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Read and Understand

⚠️ WARNING ⚠️

Read and follow all instructions and safety precautions in this manual and all other manuals for products associated with this planter as well as in all on-product warning decals. Failure to do so could result in death or serious injury, or property damage. Contact your Norwood dealer if any of your manuals are missing or illegible or you have questions.

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Preface
This manual is intended for use with the following Kwik-Till 2-Section Drawn High Speed Disk models:

HSD1600, HSD1775, HSD2100, & HSD2450

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Revision History

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1.0 - GENERAL INFORMATION

Note to the Owner

This manual contains important information about the safe operation, adjustment, and maintenance of your Kwik-Till 2-Section Drawn High Speed Disk. This manual should be considered a permanent part of your machine and should remain with the machine if you sell it.

Refer to the table of contents at the beginning or the Index at the end of this manual for locating specific items about your machine.

DO NOT operate or permit anyone to operate or service this machine until you or the other persons have read this manual. Use only trained operators who have demonstrated the ability to operate and service this machine correctly and safely.

All persons who will be operating this machine shall possess applicable local age work permits.

This Kwik-Till, with standard equipment and authorized options, is intended to be used in customary agricultural or similar operations for the purpose of tilling ground soil for seed bed preparation and residue incorporation (“INTENDED USE”). Use in any other way is considered as contrary to the intended use. The manufacturer accepts no liability for damage or injury resulting from this misuse, and these risks must be borne solely by the user. Compliance with and strict adherence to the conditions of operation, service and repair as specified by the manufacturer also constitute essential elements for the intended use.

DO NOT use this machine for any purpose or in any manner other than as described in the manual, decals, or other product safety information provided with the machine. These materials define the machine’s intended use.

Use only approved accessories and attachments designed for your machine.

Consult your dealer on changes, additions or modifications that may be required for your machine.

DO NOT make any unauthorized modifications to your machine. Any arbitrary modifications carried out on this machine will relieve the manufacturer of all liability for any resulting damage or injury.

A Message to Our Customers

We appreciate the confidence placed in us by the purchase of this machine. To ensure that the machine performs at the highest level, countless hours were spent designing and testing, before this machine was produced. To achieve the maximum performance, it is imperative that this machine is operated in accordance with the procedures outlined in this manual.
Kwik-Till Operator’s Manual Location

This Operator’s manual is to be stored in the “Operator’s Manual Canister” on the right side of the machine on the hose holder bracket for reference during field operation. (See Fig. #1-2) Make sure this manual is complete and in good condition. Contact your dealer to obtain additional manuals and approved service parts. Your dealer has technicians with special training that know the best methods of repair and maintenance for your Kwik-Till.

Kwik-Till Model / Serial Number Location

Always give your authorized Kwik-Till dealer the Model Number, and Serial Number of your Kwik-Till product when ordering parts, requesting service, or any other information to provide the most efficient service.

The Serial Number location is identified below. (See Fig. #1-3)

Make a copy of the number below and keep in a safe place. If the machine is stolen, report the numbers to your local law enforcement agency.

Write the Model Number, Serial Number, & Date Of Purchase on the lines provided.

Model Number: _______________________
Serial Number: ______________________
Date Of Purchase: ____________________
Determining Left and Right Side of the Machine

**Operator Orientation** - The directions Front (1), Back (2), Left (3), and Right (4) as mentioned throughout the manual, are determined when standing at the rear rollers and looking toward the hitch.

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**Determining Orientation Using Directional Arrows**

The symbols shown below, may be illustrated on certain pages in this manual, and where indicated, determine the front of the machine.
2.0 - SAFETY INFORMATION

Safety Rules And Signal Word Definitions

Personal Safety

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Read and understand all the safety messages in this manual and associated equipment manuals before you operate or service the machine. Obey all safety messages that follow this symbol to avoid possible death or serious injury.

Throughout this manual and on machine decals, you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

**DANGER**; Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The color associated with DANGER on the machine decals is RED.

**WARNING**; Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The color associated with WARNING on the machine decals is ORANGE.

**CAUTION**; Used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. CAUTION may also be used to alert against unsafe practices associated with events which could lead to personal injury. The color associated with CAUTION on the machine decals is YELLOW.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine Safety

**NOTICE**; Notice indicates a situation which, if not avoided, could result in machine or property damage. The color associated with Notice on the machine decals is BLUE.

**IMPORTANT**; Important indicates a situation which, if not avoided, could result in machine or property damage. The color associated with Important on the machine decals is WHITE.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

**NOTE**; Note indicates additional information which clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.
Safety Rules

Read Entire Section Before Use.

Understand that your safety and the safety of other persons is measured by how you service and operate this machine. Know the positions and operations of all controls before you try to operate. MAKE SURE YOU CHECK ALL CONTROLS IN A SAFE AREA BEFORE STARTING YOUR WORK.

READ THIS MANUAL COMPLETELY AND MAKE SURE YOU UNDERSTAND THE CONTROLS. All equipment has a limit. Make sure you understand the stability and load characteristics of this machine before you start to operate.

NOTE: Safety messages in this section point out specific safety hazards which can be encountered during the normal operation and maintenance of your machine. These safety messages also give possible ways of dealing with these conditions.

The safety information given in this manual does not replace safety codes, insurance needs, federal, state and local laws. Make sure your machine has the equipment required by the local laws and regulations.

 Owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter per OSHA (Occupational Safety and Health Administration) regulation 1928.57.

The most important safety device on this equipment is a SAFE operator. It is the operator’s responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.

A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.

Additional safety messages are used in the text of the manual to indicate specific safety hazards. See your dealer for more information if you have any questions.

Use caution when operating the machine on slopes. Raised equipment, partially full or full conveyor belt and other loads will change the center of gravity of the machine. The machine can tip or roll over when near ditches and embankments or uneven surfaces.

Travel speed must be such that complete control and machine stability is maintained at all times. Reduce speed when turning, crossing slopes and when on rough, slick or muddy surfaces.

Never permit anyone to ride on any part of the machine.

Some illustrations in this manual will show shields or cover panels removed for purposes of clarity. DO NOT operate this machine with any of the shields or cover panels removed.

Never operate the machine under the influence of alcohol, drugs or while otherwise impaired.

Pay attention to overhead power lines and hanging obstacles. High voltage lines may require significant clearance for safety. Contact local authorities or utilities to obtain safe clearance distances from high voltage power lines.

**General Safety**

Read and understand the Operator’s Manual and all safety decals before operating, maintaining, adjusting or unplugging.

Have a first-aid kit available for use should the need arise and know how to use it.

Only trained persons shall operate the machine. An untrained operator is not qualified to operate the machine.

Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.

Do not allow children, spectators or bystanders within hazard area of machine.

Keep clear of moving parts. Loose clothing, jewelry, watches, long hair and other loose or hanging items should be avoided as they can become entangled in moving parts.

Wear personal protective equipment when appropriate.

DO NOT attempt to remove material from any part of the machine while it is being operated or components are in motion.

Make sure all guards and shields are in good condition and properly installed before operating the machine. Never operate the machine with shields removed. Always close access doors or panels before operating the machine.
Dirty or slippery steps, ladders, walkways and platforms can cause falls. Make sure these surfaces remain clean and clear of debris.

A person or pet within the operating area of a machine can be struck or crushed by the machine or its equipment. DO NOT allow anyone to enter the work area.

Raised equipment and/or loads can fall unexpectedly and crush persons underneath. Never allow anyone to enter the area underneath raised equipment at any time. Always use a safety support when working on, under, or around machine. Transport/Service locks can be used for this purpose. Shut off tractor engine and remove key when working on machine. If air has been allowed to enter hydraulic hoses or cylinders, bleed hydraulic system before use. If there is a failure in hydraulic system, unsupported raised equipment could suddenly lower, causing serious personal injury or death. If support is not available, completely lower wings and frame, relieve hydraulic pressure and disconnect hoses from tractor.

Review this manual and any other associated manuals before each season of use.

Use extreme care when cleaning, or servicing the machine.

Keep riders off. Riders on the implement or tractor are subject to injury such as being struck by foreign objects and being thrown off of the machine.

Hydraulic oil leaking under pressure can penetrate the skin, causing death or serious injury, or infection.

DO NOT use your hand to check for leaks. Use a piece of cardboard or plywood.

Stop engine, remove key and relieve the pressure before connecting or disconnecting fluid lines.

Make sure all components are in good condition and tighten all connections before starting the engine or pressurizing the system.

Do not attempt any makeshift repairs to the hydraulic fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

Replace any worn, cut, abraded, flattened or crimped hoses.

If hydraulic fluid penetrates the skin, seek medical attention immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.

Continuous long term contact with hydraulic fluid may cause skin cancer. Avoid long term contact and wash the skin promptly with soap and water.

Avoid serious injury or death while working under a raised implement. Hydraulic hoses between the lift cylinders and hydraulic lockup valves should be inspected frequently for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid, or any other signs of wear or damage. Worn or damaged hose assemblies can malfunction during use and should be replaced immediately.

See your Kwik-Till dealer for replacement hoses.
Operating Safety

1. Read and understand the Operator’s Manual and all safety decals before using.

2. Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving tractor cab.

3. Clear the area of bystanders, especially children, before starting.

4. Be familiar with the machine hazard area. If anyone enters hazard area, shut down machine immediately. Clear the area before restarting.

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

6. Keep riders off. Riders on the implement are subject to injury such as being struck by foreign objects and being thrown off of the machine.

7. Stay away from overhead obstructions and power lines during operation and transporting. Electrocution can occur without direct contact.

8. Be sure that area around machine is clear before raising or lowering machine frame or wings.

9. Do not operate with wings partially folded.

10. Do not operate close to the edge of a ditch, creek, gully, or steep embankment.

11. Avoid holes, ditches, and obstructions which can cause tractor, machine, or towed equipment to roll over, especially on hillsides.

12. Avoid sharp turns on hillsides.

13. Slow down when turning or traveling over rough ground and when turning on inclines.

14. Always shut off tractor and shift to park or set brakes when leaving tractor. Remove key when leaving tractor unattended.

15. Always have tractor stopped on level ground when raising or lowering wings.

16. Operate machine from tractor seat only.

17. If chemicals are used, follow manufacturer’s recommendations for their handling and storage.

18. Tow machine behind a properly equipped tractor only.

Prepare for Emergencies

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

Personal Protective Equipment (PPE)

Wear personal protective equipment. This list includes but is not limited to:

- A hard hat
- Protective shoes with slip resistant shoes
- Safety glasses or goggles
- Heavy gloves
- Hearing protection
- Respirator or filter mask
- Protective clothing
- A face shield (when grinding)
Lock-Out Tag-Out Safety

Before you start servicing the machine:
If machine is connected to a tractor, Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving tractor cab.
If machine is detached from tractor, block wheels and use safety stands to prevent movement.
Attach a “Do Not Operate” warning tag to the machine in an area that will be visible.

General Maintenance Safety

1. Review the Operator’s Manual and all safety items before working with, maintaining or operating the Kwik-Till.
2. If machine is connected to a tractor, Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving tractor cab.
If machine is detached from tractor, block wheels and use safety stands to prevent movement.
3. Do not attempt to clean, lubricate, clear obstructions or make adjustments to the machine while it is in motion or while the engine is running.
4. Follow good shop practices:
   - Keep service area clean and dry.
   - Be sure electrical outlets and tools are properly grounded.
   - Use adequate light for the job at hand.
5. Before applying pressure to a hydraulic system, make sure all components are tight and that hoses and couplings are in good condition.
6. Relieve pressure from hydraulic circuit before servicing or disconnecting from tractor.
7. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments.
8. Place stands or blocks under the frame before working beneath the machine.
9. Before resuming work, install and secure all guards when maintenance work is completed.
10. Keep safety decals clean. Replace any decal that is damaged or not clearly visible.
11. Always make sure working area is clear of tools, parts, other persons and pets before you start operating the machine.
13. On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.
**Wheel and Tire Safety**

Make sure tires are correctly inflated. Do not exceed recommended load or pressure. Follow instructions in the manual for proper tire inflation.

Always have a qualified tire technician service the tires and rims. If a tire has lost all pressure, take the tire and rim to a tire shop or your dealer for service. Explosive separation of the tire can cause death or serious injury.

- **DO NOT** attempt to mount a tire unless you have the proper equipment and experience to do the job. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosive separation, which may result in serious injury or death.
- Have a qualified tire dealer or repair service perform required tire maintenance.
- When replacing worn tires, make sure they meet the original tire specifications. Never undersize the replacement tire.
- **DO NOT** weld on the tire rim with the tire mounted on the rim. The heat can cause an increase in air pressure, resulting in a tire explosion which could result in serious injury or death. Also welding can structurally weaken or deform the wheel.
- Inflate tires to the manufacturer's recommended pressure.
- Tires should not be operated at speeds higher than their rated speed.
- Keep wheel lug nuts tightened to manufacturer's recommendations.
- Never reinflate a tire that has been run flat or seriously under-inflated without removing the tire from the wheel. Have the tire and wheel closely inspected for damage before remounting.

**Remove Paint Before Welding or Heating**

Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Remove paint before heating:
- Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.
- **Do Not** use a chlorinated solvent in areas where welding will take place.
- **Do** all work in an area that is well ventilated to carry toxic fumes and dust away.
- Dispose of paint and solvent properly.

**Avoid Heating Near Pressurized Fluid Lines**

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can accidentally burst when heat goes beyond the immediate flame area.
Avoid Overhead Power Lines

Use a Signal Person

Use a signal person to direct movement of the tractor/implement combination whenever the tractor operator’s view is obstructed.

Designate one individual as the signal person. Always have signal person stand in clear view. Be sure that signal person stays a safe distance away from the machine when it is moving.

Before starting the tractor, discuss hand signals and what each signal means to avoid misunderstandings and confusion, which could result in a serious injury or fatal accident for someone.

Keep all bystanders away whenever the machine is moved.

Electrical Storm Safety

Do not operate machine during an electrical storm.

If you are on the ground during an electrical storm, stay away from machinery and equipment. Seek shelter in a permanent, protected structure.

If an electrical storm should strike during operation, remain in the cab. Do not leave the cab. Do not make contact with the ground or objects outside the machine.

Working at Heights (If Applicable)

Do not stand on surfaces which are not designed as steps or platforms.

Do not use the machine as a lift, ladder or platform for working at heights.

CAUTION
Keep away from overhead power lines. Serious injury or death can result. Proceed cautiously under overhead power lines and around utility poles. Know the transport height of your machine. Electrocution can occur without direct contact with overhead electrical lines.
Noise Level Safety

There are many variables that affect the sound level range, including machine configuration, condition and maintenance level of the machine, ground surface, operating environmental, duty cycles, ambient noise, and attachments.

Exposure to loud noise can cause impairment or loss of hearing.

Always wear hearing protection. Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Chemical Safety and the Environment

Soil, air, and water are vital factors of agriculture and life in general. When legislation does not yet rule the treatment of some of the substances which are required by advanced technology, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

NOTICE: The following are recommendations which may be of assistance:

• Become acquainted with and ensure that you understand the relative legislation applicable to your country.
• Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, antifreeze, cleaning agents, etc., with regard to their effect on man and nature and how to safely store, use and dispose of these substances.
• Agricultural consultants will, in many cases, be able to help you as well.

Helpful Hints

• Avoid filling tanks using cans which may cause considerable spillage.
• In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of them contain substances which may be harmful to your health.
• Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
• Avoid spillage when draining off used gearbox and hydraulic oils, etc. Do not mix drained fluids with lubricants. Store drained fluids safely until they can be disposed of properly to comply with local legislation and available resources.
• Repair any leaks or defects in the hydraulic system immediately.
• Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
• Protect hoses during welding as penetrating weld splatter may burn a hole or weaken them, allowing the loss of hydraulic fluid.

Handle Chemical Products Safely

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with Kwik-Till equipment include such items as lubricants, fluids, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

(See your Kwik-Till dealer for MSDS’s on chemical products used with Kwik-Till equipment.)
Decommissioning: Proper Recycling and Disposal of Fluids and Components

Safety and environmental stewardship measures must be taken into account when decommissioning a machine and/or component. These measures include the following:

- Use appropriate tools and personal protective equipment such as clothing, gloves, face shields or glasses, during the removal or handling of objects and materials.
- Follow instructions for specialized components.
- Release stored energy by lowering suspended machine elements, relaxing springs, disconnecting the battery or other electrical power, and releasing pressure in hydraulic components, accumulators, and other similar systems.
- Minimize exposure to components which may have residue from agricultural chemicals, such as fertilizers and pesticides. Handle and dispose of these components appropriately.
- Carefully drain engines, fuel tanks, radiators, hydraulic cylinders, reservoirs, and lines before recycling components. Use leak-proof containers when draining fluids. Do not use food or beverage containers.
- Do not pour waste fluids onto the ground, down a drain, or into any water source.
- Observe all national, state, and local laws, regulations, or ordinances governing the handling or disposal of waste fluids (example: oil, fuel, coolant, brake fluid); filters; batteries; and, other substances or parts. Burning of flammable fluids or components in other than specially designed incinerators may be prohibited by law and could result in exposure to harmful fumes or ashes.
- Service and dispose of air conditioning systems appropriately. Government regulations may require a certified service center to recover and recycle air conditioning refrigerants which could damage the atmosphere if allowed to escape.
- Evaluate recycling options for tires, metal, plastic, glass, rubber, and electronic components which may be recyclable, in part or completely.
- Contact your local environmental or recycling center, or your Kwik-Till dealer for information on the proper way to recycle or dispose of waste.

Use Safety Lights and Devices

Prevent collisions between other road users, slow moving tractors with attachments or towed equipment, and self-propelled machines on public roads. Frequently check for traffic from the rear, especially in turns, and use turn signal lights. Use headlights, flashing warning lights, and turn signals day and night. Follow local regulations for equipment lighting and marking. Keep lighting and marking visible, clean, and in good working order. Replace or repair lighting and marking that has been damaged or lost. An implement safety lighting kit is available from your Kwik-Till dealer.

Observe Maximum Transport Speed

The maximum transport speed for this implement is 20 mph (32 km/h).

Some tractors are capable of operating at speeds that exceed the maximum transport speed of this implement. Regardless of the maximum speed capability of the tractor being used to tow this implement, do not exceed the implement’s maximum transport speed.

Exceeding the implement’s maximum transport speed can result in:

- Loss of control of the tractor/implement combination.
- Reduced or no ability to stop during braking.
- Implement tire failure.
- Damage to the implement structure or its components.
Use additional caution and reduce speed when towing under adverse surface conditions, when turning, and when on inclines.

**Do Not** attempt transport if the fully loaded implement weighs more than 1.5 t (3,300 lb) and more than 1.5 times the weight of the tractor.

**CAUTION**

Never tow this implement with a motor vehicle. Tow only with a properly ballasted tractor.

**ATTACHING AND DETACHING KWIK-TILL TO / FROM TRACTOR SAFETY**

Never let another person stand between the tractor and the implement during hitching. Too fast of an approach or the operator’s foot slipping from the clutch can lead to injury or death to the person standing nearby.

**DANGER**

UPENDING HAZARD

TONGUE CAN WHIP UPWARDS WHEN UNHITCHING

The tractor **MUST** be equipped with a clevis hitch to prevent the Kwik-Till from tipping upward while unfolding from transport position, and folding into transport position. To avoid bodily injury, lower the machine before removing the hitch pin.

If negative tongue weight exists, the hitch tongue may suddenly raise, and the rear section would come crashing down. Only disconnect when the jack is lowered, there is positive tongue weight, the unit is on level ground, and in the proper transport or field position. Never disconnect the Kwik-Till from the tractor if the rear sections of the machine are partially raised. Keep others away.

