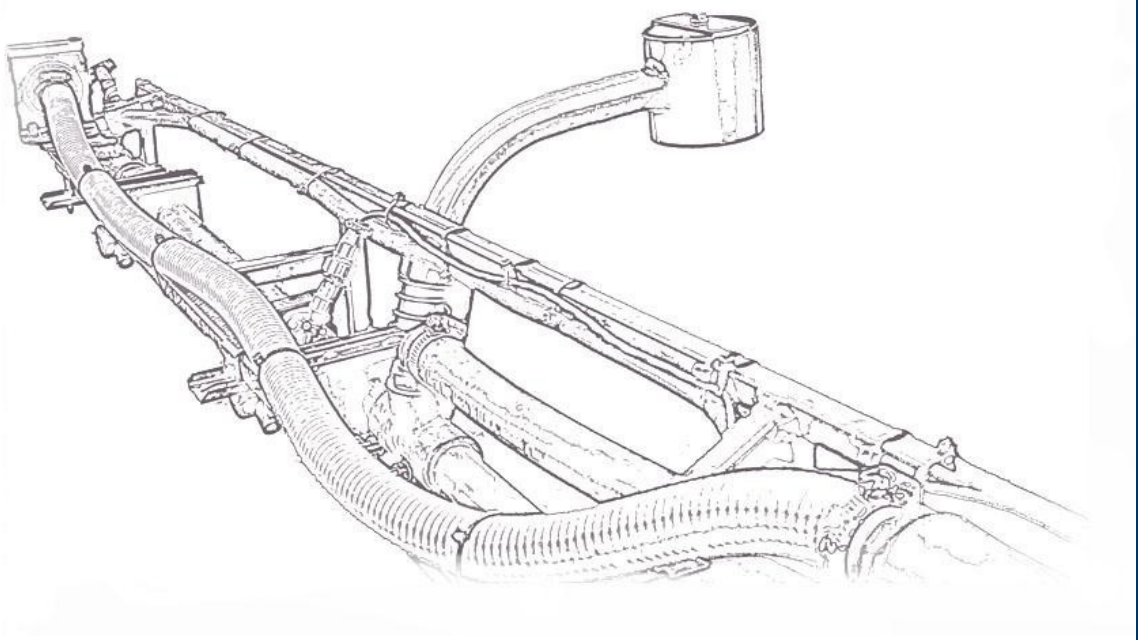
NORAC®

UC5™ CAN BUS Spray Height Control System



Generic Unit Installation Manual

GN01

Printed in Canada

Reorder P/N: UC5-BC-GN01-INST Rev M (Generic Unit)

Contents

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 and **Figure 2** illustrate the general layout of the UC5 system components:

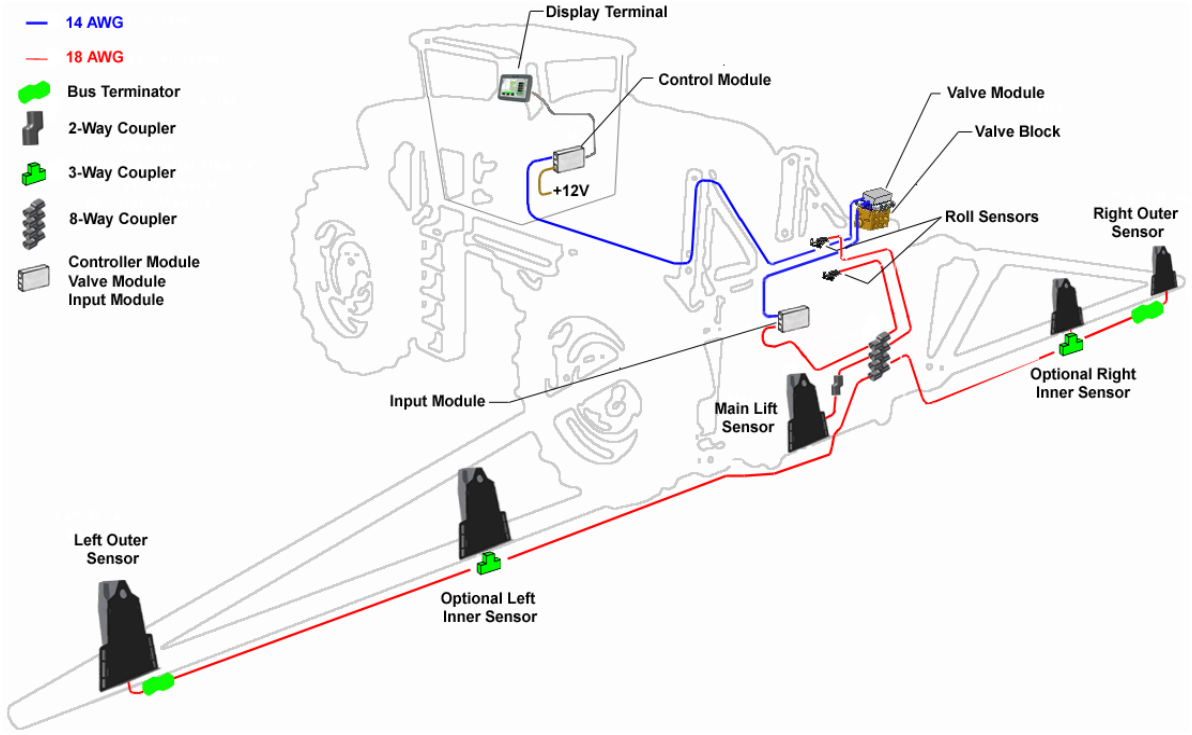


Figure 1: General UC5 System Layout (Self Propel Type)

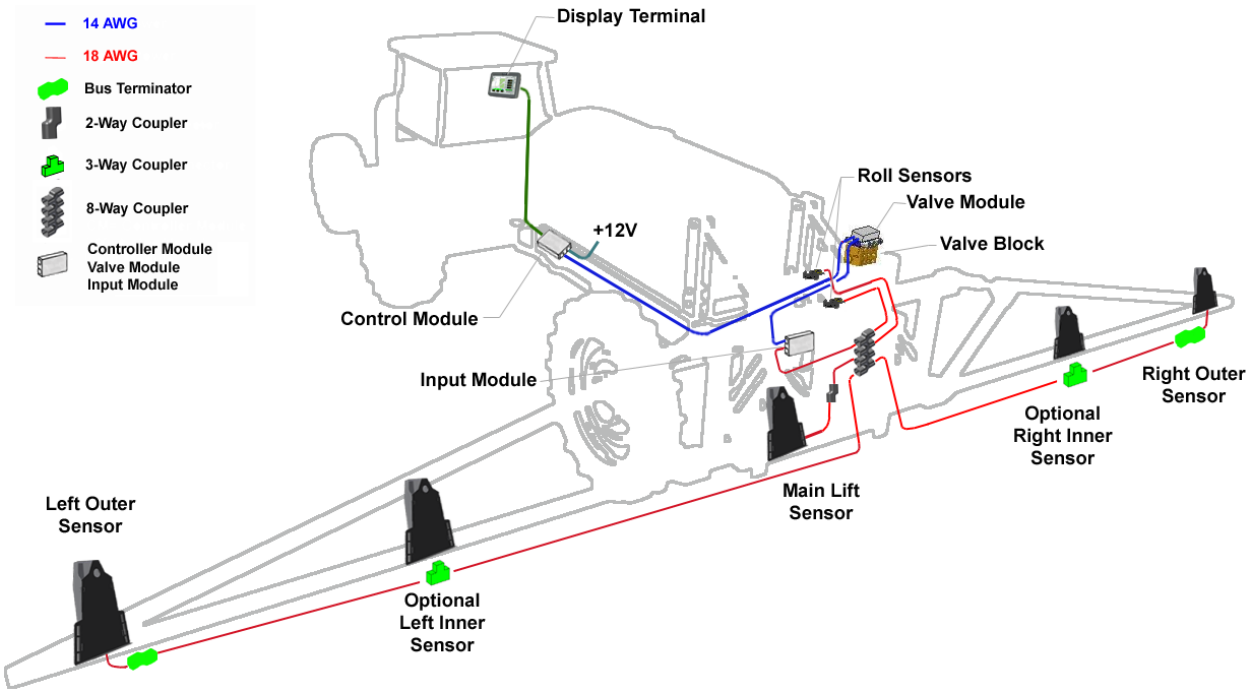


Figure 2: General UC5 System Layout (Pull Type)

4 Kit Parts

The following diagrams illustrate the GN01 kit specific parts of the NORAC UC5 system. Interface cables, power cables, hoses and fittings are shown in this manual and may not be included. Cables are available separately from NORAC. Please refer to the UC5 Generic Cable Ordering Guide (P/N: UC5-BC-CABLE-GUIDE) for cable ordering information (available at **www.norac.ca**).

