SEEDMASTER | 2026

E-SERIES CART - SMD TOOLBAR

OPERATOR'S MANUAL

CONTENTS

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 problems arise, SeedMaster Manufacturing's dealership network can provide clarification and correction. It is important that all SeedMaster units maintain a solid reputation.

SeedMaster Manufacturing would like to take this opportunity to thank you, our valued customer, and our valued dealer, for showing your confidence in purchasing and representing a quality SeedMaster product.

SAFETY

Please be SAFE! Carefully read and understand all safety alerts and warnings in this manual and all safety decals on SeedMaster products. Ensure that anyone who is going to use the SeedMaster product reads and understands the Operator's Manual. We recommend that only mature and well-trained or experienced people 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 machine.
- 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 product. Ensure that minimum safe working distances are always maintained from any obstruction.
- 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.
- If 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 test for meter calibration, keep hands and clothes well clear of rotating components. 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 drill and/or cart are properly and safely connected to each other and the tractor.
- Transport per local regulations for width and height.
- Follow all road safety regulations for your state or province.
- Store the unit on a firm, level surface.
- 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.
- Always keep safety decals and signs clean and legible. Replace safety decals and signs that are missing or have become illegible.
- Always use hitch safety chain.
- Do not transport at high speeds, especially 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 cart steering axle is moving freely before going onto roads.
- Do not transport at speeds higher than that recommended on tires and hubs (25 mph or 40 kph).
- Check all transport wheel nuts after the initial 10 hours of use and periodically thereafter. (See PAGE 8).
- Use proper tire inflation pressures (SEE TIRE TORQUE AND PSI SPECS, PAGE 8).

TIRE TORQUE AND PSI SPECS

TIRE SIZE	TORQUE REQUIREMENTS (FT. LBS.)	RECOMMENDED PRESSURE (PSI)
380/55-16.5	200	72
31x13.5	200	60
750/65R26	450	35
Single 800/70R38	450	15
Dual 800/70R38	750	12

NOTE: All tires require re-torque after the initial 10 hours of in-field use. Subsequent checks should happen every 100 hours. Higher torque values may require a torque multiplier.

SEEDMASTER E860 E-SERIES CART

HYDRAULIC HOOKUPS

HYDRAULIC HOSES

HOSE MARKING CONVENTION: 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: Red Tagged Lines – The two ⅝" Direct Opener Lift & Lower hydraulic lines with red colour bands are the opener lift and lower lines. These lines are connected to one tractor remote. The hose with 1 red band is opener down pressure. The hose with 2 red bands is pressurized to raise the openers. The openers are held up in transport with a Pilot Operated Check Valve. This maintains the pressure on the opener up pressure circuit for long transport and to facilitate unhooking under lift pressure. Leave the pressure engaged to operate the Openers. **NOTE***: See page 18 for operation instructions.*

SYSTEM PRESSURE HOSES: Green Tagged Lines - The two ⅝" hydraulic lines with 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, the operating position for this remote is locked on to provide continuous pressure to the block via the line with 1 green band. Pressure should be adjusted and set between 2600-3000 psi by using the tractor remote flow control.

When an E-Series cart is connected, the System Pressure operates the alternator, which charges the onboard batteries, and the CleanFlo Purge Pump, which is critical to cart operations.

SEED AND FERT FAN HOSES E-SERIES: The seed fan hoses will be tagged with 1x yellow (pressure) and 2x yellow (return) and the fertilizer fan will be tagged with 1x blue (pressure) and 2x blue (return).

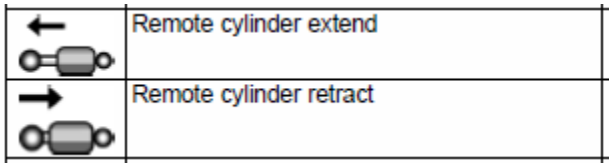
Ensure that you connect the right pair of hoses together on your tractor.

CASE DRAIN HOSE: E-Series tanks are set up with **ONE** ¾**"** case drain line (zero back pressure). This line has a ⅜" flat-faced coupler routed to the Main Hydraulic Block when paired with an SMS Toolbar. Improper connection or undersized return lines may cause inaccuracies in operation and the possibility for severe damage to the drill and tank's hydraulic systems.

SeedMaster Manufacturing recommends using the factory Case Drain connections provided with the drill and tank. It is important to ensure that the Case Drain is hooked up to a connection on the tractor with ZERO back pressure. Any back pressure values above zero can damage or cause complete failure of hydraulic motor seals. Damage of this nature is NOT covered under warranty.

HYDRAULIC CONNECTION REFERENCE CARDS

SeedMaster Toolbars and E-Series carts can be paired or separate. Please refer to your configuration below. Ensure that you are hooking the pressure and return hoses to the appropriate remotes on your tractor: Pressure to Retract, Return to Extend.



SMD Toolbar Only Hydraulic Hookup

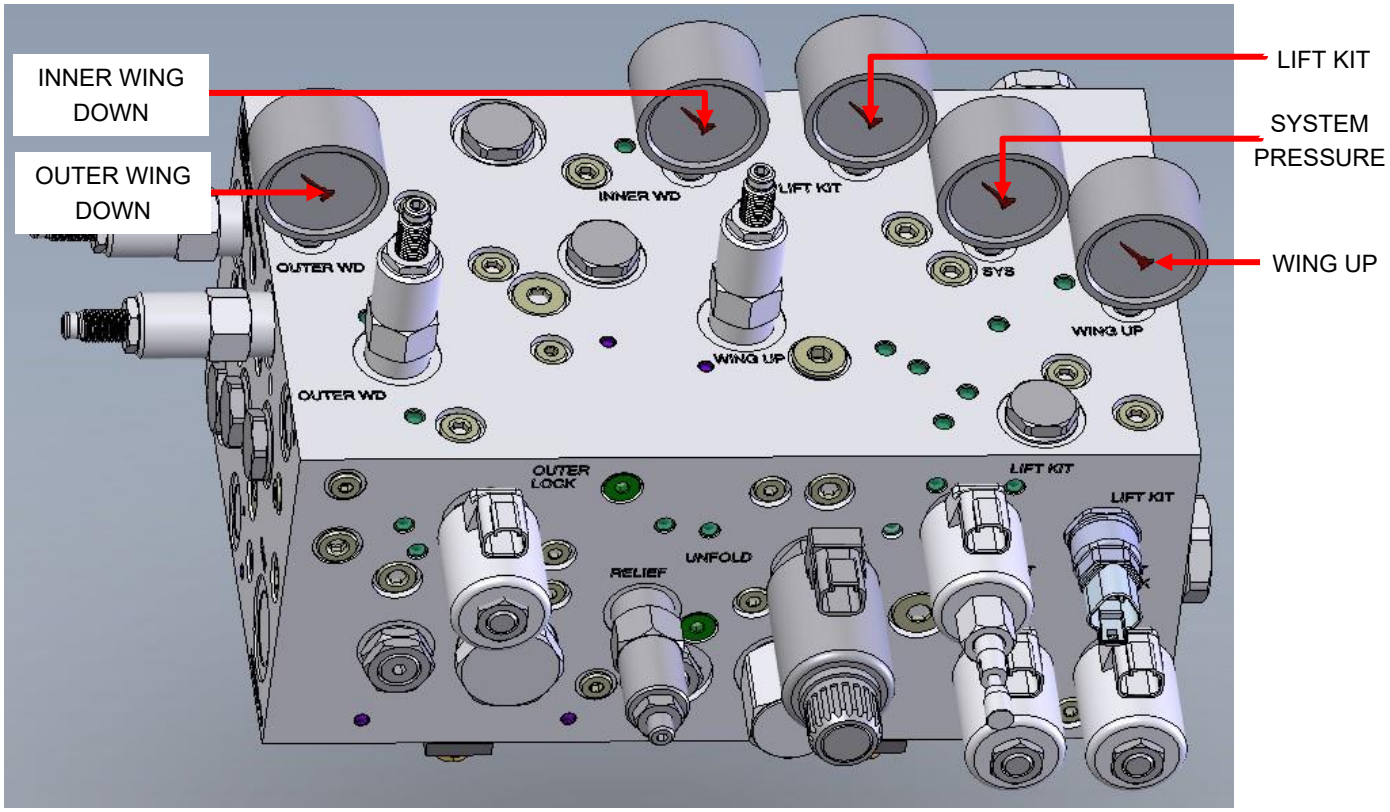
TRACTOR REMOTE	HOSE PAIR PRESSURE	RETURN	HYDRAULIC FUNCTION
SCV 1 SEEDMASTER	1 RED ⅝" Line	2 RED ⅝" Line	OPENER PRESSURE
SCV 2 SEEDMASTER	1 GREEN ⅝" Line	2 GREEN ⅝" Line	SYSTEM PRESSURE
SCV 3 UNUSED			
SCV 4 UNUSED			
SCV 5 UNUSED			
CASE DRAIN SEEDMASTER	¾" CASE DRAIN LINE		

SMD Toolbar and E-Series Hydraulic Hookup

TRACTOR REMOTE	HOSE PAIR PRESSURE	RETURN	HYDRAULIC FUNCTION
SCV 1 SEEDMASTER	1 RED ⅝" Line	2 RED ⅝" Line	OPENER PRESSURE
SCV 2 SEEDMASTER	1 GREEN ⅝" Line	2 GREEN ⅝" Line	SYSTEM PRESSURE
SCV 3 SEEDMASTER	1 YELLOW ¾" LINE	2 YELLOW ¾" LINE	SEED FAN E-SERIES
SCV 4 SEEDMASTER	1 BLUE ¾" LINE	2 BLUE ¾" LINE	FERT FAN E-SERIES
SCV 5 UNUSED			
CASE DRAIN SEEDMASTER	¾" CASE DRAIN LINE		

MAIN HYDRAULIC BLOCK DETAILS

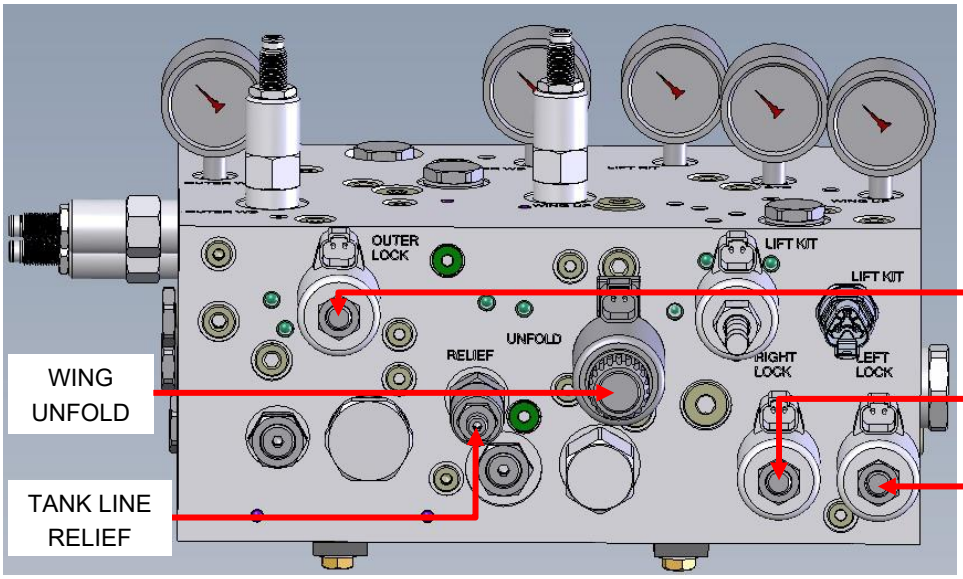
HYDRAULIC BLOCK GAUGES

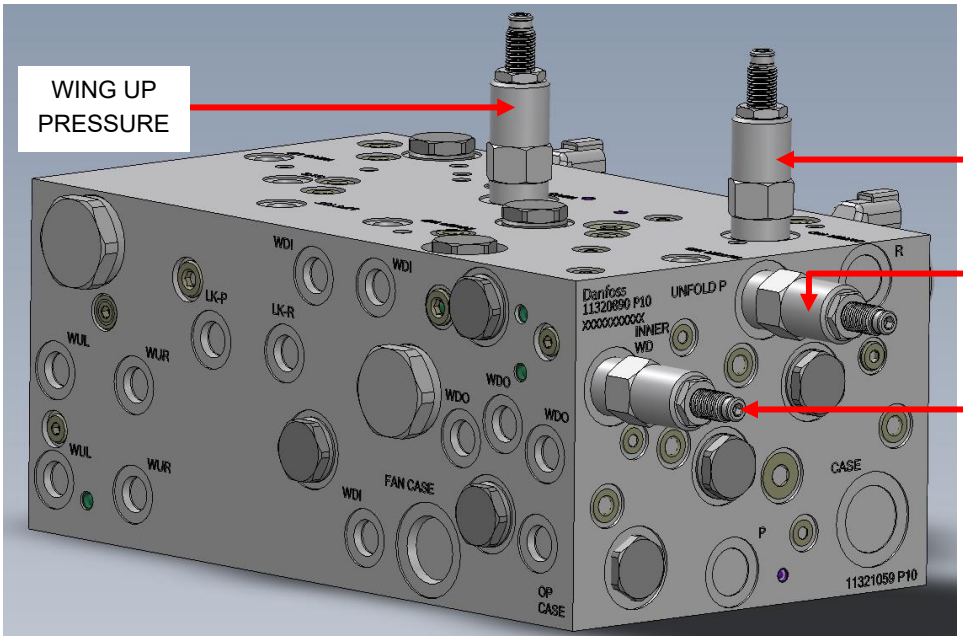


MAIN BLOCK GAUGES

OUTER WING DOWN: The OUTER WING DOWN gauge reads the amount of pressure being applied to the outer wings while they and the openers are down and in field operation.
INNER WING DOWN: The INNER WING DOWN gauge reads the amount of pressure being applied to the inner wings while they and the openers are down and in field operation.
LIFT KIT: The LIFT KIT gauge reads the amount of pressure being supplied to the lift kit.
SYSTEM PRESSURE: The gauge labeled “SYS” on the main block reads the amount of system pressure being applied to the system. System Pressure is the main pressure supply for the WING UP, INNER and OUTER DOWN, and LIFT KIT circuits. 2600-3000 psi indicates tractor working pressure to block. Pressure fluctuation can indicate back pressure or lack of flow to the circuit. Adjust tractor flow as necessary to hold within range.
WING UP: The WING UP gauge reads the positive amount of “up” pressure applied to the wing circuit to account for tractor backpressure.

MAIN BLOCK VALVES, SOLENOIDS, AND PWMS





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.

WING UNFOLD: This on/off solenoid turns the oil flow on/off to the inner wing cylinders.

TANK LINE RELIEF: The tank line relief cartridge is preset at 440 psi. If the cartridge exceeds 440 psi it will relieve to the case drain. If the case drain is not hooked up, a special coupler will relieve to atmosphere. This valve does not require adjustment.

WING UP PRESSURE: This applies pressure to the up portion of the wing cylinders to allow for fine adjustment of the differential pressure between the up and down circuits. It does not require adjustment.

INNER WING-DOWN PRESSURE: This relief valves sets the down pressure applied to the inner (main) wings of the drill. This pressure will vary with the various tractor and drill combinations.

OUTER WING-DOWN PRESSURE: This relief valve sets the down pressure applied to the outer wings of the drill. This pressure will vary with the various tractor and drill combinations.

★**Wing-Down pressures may need to be increased if the wings start to float and not contour correctly while in the seeding position.**
★**Wing-Down pressures may need to be decreased if the wings become too rigid while in the seeding position.**
★**Wing-Down pressures are only active when the openers are pressured in the down position.**
LIFT KIT: See Lift Kit procedure on page 22.
UNFOLD PRESSURE: See procedure below.

PRESSURE SETTING PROCEDURES

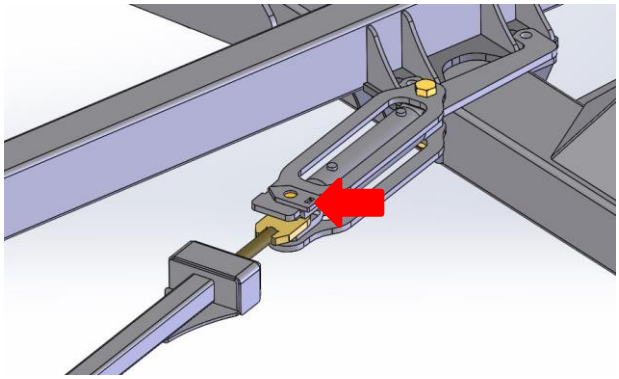
Setting Wing-Down Procedure (INNER AND OUTER WING-DOWN PRESSURE)
The Wing-Down pressure is the amount of hydraulic pressure being applied to the inner and outer wing circuits; the oil supply is supplied from the system pressure and only active when the openers are pressured down. Wing-Down Pressure is required so the wings will contour while travelling through the field. To mitigate back pressure variables, the valve labeled “Wing Up” is now used to apply pressure to the wing-up circuit on the drill. This valve is factory preset and will read 600-700 PSI when System Pressure is applied. This valve should ***NOT*** be adjusted. SeedMaster Wing-Down Pressure is a differential value. To determine your net value, subtract your displayed wing-up pressure from your current wing-down pressure. (ie. 880 PSI wing-down – 700 PSI wing-up = 180 PSI net wing-down).

- To adjust the **INNER WING-DOWN PRESSURE**, ensure the openers are lowered, loosen the jam nut on the cartridge in port **INNER WD** on the main block. Turn the cartridge in to increase the pressure, and out to decrease the pressure. When the desired pressure is set, re-tighten the jam nut.
- To adjust the **OUTER WING-DOWN PRESSURE**, ensure the openers are lowered, loosen the jam nut on the cartridge in port **OUTER WD** on the main block. Turn the cartridge in to increase the pressure, and out to decrease the pressure. When the desired pressure is set, re-tighten the jam nut.

Setting Wing Unfold Pressure Procedure (UNFOLD PRESSURE)
The wing unfold pressure relief valve applies boosted hydraulic pressure supplied from the System Pressure to the inner wing circuit while the tool bar is unfolding. If the wings are not unfolding the pressure will need to be increased. This pressure should only be increased to the point that the wings just begin to unfold. As soon as movement begins, the pressure is adequate.

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

Active Wing Brace Check
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 counteracting 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 square. When the packing pressure is increased, so is the amount of pull on the brace to a set maximum.



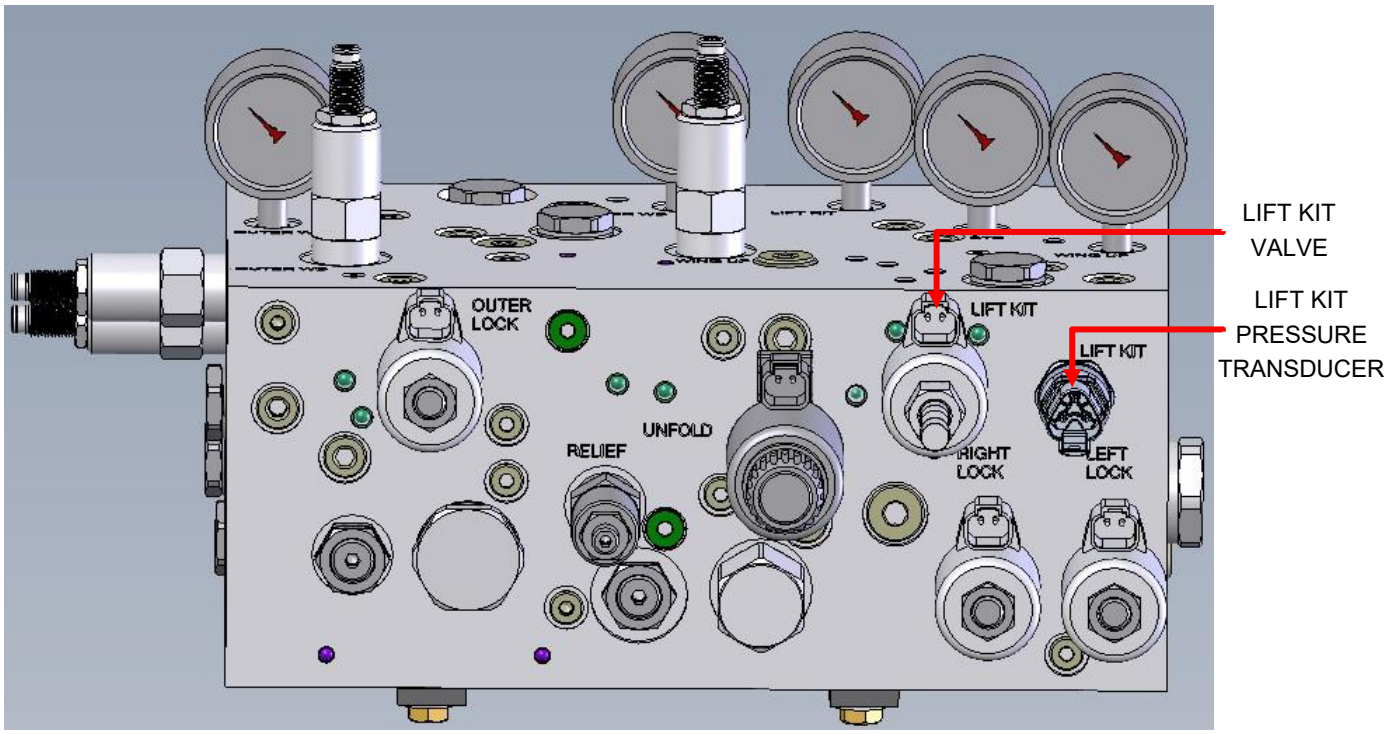
- **Adjusting the wing brace**: Start by unfolding the SM drill and activating the system pressure. Next, pressure the openers down with the opener pressure switch and adjust the shank down hydraulic pressure to 1000psi, activating the active wing braces. After the system has been completely pressurized, inspect each wing brace cylinder indicator. They should be fully retracted against the plate limiter. If not, please adjust the length of the active wing brace using the threaded link. The braces should be periodically checked to ensure proper adjustment. This will ensure your frame integrity remains true and helps increase the longevity of your machine.

LIFT KIT OVERVIEW

LIFT KIT: The Lift Kit is designed to decrease the weight on the main frame front caster wheels during field operation. It is hydraulically operated utilizing supply oil from the main hydraulic block. The Lift Kit increases floatation by redistributing weight from the front caster wheels of the drill forward to the tractor hitch and backwards to the rear of the drill. The reduced weight and draft on the drill then adds weight and traction to the rear of the tractor. It also reduces stress on the hitch and frame of the drill when seeding in wet conditions.

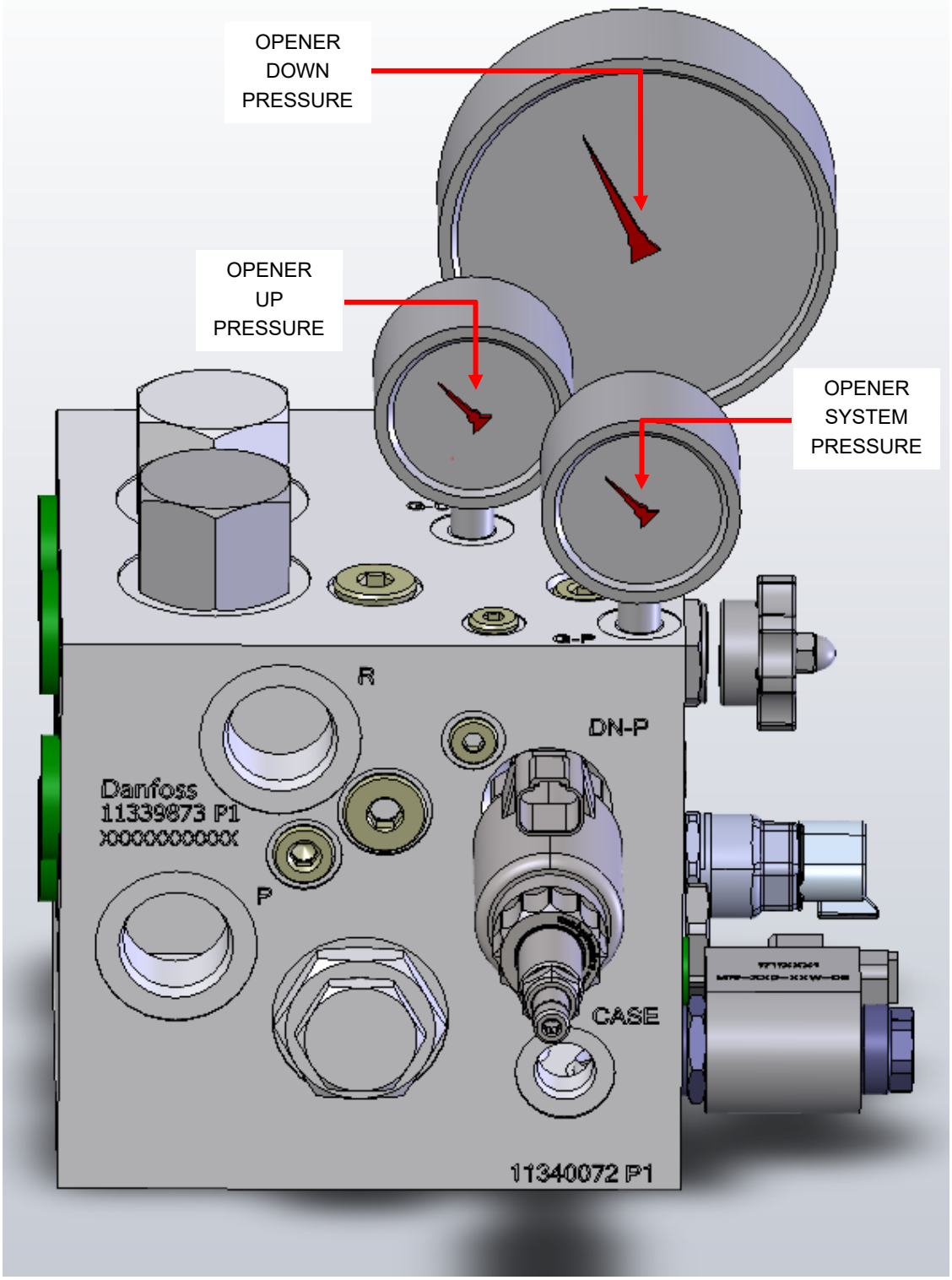
Lift Kit Pressure Settings (Proportional Relief Valve)

- See page 22 for in-cab pressure readout, pressure adjustment, and operating modes for this feature.

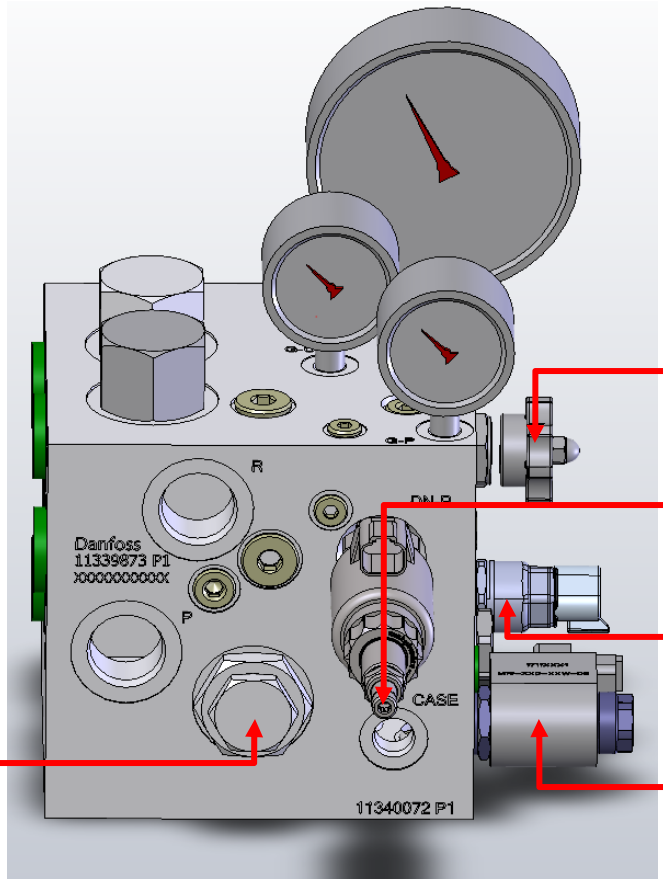


OPENER HYDRAULIC BLOCK DETAILS AND OPERATION

OPENER HYDRAULIC BLOCK GAUGES



OPENER BLOCK VALVES, SOLENOIDS, AND PWMS



OPENER BLOCK DETAILS AND OPERATION

The Opener Hydraulic Block contains the main functions of your openers: raising, lowering, and down-pressure. These functions are controlled by a Master ON/OFF solenoid and coil to raise and lower, and a PWM valve for down-pressure. The Opener block is located on the first rank behind the main block. For it to operate, you will leave the connected tractor hydraulic remote engaged during field operation. This continuous flow should be run with the least amount of flow required to raise and lower the openers. Tractor SCV flow can be decreased until the openers become slow to raise and lower. Recommended maximum flow for this remote is 75%.

OPERATION:

BEGIN:

1. LOCK ON REMOTE TO SUPPLY OPENERS WITH HYDRAULIC PRESSURE.
2. CYCLE MASTER SWITCH FROM OFF TO ON AND LEAVE THE MASTER SWITCH “ON”. OPENERS WILL LOWER AND BUILD PRESSURE TO YOUR PRESET VALUE.

LIFT:

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

LOWER:

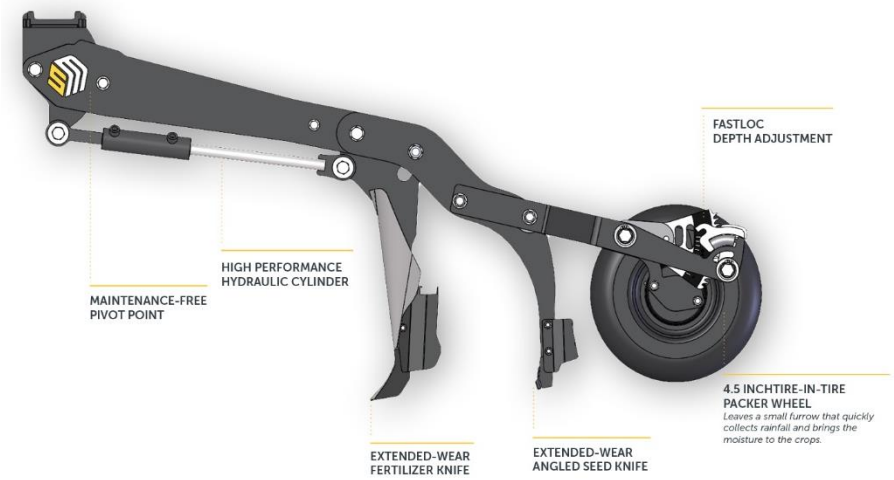
5. CYCLE MASTER SWITCH FROM OFF TO ON AND LEAVE THE MASTER SWITCH “ON”. OPENERS WILL LOWER AND BUILD PRESSURE TO YOUR PRESET VALUE.

SMD OPENERS AND KNIVES

STANDARD OPENER

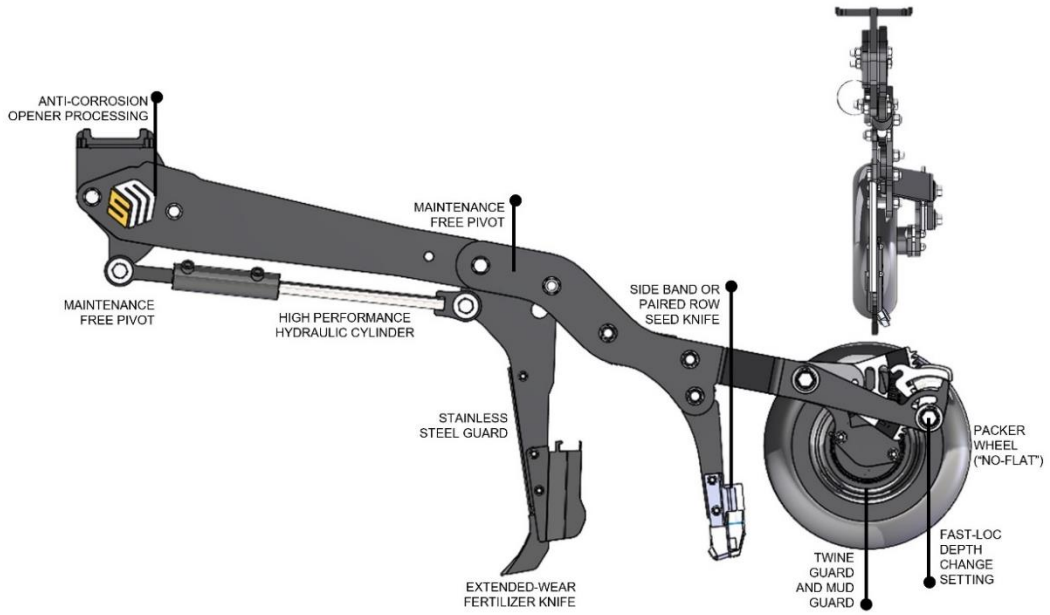
SeedMaster openers are installed on the toolbar in a “mirrored” configuration. Due to the angled seed carbides, this requires “left” and “right” seed knives. The openers are preset for seed and fertilizer depth. The seed depth is factory set at ¾” below the packed surface and the fertilizer depth is factory set approximately ¾” 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, oil seeds, and all other products at the determined seed and fertilizer depths desired by the owner/operator. The notches on the hub plate correspond to ¼” changes in depth, with the inverted notch being the factory pre-set depth of ¾”.



INLINE OPENER

SeedMaster has developed an opener that alters the placements of the fertilizer and seed arms in relation to each other. The standard opener as mentioned above employs an offset configuration where the fertilizer arm is located 1 ½” to the side of the seed arm. The inline opener brings the fertilizer and seed arms “in line” with each other. This configuration requires the use of different style seed knives. They are detailed in the next section.



INLINE OPENER SEED KNIFE OPTIONS

To ensure seed and fertilizer separation on an inline opener configuration, different style seed knives are required. There are two styles to choose from: Side Band, and Paired Row. Due to the “mirrored” opener configuration on SeedMaster toolbars, “left” and “right” Side Band seed knives are required. The side band knife places the seed in much the same manner as the traditional offset opener. The paired row will place the seed in two bands on both sides above the fertilizer band.

Side Band Front View

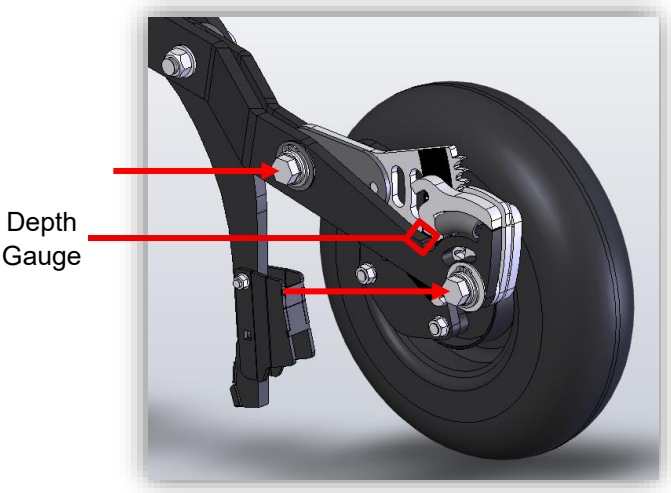
Side Band Rear View

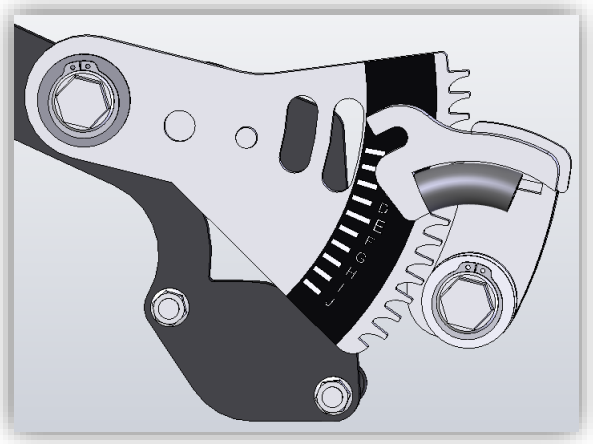
Paired Row Rear View

Paired Row Side View

FAST-LOC DEPTH ADJUSTMENT

A	7/16
B	1/2
C	5/8
D	11/16
E	3/4
F	15/16
G	1
H	1 1/16
I	1 1/8
J	1 1/4
K	1 3/8
L	1 1/2
M	1 9/16
N	1 5/8
O	1 3/4





To change depth using the Fast-Loc Depth Adjustment, you require two 1⅛" wrenches. Using the first wrench, rotate the spring-loaded depth guide backwards to release it from the adjustment plate's teeth. Then, with the second wrench, rotate the adjustment plate up or down as pictured above. Using the decal on the side to determine the appropriate setting, move the plate up or down to your desired depth using the top of the packer arm as the gauge. Return the spring-loaded depth guide into the teeth of the adjustment plate and your depth will be set for that opener.

The decal's depth measurements begin with "A" at approximately $^{7}/_{16}$" below the packed surface and increase by ⅛" with each tooth. To achieve the unlabeled depths, move the adjustment plate one tooth at a time past the labeled depths up or down.

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 the 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.

