



# **OPERATOR'S MANUAL**

## **WIL-RICH 5 BAR QUAD-5 FIELD CULTIVATOR**

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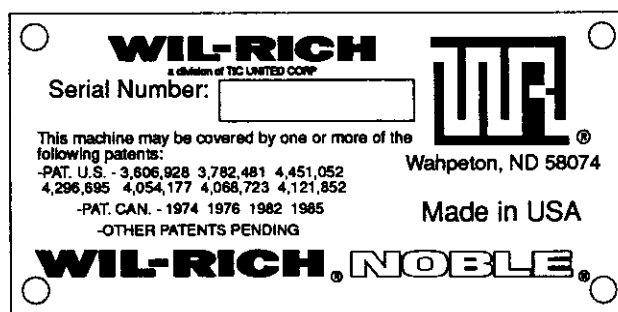
## TO THE OWNER

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It is the responsibility of the user to read the Operator's Manual and comply with the safe and correct operating procedures as pertains to the operation of the product and to lubricate and maintain the product according to the information outlined in the Operator's Manual.

The user is responsible for inspecting his machine, and for having parts repaired or replaced when continued use of the product would cause damage or excessive wear to the other parts.

The word **NOTE** is used to convey information that is out of context with the manual text; special information, and other information of supplementary nature.



When in need of parts, always specify the model and the serial number. Write this number in the space provided. The serial number plate is located on the main frame in the front left corner.

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## MODIFICATIONS

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It is the policy of Wil-Rich Operations to improve its products whenever possible and practical to do so. We reserve the right to make changes, improvements and modifications at any time without incurring the obligation to make such changes, improvements and modifications on any equipment sold previously.

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# **SAFETY**

Safety decals appear at various locations on your machine. These decals are provided for your safety and must be kept clean. Replace any decal that becomes worn, damaged, painted over, or otherwise difficult to read. Replacement decals are available through your Wil-Rich dealer.

## **BEFORE OPERATING**

Use extreme care when making adjustments.

When working under or around the machine always lower shanks to the ground.

After servicing, be sure all tools, parts, or servicing equipment is removed from the machine.

Make sure that there is no one near the machine just before operating and during operation.

Reduce speed when cornering on field ends and when operating on or across dead furrows.

Do not attempt to remove any obstruction while the machine is in motion.

Use extreme care when operating close to ditches, fences, or on hillsides.

No one other than the operator should ride on the tractor.

Before and during operation be sure no one is on or around the implement. Serious injury can result from improper use.

Hydraulic fluid escaping under pressure can have enough force to penetrate the skin. Hydraulic fluid may also infect a minor cut or opening in the skin. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can result if medical treatment is not given immediately. Make sure all connections are tight and that hoses and lines are in good condition before applying pressure to the system. To find a leak under pressure use a small piece of cardboard or wood. Never use your hands.

## **ON-HIGHWAY OPERATION**

Always place the machine in the transport position.

Comply with your state and local laws governing highway safety when moving machinery on a highway.

Reduce road speed on corners.

Drive at a reasonable speed to maintain complete control of the machine at all times.

A S.M.V. emblem must be used at all times while traveling on public roads.



THIS SYMBOL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS CONCERNING YOUR PERSONAL SAFETY. BE SURE TO OBSERVE AND FOLLOW THESE INSTRUCTIONS.



## **WARNING**

1. **BEFORE OPERATING - STUDY THE OPERATOR'S MANUAL, SAFETY MESSAGES AND SAFE OPERATING PROCEDURES, READ ALL SAFETY SIGNS ON THE MACHINE.**
2. **TRANSPORT ON PUBLIC ROADS - OBSERVE FEDERAL, STATE AND LOCAL REGULATIONS: DISPLAY SMV EMBLEM; ATTACH PROPER STRENGTH IMPLEMENT SAFETY CHAIN; AND LIMIT MAXIMUM SPEED TO 20MPH (32KM/H).**
3. **LOWER OR BLOCK ALL ELEVATED COMPONENTS BEFORE SERVICING OR LEAVING THIS MACHINE.**

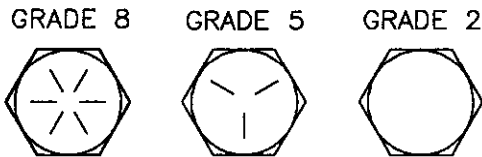
## PREPARATION

Before using the Wil-Rich field cultivator a careful inspection must become routine. A check must be made to insure that all hardware is securely tightened and moving parts properly lubricated.

Tighten all loose nuts and bolts and replace any bent or broken parts.

When tightening bolts, they must be torqued to the proper number of foot-pounds as indicated in the table unless specified. It is important that all bolts be kept tight.

On new machines, all nuts and bolts must be rechecked after a few hours of operation.



TORQUE IN FOOT POUNDS

BOLT DIA	3/8	1/2	5/8	3/4	7/8	1
HEX HEAD	9/16	3/4	15/16	1-1/8	1-5/16	1-1/2
UNC GRADE	2	18	45	89	160	252
	5	30	68	140	240	360
	8	40	100	196	340	528
UNF GRADE	2	21	51	102	178	272
	5	32	70	168	264	392
	8	48	112	216	368	792

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When replacing a bolt, use only a bolt of the same grade or higher.

Bolts with no marking are grade 2.

Grade 5 bolts furnished with the machine are identified by three radial lines on the head.

Grade 8 bolts furnished with the machine are identified by six radial lines on the head.

All U-bolts are grade 5.

## TIRE INFLATION

The use of the proper air pressure is the most important factor in satisfactory performance and maintenance of implement tires. Underinflation will damage the cord body of the tire and cause a series of diagonal breaks in the fabric in the sidewall area.

If the tire buckles or wrinkles, the air pressure should be increased to the point where the sidewalls remain smooth while operating.

Check the air pressure every two or three weeks and do not allow the pressure to drop to a point where buckling or wrinkling of the tire may be possible.

**NOTE: Do not overinflate tires.**

## WHEEL BOLTS

It is recommended that all wheel bolts be checked for tightness before using and again after one day of use. Paint or rust can work out causing the wheel to become loose. Check periodically to be sure the wheel bolts are tight.

## LUBRICATION

Make sure the field cultivator is properly lubricated. (See maintenance, page 12-13.)

## HYDRAULICS

Check lift and wing folding linkages and cylinders for proper alignment and operation. **On any machine check that the hydraulic system has been properly charged and purged.** (See wing lift circuitry and depth control circuitry, page 5 - 7.)

## TRACTOR PREPARATION

Refer to the operator's manual furnished with your tractor for recommended adjustments and weight distribution.

When using a drawn cultivator, the tractor drawbar must always be pinned in the center to allow for more stability.

**NOTE: Check your tractor's hydraulic fluid level after cycling hydraulics and filling new cylinders and lines. Refill if necessary.**

## BEARING ASSEMBLIES

**IMPORTANT:** The spindle nut on the walking tandem hub and spindle assemblies is preset at the factory.

Road transport and field working will seat the bearings and may require additional adjustment.

