

# *Kwik-Koulter*

**OPERATOR'S MANUAL  
FOR  
DISK HARROW SERIES**



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## Disclaimer

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## Read and Understand



Read and follow all instructions and safety precautions in this manual and all other manuals for products associated with this machine 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-Koulter 3-Section Drawn Coulter models:

**DH2400, DH3600, DH4800, & DH6000**

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## Revision History

Issue	Date	Reasons for Change
57-5-00002	March 5th 2024	Initial Release

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## 1 - GENERAL INFORMATION

### 1.0 - GENERAL INFORMATION

#### Note to the Owner

This manual contains important information about the safe operation, adjustment, and maintenance of your Kwik-Koulter 3-Section Drawn Coulter. 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-Koulter, 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.

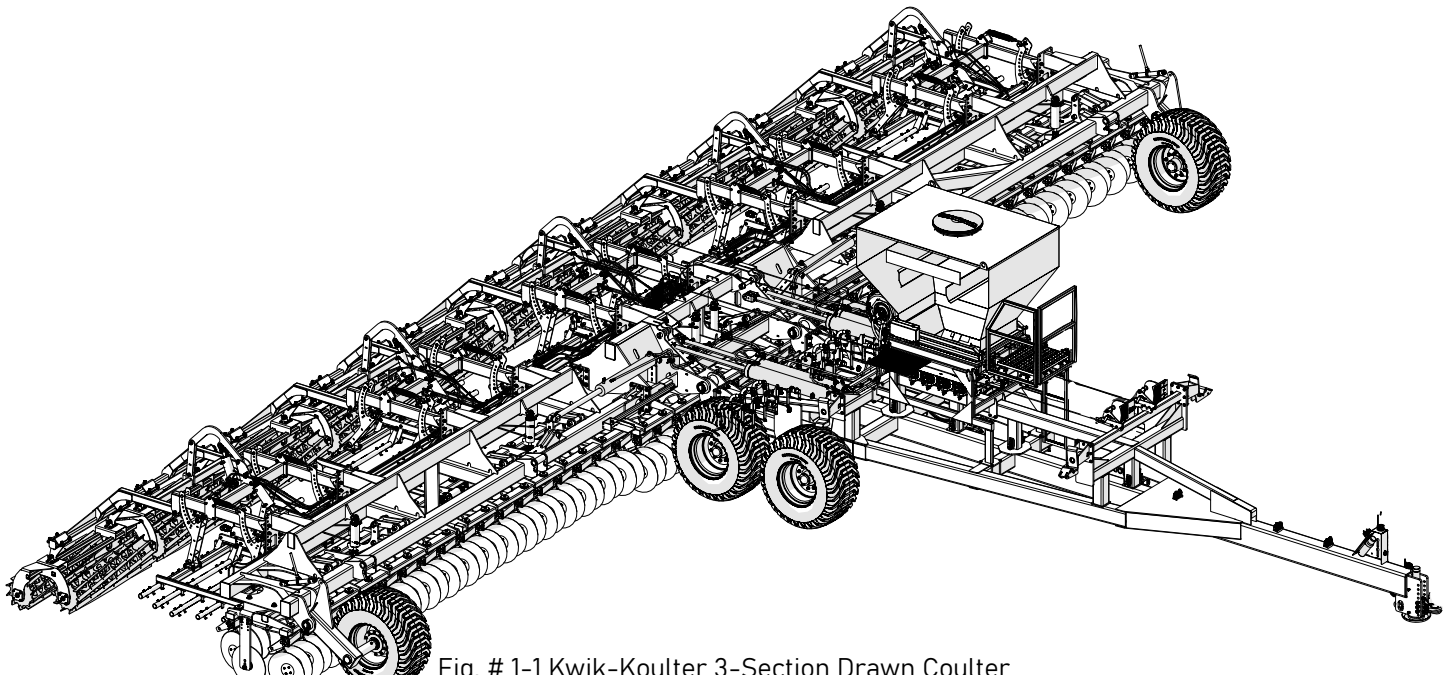


Fig. # 1-1 Kwik-Koulter 3-Section Drawn Coulter

## 1 - GENERAL INFORMATION

### KWIK-KOULTER 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-Koulter.

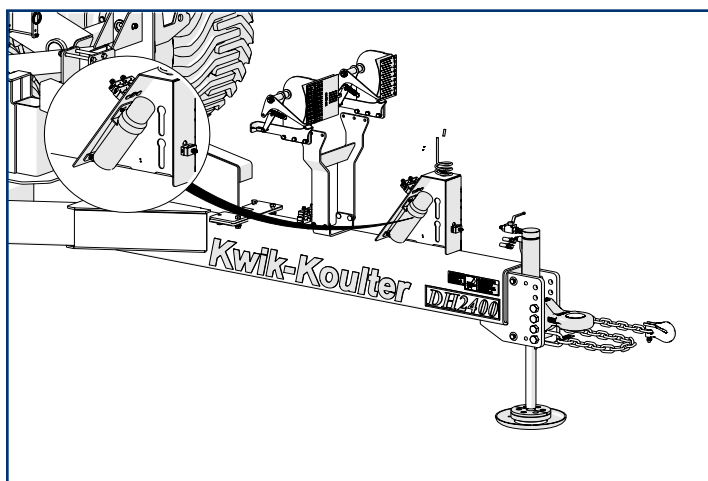


Fig. # 1-2 Locating The Operator's Manual Canister

### Kwik-Koulter Model / Serial Number Location

Always give your authorized Kwik-Koulter dealer the **Model Number**, and **Serial Number** of your Kwik-Koulter 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)

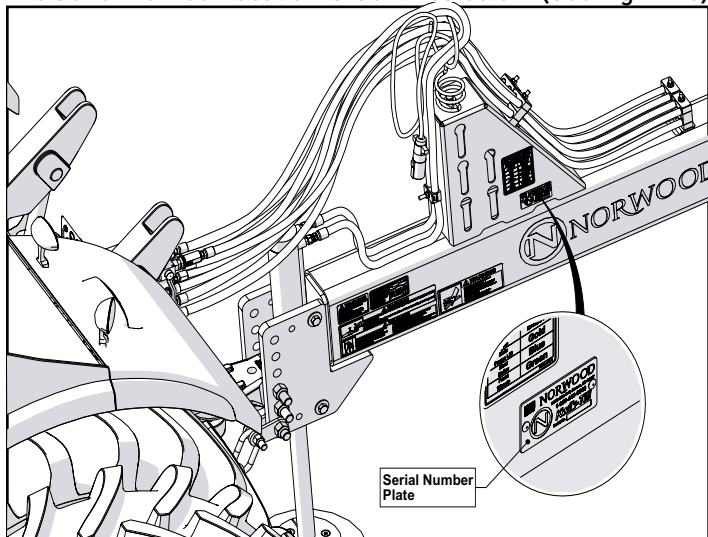


Fig. # 1-3 Locating The Serial Number Plate

The **Model Number** location is indicated below. (See Fig. # 1-4)

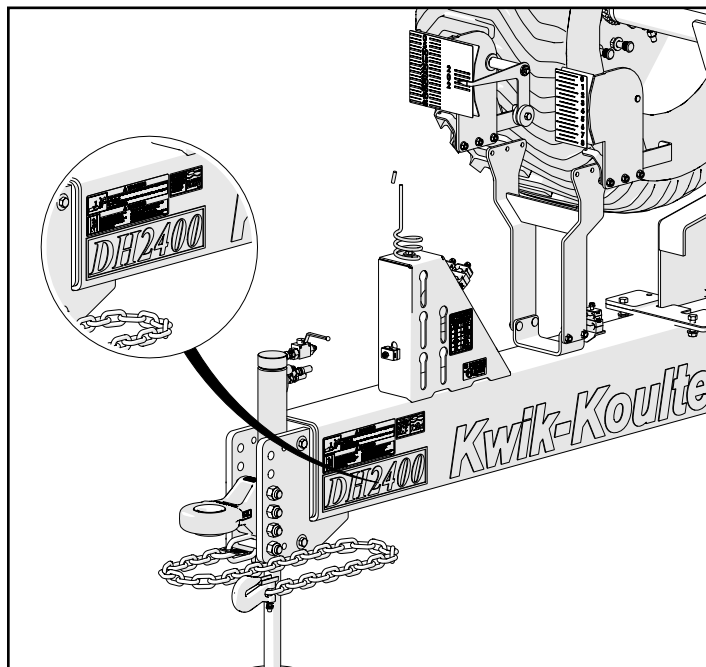


Fig. # 1-4 Locating Model Number Decal

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:** \_\_\_\_\_

## 1 - GENERAL INFORMATION

### 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 of the tractor and looking toward the forward direction of travel.