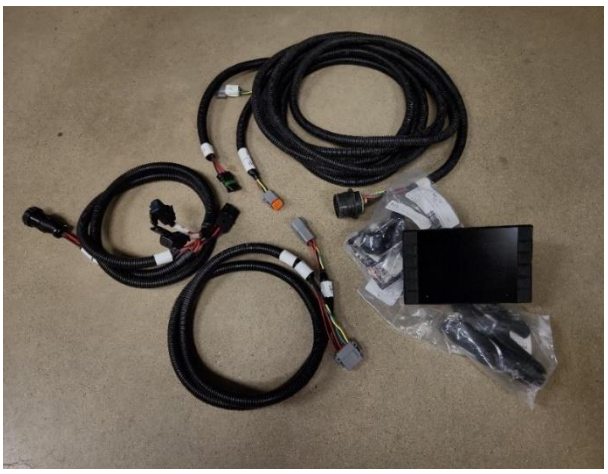
⚠ ***Warning: Avoid turning your drill very short. The opener is designed to seed primarily in straight lines. A sharp turn will cause the openers to be dragged sideways, resulting in an improper seeding job and undue stress on the openers. Never turn so short that the inside openers move straight sideways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

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

JEM TOOLBAR CONTROLLER

IN-CAB INSTALLATION

The JEM Toolbar Controller kit consists of 5-inch touch-screen display, RAM mount, and four wiring harnesses. Refer to JEM In-Cab Hookup diagram on page 97 of this manual for a connection visual.



1. Locate a convenient spot in the tractor cab to mount the display. The included mount will work for many tractors, but other RAM options (such as a suction mount) may be required.
2. Mount the Remote Lift/Lower switch where it is easily accessed during operations.
3. The Power harness will plug into a common 3-pin AMP power port, which provides both constant and key-switched power.
4. The display harness plugs into the grey connector on the back of the display.
5. Run the drill harness through the cab to the hitch. Connect the plug at the hitch to the mating connector on the drill.

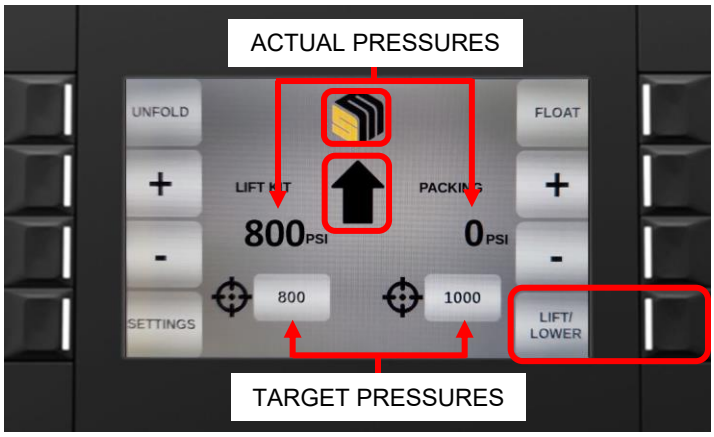
JEM CONTROLLER POWER ON/OFF

The JEM controller has a touch activated screen and physical buttons. These instructions refer to using the buttons, however for many functions you can choose to touch the screen icon instead. Entering values or silencing an alarm is only available via the touchscreen.

Power On/Off – The JEM controller is activated and deactivated via keyed power from the tractor. While loading, it displays the SeedMaster logo. When fully ready, the Standby Screen shows “Touch Screen to Begin”. Touch the screen or push any of the buttons to get to the Home Screen.

HOME SCREEN AND ALARMS

The primary working screen offers direct control of the drill operating functions as well as access to the Unfold Screen and Settings Screen.



Touch and hold the SeedMaster logo to toggle the screen between day and night mode.

The arrow in the center of the display indicates whether the openers are up or down.

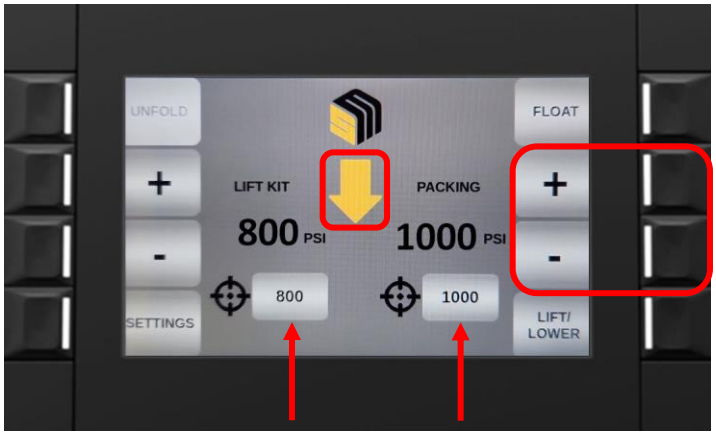
On the right-hand side of the screen, the Lift/Lower button toggles between openers raised and openers lowered. This function is duplicated with the Remote Lift/Lower switch.

Any combination of the on-screen button, adjacent side button, or remote switch can be used to toggle the position of the openers.

The target pressure settings for the lift kit and the packer wheels are shown at the bottom of the screen with the actual pressure shown just above. Touching either of the target pressure boxes will allow the target pressure to be changed directly.

Note: The relevant minimum and maximum allowable entry is provided for reference above the keypad.

When the openers are lowered, packing pressure will begin to build up to the target displaying the actual pressure above it. If desired, the +/- buttons on the right side will increase or decrease the target pressure by 25 psi with each press of the button.

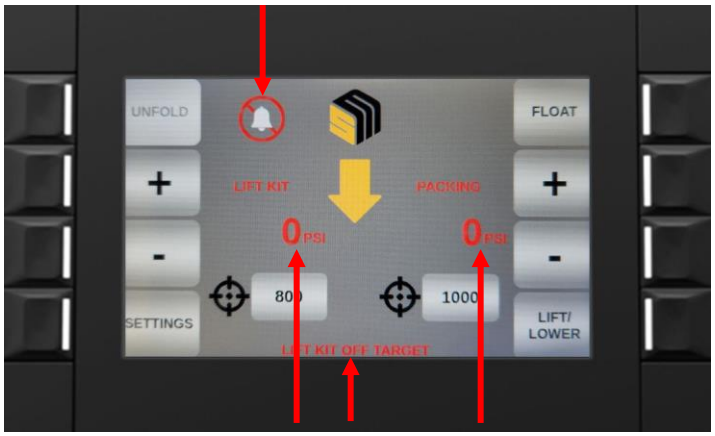


Note: The Unfold Screen cannot be accessed with the openers lowered.

A “bell” icon will appear on the screen, and an audible alarm will sound if either the lift kit or packing pressures are outside of their target pressures.

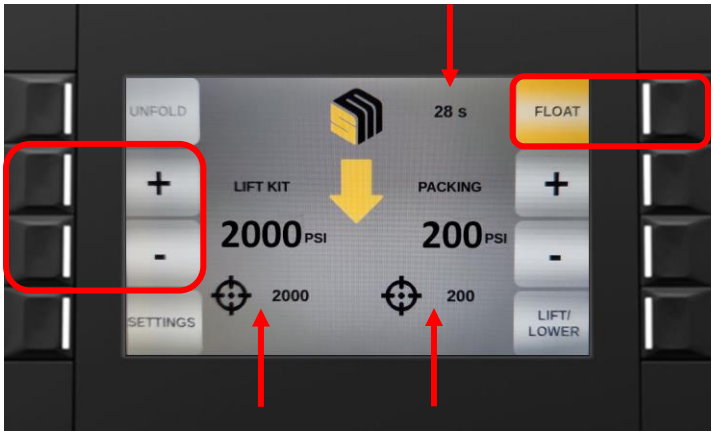
The actual pressure readings will turn red and “Lift Kit Off Target” or “Packing Off Target” will display at the bottom of the screen. If both are simultaneously active, they will appear sequentially.

Touching the “bell” icon will silence the alarm, but the visual indicators remain until the targets are met.



LIFT KIT PRESSURE SETTINGS

The Lift Kit target pressure can also be adjusted using the +/- buttons on the left side to increase or decrease the target pressure in 25 psi increments.



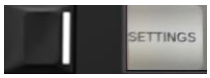
Pressing the Float button will start a timed interval where the packing pressure is reduced, and the lift kit pressure is increased to reduce the power requirement of the tractor. The primary use of this is to avoid getting stuck in a soft area of the field.

A countdown timer shows the number of seconds remaining before the float is disengaged and previous operating target pressures are resumed. This can be disengaged by touching the float button before the timer runs out.

Note: The target pressures cannot be changed when float is active. Float values are preset.

CONTROLLER SETTINGS

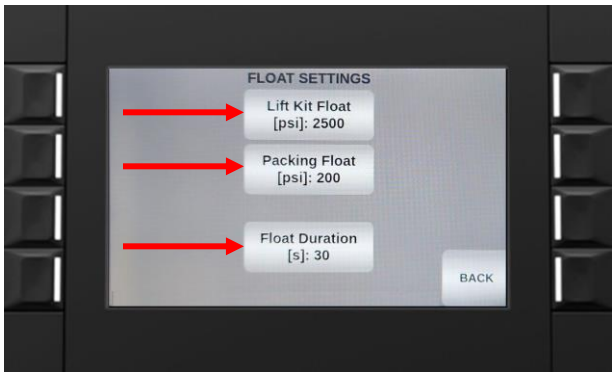
The JEM Controller settings are access by pressing the “Settings” button in the lower left portion of the main work screen. Float settings, Alarm settings, Screen brightness and basic Diagnostics are accessed here. You can also choose to put the JEM back into Standby mode from here or return to the home screen.

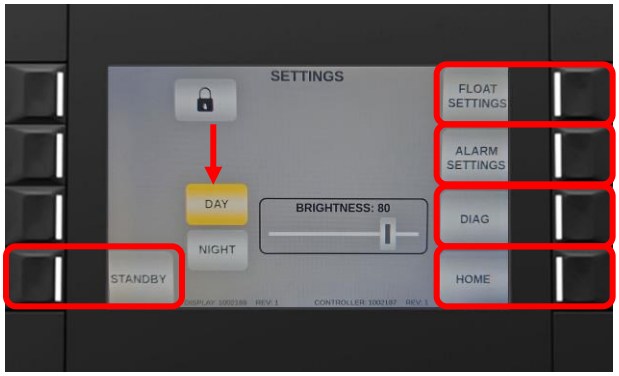


Monitor brightness levels can be set independently for Day and Night modes.

The Float Settings screen provides access to the temporary target pressures for the lift kit and packing wheel which apply only during the float interval.

You can also set the duration of the float interval on this screen. Touch the setting you want to change to enter the new value.



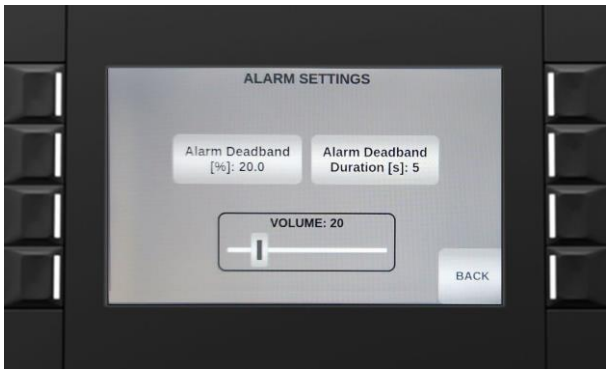


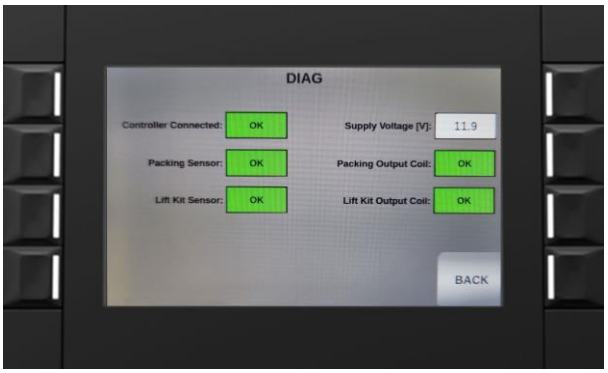
CONTROLLER ALARM SETTINGS

The Alarm Settings screen allows for customization of the lift kit and packing pressures alarms. You can adjust directly to set the percentage off target (deadband) your pressure set points can be, the volume of the audible alarm, as well as the alarm duration.

Touch the setting you want to change to enter the new value.

The Diagnostic screen provides a basic indication of wiring connectivity. This screen can be used as a first step in troubleshooting problems with toolbar operation.





UNFOLDING AND FOLDING WINGS

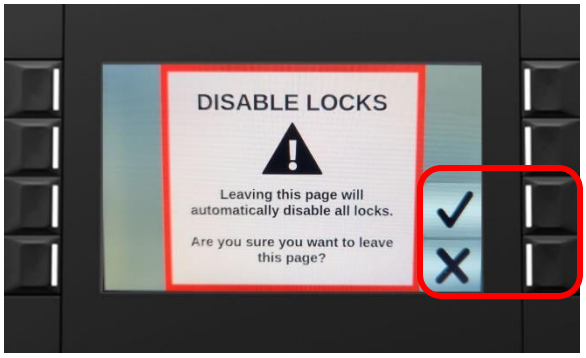
The Unfold screen houses the controls necessary for unfolding and locking the wings. If the controller has the openers set into the “down” position, the user cannot access this screen. The openers must be raised before the drill can unfold.

Caution: Always 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.

The unfold buttons are “momentary” meaning they function only while held down. Hold down one button at a time only and release it immediately when that unfold operation completes.

The left and right wings can be locked individually. Touch to lock, touch to unlock. In the picture below, the left wing is locked and visually highlighted.

NOTE: All wing locks are disabled when exiting the unfold screen. You are reminded of this and must acknowledge your understanding before leaving the Unfold screen.

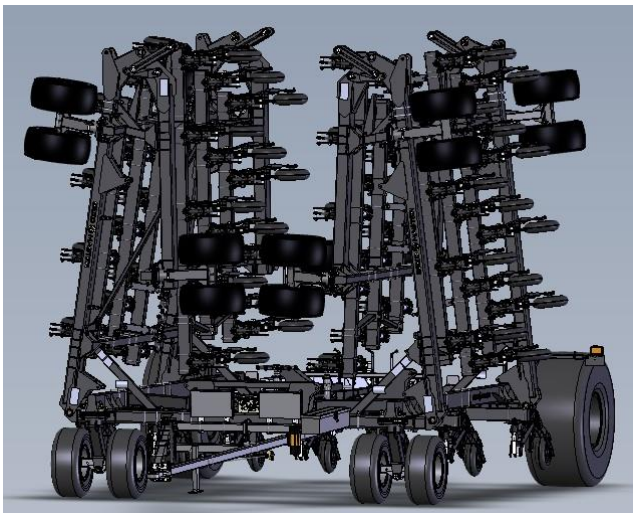


Wing Lock Acknowledgement

PROCEDURE:

1. Ensure the hydraulic remote supplying system pressure to the block is activated and locked into constant flow. The pressure needs to be adjusted from your tractor to fall within 2600-3000 PSI.
2. Enter the Unfold Screen then press and hold “UNFOLD INNER” until the inner wings are fully unfolded. 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.
3. Next, press and hold “UNFOLD OUTER” until the outer wings are fully unfolded. Once the wings have completed unfolding, immediately release the button. Holding the button down after the outer wings have contacted the ground can damage frame components.
4. If you need to partially unfold the drill, the wing lock buttons can be used. Release the unfold button you are using and turn on the lock to the wing you want to be stopped and held. When ready to resume unfolding press the lock button again to toggle it off.

   NOTE: Always exit the Unfold screen to ensure that the wing locks are left off after use. Failure to disengage will result in the wings not contouring to the land.
5. To fold, ensure the openers are raised all the way up.
6. Reverse the flow on the system pressure to the block. You may need to increase the flow from the field operation setting. The outer wings will begin to fold first, then the main wings.



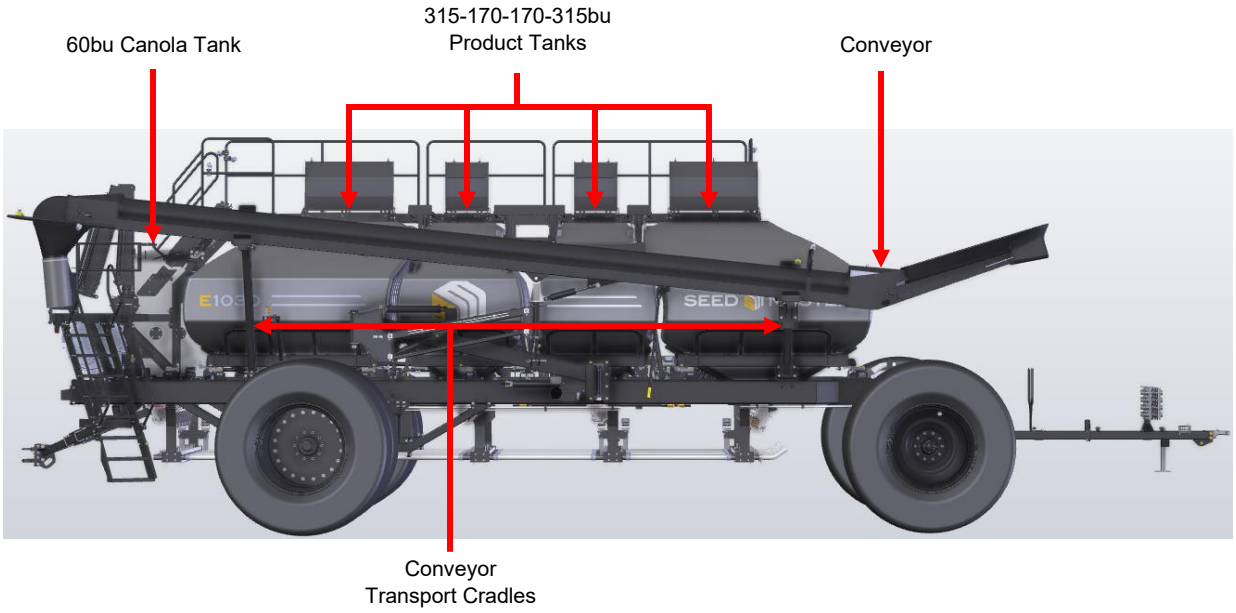
Always store the drill for extended periods of time in the unfolded wing position. This is to prevent water getting into the packer tire and wing wheel bearings. This is very important for winter storage.

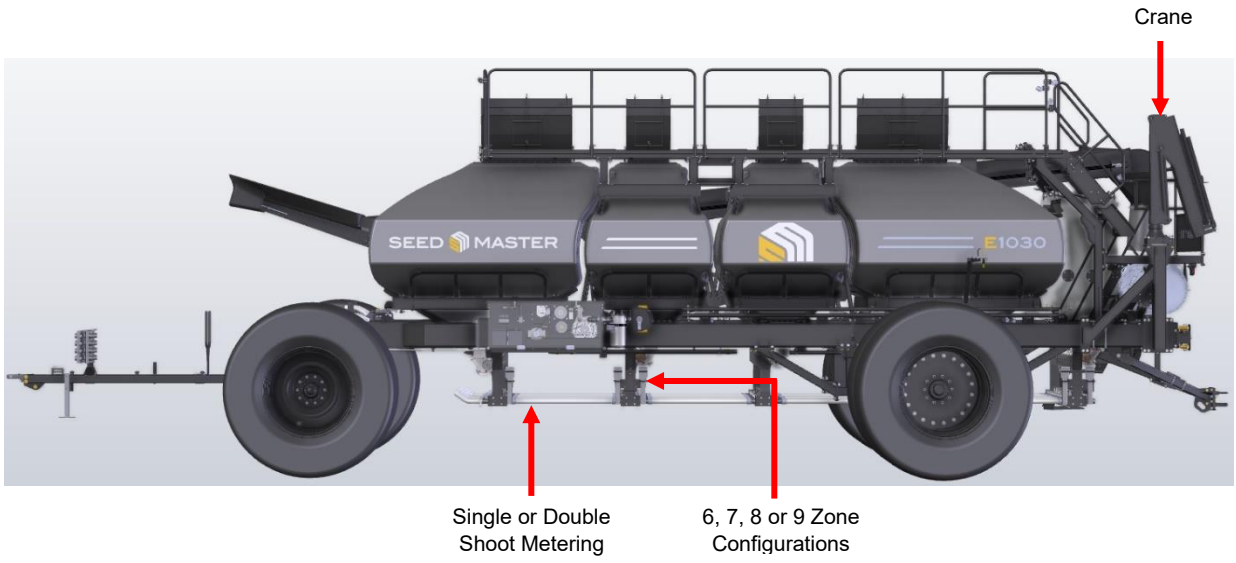
FIELD OPERATION

1. The JEM controller will be powered on when the tractor is started. Confirm that you have proceeded past the Standby Screen.
2. Ensure the SCV supplying system pressure to the block is activated and locked into constant flow. The pressure needs to be adjusted from your tractor to fall within 2600-3000 PSI.
3. Once your drill has been unfolded from the transport position, you are ready to begin seeding.
4. Using the SCV connected to your opener lift/lower lines, pressurize the Openers block. Set this SCV at a flow of 75% to ensure the lift and lower speeds are adequate.
5. Turn on the “Lift/Lower” switch. The openers will lower and begin to build pressure up to the set target.
6. When entering a headland, turn the “Lift/Lower” switch off. The opener pressure will release, and the openers will lift out of the ground.
7. Complete the turn.
8. Repeat steps 5, 6, and 7 for each headland turn required.

E-SERIES CART

The E-Series cart names reflect the total cart capacity. The E860 features 315-170-315-bushel coarse product tanks, with an additional optional 60-bushel fourth tank dedicated to canola or other fine products. An E1030 cart has additional 170-bushel course product tank. Either cart can be ordered without the 60-bushel canola tank if desired. Other available options include a remote-controlled conveyor and crane, as well as preferred number of metering zones in single or double shoot product runs. The image below depicts an E1030 and some of the many features the E-Series carts have to offer. This section of the operator's manual will explain the cart's key features and settings.



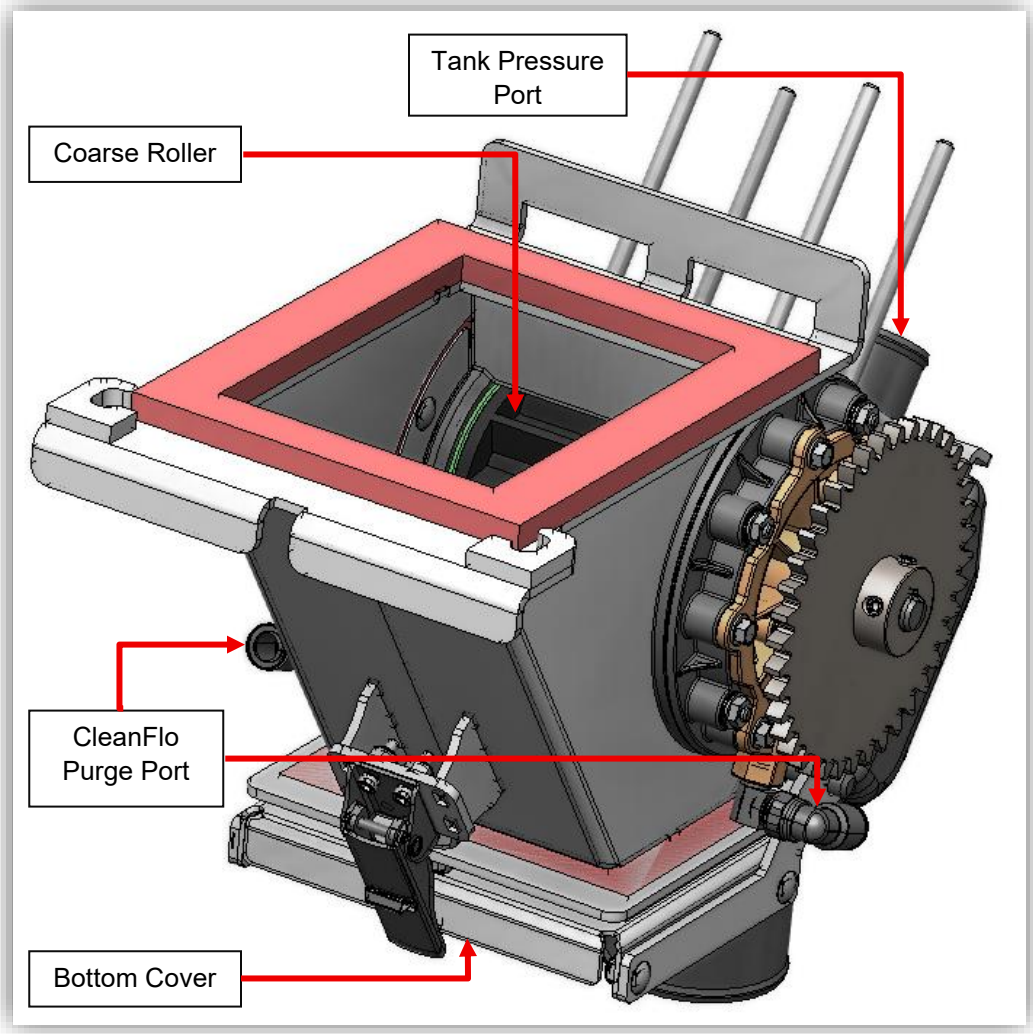


E-SERIES METERING

E-Series carts are set up with 6, 7, 8, or 9 metering zones depending on drill size. Each zone has one dedicated meter per tank.

The meter boxes on the larger tanks contain coarse product rollers designed for granular fertilizers and larger seed. Meter boxes fitted to the 60-bushel tank (if equipped) utilize fine rollers suitable for fine and low-rate products like canola or inoculant. All meters are operated electrically and are supplied 24v by a dedicated on-board system consisting of 2 batteries and a hydraulically driven, high-output alternator.

The meter boxes require no adjustments. The roller ends are kept clear of dust and fine debris by the CleanFlo purge system. CleanFlo consists of a centrifugal debris separator located on the product fan housing, a source fan selector, an intake filter, a booster blower, and pressure distribution lines connected to each meter box. The debris separators should be periodically checked for airflow-limiting blockage. Also, the filter housing should be visually monitored for excessive dirt accumulation and cleaned before warnings occur on the operator console. The housing contains both a foam prefilter and a washable main element. After washing, the element should be left to dry before reinstalling. The use of compressed air to clean or dry the filter element is not recommended. The booster blower requires no maintenance.



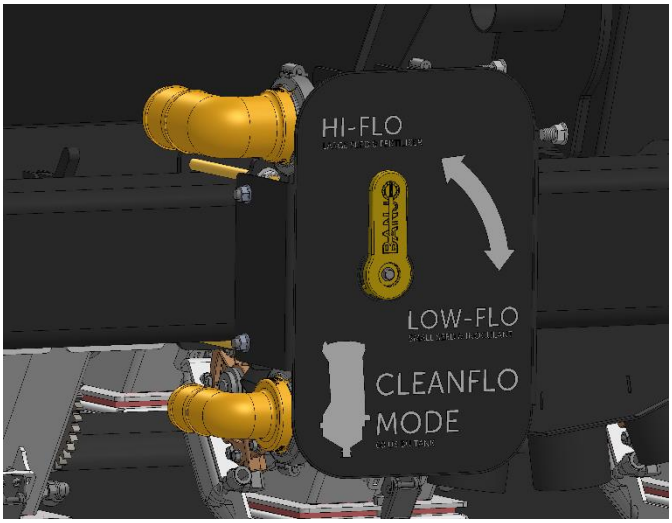
NOTE: Ensure that on Dual Shoot systems the fan running the highest RPM is selected on the CleanFlo Source Fan Selector located on the left side of the cart.

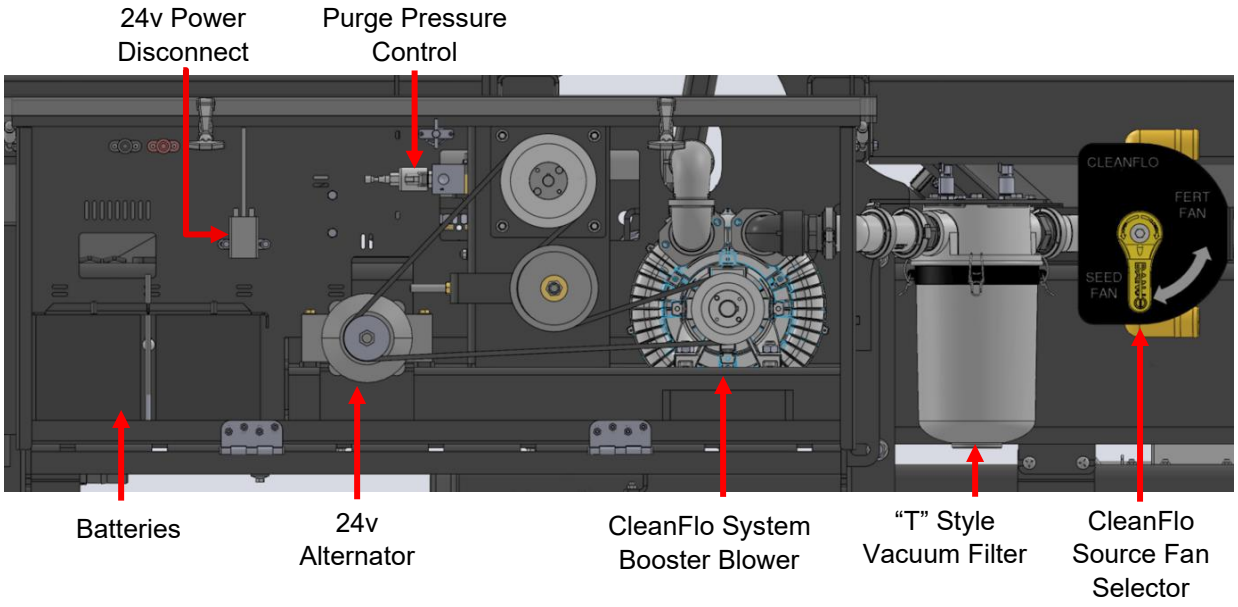
Although the 60-bushel tank with its fine roller is primarily meant for small granular products, it can be utilized for heavier products if desired, though its smaller capacity limits both rate and application time. To do so, there is a special valve located on frame at the back of the cart which allows the operator to select the CleanFlo mode specific to this tank. Move the valve lever to Low-Flo for small seed & inoculant or to Hi-Flo for large seed or fertilizer.

The roller flutes should be regularly inspected or cleaned to ensure accurate operation. The rollers are accessible from below by opening the hinged bottom cover held by an adjustable latch. If water is used for cleaning, the purge system should be running to prevent water from being trapped in the cavities.

⚠ ***The purge system is essential to the operation of the meters. If it should fail for any reason, it is critical to stop operations until the problem can be resolved***.

Both the alternator and the purge booster blower are driven by V-belts powered by a hydraulic motor plumbed into the drill's System Pressure. These should be checked periodically for signs of wear and adjusted for tension.





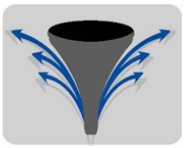
DISTRIBUTION MANIFOLD

SeedMaster utilizes a stainless-steel distribution manifold available in multiple configurations. The new manifold is more resistant to blockages in large seed sizes vs other manifold designs. It uses a 2.5” inlet pipe that has a steel choke insert welded inside. It is a two-piece design with the head being clamped onto the inlet with an exhaust style clamp. The manifold is available in a 6, 7, 8, 9, 10, 11, or 12 outlet configurations allowing SeedMaster to offer a larger list of drill sizes with various row spacing.

8-Run Distribution Manifold

This manifold design uses two types of rubber inserts for guiding product in the manifold head. There is a flat insert that is used for fertilizer and a gradual point insert that is used for seed.

- ✓ The flat insert provides excellent division at high rates of fertilizer.
- ✓ The inserts are easy to change so they can be swapped to suit the application.



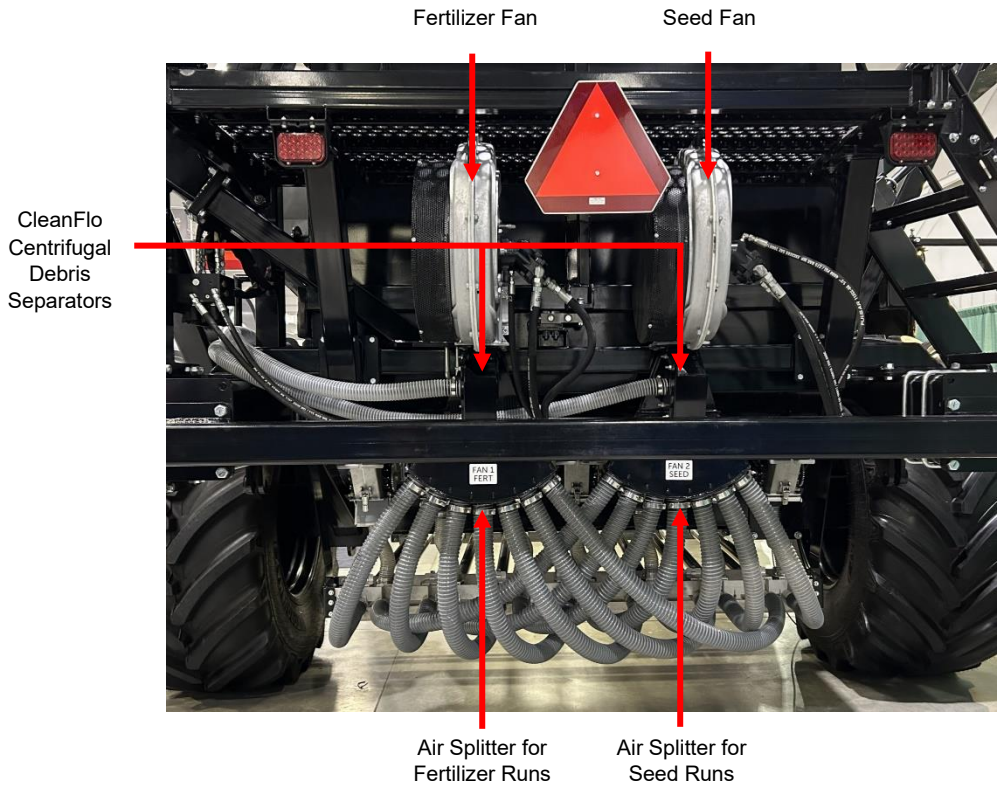
- ✓ The Cone shaped inserts optimize the separation of the seed.
- ✓ Low seed rates provide even division and distribution.

PRODUCT SELECTION

Under the dual-shoot, 7 zone E-Series, there are 7 metering boxes per tank and 14 hoses. The 7 hoses from the left splitter supply the fertilizer towers and the 7 hoses from the right splitter supply the seed towers.

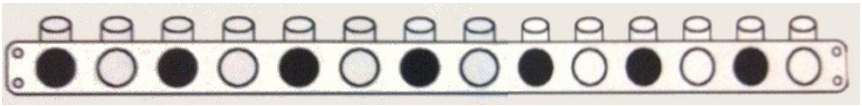
Other E-Series Cart configuration examples:

- Single-shoot, 9 zone (9 meters, 9 hoses)
- Dual-shoot, 8 zone (8 meters, 16 hoses)
- Single-shoot, 8 zone (8 meters, 8 hoses)



SEED AND FERTILIZER RUNS, DUAL SHOOT, 7-RUN E860

NOTE: Viewed from the back, the left fan is the fertilizer fan, and the right fan is the seed fan. Each has its own dedicated air splitter with the number of outputs equal to the number of zones.



FERTILIZER **SEED**

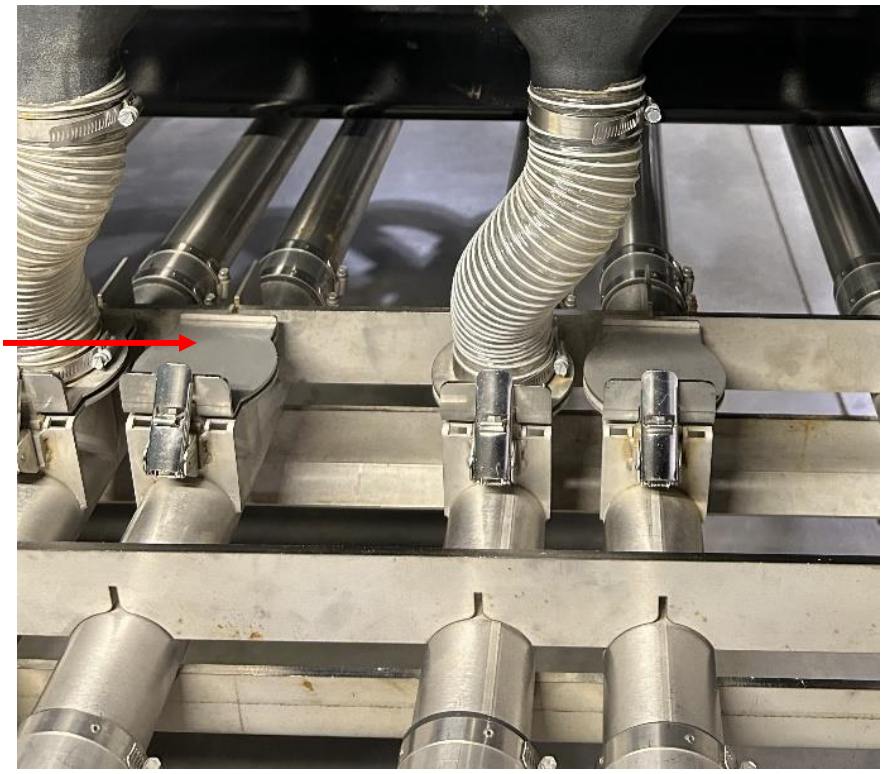
The fertilizer runs start on the left side of the cart (looking forward from behind) and alternate between seed and fertilizer. Likewise, the seed runs start on the right and alternate with fertilizer runs.

All tanks on the E-Series carts can be adjusted to provide product to either the seed or fertilizer knives in a dual-shoot configuration. To dispense product from a tank to the fertilizer runs, connect the far-left run to the far-left meter, and then work your way across, connecting meters to every second run. To dispense product from a tank to the seed runs, connect the far-right run to the far-right meter, and work your way across, connecting meters to every second run.

NOTE: Ensure that delivery lines not connected to product flow have a blocker plate installed and firmly latched down. Failure to seal delivery lines may cause uneven seeding conditions.

Always meter a small amount of product in a stationary position to ensure that all products are delivered by section to the desired knives.

Blocker Plates on Unused Runs



NOTE: Photo looking towards the back of the machine.
The meter output hoses are connected to the seed runs.

