

Black



QUAD-4

Operator's Manual

CHISEL PLOW

Printed in USA (74201) JM-200 11/96

WIL-RICH
PO Box 1030
Wahpeton, ND 58074
PH (701) 642-2621
Fax (701) 642-3372

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 the 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 judgment 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, engines, valves, pumps or other trade accessories are limited to the warranties made by the respective manufactures 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 the our judgment to affect its reliability, or which has been subject to misuse, negligence or accident.

A Warranty Validation and Delivery Report Form must be filled out and received by Wil-Rich to initiate the warranty coverage.

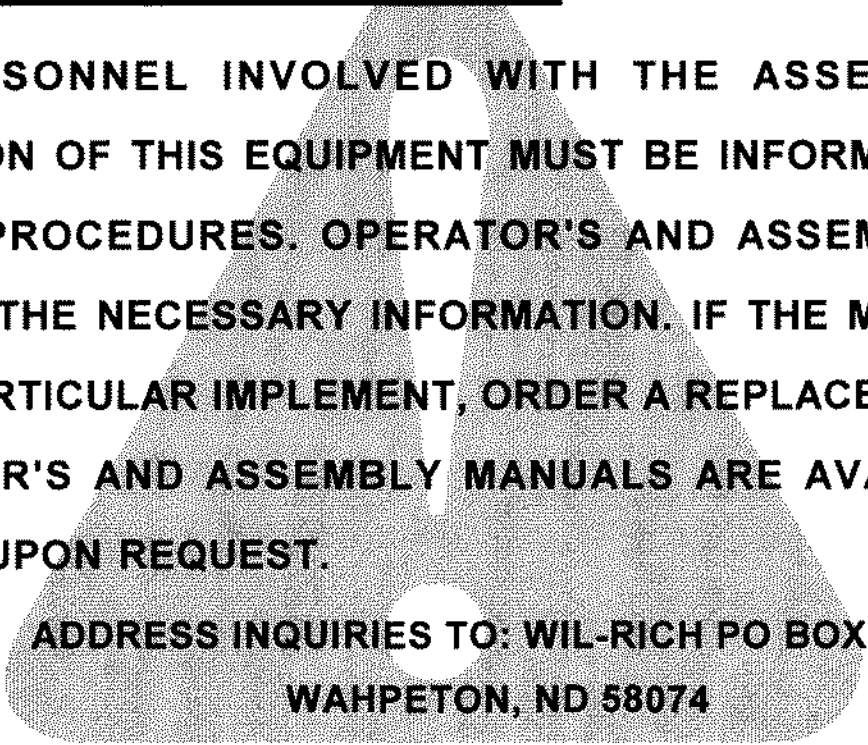
WARRANTY CLAIMS PROCEDURE

1. The warranty form must be returned to Wil-Rich within fifteen (15) working days from the repair date.
2. Parts returned to Wil-Rich 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 a Wil-Rich Sales Representative, District Sales Manager or Service Representative within the ninety (90) day retaining period.

WIL-RICH QUAD-4 CP OPERATOR'S MANUAL 74201 10/96



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 THE MANUAL IS LOST FOR A PARTICULAR IMPLEMENT, ORDER A REPLACEMENT AT ONCE. OPERATOR'S AND ASSEMBLY MANUALS ARE AVAILABLE AT NO CHARGE UPON REQUEST.

ADDRESS INQUIRIES TO: WIL-RICH PO BOX 1030
WAHPETON, ND 58074

PH (701) 642-2621 FAX (701) 642-3372

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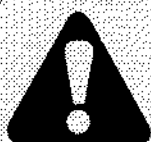
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TO THE OWNER

The **WIL-RICH** Chisel Plow has as standard equipment a clearance lighting package. If your Chisel Plow is not equipped with this package, it can be ordered by contacting your local dealer or the factory directly.

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, lubrication and maintenance of the product according to the information outlined in the Operator's Manual.

If this machine is used by an employee or is loaned or rented, make certain that the operator(s), prior to operating, is instructed in safe and proper use and reviews and understands the Operator's Manual.




**THIS SYMBOL USED TO CALL YOUR
ATTENTION TO INSTRUCTIONS CON-
CERNING YOUR PERSONAL SAFETY.**

**BE SURE TO OBSERVE AND FOLLOW
THESE INSTRUCTIONS**

The user is responsible for inspecting his/her machine and for having parts repaired or replaced when continued use of this 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 of supplementary nature.

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

WIL-RICH <small>a division of TIC UNITED CORP</small>		
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 -OTHER PATENTS PENDING		Wahpeton, ND 58074
WIL-RICH NOBLE		Made in USA

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Orientation

Any reference to left (L) or right (R) sides or components is to be understood as being viewed from behind the implement and looking forward.

Serial Number Break

Every implement has a serial number located on the forward left corner of the main frame. These serial numbers are consecutively assigned to the implements as they are manufactured. To aid in part ordering, we reference the serial number at the point the change occurred to provide an accurate means of determining the proper parts.

Modifications

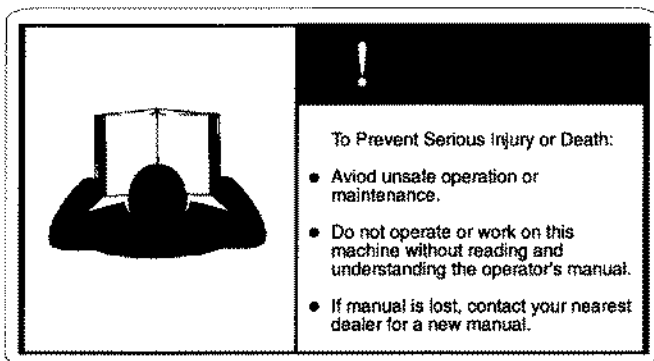
It is the policy of **WIL-RICH** Operations to improve its products whenever possible and practical to do so. We reserve the right to make changes, improvements, and modifications at any time without incurring the obligation to make such changes, improvements and modifications on any equipment sold previously.

