6.7.1.4 CONTROL SETUP

NOTE

THESE SETTINGS ARE FOR 7000 SERIES AIR SEEDERS WITH HYDRAULIC DRIVE METERING AUGERS ONLY.

- First tab will allow you to set if each tank will have custom settings or use (copy) settings from specified tank, refer to *Figure 6.65*.
- Tabs with numbers correspond to a specific tank (bin) and will have control settings for that tank(bin), refer to *Figure 6.66*.

PWM (Pulse Width Modulator) valve on each motor controls the on/off and speed of the metering auger hydraulic motor.

Minimum / Maximum PWM are the limits of the PWM drive and are represented in the percentage of voltage drive to the coil.

a. **Minimum PWM** - should be set to 15%

b. **Maximum PWM** - should be set to 95%

c. **Controller Response** - select how fast the controller will respond to changes. The default is set to Medium Fast.

NOTE

IT IS RECOMMENDED TO LEAVE THESE SETTINGS AT THE FACTORY DEFAULT.

Figure 6.65 - Control Settings - All Tanks

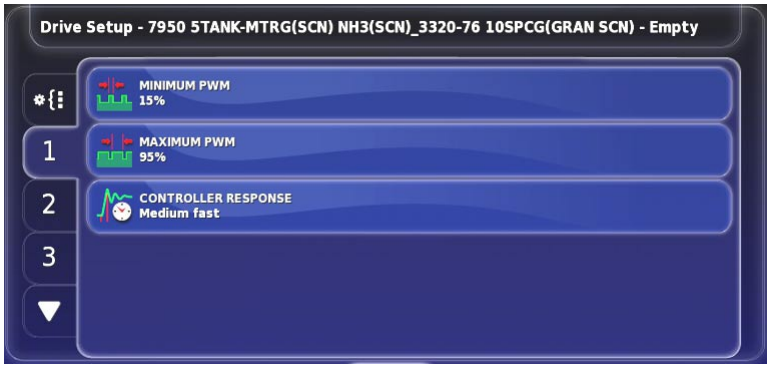


Figure 6.66 - Control Settings - Individual Tank

6.7.2 NH3/LIQUID SETUP

The X30 console has the capability to control and monitor the air seeder tanks and an NH3 applicator or Liquid tank simultaneously when used in combination for a complete seeding system.

When an NH3 or Liquid tank is being used, ensure that the correct machine is selected, refer to *Section 6.1 - Selecting an Existing Implement and 6.2 - Creating New Implement Profile*.

6.7.2.1 NH3/LIQUID TANK SETUP

NOTE

FOR THE FOLLOWING SETUP SECTIONS, NH3 WILL BE USED. LIQUID PRODUCT TANK CONFIGURATION IS SIMILAR.

6.7.2.1.1 GENERAL TANK SETUP

General settings for NH3/Liquid tank located in the first tab under Implement/Seeder/NH3 (or Liquid)/Tank.

a. **Use Product as Name** - if enabled, product that is assigned to the tank will be used as a name for that Tank.

6.7.2.1.2 INDIVIDUAL TANK SETUP

Specific settings for NH3/Liquid tank located in the tank number tab under Implement/Seeder/NH3/Tank. Refer to *Figure 6.68*.

a. **Name** - here you can enter the name for the NH3/Liquid tank. This name will be used if "use product as name" disabled. By default the name will consist of word "tank" and the number of that tank.

b. **Capacity** - enter the capacity of the NH3/Liquid tank. If this is unknown the weight of the delivered load can be used as a reference. Remember to use weight of N (not NH3) if metering as N.

c. **Status** - set to enabled if this tank will be metered from. If tank is not being metered from set to disabled, otherwise system will not allow you to start applying product, as all enabled tanks must have calibration factor even if switched off.

Figure 6.67 - NH3 & Liquid Tank Settings

d. **Section Control** - Available selections are Full Width and NH3/or Liquid. If using sectional control select NH3 or Liquid (the boom that is setup as sectional). If not using multi-section then select Full Width.

Note: On/Off time tabs will have different meaning and wording depending if boom is sectional or full width. If ASC is shut off and disabled, and all tanks are switched back to full width boom then each tank timing needs to be adjusted accordingly.

Sectional Boom:

e. **On Time to SC location** - it should be the time from when meter starts until product is at the section valve.

f. **Off Time to SC location** - it should be the time from when master is turned off until product stops flowing through section valve.

Note: The system combines this time with the section control timing to known when to turn the master on/off for the NH3/liquid tank. Since NH3/liquid is always pressurized it is typically quick to respond. This time can be left at 0 and the section control timing can be set to account for the sequence timing.

Full Width Boom:

e. **On Time to Ground** - it should be the time from when master is turned on until product is at the opener on longest run.

f. **Off Time to Ground** - it should be the time from when master is turned off until product stops flowing through the opener at shortest run.

g. **Pump Speed** - default setting is none. Can be set to monitor a pump speed sensor (not supported through Bourgault harnessing).

h. **Number of Nozzles** - this setting will appear if Section Control is set to Full Width. Enter the number of output nozzles for the system to use in the flow per nozzle calculation. In the operation mode, the flow per nozzle value is displayed in the NH3 and Liquid tank windows for reference only.

If Section Control used for NH3 or Liquid (refer to *Step D*), sectional control settings will be accessed in Implement/Section Control, refer to *Section 6.5 - Section Control.*

Figure 6.68 - NH3/Liquid Specific Tank Settings

6.7.2.2 FLOW SETTINGS

a. **Calibration Factor** - NH3 flow meters are precalibrated so no actual calibration is required. That predetermined calibration factor should be stamped on the flow meter. Obtain the factor from the flow meter. Enter the calibration factor. The units of the calibration factor should be entered in ***pulses per lb. of N***.

IMPORTANT

THE **CALIBRATION FACTORS** ON SOME FLOW METERS ARE **NOT** IN THE UNITS OF ***PULSES PER LB. OF N***. A CONVERSION FACTOR MAY NEED TO BE APPLIED BEFORE GETTING THE FINAL VALUE TO BE ENTERED INTO THE X30 MONITOR. CHECK WITH THE INSTALLER OF YOUR NH3 SYSTEM TO CONFIRM THE CALIBRATION FACTOR AND UNITS FOR YOUR SYSTEM.

b. **Flow Confirmation Sensor** - default is set to disabled. Can set to use flow confirmation sensor (not supported through Bourgault harnessing).

c. **Auto Close Valve Time** (NH3 only) - Time delay to close valve if flow is detected but the tank is off or there is a communication issue.

d. **Injection Mode Flow** (Liquid only) - this setting appears if Flow Confirmation Sensor is enabled. This drops the liquid flow alarm detection by a factor of 10 for the special injection mode case.

Figure 6.69 - NH3/Liquid Flow Settings

6.7.2.3 CONTROL VALVE SETTINGS

a. Controller Type - These settings refer to the operating characteristics of control valves for NH3 or liquid systems. The correct type of controller must be selected whether it is an electric **Regulator Valve** or a hydraulic **Proportional Valve**.

1. **Regulator Valve**: This valve uses a motor to open or close the valve depending on the flow requirements. Positive or negative power is applied to run the motor. The tank output to the regulator valve stays constant. The regulator valve either restricts or diverts excess product.

2. **Proportional Valve**: This valve controls the hydraulic oil flow to the pump and changes the output of the pump so that the pump is only delivering what is required. It uses a solenoid to open a hydraulic valve to drive a hydraulic pump. The opening of the valve varies with the voltage applied to the solenoid.

Depending on what valve is chosen, different settings will be displayed.

Figure 6.70 - NH3 Control Valve Settings

6.7.2.3.1 PROPORTIONAL VALVE SETTINGS

a. **Flow Meter Sampling** - Default setting is "standard". The optional "Reduced" sensitivity setting slows the reaction time of the proportional valve. This may be required for very low flow rates or if flow is highly irregular or worn equipment.

b. **Minimum/Maximum PWM** - are the limits of the PWM (Pulse Width Modulation) drive and they vary with the type of drive.

   i. **Min PWM:** Is a percentage of voltage drive to the coil.

   ii. **Max PWM:** Is a percentage of voltage drive to the coil.

c. **Controller Response** - This will adjust how fast the controller will respond to changes. The default is set to Fastest.

d. **Dump Valve** - Used to apply signal to a dump valve or master valve.

   - Enabled - applies power when tank is off.
   - Reversed - applies power when tank is on.

Figure 6.71 - Proportional Valve Settings

6.7.2.3.2 REGULATOR VALVE SETTINGS

a. **Flow Meter Sampling** - Default setting is "standard". The optional "Reduced" sensitivity setting slows the reaction time of the regulator valve. This may be required for very low flow rates or if flow is highly irregular or worn equipment.

b. **Close Valve When Off**- some regulating valves are a combination regulating and on/off valve, which means they must close when the tank is turned off. Select this option if this type of valve is being used to ensure it is closed when the tank is turned off. A common example of this valve is the Raven fast valve.

c. **Reverse Valve** - this will allow for the polarity of the regulating motor of NH3 or liquid systems to be reversed if it was wired incorrectly.

d. **Dump Valve** - Used to apply signal to a dump valve or master valve.

- Enabled - applies power when tank is off.
- Reversed - applies power when tank is on.

e. **Controller Mode** - this is the controller model selection.

i. For **liquid systems**, most use the "Standard" model that is a 12V Spraying Systems type of regulator valve or choose from Micro-Track, Dickey-John or Raven model.

ii. For **NH3 systems**, choose from either a Micro-trak, Dickey-John or Raven model.

e. **Minimum On Time** - is the minimum amount of time the controller will pulse the valve when it is trying to make a small correction.

f. **Maximum On Time** - is the maximum amount of time that the controller will pulse the control valve before checking the rate. It is used to make a large correction for the rate.

g. **Gain Setting** - is a software setting that either increases or reduces how hard the controller tries to stay on rate. The higher the Gain setting, the faster the valve responds. If this number is set too fast, it will lead to an overshoot, which then has to be corrected.

h. **PWM Setting** - is the Pulse Width Modulation. Lowering this number reduces the voltage supplied to the valve, slowing it down.

IMPORTANT

THESE DIFFERENT VALVE MODELS HAVE THEIR OWN DEFAULT PRESETS LOADED.

IF YOU HAVE FLUCTUATING NH3 RATES, IT IS BEST TO START ADJUSTMENTS WITH THE GAIN SETTING FIRST, THEN ADJUST THE MIN/MAX TIMES. ADJUST THE PWM SETTINGS LAST.

Figure 6.72 - Regulator Valve Settings

6.7.2.4 PRESSURE SETTINGS

Pressure sensor is selected if there is an electric pressure sensor in the product line (not supported through Bourgault Harnessing).

a. **Sensor** - Default is set to None. If set to Voltage, additional settings that need to be configured will appear.

Figure 6.73 - NH3 Flow Settings

6.7.3 FAN SETTINGS

Here you can change settings related to the fan(s).

Fan 1 represents the main fan and Fan 2 represents the auxiliary fan.

If the implement profile was created with only one fan, there will be only one tab for Fan 1.

a. **Fan Speed** - enables or disables monitoring of the fan speed.

   ***Note**: If you are not using on of the fans, disable it, otherwise the fan speed to start setting will prevent you from starting the meters.*

b. **Pulses/Revolution** - set at 1 (the fan speed sensor picks up from a target bolt on the fan hub, one pulse per revolution).

Figure 6.74 - Fan Setup

6.7.4 PUMPS SETTINGS

These settings appears only if configured with NH3/Liquid. Here you can configure settings related to the liquid/NH3 system pumps. System can have up to 4 pumps. There is a tab for each pump.

1. **Pump speed** - Default set to disabled (not supported through Bourgault harnessing)
   - Enable if you wish to monitor the speed of the liquid/NH3 system pump. (Liquid/NH3 system must be equipped with a pump speed sensor).
2 **Pulses per revolution** - set this to the number of targets/resolution that are used by the pump speed sensor.

6.7.5 DRILL CONTROL

This is a future option to integrate drill controls into the console.

At this time should be left disabled.

Figure 6.75 - Pump Settings

6.7.6 ACCESSORIES

Accessories menu will allow you to set up features such as sensors, blockage monitoring system, and granular section monitoring.

6.7.6.1 SENSORS

Depending on the configuration of the seeding system, if it has ASC and/or blockage monitoring, air seeders can have up to two I/O ECUs (EM-24). Sensor types for I/O ECUs can be assigned from the Sensors tab.

Select Implement/Seeder/Accessories/Sensors.

1. If Air Seeder has **one** EM-24 (there will be a tab only for the Apollo EM-24 1), refer to *Figure 6.76*.

   - If air seeder equipped with ASC, sensor type should be set to Granular Section Sense for all sensors.

   - If air seeder equipped with blockage monitoring, sensor type should be set to Blocked Head Sense for all sensors.

   - Press on the cell marked to change all the sensor types at once for that particular EM-24.

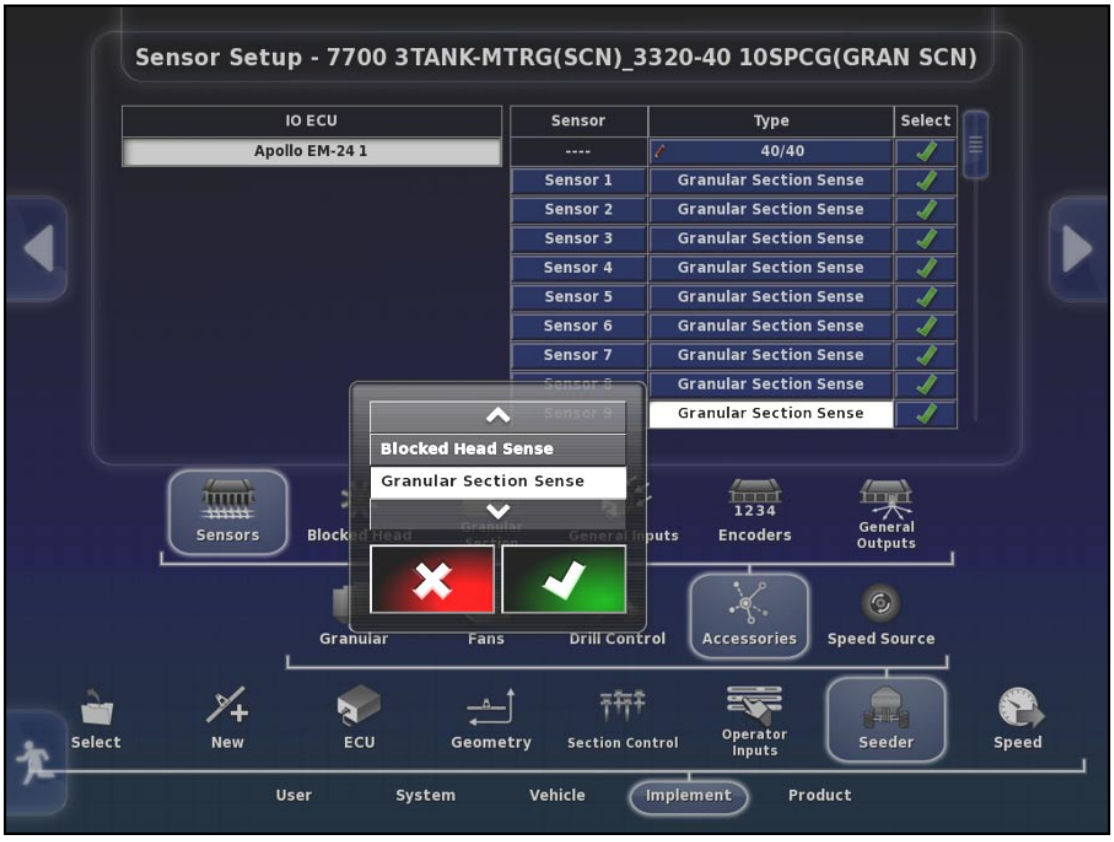


Figure 6.76 - Accessories Menu

2. If Air Seeder has **two** EM-24 (there will be two tabs: Apollo EM-24 1 & Apollo EM-24 2)

   - For the first EM-24 sensor type should be set to Granular Section Sense for all sensors, refer to *Figure 6.*77.

   - For the second EM-24 sensor type should be set to Blocked Head Sense for all sensors, refer to *Figure 6.*78.

   - Press on the cell marked to change all the sensor types at once for that particular EM-24.

Figure 6.77 - EM-24 1 Sensors

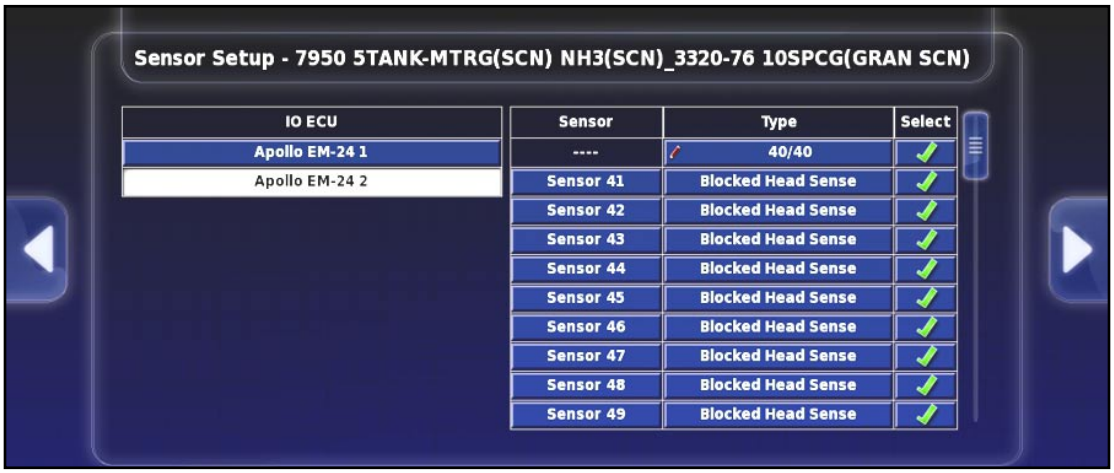


Figure 6.78 - EM-24 2 Sensors

6.7.6.2 BLOCKED HEAD MONITOR

Refer to *Figure 6.80*.

Here you can configure settings related to the Blockage Monitor.

1. **Blocked Head Monitor** - select Enabled if blockage system installed, and Disabled if there is no blockage system installed.

   When Blocked Head Monitor set to enabled additional settings will be displayed:

   - If factory drill profile was used during set up, the values for these settings will be automatically loaded, refer to example on *Figure 6.80*.
   - If custom profile was used during set up, then the following settings will need to be configured, refer to *Figure 6.81*.

Also when Blocked Head Monitor set to enabled, Blocked Head Monitor tab will be available for monitoring in Seeder Controller mini-view window and in the expanded view, refer to *Section 13.2 - Blockage Monitoring with X30 Console*.

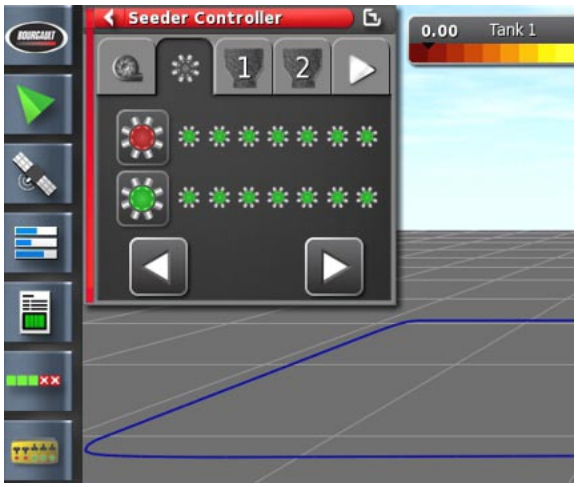


Figure 6.79 - Blocked Head Monitor Tab

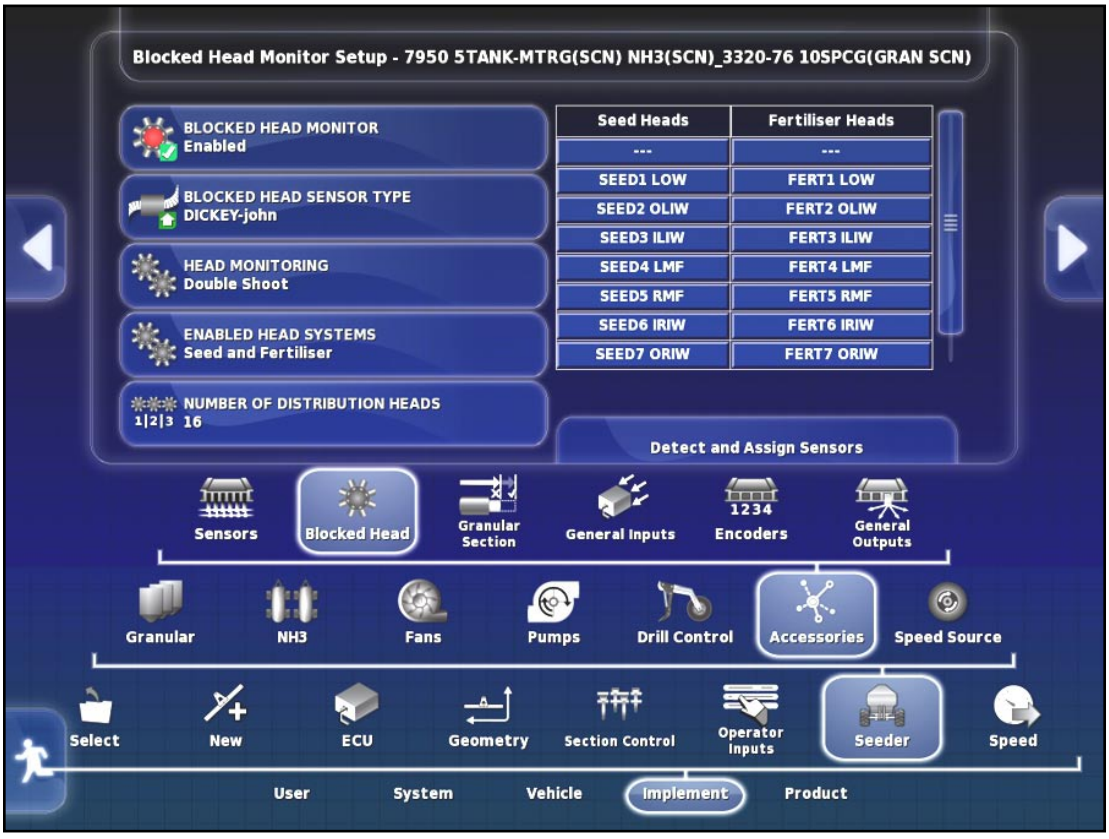


Figure 6.80 - Blocked Head Monitor Settings (Factory Profile)

2. **Blocked Head Sensor Type** - select:

   i. Dickey-John - all Bourgault X30 systems use this style of sensors.

   ii. Standard - set for Topcon sensor.

3. **Head Monitoring** - select:

   i. Single Shoot - air seeder configured with one transfer line (all product is metered into a single line).

   ii. Double Shoot - air seeder configured with two transfer lines and blockage sensors installed on both airkits on the tillage unit.

4. **Enabled Head System** (only appears if Double Shoot was selected for Head Monitoring, previous step) - enable monitoring for one of the following:

   i. Seed & Fertilizer

   ii. Seed only

   iii. Fertilizer only

   - will prevent false blockage alarms if distribution lines are not in use.

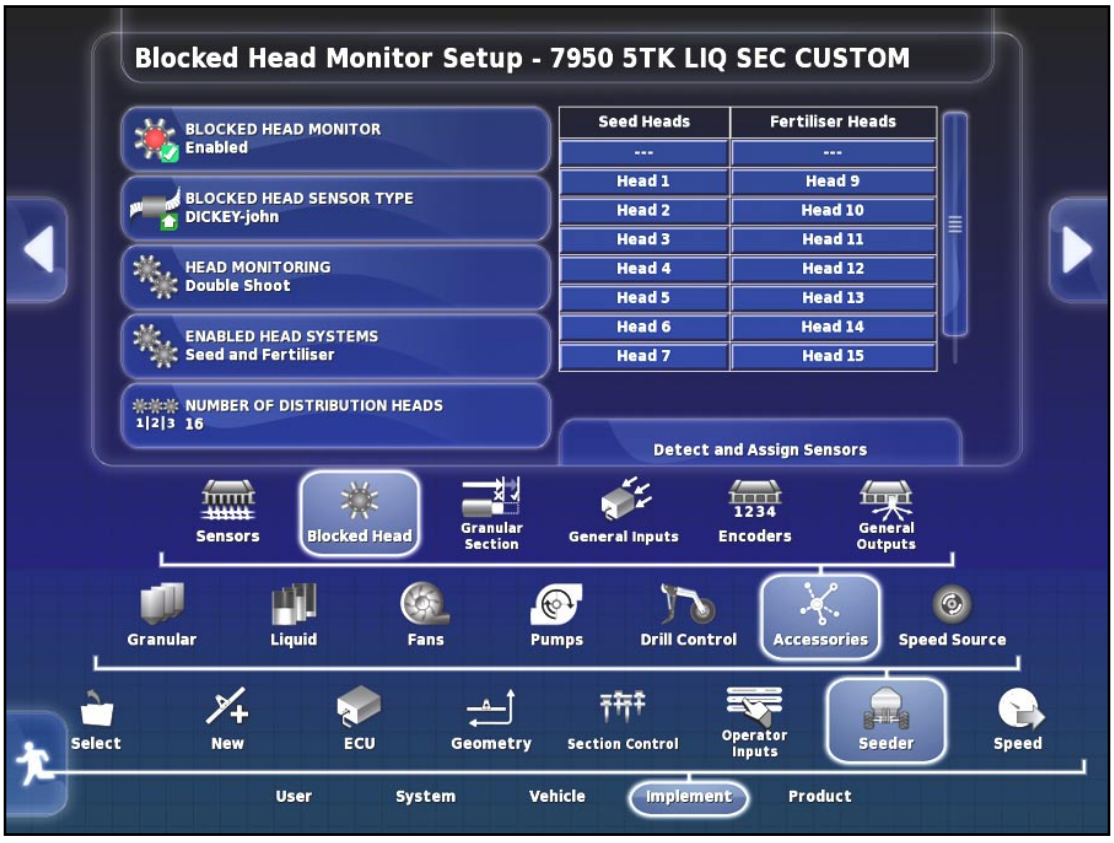


Figure 6.81 - Blocked Head Monitor Settings (Custom Profile)

5. **Number of Distribution Heads** - here you enter number of secondary manifolds on the tillage unit.

   i. 6. 8 or 10 for Single shoot.
   ii. 12. 16 or 20 for Double shoot.

   Example (double shoot): *there are 8 seed manifolds and 8 fertilizer manifolds, total number you would enter is 16. In the table seed heads will be numbered 1-8 (from left to right of machine), and fertilizer heads numbered 9-16 (from right to left of machine).*

   - A list of the Distribution Heads will be shown, refer to *Figure 6.81*. Each distribution head can be re-named by selecting a button for specific distribution head, an input screen will appear to input the desired description. Example: SEED1 LOW (seed 1 left outer wing), Seed5 RMF (seed 5 right main frame), FERT6 IRIW (fertilizer 6 inside right inner wing). The naming convention in this example is also used to name heads for a factory profile.

6. **Select Detect and Assign Sensors** button.

   Select Detect Each or Detect Sensors, Refer to *Figure 6.81*. List of sensors will appear.

   Each sensor can be re-named by selecting it in the table area. An input screen will appear allowing to enter the desired description. Example: S1 H1 (Sensor 1 on Head 1).

   Assign each sensor to the appropriate Head to show up correctly represented on the monitor.

   For units with sectional control there will be a 3rd column labelled Section. Assign the sensor to the appropriate boom and section so it is disabled when that section is switched off.

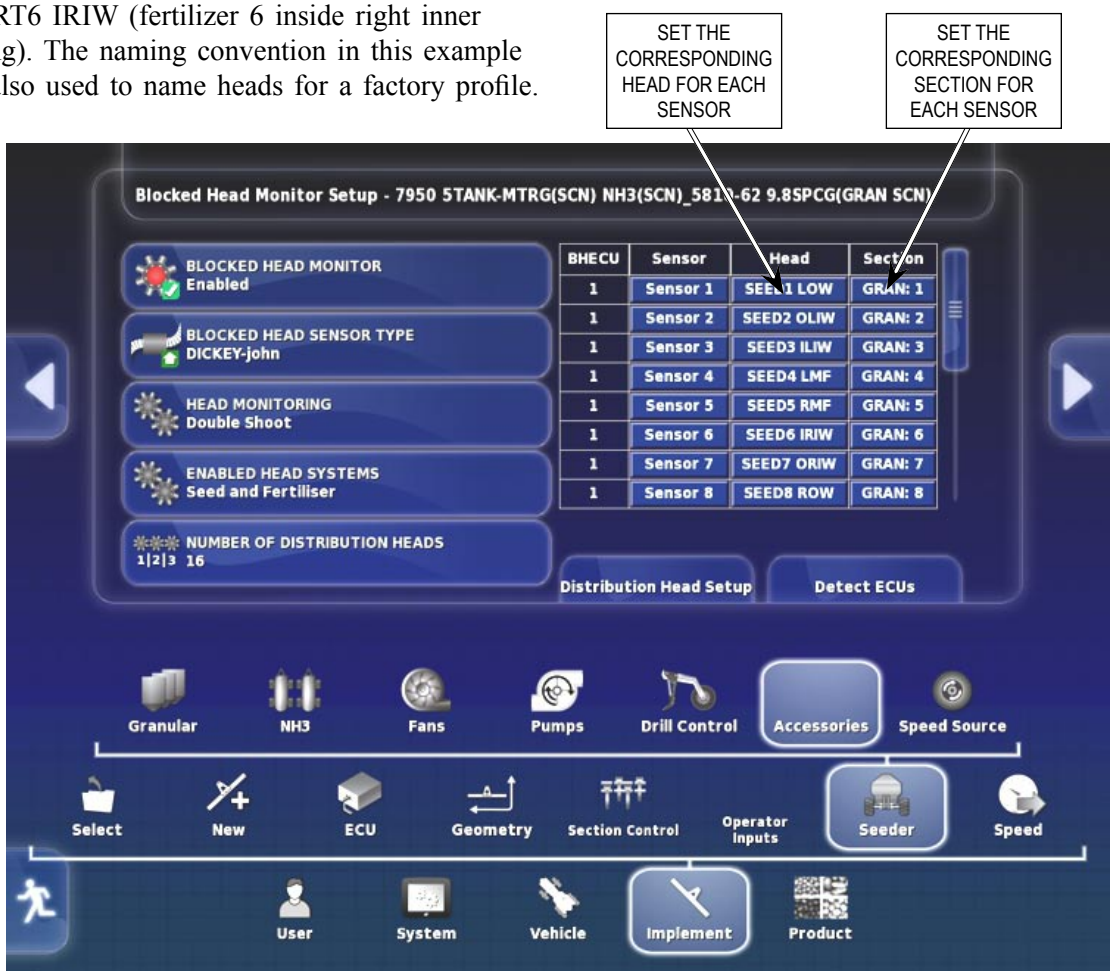


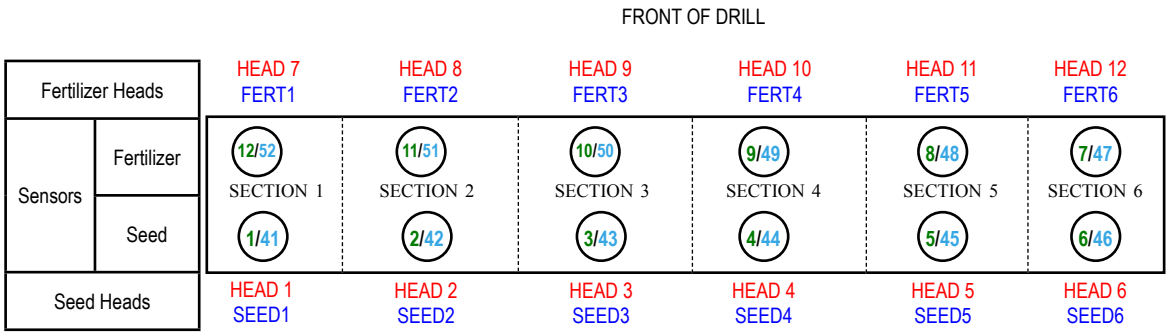
Figure 6.82 - Detect and Assign Sensors

When setting up corresponding heads and sections, refer to *Figure 6.83* that shows how the blockage sensors are wired from the factory and should be assigned to show up correctly on the screen.

