Spray Height Control System

Rogator ’54, ’64, ’74 & ’84 Series and 1386
Installation Manual

Improving the competitiveness of Industry and Agriculture through Precision Measurement
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1 INTRODUCTION

Congratulations on your purchase of the NORAC UC4+ Spray Height Control System. This system is manufactured with top quality components and is engineered using the latest technology to provide operating features and reliability unmatched for years to come.

When properly used the system can provide protection from sprayer boom damage, improve sprayer efficiency, and ensure chemicals are applied correctly.

Please take the time to read this manual completely before attempting to install the system. A thorough understanding of this manual will ensure that you receive the maximum benefit from the system.

YOUR INPUT CAN HELP MAKE US BETTER! If you find issues or have suggestions regarding the parts list or the installation procedure, please don’t hesitate to contact us.
GENERAL SYSTEM DESCRIPTION

Figure 1 depicts the general system layout of the UC4+ Spray Height Control System.

Figure 1: System Components and General Location

NOTICE:
Every effort has been made to ensure the accuracy of the information contained in this manual. All parts supplied are selected specially to fit the sprayer to facilitate a complete installation. However, NORAC cannot guarantee all parts fit as intended due to the variations of the sprayer by the manufacturer. Please read this manual in its entirety before attempting installation.

ATTENTION:
When installing the UC4+ Spray Height Control system please be aware that at a point in the installation your sprayer booms will be inoperative until the installation is complete. Any installation procedure requiring boom movement will need to be done first. Once the hydraulics have been disconnected you must complete the electrical installation before the booms become operative.
# PARTS LISTS

The parts that come with your UC4+ Spray Height Control System are listed in Table 1. The item number on the left side of this table references each part.

Please ensure that all parts in your kit are present before proceeding with your installation.

