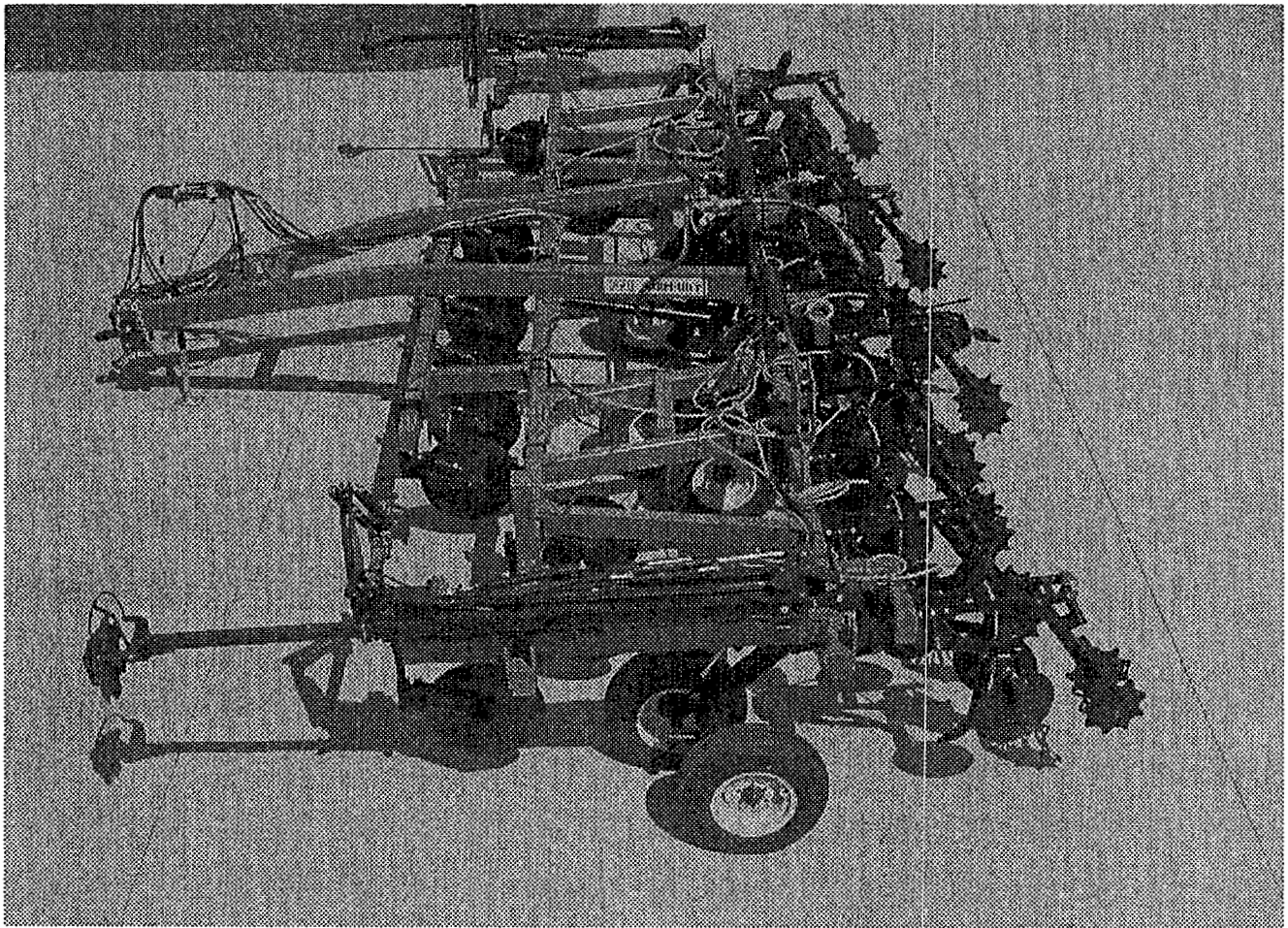


# nutri-till'r

## Model 5310

# operator's manual



**DMI yield till® system... Helping Plants Thrive®**

600 East Peoria Street • P.O. Box 65 • Goodfield, Illinois 61742-0065

# TO THE OPERATOR

The manufacturer has built performance, features, reliability, and long life into this product, but it is your responsibility to operate and service this machine properly in order to realize these built in benefits.

The manufacturer urges you to read and understand this manual and to instruct all who will operate the implement to proper operation and service.

When ordering parts, provide the complete model number and serial number of the machine (should be filled in below), in addition the part number and part description.

MODEL NUMBER \_\_\_\_\_ SERIAL NUMBER \_\_\_\_\_

DATE PURCHASED \_\_\_\_\_ DEALER PHONE NUMBER \_\_\_\_\_

DEALER NAME \_\_\_\_\_





**NOTE:** When the term "Right" or "Left" is used, it means from a position behind the implement and facing the front.

## BOLT TORQUE

### READ THESE INSTRUCTIONS FIRST:

1. Improperly tightened bolts will result in damage, breakage, expense, and down-time.
2. Always replace bolts with the specified grade and type.
3. Torque properly before first use of the machine and every 2-4 hours of use until you are sure bolts are staying tight.
4. The chart below is a guide for proper torque. Use it unless a specified torque is called out elsewhere in the manual.
5. Torque is the force you apply to the wrench handle or the cheater bar, times the length of the handle or bar.
6. Use a torque wrench whenever possible.

The following table shows torque as measured in ft-lbs.

BOLT DIA. AND THREADS PER INCH	 GRADE 2	 OR  GRADE 5 A-325	 GRADE 8
3/8 - 16	25	35	50
7/16 - 14	35	55	80
1/2 - 13	55	85	125
9/16 - 12	75	125	175
5/8 - 11	105	170	235
3/4 - 10	185	305	425
7/8 - 9	170	445	690
1 - 8	260	670	1030
1 1/8 - 7	365	900	1480
1 1/4 - 7	515	1275	2060
1 3/8 - 6	675	1675	2700
1 1/2 - 6	900	2150	3500
1 3/4 - 5	1410	3500	5600

**NOTE:** Torque values given are for lubricated hardware. Increase values given by 10% non-lubricated hardware. Use 65% of torque value given for jam nuts.

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# SAFETY SECTION

Throughout this manual, the term IMPORTANT is used to indicate that failure to observe can cause damage to equipment. The terms CAUTION, WARNING, and DANGER are used in conjunction with the Safety-Alert Symbol to indicate the degree of hazard for items of personal safety.



This Safety-Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

	<b>CAUTION</b>	Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.
	<b>WARNING</b>	Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed.
	<b>DANGER</b>	Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

**IMPORTANT:** Be sure to keep all safety signs clean and readable. When replacing signs or reflectors, remove loose pieces of old sign and clean surface. Peel off backing of new sign and position as closely as possible to original location.

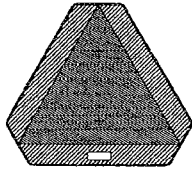
## SAFETY SIGNS AND REFLECTORS

**WARNING**  
Escaping hydraulic oil can penetrate the skin.  
To avoid serious injury or death:  
- Relieve pressure before disconnecting hydraulic lines.  
- Wear eye protection and use tread of shoes instead of heels when ascending the tractor.  
- See doctor immediately if injured.

PART NO. 18534282

**CAUTION**  
Failure to observe instructions and safety practices can result in serious bodily injury.  
To avoid injury:  
- Read and understand the Operator Manual before servicing or operating the tractor.  
- Learn to operate and adjust the mower safely.  
- Do not allow anyone to ride on the tractor or tractor.  
- Install all hydraulic cylinder stops and retract hydraulic cylinders before servicing or transporting tractor.  
- Make certain that everyone is clear before moving the tractor, hydraulics, or any component.

PART NO. 18534228



PART NO. 311860A1

**DANGER**  
**CHEMICAL HAZARD**  
Ammonia under pressure  
To avoid serious injury or death:  
- Always wear gloves and goggles.  
- Have emergency water available.  
- Do not breathe ammonia vapor.  
Refer to quick disconnect valve manufacturer's instruction sheet for proper installation and operation procedures.

PART NO. 18534368

**DANGER**  
**CRUSHING HAZARD**  
To avoid injury or death, keep everyone clear of machine when folding or unfolding wings.

PART NO. 18534227

**WARNING**  
**STRIKING HAZARD**  
To avoid injury keep everyone clear of machine when folding or unfolding tractor.

PART NO. 18534389

**WARNING**  
**STORED ENERGY HAZARD:**  
Spring assemblies have potentially dangerous stored energy.  
To avoid bodily injury, read your Operator's Manual for Service Instructions and Precaution.

PART NO. 18534277



PART NO. 311864A1



PART NO. 311865A1



PART NO. 311863A1

**WARNING**  
**TOWING HAZARD**  
To avoid serious injury or death:  
- Always use implements with agricultural tractors.  
- Never tow any implement or combination of fixed implements that exceed 1.5 times weight of towing tractor.  
- See Operator's Manual for hitching instructions, safety chain requirements and towing instructions.

PART NO. 18534348

**DANGER**  
**ELECTROCUTION HAZARD**  
To avoid injury or death, do not touch lines connected with overhead power lines.

PART NO. 18534284



# IMPLEMENT SAFETY

## nutri-till'r Model 5310

In addition to design and configuration of equipment, safety and accident prevention are dependent upon the awareness, concern and proper training of personnel involved in the operation, transport, maintenance, and storage of equipment. Failing to follow these safety messages can result in machine damage, property damage, personal injury, and/or death.



## OPERATIONAL SAFETY

- Before operating your **nutri-till'r** model 5310 unit, thoroughly read and understand your operator's manual. **If you do not understand any portion of the Operator's Manual, contact your yield-till system dealer/distributor immediately for clarification.**
- Machinery should be operated only by qualified persons familiar to the tractor and equipment, **nutri-till'r** model 5310 unit, and the safety related items. Do not let children operate machinery.
- Never permit riders on **nutri-till'r** model 5310 unit or tractor.
- Do not stand on, or straddle, the **nutri-till'r** model 5310 unit tongue when unhitching.
- Never position yourself under any portion of the **nutri-till'r** model 5310 unit. Lower machine to the ground, turn off tractor and remove key before making adjustments or repairs. Otherwise, block securely to prevent accidental lowering.
- Always store a wing implement with the wings down.
- Always have tractor coupled to the **nutri-till'r** model 5310 unit when folding or unfolding wings and raising or lowering machine.
- Raise **nutri-till'r** model 5310 unit entirely out of the ground when passing through a ditch or waterway.
- Always check for overhead obstacles during transport and before folding or unfolding the wings.
- Keep everyone clear while operating hydraulics or controls and also when machine is in motion.
- Keep everyone clear when folding and unfolding row markers.
- Be sure safety signs are clean and readable. All safety related signs must be replaced if the **nutri-till'r** model 5310 unit is painted or the signs are otherwise rendered unreadable.
- Furnish this manual to a new operator.



## TRANSPORT SAFETY

- Tow with tractor only. Never transport the **nutri-till'r** model 5310 unit in excess of 20 m.p.h. Maintain a safe speed.
- Proceed slowly on rough or slippery roadways, on side hills, and around curves.
- Reduce speed when approaching ditches or corners. Do not make sharp turns with brakes.
- Check with state and local authorities for additional guidelines concerning lighting for implements being towed on public roads and comply.
- Test and maintain lights before towing on public roads. Make sure lights are not obstructed by residue hanging from shanks or strip builders before towing on public roads.
- Be sure unit is equipped with a Slow-Moving-Vehicle (SMV) emblem when transporting.
- When transporting, always use an ASAE approved (ANSI/ASAE S338.2 Jul 93) safety chain with tensile strength equal to the gross weight of the unit, plus any attachments. The proper size for the **nutri-till'r** model 5310 unit is a 30,000 lbf rated chain.
- Be sure to comply with all state and local requirements for implement transport.
- Install transport stops before transporting.
- Always check torque on wheel bolts before transporting.
- On 12-row unit, close marker shut-off valve before transporting.



## SERVICE AND MAINTENANCE SAFETY

- Do not modify or permit anyone to modify this **nutri-till'r** model 5310 unit, any of its components, or any equipment function without first consulting your **yield-till system** equipment dealer/distributor.
- Blades have extremely sharp edges. Care must be taken when handling to avoid injury.
- **NEVER** attempt to inspect, service, or disassemble any part of the hydraulic system including the hydraulic hoses until all pressure is relieved by shutting off tractor, lowering the **nutri-till'r** model 5310 unit to the ground (or secure with cylinder transport stops provided), and placing remote control levers in float or neutral position.
- Do not cut or drill on **hot** steel tubing. Drill a vent hole on **cold** tubing **before** welding. Keep yourself and others away from vent hole while welding.
- High pressure fluid is nearly invisible, but has enough force to penetrate the skin. **NEVER** use the hands to search out a suspected leak. If injured by escaping fluid, obtain medical attention immediately. Fluid must be surgically removed or gangrene will result. Wear safety glasses or goggles to avoid eye injury when working on the hydraulic system.
- Compressed springs have potentially dangerous stored energy. Always assemble and disassemble properly.
- Keep fingers, hands, and feet away from pivot links when servicing, or adjusting shank trip mechanisms.
- Do not lubricate, adjust, or repair when **nutri-till'r** model 5310 unit is in motion.
- Automatic reset mechanisms operate quickly and forcefully. Use extreme caution when working around mechanisms.
- Never install additional equipment on top of **nutri-till'r** model 5310 units such as spray tanks, etc. Hub and spindle failure may occur.
- Use only approved replacement parts.



# A.A. SAFETY

- Before operating your **nutri-till'r** model 5310 unit, thoroughly read and understand your Operator's Manual. If you do not understand any portion of the Operator's Manual, contact your **yield-till system** dealer/distributor immediately for clarification.
- Before operating your **nutri-till'r** model 5310 unit, thoroughly read and understand your Parker quick disconnect coupling operating instructions pamphlet. If you do not understand any portion of the operating instruction pamphlet, contact your **yield-till system** dealer/distributor immediately for clarification.
- Always wear a full face mask with ammonia type canister, tight fitting safety goggles and protective gloves made of rubber or other material impervious to ammonia.
- A container of no less than five (5) gallons of readily available clean water should be on or near every tank of ammonia.
- Never look directly into hose, meter, quick coupler or shut off.
- Do not attempt to connect or disconnect the coupling until lines are completely bled and flow from open bleed valves has stopped.
- When transporting ammonia the discharge hose should be securely fastened on both ends. Hose end valves should be turned off while in transport, service, or storage. Precautionary measures must be taken to prevent accidental opening of these valves (especially quick opening or 1/4 turn valves).
- Before storage or service, close all hose end and tank valves. Bleed all A.A. hoses. Be sure to actuate hydraulic ball shutoff valves to release trapped ammonia inside the ball.
- Read and understand all safety signs and keep them in their proper places.
- Always teach all persons involved in the handling of ammonia that it is dangerous and must be handled with care. Carelessness may cause serious injury or death.
- No ammonia should be transported on wagons or applicators that are not safe for road travel.
- Work upwind whenever practical.
- Provide a warning to prevent filling of tank past 85% capacity.
- Use only approved replacement parts.
- Never allow children near equipment.
- Replace Quic-Coupler and anhydrous ammonia hoses in accordance with state regulations or manufacturer's recommendations, whichever is sooner.
- The hose from the wagon to the Quic-Coupler should not be wrapped or tied to applicator. The Quic-Coupler must be free to detach if wagon accidentally unhooks.
- The Quic-Coupler safety swing stand must pivot freely. Check before using.

## AMMONIA FACTS

The following information is taken from the joint publication of the American National Standard Institute and Compressed Gas Association. (ANSI K61.1/CGA G-2.1)

- \* Ammonia is extremely hard to ignite and is a relatively stable compound. However, the release of ammonia gas into a tightly enclosed or inadequately ventilated space may result in the accumulation of a flammable mixture that can cause a combustion explosion if a high temperature ignition source is present.
- \* Under some circumstances ammonia and ammonium compounds can react with other chemicals to form explosive products. Ammonia should never be combined with other chemicals unless the possible reactions have been adequately investigated and appropriate precautions taken.
- \* Ammonia Exposure. At low concentrations, ammonia gas is irritating to the eyes, skin and mucous membranes of the nose, throat, and lungs. At higher concentrations, ammonia is corrosive to human tissue and possibly life threatening.
- \* The U.S. Occupational Safety and Health Administration (OSHA) has adopted a short-term exposure limit (STEL) of 35 parts per million (ppm) (27 mg/m<sup>3</sup>). This is for an employee's 15 minute time-weighted average (TWA) exposure which may not be exceeded at any time during a work day.

# GENERAL INFORMATION

## FEATURES

The **DMI nutri-till'r** model 5310 unit is truly the strongest and most dependable strip till unit available. The **nutri-till'r** model 5310 unit can handle the strip till practice by cutting residue and creating soil tilth which provides excellent seedbed conditions with the option of placing your nutrients in the root zone.

The manufacturer has designed every feature, every function, and every resulting operation with the predominant needs of today's dealers and progressive farmers in mind.

### I. MAIN FRAME

Main frame bars are vertical 4" x 6" tubes and the main frame is of double bar welded construction, providing superior strength in both field and transport positions.

### II. PULL FRAME

Pull frame attaches to both front and rear bar for even distribution of pull. The pull frame tube is formed down to prevent frame interference with the tractor 3-point hitch. Adjustable combination single/double clevis hitch with one pin adjustment for leveling machines with various tractor drawbar heights. All welded construction.

### III. WINGS

The wings are constructed from vertical 4" x 6" tubes with diagonal bracing providing superior strength with less weight. The large hinge rank means less stress on the hinge pins. The 117° fold on the **nutri-till'r** model 5310 reduces transport width for added convenience.

### IV. WHEELS

On the **nutri-till'r** model 5310, hydraulic gauge wheels are standard. Synchronized hydraulic system guarantees an even lift between wings and main frame every time. Tandem tires for strip-tilling 30" rows for a smoother ride over rough terrain.

### V. SHANKS

Available with HCS or rigid shanks and strip-till knives to create soil tilth and raised strip.

### VI. COULTERS

The 24" heavy-duty spring coulters are standard equipment to slice through residue. The coulters swing side to side and adjust up and down for proper depth. 24" coulters are spring cushioned to ride up and over obstructions. 16E taper on coulters keep blades sharp to cut without bull dozing.

### VII. berm-build'rs

Double disc 18" blades are mounted independent of shank to provide a continuous, uniform berm even when the shank trips or operating depth is changed.

### VIII. berm condition'r

11.5" wide by 14" diameter rolling baskets are mounted independent of the HCS shanks and **berm build'rs**. The unique concave bar design sizes clods and pre-settles the berm. The notched side plates enhance performance in various field conditions.

### IX. ROW MARKER

The **nutri-till'r** model 5310 features a new row marker design. This new design enables the operator to adjust the down-pressure on the marker blade to allow the desired mark to be attained. The new marker also features a breakaway and auto-reset feature if the marker comes in contact with an obstruction.

### X. ANHYDROUS AMMONIA OPTIONS

The **nutri-till'r** model 5310 applicator can be equipped with either 3/8" A.A. plumbing from the remote double manifolds (standard). Double manifolds provide even product distribution. 1" high pressure A.A. hose feeds from the regulator to the manifolds. 1-1/4" quick coupler with 1-1/4" feeder hose on an 180° safety swing mount provides maximum safety for the operator as well as maximum capacity. Pressure gauges for each manifold to display accurate readings, are mounted on pull frame for easy viewing.

### XI. REAR HITCH - OPTIONAL

The patented **wagon-mate** hitch keeps wagon tongues at a constant height throughout the entire lift and lower cycle of the applicator. The Wagon-Mate hitch has the largest extending and swinging hookup pattern in the industry, with the added convenience of single lever action.

# SPECIFICATIONS

HORSEPOWER REQUIREMENTS.....	15 - 20 hp. per shank (30" spacing). Actual hp. varies with soil conditions, operating depth, knife type, etc.		
SHANK SPACING.....	Knives on 30" centers.		
SHANKS.....	HCS or rigid type shanks with 32" clearance from knife to bottom of frame.		
COULTERS.....	24" diameter.		
WORKING DEPTH.....	Knives - 5" - 8" Coulters - 2" - 4"		
WORKING SPEED.....	5-7.5 m.p.h.		
TRANSPORT WHEEL.....	12.5L x 15 FI (F) Rating		
GAUGE WHEEL.....	9.5L x 15 8-ply		
LIFT CYLINDER - <b>3,000 p.s.i.</b> .....	Synchronized - 3-1/2" x 10" rephasing with hydraulic gauge wheels.		
GAUGE WHEEL CYLINDERS - <b>3,000 p.s.i.</b> .....	Synchronized - 3-1/4" x 10" rephasing		
WING FOLD CYLINDER - 3,000 p.s.i.....	4" bore x 36" stroke inner wing 3-1/2" bore x 24" stroke outer wing		
NUMBER OF SHANKS.....	12	16	8
WORKING SPACING.....	30"	30"	30"
SWATH WORKING WIDTH.....	30'	40'	20'
TRANSPORT HEIGHT.....	13' 6"	13' 6"	-----
TRANSPORT WIDTH.....	20'	20'	18' 6"

# WARNING AND TAILLIGHTS

This machine includes warning and taillights as standard equipment.

When properly installed and connected to a tractor with a properly functioning seven-pin light system receptacle, this system will comply with ANSI/SAE Standard S279.10 - APR98 for warning and taillights. They will provide the following features.

- The location of the lights will show approaching traffic and approximate width and length of the machine.
- The red taillights will work with the tractor red tail lights.

- The amber lights, which are visible from both front and rear, will flash in unison with the tractor flashing amber warning lights.
- If the tractor is equipped with turn signals, the amber lights and the red taillights will flash in unison with the turn signals on the tractor.

**IMPORTANT:** Test and maintain the warning and tail lights before transporting the machine on public roads. Make sure lights are not obstructed by residue hanging from shanks or sealers before towing on public roads.

- A storage container is provided to keep the seven-pin connector clean when not in use.

# OPERATION SECTION

**⚠ CAUTION:** Do not allow children or unqualified operators to operate equipment. In addition to design and configuration of equipment, safety and accident prevention are dependent upon the awareness, concern and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

## IMPORTANT:

- Before moving the implement be sure the three point hitch has been raised to the top to prevent damage to the clevis and tongue when making turns.
- Before raising and lowering the machine, the markers, or folding the wings, be sure that all hydraulic hoses are tied down properly so they don't interfere with the raising, lowering and folding operation. Hoses must be fastened securely, especially near the wing hinge area.
- The machine must be on level ground with tires properly inflated to raise and lower the wings.
- Never attempt to raise or lower wings while applicator shanks are in or on the ground.
- Measure overall transport height.
- Never lower or raise the wings under full tractor hydraulic pressure. Always slowly lower the wings by partially opening the valve on the tractor.
- Make sure that wing hydraulic cylinders are fully extended to allow wings to follow the contour of the ground.
- Be sure to comply with all state and local requirements for implement transport, day and night.
- Never install additional equipment on top of **nutri-till'r** model 5310 unit except approved **DMI** Accessories. Failure to comply will void warranty.

**⚠ WARNING:** Keep everyone clear of the machine when folding or unfolding the wings.

## OPERATION OF HYDRAULIC WING LIFT

### CHANGING FROM OPERATING POSITION TO TRANSPORT POSITION

Prior to operating the hydraulic wing lift, the hydraulic system must be fully charged. See [Charging the Hydraulic System](#).

Prior to transporting the **nutri-till'r** model 5310 unit, the lift cylinders should be recharged, the wings should be folded and the transport stops installed. The tractor operator should perform the folding and locking operations and he should be the only person in the tractor cab or around the unit for safety.

1. Extend the depth control cylinders and hold the tractor hydraulic level for 30-60 seconds to purge the air from the synchronized system. Install the transport stop on the master cylinders (main frame).
2. Retract the wing lift cylinders slowly until wings are fully raised.

# CHANGING FROM TRANSPORT POSITION TO OPERATING POSITION

1. Lower the wings slowly. Fully extend the wing lift cylinders.
2. Remove the transport stop on the depth control master cylinders.

## CHARGING THE HYDRAULIC SYSTEM SYNCHRONIZED (REPHASING) LIFT SYSTEM

Each of these rephasing cylinders is equipped with a bypass port located at the rod end of the cylinder. This port allows air to be purged from the system and the cylinders to be rephased.

Because the cylinders are connected in a series it takes more time and care to properly bleed the system. After all cylinders are in place, lines properly connected and the hoses hooked to a tractor, raise the unit and hold the hydraulic lever for 30-60 seconds. Repeat this procedure several times to be certain the system is purged of air. Check the tractor hydraulic reservoir and add oil as required.

When lifting the applicator completely out of the ground, it is best to hold the tractor hydraulic valve open for a second or two to resynchronize the slave cylinders, thereby keeping both wings level with the center section.

## FOLDING SYSTEM (For 12 and 16 Row Units)

All wing folding cylinders are plumbed together. In some situations one wing may lift before the other; this is normal. The wings will fold and unfold slowly because of the throttle valve in the hydraulic hoses. **MAKE SURE THESE THROTTLE VALVES ARE INSTALLED IN THE HYDRAULIC SYSTEM, SEE PAGE #36.**

Before proceeding to charge the wing fold cylinders raise the unit onto its wheels and install the transport stops on each main axle.

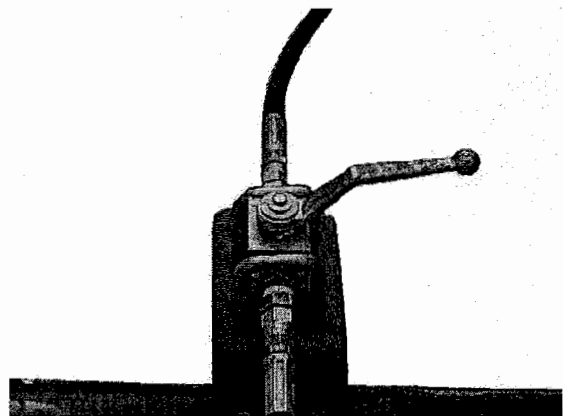
Charge the wing folding hydraulic system in the following manner. Disconnect the rod end of each wing cylinder. Block the cylinder so that the piston rod is free to move its full stroke. Hydraulically extend and retract the tractor hydraulic lever, adding oil as required. Reconnect the rod ends of all wing lift cylinders to their respective cylinder lugs. Making certain no one is near the machine, raise the wings into transport position.

## 12-ROW MARKER TRANSPORT LOCK-OUT VALVE

### CLOSING MARKER LOCK-OUT VALVE

1. Marker in folded position
2. Rotate transport lock-out valve to be 90° with valve to fully close lock-out valve.

**⚠ DANGER:** Failure to fully close marker lock-out valve could cause marker to unfold which could cause injury or death by electrocution.



# ROW MARKER FOLD

Be sure the wings are in the unfolded position. Disconnect the rod end of each **Row Marker** cylinder. Block the cylinder so the piston rod is free to move its full stroke. Hydraulically extend and retract the tractor hydraulic lever to remove the air in the system until the cylinders operate smoothly. Reconnect the rod ends of the cylinders to the **Row Markers**. Make certain no one is near the machine and you have adequate space to operate the **Row Markers** safely.



## WARNING:

- Never operate **Row Markers** with wings folded.
- Before folding or unfolding **Row Markers**, always make certain the entire area is completely clear. Take extreme care during field operation, allowing sufficient room for **Row Markers** when extended.

## ROW MARKER SEQUENCING

**NOTE:** Before operating **Row Markers** for the first time, refer to Assembly Section and check to make sure that sequence valve is connected properly.

1. The sequence valve allows both **Row Markers** to be controlled with a single hydraulic circuit. The **Row Marker** hydraulic lines should be connected to the tractor so that the **Row Markers** are unfolded to the operating position by moving the control lever forward.
2. To put a **Row Marker** into operation, move the tractor hydraulic control lever forward. One **Row Marker** will unfold to the operating position. Pulling back the control lever will fold this **Row Marker**. The next time the control lever is moved forward, the opposite **Row Marker** will unfold.

**NOTE:** It will often be necessary to operate the **Row Markers** out of sequence. When first entering a field, for example, the first **Row Marker** desired may not be the next in sequence. The **Row Markers** need not be completely cycled to alter sequence. Simply activate the control lever until the **Row Marker** starts to unfold. Pull back on the lever to fold the **Row Marker**, and then move the control lever forward to activate the opposite **Row Marker**.

## MARKER SPEED ADJUSTMENT

The sequence valve features two flow adjustments so the rate of raising and lowering the **Row Markers** can be set independently. The flow adjustments are clearly identified on the sequence valve body. Screw in the adjustment marked "Raise or Lower" to reduce the **Row Marker** speed in the desired direction. Adjust the **Row Markers** to operate just fast enough to make comfortable turns. Excessive folding and unfolding speed will cause extra wear and tear on the equipment.


## BLEEDING THE REPHASING SERIES SYSTEM

Cylinders can get out of phase (retracted length on one cylinder 1/4" - 1/2" longer or shorter than others) for a number of reasons:

1. The system is cycled many times without fully extending the cylinders. Raising the unit completely out of the ground for turning at the field ends is usually all that is necessary to keep the system synchronized.
2. If the **nutri-till'r** model 5310 unit is allowed to sit in the raised position for a period of time, oil can leak by the piston thus allowing the cylinder to get out of sequence.

3. Air in the system. To force the air out, extend the cylinder. After all cylinders are fully extended, hold the lever for 30-60 seconds. Air may enter the system by a leaky fitting, mismatched couplers, or low oil in the tractor.
4. Internal leak in the cylinder. Repack the cylinder to solve this problem.

**NOTE:** It is wise to rephase the **nutri-till'r** model 5310 unit every 2 hours to insure that the wings and main frame are running level.

 **CAUTION:** If cylinders are not bled as described wings or shanks could drop unexpectedly causing injury or death.

## CHECKING THE SYNCHRONIZED SYSTEM


After fully extending all cylinders retract them to any length, and they should be within 1/4". If they are not, it is likely that a cylinder is in the wrong location. Use the hydraulic system diagram in the Operator's Manual (Page #36) to check the plumbing and cylinder locations.

## TIRE INFLATION

**IMPORTANT:** To maintain consistent depth, be sure tires are inflated to recommended pressure:

9.5L x 15	8-ply	44 p.s.i.
12.5L x 15	FI (F) load rating tires	90 p.s.i.

## DEPTH ADJUSTMENTS

-  **WARNING:**
- Keep everyone clear while operating controls or machine.
  - Do not lubricate, adjust or repair when **nutri-till'r** model 5310 unit is in motion.
  - Blades have extremely sharp edges. Care must be taken when working around or adjusting to avoid injury.

The applicator comes standard with cylinder stroke control segments to be used to limit the depth of the applicator. The segments are of various lengths so that the desired depth can be achieved.

**IMPORTANT:** Never use a cylinder stroke control segment larger or smaller than the cylinder rod as damage to the cylinder may result.

# SETTING THE KNIVES AND COULTER DEPTH

1. Set the depth of the knives by using stroke control segments on the **MAIN FRAME CYLINDERS ONLY**.
2. Level applicator as shown in Fig. #1 below.

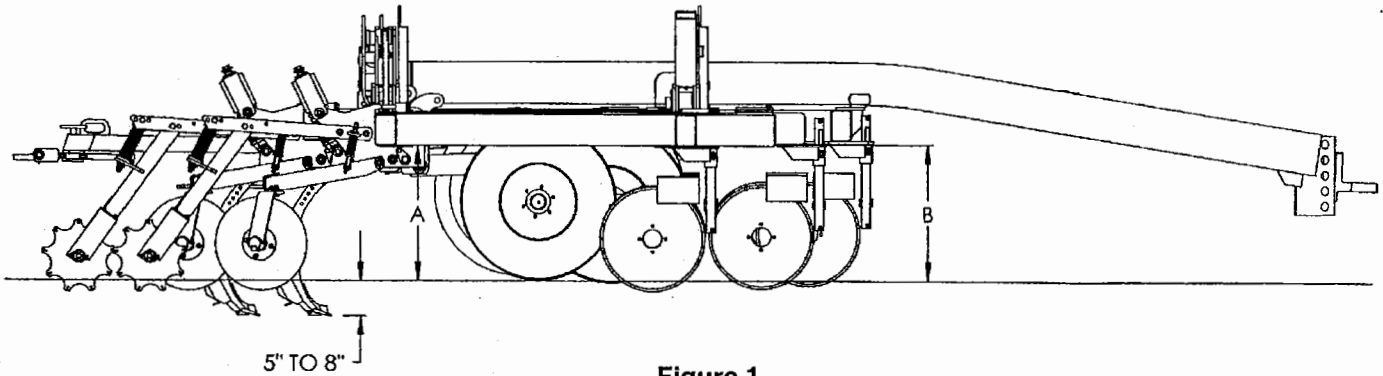
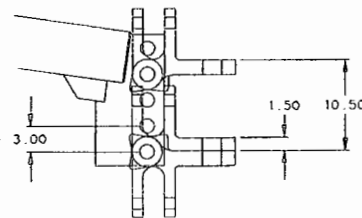


Figure 1

Once the knives are at the desired depth, the machine must be leveled. A low front end will cause the front knives to be in the ground deeper than the rear knives. With the knives in the soil, measure distance "A" and "B" (Fig. #1) from level ground to the bottom of the frame - **THIS DISTANCE MUST BE THE SAME**. Once this distance is obtained, step back approximately 50 feet and view the machine. The applicator should appear level to the ground. If not, make certain the ground is level. The applicator can be leveled by changing the position of the hitch clevis in which has an adjustment range of 10-1/2 inches (Fig. #2).

**NOTE: Do Not Use  
Top Mount Hole**



**NOTE: For 1-1/2" increments,  
flip clevis over.**

Figure 2

## For 12 and 16 Row Units

The gauge wheel has a built in adjustment. The cylinder lug can be moved forward or rearward to insure the total machine is running level side to side. If the wings of the machine are not operating as deep as the main frame (example: tractor tires are digging in and the applicator main frame is running deeper than the wings), loosen the nuts and adjust the cylinder lug rearward until equal depth is achieved. Then tighten all the nuts back up. To make wing run shallower, adjust forward. (See Fig. #3)

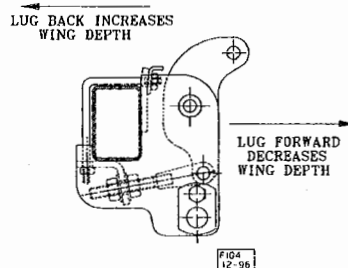


Figure 3

3. Set the coulters depth. The coulters are adjusted independent of the A.A. knives. Loosen the 3/4" set screw on the mounting bracket and slide the coulters shaft up or down to the desired height.
4. Do not run the coulters any deeper than what is needed to cut the residue. Running the coulters deeper than necessary increases coulters wear. Coulters set too deep will decrease berm height by prefacturing the soil in front of the knife.

# berm-build'r™ ADJUSTMENTS

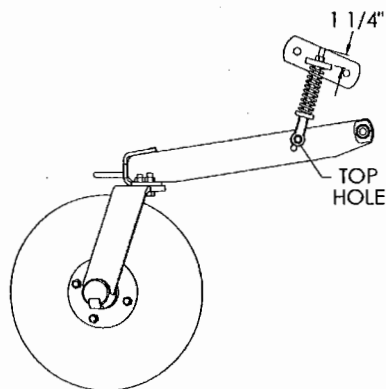
- A) **ATTACK ANGLE OF BLADE:**
- B) **EQUAL ANGLE IS IMPORTANT:** To create an uniform berm.
- C) **WIDTH OF SETTING:** Set per soil and residue conditions.
- D) **SPRING PRESSURE:** Adjustment is quickly made by changing the hole used to BOLT the rod end linkage bolt to the frame.

In the case where the knife depth used is very shallow, it may be necessary to back off the nuts at the top of the spring bolt to allow the blades to drop far enough to contact the soil.

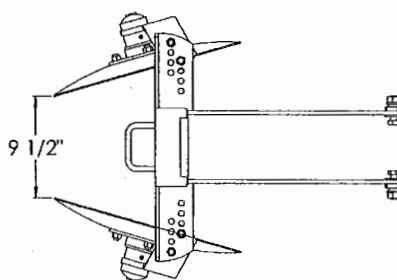
An increased spring pressure will minimize bouncing in rough fields and will provide more soil penetration; but it will result in more trenching and ridging.

Use the lightest spring pressure that will provide satisfactory berm.

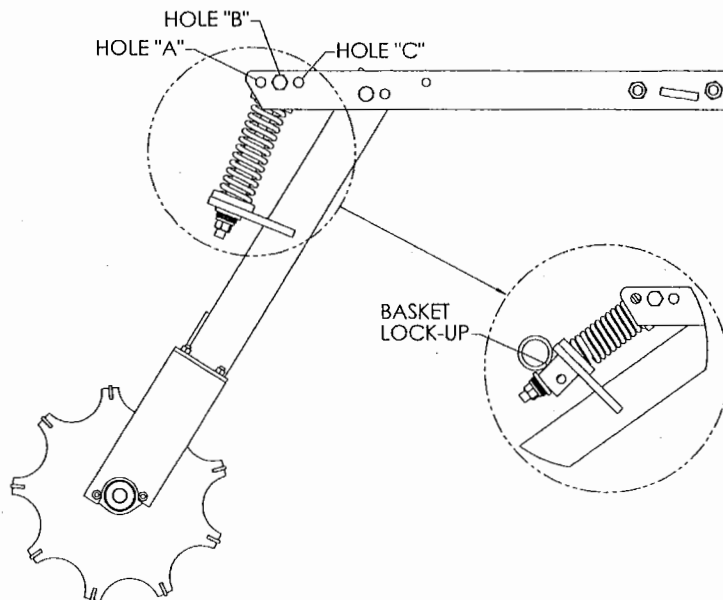
BOLT LOCATION FOR SPRING PRESSURE



BLADE POSITION



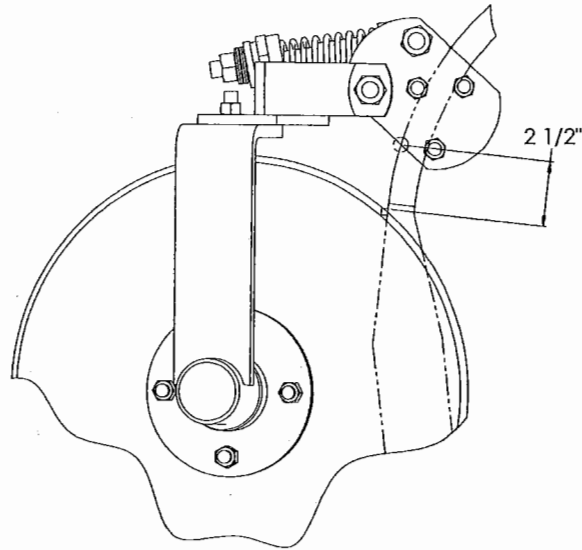
# berm condition'r™ ADJUSTMENTS



- A) **DOWN PRESSURE** - Spring down pressure can be increased by moving spring to hole "A". Decrease down pressure by placing spring in hole "C".