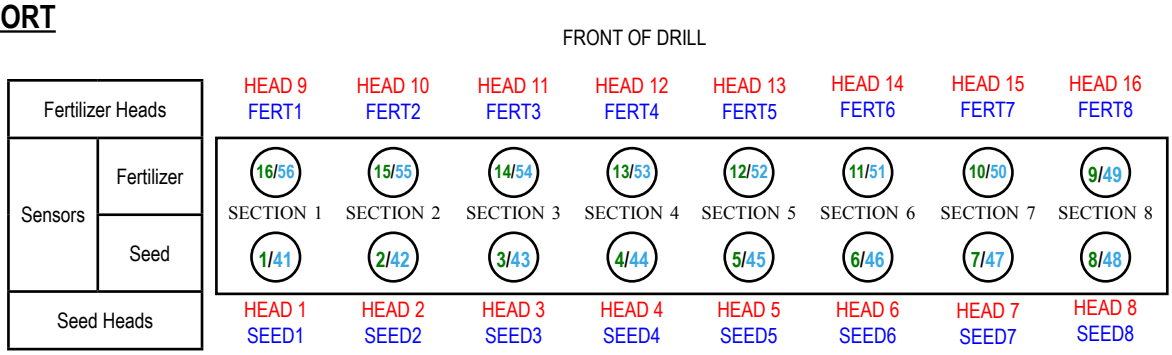
Legend:

Green	Sensor Name, units without ASC
Light Blue	Sensor Name, units with ASC
Red	Head Name, Section Name - Implement was created using Custom profile
Blue	Head Name, Section Name - Implement was created using factory profile

6 PORT



8 PORT



10 PORT

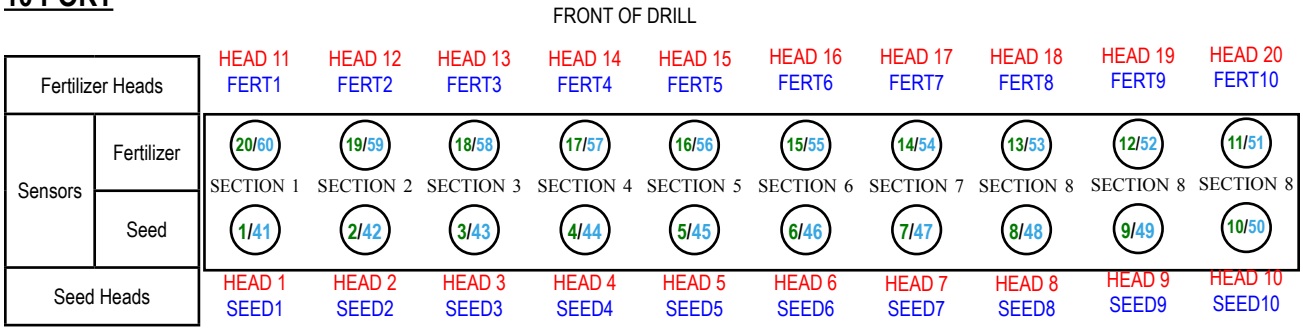


Figure 6.83 - Sensor Wiring

6 PORT PRIMARY					
1st EM-24	2nd EM-24	Factory Profile	Custom Profile Default	Factory Profile	Custom Profile Default
Sensor		**Head**		**Section**	
Sensor 1	Sensor 41	SEED1	Head 1	GRAN: 1	Boom 1: 1
Sensor 2	Sensor 42	SEED2	Head 2	GRAN: 2	Boom 1: 2
Sensor 3	Sensor 43	SEED3	Head 3	GRAN: 3	Boom 1: 3
Sensor 4	Sensor 44	SEED4	Head 4	GRAN: 4	Boom 1: 4
Sensor 5	Sensor 45	SEED5	Head 5	GRAN: 5	Boom 1: 5
Sensor 6	Sensor 46	SEED6	Head 6	GRAN: 6	Boom 1: 6
Sensor 7	Sensor 47	FERT6	Head 12	GRAN: 6	Boom 1: 6
Sensor 8	Sensor 48	FERT5	Head 11	GRAN: 5	Boom 1: 5
Sensor 9	Sensor 49	FERT4	Head 10	GRAN: 4	Boom 1: 4
Sensor 10	Sensor 50	FERT3	Head 9	GRAN: 3	Boom 1: 3
Sensor 11	Sensor 51	FERT2	Head 8	GRAN: 2	Boom 1: 2
Sensor 12	Sensor 52	FERT1	Head 7	GRAN: 1	Boom 1: 1

8 PORT PRIMARY					
1st EM-24	2nd EM-24	Factory Profile	Custom Profile Default	Factory Profile	Custom Profile Default
Sensor		**Head**		**Section**	
Sensor 1	Sensor 41	SEED1	Head 1	GRAN: 1	Boom 1: 1
Sensor 2	Sensor 42	SEED2	Head 2	GRAN: 2	Boom 1: 2
Sensor 3	Sensor 43	SEED3	Head 3	GRAN: 3	Boom 1: 3
Sensor 4	Sensor 44	SEED4	Head 4	GRAN: 4	Boom 1: 4
Sensor 5	Sensor 45	SEED5	Head 5	GRAN: 5	Boom 1: 5
Sensor 6	Sensor 46	SEED6	Head 6	GRAN: 6	Boom 1: 6
Sensor 7	Sensor 47	SEED7	Head 7	GRAN: 7	Boom 1: 7
Sensor 8	Sensor 48	SEED8	Head 8	GRAN: 8	Boom 1: 8
Sensor 9	Sensor 49	FERT8	Head 16	GRAN: 8	Boom 1: 8
Sensor 10	Sensor 50	FERT7	Head 15	GRAN: 7	Boom 1: 7
Sensor 11	Sensor 51	FERT6	Head 14	GRAN: 6	Boom 1: 6
Sensor 12	Sensor 52	FERT5	Head 13	GRAN: 5	Boom 1: 5
Sensor 13	Sensor 53	FERT4	Head 12	GRAN: 4	Boom 1: 4
Sensor 14	Sensor 54	FERT3	Head 11	GRAN: 3	Boom 1: 3
Sensor 15	Sensor 55	FERT2	Head 10	GRAN: 2	Boom 1: 2
Sensor 16	Sensor 56	FERT1	Head 9	GRAN: 1	Boom 1: 1

10 PORT PRIMARY					
1st EM-24	2nd EM-24	Factory Profile	Custom Profile Default	Factory Profile	Custom Profile Default
Sensor		**Head**		**Section**	
Sensor 1	Sensor 41	SEED1	Head 1	GRAN: 1	Boom 1: 1
Sensor 2	Sensor 42	SEED2	Head 2	GRAN: 2	Boom 1: 2
Sensor 3	Sensor 43	SEED3	Head 3	GRAN: 3	Boom 1: 3
Sensor 4	Sensor 44	SEED4	Head 4	GRAN: 4	Boom 1: 4
Sensor 5	Sensor 45	SEED5	Head 5	GRAN: 5	Boom 1: 5
Sensor 6	Sensor 46	SEED6	Head 6	GRAN: 6	Boom 1: 6
Sensor 7	Sensor 47	SEED7	Head 7	GRAN: 7	Boom 1: 7
Sensor 8	Sensor 48	SEED8	Head 8	GRAN: 8	Boom 1: 8
Sensor 9	Sensor 49	SEED9	Head 9	GRAN: 9	Boom 1: 9
Sensor 10	Sensor 50	SEED10	Head 10	GRAN: 10	Boom 1: 10
Sensor 11	Sensor 51	FERT10	Head 20	GRAN: 10	Boom 1: 10
Sensor 12	Sensor 52	FERT9	Head 19	GRAN: 9	Boom 1: 9
Sensor 13	Sensor 53	FERT8	Head 18	GRAN: 8	Boom 1: 8
Sensor 14	Sensor 54	FERT7	Head 17	GRAN: 7	Boom 1: 7
Sensor 15	Sensor 55	FERT6	Head 16	GRAN: 6	Boom 1: 6
Sensor 16	Sensor 56	FERT5	Head 15	GRAN: 5	Boom 1: 5
Sensor 17	Sensor 57	FERT4	Head 14	GRAN: 4	Boom 1: 4
Sensor 18	Sensor 58	FERT3	Head 13	GRAN: 3	Boom 1: 3
Sensor 19	Sensor 59	FERT2	Head 12	GRAN: 2	Boom 1: 2
Sensor 20	Sensor 60	FERT1	Head 11	GRAN: 1	Boom 1: 1

6.7.6.3 GRANULAR SECTIONS

This tab appears if configured with granular ASC.

To access granular section monitoring, setup select Implement/Seeder/Accessories/Granular Section. Sections should be assigned for all sensors in the same order. Refer to *Figure 6.84*.

6.7.7 GENERAL INPUTS

This is an option that is related to other types of equipment and not used with Bourgault Air Seeders. Settings should be left disabled.

6.7.8 ENCODER

Encoder settings designed for the technicians and can be accessed only if Access Level set to Dealer or Technician. Defaults are preassigned.

6.7.7 GENERAL OUTPUT

This setting allows you to assign a relay output from one of the ECU drives. Not supported through Bourgault harnessing.

Figure 6.84 - Granular Section Monitoring Setup

6.7.7 SPEED SOURCE

1. Speed Source - allows user to select the speed source:
   i. GPS - to use GPS signal for speed.
   ii. Wheel Sensor - to use wheel sensor on the air seeder tank for speed.
   iii. Manual - to use custom manual speed entered in the Configuration panel on the Seeder Controller screen. ,Refer to Section 2.6.4 - Configuration Panel.

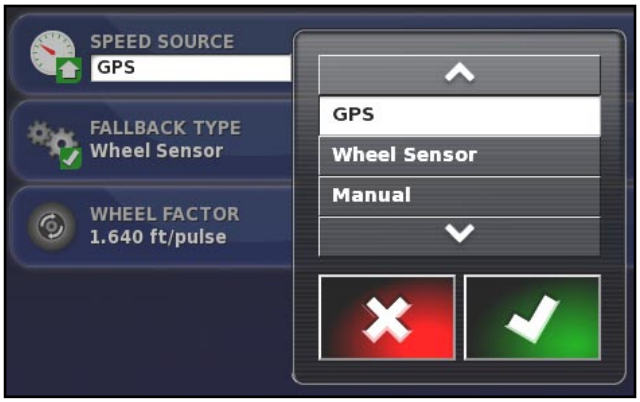


Figure 6.85 - Selecting Speed Source

IMPORTANT

FOR THE BEST ACCURACY IT IS RECOMMENDED TO USE GPS AS A SPEED SOURCE. IF THERE IS NO GPS EQUIPMENT INSTALLED OR GPS SIGNAL IS NOT AVAILABLE, MANUAL SPEED CAN BE USED IF YOU ARE MAINTAINING CONSISTENT SPEED. MAKE SURE TO MAINTAIN THE SET MANUAL SPEED TO ACHIEVE THE RATES THAT HAVE BEEN SET. THE THIRD CHOICE IS A WHEEL SENSOR. ALTERNATIVELY THE WHEEL SENSOR CAN BE USED. ACCURACY MAY AFFECTED FROM FULL TO EMPTY TANK AS THE TIRE DIAMETER CHANGES, ESPECIALLY ON THE 7000 AS WITH LARGE TIRES WHERE THE DIAMETER CHANGES SUBSTANTIALLY.

Figure 6.86 - Speed Source Setup

2. Fall Back Type - this button is enabled only when Speed Source is set to GPS.

   In case the GPS signal is lost, to continue seeding, system will automatically switch to use speed source set in the Fallback Type. The options are:

   i. Wheel Sensor
   ii. Manual
   iii. Disabled

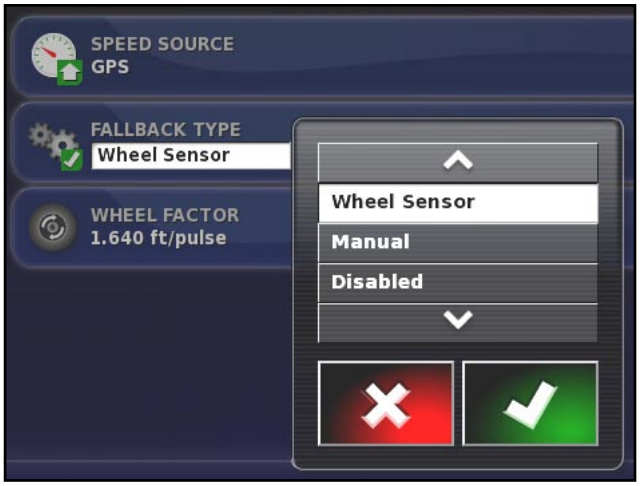


Figure 6.87 - Selecting Fallback Type

3. Wheel Factor - is pre-entered from the factory with a theoretical value and it represents the distance travelled by the seeder in the time between pulses from the ground speed sensor. The speed sensor is located on the rear left wheel, for 7000AS. For 6000AS it is located on a the transmission plate new the rear left wheel.

   This button is enabled only when Wheel Sensor is selected for primary or alternative speed source. When selected will allow to change the wheel factor value. Refer to *Table 1 & 2 in Section 8.7 - Wheel Sensor Calibration* for theoretical values.

Figure 6.88 - Wheel Factor

NOTE

ON 7000 SERIES AIR SEEDER WHEEL FACTOR VALUE, IS VARIABLE DUE TO CHANGE IN TIRE DIAMETER WHEN AIR SEEDER TANK IS LOADED AND EMPTY. THIS MAY AFFECT ACCURACY.

If found that wheel factor is incorrect (incorrect ground speed and/or acre accumulation), wheel factor can be verified and if required calibrated. *Refer to Section 8.7 - Wheel Sensor Calibration*.

6.7.8 SPEED

Sends vehicle speed information to the ISOBUS for performing rate control or other functions. Defaults settings are disabled, not used.

1. ISO Ground Speed - enabled or disabled
2. GPS NMEA2000 - enabled or disabled

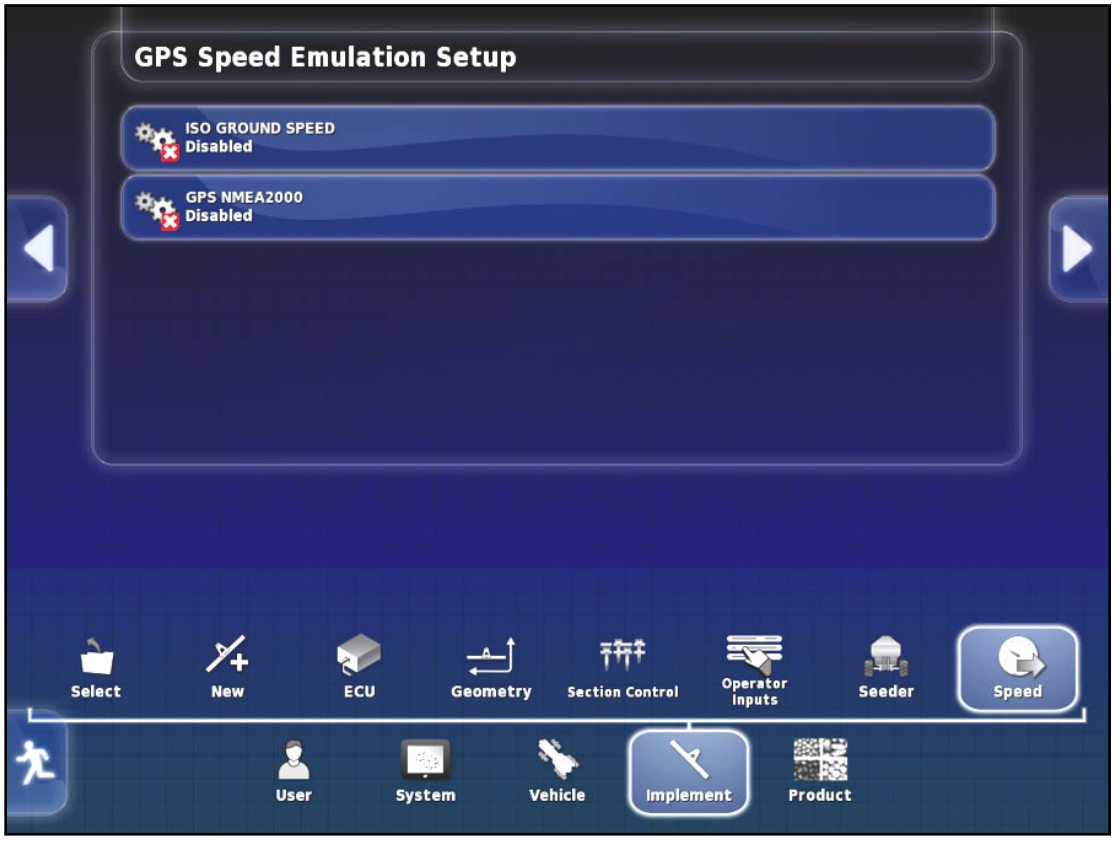


Figure 6.89 - GPS Speed Emulation Setup

7 PRODUCT SETUP

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The X30 console has a preloaded manufacturer product list for each category of the product: granular, liquid and NH3.

The NH3 list has only one product (NH3) and cannot be modified.

Granular and liquid product lists can be customized to have products that will be used in your operation. In these lists you can add new products or change presets for existing products. Products that are no longer applicable to your operation can be removed from the granular and liquid product lists, this is done in the Inventory Manager, refer to *Section 10.6 - Inventory Manager*.

The manufacturer product list is used as a starting point to create custom product lists for your operation and cannot be modified.

Settings for each product are: type, density, product rate increment, preset rate 1 and 2, and calibration factor for each tank/metering auger. Calibration factors are used with metering auger RPM to determine application rate. Product densities are used with tank volumes to determine tank capacities.

NOTE

If any of the settings in the Granular or Liquid product lists for a product that is currently set up in a tank are changed, the X30 console will ask to determine what rate settings (from the product list or from the tank) to use for the affected tanks.

Refer to *Figure 7.1*. You can select what rate setting to use for each tank or select "All" button for all tanks.

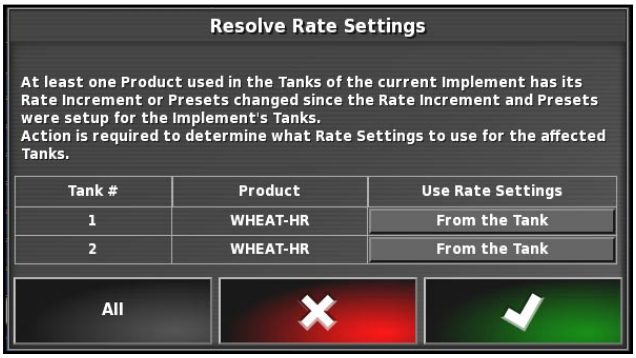

Figure 7.1 - Resolve Rate Settings

Figure 7.2 - Product Setup Menu

7.1 ADDING NEW PRODUCT

To add the product to granular/liquid products list select from the main setup menu Product/Granular or Liquid (depends on the type of product being added).

Product list will be shown on the left side of the product setup screen. If there are no products yet selected for the custom list, only the “New Product...” button will be displayed in the list.

If products were previously added to the custom product list, they will be displayed under the “New Product...” button and settings buttons with current values shown will be on the right side.

"Show Calibration Factors" button will be displayed only if the product list has products in it.

To see the calibration factor first select a product from the list on the left (selected product will have white background). Then select "Show Calibration Factors" button. Table with calibration factors will be displayed on the right side of the screen, refer to *Figure 7.4*.

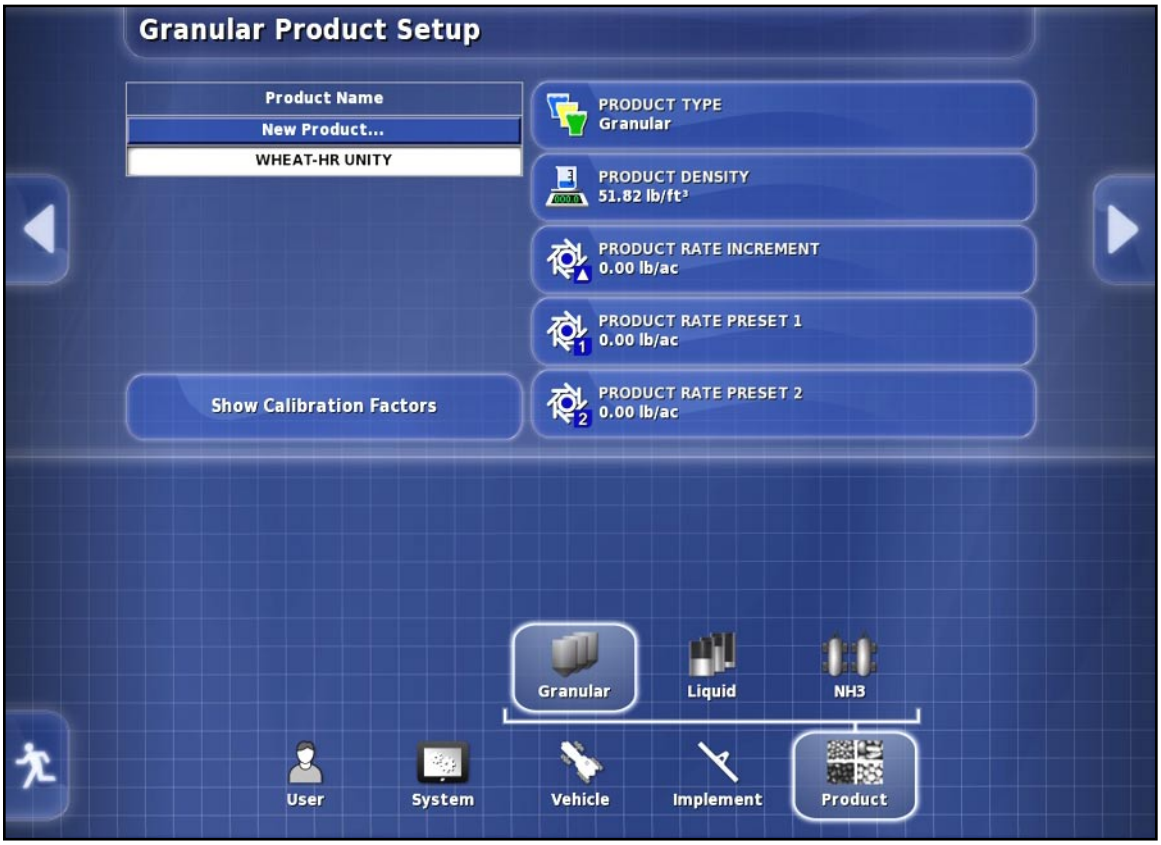

Figure 7.3 - Product Setup Screen

The X30 console will save and display calibration factors for each implement and tank that product has been calibrated in, along with the flighting that was entered for that tank.

There are two ways to add a new product to your custom list:

- Using Bourgault product template list. This is a preferred method.

or

- Adding custom product without a template use.

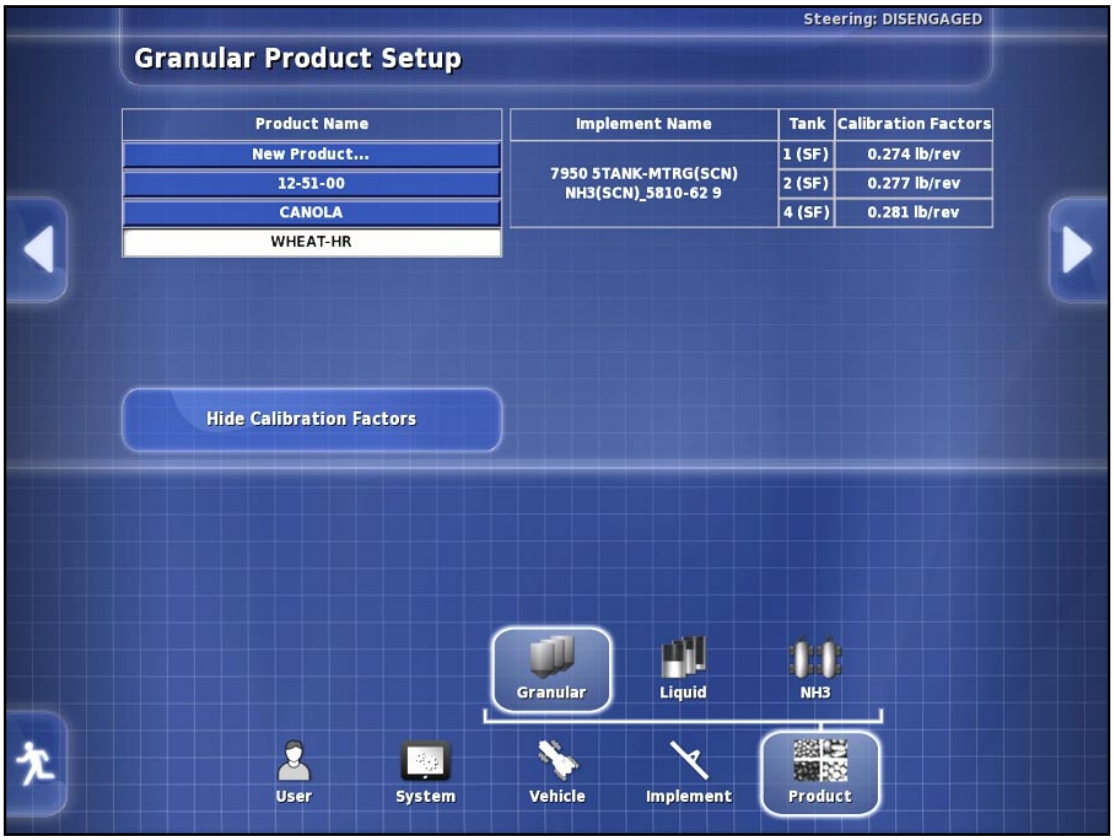

Figure 7.4 - Calibration Factors

Adding New Product Using Manufacturer Template:

1. Select "New Product ..." button. New Product Setup Screen will appear.
2. Refer to *Figure 7.5*. Select Bourgault, then select yellow arrow to proceed to the next step.
3. Refer to *Figure 7.6*. Next screen will prompt you to select product template. Using arrows or scroll bar find the product you would like to add and select it. If you can not find your product, choose the one closest to it. Select yellow arrow to proceed to the next step.
4. Refer to *Figure 7.7*. If desired you can change product name. Select Product Name button and keyboard screen will appear. Enter the product name and confirm. Select yellow arrow to proceed to the next step.
5. Product setup is complete and next screen will prompt you to save product settings or cancel it, refer to *Figure 7.8*.

Figure 7.5 - Selecting Manufacture's Product Templates

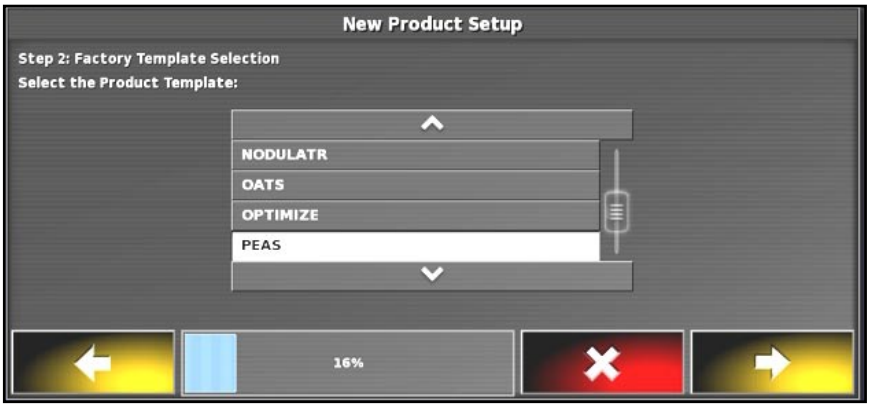

Figure 7.6 - Selecting Product Templates

Adding Custom Product Without Template Use:

1. Select "New Product ..." button. New Product Setup Screen will appear.
2. Refer to *Figure 7.5*. Select "Custom Product", then select yellow arrow to proceed to the next step.
3. Next screen will prompt you to enter product name. Refer to *Figure 7.7*. Select Product Name button and keyboard screen will appear. Enter the product name and confirm. Select yellow arrow to proceed to the next step.

Figure 7.7 - Entering Product Name

Figure 7.8 - Product Setup Complete

4. Next screen will prompt you to enter product density only if you are adding granular product, it is not required for liquid product.

   Enter product density, refer to *Figure 7.9*.

IMPORTANT

PRODUCT DENSITY IS USED FOR THE CALCULATION OF THEORETICAL TANK CAPACITY SO IT IS IMPORTANT TO HAVE THE CORRECT PRODUCT DENSITY ENTERED. FOR INSTRUCTIONS TO DETERMINE CORRECT PRODUCT DENSITY REFER TO *SECTION 7.3 - PRODUCT DENSITY*.

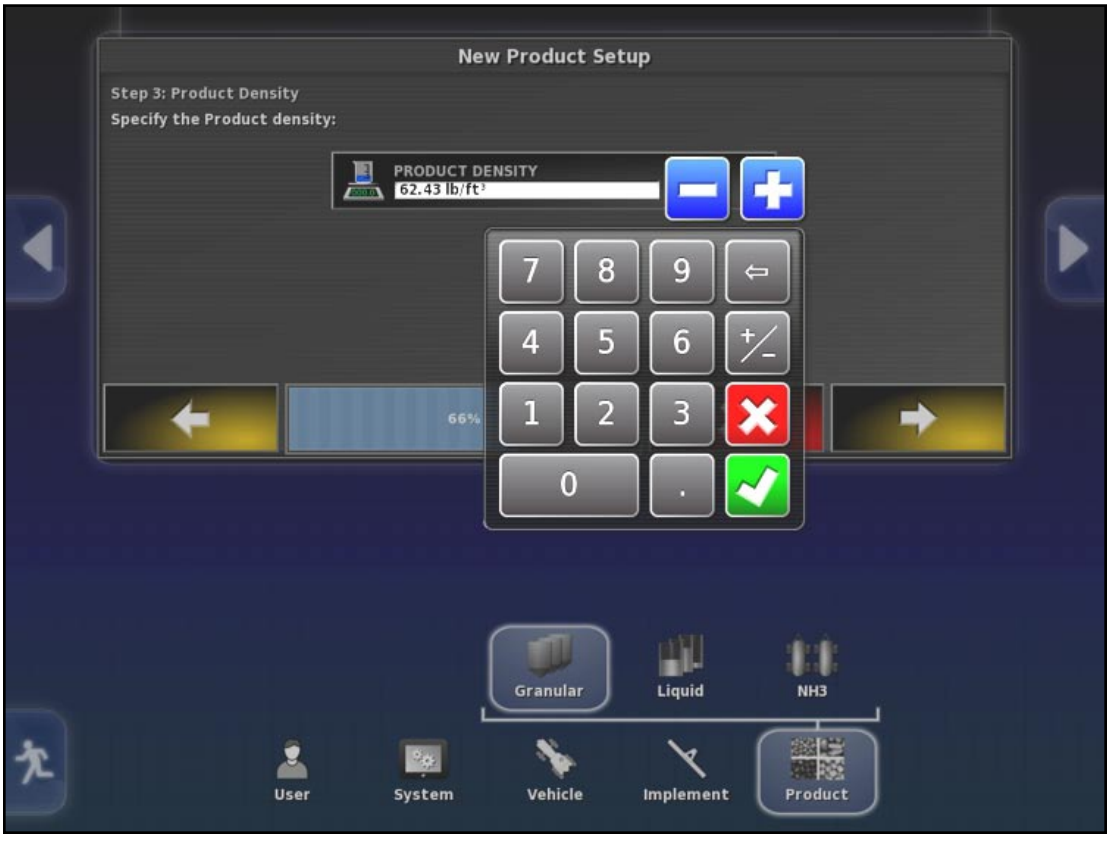

Figure 7.9 - Entering Density

5. Refer to *Figure 7.10*. Enter product rate increment, product rate preset 1 & 2.

   Rate Increment is used during operation to increase/decrease requested rate by preset value.

   Product Rate Preset 1 & 2 are preset rates, that are used to immediately adjust the application rate to that value during operation.

   Select Product Increment button, using numeric keypad enter required value and confirm. Repeat for Rate Preset 1 and Rate preset 2.

6. Product setup is complete and next screen will prompt you to save product settings or cancel it, refer to *Figure 7.11*.

Figure 7.10 - Entering Rate Increment, and Rate Preset 1 & 2

Figure 7.11 - Product Setup Complete

7.2 MODIFYING PRODUCT

To adjust product presets like density, rate increment and rate presets select from the main setup menu Product/Granular or Liquid (depend on the type of product).

Refer to *Figure 7.14*.

1. Select product from the list on the left. Selected product will have white background.
2. Product Density button appears only for granular product, does not appear for NH3 or liquid.

   Select product density button on the right, and numeric keypad will appear, refer to *Figure 7.12*. Enter new value for the density and confirm.

   It is important to enter correct product density, for more information refer to *Section 7.3 - Product Density*.
3. Select Product Rate Increment button to adjust it's value.

   Numeric keypad will appear, enter new value and confirm.

   Repeat same steps for Product Rate Preset 1 & 2.

Figure 7.12 - Entering Density

Figure 7.13 - Adjusting Product Rate Increment

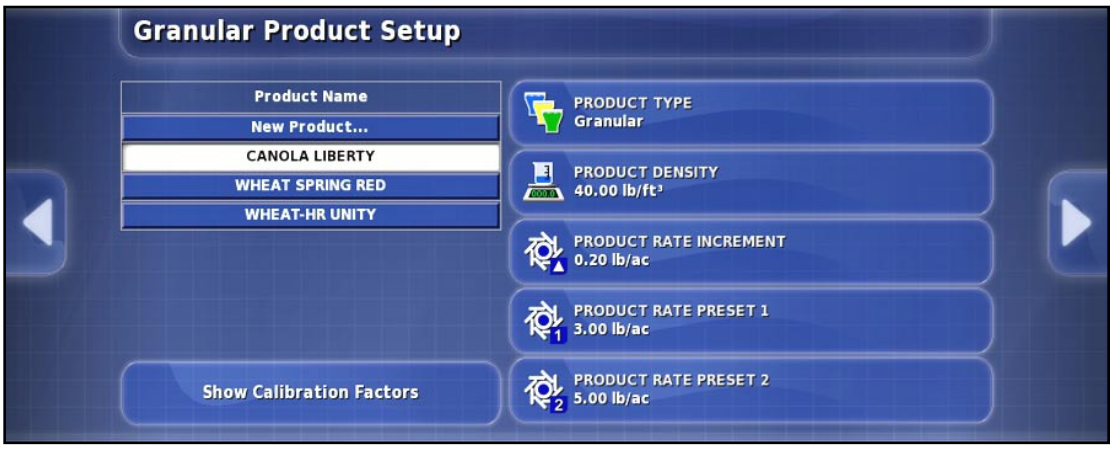

Figure 7.14 - Adjusting Product Presets

7.3 PRODUCT DENSITY

You can measure product density, or refer to the product density chart in *Appendix C* for you air seeder tank operator's manual.

To determine the density of the applied product fill the calibration pail full, level, and weigh (make sure to subtract pail weight or tare scale before weighing). Use following formula to get actual product density:

$$\text{PRODUCT DENSITY (LB/FT3)} = \frac{\text{PRODUCT WEIGHT(LB)}}{\text{CALIBRATION PALE/BOX VOLUME } (FT^3)}$$

Calibration Pale Volume - 1.04 ft3 (7000A/S)

Calibration Pale Volume - 1.00 ft3 (6000A/S)

8 GENERAL OPERATIONS

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8.1 SELECTING THE PRODUCT

1. In the Seeder Controller window (full screen mode), show the Tank that you would like to select the product for. Expand the panel for that tank. Refer to *Figure 8.2*.

2. Select the Product

   a. Select "Select Product" button (If this tank was previously used, the name of the previously used product will be shown as the name of that button). Product panel for this tank will appear, refer to *Figure 8.1*.

   The title block (*Item A, Figure 8.1*) displays name of the tank (Bin # or Tank #, product name or empty, or custom name) depend on the settings, refer to *Section 6.7.1 - Granular Setup and 6.7.2 - NH3/Liquid Setup.*

   b. To assign product for the tank select Product Name button (*Item B, Figure 8.3)* to open product scroll list.

Figure 8.1 - Product Panel - No Product Selected

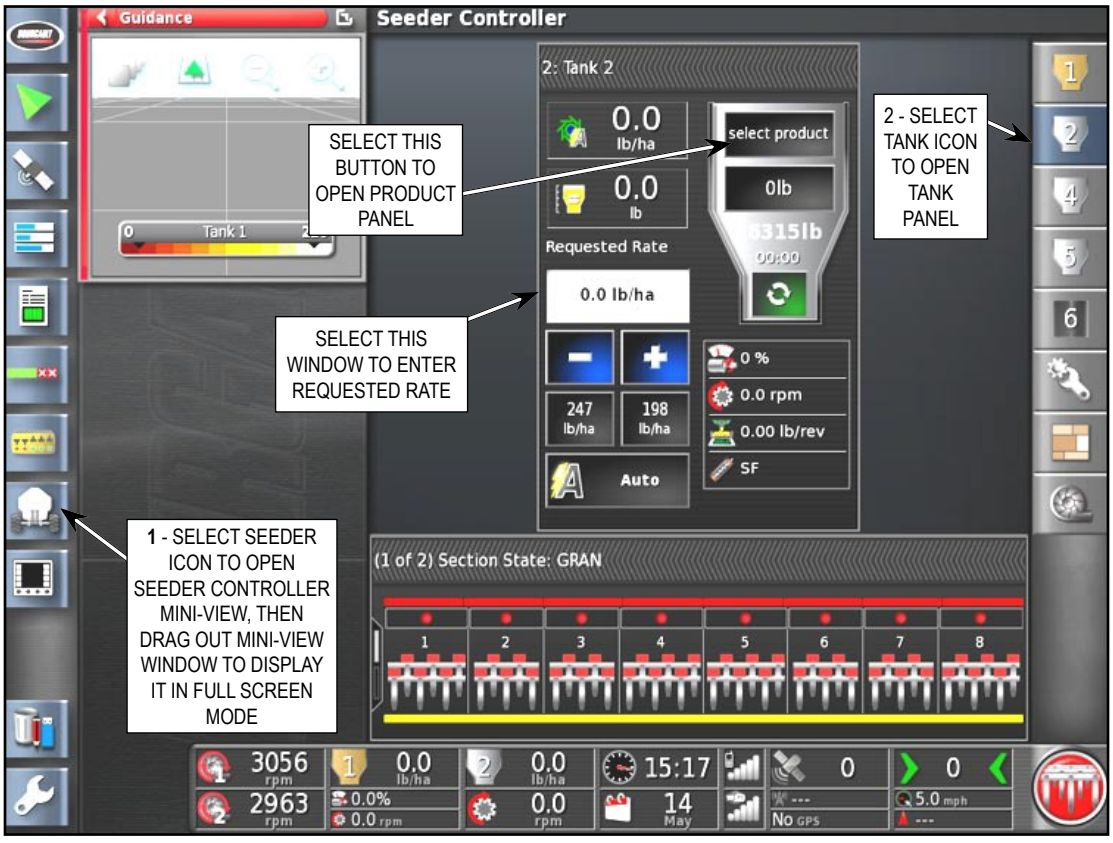


Figure 8.2 - Tank Panel Expanded View

Select desired product, if it is not on the list select new, refer to *Figure 8.4*.

Selecting new will open up the New Product Set Up wizard, refer to *Section 7 - Product Setup* for complete instructions.

c. Once a product is selected, the Rate Increment, Rate Preset 1 and 2 buttons (*Items C, D & E, Figure 8.3*) will display values (if they were entered previously for that product) or for a new product it will show 0.

Rate Increment (*Items C, Figure 8.3*) is used during seeding to adjust application rate by increments. Rate Preset 1 & 2 (*Items D & E, Figure 8.3*) are used to instantly adjust application rate to preset value.

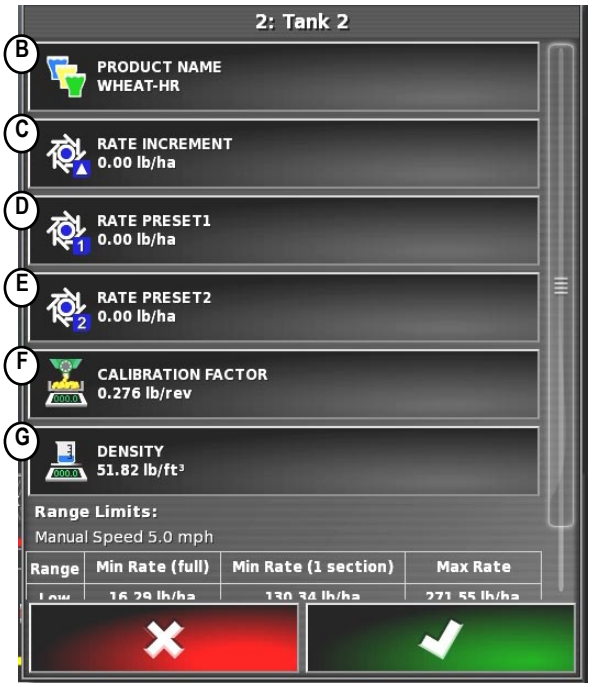
Enter new values or adjust existing.