**Table 1: Rogator ’54, ’64, ’74 & ’84 Series and 1386 Spray Height Control System Parts**

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Name</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>B05</td>
<td>44706-01</td>
<td>KIT CABLE TIE BLACK 10 PCS 21 IN 150 PCS 7.5 IN</td>
<td>1</td>
</tr>
<tr>
<td>B10</td>
<td>44700-06</td>
<td>BRACKET VALVE MOUNTING STD</td>
<td>1</td>
</tr>
<tr>
<td>B11</td>
<td>44743</td>
<td>MOUNTING BRACKET MAIN LIFT SENSOR UC4 PLUS</td>
<td>1</td>
</tr>
<tr>
<td>B13</td>
<td>44728</td>
<td>MOUNTING BRACKET COMPLETE UC4 BREAKAWAY EXTENDED</td>
<td>2</td>
</tr>
<tr>
<td>B16</td>
<td>44701-01</td>
<td>KIT ACCESS PANEL CAB</td>
<td>1</td>
</tr>
<tr>
<td>B19</td>
<td>44724</td>
<td>BRACKET BREAKAWAY SPACER 2IN WITH BOLTS</td>
<td>2</td>
</tr>
<tr>
<td>C02</td>
<td>44668</td>
<td>CABLE UC4 SENSOR BRANCH 1 AMP RECEPT 3 AMP PLUG BC</td>
<td>1</td>
</tr>
<tr>
<td>C02B</td>
<td>44664</td>
<td>CABLE UC4 CAN NODE DUAL</td>
<td>1</td>
</tr>
<tr>
<td>C03</td>
<td>44656D</td>
<td>CABLE VALVE VARIABLE RATE DT</td>
<td>1</td>
</tr>
<tr>
<td>C10</td>
<td>44650-39</td>
<td>CABLE POWER GENERIC SELF-PROPELLED</td>
<td>1</td>
</tr>
<tr>
<td>C11</td>
<td>44651-03</td>
<td>CABLE EXTENSION VALVE GENERIC</td>
<td>1</td>
</tr>
<tr>
<td>C12</td>
<td>44658-32</td>
<td>CABLE UC4 INTERFACE ROGATOR 854,1054,1254 (RG4)</td>
<td>1</td>
</tr>
<tr>
<td>C13</td>
<td>44658-33</td>
<td>CABLE UC4 INTERFACE MP2 GND2 BYPASS</td>
<td>1</td>
</tr>
<tr>
<td>C14</td>
<td>44658-28</td>
<td>CABLE UC4 INTERFACE POWER PIGTAIL</td>
<td>1</td>
</tr>
<tr>
<td>C15</td>
<td>44658-41</td>
<td>CABLE UC4 INTERFACE HAND CONTROL RG4</td>
<td>1</td>
</tr>
<tr>
<td>E01</td>
<td>4461BC+</td>
<td>UC4 PLUS BOOM CONTROL PANEL</td>
<td>1</td>
</tr>
<tr>
<td>E02</td>
<td>44631</td>
<td>UC4 ULTRASOUND SENSOR</td>
<td>3</td>
</tr>
<tr>
<td>E03</td>
<td>45000*</td>
<td>UC4 PLUS ROLL SENSOR W TEMPERATURE PROBE VER. 2</td>
<td>1</td>
</tr>
<tr>
<td>E04</td>
<td>45001*</td>
<td>UC4 PLUS ROLL SENSOR VER. 2</td>
<td>1</td>
</tr>
<tr>
<td>H04</td>
<td>44863-06</td>
<td>HOSE ASSEMBLY 122R2-06 40 IN L 6FJX 6FJX-090</td>
<td>1</td>
</tr>
<tr>
<td>H05</td>
<td>44863-17</td>
<td>HOSE ASSEMBLY 122R2-06 32 IN L 6FJX 8FJX</td>
<td>1</td>
</tr>
<tr>
<td>H07</td>
<td>44863-04</td>
<td>HOSE ASSEMBLY 122R2-06 135 IN L 6FJX 6FJX</td>
<td>1</td>
</tr>
<tr>
<td>H08</td>
<td>44863-05</td>
<td>HOSE ASSEMBLY 122R2-06 175 IN L 6FJX 6FJX</td>
<td>1</td>
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<tr>
<td>H13</td>
<td>44862-07</td>
<td>HOSE ASSEMBLY 122R2-04 18 IN L 6FJX 6FJX</td>
<td>1</td>
</tr>
<tr>
<td>H20</td>
<td>44865-26</td>
<td>HYDRAULICS FITTING KIT - RG4</td>
<td>1</td>
</tr>
<tr>
<td>M01</td>
<td>446BC+MAN7</td>
<td>OPERATOR MANUAL UC4+ SPRAY HEIGHT CONTROL</td>
<td>1</td>
</tr>
<tr>
<td>M10</td>
<td>UC4+BC+RG4-INST</td>
<td>MANUAL INSTALLATION UC4+ ROGATOR 1254, 1054, 854 (’97+)</td>
<td>1</td>
</tr>
<tr>
<td>V01</td>
<td>44963D</td>
<td>VALVE BLOCK ASSEMBLY 2 STATION CC/LS PROP DT 4 BOLT</td>
<td>1</td>
</tr>
</tbody>
</table>

* For systems purchased BEFORE October 1, 2011, the roll sensor part numbers are 44641 and 44642.
<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Name</th>
<th>Quantity</th>
<th>Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>F01</td>
<td>44928</td>
<td>ORIFICE INSERT .047 IN ONE WAY</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>F02</td>
<td>103312</td>
<td>MALE ADAPTER - 6MB 6MJ</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>F03</td>
<td>104369</td>
<td>PLUG - 6MBP</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>F04</td>
<td>103839</td>
<td>TEE ADAPTER - 6FJXR 6MJT</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>F05</td>
<td>104632</td>
<td>TEE ADAPTER - 8FJXR 8MJT</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>F06</td>
<td>104634</td>
<td>PLUG - 6FJCN CAP NO 6 FEMALE JIC</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>F07</td>
<td>104517</td>
<td>MALE TO FEMALE ADAPTER - 12FJ 6MJ</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>F08</td>
<td>44934</td>
<td>MALE TO FEMALE ADAPTER - 12MJP MACHINED PORT</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>F09</td>
<td>44926</td>
<td>ORIFICE INSERT 3/64 UC3 VALVE BLOCK</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>F11</td>
<td>104189</td>
<td>MALE ADAPTER - 10MB 8MJ</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>F12</td>
<td>104629</td>
<td>TEE ADAPTER - 12FJXR 12MJT</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
### Important

The use of dielectric grease is not recommended on any NORAC electrical connections.

