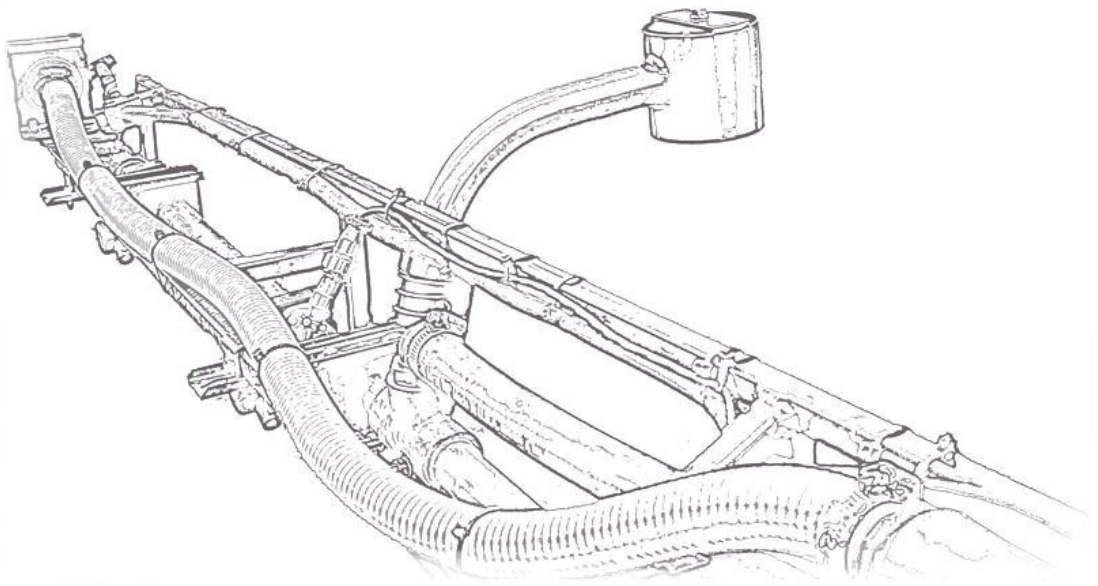
NORAC®

UC4.5™ Spray Height Control System



John Deere 4730, 4830
Installation Manual

JD8

Printed in Canada

Reorder P/N: UC4.5-BC-JD8-INST Rev E (John Deere 4730, 4830)

Contents

1 Introduction

Congratulations on your purchase of the NORAC UC4.5 Spray Height Control System. This system is manufactured with top quality components and is engineered using the latest technology to provide operating 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.

⚠ Important

Every effort has been made to ensure the accuracy of the information contained in this manual. All parts supplied are selected to specially 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.

2 General UC4.5 System Layout

Figure 1 illustrates the general layout of the UC4.5 system components:

