

DARF HAY RAKE

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

OVERHEAD CARRIER RAKE
912 SERIES, 12-WHEEL
930 SERIES, 15-WHEEL

MANUFACTURED BY:

NIKKEL IRON WORKS, INC.
17045 CENTRAL VALLEY HWY
P. O. BOX 608
SHAFTER, CA 93263



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

STUDY YOUR MANUAL

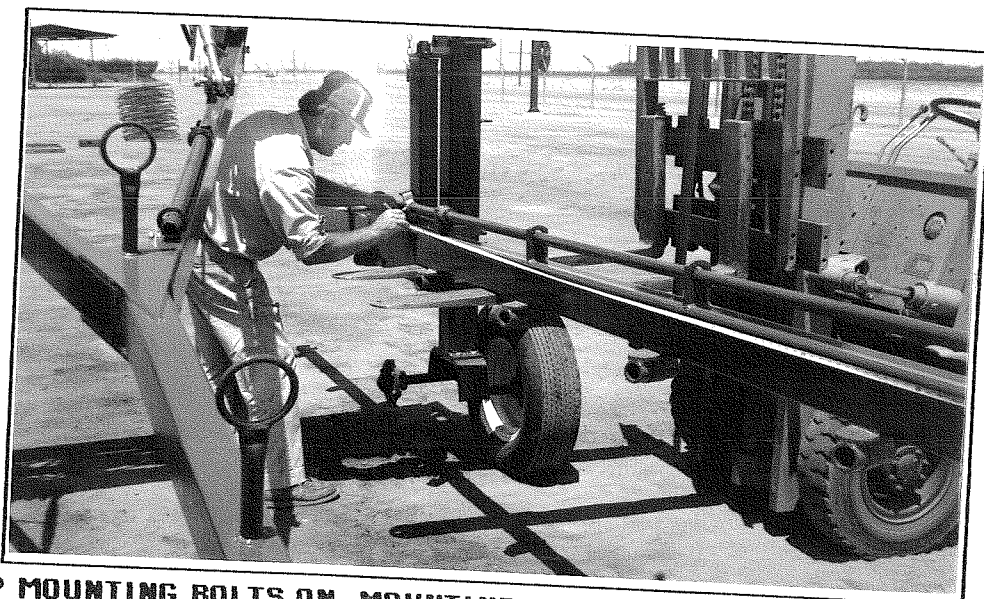
Reading this manual will acquaint you with the proper assembly of your new machine. The manual contains important assembly information as well as safety precautions.

The Darf 912 or 930 Rake will arrive at your dealership packaged as follows:

- 1- carton containing hydraulic cylinders, rake teeth and bolts, wheel board fasteners, assembly bolts, nuts and pins, top links, pins, hydraulic hoses, tandem axles and ground wheels, rake wheel cranks and springs.**
- 2- leg struts w/rake frame hinge installed (may have spindles installed)**
- 1- main overhead frame w/hydraulic hoses and cylinders installed**
- 2- rake wheel frames**
- 2- shipping stands of rake wheels**
- 1- tongue assembly**
- 1- bundle wheel shields**

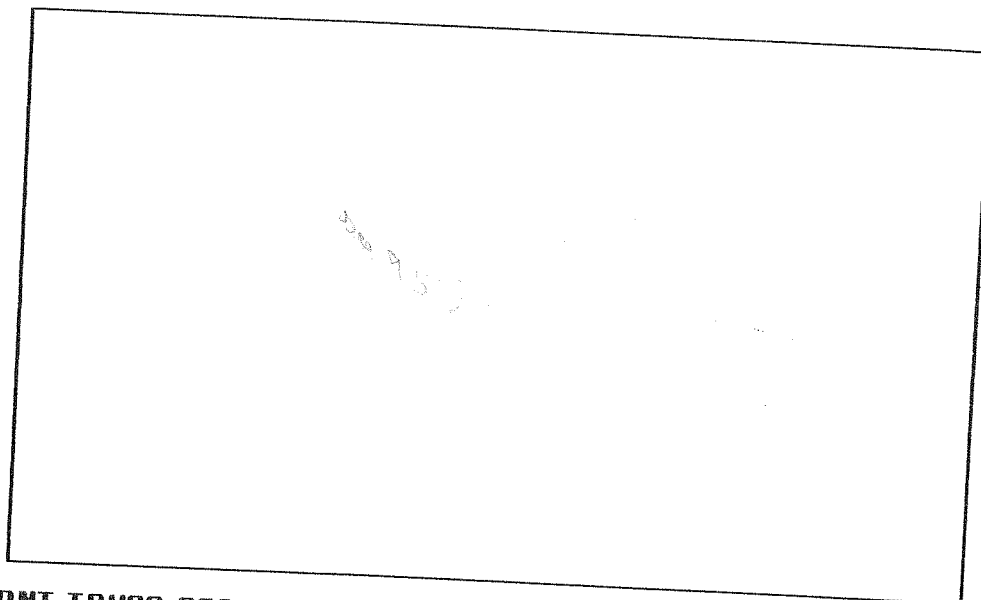
For your safety, be sure all chains, stands and tools are in proper working order. The assembly of the Darf rake will be much safer and faster if correct methods are used.

The photographs and illustrations furnished in this manual are for your 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.



REMOVE TOP MOUNTING BOLTS ON MOUNTING WELDMENT. LIFT RAKE WHEEL FRAME AND SLIDE BETWEEN PLATES.

MEASURE FROM FRONT OF RAKE WHEEL FRAME TO FRONT OF MOUNTING PLATE
-- 912 MODELS MEASURE 107.5"
930 MODELS MEASURE 116.0"



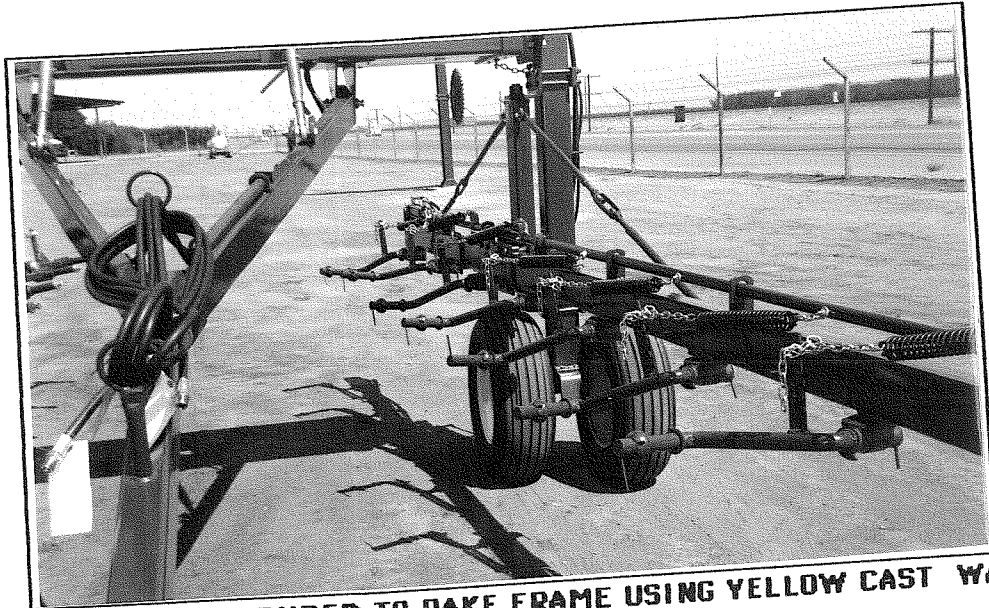
INSTALL FRONT TRUSS ROD AND LEVEL AS SHOWN.
INSTALL REAR TRUSS ROD. SECURE 1/2" ATTACHING BOLTS AND 3/4" LOCK NUT ON TURNBUCKLE - TIGHT.

