

OPERATOR'S MANUAL

WIL-RICH 3400 3-SECTION FIELD CULTIVATOR

WIL-RICH WARRANTY

The only warranty Wil-Rich gives and the only warranty the dealer is authorized to give is as follows:

We warrant products sold by us to be in accordance with our published specifications or those specifications agreed to by us in writing at time of sale. Our obligation and liability under this warranty is expressly limited to repairing, or replacing, at our option, within 12 months after date of retail delivery, any product not meeting the specifications. WE MAKE NO OTHER WARRANTY, EXPRESS OR IMPLIED AND MAKE NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR PURPOSE. Our obligation under this warranty shall not include any transportation charges or costs or installation or any liability for direct, indirect or consequential damage or delay. If requested by us, products or parts for which a warranty claim is made are to be returned transportation prepaid to our factory. Any improper use, operation beyond rated capacity, substitution of parts not approved by us, or any alteration or repair by others in such manner as in our judgement affects the product materially and adversely shall void this warranty. NO EMPLOYEE OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY.

Wil-Rich reserves the right to make improvement changes on any of our products without notice.

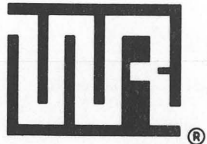
WHEN WARRANTY LIMITED OR NOT APPLICABLE: Warranty on hoses, cylinders, hubs, spindles, or other trade accessories are limited to the warranties made by the respective manufacturers of these components. Rubber tires and tubes are warranted directly by the respective tire manufacturer only, and not by Wil-Rich.

Warranty does not apply to any machine or part which has been repaired or altered in any way so as in our judgement to affect its reliability, or which has been subject to misuse, negligence or accident.

A DELIVERY REPORT FORM MUST BE FILLED OUT AND RECEIVED BY WIL-RICH TO INITIATE THE WARRANTY COVERAGE.

WARRANTY CLAIMS PROCEDURE

1. The warranty form must be returned to Wil-Rich within fifteen (15) working days from the repair date.
2. Parts returned to Hutchinson Wil-Rich Manufacturing Company without authorization will be refused. The parts must be retained at the dealership for ninety (90) days after the claim has been filed. If the Service Department would like to inspect the parts, a packing slip will be mailed to the dealer. The packing slip must be returned with the parts. The parts must be returned prepaid within thirty (30) days of receiving authorization. After the parts are inspected and warranty is verified, credit for the return freight will be issued to the dealer.
3. Parts that will be scrapped at the dealership will be inspected by Wil-Rich Sales Representatives, District Sales Managers or Service Representatives within the ninety (90) day retaining period.



WIL-RICH·NOBLE®

HUTCHINSON WIL-RICH MANUFACTURING COMPANY
BOX 1030 • WAHPETON, NORTH DAKOTA 58074

WARRANTY VALIDATION AND DELIVERY REPORT

Your new machine is covered by a warranty that appears in your Operator's Manual. To initiate the warranty, this certificate must be completed at the time of delivery and promptly returned to Hutchinson Wil-Rich Manufacturing Company.

IMPORTANT: FAILURE TO DO SO WITHIN 10 DAYS, OR PROVIDING FALSE INFORMATION ON THIS REPORT, WILL INVALIDATE THE WARRANTY.

NOTE: ALL FOLLOWING INFORMATION IS IMPORTANT AND IS KEPT AS A PERMANENT RECORD. PLEASE PRINT OR TYPE ALL DATA.

COMPLETE UNIT DESCRIPTION _____
(Include model description and size of unit)

SERIAL NUMBER _____ DELIVERY DATE _____

DEALER _____ OWNER _____

ADDRESS _____ ADDRESS _____

CITY _____ CITY _____

STATE _____ ZIP CODE _____ STATE _____ ZIP CODE _____

NAME OF DISTRIBUTOR _____
(If Applicable)

1. The equipment is set up properly and is in good operating condition.

2. Owner has been instructed by the dealer in the proper use of all safety devices. Owner has also been informed of all safety warnings on the equipment and has been advised to read the Operator's Manual.

3. Owner has received instructions by the dealer on the proper field adjustment and maintenance procedures.

4. Owner has received the proper Operator's Manual and has been advised to read the same before operating the equipment.

Owner's Signature _____ Date _____

Dealer's Signature _____ Date _____


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TO THE OWNER

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 such as specifications, techniques, reference information, and other information of supplementary nature.

<input type="radio"/>	Hutchinson Wil-Rich Manufacturing Company Wahpeton, ND Made in U.S.A.	<input type="radio"/>
	Serial Number: <input type="text"/>	
		
	This machine may be covered by one or more of the following patents:	
	-PAT. U.S. - 3,606,928 3,782,481 4,451,052 4,296,695 4,054,177 4,068,723 4,121,852	
	-PAT. CAN. - 1974 1976 1982 1985	
<input type="radio"/>	-OTHER PATENTS PENDING	<input type="radio"/>

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

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.

PERSONAL SAFETY IS IMPORTANT !!

**ALL PERSONNEL INVOLVED WITH THE ASSEMBLY
AND/OR OPERATION OF THIS EQUIPMENT MUST BE
INFORMED OF PROPER SAFETY PROCEDURES.**

**OPERATOR'S AND ASSEMBLY MANUALS PROVIDE
THE NECESSARY INFORMATION.**

**IF A MANUAL IS LOST FOR A PARTICULAR IMPLEMENT,
A REPLACEMENT SHOULD BE ORDERED AT ONCE.**

**OPERATOR'S AND ASSEMBLY MANUALS ARE AVAILABLE
AT NO CHARGE UPON REQUEST.**

ADDRESS INQUIRIES TO:

HUTCHINSON WIL-RICH MANUFACTURING COMPANY

P.O. BOX 1030

WAHPETON, ND 58074

(701) 642-2621

Safety decals appear at various locations on your machine. These decals are provided for your safety and should 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.



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. Relieve pressure before disconnecting the lines or performing other work on the hydraulic system. To find a leak under pressure use a small piece of cardboard or wood. Never use hands.

ON-HIGHWAY OPERATION

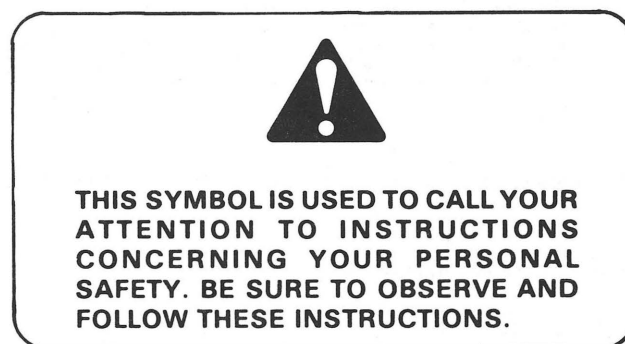
Always place the machine in the transport position.

