Spike Tooth Harrow
STH2024

322-315M
Operator’s Manual

Read the Operator’s Manual entirely. When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it!

Cover photo may show optional equipment not supplied with standard unit.
For an Operator’s Manual and Decal Kit in French Language, please see your Land Pride dealer.

Printed 12/10/18
Machine Identification
Record your machine details in the log below. If you replace this manual, be sure to transfer this information to the new manual.

If you, or the dealer, have added Options not originally ordered with the machine, or removed Options that were originally ordered, the weights and measurements are no longer accurate for your machine. Update the record by adding the machine weight and measurements provided in the Specifications & Capacities Section of this manual with the Option(s) weight and measurements.

<table>
<thead>
<tr>
<th>Model Number</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Number</td>
<td></td>
</tr>
<tr>
<td>Machine Height</td>
<td></td>
</tr>
<tr>
<td>Machine Length</td>
<td></td>
</tr>
<tr>
<td>Machine Width</td>
<td></td>
</tr>
<tr>
<td>Machine Weight</td>
<td></td>
</tr>
<tr>
<td>Delivery Date</td>
<td></td>
</tr>
<tr>
<td>First Operation</td>
<td></td>
</tr>
<tr>
<td>Accessories</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dealer Contact Information

Name: ____________________________
Street: ____________________________
City/State: _________________________
Telephone: _________________________
Email: ____________________________

California Proposition 65

⚠️ WARNING: Cancer and reproductive harm - www.P65Warnings.ca.gov
Table of Contents

Important Safety Information .................. 1
  Safety at All Times .......................... 1
  Look for the Safety Alert Symbol ............ 1
  Safety Labels .................................. 4

Introduction ..................................... 8
  Application .................................... 8
  Using This Manual ............................. 8
  Terminology: .................................. 8
  Definitions: .................................... 8
  Owner Assistance .............................. 8
  Serial Number ................................ 8
  Further Assistance ............................ 8

Section 1: Assembly and Set-up .................. 9
  Tractor Requirements ......................... 9
  Torque Requirements ........................... 9
  Dealer Uncrating .............................. 9
  Tractor Shutdown Procedure .................. 10
  Check Air Pressure In Tires .................. 10
  Tractor Hook-up ................................ 10
  Hydraulic Hook-up ............................ 11
  Hydraulic Plumbing ............................ 11
  Hook-up LED Lights ........................... 12
  Unfold Wings First ............................ 13
  Lower Harrow sections Last .................. 13
  Purge Hydraulic System ....................... 13

Section 2: Adjustments .......................... 14
  Lift Cylinder Stop Nut Adjustment .......... 14
  Raising Wings with Stop Nut ............... 14
  Lowering Wings with Stop Nut ............... 14
  Tooth Angling ................................ 15
  How To Change Tooth Angle ................... 15

Section 3: Operating Instructions ............... 17
  Operating Checklist ........................... 17
  Pre-Field Inspection .......................... 17
  Field Inspection ................................ 17
  Field Uses .................................... 17
  Safety Information ............................ 18
  Fold Harrow For Transporting ............... 18
  Transporting .................................. 19
  Unhook From A Folded Harrow ............... 19
  Unhook From An Unfolded Harrow ............ 19
  General Operating Instructions ............... 20

Section 4: Maintenance & Lubrication .......... 21
  Maintenance .................................... 21
  Tractor Maintenance ........................... 21
  Tires .......................................... 21
  Spike Tooth Replacement ..................... 21
  Long-Term Storage ............................. 22
  Ordering Replacement Parts ................... 22
  Lubrication Points ............................ 22
  Axle Hub Bearing .............................. 22

Section 5: Specifications & Capacities .......... 23

Section 6: Features & Benefits .................. 24

Section 7: Troubleshooting ....................... 25

Section 8: Torque & Tire Inflation Charts ....... 26

Section 9: Warranty .............................. 27

© Copyright 2018 All rights Reserved

Land Pride provides this publication “as is” without warranty of any kind, either expressed or implied. While every precaution has been taken in the preparation of this manual, Land Pride assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. Land Pride reserves the right to revise and improve its products as it sees fit. This publication describes the state of this product at the time of its publication, and may not reflect the product in the future.

Land Pride is a registered trademark.
All other brands and product names are trademarks or registered trademarks of their respective holders.
Printed in the United States of America.

12/10/18  STH2024 Spike Tooth Harrow 322-315M
See previous page for Table of Contents.
Important Safety Information

Listed below are common practices that may or may not be applicable to the products described in this manual.

Safety at All Times

Careful operation is your best assurance against an accident. All operators, no matter how much experience they may have, should carefully read this manual and other related manuals, or have the manuals read to them, before operating the power machine and this implement.

- Thoroughly read and understand the “Safety Label” section. Read all instructions noted on them.
- Do not operate the equipment while under the influence of drugs or alcohol as they impair the ability to safely and properly operate the equipment.
- The operator should be familiar with all functions of the tractor and attached implement and be able to handle emergencies quickly.
- Make sure all guards and shields are appropriate for the operation are in place and secured before operating implement.
- Keep all bystanders away from equipment and work area.
- Start tractor from the driver’s seat with hydraulic controls in neutral.
- Operate tractor and controls from the driver’s seat only.
- Never dismount from a moving tractor or leave tractor unattended with engine running.
- Do not allow anyone to stand between tractor and implement while backing up to implement.
- Keep hands, feet, and clothing away from power-driven parts.
- While transporting and operating equipment, watch out for objects overhead and along side such as fences, trees, buildings, wires, etc.
- Do not turn tractor so tight as to cause hitched implement to ride up on the tractor’s rear wheel.
- Store implement in an area where children normally do not play. When needed, secure attachment against falling with support blocks.

Look for the Safety Alert Symbol

The SAFETY ALERT SYMBOL indicates there is a potential hazard to personal safety involved and extra safety precaution must be taken. When you see this symbol, be alert and carefully read the message that follows it. In addition to design and configuration of equipment, hazard control, and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of equipment.

Be Aware of Signal Words

A signal word designates a degree or level of hazard seriousness. The signal words are:

- **DANGER**
  - Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

- **WARNING**
  - Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

- **CAUTION**
  - Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.

Safety Precautions for Children

Tragedy can occur if the operator is not alert to the presence of children. Children generally are attracted to implements and their work.

- Never assume children will remain where you last saw them.
- Keep children out of the work area and under the watchful eye of a responsible adult.
- Be alert and shut the implement and tractor down if children enter the work area.
- Never carry children on the tractor or implement. There is not a safe place for them to ride. They may fall off and be run over or interfere with the control of the power machine.
- Never allow children to operate the power machine, even under adult supervision.
- Never allow children to play on the power machine or implement.
- Use extra caution when backing up. Before the tractor starts to move, look down and behind to make sure the area is clear.

Tractor Shutdown & Storage

- If engaged, disengage power take-off.
- Park on solid, level ground and lower implement to ground or onto support blocks.
- Put tractor in park or set park brake, turn off engine, and remove switch key to prevent unauthorized starting.
- Relieve all hydraulic pressure to auxiliary hydraulic lines.
- Wait for all components to stop before leaving operator’s seat.
- Use steps, grab-handles and anti-slip surfaces when stepping on and off the tractor.
- Detach and store implement in an area where children normally do not play. Secure implement using blocks and supports.
Listed below are common practices that may or may not be applicable to the products described in this manual.

### Tire Safety
- Tire changing can be dangerous and must be performed by trained personnel using the correct tools and equipment.
- Always maintain correct tire pressure. Do not inflate tires above recommended pressures shown in the Operator's Manual.
- When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.
- Securely support the implement when changing a wheel.
- When removing and installing wheels, use wheel handling equipment adequate for the weight involved.
- Make sure wheel bolts have been tightened to the specified torque.

### Transport Safely
- Comply with federal, state, and local laws.
- Use towing vehicle and trailer of adequate size and capacity. Secure equipment towed on a trailer with tie downs and chains.
- Sudden braking can cause a towed trailer to swerve and upset. Reduce speed if towed trailer is not equipped with brakes.
- Avoid contact with any overhead utility lines or electrically charged conductors.
- Always drive with load on end of loader arms low to the ground.
- Always drive straight up and down steep inclines with heavy end of a tractor with loader attachment on the “uphill” side.
- Engage park brake when stopped on an incline.
- Maximum transport speed for an attached equipment is 20 mph. DO NOT EXCEED. Never travel at a speed which does not allow adequate control of steering and stopping. Some rough terrains require a slower speed.
- As a guideline, use the following maximum speed weight ratios for attached equipment:
  - 20 mph when weight of attached equipment is less than or equal to the weight of machine towing the equipment.
  - 10 mph when weight of attached equipment exceeds weight of machine towing equipment but not more than double the weight.
- IMPORTANT: Do not tow a load that is more than double the weight of the vehicle towing the load.

### Use A Safety Chain
- A safety chain will help control drawn machinery should it separate from the tractor drawbar.
- Use a chain with the strength rating equal to or greater than the gross weight of the towed implement.
- Attach the chain to the tractor drawbar support or other specified anchor location. Allow only enough slack in the chain to permit turning.
- Always hitch the implement to the machine towing it. Do not use the safety chain tow the implement.