WIL-RICH QUAD-4 CP OPERATOR'S MANUAL 74201 10/96

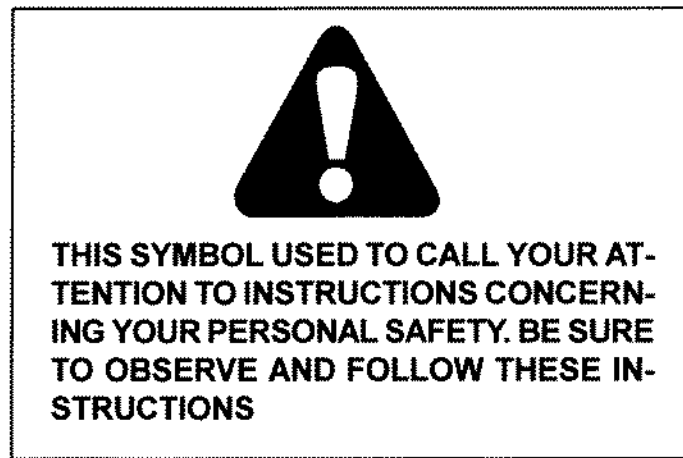
SAFETY DECALS

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

THINK! Safety First



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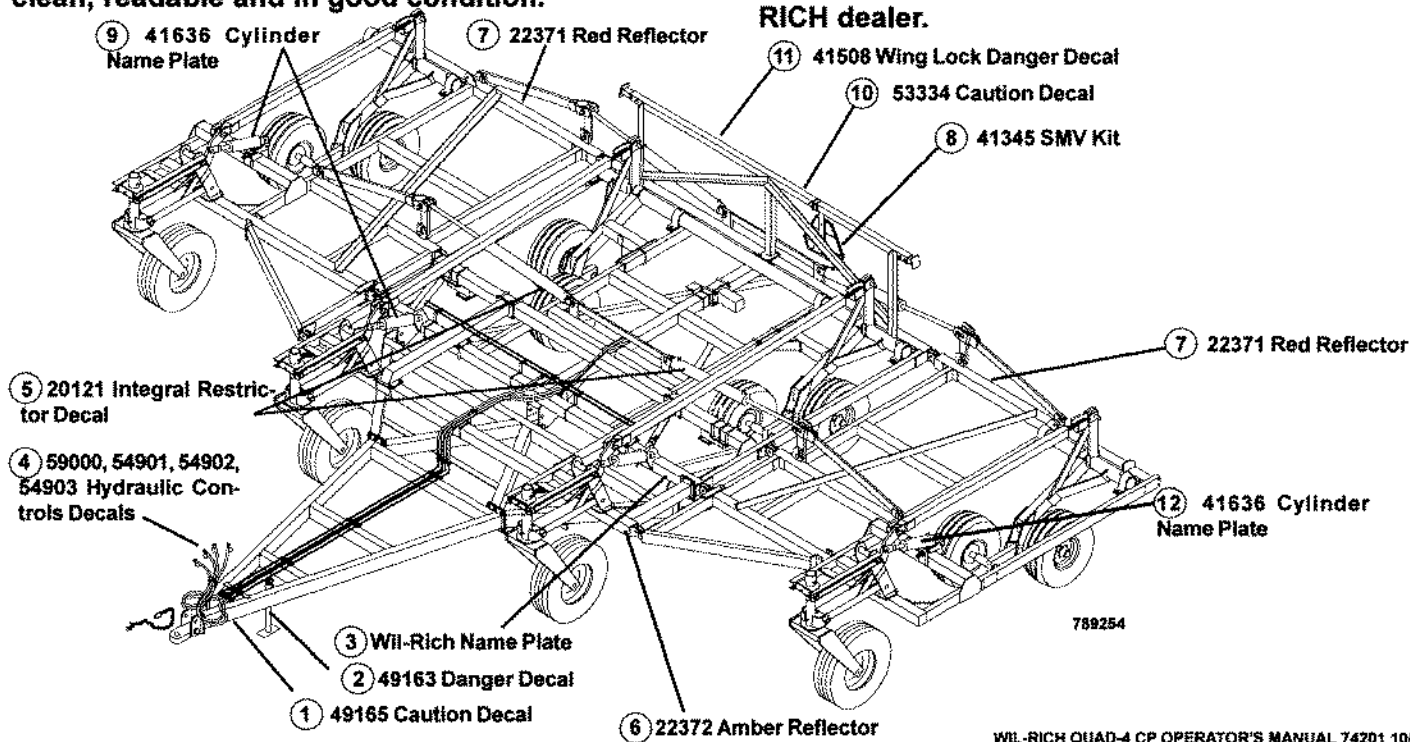


WIL-RICH QUAD-4 CP OPERATOR'S MANUAL 74201 10/96

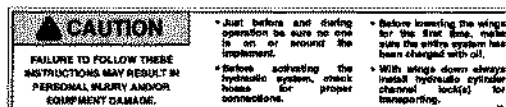
Safety Decal Placement

Caution: Keep all safety decals and reflectors clean, readable and in good condition.

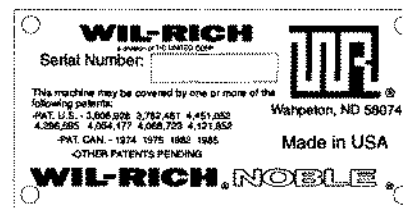
If decals or reflectors cannot be easily read or seen for any reason, replace them immediately. Decals and reflectors may be ordered through your WIL-RICH dealer.



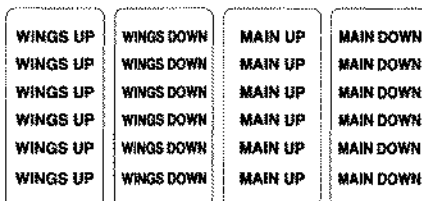
① 49165 Caution Decal



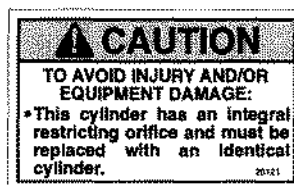
② 49163 Danger Decal



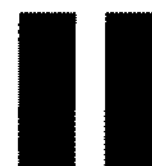
③ Wil-Rich Name Plate



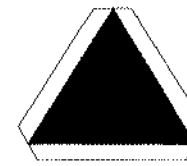
④ 59000 54901 54902 54903 Hydraulic Controls Decals



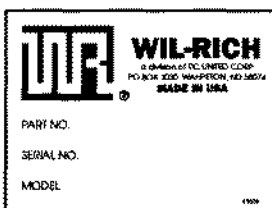
⑤ 20121 Integral Restrictor Decal



⑥ 22372 Amber Reflector
⑦ 22371 Red Reflector

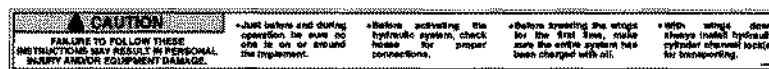


⑧ 41345 SMV Kit

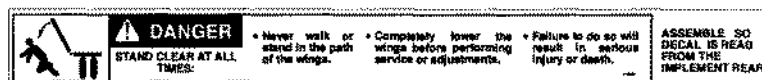


⑨ 41636 Cylinder Name Plate

⑩ 53334 Caution Decal



⑪ 41508 Wing Lock Danger Decal



WIL-RICH QUAD-4 CP OPERATOR'S MANUAL 74201 10/96

BEFORE OPERATING

Use extreme care when making adjustments.

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

After servicing , **be sure all guards are in place** and all tools, parts, or servicing equipment is removed from the machine.




Make sure that there is no one near the machine just before and during operation. Serious injury can result from improper use.

Reduce speed when cornering on field ends and when operating on rough ground.

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

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

No one other than operator should ride on the tractor.



HIGH PRESSURE FLUID HAZARD
To prevent serious injury or death:

- Relieve pressure on system before repairing or adjusting or disconnecting.
- Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
- Keep all components in good repair.

SW700

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 may 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 wood or cardboard. Never use your hands.

ON-HIGHWAY OPERATION

Always place the machine in transport position (Lift cylinders fully extended and locked with channel locks).

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 and safety chain must be used at all times while traveling on public roads.

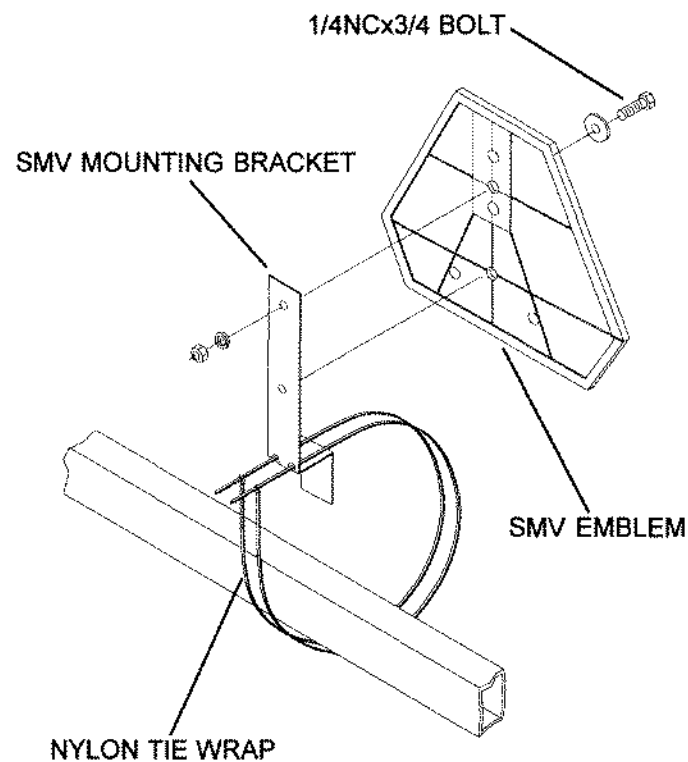
SMV

The bracket provided is designed to mount to numerous frame sizes and can be orientated in numerous positions to avoid interference with implement components.

The SMV emblem is to be secured as near to the rear and centered, or as near to the left of center of the implement as possible.

Emblem is to be 2 to 6 feet above the ground measured from the bottom edge of the emblem.

Keep safety decals clean. Replace any safety decals that are damaged, destroyed, missing, painted over or can no longer be read. Replacement safety decals are available through your dealer.

