Operator's Manual

Тетро К

60' 24 Row 30"



904164-en-us; 18.09.2024 01 Operator's Manual



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1 Introduction

Tempo K Planter Bar

Congratulations on the choice of a **Tempo K Planter Bar** to complement the farming operation. These units have been engineered for high capacity, high speed planting; without sacrificing Väderstad's reputation for outstanding planting precision.

All persons authorized to operate this implement are responsible for reading and understanding the contents of this Operator's Manual, especially the Safety Section. The owner or operator (user) should seek assistance from the dealer, distributor or manufacturer for any information not fully understood regarding the safe operation adjustment, maintenance, or repair of this implement.

The user is responsible for inspecting the machine and for having components repaired or replaced when continued use of this product would cause damage or excessive wear to other components.

Keep this Operator's Manual in a clean, dry place that is easily accessible for reference when more detailed information is required to perform tasks related to the operation, adjustment, maintenance, or repair of this implement. It is further recommended that the contents of this Operator's Manual be reviewed at least annually by persons operating, adjusting, maintaining, or repairing this implement, and any time a new person is assigned to any of the above mentioned tasks.

Any information in this Operator's Manual that is not fully understood should be clarified by contacting the dealer, distributor, or manufacturer and requesting assistance.

The contents of this Operator's Manual are accurate up to the time of printing.

It is the policy of Väderstad Inc. to improve its products whenever possible and practical to do so. Väderstad Inc. reserves the right to make changes, improvements and modifications at any time without incurring obligation to make such changes, improvements on any equipment sold previously.

Address inquiries to:

- Väderstad Inc. PO Box 1030, Wahpeton, ND 58074
- PH (701) 642-2621

1.1 Description of the Machine

Tempo K is available in 30" spacing. The planter bar features a positive air pressure system that holds the seed in place on the seed plates.

The Tempo K also features a secondary toolbar. The secondary toolbar is designed to support the row units, it also rotates 76° upward when preparing to fold, narrowing the overall width for transport.

The secondary toolbar and row units are supported by a mainframe that utilizes 10" x 10.5" (25.4 cm x 26.7 cm) wall tubing and is built to exceed the most demanding conditions.

1.2 Intended Use

This machine is designed solely for use in agricultural operations. Do not use this machine for any application or purpose other than those described in this manual. The manufacturer accepts no liability for damage or injury resulting from misuse of this machine.

Compliance with the conditions of operation, service and repair as specified by the manufacturer constitute essential elements for the intended use of this machine.

This machine should be operated, serviced and repaired only by qualified persons familiar with its characteristics and familiar with the relevant safety rules and procedures. All generally recognized safety regulations and road traffic regulations must be obeyed at all times.

Use the large-frame folding Toolbar for planting corn and soybeans. This Toolbar is designed to allow planter row units to be mounted to the secondary toolbar. The secondary toolbar rotates 76° up for narrow transport. The planter row units place corn and soybean seed at a user—defined depth. Liquid fertilizer can also be placed in-furrow. The wings forward fold and hook onto the brace arms for transport



All references to "LEFT" and "RIGHT", as used throughout this manual, are determined by facing the direction of the machine's normal forward travel when in use.



Some images in this Operator's Manual may show the machine with shields removed to better show the subject of the picture. The implement must NEVER be operated with any of the shields either opened or removed. Ensure that ALL shields are attached, closed and in good working condition prior to operating the implement.

1.3 Illustrations of the Machine



Figure 1.1 Tempo K 24R30 (Front)



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Figure 1.2 Tempo K 24R30 (Rear)
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1.4 Machine Serial Number

<u>Refer to Section "2.14.1 Location of Safety Signs on page</u> <u>15" for more information on the location of the safety</u> <u>decals and the serial number plate.</u>

1.4.1 Serial Number Data Sheet

Serial Number(s)

Record the machine model and serial number in the spaces provided below. Use these numbers when contacting the dealer for repair parts, warranty or service assistance. VADERSTAD WAHPETON, ND USA MADE IN USA TYPE & SERIAL NO.

Figure 1.3 Serial No. Decal

1.5 Technical Data Sheet

Table 1.1 Technical Data Sheet: 2025 Tempo K Planter Bar

Models	TPK 60' 24 Row 30"
Frame Specifications	
Primary Toolbar Size	10 x 10 in (25.4 x 25.4 cm)
Secondary Toolbar Size	7 x 7 in (17.78 x 17.78 cm)
Flexibility	$\pm 12^{\circ}$ over total frame width
Fold Cylinders	(x2) 5 x 30 in, double acting (12.7 x 76.2 cm)
Wheel Lift Cylinders	Four phasing, double acting
Latch Cylinder	(x1) 2-1/2 x 5 in, double acting (6.4 x 12.7 cm)
Tire Specifications	
Tires	(x4) 16.5 x 12, 12 ply (41.9 x 30.5 cm)
Tire Pressure	50 psi (482 kPa) or maximum indicated on sidewall
Wheel Bearings	Tapered roller
Track Specifications	
	1/2 in diameter 80 ±10 lb/ft (108.5 ±13.5 N.m)
Wheel Stud Diameter	5/8 in diameter 160 ±10 lb/ft (216.9 ±13.5 N.m)
Machine Dimensions	
Rows	24
Row Spacing	30 in (76.2 cm)
Transport Width	5.28 m (17 ft 4 in)
Transport Length	11.6 m (38 ft)
Transport Height	3.9 m (13 ft)
Operating Length	8.5 m (28 ft)
Operating Width	18.29 m (60 ft)
Tracks	2
Hydraulic System Specifications	
Tractor Remote Valve Requirements	4
Frame Lift — Fold System Capacity	25 gal (95 Liter)
Hydraulic Flow Requirements	
Minimum Flow Required (Utilizing Tractor Remotes)	55 gpm (208 Lpm)
Shipping Specifications	
Total Weight	43,000 lbs (19,500 kg)
Shipping Width	4.2 m (15 ft 10 in)
Shipping Height	3.9 m (13 ft)
Shipping Length	11.58 m (38 ft)
Tractor Requirements	
Horsepower	400 hp
Minimum Tractor Weight	30,010 lb (13,612 kg)

1.6	Notes

2 Safety

2.1 Safety Alert Symbols

2.1.1 Safety Information

The Safety Alert Symbol(s) are intended to direct the attention of the machine user to important safety information both published in the Operator's Manual and applied to the machine. Any time Safety Alert Symbol(s) are seen, it means that associated information is provided for recognizing, appropriately responding to and avoiding potentially hazardous situation(s).

A triangle shape surrounding an exclamation point indicates a potentially hazardous situation. Information included in a safety sign or printed in the Operator's Manual describes the hazardous situation and indicates appropriate response(s) and / or avoidance procedures.

This Safety Alert Symbol means:





DANGER! Indicates an imminently hazardous situation that, if not avoided, WILL result in death or serious injury if the proper precautions are not taken.



WARNING! Indicates a potentially hazardous situation that, if not avoided, COULD result in death or serious injury if the proper precautions are not taken.



CAUTION! Indicates a potentially hazardous situation that, if not avoided, MAY result in minor or moderate injury if the proper practices are not taken, or, serves as a reminder to follow appropriate safety practices.



NOTE! Used to clarify information.



IMPORTANT! The information next to this symbol may be worth noting since it is a hint containing particularly useful information on how to handle the machine. Failure to follow these notices may result in damage to the machine.

2.2 Safety Sign Information

Safety Sign Legibility: All safety signs applied to the implement must be visible and legible. Keep dust and dirt cleared from safety signs and ensure that visibility is not obscured.

Safety Sign Replacement: Safety signs may be ordered through the dealer or distributor. Contact Väderstad Inc. if unable to obtain replacement safety signs from a dealer or distributor.

Damaged or Deteriorated Safety Signs: Remove and replace any safety signs that have either been damaged or show signs of deterioration.

Safety Signs on Replacement Parts: Ensure that parts or components that are replaced on the implement that had a safety sign attached originally include a safety sign.



For parts and decal replacement, contact your local dealer parts department.

Affixing Safety Signs to the Implement

- 1. Ensure proper position and orientation before installing.
- 2. Ensure installation area is clean and dry.
- 3. Ensure ambient temperature is above 50° F (10° C).
- 4. Remove backing material to expose label adhesive.
- 5. Place one edge of label to machine surface.
- 6. Slowly press the label onto the surface.
- 7. Ensure no air pockets are present or become trapped under surface or label. To remove air pocket, pierce the bubble in the label with a pin, this will let the trapped air out, and then press the label down.

2.3 Hand Signals

Hand signals are an important means of communication on farms where noise levels and distance can hinder regular communication between workers. These 11 hand signals were created so that two or more persons can communicate effectively and safely.

Table 2.1 Hand Signals



Lower Equipment: Make a circular motion with either hand pointing to the ground.



Come to me: Raise the arm vertically overhead, the palm to the front, and rotate in large horizontal circles.



START THE ENGINE: Simulate cranking of vehicles by moving arm in a circular motion at waist level.



Slow it down / decrease speed: Extend the arm horizontally to the side, palm down, and wave arm downward 45 degree minimum, repeat.



Move-Out: Face the desired direction of movement, hold the arm extended to the rear; swing it overhead, forward in the direction of the desired movement until it is horizontal, palm down.



Stop: Raise hand upward to the full extent of the arm, palm to the front. Hold that position until the signal is understood.





This far to go: Place palms at ear level

inward to indicate remaining distance

facing the head and move laterally



to go.



STOP THE ENGINE: Draw right hand, palm down, across the neck in a "throat cutting" motion from left to right.





Move toward me / follow me: Point toward person(s), vehicle(s), or unit(s) beckon by holding the arm horizontally to the front, palm up, and motioning toward the body.



To perform any / or all of these signals, stand out of the pathway of the moving implement.

2.4 Operator Responsibilities

Responsibility for the safe operation, adjustment, maintenance and repair of this machine falls to the main user. It is the responsibility of the owner, or authorized person in charge, to ensure all persons who operate, adjust, maintain and/or repair this implement be familiar with the information provided in this Operator's Manual before performing any other tasks listed above.

A safe user is the key to safety. Good safety practices not only protect the user, but also persons who may be in the vicinity of the implement. Make good safety practices a part of the farming operation. Ensure that all persons operating, adjusting, maintaining and/or repairing this implement are familiar with the procedures recommended in this manual.

Always read safety warnings and follow recommended safety precautions to avoid hazardous situations. DO NOT risk personal injury or death by ignoring safety warning and safety precautions.

2.4.1 Key Safety Reminders

The most important safety device is a safe and qualified user.

A safe and qualified user is one who has read and understands the contents of the Operator's Manual prior to performing any tasks related to the machine. Owners have a responsibility to provide training to persons who may operate, adjust, maintain and/ or repair the implement prior to performing any of these tasks.

DO NOT perform any unauthorized modifications to the implement or use the implement for any purpose other than what is described in the contents of this Operator's Manual.

Owners must give operating instructions to operators and employees before allowing them to operate the implement, and at least annually thereafter per OSHA regulation 1928.57.

2.5 General Safety

Read and understand the contents of this Operator's Manual prior to operating, adjusting, maintaining and/or repairing the implement. Review at least annually thereafter.

Locate, read and understand all safety signs applied to the implement before performing any tasks.

Review the contents of this Operator's Manual at least annually, and, any time a new person is assigned to perform any tasks with the implement.

Ensure that all bystanders, especially small children, and pets/animals are kept at a safe distance while performing any tasks with the implement. Keep all personnel away from moving parts.

Do not stand between the tractor and implement to install the hitch pin while the tractor engine is running.



DO NOT allow riders on any part of the implement.

When parking, park the machine and the tractor on a solid level surface. Put all controls in neutral and apply the tractor park brake. Stop the tractor engine and take the key with you.

Always lower the machine when not in use and relieve the pressure in the hoses and cylinders.

Ensure all guards and shields are intact and in place prior to operating the implement.

Keep hands, feet, hair and loose clothing away from moving and/or rotating parts.

Stop the engine, lower the implement, set the parking brake, remove the ignition key, and allow time for moving parts to stop prior to adjusting, maintaining, and/ or repairing the implement.

Ensure that all implement lighting and marking is intact, secure, clean and operating properly prior to traveling on public roads. Check with local highway authorities to confirm implement is properly equipped for highway travel.

Provide a fully stocked First-Aid Kit in a highly visible and easily accessible location.

Ensure a fire extinguisher is available for use should the need arise and that the operator is familiar with its proper use.

Clear the implement of any and all foreign objects before beginning operation.

Ensure that the implement is securely blocked and supported prior to working underneath.

Do not work with the machine during thunderstorms and when there is a risk of lightning strikes. Do not stand on or next to the machine.

Always wear suitable ear protection for prolonged exposure to excessive noise.

Use caution when working around high pressure hydraulic systems.

Reduce speed when cornering on field ends and when operating on or across dead furrows.

Do not attempt to remove any obstruction while the machine is in motion.

Use extreme caution when operating close to ditches, fences or on hillsides.

No one other than the operator should ride on the tractor.

In the event of a fire in a crop / field setting, use a water type fire extinguisher or other water source. For fires involving anything other than crop, such as oil or electrical components. Use a dry chemical fire extinguisher with an ABC rating.

2.6 Maintenance Safety

Read and understand all information provided in the Operator's Manual covering operation, adjustment, maintenance and repair prior to performing any of these tasks. Plan work to ensure proper tools, equipment, and personal protective equipment is available prior to working on implement.

Wear appropriate clothing when performing tasks around implement. Ill-fitting and/or frayed clothing as well as loose or dangling items should not be worn when working near the implement.

Stop the engine, lower the implement, set the parking brake, remove the ignition key, and allow time for moving parts to stop prior to adjusting, maintaining, and/ or repairing the implement.

Ensure that all moving parts have come to a complete stop before performing adjustments, maintenance and/or repairs.

Ensure that hydraulic oil pressure in hoses, lines, and components is fully relieved prior to performing any maintenance, and/or repairs.

Ensure that wings are either fully lowered or fully raised and secured using transport/cylinder locks (if equipped) or securely block the wings if raised to perform adjustments, maintenance and/or repairs as needed.

Securely block main frame and/or wings (any raised components) if adjustments, maintenance, and/or repairs are required.

Wear personal protective equipment, such as gloves, eye protection, etc. when inspecting the hydraulic system for leaks. Use a small piece of cardboard or wood to detect leaks.

Ensure that all guards and shields are intact and in place after performing adjustments, maintenance and/or repairs prior to operating implement.

Store flammable fluids in approved containers and store out of access by unauthorized persons, especially children.

Replace the safety chain if one or more links or end fittings are broken, stretched or otherwise damaged or deformed.

Do not allow children or other unauthorized persons within the implement operational area.