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 should be used at all times while traveling on public roads.



PREPARATION

PREPARATION

Before using the Wil-Rich field cultivator a careful inspection should become routine. A check should 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 should 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 should be rechecked after a few hours of operation.



GRADE 8



GRADE 5



GRADE 2

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	2	18	45	89	160	320
	G 5	30	68	140	240	544
	R 8	40	100	196	340	792
UNF	A 2	21	51	102	178	368
	D 5	32	70	168	264	572
	8	48	112	216	368	840

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

Bolts with no markings 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.

BEARING ASSEMBLIES

Bearing assemblies should be checked periodically for looseness. A loose bearing will cause costly damage after a short period of time.

LUBRICATION

Make sure the field cultivator is properly lubricated. (See Maintenance, page 10-11.)

HYDRAULICS

Check lift and wing folding linkages and cylinders for proper alignment and operation. On new machines check that the hydraulic system has been properly charged and purged. (See wing lift circuitry and depth control circuitry, pages 5-6.)

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 should always be pinned in the center to allow for more stability.



CAUTION

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY AND/OR EQUIPMENT DAMAGE.

● **JUST BEFORE AND DURING OPERATION BE SURE NO ONE IS ON OR AROUND THE IMPLEMENT.**

● **BEFORE ACTIVATING THE HYDRAULIC SYSTEM, CHECK HOSES FOR PROPER CONNECTIONS.**

● **BEFORE LOWERING THE WINGS FOR THE FIRST TIME, MAKE SURE THE ENTIRE SYSTEM HAS BEEN CHARGED WITH OIL.**

● **REMOVE AND STORE THE WING LOCK PINS BEFORE LOWERING WINGS.**

● **WITH WINGS DOWN, ALWAYS INSTALL HYDRAULIC CYLINDER CHANNEL LOCK(S) FOR TRANSPORTING.**

22126

NOTE: CHECK YOUR TRACTOR'S HYDRAULIC FLUID LEVEL AFTER CYCLING HYDRAULICS AND FILLING NEW CYLINDERS AND LINES. REFILL IF NECESSARY.

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 HIT-CHING OPERATIONS EASIER.

TRANSPORTING

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

The implement should always be placed in the transport position and the cylinder channel locks (Fig. 6) 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. 6).

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.

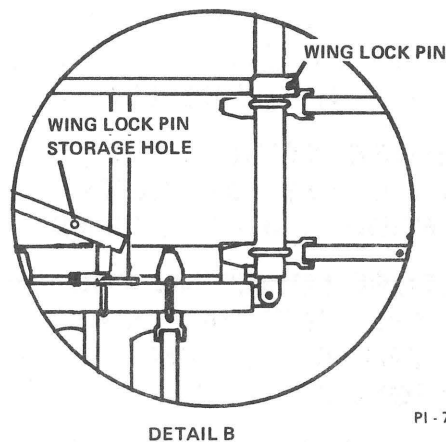
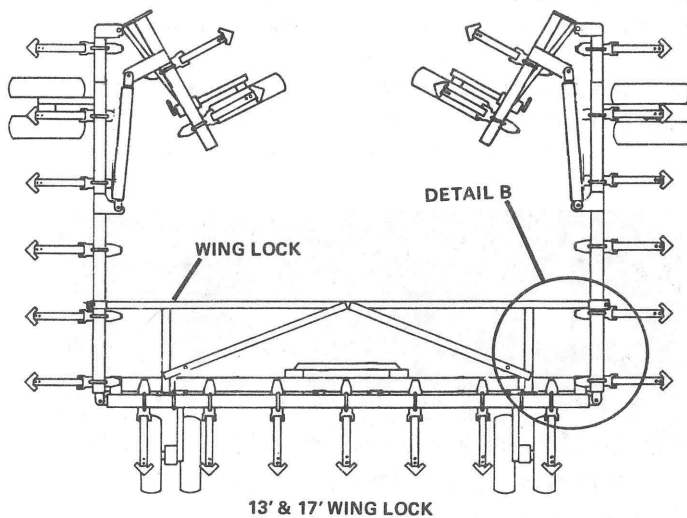
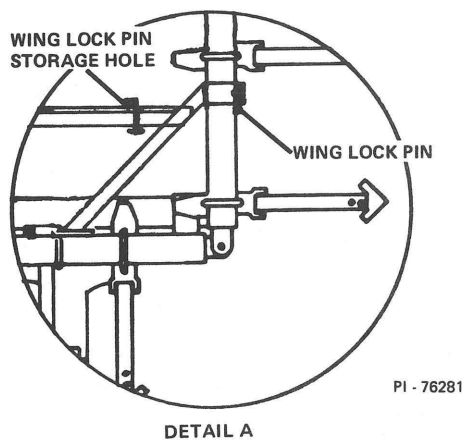
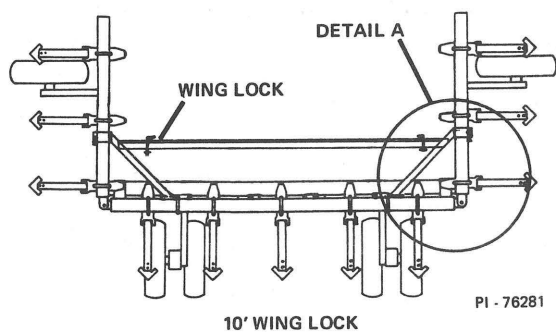


Fig. 1 Wing Lock 10' Main Frame

Fig. 2 Wing Lock 13' & 17' Main Frame



- FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY AND/OR EQUIPMENT DAMAGE.
- JUST BEFORE AND DURING OPERATION BE SURE NO ONE IS ON OR AROUND THE IMPLEMENT.
- REMOVE AND STORE WING LOCK PINS BEFORE LOWERING WINGS.
- NEVER FORCE THE REMOVAL OF A WING LOCK PIN. CHECK ALL HYDRAULIC AND MECHANICAL WING CONNECTIONS BEFORE REMOVING A TIGHT PIN.
- ALWAYS INSTALL WING LOCK PINS BEFORE TRANSPORTING OR STORING.