4.1 Kit Overview

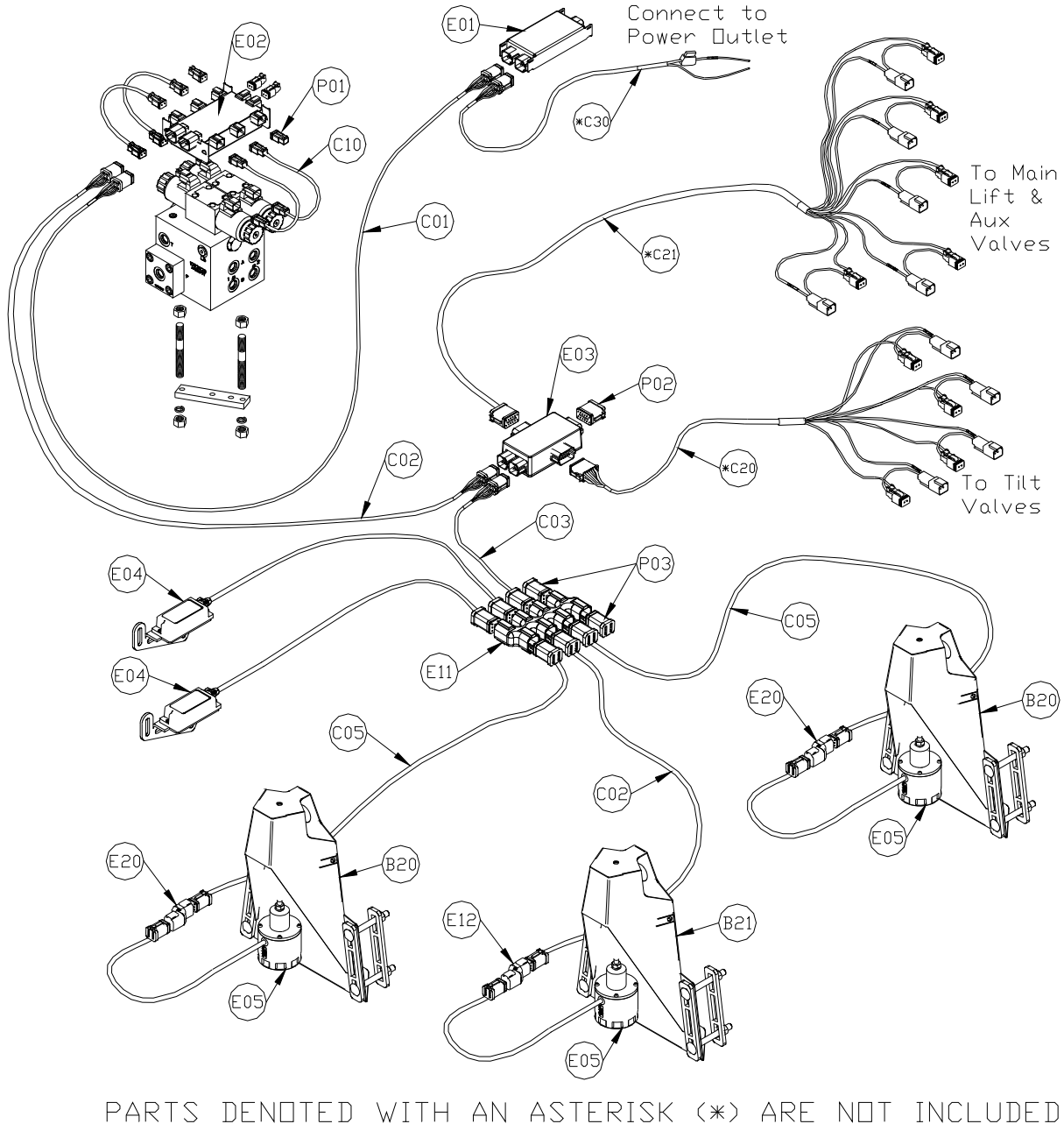


Figure 3: GN01 System Parts

*** Interface and Power cables must be ordered separately.**

4.2 Hydraulic Plumbing: Single Acting

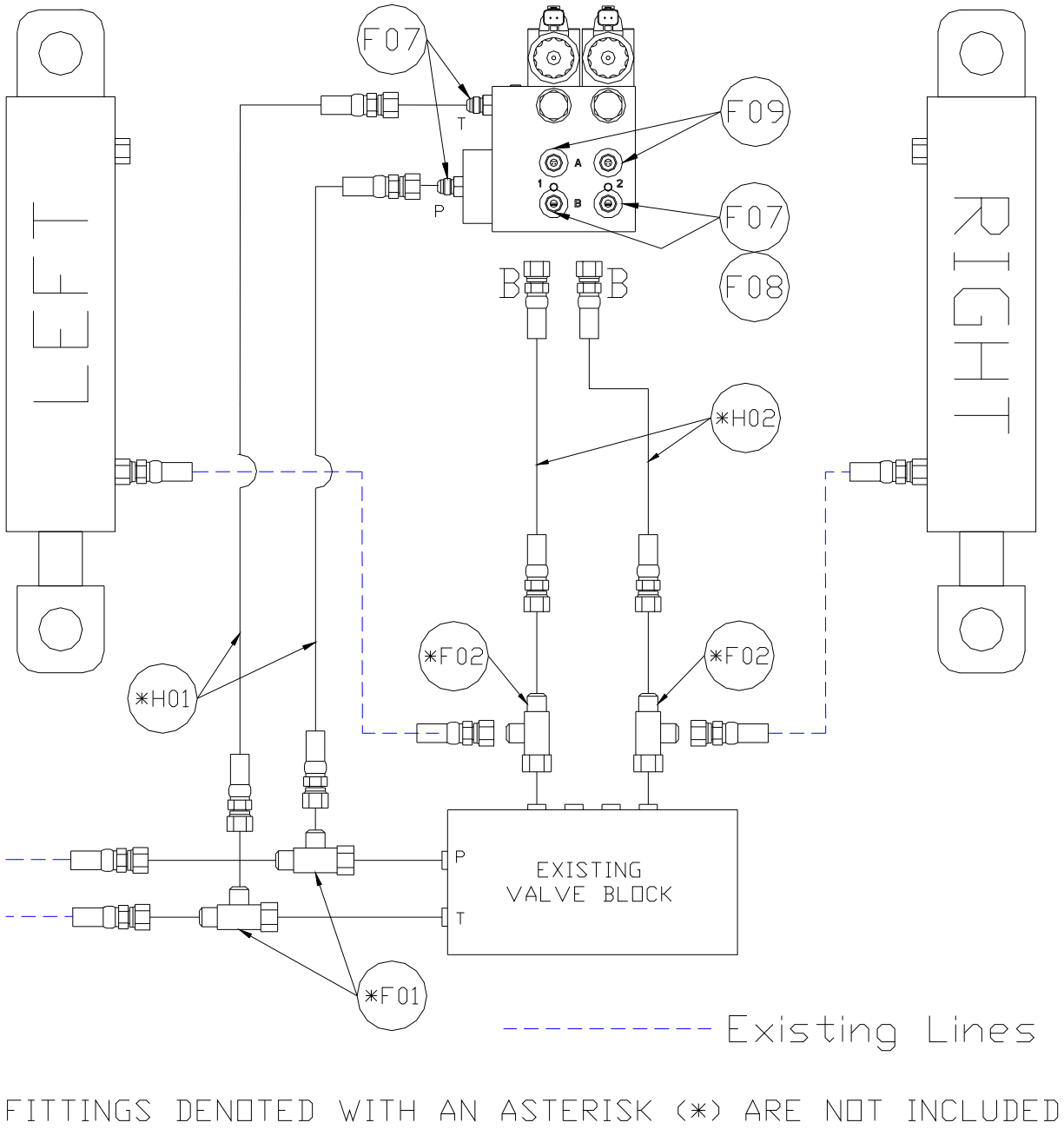


Figure 4: GN01 Hydraulic Plumbing: Single Acting

*** Hydraulic hoses and some fittings must be ordered separately.**

4.3 Hydraulic Plumbing: Double Acting

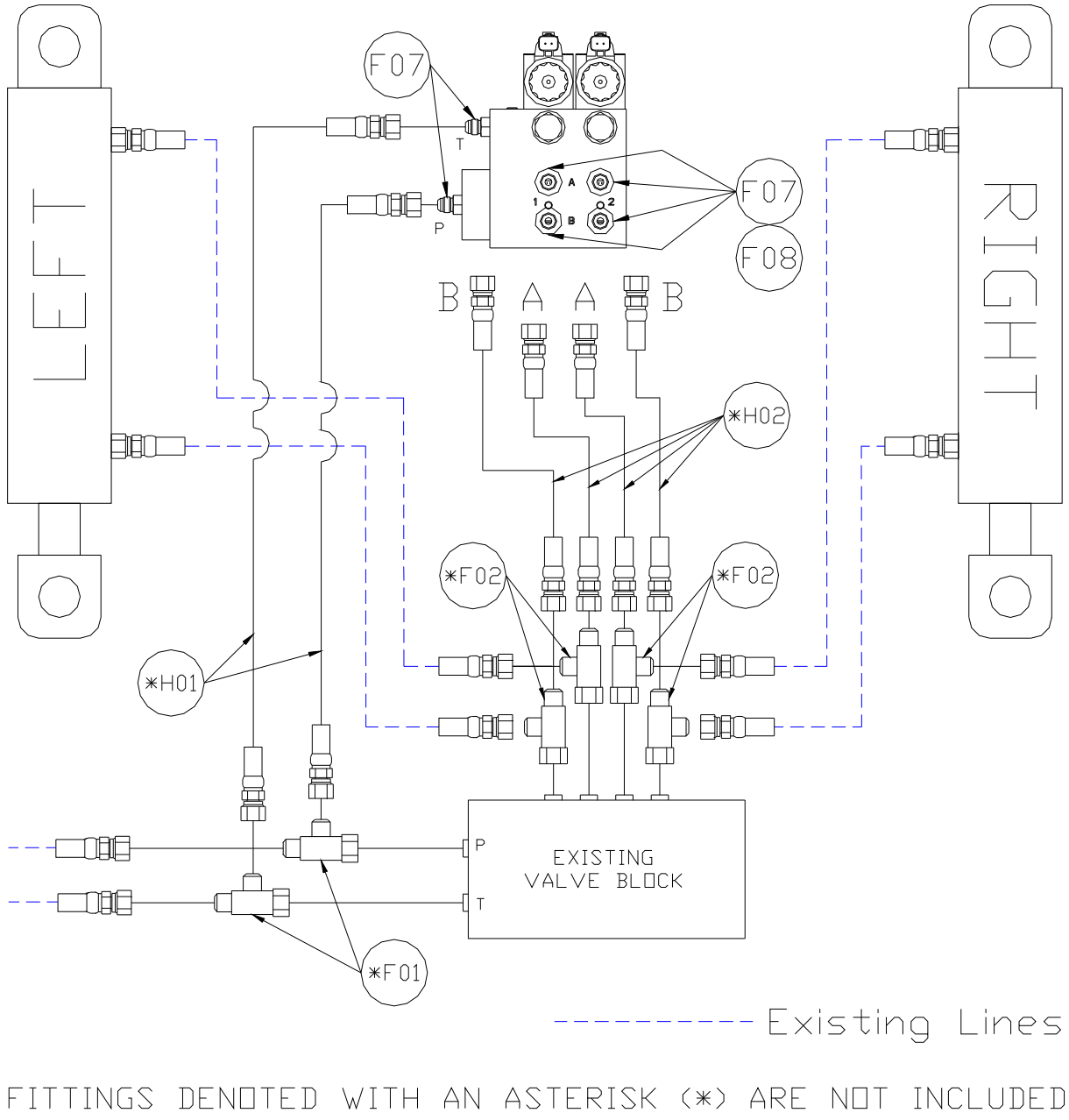


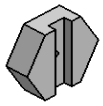
Figure 5: GN01 Hydraulic Plumbing: Double Acting

*** Hydraulic hoses and some fittings must be ordered separately.**

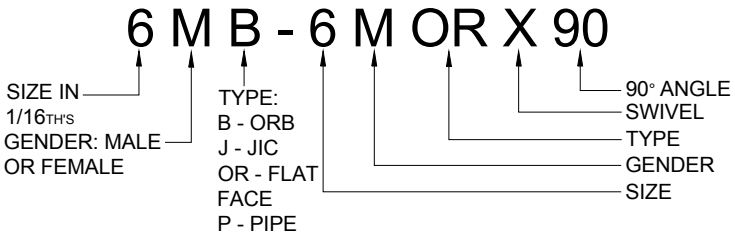
4.4 List of Parts

Item	Part Number	Name	Quantity
B05	44706-01	KIT CABLE TIE BLACK 10 PCS 21 IN 150 PCS 7.5 IN	1
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
C05	43210-20	CABLE UC5 NETWORK 18 AWG 20M	2
C10	43230-04	CABLE UC5 VALVE 2PIN DT TO 2PIN DT	4
E01	43710	UC5 CONTROLLER MODULE	1
E02	43720	UC5 VALVE MODULE	1
E03	43732	UC5 INPUT MODULE PASS THRU	1
E04	43741	UC5 ROLL SENSOR VER. 2	2
E05	43750	UC5 ULTRASONIC SENSOR	3
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
H10	44865-34	HYDRAULICS FITTING KIT - GN1	1
M01	UC5-BC-MANUAL-OPERATOR	MANUAL UC5 OPERATORS	1
M02	UC5-BC-GN01-INST	MANUAL INSTALLATION UC5 GENERIC UNIT	1
P01	106034	UC5 NETWORK 2 PIN PLUG	4
P02	106602	UC5 NETWORK 12 PIN PLUG (A-KEY)	1
P03	105882	UC5 NETWORK 6 PIN PLUG	2
V01	44963D	VALVE BLOCK ASSEMBLY 2 STATION CC/LS PROP DT 4 BOLT	1

4.5 Hydraulic Fitting Kit Details (P/N: 44865-34)

Item	Part Number	Name	Quantity	Picture
F07	103312	MALE ADAPTER - 6MB 6MJ	6	
F08	44928	ORIFICE INSERT .047 IN ONE WAY	4	
F09	104369	PLUG - 6MBP	2	

Fitting Name Example:



Important

This fittings kit is designed for either single acting or double acting hydraulics. Not all fittings are used for each installation.