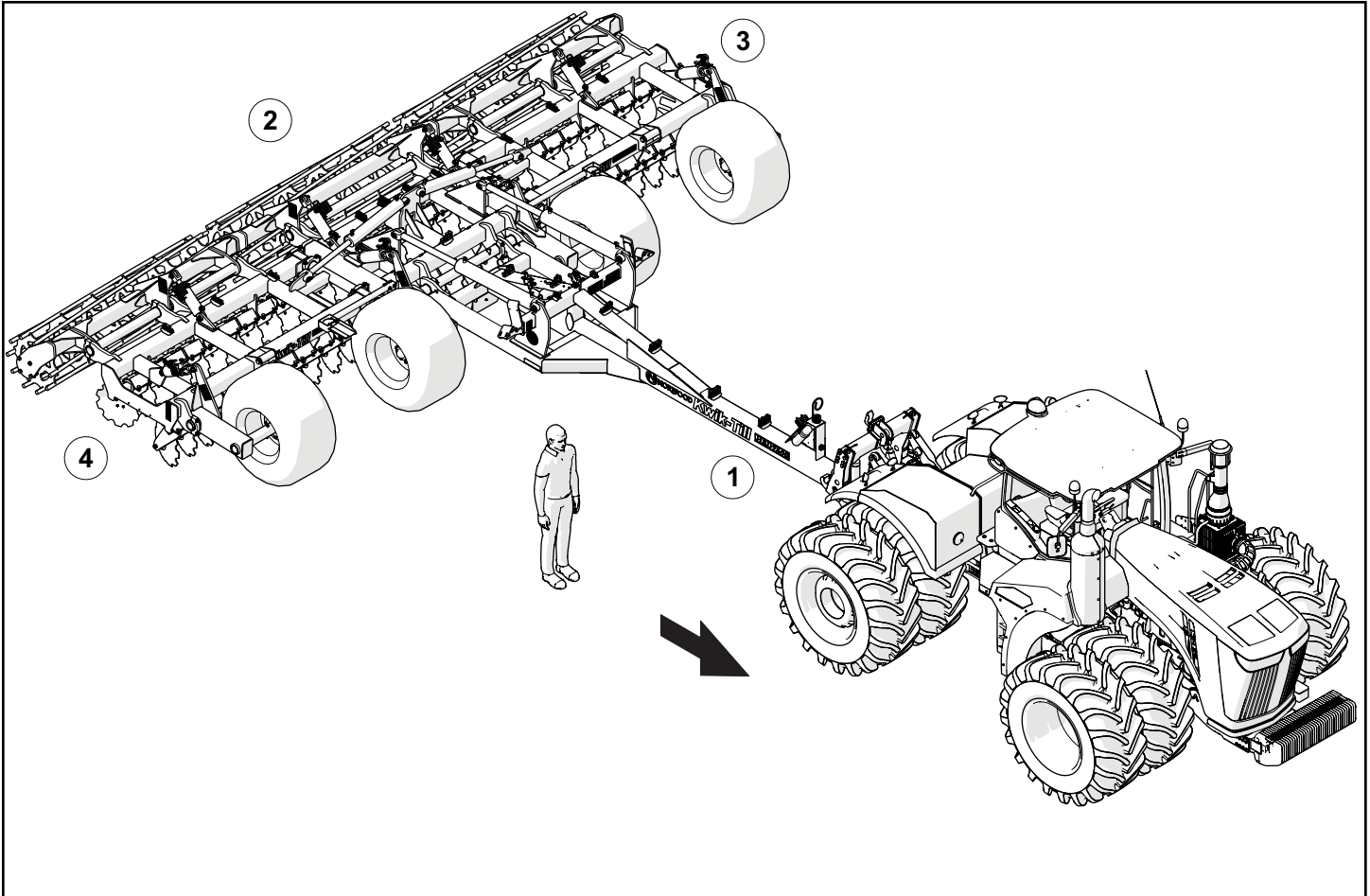
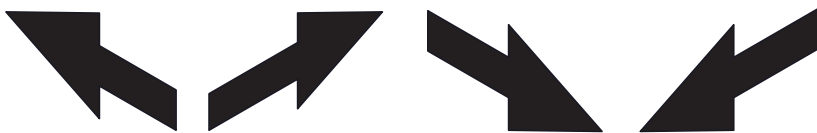


Fig. # 1-5 Determining Left and Right Side of the Machine

#### 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.



## 1 - GENERAL INFORMATION

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## 2 - SAFETY INFORMATION

### 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**

**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**

**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**

**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.

## 2 - SAFETY INFORMATION

### 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, 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.



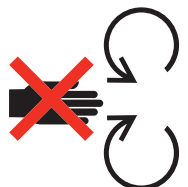
Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.



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.

### GENERAL SAFETY CONT'D.

**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.

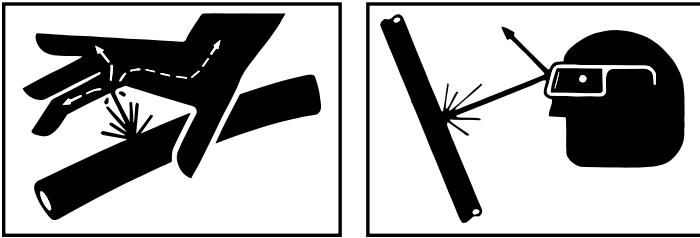
Use extreme care when cleaning, or servicing the machine.

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.

## 2 - SAFETY INFORMATION

### 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.

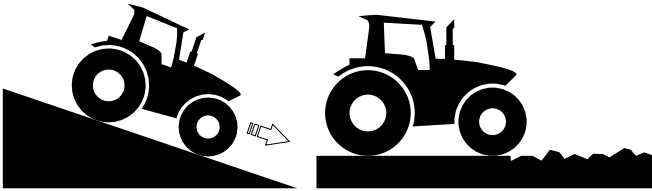


See your Kwik-Koulter dealer for replacement hoses.

## 2 - SAFETY INFORMATION

### 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. Electrocutation 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, traveling down a slope, 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 recommen-

dations for their handling and storage.

18. Tow machine behind a properly equipped tractor only.

### PREPARE FOR EMERGENCIES



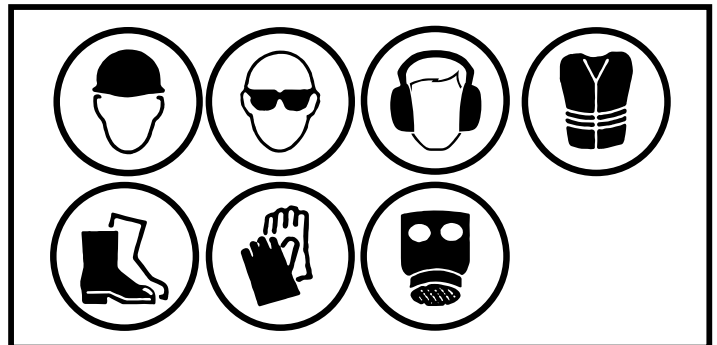
Be prepared if a fire starts.

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)

## 2 - SAFETY INFORMATION

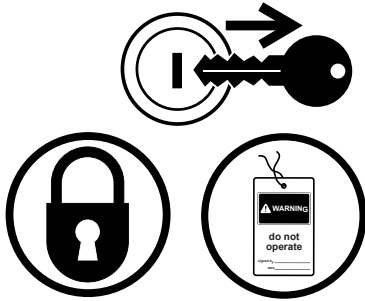
### LOCK-OUT TAG-OUT SAFETY

#### Before starting service on 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.



1. Establish a formal Lock-Out Tag-Out program for your operation.
2. Train all operators and service personnel before allowing them to work around the area.
3. Provide tags on the machine and a sign-up sheet to record tag out details.

### NON-PERMISSIBLE USE

#### **⚠ CAUTION**

**Working on an uncleaned and non-maintained machine poses unnecessary danger and is therefore forbidden.**

Pay attention to the following applications for which the machine is not suitable:

Machine usage in non-customary tillable agricultural fields, such as forests, dirt, gravel, or other roads.

Machine usage to move large rocks from fields.

### GENERAL MAINTENANCE SAFETY

1. Review the Operator's Manual and all safety items before working with, maintaining or operating the Kwik-Koulter.
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.
12. Chock wheels.
13. On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

## 2 - SAFETY INFORMATION

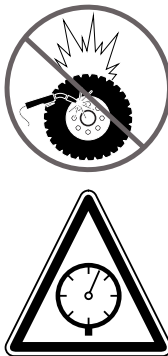
### WHEEL AND TIRE SAFETY

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

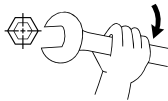
Always have a qualified tire technician service the tires and rims. If a tire has lost all pressure, take the tire and rim to a tire shop or your dealer for service. Explosive separation of the tire can cause death or serious injury.



- **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.

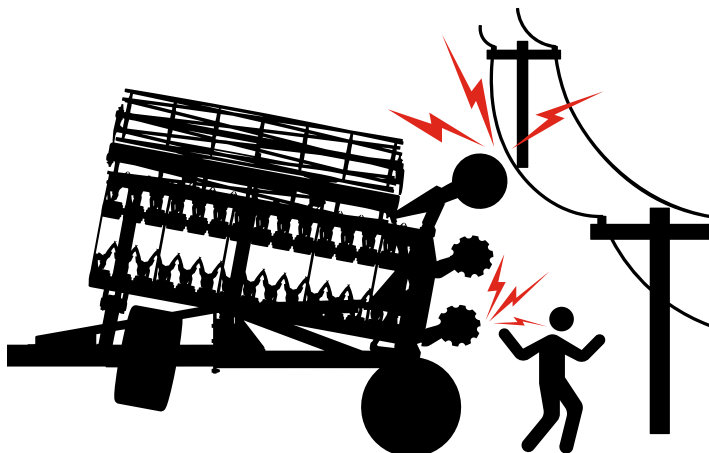
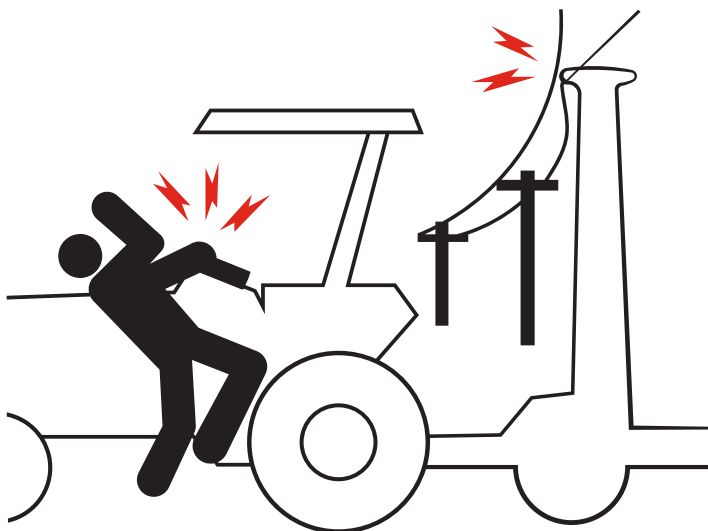
## 2 - SAFETY INFORMATION

### 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



### ⚠ 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.

### 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.



## 2 - SAFETY INFORMATION

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### 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.

### WORKPLACE HAZARD AREAS

- Review the following pages illustrating “**Workplace hazards**” before working with, maintaining or operating the Kwik-Koulter.

