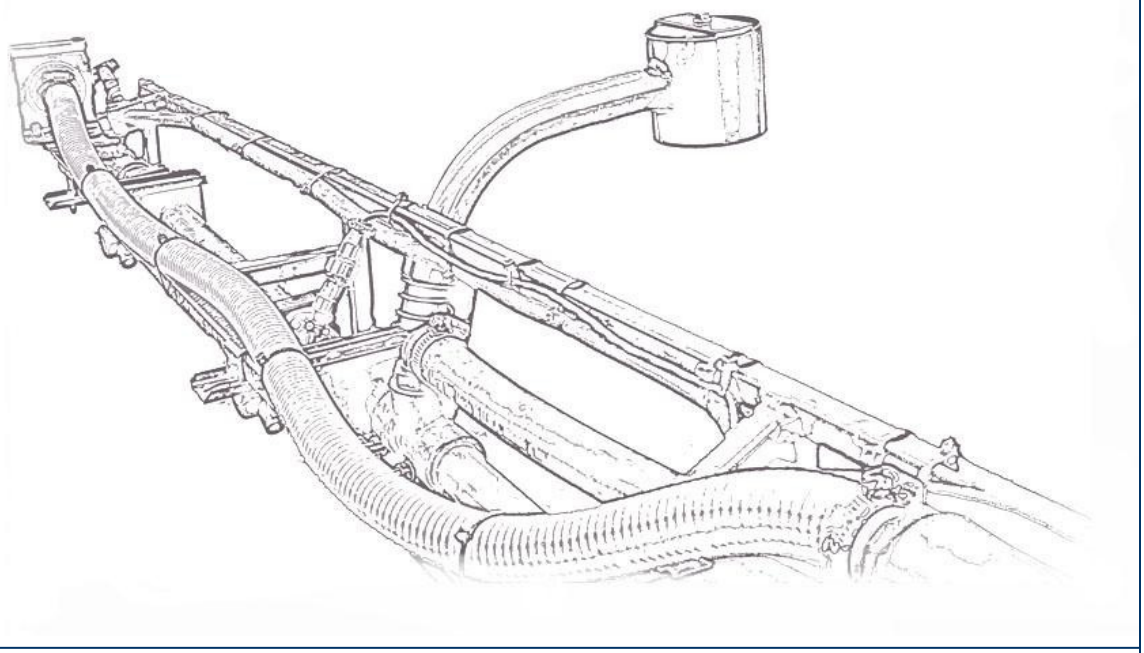
NORAC

TOPCON POSITIONING GROUP

UC5™ CAN BUS Spray Height Control System



John Deere Active Roll (4720, 4710, 4700) Installation Manual

JD07A

Printed in Canada
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Reorder P/N: UC5-BC-JD07A-INST Rev U (JD Active Roll 4720, 4710, 4700)

NOTICE: NORAC Systems International Inc. reserves the right to improve products and their specifications without notice and without the requirement to update products sold previously. Every effort has been made to ensure the accuracy of the information contained in this manual. The technical information in this manual was reviewed at the time of approval for publication.

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1 Introduction

Congratulations on your purchase of the NORAC UC5 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 Technical Specifications

CAN ICES-3(A)/NMB-3(A)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

This Class A digital apparatus complies with Canadian ICES-003.

Pursuant to EMC Directive – Article 9, this product is not intended for residential use.

Table 1: System Specifications

Supply Voltage (rated)	12VDC
Supply Current (rated)	10A
Hydraulic Pressure (maximum)	3300 psi
Baud Rate	250 kbps
Clock Frequency (maximum)	96 MHz
Solenoid Valve PWM Frequency	300 Hz
Ultrasonic Sensor Transmit Frequency	50 kHz
Operating Temperature Range	0°C to 80°C

3 General UC5 System Layout

Figure 1 illustrates the general layout of the UC5 system components:

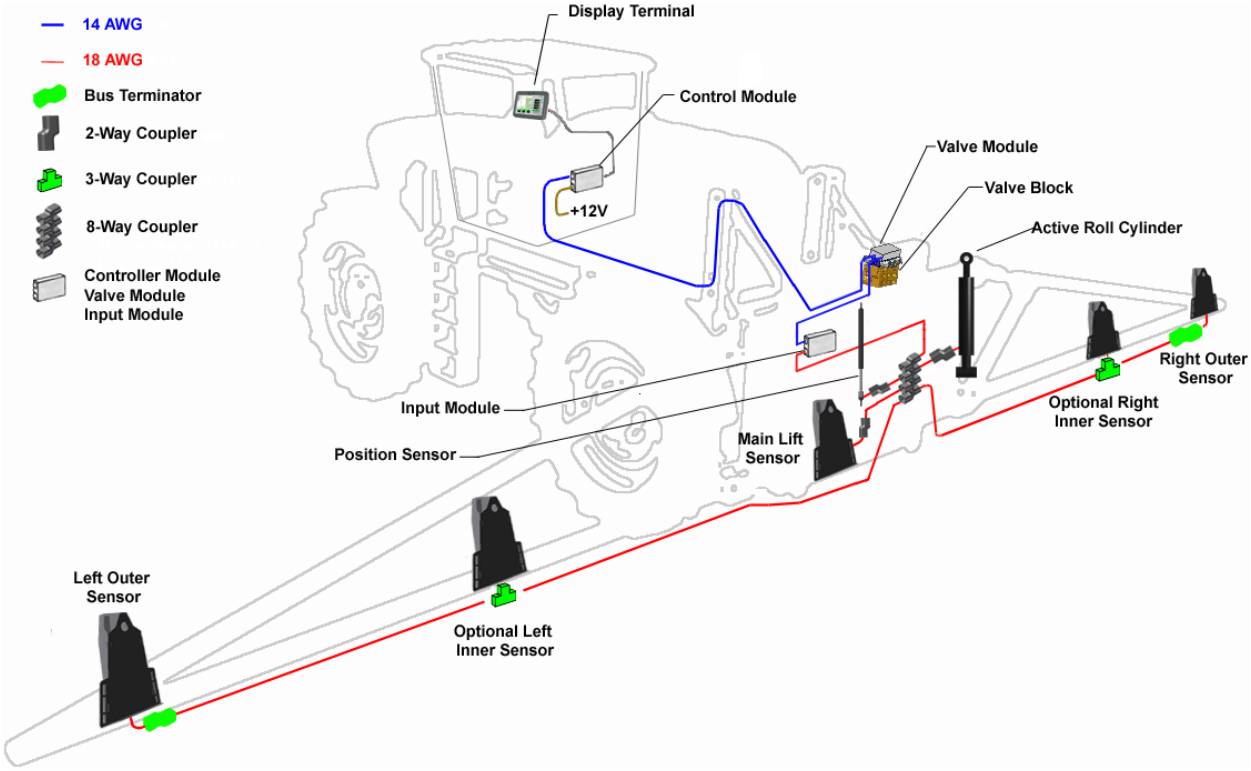


Figure 1: General UC5 System Layout

4 Kit Parts

4.1 Kit Overview

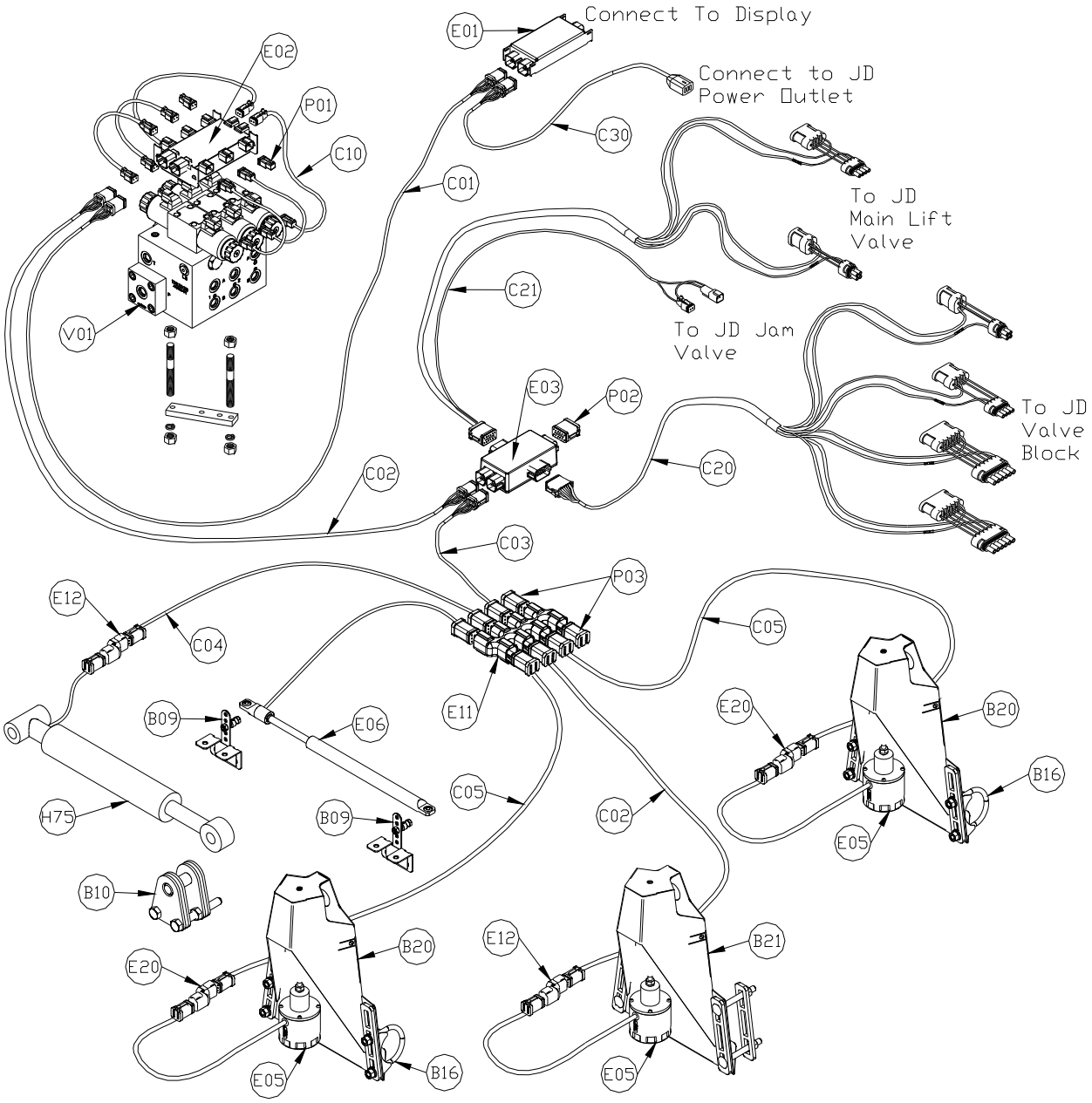


Figure 2: JD07A System Parts

4.2 Hydraulic Plumbing

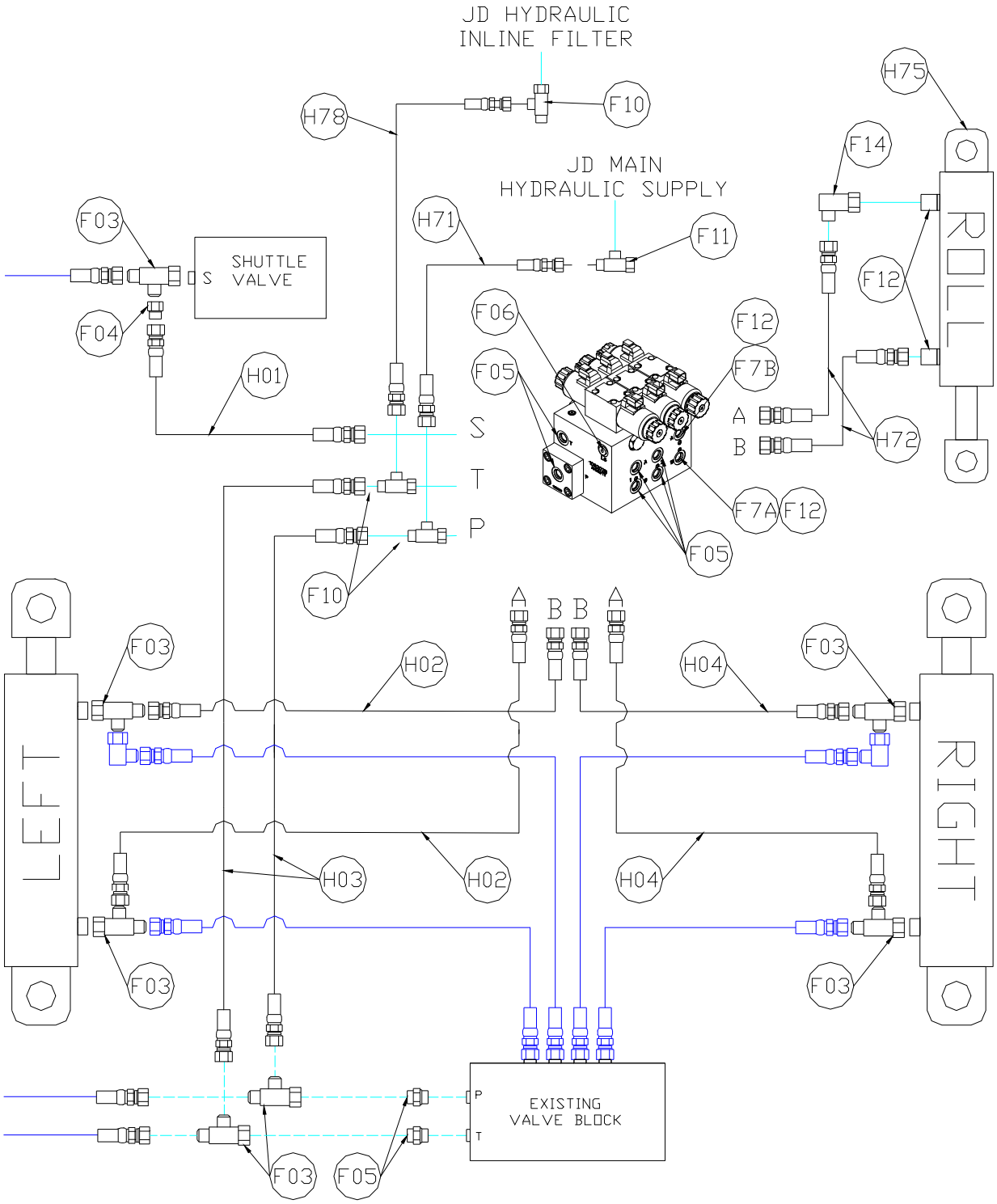


Figure 3: JD07A Hydraulic Plumbing

4.3 List of Parts

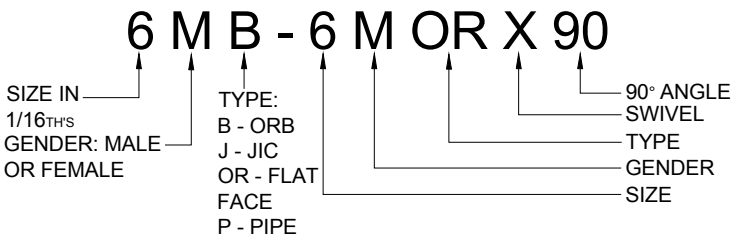
Item	Part Number	Name	Quantity
B05	44706-01	KIT CABLE TIE BLACK 10 PCS 21 IN 150 PCS 7.5 IN	1
B09	45032-1	BRACKET UC5 POSITION SENSOR MOUNT V1	2
B10	44695-21	PIN ACTIVE ROLL JD UPPER MOUNTING KIT	1
B16	105416	CLAMP ROUND 1-1/4 IN SS	4
B20	44971	SENSOR MOUNTING BRACKET LOW PROFILE 16GA	2
B21	44973	SENSOR MOUNTING BRACKET LOW PROFILE 16 GA LARGE FLANGE	1
C01	43220-10	CABLE UC5 NETWORK 14 AWG 10M	1
C02	43220-01	CABLE UC5 NETWORK 14 AWG 1M	2
C03	43220-03	CABLE UC5 NETWORK 14 AWG 3M	1
C04	43220-0.5	CABLE UC5 NETWORK 14 AWG 0.5M	1
C05	43210-20	CABLE UC5 NETWORK 18 AWG 20M	2
C10	43230-04	CABLE UC5 VALVE 2PIN DT TO 2PIN DT	6
C20	43240-06	CABLE UC5 INTERFACE TILT JD	1
C21	43240-05	CABLE UC5 INTERFACE MAIN JD	1
C30	43250-07	CABLE UC5 BATTERY JD FUSED	1
E01	43710	UC5 CONTROLLER MODULE	1
E02	43720	UC5 VALVE MODULE	1
E03	43732	UC5 INPUT MODULE PASS THRU	1
E05	43750	UC5 ULTRASONIC SENSOR	3
E06	45030	UC5 POSITION SENSOR NF W/O HARDWARE	1
E11	43765	UC5 NETWORK COUPLER 8-WAY	1
E12	43764	UC5 NETWORK COUPLER 2-WAY	2
E20	43764T	UC5 NETWORK COUPLER 2-WAY WITH TERMINATOR	2
H01	44862-05	HOSE ASSEMBLY 122R2-04 144 IN L 4FORX 4FORX	1
H02	44863-53	HOSE ASSEMBLY 122R2-06 66 IN L 6FORX 6FORX	2
H03	44863-23	HOSE ASSEMBLY 122R2-06 32IN L 6FORX 6FORX	2
H04	44863-31	HOSE ASSEMBLY 122R2-06 104 IN L 6FORX 6FORX	2
H10	44865-36	HYDRAULICS FITTING KIT - JD8	1
H70	44865-38	HYDRAULICS FITTING KIT - ACTIVE ROLL	1
H71	44864-04	HOSE ASSEMBLY 122R2-08 168 IN L 6FORX 12FORX	1
H72	44862-11	HOSE ASSEMBLY 122R2-04 60 IN L 4FORX 4FORX	2
H75	44695-22	HYD CYLINDER AR 1.75IN W/INTERNAL SENSOR	1

Item	Part Number	Name	Quantity
H78	44864-03	HOSE ASSEMBLY 122R2-08 166 IN L 6FORX 6FORX	1
M02	UC5-BC-JD07A-INST	MANUAL INSTALLATION UC5 JD ACTIVE ROLL (4720, 4710, 4700)	1
M10	106548	DRILL BIT 3/8" HSS STD JOBBER	1
P01	106034	UC5 NETWORK 2 PIN PLUG	2
P02	106602	UC5 NETWORK 12 PIN PLUG (A-KEY)	1
P03	105882	UC5 NETWORK 6 PIN PLUG	2
V01	44960D	VALVE BLOCK ASSEM 3 STATION CC/LS PROP DT 4 BOLT	1

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

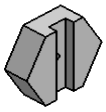
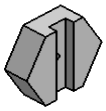
Item	Part Number	Name	Quantity	Picture
F02	104691	TEE ADAPTER - 4FORXR 4MORT	1	
F03	104586	TEE ADAPTER - 6FORXR 6MORT	7	
F04	105226	MALE TO FEMALE ADAPTER - 4MOR 6FORX	1	
F05	44917	MALE ADAPTER - 6MB-6MOR MACHINED ORB	8	
F06	104693	MALE ADAPTER - 4MOR 4MB	1	
F15	105500	SETSCREW 1/4X3/8	1	

Fitting Name Example:



*** Not all fittings are used in this installation.**

4.5 Active Roll Hydraulic Fittings Kit Details (P/N: 44865-38)

Item	Part Number	Name	Quantity	Picture
F10	104586	TEE ADAPTER - 6FORXR 6MORT	3	
F11	105338	TEE ADAPTER - 12FORXOR 12MORT	1	
F12	44916	MALE ADAPTER - 6MB-4MOR MACHINED ORB	4	
F14	104694	MALE ADAPTER 4MOR 4FORX90	1	
F07A	44928	ORIFICE INSERT .047 IN ONE WAY	1	
F07B	44935	ORIFICE INSERT .042 IN ONE WAY	1	

These fittings are only used when installing the active roll option.