WARNING: The product delivery lines CANNOT be removed while the fans are running.
This will cause a large product loss at a rapid rate.

FAN HYDRAULICS AND TANK PRESSURE

Midway along the right frame rail, the fan motor hydraulic hoses enter the fan/conveyor hydraulic manifold. This manifold contains anti-cavitation “spin down” check valves for each fan and a 50 PSI relief valve for the motor case drain hose. This valve relieves to the ground through an attached drain hose.

The case drain hose is fitted with a special male coupler at the cart hitch that also relieves to ground at approximately 15 PSI if the coupler is disconnected. If the coupler is disconnected during storage, leakage can potentially occur with ambient temperature changes. This is normal.

NOTE: If the case drain coupler requires replacement, it needs to be replaced with the same style. It should NEVER be replaced with a non-relieving coupler. Fan damage caused by the installation of the wrong coupler is NOT covered by warranty.

The E-Series cart tanks are pressurized during operation through hoses connected to the top of the discharge spout on each meter using the same stream of air which feeds the product runs. This design ensures the correct fan is used for the product selected when the meters are connected to the desired product runs. Pressurizing in this manner achieves an ideal air pressure balance on each side of the meter roller.

FAN PRESSURE GUIDELINES

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

Use the following table as a *guide* for setting the E-Series cart fan pressures.

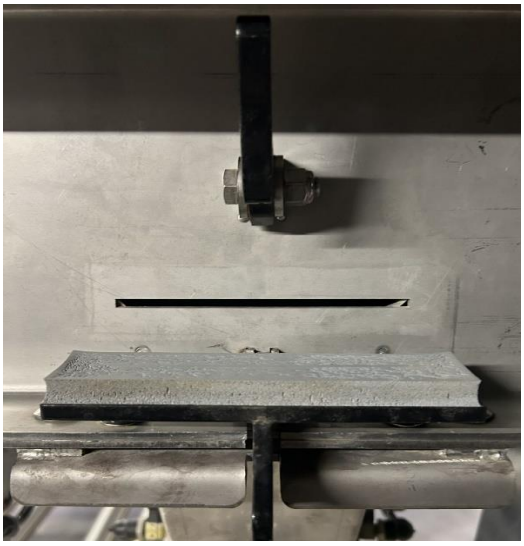
NOTE: AIR PRESSURES AND RPM’S ARE INICATED WITH NO PRODUCT FLOWING		
Product	**Application Rate Lbs/ac**	**RPM**
Fertilizer	50 to 100	3350 to 3600
Fertilizer	100 to 200	3750 to 4000
Fertilizer	200-300	4250-4750
Fertilizer	300+	5000+
Wheat	80 to 130	3775 to 4075
Barley	70 to 100	3250 to 3500
Canola	2 to 5	3000
Flax	40 to 55	3150-3250
Peas	150 to 200	3750 to 4000

Pressure too LOW - causes potential plugging in lines.
Pressure too HIGH – product damage, bouncing, or blows out of furrow.

METER INSPECTION

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

1. Shut off hydraulics to fans.
2. Above the backside of the meter, unlatch the slot cover and pivot it downward.
3. Insert a slide-gate, then unlatch and open meter bottom cover (approximately 1 gal. of product will fall out).
4. Inspect the metering.
5. Clean the bottom cover sealing surface thoroughly. Failure to do so can introduce air leaks.
6. Close the bottom cover and relatch it ensuring that there is good contact with the seal.
7. Remove the slide-gate, clean the slot cover surface, pivot the slot cover into place, and reset the latch to secure it.

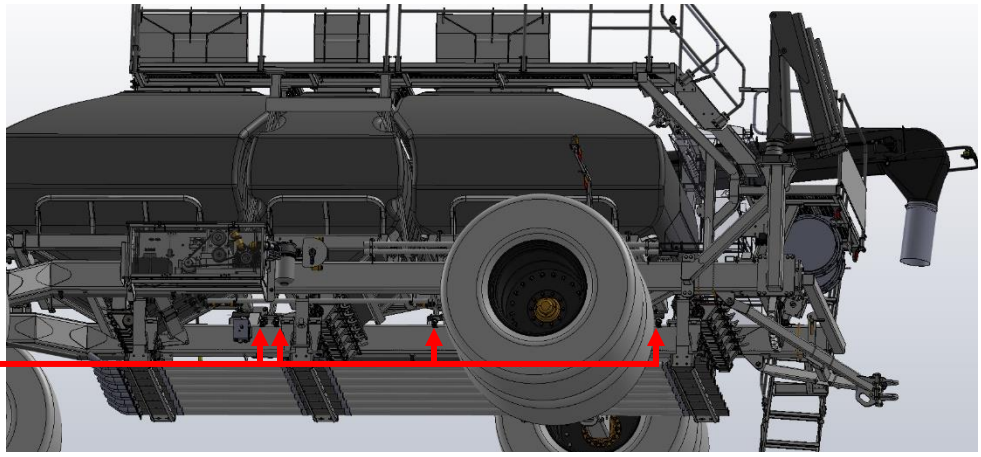


NOTE: ***Poor quality fertilizer or other foreign materials may cause uneven metering or damage to meter components. Screening of all products going into the tanks is highly recommended. The slot cover requires a proper seal to ensure there is no air loss.***

WORK LIGHTS

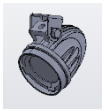
There are 24v work lights located along the right side of the frame pointed at the meters under each tank. These are activated whenever the Topcon control system is turned on.

24v Work Lights

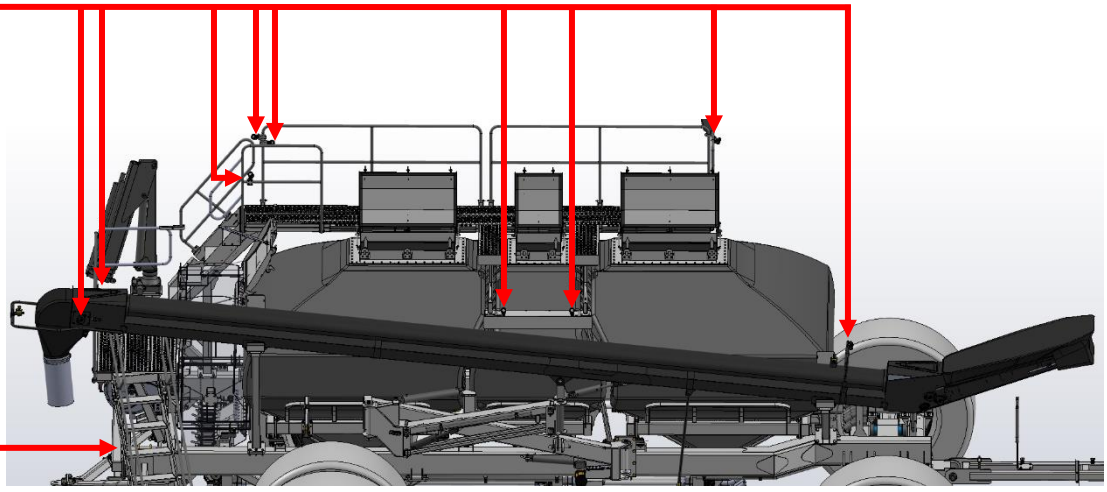


All other work lights are 12v and receive their power from the tractor. There are four located on the upper walkway, two above the conveyer and three on the conveyor. All are toggled on/off simultaneously by a momentary switch located near the bottom of the stairs or from the conveyor remote control.

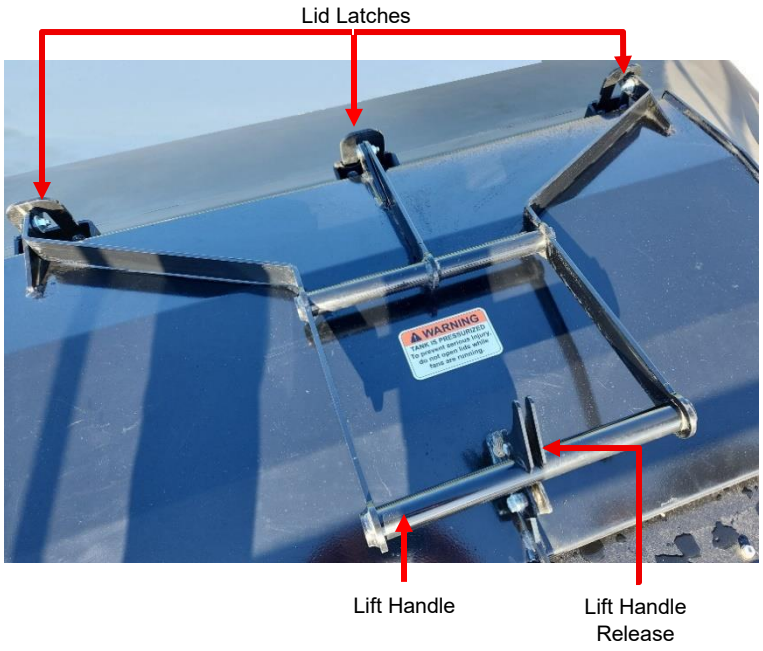
12v Work Lights

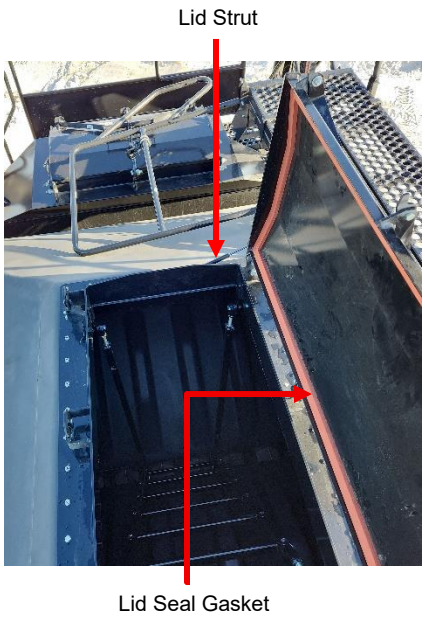


12v Work Light Switch



TANK LID OPERATION





All tank lids on the E-Series cart are operated in the same manner.

1. Push the handle release to free the lid lift handle.
2. Pivot the lift handle upwards enough to release the lid latches.
3. Pull on the handle to open the lid. The lid struts will assist in lifting the lid and act as a stop when the lid is fully open.

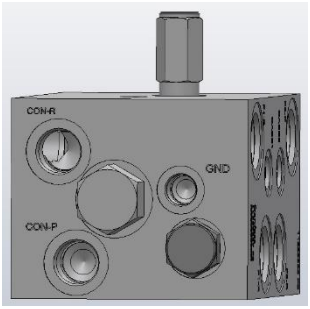
The lid latches are adjustable to ensure proper compression of the lid seal. The lid is properly set when the gap between ends of the lid and the lid stop is 1/16”.

Note: Keeping the lid seal gaskets clean will ensure a maximum seal is maintained on lids. This is extremely important for accurate metering rates. It’s good practice to wipe the seals down immediately after filling the tank, before closing the lid, to prevent product build up on the seal gasket. Adjust the lid latches if necessary to maintain seal gasket compression. Periodically inspect and replace the seals.

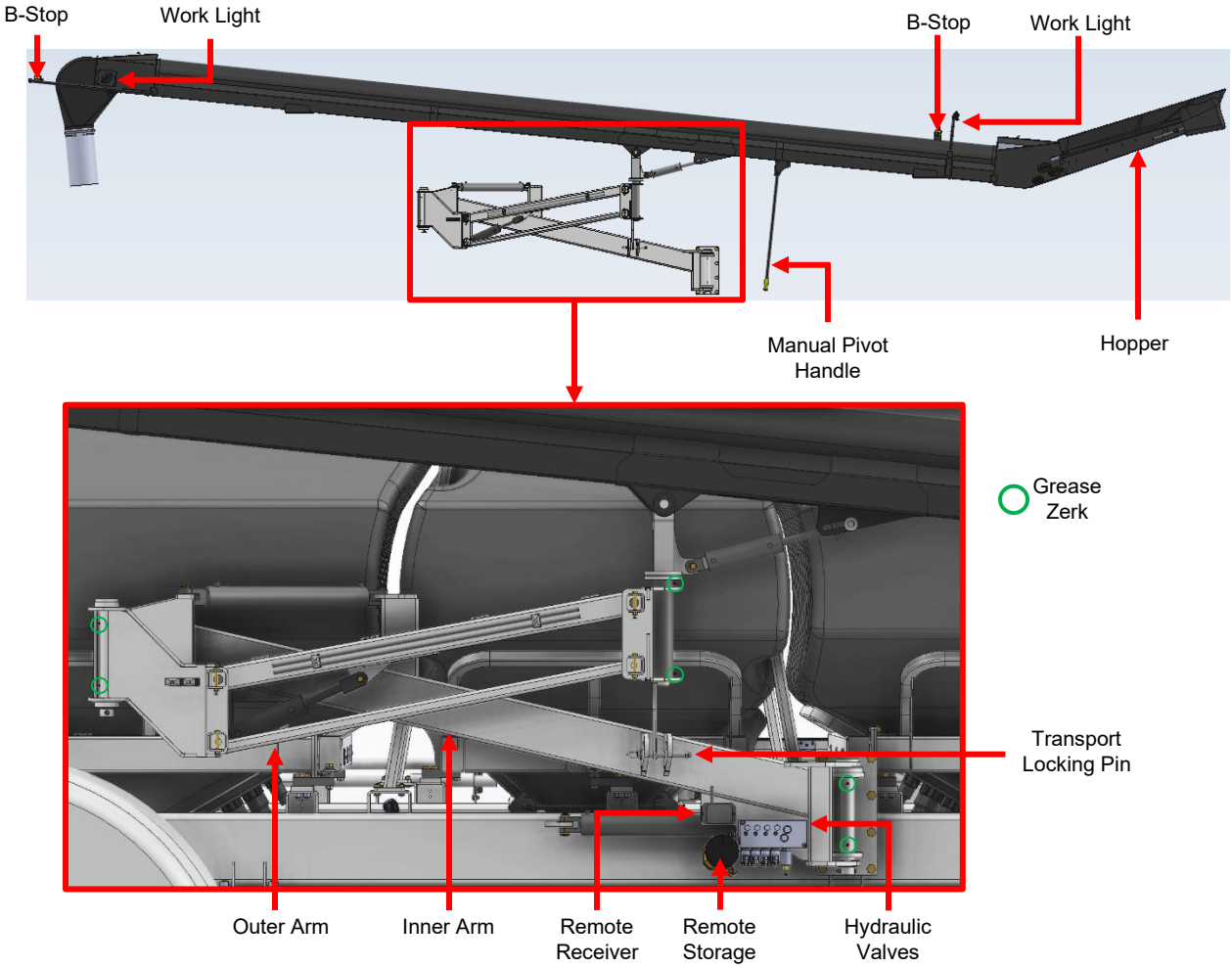
⚠CAUTION ***DO NOT ENTER TANKS WITHOUT PROPER SAFTEY EQUIPMENT AND OTHER PERSONNEL PRESENT. NEVER ENTER WHILE METERS ARE RUNNING OR FANS ARE ENGAGED.***

CONVEYOR OVERVIEW

To operate the conveyor, reverse the tractor remote supplying the fertilizer fan (pressure to the blue tagged hose). This automatically pressurizes the fan/conveyor hydraulic block allowing conveyor movement and hydraulic motor operation. The conveyor and crane can be operated at the same time. The arm pivots should be greased annually.



Bottom View



CONVEYOR CONTROLS

The E-Series Cart Conveyor is controlled with the Conveyor Wireless Remote and Receiver. Its functionality includes:

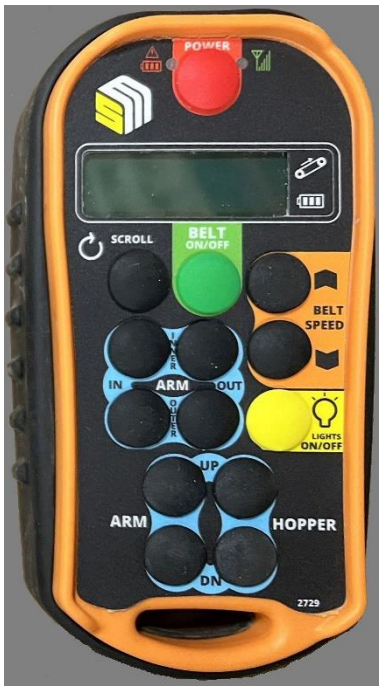
1. Move Inner and Outer Arms in and out.
2. Move Outer Arm up and down.
3. Move Hopper up and down.
4. Turn Belt on or off.
5. Set Belt Speed (1,2,3)
6. Turn work lights on or off.
7. Display Product Tank Weight

Belt Stop (B-Stop)

The conveyor is equipped with two B-Stop buttons. One is located near the hopper and the other on the handle near the discharge. In a case where you need to immediately stop the belt movement, pressing either of the B-Stops will interrupt power to the belt and stop its movement while other conveyor controls continue to function. Note that the belt will restart immediately if the B-Stop is reset unless the belt is turned off first with the remote.

If all conveyor functions need to be stopped, press the RED power button on your remote. To resume, turn the remote on again or re-cycle power to the receiver and re-engage the conveyor functions as they were before stopping.

CONVEYOR WIRELESS REMOTE



To use the Conveyor Wireless Remote, it needs to be powered on first. Simply hold the red POWER button for at least 2 seconds, release, and the LED lights will turn on. The transmitter is designed with a power saving feature which turns the transmitter off after 15 minutes of inactivity. As a safety feature, all functions are disabled if the remote is moved out of range of the receiver.

ARM MOVEMENTS: Press and hold the corresponding button to move the arms. ***NOTE****: The INNER ARM and OUTER ARM IN or OUT functions can be operated simultaneously by pressing the two buttons at the same time.*

ARM / HOPPER: Press and hold the corresponding button to raise or lower the outer arm or the hopper. ***NOTE****: The OUTER ARM and HOPPER UP or DOWN functions can be operated simultaneously by pressing the two buttons at the same time.*

BELT: To turn the belt on or off, press the BELT ON/OFF button.

BELT SPEED: Belt speed can be set to three levels using the RAISE or LOWER buttons.

LIGHTS: To turn the work lights on or off, press the LIGHTS ON/OFF button.

SCROLL: Choose which tank weight to shown on the display.

SYNCHRONIZING THE CONVEYOR REMOTE

The two conveyor remotes and the receiver are synchronized together during assembly. If a new remote is needed, synchronizing is required. To do this the two remotes must first be “cloned” so that they appear to the receiver to be the same.

Note: The remotes are identical. Referring to them as A and B below is just for the purpose of this procedure.

1. Make sure both remotes and the receiver are off.
2. On remote A, press and hold the red POWER button for more than 10 seconds to enter the Remote Config mode. Use the SCROLL button to forward to the CLONE LEADER option, then press BELT ON/OFF to select.
3. On transmitter B, press and hold the red POWER button for more than 10 seconds to enter the Remote Config mode. Use the SCROLL button to forward to the CLONE FOLLOWER option, then press BELT ON/OFF to select.
4. Wait for a few seconds until the green LED begins to blink on both remotes.
5. Turn both remotes off.
6. Press and hold the red POWER button on one of the remotes for more than 10 seconds to enter the Remote Config mode. Teach Mode should be shown onscreen. Press BELT ON/OFF to enter Teach Mode.
7. Apply power to the receiver.
8. Wait for a few seconds until the green LED begins to blink on the remote.
9. The remotes and receiver are now synchronized.

CONVEYOR OPERATION

1. Remove the transport locking pin.
2. Reverse the tractor remote connected to the fertilizer fan.

⚠ Always be aware of your surroundings and any activity around you when operating the conveyor. Ensure all nearby people stand clear.

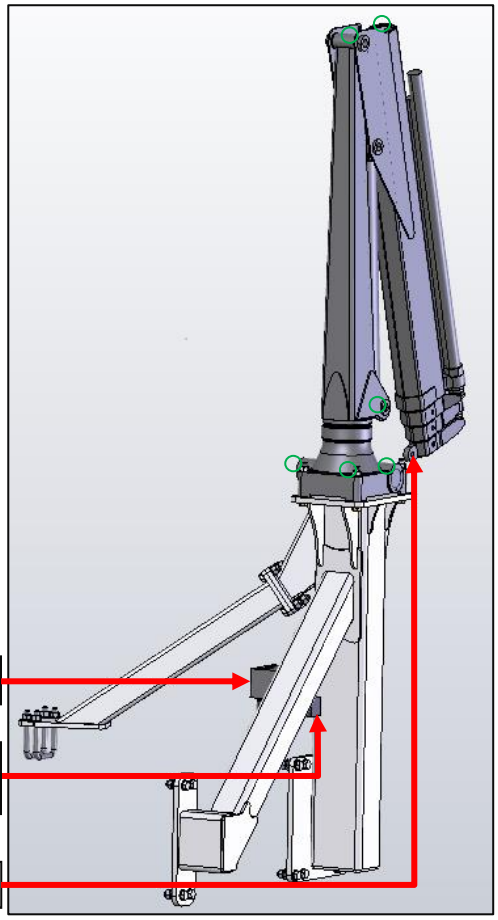
3. Power on the Conveyor Remote, then press the ARM and HOPPER “up” buttons to lift the Conveyor out of the transport cradles.
4. Using the INNER ARM and OUTER ARM “out” buttons (or a combination of both), start to move the Conveyor away from the E-Series Cart.
5. Once the Conveyor is away and clear of any obstructions, use both the ARM and HOPPER “down” buttons to lower the Conveyor into arms reach.
6. Remove the transport pin from the manual pivot handle and swing the handle down to steady or guide rotation of the conveyor.
7. Position truck as desired.
8. Using the INNER ARM and OUTER ARM “out” buttons (or a combination of both), start to move the Conveyor spout in position of the tank to fill and the hopper towards the truck chute/gate, using the manual pivot handle to rotate as necessary.
9. Once the spout is positioned, use the HOPPER “down” button to gently place the hopper on the ground. Ensure the spout is positioned on the center of the tank, not the center of the lid. This will ensure more even filling.
10. Align the truck chute/gate and hopper so product will flow directly onto the hopper.
11. Start the Conveyor belt by pressing the “BELT ON/OFF” button.
    ***NOTE**: The speed of the conveyor belt can be raised or lowered as desired using the BELT SPEED buttons. There are three preset speeds available.*
12. Before filling, ensure the tank has been zeroed out as outline on page 57. ***Perform this operation only if the tank is completely empty.***
13. Begin filling by opening the truck chute/gate.
14. When the desired amount of product is in the tank, close the truck chute/gate. Tank weight can be viewed from the screen on the remote, the Topcon monitor, or the Topcon XTEND app.
15. Allow conveyor to run for 5 – 10 seconds after closing the chute/gate to ensure the belts are free of product. To stop the belt, press the “BELT ON/OFF” button.
16. If filling another tank or putting the conveyor into transport, always start by pressing the HOPPER “Up” button to raise the hopper off the ground before repositioning the conveyor.
17. Use a combination of all the positional buttons to move the conveyor into position to fill another tank.
18. To store the conveyor back in the cradles, begin by bringing both the INNER ARM and OUTER ARM “in” towards the cart. Then press both the ARM and HOPPER “Up” buttons until the conveyor is at a convenient position to fold and store the manual pivot handle, re-inserting its transport pin.
19. Continue to raise the conveyor until it’s at the upper limits, then position it over the cradles using INNER ARM and OUTER ARM “in” buttons to the limits. Now use the ARM “down” button until the conveyor rests on both cradles.
20. Reinstall the conveyor transport locking pin.

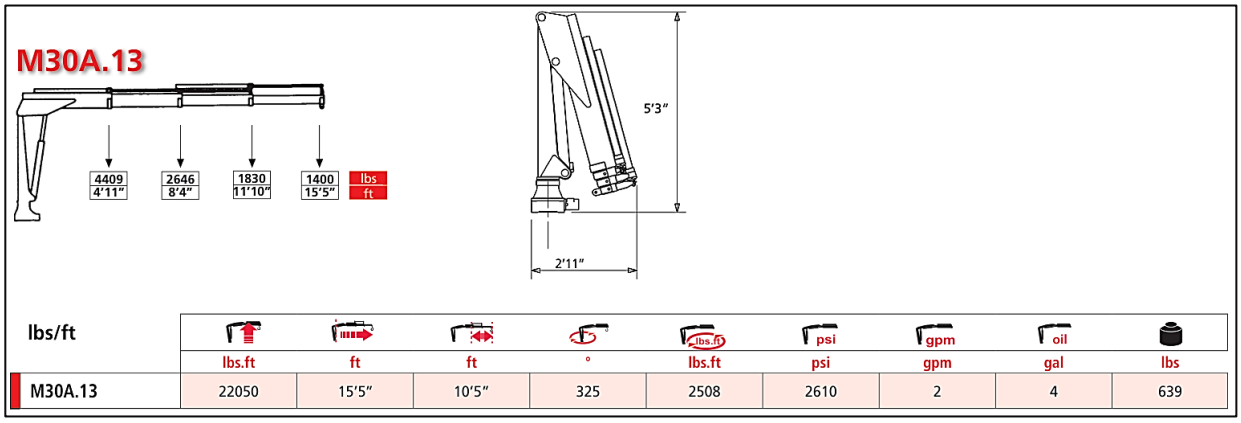
CRANE OVERVIEW

The optional crane installed on an E-Series Cart is the Fassi M30A-13.

NOTE: *Please see the Load Limits table located on the Fassi website* and decal located on the crane mounts. *The SeedMaster specific model is also located below. The operator must read and understand the safe load limits when operating the crane.*

To operate the crane, reverse flow on the tractor remote supplying the fertilizer fan (pressure to the blue tagged hose). This automatically pressurizes the fan/conveyor hydraulic block allowing conveyor movement and hydraulic motor operation. The crane and conveyor can be operated at the same time. The arm pivots and rotating points should be greased annually.





lbs/ft	lbs.ft	ft	ft	°	lbs.ft	psi	gpm	oil	lbs
M30A.13	22050	15'5"	10'5"	325	2508	2610	2	4	639

CRANE CONTROLS

The E-Series Cart Crane is controlled with the Crane Wireless Remote and Receiver. Its functionality includes:

1. Move Arm Up or Down.
2. Rotate Crane Clockwise or Counter-Clockwise.
3. Extend or Retract Arm.

CRANE WIRELESS REMOTE

To use the Crane Wireless Remote, it needs to be powered on first. Simply hold the red POWER button for at least 2 seconds, release, and the LED lights will turn on. The transmitter is designed with a power saving feature which turns the transmitter off after 15 minutes of inactivity. As a safety feature, all functions are disabled if the remote is moved out of range of the receiver.

ARM MOVEMENTS: Press and hold the corresponding button to move the arm. ***NOTE****: An ARM UP or DOWN function can be operated simultaneously with the ARM EXTEND or RETRACT function by pressing the two buttons at the same time.*

CRANE ROTATION: Press and hold the corresponding button to rotate the entire crane either clockwise or counterclockwise. ***NOTE****: A ROTATE function can be combined with a single ARM movement simultaneously by pressing the two corresponding buttons at the same time.*

SYNCHRONIZING THE CRANE REMOTE

The two crane remotes and the receiver are synchronized together during assembly. If a new remote is needed, synchronizing is required. To do this the two remotes must first be “cloned” so that they appear to the receiver to be the same.

Note: The remotes are identical. Referring to them as A and B below is just for the purpose of this procedure.

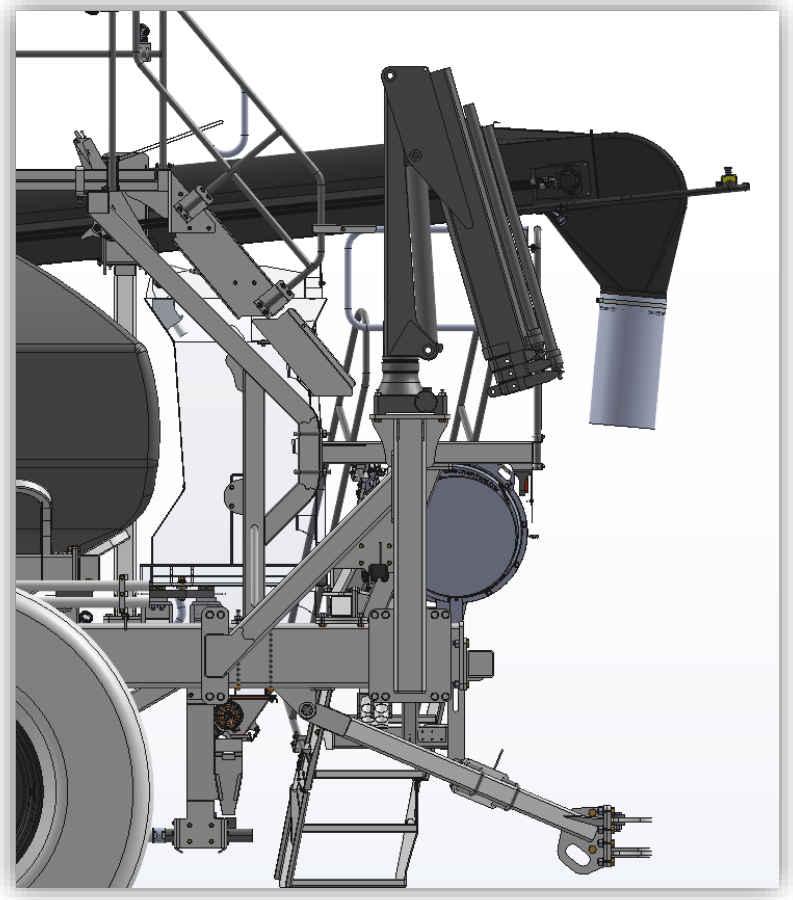
1. Make sure both the remote and receiver are powered off.
2. Press and hold the red POWER button on remote A for more than 10 seconds to enter Learn Mode. Both LEDs on the remote will begin blinking.
3. On remote B, press and hold both the ARM UP and ARM DOWN buttons simultaneously while also pressing the red POWER button for 5 seconds and then release. The LEDs will start to blink.
4. Wait for a few seconds until only the green LED double blinks on both remotes.
5. Turn both remotes off.
6. Press and hold the red POWER button on <u>one</u> of the remotes for more than 10 seconds to enter Learn Mode. Both LEDs on the remote will begin blinking.
7. Apply power to the receiver.
8. Wait for a few seconds until the green LED stays on steady.
9. Both remotes and the receiver are now synchronized.

CRANE OPERATION

1. Read and Understand the Load Limits of the crane installed on the E-Series Cart.
2. The Crane Home Position means the arm is fully down, retracted, and facing directly away from the back of the cart. This is the position the crane is to be stored in during transport, product application, and storage.
3. Reverse the tractor remote connected to the fertilizer fan. (Blue tagged line)

⚠ Always be aware of your surroundings and any activity around you when operating the crane. Ensure all nearby people are aware of your intentions; they must stay clear of the load.

4. Press the Arm UP button and then begin pressing the Arm EXTEND button to direct the arm closer to the load. Stop when the lift eye on the end of the arm is directly above the load.
5. Connect the load to the arm at the lift eye using a load-rated combination of strap and clevis, keeping the distance between the arm and the load to approximately 18 inches.
6. Lift the load by initially pressing the Arm UP button and begin retracting the arm once the load clears the ground. You may also begin to rotate the crane towards the middle of the cart.
7. Continue to direct the load towards the intended bin, ensuring you clear the upper deck safety rails.
8. When the load(s) have been completed, always return the crane to the Home Position before moving or operating the E-Series Cart.



TOPCON XD+ MONITOR

IN-CAB INSTALLATION

Using the diagram on page 96 as a connection guide, install the XD+ monitor and the 3 required wiring harnesses in the tractor where the monitor is within easy reach of the operator.

Note the 12v source for the power switch should ideally not be the tractor ignition; it should be constant power. This is to prevent inadvertent hard power-off to the system if the tractor ignition is turned off before the switch.

SYSTEM POWER-UP AND SHUT DOWN

To power up the XD+ monitor, toggle the power switch on. The power status LED on the front of the display will illuminate green. If the status indicator is red or does not illuminate, contact your SeedMaster dealer for assistance. If the SeedMaster E-Series is connected to the tractor, its on-board Apollo CM-40 will also be triggered on.

To correctly shut down the XD+ and E-Series electronics, close or pause any active tasks then simply toggle the power switch off. If the switch is connected to the tractor ignition, ensure the switch is turned off before the tractor is shut down.

DISPLAY TOOLBAR

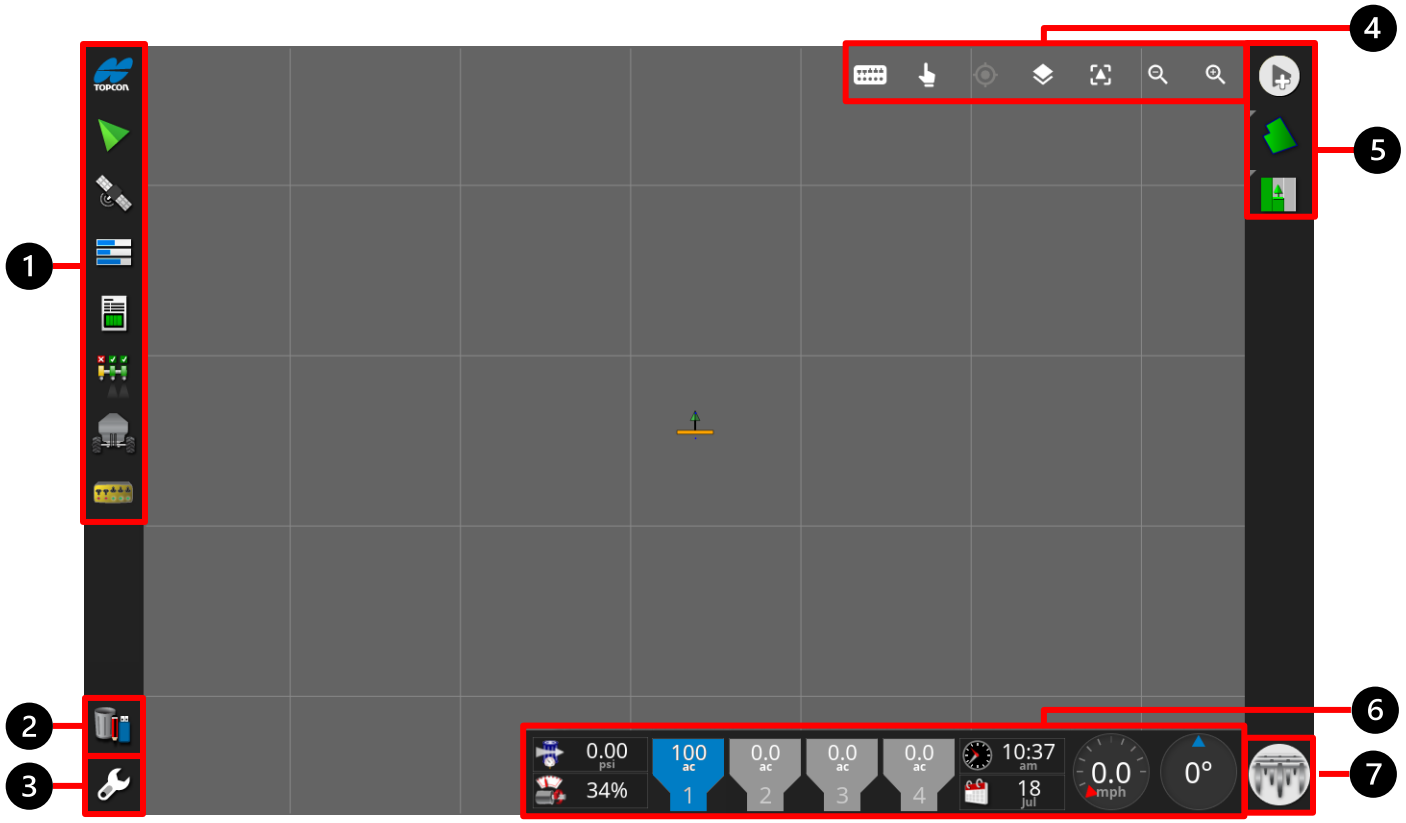
Swiping upwards from the bottom-middle of the screen reveals the Display Toolbar.

1. **Power** – Restart the XD+. Touch Yes to confirm when prompted.
2. **Tool Tips** – Selecting this will put question marks above all screen icons and buttons which provide the name or brief description of function when touched.

   Note: Tool Tips must be turned off to resume interaction with monitor applications.
3. **USB Eject** – Use prior to removing a USB storage device. This is not required if removing non-volatile devices such as the Wi-Fi antenna.
4. **Screen Capture** – In order to perform a screen capture, a formatted USB thumb drive must be in place.
5. **Video Capture** – In order to perform a video capture, a formatted USB thumb drive must be in place. Touch this button to start the capture and again to stop the recording.
6. **Home Screen Manager** – Favorite screen layouts can be saved and named for later quick callback.
7. **Home Screen** – Quickly choose any screen layouts saved and enabled in the Home Screen Manager.
8. **Display Brightness Control** – Decrease or Increase overall screen brightness.
9. **Display Color Scheme** – Toggle between Day, Night, and Auto (based on ambient light).

XD+ OPERATION SCREEN CONTROLS

The XD+ monitor is a touchscreen activated interface which provides access to mapping and application through an external GPS and control of an external ECU, such as the Apollo CM-40 used on the SeedMaster E-Series carts. The monitor records, stores, and displays data for agricultural uses.