## 2 - SAFETY INFORMATION

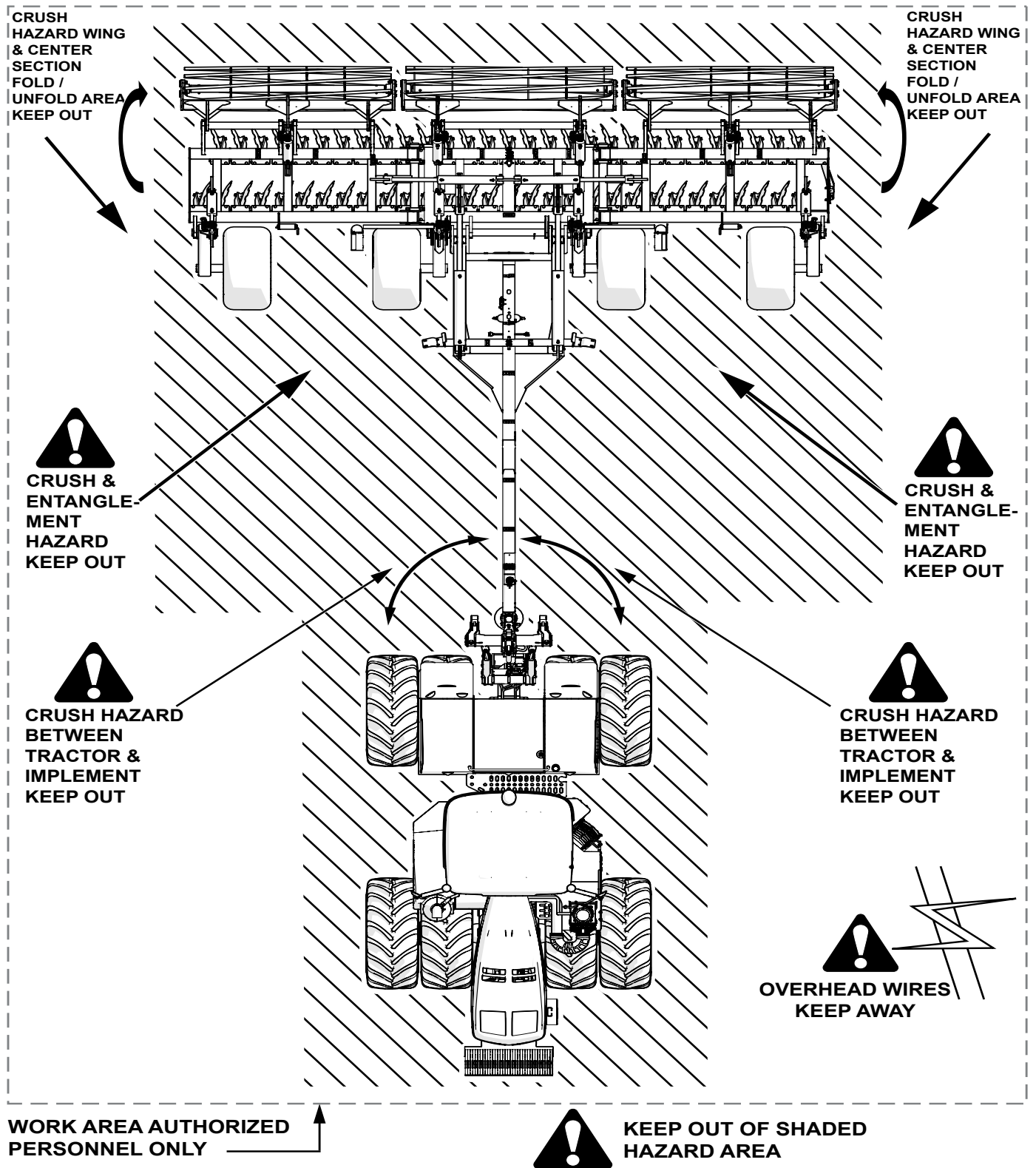


Fig. # 2-6 Workplace Hazard Area Field Position

## 2 - SAFETY INFORMATION

### 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.

#### 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.

### CHEMICAL SAFETY AND THE ENVIRONMENT

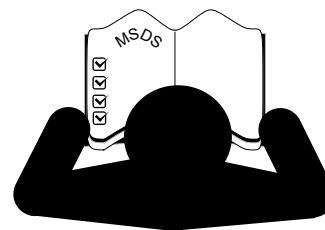


Soil, air, and water are vital factors of agriculture and life in general. When legislation does not yet rule the treatment of some of the substances which are required by advanced technology, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

**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.

### HANDLE CHEMICAL PRODUCTS SAFELY



Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with Kwik-Koulter 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-Koulter dealer for MSDS's on chemical products used with Kwik-Koulter equipment.)

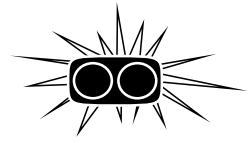
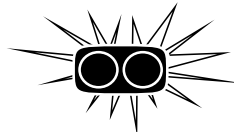
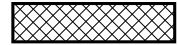
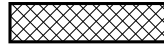
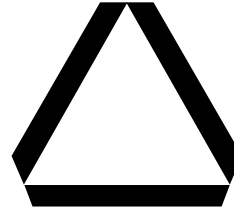
## 2 - SAFETY INFORMATION

### 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:

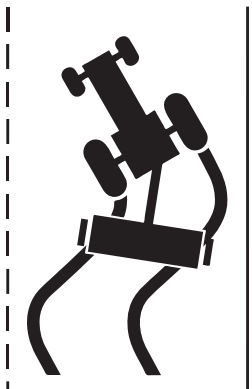
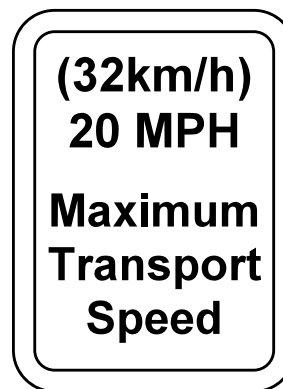
- Use appropriate tools and personal protective equipment such as clothing, gloves, face shields or glasses, during the removal or handling of objects and materials.
- Follow instructions for specialized components.
- Release stored energy by lowering suspended machine elements, relaxing springs, disconnecting 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-Koulter 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-Koulter 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.

## 2 - SAFETY INFORMATION

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 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 sized and ballasted tractor.

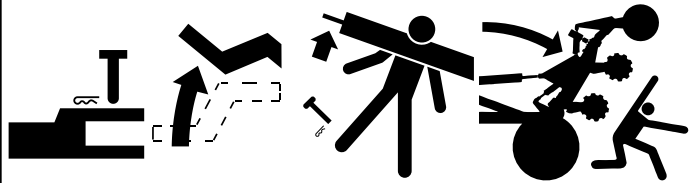
### **ATTACHING AND DETACHING KWI-KOULTER TO / FROM TRACTOR SAFETY**

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.

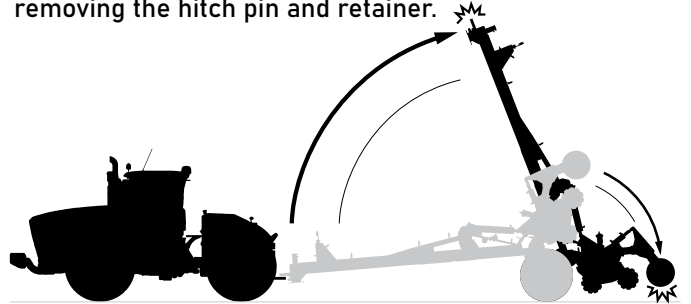
### **⚠ DANGER**

#### **UPENDING HAZARD**

**TONGUE CAN WHIP UPWARDS WHEN UNHITCHING**



The tractor **MUST** be equipped with a clevis hitch to prevent the Kwik-Koulter 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 and retainer.

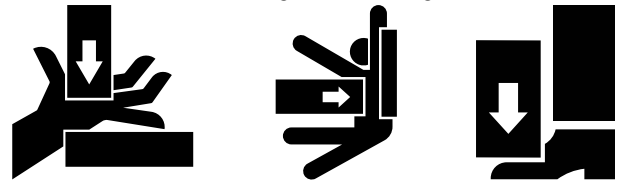


If negative tongue weight exists, the hitch tongue may suddenly raise, and the rear section would come crashing down. Only disconnect when the jack is lowered, there is positive tongue weight, the unit is on level ground, and fully in the proper transport or field position. Never disconnect the Kwik-Koulter 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-Koulter.



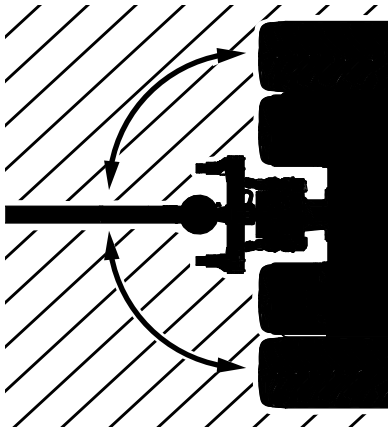
Keep feet, legs, and body clear when raising and lowering the Kwik-Koulter. Keep others away.

## 2 - SAFETY INFORMATION

### USE A SAFETY CHAIN

#### **⚠ DANGER** **CRUSH HAZARD**

Avoid being crushed in between the tractor and the implement.



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



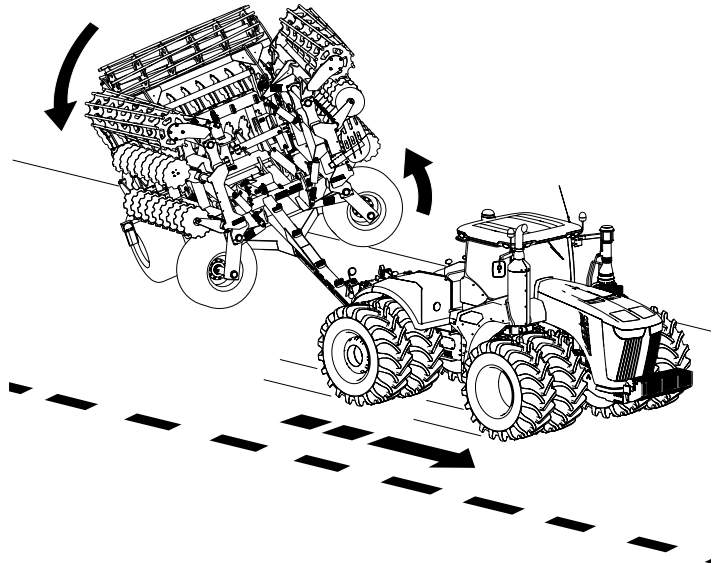
A safety chain will help control drawn equipment should it accidentally separate from the draw-bar.

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

See your Kwik-Koulter dealer if a replacement chain is needed. Your Kwik-Koulter 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



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:

- 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.

### PREPARING FOR TRANSPORT

#### **⚠ 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.

## 2 - SAFETY INFORMATION

### 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 machine 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-Koulter or the tractor.
6. Attach Kwik-Koulter 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. 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.