⚠ Important

Do not use high speed power tools/drills when installing hardware.

⚠ 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.

5 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.

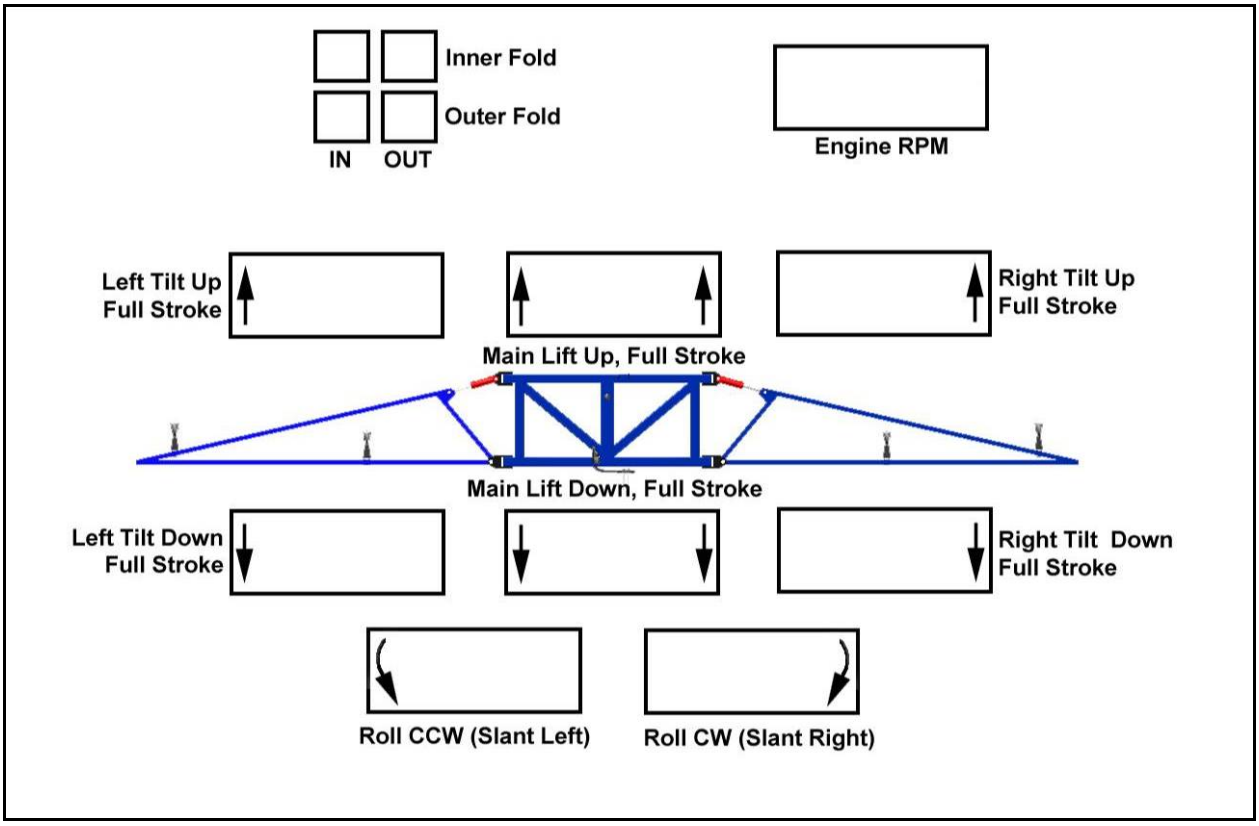


Figure 4: Pre-Install Boom Speeds

6 Ultrasonic Sensor Installation

6.1 Ultrasonic Sensor Serial Number Arrangement

When installing the UC5 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 UC5 sensor has a serial number stamped on the sensor housing.

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

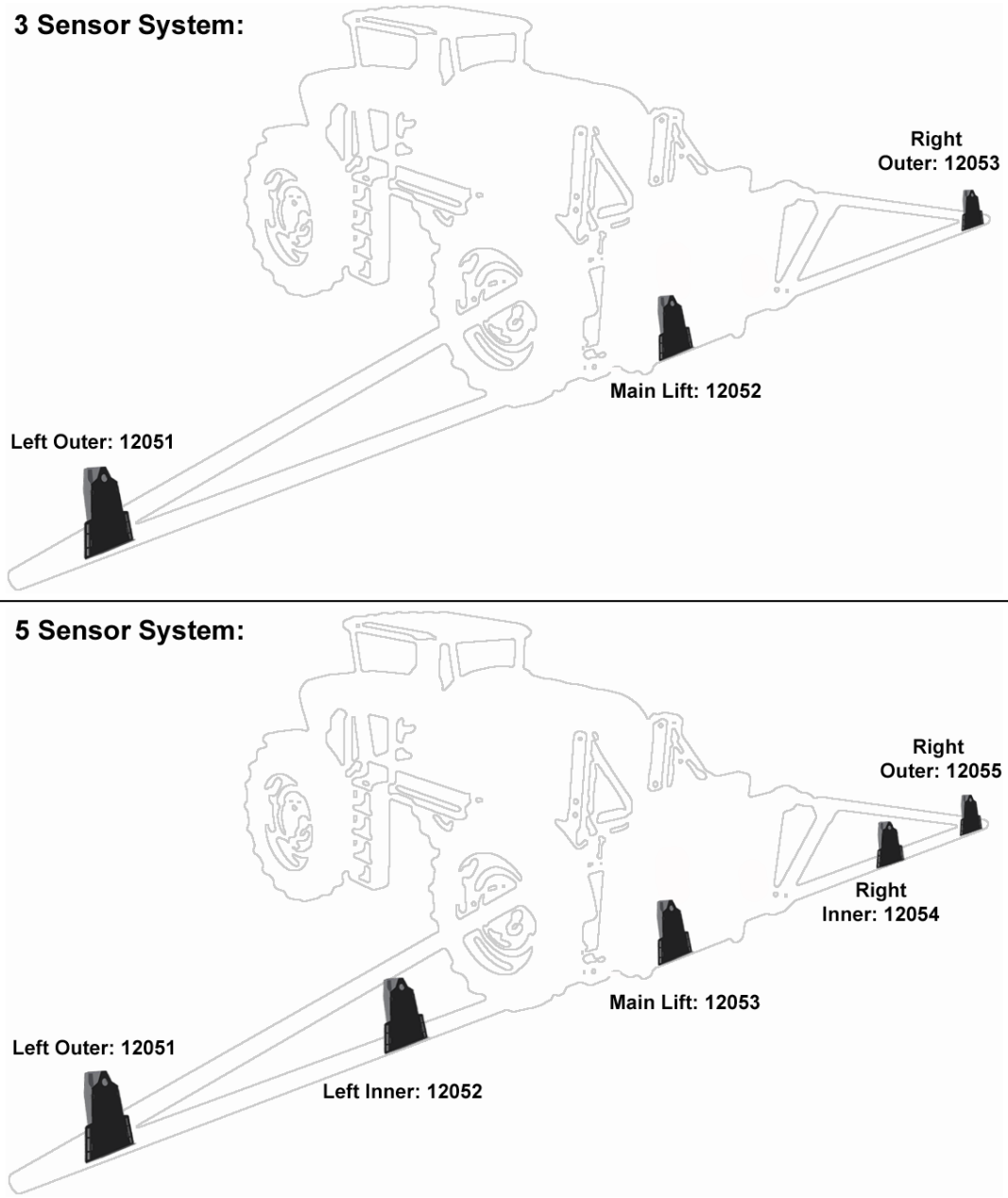


Figure 5: Sensor Serial Number Arrangement

6.2 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.

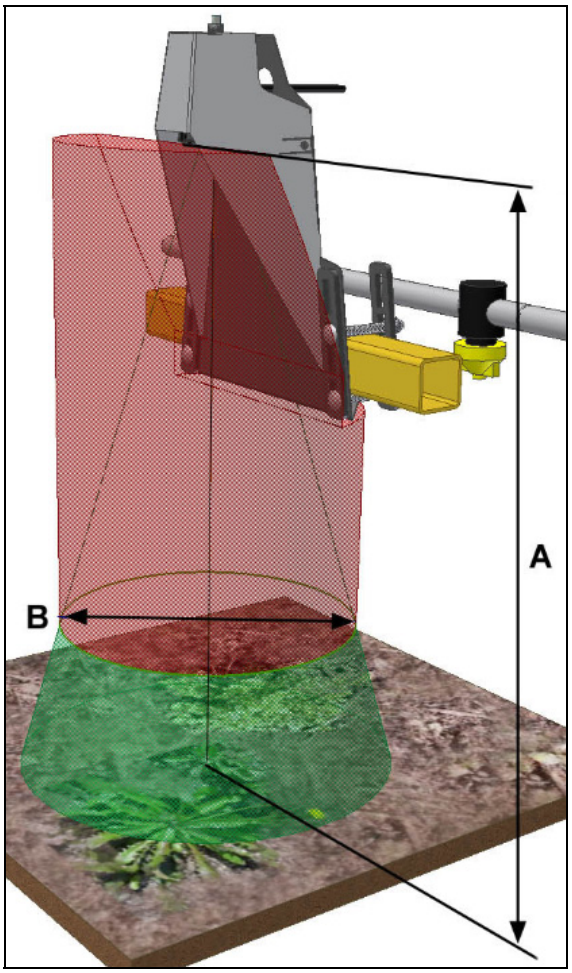


Figure 6: Sensor Mounting Guidelines

6.3 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.

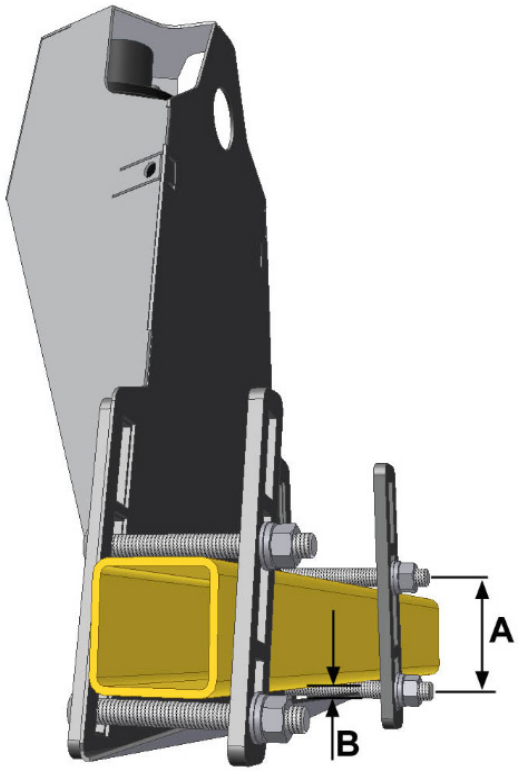


Figure 7: Bracket Mounting Guidelines

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.

6.4 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 UC5 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.

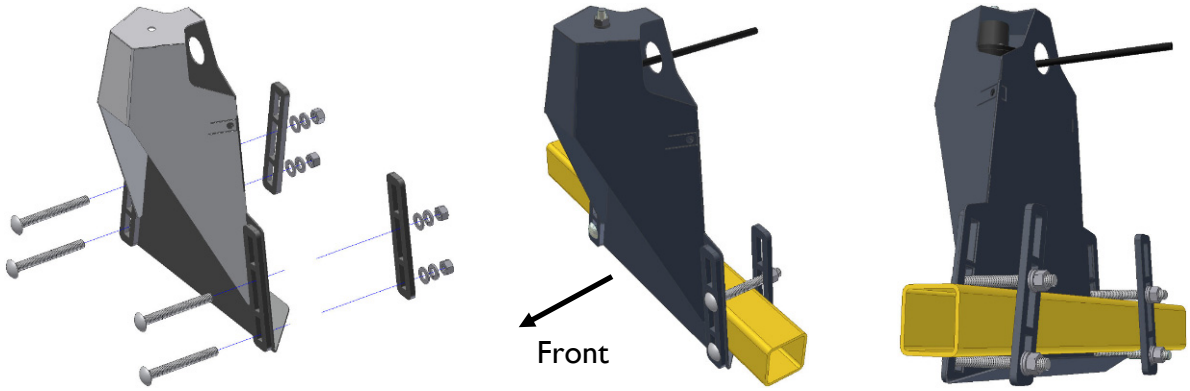


Figure 8: Bracket Mounting Example

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

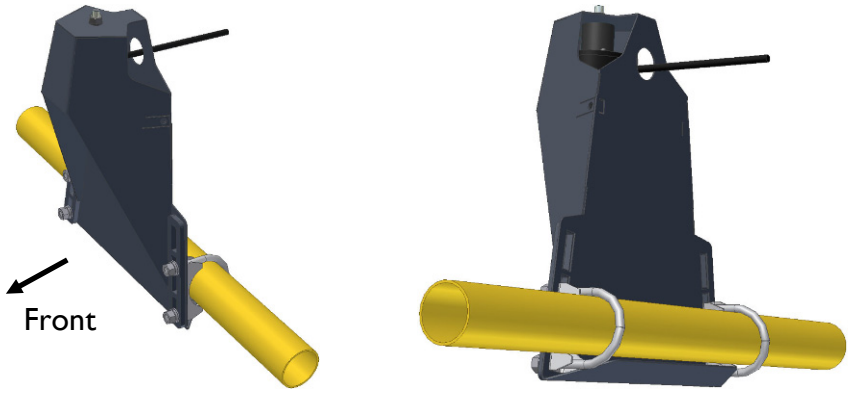


Figure 9: Bracket Mounted with Exhaust Clamps

6.5 Main Lift Sensor Installation

1. The main lift mounting bracket (B21) is the bracket with the longer mounting flange.

2. There are a variety of ways to mount the main lift bracket on most sprayers. The bracket should position the sensor approximately in the center of the sprayer, forward of the boom. An example of this mounting is illustrated in **Figure 11**.

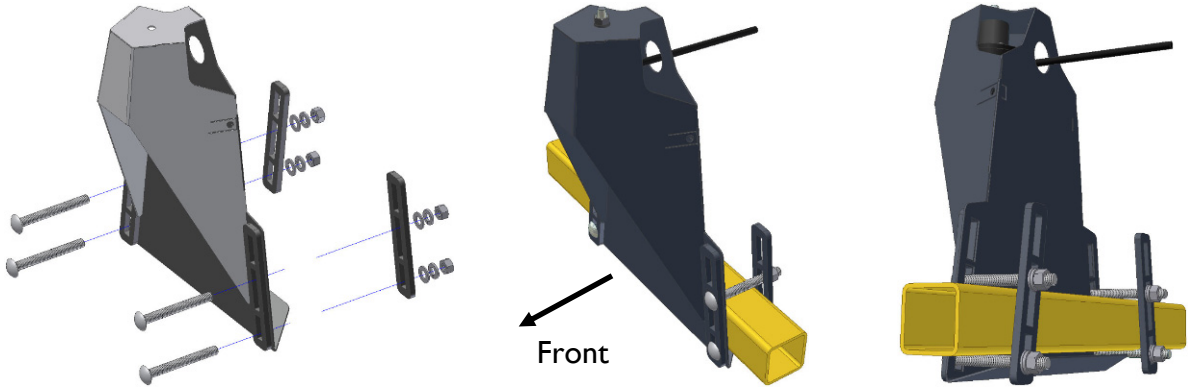


Figure 10: Bracket Mounting Example

3. Mount the ultrasonic sensor to the main lift bracket. Run the sensor cable through hole and behind the bracket.

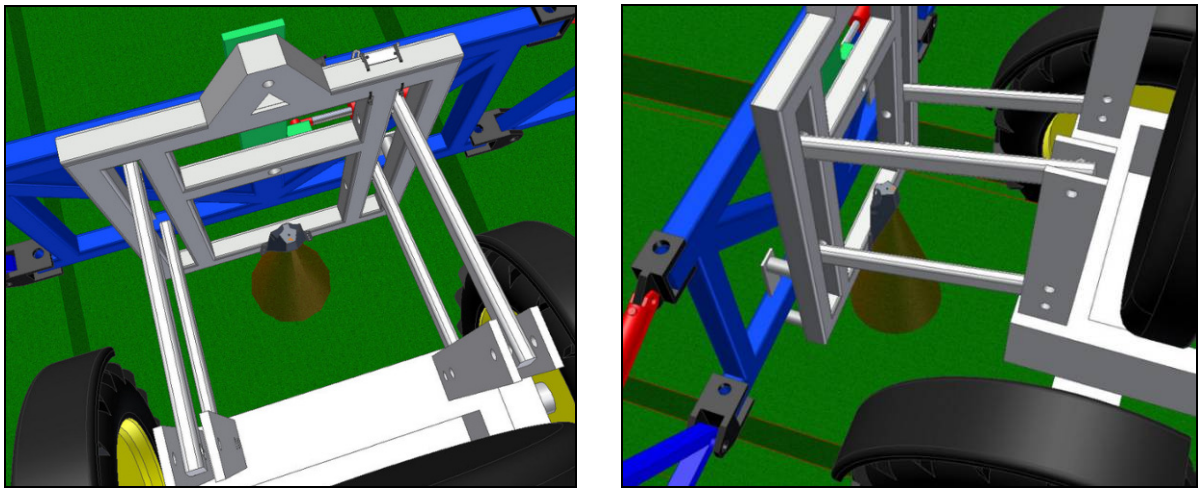


Figure 11: Example Mounting of the Main Lift Bracket

⚠ Important

Avoid mounting the main lift sensor over or near a wheel-track. Measurements from the wheel-track do not provide an accurate crop height and will cause measurement and control error.