### Practice Safe Maintenance
- Understand procedure before doing work. Refer to the Operator’s Manual for additional information.
- Work on a level surface in a clean dry area that is well-lit.
- Lower implement to the ground and follow all shutdown procedures before leaving the operator’s seat to perform maintenance.
- Do not work under any hydraulic supported equipment. It can settle, suddenly leak down, or be lowered accidentally. If it is necessary to work under the equipment, securely support it with stands or suitable blocking beforehand.
- Use properly grounded electrical outlets and tools.
- Use correct tools and equipment for the job that are in good condition.
- Allow equipment to cool before working on it.
- Disconnect battery ground cable (-) before servicing or adjusting electrical systems or before welding on implement.
- Inspect all parts. Make certain parts are in good condition & installed properly.
- Replace parts on this implement with genuine Land Pride parts only. Do not alter this implement in a way which will adversely affect its performance.
- Do not grease or oil implement while it is in operation.
- Remove buildup of grease, oil, or debris.
- Always make sure any material and waste products from the repair and maintenance of the implement are properly collected and disposed.
- Remove all tools and unused parts before operation.
- Do not weld or torch on galvanized metal as it will release toxic fumes.
Listed below are common practices that may or may not be applicable to the products described in this manual.

**Prepare for Emergencies**
- ▲ Be prepared if a fire starts.
- ▲ Keep a first aid kit and fire extinguisher handy.
- ▲ Keep emergency numbers for doctor, ambulance, hospital, and fire department near phone.

**Wear Personal Protective Equipment (PPE)**
- ▲ Wear protective clothing and equipment appropriate for the job such as safety shoes, safety glasses, hard hat, and ear plugs.
- ▲ Clothing should fit snug without fringes and pull strings to avoid entanglement with moving parts.
- ▲ Prolonged exposure to loud noise can cause hearing impairment or hearing loss. Wear suitable hearing protection such as earmuffs or earplugs.
- ▲ Operating equipment safely requires the operator's full attention. Avoid wearing headphones while operating equipment.

**Avoid High Pressure Fluids Hazard**
- ▲ Escaping fluid under pressure can penetrate the skin causing serious injury.
- ▲ Before disconnecting hydraulic lines or performing work on the hydraulic system, be sure to release all residual pressure.
- ▲ Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.
- ▲ Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks.
- ▲ Wear protective gloves and safety glasses or goggles when working with hydraulic systems.
- ▲ DO NOT DELAY. If an accident occurs, see a doctor familiar with this type of injury immediately. Any fluid injected into the skin or eyes must be treated within a few hours or gangrene may result.

**Use Safety Lights and Devices**
- ▲ Slow moving tractors, skid steers, self-propelled machines, and towed equipment can create a hazard when driven on public roads. They are difficult to see, especially at night. Use the Slow Moving Vehicle sign (SMV) when on public roads.
- ▲ Flashing warning lights and turn signals are recommended whenever driving on public roads.

**Use Seat Belt and ROPS**
- ▲ Land Pride recommends the use of a CAB or roll-over-protective-structures (ROPS) and seat belt in almost all power machines. Combination of a CAB or ROPS and seat belt will reduce the risk of serious injury or death if the power machine should be upset.
- ▲ If ROPS is in the locked-up position, fasten seat belt snugly and securely to help protect against serious injury or death from falling and machine overturn.

**Avoid Underground Utilities**
- ▲ Dig Safe, Call 811 (USA). Always contact your local utility companies (electrical, telephone, gas, water, sewer, and others) before digging so that they may mark the location of any underground services in the area.
- ▲ Be sure to ask how close you can work to the marks they positioned.

**Keep Riders Off Machinery**
- ▲ Never carry riders on tractor or implement.
- ▲ Riders obstruct operator's view and interfere with the control of the power machine.
- ▲ Riders can be struck by objects or thrown from the equipment.
- ▲ Never use tractor or implement to lift or transport riders.
Safety Labels

Your Spike Tooth Harrow comes equipped with all safety labels in place. They were designed to help you safely operate your implement. Read and follow their directions.

1. Keep all safety labels clean and legible.
2. Refer to this section for proper label placement. Replace all damaged or missing labels. Order new labels from your nearest Land Pride dealer. To find your nearest dealer, visit our dealer locator at www.landpride.com.
3. Some new equipment installed during repair requires safety labels to be affixed to the replaced component as specified by Land Pride. When ordering new components make sure the correct safety labels are included in the request.
4. Refer to this section for proper label placement. To install new labels:
   a. Clean surface area where label is to be placed.
   b. Spray soapy water onto the cleaned area.
   c. Peel backing from label and press label firmly onto the surface.
   d. Squeeze out air bubbles with edge of a credit card or with a similar type of straight edge.

**DANGER**

**TIP OVER HAZARD** - Do Not Walk Behind Machine When in the Vertical Position. Hydraulic Malfunction or Hitch Pin Coming Loose can Allow Machine to Tip Over Resulting in Injury or Death.

848-705C

Danger: Tip Over Hazard

**NOTICE**

**TIP OVER HAZARD**

Do Not Attempt to Fold or Unfold Machine Unless Securely Attached to the Towing Tractor.

848-706C

Notice: Tip Over Hazard

**WARNING**

**HIGH PRESSURE FLUID HAZARD**

To prevent serious injury or death:
- Relieve pressure on system before repairing or adjusting or disconnecting.
- Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
- Keep all components in good repair.

838-094C

Warning: High Pressure Fluid Hazard
Important Safety Information

Table of Contents

848-704C
Warning: Cylinder & Frame Damage

818-337C
Warning: Excess Speed

848-728C
Notice: Folded Wing Height Adjustment
2-Places

838-599C
Danger: Electrocution Hazard
**Warning: Overhead Wing Hazard**

1. Read and understand the Operator’s Manual before using machine.
2. Stop tractor engine, lower machine to the ground, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, unplugging or fitting.
3. Keep hands, feet, hair and clothing away from earth-working points and blades.
4. Do not allow riders.
5. Clean reflectors, SMV and lights before transporting.
6. Install safety locks before transporting or working beneath components.
7. Add extra lights and use pilot vehicle when transporting during times of limited visibility.
8. Use hazard flashers in tractor when transporting.
9. Install safety chain when attaching to tractor.
10. Review safety instructions with all operators annually.

**Caution: General Information**

**Amber Reflector: 1-Places**
(On the End of the Left Wing Frame)

**Amber Reflector: 2-Places**
(On the Left & Right Sides of the Hitch Frame)
Important Safety Information

Table of Contents

**848-730C**
Notice: Wing Tire Pressure
2-Places (Wing Tires Only)

---

**818-398C**
Warning: Overhead Wing Hazard,
2-Places (On the Ends of the Left & Right Wing Frames)

---

**838-614C**
Red Reflector: 2-Places
(On the Left & Right Bottom Side of Center Frame)

---

**818-055C**
Caution: Slow Moving Vehicle Sign
Introduction

Land Pride welcomes you to the growing family of new product owners. This Spike Tooth Harrow has been designed with care and built by skilled workers using quality materials. Proper assembly, maintenance, and safe operating practices will help you get years of satisfactory use from this product.

Application

The STH2024 Spike Tooth Harrow is built and designed by Land Pride for cutting through clods, manure and grasses to break up material into finer pieces so that it can be spread evenly across the ground. The harrow does an excellent job of smoothing garden plots, fields, arenas and landscaping areas. It loosens crusted soil, aerates legume crops such as alfalfa and uncovers overwintering insects. The harrow can be used to spread manure, grass clippings, leaf litter, previous crop stubble and gravel driveways; and can incorporate into the soil fertilizers, herbicides, granular products, broadcast seed and overseeding. It also helps to remove gopher mounds, ant hills, ridges left by tillage implements, sticks and small limbs from grassy areas.

Its 24 foot working width and pull-type hitch makes it compatible with tractors rated at 48 hp and higher. The teeth can be set at two angles with 40° off vertical for providing the best flow-through of residue and 22° off vertical for aggressive fluffing up of the soil.


Using This Manual

• This Operator’s Manual is designed to help familiarize the operator with safety, assembly, operation, adjustments, troubleshooting, and maintenance. Read this manual and follow the recommendations to help ensure safe and efficient operation.

• The information contained within this manual was current at the time of printing. Some parts may change slightly to assure you of the best performance.

• To order a new Operator’s or Parts Manual, contact your authorized dealer. Manuals can also be downloaded, free-of-charge, from our website at www.landpride.com

Terminology:

“Right” or “Left” as used in this manual is determined by facing the direction the machine will operate while in use unless otherwise stated.

Definitions:

IMPORTANT: A special point of information related to the following topic. Land Pride’s intention is this information must be read & noted before continuing.

NOTE: A special point of information that the operator should be aware of before continuing.

Owner Assistance

The dealer should complete the Online Warranty Registration at the time of purchase. This information is necessary to provide you with quality customer service.