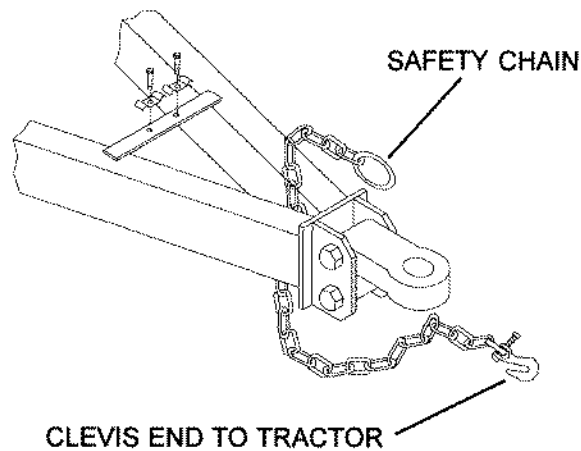


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WIL-RICH QUAD-4 CP OPERATOR'S MANUAL 74201 10/96

Safety Chains

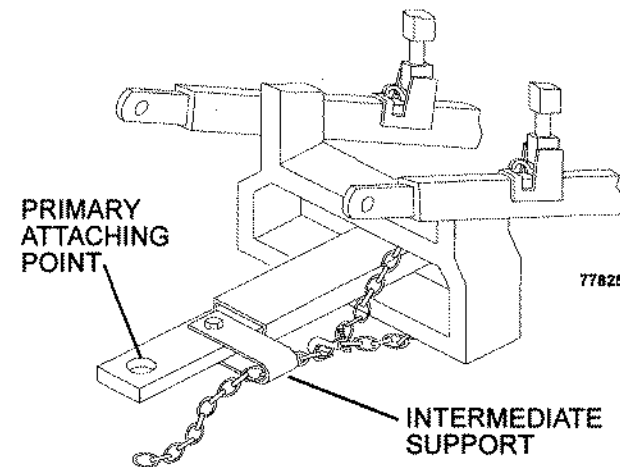
The purpose of the safety chain is to provide an auxiliary attaching system to retain the connection between towing and towed machine in the event of separation of the primary attaching system.

The safety chain should be hooked long enough to permit full turns. Unnecessary slack should be taken up.



The intermediate support is to be used if there is more than 6" of unsupported chain on either side of the primary attaching point.

The intermediate support must not be mounted more than 6" from the primary attaching point (See figure below).



PREPARATION

Before using the **WIL-RICH** Quad-4 Chisel Plow 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.








When replacing a bolt, use only 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.

GRADE 2	GRADE 5			GRADE 8		
						
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 GR2	18	45	69	160	252	320
UNC GR5	30	68	140	240	360	544
UNC GR8	40	100	185	340	528	792
UNF GR2	21	51	102	178	272	368
UNF GR5	32	70	168	264	392	572
UNF GR8	46	112	216	368	792	840

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TIRE INFLATION

The use of proper air pressure is the most important factor in satisfactory performance and maintenance of implement tire. 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 must be increased to the point where sidewall 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 chisel plow is properly lubricated. (See maintenance, page 36-39.)

HYDRAULICS

Check wing lift and depth control cylinders for proper alignment and operation. On any machine check that the hydraulic system has been properly charged and purged. (See Adjustments on pages 20-28.)

General Tractor Requirements

The **WIL-RICH** Quad-4 Chisel Plow requires approximately 6 to 10 horsepower per foot. Two remote cylinder outlets and controls are required.

Wheels and Tires

Dual tractor rear wheels are recommended for use with the chisel plow. See your tractor's operator's manual for tire inflation and instructions for wheel ballast where required.

Metering Valves

The metering valve may be set to provide varying amounts of hydraulic oil flow to the cylinders. (See your tractor's operator's manual.)

It is recommended the wing lift cylinders run as slow as possible to prevent damage to the implement, persons and property. Turn wing lift hydraulics metering valves to slow position.

Front Ballast

With a floating hitch implement, there is no transfer of weight to the tractor. Instead the front of the unit is held up by the casting gauge wheels. Because of this lack of weight transfer, high levels of ballasting may be required to achieve proper traction. Consult your local tire or tractor dealer for information on proper ballasting.



Note: Ballast recommendations provide for adequate transport and working stability at recommended speeds

TRANSPORTING

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

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



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

Note: Always install lock channels in the main lift cylinders for road transport.

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.

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

BEARING ASSEMBLIES

IMPORTANT: The spindle nuts on the wheel assemblies are preset at the factory.

Road transport and field working will seat the bearings and will require additional adjustment. After 20 hours of machine operation remove the grease cap and check the bearing tightness.

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

Repack bearing assemblies at the end of the season, or before start of the next season.

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SIGN-OFF FORM

WIL-RICH follows the general standard specified by the American Society of Agricultural Engineers (ASAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the Quad-4 Chisel Plow must read and understand ALL Safety, Operation, and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information is reviewed. Annually review this information before the season start-up.

Make periodic reviews of SAFETY and OPERATION a standard practice for all your equipment. We feel that an untrained operator is unqualified to operate this machine.

A sign-off sheet is provided for all personnel who will be working with equipment have read and understood the information in the operators Manual and have been instructed in the operation of the equipment.

DATE	EMPLOYEE'S SIGNATURE	EMPLOYER'S SIGNATURE



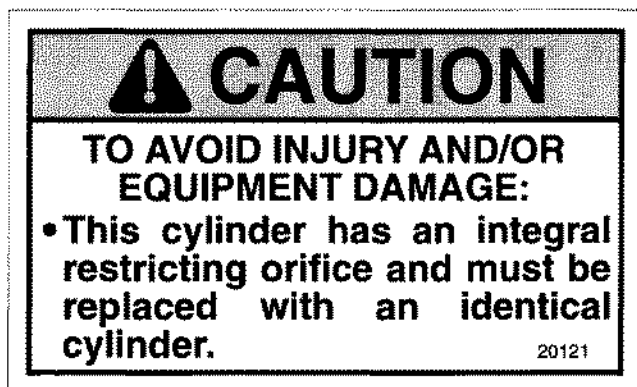
DATE	EMPLOYEE'S SIGNATURE	EMPLOYER'S SIGNATURE



WING LIFT OPERATION

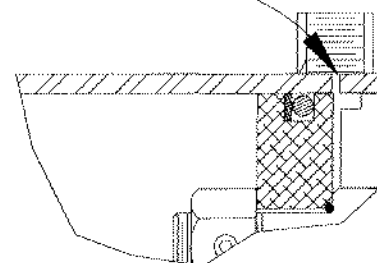
Wil-Rich Quad-4 Chisel Plows equipped with folding wings have hydraulic wing lift cylinders to fold the machine for road transport.

Wing lift cylinders are equipped with an integral restrictor on the rod end cylinder port. (See Fig. 1.) 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.