22125



STAND CLEAR AT ALL TIMES. NEVER WALK OR STAND IN THE PATH OF THE WINGS. COMPLETELY LOWER WINGS BEFORE PERFORMING SERVICE OR ADJUSTMENTS. FAILURE TO DO SO CAN RESULT IN SERIOUS INJURY OR DEATH.

ASSEMBLE SO
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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. 3). 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.



CAUTION

THIS CYLINDER HAS AN INTEGRAL RESTRICTOR ORIFICE AND MUST BE REPLACED WITH AN IDENTICAL CYLINDER.

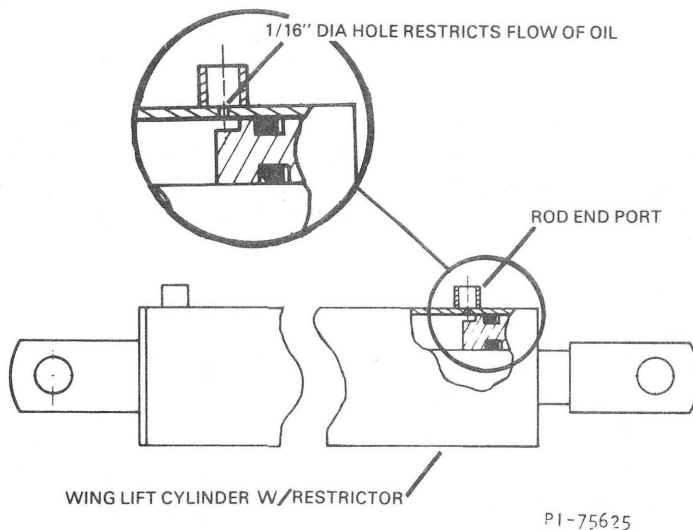
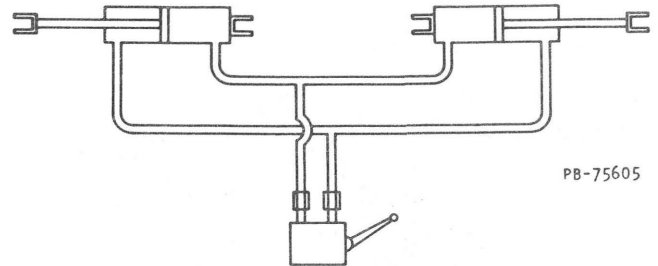


Fig. 3 Wing Lift Cylinder

Fig. 5 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 wings.



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Fig. 5 Two Cylinder Wing Lift Circuit

Multiple wing cultivators use a parallel hydraulic system as shown in Fig. 4. Pressure flows to all cylinders at once through a common line from the tractor. The cylinders or pairs of cylinders with the least amount of weight to lift will actuate first.

This type of hydraulic system properly sequences the folding and unfolding of the cultivator wings. Check that your hydraulic system is properly connected before operating.

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 lock(s) is properly positioned to allow the wings to fold and that the wing lock pins have been removed and stored. Fold the main wings until they contact the clevis and install wing lock pins.

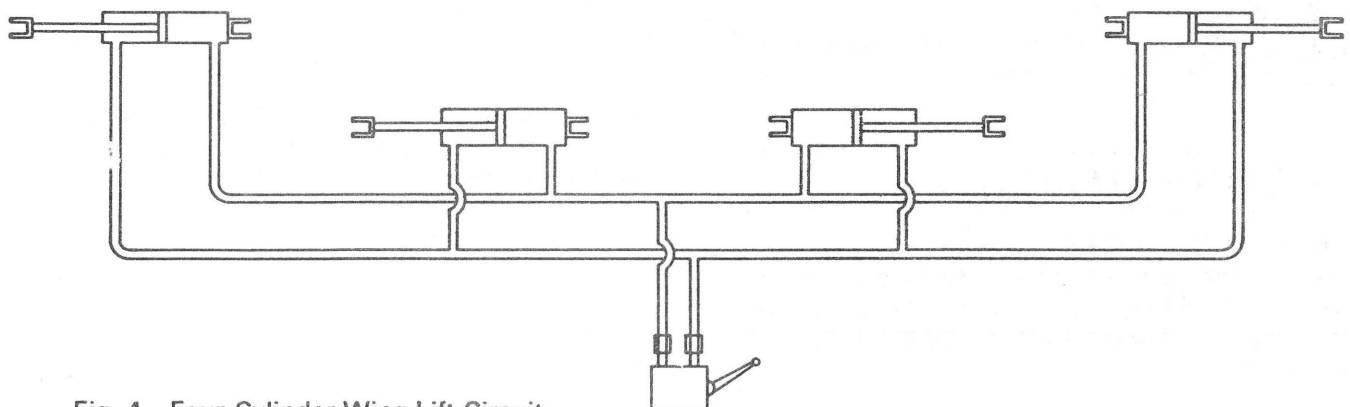


Fig. 4 Four Cylinder Wing Lift Circuit

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MAIN FRAME DEPTH ADJUSTMENT

Main frame depth on the Wil-Rich 3400 3-Section series field cultivator is regulated by a pair of top bypass hydraulic cylinders (see Fig. 6).

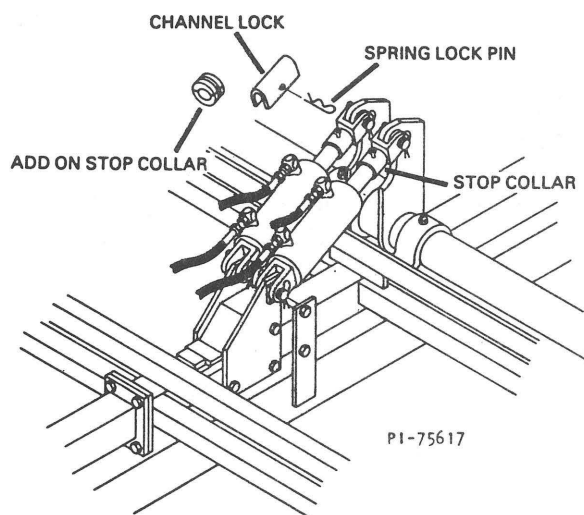


Fig. 6 Main Lift Cylinders

The top bypass cylinders have mechanical depth stop collars. The stop collar is rotated on the cylinder rod to vary the retracted length of the cylinder; thereby providing an easy means of depth adjustment.

The depth is mechanically set by turning the stop collar "down" the cylinder rod for less depth, and "up" the rod for more depth. An add-on stop collar is provided in case the stop collar doesn't provide a shallow enough setting (see Fig. 6).