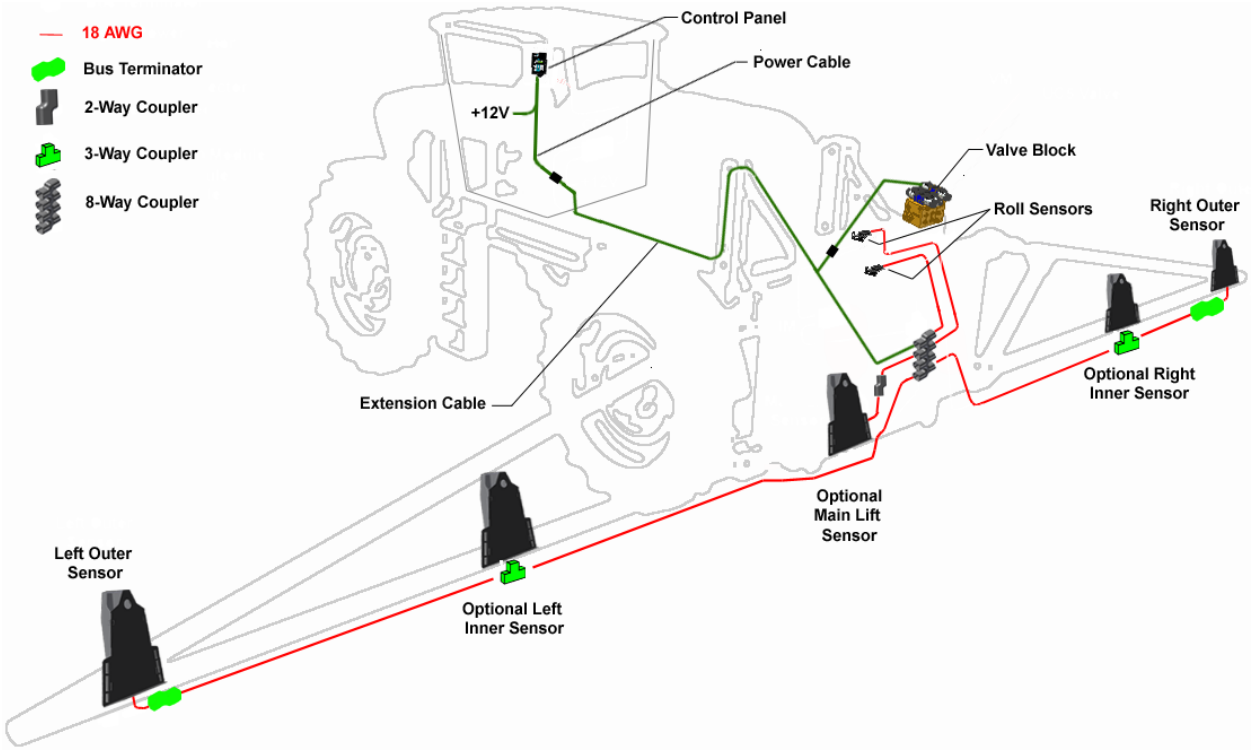


Figure 1: General UC4.5 System Layout

3 Kit Parts

3.1 Kit Overview

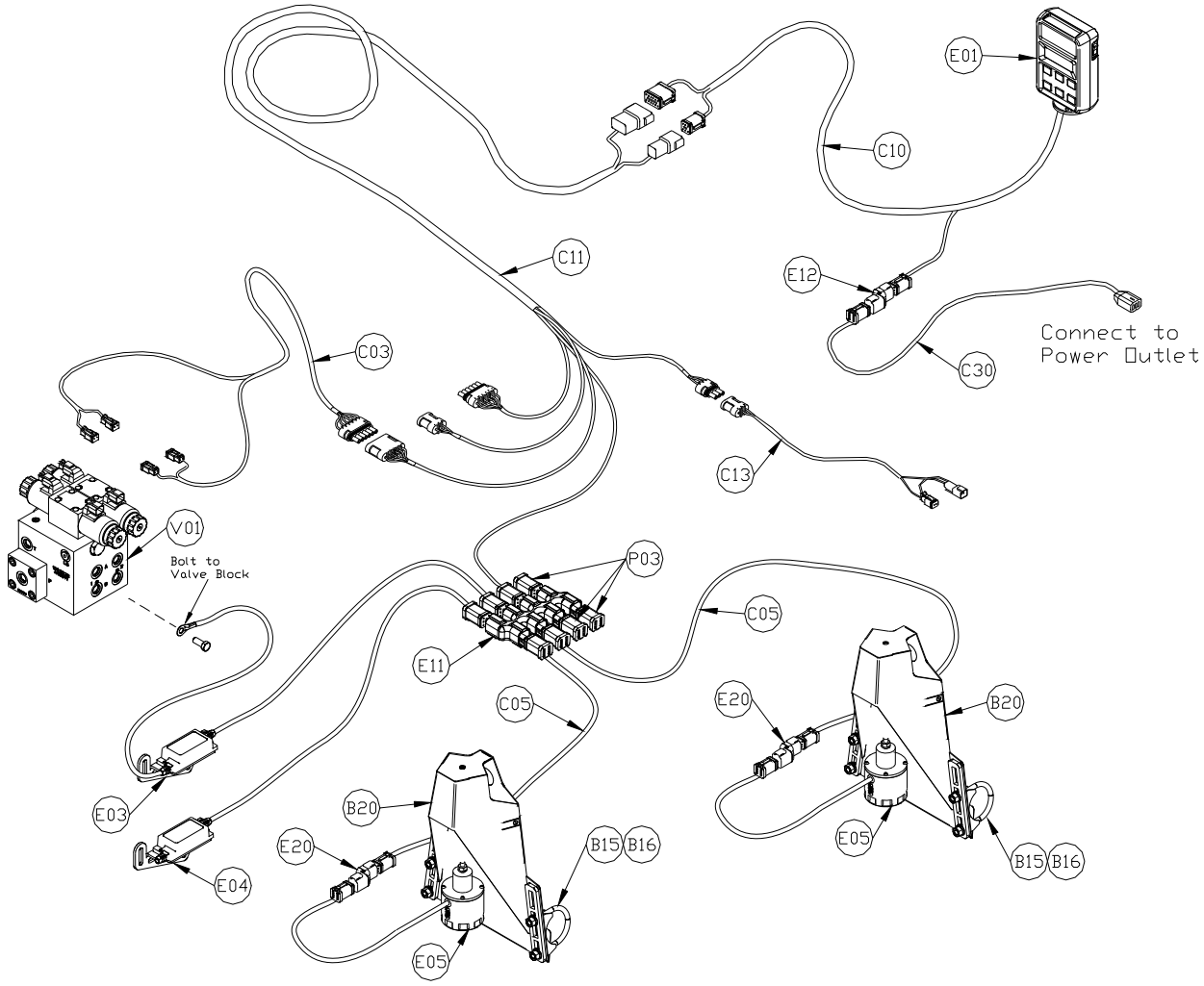


Figure 2: JD8 System Parts

3.2 Hydraulic Plumbing

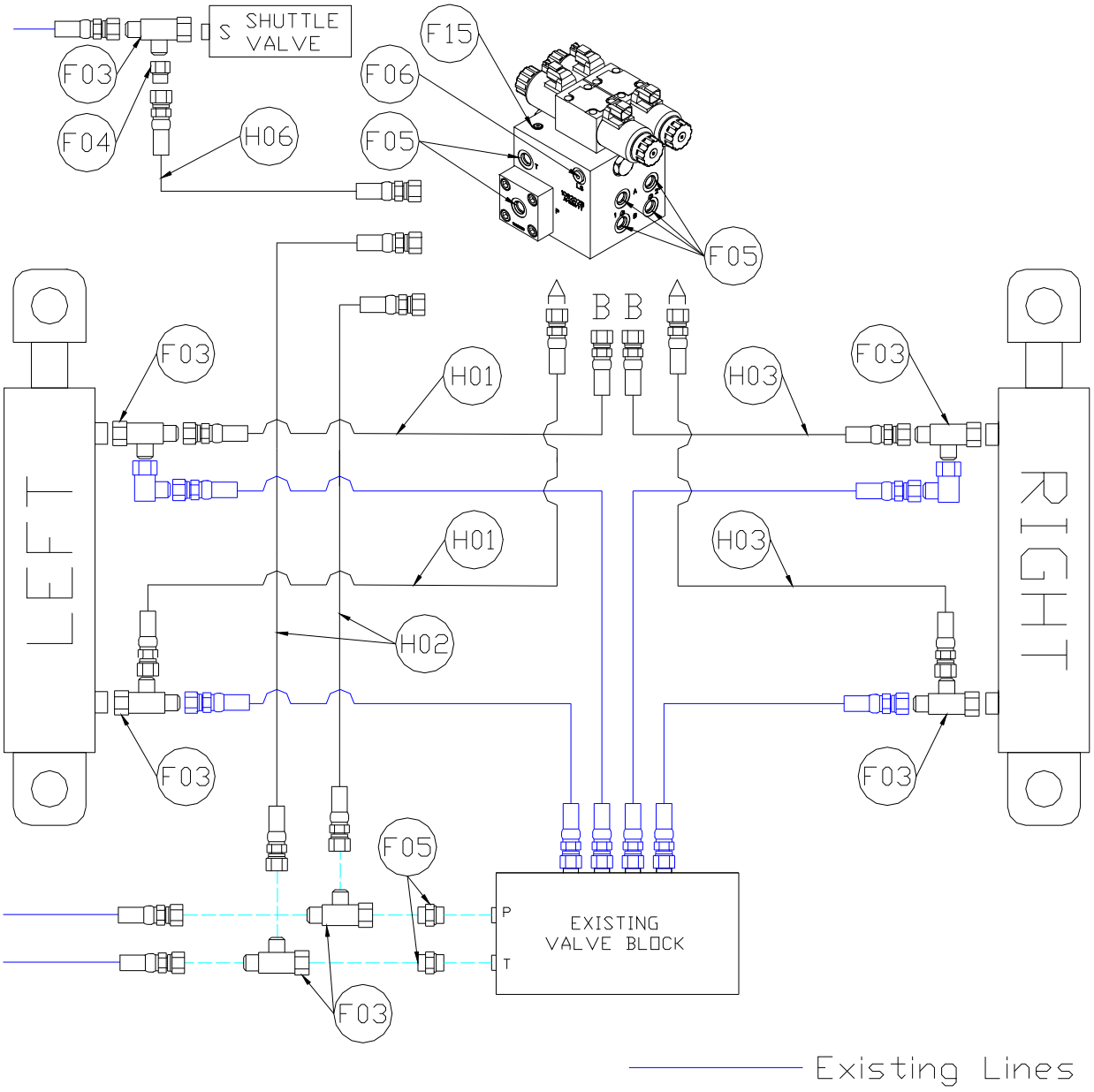


Figure 3: JD8 Hydraulic Plumbing

3.3 List of Parts

Item	Part Number	Name	Quantity
B05	44706-01	KIT CABLE TIE BLACK 10 PCS 21 IN 150 PCS 7.5 IN	1
B15	105415	CLAMP ROUND 2IN SS	4
B16	105416	CLAMP ROUND 1-1/4 IN SS	4
B18	44695-18	PIN ACTIVE ROLL CYLINDER UPPER JD 20MM ZINC	1
B20	44971	SENSOR MOUNTING BRACKET LOW PROFILE 16GA	2
C03	44656D	CABLE VALVE VARIABLE RATE DT	1
C05	43210-20	CABLE UC5 NETWORK 18 AWG 20M	2
C10	44650-50	CABLE UC4.5 POWER GENERIC SELF-PROPELLED	1
C11	44651-50	CABLE UC4.5 EXTENSION VALVE GENERIC	1
C13	44658-54	CABLE UC4 INTERFACE MP2 RMAN LONG	1
C30	43250-07	CABLE UC5 BATTERY JD FUSED - 5A	1
E01	45100	UC4.5 BOOM CONTROL PANEL	1
E03	43742	UC5 ROLL SENSOR W TEMPERATURE PROBE	1
E04	43741	UC5 ROLL SENSOR VER. 2	1
E05	43750	UC5 ULTRASONIC SENSOR	2
E11	43765	UC5 NETWORK COUPLER 8-WAY	1
E12	43764	UC5 NETWORK COUPLER 2-WAY	1
E20	43764T	UC5 NETWORK COUPLER 2-WAY WITH TERMINATOR	2
H01	44863-53	HOSE ASSEMBLY 122R2-06 66 IN L 6FORX 6FORX	2
H02	44863-23	HOSE ASSEMBLY 122R2-06 32IN L 6FORX 6FORX	2
H03	44863-31	HOSE ASSEMBLY 122R2-06 106 IN L 6FORX 6FORX	2
H06	44862-05	HOSE ASSEMBLY 122R2-04 144 IN L 4FORX 4FORX	1
H10	44865-36	HYDRAULICS FITTING KIT - JD8	1
M01	UC4.5-BC-MANUAL-OPERATOR	OPERATOR MANUAL UC4.5 SPRAY HEIGHT CONTROL	1
M02	UC4.5-BC-JD8-INST	MANUAL INSTALLATION UC4.5 JOHN DEERE 30 SERIES	1
M06	45015	ANTI-SEIZE LUBRICANT KIT	1
P03	105882	UC5 NETWORK 6 PIN PLUG	3
V01	44963D	VALVE BLOCK ASSEMBLY 2 STATION CC/LS PROP DT 4 BOLT	1

3.4 Optional Main Lift Kit

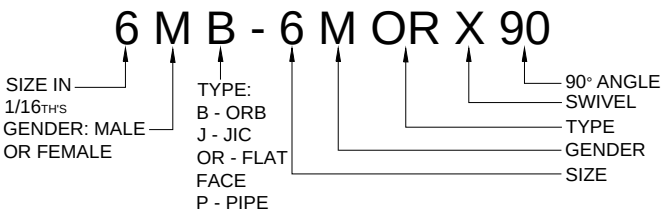
An optional main lift sensor kit is available for purchase from NORAC.

Part Number	Name
UC4.5-JD9	UC4.5 JOHN DEERE 30 SERIES PROP MAIN LIFT OPTION

3.5 Hydraulic Fitting Kit Details (P/N: 44865-36)

Item	Part Number	Name	Quantity	Picture
F02	104691	TEE ADAPTER - 4FORXR 4MORT	1	
F03	104586	TEE ADAPTER - 6FORXR 6MORT	7	
F04	105226	MALE TO FEMALE ADAPTER - 4MOR 6FORX	1	
F05	44917	MALE ADAPTER - 6MB-6MOR MACHINED ORB	8	
F06	104693	MALE ADAPTER - 4MOR 4MB	1	
F15	105500	SETSCREW 1/4X3/8	1	

Fitting Name Example:



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 (M06) to all threaded parts upon installation. Permatex Anti-seize lubricant is preferred, but other similar anti-seize products may be used.

4 Pre-Install Checklist

The pre-install checklist is necessary to check the existing sprayer functionality before the installation.

1. Unfold the sprayer over a flat, unobstructed area (i.e. no power lines…etc.).
2. Ensure all boom-fold operations are functional (place a check mark in boxes below).
3. Bring engine to field-operational RPM and record below.
4. Record the time (seconds) it takes for a full stroke for all boom functions. To ensure repeatable measurements, take the average of 3 trials.
5. Not all sprayers will have the functions listed below in **Figure 4**.

⚠ Important

Ensure the boom has sufficient travel so it does not contact the ground during these tests.

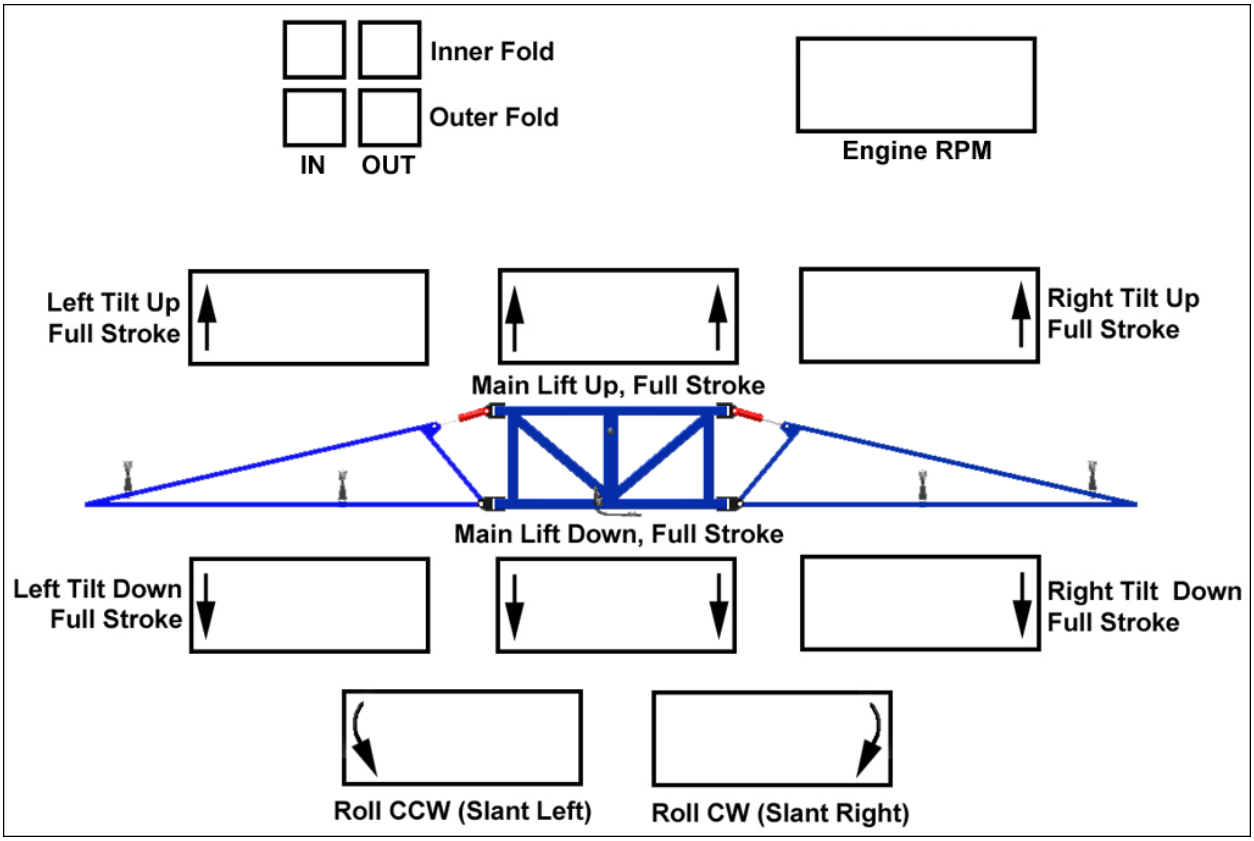


Figure 4: Pre-Install Boom Speeds

5 Ultrasonic Sensor Installation

5.1 Ultrasonic Sensor Serial Number Arrangement

When installing the sensors, start with the smallest serial number on the left-hand side, and proceed to the largest serial number on the right hand side. Each sensor has a serial number stamped on the sensor housing.

