

# **SCS 11, SCS 203 MG, SCS 303/313 EG Installation & Service Manual**

*P/N 016-0159-008 Rev. G 07/16*

*E28129*

## ***Disclaimer***

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Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better.

To serve you best, please send an email with the following information to

[techwriting@ravenind.com](mailto:techwriting@ravenind.com)

- SCS 11, SCS 203 MG, SCS 303/313 EG Installation & Service Manual
- P/N 016-0159-008 Rev. G
- Any comments or feedback (include chapter or page numbers if applicable).
- Let us know how long have you been using this or other Raven products.

We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.



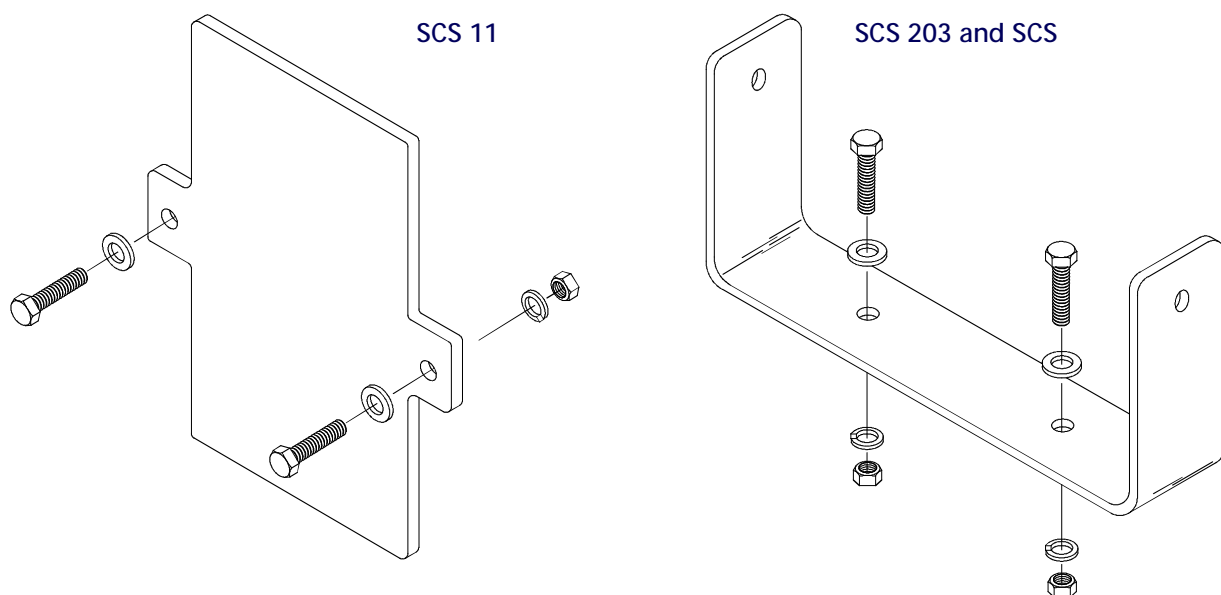
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## MOUNTING THE SPRAYER CONTROL CONSOLE

1. Select a mounting location for the console in the implement cabin where the pressure gauge is clearly visible and switches are within easy reach.
2. Use the console bracket as a pattern to drill the mounting holes.
3. Drill one 1/4" [6 mm] hole and bolt the bracket in the position desired.
4. Now drill the second hole and install the second mounting bolt.

FIGURE 1. SCS Mounting Brackets

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5. Route the red and white power and ground lead wires from the console to a source of 12 volt power.
  - a. Connect the white wire to ground.
  - b. Connect the red wire to a source of +12 VDC (e.g. battery, ignition solenoid, or fuse block).

**IMPORTANT:** Some ignition solenoids are 24 VDC and will damage the console. Contact a local equipment dealer for assistance locating an appropriate power source if necessary.

6. Route the console control cable through an access panel to the outside of the operator cabin.

## INSTALLING THE PRESSURE SENSOR

The SCS 11, SCS 202, and SCS 303 Sprayer Control Systems sense pressure by means of a pressure gauge tube which is installed into the main application plumbing and connected to the pressure tube provided with the system.

The SCS 303 and SCS 313 Sprayer Control Systems sense pressure through an electronic pressure transducer and therefore does not bring a liquid tube into the console gauge. The pressure transducer connects with a quick disconnect coupler so periodic flushing is possible when using chemical suspensions. Refer to Appendix B, SCS 303 Pressure Transducer Calibration, and Appendix C, SCS 313 Pressure Calibration, for pressure transducer calibration instructions.

## INSTALLING THE MOTORIZED CONTROL VALVE

Install the motorized control valve as shown in the figures below. The plumbing will vary depending upon whether the sprayer has a positive displacement pump or a centrifugal pump.