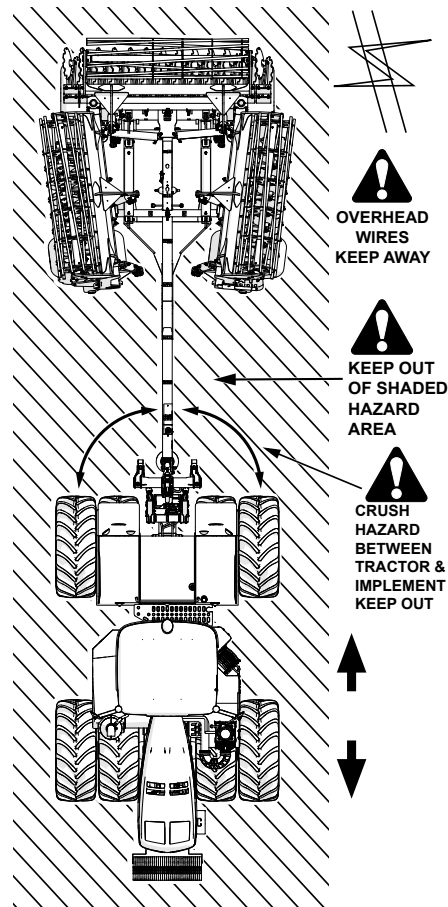


Fig. # 2-7 Transport Hazard Area



## 2 - SAFETY INFORMATION

### 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 operators manual.

### Safety Decal Locations

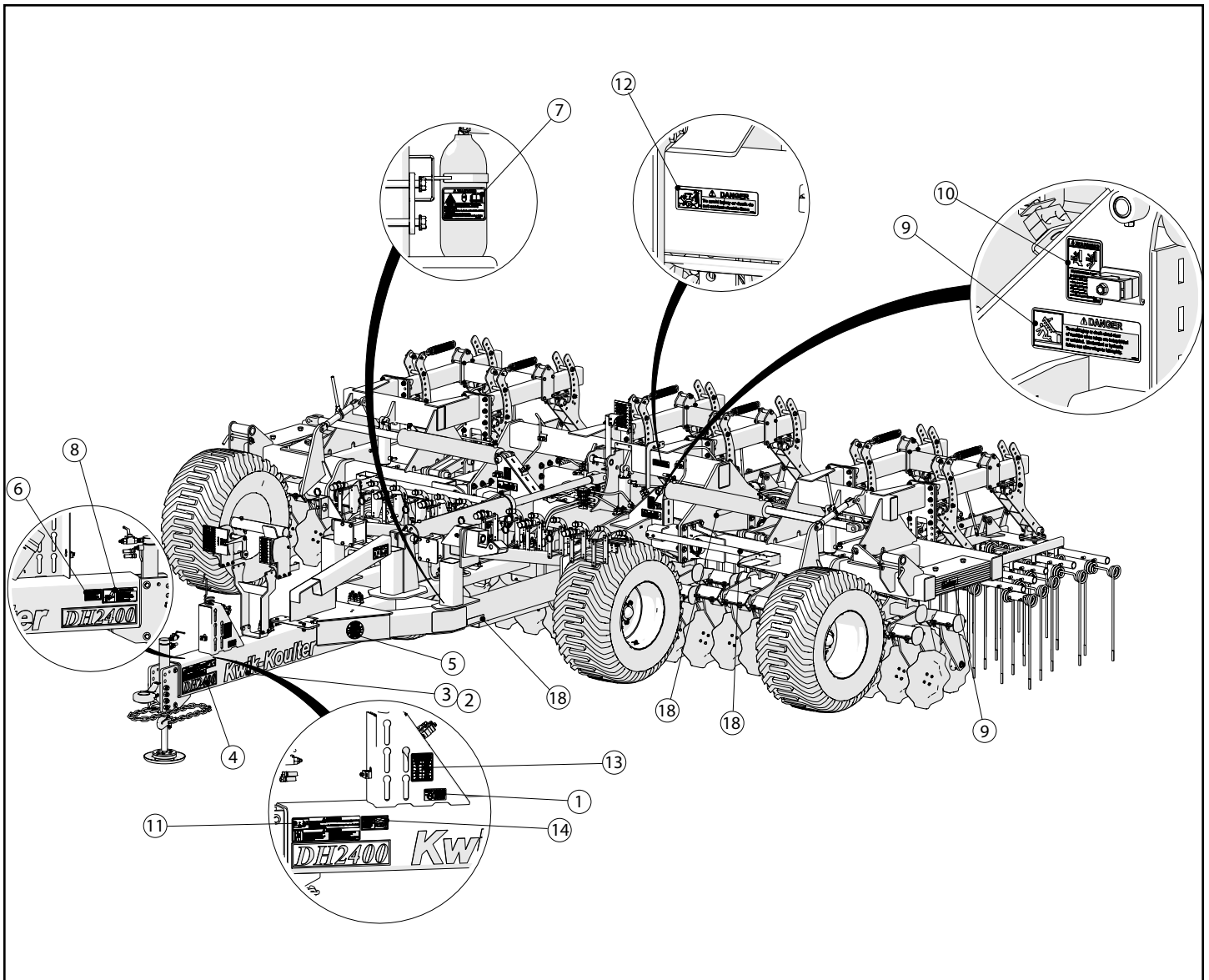


Fig. # 2-8 Safety Decal Locations

## 2 - SAFETY INFORMATION

### SAFETY DECAL LOCATIONS CONT'D.

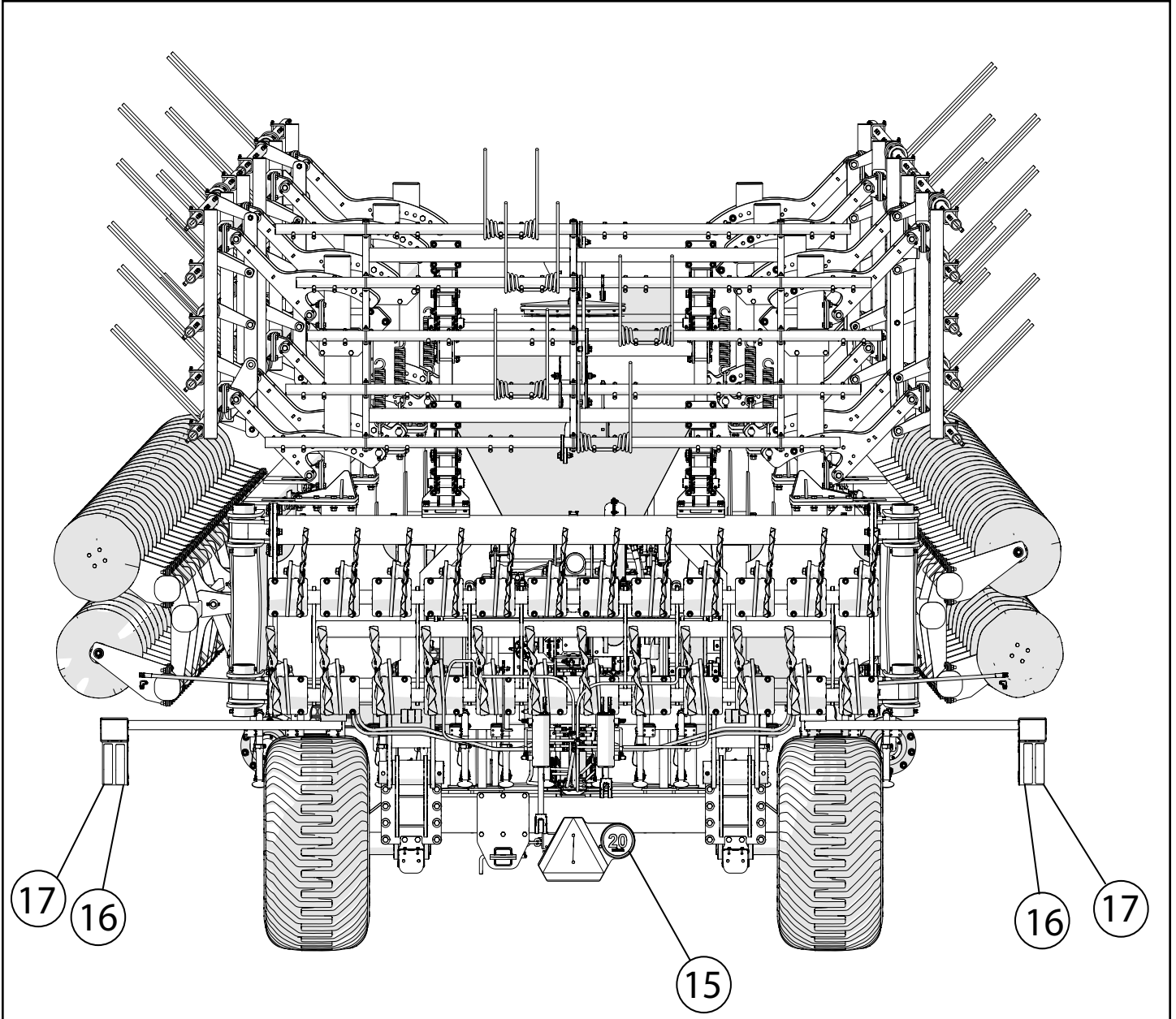


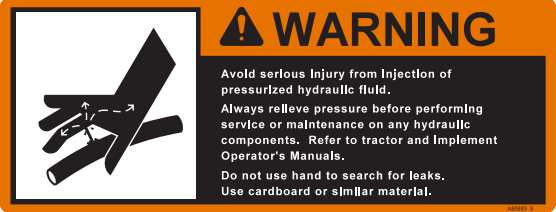
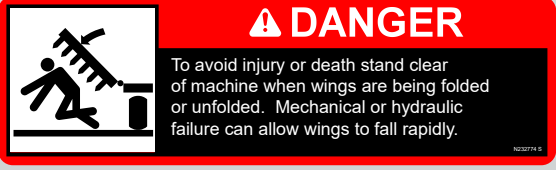
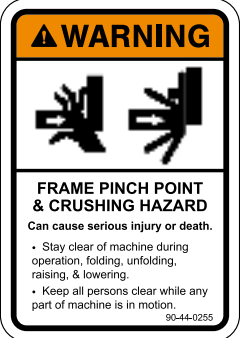


Fig. # 2-9 Safety Decal Locations

## 2 - SAFETY INFORMATION

SAFETY DECAL CATALOGUE			
DECAL	DESCRIPTION	QUANTITY	TAG
	NORWOOD BRAND SERIAL NO. DECAL WHICH WILL DISPLAY YOUR INDIVIDUAL SERIAL NO. FOR YOUR PERSONAL KWIK-KOULTER MODEL	1	1
	THE NORWOOD SALES LOGO	2	2
	THE BRAND FOR OUR DISC HARROW MODEL SERIES- KWIK-KOULTER	2	3
	MODEL SERIES DECAL	2	4
	MADE IN THE USA DECAL- ASSURING YOU AND YOURS THAT THIS KWIK-KOULTER MODEL WAS MADE DILIGENTLY AND WITH EXPERT PRECISION AT OUR FACILITIES HERE IN THE USA	2	5
	WARNING FULLY CHARGED SYSTEM- SYSTEM NEEDS TO BE FULL TO AVOID LOSS OF PRESSURE AND COLLAPSE OF HYDRAULICS	1	6
	WARNING HIGH PRESSURE VESSEL- SYSTEM NEED TO BE DEPRESSURIZED IN A SAFE CORRECT MANNER BEFORE MAINTENANCE	1	7






