SM17 Operator’s Manual

www.seedmaster.ca

Date

SeedMaster unit Serial # Size / Spacing / /

Primary Owner
Last First

Farm name / Corporation

Land Location

Mailing
City P.O. Box

Province / Territory / State Postal / Zip Code

Phone Cell Phone Fax

Email

Dealer purchased from

Dealers for part pick-up

Shipping method to be used for Factory Direct shipments:

Please include a description to your farm from nearest town:

I hereby accept the terms and conditions of the SeedMaster Warranty listed on page 13:

Signature Date

To ensure prompt and organized warranty service, fill out and please submit to: SeedMaster
#1 South Plains Road West, Emerald Park, SK S4L 1C6
E-MAIL: warranty@seedmaster.ca

CUSTOMER WARRANTY REGISTRATION COPY

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OFFICE WARRANTY REGISTRATION COPY

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INTRODUCTION

Thank you for purchasing a new SeedMaster unit. This manual will assist you in becoming a safe and efficient operator. The crops you grow because of the proper use of the unit will be your reward for spending some time studying this manual.

If you encounter any problems, contact your dealer for clarification or correction. It is important to us and to you that all SeedMaster units maintain a solid reputation.

We are building our company's reputation not only on a quality product, but also on providing quality advice and fast response to service requirements. Our objective is to keep a high resale value on used units, so the positive image you pass on to your neighbors is as important to you as it is to us in the long term.

SAFETY

Please be SAFE! Carefully read and understand all safety alerts and warnings in this manual and all safety decals on the SeedMaster drill. Ensure that anyone who is going to use the SeedMaster drill reads and understands the Operator's Manual. We recommend that only mature and well-trained or experienced persons operate this product. We advise that periodic visual checks continue as a mandatory part of the implement operating procedure. Conduct regular maintenance checks on fasteners, hydraulic connections, etc. Always follow safety precautions. Serious INJURY or DEATH can result from improper operating practices

Safety notices are one of the primary ways to call attention to potential hazards.

This Safety Alert Symbol identifies important safety messages in this manual. When you see this symbol, carefully read the message that follows. Be alert to the possibility of personal injury or death.

- Read and understand the Operator's Manual and all safety signs before operation or maintenance.
- Do not allow riders on any part of the equipment.
- Install and properly secure all shields and guards before operating the seeder.
- Keep hands, feet, clothing, and hair away from moving and/or rotating parts.
- Beware of all power lines and other overhead obstructions. Know the transport height and width of your SeedMaster. Ensure that minimum safe working distances are maintained from any obstruction at all times.
- Before servicing, adjusting, repairing, refilling, or unplugging: stop the engine, remove the engine key, set the park brake, disengage the hydraulics and wait for all moving parts to stop.
- Ensure your seeder is properly marked as required by the local highway and transport authorities. Make sure the "Slow Moving Vehicle" sign, lights, and all reflectors are in place, clean, and visible to overtaking or oncoming traffic.
- Store a fully stocked first-aid kit in a visible, accessible place for use in case of an accident.
- Keep a fire extinguisher in an accessible location.
- Be sure that the area is clear of people before starting or moving your machine.
- Do not work around or under the raised wings, unless the wings are securely chained in the transport position.
- In the event that wheel and tire assemblies must be raised off the ground for maintenance, block the implement up securely.
- Use extreme caution when working around or with high-pressure hydraulic systems. Depressurize the system when connecting or disconnecting the hose couplers.
- Wear heavy gloves and eye protection when searching for suspected hydraulic leaks. If an injury occurs, seek immediate medical attention as infection and toxic reaction could develop. Use a piece of cardboard or wood (instead of hands) when searching for such leaks.

- Never wear baggy or frayed clothing, or hanging jewelry when working around or on any of the drive system components.
- When performing, a product catch for meter calibration, keep hands and clothes well clear of rotating components. Be aware that when the hydraulics are activated, rotation may start unexpectedly at any time.
- We recommend that all maintenance and adjustments on the seeder be made when the implement wings are lowered.
- Store and transfer gasoline, solvents, cleaners, or any flammable liquids only in safety standard (i.e. CSA) approved containers.
- Clean and inspect all components in the hydraulic system on a regular basis.
- Replace all worn, cut, abraded, flattened, damaged, or crimped hoses and metal lines. Do not repair hydraulic components with tape, clamps, or cements. The system operates under extremely high pressure; such repairs will fail and create hazardous and unsafe conditions.
- Before applying pressure to the hydraulic system, make sure all connections are tight. Ensure lines, hoses, and couplings are not damaged.
- Ensure that the seeder is properly and safely connected to the tractor.
- Transport per local regulations for width and height.
- Follow all road safety regulations for your state or province.
- Store the seeder on a firm, level surface.
- Store with wings down.
- Have a qualified tire dealer or service person perform tire maintenance. Failure to follow proper procedures when mounting a tire on a wheel or rim can cause an explosion that may result in serious injury or death.
- Keep safety decals and signs clean and legible at all times. Replace safety decals and signs that are missing or have become illegible.
- Ensure proper use of wing lock-up chains in transport.
- Always use hitch safety chain.
- Do not transport at high speeds on loose gravel behind a truck or a tractor.
- Do not transport with product in tanks.
- Ensure proper hook-up of safety lights.
- Maneuver machine to ensure castors are moving freely before going onto roads.
- Do not transport at speeds higher than that recommended on tires (25 mph or 40 kph).
- Check all transport wheel nuts after 100 miles and periodically thereafter. (See Chart below).
- Use proper tire inflation pressures (SEE TIRE TORQUE AND PSI SPECS, PAGE 14).

SEEDMASTER WARRANTY

This limited warranty supersedes all previous SeedMaster Manufacturing warranties and is exclusive with no other guaranties or warranties expressed or implied.

LIMITED Warranty – Subject to the terms and conditions below, SeedMaster Manufacturing Inc., Emerald Park Saskatchewan, warrants to its original retail purchaser that new SeedMaster equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITIES AND FITNESS.

Within the warranty periods listed below, SeedMaster will repair or replace any warrantied parts or components that fail due to such defects in material or workmanship.

SeedMaster shall honor warranty claims on warrantied equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on first of April, or the first of September of the first seeding season, after the original manufacturing date.

1. 2 Years parts replacement on: all opener parts except tires and knives, all hydraulic components, all electrical components and all fasteners.
2. 2 Year parts and labor Frame structural components.
3. 1 Year (maximum 10000 acres) parts replacement for Seed knife failure , and Fertilizer knife failure.
4. Pumps, motors, fans, tires, frame spindles and hubs and metering components are warranted separately by other original manufacturers.

(SeedMaster Limited Warranty shall not apply to):

1. Road or field hazard to tires
2. Knife wear
3. Hub over heating due to high transport speed or poor service maintenance
4. Damage due to under or over inflated tires
5. Damage due to transport at high speeds
6. Damage due to transporting with loaded product tanks
7. Packer or wing wheel hubs and bearings when stored with wings up thru rain or snow events
8. Packer hubs and bearings when twine is allowed to build up on hub
9. Equipment that has been modified by any party other than SeedMaster, or equipment that has been improperly installed, improperly operated or misused based on industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.
10. Items furnished by SeedMaster, but manufactured by others, such as fans, tires, motors. These items are covered by the manufacturer's warranty.
11. Damage due to improper hydraulic hook up
12. Damage due to pulling out of stuck position while product tanks are loaded

SEEDMASTER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY FARMERS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF SEEDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at SeedMaster's option: (1) repair; or (2) replacement; or, where authorized in writing by SeedMaster in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized SeedMaster Dealer. SeedMaster's option of repair or replacement will be F.O.B. SeedMaster at Emerald Park Saskatchewan or F.O.B. at a SeedMaster Authorized SeedMaster Dealer as determined by SeedMaster. Therefore, no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT, SHALL SEEDMASTER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTEE OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT, TORT, OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY SEEDMASTER IS EXCLUDED AND DISCLAIMED BY SEEDMASTER.

TIRE TORQUE AND PSI SPECS

TIRE SIZE	TORQUE REQUIREMENTS (FT. LBS.)	MAXIMUM PRESSURE RATING (PSI)
12.5L15 (12 PLY)	200	44
12.5L15 (Hwy)	200	90
380/55-16.5	200	72
750/65R26	450	35
800/65R32	450	35
15/55 - 17	200	90
Dual 710/70R38	750	23

CAMSO TRACKS

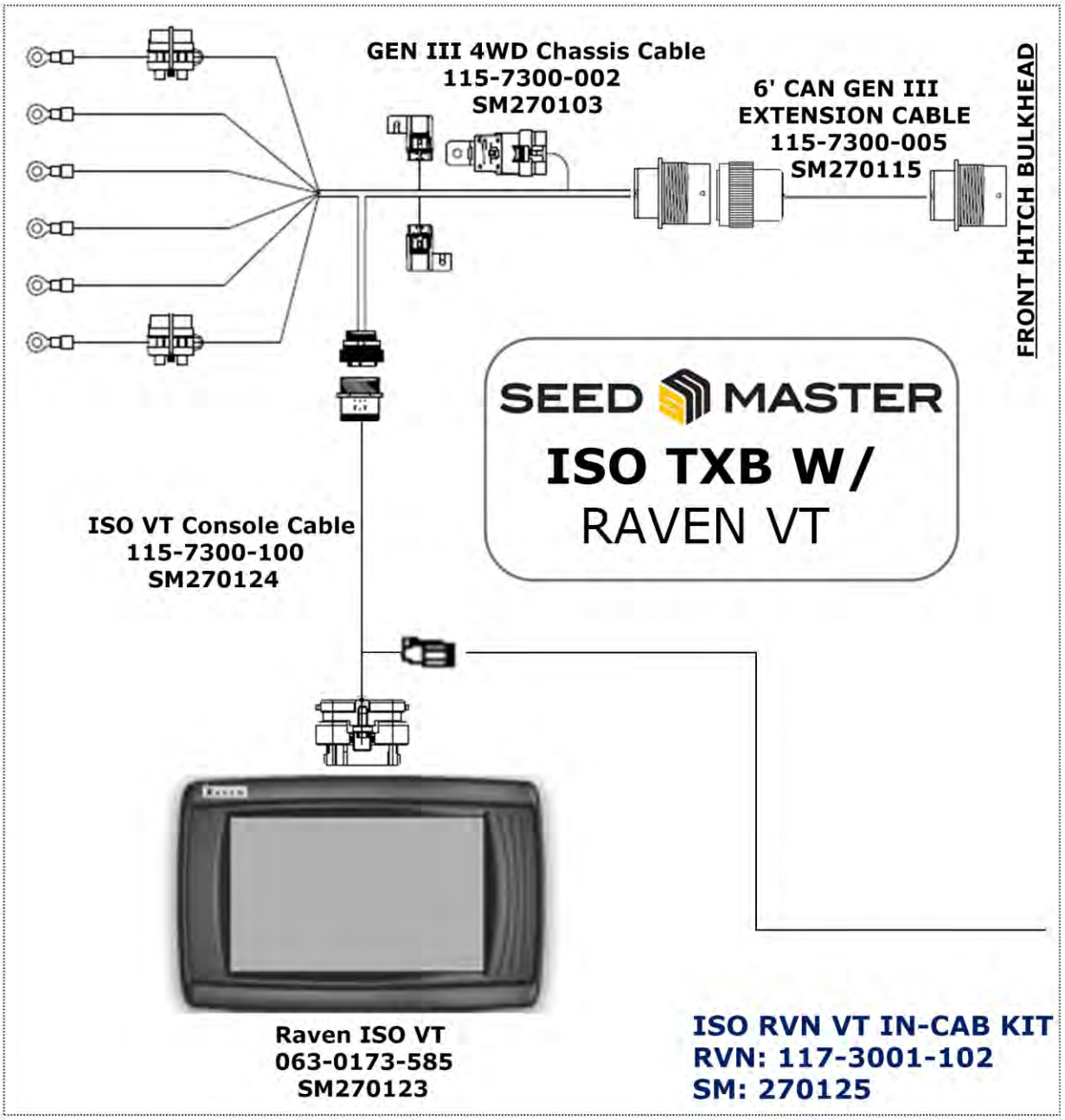
Camso tracks are optional for your SeedMaster Machine. Please visit the Camso web page to download the CPB-515 Operation and Maintenance Manual – TTS 70 Series.

CPB-515 Operation and Maintenance Manual:
https://techsupport.camso.co/uploads/publicdocs/CPB-515_Operation_and_Maintenance_Manual_(OMM)_-_TTS_45-70-80-100_Series.pdf

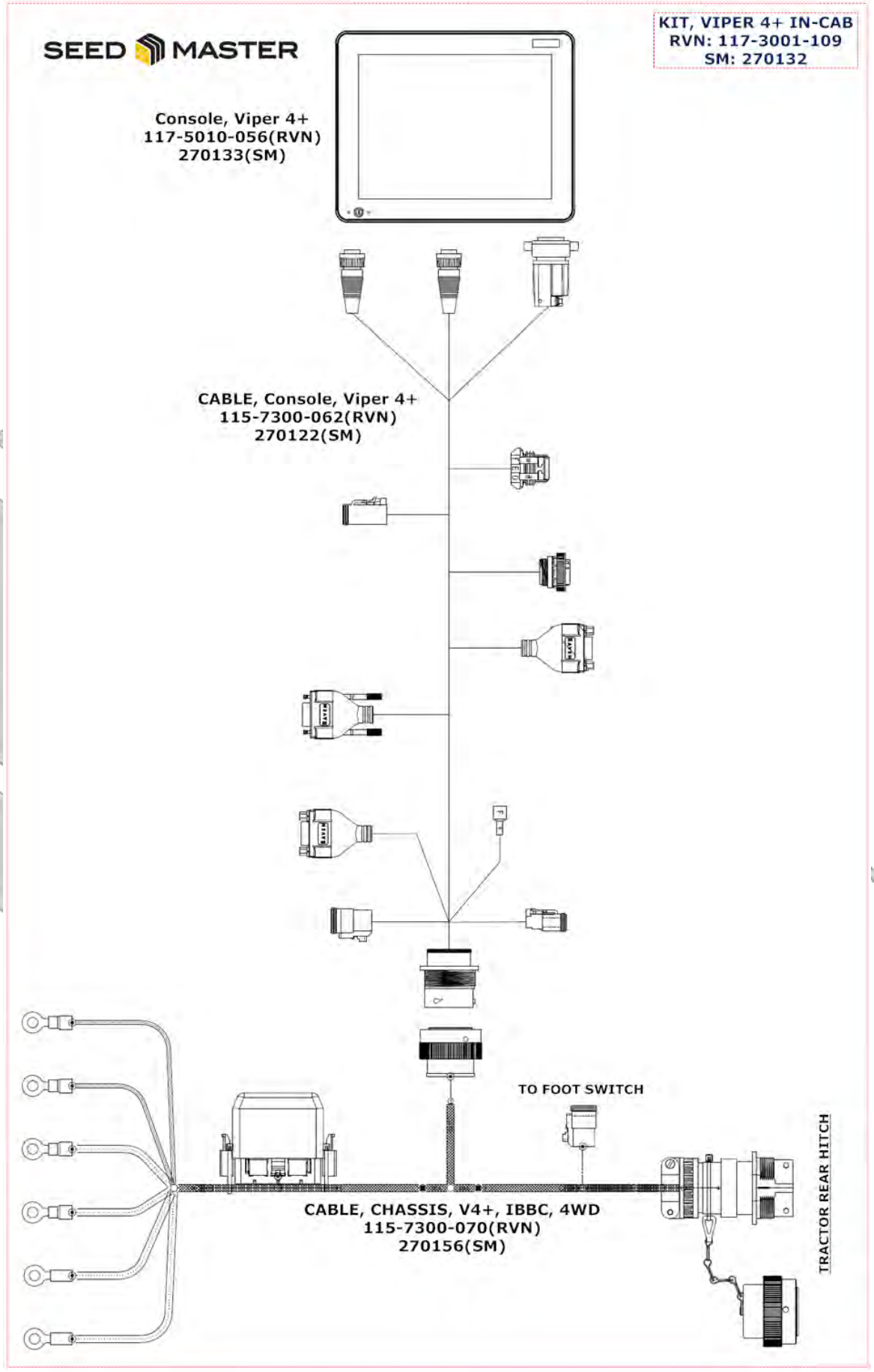
IN-CAB ELECTRICAL HOOKUP

RAVEN VT IN-CAB HOOK UP

The Raven VT In-Cab electrical hook up is only used on ISOBUS TXB ONLY machines. It will be used in the event that the tractor pulling the ISOBUS TXB is not equipped with a Virtual Terminal. If your tractor is equipped with a VT, please ignore this section.



RAVEN VIPER 4+ IN-CAB HOOK UP



TRACTOR HYDRAULIC HOOKUPS

SEEDMASTER MACHINE HYDRAULIC HOSES

HOSE MARKING CONVENTION: Hose marking has been changed in the 2016 model year to simplify connection. Each hose pair has been assigned a unique colour. The hose with 1 colour band is pressure, and the hose with 2 colour bands is return.

OPENER RAISE/LOWER HOSES: Direct Opener Lift & Lower Lines - The two 1/2" hydraulic lines with red colour bands are the opener lift and lower lines. The hose with 1 red band is opener down pressure. The hose with 2 red bands and the manual valve attached is the hose that is pressurized to raise the openers. The manual valve is used to lock the openers up for long transport and to facilitate unhooking under lift pressure. Open the valve after hooking hydraulics to tractor. **NOTE**: *Tractor remote returns to neutral after raise / lower unless you are operating with Smart Openers or Auto Lift.*

SYSTEM PRESSURE HOSES: Green Tagged Lines - The two 1/2" hydraulic lines with the green colour bands are used to activate the block and raise and lower the wings. These lines are connected to one tractor remote. In the field, operating position for this remote for is set to locked-on to provide continuous pressure to the block via the line with 1 green band. Pressure should be set by using the tractor SCV flow control to adjust the pressure.

SEED AND FERT FAN HOSES ONFRAME: There may be one or two ¾" fan pairs. If you are running a SXX machine the single fan hoses will be tagged with 1x orange (pressure) and 2x orange (return). If you are running a SXG machine the seed fan hoses will be tagged with 1x orange (pressure) and 2x orange (return) and the fertilizer fan will be tagged with 1x purple (pressure) and 2x purple (return). **Ensure that you connect the right pair of hoses together on your tractor.**

CASE DRAIN HOSE: 2017 and 2016 drills and tanks will be set up with **ONE** 1/2" case drain/return line (zero back pressure). This line has 1/2" NPT full open return coupler, through connections without any restriction or back pressure. Ensure this return line is routed to your tractor properly, without any possibility of back pressure. Improper connection may cause inaccuracies in operation and the possibility for severe damage.

HYDRAULIC CONNECTION REFERENCE CARDS

SeedMaster machines come in several different configurations. Please refer to your configuration below.

ToolBar (TXB ONLY) Hydraulic Hookup

TRACTOR REMOTE	HOSE PAIR PRESSURE	RETURN	HYDRAULIC FUNCTION
SCV 1 SEEDMASTER	1 RED ½" Line	2 RED ½" Line	OPENER PRESSURE
SCV 2 SEEDMASTER	1 GREEN ½" Line	2 GREEN ½" Line	SYSTEM PRESSURE
SCV 3 UNUSED			
SCV 4 UNUSED			
SCV 5 UNUSED			
CASE DRAIN SEEDMASTER		½" CASE DRAIN LINE	

OnFrame SXG Only Hydraulic Hookup

TRACTOR REMOTE	HOSE PAIR PRESSURE	RETURN	HYDRAULIC FUNCTION
SCV 1 SEEDMASTER	1 RED ½" Line	2 RED ½" Line	OPENER PRESSURE
SCV 2 SEEDMASTER	1 GREEN ½" Line	2 GREEN ½" Line	SYSTEM PRESSURE
SCV 3 SEEDMASTER	1 ORANGE ¾" LINE	2 ORANGE ¾" LINE	SEED FAN ONFRAME
SCV 4 SEEDMASTER	1 PURPLE ¾" LINE	2 PURPLE ¾" LINE	FERT FAN ONFRAME
SCV 5 UNUSED			
CASE DRAIN SEEDMASTER		½" CASE DRAIN LINE	

NOVA Only Hydraulic Hookup

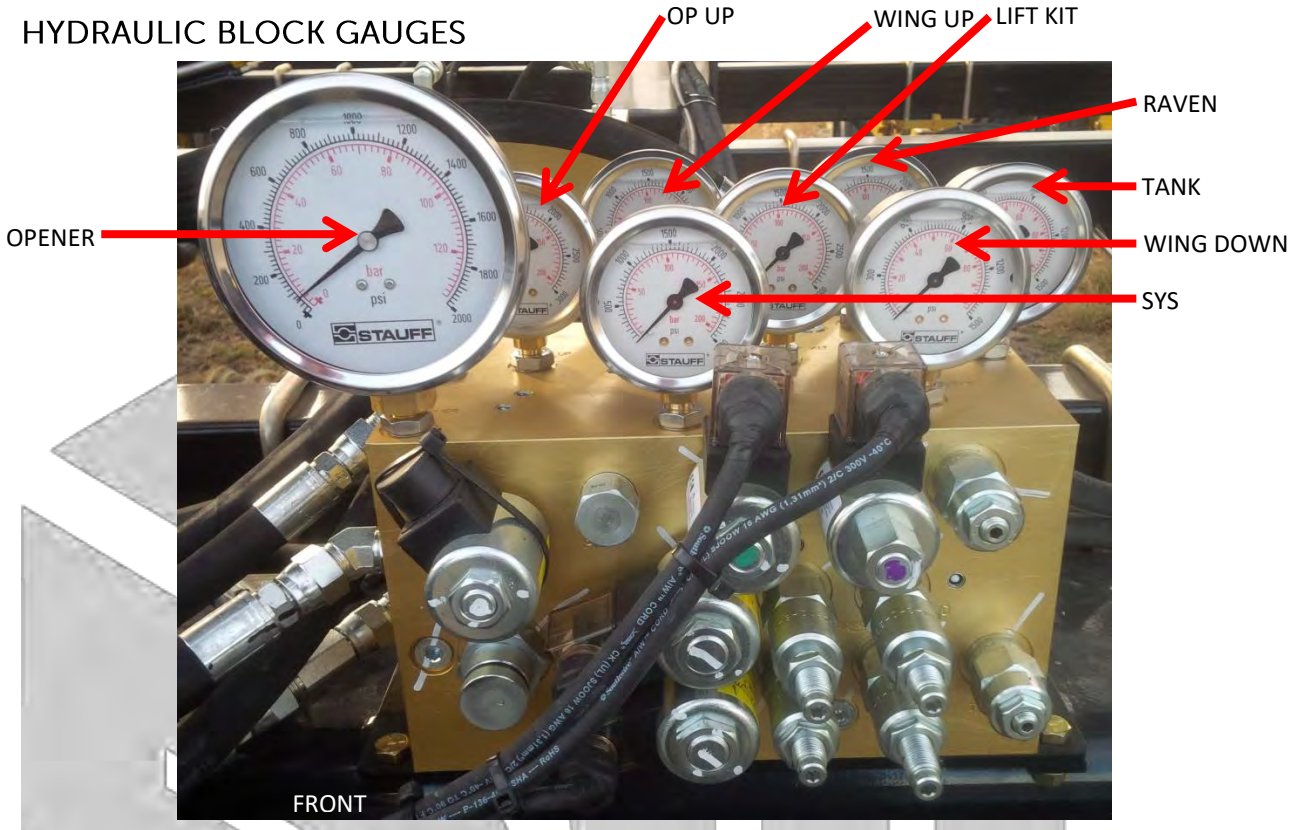
TRACTOR REMOTE	HOSE PAIR PRESSURE	RETURN	HYDRAULIC FUNCTION
SCV 1 SEEDMASTER	1 RED ½" Line	2 RED ½" Line	OPENER PRESSURE
SCV 2 SEEDMASTER	1 GREEN ½" Line	2 GREEN ½" Line	SYSTEM PRESSURE
SCV 3 SEEDMASTER	1 YELLOW ¾" LINE	2 YELLOW ¾" LINE	SEED FAN NOVA
SCV 4 SEEDMASTER	1 BLUE ¾" LINE	2 BLUE ¾" LINE	FERT FAN NOVA
SCV 5 UNUSED			
CASE DRAIN SEEDMASTER		½" CASE DRAIN LINE	

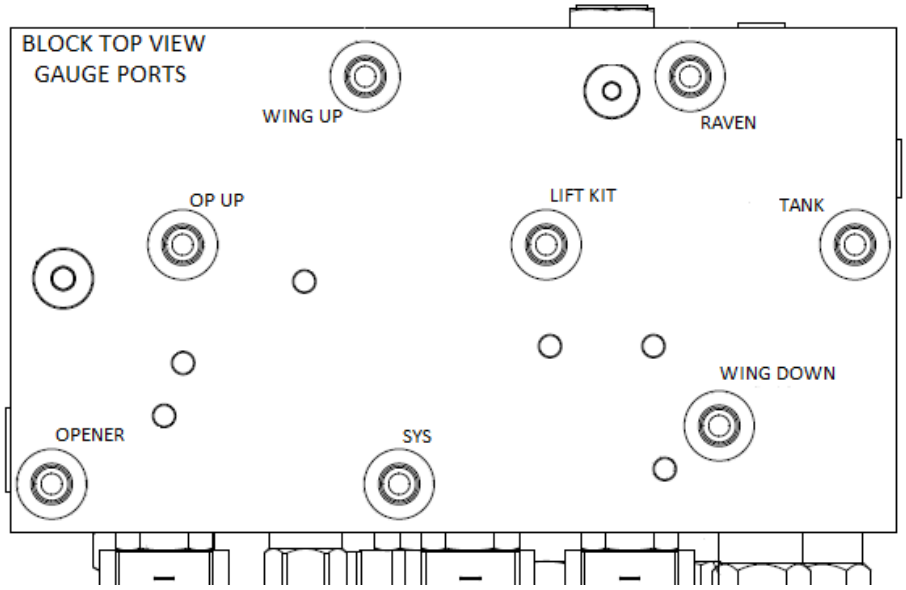
OnFrame SXX and NOVA Hydraulic Hookup

TRACTOR REMOTE	HOSE PAIR PRESSURE	RETURN	HYDRAULIC FUNCTION
SCV 1 SEEDMASTER	1 RED ½" Line	2 RED ½" Line	OPENER PRESSURE
SCV 2 SEEDMASTER	1 GREEN ½" Line	2 GREEN ½" Line	SYSTEM PRESSURE
SCV 3 SEEDMASTER	1 ORANGE ¾" LINE	2 ORANGE ¾" LINE	SEED FAN ONFRAME
SCV 4 SEEDMASTER	1 YELLOW ¾" LINE	2 YELLOW ¾" LINE	SEED FAN NOVA
SCV 5 SEEDMASTER	1 BLUE ¾" LINE	2 BLUE ¾" LINE	FERT FAN NOVA
CASE DRAIN SEEDMASTER		½" CASE DRAIN LINE	

MAIN HYDRAULIC BLOCK DETAILS

HYDRAULIC BLOCK GAUGES

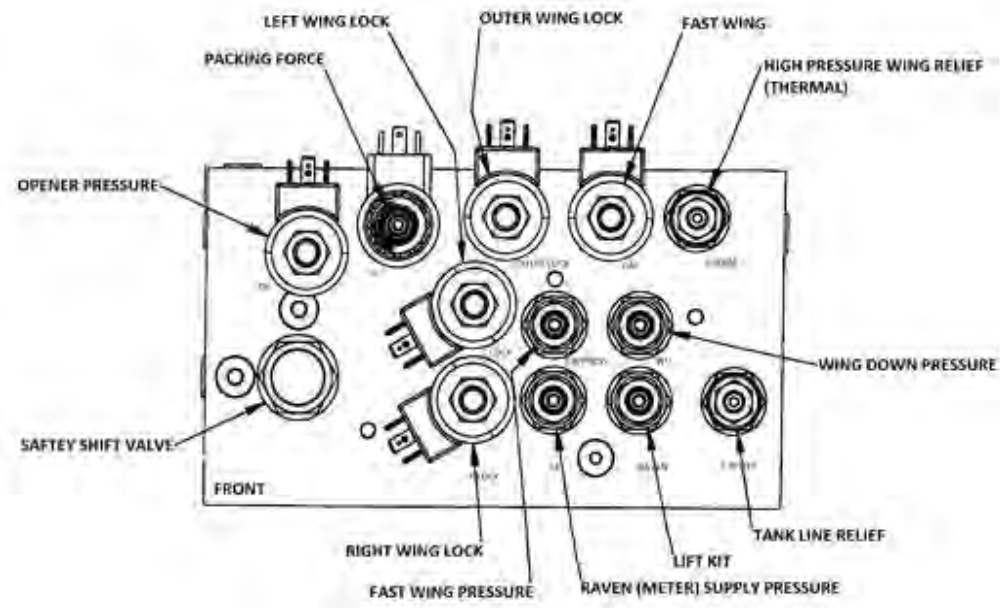




MAIN BLOCK GAUGES

OPENER: The OPENER gauge reads the amount of down pressure being applied to the Openers when they are down. 700-1300 psi; adjusted with in-cab switch; shanks must be pressured down to set. (900 psi is adequate for most fields).
OP UP: The OP UP gauge reads the amount of up pressure being applied to the Openers when they are lifted.
WING UP: The WING UP gauge reads the amount of pressure applied and required for lifting and should read 0 psi until folding up.
LIFT KIT: The LIFT KIT gauge reads the amount of pressure being applied to the lift kit cylinder during field operation.
RAVEN: The RAVEN gauge reads the amount of pressure being supplied to the hydraulic metering motors.
TANK: The TANK gauge reads the amount of pressure being returned to tank
WING DOWN: The WING DOWN gauge reads the amount psi being applied to the wings while they are down and in field operation.
SYS: The SYS gauge reads the amount of system pressure being applied to the system. System Pressure is the main pressure supply for the WING UP/DN, OPENER, LIFT KIT, RAVEN (METERING) circuits. 2500-3000 psi; indicates tractor working pressure to block.

Hydraulic Block Cartridges, Solenoids, and PWMs



MAIN BLOCK CARTRIDGES AND SOLENOIDS

OPENER PRESSURE SOLENOID: This is the main on/off solenoid for opener down pressure. It activates opener down top up pressure while seeding; activate with opener UP/DN switch in cab. This solenoid is not applicable when SmartOpeners is present.
PACKING FORCE: This is a PWM valve to control the amount of pressure supplied to the opener down pressure.
LEFT WING LOCK: This on/off solenoid turns the oil flow on/off to the left wing cylinders.
RIGHT WING LOCK: This on/off solenoid turns the oil flow on/off to the right wing cylinders.
OUTER WING LOCK: This on/off solenoid turns the oil flow on/off to the outer wing cylinders.
FAST WING: This on/off solenoid turns the oil flow on/off to the inner wing cylinders.
HIGH PRESSURE WING RELIEF (THERMAL): High tank pressure cut off cartridge is preset set at **2500 psi**
TANK LINE RELIEF: The tank line relief cartridge is preset at 450PSI. If the cartridge exceeds 450 psi it will relieve to the atmosphere.
WINGDOWN PRESSURE: 180 psi (NOTE: PRESSURE SETTING MAY VARY TO SPECIFIC TRACTOR AND DRILL COMBINATIONS)

★Wing down pressure may need to be increased if the wings start to float and not contour correctly while in the seeding position.
★Wing down pressure may need to be decreased if the wings become too ridged while in the seeding position.
RAVEN (METER) SUPPLY PRESSURE: 2000 psi
LIFT KIT: 200 psi
FAST WING PRESSURE: 1500 psi
SAFETY SHIFT VALVE: The safety shift valve will shut the hydraulic flow off to the block, if back pressure reaches 80 psi on tank line.

PRESSURE SETTING PROCEDURES

Setting Lift Kit Procedure (LIFT KIT)

The Lift Kit redistributes weight on the drill to lighten the front end, by transferring weight forward, off of the caster wheels, increasing floatation. It reduces stress on the hitch and frame when seeding in wet conditions. The oil supply for **the lift kit** is supplied from the system pressure.

- To adjust the Lift Kit pressures, loosen the jam nut on cartridge in port **LK** on the main block. Turn the cartridge in to increase the pressure and back out to decrease the pressure. When the desired pressure is set, tighten the jam nut back up
- See page 33 for in cab adjustment if your drill is equipped with this feature.

Setting WingDown Procedure (WINGDOWN PRESSURE)

The WingDown pressure is the amount of hydraulic pressure being applied to the inner and outer wing circuits; the oil supply for wing down is supplied from the system pressure. The WingDown Pressure is required so the wings will contour while travelling through the field.

- To adjust the **WINGDOWN PRESSURE**, loosen the jam nut on cartridge in port **WD** on the main block. Turn the cartridge in to increase the pressure and back out to decrease the pressure. When the desired pressure is set, tighten the jam nut back up.

Setting Wing Unfold Procedure (FAST WING PRESSURE)

The wing unfold pressure is the amount of hydraulic pressure being applied to the inner and outer wing circuits while the tool bar is unfolding. This is also known as the Fast Wing Pressure. If the wings are not unfolding the pressure will need to be increased. The oil supply for unfold pressure is supplied from the system pressure.

- To adjust the **FAST WING PRESSURE**, loosen the jam nut on cartridge in port **FW PRESS** on the main block. Turn the cartridge in to increase the pressure and back out to decrease the pressure. When the desired pressure is set, tighten the jam nut back up.

Active Wing Brace Procedure

The Active Wing Brace supports the wing sections of the frame. While in the field, a hydraulic cylinder pulls the rear of the wing section forward. This counteracts the draft while seeding. The hydraulic pressure comes from the opener cylinder hydraulic circuit. The higher the pressure is set to the active wing brace circuit, the more it will pull the rear wing forward. When the packing pressure is increased, so is the amount of pull on the brace.

- **Adjusting the wing brace cylinder**: Start by unfolding the SM drill and activating the system pressure. Next pressure the openers down with the opener pressure switch and adjust the shank down hydraulic pressure to 1000psi, activating the active wing braces. After the system, has been completely pressurized, remove the constant pressure from the drill by returning the remote of the tractor to neutral. At this time, you will require a tape measure to be able to measure the cylinder rod length of the active wing brace cylinder. Measure the cylinder from the cap face to the rod clevis, when you have the measurement (Subtract ¼") to allow a ¼" of cylinder stroke for tensioning the wing brace. With this measurement please adjust the length to the active wing brace, using the threaded link.

