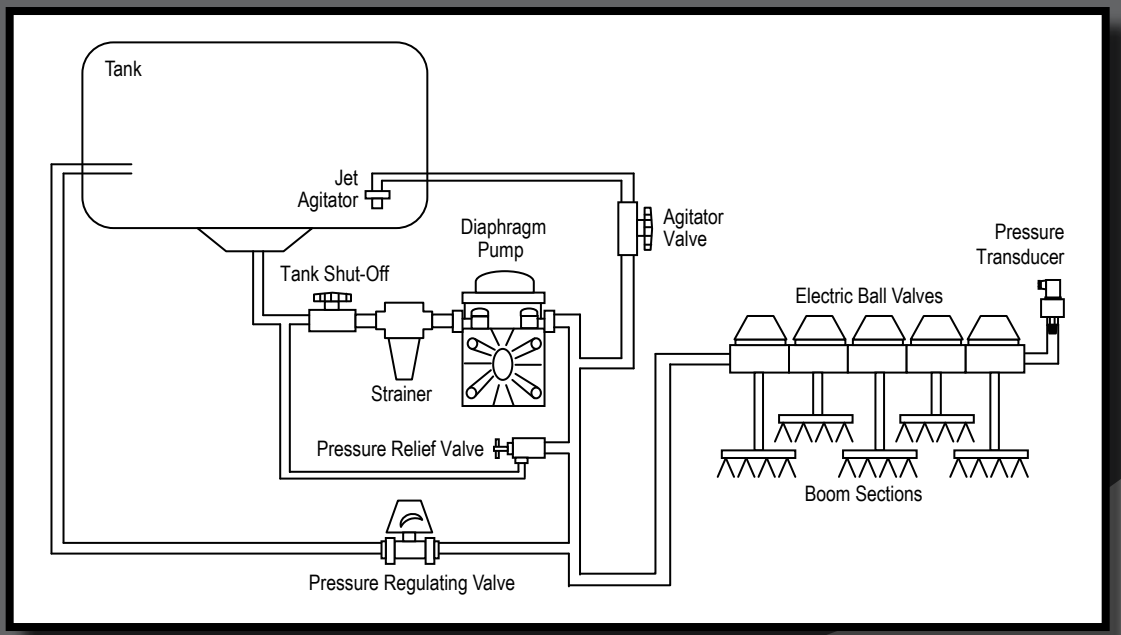
SPRAYER CONTROL
PLUMBING & INSTALLATION

Manual for SprayLink Cable Installations



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Safety Information

TeeJet Technologies is not responsible for damage or physical harm caused by failure to adhere to the following safety requirements.

As the operator of the vehicle, you are responsible for its safe operation.

Be sure that the area around the vehicle is clear of people and obstacles before and during engagement.

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PLUMBING DIAGRAMS

The following diagrams are shown as general guidelines to follow when plumbing TeeJet Sprayer control components. The type of pump used, type of valves used and location of other components can vary from sprayer to sprayer. It is important to ensure that if a pressure transducer is used that it is located as close to the spray tips as possible. Normally this is at the boom control valves. However, if a particular boom section is always used, the pressure transducer can be mounted on that particular boom section. If a flow meter is used, ensure that all of the flow going through the flow meter is directed to the spray tips. Make sure that proper distance is allowed on the inlet and outlet side of the flow meter (refer to the flow meter section of this manual).

Figure 1-1: Bypass Plumbing Diagram, Flow Based System ,Centrifugal Pump

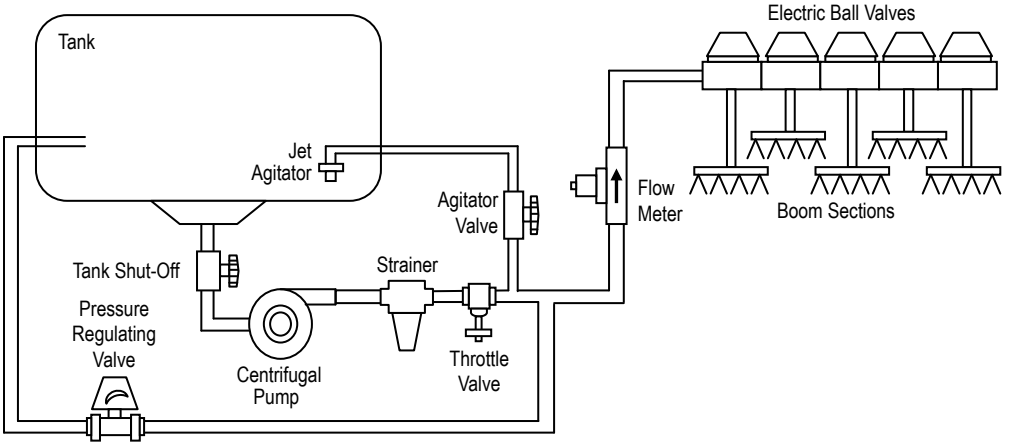
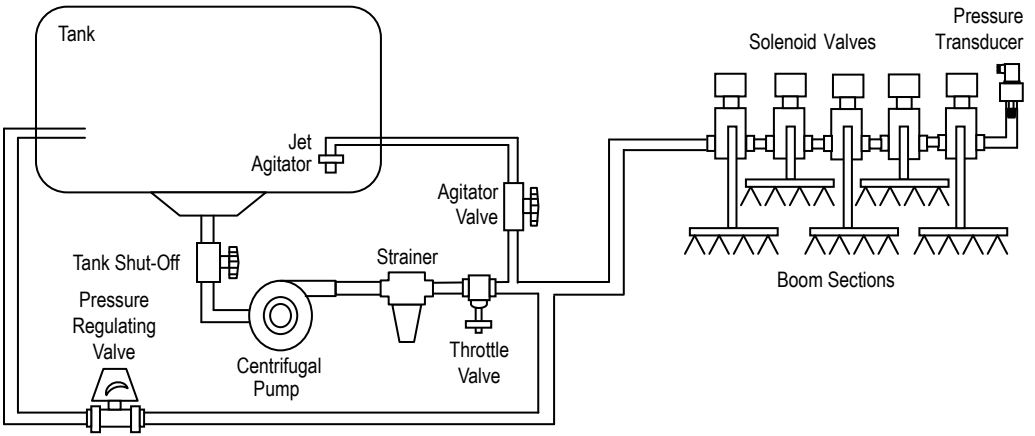