When entering rate preset 1, you will be asked whether you want to set the Requested Rate to this preset. Select "yes" to set requested rate to rate preset 1, or "no" to enter requested rate later using requested application rate window either on the Tank Panel in the Seeder Controller expanded mode or Tank Tab in the Seeder Controller mini-view window (refer to *Section 2.7.3 - Tank Tab/Panel Explained*).

d. Calibration factor (*Items F Figure 8.3*) will display: factory value or last saved calibration factor for that product.

Selecting Calibration Factor button will open Calibration Method window for the selected tank. Here you will have options to enter calibration factor manually, perform calibration for single selected tank, run tank optimizer wizard or perform area test.

e. If desired adjust density (*Items G, Figure 8.3*).



Use the scroll bar to see full Range Limits table:

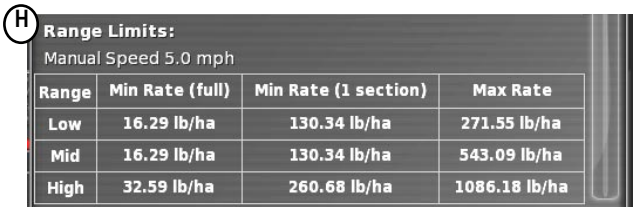


Figure 8.3 - Product Panel

Figure 8.4 - Product Selection List

IMPORTANT

PRODUCT DENSITY IS USED FOR THE CALCULATION OF THEORETICAL TANK CAPACITY SO IT IS IMPORTANT TO HAVE THE CORRECT PRODUCT DENSITY ENTERED. FOR INSTRUCTIONS TO DETERMINE CORRECT PRODUCT DENSITY REFER TO *SECTION 7.3 - PRODUCT DENSITY*.

f. Range Limits table (*Items H, Figure 8.3*) will be displayed if calibration factor exists.

Range Limits table provided to assist in selecting appropriate final drive range:
- Min Rate (full) - minimum achievable rate on the full width boom.
- Min Rate (1 section) - displayed only if there is granular ASC. This is the minimum achievable rate with only one section open.
- Max Rate - maximum achievable rate.

It is recommended to choose the range, where the desired application rate will fall approximately in the middle. This allows meters to run approximately in the middle of the allowable meter speed. Remember to confirm that range at each meter on the unit before seeding.

NOTE

REFER TO YOUR AIR SEEDER OPERATOR'S MANUAL ON HOW TO MAKE RANGE ADJUSTMENTS.

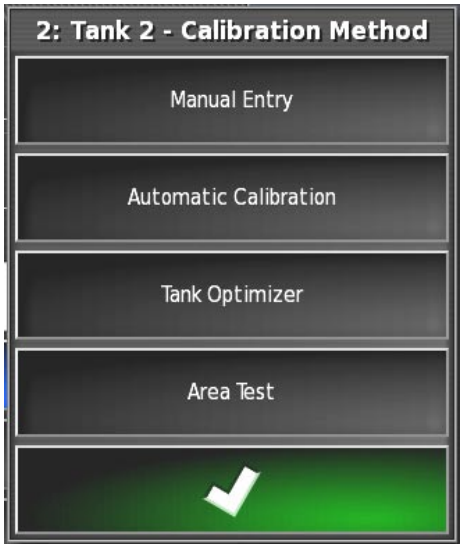


Figure 8.5 - Calibration Method Window

g. Confirm changes by selecting green check mark button.

Window with the question if you want to fill the Tank with the new product will appear.

If you select fill tank now when asked it will add product weight based on 100% tank volume used and density. Alternately you can select no and then go back in to enter a known set weight using the optional weigh system during fill.

8.2 FILLING THE TANK

When the air seeder, NH3 or Liquid tanks are filled or refilled, the tank levels will not automatically reset to full.

Once filling is complete:

1. In the Seeder Controller window (full screen mode), show the Tank that you would like to enter weight for. Expand the panel for that tank. Refer to *Figure 8.7*.
2. Select the Weight button tank fill panel will appear, refer to *Figure 8.6*.

   The title block (*Item A, Figure 8.6*) displays name of the tank (Bin # or Tank #, product name or empty, or custom name) depending on the settings, refer to *Section 6.7.1 - Granular Setup and 6.7.2 - NH3/Liquid Setup.*

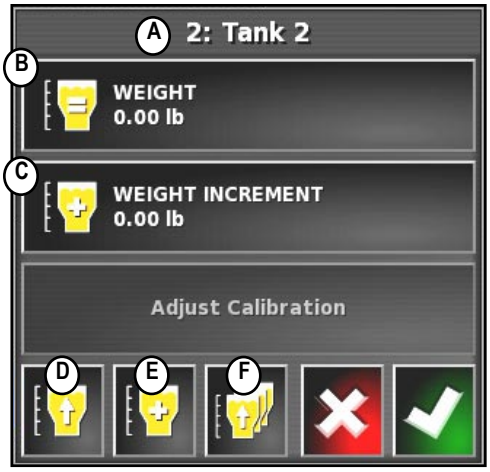


Figure 8.6 - Tank Fill Panel

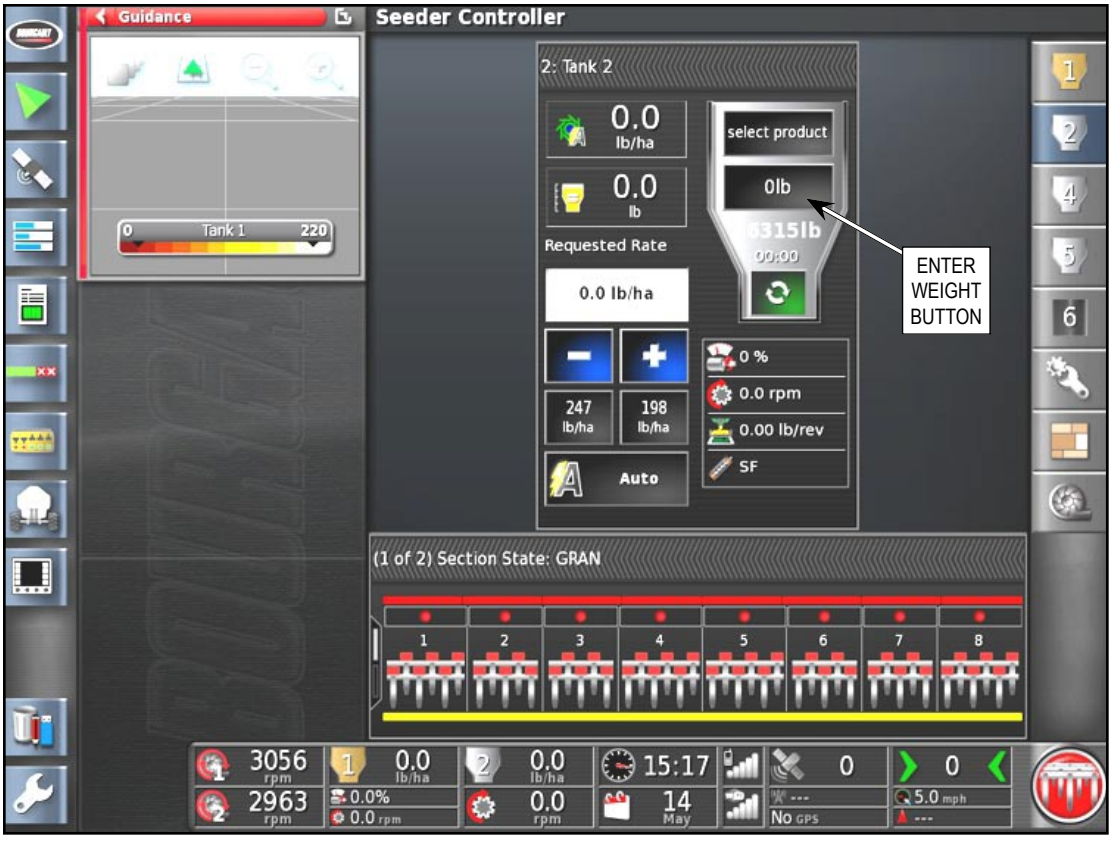


Figure 8.7 - Entering Weight

3. Fill the tank using functions of the tank fill panel, refer to *Figure 8.6*:

   - **Known Weight** (*Item B, Figure 8.6*) Exact weight of the product in the tank can be determined during the fill using air seeder tank weigh system or if using bagged product with weight stated on each bag.
   - **Weight Increment** (*Item C, Figure 8.6*). Enter weight value that will be used when increasing weight in the tank by increments.

     If product was remaining in the tank before filling, you can enter new value from weigh system and add it to existing value.

     Alternatively if adding canola bags or known weight, enter it here and press button Increase weight by increment (*Item E Figure 8.6*) for how many bags are being added.
   - **Fill Tank to Capacity** (*Item D, Figure 8.6*). Product weight based on 100% tank volume used and density will be added.
   - **Increase Weight by Increment** (*Item E, Figure 8.6*). Will add product weight based on the preset increment (refer to *Item C*)
   - **Fill All Tanks to Capacity** (*Item F, Figure 8.6*). Will add product weight to each tank, based on 100% tank volume used and density of the product in that specific tank.

8.3 DETERMINE PRODUCT ALLOCATION

The X30 console provides a "Tank Optimizer" tool to determine product allocation to minimize filling requirements in the field.

If there are tanks that you will not be putting product in, you can first disable them in the settings under Implement/Seeder/Granular/Tanks to exclude them from the optimizer scenarios. For all tanks to be considered in the optimizer ensure they are all enabled.

To access the Tank Optimizer:

Refer to *Figure 8.9*:

- In the Seeder Controller window in the expanded mode, from the menu on the right select Configuration icon to open Configuration panel.
- On configuration panel select Multi-Tank Calibration. Calibration Method window will open up.
- Select Tank Optimizer. Tank Optimizer wizard will start up, refer to *Figure 8.8*.

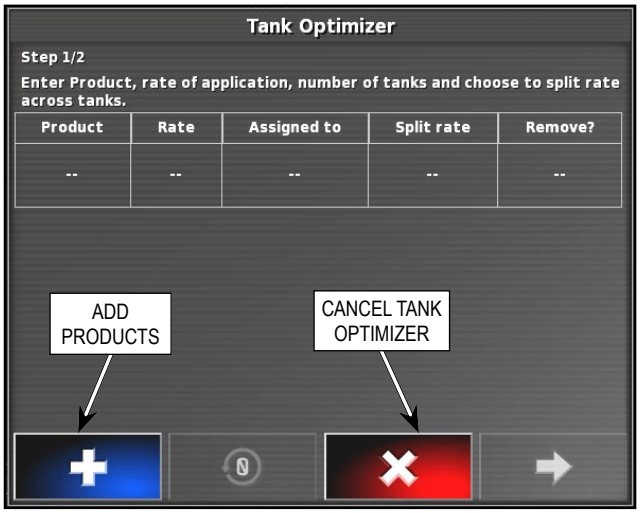


Figure 8.8 - Tank Optimizer Wizard

Figure 8.9 - OpeningTank Optimizer

1. Select  button to start adding products to the table, line for the first product will appear in the table, refer to *Figure 8.10*.

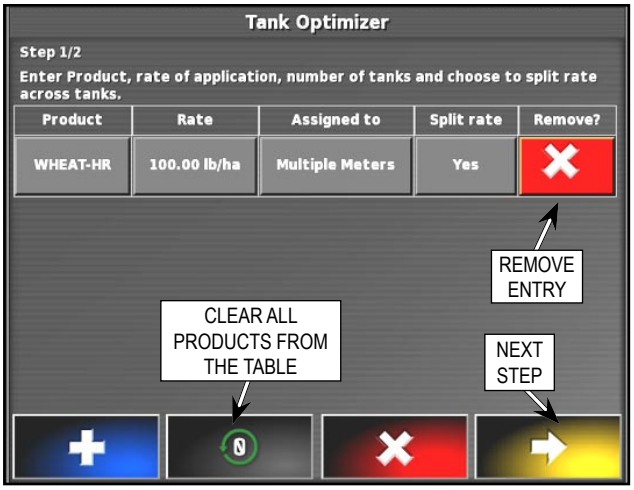


Figure 8.10 - Adding Product Details

2. Refer to *Figure 8.11*. Under the Product column select "Please select" button. Choose product from the scroll list or select New Product to enter new (for full instruction to enter new product refer to *Section 7.1 - Adding New Product)*.

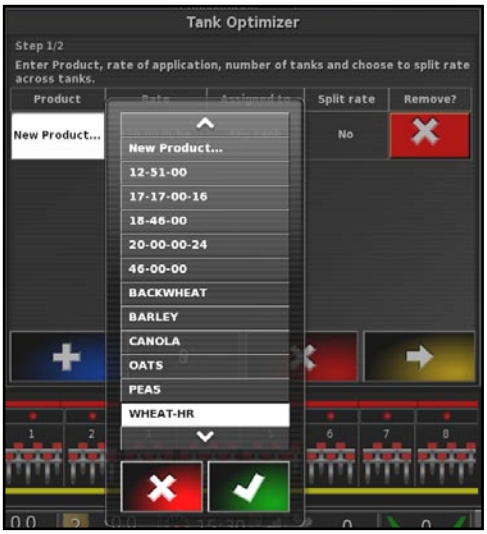


Figure 8.11 - Select Product

3. Refer to *Figure 8.12*. Enter product application rate.

Figure 8.12 - Enter Application Rate

4. Refer to *Figure 8.13*. Assign tanks for this product.

   - If you know the tank you will be putting this product in, select that tank from the scroll list.

   - If Any Single Meter selected, optimizer will assign this product to one single tank.

   - If Multiple Meters selected, optimizer will assign this product to several tanks (ex. if it has a much higher rate than other products).

5. If one product will be placed in multiple tanks, optimizer will allow you to select option of splitting rate between these tanks.

   Under Split Rate column for that product select:

   - "Yes" to allow split rates. This will set the rates for each tank so they all run out at the same time.

   or

   - "No" if you prefer not to use split rates. This will use the requested application rate for that product for each tank and you will have to manually switch tanks as they run out.

6. Repeat above steps if more products will be applied.

   Press Remove button to clear any product from the list in the Tank Optimizer.

   When finished adding all products, select yellow arrow to proceed to the next step.

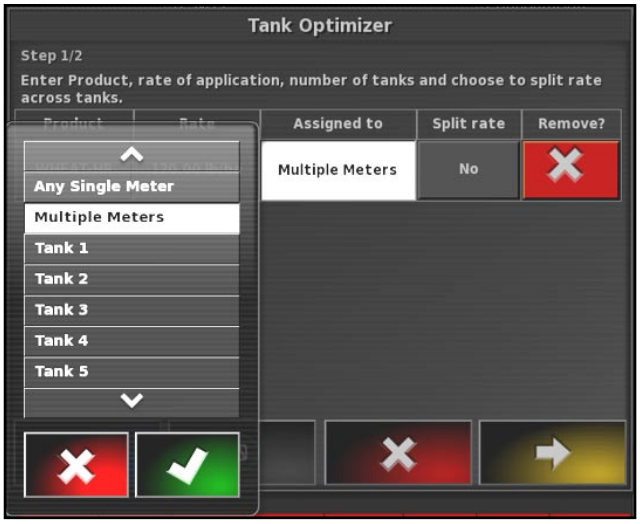


Figure 8.13 - Assigning Tank(s)

7. Refer to *Figure 8.*14. Based on the provided information, Tank Optimizer will figure out several tank groupings, approximate time and maximum area covered before the refill for each tank, application rate for each tank.

   Smallest area coverage between the individual tank groupings will be selected as a Maximum area covered before refilling for specific configuration. Acre values under tank to run out first will be red.

   Use left and right arrows to switch between all available configurations and review information for each configiuration.

   If you want to make changes in the initial information, use left yellow arrow to return to the previous step of setting product details.

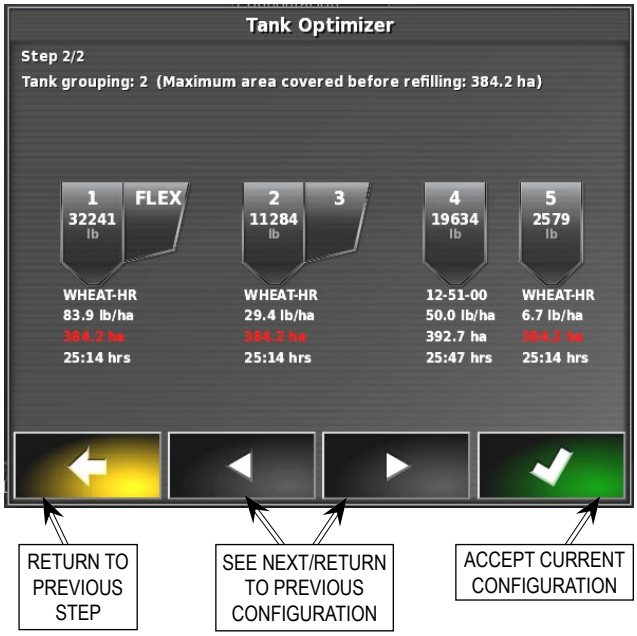


Figure 8.14 - Selecting Tank Configuration

7. Once you find a configuration that will fit your needs, select green check mark to accept it. X30 console will ask if you would like to apply this configuration, refer to *Figure 8.15*.

   If you choose to apply, air seeder settings will be changed accordingly. It will accept new tank grouping, tanks that will not apply product will be disabled. Product and application rate will be assigned to the tanks in Seeder Controller. Weights will be added to the tanks based on 100% tank volume used and density.

NOTE

ENSURE YOU SET THE INTER-CONNECT COVERS ON THE TANK ACCORDINGLY TO THE TANK GROUPING YOU SELECTED.

Figure 8.15 - Apply Configuration

8.4 CALIBRATION - GRANULAR AIR SEEDER TANK

The X30 console allows operator to manually enter calibration factors for each tank if known or perform calibration to determine value for each tank.

IMPORTANT

IT IS HIGHLY RECOMMENDED ALWAYS TO PERFORM ACTUAL CALIBRATION. USING PREVIOUSLY DETERMINED CALIBRATION FACTORS MAY NOT PROVIDE ACCURATE METERING RATE. VARIETY OF FACTORS SUCH AS TEMPERATURE, HUMIDITY, MOISTURE CONTENT, KERNEL SIZE, KERNEL SHAPE, SEED TREATMENT AND ETC. OF PRODUCT THAT WAS USED TO DETERMINE THE CALIBRATION FACTOR MAY BE DIFFERENT COMPARED TO THE PRODUCT THAT WILL BE USED.

BOURGAULT HAS DONE A LOT OF WORK TO PROVIDE FACTORY CALIBRATION NUMBERS FOR THE MAJORITY OF COMMON PRODUCTS WITH THE OPTIMUM METERING AUGER TYPES (HX, 1X, 2X, OR LO), HOWEVER NOT ALL PRODUCTS WERE EVALUATED WITH ALL METERING AUGER TYPES. DEFAULT VALUES ARE PROVIDED AS A STARTING POINT ONLY – CALIBRATION IS HIGHLY RECOMMENDED AT ALL TIMES FOR ALL PRODUCTS.

IMPORTANT

TO BE ABLE TO PERFORM CALIBRATION OR MANUALLY ENTER CALIBRATION FACTORS PRODUCT MUST BE ASSIGNED TO THE TANK(S) THAT WILL BE CALIBRATED.

To access calibration functions in the Seeder Controller window (full screen mode) select Configuration icon from the menu. The Configuration panel will open up, refer to *Figure 8.16*.

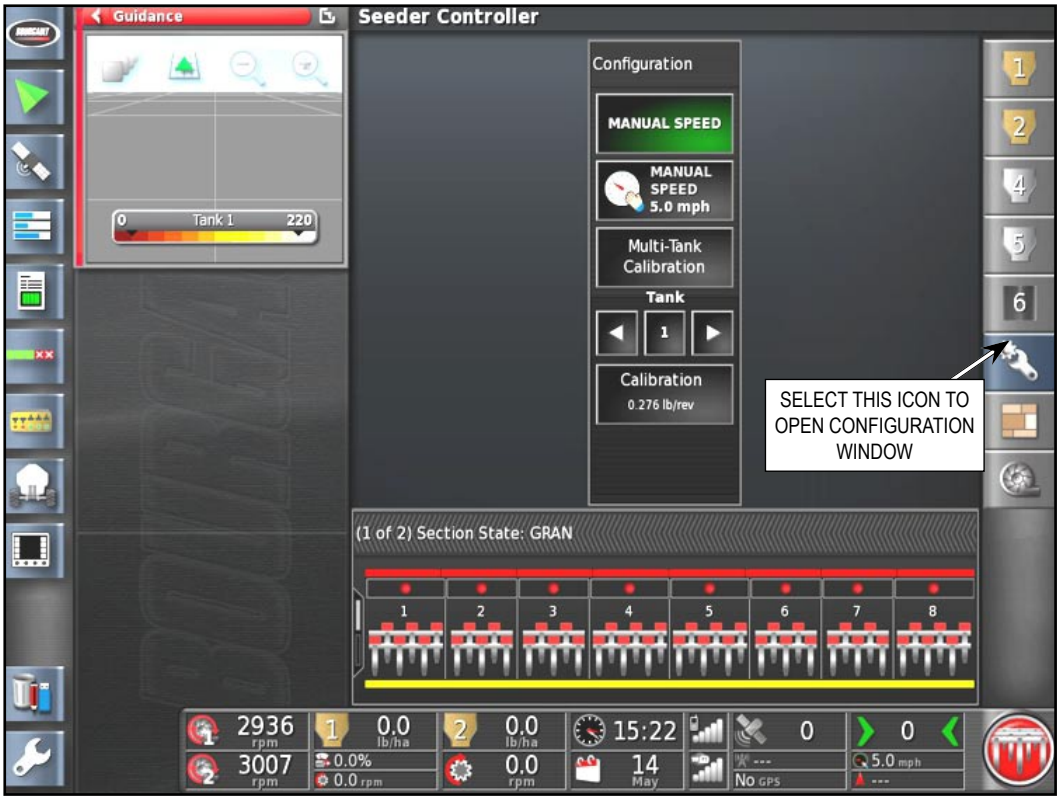


Figure 8.16 - Configuration Panel

8.4.1 MANUAL ENTRY OF CALIBRATION FACTORS

On the configuration Panel select Multi-Tank Calibration button (refer to *Figure 8.16*) to bring up Calibration Method window, refer to *Figure 8.17*.

Select Manual Entry button. Calibration Factors window will appear, refer to *Figure 8.18*.

Buttons for enabled tanks only will be displayed. Buttons title has following format:

CAL FACTOR - tank #: Tank name

The tank name may be displayed Bin #, Tank #, product name, "Empty" or custom name, depending on the tank settings, refer to *Section 6.7.1 - Granular Setup and 6.7.2 - NH3/Liquid Setup.*

Select the button for the tank that you would like to enter calibration factor. Numeric keypad will appear. Enter calibration factor value and confirm.

Repeat for the remaining tanks.

This can be used to enter the calibration factor for NH3/liquid if it has not already been entered in the settings page, refer to *Section 6.7.2.2 - Flow Settings*.

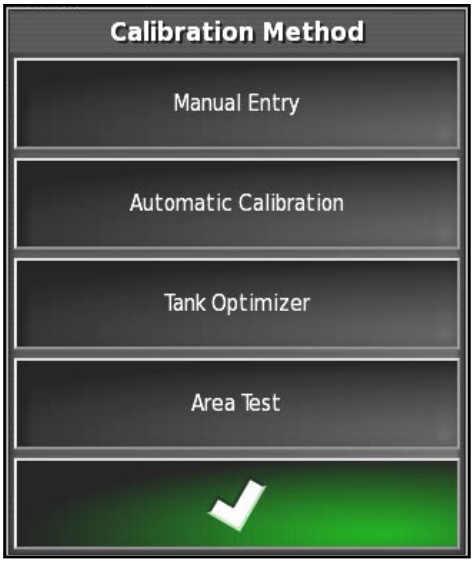


Figure 8.17 - Calibration Method Window

Figure 8.18 - Calibration Factors Window

8.4.2 STATIONARY CALIBRATION

IMPORTANT

STATIONARY CALIBRATION MODE AUTOMATICALLY USES THE MANUAL SPEED FOR THE SPEED INPUT. ENSURE THAT THE MANUAL SPEED IS SET THE SAME AS THE PLANNED SEEDING SPEED FOR THE MOST ACCURATE CALIBRATIONS. 6000 SERIES AIR SEEDERS HAVE THE CALIBRATION DRIVE SET TO 5 MPH BY DEFAULT.

1. Changing Manual Speed

   Refer to *Figure 8.19*.

   On Configuration panel select Manual Speed button. Numeric keypad will appear. Enter speed value and confirm.

   Note: This button will be disabled if in the Speed Source setup (refer to Section 6.7.7 - Speed Source) Speed Source or Fallback Type set to Wheel sensor. To enable Manual Speed button go to Setup screen, select Implement/ Seeder/Speed Source and change Speed Source or Fallback Type to Manual. Restore settings after manual speed value changed.

2. Selecting Multi or Single tank Calibration

   i. **Multi-Tank Calibration** - primarily used to calibrate granular tanks only.

   ii. **Single Tank Calibration** - can be used to calibrate liquid or single granular tank (ex. if recalibration required), or manually enter calibration factor for NH3/Liquid or granular tanks.

   Refer to *Figure 8.20*. Use left/right arrows to select the tank for calibration, or touch on the tank number to open dropdown list of available tanks, disabled tanks will not be displayed in the list. Select the tank and confirm.

   Select Multi-Tank Calibration button or Calibration button for single tank. Calibration Method window will open up.

IMPORTANT

IT IS STRONGLY RECOMMENDED TO RECALIBRATE PRODUCTS EVERY 500 ACRES OR EVERY TIME THE PRODUCT IS CHANGED. PRODUCT DENSITIES CAN VARY WHICH WILL AFFECT THE CALIBRATION FACTOR. ALSO ESPECIALLY WITH THE UHMW FLIGHTINGS, THERE IS A BREAKING PERIOD AS THE FLIGHTING WILL FLARE AFFECTING THE CALIBRATION FACTOR. THIS WILL ENSURE YOU ARE USING THE MOST ACCURATE CALIBRATION FACTOR.

Figure 8.19 - Manual Speed

Figure 8.20 - Selecting Single Tank for Calibration

8.4.2.1 7000 SERIES AIR SEEDERS

1. On the Calibration Method window, refer *Figure 8.21.*, select Automatic Calibration. Granular calibration wizard will start up, refer to *Figure 8.22*. Select yellow arrow to proceed to the next step.

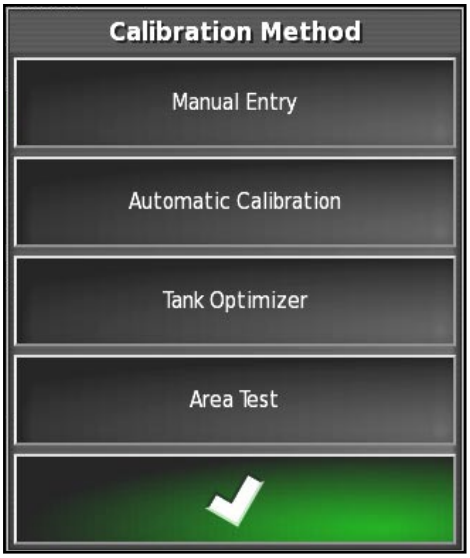


Figure 8.21 - Calibration Method Window

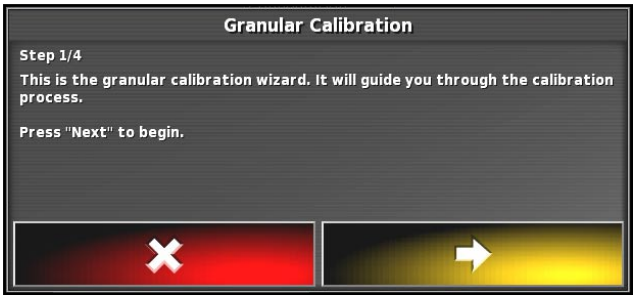


Figure 8.22 - Calibration Wizard

NOTE

ENSURE THAT DISPLAYED MANUAL SPEED IS THE SAME AS THE PLANNED SEEDING SPEED. REFER TO *FIGURE 8.23.*

2. Engage hydraulic power to Fan 1 circuit. For additional instructions refer to your *Air Seeder manual*.

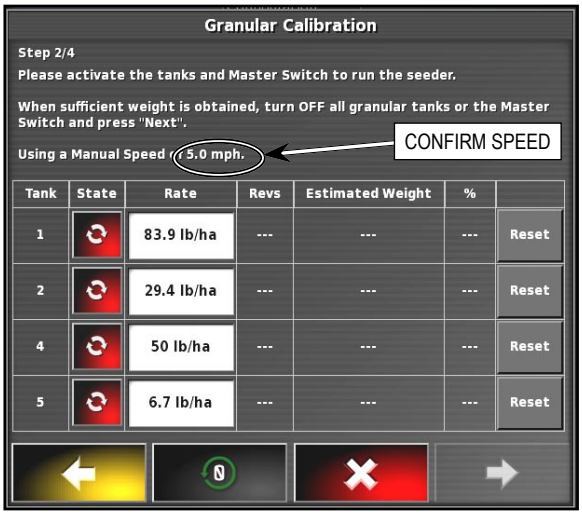


Figure 8.23 - Calibration Wizard - Screen 2/4

3. Prime Metering Augers (fill each metering auger with product):

   - Go back to the Air Seeder. Locate the on-frame remote calibration switchbox. If calibration switchbox disabled, buttons on the screen can be used.
   - Press the tank button or the in-cab switchbox to turn on the tanks that are to be calibrated.

     This will also activate corresponding tanks on calibration screen (the state button will turn green, refer to *Figure 8.24*).
   - Set calibration pails under each metering auger, that is being calibrated.
   - Turn on Master to run the meters until all are primed/filled. While priming the shaft revolutions and weight will be accumulated. Refer to *Figure 8.24.*
   - Turn Master OFF.
   - Hold PRIME/RESET button until green lights flashes. This will reset the pulses, accumulated auger shafts revolutions and expected weight to 0 in the X30 console, preparing for actual calibration.

IMPORTANT

IT IS VERY IMPORTANT TO GET COMPLETE RESET OF THE CALIBRATION SCREEN BEFORE CONTINUING THE CALIBRATION. ALWAYS HOLD PRIME/RESET BUTTON UNTIL GREEN LIGHTS FLASHES.

   - Empty buckets and set back in place. System is now ready to start calibration.

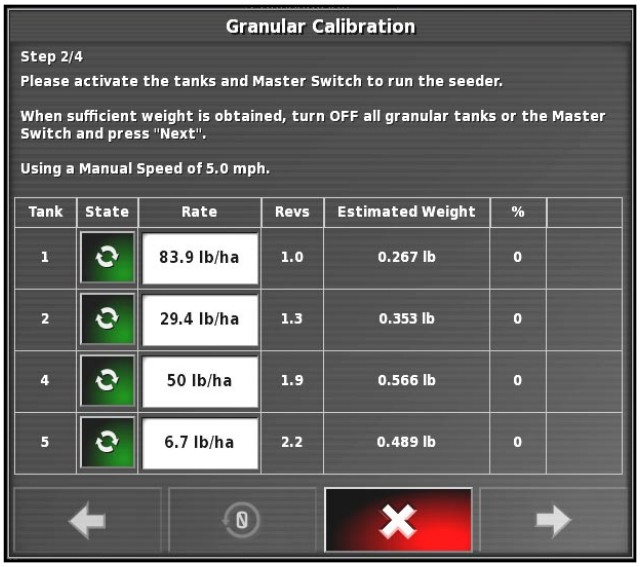


Figure 8.24 - Revolutions/Weight Accumulated

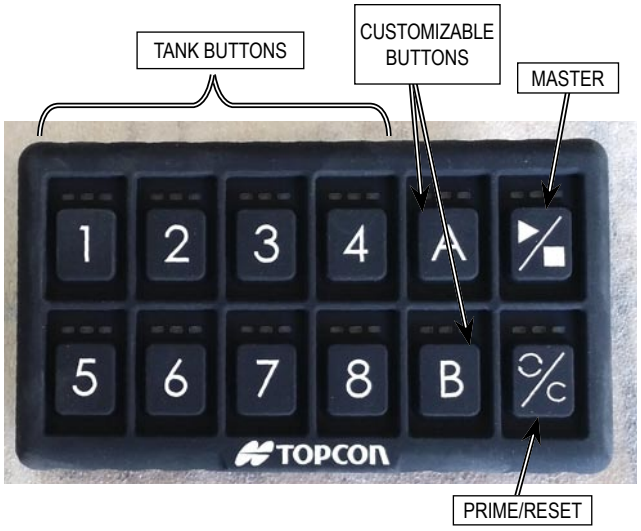


Figure 8.25 - Switchbox - Buttons

NOTE

BUTTONS FOR DISABLED TANKS WILL HAVE NO LIGHTS.

4. Calibrate metering augers:
   - Make sure that for all tanks to be calibrated, the respective tank buttons are ON as previously selected for priming the meters.
   - Turn the Master ON to start the calibration.
   - As calibration pails get full, use the tank buttons to turn OFF meters with full pails allowing others to keep filling, or switch off all tanks using the master button. During the calibration auger shaft revolutions and expected weight will be accumulated on the X30 console for each meter, refer to *Figure 8.26*.

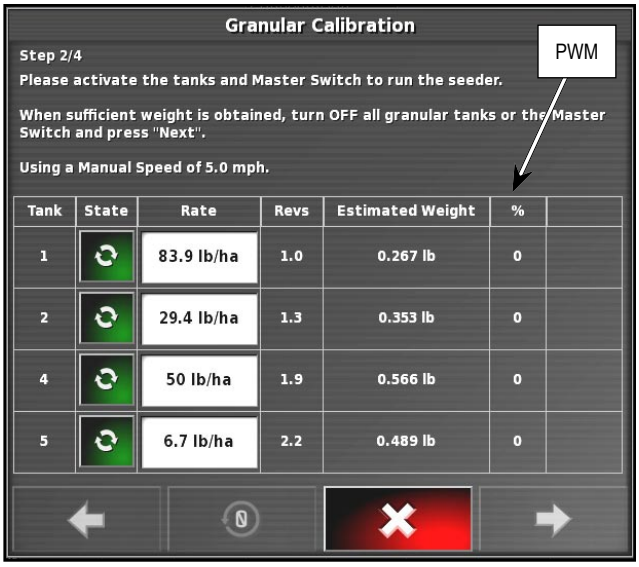


Figure 8.26 - Performing Calibration

IMPORTANT

COLLECT A MINIMUM 20LB SAMPLE FOR EACH METERING AUGER BEING CALIBRATED. THE LARGER THE SAMPLE THE MORE ACCURATE THE CALIBRATION.

NOTE

IF DURING CALIBRATION ANY OF THE ACTIVATED METER MOTOR VALVES ARE AT MINIMUM PWM OF 15% OR MAXIMUM PWM OF 95% (REFER TO *FIGURE 8.26*) THE CALIBRATION ERROR ALARM WILL POP UP, REFER TO *FIGURE 8.27*. YOU WILL NOT BE ABLE TO ACHIEVE YOUR REQUESTED RATE . SELECT A DIFFERENT FINAL DRIVE RANGE AND RE-CALIBRATE THAT METER. IF YOU IGNORE THE ALARM, THE ESTIMATED WEIGHT WILL BE HIGHLIGHTED RED FOR TANKS THAT HAD AN ERROR.

Figure 8.27 - Calibration Error

5. Turn Master Off.
6. Weigh each sample and return to the cab to enter weights.

   Touch right yellow arrow to move to the next screen.
7. Enter weights for each tank in the "Actual *Weight*" column (*Figure 8.28*) and proceed to the next step.