The parts on your Spike Tooth Harrow have been specially designed by Land Pride and should only be replaced with genuine Land Pride parts. Contact a Land Pride dealer if customer service or repair parts are required. Your Land Pride dealer has trained personnel, repair parts, and equipment needed to service the implement.

Serial Number

For quick reference and prompt service, record model and serial number on the inside cover page and again on the warranty page. Always provide model number and serial number when ordering parts and in all correspondences with your Land Pride dealer. For location of your serial number plate, see Figure 1.

Further Assistance

Your dealer wants you to be satisfied with your new Spike Tooth Harrow. If for any reason you do not understand any part of this manual or are not satisfied with the service received, the following actions are suggested:

1. Discuss any problems you have with your implement with your dealership service personnel so they can address the problem.

2. If you are still not satisfied, seek out the owner or general manager of the dealership, explain the problem, and request assistance.

3. For further assistance write to:

Land Pride Service Department
1525 East North Street
P.O. Box 5060
Salina, Ks. 67402-5060

E-mail address
lp servicedept@landpride.com
Tractor Requirements
Tractor horsepower should be within the range noted
Tractors below the horsepower range must not be used.

Tractor Horsepower Rating .......................... 45 hp & Higher
Hitch Type .......................... Draw Bar
Hydraulic ........................................ Two Duplex Outlets
Electrical (See Figure 1-6 on page 12) ........................ 7-pin outlet

WARNING
To avoid serious injury or death:
Ballast weights may be required to maintain steering control.
Refer to your tractor’s operator’s manual to determine proper ballast requirements.

Torque Requirements
Refer to “Torque Values Chart” on page 26 to determine correct torque values for common bolts.

Dealer Uncrating
Refer to Figure 1-2:

DANGER
To avoid serious injury or death:
• Do not remove wooden cross-ties and transport chains that secure wings in the folded position until after harrow is hooked-up to a tractor, hydraulic hoses are coupled to the tractor, shipping bands are removed from the spike tooth harrow sections and shipping bolts are removed from the trailing chains. The unit can fall suddenly if one or more wings swing open without notice causing serious bodily injury or death.
• Do not remove shipping bolts from trailing chains without supporting the top bar of the spike tooth harrow sections with a hoist, fork lift or other suitable lifting device. The harrow sections can fall 6 to 12 inches suddenly causing serious bodily injury or death.
• Never raise the harrow hitch above level with wings folded. Raising the hitch too high can cause a folded harrow to tip over backwards resulting in serious bodily injury or death.

CAUTION
To avoid minor or moderate injury:
To protect your eyes, face and body, always stand to the side of a shipping straps being cut and never in line with the straps. A shipping strap contain built-up energy that is suddenly released when cut.

Refer to Figure 1-1:
1. Remove cap screws (#3), flat washers (#5) and hex flange locknuts (#4) from tongue (#2) while tongue is still banded to the harrow. Keep hardware for reuse.
2. Remove hydraulic hoses from tongue (#2) while tongue is still banded to the harrow.
3. Unwrap safety chains (#8) from around the shipping lumber while tongue is still banded to the harrow.
4. Being careful to stand out of line of recoil, cut shipping straps securing tongue (#2) to the harrow and remove tongue.
5. Raise hitch frame (#1) up several inches (not higher than level) with a hoist or other suitable lifting device.
6. Attach tongue (#2) to hitch frame (#1) with 3/4"-10 x 4 1/2" GR5 hex head cap screws (#3), flat washers (#5) and hex flange locknuts (#4). Tighten locknuts to the correct torque.
7. Remove hitch pin (#7) and rotate jack stand (#6) down.
8. Reinsert hitch pin (#7). Make certain hitch pin is fully inserted and detent ball is visible on the opposite side.
9. Gently lower hitch frame until the tongue is fully supported by the jack stand (#6) and all weight is off the lifting device.
10. Route hydraulic hoses through hose support loops (#9).

Refer to Figure 1-2 on page 10:

IMPORTANT: Do not cut straps securing boards to the harrow frame until step 18 below. Start by cutting only the straps that secure the harrow sections to the boards and harrow frame.

13. Being careful to stand out of line of recoil, cut shipping straps (#4) securing harrow sections.
Section 1: Assembly and Set-up

Check Air Pressure In Tires
The center two tires require more air pressure than the wing tires. Too much air pressure in the wing tires will cause the wings to bounce excessively in the field.

Check psi ratings of all four tires. Add or remove air as needed until the tires are at the correct psi rating. See "Tire Inflation Chart" on page 26 for psi ratings.

Tractor Hook-up

**DANGER**
To avoid serious injury or death:
A crushing hazard exists while hooking-up and unhooking implement. Keep people and animals away while backing-up to implement or pulling away from implement. Do not operate hydraulic or electrical controls while a person or animal is directly behind the power machine or near the implement.

**WARNING**
To avoid serious injury or death:
Make certain harrow is securely attached to the towing tractor. Tip-over may occur during unfolding if harrow comes loose from the tractor.

Refer to Figure 1-3 on page 11:

**IMPORTANT:** Jack attachment pin (#18) must be fully inserted and secured before working around a harrow that is not hooked to the tractor drawbar.

1. Make certain jack stand (#17) is properly attached to the tongue and secured with attachment pin (#18).
2. Back tractor within close proximity of clevis (#15).
3. Raise or lower jack stand (#17) to align clevis (#15) with tractor drawbar. Drawbar should fit between lower and upper clevis plates.
4. Back tractor up to harrow hitch until holes in drawbar and clevis (#15) are aligned.
5. Shut tractor down before dismounting. Refer to “Tractor Shutdown Procedure” on this page.

**IMPORTANT:** Customer to supply properly sized hitch pin (#13) and locking device (#14). Locking device for hitch pin is required to keep hitch pin from being removed without removing locking device.

6. Attach harrow to tractor drawbar with customer supplied hitch pin (#13) and hairpin cotter (#14).
7. Lower jack stand (#17) until hitch weight is supported by tractor drawbar and jack stand is off the ground.
8. Remove jack stand attachment pin (#18) and rotate jack stand counterclockwise 90°. Reinserting attachment pin. Make sure attach pin is fully inserted and detent ball is visible.
9. Attach hitch safety chains (#16) to the tractor.
Hydraulic Hook-up

**WARNING**

To avoid serious injury or death:

- Shut power machine down and release all hydraulic pressure to the equipment before connecting or disconnecting hydraulic hoses to or from the power machine.

- Hydraulic fluid under high pressure can penetrate the skin and/or eyes causing a serious injury. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. Use a piece of cardboard or wood rather than hands when searching for leaks. A doctor familiar with this type of injury must treat the injury within a few hours or gangrene may result. **DO NOT DELAY.**

**Refer to Figure 1-4:**

The double-acting wing cylinders (#1) should be attached to a duplex outlet at the tractor with float capabilities to allow the wings to float over the contour of the ground while harrowing. The double-acting hydraulic lift cylinder (#2) should be attached to a duplex outlet at the tractor set for non-float.

1. Clean all dirt from tractor duplex outlets and all hydraulic hose quick disconnect couplers (#8).

**Refer to Figure 1-3:**

2. Make certain wing cylinder hydraulic hoses (#10) are routed through hose loops (#19, #20 & #21).

3. If tractor has float option on one of the duplex outlets, connect hydraulic hoses (#10) to that outlet and set duplex outlet in float position.

4. Make certain lift cylinder hydraulic hoses (#11) are routed through hose loops (#19, #20 & #21).

5. Attach lift cylinder hydraulic hoses (#11) to a duplex outlet of the operator’s choosing. If duplex outlet has float option, set outlet to non-float.

**Hydraulic Plumbing**

**Refer to Figure 1-4:**

1. Hydraulic wing cylinder 2” x 14” x 1 1/8” rod
2. Hydraulic lift cylinder 3 1/2” x 8” x 1 1/4” rod
3. Elbow, 3/4” MJIC x 3/4” MORB
4. Orifice elbow, 1/32” orifice, 3/4MJIC 3/4MORB
5. 3/8” R2 Hydraulic hose, 48” long x 3/4” FJIC x 3/4” FJIC
6. 3/8” R2 Hydraulic hose, 59” long x 3/4” FJIC x 3/4” FJIC
7. Tee, 3/4”JICBH x 3/4” MJIC x 3/4” MJIC
8. Quick disconnect poppet type coupling, 3/4” MORB male
9. Adapter, 3/4”FORB x 3/4” MJIC
10. 3/8” R2 Hydraulic hose, 191” long x 3/4” FJIC x 3/4” FJIC
11. 3/8” R2 Hydraulic hose, 198” long x 3/4” FJIC x 3/4” FJIC
Assembly and Set-up

Table of Contents

Section 1: Assembly and Set-up

Electrical Hook-up

1. Route lead wire harness (#4) through spring hose loops (#18 & #21).
2. Connect lead wire harness (#4) to the tractor’s 7-way round pin receiver.
3. It is best to have a second person verify the lights are operating. Start tractor and operate lights as follows:
   a. Turn on head lights to verify red lights illuminate.
   b. Turn on flasher lights to verify amber light are blinking on and off.
4. If lights did not operate properly, recheck hook-up of wire harness (#1, #2, & #4) to enhance module (#3).
   • Make sure connector (#1D) with a red wire is connected to the right-hand wire harness (#1).
   • Make sure connector (#2D) with a yellow wire is connected to the left-hand wire harness (#2).
   • Make sure connector (#3B) on the lead wire harness (#4) is connected to connector (#3A) on enhancer module (#3).
5. Check wire harness routing to make sure wires will not be pinched as the wings are folded and unfolded and while raising and lowering the unit.
6. Check hydraulic hose routing to make sure hoses will not be pinched as the wings are folded and unfolded and while raising and lowering the unit.
7. Make final adjustments to harnesses (#1, #2, & #4) and hydraulic hoses (#10 & #11). Add cable ties (not shown) as needed. When completed, draw all cable ties up tight.