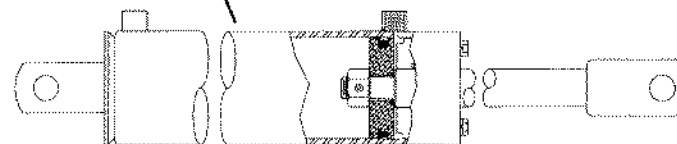


20

1/16" DIA HOLE RESTRICTS THE FLOW OF OIL



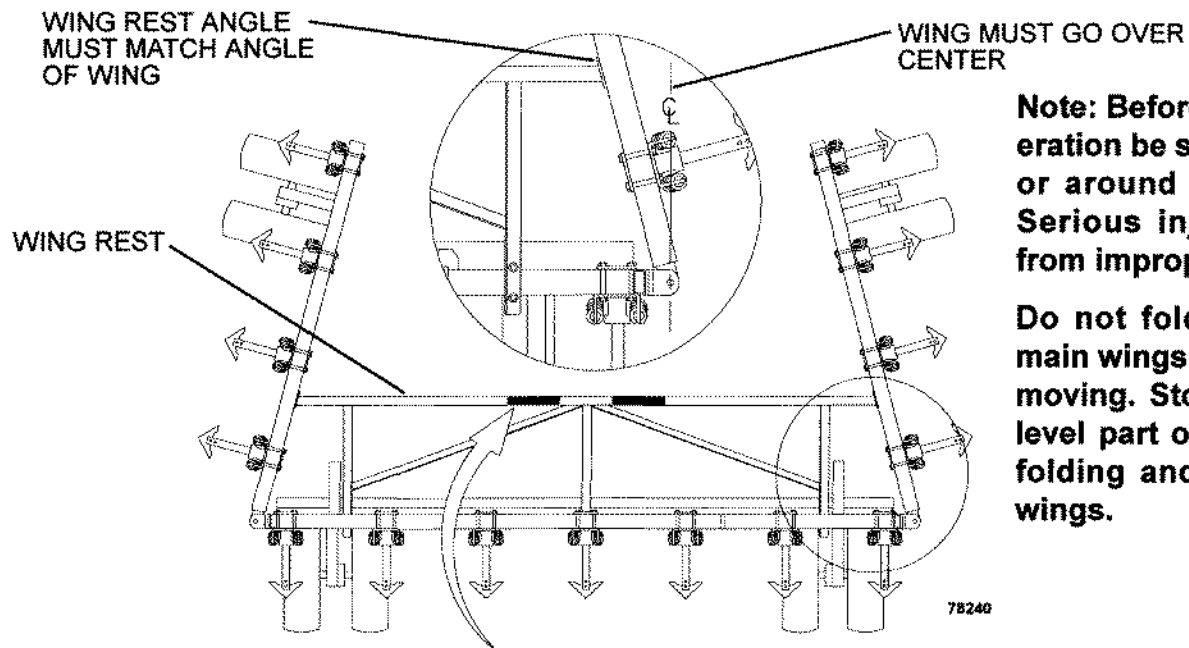
WING LIFT CYLINDER



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FIG. 1. WING LIFT CYLINDER

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

Do not fold or unfold the main wings while the unit is moving. Stop the unit on a level part of the field when folding and unfolding any wings.

	⚠ DANGER STAND CLEAR AT ALL TIMES.	• Never walk or stand in the path of the wings.	• Completely lower the wings before performing service or adjustments.	• Failure to do so will result in serious injury or death.	ASSEMBLE SO DECAL IS READ FROM THE IMPLEMENT REAR.

Note: Assemble so decal is read from the rear of the machine.

FIG. 2. WING REST

WING FOLD CIRCUITRY

For chisel plows that use a parallel hydraulic system as shown in Fig's 3. & 4. Pressure flows to all cylinders at once through a common line from the tractor. The cylinder or pair of cylinders with the least amount of weight to lift will actuate first. This type of hydraulic systems properly sequences the folding and unfolding of the chisel plow wings. Check that your hydraulic system is properly connected before operating.

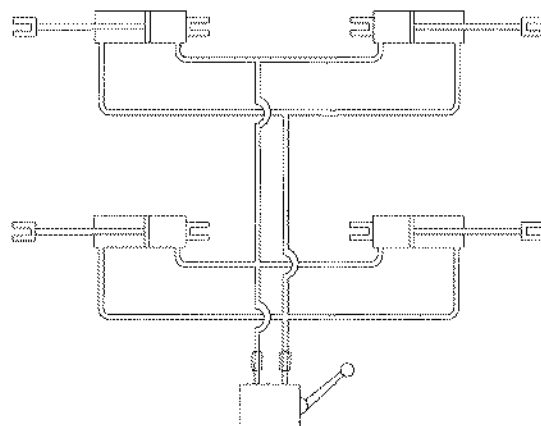


Fig. 3. Four Cylinder Wing Lift Circuit

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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.



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

Note: Before operating hydraulics for the first time it is imperative that the cylinders be cycled to remove any trapped air that may be in the system.

To do this remove the rod end cylinder pins and fully extend and retract wing lift cylinders. Repeat this operation until all air in the system has been expelled.

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.

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Multiple Wing Systems

Units equipped with a folding outer stub wing require a sequencing valve in the hydraulic fold circuitry (See Fig. 4).

The valve 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 wing have been completely unfolded.

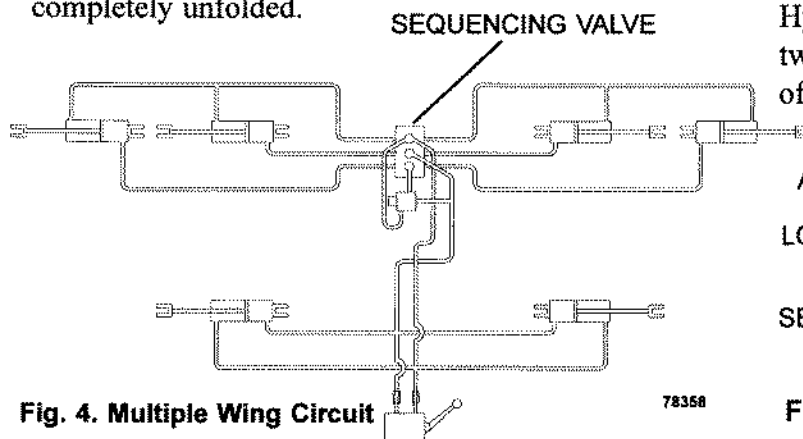


Fig. 4. Multiple Wing Circuit

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The sequencing valve should not effect the folding of the inner 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 (See Fig 5). This will raise the pressure needed to sequence the valve. Readjust valve as needed to ensure complete unfolding of inner wing before the outer wings unfold. Secure setting with the lock nut.

Hydraulic system pressure and volume will vary between tractor and may require occasional readjustment of the valve.

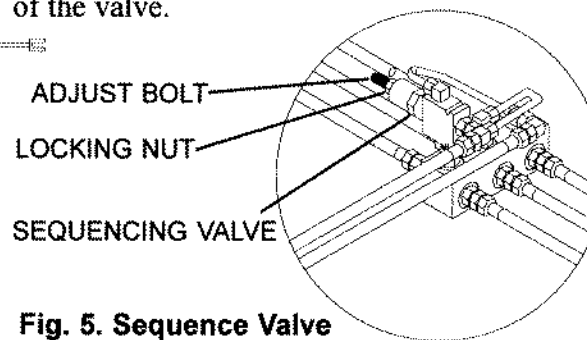


Fig. 5. Sequence Valve

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MAIN FRAME DEPTH ADJUSTMENT

The main frame depth on the **Wil-Rich** Quad-4 Chisel Plow is regulated by a pair of 10.8 top bypass hydraulic cylinders located in the front gauge wheel area.

Note: Frame depth control cylinders need to be installed with the rod end of the cylinder to the front of the machine. (See Fig. 6)

The top bypass cylinders have adjustable, mechanical depth screw stop collars. The screw stop collars are rotated on the cylinder rod to vary the retracted length of the cylinder, providing a means of machine depth adjustment.

The main frame depth is mechanically set by turning the screw stop collar "Down" the cylinder rod, away from the cylinder clevis for decreased working depth, and "up" the cylinder rod, toward the cylinder clevis for increased working depth.

An add-on stop collar is provided in situations where the cylinder rod screw stop collar does not allow a shallow enough setting.

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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 will not work.

Note: The cylinder screw 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.

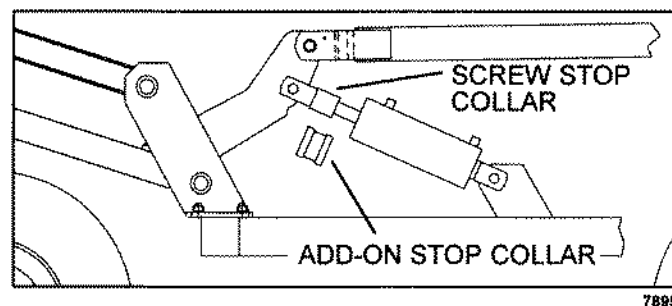


Fig. 6. Main Frame Adjustment

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MAIN FRAME LEVELING COMPONENTS

Note: THIS SCREW STOP IS USED TO SET WORKING DEPTH. It should be bottomed out against the cylinder when unit is working.

SCREW STOP COLLAR

Note: Lengthening the Clevis Adjust Rod (dim X) will lower the rear of the unit, shortening the rod (dim X) will raise the rear of the unit. This adjustment is for front to rear leveling only.

MAIN FRAME GAUGE WHEEL

MAIN ADJUST TUBE

CLEVIS ADJUST ROD
-IS USED TO LEVEL THE MAIN FRAME FRONT TO REAR ONLY.