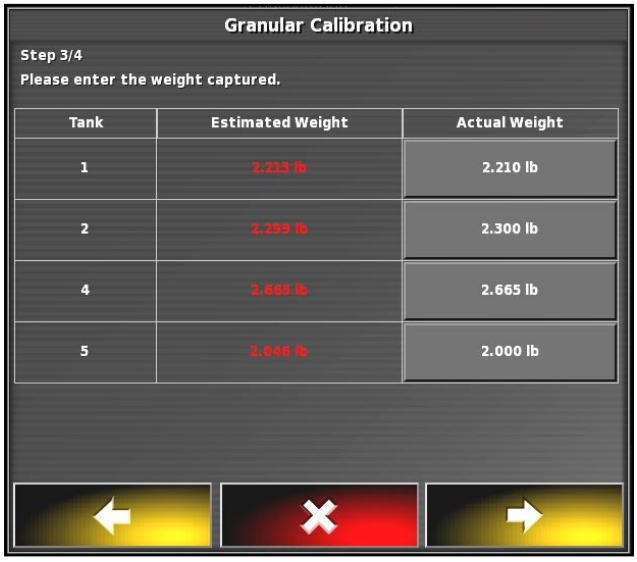


Figure 8.28 - Calibration Wizard - Enter Weights

8. When calibrating the first time it is acceptable that calibration factor(s) might be out +/- 20% depending on the product density and other variations. You should save the calibration factors and recalibrate any tanks that are out more than 5%.

   Refer to *Figure 8.29*. You can save calibration factors for each tank individually by selecting the button in the Save column for desired tank, or you can save calibration factors for all tanks at once by selecting the save all button.

   Recalibrate tanks until within 5% to confirm your new calibration factor.

9. Close out of calibration window.

10. Return to the Seeder Controller main viewing area in preparation for seeding.

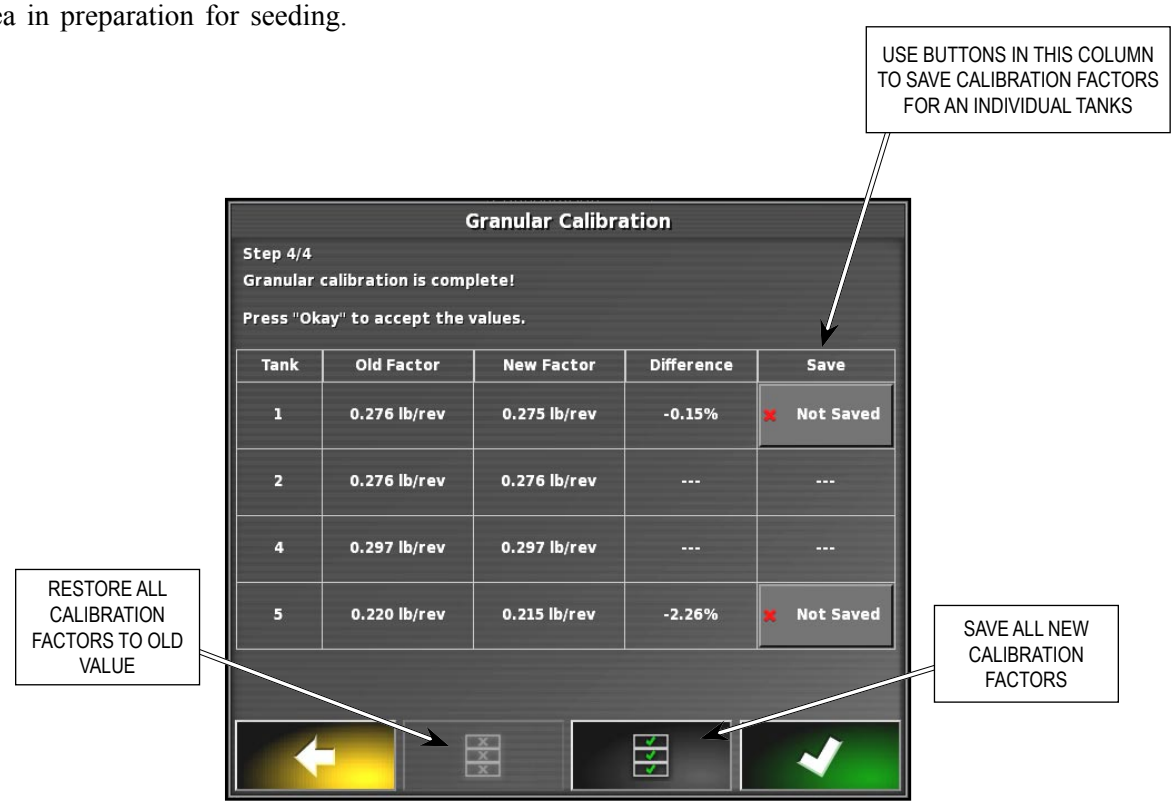


Figure 8.29 - Calibration Wizard - Save Calibration factors

8.4.2.2 6000 SERIES AIR SEEDERS

1. On the Calibration Method window, refer *Figure 8.*30*,* select Automatic Calibration. Granular calibration wizard will start up. Refer to *Figure 8.31*.

2. On this screen there are two option that can be changed.

   Calibration mode: Stationary or Rolling. Default mode is Stationary for calibrations when unit is stopped and the hydraulic motor is used to drive the system. Rolling mode is selected when calibration is done with unit in motion and using the main clutch/ wheel to drive the system. Main clutch control is activated only in rolling calibration mode.

   Style: select from Control to Rate or Control to Extension if you want to control the transmission setting rather than the rate.

   Set calibration to Stationary and Style to Control to Rate (steps in the procedure below pertain to these settings).

   Select yellow arrow to proceed to the next step.

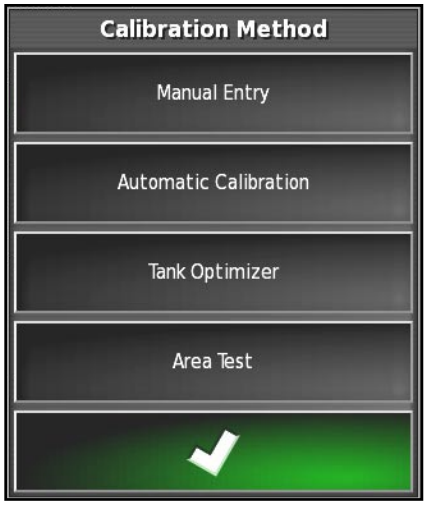


Figure 8.30 - Calibration Method Window

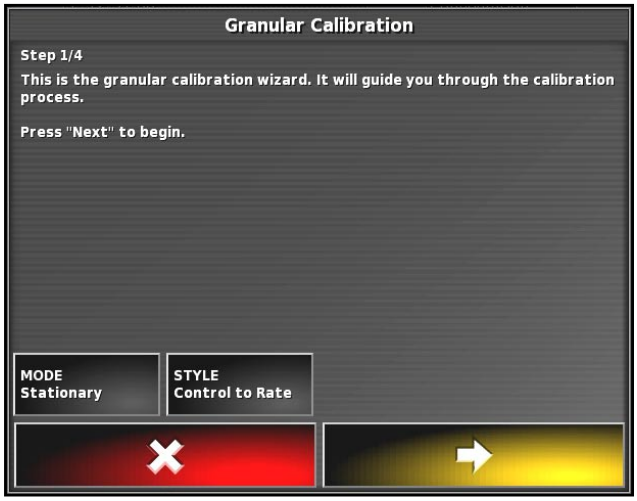


Figure 8.31 - Calibration Wizard

NOTE

ENSURE THAT DISPLAYED MANUAL SPEED IS THE SAME AS THE PLANNED SEEDING SPEED. REFER TO *FIGURE 8.32.*

3. Engage hydraulic power to Fan 1 circuit. Refer to your *Air Seeder manual,* for detail information on calibration.

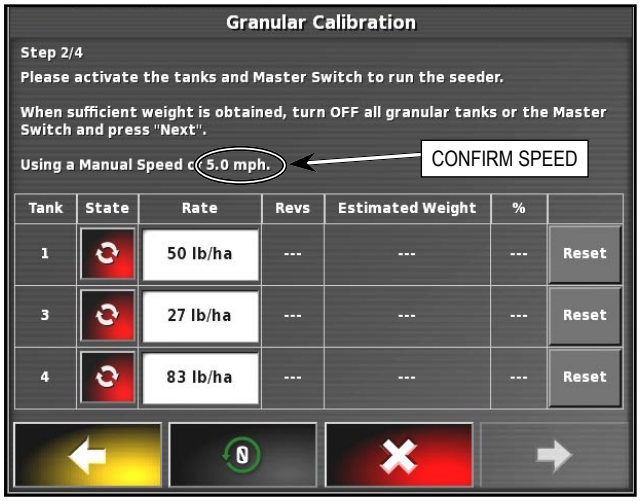


Figure 8.32 - Startting Calibration

4. Prime metering augers (fill each metering auger with product).

   - Go back to the Air Seeder.
   - Turn on calibration valve to start calibration drive motor.
   - Set calibration pails under each metering auger, that is being calibrated.
   - Turn on Master to run the meters untill all are primed /filled. While priming the shaft revolutions and weight will be accumulated, refer to *Figure 8.33*.
   - Turn Master OFF.
   - Hold prime/reset button until green light flashes. This will reset the pulses, accumulated auger shaft revolutions and expected weight for actual calibration.

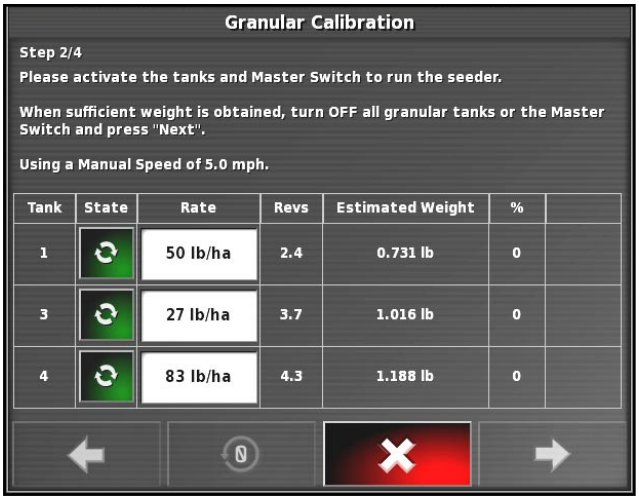


Figure 8.33 - Revolutions/Weight Accumulated

IMPORTANT

IT IS VERY IMPORTANT TO GET COMPLETE RESET OF THE CALIBRATION SCREEN BEFORE CONTINUING THE CALIBRATION. ALWAYS HOLD PRIME/RESET BUTTON UNTILL GREEN LIGHT FLASHES.

- Empty buckets and set back in place. System is now ready for calibration.
- Locate on-frame remote calibration switchbox. If calibration switchbox disabled, buttons on the screen or the in-cab switchbox can be used.
- Press the tank button to turn on the tanks that are to be calibrated. This will also actuate corresponding tanks on calibration screen (the state button will turn green).

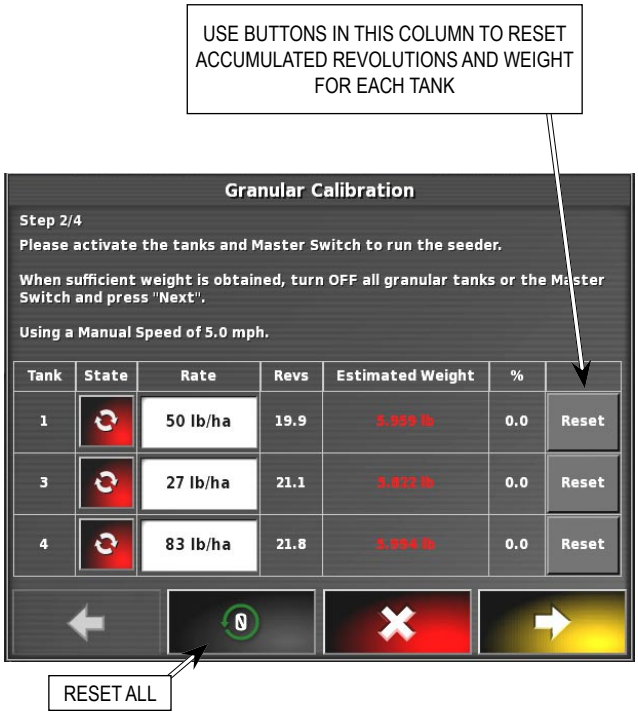


Figure 8.34 - Resetting Tanks

5. Calibrate metering augers:
   - Make sure that for all tanks to be calibrated, the respective tank buttons are ON as previously selected for priming the meters.
   - Turn the Master ON to start the calibration.
   - As calibration pails get full, use the tank buttons to turn OFF meters with full pails allowing others to keep filling, or switch off all tanks using the Master. During the calibration auger shaft revolutions and expected weight will be accumulated on the X30 console for each meter, refer to *Figure 8.35*.

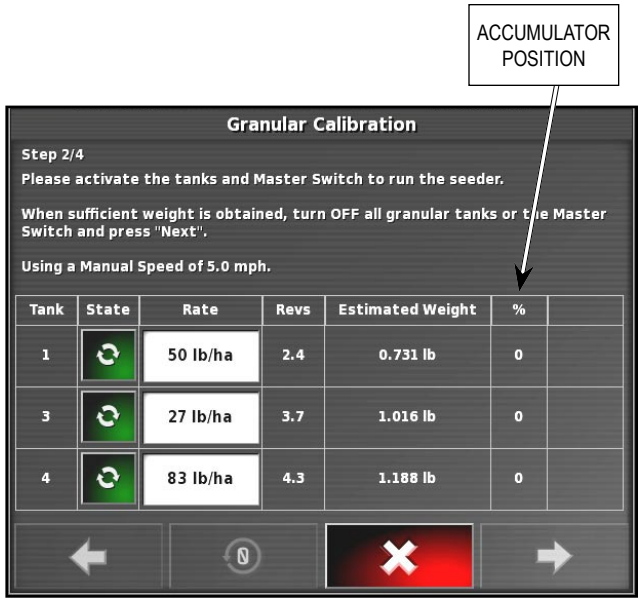


Figure 8.35 - Calibrating

IMPORTANT

COLLECT A MINIMUM 20LB SAMPLE FOR EACH METERING AUGER BEING CALIBRATED. THE LARGER THE SAMPLE THE MORE ACCURATE THE CALIBRATION.

NOTE

IF DURING CALIBRATION ANY OF THE ACTIVATED ACTUATORS ARE IN A POSITION SETTING LESS THAN 5 OR GREATER THAN 95 (REFER TO *FIGURE 8.35*) THE CALIBRATION ERROR ALARM WILL POP UP, REFER TO *FIGURE 8.36*. SELECT A METERING DRIVE RANGE THAT ALLOWS THE ACTUATOR POSITION TO BE IN THE 5-95 TRANSMISSION SETTING RANGE AND RECALIBRATE. IF YOU IGNORE THE ALARM, THE ESTIMATED WEIGHT WILL BE HIGHLIGHTED RED FOR TANKS THAT HAD AN ERROR.

Figure 8.36 - Calibration Error

6. Turn Master off.
7. Turn calibration valve OFF.
8. Weigh each sample and return to the cab to enter weights. Touch the right yellow arrow to move to the next screen.

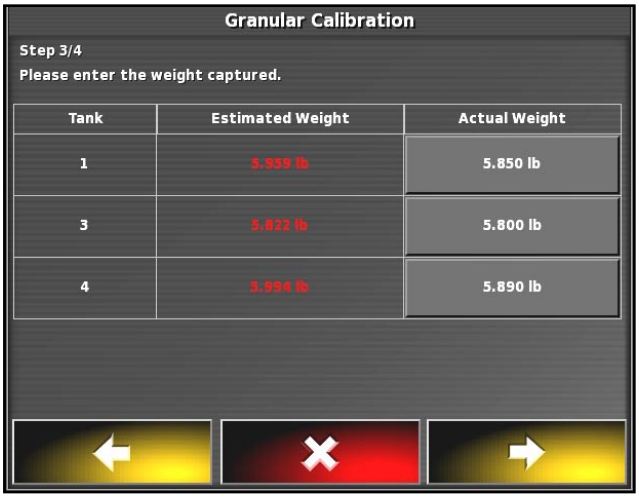


Figure 8.37 - Entering Weights

9. Enter weights for each tank in the “Actual *Weight*” column (*Figure 8.37*) and proceed to the next step.
10. When calibrating the first time it is acceptable that calibration factor(s) might be out +/- 20% depending on the product density and other variations. You should save the calibration factors and recalibrate any tanks that are out more than 5%.

    Refer to *Figure 8.38*. You can save calibration factors for each tank individually by selecting the button in the Save column for desired tank, or you can save calibration factors for all tanks at once by selecting the save all button.

    Recalibrate tanks until within 5% to confirm your new calibration factor.
11. Close out of calibration window.
12. Return to the Seeder Controller main viewing area in preparation for seeding.

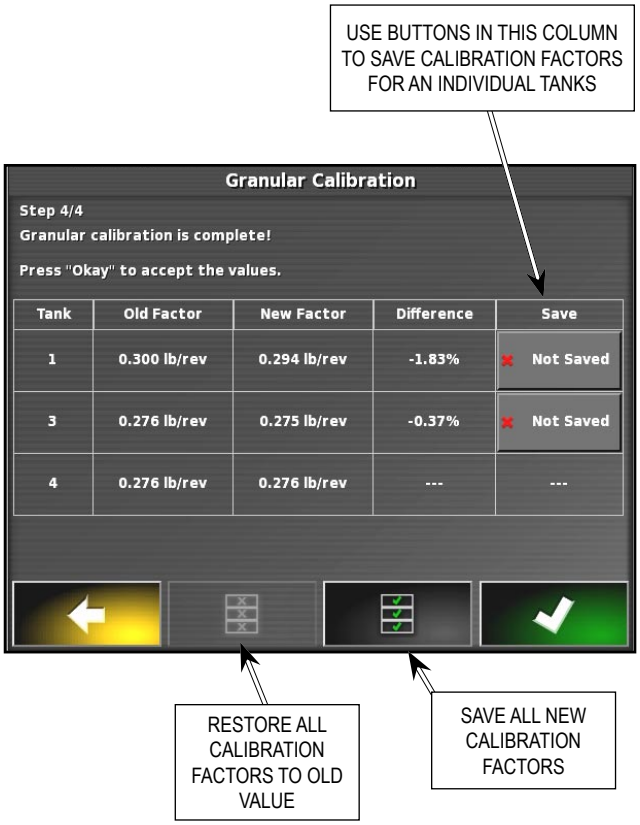


Figure 8.38 - Saving Calibration Factors

8.4.3 AREA TEST

This function can be used to verify the correct metering rate for each tank if questioning the accuracy of the calibration factors.

- Select Area Test to start the wizard that will guide you through the test.
- On the first screen enter the area to be covered. Ensure the area is small enough that metered product will fit in calibration buckets. Select next (yellow arrow) to continue.
- Select the tanks you would like to test by turning them ON. Place calibration buckets under respective metering augers. Turn on the master switch.
- Based on speed entered in the console manual speed, existing calibration factors and area to be covered, system will determine target weight. As you run metering augers, system will count revolutions and determine estimated weight. Test will be stopped automatically once the required area has been covered.
- Weigh samples and enter actual weights for each metering auger that is tested. System will calculate new calibration factors and the difference between old and new calibration factors in percentage.
- Select the calibration factors that you want updated and save.

  You can save calibration factor for each tank individually by selecting button in the Save column for desired tank, or you can save calibration factors for all tanks at once by selecting save all button. Select green check mark button to accept new values.

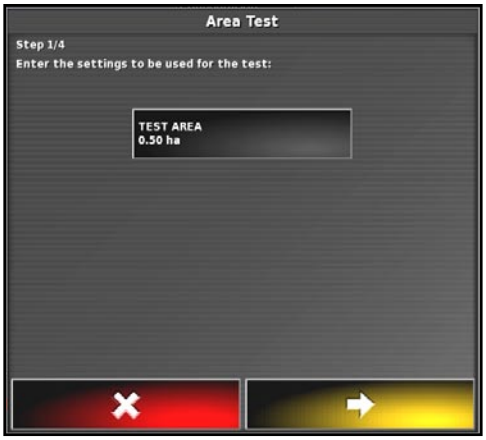


Figure 8.39 - Enter Area

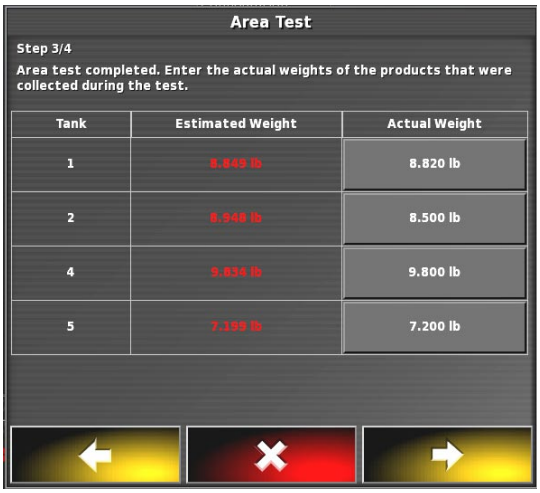


Figure 8.40 - Enter Actual Weight

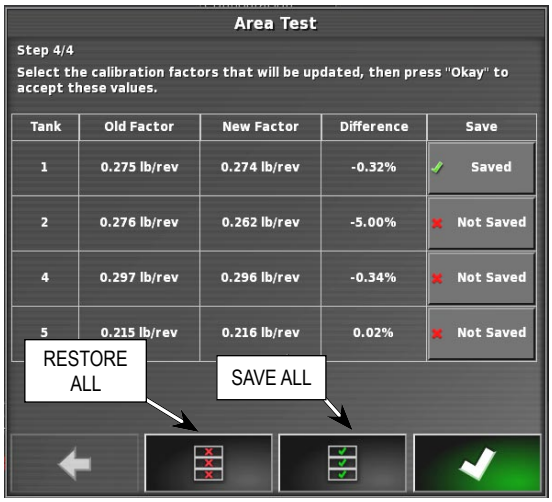


Figure 8.41 - Confirm Calibration Factors

8.5 CALIBRATION - NH3 TANK

There is no actual calibration required for NH3 flow meters, as they are pre-calibrated and pre-determined calibration factor should be stamped on the flow meter.

The calibration factor for NH3 flow meter should be entered into the console during the setup, refer to *Section 6.7.2.2 - Flow Settings.*

If you need to change calibration factor, it can be done in two ways:

1. From Setup Screen (preferred method).

   Refer to *Figure 8.44*. Select Implement/Seeder/ NH3/Flow. Then select calibration factor button and enter required value.

2. From Operational screen.

   From the menu In the Seeder Controller window select Configuration. Select NH3 tank for single tank calibration and then select Calibration button, refer to *Figure 8.43*. Window to enter calibration factor will appear, refer to *Figure 8.44*. Select Cal Factor button and using numeric keypad enter the value.

IMPORTANT

THE UNITS OF THE CALIBRATION FACTOR SHOULD BE ENTERED IN **PULSES PER LB. OF N.**

THE **CALIBRATION FACTOR** ON SOME FLOW METERS IS **NOT** IN THE UNITS OF ***PULSES PER LB. OF N***. A CONVERSION FACTOR MAY NEED TO BE APPLIED BEFORE GETTING THE FINAL VALUE TO BE ENTERED INTO THE X30 CONSOLE. CHECK WITH THE INSTALLER OF YOUR NH3 SYSTEM TO CONFIRM THE CALIBRATION FACTOR AND UNITS FOR YOUR SYSTEM.

Figure 8.42 - Entering NH3 Calibration Factor using Setup Screen

Figure 8.43 - NH3 Calibration

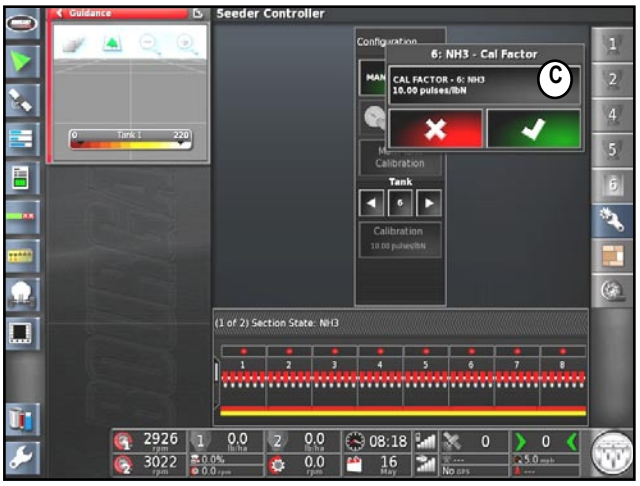


Figure 8.44 - Entering NH3 Calibration Factor

8.6 CALIBRATION - LIQUID TANK

If the X30 system is being used to monitor and control a Liquid fertilizer applicator as part of the complete seeding system, the following procedure applies.

1. From the menu in the Seeder Controller window (full screen mode) select Configuration icon. The Configuration panel will open up, refer to *Figure 8.45*.
2. Select the title of single tank calibration area (Item A). Window with the list of available tanks for calibration will appear. Select the tank that is used for liquid fertilizer (in this example tank #5 is used for liquid).
3. Select Calibration button (Item B, *Figure 8.45*). Calibration Method window will appear, refer to *Figure 8.46*.
4. Most liquid flow meters have an accurate calibration factor displayed on the flow meter body. Determine the calibration factor of the flow meter being used. Complete *Steps #4a/b - #5* to determine an accurate calibration factor. This factor can be entered using Manual Entry button (Item C, refer to *Figure 8.46*).
   a. If using a Bourgault supplied flow meter and the X30 Monitor units are set to US Gal, the calibration factor for water is 2448 if the meter is GREEN and 312 if the meter is BLACK. This number is for water and must be adjusted for the fertilizer used. Proceed to the calibration factor conversion instructions in *Step 5*.
   b. If using a different flow meter, find the calibration factor on the flow meter body. Ensure that the calibration factor units match the selected volumetric units for the tank and application rate display. In most cases this given factor will be for water and must be adjusted for the fertilizer being used. Proceed to the calibration factor conversion instructions in *Step 5*.
5. Calibration Factor Conversion
   a. Determine the conversion factor for the fertilizer being used from the table in *Figure 8.47*.

Figure 8.45 - Selecting Liquid Tank

Figure 8.46 - Calibration Method Window - LiquidTank

b. Multiply the flow meter calibration factor for water by the conversion factor.

c. This new calibration factor can be entered using Manual Entry button (Item C, refer to *Figure 8.46*).

IMPORTANT

IT IS RECOMMENDED TO PERFORM A FLOW CALIBRATION TO ENSURE ACCURATE APPLICATION RATES AS THERE ARE MANY FACTORS THAT CAN AFFECT THE ACCURACY. IF AT ANYTIME DURING OPERATION, ACCURACY IS QUESTIONED, A CALIBRATION SHOULD BE COMPLETED.

Flow Calibration

1. To prepare, disconnect the outlet hose that is connected to the distribution system on the tillage unit and place the end in a container. Use as large a container as practical to achieve the most accurate results.

Density of Solution		Product (Solution type)	Specific Gravity	Conversion Factor
lb/US gal	*kg/l*			
8.34	1.00	Water	1.00	1.00
9.00	1.08		1.08	1.04
10.00	1.20		1.20	1.10
10.65	1.28	28-00-00	1.28	1.13
10.92	1.31	15-00-00-20	1.31	1.14
11.04	1.32	12-00-00-26	1.33	1.15
11.79	1.41	10-34-00	1.42	1.19
12.00	1.44		1.44	1.20
14.00	1.68		1.68	1.30

LIQUID CONTROL CONVERSION FACTORS.XLS

Figure 8.47 - Liquid Calibration Conversion Factor

2. Select Automatic Calibration (Item D, refer to *Figure 8.46*). Liquid calibration wizard window will appear, refer to *Figure 8.48*. Read and follow instructions. Proceed to the next step.
3. Refer to *Figure 8.49*. Application rate can be adjusted using "+" and "-" buttons. To see the application rate value, it is recommended to have Seeder Controller mini-view open on liquid tank tab, as application rate is not displayed on the wizard window.

   Obtain a sample in the container. Turn OFF the master switch and proceed to the next step.
4. Refer to *Figure 8.50*. Measure the volume. Select **Volume Captured** button and using calculator enter the value. Proceed to the next step.
5. Refer to *Figure 8.51*. The system will automatically determine the calibration flow factor and percent difference from current flow factor. If satisfied, confirm results.
6. Flow sensor calibration is complete.

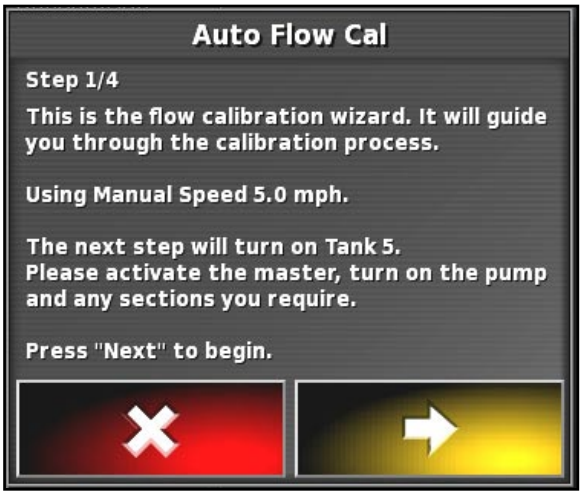


Figure 8.48 - Liquid Calibration Wizard - Screen 1

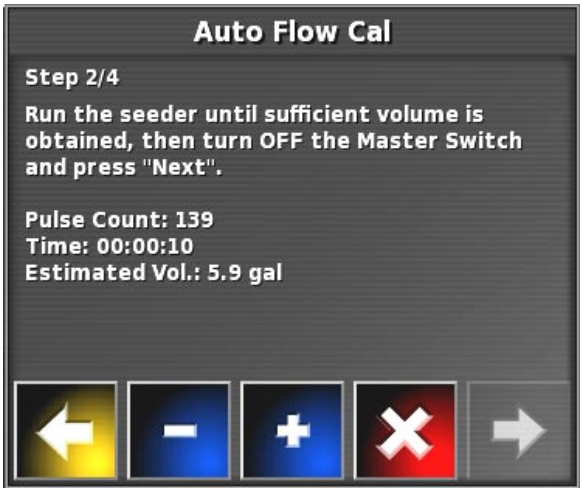


Figure 8.49 - Liquid Calibration Wizard - Screen 2

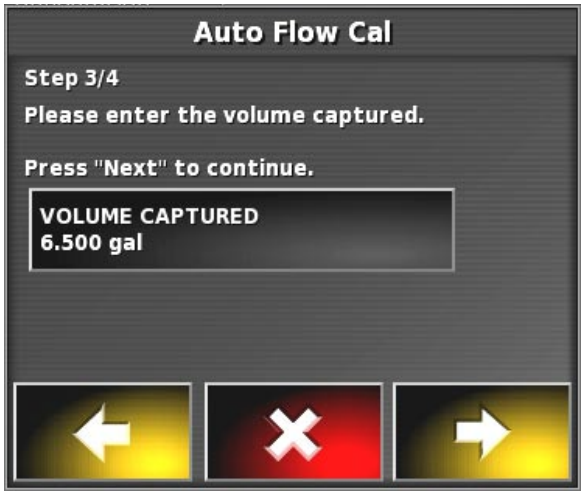


Figure 8.50 - Liquid Calibration Wizard - Screen 3

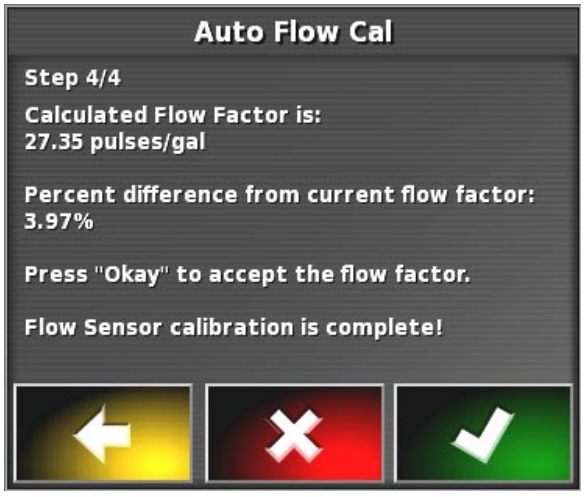


Figure 8.51 - Liquid Calibration Wizard - Screen 4

8.7 WHEEL SENSOR CALIBRATION

Information in this section is applicable when the Speed Source is set to Wheel Sensor, refer to *Section 6.7.7 - Speed Source*.

If the wheel factor is found to be inaccurate a calibration should be performed.

Alternatively, the wheel factor can just be adjusted until the wheel speed in the X30 matches the speed of a trusted source. For instance, GPS speed, tractor wheel speed, tractor radar speed, etc.

IMPORTANT

IT IS RECOMMENDED TO PERFORM THE CALIBRATION WITH THE AIR SEEDER TANK HALF FULL OF PRODUCT. ENSURE THAT THE TIRE PRESSURE ON THE UNIT IS correct. Refer to tire pressure decal on the air seeder tank.

1. Open Wheel Sensor Calibration wizard.
   i. In the Seeder Controller window (full screen mode) select configuration icon from the menu.
   ii. Select Wheel Sensor button to bring up Auto Speed Cal wizard window (button appears ONLY when Speed Source or Fallback Type is set to Wheel Sensor, refer to *Section 6.7.7 - Speed Source*).

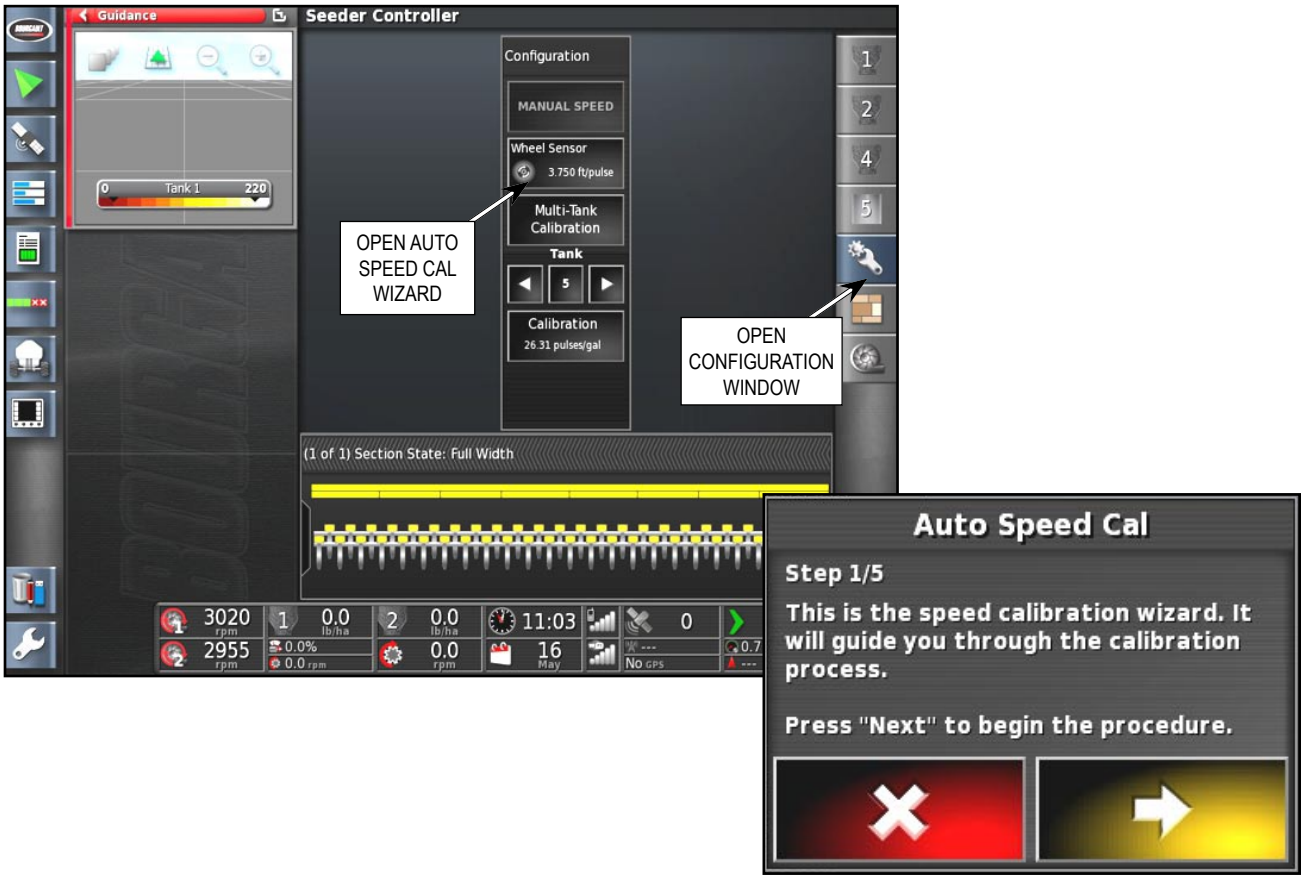


Figure 8.52 - Wheel Sensor Calibration Wizard - Step 1

2. Follow instructions.
3. Move the vehicle to align a wheel magnet with the sensor. Refer to *Figure 8.53*.
4. Mark the ground alongside one of the tractor or seeder wheels.
5. When return to the cab, on the calibration wizard screen select yellow arrow to proceed to the next step.
6. Refer to *Figure 8.54*. Drive steadily in a straight line. Pulses will accumulate from the ground speed sensor. When you have traveled the distance between 164' and 656' stop.
7. Mark the ground along side the same wheel as was marked previously.
8. Measure the distance between the two marked points - actual traveled distance.
9. On the screen select the yellow arrow to proseed to the next step.
10. Refer to *Figure 8.55*. Select Distance Covered button and enter the measured distance. Select the yellow arrow to proseed to the next step.
11. The wheel factor is then calculated and entered automatically if accepted. Refer to *Figure 8.56*.