Figure 1-2: Bypass Plumbing Diagram, Pressure Based System, Centrifugal Pump



Sprayer Control System

Figure 1-3: Throttle Plumbing Diagram, Flow Based System, Diaphragm Pump

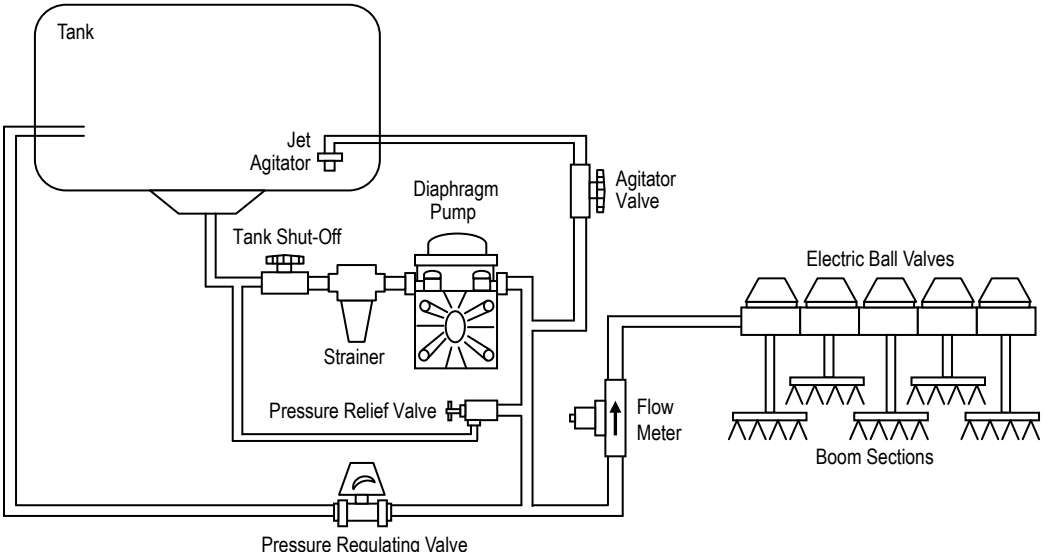


Figure 1-4: Bypass Plumbing Diagram, Pressure Based System, Diaphragm Pump

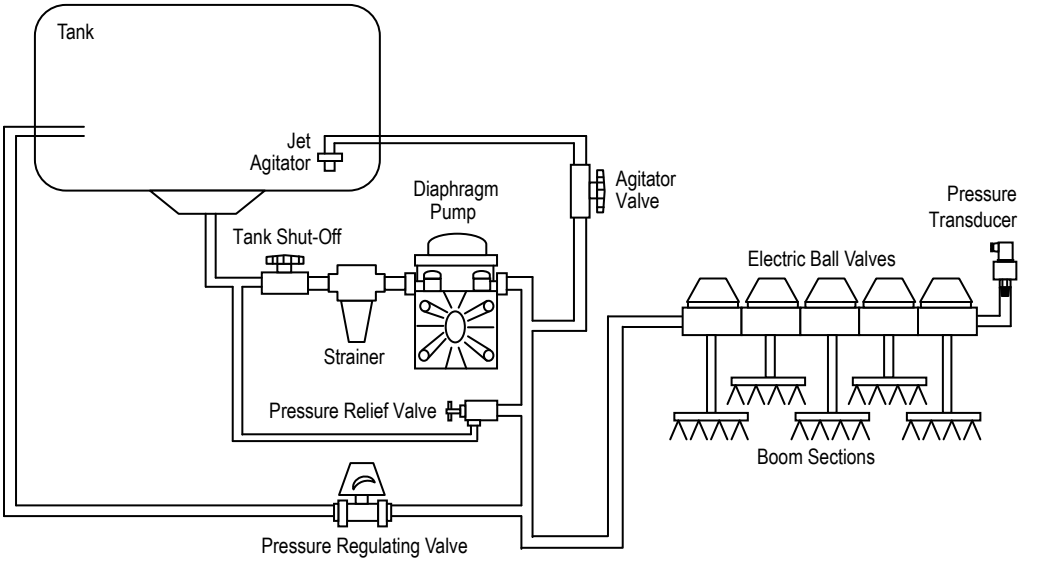


Figure 1-5: Throttle Plumbing Diagram, Flow Based System, Diaphragm Pump

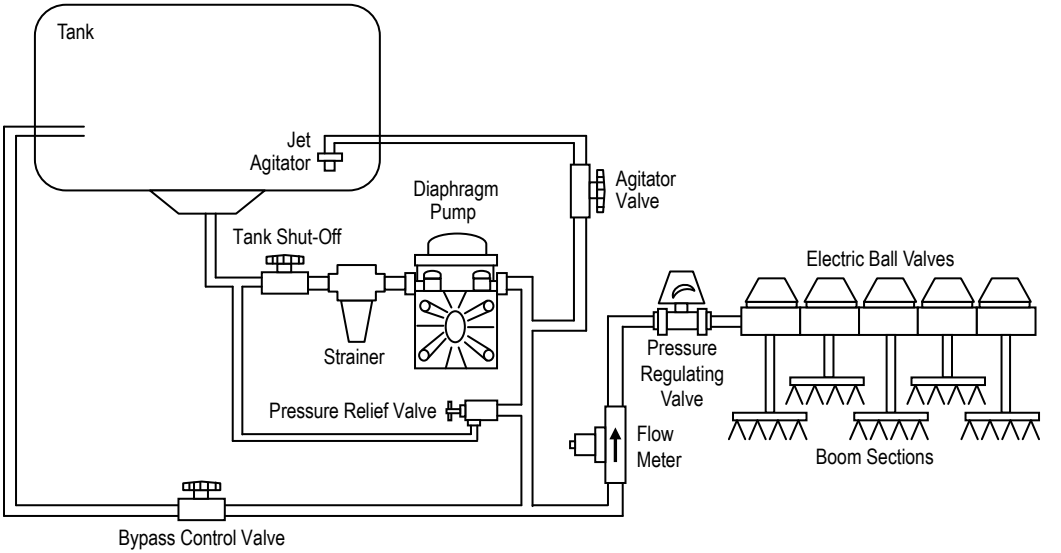
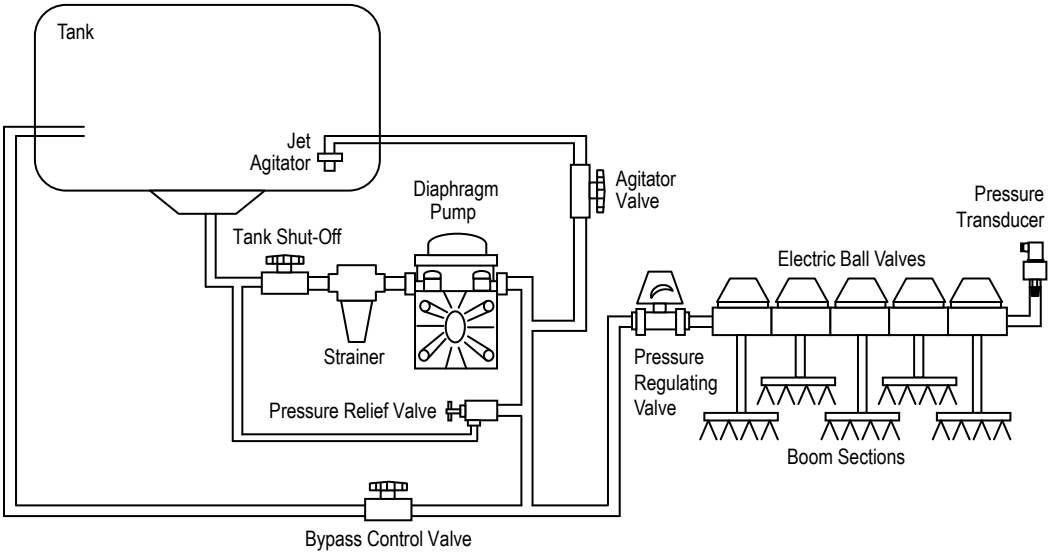