Fig. 7. Leveling
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4x10.8 TOP BYPASS CYLINDER

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WING DEPTH ADJUSTMENT

The operational depth of the wing is set by use of a 9.3" slave cylinder located at the front corners of the wing in the gauge wheel. These cylinders are connected in series with the main frame top bypass cylinders.

Note: Screw stop collars are used to set total machine depth. Adjustments required to level the wings relative to the main frame are made with yoke adjustment rod located at the base of the cylinder.

To set the wing axle, the yoke adjustment rod is made shorter or longer. Lengthening the yoke adjustment rod will lower the wing relative to the main frame. By adjusting the yoke adjustment rod to a shorter dimension the wing will be raised (See Fig. 8).

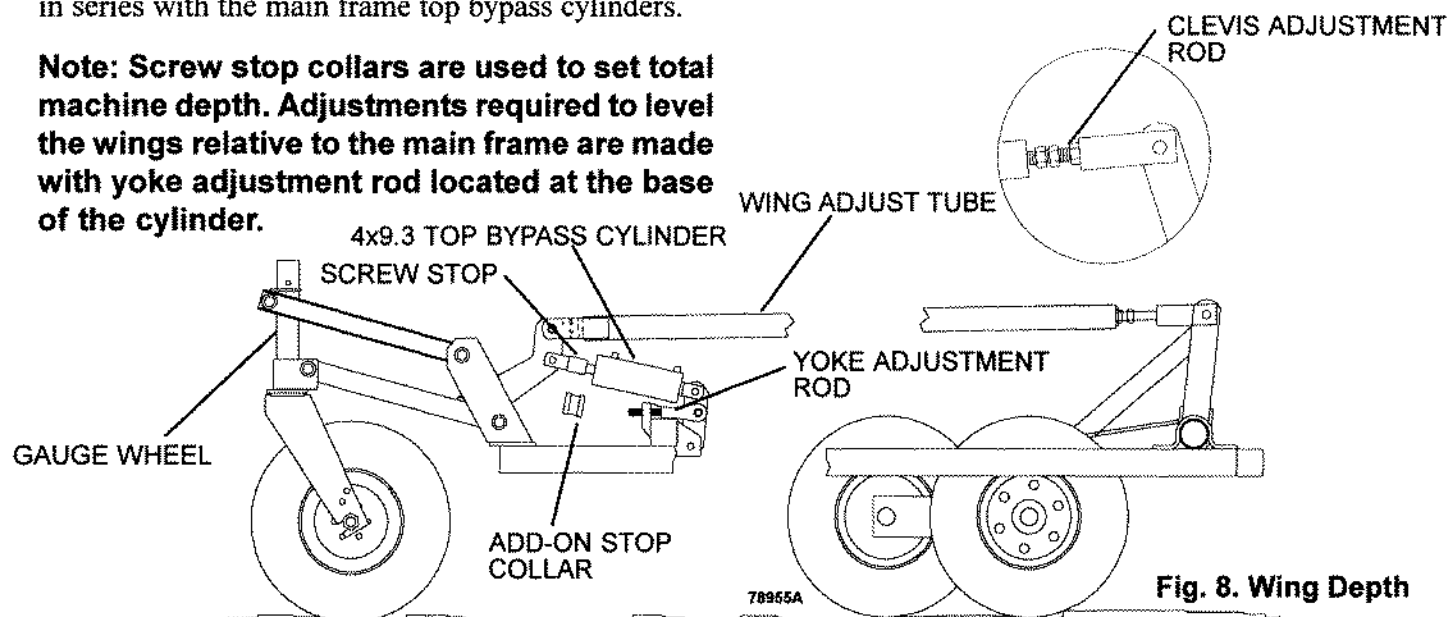


Fig. 8. Wing Depth

WING FRAME LEVELING COMPONENTS

Note: Shortening the Clevis Adjust Rod (dim X) will raise the rear of the unit, lengthening the rod (dim X) will lower the rear of the unit. This adjustment is for front to rear leveling only.

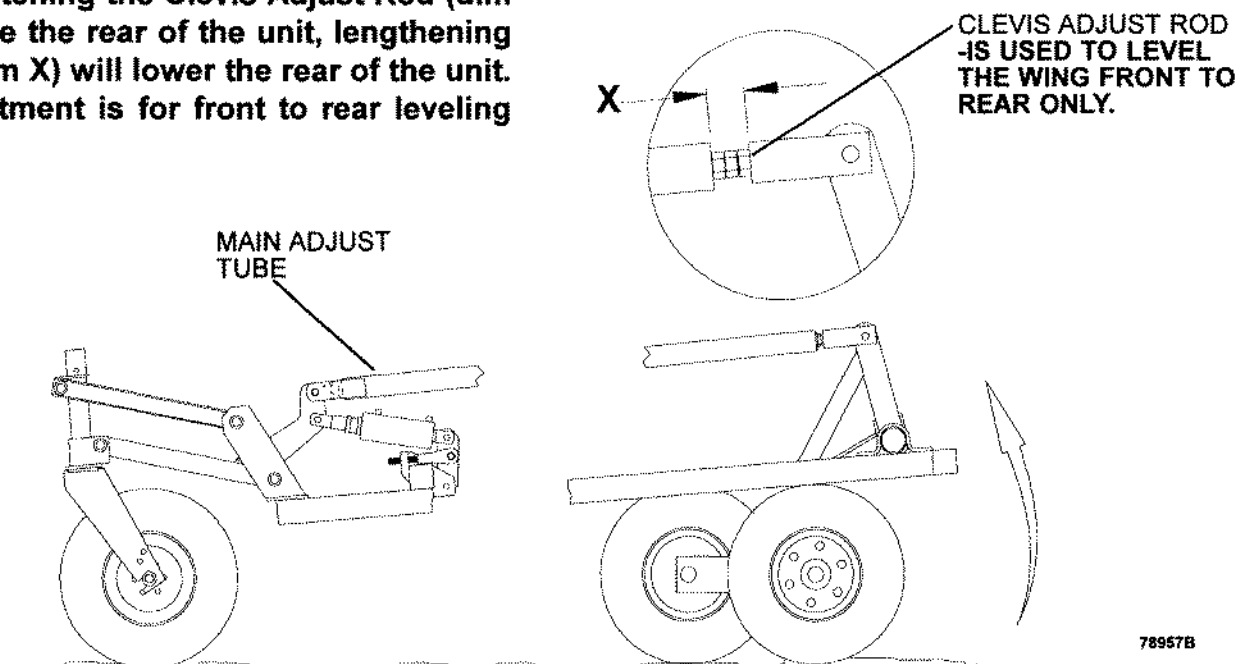


Fig. 9. Wing Leveling

DEPTH CONTROL CIRCUITRY

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

Top bypass cylinders will bypass oil when the cylinder is fully extended. This bypass condition will exist when the implement is raised to maximum ground clearance. At this time oil will pass through the 1/16" dia bypass hole and go on to the next cylinder (See Fig 10).

Synchronizing the Cylinders

With the master, slave cylinder system used on this implement it is required that the system be synchronized periodically. To do this, raise the unit completely and hold the tractor valve for several seconds after the cylinders are fully extended. This allows oil to bypass from one cylinder to the next and eliminates any air or contaminants. This also gets all cylinders in phase with each other.

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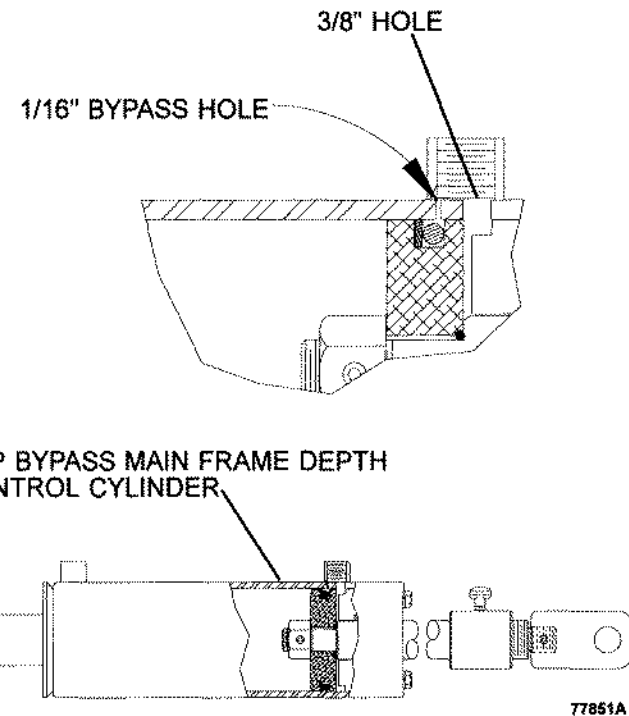


Fig. 10. Top Bypass Cylinder

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YARD LEVELING

Main Frame - Leveling Front to Rear

The operational levelling of the Quad-4 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.