INSTALL RIGHT AND LEFT SIDES IN THE SAME MANNER.

CRANK INSTALLATION

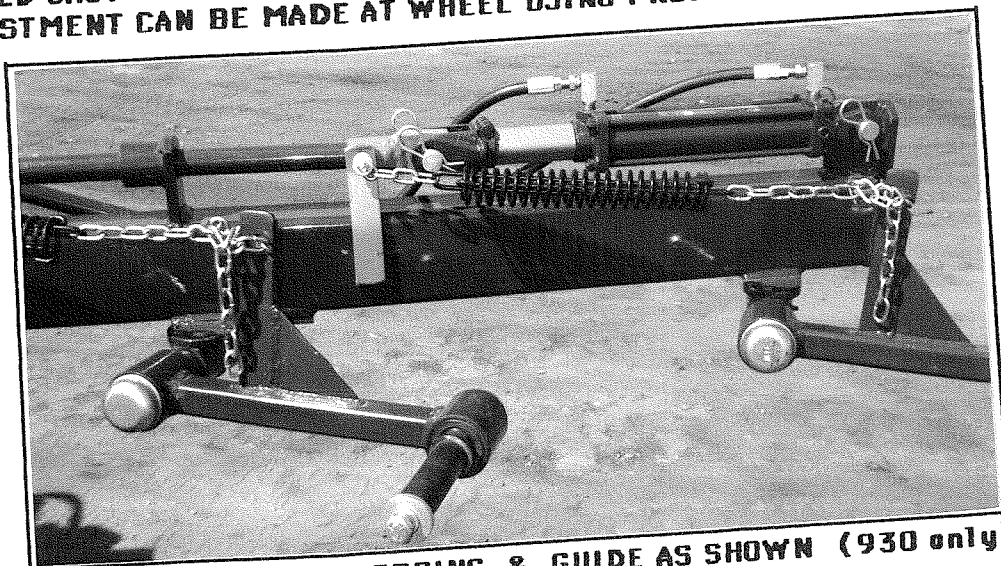
"All cranks can be identified right or left by observation of chain hook slot. Lay crank on floor and stand behind it with chain hook facing forward. The leg of the crank in front of chain slot will point to the correct side, right or left."

STANDARD CRANKS -----RED (P/N92119L) are for left side frames
-----YELLOW (P/N92119) are for right side frames



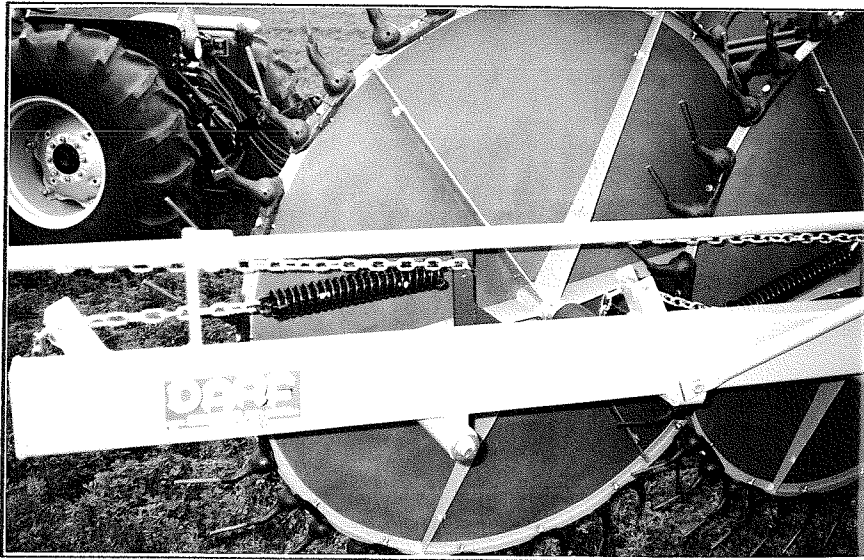
STANDARD CRANKS ARE SECURED TO RAKE FRAME USING YELLOW CAST WASHER (P/N 92107) AND (P/N 92107C) ROLL PIN.
NOTE: the cast washer can be installed to assure close fit.

ROTATE AND DRIVE PIN THROUGH SLOT THAT ALLOWS BEST FIT WITHOUT BINDING.
USE THE RED CAST WASHER (P/N 92107A) TO SECURE THE WHEEL TO CRANK.
SAME ADJUSTMENT CAN BE MADE AT WHEEL USING PROPER SLOT IN THE CAST WASHER.



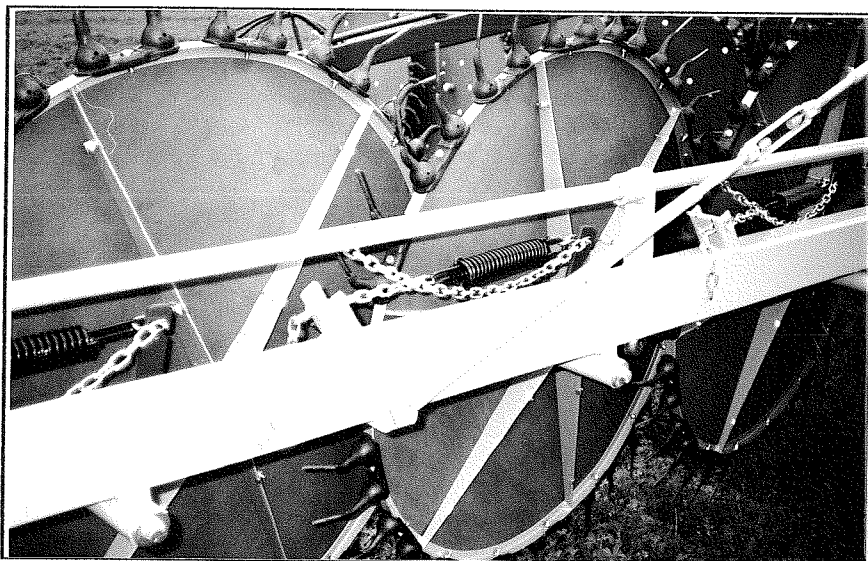
INSTALL WHEEL LIFT CYLINDER, SPRING & GUIDE AS SHOWN (930 only)

CRANK SPRING INSTALLATION MODEL 912, 12-WHEEL



BEARING CRANKS FOR ALL RAKES ARE SECURED USING 5/8 X 2" CAP SCREW, LOCK WASHER & HEAVY WASHER (P/N 92225A) AT FRAME AND WHEEL SPINDLES OF CRANKS.