- B) **DISENGAGE BASKETS** - Lift basket and insert lockout. See diagram above.

# 18" disc seal'r™ FOR 1" X 2" RIGID SHANK ADJUSTMENTS



- A) Position the 18" **disc seal'r** on the 1" x 2" shank so there is 2-1/2" space between the bottom of the sealer mounting bracket and the pin located on the back of the 1" x 2" shank.
- B) Position the blades so there is approximately 9-1/2" between the blades at the rear of the sealer and adequate space between the blades at the front of the sealer so all of the soil coming from the strip-till knife is contained within the **disc seal'r** blades. Adjust as necessary from this position as conditions indicate.

# ROW MARKER ADJUSTMENTS

For 12 and 16 Row Marker Units

(For 8 Row Marker Units, See Marker Manual)

## ADJUST OFFSET PIVOTS

For correct adjustment of the endmarker the primary arm needs to be parallel to the toolbar (1) (Fig: A). The secondary arm needs to be parallel to the primary arm (2).

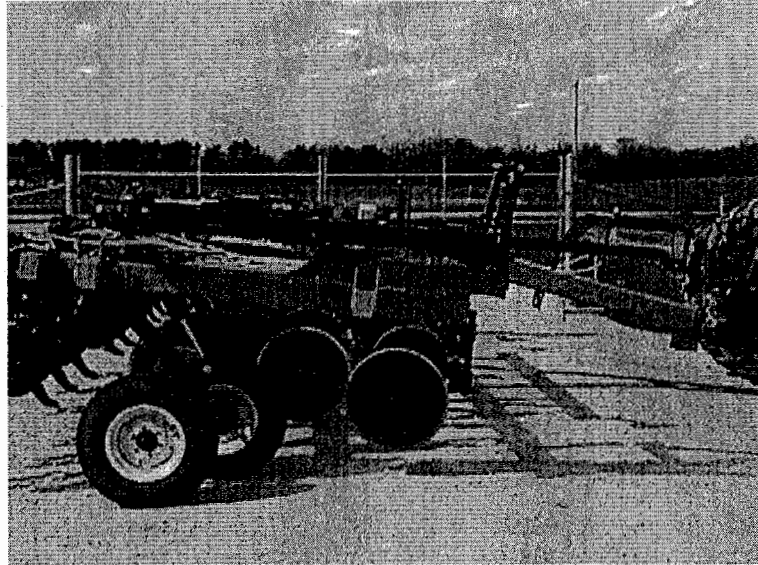


Fig A: Adjust Offset Pivots

## OFFSET PIN AT KNUCKLE PIVOT

Adjust the offset pin at the knuckle pivot (Fig: B) to align the endmarker making it parallel to the toolbar.

1. Loosen the 5/8" bolt (1) (Fig: B).
2. Turn the offset pivot pin (2) on the head end until the endmarker is aligned.

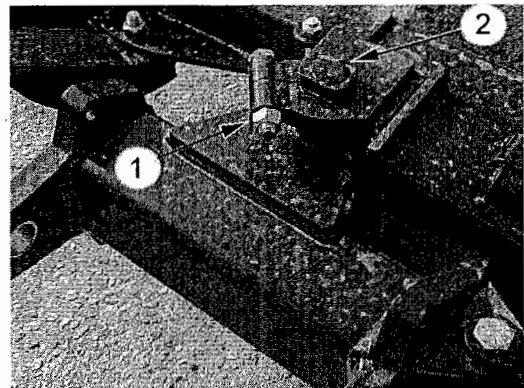


Fig B: Adjust Knuckle Pivot

## OFFSET PIN AT BIFOLD PIVOT

Adjust the offset pin at the bifold pivot (Fig:A) to align the bifold portion of the endmarker, making it parallel to the toolbar.

1. Loosen the 5/8" bolt (1) (Fig C:).
2. Turn the offset pivot pin (2) on the head end until the endmarker is aligned.

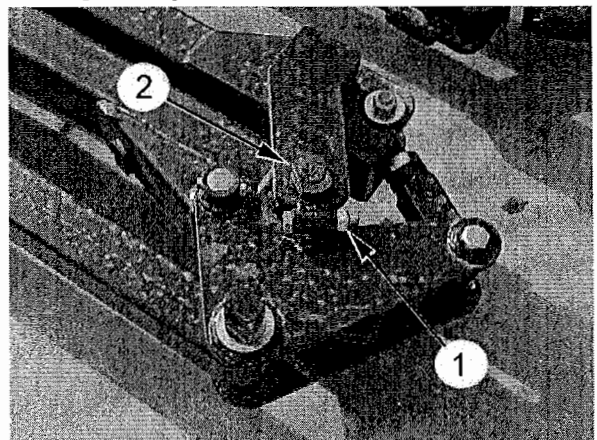


Fig C: Adjust Bifold Pivot

## ADJUSTING DISC ANGLE

A good visible mark is a combination of disc blade angle and blade down pressure. Generally the disc blade should be set at the smallest angle and least down pressure to make a visible mark that will do the job. This will take less power and put less strain on the equipment. For more difficult conditions, adjust to a more aggressive hub setting. A disc blade safety guard is provided, to help prevent inadvertent contact with the blades when the **Row Marker** is in the folded position. Do not remove this guard.

### To adjust the disc angle:

1. Loosen the front 5/8" bolt (1) (Fig: D) and remove the back bolt (2).
2. Rotate the guard and disc (3) to the desired angle.
3. Replace and re-tighten the bolts.

**NOTE:** The front bolt should be located in the second hole from the end of the extension arm to rotate properly.

**NOTE:** The marker disc should not be positioned inward or parallel to the seed tool centerline.

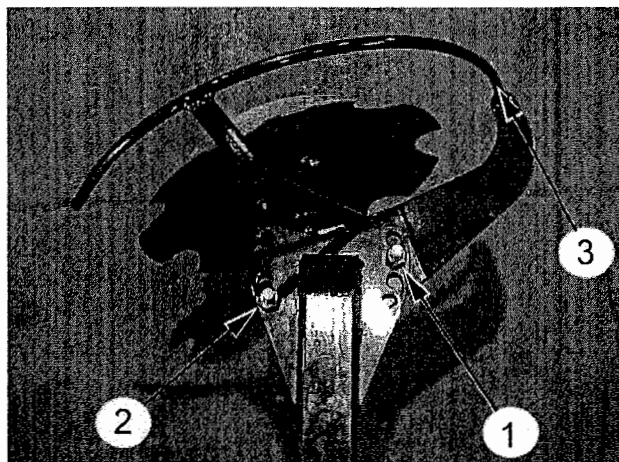


Fig D: Adjusting Disc Angle



**WARNING:** Due to the extremely sharp cutting edge on the coultter blades, extreme care should be taken when handling and adjusting to avoid injury.

## ADJUSTING MARKER LENGTH

The telescoping **Row Marker** arm may be adjusted (longer or shorter) to assure that proper row spacing is maintained between adjacent field passes. Initially, the **Row Markers** should be set as shown. In the field, the **Row Markers** should be checked and finely tuned as follows:

1. Unfold the **Row Markers** and lower the applicator to working position. Measure from the center of the applicator to the **Row Marker** disc blade. This should equal exactly one swath width:

12 - 30: Rows = 360"  
16 - 30" Rows = 480"

2. Once the applicator is put into operation, spot check row spacing between passes. If the row spacing consistently runs too wide or narrow, adjust the **Row Marker accordingly**

### To adjust the marker length:

1. Loosen the nuts (1) (Fig: E) on the u-bolt on the swing boom weldment.
2. Slide the extension arm (2) in or out as required.

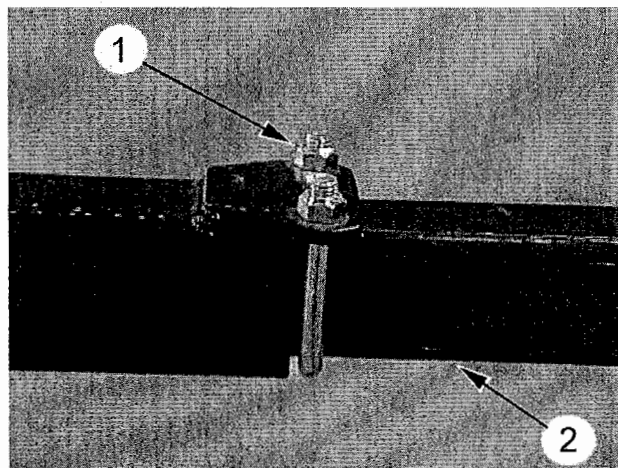


Fig E: Adjusting Marker Arm Length

## MARKER BREAKAWAY SPRING ADJUST

The break-away spring should be adjusted so that it will cycle in and out consistently without breaking away, but when an obstacle is encountered it will break-away. The operator should be able to break-away the endmarker with a good tug. The endmarker should have enough spring tension to return it to field position.

1. Adjust the eyebolts (1) (Fig: F) to set the force of the return spring. DO NOT stretch the length more than 4" initially.

**NOTE:** Tightening the eyebolts will increase the return spring force.

2. Adjust the adjustor bolt (2) (Fig: F and Fig: G) if you wish for the arm to break-away more easily. This bolt adjusts the angle between the break-away links. When the bolt is tightened as far as it can go, the force required to breakaway the arm will be the greatest. Do not adjust breakaway more than needed. Excessive force will reduce life of marker.

**IMPORTANT:** DO NOT remove the washer (1) or machine damage may result.

**NOTE:** Small adjustments to this bolt will make a big difference in the force needed to activate the break-away. Do not adjust more than 1/2 turn at a time.

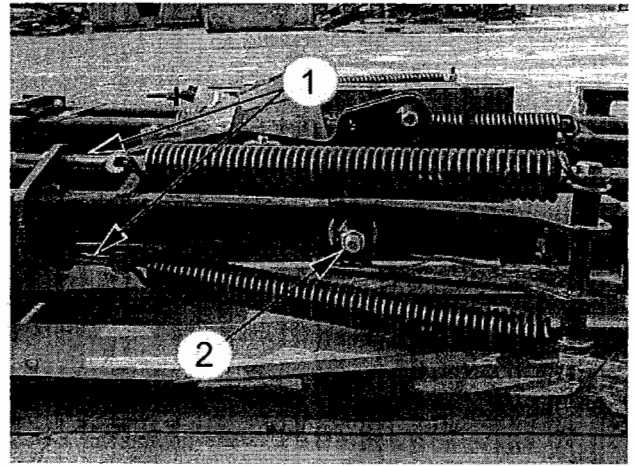


Fig F: Breakaway Spring Adjustment

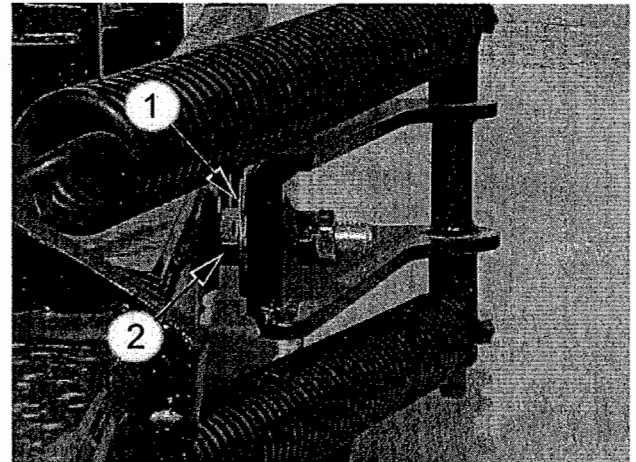


Fig G: Breakaway Bolt Adjustment

## MARKER WEIGHT BIAS SPRING

The marker bias spring should be adjusted to give efficient weight on the disc to give a good mark in the field and to have tension on the spring when the marker is folded in.

1. Loosen the adjustment bolts (2) (Fig: H) and then adjust the bolt (1). Lengthening the spring will put less force on the disc. Shortening the spring will place greater force on the disc.
2. If there is insufficient weight on the marker to stop the disc from bouncing excessively in the field, use the horizontal pivot adjustment bolts to increase the spring force.

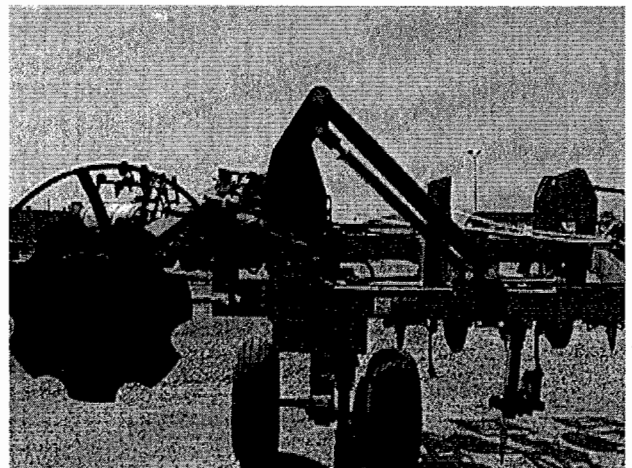


Fig H: Adjust Frame Springs

# TROUBLE SHOOTING

**TO THE nutri-till'r Model 5310 OWNER:** DMI equipment is designed for tough conditions. Our products have innovative features that greatly improve performance and reduce operating costs if the product is properly used.

Improper use of these same features can result in excessive costs, premature failure, and poor field performance. The key to proper use is knowledge and awareness on your part. This section is designed to give you that awareness.

THIS SECTION COVERS FIELD PROBLEMS, CAUSES, AND REMEDIES. A FOLLOWING SECTION, DISCUSSES CONDITIONS THAT CAN LEAD TO COMPONENT BREAKAGE, ALONG WITH THE PROBABLE CAUSES AND HOW TO PREVENT OR REMEDY THE PROBLEM.

## FIELD PROBLEM REMEDIES

POTENTIAL PROBLEM	PROBABLE CAUSES	REMEDIES
LACK OF PROPER AMOUNT OF ANHYDROUS AMMONIA PER ACRE	<p>Clogged screen in regulator.</p> <p>A.A. tubes clogged with dirt.</p> <p>Broken diaphragm in regulator.</p> <p>Hose too small from tank.</p> <p>Regulator not set properly.</p>	<p>Remove and clean often.</p> <p>Remove dirt.</p> <p>Replace.</p> <p>Replace with larger hose.</p> <p>Review setting instructions.</p>
APPLICATOR JUMPS SIDE TO SIDE	<p>Pitch of knife not correct</p>	<p>Adjust hitch clevis up or down to level implement fore and aft. Be sure rear bar is not lower than front bar.</p>
BALLING AND FREEZING	<p>Knife collecting trash is primary cause of balling and freezing.</p>	<p>Lower coulters to cut residue.</p>
INSUFFICIENT DEPTH OR MACHINE FLOATS OUT.	<p>Dull or broken knives.</p> <p>Frame of machine not level (knives riding on the heel).</p> <p>Coulters too deep.</p>	<p>Replace. Forward swept knives provide better suck in.</p> <p>Level frame.</p> <p>Raise coulters. Coulters tend to hold machine out of ground if set too deep.</p>
MACHINE PULLS HARD	<p>Blades are too deep.</p> <p>Dull or broken knives.</p> <p>Implement frame is not level.</p> <p>Insufficient tire pressure.</p> <p>Coulters not in line with shanks.</p>	<p>Excessive depth consumes power. Raise blades.</p> <p>Replace knives.</p> <p>Level the machine.</p> <p>Inflate both transport tires equally: Refer to page #12</p> <p>Adjust coulters and/or knives so coulters are in line with shanks.</p>

POTENTIAL PROBLEM	PROBABLE CAUSES	REMEDIES
MACHINE IS PULLING CROOKED.	<p>Unequal tire inflation.</p> <p>Shanks and/or coulters are spaced differently on one side compared to the other side.</p> <p>Coulters are not directly ahead of shanks.</p> <p>Gauge wheels not set evenly.</p> <p>Uneven depth stops on transport wheel cylinders.</p>	<p>Inflate to equal pressure. (See page #12.)</p> <p>Adjust shank spacing.</p> <p>Adjust and align.</p> <p>Adjust gauge wheel evenly.</p> <p>Adjust depth stops evenly.</p>
MACHINE PLUGGING	<p>Blades are running too deep.</p> <p>Blades are not deep enough.</p> <p>Dull blades.</p> <p>Coulters are not directly ahead of shanks.</p> <p>Large amount of trash.</p> <p>Dull/damaged coulters.</p>	<p>Best depth is 3"-4". Maximum depth is 6". Raising blades helps to cut residue rather than pushing it ahead and not cutting. Deep blades put the hubs and disc mount parts too close to surface and creates plugging in heavy residue.</p> <p>In soft, wet ground and tough stalks, it may be necessary to lower blades to cut heavy residue. 6" disc depth is recommended maximum depth.</p> <p>Sharpen or replace.</p> <p>Adjust coulter or disc position to directly ahead of shanks.</p> <p>Sharpen or replace.</p>
WARNING AND TAIL LIGHTS WORK IMPROPERLY	<p>Burned out bulbs.</p> <p>Bad connections in the plug connection(s).</p> <p>Damage to wiring harness or light assemblies.</p> <p>Tractor 7-pin connector malfunctioning.</p>	<p>Replace bulbs.</p> <p>Clean contacts.</p> <p>Repair or replace.</p> <p>Try different tractor and repair tractor electrical system.</p>

## berm build'rs AND berm condition'rs

PROBLEM	PROBABLE CAUSES	REMEDIES
INADEQUATE BERM HEIGHT	<p>Not enough soil lifted by strip-till knife</p> <p><b>berm build'r</b> blades set too far apart</p> <p>Inadequate blade angle (<b>berm build'r</b> blades)</p> <p>Insufficient down pressure on <b>berm build'r</b> blades</p>	<ul style="list-style-type: none"> <li>• Run knife deeper.</li> <li>• Check and replace worn knives</li> <li>• Run knife shallower if running at 8+" in compacted soils</li> <li>• Raise coulter</li> </ul> <p>Position disc blades closer. See page #14</p> <p>Increase disc angle. See page #14</p> <p>Move spring eyebolt to lower hole. See page #14</p>
<b>berm-build'r</b> CUTS EXCESSIVE GROOVE OR FURROW	<p>Excessive down pressure on <b>berm build'r</b></p> <p>Excessive blade angle</p>	<ul style="list-style-type: none"> <li>• Move spring eyebolt to upper hole. See page #14</li> <li>• Tighten eyebolt to raise builder.</li> </ul> <p>Reduce disc angle. See page #14</p>
BERM SIZE OR SHAPE IS NOT UNIFORM	<p>No <b>berm condition'r</b> baskets</p> <p>Blades not at equal angle</p> <p>Insufficient down pressure on <b>berm condition'r</b> basket</p>	<p>Install optional <b>berm condition'rs</b></p> <p>Adjust <b>berm-build'r</b> blades to exact same angle</p> <p>Change <b>berm condition'r</b> spring assembly to more aggressive hole. See page #14</p>
LARGE CLODS OR CHUCKS IN STRIP	<p>No <b>berm condition'r</b> baskets</p> <p>Insufficient down pressure on <b>berm condition'r</b> basket</p> <p>Running knife too deep</p>	<p>Install optional <b>berm condition'rs</b></p> <p>Change <b>berm condition'r</b> spring assembly to more aggressive hole. See page #14</p> <p>Run knives shallower</p>
RESIDUE OR MUD PLUGGING BASKETS	<p><b>berm build'r</b> blades too much angle</p> <p>Conditions too wet</p>	<p>Decrease disc angle. See page #14</p> <p>Lock-up <b>berm condition'r</b> baskets</p>

# ROW MARKER

PROBLEM	PROBABLE CAUSES	REMEDIES
ROW MARKER NOT FOLDING FAST ENOUGH OR WON'T FOLD	Flow control on sequence valve set too low	Screw out the flow control marked RAISE
ROW MARKER NOT UNFOLDING FAST ENOUGH OR WON'T UNFOLD	Flow control on sequence valve set too low	Screw out the flow control marked LOWER
INSUFFICIENT MARK	Disc blade worn Down pressure too low Not enough blade angle	Sharpen or replace blade Increase spring down pressure. See page #18 Increase blade angle. See page #17
EXCESSIVE FURROW OR THROWING TOO MUCH SOIL	Disc angle too steep Down pressure too high	Reduce blade angle. See page #17 Decrease spring down pressure. See page #18
DISTANCE BETWEEN PASSES TOO WIDE OR TOO NARROW	<b>Row Marker</b> length set incorrectly	Adjust telescoping arm. See page #16
MARKERS NOT RAISING/LOWERING IN SEQUENCE PROPERLY	Sequence valve installed incorrectly Operating hydraulic controls incorrectly	Check manual for correct assembly Check <b>Row Marker</b> Sequencing for correct procedure. See page #11
MARKER BREAKS AWAY WITHOUT HITTING OBSTACLE	Break away pressure set too low	Adjust breakaway pressure. See page #18
MARKER NEVER BREAKS AWAY	Break away pressure set too high	Adjust breakaway pressure. See page #18

# COMPONENT TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSES	REMEDIES
DAMAGE/BREAKAGE OF BLADE SHAFTS AND/OR BLADE MOUNT PARTS	<p>Turning with blades in ground.</p> <p>Extreme soil conditions such as very heavy ground, frozen ground or heavy rocks.</p> <p>Running blades too deep (especially with above conditions).</p> <p>Speed too fast for conditions.</p>	<p>Avoid this.</p> <p>Avoid wherever possible. Otherwise, adjust speed to match tough conditions.</p> <p>Raise blades enough to just cut trash.</p> <p>Reduce speed in rocks or other adverse conditions.</p>
BREAKAGE OR EXCESSIVE DAMAGE TO BLADES.	<p>Turning with blades in the ground.</p> <p>Heavy rock conditions, especially combined with:</p> <ul style="list-style-type: none"> <li>a. Speed is too fast.</li> <li>b. Blades are too deep.</li> <li>c. Turning with blades in ground.</li> </ul> <p>Running in hard frozen ground.</p>	<p>Avoid sharp turns with blades in the ground.</p> <ul style="list-style-type: none"> <li>a. Reduce speed in rocks or other adverse conditions.</li> <li>b. Run blades only deep enough to cut residue.</li> <li>c. Do not turn with blades in ground.</li> </ul> <p>Avoid this.</p>
<p><b>NOTE:</b> Blade breaks where the layers of steel split apart (laminated) and straight breaks are usually due to defective materials. These types of breaks are warranted. Blades with irregular breaks, chips, dented edges and/or a center break-out (around the flanges) indicate excessive flexing and side stresses and are <b>NOT</b> warranted.</p>		

## A.A. GAUGES

The A.A. gauges give the manifold pressure for each side of the machine. Unequal gauge pressure can be caused by:

- 1) Knife tube wear - Knife tubes create pressure and must be the same type (open tube or closed and drilled) and have same hole diameter.
- 2) With double regulators, adjust each for the swath they control.

# PARKER QUICK DISCONNECT COUPLING



**DANGER:** To prevent serious bodily harm, read and understand instructions completely before starting installation.



**WARNING:** If the coupling fails to connect or disconnect in a normal manner; if the poppets fail to close or move easily; or if there is any corrosion on the coupling or nipple, replace the unit immediately. Failure to bleed the pressure from both halves of the coupling before connecting or disconnecting may result in hazardous ammonia spray.

For maintenance, service and operating, see the Parker Quick Disconnect Coupling Instruction pamphlet. If the pamphlet becomes illegible or lost, contact DMI immediately for replacement Part No. 00100940.

See Warranty Section for claims.

# CONTINENTAL REGULATOR

## SETTING INSTRUCTIONS

Simplicity in setting the CONTINENTAL METER MATIC is one of its outstanding features and is based on the following known values:

1. Desired amount of 'N' to be applied in pounds per acre.
2. Swath width (in feet).
3. Tractor speed (MPH)

HOW TO SET METER MATIC FOR APPLICATION RATES SHOWN ON DIAL  
 FORMULA FOR SETTING B-9500

If appropriate charts are not available, use the formula (Lbs. Nitrogen x Swath Feet x MPH x .1212 = Lbs. Nitrogen in one hour).

Example:   Lbs. Nitrogen per acre       100  
               Swath width in feet           30  
               Tractor speed                   5

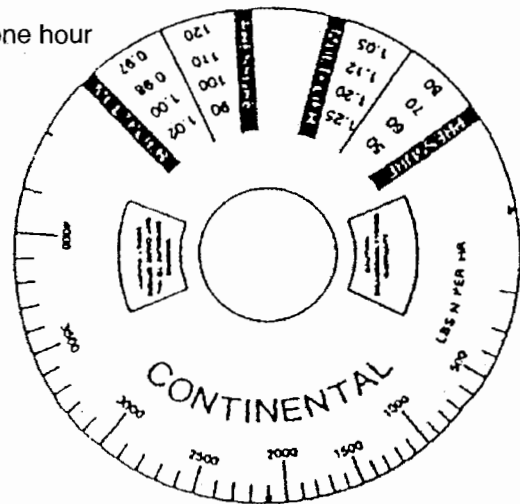
Lbs. Nitrogen x swath feet x MPH x .1212 = Nitrogen applied in one hour  
 100 x 30 x 5 x .1212 = 1818 Lbs. Nitrogen per hour

This will be the dial setting at 100 p.s.i. tank pressure in a normal fitting arrangement. (12 feet hose x hose valve x 1" QDC x 3' of 1" hose).

**NOTE A:** 1-1/4" QDC will have less pressure drop, so less vapor formation and about 10% more flow. (So 10% less dial setting)

This setting number is then multiplied by the tank pressure multiplier on the dial (if not 100 lbs. tank pressure) in order to get the actual dial setting.

If using charts, find setting number x tank pressure multiplier = dial setting.



## MULTIPLIERS FOR DIFFERENT TANK PRESSURES

PRESSURE	MULTIPLIER		PRESSURE	MULTIPLIER
50	1.25		100	1.00
60	1.20	Lbs. N x 1.22 = Lbs. NH <sub>3</sub>	110	0.97
70	1.15		120	0.95
80	1.10	Lbs. NH <sub>3</sub> x .82 = Lbs. Nitrogen	130	0.93
90	1.05		140	0.92

FORMULA FOR CHART: #N x SWATH FT. x MPH x .1212 = # NITROGEN PER HOUR AT 100# TANK PRESSURE

EXAMPLE: 100 x 30 x 5 x .1212 = 1818# NITROGEN PER HOUR AT 100# TANK PRESSURE

See Warranty Section for claims.

# SELECTOR VALVE

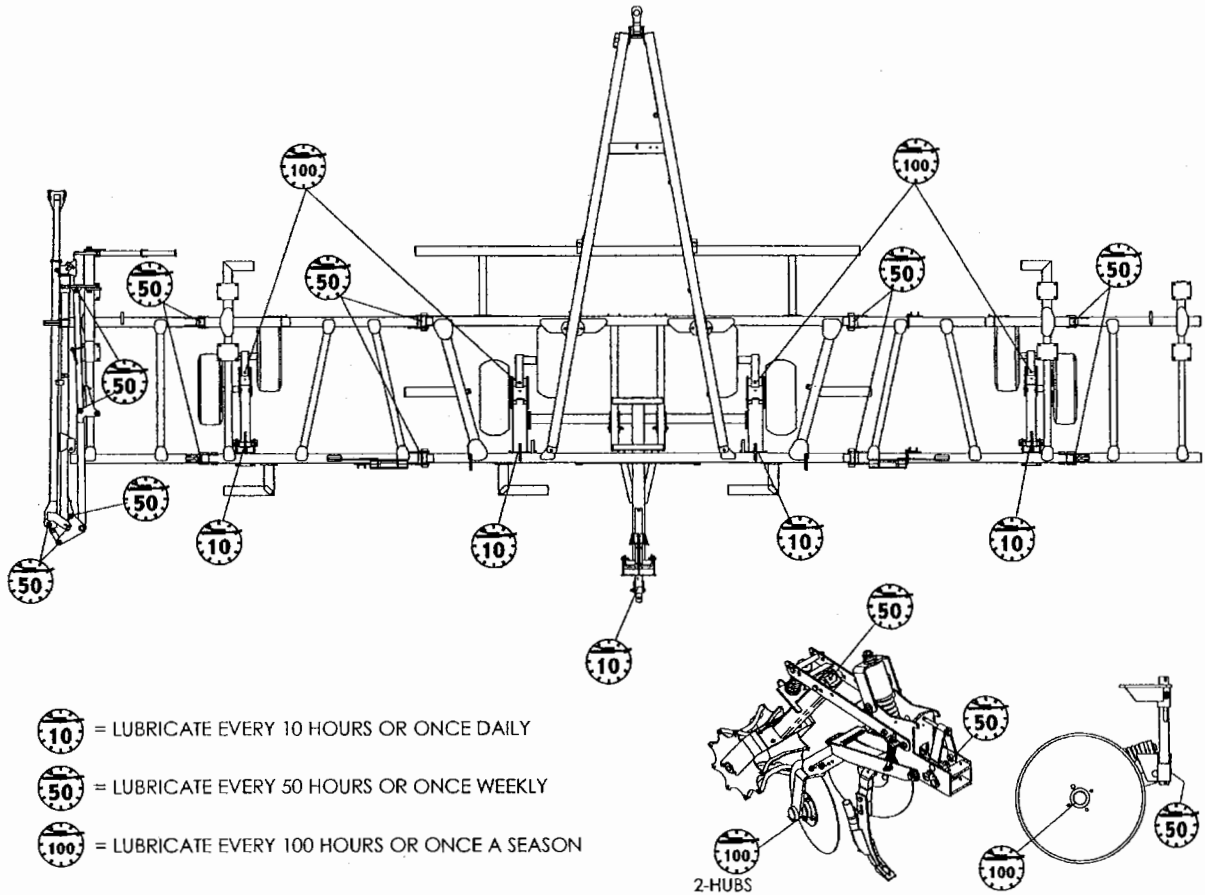
The selector valve allows the operation of two hydraulic circuits with one tractor remote outlet. On the applicator, the selector valve operates either the wing fold circuit or the main lift circuit. The hydraulic shutoff (B9500 shutoff, Gromo III, etc.) is hooked directly to the tractor for added safety.

In operating the selector valve:

- 1) When unfolding wings, be sure the wing cylinders are fully extended for full wing float before switching the selector valve to the main lift circuit.
- 2) Before folding the wings, fully raise the applicator. Install the transport lock on the main lift cylinders. Lower the machine on the stop using the float setting in the tractor. Switch the selector valve to the wings and fold the wings.

# MAINTENANCE SECTION

## LUBRICATION



(SEE NOTE "A")

- Always lubricate your implement thoroughly before taking it to the field.
- Always lower your implement until all shank points rest on the ground and stop the tractor engine prior to lubricating the machine.
- Grease fittings are provided at all points indicated in the illustration above.
- Be sure all fittings are free from dirt and paint so the lubricant is certain to enter the proper areas.
- If any grease fittings are damaged or missing, replace them immediately. Clean the fittings thoroughly before using the grease gun.
- Use a lubricating gun and No. 2 multi-purpose lithium grease at the hourly intervals indicated on the symbols.

### WHEEL AND

**MARKER HUBS:** Clean and inspect bearings before the season and repack with wheel bearing grease.

**COULTERS ARM:** Lubricate grease zerks on individual coulter arms every 50 hours or once each week.

**COULTER HUB:** Lubricate grease zerk on individual coulter hubs every 100 hours or once a season. In muddy conditions coulter hubs should be pumped with grease to purge out dirt.

**NOTE "A":** Approximately 10 pumps from the grease gun will adequately lubricate hubs. (Some cases may vary.)

# PREVENTIVE MAINTENANCE



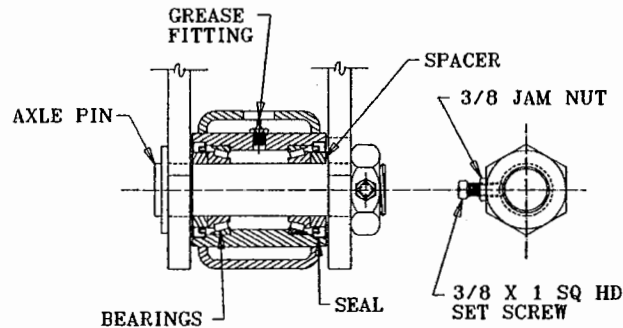
- WARNING:**
- Never position yourself under any portion of the **nutri-till'r** model 5310 unit. Lower machine to the ground, turn off tractor and remove key before making adjustments or repairs. Otherwise, block securely to prevent accidental lowering.
  - Be sure safety signs are clean and readable. All safety related signs must be replaced if the **nutri-till'r** model 5310 unit is painted or the decals are otherwise rendered unreadable.
  - Use only approved replacement parts.

**WHEEL HUB BEARINGS:** There are grease zerks in hubs which can be used during the season; however it is important to inspect bearings and seals. Repack once a year or every 250 hours of use, whichever occurs first, with a good multi-purpose wheel bearing grease. Tighten slotted nut on spindle, draw up the nut tight, and then back off one (1) slot.

**CYLINDER RODS:** When not in use for some time, coat the exposed portion of cylinder rods with grease. This will protect rod surfaces against corrosion.

## WALKING TANDEM AXLE

Check the tandem axle pivot at least once a year. Loosen the 3/8" x 1" sq. hd. set screw and torque the nut to 150-175 ft-lbs. Tighten the set screw.



If the tandem axles are removed for servicing, assemble as follows: Refer to Figure #1.

- 1) After reassembling the axle pivot bearings, place the spacers against the bearings, then press seals into place over the spacers flush with tube.
- 2) Seat the bearing assembly by torquing the nut to 260 ft-lbs. (Rotate axle up and down.)
- 3) Loosen the nut until it can be turned by hand. Retorque the nut to 150-175 ft-lbs. Tighten the set screw and jam nut. Lubricate the fitting until grease appears at both sides.

## PRE-SEASON CHECK LIST

1. Carefully review all of the safety suggestions in this manual.
2. Check all bolts for proper tightness. (See Bolt Torque Chart.) When implement is new, check after (1) hour and every few hours of operation.
3. Replace ground tools that are severely worn, broken or damaged.
4. Check tires for proper inflation. All tires should be inflated equally to avoid side draft. See Page #12.
5. Check the wheel lug bolts daily, keep wheel bolts. Torque to 100 ft-lbs.
6. Grease all fittings; refer to Lubrication Section, Page #27.
7. Inspect, repack, or replace (if necessary) wheel bearings and seals.
8. Check hoses, hose routing and hydraulic cylinders. Any indication of leakage or fraying of hoses should be corrected.
9. Check regulators - make sure they operate properly.
10. The Quic-Coupler safety swing stand must pivot freely. Check before using.
11. Check torque on walking tandem axle pivot. Refer to Page #28.
12. Check warning and taillights. Replace bad bulbs if necessary.
13. Check warning and taillights for proper function.

## OFF-SEASON STORAGE CHECK LIST

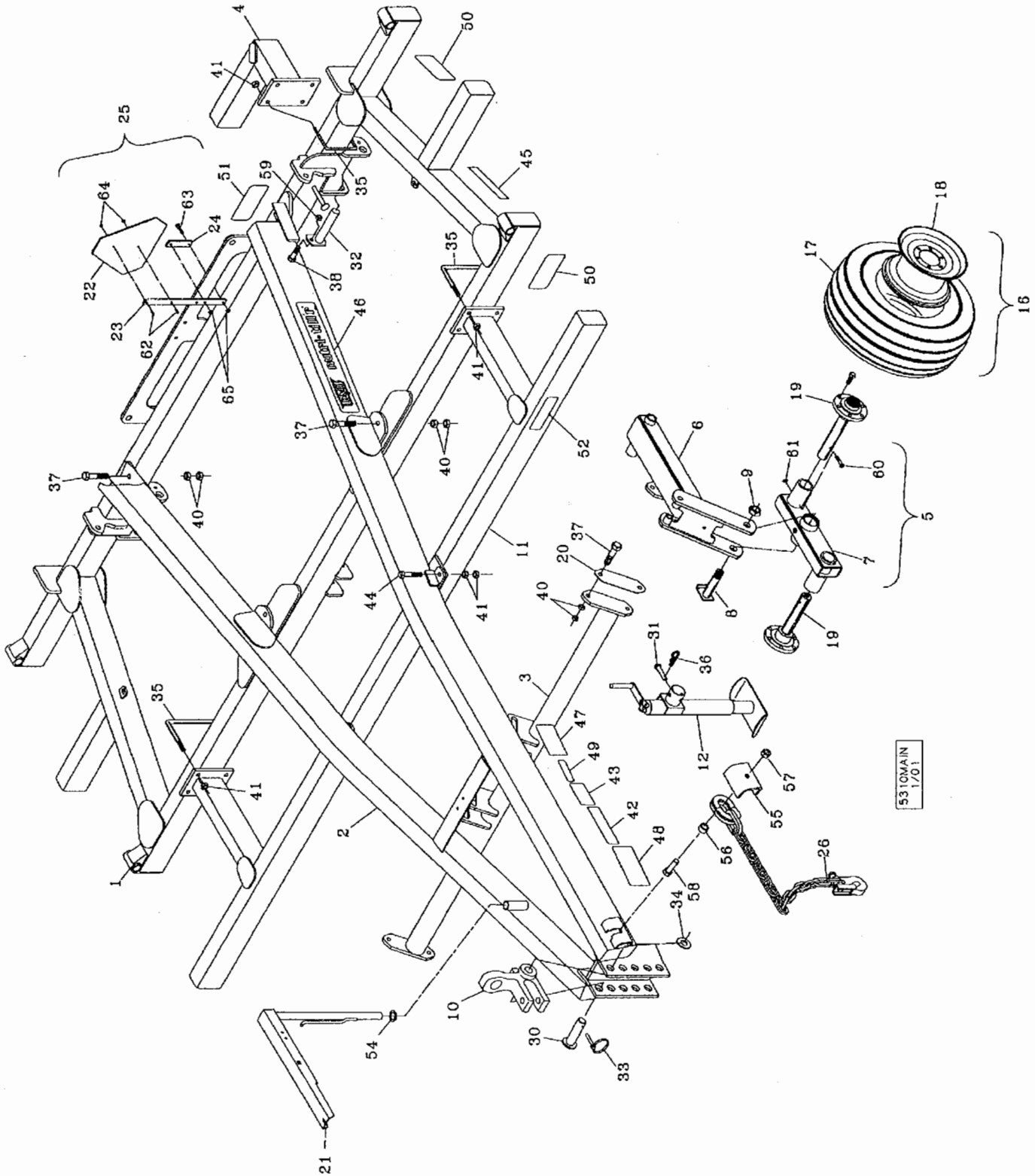
Service life and satisfaction will be extended by following these suggestions:

1. The chief enemies of your **nutri-till'r** unit, rust and corrosion, are busy year around. A little time and effort spent cleaning your machine before storing will repay in longer service, easier operation, and higher resale value.
2. Inspect for worn or damaged parts. Replace if required, to avoid delays the next season.
3. Repaint all areas where the original paint is worn off.
4. Lubricate your implement. (See Lubrication Section, Page #27.)
5. Grease all exposed metal surfaces of ground tools.
6. Store the unit on a level area inside a shed to protect from weather. The ground working parts should rest on boards.
7. The manufacturer recommends that during the off-season, when the applicator is not in use, the regulators and Quic-Couplers should be removed, cleaned and lubricated. Regulators and Quic-Couplers should be stored uncoupled to prevent damage to internal parts.
8. Retract cylinders in storage or coat cylinder rods with a light coat of oil or grease.
9. Store warning light seven pin connector in storage receptacle to prevent corrosion.

