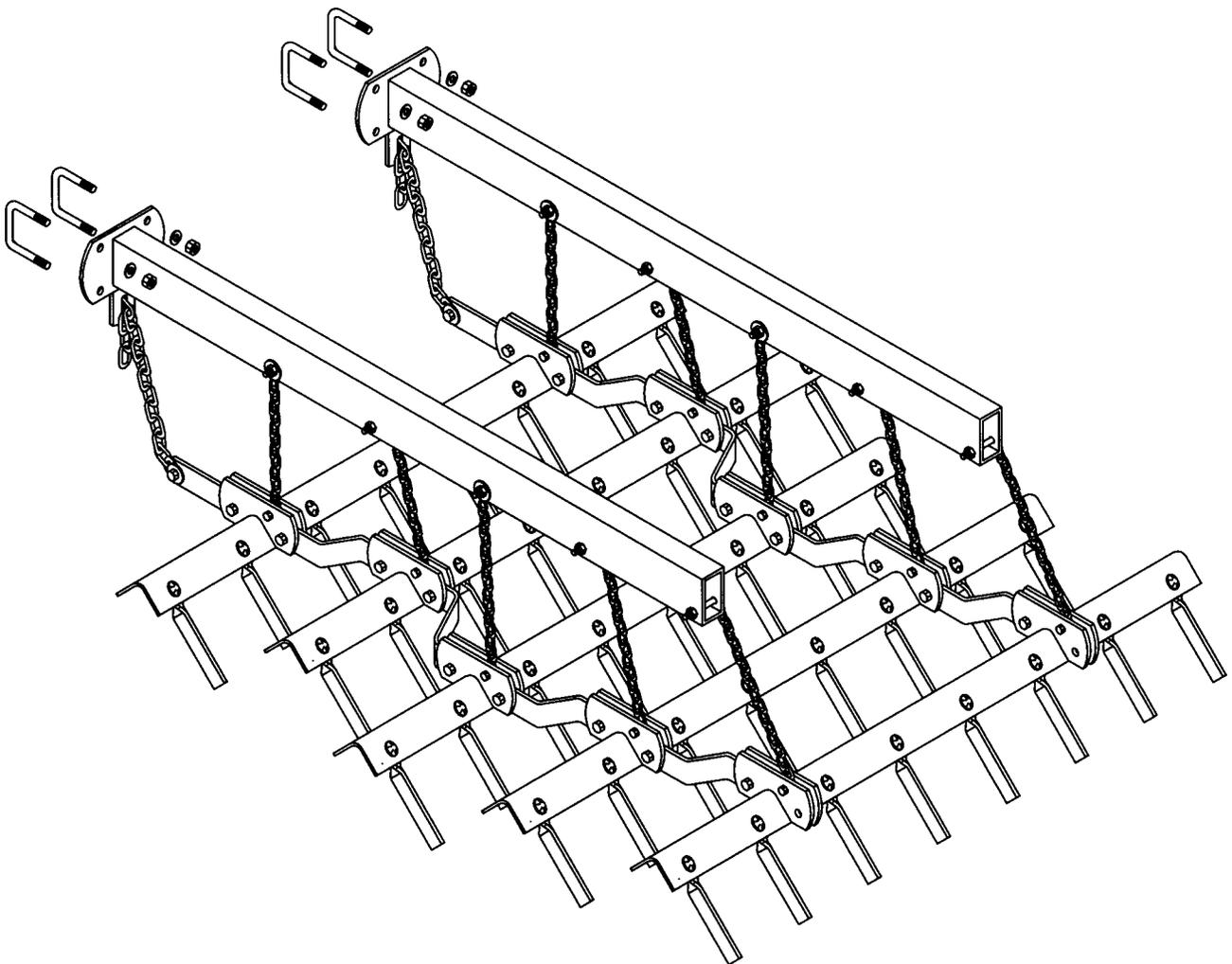


300DSPK Harrows
Flex Drag Spike Harrows

Kongskilde
300 DSPK



**3 AND 5 BAR SECTIONS
ASSEMBLY INSTRUCTIONS &
OPERATING GUIDE**

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Parts List Assembly DiagramSee Separate Booklet

Mounting Pattern DiagramsSee Separate Booklet

INTRODUCTION:

The Kongskilde Flex Drag-Spike Harrow has been developed as a levelling attachment for field cultivators. When properly adjusted the Harrow will help to prepare a level surface for planting in various field conditions and soil types.