Ensure the bracket does not collide with any other part of the sprayer throughout the full range of main lift motion.

7 Position Sensor Installation

1. Remove the rubber bumpers on both ends of the roll frame (**Figure 12**).

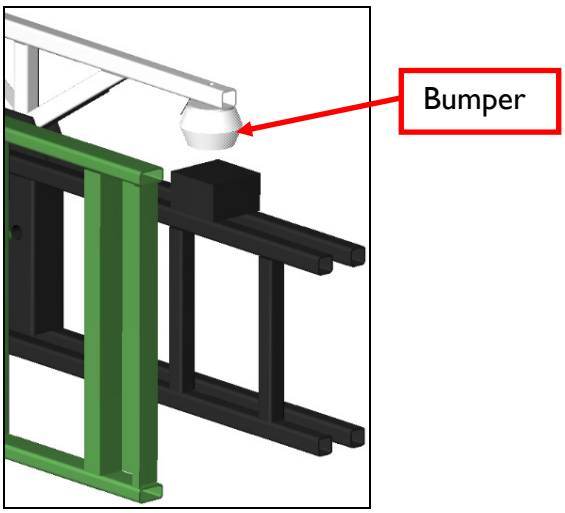


Figure 12: Rubber Bumper Location

2. The position sensor (E06) should be mounted such that the largest amount of travel of the sensor can be utilized without exceeding the travel limit. The sensor install length is 17" (430mm) center to center with ±3.5" (±90mm) travel recommended. It should be mounted in a location where the sensor will mount without binding or contacting and that is perpendicular to the direction of travel. Roll the boom fully in each direction and take measurements to ensure the travel limit is not exceeded.

3. Measure 12-3/4" (325mm) from the centerline of the intermediate frame and boom center frame towards the left side of the sprayer (when looking from the rear of the sprayer).

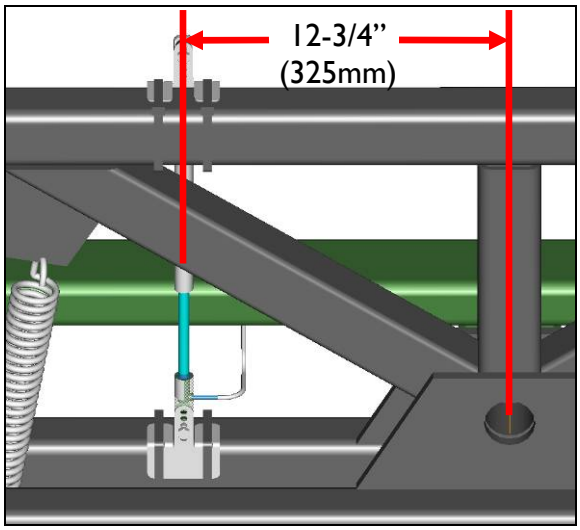


Figure 13: Measurement from Centerline of Intermediate Frame (Looking from the Rear)

4. Mount the brackets (B09) as shown in **Figure 14**. Install two (2) cable ties per bracket.

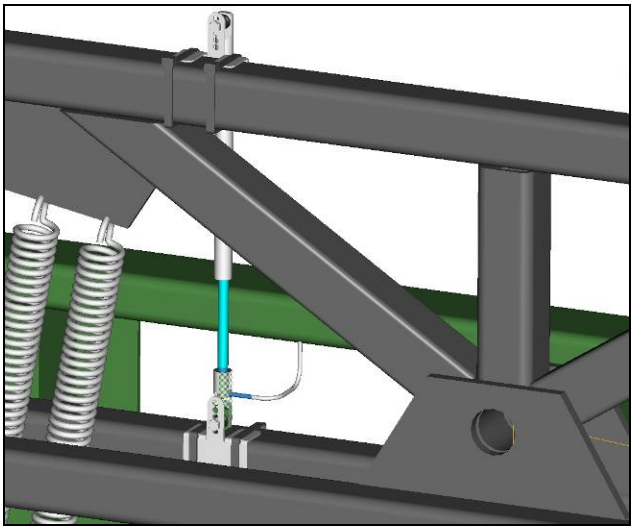


Figure 14: Bracket Mounting (Looking from the Rear)

5. Install the base end of the position sensor with the cable facing the center of the sprayer in the lowest hole of the bracket possible without making contact with the boom frame. Use the mounting hardware as shown in **Figure 15**.

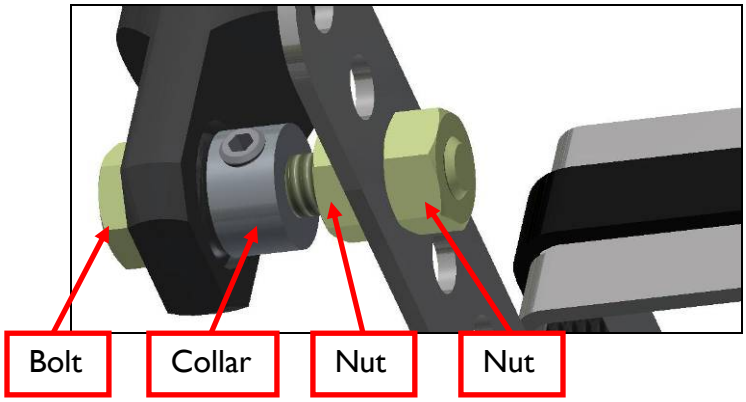


Figure 15: Mounting Hardware

6. Install the linear sensor mounting bolt in the hole of the upper bracket that closest aligns the end of the sleeve with the center of travel mark (black mark) on the sensor (**Figure 16**). If the mark is missing, the distance from the end of the sleeve to the top of the base should be 4" (100mm). The collar (**Figure 15**) clamps the sensor and prevents the rubber grommet from sitting on the bolt threads. Tighten the mounting hardware.

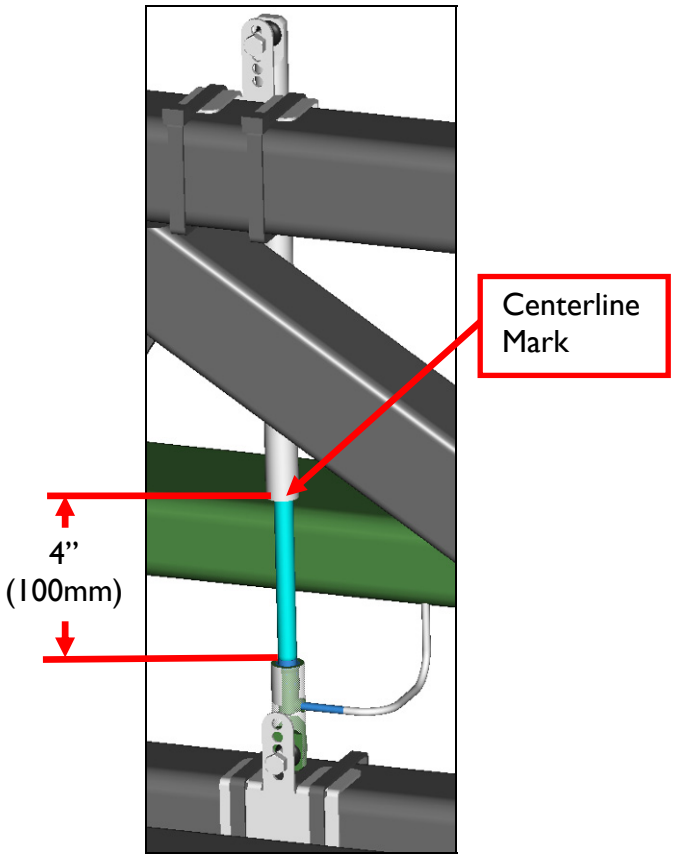


Figure 16: Center Mark Location

8 Module Installation

An optional module mounting bracket kit is available for purchase from NORAC. The mounting brackets are compatible with control modules and input modules. One kit is needed per module.

Item	Part Number	Name	Quantity
B20	43708	UC5 MOUNTING BRACKET KIT (CONTROL AND INPUT MODULES)	1

8.1 Control Module

1. Refer to **Figure 1** and **Figure 17**.

2. Securely mount the control module (E01) inside the sprayer cab using screws, cable ties or optional brackets.

3. Connect the display terminal to the control module using the display cable. This cable must be connected to the end of the control module with only one Deutsch connector.

4. Connect the power cable (C30) to one of the two CANbus connectors on the control module. Connect the other end of the power cable to the John Deere power bar inside the cab.

5. Route cable C01 from the other CANbus connector towards the rear of the sprayer.

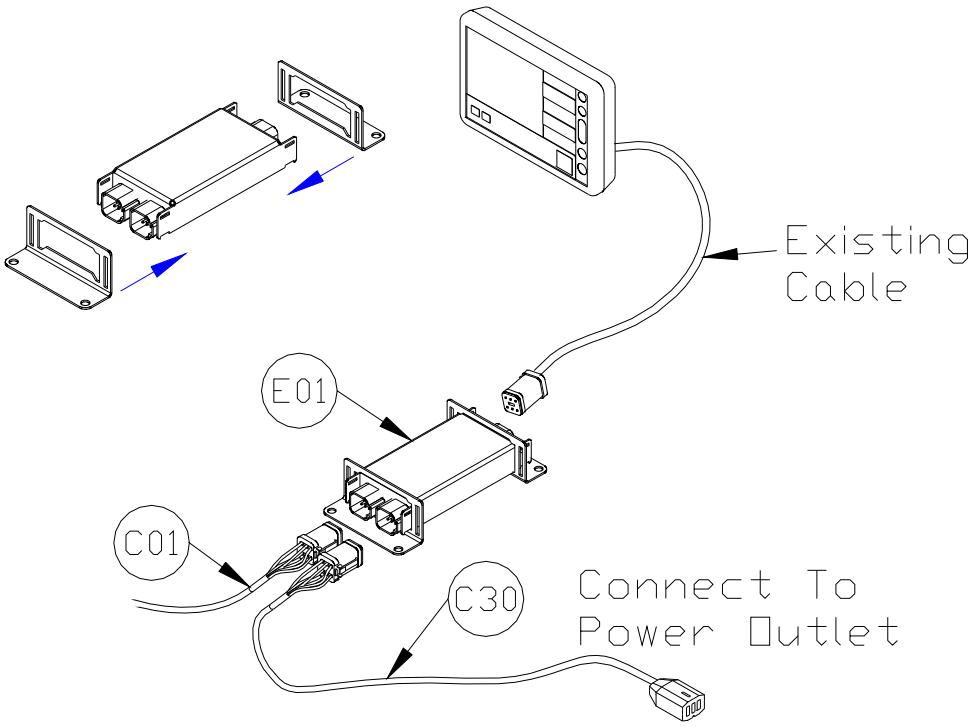
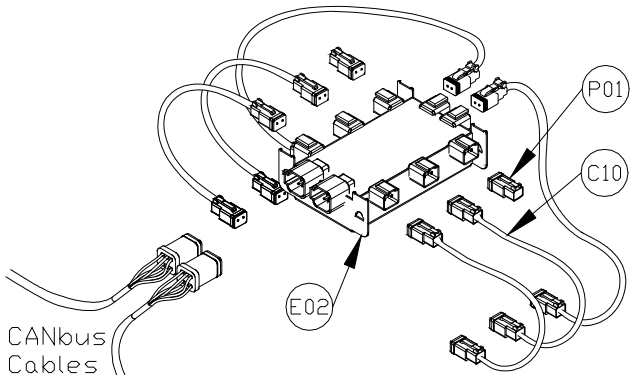


Figure 17: Control Module Mounting

8.2 Valve Module

1. Install the valve module (E02) to the top of the NORAC valve block. Orient the 6-pin Deutsch (CANbus) connectors towards the "P" and "T" ports with the label facing up.



Output Number	Normal Function
1	Left Up
2	Left Down
3	Right Up
4	Right Down
5	Option 1
6	Option 2
7	Roll CW
8	Roll CCW

Figure 18: Valve Module

2. Verify the valve coil connectors are oriented vertically (**Figure 19**).

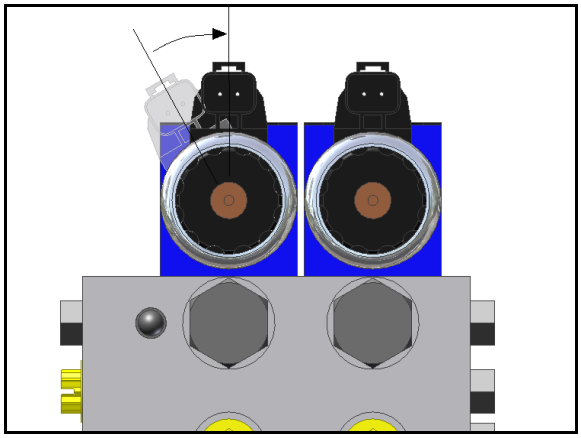


Figure 19: Align Coils

3. Place the valve module between the valve coils. Slide a valve mounting bracket over the connectors of the valve module and the valve coil connectors. This may require flexing the plastic bracket slightly (**Figure 20**).

4. Ensure the bracket is pushed over the connectors far enough to allow the clips to engage behind the valve connectors.

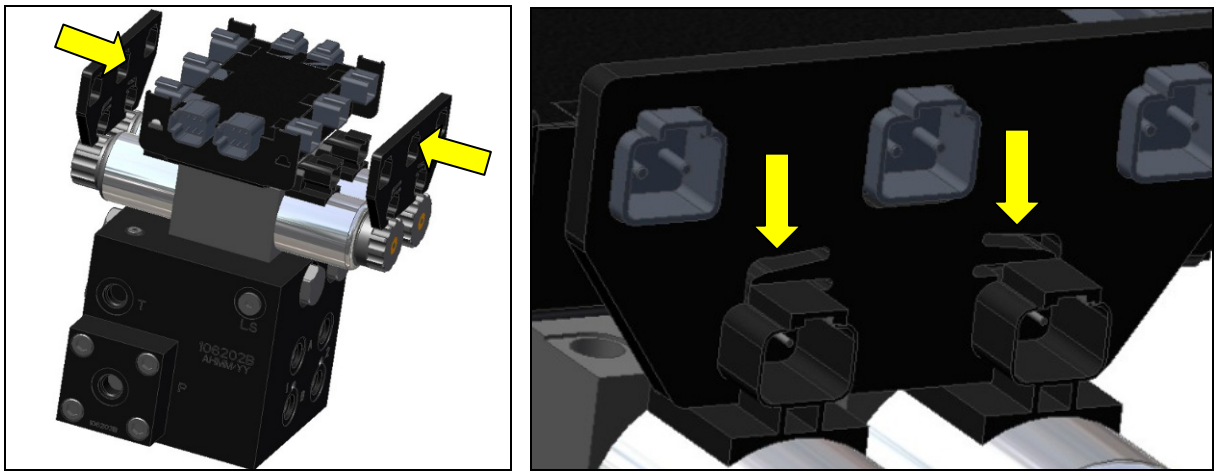


Figure 20: Valve Module Bracket Installation

5. Connect the valve module CANbus to cable C01 from the control module. Route cable C02 from the other CANbus connector to the input module.

6. With the valve module securely mounted to the valve block, connect the valve cables (C10), to the valve coils. Insert the 2-pin plugs (P01) into the unused 2-pin connectors on the valve module.

7. Connect the temperature probe to the valve block using the supplied 3/8" x 1/2" hex bolt.

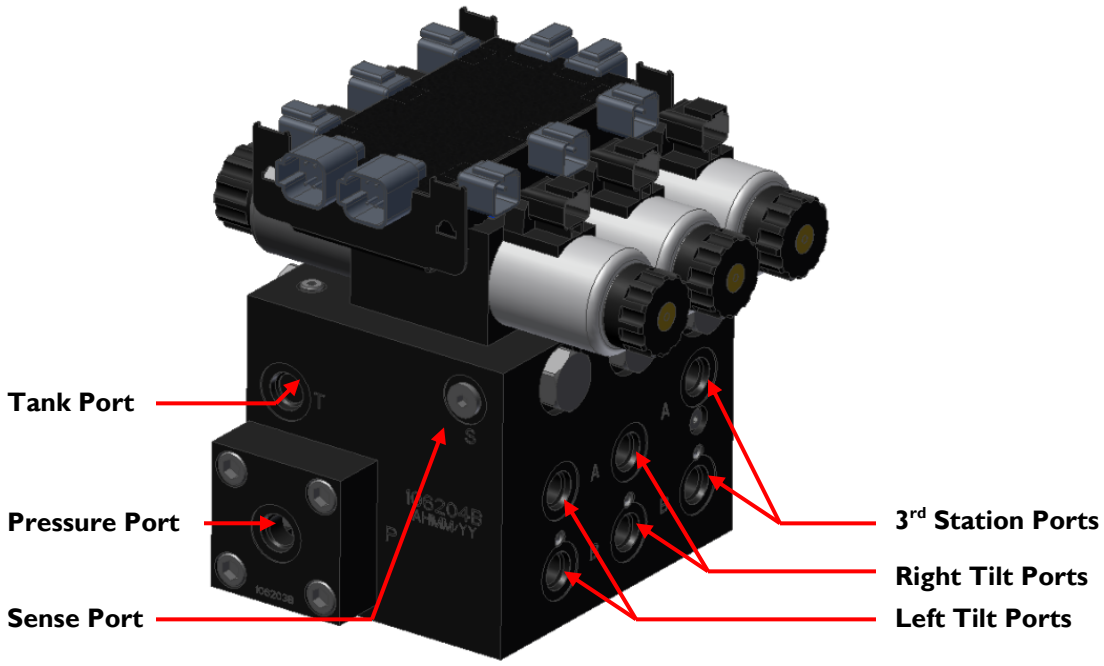


Figure 21: Valve Module - Valve Coil Connections

8.3 Input Module

1. Install the input module (E03) on the boom near the sprayer valve block. Secure it to the boom using cable ties or optional brackets.

2. Connect the free end of the CANbus cable (C02) from the valve module to the input module. Connect cable C03 to the other CANbus connector and route to the 8-way coupler.