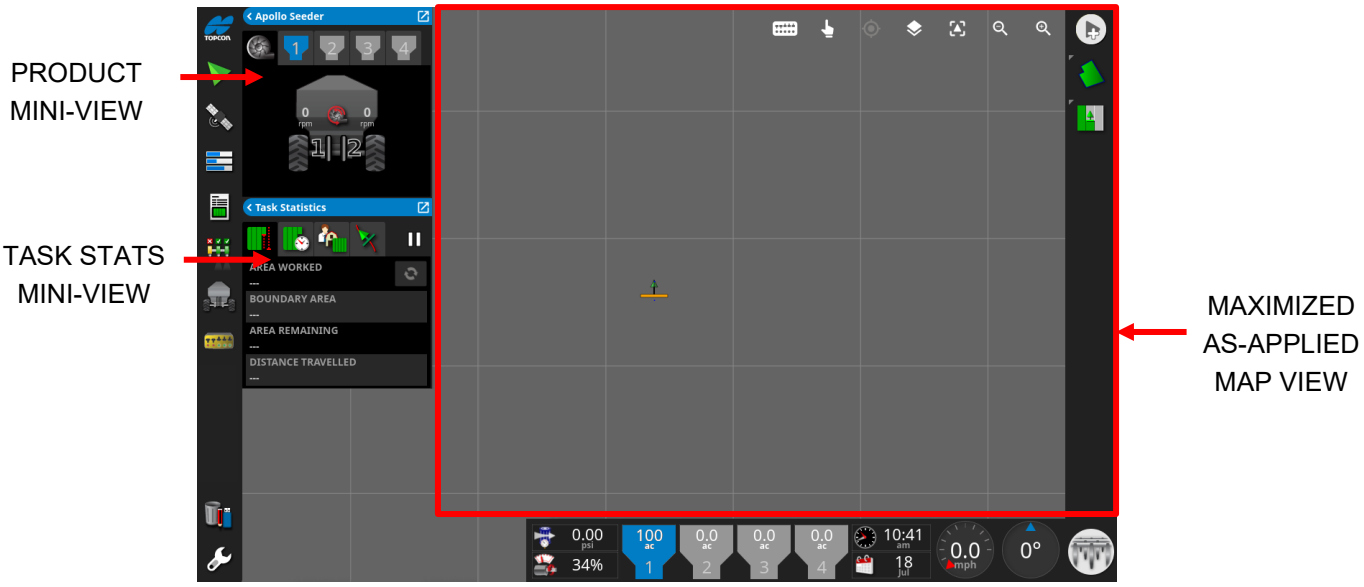
1. **Navigation Bar:** Touch each icon to open a Mini-view for that function. See page 72.
2. **Inventory Manager:** Import/Export of files representing Farms, Fields, Tasks, Maps, Vehicles, Implements, etc.
3. **Setup Screen:** Open to modify settings related to the User, System, Vehicles, Implements, and Products.
4. **View Controls:** Specific to the as-applied map, these settings determine what is displayed to the operator, including Map Layers, Map View, and Zoom.
5. **Guidance Bar:** Specific to the as-applied map, the Start Task button, Field, and Task Menus are accessed here.
6. **Dashboard:** See page 71 for details.
7. **Master Switch:** Product application is enabled using this “Virtual Master Switch”. White is Off, Flashing Blue is Waiting for Implement signal, Green is applying. A Red master switch indicates some other condition must be met before the master switch can be enabled.

XD+ VIEW OPTIONS

When selected from the navigation bar, the XD+ can display Mini-views on the left side of the main run screen allowing the user to choose the information they want displayed during operation. The availability of these views is pre-configured by SeedMaster.

Some Mini-views views can be “maximized” to become the main information on the run screen. This is achieved using the maximize arrow, or by swiping from left to right on the Mini-view. A maximized mini-view replaces and automatically minimizes the previous full-screen mini-view. To close a Mini-view, slide it to the left or touch its icon on the navigation bar.

MAP VIEW



PRODUCT VIEW

FILE MAINTENANCE & INVENTORY MANAGER

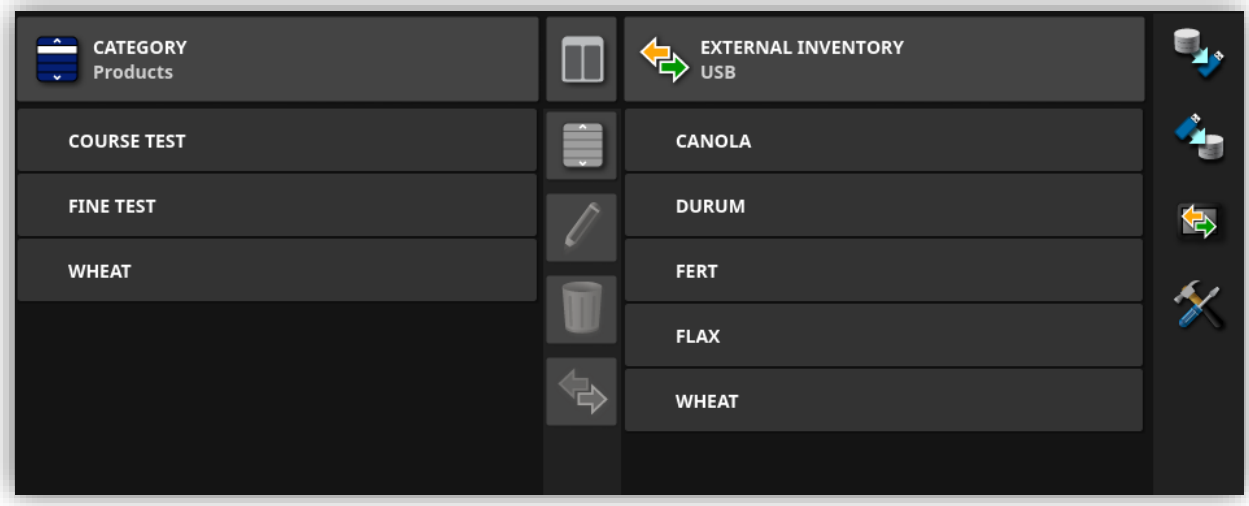
Files representing Farms, Fields, VRC Maps, Products, and Tasks are stored in the memory of the XD+ monitor. The storage location is of a fixed size and will hold a large, but limited number of files. File Maintenance is the process of backing up these files to safeguard valuable information from loss due to file corruption or accidental deletion.

Tasks can also be archived for transfer to another Topcon display or to be imported into farm information management software. Exporting and deleting Task files at the end of every season also ensures that enough storage is available for Tasks in the upcoming season.

Files representing Vehicles and Implements are also stored in the XD+ monitor's memory. These files are critical for the operation of your SeedMaster E-Series cart, and it is a good practice to maintain backup copies outside of the monitor.

For loading or exporting files, you will require a USB drive plugged into the USB connector located at the rear of the monitor.

Inventory Manager is the tool you will use to work with files. To start Inventory Manager, touch on its icon on the lower left side of the main screen. 



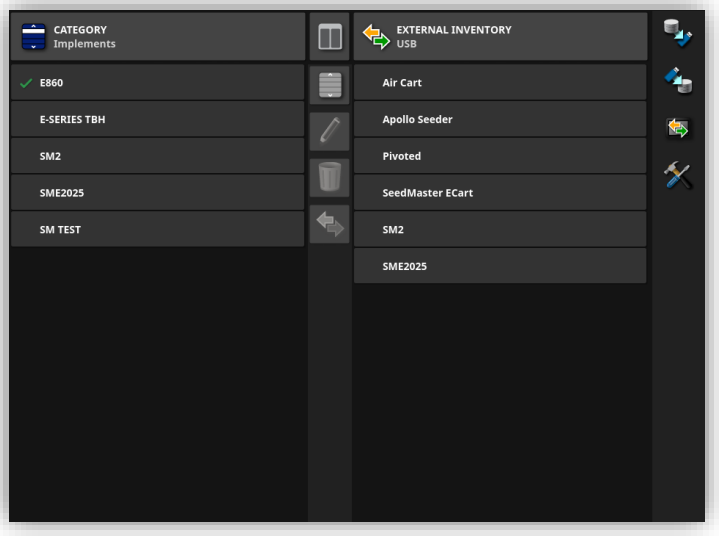
Category – Touch to select which type of files to display. Files located on the XD+ are shown in the left column, and files located on an inserted USB drive are shown in the right column.

Touching a file selects it and the tools in the center column become available.

- Select All Files
- Rename File
- Delete Selected Files
- Copy Files
- SeedMaster Support Use Only (only visible for log files)

- Save All Inventory to USB
- Restore All Inventory from USB
- Import or Export All Tasks Only
- Create and Export Diagnostic Log

Exporting Files to a USB Drive



1. Insert a USB drive into the XD+.
2. In Inventory Manager, touch Category to choose a file type from the drop-down list.
3. Select the items on the left side you want to Export.
4. Touch the Green Transfer button. 
5. Select any attributes associated with that file you want to include, then touch ok.

Deleting Files from the XD+

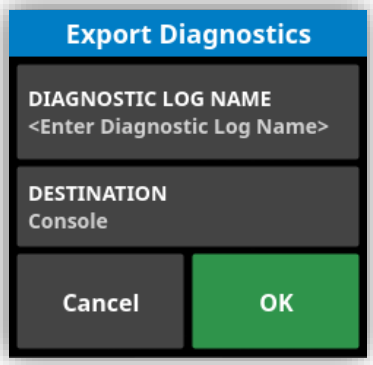
1. In Inventory Manager, touch Category to choose a file type from the drop-down list.
2. Select the items on the left side you want to Delete.
3. Touch the Trash Can button. 
4. Touch ok to confirm the deletion of the files.

Importing Files from a USB Drive

1. Insert a USB drive into the XD+
2. In Inventory Manager, touch Category to choose a file type from the drop-down list, then select the items on the right side you want to Import.
3. Touch the Yellow Transfer button. 

Create and Export a Diagnostic Log

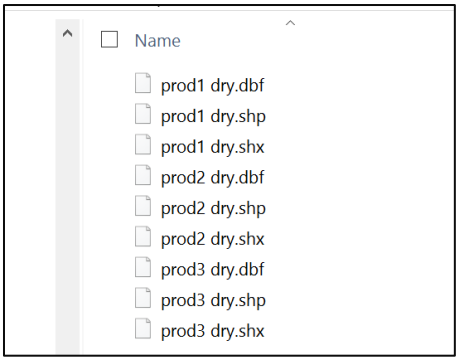
1. Insert a USB drive into the XD+.
2. In Inventory Manager, touch Diagnostic Log from the far-right side of the screen. 
3. Enter a name for the log file and set the destination to USB.
4. Alternatively, leave the Console as the destination and export the file later to a USB drive or upload it as part of a Support Call request after connecting the XD+ to a wireless network.



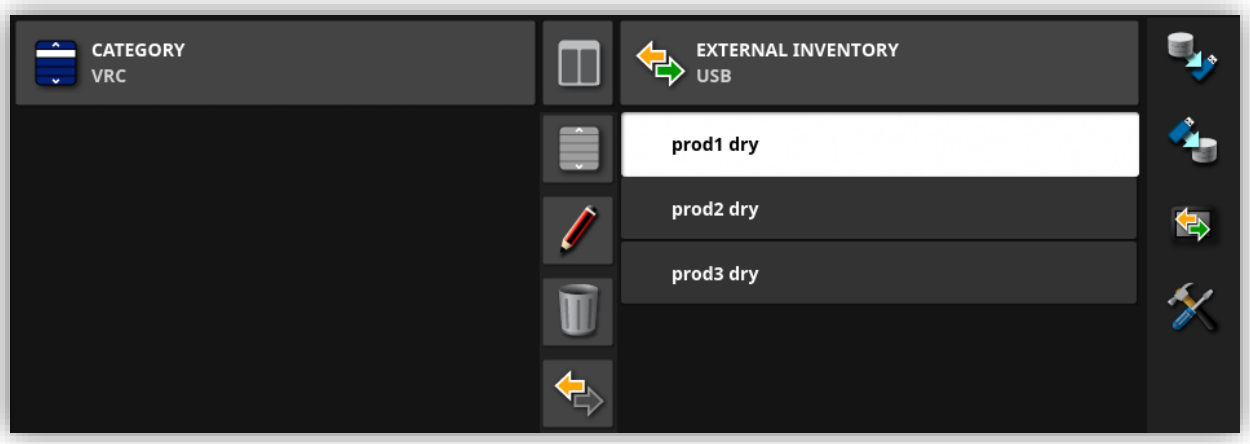
IMPORTING PRESCRIPTION SHAPEFILES

If you are importing the RX map shapefiles prior to loading and configuring the task, the files need to be loaded onto a USB drive before importing them to the XD+.

1. Insert a USB drive into your PC.
2. Create a folder called VRC on the root of the USB drive.
3. Copy the Rx files to the VRC folder. See the picture below.



4. Insert the USB Drive into the XD+.
5. Select Inventory Manager. 
6. Select VRC from the Category drop-down list on the left.
7. In the External Inventory list on the right, highlight the Shapefile bundles required for import. Note that the bundles are broken out into their separate items on the list. All three files (.dbf, .shp, and .shx) are required for each product.
8. Touch the Yellow Transfer button. 



XD+ SYSTEM SETUP

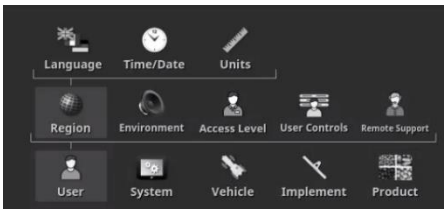
Touching the wrench icon opens the Setup pages. These pages contain configuration items set by SeedMaster which should not require change or adjustment in the day-to-day operations of your E-Series Cart. The pages are organized along the bottom row into settings related to User, System, Vehicle, Implement, and Products.

The following is a highlight of the most utilized settings.

USER SETTINGS

User preferences, such as Language, Time/Date, and Units are found in the User section of the Setup pages. Additional options include monitor volume for alarms, and touchscreen clicks etc. can also be set here.

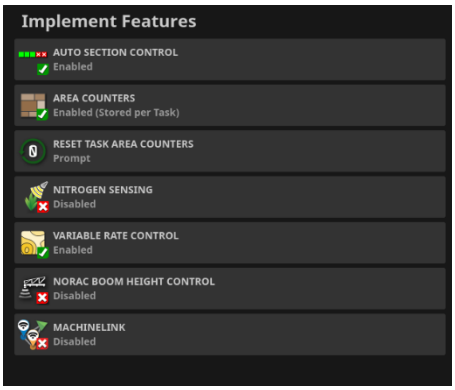
Touch Setup, then User to explore these options.



SYSTEM SETTINGS

AREA COUNTERS

Area Counters are enabled to track data such as area coverage, product dispensed, and rate averages. This is system feature is factory-enabled and configured to be Stored per Task; however, other options are available if preferred.

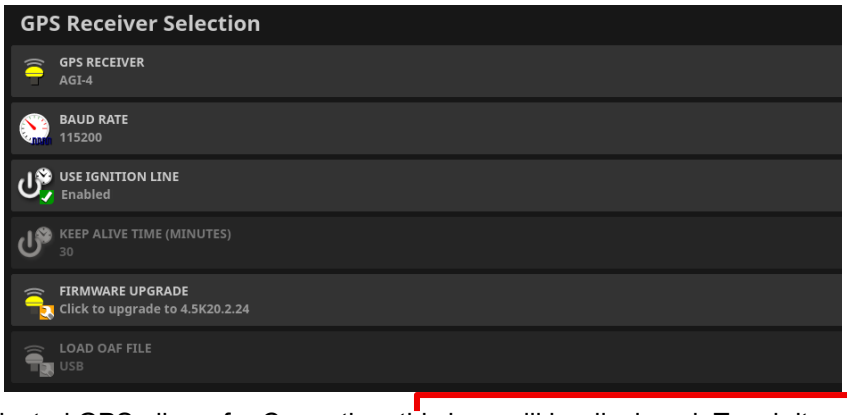


1. Touch Setup, then System.
2. Touch Features, then Implement.
3. Touch Area Counters and choose:
    a. **Disabled:** Do not track data related to product application.
    b. **Enabled (Stored per Task):** The area counters will be stored separately for every created task. *This is the recommended setting for SeedMaster E-Series machines.*
    c. **Enabled (Stored per Implement):** The area counters will accumulate in total across all tasks for each stored implement. Loading a new implement will create new area counters.
    d. **Enabled (Stored per Task and Implement):** Area counters are set and accumulated for both separate tasks and implements.
4. Touch Reset Area Counters:
    a. **Never:** Area counters must be reset manually. They will continue accumulation until they are reset.
    b. **Prompt:** When a task is deleted, a warning will display asking if the user wants to reset counters.
    c. **Auto:** Task creation and deletion automatically resets the area counters.

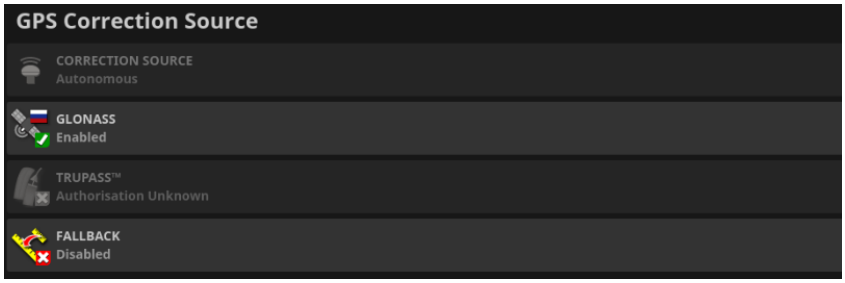
GPS SETUP

To utilize full mapping and sectional control capabilities, the XD+ system requires a GPS differential correction from a GPS receiver. This system will require configuration from the user depending on what style of correction they use:

1. Touch Setup, System, GPS, and Receiver.
    a. **GPS Receiver:** Select your receiver type from the list. The receiver will require configuration to out put the correct data format for the XD+.
        i. GGA @ 5hz
        ii. VTG @ 5hz
        iii. ZDA @ 15 seconds
        iv. Preferred baud rate of 115200bps with 8 data bits, No Parity, and 1 Stop Bit (115200, 8N1).
    b. **Firmware Upgrade:** This will upgrade the GPS Receiver firmware with the internally bundled package included with the XD+.
    c. **Use ignition line:** When the GPS requires power after the vehicle has been turned off and utilizes a compatible wiring harness, this feature is required to be selected. It separates the power supply from the vehicle ignition. Keep Alive Time sets how long the receiver will remain powered.
    d. **Baud rate:** This is the data transmission rate for the receiver.



2. If the selected GPS allows for Correction, this icon will be displayed. Touch it and select your correction source from the list. A complete list of the sources is available in the **Topcon Horizon Operator's Manual** (January 2022, Rev. B), pages 61-65.



WIFI SETUP

A USB-based WiFi antenna is provided with the XD+ Monitor, providing two modes of wireless connection.

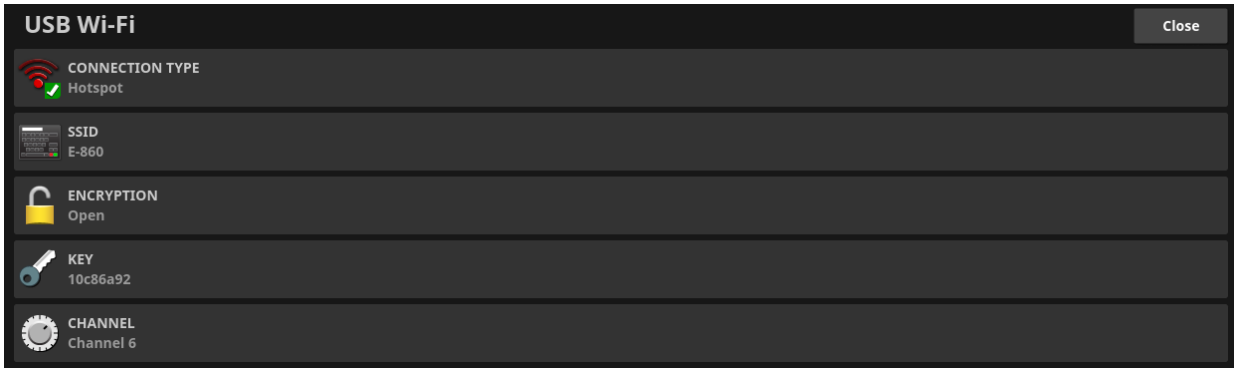
Note: One or the other mode must be chosen; both modes cannot be enabled simultaneously.

Hotspot Mode

Your XD+ monitor is pre-configured by SeedMaster to provide a local wireless hotspot. This allows the operator to run the XTEND app on their mobile device to provide remote control of the Product Calibration and Tank Filling. This is the default mode of WiFi operation.

Make sure the Wi-Fi USB dongle included with your XD+ is installed on the back of the monitor

1. Touch Setup, System, USB Wi-Fi (this is only displayed if the USB Wi-Fi antenna is installed).
2. Set **Connection Type** to Hotspot:
    a. **SSID**: Preset by SeedMaster, this can be changed if desired. When you connect from your mobile device this is the name of the WiFi Network you will choose to connect to.
    b. **Encryption**: Preset to Open, meaning no password required to connect. If security is desired, WPA2 is generally considered the current standard.
    c. **Key**: This is the password which needs to be entered into a mobile device when connecting to the XD+ hotspot. This is only needed if Encryption is set to anything other than open. If set, a minimum of 8 alphanumeric characters is suggested.
    d. **Channel**: Select a channel from 1 to 7 for the wireless hotspot. Generally, this can be left at the default unless issues are detected when connecting.

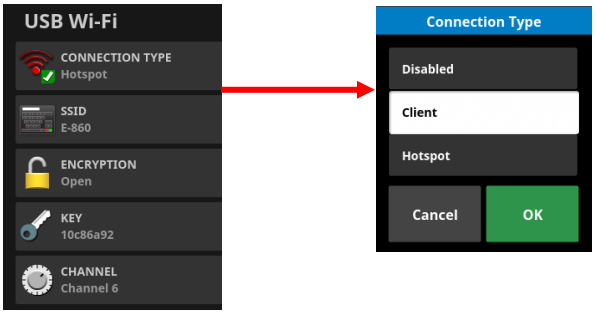


Wi-Fi Client Mode

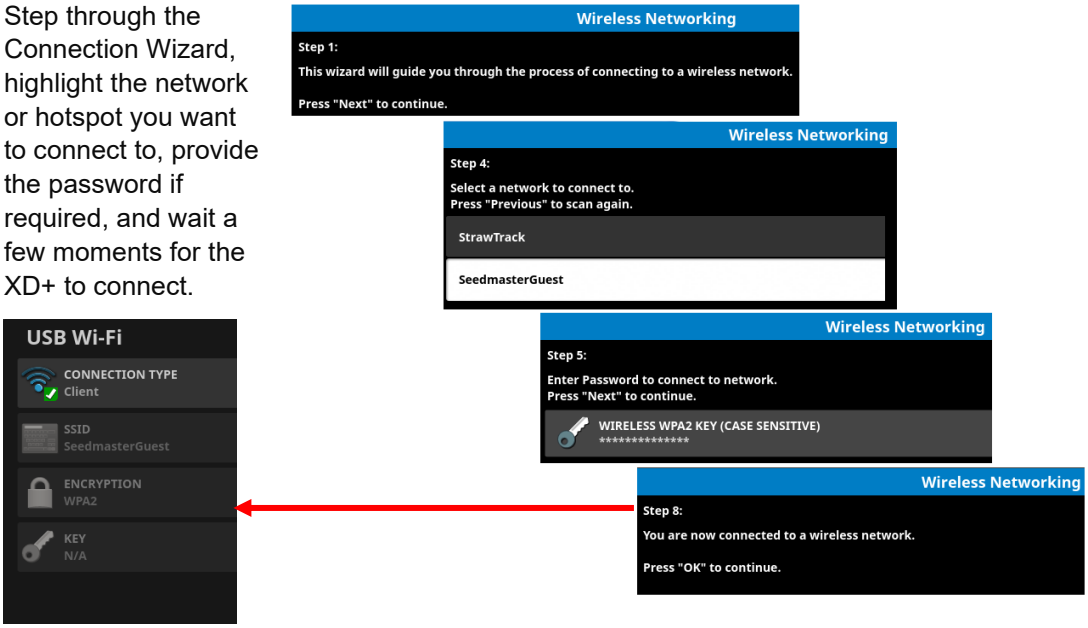
The XD+ can connect to an existing wireless network on the farm or provided by a mobile phone. With Internet access available, you can allow SeedMaster Support remote control to assist with problem solving.

NOTE: Do not enable this mode unless requested to do so by SeedMaster Support.

1. Touch Setup, System, USB Wi-Fi (this is only displayed if the USB Wi-Fi antenna is in place).
2. Touch Connection Type, choose Client and OK.



3. Step through the Connection Wizard, highlight the network or hotspot you want to connect to, provide the password if required, and wait a few moments for the XD+ to connect.



XTEND SETUP

XTEND refers to an application installed on a wireless mobile device such as smart phone or tablet, which provides remote control of some of your E-Series cart functions. See the chapter on installing and using the XTEND app on page 73.

The application relies on the WiFi Hotspot provided by the XD+ monitor as set in the previous pages. It also requires the XTEND feature to be enabled.

1. Touch Setup, System, Features, Console
2. Ensure the XTEND feature is Enabled. If it's disabled, the XTEND app on your mobile device will not connect to the XD+ monitor. Touch to Enable.

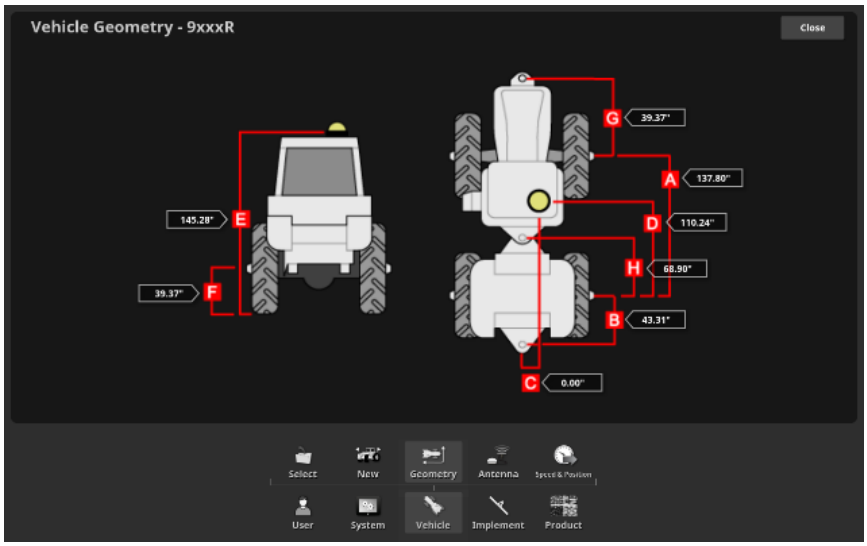
VEHICLE SETTINGS

A Vehicle Profile representing the operator's tractor must exist in order use the XD+. The vehicle configuration must include measurements to ensure as-applied mapping is accurate and to allow Section Control to function correctly.

A vehicle profile is created at the factory with measurements preset if your tractor type is known at the time of programming. However, it is a best practice to ***DOUBLE CHECK AND CORRECT*** the preset measurements for your specific set up. ***It is important to configure the measurements within +/- 2" to ensure proper mapping. Failure to do so will result in inaccurate as-applied mapping and sectional control.***

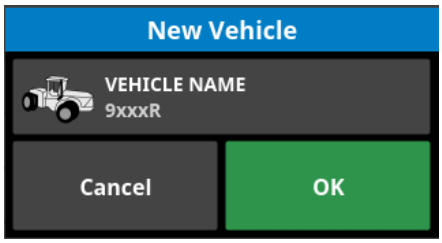
To configure the vehicle:

1. Touch Setup, Vehicle, Geometry.
2. Add or adjust the displayed measurements as required.

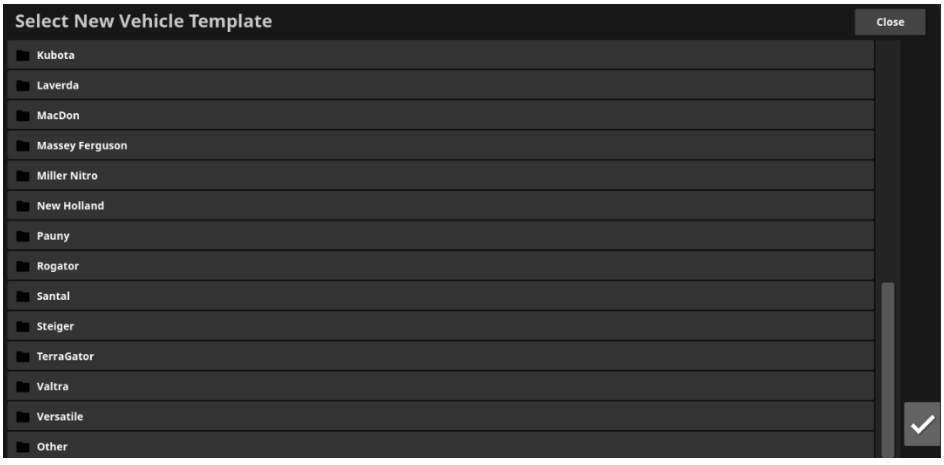


If your tractor is of a different type or you have an alternate tractor you want to be able to use, you can set up an additional vehicle profile. The XD+ can have multiple vehicle profiles available, and you choose which is active.

Creating a new vehicle profile:



1. Touch Setup, Vehicle, New.
2. From the list of pre-configured vehicles, choose your manufacturer and series model. Alternatively, choose Other to create a custom vehicle profile.
3. A new vehicle pop-up will appear. To change the name, select Vehicle Name and enter in the new name.
4. After confirming the new vehicle, the geometry will be displayed. Measure and modify as needed as shown above.

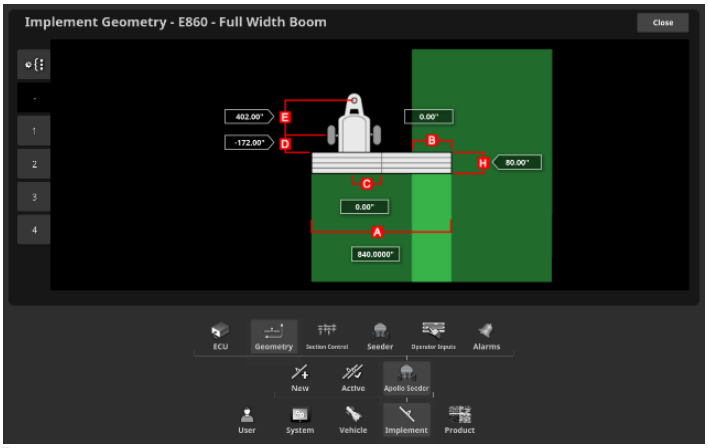


IMPLEMENT SETTINGS

Located on the E-Series cart, the Apollo CM-40 controls all functions related to product delivery to the drill. It essentially represents the Implement and is configured from the XD+ Setup Pages.

IMPLEMENT GEOMETRY

The geometry of the drill needs to be known by both the CM-40 and the XD+ for accurate application and mapping. This has been preset for your specific ***SeedMaster E-Cart and SMS Drill*** from factory.

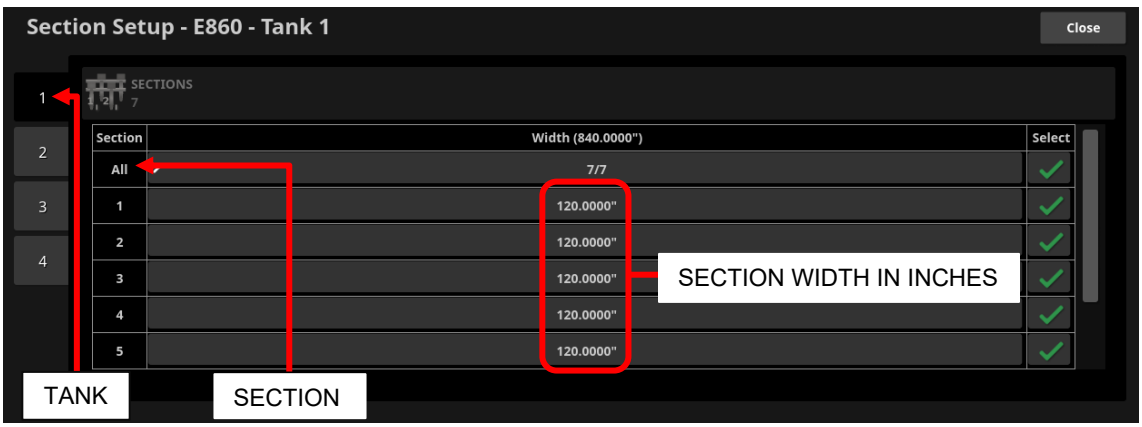


1. Touch Setup, Implement, Apollo Seeder, Geometry. The Boom for Guidance is set to Full Width Boom.
2. Under Full Width Boom, enter in inches:
   (A) Swath Width: Full implement width.
   (B) Overlap: Width of overlap between two adjacent rows. Enter "0" if there is none.
   (C) Inline Offset: Off-center offset of the implement relative to the hitch. For SeedMaster, this will be "0".
   (D) Implement Wheels Offset: Measures the distance from the rear axle to the first rank seed placement point. For SeedMaster, this will be **-180**.
   (E) Implement Offset: Measures the distance from the hitch pin to the rear axle. For SeedMaster, this will be **425**.
   (H) Working Length: Measures the distance from the first rank seed placement point to the third rank seed placement point. For SeedMaster, this will be **100**.
3. Do not change any of the settings under the numbered booms (1-4).

SECTION CONFIGURATION

Section Width Configuration

1. Touch Setup, Implement, Apollo Seeder, Section Control, Sections.
2. Set the section widths in inches. These can be set for all, or individually:
   a. **For all SMD applications**, set for all sections. Touch the All bar and enter the value in inches and touch ok.
   b. **For other applications requiring individual sections**, select the bar next to the appropriate section, enter the value, and touch ok. Repeat for the remaining sections.
3. Repeat steps 1 & 2 for each tank.



SECTION CONTROL TIMING CONFIGURATION

Accurate section control look-ahead time settings are very important to help avoid gaps and overlap when product is being applied. Factory defaults are set to 8 seconds on and 2 seconds off, however it is the user's responsibility to adjust this as required. ***SeedMaster is NOT responsible for skips or misses. Please ensure that you always have product being delivered to unapplied areas when seeding.***

The following procedure will aid in calculating and setting the section control timing.

First, calculate the product application timing:

1. Before setting the timing for a product, ensure that it has been calibrated.
2. Turn the master switch on for the whole machine, then prime all meters for application. This can be done on a tank by tank basis. ASC must be disabled, and Manual Speed enabled to prime the meters.
3. Once primed, time the delay between turning the product on and the application of product through the furthest outside opener of the drill using a stopwatch. This is the "On Time".
4. Turn the master off and time the delay between switching it off and product stopping flow. This is the "Off Time".

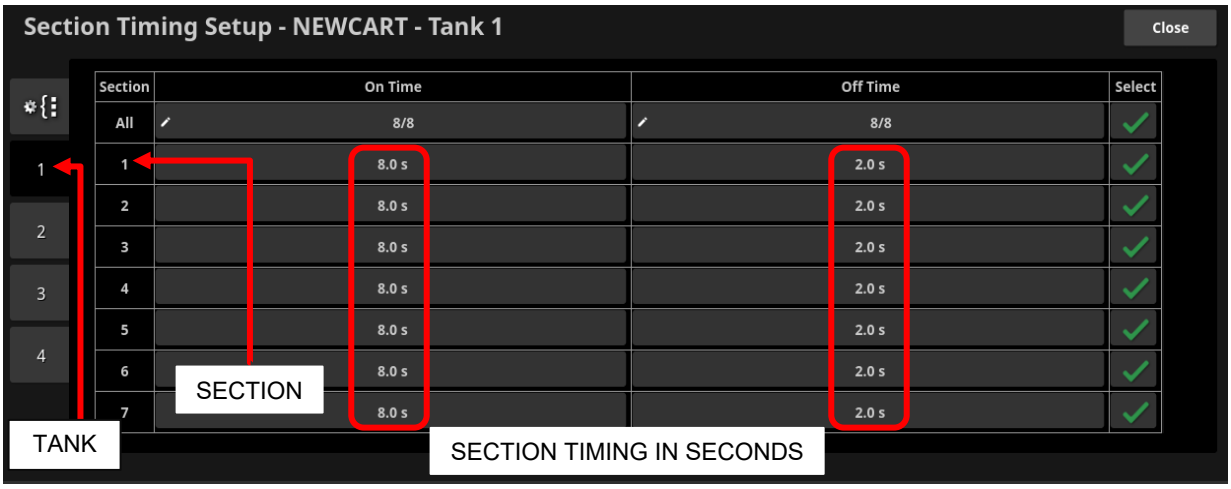
Setting Section Timing:

5. Touch Setup, Implement, Apollo Seeder, Section Control, Timing.

a. **Custom Settings** allows the user to configure the tanks individually or set all tanks the same, based on a chosen single tank.

b. **On Time** refers to the delay between turning a section on and the product arriving at the opener. Choose "All" to configure all sections with the same timing, or the section number to adjust them individually.

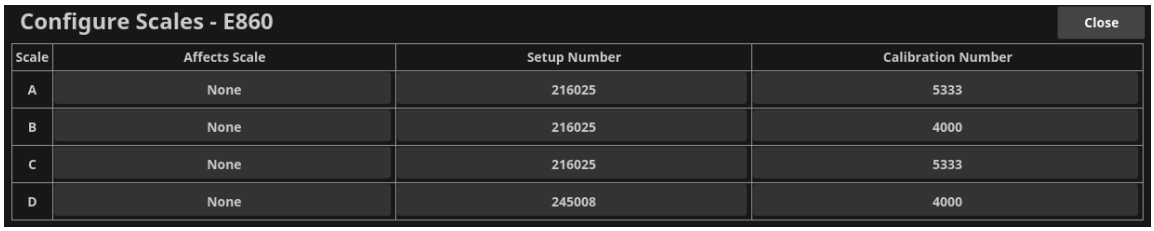
c. **Off Time** refers to the delay between turning a section off and product no longer being delivered to the opener. Choose "All" to configure all sections with the same timing, or the section number to adjust them individually.