NOTE: PROPER FIELD OPERATION IS DEPENDENT UPON THE MAIN FRAME CYLINDERS BEING THE FIRST TO CONTACT THE MECHANICAL STOPS. STOPPING ON A WING CYLINDER FIRST CAN RESULT IN IMPROPER ACTION OF THE HYDRAULIC SYSTEM.

NOTE: IT IS IMPORTANT TO SET THE CYLINDER STOP COLLARS EQUALLY WHEN THE MAIN FRAME HAS TWO DEPTH CONTROL CYLINDERS.

WING DEPTH ADJUSTMENT

Wing depth is hydraulically set by a slave or bypass cylinder located on each wing axle. These cylinders are connected in series with the top bypass depth control cylinders located on the main frame (see Hydraulic Depth Control Circuitry, Fig 9).

NOTE: STOP COLLARS ARE USED TO SET MACHINE DEPTH. ADJUSTMENTS REQUIRED TO LEVEL THE WINGS ARE MADE WITH THE ADJUSTMENT ROD.

To set the wing axle, the adjustment rod is turned either in or out. Lower the cultivator until its weight is supported by the shanks. Turning the adjustment rod "into" the adjustment tube will lower the wing and turning it "out" will raise the wing (see Fig. 7).

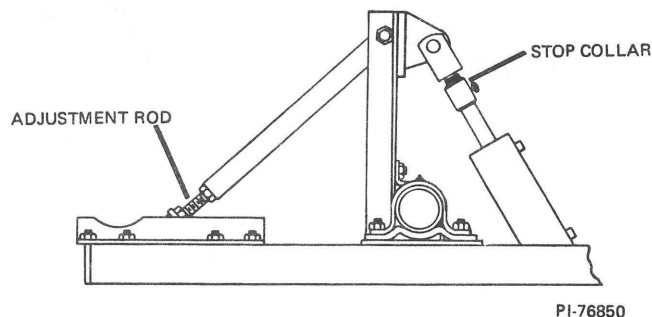


Fig. 7 Wing Axle Adjustment

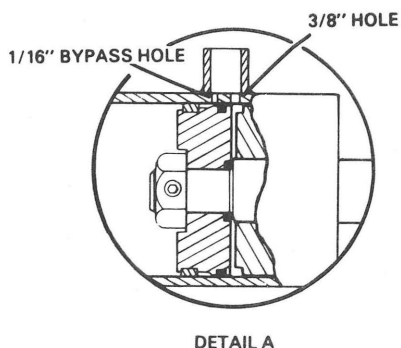
Wing depth is determined by the main frame stop collar setting. After the main frame and wings are leveled and at working depth the wing axle stop collars should be turned down against the cylinder body to mechanically lock the depth setting.

DEPTH CONTROL CIRCUITRY

The top by-pass cylinders are connected in series and therefore to charge the lines between the cylinders the cylinders have the capability of by-passing oil past the cylinder piston to the next cylinder.

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. 8).

NOTE: THIS SYSTEM REQUIRES PERIODIC RAISING OF THE UNIT AND HOLDING OF THE TRACTOR VALVE TO EXPEL AIR OR CONTAMINANTS.



DETAIL A

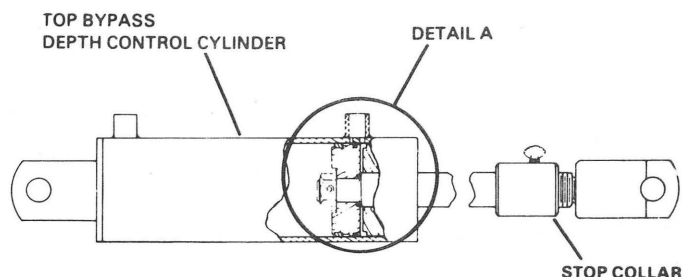


Fig. 8 Top Bypass Cylinder

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.

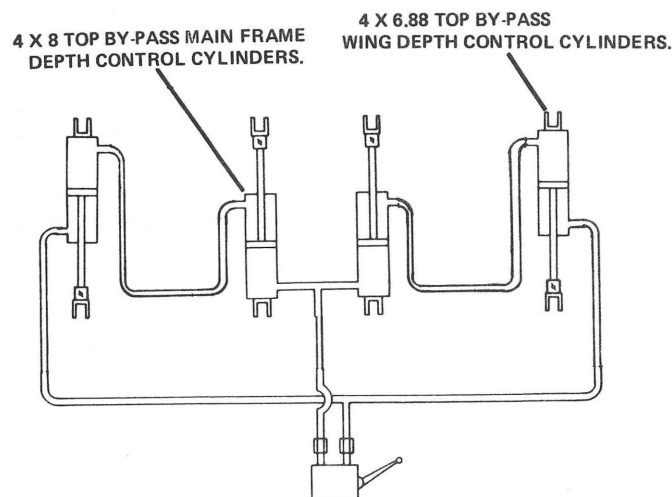
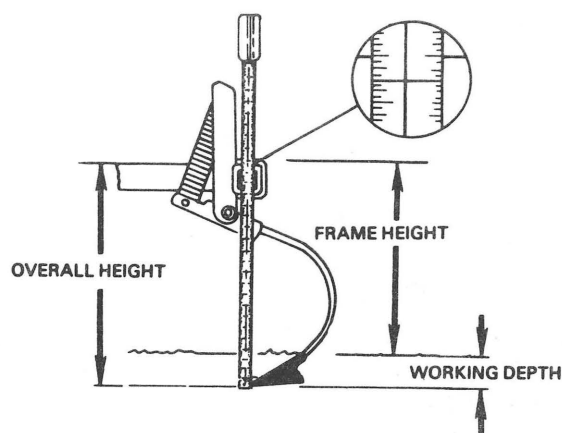


Fig. 9 Single Wing Depth Control Circuit

Proper field setting will require the use of a tape measure.

Although final leveling must be done in a level area of the field at working depth, it would be to your advantage to make pre-field adjustments in the yard to speed up the process in the field.

Hook the tape measure under the shovel point and measure to the top of the frame tube to get an overall height dimension. Subtract your working depth from the overall height dimension to arrive at a frame height dimension. The frame height dimension is then used as a gauge to level the machine (see Fig. 10).



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Fig. 10 Frame Height

LEVELING - MAIN FRAMES

Set the hitch so the top of the pole is equal to the frame height dimension. The hitch is adjusted by removing the hitch bolt and moving the hitch to the next hole (see Fig. 11).