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# PARTS SECTION

# nutri-till'r 5310 MAIN FRAME

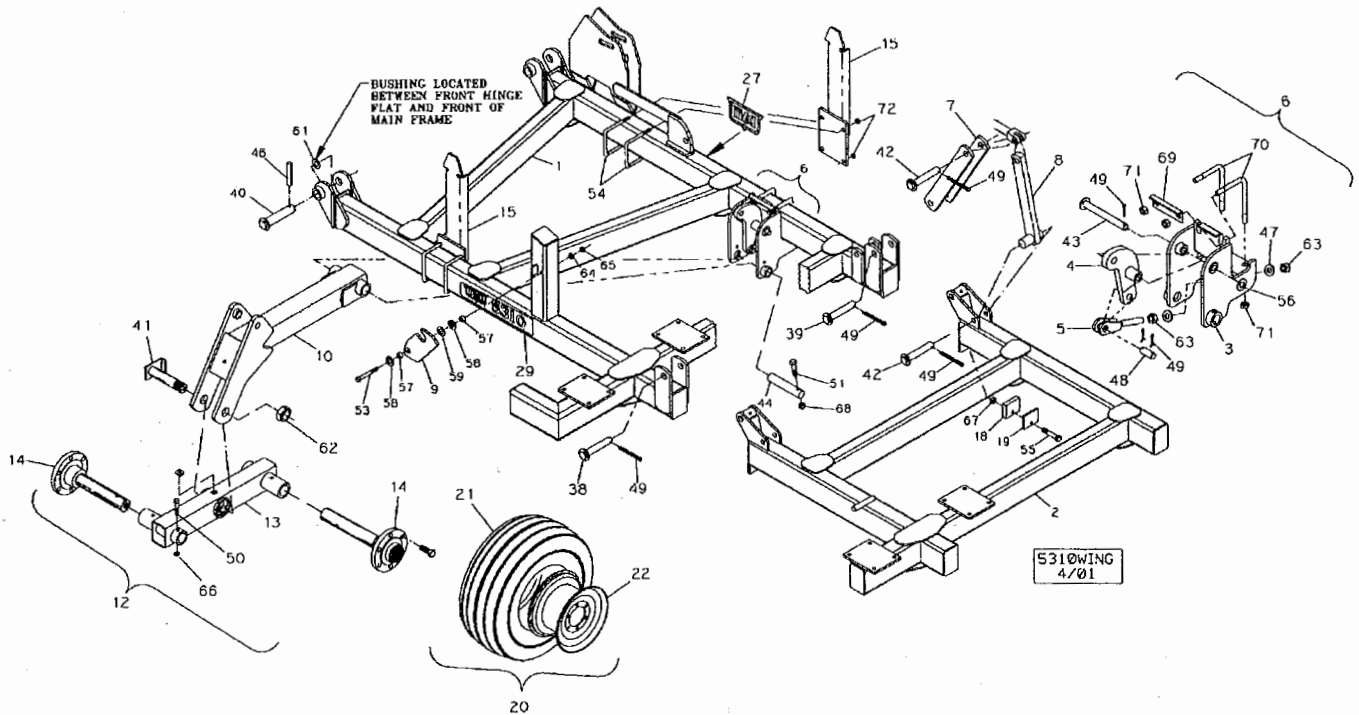


# nutri-till'r 5310 MAIN FRAME (CONTINUED)

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION	REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	04681150	1	Main Frame	30	14820525	1	1-5/8" O.D. Hitch Pin
2	04691200	1	A-Frame	31	14810251	1	5/8" O.D. x 3-1/8" Clevis Pin
3	04683600	1	Torque Tube- 92.12" Long	32	14820920	2	1-5/8" O.D. Pin
4	04662910	4	Offset Bar	33	D33805	1	7/16" x 2" Klik Pin
5	04683000	1	Main Tandem Assembly RH (Incl. #6, 7, 8, & 9)	34	17426001	1	1-5/8" I.D. HD Washer
	04683100	1	Main Tandem Assembly LH (Incl. #6, 7, 8, & 9)	35	87427186	12	3/4" x 6.18" U-Bolt
6	04683030	1	Main Tandem Arm RH	36	NSI	1	1/8" x 2" Hair Pin (14720411)
	04683130	1	Main Tandem Arm LH	37	413-1448	10	7/8" x 3" NC Hex Bolt Gd. 5
7	04683040	1	Walking Axle Weld RH	38	413-1032	4	5/8" x 2" NC Hex Bolt Gd. 5
	04683140	1	Walking Axle Weld LH	40	425-1014	20	7/8" NC Hex Nut
8	04683050	2	Axle Pin	41	425-1012	24	3/4" NC Hex Nut
9	14032408	2	1-1/2" Jam Nut with Set Screw	42	18534348	1	Warning Sign, Towing Hazard
10	20092310	1	Combination Clevis	43	18534282	1	Warning Sign
11	04691650	1	Front Coulter Bar	44	413-1240	2	3/4" x 2-1/2" Hex Bolt Gd. 5
12	87416370	1	5 - 7K Swivel Jack	45	311864A1	2	Yellow Retroreflective Strip
16	10010186	4	12.5 x 15 FI (F) Tire Assy. (12 & 16 Row Units)	46	18534276	2	<b>nutri-till'r</b> Decal
	10010152	4	11L x 15 SL Tire Assy. (8 Row Units)	47	18534107	1	Patent Decal
17	11012181	4	12.5 x 15 FI (F) Tire (12 & 16 Row Units)	48	18534228	1	Caution Decal
	1980927C1	4	11L x 15 SL 8-Ply Tubeless Tire (8 Row Units)	49	18534174	1	Other Patents Applied For Decal
18	10110174	4	10 x 15 8-Hole Wheel (12 & 16 Row Units)	50	18534227	4	Danger Decal
	10110154	4	10 x 15 6-Hole Wheel (8 Row Units)	51	18534277	1	Warning Sign, Spring Compression
19	28050885	4	50-8 Hub & Spindle Assembly (12 & 16 Row Units)	52	18534284	1	Danger Sign, (O.H.P.) Marker
	28078361	4	783 Hub & Spindle Assembly (8 Row Units)	54	17620030	1	1-1/4" Machine Bushing
20	04661154	2	Shim	55	04681210	1	Bracket
21	05302150	1	Hose & Gauge Stand	56	04681211	1	Spacer
22	311860A1	1	SMV Sign	57	86992219	1	1" Lock Nut
23	06000099	1	SMV Mount	58	413-1648	1	1" x 3" NC Hex Bolt
24	04660050	1	Plate	59	425-1010	4	5/8" NC Hex Nut
25	18584200	1	SMV Kit (Incl. #22, 23, 24, 62, 63, 64 & 65)	60	413-864	4	1/2" x 4" NC Hex Bolt Gd. 5
26	1032162	1	30,400 lbf ASAE Safety Chain	61	231-4248	4	1/2" NC Hex Lock Nut
				62	413-412	2	1/4" x 3/4" NC Hex Bolt
				63	413-628	2	3/8" x 1-3/4" NC Hex Bolt
				64	86992211	2	1/4" NC Hex Lock Nut
				65	231-4246	2	3/8" NC Hex Lock Nut

NSI - NOT A SERVICE ITEM

# nutri-till'r 5310 WING

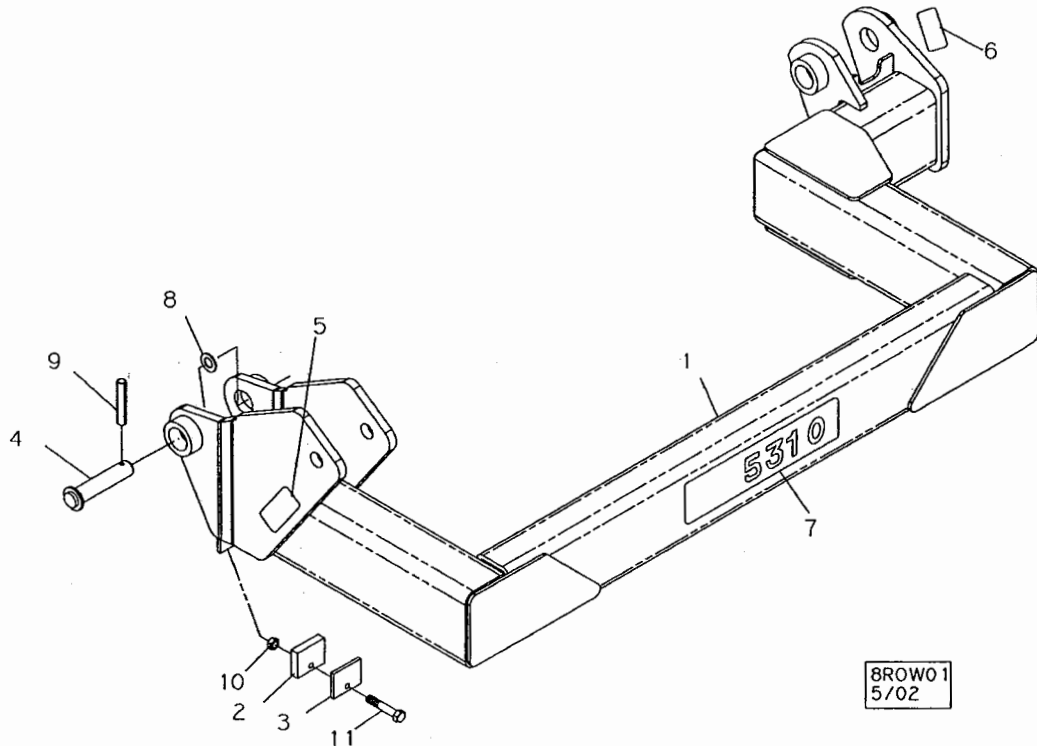


REF. NO.	PART NO.	QTY. NO.	DESCRIPTION	REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	04692050	1	Inner Wing LH	43	14816686	2	Pivot Pin
	04692075	1	Inner Wing RH	44	14892788	2	1-5/8" Dia. Pin
2	04692085	1	Outer Wing RH	46	438-32840	4	7/16" x 2-1/2" Roll Pin
	04692080	1	Outer Wing LH	47	17915000	4	7/8" Washer H.T. - Black
3	04683590	2	Gauge Wheel Mounting Bracket	48	14891619	2	1" Dia. Pin
4	04683597	2	Adjustment Pivot	49	432-1624	10	1/4" x 1-1/2" Cotter Pin
5	04683586	2	Eyebolt	50	413-848	4	1/2" x 3" NC Hex Bolt
6	04683591	2	Gauge Wheel Mount (Incl. #3, 4, 5, 43, 44, 47, 48, 49, 51, 56, 63, 68, 69, 70, & 71)	51	413-1032	2	5/8" x 2" Hex Bolt Gd. 5
7	04662630	2	H-Link, Wing Hinge	53	413-10112	2	5/8" x 7" NC Hex Bolt Gd. 5
8	04682260	2	Link Weldment	54	87427168	8	5/8" x 6" x 5-1/2" U-bolt (16 Row Unit Only)
9	06220130	2	Outer Wing Catch	55	413-824	2	1/2" x 1-1/2" NC Hex Bolt
10	04683230	2	Spindle Arm	56	17616021	2	1" Machine Bushing
12	04683210	1	Tandem Spindle Arm Ass'y RH, 5310	57	44006200	4	Bushing
	04683310	1	Tandem Spindle Arm Ass'y LH, 5310	58	17411012	4	11/16" I.D. x 1-3/4" O.D. x 1/4" thk. Washer
13	04683245	1	Walking Axle Weld RH	59	17620020	2	1-1/4" x 14 ga. Machine Bushing
	04683345	1	Walking Axle Weld LH	61	17627010	2	1-5/8" 14 ga. Machine Bushing
14	28078372	2	783 Hub & Spindle Assembly	62	14032408	2	1-1/2" Jam Nut with Set Screw
15	04692105	4	Marker Transport Weldment (16 Row Unit Only)	63	425-1014	4	7/8" NC Hex Nut, Gd. 5, ZP
18	04626130	2	Shim - Outer Wing	64	425-1010	2	5/8" NC Hex Nut
19	04626120	A/R	Shim - Outer Wing	65	425-1410	2	5/8" NC Hex Jam Nut
20	10008156	A/R	9.5L x 15 8-Ply Tire Ass'y	66	86992215	4	1/2" NC Stover Lock Nut
21	NSI	A/R	9.5L x 15 8-Ply Tire (1980928C1)	67	425-108	2	1/2" NC Hex Nut
22	10108154	A/R	8 x 15 6-Hole Wheel	68	231-42410	2	5/8" NC Hex Lock Nut
27	18534261	2	DMI Decal	69	04683565	2	Mounting Plate
29	18534425	2	5310 Decal	70	87427191	4	3/4" NC Sq. L-bolt
38	14820445	4	1-1/4" Dia. x 6.31" Pin	71	425-1012	8	3/4" NC Hex Nut, Gd. 5 ZP
39	14816466	2	1" Dia. X 5.81" Pin	72	86992216	16	5/8" NC Stover Lock Nut
40	14820650	4	1-5/8" x 8-3/4" Hinge Pin				
41	04661850	2	Axle Pin				
42	14891660	4	1" Dia. x 4.31" Pin				

NSI - NOT A SERVICE ITEM  
A/R - AS REQUIRED

# nutri-till'r 5310 WING

## (8 Row Units Only)



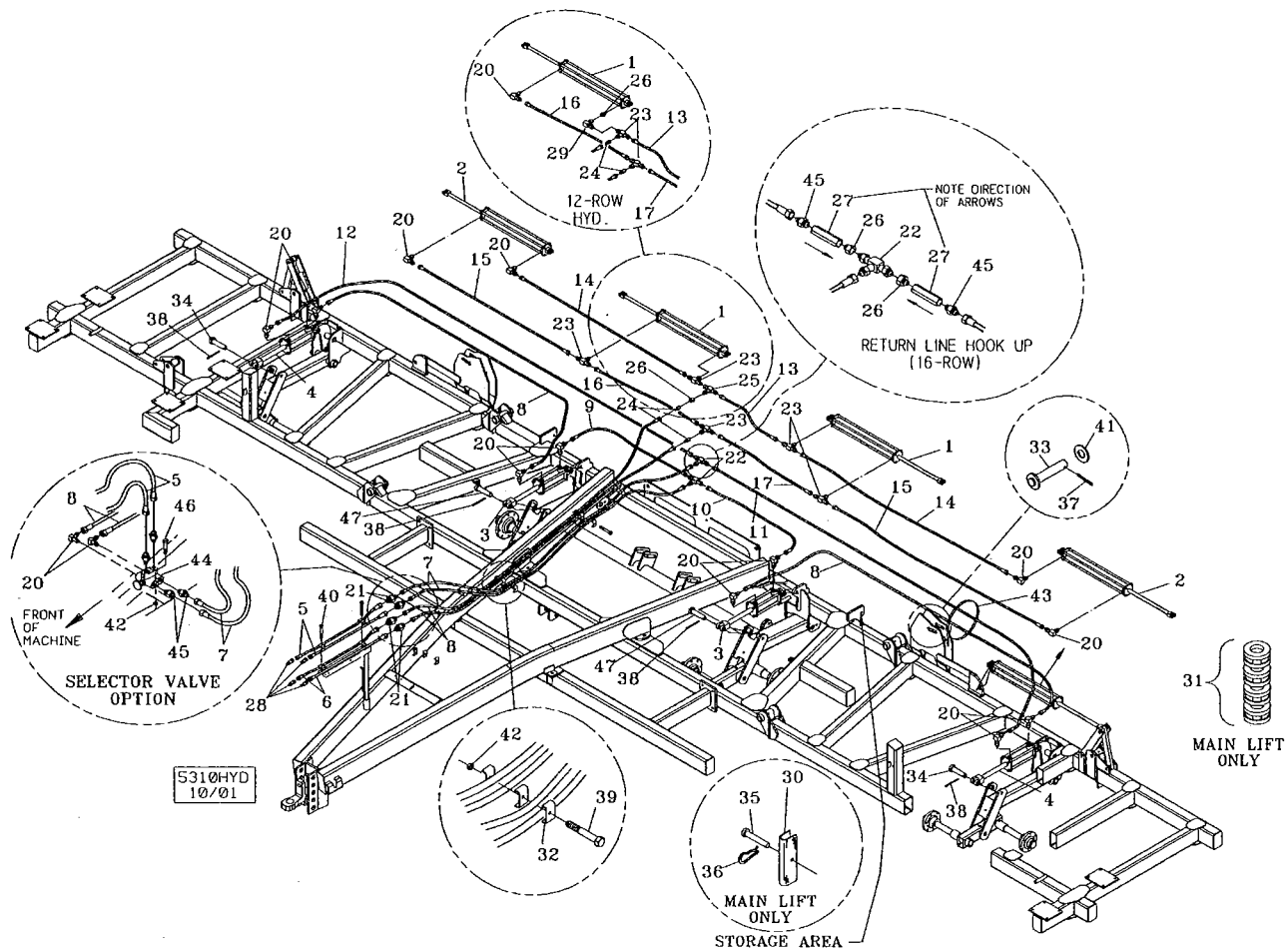
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REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	04692065	1	Wing, Strip Till, 8 Row LH (Shown)
	04692060	1	Wing, Strip Till, 8 Row RH
2	04626130	4	1/8" Thick Shim
3	04626120	A/R	1/16" Thick Shim
4	14820650	4	1-5/8" Dia. Pin
5	18534243	2	Amber Reflector
6	18534244	2	Red Reflector

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
7	18534425	2	5310 Decal
8	17627010	1	1-5/8" I.D. x 14 Ga. Mach. Bushing
9	438-32840	4	7/16" x 2-1/2" Long Roll Pin
10	425-108	4	1/2" NC Hex Nut
11	413-824	4	1/2" x 1-1/2" NC Hex Bolt

A/R - AS REQUIRED

# nutri-till'r 5310 HYDRAULICS



REF. NO.	PART NO.	QTY. NO.	DESCRIPTION	REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	25340360	2	4" x 36" Hydraulic Cylinder - 3,000 p.s.i.	24	25405013	2	Throttle Valve (Purple SAE)
2	25335242	2	3-1/2" x 24" Hydraulic Cylinder - 3,000 p.s.i. (16-Row Units Only)	25	218-845	1	3/4" JICM (2) x 3/4" JICF Tee
3	86990539	2	3-1/2" x 10" Hydraulic Cylinder - Rephase	26	25707534	1	3/4" SAEM x 3/4" JICF Adapter
4	86990538	2	3-1/4" x 10" Hydraulic Cylinder - Rephase	27	25407503	2	Relief Valve (16 Row Units Only)
5	25610855	2	1/2" Hydraulic Hose x 100" Long	28	25705041	2	Male ISO-3/4 SAEF Hydraulic Coupling
6	25610645	2	3/8" Hydraulic Hose x 80" Long	29	218-5230	1	3/4" JICM x 3/4" JICF 90E Swivel (16 Row Unit)
7	134216A1	2	1/2" Hydraulic Hose x 165" Long	30	04632700	2	Cylinder Stop 9-3/4" Long, 3 Holes
8	25600633	2	3/8" Hydraulic Hose x 165" Long	31	25800010	2	Stroke Control Kit 1-1/4"
9	25600630	1	3/8" Hydraulic Hose x 30" Long	32	06200125	15	Hose Clamp
10	25600662	1	3/8" Hydraulic Hose x 72" Long	33	14891660	2	1" x 4-1/4" E.L. Clevis Pin
11	25600695	1	3/8" Hydraulic Hose x 220" Long	34	14816466	2	1" x 5.81" E.L. Clevis Pin
12	25600615	1	3/8" Hydraulic Hose x 173" Long	35	14810251	2	5/8" x 3-1/8" E.L. Clevis Pin
13	25600655	1	3/8" Hydraulic Hose x 55" Long	36	NSI	2	1/8" x 2" Hair Pin (14720411)
14	25600650	2	3/8" Hydraulic Hose x 128" Long	37	432-1632	2	1/4" x 2" Cotter Pin
15	25600669	2	3/8" Hydraulic Hose x 114" Long	38	432-1624	2	1/4" x 1-1/2" Cotter Pin
16	25600634	1	3/8" Hydraulic Hose x 37" Long	39	413-636	5	3/8" x 2-1/4" NC Hex Bolt
17	25600704	1	3/8" Hydraulic Hose x 97" Long	40	413-648	5	3/8" x 3" NC Hex Bolt
20	218-5106	12	3/4" JICM x 3/4" SAEM 90° (16 Row Units)	41	495-21106	2	1" Std. Washer
	218-5106	11	3/4" JICM x 3/4" SAEM 90° (12 Row Units)	42	425-106	5	3/8" NC Hex Nut
21	218-735	4	3/4" JICM Adapter	44	25401000	1	Selector Valve
22	218-5183	2	3/4" JICM (2) x 3/4" SAEM Tee	45	218-5059	4	3/4" SAEM x 3/4" JICM Adapter
23	218-5183	5	3/4" JICM (2) x 3/4" SAEM Tee (16 Row Units)	46	413-640	2	3/8" x 2-1/2" NC Hex Bolt
	218-5183	1	3/4" JICM (2) x 3/4" SAEM Tee (12 Row Units)				

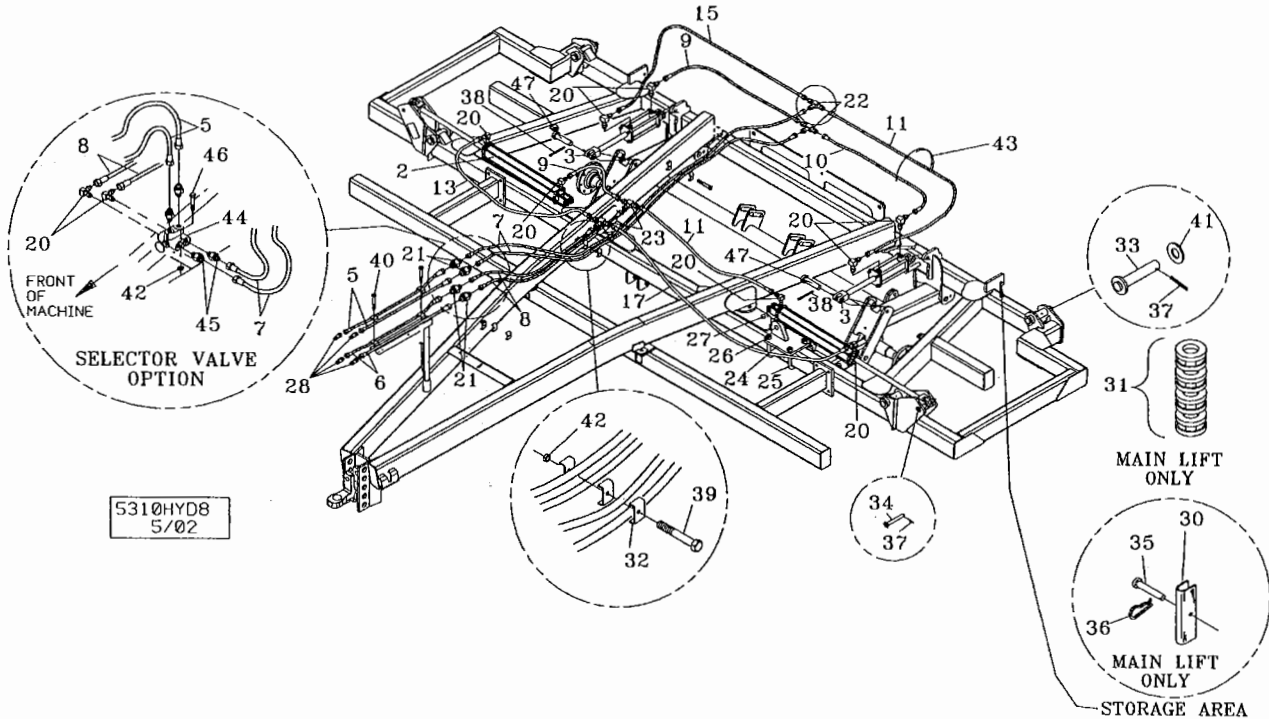
### SELECTOR VALVE ITEMS (P0466083)

20	218-5106	2	3/4" JICM x 3/4" SAEM 90°
42	425-106	2	3/8" NC Hex Nut
44	25401000	1	Selector Valve
45	218-5059	4	3/4" SAEM x 3/4" JICM Adapter
46	413-640	2	3/8" x 2-1/2" NC Hex Bolt

NSI - NOT A SERVICE ITEM

# nutri-till'r 5310 HYDRAULICS

## (8 Row Units Only)



REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
2	25335242	2	3-1/2" x 24" Hydraulic Cylinder - <b>3,000 p.s.i.</b>
3	86990539	2	3-1/2" x 10" Hydraulic Cylinder - Rephase
5	25610855	2	1/2" Hydraulic Hose x 100" Long
6	25610645	2	3/8" Hydraulic Hose x 80" Long
7	134216A1	2	1/2" Hydraulic Hose x 165" Long
8	25600669	2	3/8" Hydraulic Hose x 114" Long
9	25600630	1	3/8" Hydraulic Hose x 30" Long
10	25600662	1	3/8" Hydraulic Hose x 72" Long
11	25600735	1	3/8" Hydraulic Hose x 82" Long
13	25600655	1	3/8" Hydraulic Hose x 55" Long
14	25600650	2	3/8" Hydraulic Hose x 128" Long
15	25600642	1	3/8" Hydraulic Hose x 42" Long
17	25600692	1	3/8" Hydraulic Hose x 108" Long
20	218-5106	12	3/4" JICM x 3/4" SAEM 90°
21	218-735	4	3/4" JICM Adapter
22	218-5183	2	3/4" JICM Tee
23	218-594	2	3/4" JICM (3) Tee
24	04692020	1	Cylinder Lug, Left Hand
	04692025	1	Cylinder Lug, Right Hand

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
25	87427182	4	3/4" x 4" x 7-1/2" U-bolt
26	86992217	8	3/4" NC Stover Lock Nut
27	413-1032	2	5/8" x 2" NC Hex Bolt, Gd. 5
28	25705041	2	Male ISO-3/4 SAEF Hydraulic Coupling
29	86992216	2	5/8" NC Stover Lock Nut
30	04632700	2	Cylinder Stop 9-3/4" Long, 3 Holes
31	25800010	2	Stroke Control Kit 1-1/4"
32	06200125	9	Hose Clamp
33	14820650	2	1"-5/8" Dia. Pin
34	14816466	4	1" x 5.81" E.L. Clevis Pin
35	14810251	2	5/8" x 3-1/8" E.L. Clevis Pin
36	NSI	2	1/8" x 2" Hair Pin (14720411)
37	438-32840	2	7/16" x 2-1/2" Spring Pin
38	432-1624	2	1/4" x 1-1/2" Cotter Pin
39	413-636	5	3/8" x 2-1/4" NC Hex Bolt
40	413-648	5	3/8" x 3" NC Hex Bolt
41	495-21106	2	1" Std. Washer
42	425-106	5	3/8" NC Hex Nut

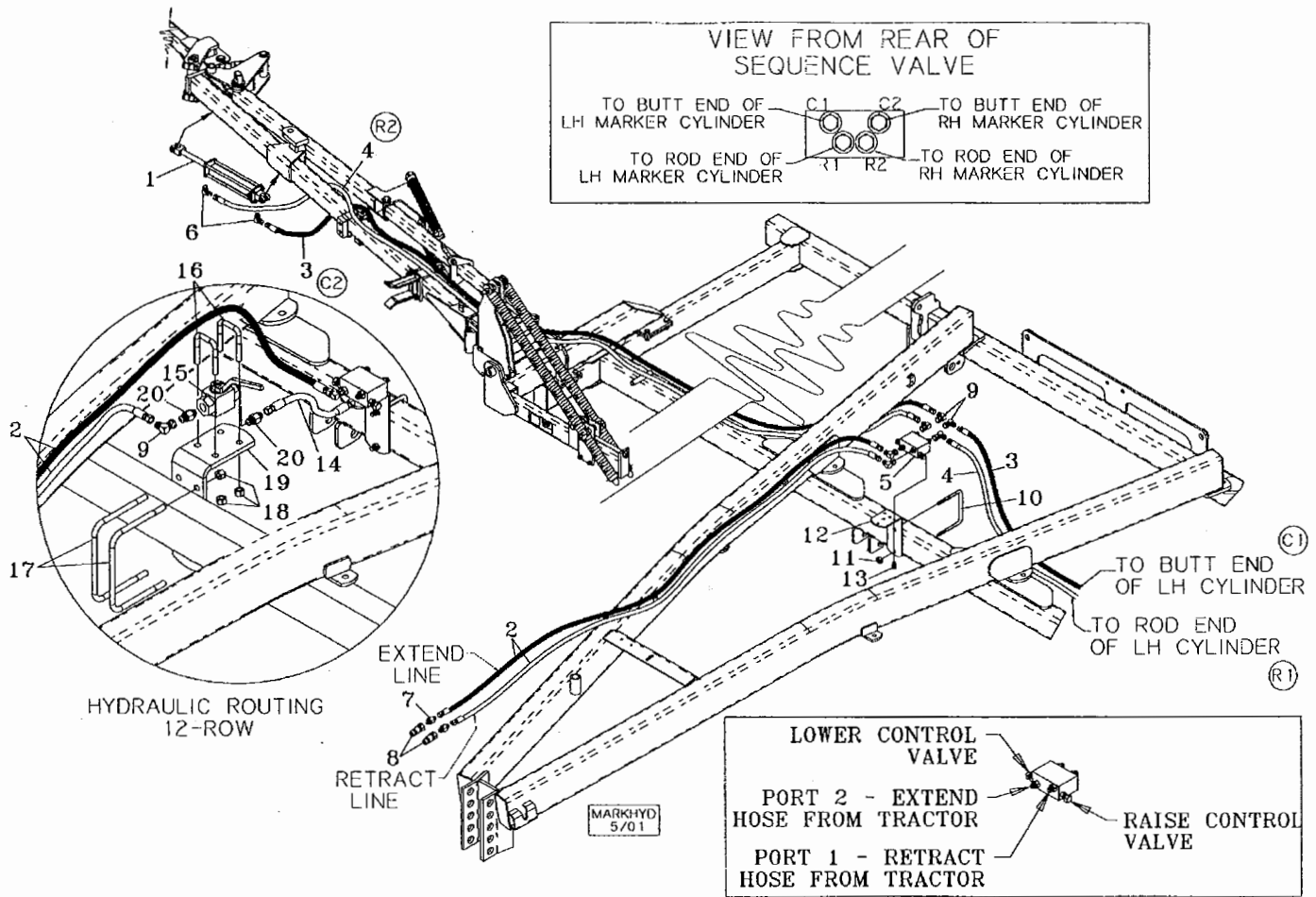
### SELECTOR VALVE ITEMS (P0466083)

20	218-5106	2	3/4" JICM x 3/4" SAEM 90°
42	425-106	2	3/8" NC Hex Nut
44	25401000	1	Selector Valve
45	218-5059	4	3/4" SAEM x 3/4" JICM Adapter
46	413-640	2	3/8" x 2-1/2" NC Hex Bolt

NSI - NOT A SERVICE ITEM

# nutri-till'r 5310

## ROW MARKER HYDRAULICS



REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	25325120	2	2-1/2" X 12" Hydraulic Cylinder - 3,000 p.s.i.
2	25600439	2	1/4" Hydraulic Hose x 212" Long
3	1284318C1	2	1/4" Hydraulic Hose x 265" Long (12 Row Unit)
	435666A1	2	1/4" Hydraulic Hose x 355" Long (16 Row Unit)
4	189348A1	2	1/4" Hydraulic Hose x 280" Long (12 Row Unit)
	435667A1	2	1/4" Hydraulic Hose x 370" Long (16 Row Unit)
5	25405620	1	Sequence Valve, Marker
6	218-5128	4	3/4" SAEM x 9/16" JICM Elbow
7	218-5058	2	3/4" SAEM x 9/16" JICM Adapter
8	25705041	2	3/4" SAEF Coupling
9	218-980	6	9/16" JICM x 9/16" JICF Elbow

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
10	87427168	1	5/8" x 6" x 5-1/2" U-bolt
11	86992216	2	5/8" NC Stover Lock Nut
12	04670050	1	Valve Bracket
13	413-612	2	3/8" x 3/4" NC Hex Bolt

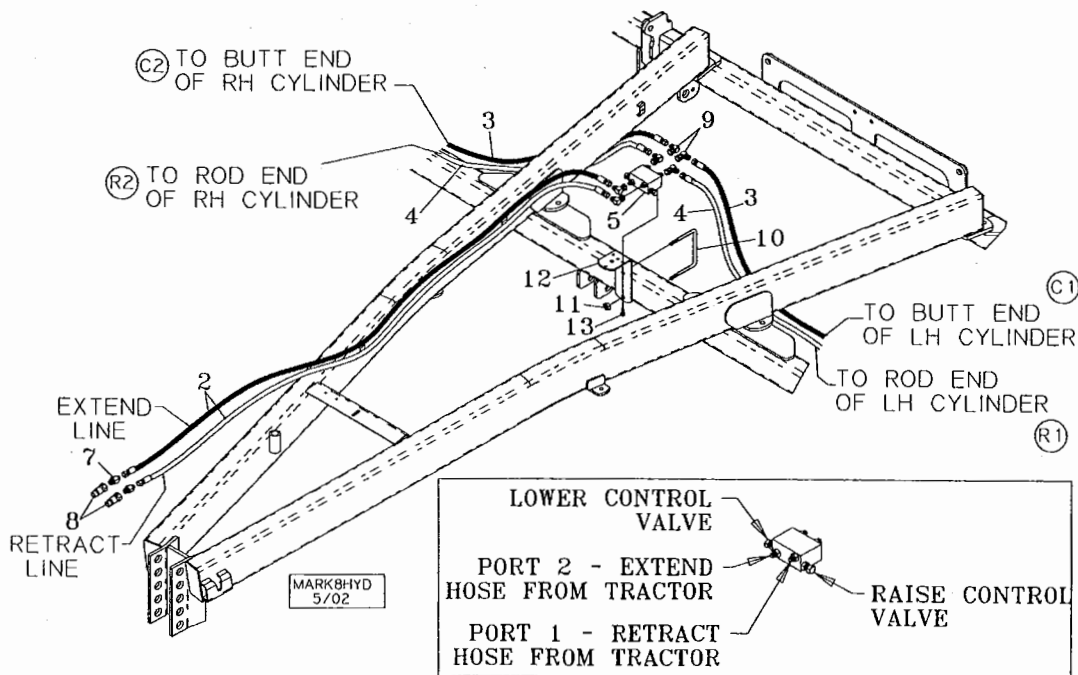
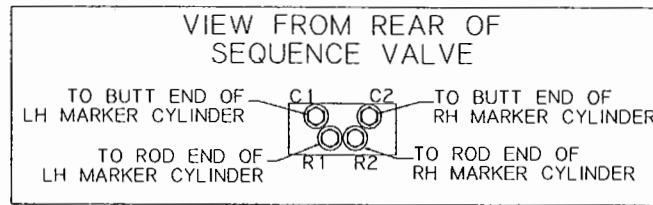
### 12-Row Units Only

14	147875C1	1	1/4" Hydraulic Hose x 35" Long
15	25402000	1	1/4 Turn Ball Valve
16	16306018	2	3/8" x 2-1/4" U-bolt, Stainless
17	16309101	2	3/8" x 4" x 6" U-bolt
18	86992213	8	3/8" NC Stover Lock Nut
19	04692223	1	Mounting Bracket
20	218-5057	2	9/16" SAEM x 9/16" JICM Adapter

# nutri-till'r 5310

## ROW MARKER HYDRAULICS

### (8 Row Units Only)

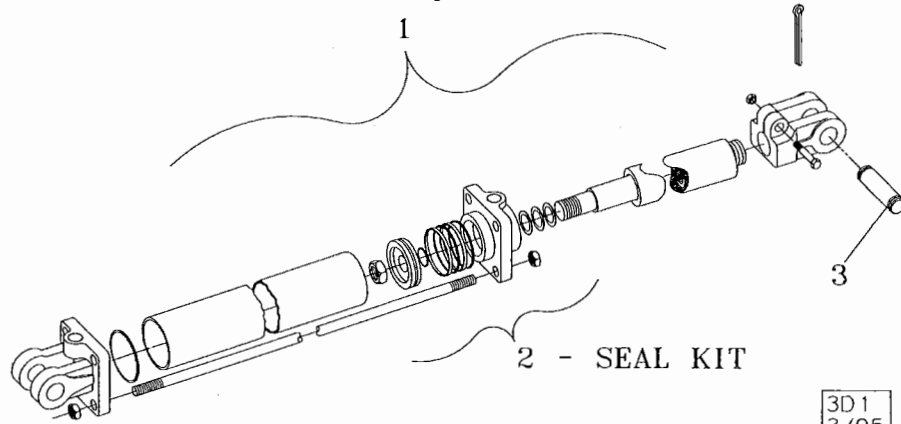


REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
2	25600425	2	1/4" Hydraulic Hose x 204" Long
3	25600410	2	1/4" Hydraulic Hose x 82" Long
4	1284366C1	2	1/4" Hydraulic Hose x 100" Long
5	25405620	1	Sequence Valve, Marker
7	218-5058	2	3/4" SAEM x 9/16" JICM Adapter

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
8	25705041	2	3/4" SAEF Coupling
9	218-980	6	9/16" JICM x 9/16" JICF Elbow
10	87427168	1	5/8" x 6" x 5-1/2" U-bolt
11	86992216	2	5/8" NC Stover Lock Nut
12	04670050	1	Valve Bracket
13	413-612	2	3/8" x 3/4" NC Hex Bolt

# HYDRAULIC CYLINDER

3,000 p.s.i.