Figure 1-6: Throttle Plumbing Diagram, Pressure Based System, Diaphragm Pump



Sprayer Control System

Figure 1-7: Throttling Plumbing Diagram, Flow Based System, Centrifugal Pump

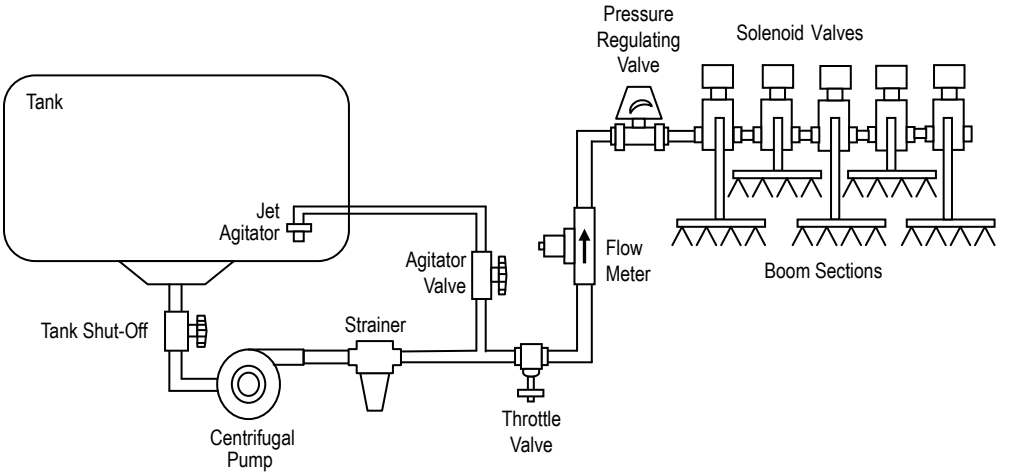
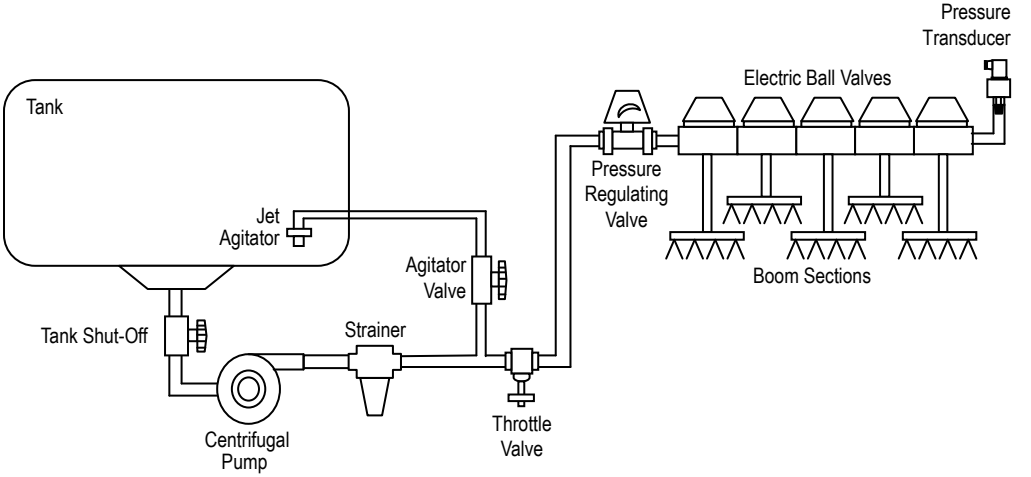


Figure 1-8: Throttling Plumbing Diagram, Pressure Based System, Centrifugal Pump



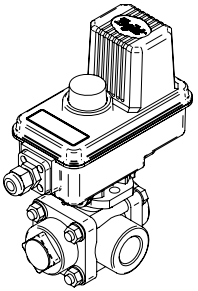
MOUNTING SPRAYER COMPONENTS

Pressure Regulator In Bypass Mode

All pressure regulating valves for TeeJet control kits will be wired for use in a by-pass system. While plumbed in a by-pass mode, with the AUTO/MAN key in the “MAN” mode, the valve should close when the [+] key (switch) is pressed and open when the [−] key (switch) is pressed.

The pressure regulating valve can also be mounted in a throttle position as an alternative location. Refer to the plumbing diagrams in the plumbing section of this manual for differences between throttle and bypass plumbing.

Figure 1-9: Pressure Regulator

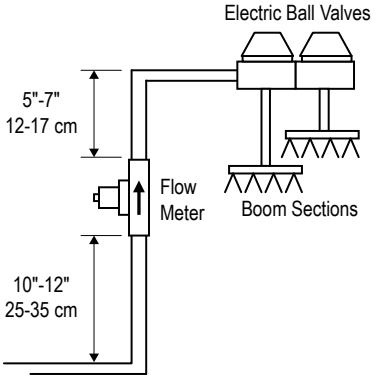


Regulator In Throttling Mode

The pressure regulating valve can be located in the supply line before the boom control valves. This means that all of the flow going through the regulating valve is directed to the spray booms. If you choose this location, the control console will need to be properly programmed to reverse the polarity of the valve. This programming step can be found in the Programming and Operating Manual supplied with your console.

When in throttling mode, with the sprayer control console in manual mode, the valve should open when the [+] key (switch) is pressed, and close when the [−] key (switch) is pressed. Be sure to check this before plumbing the valve into the system.