Apply a light coating of the supplied Permatex Anti-seize grease (M06) to all threaded parts upon installation.

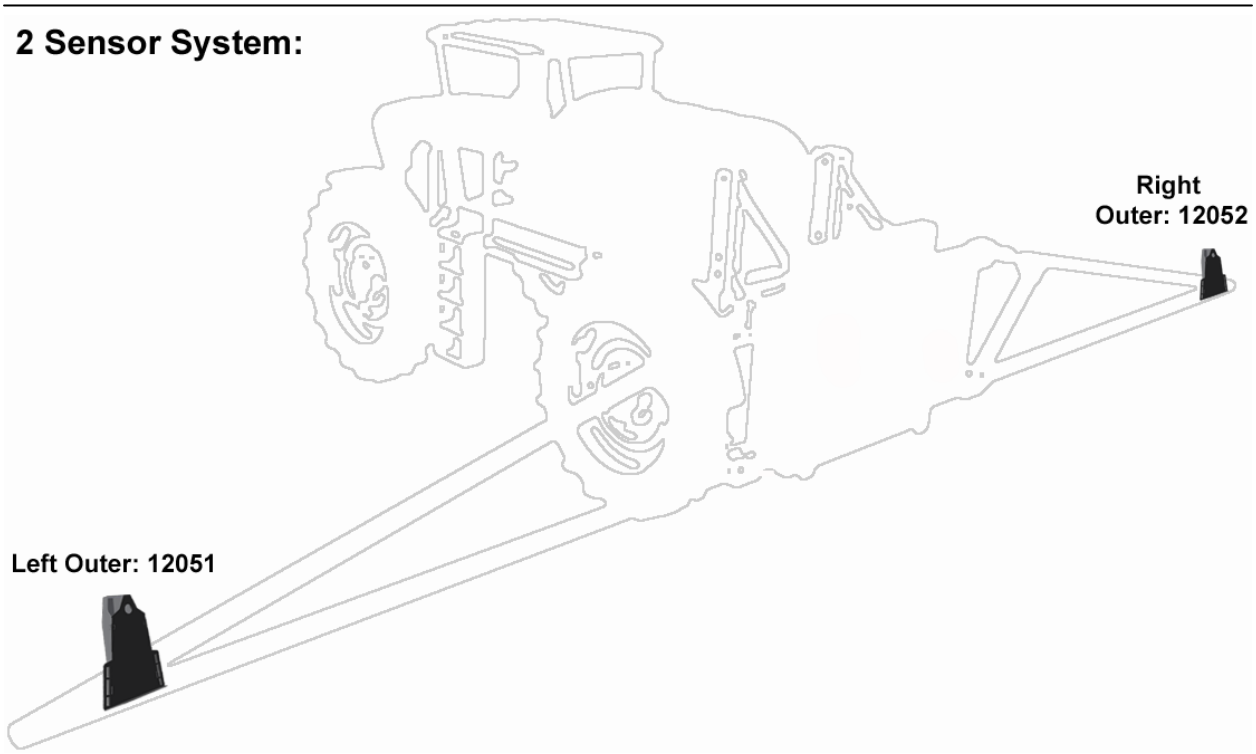


Figure 5: Sensor Serial Number Arrangement

5.2 Ultrasonic Sensor Mounting Guidelines

The following guidelines will ensure optimal sensor performance and prevent sensor measurement error. These rules should be followed for both the wing sensors and the main lift (middle) sensor.

1. In its lowest position, the sensor must be 9 inches (23 cm) or more from the ground.

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

3. The sensor should be approximately vertical at normal operating heights.

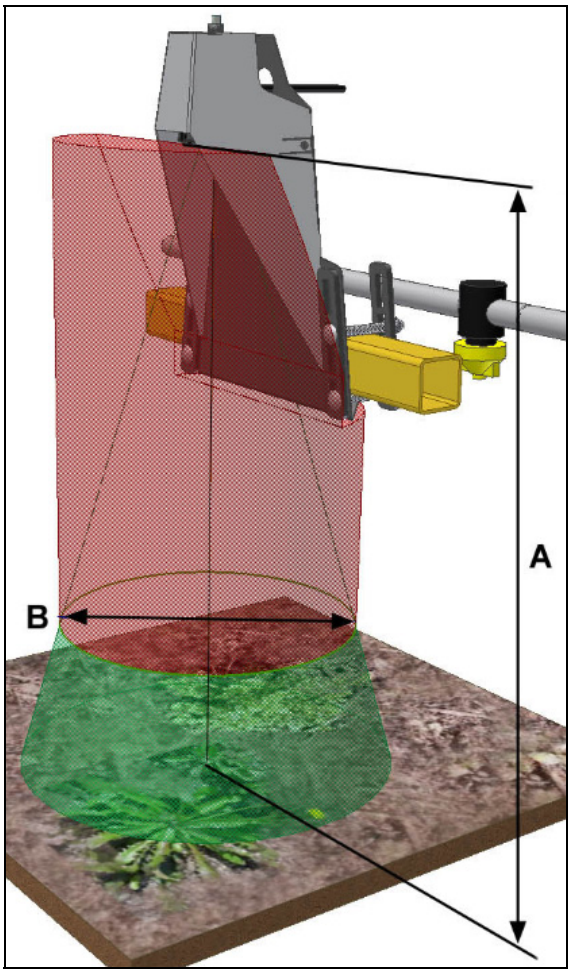


Figure 6: Sensor Mounting Guidelines

5.3 Low Profile Bracket Mounting Guidelines

1. Minimize the distance between the bolts to prevent bending the bracket and prevent the bracket from loosening over time.

2. Ensure the bracket is mounted tight against the bottom of the boom, minimizing the distance between the boom structure and the angled flange.

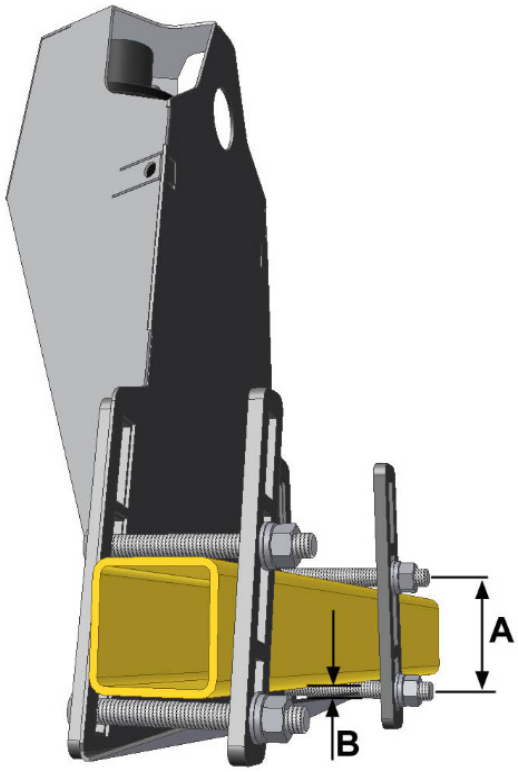


Figure 7: Bracket Mounting Guidelines

⚠ Important

A problem can arise if a sensor is not mounted correctly. It is possible for the sensor to read off of the boom instead of the ground. This may only become apparent once the control system is switched from soil to crop mode.

Also be careful that the sensor bracket does not collide with any other part of the boom when the boom is folded to transport position. If possible, mount the sensor brackets while the booms are folded to ensure they will not cause interference.

5.4 Wing Sensor Installation

1. The wing sensor mounting brackets (B20) are the two brackets with the shorter mounting flange.

2. The sensor bracket should be oriented forward (ahead of the boom).

3. Typically the best mounting location for the wing sensor brackets will be near the end of the boom tips, approximately two feet (60cm) from the end.

4. Depending on the boom design, some breakaway sections will lift upwards as they break back. If the sensor is mounted to this portion of the boom, the system will force the boom downwards towards the ground as the boom folds backwards.

5. Mount the NORAC ultrasonic sensor into the sensor bracket and run the sensor cable either through hole in the back or through the side cut-out and behind the bracket. Ensure the cable is clear of moving parts and will not be damaged during folding.

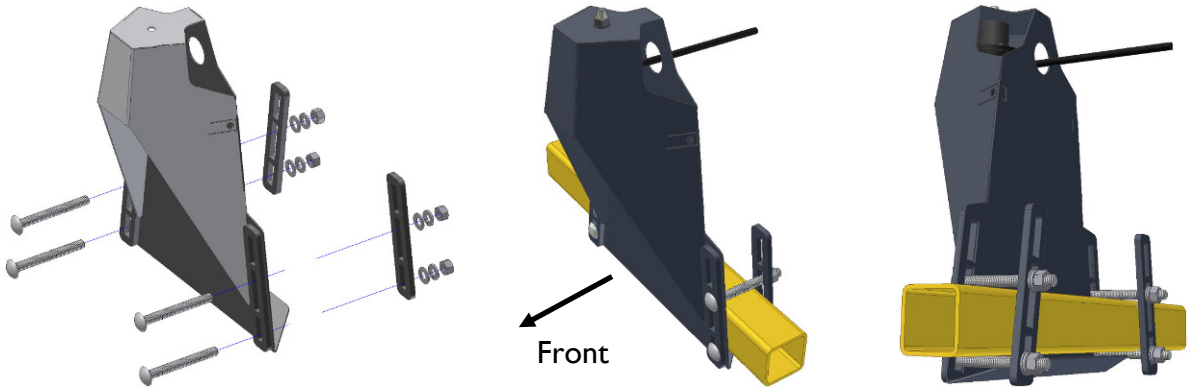


Figure 8: Bracket Mounting Example

6. Exhaust clamps (B15 and B16) can be used if mounting the sensor brackets to a portion of the boom with round tubing.

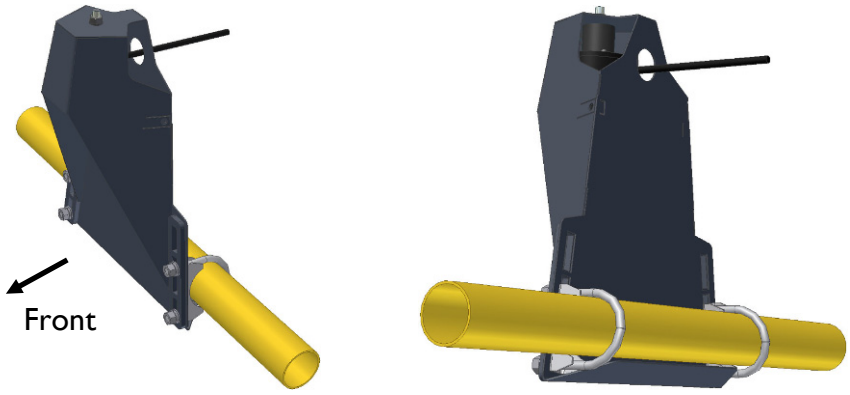


Figure 9: Bracket Mounted with Exhaust Clamps

6 Roll Sensor Installation

6.1 Bracket Assembly

1. Securely mount the roll sensors to the included roll sensor brackets using the #6 machine screws.

2. The orientation of the mounted roll sensor to the roll sensor bracket will depend on the bracket mounting. The roll sensor CANbus connector must be pointing towards the right side of the sprayer (when looking from the rear of the sprayer).