Hook-up LED Lights

Refer to Figure 1-5:

The lead wiring harness (#4) is equipped with a 7-way round pin connector for connecting to the tractor’s 7-pin electrical outlet shown in Figure 1-6.

1. Route lead wire harness (#4) through spring hose loops (#18 & #21).
2. Connect lead wire harness (#4) to the tractor’s 7-way round pin receiver.

IMPORTANT: See Detail A:

Connectors on wire harness (#1 & #2) are labeled “Light” on one end and “Enhancer” on the other end. Ends labeled “Light” connect to the LED lights. Ends labeled “Enhancer” connect to the enhance module (#3).

3. It is best to have a second person verify the lights are operating. Start tractor and operate lights as follows:
   a. Turn on head lights to verify red lights illuminate.
   b. Turn on flasher lights to verify amber light are blinking on and off.

4. If lights did not operate properly, recheck hook-up of wire harness (#1, #2, & #4) to enhance module (#3).
   • Make sure connector (#1D) with a red wire is connected to the right-hand wire harness (#1).
   • Make sure connector (#2D) with a yellow wire is connected to the left-hand wire harness (#2).
   • Make sure connector (#3B) on the lead wire harness (#4) is connected to connector (#3A) on enhancer module (#3).

5. Check wire harness routing to make sure wires will not be pinched as the wings are folded and unfolded and while raising and lowering the unit.
6. Check hydraulic hose routing to make sure hoses will not be pinched as the wings are folded and unfolded and while raising and lowering the unit.
7. Make final adjustments to harnesses (#1, #2, & #4) and hydraulic hoses (#10 & #11). Add cable ties (not shown) as needed. When completed, draw all cable ties up tight.
Unfold Wings First

**WARNING**
To avoid serious injury or death:

Allow no one near or behind the harrow while unfolding the wings. The tongue weight can temporarily shift from positive to negative. The harrow can tip over backwards or fall suddenly if the unit comes unhitched, loses hydraulic pressure or if a cylinder pin falls out.

**IMPORTANT:** Be certain to remove transport chains from wings before unfolding wings and do not move tractor while wings are unfolding.

**IMPORTANT:** Make certain wings are completely unfolded before lowering harrow sections to ground. Hydraulic cylinders and harrow frame can be damaged if wings are partially folded while lowering unit to ground.

Refer to Figure 1-7:
1. Unhook transport chain (#3) from chain hook (#4).
2. Unwrap transport chain from around the wing frame.
3. If not already removed, remove clear plastic shipping tube from transport chain.
4. Rehook transport chain to chain hook at about 6 or 7 links from end chain.
5. Repeat steps 1 & 4 above for the other wing.
7. Operate tractor control lever to slowly unfold wings. Make certain wings are completely unfolded before continuing with lowering the harrow sections.

Lower Harrow sections Last

**WARNING**
To avoid serious injury or death:

Allow no one near or behind the harrow while lowering the harrow sections to the ground. The tongue weight can temporarily shift from positive to negative. The harrow can tip over backwards or fall suddenly if the unit comes unhitched from the tractor, loses hydraulic pressure or if a cylinder pin falls out.

The back harrow sections hang overlapping the front harrow sections when raised off the ground. Therefore, it is important to allow room to drive forward while lowering the harrow to the ground to help spread the harrow sections out on the ground.

1. Using tractor control lever for the lift cylinder, lower spike tooth harrow sections down slowly.
2. Pull forward as the spike teeth begin to lay down on the ground.
3. Continue to extend lift cylinder even after all of the harrow sections are laying on the ground to make certain it is fully extended.

Purge Hydraulic System

**DANGER**
To avoid serious injury or death:

- Never remove or install lift cylinder with harrow sections raised even if wings are folded and secured with transport chains. The harrow sections can fall suddenly if wings are unfolded with lift cylinder missing. Air trapped in a new or repaired cylinder will drop the harrow sections suddenly while unfolding the wings. Either situation can render the harrow inoperable and cause serious bodily injury or death.
- Never fold wings until after the lift cylinder is fully retracted and harrow frames are fully raised. Folding wings before fully raising the harrow sections up can bend and/or break the tongue, hitch assembly and harrow frames. Also, it can cause serious bodily injury or death.

If wings were jerky while opening or if harrow is jerky while being lowered to the ground, then the cylinders and hydraulic lines should be purged of air.

Do not crack hose fittings in order to bleed air from the hydraulic system. All cylinders are doubling acting and will self purge themselves of air as hydraulic oil cycles back and forth through the cylinders several times.

Be sure tractor reservoir is filled properly before operating the cylinders. If tractor reservoir is low on hydraulic fluid, there is a chance of drawing air into the system causing jerky or uneven cylinder movements.

1. With wings opened and harrow sections resting firmly on the ground, retract and extend lift cylinder several times until sections lift and lower without jerking. Finish with wing sections fully raised up.

Refer to Figure 1-7:

**NOTE:** See instructions for lift cylinder stop nut on page 14 if guide bars (#1) do not slide onto wing support (#2) smoothly when folding wings.

1. Retract and extend wing cylinders several times until wing sections can fold in and out without jerking.
2. Finish with wings folded in, transport chains (#3) wrapped around wing frames (#5) and hooked to transport hooks (#4).
Lift Cylinder Stop Nut Adjustment

Refer to Figure 2-1 & Figure 2-2:

IMPORTANT: When folding wings, make sure guide bars (#2) slide smoothly onto wing support (#3) and is resting fully down on the flange of the wing support and not hanging above the flange.

After adjusting the stop nut, put a touch of silicone sealer (#6) between the threads and stop nut to prevent it from turning by vibration.

The wings must be adjusted up or down to properly align guide bars (#2) with upper surface of wing support (#3). This is accomplished by turning stop nut (#5) towards lift cylinder (#4) to raise wings and away to lower wings. As pins wear and settle in, wings may droop a bit and need readjusting to make them once again slide onto the wing support properly.

Raising Wings with Stop Nut

Refer to Figure 2-1 & Figure 2-2:

1. With harrow fully raised, fold wings in until the guide bars (#2) on both wings are about to make contact with the wing support (#3).
2. Slowly extend lift cylinder until guide bars (#2) on both wings are slightly below upper surface of wing support (#3).
3. Screw stop nut (#5) towards cylinder housing (#4) until stop nut is tight against cylinder housing.
4. Check fit-up by retracting wing cylinders until wing frames (#1) come against wing support (#3). Guide bars (#2) should slide smoothly onto the upper surface of the wing support and must be resting on the surface of the wing support.
5. Apply a touch of silicone sealer (#6) between the cylinder threads and stop nut secure nut in place.

Lowering Wings with Stop Nut

Refer to Figure 2-1 & Figure 2-2:

1. Unfold harrow and lower unit down to the ground.
2. Screw stop nut (#5) away from cylinder housing two or three full turns.
3. Raise harrow fully up and fold wings in until guide bars (#2) on both wings are positioned close to the wing support (#3).
4. Slowly retract lift cylinder until guide bars (#2) on both wings are slightly below the upper surface of wing support (#3).
5. Screw stop nut (#5) towards cylinder housing (#4) until stop nut is tight against housing.
6. Check fit-up by retracting wing cylinders until wing frames (#1) come against wing support (#3). Guide bars (#2) should slide smoothly onto the upper surface of wing support and must be resting on the surface of the wing support.
7. Apply a touch of silicone sealer (#6) between the cylinder threads and stop nut secure nut in place.
Tooth Angling
Refer to Figure 2-3:
Spike tooth angle is set by the tooth angle plates (#1) and is factory-set with tabs (#2) (tabs with sharp break) leading in direction of travel. This pulls the teeth 40° off vertical. This angle is suitable for most conditions, has no speed restrictions, usually creates a more optimal seedbed, and provides a better flow of residue through the teeth.

For a more aggressive spike tooth angle, (22° off vertical) reverse all harrow sections at their chain connections to positions tabs (#3) (tabs with shallow break) leading in direction of travel.

NOTE: Do not exceed 4 1/2 MPH with tines at 22°. Machine loads are much higher at 22° and spike tooth harrow sections may hop on the ground.

How To Change Tooth Angle
1. Park tractor with harrow on a level surface that is large enough to allow room for unbolting the harrow sections from the harrow frame, moving tractor with harrow frame around one end of the removed sections to the opposite side of the sections.
2. After parking tractor with harrow on a large level surface, unfold wings and lower harrow sections to the ground. Refer to “Unfold Wings First” and “Lower Harrow sections Last” on page 13 for instructions.