The harrow mounting arms come in 2 configurations:

One for direct mounting to the 2" x 3" rear frame tube on the 2600 & 3500 series cultivators or another for direct mounting to the 2.5" x 2.5" rear toolbar tube on the 2800 & 3800 series field cultivators.

This booklet has been developed to assist you in assembling your Drag Harrow Kit for all Kongskilde Field Cultivator Models 2600, 3500, 2800 and 3800. Harrow mounting patterns for each cultivator model is provided in a separate booklet.

With special OEM mounting kits the drag-spike harrow can also be mounted to a wide range of other field cultivator brands.

*(See dealer for details).

* **NOTE:** When mounting drag harrows to other cultivator makes or models take care to insure that the harrows will be adequately attached and supported to the rear of the cultivators framework. It is also important to make sure that the harrows will have enough clearance and do not interfere with other frame components during operation of the unit in the field or when folding for road transport or storage.

PRE ASSEMBLY TIPS:

Prior to assembling the Flex Spike Drag Harrows, the cultivator should be carefully unfolded and lowered to the ground, (resting on the tines), on a flat level area.

The spike drag harrows are shipped from the factory in component form with the pre-assembled spike bar sections, carrier arms and hardware bags. In order to assemble the 3 or 5 bar sections, it is best to carefully lay them out behind the cultivator in sections, according to their working width or number of spikes as shown in the assembly layout booklet provided for each model of machine.

Refer to the parts list booklet provided for a detailed breakdown and description of the assembled components. This booklet will help you to identify the items required for proper assembly.

As an added feature, the straight and offset joiner links have been double sheared on one end with two different angle cuts. This gives you the opportunity to set the spikes bars to run at a shallow angle of about 30° for levelling in light soils, or a steeper angle of about 45° for breaking clods and lumps in heavier or "Buckshot" soils. However, you must choose this option for all sections before starting the assembly, as all sections must be set the same way. See Note below.

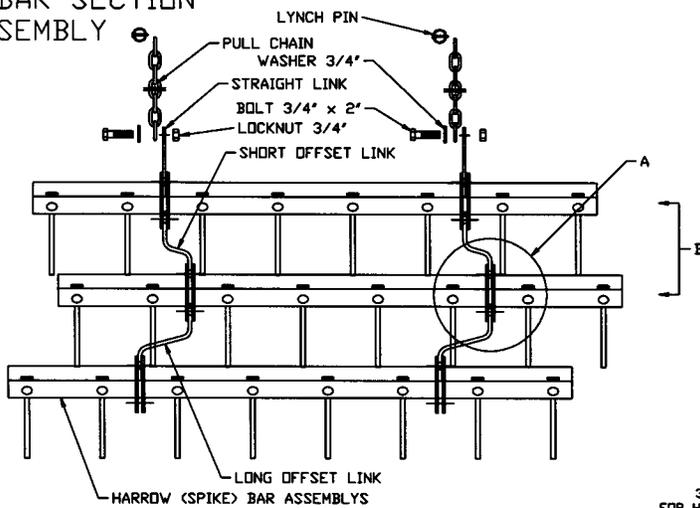
Note: All joiner links and spike bars must be set to run at the same angle. Do not try to mix one angle setting with another, as this will not allow for proper spacing (offset) of the spikes.

ASSEMBLY INSTRUCTIONS: For Shallow 30° Working Angle

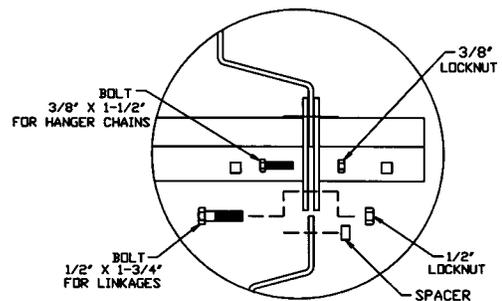
(Levelling in heavy residue / lighter soils)

1. Before starting, be sure you have the correct quantity and size of drag harrow sections for the machine that is being assembled. The size combinations and mounting location for each section are shown in the Harrow Layout Booklet provided for each machine.
2. Each harrow section may be assembled separately and then positioned behind the cultivator. However these harrow sections are very heavy and awkward to move when completely assembled. You may want to position them behind the cultivator first and then complete the assembly.
3. Lay the 3 or 5 bar harrow sections out behind the cultivator and assemble the offset joiner links and chains according to the diagram below. (see page 8 for 45° Working Angle) Start with the Centre Section first then the do the right and left hand wing sections.