3. Insert the 12 pin plug (P02) into the *OEM 3* connector on the end of the input module

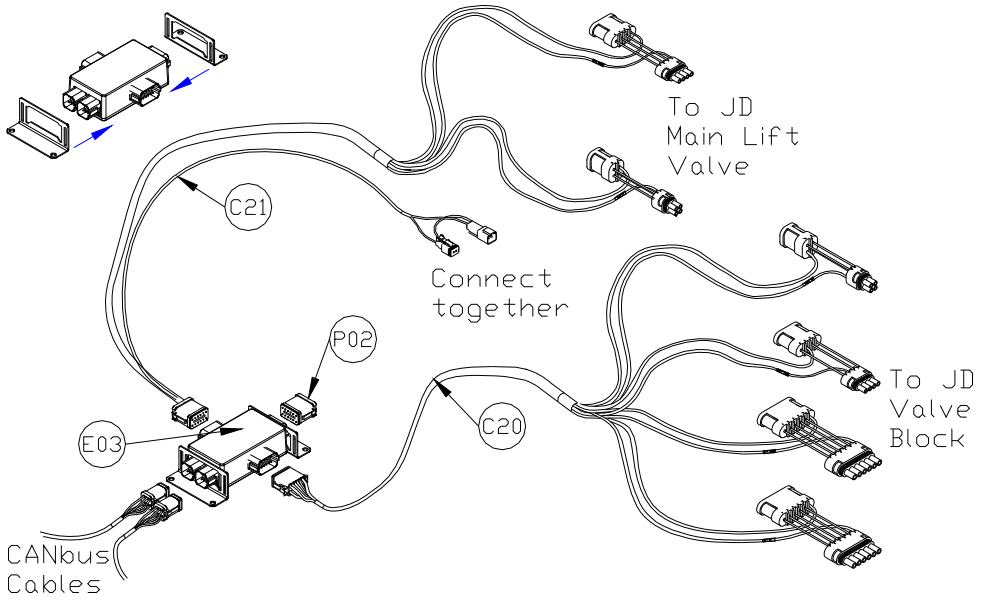


Figure 22: Input Module Connections

4. Connect the 12 pin connector on the tilt interface cable (C20) to the *Thru 2* connector on the side of the input module. Insert the other connectors on C20 into the tilt connectors on the John Deere solenoids.

5. Connect the 12 pin connector on the main lift interface cable (C21) to the *Thru 1* connector on the side of the input module. Insert the other connectors on C21 into the main lift connectors on the John Deere solenoids.

6. Connect the two Deutsch connectors on the long cable on C21 together. Coil the cable up and tie it where it will not interfere or catch on anything. These connectors are not used.

⚠ Important

There is one set of different connectors included with the tilt interface cable. Some John Deere sprayers use this connector on the left down function. If the sprayer has this connector, remove the existing connectors using the included pin removal tool. Insert the wires into the new connector and ensure they are in the same position as they were in the previous connector.

9 Connecting the Sensors to the CANbus

1. Fasten the 8-way coupler to the boom with cable ties. Connect cable C03 from the input module to the 8-way coupler (E11).

2. Connect the main lift sensor to the 8-way coupler using cable C02 and a 2-way coupler (E12). Cable C02 and item E12 may not be needed if the 8-way coupler is mounted close enough to the main lift sensor.

3. Connect the position sensor (E06) to the 8-way coupler.

4. Connect the active roll cylinder (H75) to the 8-way coupler using cable C04 and a 2-way coupler (E12).

5. 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.

6. 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.

7. Insert the 6 pin plugs (P03) into the remaining receptacles of the 8-way coupler.

Important

Ensure that all unused connectors are plugged with the plugs provided.

10 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 UC5 system warranty. It is recommended that a qualified technician perform the hydraulic installation.

10.1 Valve Assembly

1. On a clean surface remove the plastic plugs from the block.
2. Install the 6MB-6MOR (F05) fittings into the "P" and "T" ports. Tighten to 18 ft-lbs (24 Nm).
3. Remove the 4MBP plug from the "S" port and install the 4MB-4MOR (F06) fitting into the port. Tighten to 11 ft-lbs (15 Nm).
4. Install the 6MB-6MOR (F05) fittings into the "A" and "B" ports of the first two valve stations. Tighten to 18 ft-lbs (24 Nm).
5. Install the .047 orifice (F07A) into the "B" port of the 3rd station of the block with the notch facing in. Install the 6MB-4MOR (F12) fitting into the "B" port. Tighten to 18 ft-lbs (24 Nm).
6. Install the .042 orifice (F07B) into the "A" port of the 3rd station of the block with the notch facing in. Install the 6MB-4MOR (F12) fitting into the "A" port. Tighten to 18 ft-lbs (24 Nm).

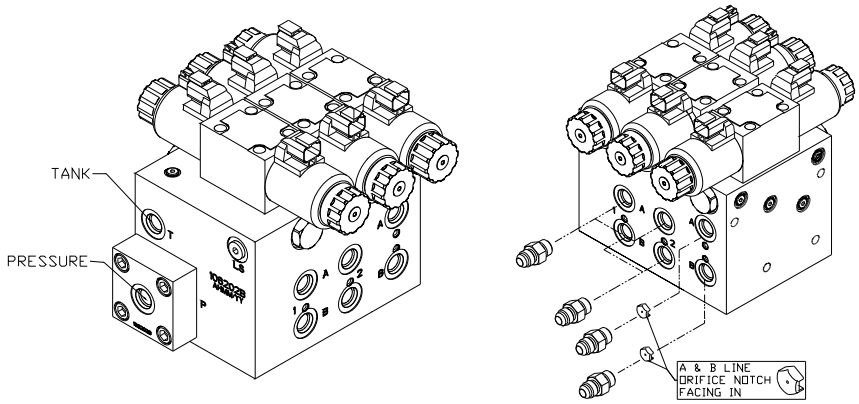


Figure 23: NORAC Valve Block Details

7. 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. To access bleed orifice, remove the valve coil that is covering it, by unscrewing the nut on the coil.

8. Remove the Sense Line Bleed Orifice and discard.

9. Install the setscrew (**F11**) 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.

10. Reinstall the plug and tighten to 3 ft-lbs (4Nm).

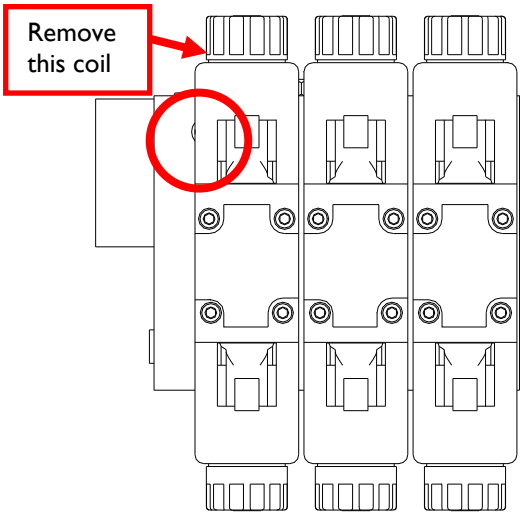


Figure 24: Load Sense Bleed Orifice Location on Top of Block

10.2 Valve Block Mounting

1. A good mounting location for the valve block on the John Deere 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.

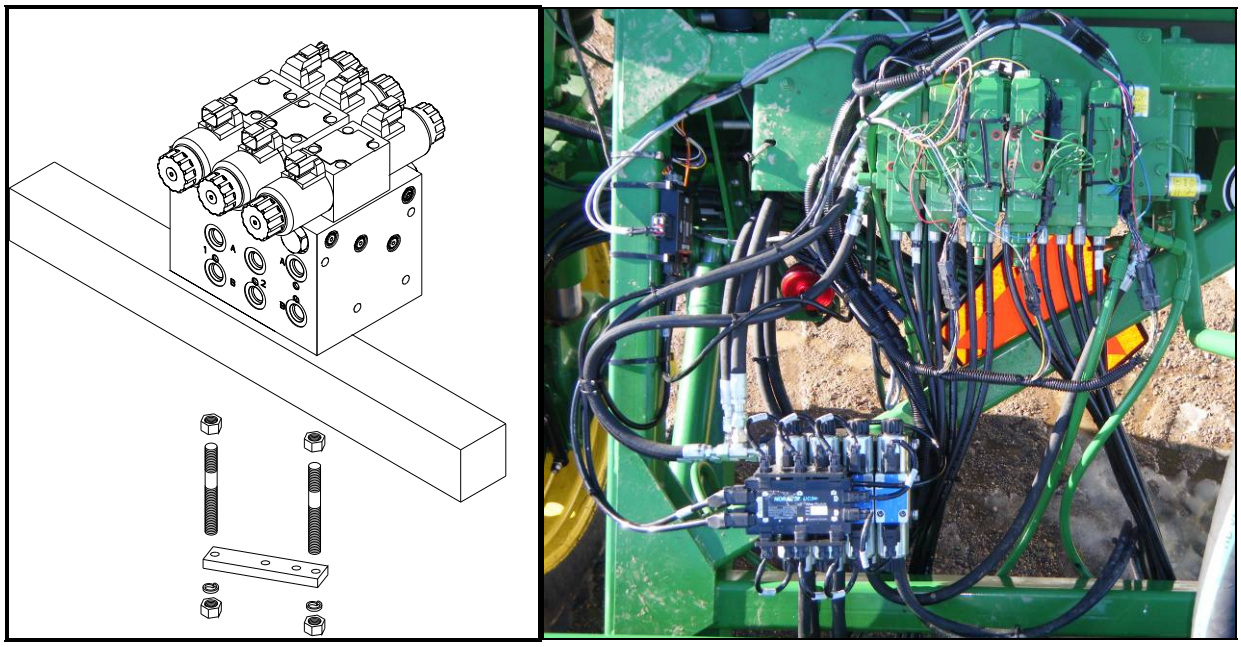


Figure 25: Valve Block Mounting

10.3 Roll Cylinder Installation

1. Remove the link arm (black square tube) connected between the parallel lift frame and roll frame. See **Figure 26** for the link arm location.

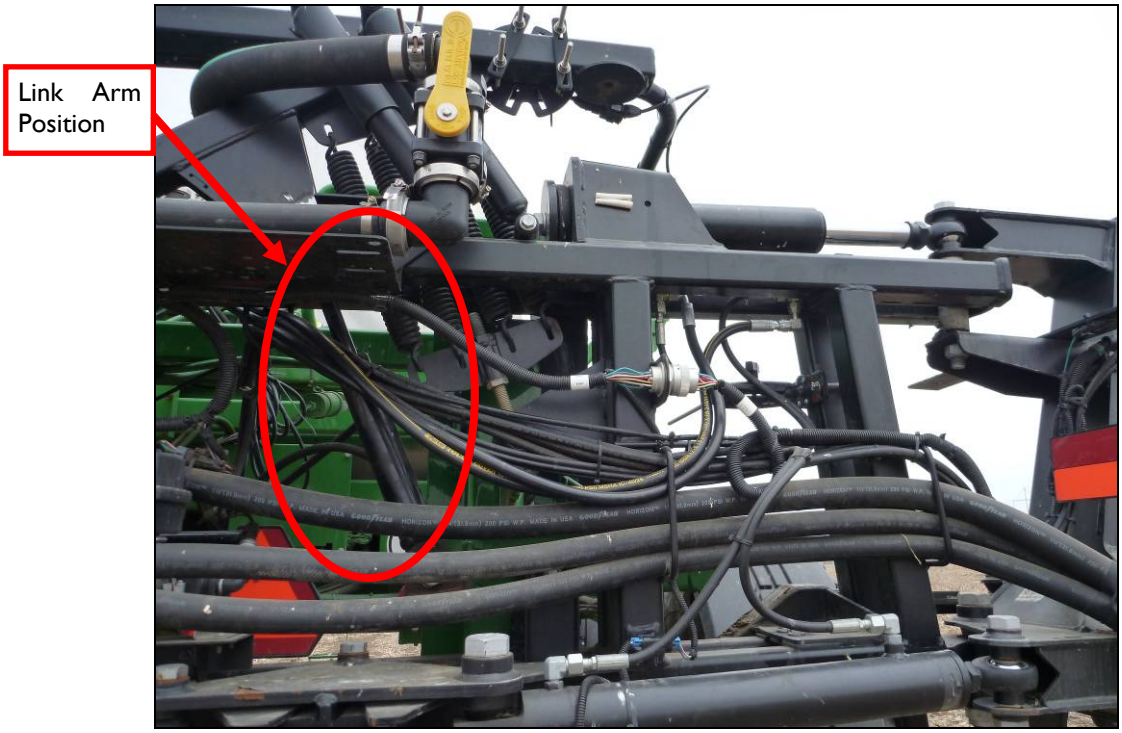


Figure 26: John Deere Link Arm Location (looking towards rear of sprayer)

2. Remove the lower link bolt and nut.

3. Roll the intermediate frame (where the link is still attached) counterclockwise until the upper link pin can be accessed. It may be helpful to use a jack or strap between the boom frame and the intermediate frame. Remove the snap-ring from the link pin. Remove the pin and link.

4. Install the cylinder (H75) into the lower mount so that the cylinder ports face the front of the sprayer. Ensure the pivot sleeve is installed into the cylinder. Install the bolt through the cylinder and sleeve and torque to 250 ft-lbs (339 Nm).

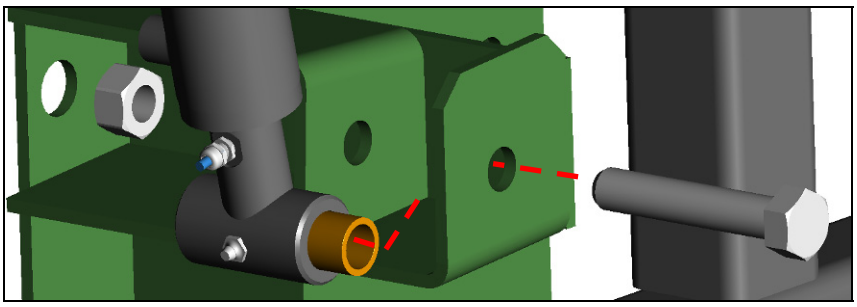


Figure 27: Lower Bolt Installation

5. Loosen the plastic port plugs and extend the cylinder to line up the hole in the intermediate frame and the cylinder.

6. Install B10 from the rear of the sprayer through the intermediate frame and the cylinder adding a mounting plate between both sides of the cylinder and the frame. Add the final plate to the front side of the intermediate frame.

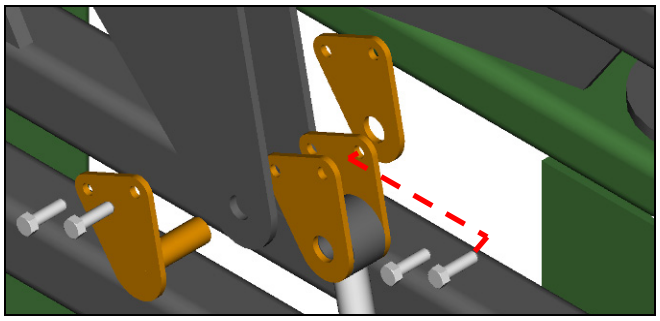


Figure 28: Upper Pin Installation

7. Using the 3/8" drill bit (M10), center the rear plate and pin on the intermediate frame. Drill through the frame plate from the rear. Clamp the plate in place if desired.

8. After drilling through the first flange of the intermediate frame, align the mounting plates and slide the drill through all 3 plates to guide and drill through the second flange.

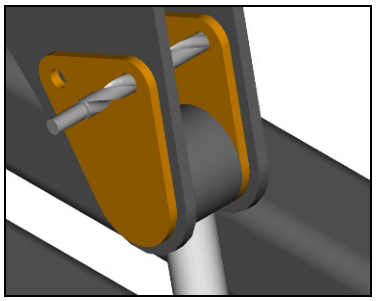


Figure 29: Drilling the Flanges

9. Deburr the holes. Install the mounting bolts into the holes and snug. Drill the second set of holes and install the mounting bolts. Torque the bolts to 20 ft-lbs (27 Nm).

Figure 30: Upper Pin Installed

10. In some cases, the bracket has failed at the weld shown in **Figure 31**. It is recommended that all sprayers with roll control add weld to the existing bracket to prevent failure. Some sprayers from 2005 and newer already have gussets added at the factory.

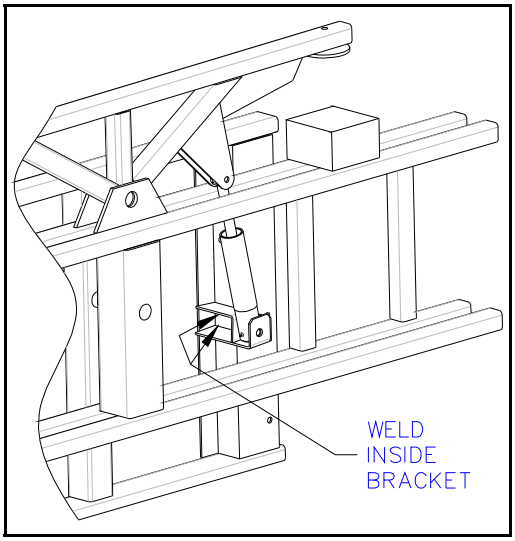


Figure 31: Roll Cylinder Mount Weld Locations

11. Install the 6MB-4MOR (F12) fittings into the cylinder.

12. Install the 4MOR-4FORX90 (F14) fitting onto the cylinder fitting at the cap end of the cylinder.

Figure 32: Roll Cylinder Installed with Hoses

10.4 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 valve is mounted, the hydraulic hoses and fittings can be plumbed. The plumbing for the hydraulic circuit is shown schematically in **Figure 3.**

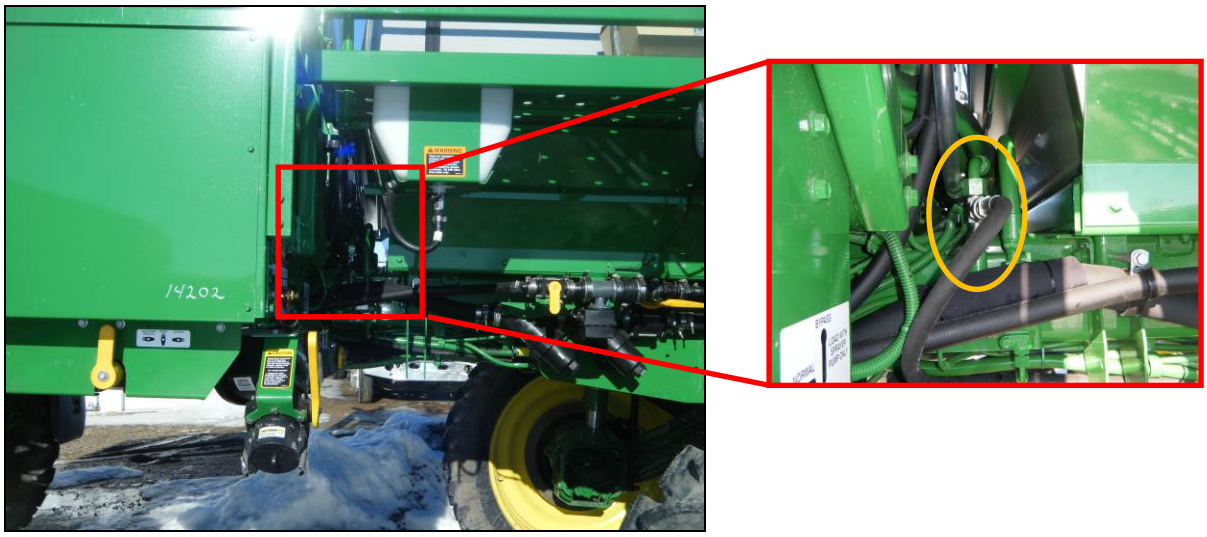
2. Attach the 6FORXR-6MORT (F10) fitting to the pressure and tank ports on the NORAC valve block (V01).