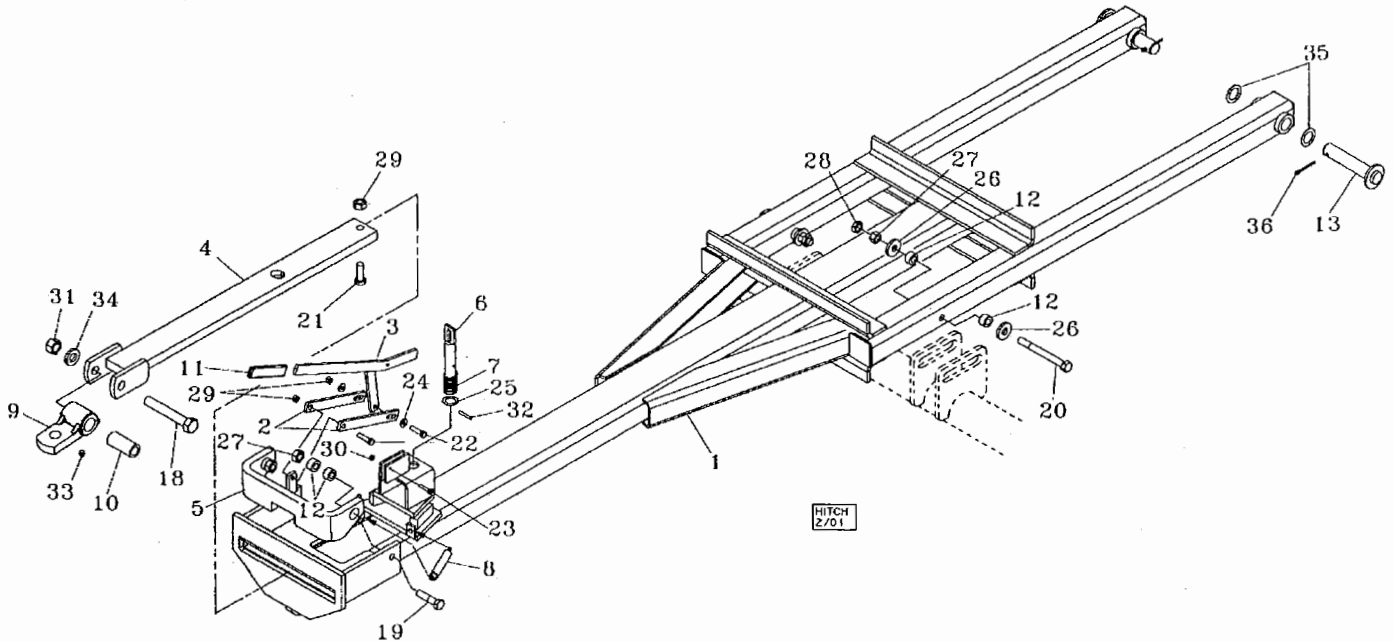


REF. NO.	2-1/2" x 12"	3-1/4" x 10"	3-1/2" x 10"	QTY	DESCRIPTION
1	25325120			1	2-1/2" x 12" Hydraulic Cylinder (22-1/4" Closed)
		86990538		1	3-1/4" x 10" Hydraulic Cylinder (20-1/16" Closed)
			86990539	1	3-1/2" x 10" Hydraulic Cylinder (20-5/16" Closed)
2	25832510	80116C2	25803500	1	Seal Kit
3	408043A1	25890100	25890100	1	1" Cylinder Pin Bag

REF. NO.	3-1/2" x 24"	4" x 36"	QTY	DESCRIPTION
1	25335242		1	3-1/2" x 24" Hydraulic Cylinder
		25340360	1	4" x 36" Hydraulic Cylinder
2	25833526	25834023	1	Seal Kit
3	25890100	25890100	2	1" Cylinder Pin Bag

- WARNING:**
- High pressure fluid is nearly invisible, but has enough force to penetrate the skin. **NEVER** use the hands to search out a suspected leak. If injured by escaping fluid, obtain medical attention immediately. Fluid must be surgically removed or gangrene will result. Wear safety glasses or goggles to avoid eye injury when working on the hydraulic system.
  - To prevent serious injury from high pressure fluid, **NEVER** attempt to inspect, service, or disassemble any part of the hydraulic system until all pressure is relieved by shutting off tractor, lowering the **nutri-till'r** model 5310 unit to the ground (or secure with cylinder transport stops provided), and placing remote control levers in float or neutral position.

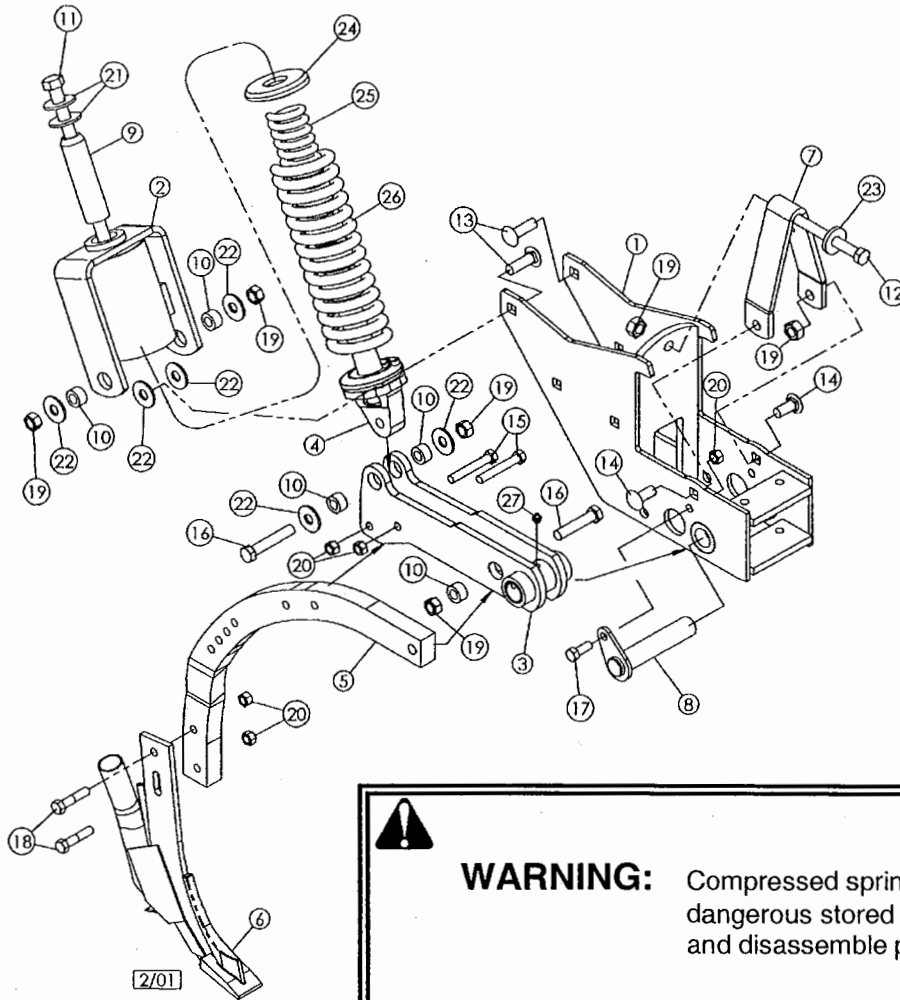
# REAR HITCH



REF. NO.	PART NO.	QTY.	DESCRIPTION	REF. NO.	PART NO.	QTY.	DESCRIPTION
1	04667310	1	Rear Hitch	23	413-424	1	1/4" x 1-1/2" NC Hex Bolt
2	04664130	2	Link	24	17618030	4	1-1/8" Mach. Bushing 18 Ga.
3	04664200	1	Handle	25	17616020	1	1" Mach. Bushing 14 Ga.
4	04664400	1	Tow Bar	26	17411012	4	11/16" I.D. x 1/4" Thk. Washer
5	04664300	1	Draw Bar Stop	27	425-1010	4	5/8" NC Hex Nut
6	14816168	1	Hitch Pin	28	425-1410	4	5/8" NC Hex Jam Nut
7	24111200	1	Compression Spring	29	425-106	4	3/8" NC Hex Nut
8	24312000	1	Extension Spring	30	425-104	2	1/4" NC Hex Nut
9	20092085	1	Single Clevis	31	86992218	1	7/8" NC Hex Lock Nut
10	44009370	1	Bushing	32	438-11624	1	1/4" x 1-1/2" Lg. Roll Pin
11	30011100	1	Vinyl Grip	33	219-86	1	1/8" NPT Self Tap Zerk
12	44006200	8	Bushing	34	17414012	1	7/8" I.D. Thk. Washer
13	14820445	2	1-1/4 Dia. Pin	35	432-1632	2	1/4" x 2" Cotter Pin
18	16901420	1	7/8" x 5-1/2" NC Hex Bolt	36	17620020	A/R	1-1/4" Mach. Bushing 14 Ga.
19	413-1088	2	5/8" x 5-1/2" NC Hex Bolt Gd. 5				
20	413-1096	2	5/8" x 6" NC Hex Bolt Gd. 5				
21	413-1028	1	5/8" x 1-3/4" NC Hex Bolt Gd. 5				
22	413-632	2	3/8" x 2" NC Hex Bolt				

A/R - AS REQUIRED

# HCS™ SHANK ASSEMBLY



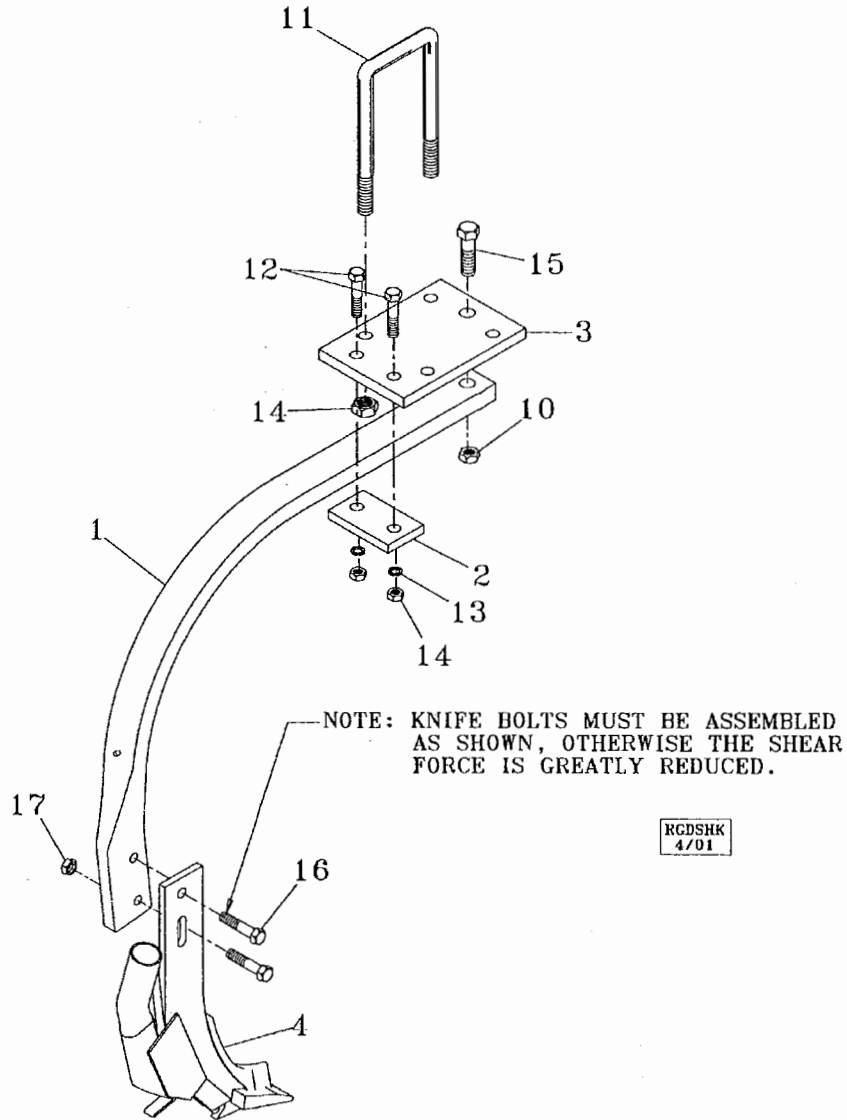
**WARNING:** Compressed springs have potentially dangerous stored energy. Always assemble and disassemble properly.

**TO DISASSEMBLE SPRINGS: BACK OFF THE 3/4" BOLT (#21) ABOUT 1/4" TO 1/2". PLACE A COLLAR OR OTHER SPACER UNDER THE DOUBLE WASHERS (#21), FILLING AS MUCH SPACE AS POSSIBLE BETWEEN THE WASHERS (#21) AND THE CANISTER WELDMENT (#2). TIGHTEN THE 3/4" BOLT DOWN UNTIL THE SPRING (#25) IS COMPRESSED ENOUGH TO TAKE THE LOAD OFF THE CARRIAGE BOLTS (#13). REMOVE CARRIAGE BOLTS, BACK OFF THE 3/4" BOLT UNTIL THE SPRING IS FULLY EXTEND AND CAN BE REMOVED.**

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION	REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
	04691800	1	HCS Shank Assy Complete (Does Not Incl. Knife & Hardware)	14	433-1024	2	5/8" x 1-1/2" NC Carriage Bolt
1	04691710	1	Shank Mount Weldment	15	16908128	2	1/2" x 3" NC A-325 Hex Bolt
2	04691730	1	Spring Canister Weldment	16	413-1056	2	5/8" x 3-1/2" NC Hex Bolt, Gd. 5 ZP
3	04691735	1	Shank Pivot Weldment	17	413-820	1	1/2" x 1-1/4" NC Hex Bolt, Gd. 5, ZP
4	04691725	1	Spring Bolt Weldment	18	413-836	2	1/2" x 2-1/4" NC Hex Bolt, Gd. 5 ZP
5	33020031	1	Formed Shank	19	86992216	7	5/8" NC Stover Lock Nut
6	33607130	1	Strip-Till Knife, Dry Only	20	86992215	5	1/2" NC Stover Lock Nut
	33607135	1	Strip-Till Knife, NH <sub>3</sub> (A.A.) Only	21	495-21081	2	3/4" Washer
7	04691717	1	Flip-Up Stop	22	495-21069	6	5/8" Washer
8	14820475	1	Flag Pin Weldment, 1-1/4" Dia.	23	17411012	1	11/16" I.D. x 1-3/4" O.D. x 1/4" Washer
9	04691721	1	Wear Tube	24	20090124	1	Spring Casting
10	44006201	5	Bushing	25	24143816	1	Compression Spring
11	16901244	1	3/4" x 11-1/2" NC Special Bolt	26	24162505	1	Compression Spring
12	413-10120	1	5/8" x 7-1/2" NC Hex Bolt, Gd. 5 ZP	27	219-86	1	1/8" NPT Self Tapping Grease Zerk
13	433-1032	2	5/8" x 2" NC Carriage Bolt				

A/R - AS REQUIRED

# RIGID SHANK

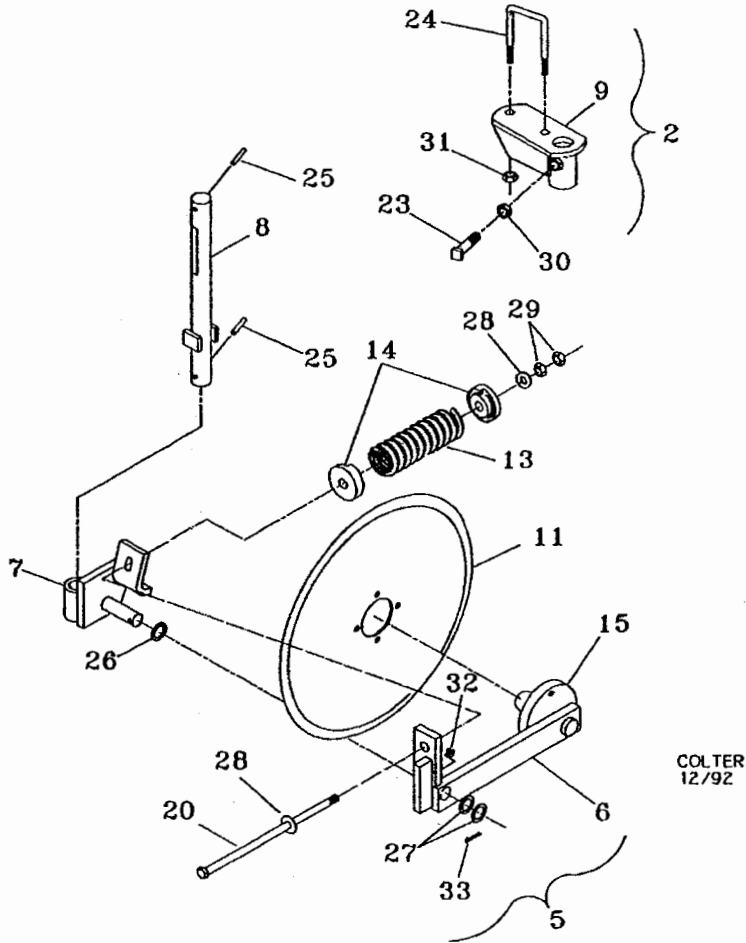


REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
	P0466018	1	Rigid Mount 4" x 6" with Hardware
1	33020017	1	Shank, Side Mount
2	09236000	1	Clamp Plate
3	04620510	1	Plate
4	33607130	1	Mole Knife (Dry & NH <sub>3</sub> )
	33607135	1	Mole Knife (NH <sub>3</sub> Only)

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
10	425-1012	A/R	3/4" NC Hex Nut
11	87427170	2	5/8" x 4" x 8" U-bolt
12	424-1048	2	5/8" x 3" NC Hex Bolt
13	492-11062	2	5/8" Lock Washer
14	425-1010	A/R	5/8" NC Hex Nut
15	413-1248	1	3/4" x 3" NC Capscrew Gd. 5
16	413-832	2	1/2" x 2" NC Capscrew Gd. 5
17	425-108	2	1/2" NC Hex Nut

A/R - AS REQUIRED

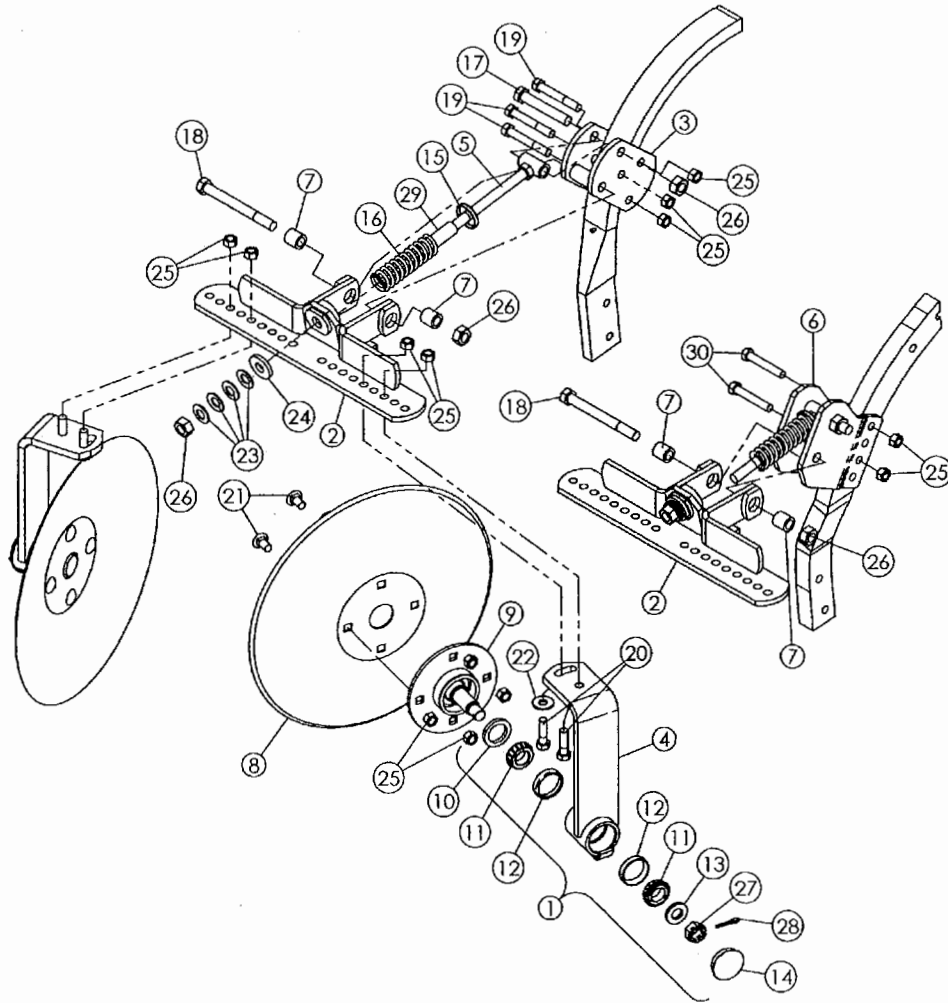
# 24" SPRING COULTER



REF. NO.	PART NO.	QTY.	DESCRIPTION	REF. NO.	PART NO.	QTY.	DESCRIPTION
2	04663400	1	Std. Mount with Hardware 24" Coulter	20	413-10216	1	5/8" x 13-1/2" Hex Bolt - 24" Coulter
4	04663700	1	24" Coulter Assy. less Mount. (incl. #5,8,11)	23	16812084	1	3/4" x 2" NC Sq. Hd. Set Screw
5	04663050	1	24" Coulter Arm Assy.	24	87427182	2	3/4" x 4" x 8" U-Bolt
6	04663300	1	Coulter Arm 24"	25	438-32840	2	7/16" x 2-1/2" Roll Pin
7	04663200	1	Coulter Pivot	26	17620030	1	1-1/4" Machine Bushing 10 Ga.
8	04663140	1	Coulter Shaft 24"	27	17620020	2	1-1/4" Machine Bushing 14 Ga.
9	04663410	1	Standard Mount	28	17411012	2	5/8" Washer x 1/4" Thk.
11	443638A1	1	24" Coulter Blade	29	425-1010	2	5/8" NC Hex Nut
13	24156205	1	Compression Spring - 24" Coulter	30	425-1412	1	3/4" NC Jam Nut
14	20090050	2	Spring Holder Casting	31	425-1012	4	3/4" NC Hex Nut
15	28063331	1	633 Hub & Spindle - 24" Coulter (See page #53)	32	219-86	1	1/8" NPT Grease Zerk
				33	432-1624	1	1/4" x 1-1/2" Cotter Pin



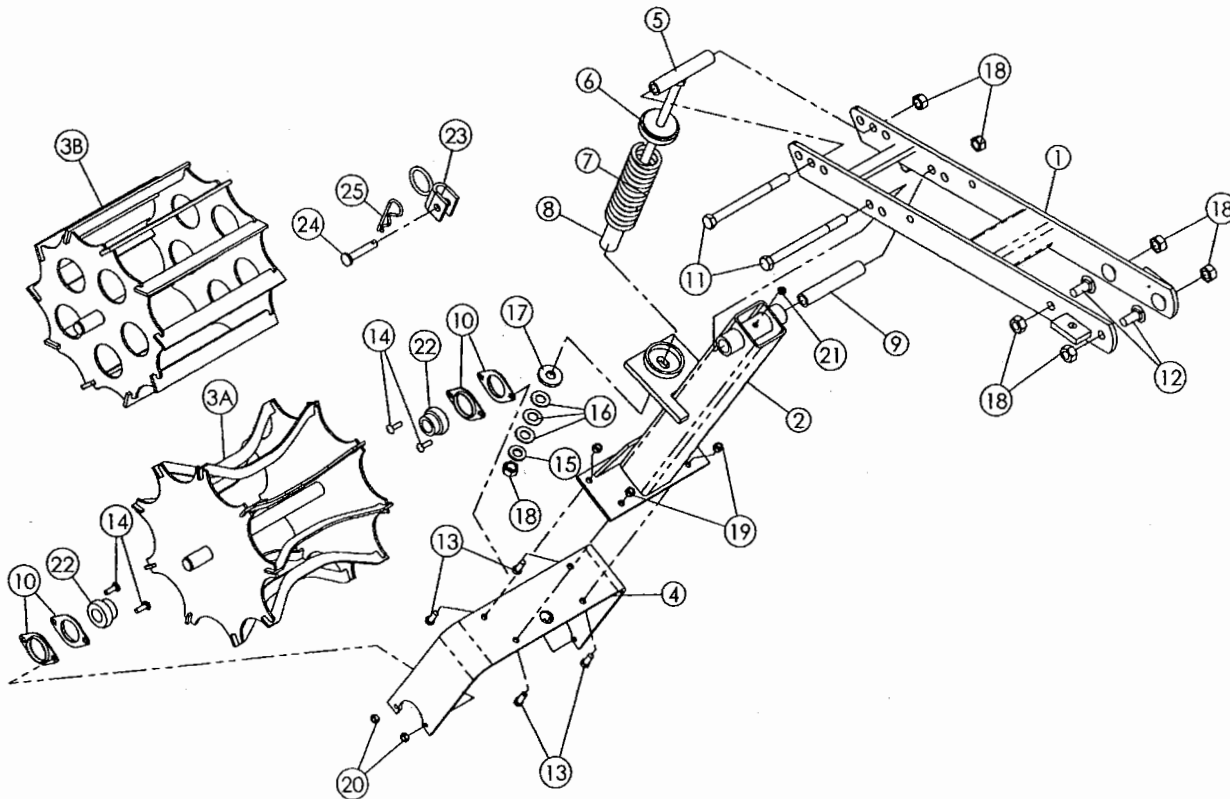
# 18" DISC SEALER (1" X 2" SHANK)



REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
	04693185	1	18" Spring Disc Sealer, Dull, 1" x 2" Shank
	04693175	1	Reverse Spring 18" Disc Sealer, Dull
1	02337230	2	Sealer Arm Assy (Incl #'s 4, 9, 10, 11, 12, 13, 14, 27, & 28)
2	04693145	1	Sealer, H-frame Weldment
3	04693195	1	1" x 2" Sealer Mount
4	02337233	2	Sealer Arm Weld w/Cups
5	04693150	1	T-bolt Weldment
7	44006204	2	Bushing
8	443625A1	2	18" Disc Blade - Dull
9	09103120	2	Disc Spindle Weld
10	21931375	2	1.37" Seal
11	463911R91	4	1.00" Bore Cone (Timken #L44643)
12	572564R1	4	1.980" Cup (Timken #L44610)
13	17412001	2	3/4" I.D. Washer, Heat Treated

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
14	28420021	2	Grease Cap
15	17506020	1	0.656" I.D. Cup Washer
16	24120702	1	Compression Spring
17	413-1064	1	5/8" x 4" NC Hex Bolt, Gd. 5, Z.P.
18	413-1096	1	5/8" x 6" NC Hex Bolt, Gd. 5 Z.P.
19	413-856	3	1/2" x 3-1/2" NC Hex Bolt Gd. 5
20	413-828	4	1/2" x 1-3/4" NC Hex Bolt, Gd. 5
21	433-816	8	1/2" x 1" Carriage Bolt
22	495-21056	2	1/2" Standard Washer
23	17511000	4	11/16" Spring Washer
24	17411012	1	11/16" I.D. x 1-3/4" x .25" Washer
25	86992215	15	1/2" NC Stover Lock Nut
26	86992216	3	5/8" NC Stover Lock Nut
27	425-1312	2	3/4" NF Slotted Hex Nut
28	432-816	2	1/8" x 1" Cotter Pin
29	04693158	1	Tube

# BERM CONDITION'R™ PARTS

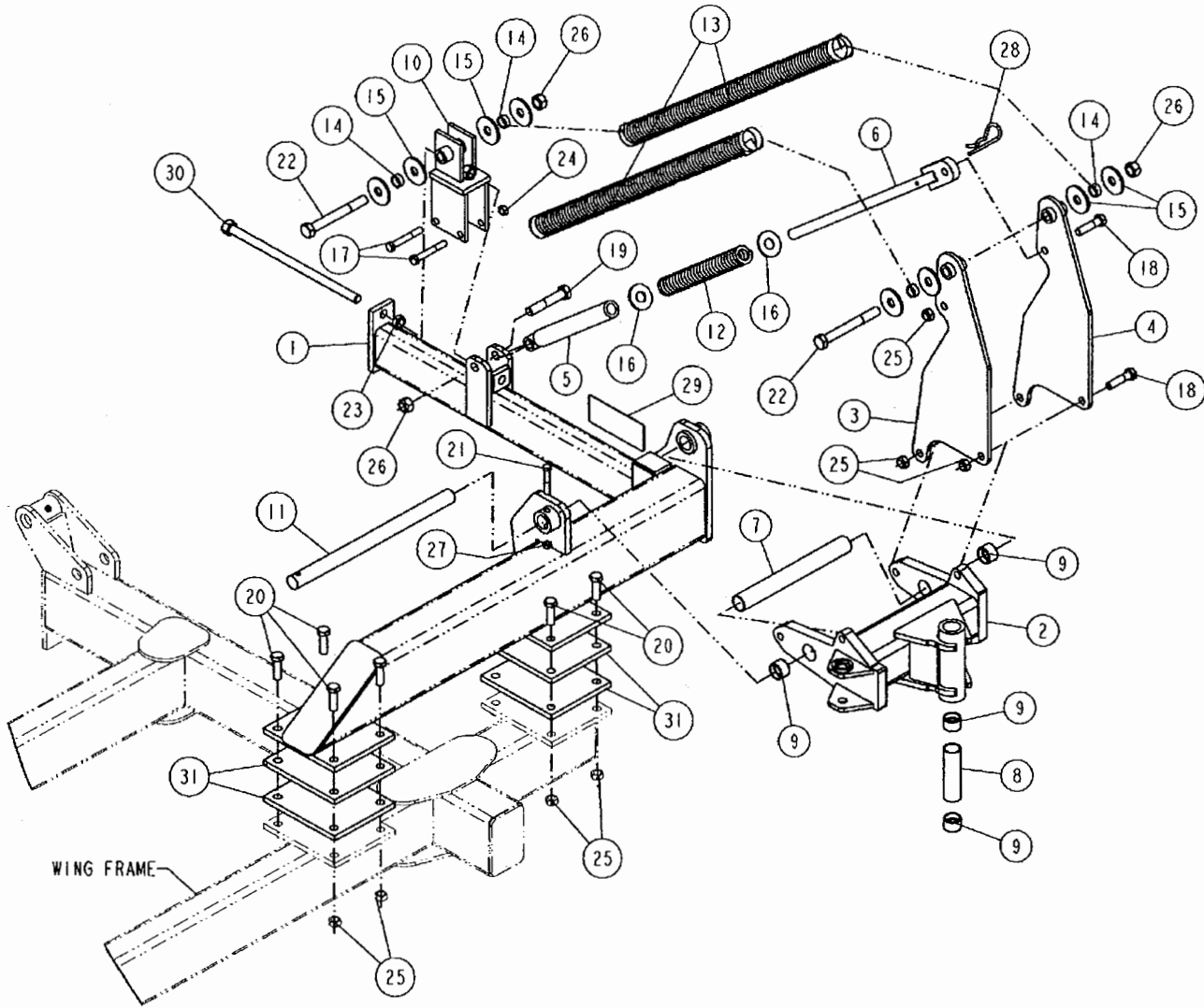


REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	04691580	1	Upper Arm Weldment
2	04691590	1	Lower Arm Weldment
3A	04691565	1	Basket Weldment
3B	87407861	1	Flat Bar Basket Weldment
4	04691555	1	Basket Bracket
5	04691595	1	Pivot Bolt Weldment
6	09666402	1	Washer Weldment
7	24131202	1	Compression Spring
8	09662040	1	Tube
9	04691597	1	Inner Tube
10	21892300	4	Flangette for 1" Flange Bearing
11	326-10120	2	5/8" x 7-1/2" NC Hex Bolt, Gd. 5, ZP
12	433-1024	4	5/8" x 1-1/2" NC Carriage Bolt, Gd. 5, ZP

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
13	413-616	4	3/8" x 1" NC Hex Bolt, Gd. 5, ZP
14	434-516	4	5/16" x 1" NC Carriage Bolt, Gd. 5, ZP
15	17411011	1	5/8" Washer
16	17511000	3	11/16" Spring Washer
17	17411012	1	11/16" I.D. x 1-3/4" O.D. x 1/4" Washer
18	86992216	7	5/8" NC Stover Lock Nut
19	86992213	4	3/8" NC Stover Lock Nut
20	86992212	4	5/16" NC Stover Lock Nut
21	219-86	1	1/8" NPT Self Tapping Grease Zerk
22	21801601	2	Flange Bearing w/Locking Collar
23	04691569	1	Basket Hold-Up Weldment
24	14808201	1	1/2" x 2-1/2" E.L. Clevis Pin
25	NSI	1	1/8" x 2" Hair Pin (14720411)

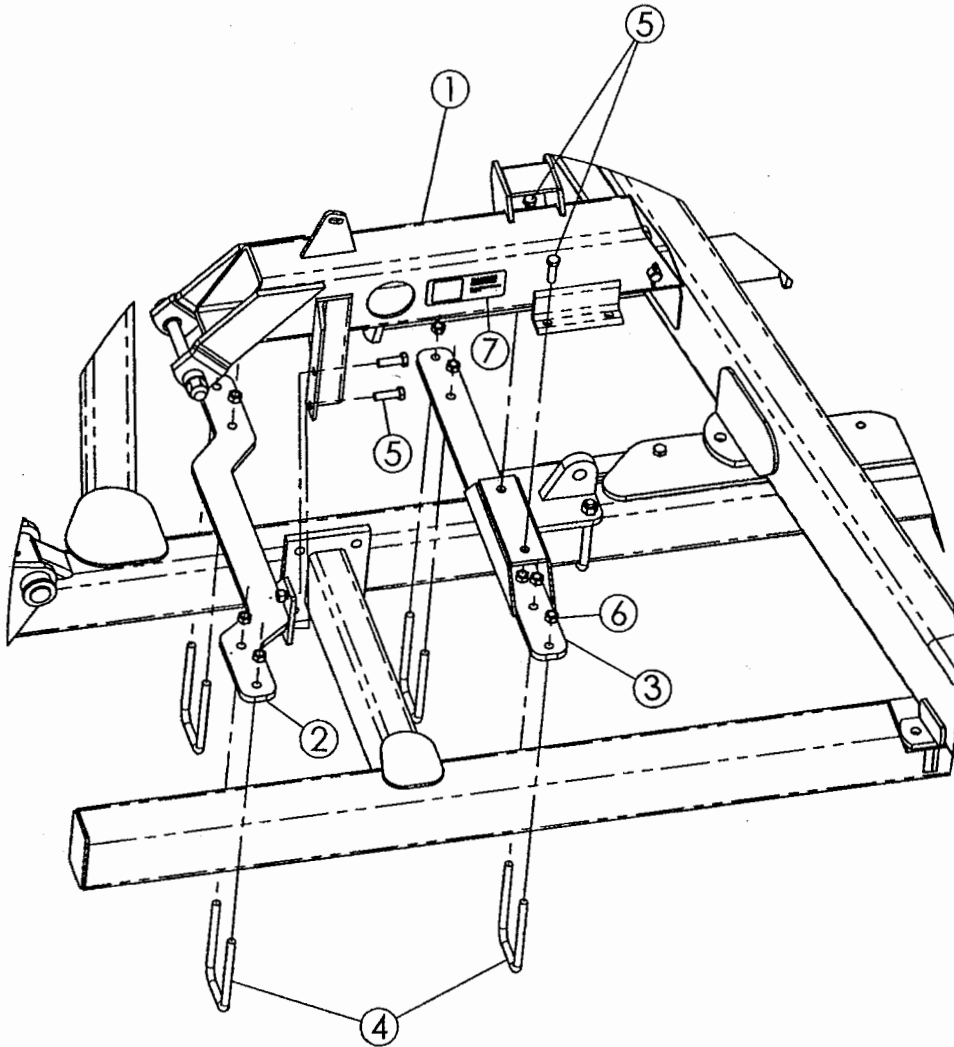
NSI - NOT A SERVICE ITEM

# MARKER MOUNT ASSEMBLY



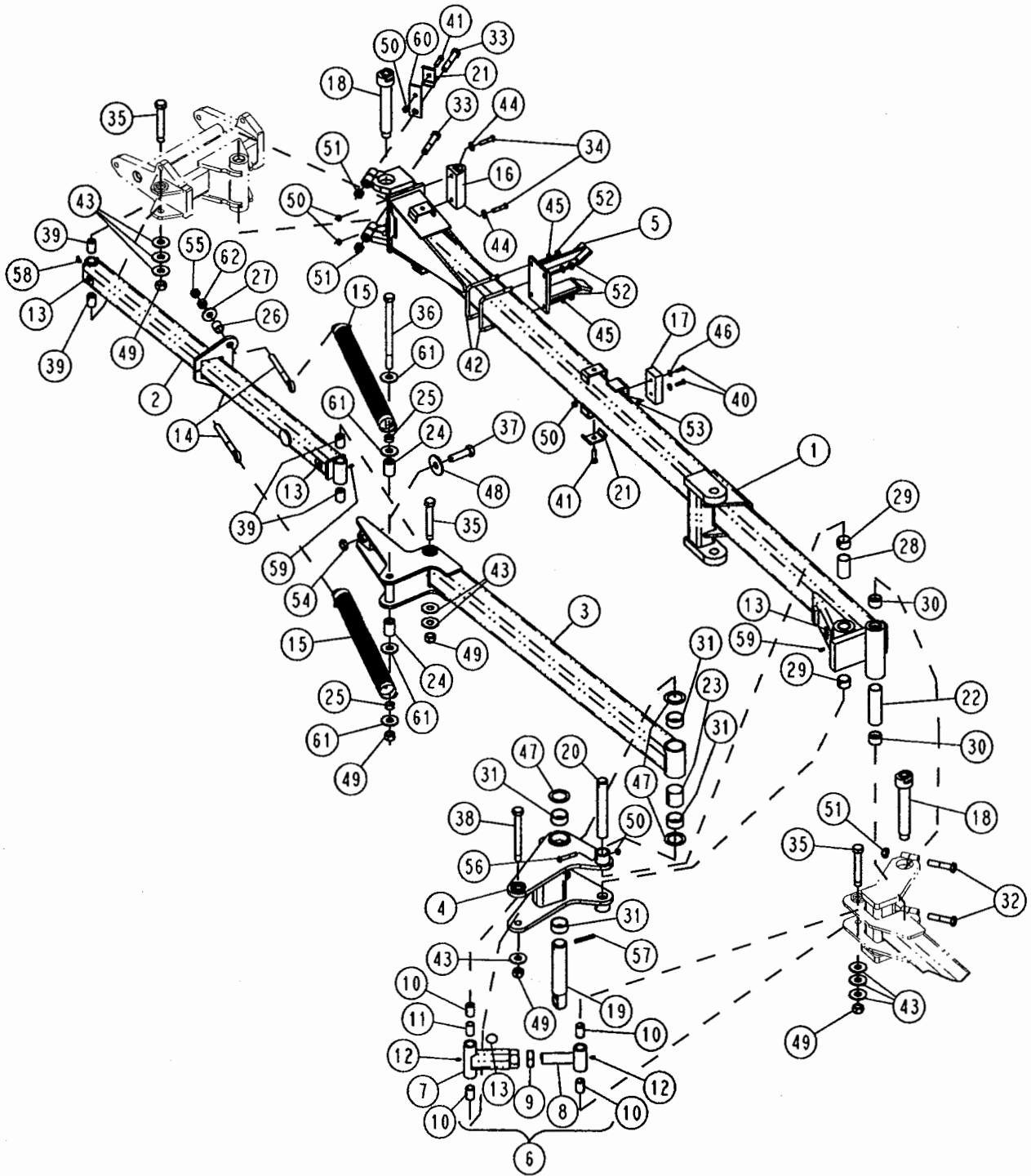
REF. NO.	PART NO.	QTY. NO.	DESCRIPTION	REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	04692090	1	Marker Mount Weldment, LH	16	495-11094	2	.938" x 1.75" x .125" Washer
	04692100	1	Marker Mount Weldment, RH	17	413-856	2	1/2" x 3-1/2" NC Bolt
2	TM-167	1	Knuckle Weldment (Incl. #'s 8 & 9)	18	413-1040	3	5/8" x 2-1/2" NC Bolt
3	TM-180	1	Mount Plate, RH	19	413-1264	1	3/4" x 4" NC Bolt
4	TM-183	1	Mount Plate, LH	20	413-1028	8	5/8" x 1-3/4" NC Bolt <b>(16-Row Units)</b>
5	TM-186	1	Cushion Spring Receiver		413-1044	8	5/8" x 2-3/4" NC Bolt <b>(12-Row Units)</b>
6	TM-187	1	Cushion Spring	21	413-740	1	7/16" x 2-1/2" Bolt
7	TM-132	1	Spacer Tube	22	413-12104	2	3/4" x 6-1/2" NC Bolt
8	NN-361	1	Plastic Spacer	23	425-1412	1	3/4" NC Jam Nut
9	6636	4	1.5" x 1.25" x 1" Garmax Bushing	24	86992215	2	1/2" NC Stover Lock Nut
10	TM-184	1	Spring Adjust Mount	25	86992216	11	5/8" NC Stover Lock Nut
11	TM-113	1	Pivot Pin	26	86992217	3	3/4" NC Stover Lock Nut
12	23343C	1	Compression Spring	27	86992214	1	7/16" NC Stover Lock Nut
13	5627C	2	Extension Spring	28	1978739C1	1	.243" x 4" Hair Pin
14	TM-188	4	Breakaway Spring Spacer	29	18534389	1	Warning Sign, Strike Hazard
15	495-21081	8	.821" x 2" x .15" Washer	30	TM-158	1	3/4" x 5" Welded Bolt
				31	09661945	4	Spacer Plate <b>(12-Row Units Only)</b>