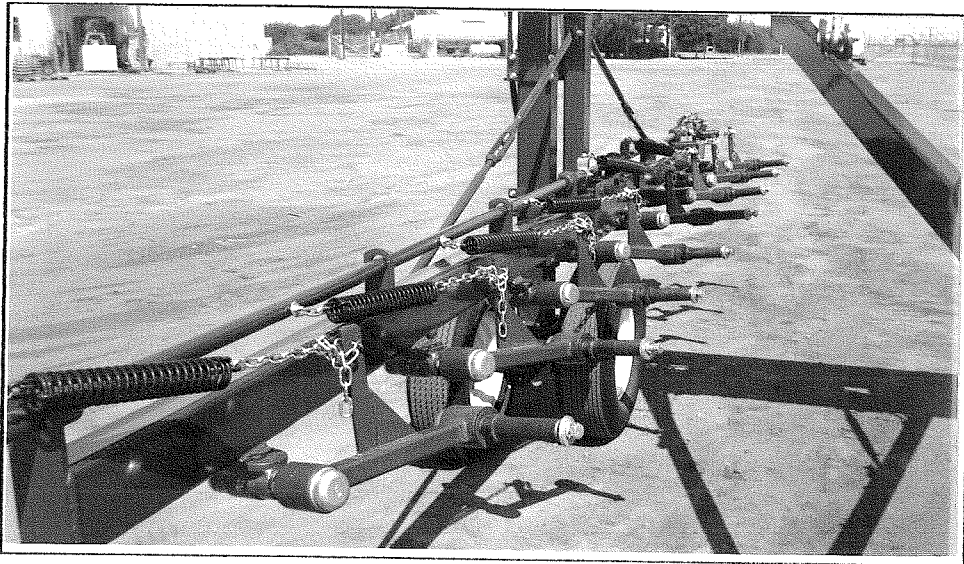
Tighten securely, re-check after 10 hours of running. Check free play of rake wheel bearings after 25 hours. Re-torque to 30fp if necessary. Lubricate by removing, cleaning & repacking annually.



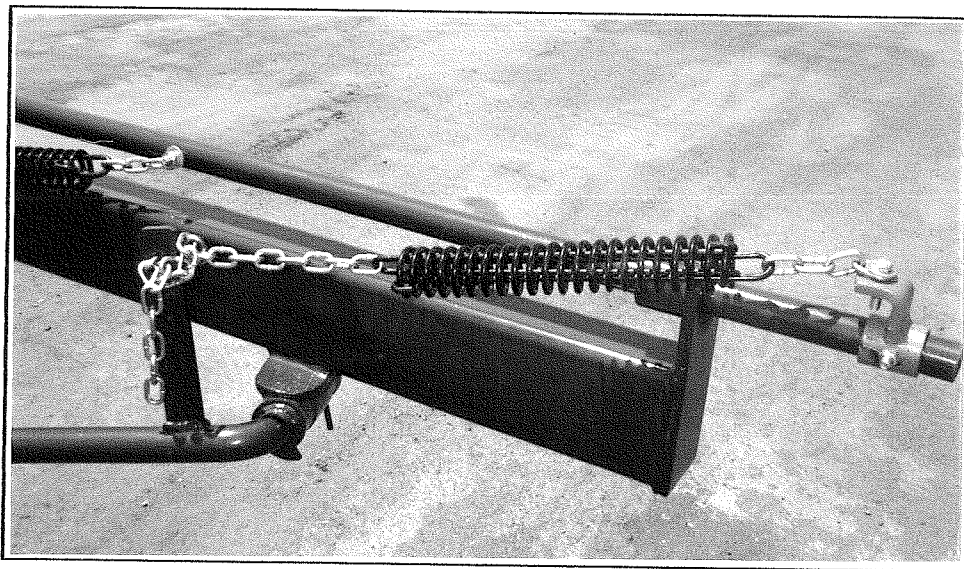
CORRECT RAKE WHEEL COMPRESSION SPRING INSTALLATION

AFTER THE RAKING WHEELS ARE INSTALLED USE THE RAKE CRANK HANDLE FOR EASIER HANDLING. REPLACE HANDLE IN RINGS ON TONGUE.

**CRANK SPRING INSTALLATION
MODEL 930, 15-WHEEL**



BEARING CRANKS FOR ALL RAKES ARE SECURED USING 5/8 X 2" CAP SCREW, LOCK WASHER & HEAVY WASHER (P/M 92225A) AT FRAME AND WHEEL SPINDLES OF CRANKS.
Tighten securely, re-check after 10 hours of running. Check free play of rake wheel bearings after 25 hours. Re-torque to 30fp if necessary. Lubricate by removing, cleaning & repacking annually.



CORRECT RAKE WHEEL COMPRESSION SPRING INSTALLATION

AFTER THE RAKING WHEELS ARE INSTALLED USE THE RAKE CRANK HANDLE FOR EASIER HANDLING. REPLACE HANDLE IN RINGS ON TONGUE.

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 fastner 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. If equipped with steel tines, use black painted tine.

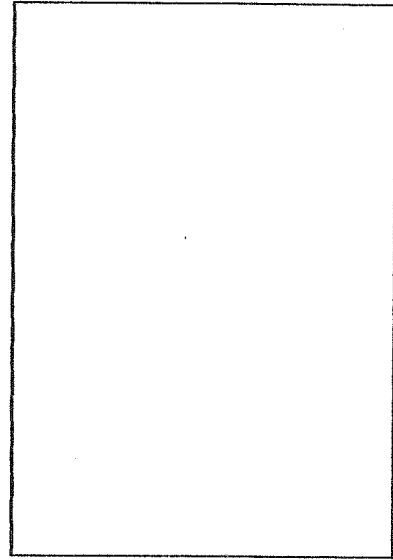
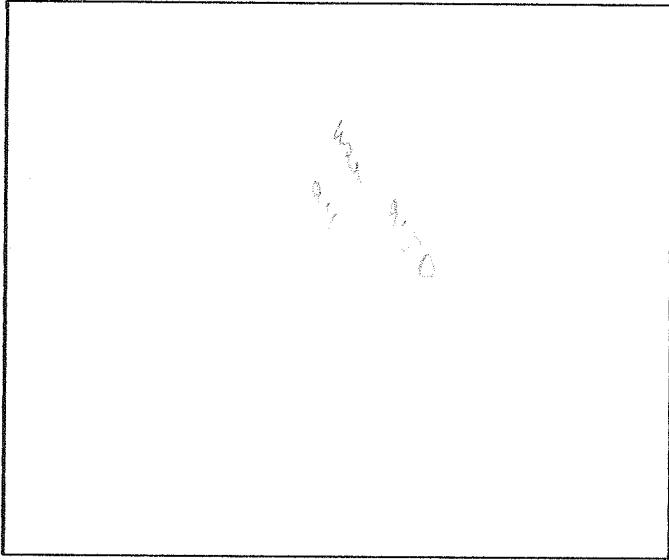


WHEELS MOUNTED ON RAKE FRAMES THAT WILL BE ON THE *LEFT* OF RAKE TO BE ASSEMBLED AS FOLLOWS:

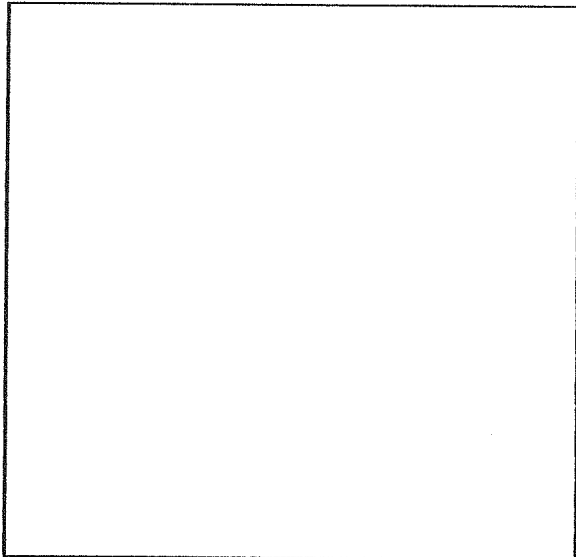
1. Shields as above.
2. Mount teeth so tines face *counter-clockwise* direction or if steel tines are used, they are red in color.