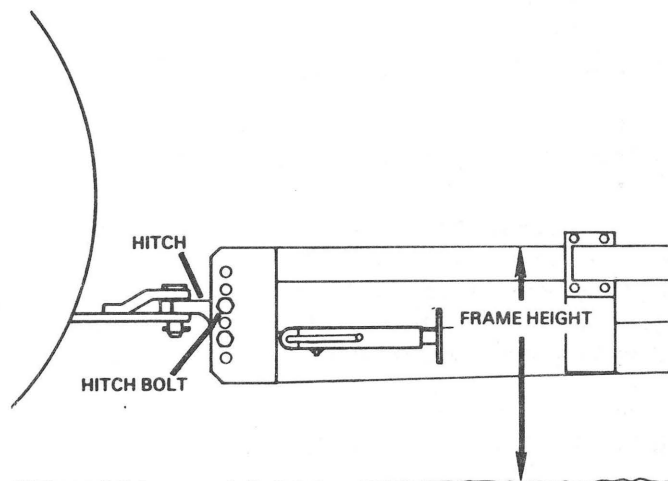


Fig. 11 Hitch

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LEVELING

NOTE: ON MACHINES EQUIPPED WITH A DUAL CAST HITCH, FLIPPING THE HITCH OVER WILL PROVIDE A FINER ADJUSTMENT THAN MOVING IT TO THE NEXT SET OF HOLES. (AN ADJUSTMENT OF 1" IS OBTAINED INSTEAD OF 2").

NOTE: WHEN MOUNTING THE DUAL CAST HITCH, SEPARATE, WHERE POSSIBLE, THE TWO HITCH BOLTS TO PROVIDE MAXIMUM SUPPORT (SEE FIG. 11).

Wil-Rich 3400 series field cultivators use two main lift cylinders to set the main frame to your frame height dimension. When set at working depth, turn the stop collars down against the cylinder body to lock the depth setting (see Fig. 12).

It is important to have the hitch and main frame set evenly to assure equal penetration between front and rear shanks.

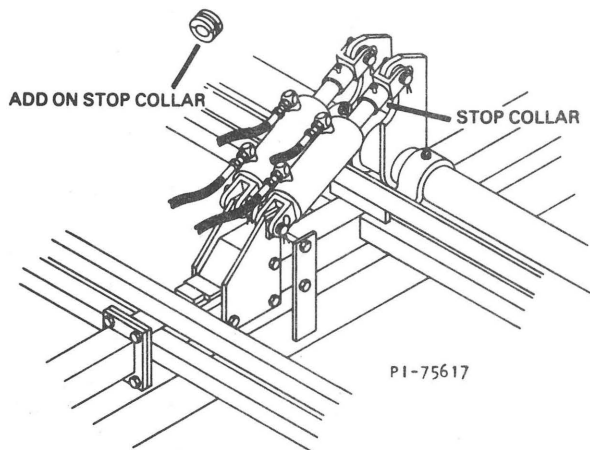


Fig. 12 Main Frame Lift Cylinder

LEVELING - WINGS

DO NOT ATTEMPT TO USE WING CYLINDER STOP COLLARS TO LEVEL WING WITH MAIN FRAME.

Wings are leveled by setting the adjustment rod (see Fig. 13).

The wings are leveled after the main frame is leveled at working depth.

To set the adjustment rod, lower the cultivator until its weight rests on the shanks. Loosen the lower nut on the end of the adjustment rod and turn the rod in or out of the adjustment tube until the ends of the wings are level with the main frame at working depth.

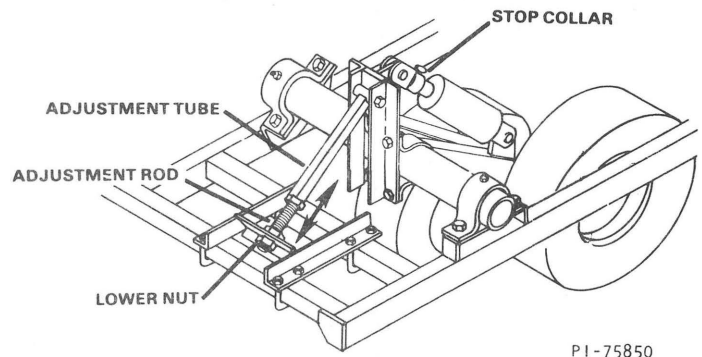


Fig. 13 Hydraulic wing adjustment

Retighten the lower nut on the end of the adjustment rod to lock the setting.

When the wings are set level with the main frame at working depth, the stop collars on the wing axle cylinders are to be turned down against the cylinder body and the thumbscrew tightened to lock in the depth setting.

NOTE: MAKE SURE ALL TIRES ARE EQUALLY INFLATED.

NOTE: IT IS IMPORTANT THAT ALL OF THE STOP COLLARS CONTACT THE CYLINDER BODIES 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.

LEVELING - EXTENSION WINGS

While the rigid and the non-floating extension wings are structurally held level to the primary wings, the floating extension wing may require additional adjustments.

When level, the rod end hydraulic cylinder pin should rest in the center of the floating wing's cylinder slot (See Fig. 14). If the cylinder pin doesn't rest centered, the hydraulic cylinder's open and closed lengths need to be checked.

The retracted length should be $34.25 + / - .06$ and the extended length should be $58.25 + / - .06$. If necessary, adjust the cylinder length by turning the rod clevis and then re-lock the setting with the set screw.

LEVELING (CONT.)

NOTE: A STUBBORN CLEVIS CAN BE MORE EASILY TURNED IF HYDRAULIC PRESSURE IS APPLIED (IN EITHER DIRECTION) TO PREVENT THE ROD FROM TURNING INSIDE THE CYLINDER BODY.

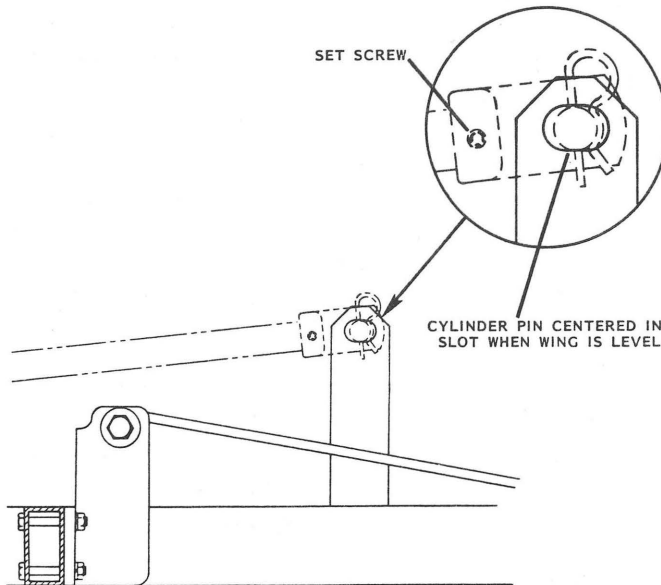


Fig. 14 Floating Wing Extension

NOTE: IF THE CYLINDER IS SHORTENED, BE SURE ANY PORTION OF THE CYLINDER ROD WHICH MAY EXTEND BETWEEN THE EARS OF THE CLEVIS DOESN'T INTERFERE WITH THE WING'S CYLINDER ANCHOR.