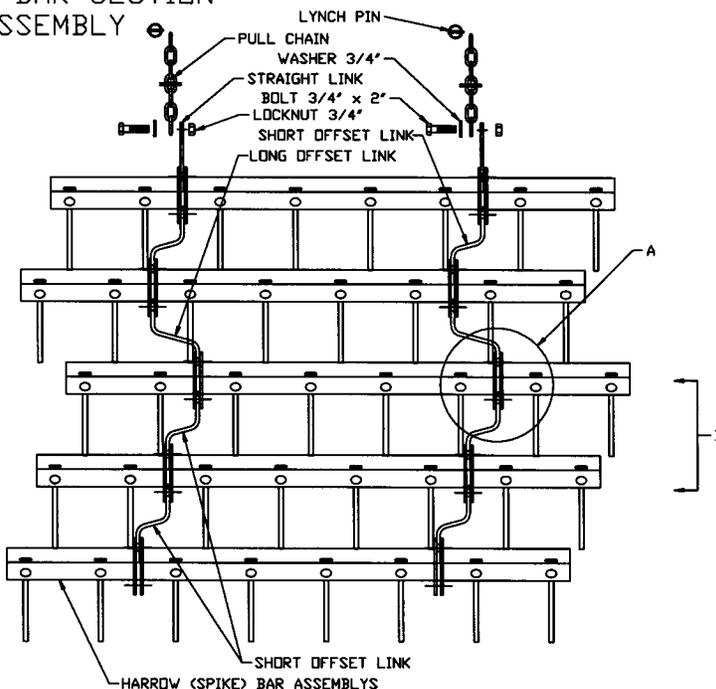
3 BAR SECTION ASSEMBLY



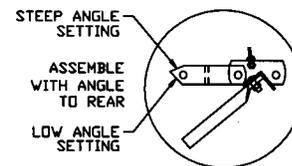
VIEW A



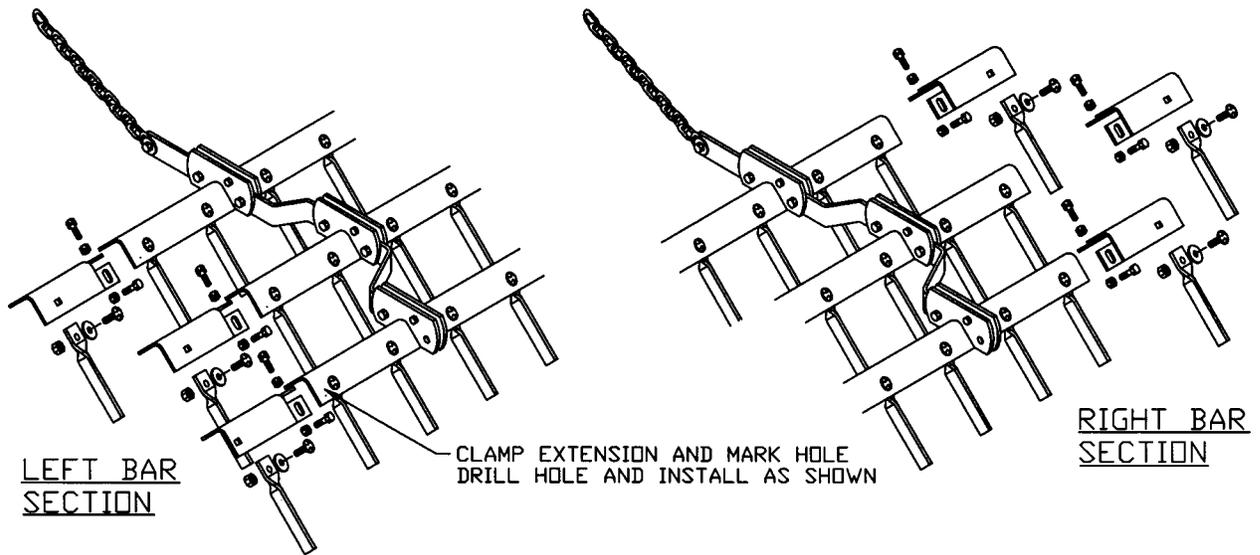
5 BAR SECTION ASSEMBLY



VIEW B

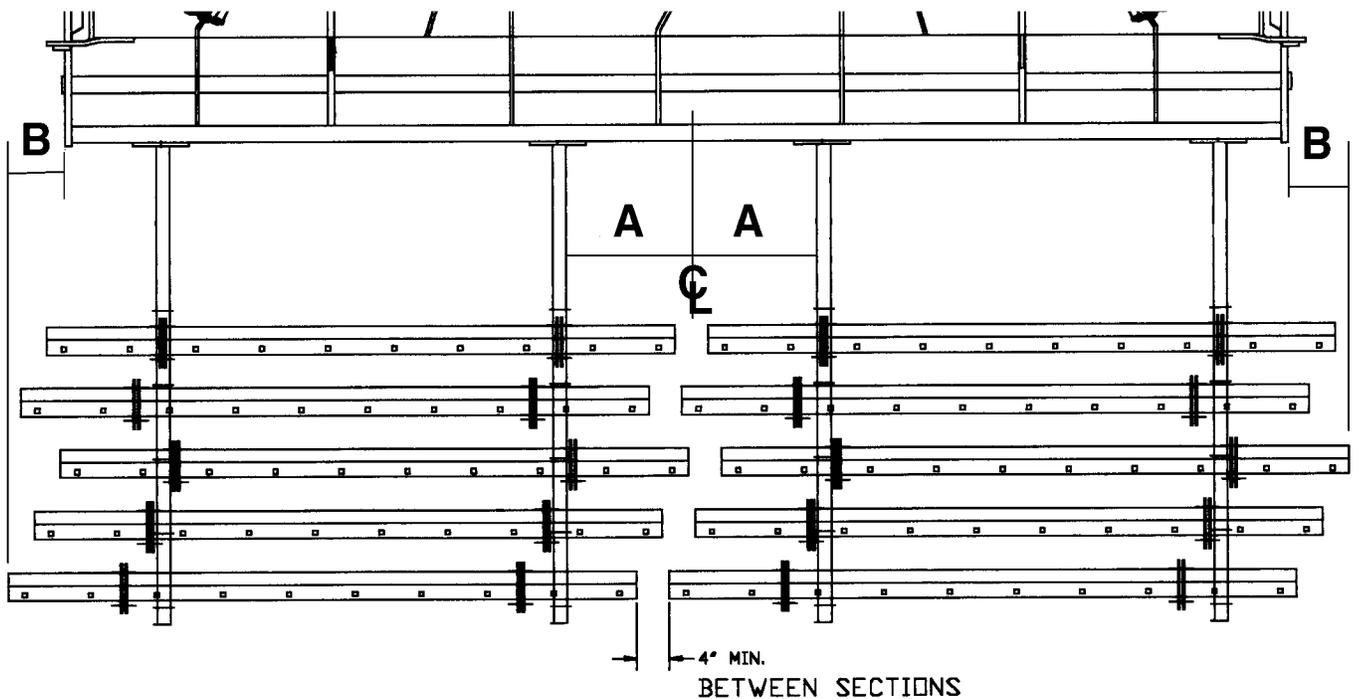


4. **Note:** On some cultivator models you will need to mount a special extension to the ends of the spike bars. Mark the locations for the bolt holes, or clamp the extensions to the spike bar and use them as a guide for drilling. Secure with bolts and locknuts supplied. See detail below.



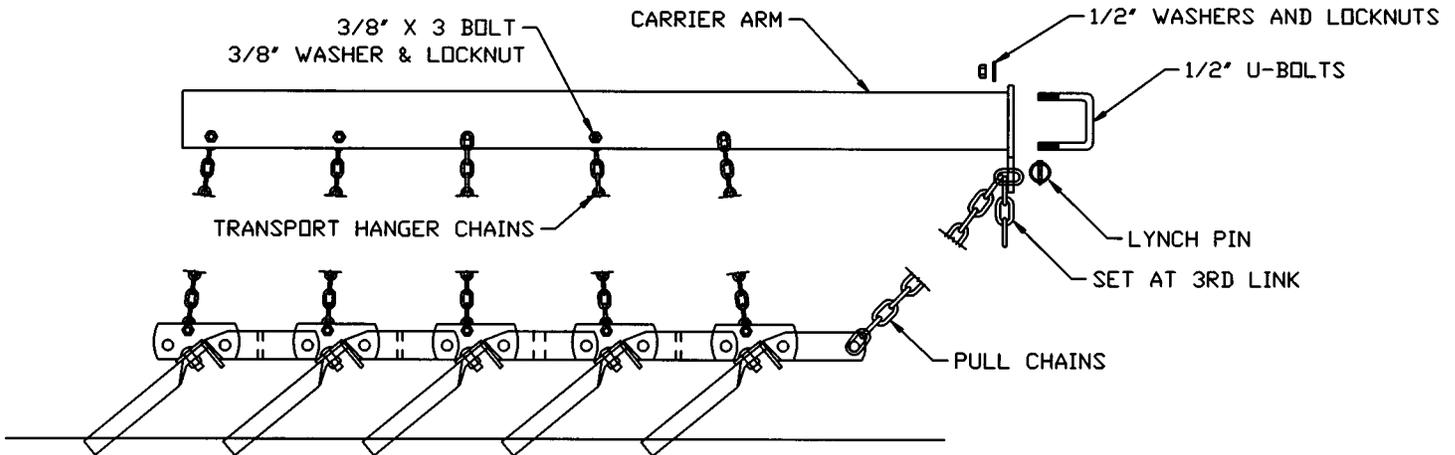
5. Mount the carrier arms to the rear accessory tube of the cultivator centre section with the U-bolts, washers and locknuts provided. Position the arms directly above the chain brackets on the drag harrow assemblies according to the diagram below.

NOTE: It is important to properly centre the drag harrows on the back of the machine so there is equal amount of overlap on both sides of the machine to ensure that it will pull straight in the field. The two centre mounting bracket should be equally spaced ($A=A$) on either side of the Centre Line of the machine, so that the overlap on the outside ($B=B$) is also equal. Therefore, never begin the assembly with the wings, always start in the middle of the machine and work out to the wings.

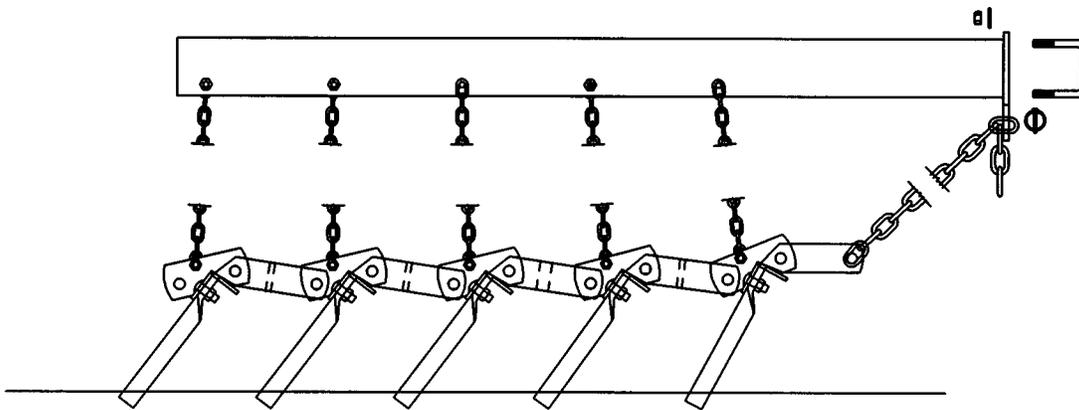


6. Connect the pull chains by inserting a link thru the slot in the plate under the carrier arm and secure with the lynch pin provided. The length of the pull chains may be adjusted as required to obtain optimal levelling and grooming of the soil surface. (see field settings)
7. Connect the transport chains to the carrier arms. Always connect the chain to the side of the carrier arm that is the closest. Be consistent with both arms. The length of these chains may also be adjusted as required to obtain optimal levelling and grooming of the soil surface. (see field settings)

5 BAR SECTION - LOW ANGLE



5 BAR SECTION - STEEP ANGLE



8. Mount the carrier arms and harrow sections to the wings in a similar manner as described in points 4 to 7. NOTE: To avoid interference between the harrow sections there should be a minimum of 4" between the ends of each harrow bar.
9. Ensure that all bolts are tight.

ASSEMBLY INSTRUCTIONS: For Steep 45° Working Angle

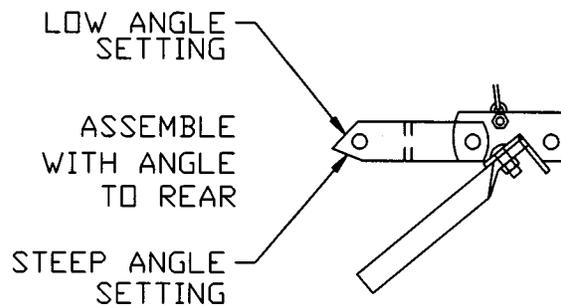
(Breaking lumps & levelling in heavy “buckshot” soils)

The 5 Bar Flex Drag Spike Harrows were initially designed to work at an approximate angle of 30° for levelling in high residue conditions without the adverse effects of other similar type harrows available on the market, (specifically bunching and dumping of residue).

Testing has demonstrated that in some field conditions and soil types a more aggressive working angle on the spikes has improved the breaking ability of the harrow with respect to clods and lumps. However, there may be a trade-off in that the harrow may have a reduced ability to clear residue in some field conditions.

The Straight and Offset Joiner Links for the Flex-Spike Drag Harrows have been sheared with two different angles on the rear end in order to accommodate both working conditions.

See diagram below.



Pre-Assembled Harrows may be changed in the field by disassembling the offset brackets, and then flipping them over and reassembling opposite to the original offset. This modification to the linkages is time consuming but will allow you to change the harrow working angle setting should you find the original set up is not providing the desired results.

NOTE: This modification must be done to all offset linkages to allow for proper re-assembly. (See note 2 below.)

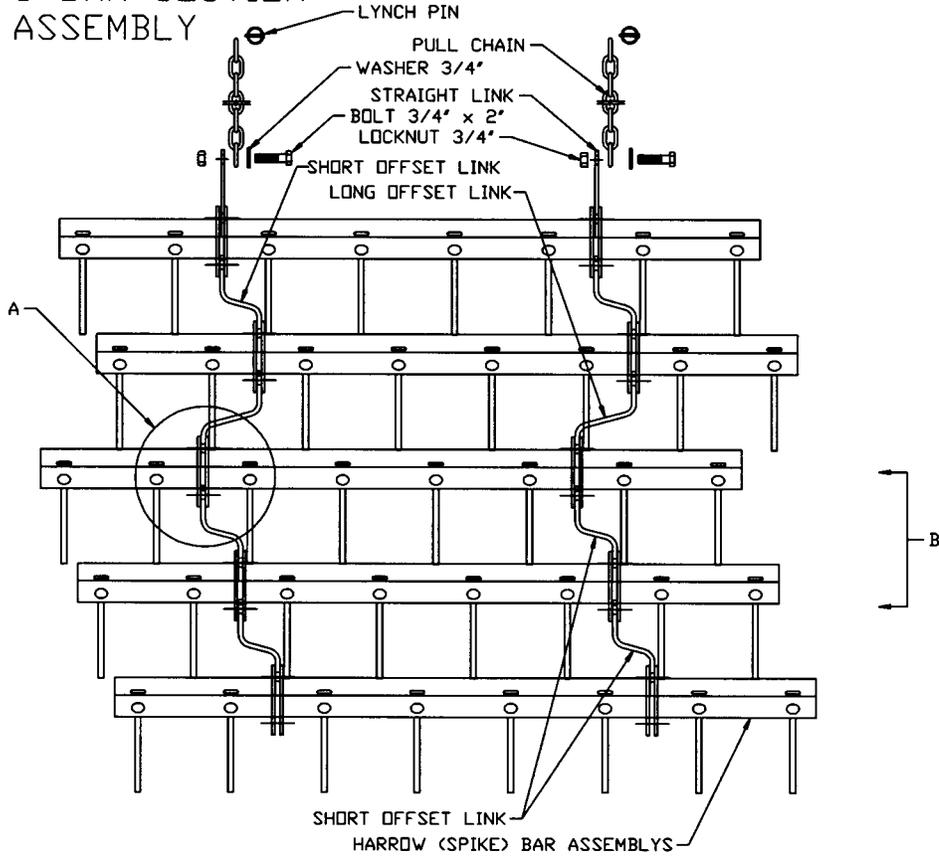
When the links are assembled as shown in the assembly diagrams on page 4 the spikes will be working in a shallow 30° angle .

However if the links are flipped over, as shown in the diagrams on page 8, a steeper and more aggressive working angle of about 45° to 50° is achieved. (See notes 1 & 2 below.)

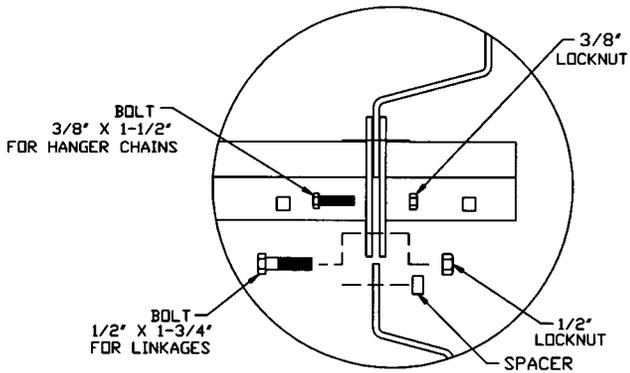
***NOTE 1:** Depending on the angle setting chosen, the harrow bars may be offset in the opposite direction to the diagrams shown in the Harrow Layout Booklets. For example; a right offset joiner link set in the shallow angle position becomes a left offset link when flipped over into the steep angle position.*

***NOTE 2:** All offset brackets must be assembled to work at the same angle; either shallow or steep. You do not have the option to mix one angle setting with another. Therefore on a 5 bar harrow for example, you cannot set the front 3 rows to run at the steep angle and the rear 2 rows to run shallow. All spike bars must work at the same angle to allow for proper spacing between the spikes.*

STEEP ANGLE
5 BAR SECTION
ASSEMBLY

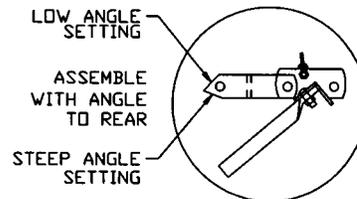


VIEW A

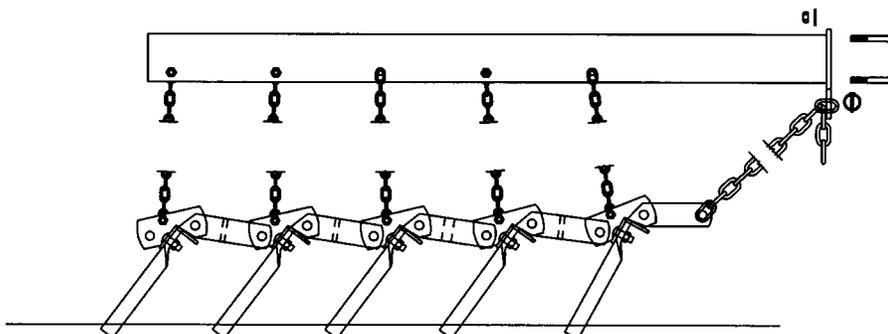


NOTE HOW BARS ARE OFFSET
WHEN LINKS ARE FLIPPED
FOR STEEP OR LOW SETTING

VIEW B



5 BAR SECTION - STEEP ANGLE



ADJUSTMENTS / PRECAUTIONS:

When the assembly of the harrows has been completed check to make sure that the complete assembly appears evenly spaced and centred across the back of the cultivator. If the harrow assembly is not centred you will have to shift the harrow sections as required. Improper centring of the harrows may cause the cultivator to pull crooked in the field.

Check to make sure that the 4" spacing between the drag harrow sections has been maintained. It is important to insure that the spacing between the spikes is maintained to ensure the soil surface is groomed evenly. It is also important that the drag sections have enough clearance between each other so they will not hit each other as they work and move up and down over the surface of the ground.

Check all nuts and bolts and secure if loose.

Take care when folding the cultivator for transport for the first time after completing the assembly. Check to make sure that the harrows do not interfere with other cultivator frame components when folding and unfolding.



DANGER! NEVER STAND OR WORK IN THE AREA BELOW THE WINGS OR UNDER AN UNSUPPORTED CULTIVATOR FRAME.

- a) ALWAYS USE WING LOCK PINS, AND WHEEL CYLINDER TRANSPORT LOCKS.
- b) USE EXTREME CAUTION WHEN WORKING AROUND HEAVY EQUIPMENT.
- c) BLOCK THE WHEELS AND MAKE SURE THAT THE UNIT IS SUPPORTED TO PREVENT IT FROM FALLING BEFORE ATTEMPTING TO MAKE ADJUSTMENTS OR WHEN PERFORMING MAINTENANCE OPERATIONS.

FIELD SETTINGS:

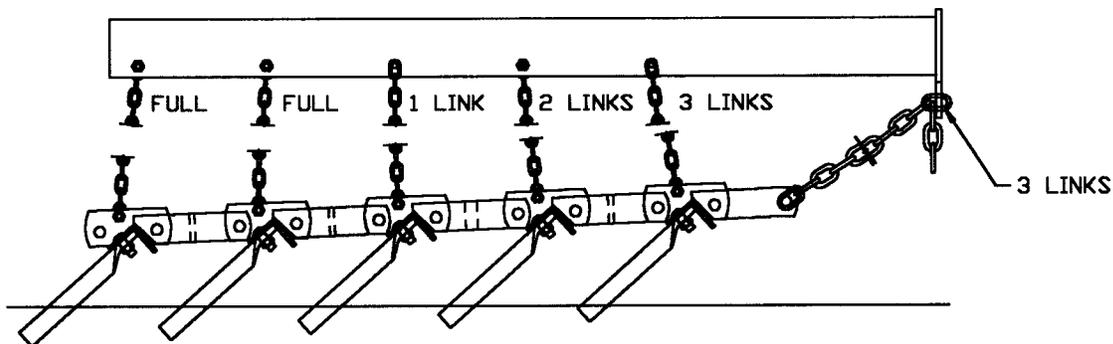
A) The pull chains for the drag harrows may be shortened in order to raise the front bar and therefore increase the working angle of the spikes. This will make the harrow more aggressive but may reduce the ability of the harrow to clear residue in some conditions. This setting will vary depending on working conditions. (See Note C below).

Initially, the 3rd chain link should be inserted thru the slot in the draw bracket and secured with the lynch pin.

B) The transport chains may be shortened to reduce the working depth of the harrow. This will change the working angle of the spikes slightly and the soil will take on a “groomed” appearance. Shortening the chains will also reduce the weight or pressure of the drag harrow on the soil surface that is needed for levelling.

In some situations the hanger chains may be adjusted so that the front 2 chains are shorter than the rear chains. This will make the front 2 rows of spikes higher and more aggressive for breaking lumps, leaving the rear rows of spikes to pull low and flat for levelling the soil.

Some experimentation with the settings A and B above, will be required to obtain the best results for your field conditions



C) **NOTE:** There are many factors that can affect the ability of the harrows to level the soil surface behind the cultivator; Cultivator tine spacing, type of shares (sweeps), cultivating depth, ground speed, direction of travel across the field (angle), soil type, and soil conditions like moisture content and crop residue levels, all have an affect on the quality and levelness of the seed bed. Therefore, do not expect the same settings to work in every case. Be prepared to adapt and adjust your equipment and operating practices to obtain the best results for each field condition.

MAINTENANCE:

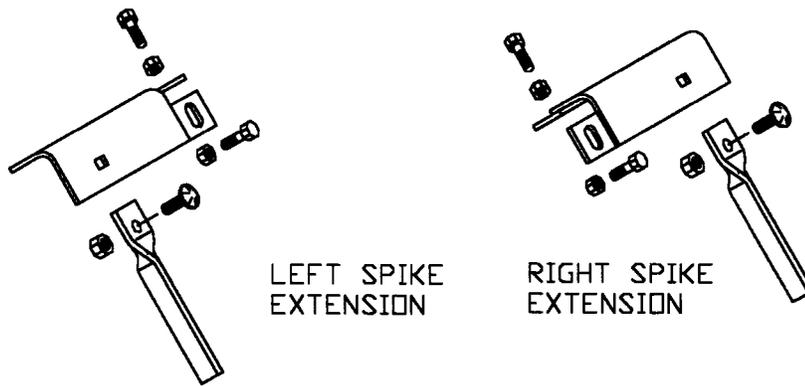
A) Periodically check all nuts and bolts and secure if loose.

B) Periodically check and remove any foreign material that may become tangled in the harrow sections.

C) Always check the condition of your field cultivator and levelling attachments at regular intervals and keep in good repair. Optimal performance cannot be expected of equipment in poor condition.

INSTALLATION ON OTHER CULTIVATORS

Flex Drag-Spike Harrows are available in modular sections of; 2.5', 4', 4.5', 5', and 6.5'. Each of the above sections can be extended 8" on either end with single spike extensions, therefore providing a wide range of working widths when sizing for adaptation to other tillage machines.



An optional Universal OEM Mounting Bracket provides for easy installation on most field cultivators and disc harrows with 2", 2.5", 3", 4" and 5" tubular frames. See diagram below.

