13. Route cables so that they will not be abused or damaged.
14. When routing cables through metal opening, always use grommets to prevent cable damage.

15. When running wires around a dump box pivot point, ensure no connectors can be separated when the hoist is activated.
16. Tie wrap cables clear of all moving parts like drive-axles or conveyor chains.
17. Consult the vehicle manufacturer for Ground Speed connections, improper connections will void all vehicle warranties.
18. Observe the cable labeling (under the clear cover) for the proper termination of inputs and outputs.
19. Use dielectric grease on all external cable connections and pins to ensure proper corrosion protection.
20. Thoroughly clean all power and ground terminals before connecting power harness.
21. Stand clear of any hydraulic functions when first powering up the system.
22. DO NOT drill holes in any of the enclosures.
23. DO NOT re-wire any of the consoles or cable harnesses.

Failure to follow the recommendations will void your warranty.

2 Typical CS-440RC System





3 CS-440RC Display and Operator Consoles



3.1 CS-440RC Mounting Bracket

The bracket base can be welded or bolted to a pedestal.



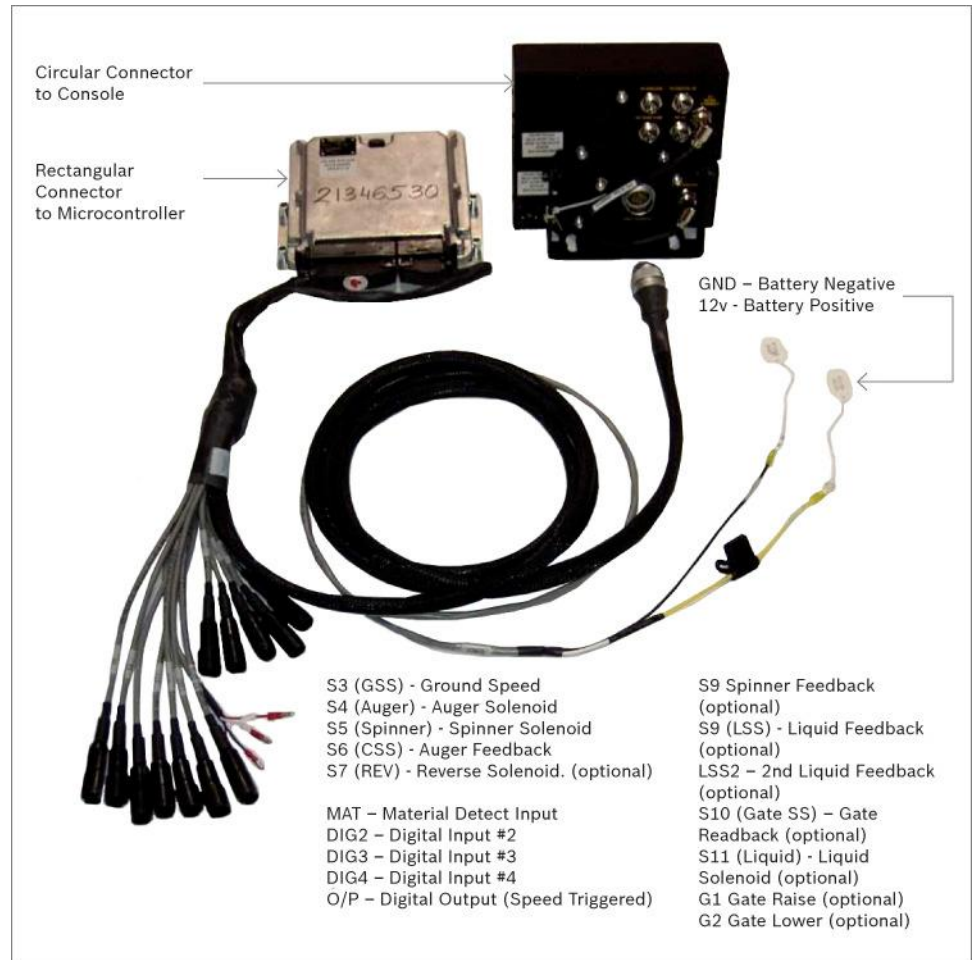
The console can be tilted at pivot point (1) to accommodate a more suitable display angle for easier viewing.