**FIGURE 2. Standard Sprayer Plumbing Diagram**

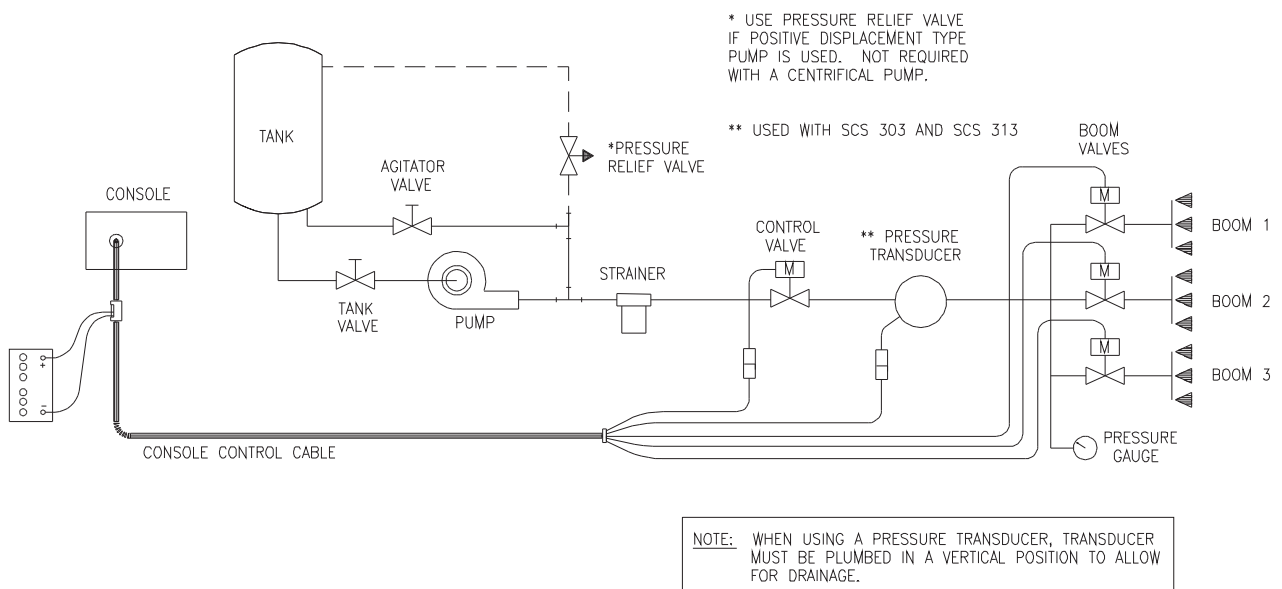
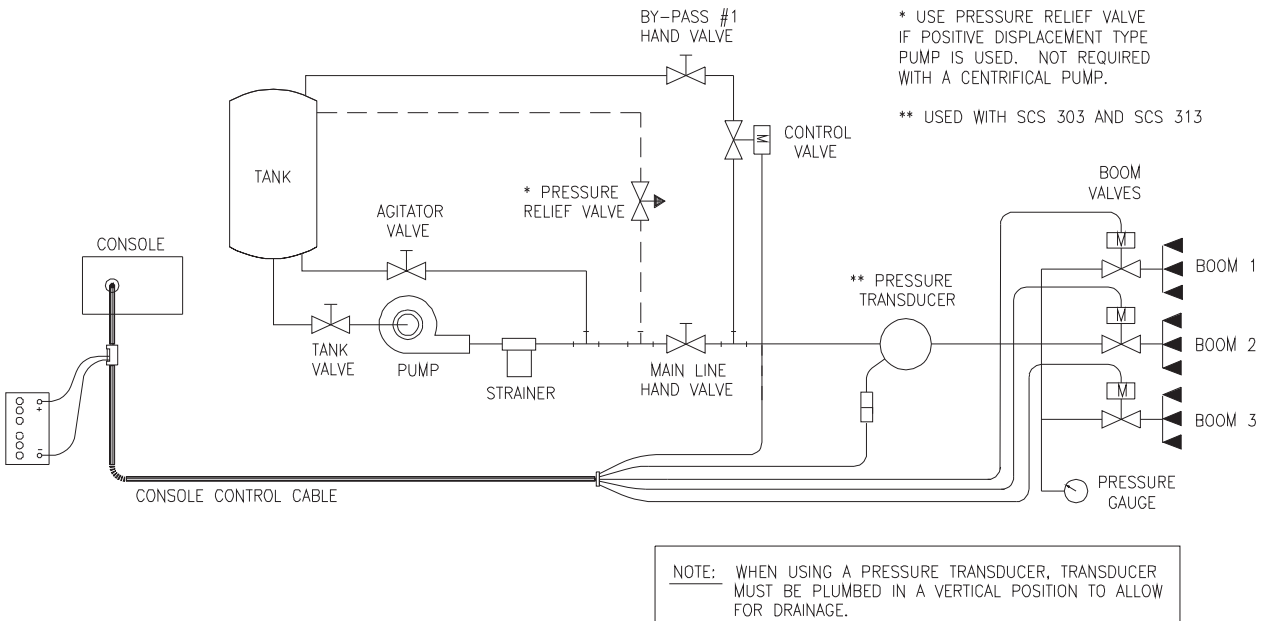