Do not modify the equipment or substitute parts in any way. Unauthorized modification may impair the function and / or safety of the machine.

Use a suitable lifting device for components which could cause personal injury by pinching, crushing or weight. Be sure lifting device is rated to handle the weight.

Always inspect lifting chains and slings for damage or wear.

Ensure all hydraulic connectors are cleaned of any dirt or debris regularly to ensure proper connection to tractor.

2.7 Hydraulic Safety

Always place all tractor hydraulic controls in neutral before dismounting.

Ensure that all hydraulic system components are kept clean and in proper working condition.

Relieve pressure before working on hydraulic system.

Use a piece of cardboard or wood to check for hydraulic leaks.

Wear personal protective equipment, such as gloves, eye protection, etc. if unsure if residual pressure may exist in hydraulic components during troubleshooting and/or making repairs.

If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.

Check hydraulic hoses regularly for wear and tighten/ replace as needed. Contact your local Dealer parts department to purchase replacement hoses specifically designed for Wil-Rich machines.

When connecting the hoses to the cylinders, tubings or fittings; always use one wrench to prevent the hose from twisting and another wrench to tighten the union. Excessive twisting will shorten hose life and loosen hose fittings.

DO NOT attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely highpressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

Do not over-tighten hydraulic fittings, excessive torque may cause them to crack.

Always contact the nearest Wil-Rich dealer or service professional when replacing hydraulic hoses.

When replacing hoses always route hoses the same as the one being replaced to ensure that the part is not subjected to wear, rubbing, kinking, etc. Make repairs following instructions provided by the manufacturer.

Ensure all fittings, couplings, and other hydraulic connections are intact and properly tightened before operating implement hydraulic system.



DO NOT touch pressurized hose assembles with any part of the body. If fluid punctures the skin, seek immediate medical attention.

Hydraulic fluids are highly flammable. Always keep open flames and ignition sources away from hydraulic fluids.

2.8 Electrical Safety

Ensure that the machinery is shut off and all electrical components are disconnected before doing any work on the machine. Ensure all live connections are not receiving power.

Check electrical wires regularly for wear related to usage and weathering. Replace any damaged wires or components immediately.

Use insulated tools whenever performing service to any electrical system or components and always wear proper protective equipment.

2.9 Transport & Towing Safety

Read and understand ALL the information in the Operator's Manual regarding procedures and SAFETY when moving the implement in the field / yard or on the road.



DO NOT allow riders on any part of the implement.

Ensure that implements are attached to the tractor properly.

Ensure transport cylinder locks are in place and functioning properly (if equipped).

Ensure safety tow chain is securely attached and retaining clip is securely locked in place.

Ensure all lighting and implement marking devices are intact and visible.

Ensure implement is properly marked according to local road regulations.

Read and follow all local road traffic regulations.



DO NOT exceed recommended transport speeds (Maximum: 20 mile/hr / 32 km/hr for wheeldriven machines, 15 mile/hr / 24 km/hr for trackdriven machines). The implements are not designed for high speed use. Ensure all local traffic rules/regulations are followed. Reduce speed and use caution when making corners and meeting traffic.

Make sure you understand the speed, steering, stability and load characteristics of this machine before you travel on public roads. Use good judgement when traveling on public roads. Maintain complete control of the machine at all times. Never coast down hills. Be aware that the implement is wider than the tractor when transporting. Always have the wings completely folded (if equipped) when transporting on public roads.

Watch for overhead wires and other obstructions. Avoid contact with electrical power lines. Contact with electrical power lines can cause electrical shock, resulting in very serious injury or death.

Make sure SMV (Slow Moving Vehicle) emblem and all lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.

Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the road shoulder, if permitted by law.

Always use hazard warning flashers on tractor when transporting unless prohibited by law.

Frequently check for traffic, especially during turns.



Always bring the machine to a complete stop before folding/unfolding. Switching between transport and working positions while in motion may result in damage to the implement.



When in working position, ensure wing fold cylinders are fully extended prior to field operation.

2.10 Storage Safety

Store the implement away from areas of human activity.



DO NOT allow children to play on or around the implement(s).

Store the implement on a dry, stable, and level surface away from areas of human activity. Support with planks if required.

2.11 Tire Safety

Ensure tire inflation pressure is maintained per specifications.

Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.

Follow proper procedures for tire repairs, especially when mounting tire to the rim.

Seek assistance from a trained person for tire repairs or mounting, especially if specialized equipment is required.

2.12 Hazards

The key is to recognize hazards while working or living on a farm; avoid dangerous situations or at least minimize the exposure to them.

This section deals with danger points on agricultural equipment; those areas which can entangle, pinch, crush, or shear clothing and limbs. Possible danger points could be wing fold points, hydraulic cylinders and hydraulic lines on many types of equipment.

A slow-moving hydraulic arm can be as hazardous as a rapidly rotating power take-off shaft.

Recognize the dangers!

The first step to avoiding danger is to recognize that hazards exist. Identify the specific hazards associated with the equipment.

The next step is to consider how to use the equipment. Using it for tasks it was meant to perform? Following all safety precautions recommended by the manufacturer?

Most machinery accidents result from human error. The operator either forgot something, took a shortcut, ignored a warning, wasn't paying close attention, or failed to follow safety rules. Be familiar with the operator manual, know the limitations of the equipment, and follow safety measures automatically.

Carefully evaluate the operation of each implement for safety before starting work.

Check equipment guards.

Check guards on all equipment as part of a routine maintenance schedule. During seasons when equipment is used heavily, check guards more often.

Equipment guards cannot eliminate all injuries.

A transport lock will only work if it is engaged prior to road transport, and will not prevent accidents if it is not engaged.

Recognize secondary hazards.

Many farm injury victims recognize hazardous situations, but they misjudge the seriousness of the hazard because of secondary factors.

For example, spilled grain or debris in an unloading area could cause someone to slip and fall into the intake auger. Icy, muddy, or manure-covered surfaces make the work area slick and increase the risk of injury. Bystanders or children in the work area can distract the operator, or limit operator vision.

Never stand near the machine during operation. Debris can be thrown from the machine during operation possibly resulting in injury.



Be careful when operating along the side of a road or building. Rocks or other debris can be thrown from the machine during operation possibly resulting in injury.

High pressure hydraulic oil is a major hazard. Any leaks in the hydraulic system must be treated as a dangerous situation and should be dealt with accordingly.

Consider human factors.

Farm operators can overestimate their ability to stop or avoid a dangerous situation. This is common when operators work around powerful equipment every day and become comfortable with their ability to control the machinery.

Operators are also limited by their reaction time. Human reaction time is not quick enough to avoid an injury with machinery.

Gravity as well is faster than human reaction. For example, it is very dangerous to reach underneath the wing of a machine if the transport/safety locks are not correctly in place. If a hydraulic line breaks, gravity could pull the machine wings to the ground very quickly, crushing the operator.

Manufacturers have built safeguards into equipment but all hazards cannot be removed. Take a realistic approach to equipment safety and think about these principles for the operation of all machinery.

- Be aware of the dangers. Read the operator manuals and think about how to use the equipment.
- Regularly repair and replace protective guards or shields on all implements.
- Look for and remove secondary hazards, such as spilled grain or debris.
- Recognize the limitations of the user and the equipment.

Farm Machinery Safety: What to do?

- A few simple actions can reduce the risk of danger around farm machinery.
- Collect operator manuals for all farm equipment and place in a central location. Read the safety section in each manual.
- Evaluate how to anticipate using each implement and identify potential safety hazards not mentioned in the manual.
- Check condition of intake guards and shields on grain augers and other implements.
- Remove debris from grain unloading areas. Shut down equipment when other people enter the area.

2.13 Anhydrous Ammonia (NH3) Safety



Anhydrous ammonia (NH3) under pressure can cause severe burning, blindness, sickness, or death.

Understand all safety instructions and warnings before operating or servicing equipment.

- Review the properties of NH3 and the procedures for safe handling, and use with your NH3 supplier.
- Contact your NH3 supplier or the appropriate agricultural department for training on handling, transporting, transferring, and applying NH3. Training should be completed at least every three years.
- Always wear appropriate personal protective equipment (PPE) when installing, inspecting, servicing, and operating the NH3 system.
- Appropriate PPE includes, but is not limited to:
 - Liquid proof gauntlet-style gloves impervious to NH3.
 - Long sleeved shirt and long pants or protective suit.
 - Indirect vent chemical splash goggles or indirect vent chemical splash goggles with full-face shield.
- Check operation of system components (e.g. valves, temperature and pressure gages) prior to charging the system with NH3.
- Seek immediate medical attention if symptoms of illness occur during or shortly after use of NH3 products.
- Use extreme caution when servicing or maintaining a system that has previously been pressurized with NH3.
- Keep a source of clean water 19 L (at least five gallons) readily available while working with NH3. This source should be in addition to, and separate from, the water source on the nurse tank.
- Read and follow instructions provided with the application system to properly discharge NH3 before performing service or maintenance.
- Pressure gauges can fail, become plugged, or display incorrect pressure. Slowly bleed pressure from a previously charged system by opening valves slightly. Allow pressure to discharge for an extended period of time. Treat every section where NH3 can be trapped as though it is pressurized.
- Thoroughly bleed all system lines and disconnect the nurse tank hose to remove NH3 from the system before transporting the system or beginning service or maintenance. Liquid NH3 can absorb heat from surroundings and re-pressurize the system.
- Any bleed valves that are opened to relieve pressure should remain open while transporting the system or maintenance is being performed.
- Stand 'up wind' when working around NH3 and related equipment. Never work on NH3 equipment in confined spaces. Always keep NH3 equipment away from buildings, livestock, and other people.

- Before each day's use:
 - Visually inspect all system plumbing components for functionality, excessive wear, and damage.
 - Some components may have recommended "replace by" dates or maximum service periods regardless of visual condition.
 - Replace individual components if excessively worn, visually damaged, or non-functioning, as recommended by the component manufacturer, or as required by regulation, whichever is sooner.
 - Test excess flow valves and document the date and result of tests. Replace any components that do not pass inspection as needed.
- Never uncouple an NH3 applicator or intermediate towing vehicle without appropriate parking stands, wheel chocks, or other braking systems if a nurse take wagon is attached.
 - Immediately evacuate the area in case of leak or accidental release of NH3. Contact your local fire department, and identify sources of clean water on the unit.
 - In case of exposure, flush exposed skin and eyes immediately with large quantities of water for at least 15 minutes and seek immediate medical attention
- NH3 can be harmful to the environment if not used properly.
 - Follow all federal, state, and local regulations regarding the handling and use of NH3.
- Only NH3 harness systems, control systems, and on / off valves approved by 3rd Party Suppliers are recommended for use with NH3 products.



3rd Party Systems must be in accordance with CSA B620, CSA B622 & ASABE S620 standards to be used in conjunction with the Seed Hawk Toolbar.

- 3rd Party Suppliers shall not be liable for any damages and this warranty shall not cover defects from:
 - The use of a system with a harness not approved by 3rd Party Suppliers.
 - The use of a control system not approved by 3rd Party Suppliers.
 - The use of an on / off valve not approved by 3rd Party Suppliers.
 - The use of the system in a manner that is inconsistent with the instructions.
 - Unauthorized modification to the system or products used in the system.



In the event of a control system failure, the flow control valve may remain open. To ensure there is a means by which flow can be shut off at the source, a master on / off control shall be present on the nurse tank and shall be capable of switching between a safe state and a system ready state from a suitable location. Deactivation of the master on / off control shall take the system to a safe state.

A nitrogen crop fertilizer that can cause severe chemical burns; frostbite to the eyes, skin, and respiratory tract; and in some cases death. It is important for all individuals working with this type of fertilizer to understand the potential risks, necessary safety precautions, and proper response in the event of accidental contact.

Anhydrous ammonia is a hygroscopic compound, meaning that it takes up water from the nearest source, which can include the human body especially the eyes, lungs, and skin because of their high moisture content. Anhydrous ammonia is caustic, corrosive, and damaging to tissue high in moisture content when it contacts the human body. Anhydrous ammonia inhalation incidents are typically severe because the victim's throat can swell shut, causing suffocation. When vapors or liquid come in contact with a person's eyes, blindness may occur.

Typically, anhydrous ammonia is stored under pressure, but it vaporizes to a colorless gas. It has a unique odor that can be detected at a low concentration of 5 ppm. The concentration in fertilizer is approximately 1,000,000 ppm, but even brief exposure to a concentration of 2,500 to 6,500 ppm can result in death.

When exposed to atmospheric conditions, it boils at -33° C (-28°F). This vaporization will freeze **anything** the liquid comes in contact with. Each 0.5 kg (1 lb) of Anhydrous Ammonia that vaporizes is capable of freezing about 1.8 kg (4 lb) of water.

Anhydrous ammonia is transported under pressure as a liquid, so all equipment used for transport must be designed for use under high pressure to avoid ruptures or breaks. Incidents can occur when anhydrous ammonia escapes from transfer hoses or valves, equipment malfunctions and sprays anhydrous ammonia in multiple directions, hoses pull apart during transportation or application, and so on.

PPE and Supplies

It is essential that all workers who use anhydrous ammonia wear the appropriate personal protective equipment (PPE), be equipped with necessary response supplies, and know how to respond in an emergency. PPE should include vent-less goggles or a full-face shield, rubber gloves with long cuffs that can be rolled to catch drips, and a long-sleeved shirt. Non-rubber gloves made of ammonia-proof material are acceptable. Because contact lenses can trap the gas and become fused to the eye, it is recommended that individuals not wear contact lenses while working with anhydrous ammonia. In the event of an exposure emergency, the most important resource is an ample supply of clean water to begin flushing the eyes and skin. If using a vehicle to transport anhydrous ammonia, there must be a 19 L (5 gal) container of clean water on board. Each person working with anhydrous ammonia should carry a 1 L (6 to 8 fl. oz.) squeeze bottle of water at all times for rapid response to an emergency.

Basic First Aid for Anhydrous Ammonia Exposure

The first-response treatment for anhydrous ammonia exposure is to flush the exposed area (skin, nose, throat, eyes, and so on) with clean water for a minimum of 15 minutes.

- Flush the exposed area immediately to decrease injury caused by the anhydrous ammonia coming in contact with skin or clothes. Although clean water is the ideal resource for flushing exposed areas of the body, if water is not available, other nontoxic liquids, such as cold coffee or orange juice, can be used.
- Remove contaminated clothing unless the clothing is frozen to the victim's skin.
- Seek medical attention immediately and inform medical staff of the exposure to anhydrous ammonia so that they will not treat the wounds with oils or ointments that can intensify the damage.