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 6**.

⚠ Important

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

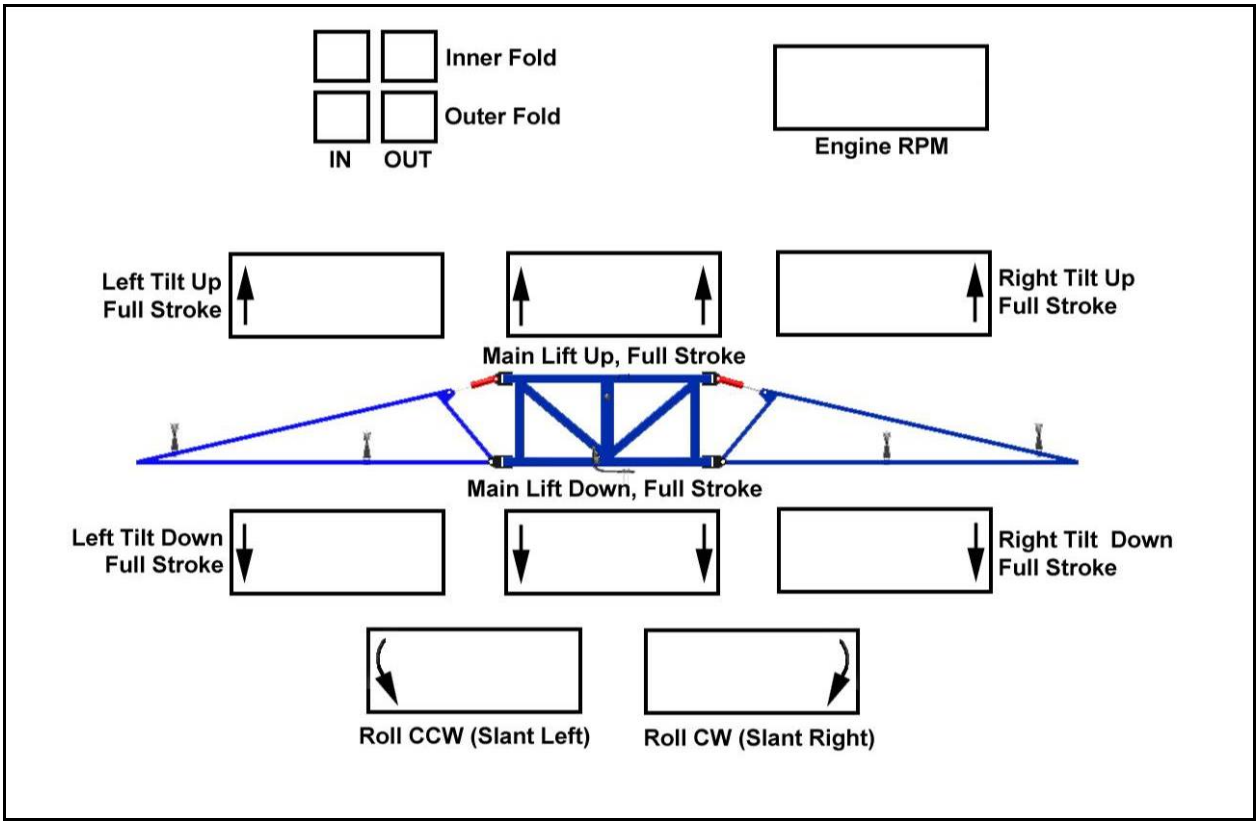


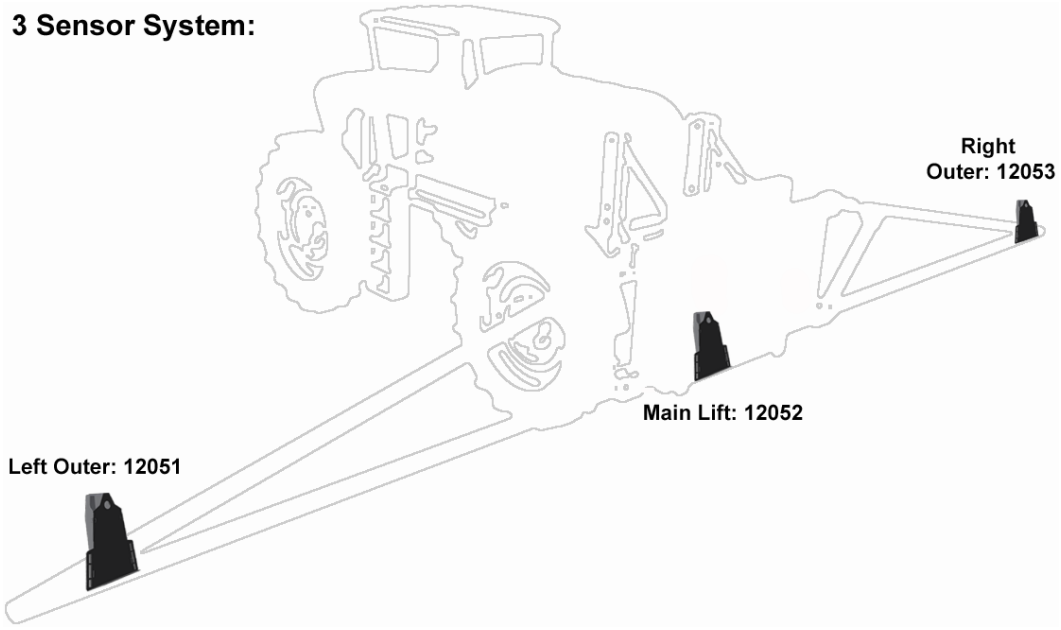
Figure 6: Pre-Install Boom Speeds

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.



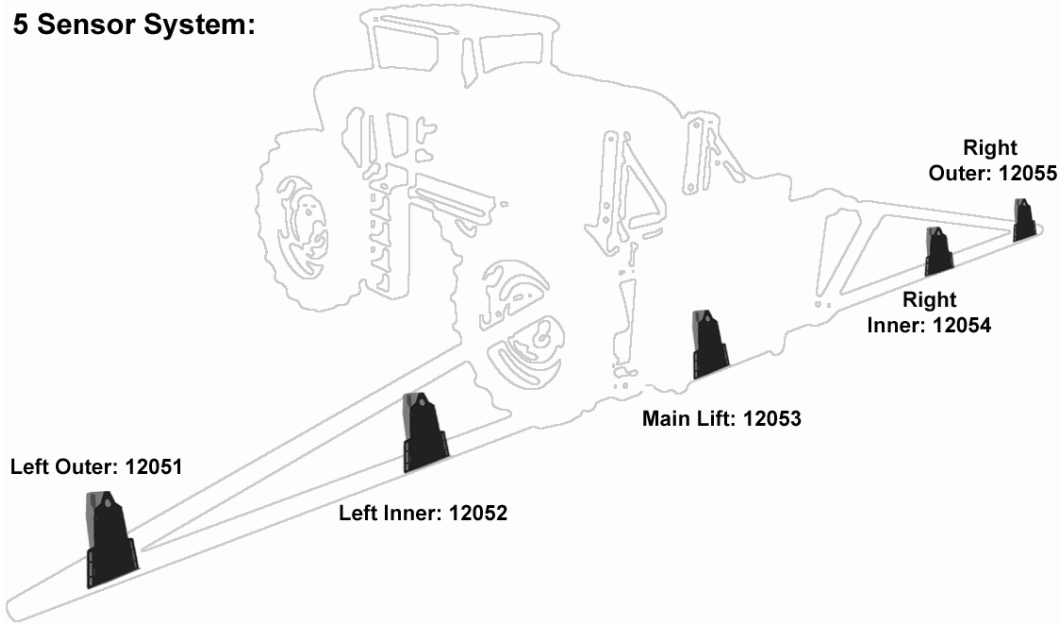


Figure 7: Sensor Serial Number Arrangement

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.

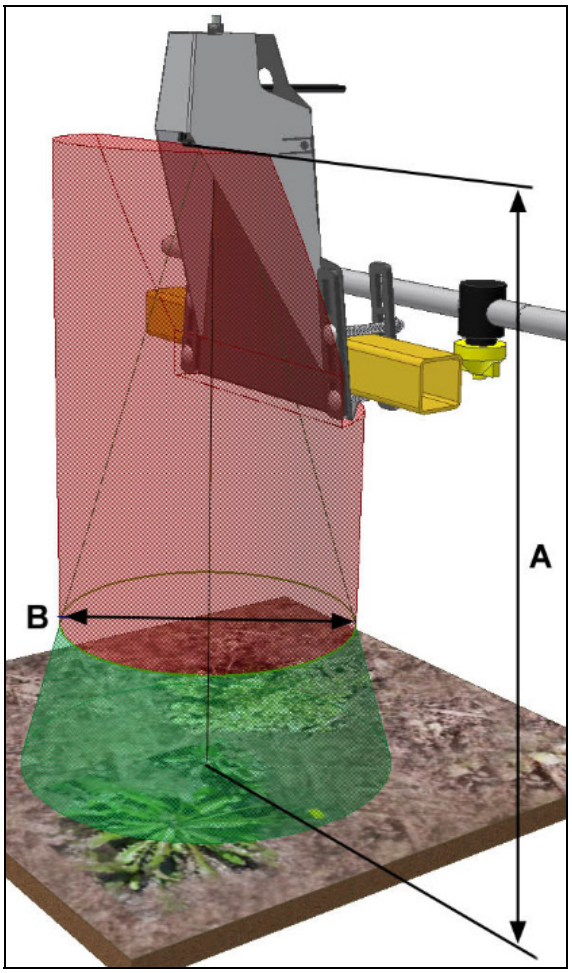


Figure 8: Sensor Mounting Guidelines

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.

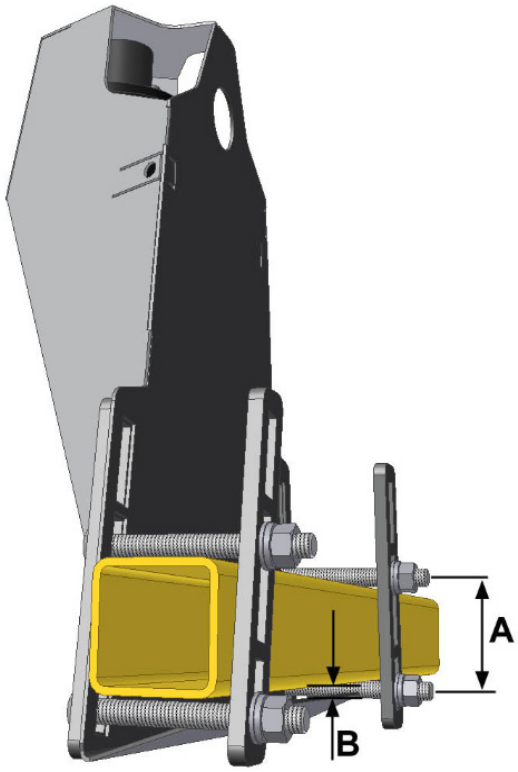


Figure 9: Bracket Mounting Guidelines

⚠ 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.