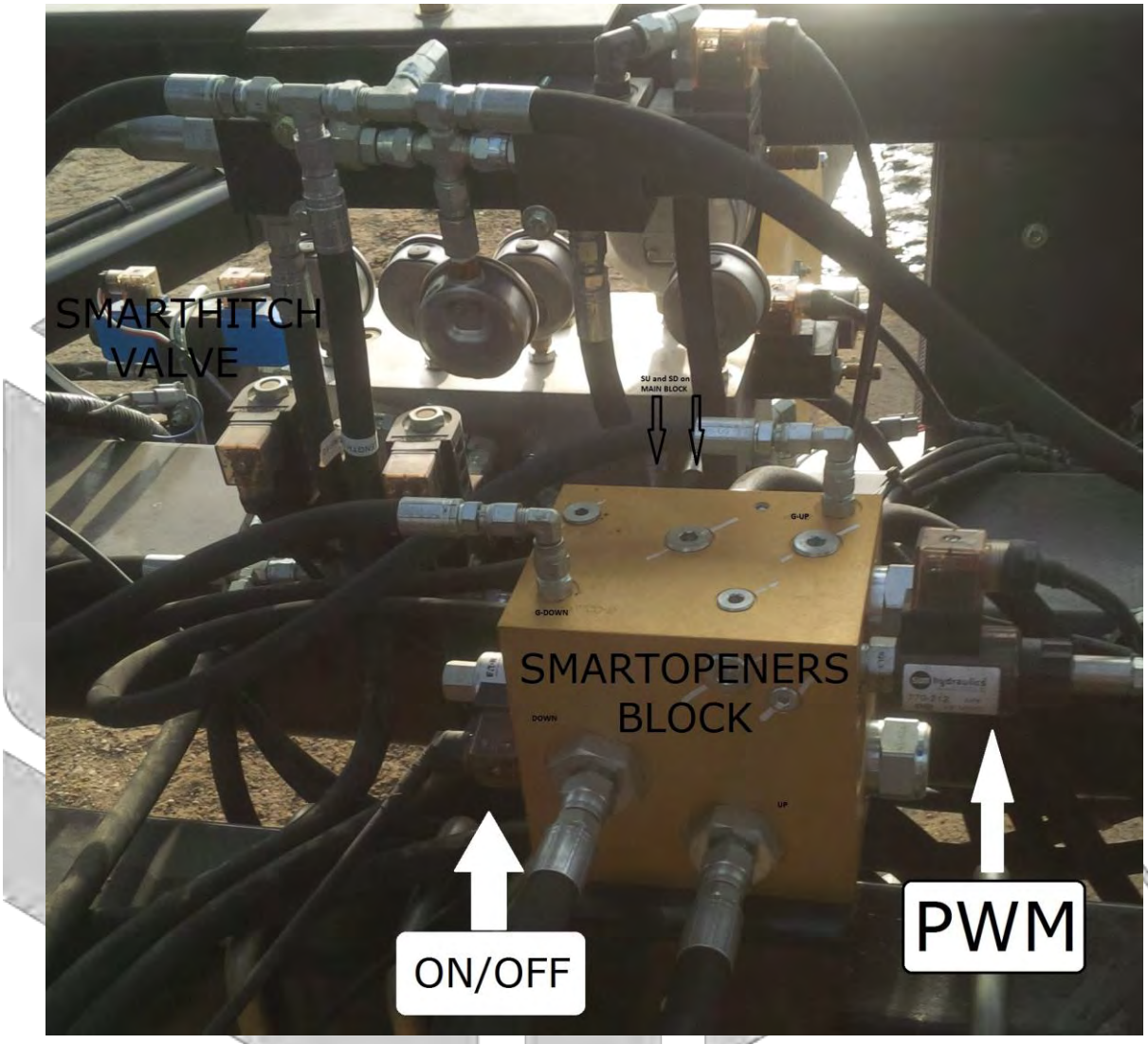
Meter Drive Pressure Setting Procedure (RAVEN (METER) SUPPLY PRESSURE)

The Meter Drive Pressure is the amount of hydraulic pressure allowed to the hydraulic metering drives. The torque to the metering drives increases as the pressure increases. Do not exceed 2200 psi. The oil supply **for RAVEN (METER) SUPPLY PRESSURE** is supplied from the system pressure.

- To adjust the **RAVEN (METER) SUPPLY PRESSURE**, loosen the jam nut on cartridge in port **RAVEN** on the main block. Turn the cartridge in to increase the pressure and back out to decrease the pressure. When the desired pressure is set, tighten the jam nut back up.

SMARTOPENERS HYDRAULIC BLOCK DETAILS

SMARTOPENERS HYDRAULIC BLOCK



If your SeedMaster machine is equipped with a SmartOpeners Block, then your openers raise and lower functions are controlled VIA the SmartOpeners Block. The openers PWM valve for controlling the amount of pressure going to the openers is located on the SmartOpeners Block, along with the Master ON/OFF solenoid and coil for turning the circuit on and off. The SmartOpeners block is located on the first rank behind the main block. With the SmartOpeners block you will leave your tractor's opener hydraulic remote engaged at all times. Recommended flow for this remote is 75% and greater. This is an optional feature for your SeedMaster machine, if it is not equipped with a Smart Openers block, please contact your SeedMaster dealer for details about upgrading your machine to SmartOpeners.

TOOLBAR OPENERS OPERATION PROCEDURES

It will need to be determined what your machine setup is before choosing the correct operation for lifting and lowering the openers while making a turn in the field. There are three different options available.

1. **Standard Opener Operation** – Lift/Lower the openers with the tractors remote and the foot switch or remote master switch.

2. **SmartOpener Operation** – Lift/Lower the openers with the foot switch or remote master switch.

3. **Auto Lift Operation** – See Viper 4+ section on Auto Lift if your unit is equipped with this feature.

STANDARD OPENER OPERATION

LOWER, LIFTING, THEN LOWERING THE OPENERS

LOWER:

1. LOWER OPENERS WITH OPENER LIFT/LOWER TRACTOR REMOTE.
2. OPENER LIFT/LOWER TRACTOR HYDRAULIC REMOTE MUST BE "RETURNED TO NEUTRAL" AFTER THE OPENERS HAVE LOWERED. APPROX 10 SECONDS.

LIFT:

3. AFTER THE TOOLBAR IS COMPLETEY OVERLAPPED INTO AN APPLIED AREA.
4. SHUT THE MASTER FOOT SWITCH OFF.
5. LIFT THE OPENERS WITH OPENER LIFT/LOWER TRACTOR REMOTE (REVERSE THE REMOTE).
6. COMPLETE THE TURN.

LOWER:

7. CYCLE MASTER FOOT SWITCH FROM OFF TO ON AND LEAVE THE MASTER SWITCH "ON".
8. LOWER THE OPENERS WITH THE LIFT/LOWER TRACTOR REMOTE.
9. WHEN THE OPENERS START PRESSURING UP, RETURN THE OPENER LIFT/LOWER TRACTOR REMOTE TO THE NEUTRAL POSITION.

SMARTOPENER OPERATION

LOWER, LIFTING, THEN LOWERING THE OPENERS

LOWER:

1. LOCK ON REMOTE TO SUPPLY OPENERS WITH HYDRAULIC PRESSURE.
2. CYCLE MASTER FOOT SWITCH FROM OFF TO ON AND LEAVE THE MASTER SWITCH "ON" OPENERS WILL LOWER.

LIFT:

3. AFTER THE TOOLBAR IS COMPLETEY OVERLAPPED INTO AN APPLIED AREA.
4. SHUT THE MASTER FOOT SWITCH OFF, OPENERS WILL LIFT.
5. COMPLETE THE TURN.

LOWER:

6. CYCLE MASTER FOOT SWITCH FROM OFF TO ON AND LEAVE THE MASTER SWITCH "ON" OPENERS WILL LOWER.

OPENER DETAILS

DEPTH

The opener is preset for seed and fertilizer depth. The seed depth is factory set at 3/4" below the packed surface and the fertilizer depth is factory set approximately 3/4" below and 1 ½" to the side of the seed.

In varying field conditions, soil types, and moisture conditions, it may be required to adjust the openers from the pre-set depths. We recommend seeding cereals, oilseeds and all other products at the determined seed and fertilizer depths desired by the owner/operator. The notches on the hub plate correspond to 1/4" changes in depth, with the inverted notch being the factory pre-set depth of 3/4". To change depth, simply loosen the nut on the slotted portion of the hub plate and rotate packer tire upwards to increase depth or downwards to decrease depth.

Semi-pneumatic packer tires are a standard feature on all SeedMaster drills. There is no internal air pressure that needs to be checked.

The resulting dent the packer wheel leaves behind is dependent on soil type and hardness. The variation in dent depth does not affect the crop, since the seed depth is always monitored from the packed surface.

*Avoid temptation to harrow after seeding, as harrowing will reduce the uniformity of crop emergence and reduce yield potential. The dent left by the packer wheel and the loose soil tossed to the side as the openers move through the soil may appear rough at first glance, but you will find the residue and soil settles over time leaving just the ripple of the packer wheel. This dent provides several agronomic benefits.

Warning: Avoid turning your drill very short. The opener is designed to seed primarily in straight lines. A sharp turn will cause the openers to be dragged sideways, resulting in an improper seeding job and undue stress on the openers. Never turn so short that the inside openers move straight sideways or backwards.

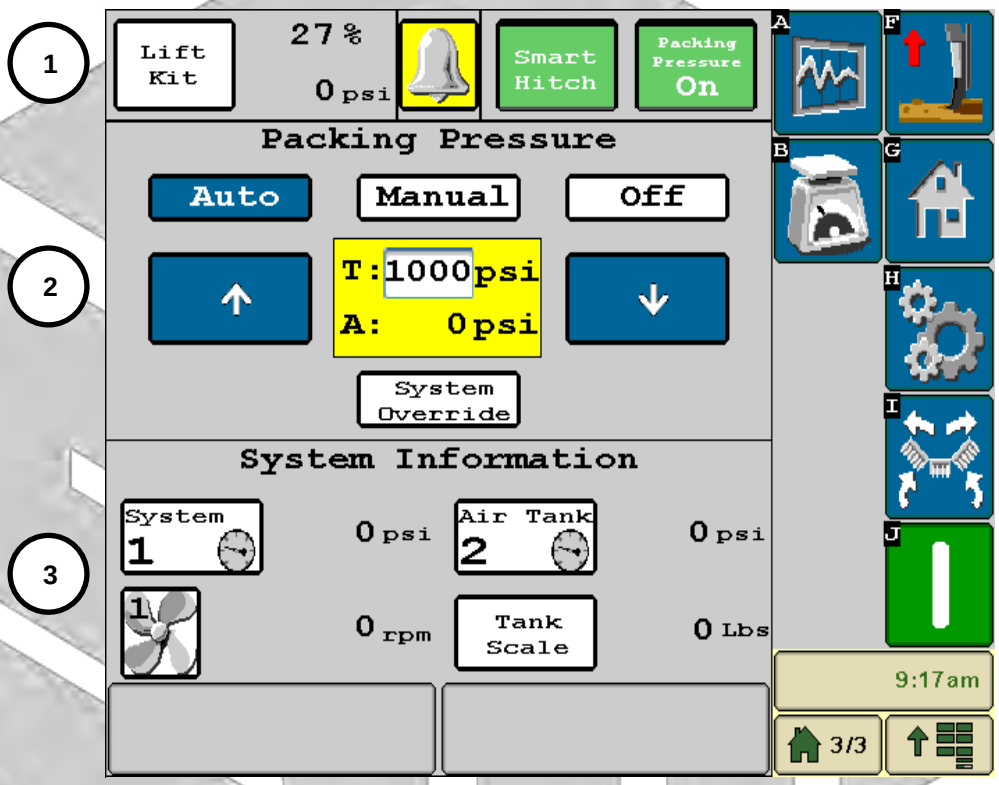
Warning: Always store drill for extended periods of time in the unfolded wing position. This is to avoid water getting into the packer tire and wing wheel bearings. This is very important for winter storage.

ISOBUS TOOLBAR FUNCTIONS

HOME SCREEN LAYOUT

The Drill ECU will monitor and control your SeedMaster ToolBar via the installed Virtual Terminal. To access the ISO ToolBar Functions, touch the ISOBUS TXB soft key on your VT display. See your VT's operator's manual for more information on locating VT soft keys.

TXB SOFT KEY



1. **Status Area:** This area will show the current status of different components of the machine including the Lift Kit, System Alarms, Smart Hitch, and Packing Pressure.
2. **Packing Pressure Area:** This area will allow you to toggle the packing pressure from **OFF** to **Manual** or **Auto**. The Packing pressure can also be quickly changed by using the UP arrow to increase and DOWN arrow to decrease or set to a predetermined pressure. The System Override will dump the opener pressure. This target override pressure and override time can be adjusted in the settings page. See packing pressure setup and operation section on page 29.
3. **System Information Area:** This area will allow for a quick view of different pressures, weights, and RPM sensors installed on your SeedMaster machine.
4. **Soft Key Area:** Touch soft keys to access different settings and functions.

ISO TXB QUICK START PROCEDURE

Before you go to the field please review the steps below to ensure your ISO ToolBar is field ready.

Step 1, Turn safety switch ON: Before turning the safety switch on please ensure the toolbar is free of any persons, animals, or objects that could damage your equipment. Touch the RED safety switch in the Soft Key Area. The Safety Switch will turn green indicating that the system is ready.


Step 2, Engage System Pressure: Engage the tractors hydraulic remote for system pressure. The System Pressure will display in the System Information Area. *NOTE: System Pressure operates with a pressure greater than 2600psi and less than 3000psi.*

Step 3, Unfold Drill: Start unfolding the drill by touching the Drill Unfold Soft Key.
BEFORE UNFOLDING MAKE SURE THE WINGS ARE FREE AND CLEAR OF ANY OBJECTS THAT COULD CAUSE HARM TO YOU OR ANYONE ELSE.
Start by unfolding the Inner Wings first then the Outer Wings. NOTE: The buttons need to be held down during the unfold process.

Step 4, Set Packing Pressure: Ensure that the packing pressure is set to your desired mode. Recommended mode is AUTO but field conditions may require Manual mode. After setting the mode to Auto the desired packing pressure must be set.
If equipped use **PFS MODE**, it will be set in LBS. The recommend starting point for the PFS is 150 LBS.
If equipped use **Hydraulic MODE**, it will be set in PSI. The recommended starting point for the Hydraulic Mode is 1000 psi.
NOTE: PACKING PRESSURE NEEDS TO CHANGE WITH FIELD CONDITIONS

Step 5, Engage Opener Pressure: Engage the tractors hydraulic remote for Opener Pressure.

Step 6, Test Openers Function UP/DWN: You will need to note your what your master switch configuration is. The machine comes from factory with a foot switch so the system is set on foot switch.
BEFORE ENGAGING THE OPENERS MAKE SURE THE OPENERS ARE FREE AND CLEAR OF ANY OBJECTS THAT COULD CAUSE HARM TO YOU OR ANYONE ELSE.
NOTE: THESE ARE INSTRUCTIONS FOR MACHINES EQUIPPED WITH SMARTOPENERS.
Begin by engaging the Master Switch, IE. Stepping on the foot pedal. After engaging the master, the openers will go to the ground and start building pressure. You will see the Packing Pressure Icon turn green and say on. To lift the openers, step on the foot switch to disengage the packing pressure.

NOTE: if the openers are not going up and down your hydraulic pressure on the tractors remote could be reversed or a hose could have popped out of the tractors remote.

Step 7, Review Lift Kit Mode: For SM16 the Lift Kit will only display the pressure in the cab in the Lift Kit area. The Lift Kit Mode will be run in the **MANUAL** Mode. There will be a PWM upgrade available later in 2016. This will give control of the Lift Kit Pressure from the cab of the tractor.

UNFOLD OPERATION & WING LOCKS

Touch the Fold button soft key located in the soft key area to access the Unfold Operation & Wing Locks. The machines system pressure will need to be engaged before the unfold process can begin. The live system pressure can be viewed in the System Information Area on the Home Page. System pressure must be

2600 psi or greater to unfold.

Wing Unfold Buttons

Begin by unfolding the **INNER** Wings first. It is important to unfold the **INNER** wings first as you can damage the **OUTER** wings by unfolding them into each other if the **INNER** wings are not completely unfolded.

- **Touch and hold the INNER Wing Fold button to unfold the INNER wings.**

After the **INNER** wings are completely unfolded then the **OUTER** wings can be unfolded.

- **Touch and hold the OUTER Wing Fold button to unfold the OUTER wings.**

Once the wings are unfolded touch the home button and then touch yes to acknowledge that you are leaving the page to return to the Home screen.

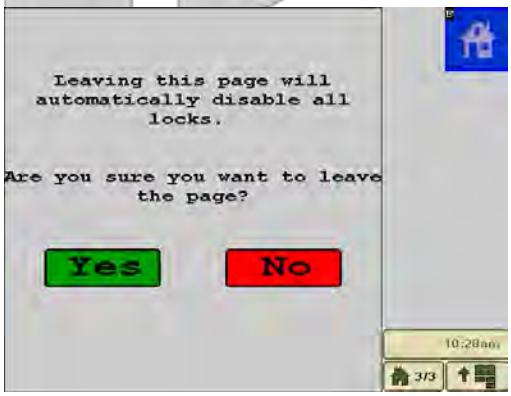
Wing Lock Buttons

Left Wing Lock Check Box: When the wings are unfolding, or folding up, use the check box to lock the left wing into its current position. Uncheck the check box to unlock the wing.

Right Wing Lock Check Box: When the wings are unfolding, or folding up, use the check box to lock the right wing into its current position. Uncheck the check box to unlock the wing.

Unfold Operation and Wing Lock Safety Page

After touching the Home soft key, a safety page will be displayed. You must acknowledge the fact that you will be leaving the page and the wing locks will be disabled. Before touching "YES", make sure the machine is free and clear of any persons, animals, or objects. After touching yes, you will return to the home page and wing locks are disabled. If you are not ready to disable the wing locks, simply touch the "NO" button and the wing locks will stay enabled.



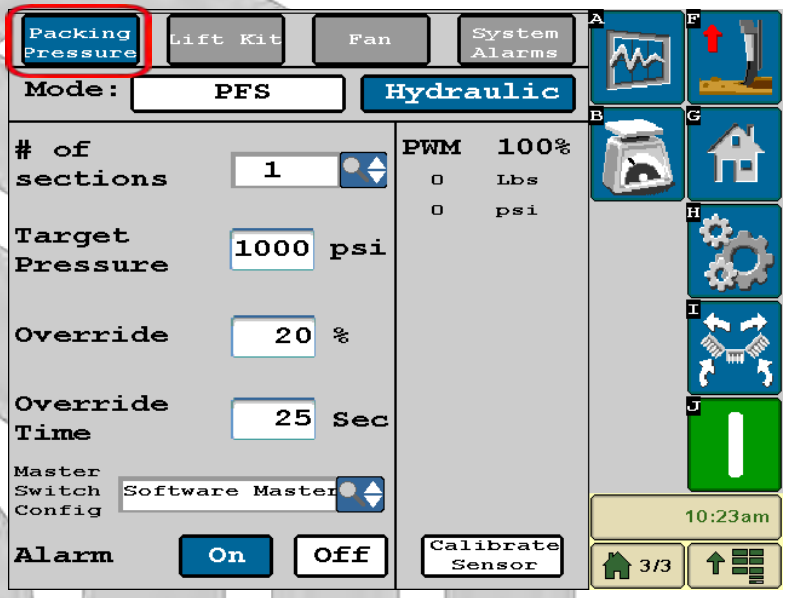
PACKING PRESSURE SETUP & OPERATION

Packing Pressure keeps the openers engaged in the ground while seeding. The "Packing Pressure ON/OFF" icon in the top right corner indicates whether Packing Pressure is engaged or disengaged. The Icon will be green if the packing pressure is ON. The Icon will be red when it's off.

NOTE: The Icon can be red and reads ON. If the Icon is red and reads ON this means the safety switch needs to be toggled to ON.

Packing Pressure Setup

To access the packing pressure setup page, touch the Settings Soft key found in the soft key area, then touch the Packing Pressure tab in the top left corner.



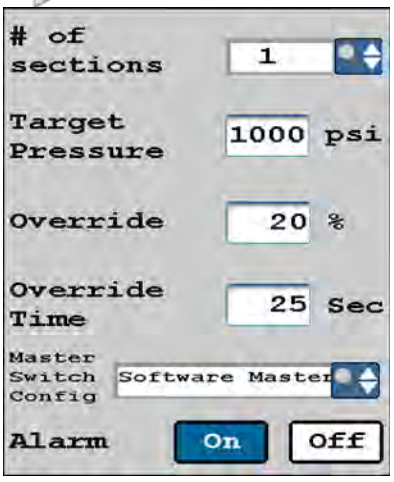
Mode Area – There are two packing pressure options from which to choose. Touch the corresponding option that is equipped on your machine.

Hydraulic Pressure: If there is a hydraulic pressure transducer installed on the main block on the tool bar, you will choose this option. This transducer is plumbed into the opener down circuit to display the toolbar packing pressure.

PFS: Auto Adjust Packing Force Sensor. If there is a PFS installed on one of the openers, you will choose this option. The PFS will be installed on an outside opener located on the main frame of the tool bar. The PFS will determine how much packing force is on the opener.

Settings Area – This area consists of the number of packing sections, opener target pressure, override percentage, override time, Master Switch Configuration, and Packing Pressure Alarm On/Off.

# of Sections: All SM16 machine are equipped with 1 packing pressure section. Multiple packing pressure sections is for future use. Please set this to 1.

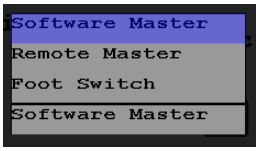


Target Pressure setting: If the machine mode is set to Hydraulic packing pressure, the target pressure will be the desired amount of packing pressure in PSI of down force to the openers. For example, if the desired amount of packing pressure is 1200PSI, touch the white box to the right of Target Pressure and enter 1200. If the machine is equipped with a PFS and the mode is set to PFS, the target pressure will be the desired amount of down force to the openers. For example, if the desired number of pounds is 150LBS then enter 150.

Pressure Override % setting: This setting will reduce the amount of packing pressure to the openers by a percentage of the set target pressure. Use the System Override button to turn the override function on/off/reset the override time. Use a lower percentage value to reduce the pressure significantly. For example, if the Target Pressure is set at 150LBS, the Override % is set at 10%, and the system override is tripped, it will drop the Target Pressure to 15LBS. To set the Pressure Override %, enter the percentage in the white box to the right of Override.

Pressure Override Time: This setting sets the amount of time that the system will override the packing pressure setting. Enter the desired amount of time in seconds in the white box to the right of Override Time.

Master Switch Configuration: Packing pressure can be enabled by three different methods: Software Master, Remote Master, or Foot Switch. Touch in the white box to choose the method of choice.



Software Master: This setting uses the Soft Key on the Home Page. Simply touch the soft key to enable or disable the packing pressure.

Remote Master: The Packing Pressure can be enabled or disabled by a third party +12v signal. The "Implement Height Connection" found on the ToolBar is used for this function. Pin C or the Black/White wire is the signal wire. This is also a power and ground wire supplied if the use of a relay is needed.

Foot Switch: Your SeedMaster machine comes standard with a Foot Switch to enable and disable the packing pressure. This is the factory default setting. Press the foot switch to enable/disable the packing pressure.

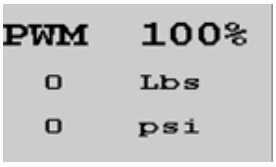
Foot Switch Inverted: Your SeedMaster machine comes standard with a Foot Switch to enable and disable the packing pressure. Use this setting when the ISO ToolBar is running with an ISO RCM. Press the foot switch to enable/disable the packing pressure.

Alarm: If alarm is "On" and the packing pressure is off-rate by 20% for more than 45 seconds, then an Off Rate alarm will be triggered.

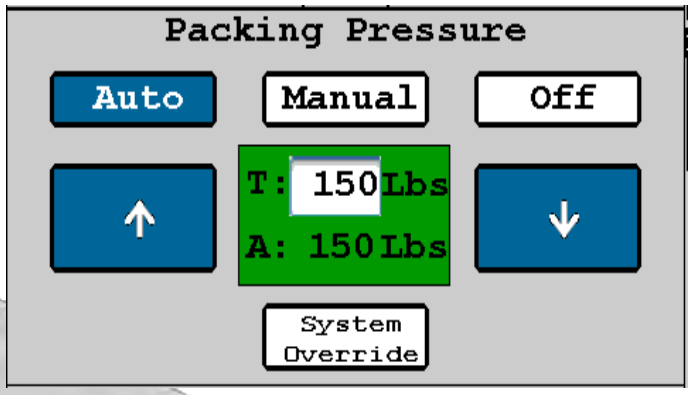
Calibrate Sensor Button: With the openers raised and the hydraulic remotes disengaged, press the "Calibrate Sensor" button to zero out either the hydraulic pressure transducer or the PFS.

Actual Reading: This reading will display the hydraulic pressure transducer's actual PSI reading and how many pounds of force are on the PFS on the opener. It also displays the current PWM percentage.

PWM Reading: This reading will display the current position in percentage of the PWM valve.



Packing Pressure Operation on Home Page: Touch the Home soft key to return to the home page to have access to the Packing Pressure operation settings.



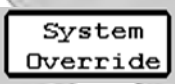
Off/Manual/Auto settings: The system is equipped with a PWM valve for controlling the hydraulic pressure to the openers when they are in the down position.

OFF: When the "Off" button is selected, the PWM will not control the packing pressure.

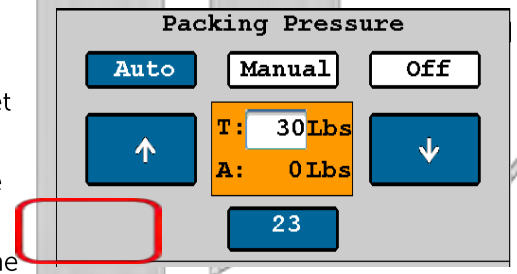
MANUAL: When "Manual" is selected, this puts the packing pressure into manual mode. Use the up and down arrows to increase or decrease the amount of down pressure to the openers.

AUTO: When the button is in the "Auto" position, this puts the packing pressure into an automatic mode. In automatic mode, the system will automatically adjust the packing pressure to keep it at the desired "Target Pressure". When slowing down, speeding up, or changing ground conditions, the system will read the amount of pressure on the openers and adjust up or down as required. This is the recommended setting.

Target and Actual Packing Pressure: The Target Pressure and Actual Pressure are displayed in the middle of the Packing Pressure area. **T: 150 LBS** indicates that the Target pressure is 150LBS. Touch in the white area to easily change the target on the fly. **A: 150 Lbs**. indicates that the Actual Packing Pressure is 150LBS.



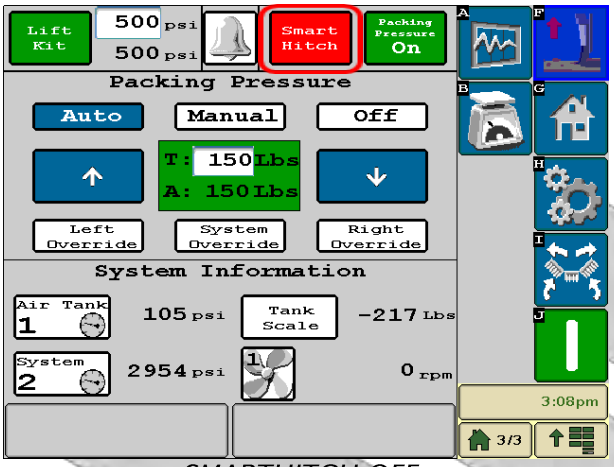
System Override: Touch the System Override button to reduce the amount of packing pressure to the openers by a percentage of the set target pressure. The System Override button will override the packing pressure for the set amount of time (set in the settings page). A timer will be displayed to show the remaining override time. To reset the time simply touch the System Override button again and it will start the timer from the top of the set amount of time.



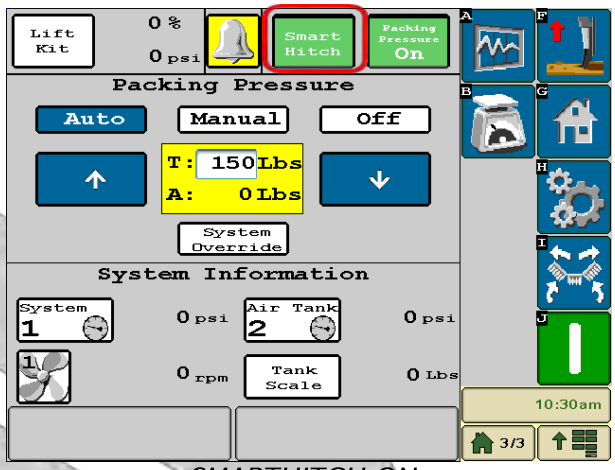
You can also touch the System Override Soft Key in the top right hand corner of the page. Touching this soft key will initiate the System Override. Touching this icon again will cancel the timer and normal packing pressure will resume.

SMARTHITCH OPERATION

The SmartHitch button simply turns the SmartHitch ON or OFF. Touch the SmartHitch Button to turn the SmartHitch ON, when the SmartHitch is ON the button is GREEN. Touch the SmartHitch Button to turn the SmartHitch OFF, when the SmartHitch is OFF the button is RED.



SMARTHITCH OFF



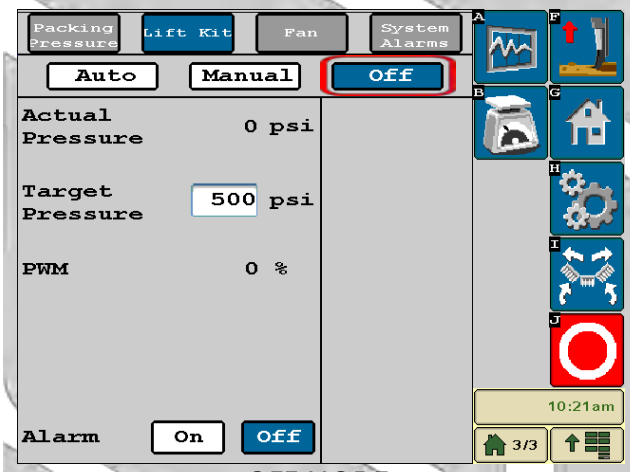
SMARTHITCH ON

LIFT KIT OPERATION

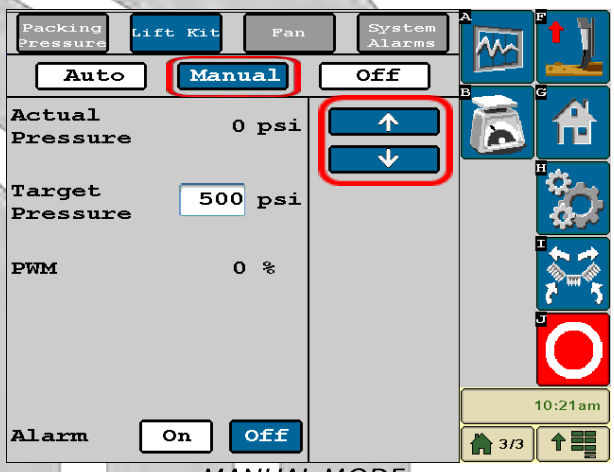
If equipped your SM17 SeedMaster ToolBar may have a hydraulic pressure transducer enabling in-cab viewing of the Lift Kit hydraulic pressure. The Lift Kit pressure can manually be changed by adjusting the hydraulic cartridge found on the main hydraulic block. See Main Hydraulic Block Section for further details. An optional PWM valve can be installed into the Main Hydraulic Block to allow for automatic and manual control of the Lift Kit's hydraulic pressure from the comfort of the cab. Please contact SeedMaster for pricing and availability.

Touch the Lift Kit soft key to access the Lift Kit Settings. The Lift Kit soft key will change color to display its current state. White is DISABLED or MANUAL, Yellow is OFF RATE and Green is ENABLED and on target.

NOTE: When a PWM VALVE is NOT installed the Lift Kit operation will be ran in manual mode. The system will ONLY display the Lift Kit pressure in the cab.



OFF MODE



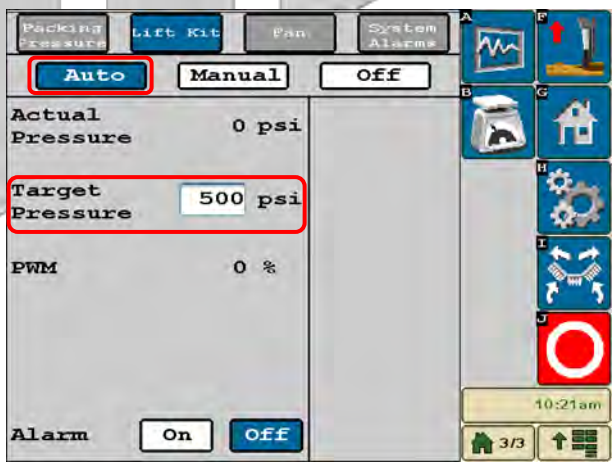
MANUAL MODE

LIT KIT MODES

1. OFF MODE: When set on OFF mode, the lift kit functions are disabled.

2. MANUAL MODE: When set on MANUAL mode, the lift kit will display the Lift Kit's pressure and is adjusted manually from cab by touching the up or down arrow.

3. AUTO MODE: When set on AUTO mode, the Lift Kit pressure will be adjusted automatically to the users set target pressure. Enter the psi value into the Target Pressure area. Auto mode also features an alarm. If the actual pressure is not on target an alarm will sound.



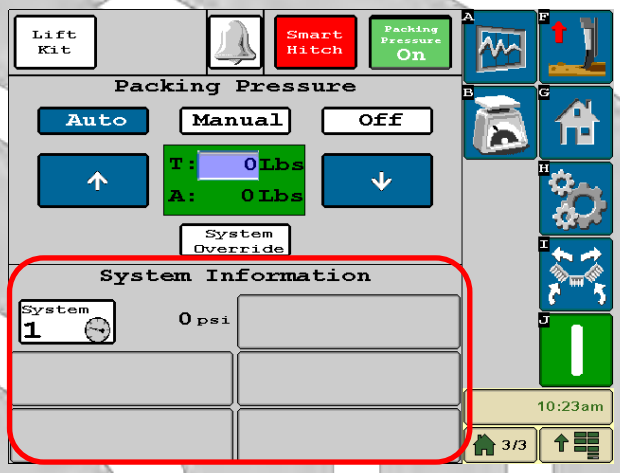
AUTOMATIC MODE

SYSTEM INFORMATION HOME PAGE SETUP

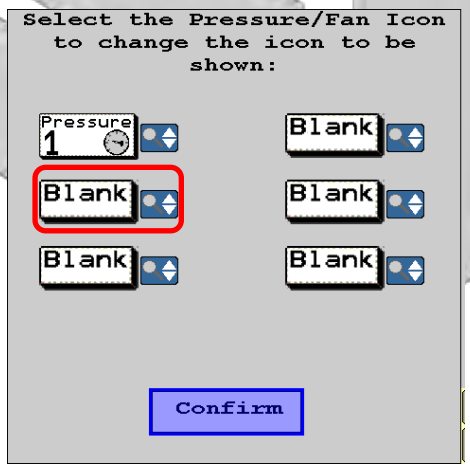
The System Information area on the home page will display up to six different hydraulic or air pressures, Fan RPM's and one Tank Weight icon. The system comes standard with a hydraulic transducer installed in line of the System Pressure. The System Pressure is easily viewed in the System Information Area.

The System Information area layout is customizable to suit your viewing needs. Follow the steps below to add an icon to the System Information area. Please note that your SeedMaster machine will need to be equipped with the corresponding sensor in order to monitor the pressure, RPM or weight.

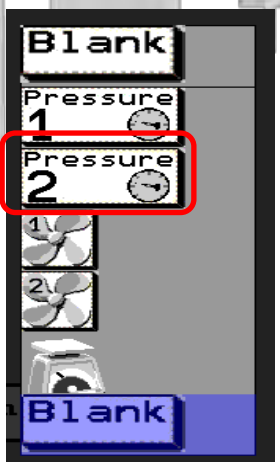
1. **Adding an icon**: Touch in any one of the six icon spots to add an icon. A new page will be displayed showing the icon layout.



2. Choose the icon to change the icon to be shown. After selecting the icon, a drop down list of available icons will be shown. Choose the icon that is being added to the System Information area.



CHOOSE ICON



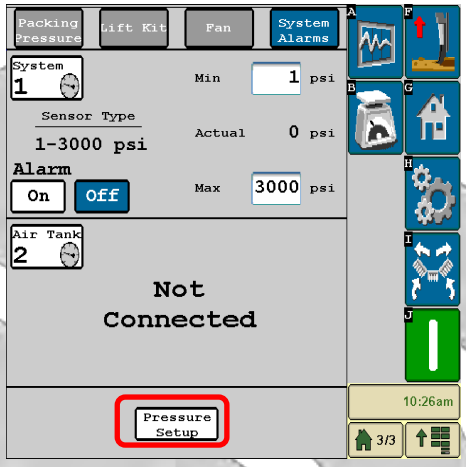
DROP DOWN LIST

3. The selected icon would now be displayed in the top right icon spot. Touch Confirm to save the changes.
   Note: If a pressure icon is selected continue to step 5. If Fan Icon was selected, then go to the settings page then choose the FAN tab. See fan setup and operation on page 37. If the scale icon is selected, no further setup is required.

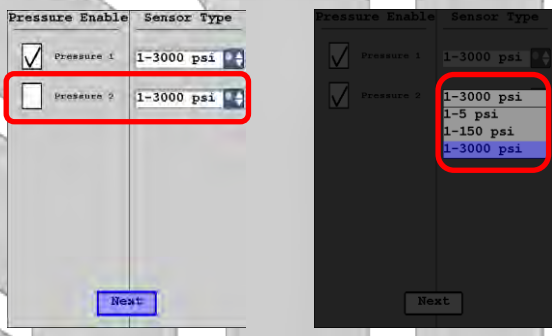
4. After adding a pressure icon to the System Information area, the transducer will need to be enabled in the settings page under System Alarms. Touch the Settings Soft Key on the right portion of the screen.