SCALE CONFIGURATION

1. Touch Setup, Implement, Apollo Seeder, Seeder, Weigh Scales, Scales.
2. The following settings are factory set. Do not change them unless directed by SeedMaster.
    a. **Scale:** Available scales. SeedMaster applications will have a maximum of 4 per SL2140 Scale Link.
    b. **Affects Scale:** Scale interaction. Set all to None.
    c. **Setup Number:** The SL2140 Scale Link uses this shorthand number to determine how the weight will be displayed.
    The Setup numbers should be set to 216025 for the 315 and 170 bu tanks, and 245008 for the 60 bu tank.
    d. **Calibration Number:** The SL2140 Scale Link uses the calibration number to match the specific load cells to the Scale Link. This determines the actual weight value.

    The calibration numbers are initially set to 5333 for the 315 bu, and to 4000 for the 170 and 60 bu tanks. These numbers provide for reasonable accuracy.



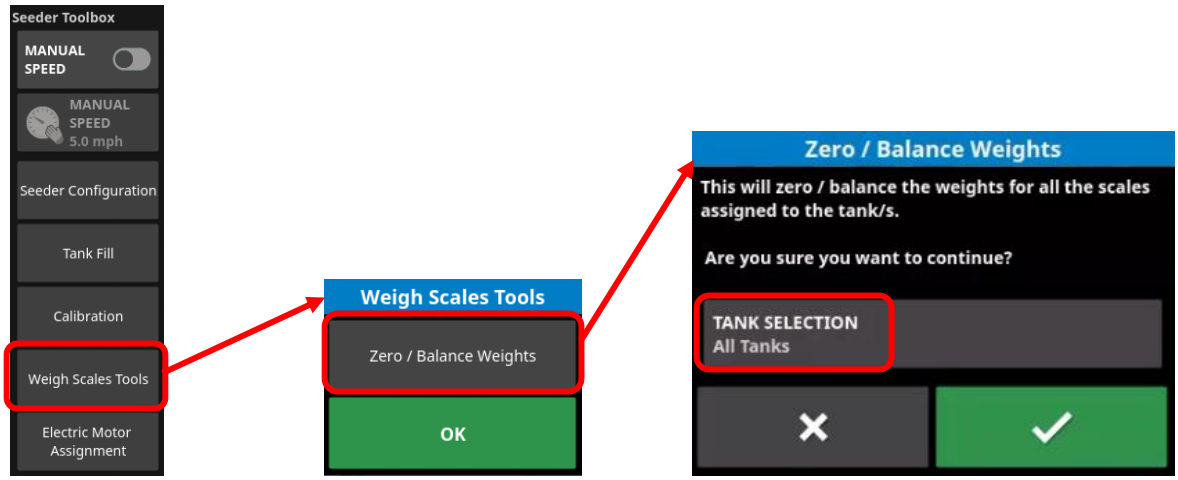
3. Touch Assignment.

    a. **Tank:** Identifies tank number.
    b. **Name:** Name of tank.
    c. **Scale:** Scale connected to the tank.
    d. **Weight remaining:** Displayed on the expanded tank graphic on the main screen.
        i. Calculated: This displays the weight of remaining product the system calculates based on rate.
        ii. Measured: This displays the actual measured product weight, as read from the load cells installed on the tank. This is the option used for SeedMaster E-Series carts.

SET EMPTY TANKS TO ZERO WEIGHT

Ensure the tank or tanks are empty. If any tank shows a non-zero measured weight while empty, it needs to be set to zero.

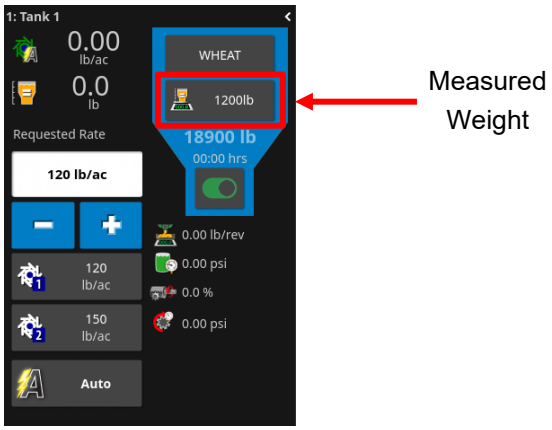
1. Open the Seeder Toolbox panel. 
2. Touch Weigh Scales Tools and select Zero/Balance Weights.
3. Touch Tank Selection to choose a specific tank, or leave as All Tanks if all are empty, then touch the checkmark to confirm.
4. Touch OK to exit the Weigh Scales Tools.



SCALE CALIBRATION

Factory scale settings for the SeedMaster E-Series carts provide for a reasonable degree of scale accuracy as measured. To obtain a higher degree of accuracy the scales must be calibrated on-site.

1. Ensure the tank is empty and “zeroed” as outlined in the procedure on page 57.
2. Add an accurate, verified weight on or in the tank. Higher weight will lead to greater calibration accuracy.
3. From the main work screen, read the value displayed in the tank block on the Tank Panel. If the weight is correct, no further action is required, move on to the next scale. If a tank is found to be inaccurate, move to step 4.



4. Navigate back to Setup, Implement, Apollo Seeder, Seeder, Weigh Scales, Scales.
5. Locate the scale requiring calibration.
6. Determine your new calibration number:
    a. $\frac{\text{Actual Known Weight X Existing Calibration Number}}{\text{Displayed Weight}}$
    b. Example of the above equation, for tank 1:
        i. Actual known weight: 1000lbs
        ii. Weight displayed: 1100lbs
        iii. Existing Calibration Number: 5333 (5333 for the 315 bu tanks, 4000 for the 170 and 60 bu tanks)
        iv. 1000 X 5333 / 1100 = 4848
        v. Accurate Calibration Number for tank 1 is now 4848
7. Touch Calibration Number.
8. Using the keypad popup, enter your new Accurate Calibration Number.
9. Repeat above steps for each tank requiring calibration.

Configure Scales - E860 Close

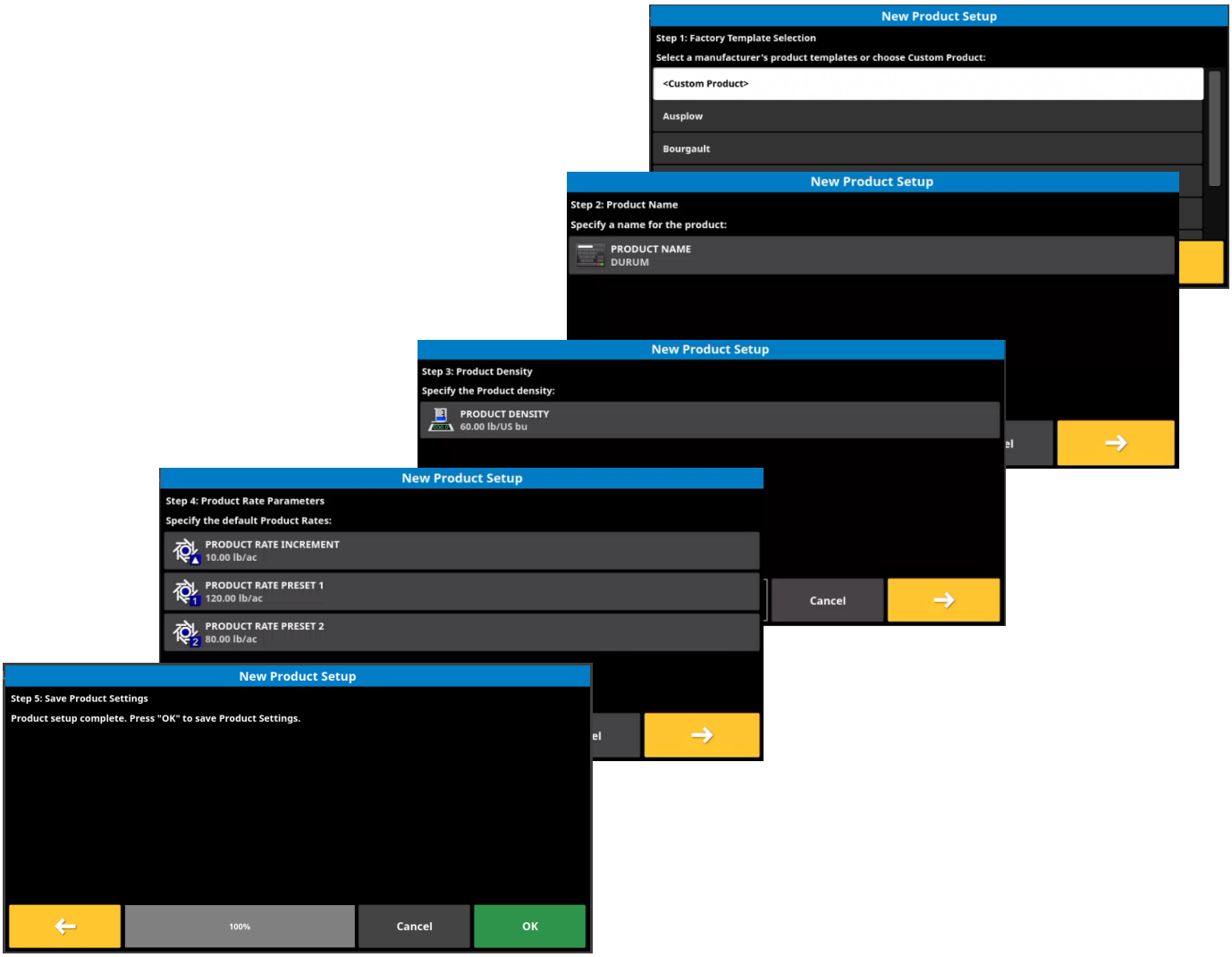
Scale	Affects Scale	Setup Number	Calibration Number
A	None	216025	4848
B	None	216025	4000
C	None	216025	5333
D	None	245008	4000

PRODUCTS

Creating preset products for common applications in upcoming field operations allows users to save the rates, increments (rate bump), and densities for various product types. This also allows the operator to select products, quickly resume, or restart an application or operation for various fields.

The products you set up here are added to your inventory. You can backup, delete, or rename these products from the Inventory Manager like any system file:

1. Touch Setup, Product, Granular.
2. Touch New Product, then Custom Product.
3. Name the product by touching on Product Name.
4. Add the product density in pounds per bushel (60lbs/bu for wheat, 50 lbs/bu for canola etc.).
5. Set the Product Rate Parameters including increment, Rate 1, and if desired, Rate 2.
6. Touch OK at the end to complete the product set up.
7. To set up another product, repeat steps 2 through 6.



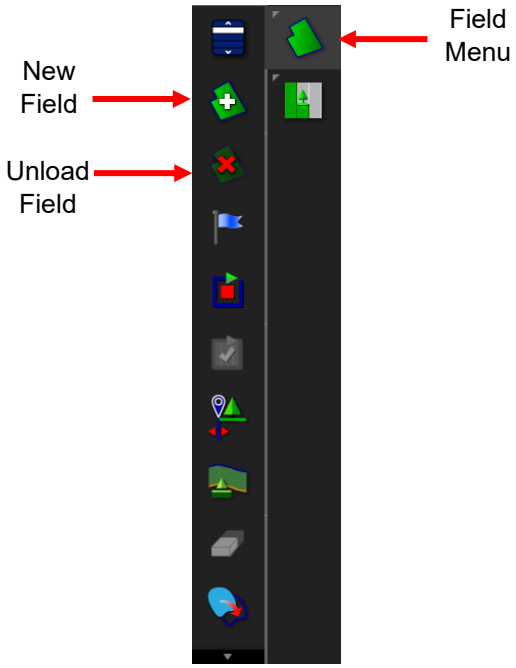
AS-APPLIED MAPPING

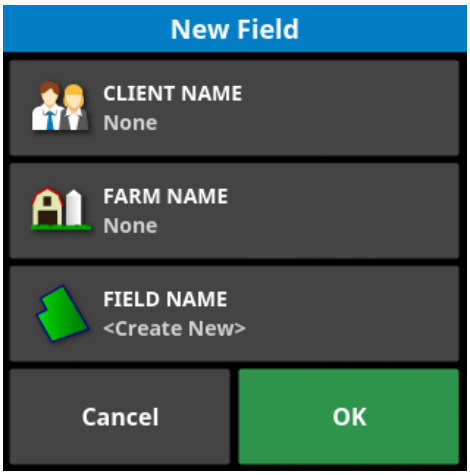
CREATING FIELDS

Setting a field allows the XD+ to store that field's information so that it may be recalled for various tasks required in the same field. It is important that GPS is active, and the machine is located within the field that is being created. Once the field is active and saved, the XD+ will automatically load that field by either driving into it, or powering on the monitor while located in the field.

1. Maximize the As-Applied Mini-view. 
2. Touch the Field Menu.
3. Touch the New Field icon. 
4. Enter a Client Name for the Field and confirm (if required).
5. Enter a Farm Name for the Field and confirm (if required).

   *NOTE: The field can be created without a Client or Farm Name if desired
6. Enter a Field Name and confirm. It is recommended that the name is familiar and organized to the Farm's structure to ensure future use is simplified.



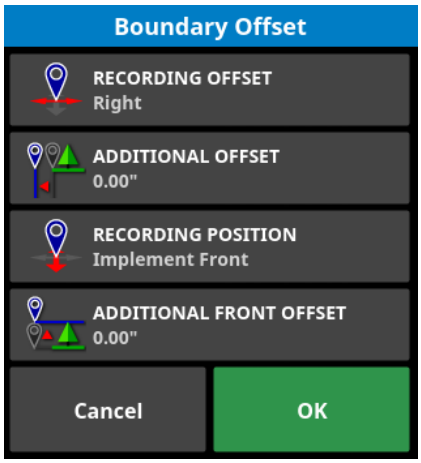


NOTE: *When work has been completed in a created field, it is important to "Unload" that field. This will prevent any new coverage from being mistakenly added if a user moves to a new field without creating a new field or task. If the "Unload Field" function is not used, and the user travels more than 15km away, the field will be unloaded automatically. A warning will pop up to warn the user of the unload.*

CREATING FIELD BOUNDARIES

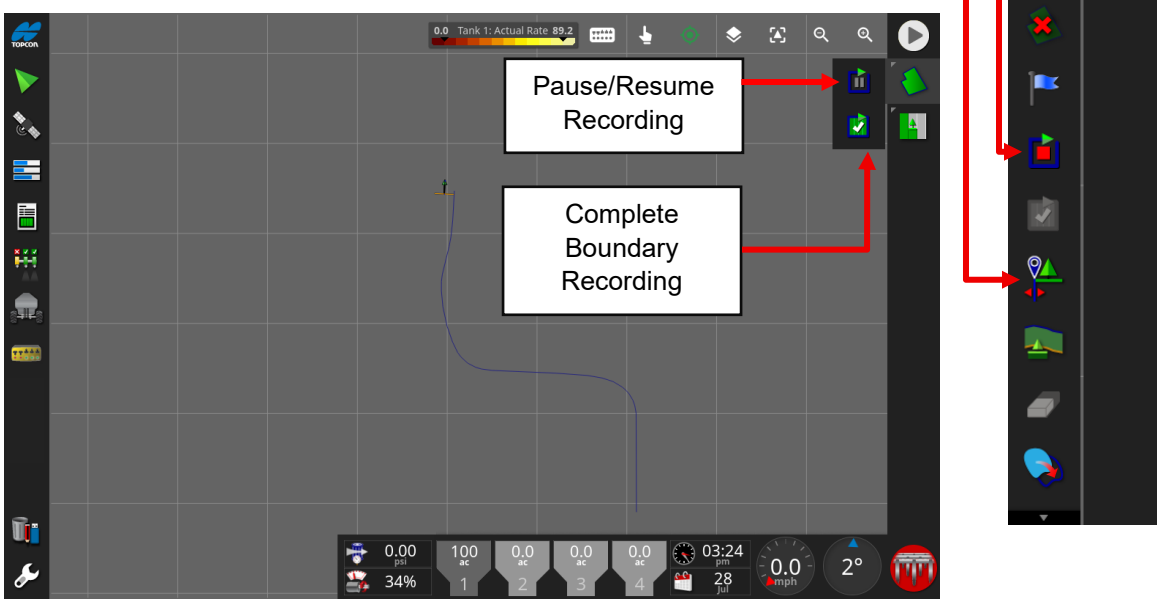
Fields can have multiple boundaries within. These boundaries do not necessarily need to align with the field edges. There are three ways of creating a boundary for your field:

- Record while Driving
- Create from Coverage
- Create from Shapefile



Recording a Boundary while Driving

1. Drive the machine to the edge of the field.
2. Touch the Field menu.
3. Touch Boundary Offset.
   a. **Recording Offset**: This sets the position of the offset on the left or right side of the implement.
   b. **Additional Offset**: By entering a positive value, the offset is extended beyond the edge of the implement. A negative value will position the offset inside the implement edge.
   c. **Recording Position**: The operator can choose to record from the front or rear of the implement or from the tractor position.
   d. **Additional Front Offset**: This moves the recording position forward (positive value) or backward (negative value).
4. Touch Record Field Boundary.
5. Drive the boundary of the field. A blue line will be recorded as the field boundary and account for any predetermined offset.



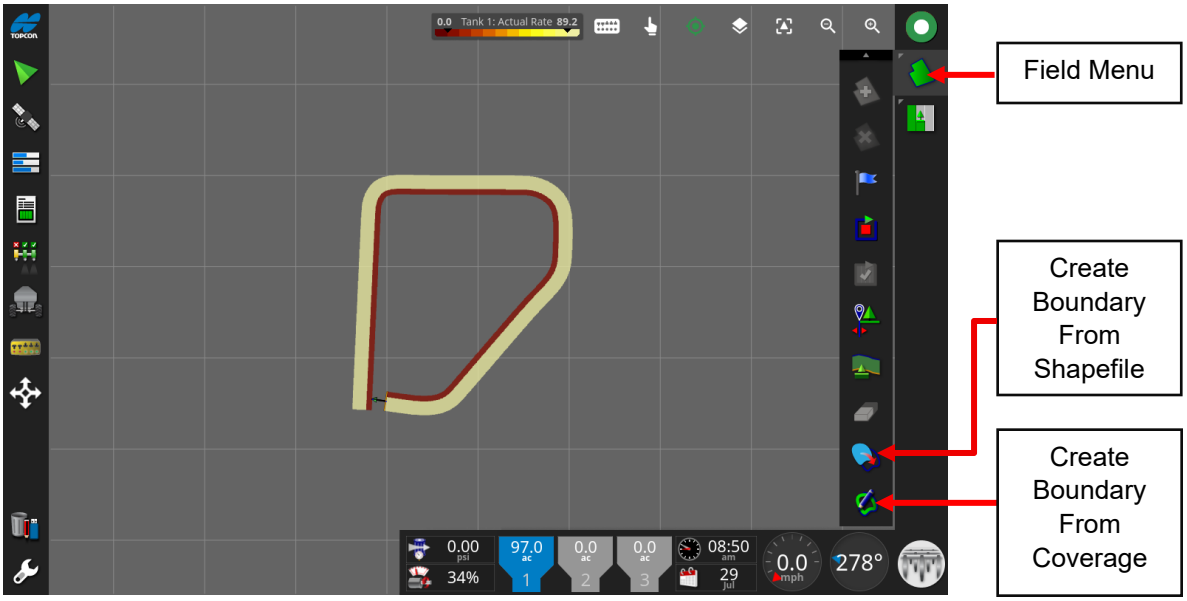
6. If a temporary obstacle is encountered while driving the boundary, touch Pause. Once the obstacle has been cleared, touch Record to resume. The boundary will automatically set a straight line between the points where recording was paused and resumed.

   NOTE: Boundary recording is automatically paused if the master is turned off.

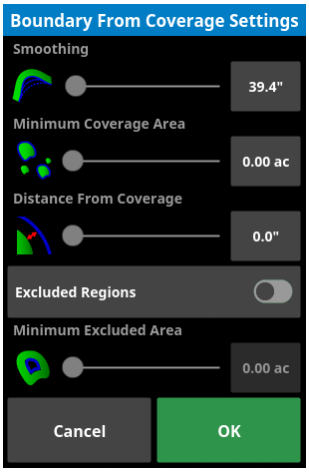
7. When you have returned to the starting point, touch Complete Boundary Recording to finish the process.

Create a Boundary from Coverage

1. Apply product to the desired field boundary.
2. Touch the Field menu.



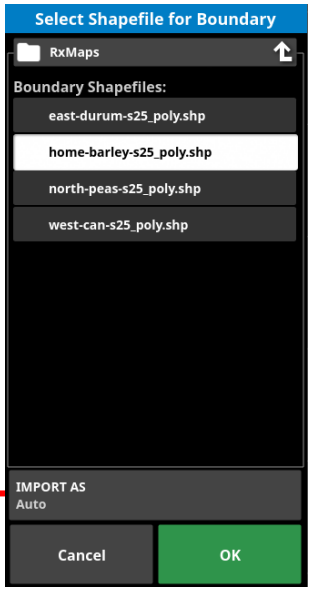
3. Touch Create Boundary from Coverage.
   a. **Smoothing**: The minimum gap size that will fill automatically.
   b. **Minimum Coverage Area**: Coverage smaller than what is specified here will not create a boundary.
   c. **Distance From Coverage**: Expands the boundary a specified distance from coverage.
   d. **Excluded Regions**: These are used to indicate areas that will not have applied product when using sectional control. When on, excluded regions are automatically created from gaps in coverage. This setting is “On” or “Off”.
   e. **Minimum Excluded Area**: A gap in coverage smaller than what is specified here will not create an excluded region.

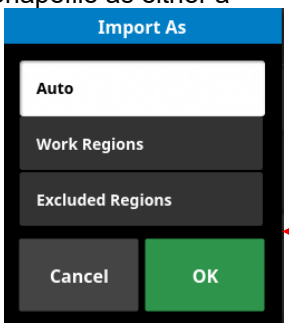


Creating a boundary from a shapefile

Insert a USB drive containing your Shapefile into the port on the back of the XD+ monitor.

1. Touch the Field menu.
2. Touch Create Boundary from Shapefile.
3. Follow the file path to the storage location of the shapefile and select it.
4. You may optionally choose to import your Shapefile as either a Work or Exclusion type.
5. Confirm and the shapefile boundary will import.

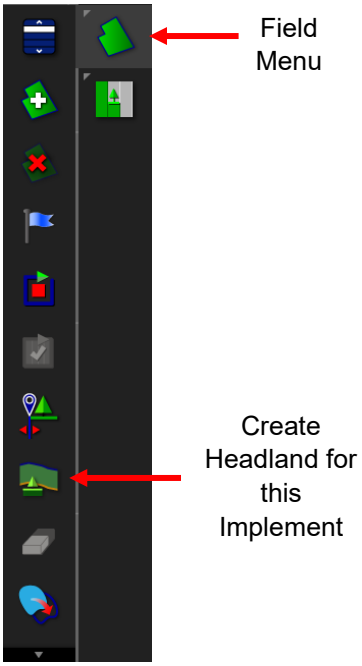


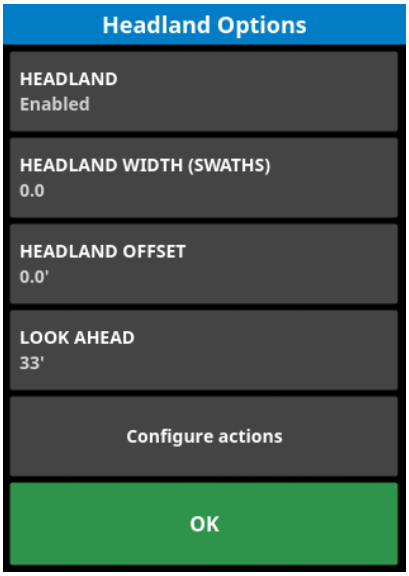


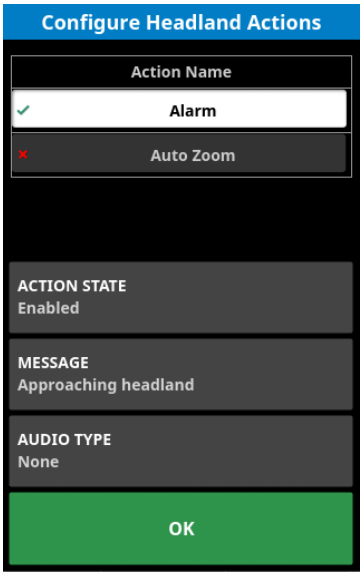
CREATING A HEADLAND

Once a Field Boundary has been created, it is possible to set a headland zone inside of that boundary. The width of this zone can be customized by setting the number of swaths, or headland offset.

1. Touch the Field Menu. 
2. Touch Create Headland for this Implement. 
3. Ensure Headland is enabled in Options.
4. Headland Width and Headland Offset can either be used individually, or combined:
    a. Touch Headland Width (Swaths) to enter the number of “swaths” desired. The swath is defined as the working width of the implement. Enter a value and confirm.
    b. Touch Headland Offset to enter a custom headland width or to expand a previously set Headland Width to include a buffer. Enter a value and confirm.
5. Touch Look Ahead and enter a value in feet representing the distance in front of the vehicle the system looks to respond with Actions. Confirm.
6. Touch Configure Actions.





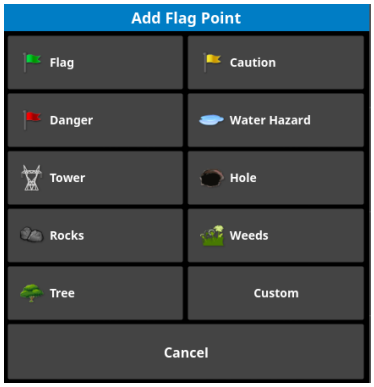


7. Action names:
    a. Alarm – triggers an alarm when approaching the headland using the predetermined look ahead time.
    b. Auto Zoom – the map will zoom in or out to a predetermined level when approaching the headland. The map will return to the original zoom level when leaving the headland.
8. Highlight an action name to edit its properties:
    a. Enabled or Disabled.
    b. Visual text message.
    c. Audio type (none or “beep”).

SETTING FLAG POINTS

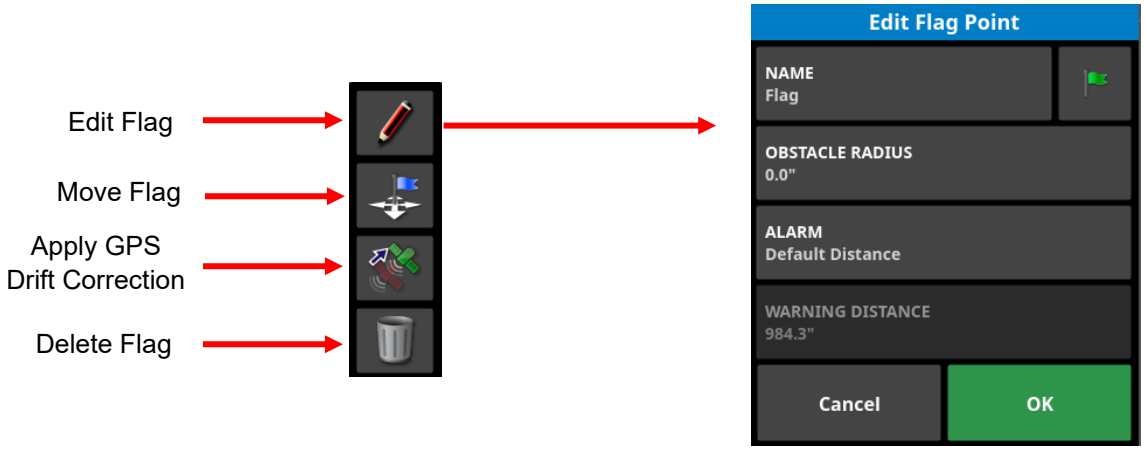
Setting flag points allows the user to identify obstacles or areas for the seeder to avoid. If required, these flag points can have an exclusion zone set around it.

1. Drive to the obstacle or area to be flagged.
2. Select the Field Menu.
3. Select Set Flag Point.
4. Choose a flag or other symbol to be placed at that spot.
    a. To name the obstacle other than the defaults, choose Custom.
    b. Touch the symbol you want, then change Flag Point Name to your desired obstacle name.



Editing Flag Points:

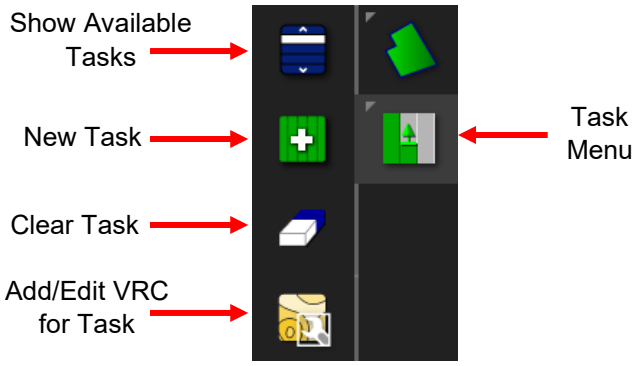
5. Press and hold the flag point until a pop-up displays to edit settings.
    a. **Name:** Edit the name or change the icon.
    b. **Obstacle Radius:** Enter a radius measurement around the flag point if known.
    c. **Alarm:** Toggle the flag point alarm on or off and customize the trigger distance. If this setting is not visible, ensure the alarm is enabled in general alarms.
    d. **Warning Distance:** Enter a custom distance for triggering the alarm. This measurement is from the edge of the set radius.
6. Flag location can be changed by pressing and dragging to a new location on the map.
7. If required, use the trash can icon to delete the flag.

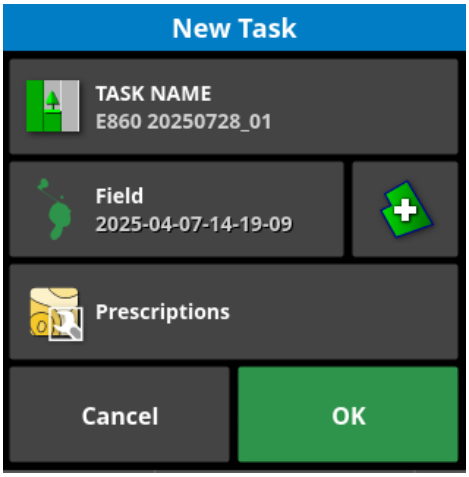


TASK CREATION

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

1. Review Apollo CM-40 Quick Start Procedure (**PAGE 86**).
2. Review Section Control Timing Configuration (**PAGE 55**).
3. Ensure the Product Database is configured with the applicable products (**PAGE 59).**
4. Touch the Task Menu. 
5. Touch Create New Task. 
6. Enter Task settings:
    a. Review and enter task name. Use a name that is easily identifiable and applicable to the farm and operation for future organization.
    b. Touch Field. Choose the appropriate associated field (if applicable). You can also create a new field here if desired. 
    c. If a Prescription is available for this task, it can be added now - see Loading VRC Maps With A Task in the next section - or a prescription can be added/adjusted later.
    d. Touch OK to confirm the task.





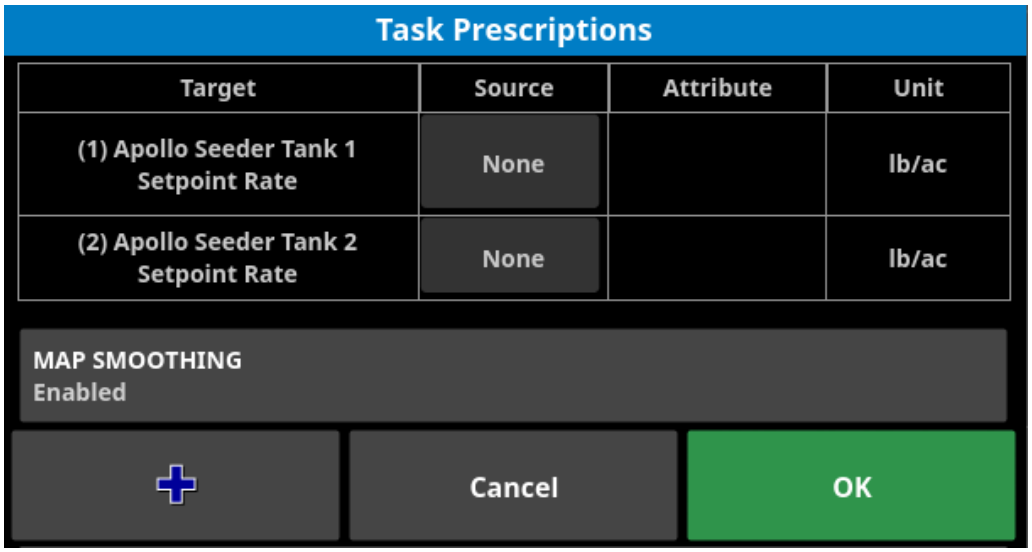
NOTE: Clearing a current task removes any applied coverage data and resets task totals. You will be given the option to also clear task area counters. Clearing a task does not delete the associated file.

LOADING VRC MAPS WITH A TASK

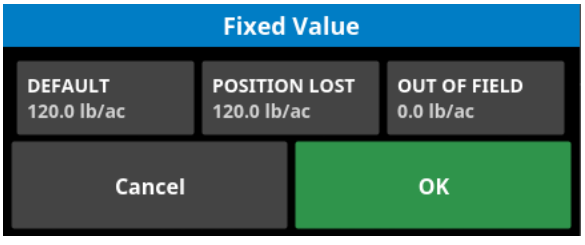
Your SeedMaster E-Series cart and XD+ monitor provide the ability to apply products at prescribed varying rates across a field, based on prescription maps. While starting a task, select Prescriptions to start the process of loading a map with a task. This mode allows the XD+ to automatically adjust the target rate for field areas as designated by the prescription map.

1. Touch the Task Menu. 
2. While creating a task, touch Prescriptions. 

If your task has already been created, touch Add/Edit VRC. 



3. **Target**: This is the tank/product that is being controlled. Touch the "**+**" button to add additional tanks/products.
4. **Source:** This is the rate-source for the target tank/product: The following options are available for each tank/product:
   a. **None**: No rate control.
   b. **Fixed**: The values for Default, Position Lost, and Out of Field are fixed.



- **Default**: This is the default rate to be applied.
- **Position Lost**: This is the rate if GPS signal is lost. Seeding can continue until the signal is regained.
- **Out of Field**: This is the rate applied if the machine moves outside the field boundary.

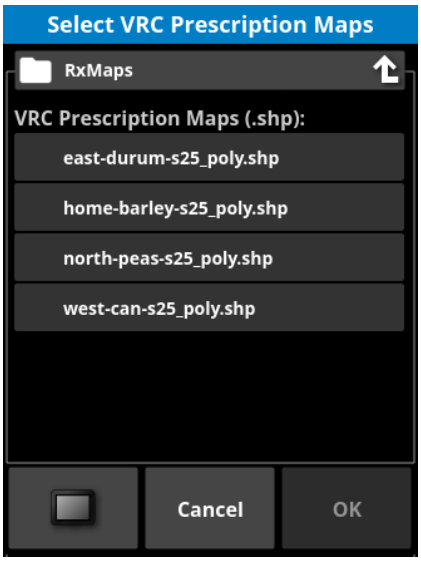
c. **Task Prescription**: Tasks created using external software can be linked with prescriptions configured in a grid format. Like shapefiles, these tasks are imported with a USB via the Inventory Manager. If this task has a prescription associated with it, use this option to apply it to the Target.

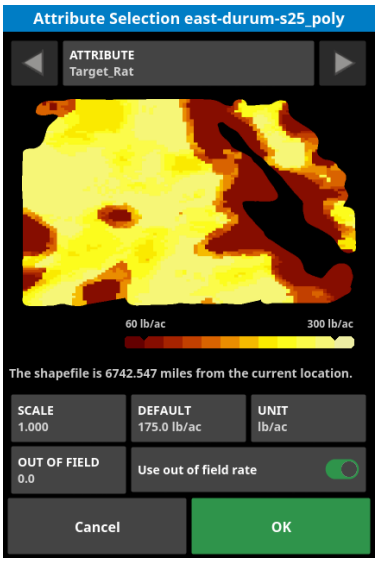
d. **Shapefile**: Import Shapefiles from a USB drive onto the display via the Inventory Manager.

   i. Ensure the shapefiles are preloaded onto the monitor or insert a USB containing the prescription shapefiles into the XD+ monitor.

   ii. Select USB or Monitor as the shapefile source.

   iii. Navigate to the appropriate shapefile and touch to highlight it. Touch ok to confirm.





   iv. The Attribute Selection menu will pop up. Hit ok to confirm after verifying your settings:

   i. **Attribute**: Select the attribute you want the shapefile to use.

   ii. **Scale**: This defaults to 1 which tells the source to follow the map as prescribed. For 50% of the prescribed rate, enter 0.5. For 110% of the prescribed rate, enter 1.1.

   iii. **Default**: This defines the rate in the areas of the field that lack a prescribed rate. The default is 0. If you want product applied, enter a positive value here.