Figure 1-10: Flow Meter Mounting

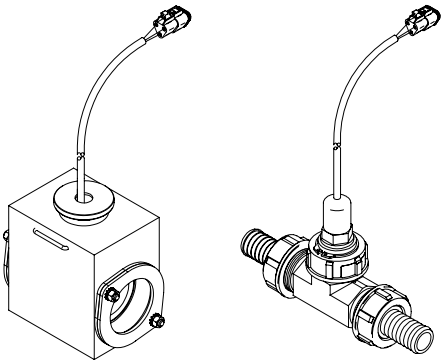


Flow Meter

To ensure accurate readings, the flow meter (if used) must be mounted 10" to 12" (25-35 cm) from other pipe fittings on the inlet side of the flow meter and 5" to 7" (12-17 cm) on the exit side of the flow meter. Mount (preferably) in a vertical position with the flow going up with direction of flow arrow (if applicable) pointing toward the boom control valves. Refer to figure below.

Be sure the flow meter is plumbed so that all liquid passing through it is routed to the booms and not back to the tank. When using three-way boom control valves, refer to Programming and Operating instruction manual of your sprayer controller for programming guidelines.

Figure 1-11: Flow Meter Examples



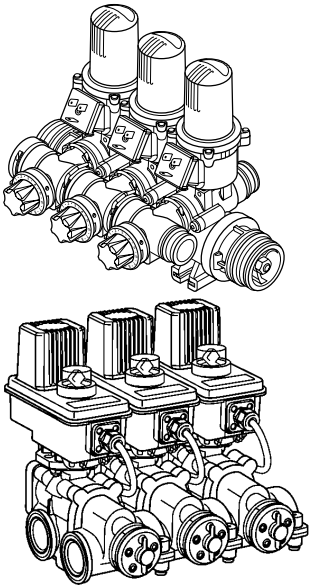
Boom Control Valves

The Boom Control Valves are connected in tandem and centered in front of the boom sections. See the Control Valve Instruction Manual for mounting instructions.

NOTE: If using a flow based (flow meter) control system, flow should not be bypassed back to the tank from the valves unless using three-way, constant pressure valves. All flow that goes through the flow meter should either be directed to the boom sections or dead–head at the valves.

If using three-way valves, refer to the instruction manual of the valves you are using for valve calibration instructions.

Figure 1-12: Boom Control Valves Examples



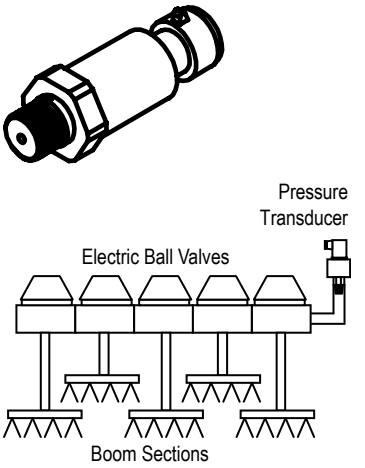
Pressure Transducer

The pressure transducer (if used) should be installed as close to the spray tips as possible. Normally this is at the boom control valve assembly. Refer to diagrams below. Mount the unit vertically on a short stand pipe to help protect the sensor.

NOTE: Pressure drop, to some degree, is found in most plumbing systems. Pressure drop is created when there is any kind of restriction in the spray line reducing flow rate and is quite often produced between the boom control valve assembly and the spray tips. If one of the boom sections on the sprayer is always used, the pressure transducer can be installed on that particular boom section, therefore minimizing any potential pressure drops between the sensor and spray tips. If the pressure drop in your system is greater than 5 psi (0.3 bar), you should consider this as an alternative location for the pressure transducer.

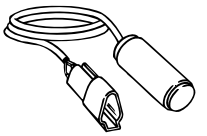
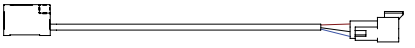
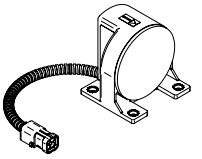
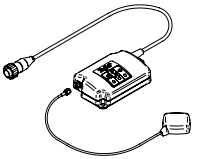
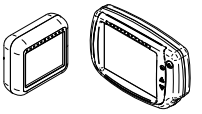
Check all components to make sure they are mounted securely to avoid excessive vibration.

Figure 1-13: Pressure Transducer



SPEED SENSORS

Options

Magnetic Speed Sensor	Two magnets, Sensor with attached connector cable, and mounting hardware.	
Proximity Speed Sensor	Proximity speed sensor with attached connector cable.	
Radar Speed Sensor	Radar speed sensor and appropriate adapter cable (if ordered). Follow the instructions supplied with Radar Speed Sensor for installation.	
GPS Speed Sensor	GPS speed sensor, GPS antenna and appropriate adapter cable (generic, Raven or Deutsch). Follow the instructions supplied with GPS Speed Sensor for installation.	
Matrix® Pro Guidance System	Built-in GPS supplies speed. Follow the instructions supplied with the Matrix Pro guidance system for installation.	

Magnet & Proximity Speed Sensor Installation

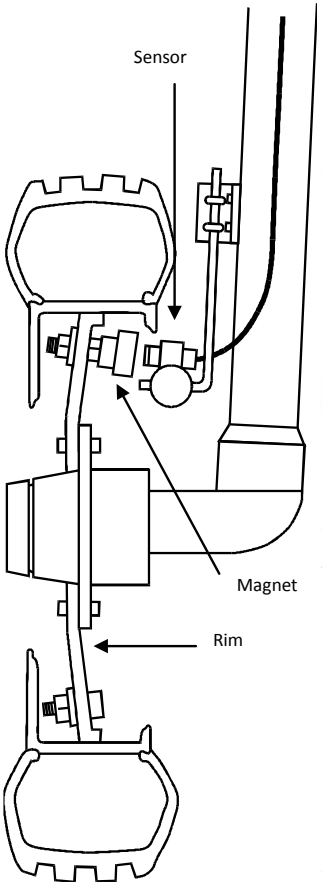
Step 1: Location

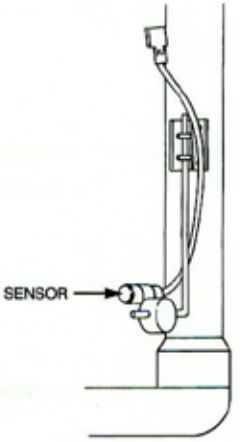
The speed sensor assembly should be installed on a non-driven wheel to avoid potential errors that are likely to occur from a slipping drive wheel. In case of a tractor mounted sprayer the speed sensor is usually mounted on one of the front wheels. In case of a trailed sprayer the sensor is usually mounted on one of the sprayer wheels.