**DANGER**

CRUSH HAZARD

Stand clear when raising or lowering the Kwik-Till.

Keep feet, legs, and body clear when raising and lowering the Kwik-Till. Keep others away.

**DANGER**

CRUSH HAZARD

Avoid being crushed in between the tractor and the implement.

When working in the danger area between the Kwik-Till and the tractor always ensure that the Tractor engine is turned off and the Key removed. Keep others away.
Use a Safety Chain

A safety chain will help control drawn equipment should it accidentally separate from the drawbar.

Using the appropriate adapter parts, attach the chain to the tractor drawbar support or other specified anchor location. Provide only enough slack in the chain to permit turning.

See your Kwik-Till dealer if a replacement chain is needed. Your Kwik-Till safety chain has a strength rating equal to or greater than the gross weight of the towed machine.

Do Not use the safety chain for towing.

Tow Loads Safely

• If towed equipment does not have brakes, do not travel more than 20 mph (32 km/h) and do not tow loads more than 1.5 times the tractor weight.

• If towed equipment has brakes, do not travel more than 25 mph (40 km/h) and do not tow loads more than 4.5 times the tractor weight.

Ensure the load does not exceed the recommended weight ratio. Add ballast to recommended maximum for tractor, lighten the load, or get a heavier towing unit. The tractor must be heavy and powerful enough with adequate braking power for the towed load. Use additional caution when towing loads under adverse surface conditions, when turning, and on inclines.

Keep Riders Off Machine

Keep riders off. Riders on the implement or tractor are subject to injury such as being struck by foreign objects and being thrown off of the machine.

Stopping distance increases with speed and weight of towed loads, and on slopes. Towed loads with or without brakes that are too heavy for the tractor or are towed too fast can cause loss of control. Consider the total weight of the equipment and its load.

Observe these recommended maximum road speeds, or local speed limits which may be lower:
Fig. # 2-6 Workplace Hazard Area LH, RH Wing, & Center Section Fold, Unfold)
2 - SAFETY INFORMATION

Fig. # 2-1 Workplace Hazard Area (Wing Fold / Unfold)
Fig. # 2-2 Workplace Hazard Area Field Position

- WORK AREA AUTHORIZED PERSONNEL ONLY
- KEEP OUT OF SHADED HAZARD AREA

- CRUSH HAZARD BETWEEN TRACTOR & IMPLEMENT KEEP OUT
- CRUSH & ENTANGLEMENT HAZARD KEEP OUT
- CRUSH & ENTANGLEMENT HAZARD KEEP OUT
- CRUSH HAZARD BETWEEN TRACTOR & IMPLEMENT KEEP OUT
- OVERHEAD WIRES KEEP AWAY
Preparing For Transport Safety

**CAUTION**
Avoid serious injury or death. Never tow machine behind a truck or other motor vehicle. This machine is designed only to be towed with a properly sized and ballasted tractor.

- Use a tractor large enough to maintain control. Properly ballast tractor for towing your machine. Refer to the tractor Operator’s Manual and this manual to ensure that machine can be safely transported with your tractor.
- Be aware of height and width restrictions to avoid collision with overpasses or other road users.
- Always fold wings fully. If wing-fold cylinders are removed, chain the wings together to prevent accidental lowering.
- Fully raise the frame, close the hydraulic lockup valve, and install the transport/service locks before transporting.
- Latch the tractor brakes together.
- Attach a proper size safety chain for load being towed. See Use a Safety Chain in this section.
- Always follow local and national regulations for equipment size, lighting, and marking before driving on public roadways. You are responsible for understanding and complying with all requirements regarding roadway transport. See Use Safety Lights and Devices in this section.

1. Fold the machine to the transport position, (See section 3-Operation) for Kwik-Till Folding and Unfolding Procedures.
2. Extend wheel cylinders and basket cylinders. (See section 3-Operation)
3. Raise the frame, fold the wings and insert transport pins to lock both wings into the transport position. (See section 3-Operation)
4. Park machine on a level surface, lower jack using tractor SCV, and chock wheels. Ensure valve is in the closed position to keep jack from lowering. (See Section 3-Operation)
Transport Safety

**IMPORTANT**

Transport the machine at a reasonable and safe speed, which permits adequate control of steering and stopping. Reduce speed considerably when traveling over rough ground. Be certain everyone is clear of machine.

1. Read and understand ALL the information in the Operator’s Manual regarding procedures and SAFETY when moving or transporting the machine.

2. Check with local authorities regarding conveyor transport on public roads. Obey all applicable laws and regulations.

3. Always travel at a safe speed. Use caution when making corners or meeting traffic. Travel speed should be such that complete control and machine stability is maintained at all times.

4. Make sure the SMV (Slow Moving Vehicle) emblem and all the 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.

5. Do not allow riders on the Kwik-Till or the tractor.

6. Attach Kwik-Till hitch link to tractor drawbar, verify that the hitch pin and retainer with spring strap or hex nut is used. Always attach the safety chain.

7. 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.

8. Do not exceed the maximum transport speed for this implement of 20 mph (32 km/h). Reduce speed on rough roads and surfaces.

9. Stay away from overhead obstructions and power lines when transporting. Electrocutation can occur without direct contact. Contact local authorities or utilities to obtain safe clearance distances from high voltage power lines. Should a contact between the machine and an electric power source occur, the following precautions must be taken: Stop the machine movement immediately. Apply the park brake, stop the engine. Check if you can safely leave the cab or your actual position without contacting the electrical wires. If not, stay in your position and call for help. If you can leave your position without touching lines, jump clear of the machine to make sure you do not make contact with the ground and the machine at the same time. Do not permit anyone to touch the machine until power has been shut off to the power lines.

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

11. Slow down and signal before turning.

12. Follow correct towing procedure for equipment with or without brakes.

13. To improve stability when traveling through the field, wings should be unfolded from transport position as soon as possible after leaving the roadway.

14. Towed loads can swerve, upset, or cause loss of control. Refer to Tow Loads Safely in this section.

---

**Fig. # 2-3 Transport Hazard Area**
Safety Decals

The following safety decals are placed on your machine as a guide for your safety and for those working with you. Walk around the machine and note the content and location of these safety decals before operating your machine.

Keep safety decals clean and legible. Clean safety decals with a soft cloth, water, and a gentle detergent. Do not use solvent, gasoline, or other harsh chemicals. Solvents, gasoline, and other harsh chemicals may damage or remove safety decals.

Replace all safety decals that are damaged, missing, painted over, or illegible. If a safety decal is on a part that is replaced, make sure the safety decal is installed on the new part. See your dealer for replacement safety decals.

Safety decals that display the “Read Operator’s Manual” symbol are intended to direct the operator to the operator’s manual for further information regarding maintenance, adjustments, or procedures for particular areas of the machine. When a safety decal displays this symbol, refer to the appropriate page of the operator’s manual.

Safety Decal Locations

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty</th>
<th>Item</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>90-44-0181</td>
<td>SMV SIGN</td>
<td>1</td>
<td>9</td>
<td>90-44-0398</td>
<td>Decal, Warning Fully Charged System</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>90-44-0192</td>
<td>Decal, Place in Float-Small</td>
<td>1</td>
<td>10</td>
<td>90-44-0399</td>
<td>Decal, Danger Do Not Contact Electric Lines</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>90-44-0255</td>
<td>Decal, Warning Pinch &amp; Crushing Hazard</td>
<td>2</td>
<td>11</td>
<td>90-44-0410</td>
<td>Decal, Yellow Retroreflective</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>90-44-0391</td>
<td>Decal, Warning-Acumulator Pressurized Hazard</td>
<td>1</td>
<td>12*</td>
<td>90-44-0411</td>
<td>Decal, Red Retroreflective</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>90-44-0392</td>
<td>Decal, Information - Hose Color Chart</td>
<td>1</td>
<td>13*</td>
<td>90-44-0412</td>
<td>Decal, Orange Fluorescent</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>90-44-0394</td>
<td>Decal, Danger To Avoid Injury Stand Clear</td>
<td>3</td>
<td>14</td>
<td>90-44-0450</td>
<td>Decal, Place in Float-Large Angled</td>
<td>1</td>
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<tr>
<td>7</td>
<td>90-44-0395</td>
<td>Decal, Warning Tongue &amp; Transport Speed</td>
<td>1</td>
<td>15</td>
<td>90-44-0455</td>
<td>Decal, Depth Stop Instructional</td>
<td>4</td>
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<td>8</td>
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<td>Decal, Warning Hydraulic Hazard</td>
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</tr>
</tbody>
</table>

* Not shown In this view
Safety Decal Locations Cont’d.

### Fig. # 2-5 Safety Decal Locations

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty.</th>
<th>Item</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90-44-0181</td>
<td>SMV SIGN</td>
<td>1</td>
<td>12</td>
<td>90-44-0411</td>
<td>Decal, Red Retroreflective</td>
<td>2</td>
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<tr>
<td>13</td>
<td>90-44-0412</td>
<td>Decal, Orange Fluorescent</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**WARNING**

Tongue can whip upwards when unhitching, if implement is equipped with a rear attachment. To avoid bodily injury, lower the machine or the rear parking stand to ground before removing hitch pin.

**WARNING**

Do not exceed this implement’s maximum transport speed of 32 km/h (20 mph). Exceeding this speed may result in loss of control during transport or braking and serious injury or death. Transport only with a properly ballasted tractor and a properly attached safety tow chain. Do not transport with a motor vehicle. Reduce speed and use additional caution when on inclines, towing under adverse surface conditions, and turning.

*(See Fig. # 2-6)*

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**Fig. # 2-6 Warning Decal P/N 90-44-0395**

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**Fig. # 2-7 Safety Decal Location**
**WARNING**

Be sure cylinder and attaching hoses are fully charged with oil before operating system. Failure to do so will allow wings to fall rapidly when attempting to lower from transport position.

(See Fig. # 2-8)

Fig. # 2-8 Warning Decal P/N 90-44-0398

Fig. # 2-9 Safety Decal Location
WARNING

Avoid serious injury from injection of pressurized hydraulic fluid.
Always relieve pressure before performing service or maintenance on any hydraulic components. Refer to tractor and implement Operator's Manuals.
Do not use hand to search for leaks. Use cardboard or similar material.

Fig. # 2-10 Warning Decal P/N 90-44-0396

Fig. # 2-11 Safety Decal Location

(See Fig. # 2-10)
WARNING

HIGH PRESSURE VESSEL
Avoid injury from high pressure escaping hydraulic fluid.
- Relieve pressure from hydraulic system before servicing accumulator.
- Precharge with dry nitrogen gas only.
Failure to comply could result in serious injury or death.

Fig. # 2-12 Warning Decal P/N 90-44-0508

(See Fig. # 2-12)

Fig. # 2-13 Safety Decal Location
DANGER

To avoid injury or death stand clear of machine when wings are being folded or unfolded. Mechanical or hydraulic failure can allow wings to fall rapidly.

Fig. # 2-14 Danger Decal P/N 90-44-0394

(See Fig. # 2-14)

Fig. # 2-15 Safety Decal Location (Left Side of Machine)

(See Fig. # 2-14)

Fig. # 2-17 Safety Decal Location

(See Fig. # 2-14)

Fig. # 2-16 Safety Decal Location (Right Side of Machine)
**DANGER**

To avoid injury or death do not contact electric lines

Fig. # 2-18 Danger Decal P/N 90-44-0399

(See Fig. # 2-18)

Fig. # 2-19 Safety Decal Location
Fig. # 2-20 Warning Decal P/N 90-44-0255

FRAME PINCH POINT & CRUSHING HAZARD
Can cause serious injury or death.
- Stay clear of machine during operation, folding, unfolding, raising, & lowering.
- Keep all persons clear while any part of machine is in motion.

Fig. # 2-21 Safety Decal Location
Important, Notice & Informational Decal Locations

Fig. # 2-22 Informational Decal P/N 90-44-0392

Fig. # 2-23 Informational Decal Location

(See Fig. # 2-22)
Fig. # 2-24 Important Decal (8 Locations) P/N 90-44-0455

TO AVOID POSSIBLE CYLINDER OR EQUIPMENT DAMAGE
- Add depth stops starting from clevis end of cylinder.

CORRECT

<table>
<thead>
<tr>
<th>Cutting Depth</th>
<th># Of Stops</th>
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</thead>
<tbody>
<tr>
<td>2.0&quot;</td>
<td>9</td>
</tr>
<tr>
<td>2.5&quot;</td>
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<td>3.0&quot;</td>
<td>7</td>
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<td>5.0&quot;</td>
<td>3</td>
</tr>
<tr>
<td>5.5&quot;</td>
<td>2</td>
</tr>
<tr>
<td>6.0&quot;</td>
<td>1</td>
</tr>
</tbody>
</table>

IMPORTANT: Add depth stops starting from this end.

Fig. # 2-25 Important Decal Locations (Located on all Packer Wheel Struts and all Packer Struts)
IMPORTANT

TO AVOID POSSIBLE CYLINDER OR EQUIPMENT DAMAGE

The Main Lift Cylinders and Wing Fold Cylinders MUST both be in the FLOAT position for the tillage to contour properly.

PLACE IN FLOAT

Fig. # 2-26 Important Decal (Small) P/N 90-44-0192

Fig. # 2-27 Important Decal Location
IMPORTANT
TO AVOID POSSIBLE CYLINDER OR EQUIPMENT DAMAGE
The Main Lift Cylinders and Wing Fold Cylinders MUST both be in the FLOAT position for the tillage to contour properly.

PLACE IN FLOAT

Fig. # 2-28 Important Decal (Large Angled) P/N 90-44-0450

(See Fig. # 2-28)

Fig. # 2-29 Important Decal Location
Safety Features

In addition to safety features shown here, other components, systems, safety decals on the machine, safety messages, and instructions in the Operator’s manual contribute to the safe operation of this machine when combined with the care and concern of a capable operator.

The construction of this implement may not meet all local or national requirements for transport on a public roadway. In regions or countries that have national certification requirements for roadway transport it may be impossible for this implement to be approved for such roadway transport. The customer is responsible for understanding and complying with all local, regional, and national requirements regarding roadway transport.

A YELLOW RETRO REFLECTIVE DECALS: Are used during times of insufficient light, adverse weather, smoke, or fog. Yellow reflectors reflect a yellow light when illuminated by headlights thereby alerting other drivers to the presence and width of machinery on roadways.

B RED RETRO REFLECTIVE DECALS: Are used during times of insufficient light, adverse weather, smoke, or fog. Red reflectors reflect a red light when illuminated by headlights thereby alerting other drivers to the presence and width of machinery on roadways.

C RED-ORANGE FLUORESCENT DECALS: Are a highly visible material, and alert other drivers to the presence and width of machinery on roadways.

D AMBER FLASHING WARNING/ TURN SIGNAL LIGHTS: Are a highly visible day and night, and alert other drivers to a slow moving vehicle ahead, warns road users of an obstruction to the free flow of traffic, alerts that a wider than normal load exists ahead, signaling for a turn, and the presence and width of machinery on roadways. (See“Kwik-Till Lighting” on page 3-15)

E RED TAIL/SIGNAL/BRAKE LIGHTS: Are a highly visible day and night, and alert other drivers to braking, signaling for a turn and the presence and width of machinery on roadways. (See“Kwik-Till Lighting” on page 3-15)

F SMV (SLOW MOVING VEHICLE) EMBLEM: Identifies slow-moving equipment and alerts traffic approaching from rear.

G SAFETY CHAIN helps control machine should it accidentally separate from tractor drawbar.

H JACKSTAND used for ease in attaching and detaching from tractor.
Safety Features Cont’d...

Fig. # 2-30 Safety Features Kwik-Till Front View

Fig. # 2-31 Safety Features Kwik-Till Side View

- **A** Yellow Retro Reflective Decals
- **B** Red Retro Reflective Decals
- **C** Red-Orange Fluorescent Decals
- **D** Amber Flashing Warning/Turn Signal Light
- **E** Red Tail/Signal/Brake Lights
- **F** SMV Emblem
- **G** Safety Chain
- **H** Jackstand
Safety Features Cont’d...

Fig. # 2-32 Safety Features Kwik-Till Rear View

- Yellow Retro Reflective Decals
- Red Retro Reflective Decals
- Red-Orange Fluorescent Decals
- Amber Flashing Warning/Turn Signal Light
- Red Tail/Signal/Brake Lights
- SMV Emblem
- Safety Chain
- Jackstand
3.0 TRANSPORT OPERATIONS

Transport Safety

IMPORTANT

Transport the machine at a reasonable and safe speed, which permits adequate control of steering and stopping. Reduce speed considerably when traveling over rough ground. Be certain everyone is clear of machine.

1. Read and understand ALL the information in the Operator’s Manual regarding procedures and SAFETY when moving or transporting the machine.

2. Check with local authorities regarding transporting on public roads. Obey all applicable laws and regulations.

3. Always travel at a safe speed. Use caution when making corners or meeting traffic. Travel speed should be such that complete control and machine stability is maintained at all times.

4. Make sure the SMV (Slow Moving Vehicle) emblem and all the 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.

5. Do not allow riders on the Kwik-Till or the tractor.

6. Attach Kwik-Till hitch link to tractor drawbar, verify that the hitch pin and retainer is used. Always attach the safety chain.

7. 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.

8. Do not exceed the maximum transport speed for this implement of 20 mph (32 km/h). Reduce speed on rough roads and surfaces.

9. Stay away from overhead obstructions and power lines when transporting. Electrocution can occur without direct contact. Contact local authorities or utilities to obtain safe clearance distances from high voltage power lines. Should a contact between the machine and an electric power source occur, the following precautions must be taken: Stop the machine movement immediately. Apply the park brake, stop the engine. Check if you can safely leave the cab or your actual position without contacting the electrical wires. If not, stay in your position and call for help. If you can leave your position without touching lines, jump clear of the machine to make sure you do not make contact with the ground and the machine at the same time. Do not permit anyone to touch the machine until power has been shut off to the power lines.

10. Always use hazard warning flashers on tractor & Kwik-Till when transporting unless prohibited by law.

11. Slow down and signal before turning.

12. Follow correct towing procedure for equipment without brakes.

13. To improve stability when traveling through the field, wings should be unfolded from transport position as soon as possible after leaving the roadway.

14. Towed loads can swerve, upset, or cause loss of control. Refer to Tow Loads Safely in this section.

Fig. # 3-1 Transport Hazard Area
Preparing The Tractor

Use Tractor Operator’s Manual

Always refer to tractor Operator’s Manual for specific, detailed information regarding operation of equipment. Use the tractor Operator’s Manual for detailed information as procedures vary by equipment.

Determine Tractor Requirements

For optimum performance, see “Tractor Engine Power Requirements” in the Specifications section. (See Fig. # 7-1 on page 7-1)

Install adapters if the tractor does not have ISO hydraulic couplers. See your tractor dealer or qualified service provider.

Hydraulic Requirements

2900 psi (183 bar) (18 271 kPa) tractor hydraulic system with ISO hydraulic couplers is required.

5 tractor control valves are preferred for operating the Kwik-Till, 4 Minimum. 6 tractor control valves are required if equipped with the rubber roller scrapers.
Drawbar Requirements

See Drawbar Requirements in Preparing Machine section. (See “Drawbar Requirements” on page 3-5)

Secure Three-Point Hitch

If equipped with a quick coupler A, raise the 3-point hitch fully.