Figure 8.53 - Wheel Sensor Calibration - Step 2

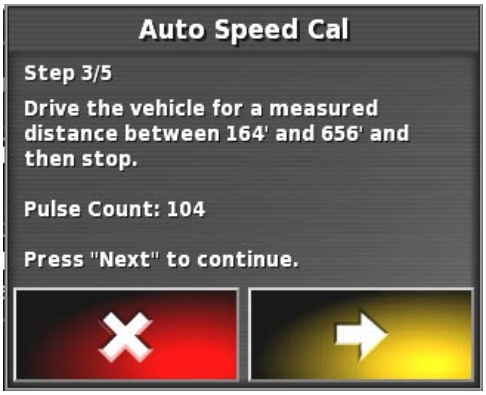


Figure 8.54 - Wheel Sensor Calibration - Step 3

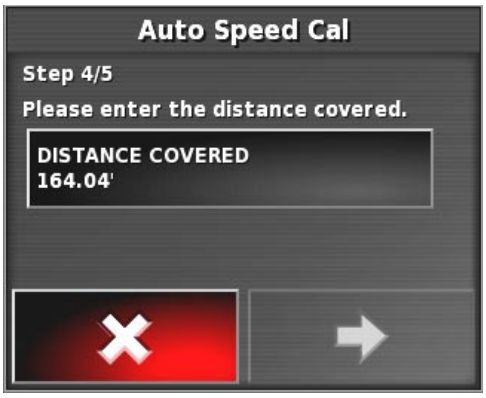


Figure 8.55 - Wheel Sensor Calibration - Step 4

Figure 8.56 - Wheel Sensor Calibration - Step 5

IMPORTANT

THESE ARE THEORETICAL VALUES AND SHOULD BE VERIFIED FOR ACCURACY AS VARIATIONS IN TIRE SIZE, INFLATION PRESSURE, ETC WILL CAUSE DIFFERENCES.

7000 SERIES AIR SEEDER		
MODEL	**TIRE TYPE**	**THEORETICAL WHEEL FACTOR**
7550	900/60 R32 (Single)	0.235
	650/75 R34 (Dual)	0.225
L7550	800/65 R32 (Dual)	0.225
7700	850/80 R32 (Single)	0.250
	710/70 R42 (Dual)	0.250
7950	850/80 R38 (Dual)	0.260
L7800	850/80 R38 (Dual)	0.260

6000 SERIES AIR SEEDER	
TIRE TYPE	**THEORETICAL WHEEL FACTOR**
900/60R32 R1-W Lug	0.207
800/65R32 R1-W Lug	0.209
650/75R34 R1-W Lug	0.206
560/65D24 Softrac	0.208
520/85R38 R1 Lug	0.207
480/80R38 R1 Lug	0.203
30.5LX32 AWT	0.208
30.5LX32 R2 Rice Lug	0.205
30.5LX32 R1 Lug	0.208
28LX26 AWT	0.203
28LX26 R2 Rice Lug	0.207
28LX26 R1 Lug	0.204
23.1X26 AWT	0.203
23.1X26 R2 Rice Lug	0.207
23.1X26 R1 Lug	0.203
20.8R38 R2 Rice Lug	0.21
18.4X26 AWT	0.208
18.4X26 R2 Rice Lug	0.205
18.4X26 R1 Lug	0.204
18.4X38 R1 Lug	0.203

8.8 FAN SETTINGS

Before seeding the fan(s) must be set to the appropriate speed. Refer to the air seeder operation's manual for the recommended fan speed given the implement width, application rate, and ground speed.

Once the fan speed is determined, engage the hydraulics to start the fan. Adjust the hydraulics to obtain the desired fan speed referencing the display on the X30 console.

IMPORTANT

NEVER OPERATE THE STANDARD RADIAL FAN FASTER THAN 5000 RPM OR THE OPTIONAL HIGHER OUTPUT FAN FASTER THAN 6000 RPM. **DAMAGE TO THE HYDRAULIC MOTOR MAY OCCUR.**

When the correct fan speed is attained, adjust High and Low Fan Speed alarm setpoints:

- select to open setup screen.

- select System/Alarms/Seeder

- from the list select High Fan Speed and adjust for Fan 1 and 2 (if equiped) Maximum RPM. Refer to *Figure 8.57*.

- from the list select Low Fan Speed and adjust for Fan 1 and 2 (if equiped) Minimum RPM. Refer to *Figure 8.58*.

- Remember that the fan will speed up when product is metered into the air stream. Allow for that when setting the high fan RPM.

Refer to *Section - 4.4.2 Seeder Alarms*.

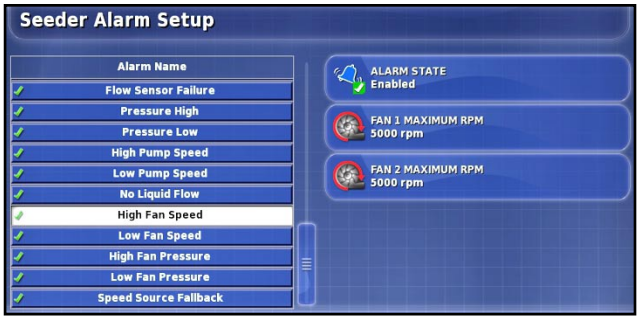


Figure 8.57 - High Fan Speed Alarm

Figure 8.58 - Low Fan Speed Alarm

8.9 CHECKING DISTRIBUTION RUNS AND ASC VALVES

A check can be performed after a calibration, when starting a new field or between fills, to ensure that ASC valves (units with granular ASC system) operating properly and there is product flowing through all of the runs of the air kit.

Figure 8.59 - On Frame Tank Switch Box

1. 7000 Series Air Seeder

With seeding implement in the field position, but with the seed boots out of the ground:

a. Ensure Fan(s) are running.

b. **Units with ASC:** Ensure section switches are ON on the X30 console, refer to *Figure 8.60*.

c. At on-frame switchbox (refer to *Figure 8.59*) turn on tank buttons for those meters that will be applying product.

Note: Calibration master has no effect during a prime.

d. Engage the metering augers:

   i. If there is no **Preload Time** entered in Seeder setup (refer to *Section 6.7.1.1.1 - General Tank Setup*), push and hold prime button and meters will run as long as button is held.

   ii. If a **Preload Time** is entered, push button until meters begin to turn. Meters will run for preload time.

e. **Units with ASC**: On the primary manifolds observe that all ASC valves are open (cylinders are extended). They should close (cylinders retracted) after meters stop running. Check for blockage in valves that do not operate properly.

f. Proceed to the seeding implement and check each of the product runs for material on the ground.

g. If there is no product at an opener, it may be possible that the secondary manifold and/ or hose supplying product to that opener is plugged. Refer to *Troubleshooting section* in the operator's manual for your air seeder.

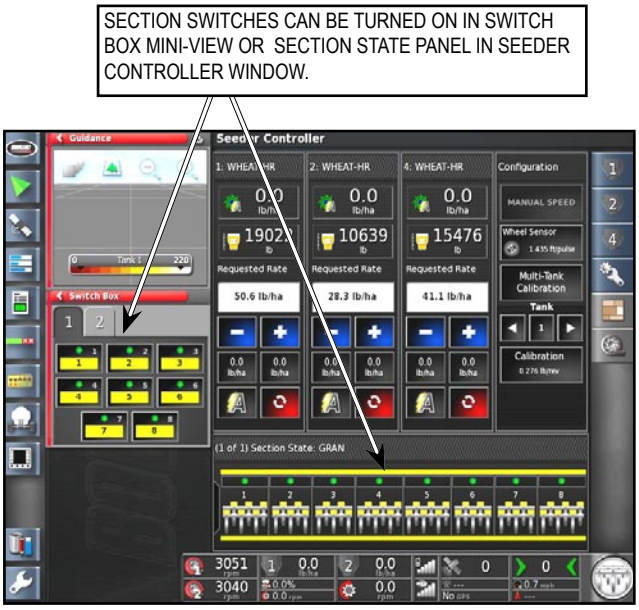


Figure 8.60 - Section Switches

1. 6000 Series Air Seeder

With seeding implement in the field position, but with the seed boots out of the ground:

a. Ensure Fan(s) are running.

b. From the menu in the Seeder Controller select Configuration. In Configuration panel select Multi-Tank Calibration. Calibration Method window will appear then select Automatic Calibration. Make sure that Calibration type set to Stationary, if not change. Proceed to the next screen - Step 2/4. This will put console into calibration mode.

c. Turn on hydraulic calibration ball valve.

d. Go to the air seeder tank. Using on-frame switchbox turn on tank switches for those meters that will be applying product.

e. Turn the Master on to meter desired amount of product then turn it off. Then shut off the hydraulic calibration ball valve.

f. Proceed to the seeding implement and check each of the product runs for material on the ground.

g. If there is no product at an opener, it may be possible that the secondary manifold and/ or hose supplying product to that opener is plugged. Refer to *Troubleshooting section* in the operator's manual for your air seeder.

h. Return to the cab.

i. Cancel out of the calibration mode without proceeding to the next steps in the calibration wizard.

IMPORTANT

ENSURE THAT THE HYDRAULIC CALIBRATION BALL VALVE IS IN THE "OFF" POSITION BEFORE CONTINUING WITH NORMAL OPERATION.

8.10 USING AUTO SECTION CONTROL

Auto Section control will automatically control master and sectional switches based on the position of the seeding system in the field: seeded/unseeded area, within or outside of the field boundary/ headlands.

Auto Section control works with the guidance, that is a standard feature on the X30 console and always enabled.

To access Auto Section control select  icon from the mini-view menu on the left side of the operators screen. Refer to *Figure 8.61*.

1. **Control Mode** - allows to set desired level of overlap using 0 to 100 scale:
   i. **100** - would ensure that all areas of the field will be seeded. It will keep boom/ sections ON to have no misses.
   ii. **0** - would avoid overlap when it is detected that a boom/section is encroaching previously covered area. It would shut off before any part of the implement starts to overlap or or turn on after entire implement is off covered area.
   iii. **50** - would shut off once half the implement is overlapping and turn on once half the implement is off covered area.

Figure 8.61 - Auto Section Control Mini-View Window

2. **Boundary Limit** - this will set the boundary for area that will be seeded. There are four choices:

   i. Unlimited - there is no boundary limit, lets you seed anywhere.

   ii. Field Boundary - will only let you seed within field boundary once created (*refer to Section 9.1.3 - Field Boundary*).

   iii. Safety Zone - does not allow product to be applied half swath width from the field boundary (sprayer applications).

   iv. Headland - will only let you seed within headlands if set up (*refer to Section 9.2.3 - Headland*).

This button acts like a toggle switch and will turn ON or OFF Auto Section control.

This button will be enabled if there is a sectional boom enabled and will allow to turn ON or OFF Auto Section control for a specific boom independently.

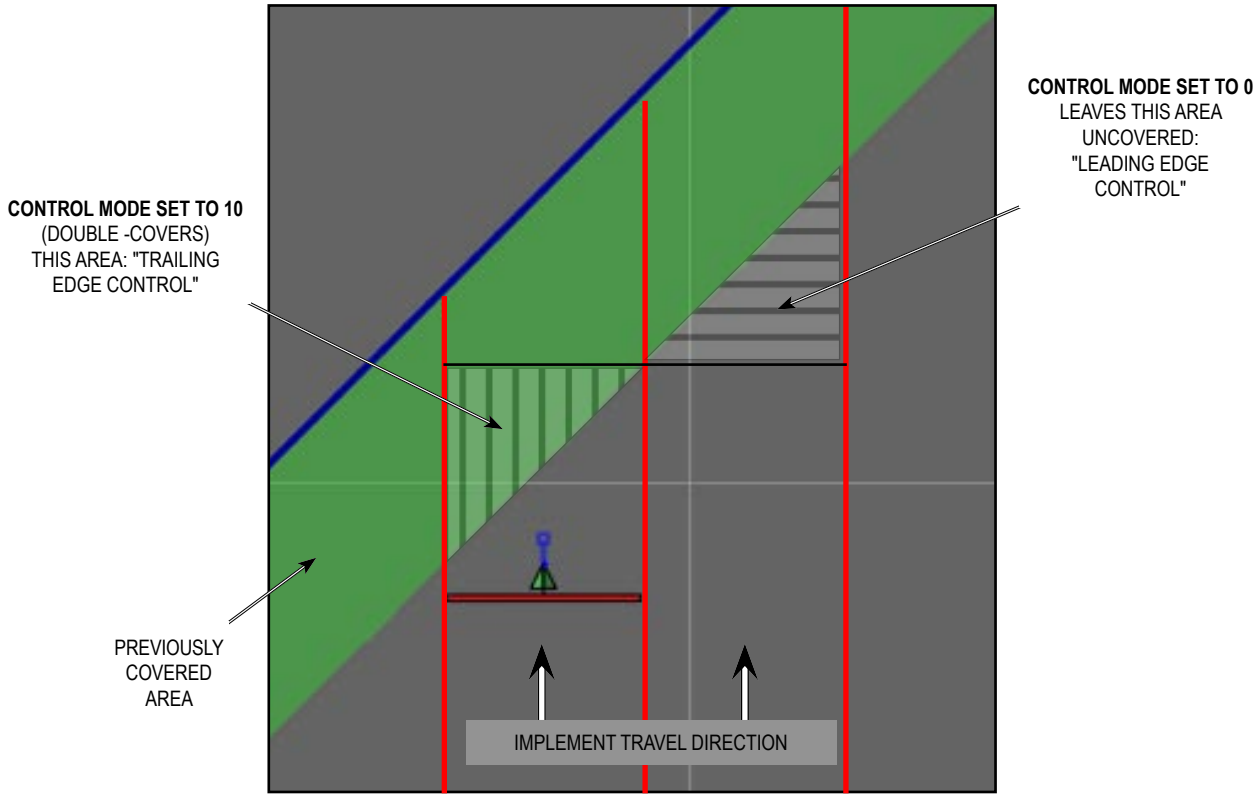


Figure 8.62 - Gaps & Overlaps

8.11 VIRTUAL SECTION SWITCHES

For Virtual Section Switches setup refer to *Section 6.5.3 - Sections Switch.*

When virtual section switches are enabled they can be accessed from the operator's screen in several ways:

1. From the Mini-View menu.

   Refer to *Figure 8.63*.

   Selecting  icon will open up Virtual Section Switches mini-view. There are tabs to represent each respective boom.

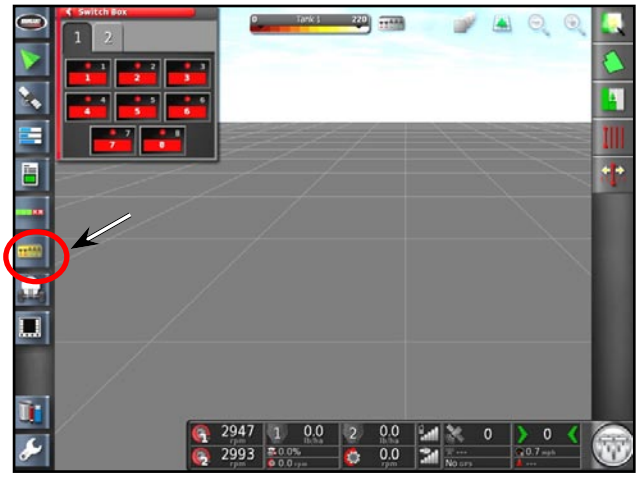


Figure 8.63 - Virtual Section Switches - MiniView

2. From the guidance screen.

   Refer to *Figure 8.64*.

   If displaying the layer for a boom with sectional control the  icon will appear on the top tool bar. If selected it will open up a panel for that boom (refer to *Section 2.6 - Guidance/Coverage Map*).

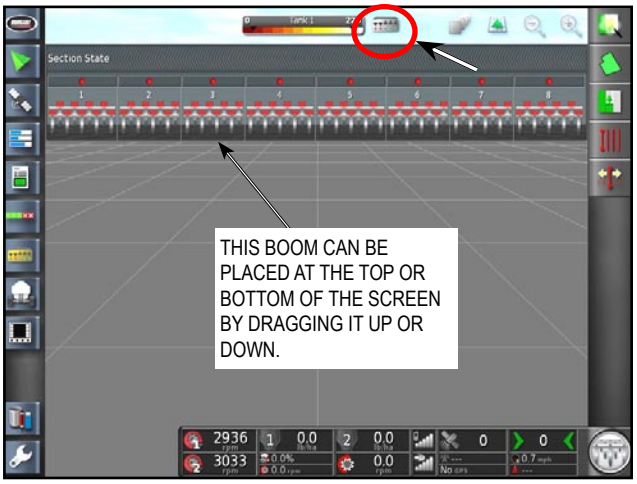


Figure 8.64 - Virtual Section Switches - Guidance Screen

   Refer to *Figure 8.65*.

   In this example:
   - if Coverage (GRAN) or Applied Rate Map (1, 2, or 5:WHEAT-HR) selected, multi-sectional boom panel for Granular will be displayed.
   - if Coverage (NH3) or Applied Rate Map (6:NH3) selected, multi-sectional boom panel for NH3 will be displayed.

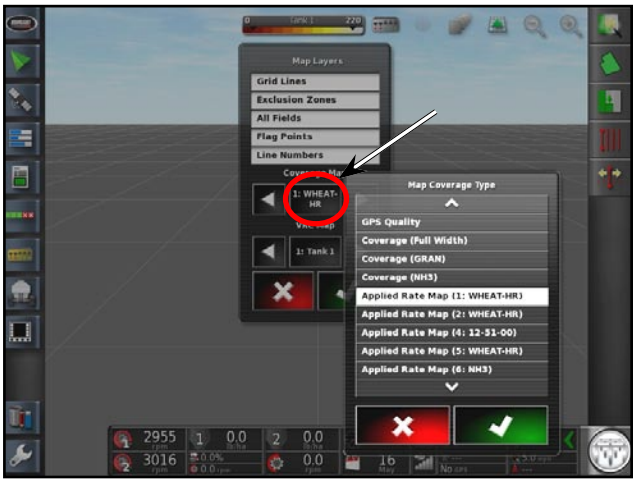


Figure 8.65 - Map Coverage Type

3. On the section state panel in the Seeder Controller window (expanded mode).

   Refer to *Figure 8.66.* When two booms are present you will see a red bar. To switch between granular product boom and NH3/ Liquid boom touch anywhere on the panel and while holding it slide it up or down (depends on the initial position of the red bar). While sliding the translucent red covering will be displayed over the panel. Release at the edge of the panel, red bar will be displayed in the opposite location to the initial position and another boom will be displayed. The name of the boom will be displayed above it.

   If you are using a Blockage Monitoring system, the manifolds can also be displayed in the same area of the screen. In this case to switch between Blocked Head Monitor and Section State(boom) simply slide up or down over the panel without holding.

   There is a position status bar to show you what location the slide is in.

Refer to *Figure 8.67*, these represent boom sections with switch. Green indicator light above each section indicates ON, and red indicates OFF. To turn ON/OFF touch anywhere in the area of the section.

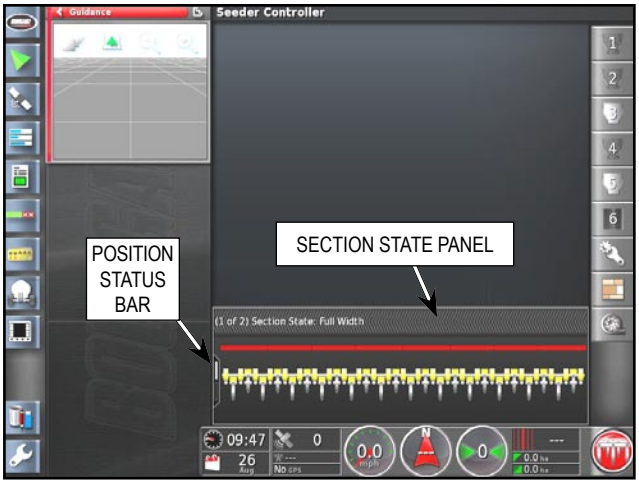


Figure 8.66 - Virtual Section Switches Panel

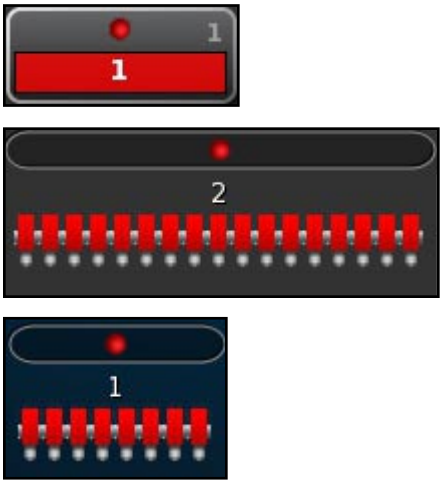


Figure 8.67 - Section Switches

9 STARTING A NEW FIELD/JOB

Table of Contents

Before product application begin, the following steps need to be completed in specified order:

1. Select an existing field or create a new field, refer to *Section 9.1 - Field Menu*.
2. Select or create a new job, refer to *Section 9.2 - Job Menu*.

IMPORTANT

WITH GPS SIGNAL DETECTED THE X30 CONSOLE WILL NOT ALLOW PRODUCT APPLICATION WITHOUT FIRST LOADING A JOB (MASTER SWITCH WILL REMAIN RED).

NOTE

IT IS HIGHLY RECOMMENDED TO ENABLE THE "JOB ASSIST" FEATURE OR SETUP "QUICK START" FEATURE.

To enable "Job Assist" or "Quick Start" feature, refer to *Figure 9.1*:

- Go to Setup.
- From the menu select System/Features/ Guidance
- For Job Helper Mode select Job Assist or Quick Start.

If Quick Start selected, it would need to be configured, to do that in the Setup screen select System/Features/Quick Start, for more details refer to *Section 4.7 - Quick Start*.
If configured correctly, Quick Start will automatically walk you through the following setup to start/change fields and jobs.

Figure 9.1 - Enabling Job Assist

To open the Job Assist Window or Quick Start in the operational screen, select the icon for that feature from the menu on the right side of the screen, refer to *Figure 9.2* & *Figure 9.3*.

Figure 9.2 - Job Assist

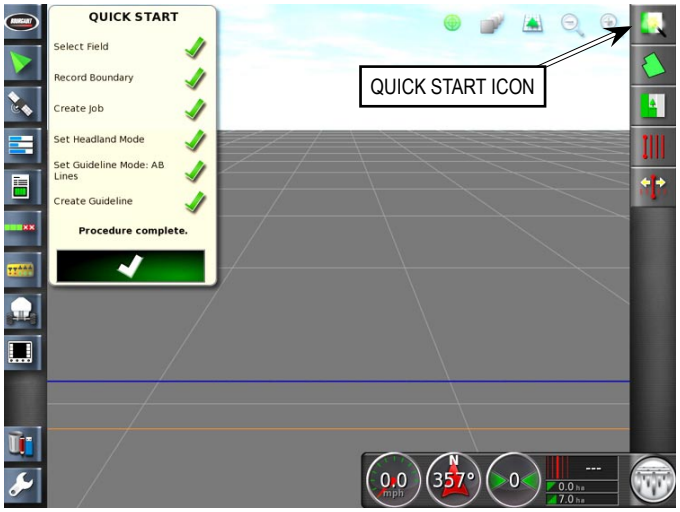


Figure 9.3 - Quick Start

The X30 console records and stores information about the client, farm, field and the jobs in the following way, refer to *Figure 9.4*.

It is important to create clear names for farms, fields and jobs so that the information can be accessed easily next season.

When creating a job name, there is no reason to include the field name, due to the file structure (jobs are stored under the fields). Also multiple jobs can share the same name, provided that they are all stored under different field names.

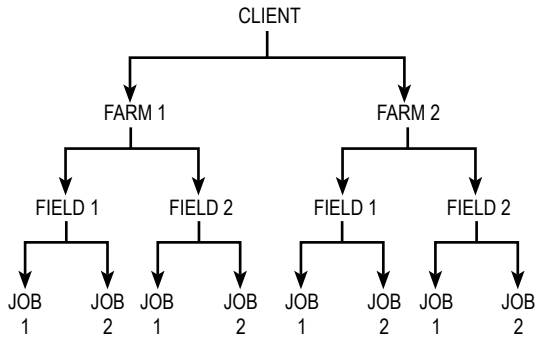


Figure 9.4 - Information Levels

9.1 FIELD MENU

The field menu provides the tools to set client, farm, boundaries, flag points and exclusion zones.

The X30 console will store information such as boundaries, obstacles, exclusion zones, guidelines under the field, so it is can be easily recalled for other jobs in the same field.

9.1.1 SELECTING AN EXISTING FIELD

Refer to *Figure 9.5*.

From the Job/Guidance Toolbar on the right side of the guidance screen select Field icon  and then select  to open up Select Field window, refer to *Figure 9.6*.

The list of fields for the currently selected client and farm will be displayed in the Field section.

Confirm that the right client and farm are selected (names displayed in the corresponding tabs), select required field and confirm.

Figure 9.5 - Field Menu

To change client or farm, select corresponding tab and then make a selection from the list.

You also can choose the closest field based on current GPS location by selecting  .

Also alternatively you can select a field from a USB device. To switch to USB memory, USB device must be connected. Then select  .

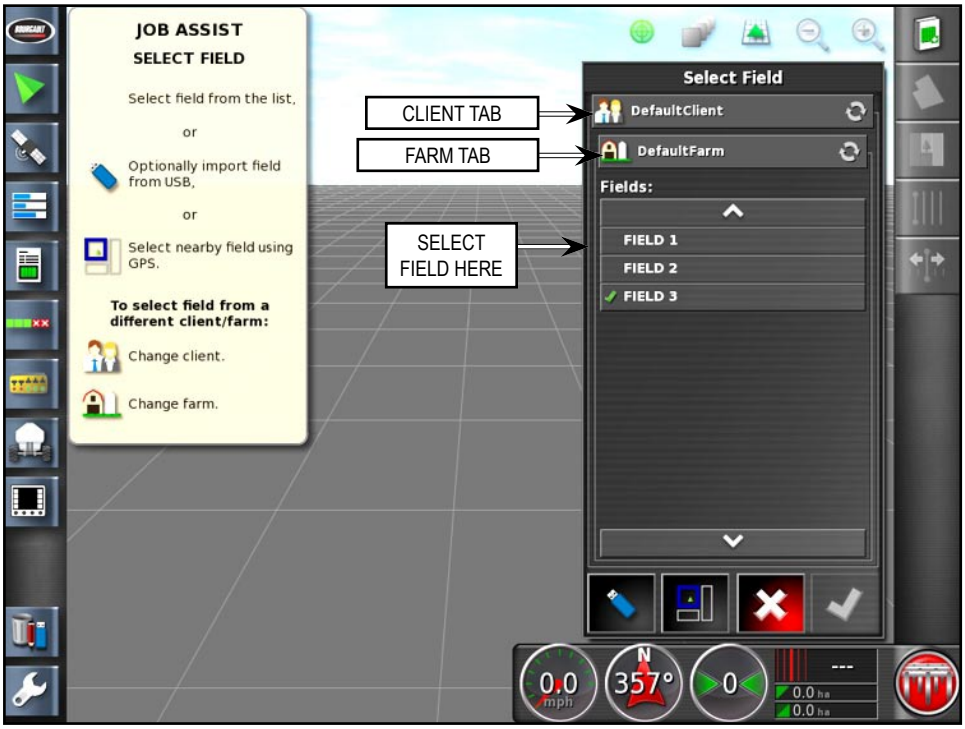


Figure 9.6 - Select Field Window

9.1.2 STARTING A NEW FIELD

Refer to *Figure 9.5*.

From the Job/Guidance Toolbar on the right side of the guidance screen select Field icon  and then select  to open up Add New Field window, refer to *Figure 9.7*.

1. Select Client Name button to select or create new client.
2. Select Farm Name button to select or create new farm.
3. Select Field Name button and then enter new field name.

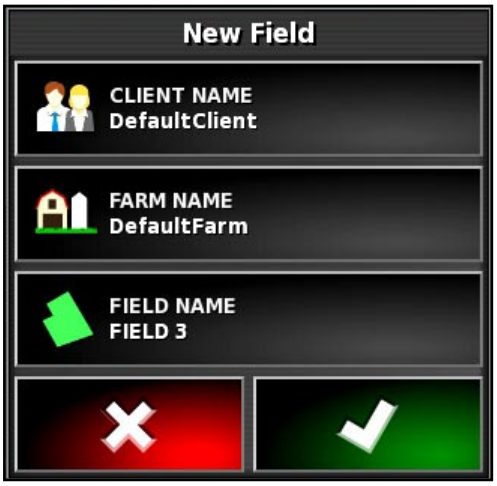


Figure 9.7 - Add New Field Menu

NOTE

To rename Client, Farm or Field after they have been set up, refer to *Section 10.6 - Inventory Manager*.

9.1.3 FIELD BOUNDARY

Field boundaries are optional. It is not required to have a field boundary to start a job. However, it is recommended to create a field boundary for extra functionality (ASC limit to boundary, field area calculation, seeding headlands last, etc.).

There are two ways to create a field boundary:

1. From the Shapefile, if information was previously recorded (ex. field was mapped during preseed burnoff). Refer to *Section 9.1.3.1 - Creating Field Boundary From Shapefile*.
2. Record field boundary using X30 console. Refer to *Section 9.1.3.2 - Recording Boundary*.

9.1.3.1 CREATING FIELD BOUNDARY FROM SHAPEFILE

Refer to *Figure 9.*8. Follow these steps to import a field boundary from the shapefile:

1. Drive to the field.
2. From the Guidance Toolbar select the Field menu icon  , and then select create boundary from shapefile icon  .
3. Choose the Client, Farm and Field. Select corresponding tab and make selection from the list, similar way as selecting an existing field (refer to *Section 9.1.1 Selecting an existing Field*).
4. The scroll list will display shapefiles from the X30 internal memory.

   If importing from USB device, make sure that the USB device is connected to the X30 console and then select the  icon.

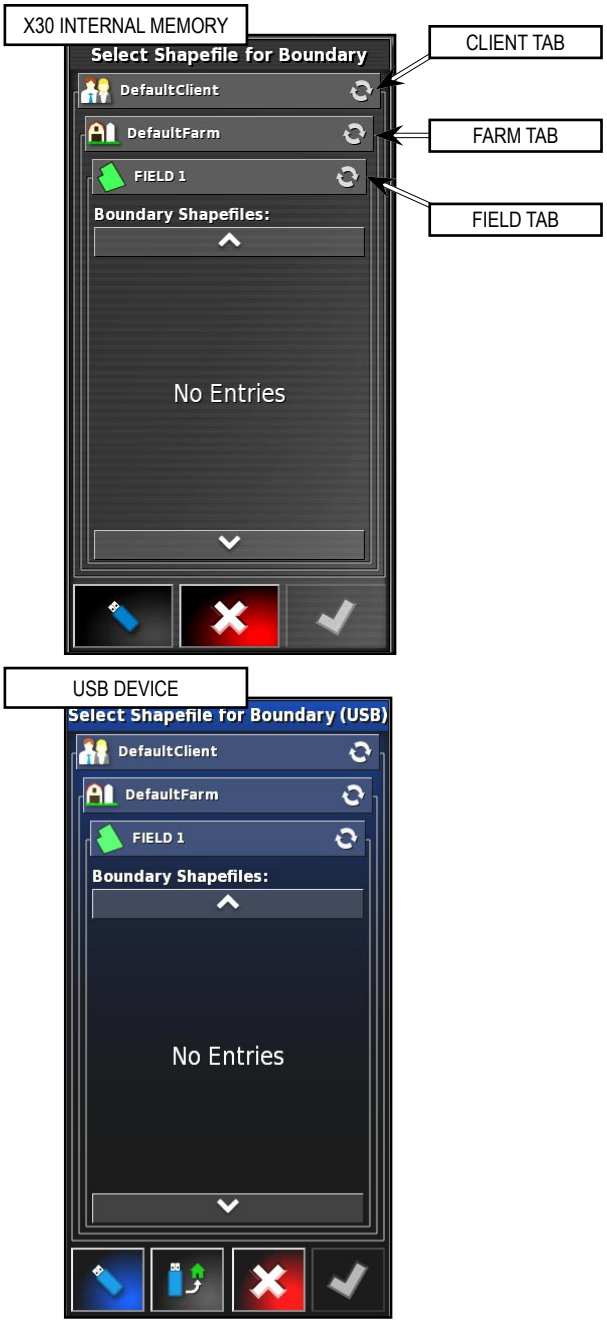


Figure 9.8 - Selecting ShapeFile

Information on the USB device can be displayed in Client/Farm/Field format or USB Home format (will display folders/files, same way as Windows explorer).

To switch between formats use  icon.

5. Select the shapefile and confirm. Boundary will appear on the screen as a blue line.

9.1.3.2 RECORDING BOUNDARY

The following are controls available to create the field boundary, refer to *Figure 9.9*.

Drive the vehicle to the edge of the field and follow the steps to establish a boundary for the field:

1. Set the Boundary Offset - the distance from the centre of the vehicle to the actual boundary to be worked. This accounts for any obstacles (fences, tree line and etc.) that do not allow the vehicle to drive exactly on the boundary.

   To enter boundary offset, from the Field menu select Boundary offset icon, then select boundary offset button and enter the offset distance.

   Refer to *Figure 9.10*. Use negative offset (Item A) if the field boundary is to the vehicle's left and positive offset (Item B) if the field boundary is to the vehicle's right. A setting of zero indicates that the vehicle has driven exactly on the boundary (Item C).

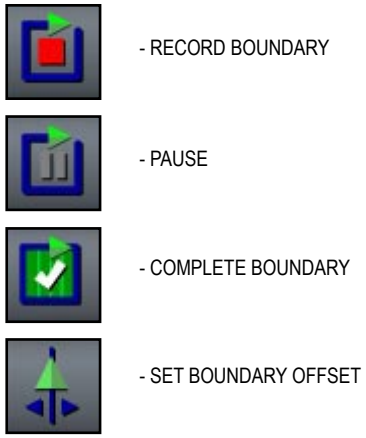


Figure 9.9 - Field Boundary Control Icons

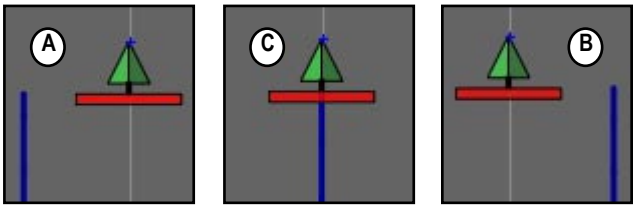


Figure 9.10 - Boundary Offset

NOTE

AN IMPLEMENT NEEDS TO HAVE BEEN ESTABLISHED DURING SETUP, BUT THE ACTUAL IMPLEMENT DOES NOT NEED TO BE PHYSICALLY ATTACHED TO THE VEHICLE FOR A BOUNDARY TO BE CREATED.

2. Position the vehicle at the start of the boundary.
3. Press record field boundary icon.
4. Drive the vehicle around the boundary of the field. The recorded boundary will be displayed as a blue line. Record icon will change to pause.
5. Use Pause icon to pause boundary recording. This is useful if an obstacle prevents driving on the boundary. Pause icon will change back to record icon. Select record to resume. The boundary will record a straight line between the paused and resumed points.

   Alternatively the Pause Boundary Recording with Master option can be enabled and that will pause a resume the boundary recording with the master switch, refer to *Section 3.2.4 - Map* to enable.

6. As approaching the start point, select Complete field boundary recording icon to automatically complete the boundary. It will draw a straight line between your current location and the starting point.