### Important

To ensure all stainless steel hardware does not gall or seize apply a light coating of the supplied Permatex Anti-seize grease to all threaded parts upon installation. Permatex Anti-seize lubricant is preferred, but other similar anti-seize products may be used.
ATTENTION:
Your Rogator sprayer may require different cabling depending on the connectors used near the valve block. Please refer to Table 3 and Table 5 for ordering alternate cabling from NORAC.

Table 3: Alternate Interface Cabling Available from NORAC

<table>
<thead>
<tr>
<th>Item Replaced</th>
<th>Description</th>
<th>Connector Type</th>
<th>Norac Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>C12</td>
<td>Interface Cable</td>
<td>Weatherpack</td>
<td>44658-21</td>
</tr>
<tr>
<td>C12</td>
<td>Interface Cable</td>
<td>Metripack 280</td>
<td>44658-32</td>
</tr>
<tr>
<td>C12</td>
<td>Interface Cable</td>
<td>Deutsch DT</td>
<td>44658-24</td>
</tr>
</tbody>
</table>

If your sprayer uses a bypass/jam valve, choose from the Bypass/Jam Cabling options in Table 4 and Table 5 for ordering bypass cabling from NORAC.

Table 4: Bypass/Jam Cabling Available from NORAC

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Connector Type</th>
<th>Norac Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>C13</td>
<td>Bypass Cable</td>
<td>Weatherpack</td>
<td>44658-34</td>
</tr>
<tr>
<td>C13</td>
<td>Bypass Cable</td>
<td>Metripack 280</td>
<td>44658-33</td>
</tr>
<tr>
<td>C13</td>
<td>Bypass Cable</td>
<td>Deutsch DT</td>
<td>44658-27</td>
</tr>
</tbody>
</table>

Table 5: Illustrations of Connector Types

<table>
<thead>
<tr>
<th>Connector Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weatherpack</td>
</tr>
<tr>
<td>Metripack 280</td>
</tr>
<tr>
<td>Deutsch DT</td>
</tr>
</tbody>
</table>
The parts that come with your UC4+ Spray Height Control system are shown below in their general installation configuration.

Figure 2: UC4+ Spray Height Control Components
Figure 3: Hydraulic Plumbing Schematic
4 INSTALLATION PROCEDURE

4.1 EXISTING SYSTEM CHECK

It is necessary to check the existing system’s functionality before installing the UC4+ Spray Height Control system.

1. Drive your sprayer onto a flat piece of land, with unobstructed boom movement (e.g. no power lines).

2. Test that all boom functions operate correctly. As you test each function check it off in Table 6.

⚠️ It is necessary to test the boom functions in all directions

Table 6: Hydraulic System Function Check Sheet

<table>
<thead>
<tr>
<th>BOOM</th>
<th>FOLD IN</th>
<th>FOLD OUT</th>
<th>UP</th>
<th>DOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEFT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIGHT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROLL*</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Some sprayers may not have this function.

4.2 BOOM SPEED TEST

⚠️ IMPORTANT:

Raise/lower all boom sections several times to warm up the hydraulic system. Grease all moving parts for consistent results.

1. Lower each boom and main section as close to the ground as possible.

2. Set your sprayer at field working RPM on the throttle and mark this value in Table 7.

⚠️ You will need a stopwatch or a watch that displays “seconds” for the next step.