Refer to Figure 2-4:
3. Unbolt the six leading chains (#1) from pull tabs (#4). Save nuts (#3) by installing them back on the bolts for use later. Do not remove bolts (#2) from leading chains (#1).

Refer to Figure 2-5:
4. Unbolt the six trailing chains (#1) from angle plates (#4). Save nuts (#3) for reuse. Do not remove bolts (#2) from angle plates (#4).
5. Wrap trailing chains (#1) around harrow frames to keep chains from becoming entangled in the harrow sections as center and wing frames are pulled away.

Refer to Figure 2-6 on page 16:
6. Pull tractor and harrow straight ahead until harrow frames are clear of harrow sections.
7. Pull harrow frame around one end of the harrow sections to the other side of the harrow sections and then back harrow frames to the harrow sections until leading chains are above pull tabs (#5).

Refer to Figure 2-7 on page 16:
8. Connect leading chains (#2) to pull tabs (#1) with existing nuts (#3). Tighten nuts to the correct torque.
9. Connect trailing chains (#7) to angle plates (#4) (5th row back from pull tab (#1) with existing nuts (#6). Tighten nuts to the correct torque.
Section 2: Adjustments

Table of Contents

DIRECTION OF TRAVEL With Tooth Angle At 40°

Connect leading chains to pull tabs with sharp breaks in angle plates to the front when harrowing with spike teeth set at 40°.

Connect trailing chains to 5th bar from the front when harrowing with spike teeth set at 40°.

DIRECTION OF TRAVEL With Tooth Angle At 22°

Connect leading chains to pull tabs with shallow breaks in angle plates to the front when harrowing with spike teeth set at 22°.

Connect trailing chains to 5th bar from the front when harrowing with spike teeth set at 22°.

Hook-up Harrow Frames to Harrow Sections
Figure 2-6

Reconnect Leading And Trailing Chains
Figure 2-7
Operating Checklist

Hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training involved in the operation, transport, maintenance and storage of the Spike Tooth Harrow. Therefore, it is absolutely essential that no one operates the Spike Tooth Harrow unless they are age 16 or older and have read, fully understood, and are totally familiar with the Operator’s Manual. Make sure the operator has paid particular attention to:

- **Important Safety Information**, page 1
- **Section 1: Assembly and Set-up**, page 9
- **Section 2: Adjustments**, page 14
- **Section 3: Operating Instructions**, page 17
- **Section 4: Maintenance & Lubrication**, page 20

Pre-Field Inspection

Make the following inspections with harrow attached to a tractor:

1. Inspect tractor safety equipment to make sure it is in good working condition.
2. Inspect harrow for loose bolts and nuts. Tighten all loose bolts and nuts as indicated in the “Torque Values Chart” on page 26.
3. Verify lift cylinder stop is adjusted correctly for the wings to be supported by the cross support angle.
4. Check for and remove foreign objects wrapped around the spike teeth and frame. Raise harrow sections up, fold wings in and secure wings with transport chains before removing foreign objects.
5. Check for missing, bent, broken and worn spike teeth. Replace spike teeth as required. Refer to “Spike Tooth Replacement” on page 21.

Field Inspection

Do not harrow in wet conditions. Wet material will build up causing harrow to not be as effective.

1. Thoroughly inspect area to be harrowed for ditches, drop-offs, stumps, post, rocks, and other unforeseen objects that the harrow or tractor can snag on or hit. Mark all potential hazards before working the area.
2. After the first 50 feet, stop and check to see that the harrow is pulling on the leading and trailing chains correctly and that no sections are entangled.
3. Periodically turn tractor off, remove switch key and check for foreign objects wrapped around the spike teeth and frame. Raise harrow sections up, fold wings in and secure wings to transport chains before removing foreign objects.
4. Frequently inspect the Spike Tooth Harrow for loose bolts and nuts. Tighten all loose hardware as indicated in the “Torque Values Chart” on page 26.

Field Uses

- **Firming Seedbeds**
  Most seedbeds are too loose and fluffy. Research shows that by firming the seedbed, planting depth can be better controlled resulting in huge increases (up to 54%) in germination rates. A firm seedbed also gives better seed/soil contact for proper germination.

- **Leveling Soil**
  Eliminates troublesome ridges left by some tillage tools and helps provide consistent planting depth across the width of the drill, seeder or planter.

- **Spreads Residue**
  This harrow handles large amounts of residue while spreading it to manageable levels to allow tillage and planting tools to do their job without the plugging associated with heavy residue. It is a must-have tool for processing no-till residue.

- **Breaking-up Residue**
  This harrow pulled 7 to 10 MPH on a hot, dry day will shatter residue, turning it into mulch.

- **Conserving Moisture**
  Harrowing behind a primary tillage tool helps seal the open soil and lowers the evaporation rate of moisture in the freshly broken soil. Also, harrowing soil that has crusted, breaks the capillary action that releases moisture out of the soil.

- **Controls Sprouting of Volunteer and Cheat**
  Dry years delay sprouting of volunteer. By stirring the soil with the harrow, the dormant seed contacts the moist soil and sprouts prior to planting season. This allows time to control the volunteer and cheat before planting a new crop.

- **Incorporates herbicides**
  Preplant herbicides can be incorporated as deeply or shallow as desired.

- **Covers Broadcast Seed**
  Wheat pasture and cover crops can be planted inexpensively by spreading the seed with a fertilizer spreader and covering it with the harrow.

- **Decreases Chemical Usage**
  Harrowing pulls out small weeds and volunteer, uncovers overwinter insects to expose them to the elements for fewer insects problems and firms the soil to speed germination of weed and volunteer seed so they can be destroyed prior to planting.

- **Good for Alfalfa Fields**
  Makes a perfect alfalfa seedbed. Use on existing alfalfa fields before spring to level the ground, control gopher mounds, ant hills and pulls out small weeds. It also aerates the soil for root/oxygen exchange, breaks up and spreads clumps of old residue.

- **Good for Grasslands**
  Grooms grass plants, knocks down gopher mounds and ant hills, helps removes sticks and small limbs and pulls out small weeds.
Safety Information

**DANGER**

*To avoid serious injury or death:*

- Never allow anyone to ride or walk on the harrow. They can fall and be ran over causing serious injury or death.
- Stay away from electrical power lines when transporting and when operating hydraulics to lift and fold implement. Electrocutio can occur without personally making contact with the power lines.

**WARNING**

*To avoid serious injury or death:*

- Hydraulic fluid under high pressure can penetrate the skin and/or eyes causing a serious injury. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. Use a piece of cardboard or wood rather than hands when searching for leaks. A doctor familiar with this type of injury must treat the injury within a few hours or gangrene may result. **DO NOT DELAY.**
- Always shut tractor down using “Tractor Shutdown Procedure” provided in this manual before dismounting tractor.
- Do not operate and/or travel across inclines where tractor and/or implement can roll over. Consult your tractor’s manual for acceptable inclines the tractor is capable of traveling across.
- Never carry riders on the implement or tractor. Riders can obstruct the operator’s view, interfere with control of the equipment, be pinched by moving components, become entangled in rotating components, be struck by objects, be thrown or fall from the equipment, etc.
- Do not use tires as a step or lean against them. They can move suddenly even when they appear to be on solid ground resulting in a falling hazard against metal protruding objects.
- Walk carefully around the harrow to prevent falling onto the unit. Always store harrow with spike teeth pointing down.
- Allow no one near or behind the harrow while unfolding wings and lowering implement to the ground. The tongue weight can temporarily shift from positive to negative. The harrow can tip over backwards or fall suddenly if unit comes unhitched from the tractor, loose hydraulic pressure or if a cylinder pin falls out. Any of the above can cause serious injury or death.
- Clear area to be worked of debris and other unforeseen removable objects. Mark any potential hazards that cannot be removed such as tree stumps, post, rocks, holes, drop-offs, etc. with a visible flag.
- Do not use implement to lift objects; to pull objects such as fence posts, stumps, etc; or to push objects. The unit is not designed or guarded for these uses.
- Do not use implement to tow other equipment unless it is designed with a tow hitch. Doing so can result in loss of control and damage the equipment.

**IMPORTANT:** Do not use implement as a man lift, work platform or as a wagon to carry objects. It is not properly designed or guarded for this use.

**IMPORTANT:** Be aware of negative hitch weight when unhooking the Spike Tooth Harrow, especially when the wings are not folded and secured with transport chains.

**IMPORTANT:** Perform scheduled maintenance. Check for loose hardware, missing parts, broken parts, structural cracks, and excessive wear. Make repairs before putting implement back into service. Serious breakdowns can result in injury or death.

**IMPORTANT:** Never work near utilities such as gas lines, electrical lines, or other hazards that can cause serious injury or death from electrocution, explosion, or fire.

**IMPORTANT:** Do not add weights to the harrow. Adding weights will cause high tooth wear and/or bend harrow frame and bars.

