

# MATRIX™

## INSTALLATION MANUAL



**AUTO BOOM SECTION CONTROL**  
**Hardi BT-9 - LH4000/LH5000/LH5000GPS**

**TeeJet®**  
**TECHNOLOGIES**

A Subsidiary of  **Spraying Systems Co.®**

This installation manual covers installation of MATRIX™ or CenterLine 230BP with Hardi BT-9 Switchbox. We have endeavoured to deliver a fault free product. To ensure optimal use of the equipment, we ask you to pay great attention when reading this manual. Regarding responsibility for use of the product, we refer to our sales and delivery terms - especially paragraph 7, which follows:

Product usage.

7.1 Any use of the product is at the sole risk of the buyer. The buyer is therefore not entitled to any form for compensation caused by, for example, any of the following:

- Disturbance to/from any electronic services or products that do not confirm to the standards for CE marking,
- Missing or poor signal coverage or a succession hereof from external transmitters/receivers, used by the buyer,
- Functional faults, which apply to or from a PC-program or PC-equipment, not delivered by the seller.
- Faults that may arise from the buyers negligence to react to warnings and fault messages from the product, or which can be traced to negligence and/or absent constant control of the work carried out in comparison to the planned job.

7.2 When implementing any new equipment the buyer must take great care and pay attention. Any doubts as to correct operation/use should result in contacting TeeJet Technologies.



## INTRODUCTION TO MATRIX™ AND CL230

The MATRIX™ and Centerline 230BP are combined Guidance and Automatic Boom Section Control (ABSC) devices that features control of up to 15 boom sections. The MATRIX™ or the Centerline 230BP connects in parallel to the existing wiring loom to the section valves.

### Principle of Operation

The MATRIX™ or Centerline 230BP control the sections valves according to the GPS position and the GPS guidance makes it possible to avoid overlaps or skips.

The MATRIX™ or Centerline 230BP controls the section valves in automatic mode, and the section switches should be set to off unless the operator wants to override the auto mode and thus force spraying.

The MATRIX™ or Centerline 230BP monitors the section switches that controls the valves in manual mode. The Master switch can be used both in automatic mode as well as in manual mode.

## REQUIRED PARTS AND KIT SELECTION

To add Automatically Boom Section Control to a Hardi BT-9 Switch Box, the following part numbers are required:

### MATRIX™:

Part no.	Description
* xxx-xxx	MATRIX™ Guidance controller kit
903-339	ABSC Box for Hardi BT-9 Switch Box, 3-9 Sections
45-05626	Power/CAN/Data cable for MATRIX™ (Pos. 2 /System Overview)