# MARKER MOUNT ASSEMBLY (8 Row Units Only)



REF. NO.	PART NO.	QTY. NO.	DESCRIPTION	REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	09667410	1	Marker Mount Weldment, Right Hand	4	87427170	8	5/8" x 4" x 8" U-bolt
	09667510	1	Marker Mount Weldment, Left Hand	5	413-1032	8	1/2" x 3-1/2" NC Bolt
2	04692015	2	Marker Mount	6	86992216	24	5/8" Stover Lock Nut
3	04692010	2	Marker Mount	7	18534285	2	Danger Sign

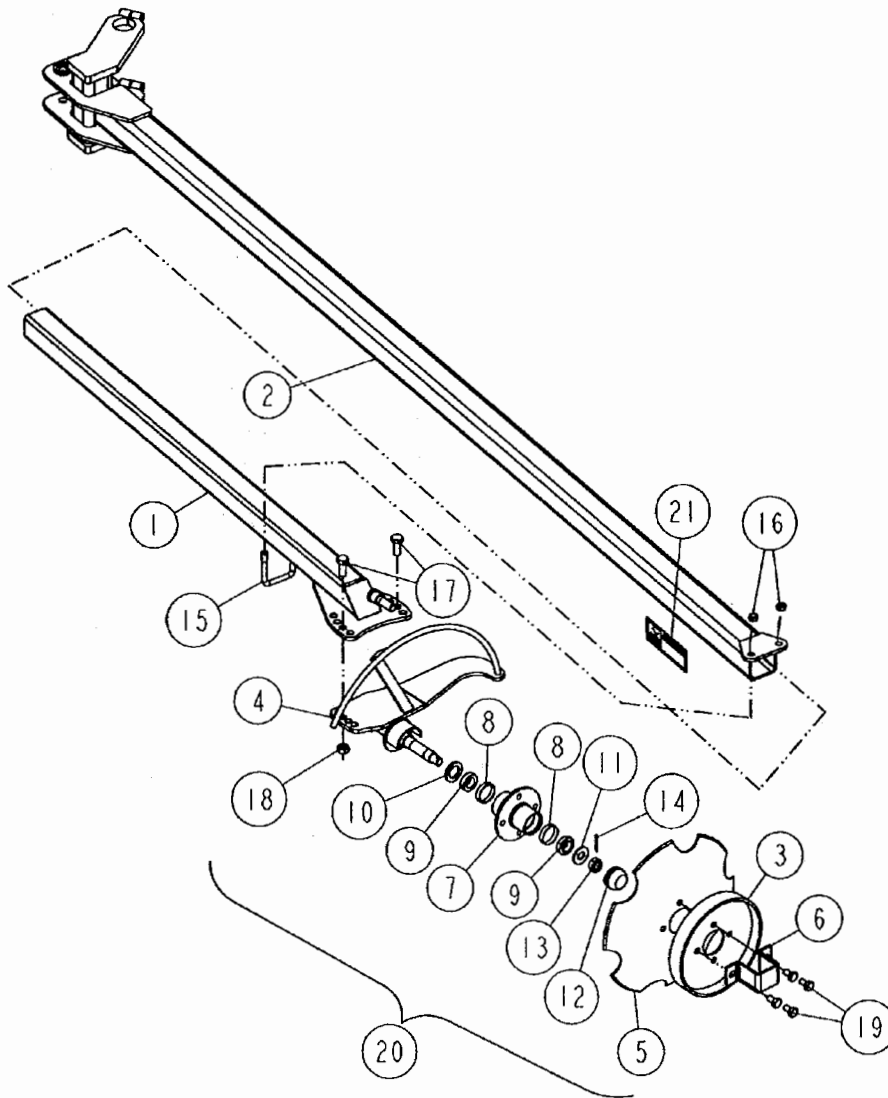
# MARKER - ARM LINKAGES



# MARKER - ARM LINKAGES (CONTINUED)

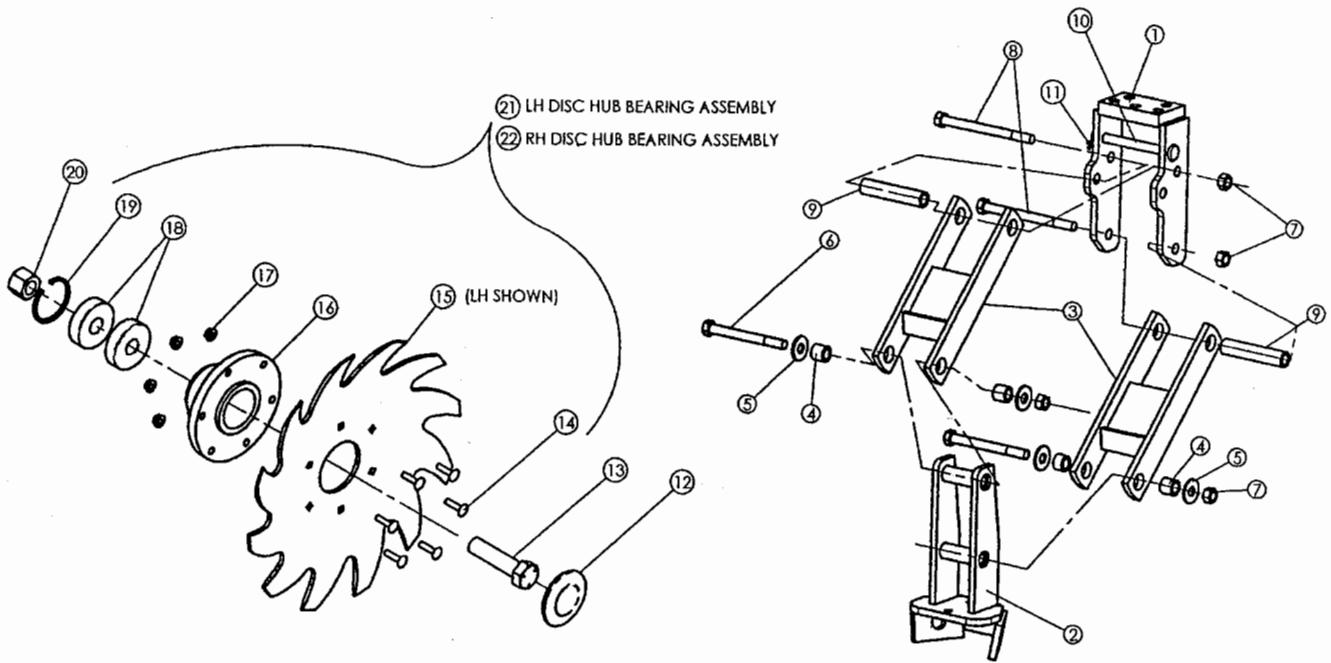
REF. NO.	PART NO.	QTY. NO.	DESCRIPTION	REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	TM-100V2	1	Main Boom Weldment (16-Row) (Incl. #13, 22, 26, 29, 30, & 59)	26	TM-118	2	Spacer (12-Row Only)
	TM-120V3	1	Main Boom Weldment (12-Row) (Incl. #13, 22, 26, 29, 30, & 59)	27	1567	2	5/8" I.D. Washer (12-Row Only)
				28	TM-115	1	Spacer Tube
				29	5224	2	1.5" x 1.25" x 1" Tension Bushing
2	TM-210	1	Inner Breakaway Weldment (16-Row) (Incl. #13, 39, 58, & 59)	30	6636	2	1.5" x 1.25" x 1" Garmax Bushing
	TM-197	1	Inner Breakaway Weldment (12-Row) (Incl. #13, 39, 58, & 59)	31	6637	4	2" x 1.75" x 1" Garmax Bushing
				32	413-1048	2	5/8" x 3" NC Hex Bolt
				33	413-1056	2	5/8" x 3-1/2" NC Hex Bolt
3	TM-209	1	Outer Breakaway Weldment (16-Row) (Incl. #23 & 31)	34	413-628	2	3/8" x 1-3/4" NC Hex Bolt
	TM-213	1	Outer Breakaway Weldment (12-Row) (Incl. #23 & 31)	35	413-1280	3	3/4" x 5" NC Hex Bolt
				36	413-12160	1	3/4" x 10" NC Hex Bolt (16-Row)
					413-12128	1	3/4" x 8" NC Hex Bolt (12-Row)
4	TM-182	1	Link Lug Weldment (Incl. #31)	37	413-1244	1	3/4" x 2-3/4" NC Hex Bolt
5	TM-192	1	Cradle Weld, Outer Boom (16-Row Only)	38	23582	1	3/4" x 6-3/4" NC Hex Bolt
6	TM-151A	1	Lever Link Weldment (Incl. #7-13)	39	3929	4	1" x .75" x 1.5" Tension Bushing
7	TM-151	1	Lever Link, Female End	40	413-416	2	1/4" x 1" NC Hex Bolt
8	TM-147	1	Lever Link, Male End	41	413-624	3	3/8" x 1-1/2" NC Hex Bolt (16-Row)
9	425-1420	1	1-1/4" NC Jam Nut		413-624	2	3/8" x 1-1/2" NC Hex Bolt (12-Row)
10	3929	4	1" x .75" x 1.5" Tension Bushing	42	8598	2	7/16" x 4.125" x 4.25" U-bolt (16-Row Only)
11	SQ-803	1	Spacer Bushing	43	2906	10	.813" I.D. Washer
12	219-87	2	1/4-28 Straight, Self-Tapping Grease Zerk	44	1563	2	.438" I.D. x 1" Washer
13	6566	4	"Grease 50 Hours" Decal	45	1552	4	7/16" I.D. Lock Washer (16-Row Only)
14	4269	2	5/8" x 7-3/8" Eyebolt	46	1561	2	5/16" I.D. Washer
15	23198C	2	Extension Spring (16-Row)	47	1757	2	1.75" I.D. Mach. Bushing 14 Ga.
	6714C	2	Extension Spring (12-Row)	48	6631	1	.781" x 2.5" x .188" Washer
16	23264	1	Rubber Bumper Pad	49	86992217	5	3/4" NC Stover Lock Nut
17	CA-250	1	Stop Pad (16-Row Only)	50	86992213	6	3/8" NC Stover Lock Nut (16-Row)
18	DR-753	2	Offset Pin		86992213	5	3/8" NC Stover Lock Nut (12-Row)
19	TM-181	1	Cylinder Mount Pivot Pin	51	86992216	4	5/8" NC Stover Lock Nut
20	TM-111	1	Pivot Link Pin	52	86992214	4	7/16" NC Stover Lock Nut (16-Row Only)
21	CC-105	3	Hose Clamp (16-Row)	53	86992211	2	1/4" NC Stover Lock Nut (16-Row Only)
	CC-105	2	Hose Clamp (12-Row)	54	425-1412	1	3/4" NC Jam Nut
22	NN-361	1	Plastic Spacer	55	425-1410	2	5/8" NC Jam Nut
23	DR-872	1	Spacer Tube	56	413-636	1	3/8" x 2-1/4" NC Hex Bolt
24	TM-154	2	Spacer (16-Row)	57	438-32440	1	3/8" x 2-1/2" Roll Pin
	TM-118	2	Spacer (12-Row)	58	219-93	1	1/4-28 90 Deg, Self-Tapping Grease Zerk
25	TM-142	2	Pipe Bushing	59	219-87	2	1/4-28 Straight, Self-Tapping Grease Zerk
				60	RC-515	1	Hydraulic Support Tab
				61	2906	4	.813" I.D. Washer (16-Row)
					4221	4	.813" I.D. x 1.5" O.D. Washer (12-Row)
				62	425-1010	2	5/8" NC Hex Nut, Gd. 5

# MARKER - HUB ASSEMBLY



REF. NO.	PART NO.	QTY. NO.	DESCRIPTION	REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	TM-163V2	1	Extension Arm Weldment	11	1586	1	Spindle Washer, H211 Hub
2	TM-101	1	Swing Boom Weldment (16-Row)	12	23428	1	Hub Cap, H211 Hub
	TM-121	1	Swing Boom Weldment (12-Row)	13	1589	1	3/4" NF Slotted Hex Nut, Spindle
3	09662450	1	Marker Blade Shield Weldment	14	2039	1	5/32" x 1-1/4" Cotter Pin
4	TM-206	1	Disk Protector Weldment, LH (Incl. #11 & 13)	15	2913	1	1/2" x 2-1/2" x 3-1/2" U-bolt
	TM-207	1	Disk Protector Weldment, RH (Incl. #11 & 13)	16	86992215	2	1/2" NC Stover Lock Nut
5	9520	1	Disk Blade, 16" Dia. Notched	17	413-1028	2	5/8" x 1-3/4" NC Hex Bolt
6	TM-916	1	Hub Cap Protector	18	86992216	2	5/8" NC Stover Lock Nut
7	23515	1	H211 Disk Hub with Cups (Incl. #8)	19	414-820	4	1/2" x 1-1/4" NF Wheel Bolt
8	1581	2	Cup, H211 Hub	20	TM-206A	1	Disk Protector Assy, LH (Incl. #4-14)
9	1582	2	Cone, H211 Hub		TM-207A	1	Disk Protector Assy, RH (Incl. #4-14)
10	1583	1	Seal, H211 Hub	21	18534389	1	Warning Sign, "Strike Hazard"
					6211		Hub Bearing Kit Complete H211

# ROW CLEANER PARTS

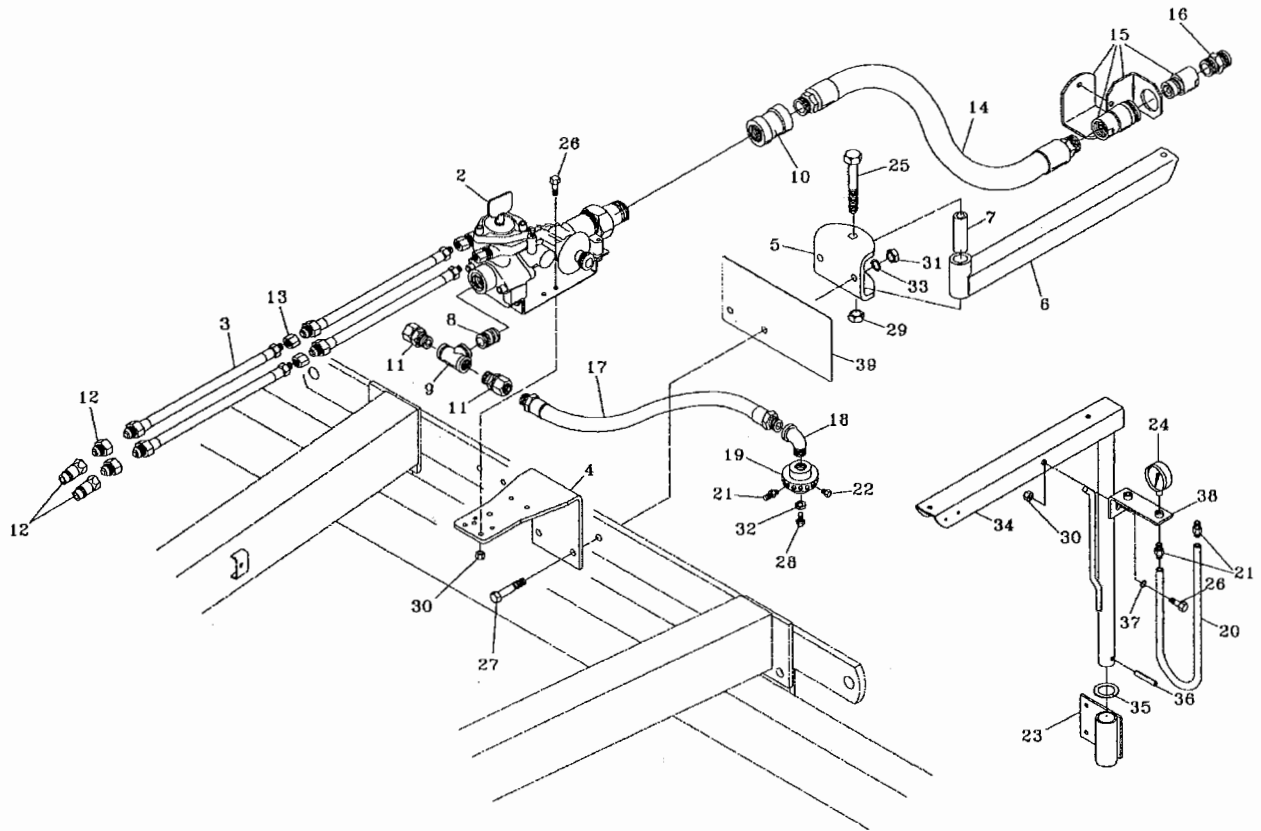


REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	04694070	1	Mount Weldment
2	04694062	1	Blade Mount
3	04694063	2	Link Weldment
4	04694059	4	Bushing
5	495-21056	4	1/2" Std. Flat Washer
6	413-880	2	1/2" x 5" NC Hex Bolt
7	86992215	4	1/2" NC Stover Lock Nut
8	413-888	2	1/2" x 5-1/2" NC Hex Bolt
9	04694043	2	Tube
10	14808400	1	1/2" x 5" E.L. Pin
11	NSI	2	1/8" x 2" Hair Pin (14720411)
12	87413883	2	Hub Cap

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
13	413-1248	2	3/4" x 3" NC Hex Bolt
14	86508769	4	1/4" x 1" NC Carriage Bolt
15	87413884	1	Disc Blade, L.H.
	87413885	1	Disc Blade, R.H.
16	87413886	2	Row Cleaner Hub
17	231-5344	12	1/4" Flange Nut
18	87413887	4	2" x .75" Bearing (Fafnir 205KPR2)
19	87413888	2	2" Internal Snap Ring
20	429-1012	2	3/4" NC Hex Nut
21	87413889	1	Disc Hub Bearing Assy. L.H. (Incl. Item #s 14, 15(L), 16, 17, 18, & 19)
22	87413890	1	Disc Hub Bearing Assy. R.H. (Incl. Item #s 14, 15(R), 16, 17, 18, & 19)

NSI - NOT A SERVICE ITEM

# B-9500 REGULATOR ASSEMBLY

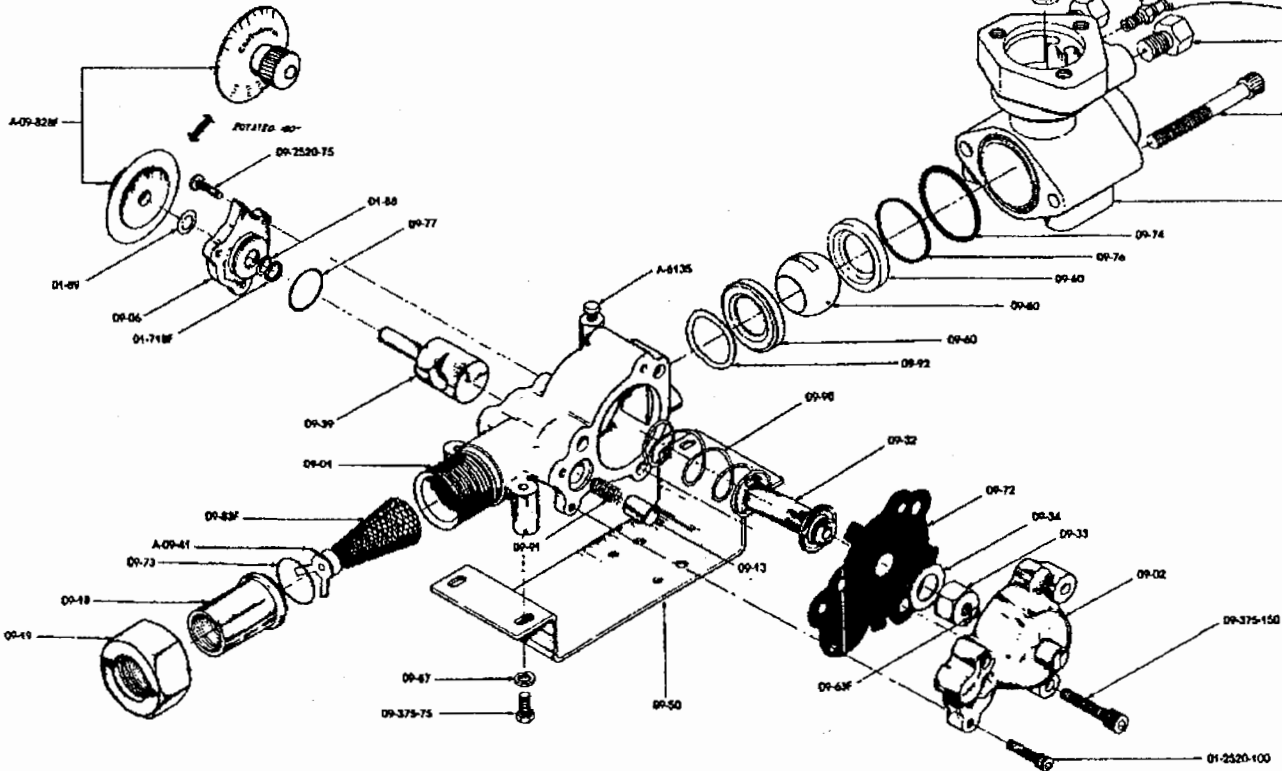
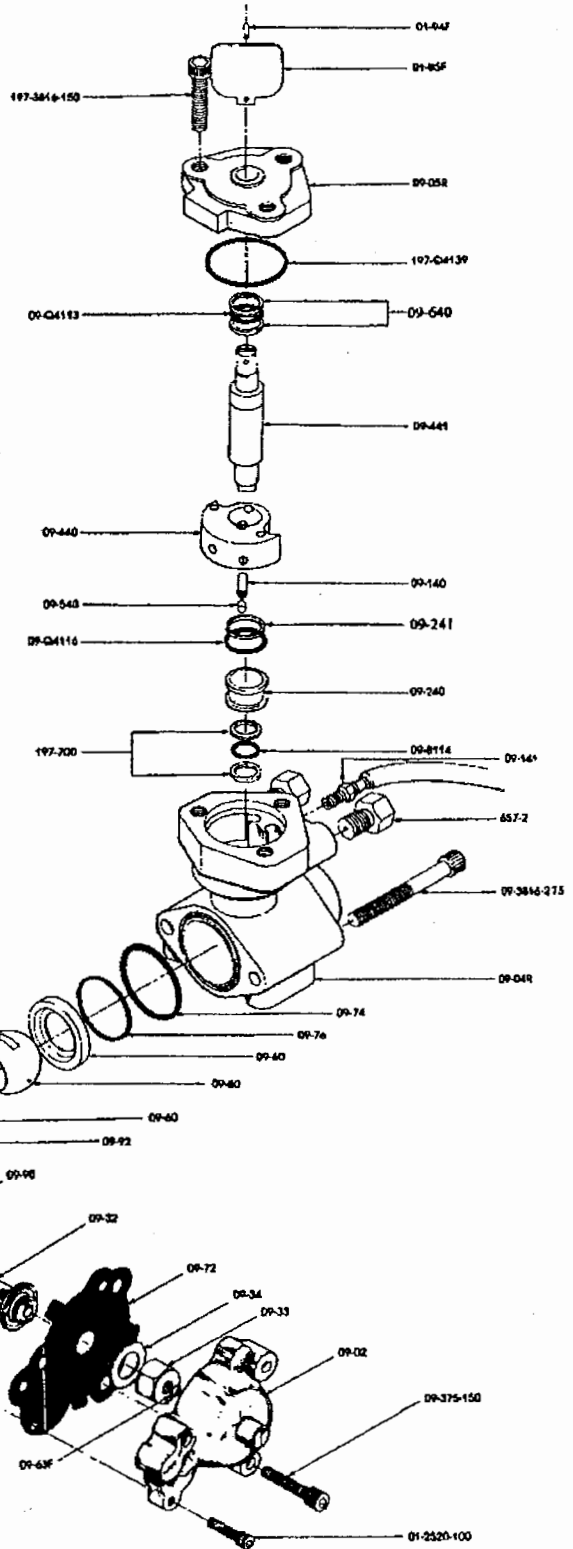


REF. NO.	PART NO.	QTY. NO.	DESCRIPTION	REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	P1466079	1	B9500 Regulator w/Hoses	21	15040251	A/R	1/4" NPT x 3/8" Hose Barb
2	34107100	1	B9500 Regulator	21	15040252	A/R	1/4" NPT x 1/2" Hose Barb
3	25600412	4	1/4"Hydraulic Hose x 144" Long	22	15020250	A/R	1/4" NPT Plug
4	04660310	1	Regulator Stand	22	15020120	A/R	1/8" Pipe Plug
5	04660320	1	Bracket	23	09983458	1	Hose Stand Mount Weldment
6	04660330	1	Extension Pivot Mount	24	34599060	1	Dial Gauge - 60 p.s.i.
7	04660340	1	Pivot Tube	25	413-1296	1	3/4" x 6" NC Hex Bolt Gd. 5
8	15011000	1	1" NPT x 1-1/2" Lg. Nipple	26	413-616	3	3/8" x 1" NC Hex Bolt
9	15051001	1	1" Pipe Tee Blk. Mal.	27	413-1040	2	5/8" x 2-1/2" NC Hex Bolt Gd. 5
10	15071251	1	1-1/4" NPT Coupling	28	NSI	2	1/2" x 3/4" NC Hex Bolt (16008031)
11	15081006	2	1" Swivel Pipe Coupling	29	86992217	1	3/4" NC Stover Lock Nut
12	217-1109	2	1/4" NPTF x 1/2" NPTM Adapter	30	425-106	3	3/8" NC Hex Nut
13	217-1101	2	1/4" NPT Coupling	31	425-1010	2	5/8" NC Hex Nut
14	25675320	1	1-1/4" A.A. Hose x 32"	32	492-11050	2	1/2" Lock Washer
15	02600040	1	1-1/4" Quick Coupler Assembly	33	492-11062	2	5/8" Lock Washer
16	34314100	1	1-3/4" ACME x 1-1/4" NPTM Adapter	34	05302150	1	Hose Stand
17	25674955	2	1" A.A. Hose x 126" Long	35	17624021	1	1-1/2" Machine Bushing
18	15001002	2	1" NPT 90° Street Elbow	36	438-32840	1	7/16" x 2-1/2" Roll Pin
19	34199024	2	Continental Manifold, 14 Outlet	37	495-21044	1	3/8" Standard Washer
20	25630601	A/R	3/8" I.D. x 166' Long A.A. Hose	38	04681830	1	Gauge Bracket
	25630801	A/R	1/2" I.D. x 166' Long A.A. Hose	39	04681850	1	Decal Plate with Danger Sign
				40	18534368	1	Danger Sign (Not Shown)
				41	25705041	2	Male ISO-3/4 SAEF Hydraulic Coupling

NSI - NOT A SERVICE ITEM  
A/R - AS REQUIRED

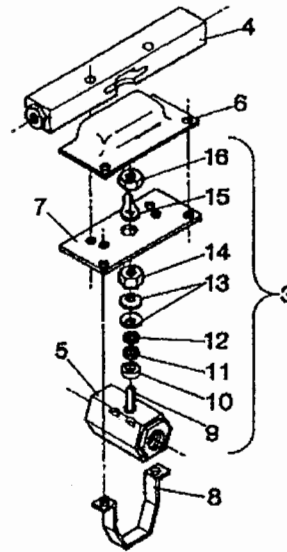
# B-9500 REGULATOR

PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
01-37	DIAL BASE	01-85F	INDICATOR FLAG
01-38	DIAL KNOB	**01-64F	FLAG LOCK PIN
*01-71BF	CAP SEAL	09-04R	ROTOR SHUT OFF BODY
01-88	RETAINER WASHER	09-05F	ROTOR SHUT OFF BONNET
*01-89	DIAL TENSION WASHER	09-440	ROTOR
*01-72BF	DIAL LOCK PIN	09-441	SHUT OFF PINION
01-832-23	DIAL SET SCREW	09-140	ROTOR SHAFT PIN
01-2520-100	CAP SCREW	09-241	LOWER SHAFT SEAL BACK UP RING
09-01	METER BODY	09-240	SHAFT SEAL GLIAND
09-02	METER BONNET	**09-60	BALL VALVE SEAL (2)
09-06	METER BARREL BONNET	09-540	WEAR PAD (FOR ROTOR PIN)
09-13	SLAVE VALVE	**09-74	BODY O' RING
09-18	HALE UNION	**09-76	O' RING SEAL: SHUT OFF BODY
09-19	UNION NUT	09-640	SEAL BACK UP WASHER (9/16" ID) (2)
09-32	THROTTLE STEM	197-700	SEAL BACK UP WASHER (2)
09-33	THROTTLE LOCK NUT	09-80	SHUT OFF BALL
09-34	DIAPHRAGM PLATE	09-02	BALL VALVE TENSION WASHER
09-39	METER BARREL	09-3816-275	SHUT OFF BODY CAP SCREW (2)
A-09-41	FILTER PULL ASSY	**09-04113	UPPER SHAFT SEAL
09-50	METER BRACKET	**09-04116	LOWER SHAFT SEAL
*09-63F	THROTTLE STEM GUIDE	**09-8115	CAP SEAL
*09-77	DIAPHRAGM	197-3816-150	BONNET SCREW
*09-77	UNION O' RING	**197-04139	BONNET QUAD RING
*09-77	DIAL BONNET O' RING SEAL	657-2	CYLINDER ORIFICE ADAPTOR
09-82BF	DIAL ONLY	09-17	DRAIN HOSE CONNECTOR
A-09-82BF	DIAL ASSY	B-9500-B5	REPAIR KIT (FOR METER ONLY)
09-83F	STRAINER SCREEN		(ITEMS MARKED *)
09-87	3/8" LOCK WASHER (4)	09-141	DRAIN HOSE CONNECTOR
09-90	METER SPRING	B-9500-RX	REPAIR KIT (ACTUATOR ONLY)
09-91	SLAVE VALVE SPRING		(ITEMS MARKED **)
09-375-75	BRACKET BOLT (4)		
09-375-150	METER BONNET CAP SCREW (3)		
09-2520-75	BONNET CAP SCREW (6)		



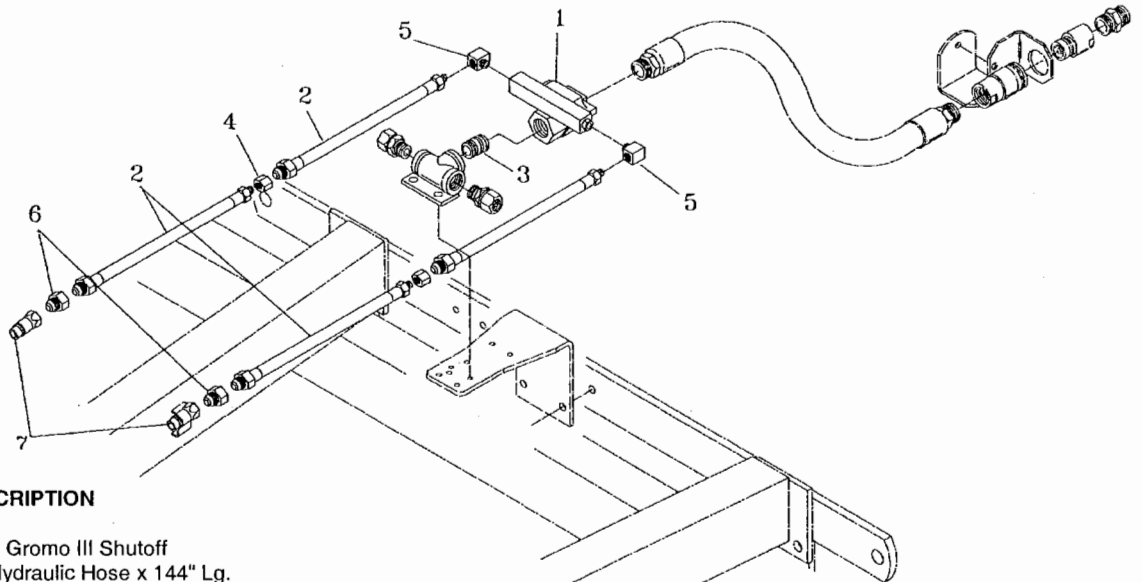
# 1-1/4 GROMO III SHUT-OFF

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	34210300	1	1-1/4" Gromo III Shut-off (incl. #4-#16)
2	34210301	1	Seal Kit
3	34210302	1	Stem Kit (incl. #9-#16)
4	NSI	1	Actuator Assembly
5	NSI	1	Ball Valve Assembly
6	NSI	1	Cover
7	NSI	1	Mounting Plate
8	NSI	1	Strap
9	NSI	1	Stem
10	NSI	1	Thrust Washer
11	NSI	1	Top Washer
12	NSI	1	Follower Washer
13	NSI	2	Belleville Washer
14	NSI	1	Stem Nut
15	NSI	1	Cam Arm
16	NSI	1	Jam Nut



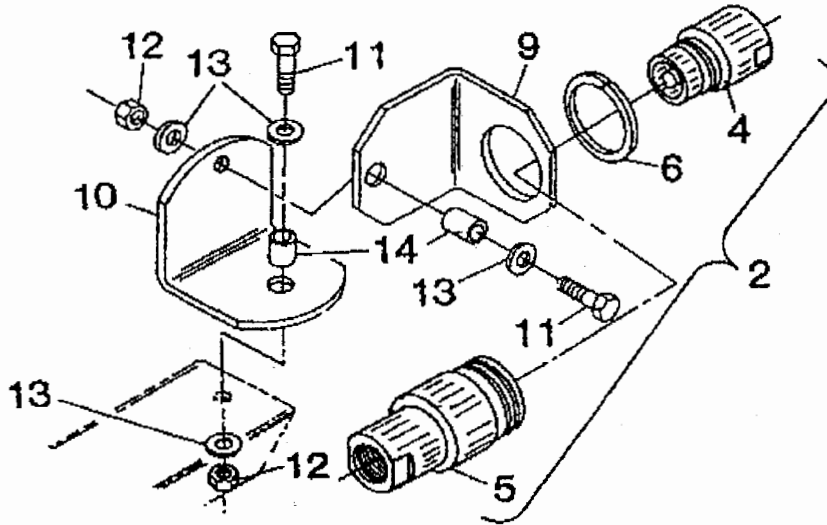
NSI - NOT A SERVICE ITEM

# 1-1/4" GROMO III TO TRACTOR



REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	34210300	1	1-1/4" Gromo III Shutoff
2	25600412	4	1/4" Hydraulic Hose x 144" Lg.
3	15011251	1	1-1/4" x 3" Lg. Nipple
4	217-1101	2	1/4" NPT Coupling
5	217-1028	2	1/8" NPTM x 1/4" NPTF Elbow
6	217-1109	2	1/4" NPTF x 1/2" NPTM Adapter
7	25705041	2	Male ISO-3/4 SAEF Hydraulic Coupling

# 1-1/4" QUICK COUPLER

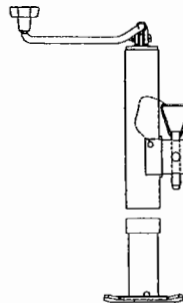


REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
2	02600040	1	1-1/4" Quick Coupler Assembly w/Bracket (incl. #4,5,6,9-14)
4	34410032	1	1-1/4" Quick Coupler - Male
5	34410033	1	1-1/4" Quick Coupler - Female
6	103-11250	1	Retaining Ring
7	34410034	1	Gasket Kit (consists of (2) O-Rings)
9	02628012	1	Upper Swivel Bracket (Incl. 11-14)
10	02138100	1	Lower Swivel Bracket w/Bushing
11	413-824	2	1/2" x 1-1/2" NC Capscrew
12	231-4248	2	1/2" NC Hex Lock Nut
13	495-21056	4	1/2" Std. Washer
14	02138110	2	Pipe

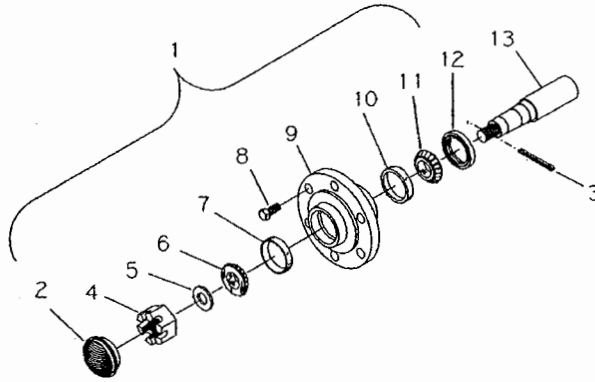
NSI - NOT A SERVICE ITEM

# JACK ASSEMBLY

REF. NO.	PART NO.	QTY. NO.	DESCRIPTION
1	87416370	1	5 - 7K Jack Assembly



NOTE: CHECK HUB NO. BEFORE ORDERING PARTS  
 IMPORTANT: TORQUE 1/2" WHEEL BOLTS  
 TO 100 FT.-LBS.