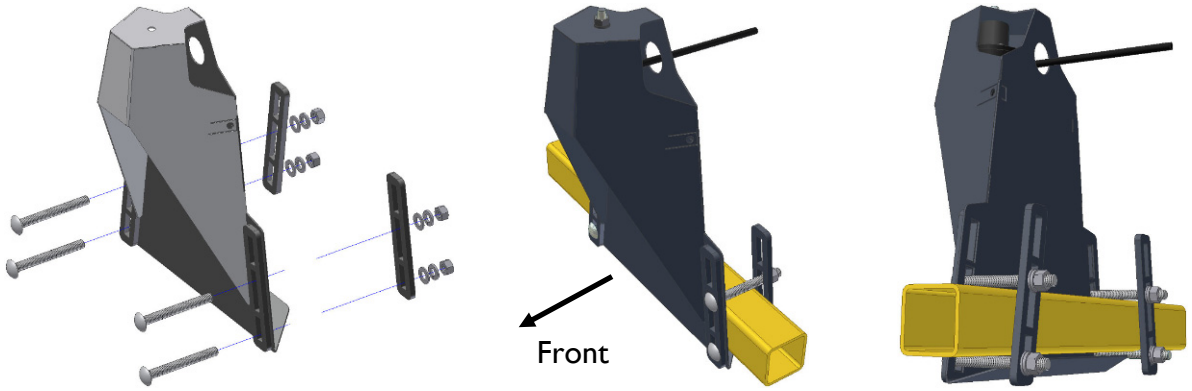


Figure 10: Bracket Mounting Example

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 12**.

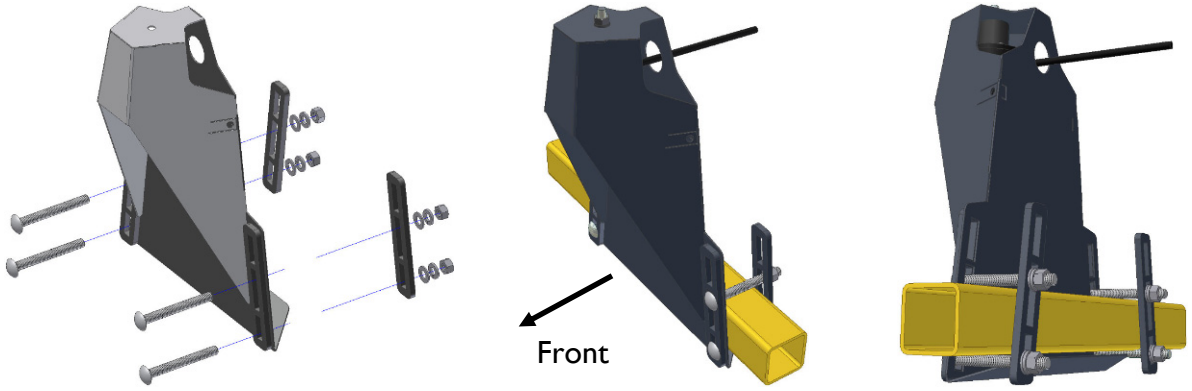


Figure 11: Bracket Mounting Example

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

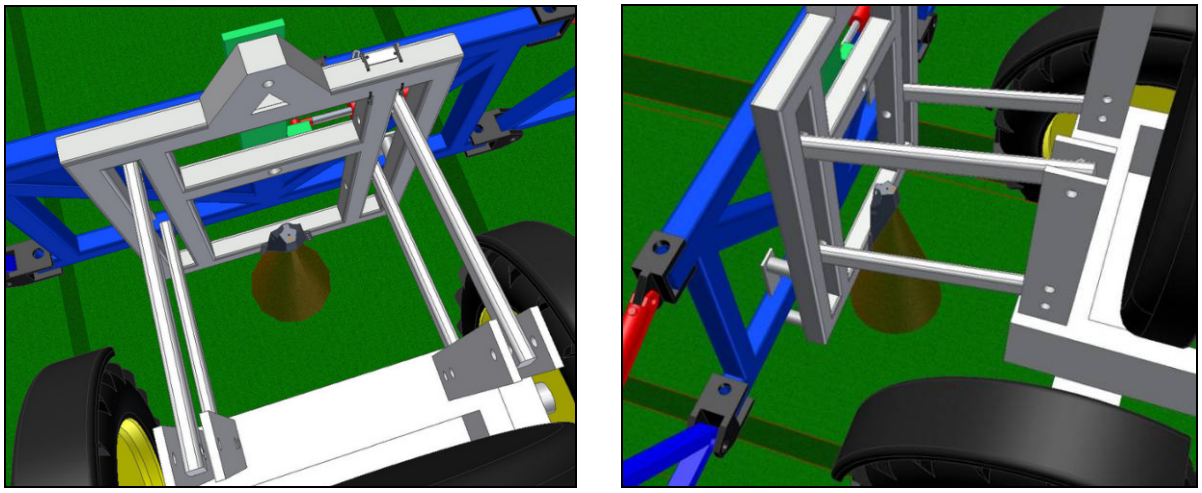


Figure 12: Example Mounting of the Main Lift Bracket

⚠ 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 Roll Sensor Installation

Before installing the roll sensors, determine if the sprayer has a trapeze style, center pivot style or high pendulum style boom. For installation on a trapeze style boom refer to **Section 7.2.** For installation on a center pivot boom refer to **Section 7.3.** For installation on a high pendulum boom refer to **Section 7.4**

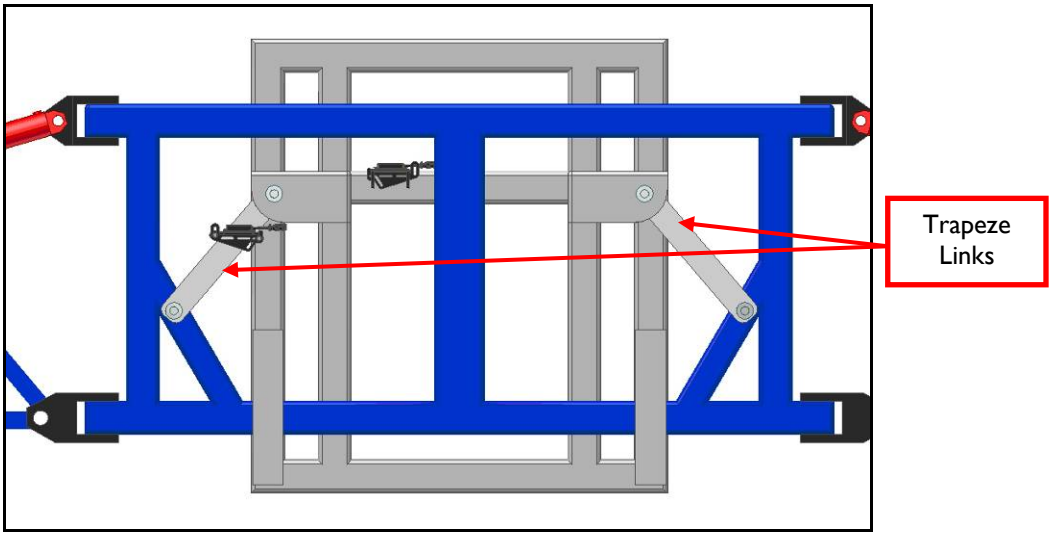


Figure 13: Trapeze Style Boom

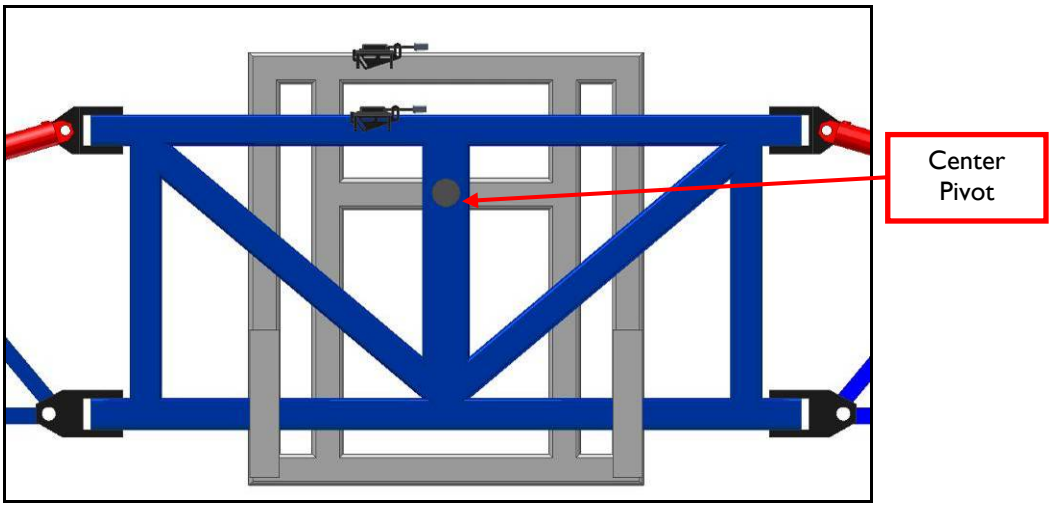


Figure 14: Center Pivot Boom

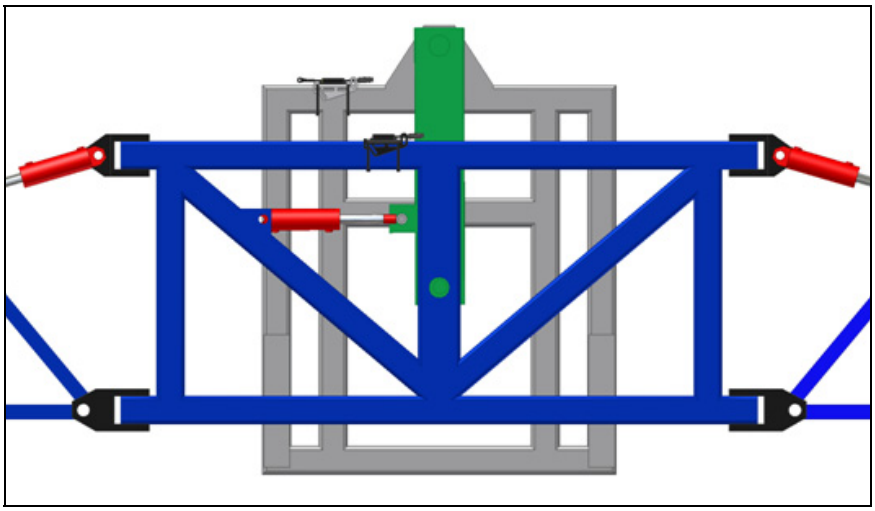


Figure 15: High Pendulum Boom

7.1 Bracket Assembly

1. Securely mount the roll sensors to the included roll sensor brackets using the #6 machine screws. Tighten screws to 10 in-lbs (1.1 Nm).

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).