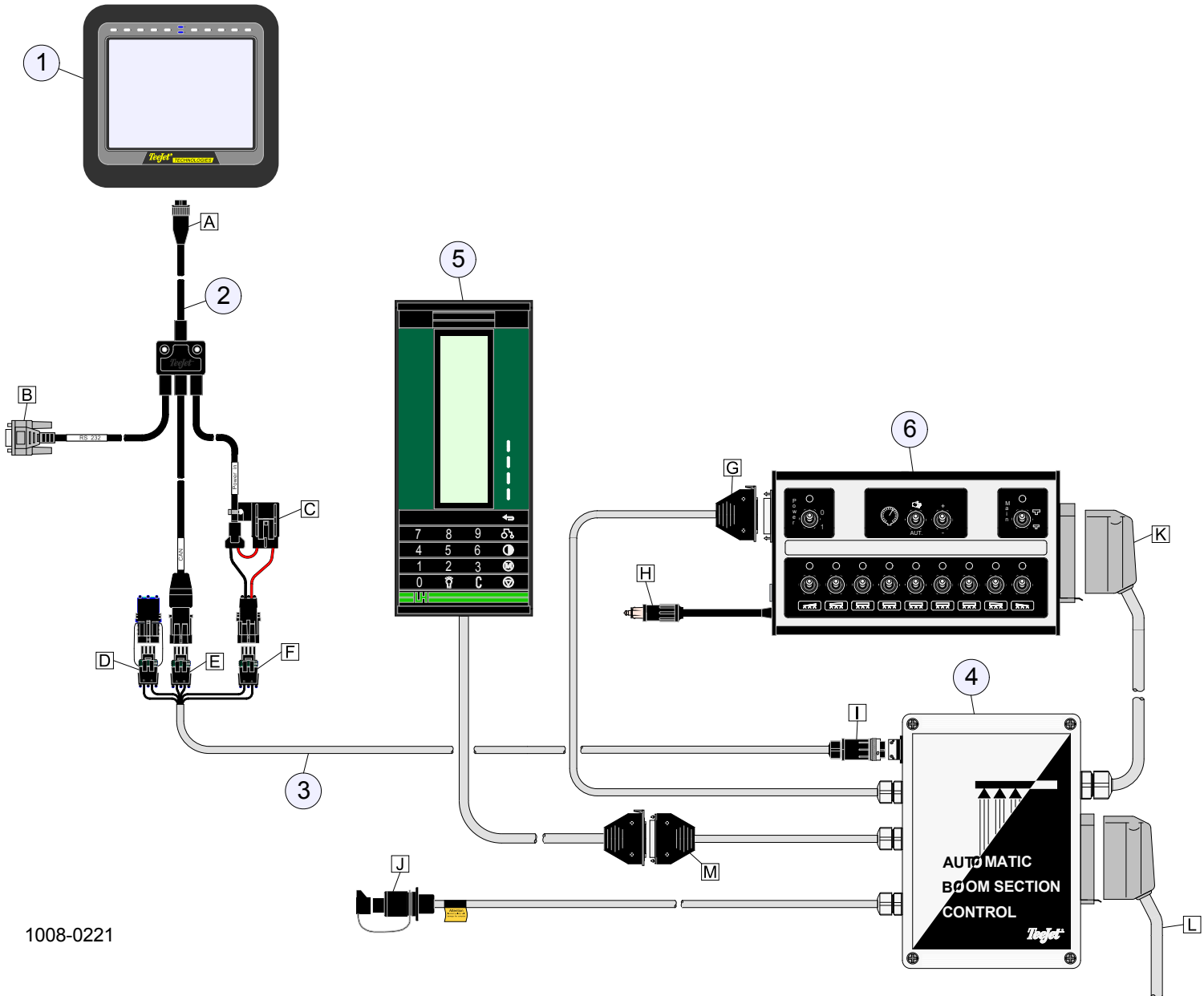
\* Refer to the MATRIX™ pricelist,

### CL230:

Part no.	Description
* xxx-xxx	CL230 Guidance controller kit
903-339	ABSC Box for Hardi BT-9 Switch Box, 3-9 Sections