**IMPORTANT:** Always raise harrow off the ground before backing up. Backing up with spike teeth in the ground can damage the harrow and tractor.

**IMPORTANT:** Harrow is 24 ft. wide. Slow down and be ready to stop when working near solid objects. Allow sufficient room to make turns.

**IMPORTANT:** Slow down and be ready to stop when crossing uneven terrain with wings folded. The wing tires can drag on the ground causing serious damage to the equipment and tires.

**IMPORTANT:** Make certain harrow is fully raised before folding wings. Hydraulic cylinders and harrow frame can be damaged if harrow is not fully raised before folding wings.

**Fold Harrow For Transporting**

*Refer to Figure 3-1:*

**IMPORTANT:** Make certain harrow is fully raised before folding wings. Hydraulic cylinders and harrow frame can be damaged if harrow is not fully raised before folding wings.

1. Park on a solid level surface.
2. Raise harrow sections fully up. Make sure lift cylinder stop nut is against cylinder housing.
3. Fold wings fully in and secure with transport chains (#3) as follows:
   a. Make certain guide bars (#1) are resting fully on wing support (#2).
   b. Wrap transport chains (#3) around wing frames (#5) as shown.
   c. Pull transport chains tight while holding them level at the wing frames.
   d. Attach closest chain loop to transport hook (#4). Make certain transport chain is in its tightness position.
4. The harrow is now ready for transporting.
Transporting

**WARNING**
To avoid serious injury or death:
When traveling on public roads, use accessory lights, SMV sign, clean reflectors and other adequate devices to warn operators in other vehicles of your presence. Always comply with all federal, state and local laws.

1. Reduce tractor ground speed when turning and leave enough clearance so harrow does not contact obstacles such as buildings, trees or fences.
2. Limit transport speed to 20 MPH. Transport only with a tractor of sufficient size and horse power.
3. When traveling on roadways, transport in such a way that faster moving vehicles may pass you safely.
4. Shift tractor to a lower gear when traveling over rough or hilly terrain.
5. Be aware of electrical power lines over head. Make sure implement does not make contact with them.

4. Move cylinder lift lever back and forth to release hydraulic pressure in the lines.
5. Place chocks in front of and in back of center wheels if parked on a sloping surface.
6. Rotate parking jack on the tongue down and install detent pin. Make sure detent pin is fully inserted and detent ball is visible.
7. Rotate jack handle to raise tongue until tongue weight is off the tractor drawbar.
8. Unhook hydraulic hoses from tractor and store hose ends on harrow hitch.
9. Unhook electrical wire harness from the tractor’s 7-pin outlet. Coil wire harness up and store on the harrow hitch.
10. Remove hitch safety chains and hitch pin.
11. Move tractor forward.

**Unhook From An Unfolded Harrow**

**WARNING**
To avoid serious injury or death:
Be certain harrow is fully lowered to the ground and all hydraulic pressure is relieved before disconnecting any hydraulic hoses.

1. See “Long-Term Storage” on page 22 before parking harrow for a long period.
2. Park on a solid level surface.
3. Remove transport chains and unfold wings. Make sure wings are fully open. For detailed instructions see “Unfold Wings First” on page 13.
4. Lower harrow fully down onto the ground. Make sure lift cylinder rod is fully extended. For detailed instructions see “Lower Harrow sections Last” on page 13.
6. Move cylinder lift lever back and forth to release hydraulic pressure in the lines.
7. Place chocks in front of and in back of center wheels if parked on a sloping surface.
8. Rotate parking jack on the tongue down and install detent pin. Make sure detent pin is fully inserted and detent ball is visible.
9. Rotate jack handle to raise tongue until tongue weight is off the tractor drawbar.
10. Unhook hydraulic hoses from tractor and store hose ends on harrow hitch.
11. Unhook electrical wire harness from the tractor’s 7-pin outlet. Coil wire harness up and store on the harrow hitch.
12. Unhook safety chains from tractor and store chains wrapped around implement tongue.
13. Remove hitch pin and move tractor forward.

**Unhook From A Folded Harrow**

**WARNING**
To avoid serious injury or death:
Be certain center wing sections are folded and, secured with transport chains, and all hydraulic pressure is relieved before disconnecting any hydraulic lines.

1. See “Long-Term Storage” on page 22 before parking harrow for a long period.
2. Raise harrow fully up, fold wings in and hook transport chains. For detailed instructions, see “Fold Harrow For Transporting” on page 18.
4. Move cylinder lift lever back and forth to release hydraulic pressure in the lines.
General Operating Instructions

Before using your Land Pride Spike Tooth Harrow, it is important that you familiarize yourself with the Operator’s Manual, properly attach harrow to your tractor, check tire pressures, and verified that the harrow sections attached to the frame with the spike teeth at the preferred angle to do the work at hand.

Make sure before starting the tractor that it is out of gear and the park brake is engaged. Start tractor and set engine throttle speed at a low idle. If harrow is unfolded, raise harrow sections, fold wings in and hook transport chains to the folded wings before transporting to the field.

You should now be ready to transport to your harrowing site at a safe ground speed. On roadways transport in such a manner that faster moving vehicles can easily see you and pass you safely. Reduce your speed when traveling over rough and hilly terrain. Avoid quick or sharp steering corrections. Take extra care to insure that the harrow doesn't come in contact with obstacles such as trees, buildings or fences. Use accessory lights and appropriate reflective devices to provide adequate warning to pedestrians and other vehicle operators when traveling on public roads and in the dark of night. Comply with all local, state and federal laws.

It is important that you inspect the area where you will be harrowing and clear it of safety hazards, foreign objects and drop-offs either before or after you arrive at the site. Never assume the area is clear. Harrow only in areas you are familiar with and are free of debris and unseen objects. In the event you do strike an object stop the harrow and tractor immediately to inspect and make necessary repairs before resuming operation. It really pays to inspect a new area and to develop a safe plan before harrowing.

Now that you’re prepared and well briefed you may begin harrowing. You will need to maintain 7 to 10 MPH ground speed to shatter residue. Do not exceed 4 1/2 MPH with tines at 22°. Make a tractor gear and range selection that will enable you to maintain these speed combinations.

Avoid crossing the face of steep slopes and sharp drops. Cross diagonally through dips to prevent hanging up the tractor and harrow. Slow down in turns and make wide turns when possible. Harrow sections should be raised to make tight turns. Try increasing or decreasing ground speed to determine the effect on quality of work. Remember to look back often.

With a little practice you will be pleased with what you and your Land Pride Spike Tooth Harrow can do. Whether you are done harrowing, need to take a break, or just need to make a few adjustments to the harrow, remember to reduce tractor’s engine rpm, stop on level ground, set tractor park brake, turn off the engine and remove the key before dismounting from the tractor.
**Maintenance**

Proper servicing and adjustments are key to the long life of any implement. With careful inspection and routine maintenance, you can avoid costly downtime and repair.

Check all bolts and pins after using unit for several hours and on a regular basis thereafter to insure they are tight and secured.

Replace worn, damaged or illegible safety labels by obtaining new labels from your Land Pride Dealer.

---

**DANGER**

To avoid serious injury or death:

Always secure equipment with solid, non-concrete supports before working under it. Never go under equipment supported by concrete blocks or hydraulics. Concrete can break, hydraulic lines can burst, and/or hydraulic controls can be actuated even when power to hydraulics is off.

---

**WARNING**

To avoid serious injury or death:

- For safety reasons, each maintenance operation must be performed with harrow lowered completely to the ground or safely supported on blocking with tractor park brakes engaged, engine shut off and ignition key removed.
- Do not alter implement or replace parts on the implement with other brands. Other brands may not fit properly or meet OEM (Original Equipment Manufacturer) specifications. They can weaken the integrity and impair the safety, function, performance, and life of the implement. Replace parts only with genuine OEM parts.

---

**Tractor Maintenance**

One of the most important things you can do to prevent hydraulic system problems is ensure that your tractor's reservoir remains free of dirt and contamination.

Use a clean cloth to wipe hose ends before attaching them to your tractor. Replace your tractor's hydraulic filter element at the prescribed intervals. These simple maintenances will go a long way to prevent occurrence of control valve and hydraulic cylinder problems.

---

**Tires**

It is important that the tires on the harrow have correct air pressure. Check air pressure in all four tires before each use and visually inspect tires for loss of air throughout each day of operation. The wing tires require less air pressure than the center two tires. See "Tire Inflation Chart" on page 26 for correct air pressure ratings.

---

**Spike Tooth Replacement**

Refer to Figure 4-1:

---

**NOTE:** Always replace spike teeth and locknuts at the same time to insure that the locknuts will not come loose and allow the spike teeth fall off.

Always inspect spike teeth before each use. Make certain they are properly installed and are in good working condition. Replace any tooth that is lost, worn excessively or broken as follows:

1. Place tractor gear selector in park and set brakes, shut engine off and remove ignition key.
2. Secure harrow with solid supports before servicing underside of harrow.
3. Remove 1/2"-13 locknut (#2) and spike tooth (#3) from harrow bar (#1).
4. Insert new spike tooth (#3) in harrow bar (#1) and secure with 1/2"-13 new locknut (#2). Tighten locknut to the correct torque.