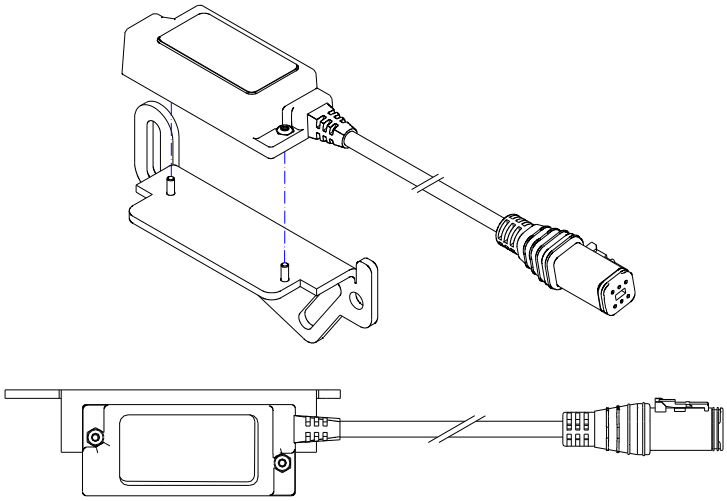


Figure 10: Mounting Roll Sensor to Bracket

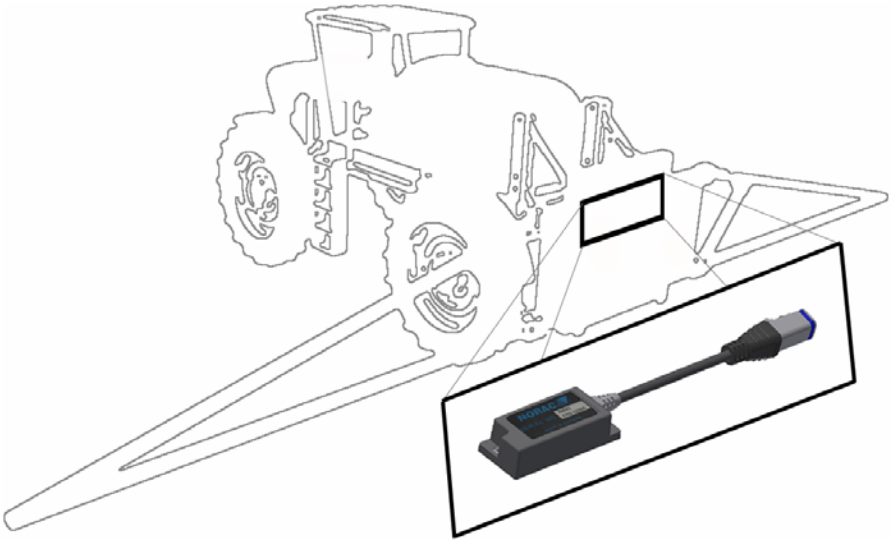


Figure 11: Roll Sensor Orientation - Connector Facing Right Wing

6.2 Roll Sensor Mounting Guidelines: Center Pivot Booms

1. When mounting the roll sensors, mount the roll sensor **without** the temperature probe on the boom frame and the roll sensor **with** the temperature probe on the chassis (non-pivoting portion of the sprayer). For optimal performance, minimize the distance between the roll sensors (A) and minimize the height from each roll sensor to the pivot point (B).

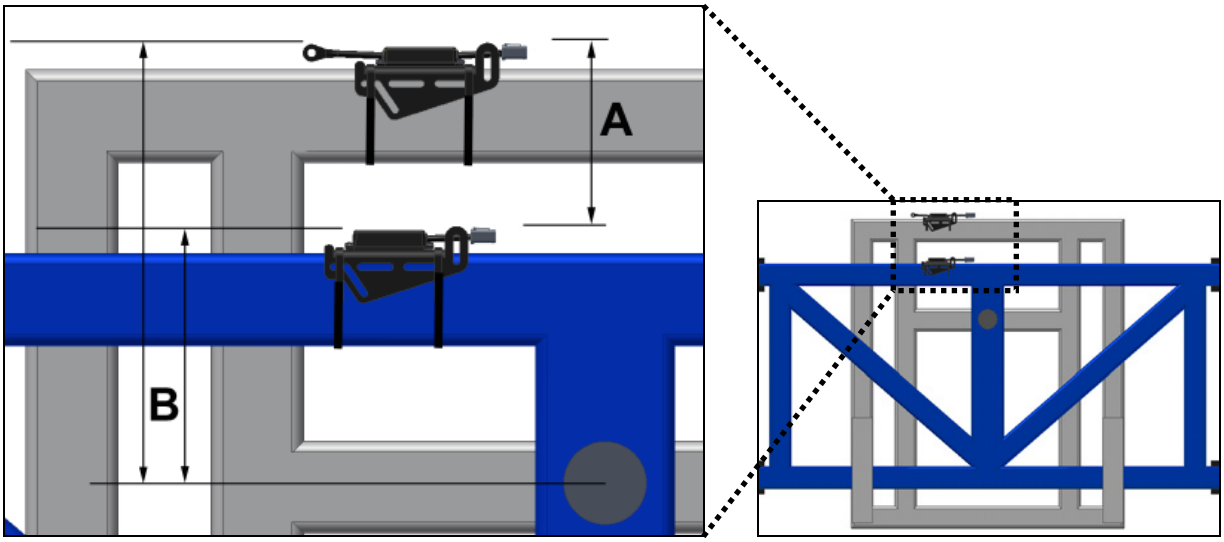


Figure 12: Roll Sensor Mounting on a Center Pivot Suspended Boom

2. Ensure the roll sensors are relatively level when the sprayer boom and chassis are level.

3. Both roll sensor cables should be pointing towards the right hand wing of the sprayer.

4. Ensure both roll sensors are mounted adequately and that the cables provide enough slack to allow sufficient boom roll.

5. The chassis roll sensor can also be mounted inverted to minimize the distance between the roll sensors (**Figure 13**).

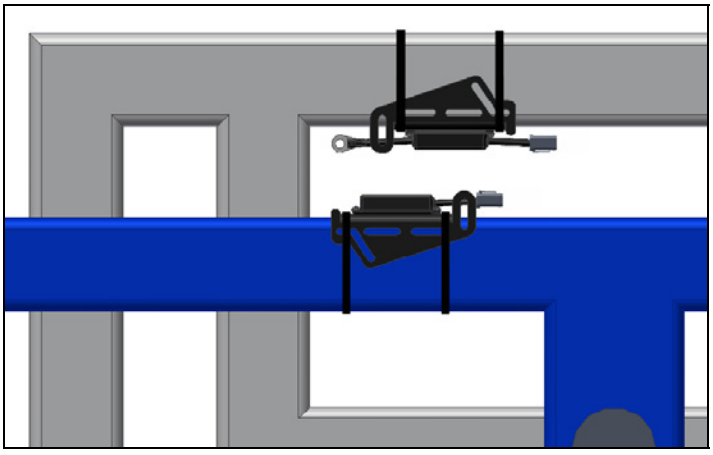


Figure 13: Inverted Chassis Roll Sensor Mounting on a Center Pivot Suspended Boom

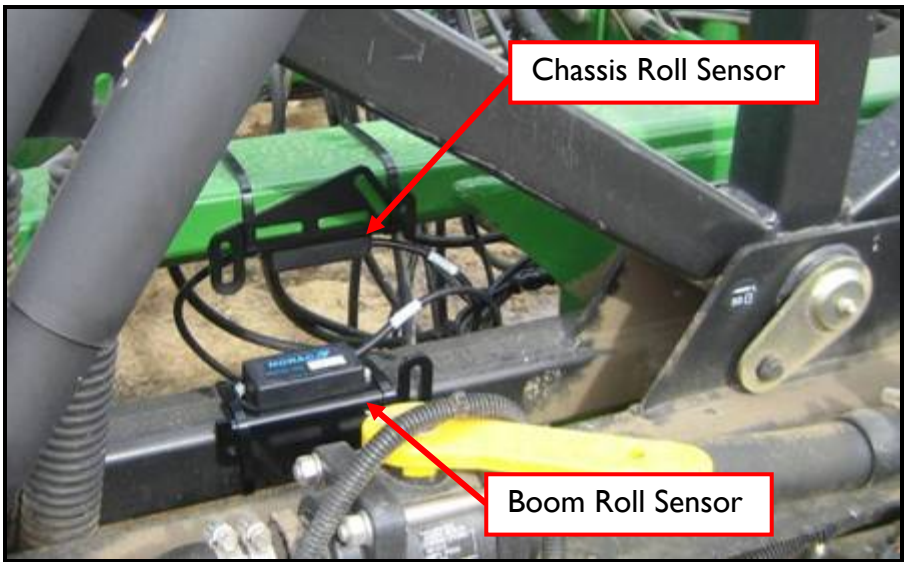


Figure 14: Roll Sensor Mounting (Viewed from Rear of Sprayer)

6.3 Temperature Probe

Once the block is mounted, fasten the temperature probe from E03 to the NORAC valve block using the included 3/8x1/2" bolt as illustrated in **Figure 15**.

Figure 15: NORAC Valve Block with Temperature Probe Installed

6.4 Link Arm Pin Replacement

The John Deere link arm located between the black tee frame and the boom must have the top pin replaced. Remove the Top pin from the arm and insert the supplied pin (B18). Replacing this pin removes some free movement on the boom and will improve performance. **Figure 16** shows a link arm, but this is often an aluminum color. The bottom bolt must be tightened to 266 ft-lbs.