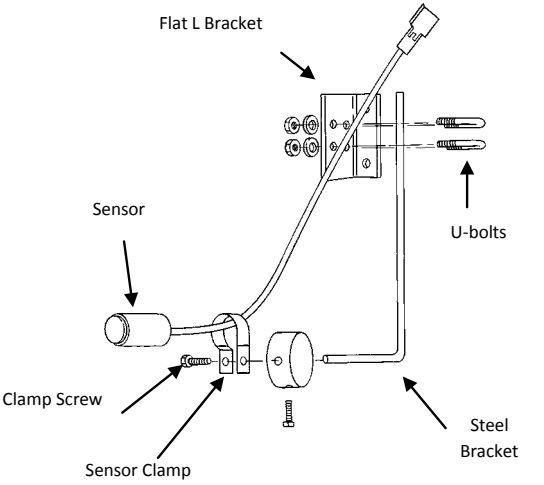
Step 2A: Installing The Magnetic Sensor

The flat L bracket of the wheel speed sensor kit should be secured to a vertical member near the non-driven wheel. The round, right angle steel bracket is then secured to the flat bracket with the two U-bolts and necessary hardware provided. The round, right angle bracket is then used to secure the magnetic sensor mounting clamp.

Figure 1-14: Installing The Magnetic Sensor







The magnetic sensor should be inserted into the mounting clamp and positioned to within 1/8" to 3/8" (3-10 mm) of the wheel magnet. Tighten the sensor clamp using the clamp screw.

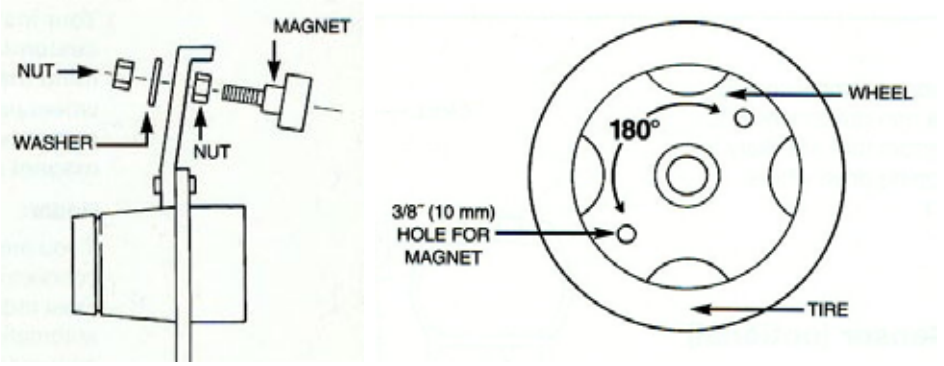
NOTE: Your installation will likely vary from the example. It may be necessary to customize the installation to accommodate your specific machine. The magnetic sensor must be mounted in-line with the magnets and positioned within 1/8" to 3/8" (3-10 mm) from each magnet as they pass the Sensor assembly.

Installing the Wheel Magnets

The two magnets must be spaced an equal distance around the wheel. Check for pre-drilled holes in the wheel rim. If pre-drilled holes are not available, lay out a pattern as shown in figure above and drill two 3/8" (10 mm) holes, locating them near the outer edge of the rim, if possible, and 180° from each other.

Place the magnets into each of the two holes on the inside rim and securely fasten using the nuts and washers provided.

Figure 1-15: Installing the Wheel Magnetics



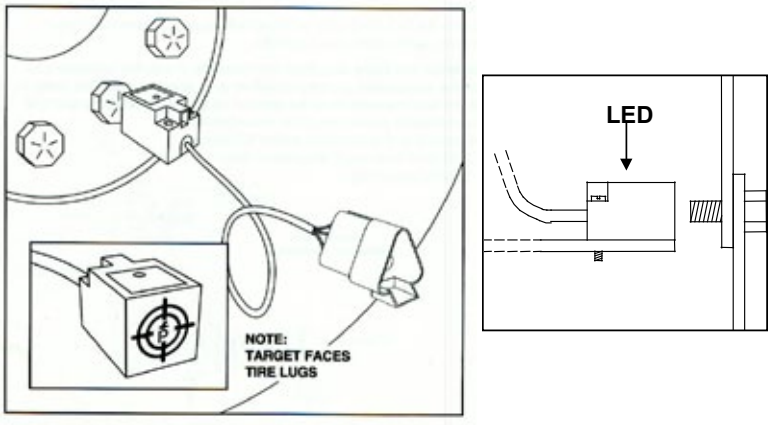
Step 2B: Installing The Proximity Sensor

An optional proximity sensor is available to use in cases where space is limited or for drive shaft speed sensing. The proximity sensor will work by sensing any metal object. The proximity sensor must be mounted in-line with the bolts and positioned within 1/8" to 3/8" (3-10 mm) from each bolt as they pass the Sensor assembly.

Secure the Proximity speed sensor to a bracket that is mounted on a vertical member near the non-driven wheel.

NOTE: A mounting bracket is not included with a proximity speed sensor kit. You will need to fabricate a mounting bracket. This is usually accomplished using a flat piece of steel that is rigid enough to avoid vibration yet flexible enough to bend to position the sensor in the desired location.

Figure 1-16: Installing The Proximity Sensor



The proximity sensor should be secured with two self tapping screws. The sensor bracket must be installed in such a way that excessive vibration is prevented. Otherwise false pulses can be detected by the sensor due to vibrations of the sensor itself.

NOTE: Your installation will likely vary from the example. It may be necessary to customize the installation to accommodate your specific machine. Keep in mind that the bolts must be spaced an equal distance around the wheel (which is normally the case).

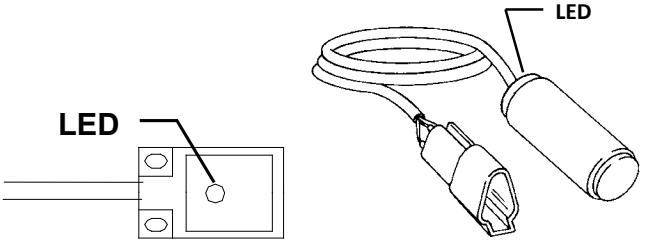
Confirming Speed Sensor Installation

NOTE: Control console must be powered on to confirm the speed sensor installation. If you have not yet installed the control console and connection to power, continue on with the installation and confirm speed installation during the testing procedures.

Magnetic & Proximity Wheel Sensor

After your wheel or proximity sensor is installed and once the control console is installed and powered up, you can test the speed sensor installation. Connect the wheel speed or proximity sensor to the main cable, and in turn connect the main cable to the control console. When the connection is made, rotate the wheel that is being used for the speed sensor. If using a proximity sensor, you will be sensing metal objects and not magnets. Each time a magnet (metal object for proximity sensor) passes the sensor a red LED (orange LED for proximity sensor) on the back of the sensor will light. The LCD display on the console will also indicate a speed as the sensor receives and sends electronic pulses.