After 20 hours of machine operation remove the grease cap and check the bearing tightness of these hub and spindles.

Remove the cotter pin and rotate the tire while tightening the spindle nut. Tighten until the drag on the tire assembly stops the tire rotation. Locate the cotter pin hole in the spindle and loosen the spindle nut enough to allow insertion of the cotter pin.

Replace cotter pin and grease cap.

The front gauge wheel yoke type wheel assemblies must be checked after the first 20 hours of machine operation.

Move the unit to a flat area and lower the machine to the ground until the shanks are resting on the ground.

By use of the lift hydraulics slowly retract the main cylinder until the front gauge wheels are off the ground. Grasp the tire and check to see if the wheel is loose. If the tire shows notable side to side play in the bearings the cotter key should be removed from the castle nut on one side of the axle assembly.

Tighten the castle nut while rotating the tire until a slight drag is felt on the tire.

Locate the cotter pin hole in the spindle and loosen the spindle nut enough to allow insertion of the cotter pin.

Replace the cotter pin to lock the spindle nut.

## HITCHING

After backing your tractor into position, attach the cultivator hitch to the tractor drawbar, using a hitch pin of adequate strength for the tractor - cultivator combination. Lock the pin in place to prevent loss (particularly when transporting). It is recommended that a safety chain be used for road transport.

Connect the cultivator's hydraulic hoses to the proper couplers on your tractor.

**NOTE:** An optional pole jack makes the hitching operations easier.

## TRANSPORTING

A S.M.V. (Slow Moving Vehicle) emblem should be used at all times while traveling on public roads.

The implement must always be placed in the transport position and the cylinder channel locks (Fig. 4) used when traveling on public roads. Never depend on your tractor's hydraulic system to carry the weight of the implement while transporting.


**NOTE:** Use extreme caution when working around overhead power transmission lines.

**NOTE:** Use a low tractor throttle when unfolding wings.

**NOTE:** Always install lock channels in the main lift cylinders for road transport (see fig. 4).

Reduce speed when cornering and when traveling over rough and/or uneven ground. Drive at a reasonable speed to maintain complete control of the machine at all times.

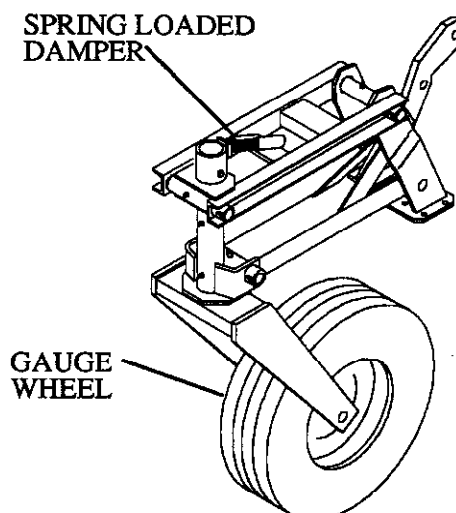
Comply with your state and local laws governing highway safety when moving machinery on a highway.

 <b>CAUTION</b>	FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY AND/OR EQUIPMENT DAMAGE.	
	<ul style="list-style-type: none"><li>● JUST BEFORE AND DURING OPERATION BE SURE NO ONE IS ON OR AROUND THE IMPLEMENT.</li><li>● BEFORE ACTIVATING THE HYDRAULIC SYSTEM, CHECK HOSES FOR PROPER CONNECTIONS.</li></ul>	<ul style="list-style-type: none"><li>● BEFORE LOWERING THE WINGS FOR THE FIRST TIME, MAKE SURE THE ENTIRE SYSTEM HAS BEEN CHARGED WITH OIL.</li><li>● WITH WINGS DOWN ALWAYS INSTALL HYDRAULIC CYLINDER CHANNEL LOCK(S) FOR TRANSPORTING.</li></ul>

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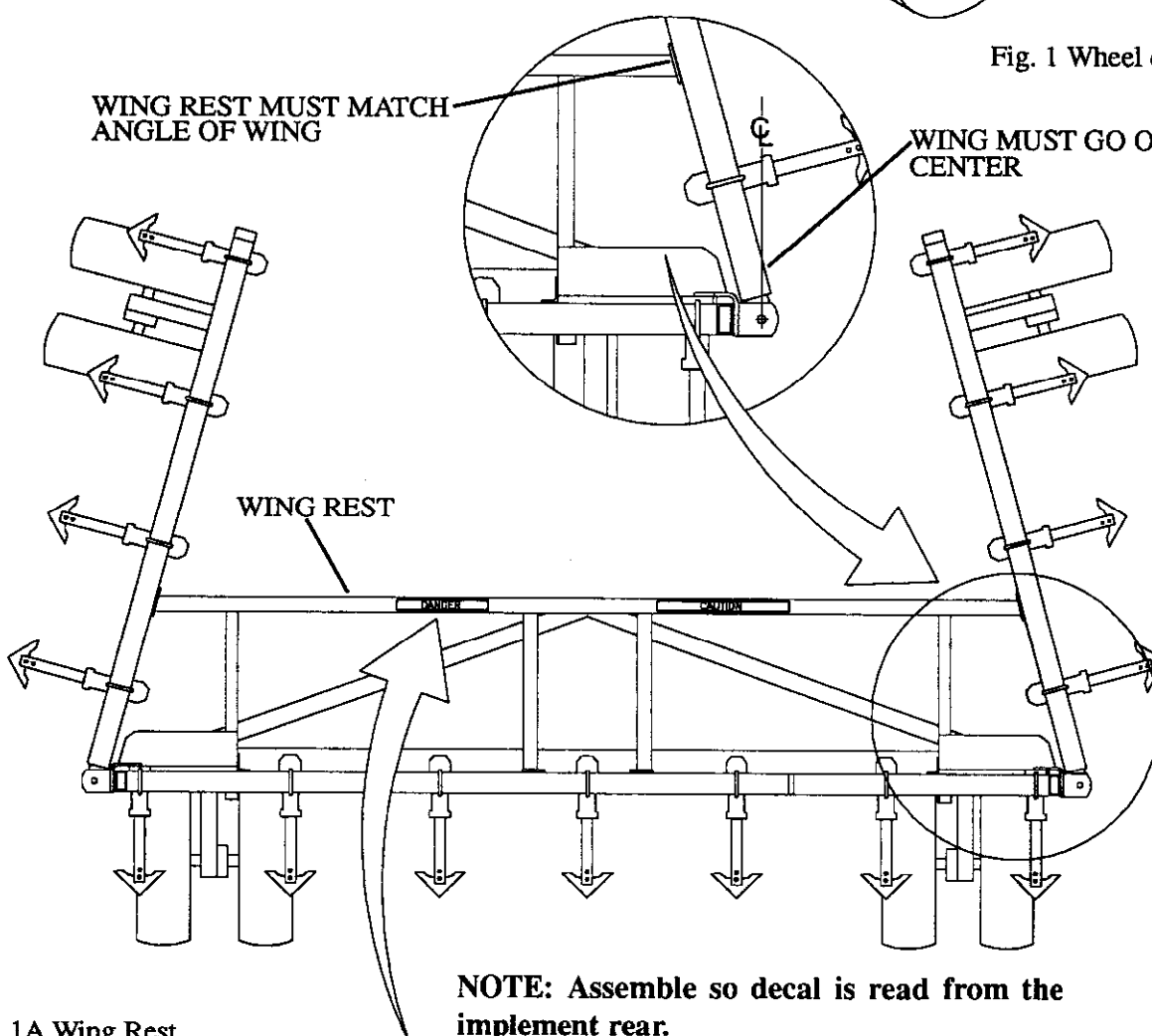
## MAIN FRAME GAUGE WHEEL DAMPER