Finding a person who is in a continuous stream of anhydrous ammonia, the first step is to contact the local emergency service responders or 911. Inform the emergency medical responders about the type of incident so they can bring the proper equipment to the scene. A self-contained breathing apparatus (SCBA) and protective clothing are necessary to remove a person from a continuous stream. Rescue workers will contact a hazardous materials (HAZMAT) disposal team if HAZMAT services are needed at the scene.



These guidelines are not comprehensive, and all individuals working with anhydrous ammonia should receive training in the proper response to exposure emergencies.

Storage and Transportation

Anhydrous ammonia is a strong alkali that, when dissolved in water, readily reacts with copper, zinc, brass, and other alloys. Therefore, the only types of containers, fittings, and piping that should come in contact with anhydrous ammonia should be non-galvanized steel or iron. Do not store other materials, such as propane or liquefied petroleum gas, in a tank that has been used to store anhydrous ammonia.



Park the applicator so that the operating station is upwind from the applicator before attempting to connect and disconnect the nurse tank hosing. Do not park applicator and / or nurse tank in an enclosed area as toxic or flammable conditions can result.



Remain upwind when depressurizing the system. And the nurse tank valve shall only be open during operation.

When filling the anhydrous ammonia tank, do not fill it more than 85% full, and always disconnect the fill hose before moving the tank. Remember to bleed pressurized anhydrous ammonia from the hose before connecting or disconnecting the hose.



Pressure gauges can fail or, become plugged. Every section where NH3 can be trapped should be treated as if it were pressurized.

When transporting anhydrous ammonia, be sure to adhere to the following precautions and safety rules:

Running Gear: Regularly inspect the unit's frame tongue, reach poles, anchor devices, wheel bearings, knuckles, ball joints, and pins for structural damage and wear and make necessary repairs and adjustments.

Tires: Check tires for proper inflation, bald spots, and signs of wear and ensure that lug nuts are tight.

Hoses and Valves: Inspect and replace hoses and valves as needed.

- The hydrostatic relief valve should be replaced every five years.
- The transfer hose should be replaced five years from the date of manufacture.

Lubrication: Annually lubricate the unit's knuckle, wheels, tongues, and so on.

Towing Vehicle: To increase the driver's ability to control the towing vehicle, ensure that the towing vehicle weighs at least as much as the tank.

- A tractor can tow two tanks, but a truck can tow only one tank at a time.
- NEVER tow anhydrous equipment into public places without authorization.

Speed Limit: When towing an anhydrous ammonia tank, observe a speed limit of 25 mph.

Hitch Pin: Use a hitch pin with a safety chain when towing a tank wagon.

Warning Lights: Ensure that the tank is equipped with a seven-terminal breakaway connector plug to properly operate turn signals, flashing warning lights, and a red brake light. Safety Signage: If operating on a highway, outfit the tank with all required safety markings, including a slowmoving vehicle (SMV) sign.

- The words Anhydrous Ammonia must appear on both sides of the tank and on the rear of the tank in letters 4 in. high. The words should be in contrast to the tank so that they can be read easily.
- Inhalation Hazard must appear on both sides of the tank in letters 3 in. high.
- A Department of Transportation (DOT) placard number UN1005 for nonflammable gas should be placed on the front, back, and sides of the tank.

Additional Safety Recommendations



Liquid ammonia in the system can absorb heat from surroundings and unexpectedly re-pressurize the system.

- Paint the tank with reflective white paint to decrease excessive pressure buildup that can occur when the tank is heated from direct sunlight.
- Do not use dented or damaged tanks until they have been checked by an authorized inspector and necessary repairs are completed.
- Allow only certified welders to perform welding on the tank.
- When transporting anhydrous ammonia, verify discharge hoses are securely fastened to both ends. Some locations require supply hoses to be secured to nurse tank before transporting.
- Regulations and codes regarding towing of anhydrous ammonia and signage may vary, so be familiar with and obey the provincial / state regulations.



An NH3 applicator or intermediate towing implement without appropriate parking stands and wheel chocks or other braking systems should not be uncoupled from the tractor if a nurse tank wagon is attached.

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Carefully read and understand all information provided by the SDS (Safety Data Sheet).

2.14 Safety Signs

2.14.1 Location of Safety Signs

(X) refers to the decal(s) at each location. <u>Refer to Section "2.14.3 Decals on page 19" for more information on each decal.</u>



Figure 2.1 TPK Frame Decal Locations



Figure 2.2 TPK Frame Decal Locations (Rear)

2.14.2 Marker Lamps

The machine has marker lamps that must be used when moving the machine in the folded position on roads. The machine is equipped with two red lamps (1) located toward the rear center of the machine.

The machine is equipped with two amber lamps (2) located toward the rear center of the machine.



Figure 2.3 Marker Lamps I

Marker Lamps II Legend

- (A) Amber Light LED
- (B) Red Light
- (C) Light Bracket
- (D) 12 x 36 Light Arm
- (E) Long Base Pivot

- (F) 3/8 x 7 x 8–1/4 U-Bolt
- (G) SMV Emblem
- (H) SMV Bracket
- (I) BLT Hex 3/16–24NC x 3/4 5Z
- (J) Module Interface
- (K) Plate-Module Interface Mount



Figure 2.4 Marker Lamps II

2.14.3 Decals

Decal Image	Decal Name	Pin	Description
	Tongue Latch Lock Valve	(A)	Heed all instructions.
	WARNING Foot Crushing Hazard	(B)	Part may lower without warning. Turn off the engine, remove the key, relieve the pressure before maintenance or repair. Refer to the operator manual for correct service procedures.
	CAUTION Loss of Machine Control — Safety Chain	(C)	Install the safety chains when connecting the machine to the tractor. Read the operator manual for safety information and the operating instruction before operating the machine.
	WARNING Negative Tongue Weight	(C)	Can cause the tongue to rise immediately when disconnecting the machine. Stay clear of the tongue when disconnecting the machine from the tractor. Read the operator manual for safety information and operating the instructions before operating the machine.
	Remove Key	(C)	Turn off the machine and remove the key before maintenance or repair.
	WARNING Read Manual	(C)	Read and understand the operator manual before operating the machine.
	DANGER Electrical Shock Haz- ard — High Line	(C)	Risk of personal injury and component damage. Keep correct distance away from electrical power lines.
	WARNING Injection Hazard — Hydraulic Fluid Pressure	(C)	Escaping fluid under high pressure. Turn off the engine, remove the key, relieve the pressure before maintenance or repair. Refer to the operator manual for the correct service procedures.

Safety

Decal Image	Decal Name	Pin	Description
15 mile/h	SIS Decal — 15 mph	(D)	The maximum speed safety sign displays the maximum speed to transport the machine.
<u>↓</u> *= <u>↓</u>	WARNING Crushing Hazard	(E)	Avoid potential pinch points. Take extra caution when working around moving parts.
	WARNING Row Marker Drop	(F)	Stay clear of area around row marker when engine is running.
	WARNING Planter Frame Movement	(G)	Stay clear of this area while engine and machine are operating.
All Interest	WARNING Planter Frame Drop	(H)	Install lift cylinder lockups before work- ing on the machine.
	WARNING Chemical Ingestion Hazard, Lungs — Opening the Cover	(I)	Refer to the operator manual and the chemical manufacturer's instructions.
	WARNING Falling Off Hazard	(J)	Do not ride on the machine when it is operating or moving.

2.15	Notes
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3 Operation

3.1 Quick Start Guide

The quick start guide is designed for quickly getting to work on the field. Each section contains references to the section in the manual that describes the process in detail. If you have the slightest doubt, read the detailed description.

Hitching

- Connect the machine's hitch device to the tractor. Raise and secure the machine's parking support. (*Refer to Section "3.4.1 Hitching on page 25"*)
- Always connect the case drain and free return first.
- Depending on the equipment, connect one or two pairs of hydraulic hoses in pairs to their respective hydraulic couplings on the tractor. <u>(Refer to Section</u> <u>"3.5 Hydraulic Connections on page 27")</u>
- Connect the lighting connector. <u>(Refer to Section "3.7</u> Lights on page 28")
- Connect the PTO shaft to the tractor, only applies for machines with PTO-shaft.
- Attach the brake couplings and the emergency brake's wire to the tractor; only applies to machines equipped with brakes.

Switching to Working Position

- Lift the wings from the wing supports, **lifting**/ **lowering.**
- Fold out the wings, wing lock while folding out the wings.
- Fold until the row units almost touches the ground, then stop the folding motion. Start the seed fan, and then continue the folding motion until the cylinder has reached its outermost position to release the hydraulic transport lock of the row units.

Default Settings

• Check the ground parallelism of the machine. Linkage in the row unit, drawbar tube and adjustment screw on front drawbar.

Settings Legend

- (A) Planting Depth
- (B) Closing Wheel
- (C) Press Wheel
- **(D)** Singulator
- (E) Sliding Hatch
- (F) The angle of the wheels can be adjusted by changing the position of the wheel.
- (G) Row cleaners, accessory



Figure 3.1 Settings



For instructions for settings on the row unit, refer to the row unit manual.

Air pressure in the seed feed housing can be adjusted using the fan's rpm and it is controlled by the tractor.

Weight transfer, <u>refer to the E-Services Guide for more</u> information.

For the selection of seed disk and output unit settings, *refer to Section "3.17.1 Output Settings for Sowing / Planting on page 40"*.

Select the output roller intended for the preparation that is to be fed.

- Setting bottom flaps, sliding hatches and calibration flaps.
- Fit a calibration bag to the output unit that is to be calibrated.
- Go into the calibration menu and carry out the calibration.



Return the lever for the calibration flaps into the position for sowing!



Check that all settings are the same on all row units. Always test drill a short distance and check the result. Where necessary adjust the settings.

Drilling Recommendations

• Setting rpm of seed output fan, <u>see Section "3.17.1</u> <u>Output Settings for Sowing / Planting on page 40"</u>.

During Conditions of Dampness:

• Start the seed output fan to blow the system dry.

3.2 Tractor Requirements

The tractor cab must be designed so that it protects the operator from debris and dust which is hazardous to health. Refer to local provisions regarding the design of the tractor cab. This relates to protection against dangerous substances in the form of pesticides.



The tractor may not be hitched to the machine if the maximum permitted total weight or axle load for the tractor is exceeded.



The load on the tractor's front axle may not be less than that specified.

3.2.1 Hydraulic System

Tractor Hydraulic Connection Requirements

- 4 5x double acting hydraulic connectors, depending on the equipment option.
- One (1) free return (zero pressure).
- One (1) case drain (free return with max 3 bar of counterpressure).
- One (1) power beyond.
- One (1) LS (load sense) port.

Refer to Section "3.5 Hydraulic Connections on page 27" for more detailed information.

3.2.2 Hydraulic Oil

Oil Temperature Requirements

• Väderstad recommends that the temperature of the hydraulic oil during operation be kept between 40° and 60° C for best performance and longevity.

Table 3.1 Hydraulic Oil Temperature Req.

Hydraulic Oil Temperature								
	$0^{\circ} C$ $40^{\circ} C$ $60^{\circ} C$ $80^{\circ} C$							
3 2		1			2	3		

- 1. Recommended temperature range for hydraulic oil.
- 2. Outside the recommended temperature range for the hydraulic oil.
- 3. Hydraulic oil temperature without guaranteed function and with reduced life expectancy.

Viscosity Requirements

• Väderstad recommends that the viscosity of the hydraulic oil during operation is kept between 20 and 50 cSt for best performance and longevity.

Table 3.2 Hydraulic Oil Viscosity Req.

Hydraulic Oil Temperature								
40	400 cSt 50 cSt 20 cSt 10 cSt							
3 2		1		2		3		

- 1. Recommended viscosity range for hydraulic oil.
- 2. Outside the recommended viscosity range for the hydraulic oil.
- 3. Hydraulic oil viscosity without guaranteed function and with reduced life expectancy.

Purity Requirements

• Väderstad recommends a hydraulic oil purity of 18/ 16/13 according to ISO 4406 for best performance and longevity.

Oil Quality Requirements

• Väderstad recommends that mineral oil be used in accordance with ISO VG 46 — 68.

Pressure Levels

- Väderstad recommends a maximum pressure level of 200 210 bar (2900 3050 psi). The pressure will drop slightly when continuous hydraulic power is taken out, however it should not drop below 190 bar in order to maintain the best performance.
- The free return connection must have a maximum pressure of 6 bar.

3.3 Control System

All machine functions are controlled and monitored from the tractor cab using a control unit. Väderstad offers options for controlling and monitoring the machine using an iPad. <u>*Refer to the E-Services Guide for more*</u> <u>information.</u>

3.3.1 Overview

TPK Overview Legend

- (1) Oscillating Hitch
- (2) Hydraulic Jack
- (3) Telescoping Tongue
- (4) Brace Arm
- (5) Rubber Track Assembly
- (6) Front and Rear Knuckle
- (7) Primary Wing LH
- (8) Wing Wheel

- (9) Wing Wheel Leg
- (10) Wing Wheel Mount
- (11) Belt Conveyor
- (12) Rear Staircase
- (13) Speed Tanks
- (14) Secondary Toolbar Wing
- (15) Toolbar Bearing
- (16) Secondary Toolbar Center
- (17) Main Hinge LH
- (18) Lower Lift Arm
- (19) Center Frame
- (20) Axle Main Frame
- (21) Transport Pad
- (22) Main Frame
- (23) Plenum
- (24) Horizontal Seed Tubes
- (25) Liquid Fertilizer Tanks



Figure 3.2 TPK Overview

3.4 Hitching & Unhitching

3.4.1 Hitching

Make sure there are no persons or obstructions between the tractor and the machine.



Figure 3.3 Tractor Connection I

- 1. Use the hitch jack (1) on the front hitch of the machine to adjust the height of the hitch (2).
- 2. Slowly reverse the tractor toward the hitch of the machine. Align the hitch on the tractor with the hitch on the machine when backing.
- 3. Stop the tractor when the hole of the tractor draw-bar aligns with the hole in the machine hitch.
- 4. Stop the engine, apply the park brake and take the key with you.



Figure 3.4 Tractor Connection II

- Install the hitch pin (3) through the holes in the tractor draw-bar (4) the machine hitch. Install the keeper pin (5) in the hitch pin.
- 6. Connect the safety chain (6) from the front hitch of the machine to the tractor.



Figure 3.5 Tractor Connection III

7. Retract the hitch jack. Move the hitch jack to the storage position (7) and fasten with pin.

The location and position of the storage location of the hitch jack can vary.