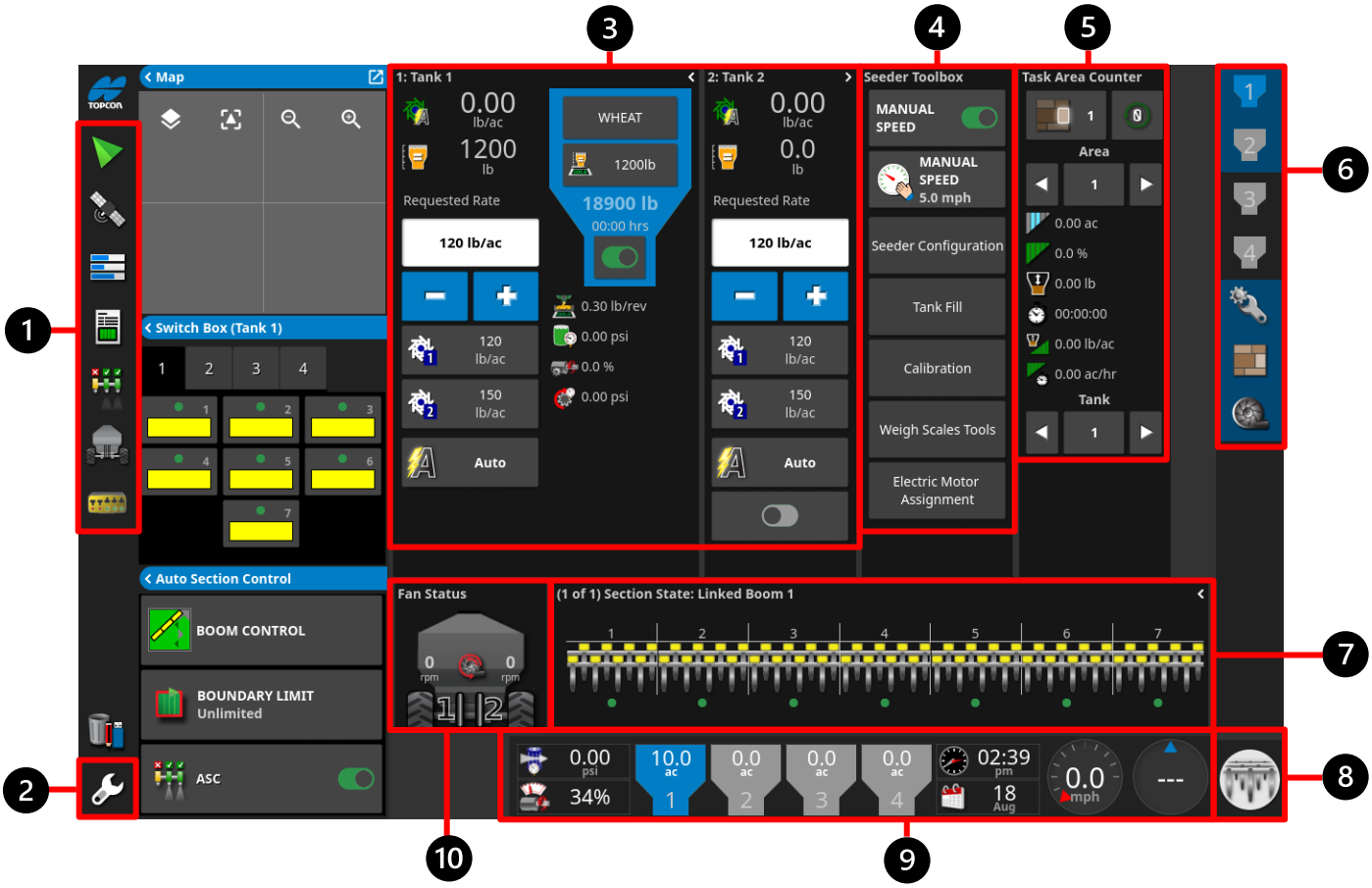
   iv. **Unit**: Select the units the shapefile uses from a drop-down list. If the units differ from the display, they will be scaled appropriately.

E-SERIES CART OPERATION

CART SCREEN CONTROLS

The Topcon Apollo CM-40 is a multi-product application control system that can control up to 4 product applications such as liquid, granular, and NH3 via task control for as-applied documentation, prescription rate, and section control. Paired with and configured by the XD+ Monitor, the Apollo CM-40 will run the functions of your E-Series Cart.

The XD+ monitor can be configured to display the information most relevant to the current activity. When you touch the Seeder Controller Mini-View and maximize it, the primary screen shows the CM-40 control system as configured for your cart.

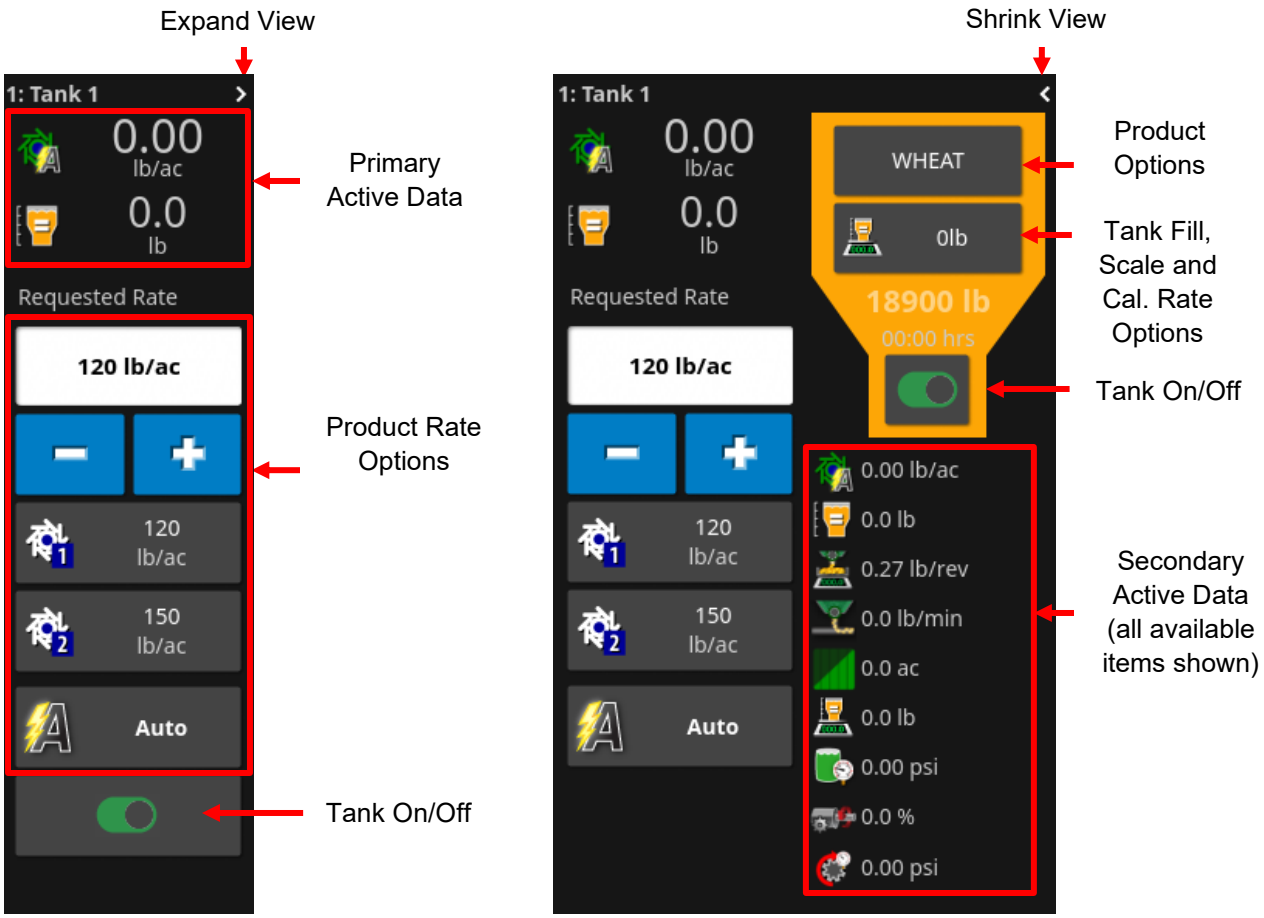


1. **Navigation Bar:** Touch each icon to open a Mini-view for that function. See page 72.

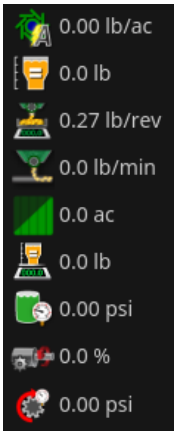
2. **Setup:** Open the Setup Screen to modify settings related to the User, System, Vehicles, Implements (CM-40), and Products.

3. **Tank Panels:** These panels show information about live operation status, product contained, and product application rate. Individual tanks can be expanded to show additional information. Individual tanks can also be hidden from view by touching their icons on the Toolbar Panel along the right-hand side of the screen.

SeedMaster pre-configures the live information displayed, however the operator can choose to add or remove specific items.



Touch in either the Primary or Secondary Data Areas for a pop-up to select which data items to display. The primary can contain up to three items and the secondary can display all items.



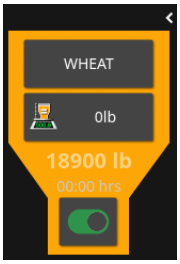
Application Rate (real time) *
Calculated Remaining Product Weight *
Product Calibration Factor **
Discharge Rate
Area Remaining
Measured Remaining Product
Tank Pressure **
Average Torque of Tank Motors **
Tank Purge Pressure **

* SeedMaster Default for Primary Active Data Area

** SeedMaster Default for Secondary Active Data Area

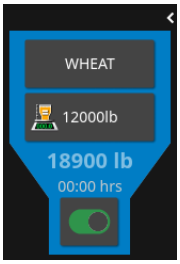
TANK STATUS BY COLOR

Tank Empty and Off



Tank Empty and On

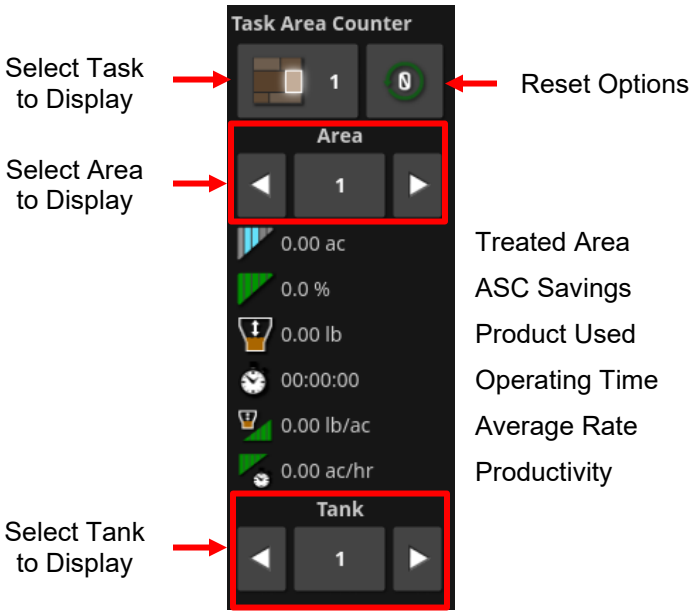
Tank Not Empty and Off



Tank Not Empty and On

4. **Seeder Toolbox:** Displays manual speed settings and tools related to product/tank calibration. See Catch Test Calibration Procedure on page 79.

5. **Task Area Counter:** Displays accumulated counts and information by tank about product application and area covered. The Counter panel can be hidden from view by touching its icon on the Toolbar Panel along the right-hand side of the screen.

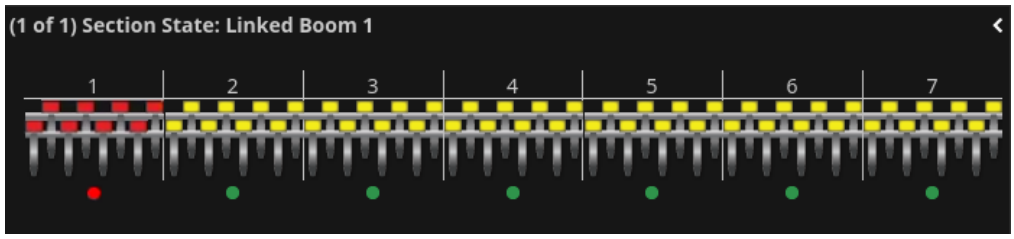


The SeedMaster default is to accumulate and store this data per Task. For other options see Area Counters on page 49.

6. **Toolbar Panel:** Allows the user to choose the tanks they would like to show in the main area, and hide/show the Seeder Toolbox, Task Area Counter Panel and Fan Status graphic.

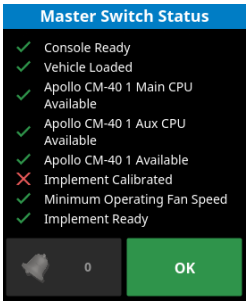
7. **Section Status:** Displays the current state of the combined active tank sections. The section graphics change colour where red is not ready, yellow signifies ready, and green is operating. In operation, this translates into drill opener engagement and product metering. You will note a delay in colour change after raising/lowering drill openers which is directly related to section timing (see page 55), representing time for product to reach drill openers.

   The dots below each section indicate if the section is enabled (green), or disabled (red). Touching any section disables that section on every active tank. Individual tank sections can be toggled off using the Switchbox Mini-View if desired.



8. **Master Switch:** Product application operations are initiated by enabling the Virtual Master Switch. White indicates the switch is Off. After touching to enable it, the switch will alternately flash Blue and White, indicating it is waiting for the drill to signal when the openers have been lowered. The switch will turn Green when the drill signal has been received and the E-Series cart begins to meter product.

   A Red master switch indicates some other condition must be met before the master switch can be enabled – touching it will show a pop-up display revealing un-met condition(s).



9. **Dashboard:** At the bottom of the main screen, the always visible, user-configurable dashboard is used for viewing current system information briefly. CleanFlo filter and motor load, acres remaining per tank, time & date, ground speed, and heading are commonly enabled displays.

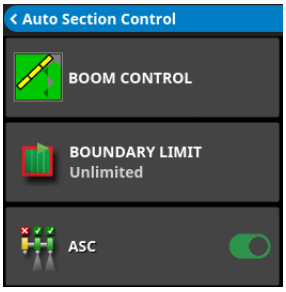
   Touching the dashboard allows the user to change the types of information displayed. Further customization can be accomplished by then touching individual elements.

10. **Fan Status:** Displays a graphic showing the current speed of enabled fans. Fan 1 services the fertilizer runs, Fan 2 services the seed runs.

PRODUCT APPLICATION MINI-VIEWS

Mini-Views specific to product application provide quick access to less frequently used adjustments and information during operation of the E-Series cart.

Auto Section Control

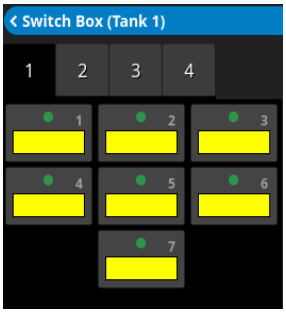


Boom Control is pre-configured to minimize both coverage overlap and gaps. Further refinement is available per boom (tank).

Boundary at which coverage is turned off by ASC

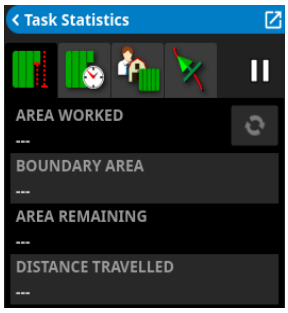
Auto Section Control can be toggled off for all enabled tanks for overseeding previously covered areas.

Switch Box



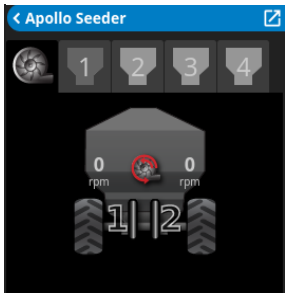
Any section or multiple sections of any tank can be toggled off/on.

Task Statistics



Displays Task-specific data vs. the tank-specific data collected on the Area Panel

Seeder (Fan View)

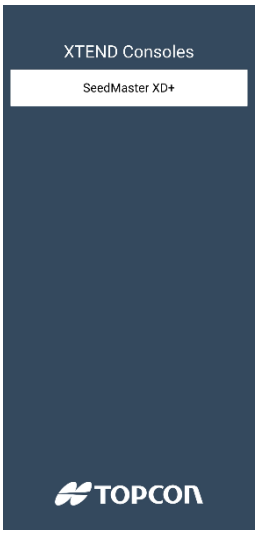


Seeder (Tank View)

The Seeder Mini-View is essentially a smaller, combined version of the Tank Panels and Fan Speed graphic. When a tank is chosen as the view, the tank can be toggled off, product rate can be changed, and touching on the data area on the left allows the user to choose two of the nine available data types to display. See the bottom of page 70 for data options.

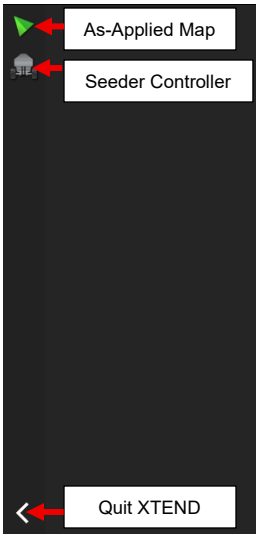
XTEND APPLICATION

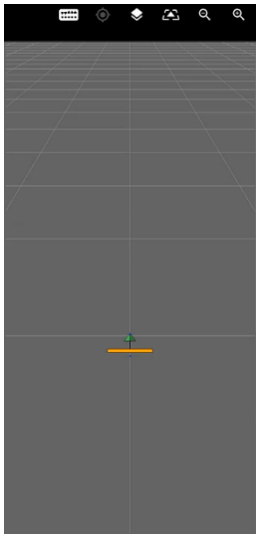
XTEND is a freely available mobile app provided by Topcon Precision Agriculture. It is available for Apple and Android-based mobile phones and tablets in their respective application stores.

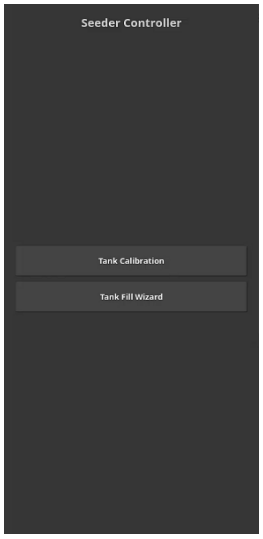


1. After installing the XTEND app, connect your mobile device to the WiFi Hotspot provided by your E-Series Cart. By default, the name of this hotspot is the model of your cart – eg: E-860 – and there is no password. See WiFi Setup in this manual for more information.
2. Start the XTEND app and touch on XD+.
3. Read the warning, scroll down, and touch Accept. The first time you connect a new device to your XD+, you will need to accept the connection on the monitor.

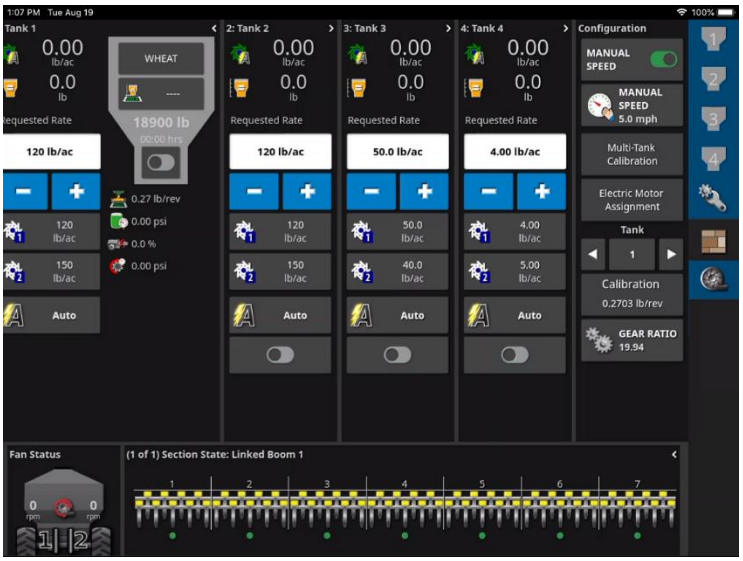
4. The functions available depend on the physical size of your mobile device screen. For a mobile phone, you have access to a small As-Applied map and the Seeder Controller, which provides remote control of the Tank Calibration and Tank Fill wizards.







5. When XTEND is run on a tablet, the As-Applied Map provides a better perspective and the Seeder Controller duplicates much of the function available on the XD+ monitor with respect to the tanks, rates, products etc.



FILLING TANKS

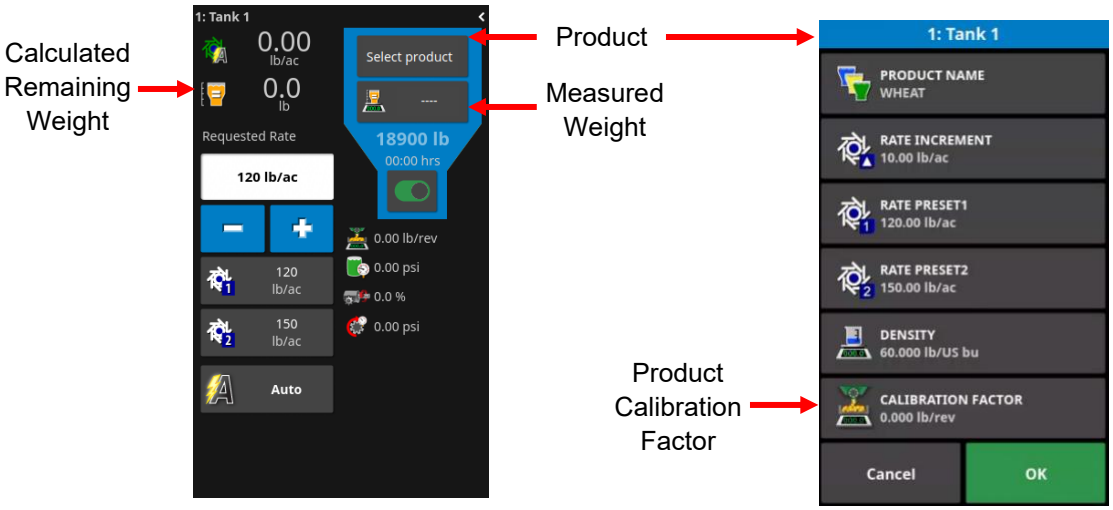
The processes outlined below include using either the XD+ or the XTEND app. Utilization of the XTEND app can help avoid multiple trips between the tractor and the cart. See the previous chapter on using XTEND.

CHOOSING PRODUCTS

Before filling a tank with a product, you need to tell the CM-40 what kind of product the tank will contain. You will choose the product from the list you previously entered in Setup as outlined on page 59; however, you can also set up a new product from the tank view while preparing for a fill:

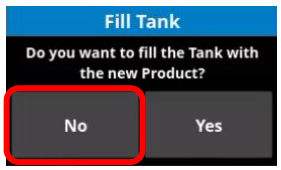
1. Expand Tank Panel and touch Select Product or previous product name.
2. Choose your product from the pop-up list. If you choose Custom, you will create the product using the same Product Wizard described in the Setup section of this manual under Products, Granular.
3. Note that Rates are recalled for the product you select, however if this is the first time using this product there will be no Calibration Factor listed. Touching Calibration Factor offers the choice to start Automatic Calibration or enter a Manual Calibration number.

   Note: It is preferred to manually enter a starting calibration number here and do the actual calibration later with your other tanks. Enter 0.3 for coarse products or 0.05 for fine products.



4. Touch OK.
5. When asked if you want to fill the tank with the product, we recommend “No”.

   Touching “Yes” assumes an ideal weight based on the capacity of the tank and the product density. This will result in an inaccurately calculated remaining product weight.



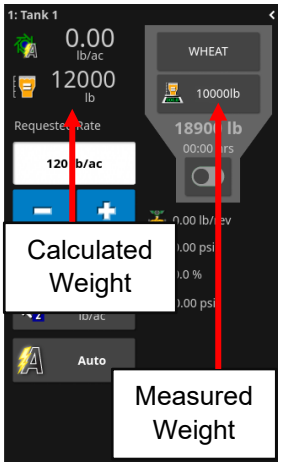
6. Perform the above steps for each tank before continuing.
7. Your tanks are now ready to be physically filled.

FILLING TANKS

After entering your intended products into the cart control system as outlined above, you are ready to physically fill the tanks.

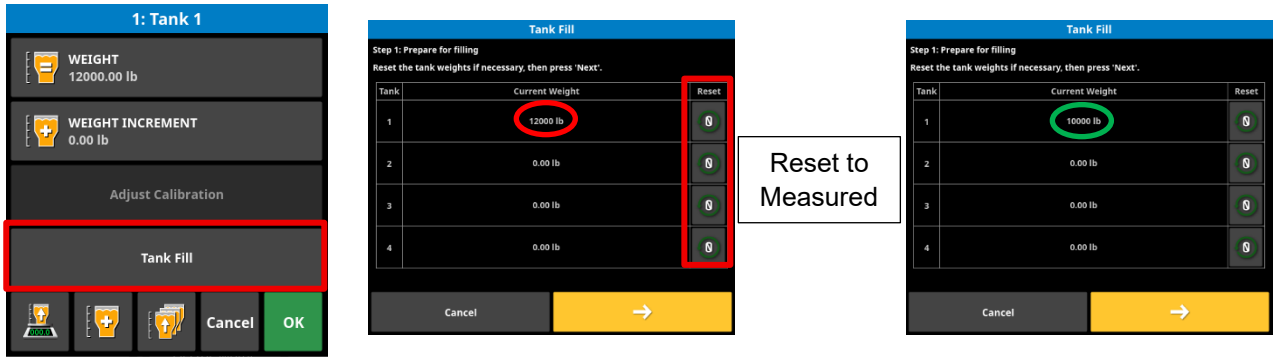
The Tank Fill Wizard can be run directly on the XD+, however you would need to return to the tractor after filling each tank. Using the XTEND app to run the Tank Fill Wizard on your mobile device allows for convenience and efficiency while filling multiple tanks.

Each tank block displays a Calculated Remaining Weight after product has been applied. This is based on calibration factor, speed, and area covered. It will deviate over time from the actual Measured Weight determined by the load cells, which is shown on the expanded tank block. It is important to reset this Calculated Weight to the actual Measured Weight whenever tanks are filled or refilled.



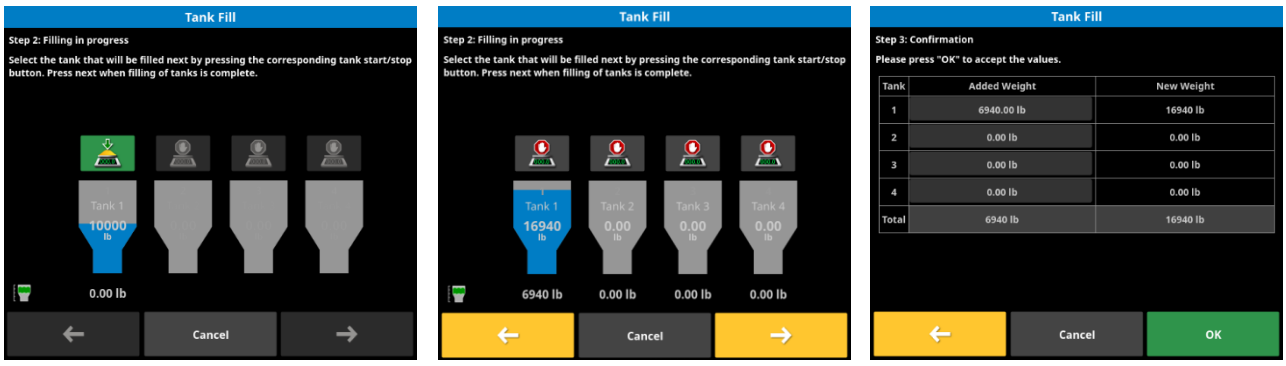
TANK FILL WIZARD USING THE XD+ MONITOR

1. On the tank icon to the right in the Expanded Tank View, touch Measured Weight to open tank details.
2. Touch Tank Fill. The Tank Fill wizard will begin. Reset the calculated weight to measured weight for each tank you plan to fill before touching the next arrow.



3. Touch the Stop/Start symbol above the first tank you want to fill. It will turn green indicating it is ready to begin filling with product.
4. Fill tank with product. Touch Stop/Start again after you have stopped filling that tank.

   Repeat this process for any other tank you want to fill. You cannot fill more than one tank at a time. You do not need to fill all tanks. You do not need to completely fill any tank.

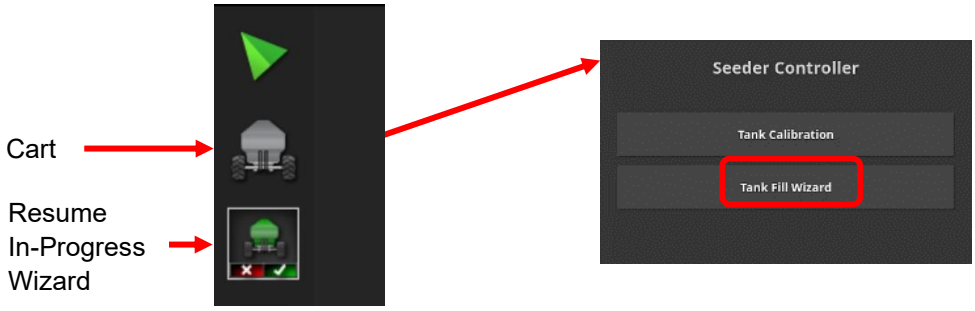


5. When finished loading, touch the Next arrow, confirm values, and touch OK to complete.

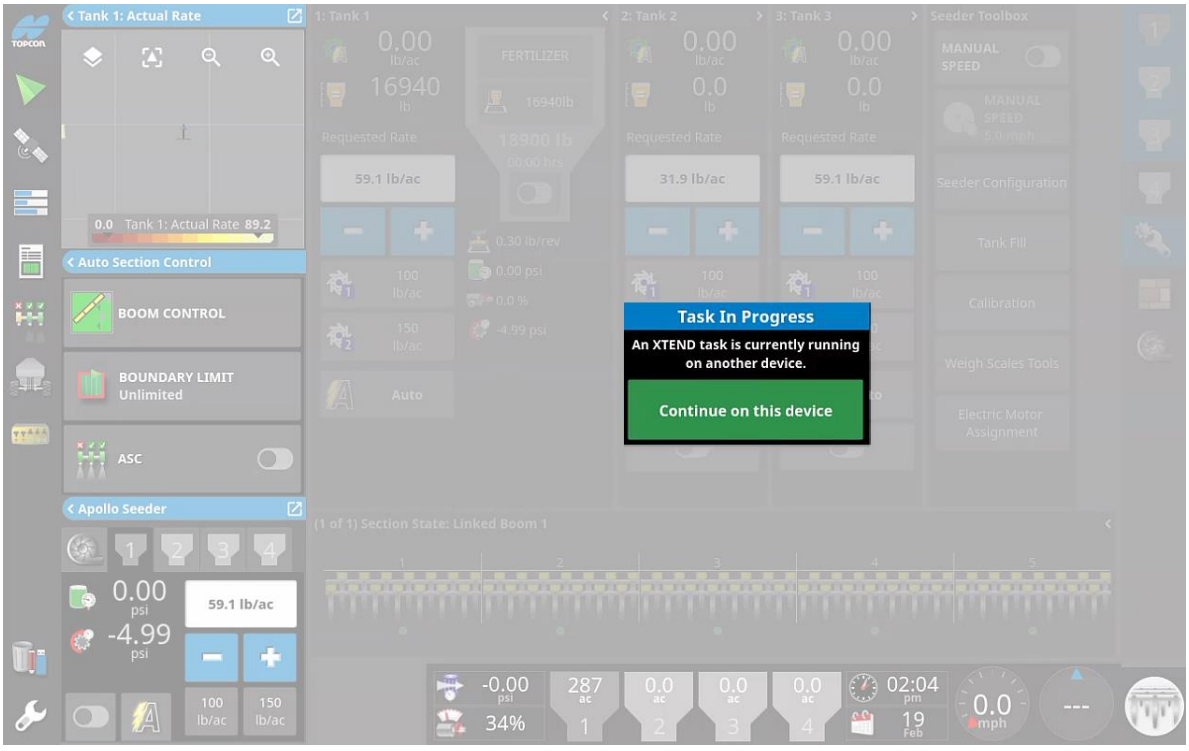
TANK FILL WIZARD USING XTEND

The process for filling tanks using the XTEND app is the same as when performed from the XD+ monitor and uses the same screens shown on the previous page. The only difference is where you start the wizard.

1. Start the XTEND app on your mobile device and connect to your SeedMaster XD+ over its WiFi connection. (See PAGE 73).
2. Touch the Cart icon, then Tank Fill Wizard, and the wizard will launch.
3. All remaining steps are identical to those if done directly on the XD+ monitor.



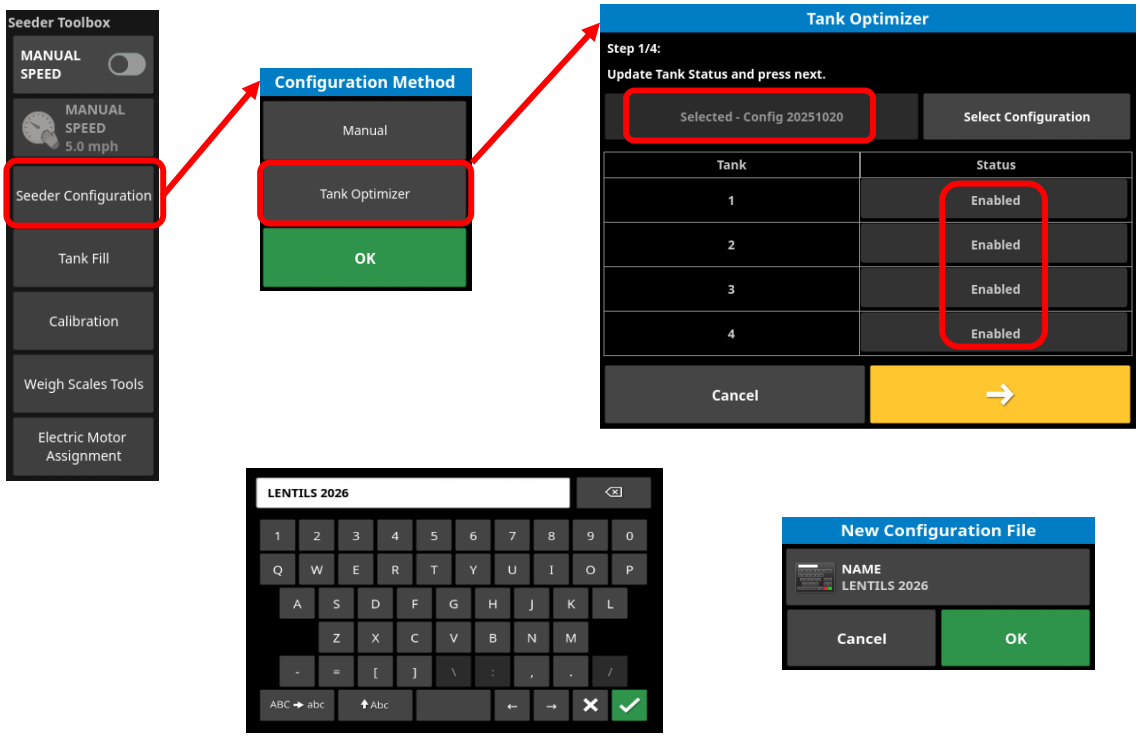
Note that when an XTEND connection is made to the XD+ monitor, a notification appears on the monitor. Anyone in the tractor can seize back control from the remote device and continue an in-progress wizard if desired. Similarly, a wizard can be started on the monitor and resumed on the remote device using XTEND.



PRODUCT TEMPLATES AND TANK OPTIMIZATION

An operator may have regular combinations of products, rates, and tanks, which they repeat on a regular basis. These can be saved as templates to be re-selected for use again later, ensuring consistency of application. This can be set up manually, or the operator can allow the Tank Optimization wizard to automatically minimize refill stops by splitting some product rates across tanks.

1. Open the Seeder Toolbox panel. 
2. Touch Seeder Configuration, then either Manual or Tank Optimizer (shown here).
3. When Tank Optimizer begins, a blank product load template is created named Config [*Date*]. Touch on this to rename to something meaningful or touch on Select Configuration to bring up a list of previously created templates to choose from.

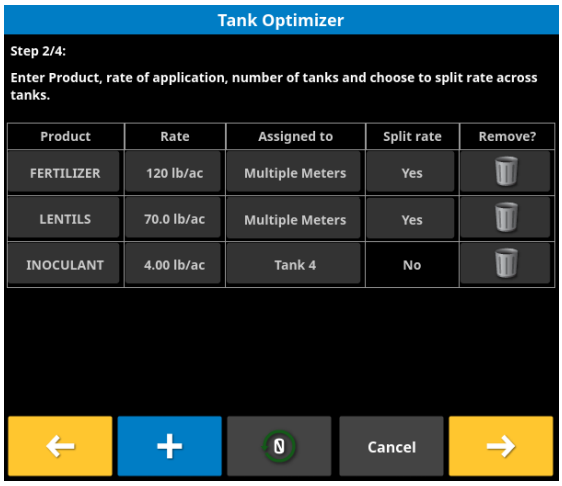


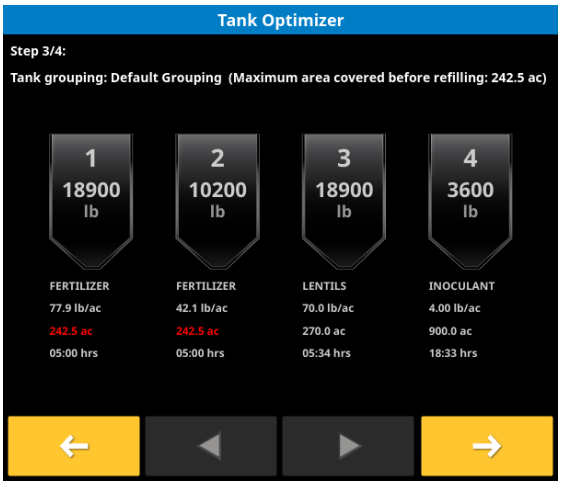
In the example the new configuration is named Lentils 2026.

You can add a new configuration, edit the name of a new or existing one and delete one. You can also choose to start off a new configuration by making a clone of an existing one.

Touch OK, then ensure all tanks you want to utilize in this product load template are enabled before touching the arrow to proceed to the next step.