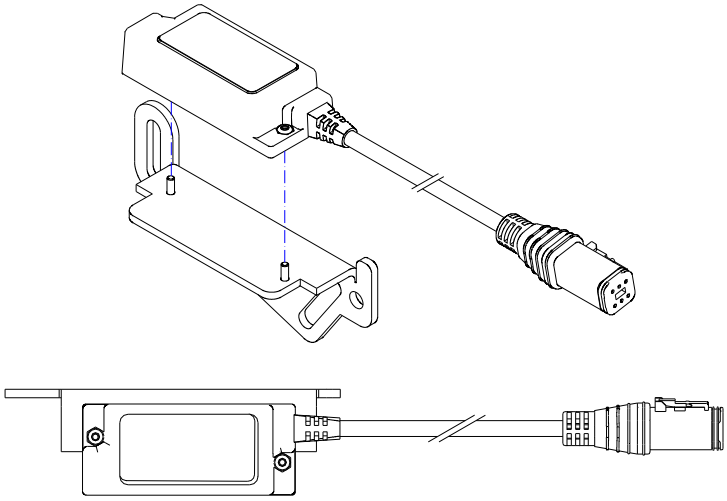


Figure 16: Mounting Roll Sensor to Bracket

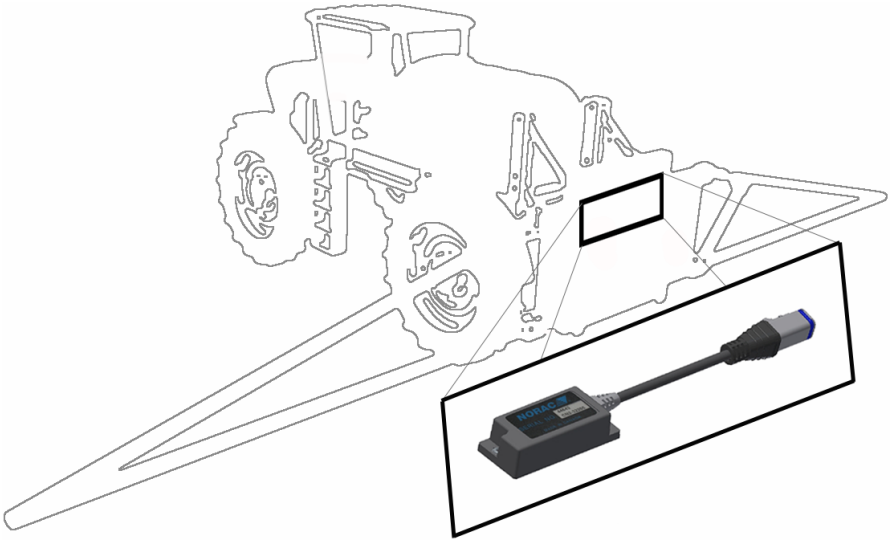


Figure 17: Roll Sensor Orientation - Connector Facing Right Wing

7.2 Roll Sensor Mounting Guidelines: Trapeze-Suspended Booms

1. When mounting the roll sensors, mount the lowest serial number on the trapeze link (boom frame) and the highest serial number on the trapeze support (chassis). For optimal performance, minimize the distance from the boom frame roll sensor to the pivot point (A) and minimize the vertical distance between the chassis roll sensor and the pivot point (B).

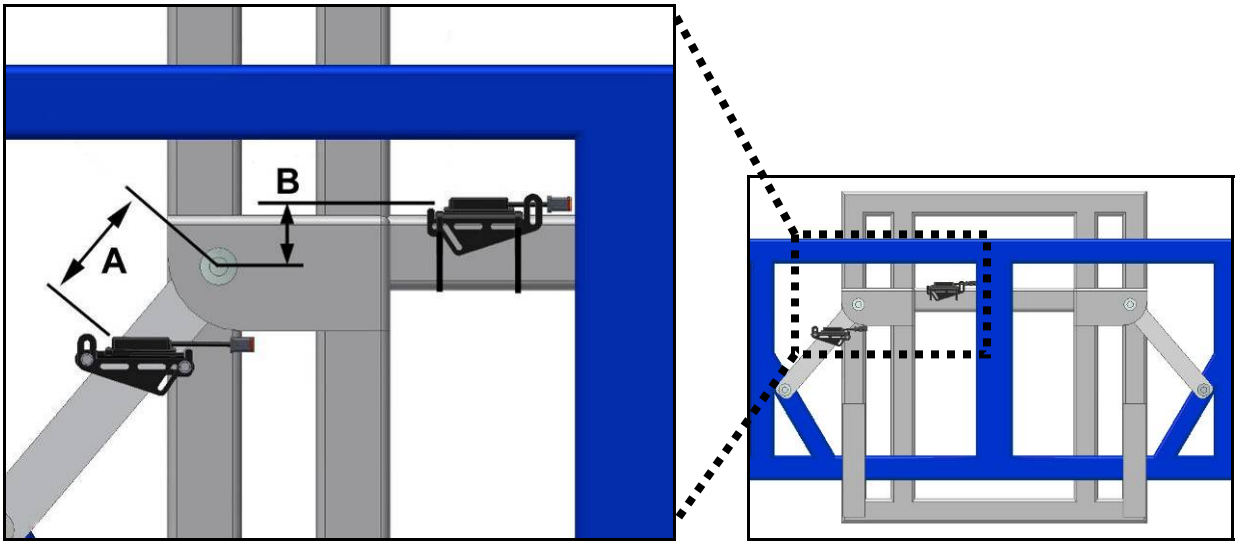


Figure 18: Roll Sensor Mounting on a Trapeze Suspended Boom

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.

7.3 Roll Sensor Mounting Guidelines: Center Pivot Booms

1. When mounting the roll sensors, mount the lowest serial number on the boom frame and the highest serial number 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).

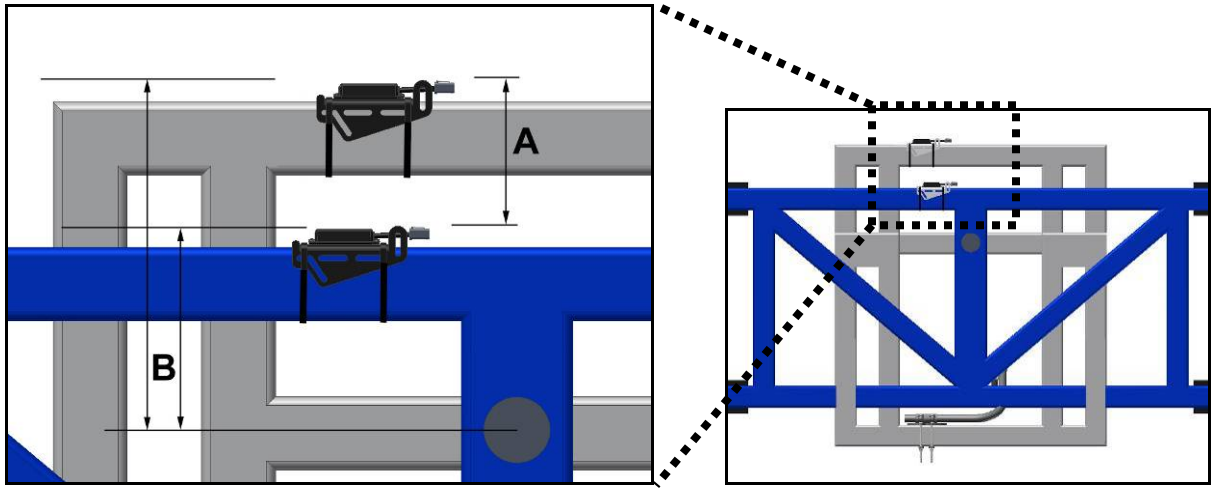


Figure 19: Roll Sensor Mounting on a Center Pivot Suspended Boom

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 20**).

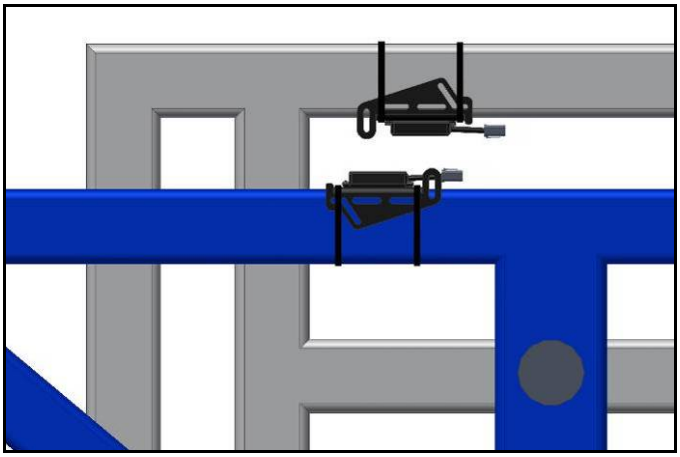


Figure 20: Inverted Chassis Roll Sensor Mounting on a Center Pivot Suspended Boom

7.4 Roll Sensor Mounting Guidelines: High Pendulum Booms

1. When mounting the roll sensors, mount the lowest serial number on the boom frame and the highest serial number on the chassis (non-pivoting portion of the sprayer).

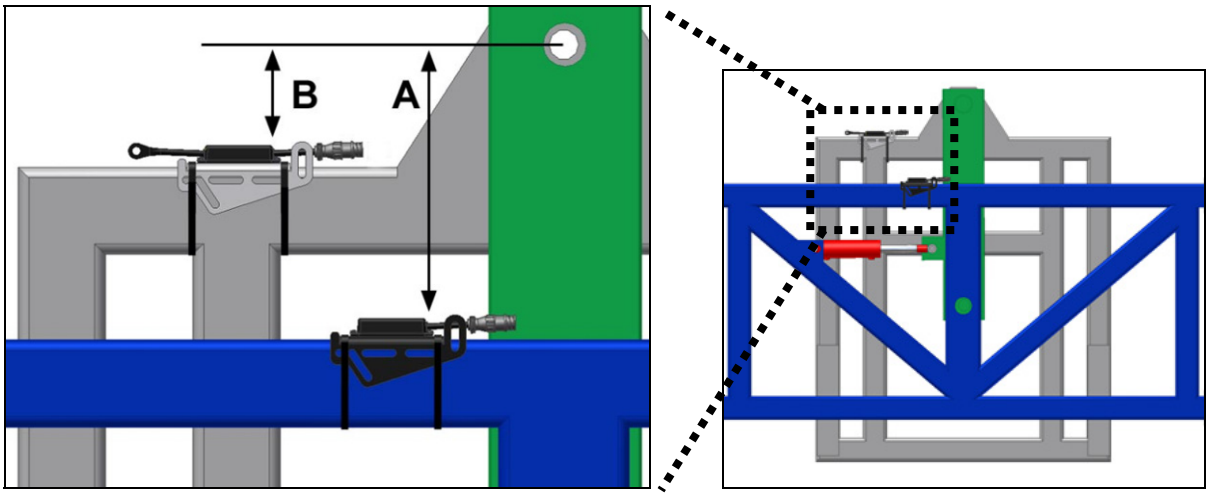


Figure 21: Roll Sensor Mounting on a High Pendulum Boom

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.

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: Self Propel Sprayer

1. Refer to **Figure 1** and **Figure 22**.

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 existing 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 an appropriate power source.

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

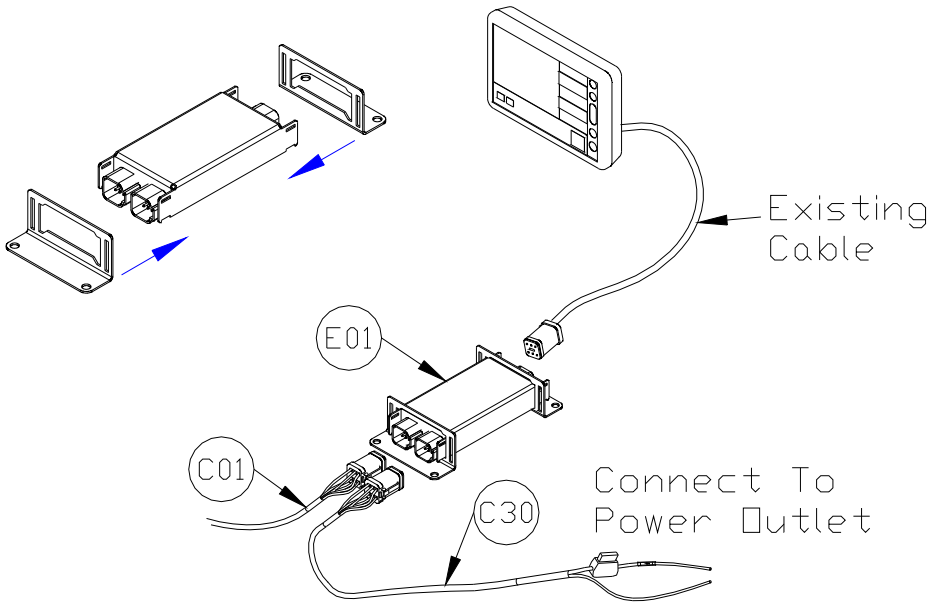


Figure 22: Control Module Mounting (Self Propel Sprayer)

⚠ Important

Cable C30 is shown in Figure 22 for informational purposes only. The battery cable is ordered separately from this kit and may differ from the diagram above.