Figure 1-17: Magnetic & Proximity Wheel Sensor



Radar

If you are using a radar speed sensor it should be connected to the speed sensor connector on the main cable. An adapter cable will be necessary when using most radars and is available through your TeeJet dealer. The TeeJet control console will automatically sense if the speed sensor is a wheel speed, proximity type or radar type sensor during calibration. TeeJet control consoles are automatically adapted to most brands of radar speed sensors, provided that the appropriate adapter cable is used. If using a radar sensor, the control console will usually show some indication on the display during the calibration procedure. The indication may be different from console to console. Refer to the speed sensor calibration instructions in the Programming and Operating Manual for your console.

MOUNTING THE CONSOLE

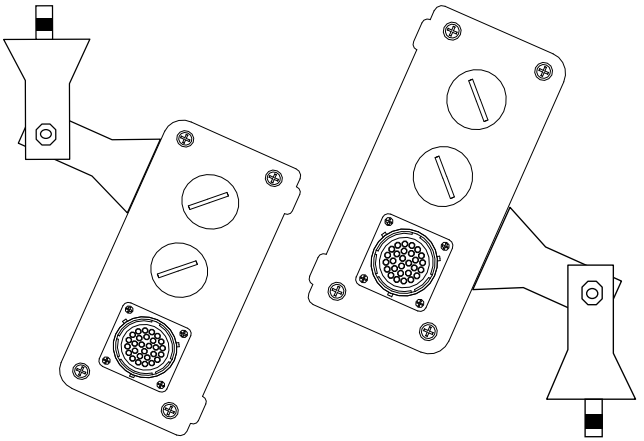
Console Step 1: Location

Determine the best location for the control console in the cab or operator's compartment. Allow sufficient clearance, approximately 6" to 8" (15-20 cm) to accommodate for the Main Cable that will be connected to the connector on the right hand side of the console.

Console Step 2: Mounting

Mount the console to a firm support within the cab area, and secure using the slots provided on the top, back, or bottom of the Console. The mounting brackets included with the kit can provide angle adjustment if necessary. The slots in the Console will accept 1/4" (6 mm) bolts.

Figure 1-18: Installing The Proximity Sensor



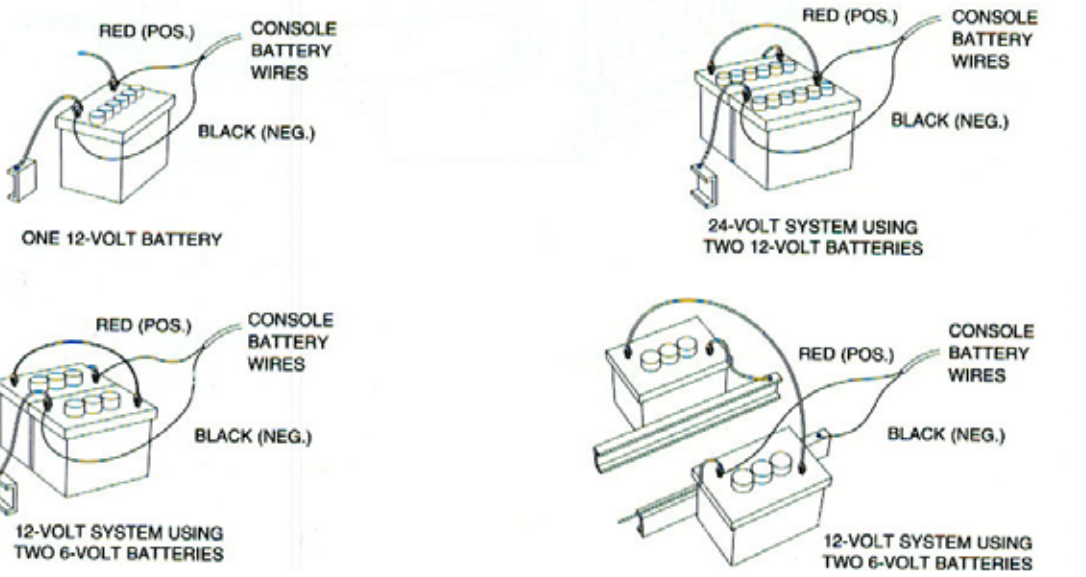
ELECTRICAL CONNECTIONS

Connect Step 1: Power

Locate the power cable; it has a black connector on one end, and two battery terminal rings on the other. Extend the battery terminal ring end of this cable to the battery.

NOTE: Some tractors use two 6 Volt batteries as a power source. Make sure there is a total of 12 Volts delivered to the controller by connecting to the (+) terminal on one battery and the (-) terminal on the other battery. Refer to the diagram below.

Figure 1-19: Electrical Connections



Reliable operation of the 844 Sprayer Control depends on a clean power supply. Ensure this by connecting the power cables directly to the battery and not to another power source.

Connect the battery terminal rings to the battery posts, making sure that the positive (red) and negative (black) wires correspond with the polarity of the battery terminals. Connect the battery cable to the main cable by matching the appropriate connectors.

NOTE: The power cable is designed to provide the simple addition of a remote master boom switch in a convenient location (i.e., on the throttle, gear shift, of floor switch). To install a remote boom switch, simply splice the switch into the brown wire in the power cable. The switch should be rated to handle the total current used by all boom section valves combined. If installed, the remote master switch will operate in series with the boom switches on the console.

Connect Step 2: Sensors

Now that you have the console installed you can begin connecting it to the other components of the system.

Lay out the cables before installing the sprayer components to be sure the cables are long enough. If your installation requires longer cables, an extension that installs between the console and the standard main cable is available. If an exit hole had to be cut in the cab, be sure the edges are de-burred and protected to prevent damage to the cables.

First match the connectors from the main cable to the mating connectors on the sensors (i.e. speed, flow, etc.)

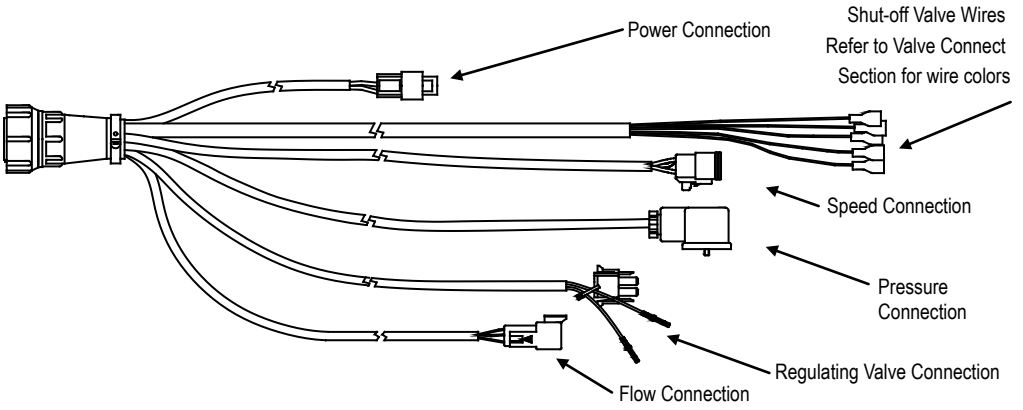
Next, determine the best cable routing to the sprayer control components on the sprayer. This could be along the flow line, mainframe of the sprayer, or wherever the cables can be conveniently secured. Avoid any situation where the cables may lay in puddles, or come in contact with extreme heat sources.