FIGURE 3. Alternate By-Pass Line Plumbing Diagram



## WIRING THE SPRAYER CONTROL SYSTEM

FIGURE 4. SCS 11 Wiring Diagram

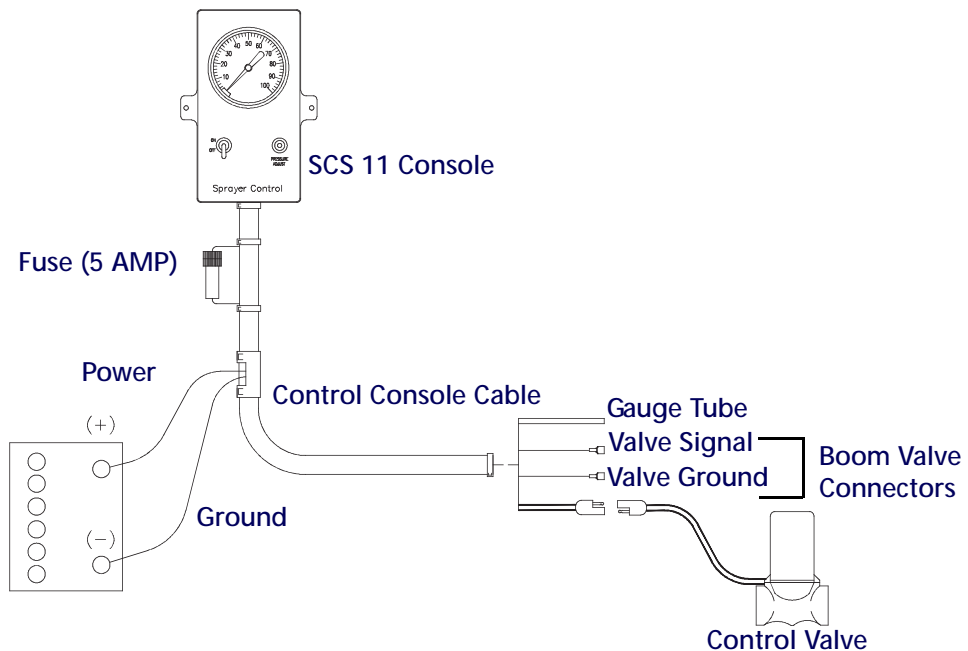


FIGURE 5. SCS 200 Series Wiring Diagram

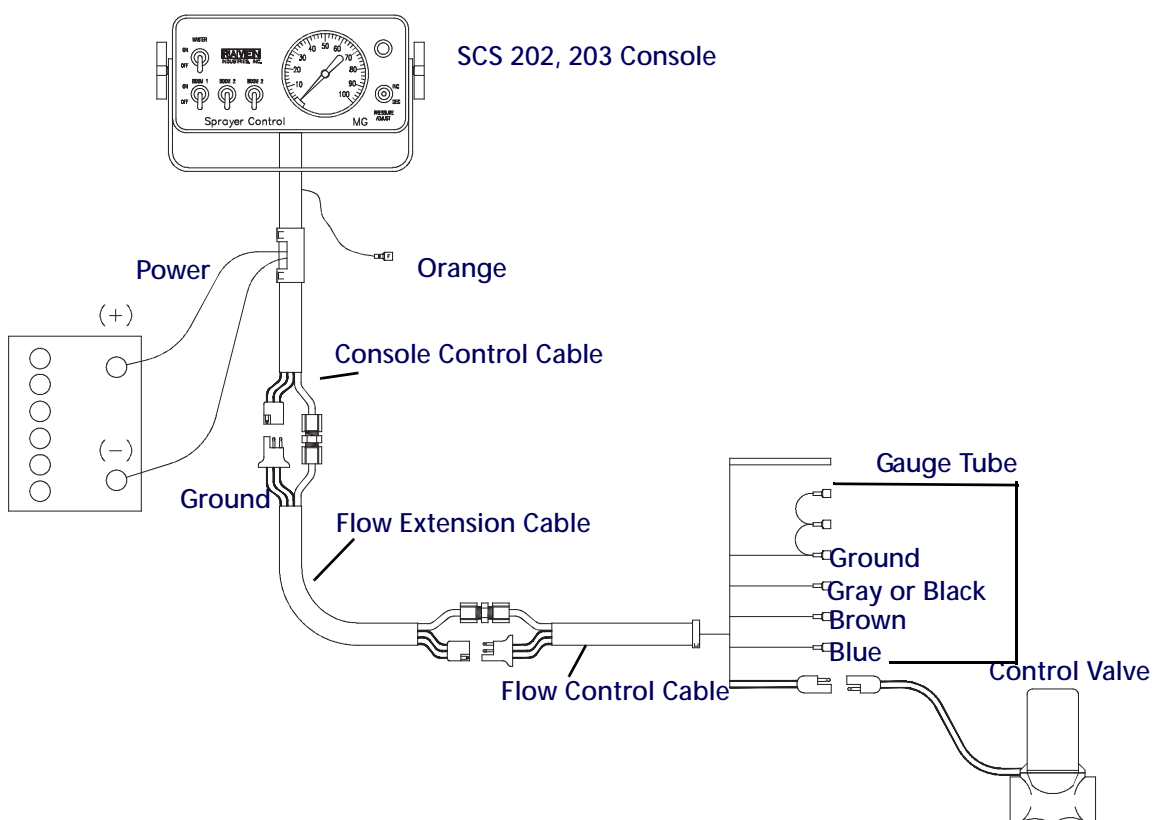


FIGURE 6. SCS 303 Wiring Diagram

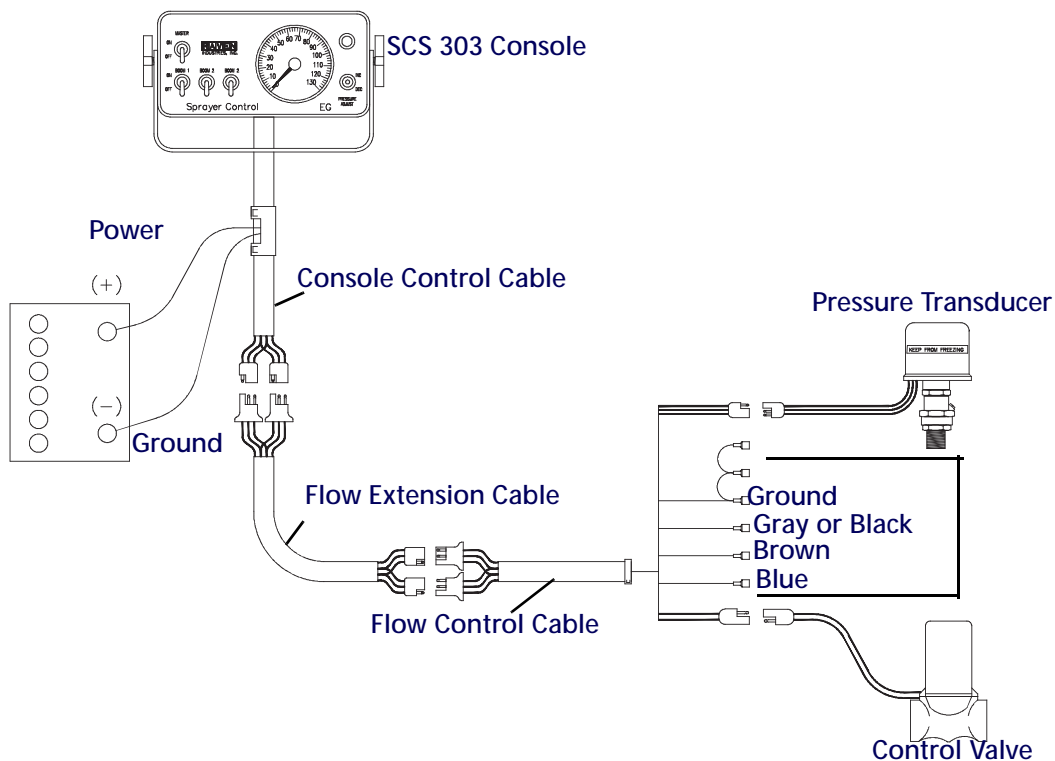
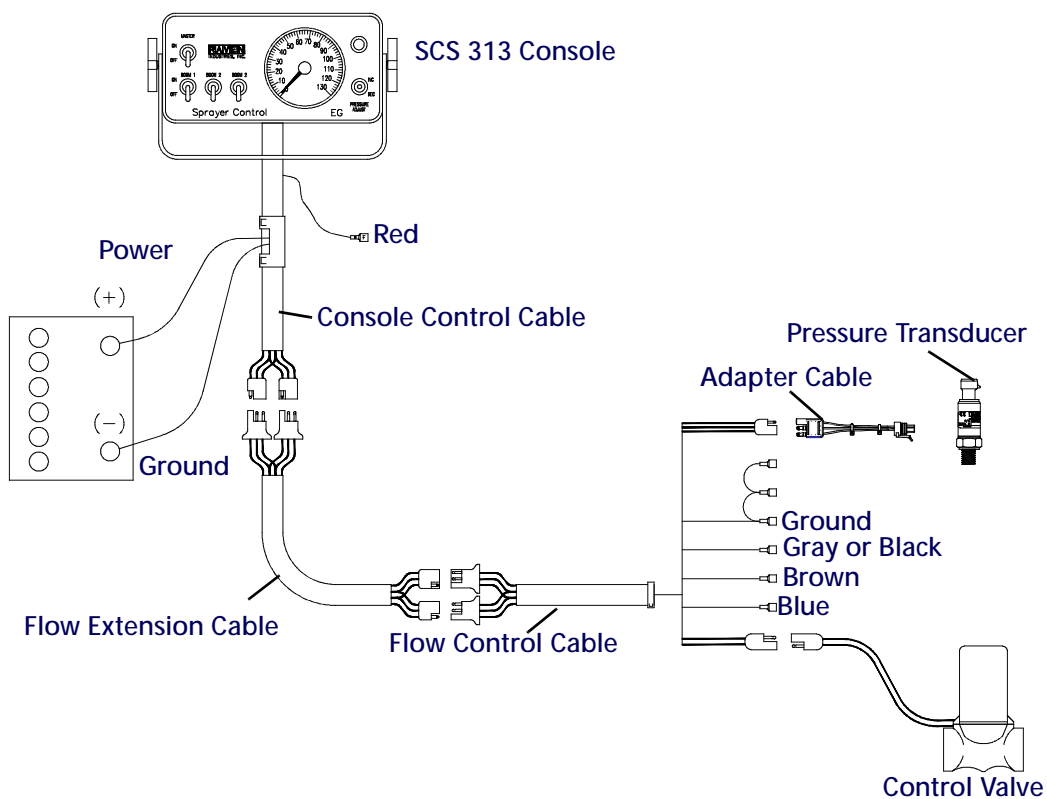


FIGURE 7. SCS 313 Wiring Diagram





### ADJUSTING THE SPRAYER CONTROL SYSTEM

1. Fill the implement tank with water only.
2. Place the console master on/off switch to ON and all boom section switches to OFF.
3. Open the tank shut off valve.
4. With the pump not running, fully open the main line hand valve and totally close the agitator line hand valve.

**NOTE:** If a positive displacement type pump is used, fully open the pressure relief valve.

5. If a centrifugal type pump is used, skip to step 9. For positive displacement type pump is used, proceed as follows.
6. Place the master on/off switch to OFF.
7. Set the pressure relief valve to 65 PSI [448 kPa].
8. Place the master on/off switch to ON.
9. Verify that each boom solenoid valve operates by toggling the boom section on/off switches and that no nozzles are clogged.
10. Place all boom section on/off switches to ON.
11. Hold the manual adjustment (MAN ADJ) switch in the increase (INC) position until the pressure stops rising and begins to decrease.
12. Adjust the agitator hand valve for desired agitation.
13. Close the main line hand valve, if necessary, to set the maximum desired operation pressure. The maximum pressure should be approximately 10 PSI [69 kPa], above the nominal spraying pressure.
14. Hold the manual adjustment switch in the decrease (DEC) position until the pressure stops decreasing and begins to increase.