5. After Selecting the settings icon touch the **System Alarms** tab.

6. Once the system alarms page is displayed. Touch the Pressure Setup button on the bottom of the screen.

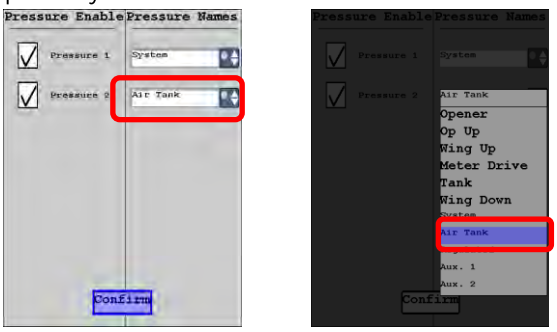


7. Place a check mark to the right of Pressure 2 then select the type of senor that is installed on the machine. Then touch Next.



NOTE: for an Air Sensor choose 1-150 & for a Hydraulic sensor choose 1-3000.

8. After touching Next, you will need to select what text will be displayed on the icon. **Touch** the drop down list to the right of pressure. A list of display items will be display, choose the text that represents the type of sensor installed. Then **touch** confirm to save the settings. Continue to next page to setup the System Alarms.

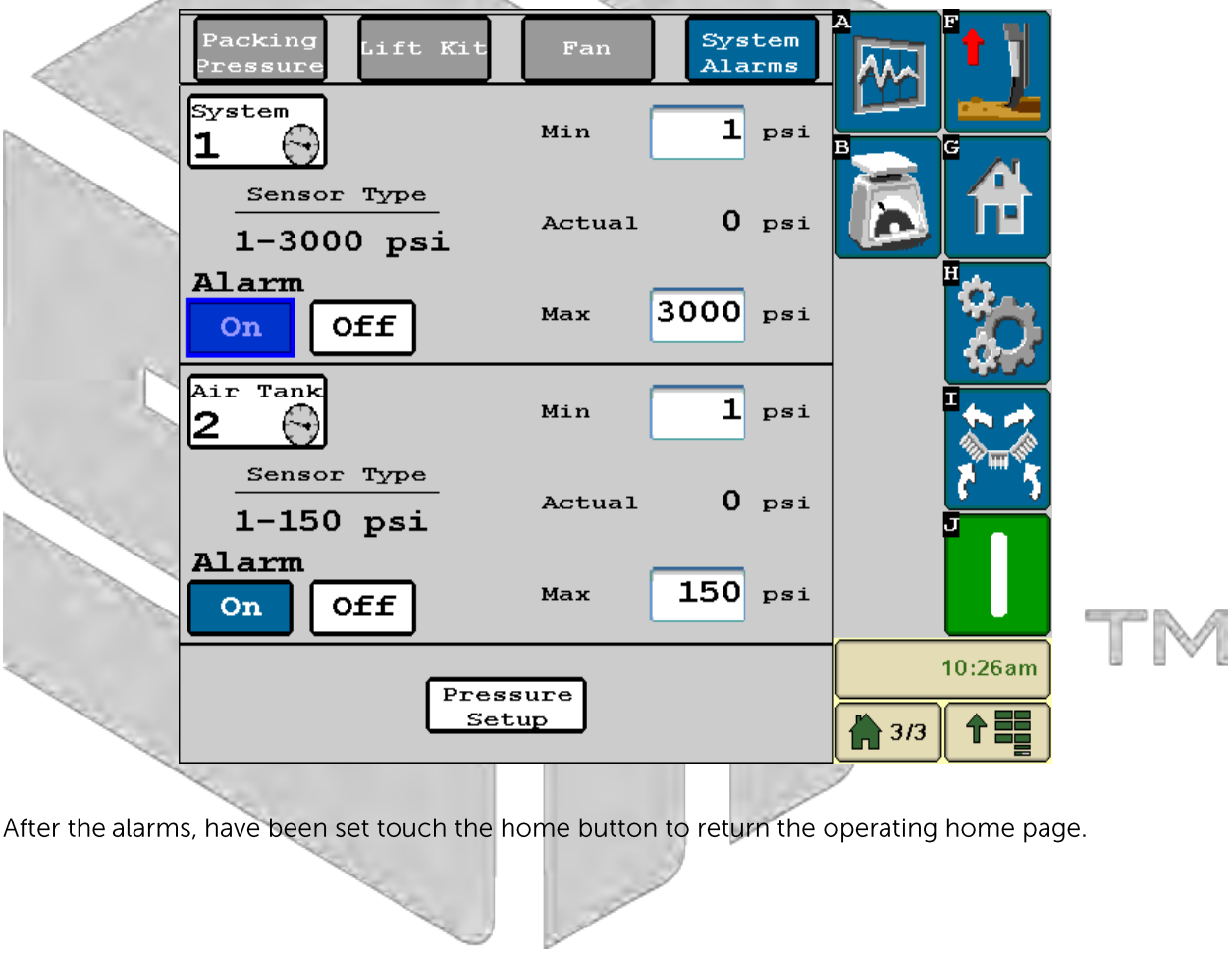


SYSTEM ALARMS

The system is equipped with alarms to warn the operator of any potential issue on the machine. To access the System Alarms settings, touch the Settings Soft Key. After touching the settings soft key, touch the Systems Alarm Tab to access the System Alarm settings.

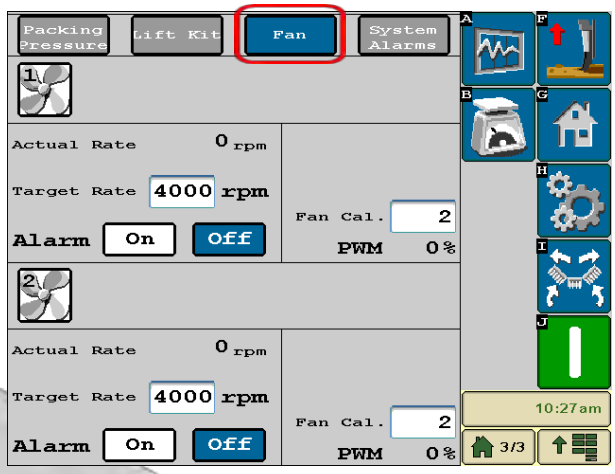
Enabling or Disabling an alarm: To enable an alarm, touch the Alarm On button. To disable an alarm, touch the Off button. If the alarm is enabled, the Min and Max values of the alarm range must be set.

Setting the Min and Max Range: To set the Min alarm value, touch the white area to the right of Min. If the installed sensor drops below this value, the operator will be notified that a System Alarm has been tripped. To set the Max value, touch the white area to the right of Max. If the installed sensor rises above this value, the operator will be notified that a System Alarm has been tripped.



After the alarms, have been set touch the home button to return the operating home page.

FAN SETUP & OPERATION



If your machine is equipped with a SeedMaster On-Board metering tank, the fan from the On-Board tank will be set up and displayed on the ToolBar function page. To access the Fan Setup page, touch the Settings Soft Key in the Soft Key area, then touch the "Fan" tab located at the top of the page. The Fan Setup comes with a simple alarm setting. Enter the desired fan RPM in the Target Rate, turn the Alarm to On, and the alarm will trigger if the fan is 30% above or below the desired target rate.

Fan Cal. is the calibration number that represents how many targets the Fan Sensor is reading. SeedMaster fans are equipped with 2 targets for the sensor to read. Fan Cal. is always 2 on your SeedMaster machines.

TANK SCALE SETUP

If your machine is equipped with a SeedMaster On-Board metering tank, there will be tank load cells under the tank. The load cells measure how much weight is on the tank or how much the product in the tank weighs. The load cells are calibrated from factory but will require to be calibrated after transport. It is also important to check the accuracy of the Tank Scale on a regular basis. Calibration has never been easier. Please see below for the calibration setups. To access the Tank Scale setup page, touch the Scale soft key located in the soft key area.

Zero Scale: When the tank is empty, the tank scale will need to be zeroed out. Simply touch the "Zero" button in the middle of the page to Zero out the Tank Scale.

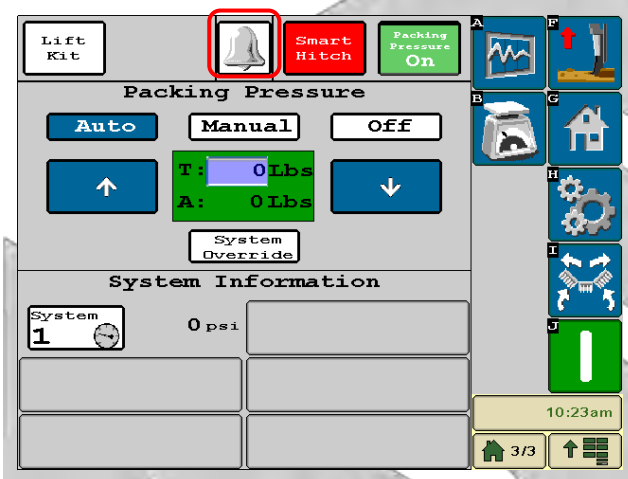
Calibration: Before calibration, you will need to know the exact weight of an object that can be placed on the center of the tank. This known weight will be referred to as your Certified Weight. **Step one** is to enter the Certified weight into the Certified weight area. **Step two** is to place the Certified Weight onto the tank. The weight will be displayed above the Zero button. Please enter the weight being displayed into the Load Cell Weight area. **Step three** is to simply touch the calibrate button and the new Weight Calibration value will be calculated. It is important to double check all values inputted and check the certified weight after the calibration.

SYSTEM DIAGNOSTICS PAGE

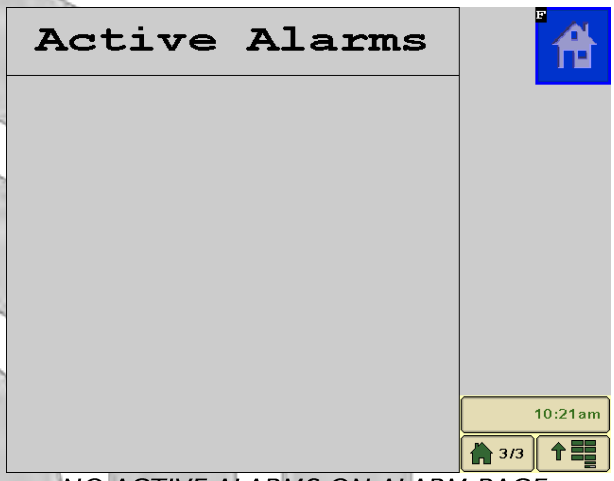
Touch the System Diagnostic Soft Key to access the Diagnostics page. The Diagnostics page will display the ECU Firmware version and also display any installed load cell voltage for diagnosing any potential issue. This page also houses a Factor Cal (Factory Calibration) button for SeedMaster and Dealer use during a service call or visit.

ACTIVE ALARM PAGE

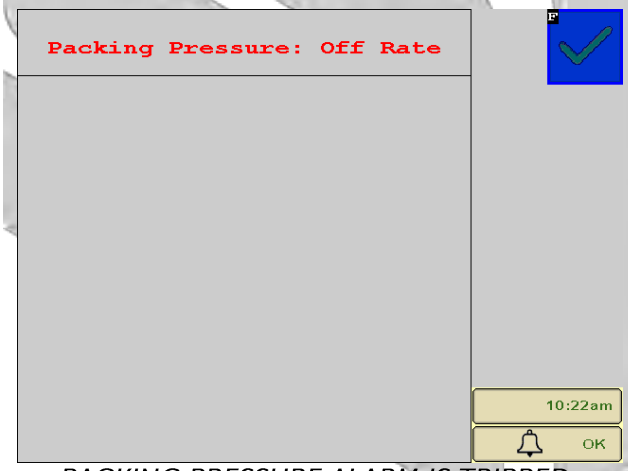
If the color around the bell changes to yellow, this means that there is an active alarm. If you touch in the bell it will display the Active Alarms Page. Touch the Home button to return to the home page after the alarm has been determined.



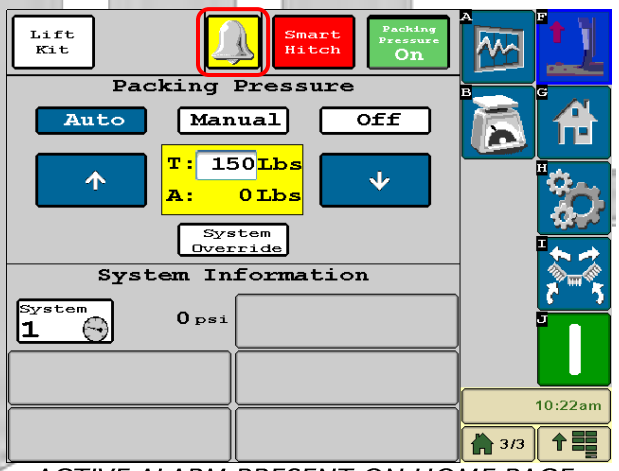
NO ALARM ON HOME PAGE



NO ACTIVE ALARMS ON ALARM PAGE



PACKING PRESSURE ALARM IS TRIPPED



ACTIVE ALARM PRESENT ON HOME PAGE

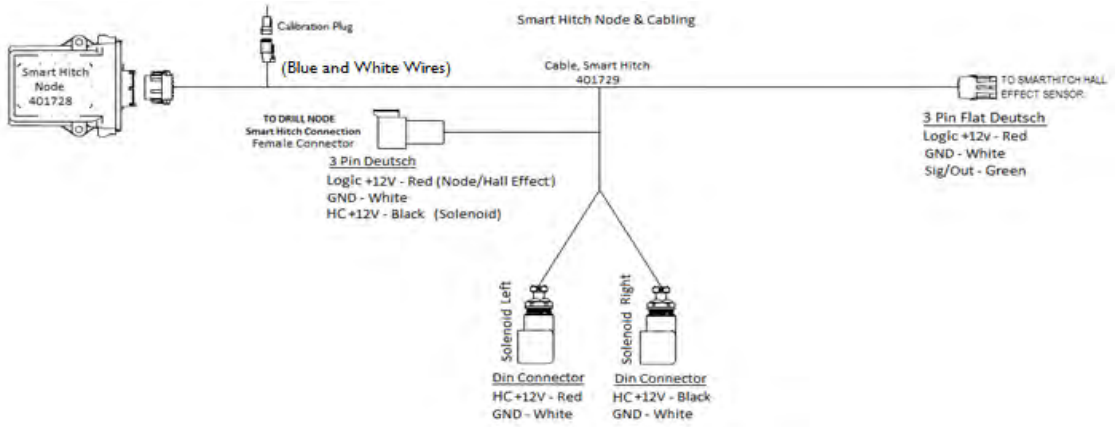
SMARTHITCH CALIBRATION

The SmartHitch raises and lowers with the Openers on your SeedMaster ToolBar. Open the Needle Valve on the Sensor Lift Cylinder ¾ of a turn, the amount you open the valve determines the speed the Smart Hitch raises and lowers at the headlands. Remove the 1" bolt on the hitch tongue before trying to operate the SmartHitch. Follow the steps below to perform a calibration on the SmartHitch.

1. Power up the ISO VT
2. **Lower the Openers and SmartHitch**. Place a level across the SmartHitch disks to ensure the disks are level.
3. When both disks are perfectly level, **unplug High Current (HC) fuse (15AMP/Blue Fuse) at Drill Node**
4. **Unplug the calibration plug** (Blue and White Wire, see drawing below)
5. **Turn SmartHitch on**. (From the ISO TXB main screen touch the RED SmartHitch Button to turn it on. The button should be green now)
6. **Wait 15 seconds**
7. **Turn off SmartHitch** from the ISO TXB main screen
8. **Plug the calibration plug back in** (Blue and White Wire)
9. **Plug HC fuse back in**
10. **Turn ON SmartHitch** from the ISO TXB main screen
11. Test the operation for left and right and speed.
12. Left disk lifted should move hitch tongue to left side
13. Right disk lifted should move hitch tongue to right side

NOTE: When not in use turn the SmartHitch off, and lock up with Needle Valve on the Lift Cylinder

***Adjusting the speed of the SmartHitch that it will operate while in the field**: If the speed is set to move at a high speed, moving it too quick can shift the tractor causing it to require an auto steer correction. Adjust the hydraulic flow to the SmartHitch directional block by using a 1/2" wrench to loosen the jam nut and a 5/32" Alan wrench to turn the flow needle valve in or out. Turning it out to increase speed and in to decrease speed.*


Smart Hitch Node & Cabling
Calibration Plug
(Blue and White Wires)
Smart Hitch Node 401728
Cable, Smart Hitch 401729
TO SMARTHITCH HALL EFFECT SENSOR
3 Pin Flat Deutsch
Logic +12v - Red
GND - White
Sig/Out - Green
TO DRILL NODE
Smart Hitch Connection
Female Connector
3 Pin Deutsch
Logic +12V - Red (Node/Hall Effect)
GND - White
HC +12V - Black (Solenoid)
Solenoid Left
Solenoid Right
Din Connector
HC +12V - Red
GND - White
Din Connector
HC +12V - Black
GND - White

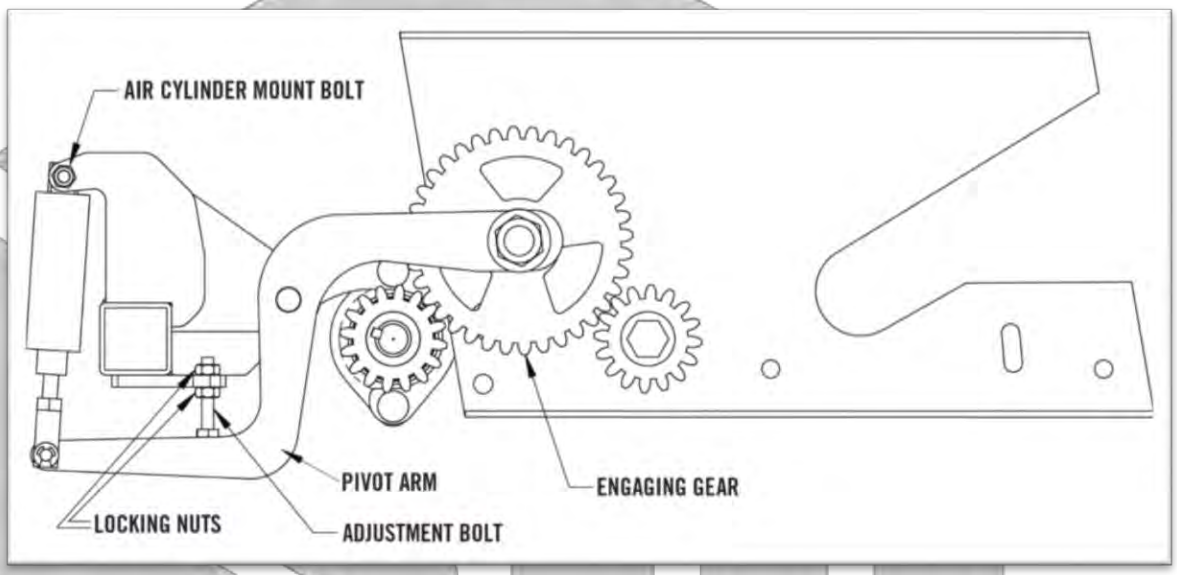
GEN I ONFRAME TANKS

GEN I ZONE COMMAND METER BOX (VALMAR STYLE)

The mechanical adjustments of the Zone Command Meter Box will be pre-set at the factory. *It is the owner's responsibility to ensure that Zone Command is functioning properly. SeedMaster is not responsible for misses or skips in product application.*

Periodic checks of moving components are necessary to ensure long term trouble-free operation. Please follow the instructions below:

Typical Zone Command mechanical components



Zone Command components also shown in the SeedMaster Tank Parts Manual.

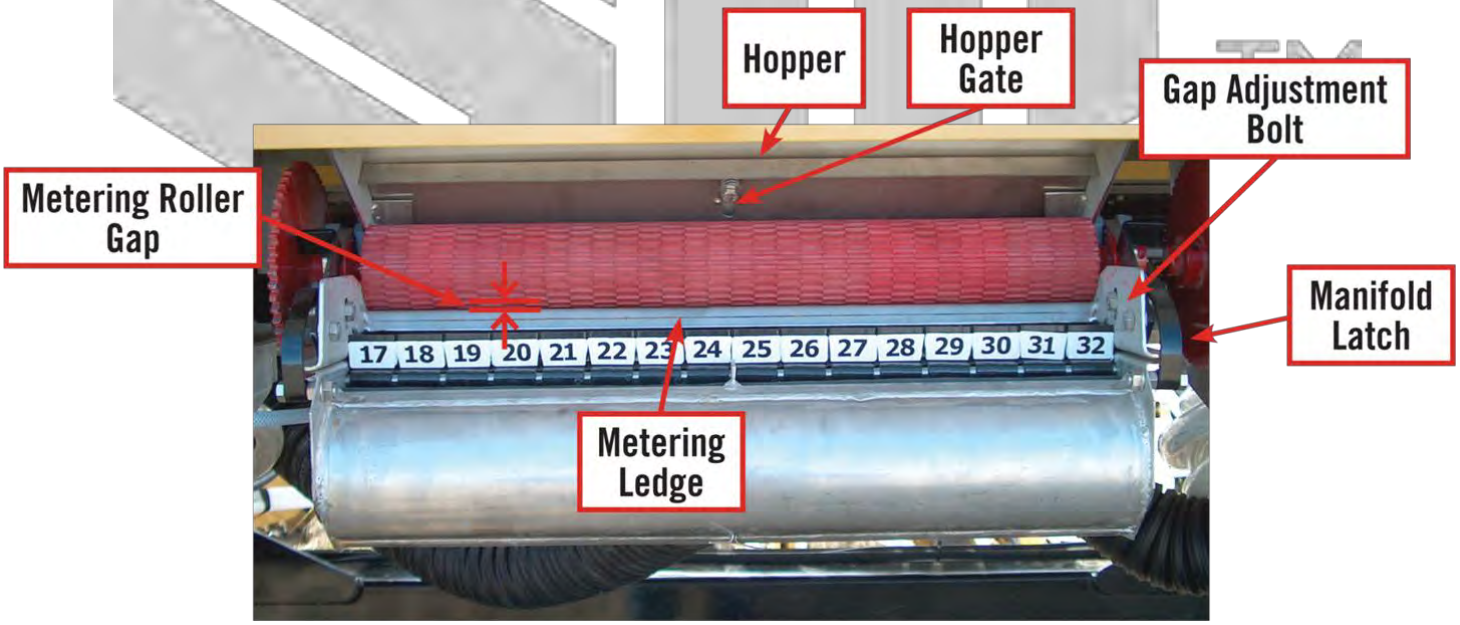
1. Loosen the nut on the engagement gear so that the gear is able to freely slide in the slot holding it.
2. Turn the adjustment bolt until the engaging gear is allowed to fully mesh with both small gears.
3. Tighten the nut on the engaging gear, locking the position of the gear in place. While doing this, ensure that the gear is able to turn freely, while still being held snugly in place.
4. Manually extend air cylinder rod so that engaging gear is disengaged. Ensure gear doesn't have excessive side to side play, but is not so snug that it doesn't turn freely.
5. Turn the adjustment bolt until it is touching the pivot arm, and then give a last half turn to lift the engaging gear slightly off the smaller gears. This will prevent the gears from binding which causes excessive wear to gears.
6. Pull on bottom of air cylinder rod. Let go of the rod and cylinder should retract on its own. If air cylinder mount bolt is too tight, it may cause the pivot arm to not return to the seeding position.

GEN I ONFRAME ROLLER TYPES (VALMAR STYLE)

Refer to the table below for the type of roller and the gap setting for different types of products.

Roller Size	Gap	Large Seed	Density (lbs/bu)	Flow Rate (lbs/rev/venturi)
Grey Rollers	1/8"	Wheat, Durum	62	.116 (range .10 - .19)
Grey Rollers	1/8"	CPS wheat (Taber)	62	.125 (range .11 - .15)
Grey Rollers	1/8"	HRS wheat (Minto)	62	.141 (range .12 - .16)
Grey Rollers	1/8"	Barley (Manley)	50	.109 (range .10 - .12)
Grey Rollers	1/8"	Oats (Dumont)	40	.072 (range .06 - .085)
Grey Rollers	1/8"	Lentils (Laird)	63	.170 (range .14 - .20)
Black Rollers	3/8"	Peas (Sirius)	60	.140 (range .10 - .19)
Black Rollers	3/8"	Fertilizer	65	.113 (range .10 - .16)
Grey Rollers	1/8"	Fertilizer	65	.110 (range .10 - .13)
Roller Size	**Gap**	**Small Seed**	**Density (lbs/bu)**	**Flow Rate (lbs/rev/venturi)**
Red Roller	1/8"	Flax (Norman)	56	.045 (range .035
UltraPro	N/A	Canola (Sing. Treat)	50	.0057 (range .0035
Red Roller	1/8"	Mustard (Brown)	50	.057 (range .045

NOTE: *If excess amount of seed is being crushed by roller, increase roller gap. If excess pea kernels are being shot out, increase roller gap.*



ONFRAME METER REAR VIEW

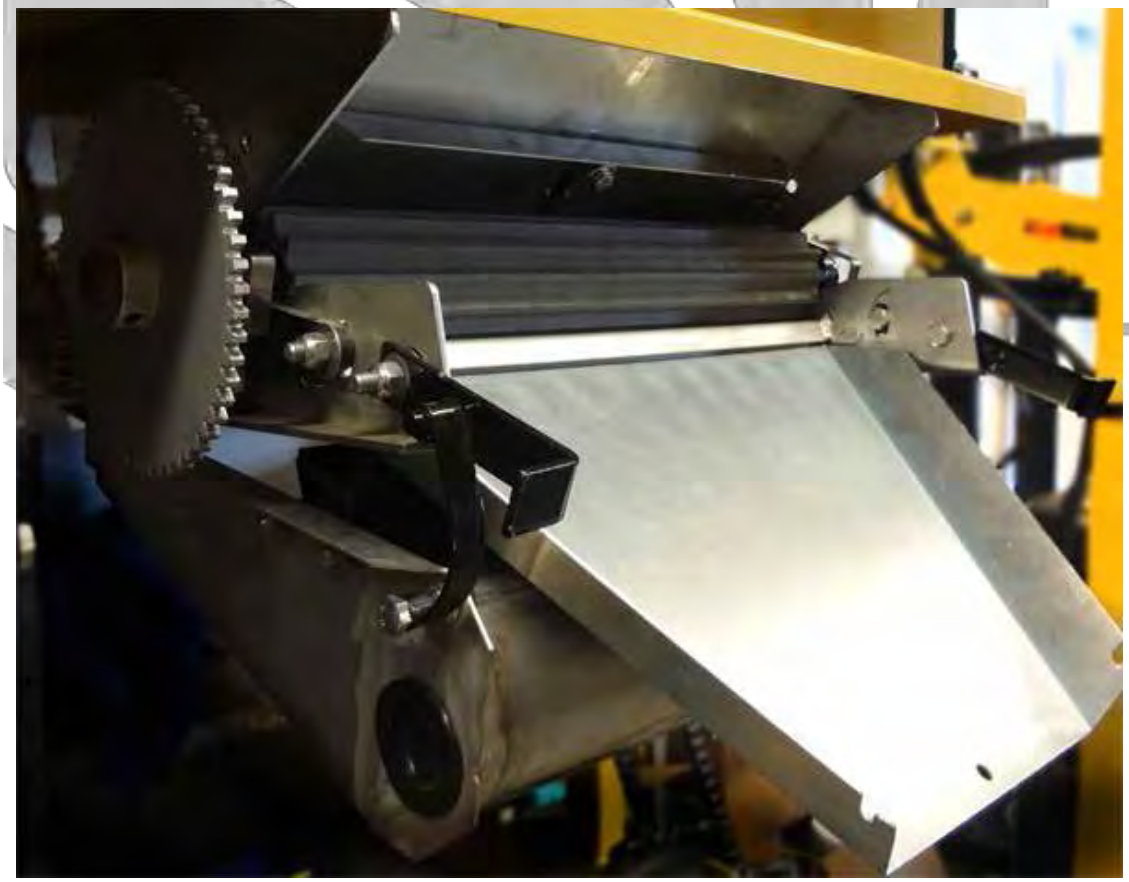
GEN I CALIBRATION PROCEDURE PRE-SETUP (VALMAR STYLE)

Check the metering rollers. Worn, encrusted, or dirty rollers will not meter accurately.
Check the metering roller gap. Ensure that the metering ledge is free of buildup. Product application rate is affected by the gap between the metering rollers and metering ledge.
Note: *It is crucial that all metering roller gaps be the same for each roller across the full drill width. For large seed use the black, rubber-tipped roller with a roller gap of 3/8" or wider; for all other seed rollers, use a roller gap of 1/8".*
To change roller gap:

- Loosen the gap adjustment bolts on both sides of the metering section.
- Insert appropriate width gauging spacers (e.g. drill bit) between the metering roller and metering ledge.
- Tighten the bolts securing the roller bearing assembly. Remove spacer from between metering roller and metering ledge.

⚠CAUTION Hoppers must contain material. Close all hopper gates except the one hopper bottom being used for calibration or use Zone Command controls to dispense product from the desired metering section. Be prepared to catch the material from one metering section in a container so it can be weighed at the end of the calibration.

See page 70 for the step by step calibration procedure.



Meter ready to collect product with catch tray setup

GEN I FAN PRESSURE GUIDELINES (VALMAR STYLE)

Before starting for the day, run fans for a minimum of 10 minutes to dry moisture out of the hoses and venturis.

Use the following table as a guide for setting on-board tank fan pressures.

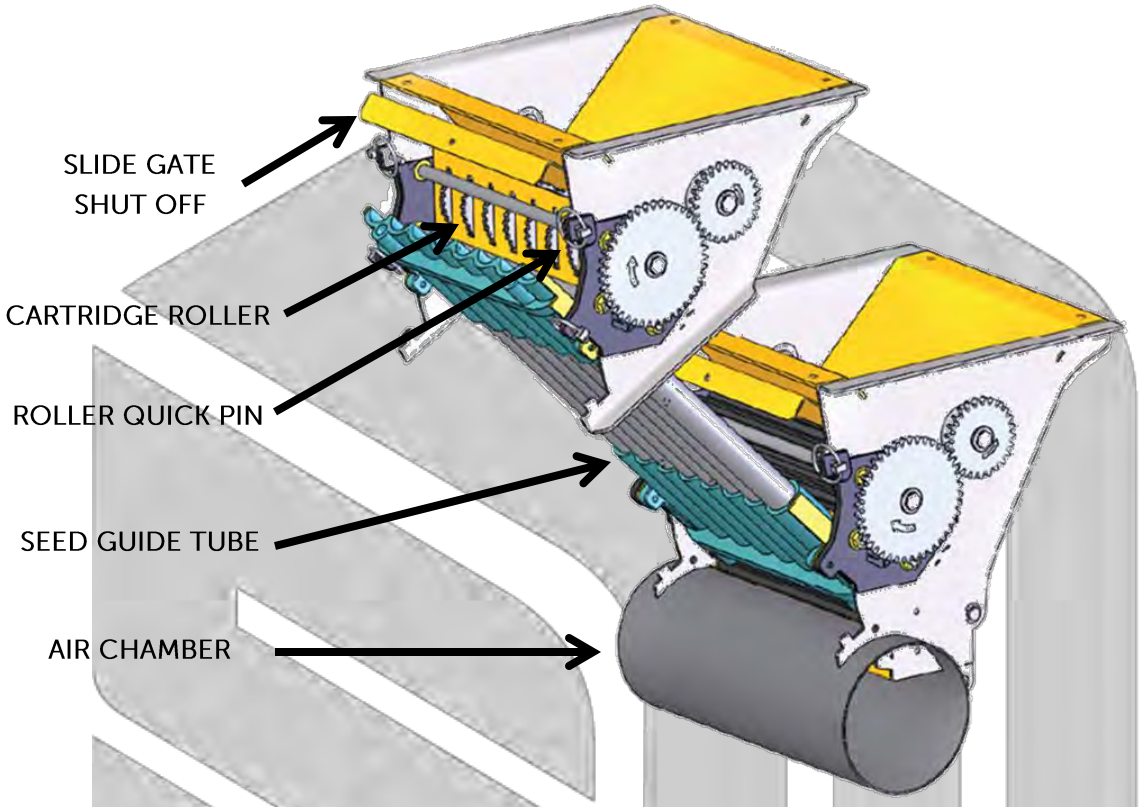
Product	Application Rate Lbs/ac	Drill Size Range Feet	Air Pressure Ounces	Air Pressure PSI	RPM
Fertilizer	50 to 100	30 to 48	11 to 13	0.69 to 0.81	4000
Fertilizer	100 to 200	30 to 48	12 to 15	0.75 to 1.00	4200 to 5000
Fertilizer	200+	30 to 48	13 to 17	0.81 to 1.06	5000 +
Fertilizer	50 to 100	50 to 100	12 to 16	0.75 to 1.00	4200 to 4900
Fertilizer	100 to 200	50 to 100	14 to 17	0.88 to 0.94	4500 to 5000
Fertilizer	200+	50 to 100	17 +	1.06 to 1.31	5000 +
Wheat	80 to 130	30 to 48	12 to 14	0.75 to 0.88	4200 to 4800
Wheat	80 to 130	50 to 100	14 to 17	0.88 to 1.06	4800 to 5000
Barley	70 to 100	30 to 48	12 to 14	0.75 to 0.88	4200 to 4800
Barley	70 to 100	50 to 100	14 to 17	0.88 to 1.06	4500 to 5000
Canola	2 to 5	30 to 48	9 to 10	0.63 to 0.69	3500 to 3900
Canola	2 to 5	50 to 100	10 to 11	0.69 to 0.75	3900 to 4100
Flax	40 to 55	30 to 48	10 to 11	0.63 to 0.75	3900 to 4200
Flax	40 to 55	50 to 100	11 to 12	0.75 to 0.88	4100 to 4300
Peas	150 to 200	30 to 48	12 to 16	0.75 to 1.00	4200 to 5000
Peas	150 to 200	50 to 100	15 to 18	0.94 to 1.12	4900 to 5300

Pressure too LOW - causes potential plugging in lines
Pressure too HIGH - product bounces or blows out of furrow

GEN II ONFRAME TANKS

GEN II ZONE COMMAND METER BOX (ULTRAPRO II)

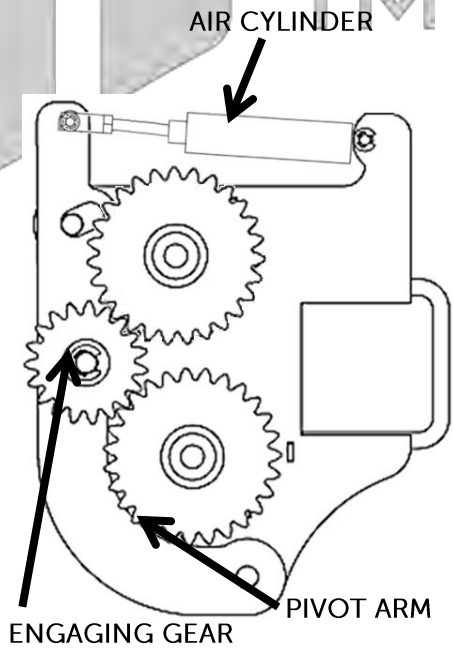
The UltraPro II Meter is the next generation in SeedMaster metering. The mechanical adjustments of the Zone Command Meter Box will be pre-set at the factory.
It is the owner's responsibility to ensure that Zone Command is functioning properly. SeedMaster is not responsible for misses or skips in product application.
Periodic checks of moving components are necessary to ensure long term trouble-free operation. Please follow the instructions below:



***Note**: Zone Command components also shown in the SeedMaster Tank Parts Manual.*

Zone Command Check

1. Manually extend air cylinder rod so that engaging gear is disengaged. Ensure gear turns freely, and both the air cylinder and pivot arm pivot freely.
2. The pivot arm is designed with limits for engaging and disengaging. This will allow the gear to engage smoothly and prevent binding and excessive wear.
3. Test the Zone Command by pulling on the air cylinder rod and letting go of the rod. The cylinder should retract on its own to the seeding position. If it has tight pivot point, it may cause the pivot arm to not return to the seeding position.
4. Ensure that all quick keeper pins are installed into the roller cartridges and seed guide tube, this will keep the meter rollers retained and in the proper drive position.