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.

If the rear bar is higher than the front, adjust the main adjust tube (See Fig. 13) at the rear of the implement.

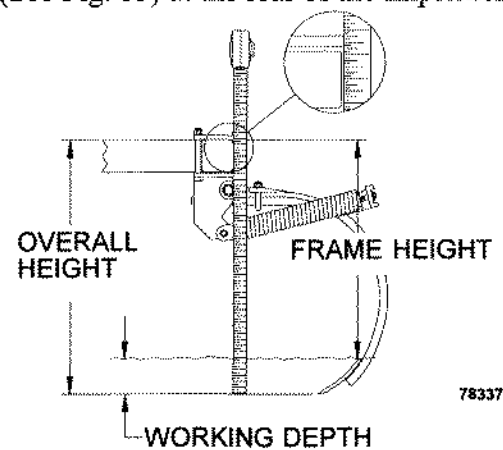


Fig. 12. Frame Height

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

By lengthening the 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 tube, the clevis adjust rod will need to be made shorter.

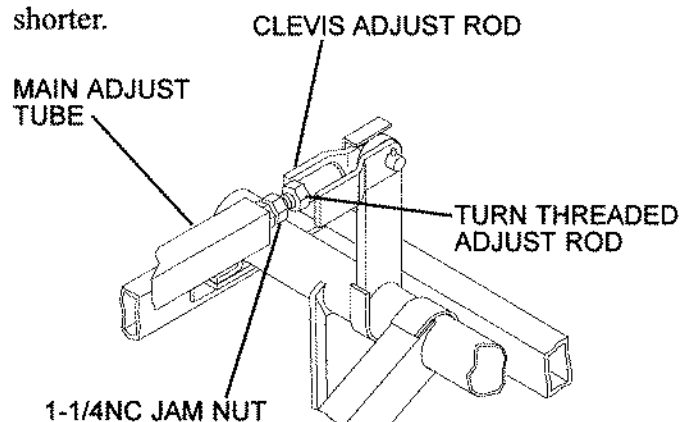


Fig. 13 Clevis Adjustment

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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.

Retighten the jam nuts on the clevis 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. Then check the depth and level of the wings.

Wing - Leveling to Main Frame

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 yoke adjustment rod at the front corner of the wing.

To raise the wing relative to the main frame, turn the front nut down the threaded rod to raise the wing. If the wing is high relative to the main frame, turn the nut up to lower the wing (See Fig 14).

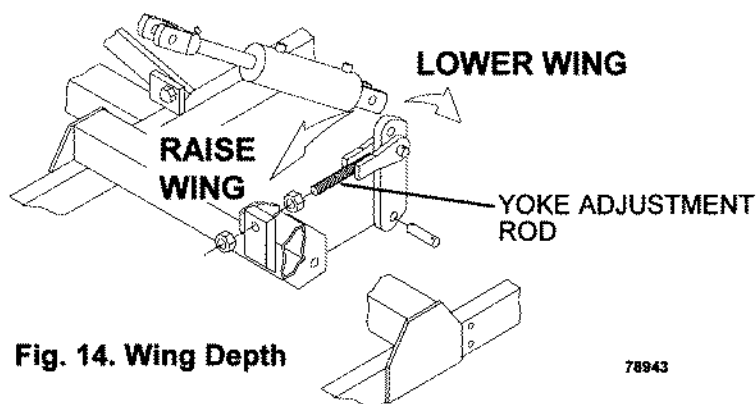


Fig. 14. Wing Depth

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Wing - Leveling Front to Rear

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

By turning the threaded clevis adjust rod as was done on the main frame (page 30) 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.

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

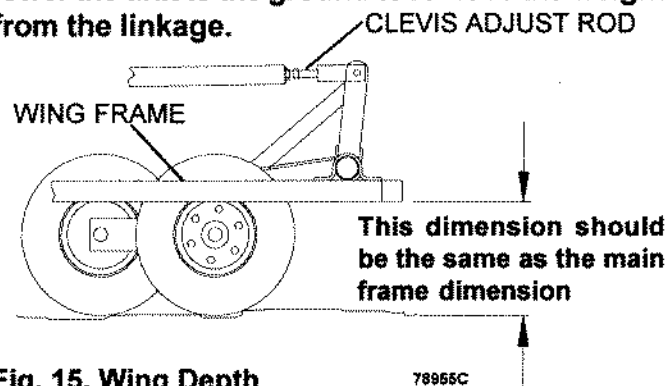


Fig. 15. Wing Depth

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IN FIELD LEVELING

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 be level in the field at operating depth.

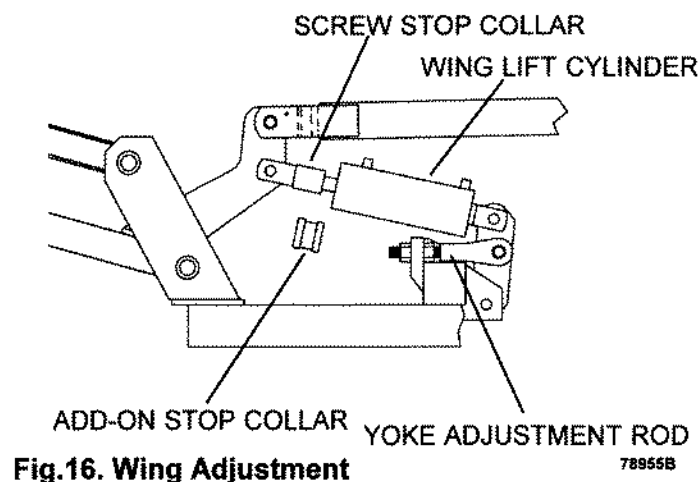
Move to the field, unfold the wings and remove channel locks from the main lift cylinders. Turn all screw stop collars on the main and wing lift cylinders up to the clevis end of the cylinder rod. Drive forward and lower the unit into the ground. Stop and check the depth of the shanks on the front bar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

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

Note: Do not adjust the wing cylinder screw stop collars at this time.

Move to rear and measure the shank depth at the rear bar. By use of the main adjust tube, (See Fig 13) adjust axle to get the desired rear shank depth.

Then, raise the unit out of the ground, cycle the main lift hydraulics and drive forward lowering the unit to operating depth. Walk to the front corner of each wing and check the working depth of the front shanks. If needed, use the yoke adjustment rod (Fig 16) to adjust depth, **DO NOT** attempt to use the wing lift cylinder screw stop collar to adjust the depth.(See Fig. 16.)



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Once the wing front shanks are at the desired depth use the clevis adjust rod to set the rear of the wing to the desired depth (See Fig. 18).

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.

Leveling - Final Step

Do not adjust wing cylinder screw stop collars until final adjustments have been made to main frame cylinder stops.

The screw stop collars are used on the wings to extend the life of the cylinders and to prevent any gradual settling of the machine.

To properly set the wing stop collars, lower the unit into the ground until the main frame cylinders screw stop collars bottom out. Then, go to the wing cylinders and turn the screw stop collars until they bottom out against the cylinder body (See Fig. 17.). Use the add-on stop collar if necessary. The wing cylinder will then be properly adjusted.