3. Connect hose H78 to fitting F10 on the tank port of the NORAC valve and H71 to fitting F10 on the pressure port.

4. Connect hoses H03 to the tees (F10) installed at the pressure and tank ports on the NORAC valve block (V01).

5. Tee hoses (H03) into the pressure and tank 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).

6. Route the secondary pressure hose (H71) to the main hydraulic supply located on the left hand side, under the rear corner of the cab. Tee the hose into the port on the priority valve labeled EF using the 12FORXR-12MORT tee fitting (F11) (**Figure 33**).



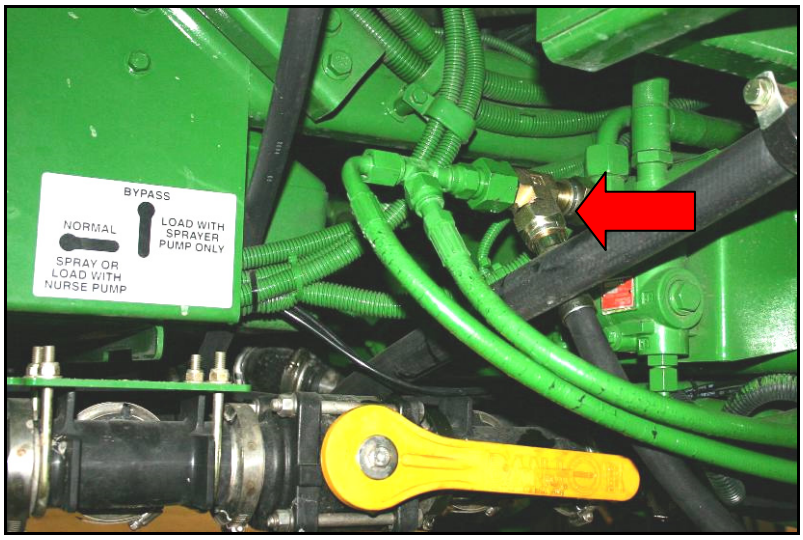
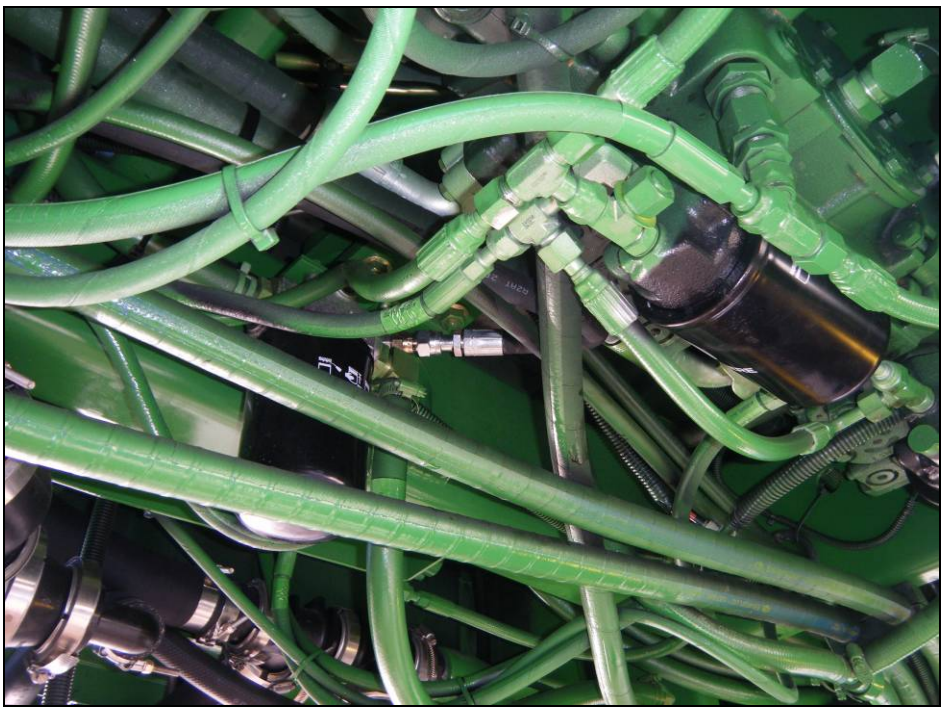


Figure 33: Secondary Pressure Line Connection

7. Route the secondary tank line (H78) to the inlet on the sprayer's hydraulic in-line filter. Tee hose H78 into the in-line filter using a 6FORXR-6MORT tee fitting (F10) (**Figure 34**).



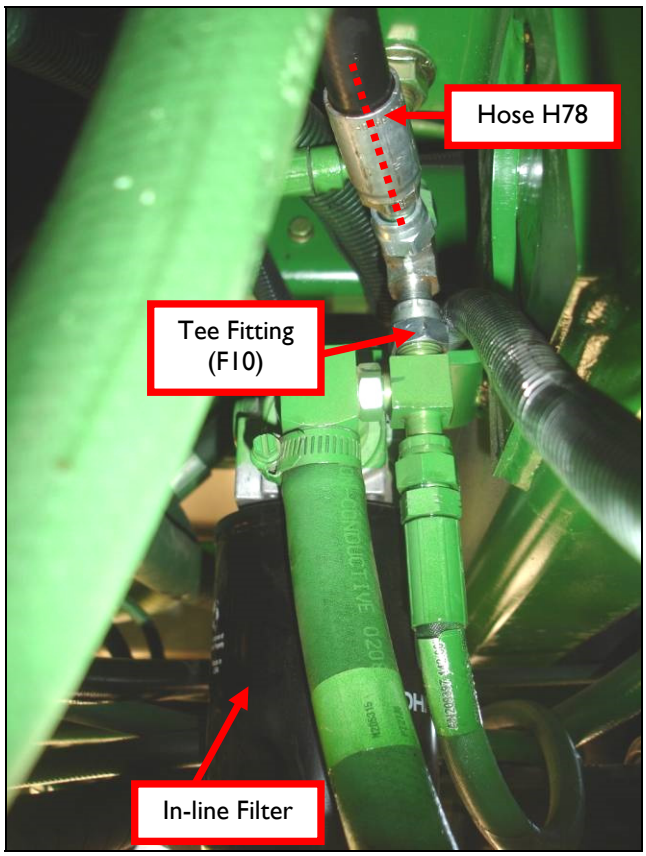


Figure 34: Secondary Tank Line (H78) (teed into the tank return near the in-line filter)

Important

The load-sense return line (also teed into the in-line filter) has an orifice between the fittings. Ensure the load sense is located so it will not restrict flow of the secondary tank line (H78). Illustration A shows the original plumbing of the load sense return and orifice. B and C show two options for the installation of the tee fitting.

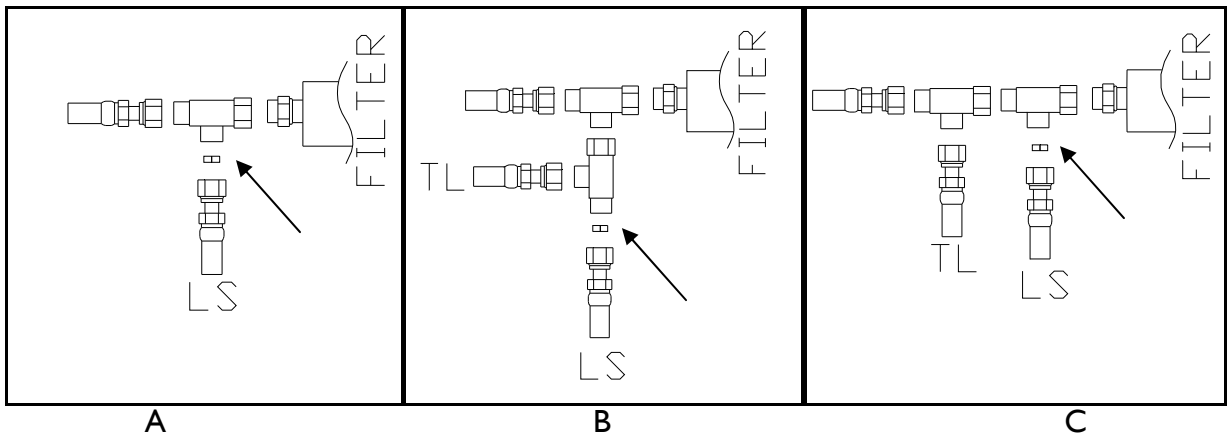


Figure 35: Secondary Tank Line Install
(Load Sense = LS, NORAC Secondary Tank Line = TL)

8. Disconnect the existing hoses from the tilt cylinders. Remove the existing 90 degree fitting on the rod end of each cylinder as well. 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.

9. Connect one end of hoses H02 to the F03 fittings on the LEFT tilt cylinder. Connect the other end of hoses H02 to the NORAC valve block "A" and "B" ports.

10. Connect one end of hoses H04 to the F03 fittings on the RIGHT tilt cylinder. Connect the other end of hoses H04 to the NORAC valve block "A" and "B" ports.

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

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

13. Install hoses H72 to the roll cylinder that was previously installed. Route the hoses to the NORAC valve block. Connect the hose attached to the rod end of the cylinder to the "B" port of the 3rd station of the block. Connect the hose attached to the cap end of the cylinder to the "A" port of the 3rd station of the block.

14. Install the load sense line (H01) onto the 4MB-4MOR fitting (F06) installed in the "S" port of the NORAC block.

15. Route the load sense line (H01) to the shuttle valve manifold located underneath the sprayer.

⚠ **On sprayers manufactured before 2000, the load sense line will be connected on the main John Deere valve block not the shuttle valve manifold. (Figure 40)**

16. Tee the load sense line (H01) directly in to the "S" port of the shuttle valve manifold using F03 and F04.

⚠ **There are multiple versions of JD load sense blocks on sprayers. Choose the picture that most closely resembles the sprayer valve block and tee in accordingly.**

⚠ **On some installs the Load sense hose (H01) may be too long and the excess hose must be coiled and secured where it will not interfere with other components.**