GEN II CALIBRATION PROCEDURE PRE-SETUP (ULTRAPRO II)

Check the metering rollers. Worn, encrusted, or dirty rollers will not meter accurately. Ensure that the metering ledge is free of buildup as product application rate can be affected by the gap between the metering rollers and metering ledge.

Note: *It is crucial that all metering roller are installed fully, ensuring that all retaining quick pins are placed into all pin locations.*

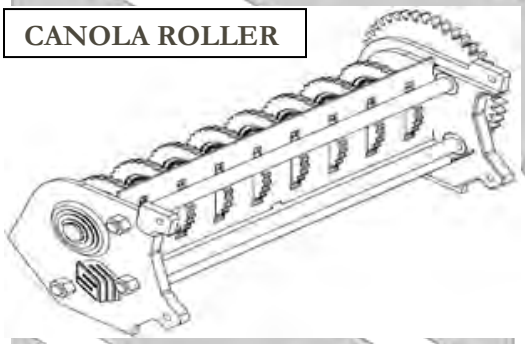
⚠CAUTION Hoppers must contain material. Close all hopper gates except the one hopper bottom being used for calibration or use Zone Command controls to dispense product from the desired metering section. Be prepared to catch the material from one metering section in a container so it can be weighed at the end of the calibration.

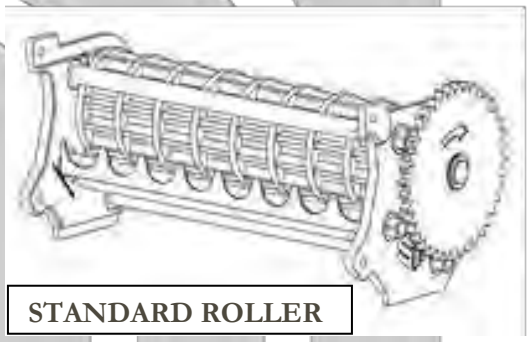
ULTRAPRO METER ROLLERS:

The UltraPro Canola Roller can be used to meter Canola, Mustard, Granular Inoculant, and other fine products.

The Ultra pro Standard Roller can be used to meter Cereals, Lentils, Peas, Beans, and all other coarse products.

CANOLA ROLLER



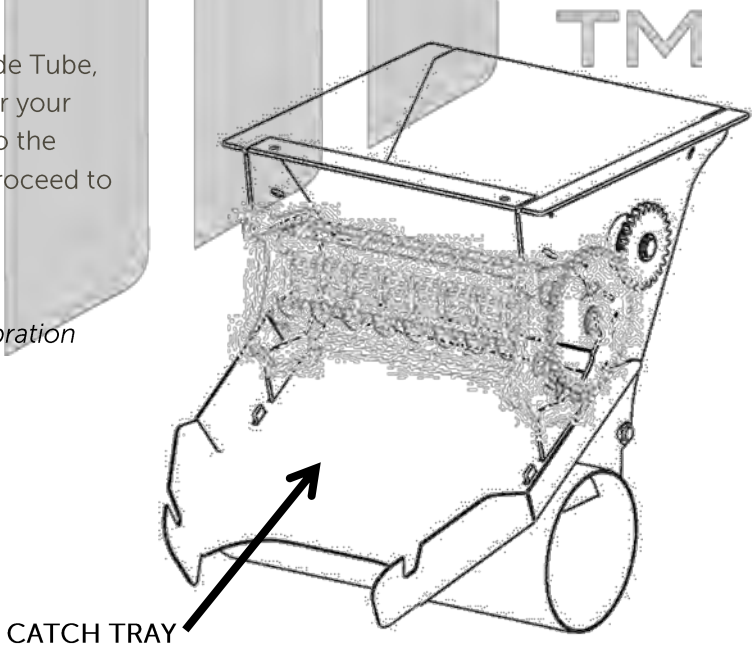


STANDARD ROLLER

METER BOX WITH CATCH TRAY

To setup for calibration remove the Seed Guide Tube, and ensure that you have the correct roller for your product type. Then, install the catch tray on to the desired meter to complete a catch test and proceed to calibration procedure.

NOTE: See page 70 for the step-by-step calibration procedure.



GEN II FAN PRESSURE GUIDELINES (ULTRA PRO II)

Before starting for the day, run fans for a minimum of 10 minutes to dry moisture out of the hoses and venturis.

Use the following table as a guide for setting on-board tank fan pressures.

Product	Application Rate Lbs/ac	Drill Size Range Feet	Air Pressure Ounces	FAN RPM
Fertilizer	50 to 100	30 to 48	10 to 12	3800 to 4000
Fertilizer	50 to 100	50 to 100	12 to 16	4000 to 4900
Wheat	80 to 130	30 to 48	12 to 14	4000 to 4800
Wheat	80 to 130	50 to 100	14 to 17	4800 to 5000
Barley	70 to 100	30 to 48	12 to 14	4000 to 4800
Barley	70 to 100	50 to 100	14 to 17	4500 to 5000
Canola	2 to 5	30 to 48	9 to 10	3000 to 3800
Canola	2 to 5	50 to 100	10 to 11	3800 to 3900
Flax	40 to 55	30 to 48	10 to 11	3800 to 3900
Flax	40 to 55	50 to 100	11 to 12	3900 to 4300
Peas	150 to 200	30 to 48	12 to 16	4000 to 5000
Peas	150 to 200	50 to 100	15 to 18	4900 to 5300

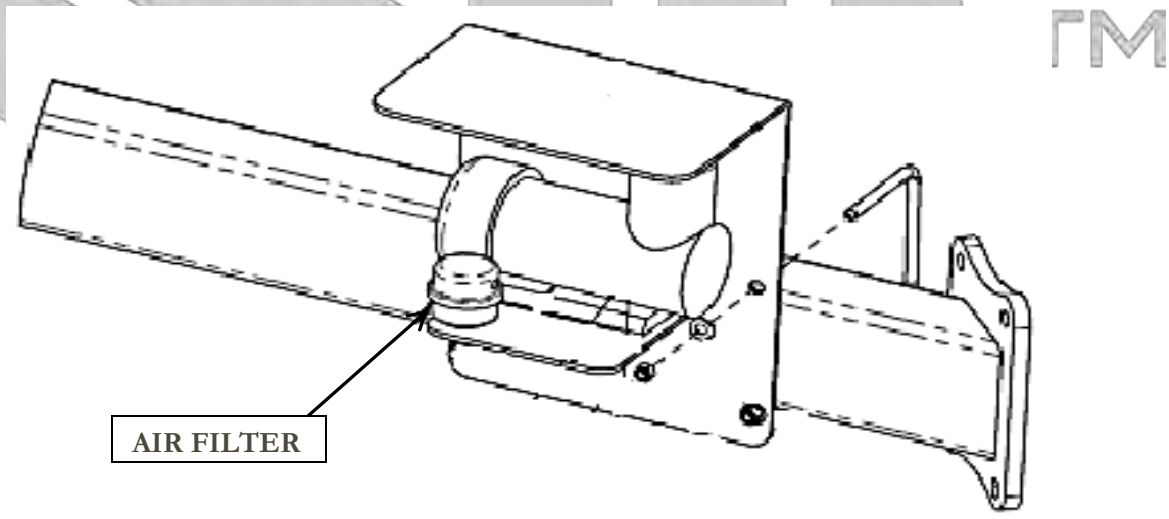
Pressure too LOW - causes potential plugging in lines
Pressure too HIGH - product bounces or blows out of furrow

ZONE COMMAND AIR COMPRESSOR

Zone Command is controlled pneumatically. Located on the drill is a compressor and air tank. The compressor is set to turn off when the pressure in the tank reaches 105 psi, and to turn on when the pressure falls below 85 psi. The regulator is used to reduce the tank pressure for the air cylinder. This regulator is factory set to 65 psi.

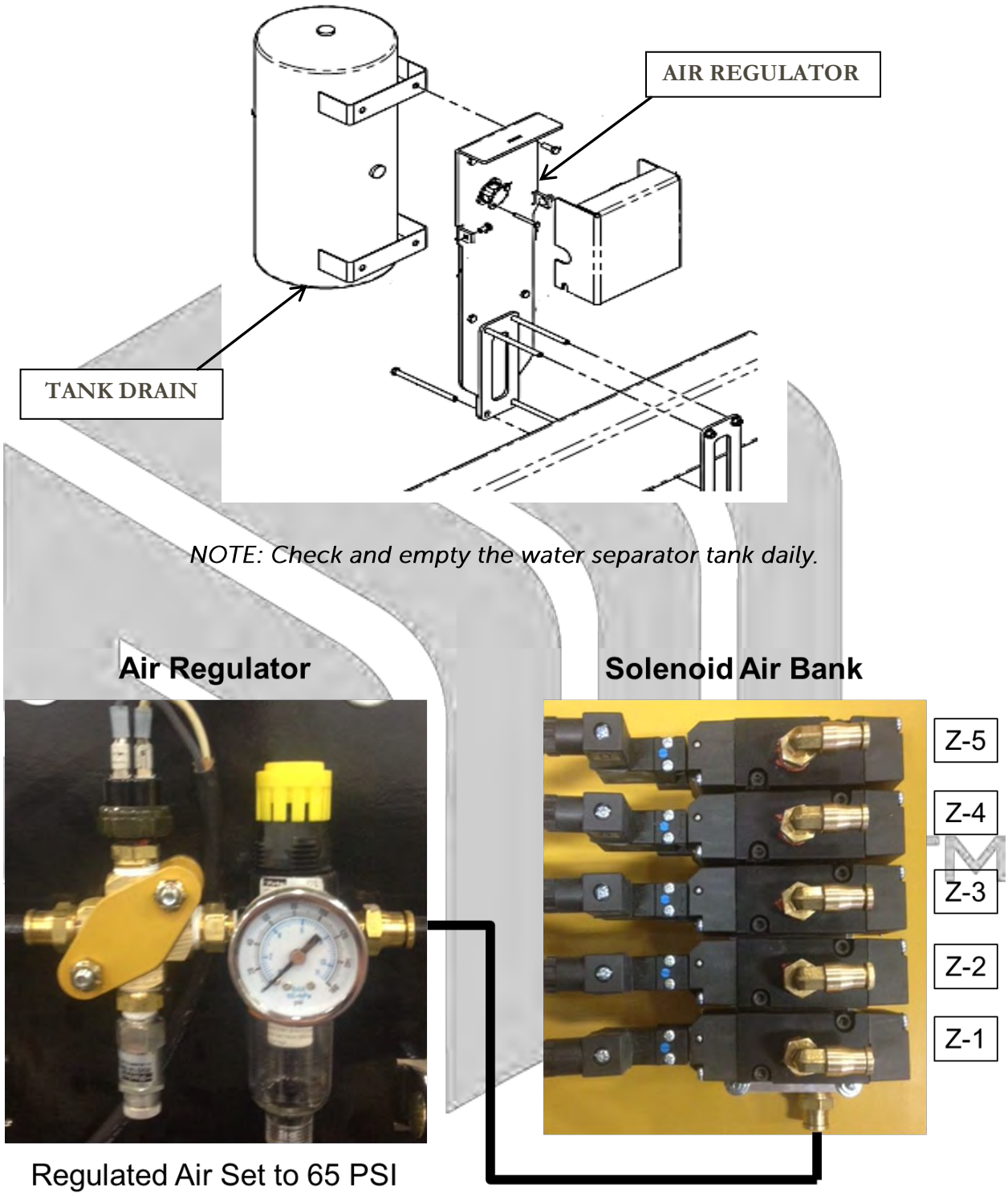
NOTE: The air compressor will start when the monitor is powered on, ensure that the compressor builds up to proper operating pressure and shuts off. Inspect air system for any air leaks, which may increase compressor run times.

Zone Command Air Compressor



NOTE: Check and replace the air inlet filter on the compressor daily. Ensure that the air filter is dry and not dirty, or damage to the compressor will result.

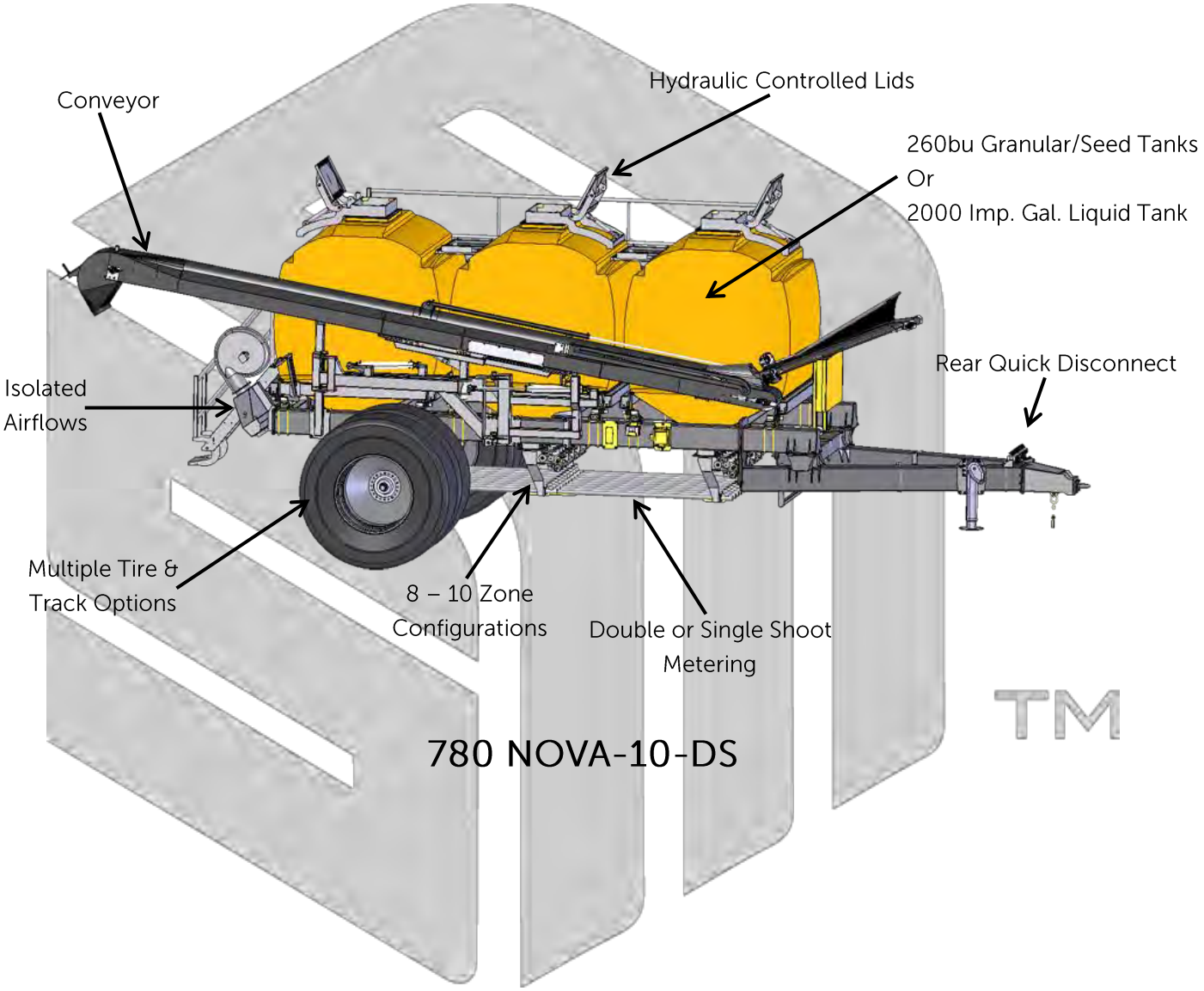
ZONE COMMAND AIR SYSTEM



Zone Command Air Components

NOVA TANK

There are many different configurations of the NOVA tank. The image below illustrates a 780 NOVA and some of the many options and features the NOVA has to offer. This section of the operator's manual will explain the key features and the settings for the NOVA tank.



NOVA ZONE COMMAND / METER BOX

Nova carts are setup as either an 8 zone or 10 zones depending on drill size. The number of meter boxes is typically the number of zones being operated as each meter is expelling product to an individual air stream and tower. The meter boxes are engaged and disengaged with an air cylinder. If an air cylinder is to fail it will fail to the engaged position. Each meter is setup with a sprocket selection to adjust the amount of product between 6, 7 and 8 run outlet towers. This is to reduce the percent of error between towers and each run. The 8 run manifold will be configured to the 15-20 tooth sprockets on the side of the meter box to the main shaft and the 6 run manifold will be configured to the 20-15 tooth sprockets on the side of the meter box to the main shaft. The 7 run manifold will be used when zones are all equal widths and will be configured to 20-15. Example: (70-12 with 10 zones nova).

Air Cylinder for engaging and disengaging the meter's zone command

In the image above the meter box is configured for an 8 run manifold (15-20)

Note: Meter box housing has a removable plate which encloses the roller ends. This roller clean out plate can be removed to clean build up product from metering box and roller. The roller clean out plate can be excessed through the bottom clean out gate.

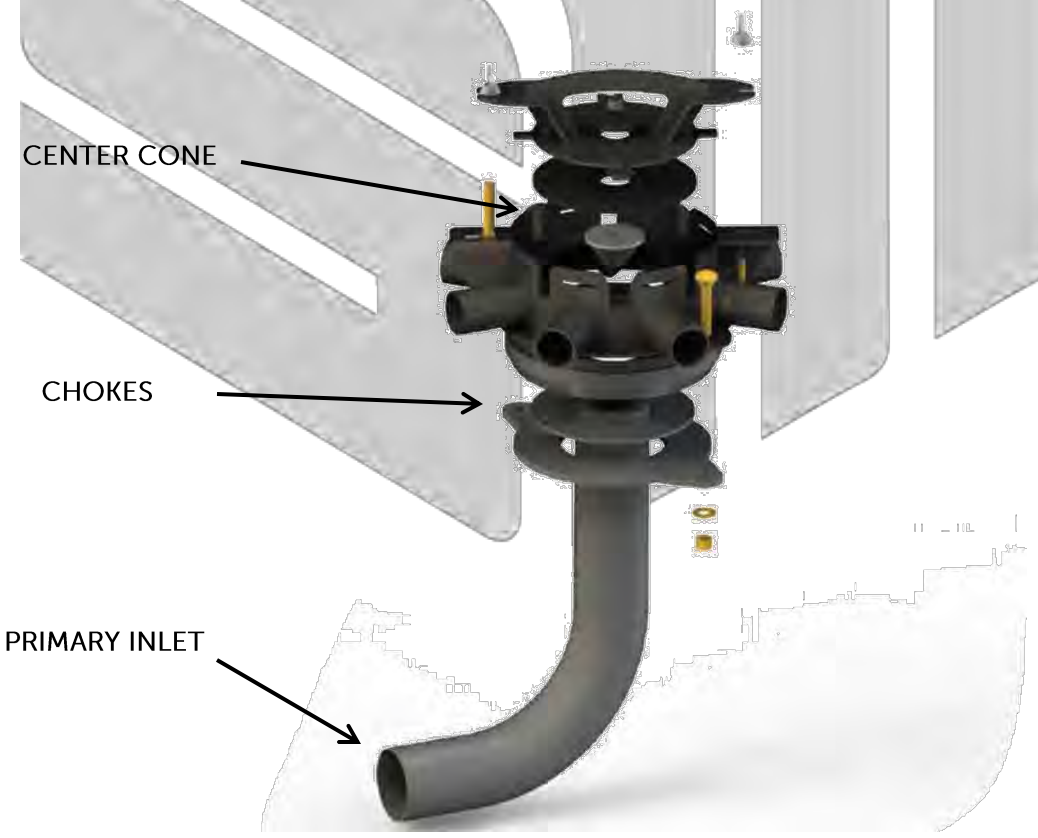
PNEUMATIC CONNECTIONS

Connect the 3/8" air hose at the Nova hitch to the push-on fitting located on the drill. A minimum of 65 psi pressure from the on-frame air receiver is requires to operate Zone Command. See compressor in On Frame section of manual for more information.

TUNABLE TOWER

The tunable tower is an industry leading Stainless steel manifold in product flow. Configured in 6, 7, and 8-outlet, the product flows unrestricted through 1-inch delivery lines from manifold to shank. The manifold is designed with a drain-back feature to limit plugged product delivery lines. To increase the manifold performance, it is combined with equal length primary delivery lines providing a more consistent back-pressure for distribution.

The tunable top of the tower allows you to manipulate product flow to all the runs by adjusting the center-cone. To tune the tower manifold properly, it requires a highly sensitive, product-monitoring system for optimum distribution.



NOVA PRODUCT SELECTION

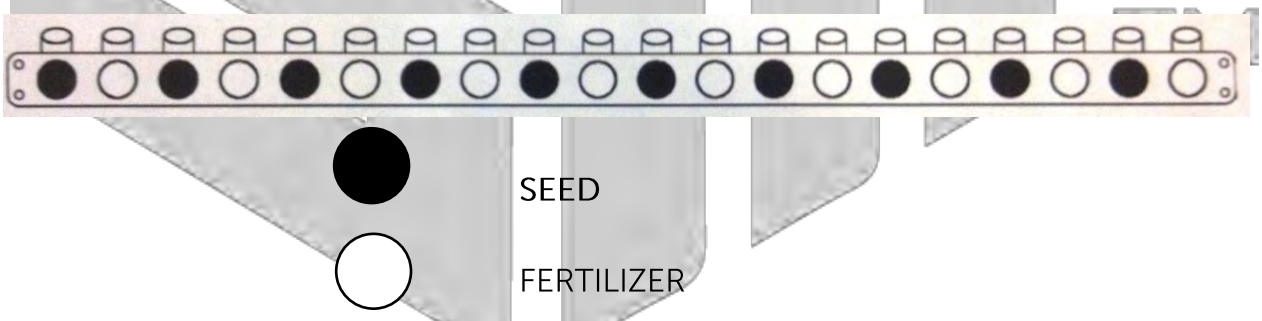
Under the dual-shoot, 10 zone Nova, there are 10 metering boxes and 20 hoses. 10 hoses lead to the fertilizer towers and 10 hoses lead to the seed towers.

Other Nova configurations are:

- Single-shoot, 10 zone (10 meters, 10 hoses)
- Dual-shoot, 8 zone (8 meters, 16 hoses)

SEED AND FERTILIZER RUNS, DUAL SHOOT, 10 RUN NOVA

Under each tank in a dual-shoot configuration, you will be able to choose to connect the meter to either fertilizer or seed runs. The seed runs start on the left side of the cart (looking from behind) and alternate between seed and fertilizer. Likewise, the fertilizer runs start on the right and alternate with seed runs.



SEED AND FERTILIZER RUNS LOOKING FORWARD FROM BACK OF CART

The 3 large tanks can be adjusted to provide product to either seed or fertilizer knives in a dual-shoot configuration.

If you would like to dispense product from a tank to the seed runs, connect the far left run to the far left meter, and then work your way across, connecting meters to every second run. If you would like to dispense product from a tank to the fertilizer runs, connect the far right run to the far right meter, and work your way across, connecting meters to every second run. Ensure that the runs that are not connected have a plug firmly installed with an airtight seal. Failure to create an airtight seal may cause an uneven seeding condition.

Always meter a small amount of product in a stationary position to ensure that each product is delivered in the desired seed or fertilizer knives.

To change from seed to fertilizer or from fertilizer to seed, take all of the yellow plugs out and replace them with a flexible tube. Insert the yellow plugs where you disconnected flexible tubes.

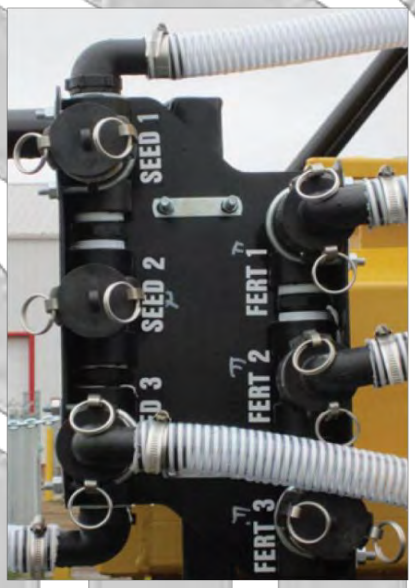
PRODUCT RUN SELECTION

FANS ON AIR SPLITTER

NOTE: The fan connected to the top of air splitter is the seed fan and the lower fan is the fertilizer fan.

NOVA PRESSURE AND TOP-UP AIR

When a tank is selected to meter to the seed or fertilizer knives, the top-up air must be set to match the proper fan. When the tank is metering to the seed knife, the top up air must come from the seed fan.



NOTE: When you change the product selection at the tank, do not forget to switch the top-up air at the same time.

INDIVIDUAL METER INSPECTION

It is possible to inspect meter parts while the tank is full of product.

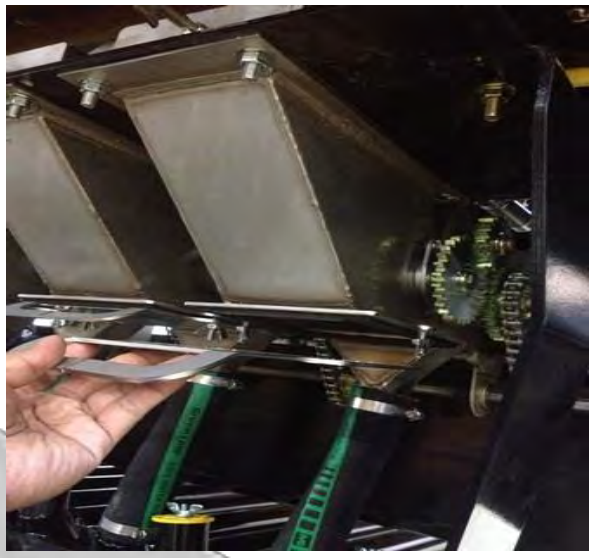
1. Shut off hydraulics to fans and metering.
2. Remove slide gate cover.

SLOT

SLOT COVER

3. Note internal wings are aligned with external wings for ease of assembly.
4. Loosen wing nut and turn exterior wings until parallel with the slot.
5. Insert slide gate and open meter bottom cover. (approximately 1 gal. of product will fall out)

SLIDE-IN GATE



BOTTOM COVER

6. Inspect metering.
7. Close bottom meter cover (ensure a good seal) and remove slide gate.
8. Reinstall slot cover, tightening wing nut while holding external wings in vertical position

NOTE: *Poor quality fertilizer or other foreign materials may cause uneven metering or damage to metering. Screening of all fertilizer products going into the Nova is highly recommended.*

WORK LIGHTS

There are three work lights on a Nova cart. One is located at the walkway, another is located at the signal light bracket and one is installed at the conveyor. The switch for the work light is mounted on the passenger side below the conveyor.

WORK LIGHT SWITCH

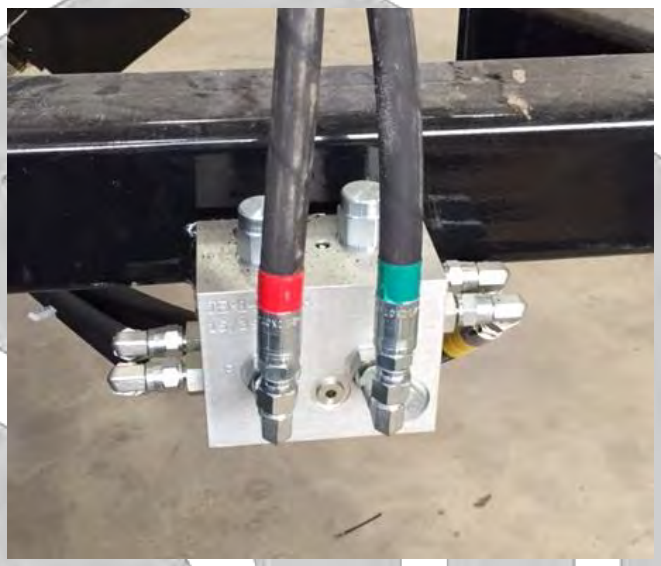
Note: *Protected by 10-amp fuse found in the main Nova electrical panel*

LID OPERATION

Automatically selects the highest hydraulic pressure fan source: The lids are designed to be held closed with hydraulic pressure when fans are in use (lid cylinders are being supplied with oil pressure to keep the lids closed).

Near the back of the cart (under the walkway) there is a selector valve. This valve will automatically select the fan that is running at a higher RPM. For example, if you are seeding canola, you should have the fan RPM turned down on the seed fan. This valve will ensure sufficient force to keep a tight seal on the lids.

Note: *We must ensure maximum seal is maintained on lids, for accurate metering rates.*



Lid Selection Valve

To open the lids, reverse the hydraulic remote for the fan that is pressurizing the lids. There is check valve on the fan return which will prevent the fan from turning backwards. All of the lids will open at once.

The lid selector valve will lock the lids from opening or closing, when the fans are shut off. Do not enter tanks without proper safety equipment and other personnel present. Never enter with equipment running or operating.

CONVEYOR

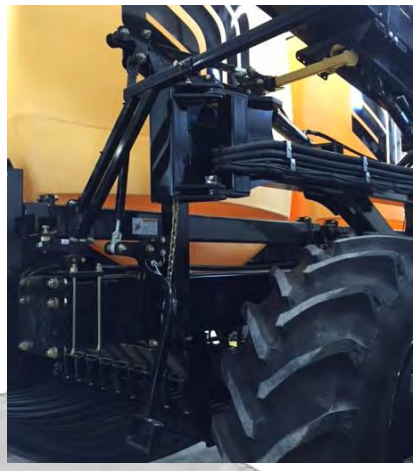
NOVA CONVEYOR

Similar to lid operation, to operate the conveyor you must reverse the hydraulic flow of the oil to the seed fan (pressure to white tagged hose). This will provide pressure to the conveyor hydraulics, which will be used to move the conveyor around the cart and provide flow for the conveyor motors. You may see the lids open when you reverse the fan flow depending on position of lid selector valve.

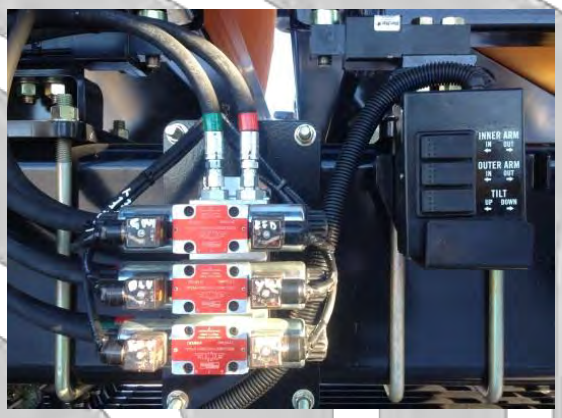
NOVA CONVEYOR CRADLE

Use the following procedure to release the conveyor from its cradle:

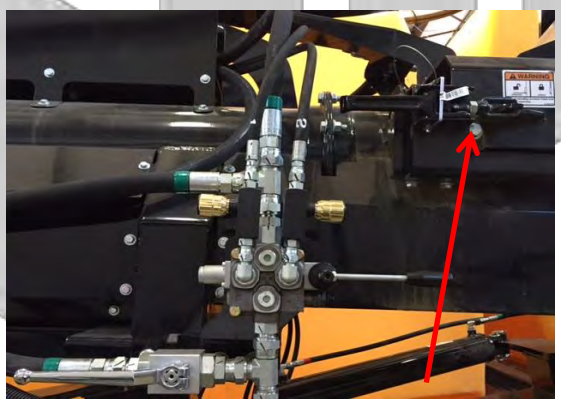
1. Release the safety lock chain, and unpin the latch handle. Move latch handle to release the conveyor transport lock arm.



2. Press the tilt button on the remote to tilt the conveyor up off the cradle.



3. Press the outer arm button to extend the cylinder and swing the arm out.
4. Use the inner arm, outer arm and tilt buttons to position the conveyor as desired.
5. The conveyor is equipped with hopper lock, ensure to unhook it before executing any movement of the hopper.



BALL VALVE HOPPER LOCK

To turn on the conveyor, open the ball valve to provide flow to the conveyor motor. Close the ball valve when done.

NOVA FAN PRESSURE GUIDELINES

Before starting for the day, run fans for a minimum of 10 minutes to dry moisture out of the hoses and venturis.

Use the following table as a guide for setting Nova fan pressures.

NOTE: AIR PRESSURES AND RPM'S ARE INICATED WITH NO PRODUCT FLOWING				
Product	Application Rate Lbs/ac	Drill Size Range Feet	Air Pressure Ounces	RPM (HIGH FLOW) BLACK FAN
Fertilizer	50 to 100	50 to 100	9 to 11	3350 to 3600
Fertilizer	100 to 200	50 to 100	11 to 13	3600 to 3950
Fertilizer	200+	50 to 100	13 +	4000 +
Wheat	80 to 130	50 to 100	12 to 14	3775 to 4075
Barley	70 to 100	50 to 100	11 to 13	3600 to 3950
Canola	2 to 5	50 to 100	7	3000
Flax	40 to 55	50 to 100	9 to 11	3350 to 3600
Peas	150 to 200	50 to 100	15 to 17	4100 to 4400

Pressure too LOW - causes potential plugging in lines

Pressure too HIGH – product bounces or blows out of furrow

SEEDMASTER APP

The SeedMaster Seed Rate Calculator is a two-part App, part one of the App will allow a grower too rapidly and effectively calculate a seed rate to achieve a desired plant population within a given field. Part one of the App will also allow a grower to calculate how many pounds of seed that is required and the total cost associated.

Part two of the App is associated with SeedMaster machines that are controlled by the Raven Viper in-cab monitor or ISOBUS RCM. A "cal weight" number controls the rate of the granular metering system. Every granular product requires a calibrated cal weight number to allow the product to be metered at the desired rate.

The Cal Weight Estimator will allow a grower to receive an estimated calibration number for a specific product being metered, meter type used, and drill width. SeedMaster recommends that an initial calibration catch test be performed to ensure calibration accuracy. The purpose of providing this tool is to alert a grower of a potential error during the calibration process before unwanted field results can occur. This tool will be especially valuable for new operators or when new products are metered.

The Cal Weight Info Submission will allow growers to very easily and quickly send their calibration information to SeedMaster. This will allow SeedMaster to provide a more accurate estimated calibration number to all users of the App. Not only will yourself benefit in the future, but all users of the App. All submissions are reviewed by SeedMaster to ensure validity before becoming a component of the Cal Weight Estimator.

The Cal Weight Note Book is a grower's own personal notebook with saved calibration values from his or her own specific machine(s). All Cal Weight submissions are automatically stored for the grower for future reference at any time.

Download on the App Store

ANDROID APP ON Google play

Part 1: Seed Rate Calculator

Figure 1: **Rate Tab**. Pg1 → Use the slider bars to set the desired values to determine your seed rate in LBS/ACRE.

Figure 2: **Rate Tab**. Pg2 → Use this page to as a guideline for target plants/ft and TWG.

Figure 3: **Cost Tab** → Use the slider bars to determine how much seed is required and an estimated cost.

