



# OPERATOR'S MANUAL

# *EXCEL* FIELD CULTIVATOR

# 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.

## 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, 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.

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.

<b>WIL-RICH LLC</b>	
Wahpeton, ND	
Serial Number:	<input type="text"/>
	
Made in USA	

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

### **MODIFICATIONS**

It is the policy of Wil-Rich 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 obligation to make such changes, improvements on any equipment sold previously.

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## GENERAL INFORMATION

Remove all wires and/or banding material. The parts have been conveniently arranged on the pallet for ease of assembly.

NOTE: Always wear safety glasses or goggles and be careful when cutting wires and steel bands as they are under tension and will spring back when cut.

Wherever the terms "left" and "right" are used, it must be understood to mean from a position behind and facing the machine.

Lubricate all bearings and moving parts as you proceed and make sure they work freely.

Loosely install all bolts connecting mating parts before final tightening.

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 re-checked after a few hours of operation.

When replacing a bolt, use only a bolt of the same grade or higher. Except in shear bolt applications, where you must use the same grade bolt.

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.



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

	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	89	160	252	320			
UNC GR5	30	68	140	240	360	544			
UNC GR8	40	100	196	340	528	792			
UNF GR2	21	51	102	178	272	368			
UNF GR5	32	70	168	264	392	572			
UNF GR8	48	112	216	368	792	840			

TORQUE.EPS



### **CAUTION**

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

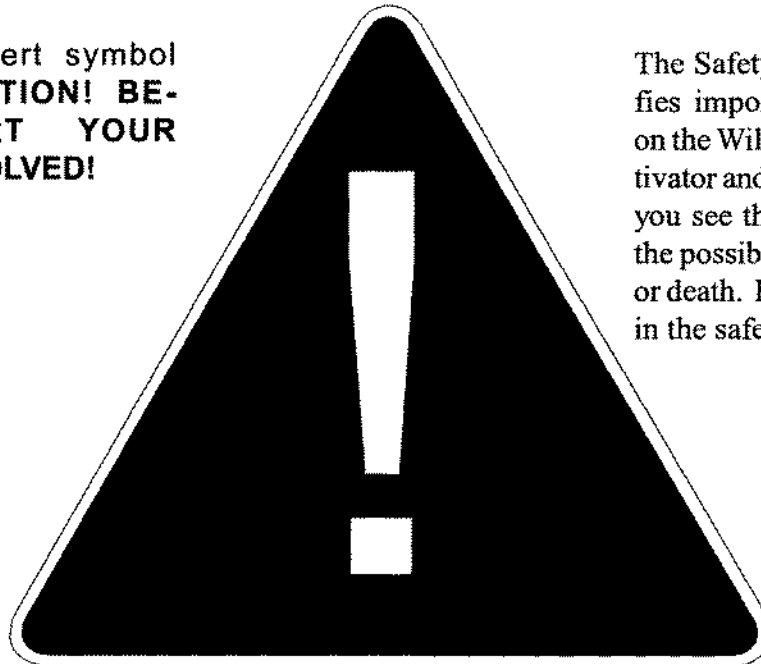
- Just before and during operation be sure no one is on or around the implement.
- Before activating the hydraulic system, check hoses for proper connections.
- Before lowering the wings for the first time, make sure the entire system has been charged with oil.
- With wings down always install hydraulic cylinder channel lock(s) for transporting.

49165.EPS

# 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/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.

This Safety Alert symbol means **ATTENTION! BECOME ALERT YOUR SAFETY IS INVOLVED!**



The Safety Alert symbol identifies important safety messages on the Wil-Rich Excel Field Cultivator and in this manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

## 3 Big Reasons

**Accidents Disable and Kill**  
**Accidents Cost**  
**Accidents Can Be Avoided**

### SIGNAL WORDS:

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines:

### DANGER

An immediate and specific hazard which **WILL** result in severe personal injury or death if the proper precautions are not taken.

### WARNING

A specific hazard or unsafe practice which **COULD** result in severe personal injury or death if the proper precautions are not taken

### CAUTION

Unsafe practices which **COULD** result in personal injury if proper practices are not taken, or as a reminder of good safety practices.