\* Refer to the CL230BP pricelist,

**SYSTEM OVERVIEW, MATRIX™**



1008-0221

## SYSTEM DESCRIPTION, MATRIX™

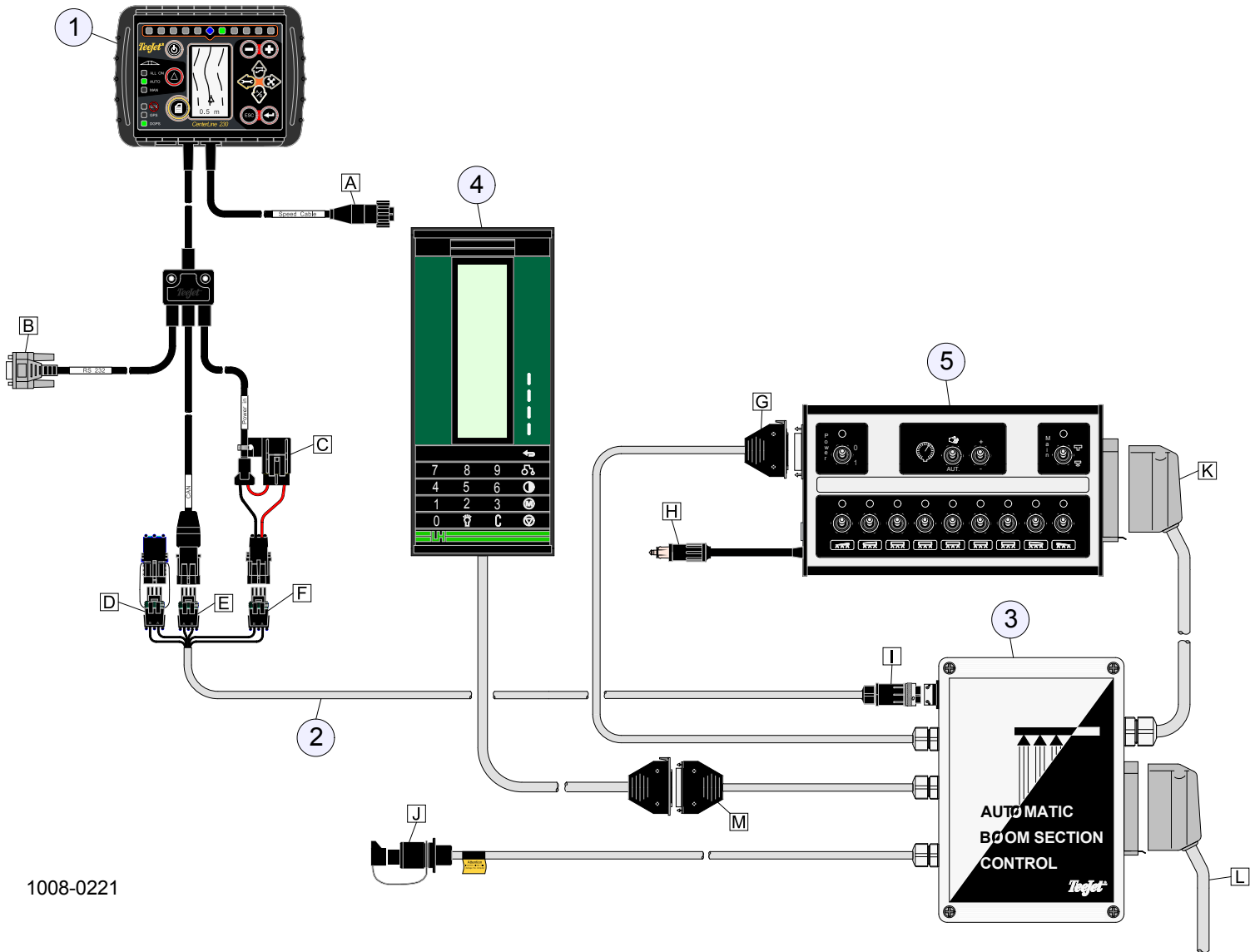
Pos.	Description	Part Number
1	MATRIX™ Guidance Controller	* xxx-xxx
2	Power/CAN/Data Cable, MATRIX™	45-05626
3	BoomPilot Adapter Cable	199-263
4	ABSC Adapter Box, 3-9 Sections	902-369
5	LH4000 / LH5000 /LH5000GPS Computer	-
6	BT-9 Switch Box, 3 to 9 sections	-

\* Depending on MATRIX™ Kit,

### Connectors and fuses:

Pos.	Description	Part Number
A	8P Connector (Power/CAN/Data to Matrix)	
B	9P Connector (Data in/out, Sub.D. Female)	
C	Fuse (3A)	166-603
D	2P Connector (All On)	
E	4P Connector (CAN, CAN Power)	
F	2P Connector (Power to Matrix Controller)	
G	25P Connector to BT-9 from ABSC Box	
H	2P Power Connector	
I	8P Connector (CAN, Power, All ON)	
J	3P COBO connector	
K	30P Connector (Signals from BT-9 Box)	
L	30P Connector (Signals to Sprayer)	
M	25P Connector to LH4000 / LH5000 / LH5000GPS	

**SYSTEM OVERVIEW, CL230**



## SYSTEM DESCRIPTION, CL230

Pos.	Description	Part Number
1	CL230 Guidance Controller	* xxx-xxx
2	BoomPilot Adapter Cable	199-263
3	ABSC Adapter Box, 3-9 Sections	902-369
4	LH4000 / LH5000 / LH5000GPS Computer	-
5	BT-9 Switch Box, 3 to 9 sections	-

\* Depending on CL230 Kit,

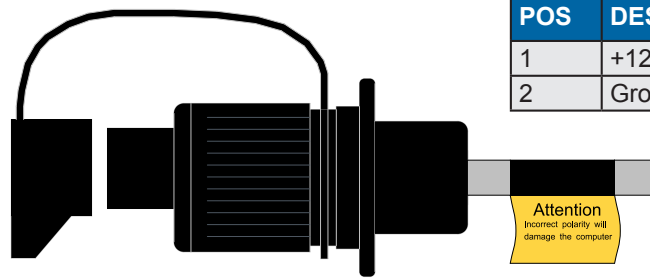
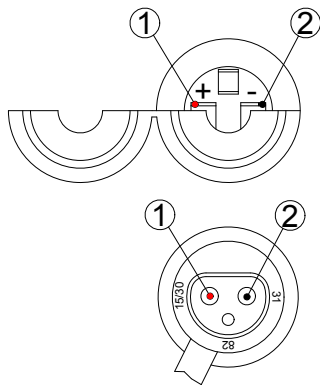
### Connectors and fuses:

Pos.	Description	Part Number
A	8P Connector (Power/CAN/Data to Matrix)	
B	9P Connector (Data in/out, Sub.D. Female)	
C	Fuse (3A)	166-603
D	2P Connector (All On)	
E	4P Connector (CAN, CAN Power)	
F	2P Connector (Power to Matrix Controller)	
G	25P Connector to BT-9 from ABSC Box	
H	2P Power Connector	
I	8P Connector (CAN, Power, All ON)	
J	3P COBO connector	
K	30P Connector (Signals from BT-9 Box)	
L	30P Connector (Signals to Sprayer)	
M	25P Connector to LH4000 / LH5000 / LH5000GPS	

## INSTALLING THE HARDI BT-9 KIT

Connect the Automatic Boom section kit as shown on the system overview drawings. The kit includes all necessary connectors to get electrical contact with the HARDI BT-9 system.

**CONNECTING POS. J TO POWER**



POS	DESCRIPTION
1	+12V (15/30)
2	Ground (31)

***! When connecting the system to 12V power it's very important that the polarity is correct, if not the system will be damaged.***

**BATTERY CABLE (OPTION):**

The power supply must be strong enough to operate the Section and Master valves. The total current will depend on the used valve type. If a power connector (Socket) isn't available in the tractor cabin, a optional battery cable can be used (PN 96ET14).