---

**Figure 4-1**

Spike Tooth replacement

---

**NOTE:** Always replace spike teeth and locknuts at the same time to insure that the locknuts will not come loose and allow the spike teeth fall off.
Section 4: Maintenance & Lubrication

Long-Term Storage
Clean, inspect, service, and make necessary repairs to the implement when storing it for long periods and at the end of the season. This will help to ensure the unit is ready for field use the next time you hook-up to it.

Clean, inspect, service and make necessary repairs to the harrow when parking it for long periods and when parking it at the end of a working season. This will help ensure the harrow is ready for field use the next time you hook-up to it.

⚠️ WARNING ⚠️
To avoid serious injury or death:
The harrow when not hooked to a tractor can fall backwards unexpectedly causing bodily injury. Always store harrow with wings folded and transport chains hooked.

1. Clean off any dirt and grease that may have accumulated on the harrow and moving parts. Scrape off compacted dirt and then wash surface thoroughly with a garden hose.

2. Check teeth and locknuts to make sure they are not missing, broken, or excessively worn. Replace harrow teeth as needed. See “Spike Tooth Replacement” on page 21.

3. Inspect for loose, damaged or worn parts and adjust or replace as needed.

4. Replace all damaged or missing decals.

5. Repaint parts where paint is worn or scratched to prevent rust. Ask your dealer for Land Pride aerosol touch-up paint. They are also available in touch-up bottles with brush, quarts and gallon sizes by adding TU, QT or GL to the end of the aerosol part number.

6. A coating of oil may also be applied to the teeth to minimize oxidation.

7. Store harrow on a level surface in a clean, dry place. Inside storage will reduce maintenance and make for a longer harrow life.

8. Follow all unhooking instructions on page 19 when disconnecting tractor from harrow.

Ordering Replacement Parts
Land Pride offers equipment in factory standard Beige with black highlights. This implement is also available in Orange.

When ordering an optional color, the suffix number corresponding to the color must be added at the end of the part number. Parts ordered without the suffix number will be supplied in factory standard colors.

82 . . . . . Orange 85 . . . . . Black

For example, if you are ordering a replacement part with part number 555-555C and the existing part is orange, then add the suffix 82 to the end of the number to make the part number read 555-555C82.

Land Pride Touch-up Paint

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Part Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>821-011C</td>
<td>PAINT LP BEIGE SPRAY CAN</td>
</tr>
<tr>
<td>821-066C</td>
<td>PAINT ORANGE SPRAY CAN</td>
</tr>
<tr>
<td>821-070C</td>
<td>PAINT GP GLOSS BLACK SPRAY CAN</td>
</tr>
</tbody>
</table>

Lubrication Points

Axle Hub Bearing
1 - Zerks per Wheel (Zerk can be on either side)
Type of Lubrication: Wheel Bearing Grease
## STH2024 Model Specifications & Capacities

<table>
<thead>
<tr>
<th>Specification</th>
<th>STH2024</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model Number</strong></td>
<td>STH2024</td>
</tr>
<tr>
<td><strong>Recommended tractor hp</strong></td>
<td>Minimum 45 hp</td>
</tr>
<tr>
<td><strong>Machine weight</strong></td>
<td>2,100 lbs.</td>
</tr>
<tr>
<td><strong>Tongue weight</strong></td>
<td>Folded for transport 432 lbs.</td>
</tr>
<tr>
<td><strong>Hitch</strong></td>
<td>Pull type with clevis</td>
</tr>
<tr>
<td><strong>Working width</strong></td>
<td>23' - 7&quot;</td>
</tr>
<tr>
<td><strong>Overall working width</strong></td>
<td>23' - 9&quot;</td>
</tr>
<tr>
<td><strong>Overall working length</strong></td>
<td>23' - 0&quot;</td>
</tr>
<tr>
<td><strong>Overall transport width</strong></td>
<td>8' - 6&quot;</td>
</tr>
<tr>
<td><strong>Overall transport height</strong></td>
<td>8' - 8&quot;</td>
</tr>
<tr>
<td><strong>Overall transport length</strong></td>
<td>15' - 0&quot;</td>
</tr>
<tr>
<td><strong>Rear frame suspension</strong></td>
<td>Chain suspension</td>
</tr>
<tr>
<td><strong>Size of bars</strong></td>
<td></td>
</tr>
<tr>
<td>1) Center section</td>
<td>1 11/16&quot; OD x 84&quot; long</td>
</tr>
<tr>
<td>2) Wing sections</td>
<td>1 11/16&quot; OD x 93&quot; long</td>
</tr>
<tr>
<td><strong>Number of bars</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>Number of teeth</strong></td>
<td>244</td>
</tr>
<tr>
<td><strong>Construction of spike teeth</strong></td>
<td>Diamond shaped tooth x 8 1/2&quot; long. Tip is forge hardened</td>
</tr>
<tr>
<td><strong>Number of teeth on the ground per ft.</strong></td>
<td>10.3</td>
</tr>
<tr>
<td><strong>Signal lights</strong></td>
<td>LED (light-emitting diode)</td>
</tr>
<tr>
<td>7 Pin connector</td>
<td>SAE J560 pin configuration</td>
</tr>
<tr>
<td><strong>Tires</strong></td>
<td>4 Ea., 205R15</td>
</tr>
<tr>
<td><strong>Wheel hub</strong></td>
<td>4-bolt</td>
</tr>
<tr>
<td><strong>Wheel spindles</strong></td>
<td>Replaceable</td>
</tr>
<tr>
<td><strong>Lift cylinder</strong></td>
<td>3 1/2&quot; x 8&quot;</td>
</tr>
<tr>
<td><strong>Wing cylinders</strong></td>
<td>2&quot; x 14&quot;</td>
</tr>
</tbody>
</table>

![Diagram of STH2024 Spike Tooth Harrow](image-url)
### STH2024 Model

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chain suspension</td>
<td>Permits harrow to follow the terrain for even tooth penetration.</td>
</tr>
<tr>
<td>Heavy constructed tooth bars</td>
<td>Designed to handled the job.</td>
</tr>
</tbody>
</table>
| **2 Tooth angles (40° & 22° off vertical)** | The least aggressive tooth angle (40°) gives the best flow-through of residue.  
The most aggressive tooth angle (22°) is for fluffing-up the ground such as an arena. |
| 10 Teeth on the ground every foot     | Provides maximum conditioning of the soil, breaking and spreading of manure and residue, and for even leveling and firming of the soil. |
| Diamond shaped teeth                  | Helps to break-up material into finer pieces for a more even spreading of material across the ground. Great for seed bed preparation, preparing arena floors, and breaking up clumps of manure blocking sunlight and spreading it over the ground to act as a fertilizer. |
| Narrow tooth point                    | Cuts through grasses instead of pulling out desirable grasses and plants. |
| Forged hardened tooth tips            | Forged hardened tooth tips extends the life of the teeth.                |
| Softer metal at threaded end of teeth | Helps resist breakage when striking rocks or other obstacles. Threaded end allows the tooth to be removed for repair or replacement. |
| LED Signal lights                     | LED lights are bright, long lasting, and resistant to vibration, unlike incandescent counterparts. |
## STH2024 Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bent or broken teeth</td>
<td>Hitting solid objects</td>
<td>Avoid hitting solid objects</td>
</tr>
<tr>
<td>Bent tooth bar</td>
<td>Added weights to the harrow</td>
<td>Remove weights.</td>
</tr>
<tr>
<td></td>
<td>Hitting solid objects with harrow in the ground</td>
<td>Inspect field and mark areas of trouble such as stumps, broken fence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>post and outcropping of rocks.</td>
</tr>
<tr>
<td></td>
<td>Hitting solid objects with harrow raised</td>
<td>Stay away from buildings, fences, trees banks and other solid objects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>when traveling straight and turning corners.</td>
</tr>
<tr>
<td>Excessive tooth wear</td>
<td>Added weights to the harrow</td>
<td>Remove added weights.</td>
</tr>
<tr>
<td></td>
<td>Loose teeth</td>
<td>Tighten teeth to the tooth bar.</td>
</tr>
<tr>
<td>Harrow does not penetrate the ground</td>
<td>Grass, wire and trash have accumulated under the harrow.</td>
<td>Remove grass, wire and trash from under the harrow.</td>
</tr>
<tr>
<td></td>
<td>Teeth not set at the correct angle</td>
<td>Adjust angle of teeth to be more upright.</td>
</tr>
<tr>
<td></td>
<td>Ground is too hard</td>
<td>Break ground with a field tool.</td>
</tr>
<tr>
<td>Loose teeth</td>
<td>Locknuts have worked loose</td>
<td>Tighten locknuts to the correct torque.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace locknuts that won't stay tight.</td>
</tr>
<tr>
<td>Spike tooth mounting holes are</td>
<td>Teeth are loose</td>
<td>Check for loose nuts frequently,</td>
</tr>
<tr>
<td>wallowing out.</td>
<td></td>
<td>Tighten loose nuts to the correct torque.</td>
</tr>
</tbody>
</table>
## Torque Values Chart for Common Bolt Sizes