3. Raise the LEFT boom from its extreme LOW position to the very TOP of its travel. Record the time this takes in Table 7, “Trial #1” for “Left UP”.

4. Lower the LEFT boom from its extreme HIGH position to the BOTTOM of its travel. Record this time in Table 7, Trial #1 for “Left DOWN”.

⚠️ Be careful when lowering the booms so they don’t hit the ground.

5. Similarly, record two more time trials (Trial #2 & #3) for the LEFT boom and record in Table 7.

6. Repeat Steps 1 through 5 for the RIGHT, MAIN and ROLL functions.

⚠️ Your sprayer may not have a roll feature.

7. Average the three trials recorded for each boom movement and record this calculation in the “Average Time” slot in Table 7.

8. These “Average Times” now represent how quickly your system can react to manual control. In Section 4.8, this procedure is repeated with the UC4+ Spray Height Control system installed for comparison and troubleshooting purposes.
Table 7: Boom Test Record (WITHOUT UC4+ Spray Height Control system)

<table>
<thead>
<tr>
<th>Working RPM:</th>
<th>Trial #1 [Sec]</th>
<th>Trial #2 [Sec]</th>
<th>Trial #3 [Sec]</th>
<th>Avg Time [Sec]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left UP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left DOWN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right UP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right Down</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main UP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main DOWN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll CW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll CCW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8: Boom Test Record (WITH UC4+ Spray Height Control system)

<table>
<thead>
<tr>
<th>Working RPM:</th>
<th>Trial #1 [Sec]</th>
<th>Trial #2 [Sec]</th>
<th>Trial #3 [Sec]</th>
<th>Avg Time [Sec]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left UP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left DOWN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right UP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right Down</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main UP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main DOWN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll CW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll CCW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

⚠️ Some sprayers may not have the Roll functions.
4.3 **WING SENSOR INSTALLATION**

1. Assemble the Breakaway Sensor Mounting Brackets (B11) as shown in Figure 4 and Figure 5.

![Figure 4: Breakaway Sensor Bracket Exploded View](image)

![Figure 5: Breakaway Sensor Mounting Bracket Assembly](image)

To assemble the breakaway sensor bracket:

a) Assemble the bolt and nut into the collar.

b) Grease the bottom edge of the collar and the angled tube of the base.

c) Place the collar onto the angled tube of the mounting base.

d) Install the spring between the collar and the upper ring of the base.

e) Insert tube through assembly and tighten the collar.

2. Mount the sensor bracket onto the boom.

**⚠️ If possible, mount the sensor brackets while the booms are in their folded position to ensure that they will not interfere with anything when the boom is folded for transport.**

3. The sensor mounting brackets can be installed with the mounting base behind (Figure 8) or in front of the tube (Figure 6).

**⚠️ Mounting the sensor bracket to the break-away section of the boom may cause the boom to drop suddenly as a break-away occurs. This will occur on break-away sections which lift as they break away.**

**⚠️ For optimal boom tip protection, it is recommended that the sensor be mounted within approximately two feet (60cm) of the boom tip.**

Please refer to the UC4+ Spray Height Control system warranty at the end of the [UC4+ Spray Height Control Operator’s Manual (M01)](link) for implications.

4. Mount the NORAC UC4+ ultrasonic sensor (E02) into the sensor brackets. The sensors should be oriented forward (ahead) of the boom (see Figure 6 and Figure 8).
When installing the UC4+ sensors (E02), start with the smallest serial number on the left hand side proceeding to the largest serial number on the right hand side (Figure 9).

5. Sensor cables should run through the mounting bracket tube and then behind the member the bracket is mounted onto. Cable-tie the connector in place. The cable must not be allowed to hang below the boom (Figure 6).

Avoid mounting sensors in locations where they may read from parts of the boom as shown in Figure 7.