The main frame front gauge wheels are equipped with a spring loaded damper to hold the wheel straight in transport. When transporting units with heavy rear attachments the unit may not have sufficient weight on the front gauge wheels to prevent oscillation. The spring damper will prevent this oscillation and allow transport at normal tractor speeds. **IMPORTANT** - This spring damper will not function unless the unit is in the fully raised position. This means the main lift cylinders must be fully extended for the dampers to work. Failure to raise the unit fully can cause transport stability problems. (See Fig 1.)



CI-78312

Fig. 1 Wheel damper



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Fig. 1A Wing Rest

	<p><b>⚠ DANGER</b></p> <p>STAND CLEAR AT ALL TIMES:</p>	<ul style="list-style-type: none"> <li>• Never walk or stand in the path of the wings.</li> <li>• Completely lower the wings before performing service or adjustments.</li> <li>• Failure to do so will result in serious injury or death.</li> </ul>	<p><b>ASSEMBLE SO DECAL IS READ FROM THE IMPLEMENT REAR.</b></p>
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# WING LIFT CIRCUITRY

Wing equipped Wil-Rich field cultivators have hydraulic wing lift cylinders to fold the implement for road transport.

Wing lift cylinders are equipped with an integral restrictor on the rod end cylinder port (see fig. 2). This allows the wings to lower at a slower rate and prevents the wings from falling too fast should there be some type of hydraulic failure.

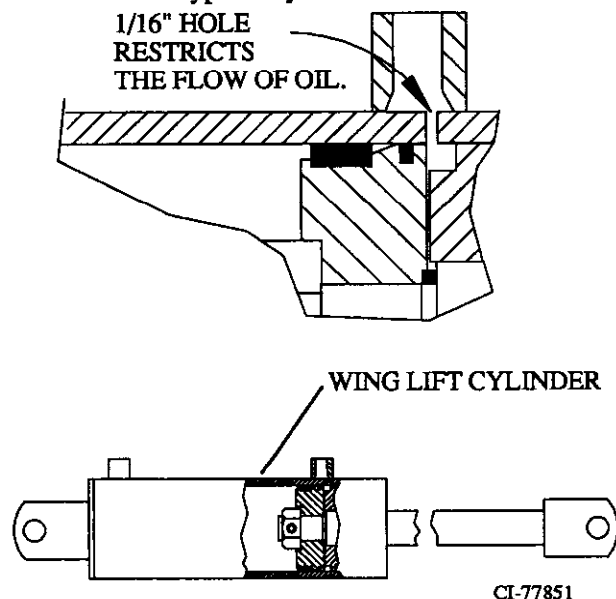


Fig. 2 Wing Lift Cylinder

Fig. 3 shows a simple two (2) cylinder circuit used to fold a pair of wings. This system is used on Wil-Rich cultivators with a single pair of folding

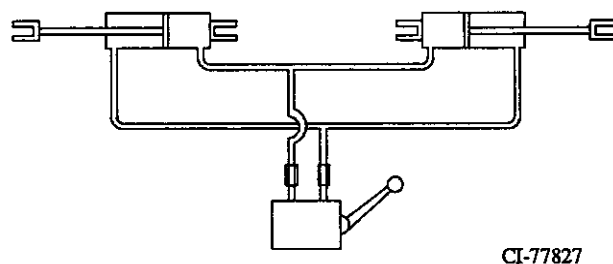


Fig. 3 Two Cylinder Wing Lift Circuit

When lowering the wings, hold the tractor control lever until all cylinders are completely extended. Fully extending the cylinders allows the wings to flex properly in the field.

When raising the wings be sure the wing rest is properly positioned to allow the wings to fold. Fold the main wings until they contact the wing rest.

Fig. 3A shows a simple four (4) cylinder circuit used to fold a pair of wings. This system is used on Wil-Rich Quad 5 field cultivators with a single pair of 9'4" or 11' 8" folding wings.

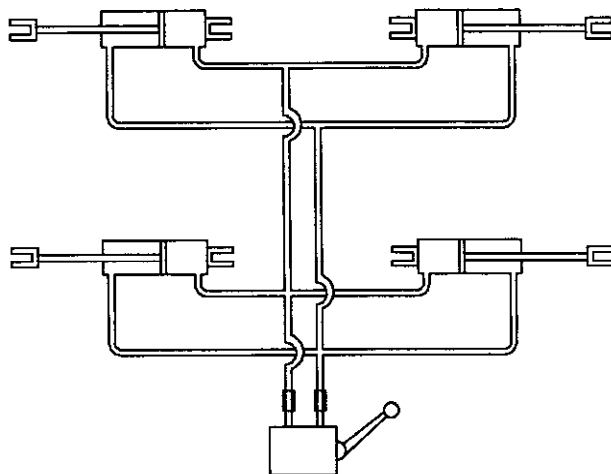


Fig. 3A Four Cylinder Wing Lift Circuit

When lowering the wings, hold the tractor control lever until all cylinders are completely extended. Fully extending the cylinders allows the wings to flex properly in the field.

When raising the wings be sure the wing rest is properly positioned to allow the wings to fold. Fold the main wings until they contact the wing rest.

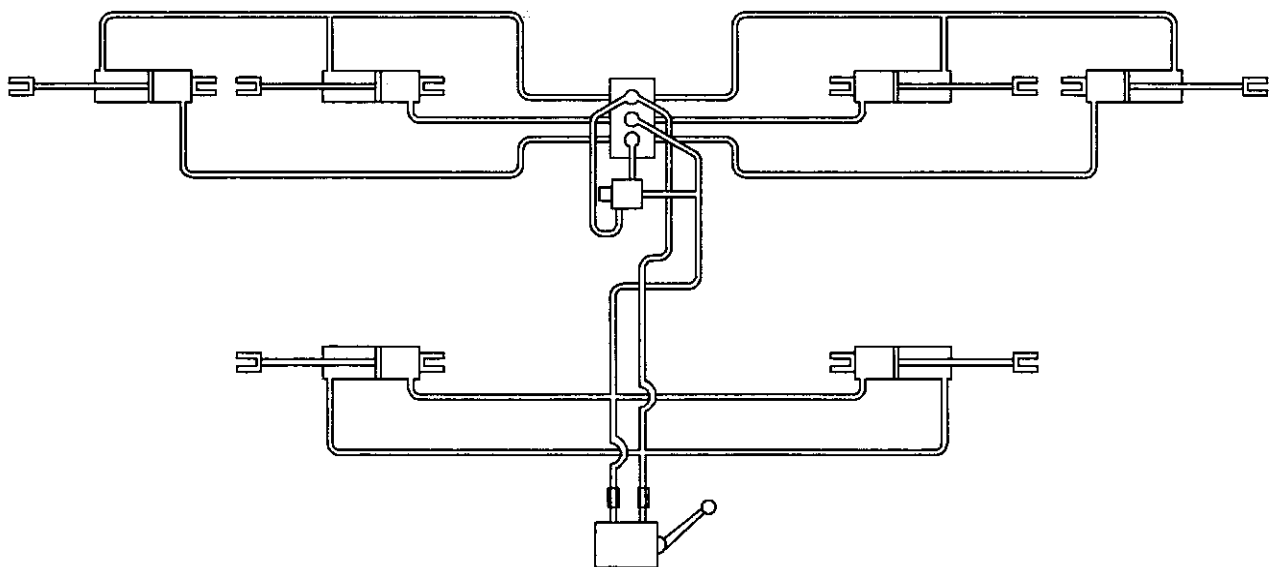
Units equipped with a folding outer stub wing require a sequencing valve in the hydraulic fold circuitry.