\* DECALS NOT SHOWN TO SCALE

## 2 - SAFETY INFORMATION

SAFETY DECAL CATALOGUE			
DECAL	DESCRIPTION	QUANTITY	TAG
	<b>WARNING HIGH PRESSURE LINE- FLUID LEAKS FROM PRESSURIZED LINES CAN DAMAGE AND PIERCE THE SKIN LEADING HAZARDOUS MATERIALS TO ENTER TO BLOOD STREAM. USE CAUTION AND PROTECTION WHEN FINDING LEAKS</b>	1	8
	<b>WARNING AVOID CRUSHING AND DEATH- STAND FULLY CLEAR OF ALL MOVING IMPLEMENTS WHEN IN MOTION</b>	3	9
	<b>WARNING PINCH POINTS- MANY IMPLEMENTS CAN CONTACT OR CAPTURE LIMBS OR WHOLE BODYS WHEN IN MOTION, BE SURE TO STAY CLEAR AND HAVE SAFE EXIT WHEN PERFORMING MAINTENANCE</b>	2	10
	<b>WARNING UNBALANCED HITCH- BE CAREFUL WHEN UNHITCHING THE KWIK-KOULTER AND BE SURE TO PLACE IT IN THE FIELD RAISED POSITION BEFORE YOU UNHITCH, IF NOT THE HITCH WILL BE UNBALANCED AND THE WHOLE KWIK-KOULTER COULD FALL BACK RAISING THE HITCH IN A RAPID AND DANGEROUS MANNER</b>	1	11
	<b>AVOID ELECTRIC LINES DECAL- CONTACTING OR DAMAGING AN ELECTRIC LINE CAN RESULT IN SEVERE INJURY AND DEATH</b>	1	12

\* DECALS NOT SHOWN TO SCALE

## 2 - SAFETY INFORMATION

SAFETY DECAL CATALOGUE															
DECAL	DESCRIPTION	QUANTITY	TAG												
<div><div><div>INFORMATION</div><div>HOSE COLOR CHART</div><table><tr><td>Optional Equipment</td><td>Silver</td></tr><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>Coulter Raise</td><td>Blue</td></tr><tr><td>Tine Angle</td><td>Green</td></tr></table><div><small>P/N 90-44-0591</small></div></div></div>	Optional Equipment	Silver	Hitch Jack	Red	Wing Fold	Black	Main Frame Lift	Gold	Coulter Raise	Blue	Tine Angle	Green	HYDRAULIC HOSE COLOR CHART	1	13
Optional Equipment	Silver														
Hitch Jack	Red														
Wing Fold	Black														
Main Frame Lift	Gold														
Coulter Raise	Blue														
Tine Angle	Green														
<div><div><div>IMPORTANT</div><div>TO AVOID POSSIBLE CYLINDER OR EQUIPMENT DAMAGE</div><div>The Wing Fold Cylinders MUST be in the FLOAT position for the tillage to contour properly.</div></div><div><div>PLACE IN FLOAT</div><div><small>90-44-0656</small></div></div></div>	PLACE IN FLOAT WING HYDRAULIC CYLINDERS DECAL- PLACE WING CYLINDERS IN FLOAT POSITION FOR PROPER USE	1	14												
<div></div>	20 MPH SPEED IDENTIFICATION SYMBOL- THIS IS THE RECOMMENDED SPEED FOR TRANSPORT AND SIGNALS TO OTHER VEHICLES YOUR INTENTION TO TRAVEL AT THIS SPEED AND FOR THEM TO ACT ACCORDINGLY	1	15												
<div></div>	ORANGE FLORESCENT STRIP	4	16												
<div></div>	RED RETROREFLECTIVE STRIP	4	17												
<div></div>	YELLOW RETROREFLECTIVE STRIP	8	18												

\* DECALS NOT SHOWN TO SCALE

## 2 - SAFETY INFORMATION

### 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

**(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.

**(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 while transporting.

**(H) JACK STAND** Is used for raising and lowering the implement and makes the attaching and detaching from tractor easier.

**(I) Speed Identification Symbol (SIS) Decal** is used for identifying agricultural implements traveling at a speed of 20 mph (30 kph) which alerts traffic approaching from rear.

The SIS decal also identifies the maximum equipment ground speed based on the ground speed design capability of the specified piece of equipment.

## 2 - SAFETY INFORMATION

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## 2 - SAFETY INFORMATION

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## 3 - TRANSPORT OPERATIONS

### 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-Koulter or the tractor.
6. Attach Kwik-Koulter 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-Koulter 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.

### 3 - TRANSPORT OPERATION

#### STEP ONE: REVIEW

It's important to review all required spec and materials for both your Kwik-Koulter model and your tractor before

Transporting your Kwik-Koulter. See the table below for weights and horsepower requirements

Model	Minimum Tongue weight	Total Weight (w/ Baskets)	HP Recommended
DH2400	1,750	20,000 (25,300)	125-300
DH3600	3,450	24,000 (31,500)	200-325
DH4800	4,850	31,000 (41,300)	300-400
DH6000	10,150	47,000 (60,000)	525-620

#### STEP TWO: IMPLEMENT HOOK UP

Use the hydraulic controls to lower the jack to attain appropriate height of your hitch to the tractor drawbar. Make sure to install your hitch pin & locks. Next, attach all hydraulic function lines to their correct locations. Finish attaching the safety tow chain and lighting harness cables. Be sure to check that all the lights are functioning properly (see 3-4 for lighting checklist). Lastly, retract the hitch jack to the top position and turn the lock valve to the closed position.

#### STEP THREE: SAFETY CHECK

Part of safe transportation is making sure your Model is safe for travel. Be sure to check your hydraulic hoses for leaks, your frame for any cracks or damage, your implements for any loose or broken tooling, and that your visibility and signal lights are working correctly and in unison with your tow vehicle.

Once you've completed your safety check you're ready to put the Kwik-Koulter in Transport position.

#### STEP FOUR: FOLDING

From the cab, check around the Kwik-Koulter, make sure that nobody is in the way of any pinch or crush points and make sure everyone is safely clear of the tow vehicle. Verify the wing cylinders are not in float and subsequently place the Optional Basket Cylinders in Float using the SCV. Using the hydraulic controls retract the Main Lift Cylinders until the machine is tilted up to approximately 85 degrees. Next retract the wing cylinders so that the wing sections slowly move toward the cradle rests.

The Main Lift Cylinders may require feathering to bring the wings in just above the rests.

When both wings are at the in-most position, using the Main Lift Cylinder function, slowly lower the wings into the rests. Place the Main Lift Cylinder in float using the SCV. Remember to stay clear of all moving parts during this process and avoid pinch points. Be sure to place all Transport pin locks in places on the wing before towing.

#### STEP FIVE: TRANSPORT

Remember to obey all traffic laws regarding large equipment transport for your governing area. While traveling on public or private roads the Kwik-Koulter should not exceed the recommended 20 MPH

### 3 - TRANSPORT OPERATIONS

#### STEP SIX: UNFOLDING

After you reach your destination and are off the road way you can place your Kwik-Koulter into the field raised position. Remove the lock pins from the wing rests. Extend the Main Lift Cylinders and raise the wings until they clear the rests.

Extend the Wing Cylinders, unfold the wings until they are parallel with the main frame.

**Extend the Main Lift Cylinder and lower the implement level with the ground surface. If you have the optional packer baskets lower the main lift only halfway then energize the basket cylinder and raise the baskets until the frame arm sits level with the wing frame (see fig 3-1). once on the ground place the Basket Cylinder back in float**

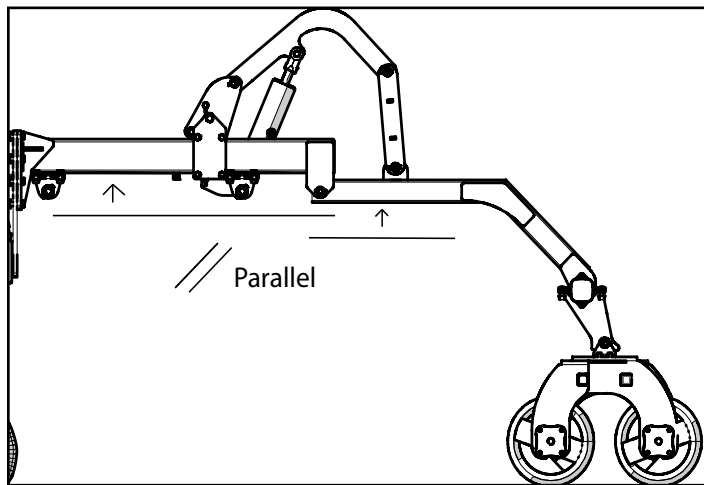


Fig. # 3-1 Wing frame and Basket frame in parallel

**Place the Wing Cylinder in float and the Main Lift Cylinder in neutral for operation using the SCV. (Failure to do this may cause damage to the hydraulic cylinders).**

**Place the Optional Baskets Cylinders in float as well when in use on the field.**

#### STEP SEVEN: FIELD READY

Once in the field position you're free to relocate within the field area to set the operating parameter of your Kwik Koulter.

### 3 - TRANSPORT OPERATION

#### KWIK-KOULTER LIGHTING

The Kwik-Koulter's turn signal, brake, and warning lamp system is compatible with enhanced tractor brake lighting. When the tractor brake pedal is depressed, the Kwik-Koulter's brake lamps illuminate along with the tractor's brake lamps.

Your Kwik-Koulter lighting should follow the pattern indicated in the table below. (See Fig. # 3-2) The Kwik-Koulter 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-Koulter lighting does not follow the pattern from the table below, (See Fig. # 3-2) contact your Kwik-Koulter dealer.

#### IMPORTANT

If you have an older model tractor, it may be possible that your **Seven-Terminal Outlet Terminal Numbers** does not match that of the Kwik-Koulter. If this is true, then your Kwik-Koulter 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**.

Tractor Function	Lights OFF	Road Lights ON							
		None	Left Turn		Brakes Only	Right Turn		Warning Lights	
Brake Lamps		None	No Brakes	With Brakes		No Brakes	With Brakes	No Brakes	With Brakes
Left amber	OFF	Pulse	Pulse	Pulse	Pulse	ON	ON	Pulse	Pulse
Left tail light	OFF	ON	ON	ON	ON	ON	ON	ON	ON
Left red signal/ brake (*)	OFF	OFF	OFF (^)	ON (^)	ON	OFF	ON	OFF	ON
Right amber	OFF	Pulse	ON	ON	Pulse	Pulse	Pulse	Pulse	Pulse
Right Tail Light	OFF	ON	ON	ON	ON	ON	ON	ON	ON
Red Right Signal/ Brake (*)	OFF	OFF	OFF	ON	ON	OFF (^)	ON (^)	OFF	ON

Fig. # 3-2 Table: Kwik-Koulter Lighting Behaviors

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

**NOTE:** (^) For use with some older model tractors, your machine may require the installation of a lighting module which will enable the tail/brake lamps to pulse along with the turn lamps when the turn signal is activated. Refer to the chart above, local laws and regulations, as well the latest version of the ANSI/SAE S279 "Lighting and Marking of Agricultural Equipment on Highways" standard to ensure the compliance of your transport lighting system. See your Kwik-Koulter dealer for further information on the optional lighting module.