FOR RUBBER TEETH ----- no clip is needed, mount with P/N 92133 bolt & nut.

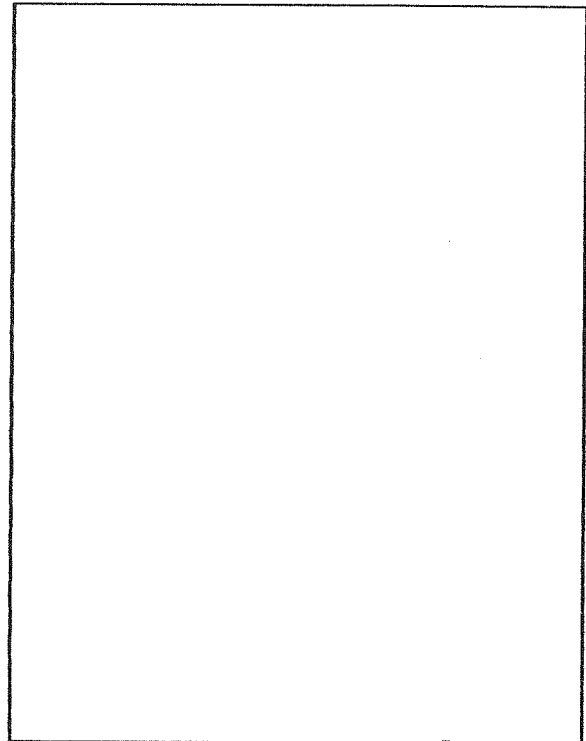
FOR STEEL TEETH ----- mount with p/n 92118 clip & 92133 bolt & nut.



TO SPEED UP WHEEL BOARD AND 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.

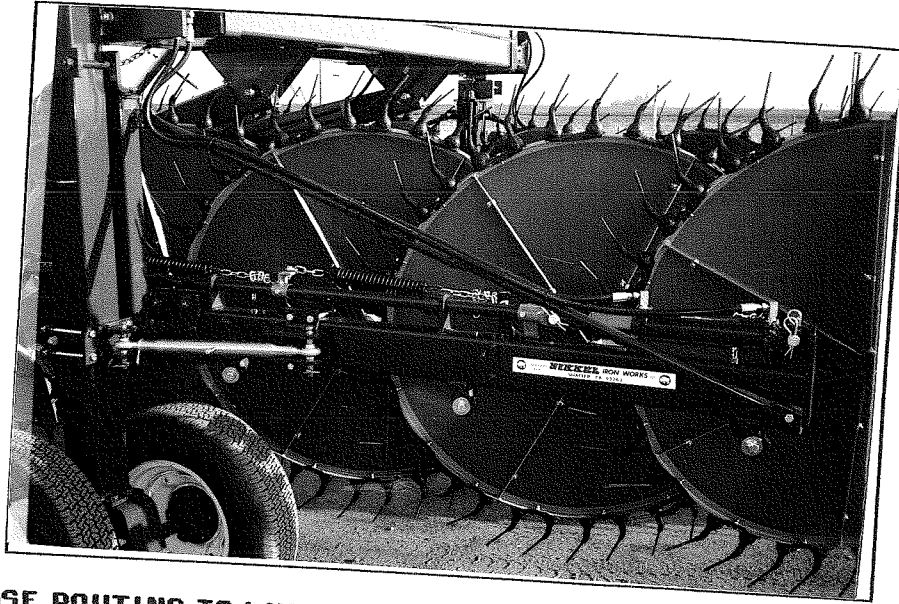


**INSTALL WHEEL BOARDS BEFORE
INSTALLING TEETH**



INSTALL TEETH USING INSTRUCTIONS ON PREVIOUS PAGE.

930 STD ASSEMBLY PHOTOS - for reference



NOTE HOSE ROUTING TO WHEEL LIFT CYLINDERS & LOCATION OF RAKING FRAME ADJUSTING LINK & BRACKETS. SHOWN IN TRANSPORT POSITION.

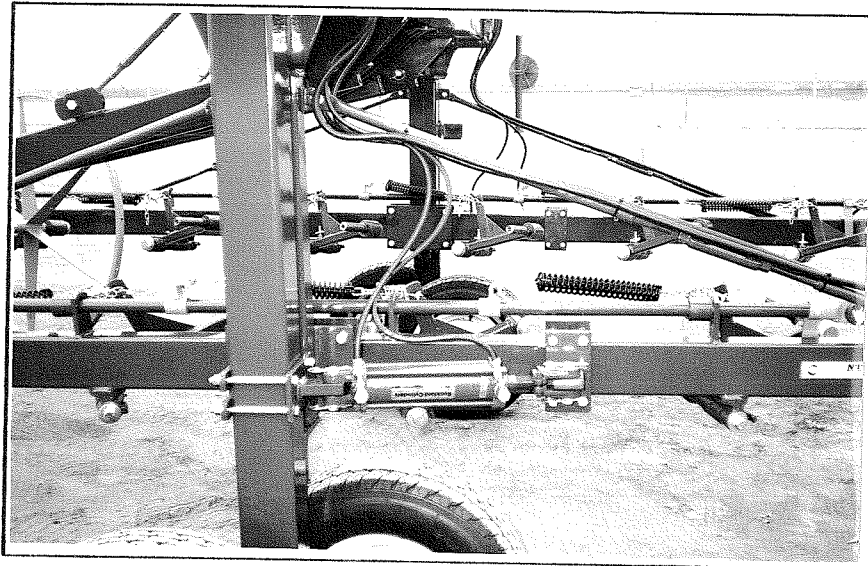
See 917

See 917

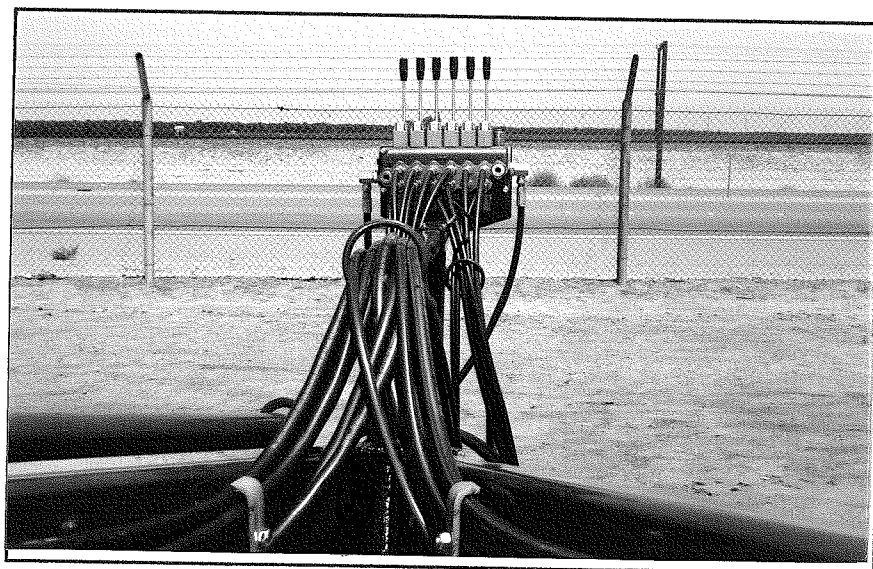
**HOSE ROUTING: TOP HOSES ----- FOR OPENING & CLOSING MAIN FRAME
LOWER HOSES -- FOR RAISING & LOWERING RAKE WHEEL
(hose tips not included)**

NOTE: On tractors equipped with flow control valves, adjust to "SLOW" position.