The valve is connected as shown in the hydraulic assembly instructions. Correct assembly is critical for proper operation.

The sequencing valve is intended to retard the unfolding of the outer wings until the inner wings have been completely unfolded.

The sequencing valve should not effect the folding of the inner or outer wings. If the outer wings start to unfold before the inner wings have completely unfolded the valve needs to be adjusted. Loosen the valve adjustment locking nut on the valve and, using an allen wrench, turn the adjust bolt in or clockwise. This will raise the pressure needed to sequence the valve. Readjust valve as needed to ensure complete unfolding of the inner wing before the outer wings unfold. Secure setting with the lock nut.

Hydraulic system pressure and volume will vary between tractors and may require occasional readjustment of this valve.



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Fig. 3B 4 Cylinder Wing Lift Circuitry  
w/2 Cylinder Outer Wing Circuitry



## MAIN FRAME DEPTH ADJUSTMENT

The main frame depth on the Wil-Rich Quad-5 field cultivator is regulated by a pair of 9.3" stroke by-pass hydraulic cylinders located at the front corners of the main frame. See Fig. 4.

**NOTE:** Frame depth control cylinders need to be installed with the rod end of the cylinder to the front of the machine. See Fig. 4.

The top by-pass cylinders have adjustable mechanical depth stop collars. The stop collars are rotated on the cylinder rod to vary the retracted length of the cylinder, providing the means to adjust the working machine depth.

The main frame depth is mechanically set by turning the stop collar "DOWN" the cylinder rod for decreased working depth and "UP" the cylinder rod for increased working depth. An add-on stop collar is provided in situations where the cylinder rod stop collar does not allow a shallow enough setting. See Fig. 4.

**NOTE:** Proper field operation is dependent upon the main frame cylinders being first to contact the mechanical stops. If a wing cylinder stop contacts first the leveling function of the system will not function properly.

**NOTE:** The cylinder stop collars on the main frame depth control cylinders must be set equally- failure to do so can twist the main axle and cause axle failure. Measure the collar locations or count the number of turns each collar is rotated to ensure they are set the same.

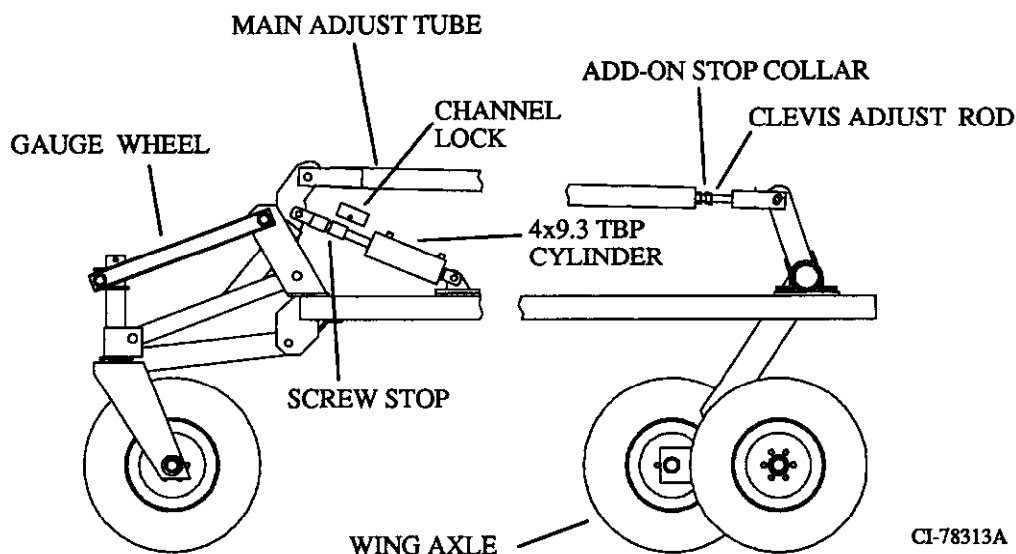


Fig. 4 Main Frame Adjustment

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## WING DEPTH ADJUSTMENT

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The operational depth of the wing is set by use of a slave cylinder located at the front corners of the wing. These 8" stroke cylinders are connected in series with the main frame top by-pass cylinders. See Depth Control Circuitry, Fig. 7.

**NOTE:** Stop collars are used to set total machine depth. Adjustments required to level the wings relative to the main frame are made with the wing adjust rod - located at the outer front corners of the wings. (See Fig. 5)

To set the wing axle, the wing adjust rod is made shorter or longer. Lengthening the adjustment will raise the wing relative to the main frame. By adjusting the wing adjust rod shorter the wing will be lowered relative to the main frame. See Fig. 5.

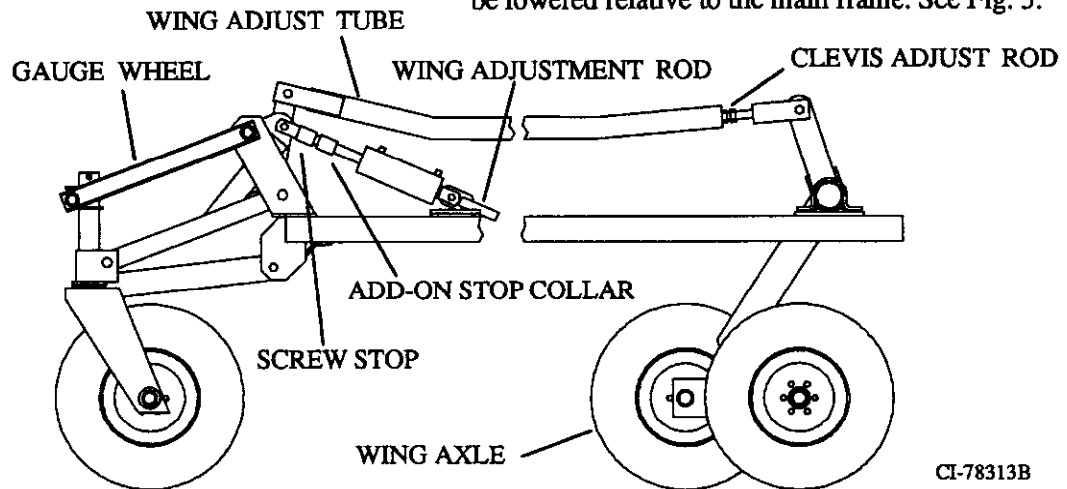


Fig. 5 Wing Adjustment

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## DEPTH CONTROL CIRCUITRY

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The depth control cylinders are hooked in series. Each cylinder is a top by-pass cylinder and when fully extended will pass oil by the piston into the next cylinder charging the system.