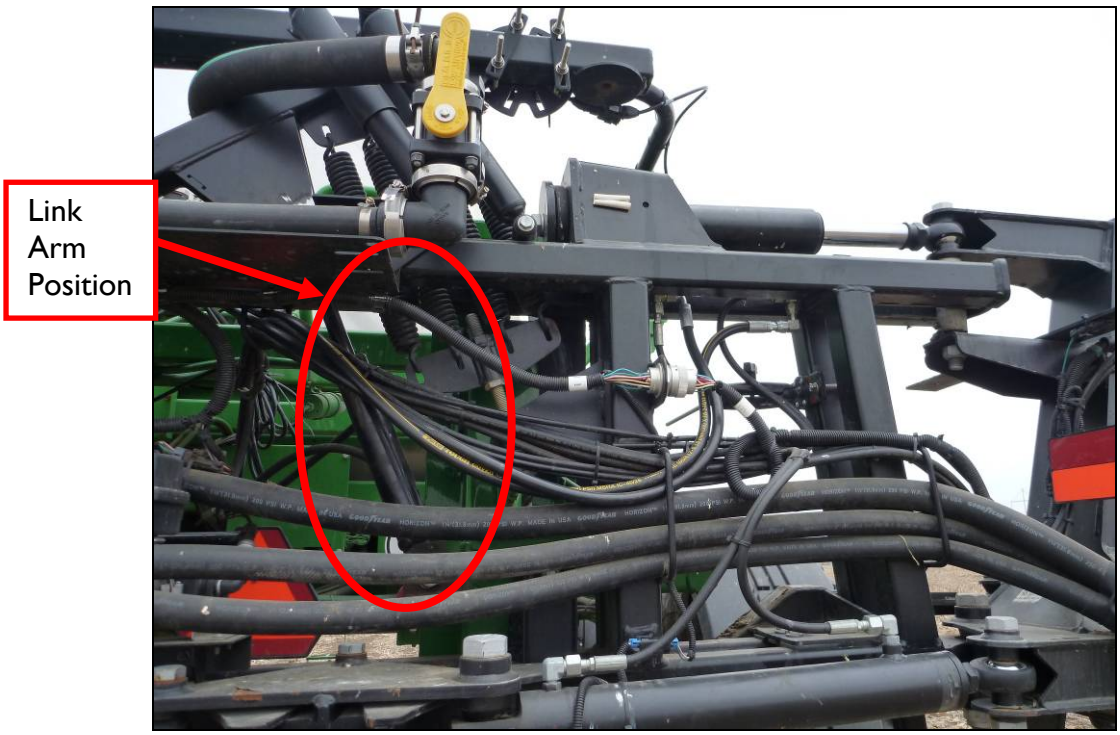


Figure 16: John Deere Link Arm Location (looking towards rear of sprayer)

7 Electrical Installation

1. Install the UC4.5 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 UC4.5 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.

   If desired, a mounting bracket (part #A53255) can be purchased from your local John Deere dealer to allow the UC4.5 control panel to be mounted to the existing John Deere terminal mount. 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 the existing JD mount. These are available at your local outdoor store as a RAM mount part number RAM-B-236. (See http://www.ram-mount.com/)

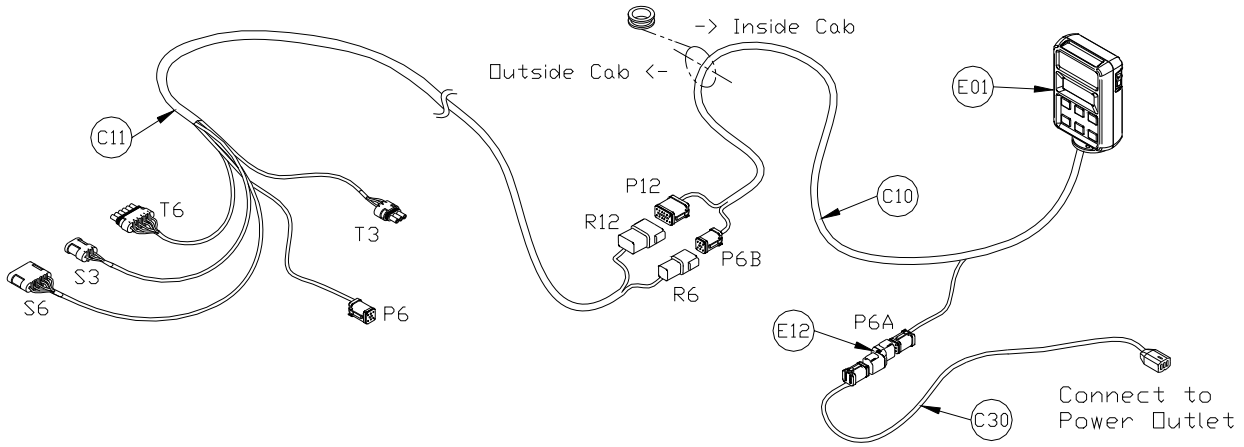


Figure 17: Cable Configurations: C10, C11 and C30

2. Connect the UC4.5 power cable (C10) to the UC4.5 Control Panel in the cab. Ensure that both plugs (P16 and P4) are connected to the panel. Cable tie C10 to the RAM mount to help provide strain relief.

⚠ **Ensure the UC4.5 Control Panel's power is OFF for the remaining installation. (Bottom of switch pressed IN).**

3. Connect C30 to P6A of C10 using a 2-way coupler (E12). Plug the 3-pin connector on C30 to the power bar in the cab.

4. Route the free end of C10 along the side of the cab post and under the floor mat.

⚠ **The hole in the floor may be covered by a plate, or a grommet may be installed in the hole. They can be reinstalled after the wiring is complete. NORAC supplies a grommet for the hole if one does not exist.**

Figure 18: Hole under Floor Mat

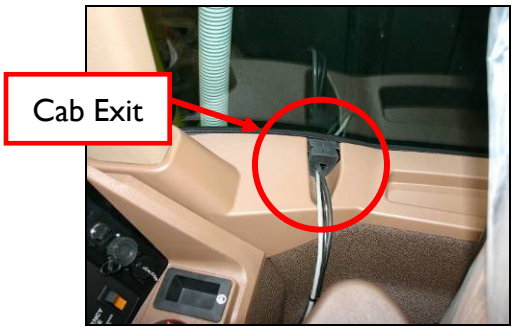


Figure 19: Alternate Cab Exit for Cabling

⚠ **The hole in the floor may be too small for the connector. In this situation the cable can be routed out the back of the cab through an opening close to the bottom of the rear, right window (Figure 19).**

5. Connect P12/P6 on C10 to R12/R6 of C11.

6. Route C11 to the rear of the sprayer near the sprayer valve block. Run the cables along the sprayer frame with the JD harness.

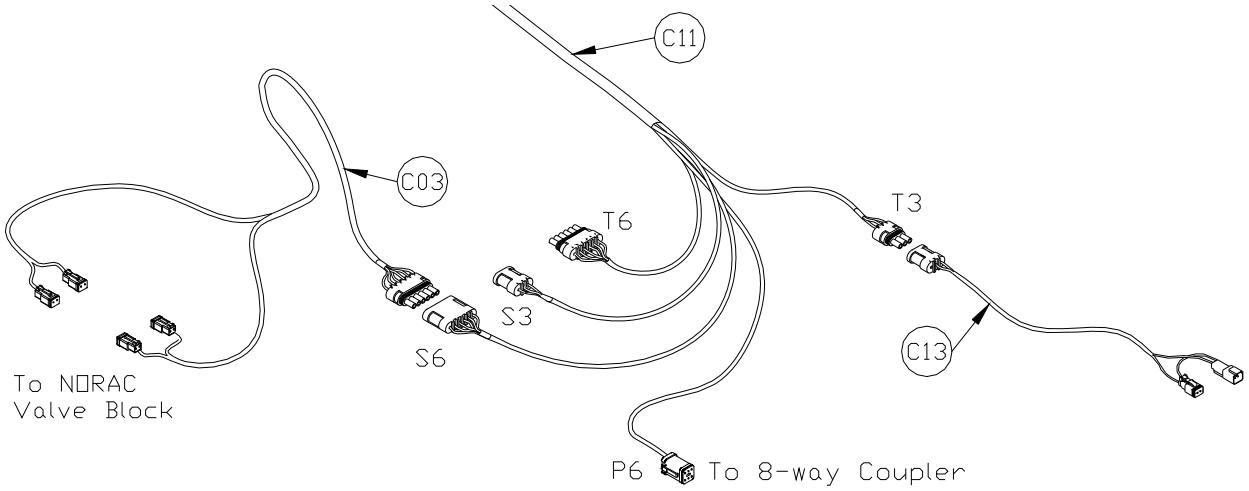


Figure 20: Cable Configurations: C03 and C13

7. Connect S3 on cable C13 to the 3-pin tower (T3) on C11.

8. Route the free end of C13 under the sprayer to the shuttle valve manifold. Unplug the load sense jam valve connector (**Figure 21**). Plug the connectors on C13 into the load sense jam valve connectors.

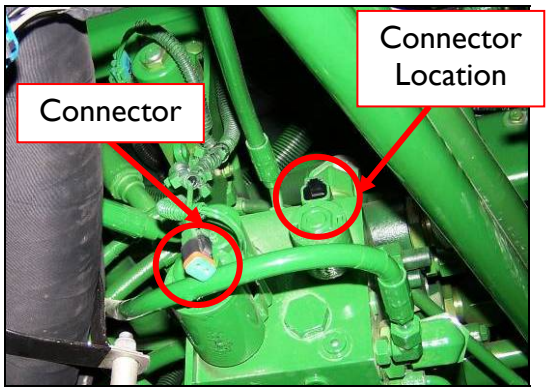


Figure 21: Load Sense Jam Valve Connector

9. Connect the 6-pin tower on the valve cable (C03) to the 6-pin shroud on C11.

10. Connect the 2-pin connectors on C03 to the NORAC valve block, as shown in **Figure 22**.

11. 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.

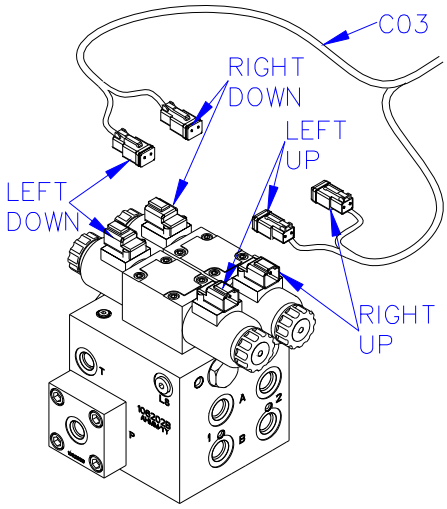


Figure 22: Valve Cable Connections

12. Fasten the 8-way coupler to the boom with cable ties. Connect P6 on C11 to the 8-way coupler.

13. Connect both roll sensors to the 8-way coupler.

14. Connect two cables (C05) to the 8-way coupler and route along the booms to the wing sensors. Follow existing cables and hoses to be sure the cable will not be pinched or stretched.

15. At the sensor brackets, attach a 2-way coupler with terminator (E20) to the sprayer boom. The 2-way coupler with terminator is the white two way coupler. Plug the sensor and the CANbus cable into the 2-way coupler.

<u>IMPORTANT</u>:

Provide enough slack in all cables to account for the movement of the main section, parallel lift, and FOLDING boom movement.

8 Hydraulic Installation

Warning!

Ensure all pressure has been bled from the system before disconnecting any lines or fittings. Hydraulic pressure will exist on the wing tilt circuits unless the wings are being supported by other means. The hydraulic installation may be performed with the wings in transport position, resting on the ground or with the tilt cylinders fully extended.