930FD ASSEMBLY PHOTOS - for reference

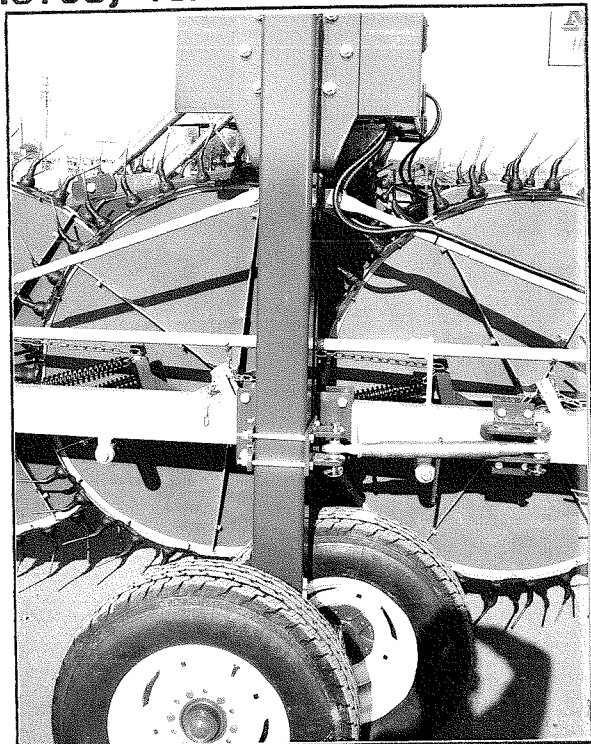
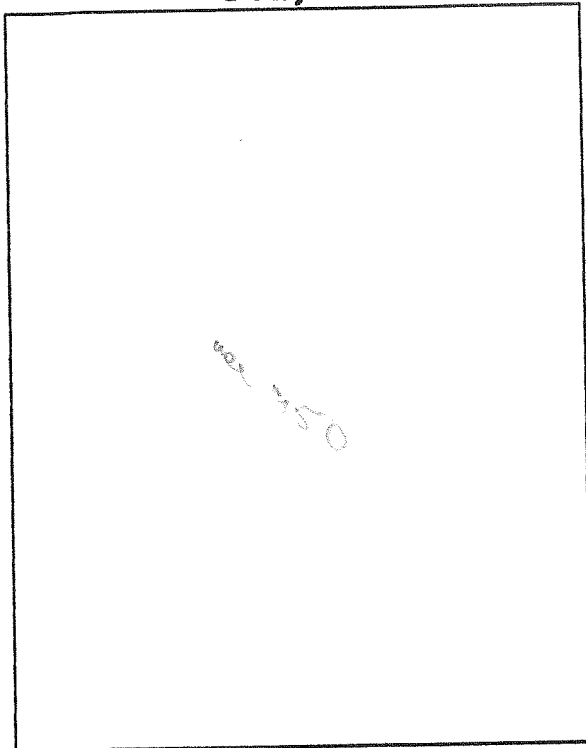


**HOSE ROUTING FOR RAKE WHEEL LIFT CYLINDERS.
INSTALLATION OF RAKE WHEEL FRAME SWING CYLINDERS & HOSE ROUTING.
Locate frame angle cylinder (piston end) bracket 17-1/2" to the rear of
rake frame mounting plate, with cylinder closed position as shown.**



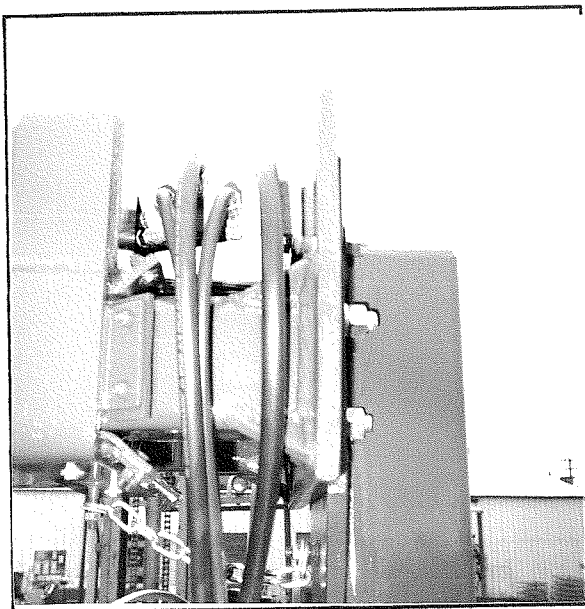
HOSE ROUTING FOR 6-SPOOL VALVE, AS SHOWN FROM REAR OF VALVE.

912, 930 ASSEMBLY PHOTOS, for reference

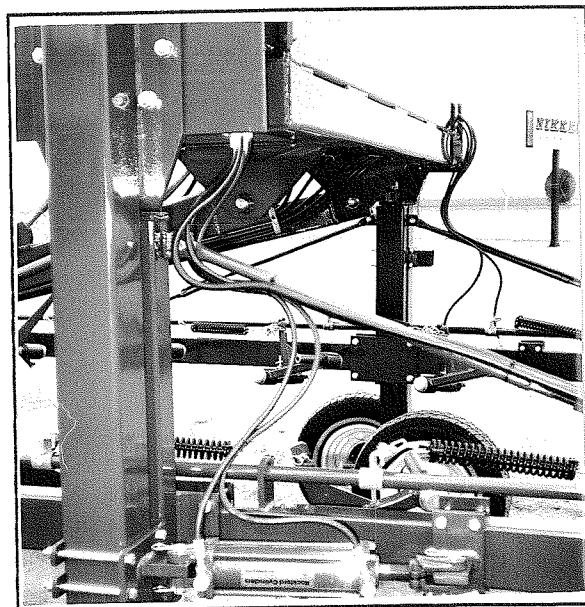


912, 930 LEG STRUT HOSE ROUTING - left side

Locate frame angle link bracket 16" to the rear of rake frame mounting plate, with adjusting link in closed position as shown.