- 8. Clean the ends of the hydraulic connections on the machine and the tractor.
- 9. Make the following connections between the tractor and the machine. (*Refer to Section "3.5 Hydraulic* <u>Connections on page 27" for more information on</u> <u>connecting the hydraulics</u>)
 - Jack cylinder hydraulic hoses.
 - CFS Fan / Lift cylinder hydraulic hoses.
 - Wing fold / tilt cylinder hydraulic hoses.
 - Pressure fan hydraulic hoses.
 - Marker lamp harness.
 - ISOBUS harness.
 - Power beyond and free return hoses.
 - Case drain.

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The frame lift/lower and central fill fan circuit runs the lift/lower operations of the toolbar. This circuit also operates the central fill fan.

Connect the 1/2" diameter hydraulic hose labeled case drain to a tractor port with Zero back pressure. This hose must be connected at all times to eliminate any damage to fan seals.

- 10. Start the tractor. Use the tractor hydraulics to lift the machine to the highest position.
- 11. If the wing frames were out during storage, connect the wing cylinders to the wing frames.
- 12. Use tractor hydraulics to fold the wing frames.
- 13. Stop the engine, apply the park brake and take the key with you.
- 14. Remove the wheel chocks or blocks from in front of and behind the support tires.
- 15. Make sure all persons and obstructions are clear before moving the tractor and machine.

3.4.2 Unhitching



Disconnect the tractor from the planter in the transport position only.

Because the planter has negative hitch weight when in working position. Park the planter on a firm level surface in the folded transport position.

- 1. Park the machine on a solid, level surface.
- 2. Lock secondary toolbar in vertically rotated position, use the pins supplied in locations on the tilt bearings.
- 3. Remove the pin from the storage position (1) and put in the locked position (2). Do this procedure in the front and rear bearing locations for each individual wing section (two pins per section).
- 4. Lift the hitch, use the hydraulic jack sufficient to remove the load on the tractor draw-bar for easy hitch pin removal.



Figure 3.6 Tractor Disconnect I

- 5. Remove the pin from the tractor draw-bar and disconnect the safety transport chain between the machine and the tractor.
- 6. Move the tractor draw-bar so the draw-bar does not touch the hitch on the planter.
- 7. Lift the hitch fully with the hydraulic jack, and put the lock pin (3) in the hydraulic jack.



The jack must only be unpinned when you use the jack to connect to a tractor.



Figure 3.7 Tractor Disconnect II

- 8. Release the internal hydraulic system pressure in the tractor.
- 9. Stop the tractor engine, move to the park or neutral position and set the brakes before you dismount from the tractor.
- 10. Disconnect the wiring harnesses and install dust covers on the plug ends.
- 11. Disconnect the hydraulic hoses.

3.5 Hydraulic Connections

The hydraulic hoses on the machine have color-coded, quick-release couplings and there are illustrative decals on the frame to help avoid incorrect connection.



The tractor must always be switched off during connection and disconnection of the hydraulic hoses, otherwise the planter's hydraulics can be damaged.

!

Prior to connecting the hydraulic hoses, always make sure the planter toolbar and the tractor's couplings are clean and free of dirt.

Always begin by connecting the free return and,

Make sure that the hoses are connected in colored pairs to the correct hydraulic couplings

where appropriate, the case drain.

on the tractor.

Hydraulic Circuit	Bands	Dimensions	Tractor Req.	Decal
Case Drain	-	3/8" ISO 16028	-	Unmarked
Load Sense	-	1/4" Male Connector ISO 7241–1 Series A	-	Unmarked
Free Return (for re- turn flow above 50 L/min)	-	3/4" Male Connector ISO 7241–1 Series A	-	Unmarked
Power Beyond	-	3/4" Male Connector ISO 7241–1 Series A	-	Unmarked
Lift/Lower Central Seed Fill Fan		1/2" Male Connector ISO 7241–1 Series A	28 gal/ min 16 gal/	
Wing Fold/Tilt		1/2" Male Connector ISO 7241–1 Series A	10 gal/ min	
Hydraulic Jack		1/2" Male Connector ISO 7241–1 Series A	5 gal/min	
Seed Fan		1/2" Male Connector ISO 7241–1 Series A	16 gal/ min	THEM

Table 3.3 TPK Hydraulic Connections

3.6 Hose Length Adjustment

Adjust the hose length using the hose holder.

When the hydraulic hoses are disconnected from the tractor, they should be secured in the hose holder.



Figure 3.8 Hose Length Adjustment

This is a recommended hose routing shown above. Keep in mind that the hose attached to the hose holder should reach the socket on the tractor.

3.7 Lights



Make sure to check before road transport that the lighting connections are properly attached and that all lights are working. Check that the cables are not at risk of being crushed.



Figure 3.9 Light Power

3.7.1 Work Lights



Work lights must be used when driving on the road.

The work lights are controlled through E-control. <u>Refer to the E-Services Manual for more</u> <u>information.</u>

Work lights on/off is done by plugging in / unplugging the plug in the tractor cab.

3.8 Preparing for Operation



Machine electrical shock and electrocution hazard. Personal injury or death can occur. Keep the machine clear of overhead electrical power lines.



Loss of machine control hazard. Personal injury or death can occur. Travel at a speed that permits complete control of the machine but not to exceed a speed of 15 mph (25 km/h).

Procedure

- 1. Travel at an appropriate speed which allows for proper control of the tractor and machine but not faster than 15 mph (25 km/h).
- 2. Park the machine on a solid, level surface.
- 3. Apply the parking brake, stop the engine and take the key with you.
- 4. Block the wheels.
- 5. Install the cylinder stops.
- 6. Check the draw bar hitch height.
- 7. Check the tractor wheel spacing.
- 8. Do the correct maintenance to the machine.
- 9. Lubricate the machine.
- 10. Check the tire inflation pressure.

3.9 Track Operation

3.9.1 New Track Break-In

Operate the new tracks in dry and dusty soil conditions as soon as possible.

During the break in period, rolling components undergo a polishing in process to get a smooth steel to rubber interface with the guide lug. Rubber uses dust and dirt as a dry lubricant during the break in and operation to the minimum heat and decrease rubber stickiness.

Operation without dust or soil in the system, especially during high speed roading, could result in severe damage to the implement.

If roading must be done, a dry lubricant such as soil, talc, floor dry or cat litter must be applied to the guide lugs in intervals during roading until filed operation continues.

3.9.2 Track Operation

The rubber tracks have not been designed for extended operation on the road. Long road periods and/or roading at higher than recommended maximum speeds of 15 mph (25 km/h) will cause wear or failure of the tracks or wheels. To decrease the damage during roading decrease overall machine weight and decrease machine speed.

An application different from those in this manual is incorrect and dangerous.

Correct track tension is necessary for best performance and track life.

The track system can operate in very bad conditions; for operator and machine safety, be sure to know your surroundings.

The track system is free to pivot around the main axle following the ground conformation. During the change over rough ground terrain, check for interferences and move slowly to prevent over oscillating the undercarriage.

Be sure to know accurate machine height, width and width limits before operation.

Go across large ground irregularities with correct speed reductions and/or correct incidence angle. When high, sharp bumps are crossed move forward slowly to prevent shocks on the machine.

The tracks do not damage standard road-bed contractions. Operator must know and respect road traffic laws.

If you operate on side slopes for a long period you can increase the wear on the side of the guide lugs and idlers.

Keep material out of the undercarriage. Examine the undercarriage daily. This can make it necessary to scrape material out of tight areas and in some conditions it can be necessary to clean and examine more frequently. Remove material as necessary.

If a machine becomes blocked, clear away as much material from the undercarriage as possible before you pull the machine out.

Prevent low speed, high torque turns and operations especially when loaded. Prevent spot turning.

Configure draw-bar and hitch correctly during field operation.

Use caution when you operate track systems in loose flowing material. Loose material can become caught between track and idlers, this can result in track damage.

3.10 Folding the Machine

Procedure

- 1. Start the tractor engine, release the brakes and shift to neutral.
- 2. Fully raise the planter using the tractor hydraulic valve.
- 3. Remove all stop collars.
- 4. Set ball valve to the open position (1) for folding.
- 5. Using the tractor valve activate the fold circuit (red).
- 6. The tongue latch (2) will disconnect and the secondary toolbars (row units) will tilt up 75°.
- 7. The wings will begin to forward fold. Feather the tractor forward to aid in the fold process.



Figure 3.10 Folding Machine I

- 8. Once the wings have completely forward folded and the wing hook frames contact the brace arms, lower the lift circuit (yellow) until the wing axles are completely retracted.
- After wings are folded and hooked onto the brace arms. Install the lock pins from the storage positions

 into the tilt bearing locations in the locked position
 Install these pins at the front and rear bearing locations (P243811) (three per wing). Click pin (P23013).



Figure 3.11 Folding Machine II



Always bring the machine to a complete stop before folding/unfolding. Switching between transport and working positions while in motion may result in damage to the implement.

3.10.1 Transport Locks

The machine is equipped with transport locks and depth stop collars. Remove the transport locks (1) and depth stop collars (2) before moving the machine on roads. When not in use, store the transport locks and depth stop collars in the storage position (3). Install transport locks when machine is completely unfolded before doing any maintenance or service work.



Figure 3.12 Transport Locks Center Section



Figure 3.13 Transport Locks Wing Section

3.11 Unfolding the Machine



When in working position, ensure wing fold cylinders are fully extended prior to field operation.

Before starting the procedure:

- Make sure there is 6.7 m (25 ft) clearance behind the planter for unfolding.
- The tractor must roll slightly as the frame is unfolded. Do not engage the parking brake.



Crushing Hazard. Personal injury or death can occur. Stay clear of machine while the machine components are being operated.



Machine Movement Hazard. Personal injury or death can occur. Park the machine on a solid level surface. Lower all implements to the ground. Stop the engine, apply the park brake and take the key with you.

Procedure

- 1. In the tilt bearings, remove the click pins from the lock pins.
- 2. Install the lock pins in the storage positions.
- 3. Install the click pins in the lock pins. There are (x3) lock pins on the left wing; and (x3) lock pins on the right wing.
- 4. Confirm that the ball valve is in the open position (1) for folding and unfolding.



Figure 3.14 Unfolding the Machine

- 5. Start the tractor engine, release the brakes and shift to neutral.
- 6. Fully raise the planter with the lift circuit (red) to get the frame off the fold rests.
- Using the tractor hydraulics fold the wings out 90°. Feathering the tractor in reverse to aid in the unfold process is required.
- Continue to activate the fold circuit. The left hand and right hand wing tilt system will rotate the row units down 76°.
- 9. Once the row units are fully down, the tongue latch will activate and connect.
- 10. The toolbar is now ready to use and can be raised and lowered with the tractor hydraulic valve (yellow).



Always bring the machine to a complete stop before folding/unfolding. Switching between transport and working positions while in motion may result in damage to the implement.
3.12 Road the Machine

3.12.1 Preparation

Procedure

- 1. Make sure the large frame planter toolbar is connected according to the procedures outlined.
- 2. Fold the planter as described on the previous pages.
- 3. Lock the wings in the transport position. <u>(Refer to</u> <u>Section "3.10 Folding the Machine on page 30")</u>
- 4. Empty all hoppers and tanks before transporting the large frame planter toolbar. The hoppers must be empty. For easier access, empty the tanks when the toolbar is folded.
- 5. Observe all safety precautions.
- 6. Make sure the tracks have been dry lubricated.



New tracks requiring extended transport must be carried on a flat bed and not road-driven. Do not road a new system without first checking the alignment and introducing the tracks to dirt or dry lubricant.

3.12.2 Safety Precautions



Transporting planter may be unstable on rough ground. Travel according to conditions but not faster than 15 mph (25 km/h).



Machine electrical shock and electrocution hazard. Personal injury or death can occur. Keep the machine clear of overhead electrical power lines.

Procedure

- 1. Always install and use the highway safety transport chain.
- 2. Comply with state/local laws governing highway safety and regulations when moving machinery.
- 3. Use good judgement when transporting the tractor implements on the highway. Maintain complete control of the machine at all times.
- 4. Always make the necessary safety precautions prior to transporting the large frame planter toolbar on public roads. This includes maintaining the SMV (Slow Moving Vehicle) emblem and using taillights and side marker lights.
- 5. Never tow the large frame planter toolbar with a tractor having less than 250 hp (187 kW). Transport the toolbar only with a tractor.

/ · \

Loss of Control of the Machine Hazard. Personal injury or death can occur. Travel at a speed that permits complete control of the machine but not to exceed a speed of 15 mph (25 km/h).

3.13 Central Seed Fill System

Central Fill System Legend

- (A) Plenum
- **(B)** Fan
- (C) Central Fill Hoppers
- (D) Splitter Tube



Figure 3.15 Central Fill System

3.13.1 Central Seed Fill — Seed Gate

This is a picture of the plenum assembly. There is a seed gate under each central fill hopper.

The seed gate must be in the open position as shown for proper seed flow. Close the seed gate for plenum inspection.



Figure 3.16 Central Feed Gate

Initial Start Up:

For all crops, the plenum gate should be set to the maximum open setting.

Adjust the tractor hydraulic remote flow to achieve the correct CFS pressure for the seeds being planted. This adjustment should be made to the tractor remote showing a retracting cylinder or a negative sign indicating reverse flow. The following are suggested initial CFS pressures for most common seeds. Actual optimal pressures will vary with seed type, desired seed population and environmental conditions.

Table 3.4 CFS Pressures

Seed	Desired Seed Population	Air Pressure Seeding Fan (psL)	Air Pressure Central Seed Fill Fan (psL)
Corn	24,000 — 48,000 / acre	16" — 17" of water	36" of water
Soy Bea- ns	120,000 — 180,000 / acre	16" — 17" of water	38" of water

3.13.2 Central Seed Fill System Operation

The seed drops down from the main seed tank through the seed gate into the plenum. Air comes into the plenum from the central fill fan. Air travels through perforated holes in the plate to mix with the seed. Air carries the seed to the manifold where the seed is divided into the individual seed tubes. The seed continues through the seed tubes to the row unit. When the row unit is full of seed the air flow is cut off and seed stops flowing. When the seed in the row unit gets low enough the air flow picks up and the seed is again carried to the row unit.



Figure 3.17 Center Fill System

3.13.3 Central Seed Fill Air Pressure

A hydraulically driven blower (1) at the rear of the central fill hoppers maintains air pressure for delivering seed to the row units. Seed is forced through flexible air hoses to the planter seed meter reservoirs.

A splitter tube (2) is connected to the central fill fan.

The splitter tube connects to each plenum (3).



Figure 3.18 Central Fill Air Pressure I

Control the central fill fan air pressure by connecting the central fill fan hydraulic circuit to a tractor circuit with a flow control valve. The central fill fan is part of the raise and lower circuit. Hydraulic flow required is 16 gal/min.



To warm the fluid and prevent pressure spikes, operate blower for 5 to 10 minutes at minimum speed.