Important

Component failure due to oil contamination is not covered under the NORAC UC4.5 system warranty. It is recommended that a qualified technician perform the hydraulic installation.

8.1 Valve Assembly

Orifices are not installed in the 1st and 2nd stations of the NORAC valve block for this sprayer because the John Deere orifices in the wing cylinders are used.

1. On a clean surface remove the plastic plugs from the block.
2. Install the 6MB-6MOR (F05) fittings on the "P" and "T" ports on the NORAC block. Tighten to 18 ft-lbs (24 Nm).
3. Install the 4MOR-4MB (F06) fitting into the "S" port and tighten to 11 ft-lbs.
4. Install the 6MB-6MOR (F05) fittings into the "A" and "B" ports on the NORAC block. Tighten to 18 ft-lbs (24 Nm).

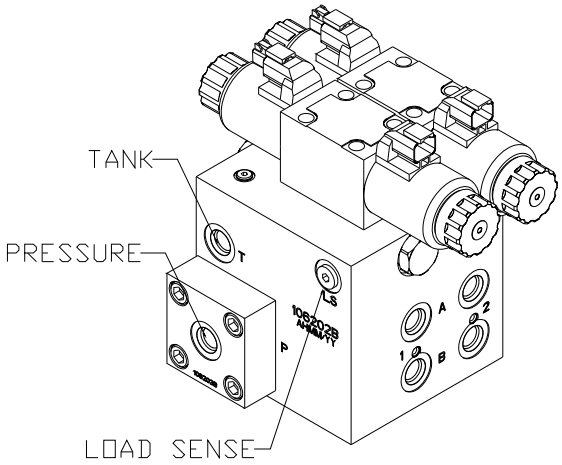


Figure 23: NORAC Valve Block Details

5. Remove the plug from the Sense Line Bleed port. Location is shown in **Figure 24**. Gently tap the plug with a hammer to loosen it before attempting to remove it. Remove the Sense Line Bleed Orifice and discard.

6. Install the setscrew (F15) into the Sense Line Bleed Orifice location. Ensure the setscrew is threaded entirely into the hole and tightened to 35-40 in-lbs to ensure a tight seal. Reinstall the plug and tighten to 35-40 in-lbs.

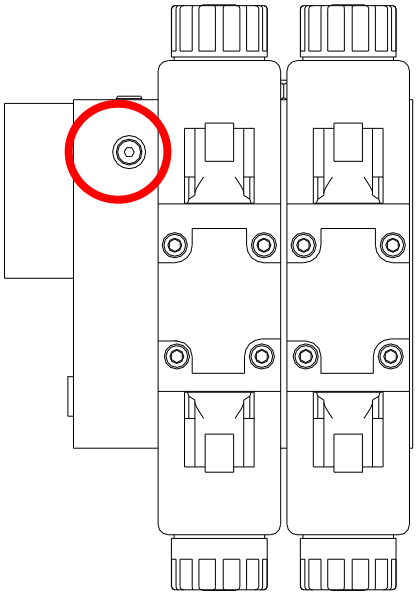


Figure 24: Load Sense Bleed Orifice Location on Top of Block

8.2 Valve Block Mounting

⚠ Important

Ensure that no hydraulic components will interfere with any sprayer parts or be pulled tight at any time.

⚠ **The recommended location for the valve is on the angled cross tube of the parallel linkage on the sprayer. Orient the valve block so the "A" and "B" ports face towards the boom (Figure 25).**

1. A suitable mounting location for the valve block is illustrated in **Figure 25**.

2. Insert the threaded rod into the block and use a hex nut to hold the rod. The block holes are 3/8" NC-1" deep. If bolts are used instead of the threaded rod, ensure the bolts thread in at least 3/8".

3. Use the remaining hardware to secure the block to the sprayer.

4. Cut off excess threaded rod, if necessary.

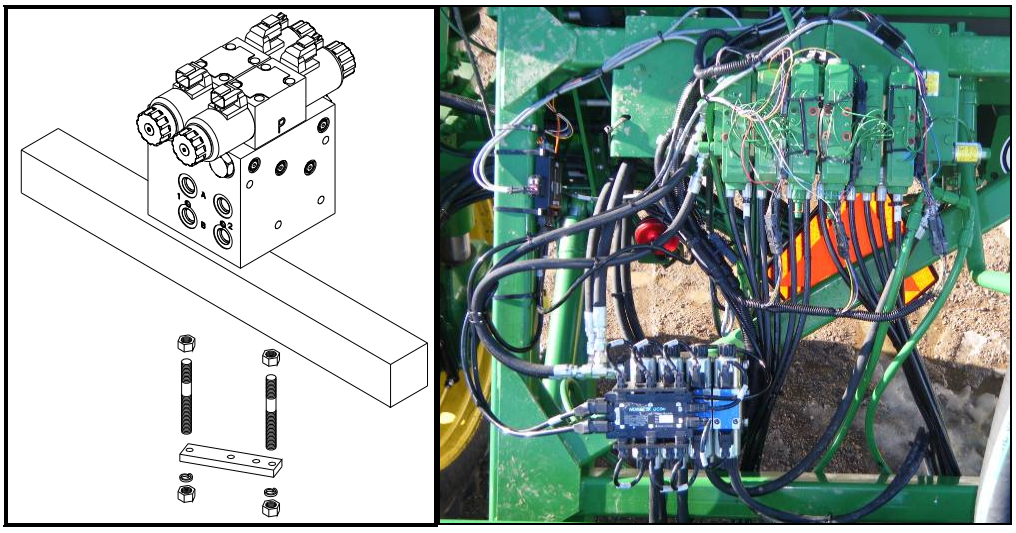


Figure 25: Valve Block Mounting

8.3 Hydraulic Plumbing

Warning!

From this point on in the installation the booms will be inoperative until the hydraulics 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. Connect the NORAC supplied hoses (H02) to the Pressure ("P") and Tank ("T") ports on the NORAC valve block (V01). Tee the hoses, H02 ("P" and "T" lines), into the ports on the sprayer valve block with 6FORXR-6MORT fittings (F03) and 6MB-6MOR fittings (F05). The elbow fittings currently in place must be replaced by the 6MB-6MOR fitting (F05).

3. Disconnect the existing hoses from the tilt cylinders. Remove the existing 90 degree fitting on the rod end of each cylinder. Install a 6FORXR-6MORT fitting (F03) onto the ports of each tilt cylinder. Reconnect the cylinder hoses and 90 degree fittings to the newly installed tees.

4. Connect one end of hoses H01 to the F03 fittings on the LEFT tilt cylinder. Connect the other end of hoses H01 to the NORAC valve block "A" and "B" ports.

5. Connect one end of hoses H03 to the F03 fittings on the RIGHT tilt cylinder. Connect the other end of hoses H03 to the NORAC valve block "A" and "B" ports.

6. The "raise" lines must be connected to the "B" ports of the NORAC valve block. The "lower" lines must be connected to the "A" ports of the NORAC valve block.

7. Connect H06 to the Load Sense ("S") port on the NORAC valve block. Route the Load Sense Line (H06) to the shuttle valve manifold located underneath the sprayer. Tee the Load Sense line (H06) into the "S" port of the shuttle valve manifold using fittings F03 and F04 (**Figure 26**).

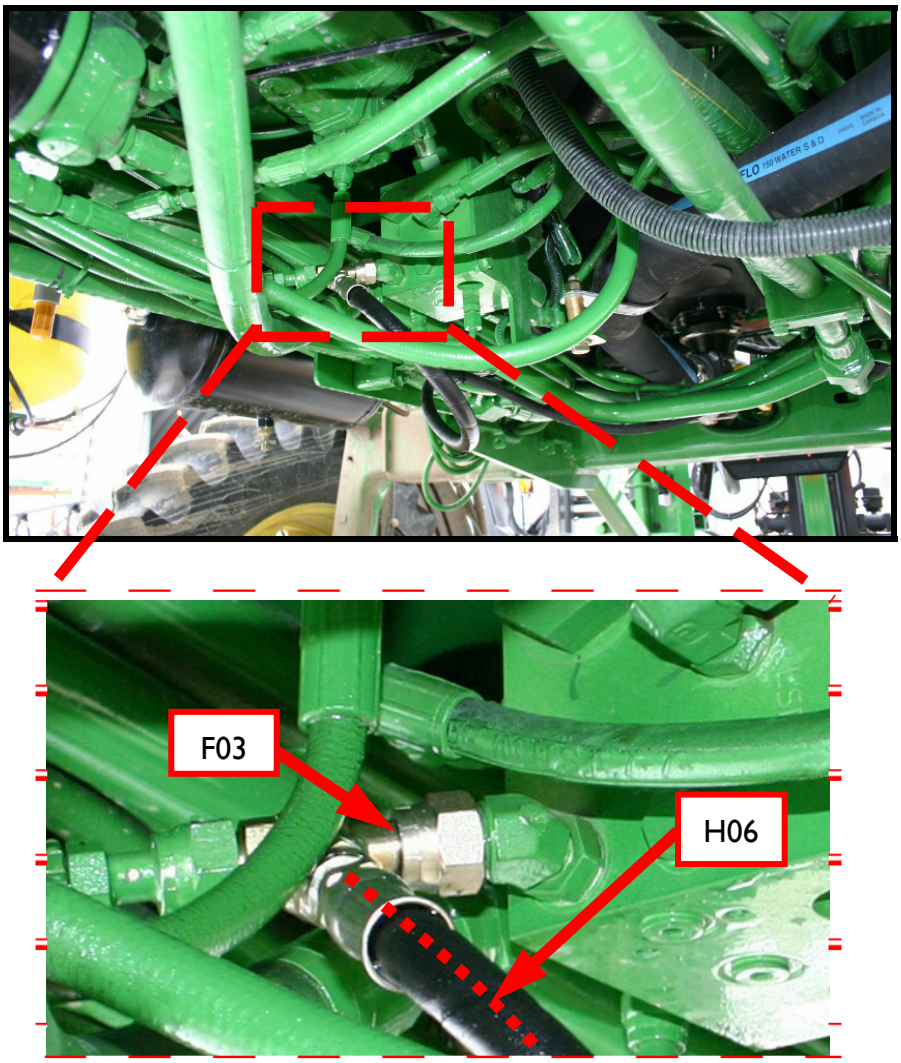


Figure 26: JD Shuttle Valve Location

9 Software Setup

1. Start up the sprayer and test the sprayer's functionality. The NORAC control panel does not need to be powered on for the original boom function switches to operate. Unfold the booms and raise/lower each boom and the main section.