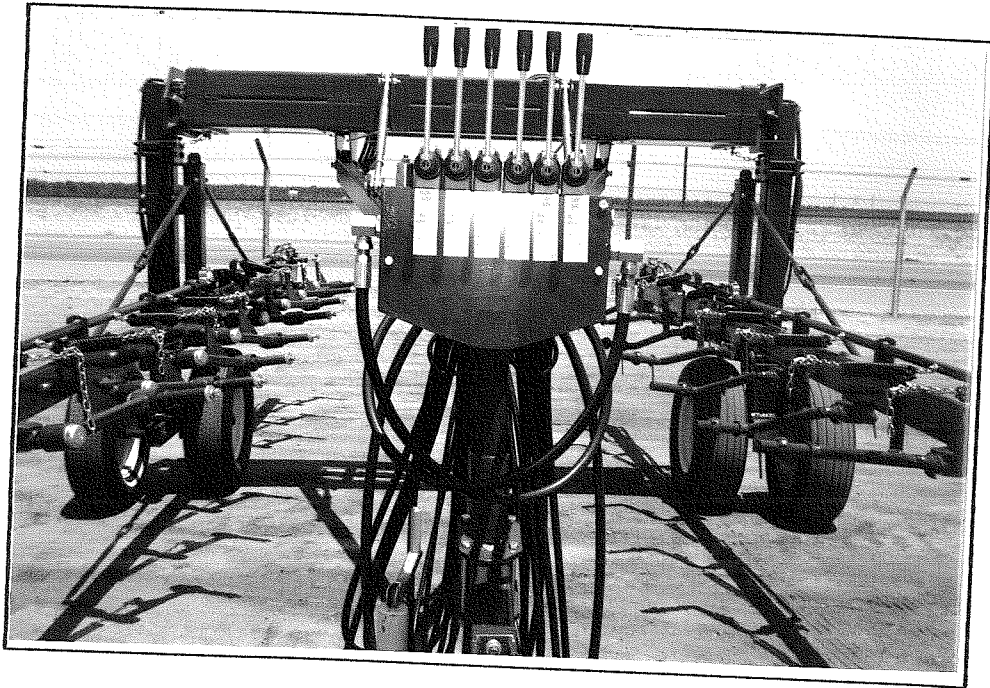
RIGHT SIDE-REAR VIEW



LEFT SIDE

912FD, 930FD LEG STRUT HOSE ROUTING

912FD and 930FD 6-SPool VALVE



LEFT SIDE	RIGHT SIDE	LEFT SIDE	RIGHT SIDE	LEFT SIDE	RIGHT SIDE
RAKE WHEELS	RAKE WHEELS	FRAME OPEN	FRAME OPEN	RAKING FRAME ANGLE	RAKING FRAME ANGLE
RAISE /	RAISE /	CLOSE	CLOSE	OPEN /	OPEN /
LOWER	LOWER	PULL TYPE MODELS MUST BE MOVING SLOWLY	PULL TYPE MODELS MUST BE MOVING SLOWLY	CLOSE	CLOSE

FACING FROM FRONT
SUGGESTED DECAL LOCATION & CORRESPONDING HOSE ROUTING

DARF RAKE OPERATING INSTRUCTIONS

MODEL 912 & 930, W/ FULL HYDRAULICS

- ** Maintain tire pressure: 12 PSI front, 18 PSI rear
- ** Adjust spring tension to allow crop to rotate raking wheels
- ** Do not operate raking wheels in the ground
- ** Install suitable hose couplers on the 1/2" hoses from the valve. Insert in tractor couplers. Lock tractor remote handle in position so oil is entering at the correct valve "in" port. If your tractor is closed center, install the closed center adapter furnished with the rake valve.
- ** Remove the 2 dealer installed 03PCCHAIN08 safety transport chains.

TO OPEN FROM TRANSPORT POSITION TO RAKING POSITION

1. Operate the valve indicated on the valve decal to raise the raking wheels to the "up" position.
2. Operate the frame valves indicated on the valve decal WHILE MOVING. Pull forward slowly until the main frame is fully open.
3. Using the hydraulic valves indicated on the valve decal, adjust the raking wheel frames to the required angle.
4. Level raking frames to the ground by alternately adjusting the main frame to drawbar adjusting links.
5. Operate the hydraulic valves indicated on the valve decal to lower the raking wheels.
6. Check hydraulic fluid in your tractor. You will likely need to add approximately 2 gallons for initial start up.
7. Adjust the raking wheel crop contact (spring tension) by using the supplied rake crank handle and position chain in crank slot so the raking wheel will move the crop with minimum or no ground contact. Replace handle in rings on tongue.

NOW YOU ARE READY TO RAKE

TO CLOSE TO TRANSPORT POSITION FROM RAKING POSITION

1. Operate the hydraulic valves indicated on the valve decal to raise the raking wheels to the "up" position.
2. Return raking frames to straight position.
3. Operate the frame valves indicated on the valve decal WHILE MOVING. Pull forward slowly until the main frame is fully closed.

NOW YOU ARE READY TO TRANSPORT

DRIVE CAUTIOUSLY. GIVE ONCOMING AND PASSING TRAFFIC AMPLE ROOM

DARF RAKE OPERATING INSTRUCTIONS

MODEL 912 & 930, W/STANDARD HYDRAULICS

- ** Maintain tire pressure: 12 PSI front, 18 PSI rear
- ** Adjust spring tension to allow crop to rotate raking wheels
- ** Do not operate raking wheels in the ground
- ** Install suitable hose couplers on the 4 hoses supplied. You will need 1 double acting valve to open and close the main frame and 1 double acting valve for raising and lowering the raking wheels.
- ** Remove the 2 dealer installed 03PCCHAIN08 safety transport chains.

TO OPEN FROM TRANSPORT POSITION TO RAKING POSITION

1. Operate the tractor valve to raise the raking wheels to the "up" position.
2. To open the overhead frame, operate the tractor valve WHILE MOVING. Pull forward slowly until the main frame is fully open, or to the width suitable for your raking conditions.
3. Use the adjusting links on the raking wheel frames to adjust raking angle as required. 3 pin positions are also available for faster positioning of frame.
4. Level raking frames to the ground by alternately adjusting the main frame to drawbar adjusting links.
5. Operate the tractor valve to lower the raking wheels, check each raking wheel for proper crop contact.
6. Check hydraulic fluid in your tractor. You will likely need to add approximately 2 gallons for start up.
7. Adjust the raking wheel crop contact (spring tension) by using the supplied rake crank handle and position chain in crank slot so the raking wheel will move the crop with minimum or no ground contact. Replace handle in rings on tongue.

NOW YOU ARE READY TO RAKE

TO CLOSE TO TRANSPORT POSITION FROM RAKING POSITION

1. Operate the tractor valve to raise raking wheels to the "up" position.
2. Return raking frames to straight position.
3. To close the overhead frame, operate the tractor valve WHILE MOVING. Pull forward slowly until the frame is fully closed.

NOW YOU ARE READY TO TRANSPORT

DRIVE CAUTIOUSLY. GIVE ONCOMING AND PASSING TRAFFIC AMPLE ROOM



SAFETY PRECAUTIONS



AVOID INJURY OR FATAL ACCIDENTS. READ THESE SAFETY PRECAUTIONS COMPLETELY & 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 and 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., and make necessary repairs. Follow the Performing Maintenance Safety Precautions
- ** Be sure 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 or lubricate or adjust your equipment while it is running.
- ** Be extra careful on inclines.
- ** Avoid loose fill, rocks & holes; they can be dangerous to machine operation or movement.
- ** Do not back up with the rake wheels lowered to raking position. Tooth breakage may result.
- ** Rake teeth can cause injury. Use special caution when lowering and raising rake wheels. Do not drop rake wheels on feet.
- ** Periodically clear the 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.