9.1.3.3 REMOVING BOUNDARY

If required, a boundary can be erased.

NOTE

ERASING A BOUNDARY IS A PERMANENT ACTION. A NEW BOUNDARY WILL NEED TO BE RECORDED.

1. Drive to the field.
2. From the Guidance Toolbar select the Field menu, and then select Field icon.
3. Choose the client, farm and field. Boundary will appear on the screen.
4. Select  icon to remove the boundary. A window with a message to confirm will appear.
5. Confirm or cancel action.

9.1.4 SETTING FLAG POINTS

Flag points are used on the guidance map to indicate obstacles and noted items in the field.

1. Drive to item to be flagged.
2. Select  icon.
3. To flag the obstacle, choose a flag symbol to be placed at that spot on the map, refer to *Figure 9.11*.

   ***Note**: To change Flag Point presets, refer to Section 4.5 - Flag Points.*
4. To customize flag points, choose Custom to define a particular flag point.
   - Select the symbol for the flag point.
   - Enter the name for the flag point.
5. If an exclusion zone is needed around the obstacle, refer to *Section 9.1.5 - Exclusion Zones*.
6. If an exclusion zone is not needed, repeat steps 1 - 5 for the rest of the obstacles on the field.

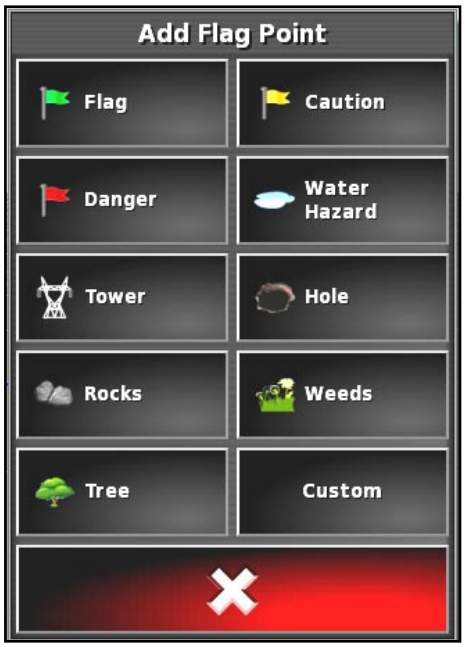


Figure 9.11 - Add Flag Point Menu

9.1.4.1 REMOVING OR CHANGING FLAG POINTS

Once created, flag points can be renamed, changed, or deleted.

1. Select (touch) the flag point marker on the screen. Flag point edit window will appear.
2. Choose an action that you would like to perform:
   - select Change to choose a different flag point.
   - select Rename to change the name showing on the flag point.
   - select Delete to remove the selected flag point from the field.
   - select Clear All to clear all flag points from the field.
   - select GPS Drift Correction to .move the vehicle to a flag point location to compensate fro GPS drift. Can be used when reloading a field if it has drifted.

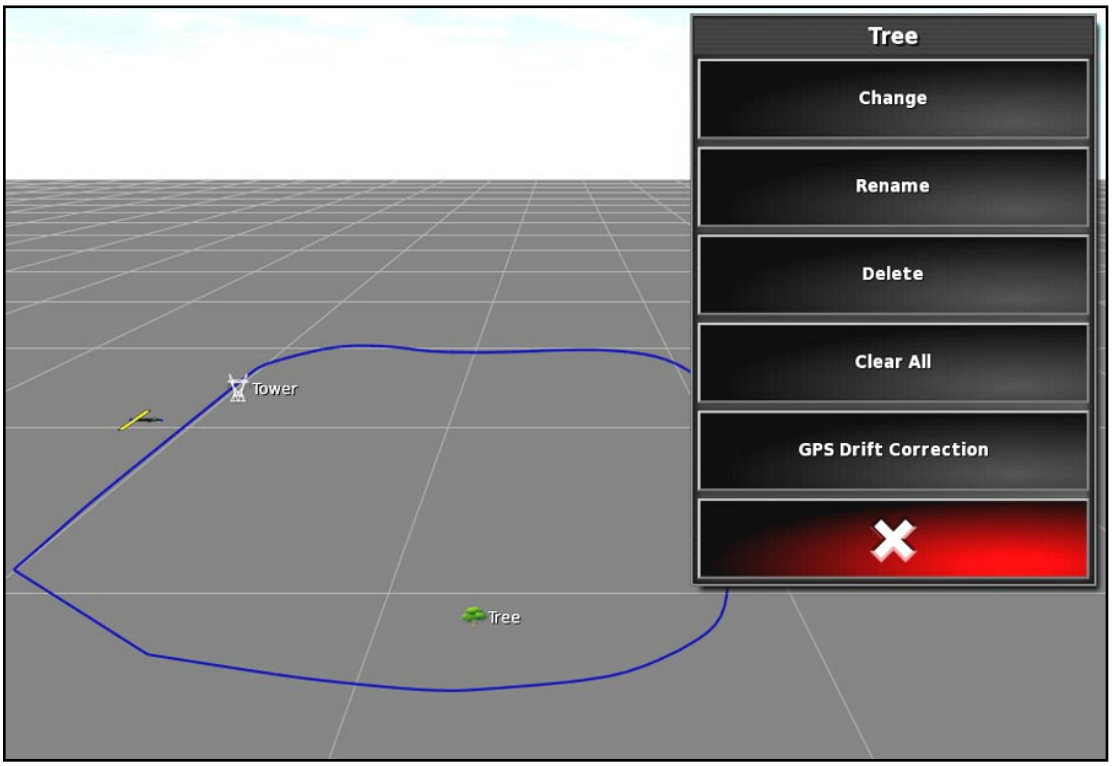


Figure 9.12 - Flag Point Edit Menu

9.1.5 EXCLUSION ZONES

Exclusion zones are areas within the field boundary that will not be seeded (for example a permanent body of water).

After the field boundary is established all the icons to record the field boundary will be replaced with icons to record exclusion zone boundaries, refer to *Figure 9.13*. Note that the boundary line colour on the icons changed from blue to yellow.

Drive the vehicle to the area and follow the steps to set an exclusion zone:

1. If required, set the Exclusion Zone Offset to allow for any offset from the centre of the vehicle's implement or to avoid contact with an obstacle.

   From the Field menu select Offset icon, then select boundary offset button and enter the offset distance.

   Use negative offset if the exclusion zone boundary is to the vehicle's left and positive offset if the exclusion zone boundary is to the vehicle's right.

NOTE

AN IMPLEMENT NEEDS TO HAVE BEEN ESTABLISHED DURING SETUP, BUT THE ACTUAL IMPLEMENT DOES NOT NEED TO BE PHYSICALLY ATTACHED TO THE VEHICLE.

2. Position the vehicle at the start of the boundary.
3. Press record boundary icon.
4. Drive the vehicle around the exclusion zone. Recorded exclusion zone boundary will be displayed as a yellow line. Record boundary icon will change to pause.
5. Use Pause icon to pause boundary recording. This is useful if an obstacle prevents driving on the boundary. This icon will change back to record boundary icon. Select record to resume. The missing interval between pause and resume will be completed as a straight line.

- RECORD EXCLUSION ZONE BOUNDARY
- PAUSE
- COMPLETE EXCLUSION ZONE BOUNDARY
- SET BOUNDARY OFFSET

Figure 9.13 - Exclusion Zone Boundary Icons

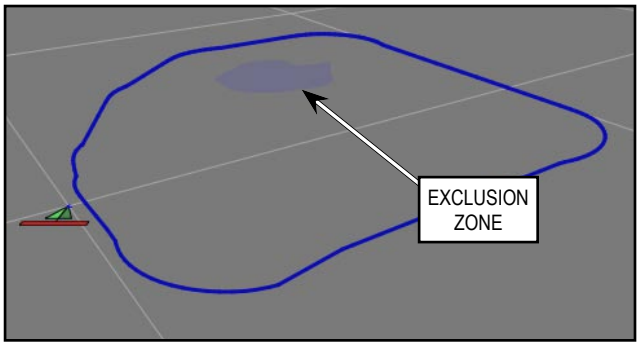


Figure 9.14 - Exclusion Zone

6. As approaching the start point, select Complete boundary recording icon to automatically complete the exclusion zone boundary.

The exclusion zone displays as a shaded area, refer to *Figure 9.14*.

9.1.5.1 REMOVING AND RESTORING AN EXCLUSION ZONE

If exclusion zones are no longer needed, these can be removed by selecting  (Remove Exclusion Map) from the Field menu.

To restore the removed exclusion zones, select  (Select Exclusion Map) from the Field menu. Select Exclusion Map window will appear, refer to *Figure 9.15*. Select the shape file from the list and confirm. Exclusion zone will appear on the guidance map.

 (Select Exclusion Map) also can be used to import exclusion map and shapefiles, that were created externally, refer to *Figure 9.16*:

- Make sure that the USB device is connected to the X30 console.
- Select the  icon.
- Information on USB device can be displayed in Client/Farm/Field format or USB Home format.

  To switch between formats use  icon.
- Select the shapefile and confirm. Exclusion zone will appear on the guidance map.

Figure 9.15 - Select Exclusion Map - X30 Internal memory

Figure 9.16- Select Exclusion Map - USB

9.2 JOB MENU

A Job is a different application performed on the field (example spraying, seeding, fertilizing, etc.). New job can be created for each year to record coverage.

9.2.1 SELECTING AN EXISTING JOB

The X30 Console records and stores all information related to the job so it can be accessed later.

Refer to *Figure 9.17*.

To access an existing job:

- Drive to the field.
- From the Job/Guidance Toolbar on the right side of the guidance screen select  Job icon and then select  to open up Select Job window, refer to *Figure 9.18*.
- Browse and select the client, the farm, the field and the job in X30 internal memory.
- Alternatively you can access jobs stored on a USB device (if previously they were transferred onto the USB device). Select USB icon  and browse and select the client, the farm, the field and the job on USB device.
- Confirm your selection.

Figure 9.17 - Job Menu

Figure 9.18 - Select Job

9.2.2 CREATING A NEW JOB

To set up a new job:

- From the Job/Guidance Toolbar on the right side of the guidance screen select  to open Job Menu.
- Select  Create New Job icon. Add a new job window will appear, refer to *Figure 9.19*.
- Select Job Name button.
- Enter name and confirm.

NOTE

WHEN CREATING JOB NAME, THERE IS NO REASON TO INCLUDE FIELD NAME, AS JOBS ARE STORED UNDER THE FIELDS. ALSO MULTIPLE JOBS CAN SHARE THE SAME NAME, PROVIDED THAT THEY ARE ALL STORED UNDER DIFFERENT FIELD NAMES.

- Confirm the new job.

Figure 9.19 - Create New Job

9.2.3 HEADLAND

IMPORTANT

A HEADLAND CAN ONLY BE CREATED IF A BOUNDARY HAS BEEN ESTABLISHED.

To set up the working headland follow the steps:

1. Select Job Menu  and select  Headland.
2. Headland Option window will appear, refer to *Figure 9.20*.
3. Set the Headland Width.

   Select Headland Width (Item A, *Figure 9.20)*. From the scroll list select the width of the headland from the inside of the field boundary (0.5 swath or anywhere from 1 to 5 swath, where swath is the working width of the implement) and confirm.
4. Set the Headland Offset (if required)

   A positive headland offset will increase the width of the headland. A negative headland offset will decrease the width of the headland. To select Headland Offset (Item B, *Figure 9.20)*. Enter the offset distance and confirm.
5. Set Look Ahead distance.

   Look ahead distance is a distance in front of the vehicle the system will look to respond with actions. Example, when approaching the headland an alarm will sound and/or warning message will be displayed (depending on the alarm settings).
   Select Look Ahead, (Item C, *Figure 9.20).* Enter the distance and confirm.
6. Select Configure Action to set an alarm and zoom actions, (Item D, *Figure 9.20).* Configure Headland Actions window will appear, refer to *Figure 9.21*.

   Note*: When an action is enabled it is marked with a green check mark. When an action is disabled it is marked with a red cross. It is recommended to check if these actions are enabled or disabled before starting work on the job.*

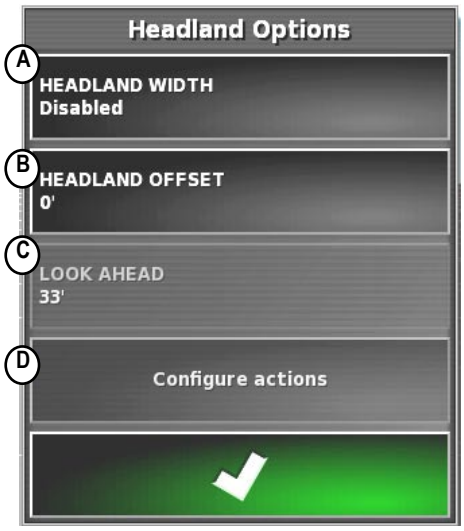


Figure 9.20 - Headland Option Menu

Figure 9.21 - Setting Headland Action - Alarm

A. Select Alarm (background will change to white).

   i. Select Action State to enable/disable an alarm.

   ii. Select Message to enter the message that will appear on the screen when approaching headlands (for example "Approaching Headland").

   iii. Select action type to set an audible alarm.

B. Select Auto Zoom, refer to *Figure 9.22*.

   If this is enabled, the map view will zoom in or out to the defined zoom level as the vehicle approaches the headland and return to the original defined zoom level as the vehicle leaves the headland.

   i. To allow map view to zoom in when approaching the headland, select Action State and choose enabled and confirm.

   ii. Select preferred zoom level in the range from 1 to 10, where 1 being zoomed all the way out and 10 being zoomed all the way in.

7. Confirm the alarm and zoom actions. An orange headland will be displayed inside the boundary line. Approaching the headland will trigger the alarm and zoom that has been set, refer to *Figure 9.23*. If you want to control within headland, the Boundary Limit in Auto Section Control mini-view window needs to be set to Headland, as described in *Section 8.10 - Using Auto Section Control*.

Figure 9.22 - Setting Headland Actions - Zoom

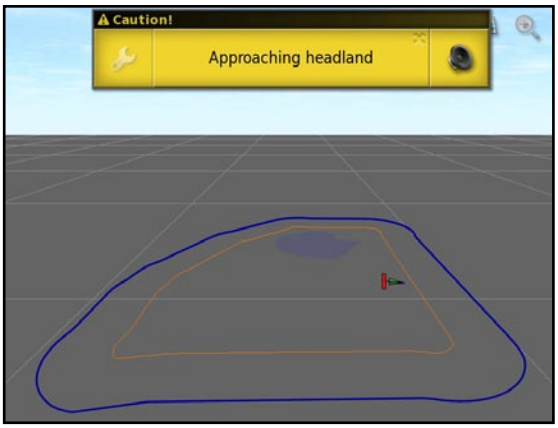


Figure 9.23 - Approaching Headland

9.2.4 RECORDING JOB INFORMATION

The X30 console is capable of recording job information such as weather conditions, soil type and conditions, product applied and rates, application method, etc. This information will be stored in the console's internal memory and can later be exported onto a USB thumbdrive.

1. From the Job Menu select  to open Record Job Info window, refer to *Figure 9.24*.
2. There are three categories to enter information: weather, crop and product, refer to *Figure 9.25*.

   Each category can be expanded to view and enter information by selecting the arrow on the right side of the category button. When expanded, use scroll bar or hide arrow to see more options.
3. Weather and site conditions are optional. Adding some crop and product information is recommended.
   Select categories as needed, enter the information and confirm.

Figure 9.24 - Record Job Info Window

Figure 9.25 - Record Job Information - Weather, Crop and Product Categories

9.2.5 EXPORTING JOB REPORT

IMPORTANT

IT IS IMPORTANT TO DO THIS STEP WHILE IN THE FIELD WITH A GPS SIGNAL TO BE ABLE TO ACCESS COVERAGE INFORMATION LATER. WITH QUICK START IT CAN BE SETUP TO DO THIS AUTOMATICALLY WHEN CHANGING JOBS AS LONG AS A THUMBDRIVE IS INSTALLED IN X30 CONSOLE.

To export a job report to a USB thumbdrive make sure that the USB device is connected to the X30 console (if not connected, export function will be disabled).

To export job report select  from the Job Menu. Window with message that export in progress will appear. Once done, a message that the export completed successfully will be displayed. Confirm message.

Job report will be saved as a pdf file in folder named Reports.

Job report will have:

- boundary shapefile
- coverage shapefile for each tank
- pdf report that includes job summary (implement, vehicle, start and finished date/time, hours, distance travelled and etc.), crop/weather and product details if entered, coverage maps for each boom, applied map for each product, and area counter summary.

Alternatively Job reports can be created/exported through the Inventory Manager at a later time. Refer to *Section 10.6 - Inventory Manager*.

9.2.6 CLEARING A JOB

This action will remove any coverage information on the screen and delete job data that has been recorded on the current job. It does not affect field information or guidelines set for the field.

To clear job data select  from the Job Menu and confirm.

9.2.7 VARIABLE RATE CONTROL

NOTE

VRC OPTIONS ARE ONLY AVAILABLE WITH THE X30 CONTROLLER PACKAGES.

If Variable Rate Control (VRC) has been enabled (refer to *Section 4.1.3 - Implement*), select  - Configure VRC on the Job Menu to start the VRC wizard (*Figure 9.26*).

Figure 9.26 - VRC Wizard - Step 1

1. Pick VRC file format.

   Select from Shape files (most common) and ISO XML. Note that these file types are different from the XML file type that was used with the X20. Refer to *Figure 9.27*.

2. Select Prescription map.

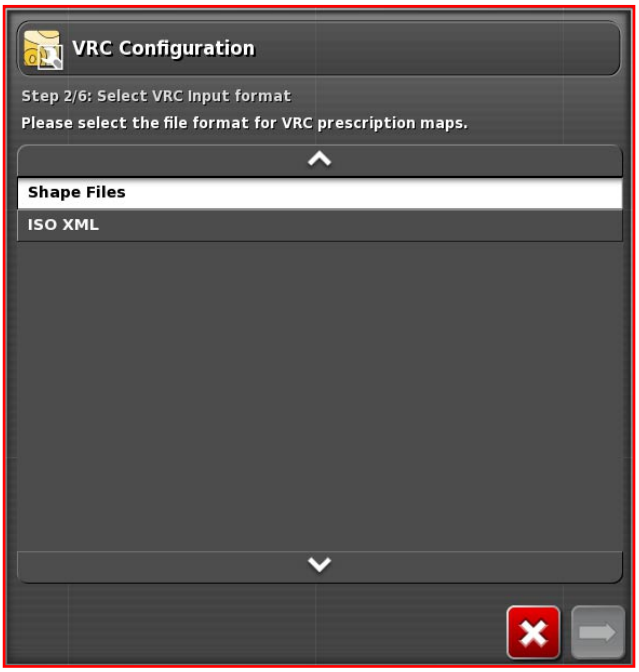


Figure 9.27 - VRC Wizard - Step 2

A prescription map can be loaded from X30 or directly from USB. To switch between X30 internal memory and USB device select  . When loading from USB device, by selecting  can switch the display format between Client/Farm/Field and USB Home format (*Figure 9.28*).

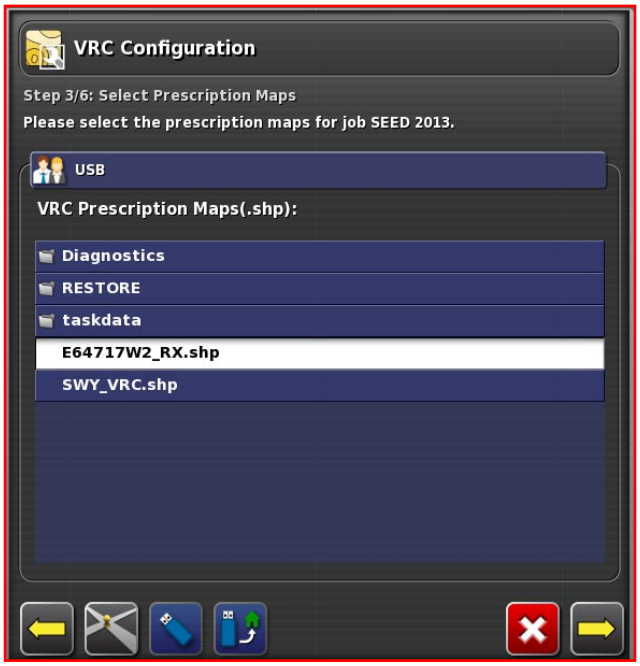


Figure 9.28 - VRC Wizard - Step 3

3. Refer to *Figure 9.29*. When the prescription map is loaded, assign file to each tank that will be using VRC application. Also pick the attribute/layer for each tank, which should be clear if the creator of the prescription file named the layers appropriately. Select No VRC fornon-VRC tanks.
4. If necessary, change units and also rescale the rates if something changed since the map was created. This will rescale all zones for that product. Example: if want 20% extra enter 1.20, if want 20% less enter 0.80.

   Enter a default rate for each tank for out of zone (areas that might not be included on prescription map) or loss of GPS signal.
5. Next step completes VRC wizard and prescription map is displayed on screen.

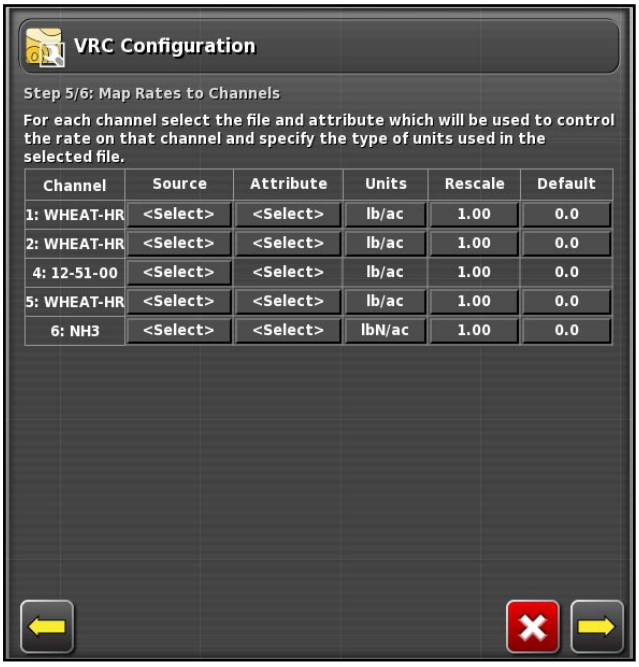


Figure 9.29 - VRC Wizard - Step 5

IMPORTANT

BEFORE STARTING TO APPLY YOU NEED TO SWITCH THE TANK APPLICATION MODE FROM THE DEFAULT "AUTO" TO "VRC" FOR EACH TANK CONTROLLED BY VRC. THAT CAN BE DONE FROM THE SEEDER CONTROLLER MINI-VIEW OR EXPANDED WINDOW (REFER to *Figure 9.30* & *Figure 9.31*).

You can change the mode for each tank separately, or you can change them all at once by pressing on the top tab that has the product name. This will change the tab to say All Products and by selecting a mode it will change them all.

Refer to *Figure 9.30* & *Figure 9.31*. During application the rate icon for the VRC tanks changes in the main seeder view. Requested rate area will also grey out as rate is being driven by the VRC map. Displayed rates for those tanks will change as moving in and out of the different zones.

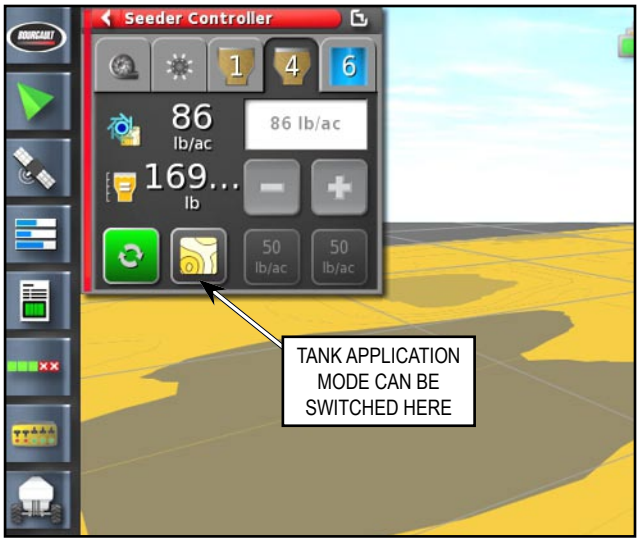


Figure 9.30 - Seeder Controller (mini-view)

Figure 9.31 - Seeder Controller (main view)

10 MONITORING & MANAGING FILES

Table of Contents

10.1 VIEWING INFORMATION ON THE DASHBOARD

10.1.1 CONFIGURING THE DASHBOARD

The Dashboard is located at the bottom of the operational screen. It can be customized to display desired information.

Refer to *Figure 10.1*.

Select anywhere on the Dashboard to bring up the Customize Dashboard window, that will have a list of available information display panels.

Chosen options in the list will appear with a white background. Only enabled tanks will appear in the list (ex. tank #3 disabled, product from this tank redirected to tank #2 for metering).

Choose options for display. Chosen data will have white background. Confirm the new Dashboard display. Selected panels will appear on the dashboard.

Each panel on the dashboard also can be customized to display certain information.

First select anywhere on the Dashboard to bring up the Customize Dashboard window. While the Customize Dashboard window is open select the panel to be customized (touch the panel on the Dashboard). New window with the list of data for display will appear. Refer to *Figure 10.1* for an example of customizing granular tanks panels.

Choose information to be displayed on that panel and confirm. Then confirm the new Dashboard display. Selected items for configured panel will appear on the dashboard.

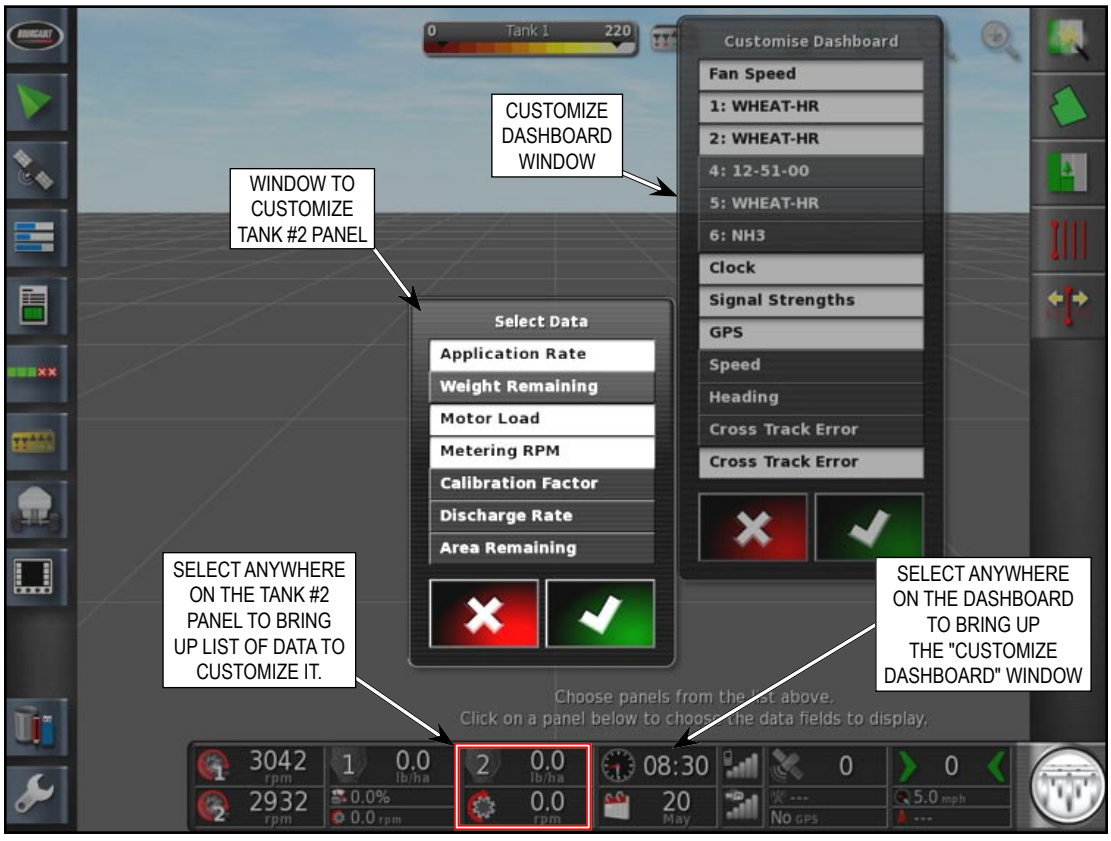


Figure 10.1 - Dashboard

10.1.2 DASHBOARD ITEMS

Refer to *Figure 10.*4. This figure shows an example of the Dashboard with Fan and all tanks selected for display from the Customize Dashboard menu. *Note: only enabled tanks will be available for selection on the Customize Dashboard menu.*

A **Fan** - displays fan speed in RPM. Can be configured to display one or two fans.

B **Tank (granular)** - displays data related to the specific granular air seeder tank, number of the tank shown on the icon. Can be customized to display up to three parameters, related to that specific tank, refer to *Figure 10.2*:

- Application Rate (1)
- Weight Remaining (2)
- Motor Load (3)
- Metering RPM (4)
- Calibration Factor (5)
- Discharge Rate (6)
- Area Remaining (7)

C **Tank (Liquid/NH3)** - displays data related to the Liquid/NH3 tank, number of the tank shown on the icon. Can be customized to display up to three parameters, refer to *Figure 10.3*:

- Application Rate (1)
- Pressure (2)
- Boom Flow (3)
- Nozzle Flow (4)
- Pump Speed (5)
- Tank Volume Remaining (6)
- Area Remaining (7)

NOTE

FOR DETAILED INFORMATION ABOUT GRANULAR/LIQUID/NH3 TANK PARAMETERS REFER TO *SECTION 2.7.3.1 - TANK PARAMETERS*.

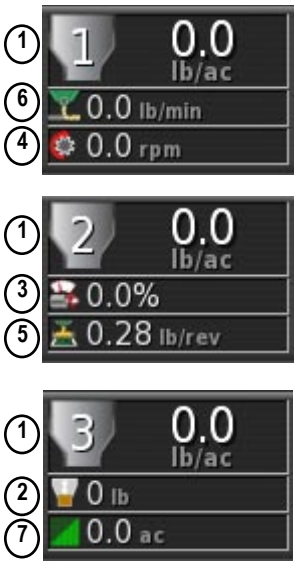


Figure 10.2 - Granular Tank Panel Configuration Examples

Figure 10.3 - Liquid/NH3 Tank Panel Configuration Examples

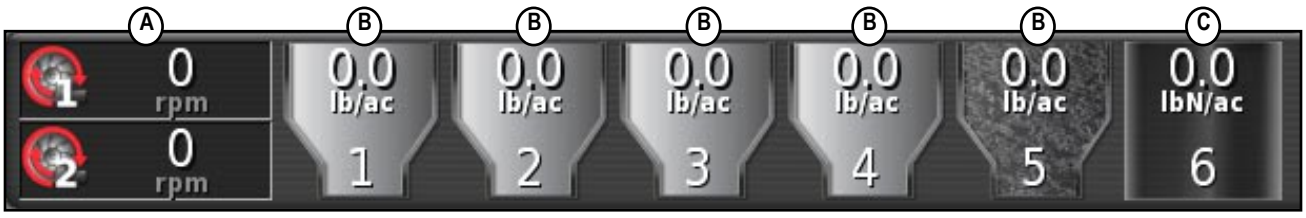


Figure 10.4 - Fan and Tanks

Date and time can be displayed on the Dashboard by selecting Clock from the Customize Dashboard menu, refer to *Figure 10.5*.

Figure 10.5 - Clock Panel

D **Clock** - displays time and date in the format that was selected when setting up user preferences (refer to *Section 3.2.2 - Time/ Date*). Can be customized to display either time, date, or both.

To display GPS information select GPS from the Customize Dashboard menu, refer to *Figure 10.6*.

Figure 10.6 - GPS Panel

E **GPS** - displays information related to GPS. Can be customized to display up to three parameters:

Number of Satellites - System readiness and the number of satellite signals available.

The satellite symbol will be displayed in different colours depending on the reported accuracy of the GPS:

green - good accuracy
yellow - average accuracy
red - poor accuracy
grey - no signal

HMRS - Correction quality and position accuracy.

Correction symbol can display different colours:

grey - if correction source is set to Autonomous.

green - if the correction source received and accurate.

yellow - if correction source received, but not accurate enough engage steering.

red - if the correction source is different from the one that was selected during setup.

Differential correction - Correction source in use - DGPS, PPS, RTK, Omnistar etc.

If correction source is set to Autonomous during setup, "GPS" will be displayed on the panel.

NOTE

IF **GPS RECEIVER TYPE SET AS OTHER,** DIFFERENTIAL FIX INDICATOR WILL BE:
- RED, IF RECEIVING AUTONOMOUS
- GREEN, IF IT HAS DIFFERENTIAL OR RTK FIX.

Refer to *Figure 10.9*. This figure shows an example of the Dashboard with Speed, Heading, Cross Track Error and Swath selected for display from the Customize Dashboard menu.

Speed, Heading, Cross Track Error or Swath panels can be customized to display up to three items, when selected Select Data menu will appear, refer to *Figure 10.7*.

F **Speed panel** - displays ground speed of your vehicle(tractor)/seeding implement. The symbol in the right lower corner of the speed panel indicates the speed source, refer to *Figure 10.8*.

G **Heading** - displays the direction of travel.

H **Cross Track Error** - displays the distance of the vehicle (tractor) from the nearest wayline (if applicable).

I **Swath** - displays the swath or wayline being travelled (if applicable).

J **Area Covered** - displays covered area, that corresponds to the boom displayed on the coverage map. This area calculated based on the travel speed and the width of the seeding implement, does not include any overlapped areas.

For more representative area that product is applied over see treated area under area counter for each tank, refer to *Section 2.7.5 - Area Counters Panel*.

K **Area Remaining** - displays remaining area. The value is theoretical and is based on the area within the boundary minus the area covered. Only appears once a field boundary is created.

L **Signal Strengths** - will display signal strength if feature are enabled.

Figure 10.7 - Job Statistics Select Data List

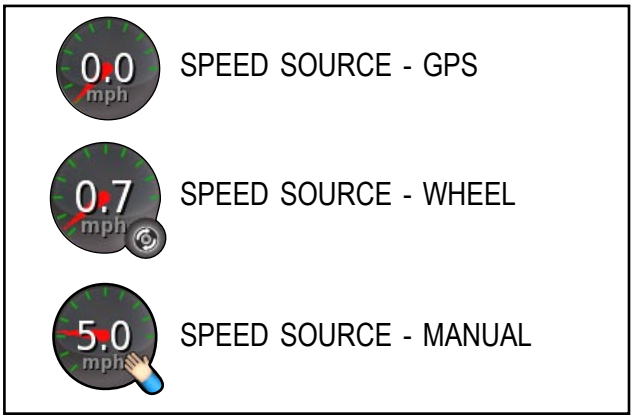


Figure 10.8 - Speed Source Indicator

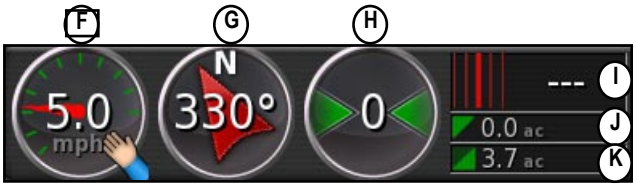


Figure 10.9 - Speed, Heading, Cross Track Error and Swath

10.2 VIEWING JOB INFORMATION

From the mini-view menu (left side of the operational screen) select  to open Job information mini-view window.

This window has five tabs that will display information related to the current job:

1. **Job Statistics** (*Figure 10.10*.) - displays area covered, boundary area and area remaining, distance travelled.

   Select  icon to change between different booms.

2. **Job Duration** (*Figure 10.11*.) - displays total and productive hours, average productivity, time left to finish the job.

3. **Job Settings** (*Figure 10.12*) - displays client, farm, field and job names.

4. **Guidance Settings** (*Figure 10.12*) - displays current guideline name (several guideline can be associated with one field, example seeding North-West and spraying South-East), vehicle and implement used for the current job.

5. **Job Notes** (*Figure 10.12*) - this screen allows you to enter notes relating to that particular job.