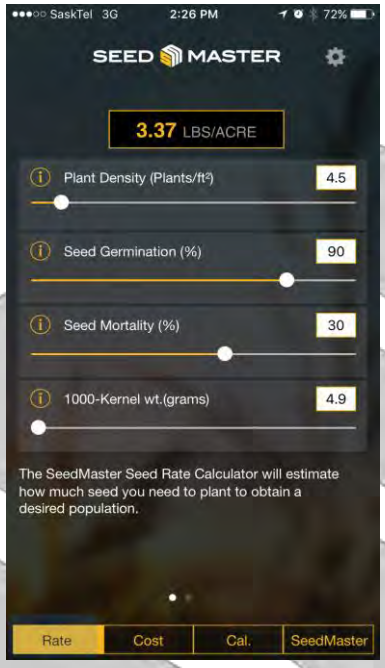


Figure 1

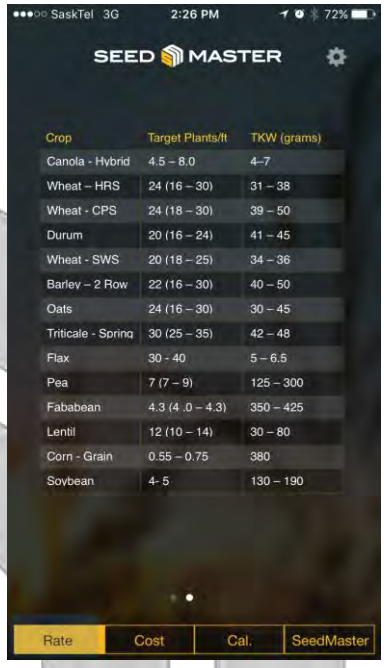


Figure 2

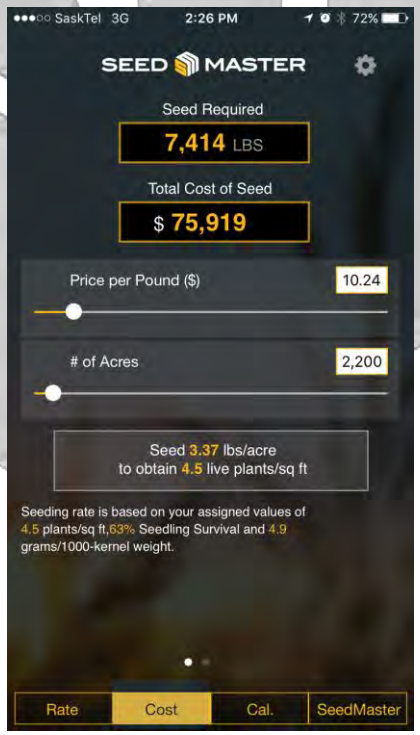


Figure 3

Part 2: Cal Weight Estimator

Figure 4: → Operator Liability Warning

Figure 5: **Cal. Tab.** Pg1 → Choose the product type, meter type and drill width to determine an estimated cal weight.

Figure 6: **Cal. Tab.** Pg2 → this page gives you the ability to submit your cal weights

Figure 7: **Cal. Tab.** Pg3 → Submitted cal weights get stored in the Cal Weight Note Book.

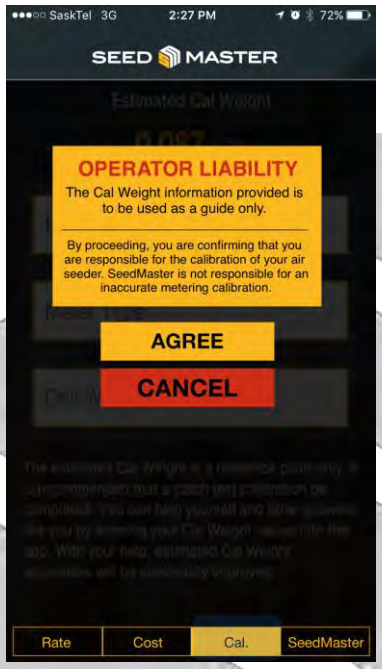


Figure 4

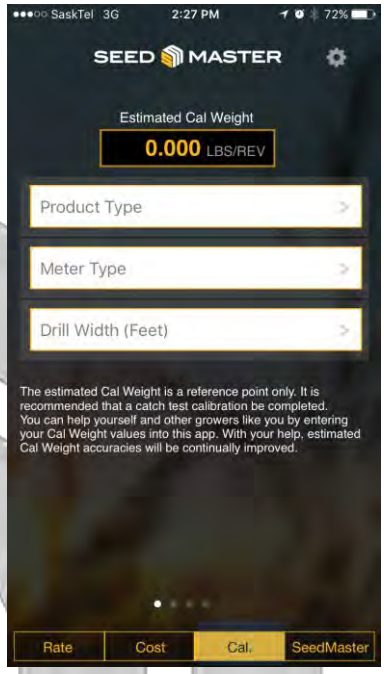


Figure 5

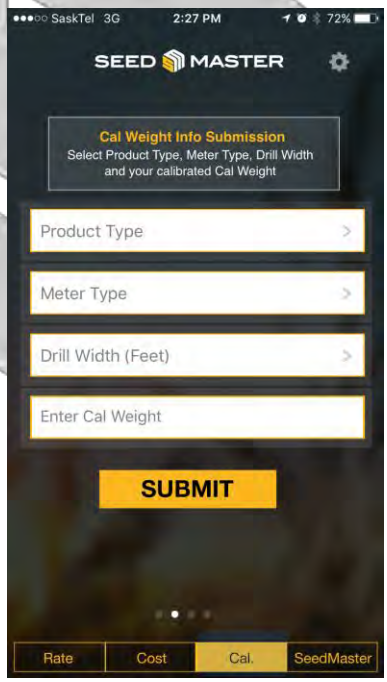


Figure 6

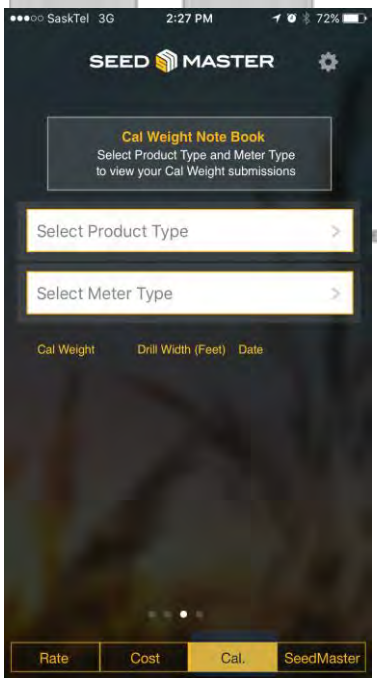


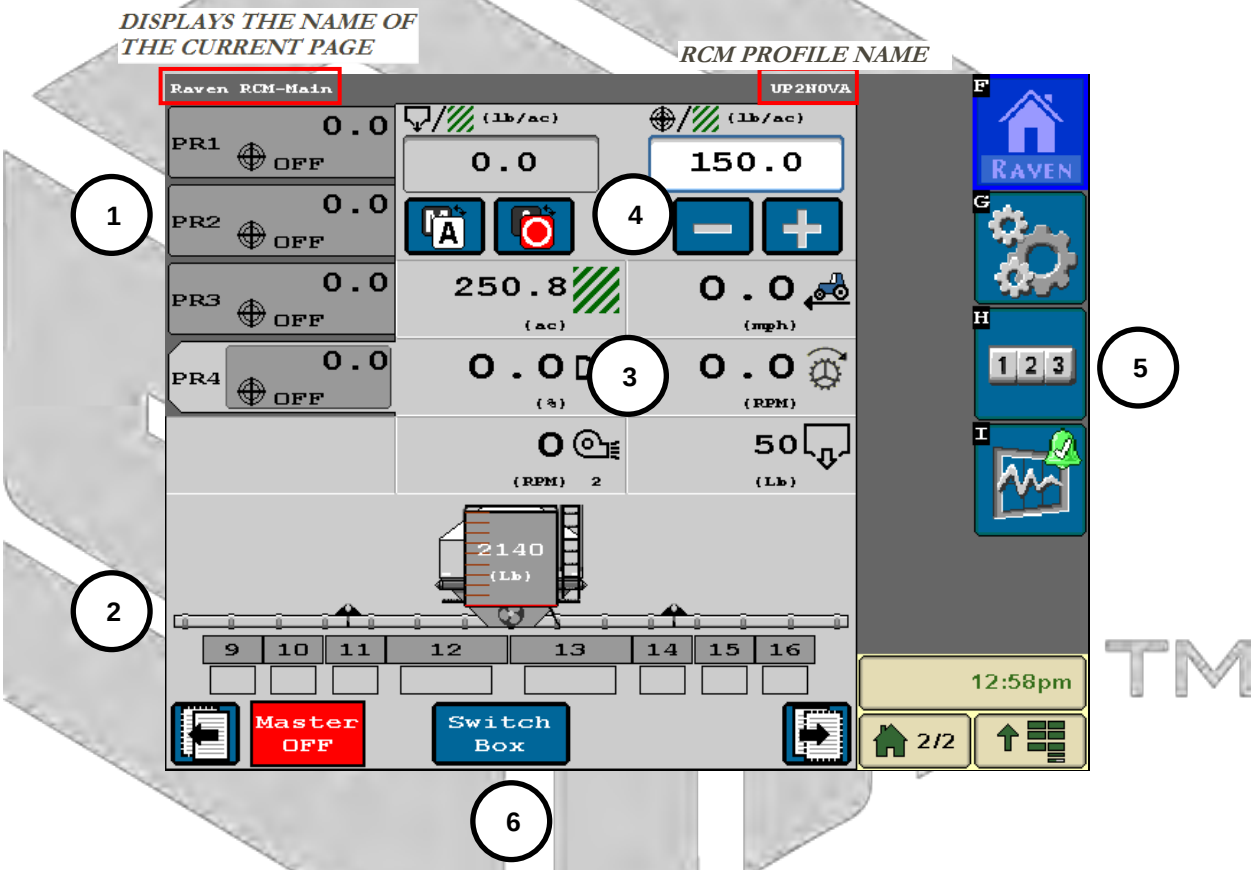
Figure 7

ISOBUS RCM FUNCTIONS

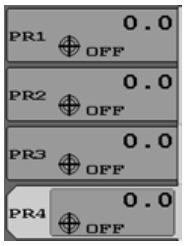
HOME SCREEN LAYOUT

The Raven Rate Control Module (RCM) is a multi-product application control system built on an ISOBUS platform. Raven Rate Controller Module controls up to 4 product applications such as liquid, granular and NH3 via ISOBUS Virtual Terminal (VT) and task control for as-applied documentation, prescription rate, and section control. ISOBUS RCM will control your SeedMaster multi product OnFrame Tank or NOVA Air Cart via the installed Virtual Terminal. To access the RCM Tank Functions, touch the ISOBUS RCM soft key on your VT display. See your VT's operator's manual for more information on locating VT soft keys.

RCM SOFT KEY



1. **Area 1,** displays the products that are setup for the specific RCM. Each product displays the state of the product. It will display Off when the product is off, it will display the target rate when it is on and set to auto and will display MAN when it is on and set to Manual mode. Simply touch the desired product to make it the active product. The active product shows the product number in a lite grey color. If the active product button is touched while it is active it will go to the "Setup Rates" page.



ACTIVE PRODUCT

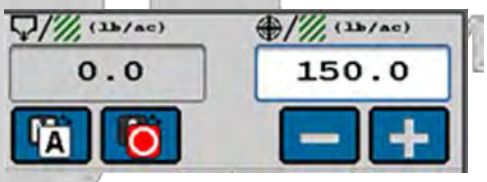
2. **Area 2**, displays the current tank weight, the tank it also a button that will go to the Refill Tank/Bin page if touched. Below the tank the implement sections are displayed with their status. If they are grey that indicates that they are off, and if they are brown in color that indicates that they are on.

3. **Area 3**, is the Display Menu, this area displays different information about the active product. From factory, it is setup to display:

- **Task Area**: this will display how many acres have been covered by the active product.
- **Traveling Speed**: this will display the current ground speed or Test Speed.
- **PWM Duty Cycle**: this will display the current PWM position in a percentage.
- **(RPM) sensor**: this will display the current RPM of the drive motor for the active product
- **(RPM) 1 or 2**: this will display the current FAN RPM for the active product
- **Volume Applied (lb.)**: this will display how many pounds of product has been applied for the active product.

NOTE: The Task Area and Volume Applied can be reset from the Current Totals page. Touch the Tally Registers button to access the Totals page.

4. **Area 4,** is the adjust rate control area. This area displays the actual rate and target rate. It includes the Auto/Manual toggle button, Product Master ON/OFF button and the Rate increase or decrease buttons.



5. **Area 5**, is the softkey area. Touch soft keys to access different settings and functions.

6. **Area 6**, displays the page left/right buttons, the Master Switch indicator, the SwitchBox button and Quick Start button.

ISO RCM QUICK START PROCEDURE

Before you go to the field please review the steps below to ensure your ISO SXX is field ready.

Step 1, Review ISO TXB Quick Start Procedure (PAGE 27)

Step 2, Turn Safety Switch ON for each product being applied: Before turning the safety switch on please ensure the machine is free of any persons, animals or objects that could damage your equipment. Touch the RED safety switch. The Safety Switch will turn green indicating that the system is ready.

Step 3, Review the Calibration Weight: The Calibration Weight value indicates the number of pounds per revolution that the product meter will output. **ALWAYS** ensure that the correct Calibration Weight is inputted into Calibration Weight area. Refer to the **Calibration Catch Test** Section for instructions to perform a Calibration Weight Calibration. To access the Calibration weight, touch the tank for the active product. It is important to review the calibration weight for any active product.

Step 4, Review the Target Rate & Product Control: The target rate is the desired pounds of product that will be applied per acre. Before going to the field ensure the correct pounds per acre is set. Also, ensure that the product control is set to Auto. Auto mode will automatically adjust the product rate during seeding to keep the rate the desired target. If set on Manual, it will lock the PWM valve at its current setting and will not adjust for terrain changes and speeds changes. Typically, manual mode is used for troubleshooting or the loss of the rate controllers speed input.

Step 5, Review Tank Weight: The live tank weight from the load cells is displayed on the home page in the middle of the screen. Ensure the tank weight is correct before entering the field. Before filling the tank, it is important to zero the tank weight. Touch tank then the "zero" button. After filling the tank a tank capacity can be entered. Touch the tank then view the Current Tank Level and then enter that number into the Tank Capacity. This would be used if a low tank alarm is being used.

Step 6, Review Tally Registers: Before starting a new field, review and reset the Field Area and Field Product Weight. Touch the reset button on the Current Totals page to reset the Tally Registers for a new field.

Step 7, Review Onscreen Switch Box: Ensure that all Zone sections are enabled. There will be a square located below that Zone Sections indicating that the Zone is enabled and will be engage when the product control is turned on. The square will turn brown when zone is engaged.

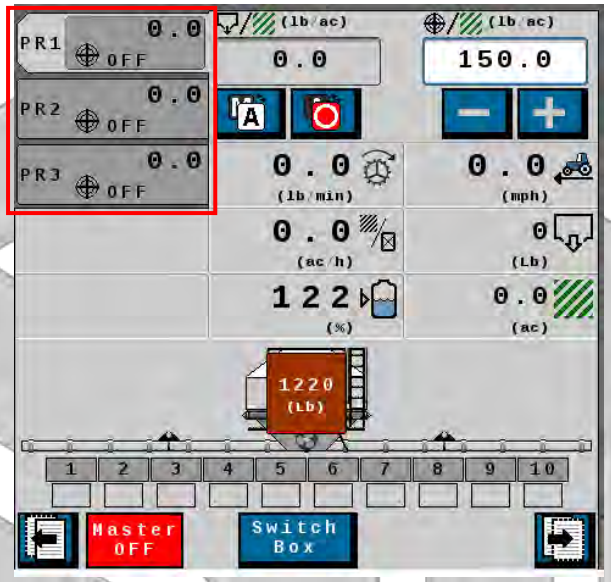
Step 8, Review Fan RPM: Fan RPM is located Display Menu Area. Ensure that each active product has a Fan RPM.

Step 9, Turn Master Switch ON: When the machine is in position to apply product, use the foot switch to turn the master switch on. The Master will display Green and ON.

RCM MAIN (HOME) PAGE

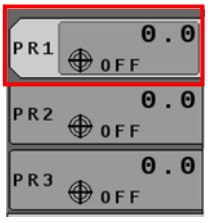
PRODUCT SELECTION

The product section area displays the products that are setup for the specific RCM. Each product displays the state of the product. It will display Off when the product is off, it will display the target rate when it is on and set to auto and will display MAN when it is on and set to Manual mode. Simply touch the desired product to make it the active product. The active product shows the product number in a light grey color. If the active product button is touched while it is active it will go to the "Setup Rates" page.

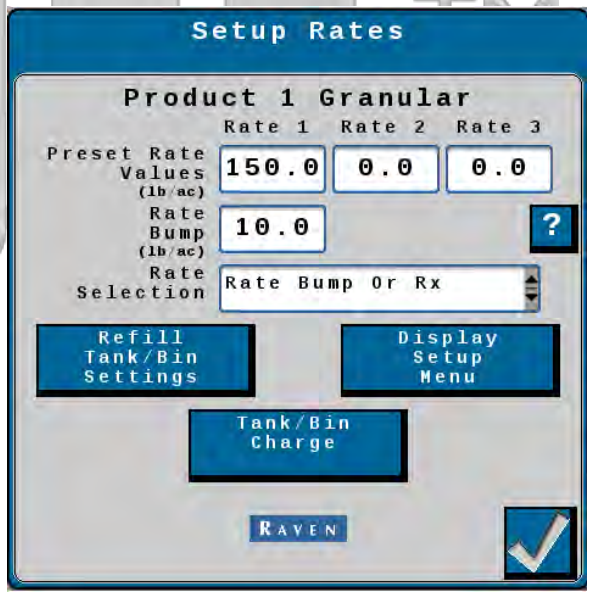


Setup Rates Page

The Rates Setup page allows the operator to change the rate settings after creating a profile with the setup wizard. Touch on the active product to access this setup page. Three predefined preset rate values can be set for quick rate changes on the fly. Set each rate to the desired rate. To have the predefined rates display on the home screen select the Rate Selection from the drop-down Menu then choose the rate type Predefined or RX.



The Rate Bump or RX selection displays (+) and minus (-) buttons that increment the target rate by the Rate Bump Value. Enter the Rate Bump. If a job is set up with a prescription map, the target rate will be generated from the map.



Touching the **Refill Tank/Bin Settings** button takes you to the Refill setup page also accessible by touching the bin. See next page for more info.

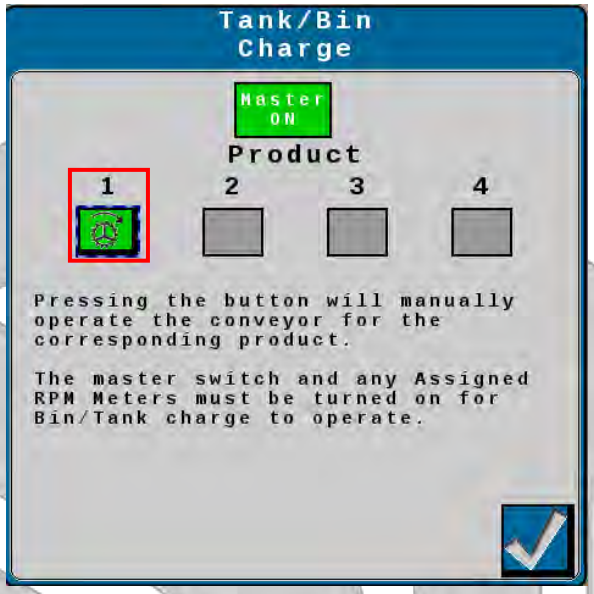
Touching the **Display Setup Menu** button allows you to setup the main page display area. It recommended to leave these setting at the factory defaults.

Touch the **Tank/Bin Charge** button to access the Tank/Bin Charge function page. See next page for more details.

TANK/BIN CHARGE PAGE

Use this page to quickly charge the meter roller.

1. Engage the master foot switch.
2. Touch the product Tank/Bin Charge button for the desired meter/product.
3. The meter will spin for 3 seconds.
4. Repeat to charge other meter rollers.
5. When finished disengage the master foot switch.
6. Touch the check mark to exit.



CONTROL MODE

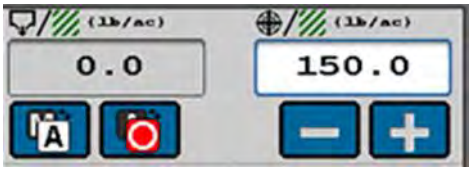
The control mode indicator displays the selected mode for product application. Select the "Auto/Manual" button to toggle the application mode between automatic and manual. If the product is active the safety switch will display green to the right of the Auto/Manual button.

- **Manual mode** allows the operator to control the actual application rate directly using the on-screen increase and decrease buttons.
- **Automatic mode**, the product control system automatically adjusts the application rate to an operator set target rate. Using the rate increase or decrease buttons in auto mode adjusts the target application rate.

***Note**: Both the remote master (foot switch) and the product safety switch must be toggled on to apply product.*

RATES AREA

The application rates area displays the actual and target rate information as well as the currently selected units in which the information is displayed.



Target Rate: Select the target value to enter the target rate for the current application. (i.e. 4 pounds per acre).

Actual Rate: The actual rate display shows the operator the actual volume of product being applied.

REFILL TANK/BIN & PRODUCT CALIBRATION PAGE

To quickly access the tank fill and product calibration settings simply touch on the tank in the middle of the screen. The tank indicator on the product control home screen displays a tally of product remaining based upon the load cells. The tank volume is the volume of product currently in the tank or bin, not the capacity of the tank or bin. The tank capacity can manually be set by entering the Current Tank Level. The current tank level value will adjust as product is applied. Before adding product to the tank, it is important to Zero out the Current Tank Level. Simply touch the Zero button to Zero the tank weight.

To perform a product calibration, catch test touch the Catch Test button. Please see the "CALIBRATION CATCH TEST PROCEDURE" for more info.

To perform an automatic product calibration, where the load cells and rate controller compare applied product weights, touch on the Applied Product button.

Please see the APPLIED PRODUCT PROCEDURE (SMARTCAL)" for more info. A manual Calibration weight can be entered from this page.

NOTE: SeedMaster does not utilize the Product Density, it is recommended to leave at one and do not change as it will change the Calibration Number resulting in incorrect metering.

SECTION STATUS & SWITCH BOX

1. Select the Section Switchbox button.
2. Disable or enable sections:

• Select the Section Number button to enable or disable a section. If operating multiple product configurations, enabling or disabling a section affects all products in that section group. If needed, select a different product to access different section groups.

• Select All On button to enable all sections for the product or section group.

3. Select the back button to return to the main run page.
4. The implement sections can be in one of three states:

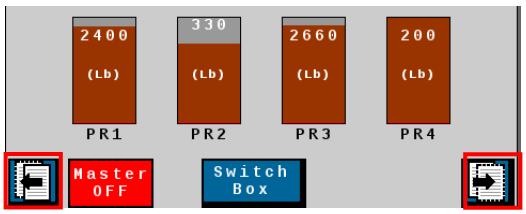
Disabled - Manually disabled by Section Switchbox buttons. Square block below section number is clear.

Enabled - Section is ready to apply. Square block below section number has a black rectangular outline.

Active - Section is applying. Square block below section number is filled brown.

ALTERNATE TANK VIEW

Use the Page Left or Page Right buttons to show the following screen. It shows each products tank weight. Touch on anyone of the tanks to access the tank fill and product calibration page. To toggle back to the single tank view, Use the Page Left or Page Right buttons.



QUICK START BUTTON

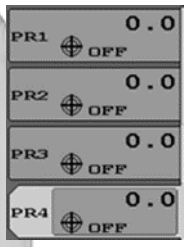
The Quick Start button enables after activating system for a product. If operating multiple products, select the desired products and enable system, and then select Quick Start button for each product. Selecting a Quick Start button turns on all sections only for active product and applies the product at target rate. When selected, Quick Start overrides Section Control and machine speed threshold for 15 seconds for the active product. A countdown indicator appears when selected. Select the Quick Start button at any time during countdown to reset counter back to 15 seconds.

CATCH TEST CALIBRATION PROCEDURE

Your SeedMaster tank will need to be calibrated for the specific product you are using. The calibration procedure will require two 5 gallon pails, a catch tray and a digital scale. Before calibration please be sure that the meter roller is set to the correct gap for the product being used. After setting the gap you will need to setup the catch tray. ***Note**: The UltraPro II does not require gapping.*

CALIBRATION PROCEDURE

1. Zero the digital scale used to weight the pail of product.
2. Prepare the meter that you will be catching out of by placing the pail underneath the catch tray.
3. Shut the **MASTER SWITCH OFF** (Foot Switch).



SELECT ACTIVE PRODUCT

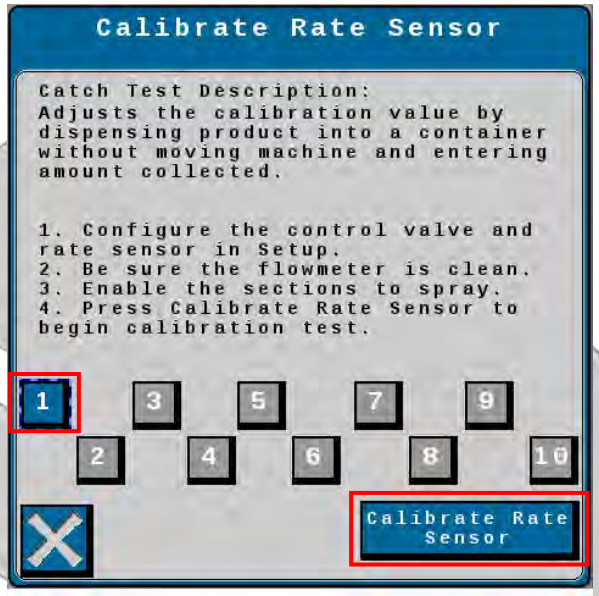
4. Select the product that the catch test will be performed on.
5. Touch the Tank in the middle of the screen.

REVIEW INITIAL CALIBRATION SETTINGS

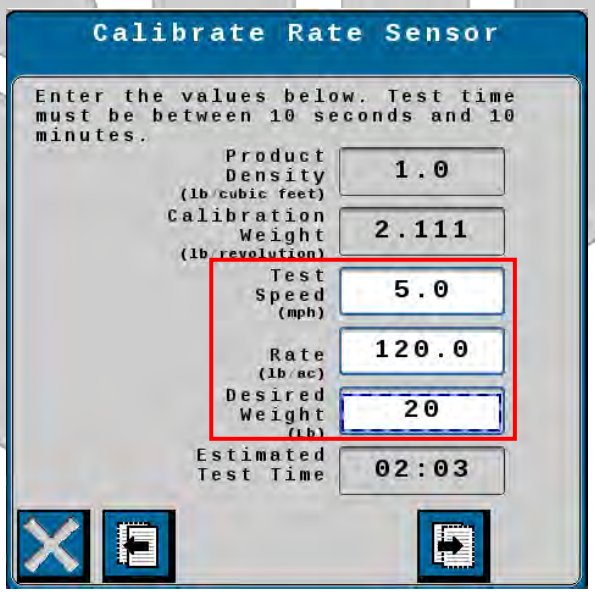
6. Enter the Current Tank Level Reading into the Tank Capacity area.
7. Enter 1 into the Product Density.
8. Enter the Calibration Weight. A starting Calibration Weight can be found with the SeedMaster App. The Estimated Cal Weight will be calculated as a starting point.
   ***NOTE**: Please see the "SEEDMASTER APP" Chapter for more information.*
9. After the settings have been reviewed touch "Catch Test".

10. After touching "Catch Test" a warning screen will appear saying that product will be expelled. Please read the warning before touching the green check mark.

11. Please read through the Catch Test Description.
12. Touch the Zone (section) number that is setup to catch product. In this example the catch tray would be setup under Zone 1. After selecting the zone to catch from touch "Calibrate Rate Sensor".



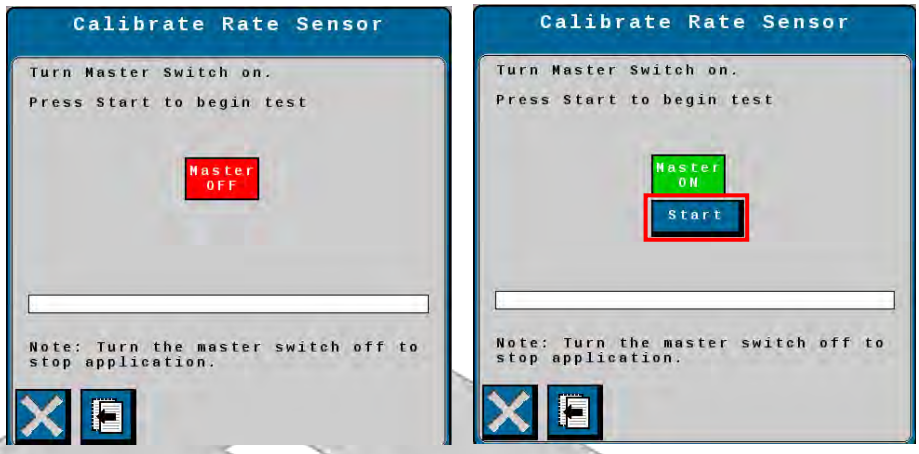
13. Enter the following values:
    a. **Test Speed** = 5
    b. **Rate (lb/ac)** = Desired Rate for the product being metered in the field.
    c. **Desired Weight (lb)** = The amount of product to be caught into the catch pail.



14. After entering the Test Speed, Rate and Desired weight, touch the next button pointing to the right.

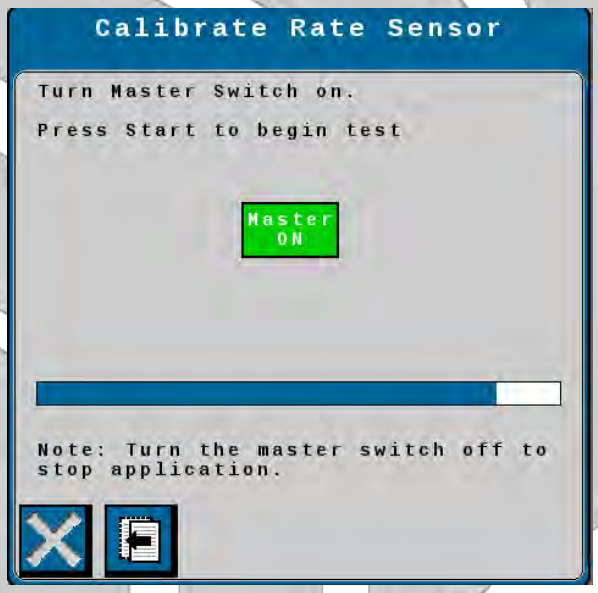
NOTE: The Estimated Test Time must be under ten minutes. If the test time is greater than 10 minutes, first try to decrease the Desired Weight (the amount of product being caught).

15. Turn the master switch on by pressing the foot switch.
16. Touch the Start button.



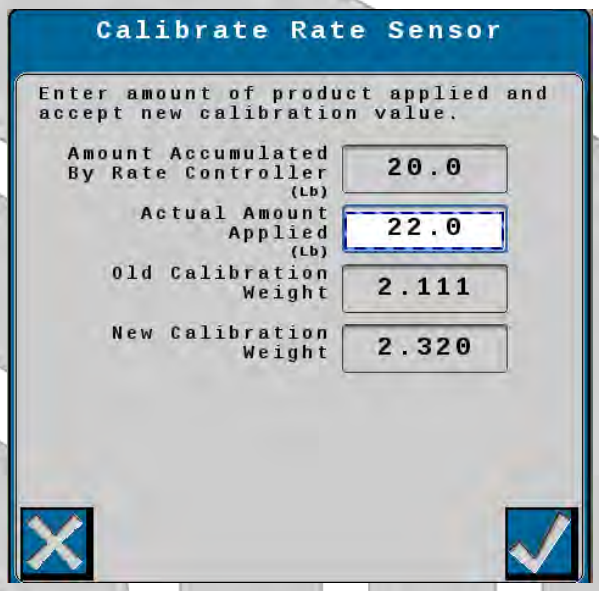
NOTE: Ensure the system pressure is engaged so that the metering drive motors have hydraulic pressure. Also, note that the meters will begin to expel product after touching the start button.

17. A blue bar will display during the calibration, this indicates the progress of the calibration. When the calibration time is expired, the meter will shut off automatically.



NOTE: if the product needs to be shut off at any time during the calibration progress simply press the master foot switch to stop the meter from spinning. This will compete the catch process and advance the calibration process to the next screen. Please cancel the calibration process and start over if catch sample is inaccurate or light.

18. After the catch time expires the calibration will advance to the last calibration screen. This screen displays the accumulated weight computed by the Rate Controller. Below the computed weight is where the actual weight accumulated gets imputed.
    a. Weigh the product that was caught (ensure that the weight scale is accurate and the weight of the pail is removed from the total weight).
    b. Enter the weight reading in the Actual Amount Applied.
    c. The old calibration weight value will be displayed along with the new calculated calibration weight. Please review these values for inaccuracies. If the results are acceptable then touch the check mark to accept then new calibration weight value.
    NOTE: *The calibration number will change automatically to the new calibration number.*



19. Shut Master Switch OFF (Foot Switch)

NOTE: IT IS RECOMMENDED TO COMPLETE 2 TO 3 CATCH CALIBRATIONS PER PRODUCT. PRODUCTS SUCH AS CANOLA SHOULD BE CALIBRATED NO LESS THEN 3 TIMES. IF THE CALIBRATIONS ARE INACCURATE FROM ONE TO THE NEXT PLEASE INSPECT THE METERING COMPONENTS AND START THE CALIBRATION OVER.

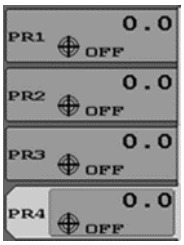
APPLIED PRODUCT CALIBRATION PROCEDURE (SMARTCAL)

SeedMaster Machines equipped with Load Cells are capable of Auto Calibration on granular products. The SmartCal Auto Calibration feature will maintain a high accuracy on granular products. Auto Calibration software continuously reads the actual weight loss in each tank and compares that to how much weight should be lost if the calibration was perfect. Then it makes the necessary metering adjustments either up or down, spins the rollers faster or slower to move it closer to perfect. The SmartCal feature will become more accurate with more acres because an increasing amount of ground-truth data is fed into the system. A heavy bulky product, such as granular fertilizer going down at a high rate, gives the system enough feedback so that it self-calibrates quickly and accurately, while a light weight product, such as canola seed going down at a low rate, takes more acres to dial in.

NOTE: Before using the SmartCal feature it is recommended to perform a catch test product calibration on each product. The initial product calibrations will determine the Cal Weight for the products being metered. This will allow for a more accurate SmartCal.

APPLIED PRODUCT CALIBRATION PROCEDURE

1. Shut the **MASTER SWITCH OFF** (Foot Switch) and park the machine.
2. Select the product that the applied product calibration will be performed on.
3. Touch the Tank in the middle of the screen.



SELECT ACTIVE PRODUCT

REVIEW INITIAL CALIBRATION SETTINGS

4. Enter the Current Tank Level Reading or maximum product weight into the Tank Capacity area.
5. Enter 1 into the Product Density.
6. Enter the Calibration Weight. A starting Calibration Weight can be found with the SeedMaster App. The Estimated Cal Weight will be calculated as a starting point.
   NOTE: Please see the "SEEDMASTER APP" Chapter for more information.
7. After the settings, have been reviewed touch "Applied Product".

8. Please read / review the Applied Product test description. Then touch the check mark to begin an applied product calibration.

9. The SmartCal (Applied Product) calibration is now active.
10. Touch the Check Mark to exit.
11. Multiple Applied Product calibrations can be done at the same time. Simply repeat 2 to 10.

NOTE: It is important that the machine is in the field and ready to apply product before initiating an Applied Product Calibration.

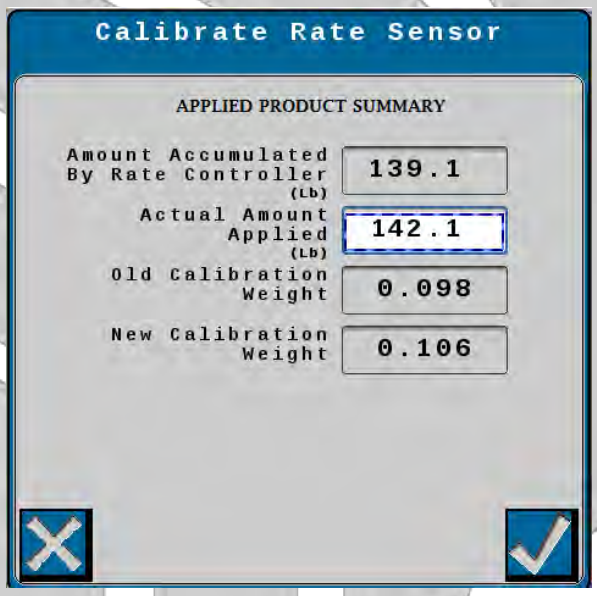
12. Return the home screen and continue to apply product as per usual.
13. After applying a minimum of 15 acres for higher rate product and/or 50 acres for lower rate products return to the Applied Product Calibration screen.
14. Park the machine and turn OFF the master switch.
15. Select the correct product.
16. Touch the tank in the middle of the screen.
17. Touch Applied Product button.