If not equipped with quick coupler, secure lift links B and center link C so they do not swing into the tractor tires or hoses. (See Fig. # 3-4)

A - Quick Coupler
B - Lift Link (2 used)
C - Center Link

Position Drawbar

\[\text{Fig. # 3-4 Secure Three-Point Hitch}\]

\[\text{CAUTION}\]
Avoid personal injury or death to you or others due to lost machine steering control. Always pin the drawbar in the center position for all tractors when transporting machine.

1. Two-Wheel Drive Tractors: Place drawbar in fixed, centered, and down position.
2. Four-Wheel Drive and Tracked Tractors: Place drawbar in fixed, center position for transport. Leave one hole clearance on each side of drawbar for field operation only.
3. Wide-Swing Drawbar: Place drawbar in fixed, center position for transport. Place the stop blocks on storage brackets for field operation.

\[\text{Fig. # 3-5 Standard Drawbar in Transport Position}\]
Prepare Hydraulic System

**IMPORTANT**
Refer to tractor Operator’s Manual for specific, detailed information regarding hydraulic flow. To prevent damage to relief valves, do not exceed 30 gal/min (113 L/min) on main lift cylinders.

---

1. Check hydraulic oil level. Fill if necessary.
2. Use the chart below as a starting point to set tractor hydraulic flow and detent times. Adjust as desired.

### Tractor Hydraulic Flow Settings

<table>
<thead>
<tr>
<th>SCV</th>
<th>Function</th>
<th>Flow</th>
<th>Detent Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Front Wheels</td>
<td>25 gal/min (95 L/min)</td>
<td>7 s</td>
</tr>
<tr>
<td>II</td>
<td>Rear Roller</td>
<td>25 gal/min (95 L/min)</td>
<td>7 s</td>
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<tr>
<td>III</td>
<td>Main Frame Lift</td>
<td>30 gal/min (113 L/min)</td>
<td>Float</td>
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<tr>
<td>IV</td>
<td>Wing Fold</td>
<td>8 gal/min (30 L/min)</td>
<td>Float</td>
</tr>
<tr>
<td>V</td>
<td>Hitch Jack</td>
<td>5 gal/min (19 L/min)</td>
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</tr>
<tr>
<td>VI</td>
<td>Optional Equipment</td>
<td>15 gal/min (57 L/min)</td>
<td>5 s</td>
</tr>
</tbody>
</table>

---

*Fig. # 3-6 Adjust The Tractor Hydraulic Flow Settings*

*Fig. # 3-7 Tractor Hydraulic Flow Settings*
Preparing Kwik-Till

Drawbar Requirements

**IMPORTANT**

Tractor drawbars must be compatible with the Kwik-Till hitch links or damage to machine and/or tractor can occur. Refer to the tractor Operator's Manual for specific drawbar requirements. For ordering hitch links see your Kwik-Till dealer, for hitch pins, see your tractor dealer or qualified service provider. Do not exceed static vertical load capacity of tractor drawbar. See Specifications section (See “Downward Force on Tractor Drawbar” on page 7-1) for vertical load and see tractor operator's manual for drawbar limits and heavy-duty supports.

<table>
<thead>
<tr>
<th>Hitch Category</th>
<th>Tractor Drawbar</th>
<th>Hitch Pin Diameter (A)</th>
<th>Drawbar Opening Height (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td>2.0 in (51 mm)</td>
<td>3.54 in (90 mm)</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>2.75 in (71 mm)</td>
<td>3.94 in (100 mm)</td>
</tr>
</tbody>
</table>

**Fig. # 3-8 Determining Drawbar Hitch Link Size**

**Fig. # 3-9 Table: Determining Drawbar Hitch Link Size (Non-Articulating Ball)**

**Fig. # 3-10 Cat. 4 Hitch Link, Non Articulating Ball, Standard For HSD2500, & HSD3000 (Max Dia. Hitch Pin Ø2.0 (51 mm))**

**Fig. # 3-11 Cat. 5 Hitch Link, Non Articulating Ball, Standard For HSD3500, HSD4000, & HSD4500 (Min. Hitch Pin Dia. Ø2.0” (51 mm)) (Max. Hitch Pin Dia. Ø2.75” (71 mm)) P/N 90-42-0026**
### Hitch Category

<table>
<thead>
<tr>
<th>Hitch Category</th>
<th>Tractor Drawbar</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hitch Pin Diameter (A)</td>
<td>Drawbar Opening Height (B)</td>
</tr>
<tr>
<td>4</td>
<td>1.5 in (39 mm)</td>
<td>3.54 in (90 mm)</td>
</tr>
<tr>
<td>4</td>
<td>2.0 in (51 mm)</td>
<td>3.54 in (90 mm)</td>
</tr>
<tr>
<td>5</td>
<td>2.0 in (51 mm)</td>
<td>3.94 in (100 mm)</td>
</tr>
<tr>
<td>5</td>
<td>2.75 in (71 mm)</td>
<td>3.94 in (100 mm)</td>
</tr>
</tbody>
</table>

**Fig. # 3-13 Table: Determining Drawbar Hitch Link Size (Articulating Ball)**

**Fig. # 3-12 Determining Drawbar Hitch Link Size**

**Fig. # 3-14 Cat. 4 Hitch Link With Articulating Ball, Optional For HSD2500, HSD3000, HSD3500, HSD4000 & HSD4500**

**Fig. # 3-15 Cat. 5 Hitch Link With Articulating Ball, Optional For HSD2500, HSD3000, HSD3500, HSD4000 & HSD4500**

Hitch Link Bushing
- For 1-1/2 (39 mm) Dia. Hitch Pin
  - P/N 90-42-1004

Cat. 4 Hitch Link
- Use 2" (51 mm) Dia. Hitch Pin
  - P/N 90-42-0011

Cat. 5 Hitch Link
- Use 2-3/4" (71 mm) Hitch Pin
  - P/N 90-42-0027
Check Tire Pressure

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Load/Speed Index</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>600/50R22.5</td>
<td>168B</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>317</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.1</td>
</tr>
</tbody>
</table>

*Fig. # 3-16 Table: Tire Pressure*

**CAUTION**

Tire failure due to overloading can cause loss of vehicle control during transport resulting in serious injury or death to you or others. Prevent tire failure by using only tires specified for your machine and inflating them to correct pressures.

**IMPORTANT**

Chart shown is for tire reference only. Ensure machine performance by using only tires specified for your machine and inflating them to correct pressures.

For the even working depth of attachments in the ground, tires must be inflated to specification. A low tire causes deeper penetration on one side than the other. Deeper penetration on one side can cause the machine to side draft. Inflate all tires to correct pressures.

Check Wheel Hardware

- Re-torque lug nuts after the first 1 hour of use.
- Re-torque lug nuts at 10 hour intervals or (daily). If bolt torque is stable, check at 50 hour intervals.

Tighten all wheel lug nuts to specification.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheel Lug Nuts</td>
<td>350 lb·ft (474 N·m)</td>
</tr>
</tbody>
</table>

*Fig. # 3-17 Table: Wheel Lug Nut Torque*
Attaching and Detaching Kwik-Till To/From Tractor

Use Your Tractor and Tillage Equipment Operator’s Manuals

Always see your tractor and Kwik-Till equipment Operator’s Manual for specific, detailed information regarding equipment operation. Operation and adjustment procedures vary by equipment.

Fig. # 3-18 Consult Your Tractor & Kwik-Till Operator’s Manual

Attaching and Detaching Kwik-Till To/From Tractor Safety

Never let another person stand between the tractor and the implement during hitching. Too fast of an approach or the operator’s foot slipping from the clutch can lead to injury or death to the person standing nearby.

DANGER
CRUSH HAZARD

Stand clear when raising or lowering the Kwik-Till.

Keep feet, legs, and body clear when raising and lowering the Kwik-Till. Keep others away.

DANGER
UPENDING HAZARD

The tractor MUST be equipped with a clevis hitch to prevent the Kwik-Till from tipping upward while unfolding from transport position, and folding into transport position. To avoid bodily injury, lower the machine before removing the hitch pin.

If negative tongue weight exists, the hitch tongue may suddenly raise, and the rear section would come crashing down. Only disconnect when the jack is lowered, there is positive tongue weight, the unit is on level ground, and in the proper transport or field position. Never disconnect the Kwik-Till from the tractor if the rear sections of the machine are partially raised. Keep others away.

DANGER
CRUSH HAZARD

Avoid being crushed in between the tractor and the implement.

When working in the danger area between the Kwik-Till and the tractor always ensure that the Tractor engine is turned off and the Key removed. Keep others away.
Attaching Kwik-Till To Tractor

1. Clear the area of bystanders and remove foreign objects from the Kwik-Till and working area.
2. Make sure there is enough room to back the tractor up to the Kwik-Till hitch.
3. Start the tractor and slowly back it up to the align the hitch point. *(See Fig. # 3-19)*

![Fig. # 3-19 Back Tractor To Align Hitch Point](image)

**WARNING**
Before connecting equipment, servicing, adjusting, or repairing:
Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving the tractor cab.

**WARNING**
Avoid hazards due to escaping fluid under pressure. See the Hydraulic Safety section in this manual. Hydraulic hoses can fail due to physical damage, kinks, age, and exposure. Check hoses regularly. Replace damaged hoses.

**IMPORTANT**
All hydraulic couplers must be clear of debris, dust, and sand. Foreign material can damage hydraulic system.

4. Locate the “Hitch Jack Hydraulic Hoses” \( B \) attached to the “Hitch Jack” \( A \). *(See Fig. # 3-20)*

![Fig. # 3-20 Locate The Hitch Jack Hydraulic Hoses](image)

5. Make sure that the Hitch Jack hydraulic hose ball valve is in the “CLOSED” position. *(See Fig. # 3-21)*

![Fig. # 3-21 Make Sure The Ball Valve Is “CLOSED” (Shown in the “CLOSED” Position)](image)
6. Use a clean cloth or paper towel to clean the couplers on the ends of the hoses. Also clean the area around the couplers on the tractor.

7. Connect the “Hitch Jack” hydraulic hoses at this time. Refer to the following figures. (See Fig. # 3-23) (See Fig. # 3-24) (See Fig. # 3-25)

8. Turn the Ball Valve to the “OPEN” position. (See Fig. # 3-26)
9. Start the tractor and use the tractor remote valve levers to raise or lower the hitch to align it with the tractor drawbar. Extending the Hitch Jack raises the hitch, while retracting the Hitch Jack lowers the Hitch. *(See Fig. # 3-27)  (See Fig. # 3-28)*

10. Slowly back tractor up to align the hitch.

**DANGER**

**CRUSH HAZARD**

Stand clear when raising or lowering the Kwik-Till.

Keep feet, legs, and body clear when raising and lowering the Kwik-Till. Keep others away.

**DANGER**

**UPENDING HAZARD**

TONGUE CAN WHIP UPWARDS WHEN UNHITCHING

The tractor **MUST** be equipped with a clevis hitch to prevent the Kwik-Till from tipping upward while unfolding from transport position, and folding into transport position. To avoid bodily injury, lower the machine before removing the hitch pin.

If negative tongue weight exists, the hitch tongue may suddenly raise, and the rear section would come crashing down. Only disconnect when the jack is lowered, there is positive tongue weight, the unit is on level ground, and in the proper transport or field position. Never disconnect the Kwik-Till from the tractor if the rear sections of the machine are partially raised. Keep others away.
DANGER
CRUSH HAZARD
Avoid being crushed in between the tractor and the implement.

When working in the danger area between the Kwik-Till and the tractor always ensure that the Tractor engine is turned off and the Key removed. Keep others away.

11. Install drawbar pin A as required. See your tractor operator's manual for a proper connection. (See Fig. # 3-29)

12. Install the safety chain between the tractor and the hitch. (See Fig. # 3-30)

WARNING
A safety chain helps control the Kwik-Till A should it accidentally separate from the drawbar B while transporting. A runaway machine can cause serious injury or death to you or others. Using appropriate adapter parts, attach chain to tractor drawbar support. Provide only enough slack in the chain to permit turning. Do not attach chain to intermediate support C. Chain must only loop through intermediate support.

Fig. # 3-30 Install Safety Chain

| A | Kwik-Till      |
| B | Drawbar        |
| C | Intermediate Support |

Fig. # 3-29 Kwik-Till Connected To Tractor
13. Raise the hitch jack until it fully retracts.  
   (See Fig. # 3-31)

![Fig. # 3-31 Raise the Hitch Jack](image)

14. Close the hydraulic hitch jack ball valve.  
   (See Fig. # 3-32)

**IMPORTANT**

Close the hydraulic hitch jack ball valve to prevent accidental operation of this circuit. Ensure ball valve handle remains in closed position when not in use.

- Failure to close the ball valve during operation may cause the hitch jack to extend causing damage to the hitch jack and machine by accidental activation of the hitch jack SCV.

![Fig. # 3-32 Close the Ball Valve (Shown in the “CLOSED” Position)](image)

15. Relieve pressure in the “Hitch Jack” circuit by placing the tractor remote valve lever in the “FLOAT POSITION” position temporarily with engine running.  
   (See Fig. # 3-33)

![Fig. # 3-33 Tractor Remote Valve Levers](image)

**NOTE**

At this time, the hitch jack hydraulic hoses can be unhooked and stowed if the tractor does not have enough SCV valves. If your tractor does not have enough SCV valves proceed to the next step, otherwise, skip the next step.  
   (See Fig. # 3-34)

![Fig. # 3-34 Hitch Jack Hoses Stowed In The Hydraulic Hose Storage Slots](image)
16. Connect the remainder of the Kwik-Till hydraulic hoses to the tractor SCV's at this time. Refer to the following figures. (See Fig. # 3-35) (See Fig. # 3-36) (See Fig. # 3-37)

**Fig. # 3-35 Connect the Remaining Hydraulic Hoses to the Tractor SCV**

**Fig. # 3-36 Table: SCV Identification**

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>Color</th>
<th>SCV Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Pressure</td>
<td>Green</td>
<td>Front Wheels Pressure (+)</td>
</tr>
<tr>
<td>B</td>
<td>Return</td>
<td>Green</td>
<td>Front Wheels Return (-)</td>
</tr>
<tr>
<td>C</td>
<td>Pressure</td>
<td>Blue</td>
<td>Rear Rollers Pressure (+)</td>
</tr>
<tr>
<td>D</td>
<td>Return</td>
<td>Blue</td>
<td>Rear Rollers Return (-)</td>
</tr>
<tr>
<td>E</td>
<td>Pressure</td>
<td>Gold</td>
<td>Main Frame Lift Pressure (+)</td>
</tr>
<tr>
<td>F</td>
<td>Return</td>
<td>Gold</td>
<td>Main Frame Lift Return (-)</td>
</tr>
<tr>
<td>G</td>
<td>Pressure</td>
<td>Black</td>
<td>Wing Fold Pressure (+)</td>
</tr>
<tr>
<td>H</td>
<td>Return</td>
<td>Black</td>
<td>Wing Fold Return (-)</td>
</tr>
<tr>
<td>I</td>
<td>Pressure</td>
<td>Red</td>
<td>Hitch Jack Pressure (+)</td>
</tr>
<tr>
<td>J</td>
<td>Return</td>
<td>Red</td>
<td>Hitch Jack Return (-)</td>
</tr>
<tr>
<td>K</td>
<td>Return</td>
<td>Silver</td>
<td>Optional Equipment (+)</td>
</tr>
<tr>
<td>L</td>
<td>Pressure</td>
<td>Silver</td>
<td>Optional Equipment (-)</td>
</tr>
</tbody>
</table>

**Fig. # 3-37 Hydraulic Hose To SCV Decal**

**INFORMATION**

**HOSE COLOR CHART**

<table>
<thead>
<tr>
<th>Optional Equipment</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitch Jack</td>
<td>Red</td>
</tr>
<tr>
<td>Wing Fold</td>
<td>Black</td>
</tr>
<tr>
<td>Main Frame Lift</td>
<td>Gold</td>
</tr>
<tr>
<td>Rear Roller</td>
<td>Blue</td>
</tr>
<tr>
<td>Front Wheels</td>
<td>Green</td>
</tr>
</tbody>
</table>
CAUTION
When transporting the Kwik-Till on a road or highway at night or during the day, use lights and devices to properly warn the operators of other vehicles.

Follow local regulations for equipment lighting and marking.

Keep lighting and marking visible, clean, and in good working order. Replace or repair lighting and marking that has been damaged or lost.

Replacement lights and devices are available from your Kwik-Till dealer.

17. Connect the Warning Light Plug (A) to the Seven-Terminal Outlet (B) on the tractor. (See Fig. # 3-38)

18. Verify correct operation of all warning lights.

19. To obtain maximum warning, be sure that warning lights, reflectors, and SMV emblem are clean.

Using The Seven-Terminal Outlet

A Seven Terminal Outlet (B) is used to connect road lights, turn signals, brake lights, & hazard lights. (See Fig. # 3-39)

Always use auxiliary lights on towed implement when tractor rear signals and other lights are obscured.

Refer to the following table for the Terminal Number (A) definitions and their functions. (See Fig. # 3-40)

<table>
<thead>
<tr>
<th>Terminal Numbers (A)</th>
<th>Function</th>
<th>Wire Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground</td>
<td>White</td>
</tr>
<tr>
<td>2</td>
<td>Flood Light</td>
<td>Black (Not Used)</td>
</tr>
<tr>
<td>3</td>
<td>Left Turn Signal &amp; Hazard Signal Lamps</td>
<td>Yellow</td>
</tr>
<tr>
<td>4</td>
<td>Brake Lights</td>
<td>Red</td>
</tr>
<tr>
<td>5</td>
<td>Right Turn Signal &amp; Hazard Signal Lamps</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>Tail Light</td>
<td>Brown</td>
</tr>
<tr>
<td>7</td>
<td>Accessory</td>
<td>Blue (Not Used)</td>
</tr>
</tbody>
</table>

Fig. # 3-38 Connect Warning Light Plug

Fig. # 3-39 Seven-Terminal Outlet Terminal Numbers

Fig. # 3-40 Table: Seven-Terminal Outlet Terminal Numbers
Kwik-Till Lighting

The Kwik-Till turn signal, brake and warning lamp system is compatible with enhanced tractor brake lighting:

If your tractor is equipped with enhanced brake lighting, the Kwik-Till will follow the table in. (See Fig. # 3-41)

If your tractor is not equipped with enhanced brake lighting, the Kwik-Till brake lamps will illuminate continuously. Consult your tractor operator’s manual or tractor dealer to see if brake functionality can be added to Terminal Number 4. (See Fig. # 3-40)

Your Kwik-Till lighting should follow the pattern indicated in the table below. (See Fig. # 3-41) The Kwik-Till features a combined tail light and brake light with two filaments: the bright light is the brake, the normal light is the tail light. If your Kwik-Till lighting does not follow the pattern from the table below, (See Fig. # 3-41) contact your Kwik-Till dealer.

<table>
<thead>
<tr>
<th>Tractor Function</th>
<th>Lights OFF</th>
<th>Road Lights ON</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brake Lamps</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Signal Lamps</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left Amber</td>
<td>OFF</td>
<td>Pulse Pulse Pulse Pulse ON ON Pulse Pulse</td>
</tr>
<tr>
<td>Left Tail Light</td>
<td>OFF</td>
<td>ON ON ON ON ON ON ON ON</td>
</tr>
<tr>
<td>Left Red Signal/Brake*</td>
<td>OFF OFF</td>
<td>Pulse Pulse ON OFF ON OFF ON</td>
</tr>
<tr>
<td>Right Amber</td>
<td>OFF</td>
<td>Pulse ON ON Pulse Pulse Pulse Pulse</td>
</tr>
<tr>
<td>Right Tail Light</td>
<td>OFF</td>
<td>ON ON ON ON ON ON ON ON</td>
</tr>
<tr>
<td>Red Right Signal/Brake*</td>
<td>OFF OFF</td>
<td>OFF ON ON Pulse Pulse OFF ON</td>
</tr>
</tbody>
</table>

* The brake lamp is the bright filament, the tail light is the normal filament within the same red lens.