**NOTE:** If desired minimum pressure cannot be obtained, installed larger by-pass hose.

15. Verify the desired maximum pressure of the system by repeating step 11.

## CALIBRATING THE PRESSURE GAUGE

The pressure tap on the Raven sprayer control systems is located away from the nozzles (non-transducer monitoring systems). This configuration allows for the potential pressure difference between the nozzle pressure and gauge pressure at the console. For best results, refer to the following points when using the console gauge:

1. When the sprayer is ready and the tank filled with water (do not fill the tank with chemicals at this time), attach an accurate pressure gauge to a nozzle in place of the spray tip.
2. Start the pump, turn on the electric shut-off valves (boom valves), and adjust the pressure control valve so that the desired pressure is maintained on the gauge at the nozzle.
3. Because of pressure drops through the chemical system, the pressure shown on the gauge in the console may read slightly higher than the gauge at the nozzle.
4. Use the console pressure reading as a reference point for maintaining the desired pressure at the nozzle.

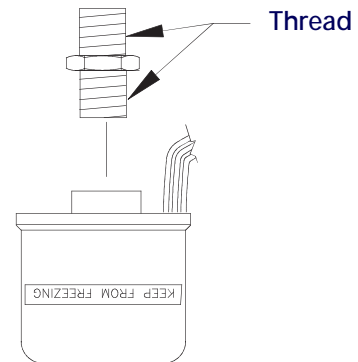
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1. Apply thread sealant to the pipe nipple.
2. Thread pipe nipple onto transducer and tighten.

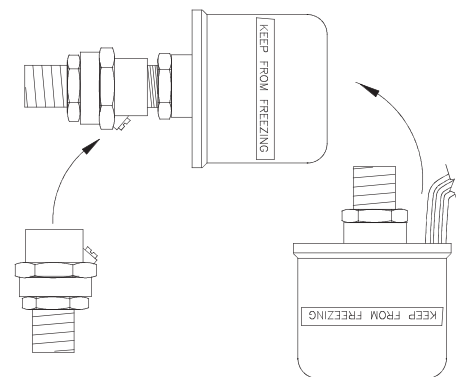
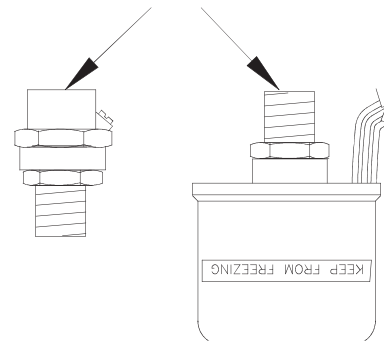
3. Fill the transducer and gauge guard cavity with 5W-30 weight oil.

4. Assemble the gauge guard to transducer.

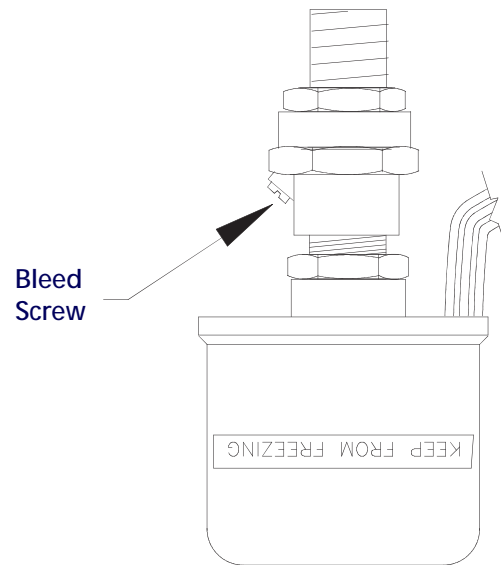
**IMPORTANT:** An excessive loss of oil during assembly may affect the transducer calibration.



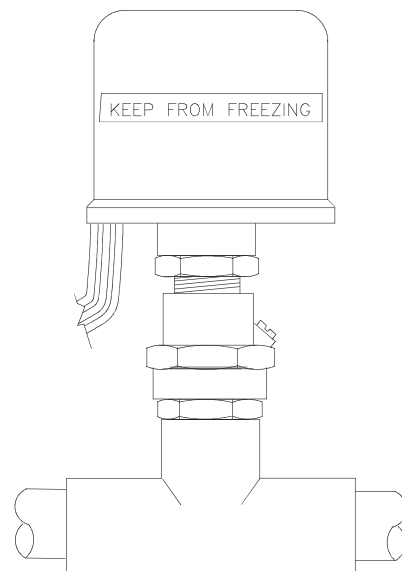
**Fill with Oil**



5. With the transducer positioned as shown, remove the bleed screw. Some air and excess oil will be discharged.
6. Replace and tighten the bleed screw.



7. Install transducer and calibrate as described in Appendix B, SCS 303 Pressure Transducer Calibration.

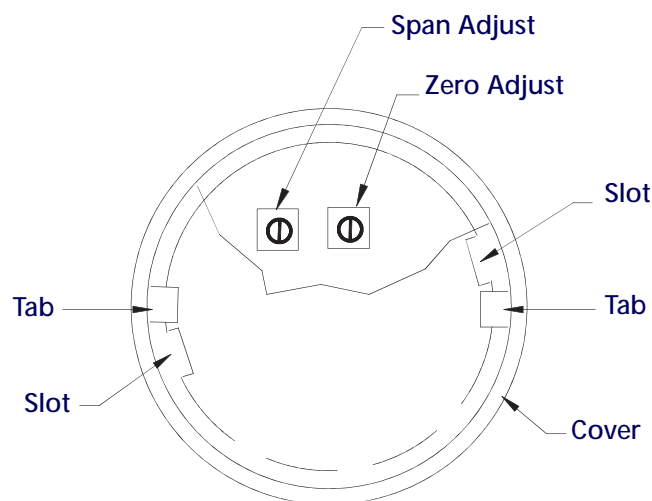




The SCS 303 control console and pressure transducer are factory calibrated. However, if recalibration is necessary, complete the following procedure:

1. Install the pressure transducer and control valve (review Chapter 2, Installation).
2. Install the test gauge (standard pressure gauge) on the boom line.
3. Fill the sprayer tank with water only.
4. Remove the transducer cover:
  - a. Rotate the cover until the slot and tab are aligned.
  - b. Lift the cover off of the transducer body.