Figure 10.10 - Job Statistics

Figure 10.11 - Job Duration

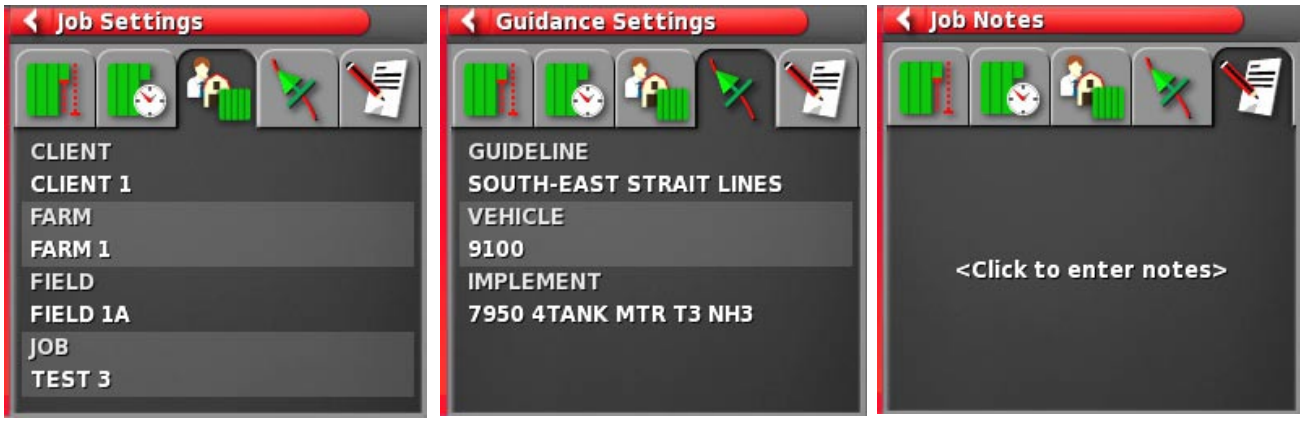


Figure 10.12 - Job & Guidance Settings, Job Notes

10.3 GPS DETAILS (MINI-VIEW WINDOW)

Select  button to open GPS Information mini-view window.

There are three tabs available to view information:

1. **GPS Position (***Figure 10.13.***)** tab displays Latitude and Longitude (positioning of the vehicle), Easting and Northing (Universal Transverse Mercator (UTMS) position and zone of the vehicle).
2. **Vehicle Orientation** (*Figure 10.14)* tab displays altitude, heading (degrees) and actual speed of the vehicle, and roll/pitch (Roll is the left/right tipping of the vehicle. Pitch is the forward/back tipping of the vehicle.)
3. **GPS Accuracy** (*Figure 10.15)* tab displays the number of available satellites, the correction age in seconds, the HDOP and HRSM. Lower value of HDOP and HRSM indicates better accuracy. Satellite and correction icons can display different colours, *refer to Section 10.1.2 - Dashboard Items*.

NOTE

THE HDOP (HORIZONTAL DILUTION OF PRECISION) INDICATES THE EFFECT ON ACCURACY OF THE NUMBER OF SATELLITE SOURCES AND THEIR GEOMETRY. THE HRMS (HORIZONTAL ROOT MEANS SQUARED) CALCULATES AN AVERAGE HORIZONTAL POSITION FROM THE SOURCE INFORMATION FROM THE SATELLITES. LOWER VALUE INDICATES BETTER ACCURACY:

Good accuracy	HDOP < 1.0
Average accuracy	HDOP 1.0 - 4.0
Poor accuracy	HDOP > 4.0
No signal	GPS invalid 0

KEEP THE ANTENNAE CLEAR OF OBSTRUCTIONS TO MAINTAIN ACCURATE GPS READINGS.

Figure 10.13 - GPS Position

Figure 10.14 - Vehicle Orientation

Figure 10.15 - GPS Accuracy

10.4 VIEWING DIAGNOSTICS

Select  button to view diagnostic information like memory usage, console working parameters, trouble codes, etc. There are four tabs available, which provide various information for customer support technicians to use when troubleshooting:

1. Memory Usage (*Figure 10.16*) tab displays memory usage in % for main console memory, USB memory and file system.
2. Console Diagnostics (*Figure 10.17*) tab displays console working parameters such as internal temperature, battery voltage, external voltage, and time console has been on.
3. Trouble Codes (*Figure 10.18*) tab displays trouble codes if there are any. For more information refer to *Trouble Shooting Guide and Trouble Codes table in your Topcon X30 Guidance and Auto Steering manual*. Many common errors can be corrected. For persisting problems and errors not listed in the *Topcon X30 Guidance and Auto Steering manual* ALWAYS record the error message and the code to report to your dealer.

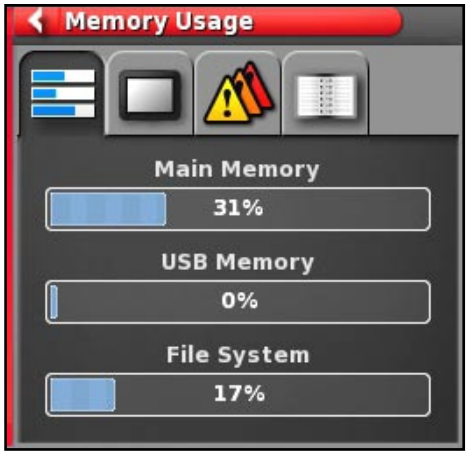


Figure 10.16 - Memory Usage

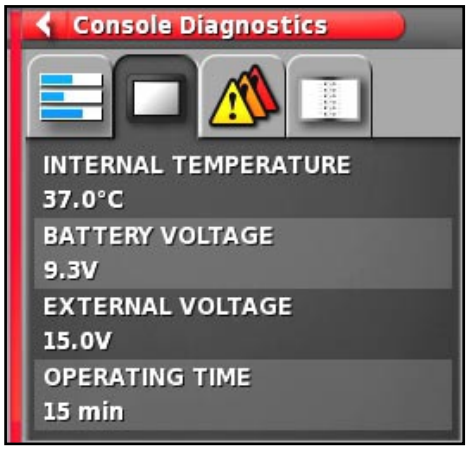


Figure 10.17 - Console Diagnostics

Figure 10.18 - Trouble Codes

4. Logging (*Figure 10.19*)

   Logging is intended for use by customer support personnel only. However if a logging configuration file has been provided by the technician, it can be loaded via USB and ran using this screen.

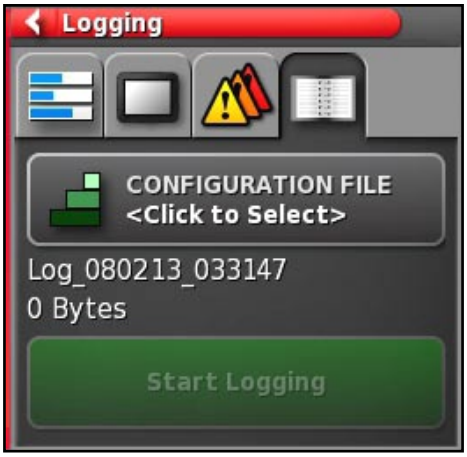


Figure 10.19 - Logging

10.5 SYSTEM INFORMATION

Select  to open About mini-view window.

Refer to *Figure 10.20.*

About window displays date, time, and the current version of the software.

Selecting the maximize arrow (top right corner) will expand mini-view window into main viewing area.

The information displayed in the full System Information panel is divided in to five sections:

- Console
- GPS Receiver
- Steering Controller
- Implement
- Wireless Network

Use arrows in the sections title bar to expand or hide. When needed a scroll bar will be displayed. Refer to *Figure 10.21*.

Figure 10.20 - About Mini-View Window

Figure 10.21 - System Information Panel

10.6 INVENTORY MANAGER

All information, like vehicle and implement profiles, products, clients, farms, fields, jobs etc., are saved in files and stored in the internal memory of X30 console.

The Inventory Manager will allow the user to view the file system, make changes and export files to USB or import from USB.

Select  to open Inventory Manager, refer to *Figure 10.23*.

A Category - will open a drop down list with file categories, refer to *Figure 10.22*. Selecting a specific category will open up a list of related files.

Once a category is selected, the following functions can be performed:

B This will select/deselect all files in the opened category.

C This will allow the selected file to be renamed.

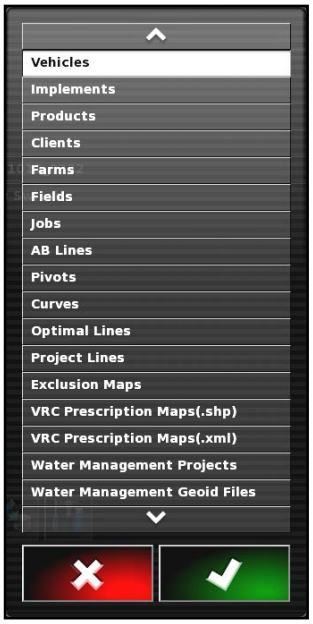


Figure 10.22 - File Categories List

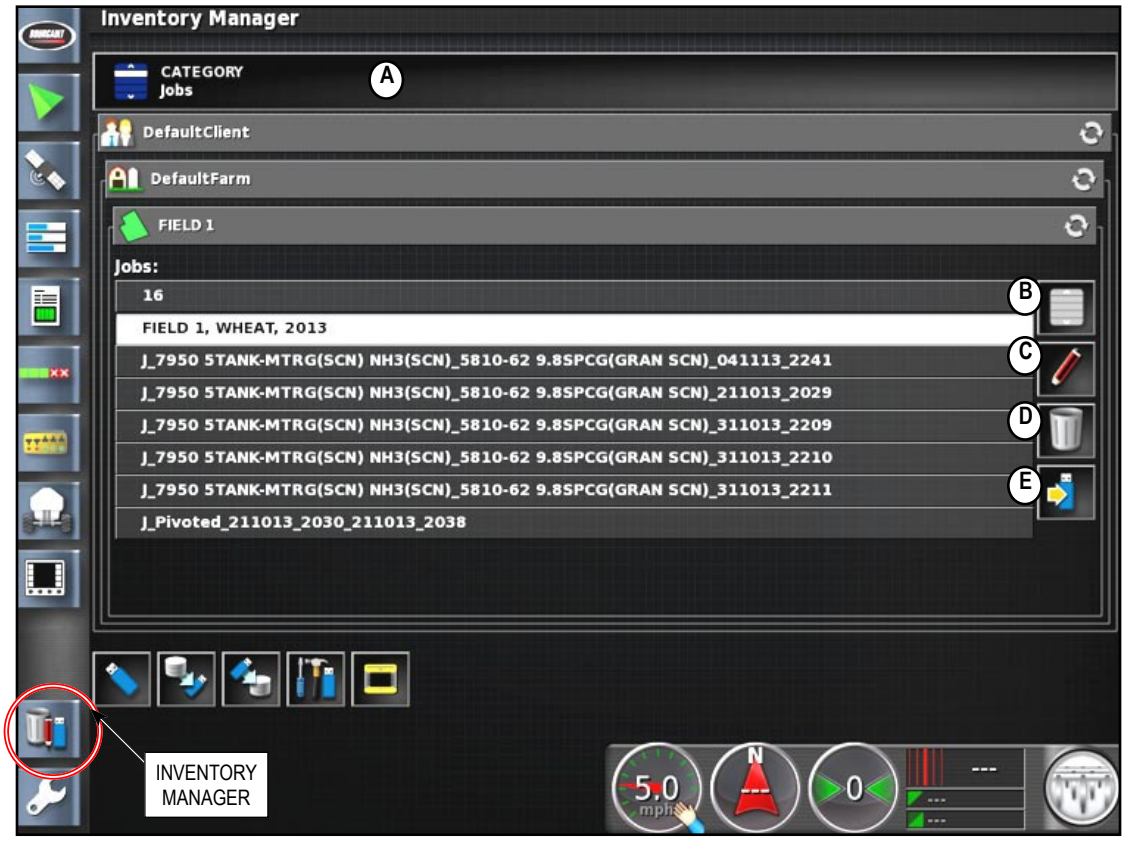


Figure 10.23 - Inventory Manager

D This will delete the selected file(s).

E If browsing a file in X30 internal memory this will export selected file(s) onto USB. USB device must be connected to the X30 console for this function to work.

If browsing files on USB this will import selected file(s) from USB onto X30 console.

For the Jobs item list when this category is selected it will bring Job Export Options menu with following options (refer to *Figure 10.24*): Export Job, Create Job Report, Export Job and Create Report. Use this to create job reports and get coverage shapefiles for completed jobs. To Create Job Report a GPS signal is required.

The Manager Toolbar (located at the bottom provides the following functions, refer to *Figure 10.23*.:

A Switches between X30 internal memory and connected USB device. When browsing files on USB, the display turns blue instead of grey.

B This will backup all system data onto USB.

C This will restore the entire inventory from USB. Current inventory on X30 internal memory will be overwritten. The system will restart. This function can be used to restore content from backup USB.

D This will export diagnostic information onto USB and can be used when your dealer asks for it to assess the data.

E This appears only if **System 150 Files Transfers** are enabled in User/Environment Setup. It will toggle System 150 File Transfer mode. When System 150 Files transfer mode is active, the background will display green and files from earlier Topcon systems can be transferred.