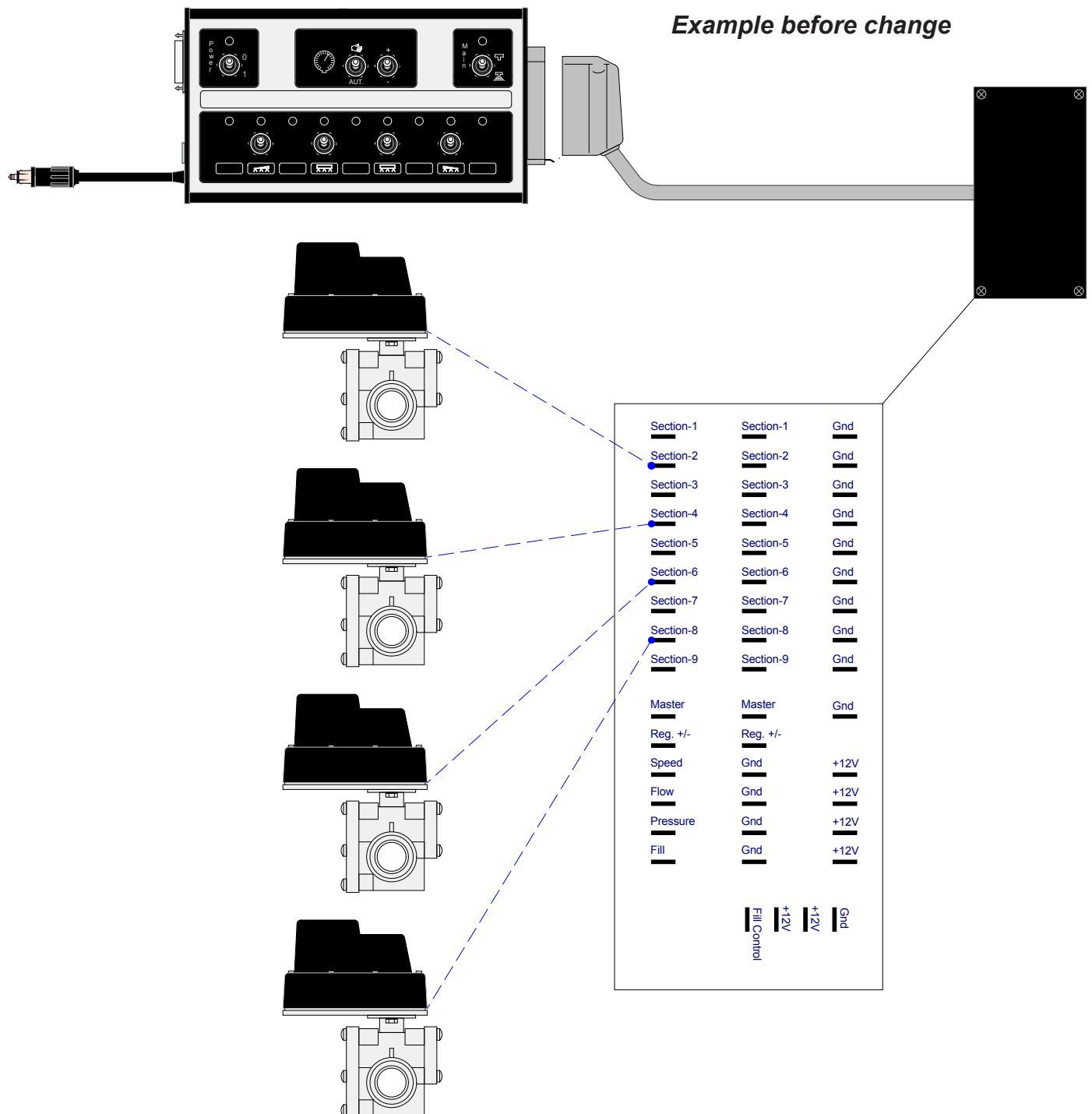


## CHANGE THE CONNECTION IN THE SPRAYER JUNCTION BOX

Because of the placement of the switches in the Hardi BT-9 switch box and the design of the Hardi BT-9 ABSC kit, which cover systems from 3 to 9 sections, it's necessary to change the connection of the section valves in the junction box.

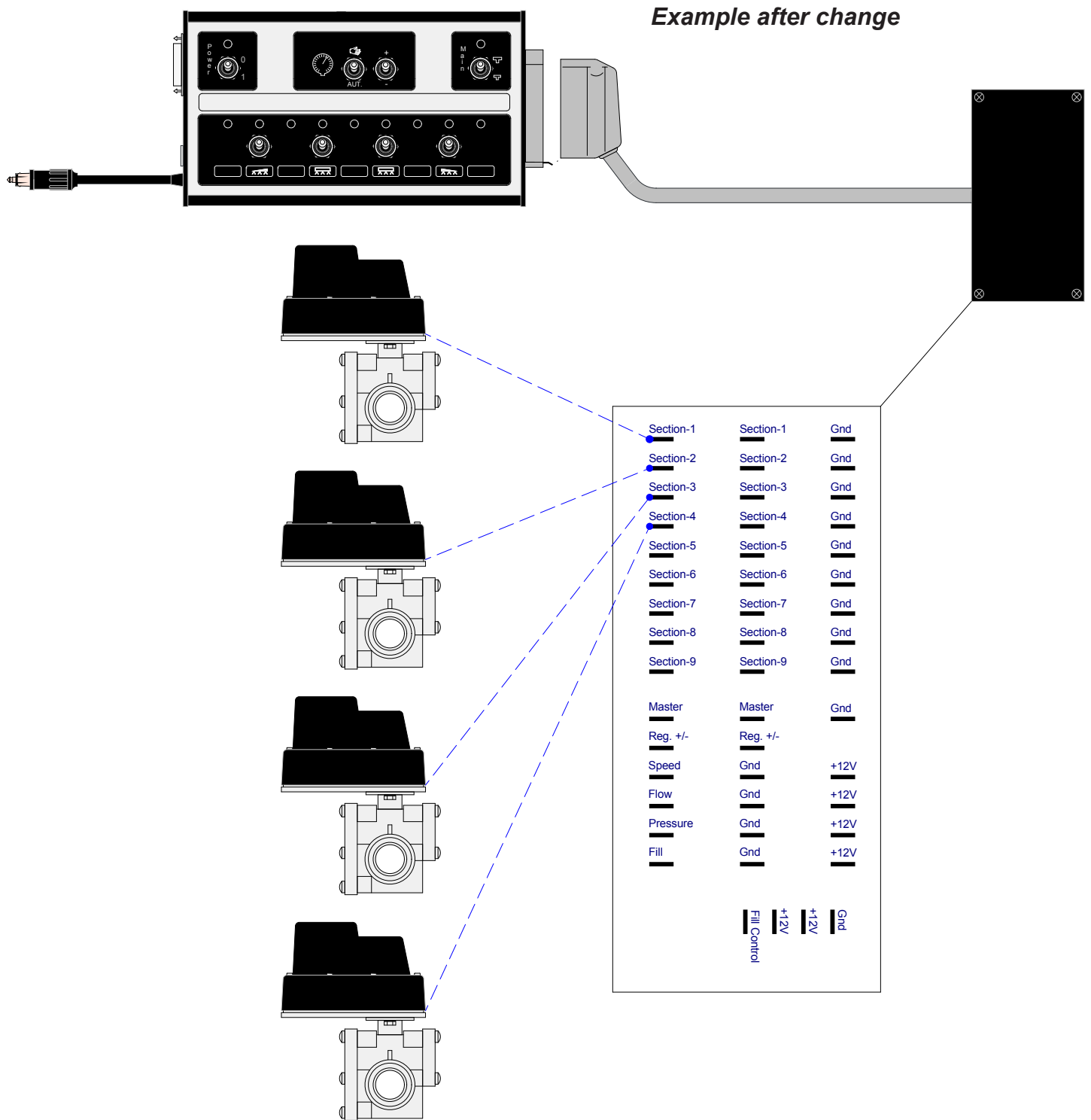
### Connection of Section Valves in the junction box BEFORE change:

Below an example of a 4 section system. The section valves are connected to the following positions in the junction box: 'Section-2', 'Section-4', 'Section-6' and 'Section-8'.



**Connection of Section Valves AFTER change:**

Below an example of a 4 section system after change of the connection. The section valves are connected to following positions in the junction box: 'Section-1', 'Section-2', 'Section-3' and 'Section-4'.



## SYSTEM CHECK

After connecting the power connector, it's time to make a system check. To check the system it's necessary to have full GPS signal so the vehicle must be placed outside.

### Check AUTO mode:

#### **Hardi BT-9 Switch Box:**

- Section switches should be in OFF position when working in Automatic mode.
- The Master switch will control the sprayer and should be ON to enable automatic switching of the sections.

#### **MATRIX™ or CL230:**

- Turn the Guidance controller on
- Encode the number of sections and the width of each (Refer to the MATRIX™ or CL230 user manual)
- Wait for GPS signal
- Set the mode to AUTO
- Drive forward (> 2 km/h)
- Observe that all sections and the master valve open.
- Check that the Master valve closes when the Master switch is set off.
- Check that the section symbols in the LH4000/LH5000 turn on/off correct.

### Check MANUAL mode:

#### **MATRIX™ or CL230:**

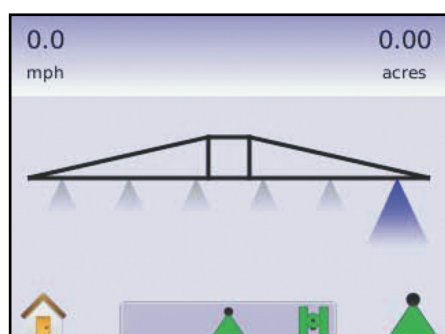
- Set the ABSC mode to MANUAL

Check in the 'Boom Section Control Screen' (Matrix or CL230) that the section icons turn off and on according to the valve/switch status.

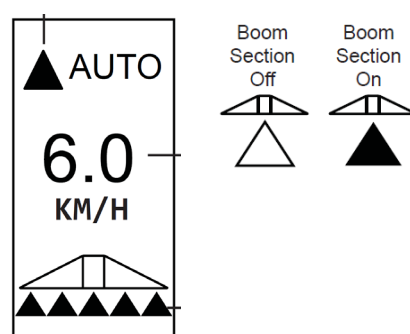
#### **Hardi BT-9 Switch Box:**

- Set the section switch's on
- Set the Master switch on
- Observe that all sections and the master valve open.

#### **MATRIX™:**



#### **CL230:**



# MATRIX™

## I N S T A L L A T I O N M A N U A L

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### Matrix Guidance: Exclusive Features

- RealView™ Guidance Over Video  
Guidance Superimposed Over Video  
Guidance Only  
Video Only
- Bright Daylight Readable Screen
- Easy-to-Use 3D Graphical Guidance
- Coverage Mapping/Data Export



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