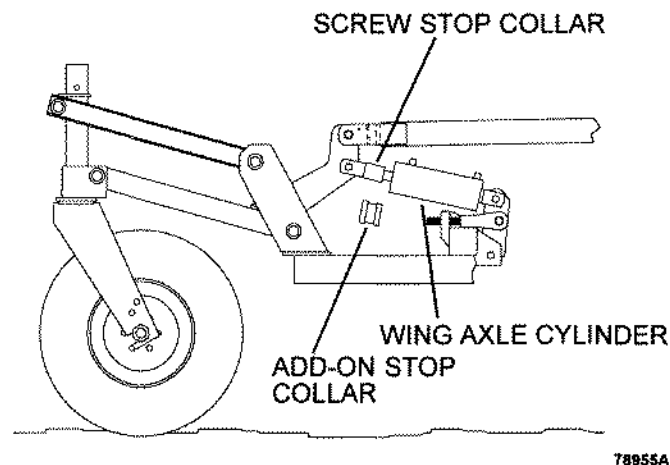


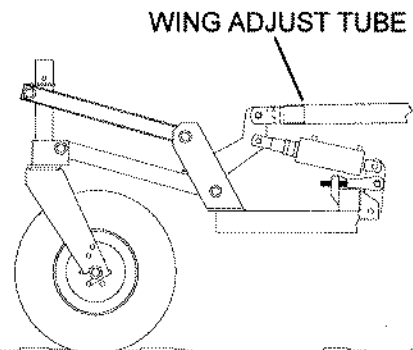
Fig. 17. Wing Stop Collar

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NOTE: The setting of the screw stop collars on the wings will be at a different location than the main frame cylinders. This occurs because different lengths of cylinders are used on the main frame and wings.

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 overall level working of the unit.

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



Final Leveling Note

The aforementioned procedures may have to be repeated several times, adjusting one item may have an affect on another. For example; Setting the main frame deeper may require the wings to be releveled.

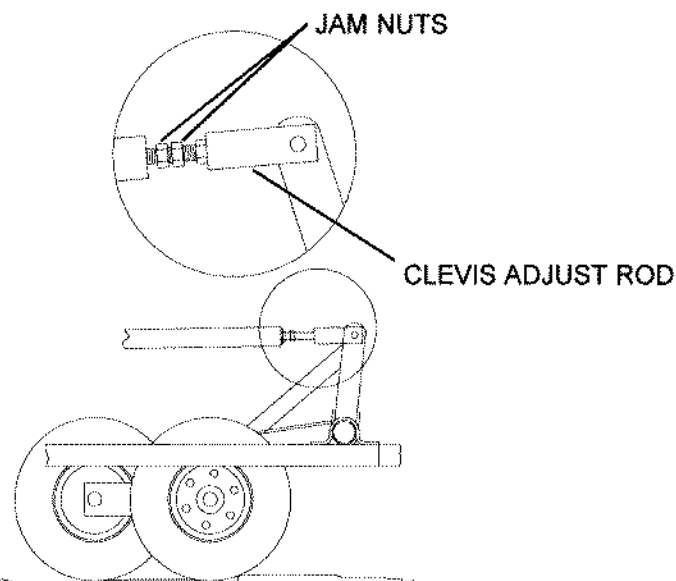


Fig. 18. Wing Height

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100% 300dpi



SHANK ADJUSTMENT

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

The spring adjustment bolt is tightened to 3/4" dimension (Fig. 19.) at the factory. Minor adjustment may be made to accommodate individual needs. If shanks are tripping excessively, springs can be tightened fully.

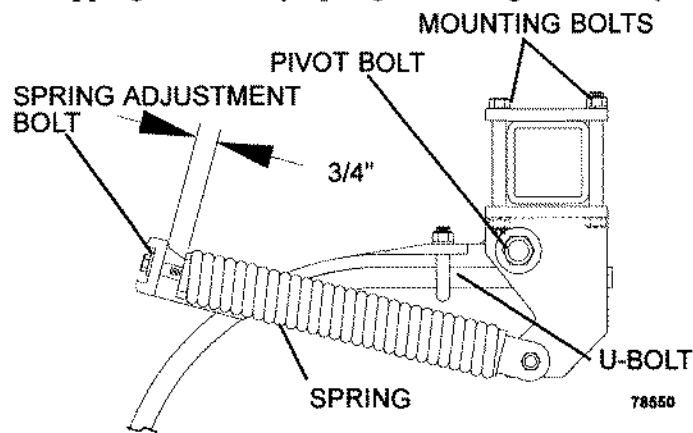


Fig. 19. Shank Assembly

The mounting bolts, U-bolts and shank bolts should 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.

50° stem angle shovels must be used.

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

MAINTENANCE

Periodic checks should be made to assure that 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 would 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 chisel plow be regularly lubricated as recommended to obtain the most efficient operation. Proper lubrication helps prevent downtime due to excessive wear and increase machine life. When replacing springs make sure springs are positioned as the original spring was.



DO NOT attempt to clean, adjust or lubricate the chisel plow while it is in motion.

Cylinder Shafts

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

Axle Caps

All axle caps must be greased once a day with a good quality grease. Lower machine onto the shovel points to relieve pressure on caps to make greasing easier.

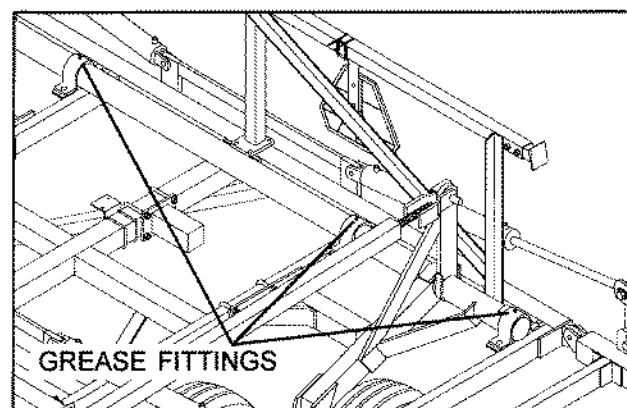


Fig. 20. Grease Fittings

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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. **Note: Hubs are not filled with grease at the factory. Caution - do not over grease.**

Clean and repack hub and spindle bearings once each season.

Tighten spindle nut until the drag on the tire stops the rotation. Locate the cotter pin hole in the spindle and loosen the spindle nut just enough to allow insertion of the cotter pin.

Replace cotter pin and grease cap.

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 repack walking tandem assemblies once each season.

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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 overtighten 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.

Note: Torque all hoses 20 to 40 foot pounds. Do not over tighten.

Storage

Note: If possible store your machine 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.

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

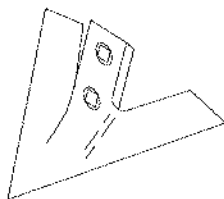
Avoid possible damage to the hydraulic system by lowering the machine onto shanks and relieve pressure on the system. Doing this will also prevent damage to the tires by removing the chisel plow's weight.

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. 50 degree shovels are currently standard.



77905

12", 14", 16" and 18" plain shovels

Spikes

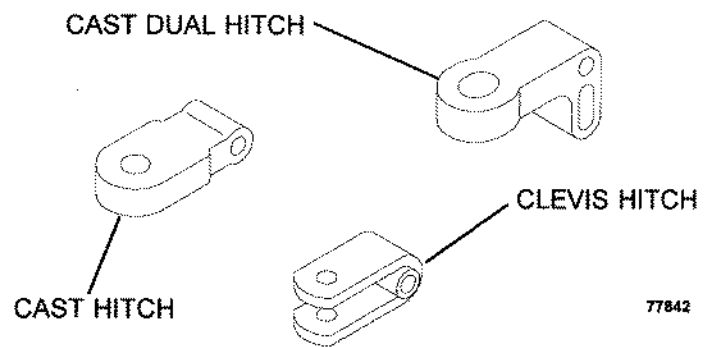
Spikes are recommended for deep penetration, hard soil conditions, killing of quack grass and other grassy weeds.



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2" reversible spike
3" (right and left) plain twisted spike
4" (R & L) moldboard spike

Hitches



DEPTH CONTROL SETTLING DIAGNOSIS

Locating Leaking Cylinders

With wings unfolded, check all hoses, hydraulic fittings and cylinder rod seals for external leaks.

Replace leaking components before continuing procedure.

Remove or retract stops on mechanical depth stop to perform check.

Cycle machine up and down 3 times, holding the unit up for 15-20 seconds at the top of each stroke.

Lower the machine until shovels or spikes are 4-8 inches above the ground.

Shut off tractor engine.