⚠ Important

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

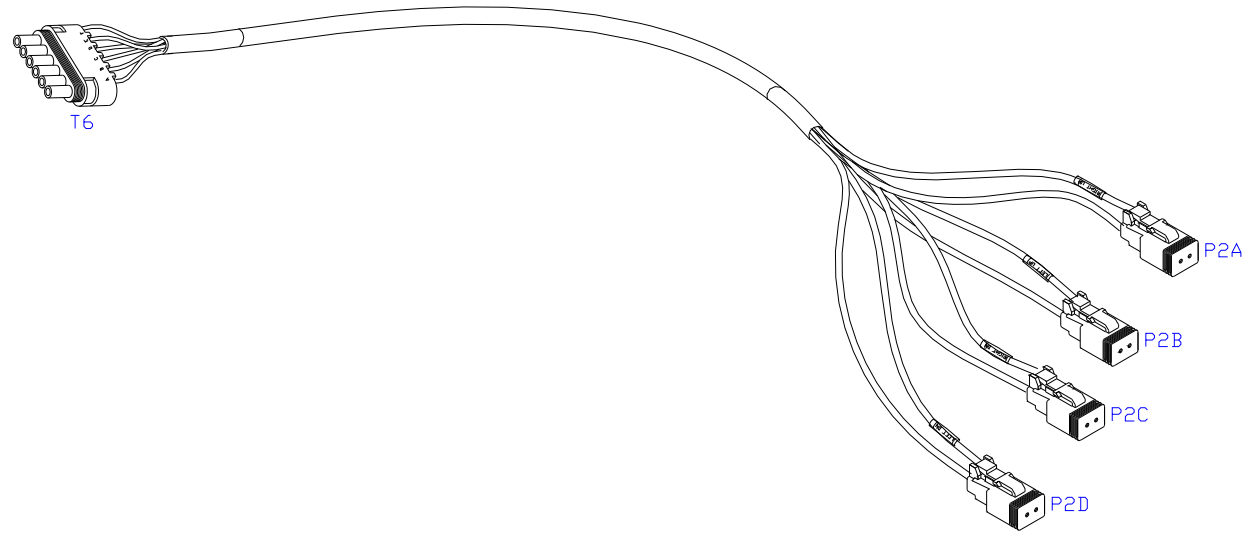
2. If any functions do not work, review the hydraulic and electrical portions of this manual to check for proper installation.

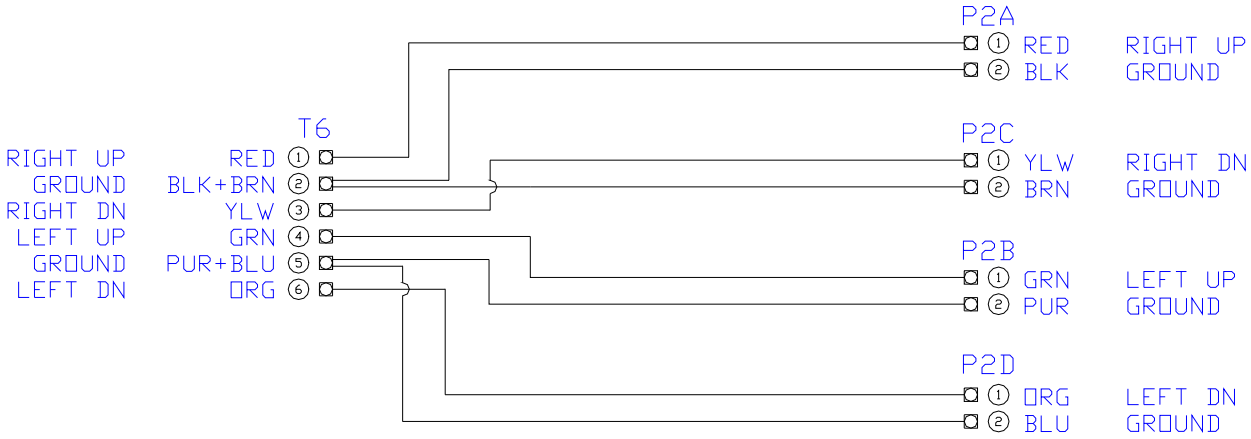
3. Turn on the power for the UC4.5 Control Panel using the switch on the side of its chassis.

4. The procedure for the installation of the UC4.5 Spray Height Control system is now complete. Begin the AUTOMATIC SYSTEM SETUP procedure as described in the UC4.5 Spray Height Control Operator's Manual (M01).