8.2 Control Module: Pull Type Sprayer

1. Refer to **Figure 2** and **Figure 23**.

2. Refer to the display kit installation manual to determine the best mounting location for the control module (E01).

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

4. Connect the existing power cable to one of the two CANbus connectors on the other end of the control module.

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

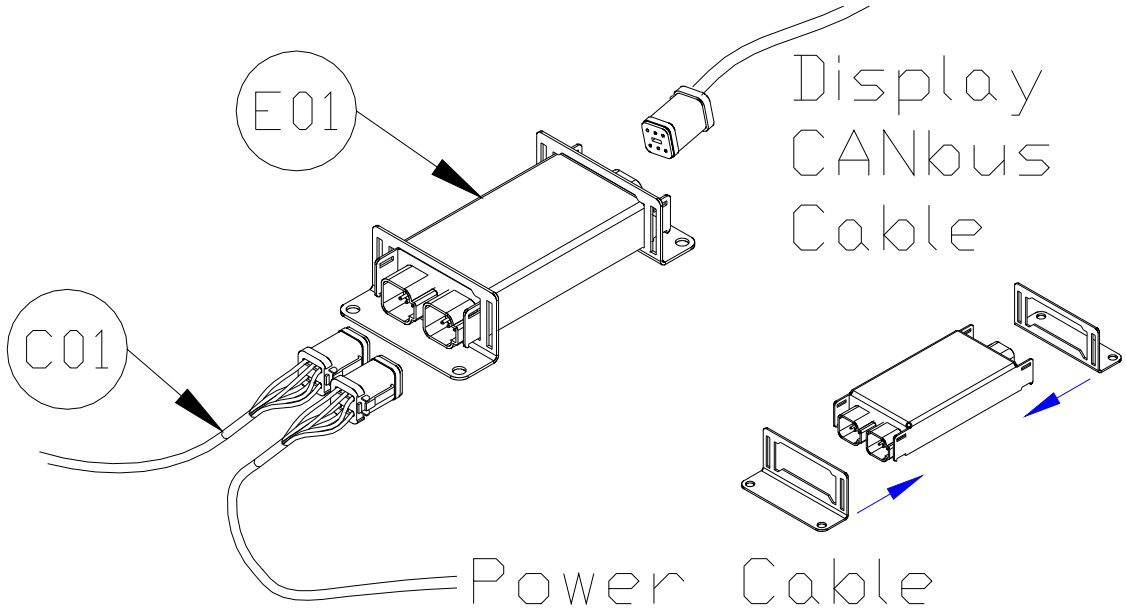
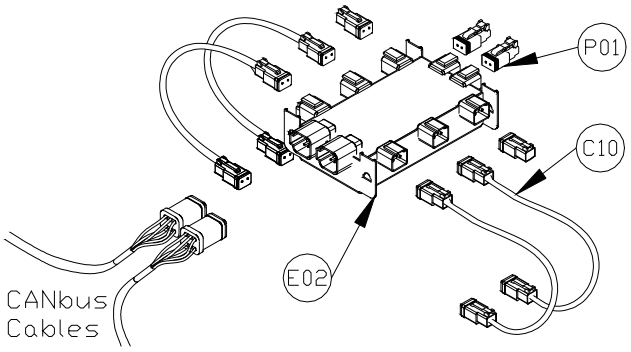


Figure 23: Control Module Mounting (Pull Type Sprayer)

8.3 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	Option 3
8	Option 4

Figure 24: Valve Module

2. Verify the valve coil connectors are oriented vertically (**Figure 25**).

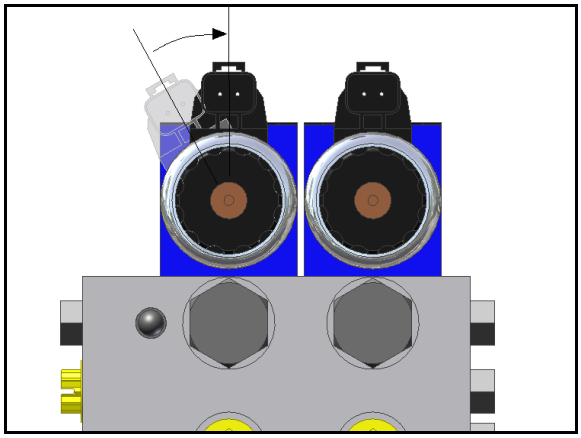


Figure 25: Align Coils

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 26**).

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

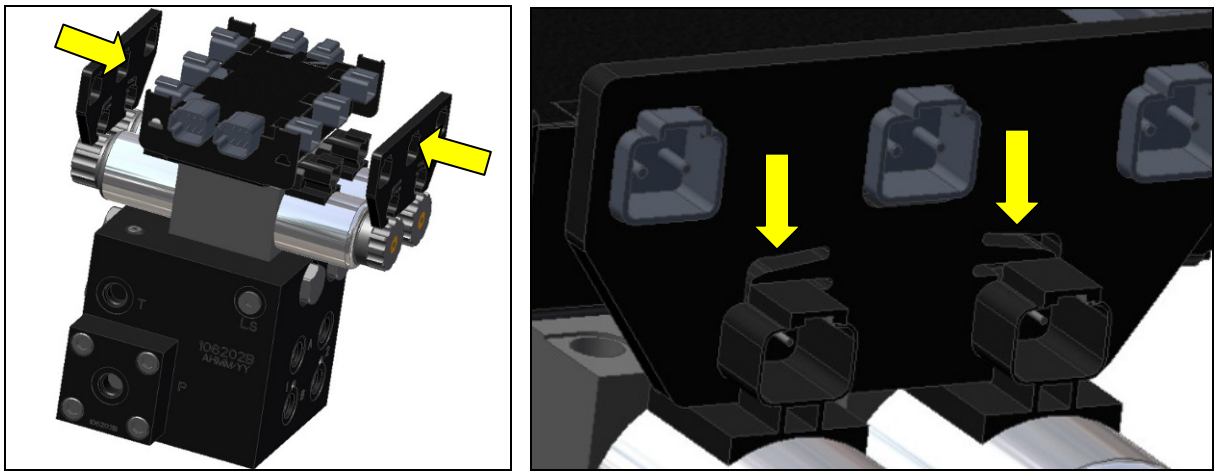


Figure 26: Valve Module Bracket Installation

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 as illustrated in **Figure 27**. 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.

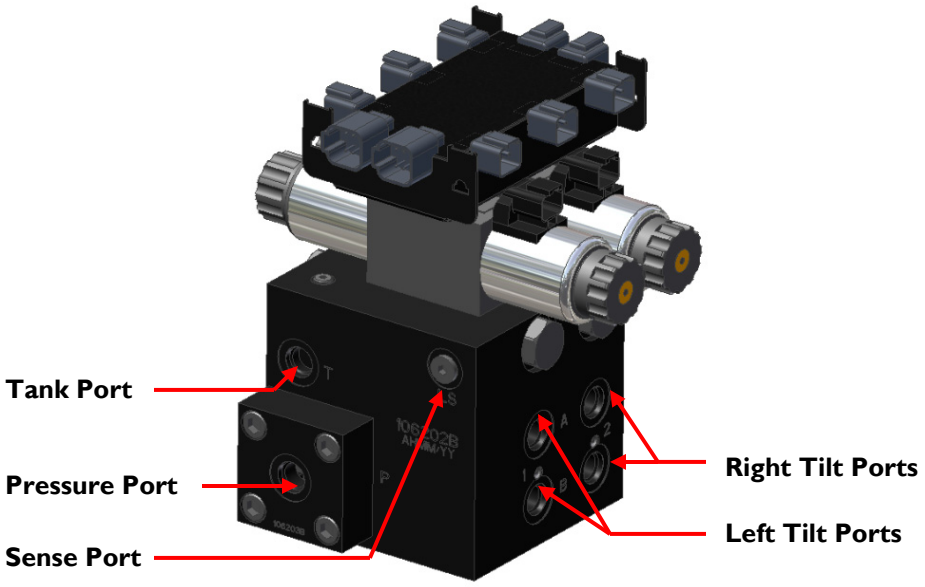


Figure 27: Valve Module - Valve Coil Connections

8.4 Input Module

⚠ Important

Cables C20 and C21 are shown in Figure 28 for informational purposes only. The interface cables are ordered separately from this kit and may differ from the diagram below.

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.

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

4. Connect the 12 pin connector on the tilt interface cable (C20) to the *Thru 2* connector on the side of the input module and insert the other connectors on C20 into the tilt connectors on the sprayer valve block.

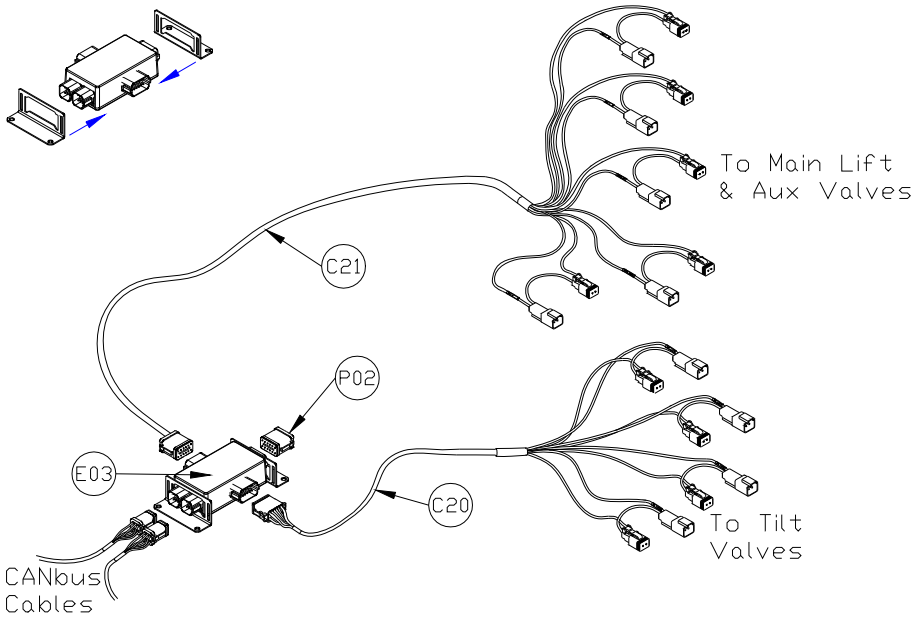


Figure 28: Input Module Connections

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 and insert the other connectors on C21 into the main lift connectors on the sprayer valve block.