Top by-pass cylinders will by-pass oil when the cylinder is fully extended. This by-pass condition will exist when the implement is raised to maximum ground clearance. At this time oil will pass through the 1/16" dia. by-pass hole and go on to the next cylinder. (See fig. 6).

**NOTE:** This system requires periodic raising of the unit and holding of the tractor valve to expel air or contaminants.

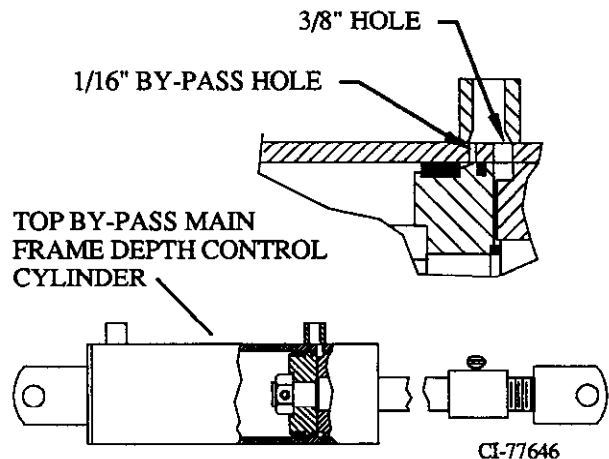


Fig. 6 Top By-pass Cylinder

**NOTE:** To synchronize or re-synchronize the by-pass system, the tractor control valve is held in the raised position until the entire implement is raised and any air that may be in the lines has been expelled.

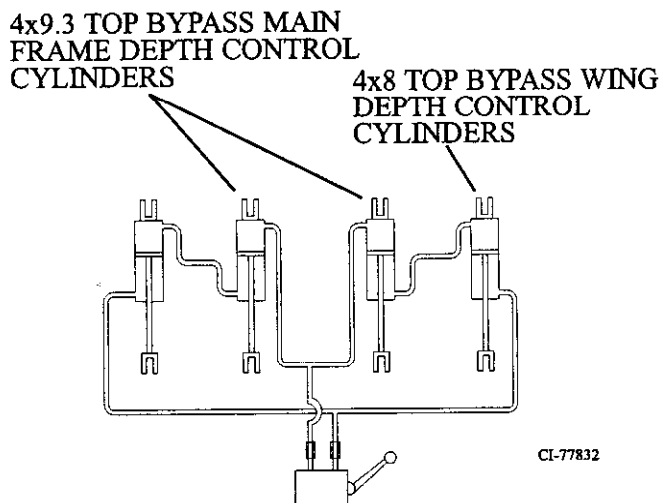


Fig. 7 Single Wing Depth Control Circuit

## LEVELING

The operational levelling of the Quad-5 floating hitch machine must be done in a level area of the field. Final front to rear and side to side leveling is done at working depth. Preliminary settings can be made in the yard to speed up the field setting operation.

This unit is equipped with a free floating hitch. This hitch acts as a linkage between the tractor and the field cultivator. The operational depth of the unit is controlled by the front gauge wheels and the rear walking tandem or single tire axles. Both the main frame and the wings will need to be adjusted for front to rear level and side to side level.

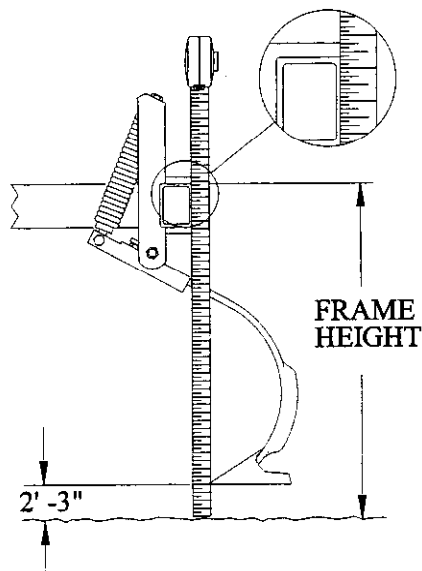


Fig. 8 Frame Height

## PRELIMINARY SETTINGS

Proper preliminary and field settings will require the use of a measuring device. Once the unit has been properly assembled and hitched to the tractor, **make certain the hydraulic system has been charged.**

Position the unit on a level area of ground and unfold the wings, **checking to ensure there are no people or obstructions in the path of the wings.**

**NOTE:** Cycle the main lift hydraulics a number of times to remove air in the system. Holding the hydraulic lever in the "raise" position will remove unwanted air from the circuit.

Lower the unit to the ground so that the front row of shanks on the main frame are 2"-3" above the ground.

Measure the main frame height from the ground to the top of the front frame tube and compare this to the distance from the ground to the top of the rear tube on the rear bar of the main frame. See Fig 8.

If the rear bar is higher than the front move to the front gauge wheel area and adjust the main adjust tube.

Loosen the jam nut and turn the threaded adjust rod out to lengthen the main adjust tube. See Fig. 9.

By lengthening this connection between the front gauge wheels and the rear axle, the rear of the machine will be lowered.

If the rear tube of the main frame is lower than the front the threaded adjust rod will need to be made shorter.

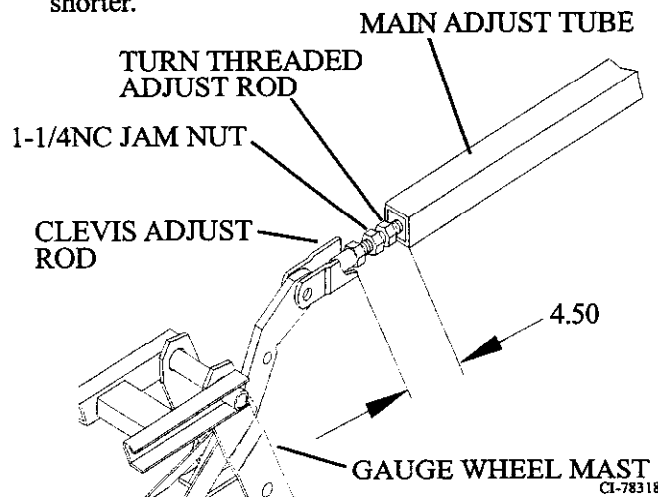


Fig. 9 Main Frame Leveling - Front to Rear

## FIELD SETTINGS

**NOTE: If the clevis adjust rod is difficult to turn, lower the unit to the ground to remove the weight from the linkage.**

Repeat this procedure on both sides of the main frame, checking to ensure that the main adjust tubes are the same relative length. See Fig. 9.