Grind either the end of the cylinder rod or the edges of the cylinder anchor as required to avoid any possible binding when folding wings (See Fig. 15).

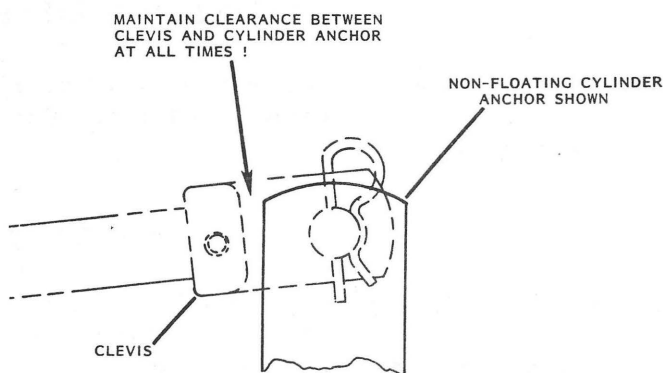


Fig. 15 Clevis Clearance

WING REST ADJUSTMENT

Set the wing rests. Carefully fold the extension wings until the cylinder is completely retracted. If the wing rests are not contacting, turn the adjustment bolt out until firm contact is made, then tighten the locking nut against the adjustable wing rest frame. (See Fig. 16).

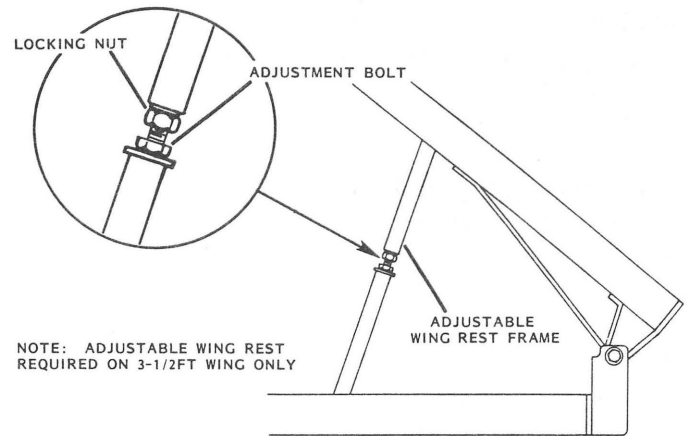


Fig. 16 Wing Rest Setting

NOTE: BE SURE TO CHECK LEVELING OF CUTLIVATOR WHENEVER WORKING DEPTH CHANGES, WHEN CHANGING FIELDS, OR WHEN CHANGING TRACTORS.

STABILIZER WHEEL

Larger models of the 3400 3-Section series field cultivator can be equipped with a stabilizer wheel mounted on the outer wing of the implement (see Fig. 17). This gives added stability to the machine during the tillage operation.

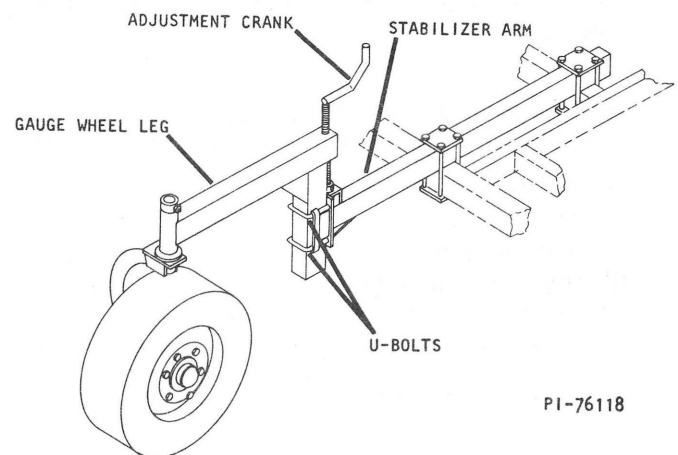


Fig. 17 Stabilizer Wheel

PI-76118

Adjustment of this stabilizer wheel is made by loosening the u-bolts that lock the gauge wheel leg to the stabilizer arm and turning the adjustment crank until the wheel is in the desired position.

The stabilizer wheel should be set to control forward "dipping" of the wing, it is not used for depth control. Set the wheel 1/2" to 1" above ground level, with the field cultivator at working depth and the tractor in neutral.

Retighten the bolts to secure the caster wheel leg to the stabilizer arm.

SHANK ADJUSTMENT

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

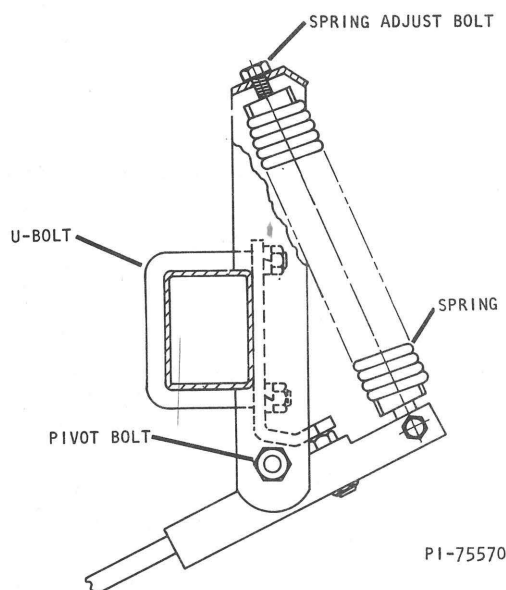


Fig. 18 Shank Assembly

It is recommended that 47 degree stem angle shovels be used.

NOTE: SPRING ADJUST BOLT SHOULD BE TIGHTENED JUST ENOUGH TO CRACK THE PAINT BETWEEN SPRING COILS.

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

The shank pivot bolt should not be overtightened, but kept tight enough to prevent turning.