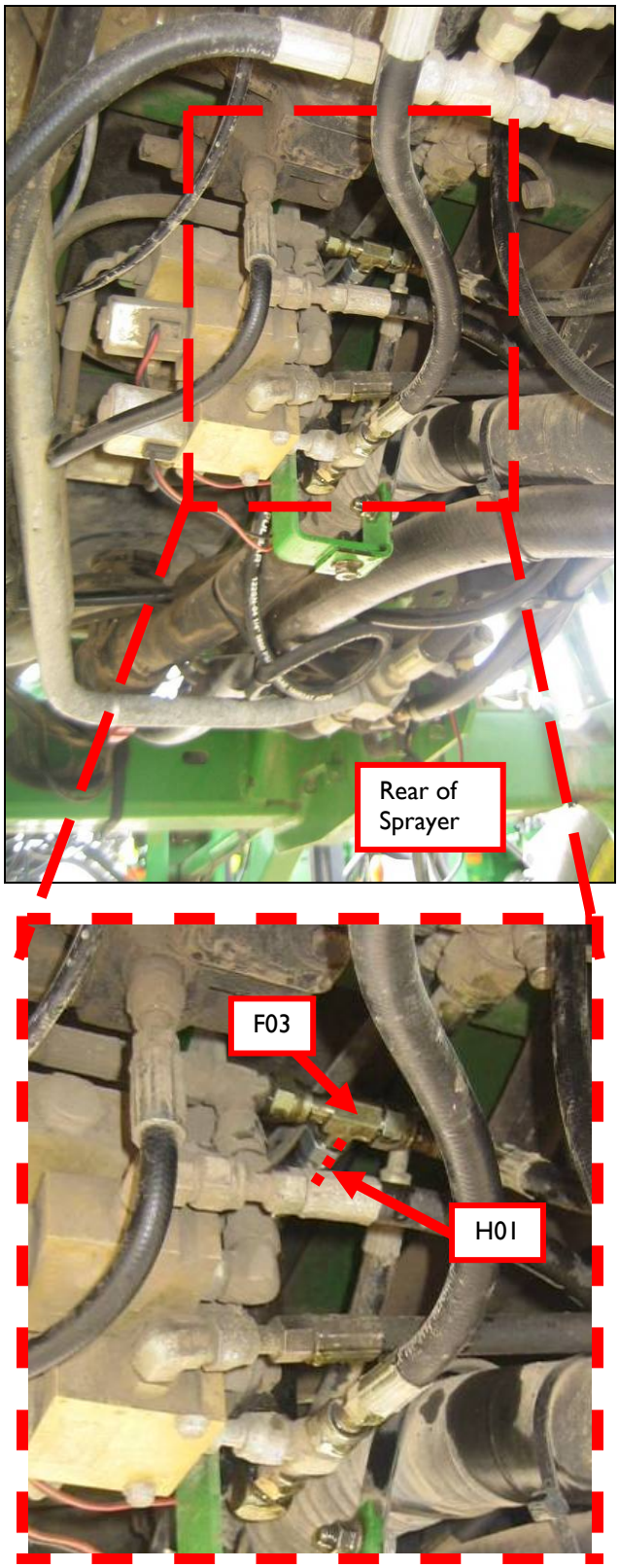


Figure 36: Looking towards the rear of the sprayer on a JD4700, JD4710

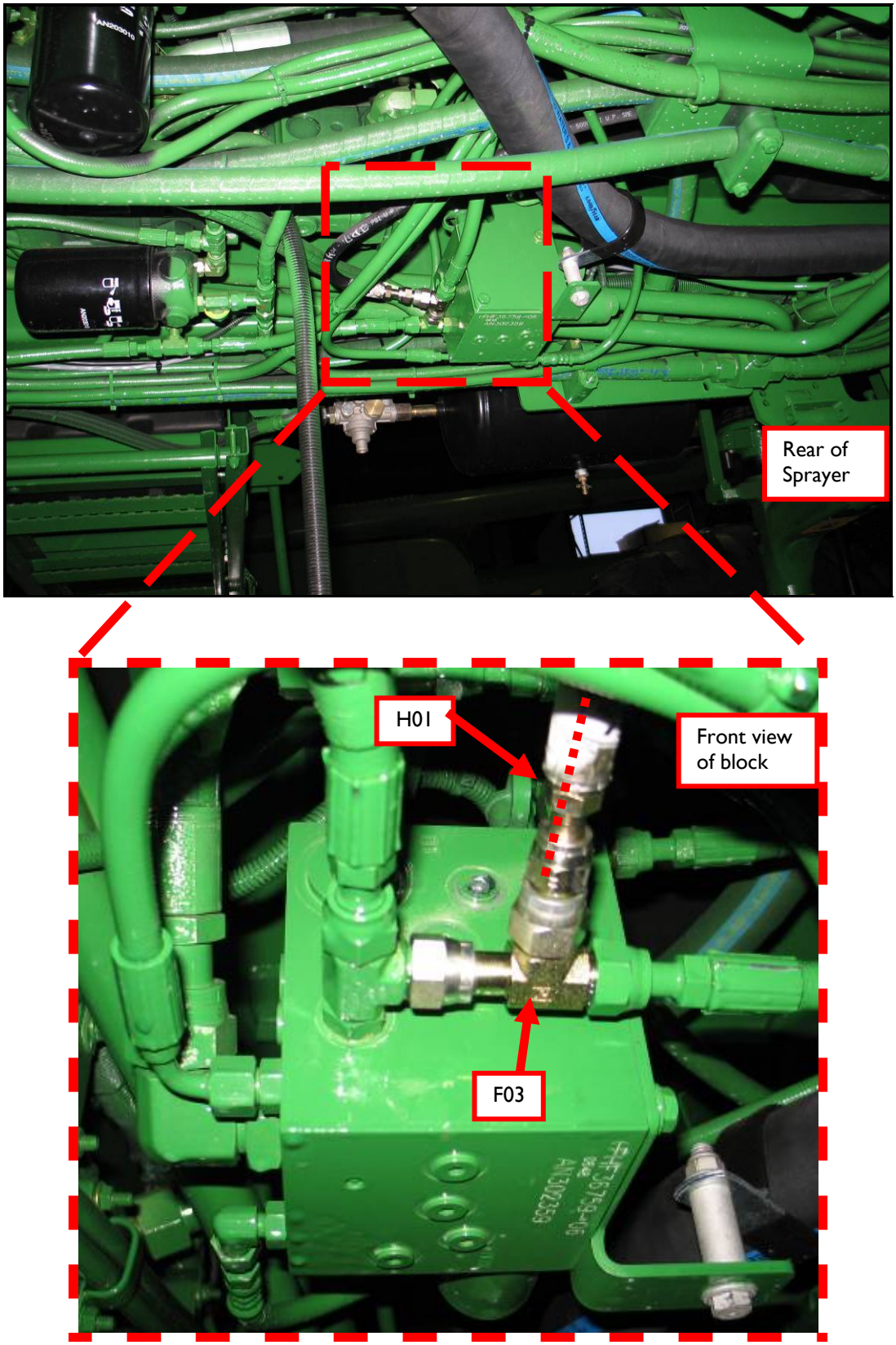


Figure 37: Load Sense Plumbing on some JD4710

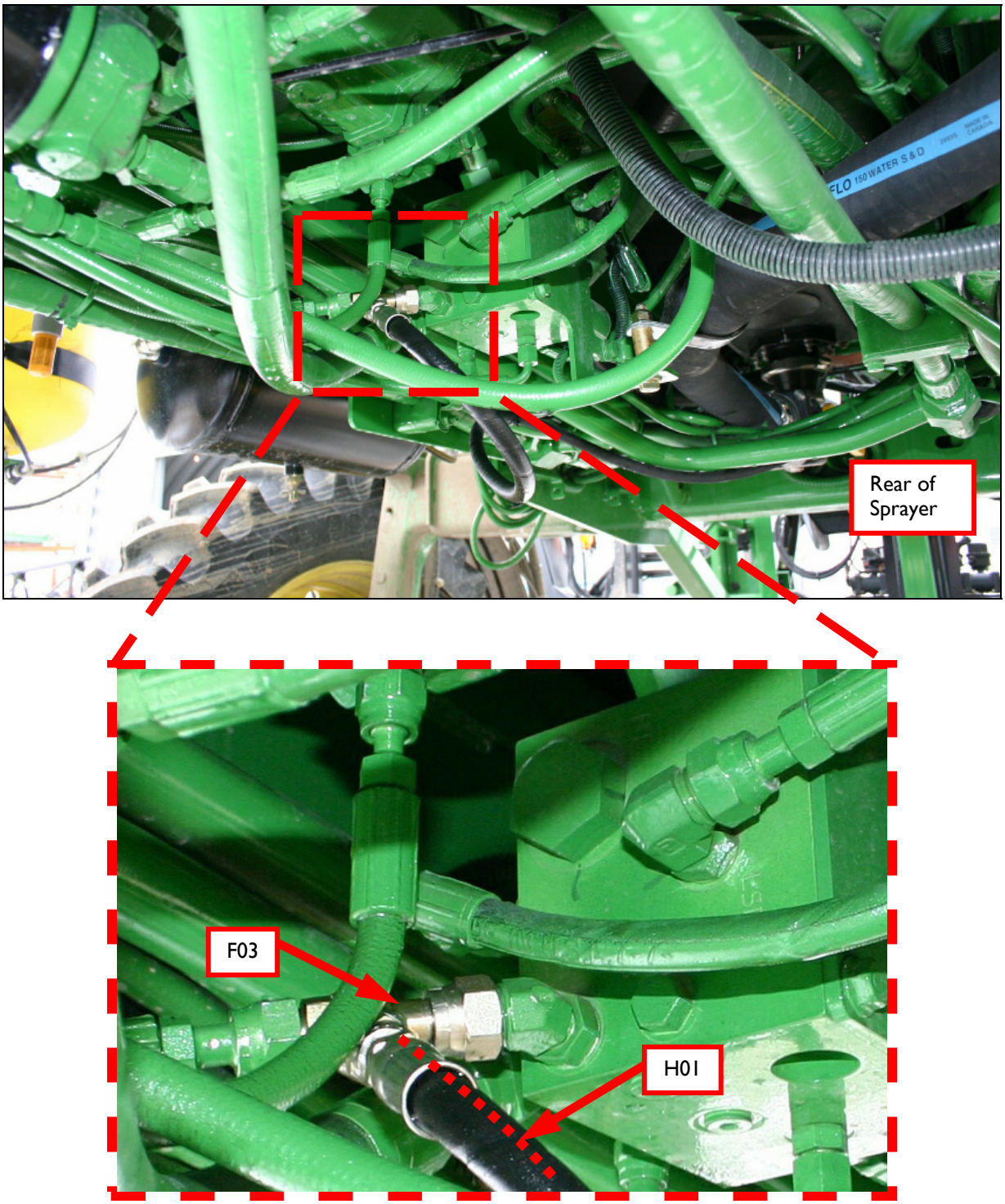


Figure 38: Load Sense Line Connection to John Deere Combination Valve Block

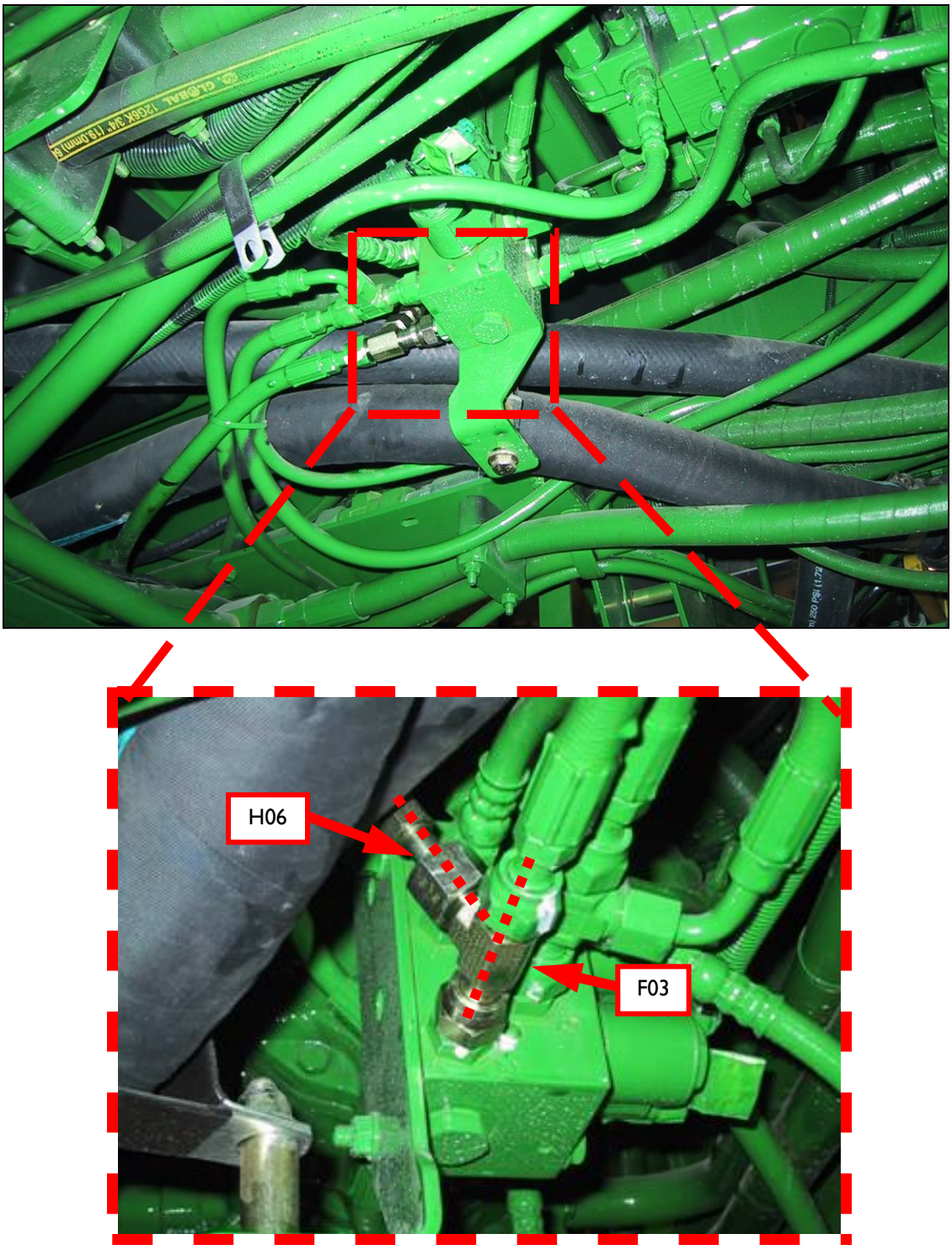


Figure 39: 2003+ Load Sense Line Connection

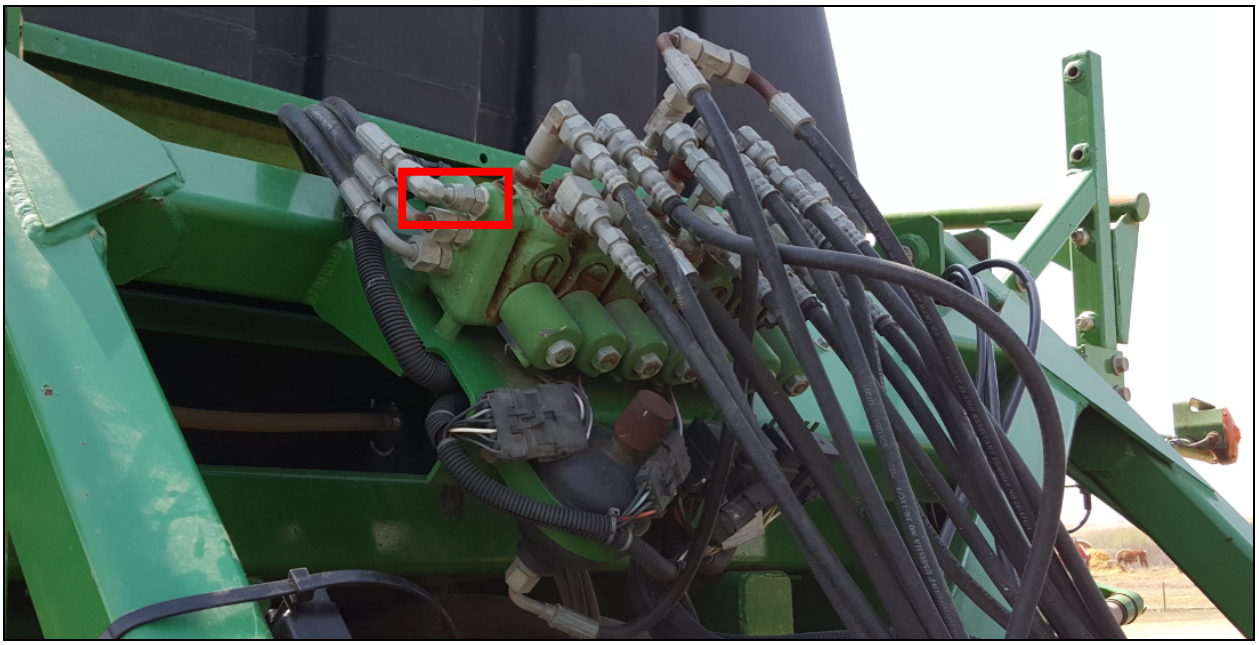


Figure 40: Load Sense Connection on Pre-2000 Sprayers

11 Software Setup

1. Start up the sprayer and test the sprayer's functionality. The display terminal 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 display terminal using the switch on the side.

4. The procedure for the installation of the UC5 Spray Height Control system is now complete. Begin the AUTOMATIC SYSTEM SETUP procedure as described in the UC5 Spray Height Control Operator's Manual.

5. Press and hold the brake pedal during the valve setup section (**Figure 41**) of the automatic setup to activate the jam valve.

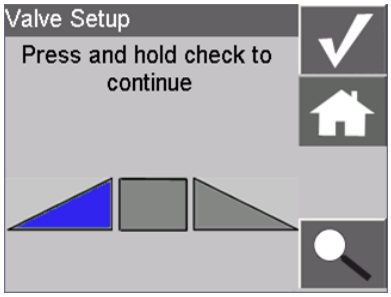


Figure 41: Valve Setup Screen in Automatic Setup

Important

Control Module version must be 4.3.2.0 or higher. Refer to the Operator's Manual to check the version.

12 System Maintenance

For good performance in corners, when driving over terraces or through ditches at an angle, or in hard steer situations it is important to do the following:

1. The Teflon sliding pads on the boom must not grab in dynamic situations (corners, terraces etc). See the photos below for the location of the sliding pads. Apply grease to the complete surface of all sliding pads. Manually rotate the boom (by pushing on the ends) to access the entire surface of the pads when greasing.

2. Check that the pin in the top of the cylinder is not loose and does not have any free movement or slop. The bottom cylinder mounting bolt torque must be checked regularly. The bolt must be tightened to 260 ft-lbs (350 Nm).

3. Ensure the sprayer operator continues this maintenance for proper operation.

⚠ Important

It is recommended that the pads be re-coated with grease every 20 hours of operation.

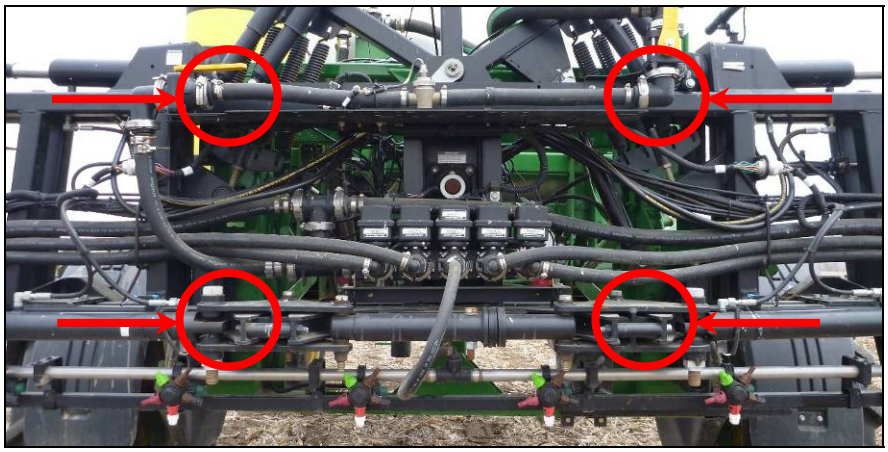


Figure 42: Sliding Pad Locations

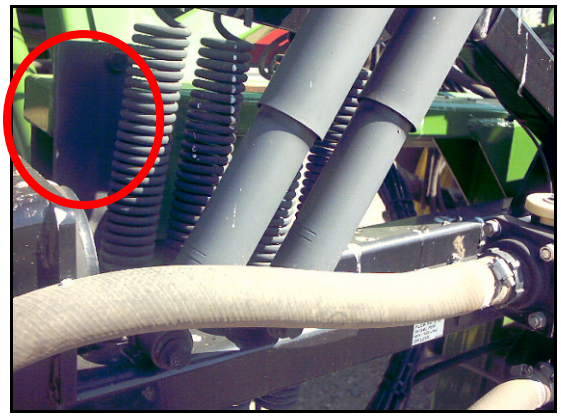


Figure 43: Upper Front Sliding Pad

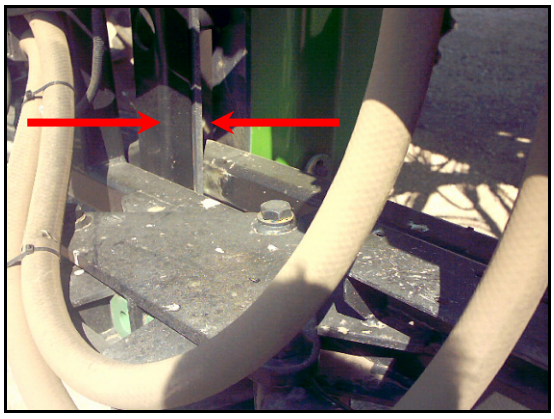
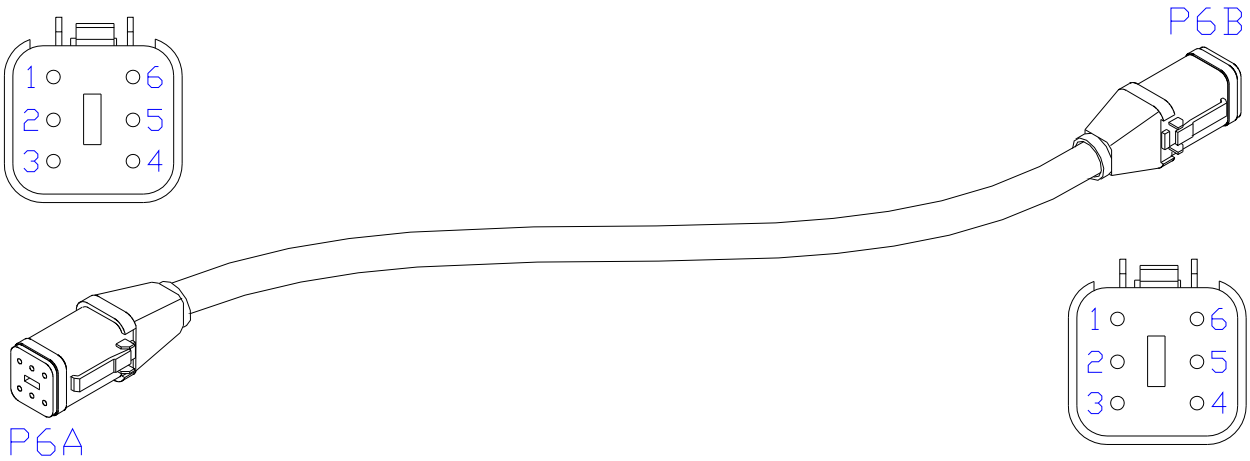


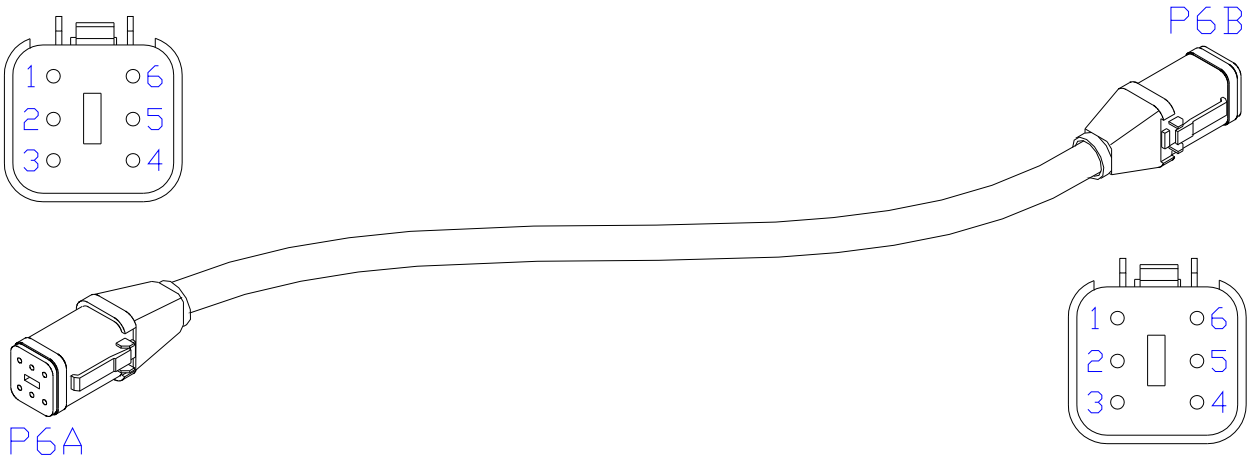
Figure 44: Lower Front and Rear Sliding Pads

13 Cable Drawings

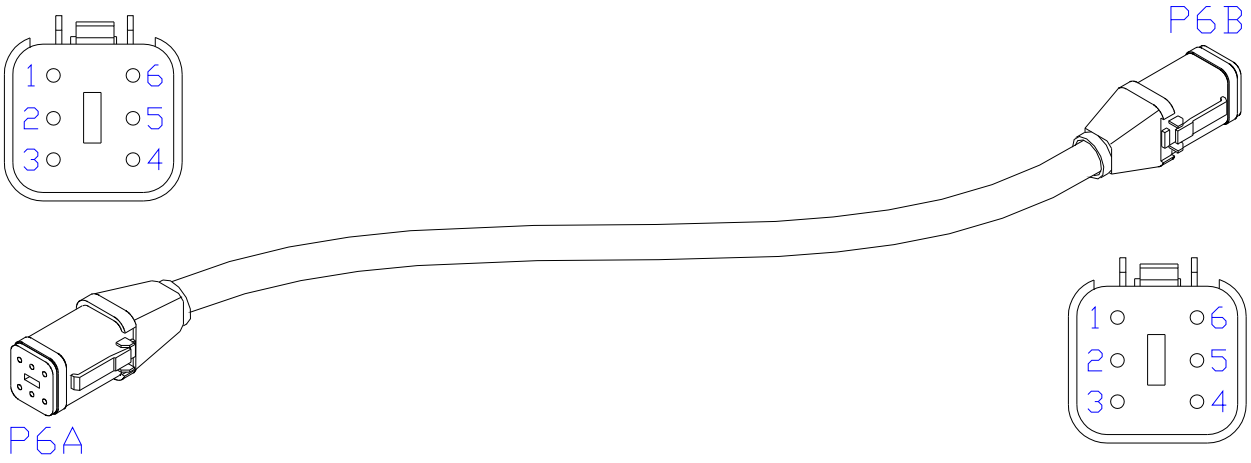
13.1 ITEM C01: 43220-10 - CABLE UC5 NETWORK 14 AWG - 10M