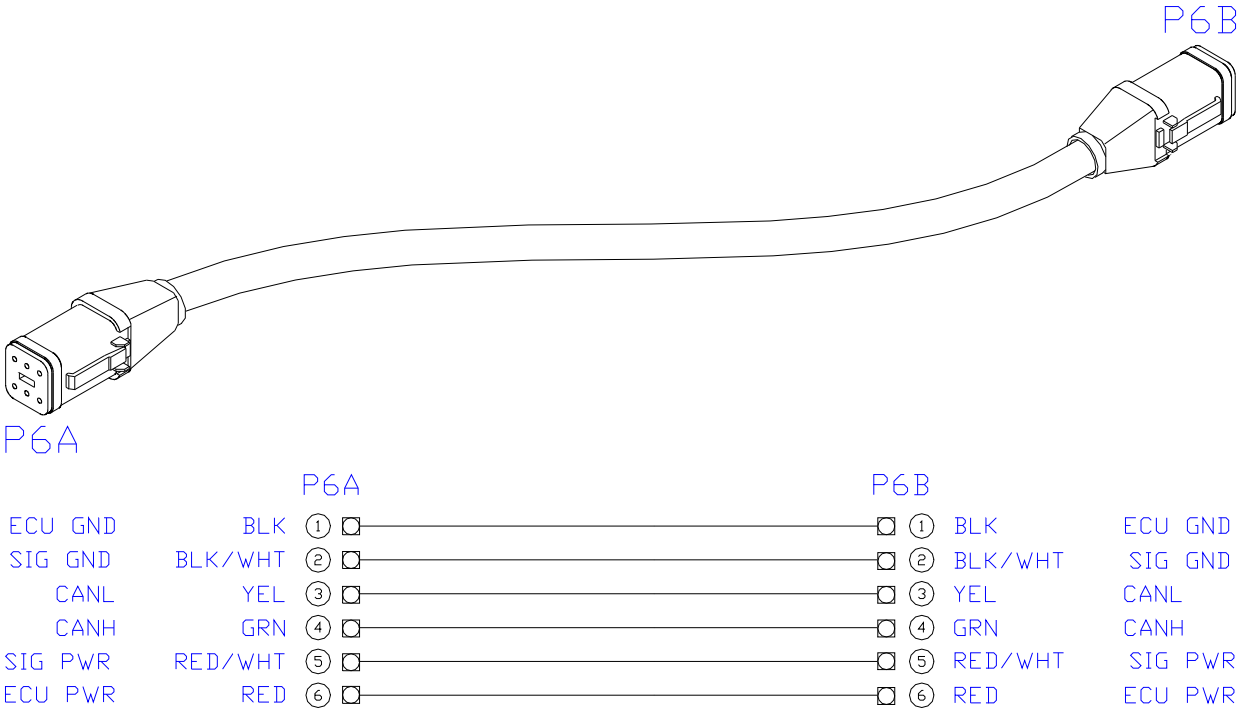
10 Cable Drawings

10.1 ITEM C03: 44656D – CABLE VALVE VARIABLE RATE DT

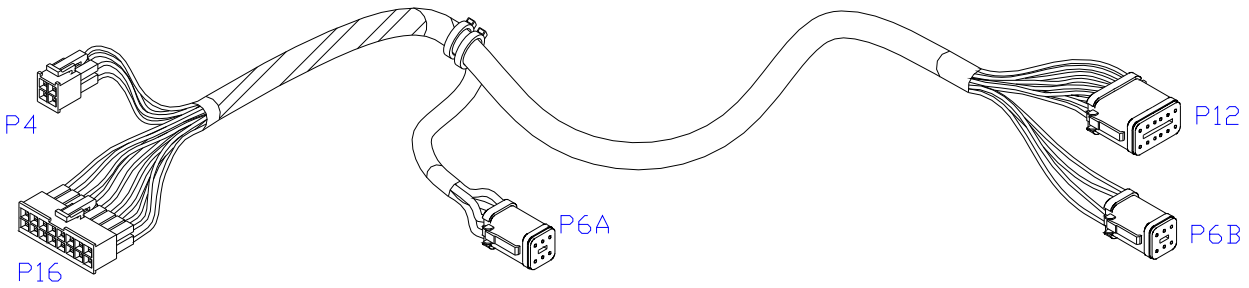


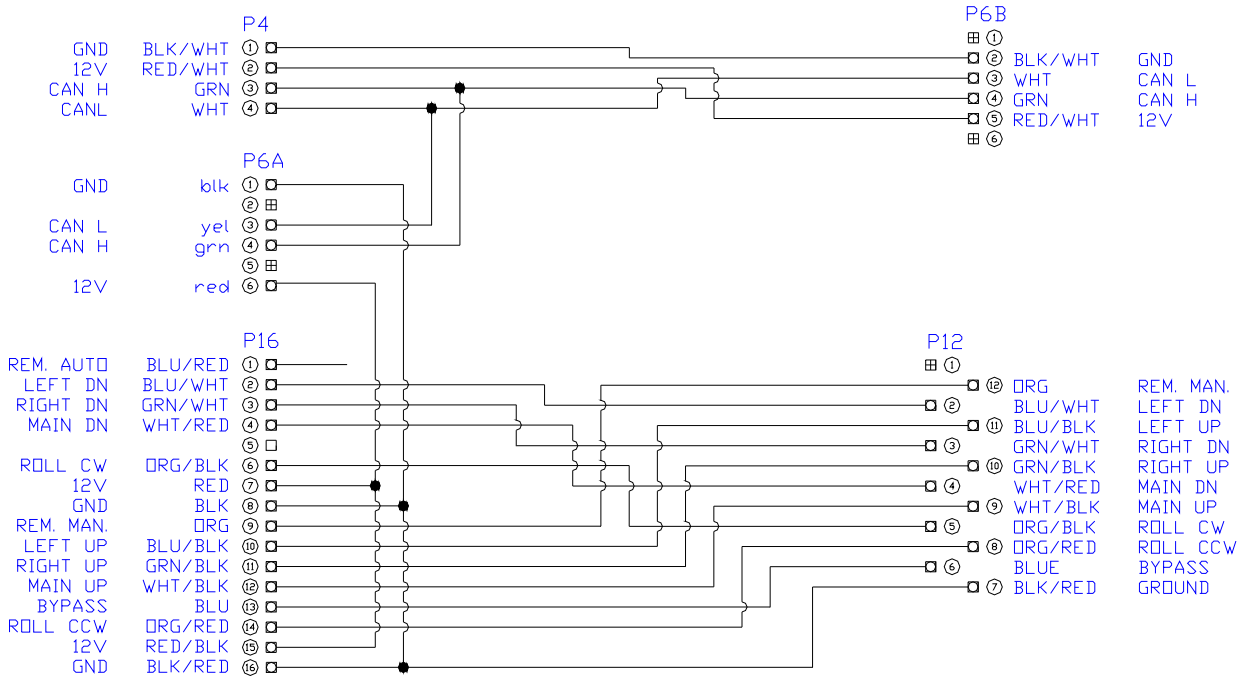


10.2 ITEM C05: 43210-20 - CABLE UC5 NETWORK 18 AWG - 20M

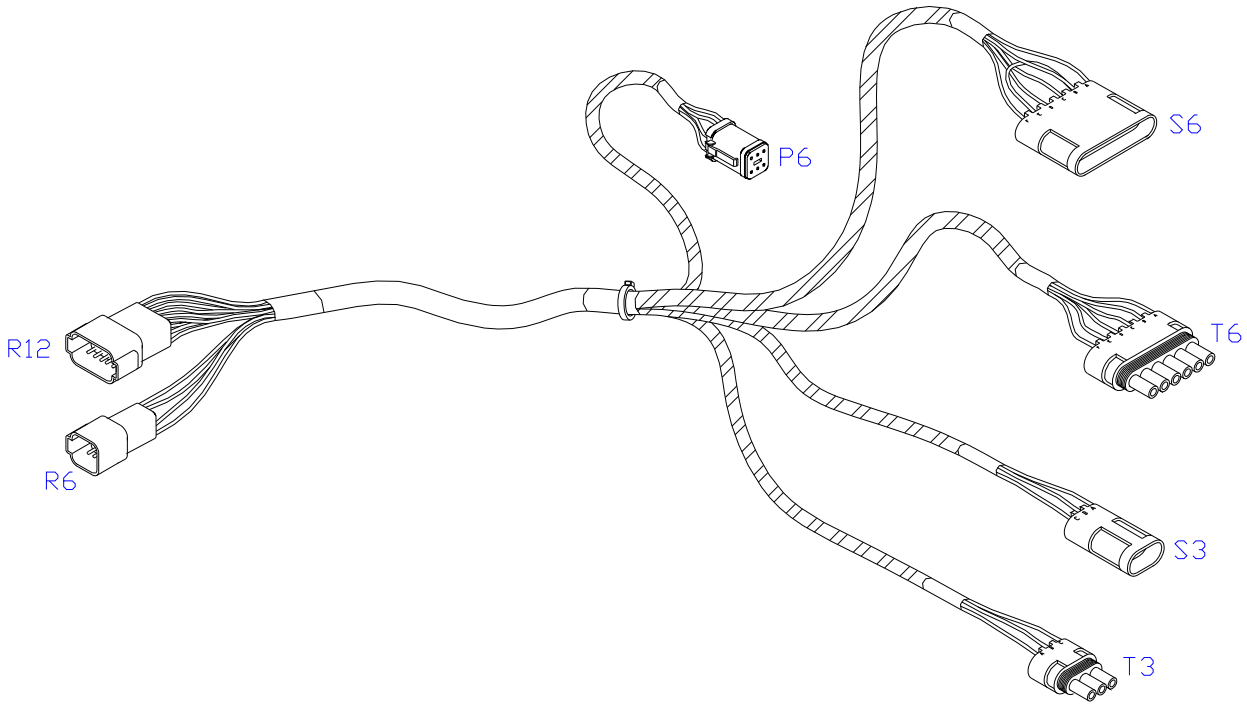


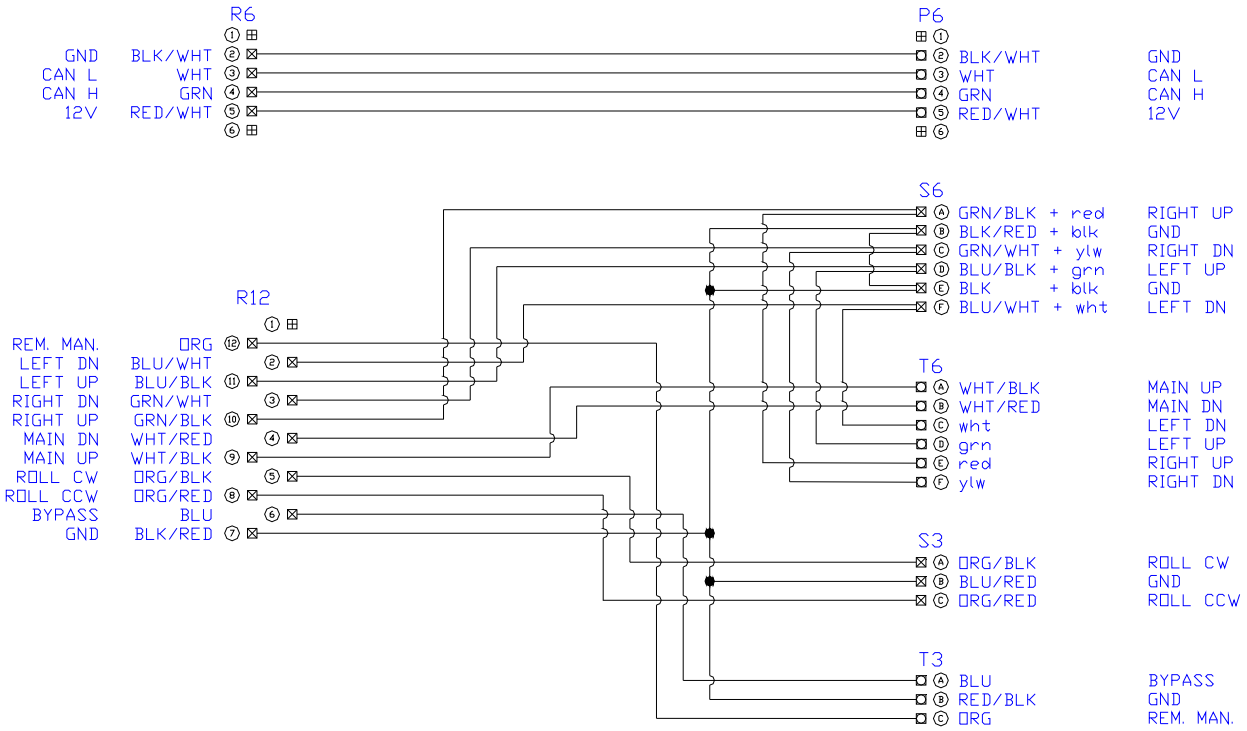
10.3 ITEM C10: 44650-50 - CABLE UC4.5 POWER GENERIC SELF-PROPELLED



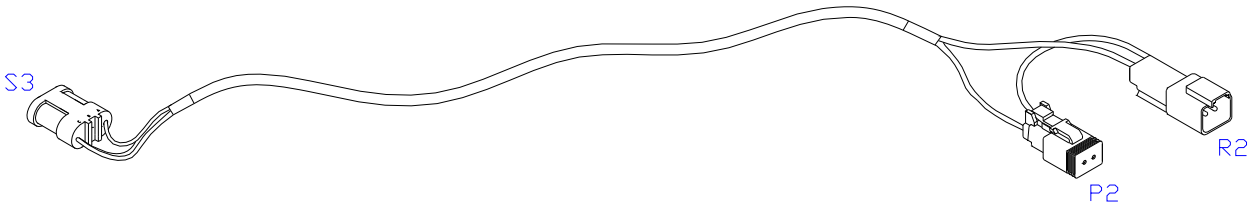


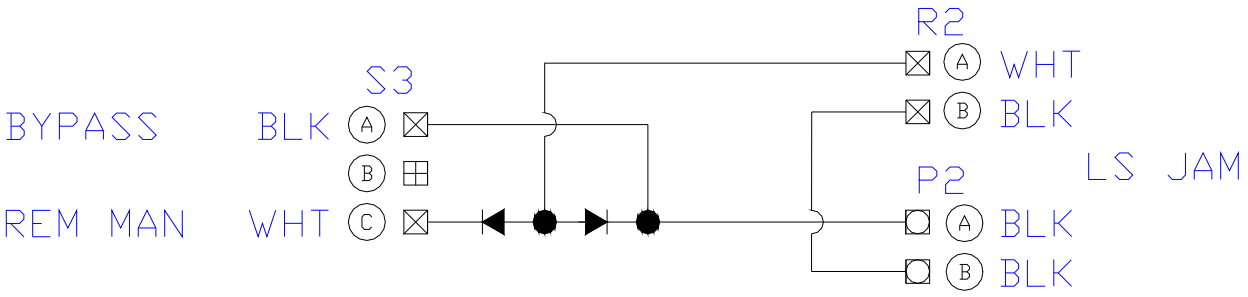
10.4 ITEM C11: 44651-50 – CABLE UC4.5 EXTENSION VALVE GENERIC



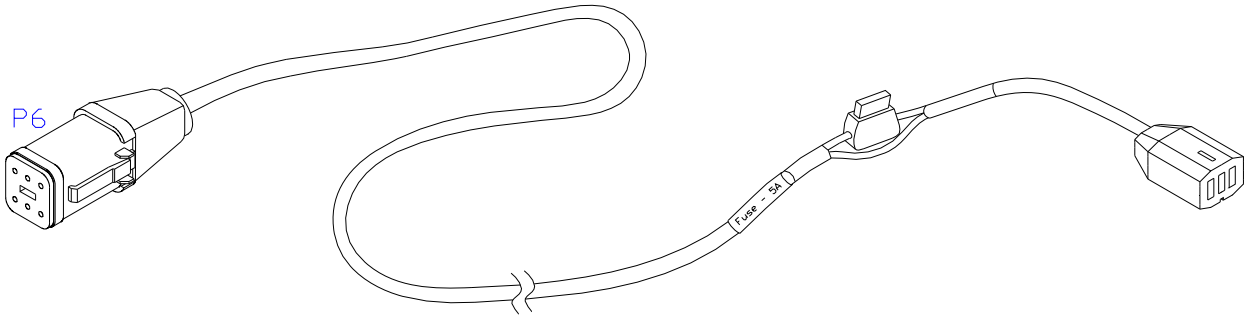


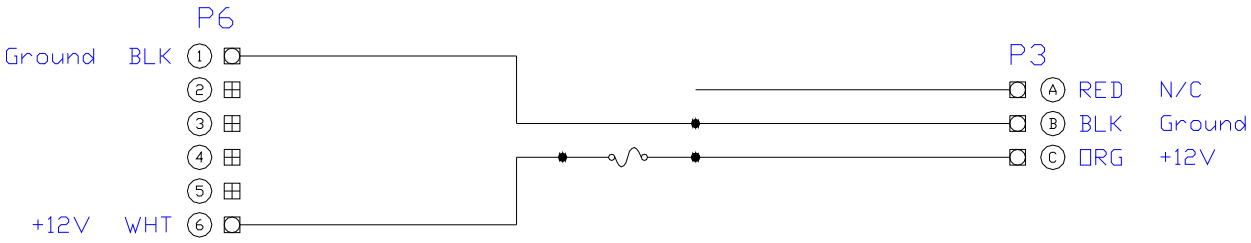
10.5 ITEM C13: 44658-54 – CABLE UC4 INTERFACE MAN/BYPASS





10.6 ITEM C30: 43250-07 – CABLE UC5 BATTERY JD FUSED - 5A





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