6. If the sprayer has a bypass valve, insert the 2-pin tee connector marked "AUX 1" into the bypass valve connection.

7. If the sprayer has a slant (roll) function, insert the 2-pin tee connectors marked "AUX 2" into the slant clockwise connection and insert "AUX 3" into the slant counterclockwise.

9 Connecting the Sensors to the CANbus

1. Route cable C03 from the input module to the 8-way coupler (E11).

2. Connect both roll sensors to the 8-way coupler. Fasten the 8-way coupler to the boom with cable ties.

3. 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.

4. 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.

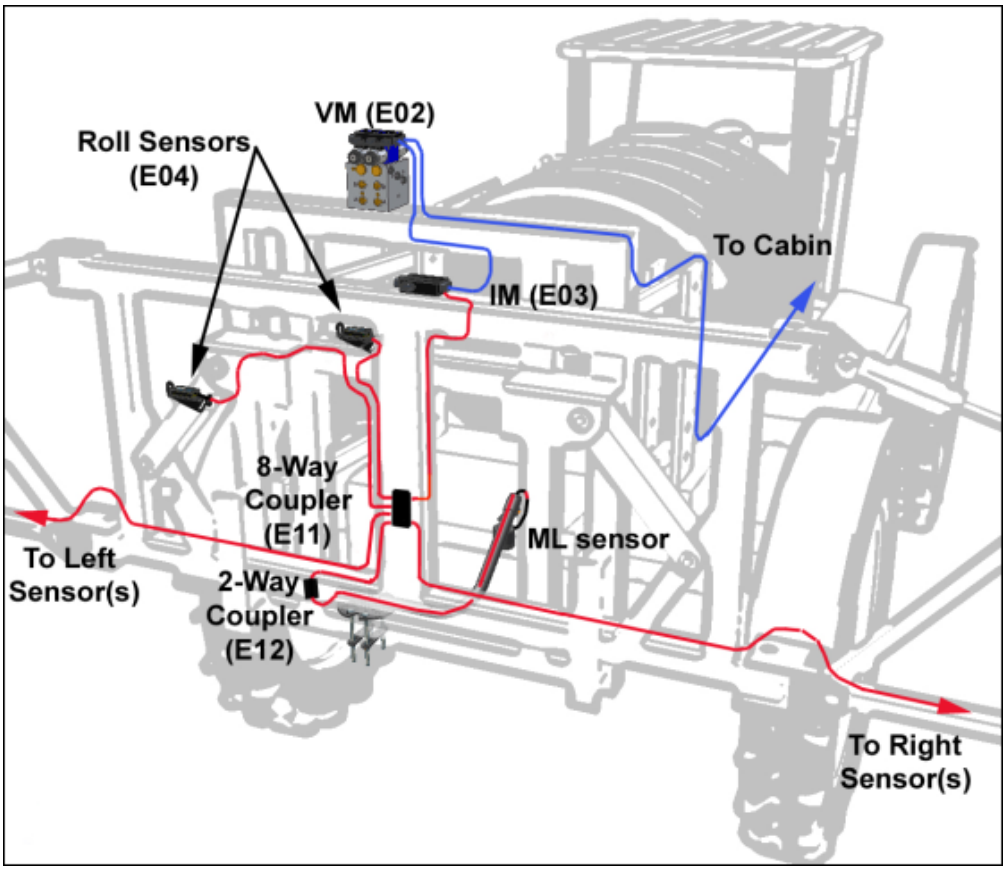


Figure 29: UC5 Module Locations and Cable Connections

5. 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.

⚠ 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.

Before assembling the valve block, identify if the sprayer tilt cylinders are single acting or double acting. A single acting cylinder will only have one hose running to it, while a double acting cylinder has two hoses routed to it.

10.1 Valve Assembly: Single Acting

1. On a clean surface remove the plastic plugs from the block.
2. Install the 6MB-6MJ (F07) fittings into the "P" and "T" ports. Tighten to 18 ft-lbs (24 Nm).
3. Insert the two orifices (F08) into the "B" ports with the notch facing out.
4. Install the 6MB-6MJ (F07) fittings into the "B" ports. Tighten to 18 ft-lbs (24 Nm).
5. Install the 6MBP (F09) plugs into the "A" ports. Tighten to 18 ft-lbs (24 Nm).

Fitting F07 is a special fitting; if an additional coupler is required, contact NORAC.

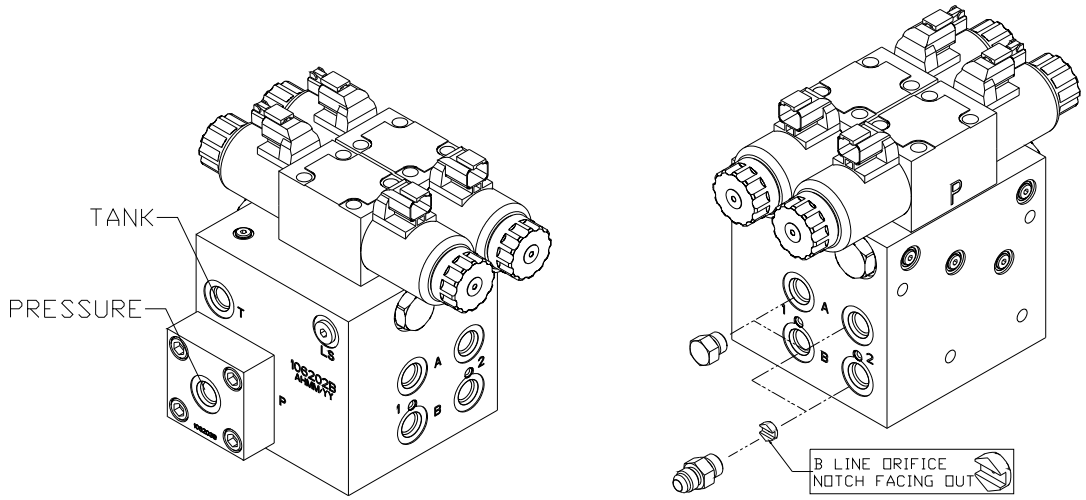


Figure 30: NORAC Valve Block Details (Single Acting)

10.2 Valve Assembly: Double Acting

1. On a clean surface remove the plastic plugs from the block.
2. Install the 6MB-6MJ (F07) fittings into the "P" and "T" ports. Tighten to 18 ft-lbs (24 Nm).
3. Insert the two orifices (F08) into the "B" ports with the notch facing out.
4. Install the 6MB-6MJ (F07) fittings into the "B" ports. Tighten to 18 ft-lbs (24 Nm).
5. Insert the two orifices (F08) into the "A" ports with the notch facing in.
6. Install the 6MB-6MJ (F07) fittings into the "A" ports. Tighten to 18 ft-lbs (24 Nm).

Fitting F07 is a special fitting; if an additional coupler is required, contact NORAC.

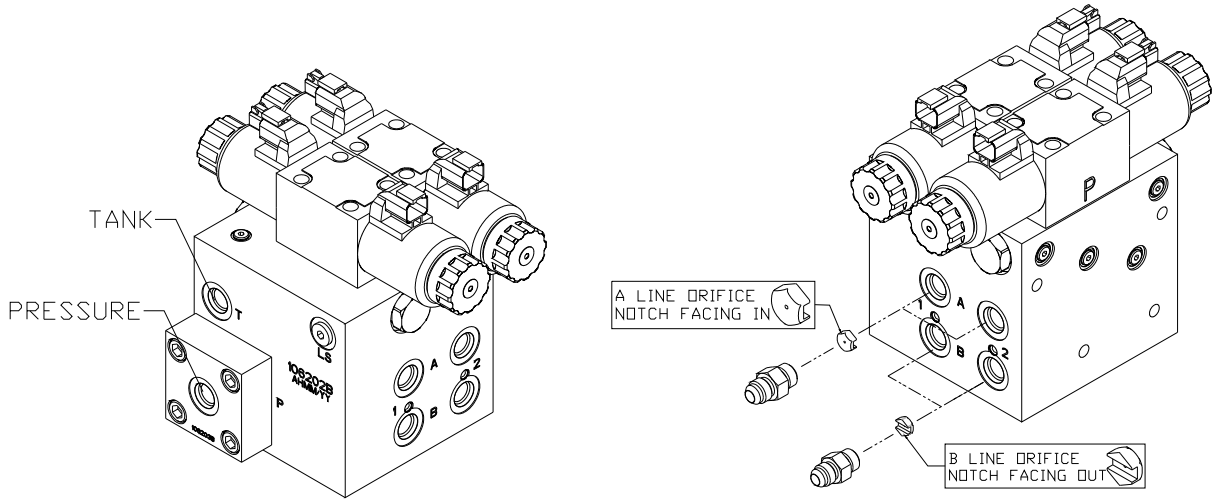


Figure 31: NORAC Valve Block Details (Double Acting)

10.3 Valve Block Mounting

1. Mount the valve block on the sprayer near the existing valve block.

2. Use the supplied valve bracket B10 to install the valve block.

3. 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".

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

5. Cut off excess threaded rod, if necessary.

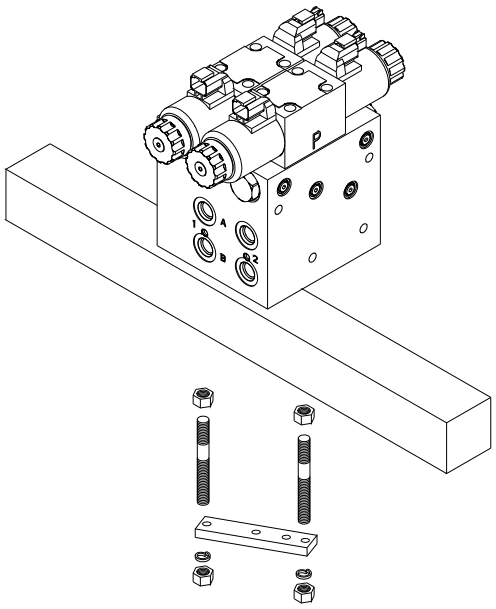


Figure 32: Valve Block Mounting

10.4 Hydraulic Plumbing: Single Acting

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 4.**

2. Disconnect the tilt raise lines from the sprayer valve block and insert the two tees (F02) between the hoses and the valve block.

3. Connect two hydraulic hoses (H02) from the free ends of the tees to the NORAC valve block. The raise lines must be connected to the "B" ports.

4. If there are any accumulators on the tilt hydraulic circuits, ensure there is a 2-way orifice in the accumulator fitting.

5. There must be no other orifices in the hydraulic circuit between the NORAC valve block and the tilt cylinders.

6. Disconnect the pressure and tank lines from the sprayer valve block and insert the two tees (F01) between the hoses and the valve block.

7. Connect two hydraulic hoses (H01) from the free ends of the tees to the pressure and tank port on the NORAC valve block.

10.5 Hydraulic Plumbing: Double Acting

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 5.**

2. Disconnect the tilt raise and lower lines from the sprayer valve block and insert the four tees (F02) between the hoses and the valve block.

3. Connect four hydraulic hoses (H02) from the free ends of the tees to the NORAC valve block. The raise lines must be connected to the "B" ports and the lower lines must be connected to the "A" ports.

4. If there are any accumulators on the tilt hydraulic circuits, ensure there is a 2-way orifice in the accumulator fitting.

5. There must be no other orifices in the hydraulic circuit between the NORAC valve block and the tilt cylinders.

6. Disconnect the pressure and tank lines from the sprayer valve block and insert the two tees (F01) between the hoses and the valve block.