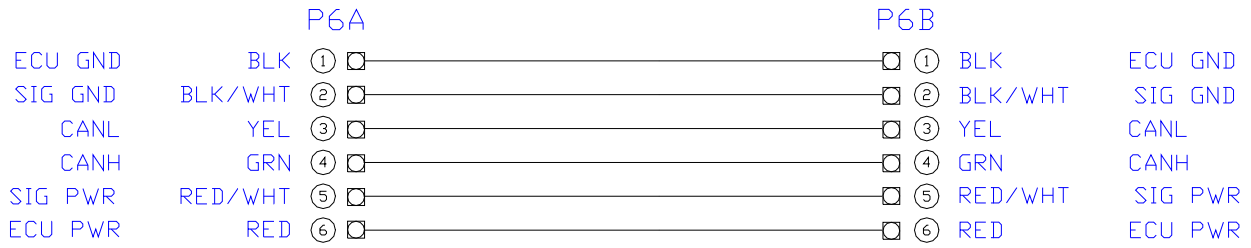


13.2 ITEM C02: 43220-01 - CABLE UC5 NETWORK 14 AWG - 1M

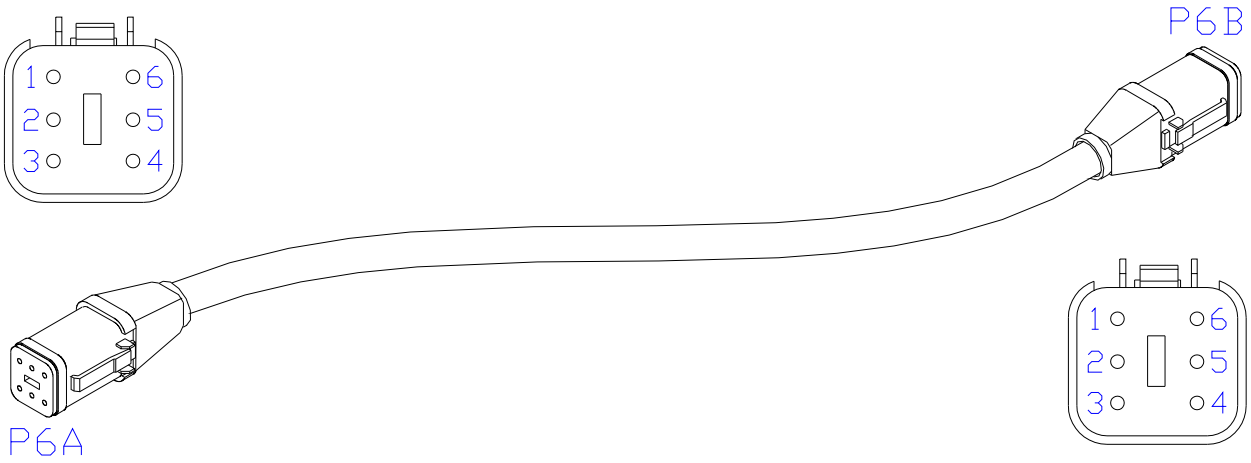


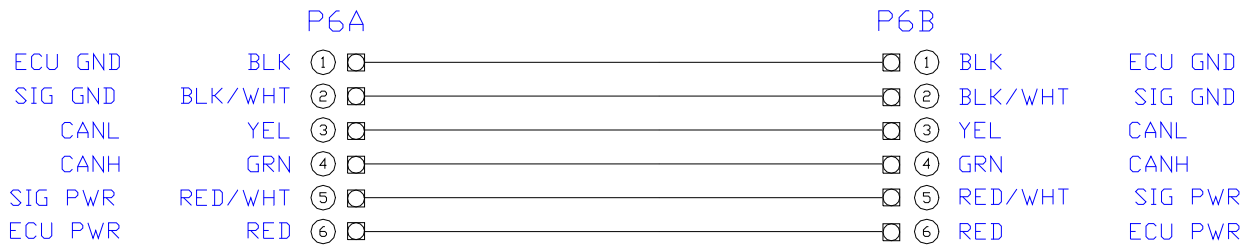
13.3 ITEM C03: 43220-03 - CABLE UC5 NETWORK 14 AWG - 3M



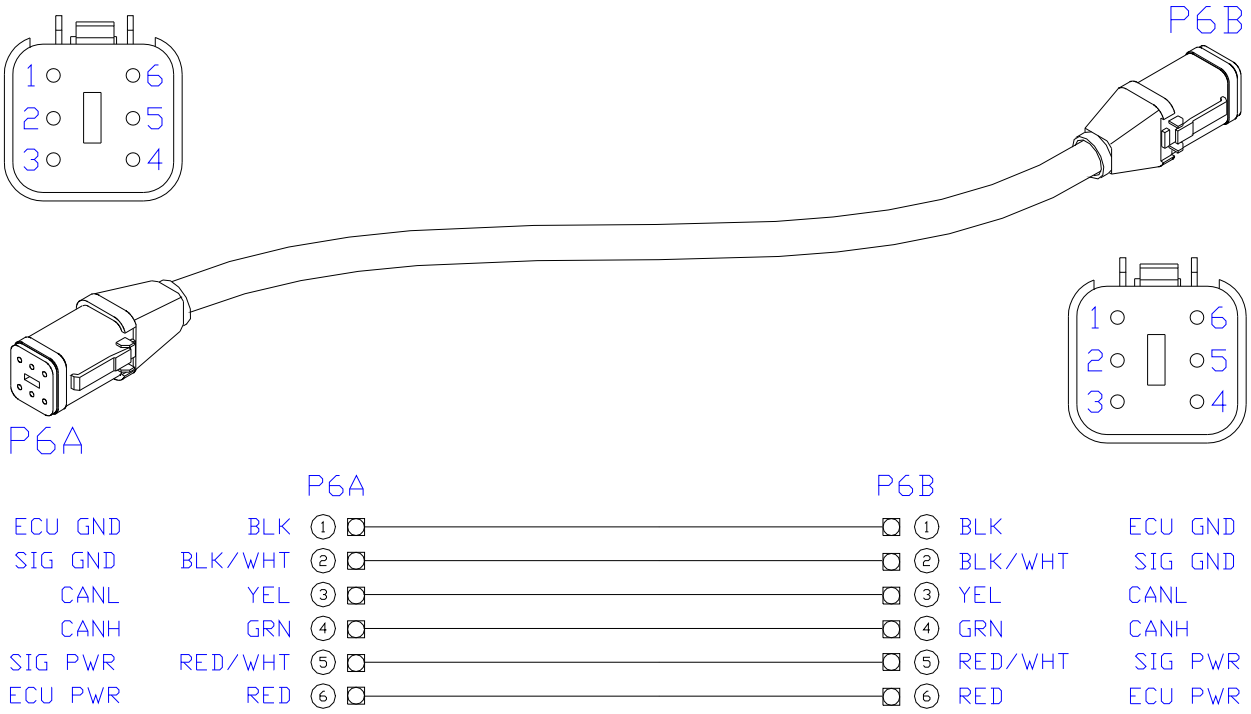


13.4 ITEM C04: 43220-0.5 - CABLE UC5 NETWORK 14 AWG – 0.5M

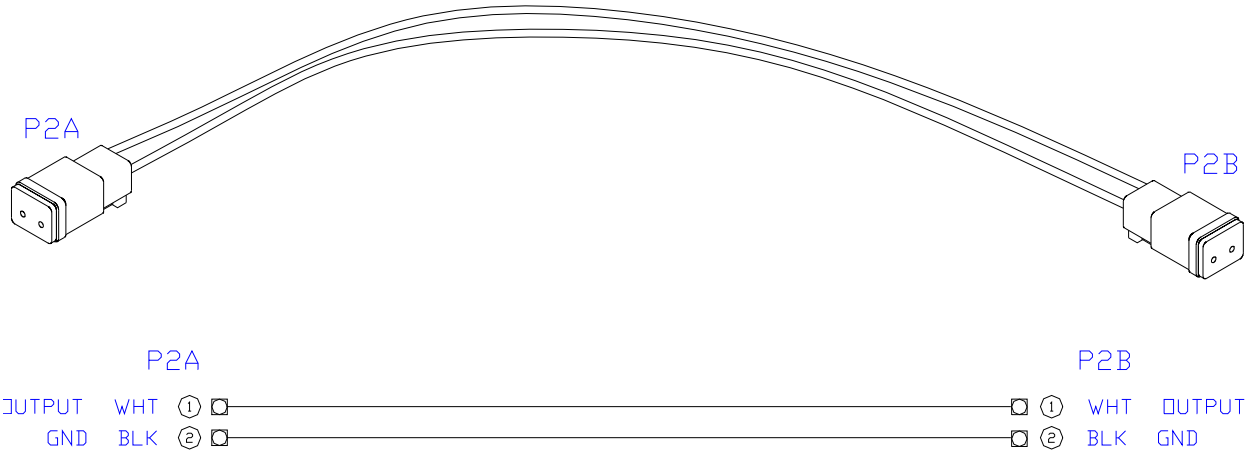




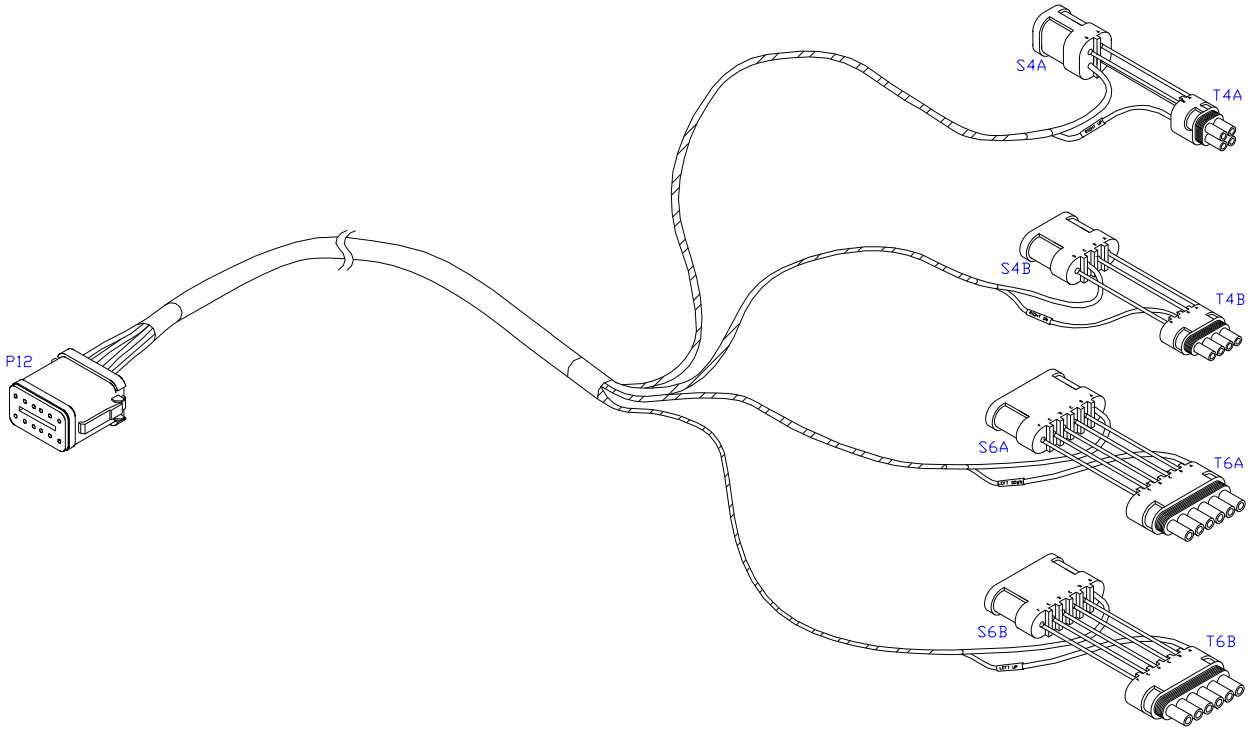
13.5 ITEM C05: 43210-20 - CABLE UC5 NETWORK 18 AWG - 20M

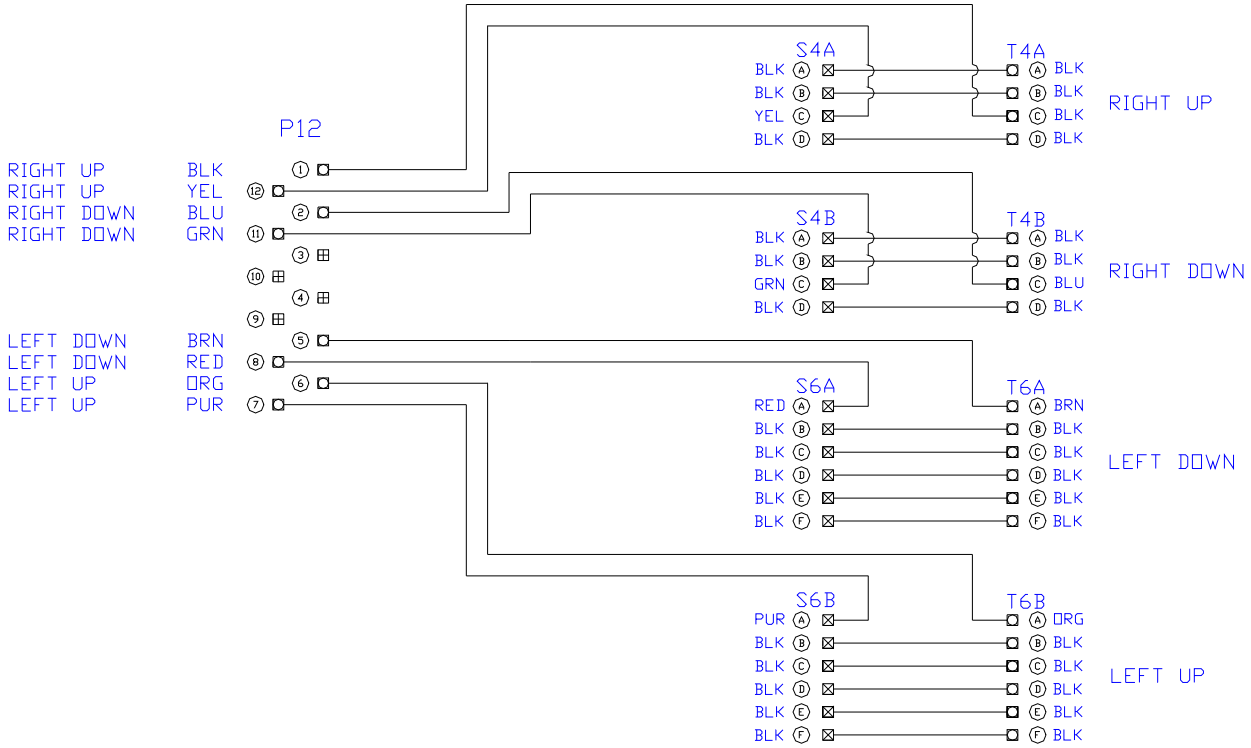


13.6 ITEM C10: 43230-04 – CABLE UC5 VALVE DT TO DT

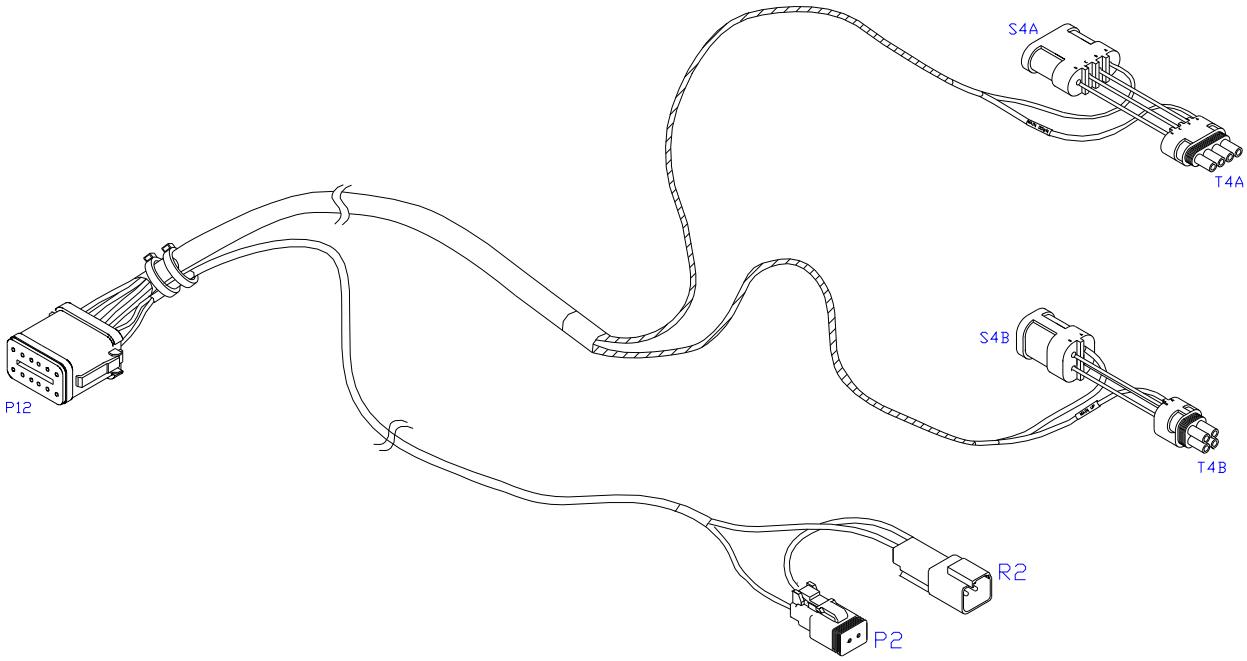


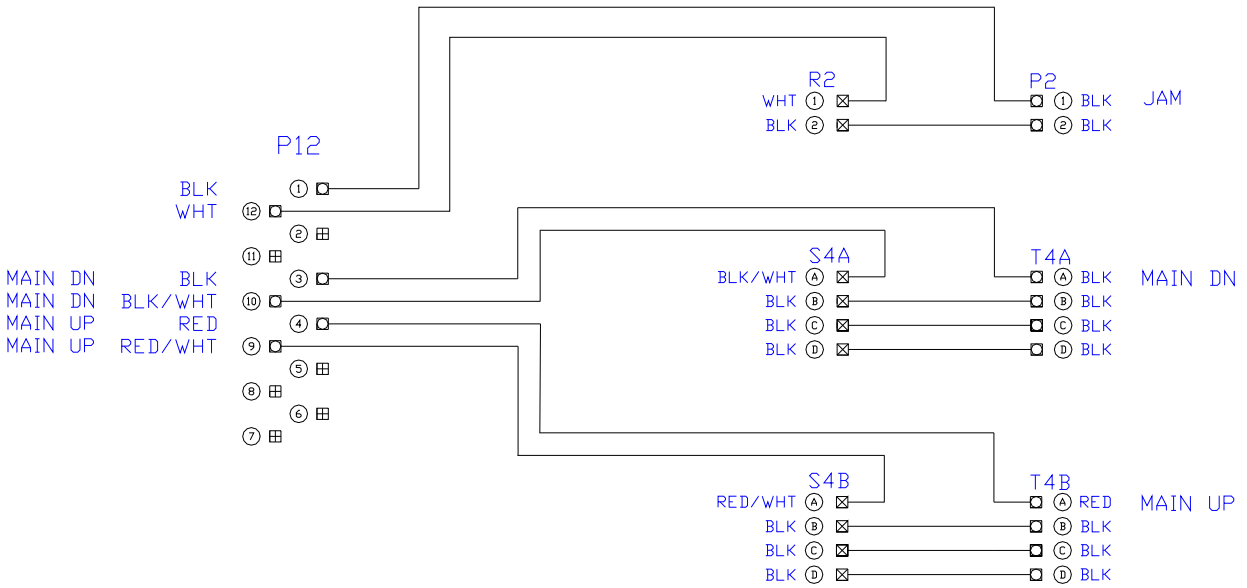
13.7 ITEM C20: 43240-06 – CABLE UC5 INTERFACE TILT JD