## 633 HUB & SPINDLE

REF. NO.	PART NO.	NO. REQ.	DESCRIPTION
	28063331	1	Hub & Spindle Assy. (4-1/2")
1	28163311	1	633 4-Bolt Hub Assy.
2	28463300	1	Hub Cap
3	432-1024	1	5/32" x 1-1/2" Cotter Pin
4	425-1312	1	3/4" NF Slotted Nut
5	495-11081	1	3/4" SAE Washer
6	651815R91	1	.75" Bore Cone - Timken #LM11949
7	651814R1	1	1.78" O.D. Cup - Timken #LM11910
8	414-820	4	1/2" x 1-1/4" NF Flat Head Bolt
9	NSI	1	633 Hub (28263340)
10	651817R1	1	2.33" O.D. Cup - Timken #LM67010
11	651818R91	1	1.25" Bore Cone - Timken #LM67048
12	126621C1	1	1.50" I.D. x 2.33" O.D. Seal - CR #14975
13	NSI	1	Spindle (28363331)

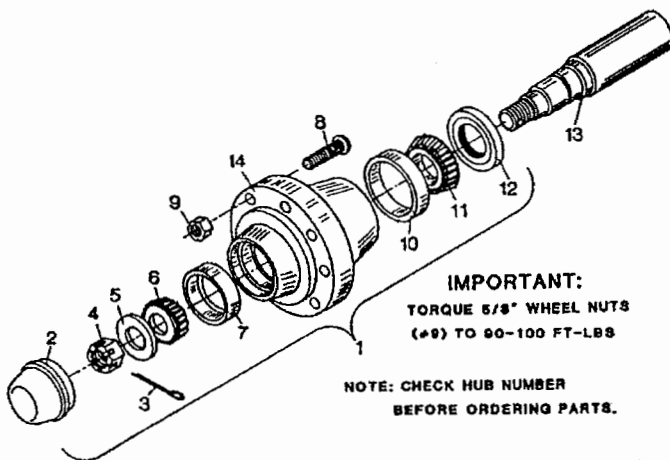
NSI NOT A SERVICE ITEM

## 783 HUB & SPINDLE

REF. NO.	PART NO.	NO. REQ.	DESCRIPTION
	28078372	1	Hub and 2" Spindle Assembly
	28078361	1	Hub and 2-1/2" Spindle Assembly
1	28178300	1	783 6-Bolt Hub Assembly
2	28477700	1	Hub Cap
3	432-1024	1	5/32" x 1-1/2" Cotter Pin
4	425-1314	1	7/8" NF Slotted Nut
5	495-61094	1	7/8" Washer 2" O.D.
6	651818R91	1	1.25 Bore Cone - Timken #LM67048
7	651817R1	1	2.33" O.D. Cup - Timken #LM67010
8	549962R1	6	1/2" NF x 1-15/32" Lug Bolt
9	NSI	1	Hub w/Cups (28278300)
10	663558R1	1	2.89" O.D. Cup - Timken #LM501310
11	663557R91	1	1.625" Bore Cone - Timken #LM501349
12	145769C91	1	1.875" I.D. x 3.005" O.D. Seal - CR #18823
13	28378371	1	2" Spindle
	28378361	1	2-1/2" Spindle

NSI - NOT A SERVICE ITEM

## 50-8 HUB & SPINDLE

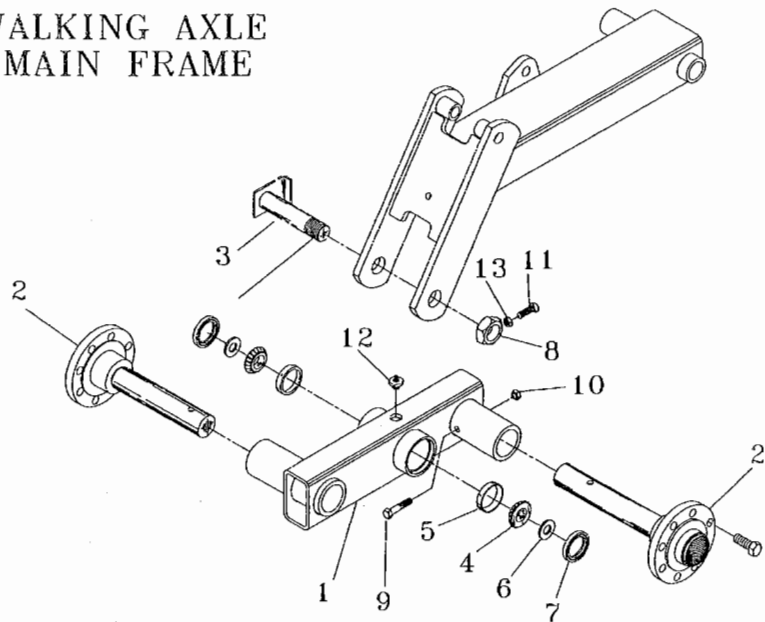


REF. NO.	PART NO.	NO. REQ.	DESCRIPTION
	28050885	1	50-8 Hub and Spindle Assembly
1	28150800	1	50-8 8-Bolt Hub Assembly
2	28460800	1	Hub Cap
3	432-1232	1	3/16" x 2" Cotter Pin
4	425-1316	1	1" NF Slotted Nut
5	95-11106	1	1" SAE Washer
6	663557R91	1	1.62" Bore Cone - Timken #LM501349
7	663558R1	1	2.89" O.D. Cup - Timken #LM501310
8	16410087	8	5/8" NF x 2-1/4" Wheel Bolt
9	554480R1	8	5/8" NF Wheel Nut
10	376463C1	1	3.22" O.D. Cup - Timken #JLM104910
11	21872005	1	2.00" O.D. Bore Cone - Timken #LM104948
12	21932502	1	2.50" I.D. x 3.25" O.D. Seal - CR #24909
13	28350805	1	Spindle

# nutri-till'r 5310 MAIN FRAME WALKING AXLE ASSEMBLY

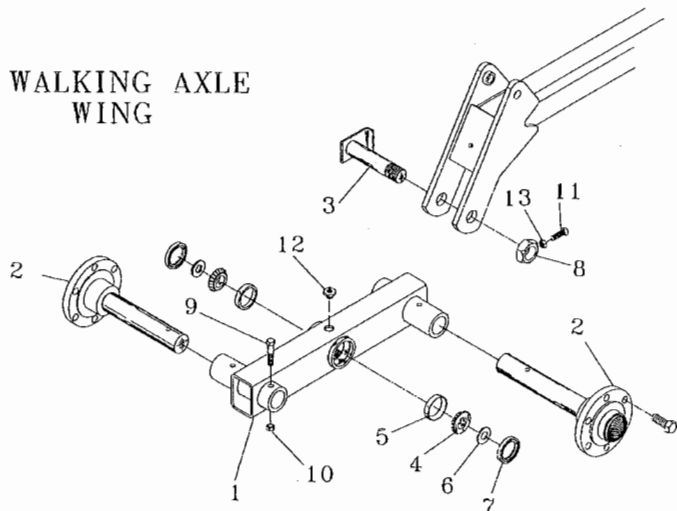
REF. NO.	PART NO.	NO. REQ.	DESCRIPTION
1	04683045	1	Walking Axle Weld RH
	04683145	1	Walking Axle Weld LH
2	28050885	2	50-8 Hub and Spindle Assembly
3	04683050	1	Axle Pin
4	21871501	2	1.50" Bore Cone - Timken #2776
5	17498D	2	3.00" O.D. Cup - Timken #2720
6	06400573	2	Spacer
7	21932510	2	3.148" Bore Seal - CR #22870
8	14032409	1	1-1/2" Special Jam Nut
9	413-864	2	1/2" x 4" NC Hex Bolt Gd. 5
10	231-4248	2	1/2" NC Hex Lock Nut
11	16806045	1	3/8" X 1" Square Head Set Screw
12	219-86	1	1/8" NPT Self Tap Zerk
13	425-146	1	3/8" NC Hex Jam Nut

## WALKING AXLE MAIN FRAME



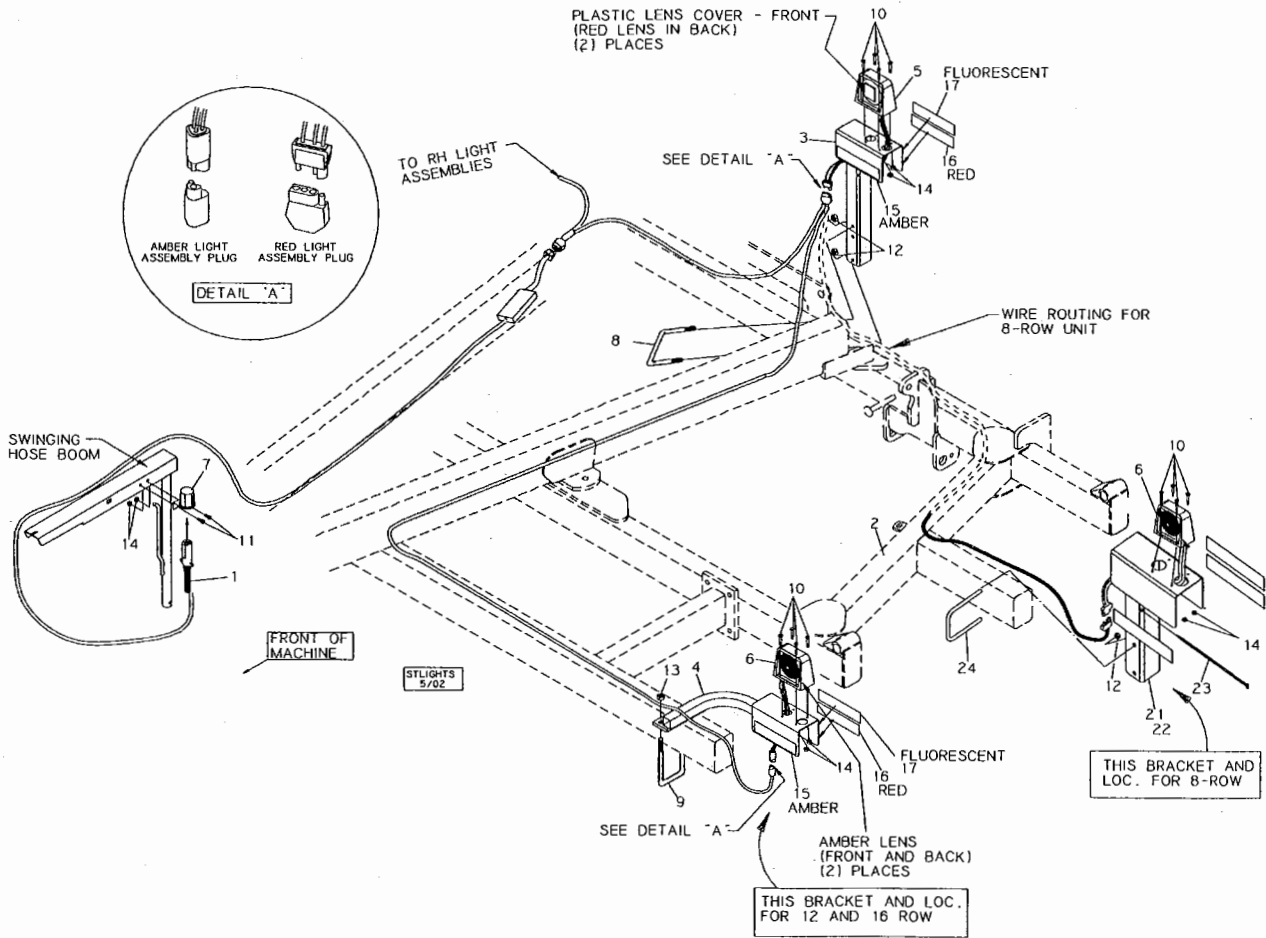
# nutri-till'r 5310 WING WALKING AXLE ASSEMBLY

## WALKING AXLE WING



REF. NO.	PART NO.	NO. REQ.	DESCRIPTION
1	04683245	1	Walking Axle Weld RH
	04683345	1	Walking Axle Weld LH
2	28078372	2	783 Hub & 2" Spindle Assembly
3	04661850	1	Axle Pin
4	160558C91	2	1.50" Bore Cone - Timken #LM29749
5	478793R1	2	2.56" O.D. Cup - Timken #LM29710
6	06201425	2	Spacer
7	21932090	2	2.094" Bore Seal - CR #20952
8	14032409	1	1-1/2" Special Jam Nut
9	424-852	2	1/2" x 3-1/4" NC Hex Bolt
10	231-4248	2	1/2" NC Hex Lock Nut
11	16806045	1	3/8" X 1" Square Head Set Screw
12	219-86	1	1/8" NPT Self Tap Zerk
13	425-146	1	3/8" NC Hex Jam Nut

# WARNING AND TAILLIGHT KIT



REF. NO.	PART NO.	QTY	DESCRIPTION	REF. NO.	PART NO.	QTY	DESCRIPTION
1	27602311	1	Front Wiring Harness	11	413-412	2	1/4" x 3/4" NC Hex Bolt, Gd. 5, ZP
2	27602234	1	Rear Wiring Harness	12	86992213	4	3/8" NC Stover Lock Nut
3	27602420	1	Light Bracket, Long, L.H.	13	86992216	4	5/8" NC Stover Lock Nut
	27602425	1	Light Bracket, Long, R.H.	14	86992211	18	1/4" NC Lock Nut
4	04681730	1	Light Bracket, R.H.	15	311864A1	4	Yellow Retroreflective Strip
	04681740	1	Light Bracket, L.H.	16	311863A1	4	Red Retroreflective Strip
5	27602202	2	Red Light Fixture	17	311865A1	4	Fluorescent Strip
6	27602201	2	Amber Light Fixture	18	386170C1	A/R	28" Plastic Hose Tie
7	27601214	1	Plug Holder	19	27601215	A/R	Replacement Lens - Amber
8	16309101	2	3/8" x 4" x 6" U-bolt	20	27601216	A/R	Replacement Lens - Red
9	87427170	9	5/8" x 4" x 8" U-bolt	21	27602415	1	Light Bracket Assembly, Right Hand
10	413-420	16	1/4" x 1-1/4" NC Hex Bolt, Gd. 5 ZP	22	27602410	1	Light Bracket Assembly, Left Hand
				23	30007000	A/R	20" Plastic Hose Tie
				24	16309091	2	3/8" x 4" x 4" U-Bolt

\*See pages #67 and #68 for Light Kit installation instructions.

A/R - AS REQUIRED

# ASSEMBLY SECTION

The following text describes procedure for assembling the **nutri-till'r** applicator. Place all bundles where they will be convenient. Part numbers are stamped on each bag. It may be helpful to open the bags for easier identification, but do not mix parts from different bags, and keep the bag number with the bundle of loose parts. Study and refer to the Assembly Drawings in this manual and proceed with the step-by-step instructions. All bolts should be torqued to the recommended torque shown on bolt torque chart on inside of cover unless otherwise specified.

- ⚠ WARNING:**
- Never position yourself under any portion of the **nutri-till'r** applicator. Lower machine to the ground, turn off tractor and remove key before making adjustments or repairs. Otherwise, block securely to prevent accidental lowering.
  - Compressed springs have potentially dangerous stored energy. Always assemble and disassemble properly.

## nutri-till'r 5310 FRAME

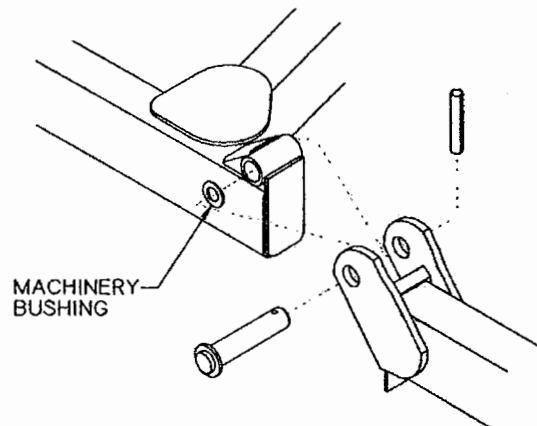
Refer to parts drawing and reference numbers on pages #32 through #34.

- 1) Place main frame (#1) on stands approximately 36" high on level surface.
- 2) Place lift wheel spindle assemblies (#6) on pages #32 & 33 onto main frame using the 1-5/8" dia. pins (#32). Place the 5/8" bolt (#38) through the pin and tighten 5/8" nut (#59).
- 3) Install torque tube (#3) onto the lift wheel spindles using the 7/8" bolts (#37), shims (#20), and nuts (#40). Torque to 450 ft-lbs and double nut.
- 4) For tandem lift wheel assembly, install hub and spindle assemblies (#19) into walking axle (#7) and secure using 1/2" bolt (#60) and lock nut (#61). See pages #77 & 78 for spindle location.
- 5) Mount the tire and wheel assembly (#16) to lift wheel spindle assemblies and torque wheel bolts to 90-100 ft-lbs. **Re-torque after 1 hour of use.**
- 6) Place pull frame (#2) on top of the main frame and align the holes. Bolt the pull frame to the frame using the 7/8" bolts (#37) and nuts (#40).

**IMPORTANT:** Torque 7/8" bolts of pull frame to main frame to 450 ft-lbs and double nut.

- 7) Place front coulter bar (#11) under pull frame and attach to main frame and pull frame using 3/4" U-bolts (#35) and nuts (#41) and 3/4" bolts (#44) and nuts (#41).
- 8) Install hose and gauge stand (#21) onto pull frame using 3/8" hardware.
- 9) Refer to page #41 for rear hitch. Mount rear wagon hitch (#1) to the front bar of the main frame using the 1-1/4" pins (#13), 1-1/4" machine bushings (#36), and cotter pins (#35), and bushings (#12) from the rear wagon hitch. Align the hole on the hitch with the slotted mounts on the torque tube and re-assemble bolts, washers, nuts, and bushings.

- 10) Refer to page #34 for wings. Install the inner wings (#1) by positioning onto main frame. Be sure to support the wings on the outside for stability. Place the 1-5/8" machine bushing (#61) **between the front of the main frame and the front wing hinge flat only** (shown below). Install the 1-5/8" hinge pins (#40) through the hinge flats and secure with 7/16" x 2-1/2" roll pin (#46).
- 11) Install the outer wings (#2) onto the inner wing using the 1-1/4" hinge pins (#38) and 1/4" x 1-1/2" cotter (#49). Attach outer wing shims (#18 and #19) to the outer wing (#2) with the 1/2" bolt (#55) and nut (#67) to level outer wing with the inner wing.



- 12) **For 8 Row Units:** Install left and right hand cylinder lugs (#24, page 37) on the front tube of the main frame using two 3/4" U-bolts (#25) and four 3/4" stover lock nuts (#26) for each side. Attach the lug strap to the main frame gusset using 5/8" x 2" bolt (#27) on each side.

# nutri-till'r 5310 WING GAUGE WHEELS

Refer to the parts drawing and reference numbers on page #34 and location charts on pages #83, 84, & 85. (Bag #04661050).

- 1) Attach the gauge wheel mount assembly (#6) to the rear bar of the wings in the location shown on Page #34 with the 3/4" L-bolts (#70) and nut (#71). Bolts must be inserted from the front through the gauge wheel mount and through the gauge wheel mount. Bolts must be drawn down squarely on the bar by tightening nuts evenly to 325 ft-lbs.
- 2) Mount the gauge wheel arm assemblies (#12) to the spindle mount using the 1-5/8" pivot pin (#44). Secure the pivot pin to the spindle mount with the 5/8" bolt and nut (#51 and #68) and torque to 170 ft-lbs.
- 3) Adjust rear spindle to outer hole. Refer to pages #83, 84, & 85.
- 3) Mount the tire and wheel assembly (#20) to the gauge wheel arm assemblies and torque wheel bolts to 100 ft-lbs.

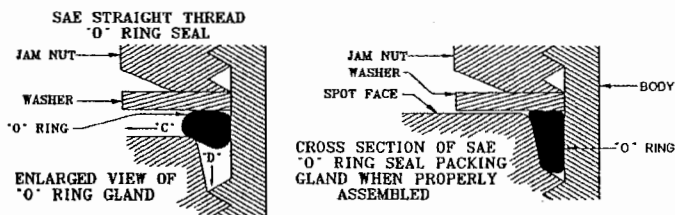
## HYDRAULICS



**WARNING:** High pressure fluid is nearly invisible but has enough force to penetrate the skin. **NEVER** use the hands to search out a suspected leak. If injured by escaping fluid, obtain medical attention immediately. Fluid must be surgically removed or gangrene will result. Wear safety glasses or goggles to avoid eye injury when working on the hydraulic system.

**IMPORTANT:** Read this before installing adapters.

1. Jam nut and washer must be to the backside of the smooth portion of the elbow adapter.
2. Lubricate the "O" Ring – **VERY IMPORTANT!**
3. Thread into port until washer bottoms onto spot face.  
**NOTE:** is the spot face large enough for the washer?  
Does hex of the straight adapter fit into spot face?
4. Position elbows by backing up the adapter.
5. Tighten jam nut.



### WHY "O" RING LUBRICATION IS IMPORTANT:

1. Fitting engaged to point where "O" Ring touches face of boss. Lubrication on "O" Ring permits it to move in direction "D".
2. When "O" Ring and boss are dry, rotary motion of assembly can cause friction and "O" Ring can move in direction "C".
3. Jam nut and washer cannot bottom fully if the "O" Ring is between the washer and the face of the boss.

### WHAT HAPPENS WHEN THE JAM NUT AND WASHER ARE NOT BACKED UP PRIOR TO ASSEMBLY:

1. When jam nut and washer have not been backed up, there is not enough room for the "O" Ring Seal when the squeeze takes place.
2. Washer can't seat properly on the face of the boss. The compressed rubber between the washer and the boss face will cold flow out from compression and the fitting will be loose and usually leak.

NOTE: Hydraulic hardware is in bag #04681010 standard hardware and #04661050 hydraulic gauge wheel.

# nutri-till'r 5310 LIFT HYDRAULICS

- 1) Refer to Page #36. Install the ram end of the 3-1/2" x 10" hydraulic cylinders(#3) on the cylinder lug on the main frame. Then connect the rod end of the hydraulic cylinder to the cylinder lug on the spindle arm.
- 2) Install the ram end of the 3-1/4" x 10" hydraulic cylinder (#4) on the top gauge wheel mount assembly on the wing. Then connect the rod end of the hydraulic cylinder to the gauge wheel spindle arm using the 1" pin (#34) and cotter pin (#38).
- 3) Install the 3/4" SAEM x 3/4" JICM 90E (#20) elbows in the cylinder ports.
- 4) Attach 3/8" x 30" hose (#9) to the elbow on the ram end of the right hand main frame 3-1/2" x 10" master cylinder. Attach 3/8" x 72" hose (#10) to the elbow on the ram of the left hand main 3-1/2" x 10" master cylinder. Then connect these hoses together to the 3/4" JICM tee (#22).
- 5) **For 8 Row Units (See Page 37):**  
Attach the 3/8" x 42" hydraulic hose (#15) to the elbow (#20) on the rod end of the right hand 3-1/2" x 10" master cylinder (#3). Connect the 3/8" x 82" hydraulic hose (#11) to the elbow (#20) on the rod end of the left hand 3-1/2" x 10" master cylinder (#3). Connect these hydraulic hoses to the 3/4" JICM tee (#22).
- 6) **For 12 Row Units (See Page 36):**  
Attach the 3/8" x 165" hoses (#8) to the elbows on the rod end of the 3-1/2" x 10" master cylinders. Connect these hoses to the elbows on the ram end of the 3-1/4" x 10" wing cylinders. Connect the 3/8" x 173" hose (#12) to the elbow on the rod end of the right hand 3-1/4" x 10" wing cylinder and connect the 3/8" x 220" hydraulic hose (#11) to the elbow on the rod end of the left hand 3-1/4" x 10" wing cylinder. Connect these hoses to the 3/4" JICM tee (#22).
- 7) **For 16 Row Units (See Page #36):**  
Attach the 3/8" x 165" hoses (#8) to the elbows on the rod end of the 3-1/2" x 10" master cylinders. Connect these hoses to the elbows on the ram end of the 3-1/4" x 10" wing cylinders. Connect the 3/8" x 173" hose (#12) to the elbow on the rod end of the right hand 3-1/4" x 10" wing cylinder and connect the 3/8" x 220" hose (#11) to the elbow on the rod end of the left hand 3-1/4" x 10" wing cylinder.  
  
Connect adaptor fitting (#45) and in-line relief valve (#27) to each of the return line hoses. Use adaptor fitting (#26) to connect relief valves to tee (#22).  
  
**NOTE:** Have arrow indicating free-flow path toward tee.
- 8) Connect a 1/2" x 165" hose (#8) to each 3/4" JICM tee (#22). Attach a 1/2" x 100" hose (#5) to each 1/2" x 165" hose with the 3/4" JICM couplers (#21).  
  
**NOTE:** FOR SELECTOR VALVE OPTION:  
Connect the 1/2" x 165" hose (#7) to the left side of the selector valve (#44) using the 3/4" SAEM x 3/4" JICM adapters (#45). Insert 3/4" SAEM x 3/4" JICM adapters (#45) in the top of the selector valve and attach the 1/2" x 100" hoses (#5) to the top of the selector valve. Insert 3/4" SAEM x 3/4" JICM elbows (#45) to the right side of the selector valve. The 3/8" x 165" hose (#8) will attach to these.
- 9) See Page #10 for charging hydraulic cylinders.

# nutri'till'r 5310 16-ROW WING HYDRAULICS

**IMPORTANT:** The wing folding hydraulic system must be charged before initial operation.

Assemble wing fold per page #36.

- 1) Install the ram end of the 4" x 36" hydraulic cylinders (#1) on the wing cylinder lug on the main frame. Then connect the rod end of the hydraulic cylinder to the cylinder lug on the wing using the 1" pin (#33), 1" washer (#41), and cotter pin (#37).
- 2) Install the ram end of the 3-1/2" x 24", or the hydraulic cylinders (#2) to the outer wing cylinder lug on the inner wing using the 1" pin (#42, page #34) and 1/4" cotter pin (#49, page #34). Next install the H-link (#7, page #34) to the inner wing using the 1" pin (#39, Page #34) and 1/4" cotter pin (#49, Page #34).
- 3) Attach the H-link to the outer wing using the 1" pin (#39, Page #34) and 1/4" cotter pin (#49, page #34).
- 4) Attach the rod end of the outer wing cylinder to the H-link and the weld-link using the 1" pin (#42, page #34) and 1/4" cotter pin (#49, page #34). The H-link fits outside the rod clevis and the weld-link fits inside the rod clevis.
- 5) Install a 3/4" JICM Adapter (2) x 3/4" SAEM tee (#23) in the ram end port of the right hand 4" x 36" hydraulic cylinder (#1). Then install a 3/4" JICM (2) x 3/4" JICF tee (Item#25) to the right side of item #23. Next, install a 3/4" SAEM x 3/4" JICF adapter (Item #26) in the short leg of the tee Item #25.
- 6) Install 3/4" JICM (2) x 3/4" SAEM tee (#23) in the rod end ports of both 4" x 36" hydraulic cylinders (#1) and in the ram end port of the left hand 4" x 36" hydraulic cylinder (#1). Next install 3/4" SAEM x 3/4" JICM 90E elbow (#20) in both ports of the 3" x 24" or 3-1/2" x 24" outer fold hydraulic cylinders.
- 7) Connect the 3/8" x 55" hydraulic hose (#13) to the left side of the tee (#25) of the right cylinder and to the 3/4" JICM SAEM tee (#23) in the ram end port of the left hand 4" x 36" hydraulic cylinder (#1). Next connect one 3/8" x 128" hydraulic hose (#14) from the right side of the ram end tee (Item #23) of the right cylinder to the ram end of the right hand outer fold hydraulic cylinders (#2). Connect the other 3/8" x 128" hydraulic hose (#14) from the ram end 3/4" JICM (2) x 3/4" SAEM tee (#23) of the left hand 4" x 36" hydraulic cylinder (#1) to the ram end of the left hand outer fold hydraulic cylinder (#2).
- 8) Connect the rod ends of the 4" x 36" hydraulic cylinders (#1) to the rod ends of the outer fold hydraulic cylinders (#2) with 3/8" x 114" hydraulic hoses (#15). Next connect the 3/8" x 37" hydraulic hose (#16) to the rod end port of the right hand 4" x 36" hydraulic cylinder (#1) and connect a 3/8" x 97" hydraulic hose (#17) to the rod end port of the left port of the 4" x 36" hydraulic cylinder (#1). Connect both hoses to a 3/4" JICM (2) x 3/4" SAEM tee (#23).
- 9) Install the throttle valves (#24) on the 3/4" SAEM (2) x 3/4" SAEM tee (#23) and to the 3/4" SAEM x 3/4" JICF adapter (#26).

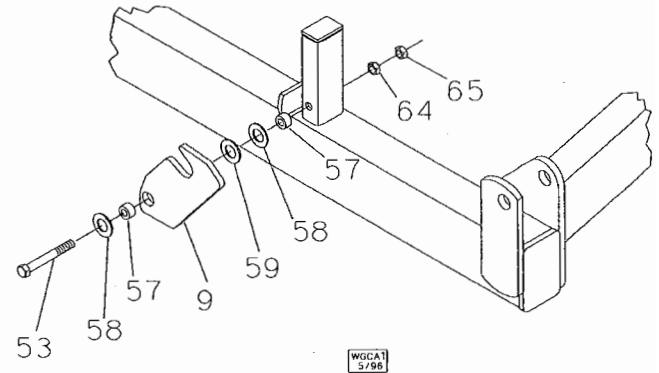
**IMPORTANT:** Throttle valves are used to control wing fold and unfold speeds. Failure to install the throttle valves can cause damage to the applicator as well as personal injury or death.

- 10) Connect the 3/8" x 165" hydraulic hose (#8) to the throttle valves (#24). Attach a 3/8" x 80" hydraulic hose (#6) to each 3/8" x 165" hydraulic hose (#8) with the 3/4" JICM coupler (#21).

**NOTE: FOR SELECTOR VALVE OPTION.** Connect the 3/8" x 165" hydraulic hose (#8) to the throttle valves (#24). Attach the other ends of the hose to the right side of the selector valve using the 3/4" JICM x 3/4" SAEM 90E elbows (#20). See also 5310 Lift Hydraulic Section.

- 11) Charge the wing folding hydraulic system (Page #36) in the following manner. Disconnect the rod end of each wing cylinder. Block the cylinder so that the piston rod is free to move its full stroke. Hydraulically extend and retract the tractor hydraulic lever, adding oil as required. Reconnect the rod ends of all wing lift cylinders to their respective cylinder lugs. Making certain no one is near the machine, raise the wings into transport position.

- 12) Refer to Page #34. Assemble the outer wing catch (#9) to the front side of the 2" x 3" wing stop which is welded to the front part of the inner wing (#1). Insert the 5/8" x 6" bolt (#53) through the 5/8" H.D. washer (#58), 1-1/8" O.D. bushing (#57), and outer wing catch (#9). Next insert 1-1/4" machine bushing (#59) over H.D. washer (#58), 1-1/8" O.D. Bushing (#57), and wing stop. Secure with 5/8" nut (#64) and 5/8" jam nut (65). When tightening, make sure the 1-1/8" I.D. machine bushing fits over the 1-1/8" O.D. bushing. This bushing is used to control end play of the latch which needs minimal end play for proper operation.



**IMPORTANT:** Catch must be free to pivot.

## nutri'till'r 5310 12-ROW WING HYDRAULICS

**IMPORTANT:** The wing folding hydraulic system must be charged before initial operation.

Assemble wing fold per page #36.

- 1) Install the ram end of the 4" x 36" hydraulic cylinders (#1) on the wing cylinder lug on the main frame. Then connect the rod end of the hydraulic cylinder to the cylinder lug on the wing using the 1" pin (#33), 1" washer (#41), and cotter pin (#37).
- 2) Install the 3/4" SAEM x 3/4" JICM 90° (#20) elbow in the rod end of the right hand 4" x 36" hydraulic cylinder and install a 3/4" SAEM x 3/4" JICF adapter (#26), then a 3/4" JICM x 3/4" 90° swivel (#29) on the ram end of the right hand 4" x 36" hydraulic cylinder. Next, install the 3/4" SAEM x 3/4" JICM 90° elbows (#20) on the rod and ram ends of the left hand 4" x 36" hydraulic cylinder.
- 3) Connect the 3/8" x 55" hydraulic hose (#13) to the elbow on the ram end of the left hand 4" x 36" hydraulic cylinder. Then connect this hose to the elbow on the ram end of the right hand 4" x 36" hydraulic cylinder with a 3/4" SAEM x 3/4" JICM tee (#23).
- 4) Connect the 3/8" x 37" hydraulic hose (#16) to the elbow on the rod end of the right hand 4" x 36" hydraulic cylinder and connect the 3/8" x 173" hydraulic hose (#12) to the elbow on the rod end of the left hand 4" x 36" hydraulic cylinder. Next, connect these hoses together with the 3/4" SAEM x 3/4" JICM tee (#23).

- 5) Install the throttle valves (#24) to the 3/4" SAEM x 3/4" JICM tee (#23) which connect the hydraulic hoses together.

**IMPORTANT:** Throttle valves are used to control wing fold and unfold speeds. Failure to install the throttle valves can cause damage to the applicator as well as personal injury or death.

- 6) Connect the 3/8" x 165" hydraulic hose (#8) to the throttle valves (#24). Attach a 3/8" x 80" hydraulic hose (#6) to each 3/8" x 165" hydraulic hose (#8) with the 3/4" JICM coupler (#21).

**NOTE:** FOR SELECTOR VALVE OPTION.

Connect the 3/8" x 165" hydraulic hose (#8) to the throttle valves (#24). Attach the other ends of the hose to the right side of the selector valve using the 3/4" JICM x 3/4" SAEM 90E elbows (#20). See also 5310 Lift Hydraulic Section.

- 7) Charge the wing folding hydraulic system (Page #36) in the following manner. Disconnect the rod end of each wing cylinder. Block the cylinder so that the piston rod is free to move its full stroke. Hydraulically extend and retract the tractor hydraulic lever, adding oil as required. Reconnect the rod ends of all wing lift cylinders to their respective cylinder lugs. Making certain no one is near the machine, raise the wings into transport position.

# nutri'till'r 5310 8-ROW WING HYDRAULICS

**IMPORTANT:** The wing folding hydraulic system must be charged before initial operation.

Assemble wing fold per page #37.

- 1) Install the ram end of the 3-1/2" x 24" hydraulic cylinders (#2) to the bolt-on wing cylinder lug, on the front rank of the main frame. Then connect the rod end of the hydraulic cylinder to the cylinder lug on the wing using the 1" pin (#33), 1" washer (#41), and cotter pin (#37).
- 2) Install the 3/4" SAEM x 3/4" JICM 90° elbows (#20) in the rod and ram ends of the left and right hand 3-1/2" x 24" hydraulic cylinders.
- 3) Connect the 3/8" x 82" hydraulic hose (#11) to the elbow in the ram end, of the right hand 3-1/2" x 24" hydraulic cylinder. Connect the 3/8" x 108" hydraulic hose (#17) to the elbow in the rod end, of the right hand 3" x 24" hydraulic cylinder.
- 4) Connect the 3/8" x 30" hydraulic hose (#9) to the elbow in the rod end, of the left-hand 3-1/2" x 24" hydraulic cylinder. Connect the 3/8" x 55" hydraulic hose (#13) to the elbow in the rod end, of the left-hand 3" x 24" hydraulic cylinder.
- 5) Connect the 3/8" x 82" hydraulic hose (#11) to one end of the 3/4" JICM tee (#23) and the other end of the tee to the 3/8" x 30" hydraulic hose (#9).
- 6) Then connect the 3/8" x 108" hydraulic hose (#17) to one end of a 3/4" JICM tee (#23) and the other end of the tee to the 3/8" x 55" hydraulic hose (#13).
- 7) Connect each of the remaining ends of the tees to a 3/8" x 114" hydraulic hose (#8). Attach the 3/8" x 80" hydraulic hoses (#6) to each of the 3/8" x 114" hydraulic hoses (#8) with the 3/4" JICM couplers (#21).
- 8) Charge the wing folding hydraulic system (Page #37) in the following manner. Disconnect the rod end of each wing cylinder. Block the cylinder so that the piston rod is free to move its full stroke. Hydraulically extend and retract the tractor hydraulic lever, adding oil as required. Reconnect the rod ends of all wing lift cylinders to their respective cylinder lugs. Making certain no one is near the machine, raise the wings into transport position.

# WARNING AND TAILLIGHT INSTALLATION INSTRUCTIONS

See page #60 for parts list and diagrams.