Fig. # 3-41 Table: Kwik-Till Lighting Behaviors

**IMPORTANT**

If you have an older model tractor, it may be possible that your Seven-Terminal Outlet Terminal Numbers A does not match that of the table in (See Fig. # 3-40) If this is true, then your Kwik-Till brake light function will be always “ON”. Consult your tractor operator’s manual or tractor dealer to see if brake functionality can be added to Terminal Number 4.
Detaching Kwik-Till From Tractor

1. Clear the area of bystanders and remove foreign objects from the Kwik-Till and working area.

2. Locate the “Hitch Jack Hydraulic Hoses” attached to the “Hitch Jack” (See Fig. # 3-42)

3. Make sure that the Hitch Jack hydraulic hose ball valve is in the “CLOSED” position. (See Fig. # 3-43)

4. Use a clean cloth or paper towel to clean the couplers on the ends of the hoses. Also clean the area around the couplers on the tractor.

5. Connect the “Hitch Jack” hydraulic hoses at this time. Refer to the following figures. (See Fig. # 3-45) (See Fig. # 3-46) (See Fig. # 3-47)

**IMPORTANT**

Note the polarity on each hose grip. Plus (+) is for pressure side hydraulic hose, and Minus (-) is for return side hydraulic hose. (See Fig. # 3-44)

---

**Fig. # 3-42 Locate The Hitch Jack Hydraulic Hoses**

**Fig. # 3-43 Make Sure The Ball Valve Is CLOSED (Shown in the “CLOSED” Position)**

**Fig. # 3-44 Determine Hydraulic Hose Is Pressure (+) Or Return (-)**

**Fig. # 3-45 Connect “Hitch Jack” Hydraulic Hoses To Tractor**

**Fig. # 3-46 Table: SCV Identification**

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>Color</th>
<th>SCV Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Pressure</td>
<td>Red</td>
<td>Hitch Jack Pressure (+)</td>
</tr>
<tr>
<td>J</td>
<td>Return</td>
<td>Red</td>
<td>Hitch Jack Return (-)</td>
</tr>
</tbody>
</table>

---
6. Turn the Ball Valve to the “OPEN” position. (See Fig. # 3-48)

**DANGER**

UPENDING HAZARD

TONGUE CAN WHIP UPWARDS WHEN UNHITCHING

The tractor **MUST** be equipped with a clevis hitch to prevent the Kwik-Till from tipping upward while unfolding from transport position, and folding into transport position. To avoid bodily injury, lower the machine before removing the hitch pin.

If negative tongue weight exists, the hitch tongue may suddenly raise, and the rear section would come crashing down. Only disconnect when the jack is lowered, there is positive tongue weight, the unit is on level ground, and in the proper transport or field position. Never disconnect the Kwik-Till from the tractor if the rear sections of the machine are partially raised. Keep others away.

**DANGER**

CRUSH HAZARD

Avoid being crushed in between the tractor and the implement.

When working in the danger area between the Kwik-Till and the tractor always ensure that the Tractor engine is turned off and the Key removed. Keep others away.
7. Before unhitching from tractor, start the tractor and use the tractor remote valve levers to lower the hitch jack completely to the ground. If machine is to be unhitched in the transport position, be sure that transport locks (See “Transport Locks” on page 4-10) are installed and machine is on a firm and level surface. (See Fig. # 3-49) (See Fig. # 3-50)

8. Remove remaining weight from drawbar using tractor remote valve levers and hitch jack.

9. Be sure that no negative tongue weight exists.

**WARNING**

Before disconnecting equipment, servicing, adjusting, or repairing:
Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving the tractor cab.

The Kwik-Till can be attached and detached from the tractor from three different positions:

- **Transport Position** (See Fig. # 3-51)
- **Field Raised Position** (See Fig. # 3-52)
- **Field Lowered Position** (See Fig. # 3-53)
10. Disconnect the **Warning Light Plug** ![A](image) from the **Seven-Terminal Outlet** ![B](image) on the tractor. *(See Fig. # 3-54)*

11. Secure the **Warning Light Plug** ![A](image) in the **Hose Holder Spring** ![B](image) located on the hitch of the Kwik-Till. *(See Fig. # 3-55)*

12. Close the hydraulic hitch jack ball valve. *(See Fig. # 3-56)*

**IMPORTANT**

Close the hydraulic hitch jack ball valve to prevent accidental operation of this circuit. Ensure ball valve handle is in closed position when not in use.

- Failure to close the ball valve during operation may cause the hitch jack to extend causing damage to the hitch jack and machine by accidental activation of the hitch jack SCV.
- Failure to close the ball valve during storage will cause the machine to slowly settle causing the hitch to lower to the ground.
13. Relieve pressure in the "Hitch Jack" circuit by placing the tractor remote valve lever in the "FLOAT POSITION" position with engine running. (See Fig. # 3-57)

![Fig. # 3-57 Tractor Remote Valve Levers](image)

**WARNING**

Avoid hazards due to escaping fluid under pressure. See the Hydraulic Safety section in this manual. Hydraulic hoses can fail due to physical damage, kinks, age, and exposure. Check hoses regularly. Replace damaged hoses.

14. Remove drawbar pin A as required. See your tractor operator's manual for a proper disconnection. (See Fig. # 3-58)

![Fig. # 3-58 Remove Drawbar Pin](image)

15. Disconnect the hydraulic hoses from the tractor. (See Fig. # 3-59)

![Fig. # 3-59 Disconnect Hydraulic Hoses](image)
16. Place the hydraulic hoses in the storage slots \( C \). (See Fig. # 3-60)

17. Remove safety chain from tractor.

18. Start the tractor and slowly pull forward to disconnect. (See Fig. # 3-61)

**IMPORTANT**

All hydraulic couplers must be clear of debris, dust, and sand. Use protective caps on fluid openings until ready to make connection. Foreign material can damage hydraulic system.
4.0 - WORKING OPERATIONS

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the Kwik-Till.

Follow all safety instructions exactly. It is everyone’s business. By following recommended procedure, a safe working environment is provided for the operator, bystanders and the area around the work site.

The design and configuration of this machine includes safety decals and equipment. Hazard controls and accident prevention are dependent upon the personnel operating and maintaining it. Their awareness, concern, prudence and proper training are crucial.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely, and to provide maximum efficiency.

By following the operating instructions, in conjunction with a good maintenance program, your Kwik-Till will provide many years of trouble free service.

<table>
<thead>
<tr>
<th>Operating Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Read and understand the Operator’s Manual and all safety decals before using.</td>
</tr>
<tr>
<td>2. Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving tractor cab.</td>
</tr>
<tr>
<td>3. Clear the area of bystanders, especially children, before starting.</td>
</tr>
<tr>
<td>4. Be familiar with the machine hazard area. If anyone enters hazard area, shut down machine immediately. Clear the area before restarting.</td>
</tr>
<tr>
<td>5. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.</td>
</tr>
<tr>
<td>6. Keep riders off. Riders on the implement are subject to injury such as being struck by foreign objects and being thrown off of the machine.</td>
</tr>
<tr>
<td>7. Stay away from overhead obstructions and power lines during operation and transporting. Electrocution can occur without direct contact.</td>
</tr>
<tr>
<td>8. Be sure that area around machine is clear before raising or lowering machine frame or wings.</td>
</tr>
<tr>
<td>9. Do not operate with wings partially folded.</td>
</tr>
<tr>
<td>10. Do not operate close to the edge of a ditch, creek, gully, or steep embankment.</td>
</tr>
<tr>
<td>11. Avoid holes, ditches, and obstructions which can cause tractor, machine, or towed equipment to roll over, especially on hillsides.</td>
</tr>
<tr>
<td>12. Avoid sharp turns on hillsides.</td>
</tr>
<tr>
<td>13. Slow down when turning or traveling over rough ground and when turning on inclines.</td>
</tr>
<tr>
<td>14. Always shut off tractor and shift to park or set brakes when leaving tractor. Remove key when leaving tractor unattended.</td>
</tr>
<tr>
<td>15. Always have tractor stopped on level ground when raising or lowering wings.</td>
</tr>
<tr>
<td>16. Operate machine from tractor seat only.</td>
</tr>
<tr>
<td>17. If chemicals are used, follow manufacturer’s recommendations for their handling and storage.</td>
</tr>
<tr>
<td>18. Tow machine behind a properly equipped tractor only.</td>
</tr>
</tbody>
</table>
Machine Components (Page 1 of 3)

Fig. # 4-1 Machine Components (Shown In Field Position Raised)

1 Hitch Section
2 Center Section
3 Left Wing
4 Right Wing
5 Center Strut
6 Center Strut Wheels
7 Main Frame Lift Hydraulic Cylinder
8 Wing Fold Hydraulic Cylinder
9 Front Wheel Hydraulic Cylinder
10 Rear Roller (Basket) Hydraulic Cylinder
11 Hitch Jack Hydraulic Cylinder
12 Hitch Jack Pivoting Foot
13 Safety Chain
14 Hitch Link
15 Hose Holder Bracket
16 Hose Holder Spring
17 Hose Holder Slots
18 Transport Rests
19 Wing Transport Roller
20 Transport Lock Pin
21 Tillage Deflector
22 Accumulator
23 Front Disk Shank
24 Rear Disk Shank
25 Manual Depth Control
26* SMV Emblem (Not Shown)
27* Amber Flashing Warning/Turn Signal Light (Not Shown)
28* Red Tail/Signal/Brake Lights (Not Shown)
29 Operator’s Manual Tube
30 Rear Roller Hanger
31 Rear Cage Roller (Option) (Shown)
32* Spring Roller (Option) (Not Shown)
33* Rubber Roller (Option) (Not Shown)
34* Rear Roller Deflector (Option) (Not Shown)
35* Rubber Roller Scrapers (Option) (Not Shown)
36* Hydraulic Hitch Jack Ball Valve

Optional Disks:
• 20” Dia. Disk Offset Smooth
• 20” Dia. Disk Offset Notched (Shown)

On All Options The Farthest Left Disk Is:
• 18” Smooth Disk (Shown)

Note: Operator’s Manual Canister Shown From Right Side of Machine

* Not shown in this view
Machine Components Contd.

The Norwood Kwik-Till consists of forward folding frames, individual disk assemblies, and rolling baskets. The Kwik-Till combines the right disk angle with the perfect roller basket to do a complete job every time you work your field.
Machine Components (Page 3 of 3)

Fig. # 4-3 Machine Components
(Cage Roller Option Shown In Field Position Raised)

Fig. # 4-4 Machine Components
(Spring Roller Option Shown In Field Position Raised)

Fig. # 4-5 Machine Components
(Rubber Roller Option Shown In Field Position Raised)

<table>
<thead>
<tr>
<th>31</th>
<th>Rear Cage Roller (Option)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Spring Roller (Option)</td>
</tr>
<tr>
<td>33</td>
<td>Rubber Roller (Option)</td>
</tr>
<tr>
<td>34</td>
<td>Rear Roller Deflector</td>
</tr>
<tr>
<td>35</td>
<td>Rubber Roller Scrapers (Option)</td>
</tr>
</tbody>
</table>
PRE-OPERATION CHECKLIST

(OWNER’S RESPONSIBILITY)

Efficient and safe operation of the Kwik-Till requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this section.

A pre-operation checklist is provided for the operator. It is important for both the personal safety and maintaining the good mechanical condition of the Kwik-Till that this checklist is followed.

Before operating the Kwik-Till and each time thereafter, the following areas should be checked off:

1. Read the Operator’s Manual before operating.
2. Check all lubrication points and grease as instructed in the maintenance section. (See “5.0 MAINTENANCE” on page 5-1)
3. Use recommended size tractor. (See “Tractor power requirements are shown in the following” on page 7-1)
4. Be sure that tractor and machine have been properly prepared. Check that the unit is properly attached to the tractor. On pull-type unit, be sure there is a mechanical retainer through the draw-bar pin and the safety chain is installed. (See “Attaching Kwik-Till To Tractor” on page 3-9)
5. Check tire pressure. (See “Tire Specifications” on page 7-3)
6. Inspect all hydraulic lines, hoses, couplers, and fittings. Tighten, repair, or replace any leaking or damaged components.
7. Inspect, or torque all specified hardware. (See “5.0 MAINTENANCE” on page 5-1)
8. Fully charge hydraulic system.
CONTROLS

Before starting to work, all operators should familiarize themselves with the location and function of the controls.

Hydraulic Hitch Jack Ball Valve

The hydraulic hitch jack ball valve prevents accidental flow of hydraulic fluid into the hitch jack causing it to extend while in operation thereby causing damage to the hitch jack and the machine. The hydraulic hitch jack ball valve also keeps pressure from dropping in the hitch jack cylinder to avoid the hitch from settling.

**IMPORTANT**

Close the hydraulic hitch jack ball valve to prevent accidental operation of this circuit. Ensure ball valve handle is in closed position when not in use.

- Failure to close the ball valve during operation may cause the hitch jack to extend causing damage to the hitch jack and machine by accidental activation of the hitch jack SCV.
- Failure to close the ball valve during storage will cause the machine to slowly settle causing the hitch to lower to the ground.

A. Close the hydraulic hitch jack ball valve while in operation to keep the hitch jack from extending and potentially causing damage to the hitch jack and machine. (See Fig. # 4-7)

![Fig. # 4-6 Hydraulic Hitch Jack Ball Valve (Shown in the “CLOSED” Position)](image)

![Fig. # 4-7 Close the Ball Valve When In Operation (Shown in the “CLOSED” Position)](image)

![Fig. # 4-8 Close the Ball Valve When In Operation Or Damage may Result](image)
Manual Depth Control

Understanding Manual Depth Control

Before you start work in a field you may need to adjust the depth depending on the type of crop residue or soil conditions.

The operator can adjust the depth by raising or lowering the front or rear sets of disk shanks by adjusting the depth stops of the rear roller and front wheels.

Adjusting the digging depth of the front and rear disk shanks is accomplished by adding or subtracting a number of depth stops from the rear roller and wheel cylinders.

**IMPORTANT**

Failure to add or remove depth stops from the wrong end of the hydraulic cylinder will cause hydraulic cylinder component and hydraulic cylinder damage. (See Fig. # 4-9) (See Fig. # 4-10)

Each spacer that is added to the cylinders raises the frame height by 1/2”. (See Fig. # 4-11)

![Fig. # 4-11 Manual Depth Stop Adjustment - Raising Height](image)

Each spacer subtracted from the cylinder lowers the disks deeper into the soil, you would remove one spacer for each 1/2” of depth change required. (See Fig. # 4-12)

![Fig. # 4-12 Manual Depth Stop Adjustment - Lowering Height](image)

A typical recommended penetration depth of 2 in - 3 in (51 mm - 76 mm) is suggested for both front and rear disk shanks. This depth, however, can be adjusted to the operators needs and preferences or based on different crop varieties and soil conditions.

Some operators may also prefer to adjust the front or rear disk shanks to run slightly higher than the other. Adjustments to the front or rear disk shanks are done individually:

<table>
<thead>
<tr>
<th>Digging Depth</th>
<th>Number Of Depth Stops Engaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0 in (51 mm)</td>
<td>9</td>
</tr>
<tr>
<td>2.5 in (64 mm)</td>
<td>8</td>
</tr>
<tr>
<td>3.0 in (76 mm)</td>
<td>7</td>
</tr>
<tr>
<td>3.5 in (89 mm)</td>
<td>6</td>
</tr>
<tr>
<td>4.0 in (102 mm)</td>
<td>5</td>
</tr>
<tr>
<td>4.5 in (114 mm)</td>
<td>4</td>
</tr>
<tr>
<td>5.0 in (127 mm)</td>
<td>3</td>
</tr>
<tr>
<td>5.5 in (140 mm)</td>
<td>2</td>
</tr>
<tr>
<td>6.0 in (152 mm)</td>
<td>1</td>
</tr>
</tbody>
</table>

![Fig. # 4-13 Table: Depth Stop Adjustment](image)
• Adjust operating speed to 10.5 mph - 11.5 mph (17 km/h - 18.5 km/h) for best performance.

• Adjusting the **Front Disk Height** \(A\) is done by adding/removing **Depth Stops** \(B\) to the two **Center Strut Wheel Cylinders** \(C\), and the two **Wing Strut Cylinders** \(C\). *(See Fig. # 4-14)*

### Understanding Depth Control Components

#### **WARNING**

Before disconnecting equipment, servicing, adjusting, or repairing:

- Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving the tractor cab.

- To set the **Depth Stops** \(C\), remove the **Hair Pin** \(A\), and the **Hitch Pin** \(B\). *(See Fig. # 4-16)*

- Engage the required amount of **Depth Stops** \(C\), 90 Degrees towards the **Cylinder Rod** \(E\). Add **Depth Stops** \(C\) starting from the **Cylinder Stop Plate** \(D\) only. *(See Fig. # 4-17)*

#### **IMPORTANT**

Failure to add or remove depth stops from the wrong end of the hydraulic cylinder will cause hydraulic cylinder component and hydraulic cylinder damage. *(See Fig. # 4-9) (See Fig. # 4-10)*
• Install the Hitch Pin [B], & secure with the Hair Pin [A].  
  (See Fig. # 4-18)

Fig. # 4-18 Adjusting The Depth Stops Step # 3

Manual Depth Control Procedure

1.  Transport the Kwik-Till onto level ground.
2.  Unfold the Kwik-Till to the “Field Raised Position”. (See “Kwik-Till Folding & Unfolding” on page 4-11)

Fig. # 4-19 “Field Raised Position”

3.  Make sure that the Rear Roller [A] and Front Wheel Cylinders [B] are fully extended. When these cylinders are extended, the disks will be completely off the ground.  
  (See Fig. # 4-20)

Fig. # 4-20 “Field Raised Position”

4.  Make the necessary adjustments with the “Depth Stops”
  A good starting setting is to a depth of 2 in - 3 in (51 mm - 76 mm) in spring and 3.5 in - 4.5 in (89 mm - 114 mm) in fall.  
  (See “Table: Depth Stop Adjustment” on page 4-7)

5.  Fully retract the Rear Roller [A] and Front Wheel Cylinders [B]. The cylinders will bottom out on the Depth Stops [C], and the disks will engage the soil at the set depth.  
  (See Fig. # 4-21)

Fig. # 4-21 Fully Retract the Rear Roller & Front Wheel Cylinders
6. Check the **Penetration Depth** \(D\) of the **Front Row Disks** \(A\) & the **Rear Row Disks** \(B\). Take note of how much you would like to raise or lower both the front and rear disk rows - round to the nearest 1/2". *(See Fig. # 4-22)*

7. If you are satisfied with this setting proceed with field operation, if not proceed to step # 8.

8. Repeat steps # 4 thru. # 7 until the proper depth is achieved.

**Transport Locks**

The Kwik-Till has two **Transport Locks** \(A\) to keep the wings locked to the hitch during transport, service and storage. The transport locks are located on the left and right **Transport Rests** \(D\). The transport locks **MUST** be installed on the transport rests securing the wings in the **Locked Position** \(B\) whenever the Kwik-Till is transported, serviced, or stored to avoid the wings breaking free from the transport rests.

The transport locks have a designated **Stowed Position** \(C\) on the transport rests. The transport locks **MUST** be returned in the Stowed Position before the Kwik-Till is unfolded.