7. Connect two hydraulic hoses (H01) from the free ends of the tees to the pressure and tank port on the NORAC valve block.

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.

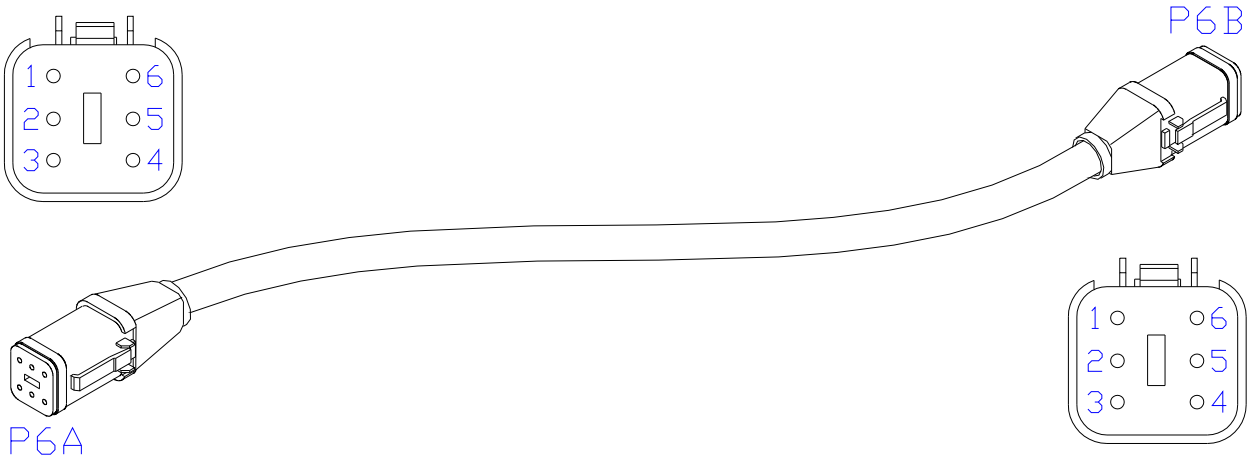
4. The procedure for the installation of the UC5 Spray Height Control system is now complete. Begin the AUTOMATIC SYSTEM SETUP procedure as described in the UC5 Spray Height Control Operator's Manual.

5. For optimal performance of the UC5 system, there should be very little play at the hitch clevis. The addition of polymer washers can help tighten up this connection (**Figure 33**).

Figure 33: Hitch Point

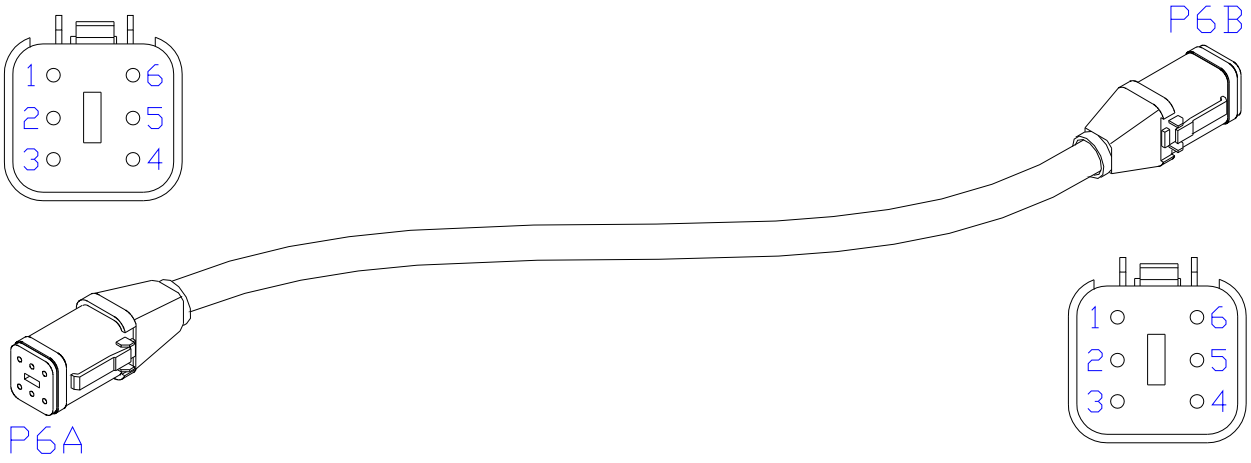
12 Cable Drawings

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



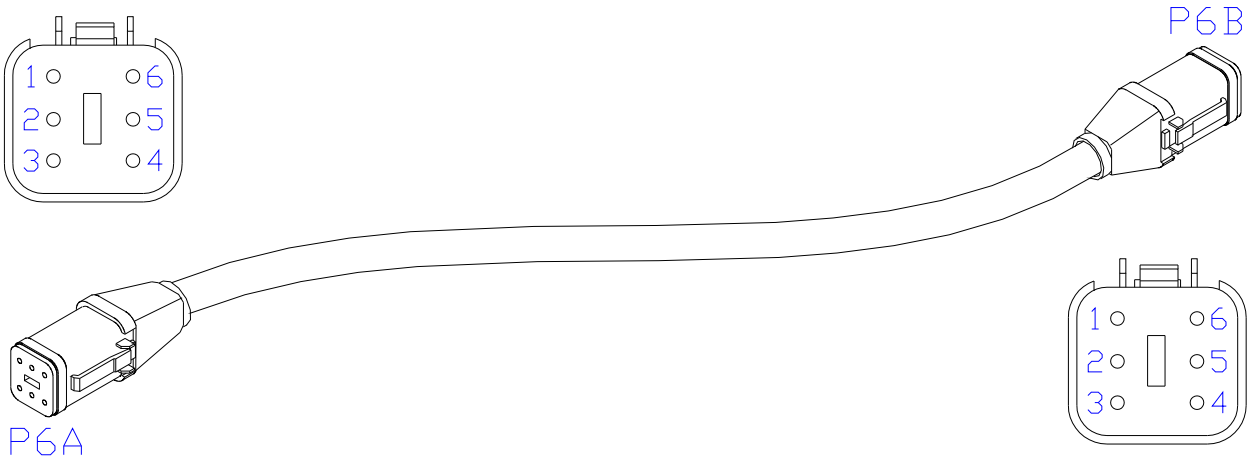
P6A			P6B	
ECU GND	BLK	1	BLK	ECU GND
SIG GND	BLK/WHT	2	BLK/WHT	SIG GND
CANL	YEL	3	YEL	CANL
CANH	GRN	4	GRN	CANH
SIG PWR	RED/WHT	5	RED/WHT	SIG PWR
ECU PWR	RED	6	RED	ECU PWR

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



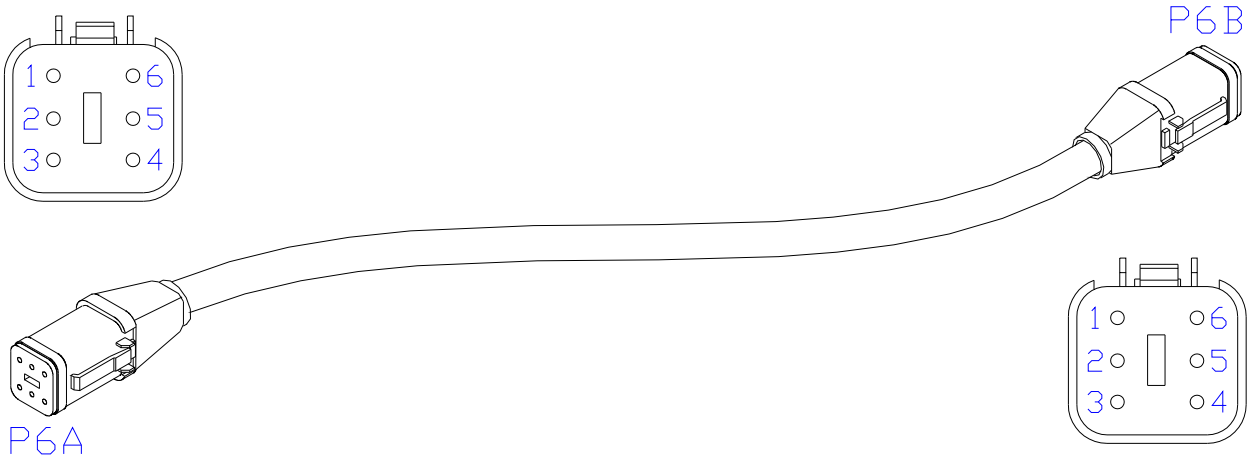
P6A			P6B	
ECU GND	BLK	1	BLK	ECU GND
SIG GND	BLK/WHT	2	BLK/WHT	SIG GND
CANL	YEL	3	YEL	CANL
CANH	GRN	4	GRN	CANH
SIG PWR	RED/WHT	5	RED/WHT	SIG PWR
ECU PWR	RED	6	RED	ECU PWR

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



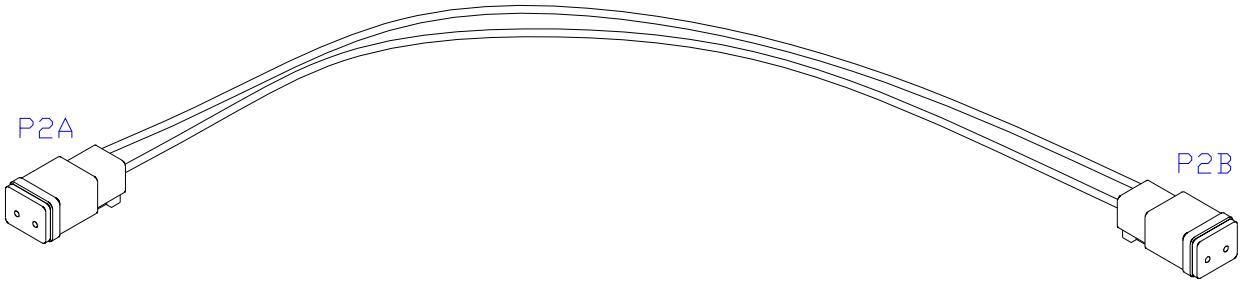
	P6A		P6B	
ECU GND	BLK	1	1 BLK	ECU GND
SIG GND	BLK/WHT	2	2 BLK/WHT	SIG GND
CANL	YEL	3	3 YEL	CANL
CANH	GRN	4	4 GRN	CANH
SIG PWR	RED/WHT	5	5 RED/WHT	SIG PWR
ECU PWR	RED	6	6 RED	ECU PWR

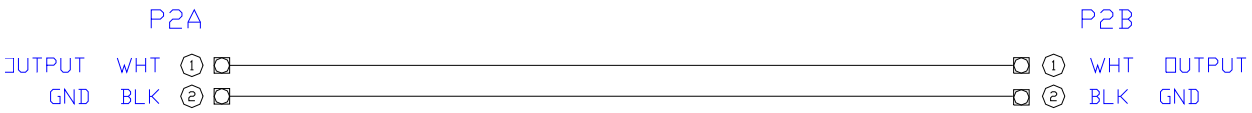
12.4 ITEM C05: 43210-20 - CABLE UC5 NETWORK 18 AWG - 20M



	P6A		P6B	
ECU GND	BLK	1	1 BLK	ECU GND
SIG GND	BLK/WHT	2	2 BLK/WHT	SIG GND
CANL	YEL	3	3 YEL	CANL
CANH	GRN	4	4 GRN	CANH
SIG PWR	RED/WHT	5	5 RED/WHT	SIG PWR
ECU PWR	RED	6	6 RED	ECU PWR

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





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