1. Lay out parts:
  - A. Unroll the wiring harness. The seven-pin connector will plug into the receptacle on the rear of the tractor. The longer of the two wiring harness leads will go to the left-hand light assembly. The shorter lead goes to the right hand assembly. The seven-pin receptacle goes to the rear of the machine.
  - B. Identify the left hand and right hand light assemblies by referring to the connector diagram on page #60. (Note the different pin locations.)
  - C. Identify the light brackets by referring to page #60.
  - D. Locate and identify hardware:
    - The light parts box includes all 1/4" fasteners for both light assemblies and the plug storage container.
    - Light mounting kit contains right hand and left hand brackets, 5/8" U-bolts and 5/8" hex nuts.

## 2. Test System

- A. Lay out the wiring harness on the machine with the longer lead to the left light assembly.
- B. Plug the two light assemblies into the plugs on the two leads.

**IMPORTANT:** Left hand and right hand light assemblies must be mounted on their respective sides or the warning lamps will not work properly as turn signals. Refer to the connector diagrams on page #60.

To make sure that light assemblies will be mounted correctly, check the following:

  - From the rear of machine, amber lights should be on top and red lights on the bottom of both light assemblies.
  - From the front of machine, only the amber-lights should be visible.
- C. Clean the tractor receptacle and plug the seven pin connector into the tractor receptacle.
- D. Test the light system.
  - Red taillights should work with the red taillights on the tractor and the tractor headlights.
  - Amber lights should flash with the amber warning lights on the tractor and flash correctly with the tractor turn signals.

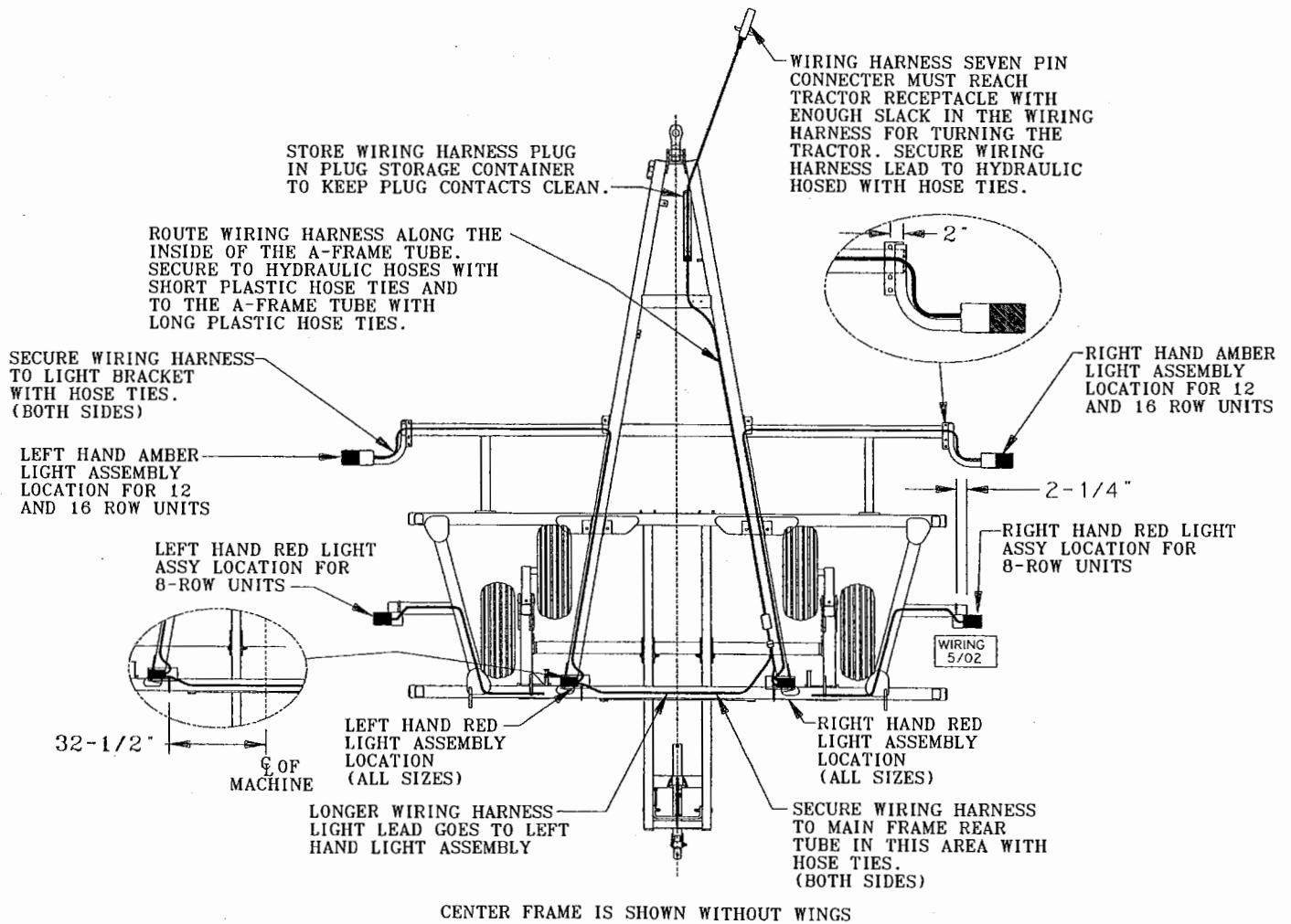
**NOTE:** If you experience a problem with the lights operating properly, besides checking the lights and wire harness, you will want to:

- Check for loose wires on the tractor receptacle.
  - Have the tractor ignition key in the "running" position or have the tractor engine "running" to have the lights work correctly.
3. Attach light brackets (#3 & #4) to the rear frame tube of the machine with the 5/8" U-bolts (#9) and 5/8" hex nuts (#13) as shown on page #60. Then attach lights (#5 & #6) to the correct light bracket using 1/4" x 1-1/4" hex bolts (#10) and 1/4" lock nuts (#14). **Do not over tighten fasteners on the plastic light assemblies.**
  4. Refer to diagrams on pages #60 & #69. Plug left hand and right hand harness leads. Route leads along the rear frame tube until reaching the right hand A-frame tubes. Then route to the front of the machine similar to hydraulic hoses.
  5. Secure wiring harness with hose ties as shown in diagram on Page #69 **after** hydraulic hoses have been installed.

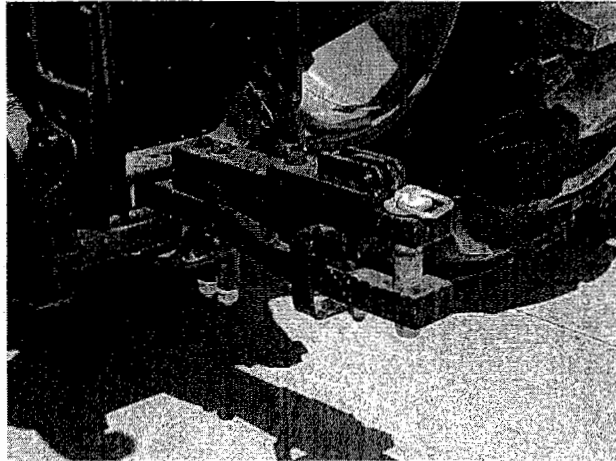
**IMPORTANT:** Wiring harness must be routed as shown and secured to prevent damage.

    - Do not stretch leads too tight.
    - Secure leads so they cannot be snagged.
    - Use plenty of plastic hose ties.
  6. Plug the seven-pin connector into the tractor receptacle and allow enough slack for tractor maneuvering.
  7. Attach plug storage container (#7) to the hose stand (#21, page 23) using 1/4" x 3/4" hex bolts (#8) and 1/4" lock nuts (#14). **Do not over tighten fasteners on the plastic container.**
  8. Retest the light system.
  9. When not in use, store the seven-pin connector in the plug storage container to keep it clean. Align the rib on the connector, with one of the slots in the bottom of the container push the connector up into the container and turn one-quarter turn for storage.

# WIRE ROUTING DIAGRAM



# TRACTOR/nutri-till'r 5310 CONNECTION



## HITCH

Before connecting the **nutri-till'r** model 5310 applicator to the tractor drawbar, raise the tractor three point hitch (if equipped) to prevent interference between the hitch and the tractor.

The tractor must be equipped with a drawbar and drawbar safety chain clevis.

For rigid frame tractors with swinging drawbar: the drawbar must be fastened in the center position.

For articulated frame or track type tractors with swinging drawbar, allow the drawbar to swing a limited amount in each direction. However, for road transport, the drawbar must be fastened in the center position.

For rigid frame tracked tractors equipped with swinging drawbar: the drawbar must be permitted to swing a small amount both ways, but the drawbar must be located in a fixed position in the center of the tractor before transporting on the highway.

Refer to your tractor operator's manual for drawbar adjustments and drawbar operating instructions.

**▲ WARNING:** Make sure that the weight of a trailed implement that is not equipped with brakes NEVER EXCEEDS the weight of the machine that is towing the vehicle. Stopping distance increases with increasing speed, typically on hills and slopes.

## DRAWBAR CONNECTION

Connect the **nutri-till'r** model 5310 applicator to the tractor drawbar only. Do not connect the hitch to any other part of the tractor. Connect the **nutri-till'r** model 5310 applicator hitch to the tractor drawbar with a hitch pin.

**▲ WARNING:** Do not move articulated tractor steering wheel until everyone is clear of the equipment. Moving the steering wheel can swing or move attached equipment which could cause serious personal injury.

**▲ WARNING:** The tractor drawbar must be located in a fixed position before transporting the implement.

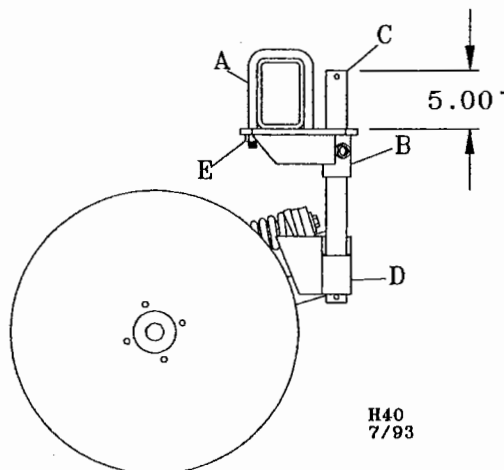
# COULTERS

Attach coulters to the 4" x 6" bar per locations on pages #83, #84, & 85. Coulters assembly drawings are on Page #44. All coulters hardware is in hardware bags 04663001 and 04660015.

**NOTE:** The center of the 3/4" U-bolt is the center of the coulters when assembled. Attach the standard coulters mount (B) to the bar using the 3/4" U-bolt (A) and nuts (E). Insert the coulters shaft (C) through the bottom of the mount, aligning the milled surface with the set screw location. Insert the 3/4" set screw and 3/4" jam nut into the coulters mount (B). Slide the coulters shaft up until the 5.00" dimension is obtained. Use this only as a guide for coulters depth.

After desired coulters depth is obtained, **tighten and loosen the set screws three times.** Tighten jam nut after the set screw has been tightened for the third time.

Slide the coulters arm assembly onto the shaft and secure with the 7/16" x 2-1/2" roll pins (Item #25, page 44) on both ends of the shaft. Attach coulters blade to coulters

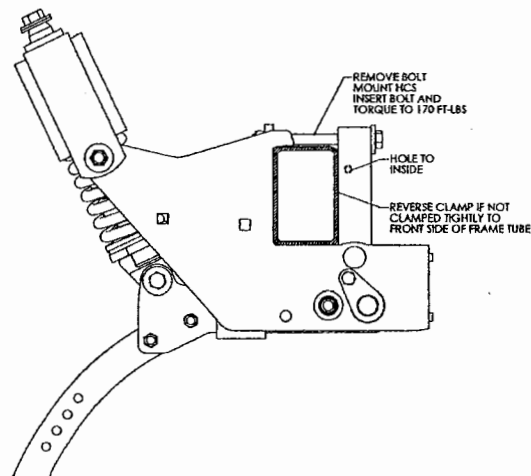


# SHANK INSTALLATION

Shank locations are found on pages #83, #84, & 85.

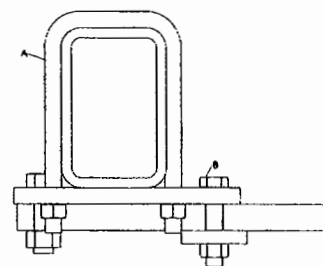
## HCS™ SHANK INSTALLATION

After mounting the shank, install the knife on the shank with the 1/2" bolts and nuts from bag 04692225. Make sure to insert the bolt through the knife first and then the shank. This allows for the full body of the bolt to resist the load. Inserting from the shank through the knife puts the load on the threads and greatly decrease the shear strength.



## RIGID SHANK INSTALLATION

Attach rigid shank to the bar as shown below using 5/8" U-bolts. The 5/8" U-bolts (A) must be drawn down squarely on the bar by tightening the nuts evenly to 170 ft-lbs. Assemble the clamp plate with 5/8" x 3" NC hex bolts, nuts and torque nuts to 170 ft-lbs. Torque the 3/4" x 3" bolt, nut and jam nut (B) that holds the front end of the shank to the plate to 325 ft-lbs.

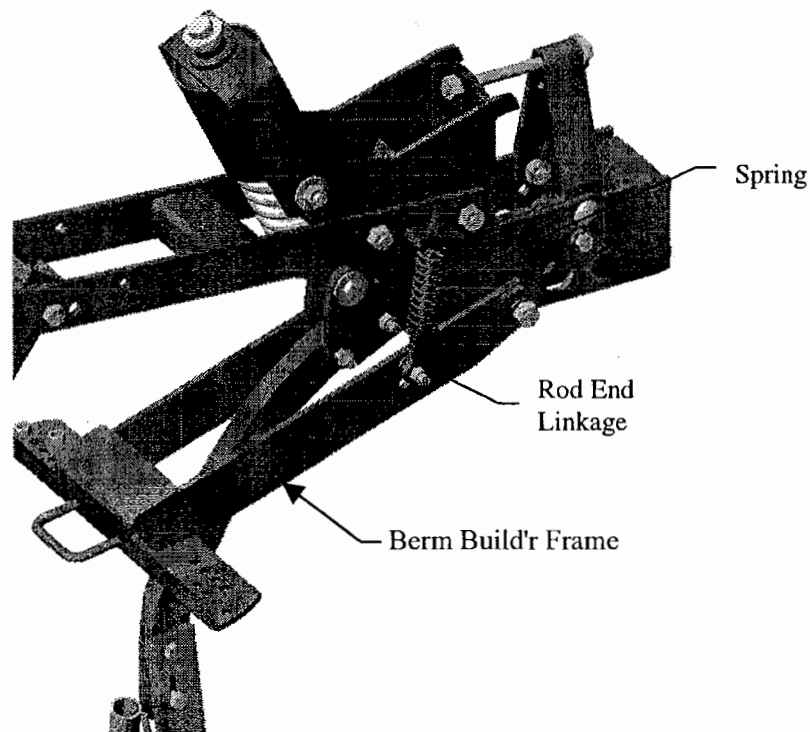


# berm build'r™ ASSEMBLY

Hardware Bag Number: 04692210  
See page #45 for **berm build'r™** Parts

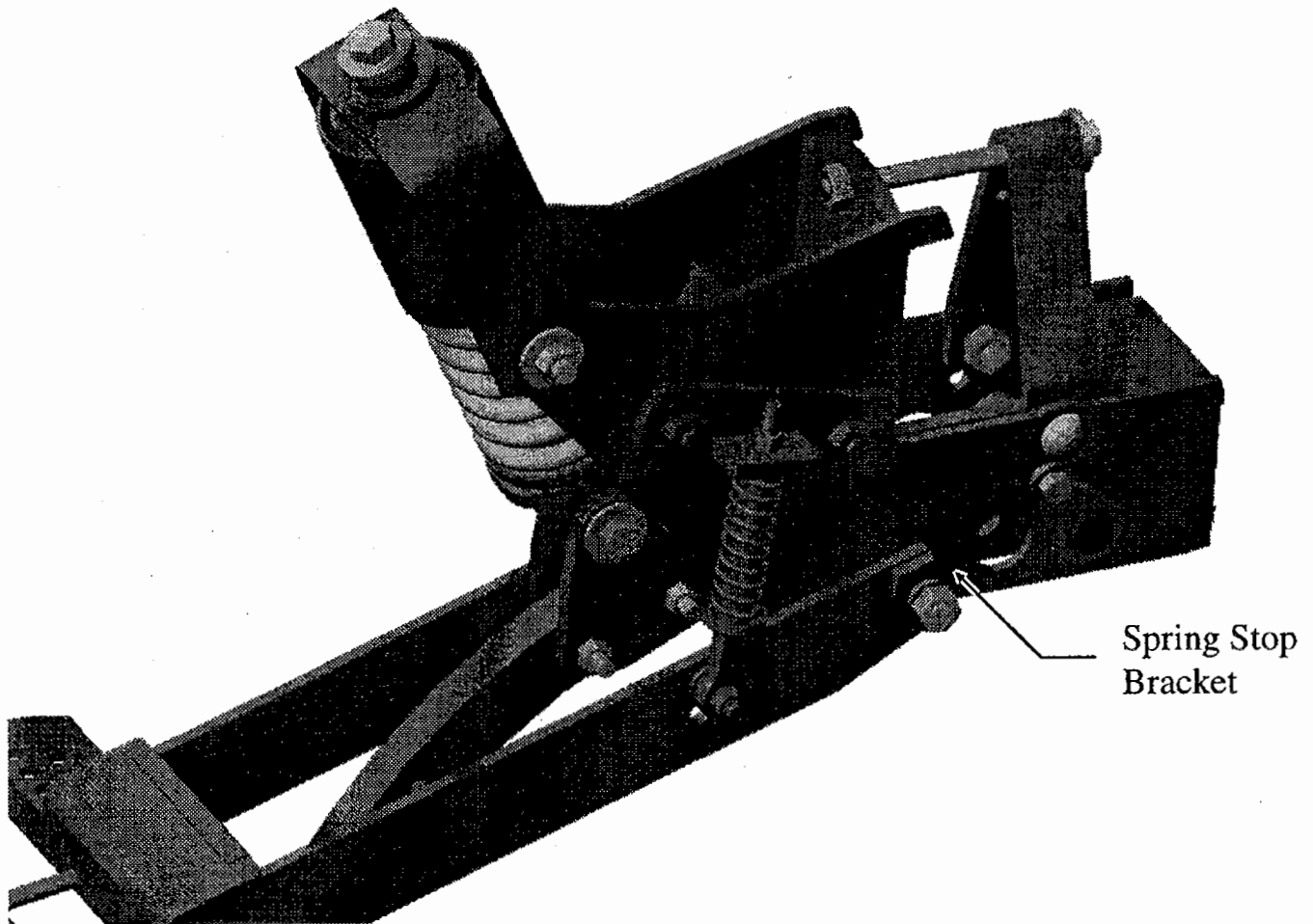
## Installation with **berm condition'r™**

1. Attach **berm build'r** frame to HCS™ shank mount with (2) 5/8" x 2-1/4" hex bolts (#16). Position the bolt with the head on the inside of the shank mount. Use a 5/8" standard flat washer (#20) on the head end of the bolt. Install the heat-treated bushing (#23) over the bolt and through the pivot hole on the strip builder frame. Use a heavy washer against the bushing, and secure with the 5/8" hex lock nut (#24).
2. Connect a rod end linkage (#13) to each side of the **berm build'r** frame as shown. Place cup washer (#14) and spring (#15) onto rod end linkage (#13), insert through upper spring mount. Use a 1/2" x 1-3/4" hex bolt (#17) in the top hole of the **berm build'r** frame. Have the bolt head to the inside.
3. Use a 1.25" x .531" x .179" thick washer (#22) between the **berm build'r** frame and the rod end linkage. Secure with 1/2" hex lock nut (#25).
4. Slide cup washer (#14) onto the rod end linkage, followed by the spring (#15). Then, run the threaded end of the eyebolt through the anchor hole provided on the seedbed conditioner arm, and secure with 1/2" hex lock nut (#25).
5. Pre-load both springs by running the nut onto each eyebolt until there is 3/4" exposed thread. Be sure both bolts are adjusted to equal settings.



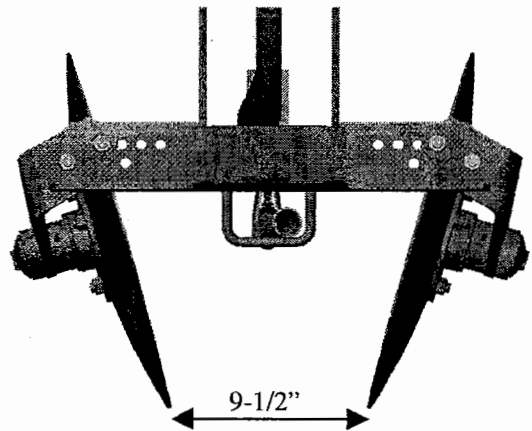
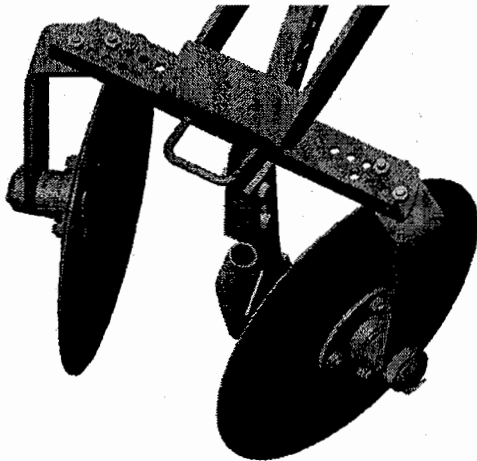
## Installation without berm condition'r™

1. When the **berm condition'r™** is not used, a spring stop bracket (#26) must be mounted to each side of the HCS™ shank mount before the strip builder assembly can be installed properly.
2. Refer to figure below. Attach right-hand and left-hand spring stop brackets (#26) in the square holes provided in the shank mount. Secure with 5/8" hex lock nut (#28).
4. Complete installation with instructions from "With **berm condition'r™**" assembly on page #75.

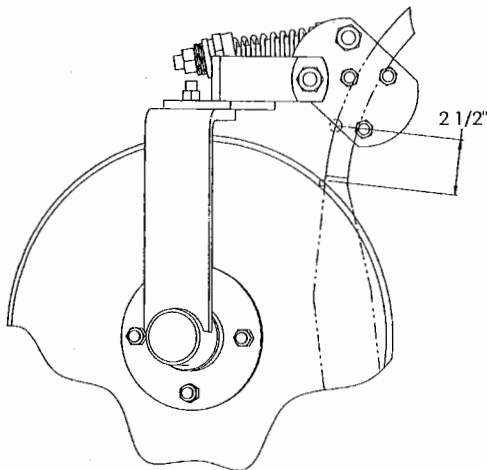


## Disc Blade Installation

1. Attach the right-hand disc mounting arm (#2) to the strip builder frame as shown. Run 1/2" x 1-3/4" hex bolt (#17) up through the hole in the mounting arm and into the outer rear hole of the strip builder frame. Secure with 1/2" hex lock nut (#25) but do not tighten. Run another 1/2" x 1-3/4" hex bolt with 9/16" I.D. x 1-3/8" O.D. washer (#19) through the slotted hole on the mounting arm, and into the outer front hole of the strip builder frame. Secure with 1/2" lock nuts but do not tighten at this time.
2. Attach the left-hand disc mounting arm in the same manner, to the opposite side of the strip builder frame.
4. Mount the disc blades (#12) to the flange of the disk hub, using 1/2" x 1" carriage bolts (#18). Secure with 1/2" hex lock nuts (#25).
5. For initial adjustment, position the disk blades as shown below. After making sure both disks are angled identically, tighten the mounting bolts to a torque of 85 ft-lbs.



## 18" DISC SEALERS



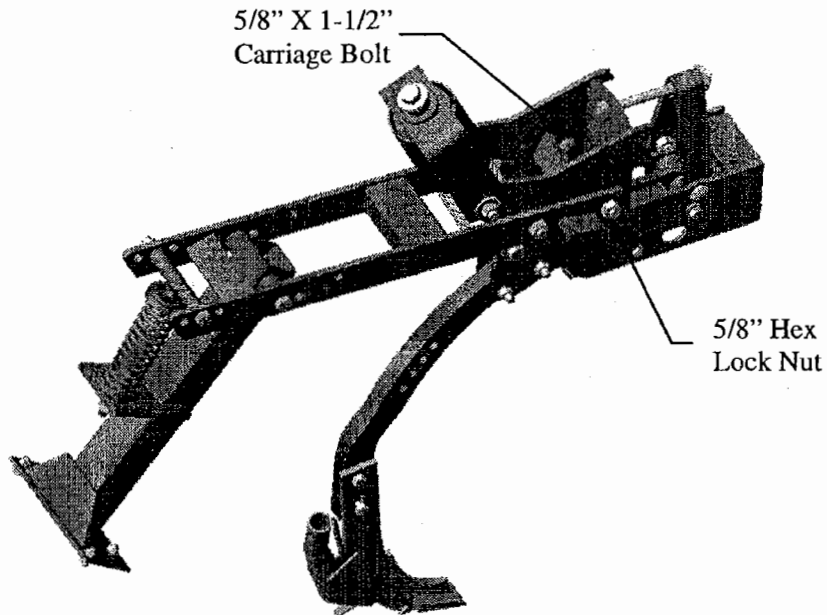
Mount the disc sealer assembly to the shank above the projection on back of shank with 1/2" bolt, nuts, and lock washers in hardware bag #02400025. Mount the two disc blades to the hub with the 3/8" carriage bolts, lock washers, and nuts in hardware bag #02400025.

**NOTE:** The disc sealer must be free to pivot. The weight of the disc sealer should hold down the sealer.

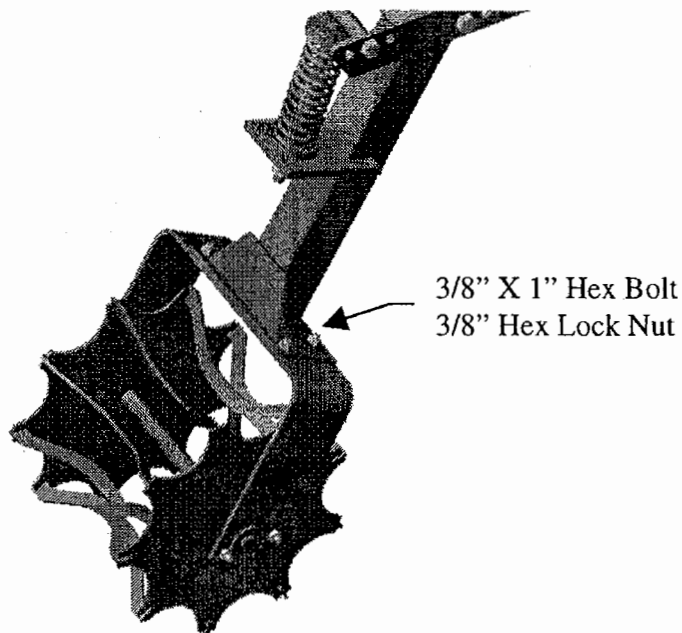
# berm condition'r™ ASSEMBLY

Hardware Bag Number: 04692215  
See page #47 for **berm condition'r™** Parts

Attach conditioner assembly to the HCS™ shank mount as shown. Use 5/8" x 1-1/2" carriage bolts (#12) through the square holes provided on each side of the shank mount. Secure with 5/8" hex lock nuts (#18).



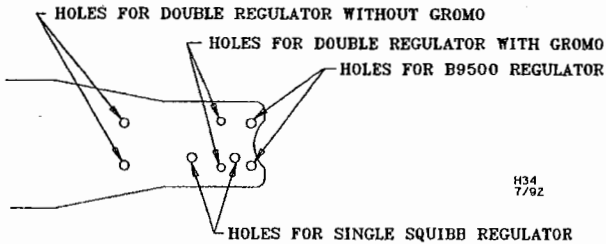
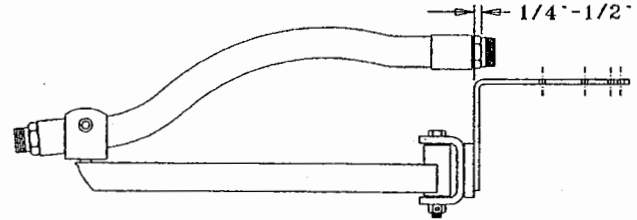
Attach the basket assembly to the mounting arm, using (4) 3/8" x 1" hex bolts (#13) and 3/8" hex lock nuts (#19).



# A.A. COMPONENTS

Refer to the Regulator Assemblies on page #54 for specific component placement and assembly.

Mount the regulator stand bracket to the rear bar, making sure to clear shank. Attach the regulator stand and extension pivot mount assembly to the regulator stand bracket with the 5/8" x 2-1/2" bolt and nut. Mount the regulator assembly on the regulator stand using the hole locations shown below. Attach 1-1/4" x 32" hose and Quic-Coupler to regulator and extension pivot mount assembly.



**IMPORTANT:** If another regulator or hydraulic shutoff is used, mount them so the end of the fitting on the hose is in the location shown below for proper and safe operation.

**IMPORTANT:** The 1-1/4" x 32" hose must have some slack so the Quic-Coupler can disconnect.

Bolt the manifolds to the brackets on the wings and connect the 1" x 104" large A.A. hose to the manifold and regulator. Using the 3/8" or 1/2" A.A. hose, hose clamps, and hose clips, start on the middle shank and connect the hose from the center knife to the left manifold. Continue connecting knives on the left side to the left manifold and knives on the right side to the right manifold. Connect a hose from each manifold to each A.A. gauge to the stand on the pull frame.

Take care when routing all A.A. hoses so that they do not get cut or pinched when folding the machine. Recheck, making sure all fittings are tight.

# ROW MARKER ASSEMBLY

Crate # 04692112

## Marker Assembly (12-Row Shown)

### Marker Mount (See page #48)

1. Refer to Figure "A". Attach the marker mount (#1) to the pads provided on the wing frame. Use 5/8" x 1-3/4" hex bolts (#20) and 5/8" lock nuts (#25). Additional mount plates (#31) and longer hex bolts (#20) are for 12-row markers.

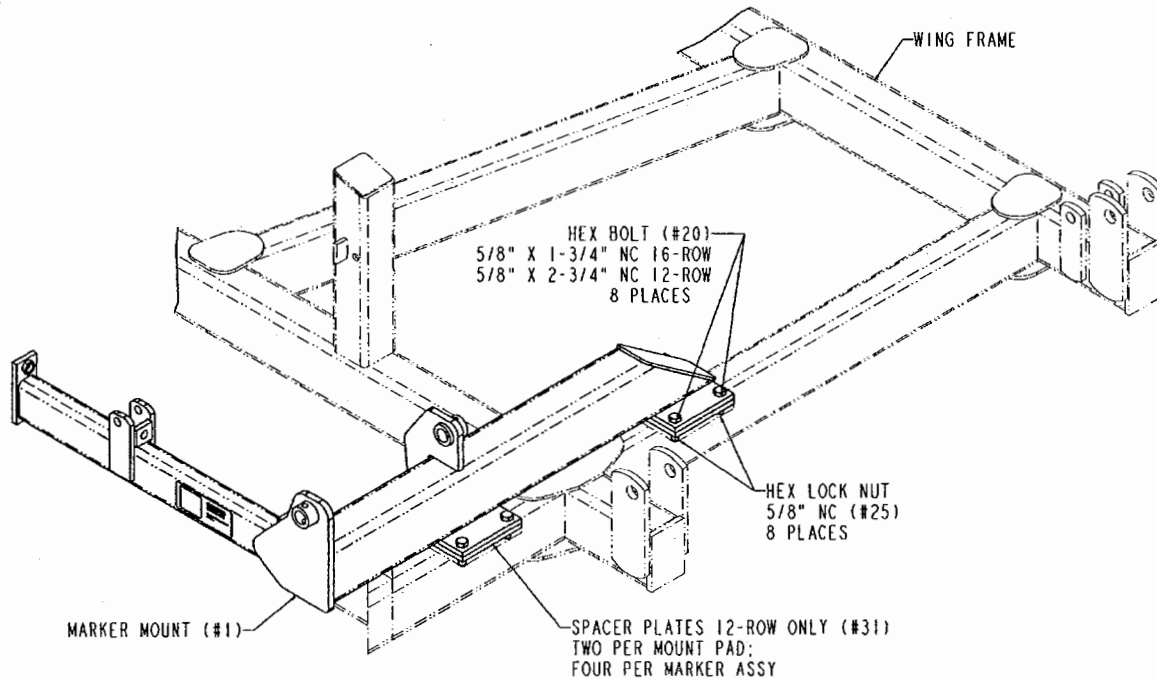
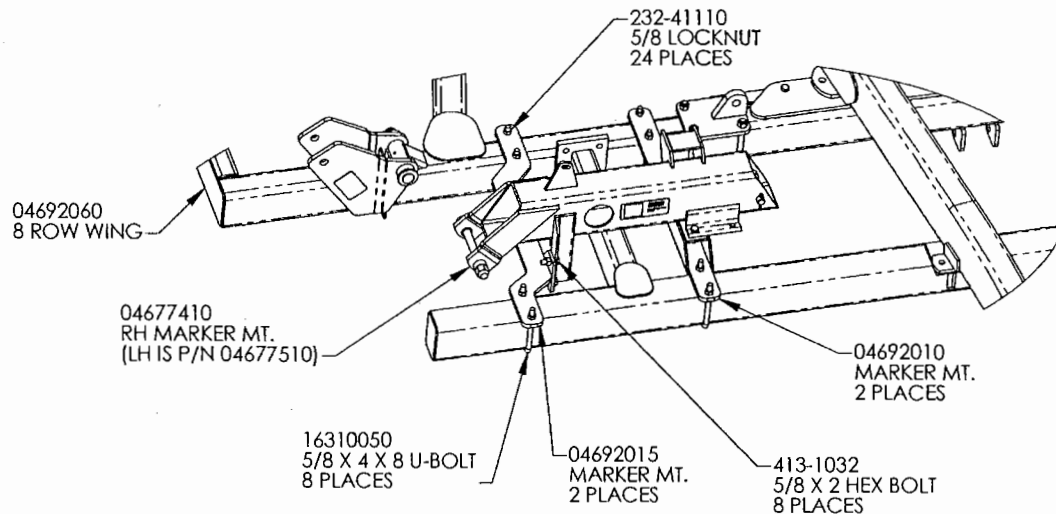


Figure A



2. Refer to Figure "B". Secure marker arm assembly to hinge, using hinge pin (#11). Be sure to install spacer tube (#7) over the pin and between the hinge plates. Secure with hinge pin with 7/16" x 2-1/2" hex bolt (#21) and 7/16" lock nut (#27).

Clamp the spring adjusting bracket (#10) to the front bar of the marker mount, using (2) 1/2" x 3-1/2" hex bolts (#17) and 1/2" hex lock nuts (#24). Snug, but do not tighten. Next, install the 3/4" x 15" spring adjusting bolt (#30). Run the bolt through the hole in the lug at the end of the marker mount cross bar. Then screw a jam nut (#23) onto the adjusting bolt. Run the jam nut up to, but not tight against the lug. Screw the bolt into the nut on the spring adjusting bracket.

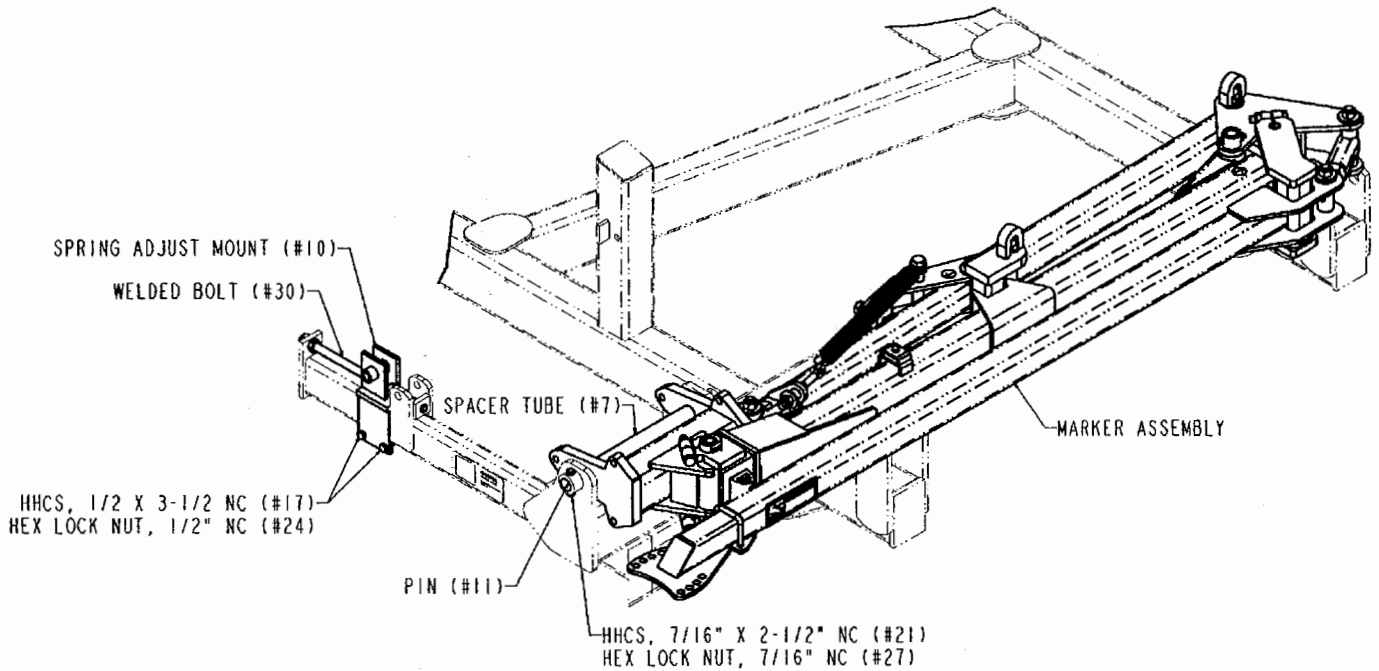


Figure B

- Refer to Figure "C". Attach right hand spring mount plate (#3) and left hand spring mount plate (#4) to the holes provided on the front side of the marker hinge with the long end of the bushing to the outside. Use 5/8" x 2-1/2" hex bolts (#18) and 5/8" lock nuts (#25).

Insert a 5/8" x 2-1/2" hex bolt (#18) through one spring mount plate, through the bushing in the spring cushion rod guide (#6) and into the second spring mount plate. Secure with a 5/8" hex lock nut (#25).