- Remove the **Transport Locks** \(A\) from the **Stowed Position** \(C\) and install into the **Locked Position** \(B\) before transport, service and storage. *(See Fig. # 4-23)*
KWIK-TILL FOLDING & UNFOLDING

Follow the steps in Kwik-Till Unfolding (See Below) & Kwik-Till Folding (See “Kwik-Till Folding” on page 4-16) to properly unfold the Kwik-Till from the transport position, and fold the Kwik-Till from the field position.

⚠️ Attaching and Detaching Kwik-Till To / From Tractor Safety ⚠️

Never let another person stand between the tractor and the implement during hitching. Too fast of an approach or the operator’s foot slipping from the clutch can lead to injury or death to the person standing nearby.

⚠️ DANGER UPENDING HAZARD ⚠️
TONGUE CAN WHIP UPWARDS WHEN UNHITCHING

The tractor MUST be equipped with a clevis hitch to prevent the Kwik-Till from tipping upward while unfolding from transport position, and folding into transport position. To avoid bodily injury, lower the machine before removing the hitch pin.

If negative tongue weight exists, the hitch tongue may suddenly raise, and the rear section would come crashing down. Only disconnect when the jack is lowered, there is positive tongue weight, the unit is on level ground, and in the proper transport or field position. Never disconnect the Kwik-Till from the tractor if the rear sections of the machine are partially raised. Keep others away.

⚠️ DANGER CRUSH HAZARD ⚠️

Stand clear when raising or lowering the Kwik-Till.

Keep feet, legs, and body clear when raising and lowering the Kwik-Till. Keep others away.

⚠️ DANGER CRUSH HAZARD ⚠️

Avoid being crushed in between the tractor and the implement.

When working in the danger area between the Kwik-Till and the tractor always ensure that the Tractor engine is turned off and the Key removed. Keep others away.

⚠️ Use a Safety Chain ⚠️

A safety chain will help control drawn equipment should it accidentally separate from the drawbar.
Using the appropriate adapter parts, attach the chain to the tractor drawbar support or other specified anchor location. Provide only enough slack in the chain to permit turning.

See your Kwik-Till dealer if a replacement chain is needed. Your Kwik-Till safety chain has a strength rating equal to or greater than the gross weight of the towed machine.

**Do Not** use the safety chain for towing.

**Kwik-Till Unfolding**

1. If the Kwik-Till is already attached to the tractor, proceed to step # 2, if not already attached to tractor. *(See “Attaching Kwik-Till To Tractor” on page 3-9)*

2. Transport the Kwik-Till onto level ground. *(See Fig. # 4-25)*

**WARNING**

Before disconnecting equipment, servicing, adjusting, or repairing:
Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving the tractor cab.

**IMPORTANT**

Always return the transport locks in the stowed position on the Kwik-Till when not in use.

3. Remove the **Transport Locks** A from the **Locked Position** B and install into the **Stowed Position** C. *(See Fig. # 4-26)*

**Fig. # 4-25 Kwik-Till Shown In The Transport Position**

**Fig. # 4-26 Transports Lock Shown In Locked Position**

**Fig. # 4-27 Transports Lock Shown In Stowed Position**
4. Refer to the following 2 figures when unfolding/folding your Kwik-Till. **Hose Color Chart** decal (See Fig. # 4-28) & **Using the Tractor Remote Valve Lever's.** (See Fig. # 4-29)

**Hose Color Chart**

<table>
<thead>
<tr>
<th>Optional Equipment</th>
<th>Silver</th>
<th>Red</th>
<th>Black</th>
<th>Gold</th>
<th>Blue</th>
<th>Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jack</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wing Fold</td>
<td>Float During Operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Frame Lift</td>
<td>Float During Operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear Roller</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front Wheels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fig. # 4-28 Hydraulic Hose To SCV Decal**

**Fig. # 4-29 Tractor Remote Valve Levers**

5. Start the tractor and set to high idle and remove the **Main Frame Lift & Wing Fold** cylinders from **FLOAT POSITION**. (See Fig. # 4-30)

**IMPORTANT**

Do not fully extend cylinders in the next step.

6. Use the tractor remote valve lever to extend the **Main Frame Lift** cylinders until the **Wing Transport Rollers** **A** can clear the **Transport Rests** **B**. (See Fig. # 4-31)

**Fig. # 4-30 Tractor Remote Valve Levers Removing SCV From Float Position**

**Fig. # 4-31 Unfold Step # 2 - Unfolding, Check For Clearance**

**Fig. # 4-31 Unfold Step # 2 - Unfolding, Check For Clearance**
7. Use the tractor remote valve lever to extend the Wing Fold cylinders A until the Wings B are aligned with the Center Section C. (See Fig. # 4-32)

8. The Kwik-Till should now be in the position shown in the following figure. (See Fig. # 4-33)

9. Use the tractor remote valve levers to extend the Main Frame Lift A cylinder until the Rear Rollers B contact the ground. (See Fig. # 4-34)

10. The Kwik-Till should now be in the Field Raised Position as shown in the following figure. (See Fig. # 4-35)
11. Set the Main Frame Lift & Wing Fold cylinders to FLOAT POSITION. (See Fig. # 4-36)

Fig. # 4-36 Tractor Remote Valve Levers Setting SCV To Float Position

12. To set the disk cutting depth, proceed to the following section in this manual. (See “Manual Depth Control” on page 4-7)

13. Proceed with Field Operation. (See “Field Operation” on page 4-19)
Kwik-Till Folding

1. If the Kwik-Till is already attached to the tractor, proceed to step # 2, if not already attached to the tractor. (See “Attaching and Detaching Kwik-Till To/From Tractor” on page 3-8)

2. Transport the Kwik-Till onto level ground. (See Fig. # 4-25)

**WARNING**

Before disconnecting equipment, servicing, adjusting, or repairing:
Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving the tractor cab.

3. If the Kwik-Till is in the “Field Raised Position” (See Fig. # 4-37), proceed to step # 5, if not proceed to the next step.

4. Start the tractor and set to high idle, position the Kwik-Till into the “Field Raised Position” make sure that the Rear Roller A and Front Wheel Cylinders B are fully extended. When these cylinders are extended, the disks will be completely off the ground. (See Fig. # 4-38)

5. Remove the Main Frame Lift & Wing Fold cylinders from FLOAT POSITION. (See Fig. # 4-39)

6. Use the tractor remote valve lever to retract the Main Frame Lift A cylinder to raise Center Section B, Left Wing C, & Right Wing D from the ground. (See Fig. # 4-40)
7. The Kwik-Till should now be in the partially folded position shown in the following figure. *(See Fig. # 4-41)*

8. Use the tractor remote valve lever to retract the Wing Fold cylinder A to fold the Wings B inward towards the Transport Rests C. *(See Fig. # 4-42)*

9. While folding the wings inward ensure that the Wing Transport Rollers A can clear the Transport Rests B. *(See Fig. # 4-43)*

10. The Kwik-Till should now be in the partially folded position as shown in the following figure. *(See Fig. # 4-44)*
11. Use the tractor remote valve lever to retract the **Main Frame Lift** \( A \) cylinders until the **Wing Transport Rollers** \( B \), can rest in the **Transport Rests** \( C \). (See Fig. # 4-45)

12. Set the **Main Frame Lift & Wing Fold** cylinders to **FLOAT POSITION** \( \rightarrow \) temporarily to relieve the downward pressure against the transport rests. (See Fig. # 4-46)

13. Remove the **Transport Locks** \( A \) from the **Stowed Position** \( C \), and install into the **Locked Position** \( B \). (See Fig. # 4-47) (See Fig. # 4-48)

14. Proceed with **Transport Operations**. (See “Check Disk Hubs For Excessive Wear” on page 5-27)
FIELD OPERATION

Before Entering Field Guidelines

1. Read the Operator’s Manual before operating.
2. Check all lubrication points and grease as instructed in the maintenance section. (See “5.0 MAINTENANCE” on page 5-1)
3. Use recommended size tractor. (See “Tractor Engine Power Requirements” on page 7-1)
4. Be sure that tractor and machine have been properly prepared. Check that the unit is properly attached to the tractor. On pull-type unit, be sure there is a mechanical retainer through the draw-bar pin and the safety chain is installed. (See “Attaching Kwik-Till To Tractor” on page 3-9)
5. Check tire pressure. (See “Tire Specifications” on page 7-3)
6. Inspect all hydraulic lines, hoses, couplers, and fittings. Tighten, repair, or replace any leaking or damaged components.
7. Inspect, or torque all specified hardware. (See “5.0 MAINTENANCE” on page 5-1)
8. Fully charge hydraulic system.

Tighten Hardware

10

50

Check tightness of all bolts after first 10 hours of then every 50 hours thereafter. Tighten all bolts to torques specified in the Maintenance Section unless otherwise noted. (See “5.0 MAINTENANCE” on page 5-1)

Leveling the Hitch

The Kwik-Till must be parallel to the ground when the Kwik-Till is operating in the field. A level hitch will reduce issues in the field.

Attach the Kwik-Till to the tractor. Set tractor hitch sway limiters for ‘No Sway’ operation. Check the tractor and Kwik-Till for correct tire pressure and adjust as necessary.

1. Lower the Kwik-Till to the Field Lowered Position, by fully retracting the Rear Roller \( A \) and Front Wheel Cylinders \( B \). The cylinders will bottom out on the Depth Stops \( C \), and the disks will engage the soil at the set depth. (See Fig. # 4-49)

2. If the hitch is not level as shown (See Fig. # 4-50) & (See Fig. # 4-51), then adjust the Hitch Link position on the hitch tongue. (See Fig. # 4-52) & (See Fig. # 4-53) on the following pages to adjust the clevis.

Fig. # 4-49 Field Lowered Position

Fig. # 4-50 Kwik-Till Not Level - Raise Hitch Link (Downward Angle)
3. The Kwik-Till hitch is equipped with a hitch link which can be adjusted as needed to level the hitch. The Cat. IV hitch link can be installed on the hitch tongue in four different positions. (See Fig. # 4-45) The Cat. V hitch link can be installed on the hitch tongue in three different positions.

NOTE
The Kwik-Till was leveled at the factory at “Position 4” for Cat. IV Hitch links, and “Position 3” for Cat. V Hitch links.

NOTE
NOTE: Rear Roller and Front Wheel depth stops may affect hitch leveling. Recheck Rear Roller and Front Wheel settings after changing hitch link positions.
Adjusting The Hitch Link

1. Use a 1-1/2" wrench & 1-7/16" socket to remove the (Qty. 3) 1"-8 x 8-1/2 Hex Head Bolts (B), & (Qty. 3) 1"-8 Nylock nuts (C). (See Fig. # 4-54)

   **NOTE**
   Cat. IV Hitch links use (Qty. 2) Hex Head Bolts & Nuts, and Cat. V Hitch links use (Qty. 3) Hex Head Bolts & Nuts.

2. Determine the new location of the clevis. (Example, Position # 1, Position # 2, Position # 3, or Position # 4. (See Fig. # 4-52) (See Fig. # 4-53)

3. If the hitch end of the Kwik-Till is too high, then move the hitch link to a higher position. (See Fig. # 4-50)

4. If the hitch end of the planter is too low, then move the hitch clevis to a lower position. (See Fig. # 4-51)

5. Once the hitch is level, tighten the hardware securing the hitch clevis to the hitch tongue.
In-Field Operation

**IMPORTANT**
Ensure that Main Frame Lift SCV and Wing Fold SCV are placed in the FLOAT POSITION before operating the machine in field to prevent damage to cylinders.

**IMPORTANT**
Never use Main Frame Lift SCV during headland turns.

![Fig. # 4-55 Do Not Use Main Frame Lift SCV To Raise Rear Sections During Headland Passes](image)

- For lifting the tool on pass to pass turns, use Front Wheels SCV and Rear Roller SCV to raise the tool to the Field Raised Position. (See Fig. # 4-56)

![Fig. # 4-56 “Field Raised Position”](image)

- For turning, using skip passes is recommended with the tool in the ground and operating speeds of 7 mph (11 km/h).

- For backing up the tool, always raise Front Wheels SCV and Rear Roller SCV.

![Fig. # 4-57 “Field Raised Position”](image)

- For backing up the tool with the rubber roller option, retract the Optional Equipment SCV which is the SCV for Rubber Roller Scrapers.

![Fig. # 4-58 Retract The Rubber Roller Scraper Cylinders](image)

- Adjust machine to a depth of 2 in - 3 in (51 mm - 76 mm) in spring and 3.5 in - 4.5 in (89 mm - 114 mm) in fall.

- Adjust operating speed to 10.5 mph - 11.5 mph (17 km/h - 18.5 km/h) for best performance.

- When the rubber roller option is used, and the Rubber Roller Scrapers are not being used, retract the Optional Equipment SCV which is the SCV for Rubber Roller Scrapers.

- Operate the tillage in the field at a 8-10 degree angle from the previous planted crop to reduce wear on the machine.
Headland Turns & Skipped Passes

**Anatomy Of Headland Turns**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tilled 1st Pass</td>
<td>D</td>
<td>Edge Of Field</td>
</tr>
<tr>
<td>B</td>
<td>Untilled 1st Pass</td>
<td>E</td>
<td>Headland Turn</td>
</tr>
<tr>
<td>C</td>
<td>Untilled 2nd Pass</td>
<td>F</td>
<td>Tilled 2nd Pass</td>
</tr>
</tbody>
</table>

*Fig. # 4-61 Table: Anatomy Of Headland Turns*
Adjusting Soil Deflector

For spring tillage, set the soil Soil Deflector A as far rearward as possible to allow residue to pass without causing ridging. If a furrow is noticed, adjust the operating speed to 10.5 mph (17 km/h) and adjust the Soil Deflector A towards the Rear Shank Tube C.

1. To adjust the soil deflector A forward or rearward, loosen (Qty. 4) 1/2" Nylock Nuts D. (See Fig. # 4-62)

![Fig. # 4-62 Adjusting The Soil Deflector Forward or Rearward](image)

2. To adjust the soil deflector A depth, remove pin B and adjust up or down. The soil deflector has 5 height settings. (See Fig. # 4-63)

![Fig. # 4-63 Adjusting The Soil Deflector Up Or Down](image)

NOTE

To prevent furrowing, avoid running the soil deflector A too deep into the soil.

3. To disengage the soil deflector, remove it and place it into the storage position. (See Fig. # 4-64)

![Fig. # 4-64 Placing The Soil Deflector Into The Storage Position.](image)

NOTE

For fall or heavy residue tillage, place the soil deflector in the storage position.
Adjusting Rear Roller Deflector

The following instructions are for adjusting the "Rear Roller Deflector" for the "Kwik-Till tillage equipment. To start this process, proceed as follows:

1. Determine the Rear Roller Deflector installed locations. The Rear Roller Deflectors are installed in these locations. (See Fig. # 4-69)

2. The Rear Roller Deflector (A) is set at the factory to the highest position. It is the operator’s responsibility to adjust to the working depth for the soil conditions. (See Fig. # 4-65) (Note: Center and Right Wing is removed to clarify illustration)

3. To adjust the Rear Roller Deflector (A), loosen the adjustment bolts, & nuts. (See Fig. # 4-66)

4. Adjust to desired position. The Rear Roller Deflector (A) has 20° of vertical adjustment. The Spring Packer (B) has 1.72" of side to side adjustment. (See Fig. # 4-67)

5. Tighten the bolts, & nuts. (See Fig. # 4-68)

**NOTE**
Setting the Rear Roller Deflector too low can result in a trench or possibly cause plugging.

Rear Roller Deflector Troubleshooting:
• Adjust Rear Roller Deflector down slightly to remove ridge.
• Adjust Rear Roller Deflector up slightly to eliminate groove.
Fig. # 4-69 Rear Roller Deflector Locations
5.0 MAINTENANCE

General Maintenance Safety

1. Review the Operator’s Manual and all safety items before working with, maintaining or operating the Kwik-Till.

2. If machine is connected to a tractor, Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving tractor cab.

3. If machine is detached from tractor, block wheels and use safety stands to prevent movement.

4. Do not attempt to clean, lubricate, clear obstructions or make adjustments to the machine while it is in motion or while the engine is running.

5. Follow good shop practices:
   - Keep service area clean and dry.
   - Be sure electrical outlets and tools are properly grounded.
   - Use adequate light for the job at hand.

6. Before applying pressure to a hydraulic system, make sure all components are tight and that hoses and couplings are in good condition.

7. Relieve pressure from hydraulic circuit before servicing or disconnecting from tractor.

8. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments.

9. Before resuming work, install and secure all guards when maintenance work is completed.

10. Keep safety decals clean. Replace any decal that is damaged or not clearly visible.

11. Always make sure working area is clear of tools, parts, other persons and pets before you start operating the machine.


13. On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

Hydraulic Safety

Hydraulic oil leaking under pressure can penetrate the skin, causing death or serious injury, or infection.

DO NOT use your hand to check for leaks. Use a piece of cardboard or plywood.

Stop engine, remove key and relieve the pressure before connecting or disconnecting fluid lines.

Make sure all components are in good condition and tighten all connections before starting the engine or pressurizing the system.

Do not attempt any makeshift repairs to the hydraulic fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

Replace any worn, cut, abraded, flattened or crimped hoses.

If hydraulic fluid penetrates the skin, seek medical attention immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.

Continuous long term contact with hydraulic fluid may cause skin cancer. Avoid long term contact and wash the skin promptly with soap and water.

Avoid serious injury or death while working under a raised implement. Hydraulic hoses between the lift cylinders and hydraulic lockup valves should be inspected frequently for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid, or any other signs of wear or damage. Worn or damaged hose assemblies can malfunction during use and should be replaced immediately.

See your Kwik-Till dealer for replacement hoses.
Replace Hydraulic Hoses

⚠️ WARNING
Avoid hazards due to escaping fluid under pressure.
See Avoid High-Pressure Fluids in the Safety section.

Inspect hydraulic hoses between the lift cylinders and hydraulic lockup valve frequently for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid, or any other signs of wear or damage. Replace worn or damaged hose assemblies immediately. See your Kwik-Till dealer for replacement hoses.

⚠️ WARNING
If an incorrectly rated hose is used, injury or death could occur due to uncontrolled machine movement.

⚠️ IMPORTANT
If an incorrectly rated hose is used, machine damage could occur due to uncontrolled machine movement.

If hoses are to be fabricated, ensure that hoses are rated at no less than 82,737 kPa (827 bar) (12,000 psi) burst pressure according to SAE standard J517, 100R17 hose specification.

Incorrect hose length or routing can increase chance of hose wear or damage. Use old hose as a guide for length and hose routing.

Incorrect fittings can damage mating parts or cause leaks. Make sure to use steel fittings approved for use with the hose manufacturer. When replacing hoses, use fittings of the correct size and thread to prevent leaks.

Practice Safe Maintenance

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing away from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

Falling while cleaning or working at height can cause serious injury. Use a ladder or platform to easily reach each location. Use sturdy and secure footholds and handholds.

Work in Clean Area

Before starting a job:
• Clean work area and machine.
• Make sure you have all necessary tools to do your job.
• Have the right parts on hand.
• Read all instructions thoroughly; do not attempt shortcuts.

Use Safe Service Procedures

⚠️ WARNING
To help prevent personal injury or death caused by unexpected movement, be sure to service machine on a level surface. If machine is connected to tractor, engage park brake and place transmission in PARK, shut off engine, and remove key. If machine is detached from tractor, block wheels and use safety stands to prevent movement.
Service Machine Safely

**DANGER**

CRUSH HAZARD

Stand clear when raising or lowering the Kwik-Till.

Keep feet, legs, and body clear when raising and lowering the Kwik-Till. Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts. Keep others away.