Position the mounting bracket to allow an unobstructed clear view of the controller in the driver's field of vision without blocking his or her view of the road and right side mirrors. Also be aware of any movement required for the operation of the vehicle such as the gearshift lever.

3.2 Remote Mounting of the CS-440RC Display Console

The standard cable and bracket configuration as provided, allows for mounting of both the Display and the Operator Consoles on the same bracket. An optional installation bracket and cable are available to allow for mounting the Display Console separate from the Operator Console if space is limited.

4 CS-440RC Wiring Layout



S3 GSS

Groundspeed input, interface with cable P/N 011923 to the proper ground speed pickup for the particular truck (see vehicle manual for correct ground speed connection).

S4 Auger

Connects to the conveyor/auger valve solenoid.

S5 Spinner

Connects to the spinner valve solenoid.

S6 CSS

Conveyor speed sensor connection, connect to the conveyor speed sensor.

S7 Reverse

Connects to the optional auger reversing valve solenoid.

S8 Spinner SS

Connects to the optional spinner speed sensor.

S9 Liquid SS

Connects to the optional liquid system flow meter.

LSS2 Liquid SS2

Connects to an optional anti-ice flow meter.

S10 Gate SS

Connects to the optional gate read back device.

S11 Liquid

Connects to the optional liquid valve solenoid.

G1 Gate Raise

Connects to the optional gate raise valve solenoid.

G2 Gate Lower

Connects to the optional gate lower valve solenoid.

4.1 Connector Details

1. To secure the rectangular connectors to the RC microcontroller, first ensure the locking tabs are extended, then partially insert into the receptacle. There are 4 coding posts that must be aligned.



2. Then push in the locking tab and the connectors will automatically secure.



Push down the wire retainer.



Pull connector from solenoid.



5 Mounting Details

5.1 Display Unit

1. Using the supplied bracket, secure the console to a pedestal as not to obstruct vehicle controls and operator visibility.
2. Position the console in clear view and within reach of the operator.
3. Route cables to the microcontroller in a way to prevent damage. See installation recommendations page 3.

5.2 Microcontroller

1. The electronic control unit must be secured at all 4 points and mounted inside the cab.
2. Recommended tightening torque is 8 +/- 2 Nm with M6 bolts.
3. Allow adequate space for plugging and unplugging of the mating connector.

6 Peripheral Connections

The CS-440RC spreader controller can support a number of external devices such as Flow Meters, Spinner speed, Temperature Sensors, GPS Receivers as well as multiple Digital Inputs.



6.1 Digital Input

Cable is used to apply Sensor digital signals to the controller to activate a pre-defined function or illuminate the front panel lights. This cable is to be connected to **P3** and the numbered functions are defined below.

Pins 2 to 5 are recorded with the logged data; all other pins provide light indication only.

Note: All unused digital inputs on the DIG IN cable should be connected to a good battery or chassis ground.



	DIG IN Cable
1	N/A
2	Material Change/PPS
3	Liquid Pressure
4	Plow Indicator
5	Spare 1 Indicator
6	P-Float Indicator
7	Low Oil Indicator
8	Body Up Indicator
9	Ground



MAT	Material Detect Input
DIG2	Digital Input #2
DIG3	Digital Input #3
DIG4	Digital Input #4
O/P	Digital Output (speed triggered)

6.2 Material Detection

In order to provide proof that there is material discharging from the hopper during the spreading operation, a limit switch is used to sense the flow of material. If material detection is required, the bullet connector input on the main harness labeled MAT can be used and it's status will be recorded in the log data.

The limit switch is attached to the center of the gate so that about an ½ inch of the stainless steel sweep extends below the gate.

When the material lifts the sweep, the circuit is closed and a 12Volt signal is introduced into the CS-440RC.

Connect 12 volt fused power to the limit switch and connect the return wire to the MAT bullet connector.

O/P

Speed triggered digital output provides up to 2.5 amps positive output to drive a load whenever the system detects vehicle speed. The output shuts down when the vehicle stops. Usefull for switching ball valves in an anti-ice system.

Dig 2, 3 and 4

Digital inputs used for future expansion (not used).

6.3 Material Change/PPS

The MATERIAL CHANGE input allows for automatic roll over from one solid de-icer function to another to suit specific needs.

For example, vehicles using single and dual cross conveyors need to be calibrated for both single conveyor or dual conveyor use to obtain the greatest accuracy in spread rates.