3.13.4 Fill the Seed Tanks with the Belt Conveyor (if equipped)

We always recommend mixing talc in the seed to reduce the friction between the seeds and between seeds and seed meter. Talc and seed can be mixed directly in the seed hopper.

Procedure

- 1. Open the tank cover.
- 2. Slide the top of the conveyor over the tank fill hole.
- 3. Move the selector valve (1) out, to the upper position. This will allow the oil to flow to the flow control valve.
- 4. Activate the tractor remote.
- 5. Adjust the flow control valve (2) to set the desired speed of the belt.
- 6. After the seed tanks are full, move the selector valve in, to the lower position.



Figure 3.19 Belt Conveyor

Operation

3.13.5 Remove the Seed from the Central Seed Fill System

Procedure

- 1. Park the machine on a solid level surface.
- 2. Lower the machine to the ground and apply the park brake.
- 3. Block the wheels.
- 4. First close the gate (1). To close the gate push the plate toward the rear of the planter.
- 5. Stop the Central Seed Fill fan.
- 6. Remove the cap (2).
- 7. Connect a 3 inch hose to the plenum where the cap was located.
- 8. Start the fan and open the gate 1-1/2 inches to blow seed into a vented container. To open the gate, pull the plate toward the front of the planter.
- 9. Make sure the tank lid is sealed on the main seed hoppers to prevent the clean-out hose from plugging.



Figure 3.20 Removing Seed I

- 10. Start the Central Seed Fill fan to blow the seed out of each plenum (3) and all the horizontal seed tubes into a vented container.
- 11. Stop the Central Seed Fill fan.



Figure 3.21 Removing Seed II

3.14 Lamp Operation

The machine lighting system includes a turn signal module that causes the machine lamps to operate differently than some tractor / machine lighting systems.



For lamp operation, the tractor hazard flashers must be ON or the machine lamps will not operate.

3.14.1 Day Operation

Table 3.5 Lamp Operation

	Machine Lamps									
Machine Operation	Left-hand Amber Lamp	Left-hand Tall/Stop Lamp	Right-hand Amber Lamp	Right-hand Tall/ Stop Lamp						
Straight Line	Flashing	Solid	Flashing	Solid						
Stopping	Flashing	Solid	Flashing	Solid						
Left Turn	Flashing	Flashing	Solid	Solid						
Right Turn	Solid	Solid	Flashing	Flashing						

3.15 Field Operation

3.15.1 Operate in the Field

Personal injury or machine damage can occur. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.



Dust / Fume Inhalation Hazard. Personal injury can occur from asphyxiation or chemical burn. Read, understand and follow the manufacturer's label instruction when handling and cleaning up agricultural chemicals.



Moving Parts Hazard. Personal injury or death can occur. Shift to park and apply the park brake. Make sure all persons are clear of moving parts during this adjustment procedure.



Whole Body Crushing Hazard. A loss of hydraulic pressure or movement of the mechanism can cause the raised machine component to fall. Personal injury or death can occur. Install the lift cylinder stops before working on the machine to prevent movement.

Procedure

- 1. Unfold the machine. <u>(Refer to Section "3.11</u> <u>Unfolding the Machine on page 32")</u>
- Confirm that the ball valve is in the closed position

 for planting.
- 3. Lower the machine to the operating position.



- 4. Adjust the initial settings.
 - All row unit down pressure adjustment.
 - All row unit attachment adjustment.
 - Put the fertilizer in the fertilizer tank.



Figure 3.22 Operate in the Field

3.16 Center Section (Leveling)



Figure 3.23 Leveling I

The center section (1) is set to run one inch higher than the wings (2). The center section carries more weight than the wings. When operating in the field the center section and the wings should all run level.

If operating in soft ground, the center section can be set to run higher by adding bolts and washers in the link arms (1) as shown below. When using the cylinder stops, the cylinder stops must be used on all the lift cylinders.

On the link arm with the 4-1/2 cylinder (1), use four 3/4 x 2-1/2 G5 Hex Bolts (2), eight 3/4 flat washers (3), and four 3/4 lock nuts (4). Flat washers can be added to raise

the bolts higher or lower as desired. Make sure to add this hardware to both sides to prevent any twisting on the lift arms.

When toolbar is set, cylinder stops (5) must be added to all main lift cylinders and to all wing lift cylinders to set the toolbar height to the desired level.



Recommended Start Setting: Install red cylinder stops on all cylinder locations, providing



Figure 3.24 Leveling II

3.17 Planting Recommendations

3.17.1 Output Settings for Sowing / Planting

3.17.1.1 Output Settings Matrix

Explanation of Seed Disk Type No.

- (A) Number of holes, which gives 32 in the example.
- **(B)** The holes diameter is given in 1/10 mm, which gives 5.5 mm in the example.

Table 3.6 Output Settings Matrix

• (C) Number of agitators, which gives 32 in the example.



Figure 3.25 Seed Disk Type No. Example

Сгор	TKW (Thou- sand Kernel Weight) (g)	Seed Disc Type & No.	Cleaning Wheel	Position of Slid- ing Hatch	Position of Slid- ing Hatch (CF ¹)	Insert (Central Seed Fill)	Singula- tor Basic Setting	Seed Feed Housing Pressure (kPa)	Tank Pressure (CF ¹) (kPa)
Maize	-150	3240P- 32	Grey/7	9	4	А	4	3, 5	6, 0
Maize	150–250	3250P- 32	Grey/7	9	4	А	4	3, 5	7, 0
Maize	250-350	3255P- 32	Grey/7	9	4	А	4	3, 5	7, 5
Maize	350-2	3260P- 32	Grey/7	9	4	А	4	3, 5	8,0
Rapeseed	3–5	12112P- 32S	Red/9	2	1	В	7	2, 3	4, 5
Rapeseed	6–	12114P- 32S	Red/9	2	13	В	7	2, 3	4, 5
Sugar Beet	All	4125P- 32S	Red/9	2	22	В	7	2,8	5, 5
Sunflow- er	-40	2125P- 21	Yellow/5	9	4	А	2	3, 3	5, 0
Sunflow- er	40–60	2130P- 21	Yellow/5	9	4	А	2	3, 2	5, 5
Sunflow- er	60–80	2135P- 21	Yellow/5	9	4	А	2	3, 2	6, 0
Sunflow- er	80–1	2140P- 21	Yellow/5	9	4	А	2	3, 2	6, 5
Soya	125–260	12040F- 21	Blue/24	7	5	А	9	3, 5	7, 0
Sorghum	25–45	8323P- 32	Red/9	7	4	В	6	3, 5	7, 0
Cotton	All	6535P- 32	Grey/7	9	5	А	7	3, 3	6, 5

^{1.} Central Fill

^{2.} For kernels larger than 15 mm, use 22 mm sowing tubes.

^{3.} Use insert as described in section Seed Meter Central Seed Fill (option).

3.17.1.2 Theoretical Maximum Speed (km/h)



Note that the speed indication is only a *theoretical* maximum speed. Always adjust your speed to suit the prevailing field conditions!

Table 3.7 Seed/ha I

CM	-		21					32			
		45 cm	50 cm	70 cm	75 cm	80 cm	45 cm	50 cm	70 cm	75 cm	80 cm
	50 000					18, 9					
	60 000			18, 0	16, 8	15, 8					
	70 000			15, 4	14, 4	13, 5					
	80 000		18, 9	13, 5	12, 6	11, 8					18, 0
	90 000	18, 7	16, 8	12, 0	11, 2	10, 5			18, 3	17, 1	16, 0
	100 000	16, 8	15, 1	10, 8	10, 1	9, 5			16, 5	15, 4	14, 4
	110 000	15, 3	13, 7	9,8	9, 2	8,6			15, 0	14, 0	13, 1
	120 000	14, 0	12, 6	9,0	8,4	7,9		19, 2	13, 7	12, 8	12, 0
	125 000	13, 4	12, 1	8,6	8, 1	7,6		18, 4	13, 2	12, 3	11, 5
	150 000	11, 2	10, 1	7, 2	6,7	6, 3	17, 1	15, 4	11, 0	10, 2	9,6
	175 000	9,6	8,6	6, 2	5, 8	5,4	14, 6	13, 2	9,4	8, 8	8, 2
	200 000	8,4	7,6	5, 4	5,0	4, 7	12, 8	11, 5	8,2	7,7	7, 2
	225 000						11, 4	10, 2	7,3	6, 8	6, 4
	250 000						10, 2	9, 2	6,6	6, 1	5, 8

Operation

Table 3.8 Seed/ha II

CM	-		41					65			
		45 cm	50 cm	70 cm	75 cm	80 cm	45 cm	50 cm	70 cm	75 cm	80 cm
	100 000		-		19, 7	18, 5	-			-	
	110 000			19, 2	17, 9	16, 8					·
	120 000			17, 6	16, 4	15, 4					
	125 000			16, 9	15, 7	14, 8					
	150 000		19, 7	14, 1	13, 1	12, 3					19, 5
	175 000	18, 7	16, 9	12, 0	11, 2	10, 5			19, 1	17, 8	16, 7
	200 000	16, 4	14, 8	10, 5	9, 8	9, 2			16, 7	15, 6	14, 6
	225 000	14, 6	13, 1	9,4	8,7	8, 2			14, 9	13, 9	13, 0
	250 000	13, 1	11, 8	8,4	7,9	7,4		18, 7	13, 4	12, 5	11, 7
	300 000	10, 9	9, 8	7,0	6, 6	6, 2	17, 3	15, 6	11, 1	10, 4	9, 8
	350 000	9,4	8,4	6, 0	5,6	5, 3	14, 9	13, 4	9,6	8,9	8, 4
	400 000						13, 0	11, 7	8,4	7,8	7, 3
	450 000						11, 6	10, 4	7,4	6, 9	6, 5
	500 000						10, 4	9, 4	6, 7	6, 2	5, 9
	600 000						8,7	7,8	5,6	5,2	4, 9

Operation

Table 3.9 Seed/ha III

CM			83					120			
		45	50	70	75 cm	80	45 am	50	70	75 cm	80
	175.000	CIII	CIII	CIII	CIII	CIII	CIII	CIII	CIII	CIII	CIII
	200 000					18, 7					
	225 000				17, 7	16, 6					
	250 000			17, 1	15, 9	14, 9					
	300 000		19, 9	14, 2	13, 3	12, 5				19, 2	18, 0
	350 000	19, 0	17, 1	12, 2	11, 4	10, 7			17, 6	16, 5	15, 4
	400 000	16, 6	14, 9	10, 7	10, 0	9, 3			15, 4	14, 4	13, 5
	450 000	14, 8	13, 3	9, 5	8,9	8, 3		19, 2	13, 7	12, 8	12, 0
	500 000	13, 3	12, 0	8,5	8,0	7,5	19, 2	17, 3	12, 3	11, 5	10, 8
	600 000	11, 1	10, 0	7, 1	6, 6	6, 2	16, 0	14, 4	10, 3	9,6	9, 0

3.18	Notes

4 Troubleshooting

Electrical, hydraulic and mechanical components are used to control the machine. Work methodically and, step by step, eliminate possible sources of error using the troubleshooting page.

4.1 Hydraulic Electric Valves



Figure 4.1 Hydraulic Electric Valves

An electric valve has a coil which acts as an electromagnet when an electrical current is connected to the valve. It is easy to determine whether or not the power is on:

- The connecting contact's coil becomes warm after a few minutes. The top nut will also become magnetized.
- Use a small chisel or the side of a blade to determine whether or not the top nut has become magnetic. The nut is always weakly magnetic, so try both with and without power.

4.2 Hydraulic Fault

General checks in the event of hydraulic faults:

- Check that the hydraulic hoses are connected to the correct socket on the tractor. Hoses with the same colour coding constitute a pair.
- Make sure the hydraulic quick coupler are designed for and suited to the tractor's couplings. There is a wide variety of connectors on the market, all standardized but still there are problems. Problems can manifest themselves so that female and male couplings operate as non-return valves, that is, that a machine can be raised but not lowered or vice versa. The problem may be aggravated by a large flow or worn couplings.

4.3 Inductive Sensor



Figure 4.2 Inductive Sensor

- Reacts to metal objects passing within a distance of 1 - 1.5 mm.
- Function testing can be carried out easily, since a diode at the rear of the sensor lights up each time an object is detected.

4.4 Capacitive Sensor



Figure 4.3 Capacitive Sensor

- Reacts to objects that contain moisture, for example grain or a hand, and so on.
- Function testing is easily carried out since a diode at the rear of the sensor lights up each time such an objects is detected.
- The sensitivity of the sensor can be adjusted by use of the screw next to the LED. Various types of grain and fertilizer contain different amounts of moisture. For this reason, adjustment may be necessary under certain conditions.

4.5 Seed Counter / Sensor



Figure 4.4 Seed Counter / Sensor

- The seed counter is equipped with an LED.
- Using colors, the seed counter's sensor indicates different event situations.

Table 4.1 Seed Counter LED States

Color	Event
Steady Green	No material passing.
Blinking Green	Seed passing.
Steady Yellow	1 — 10 second longer steady light, dirty sensor. If necessary, clean the sensor. <u>(Refer to Cleaning and</u> <u>replacing the seed counter in the Row</u> <u>Unit Manual</u>)
Blinking Yellow	Starting up or calibration.
Steady Red	Insufficient voltage or the cable may be incorrectly connected.
Blinking Red	The sensor is dirty and needs cleaning.

4.6 List of Conditions for Seed Output

The machine is in working mode

- If the machine has been raised above the 'output start' level, metering will not begin until the machine height comes under the 'output start' level.
 - For machines with ISOBUS cable 11783 and 11786.
- If the machine has been raised above the 'output stop' level, but not above the 'output start' level, output will begin when the machine height comes under the 'output stop' level.
 - For machines with ISOBUS cable 11783 and 11786.
- The user has clicked on 'exit transport mode' on the dashboard.
- Speed > 1.5 mph (2 km/h)

Calibration

- Seed distance calibration is > 0 and feed rate is > 0.
- The seed disc is set at > 0 holes.

Other

- 'Master feed' seed is activated.
- No critical alerts are active.
- Row units are activated.
- The motor outputs are correctly mapped.