18. Touch the "Stop Accumulating" button. The amount of product that was accumulated will display in the button.

NOTE: If the button just says Accumulating this means the master switch has not been shut off.

19. The Applied Product Test description will appear on the screen. Please read through the description before continuing.
20. Touch the Calibrate Rate Sensor button.

21. The Applied Product Summary page will be displayed. Review the values on this page. If the values are acceptable touch the check mark to accept the new calibration weight. To discard the new calibration weight, touch the X and this will stop the calibration process.

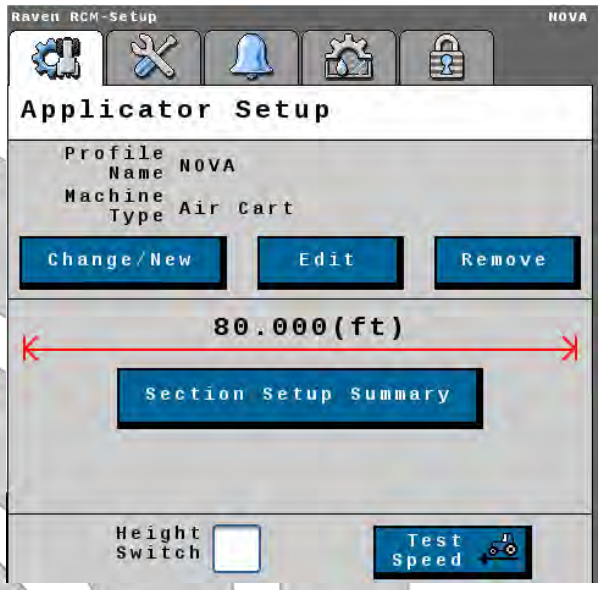


22. After accepting or discarding the new Calibration Weight you will return to the Setup Rate Sensor page. Touch the check mark to return to the home page or touch Applied Product button to initiate another calibration.
23. If multiple Applied Product Calibrations were being performed, please repeat steps 15 to 22.

    ***Note**: You can initiate a SmartCal at any time while you are in a job and perform as many SmartCal's to the product(s) as you feel necessary.*

RCM SETUP PAGE

APPLICATOR SETUP TAB



- View Profile and machine type information

- **Change/New Button**: Touch this button to create a new machine profile. If there are multiple profiles created already you can change to an existing profile.

- **Edit Button**: Touch the edit button to edit the current selected profile.

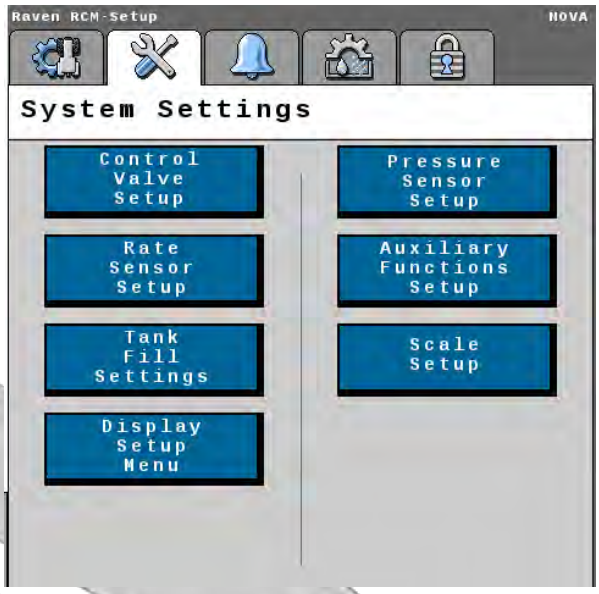
NOTE: this will walk you through the entire setup wizard.

- **Remove Button**: Touch the remove button to delete the current selected profile.

- **Section Setup Summary Button**: Touch this button to review each products section widths, the wired signal driver and switch number that each section is assigned to.

- **Test Speed Button**: Use the test speed to simulate a ground speed. This is used to spin the meters over when standing still.

SYSTEM SETTINGS TAB



- **Control Valve Setup Button:** Touch the control valve button to access settings for the control valve including the valve response rate, control Deadband and PWM settings. SEE CONTROL VALVE SETUP PAGE FOR MORE INFORMATION

- **Rate Sensor Button:** Access the Product Density, Calibration Weight and Pulses/Revolution setting, these are also available from the main page. Also, access the Catch Test and Applied Product pages from here.

- **Tank Fill Settings Button**: Set the Tank Capacity from this page. It also includes the ability to set a Low Tank Level Alarm.

- **Display Setup Menu Button:** Change the selected readout desired in the selected location on the Main Run screen.

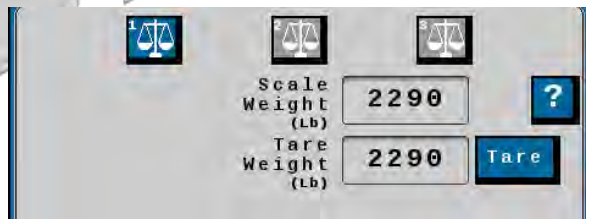
- **Pressure Sensor Setup Button**: Touch here to access pressure sensor settings.

NOTE: SeedMaster does not use pressure sensors on the granular products.

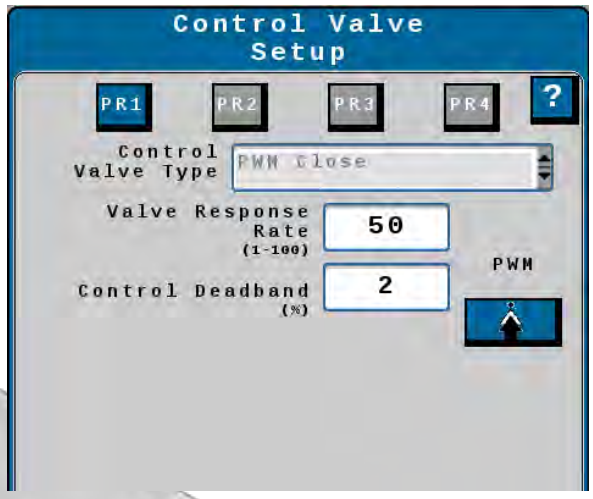
- **Auxiliary Functions Setup Button:** Access the FAN RPM calibration values from here. This page allows for setting a Low and High RPM limit for the Fans. The RPM Assignment Setup button lets you view what products assigned to each product.

NOTE: If the product stream for the fan changes you must edit the profile to change the RPM Sensor Assignment for the product being changed.

- **Scale Setup Button:** View the weight of each product scale. You can zero the scale from here. If the scale needs to be calibrated, touch the Scale Calibration button. See Scale Calibration for more information.



CONTROL VALVE SETUP PAGE



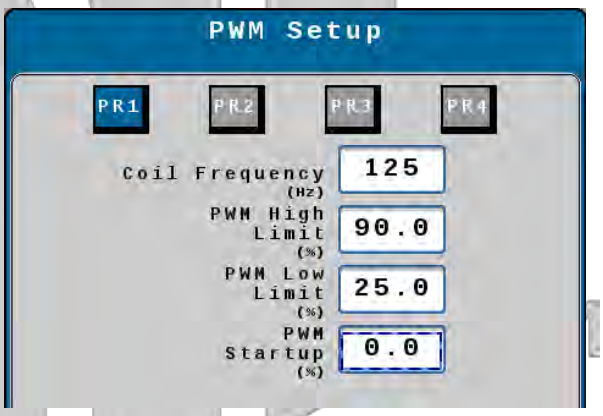
- **Control Type**: This is set during setup wizard process and can only be changed if you edit the profile.

- **Valve Response Rate (1-100):** Enter value for aggressiveness of rate controller as it approaches target rate. A value too high may lead to oscillation. A value too low may take a long time to reach target rate.

- **Control Deadband (%):** Enter percentage of rate tolerance for control valve. For example, if 2% is entered, the rate controller attempts to adjust the flow rate until the actual rate is within 2% of the target rate.

PWM Setup Button: Touch this button to access the PWM Valve Setup Page: See below.

PWM VALVE SETUP PAGE



- **Coil Frequency**: Frequency of pulses sent to PWM valve. SeedMaster Factory setting is 125.

- **PWM High Limit (%):** Maximum PWM percent the rate controller allows the system to reach when the

product is applying.

- **PWM Low Limit (%):** Minimum PWM percent the rate controller allows the system to reach when the product is applying.

PWM Startup (%): Duty cycle rate controller commands to when the valve is opened.

SCALE CALIBRATION

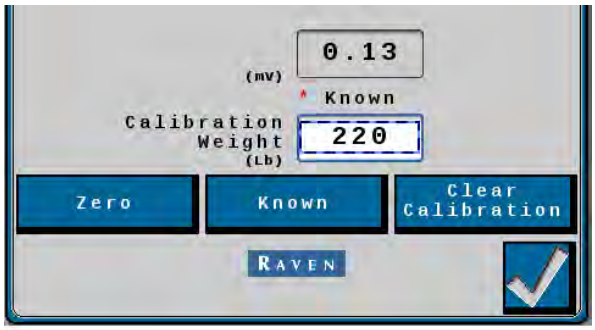
1. Touch the Settings soft key.

2. Touch the System Settings Tab.

3. Touch Scale Setup button.

4. Choose the scale being calibrated.

5. Touch the Scale Calibration button.



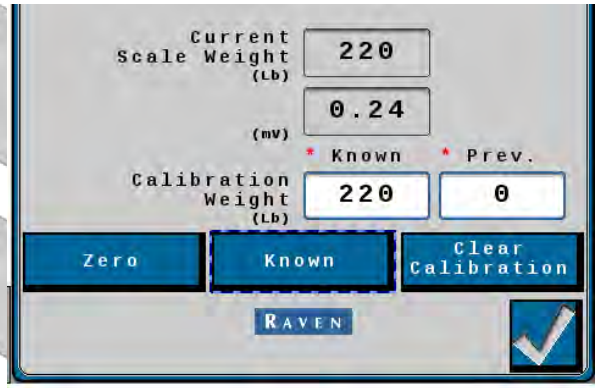
6. Touch the Zero Button.

7. Touch the check mark to Zero the bin.

8. Put a known weight on the Bin.

9. Enter the Calibration weight. Touch the Known Button.

NOTE: The (mv) must change by 0.10 to calibrate the scales. Add weight to increase the mv.



11. Touch the check mark to truth the bin.

12. Ensure the Current Scale Weight is accurate.

13. If scale reading is off, enter the Current Weight into the Prev. box.

14. Touch the Known button.

15. Touch the check mark to truth the bin.

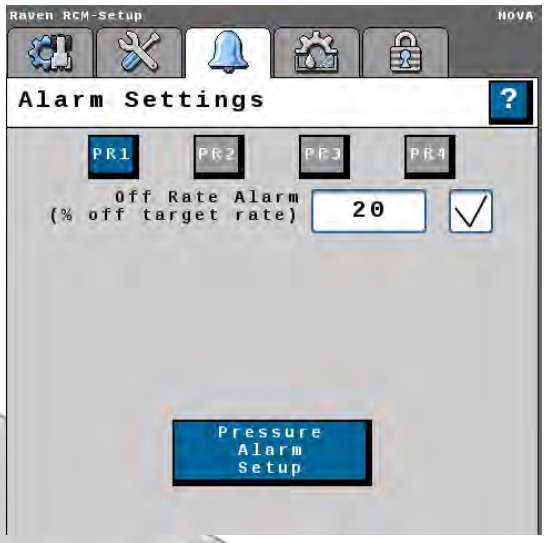
16. Touch the check mark to finish scale calibration for the selected bin.

17. Repeat from step 4 if other scales require calibration.

18. Touch the check mark to exit the Scale Setup.

ALARM SETTINGS TAB

The Alarm Settings tab allows operator to change alarm settings after creating a profile with the setup wizard.

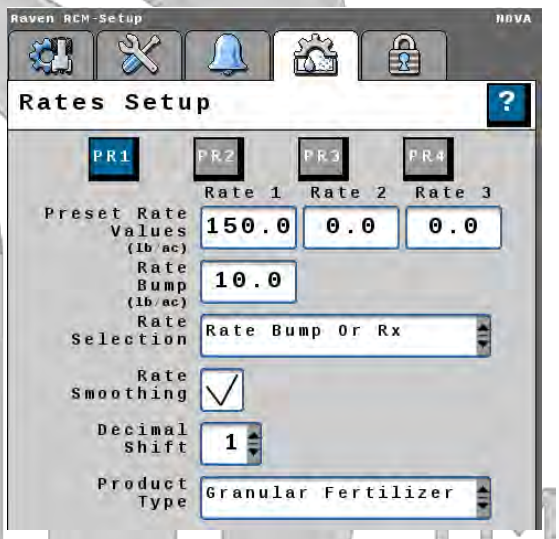


- Enter the desired Off Rate Alarm percentage.

RATE SETUP TAB

The Rates Setup tab allows the operator to change the rate settings after creating a profile with the setup wizard.

Select the Rate Selection from the drop-down Menu to choose the rate type displayed on the main run page.



- Predefined or RX- Displays selection buttons for Preset Rate Values. Enter up to three Preset Rate values. Rate 1 Preset value is required. If a job is setup with a prescription map, the target rate will be generated from the map.
- Rate Bump or RX- Displays (+) and minus (-) buttons that increment the target rate by the Rate Bump Value. Enter the Rate Bump. If a job is set up with a prescription map, the target rate will be generated from the map.
- VT Rate Entry - Enter the desired rate.
- If desired, select the Rate Smoothing check box.

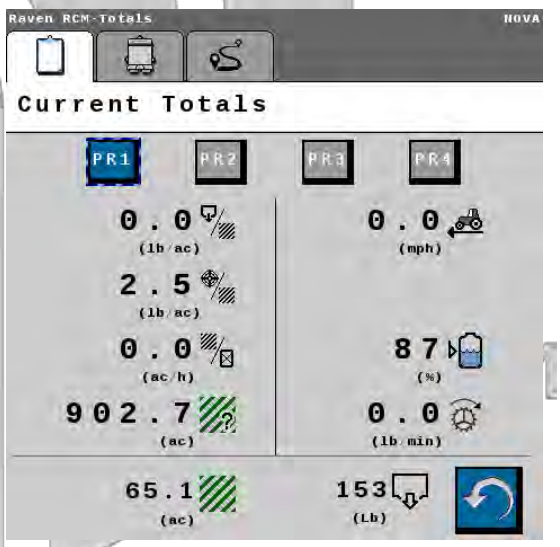
FEATURE UNLOCK TAB

Feature Unlocks tab allow to unlock various features of the RCM. Note: SeedMaster RCM's do not require any unlock codes.

RCM TOTALS PAGE

CURRENT TOTALS TAB

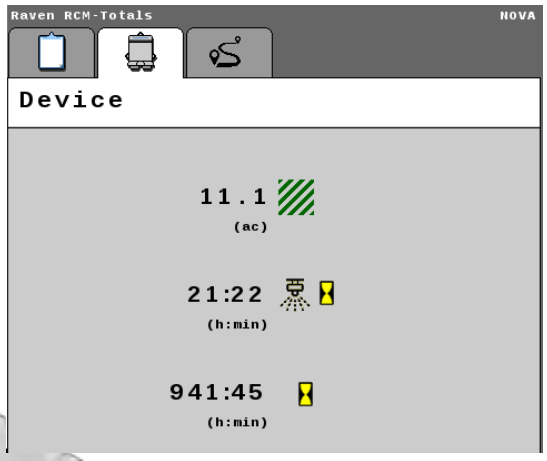
Current Totals tab displays instant values of each product. Select the product to view from the Product Selection buttons at the top of the tab. To zero current totals, select the Reset Counter button.



DEVICE TAB

Device tab displays totals for lifetime of current profile.

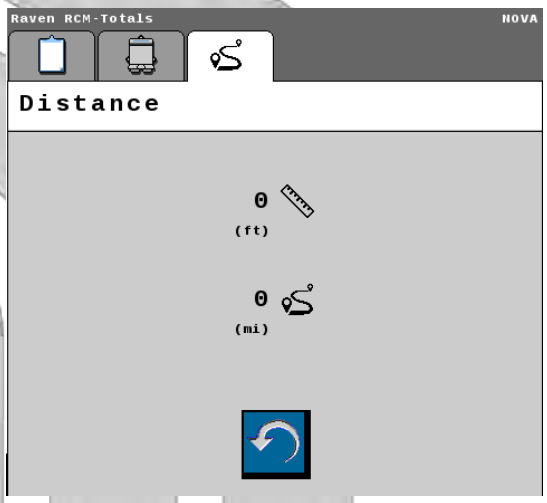
- Total Area (Device)
- Time Spent Applying
- Total Hours



DISTANCE TAB

Distance tab shows distance values that increase as the implement drives forward.

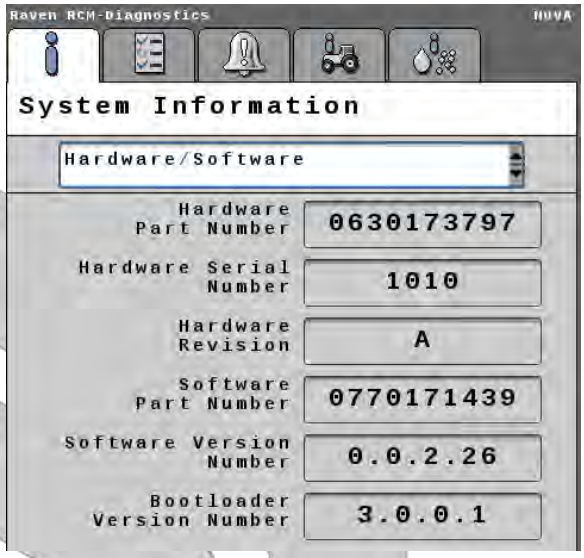
- The first value shows smaller increments (ft or m).
- The second value shows larger increments (mi or km).
- To zero current distance data, select the reset counter button.



RCM DIAGNOSTICS PAGE

SYSTEM INFORMATION TAB

The System Information Tab display hardware and software information about the RCM.



SELECT ONE OF THE FOLLOWING FROM THE DROP-DOWN MENU FOR VIEW INFORMATION

Hardware/Software: Displays the manufacturer's information for the Raven Rate Control Module hardware and software.

Switchbox: Displays if an external switchbox is present and the status of the switches.

Delivery System: Shows application information for the selected product.

Section Status: Shows if each section valve is currently open or closed.

System Voltages: Shows voltage and current information for the Raven Rate Control Module.

Working Parameters: Displays the implement width, current speed, and speed source.

Switches/Status: Displays the status of the Master switch.

Pressure Sensors: Displays voltage and pressure information for each pressure sensor.

Bin Level Sensors: Displays whether each bin level sensor is covered or uncovered.

RPM Sensors: Shows the signal detected by each RPM sensor.

Tank Fill Monitor: Displays the fill rate and volume detected by the tank fill monitor.

Task Totals: Shows the area covered and volume applied for the current task.

TESTS TAB

The RCM has built in system tests. The following tests can be performed on each product:

- Spreader/Air Cart Check
- Control/Section Test
- Calibrate PWM Limits
- Bin/Tank Cleanout
- Demonstration Mode
- Diagnostic Loop Back Test

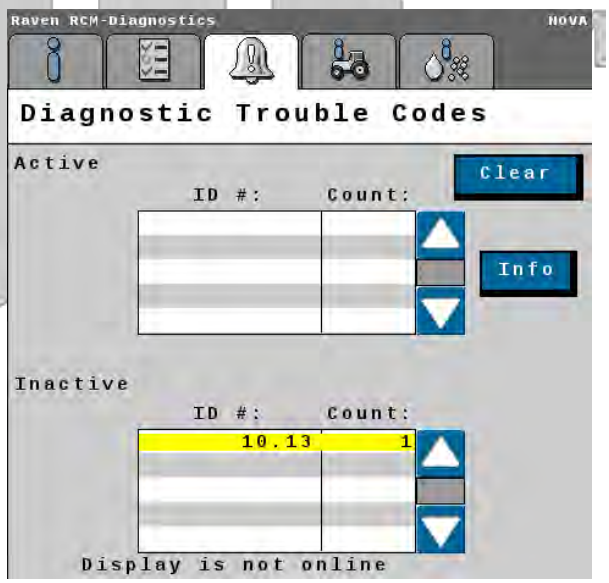
If performing any of the test above, please follow the onscreen instructions.

NOTE: The Master Switch must be off to select test

DIAGNOSTICS TROUBLE CODES TAB

This tab is used for troubleshooting active system errors and displaying inactive errors.

- Current trouble codes appear in the Active table. The DTC Identification number and occurrence count is listed.
- Resolved trouble codes appear in the Inactive table. The DTC Identification number and occurrence count is listed.

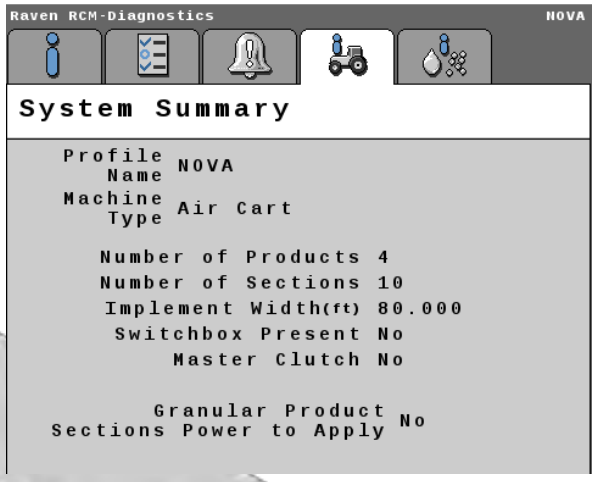


Use the up and down arrows to scroll through the list of trouble codes. A description of the highlighted code is shown below each table.

If desired, press the Clear button to erase all the trouble codes listed in the Inactive table.

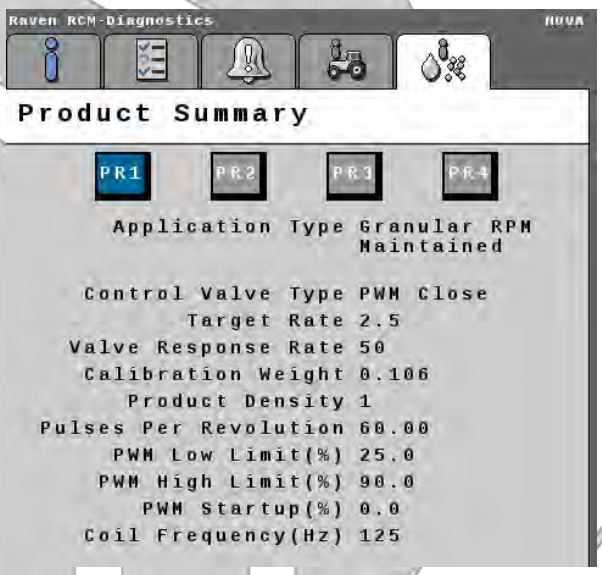
SYSTEM SUMMARY TAB

This tab displays the machine setup summary.



PRODUCT SUMMARY TAB

This tab displays the configured products setup summary.



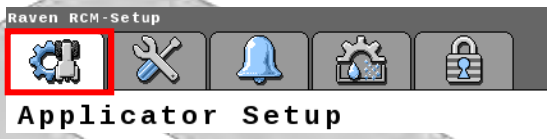
GENERAL TROUBLESHOOTING

Symptom	Problem	Solution
Unexpected application rate.	Incorrect rate type selected (gal/min or gal/acre).	Select the correct rate type.
Product does not shut off.	Valve does not respond to commands.	Select the correct valve type.
2-Wire valve selection is not available.	Dual boom is selected.	Disable dual boom.
	More than seven sections are selected.	Assign fewer than eight sections.
Implement section is not turning on or off.	Incorrect section valve type selected.	Select correct section valve type.
Application is erratic.	Calibration number is not set correctly.	Enter the correct calibration number.
Trouble code is displayed for high pressure.	System pressure is too high.	Select flow return in the system setup.
Trouble code is displayed for unexpected flow.	Constant flow is disabled when using a constant flow system with boom valve closed.	Select constant flow in system setup.
Flow is not applying at desired rate.	Incorrect application rate.	Ensure 10 gal/10L unit is used.
	Minimum Flow rate feature causes over-application in areas where machine speed is low enough to activate Minimum Flow Rate.	Set minimum flow rate to zero to disable feature.
System detects implement is down for an extensive period of time.	Height switch is disabled.	If height switch indicator does not match machine operation, service height switch.
Unexpected chemical flow detected.	Controller attempts to close section valves, but detects flow on a sprayer or liquid fertilizer system.	Shut off solution pump.
Unable to setup minimum and maximum alarms.	Minimum and maximum alarms are disabled.	Ensure pressure sensor is installed and configured.
Unable to set values.	System not allowing changes values or settings.	Ensure Master Switch is off.
Unexpected anhydrous ammonia flow detected.	Controller attempts to close On/Off valve, but still detects flow.	Select button to turn off control valve.
	Controller attempts to close all valves, but still detects flow.	Follow instructions on Warning page on display.
Pressure sensors are not configured.	Pressure sensor 2 is not an option.	Ensure both sensors are configured.
Not able to activate system.	Master Switch indicator is orange.	Cycle master switch.
Unwanted minimum flow rate activation.	Over application in low speed areas.	Set minimum flow rate to zero to disable function.

PRODUCT CONTROL SETUP WIZARD

1. Touch the **RCM** working set button. 

2. Touch the **Settings** soft key. 
3. Touch the **Applicator Setup tab.**

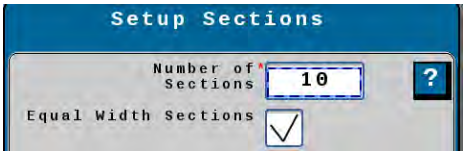


4. Touch the **Change/New button,** the setup wizard will begin.
5. Touch the drop down box and select **New** and then touch the **Check Mark**.

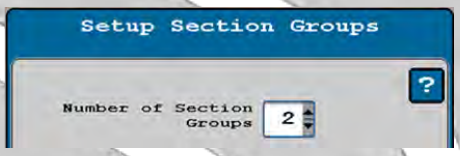
6. Enter a **Profile Name.**
7. Touch the **Drop Down** Box for Machine Type and select **Air Cart.**
8. Enter an Application Width of the toolbar then touch the **next** button. 

9. Enter the number of Granular Products.
10. After entering the Number of Products touch the **next** button.
11. Touch the **drop down** box and choose **1 or 2** for the number fans installed, touch **next**.
12. Touch each **drop down** box and select **Granular Fertilizer** for each product, touch **next**.
13. Set the application type for each product by touching the **drop down** and selecting **Granular. RPM Maintained** for the Application Mode. Do this for each product touch **next** after selecting the correct Application Mode.

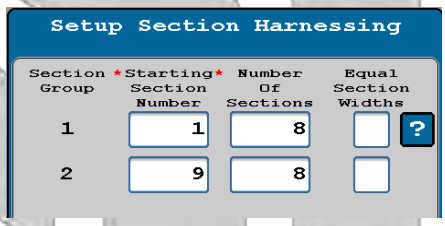
14. If The Machine shares all the section drivers. Choose **YES** and then touch next.
    NOTE: If the sections don't share all drivers skip to step 18.
15. Enter the number of zones for the Number of Sections. If the sections are Equal Width leave the check mark on for this setting. The Master Clutch and Power to Apply will remain with NO check marks. Touch **Next**.



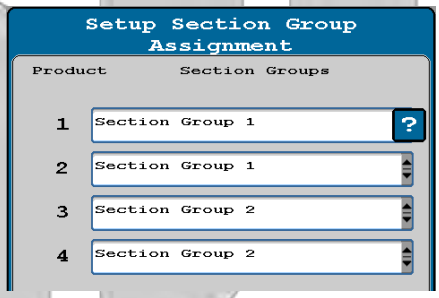
16. The section widths for each section will be displayed. Each section is X amount of feet. Review and confirm then touch **next**.
17. Section Summary will display the products and sections and the assigned driver and switch review and touch **next**. Note you may have two page for the summary. Skip to step 24.
18. If the Machine DOES NOT share all the section drivers. Choose NO and then touch next.
19. Enter the number of Section Groups



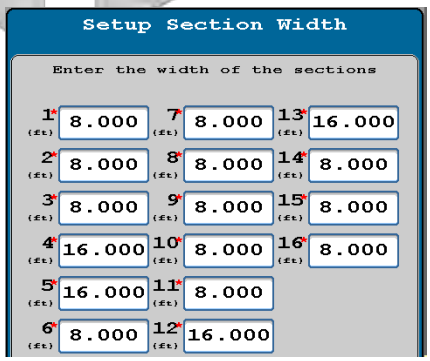
20. An example of the section group mapping will be displayed. Review the guide then touch next.
21. Enter the Starting Section Number and Number of Sections associated to the starting number. Then touch next.



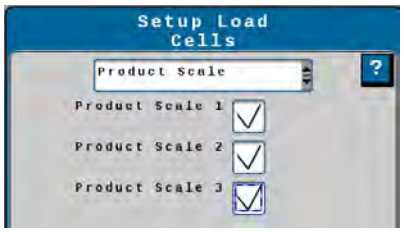
22. Select the section group that is associated to the corresponding product.



23. Enter the widths of each section then touch next and review summary and touch next.



24. Touch the **drop down** box for the Load Cells Setup and then select **Product Scale**. Place a check are beside each Product Scale. After all check are installed touch **next**.



25. There are NO pressure sensors installed. Leave each pressure sensor defaulted to None and then touch **next**.
26. Enter *2* into the Fan RPM 1 / RPM 2 Calibration Box. RPM 1 Low and High Limits will remain at 0. Touch **next**.
27. RPM 1 / RPM 2 sensor Assignments will be displayed. There should be a check mark defaulted for each product. Review and ensure that each product has a check mark. Touch **Next**.
28. The setup wizard will now setup through the product control setup for each product. Each product has 6 configuration pages. Each product will get the same settings inputted. Follow the steps below for product. Touch next on each page after entering the correct settings.
    a. SETUP CONTROL VAVLE PAGE
        i. Control Type = PWM CLOSE
        ii. Valve Response Rate = 50
        iii. Control Deadband = 2
    b. SETUP PWM PAGE
        i. Coil Frequency = 125
        ii. PWM High Limit = 90
        iii. PWM Low Limit = 25
        iv. PWM Startup = 0.0
    c. SETUP Rate Sensor PAGE
        i. Product Density = 1 (LEAVE AT 1 ALL THE TIME)
        ii. Calibration Weight = 2.958 (CALIBRATION REQUIRED)
        iii. Pluses / Revolution = 60.00
    d. SETUP Tank / Bin PAGE
        i. Tank Capacity = 0
        ii. Low Tank Level = 0
        iii. Low Bin Level Sensor = NO check Mark
    e. SETUP Rates PAGE
        i. Preset Rate Values: Rate 1 = 150, Rate 2 = 0, Rate 3 = 0
        ii. Rate Bump = 10
        iii. Rate Selection = Rate Bump Or Rx
        iv. Rate Smoothing = YES check mark
        v. Decimal Shift = 1
    f. SETUP Alarms PAGE
        i. Off Rate Alarm = 30 with check mark
        ii. Shaft Sensor Alarm = NO check mark
29. The setup for the first product is complete. Repeat the settings above for each product until the setup wizard gets to the setup summary page. Please review the setup summary page then touch next.

VIPER 4+

POWER BUTTON AND STATUS

To power up the ROS device, press the power button once.

The power status indicator will flash red and then should illuminate green. If the status indicator stays red or does not illuminate, contact your equipment dealer for assistance.

***Note**: Do not connect any USB drives or devices to the ROS device during the power up sequence.*

VIPER 4+ BUILT-IN SELF TEST

If the Viper 4+ fails to display a picture on the screen, perform a Viper 4+ self test to diagnose the issue. The Built-In Self Test will help determine if a black screen symptom is caused by a hardware issue or a software issue.

To perform a Viper 4+ self test:

1. Remove power from the Viper 4+ by disconnecting the four pin power plug.
2. Press and hold the power button on the side of the Viper 4+.
3. Reconnect the four pin power plug.
4. Release the power button and note the power button color. If the button is:
   - Green - Hardware is working properly. The cause of the black screen is likely a software issue. Reload the software on the Viper 4+.
   - Yellow - Hardware is functioning properly but the firmware may be corrupt. Use the thumb drive with the appropriate firmware to reinstall the firmware.
   - Red - A hardware issue has occurred. Contact a distributor to schedule the Viper 4+ to be returned to the Raven service department for analysis and repair.
   - No Color - If the power button does not display a color, this could indicate that there is no power being applied to the Viper 4+. Check the power and input with the voltmeter and troubleshoot any external power issues. If power is present at the Viper 4+ power plug, contact your distributor to return the Viper 4+ to the Raven service department for analysis and repair.

DEVICE SHUT DOWN

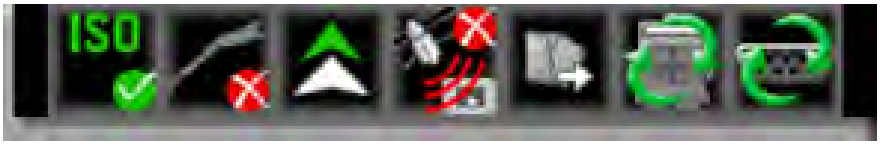
When finished using the Viper4+ device:

1. Close any active jobs by selecting the home icon in the lower, right corner of the display.
2. Touch the administrator or user panel

3. Touch the shut down icon. Then touch Yes to confirm shut down.

VIPER 4+ MAIN SCREEN NAVIGATION

STATUS HEADER



The status of various features or other system components connected to the field computer is displayed in the upper, right corner of the ROS display.
This area allows the equipment operator to quickly check communication or processes in progress at a glance and, if necessary, take action to address any issues before beginning the day's operations.
The following status indicators will be displayed in the status header:

Slingshot®. The status of a Slingshot Field Hub is displayed. A red x will display on this indicator if a Field Hub is not connected or not detected. When a Field Hub is connected to the ROS device, this area will display the current signal strength for wireless communication status.

GPS. This indicator displays the status of the position solution. This indicator will display:

- Green if the status of GPS is okay
- Yellow if an error or cautionary condition has been encountered
- Red if GPS is non-functional

Software Update Available. One of these status displays will be available if a ROS update or feature unlock file is available. The update will remain available even after the USB flash drive is disconnected from the device to allow the operator to perform the update process at a convenient time during the day and without disrupting field operations.

File Transfer. The status header displays the status of wireless file transfers with a Slingshot® Field Hub. If a file transfer is in progress, the file transfer indicator will display a green "in progress" status.

CANbus Communications. This indicator displays the communication status for a CANBUS system. A green indicator will be displayed when communication is detected without errors.

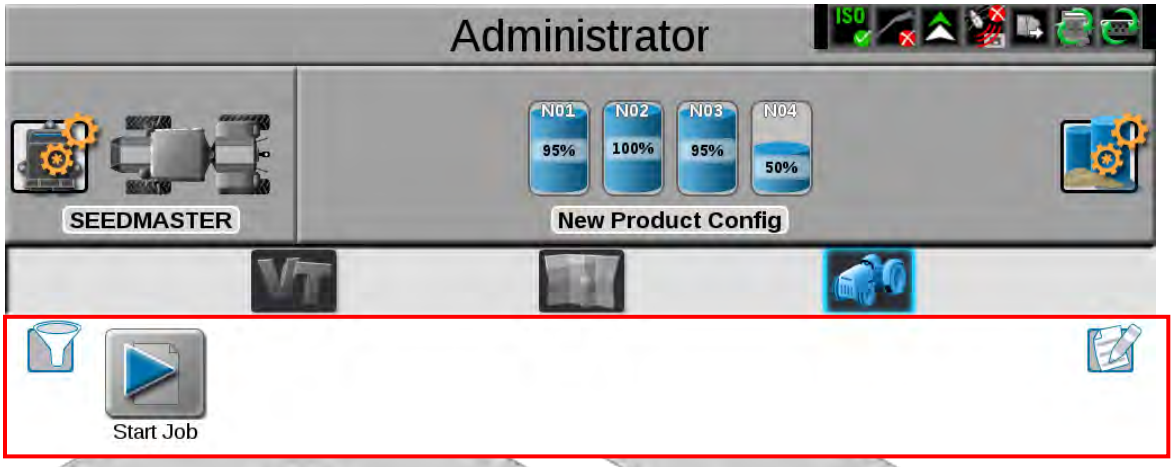
ISOBUS Communications. This status display indicates the status of ISOBUS communication with ECUs, working sets, implements, etc. This status will only be shown if an ISOBUS ECU is detected by the ROS device.