FIGURE 1. Top View of Pressure Transducer



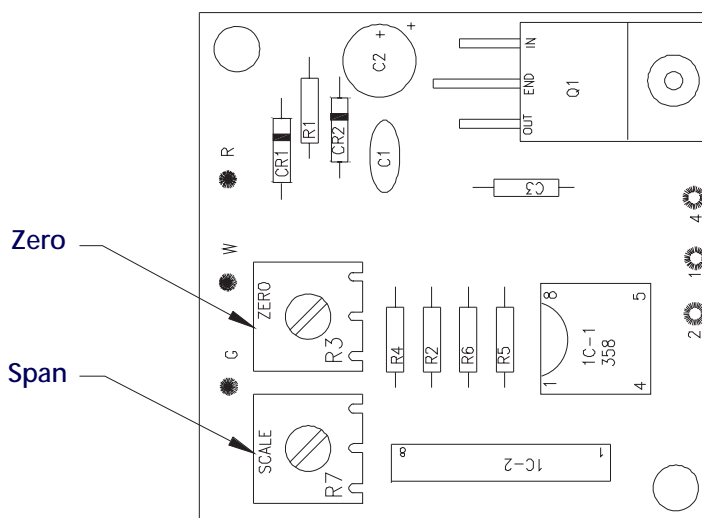
5. Toggle the console master on/off switch and boom section switches in the ON positions.
6. Run the pump at normal operating RPM.
7. Hold the manual adjustment (MAN ADJ) switch in the DEC position until the test gauge displays 10 PSI [69 kPa]. If necessary, open the main line hand valve to obtain this gauge pressure.
8. Use a small screwdriver to turn the zero adjust until the SCS 303 pressure gauge displays 10 PSI [69 kPa].
9. Hold the manual adjustment (MAN ADJ) switch in the INC position until the test gauge displays 40 PSI [275 kPa]. If necessary, open the main line hand valve to obtain this gauge pressure.
10. If the SCS 303 pressure gauge does not read within  $\pm 2$  PSI [13 kPa] of the test gauge, use a small screwdriver to turn the SPAN ADJUST.
11. If span adjust is required, repeat step 7 through step 10. The transducer is now calibrated and ready for field use.
12. Replace the transducer cover and remove the test gauge. It is recommended to perform this calibration procedure at the beginning of each spray season.



The SCS 313 control console is factory calibrated. However, if recalibration is necessary, complete the following procedure:

1. Install the pressure transducer and control valve (review Chapter 2, Installation).
2. Install the test gauge (standard pressure gauge) on the boom line.
3. Fill the sprayer tank with water only.
4. Remove screws from the console faceplate and gently pull the faceplate outward.

FIGURE 1. Top View of PC Board



5. Toggle the console master on/off switch and boom section switches in the ON positions.
6. Run the pump at normal operating RPM.
7. Hold the PRESSURE ADJUST switch in the DEC position until the test gauge displays 10 PSI [69 kPa]. If necessary, open the main line hand valve to obtain this gauge pressure.
8. Use a small screwdriver to turn the zero adjust until the SCS 313 pressure gauge displays 10 PSI [69 kPa].

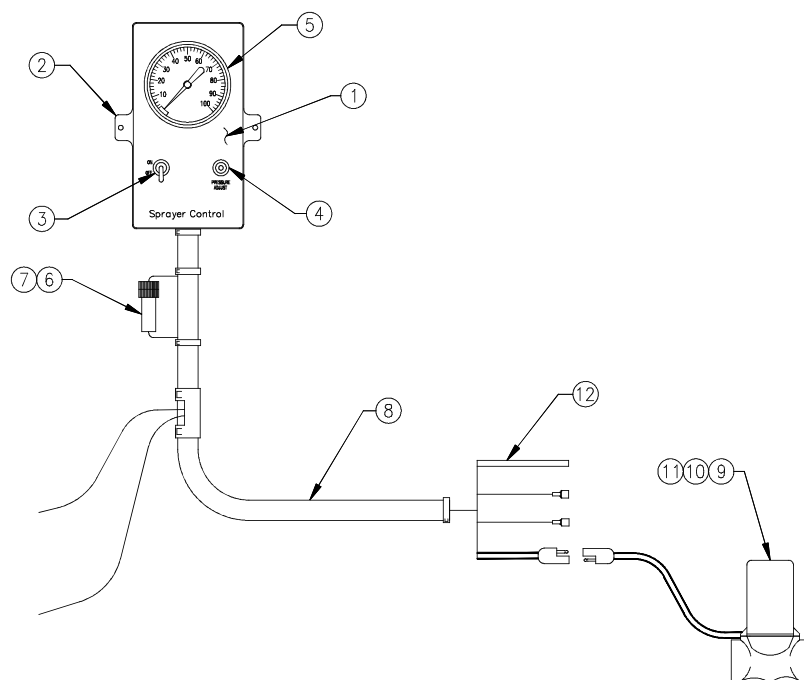
**IMPORTANT:** Be sure that the screwdriver does not make contact with components mounted to the console faceplate.

9. Hold the manual adjustment (MAN ADJ) switch in the INC position until the test gauge displays 40 PSI [275 kPa]. If necessary, open the main line hand valve to obtain this gauge pressure.
10. If the SCS 313 pressure gauge does not read within  $\pm 2$  PSI [13 kPa] of the test gauge, use a small screwdriver to turn the SPAN ADJUST.
11. If span adjust is required, repeat step 7 through step 10. The transducer is now calibrated and ready for field use.
12. Replace the faceplate and mounting screws and remove the test gauge. It is recommended to perform this calibration procedure at the beginning of each spray season.