WARNING: System Components should be mounted at least 3 feet (1 meter) from areas of excessive vibration (i.e., engines) to avoid high frequency interference.

Now route the appropriate cable lead for each sensor to the sensor. Be sure to tie up any unused cable lengths to prevent possible damage. Connect the sensor leads from the main cable to the sensors.

If both the flow meter and pressure transducer are not used simultaneously, there will be one extra connection on the sensor end cable. Simply tie this part of the cable back as it will not be used.

Figure 1-20: Sensors



Connect Step 3: Valves

Repeat the procedure above with the cable leads to the Pressure Regulating Valve and the Boom Control Valves. Refer to the chart below when attaching the boom section wires. This cable also includes two ground wires for ground connections and two wires for constant power (+12 VDC) connections if needed (i.e. for electric ball valves).

Main Cable Valve Wire Chart

Description	Wire Color
Section 1	White
Section 2	Brown
Section 3	Green
Section 4	Yellow
Section 5	Gray
Ground	Green
+12 VDC	Red

NOTE: Most TeeJet controls are designed to handle a maximum of 4 amps per boom section.

T-tap connectors must be attached to the ground wires to connect them to the boom control valves, which should be evenly distributed across the two. The same procedure with the T-tap connectors should be followed for the constant power wires (if used).

Figure 1-21: Valves

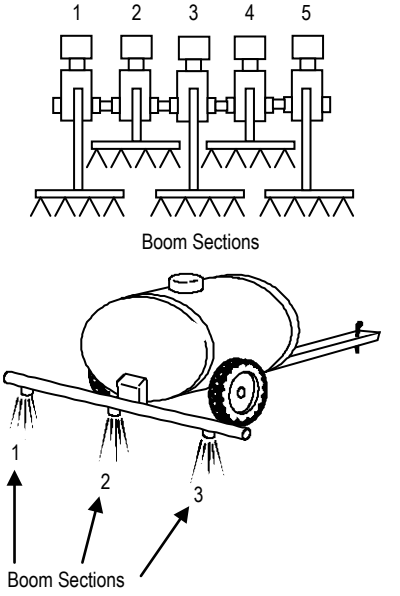


Figure 1-22: T-tap connectors

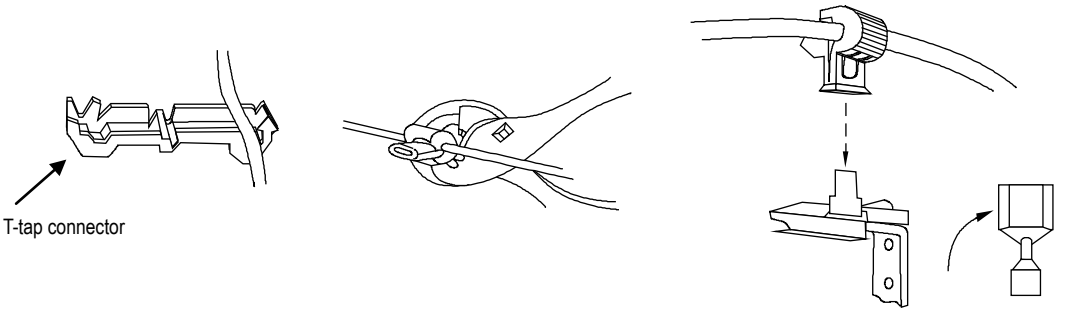
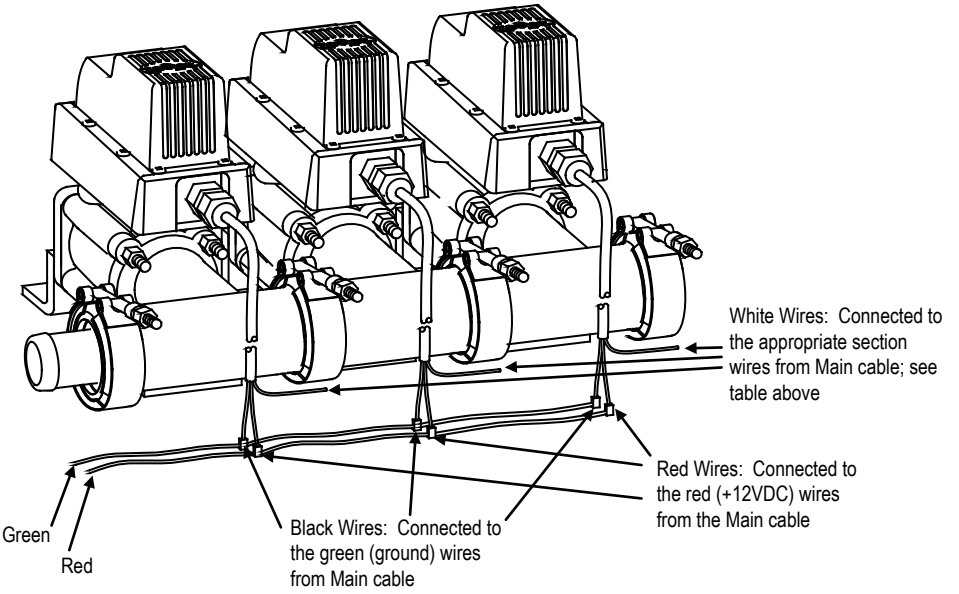


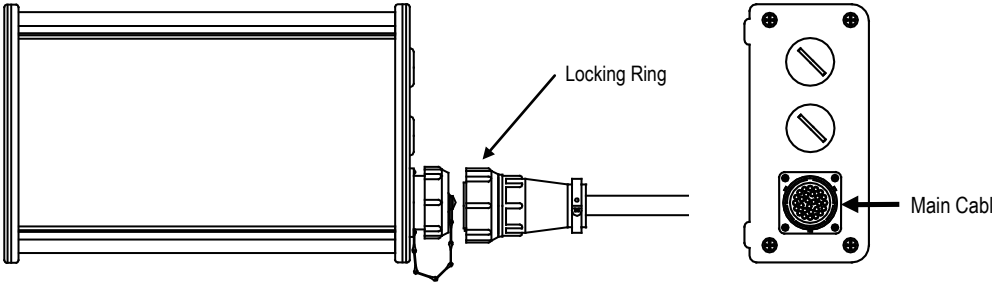
Figure 1-23: Wire Connections



Connect Step 4: Console

Now connect the main cable to the console. The connection is slotted so that it will connect in only one way. Simply rotate the connector until you feel the slots line up Then twist the locking ring of the connector onto the console connection to complete the connection.