Serial Communications. This indicator displays the communication status for serial communication ports. A green indicator will be displayed when all communication ports are configured.

Forward/Reverse. The forward/reverse status indicator shows if the machine is traveling forward or reverse according to the ROS device.

JOB PROFILE PANEL

The job profile panel provides the operator or system administrator with the following tools to set up, filter, and select profiles for specific field operations or tasks:



On initial bootup the Viper4+ will load the Job Profile screen. To access the Job Profile screen, touch the Job Profile icon.

the Job Profile panel allows you to do the following:

- Start a NEW or EXISTING Job
- Create a NEW or EDIT Job Profiles
- Sort or Filter Jobs and Job Profiles

JOB PROFILE CONFIGURATION

Configure common or recurring field operations to save job settings such as grower and field data, scouting information, or saved guidance lines for use during upcoming field operations or reuse during future seasons.

JOB PROFILE SELECTION

When the equipment arrives at the field, the operator selects the preconfigured job profile and verifies the job settings, enters the target product rate or rates, selects any modifications to the guidance or scout information and selects start to begin a new field application or start operations.

The job profile panel also displays any previous jobs started using a preconfigured profile. To resume a previous job operation, select the specific job file, verify the job settings, and select start. The V4+ also provides utilities to help sort and filter the items displayed in the job profile panel to help the operator quickly locate and select the correct profile or previous operation.

***Note**: Setting up a job profile is not a requirement and is designed as a Grower function. The default Start Job profile allows a user to quickly start a job and allows the user to assign GFF, saved guidance lines, and scout groups (if applicable).*

VT PANEL

The VT panel provides access to the ISOBUS **working set** displays and ECU options or features. Use this panel to access features such as the Raven ISO Product Control, Raven or various third party features connected to the ISOBUS communication network.

***Note**: The VT panel will be available in the lower, left corner of the main panel display only if an ISOBUS compatible ECU is detected by the ROS device.*

ADMINISTRATOR OR USER PANEL

Touch "Administrator" or "User Name" at the top of the display to access the Administrator or User Panel and the following utilities:

Power Down

Touch the power down icon to shut down the ROS device. It is recommended to shut down the device using this icon prior to removing power from the ROS device by switching the vehicle ignition off.

Log Out

Touch the log out icon to exit the current user profile. Log out of the ROS device when leaving the equipment for short periods or at the end of the shift or when switching operators to secure the management system from unauthorized access or operation of the control system.

***Note**: Demonstration mode features are also available via the logout prompt.*

User Profile

User profiles may be created for each operator to save user preferences such as language and displayed units to maximize each user's comfort level while operating the equipment with ROS. Each user profile may also be assigned a unique Personal Identification Number (PIN) to secure the ROS device from unauthorized access, modification, or operation while the operator.

In addition to securing the system from unauthorized use, ROS saves active user profile information with each job report. If multiple operators will be using the same machine during the a specific field operation, the job report will display each user profile active during the job. The system administrator may also review the specific field areas in which each operator was logged in and operating the equipment.

System Manager

Access the system manager utility within the administrator or user panel to perform software updates and CAN node firmware updates. Product software and documentation updates may be made available periodically on the SeedMaster MFG web site: www.seedmaster.ca

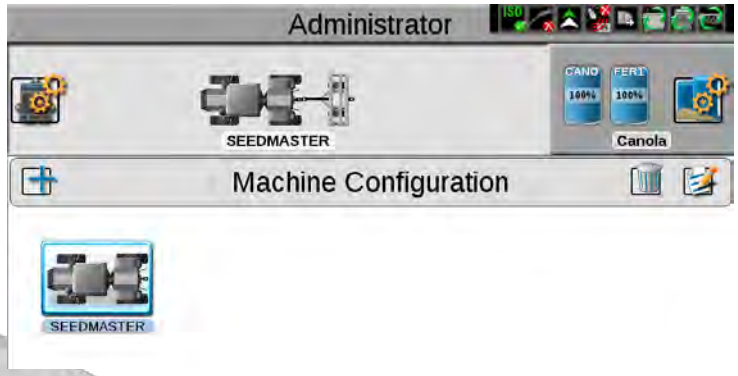
File Manager

Access the file manager to perform file maintenance, access utilities for exporting and transferring job files and other data to and from the ROS device, and to view the transfer history for previous job data.

Do not store job and field information on the ROS device for long term reference or archiving. Perform file maintenance regularly and remove files associated with completed jobs or field operations to ensure memory resources are available for new operations as needed. Archive and back up job and field information on a home or office PC to ensure the data is securely archived and backed up.

MACHINE CONFIGURATION PANEL

The Machine Panel contains the following utilities for selecting and configuring the various types of vehicles and equipment with which the ROS device will be operated:



CAN System Configuration

A machine configuration saves vehicle or tractor calibration information, implement geometry for each configured implement, and CANbus system information. If a configuration is completed for a specific implement, the ROS device will automatically identify and select the matching configuration on start up. The ROS device will also alert the operator if a CAN component in the saved profile is not detected.

Machine Configuration and Implement Garage

In some instances, a machine configuration may match more than one equipment set up such as a tractor used with a plow, swather, hay rake, or a rock picker. If desired, create profiles for each of these implements to allow the ROS device to save geometry and guidance settings for each specific implement. When ROS detects a set up matching these configurations, the device allows the operator to select the saved machine configuration to quickly set up the field computer for the days operations. ROS also allows a system administrator or operator to access other saved configurations via the machine or implement "garage" to modify or remove profiles to keep the ROS device updated for the equipment currently in the fleet or machine shed.

PRODUCT CONFIGURATION PANEL

The product configuration panel provides the following utilities for setting up control channels for common product applications, tank mixes, or seed varieties which the ROS device will be used to control input or application:

Product Configuration

ROS allows the operator to set up a profile for common applications for upcoming field operations. The product configuration saves control channel and product or mix information for various application or product types and allows the operator to reselect profiles to quickly resume or restart an application or operation for various fields. New product configurations may be created using existing products entered into ROS or via the AgX product database pre-loaded on the ROS device.

Product Configuration Selection

Once a product configuration is setup, the product may be selected to quickly set up ROS for operations and resume operation or repeat the same operation in a different field. Simply select the product configuration, verify and adjust mix ratios as necessary for accurate job reporting, and get to the field tasks at hand.

CREATING JOB PROFILES

Use Job Profiles for each field. The Job Profile can be used year after year. It stores field data, scouting information (FLIP Maps), AB Lines and Grower/Farm/Field information.

1. Touch the Job Profile Icon 

2. Touch the Configure Job Profile Icon 

3. Touch the Add Button at the bottom of the screen

4. Enter a Profile Name for the Field (Field Name)

5. Touch the Edit button to add the Grower/Farm/Field Field Information 

6. Touch the Edit button again to add Grower/Farm/Field data. 

7. Touch the Add button to add Grower Information 

8. There are several data fields that can be added to the Grower Info. Add Grower info as desired. The more information the better. Touch the check mark when complete. 

9. Touch the Farm Panel to add Farm data.

10. Touch the Add button to add Farm data 

11. There are several data fields that can be added to the Farm Info. Add Farm info as desired. The more information the better. Touch the check mark when complete. 

12. Touch the Field Panel to add Field data.

13. Touch the Add button to add Farm data 

14. There are several data fields that can be added to the Farm Info. Add Farm info as desired. The more information the better. Touch the check mark when complete. 

15. After adding the Grower/Farm/Field information touch the check mark to confirm. 

16. For general settings choose Last Pass for Guidance

17. If FLIP maps are set up you can add the appropriate FLIP map to the scout setting. This will preload FLIP maps when starting a job.

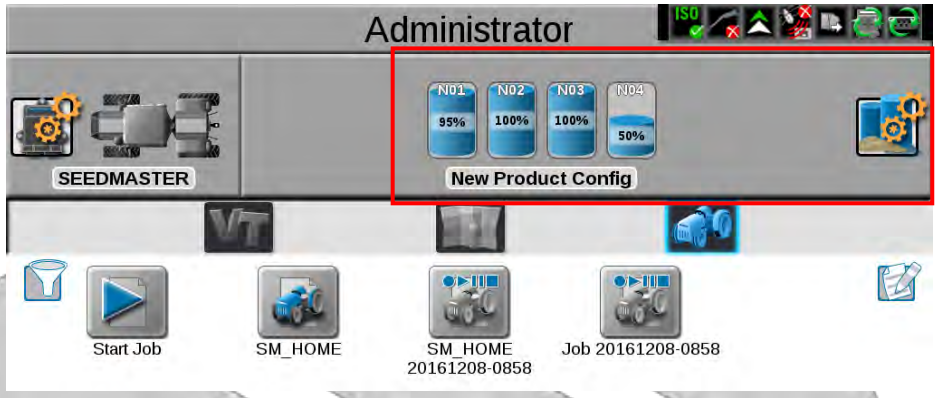
18. Touch the check mark when complete, the Job Profile is created. 

19. Touch the check mark to exit. 

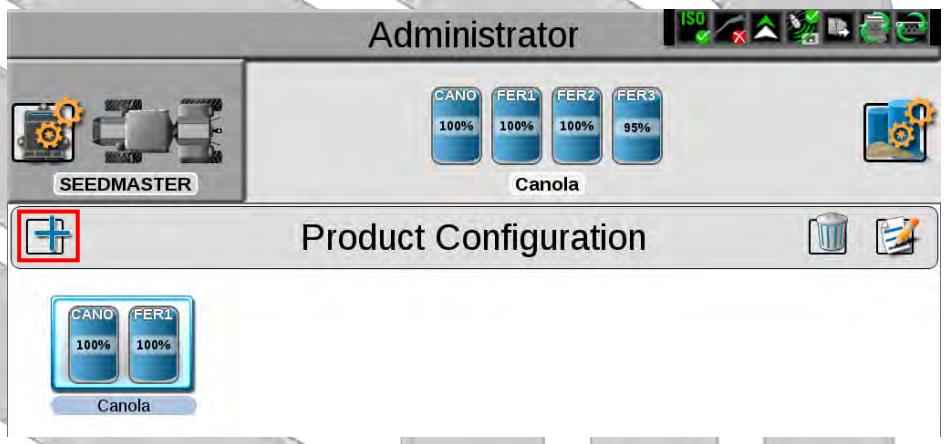
CREATING PRODUCT PROFILES

Create Product Profiles for common applications for upcoming field operations. The product configuration saves the control channel and the product information for various product types. It allows the operator to reselect profiles, to quickly resume, to restart an application or operation for various fields.

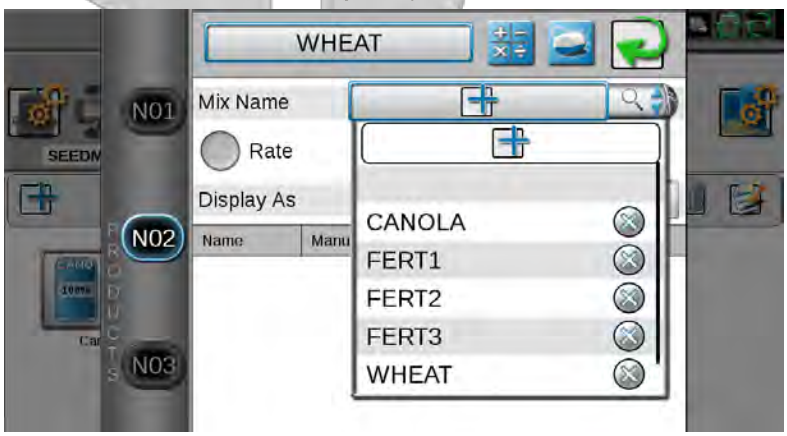
1. Touch the Product Profile Panel



2. Touch the Add button



3. Enter a Product Configuration Name and then touch the check mark
4. Name each product. Select the product from the left-hand side. (N01, N02, N03 or N04).
5. To add product names touch the Mix Name add button.
6. Type in the name of the product.
7. The product list saves the names of products as they are added. To choose an already added product name touch the magnifying glass in Mix Name.
8. Touch the green check mark to finish naming the products.



AUTOZONE COMMAND LOOK AHEAD TIME SETUP

To access the Auto Zone Command Setup (Section Control Setup) page.

1. Touch the Can System Configuration Icon on the main screen to begin setting up the system.
2. The CAN configuration icons screen will be displayed. Touch on the AccuBoom Icon.
3. The AccuBoom Settings page will be displayed.

AccuBoom Settings Review

1. Confirm there is a check mark in "AccuBoom Enabled"
2. Confirm there is a check mark in "Corrected Coverage"

3A. If all the Products share the same section drivers, place a check mark in "Apply to all products".

3B. If products don't share section drivers remove the check mark from "Apply to all products"

4. **Set On-override time:** The On-override feature allows the operator to momentarily apply product to a previously applied area while in a job. The override feature is useful to ensure product application in small unapplied areas near irregular headlands and previously applied areas. Enter the number of seconds to override automatic section control and apply product after the "OVERRIDE" button is pressed from within a job. Default valve setting is 30 seconds.

5. **Set Turn-off Percent:** This value controls the percentage of the section width that must be inside a previously applied area in order for the section to turn off. The default value is 99%. This would require that 99% of a section (zone) to be in a previously applied area before the Auto Zone Command system would turn off that zone.

6. Set Look ahead based on Time.

Turn-On/Turn-Off Look-Ahead

Depending upon the type of valve used to control products, control valves may take several seconds to adjust when opening or closing. To help compensate for the valve response time and lag due to filling or emptying product supply lines, the look-ahead values allow the Viper 4+ to begin adjusting control valves for map zones and previously applied areas.

***Note**: The look-ahead times should always be entered as positive values.*

7. Set Turn-Off Look-Ahead: Enter the number of seconds ahead of the vehicle (based on vehicle speed) which the Viper 4+ will scan for zone boundaries and changes when turning product application off.

8. **Set Turn-On Look-Ahead**: Enter the number of seconds ahead of the vehicle (based on vehicle speed) which the Viper 4+ will scan for zone boundaries and changes when turning product application on.

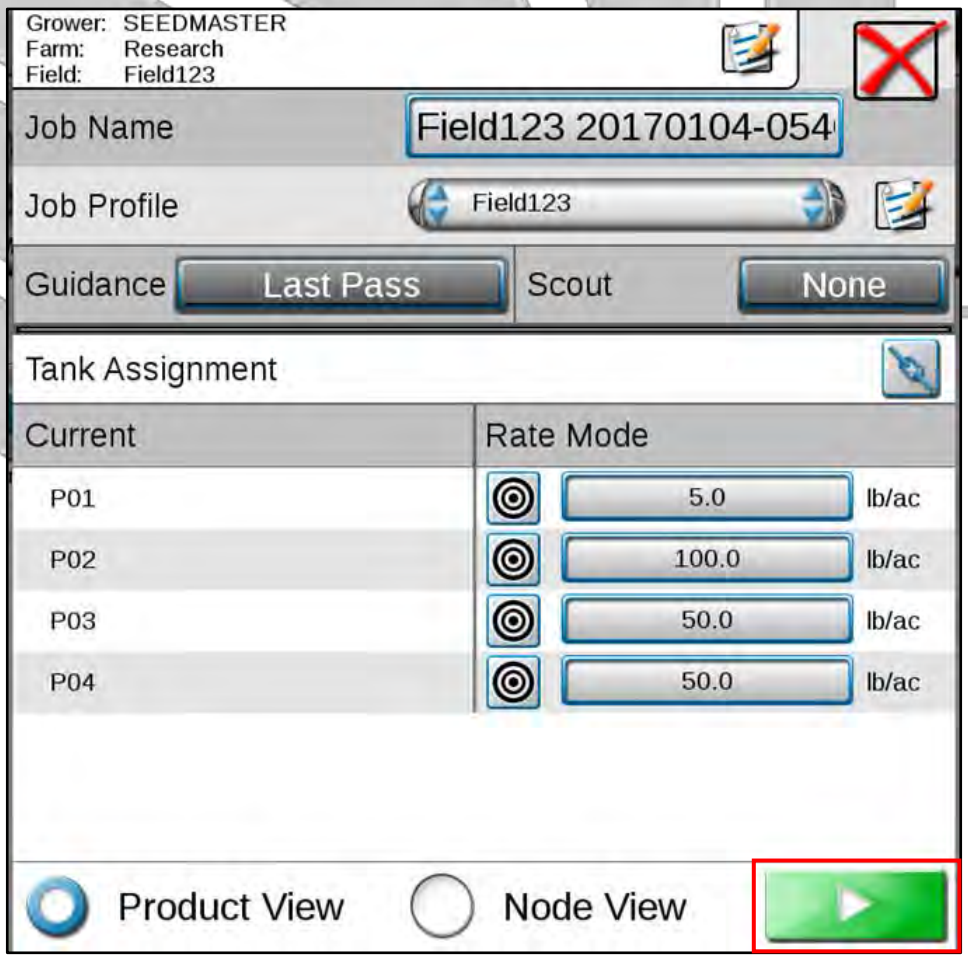
Factory Default Look ahead times: Use the chart below as suggested starting look ahead times. It is not SeedMaster responsibility for skips or misses. Please ensure that you have product being delivered to unapplied areas always when dispersing product.

TANK TYPE	TURN-OFF	TURN-ON
NOVA TANK	4 SECONDS	7 SECONDS
ON-FRAME TANK	3 SECONDS	5 SECONDS

VIPER 4+ JOB QUICK START PROCUDRE

Before you go to the field please review the steps below to ensure your Viper 4+ is field ready.

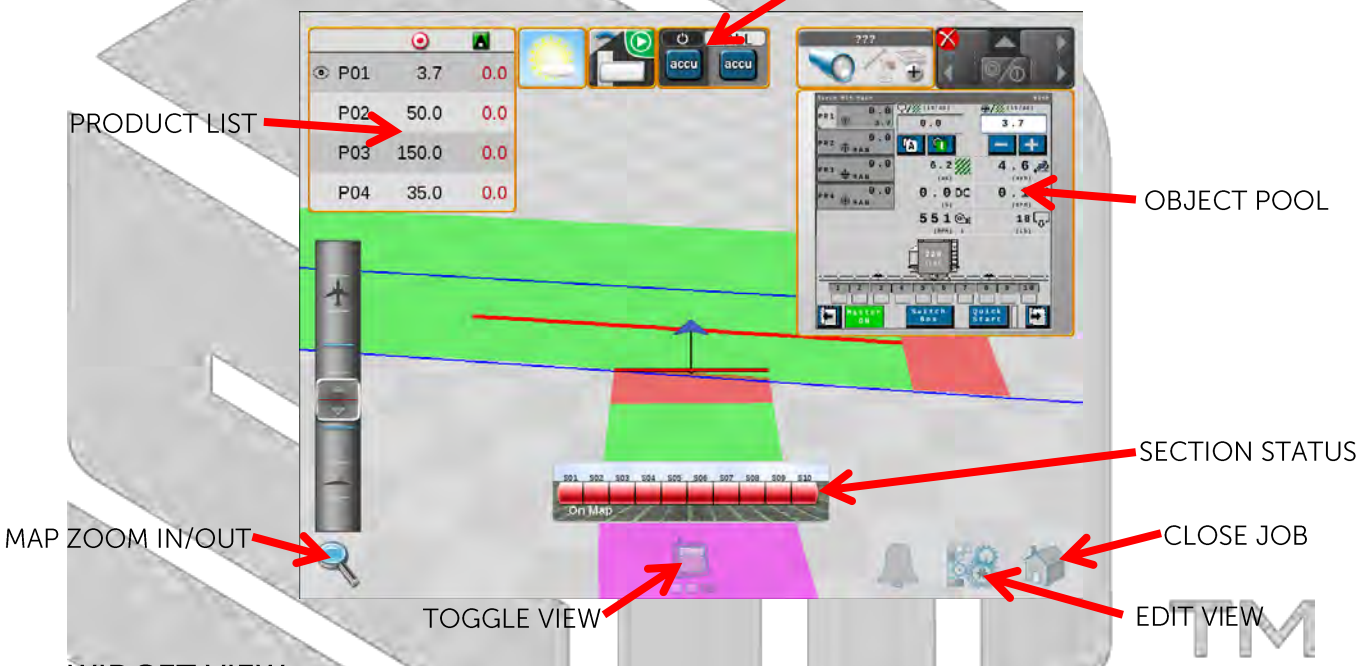
1. Review ISO TXB Quick Start Procedure (PAGE 27)
2. Review ISO RCM Quick Start Procedure (PAGE 67)
3. Review AutoZone Command Look Ahead Time Setup (PAGE 99)
4. Choose the correct Product Profile
   - Touch the Product Profile Panel
   - Choose the Product Profile for the specific field
   - If you need to create a Product Profile see PAGE 98 for more information
5. Touch the Job Profile Icon 
6. Choose the correct Job Profile OR just touch "Start Job" if not using Job Profiles
   - If you need to create a Job Profile see PAGE 97 for more information
7. Review Job settings
   A. Review Grower / Farm / Field Information (if applicable)
   B. Job Name: Enter the name of the Job
   C. Job Profile: Review or edit Job Profile information
   D. Guidance = Last Past
   E. Scout = None or if using FLIP Maps choose the appropriate FLIP Map.
   F. Rate Mode: Set the Rate for each product.
   G. Touch the Play Button when ready to open the Job



VIPER 4+ RUN SCREENS

There are 3 different operators run screens. The 3D Guidance, Field Review and Widget View. After starting a job you can easily toggle each view by touch the computer icon located on the bottom middle of the screen. A selection widget will pop up. The first icon from left to right is the 3D Guidance View then the Field Review map then the Browser Page if V4+ is connected to the internet and the last one is the Widget View.

GUIDANCE VIEW



WIDGET VIEW

FIELD REVIEW MAP

MANAGING SCREEN LAYOUTS

Each run screen layout can be modified or created. If modifying the run screen, it is recommended that a new personalized run screen is created. Follow the procedure below to create a new screen layout.

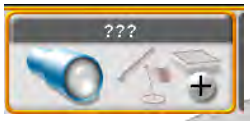
1. From the operating run screen touch the widget settings button.
2. Choose the layout view by either swiping left or right. The name of the view will appear at the top of the screen.
3. Touch the add view button. 
4. Enter a name for your view and touch the check mark.
5. Touch the pencil and paper to edit the layout. 
6. Touch the Widget Add Button to add widgets. There are a variety of widgets to choose from. Scroll left or right to browse the widgets.
7. To add a widget simply touch and hold the widget for 3 seconds. The widget will be added to the run screen.
8. Touch and hold and drag the widget around to your desired location on the screen. To delete a widget, tap on it the touch the red trash can located in the top left corner of the widget.
9. When all desired widgets have been added touch the widget finish or back button. Then touch the green check mark to complete the widget layout editing. 

CREATING A FLIP MAP AND BOUNDARY FOR ENTIRE FIELD

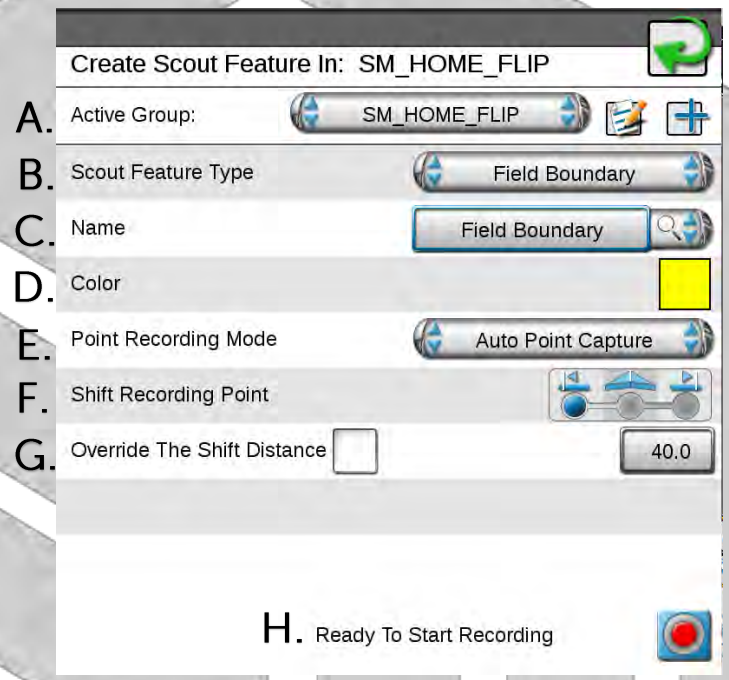
Follow the procedure below to create a flip map and boundary for the entire field.

1. From the run screen touch the Scouting Widget

   NOTE: If the scouting widget is not on your run screen you will need to add it. Please see the chapter for Adding Widgets to the run screen.

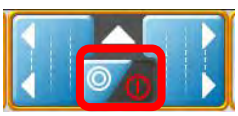


2. After touching the Scouting Widget, a window will pop up. Follow the steps below to setup the FLIP MAP.



A. **Name the Active Group**: touch the + sign and name the FLIP map the field name with FLIP at the end.
B. **Set the Scout Feature Type:** Leave as "Field Boundary"
C. **Name**: Leave as "Field Boundary"
D. **Color**: Touch the grey color box and select the yellow color
E. **Point Recording Mode**: Leave as "Auto Point Capture"
F. **Shift Recording Point**: Select **RIGHT** if traveling **counter clockwise** or select **LEFT** if traveling **clockwise**
G. **Override the Shift Distance**: Leave unchecked
H. **Ready to Start Recording:** After setup is complete touch the record button.

3. After setting up the field boundary you will need to enable FLIP. Turn on the FLIP widget by touching the circles in the middle.


FLIP WIDGET OFF

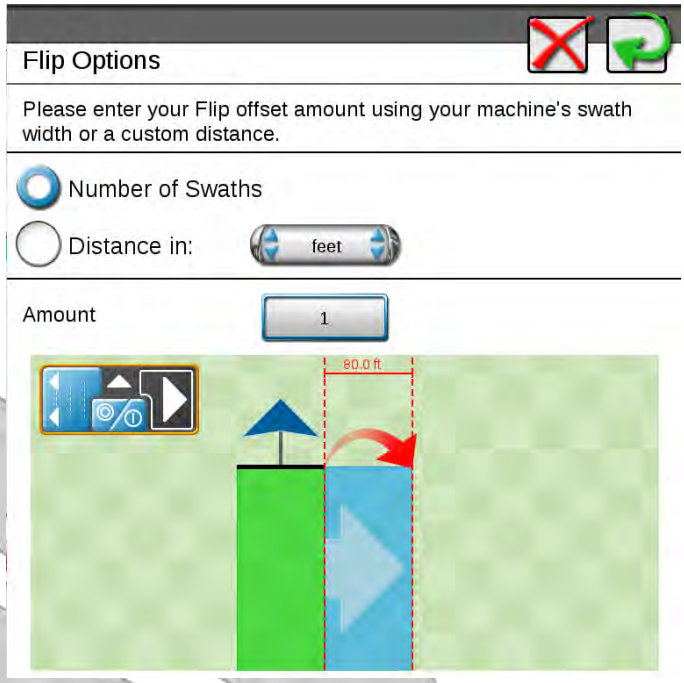

FLIP WIDGET ON

NOTE: If the FLIP widget is not on your run screen you will need to add it. Please see the chapter for Adding Widgets to the run screen.

4 Set how many virtual passes you would like to create. The FLIP widget will default it to one virtual pass. To change this touch and hold on the FLIP widget. If you would like to shrink the virtual pass touch the "Distance in" and enter the width of the virtual pass.

For example, on 80 feet enter 70.

When finished touch the green arrow.



5 Enable FLIP LEFT OR FLIP RIGHT. If you are doing the headland clockwise you will touch FLIP RIGHT and if you are doing the field counter clockwise you will touch FLIP LEFT.

FLIP RIGHT ENABLED

6. After enabling FLIP touch the record button on the Field Boundary Widget.

7. Complete the first headland pass. Stop moving then touch the Save Boundary button and Save FLIP map button.

NOTE: If at any time it is necessary to lift and turn out touch the pause button.

FIELD BOUNDAY & FLIP MAP SAVE BUTTONS

1. FIELD BOUNDARY & FLIP map is complete. The name of the FIELD BOUNDARY will appear in the Scout Widget and the FLIP widget is ready for inside FLIP maps.

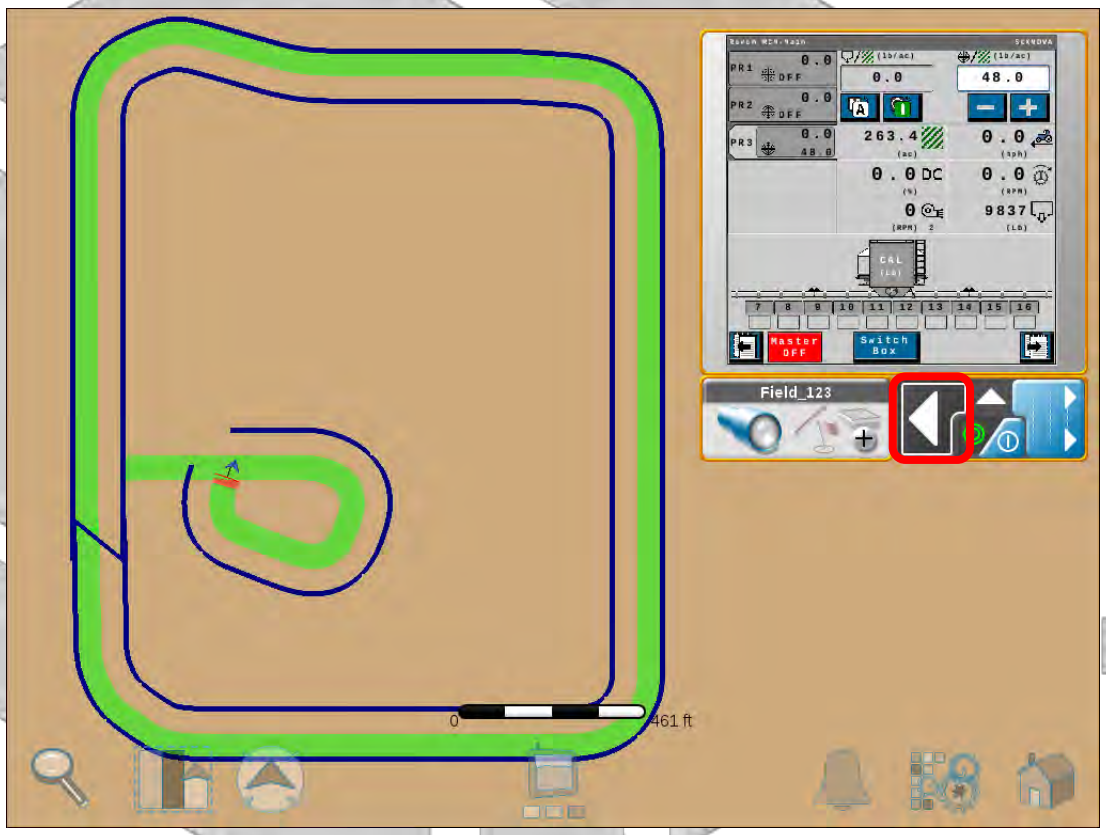
CREATING AN INSIDE FLIP MAP

Once the outside FLIP & Boundary are created it is possible to create a FLIP Map inside the field boundary.

1. To begin creating an inside FLIP map simply touch FLIP LEFT or FLIP RIGHT. If you are going around the object clockwise touch FLIP LEFT. If you are going around the object counter clockwise touch FLIP RIGHT.

FLIP LEFT  FLIP RIGHT

2. Drive around the object until you reach the previously applied area. Once all of the zones are off stop the vehicle.
3. Touch the FLIP LEFT or FLIP RIGHT button to complete the inside FLIP Map.
4. Repeat as necessary



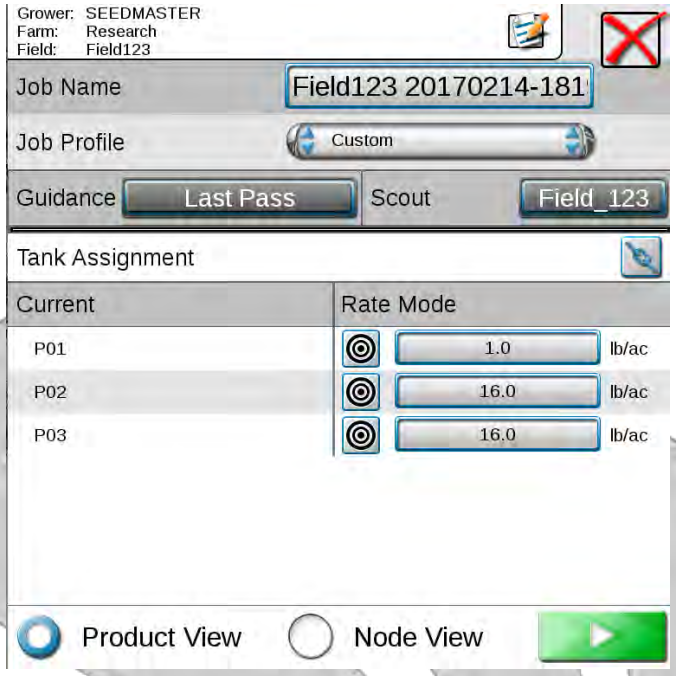
SEEDING THE VIRTUAL PASS

After completing the field or around an object the virtual pass will need to be seeded. To override FLIP the on-screen switch box will need to be set to on.

1. Touch the Master accu button
2. Touch the green on button.
3. when finished change it back to accu.

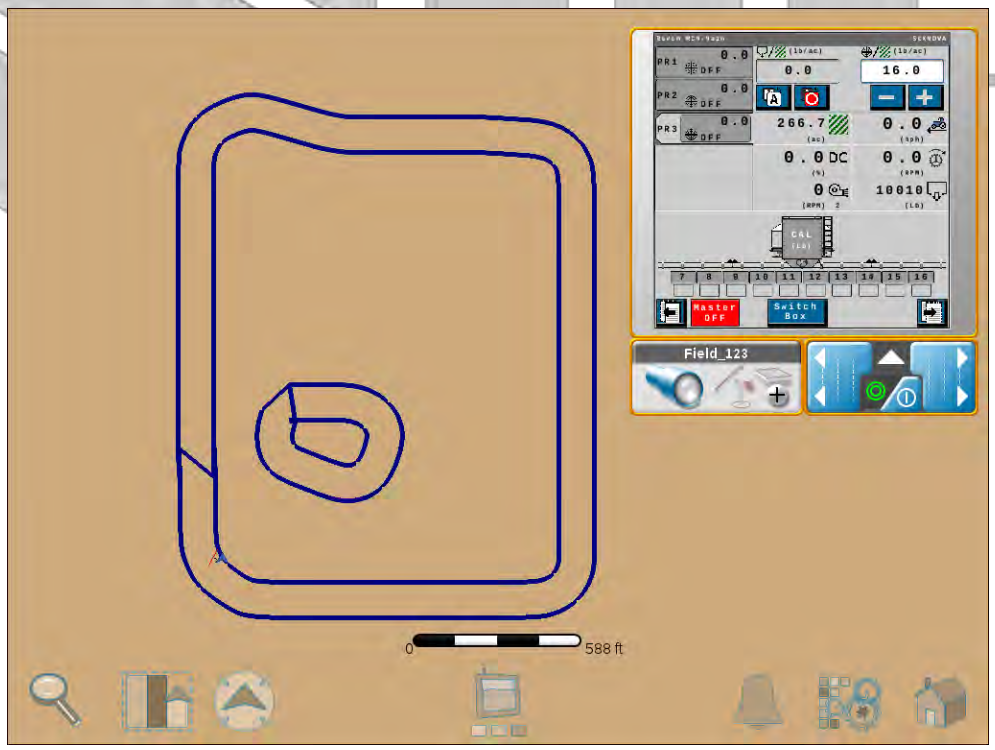
LOADING A PREVIOUSLY CREATED BOUNDARY & FLIP MAP

1. Start a new job
2. Touch scout and choose the appropriate FLIP map for the field.



3. Touch Play
4. The FLIP map will load automatically
5. Turn FLIP ON

FLIP WIGET OFF FLIP WIDGET ON



VIPER 4+ FILE MAINTENCE

File Maintenance can be defined as the process of archiving specific files from the Viper 4+ and deleting files that are no longer needed.