### 3 - TRASNPORT OPERATIONS

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### 3 - TRANSPORT OPERATION

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## 4 - WORKING OPERATIONS

### 4.0 - WORKING OPERATIONS

#### 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. Electrocutation 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, traveling down a slope, 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.

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-Koulter.

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.

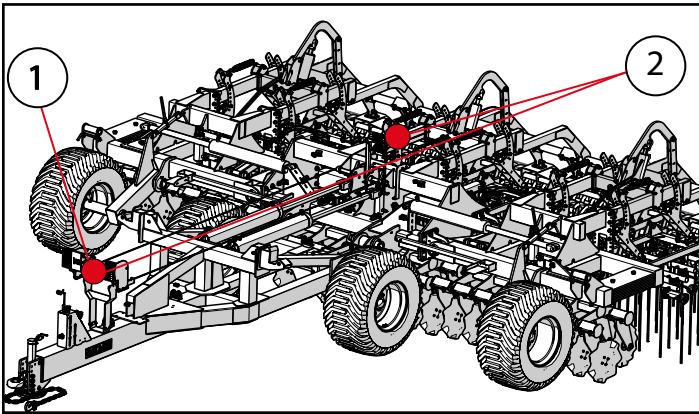
Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely, and to provide maximum efficiency.

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

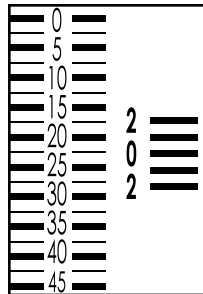
## 4 - WORKING OPERATIONS

### STEP ONE: FIELD LOWERED POSITION

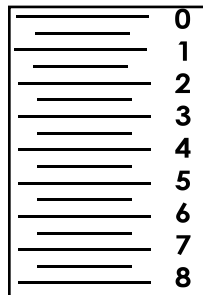
Placing the Kwik Koulter in Lowered position starts with being in the field Raised position (see. Transport Step Six pg. 3-2) . Once in the Raised position and properly aligned in your field make sure the Wing Cylinders are in float and the Main Lift Cylinder is in Neutral using the SCV (Optional Packer Baskets should also be in float when in use). You can then activate the single point depth control hydraulic setting to raise and lower your coulter discs to your desired height, you can see this height from your coulter depth meters located at the front of the hitch next to the Level gauge and the front of the wings as seen below.



- 1. Hitch Level and Tine Angle Combo Decal-**  
located at the front of the Kwik-Koulter, the left side displays the angle of your Harrow Tines. The right side displays your hitch level with 0 being level



- 2. Coulter Depth Decal-**  
Located at the Front of the hitch and the center section, this displays the depth of your coulter disks and Tines.

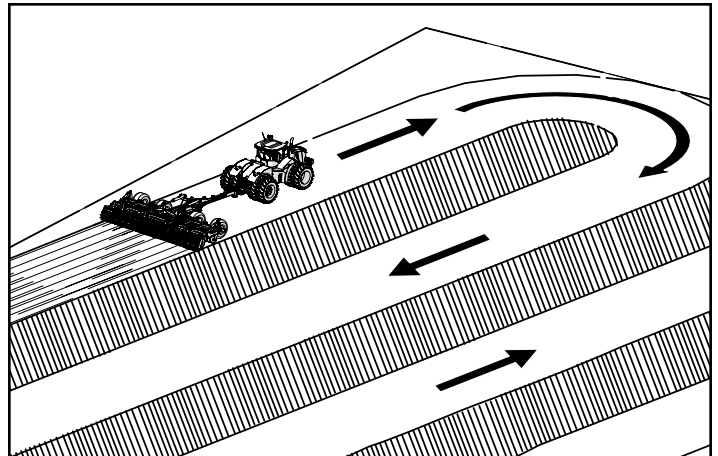


### STEP TWO: CALIBRATION AND TROUBLE- SHOOTING

After setting your depth you're ready to mix up your field residue. Make sure to take a couple test passes to assess performance, if its not to your liking to can adjust the tine angle between 0 and 45 degrees tine angle, coulter discs 0 to 6 inches of tillage depth, basket engagement, and speed from 8-12 mph to see a better result. Be sure to check the trouble-shooting guide in section 6 for a quick layout of adjustment solutions.

### STEP THREE: RESIDUE REMOVAL

After you are calibrated and getting the required results you'll need to run the Kwik-Koulter up and down your field a few times to ensure an even distribution of residue and solid soil re-packing. Recommended operating speed is 8-12 mph with Skip-pass turning as shown below. Remember to check your settings every couple passes, fields are not perfect or universal so you may need to adjust as you move throughout, The Kwik-Koulter is a field finisher as much as a residue solution so you should be seeing a well mixed and well leveled row.





### STEP FOUR: FIELD FINISHED

Once you have finished making all passes, you will need to pack up your Kwik-Koulter and get it ready for transport(see section 3). Before that however you need to do an inspection to ensure its travel ready. You should also check for any other potential hazards at this time such as damaged wheels and tires, bent frames, leaking hydraulics, and missing or broken discs, tines, and baskets. Once you completed your inspection and confirmed the Kwik-Koulter is safe for transport you can shift back into field raised position and from there the transport position.

## 4 - WORKING OPERATIONS

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## 5 - MAINTENANCE

### 5.0 MAINTENANCE

#### GENERAL MAINTENANCE SAFETY

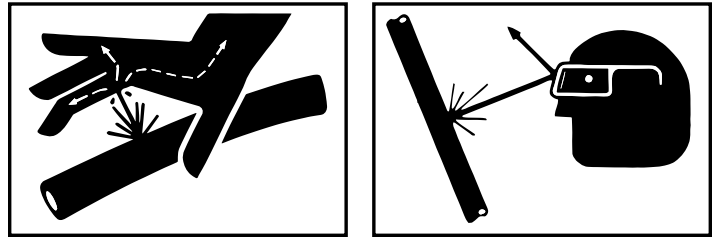
1. Review the Operator's Manual and all safety items before working with, maintaining or operating the Kwik-Koulter.
2. If machine is connected to a tractor, Park on a level surface, engage park brake, place transmission in PARK, shut off engine, remove key, and wait for all moving parts to stop before 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.
12. Chock wheels.
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-Koulter dealer for replacement hoses.

## 5 - MAINTENANCE

### 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-Koulter dealer for replacement hoses.

#### **⚠ WARNING**

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

#### **IMPORTANT**

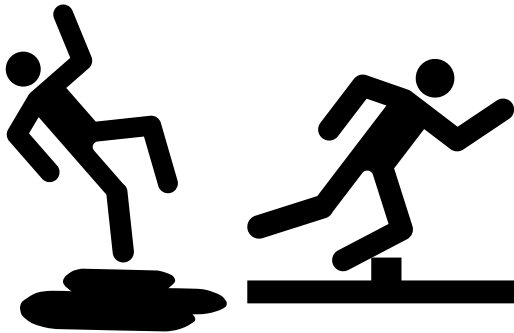
If an incorrectly rated hose is used, machine damage could occur due to uncontrolled machine movement.

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.

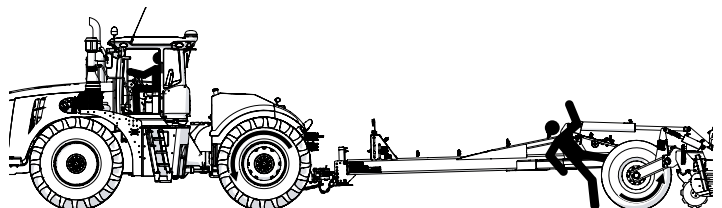


### **Work in Clean Area**

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**



## 5 - MAINTENANCE

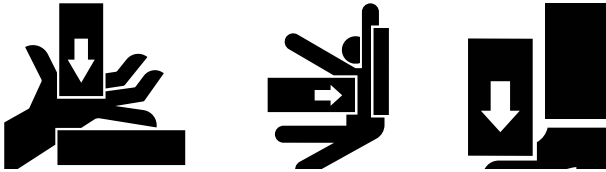
### **⚠ WARNING**

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**

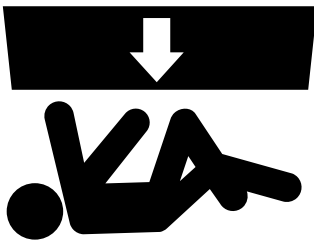
### **⚠ DANGER CRUSH HAZARD**

Stand clear when raising or lowering the Kwik-Koulter.



Keep feet, legs, and body clear when raising and lowering the Kwik-Koulter. 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**



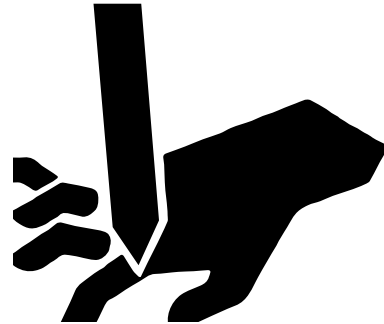
Always lower the attachment or implement to the ground before you work on the machine. If the work requires that the machine or attachment be lifted, provide secure support for them. If left in a raised position, hydraulically supported devices can settle or leak down.

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.

When implements or attachments are used with a machine, always follow safety precautions listed in the implement or attachment operator's 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.

### **FLUIDS AND LUBRICANTS**

#### **Hydraulic Oil:**

Consult your tractor equipment Operator's Manual for information regarding which hydraulic oil is recommended for use. Hydraulic oil requirements vary by equipment.

The Kwik-Koulter is compatible with petroleum based hydraulic oil with a minimum ISO Grade of 32 and contains anti-rust, anti-foam and oxidation inhibitors.

#### **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 mm<sup>2</sup>/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.

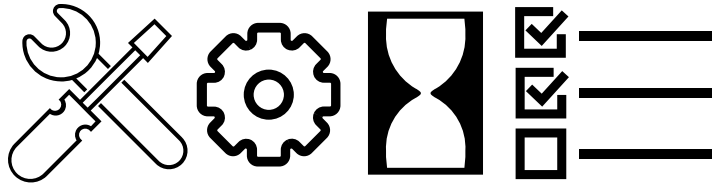
1. Use only a hand-held grease gun for all greasing. An air-powered greasing system can damage the seals on bearings and lead to early failures.