SAFETY PRECAUTIONS

(CON'T)

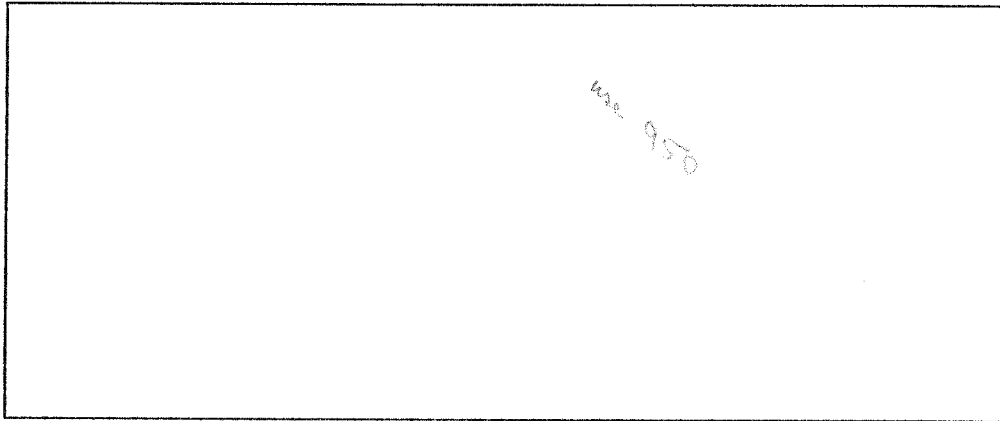
HIGHWAY OPERATION

- ** Comply with your state and local laws governing highway safety, and movement of farm machinery on public roads.
- ** Be a safe and 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.