Retighten the jam nuts on the threaded adjust rods when final settings are reached.

Once the main frame is level front to rear, cycle the main lift hydraulics and lower the unit so the main frame shanks are 2"-3" above the ground.

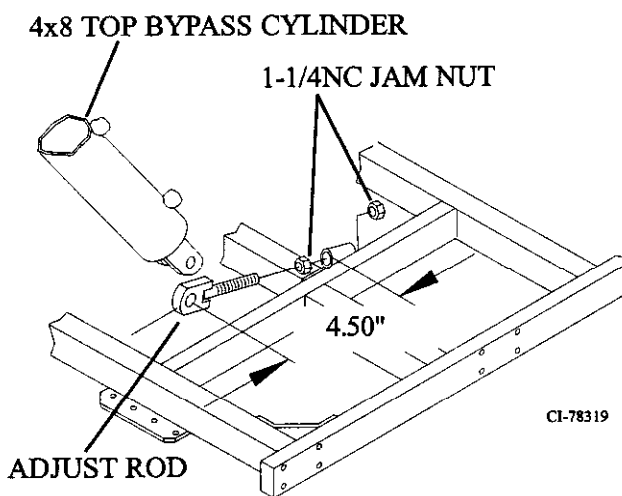


Fig. 10 Wing Depth Adjustment

Measure the distance from the ground to the top of the front tube at the outer corner of the wing. If the wing is lower at that point than the main frame, loosen the nuts at the adjust rod at the front corner of the wing. See Fig. 10.

To raise the wing relative to the main frame turn the front nut down the threaded rod to raise the wing. (See Fig. 10) If the wing is high relative to the main frame turn the nut up to lower the wing.

Once the wing is level to the main frame move to the rear wing axle and adjust the front to rear level of the wing. See Fig. 11.

By turning the threaded adjust rod as was done on the main frame the rear axle can be brought to correct level. Measure the height of the rear corner of the wing, compare to the rear corner of the main frame and adjust as needed. Once adjustments are made as needed tighten all jam nuts.

Once the preliminary settings have been made in the yard there should be minimal field adjustments required. It should never be assumed that since the unit is level in the yard it will operate level in the field. All final adjustments should be made in the field at operating depth.

Move to the field, unfold the wings and remove the transport channel locks from the main lift cylinders. Turn all screw stop collars on the main and wing lift cylinders up to the clevis end of the cylinder rod. Move forward and lower the unit into the field. Stop and check the depth of the shanks on the front bar of the main frame.

By use of the cylinder screw collars and stop collars provided, set the front main frame depth. Make certain that the two main frame lift cylinders are set the same.

Move to the rear and measure the shank depth at the rear bar. By use of the main adjust tube as noted above adjust rear axle to get the desired rear shank depth.

Raise the unit out of the ground, cycle the main lift hydraulics and drop the unit back to operating depth. Move to the front corner of each wing and check the working depth of the front shanks.

If needed, use the threaded adjust rod at the front corner of the wing to adjust depth, **DO NOT attempt to use the screw collar of the wing lift cylinder to adjust the depth.**

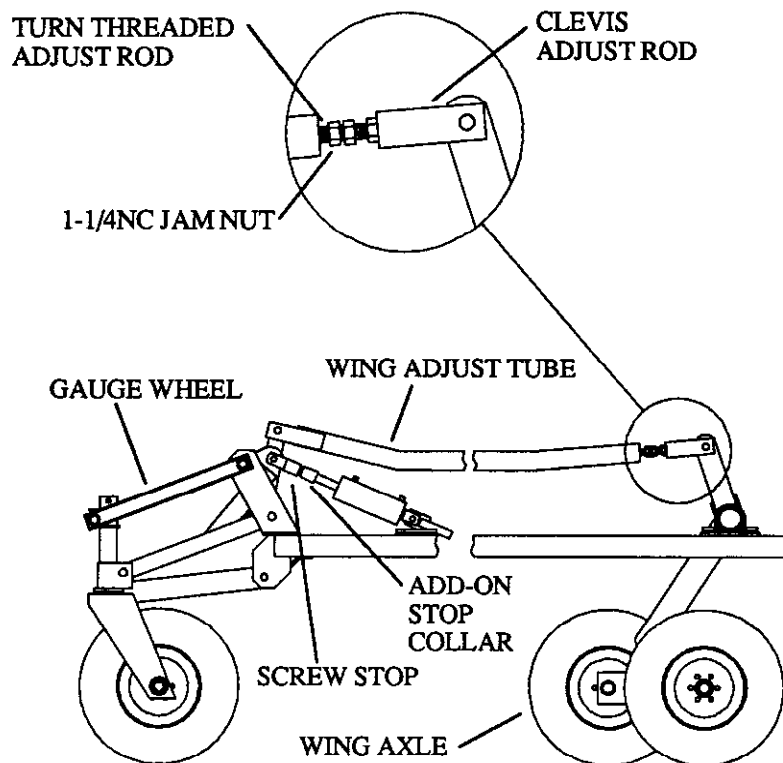
Once the front shanks are at the desired depth use the wing adjust tube to adjust the rear axle, setting the shanks on the rear of the wing to the desired depth.

Repeat the process for the other wing and secure all adjustments with the jam nuts. Raise and cycle the lift hydraulics and lower back to working depth.

Depth should be reached when the main frame lift cylinder screw collars contact the cylinder end plate. With the main frame cylinders resting on the screw stops you may turn the screw collars on the wing lift cylinders to just contact the cylinder end plate.

Level operation should be maintained throughout the field. It should be noted that any attachments or extra weight mounted on these units will effect the over-all level working of the unit.

As field conditions drastically change you may need to readjust the front to rear level of the unit.



CI-78313

Fig. 11 Hydraulic Wing Adjustment

**NOTE:** Make sure all tires are equally inflated.

**NOTE:** It is important that all of the stop collars contact the cylinder end plates when at working depth. If all the stop collars fail to contact the cylinders at the same time, the first to contact will stop the lowering of the machine and the remaining cylinders will not be positively locked.

## SHANK ADJUSTMENT

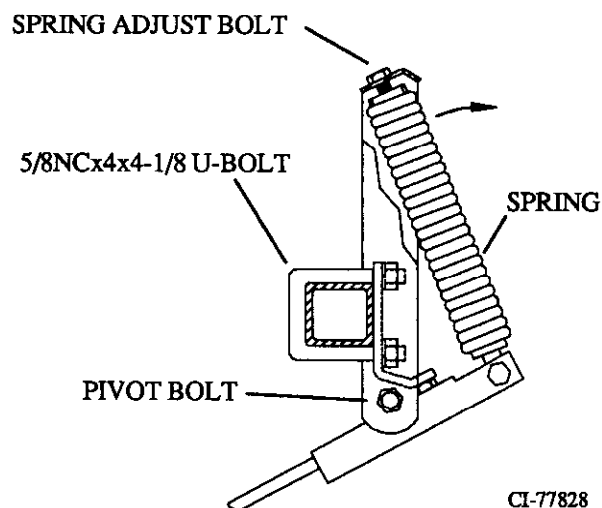
Each shank comes fully assembled from the factory. Install the shanks in their proper location (See assembly manual for shank placement.) and securely tighten U-bolt nuts.