General mounting rules for UC4+ ultrasonic wing sensors:

a) In its lowest position, the sensor mouth must be 9 inches or more from the ground.

b) The bottom of the sensor must be at least 9 inches in front of the spray nozzles.

c) The bottom of the sensor must be at least 9 inches above the spray nozzles.

d) Ensure that there are no obstructions within a 12-inch diameter circle projected directly below the center of the sensor.

e) The sensor should be approximately vertical at normal operating heights.
Apply a light coating of the supplied Permatex Anti-seize grease to all threaded parts upon installation.

3 Sensor System:

5 Sensor System:

Figure 9: Sensor Serial Number Installation Location
4.4 **Main Lift Sensor Installation**

1. Assemble the main lift sensor bracket (B11) as shown in *Figure 10*.

![Figure 10: Main Lift Sensor Bracket](image)

2. The bracket can then be mounted to the lowest frame member on the center section of the sprayer. The bracket should be mounted so the sensor mounting collar is in approximately the center of the sprayer and ahead of the boom (*Figure 11* and *Figure 12*).

   ![Figure 11: Main Lift Sensor Bracket Mounting Position](image)

   - **Figure 11: Main Lift Sensor Bracket Mounting Position**

   ![Figure 12: Main Lift Sensor Mounted in the Correct Location](image)

   - **Figure 12: Main Lift Sensor Mounted in the Correct Location**

   - **Figure 11: Main Lift Sensor Bracket Mounting Position**

3. Mount the sensor onto the sensor mounting collar (*Figure 11*).

   ![Figure 12: Main Lift Sensor Mounted in the Correct Location](image)

   - **Figure 12: Main Lift Sensor Mounted in the Correct Location**

   - **Figure 11: Main Lift Sensor Bracket Mounting Position**

   - **Figure 12: Main Lift Sensor Mounted in the Correct Location**
4.5 **Roll Sensor Installation**

Mount the roll sensors to the included roll sensor brackets using the machine screws and nylon lock nuts, as illustrated in **Figure 13**.

⚠️ **The roll sensors must be mounted tightly to the brackets.**

![Figure 13: Mounting the Roll Sensor to the Roll Sensor Mounting Bracket](image)

When mounting the roll sensors use the following guidelines and refer to **Figure 14**.

a) The smaller the distance between A and B in **Figure 14**, the better the performance will be.

⚠️ **Distance A cannot be more than 12”**.

b) The roll sensors must not be mounted below the pivot point.

c) Ensure the roll sensors are sitting relatively level when the sprayer chassis and boom are level.

d) Both roll sensors must be mounted with the circular AMP connector facing towards the Right-Hand Wing (when looking from the rear of the sprayer).

![Figure 14: Mounting Guidelines for Center Pivot Sprayers](image)
4.5.1 Boom Roll Sensor Mounting

The boom roll sensor (E04) must be mounted to the rotating part of the boom. Follow these guidelines and refer to Figure 16 to mount the sensor.

a) Make sure you are using the roll sensor that does NOT have a temperature probe (only one cable) (E04).

b) The boom roll sensor must be mounted to the rotating part of the boom suspension.

c) Use cable-ties to secure the bracket to a square edge feature (square tube).

d) Ensure the AMP (circular) connector exits towards the Right Hand Wing (when looking from the rear of the sprayer).

e) Securely cable-tie the connector to the frame.

4.5.2 Chassis Roll Sensor Mounting

The chassis roll sensor must be mounted to a non-rotating part of the boom. To mount the chassis roll sensor, follow the following guidelines and refer to Figure 16.

a) Make sure you are mounting the roll sensor that does have a temperature probe (2 cables) (E03).

b) Mount the chassis roll sensor (E03) to a non-rotating part of the boom.

c) Cable-tie the bracket to a square edge feature (square tube).

d) The AMP (circular) connector MUST exit towards the Right Hand Wing (when looking from the rear).

e) Securely cable-tie the connector to the frame.
4.5.3 Inverted Roll Sensor Mounting

If desired, the Roll sensor may be mounted inverted, so long as the connector exits towards the right-hand boom. Inverted mounting may be used to optimize the mounting criteria explained in Section 4.5.