Locate and disconnect the pressure line from the tractor outlet. This line goes to the base end of the main frame cylinders. Leave return line (wing frame to tractor) as is.

Return to the tractor cab. Move hydraulic lever fully forward to the "float" position.

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Measure and record the length (A Fig 21) of all depth control cylinder rods. (Fig. 22 page 44.)

Note: The main frame cylinders will have more rod exposed than the wing frame cylinders.

Let the machine stand for one hour. After an hour, measure and record the rod length for each cylinder as done in previous step. **Record if the cylinder(s) extended or retracted.**

If any of the depth control cylinders have extended or retracted more than 3/8", match the results to the table on page 44-45, to identify the leaking cylinder(s).



Keep people away from machine when placing tractor control lever in "float" position because unexpected movement of the machine could injure someone.

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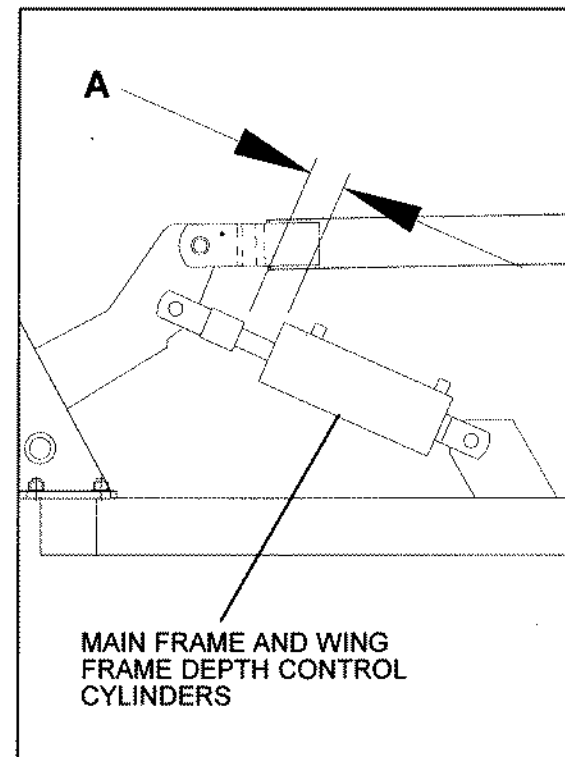
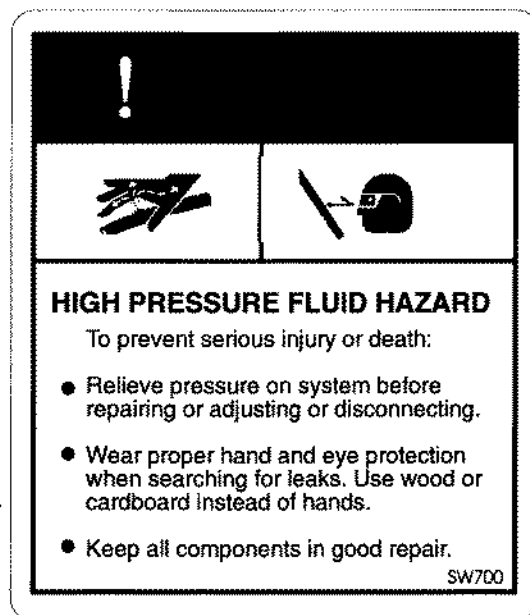


Fig. 21. Cylinder Measurements

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HYDRAULIC CYLINDER TROUBLE SHOOTING

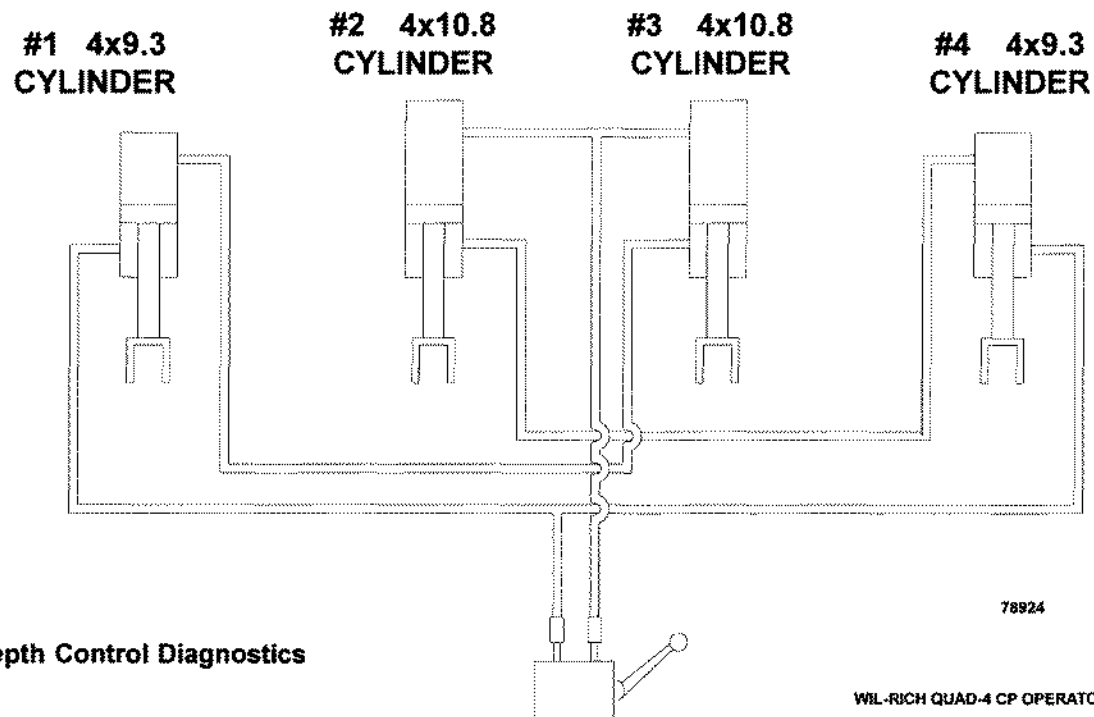


Fig. 22. Depth Control Diagnostics

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TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Machine will not pull straight (skewing or dog tracking).	Chisel Plow not level.	See leveling, pages 24-36.
	Incorrect shank placement.	Check shanks for proper location, see Assembly manual.
	Tires not equally inflated.	See tire inflation.
Settling of entire implement from raised position.	Leaking cylinder.	Replace cylinder seals. (See locating leaking cylinders)
	Leaking tractor hydraulic control valve.	See tractor manual.
Wings lowering to rapidly.	Incorrect cylinder installed, should have 1/16" dia. integral restrictor cylinder.	See wing lift circuitry page 20 and install correct cylinder.

**#1 LEFT WING
CYLINDER #2 LEFT
MAIN FRAME
CYLINDER #3 RIGHT
MAIN FRAME
CYLINDER #4 RIGHT WING
CYLINDER**

LEFT WING CYLINDER	LEFT MAIN FRAME CYLINDER	RIGHT MAIN FRAME CYLINDER	RIGHT WING CYLINDER	REPAIR LEAKING CYLINDER
R	NC	NC	NC	L.H. WING #1
NC	NC	NC	R	R.H.WING #4
R	R	R	NC/E	L.H. M.F. #2
NC/E	R	R	R	R.H. M.F. #3
NC/E	R	R	NC/E	M.F. #2 & #3

DIAGNOS.TBL

R = Retracts more than 3/8" (10mm)

E = Extends more than 3/8" (10mm)

C = No change or less than 3/8" (10mm)

NC/E = No change or extends

Note: 1. When a main frame cylinder is leaking, the wing frame on the opposite side will extend in most cases.

Note: 2. In some cases, after repairing main frame cylinder(s), a wing frame cylinder leak may be discovered.



Poor or uneven penetration. Cylinders getting out of synch.	Incorrect sweep stem angle.	Use 50 degree sweeps.
	Incorrect leveling adjustments on main frame or wings.	See leveling pages 24-36.
	Hydraulic malfunction - air in lines, cylinders or hoses leaking or not installed properly.	Make sure wing fold cylinders are fully extended. Check for oil leakage in cylinders, hoses and fittings. Make sure all hydraulic cylinders and hoses are properly connected
	Worn shovel points.	Resynchronize cylinders (see page 27 & 36) 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 15.