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-Koulter 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 Timing

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

## 5 - MAINTENANCE

### MAINTENANCE CHART

Change Fluid / Repack						Adjust	
		Grease	Check	Drain Fluid			
Interval	Maintenance Action						
FIRST 1 HOUR OF OPERATION	Re-Torque Wheel Flange Nuts				X		
FIRST 10 HOURS OF OPERATION	Re-Torque Wheel Flange Nuts				X		
	Check Tightness Of All Bolts, & Cap Screws		X				
DAILY	Check For Hydraulic Leaks		X				
	Check For Damaged Hydraulic Hoses, Adapters, Crossovers, Junctions, & Hydraulic Cylinders		X				
	Check Tire Pressure		X				
WEEKLY	Re-Torque Wheel Flange Nuts		X				
	Check Tightness Of All Bolts, & Cap Screws		X				
	Grease Hitch Link Articulating Ball	X					
MONTHLY	Check Disk Hub Nuts (Re-Torque If Needed)		X		X		
	Check Disk Shank Cord Alignment		X		X		
	Lubricate Wheel Hubs	X					
ANNUALLY	Check Disks For Damage And / Or Excessive Wear		X				
	Check Wheel Bearings		X				
	Check And Grease Pivot Joints	X	X				
	Check Disk Hubs For Excessive Wear		X				
	Check Accumulator		X				
AS REQUIRED	Clean and Wash the Machine		X				

MAINTENANCE TORQUE AND INSTALTION INSTRUCTIONS

RETORQUE WHEEL FLANGE NUTS

Specification	
Wheel Lug Nuts	Torque
	350 lb·ft (475 N·m)

Fig. # 5-3 Table: Wheel Lug Nut Torque

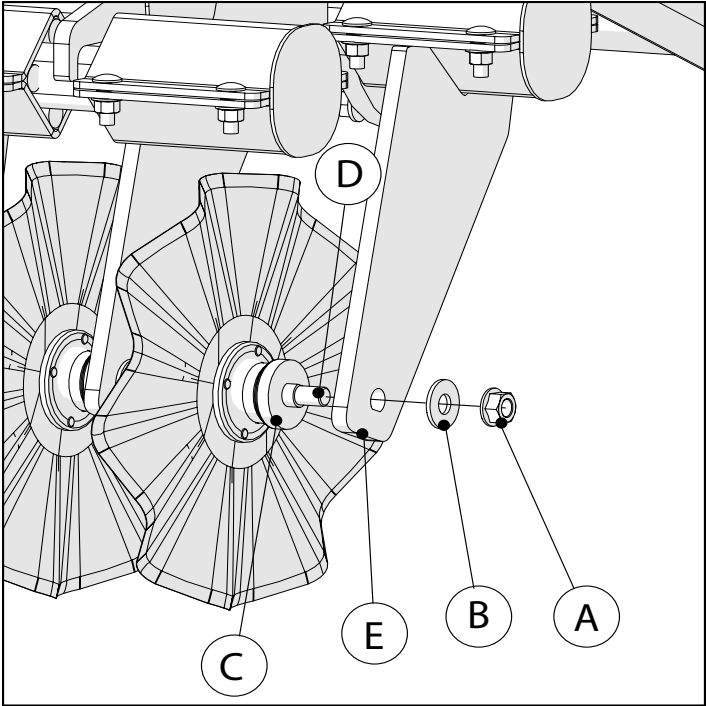


Fig. # 5-4 Wheel Lug Tightening Sequence (Diagonal Pattern)

Use the above pattern for both installing and re-torquing the wheel lugs

CHECK DISK HUBS

Be sure to check your disk hubs in the time intervals stated in the maintenance chart. When replacing or re torquing disks use the image below for easy assembly and disassembly



Specification		
Disk Hub Nuts	Torque	Qty.
	300 lb·ft (475 N·m)	1 x 108

Fig. # 5-6 Table: Disk Hub Nut Torque



### CHECK DISK SHANK CORD ALIGNMENT

Adjusting the shank cords is as follows, loosen the main 4 fixture bolts shown below and shift the cord till it sits flush with the fixture then retighten the bolts till no gap shows between plates.

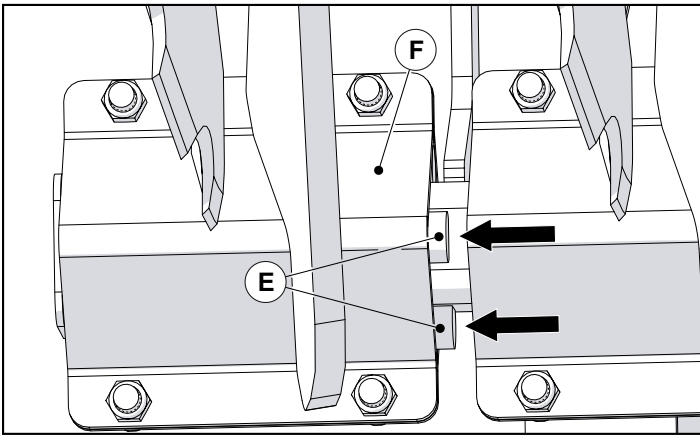


Fig. # 5-5 Adjusting Disk Shank Cords

accumulator loses pressure rapidly, replace the accumulator due to an internal bladder rupture.

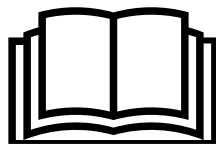
### **⚠ WARNING**

Always use dry inert gas (Dry Nitrogen - N<sub>2</sub>) for pre-charging.

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

### CHECK ACCUMULATOR

#### **⚠ WARNING**



### **HIGH PRESSURE VESSEL**

Avoid injury from high pressure escaping hydraulic fluid.

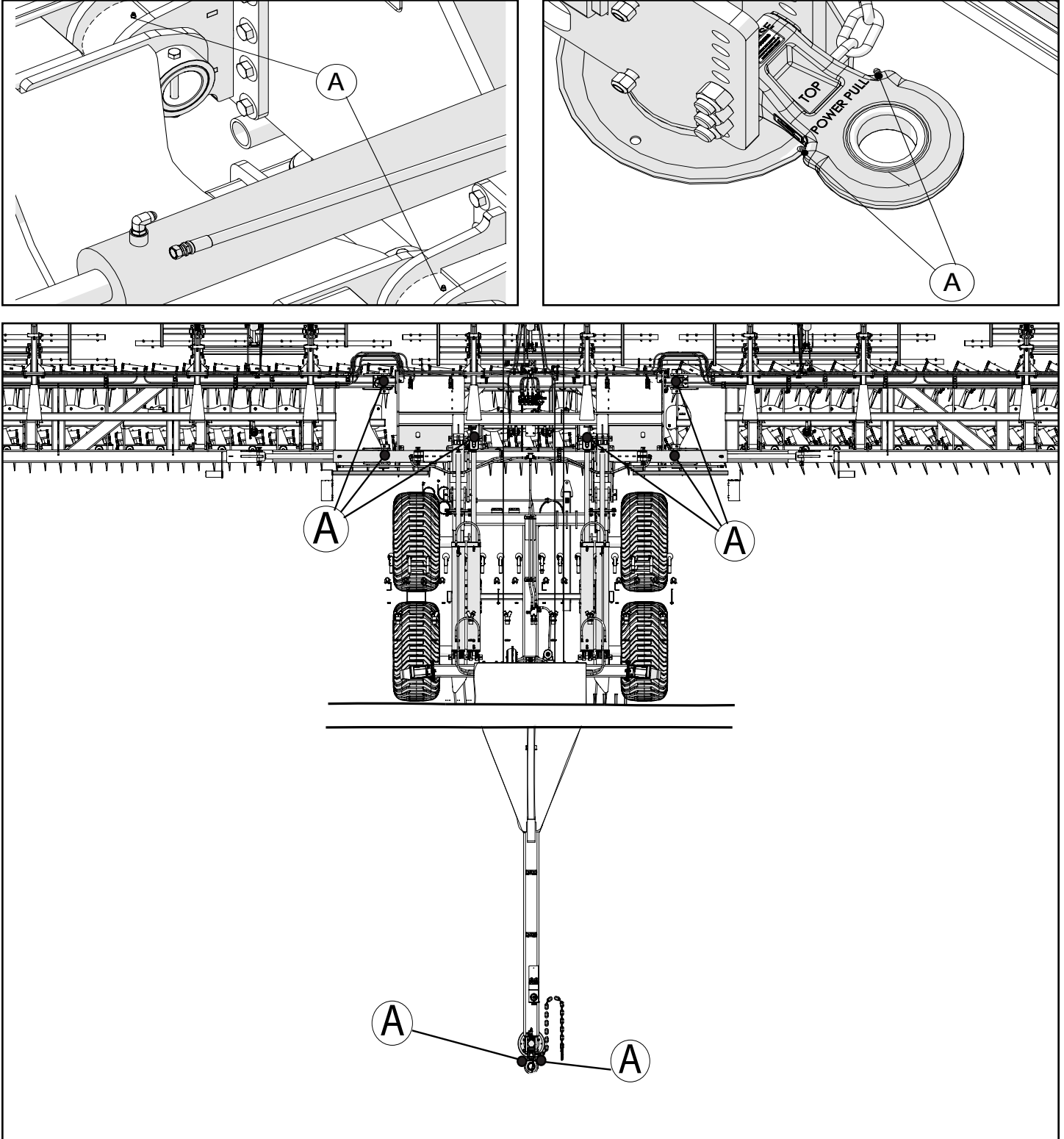
- Relieve pressure from hydraulic system before servicing
- Precharge with dry nitrogen gas only.

Failure to comply could result in serious injury or death.