Name Material 1 “Salt-D”, enter the desired dual conveyor spread rates and calibrate this material under dual conveyor operation conditions. Name Material 3 “Salt-S”, enter the desired single conveyor spread rates and calibrate this material under single conveyor operation.

Make a connection from the output of the switch which activates the “single-dual” operation to Pin 2 and each time the driver activates the switch to go from Dual to Single operation, the CS-440RC will roll over from Material 1 to Material 3. When the driver activates the switch to go from Single to Dual operation again, the CS-440RC will roll over from Material 3 to Material 1.

If pre-wetting is used Liquid 1 and Liquid 3 must also be configured to match the set up above.

The PPS – (Positive Placement System) input allows for the configuration of the CS-440RC for PPS use. See Setup Manual for configuration details.

6.4 Liquid Pressure

By installing a pressure switch in the pre-wetting or anti-icing pump outlet side, the liquid pressure can be monitored. Any high pressure indication will be recorded on the Logged Data print out.

6.5 Plow Indicator

The plow position can be monitored to record actual plowing time, by installing a pressure switch in the hydraulic line or a proximity switch on the plow harness then connecting the output to Pin 4.

6.6 Spare 1 Indicator

Pin 5 is available for the monitoring of other operational functions.

6.7 P-Float Indicator

A pressure switch in the hydraulic line of the power float system can be connected to pin 6, an indicator light on the Display Console gives the driver a visual indication of the Power Float status.

6.8 Low Oil Indicator

A level switch in the Hydraulic reservoir can be connected to pin 7, an indicator light on the Display Console gives the driver a visual indication of low oil levels.

6.9 Body Up Indicator

The Dump Box position can be monitored by installing a pressure switch in the hydraulic line lifting the dump box and connecting this to Pin 8, an indicator light on the Display Console gives the driver a visual indication when the dump box is raised.

6.10 Gate Sensor and Cylinder

6.10.1 Gate Read Back Sensor

The sensor is equipped with ½” base and rod mounting holes. Position the sensor that the rod does extend past 9 1/4” (235mm) of extension. Inaccurate readings will result. Also mount the sensor that the rod does not bottom out when fully retracted.

See the connection diagram for wiring details (next page).



6.10.2 Gate Read Back Sensor

The cylinder has 1” rod and base eyes for mounting and #6 ORB ports. See the connection diagram for wiring details (next page).



6.10.3 Sensor Wiring

Connect the y-adapter to the CS-440 main harness. Match the connector ends that read S8 SPINNER SS with the S8 connector on the 440 harness. Also match the connectors that are labeled S10 GATE.