It is recommended that a 47° stem angle shovels be used on all shank assemblies.

**NOTE:** Spring adjust bolt should be tightened just enough to crack the paint between spring coils.

The mounting bolts, U-bolts and shank bolts should all be checked after a few days work and kept tightened.

The shank pivot bolt must not be overtightened, but kept tight enough to allow free movement of the shank.



CI-77828

Fig. 13 Shank Assembly

Wil-Rich field cultivators are also available with twin spring or hi-torque shank assemblies. The twin spring shank assemblies are recommended for heavy duty use. (See Optional Equipment page 12).

**NOTE:** Be sure to maintain adequate tire/shovel clearance on shanks located in and around the wheel well when machine is fully raised or lowered.

## MAINTENANCE

Periodic checks must be made to assure that all nuts and bolts remain securely tightened. Loose hardware is easily bent or lost and can cause excessive wear on parts. Replace any bent or broken bolts as soon as they are discovered.

Clean off any dirt or grease that may accumulate on moving parts at regular intervals. This will prevent any abrasive action which could cause excess or premature wear. Thoroughly inspect the implement for loose or broken parts and adjust or replace as necessary.

It is important that the implement be regularly lubricated as recommended to obtain the most efficient operation. Proper lubrication helps prevent down-time due to excessive wear and increase machine life.

### CYLINDER SHAFTS

If cylinder shafts are left exposed for any extended period of time, they should be coated with grease to protect them from rust and corrosion.

### AXLE CAPS

All axle caps should be greased once a day with a good quality grease. Lower machine onto the shovel points to relieve pressure on the caps which will make greasing easier. (See fig. 14.)

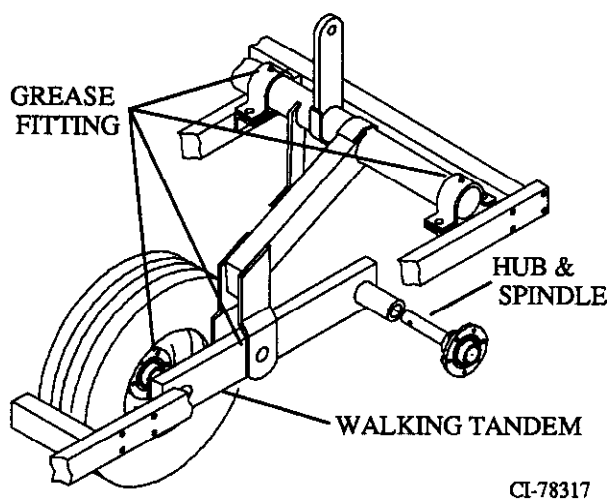


Fig. 14 Walking Tandem

### HUB AND SPINDLE ASSEMBLIES

Each hub and spindle assembly comes with a grease fitting installed in the hub. These must be greased once a week during steady useage. **Caution - do not over grease.**

Clean and re-pack hub and spindle bearings once each season.

Tighten spindle nut so that there is a slight drag on the wheel when turned by hand (See page 3).

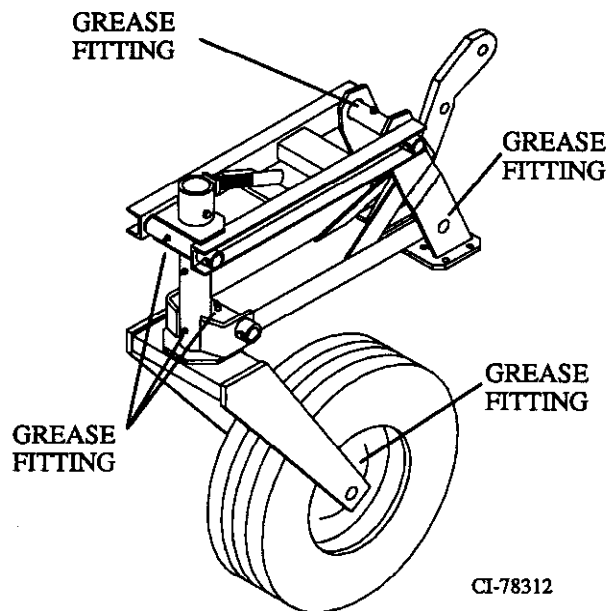


Fig. 15 Gauge Wheel

### WALKING TANDEM ASSEMBLIES

Periodically check each walking tandem assembly for looseness and tighten spindle nut if the bearings show any evidence of side play.

Clean and re-pack walking tandem assemblies once each season.

The spindle nut should be tightened to allow a heavy drag when assembly is rotated by hand (See fig. 15).

## OPTIONAL EQUIPMENT

### HYDRAULICS

Inspect all hydraulic hoses and fittings for cracks and abrasion at least once a year. Tighten or replace as needed.

When connecting the hoses to the cylinders, tubing, or fittings; always use one wrench to prevent the hose from twisting and another wrench to tighten the union. Excessive twisting will shorten the hose life.

Do not over-tighten hydraulic fittings, excessive torque may cause them to crack.

Care must be taken to prevent twisting when tightening hose connections. Straighten any hose that appears twisted immediately. A twisted hose can burst under operating pressure.

### STORAGE

**NOTE: If possible store your cultivator inside.**

At the end of a season, clean the implement thoroughly to remove any trash, soil or dirty grease which could hold moisture and cause premature rusting. Repaint any chipped, bare, or rusted areas to prevent any further deterioration. Inspect the machine for any worn or broken parts and adjust or replace as required.

*See your Wil-Rich dealer for any parts and/or service which may be needed.*

Thoroughly lubricate all grease fittings at the end of the season's use and again before the first operation of the next season.

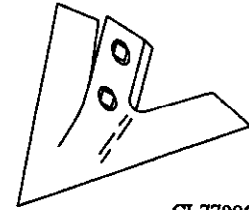
It is advisable, if possible, to store larger field cultivators with the wings down. With the wings completely lowered, the rod end cylinder pins of the wing lift cylinders should be removed and the cylinders carefully retracted.

Avoid possible damage to the hydraulic system by lowering the machine onto the shanks and relieve the pressure on the system. Doing this will also prevent damage to the tires by removing the field cultivator's weight.

Coat the shovels with grease and place boards under the points to prevent the shovels from settling into the ground.

### SHOVELS

Shovels should be used for general tillage, seedbed preparation and weed eradication.