4.5.4 Temperature Probe

Fasten the temperature probe (E03) to the UC4+ valve block using the included 3/8x1/2” bolt as illustrated in Figure 18.
4.6 Hydraulic Installation

⚠️ WARNING!
The hydraulic system creates very high pressure. Before disconnecting any hydraulic lines ensure all pressure has been bled from the system. When changing the boom hydraulic hoses leave the booms in TRANSPORT POSITION.

⚠️ IMPORTANT:
Component failure due to oil contamination is not covered under the UC4+ Spray Height Control system warranty. It is recommended that a qualified technician does the hydraulic installation.

4.6.1 Valve Assembly

1. On a clean surface remove all plastic plugs from the NORAC hydraulic Valve (V01) (Figure 19).

2. Install the male adapters (F02) on the "P" and "T" ports and tighten to 18 ft-lbs.

3. Install the orifices (F01) into the "B" ports with the notch facing outward as shown in Figure 20.

4. Install the male adapters (F02) into the "B" ports and tighten to 18 ft-lbs.

5. Install the plugs (F03) into the "A" ports and tighten to 18 ft-lbs.

Figure 19: NORAC Valve Block

Figure 20: Valve Block Assembly
4.6.2 Valve Mounting

1. Mount the NORAC valve (V01) on the sprayer using the valve mounting bracket (B10).

2. As shown in Figure 21, screw short side of the threaded rods into the bottom of the valve block at least 3/8". The valve mounting holes are drilled and tapped 3/8 NC-1" deep.

3. Tighten the Hex nuts to hold the rods.

4. Put the mounting bracket on the other side of the tube and tighten with the spring washers and the Hex nuts. Cut excess off of the rods, if necessary.

⚠️ If using bolts, the bolts should thread into the valve block at least 3/8". The valve mounting holes are drilled and tapped 3/8 NC-1" deep. The rule of thumb for bolt length is 1-1/2" longer than the tube size.

⚠️ You must ensure no hydraulic components will interfere with any sprayer parts or be pulled tight at any time.

Figure 21: Valve Mounting Location

Figure 22: Valve Mounting Example
### 4.6.3 Hydraulic Plumbing

**WARNING!**

From this point in the installation the booms will be inoperative until the electronics are fully installed.

1. After the NORAC valves are mounted, the hydraulic hoses and fittings can be plumbed. The plumbing for the hydraulic circuit is shown schematically in Figure 3.

2. The “raise” lines from the side of the cylinders, which raise the booms, must be connected to the “B” ports of the NORAC valve block. Disconnect the existing 3/4” “raise” lines on the boom cylinder end. Install F08, F09, F02 and H13 onto the disconnected hose end (Figure 23).

3. Install F07 and F04 onto the cylinder and run the provided hoses H7 and H8 (Figure 23). The longer hose H8 must be installed on the side of the sprayer opposite the valve block.

4. Tee the free end of H13 in to the open port on F04.

5. Route H7 and H8 to the NORAC valve block. Connect to the “B” ports. Follow the existing 3/4” lines to the valve. (Do NOT disconnect the 3/4” lines from the Rogator valve block.)

6. Install F12 between the tank port and the existing tank line (Figure 24).

7. Tee H5 in to the open port on F12 using F13 (Figure 24).

8. Install F05 between the pressure port and the existing pressure line with F11 (Figure 24).

9. Tee H4 in to the open port on F05 using F14 (Figure 24).

10. Route hoses H4 and H5 from the tee(s) to the NORAC valve block to supply pressure and tank respectively.

---

**Figure 23: Boom Cylinder “Raise” Line Fittings**
Figure 24: Hydraulic Plumbing at Sprayer Valve Block
4.7 **ELECTRICAL INSTALLATION**

1. Install the UC4+ Control Panel (E01) in the cab of the sprayer. Mount the panel where it will be clearly visible and within easy reach of the operator.