Support Machine Properly

Always lower the attachment or implement to the ground before you work on the machine. If the work requires that the machine or attachment be lifted, provide secure support for them. If left in a raised position, hydraulically supported devices can settle or leak down.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.

Avoid Sharp Disks

**WARNING**

Disks are sharp and can cause serious injury to you or others. To avoid being cut, wear gloves when handling disks.

When implements or attachments are used with a machine, always follow safety precautions listed in the implement or attachment operator’s manual.
FLUIDS AND LUBRICANTS

Hydraulic Oil:
Use an ISO grade 36 hydraulic oil for all operating conditions (Hydrex MV36 or comparable).

Storing Lubricants:
Your machine can operate at top efficiency only if clean lubricants are used.

Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

Make certain that all containers are properly marked to identify their contents.

Grease:
Use an SAE multipurpose high temperature grease with extreme pressure (EP) performance. Also acceptable, SAE multipurpose lithium-based grease.

Other greases may be used if they meet the following:
- NLGI Performance Classification GC-LB
- ISO-L-X-BDHB 2 or DIN KP 2 N-10 Lithium Complex-Non-Synthetic Base Oil (100 to 220 mm²/s @ 40°C)

Greasing
Use the Maintenance Chart provided on page (See “MAINTENANCE CHART” on page 5-5) to keep a record of all scheduled maintenance.

1. Use only a hand-held grease gun for all greasing. An air-powered greasing system can damage the seals on bearings and lead to early failures.
2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
3. All roller bearings are sealed and not greasable, only the wheel hubs are greasable. They require minimal lubricant. Recommended greasing is 1 small stroke every 2 weeks. Be careful not to over-grease, as this may push the seal out.
4. Replace and repair broken fittings immediately.
5. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

SERVICING INTERVALS

Make sure your Kwik-Till is ready to go to the field when you are. Perform the service and maintenance procedures that are recommended in this section to prepare for the next season. Careful maintenance preparation will save time and expense as you enter the busy season.

The periods recommended on page (See “MAINTENANCE CHART” on page 5-5) are based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication and oil changes.

Schedules may vary depending on equipment options contained in the present unit.

Lubrication Symbols

Lubricate at the hourly interval indicated on symbol. Use SAE multi-purpose high-temperature grease with extreme pressure (EP) performance. SAE multi-purpose lithium-based grease is also acceptable.

Repack bearings at the hourly interval indicated on symbol. Use SAE multi-purpose high-temperature grease with extreme pressure (EP) performance. SAE multi-purpose lithium-based grease is also acceptable.
<table>
<thead>
<tr>
<th>Interval</th>
<th>Page #</th>
<th>Maintenance Action</th>
<th># of Pts.</th>
<th>Grease</th>
<th>Change Fluid</th>
<th>Repack</th>
<th>Cleaning</th>
<th>Adjust</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 10 Hours Of Operation</td>
<td>5-6</td>
<td>Re-Torque Wheel Flange Nuts</td>
<td>40</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-7</td>
<td>Check Tightness Of All Bolts, &amp; Cap Screws</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DAILY</td>
<td>5-8</td>
<td>Check For Hydraulic Leaks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-9</td>
<td>Check For Damaged Hydraulic Hoses, Adapters, Crossovers, Junctions, &amp; Hydraulic Cylinders</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>5-10</td>
<td>Check Tire Pressure</td>
<td>4</td>
<td>X</td>
<td></td>
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<tr>
<td></td>
<td>5-11</td>
<td>Check Rubber Roller Scraper Alignment If Equipped With The Rubber Roller Basket</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WEEKLY</td>
<td>5-15</td>
<td>Re-Torque Wheel Flange Nuts</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-16</td>
<td>Check Tightness Of All Bolts, &amp; Cap Screws</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>5-17</td>
<td>Check Pivot Bushings For Wear</td>
<td>68</td>
<td>X</td>
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<tr>
<td></td>
<td>5-19</td>
<td>Check For Gap At Pivot Bushing Caps</td>
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<td>X</td>
<td></td>
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<tr>
<td></td>
<td>5-19</td>
<td>Grease Hitch Link Articulating Ball</td>
<td>2</td>
<td>X</td>
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<tr>
<td>MONTHLY</td>
<td>5-21</td>
<td>Check Disk Hub Nuts (Re-Torque If Needed)</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-22</td>
<td>Check Disk Shank Cord Alignment</td>
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<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>5-24</td>
<td>Lubricate Wheel Hubs</td>
<td></td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>ANNUALLY</td>
<td>5-25</td>
<td>Check Disks For Damage And / Or Excessive Wear</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>5-26</td>
<td>Check Wheel Bearings</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-27</td>
<td>Check Disk Hubs For Excessive Wear</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-29</td>
<td>Check Accumulator</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-30</td>
<td>Check Rear Roller Hubs For Wear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>AS REQUIRED</td>
<td>5-31</td>
<td>Clean and Wash the Machine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>5-32</td>
<td>Replace Pivot Bushings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>5-33</td>
<td>Repack Wheel Bearings</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-35</td>
<td>Replace Rear Roller Hubs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
First 10 Hours Of Operation
Re-Torque Wheel Flange Nuts

1. Unfold the machine into the **Field Position**. *(See “Kwik-Till Folding & Unfolding” on page 4-11)*

2. Lower the disks to the ground by retracting the **Front Wheel Cylinders** A and **Rear Roller Cylinders** B. *(See Fig. # 5-1)*

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the **FLOAT POSITION** with engine running for the **Main Frame Lift & Wing Fold** cylinders.

4. The machine should now be in the “**Field Lowered Position**” *(See Fig. # 3-53).*

5. Re-torque wheel flange nuts A *(In A Diagonal Pattern)* at 10 hour intervals or (daily). If bolt torque is stable, check at 50 hour intervals or (weekly).

- **10**
- **50**
- **350 ft-lbs**
- **475 N-m**
First 10 Hours Of Operation
Check Tightness Of All Bolts, & Cap Screws

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the disks to the ground by retracting the Front Wheel Cylinders A and Rear Roller Cylinders B. (See Fig. # 5-4)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the FLOAT POSITION with engine running for the Main Frame Lift & Wing Fold cylinders.

4. The machine should now be in the “Field Lowered Position” (See Fig. # 3-53).

5. Check tightness of all bolts, & cap screws.

6. Use the torque charts at the back of this manual for proper torque, unless otherwise specified in this manual. (See “Torque – Fasteners” on page 7-5)
DAILY
Check For Hydraulic Leaks

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the disks to the ground by retracting the Front Wheel Cylinders A and Rear Roller Cylinders B. (See Fig. # 5-5)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the FLOAT POSITION with engine running for the Main Frame Lift & Wing Fold cylinders.

4. The machine should now be in the “Field Lowered Position” (See Fig. # 3-53).

   **WARNING**
   Hydraulic oil leaking under pressure can penetrate the skin, causing death or serious injury, or infection.

   DO NOT use your hand to check for leaks. Use a piece of cardboard or plywood.

5. Check all Hydraulic Hoses A, Adapters B, Crossovers C, Junctions D, & Hydraulic Cylinders E for leaks. (See Fig. # 5-6) (See Fig. # 5-7) (See Fig. # 5-8)
DAILY

Check For Damaged Hydraulic Hoses, Adapters, Crossovers, Junctions, & Hydraulic Cylinders

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the disks to the ground by retracting the Front Wheel Cylinders A and Rear Roller Cylinders B. (See Fig. # 5-9)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the FLOAT POSITION with engine running for the Main Frame Lift & Wing Fold cylinders.

4. The machine should now be in the “Field Lowered Position” (See Fig. # 3-53).

5. Visually check for damaged Hydraulic Hoses A, Adapters B, Crossovers C, Junctions D, & Hydraulic Cylinders E. (See Fig. # 5-10) (See Fig. # 5-11) (See Fig. # 5-12)
**DAILY**

**Check Tire Pressures**

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and **NOT** in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

⚠️ **CAUTION**

Tire failure due to overloading can cause loss of vehicle control during transport resulting in serious injury or death to you or others. Prevent tire failure by using only tires specified for your machine and inflating them to correct pressures.

**IMPORTANT**

Tire pressure chart shown (See Fig. # 5-15) is for tire reference only. Ensure machine performance by using only tires specified for your machine and inflating them to correct pressures.

For the even working depth of attachments in the ground, tires must be inflated to specification. A low tire causes deeper penetration on one side than the other. Deeper penetration on one side can cause the machine to side draft. Inflate all tires to correct pressures.

1. Unfold the machine into the **Field Position**. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the disks to the ground by retracting the **Front Wheel Cylinders** A and **Rear Roller Cylinders** B. (See Fig. # 5-13)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the **FLOAT POSITION** with engine running for the **Main Frame Lift & Wing Fold cylinders**.

4. The machine should now be in the **Field Lowered Position** (See Fig. # 3-53).

5. Check the tire pressures A at the specified locations. (See Fig. # 5-14)

---

**Fig. # 5-13 Lower Disks to the Ground**

**Fig. # 5-14 Tire Valve Locations HSD1600, HSD1775, HSD2100, & HSD2450**

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Load/Speed Index</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>600/50R22.5</td>
<td>168B</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>317</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.1</td>
</tr>
</tbody>
</table>

---

**Fig. # 5-15 Table: Tire Pressure Chart**
DAILY
Checking / Adjusting Scraper Alignment

1. Fully extend the scraper hydraulic cylinders. (See Fig. # 5-16)

2. With the hydraulic cylinders fully extended, check the gap between the scraper plates and the tire valley’s. Desired Gap is 3/8". (See Fig. # 5-17) (Note: Shank is removed for illustrative purposes)

3. Check to see if the Shank Scraper Assemblies A are centered in the valley of the Rubber Tires B. (See Fig. # 5-18)

4. If the shank scraper assemblies are not centered, loosen the 1/2-13 X 1-1/2 Bolts A securing the Scraper Base Pivot Weldments B. Adjust left or right until centered. (See Fig. # 5-19)
5. Once the gap is set, adjust the 7/16” Set Screws A against the Adjustable Scraper Ears B. (See Fig. # 5-20)

6. Tighten the (Qty 8) 1/2”-13 Nylock Nuts A. (See Fig. # 5-21)

---

**Scraper Blade Replacement & Alignment**

The following instructions are for the purpose of replacement and alignment of the scraper blades of the Kwik-Till tillage equipment rubber roller option. To start, proceed as follows:

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)
2. Lower the disks to the ground by retracting the Front Wheel Cylinders A and Rear Roller Cylinders B. (See Fig. # 5-22)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the FLOAT POSITION with engine running for the Main Frame Lift & Wing Fold cylinders. (See Fig. # 5-23)
4. Use the tractor remote valve lever to retract the Rubber Roller Scraper Cylinders A to raise the Scraper Shanks B, away from the Rubber Rollers C.  (See Fig. # 5-25)

Fig. # 5-24 Retract The Scraper Cylinders

**WARNING**

Before disconnecting equipment, servicing, adjusting, or repairing:
Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving the tractor cab.

**SERVICE PROCEDURE: Dis-Assembly**

5. Use lifting device and lifting strap to support the Scraper Assembly A as shown. (See Fig. # 5-25)

Fig. # 5-25 Remove Old Scraper Plates & Hardware

6. Loosen and remove the old Scraper Plates A, 3/8"-16 X1-1/4 Bolts B, & 3/8"-16 Nylock Nuts C. (See Fig. # 5-26)

Fig. # 5-26 Remove Old Scraper Plates & Hardware

7. Discard old scraper plates and hardware.
SERVICE PROCEDURE:
Assembly:

8. Install new Scraper Plates \( A \), 3/8"-16 X1-1/4 Bolts, & 3/8"-16 Toplock Nuts \( C \) in reverse order of disassembly. (See Fig. # 5-27)

![Fig. # 5-27 Install New Scraper Plates & Hardware](image)

<table>
<thead>
<tr>
<th>Model</th>
<th>Scrapers</th>
<th>Bolts</th>
<th>Nuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSD1600</td>
<td>36</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>HSD1775</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>HSD2100</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>HSD2450</td>
<td>56</td>
<td>56</td>
<td>56</td>
</tr>
</tbody>
</table>

![Fig. # 5-28 Scraper Quantity Hardware Chart](image)
WEEKLY
Re-Torque Wheel Flange Nuts

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the disks to the ground by retracting the Front Wheel Cylinders A and Rear Roller Cylinders B. (See Fig. # 5-1)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the FLOAT POSITION with engine running for the Main Frame Lift & Wing Fold cylinders.

4. The machine should now be in the "Field Lowered Position" (See Fig. # 3-53).

5. Re-torque Wheel Flange Nuts A at 10 hour intervals or (daily). If bolt torque is stable, check at 50 hour intervals or (weekly).

Fig. # 5-1 Lower Disks to the Ground

Fig. # 5-2 Wheel Flange Nut Tightening Sequence

Fig. # 5-3 Wheel Flange Nut Locations HSD1600, HSD1775, HSD2100, & HSD2450
WEEKLY
Check Tightness Of All Bolts, & Cap Screws

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the disks to the ground by retracting the Front Wheel Cylinders A and Rear Roller Cylinders B. (See Fig. # 5-4)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the FLOAT POSITION with engine running for the Main Frame Lift & Wing Fold cylinders.

4. The machine should now be in the “Field Lowered Position” (See Fig. # 3-53).

5. Check tightness of all bolts, & cap screws.

6. Use the torque charts at the back of this manual for proper torque, unless otherwise specified in this manual. (See “Torque – Fasteners” on page 7-5)
WEEKLY
Check Pivot Bushings For Wear

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the disks to the ground by retracting the Front Wheel Cylinders A and Rear Roller Cylinders B. (See Fig. # 5-5)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the FLOAT POSITION with engine running for the Main Frame Lift & Wing Fold cylinders.

4. The machine should now be in the “Field Lowered Position” (See Fig. # 3-53).

5. Check Pivot Bushings A for gaps E caused by wear. (See Fig. # 5-6)

6. For Pivot Bushings A locations, see the figure on the next page. (See Fig. # 5-9)

7. Check Pivot Bushings A for deformation caused by wear. (See Fig. # 5-7)

8. For instructions to replace the pivot bushings, see (See “Replace Pivot Bushings” on page 5-32)

IMPORTANT
Pivot bushings A with a 1/8 in (3.2 mm) per side 1/4 in total (6.3 mm) gap E should be replaced. Excess gap can cause excessive wear and/or damage to the pivot shaft.
5 - MAINTENANCE

Fig. # 5-8 Pivot Cap/Bushing Components

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>55-4-01688</td>
<td>Pivot Bushing</td>
<td>48</td>
</tr>
<tr>
<td>B</td>
<td>90-10-2847</td>
<td>Bolt, Hex 3/4-10 X 3-3/4 GR8 ZP W TL Patch</td>
<td>48</td>
</tr>
<tr>
<td>C</td>
<td>55-4-00700</td>
<td>Pivot Cap 4&quot;</td>
<td>24</td>
</tr>
<tr>
<td>D</td>
<td>90-14-9016</td>
<td>Washer, Flat 3/4 CZ</td>
<td>48</td>
</tr>
</tbody>
</table>

Fig. # 5-9 Pivot Bushing Component Locations
**WEEKLY**

**Check For Gap At Pivot Bushing Caps**

1. Unfold the machine into the **Field Position**. *(See “Kwik-Till Folding & Unfolding” on page 4-11)*

2. Lower the disks to the ground by retracting the **Front Wheel Cylinders** A and **Rear Roller Cylinders** B. *(See Fig. # 5-10)*

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the **FLOAT POSITION** with engine running for the **Main Frame Lift & Wing Fold** cylinders.

4. The machine should now be in the “**Field Lowered Position**” *(See Fig. # 3-53).*

5. Check **Pivot Bushing Caps** C for gaps E. *(See Fig. # 5-11)*

6. For **Pivot Bushing Cap** C locations, *(See Fig. # 5-9).*

7. If any **Pivot Bushing Caps** C have **Gaps** E, re-torque the **3/4-10 X 3-3/4 Hex Bolts** B to 500 ft-lbs (678 N-m). *(See Fig. # 5-12)*

---

**IMPORTANT**

Any indication of any **Gap** E between **Pivot Bushing Caps** C will cause bolt breakage and further machine damage could occur due to uncontrolled machine movement.

---

**WEEKLY**

**Grease Hitch Link Articulating Ball (If Equipped)**
1. Grease 2 points as indicated by the following symbol for the articulating ball type CAT 3, CAT 4, & CAT 5 Hitch Links located on the front of the hitch every week or (40 hours) of use. (See Fig. # 5-13)

   Use an SAE multipurpose high temperature grease with extreme pressure (EP) performance. Also acceptable, SAE multipurpose lithium based grease.

   Pump until the grease becomes visible.

   ![Fig. # 5-13 Grease Articulating Ball](image-url)
MONTHLY
Check Disk Hub Nuts (Re-Torque If Needed)

1. Fold the machine into the Transport Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

**WARNING**
When servicing the machine in the transport position, the wings must be secured with the transport locks.

2. Make sure the Transport Locks A are moved from the Stowed Position C, and installed into the Locked Position B. (See Fig. # 5-14)

3. Check Disk Hub Nuts A for correct torque. (See Fig. # 5-15)

4. Check the Disk Hub Nuts A for correct torque by moving the Disk C side to side. (See Fig. # 5-16)

5. If endplay exists, remove the Disk Hub Nut A and Disk Assembly C from the Shank E. Discard the old nut. (See Fig. # 5-17)

6. With the Disk Assembly C on a sturdy surface, clean the Hub Stud D from debris, use a cleaner/degreaser to promote thread-locker adhesion.

7. Replace the Disk Hub Nut A with a new nut and reassemble in reverse order of disassembly.

8. Tighten the Disk Hub Nut A to specification.

9. Repeat procedure for other locations.

**Specs**

- 221 ft-lbs
- 300 N-m
MONTHLY
Check Disk Shank Cord Alignment

1. Fold the machine into the Transport Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

**WARNING**
When servicing the machine in the transport position, the wings must be secured with the transport locks.

2. Make sure the Transport Locks (A) are moved from the Stowed Position (C), and installed into the Locked Position (B). (See Fig. # 5-18)

   ![Fig. # 5-18 Transports Lock Shown In Locked Position](image)

3. Check Disk Shank Cord (E) alignment. (Qty. 4 Per Disk Shank) (See Fig. # 5-19)

4. The Cords (E) should not extend more than 3/4” from the Tube Caps (F). (See Fig. # 5-19)

5. If Cords (E) extend greater then 3/4” from the Tube Caps (F), the Cords (E) should be readjusted.

   ![Fig. # 5-20 Check Disk Shank Cord Alignment](image)

**Adjusting Disk Shank Cords**

1. Loosen (Qty. 4) 5/8” Nylock Nuts (G). Only loosen the Nylock Nuts enough to allow movement of Disk Shank Cords (E). Do not completely loosen the Nylock Nuts. (See Fig. # 5-21)

   ![Fig. # 5-21 Loosen (Qty. 4) 5/8” Nylock Nuts](image)
2. Some upward pressure on the Shank (H) may be required to reduce pressure against the Cords (E). (See Fig. # 5-22)

3. Slide Cords (E) into place. The Cords (E) should be centered with the Tube Caps (F).

4. Tighten the (Qty. 4) 5/8" Nylock Nuts (G) in a criss-cross square pattern. (See Fig. # 5-24)

5. Torque the (Qty. 4) 5/8" Nylock Nuts (G) until the Gaps (H) in the Tube Caps (F) are flush.
MONTHLY

Lubricate Wheel Hubs

1. Unfold the machine into the Field Position. *(See “Kwik-Till Folding & Unfolding” on page 4-11)*

2. Lower the disks to the ground by retracting the Front Wheel Cylinders A and Rear Roller Cylinders B. *(See Fig. # 5-26)*

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the FLOAT POSITION, with engine running for the Main Frame Lift & Wing Fold cylinders.