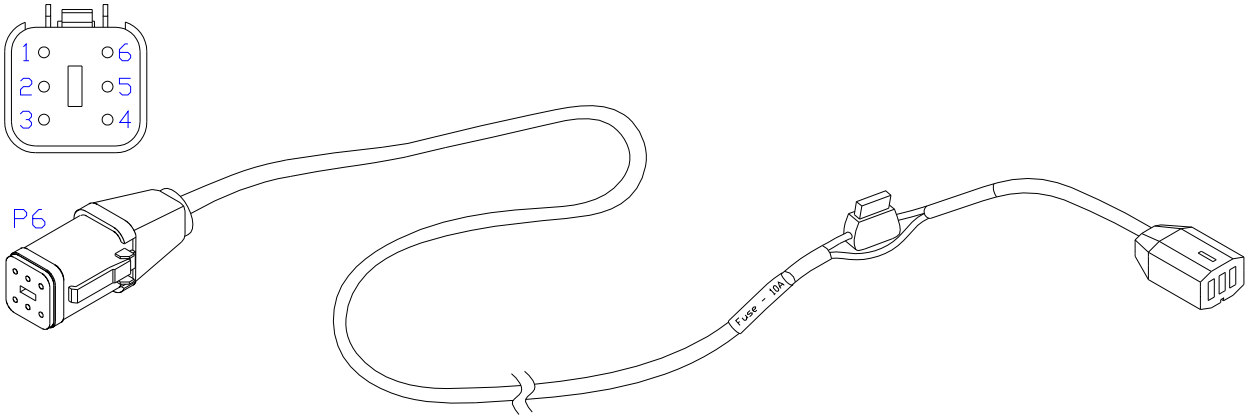


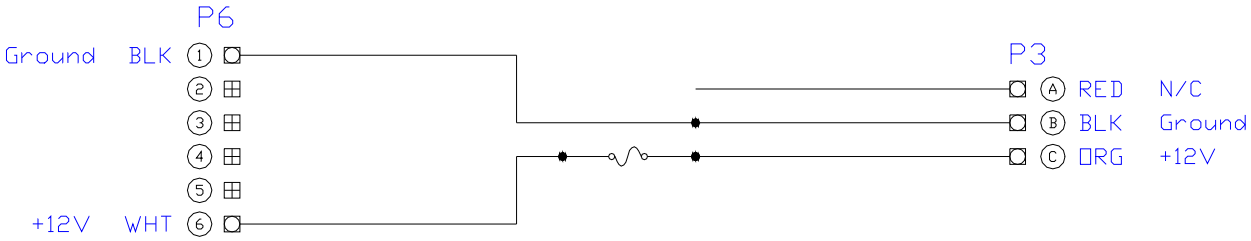
13.8 ITEM C21: 43240-05 – CABLE UC5 INTERFACE MAIN JD





13.9 ITEM C30: 43250-07 – CABLE UC5 BATTERY JD FUSED





14 Appendix A: Interface Cable Modification Procedure

Some earlier models of John Deere sprayers (4700 and 4710) may use a different style of boom valve block with a different arrangement of the connectors. As a result, the NORAC 43250-06 tilt interface cable (C20) and the NORAC 43250-05 main interface cable (C21) will need to be modified according to the following instructions (See **Figure 45** and **Figure 46** for before and after schematics):

1. Using the supplied GP Weatherpack pin tool, locate and remove the black and black/white wires (Main Down) from the A-positions of the 4-pin flat connector tee (S4A & T4A) on the 43240-05 cable.

2. Locate and remove the red and brown wires (Left Down) from the A-position of the 6-pin flat connector tee (S6A & T6A) on the 43250-06 cable.

3. Insert the black wire from step 1 into the A-position of the 6-pin flat tower (T6A). Insert the black/white wire from step 1 into the A-position of the 6-pin flat shroud (S6A).

4. Locate and remove the red and red/white wires (Main Up) from the A-positions of the 4-pin square connector tee (S4B & T4B) on the 43240-05 cable.

5. Locate and remove the purple and orange wires (Left Up) from the A-position of the 6-pin flat connector tee (S6B & T6B) on the 43250-06 cable.

6. Insert the red wire from step 4 into the A-position of the 6-pin flat tower (T6B). Insert the red/white wire from step 4 into the A-position of the 6-pin flat shroud (S6B).

7. Remove the black wire that goes across the connection in the A-position of the 4-pin square tee with the yellow and black wires (Right Up) in the C-position (S4A & T4A) on cable 43240-06. Insert the purple wire (Left Up) from step 5 into the A-position of the 4-pin shroud (S4A). Insert the orange wire (Left Up) from step 5 into the A-position of the 4-pin tower (T4A).

8. Remove the black wire that goes across the connection in the A-position of the 4-pin flat tee with the green and blue wires (Right Down) in the C-position (S4B & T4B). Insert the red wire (Left Down) from step 2 into the A-position of the 4-pin shroud (S4B). Insert the brown wire (Left Down) from step 2 into the A-position of the 4-pin tower (T4B).

9. The cable modifications are complete. There should be 2 black wires, an incomplete 4-pin square tee and an incomplete 4-pin flat tee left over.

10. Connect the modified harness to the sprayer as indicated in **Figure 47**.

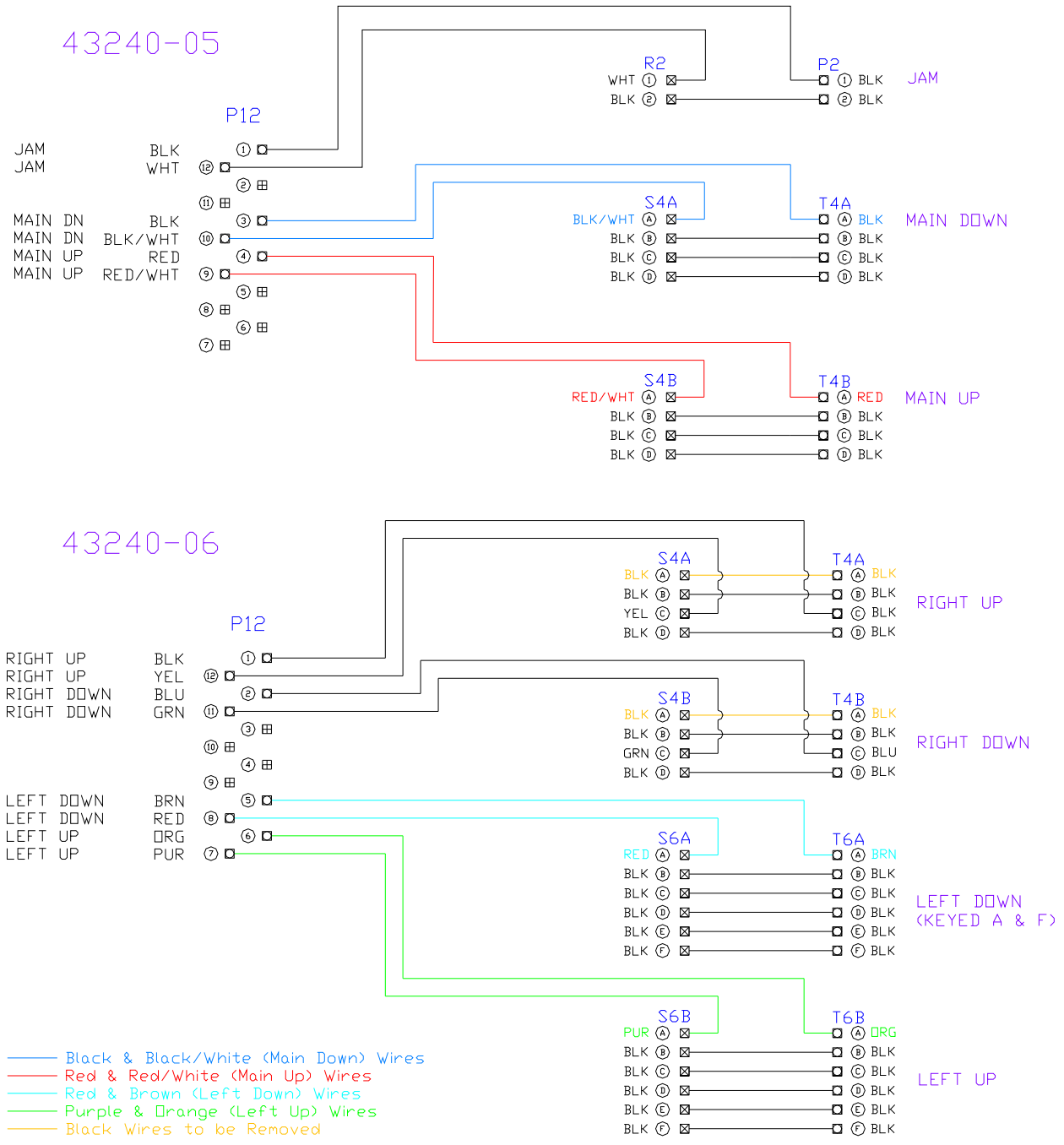


Figure 45: Cables C20 (43240-06) and C21 (43240-05) BEFORE Modification

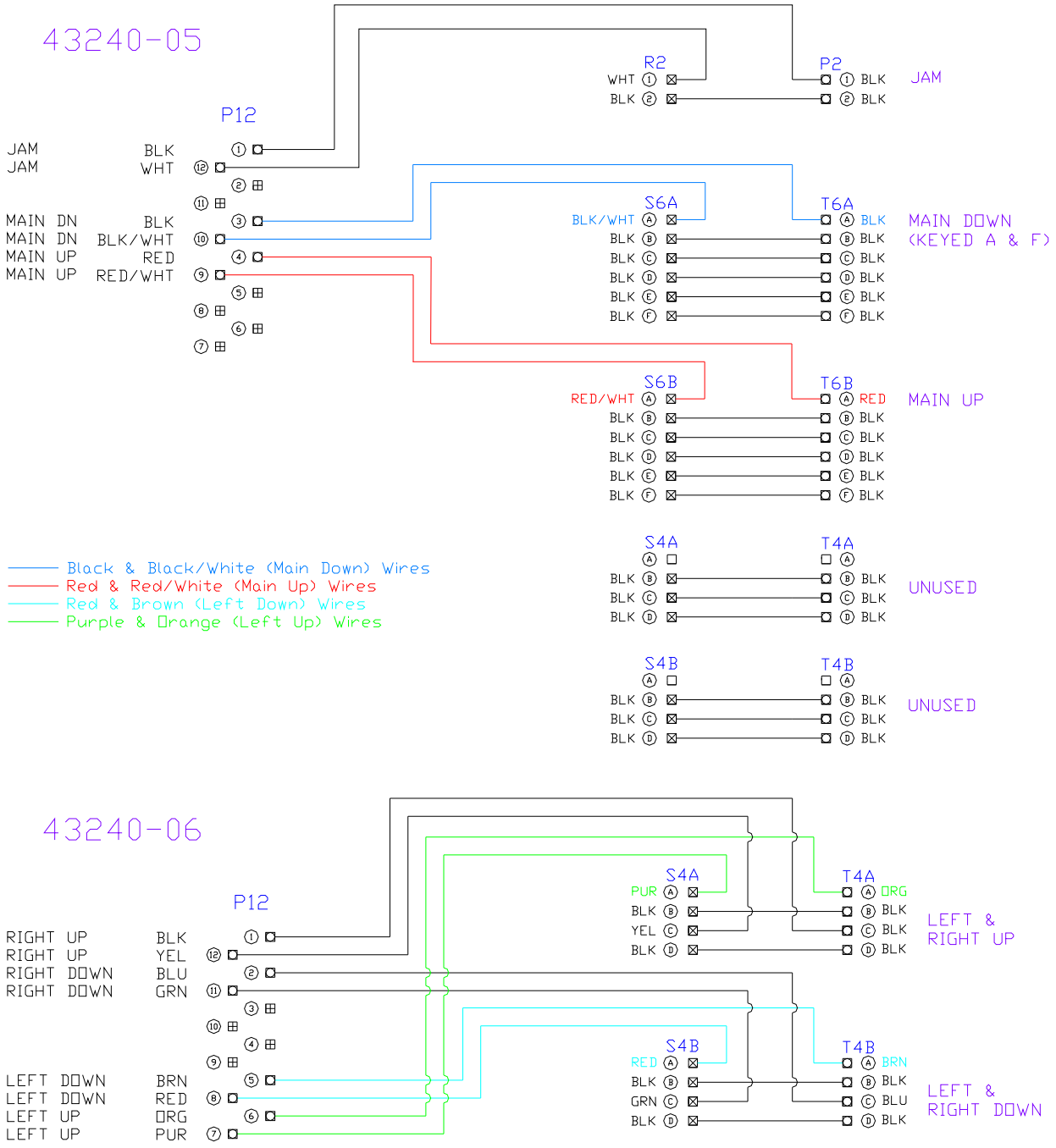


Figure 46: Cables C20 (43240-06) and C21 (43240-05) AFTER Modification

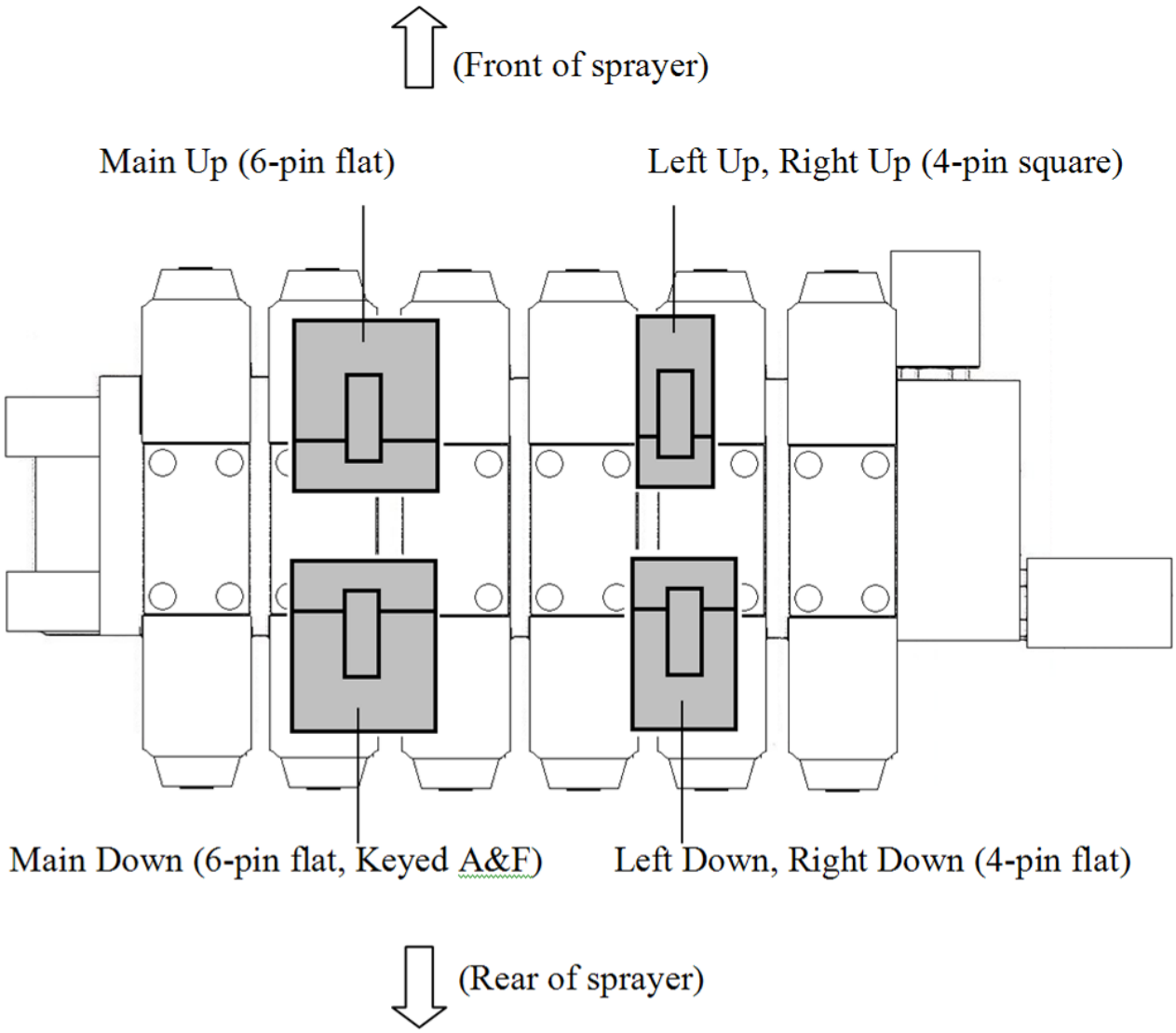


Figure 47: Early-Model John Deere Boom Valve Block (top view) with Connectors Labelled. (Valve may be different than illustrated.)

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