<table>
<thead>
<tr>
<th>Bolt Size (inches)</th>
<th>Grade 2</th>
<th>Grade 5</th>
<th>Grade 8</th>
<th>Bolt Size (Metric)</th>
<th>Class 5.8</th>
<th>Class 8.8</th>
<th>Class 10.9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N·m 1 ft-lb 2</td>
<td>N·m 1 ft-lb 2</td>
<td>N·m 1 ft-lb 2</td>
<td>N·m 1 ft-lb 2</td>
<td>N·m 1 ft-lb 2</td>
<td>N·m 1 ft-lb 2</td>
<td>N·m 1 ft-lb 2</td>
</tr>
<tr>
<td>1/4” - 20</td>
<td>7.4</td>
<td>5.6</td>
<td>11</td>
<td>8</td>
<td>16</td>
<td>12</td>
<td>M 5 X 0.8</td>
</tr>
<tr>
<td>1/4” - 28</td>
<td>8.5</td>
<td>6</td>
<td>13</td>
<td>10</td>
<td>18</td>
<td>14</td>
<td>M 6 X 1</td>
</tr>
<tr>
<td>5/16” - 18</td>
<td>15</td>
<td>11</td>
<td>24</td>
<td>17</td>
<td>33</td>
<td>25</td>
<td>M 8 X 1.25</td>
</tr>
<tr>
<td>5/16” - 24</td>
<td>17</td>
<td>13</td>
<td>26</td>
<td>19</td>
<td>37</td>
<td>27</td>
<td>M 8 X 1</td>
</tr>
<tr>
<td>3/8” - 16</td>
<td>27</td>
<td>20</td>
<td>42</td>
<td>31</td>
<td>59</td>
<td>44</td>
<td>M 10 X 1.5</td>
</tr>
<tr>
<td>3/8” - 24</td>
<td>31</td>
<td>22</td>
<td>47</td>
<td>35</td>
<td>67</td>
<td>49</td>
<td>M 10 X 0.75</td>
</tr>
<tr>
<td>7/16” - 14</td>
<td>43</td>
<td>32</td>
<td>67</td>
<td>49</td>
<td>95</td>
<td>70</td>
<td>M 12 X 1.75</td>
</tr>
<tr>
<td>7/16” - 20</td>
<td>49</td>
<td>36</td>
<td>75</td>
<td>55</td>
<td>105</td>
<td>78</td>
<td>M 12 X 1.5</td>
</tr>
<tr>
<td>1/2” - 13</td>
<td>66</td>
<td>49</td>
<td>105</td>
<td>76</td>
<td>145</td>
<td>105</td>
<td>M 12 X 1</td>
</tr>
<tr>
<td>1/2” - 20</td>
<td>75</td>
<td>55</td>
<td>115</td>
<td>85</td>
<td>165</td>
<td>120</td>
<td>M 14 X 2</td>
</tr>
<tr>
<td>9/16” - 12</td>
<td>95</td>
<td>70</td>
<td>150</td>
<td>110</td>
<td>210</td>
<td>155</td>
<td>M 14 X 1.5</td>
</tr>
<tr>
<td>9/16” - 18</td>
<td>105</td>
<td>79</td>
<td>165</td>
<td>120</td>
<td>235</td>
<td>170</td>
<td>M 16 X 2</td>
</tr>
<tr>
<td>5/8” - 11</td>
<td>130</td>
<td>97</td>
<td>205</td>
<td>150</td>
<td>285</td>
<td>210</td>
<td>M 16 X 1.5</td>
</tr>
<tr>
<td>5/8” - 18</td>
<td>150</td>
<td>110</td>
<td>230</td>
<td>170</td>
<td>325</td>
<td>240</td>
<td>M 18 X 2.5</td>
</tr>
<tr>
<td>3/4” - 10</td>
<td>235</td>
<td>170</td>
<td>360</td>
<td>265</td>
<td>510</td>
<td>375</td>
<td>M 18 X 1.5</td>
</tr>
<tr>
<td>3/4” - 16</td>
<td>260</td>
<td>190</td>
<td>405</td>
<td>295</td>
<td>570</td>
<td>420</td>
<td>M 20 X 2.5</td>
</tr>
<tr>
<td>7/8” - 9</td>
<td>225</td>
<td>165</td>
<td>585</td>
<td>430</td>
<td>820</td>
<td>605</td>
<td>M 20 X 1.5</td>
</tr>
<tr>
<td>7/8” - 14</td>
<td>250</td>
<td>185</td>
<td>640</td>
<td>475</td>
<td>905</td>
<td>670</td>
<td>M 24 X 3</td>
</tr>
<tr>
<td>1” - 8</td>
<td>340</td>
<td>250</td>
<td>875</td>
<td>645</td>
<td>1230</td>
<td>910</td>
<td>M 24 X 2</td>
</tr>
<tr>
<td>1” - 12</td>
<td>370</td>
<td>275</td>
<td>955</td>
<td>705</td>
<td>1350</td>
<td>995</td>
<td>M 30 X 3.5</td>
</tr>
<tr>
<td>1-1/8” - 7</td>
<td>480</td>
<td>355</td>
<td>1080</td>
<td>795</td>
<td>1750</td>
<td>1290</td>
<td>M 30 X 2</td>
</tr>
<tr>
<td>1-1/8” - 12</td>
<td>540</td>
<td>395</td>
<td>1210</td>
<td>890</td>
<td>1960</td>
<td>1440</td>
<td>M 36 X 3.5</td>
</tr>
<tr>
<td>1-1/4” - 7</td>
<td>680</td>
<td>500</td>
<td>1520</td>
<td>1120</td>
<td>2460</td>
<td>1820</td>
<td>M 36 X 2</td>
</tr>
<tr>
<td>1-1/4” - 12</td>
<td>750</td>
<td>555</td>
<td>1680</td>
<td>1240</td>
<td>2730</td>
<td>2010</td>
<td></td>
</tr>
<tr>
<td>1-3/8” - 6</td>
<td>890</td>
<td>655</td>
<td>1990</td>
<td>1470</td>
<td>3230</td>
<td>2380</td>
<td></td>
</tr>
<tr>
<td>1-3/8” - 12</td>
<td>1010</td>
<td>745</td>
<td>2270</td>
<td>1670</td>
<td>3680</td>
<td>2710</td>
<td></td>
</tr>
<tr>
<td>1-1/2” - 6</td>
<td>1180</td>
<td>870</td>
<td>2640</td>
<td>1950</td>
<td>4290</td>
<td>3160</td>
<td></td>
</tr>
<tr>
<td>1-1/2” - 12</td>
<td>1330</td>
<td>980</td>
<td>2970</td>
<td>2190</td>
<td>4820</td>
<td>3560</td>
<td></td>
</tr>
</tbody>
</table>

1. in-tpi = nominal thread diameter in inches-threads per inch
2. N·m = newton-meters
3. ft-lb = foot pounds
4. mm x pitch = nominal thread diameter in millimeters x thread pitch

### Tire Inflation Chart

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Inflation PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST205/75R 15 Center Tires</td>
<td>32</td>
</tr>
<tr>
<td>ST205/75R 15 Wing Tires</td>
<td>15</td>
</tr>
</tbody>
</table>

Torque tolerance + 0%, -15% of torquing values. Unless otherwise specified use torque values listed above.
Warranty

Land Pride warrants to the original purchaser that this Land Pride product will be free from defects in material and workmanship beginning on the date of purchase by the end user according to the following schedule when used as intended and under normal service and conditions for personal use.

Overall Unit: One year Parts and Labor

Spike Teeth & Tires: Considered wear items

This Warranty is limited to the repair or replacement of any defective part by Land Pride and the installation by the dealer of any such replacement part, and does not cover common wear items. Land Pride reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

This Warranty does not apply to any part or product which in Land Pride’s judgment shall have been misused or damaged by accident or lack of normal maintenance or care, or which has been repaired or altered in a way which adversely affects its performance or reliability, or which has been used for a purpose for which the product is not designed. Misuse also specifically includes failure to properly maintain oil levels, grease points, and driveline shafts.

Claims under this Warranty should be made to the dealer which originally sold the product and all warranty adjustments must be made through an authorized Land Pride dealer. Land Pride reserves the right to make changes in materials or design of the product at any time without notice.

This Warranty shall not be interpreted to render Land Pride liable for damages of any kind, direct, consequential, or contingent to property. Furthermore, Land Pride shall not be liable for damages resulting from any cause beyond its reasonable control. This Warranty does not extend to loss of crops, any expense or loss for labor, supplies, rental machinery or for any other reason.

No other warranty of any kind whatsoever, express or implied, is made with respect to this sale; and all implied warranties of merchantability and fitness for a particular purpose which exceed the obligations set forth in this written warranty are hereby disclaimed and excluded from this sale.

This Warranty is not valid unless registered with Land Pride within 30 days from the date of purchase.

IMPORTANT: The Online Warranty Registration should be completed by the dealer at the time of purchase. This information is necessary to provide you with quality customer service.

Model Number ____________________ Serial Number ____________________