4. The machine should now be in the “Field Lowered Position” *(See Fig. # 3-53).*

5. Apply 3-4 pumps of grease 30 D to the hubs monthly. *(See Fig. # 5-27)*

**IMPORTANT**

If grease is visible on the back side of the hub, reduce the amount of grease added by 50%.
ANNUALLY
Check Disks For Damage And / Or Excessive Wear

1. Fold the machine into the Transport Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

   ![Transport Locks Diagram](image1)

   **WARNING**
   When servicing the machine in the transport position, the wings must be secured with the transport locks.

2. Make sure the Transport Locks (A) are moved from the Stowed Position (C), and installed into the Locked Position (B). (See Fig. # 5-28)

3. Check all disks on the machine. (See Fig. # 5-29)

   ![Check All Disks Diagram](image2)

4. Replace damaged disks or disks that are worn 2.0 in (50.8 mm) smaller than their original diameter. *(Note: Norwood recommends replacing at 2.0 in (50.8 mm) wear for optimum performance.)*

   ![Replace Damaged Disks Diagram](image3)

   **NOTE**
   Blades wear differently depending on conditions and proper operation.
ANNUALLY
Check Wheel Bearings

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the Kwik-Till to the Field Lowered Position, by fully retracting the Rear Roller \( A \) and Front Wheel Cylinders \( B \). The cylinders will bottom out on the Depth Stops \( C \), and the disks will lower to the floor raising the wheels and rear roller. (See Fig. # 5-31)

3. All 4 wheels should now be raised off the ground.

4. Check for bearing endplay by moving wheel side to side. (See Fig. # 5-32)

5. Rotate wheel to check for bearing roughness. (See Fig. # 5-32)

6. If endplay exists, the bearings could be out of adjustment or worn. (See “Repack Wheel Bearings” on page 5-33)

7. If bearings sound or feel rough. (See “Repack Wheel Bearings” on page 5-33)
ANNUALLY
Check Disk Hubs For Excessive Wear

1. Fold the machine into the Transport Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

**WARNING**
When servicing the machine in the transport position, the wings must be secured with the transport locks.

2. Make sure the Transport Locks A are moved from the Stowed Position C, and installed into the Locked Position B. (See Fig. # 5-28)

3. Check all Disk Hubs A on the machine. (See Fig. # 5-34)

4. Rotate Disks B CW (Clockwise) and CCW (Counter-Clockwise) to check for bearing roughness. (See Fig. # 5-34)

5. If bearings sound or feel rough, replace the hub.

6. Remove the Disk Hub Nut C and Disk Assembly D from the Shank E. (See Fig. # 5-35)

**IMPORTANT**
The Disk Hubs H are not serviceable, and must be replaced as a unit.

7. Support the Disk Assembly D on a sturdy surface with (Qty. 2) 6” X 6” X 8” Wood Spacers F. (See Fig. # 5-36)
8. Remove the Disk Hub to be replaced, by removing the (Qty. 4) M12-1.25 X 25mm Bolts. Discard the old hub and bolts. (See Fig. # 5-37)

9. Install the new Disk Hub and secure with new (Qty. 4) M12-1.25 X 25mm Bolts.

10. Tighten the Disk Hub Nut to specification.

11. Reassemble the Disk Assembly to the Shank by aligning the flat part of the Disk Hub Stud to the flat part of the Shank Hole. (See Fig. # 5-39)


13. Tighten the Disk Hub Nut to specification.

14. Repeat procedure for other locations.

93 ft-lbs
126 N-m

221 ft-lbs
300 N-m
ANNUALLY

Check Accumulator

1. Unfold the machine into the **Field Position**. *(See “Kwik-Till Folding & Unfolding” on page 4-11)*

2. Lower the disks to the ground by retracting the **Front Wheel Cylinders** A and **Rear Roller Cylinders** B. *(See Fig. # 5-40)*

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the **FLOAT POSITION** with engine running for the **Main Frame Lift & Wing Fold** cylinders.

4. The machine should now be in the **“Field Lowered Position”** *(See Fig. # 3-53).*

5. The accumulator pressure should be checked annually.

6. Operational dry nitrogen pressure levels are between 700-800 psi (4826-5516 kPa) (48.3-55.2 bar). If levels are below this range, recharge the accumulator with dry nitrogen.

7. If pressure is 0 psi (0 kPa) (0 bar), replace the accumulator due to an internal bladder rupture.

---

**WARNING**

Always use dry inert gas (Dry Nitrogen - N2) for pre-charging.

**NEVER USE AIR OR OXYGEN, DUE TO THE DANGER OF COMBUSTION / EXPLOSION**

---

**WARNING**

Avoid injury from high pressure escaping hydraulic fluid.
- Relieve pressure from hydraulic system before servicing
- Precharge with dry nitrogen gas only.
Failure to comply could result in serious injury or death.

---

**WARNING**

Only qualified and trained personnel should perform this procedure. Always wear personal protective equipment.
ANNUALLY
Check Rear Roller Hubs For Wear

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the disks to the ground by retracting the Front Wheel Cylinders A and Rear Roller Cylinders B. (See Fig. # 5-42)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the FLOAT POSITION, with engine running for the Main Frame Lift & Wing Fold cylinders.

4. The machine should now be in the “Field Lowered Position” (See Fig. # 3-53).

5. Retract the Rear Roller A cylinder. The cylinder will bottom out on the Depth Stops C, and the Rear Roller D will raise off the ground. (See Fig. # 5-43)

6. With the rear roller off the ground, rotate the cage roller to check for bearing roughness.

Fig. # 5-42 Lower Disks to the Ground

7. When rotating the rubber wheel roller, retract the rubber roller scraper cylinders.

Fig. # 5-44 Rotate Rear Roller To Check For Bearing Roughness (Rolling Spiral Basket Shown)

8. If bearings sound or feel rough, or rear rollers are difficult to turn. It is possible that the rear rollers hubs need replacement, see (See “Replace Rear Roller Hubs” on page 5-35)

NOTE
Checking the rear roller hubs is identical where applicable for the Rolling Spiral Basket, Spring Cage Roller, & Rubber Wheel Roller. Therefore only the Rolling Spiral Basket rear attachment will be covered in the instructions.

Fig. # 5-43 Field Lowered Position With Rear Roller Raised For Service

Fig. # 5-45 Retract The Rubber Roller Scraper Cylinders
AS REQUIRED

Clean And Wash The Machine

1. Clean out excess material from all areas of the Kwik-Till.

2. Clean the Kwik-Till on a regular basis. Regular and thorough cleaning will lengthen equipment life and reduce maintenance and repair.

3. The hydraulic cylinders and bearings should not be cleaned with a high-pressure cleaner or direct water jet. The seals and bearings are not waterproof under high pressure.

4. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.
AS REQUIRED

Replace Pivot Bushings

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the disks to the ground by retracting the Front Wheel Cylinders A and Rear Roller Cylinders B. (See Fig. # 5-46)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the FLOAT POSITION with engine running for the Main Frame Lift & Wing Fold cylinders.

4. The machine should now be in the “Field Lowered Position” (See Fig. # 3-53).

5. Remove (Qty. 2) 3/4-10 X 3-3/4 Hex Bolts B, (Qty. 2) 3/4 Washers D, and the Pivot Bushing Cap C, and remove old Pivot Bushings A.

6. Install new pivot bushing and re-assemble in reverse order using new hardware.

7. Tighten cap screws to specification.

500 ft-lbs
678 N-m

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>55-4-01688</td>
<td>Pivot Bushing</td>
</tr>
<tr>
<td>B</td>
<td>90-10-2847</td>
<td>Bolt, Hex 3/4-10 X 3-3/4 GR8 ZP W/TL Patch</td>
</tr>
<tr>
<td>C</td>
<td>55-4-00700</td>
<td>Pivot Cap 4”</td>
</tr>
<tr>
<td>D</td>
<td>90-14-9016</td>
<td>Washer, Flat 3/4 CZ</td>
</tr>
</tbody>
</table>

Fig. # 5-46 Lower Disks to the Ground

Fig. # 5-48 Pivot Cap/Bushing Components

Fig. # 5-47 Pivot Bushing Component Locations
AS REQUIRED
Repack Wheel Bearings

A grease change in hub bearings is recommended Every 3,000 working hours or every 3,107 mi (50,000 km) traveled).

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)

2. Lower the Kwik-Till to the Field Lowered Position, by fully retracting the Rear Roller (A) and Front Wheel Cylinders (B). The cylinders will bottom out on the Depth Stops (C), and the disks will lower to the floor raising the wheels and rear roller. (See Fig. # 5-31)

3. All 4 wheels should now be raised off the ground.

4. Remove the Wheel Flange Nuts (A) and the Wheel. (See Fig. # 5-50)

5. Remove (Qty. 4) 3/8"-24 X 3/4 Socket Bolts (D), the Dust Cap (C), and the Dust Cap Gasket (G). (See Fig. # 5-51)

6. Remove 1/4"X 2-1/2" Cotter Pin (E), & the 1-1/4"-12 Slotted Nut (F). (See Fig. # 5-52)
7. Remove the 1-1/4” Thick Washer (H). (See Fig. # 5-53)

8. Slide the Hub (J) off the Spindle (K) along with the Outer Cone Bearing (I), Inner Cone Bearing (L), & Seal (M).

9. Only replace Seal (M) if damaged.

10. Clean the wheel bearings and pack with grease. Use SAE multi-purpose high-temperature grease with extreme pressure (EP) performance. SAE multi-purpose lithium-based grease is also acceptable.

11. Inspect the Inner Cone Bearing (L), Outer Cone Bearing (I), Inner Bearing Race (O), & Outer Bearing Race (N) for wear, replace as a set if needed.

12. Clean wheel and hub mounting surfaces to ensure there is no rust or debris.

13. Reverse disassembly procedure.

14. Torque Wheel Flange Nuts (A) (In A Diagonal Pattern) to specification below. Inspect to make sure the wheel is sitting flush with the hub.

15. Then re-torque at 10 hour intervals or (daily). If bolt torque is stable, check at 50 hour intervals or (weekly).

- 3,107 mi
- 50,000 km
- 3,107 mi
- 50,000 km
- 10
- 50
- 350 ft-lbs
- 475 N-m
AS REQUIRED
Replace Rear Roller Hubs

1. Unfold the machine into the Field Position. (See “Kwik-Till Folding & Unfolding” on page 4-11)
2. Lower the disks to the ground by retracting the Front Wheel Cylinders \textbf{A} and Rear Roller Cylinders \textbf{B}. (See Fig. # 5-57)

3. Relieve all the hydraulic pressure by placing the tractor SCV levers to the \textbf{FLOAT POSITION}, with engine running for the Main Frame Lift & Wing Fold cylinders.
4. The machine should now be in the “Field Lowered Position” (See Fig. # 3-53).

SERVICE PROCEDURE:
Dis-Assembly (Rolling Spiral Basket, Spring Cage Roller and the Rubber Wheel Roller):

1. Use an impact wrench, 1-5/16” Impact Socket, and 1-5/16” wrench to loosen and remove the (Qty. 8) 7/8”-9 X 3” \textbf{Bolts A} and 7/8”-9 Nuts \textbf{B}. (See Fig. # 5-58)

2. If necessary, you may need to use a pry bar as shown. (See Fig. # 5-59)

3. Use a lifting device such as an overhead hoist, crane or forklift with a lifting strap to remove the rear attachment. (See Fig. # 5-60)
4. If you have an extra set of hubs, P/N 90-34-0010, *(See Fig. # 5-61)* then proceed to *(See"SERVICE PROCEDURE: Assembly (Rolling Spiral Basket, Spring Cage Roller, or Rubber Wheel Roller)" on page 5-37).* If you do not have an extra set of hubs, then you will need to remove the hubs from the rear attachment you just removed. Proceed to the next step to remove the hubs.

![Fig. # 5-61 Set Of Hubs](image1)

5. Remove (Qty. 2) 1/2"-13 X 5-1/2" Bolts B, (Qty. 2) 1/2"-13 Nylock Nuts C, and (Qty. 2) Hub Roller Assemblies C. *(See Fig. # 5-62)*

![Fig. # 5-62 Removing Hubs](image2)

**NOTE**

If the hubs are difficult to remove, then go to the following section. *(See"SERVICE PROCEDURE: Removing Hard To Remove Hubs" on page 5-36)*

6. Now that the Rolling Spiral Basket rear attachment has been removed, you can either assemble the Spring Cage Roller rear attachment, or the Rubber Wheel Roller rear attachment. If installing the Spring Cage Roller, or the Rolling Spiral Basket rear attachment, proceed to the next step.
SERVICE PROCEDURE:
Assembly (Rolling Spiral Basket & Spring Cage Roller):

1. Although the rear attachment differs from one to the other, the installation in the following steps are the same with the exception of the length of the bolt.

2. Apply grease to the Hub A spindle with multi purpose grease before assembling the Hub A to the Spring Roller Weldment D and secure with the 1/2”-13 X 7” Bolt B and 1/2”-13 Nylock Nut C. Repeat for the other side. (See Fig. # 5-63)

3. Position Spring Roller assembly parallel to machine as shown. (See Fig. # 5-64)

4. Install rear attachment, by spreading the side roller plate with a pry bar as shown. (See Fig. # 5-65)

NOTE
The following steps may not need to be performed if the rear attachment has sufficient clearance.
5. Align bolt hole and install (Qty. 1) 7/8"-9 X 3" Bolt and (Qty. 1) 7/8-9 Nylock Nut. (See Fig. # 5-68)

6. Use lifting device and lifting strap to rotate the rear attachment into position. (See Fig. # 5-69)

7. Install remaining bolts and nylock nuts.
SERVICE PROCEDURE: Removing Hard To Remove Hubs

1. If the hubs are difficult to remove on one, or both sides, then use the following steps to remove the hub(s).

2. Use a pry bar to remove the DUST CAP, ROLLER HUB A. (See Fig. # 5-71)

3. Use a 5/8” Impact Socket to remove the (Qty. 2) 7/16” HEX HEAD BOLTS B, & BEARING SHOULDER C. (See Fig. # 5-72)

4. Weld a 1” NUT D on the face of the SPINDLE, ROLLER HUB E.

   Fig. # 5-73 Weld A Nut To The Spindle Face

   Note

   Using a 1” Nut is the recommended nut size. Welding too large of a nut may cause insufficient weld size, and socket engagement. Welding too small of a nut may cause insufficient weld size, which may cause the nut to break off during impacting with the impact wrench.

5. The 1” NUT D must be concentric with the SPINDLE, ROLLER HUB E. The Weld Bead F must completely surround the perimeter of the nut.

   Fig. # 5-74 Nut Welded To The Spindle Face
6. Heat the external spindle area with Propylene (Fg105 or FG26) Oxygen, (ox200 or ox125) gas, using a Smith ST815 Propylene Heating Tip Assembly - ST815 (Rosebud Equivalent). Heat the tube until it reaches a dull red glow. (See Fig. # 5-75)

**NOTE**
Norwood recommends Propylene (Fg105 or FG26) Oxygen, (ox200 or ox125) gas mixture for faster heating times. If this gas mixture is not available, an Oxy-Acetylene mix is acceptable, but will take longer to heat.

7. Immediately drive the 1" NUT (D) with an impact driver, driving it CW & CCW directions until the stuck hub is free. (See Fig. # 5-76)

8. In addition, you can use a PRY BAR (H), to pry between the ROLLER TUBE (G), and the SPINDLE, ROLLER HUB (E) to break it free. (See Fig. # 5-77)
STORAGE

Preparing For Storage

After the season’s use or when the Kwik-Till will not be used for a period of time, completely inspect all major systems of the Kwik-Till.

Replace or repair any worn or damaged components to prevent any unnecessary down time at the beginning of the next season.

Follow these procedures before storing:

1. Store in either Transport or Field position.
2. Make sure that the Hitch Jack hydraulic hose ball valve is in the “CLOSED” position. *(See Fig. # 5-78)*

   ![](Fig. # 5-78 Make Sure The Ball Valve Is CLOSED (Shown in the “CLOSED” Position))

3. Inspect all rotating parts for entanglements. Remove anything caught in the mechanisms.
4. Thoroughly wash the unit to remove all dirt, mud and debris.

5. Check the condition of the components in the hydraulic system. Repair, replace or adjust as required. Tighten any loose fittings. Replace any hose that is badly cut, nicked or abraded or is separating from the crimped end of the fitting.
6. Lubricate all fittings and fill grease cavities to remove moisture.
7. Grease any exposed chrome shafts on the hydraulic cylinders to prevent rusting.
8. Touch up all paint nicks and scratches to prevent rusting.
9. Store the Kwik-Till inside for protection from the weather. If the Kwik-Till must be stored outside, cover with a waterproof tarpaulin and tie down securely, place boards under the wheels and parking stands to prevent sinking into the soil.
10. Check tire pressure and inflate according to tire side-wall recommendations.
11. Chock wheels.

**WARNING**

Before disconnecting equipment, servicing, adjusting, or repairing:

Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving the tractor cab.

**IMPORTANT**

Close the hydraulic hitch jack ball valve to prevent accidental operation of this circuit. Ensure ball valve handle is in closed position when not in use.

- Failure to close the ball valve during storage will cause the machine to slowly settle causing the hitch to lower to the ground.

1. Before disconnecting equipment, servicing, adjusting, or repairing:
2. Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before leaving the tractor cab.
## 6.0 - TROUBLESHOOTING

### Troubleshooting Field Problems

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine does not track straight.</td>
<td>Machine not level from front to back.</td>
<td>Adjust hitch link height to the tractor drawbar</td>
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<tr>
<td></td>
<td></td>
<td>Add a depth stop to rear attachment cylinders</td>
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<tr>
<td></td>
<td></td>
<td>Reduce machine tracking spacing for more overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjust AutoTrac to the left</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjust AutoTrac to the right</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Add a depth stop to wheel strut cylinders</td>
</tr>
<tr>
<td>Full machine plugs.</td>
<td>Ground speed too low.</td>
<td>Increase speed as specified in operations.</td>
</tr>
<tr>
<td></td>
<td>Working depth too deep.</td>
<td>Set for (2-3 in) in spring and (3.5-4.5) in for fall</td>
</tr>
<tr>
<td>Wings Plug.</td>
<td>Wings not level.</td>
<td>Verify that main and wing cylinders are in float.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Verify that cylinder stops are consistent with the main frame</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduce digging depth.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduce speed to 10.5 mph (17 km/h).</td>
</tr>
<tr>
<td>Furrow on the left side.</td>
<td>Soil not filling cut.</td>
<td>Increase machine speed to 10.5 mph (17 km/h).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjust deflector towards the rear rank.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make certain that deflector is not running in the soil.</td>
</tr>
<tr>
<td>Surface finish unsatisfactory.</td>
<td>Speed too low.</td>
<td>Increase machine speed to 10.5 mph (17 km/h).</td>
</tr>
<tr>
<td>Subsurface ridges.</td>
<td>Machine unlevel.</td>
<td>Verify that depth stops and hitch link are adjusted properly.</td>
</tr>
<tr>
<td>Deflector plugging.</td>
<td>Too much residue.</td>
<td>During Fall tillage or high residue flip deflector up.</td>
</tr>
<tr>
<td>Residue flow unsatisfactory.</td>
<td>Adjust front rank.</td>
<td>In high residue, it may be necessary to raise front rank.</td>
</tr>
</tbody>
</table>
Troubleshooting Machine Operation

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow folding sequence.</td>
<td>Low hydraulic pressure/flow from tractor.</td>
<td>Verify SCV settings and fluid levels.</td>
</tr>
<tr>
<td>Machine not folding at all.</td>
<td>Hydraulic connection issue.</td>
<td>Verify that all hoses are connected properly. (See Make Proper Hose Connections in the Attaching and Detaching section.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Verify that hose pairs are mated properly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Refer to the hose chart on the machine.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hydraulic fluid bypassing piston seals in one or both hydraulic cylinders. (Replace cylinder or re-build with new seals).</td>
</tr>
</tbody>
</table>
7.0 - SPECIFICATIONS

Kwik-Till Specifications:
Tractor power requirements are shown in the following charts for each specific model of machine and working width.