   A good spot to mount the UC4+ control panel is on the right hand side of the cab to the Roll Over Protection Bar. Four pilot holes for the screws provided need to be drilled to facilitate the control panel mounting.

   Another option is to purchase an adapter for the flexible panel mount that has a 3/8" NC threaded stud on the end to bolt through an existing mount. You can find these at your local outdoor store as a RAM mount part number RAM-B-236. (See [http://www.ram-mount.com/](http://www.ram-mount.com/))

2. Connect the UC4+ power cable (C10) to the UC4+ Control Panel in the sprayer cab. Ensure that both plugs (P16A and P4) are connected to the receptacles of the panel (Figure 26).

   ![](http://www.ram-mount.com/) Ensure the UC4+ control panel’s power is OFF for the remaining installation (Bottom of switch pressed IN). Use caution when handling the 12 V power line of the Rogator wiring.
3. Connect \( \text{R16} \) on the hand control interface cable (C15) to P16B on C10.

4. Connect \( \text{R3} \) on the power pigtail interface cable (C14) to P3 on C10.

5. There is an access hole to the sprayer electrical panel on the front right corner. Route the free end of C14 to the electrical panel through this hole.

6. In the electrical panel towards the front of the sprayer, wire the white wire on C14 to +12V and the black wire to Ground. Each polarity is labeled on the wire. Refer to for Figure 27 recommended +12V and Ground connections inside of the electrical panel.

7. Install the provided 15A automotive fuse into the slot beside the +12V power connection.

8. Route \( \text{R16} \) of C10 to the exterior of the cab. There is an access panel located on the front right corner of the cab floor. It can be removed to allow cables to be routed to the exterior of the cab. Use this panel to route P16 through the hole of the provided access panel kit (B16) (Figure 28). B16 maintains the cab seal. Leave the cover plates unscrewed at this point. Figure 29 shows the access panel and the installed plates.

9. Connect the 16-pin AMP plug (P16) of the valve extension cable (C11) to the free end (R16) of C10 on the outside of the cab (Figure 26).

Figure 27: Power and Ground Connections
10. Route C11 to the rear of the sprayer, in the vicinity of the valve block.

11. Connect S6 on the Interface cable (C12) to T6A on C11 (Figure 30).

12. Route the free end of C12 to the Rogator valve block.

13. Insert two sets of the Metri-Pack connector tees (P2A-R2A and P2C-R2C) on C12 between the matching solenoid valve connections: MAIN UP and MAIN DOWN. For each tee, the function is labeled on the branch wire. Figure 31 illustrates where to tee in the MAIN UP and MAIN DOWN connections to the Rogator valve block.

⚠️ The tee, P2B-R2B (labeled MAIN UP), is not used for this installation. Leave it unplugged.

14. Unplug the existing connectors on the Rogator left and right boom control valve connections. There are four connectors to unplug: SV9 (RIGHT UP), SV7 (RIGHT DOWN), SV10 (LEFT UP) and SV8 (LEFT DOWN). Refer to Figure 32.

15. Connect four 2-pin Metri-Pack
Connectors of C12 (R2D, R2E, R2F and R2G) to the matching connectors of Rogator cable(s), which are unplugged in **STEP 14**. For each connector, the function (e.g. “LEFT UP”) is labeled on the branch wire of C12.

16. If there is a bypass/jam valve (SV6), insert the tee (P2-R2) on C13 between the bypass/jam valve connection on SV6 (Figure 32).

17. Connect the 6-pin Tower on the valve cable (C03) onto S6A on C13 (Figure 30).

⚠️ Alternate cabling is available from NORAC if the connectors on C12 (and C13) do not match your valve block. Refer to Table 3 on page 6.
18. Connect the 6-pin Tower on the valve cable (C3) onto the mating connector (S6A) on C11.

19. The connectors on the valve cable (C03) are marked **RIGHT UP, LEFT UP, RIGHT DOWN** and **LEFT DOWN**. Cables labeled with **UP** go on the same side as the hydraulic hoses.