Figure 1-24: Locking Ring and Cable Connection



SYSTEM TESTS

Test Step 1: Test Console Power Up

Make sure that the Main Cable is connected with the Console. Check if the Console starts up by pressing the appropriate "ON" key (refer to the Programming and Operating Manual of your console for instructions on turning the console on) of the Console. If the display shows information then the power to the Console is correctly connected. If the Console does not power up, check the Main Cable connection and check the connection at the battery.

NOTE: Most TeeJet Sprayer Controls have an automatic power down feature. With the master boom switch in the "off" position, the console will automatically shut down after 10 minutes of no inputs. This prevents possible battery drainage. To turn the console "off", refer to the Programming and Operating manual shipped with your console.

WARNING: DO NOT SWITCH OFF THE CONSOLE BY REMOVING THE MAIN CABLE.

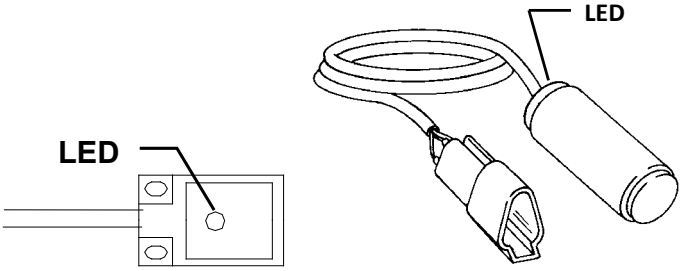
Test Step 2: Test Speed Sensor Installation

Rotate the wheel on which the speed sensor is installed. Each time a bolt (magnet) passes the sensor, an LED on the sensor will light up

The display on the console will also indicate a speed as the bolts (magnets) pass the sensor or you can count the pulses when the Console has an auto speed calibration mode (see Programming and Operation Manual of the Console).

If using a radar speed sensor, follow the instructions supplied with that unit. The only good test with a radar is to actually drive the vehicle with the radar installed and connected to determine if you are getting a speed signal.

Figure 1-25: Speed Sensor



Test Step 3: Test Valves Installation

From the Console turn the Master switch and the Boom Section switches ON and OFF - one by one - and verify whether the valves open and close properly. The Master switch must be on for the individual boom switches to work correctly.

The regulating valve can be tested by switching the Console to Manual mode. When the Master switch is ON, you can drive the regulating valve by pressing the [+] or the [−] key. The [+] key should increase pressure and the [−] key should decrease pressure.

Test Step 4: Test Flow Meter Installation

Warning: Perform those initial tests only with water (no chemicals) !

Make sure that the flow meter pick-up sensor is mounted in the correct position. If using a standard turbine type flow meter the pickup sensor should be mounted in the hole closest to the arrow on the flow meter body. This hole is also deeper than the other one.

To test the flow meter, with the control console powered on, activate the sprayer pump. Now turn on the individual spray boom switches that will be used during the test. Next toggle the Master switch to the on position. You should see spray start to come out of the spray tips. View your console display screen to see if the flow information is being recorded.

It is also possible to activate the flow meter by blowing through the flow meter until you see the turbine turning in the flow meter body. You can test the flow signal also when the flow meter pickup sensor is not yet screwed into flow meter body. The sensor can be activated by bringing a piece of metal (e.g. screw driver) against the pickup.

Test Step 5: Pressure Transducer Installation

Make sure that the pressure sensor is securely mounted and the sensor lead for the pressure transducer has been plugged in.

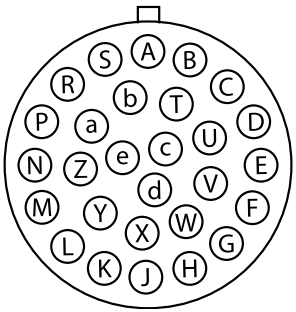
To test the pressure transducer, with the control console powered on, activate the sprayer pump. Now turn on the individual spray boom switches that will be used during the test. Next toggle the Master switch to the on position. You should see spray start to come out of the spray tips. View your console display screen to see if pressure information is being recorded.

Machine Connector

The machine connector is a 28-pole Framatome connector with all necessary machine connections. The connector socket on the side plate has male pins, so the connector on the cable should have the matching female sockets.

The functions of each pin are explained in the following table.

Figure 1-26: Male Pin Connector (console connector)



Pin	Signal	Remarks
A	Main Valve	Output to drive the Main Valve if used (+12V when active)
B	Section 1	Output to drive the valve for section 1
C	Section 2	Output to drive the valve for section 2
D	Section 3	Output to drive the valve for section 3
E	Section 4	Output to drive the valve for section 4
F	Section 5	Output to drive the valve for section 5
G	Section 6	Output to drive the valve for section 6
H	Section 7	Output to drive the valve for section 7
J	Section 8	Output to drive the valve for section 8.
K	Section 9	Output to drive the valve for section 9
L	N/A	Not Used
M	N/A	Not Used
N	N/A	Not Used
P	N/A	Not Used
R	Flow Sensor	Input for the flow sensor (active GND)
S	Pressure Sensor	Input for the pressure sensor (0 to 20mA or 4 to 20mA)
T	Speed Sensor	Input for the speed sensor (Active GND). Proximity or Radar type.
U	N/A	Not Used
V	N/A	Not Used
W	N/A	Not Used
X	N/A	Not Used
Y	N/A	Not Used
Z	N/A	Not Used
a	Reg. Valve +	Output with the plus signal for the regulating valve
b	Reg. Valve -	Output with the minus signal for the regulating valve
c	+12V Switched Input	+12V Supply for Main valve and Boom section valve outputs
d	Ground (-)	Supply GND
e	+12V supply	+12V Supply for Console

SPRAYER CONTROL

PLUMBING & INSTALLATION MANUAL

Congratulations! And thank you for choosing a TeeJet Technologies advanced sprayer control system. With its proper installation and maintenance, you can enjoy many seasons of accurate and uniform spray application with fingertip convenience and ease of operation.

Installation of your control system components will be covered in easy-to-follow, step-by-step instructions.

WE RECOMMEND THAT YOU READ THESE INSTRUCTIONS COMPLETELY before attempting installation of your sprayer control system. The unit's performance will depend on it's proper installation, along with planned preventive maintenance of your entire sprayer.

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