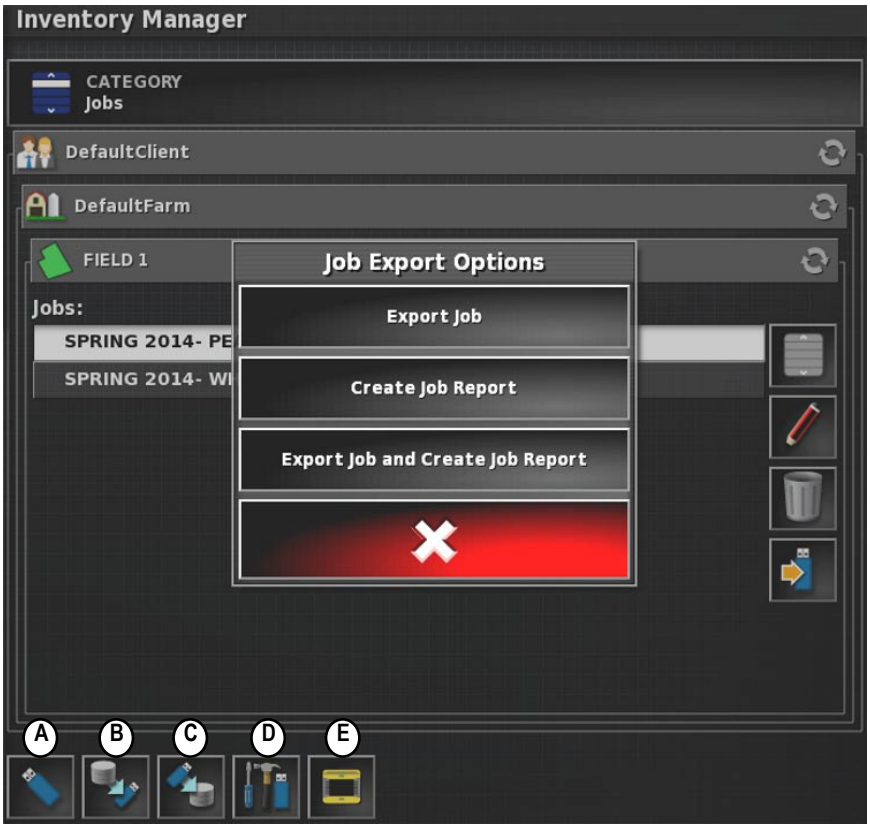


Figure 10.24 - Job Export Options

11 WIRING SCHEMATICS

11.1 IN-CAB COMPONENTS

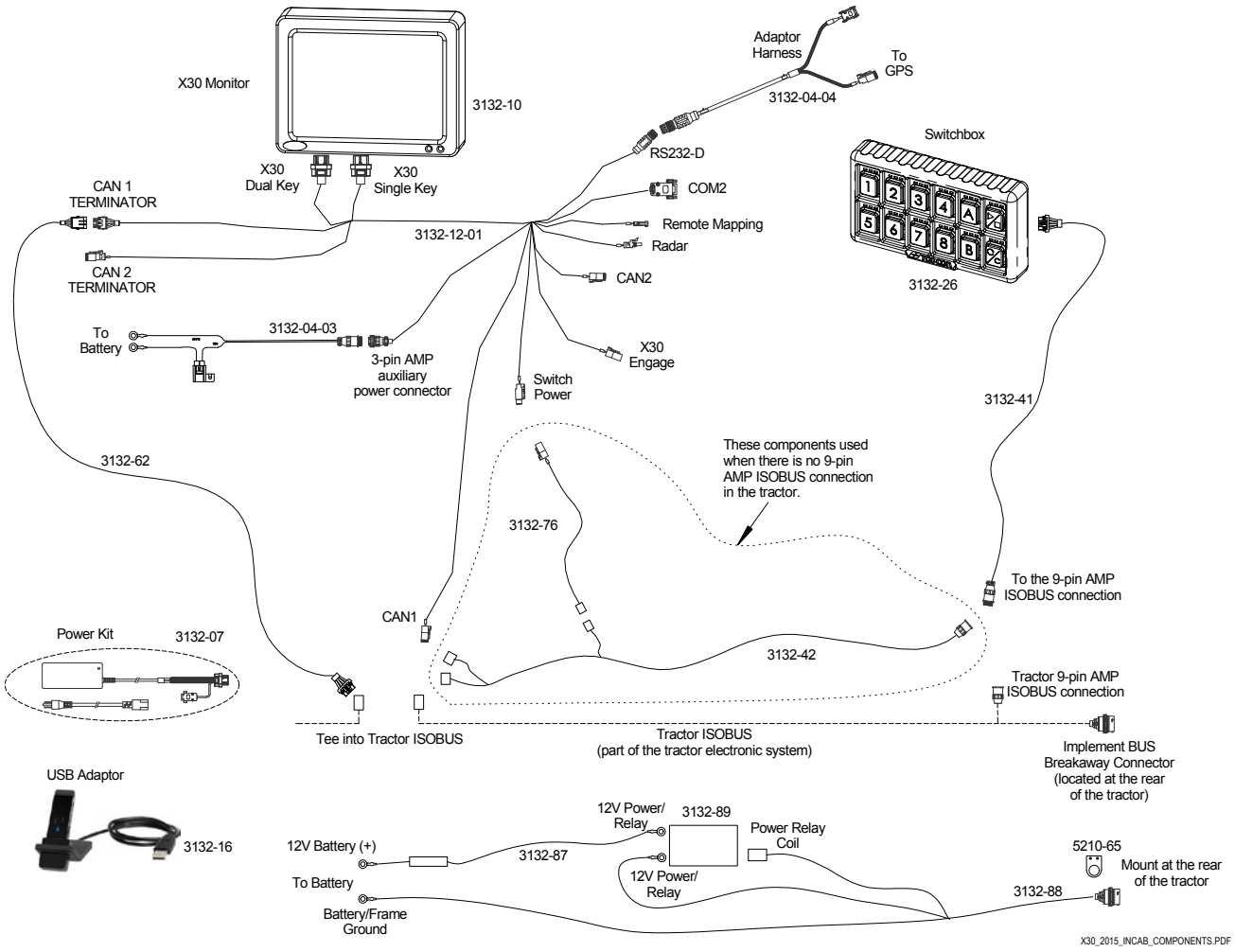


Figure 7.1 - X30 SRC - In-Cab Components

11.2 COMPONENTS ON THE AIR SEEDER TANK AND IMPLEMENT

11.2.1 6000 SERIES AIR SEEDERS

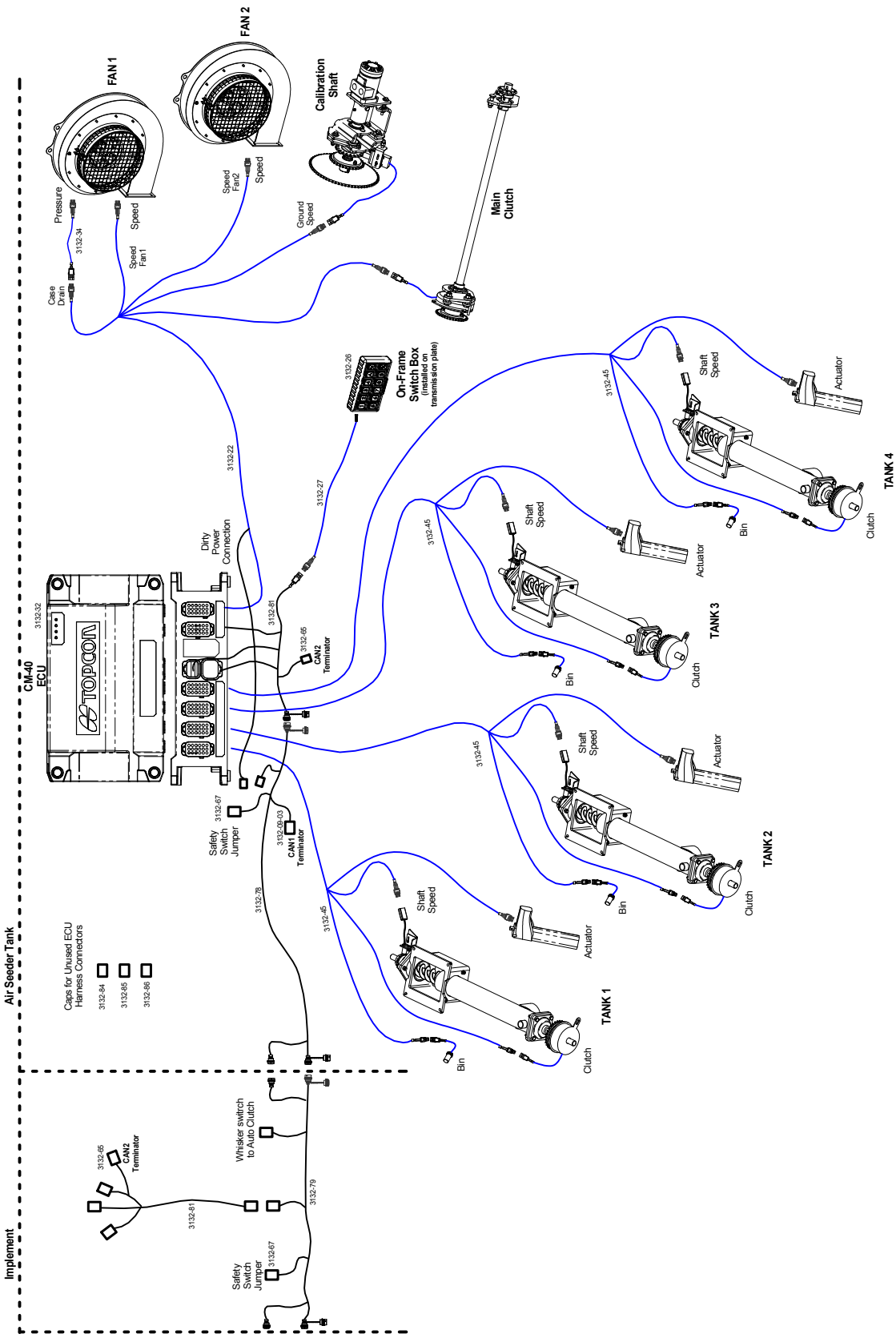


Figure 7.2 - Implement/AS Tank Components - 6000 Series

11.2.2 7000 SERIES AIR SEEDERS

11.2.2.1 TBHD AIR SEEDERS

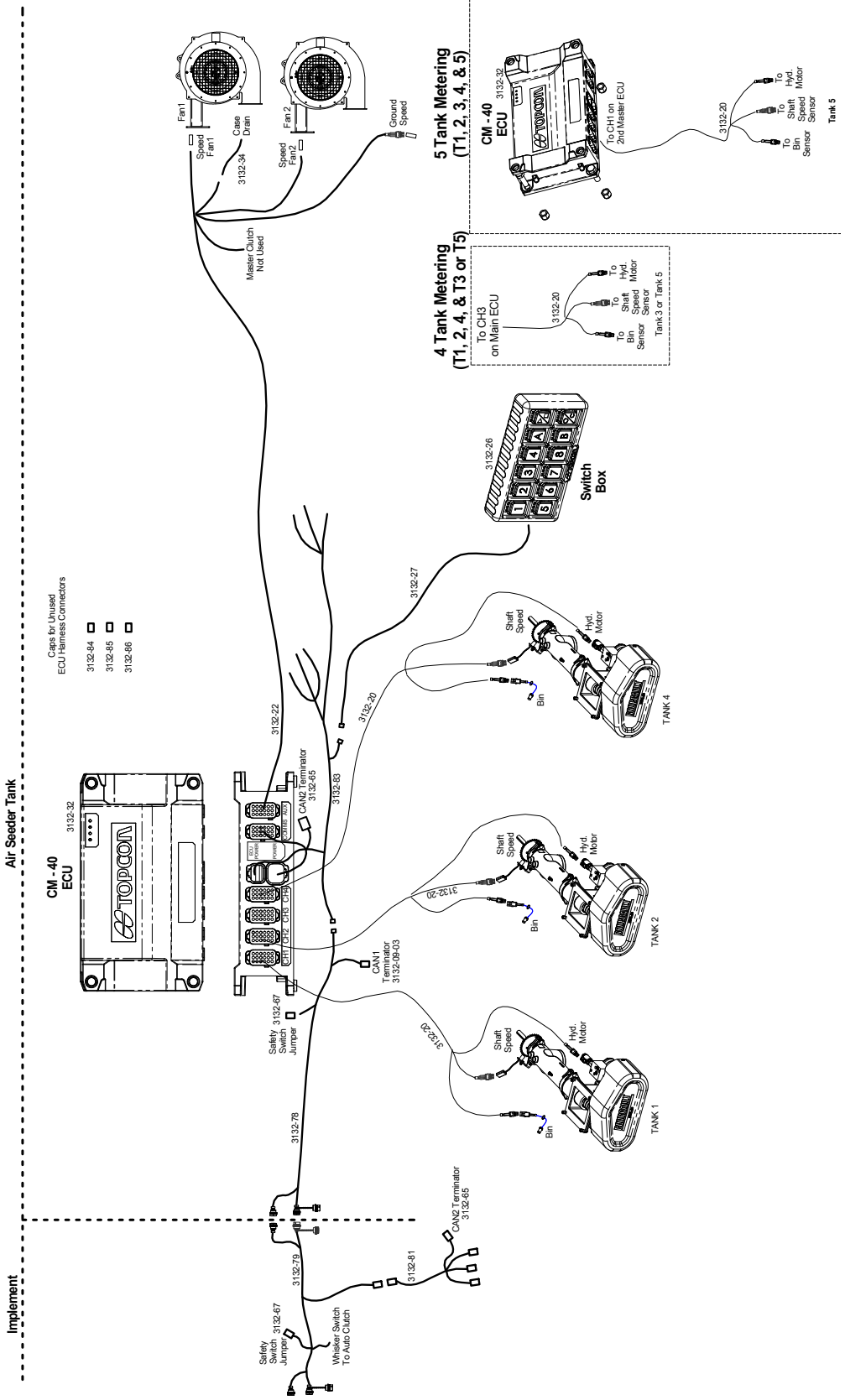


Figure 7.3- Implement/AS Tank Components - TBHD Units

11.2.2.2 LDG AIR SEEDERS

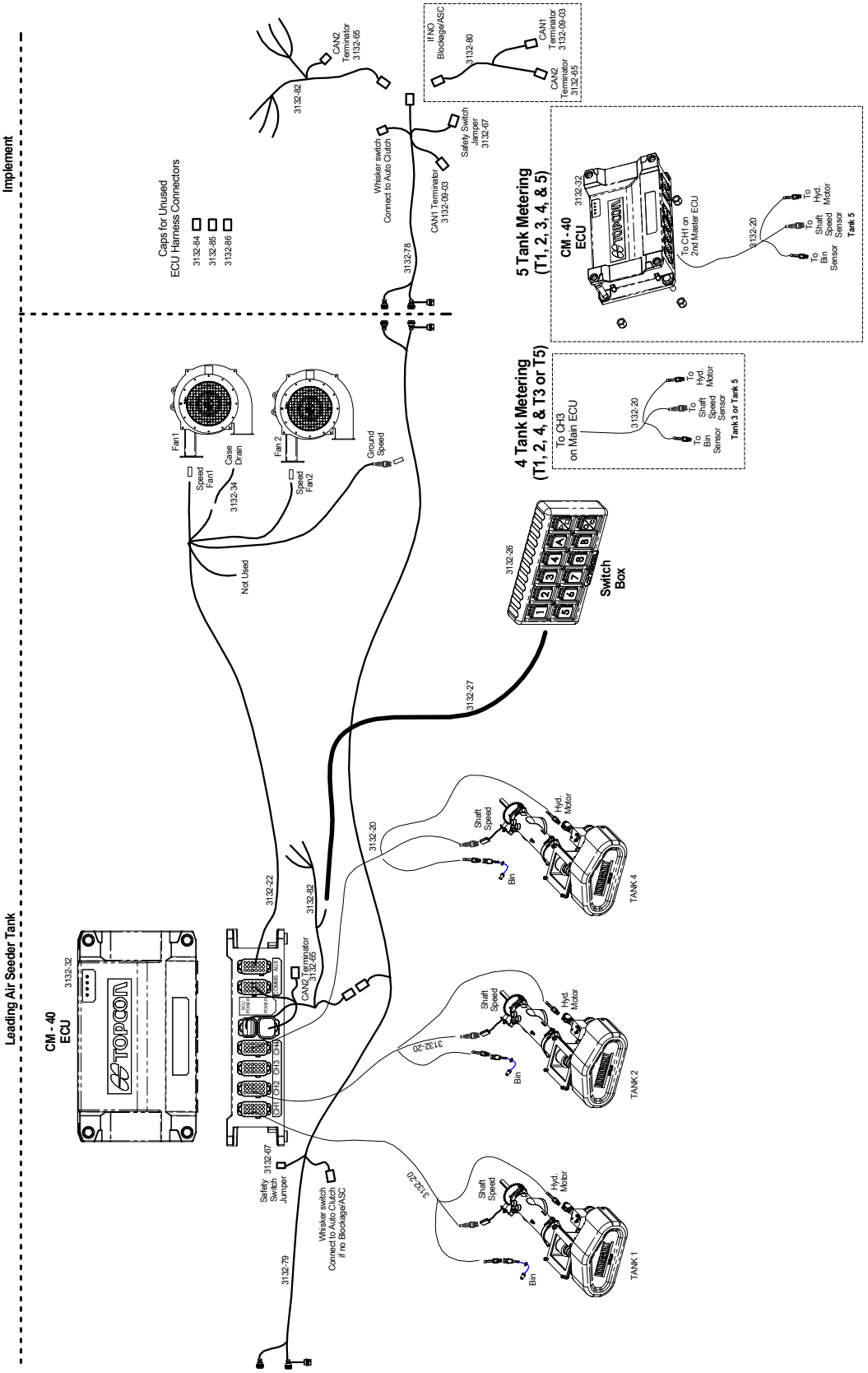


Figure 7.4- Implement/AS Tank Components - LDG Units

11.2.3 NH3 / LIQUID - NON BOURGAULT SYSTEMS WITH 6000 & 7000 SERIES AS

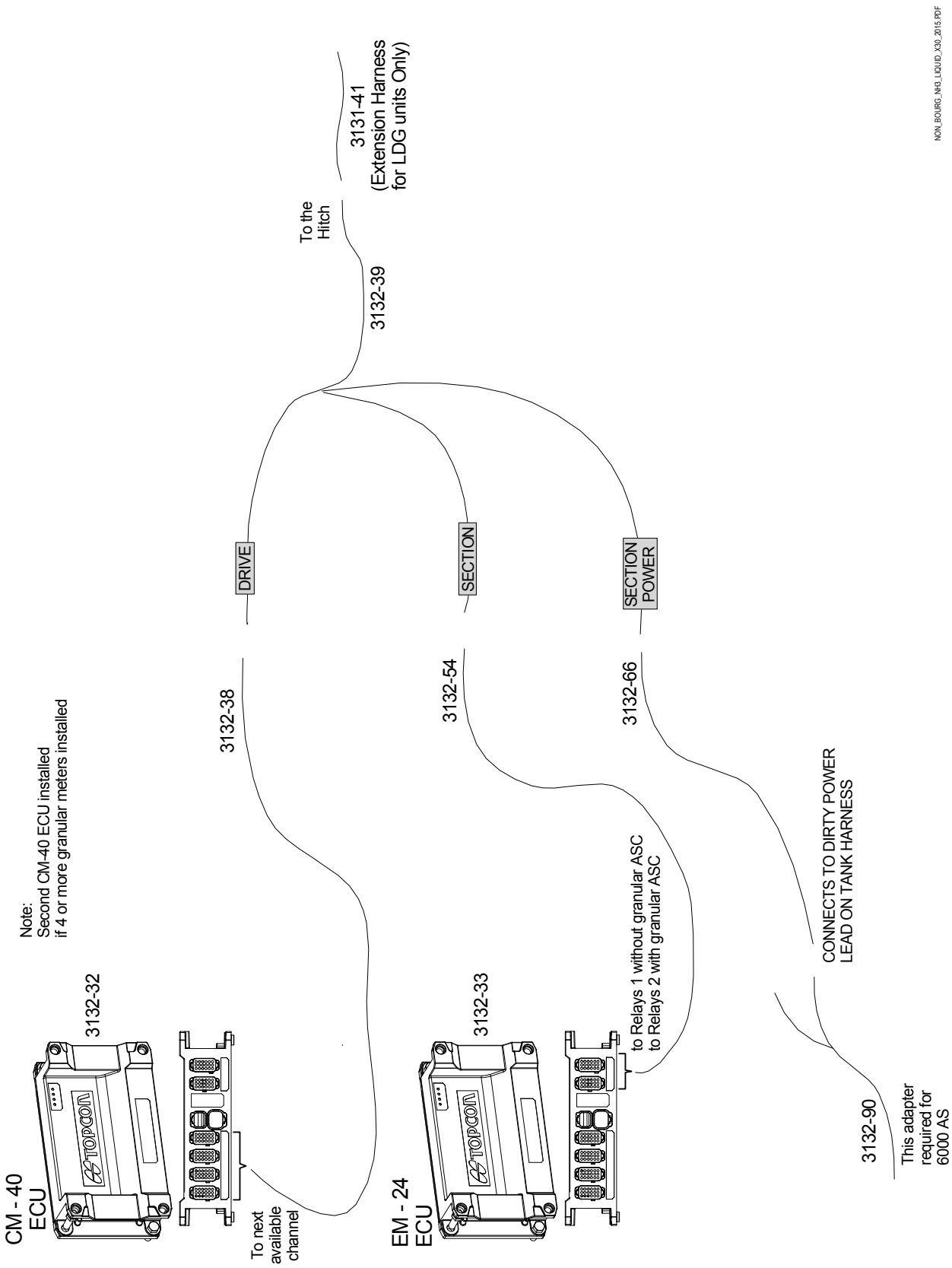


Figure 7.5 - NH3 / Liquid - Non Bourgault Systems

11.2.4 LIQUID - BOURGAULT LFC WITH 6000/7000 SERIES AIR SEEDERS

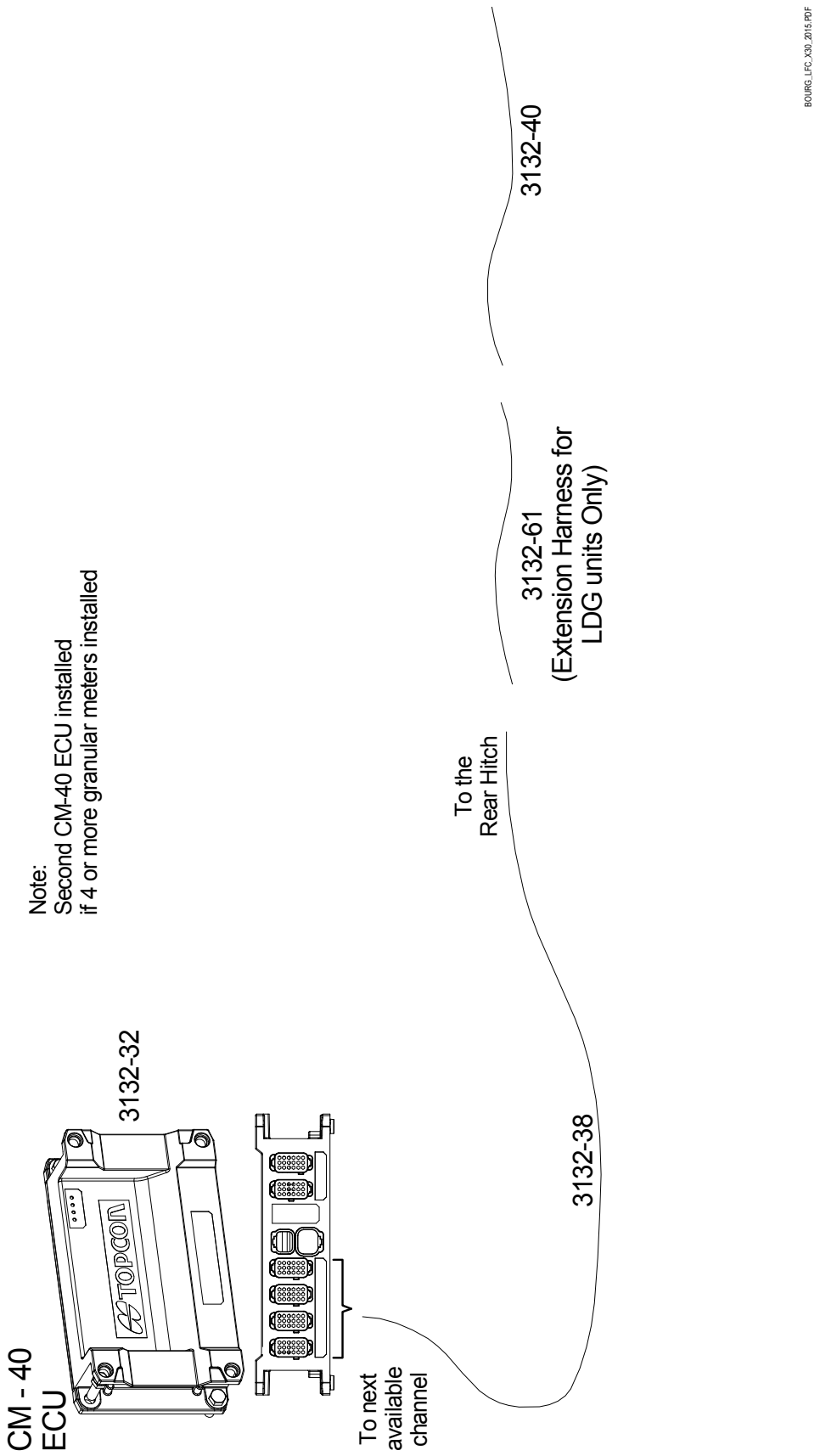


Figure 7.6 - Liquid - Bourgault LFC

11.2.5 AUTO SECTION CONTROL

11.2.5.1 SYSTEMS WITH 6 PORT PRIMARY MANIFOLDS

MANIFOLD PORT LABEL	HARNESS LABEL
A	1
B	3
C	5
D	2
E	4
F	6

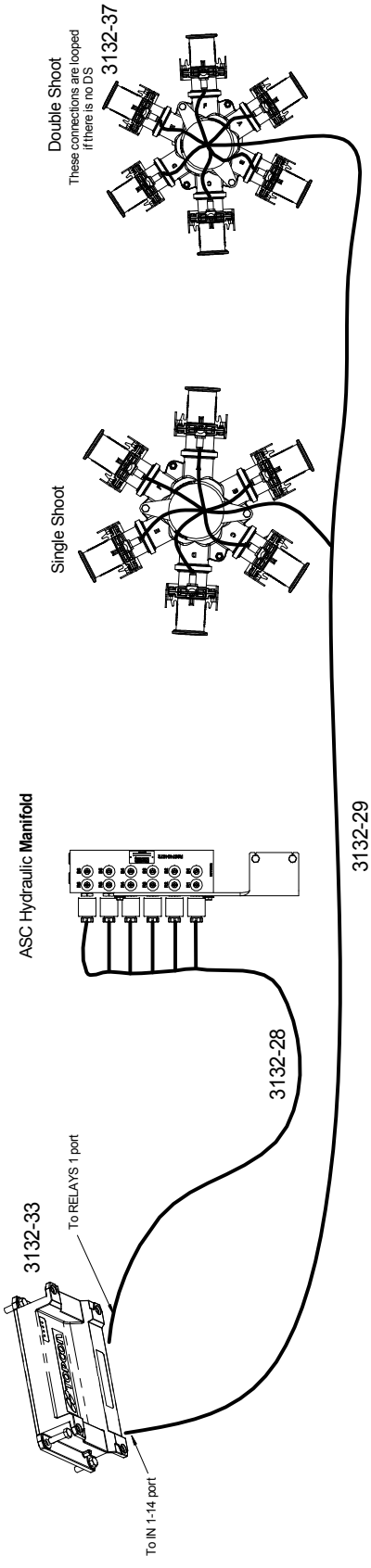


Figure 7.7 - Auto Section Control - 6 Ports

11.2.5.2 SYSTEMS WITH 8 PORT PRIMARY MANIFOLDS

MANIFOLD PORT LABEL	HARNESS LABEL
A	1
B	5
C	3
D	7
E	2
F	6
G	4
H	8

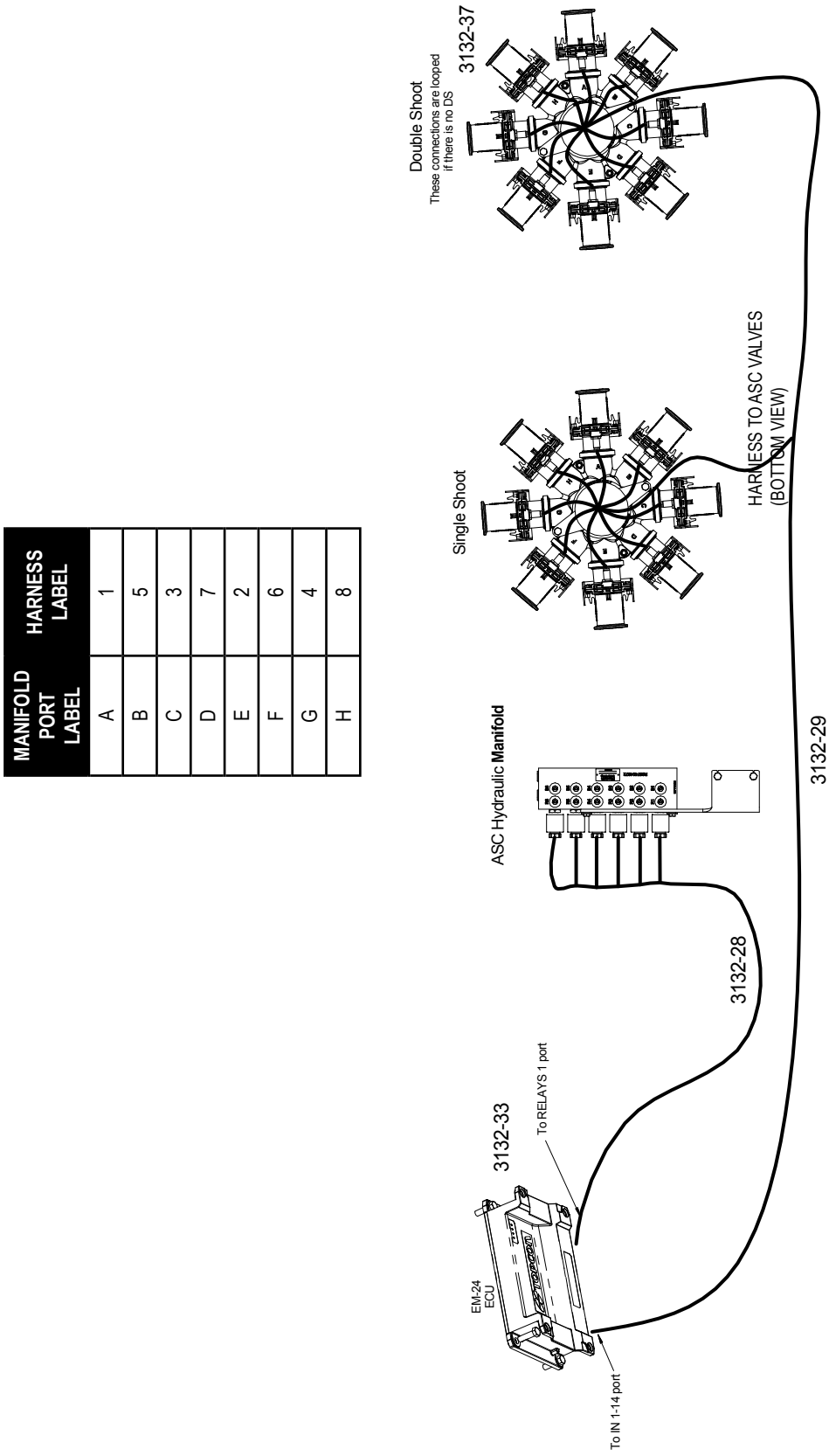


Figure 7.8 - Auto Section Control - 8 Ports

11.2.5.3 SYSTEMS WITH 10 PORT PRIMARY MANIFOLDS

MANIFOLD PORT LABEL	HARNESS LABEL
A	1
B	7
C	3
D	5
E	9
F	2
G	8
H	4
I	6
J	10

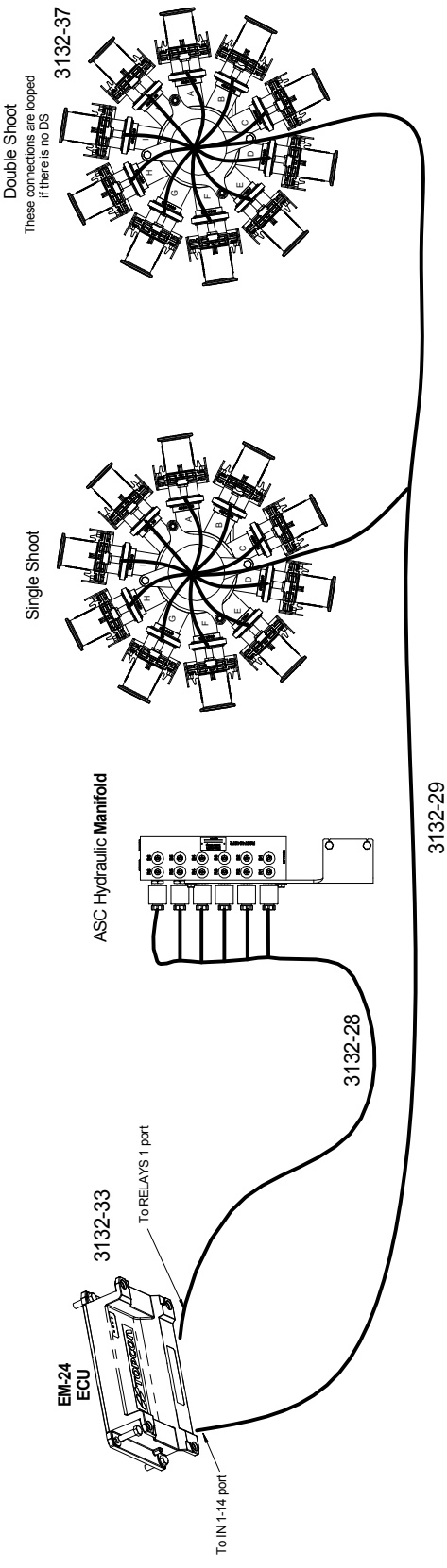


Figure 7.9 - Auto Section Control - 10 Ports

12 TROUBLESHOOTING

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For more troubleshooting tips and specific instructions go to
www.Bourgault.com/Service & Support/Frequently asked questions/FAQ X30 monitor/controller.

12.1 START-UP

SYMPTOM	PROBABLE CAUSE	SOLUTION
Monitor will not power up.	Low voltage.	Start vehicle - check battery voltage. Check status of indicator lights (refer to *Section 2.3 - Interpreting Led Lights*).
	Blown fuse.	Check for damaged wiring.
	Damaged unit.	Contact Bourgault dealer for repair and/or replacement.
Blank display after startup.	Damaged unit.	Contact Bourgault dealer.
Error messages on startup.	Missing or corrupt files.	Contact Bourgault dealer.
White Screen	Frozen screen.	Press reset button on the back of the console and power up again.
No power to ECU's on the tank (No LED's lit up)	No implement power.	Recycle tractor key.
	Blown fuse.	Check 100A fuse near tractor battery.
	Poor connection.	Check connection at the tractor, rear of the drill and connections into the ECU(s).

12.2 CONTROLS

SYMPTOM	PROBABLE CAUSE	SOLUTION
Touch screen control buttons will not work.	Virtual switches not enabled.	Disable switch box. In Setup screen go to Implement/Operator Input (refer to *Section 6.6 - Operator Input*).
Cabin switch box controls will not work.	Keypad switches not enabled.	In Setup screen go to Implement/Operator Inputs (refer to *Section 6.6 - Operator Input*).
Cabin or on-frame keypad flashing.	Not set up.	Assign keypads. In setup screen go to Implement/ Operator Inputs. Refer to *Section 6.6.2 - Keypad*.
	Not synchronized.	Unplug both keypads and reconnect.

12.3 OPERATION

SYMPTOM	PROBABLE CAUSE	SOLUTION
Monitor performs slower than normal.	Using large VRC map	Disable VRC map layer on the guidance screen. It will still control the rate to the VRC map, just will not display the prescription map on the screen. This will improve monitor performance.
Monitor automatically turns off.	Low voltage.	Check battery voltage, alternator output, and power cable wiring. Check status of indicator lights (refer to *Section 2.3 - Interpreting Led Lights*).
	Blown fuse.	Check for damaged wiring.
No ECU communication	Profile not setup correctly.	Refer *to Section 6.2 - Creating New Implement Profile* to setup profile and detect ECU(s).
	Poor harness connection	Check all harness connections from ECU on air seeder to monitor.
	Incorrect harness connection.	Ensure harnesses are connected properly. Refer to *Section 11 - Wiring Schematics*.
	Poor power supply	Check battery voltage.
	Poor fuse connections.	Check fuse holder connections.
	Blown fuse.	Check for damaged wiring.
	Faulty/damaged ECU.	Contact Bourgault dealer.
	Monitor and ECU software versions are not compatible.	Check software versions. Refer to *Section 10.5 - System Information* & *Section 1.1.1 - Software Version.*
Intermittent sensor readings.	Poor harness connection.	Check harness connections for dirt and/or corrosion. Clean as required.
	Incorrect sensor to target adjustment.	Ensure proper to alignment and gap. Ensure that the speed sensor to target gap is 1/32”-1/8” (1mm-3mm). Refer to your *Air Seeder Operator's manual*.
Cannot reach target metering rate.	Torque limiter on auger shaft slipping.	Ensure metering auger shaft is turning freely (no rubbing or foreign objects in housing).
	Drive range in incorrect range.	Change to higher range. For instructions refer to your *Air Seeder Operator's manual*.
	Rate too high.	Lower rate.
Incorrect ground speed display.	Incorrect wheel factor.	GPS speed prefered. If not available, complete a distance check to verify wheel factor is incorrect. If so complete a wheel factor calibration.
	Incorrect sensor to target adjustment.	Ensure proper alignment and gap. Ensure that the ground speed sensor to target gap is 1/32”-1/8” (1mm-3mm). Refer to your *Air Seeder Operator's manual*.
Incorrect area accumulation.	Incorrect wheel factor.	GPS speed prefered. If not available, complete a distance check to verify wheel factor is incorrect. If so complete a wheel factor calibration.
	Incorrect implement width.	Enter correct implement width.
Meters will not start.	No fan speed or too low.	Engage Fans and ensure proper speed is set.
	No ground speed.	Ensure speed is being picked up.
	No set rate.	Enter a requested rate.
	No calibration factor.	Check Calibration factors under manual entry and enter missing calibration factor or calibrate.
	ASC is on but in covered area or outside boundary.	Override ASC or move to are to be seeded.

12.4 ALARMS

SYMPTOM	PROBABLE CAUSE	SOLUTION
Alarms not activating.	Incorrect alarm settings.	Check alarm settings. In Setup screen go to System/Alarms (refer to *Section 4.4 - Alarms*).
Tank low alarm activates but display still shows product remaining in tank.	Displayed weight is theoretical based on 100% capacity and tank was not filled completely.	Adjust tank capacity manually to account for the tank volume that was not filled.
Case drain alarm.	Case drain line not connected to tractor or blocked.	Re-connect case drain or find restriction in line.
Constant sensor alarm even though component seems to be working properly.	Faulty sensor.	Replace sensor in question with one that is working properly. If constant alarm stops then sensor is faulty and should be replaced.
	Incorrect sensor/target clearance.	Check that clearance is 1/32”-1/8” (1mm-3mm) and adjust as required.
	ECU fault.	Contact Bourgault dealer for instructions.
PWM signal/actuator goes to 95/100.	Metering auger stopped.	Correct mechanical blockage or failure.
	Metering auger speed sensor faulty.	Replace sensor.
	Incorrect sensor/target clearance.	Check clearance. Refer to your *Air Seeder Operator's manual*.
False blockage alarms.	Sensors assigned improperly.	Check that sensor location on the drill aligns with display on the console.
	Disconnected or faulty sensor.	Reconnect or replace sensor.
Section Switching Problem Alarm	No power to solenoids.	Check power to solenoids from seeder ECU.
	Blockage at ASC valve.	Check for blockages at ASC valves.
	Faulty sensor.	Light should be on when gate is open. Replace sensor.
	Miswired sensors.	Contact Bourgault dealer.

12.5 GUIDANCE

SYMPTOM	PROBABLE CAUSE	SOLUTION
Not receiving GPS signal.	Not outputting proper NMEA strings.	Enable GGA, VTG & ZDA strings. Refer to *Section 4.2.2 - Output*.
	Signal subscription expired (not if using WAAS based signal).	Contact signal supplier to re-subscribe.
	COM port or BAUD rate not correct.	Check that selected COM port matches actual port that cable from receiver is plugged into. Refer to receiver manual to check what BAUD rate is used.
	Faulty receiver or antenna.	Contact Bourgault dealer or supplier of receiver.
	DGPS receiver not connected.	Connect receiver and ensure it is turned on.
	Required null modem adapter.	Use null modem adapter (switches the input/output pin between different systems)
Intermittent signal.	Too low of output frequency from receiver.	Set to at least 5Hz.

13 OPTIONAL EQUIPMENT

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13.1 IMPLEMENT / AUTO-CLUTCH / WHICKER SWITCH

NOTE:
REFER TO THE AUTO CLUTCH SWITCH ASSEMBLY INSTRUCTIONS FOR FURTHER DETAILS.

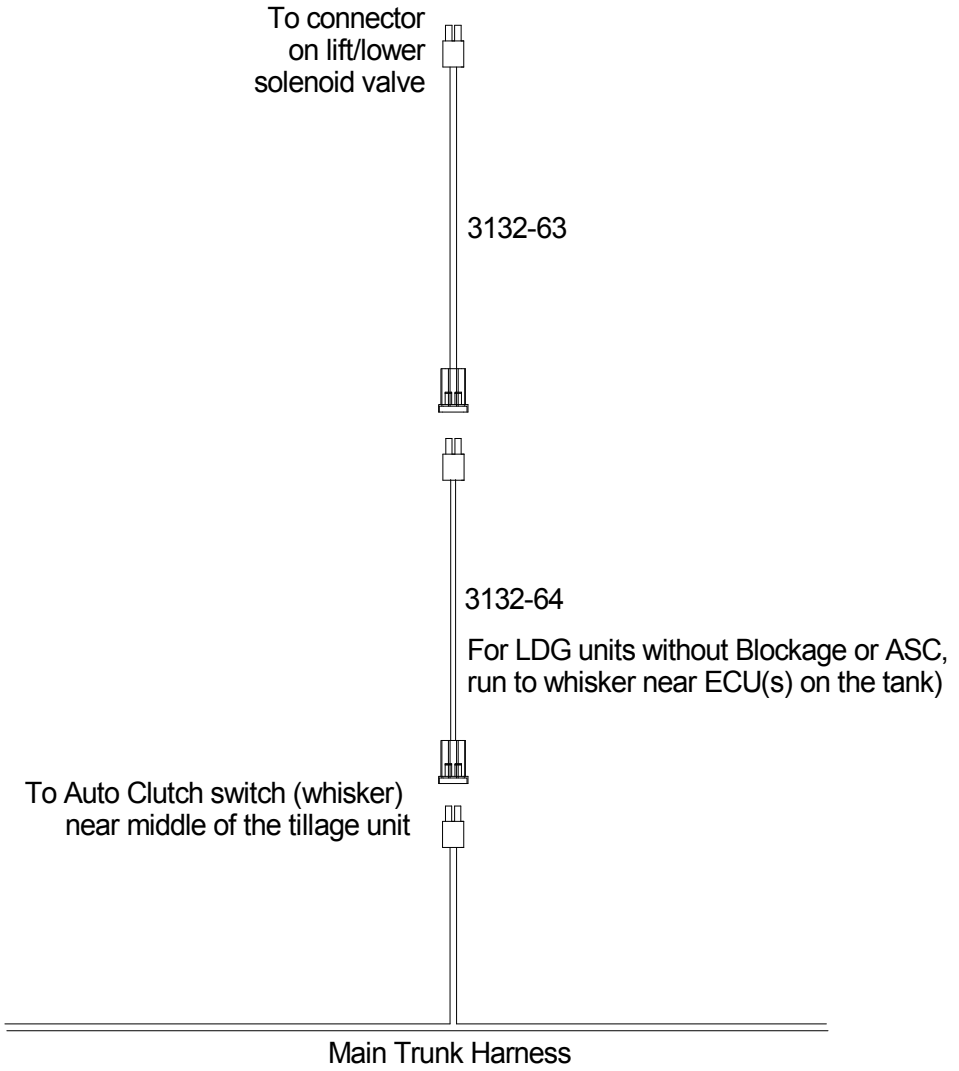

Figure 13.1 - Auto Clutch Switch Harness Layout

The auto-clutch switch allows the air seeder main clutch to turn on/off as the tillage implement is lowered/raised.

X20630980.SKF

13.1.2 OPERATION

NOTE

THE FOLLOWING INSTRUCTIONS ONLY APPLY IF THE AUTO-CLUTCH SWITCH IS CONNECTED ON THE TILLAGE IMPLEMENT. IT IS STANDARD ON 3320 AND 3710, AND IT IS OPTIONAL ON 5810.

IMPORTANT

IT IS HIGHLY RECOMMENDED TO ENABLE THE IN CABIN KEYPAD AND/OR VIRTUAL SWITCHES WHEN USING THE AUTO CLUTCH SWITCH, AND TO TURN OFF THE MASTER SWITCH UNTIL READY TO SEED. WITHOUT THE CABIN/VIRTUAL MASTER ENABLED AND OFF, THERE WILL BE SCENARIOS WHERE THE AUTO CLUTCH WILL ATTEMPT TO TURN ON THE MASTER PRIOR TO DESIRED SEEDING. FOR EXAMPLE, IF USED WITH A 3320 OR 3710 WITH DRILL CONTROL BOX POWERED OFF.

1. If the cabin keypad/virtual switches are enabled and the Auto clutch switch is enabled (refer to *Section 6.6 - Operator Input* and *Figure 13.2*), the cabin master has **priority** over the auto clutch switch. In that case the in-cab/virtual master would have to be turned on for the auto clutch switch to control the Air Seeder.

   If the cabin keypad/virtual switches are disabled (refer to *Section 6.6 - Operator Input* and *Figure 3.3*), you **will not be able to override** the auto clutch switch when required.

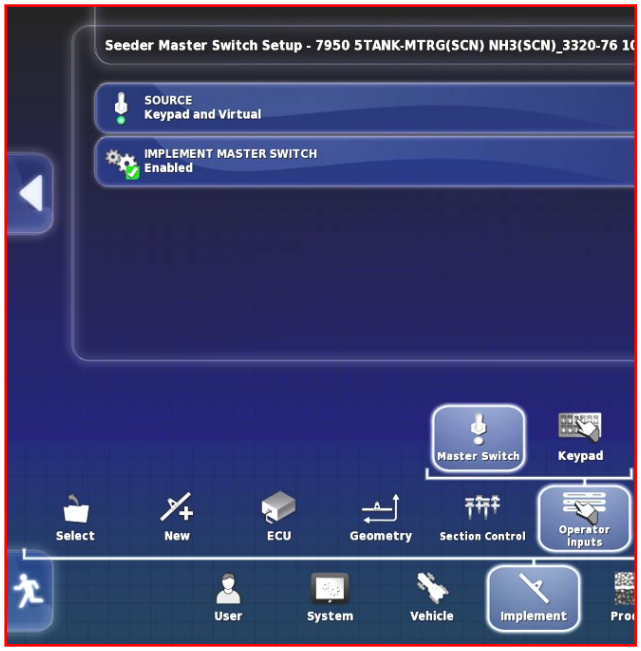

Figure 13.2 - SwitchBox Setup

Figure - 13.3 - Cabin Switchbox Disabled

13.2 X30 BLOCKAGE MONITORING

X30 single run blockage monitor packages are available for Bourgault tow-behind and leading Air Seeding systems.

The BH sensors (*Figure 13.5*) are sized for 1” hose or 1-1/4" hose. A 7/8” adapter (*Figure 13.4*) (4 per sensor) is used to adapt the 1" sensor to the smaller size hose.

For an 8 port configuration secondary manifolds (on the tillage unit) are numbered 1-8 from left to right for single shoot (standard) and then 9-16 from right to left for double shoot (optional). For 6 and 10 port configurations numbering is similar. Connections at the ECU (*Figure 13.8*) will match this numbering.

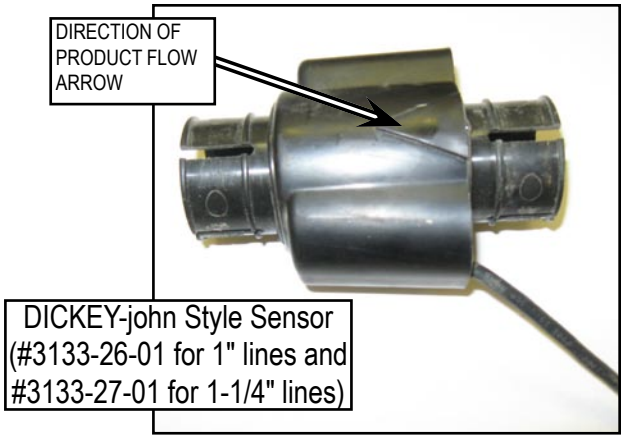

Figure 13.5 - BH Sensor (Blocked Head)

Figure 13.6 - EM-24 ECU (#3132-33)

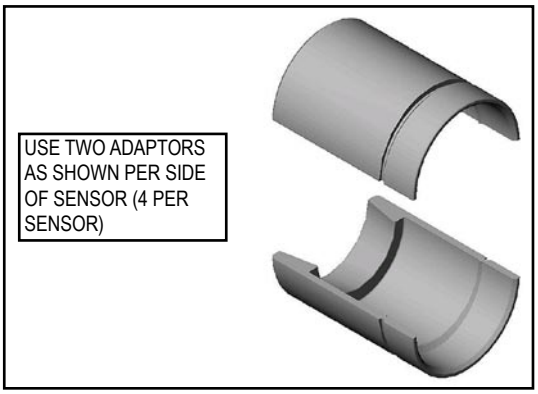

Figure 13.4 - 7/8" to 1" Hose Adaptors

13.2.1 MOUNTING THE COMPONENTS

1. Mount the EM-24 ECU onto the main frame secondary manifold stand (location shown in *Figures 13.8*) by attaching the mount plate to the stand with the existing u-bolts.

   a. Mount the ECU onto the mount plate with the mount bolts provided.

Figure 13.7 - BH Sensor Mounts onto ONE hose per Secondary Manifold

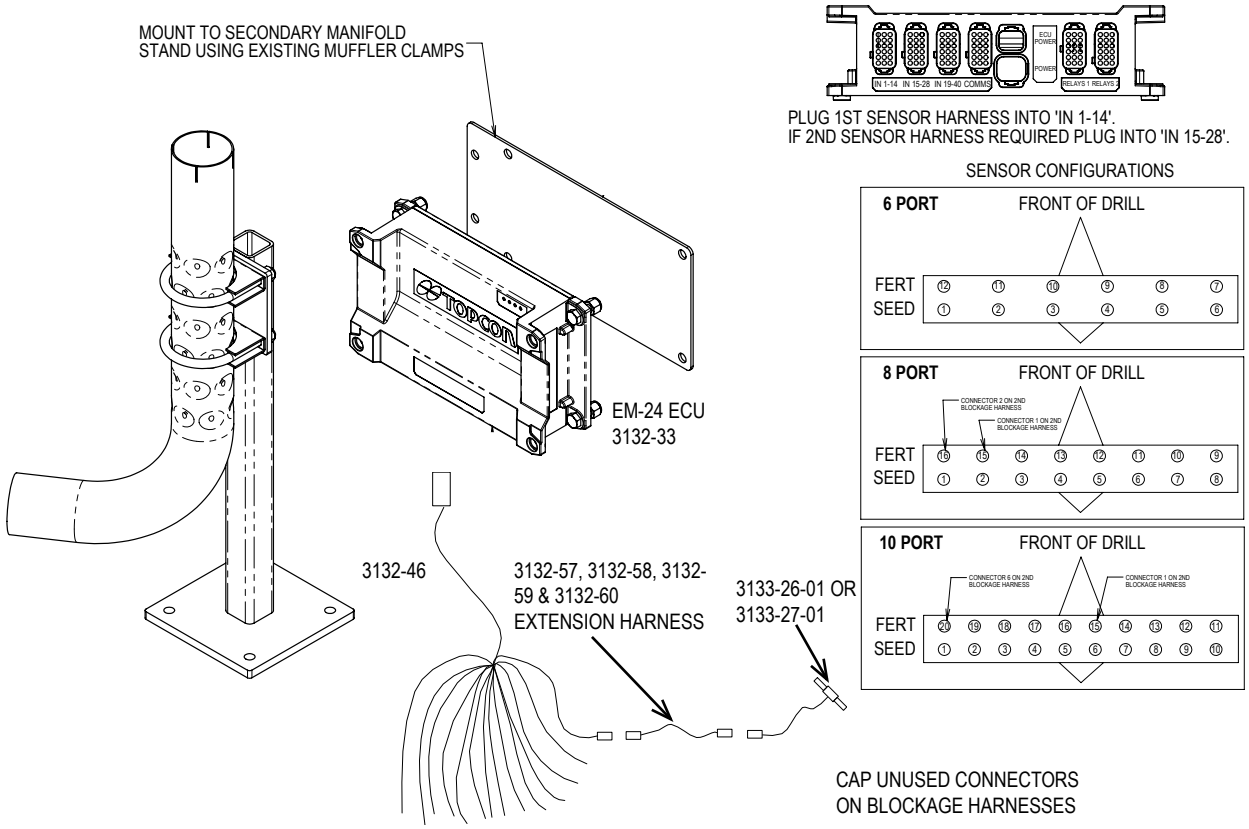

Figure 13.8 - ECU & Components Layout

2. Mount a BH Sensor (*Figure 13.5*) onto ONE of the tertiary lines from each secondary manifold (refer to *Figure 13.7*).

   a. Cut the tertiary line approximately 3-4" from the secondary manifold head and insert the BH Sensor. Orient the sensor with the sensor wire running away from the secondary head. Use the clamps to secure the sensor to the tertiary line.

      DICKEY-john style sensors (*Figure 13.5*) have an arrow on them to show the install direction. Ensure that the arrow points in the direction of product flow OUT of the manifold head.

   b. Place a number sticker (included with kit) on each of the BH Sensors, as they are numbered in the layout drawings (*Figures 13.8*). This will assist with finding the blocked sensor when it is reported on your monitor.

3. Refer to *Figures 13.8*.

   Connect ECU leads from main trunk harness into EM-24 ECU.

4. Install the 14 BH Sensor Adaptor harness (3132-46) to the IN 1-14 port on the ECU. Connect all of the remaining BH Sensors to the 14 BH Sensor Adaptor harness as shown in *Figures 13.8*.

   If more than 14 sensors there is a second 3132-46 harness installed.

   - Cap all unused connectors.
   - connect in different length extensions and run to each sensor.

5. Tie all harnesses to the tertiary hoses where available with the ties that are provided with the kit. Ensure that the harnesses do not interfere with any trips or linkages on the tillage unit.

Refer to *Section 6.7.6.2 - Blocked Head Monitor* and *Section 13.2.2 - Blockage Monitoring with X30 Console* for operating information of the Blockage Sensors.

13.2.2 BLOCKAGE MONITORING WITH X30 CONSOLE

The EM-24 ECU is installed on the secondary manifold stand (on the rear left side of the unit) and communicates with the BH sensors. The sensors are installed "in-line" on one tertiary line per secondary manifold. There is a maximum of 20 BH sensors per unit.

The information from this ECU is then sent back to the X30 console.

To operate the ECU/Sensors:

1. Ensure that the BH sensors and ECU are installed on the tillage unit.

2. Refer to *Section 6.7.6.2 - Blocked Head Monitor* for more information on setting the parameters for the blockage sensors and BHECU.

3. During normal operation Blockage system status can be checked one of the following ways:

   a. In Seeder Controller mini-view window.

   Open Seeder controller mini-view window by selecting air seeder icon, then select Blocked Head Monitor tab. Refer to *Figure 13.12*.

   Window will display all secondary manifolds on the unit. By pressing on each manifold it displays the Head name that can be edited as well as the sensor assigned to that head.

Figure 13.12 - Blockage System Status

b. In Section/Blockage status panel in Seeder Controller expanded view. Refer to *Figure 13.13*.

Expand Seeder Controller mini-view window into main viewing area by selecting maximize arrow. Select Section/ Blockage status panel and slide up or down until manifolds appear.

Colour of the manifold indicates status:
green - no blockage
red - there is a blocked run.

Selecting (touch) manifold icon will bring up sensors list. Sensors that report no blockage will have green background. Sensors that report blockage will have red background.

4. If a blockage occurs, switch the master switch OFF and stop the unit.
5. Obtain the list of plugged runs (refer to Step 3). Clear all blocked runs.
6. Resume seeding.

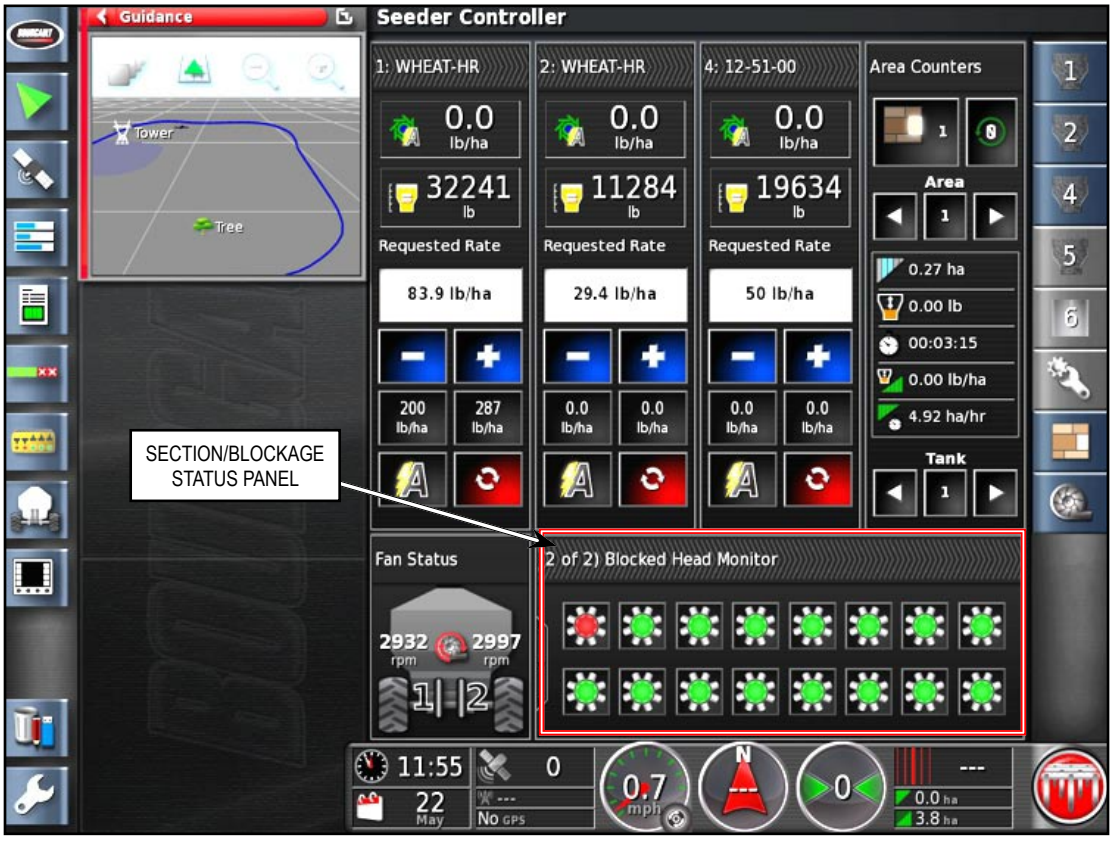

Figure 13.13 - Blockage System Status - Seeder Controller Expanded View

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