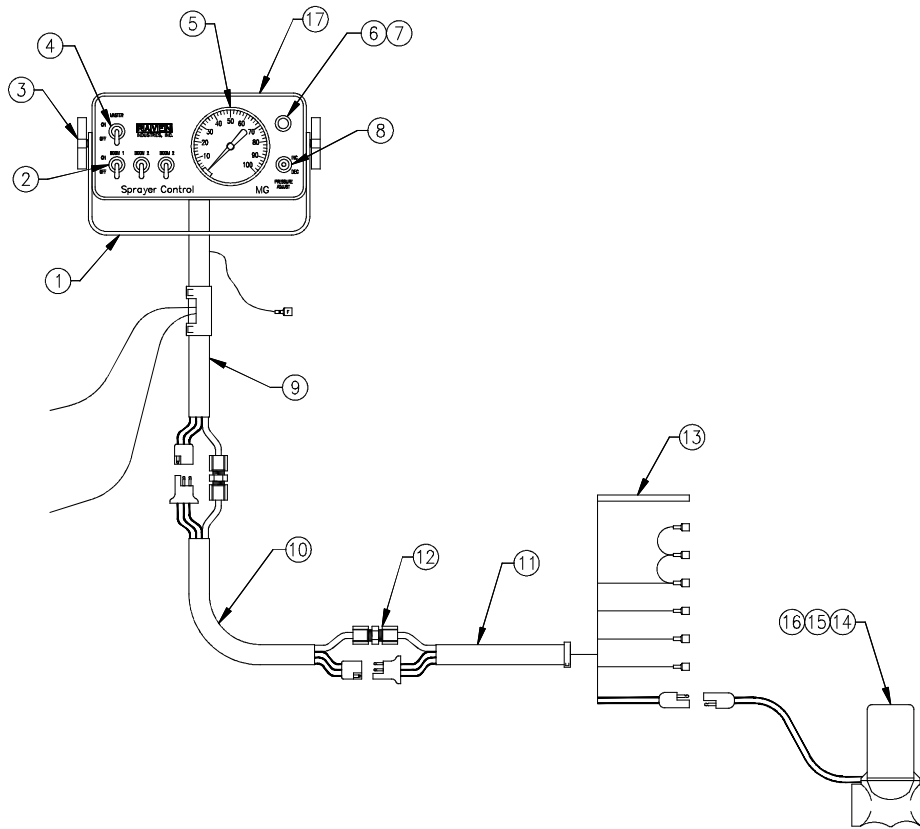
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## SCS 11 REPLACEMENT PARTS



Item Number	Description	Part Number
1.	Printed Enclosure	107-0159-092
2.	Back Cover Bracket	106-0159-001
3.	On/Off Switch	412-2011-038
4.	Pressure Adjust Switch	412-2011-041
5.	PSI Gauge, Female Fitting, Male Fitting, 195" Tubing	117-0159-007
6.	Fuse Holder	510-2001-010
7.	Fuse, 5 Amp	510-1003-001
8.	Console Control Cable (16 ft.)	115-0159-005
9.	3/4" Valve Assembly	063-0159-001
10.	1" Valve Assembly	063-0159-447
11.	1-1/2" Valve Assembly	063-0159-448
12.	Tubing (length as required)	214-0001-001

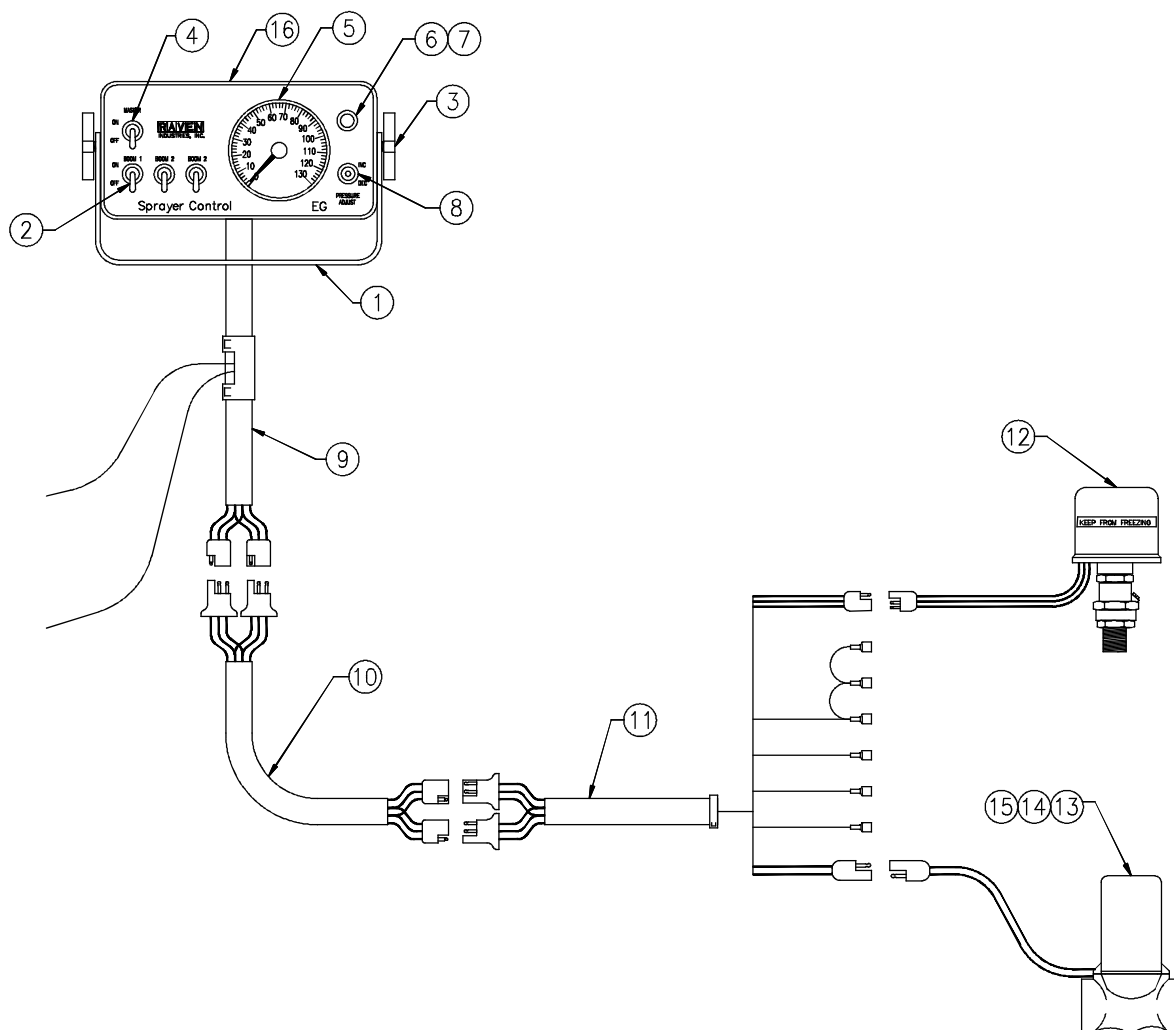
## SCS 202 AND SCS 203 REPLACEMENT PARTS



