

**McFARLANE**  
MFG. CO.  
INC. *Sauk City, Wisconsin*

MANUFACTURERS OF QUALITY AGRICULTURAL EQUIPMENT SINCE 1936

OPERATOR'S MANUAL  
AND  
PARTS LISTING  
FOR THE

**HDL Series**

16 through 24 Models

VERSION: 4-99TSK

TO THE OWNER AND OPERATORS

Before assembling or operating this unit, READ THIS MANUAL THOROUGHLY. To obtain the best performance of the unit, familiarize yourself with each component and adjustment. Store this manual where it can be readily available for future reference. In the event that the harrow or any part of the unit should be sold, be sure that the new owner receives a copy of this manual for their reference.

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## **INTRODUCTION**

Thank you for purchasing your new McFarlane transport cart and harrow sections. We know that you will get many years of dependable service from this modernly designed unit.

You may have had a particular application in mind when you purchased this unit. There are actually many uses for the McFarlane harrow including incorporation of herbicides and pesticides, leveling and smoothing tilled soil, and covering of broadcast seeds. Contact your dealer if you would like more information or have questions concerning these or other applications.

## **LIMITED WARRANTY**

### **FULL ONE - YEAR WARRANTY OF**

HDL-8 Series  
HDL-44 Series  
Harrow Transport Cart

Models 16 through 22

If within one year from the date of purchase, this transport cart and/or its accompanying harrow sections fail due to defect in material or workmanship, McFarlane Mfg. Co., Inc. will repair it, free of charge.

Warranty service is available by simply contacting the nearest McFarlane dealership throughout the United States or Canada.

This warranty applies only while this product is used in the United States or Canada.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

McFarlane Mfg. Co., Inc., Sauk City, Wisconsin 53583

## **SAFETY**

TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY AND THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.



THIS SYMBOL MEANS

- **ATTENTION!**
- **BECOME ALERT!**
- **YOUR SAFETY IS INVOLVED!**

### **SIGNAL WORDS:**

Note the use of the signal words DANGER, WARNING, and CAUTION with the safety messages. The appropriate signal word for each has been selected using the following guidelines:

**DANGER:** Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

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

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

## CONTACT INFORMATION

If you have questions not answered in this manual, require additional copies, or the manual is damaged, please contact your local dealer or:

McFarlane Mfg. Co., Inc.  
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## **SAFETY FIRST!**



### **Equipment Safety Guidelines**

Safety of the operator is one of the main concerns in designing and developing a new piece of equipment. Designers and manufacturers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions. To avoid personal injury, study the following precautions and insist that those working with you, or for you, follow them.

Replace any CAUTION, WARNING, DANGER, or instruction safety decal that is not readable or missing.

Do not attempt to operate this equipment under the influence of drugs or alcohol.

Review the safety instructions with all users annually.

This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible adult familiar with farm machinery and trained in this equipment's operations. **Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how it works.**

To prevent injury, use a tractor equipped with a Roll Over Protective System (ROPS). Do not paint over, remove, or deface any safety signs or warning decals on your equipment. Observe all safety signs and practice the instructions on them.

Never exceed the limits of the transport cart or the harrows. If their ability to do a job, or to do so safely, is in question - **DO NOT TRY IT.**



### **Lighting and Marking**

It is the responsibility of the customer to know the lighting and marking requirements of the local highway authorities and to install and maintain the equipment to provide compliance with the regulations. Add extra lights when transporting at night or during periods of limited visibility.

Lighting kits are available from your dealer.



### **Safety Sign Care**

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or have become illegible.
- Replacement parts that display a safety sign should display the same sign.
- Safety signs are available from your Distributor, Dealer Parts Department, or the factory.

How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Decide on the exact position before you remove the backing paper.



### **Tire Safety**

- Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.
- Do not attempt to mount tires unless you have the proper equipment and experience to do the job.
- Inflating or servicing tires can be dangerous. Whenever possible, trained personnel should be called to service and/or mount tires.
- Always order and install tires and wheels with appropriate capacity to meet or exceed the weight of the unit. Be sure to inflate tires to tire manufacturer's specifications
- Tires that are provided by the manufacturer are designed for speeds LESS THAN 20mph. Do Not exceed or tire failure will occur.



### **Remember:**

**Your best assurance against accidents is a careful and responsible operator. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer.**



### **Before Operation:**

- Carefully study and understand this manual.
- Do not wear loose fitting clothing which may catch in moving parts.
- Always wear protective clothing and substantial shoes.
- It is recommended that suitable protective hearing and (eye protection) sight protectors be worn.
- Keep wheel lug nuts or bolts tightened.
- Assure that the tires are inflated evenly.
- Give the unit a visual inspection for any loose bolts, worn parts, or cracked welds, and make necessary repairs. Follow the maintenance safety instructions included in this manual.
- Before using the hydraulics on the cart, be sure all fittings and connections are tight.
- Be sure that there are no tools lying on the unit.
- Make sure that the area is clear of children, animals, and other obstacles before using.
- Don't hurry the learning process or take the unit for granted. Ease into it and become familiar with your new equipment. Practice operation of your new unit. Completely familiarize yourself and other operators with its operation before using.

- Securely attach to towing unit. Use a high strength, appropriately sized hitch pin with a mechanical retainer and attach safety chain.
- Do not allow anyone to stand between the tongue or hitch and the towing vehicle when backing up to the equipment.



### **During Operation:**

- **SAFETY CHAIN** - If equipment is going to be transported on a public highway, a safety chain should be obtained and installed. Always follow state and local regulations regarding a safety chain when towing farm equipment on a public highway. Be sure to check with local law enforcement agencies for your own particular regulations. Only a safety chain (not an elastic or nylon/plastic tow strap) should be used to retain the connection between the towing and towed machines in the event of separation of the primary attaching system.
- Install the safety chain by crossing the chains under the tongue and secure to the draw bar cage or hitch or bumper frame.
- Beware of bystanders, **particularly children!** Always look around to make sure that it is safe to start the engine of the towing vehicle or move the unit. This is particularly important with higher noise levels and quiet cabs, as you may not hear people shouting.
- **NO PASSENGERS ALLOWED** - Do not carry passengers anywhere on, or in, the tractor or equipment, except as required for operation.
- Keep hands and clothing clear of moving parts.
- Do not clean, lubricate, or adjust your equipment while it is moving.
- When altering operation, even periodically, set the tractor or towing vehicle brakes, shut off the engine, and **remove the ignition key.**
- Do not operate the hydraulic cylinders without the flow restrictors installed; the free falling harrow sections may cause serious injury.
- Pick the levellest possible route when transporting across fields. Avoid the edges of ditches or gullies and steep hillsides.
- Periodically clear the equipment of brush, twigs, or other materials to prevent buildup of dry combustible materials.
- Maneuver the tractor or towing vehicle at safe speeds.
- Avoid overhead wires or other obstacles. Contact with overhead lines could cause serious injury or death.
- Allow for unit length when making turns.
- Do not walk or work under raised wings unless securely positioned in wing rests.
- Keep all bystanders, pets, and livestock clear of the work area, particularly when raising or lowering harrow sections.
- Operate the towing vehicle from the operator's seat only.
- As a precaution, always recheck the hardware on equipment periodically. Correct all problems. Follow the maintenance safety procedures.





### **Following Operation:**

- When disconnecting, stop the tractor or towing vehicle, set the brakes, secure the wings in the wing rests, relieve hydraulic fluid pressure, shut off the engine and **remove the ignition keys**. Make sure all jack and support stands are in place before removing hitch pins.
- Store the unit in an area away from human activity on a hard level surface.
- Do not park equipment where it will be exposed to livestock for long periods of time. Damage and livestock injury could result.
- Do not permit children to play on or around the stored unit.



### **Highway and Transport Operations:**

- Make sure all transport lock provisions are in place and jack/parking stands are in their storage position before transporting the unit.
- Adopt safe driving practices:
  - Keep the brake pedals latched together at all times. **NEVER USE INDEPENDENT BRAKING WITH MACHINE IN TOW AS LOSS OF CONTROL AND/OR UPSET OF UNIT MAY RESULT.**
  - Always drive at a safe speed relative to local conditions and ensure that your speed is low enough for an emergency stop to be safe and secure. Keep speed to a minimum.
  - Reduce speed prior to turns to avoid the risk of overturning.
  - Avoid sudden uphill turns on steep slopes.
  - Always keep the tractor or towing vehicle in gear to provide engine braking when going downhill. Do not coast.
  - Do not drink and drive!
- Comply with state and local laws governing highway safety and movement of farm machinery on public roads.
- Use approved accessory lighting flags and necessary warning devices to protect operators of other vehicles on the highway during daylight and nighttime transport. Various safety lights and devices are available from your dealer.
- The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use. Local laws should be checked for all highway lighting and marking requirements.
- When driving the tractor and equipment on the road or highway under 20 mph at night or driving during the day, use flashing amber warning lights and a slow moving vehicle (SMV) identification emblem.
- Remember, tires supplied by the manufacturer are designed to operate LESS THAN 20mph. Do Not exceed or tire failure will occur.
- Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc. Plan your route to avoid heavy traffic.

- Be observant of bridge loading ratings. Do not cross bridges rated lower than the gross weight at which you are operating.
- Watch for obstructions overhead and to the side while transporting.
- Always operate equipment in a position to provide maximum visibility at all times. Make allowances for increased length and weight of the equipment when making turns, stopping, etc.



### **Performing Maintenance:**

- Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.
- Before working on this machine, stop the tractor or towing vehicle, set the brakes, lower into field position, relieve the hydraulic fluid pressure, shut off the engine and **remove the ignition keys**.
- **Always** use safety support and block the wheels. When performing maintenance, never use a jack to support the machine. Assist the jack with blocks or other adequate support.
- Use extreme caution when making adjustments.
- When disconnecting hydraulic lines, shut off hydraulic supply and relieve all pressure.
- Never use hands to locate a hydraulic leak on attachments. Use a piece of cardboard or wood. Hydraulic fluid escaping under pressure can penetrate the skin.
- Openings in the skin and minor cuts are susceptible to infection from hydraulic fluid. **If injured by escaping hydraulic fluid, see a doctor at once. Gangrene can result. Without immediate medical treatment, serious infection and reactions can occur.**
- When installing, replacing, or repairing hydraulic system cylinders or parts, make sure that the entire system is charged and free of air before resuming operations. Failure to bleed the system of all air can result in improper machine operation, causing severe injury.
- After servicing, be sure all tools, parts, and service equipment are removed.
- Never replace hex bolts with less than grade five bolts unless otherwise specified.
- Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not claim responsibility for damages as a result of the use of unapproved parts and/or accessories.
- If equipment has been altered in any way from original design, the manufacturer does not accept any liability for injury or warranty.

## **MAINTENANCE AND SERVICE SCHEDULE**

- Prior to each use, check for loose bolts and replace lost or worn parts.
- Grease hinge pins before each use when necessary.  
Note: Clean grease fittings and replace those that are broken or missing.
- Inspect and repack wheel bearings at the beginning of each year.
- Remove dirt and debris from the harrow sections before storage.
- Parts diagrams and listings for service and repair references may be found in appendix B.

## **OPERATING SUGGESTIONS**

There are some important points to remember in order to obtain the best possible results from your McFarlane harrow.

- To maximize the harrow's performance, it should be towed at speeds ranging from six to nine (6 - 9) mph. This keeps the field debris moving through the harrow sections and avoids clogging. The best results will be obtained after the paint has been scoured from the teeth.
- Choose the angle of attack of the harrow teeth based on field conditions. For more information see the section titled Angle of Attack.
- Getting the unit ready for transport includes the following steps:
  1. Rotate the harrow sections up.
  2. Swing the wings forward and lock them into the wing rests.
  3. Rotate the wing wheel tires so they are clear of the ground. When looking at the end of the wing, they should be up and towards the center of the unit.
  4. Wrap the wing cables around the harrow sections so they don't drag on the ground.
- Getting the unit ready for field use includes the following steps:
  1. Rotate the wing wheel tires back to the field position.
  2. Unlock the wings from the wing rests and swing the wings out.
  3. Rotate the harrow sections down.
- If the wing cables are not tight, adjust the bracket on the wing outward to tighten them. Follow the instructions in the section titled Attach the Wing Cables.

## ASSEMBLY SUGGESTIONS

- You will find the machine is easier to assemble if the set-up instructions are followed in the order given in the manual.
- Before beginning, sort the various bolt bags, hardware bags and hydraulic bags according to what part of the unit that is being setup. Refer to the end of the parts listing in appendix B. Only open the bag or bags that are required as the setup instructions are followed.
- Whenever the terms “left” and “right” are used, it should be understood to mean when standing behind and facing the unit. This is also known as the “driver’s left” and the “driver’s right.”
- The term “field position” refers to the position the harrows are in when the unit is being used in the field - that is, with the wings out and the harrow sections down.
- The term “transport position” refers to the position the harrows would be in when the unit is being transported from place to place - that is, with the harrows up and the wings folded and secured in the wing rests.
- When assembling this unit, make sure that the parts are securely held before proceeding to the next step.
- Bolt torque specifications are given in appendix A.
- The cart requires an ASAE 4” x 8” dual acting, agricultural grade hydraulic cylinder on the main frame, and 1/2” hydraulic hoses. It is not recommended that other size cylinders or hoses be substituted. The hydraulics are NOT supplied with this transport cart. Only the 1/2” hydraulic flow restrictor is provided.
- A dual acting hydraulics supply is required. The unit is designed for the standard ASAE pressure of 1500 psi.
- Tire requirements are also listed in the parts listing in appendix B.
- Layout diagrams for each unit may be found in appendix C. Mark the page with the diagram that refers to your unit, it will be referred to periodically throughout the manual.

## STEP - BY - STEP ASSEMBLY INSTRUCTIONS

### Main Frame Assembly

1. Determine the desired track width. Unless the unit is going to be used for row crop work, the manufacturer recommends the 80" spacing. (The HDL-16 *must* use the 65" spacing.)
2. Bolt the axle assemblies in position. Use 1/2" x 4" bolts, lock washers, and hex nuts. Refer to Figure 1. Note the location of the spindle is below the axle assembly tube.

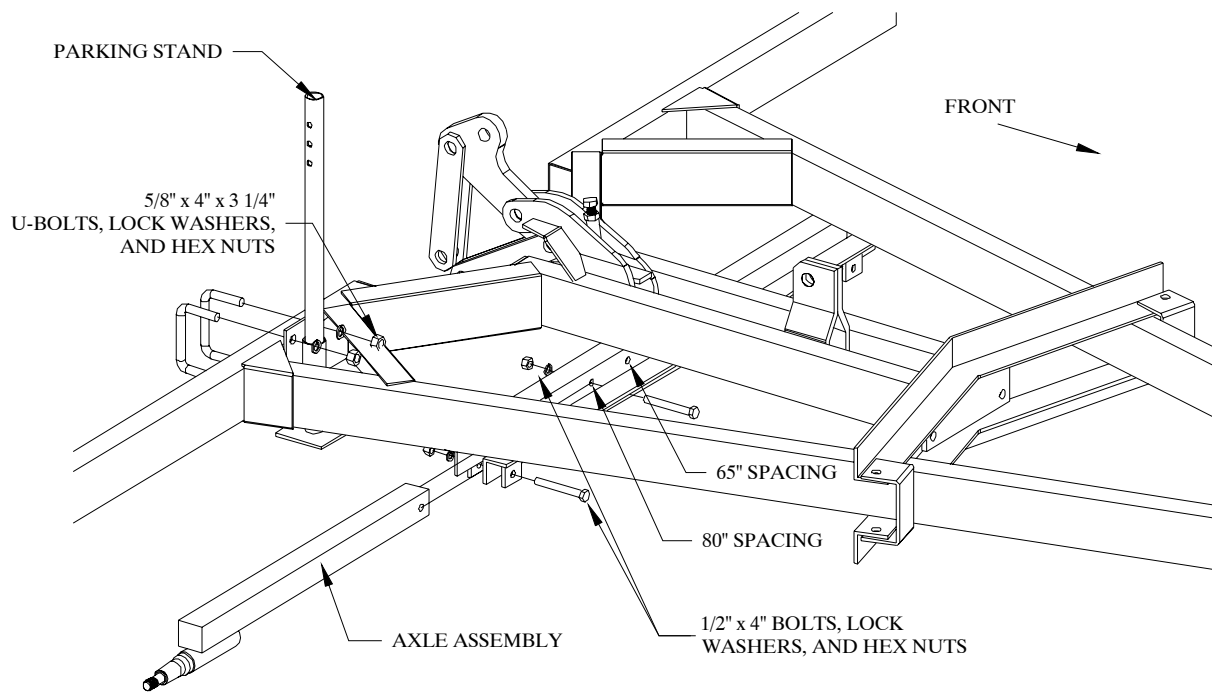
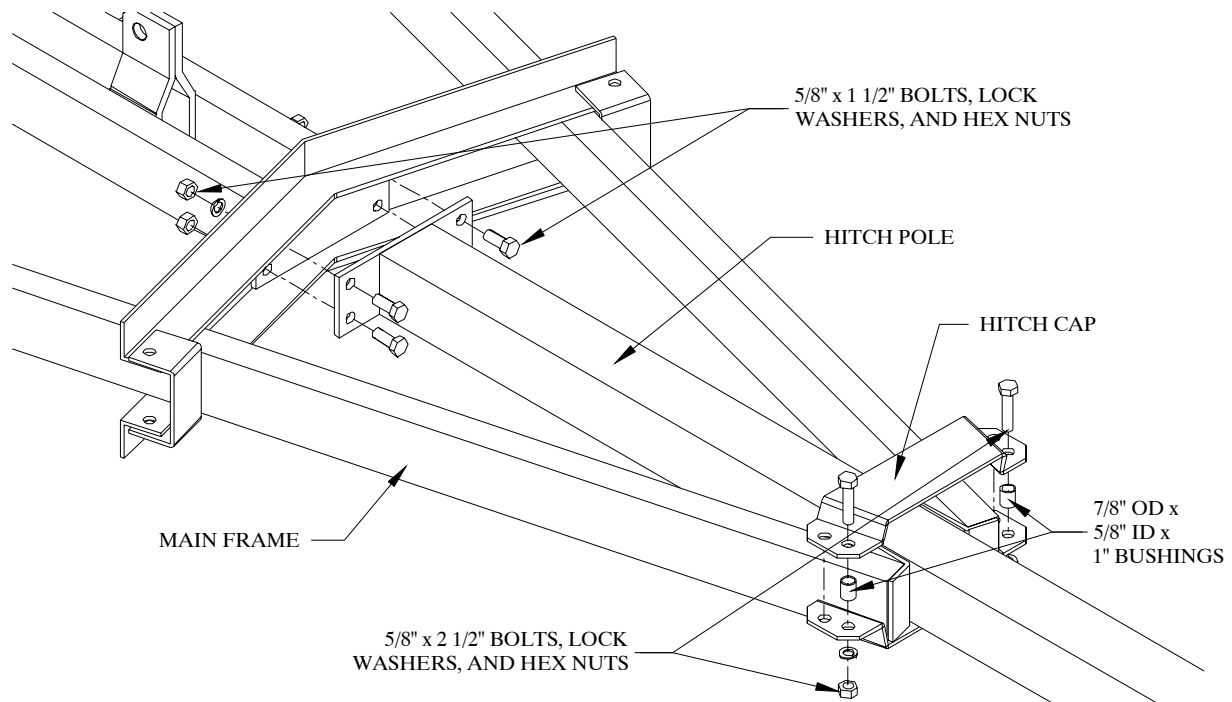


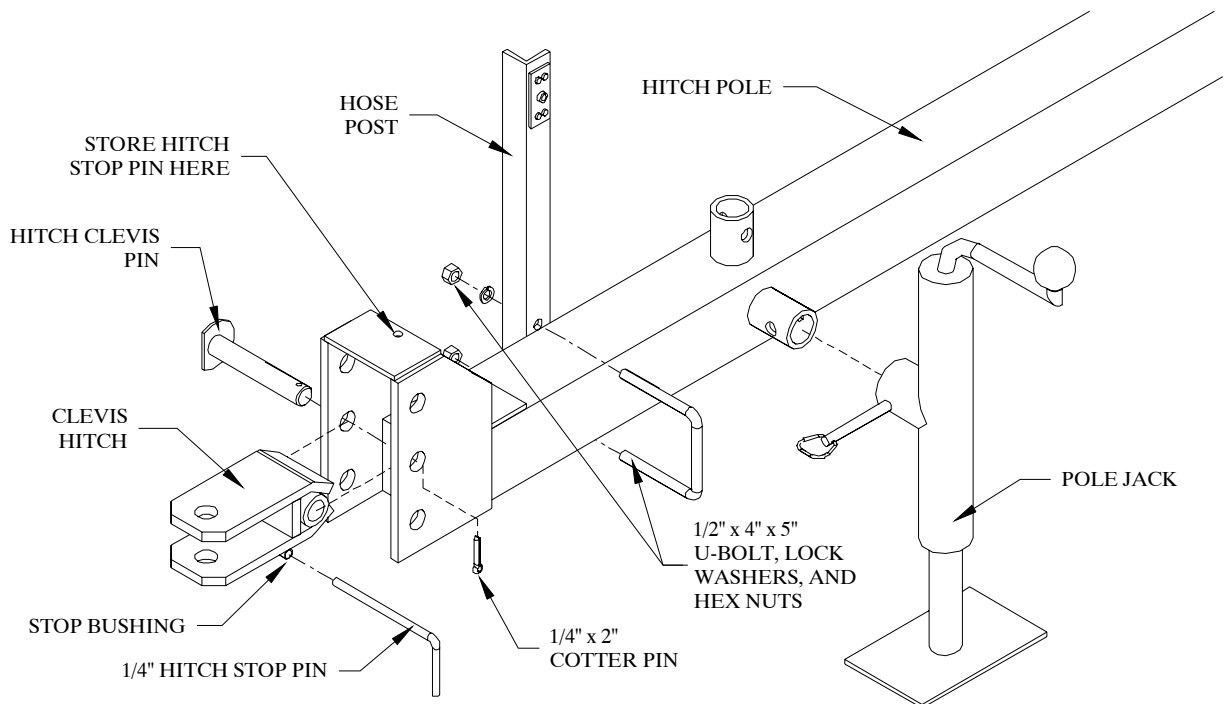
Figure 1

3. Mount the tires on the rims and the wheels on the hubs.
4. Attach the rear parking stand to the rear cross channel at the rear of the main frame with two 5/8" x 4" x 3 1/4" U-bolts, lock washers, and hex nuts. Refer to Figure 1.
5. Place the hitch pole inside the main frame as shown in Figure 2 and bolt the rear of the pole to the frame with four 5/8" x 1 1/2" hex bolts, lock washers, and hex nuts. Be sure the hitch head is oriented as shown in Figure 3.
6. Place the hitch cap over the hitch pole with two 7/8" OD x 5/8" ID x 1" bushings between the plates at the front two holes. Refer to Figure 2. Fasten the hitch cap with two 5/8" x 2 1/2" bolts, lock washers, and hex nuts in the front two holes. Do *not* completely tighten the bolts yet.
7. Attach the pole jack to the hitch pole. Refer to Figure 3. A round tubular stud is welded to the side of the hitch pole. A matching tubular stud on the jack fits over the first stud. The jack is held in place with the hitch pin that is attached to the jack.



**Figure 2**

8. Attach the hose post to the hitch pole ahead of the jack. Refer to Figure 3. The post is fastened with a 1/2" x 4" x 5" U-bolt, lock washers, and hex nuts.



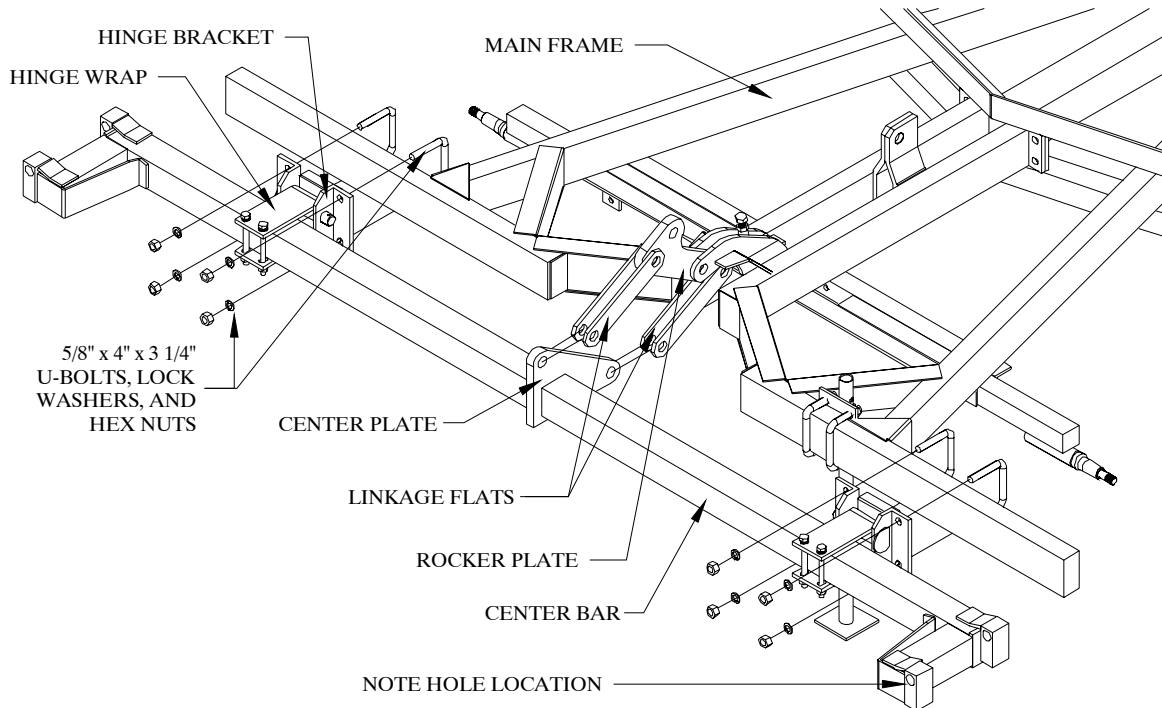
**Figure 3**

9. Attach the clevis hitch to the hitch pole using a 1" x 5 5/8" clevis pin. Be sure the stop bushing on the clevis is facing down. Secure the pin in place using a 1/4" x 2" cotter pin. Use the 1/4" stop pin to hold the clevis hitch upright when hooking to the towing vehicle; store it in the hole in the hitch head.

## Attach the Center Bar Assembly

The center bar, hinge wraps, and the hinge brackets are pre-assembled at the factory for easier field assembly.

1. Hold the assembly against the rear cross bars of the main frame and clamp in place with four 5/8" x 4" x 3 1/4" U-bolts, lock washers, and hex nuts. Because further alignment may be necessary, do *not* completely tighten the U-bolts yet. Be sure that the center bar assembly is centered on the main frame and that the holes in the hinges at the ends of the assembly are towards the top. Refer to Figure 4.



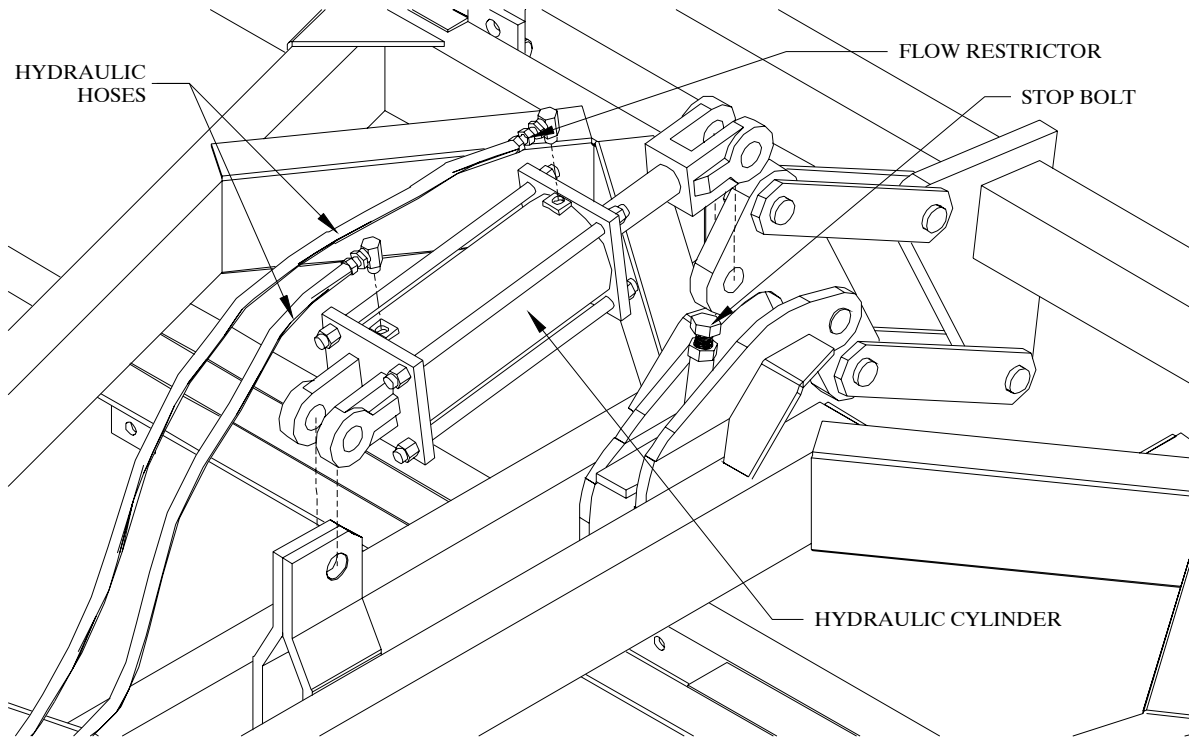
**Figure 4**

2. Attach the rocker plate to the center bar. The linkage flats and rocker plate come attached to the main frame from the factory. The required clevis pins are already in the linkage flats so all that is necessary to complete the connection is to remove the pins from the free ends of the linkage flats and pin them to the center plate on the center bar as shown above.
3. Rotate the completed assembly to assure that all of the parts are properly aligned. If so, tighten the U-bolts on the hinges.

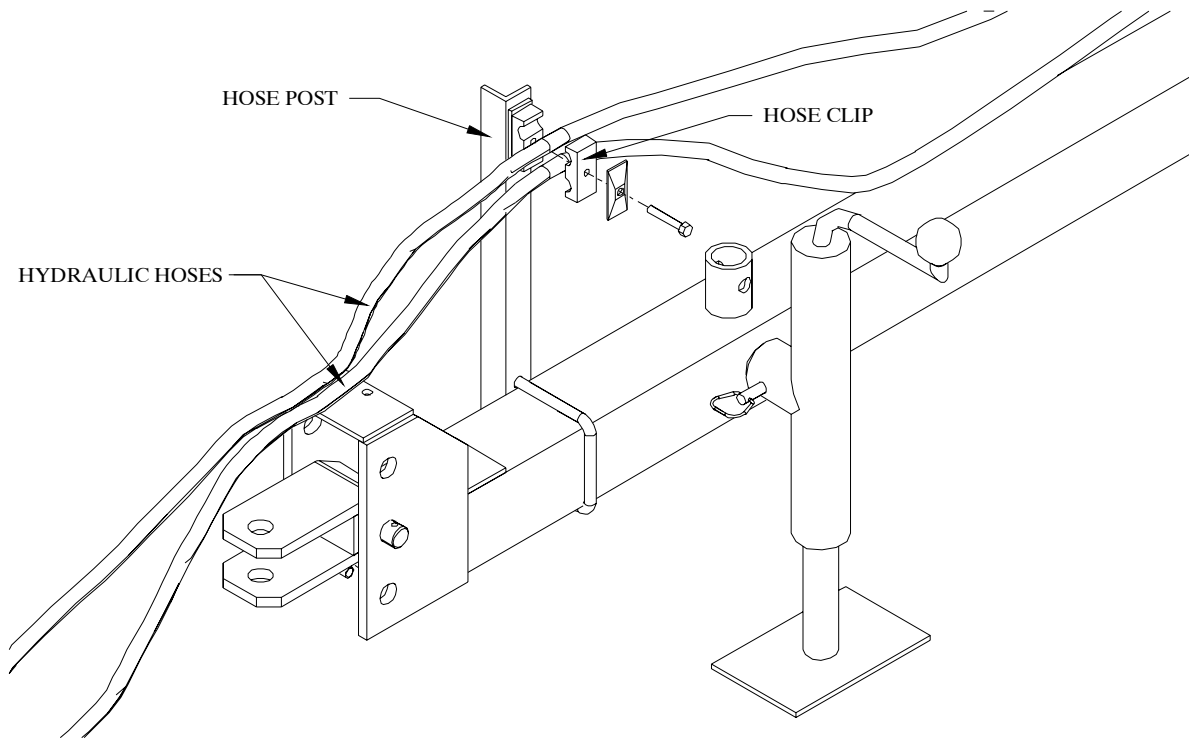
## Install the Hydraulics

Assemble the hydraulic system as shown in Figures 5 and 6.

- The flow restrictor is the only component of the hydraulic system which is included with your harrow. The restrictor *must* be installed before operating the hydraulics.



**Figure 5**



**Figure 6**

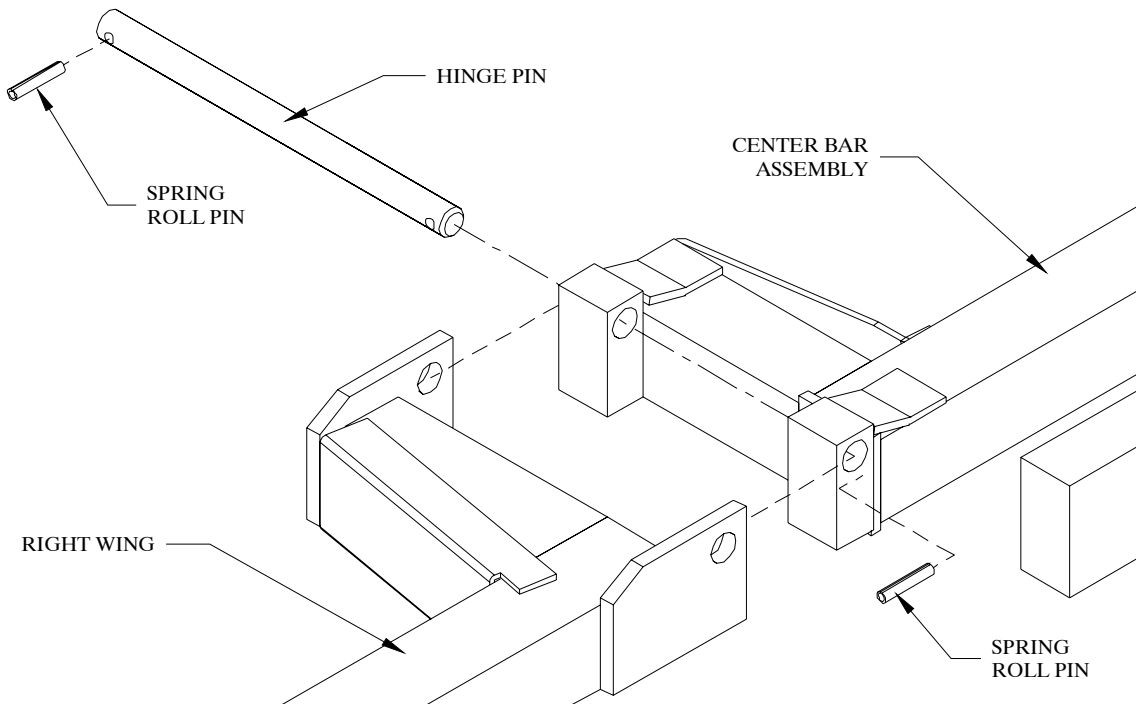
Before further assembly, the hydraulic system must be filled with oil. Attach the unit to a tractor and connect the hydraulic lines. Using hydraulic controls, rotate the center bar several times to fill the cylinder and hoses with oil.



The remainder of the assembly steps (except the wing cable attachment) can be done in either the transport or field position. Because most people will assemble the unit in the field position (and it is recommended that you do), the following diagrams show the unit in the field position.

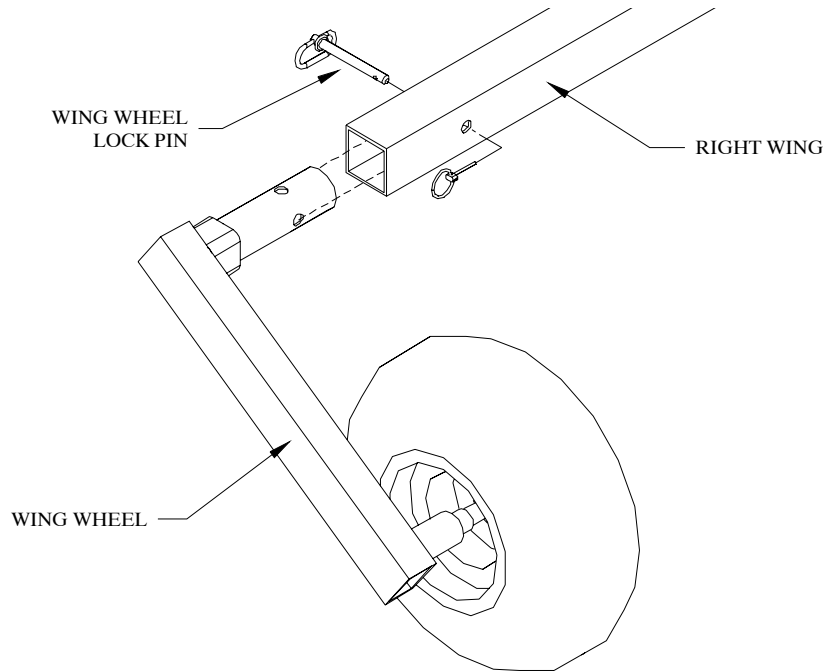
### Wing Assembly

The left and right wings can be identified by inspecting the hinges. Notice in Figure 7 that the hinge point is not centered, but rather is towards the top of the hinge and is nearly in line with the top edge of the center bar assembly. Figure 7 is a representation of the unit in the field position.



**Figure 7**

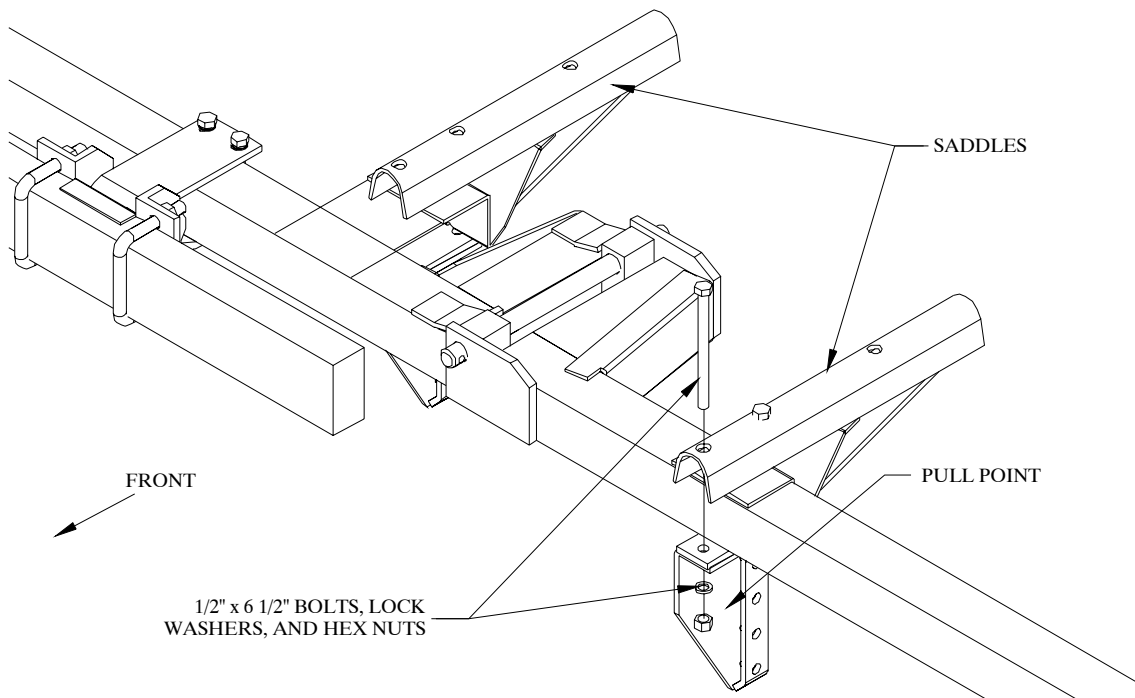
1. Remove all dirt and debris from one of the hinge pins, and the hinge blocks on the right side of the center bar. Press a 3/8" x 2" spring roll pin into one end of the hinge pin. Lightly grease the hinge pin and the hinge blocks. Lift the right wing assembly to align the hinge and slide the hinge pin from the back into the hinge blocks until the inserted spring roll pin rests between the two small blocks that are welded to the back surface of the wing hinge plate (not shown in the figure). Press the second spring roll pin into the other end of the hinge pin. Grease the hinge thoroughly through the grease fittings on the hinge blocks. Check the movement of the wing to assure that it moves freely.
2. Attach the other wing assembly.
3. Mount the wing wheels on the wing wheel brackets. Refer to Figure 8.
4. Insert the wing wheel assemblies (they have been labeled 'L' for left and 'R' for right) into the ends of the wing tubes until the holes for the wing wheel lock pins align. Insert the wing wheel lock pins and lock the wing wheel assemblies into place.



**Figure 8**

**Assemble the Saddles and Pull Points**

1. Refer to the diagrams in appendix C. Note the dimensions for saddle locations. Place a mark on the center bar and wings at the locations of each of the saddles. These dimensions may have to be adjusted slightly later when the wing cables are mounted.



**Figure 9**

2. Center a saddle on each of the saddle location marks that you put on the wing and center bar tubes in the previous step. Refer to Figure 9. Insert two  $\frac{1}{2}$ " x  $6\frac{1}{2}$ " bolts through each of the saddles so as to straddle the tubes. Slide the pull points onto the bolts from the back side and bolt them in the place with  $\frac{1}{2}$ " lock washers and hex nuts.

### Attach the Wing Cables

At this point there should still be two holes available between the hitch caps (refer to Figure 10).

1. Insert  $\frac{7}{8}$ " OD x  $\frac{5}{8}$ " ID x 1" bushings into the ends of the wing cables and bolt them between the hitch caps. Refer to Figure 10. Use a  $\frac{5}{8}$ " x  $2\frac{1}{2}$ " bolt, lock washer, and hex nut. Tighten all four of the  $\frac{5}{8}$ " bolts on the hitch cap.

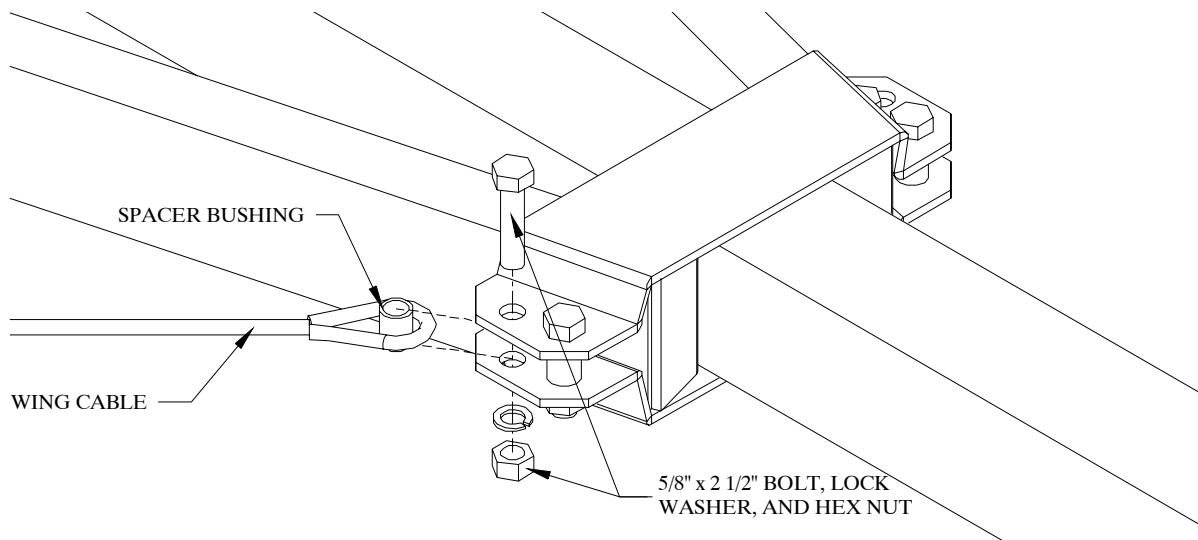
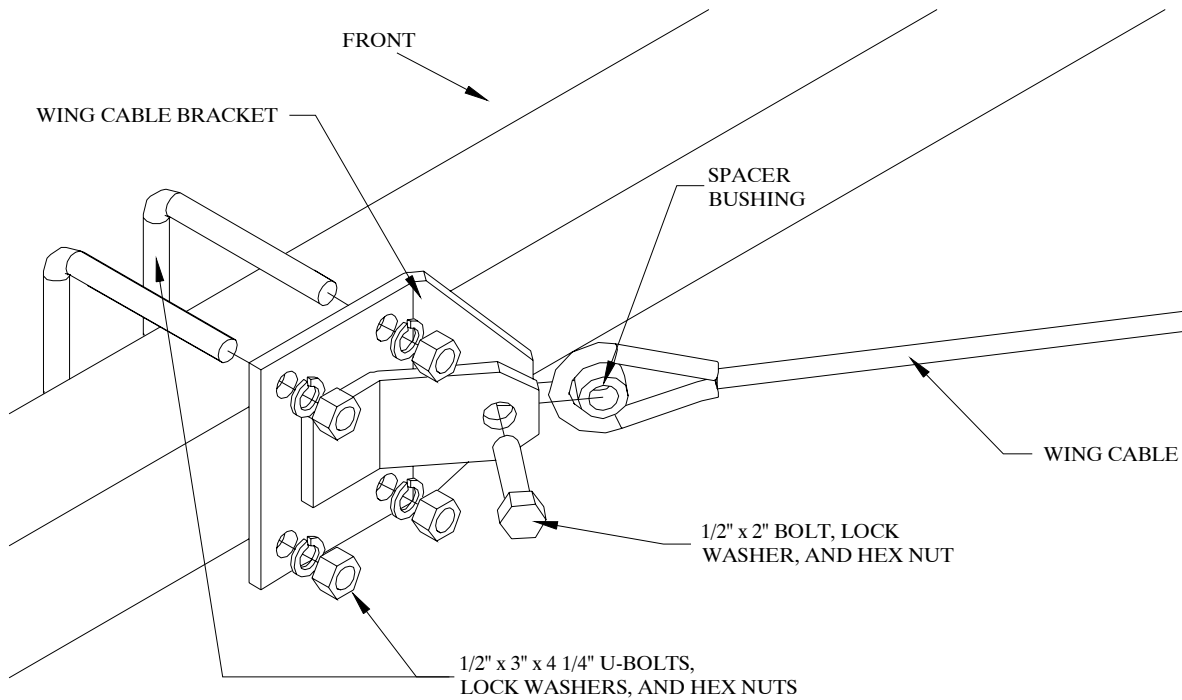


Figure 10

The remainder of the assembly is much easier if you have enough room to open both wings. We suggest that you hook the unit to a tractor with a hydraulic supply and move the unit to a large, flat area.

**For the following two steps, the unit must be in the field position:** swing the wings out and rotate the center bar and wings down.

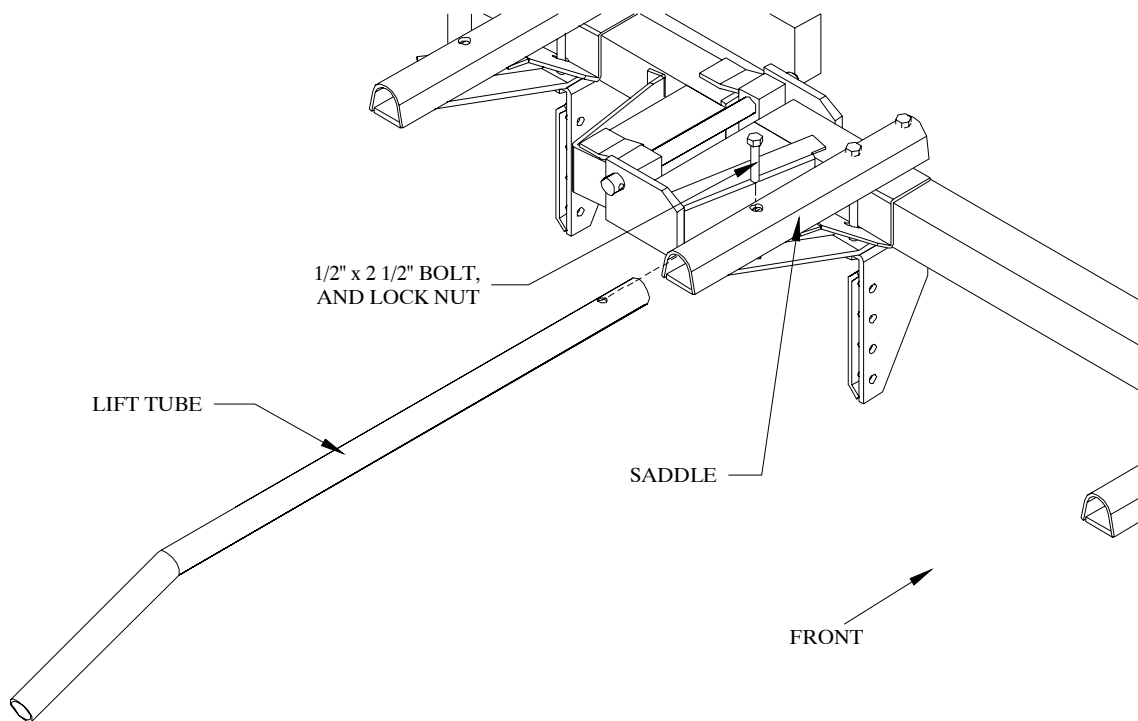
2. Bolt the wing cable brackets to the free end of the wing cables. Refer to Figure 11. Place one of the  $\frac{17}{32}$ " ID x  $\frac{15}{16}$ " OD x  $\frac{9}{16}$ " spacer bushings into the free ends of the wing cables, then bolt the wing cables to the wing cable brackets using  $\frac{1}{2}$ " x 2" bolts, lock washers, and hex nuts.
3. Use two  $\frac{1}{2}$ " x 3" x  $4\frac{1}{4}$ " U-bolts to clamp the wing cable brackets to the wings. Pull the cables tight by sliding the bracket outward until the wings line up with the center bar. Tighten the U-bolts.



**Figure 11**

**Install the Lift Tubes**

Insert a lift tube into each of the saddles. Refer to Figure 12. The bend in the lift tube should be to the rear, facing downward. Bolt the tubes in place using  $\frac{1}{2}$ " x  $2\frac{1}{2}$ " bolts and lock nuts.



**Figure 12**

## Harrow Configurations

McFarlane harrow sections may be attached in one of two distinct configurations: 8-bar and 4+4-bar. The 8-bar harrow configuration utilizes a single set of pull points (already installed) located adjacent to the center bar and wings. The 4+4-bar harrow configuration also utilizes a second set of pull points located at the rear end of the lift arms. Persons assembling an 8-bar harrow should **ignore** the instructions in *italics* describing the attachment of the rear pull points. Those assembly a 4+4-bar harrow should be sure to **follow** the instructions for attaching the rear pull points in *italics*.

### Attach the Rear Pull Points

*Note that the pull points consist of two assemblies: one right hand and one left hand.*

*Attach a rear pull point to the end of each lift arm. Refer to Figure 13. Secure the pull point with a 1/2" x 3" bolt, lock washer, and hex nut through the hole in the lift arm, and a 1/2" x 1 1/2" bolt, lock washer, and hex nut through the hole immediately below the lift arm.*

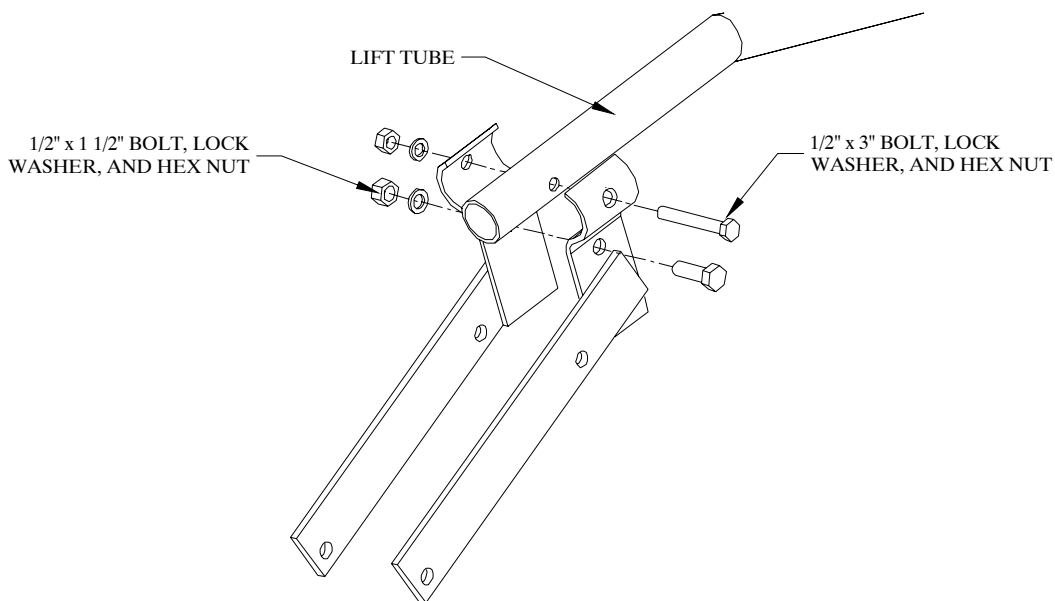


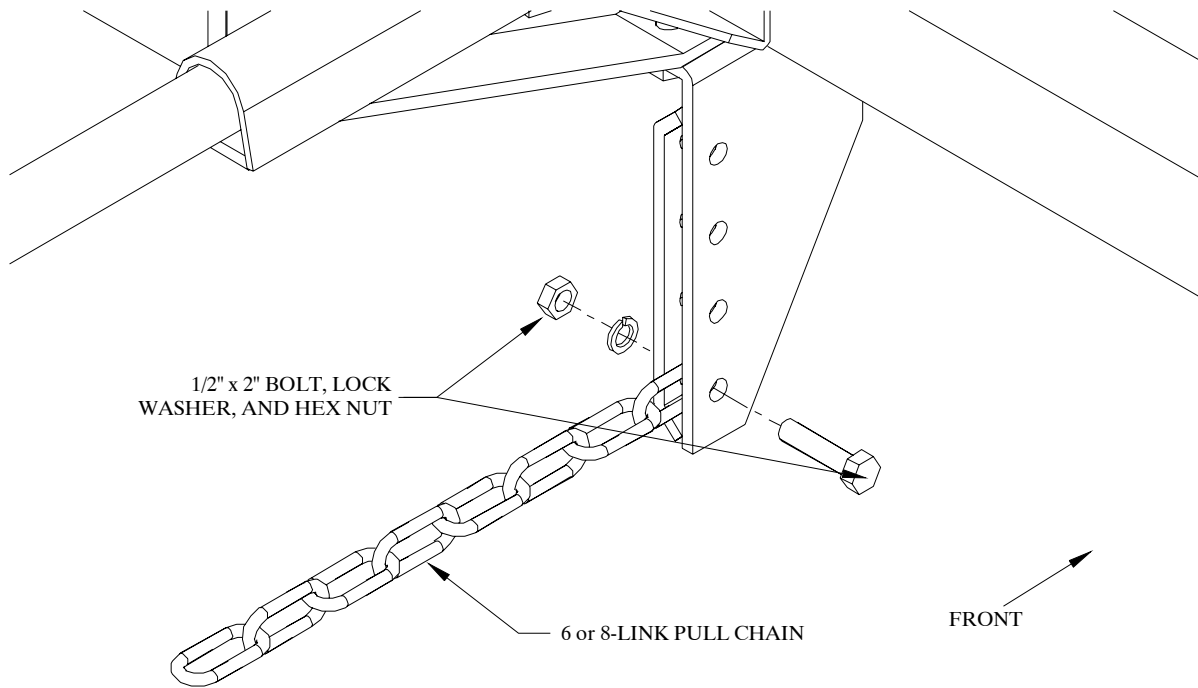
Figure 13

### Attach the Pull Chains

Be sure to follow the instructions for your particular harrow configuration.

#### 8-Bar Pull Chains

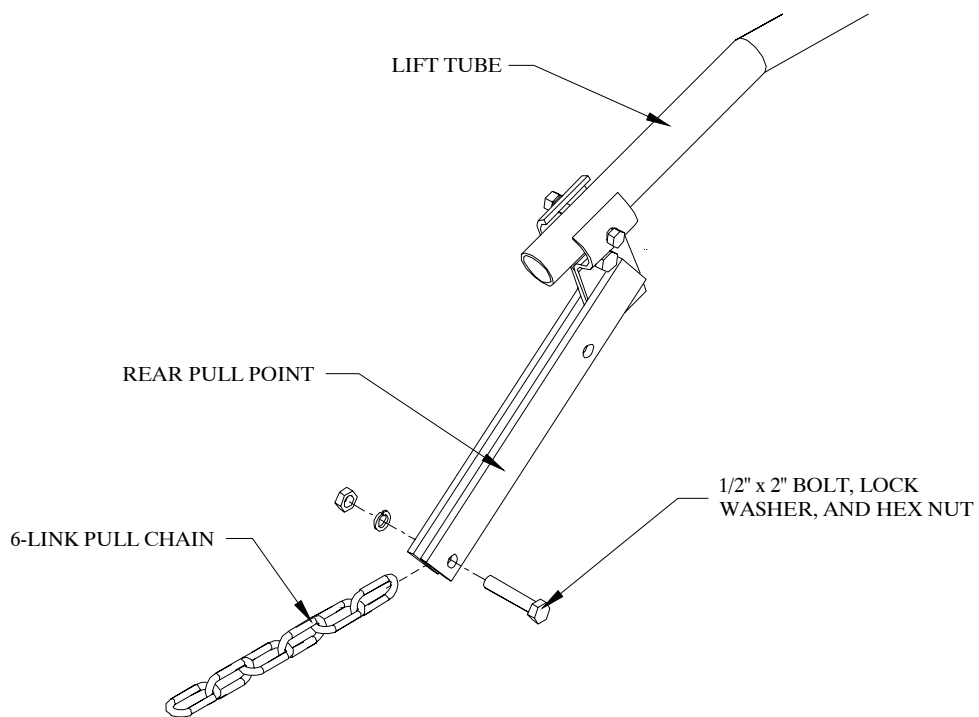
Attach an 8-link pull chain to each of the pull points. Refer to Figure 14. Use a 1/2" x 2" bolt, lock washer, and hex nut. There should be one pull chain for each of the pull points.



**Figure 14**

**4+4-Bar Pull Chains**

Attach a 6-link pull chain to each of the pull points. Refer to Figures 14 and 15. Use a 1/2" x 2" bolt, lock washer, and hex nut. There should be one pull chain for each of the pull points.



**Figure 15**

### Attach the Stabilizer Angles

Place the proper stabilizer angle (refer the appropriate diagram in appendix C and Figure 16) across the ends of each set of lift tubes. Bolt the stabilizer angles to the lift tubes using  $7/16''$  x  $1\ 11/16''$  x  $2\ 11/16''$  U-bolts, flat washers, lock washers, and hex nuts.

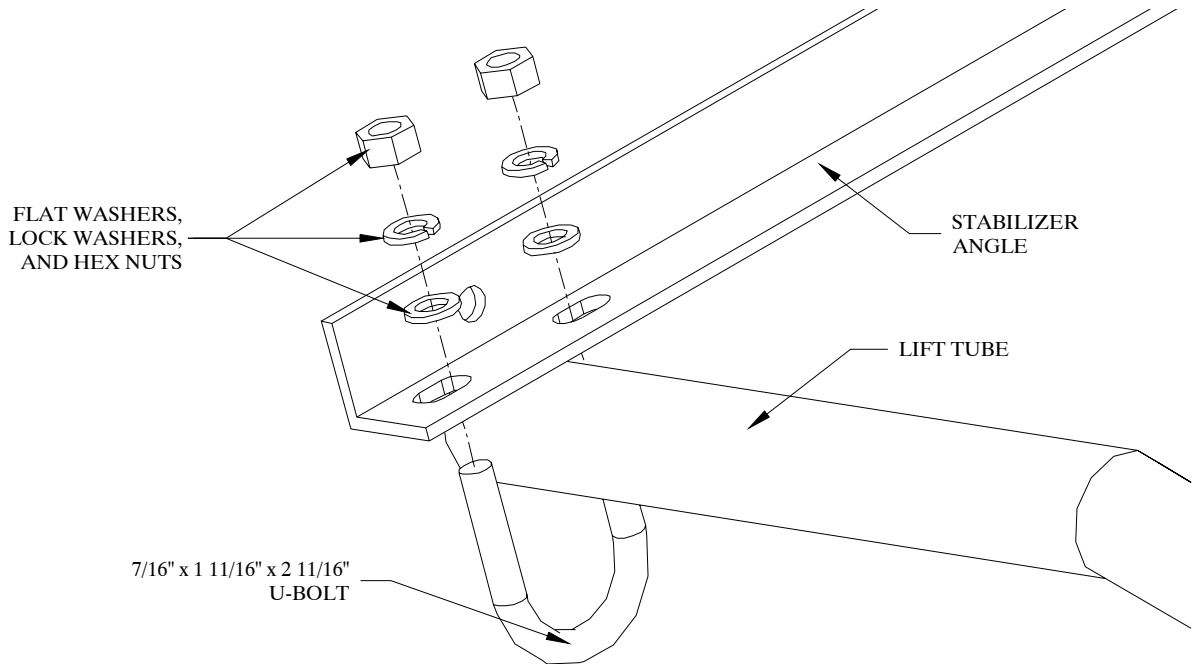


Figure 16

### Attach the Lift Chains

Be sure to follow the instructions for your particular harrow configuration.

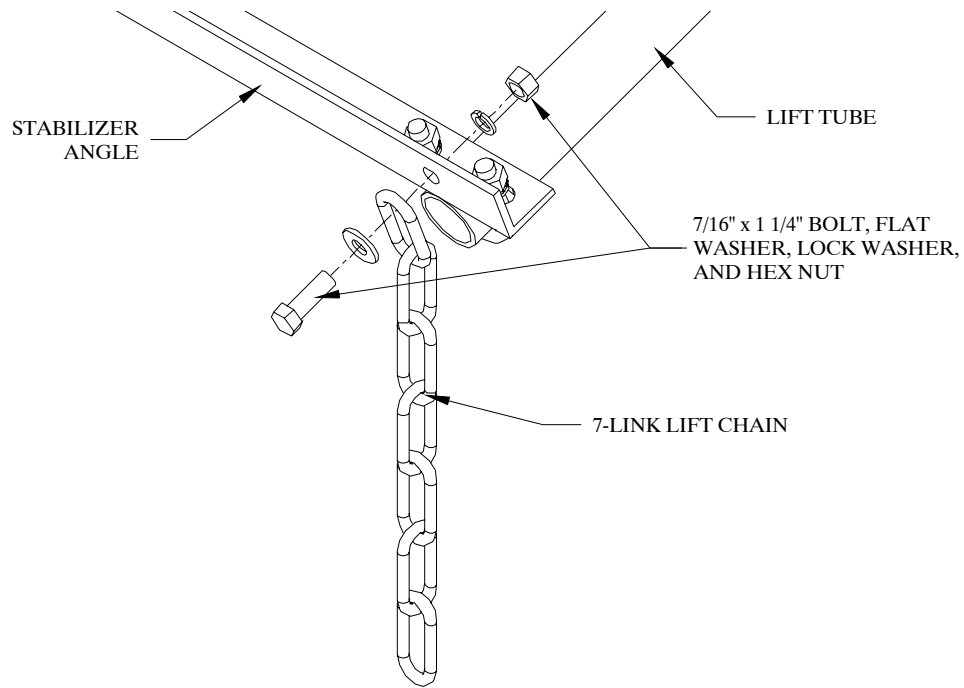
#### 8-Bar Section Lift Chains

Attach 7-link lift chains to the stabilizer angles at the back end of each of the lift tubes. Refer to Figure 17. Use  $7/16''$  x  $1\ 1/4''$  bolts, flat washers, lock washers, and hex nuts.

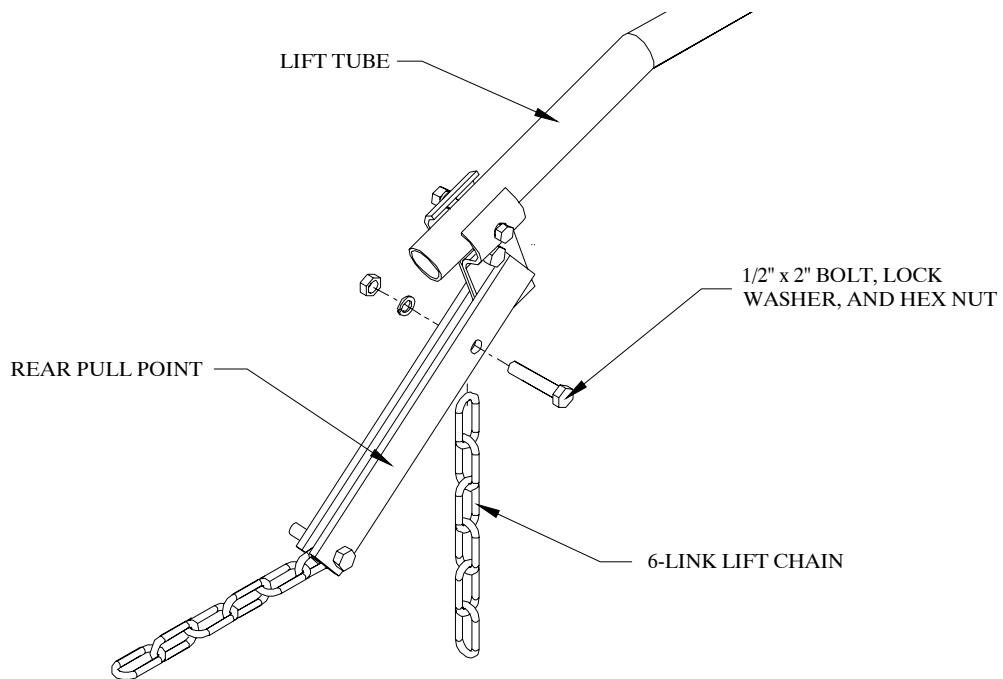
#### 4+4-Bar Section Lift Chains

Attach 6-link lift chains to the rear pull points as shown in Figure 18. Use  $1/2''$  x  $2''$  bolts, lock washers, and hex nuts.

There should be one lift chain for each tube.



**Figure 17**



**Figure 18**

**Angle of Attack**

Before actually placing the harrows, you may want to determine the ‘angle of attack’ desired for your particular application. Refer to Figure 19 to help clarify what is meant by ‘angle of attack.’ McFarlane flexible harrow sections have a built-in system which allows the harrow owner a choice between a steep or shallow angle of attack. To change the angle of attack, simply reverse the harrow section and pull it from the other end.



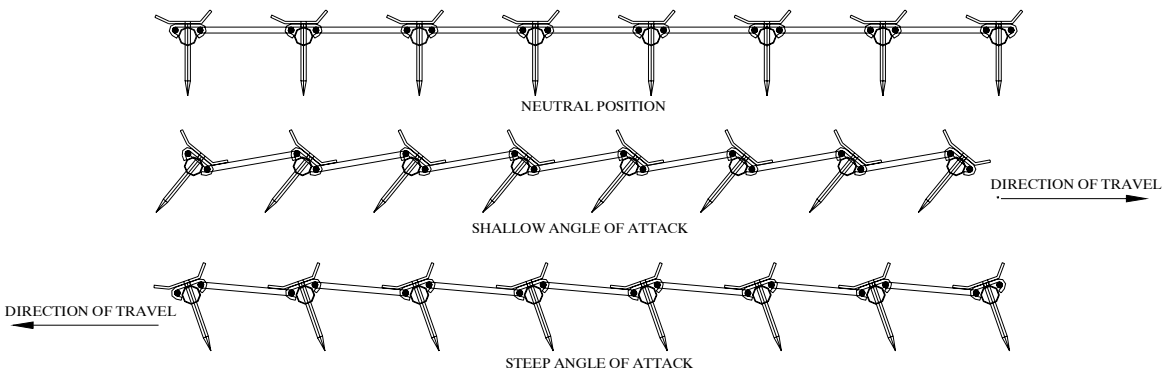


Figure 19

Each angle has its advantages and disadvantages. The steeper the angle of attack, the more aggressive the harrowing action. However, the steeper the angle, the greater the tendency there is for the sections to clog with field debris.

### **Harrow Identification**

The number of teeth on a bar is the same as the first digit of the harrow identification number. The last number is the number of bars per section. An FH-600-8 would have six teeth per bar and 8 bars; an FH-800-8 would have eight teeth per bar and 8 bars.

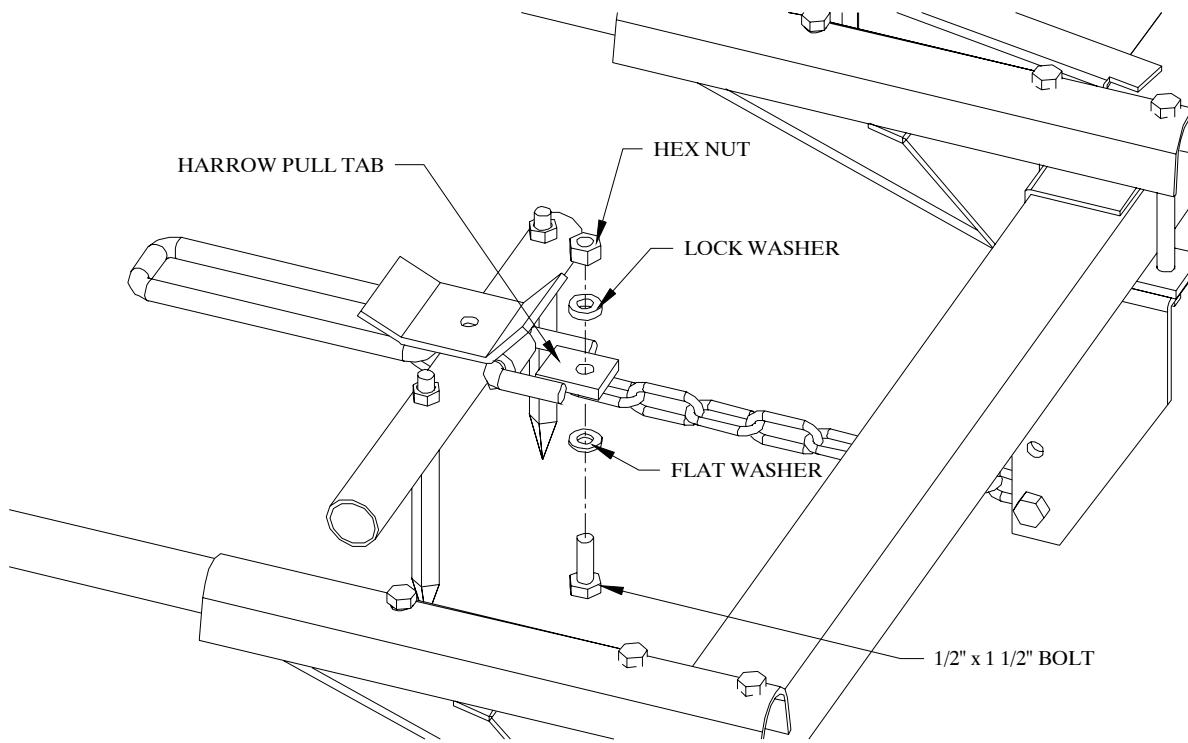
- Now that you have determined the desired angle of attack and identified the harrow sections, position the harrow sections on the ground under each pair of lift arms. A diagram and parts listing of the FH harrow sections may be found in appendix B.

### **Attach the Harrow Sections**

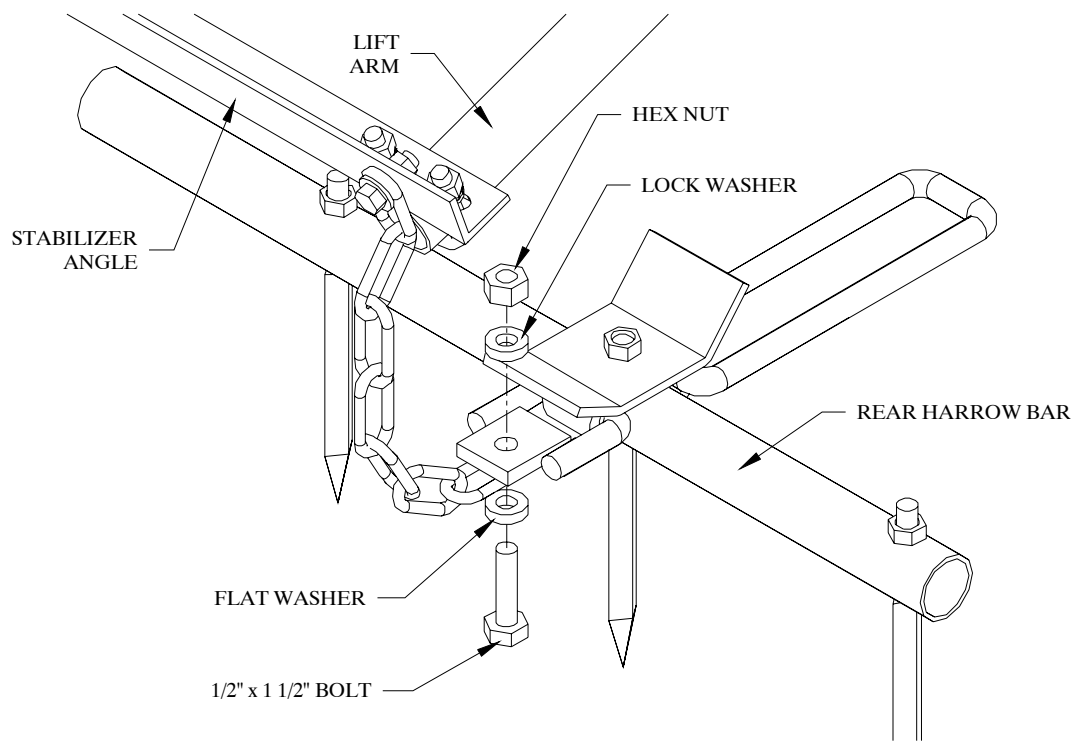
Refer to the appropriate diagram in appendix C for proper harrow placement. Be sure to follow the instructions for your particular harrow configuration.

#### **8-Bar Harrow Sections:**

1. Place the harrow sections on the ground under the lift arms where each one is to be mounted.
2. Attach the pull chains as shown in Figure 20; use a ½" x 1 ½" bolt, flat washer, lock washer, and hex nut. Make sure the pull chains are not twisted, or binding may occur during transporting or when the harrow is being used in the fields.
3. Attach the lift chains as shown in Figure 21; use a ½" x 1 ½" bolt, flat washer, lock washer, and hex nut. Make sure the lift chains are not twisted, or binding may occur during transporting or when the harrow is being used in the fields.



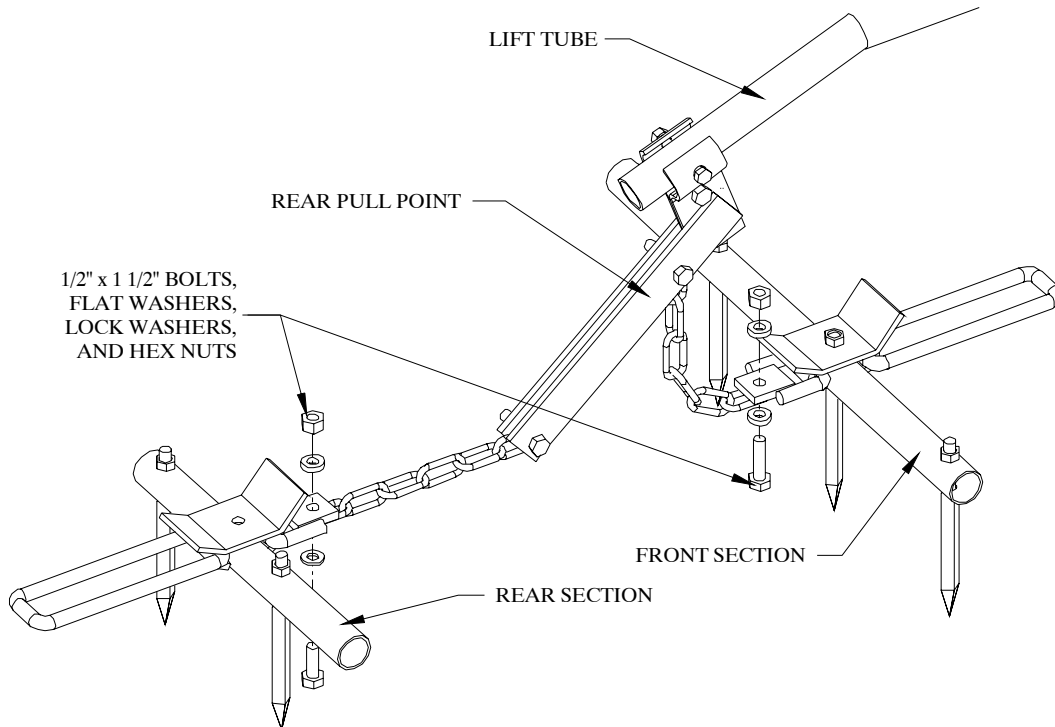
**Figure 20**



**Figure 21**

### **4+4 Bar Harrow Sections:**

1. Place the harrow sections on the ground under the lift arms where each one is to be mounted.
2. Attach the pull chains as shown in Figure 20 and 22; use ½" x 1 ½" bolt, flat washers, lock washers, and hex nuts. Make sure the pull chains are not twisted, or binding may occur during transporting or when the harrow is being used in the fields.



**Figure 22**

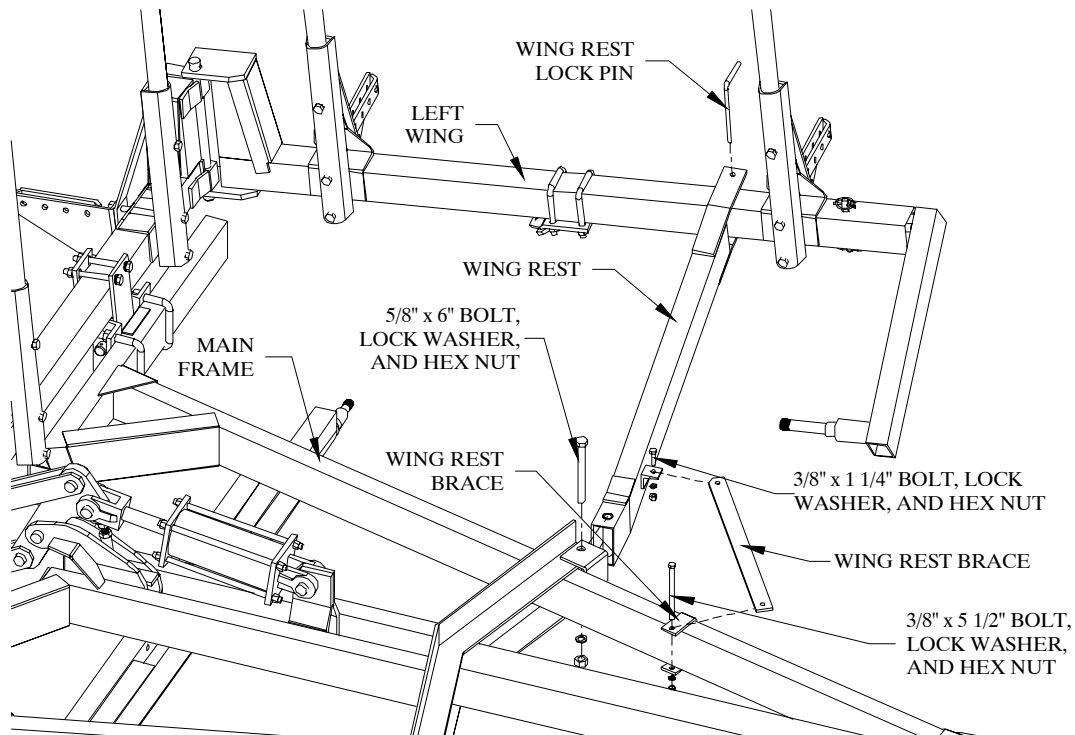
3. Attach the lift chains as shown in Figure 22; use ½" x 1 ½" bolts, flat washers, lock washers, and hex nuts. Make sure the lift chains are not twisted, or binding may occur during transporting or when the harrow is being used in the fields.

### **Attach the Wing Rests**

(Refer to Figure 23)

The left and right wing rests can be differentiated by noticing the small angle welded to the side of the arm. The angle should be on the front side of the arm when the arm is in position on the main frame.

1. Slide the wing rests between the cross angles on the main frame. Bolt the wing rests into place with 5/8" x 6" bolts, lock washers, and hex nuts. *Do not* tighten the bolts yet.
2. With the center bar and wings in the upright position, swing the wings forward. **Be sure the unit is attached to a tractor of adequate size before actuating the hydraulics!** Place the wings in the wing rests as shown in Figure 23. If the wing tube height does not line up with the wing rest, the stop bolt must be adjusted (this will be done later in the final adjustment).
3. It may be necessary to swing the wing rests forward or backward in order to clear the saddles on the wings. Use the wing rest lock pins and lock the wings in the wing rests. Place the bridge pins in the ends of the wing rest lock pins. *Do not* tighten the bolts yet.

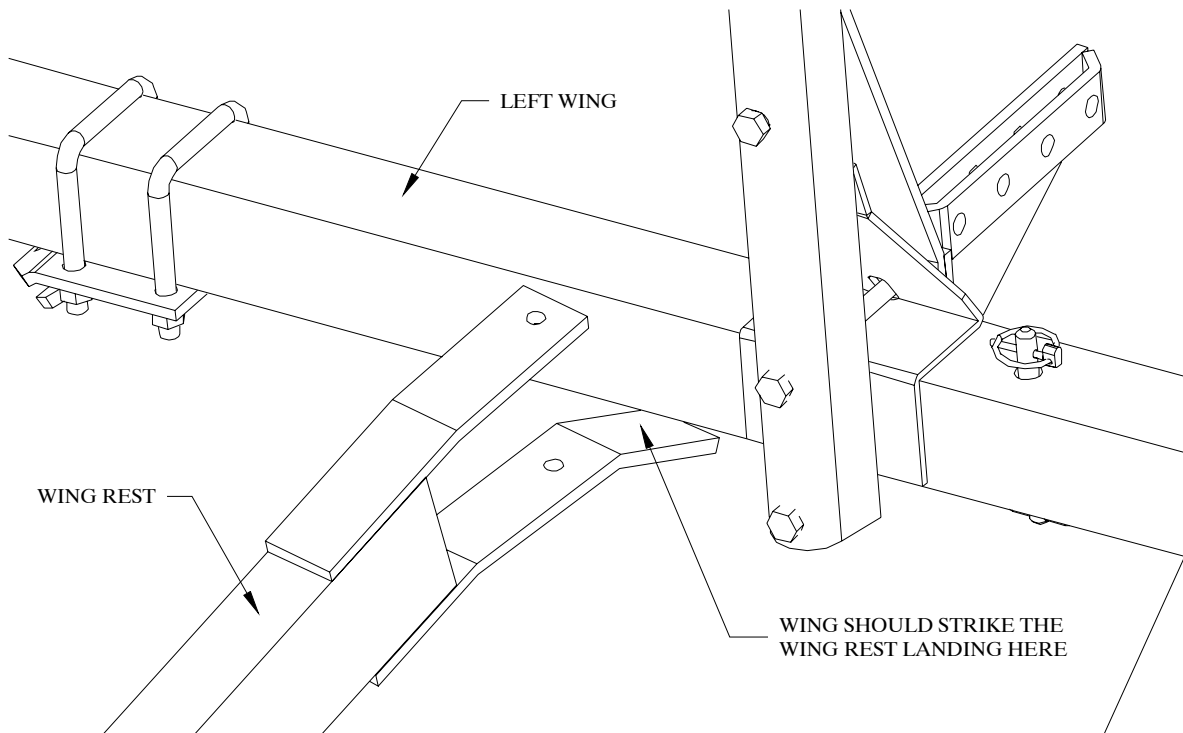


**Figure 23**

4. Bolt the wing rest braces to the small angles which are welded to the front side of the wing rests using 3/8" x 1 1/4" bolts, lock washers, and hex nuts. Do *not* tighten the bolts yet.
5. Rotate the wing rest braces back and connect them to the main frame using the wing rest brace clamps with 3/8" x 5 1/2" bolts, lock washers, and hex nuts.
6. Tighten all the bolts that hold the wing rest assemblies in place.

### Adjust the Wing Rests

Adjust the position of the wing rests so that they provide support to the wings while in the transport position. Refer to Figure 23 and 24. Rotate them either backward or forward until the wings rest solidly on the wing rest plate. If necessary, adjust the clevis on the main frame cylinder in/out to move the wings up/down. Adjust the stop bolt (refer to figure 5) tight against main hinge plate when the unit is in the transport position. Main hinge plate stop bolt **MUST** be adjusted **AFTER** cylinder has been adjusted. When adjusted properly, tighten all bolts. Be sure to pin the wings into the wing rests with the wing rest lock pins.



**Figure 24**

### **Final Adjustments**

1. Unfold the unit into the field position.
2. Pull the completed unit ahead a few feet to check that everything is properly assembled and that nothing is binding or misaligned.
3. Check to make sure that all bolts and fasteners are tight.
4. With the unit in the transport position, attach the red and amber reflectors at the widest visible points. The red reflectors should be visible from the rear of the unit, and the amber reflectors should be visible from the front of the unit.
5. Do not detach the unit from the tractor unless the jack stand is down and the wings are secured in the wing rests.
6. After the first few hours of operation, check all fasteners and tighten if necessary. Include wheel lugs.

This completes the assembly of your harrow and transport cart. Before using the unit, double check that all components have been assembled properly. If there are any questions regarding any of the assembly steps, contact your local dealer for an explanation. Do not operate this or any equipment unless you are sure that all components operate as they were designed to operate.

## TROUBLESHOOTING

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Hydraulics actuate too rapidly	Hydraulic restrictors not installed	Install hydraulic restrictors
Wings will not slide into wing rests	Wing rests improperly positioned	Reposition wing rests
	Main hinge plate stop bolt maladjusted	Readjust hinge plate stop bolt
Excessive clogging during operations	Angle of attack too steep	Pull harrow sections from the other end
	Ground speed too low	Increase ground speed to 6 - 9 mph

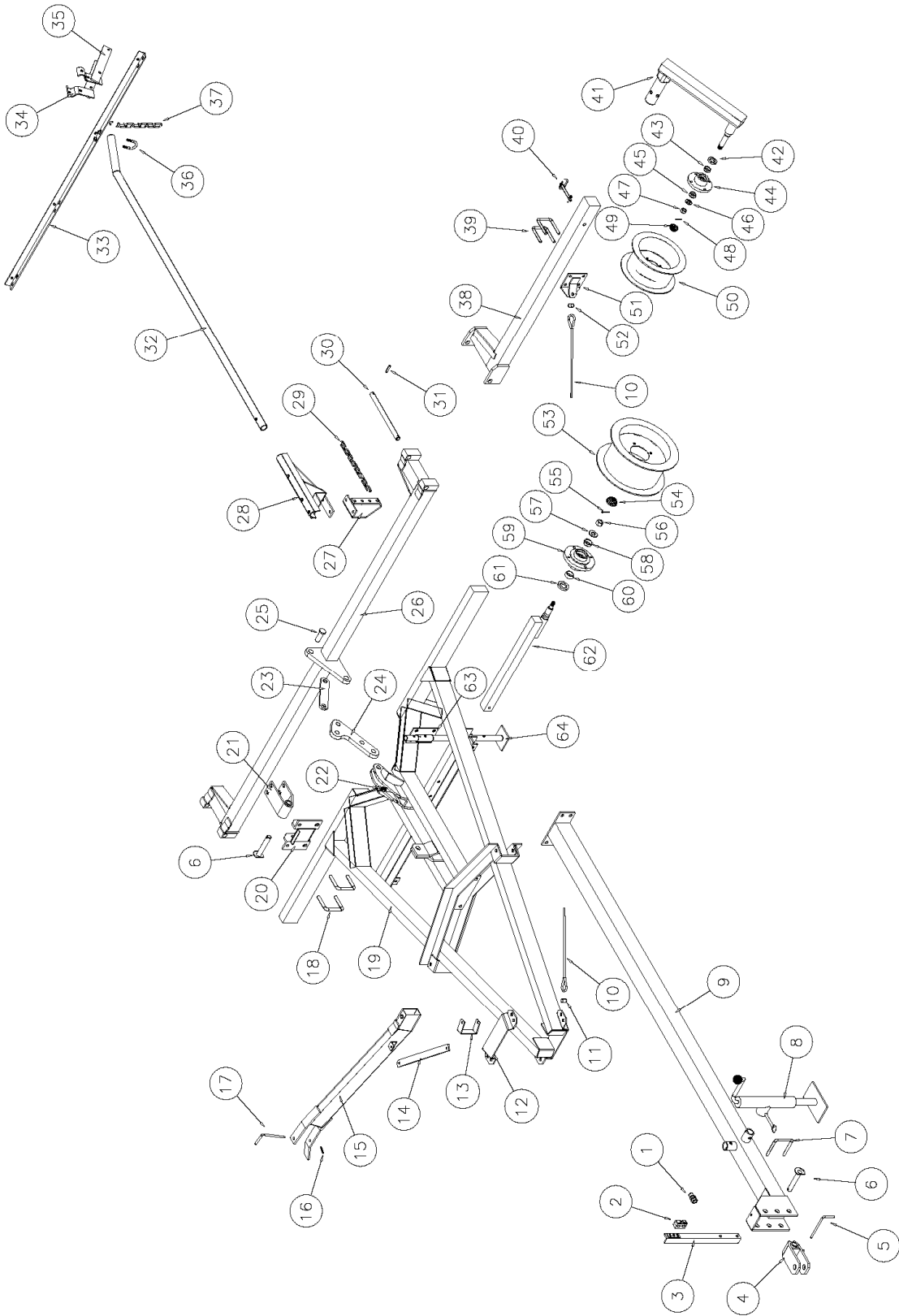
## BOLT TORQUE SPECIFICATIONS

Coarse Thread Series			Fine Thread Series		
Nut Size and Threads per Inch	Nut Tightening Torque (lb.ft.)		Nut Size and Threads per Inch	Nut Tightening Torque (lb.ft.)	
Grade C Nuts			Grade C Nuts		
	Max.	Min.		Max.	Min.
1/4 - 20	14.7	10	1/4 - 28	14.7	10
5/16 - 18	22.3	15.2	5/16 - 24	23.4	18.4
3/8 - 16	39	28	3/8 - 24	41	30
7/16 - 14	60	44	7/16 - 20	60	44
1/2 - 13	88	63	1/2 - 20	98	70
9/16 - 12	134	98	9/16 - 18	134	98
5/8 - 11	172	127	5/8 - 18	176	127
3/4 - 10	295	218	3/4 - 16	295	218
7/8 - 9	440	317	7/8 - 14	440	317
1 - 8	651	506	1 - 14	703	610

## WHEEL LUG TORQUE SPECIFICATIONS

Tire Size	Lug Size	Lug Tightening Torque (lb.ft.)	
		Max.	Min.
18.5X8.5-8	½ nut	85	75
7.60-15	½ x 1	85	75
9.5L-15	½ x 1	90	80
11L-15	½ x 1	90	80
12.5L-15	9/16 x 1	90	80
13X13.5-15	9/16 x 1	90	80
425/65R 22.5	¾ nut	90	80

# HDL-16 THROUGH HDL-22 HARROW CART PARTS DIAGRAM





**HDL-16 through HDL-22 HARROW CART  
PARTS LIST**

Always order by Part Number - *Not* by Key Number

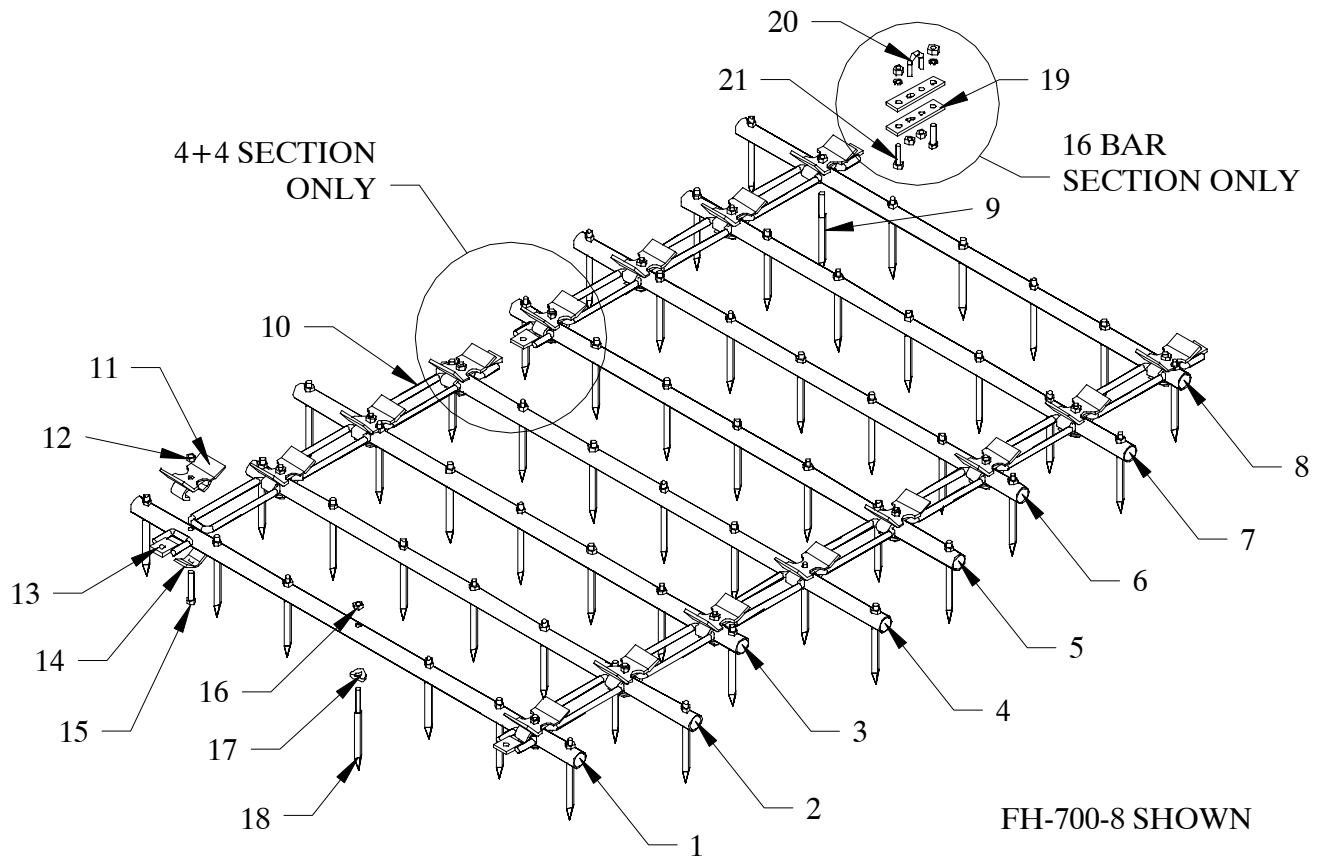
KEY	PART #	DESCRIPTION	QTY.
1	HY-1301	1/2" HYDRAULIC FLOW RESTRICTOR	1
2	HY-3008	3/8" HYDRAULIC HOSE CLIP	1
3	HD-1154	HOSE POST (20")	1
4	WD-301	CLEVIS HITCH	1
5	HD-1158	HITCH STOP PIN	1
6	HD-1157	HINGE PIN	3
7	BU-1245	U-BOLT (1/2" x 4" x 5")	1
8	HD-1151	POLE JACK (10")	1
9	HD-2010	HITCH POLE (10')	1
10	WC-8xxx	WING CABLE	2
11	HD-1216	HITCH CAP BUSHING	4
12	HD-1217	HITCH CAP	1
13	HD-1219	WING REST BRACE CLAMP	2
14	HD-1211	WING REST BRACE	2
15	HD-1221	WING REST (right hand)	1
**	HD-1220	WING REST (left hand)	1
16	HD-1184	#3 BRIDGE PIN	2
17	HD-1153	WING REST LOCK PIN	2
18	BU-5843	U-BOLT (5/8" x 4" x 3 1/2")	4
19	HD-1100	SHD MAIN FRAME	1
20	HD-1138	CENTER BAR HINGE BRACKET	2
21	HD-1225	HINGE WRAP	2
22	HD-1223	STOP BOLT (5/8")	1
23	HD-1148	LINKAGE FLAT	4
24	HD-1147	ROCKER PLATE	1
25	HD-1149	LINKAGE FLAT PIN	5
26	HD-2144	CENTER BAR ASSEMBLY (HDL-16 only)	1
26	HD-2153	CENTER BAR ASSEMBLY (HDL-18 and HDL-20 only)	1
26	HD-2162	CENTER BAR ASSEMBLY (HDL-22 only)	1
27	HD-1137	PULL POINT	8
28	HD-1133	SADDLE	8
29	CH-0706	6-LINK PULL CHAIN	*
29	CH-0708	8-LINK PULL CHAIN	*
30	HD-1132	WING HINGE PIN	2
31	HD-1229	SPRING ROLL PIN (3/8" x2")	4
32	HD-1135	8-BAR LIFT TUBE	*
32	HD-1140	4-BAR LIFT TUBE	*
33	HD-3xxx	LIFT TUBE STABILIZER ANGLE	*
34	HD-1145	REAR PULL POINT (right hand)	*
35	HD-1146	REAR PULL POINT (left hand)	*
36	BU-7612	U-BOLT (7/16" x 1 11/16" x 2 11/16")	8
37	CH-0706	6-LINK LIFT CHAIN	*
37	CH-0707	7-LINK LIFT CHAIN	*
38	HD-2753	LEFT WING ASSEMBLY (HDL-16 and HDL-18 only)	1
38	HD-2762	LEFT WING ASSEMBLY (HDL-20 only)	1

38	HD-2771	LEFT WING ASSEMBLY (HDL-22 only)	1
**	HD-2653	RIGHT WING ASSEMBLY (HDL-16 and HDL-18 only)	1
**	HD-2662	RIGHT WING ASSEMBLY (HDL-20 only)	1
**	HD-2671	RIGHT WING ASSEMBLY (HDL-22 only)	1
39	BU-1234	U-BOLT (1/2" x 3" x 4 1/4")	4
40	HD-1231	WING WHEEL LOCK PIN	2
41	HD-1129	WING WHEEL LEG (left hand)	1
**	HD-1130	WING WHEEL LEG (right hand)	1
42	HD-1179	GREASE SEAL	2
43	HD-1178	INNER BEARING	2
44	HD-1180	HUB WITH RACES	2
45	HD-1178	OUTER BEARING	2
46	HD-1187	SPINDLE FLAT WASHER	2
47	HD-1185	SPINDLE HEX NUT	2
48	CP-5312	COTTER PIN (5/32" x 1 1/4")	2
49	HD-1181	DUST CAP	2
50	HD-1188	RIM & TIRE	2
51	HD-1142	WING CABLE BRACKET	2
52	HD-1144	WING CABLE BRACKET BUSHING	2
53	HD-1168	RIM (15" x 4.5" 4-hole) FOR 7.60-15 TIRE	2
54	HD-1167	DUST CAP	2
55	CP-5312	COTTER PIN (5/32" x 1 1/4")	2
56	HD-1165	SPINDLE HEX NUT	2
57	HD-1164	SPINDLE FLAT WASHER	2
58	HD-1163	OUTER BEARING	2
59	HD-1161	HUB WITH RACES	2
60	HD-1162	INNER BEARING	2
61	HD-1160	GREASE SEAL	2
62	HD-1102	SHD MAIN FRAME AXLE ASSEMBLY	2
63	HD-1232	PARKING STAND MOUNT PLATE	1
64	HD-1233	REAR PARKING STAND	1
**	DC-111	DECAL: "STAND CLEAR..."	1
**	DC-116	DECAL: "DO NOT CLIMB ON..."	1
**	DC-117	DECAL: "...USE JACK STAND"	1
**	DC-119	DECAL: "ESCAPING FLUID..."	1
**	***	BOLT BAG	1
**	***	LITERATURE PACKET	1
*		Quantity depends on harrow sections used.	
**		Unnumbered items are not pictured.	
***		Please specify model number when ordering these parts.	
xxx		length in inches (84" is 084, 112" is 112)	

Bolts, washers, nuts, and cotter pins are not shown. Refer to the setup instructions for details.  
**McFarlane Manufacturing reserves the right to change specifications of design at any time without obligation to modify previous products.**

## FH-8-BAR HARROW SECTIONS PARTS DIAGRAM & LISTING

INCLUDES FH-500-8, FH-600-8, FH-700-8, FH-800-8, AND FH-900-8



ITEM #	PART #	DESCRIPTION
1	FH-801	#1 HARROW BAR (FH-500-8)
1	FH-805	#1 HARROW BAR (FH-600-8)
1	FH-809	#1 HARROW BAR (FH-700-8)
1	FH-813	#1 HARROW BAR (FH-800-8)
1	FH-817	#1 HARROW BAR (FH-900-8)
2	FH-802	#2 HARROW BAR (FH-500-8)
2	FH-806	#2 HARROW BAR (FH-600-8)
2	FH-810	#2 HARROW BAR (FH-700-8)
2	FH-814	#2 HARROW BAR (FH-800-8)
2	FH-818	#2 HARROW BAR (FH-900-8)
3	FH-802	#3 HARROW BAR (FH-500-8)
3	FH-806	#3 HARROW BAR (FH-600-8)
3	FH-810	#3 HARROW BAR (FH-700-8)
3	FH-814	#3 HARROW BAR (FH-800-8)
3	FH-818	#3 HARROW BAR (FH-900-8)
4	FH-804	#4 HARROW BAR (FH-500-8)
4	FH-808	#4 HARROW BAR (FH-600-8)
4	FH-812	#4 HARROW BAR (FH-700-8)
4	FH-816	#4 HARROW BAR (FH-800-8)

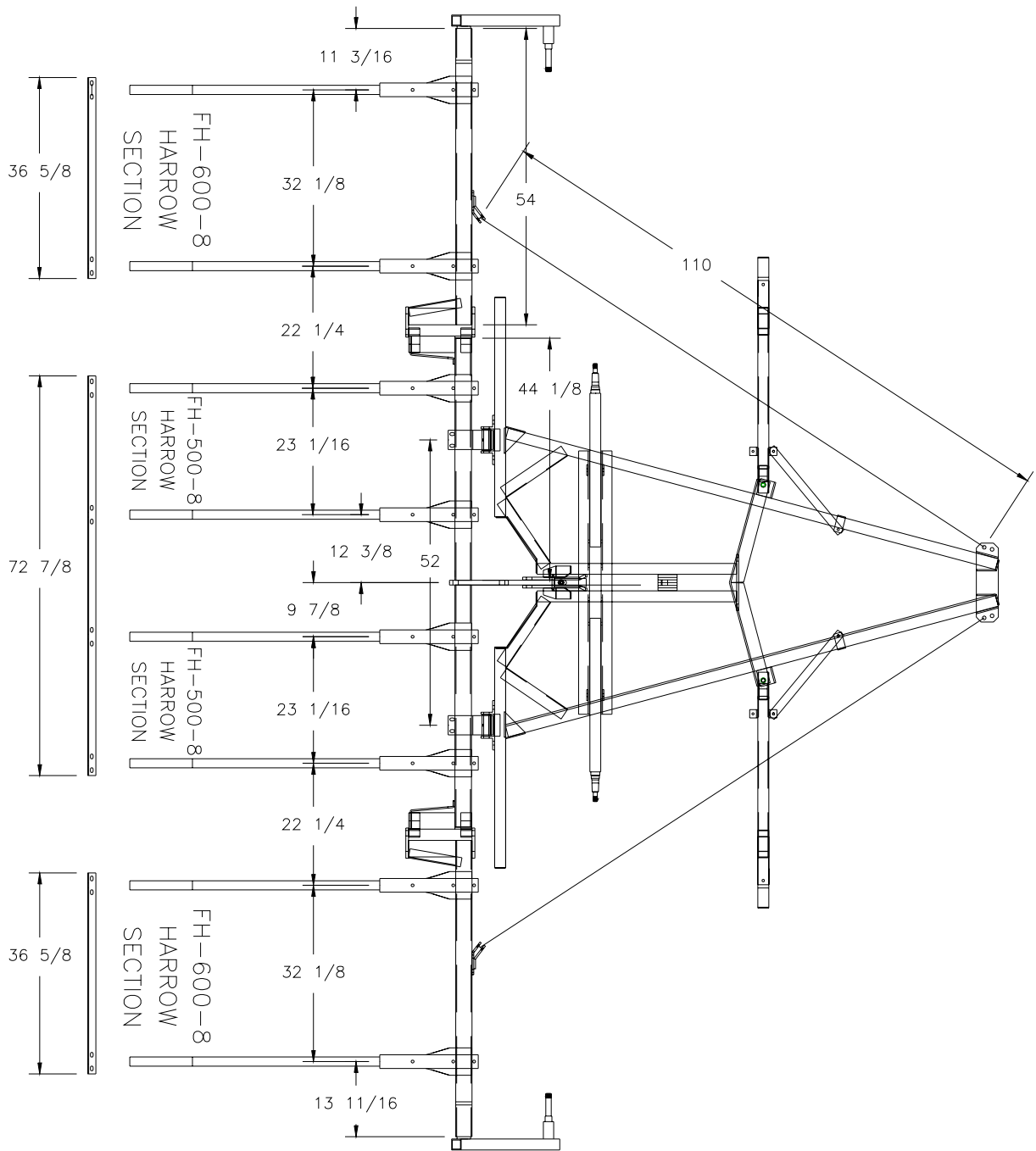
4	FH-820	#4 HARROW BAR (FH-900-8)
5	FH-803	#5 HARROW BAR (FH-500-8)
5	FH-807	#5 HARROW BAR (FH-600-8)
5	FH-811	#5 HARROW BAR (FH-700-8)
5	FH-815	#5 HARROW BAR (FH-800-8)
5	FH-819	#5 HARROW BAR (FH-900-8)
6	FH-803	#6 HARROW BAR (FH-500-8)
6	FH-807	#6 HARROW BAR (FH-600-8)
6	FH-811	#6 HARROW BAR (FH-700-8)
6	FH-815	#6 HARROW BAR (FH-800-8)
6	FH-819	#6 HARROW BAR (FH-900-8)
7	FH-801	#7 HARROW BAR (FH-500-8)
7	FH-805	#7 HARROW BAR (FH-600-8)
7	FH-809	#7 HARROW BAR (FH-700-8)
7	FH-813	#7 HARROW BAR (FH-800-8)
7	FH-817	#7 HARROW BAR (FH-900-8)
8	FH-804	#8 HARROW BAR (FH-500-8)
8	FH-808	#8 HARROW BAR (FH-600-8)
8	FH-812	#8 HARROW BAR (FH-700-8)
8	FH-816	#8 HARROW BAR (FH-800-8)
8	FH-820	#8 HARROW BAR (FH-900-8)
9	E-611	1/2" x 3" SHANK SPIKE TOOTH ONLY
10	FH-125	CONNECTOR LINK (REGULAR)
11	FH-127	NOTCHED LINK CAP
12	**	1/2" LOCK NUT
13	FH-122	PULL FLAT
14	FH-019	CAP CLIP
15	**	1/2" x 3" BOLT
16	**	1/2" FLANGED LOCK NUT
17	E-630	SPIKE TOOTH WASHER
18	E-620	1/2" x 2 1/2" SHANK SPIKE TOOTH ONLY
**	E-610	1/2" x 2 1/2" SHANK SPIKE TOOTH w/WASHER
19	HDL-5100	DUAL SECTION CONNECTOR FLAT (16 BAR ONLY)
20	BV-7611	7/16" V-BOLT (16 BAR ONLY)
21	**	1/2" x 2" BOLT, LOCK WASHER AND NUT (16 BAR ONLY)
**	HDL-5101	DUAL SECTION CONNECTOR ASSEMBLY (16 BAR ONLY)

The #1 bar is the bar with an equal amount of tube to the right and left of the pull flats. The #8 bar is the bar that is staggered off to one side.