CI-77905A

4" Shovel (924)

7" High Crown Shovel

9" High Crown Shovel

9" Dura-Face Sweep

7" Low Crown Shovel (924)

9" Low Crown Shovel (924)

10" Low Crown Shovel (924)

12" Low Crown Shovel (924)

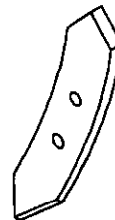
10" High Crown FC Shovel

12" High Crown FC Shovel

**NOTE: Wil-Rich shanks have a 52° shank angle and a 47° sweep angle is recommended.**

### SPIKES

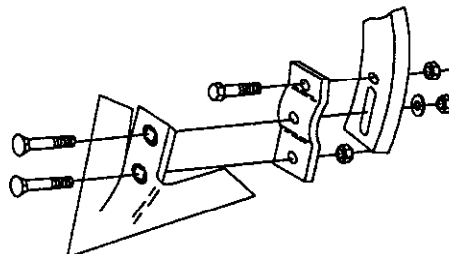
Spikes are recommended for deep penetration, hard soil conditions, killing of quack grass and other grassy weeds, and also for general tillage. These spikes are reversible for longer wear.



CI-77905B

### SHOVEL EXTENSION

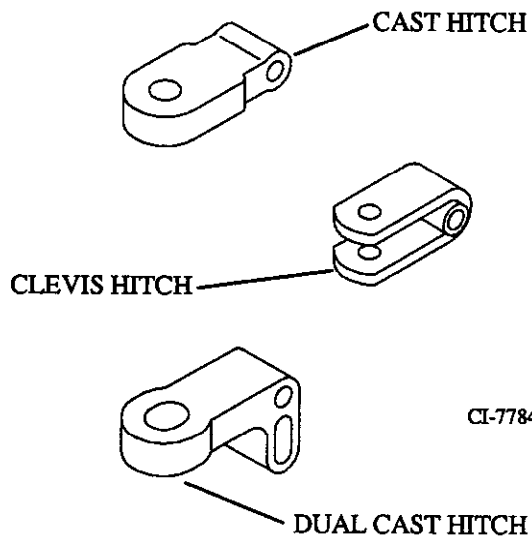
A shovel extension kit is available to increase shovel penetration behind wheel tracks.



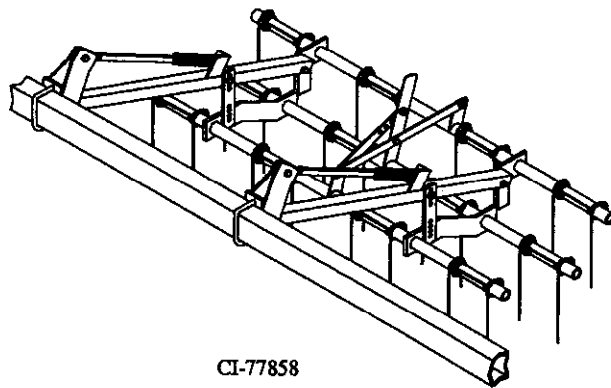
CI-77905C

## SHANK ASSEMBLIES

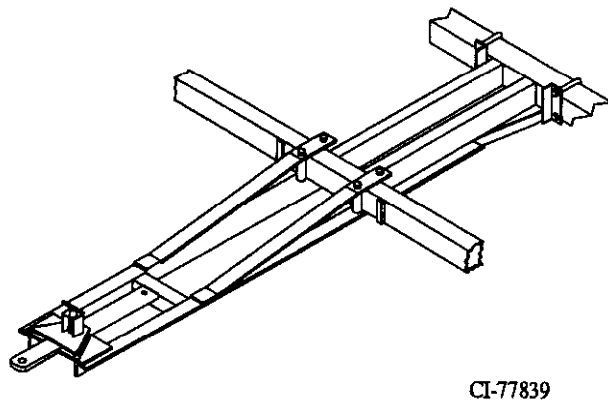
### HITCHES



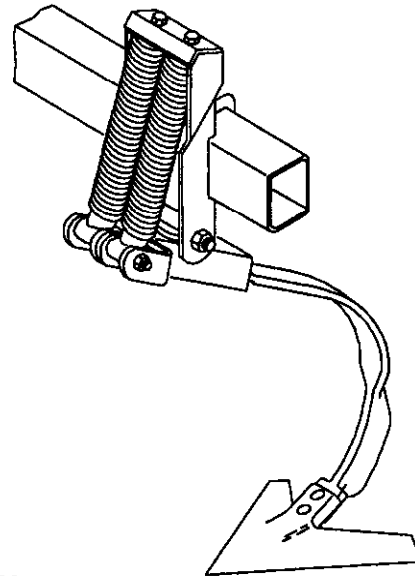
### HARROWS



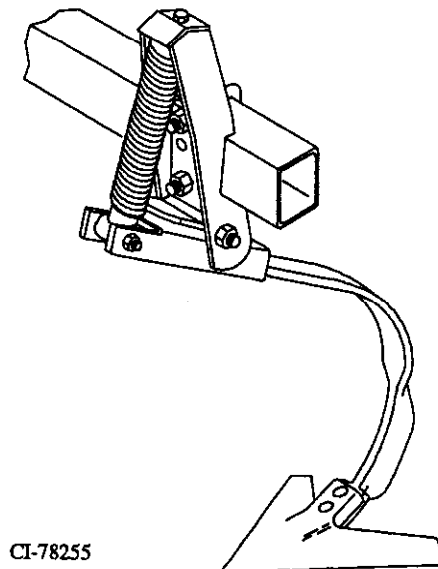
### AUXILIARY HITCH



### EDGE FORMED TWIN SPRING SHANK



### EDGE FORMED HI-TORQUE SHANK





## **TROUBLE SHOOTING**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Poor or uneven penetration.	<p>Incorrect leveling adjustments on main frame or wings.</p> <p>Sweeps with incorrect stem angle.</p> <p>Hydraulic malfunction - air in lines, cylinders or hoses leaking or not installed properly.</p> <p>Tires not equally inflated.</p>	<p>See leveling, page 9-11.</p> <p>See page 13.</p> <p>Make sure wing cylinders are fully extended.</p> <p>Check for oil leakage in cylinders, hoses and fittings. Make sure all hydraulic cylinders and hoses are properly connected.</p> <p>See tire inflation, page 2.</p>
Settling of entire implement from raised position.	<p>Leaking cylinder.</p> <p>Leaking tractor hydraulic control valve.</p>	<p>Replace cylinder seals.</p> <p>See tractor manual.</p>
Wings unfolding too rapidly.	Incorrect cylinder installed, should have 1/16" dia. integral restrictor cylinder.	See Wing Lift Circuitry page 5 & 6 and install correct cylinder.
Machine will not pull straight, (skewing).	<p>Cultivator not level.</p> <p>Incorrect shank placement.</p> <p>Tires not equally inflated.</p>	<p>See Leveling page 9-11.</p> <p>Check shanks for proper location, see Assembly Manual.</p> <p>See tire inflation, page 2.</p>
Main frame gauge wheel vibrates during transport.	Main frame lift cylinder not fully extended.	Make sure main frame lift cylinders are fully extended. See page 4.
Wings running at different depths after setting.	Jam nut on clevis adjust rod has loosened.	Reset wing height and tighten jam nut. See page 8.