**IMPORTANT**
Recommended operating speed is between 9-14 mph (14.5-22.5 km/h). In certain hilly, soft, or wet conditions it may require an additional 25% engine hp to maintain operating speeds at working depth.

Tractor Engine Power Requirements

<table>
<thead>
<tr>
<th>Kwik-Till Model</th>
<th>Recommended Tractor Engine Power hp (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSD1600</td>
<td>220 (164) Minimum</td>
</tr>
<tr>
<td>HSD1780</td>
<td>250 (186) Minimum</td>
</tr>
<tr>
<td>HSD2100</td>
<td>290 (216) Minimum</td>
</tr>
<tr>
<td>HSD2450</td>
<td>340 (253) Minimum</td>
</tr>
</tbody>
</table>

*Fig. # 7-1 Table: Tractor Engine Power Requirements*

Downward Force on Tractor Drawbar

<table>
<thead>
<tr>
<th>Kwik-Till Model</th>
<th>Maximum Tongue Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSD1600</td>
<td>1800 (816)</td>
</tr>
<tr>
<td>HSD1775</td>
<td>2000 (907)</td>
</tr>
<tr>
<td>HSD2100</td>
<td>2600 (1179)</td>
</tr>
<tr>
<td>HSD2450</td>
<td>3200 (1451)</td>
</tr>
</tbody>
</table>

*Fig. # 7-2 Table: Downward Force on Tractor Drawbar*

Machine Weights & Working Widths

<table>
<thead>
<tr>
<th>Kwik-Till Model</th>
<th>Working Width ft-in (m)</th>
<th>Total Weight * lb (kg)</th>
<th>Number Of Disks</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSD1600</td>
<td>15'-11&quot; (4.9)</td>
<td>15,020 (6,813)</td>
<td>38</td>
</tr>
<tr>
<td>HSD1775</td>
<td>17'-7&quot; (5.4)</td>
<td>15,600 (7,076)</td>
<td>42</td>
</tr>
<tr>
<td>HSD2100</td>
<td>20'-11&quot; (6.4)</td>
<td>16,800 (7,620)</td>
<td>50</td>
</tr>
<tr>
<td>HSD2450</td>
<td>24'-4&quot; (7.4)</td>
<td>17,800 (8,074)</td>
<td>58</td>
</tr>
</tbody>
</table>

* Total weight is for machines equipped with cage rollers.

*Fig. # 7-3 Table: Machine Weights & Working Widths*

Transport Width and Height

<table>
<thead>
<tr>
<th>Kwik-Till Model</th>
<th>Transport Width ft-in (m)</th>
<th>Transport Height ft-in (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSD1600</td>
<td>12'-5&quot; (3.8)</td>
<td>12'-5&quot; (3.8m)</td>
</tr>
<tr>
<td>HSD1775</td>
<td>12'-5&quot; (3.8)</td>
<td>12'-6&quot; (3.8m)</td>
</tr>
<tr>
<td>HSD2100</td>
<td>12'-5&quot; (3.8)</td>
<td>12'-8&quot; (3.9m)</td>
</tr>
<tr>
<td>HSD2450</td>
<td>12'-5&quot; (3.8)</td>
<td>12'-11&quot; (3.9m)</td>
</tr>
</tbody>
</table>

*Fig. # 7-4 Table: Transport Width and Height*
7.0 - SPECIFICATIONS Cont’d.

### Ground Engaging

<table>
<thead>
<tr>
<th>Machine Model</th>
<th>HSD1600</th>
<th>HSD1775</th>
<th>HSD2100</th>
<th>HSD2440</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disc Spacing</td>
<td>10 in (254 mm)</td>
<td>10 in (254 mm)</td>
<td>10 in (254 mm)</td>
<td>10 in (254 mm)</td>
</tr>
<tr>
<td>Number of Discs</td>
<td>38</td>
<td>42</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td>Estimated Weight of Blades</td>
<td>395 lb (179 kg)</td>
<td>371 lb (168 kg)</td>
<td>336 lb (152 kg)</td>
<td>307 lb (139 kg)</td>
</tr>
<tr>
<td>Working Depth</td>
<td>2 in (51 mm) to 6 in (152 mm)</td>
<td>2 in (51 mm) to 6 in (152 mm)</td>
<td>2 in (51 mm) to 6 in (152 mm)</td>
<td>2 in (51 mm) to 6 in (152 mm)</td>
</tr>
</tbody>
</table>

- **Standards**: Independent Disc Arms
- **Arm Suspension**: Compressed Rubber Elements
- **Arm Travel**: 9 in (228 mm)
- **Front Rank Angle**: 17°
- **Front Rank Tilt**: 0
- **Rear Rank Angle**: 14°
- **Rear Rank Tilt**: 0

**Fig. # 7-6 Table: Ground Engaging**

### Disk Blades

<table>
<thead>
<tr>
<th>Solid-Spherical Blade</th>
<th>Diameter</th>
<th>Thickness</th>
<th>Concavity</th>
<th>Application</th>
<th>Soil Type</th>
<th>Penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>20 in (508 mm)</td>
<td>0.25 in (6.5 mm)</td>
<td>1.84 in (47 mm)</td>
<td>Soil control at higher speeds</td>
<td>Medium Soils</td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cutout or Notched-Spherical Blade</th>
<th>Diameter</th>
<th>Thickness</th>
<th>Concavity</th>
<th>Application</th>
<th>Soil Type</th>
<th>Penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>20 in (508 mm)</td>
<td>0.25 in (6.5 mm)</td>
<td>1.84 in (47 mm)</td>
<td>Chopping or trapping residue</td>
<td>Medium to Heavy Soils</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

**Fig. # 7-7 Table: Disk Blades**

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE
Rear Attachments

<table>
<thead>
<tr>
<th>Machines With Spiral Cage Rolling Basket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear Attach Bearing</td>
</tr>
<tr>
<td>Diameter</td>
</tr>
<tr>
<td>Application</td>
</tr>
<tr>
<td>Compaction</td>
</tr>
<tr>
<td>Soil Type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Machines With Rubber Rolling Wheel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear Attach Bearing</td>
</tr>
<tr>
<td>Diameter</td>
</tr>
<tr>
<td>Application</td>
</tr>
<tr>
<td>Compaction</td>
</tr>
<tr>
<td>Soil Type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Machines With Spring Tine Basket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear Attach Bearing</td>
</tr>
<tr>
<td>Diameter</td>
</tr>
<tr>
<td>Application</td>
</tr>
<tr>
<td>Compaction</td>
</tr>
<tr>
<td>Soil Type</td>
</tr>
</tbody>
</table>

Fig. # 7-7 Table: Rear Attachments

Tire Specifications

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Load/Speed Index</th>
<th>Tire Pressures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>psi</td>
<td>kPa</td>
</tr>
<tr>
<td>600/50R22.5</td>
<td>168B</td>
<td>46</td>
</tr>
</tbody>
</table>

Fig. # 7-9 Table: Tire Specifications

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE
Torque – Hydraulic Tubes and Fittings

Standard torque data for hydraulic tubes and fittings

<table>
<thead>
<tr>
<th>Size</th>
<th>Tubing OD Inches</th>
<th>Thread Size</th>
<th>ft-lbs Min</th>
<th>ft-lbs Max</th>
<th>Nm Min</th>
<th>Nm Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1/4</td>
<td>7/16-20</td>
<td>9</td>
<td>12</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>5/16</td>
<td>1/2-20</td>
<td>12</td>
<td>15</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>3/8</td>
<td>9/16-18</td>
<td>21</td>
<td>24</td>
<td>29</td>
<td>33</td>
</tr>
<tr>
<td>8</td>
<td>1/2</td>
<td>3/4-18</td>
<td>35</td>
<td>40</td>
<td>47</td>
<td>54</td>
</tr>
<tr>
<td>10</td>
<td>5/8</td>
<td>7/8-14</td>
<td>53</td>
<td>58</td>
<td>72</td>
<td>79</td>
</tr>
<tr>
<td>12</td>
<td>3/4</td>
<td>1-1/6-12</td>
<td>77</td>
<td>82</td>
<td>104</td>
<td>111</td>
</tr>
<tr>
<td>14</td>
<td>7/8</td>
<td>1-3/16-12</td>
<td>90</td>
<td>100</td>
<td>122</td>
<td>136</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>1-5/16-12</td>
<td>110</td>
<td>120</td>
<td>149</td>
<td>163</td>
</tr>
<tr>
<td>20</td>
<td>1-1/4</td>
<td>1-5/8-12</td>
<td>140</td>
<td>150</td>
<td>190</td>
<td>204</td>
</tr>
<tr>
<td>24</td>
<td>1-1/2</td>
<td>1-7/8-12</td>
<td>160</td>
<td>175</td>
<td>217</td>
<td>237</td>
</tr>
<tr>
<td>32</td>
<td>2</td>
<td>2-1/2-12</td>
<td>225</td>
<td>240</td>
<td>305</td>
<td>325</td>
</tr>
</tbody>
</table>

The above torque figures are recommended for plain, cadmium or zinc plated fittings, dry or wet installations and swivel nuts either swagged or brazed. These torques are not recommended for tubes 12.7 mm (0.5 in) OD and thicker with wall thickness of 0.889 mm (0.035 in) or less. The torque is specified for 0.889 mm (0.035 in) wall tubes on each application individually.
### Torque – Fasteners

#### Society of Automotive Engineers (SAE) Fastener Torque

Use these torques, unless special torques are specified. Values are for Unified Coarse (UNC) and Unified Fine (UNF) thread fasteners, plated or unplated, as received from supplier. Fasteners can be dry or lubricated with normal engine oil. Values do not apply if graphite, molydisulphide or other extreme pressure lubricant is used.

* Use the torque values as shown, unless specified otherwise. Torque values specified as lubricated, are fasteners that are to be assembled with threadlocker.

##### SAE Grade No. | Grade 2 | Grade 5 | Grade 8 (See Note Below)
---|---|---|---
Bolt Head Identification (See Note Below.)

<table>
<thead>
<tr>
<th>Bolt Size</th>
<th>ft-lbs (Lubricated)*</th>
<th>ft-lbs</th>
<th>ft-lbs (Lubricated)*</th>
<th>ft-lbs</th>
<th>ft-lbs (Lubricated)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>3.6</td>
<td>2.7</td>
<td>8.5</td>
<td>6.3</td>
<td>11.9</td>
</tr>
<tr>
<td>5/16</td>
<td>7.4</td>
<td>5.5</td>
<td>17.4</td>
<td>13.1</td>
<td>24.6</td>
</tr>
<tr>
<td>3/8</td>
<td>13.1</td>
<td>9.8</td>
<td>30.9</td>
<td>23.2</td>
<td>43.6</td>
</tr>
<tr>
<td>7/16</td>
<td>20.9</td>
<td>15.7</td>
<td>49.4</td>
<td>37.1</td>
<td>69.8</td>
</tr>
<tr>
<td>1/2</td>
<td>31.9</td>
<td>23.9</td>
<td>75.4</td>
<td>56.5</td>
<td>106.4</td>
</tr>
<tr>
<td>9/16</td>
<td>46.1</td>
<td>34.5</td>
<td>108.7</td>
<td>81.6</td>
<td>153.5</td>
</tr>
<tr>
<td>5/8</td>
<td>63.6</td>
<td>47.7</td>
<td>150.1</td>
<td>112.6</td>
<td>211.9</td>
</tr>
<tr>
<td>3/4</td>
<td>113</td>
<td>85</td>
<td>267</td>
<td>200</td>
<td>376</td>
</tr>
<tr>
<td>7/8</td>
<td>182</td>
<td>136</td>
<td>429</td>
<td>322</td>
<td>606</td>
</tr>
<tr>
<td>1</td>
<td>273</td>
<td>204</td>
<td>644</td>
<td>483</td>
<td>909</td>
</tr>
<tr>
<td>1-1/8</td>
<td>386</td>
<td>290</td>
<td>794</td>
<td>596</td>
<td>1288</td>
</tr>
<tr>
<td>1-1/4</td>
<td>409</td>
<td>545</td>
<td>1121</td>
<td>840</td>
<td>1817</td>
</tr>
<tr>
<td>1-3/8</td>
<td>536</td>
<td>715</td>
<td>1469</td>
<td>1102</td>
<td>2382</td>
</tr>
<tr>
<td>1-1/2</td>
<td>949</td>
<td>711</td>
<td>1950</td>
<td>1462</td>
<td>3162</td>
</tr>
</tbody>
</table>

**NOTE:** Bolt head identification marks as per grade. Manufacturing marks will vary.

**NOTE:** Thick nuts must be used with Grade 8 bolts.
Metric International Standards Organization (ISO) Fastener Torque

Use these torques, unless special torques are specified. Values are for coarse thread fasteners, plated or unplated, as received from supplier. Fasteners can be dry or lubricated with normal engine oil. Values do not apply if graphite, molydisulphide or other extreme pressure lubricant is used.

* Use the torque values as shown, unless specified otherwise. Torque values specified as lubricated, are fasteners that are to be assembled with threadlocker.

<table>
<thead>
<tr>
<th>ISO Class No.</th>
<th>8.8</th>
<th>10.9</th>
<th>12.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolt Head Identification (See Note below.)</td>
<td><img src="image" alt="8.8" /></td>
<td><img src="image" alt="10.9" /></td>
<td><img src="image" alt="12.9" /></td>
</tr>
<tr>
<td>Bolt Size</td>
<td>ft-lbs</td>
<td>ft-lbs (Lubricated)*</td>
<td>ft-lbs</td>
</tr>
<tr>
<td>M5</td>
<td>4.6</td>
<td>3.4</td>
<td>6.5</td>
</tr>
<tr>
<td>M6</td>
<td>7.7</td>
<td>5.8</td>
<td>11.1</td>
</tr>
<tr>
<td>M8</td>
<td>18.8</td>
<td>14.1</td>
<td>26.9</td>
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<td>M10</td>
<td>37.2</td>
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<td>53.3</td>
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<td>M12</td>
<td>64.9</td>
<td>48.7</td>
<td>92.9</td>
</tr>
<tr>
<td>M14</td>
<td>103</td>
<td>77.5</td>
<td>148</td>
</tr>
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<td>M16</td>
<td>161</td>
<td>121</td>
<td>231</td>
</tr>
<tr>
<td>M18</td>
<td>229</td>
<td>172</td>
<td>317</td>
</tr>
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<td>M20</td>
<td>325</td>
<td>244</td>
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<td>M22</td>
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<td>332</td>
<td>612</td>
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<td>M24</td>
<td>562</td>
<td>422</td>
<td>778</td>
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<tr>
<td>M27</td>
<td>823</td>
<td>617</td>
<td>1138</td>
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<td>M30</td>
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<td>M36</td>
<td>1952</td>
<td>1464</td>
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</tr>
<tr>
<td>M39</td>
<td>2527</td>
<td>1895</td>
<td>3495</td>
</tr>
</tbody>
</table>

**NOTE:** Bolt head identification marks as per grade. Manufacturing marks will vary.
Norwood follows the general Safety Standards specified by the American Society of Agricultural Engineers (ASAE), and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the equipment must read and clearly understand all Safety, Operating and Maintenance information presented in this manual.

Do not operate, or allow anyone else to operate, this equipment until this document has been read. Review this information annually, before the season start-up.

Make periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment.

The following Sign-Off Form is provided for your record keeping. Use it to show that all personnel who will be working with the equipment have read and understand the provided information. Also, they have been instructed in the operation of the equipment. Copy this page to continue the record.

**SIGN - OFF FORM**

<table>
<thead>
<tr>
<th>DATE</th>
<th>EMPLOYEES SIGNATURE</th>
<th>EMPLOYERS SIGNATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
This Page Is Intentionally Left Blank
Warranty

Warranty Registration

Customer’s Name __________________________________________
Dealer’s Name __________________________________________
Street Address __________________________________________
Street Address __________________________________________
City State Zip Code __________________________________________
City State Zip Code __________________________________________
Phone Number __________________________________________
Phone Number __________________________________________
Model __________________________________________
Serial Number __________________________________________
Check One Below:
Commercial Use _____ Farm Use _____

Dealer Inspection Report

_____ Wheel Nuts Tight _____ Signal Lights Work Properly
_____ Tire Pressure _____ Safety Chain Installed
_____ Fasteners Tight _____ Review Operating & Safety Instructions
_____ All Decals Installed _____ Operator Manual Supplied

I have thoroughly instructed the buyer on the above described equipment including a review of the Operator’s Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date ___________________________ Dealer’s Signature ___________________________

I have received the above equipment and Operator’s Manual and I have been thoroughly instructed on its care, adjustments, safe operation and applicable warranty policy.

Date ___________________________ Owner’s Signature ___________________________
Warranty

Limited Warranty Policy

Norwood Sales Inc. warrants to the buyer that the new machinery is free from defects in material and workmanship.

This warrant is only effective on new machinery, which has not been altered, changed or repaired since its delivery to the buyer.

Norwood Sales Inc. shall only be liable for defects in materials or workmanship and specifically excludes liability for repairs arising as a result of normal wear and tear of the new machinery and without limiting the generality of the foregoing, excludes application or installation of parts not completed in accordance with Norwood Sales Inc. operator’s manual, specifications, or printed instructions.

Written notice shall be given by registered mail, to Norwood Sales Inc. within seven (7) days after the defect shall have become apparent or the repairs shall have become necessary, addressed as follows: Norwood Sales Inc., 11202 38th Street South, Horace, ND 58047.

A Warranty Registration Form and Dealer Inspection Report must be completed at the time of delivery and returned to Norwood Sales Inc., 11202 38th Street South, Horace, ND 58047 within thirty (30) days.

Warranty Period

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<td>Private Farm Use</td>
<td>One (1) year from date of purchase.</td>
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<tr>
<td>Commercial, Custom, or Rental Use</td>
<td>Ninety (90) days from date of purchase.</td>
</tr>
<tr>
<td>Replacement Parts</td>
<td>Ninety (90) days from date of replacement</td>
</tr>
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If these conditions are fulfilled, Norwood Sales Inc. at its option will either repair or replace any defect. The buyer shall be responsible for all expenses incurred as a result of repairs, labor, parts, transportation or any other work, unless Norwood Sales Inc. authorizes such expenses in advance.

The warranty shall not extend to any repairs, changes, alterations, or replacements made to the new equipment other than by Norwood Sales Inc. or its authorized dealers.

This warranty extends only to the original owner of the new equipment.

This warranty is limited to the terms stated herein and is in lieu of any other warranties whether expressed or implied, and without limiting the generality of the foregoing, excluded all warranties, expressed or implied or conditions whether statutory or otherwise as to quality and fitness for any purpose of the new equipment. Norwood Sales Inc. disclaims all liability for incidental or consequential damages.

This machine is subject to design changes and Norwood Sales Inc. shall not be required to retro-fit or exchange items on previously sold units except at its own option.
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