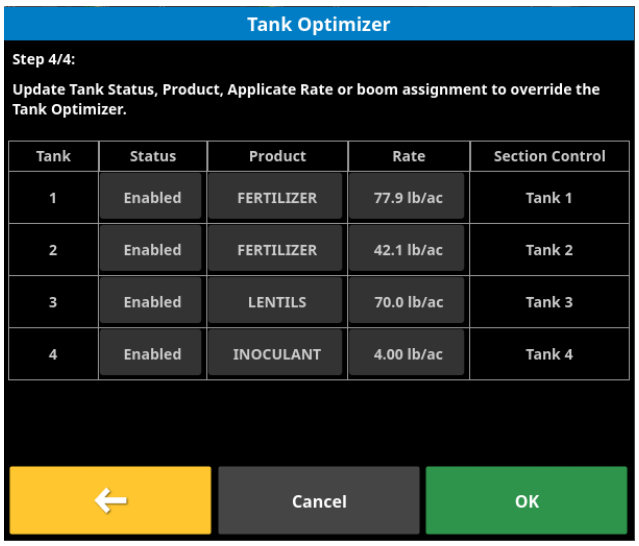
4. Touch on the + button to add each product you want to include in your template and enter an application rate. You can specify which tank to use for each product, but the value of the Optimizer is in allowing it to work out a split rate for high-rate product across multiple tanks. In the example, we set the fine, low-rate inoculant to tank 4 but the lentils and fertilizer we set to multiple meters (tanks) and enable split rate. Touch the right arrow to proceed.

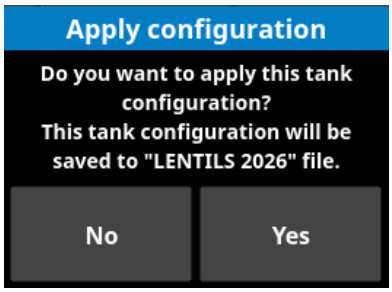




Now we can see the suggested product load which maximizes the acres to be applied between tank fill stops. Note the fertilizer rates are different for the two tanks but add to the effective rate chosen.

5. Touch the right arrow to bring up the summary screen. If this is acceptable, touch OK to confirm saving the new configuration.





* ***Note: If a template is created which does not utilize all tanks, the unused tank is disabled and must be re-enabled if required for subsequent operations.***

1. Enter the Setup pages 
2. Navigate to **Implement, Apollo Seeder, Seeder, Granular, Tank**
3. Select the specific tank tab at the left and toggle Status to Enabled

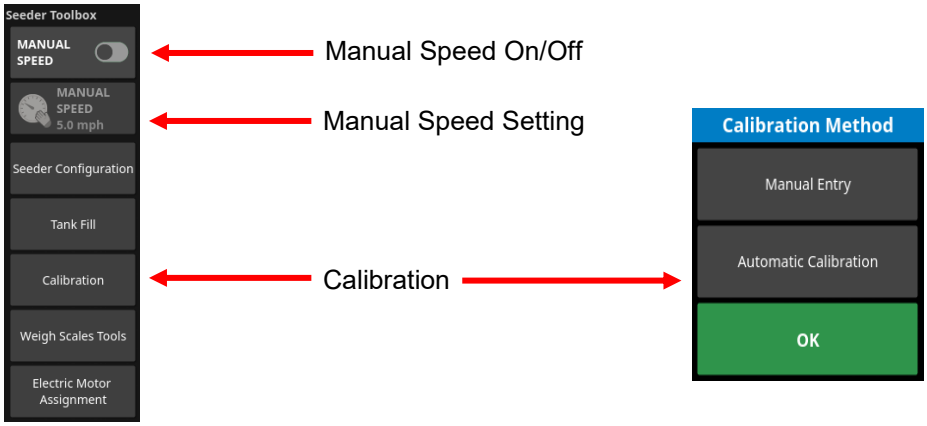
CATCH TEST CALIBRATION PROCEDURE

Each of the E-Series tanks will need to be calibrated for product application. This is completed with the Calibration Wizard by using the XD+, a combination of both the XD+ and the Tank Keypad, or the mobile XTEND app. For more information using XTEND, see page 73.

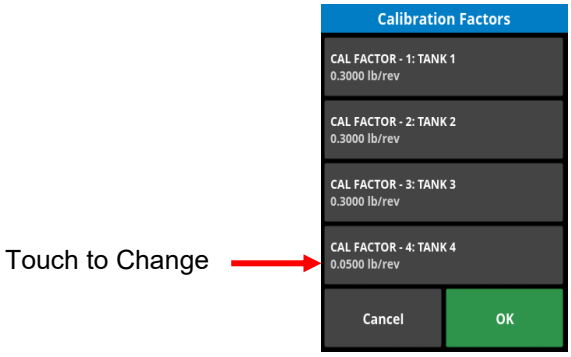
You can calibrate a single tank or multiple tanks at a time. You will require 5-gallon pails, the included calibration funnels, and a digital scale.

REVIEW INITIAL SETTINGS

1. Fill your tank or tanks with product and review your tank settings:
    a. Ensure the product type is set.
    b. Check that your desired product rate is set.
2. Touch the Toolbox icon on the toolbar panel to bring up the Seeder Toolbox.

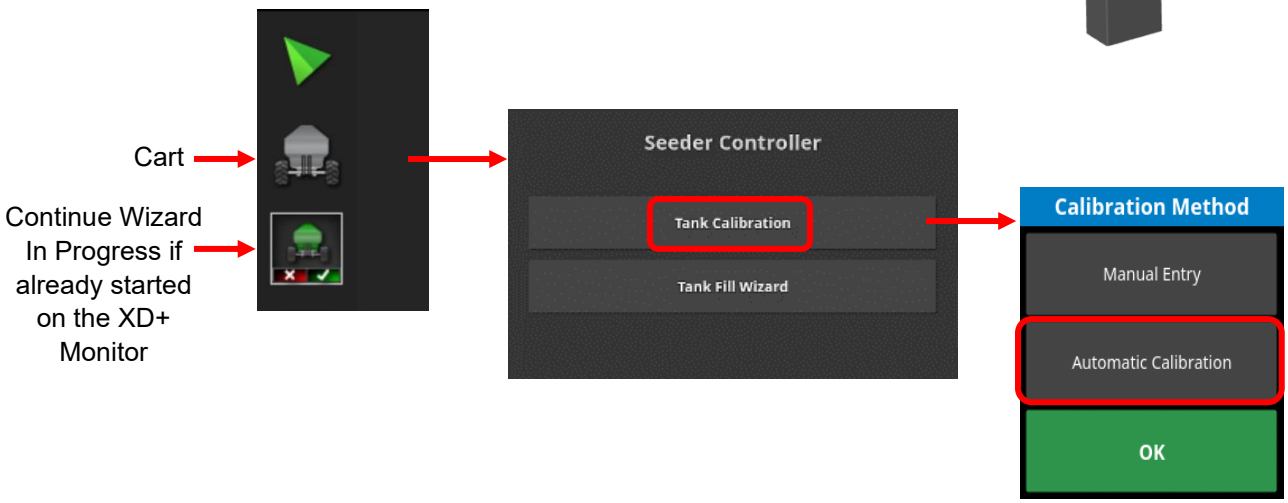


3. Enable Manual Speed, set it to 5.0 mph, then disable. It will automatically be enabled when the Automatic Calibration wizard starts and disabled when complete.
4. Tank/Products to be calibrated require an Initial Calibration Factor to be assigned prior to running the Calibration Wizard. To do so, choose Manual Entry after touching Calibrate button, and enter 0.3 for coarse products or 0.05 for fine products.

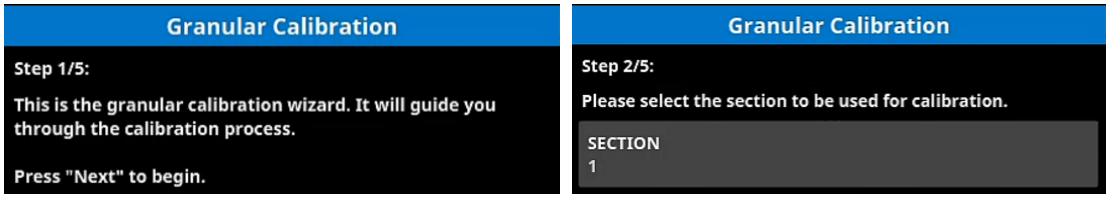


TANK CALIBRATION USING XTEND

1. Start the XTEND app on your mobile device, connect to your SeedMaster XD+, and make your way to the E-Series cart.
2. Weigh the empty pail(s). Ensure to record their weight(s) so that it may be removed from the gross weight after catching product.
3. Remove the drop hose on Section 1 of each tank that requires calibration. Attach the provided Calibration Funnel and place a pail below to catch the metered product.
4. In XTEND, touch the Cart Icon, select Tank Calibration, and choose Automatic Calibration to start the Granular Calibration Wizard.

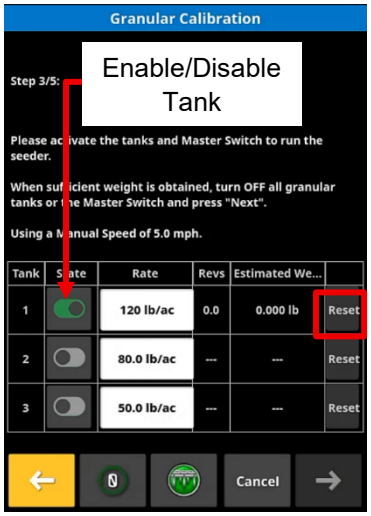


5. Step past the first two screens of the wizard. Leave Section 1 selected as the default meter for calibration.

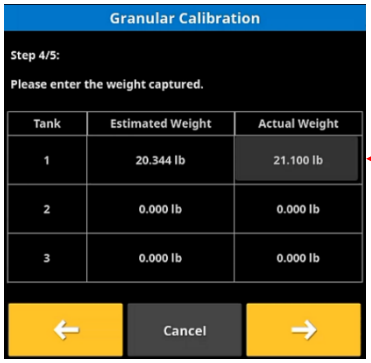


NOTE: The EXTEND app does not offer single tank calibration as a separate task. If you want to calibrate just one tank, ignore other tanks and they will not be changed by the wizard.

6. Enable the first tank you want to calibrate by switching its state to “green”. Now toggle the Master Switch On and meter 1 for your enabled tank will begin turning immediately.
   Note: Multiple tanks can be enabled and run simultaneously if desired. If one pail fills before another, the tanks can be disabled individually by touching the state.
   If you did not prime the tank meters after filling with product, you can achieve this on meter 1 by toggling the tank state off after a few seconds and touching “Reset” for that tank. Empty your pail, then restart the calibration by toggling the tank back on.



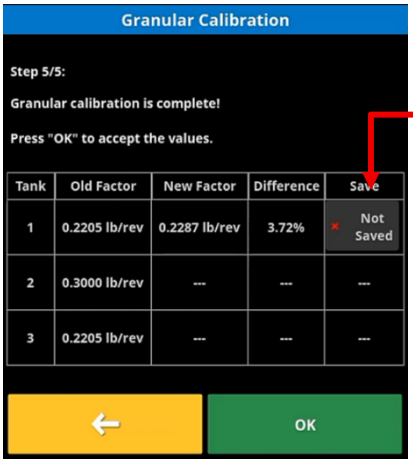
7. SeedMaster recommends collecting approximately 20lbs of coarse product and at least 5lbs of fine product before turning your tank(s) off. Once you have completed collection from all tanks, toggle the Master Switch Off and continue to the next screen.
8. Using your digital scale, weigh your collected product and subtract the pail weight. This will be your Actual Weight to be entered for the tank. Continue to the next screen.



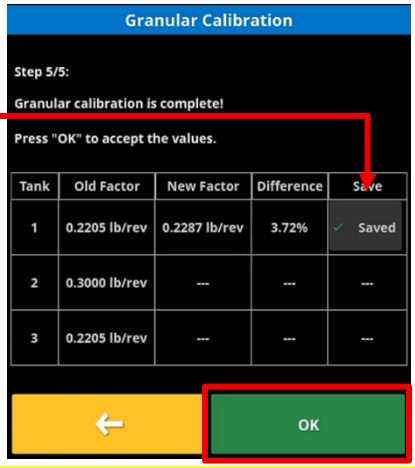
Enter Actual Weight

Note:
In this example, only one tank is being calibrated.

9. Review the results and note the difference between previous and current calibration numbers. If acceptable, you **must** touch Not Saved to toggle it to Saved before touching OK to complete the calibration wizard. Do this for every tank that was calibrated. Any new factor not saved will be discarded and the old factor will be retained.



Touch to Save



IT IS RECOMMENDED TO RUN THE CALIBRATION WIZARD AT LEAST 2 TO 3 TIMES FOR EACH PRODUCT TO ENSURE ACCURACY. PRODUCTS SUCH AS CANOLA SHOULD BE CALIBRATED NO LESS THAN 3 TIMES. IF THE CALIBRATIONS ARE INACCURATE FROM ONE TO THE NEXT, PLEASE INSPECT THE METERING COMPONENTS AND START THE CALIBRATION WIZARD OVER.

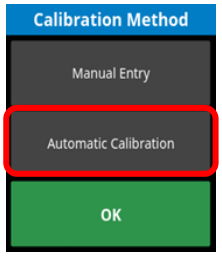
TANK CALIBRATION USING ON-FRAME KEYPAD WITHOUT XTEND

Running the Calibration Wizard entirely from the keypad is not possible. The process must be started and completed from the XD+ in the tractor. Once the process is started you may use the keypad to:

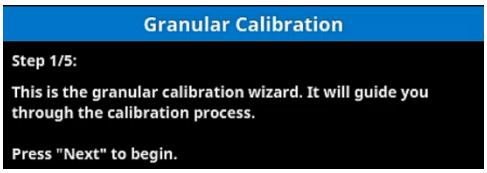
- Turn tanks On and Off individually
- Turn the Master Switch On and Off

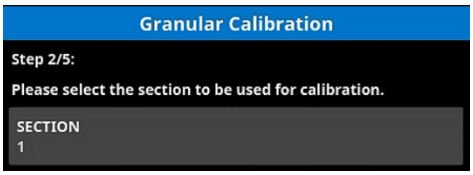
The keypad prime button is not available while running the calibration. If just the keypad and XD+ are being used, you should prime the meters on each tank before starting the calibration process. This will ensure the meter will immediately dispense product when calibration begins.

1. From the Seeder Toolbox on the monitor, touch Calibration, then choose Automatic Calibration.



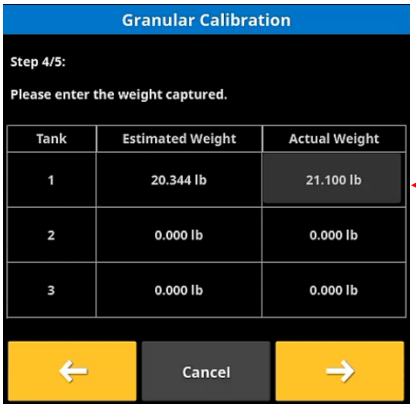
Step past the first two screens of the wizard, leaving Section 1 selected as the default meter for calibration. Move to the cart beside the keypad.





2. Weigh the empty pail(s). Ensure to record their weight so that it may be removed from the gross weight after catching product.
3. Remove the drop hose on Section 1 of each tank that requires calibration. Attach the provided Calibration Funnel and place a pail below to catch the metered product.
4. Push the Master Switch button turning the LEDs from red to green. Enable the first tank you want to calibrate by pressing the tank number on the keypad. The tank LEDs will turn from red to green. Meter 1 for your enabled tank will begin turning.
   Note: Multiple tanks can be enabled and run simultaneously if desired. If one pail fills before another, the tanks can be disabled individually.
5. SeedMaster recommends collecting approximately 20lbs of product before turning your tank(s) off. Once you have completed collection from all tanks, toggle the Master Switch Off.
6. Using your digital scale, weigh your collected product and subtract the pail weight. This will be your Actual Weight to be entered for the tank. Return to the XD+ monitor in the tractor.

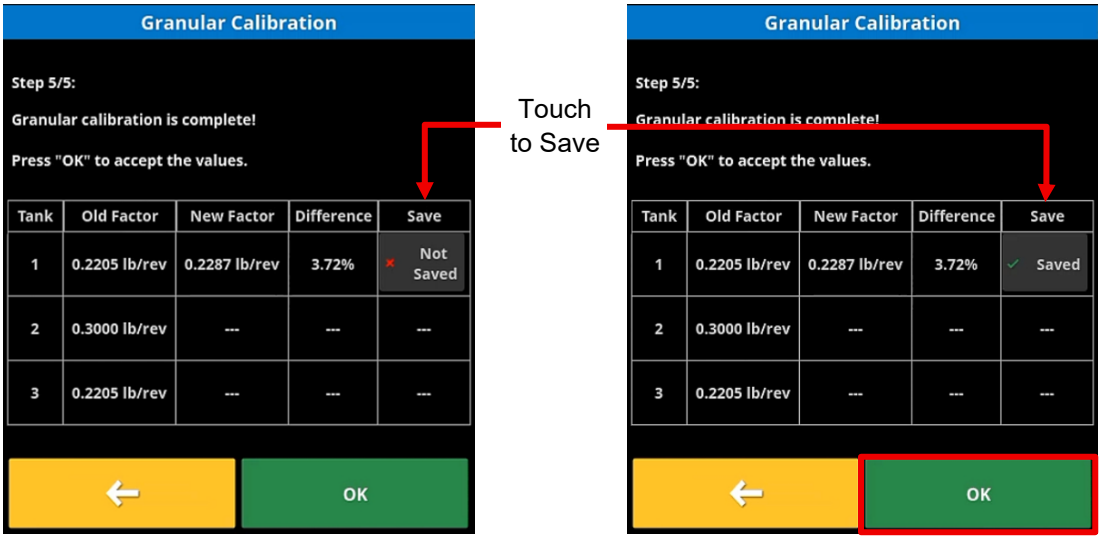
7. On the XD+, enter the Actual Collected Weight for each tank then continue to next screen.



Enter Actual Weight

Note:
In this example, only one tank is being calibrated.

8. Review the results, noting the Difference between Old and New Calibration Factor. If acceptable, you **must** touch Not Saved to toggle it to Saved before touching OK to complete the calibration wizard. Do this for every tank that was calibrated. Any new factor not saved will be discarded and the old factor will be retained.



IT IS RECOMMENDED TO RUN THE CALIBRATION WIZARD AT LEAST 2 TO 3 TIMES FOR EACH PRODUCT TO ENSURE ACCURACY. PRODUCTS SUCH AS CANOLA SHOULD BE CALIBRATED NO LESS THAN 3 TIMES. IF THE CALIBRATIONS ARE INACCURATE FROM ONE TO THE NEXT, PLEASE INSPECT THE METERING COMPONENTS AND START THE CALIBRATION WIZARD OVER.

SMARTCAL FEATURE

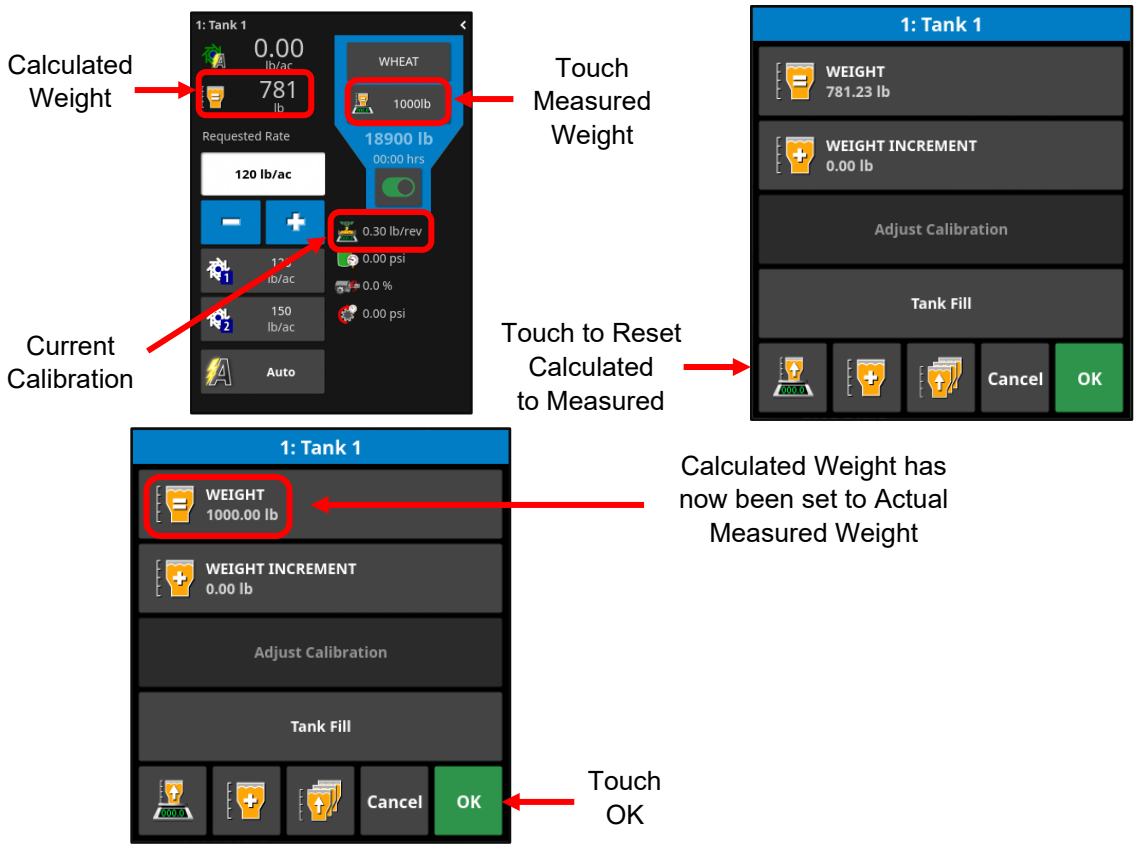
If desired, E-Series users can fine tune calibration after running the Calibration Wizard by using SmartCal. This constantly active feature allows for increased accuracy in the calibration factor and, therefore, product application.

SmartCal is the process of comparing the calculated reduction of weight from a tank to the actual measured weight reduction from the tank ***over a period of application***. If your tank has been reset to have the Calculated and Measured Weights match after filling the tank, SmartCal is always running.

SmartCal is not recommended for low-rate products such as oilseeds, inoculants etc. For these, multiple catch-test calibrations are mandatory.

NOTE: Before using the SmartCal feature, it is HIGHLY recommended to perform a Scale Calibration (PG. 58) before filling the tanks, as well as a Catch Test Calibration (PG. 79) on each product. The initial product calibrations will determine the Calibration Factor for the products being metered. This will allow for a more accurate SmartCal.

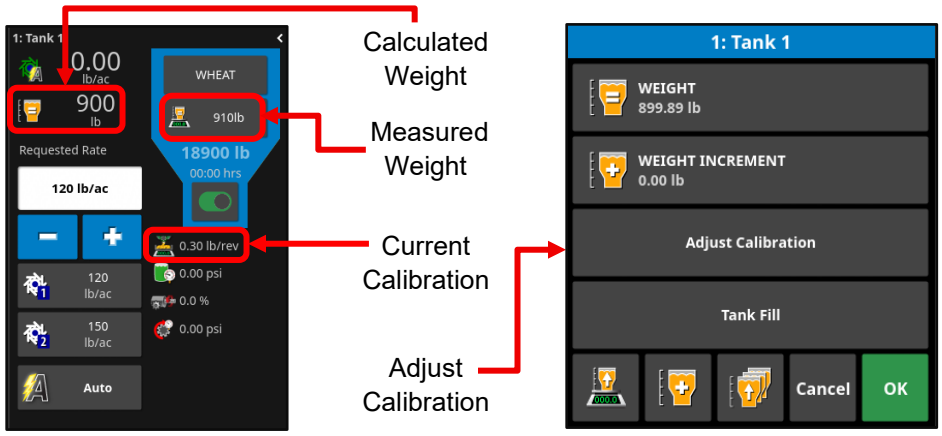
1. To begin, the tractor must be stationary and the calculated weight needs to match the actual measured weight.

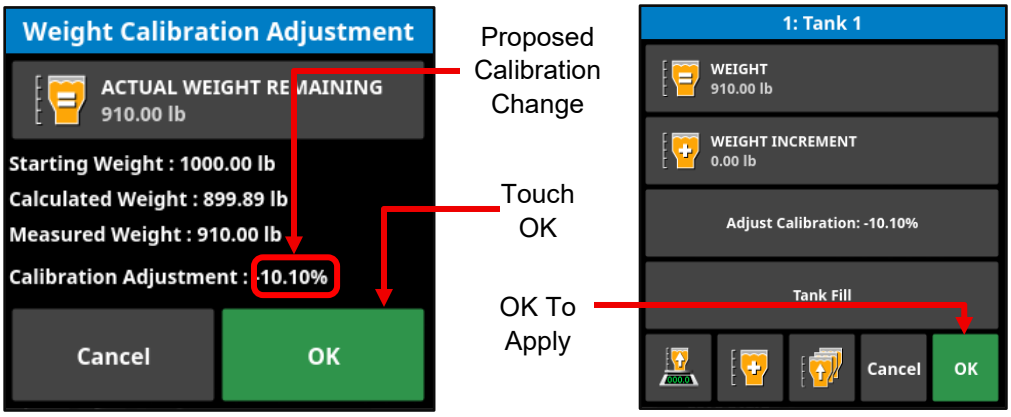


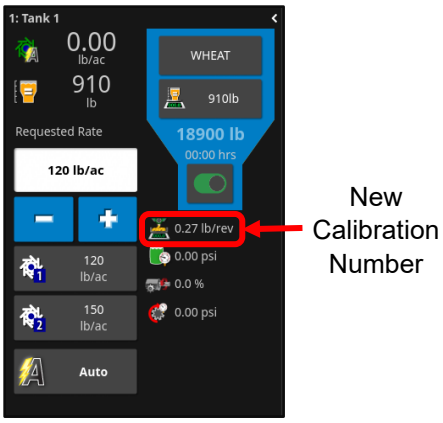
2. Begin or resume product application. A minimum application of 50 acres should be completed before stopping the tractor to check the results of SmartCal. During this time, you will observe some difference between Measured and Calculated Weight showing on the monitor. It's reasonable to accept up to a 10% difference over the course of the 50 acres.

   Note: If you see a significant difference early on (>10%), stop and determine the potential cause.

3. Stop the tractor and touch Measured Weight, then Adjust Calibration. Observe the difference in calibration being proposed based on your product application so far. Touch OK to close this pop-up.
4. You can discard the adjustment and stay with your current calibration number by touching cancel or accept it by touching OK. If the new calibration number is more than a 10% difference from the old, you will be prompted to acknowledge this or cancel. SeedMaster recommends repeating a Catch Test Calibration for any differences above 10%.





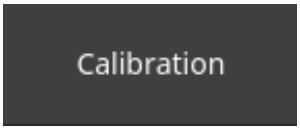


APOLLO CM-40 QUICK START PROCEDURE

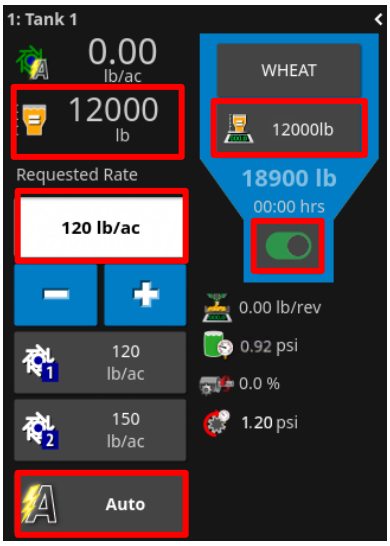
Before you go to the field, please review the steps below to ensure your Apollo CM-40 is field ready.

Step 1. Turn Tank Switches ON for each product being applied: Before turning the switch on, please ensure the machine is free of any people, animals, or objects that could come to harm or damage your equipment. Touch the grey safety switch. The Safety Switch will turn green indicating that the tank is ready.

Step 2. Review the Calibration Factor: A Calibration Factor **MUST** exist for all tanks/products, even if not all tanks are going to be used. A temporary, manual factor can be entered for unused tanks. Refer to the **Catch Test Calibration Procedure** section (page 79) for instructions to perform a Calibration.



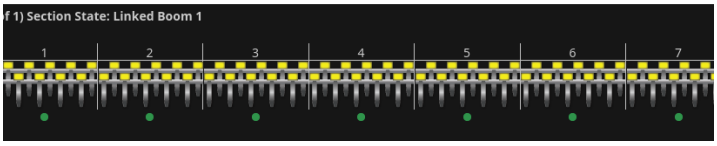
Step 3. Review the Target Rate & Product Control: The target rate is the desired pounds of product that will be applied per acre. Before going to the field, ensure the correct rate is set. Also, ensure that the product control is set to **Auto** for standard application with section control, or **VRC if using a Prescription**. Auto mode will automatically adjust the product rate during seeding to keep the rate at the desired target. If using **Auto** with Field Boundaries, Boundary Limit must be set to Field Boundary or Headland in the ASC mini-view. See page 69.



Step 4. Review Tank Weight: The measured tank weight from the load cells is displayed for each tank in the middle of the tank block graphic (expanded view). Ensure the calculated tank weight to the left is identical before entering the field. Refer to page 75 to set this.

Step 5. Review Area Counters: If desired before starting a new field, review and reset the Area Counters. See page 49 for details.

Step 6. Review Section Status: Ensure that all Sections are enabled. The sections will turn green when drill openers are lowered.



Step 7. Review Fan RPM: Fan RPMs are located beside the Section Status on the main work screen or on the Seeder Min-View. Ensure that the active run(s) have a suitable Fan RPM for the product in use.

Step 8. Check Purge Pressure: In the expanded tank view, check that purge pressure for each tank in use is above 1 psi. For the 60-bushel tank, if so equipped, anything above 0.10 psi is acceptable in Fine Product mode.

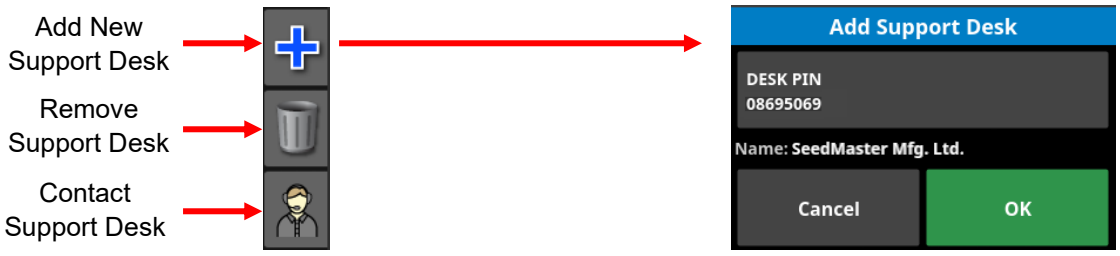
Step 9. Turn Master Switch ON: When the machine is in position to apply product, touch the Master Switch. It will flash blue/white to indicate a “Ready” status. Engaging the JEM Remote Lift/Lower function will now signal the Master Switch to turn on and change to green as the drill openers are lowered.

REMOTE SUPPORT

Most support questions will not require remote access to the E-Series system via the XD+. If essential, a remote support session can be launched at the request of your dealer or SeedMaster.

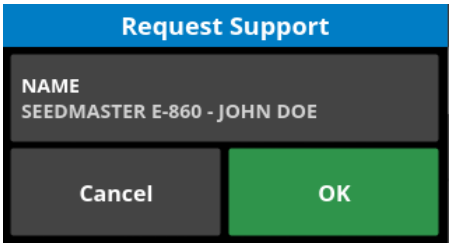
To enable remote support, first place your XD+ in WiFi Client mode (WiFi Setup on page 51), then complete the following steps:

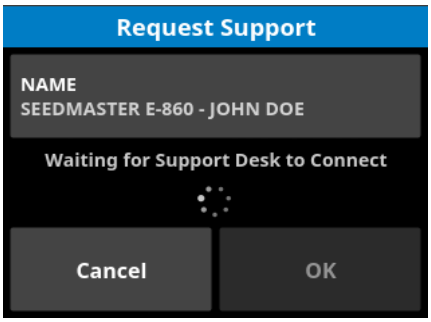
1. Touch the Setup button in the lower left corner of the screen. Navigate to User, Remote Support.
2. Select the Plus symbol in the top right corner of the screen.
3. Touch Desk Pin and enter the number provided by the support person assisting you, then touch OK to add the Support Desk to your list.



4. Touch to highlight the newly added support desk, then touch the Contact Support Desk Icon.

5. Enter your identifying Information in the name section of the pop-up, click OK, and wait for your support contact to accept the request.





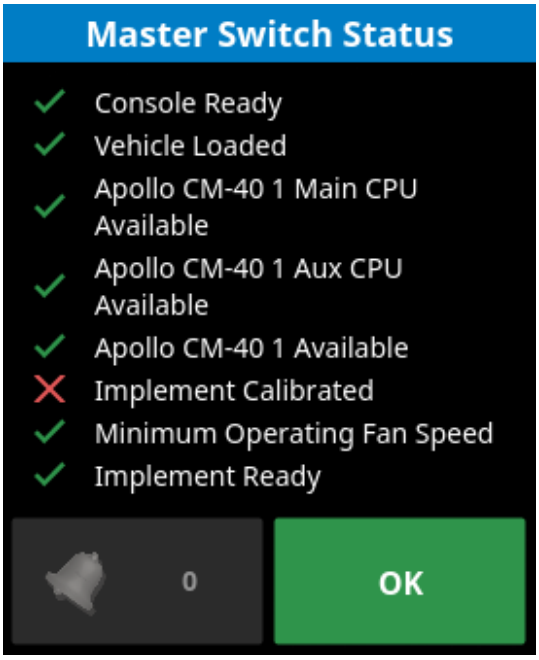
6. The XD+ will pop up a window every 15 minutes to ask if you would like to continue the remote session. Select Yes to continue, or No to terminate.

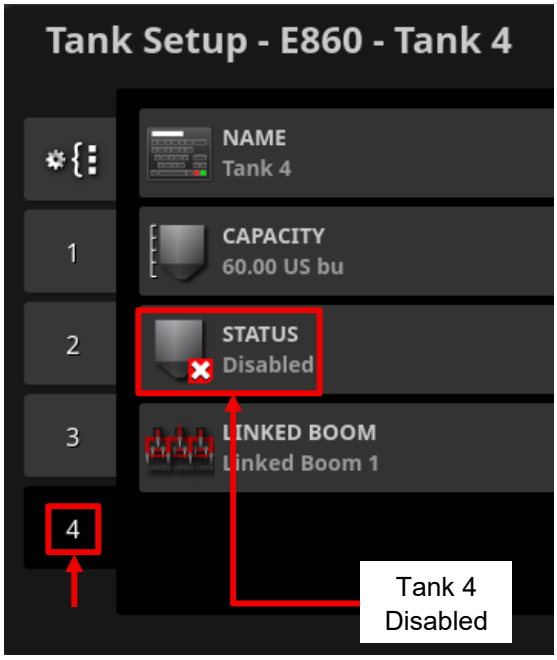
ADDITIONAL INFORMATION

Implement Not Calibrated

All tanks must have a calibration factor to apply product, even if they are not in use. For example, if you are trying to apply product using tank 1 while tank 4 is empty, a Master Switch Status warning will display. This would also occur if tank 4 contained product that had not yet been calibrated.

To overcome this, you can manually enter a “dummy” calibration number for an empty Tank 4, do an actual calibration if it contains product, or temporarily disable the tank in the configuration menu.





Separating Master and Implement Switch

All functions of the SeedMaster E-Series carts are controlled by the Topcon XD+. SeedMaster drills are operated entirely by the JEM Toolbar Controller. In order to start/stop metering product and display an accurate as-applied map, the cart needs to be signalled when the implement has lowered/raised the drill openers. The Work Switch Adaptor (page 97) is the electrical connection, and the Implement Master Switch is the software logic for this function.

If an operator wants to apply product without lowering the drill openers, the Implement Master Switch can be temporarily disabled. See Setup Step 17 (b) on page 94. Note that this does not affect Auto Section Control. If it is desired to deliver product across the full width of the drill regardless of coundaries and existing coverage, turn ASC off.

FULL USER & SYSTEM SETUP

The following are the steps required to complete the SeedMaster standard configuration for an XD+ monitor when used for E-Series carts. This encompasses both the User and System settings. Some settings will be a “user preference”, so this procedure can be used as a “factory reset reference”.

1. Enter the Setup pages. 
2. Navigate to **User, Region, Language.**
   a. **Language**: English.
   b. **Decimal Point Format**: Period (.)
3. Navigate to **User, Region, Time/Date.**
   a. **Date Format**: Day, Month, Year.
   b. **Time Format**: 12-hour.
   c. **Time Zone**: Americas/Regina (or other nearby listed cities).
   d. **Time Source**: Automatic.
   Note: If the time/date is incorrect, you must change the Time Source to Manual to adjust.
4. Navigate to **User, Region, Units**.
   a. **Units**: Imperial (US).
   b. **Latitude/Longitude Format**: Standard.
   c. **Pressure Units**: Default (psi).
   d. **Short Distance Units**: Default (Inches).
   e. **Area Units**: Default (ac).
   f. **Capacity Units (Dry)**: US Bushels.
   g. **Volume Units (Dry)**: Pounds.
   h. **Dry Density Units**: Pounds Per US Bushel.
   i. **Capacity Units (Liquid)**: Default (Gallons).
   j. **Volume Units (Liquid)**: Default (Gallons).
   k. **Application Rate Units (Liquid)**: Default (gal/ac).
   l. **Application Rate Increment Type**: Fixed Rate.
5. Navigate to **User, Environment.**
   a. **Audio Volume**: 30%.
   b. **Button Clicks**: Enabled.
   c. **Alarm Audio**: Enabled.
   d. **Global Home Screen Mode**: Select.
   e. **Toolbar Button Size**: Small.
6. Navigate to **User, Access Level –** Leave as Default.
7. Navigate to **User, User Controls –** Leave as Default.
8. Navigate to **User, Remote Support** – See page 87 for details.
9. Navigate to **System.**
   a. **Console Name**: SeedMaster XD+.
   b. **MyTopcon Account**: – Blank.
   c. **Diagnostics Upload Account**: – Blank.
   d. **Export Resolution**: High.