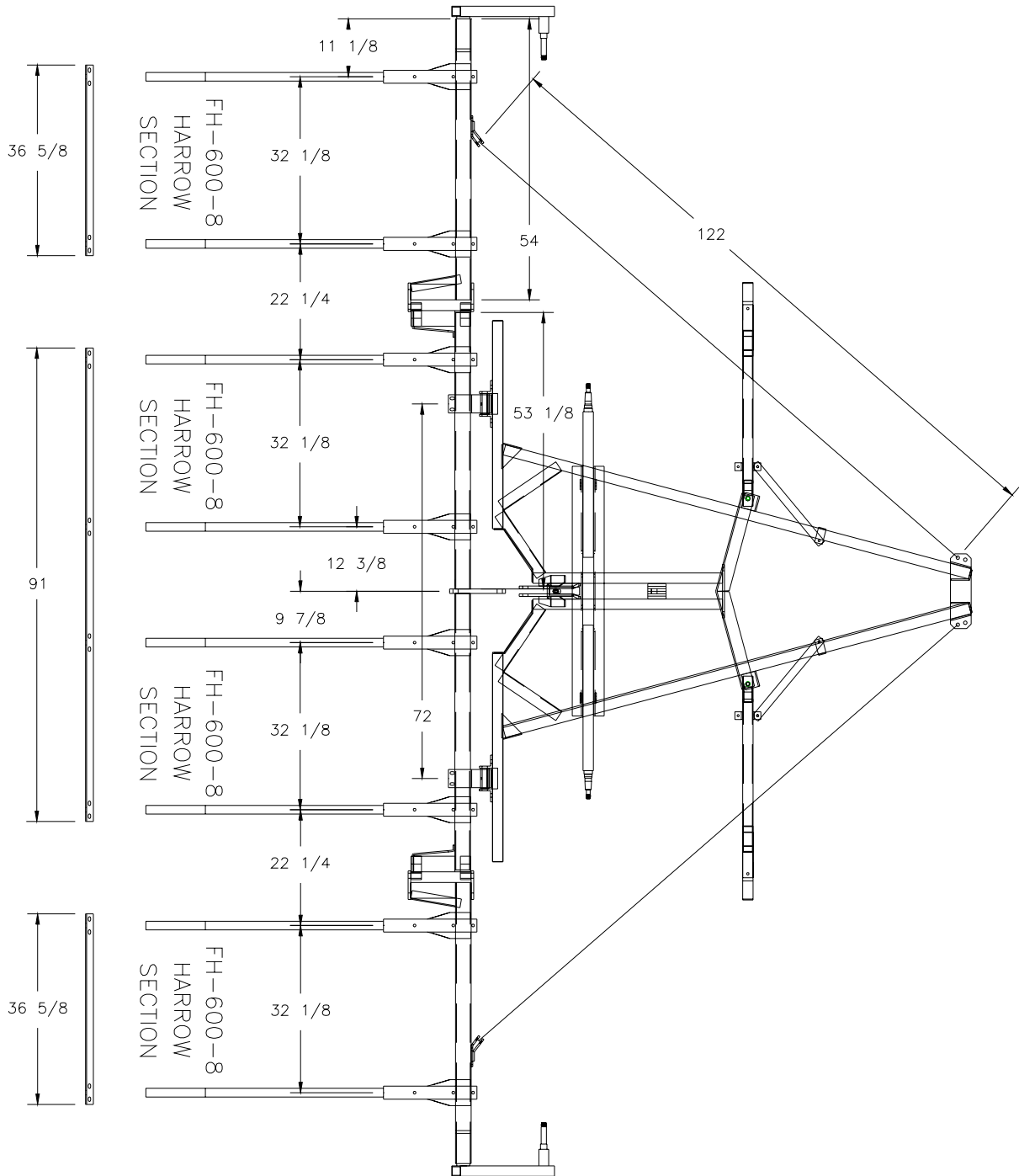
When pulling the harrow section from the #1 bar, the teeth will be in the least aggressive setting. When pulling from the #8 bar the teeth will be in the most aggressive setting.

9/24/08

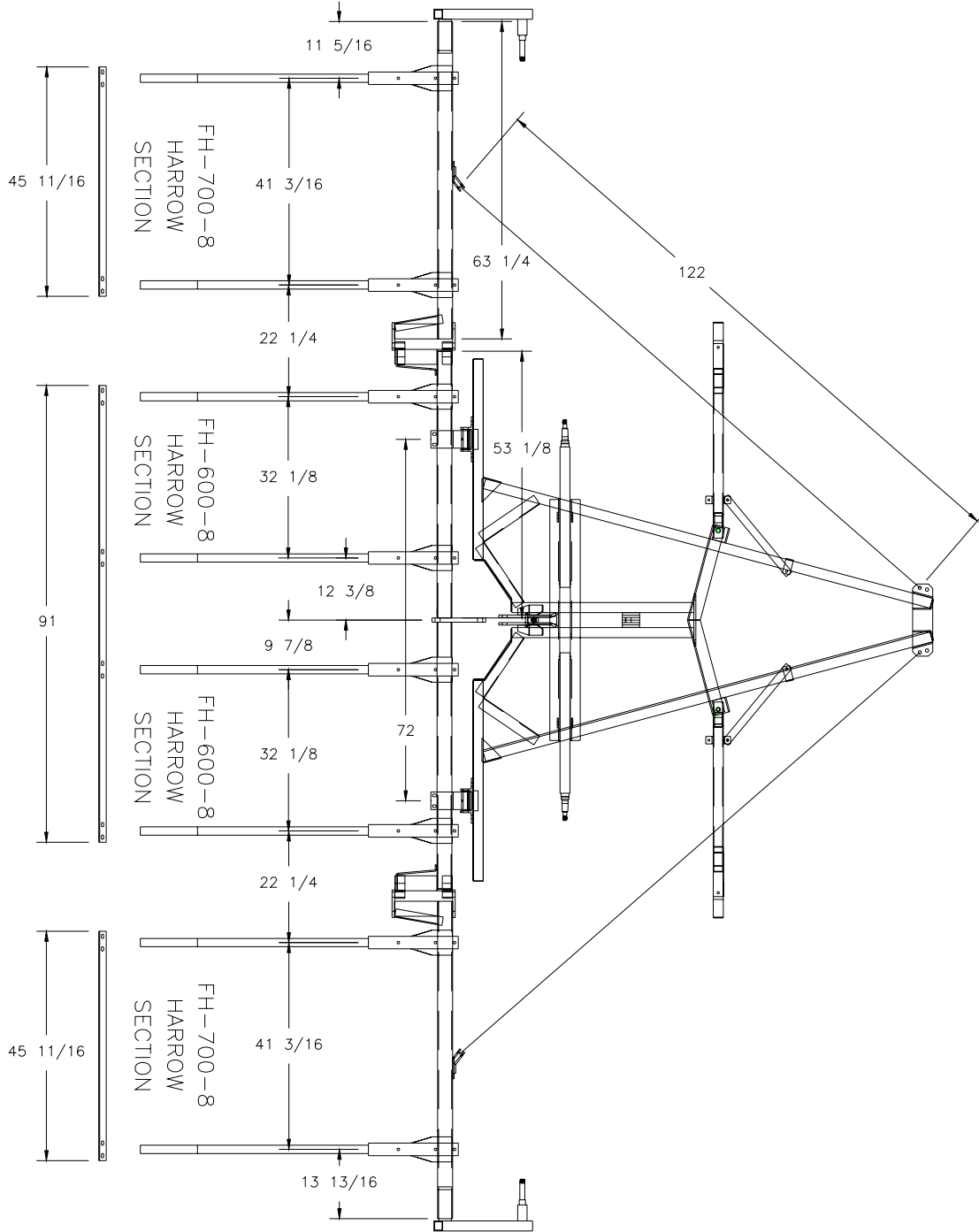
# HDL-16 LAYOUT DIAGRAM



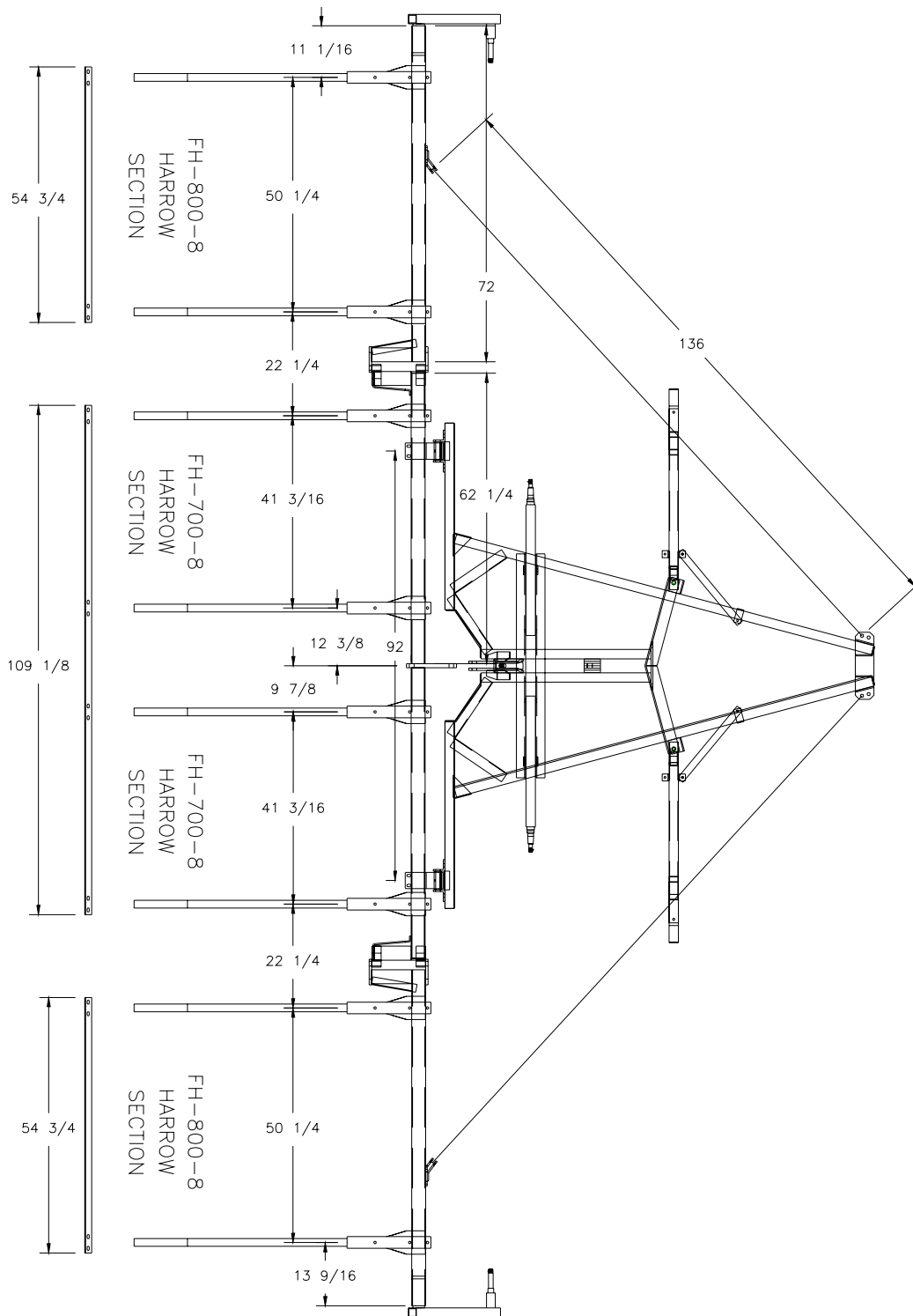
# HDL-18 LAYOUT DIAGRAM



# HDL-20 LAYOUT DIAGRAM



# HDL-22 LAYOUT DIAGRAM





## WARRANTY REGISTRATION FORM

This form must be filled out by the dealer and owner and sent to: McFarlane Mfg. Co., Inc., 1330 Dallas Street, P.O. Box 100, Sauk City, WI 53583.

### WARRANTY REGISTRATION FORM & INSPECTION REPORT

#### WARRANTY REGISTRATION

This form must be filled out by the dealer and signed by both the dealer and customer at the time of delivery.

Customer Name \_\_\_\_\_ Dealer Name \_\_\_\_\_

Address \_\_\_\_\_ Address \_\_\_\_\_

City, state, code \_\_\_\_\_ City, state, code \_\_\_\_\_

Phone number (\_\_\_\_) \_\_\_\_\_

Model \_\_\_\_\_ Serial Number \_\_\_\_\_ Delivery Date \_\_\_\_\_

#### DEALER INSPECTION REPORT

- \_\_\_\_\_ Wheel bolts tight
- \_\_\_\_\_ Fasteners tight
- \_\_\_\_\_ Hydraulic hoses free
- \_\_\_\_\_ Hydraulic fittings tight
- \_\_\_\_\_ Arms free
- \_\_\_\_\_ Check tire pressures
- \_\_\_\_\_ Lubricate machine

#### SAFETY

- \_\_\_\_\_ All decals installed
- \_\_\_\_\_ Review operating and safety instructions

I have thoroughly instructed the buyer on the above described equipment; review included the operator's manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date \_\_\_\_\_ Dealer's signature \_\_\_\_\_

The above equipment and operator's manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation, and applicable warranty policy.

Date \_\_\_\_\_ Owner's signature \_\_\_\_\_