Item Number	Description	Part Number
1.	Mounting Bracket	107-0159-007
2.	Boom Switch	412-2011-038
3.	Mounting Knob	309-1000-006
4.	Master Switch	412-2011-037
5.	PSI Gauge, Female Fitting, Male Fitting, 195" Tubing	117-0159-006
	**Liquid Gauge (Optional)	417-0001-018
6.	Fuse Holder	510-2001-003
7.	Fuse, 15 Amp	510-1003-001
8.	Pressure Switch	412-2011-039
9.	Console Control Cable (8 ft.)	115-0159-010
10.	Flow Ext. Cable (12 ft.)	107-0159-025
11.	Flow Control Cable (6 ft.)	115-0159-013
	Flow Control Cable (12 ft.)	115-0159-015
12.	Union Fitting	333-0001-008
13.	Tubing (length as required)	214-0001-001
14.	3/4" Valve Assembly	063-0159-001
15.	1" Valve Assembly	063-0159-447
16.	1-1/2" Valve Assembly	063-0171-895
17.	SCS 200 Series Console	063-0159-203

Item Number	Description	Part Number
18.	Gauge Only	417-0001-002
19.	Gauge Fitting	333-0001-004

## SCS 303 REPLACEMENT PARTS



Item Number	Description	Part Number
1.	Mounting Bracket	107-0159-007
2.	Boom Switch	412-2011-038
3.	Mounting Knob	309-1000-006
4.	Master Switch	412-2011-037
5.	Pressure Gauge	417-0001-016
6.	Fuse Holder	510-2001-003
7.	Fuse, 15 Amp	510-1003-003
8.	Pressure Adjust Switch	412-2011-039

Item Number	Description	Part Number
9.	Console Control Cable (8 ft.)	115-0159-011
10.	Flow Ext. Cable (12 ft.)	107-0159-008
11.	Flow Control Cable (6 ft.)	115-0159-008
12.	Pressure Transducer	063-0159-316
13.	3/4" Valve Assembly	063-0159-001
14.	1" Valve Assembly	063-0159-447
15.	1-1/2" Valve Assembly	063-0171-895
16.	Console	063-0159-315





## Limited Warranty

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### ***What Does this Warranty Cover?***

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

### ***How Long is the Coverage Period?***

Raven Applied Technology products are covered by this warranty for 12 months from the date of retail sale. In no case will the Limited Warranty period exceed 24 months from the date the product was issued by Raven Industries Applied Technology Division. This warranty coverage applies only to the original owner and is non-transferable.

### ***How Can I Get Service?***

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries.

### ***What Will Raven Industries Do?***

Upon confirmation of the warranty claim, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

### ***What is not Covered by this Warranty?***

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

**Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.**



## Extended Warranty

### ***What Does this Warranty Cover?***

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

### ***Do I Need to Register My Product to Qualify for the Extended Warranty?***

Yes. Products/systems must be registered within 30 days of retail sale to receive coverage under the Extended Warranty. If the component does not have a serial tag, the kit it came in must be registered instead.

### ***Where Can I Register My Product for the Extended Warranty?***

To register, go online to [www.ravenhelp.com](http://www.ravenhelp.com) and select Product Registration.

### ***How Long is the Extended Warranty Coverage Period?***

Raven Applied Technology products that have been registered online are covered for an additional 12 months beyond the Limited Warranty for a total coverage period of 24 months from the date of retail sale. In no case will the Extended Warranty period exceed 36 months from the date the product was issued by Raven Industries Applied Technology Division. This Extended Warranty coverage applies only to the original owner and is non-transferable.

### ***How Can I Get Service?***

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries. In addition, the words "Extended Warranty" must appear on the box and all documentation if the failure is between 12 and 24 months from the retail sale.

### ***What Will Raven Industries Do?***

Upon confirmation of the product's registration for the Extended Warranty and the claim itself, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

### ***What is Not Covered by the Extended Warranty?***

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. Cables, hoses, software enhancements, and remanufactured items are not covered by this Extended Warranty. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

**Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.**