It is recommended that the user perform this maintenance at the end of each day. If this is not possible, maintenance should be performed at least once a week.

File maintenance ensures that the Viper 4+ system can perform at optimal efficiency by removing files that are no longer needed. Maintenance also safeguards valuable information from being lost in the event that a file is damaged or corrupted, since files will be archived on a personal computer or laptop for future reference.

All Viper 4+ job files are stored in memory located inside the Viper 4+. The storage location for these files is of a fixed size and will hold a large, but limited, number of files. File maintenance should be conducted on a regular basis to ensure sufficient storage space is available for future jobs.

Files can be loaded onto the Viper 4+ or downloaded from the Viper 4+ using an external USB thumb drive. Insert the USB thumb drive into the USB connector located in the left side of the Viper 4+.

Note: Do not leave the USB flash drive in the front USB connector while operating the machine. Insert the USB flash drive into the front USB connector only to perform file maintenance.

Transferring Files to a UBS Drive

1. Insert a USB drive into the Viper 4+
2. Touch the Administrator Panel
3. Touch the File Manager Button
4. Select the Files to be copied to the USB drive or select all to transfer all files
5. Touch the File Transfer button
6. Touch the USB_DISK button
7. Touch the Move Button
8. Touch the GFF Structure Button
9. Place check marks in the Generate Report and Include Shape Files selections
10. Touch the Export Button
11. The files will be deleted from the Viper 4+ touch Yes to continue
12. After a successful transfer the File Transfer is complete touch the OK button

Deleting Files from the Viper 4+

1. Touch the Administrator Panel
2. Touch the File Manager Button
3. Select the Files to be deleted from the Viper 4 or select all to delete all files
4. Touch the Trash Can button
5. Touch Yes to confirm the deletion of the files

3RD PARTY GPS

The Viper 4+ system requires a GPS differential correction from a GPS receiver. The GPS receiver that connects to the Viper 4+ is required to output the correct NEMA strings. The NEMA strings required are:

- GGA @ 10hz
- VTG @ 10hz
- RMC or ZDA @ 1HZ
- Minimum BAUD Rate Setting of 19200bps.

After the correct patch cable is installed to the Viper 4+ main console harness (Connection is labeled DGPS, it is a 9pin Male RS232 connector) and the 3rd party GPS receiver has been correctly configured. It is a simple procedure on the Viper 4+ to connect the GPS receiver.

To access the Serial Devices page.

1. Touch the Can System Configuration Icon on the main screen to begin setting up the system.
2. The CAN configuration icons screen will be displayed. Swipe the pages left until you see the Serial Devices Icon. Touch the Serial Devices Icon.

3. The Serial Device Settings page will be displayed.
4. Touch the Serial Devices Reset / Redetect button. 

The Viper 4+ will search for the installed GPS receiver. If it's not found check your connections and GPS receiver setup. If found the GPS icon in the top right will go green.

NOTE: *There are Commonly used 3rd Party GPS Patch Cables. Please contact your GPS supplier to obtain the correct patch cable.*

Please refer to your 3rd party GPS receiver manual or Dealer for instructions on setting up NEMA strings and outputting GPS. The part numbers are used as guidelines please consult your GPS dealer before ordering any of the above cables.

Note: If you are connecting to a Raven DGPS receiver, the receiver will be configured to output the correct NEMA strings to your Viper 4+ Field Computer. Raven DGPS receivers are also available for purchase. Please contact your ACE Advisor for more details.

SETTING THE TRACTOR MEASUREMENTS

The Viper 4+ and RCM are setup for your specific SeedMaster machine from Factory. The Viper 4+ **IS NOT SETUP** for your specific tractor pulling your SeedMaster machine. It is important to configure the tractor to ensure proper as-applied mapping. The procedure below walks through the setup of the tractor.

1. Touch the Machine Configuration Panel
2. Touch the edit icon

3. The setup will take you to the Machine/Implement Garages. Touch the Tractor garage button to edit the tractor measurements of the tractor pulling your SeedMaster machine.

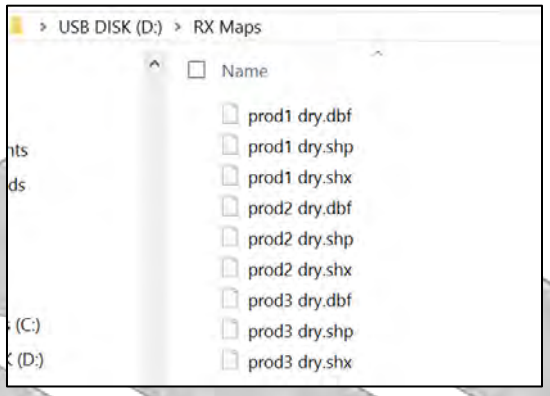
4. The setup will take you to the Machine Garage. Touch the add new Machine Button to add the tractor type pulling your SeedMaster machine.
5. Choose the Tractor Type: Traditional Tractor, Track Tractor or Articulated Tractor (Swipe left).
6. After choosing the tractor type. Name the Tractor. IE. MY4WD.
7. Enter any General Information if desired.
8. Touch the blue arrow pointing to the right. Measure and enter ALL measurements for the tractor.
9. Touch the blue arrow pointing to the right. Measure and enter ALL measurements for the tractor on page 2.
   ***NOTE**: It is important to measure and enter the all machine measurements to ensure correct as applied mapping.*
10. Touch the Green check mark to finish setting up the tractor.
11. Touch the Green check mark to exit the Machine Garage.
12. Touch the Green check mark to exit the Tractor Machine Setup.

IMPORTING PERSCRIPTION MAPS

The RX map shape file needs to be loaded onto a UBS drive before importing them to the Viper 4+.

***NOTE**: THE Viper 4+ needs to be unlocked for RX maps before they can be applied.*

1. Insert a the USB drive to your PC
2. Create a folder called RX Maps on the root of the USB drive
3. Copy the RX files to the RX Maps folder. There will be 3 files associated the RX map. See below.



4. Insert the USB Drive into the Viper 4+
5. Go to the Administrator Panel on the Viper 4+
6. Touch the File Manager button
7. Touch the UBS Drive Tab
8. Touch the drop down menu for "USB" and choose your USB drive
9. Touch the drop down menu for "Choose file type" and choose "RX Maps"
10. Touch the blue arrow pointing to the right

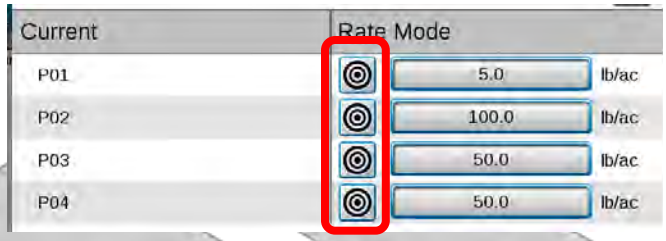
11. Navigate to the RX Maps folder
12. Choose the RX maps to import or Select All
13. After selecting the RX maps touch the import button

14. Touch the check mark to confirm the RX Map import
15. A pop window will appear when the files have been successfully imported touch OK to finish.
16. Touch the green arrow to return to the main screen

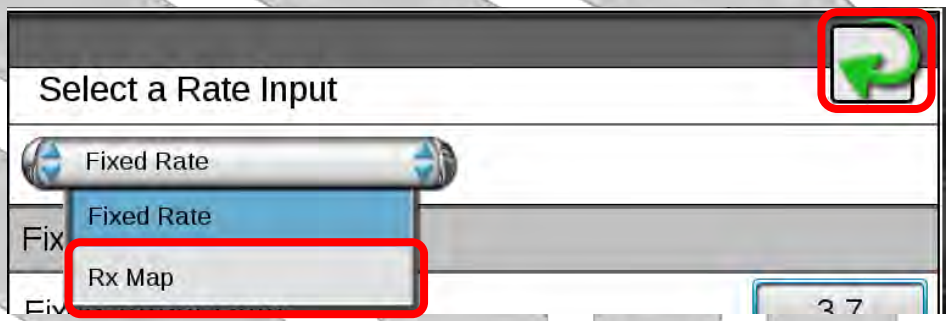
LOADING RX MAPS WITH JOB

After the initially starting a job select the prescription (Rx) rate mode to apply product according to a prescription map stored on the Viper4+ and load it into the job profile or active job operation. This mode allows the Viper 4+ to automatically adjust the target rate for field areas as designated by the prescription map.

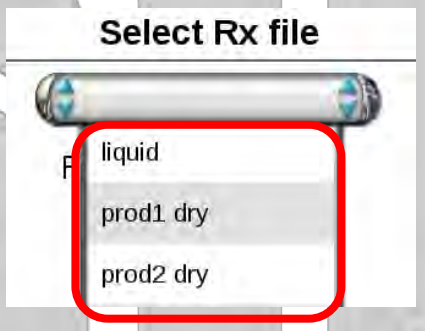
1. Determine what product the RX map will be applied to.
2. Touch the target icon for the product that the RX map will be applied to.



3. Touch the drop down menu below "Select a Rate Input".
4. Select "Rx Map" then touch the green arrow.



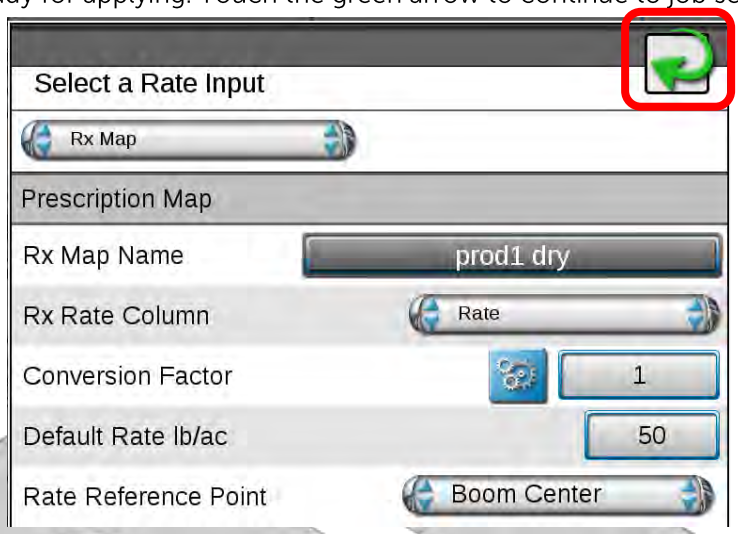
5. Touch on "RX Map Name" then choose the RX associated to that product.



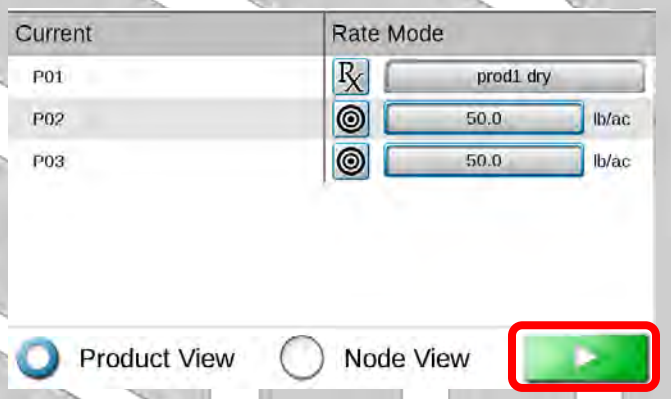
6. After selecting the RX map touch on the drop down menu for "RX Rate Column" then choose the desired Rate.

7. The conversion factor for the RX map is set to 1 for a ratio of 1 to 1. If you desire to cut the rates in half for the RX Map enter .5.
8. The Default Rate for applying outside of the RX map is set to 0. If desired change this to your desired default rate.

9. Rate reference defaults to the center of the machine.
10. The RX map is ready for applying. Touch the green arrow to continue to job setup.



11. If multiple RX maps are being applied please repeat the above steps .
12. When finished touch the play button to open the job.



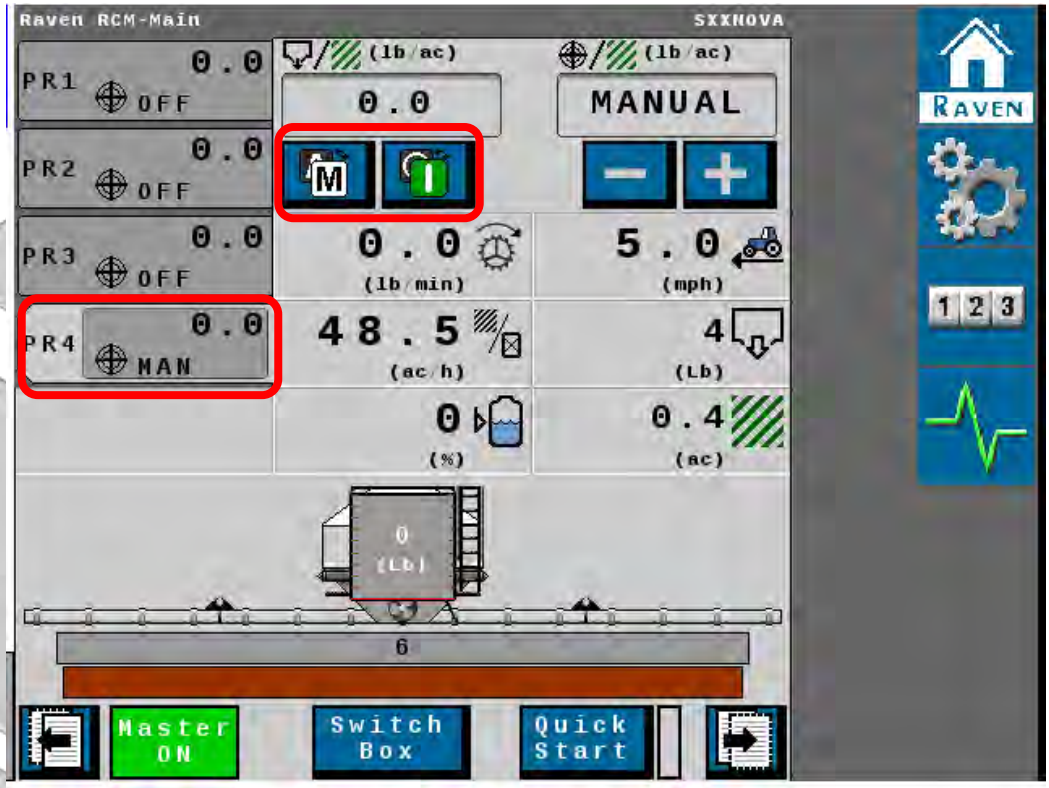
***NOTE**: THE RX MAP WIDGET CAN BE ADDED TO THE RUN SCREENS FOR RX MAP SETTINGS DURING JOB OPERATION*

VIPER 4+ AUTOLFT OPERATION

MANUALLY LOWER THE OPENERS

LOWER:

1. LOCK ON REMOTE TO SUPPLY OPENERS WITH HYDRAULIC PRESSURE.
2. ON THE RCM OBJECT POOL SCREEN SELECT THE PRODUCT THAT IS TIED TO AUTOLIFT.
3. SET THE PRODUCT TO MANUAL AND TURN THE MASTER PRODUCT SWITCH TO ON
4. INPUT A SELF TEST SPEED
    a. Touch the settings soft key, choose the Applicator Setup tab, touch test speed and enter 5 and touch the check mark then the home soft button.



5. CYCLE MASTER FOOT SWITCH FROM OFF TO ON AND LEAVE THE MASTER SWITCH "ON" OPENERS WILL LOWER.

LIFT:

6. AFTER THE TOOLBAR IS COMPLETEY OVERLAPPED INTO AN APPLIED AREA.
7. SHUT THE MASTER FOOT SWITCH OFF, OPENERS WILL LIFT.

LOWER:

8. CYCLE MASTER FOOT SWITCH FROM OFF TO ON AND LEAVE THE MASTER SWITCH "ON" OPENERS WILL LOWER.

AUTOLIFT FIELD OPERATION

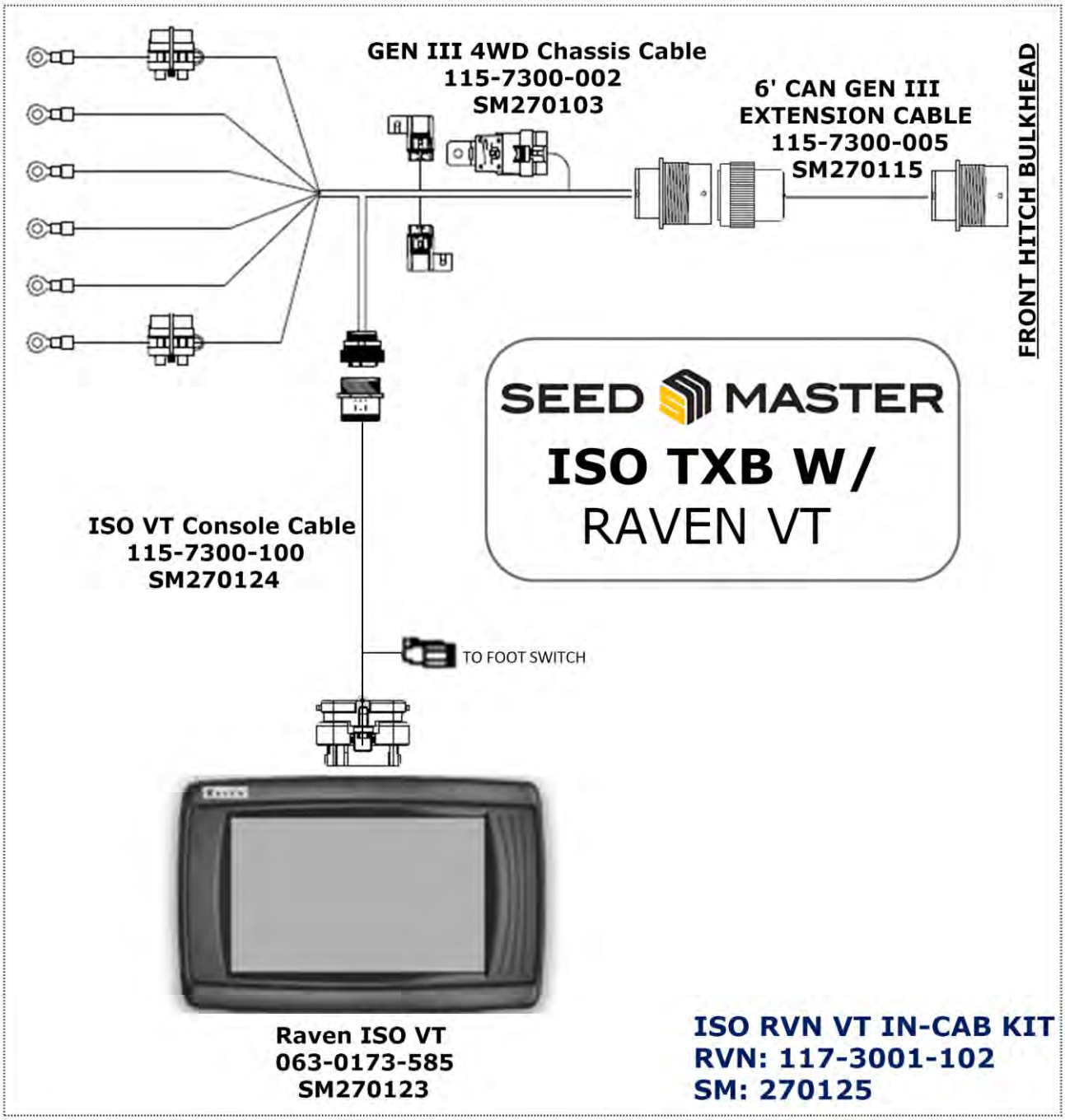
1. LOCK ON REMOTE TO SUPPLY OPENERS WITH HYDRAULIC PRESSURE.
2. ON THE RCM OBJECT POOL SCREEN SELECT THE PRODUCT THAT IS TIED TO AUTOLIFT.
3. SET THE PRODUCT TO MANUAL AND TURN THE MASTER PRODUCT SWITCH TO ON
4. START A JOB

5. WHEN YOU ARE READY TO APPLY TURN THE MASTER FOOT SWITCH ON
6. WHEN YOU START MOVING THE OPENERS WILL GO INTO THE GROUND
7. TO OVER RIDE AUTOLFT TURN THE AL SWITCH ON THE SWITCH BOX TO ON. PUT BACK TO accu TO TURN AUTOLIFT BACK TO AUTOMATIC MODE.

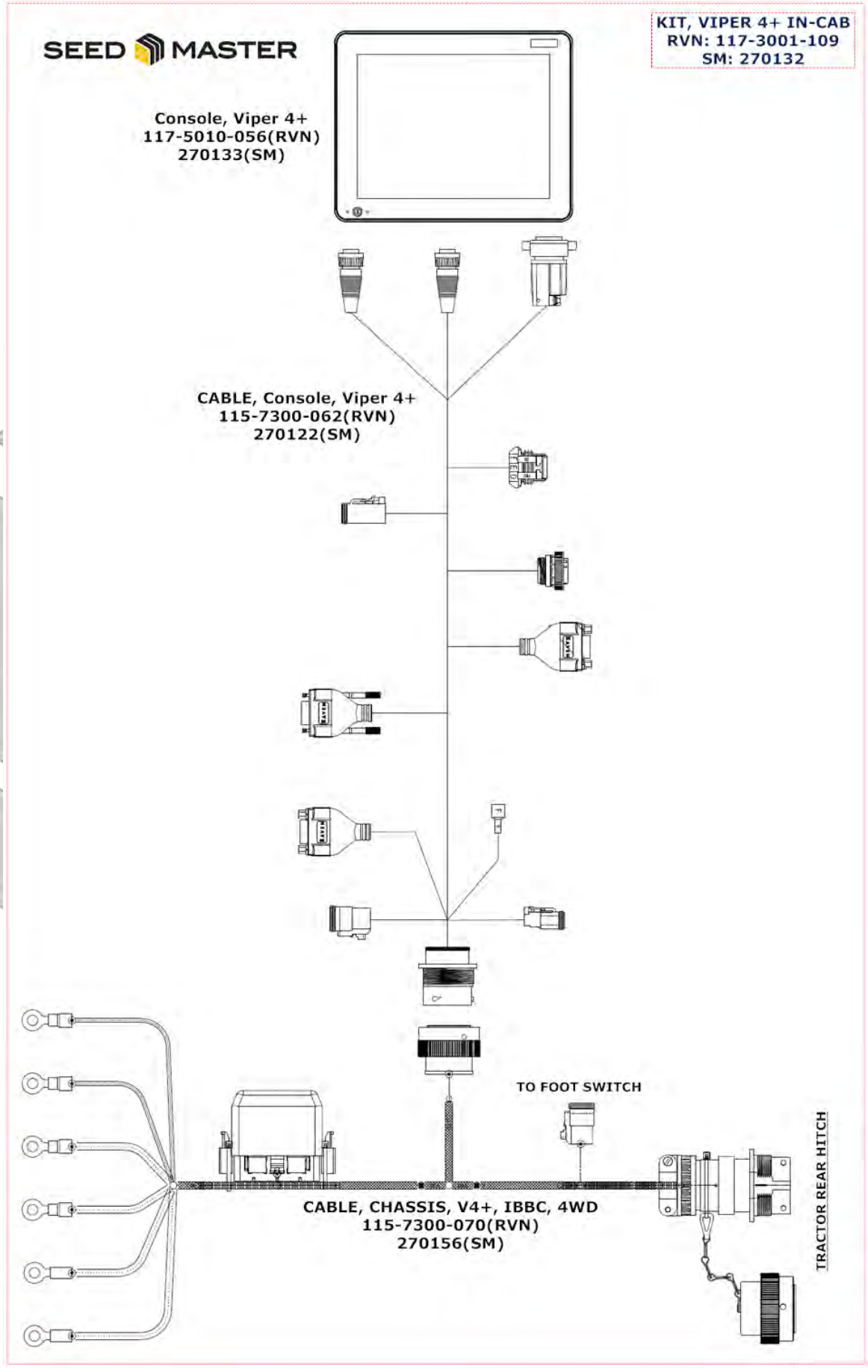
8. IN THE TURNS TURN THE MASTER FOOT SWITCH OFF TO AVOID OPENERS FROM DROPPING.

SYSTEM ELECTRICAL DRAWINGS

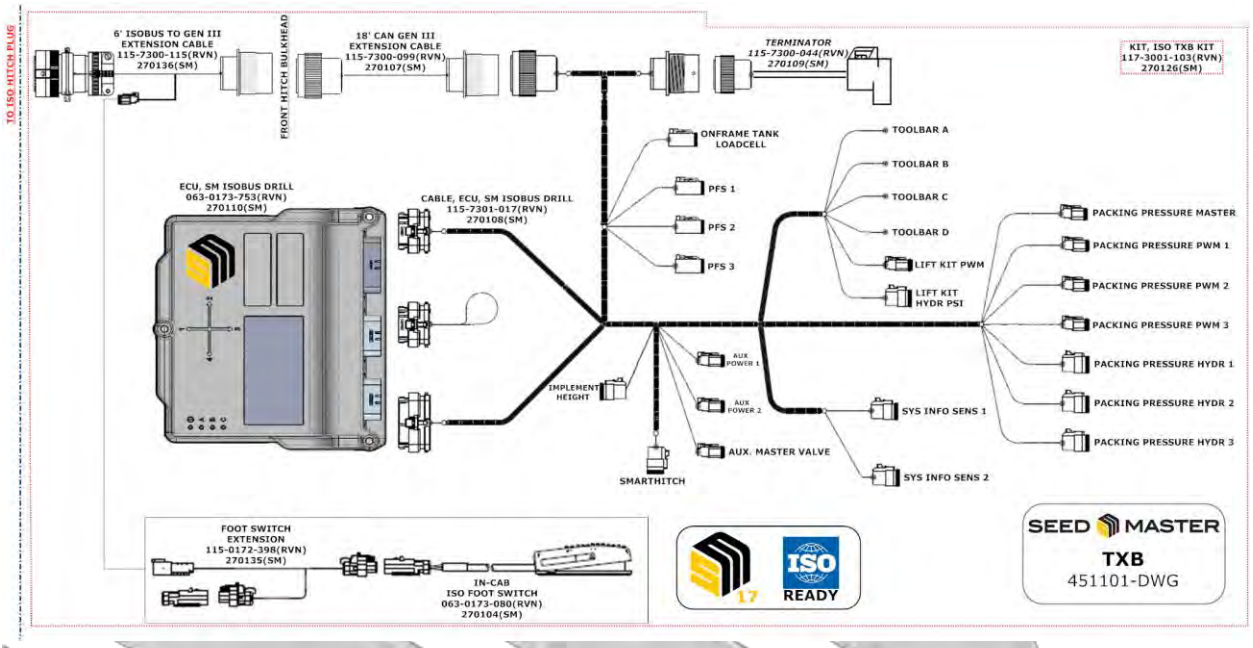
IN-CAB RAVEN VT



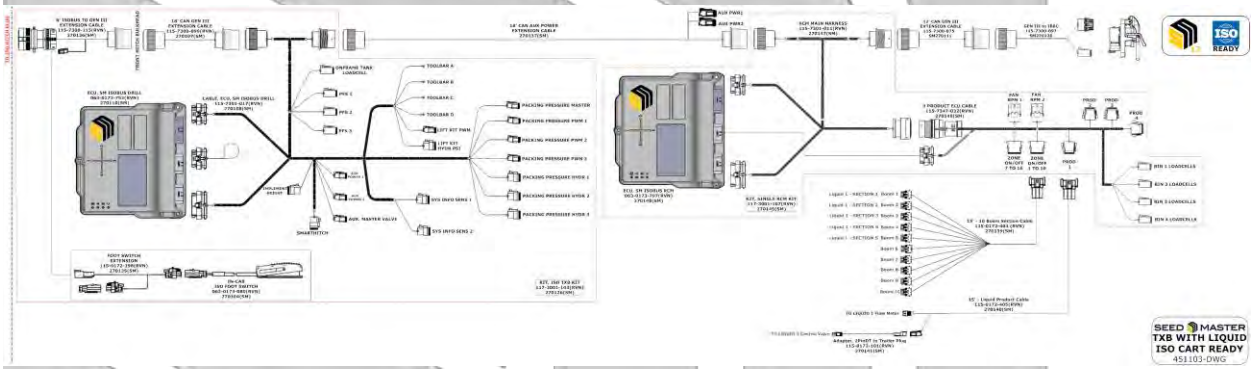
IN-CAB VIPER 4+



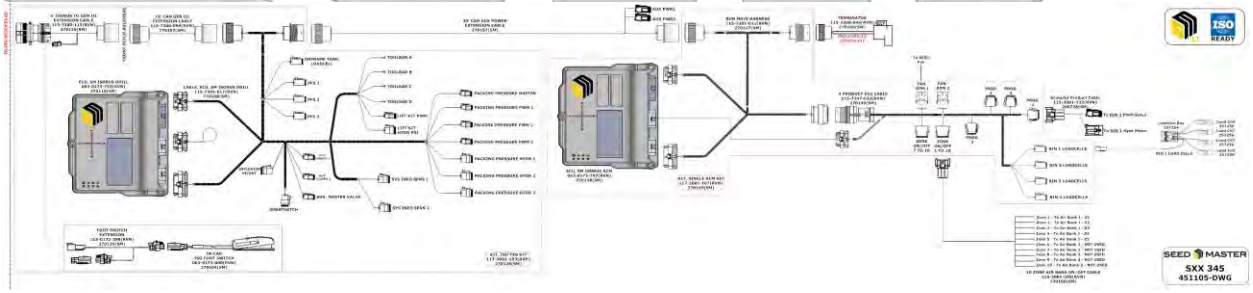
ISO TXB ONLY



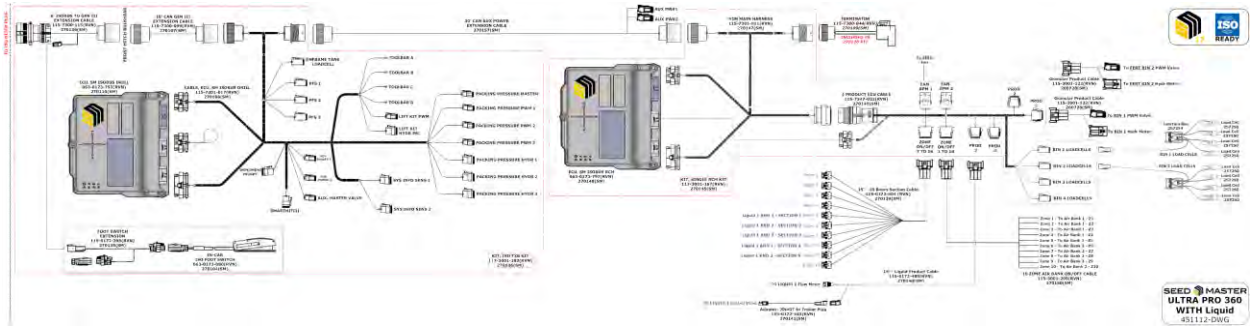
ISO TXB WITH EXISTING VT & ISO CART READY WITH LIQUID CADDY



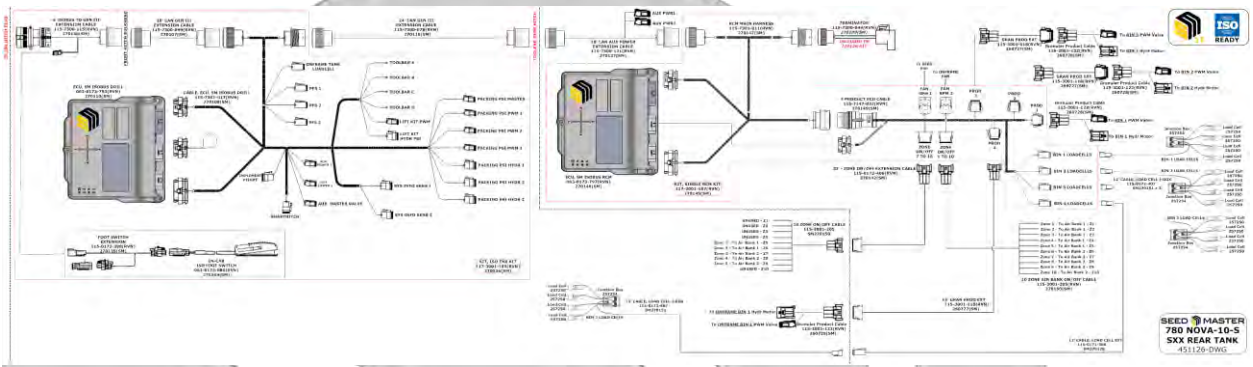
ISO SXX345



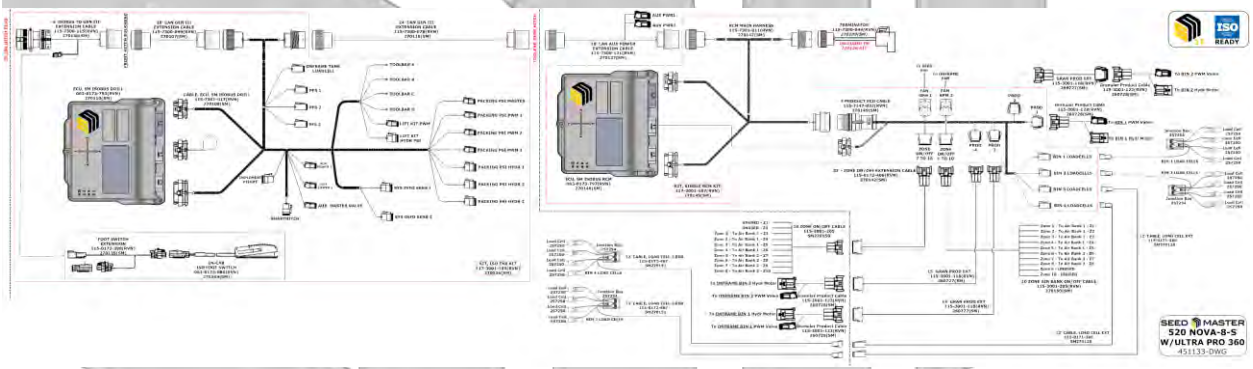
ISO ULTRA PRO II 360 WITH LIQUID CADDY



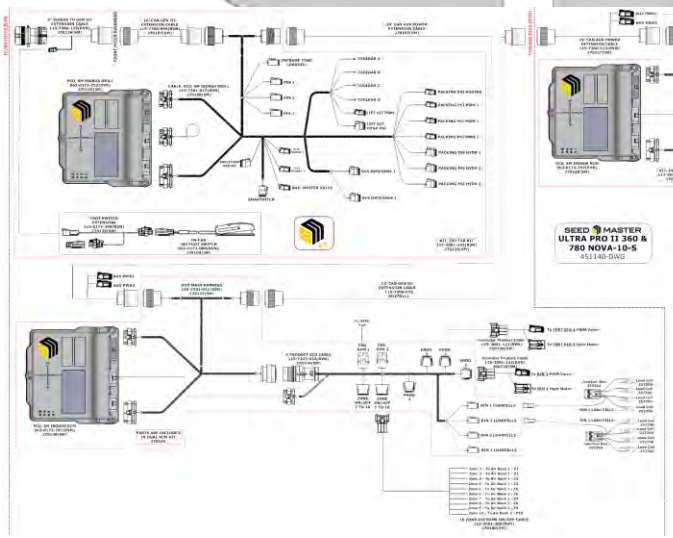
ISO 780 NOVA WITH SXX (REAR TANK)



ISO 520 NOVA WITH ULTRA PRO II 360



780 NOVA WITH ULTRA PRO II 360



NOTES