10. Navigate to **System, Features, Licenses** – The following 9 licenses are enabled and unlimited:
    a. Cameras.
    b. XTEND.
    c. Auto Section Control.
    d. Variable Rate Control.
    e. Additional Seeder Tanks.
    f. 3rd party NMEA Receivers.
    g. Tasks.
    h. Guidelines.
    i. Multi Metering CAN Motors.
11. Navigate to **System, Features, Console.**
    a. **Universal Terminal**: Disabled.
    b. **ISOBus Shortcut Button**: Disabled.
    c. **File Server**: Enabled.
    d. **Dashboard**: Enabled.
    e. **Cameras**: Disabled.
    f. **Cloud Based Services**: Disabled.
    g. **VDC Support**: Disabled.
    h. **Tasks**: Enabled.
    i. **XTEND**: Enabled.
12. Navigate to **System, Features, Guidance.**
    a. **Guidelines**: Disabled.
    b. **ISOBus Tramline Control**: Disabled.
13. Navigate to **System, Features, Implement.**
    a. **Auto Section Control**: Enabled.
    b. **Area Counters**: Enabled (Stored per Task).
    c. **Reset Task Area Counters**: Prompt.
    d. **Variable Rate Control**: Enabled.
    e. **Lock Setup When Implement Is Active**: Enabled.
    f. **Weigh Scales**: Enabled.
14. Navigate to **System, Features, XTEND** – Nothing to set here.
15. Navigate to **System, Alarms** – *See Table on next page.*
16. **System, Flag Points –** Leave as Default.
17. **System, ISOBUS –** DO NOT CHANGE UNLESS DIRECTED TO DO SO BY SEEDMASTER.
18. **System, Utilities.**
    a. **Console Software Upgrade:** DO NOT UPGRADE UNLESS REQUESTED BY SEEDMASTER.
    b. **Restore Settings To Factory**: Resets many, but not all, User and System Settings to Topcon defaults. SeedMaster settings would then have to be re-applied.
19. **System, USB Wi-**Fi (only exists if the Wi-Fi antenna is plugged into the USB port).
    a. **Connection Type**: Hotspot.
    b. **SSID**: E-860 (or customer model).
    c. **Encryption**: Open.
    d. **Key**: *Anything (not used with Open Encryption).*
    e. **Channel**: Channel 6.

General Alarms	Enabled	General Alarms	Enabled
End Of Row		GPS Drift Correction	✓
Excluded Regions		Parameters Mismatch	
Headland Turns		Steering Profile Mismatch	
Steering Unable To Engage		Invalid Vehicle Profile	✓
GPS Receiver Firmware Mismatch	✓	Master Switch Off	✓
GPS Receiver Rescue Mode Enabled		Base Station Location Mismatch	
Steering Controller Error(s) Reported		Cross-track Threshold Exceeded	
Line Accuracy		Flag Point Nearby	✓
TIM Error(s) Reported		Registration Expiring	
Information Message to Enable TIM		Resources Exhausted	
Vehicle Pitch		Low Resources	✓
Vehicle Roll		Receiver Disconnected	
Compass Hot Calibration		Steering Restart Needed	
ISOBUS Task Controller		Max Guideline Length Exceeded	
ISOBUS TASKDDATA		COM Port Fail	
Field Unloaded	✓	Path Too Far Away	
Task Not Active	✓	Appling Guideline Nudge Offset	
Task Paused	✓	Invalid/Obsolete Profile Loaded	
Task Paused On Restart	✓	Wireless Connection	✓
Fallback		VDC Connection	
Skybridge		NTRIP Failure	
Skybridge Degraded		RTK Base Sync Failure	
NavBridge		No SIM Detected	
TopNET Invalid Detection		C24 Nodem Activation Failed	
TopNET Near Expiry Detection		C24 Modem Activation In Progress	
TopNET Expired Detection		Tramline Implement Width Mismatch	
Reverse Station		Tramline Pass	
Receiver Not Responding		Tramline Accuracy Degraded	
No GPS	✓	Remote Machine joined Task	
No GPS Time	✓	TAP Upload Failed	
GPS Lost	✓	Invalid Vehicle ISOBUS	

FULL IMPLEMENT SETUP

The following is an overview of the full implement setup process. This should only be performed with the assistance of your dealer or SeedMaster Support if the Implement Profile is damaged and not recoverable. Backing up the factory Implement Profile using Inventory Manager is the best way to avoid requiring an implement profile rebuild.

1. Enter the Setup pages. 
2. Navigate to Implement, New, Custom, then choose the Pivot type and touch the **+** symbol. 
3. Touch on Implement Name and enter your model, for example E860.
4. A New Implement Setup Wizard will begin. Make the following selections as you are led through the steps, touching the yellow arrows to progress through the steps. 
   - **i) ECU Type:** Apollo
   - **ii) Implement Control:** Section Control and Rate Control
   - **iii) Implement Function:** Seeder
   - **iv) ECU Detection:** Auto Detection. Wait until the Apollo ECU(s) is(are) found, then confirm this and the Summary step.
   - **v) Seeder Manufacturer:** SeedMaster.
   - **vi) Number of Tanks:** 3, 4, or 5, *depending on model.*
   - ***vii)* Number of Metering Units per Tank:** 6, 7, 8, or 9, *depending on drill width in feet / 10.*
   - **viii) Number of Fans:** 1 or 2, *depending on single or dual shoot.*
   - **ix) Boom Summary:** SeedMaster does not change default tank names.
   - **x) Number of Tanks**: *Leave as you have selected above.*
   - xi) **Tank Summary:** Leave as-is and continue.
   - xii) **Touch OK** to complete the setup and wait until your new Implement Profile is connected.
5. Before continuing with configuring the E-Series implement, navigate **to Implement, Apollo Seeder, Alarms**. Select the top item on the list – All Seeder Alarms – and on the right side choose Disable. This will prevent nuisance alarms during configuration. Alarms will be configured in Step 19.
6. Navigate to **Implement, Apollo Seeder, Geometry.**
   a. Find the first tab on left, **Boom For Guidance**: Full Width Boom.
   b. Find the second tab on the left, **Full Width Boom**:

   A = drill width in inches B = 0” C = 0” D = -180” E = 425” H = 100”

   The **Tank** tabs are Disregarded, do not change anything in them.
7. Navigate to **Implement, Apollo Seeder, Section Control.**
   a. Under **Sections**: For each Tank tab on the left, Touch the **All** row and set the **Section Width** in inches. This sets all sections for that tank to the same width, normally 120”.
   b. Under **Section Timing**: First select the **Settings For All Booms** tab at the top left and choose to Use Settings from Tank 1.
   c. Under the Tank 1 tab, touch the **All** row under **On Time** and set to 8 seconds, then the **Off Time** to 2s. These are the SeedMaster Factory Times and require in-field adjustment for accuracy. This will automatically apply to all other tanks.
   d. Under **Section Switch**, enable the **Virtual Section Switchbox**.
   Nothing in the Tank tabs needs to be set.

8. Navigate to **Implement, Apollo Seeder, Seeder, Granular, Tank.** Select the top tab at the left.
   a. **Name As Bin Or Tank**: Tank (default).
   b. **Use Product as Name**: Disabled.
   c. **Preload Time**: 0.0s (default).
   d. **Ignore Ground Speed When Preload Active**: Enabled (default).
   e. **Minimum Operating Fan Speed**: 1000rpm.

   For each of the Tank tabs on the left, set the following:

   f. **Tank Name**: Tank 1, 2, 3, 4 (use the default).
   g. **Capacity**: Large tanks – 315 bu, Medium tanks – 170 bu, Fine Products tank – 60 bu.
   h. **Status**: Enabled (default).
   i. **Linked Boom**: Linked Boom 1.
9. Navigate to **Implement, Apollo Seeder, Seeder, Granular, Drive Setup**. Select the top tab at the left.
   a. Touch **Settings for All Tanks** and select **Use Settings from Tank 1.**

   Check Tank 1 is set as follows:

   b. **Drive Type**: Roj Motor (not changeable).
   c. **Gear Ratio**: 19.94 (default).
   d. **Minimum Shaft RPM**: 0 (default).
   e. **Maximum Shaft RPM**: 1000 (default).
   f. **Motor Direction**: Reverse (default).
10. Navigate to **Implement, Apollo Seeder, Seeder, Granular, Pressure.** For all Tank tabs on the left, set the following:
    a. **Sensor**: Voltage (default).
    b. **Sensor Minimum Pressure**: -5.00 psi. **Sensor Maximum Pressure**: 5.00 psi.
    c. **Sensor Minimum Voltage**: 0.00 V. **Sensor Maximum Voltage**: 5.00 V.
11. Navigate to **Implement, Apollo Seeder, Seeder, Fan**. For both Fan tabs set:
    a. **Fan Speed**: Enabled (default).
    b. **Pulses/Revolution** to 4.
    c. **Pressure Sensor**: None (default).
    d. **Case Drain Sensor**: None (default).
12. **Implement, Apollo Seeder, Seeder, Drill Control & Accessories – Not Applicable.**
13. Navigate to **Implement, Apollo Seeder, Seeder, Clean Flo.**
    a. **General**: **Clean Flo** Enabled.

    Filter Sensors: For both Input and Output tabs set the following:

    b. **Sensor**: Voltage (default).
    c. **Sensor Minimum Pressure**: -5.00 psi. **Sensor Maximum Pressure**: 5.00 psi.
    d. **Sensor Minimum Voltage**: 0.00 V. **Sensor Maximum Voltage**: 5.00 V.

    Tank Sensors: For all Tank tabs set the following:

    e. **Sensor**: Voltage (default).
    f. **Sensor Minimum Pressure**: -5.00 psi. **Sensor Maximum Pressure**: 5.00 psi.
    g. **Sensor Minimum Voltage**: 0.00 V. **Sensor Maximum Voltage**: 5.00 V.

14. Navigate to **Implement, Apollo Seeder, Seeder, Weigh Scales, ECU.**
    a. Touch **Detect New ECU**, then OK when the Scale Link is found and set **Scales** to 4. Leave both ISOBUS UT and Angle Compensation options disabled.
    b. Touch **Scales**:

       Affects Scale: None (default)

       For **Setup Number** and **Calibration Number**, use the following based on tank size:

Tank Size	Setup Number	Calibration Number
315 bu	216025	5333
170 bu	216025	4000
60 bu	245008	4000

    c. **Scale Assignment**:

       Tank Name: Leave default (Tank 1, Tank 2 etc).

       Scale: Tank 1 to Scale 1-A, Tank 2 to Scale 1-B, Tank 3 to Scale 1-C and Tank 4 to Scale 1-D.

       Weight Remaining: Measured for all.
    d. **Pressure Compensation**: Set All tanks to 0.00 psi.

15. Navigate to **Implement, Apollo Seeder, Seeder, Speed.**
    a. **Speed Source**: GPS (default).
    b. **Fallback**: Disabled (default).
    c. **Wheel Factor**: 0.00000 ft/pulse (default).
    d. **Maximum Operating Speed**: 0.0 mph (default).

16. Navigate to **Implement, Apollo Seeder, Seeder, Audio.**
    a. **Master Switch Audio**: Enabled.
    b. **Tank Switch Audio**: Enabled.
    c. **Sections On/Off Audio**: Enabled.

17. Navigate to **Implement, Apollo Seeder, Operator Inputs, Master Switch.**
    a. **Source**: Virtual (default).
    b. **Implement Master Switch**: Enabled.
    c. **Master ECU Master/Implement Switches**: +V Signal (default).

18. Navigate to **Implement, Apollo Seeder, Operator Inputs, Keypad.**
    a. **In-Cab**: Skip, Not Used.
    b. **On-Frame**: Touch **KeyPad ID** and select the available ID.

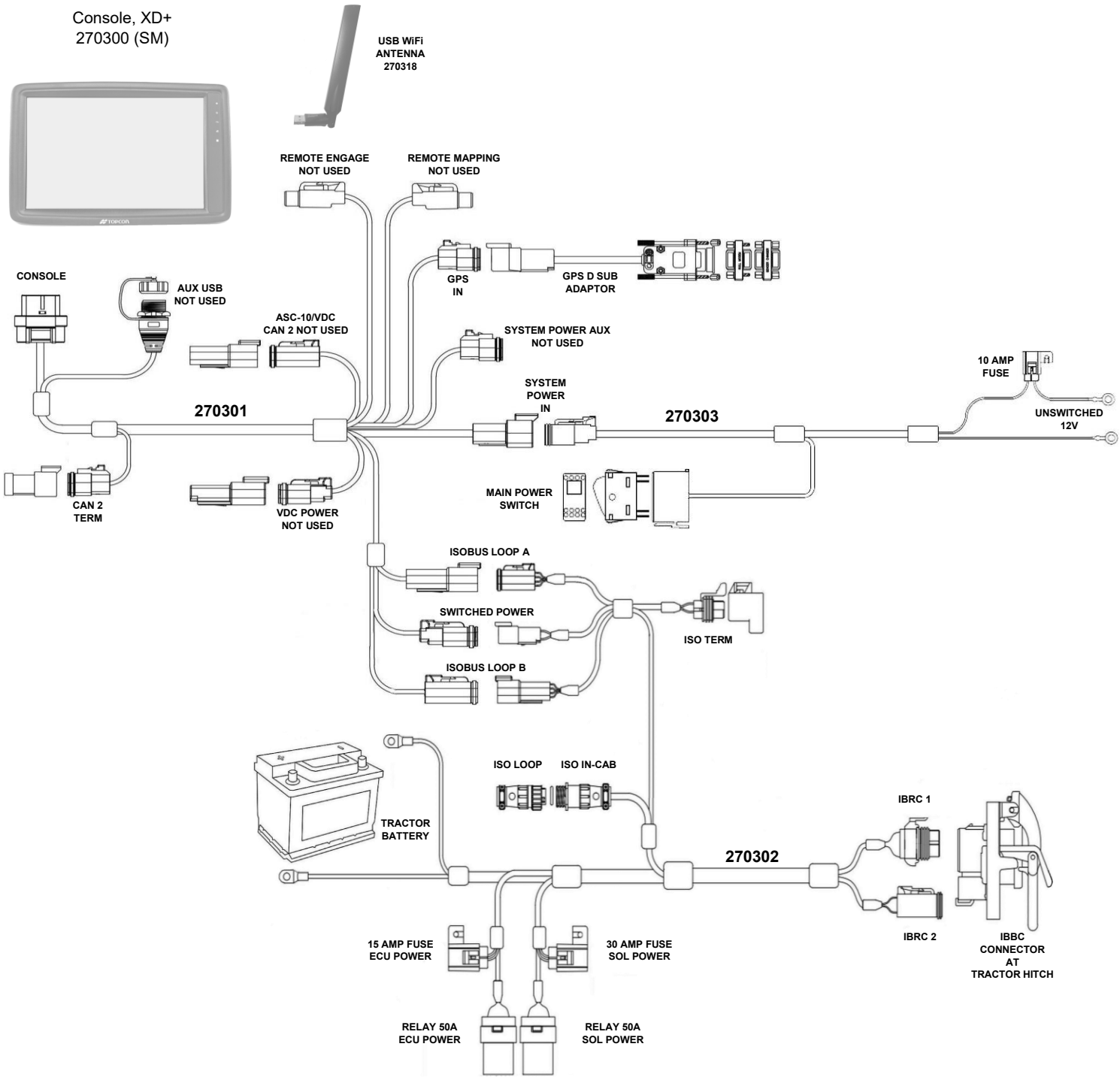
       Button A: Unassigned, **Button B**: Unassigned, **Other Buttons**: Not Accessible.

19. Navigate to **Implement, Apollo Seeder, Seeder, Alarms.**

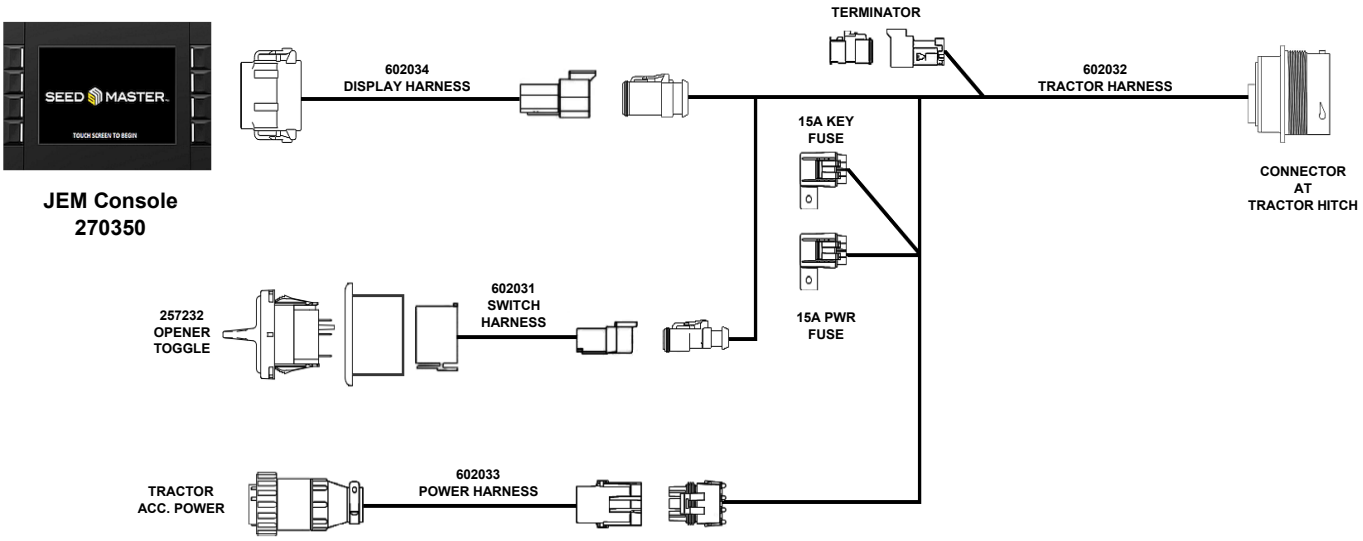
Alarm Name	Enabled	Threshold	Alarm Name	Enabled	Threshold
Incorrect Rate	✓	5% (default)	Scale Setup Number Mismatch	✓	
No Comms	✓		Scale Calibration Number Mismatch	✓	
Tank Empty (Sensor)			Brake On		
Tank Low	✓	10% (default)	Brake Disengaged		
Blocked Distribution Head			Low Fan Air Velocity		
Product Variation	✓	4.0s (default)	High Fan Air Velocity		
Shaft Moving Tank Off	✓		Air Velocity Sensor Fault		
No Ground Speed	✓		Fan Fluctuating Speed	✓	10 % (default)
Case Drain			ECU Series Mismatch - Apollo CM-40	✓	
Ladder Down			Auto Fill Emergency Stop		
Section Switching Problem			Max Operating Speed		
Motor Firmware Mismatch	✓		Manual Speed In Use	✓	
Section Off, Flow Detected			Tank Low (Sensor)		
Section Turned Off			Tank Full (Sensor)		
Gear Ratio			High Motor Temperature	✓	
Stopped Shaft	✓		High Motor Temperature Warning	✓	
Tank Active, No Rate	✓		Locked Motor Rotor	✓	
Tank Off			Locked Motor Rotor Warning	✓	
High Auxiliary RPM Speed			Motor Communication Fault	✓	
Low Auxiliary RPM Speed			High Shaft RPM	✓	
Pack Control Off			Low Shaft RPM	✓	
Drill Raised, Master On	✓		Motor Over-Current Trip	✓	
Hydraulic Pressure Low			Power Enable Motor Missing	✓	
Granular Pressure Low	✓	0.50 psi (default)	High Motor Voltage	✓	
Granular Pressure High			Low Motor Voltage	✓	
High Fan Speed			Low Motor Voltage Warning	✓	
Low Fan Speed	✓	2000 rpm	High Motor PCB Temperature	✓	
Fan Below Operating Speed	✓	1000 rpm	Motor Speed Opposite To Target	✓	
High Fan Pressure			Low Motor Control Voltage	✓	
Low Fan Pressure			Motor Position Error	✓	
Speed Source Fallback	✓		High Motor PCB Temperature Warning	✓	
Cabin Keypad Not Communicating			Low Motor Torque	✓	5%
Frame Keypad Not Communicating	✓		High Motor Torque	✓	80%
Moving with QDA Raised			Purge Pressure Low (60bu tank)	✓	1.08 (0.07) psi
Implement Raised			Purge Pressure High	✓	2.75 psi
Fluctuating RPM	✓		Filter Blocked Low	✓	0.54 psi
Pack Control Incorrect Rate			Filter Blocked High	✓	0.72 psi
Scale Weight Difference			Max Cleanflo PWM Reached	✓	30s

SYSTEM ELECTRICAL DRAWINGS

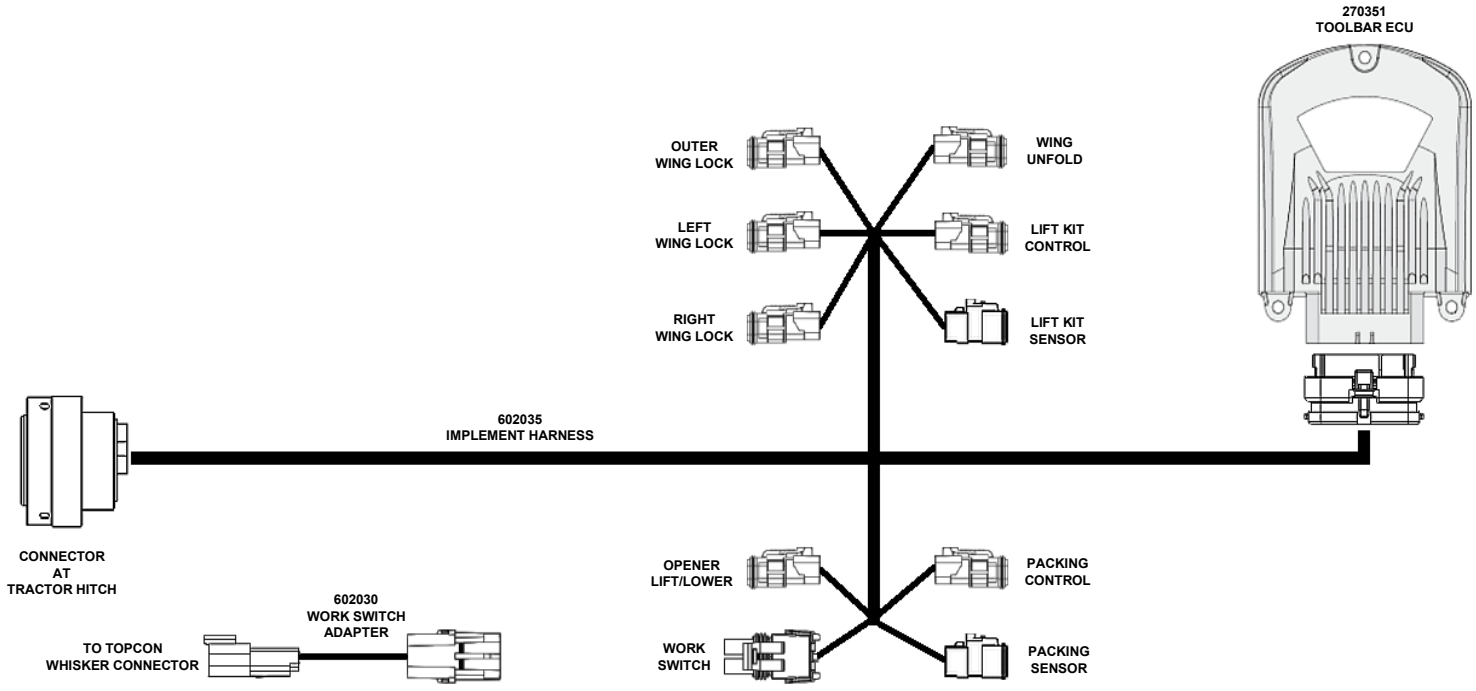
TOPCON XD+ IN-CAB HOOKUP



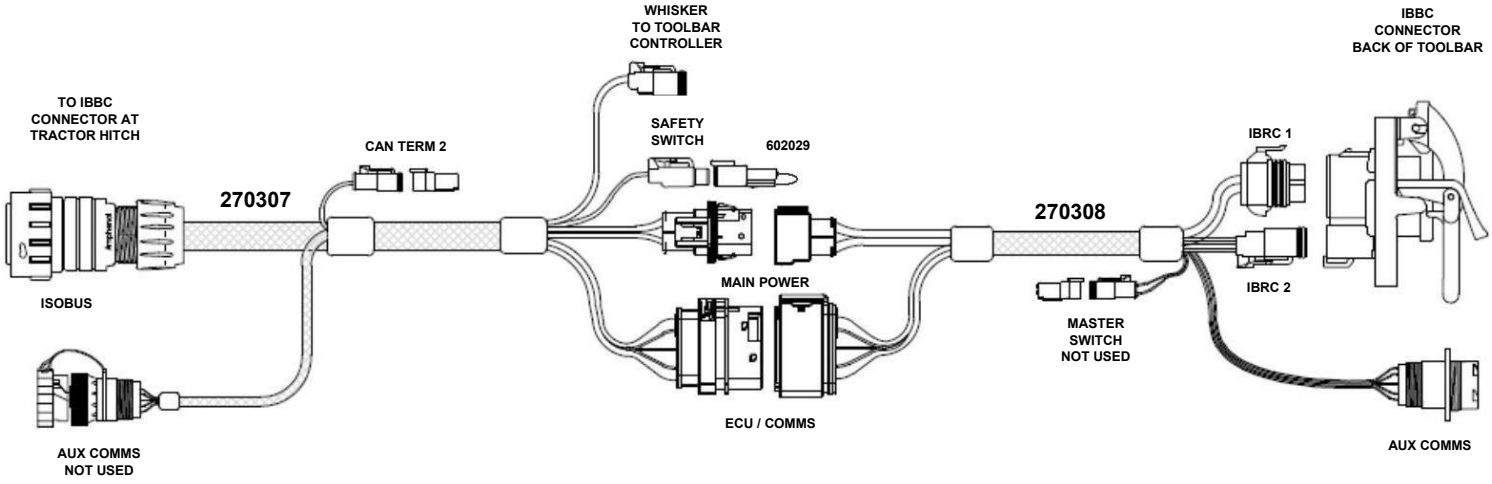
JEM TOOLBAR CONTROL IN-CAB HOOKUP

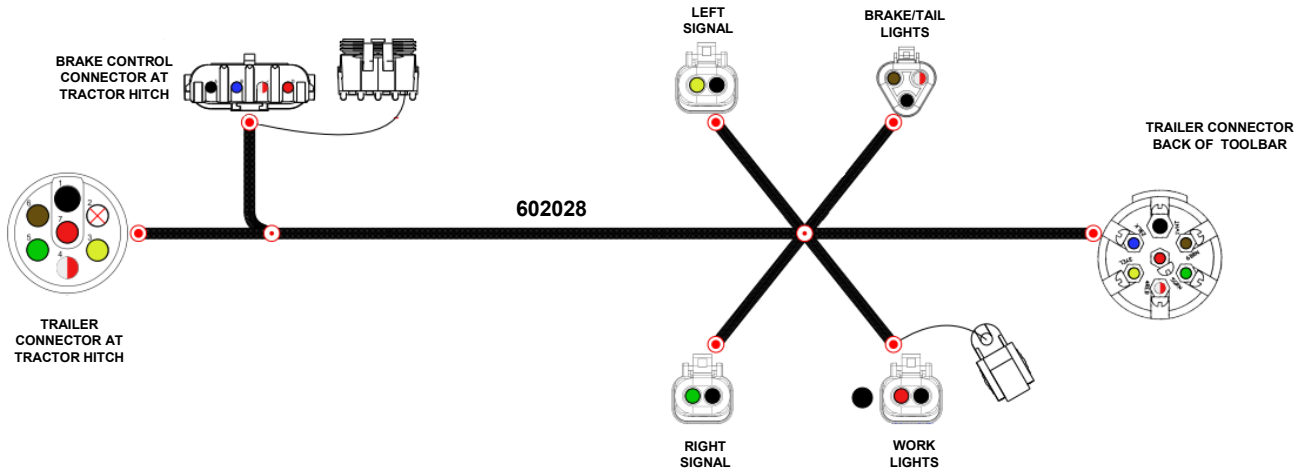


JEM TOOLBAR CONTROL ON-FRAME



E-SERIES CROSS TILLAGE ELECTRICAL



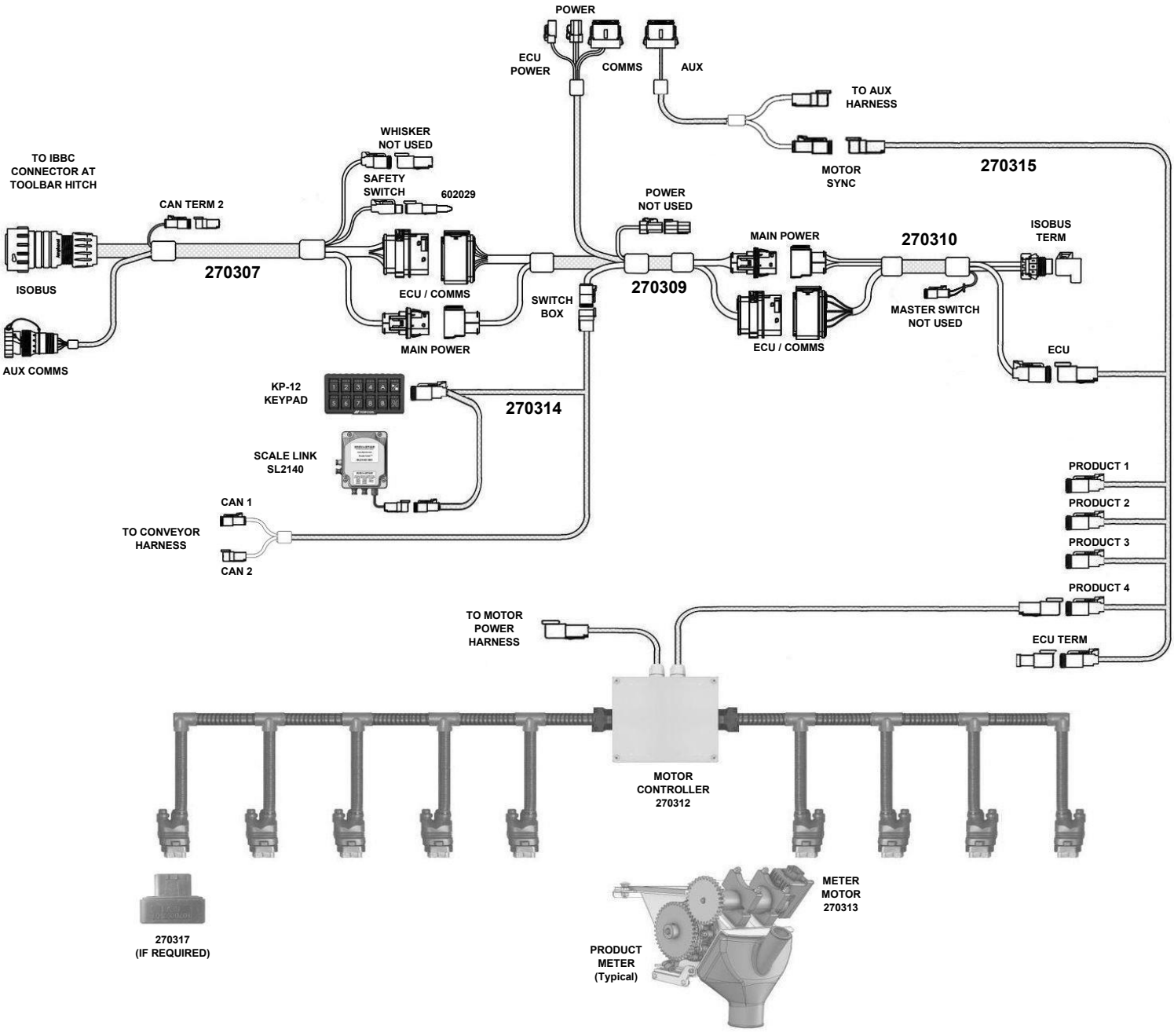


1	Black	Ground
2	Blue	Brake Actuator (if equipped)
3	Yellow	Left Turn Signal
4	Red/White	Brake Lights
5	Green	Right Turn Signal
6	Brown	Tail Lights
7	Red	12v Main

SeedMaster E-Series carts utilize a standard 7-pin trailer connector of the round pin style. The 12-volt main supply from the tractor is used to power the carts 12v work lights and the wireless receiver for the crane, if so equipped. SeedMaster drills provide a mating cross-tillage trailer harness.

E-SERIES CART ELECTRICAL

SEE ONLINE PARTS BOOK FOR FULL HARNESS LISTING



MAINTENANCE CHECKLIST

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
Tire Pressure				
Inspect tire conditions and pressures	Refer to page 8 of this manual for proper tire pressure			
Wheel Bolt/Nut Torque				
Check torque for wheel bolt/nut	Refer to page 8 of this manual for proper torque specifications. Please use a torque wrench only			
Transport Hub				
Grease each hub every 100 hours	Transport wheels have grease zerks			
Transport Caster				
Grease each caster on main pivot every 100 hours	Transport casters have grease zerks			
Grease each caster on walking beam pivot every 100 hours	Walking casters have grease zerks			
Transport Caster Adjustment				
Adjust the main frame caster wheels, pull the machine forward	Main frame casters will be adjusted to caster firmer than wing caster wheels. Wing caster wheels should turn freely (by hand) after adjustment. If they do not, loosen the bolts equally until they pivot freely			
With the caster positioned (driving forward), loosen all four jam nuts on the caster pivot point bolts				
Tighten the two rear bolts until they are snug ensuring left and right bolts are tensioned equally				
Back the machine up so the caster is turned forward (reverse the drill)				
Tighten the two front bolts until they are snug ensuring left and right bolts are tensioned equally				
Tighten the top jam nuts locking everything into place				
Frame Connection and Components				
Check the following:				
• All Frame Components				

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
• Frame Fasteners				
• U-bolts				
• Hydraulic cylinders				
• Lift Kit cables and components				
• Check that all components work at proper hydraulic pressure and speeds	Refer to your Operator's Manual for proper hydraulic pressures			
Hitch Tongue, Pintle Hitch and Keeper Bolts				
Inspect all hitch pins for excess wear, stress, and grease bull-pull style	Replace any stressed or worn-out components.			
Inspect hitch fasteners				
Inspect keeper bolts				
Pivot Pins and Keeper Bolts				
Inspect wing folds. Apply grease to greaseable pins.	Replace any stressed or worn-out components. Refer to the Parts Book for parts breakdowns			
Check all keeper bolts				
Link Pins and Retainers				
Inspect link pins, wing fold pins, cylinder pins, and retainers	Replace any stressed or worn-out components. Refer to the Parts Book for parts breakdowns			
Inspect keeper roll pins and cotter pins				
Opener Components				
Inspect openers and check for loose fasteners	Refer to the Parts Book for parts breakdowns			
Adjust main pivot and fertilizer pivot to account for any wear	Ensure proper pivoting while limiting side movement			
Spin each packer wheel and check for mud or failed bearings				

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
Batteries				
Check both batteries for charge at 12v each.				
Clean and tighten all terminals and secondary lugs	Battery terminals, disconnect switch, load lugs, chassis ground and alternator connections			
Metering				
Check that the electric meter motor mounting hardware is secure and tight.	Loose fasteners can cause excessive or inconsistent gear lash.			
Check that all sprockets are securely fastened and aligned properly				
Inspect meter spouts	Inspect for air loss, blocks, or restrictions.			
Fan Inspection				
Inspect all product delivery fans and air-splitter manifolds.				
Ensure fan blade is:				
• Aligned, turns freely				
• free of any dirt and build up				
• Inspect the fan delivery lines				
Ensure that each line is free of:				
• moisture and product build up				
• any type of obstruction				
CleanFlo Purge System				
Inspect purge pump/alternator belt	Check for wear, damage, and tension			
Clean and inspect centrifugal debris separator	Located on fan air-splitters, remove and flush with water.			
Clean and inspect purge canister filter	Refer to page 27-28 of this manual			
Inspect purge system hoses for damage	Check each tank purge distribution rail, all meter tubing and connecters for cracks or disconnections			

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
Tanks and Lids				
Open tank lids and ensure lid seal is in good condition	You will see an indentation where the lid seal contacts the lid frame			
Close the lids and with fans running inspect the tank and lids for any air loss				
Inspect tank pressure lines	Check for air loss, blocks, or restriction			
Product Delivery Lines and Towers				
Inspect tower for blocks or restriction				
Inspect primary and secondary lines	Check for air loss, blocks, or restriction			
Inspect towers and caps for wear and air loss	Check for air loss, blocks, or restriction			
Conveyor and Crane				
Check that conveyor belt and boot are cleaned out, washed, lubricated, and operation verified	Remove and leave the clean-out doors off. Run the conveyor until the splice is on the top side of the belt to allow moisture to drain properly.			
Inspect the Conveyor and Crane arms	All pivot points require periodic greasing in season and before storage			
Washing machine before storage				
Check that there is no product remaining in tanks or meters				
Open bottom clean-out doors on all meter boxes				
Thoroughly clean and wash the inside and outside of the tanks				
Flush meter boxes with water from inside the tank	With purge system running, operate the meters at moderate rate while flushing with a water hose. Do NOT use pressure washer on or inside meter boxes. Leave purge running until the meters are dry. Reconnect clean-out door latches but leave them unsecured.			
Clear distribution lines	Close tank lids and run fans to ensure distribution lines are cleared of water.			

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
Clean gaskets under drop tubes and blocker plates	Reconnect latches but leave unsecured			
Clean meter blocker plate slot cover gaskets	Wipe gasket and sealing surface clean and leave unlatched			
Clean tank lids seals	The doors should be lightly closed and left unlatched with lift handles upright			
Storage				
Lubricate metering ONLY at the sprockets using a synthetic chain lube (ie. Royal Purple)				
Keep drill unfolded when stored for extended period				
Relieve all the hydraulic pressures, including the opener cylinders.	All hydraulic cylinder rods should be properly coated with Fluid Film to prevent corrosion			
Free return lines should be left uncapped to ensure no pressure can build during storage				
Indoor storage is ideal				
All monitors should be removed from tractor and machine to be stored indoors during winter months				
24v Battery tender	Consider using a low current 24v trickle charger to keep batteries fresh			

NOTES