1. The accumulator pressure should be checked annually. Kwik-Koulter should be in the field lowered position at this time
2. 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.
3. If pressure is 0 psi (0 kPa) (0 bar) or

## GREASE ZERK LOCATIONS

Use the following pictures to locate and lubricate the grease zerks on your Kwik-Koultter



## 5 - MAINTENANCE

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## 5 - MAINTENANCE

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## 6 - TROUBLESHOOTING

### 6.0 - TROUBLESHOOTING

#### TROUBLESHOOTING FIELD PROBLEMS

Problem	Possible Cause	Solution
Machine does not track straight.	Machine not level from front to back.	Adjust hitch link height to the tractor drawbar
		Reduce machine tracking spacing for more overlap
		Adjust AutoTrac to the left
		Adjust AutoTrac to the right
Wings Plug.	Wings not level.	Verify that wing cylinders are in float.
		Reduce digging depth.
		Reduce speed to 10.5 mph (17 km/h).
Baskets plugged with mud	Soil too wet	Disengage baskets from soil by raising them
Tine caught in discs	Tines caught either in the raising or lowering of main lift	Adjust the disc depth fully from top to bottom to see if tines dislodge
		Dislodge manually
Discs leaving uneven soil distribution	Broken disc or missing or misaligned shank cords	Replace all broken discs
		Check shank cords and adjust where needed

## 6 - TROUBLESHOOTING

### TROUBLESHOOTING MACHINE OPERATION

Problem	Possible Cause	Solution
Slow folding sequence.	Low hydraulic pressure/flow from tractor.	Verify SCV settings and fluid levels.
Machine not folding	Hydraulic connection issue.	Verify that all hoses are connected properly. (See Make Proper Hose Connections in the Attaching and Detaching section.)
		Verify that hose pairs are mated properly.
		Refer to the hose chart on the machine.
		Hydraulic fluid bypassing piston seals in one or both hydraulic cylinders. (Replace cylinder or re-build with new seals).
		Hydraulic pressure relief valves may be damaged or failing (Replace relief valves with new ones)

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## 7 - SPECIFICATIONS

### SPECIFICATIONS

#### Kwik-Koulter 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 8-12 mph (12.8-19.3km/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

Kwik-Koulter Model	Recommended Tractor Engine Power hp (kW)
DH2400	125-300 (93-224)
DH3600	200-325 (149-242)
DH4800	300-400 (224-298)
DH6000	525-620 (391-462)

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

#### Downward Force on Tractor Drawbar

Kwik-Koulter Model	Minimum Tongue Weight lb (kg)
DH2400	1600 (1269)
DH3600	3300 (1680)
DH4800	4700 (1941)
DH6000	10000 (2538)

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

#### Machine Weight

Kwik-Koulter Model	Working Width ft (m)	Total Weight * lbs (kg)	Weight w/Baskets lbs (kg)	Number Of Disks
DH2400	25 (7.6)	20,000 (9,071)	25,300 (11,476)	48
DH3600	35 (10.7)	24,000 (10,886)	31,500 (14,288)	72
DH4800	48 (14.6)	31,000 (14,061)	41,300 (18,733)	96
DH6000	60 (18.2)	47,000 (21,318)	60,000 (27,215)	120

Fig. # 7-3 Table: Machine Weight

Kwik-Koulter Model	Transport Width ft-in/m (w/Baskets)	Transport Height ft-in (m)
DH2400	14'-4" /4.3m (19'-4" /5.9m)	13' (4m)
DH3600	18'-4" /5.5m (23'-6" /7.1m)	13'-1" (3.9m)
DH4800	18'-4" /5.5m (23'-6" /7.1m)	13' (4m)
DH6000	18'-4" /5.5m (23'-6" /7.1m)	13' (4.1m)

Fig. # 7-4 Table: Transport Width and Height

## 7 - SPECIFICATIONS

### SPECIFICATIONS CONT'D.

#### Ground Engaging

Machine Model	DH2400	DH3600	DH4800	DH6000
Disc Spacing	12 in (254 mm)			
Number of Discs	48	72	96	120
Estimated Weight per Blade	346 lb (157 kg)	308 lb (140 kg)	307 lb (139 kg)	296 lb (134 kg)
Working Depth	2 in (51 mm) to 6 in (152 mm)			
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. # 7-5 Table: Disk Blades

#### Disk Blades

Waffle Blade	
Diameter	20 in (508 mm)
Thickness	0.25 in (6.5 mm)
Concavity	8 Wave Waffle
Application	Soil control at higher speeds
Soil Type	Medium Soils
Penetration	High

Fig. # 7-6 Table: Disk Blades

## 7 - SPECIFICATIONS

### Rear Attachments

Machines With Bar Cage Rolling Basket	
Rear Attach Bearing	Maintenance Free Roller Hub
Diameter	16 in (406 mm)
Application	Even seedbed setup with clump removal
Compaction	Moderate
Soil Type	Light to Medium Heavy
Machines With Rod Spiral Rolling Wheel	
Rear Attach Bearing	Maintenance Free Roller Hub with 2.5 in (64 mm) shaft
Diameter	16 in (406 mm)
Application	Excellent seedbed and moisture barrier
Compaction	High
Soil Type	Light to Heavy
Machines With Coil Basket	
Rear Attach Bearing	Maintenance Free Roller with 1.5 in (40 mm) shaft
Diameter	16 in (406 mm)
Application	Level seedbed setup
Compaction	Medium to High
Soil Type	Light to Medium

Fig. # 7-7 Table: Rear Attachments

### Tire Specifications

Tire Size	Load/Speed Index	Tire Pressures		
		psi	kPa	bar
600/50R22.5	168B	46	317	3.17
710/40R22.5	170B	46	317	3.17
800/40R22.5	176B	46	317	3.17
710/40R22.5	165D	73	503	5.03

Fig. # 7-9 Table: Tire Specifications

## 7 - SPECIFICATIONS

### TORQUE — HYDRAULIC TUBES AND FITTINGS

Tube Nuts for 37° Flared Fittings								O-Ring Boss Plugs, Adjustable Fitting Lock Nuts, Swivel JIC - 37 ° Seats			
Size	Tubing OD		Thread Size	ft-lbs		Nm		ft-lbs		Nm	
	Inches	mm		Min	Max	Min	Max	Min	Max	Min	Max
4	1/4	6.4	7/16-20	9	12	12	16	6	10	8	14
5	5/16	7.9	1/2-20	12	15	16	20	10	15	14	20
6	3/8	9.5	9/16-18	21	24	29	33	15	20	20	27
8	1/2	12.7	3/4-18	35	40	47	54	25	30	34	41
10	5/8	15.9	7/8-14	53	58	72	79	35	40	47	54
12	3/4	19.1	1-1/6-12	77	82	104	111	60	70	81	95
14	7/8	22.2	1-3/16-12	90	100	122	136	70	80	95	109
16	1	25.4	1-5/16-12	110	120	149	163	80	90	108	122
20	1-1/4	31.8	1-5/8-12	140	150	190	204	95	115	129	156
24	1-1/2	38.1	1-7/8-12	160	175	217	237	120	140	163	190
32	2	50.8	2-1/2-12	225	240	305	325	250	300	339	407

#### Standard torque data for hydraulic tubes and fittings

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.

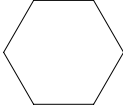
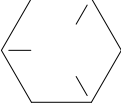
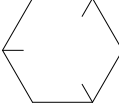
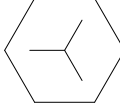
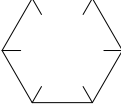
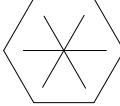
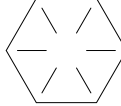
## 7 - SPECIFICATIONS

### 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)	
<b>Bolt Head Identification</b> (See Note Below.)			  		  	
Bolt Size	ft-lbs	ft-lbs (Lubricated)*	ft-lbs	ft-lbs (Lubricated)*	ft-lbs	ft-lbs (Lubricated)*
1/4	3.6	2.7	8.5	6.3	11.9	8.9
5/16	7.4	5.5	17.4	13.1	24.6	18.4
3/8	13.1	9.8	30.9	23.2	43.6	32.7
7/16	20.9	15.7	49.4	37.1	69.8	52.3
1/2	31.9	23.9	75.4	56.5	106.4	79.8
9/16	46.1	34.5	108.7	81.6	153.5	115.1
5/8	63.6	47.7	150.1	112.6	211.9	158.9
3/4	113	85	267	200	376	282
7/8	182	136	429	322	606	455
1	273	204	644	483	909	681
1-1/8	386	290	794	596	1288	966
1-1/4	409	545	1121	840	1817	1363
1-3/8	536	715	1469	1102	2382	1786
1-1/2	949	711	1950	1462	3162	2371

**NOTE:** Bolt head identification marks as per grade. Manufacturing marks will vary.

**NOTE:** Thick nuts must be used with Grade 8 bolts.




## 7 - SPECIFICATIONS

### 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.

ISO Class No.	8.8		10.9		12.9	
Bolt Head Identification (See Note below.)						
Bolt Size	ft-lbs	ft-lbs (Lubricated)*	ft-lbs	ft-lbs (Lubricated)*	ft-lbs	ft-lbs (Lubricated)*
M5	4.6	3.4	6.5	4.9	7.6	5.7
M6	7.7	5.8	11.1	8.3	12.9	9.7
M8	18.8	14.1	26.9	20.2	31.4	23.6
M10	37.2	27.9	53.3	39.9	62.2	46.7
M12	64.9	48.7	92.9	69.7	109	81.4
M14	103	77.5	148	111	173	130
M16	161	121	231	173	270	202
M18	229	172	317	238	371	278
M20	325	244	450	337	526	394
M22	443	332	612	459	715	537
M24	562	422	778	583	909	682
M27	823	617	1138	854	1330	998
M30	1117	838	1546	1159	1806	1355
M33	1520	1140	2103	1577	2458	1843
M36	1952	1464	2701	2026	3157	2367
M39	2527	1895	3495	2622	4085	3064

**NOTE:** Bolt head identification marks as per grade. Manufacturing marks will vary.

## 8 - FORMS AND DECLARATIONS

### 8 - FORMS AND DECLARATIONS

Norwood follows the general Safety Standards specified by the American Society of Agricultural and Biological Engineers (ASABE), 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

DATE	EMPLOYEES SIGNATURE	EMPLOYERS SIGNATURE

## 8 - FORMS AND DECLARATIONS

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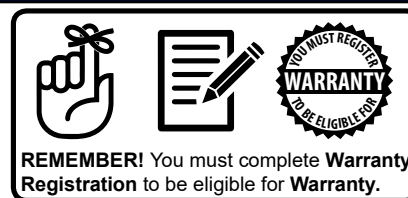
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## 8 - FORMS AND DECLARATIONS

### 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 \_\_\_\_\_

Delivery Date \_\_\_\_\_

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**

Private Farm Use	One (1) year from date of purchase.
Commercial, Custom, or Rental Use	Ninety (90) days from date of purchase.
Replacement Parts	Ninety (90) days from date of replacement

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.

## 8 - FORMS AND DECLARATIONS

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**Norwood Sales Inc. (Main Office)**

• Toll Free: 800-446-0316 • [www.norwoodsales.com](http://www.norwoodsales.com)

<b>Norwood Sales Inc. Cooperstown, ND</b>	<b>☎ 701-797-3684</b>	<b>☎ 701-797-3685</b>
<b>Norwood Sales Inc. Horace, ND</b>	<b>☎ 701-588-4000</b>	<b>☎ 701-588-4004</b>
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