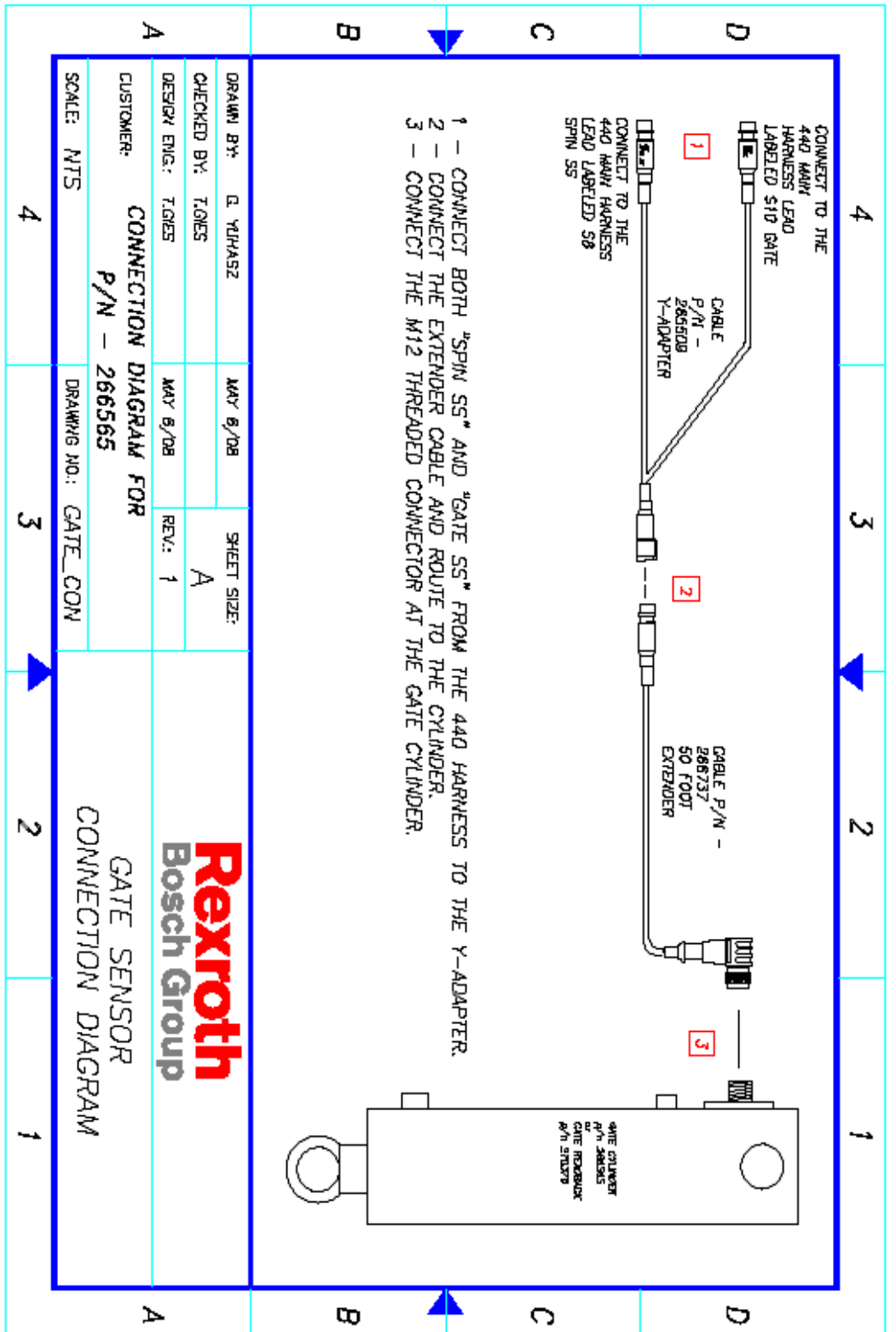
Connect the 50” extender to the other end and route the extender to the sensor. Push on the M12 connector and tighten the locking ring. Tie all cabling so it does not interfere with any moving parts.

See the connection diagram for clarification (next page).



The gate setting will have to be calibrated as part of configuring and setting up of the system. See Set-up Manual.

Note: The stroke limiters on the valve may need to be adjusted in to limit the flow to the cylinder. This will provide smooth and slow gate movement.



DRAWN BY: G. YELHASSZ	MAY 8/08	SHEET SIZE: A
CHECKED BY: TONES		
DESIGN ENG: TONES	MAY 8/08	REV: 1
CUSTOMER: CONNECTION DIAGRAM FOR	GATE SENSOR CONNECTION DIAGRAM	
P/N - 266565		
SCALE: NTS	DRAWING NO.: GATE_CON	



6.11 Global Positioning System

Using a COMM CABLE connect the GPS system to connector **P5 GPS**.

6.12 Temperature Sensors

Using a COMM CABLE connect the sensor to connector **P4**.

Control products temperature sensor.



Sprague temperature sensor



Sprague temperature sensor.

7 Anti-icing Mode

The CS-440RC has the capability to operate as an Anti-icing Controller for single boom or multiple boom operation.

The digital input connector serves as the input for the anti-icing modes as well.

For configuring and setting up the anti-icing mode see the Configuration and Set-up Manual.

7.1 Simulated Anti-icing Mode

In the simulated anti-icing mode the spreader is equipped with a single boom across the back of the truck and is capable of applying salt/sand and pre-wetting the salt/sand or applying liquid for a single lane anti-icing application. A digital input is required from the anti-icing output side of the Pre-wetting/Anti-icing selector switch to both pins 2 and 5.

7.2 Multiple Boom Anti-icing

In the three booms anti-icing mode the vehicle is equipped with three booms, for single, double or three lane applications.

When selecting each boom, the CS-440RC also needs a digital input for each boom selected.

Connect a wire from the output of the boom selector switch to the DIG IN cable as follows:

Left boom – Connect to pin 1

Right boom – Connect to pin 4

Centre boom – Connect to pin 5

Notes: