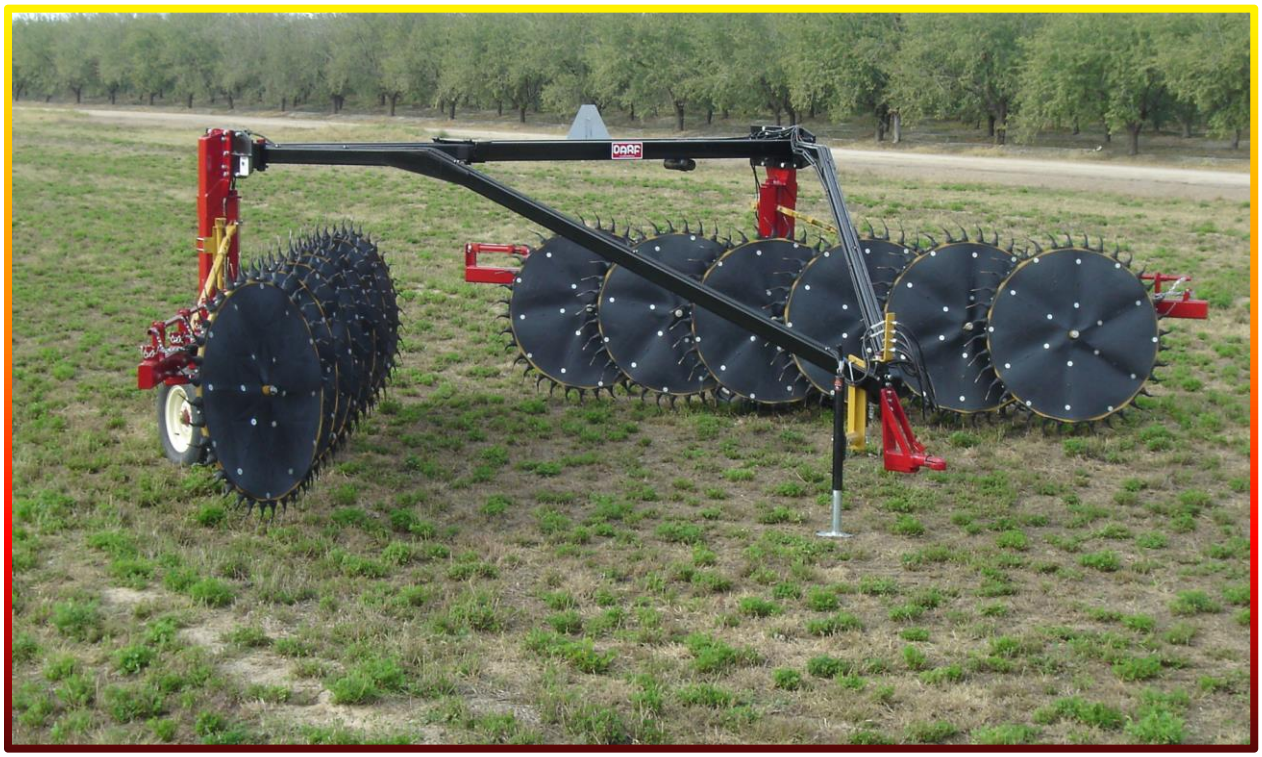
ASSEMBLY INSTRUCTIONS MANUAL ----------

DARF
HAY RAKES

MODEL 513
HEARTLANDER



MANUFACTURED BY:

NIKKEL IRON WORKS

SHAFTER, CA 93263

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THIS MANUAL INCLUDES INSTRUCTIONS CONCERNING YOUR PERSONAL SAFETY & THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH……..

ALL INSTRUCTIONS REFER TO RAKE FACING THE DIRECTION OF TRAVEL AS VIEWED FROM THE DRIVERS POSITION, SITTING IN SEAT FACING FORWARD. DRIVERS RIGHT IS CONSIDERED RIGHT SIDE OF RAKE.

The DARF 513 Rake will arrive at your dealership packaged as follows:

1 carton containing: Hydraulic cylinders, rake teeth & bolts, wheel board fasteners, assembly bolts, nuts & pins, top links, pins, hydraulic hoses, walking beam axles and ground wheels, rake wheel cranks and springs, wheel adjusting lever, jack, jack brackets, and hitch.

1 bundle wheel shields (under the above box)

2 leg struts with rake frame hinge installed

1 main overhead frame with hydraulic hoses and cylinders installed

2 rake wheel frames with lift tubes installed

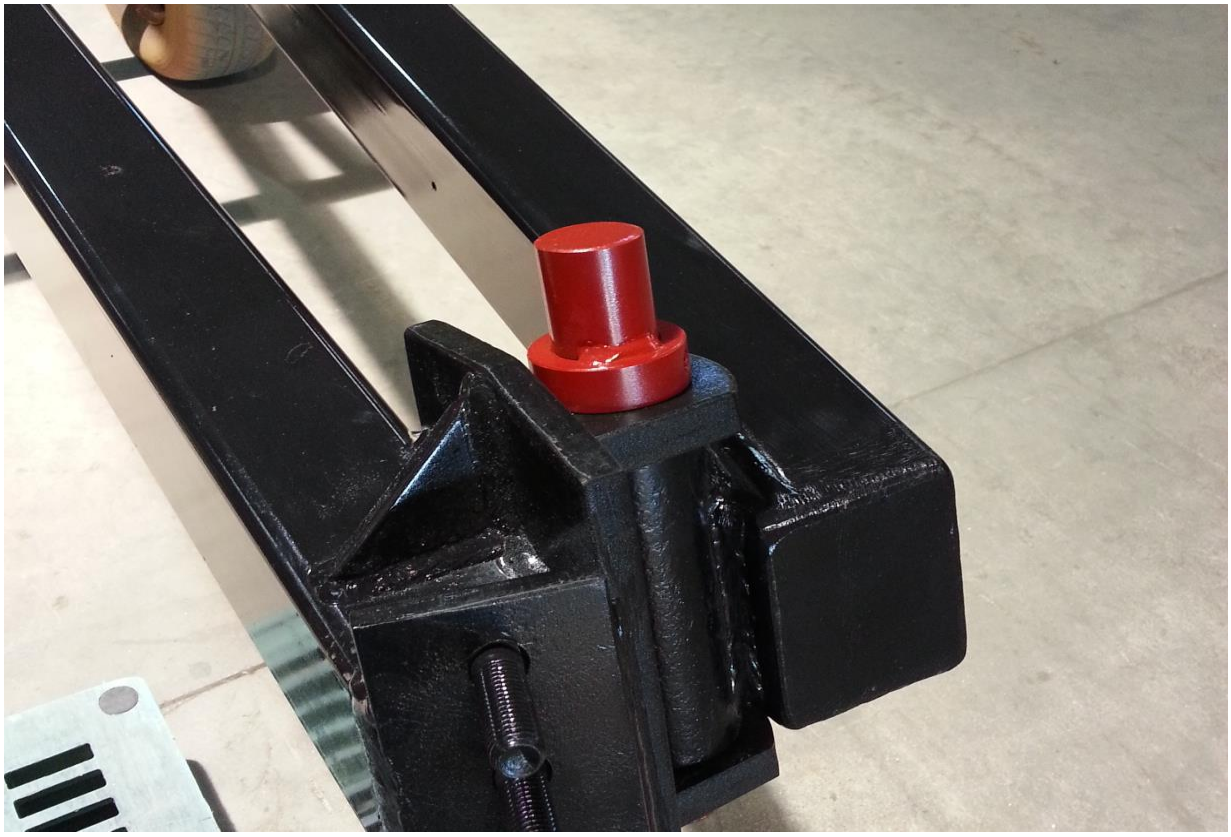
2 shipping stands of rake wheels

1 tongue assembly, consisting of 2 side frames

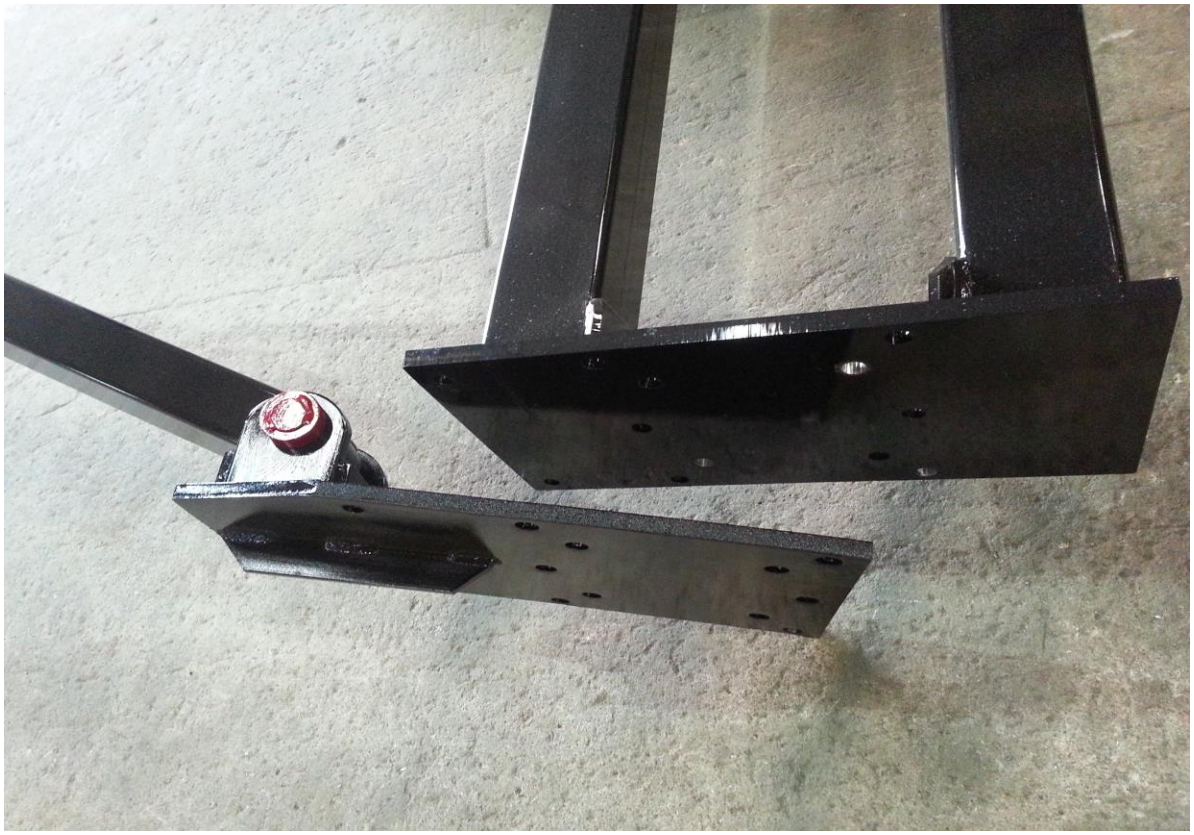
2 turnbuckles

For your safety, be sure all chains, stands, and tools are in proper working order. The assembly of the DARF rake will be much safer and faster if the correct method is used.

The photographs and illustrations furnished in this manual are for reference to make the assembly process easily understood. You may have overhead cranes or other lifting equipment available. In any case, SAFETY is your responsibility

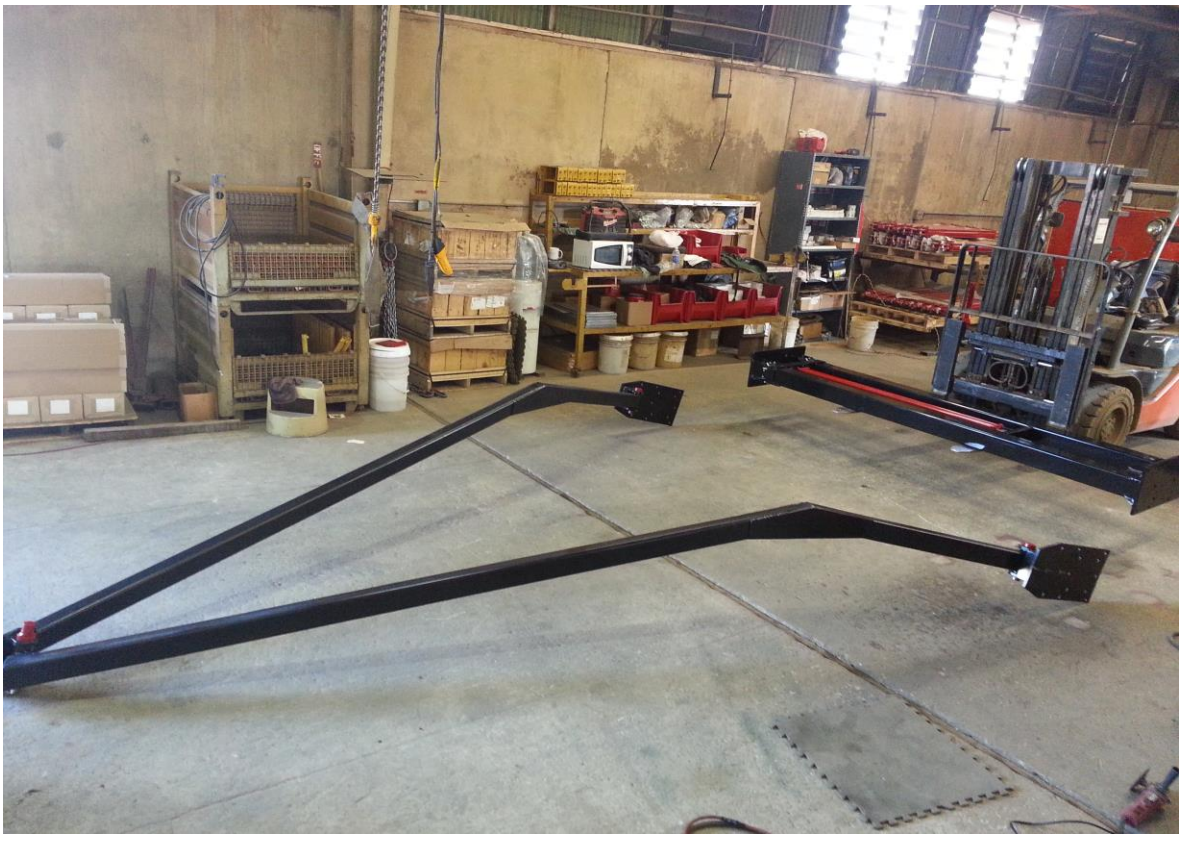


Insert the center pin (98797H) in the front of the tongue unit, connecting the 2 halves of the tongue unit (98796L & 98796R)

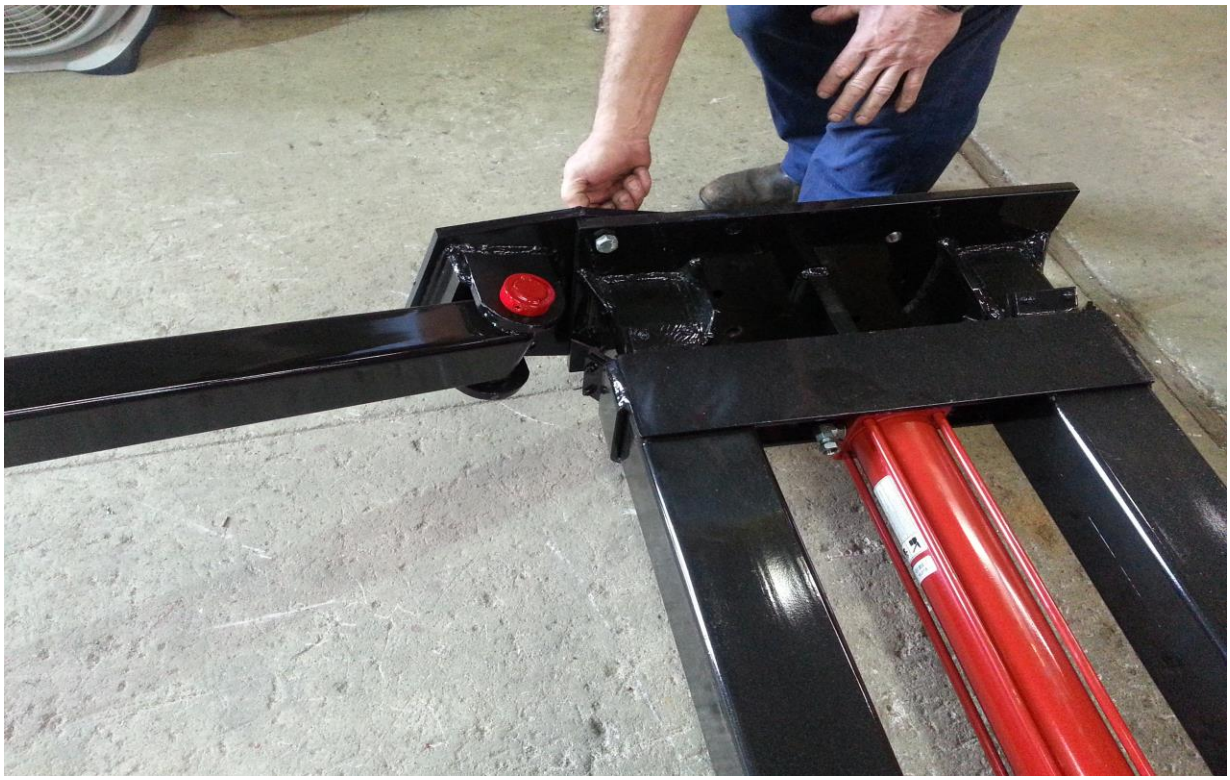


Mount the tongue anchor brackets (98795) to the back end of each side of the tongue unit

Spread the rear of the tongue sections to accommodate the width of the overhead mainframe (approximately 10ft)

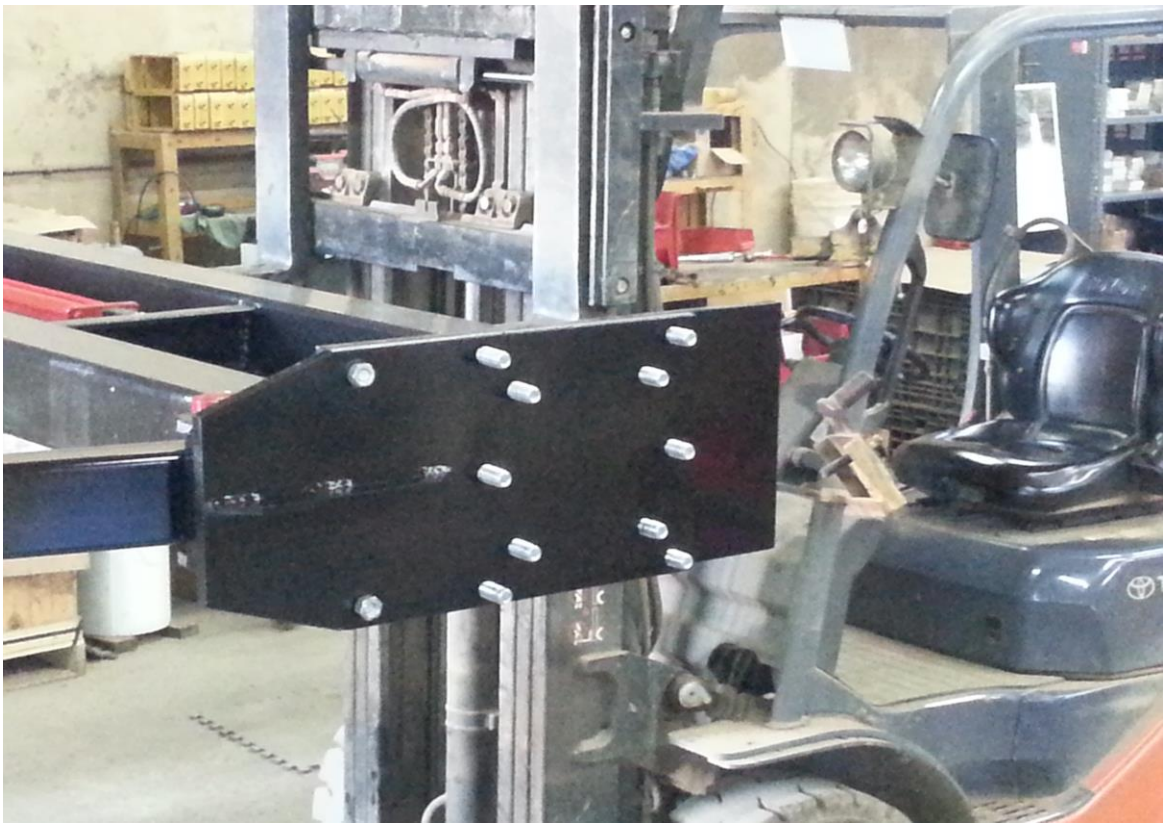


Move overhead into position between the tongue anchor brackets



Attach the tongue anchor brackets to the end plates of the overhead mainframe with one bolt per side as show in the picture above

Raise the overhead mainframe vertically until all holes line up between end plates and the tongue anchor brackets



Complete the bolt pattern to secure the tongue anchor brackets to the overhead mainframe end plates using the ¾” bolts, washers, and nuts. (Do NOT tighten past snug, yet)

Lift the overhead mainframe to a height of ~65” and position the leg struts on either side, so the holes in the top plate line up with the holes in their respective tongue anchor brackets

Secure the leg struts to the overhead mainframe assembly by sandwiching the tongue anchor brackets and fastening with (p/n) bolts. (Do NOT tighten past snug yet, leveling needed)

You may now lower the overhead mainframe and allow it be supported by the vertical leg struts

Raise the front of the tongue unit to install the hitch and the jack stowage bracket bundle (901200) and hose manifold (MS150)

Extend the tongue jack until the hitch is 16”-18” off the floor

Raise the main frame to install the walking beams and ground wheels. (Do NOT tighten past snug)
Then lower the overhead until the ground wheels are resting on the floor

Set the raking frames in place between the vertical leg struts

From the side, raise each raking frame into position and secure with the U-Bolts (9027) (Do NOT tighten past snug, yet) The correct position can be found by positioning the mounting plate between the “locator lugs” on the raking frame

Install the raking frame support adjustment braces

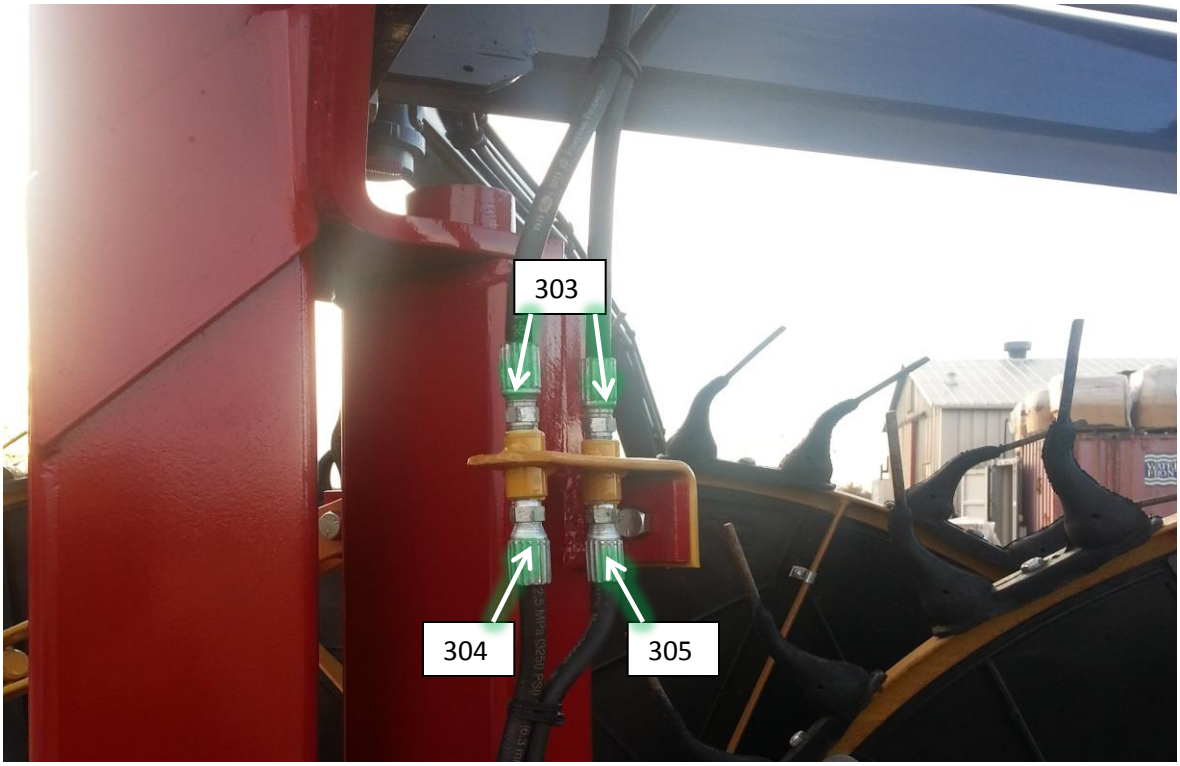
Square, level, and securely tighten the junction of the leg struts with the overhead main frame

Adjust the front brace (9099) until the raking frame is square with the leg struts, then tighten the U-Bolts securely. **DO NOT TIGHTEN THE U-BOLTS UNTIL THE UNIT IS COMPLETELY LEVEL!! At this point you may tighten all nuts and bolts previously “snugged”

Using the inside set of tires, set toe-in to ~1/8” and securely tighten walking beam mounting bolts

Install 2” x 8” hydraulic cylinders to the rear of the lift tubes on each raking frame

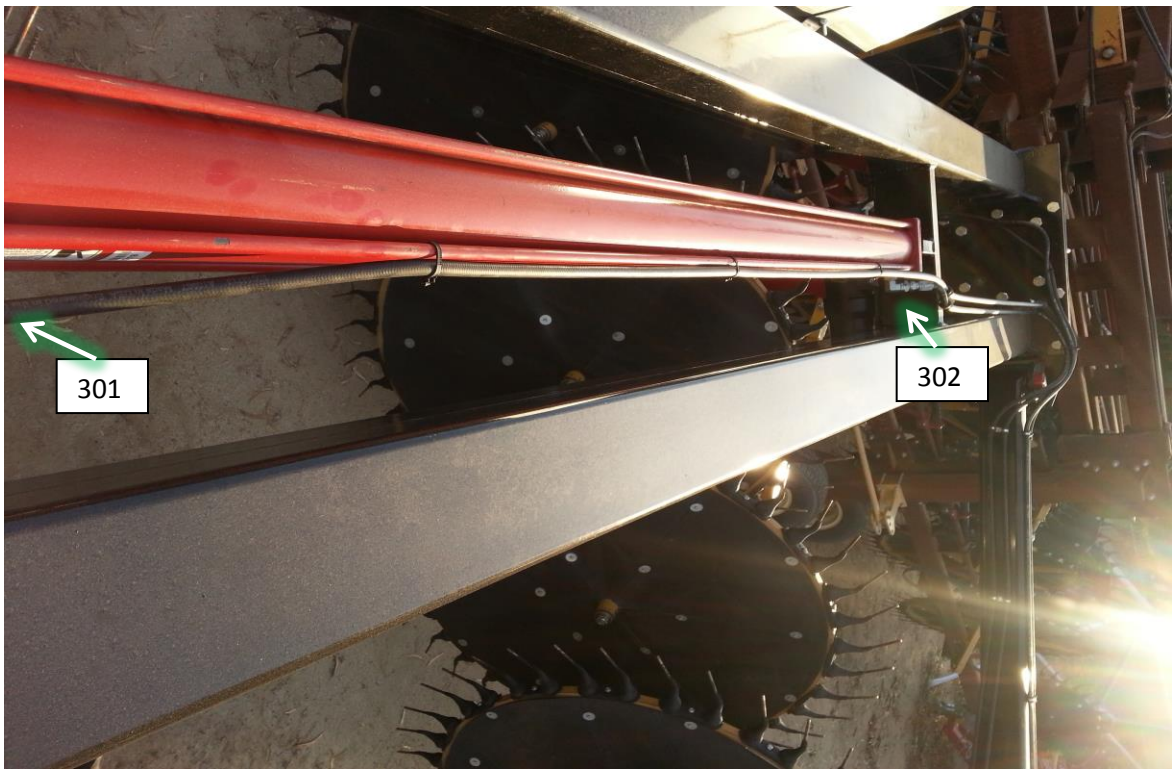
- Make sure ports face out



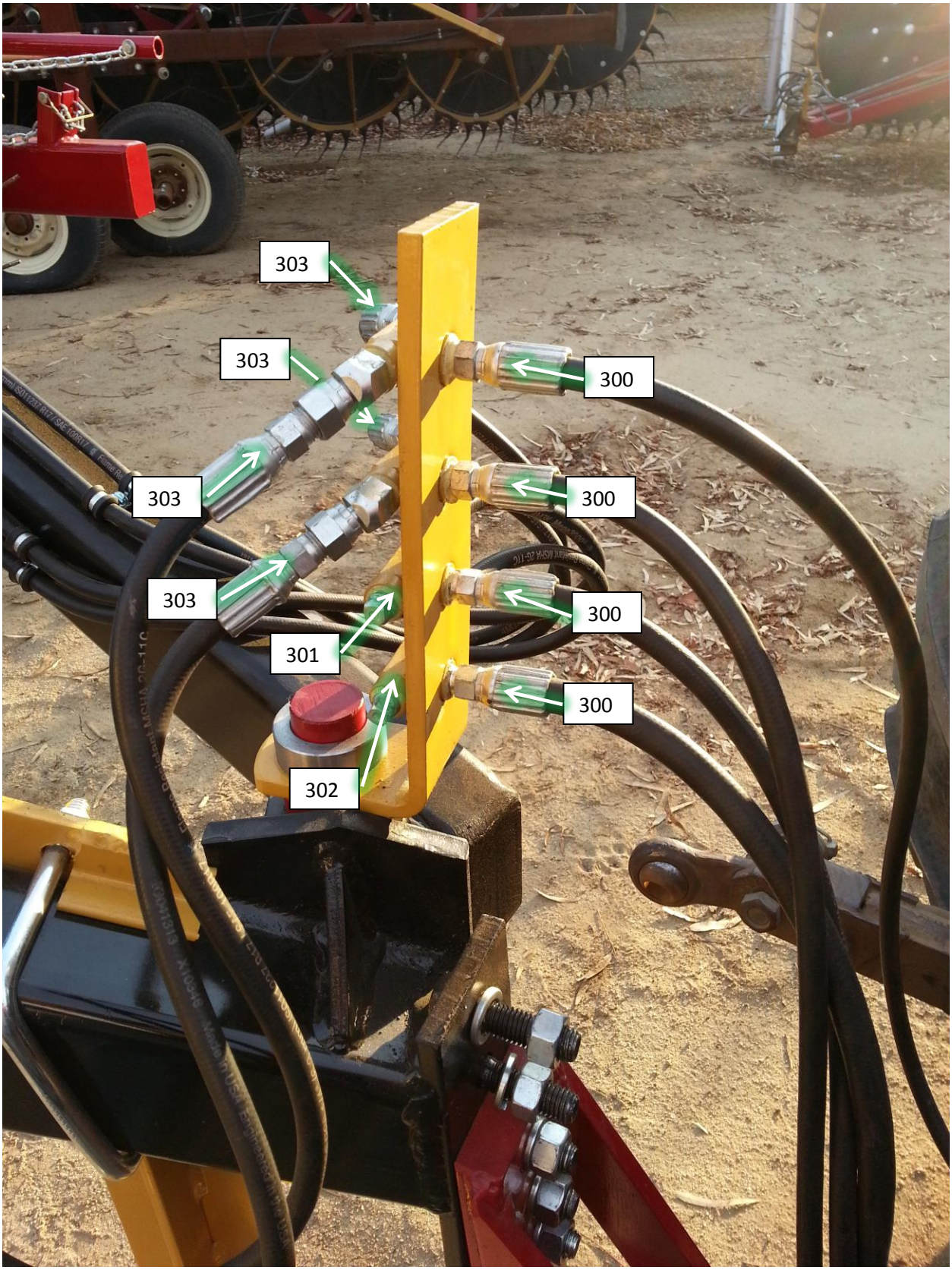
Connect hoses starting at the coupler on the leg strut.

(Numbers referenced may be found on the Hose Routing table on pg. 25 of this manual)

- The longer of the hoses (outer) should attach to the piston port (rear)

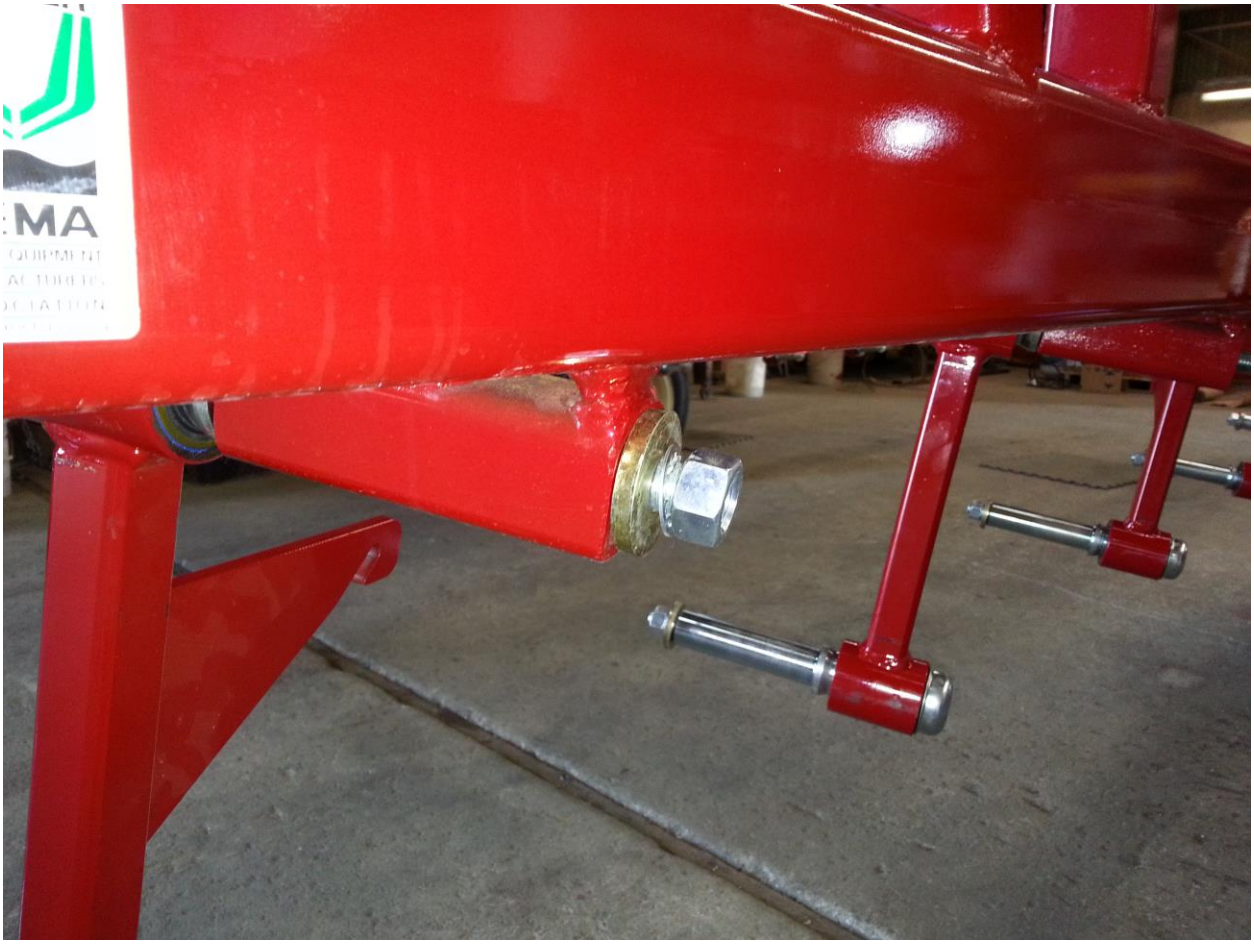


Route hydraulic hoses from couplers in overhead main frame, down the tongue unit to the hose manifold



Attach the 4 hydraulic hoses from the manifold to the tractor

(Numbers referenced may be found on the Hose Routing table on pg. 26 of this manual)

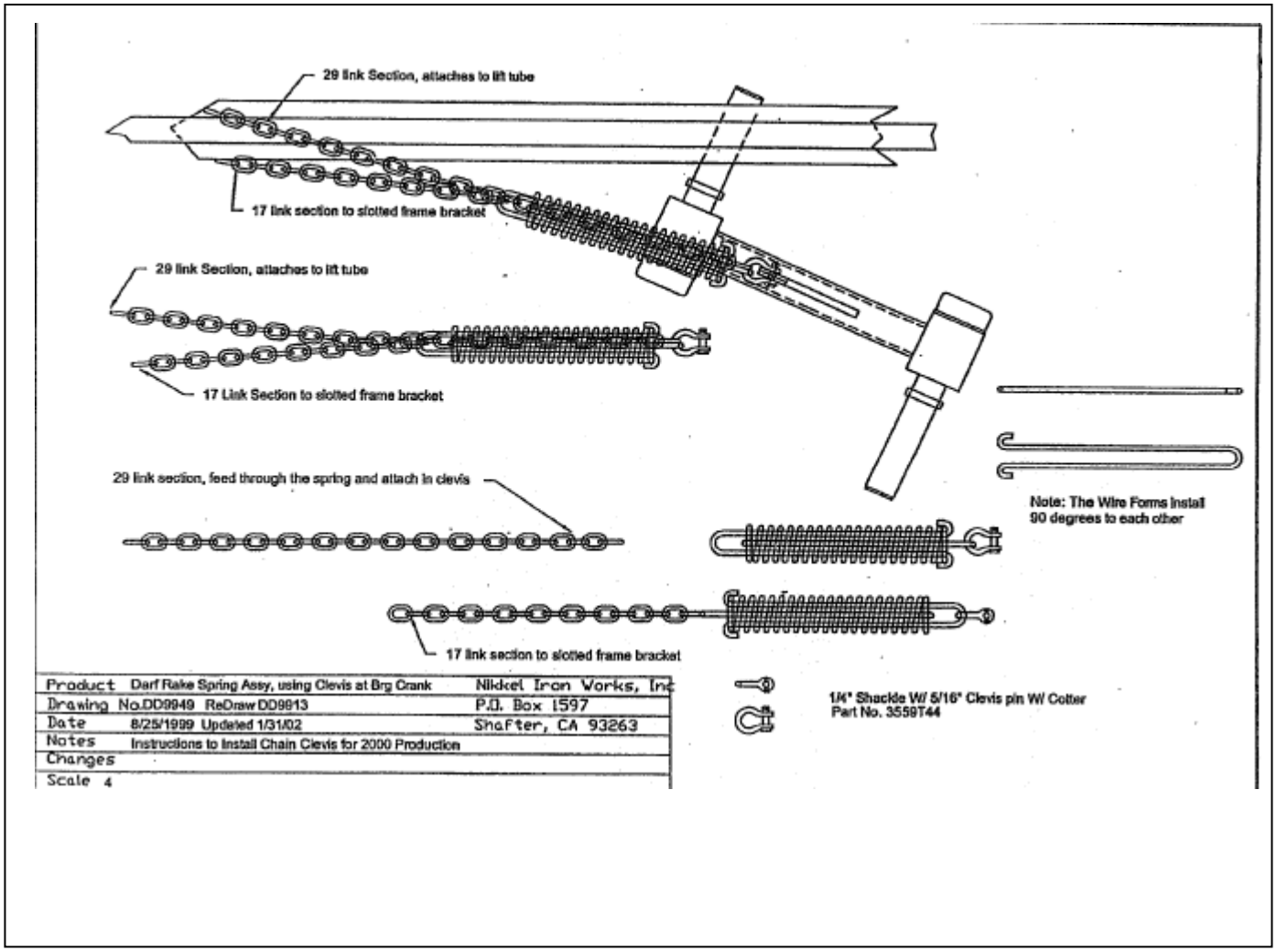


Install all bearing cranks at this time. Secure to frame mounting housing using 95045 ¾” Internal - 5/16” thick flat washer, 95044 ¾” internal star lock washer, and NUT12NC ¾”-10 hex nut

- All cranks can be identified right or left by observation of chain hook slot. Lay the crank on the floor and stand behind it with chain hook facing forward. The leg of the crank in front of the chain slot will point to the correct side, right or left.

RAKE WHEEL COMPRESSION SPRING & CHAIN INSTALLATION

(Refer to sample Compression Spring Assembly included in original shipment)



SOME TIPS ON ADJUSTING RAKE SPRING TENSION

- The 17-link chain attaches to the forward end of the spring and to the slotted frame bracket.
- Check to make sure the rake wheel lift cylinder is fully closed before making this adjustment.
- Use the rake crank handle (located on the right leg strut) to raise the rake wheel.
- Remove the safety lock pin.
- Lower the raking wheel so the teeth just contact the crop and drop the chain in the slot that works best. (The 2 slots allow approximately ½ link adjustment)

ASSEMBLY OF THE COMPRESSION SPRING

1.
TO INSET THE 29-LINK CHAIN THRU THE SPRING, USE A WIRE WITH A HOOK ON THE END.

FEED THRU THE UPPER END OF THE SPRING, HOOK TO CHAIN, AS SHOWN.

2.

PULL CHAIN COMPLETELY THRU THE SPRING.

3.

PULL CHAIN THRU THE SPRING AS SHOWN.

ASSEMBLY OF THE COMPRESSION SPRING

4.

ATTACH END LINK TO LIFT TUBE WITH 3/8”X1-1/2” CAPSCREW, FLAT WASHER & LOCK NUT.

5.

INSERT 17-LINK SECTION OF CHAIN IN SLOTTED BRACKET AND INSTALL PTO PIN AS SHOWN.

6.

THE COMPLETED ASSEMBLY.

RAKE WHEEL ASSEMBLY

WHEELS MOUNTED ON RAKE FRAMES THAT WILL BE ON THE RIGHT OF RAKE TO BE ASSEMBLED AS FOLLOWS:

1. Shield boards mount on flat side of wheel only, use long fastener screws in holes toward center of wheel. Short screws are for holes on outer edge of shield. Use large washer under head of screw and next to shield. Clip hooks over wheel spoke in rear of shield.

2. Mount teeth so tines face clockwise direction.

3. Use #92133 nut & bolt.

WHEELS MOUNTED ON RAKE FRAMES THAT WILL BE ON THE LEFT OF RAKE TO BE ASSEMBLED AS FOLLOWS:

1. Shields as above.

2. Mount teeth so tines face counter-clockwise direction.

3. Use #92133 nut & bolt.

DARF POLY SHIELD

INSTALLATION INSTRUCTIONS

UNPACK SHIELDS FROM

SHIPPING BOX

OVERLAP PIE SHAPED SECTIONS

TO FORM FLAT JOINT

USE (1) PLASTIC FASTENER IN MIDDLE HOLE ON JOINT

ASSEMBLE (6) SECTIONS TO FORM ROUND SHIELD

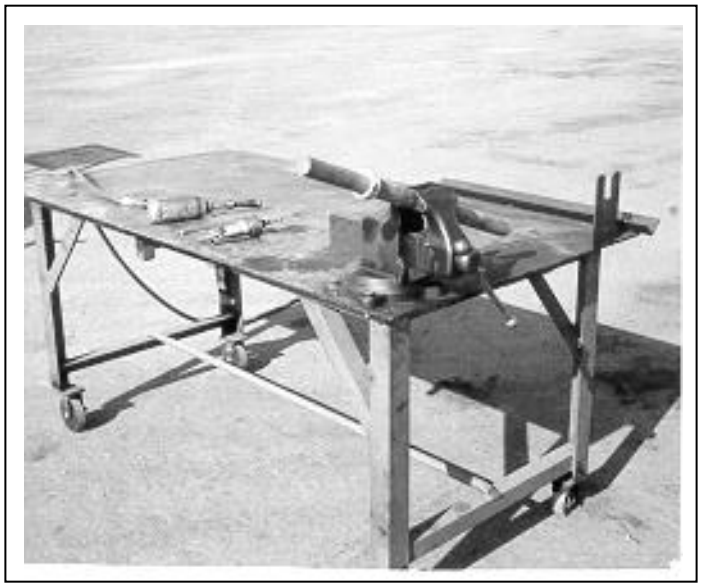
POSITION ON RAKE WHEEL

USE CLAMPS TO HOLD ASSEMBLED SHIELD TO WHEEL FRAME

FASTEN TO RAKE WHEEL USING STD. FASTENERS IN TOP & BOTTOM HOLES ON JOINT. FASTEN OUTSIDE EDGES USING (1) SHORT FASTENER, (2) FLAT WASHERS, AND (1) NUT.

DARF ANTI-WRAP SHIELD……PART # 92114AWS

INSTALL ON RAKE WHEEL AS SHOWN BEFORE INSTALLING WHEELS ON RAKE FRAME:



TO SPEED UP WHEEL BOARD & TOOTH INSTALLATION YOU CAN CLAMP A 1-1/2" SHAFT IN A VISE AS SHOWN ON THE LEFT OR WELD UP A STAND AS SHOWN ON THE RIGHT. THE USE OF AIR TOOLS WILL MAKE THIS JOB AN EASY ONE.

INSTALL POLY SHIELDS BEFORE INSTALLING TEETH.

Install the raking frame angle adjustment brackets (position according to photo) and top link (TL165P)

- Place the Single Hole Manual Adjustment Bracket (922993) on the leg strut so the bottom u-bolt rest on top of the locator lug

- Place the Trhree Hole Link Manual Adjustment Bracket (922994) on the raking frame between the 1st chain bracket and lift tube support to the rear of the leg strut

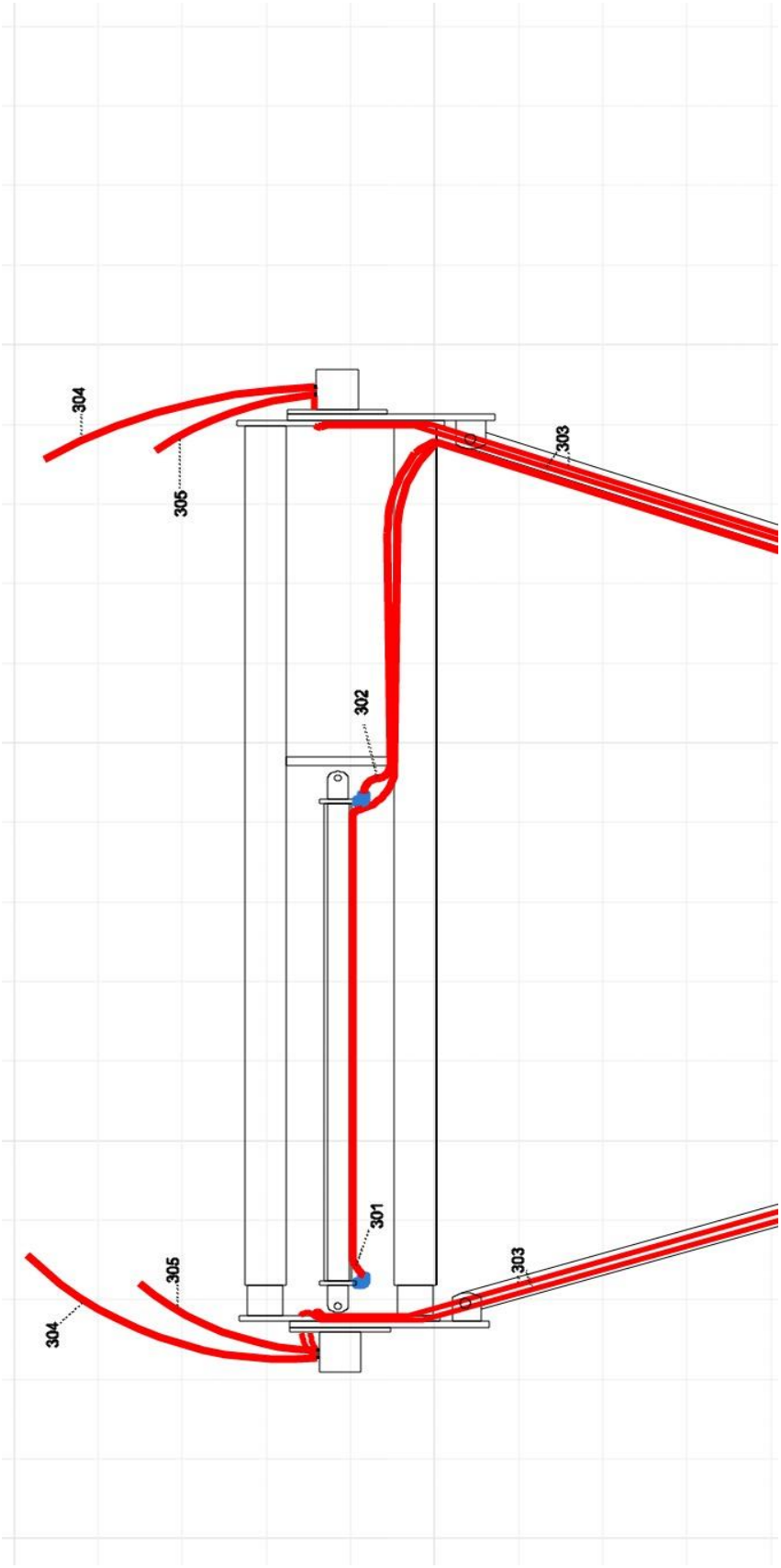
Before opening the lift tube cylinders, make sure the 17 link chain for each raking wheel is adjusted to the lowered raking position