Wil-Rich field cultivators are also available with twin spring, hi-torque, or spring tine shank assemblies. The twin spring shank assemblies are recommended for heavy duty use. (See Optional Equipment, Page 12-13)

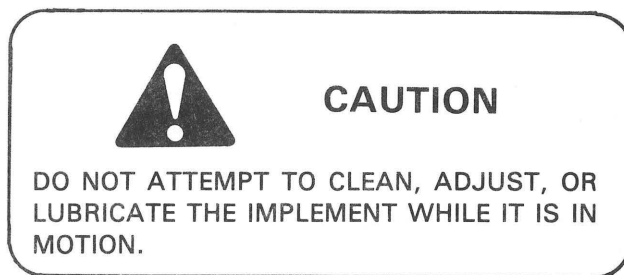
NOTE: BE SURE TO MAINTAIN ADEQUATE TIRE/SHOVEL CLEARANCE ON SHANKS LOCATED IN AND AROUND THE WHEEL WELL WHEN MACHINE IS FULLY RAISED OR LOWERED.

MAINTENANCE

Periodic checks should 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 increases 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. 19).

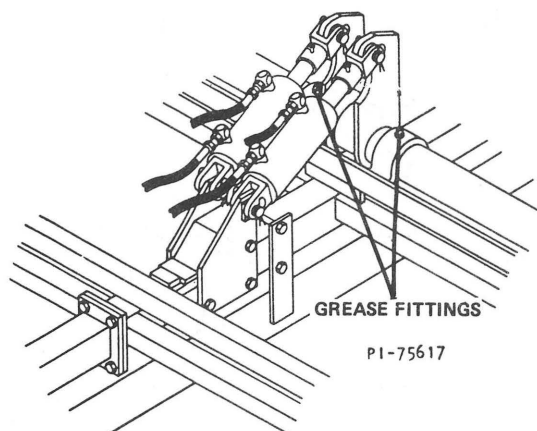


Fig. 19 Axle Caps

HUB AND SPINDLE ASSEMBLIES

Each hub and spindle assembly comes with a grease fitting installed in the hub. These should be greased once a week during steady usage. 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 Fig. 20).

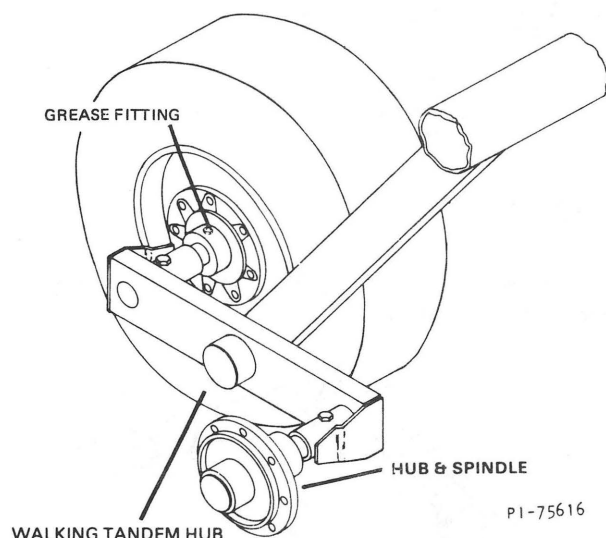


Fig. 20 Walking Tandem

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. 20).

HYDRAULICS

Inspect all hydraulic hoses and fittings for cracks and abrasions 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 should 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 each season's use and again before the first operation of the next season.

It is advisable, if possible, to store larger field cultivator's 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.

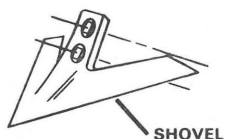
Avoid possible damage to the hydraulic system by lowering the machine onto the shanks and relieve the pressure on the system. Doing this will also prevent damage to the tires by removing the field cultivator's weight.

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

OPTIONAL EQUIPMENT

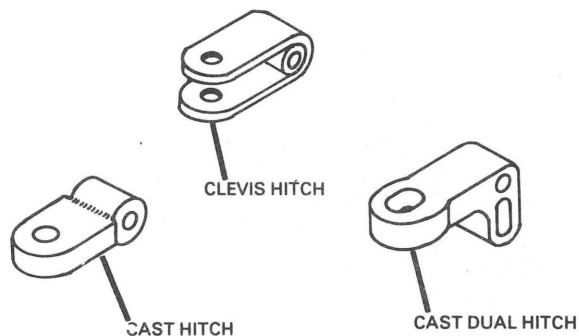
SHOVELS

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



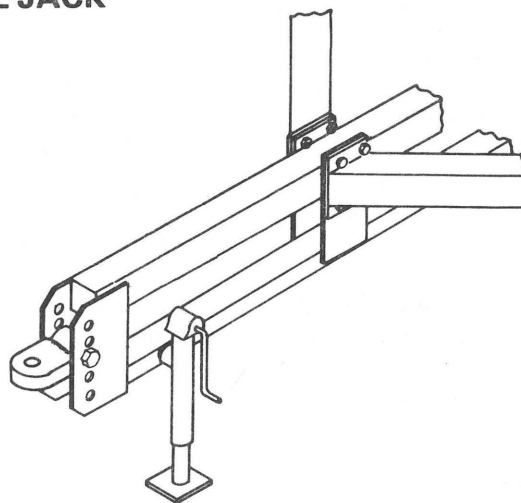
4" Shovel (924)
7" High Crown Shovel
9" High Crown Shovel
9" Dura-Face Sweep
7" Low Crown Shovel (924)
9" Low Crown Shovel (924)
10" Low Crown Shovel (924)
12" Low Crown Shovel (924)
10" High Crown FC Shovel
12" High Crown FC Shovel

HITCHES



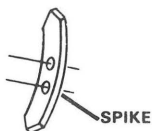
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POLE JACK



SPIKES

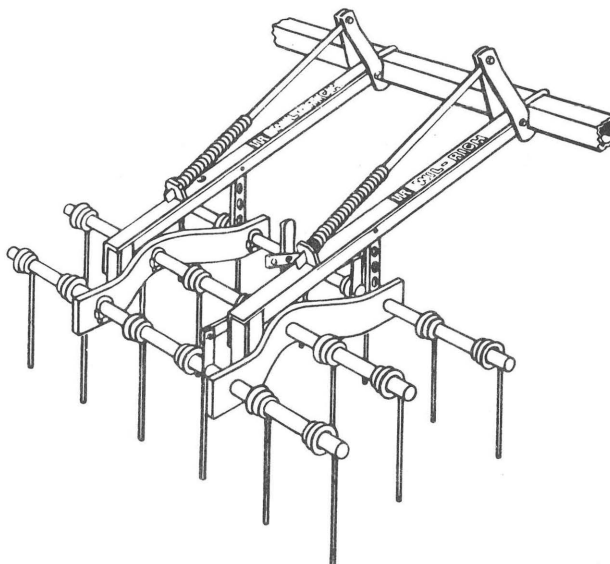
Spikes are recommended for deep penetration, hard soil conditions, killing of quack grass and other grassy weeds, and also for general tillage. These spikes are reversible for longer wear.