4.7 Troubleshooting the Tempo K

Table 4.2 Troubleshooting the TPK I

Issue	Possible Solution(s)
The home screen does not show any air pressure although the fan is running.	Check that the speed sensor to the fan is functioning.
The planting depth is not constant in stiff and/or	Increase weight transfer on the row unit.
hard soil.	Reduce the spring force of the fertilizer unit.
The seeds are lying very irregularly in the	Check the position of the stop wheel on the row unit. Lower the wheel if necessary.
Turrows.	Check for wear on the top of the seed sensor.
The seeds are being pressed too firmly in the furrows.	Check the position of the stop wheel on the row unit. Raise the wheel if necessary. Do not adjust so much that the seeds "sneak in under" the wheel.
The furrow is not being closed properly.	Increase the force on the closing wheels or adjust the working angle.
The seed is not lying on the bottom of the furrow.	Check id the seed discs are badly worn and no longer have contact with each other. Adjust the seed discs.
	Check that the seed pressure is 3.5 kPa (0.035 bar).
	Check that the air grille in the seed meter (accessory for some models) is clean and free from dust and plant residue.
The home screen displays lots of skips.	Check that the seal on the cover of the seed meter is sitting properly and is not worn or leaking.
	Check the settings of the singulator.
	Check that the singulator is not damaged.
	Check that the correct knock out wheel is installed.
	Check the functioning of the knock out wheel and that the hole in the seed disc is not clogged.
	Check that the correct seed disc is installed.
	Try using a seed disc with a larger hole.
	Check that the seed disc (electric motor) can be rotated relatively easily by hand.
	Check the position of the sliding hatch and, if necessary open it a little.
	Check that the air pressure is 3.5 kPa (0.035 bar).
	Check the settings of the singulator.
	Check that the seal on the cover of the seed meter is sitting properly and is not worn or leaking.
The home screen displays lots of doubles	Check that the singulator is not damaged.
The nome screen displays lots of doubles.	Check that the singulator rollers are not worn or difficult to turn.
	Check that the correct seed disc is installed.
	Try using a seed disc with a smaller hole.
	Check the position of the sliding hatch and, if necessary close it one or two steps.

Troubleshooting

Table 4.3	Troubleshooting the T	PK II

Issue	Possible Solution(s)
	Check that the air pressure is 3.5 kPa (0.035 bar).
The circulator must be get to a year low value	Check that the singulator is not damaged.
The singulator must be set to a very low value.	Check that the correct seed disc is installed.
	Try using a seed disc with a smaller hole.
	Check that the air grille in the seed meter (accessory for some models) is clean and free from dust and plant residue.
	Check that the air pressure is 3.5 kPa (0.035 bar).
	Check that the singulator is not damaged.
The singulator must be set to a very high value	Check that the correct seed disc is installed.
The singulator must be set to a very high value.	Try using a seed disc with a larger hole.
	Check that the seed disc (electric motor) can be rotated relatively easily by hand.
	Check that the seal on the cover of the seed meter is sitting properly and is not worn or leaking.
	Check the setting on the iPad to ensure that the row unit is not shut off.
	Make sure that the interior of the seed meter is free from contamination.
	Make sure the outlet and seed tube are not blocked or clogged.
	Check that the air grille is clear of dust and plant residues.
	Check the settings of the singulator.
	Check that the singulator is not damaged.
A seed meter is not outputting any seed.	Check the functioning of the knock out wheel and that the hole in the seed disc is not clogged.
	Check that the correct seed disc is installed.
	Check that the seal on the cover of the seed meter is sitting properly and is not worn or leaking.
	Check that the seed disc (electric motor) can be rotated relatively easily by hand.
	Check that the connectors and cables are intact and undamaged.
	Make sure that the sliding hatch is open and properly installed. If necessary, open the hatch a little more.
Pulsations occur in P or LS hose.	Carefully turn V4 clockwise until the pulsations disappear. Tighten the counter nut.

4.8	Notes

5 Maintenance

5.1 Maintenance Schedules

The following will list standard checks, frequency and other information regarding repairs.

Table 5.1 Maintenance: Tempo K Planter Bar

Component	Freq. (Hrs)	Procedure
Lubricate the Hitch	Weekly (40)	Lubricate with pressure gun, using multi-purpose grease.
Lubricate the Wing Brace Front and Rear Hinge	Weekly (40)	Lubricate with pressure gun, using multi-purpose grease.
Lubricate the Wing Pivot Points	Weekly (40)	Lubricate with pressure gun, using multi-purpose grease.
Lubricate the Main Hinge RH & LH	Weekly (40)	Lubricate with pressure gun, using multi-purpose grease.
Lubricate the Upper Link Arm	Daily (8)	Lubricate with pressure gun, using multi-purpose grease.
Lubricate the Toolbar Bearing	Daily (8)	Lubricate with pressure gun, using multi-purpose grease.
Lubricate the Main Lift Bearings — 4 Cylinders	Daily (8)	Lubricate with pressure gun, using multi-purpose grease.
Lubricate the Tilt Cylinders	Weekly (40)	Lubricate with pressure gun, using multi-purpose grease.
Lubricate the Wing Fold Cylinders	Weekly (40)	Lubricate with pressure gun, using multi-purpose grease.
Lubricate the Wing Lift Cylinders	Daily (8)	Lubricate with pressure gun, using multi-purpose grease.
Lubricate the Track — Center Pivot	Weekly (40)	Lubricate with pressure gun, using a NLGI GC-LB equivalent grease.
Lubricate the Track — Frame Pivot	Weekly (40)	Lubricate with pressure gun, using a NLGI GC-LB equivalent grease.
Lubricate the Track — Boggie Pivot	Weekly (40)	Lubricate with pressure gun, using a NLGI GC-LB equivalent grease.
Lubricate the Track — Repack Bearings	End of Season	Lubricate with pressure gun, using a NLGI GC-LB equivalent grease.
Lubricate the Track — Stabilizer Bars	Weekly (40)	Lubricate with pressure gun, using a NLGI GC-LB equivalent grease.



Wheel Bearing Assemblies: The spindle nuts on the wheel assemblies are set at the factory. Road transport and work in the field will seat the bearings. More adjustment on the wheels will be necessary on the machine after 20 hours of operation. Remove the grease cap and tighten the bearings. Remove the cotter pin and turn the tire while you tighten the spindle nut. Tighten until the drag on the tire stops the turn. Find the cotter pin hole in the spindle and loosen the spindle nut sufficient to put in the cotter pin. Replace cotter pin and grease cap.

5.2 Tools

To make maintenance and service work easier, the machine's mounting elements are standardized. No special tools are required for daily maintenance.

Recommended Tools

- 2 Torx Screwdrivers T20 & T25
- 1 Socket Wrench no. 24
- 1 Socket Spanner no. 10
- Brush for cleaning the Seed Meter's Sensor
- Cabinet Screwdriver
- Small Allen Keys
- Ring-open-end Spanners (Sizes 12, 13, 16, 17, 18, 19, 22, 24 and 30)
- Torque Wrenches with a torque range of 0.7 516.3 ft/lbs. (1 700 N.m)

If a torque wrench is not available, the example below may be of use.



Figure 5.1 Torquing Example

5.3 Checklists

5.3.1 Beginning of the Day

- Do the daily lubrication.
- Check 16.5 x 12 wing tire pressure. Inflate to 50 psi (344 kPa) or maximum listed on tire sidewall.
- Inspect the condition of the tracks.
- Check the alignment of the tracks.

5.3.2 End of the Day

Clean collected chemicals off of the planter.



Use same precautions as in the chemical manufacturer's instructions when you clean up chemicals as when you fill the toolbar. Failure to do so can cause injury.

- Repair damage that occurred during the day.
- If the toolbar will not be used for a period of time, layer the surface that touches soil with the correct rust preventative.
- Examine the track system for material build-up on frames and wheels. Clean material from the undercarriage.
- Examine the tracks for oil leaks on the idler, midroller hubs and pivot axles. If leaks are recorded, check oil level of the hub to make sure the oil is up to the fill hole when on a level surface.
- Check the rubber track alignment daily by inspecting the guide lugs. If wear or chunking of the guide lug occurs, track alignment adjustment can be necessary.
- Inspect the track surface to remove embedded stones or debris. Steel wire can come out from the track carcass without effect on the performance of the track. Cut the wire at the rubber surface to remove loose wires.
- Clean the hydraulic oil cooler fins (or optional screen).
- Clean seed coating residue off the seed discs with soap and hot water.

5.3.3 Beginning of the Season

- Lubricate the machine. <u>Refer to Section "5.1</u> <u>Maintenance Schedules on page 50".</u>
- Make sure all the chemical tanks and the hoppers are clean and dry before filling.
- Clean the monitor harness connections with the correct electrical contact cleaner.
- Check the tire pressure.

5.3.4 When Storing for Longer Periods



Use same precautions as in the chemical manufacturer's instructions when you clean up chemicals as when you fill the toolbar. Failure to do so can cause injury.

- Make sure that the machine has been emptied and thoroughly cleaned.
- Clean all chemicals from the hoppers, tanks, tubes, spreaders, discs and areas where chemicals collect.
- Replace damaged parts.
- Check the hydraulic hoses for leaks and abrasions. Replace as necessary.
- Remove the iPad from the tractor and store in a clean dry location.
- Disconnect the battery to prevent current leakage discharging from the battery.



The control bos and the battery should be stored at room temperature when stored for long periods.

- Store the toolbar away from livestock.
- When the machine is not being used, it should be stored indoors. This is very important given that the machine has electronic instruments.
- Securely block the machine wheels.
- Machine parts with a bright finish, such as piston rods and wearing parts, should be treated with rust protection before longer storage periods.
- If you have tight-fitting covers with rubber seals, they must be stored open to relieve pressure and thus prevent deformation.



Overhead Crushing Hazard. Movement of the mechanism can cause the lifted machine components to fall. Injury or death can occur.

5.4 Adjustment for Field Position



Figure 5.2 Field Position Adjustment I

Field Position Adjustment Legend

- (A) Inner Wing
- **(B)** 1 x 3–1/2 Bolt
- (C) 2 x 8–3/4 Pin
- (D) 5/8 Nut
- (E) 5/8 x 2 Bolt
- (F) Rear Hinge
- (G) Space Plate
- (H) Front Hinge
- (I) 1.00 Nut
- (J) 2 x 6–3/4 Pin
- (K) 5/8 Bolt
- (L) Wing Brace

Adjustment Procedure

- Unfold the planter to the filed position.
- Lower the toolbar down to the lowest position.
- Use a suitable hoist or stand to support the win brace.
- Loosen the four $1 \ge 3-1/2$ bolts (2).
- Add or remove the spacer plates until wings are in the desired position. The spacer plate will slide out from the bottom.

- Tighten the bolts.
- Repeat these steps for the other wing.



Figure 5.3 Field Position Adjustment II

5.5 Hydraulic Belt Drive

5.5.1 Maintenance & Service of the Hydraulic Motor

- After operating for 500 700 hectares, we recommend a careful check of the fan and the fan belt.
- Make sure the belt is properly tensioned in accordance with the recommendations. The belt must be tensioned correctly for optimum life. Insufficient or excessive belt tension will reduce belt life.
- Also make sure that the belt shows no signs of wear.

Never use force to tension the belt, e.g. prying it with a screwdriver. Regular checking of the tensioning of belts ensures their optimum working life.

A spare drive belt should always be available.

5.5.2 Check for Tension & Wear of the Belt



Figure 5.4 Belt Inspection

- 1. Loosen the four screws (B) completely to remove the cover (C), so the belt (A) is visible.
- 2. Check the tensioning of the belt. Adjust if necessary. (Refer to Section "5.5.3 Adjusting the Tension of the <u>Belt")</u>

Check the belt for wear. Replace if necessary.

5.5.3 Adjusting the Tension of the Belt



Figure 5.5 Belt Tension I

- 1. Use the handles **(B)** to remove the cover **(A)**.
- 2. Loosen the screw (**D**) in the long narrow hole.
- 3. Insert a 1/2 inch breaker bar into the square hole (C) and rotate the generator to increase the tensioning on the belt.

For TPL 24-32

- Push the belt in 7 mm.
- Measure the force F of the new belt: F = 50 N

For Other Tempo Models

- Push the belt in 4.2 mm.
- Measure the force F of the new belt: F = 21.3 N



Figure 5.6 Belt Tension II

- 4. Tighten the screw (D).
- 5. Using the handles (B), replace the cover (A).

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5.5.4 Fan Noise

Noise Level: 83.6 dB (A).

Sounds Output: 104.4 dB (A).

Microphone positioning according to standard EN ISO 4254–1, measuring uncertainty ± 2 dB (A).

5.5.5 Replacing the Belt

1. Release the belt tension in accordance with <u>Section</u> <u>"5.5.3 Adjusting the Tension of the Belt".</u>



Figure 5.7 Replacing the Belt I

2. Loosen the screws that hold the side plate (**B**) to the fan house (**A**) and lift the side plate (**B**) together with the drive unit (**C**).



Figure 5.8 Replacing the Belt II

3. Loosen the screws that hold the side plate (B) to the drive unit (C).



Figure 5.9 Replacing the Belt III

4. Remove the central screw (D).



Figure 5.10 Replacing the Belt IV

- 5. Use a puller (E) to release the fan wheel (F).
- Pull the fan wheel (F) off is shaft. Let the side plate (B) follow along.
- 7. Change belt (G).
- 8. Push the fan wheel back on to the shaft and assemble the fan wheel and side plate with the drive unit. Use the service hatch (H) to make sure the belt ends up in the correct position.
- Loosen the screws that hold the side plate to the drive unit. <u>Refer to "Figure 5.8 Replacing the Belt II on</u> page 55"; tightening torque 8 N.m.
- 10. Fasten the centre screw (**D**). <u>Refer to "Figure 5.8</u> <u>Replacing the Belt II on page 55"; tightening torque</u> <u>25 N.m.</u>
- 11. Fasten the screws that hold the side plate, fan wheel and drive unit to the fan housing. <u>Refer to "Figure 5.7</u> <u>Replacing the Belt I on page 55".</u>
- 12. Adjust the belt tension in accordance with <u>Section</u> <u>"5.5.3 Adjusting the Tension of the Belt on page 54"</u>.

5.6 Track System

5.6.1 Track Tension

The tension is set at the factory and no adjustment during operation is necessary. The track system is prepared to de-tension to let you align the rubber track.

5.6.2 Align the Track

Procedure

1. Remove the retainer lock plate cap screws (1) and lock plate (2) from the inboard and outboard sides of the track that it is necessary to adjust.



Figure 5.11 Align the Track

- 2. Loosen the cap screw (3) counterclockwise 1.0 to 1.5 turns on the side of the undercarriage that is necessary for the track to move towards.
- 3. Tighten the cap screw on the opposite side to (221 lb/ ft) (300 N.m). Tighten the cap screw that was loosened first to 221 lb/ft (300 N.m).



• One full turn is the standard increment during adjustment. Decrease this quantity as you near the last adjustment.

- 4. Check the track alignment again. Adjust until you near correct clearance on the two sides of the guide lugs.

Lock plates are reversible for double the index increments. If necessary, increase the torque on the special cap screw to let small advancement to a correct lock plate position.