![Figure 33: Valve Cable Connections](image)

**Figure 33: Valve Cable Connections**

20. Connect the CAN Node cable (C02B) to the 4-pin AMP plug on C11 (Figure 33).

21. Route the CAN Node cable (C02B) to the roll sensors which are installed in **Section 4.5**. Follow existing cables and/or hydraulic lines.

22. Connect the 4-pin AMP connectors to the roll sensors.

23. Connect the sensor branch cable (C02) to the 4-pin AMP plug on C02B (Figure 33).

24. Route the sensor branch cable (C02) to the wing and main sensors and connect to the sensors. Follow existing cables and/or hydraulic lines along the boom.

25. Cable-tie the installed cables every 12 inches.

![Figure 33: Cable Configurations: C11, C02 and C02B](image)

**Figure 33: Cable Configurations: C11, C02 and C02B**

**IMPORTANT:**
Provide enough slack in all cables to account for the movement of the main section, parallel lift, and FOLDING boom movement.
4.8 Completing the Installation

1. Start up your sprayer and test the sprayer’s functionality. The NORAC Control Panel does not need to be powered up for the original switches to function. Unfold the booms and raise/lower each boom and main section.

⚠️ Confirm that the cabling and hoses are agreeable to the entire range of motion.

2. If any functions do not work, review the hydraulic and electrical portions of this manual to check for proper installation. If you still have trouble, contact NORAC for assistance.

3. Turn on the power for the UC4+ Control Panel using the switch on the side of its chassis.

4. Repeat the Boom Speed Test as described in Section 4.2 Boom Speed Test with the NORAC UC4+ System installed. Record the results for comparison in Table 8.

5. The procedure for the installation of the UC4+ Spray Height Control system is now complete. Begin the AUTOMATIC SYSTEM SETUP procedure as described in the UC4+ Spray Height Control Operator’s Manual (M01).
5.1  **ITEM C02: 44668 – CABLE SENSOR BRANCH**

1 = BLACK
2 = GREEN
3 = RED
4 = WHITE

[Diagram of cable and connector with labels]
5.2 ITEM C02B: 44664 – Cable UC4 CAN Node Dual

1 - BLACK
2 - GREEN
3 - RED
4 - WHITE

LENGTH = 10' (3.0m)

LENGTH = 60' (18m)

1 - BLACK
2 - GREEN
3 - RED
4 - WHITE

LENGTH = 60' (18m)
5.3 ITEM C03: 44656D – CABLE VALVE VARIABLE RATE DT
5.4 Item C10: 44650-39 – Cable Power Generic Self-Propelled

L = 100" (2.54m)
5.5 ITEM C11: 44651-03 – CABLE VALVE EXTENSION GENERIC
5.6 Item C12: 44658-32 – Cable UC4 Interface Rogator 854, 1054, 1254
5.7 Item C13: 44658-33 – Cable UC4 Interface MP2 GND2 Bypass
5.8  **ITEM C14: 44658-28 – CABLE UC4 INTERFACE POWER PIGTAIL**

![Diagram of the cable with terminals labeled](image)

**Terminals and Cable Pinout:**

- **12V**: WHT 1
- **GND**: FLK 2
- **V+**: WHT 1
- **V-**: FLK 2

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5.9 ITEM C15: 44658-41 – CABLE UC4 INTERFACE HAND CONTROL RG4
Canada
NORAC Systems International Inc.
CALL TOLL FREE: 1-800-667-3921
(306)664-6711
SHIPPING ADDRESS:
3702 Kinnear Place
Saskatoon, SK
S7P 0A6

United States
NORAC, Inc.
CALL TOLL FREE: 1-866-306-6722
(952)224-4142
SHIPPING ADDRESS:
6667 West Old Shakopee Road, Suite 111
Bloomington, MN
55438

Europe
NORAC Europe sarl
(+33) (0)4 26 47 04 42
SHIPPING ADDRESS:
Rue de l’hermitage
01090 Guereins
France

www.norac.ca