Slide .821" I.D. x 2" O.D. washer (#15) onto 3/4" x 6-1/2" hex bolt (#22). Slide spring spacer tube (#14) onto the bolt and against the washer. Install one end of extension spring (#13) over the spacer tube. Install second .821" I.D. x 2" O.D. washer (#15). Insert assembly through both spring mount plates. Use (2) washers and a spacer tube to attach the second extension spring in the same manner. Secure the assembly with 3/4" hex lock nut (#26).

Remove the top 5/8" x 3-1/2" hex bolt (#33, page 51). Install hydraulic support tab (#60, page 51) using the same bolt. Install a hose clamp (#21, page 51) using 3/8" x 1-1/2" hex bolt and 3/8" hex nut.

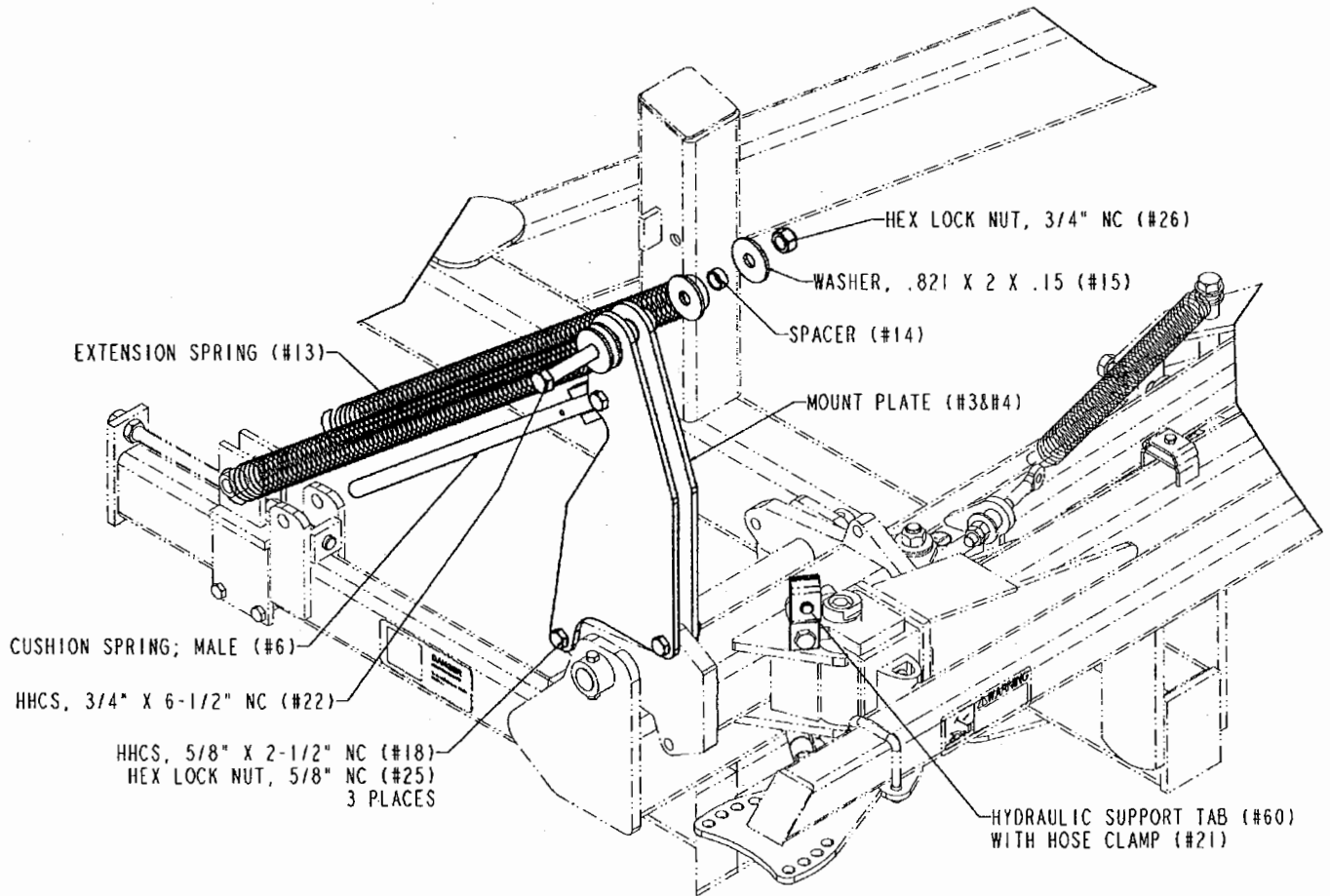


Figure C

4. Refer to Figure "D". Slide a 2" O.D. washer (#16, page 48) over the 7/8" cushion spring guide rod, followed by the compression spring (#12, page 48) and a second 2" O.D. washer. Slide the cushion receiver (#5, page 48) onto the guide rod, and secure to the lugs provided on the marker mount, using 3/4" x 4" hex bolt (#19, page 48) and 3/4" hex lock nut (#26, page 48). Secure the lower ends of the (2) extension springs (#12, page 48) to the spring adjusting mount (#10, page 48) using a 3/4" x 6-1/2" hex bolt (#22, page 48), (4) washers (#15, page 48), (2) spacer tubes (#14, page 48), and 3/4" hex lock nut (#26, page 48). Install hairpin (#28, page 48) in the spring guide rod. Adjust spring tension by turning the welded bolt (#30, page 48). See Adjustment Section.

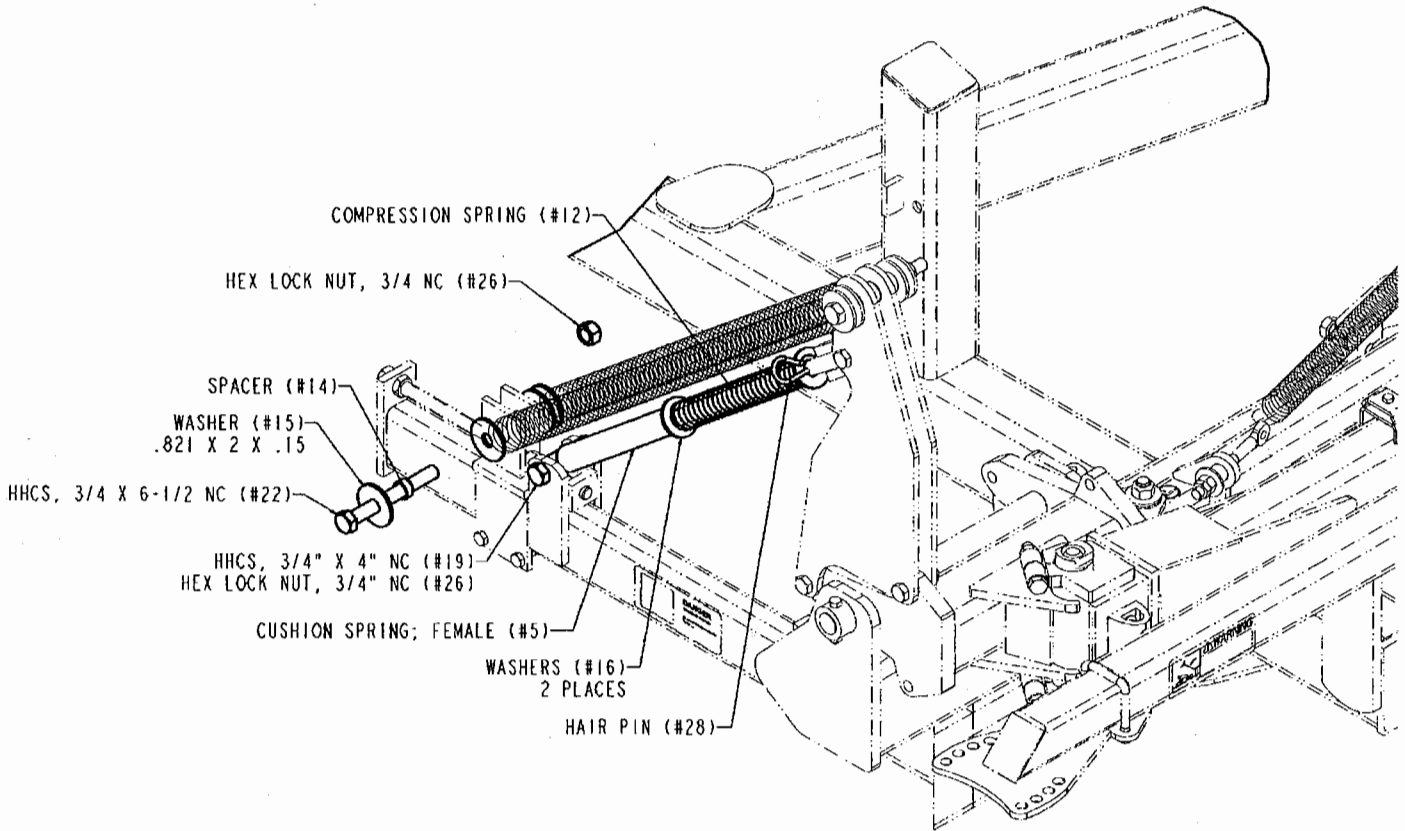


Figure D

## Marker Blade Assembly (see page #52)

Refer to Figure "E". Attach right hand or left hand disk assembly (#20) to extension arm (#1) using 5/8" x 1-3/4" hex bolts (#17) and 5/8" hex nuts (#18).

Locate the front bolt in the second hole (from the outer end) of the extension arm, as shown.

For initial adjustment, locate the rear bolt in the second hole, as shown.

The disk marker angle can be adjusted to be more or less aggressive, depending on the field condition and operating speed. Generally, the blade should be adjusted to leave a visible mark, without excessive furrowing or soil throw.

Remove the 5/8" x 3/4" NF hex bolts for the disk blade and hub cap protector. Install the marker blade shield as shown and attach with 5/8" x 1-1/4" NF hex bolts.

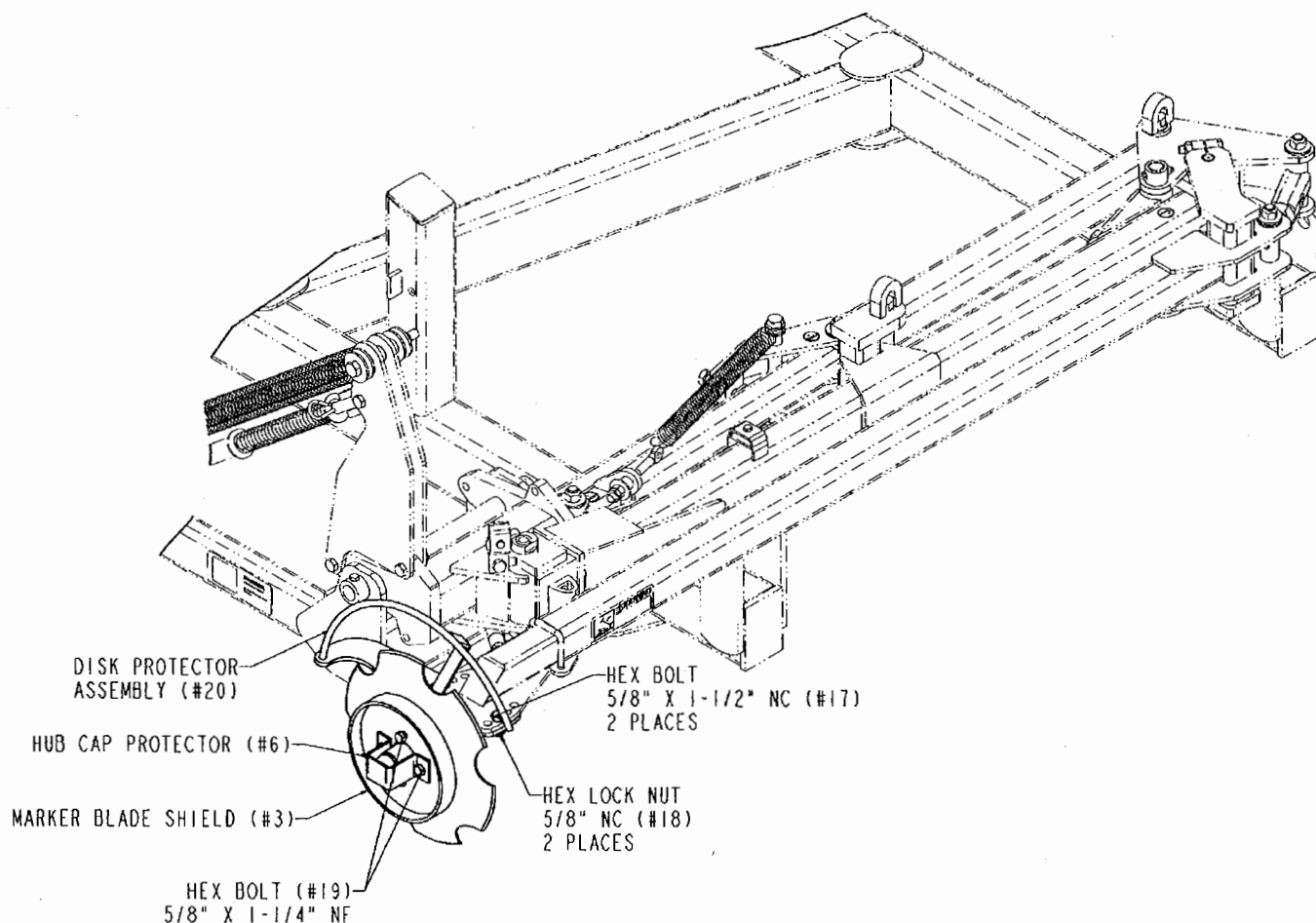


Figure E

## Marker Hydraulics (see page #38 or 39)

For installation of marker hydraulics, refer to the "Row Marker Hydraulics" page in the Parts Section.

## 16-Row Marker Installation

The 16-row marker installs similar to the 12-row marker. The 16-row marker has additional mount pads on the inner wing frame.

A marker transport weldment is mounted to the wing frame for the 16-row marker only. See Figure "F" and refer to page #34 for parts listing. Attach marker transport weldment (#15) to wing weldment using (2) 5/8" x 6" x 5-1/2" U-bolts (#54) and (4) 5/8" stover lock nuts (#72).

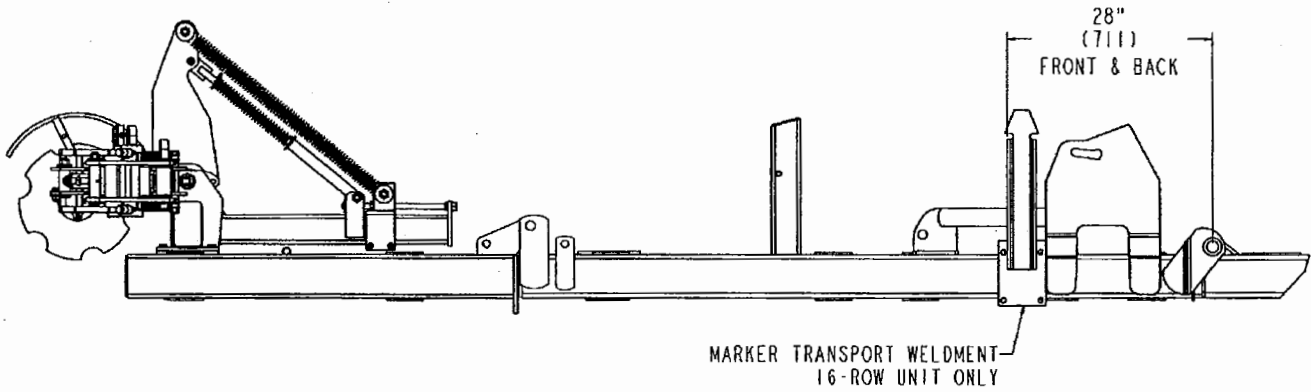
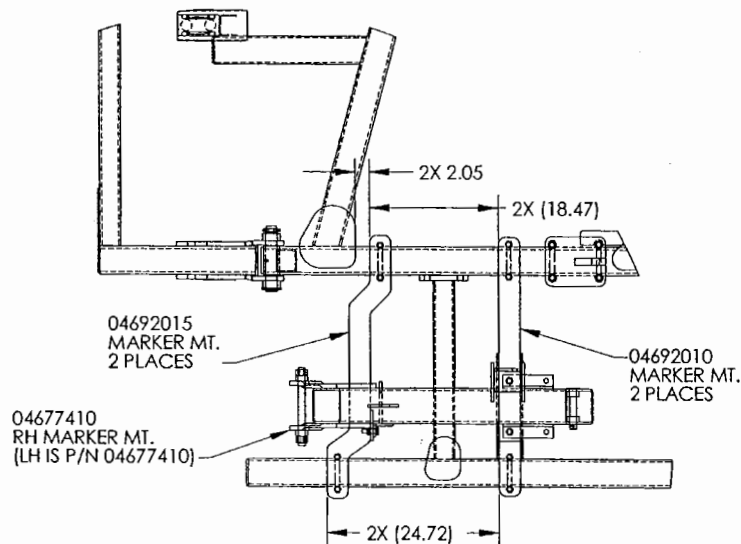


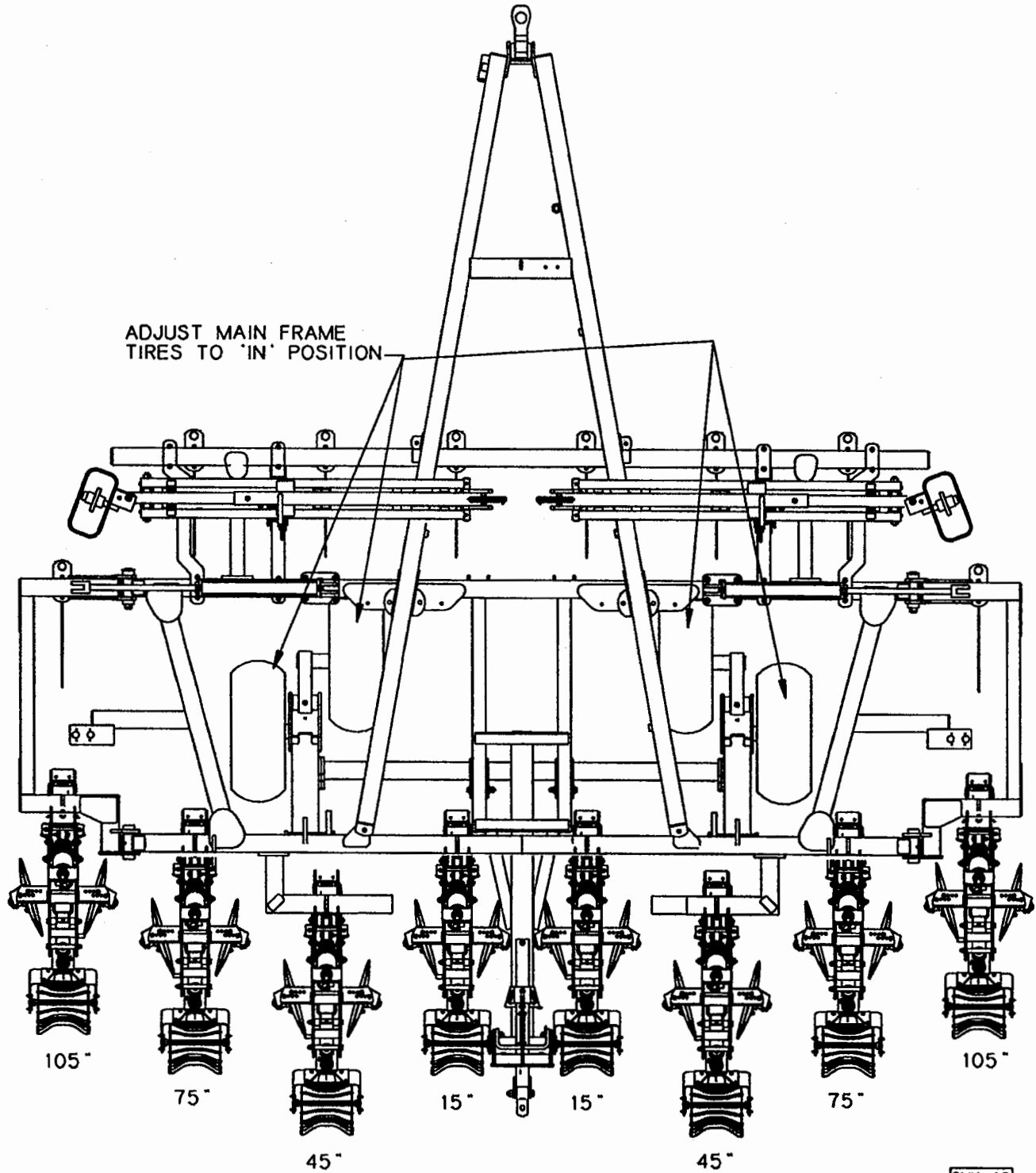
Figure F

## 8-Row Marker Installation

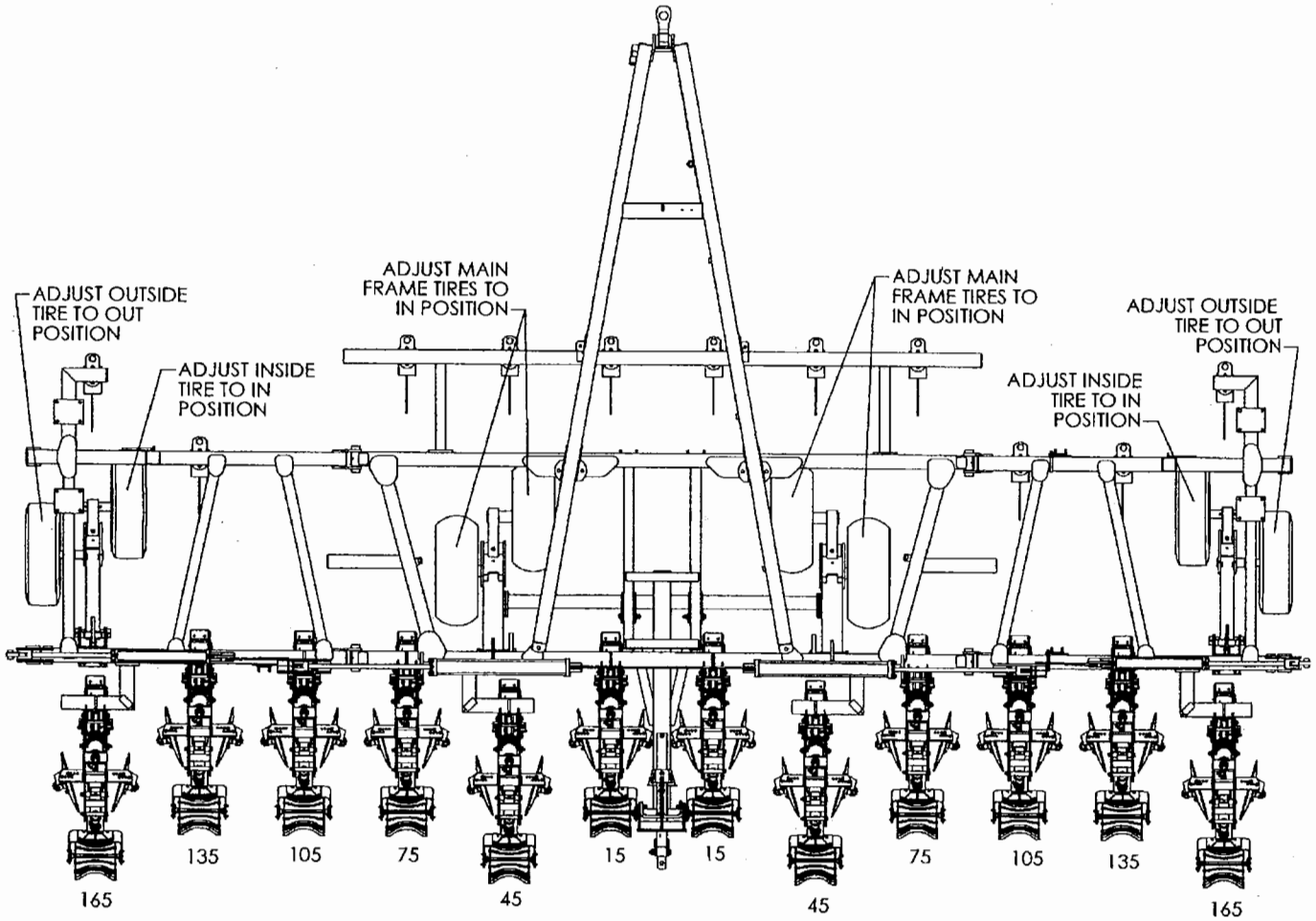


# SHANK LOCATIONS

## 5310 - 8 ROW

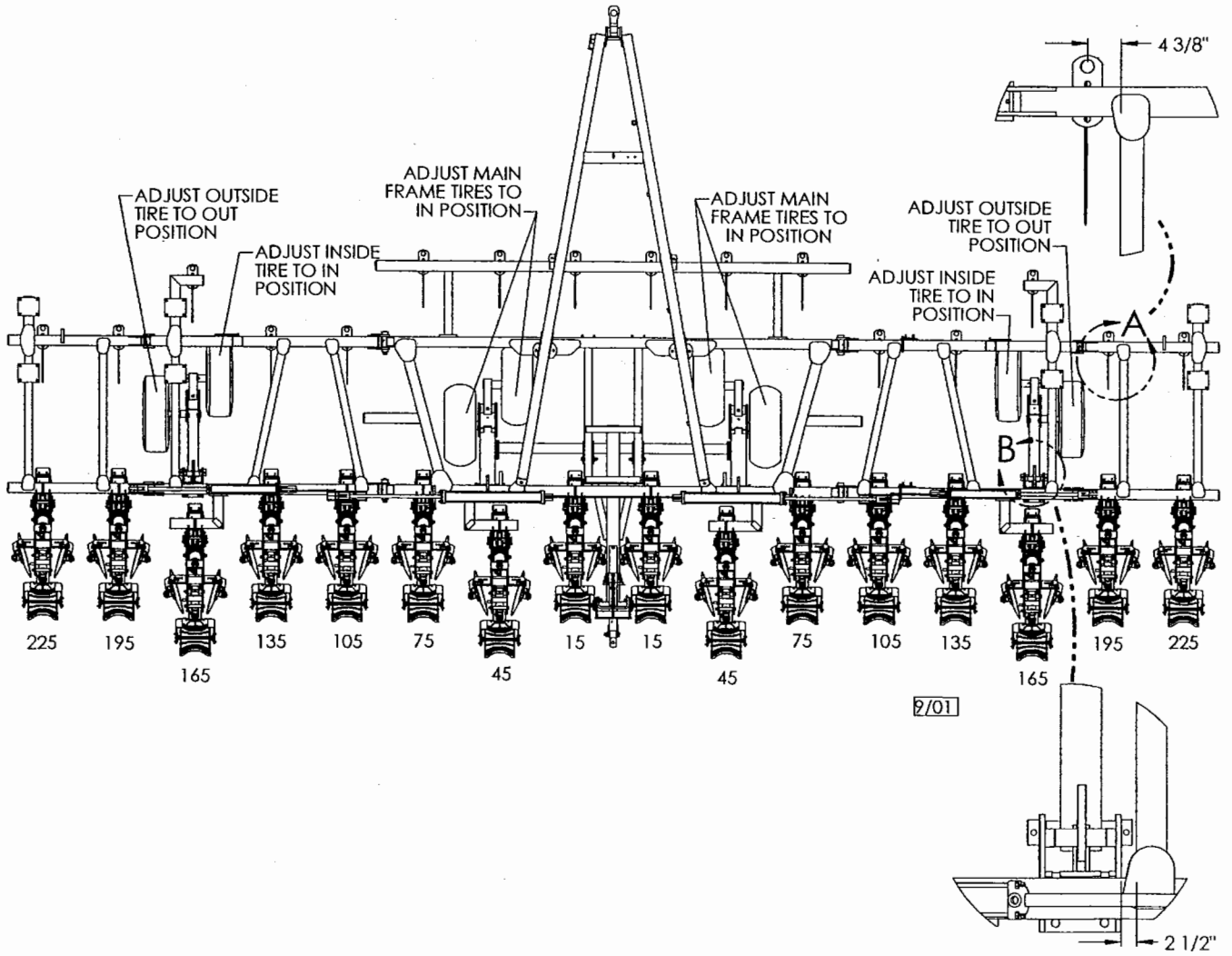


# 5310 - 12 ROW



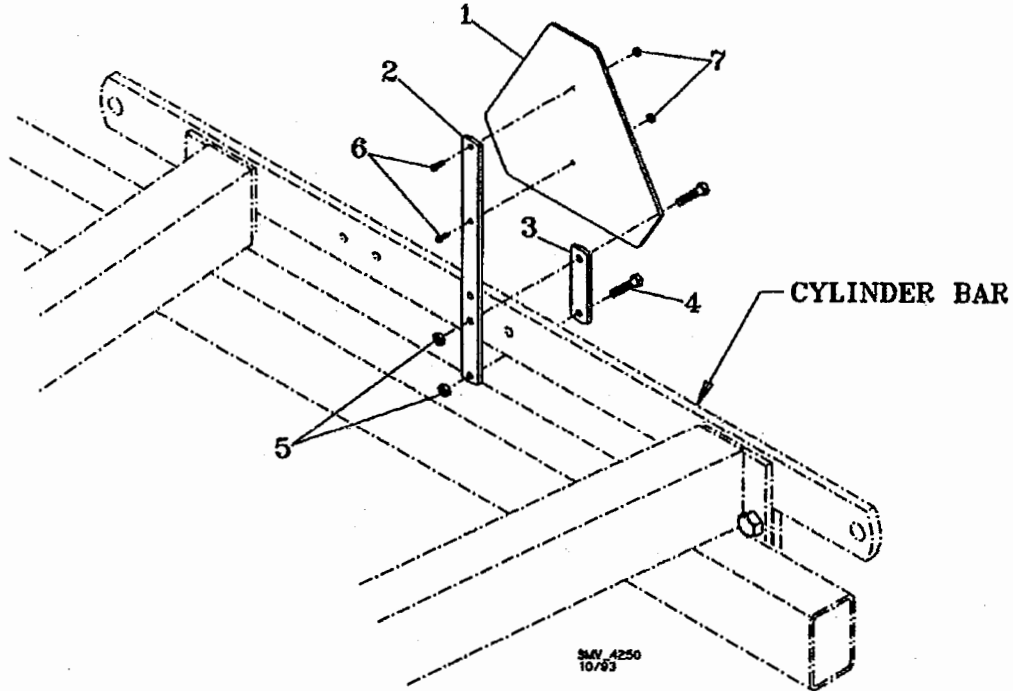
5/01

# 5310 - 16 ROW



# SMV EMBLEM INSTALLATION INSTRUCTIONS

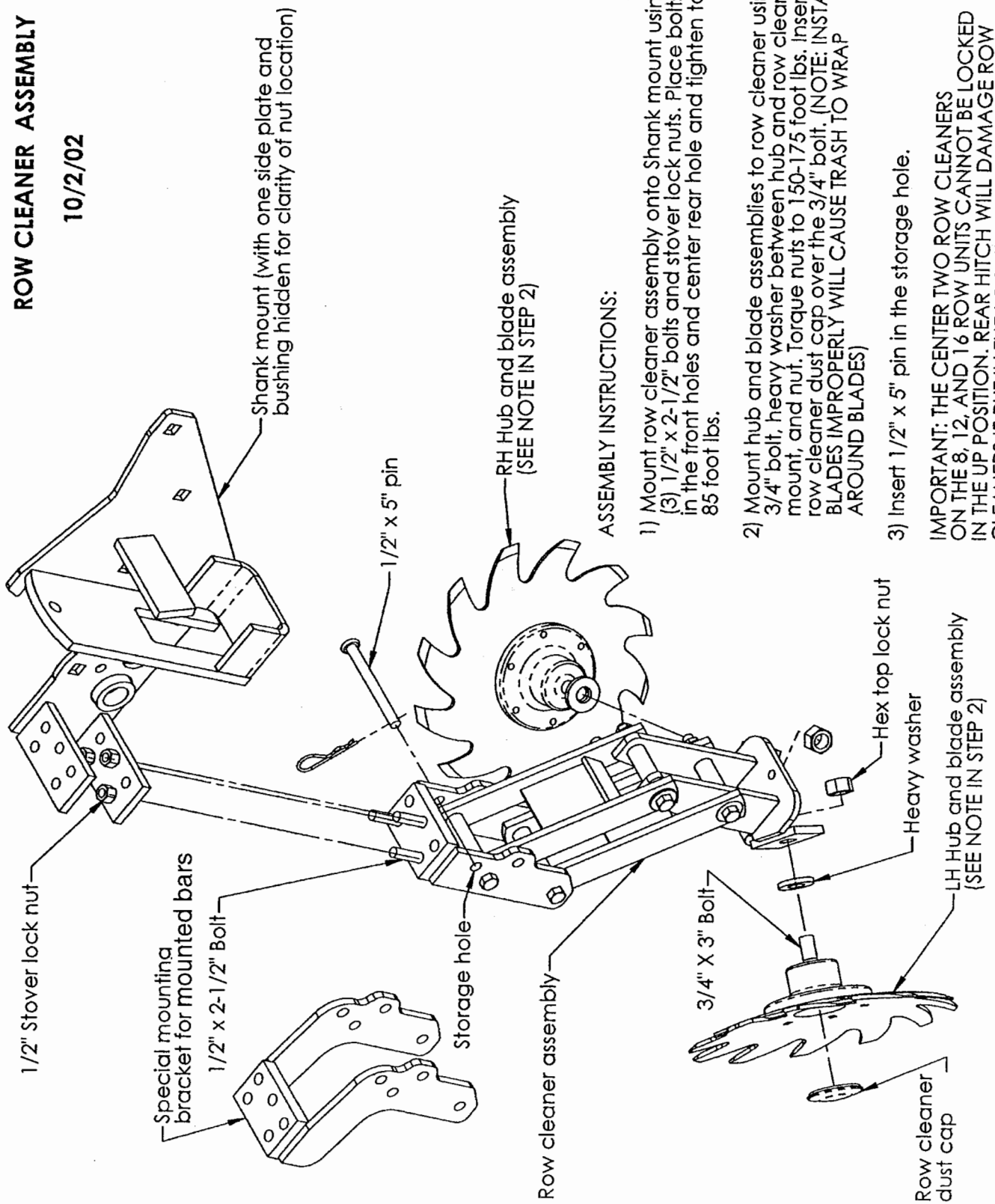
The SMV emblem must be visible when viewing the implement from the rear. Attach the SMV emblem to the rear 3/4" x 4" cylinder bar of the implement. Locate the SMV emblem on the implement centerline or near the centerline on the left side of the implement when viewed from the rear.



1. Assemble SMV emblem (item #1) to SMV bracket (item #2) using 1/4" cap screws (item #6) and 1/4" nuts (item #7).
2. Position SMV emblem and bracket assembly on implement centerline or near the centerline on the left side of the implement when viewed from the rear. Attach assembly to cylinder bar of the main frame with SMV brace (item #3), 3/8" cap screws (item #4) and 3/8" lock nuts (item #5) and tighten hardware.

# ROW CLEANER ASSEMBLY

10/2/02



### ASSEMBLY INSTRUCTIONS:

- 1) Mount row cleaner assembly onto Shank mount using (3) 1/2" x 2-1/2" bolts and stover lock nuts. Place bolts in the front holes and center rear hole and tighten to 85 foot lbs.
- 2) Mount hub and blade assemblies to row cleaner using 3/4" bolt, heavy washer between hub and row cleaner mount, and nut. Torque nuts to 150-175 foot lbs. Insert row cleaner dust cap over the 3/4" bolt. (NOTE: INSTALLING BLADES IMPROPERLY WILL CAUSE TRASH TO WRAP AROUND BLADES)
- 3) Insert 1/2" x 5" pin in the storage hole.

**IMPORTANT: THE CENTER TWO ROW CLEANERS ON THE 8, 12, AND 16 ROW UNITS CANNOT BE LOCKED IN THE UP POSITION. REAR HITCH WILL DAMAGE ROW CLEANERS IF PUT IN THE LOCKED UP POSITION.**

# WARRANTY SECTION

## MISCELLANEOUS WARRANTIES

### CONTINENTAL REGULATOR

All warranty claims must be filed, or regulator sent directly to:

Continental NH3 Products Co., Inc  
Box 5423  
Dallas, Texas 75200  
Phone No. (214) 741-6081

For maintenance, service and operating instructions, see the Continental Operator's Manual.

### PARKER QUICK DISCONNECT COUPLING

All warranty claims must be filed, or coupling sent directly to:

Parker Fluid Connectors  
8145 Lewis Road  
Minneapolis, MN 55427  
Phone No. (612) 544-7781

# WARRANTY

## THREE YEAR LIMITED WARRANTY

The manufacturer warrants to the original purchaser of each new **DMI nutri-till'r** model 5310 unit that the product will be free from defects in material and workmanship for the following periods:

Basic, Main and Wing Frame Weldments.....Three (3) years  
All other components, except tires .....One (1) year

This warranty does not cover replacement parts or tires. Tires on **DMI** equipment are warranted through the respective tire manufacturer. Contact a dealer of the manufacturer in your local area. Parts are warranted to be free of defects in material and workmanship for a period of ninety (90) days from the date of delivery.

This Warranty covers only defective material or workmanship. It does not cover normal wear or maintenance or repair resulting from accident, improper maintenance, improper use, or alteration of the product. The cost of normal maintenance, service, and repair items shall be paid by the owner.

Under this Warranty, the manufacturer shall, at its option, either repair or replace, free of charge, any defective part or parts. The part or parts must be returned to the manufacturer within thirty (30) days from the date of failure through the dealer from whom the product was purchased. Transportation charges are paid. The only remedies are those which are outlined herein. The manufacturer will not be liable for incidental or consequential damages, including, but not limited to, loss of crops, loss because of delay in harvesting, or any expense or loss incurred for labor, supplies, substitute machinery or rental.

This Warranty is subject to any existing conditions of supply which affect the manufacturer's ability to obtain materials or manufacture replacement parts.

The manufacturer reserves the right to make improvements in design or changes in specification at any time, without incurring any obligations to owners of products previously sold.

No one is authorized to alter, modify, or enlarge this Warranty nor its exclusions, limitations, and reservations.

THE FOREGOING WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE.

**TITAN/ARMSTRONG TIRES:** Warranty claims on **nutri-till'r** units equipped with Armstrong ag tires can be filed by contacting your local Titan Tire/Armstrong Ag Tire Dealer or by calling the Armstrong Claim Service at **1-800-219-6239**, for both United States and Canada.

or write to the Company at:

**Titan Tire Corporation**  
2345 E. Market Street  
Des Moines, Iowa 50317