2" reversible spike

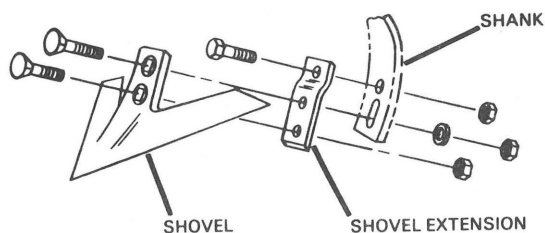
HARROWS

Wil-Rich harrows are available in 3-bar and 4-bar models to fit any size field cultivator.

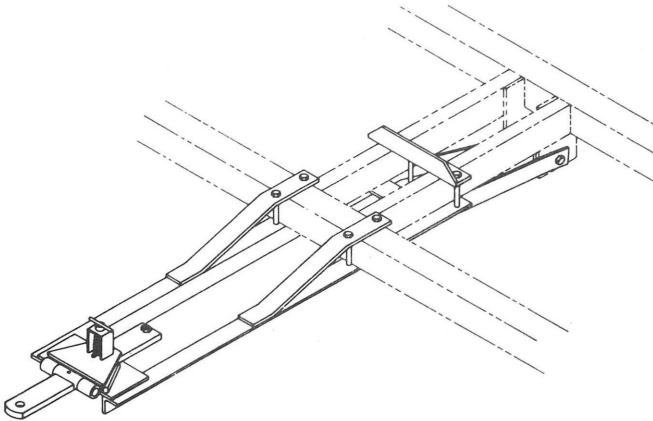
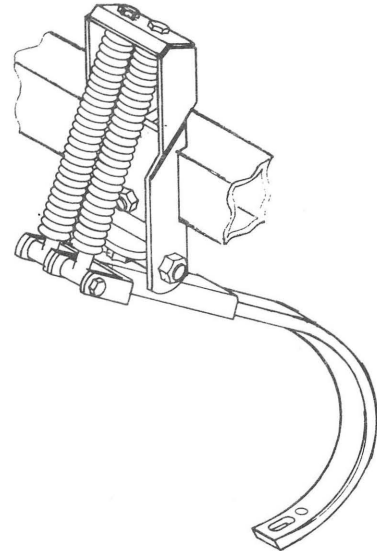


SHOVEL EXTENSION

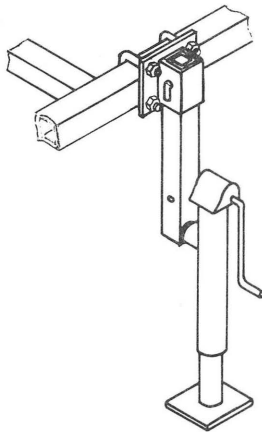
A shovel extension kit is available to increase shovel penetration behind wheel tracks.



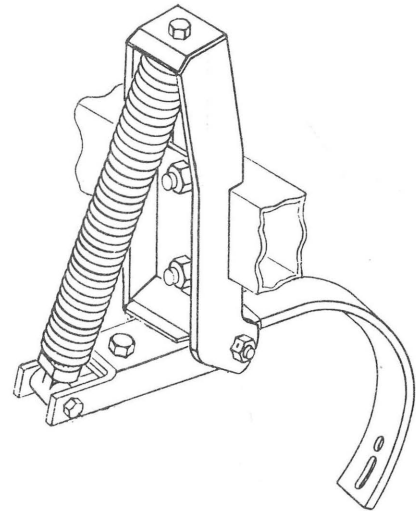
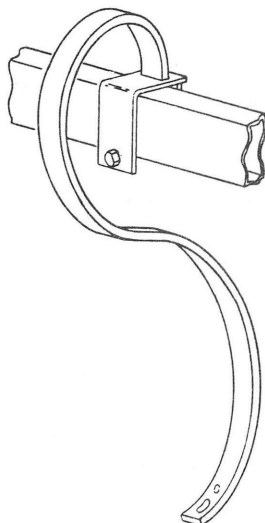
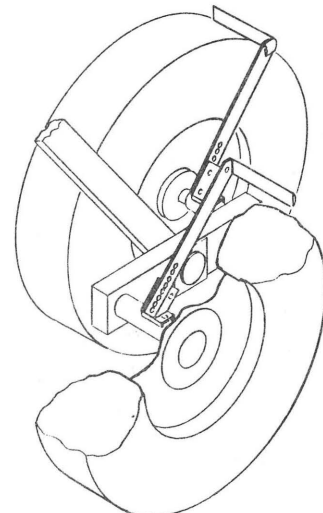
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AUXILIARY HITCH**TWIN SPRING SHANK****REAR JACK STAND**

The rear jack stand kit can be attached to the rear of the cultivator to prevent it from tipping backwards. The pole jack, which attaches to the jack stand, must be ordered separately.



PA-75596

HI-TORQUE SHANK**SPRING TINE SHANK****MUD SCRAPERS**

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Poor or uneven penetration	Incorrect leveling adjustments on main frame or wings.	See leveling, page 7-8.
	Hitch not adjusted properly	Make sure wing cylinders are fully extended. Install clevis hitch or cast hitch in proper hole to keep machine level.
	Hydraulic malfunction - air in lines, cylinders or hoses leaking or not installed properly.	Check for oil leakage in cylinders, hoses and fittings. Make sure all hydraulic cylinders and hoses are properly connected.
	Worn shovel points.	Adjust stop collar of main lift cylinder(s) to compensate for wear. Replace shovels if wear is severe.
	Tires not equally inflated	See tire inflation, page 2.
Settling of entire implement from raised position	Leaking cylinder	Replace cylinder seals
	Leaking tractor hydraulic control valve.	See Tractor Manual
Wings lowering too rapidly.	Incorrect cylinder installed, should have 1/16" dia. integral restrictor cylinder.	See wing lift circuitry page 5 and install correct cylinder.
Machine will not pull straight (skewing)	Cultivator not level	See leveling, page 7-8.
	Incorrect shank placement	Check shanks for proper location, see Assembly Manual.
	Tires not equally inflated	See tire inflation, page 2.