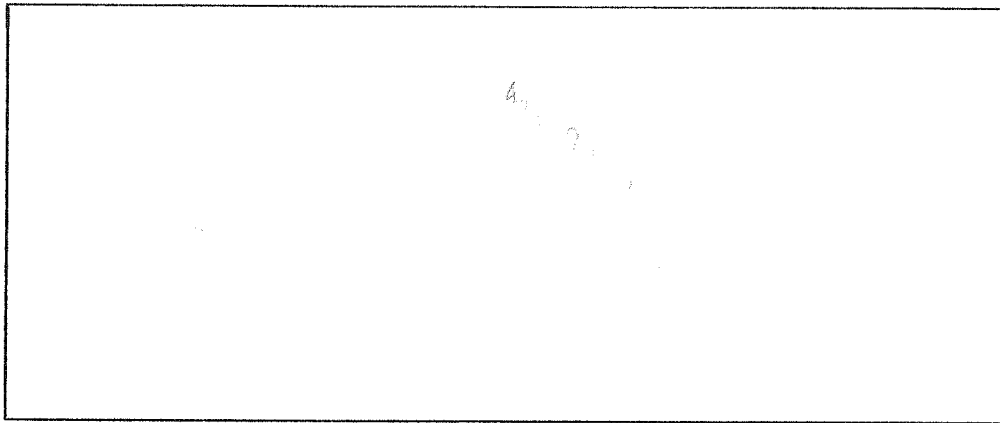
PERFORMING MAINTENANCE

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

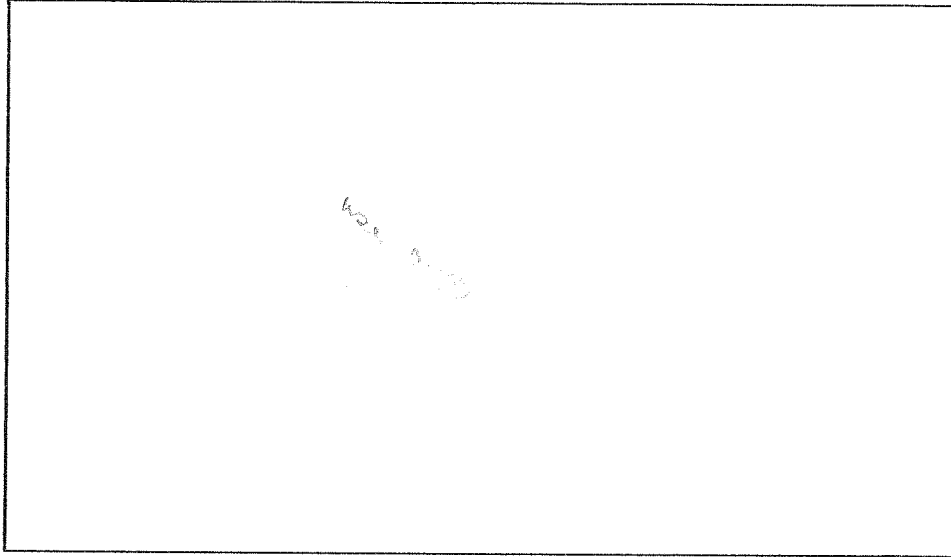
DARF 930 MAIN OVERHEAD FRAME



**SUPPORT THE MAIN OVERHEAD FRAME AS SHOWN OR WITH ADEQUATE STANDS.
NOTE ANGLE BRACKETS ARE TO THE FRONT.**

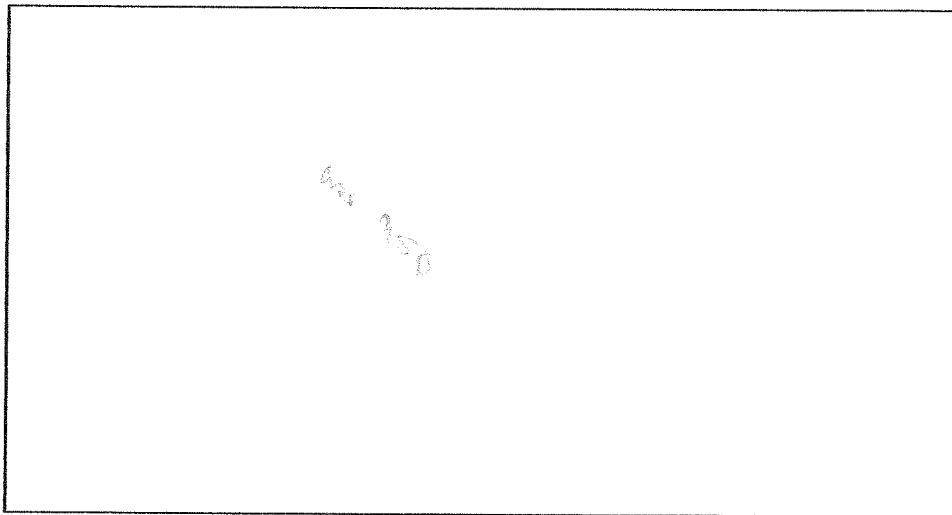


**INSTALL HITCH AS SHOWN USING 1" PINS AND LYNCH PINS.
INSTALL TONGUE JACK.**

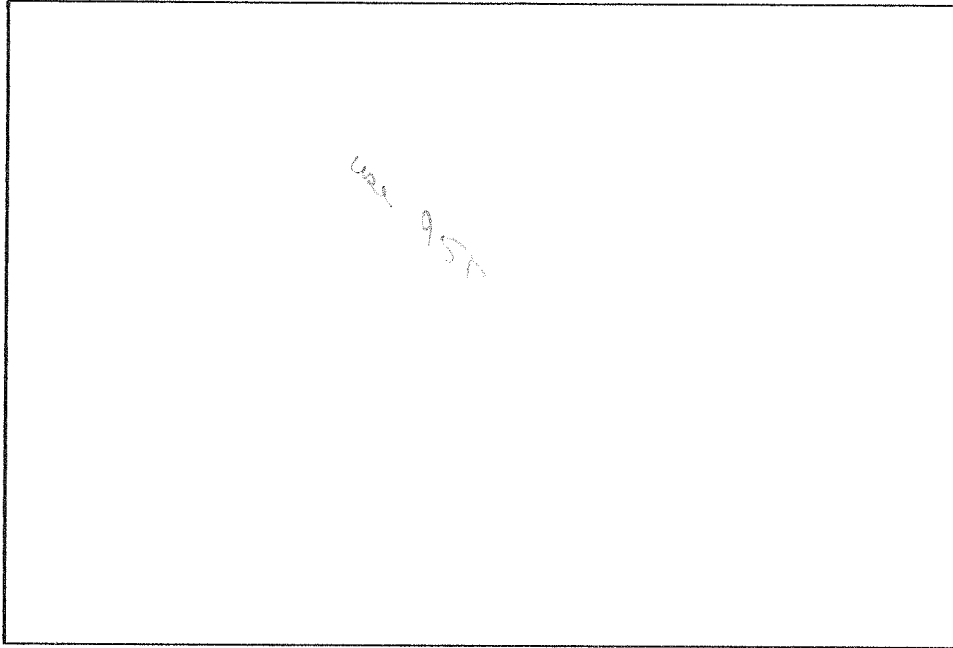


**RAISE MAIN FRAME WITH HOIST OR FORKLIFT AS SHOWN APPROX. 6 FT HIGH.
ADJUST TONGUE JACK SO THAT HITCH IS APPROX. 16" OFF THE GROUND OR FLOOR.
ADJUST 2 CAT. I TOP LINKS TO APPROX. 27" CENTERS.**

**INSTALL BETWEEN FRAME ANGLES AND HITCH TABS WITH 2, 3/4X3-1/2 GRD 5 CAP
SCREWS AT TOP & 2, 3/4X4" GRD 5 CAP SCREWS ON TONGUE, (USE 3/4" SELF LOCKING NUTS)**



**SET THE RAKE WHEEL FRAMES IN PLACE.
NOTE THE TRUSS BRACES FACE THE OUTSIDE. THE RAKE FRAMES ARE RIGHT AND LEFT.**



LEG STRUTS ARE INTERCHANGEABLE.

- a. If dual wheel mounts are installed, be sure outside ground wheel is mounted to front of rake.
- b. If ground wheel mounts are not installed, lay out on proper side for installation.

REMEMBER ----- OUTSIDE WHEEL GOES TO FRONT OF RAKE.

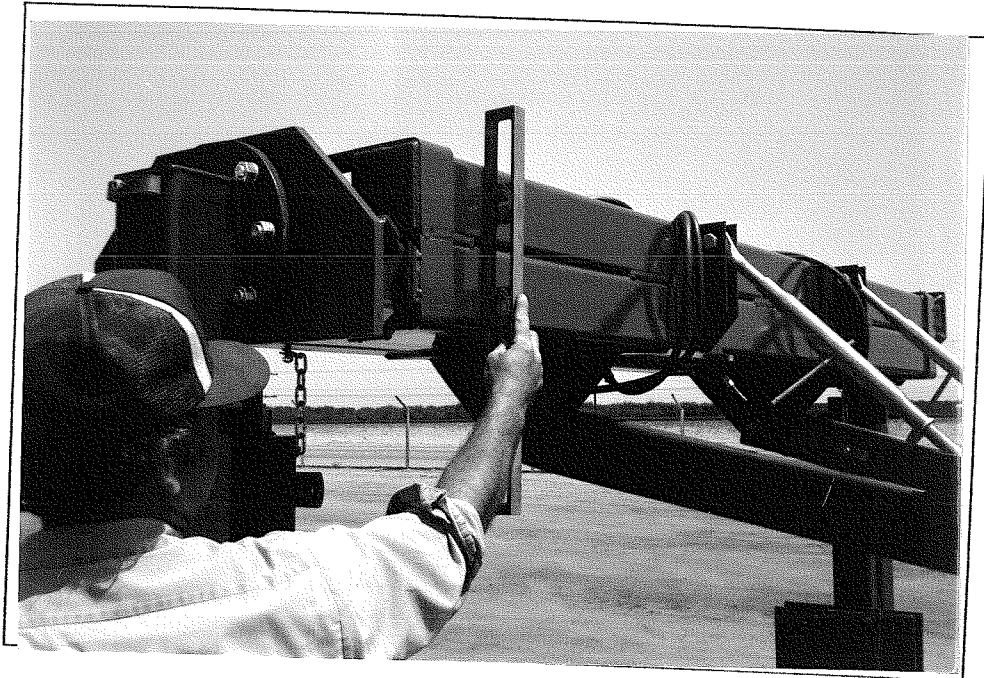
WITH MAIN FRAME SECTION UP, MOUNT LEG STRUTS TO EACH SIDE AT PLATES WELDED TO MALE EXTENSION TUBES. BOLTS FOR MOUNTING WERE SHIPPED IN PROPER PLACE.

IF GROUND WHEEL SPINDLES ARE YET TO BE MOUNTED, DO SO NOW.

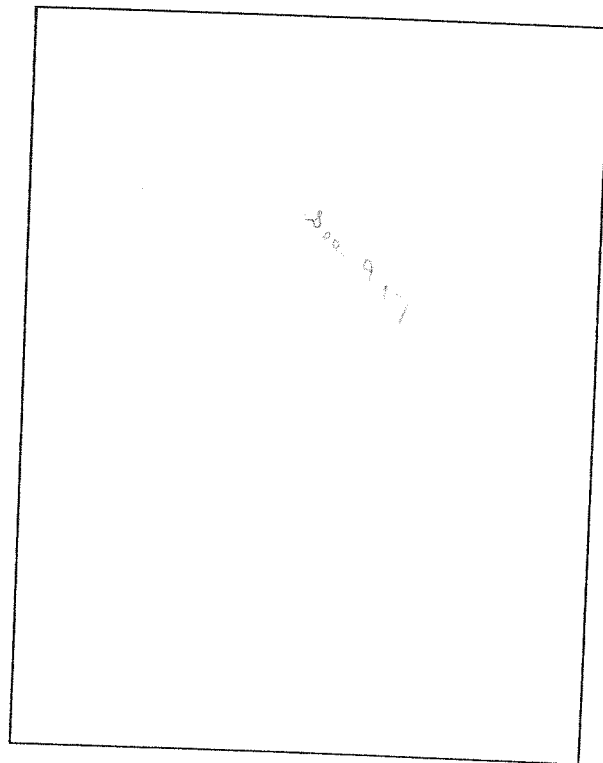
INSTALL GROUND WHEELS WITH TIRES MOUNTED .

Rake will now rest on ground wheels and tongue jack for final assembly.

After the rake is fully assembled, raise raking wheels then measure front of leading tire approx. 4" from floor, then repeat this step on trailing tire. Note measurement and slip hub assembly until approx. 1/8" + or - toe in is achieved. Retighten ground wheel assembly at bottom of leg strut securely.



BY ALTERNATING ADJUSTING TONGUE TOP LINKS APPROX 1/2 TURN EACH, LEVEL MAIN FRAME AS SHOWN.



WITH MAIN FRAME LEVEL, CHECK LEG STRUTS FOR LEVEL AND TIGHTEN LEG STRUT BOLTS TO MAXIMUM. USE 3/4" DRIVE TOOLS WITH FLEX HANDLE AND EXTENSION TO 300 FP.