HOSE ROUTING DIAGRAM

(Top View)

= Hose path

See table on following page for part numbers and description

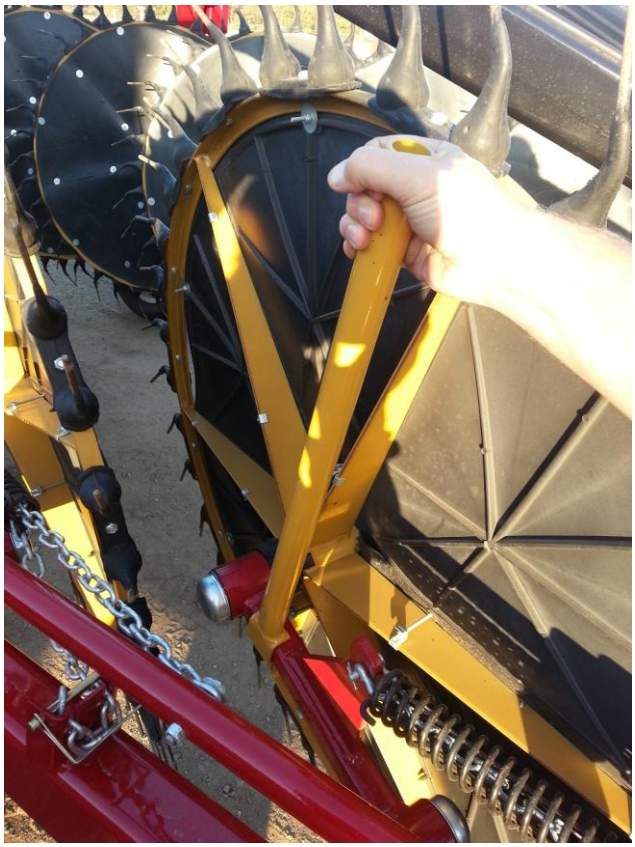


HOSE ROUTING

MODEL 513

REF	PART	DESCRIPTION	ROUTING FUNCTION
300	04X960X08	1/4" X 60" HOSE, 1/2" END, 1/4" END	HOSE MANIFOLD TO TRACTOR PORTS
301	04X4656X06	1/4" X 291" HOSE, 3/8" END, 1/4" END	HOSE MANIFOLD TO ROD END OF MAIN FRAME CYLINDER
302	04X3664X06	1/4" X 229" HOSE, 3/8" END, 1/4" END	HOSE MANIFOLD TO PISTON PORT OF MAIN FRAME CYLINDER
303	04X3568X04	1/4" X 223" HOSE, 1/4" ENDS	HOSE MANIFOLD TO 2-HOSE COUPLER ON LEG STRUT
304	04X1728X04	1/4" X 108" HOSE, 1/4" ENDS	2-HOSE COUPLER TO PISTON PORT OF LIFT TUBE CYLINDER
305	04X1552X04	1/4" X 97" HOSE, 1/4" ENDS	2-HOSE COUPLER TO ROD END PORT OF LIFT TUBE CYLINDER

USING THE RAKE WHEEL HANDLE



USING THIS HANDLE WILL MAKE ADJUSTING THE RAKE WHEEL SPRING TENSION AN EASY AND QUICK CHORE.

REPLACE THE HANDLE IN STORAGE BRACKET WHEN NOT IN USE.

SAFETY PRECAUTIONS

AVOID INJURY OR FATAL ACCIDENTS. READ THESE SAFETY PRECAUTIONS COMPLETELY AND CAREFULLY! UTILIZE THESE INSTRUCTIONS WHEN OPERATING YOUR MACHINE.

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

To prevent injury or death, use a tractor equipped with a roll-over protection system (ROPS). Do not paint over, remove or deface any safety or warning decals on your equipment. Observe all decals and practice the instructions on them.

REMEMBER! Your best insurance against accidents is a careful and responsible operator. If there is any portion of this manual or of the machine's operation you do not understand, contact your local authorized dealer.

BEFORE OPERATING

** Carefully study and understand your manual.

** Give the machine a ''once-over'' for any loose bolts, worn parts, cracked welds, hydraulic leaks, frayed hoses, etc. – make necessary repairs. Follow the Performing Maintenance guidelines.

** Be sure the hydraulic lines do not conflict with moving parts.

** Be sure the machine is hitched properly to the tractor.

DURING OPERATION

** Do not allow others to be careless near this equipment, or to ride in or on it.

** Do not clean, lubricate or adjust your equipment while it is running.

** Be extra careful on inclines.

** Avoid loose fill, rocks & holes; they can be dangerous to the machines operation or movement.

** Do not backup with rake wheels lowered to raking position. Tooth breakage may result.

** Rake teeth can cause injury. Use special caution when lowering and raising, rake wheels will drop.

** Periodically clear machine of hay or other materials to prevent build-up of dry flammable materials.

** Always drive at a reasonable speed to maintain control for the situation at hand.

HIGHWAY OPERATION

** Comply with your state and local laws governing highway safety and movement of farm machinery on public roads.

** Be a safe, courteous operator. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc.

** Watch for obstructions overhead and to the side while transporting.

PERFORMING MAINTENANCE

** Good maintenance is your responsibility. A poorly maintained machine is an invitation to trouble.

** Always use proper tools or equipment for the job at hand.

** Never use your hands to locate a hydraulic leak. Use a small piece of cardboard or wood. Hydraulic fluid escaping under pressure can penetrate the skin.

** Never replace hex bolts with less than Grade 5 bolts, unless otherwise specified.

** If the DARF rake is altered or modified from the original design, or if genuine replacement parts or teeth are not used and properly installed, NIKKEL IRON WORKS, INC. will not accept any responsibility or liability for injury or warranty.