5. When alignment is complete install the lock plates and tighten the cap screws to 95 lb/ft (130 N.m).

5.7 **Bleeding Air from the Hydraulic Lift** System

Before starting the procedure.



Leaking fluid under pressure can enter the skin causing serious injury. Release pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Wear correct hand and correct eye protection when looking for leaks. Use a piece of cardboard or paper instead of your hand. Any fluid injected into the skin can cause gangrene. The fluid must be removed by a doctor familiar with this type of injury.



Be careful of sweeps or blades when folded to prevent serious injury.

To bleed the air from the hydraulic lift system, connect the machine to a tractor that is the correct size to operate the machine. Refer to Section "6.1 Implement Specifications on page 65".

Total volume of oil required to fill the lift system is 16 gallons (estimated).

The lift system is filled with hydraulic oil for the first time.

Air has entered the hydraulic system through a leak or through repair of the hydraulic system.

Procedure

- 1. Park the machine on a flat, level surface that is large enough for the machine when unfolded.
- 2. Set the tractor hydraulic flow to less than 20 gal/min (75.7 L/min) the hydraulics will not operate correctly.
- 3. Connect the lift system hoses to the tractor.
- 4. Make sure the tractor reservoir is full of the hydraulic oil required by the manufacturer.

Do	r
C	

not loosen any hydraulic fittings to bleed air from the system.

- 5. Raise the machine. Continue to hold the tractor lever to let oil bypass and fill each wing lift cylinder.
- 6. Engage the hydraulics to remove any hydraulic transport locks if equipped.
- 7. Stop the engine, apply the park brake and take the key with you.
- 8. Remove the transport locks when all lift cylinders are fully extended.
- 9. Lower the unit. Make sure the cylinders move at the same time through the cycle.
- 10. Hold the hydraulic lever with the cylinders fully extended.
- 11. If the cylinders are not operating together, cycle the cylinders to remove the remaining air.

Do not loosen any hydraulic fittings to bleed air from the system.

- 12. Stop the engine, apply the park brake and take the key with you.
- 13. Check the tractor hydraulic oil reservoir to make sure the hydraulic oil is still within operating limits.
- 14. Make sure all lift cylinders are operating together before starting any field operation.
- 15. Fully raise the machine when making turns during field operation. This will make sure that the cylinders are operating together and keep the machine level during operation.

5.8 Bleeding Air from the Hydraulic Fold System

Leaking fluid under pressure can enter the skin causing serious injury. Release pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Wear correct hand and correct eye protection when looking for leaks. Use a piece of cardboard or paper instead of your hand. Any fluid injected into the skin can cause gangrene. The fluid must be removed by a doctor familiar with this type of injury.



Be careful of sweeps or blades when folded to prevent serious injury. Never keep the machine with the wings in the folded position.



Do not fold or unfold the fold system before bleeding air from the fold system.

To bleed the air from the hydraulic fold system, connect the machine to a tractor that is the correct size to operate the machine. <u>*Refer to Section "6.1 Implement*</u> <u>Specifications on page 65"</u>.

Total volume of oil required to fill the fold system is 24 gallons (estimated).

Completely bleed the hydraulic system of air when:

- The fold system is filled with hydraulic oil for the first time.
- Air has entered the hydraulic system through a leak or through repair of the hydraulic system.

Procedure

1. Set the tractor hydraulic flow to less than 20 gal/min (75.7 L/min).



If the hydraulic flow is set to more than 20 gal/ min (75.7 L/min), the hydraulics will not operate correctly.

- 2. Stop the engine, apply the park brake and take the key with you.
- 3. Connect the fold system hoses to the tractor.
- 4. Make sure the tractor reservoir is full of the hydraulic oil required by the manufacturer.

Do not loosen any hydraulic fittings to bleed air from the system.

- 5. Remove the pins from the rod ends of the fold cylinders.
- 6. Make sure the rod ends of the fold cylinders will not come into contact with any obstructions. If a blockage is present, lift the rod ends of the fold cylinders.
- 7. Use the remote level in the tractor to fully extend and retract the fold cylinders. Extend and retract multiple times.
- 8. If the fold cylinders are not operating together, cycle fold cylinders to remove the remaining air.

Do not loosen any hydraulic fittings to bleed air from the system.

- 9. Stop the engine, apply the park brake and take the key with you.
- 10. Check the tractor hydraulic oil reservoir to make sure the hydraulic oil reservoir is still within operating limits.
- 11. Connect rod ends of fold cylinders to the machine.
- 12. Find an area large enough for the machine when unfolded.
- 13. Park the machine on a solid, level surface. Stop the engine, apply the park brake and take the key with you.
- 14. With the tractor at a low idle, slowly engage the hydraulics to fold and unfold the machine.
- 15. Fully extend the fold cylinders to let the wings flex freely.

5.9 Cleaning Procedures

5.9.1 CFS Clean-Out Procedure

- 1. When tank runs empty; Open seed gate all the way.
- 2. Turn off CFS Fan.
- 3. Open lid on tank being cleaned out and brush away any left over product down into plenum. Close tank lid and latch.
- 4. Close the seed gate.
- 5. Connect clean out hose to plenum, turn on CFS fan to blow seeds out of tank/plenum.

5.9.2 Row Unit / Seed Meter Clean-Out Procedure



Raise machine row units to allow easier access. Turn off fans.

- 1. Remove seed meter cover.
- 2. Place something under the meter assembly to catch seed.
- 3. Remove seed disk, move sliding latch and leave in fully open position.
- 4. Repeat for all meters/row units.
- 5. With all meters open and CFS gates closed. Lower machine to start CFS fan. CFS system will blow out through the meters.



Verify CFS system was cleaned out. Product left in tanks will blow out.

 Once satisfied that system is cleaned out, reinstall seed disk and seed meter cover and set sliding latch to desired setting indicated in <u>"Table 3.6 Output Settings</u> <u>Matrix on page 40".</u>

5.10 Lubrication Points

See the machine specifications for the correct lubricant.

Shut off the engine, lower the machine to the ground, set the parking brake and the key with you.

Make sure to clean the lubrication fittings fully before connecting the grease gun.

Watch each lubrication point while lubricating to make sure the lubricant applies correctly.

Check for any loose, missing, or worn parts when lubricating the machine.

Check the lubrication service schedule for the correct lubrication interval.

Wil-Rich 460ep Lubricant

Wil-Rich 460ep lubricant is recommended in Wil-Rich Wishek and Concord bearings and fittings. Wil-Rich 460ep lubricant is not an all-purpose grease. Because of the heavy weight of the grease, it should not be used at high-speeds or in small bearings. If you have questions about the grease you are using, please contact your Wil-Rich representative for assistance (P240799 10pk).



Figure 5.12 Wil-Rich 460ep Lubricant

5.10.1 Sealed bearings

Sealed bearings are used to give trouble free operation with a minimum of maintenance and lubrication.

Sealed bearings are lubricated for life. Because of the type of seal, lubricant cannot be added.

If a seal is damaged, replace the sealed bearing.



The bearings used on some components must be lubricated.



Figure 5.13 Lubrication Points — Overview

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Interval

Each week

Interval

Each week



Pos.	Lubrication point	Interval
7	Wing lift cylinders (2x)	Each week

4	Wing fold cylinders (2x)	Each week
Pos.	Lubrication point	Interval





Pos. Lubrication point Interval 10 Tracks See separate Camso Operation and Maintenance Manual

5.11 Wheel Bearing Assemblies

The spindle nuts on the wheel assemblies are set at the factory.

Road transport and field work will seat the bearings. More adjustment on the bearings will be necessary. After 20 hours of machine operation remove the grease cap and check if the bearings are tight.

Remove the cotter pin and turn the tire while you tighten the spindle nut. Tighten until the drag on the tire turn stops. Put the cotter pin hole in the spindle and loosen the spindle nut sufficient to put in the cotter pin. Replace cotter pin and grease cap.



Figure 5.14 Wheel Bearing Assemblies

5.12 Prime the Hydraulic Circuits

Before you release air from (priming) the hydraulic circuits, select an area with a hard, level surface sufficient to let the wings fully extend. Also, have space in front of and behind the tractor.



It is necessary for the planter hydraulic system to have approximately 25 gal of fluid. Make sure to examine tractor fluid supply frequently when priming circuits and add as necessary.



Use the tractor to help pull the wings forward to fold up the planter toolbar. Use the tractor to push the wings rearward to unfold the planter toolbar.



To prevent personal injury, make sure each person is clear of the planter before you continue to fold or unfold the planter.

Procedure

The hydraulic system will be primed at the factory. If a cylinder is replaced and it is necessary to prime the system, follow these steps.

- 1. Connect the bottom end of all cylinders but do not connect the rod ends. Hold the cylinders to let the rods extend without machine contact.
- 2. Most fittings, but not the connection points at the tractor end and some valves, are JIC, BSPP or O-ring type fittings. It is not necessary to use thread compound to correctly seal the JIC and O-ring fitting.

Keep all connections, fitting, hose, etc. as clean as possible.

3. Where pipe threads are used a thread-sealing compound must be used.

Do not use Teflon type tape on hydraulic circuitry use an applicable liquid compound. If tape or contamination enters the system, the tape can clog the bypass hole.

- 4. With all connections attached and if the cylinders have support it will let the rod extension apply pressure to the system. The main or base cylinder must extend as oil flows into the bottom of the cylinder. Because there is air in the remaining cylinders and in the connecting hoses the outer cylinders can extend quickly. Because the cylinders are extended it does not show the system is purged.
- 5. Continue to pour oil into the system until all cylinders have extended fully.

The cylinders will only bypass when the cylinders are fully extended. If you let the cylinders extend without the lift of the unit, the cylinders will touch the bypass position.

Keep in mind that all the oil that goes to the outer cylinders must be bypassed through the base cylinder bypass hole and subsequent cylinders. This will be some time, in come conditions a large quantity of time. Machines with many wings and lift cylinders, the system will take longer to charge. Make sure to see that the tractor has sufficient oil capacity. It can be necessary to add oil to the tractor reservoir. It is necessary to have 2500 to 3000 psi to push all the oil through the bypass holes.

- 6. When all the cylinders on the unit are fully extended, retract the cylinders and again extend fully.
- 7. Hold the cylinders in the extended (bypass) position for some minutes.
- 8. Retract the cylinders and monitor the cylinders that they work in sequence.
- 9. Connect the cylinder rod ends to the anchor points of the unit.
- 10. Lift and lower the unit and check to make sure the unit moves in a level manner. If the cylinders are correctly bypassed, all cylinders and hoses must be filled with oil with no air in the system. There will be some air in the system as it is possible that all air is not removed from the system. With some air in the system the cylinders must move in sequence and lift and control the depth of the unit. If the cylinder is apparently not bypassing it can show that some contamination has blocked the bypass hole. Because the hole can possibly be blocked, it is very important to keep clean oil.
- 11. Supply protection for the complete hydraulic system at all connection points.

5.13	Notes

6 Specifications

6.1 Implement Specifications

Table 6.1 Specifications: 2025 Tempo K Planter Bar

Models	TPK 60' 24 Row 30"
Frame Specifications	
Primary Toolbar Size	10 x 10 in (25.4 x 25.4 cm)
Secondary Toolbar Size	7 x 7 in (17.78 x 17.78 cm)
Flexibility	$\pm 12^{\circ}$ over total frame width
Fold Cylinders	(x2) 5 x 30 in, double acting
Wheel Lift Cylinders	Four phasing, double acting
Latch Cylinder	(x1) 2-1/2 x 5 in, double acting
Tire Specifications	
Tires	(x4) 16.5 x 12, 12 ply
Tire Pressure	50 psi (482 kPa) or maximum indicated on sidewall
Wheel Bearings	Tapered roller
Track Specifications	
	1/2 in diameter 80 ±10 lb/ft
Wheel Stud Diameter	$5/8$ in diameter 160 ± 10 lb/ft
Machine Dimensions	
Rows	24
Row Spacing	30 in (76.2 cm)
Transport Width	5.28 m (17 ft 4 in)
Transport Length	11.6 m (38 ft)
Transport Height	3.9 m (13 ft)
Operating Length	8.5 m (28 ft)
Operating Width	18.29 m (60 ft)
Tracks	2
Hydraulic System Specifications	
Tractor Remote Valve Requirements	4
Frame Lift — Fold System Capacity	25 gal (95 Liter)
Hydraulic Flow Requirements	
Minimum Flow Required (Utilizing Tractor Remotes)	55 gpm (208 Lpm)
Shipping Specifications	
Total Weight	43,000 lbs (19,500 kg)
Shipping Width	(15 ft 10 in)
Shipping Height	3.9 m (13 ft)
Shipping Length	11.58 m (38 ft)
Tractor Requirements	
Horsepower	400 hp
Minimum Tractor Weight	30,010 lb (13,612 kg)

6.2 Standard Bolt Torques



Failure to follow these instructions may result in personal injury and/or equipment damage.

- Just before and during operation be sure no one is on or around the implement.
- Before activating the hydraulic system, check hoses for proper connections.
- Before lowering the wings for the first time, make sure the entire system has been charged with oil.
- With wings down always install hydraulic cylinder channel lock(s) for transporting.

When tightening bolts, they must be torqued to the proper number (ft-lbs) as indicated in the table unless specified. It is important that all bolts be kept tight.

On new machines, all nuts and bolts must be rechecked after a few hours of operation.

When replacing a bolt, use only a bolt of the same grade or higher. Except in shear bolt applications, where you must use the same grade bolt.

Bolt Grades

- (A) Bolts with no marking are grade 2.
- (B) Grade 5 bolts furnished with the machine are identified by three radial lines on the head.
 - All U-bolts are grade 5.
- (C) Grade 8 bolts furnished with the machine are identified by six radial lines on the head.



Figure 6.1 Bolt Grades

Bolt	3/8"	1/2"	5/8"	3/4"	7/8"	1"
Diameter	(9.53 mm)	(12.7 mm)	(15.88 mm)	(19.05 mm)	(22.23 mm)	(25.4 mm)
Her Heed	9/16"	3/4"	15/16"	1-1/8"	1-5/16"	1–1/2"
Hex Head	(14.3 mm)	(19.05 mm)	(23.83 mm)	(28.58 mm)	(33.34 mm)	(38.1 mm)
Torque ft/lbs	(N.m)					
UNC GR2	18 (24.40)	45 (61.01)	89 (120.67)	160 (216.93)	252 (341.67)	320 (433.86)
UNC GR5	30 (40.67)	68 (92.19)	140 (189.81)	240 (325.39)	360 (488.09)	544 (737.56)
UNC GR8	40 (54.23)	100 (135.58)	196 (165.74)	340 (460.98)	528 (715.87)	792 (1073.81)
UNF GR2	21 (28.47)	51 (69.15)	102 (138.29)	178 (241.34)	272 (368.78)	368 (498.94)
UNF GR5	32 (43.39)	70 (94.91)	168 (227.78)	264 (357.94)	392 (531.48)	572 (775.53)
UNF GR8	48 (65.08)	112 (151.85)	216 (292.86)	368 (498.94)	792 (1073.81)	840 (1138.89)

Table 6.2 Bolt Torques

6.3 Hydraulic Connection Torques

Hydraulic Connection Torques Legend

- (1) Straight Thread O-ring Boss (ORB)
 - Example: 12MB 12MJ is —12 male ORB to —12 male JIC
- (2) SAE 37°C (JIC)
 - Example: 8FJ 8FJ is —08 female JIC



Figure 6.2 Hydraulic Connection Torques

SAE 37° fittings can be damaged if over torqued. Use caution when tightening these fittings.

Table 6.3	Straight	Thread	O-ring	Boss	(ORB)
-----------	----------	--------	--------	------	-------

Dash Size	Jam Nut or Straight Fitting Torque		
	ft/lbs	Newton Meters	
-04	13 — 15	18 — 20	
-05	14 — 15	19 — 21	
-06	23 — 24	32 — 33	
-08	40 — 43	55 — 57	
-10	43 — 48	59 — 64	
-12	68 — 75	93 — 101	

Table 6.4 SAE 37°C (JIC)

Dash Size	Jam Nut or Straight Fitting Torque			
	ft/lbs	Newton Meters		
-04	11 — 12	15 — 16		
-05	15 — 16	20 - 22		
-06	18 — 20	24 - 28		
-08	38 — 42	52 — 58		
-10	57 — 62	77 — 85		
-12	79 — 87	108 — 119		

6.4 Electrical System

6.4.1 ISO 11783 Power Supply, Gateway



Figure 6.3 ISO 11783 Pinout

Table 6.5 Pinout Legend: ISO 11783

 (1) Electrical Ground (2) Electrical Control Unit, Ground (3) Voltage (12 V) (4) Electrical Control Unit (12 V) (8) CAN High (9) CAN Low 	Pin	Function
 (2) Electrical Control Unit, Ground (3) Voltage (12 V) (4) Electrical Control Unit (12 V) (8) CAN High (9) CAN Low 	(1)	Electrical Ground
 (3) Voltage (12 V) (4) Electrical Control Unit (12 V) (8) CAN High (9) CAN Low 	(2)	Electrical Control Unit, Ground
 (4) Electrical Control Unit (12 V) (8) CAN High (9) CAN Low 	(3)	Voltage (12 V)
(8) CAN High(9) CAN Low	(4)	Electrical Control Unit (12 V)
(9) CAN Low	(8)	CAN High
	(9)	CAN Low
6.4.2 TPK Electrical Layout

Overview

- (A) Front & Middle Section (Worklights)
- (B) Rear Section
- (C) Left Wing
- (D) Middle Wing Section
- (E) Right Wing
- (F) Row Units
- (G) Marking Tables

6.5 Hydraulics

6.5.1 Wing Folding



Figure 6.4 Wing Folding Hydraulics

6.5.2 Central Seed Fill Fan, Support Wheels

Central Seed Fill Fan, Support Wheels Legend

- 1.A connects to 2.A
- 1.B connects to 2.B



Figure 6.5 Central Seed Fill Fan, Support Wheels

6.5.3 Support Stand

Hydraulic Support Stand



Figure 6.6 Hydraulic Support Stand

6.5.4 Wings Weight Transfer

Wings Weight Transfer Legend

- 2.A connects to 1.A
- 2.B connects to 1.B
- 2.C connects to 3.C or 4.C
- 2.D connects to 3.D or 4.D



Figure 6.7 Wings Weight Transfer

6.5.5 Row Unit Weight Transfer

Row Units Weight Transfer Hydraulics Legend

- 3.C connects to 2.C
- 3.D connects to 2.D



Figure 6.8 Row Units Weight Transfer Hydraulics

6.5.6 Individual Hydraulic Row Unit Weight Transfer (Option)

Individual Hydraulic Row Unit Weight Transfer Legend

- 4.C connects to 2.C
- 4.D connects to 2.D



Figure 6.9 Individual Hydraulic Row Unit Weight Transfer

6.6 Hydraulic Diagram Functions

Table 6.6 Hydraulic Diagram Function Descriptions I

Parent	Label	Туре	Function
	A1	Accumulator	Row unit pressure
	A2	Accumulator	Row unit pressure
	A3	Accumulator	Row unit pressure
	A4	Accumulator	Frame pressure
	B1	Manifold	Pilot check valve
	B2	Manifold	Wing fold and frame tilt
	B3	Manifold	Central seed fill fan speed control
	B4	Manifold	Wings weight transfer
	B5	Manifold	Tractor power beyond control
	B6	Manifold	Central row unit pressure control
	B7	Manifold	Individual row unit pressure supplying manifold
	B8 — B32	Manifold	Row unit connection
	B33 — B57	Manifold	Individual row unit pressure
	C1	Hydraulic Cylinder	Lift tracks
	C2	Hydraulic Cylinder	Lift tracks
	C3	Hydraulic Cylinder	Lift tracks
	C4	Hydraulic Cylinder	Lift tracks
	C5	Hydraulic Cylinder	Lift tracks
	C6	Hydraulic Cylinder	Lift support wheels
	C7	Hydraulic Cylinder	Tilts the frame with the row units
	C8	Hydraulic Cylinder	lic Cylinder Tilts the frame with the row units
	С9	Hydraulic Cylinder	Tilts the frame with the row units
	C10	Hydraulic Cylinder	c Cylinder Tilts the frame with the row units
	C11	Hydraulic Cylinder	Tilts the frame with the row units
	C12	Hydraulic Cylinder	Tilts the frame with the row units
	C13	Hydraulic Cylinder	Wing folding
C14 Hydra	Hydraulic Cylinder	Wing folding	
	C15	Hydraulic Cylinder	Locks the frame in work mode
	C16	Hydraulic Cylinder	Locks the frame in work mode
	C17	Hydraulic Cylinder	Transfer down force to wings
	C18	Hydraulic Cylinder	Transfer down force to wings
	C19—C43	Hydraulic Cylinder	Weight transfer row unit
B2	CV1	Pilot Operated Check Valve	Prevents under pressure folding
B2	CV2	Pilot Operated Check Valve	Prevents under pressure folding
B8	E37	3/2 proportional re- ducing / relieving valve	Removes weight from row units

Parent	Label	Туре	Function	
B33 — B57	E37	3-way pressure re- ducing valve	Electrically controlled, removes weight from row units	
B8	E72	2/2 valve normally open	Prevents row units to sink during headland turns	
В9	E72–1	2/2 valve normally open	Prevents row units to sink during headland turns, activated together with E72–2	
В9	E72–2	2/2 valve normally open	Prevents row units to sink during headland turns, activated together with E72–1	
	HM1	Hydraulic piston motor	Central Seed Fill fan	
	HM2	Hydraulic piston motor	Seed fan, alternator	
B4	OR1	Orifice cavity	Empty	
HM1	S1	Speed Sensor	Central Seed Fill fan	
HM2	S2	Speed Sensor	Seed fan	
B4	\$5	Pressure sensor	Measures weight transfer down force pressure	
B4	S6	Pressure sensor	Measures supplied pressure to weight transfer	
B2	SQ1	Sequence valve	With parallel check valve, ensures sequence control of folding and frame tilt	
В5	V1	Pressure reducing valve	With drain, defines pressure to tractor LS- port	
B3	V1	3-way flow valve	Regulated the flow through the Central Seed Fill fan to maintain constant speed	
B33 — B57	V1	2/2 valve normally closed	Lock row units during transport	
	V1	Check valve	Prevents backwards rotation of fan	
B1	V1	Pilot check valve	Prevents lift tracks to rise	
B4	V2	3-way pressure re- ducing valve	Electrically controlled, sets weight transfer pressure	
В5	V2	2/2 external pilot normally closed	Allows flow to RUP once FP is pressurized.	
	V2	Ball valve	Frame lock on/off, closed in field	
B33 — B57	V2	Check valve	Let row unit sink to transport position	
	V3	Check valve	Prevents pressurizing of return line	
B5	V3	Check valve	Prevents pressurizing V1 & V2 spring chamber	
В5	V4	Fully adjustable nee- dle valve	Creates pressure drop to tractor LS if pulsations occur.	
B8	V41	Pressure reducing valve	Fixed manual setting with drain, transfer weight to row unit	
B8	V42	2/2 Internal pilot normally closed	Lock row units during transport	
B8	V43	Pressure relief valve	With parallel check valve, prevents pressure built up in RU and lets row units sink to transport position	

Table 6.7 Hydraulic Diagram Function Descriptions II

Parent	Label	Туре	Function
В9	V44	Pressure reducing valve	Fixed manual setting with drain, transfer weight to row unit
B9	X1	M6 orifice cavity	Empty, to restrict flow to row unit pressure
B8	X1	M6 orifice cavity	Empty, to restrict flow to row unit pressure
	X1	Orifice adapter	Restricts motor housing flush flow
	X2	Orifice adapter	Restricts motor housing flush flow
	X3	Orifice adapter	Restricts flow

Table 6.8 Hydraulic Diagram Function Descriptions III

Specifications

6.7	Notes

7 Aftermarket

7.1 Warranty

Väderstad Inc. Limited Warranty Terms and Conditions — United States and Canada, Effective for Equipment Retailed and Delivered after May 21, 2021.

7.1.1 What is Warranted

Väderstad Inc. warrants it's new equipment to be free of defects in material and workmanship at time of delivery to the first retail purchaser, renter or lessee. These terms apply to all 10K, Amity, Concord, Wil-Rich and Wishek brands of new equipment originally marketed in the United States and Canada.

7.1.2 Warranty Period

- 12 months from the date of delivery to the first retail purchaser, renter or lessee.
- **483 Disk Chisel, Field Cultivator and Disk Cultivators:** 3 years on main frames, wing frames and shank assemblies.

7.1.3 Exceptions from this Warranty

- Freight Charges: This warranty does not cover freight charges.
- Improvements, Changes, or Discontinuance: Väderstad Inc. reserves the right to make changes and improvements in design or changes in specifications at any time to any product without incurring any obligations to owners of products previously sold.
- **Satellite Outages:** Interruptions in satellite interfaces and satellite communications are outside the control of this product and are not covered by this warranty. The company is not responsible for issues or degradation of system performance resulting from such interruptions in satellite interfaces and satellite communications where the issues are not related to defects in this product.
- Repairs and Maintenance Not Covered Under Warranty: This warranty does not cover conditions resulting from misuse, natural calamities, use of non-Väderstad Inc. parts, negligence, alteration, accident, use of unapproved attachments, usage which is contrary to the intended purposes, or conditions caused by failure to perform required maintenance. Replacement of wear or maintenance items (unless defective) such as but not limited to, filters, hoses, belts, lubricants, light bulbs, wheel alignment, tightening of nuts, belts, bolts and fittings, service tune-up, computer parameter adjustments and general adjustments which may from time to time be required are not covered.

• **Rubber Tire Warranty:** Rubber tires are warranted directly by the respective manufacturer only and not by Väderstad Inc.

7.1.4 Owners Obligation

It is the responsibility of the owner to transport the equipment or parts to the service shop of an authorized Väderstad Inc. dealer or alternatively to reimburse the dealer for any travel or transportation expense involved in fulfilling this warranty. This warranty does NOT cover rental of replacement equipment during the repair period, damage to products which have been declared a total loss and subsequently salvaged, overtime labor charges, freight charges for replacement parts, or special handling requirements (such as, but not limited to, the use of cranes).

7.1.5 Exclusive Effect of Warranty and Limitation of Liability

This warranty is in lieu of all warranties of merchantability, fitness for a purpose or other representations, warranties or conditions, expressed or implied.

The remedies of the owner set forth herein are exclusive. The company neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the sale of covered machines. Correction of defects, in the manner and for applicable period of time provided above, shall constitute fulfillment of all responsibilities of Väderstad Inc. to the owner, and Väderstad Inc. shall not be liable for negligence under contract or in any manner with respect to such machines.

In no event shall the owner be entitled to recover for incidental, special or consequential damages such as but not limited to, loss of crops, loss of profits or revenue, other commercial losses, inconvenience or cost of rental or replacement equipment.



Some states or provinces do not permit limitations or exclusions of implied warranties or incidental or consequential damages, so the limitations or exclusions in this warranty may not apply. Väderstad Inc. as referred to herein with respect to sales in:

United States & Canada:

- Väderstad Inc.
- PO Box 1030
- Wahpeton, ND 58074

7.1.6 Additional Warranty Information

New Equipment Warranty

Equipment is eligible for warranty service only if it qualifies under the provisions of the new equipment warranty. The selling dealer will deliver this warranty to the original retail purchaser at the time of sale, and the dealer will register the sale and warranty with Väderstad Inc.

Subsequent Owners

This warranty covers the first retail purchaser and all subsequent owners of the equipment during the specified warranty period.

Should the Väderstad Inc. dealer sell this equipment to a subsequent owner, the dealer must deliver the warranty document to the subsequent owner so the subsequent owner can register ownership with Väderstad Inc. and obtain the remaining warranty benefits, if available, with no intermission in the warranty period. Subsequent owner procedure will apply. It is the responsibility of the subsequent owner to transport the equipment to the service shop of an authorized Väderstad Inc. dealer or alternatively to reimburse the dealer for any travel or transportation expense involved in fulfilling this warranty. This warranty does NOT cover charges for rental or replacement equipment during the repair period, products which have been declared a total loss and subsequently salvaged, overtime labor charges, freight charges for replacement parts, or units sold at auction.

Warranty Service

To be covered by warranty, service must be performed by an authorized Väderstad Inc. It is recommended that you obtain warranty service from the dealer who sold you the equipment because of that dealer's continued interest in you as a valued customer. In the event this is not possible, warranty service may be performed by any other authorized Väderstad Inc. dealers in the United States or Canada. It is the responsibility of the owner to transport the equipment to the service shop of an authorized Väderstad Inc. dealer or alternatively to reimburse the dealer for any travel or transportation expense involved in fulfilling this warranty.

Maintenance Service

The owner's manual furnished to you with the equipment at the time of delivery contains important maintenance and service information. You must read the manual carefully and follow all the maintenance and service recommendations. Doing so will result in greater satisfaction with your equipment and help avoid service and warranty problems. Please remember that failures due to improper maintenance of your equipment are not covered by warranty.

Maintenance Inspections

To insure the continued best performance from your agricultural equipment, we recommend that you arrange to make your equipment available to your selling dealer for a maintenance inspection 30 days prior to warranty expiration.

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