ADDRESS INQUIRIES TO: WIL-RICH PO BOX 1030  
WAHPETON, ND 58074  
PH (701) 642-2621 FAX (701) 642-3372

# **SAFETY**

YOU are responsible for SAFE operation and maintenance of your Wil-Rich Excel Field cultivator. YOU must ensure that you and anyone else who is going to operate, maintain or work around the Excel be familiar with the operating and maintenance procedures and related safety information contained in this manual. This manual will take you step by step through your working day, alerts you to all good safety practices that should be adhered to while operating this equipment.



**Remember, YOU are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that EVERYONE operating this equipment is familiar with the recommended operating and maintenance procedures and follows all safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.**

Excel owners must give operating instructions to operators and employees before allowing them to operate the field cultivator, and at least annually thereafter per OSHA regulation 1928.57.

The most important safety device on this equipment is a safe operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.

A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes themselves and bystanders to possible serious injury or death.

Do not modify the equipment in any way. Unauthorized modifications may impair the function and/or safety and could affect the life of the equipment.

Think SAFETY! Work SAFELY!

## **General Safety**

Read and understand the operator's manual and all safety signs before operating, maintaining or adjusting the Excel.

Install and properly secure all shields and guards before operating.

Have a first-aid kit available for use should the need arise and know how to use it.

Have a fire extinguisher available for use should the need arise and know how to use it.

Clear the area of people and remove foreign objects from the machine before starting and operating.

Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing and head.

Do not allow riders.

Wear suitable ear protection for prolonged exposure to excessive noise.

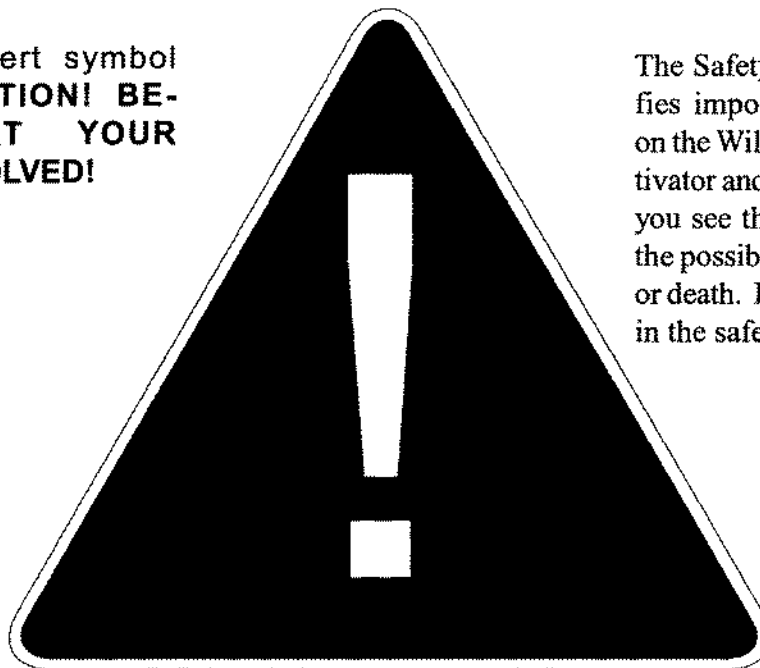
Stop tractor engine, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

Review safety related items with all operators annually.

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### CAUTION

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WAHPETON, ND 58074  
PH (701) 642-2621 FAX (701) 642-3372

## HYDRAULIC SAFETY

Always place all tractor hydraulic controls in neutral before dismounting.

Make sure that all components in the hydraulic system are kept in good condition and are clean.

Relieve pressure before working on hydraulic system.

Replace any worn, cut, abraded, flattened or crimped hoses and metal lines.

Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

Wear proper hand and eye protection when searching for high pressure leaks. Use a piece of cardboard as a backstop instead of hands to isolate and identify a leak.

If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.

Before applying pressure to the system, make sure all components are tight and that lines, hoses and couplings are not damaged.

Think SAFETY! Work SAFELY!

## TRANSPORT SAFETY

Read and understand ALL the information in the Operator's Manual regarding procedures and SAFETY when moving Excel in the field/yard or on the road.

Check with local authorities regarding transportation on public roads. Obey all applicable laws and regulations.

Always travel at a safe speed. Use caution when making corners or meeting traffic.

Make sure SMV (Slow Moving Vehicle) emblem and all lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic

Use a drawbar pin with provisions for a mechanical retainer.

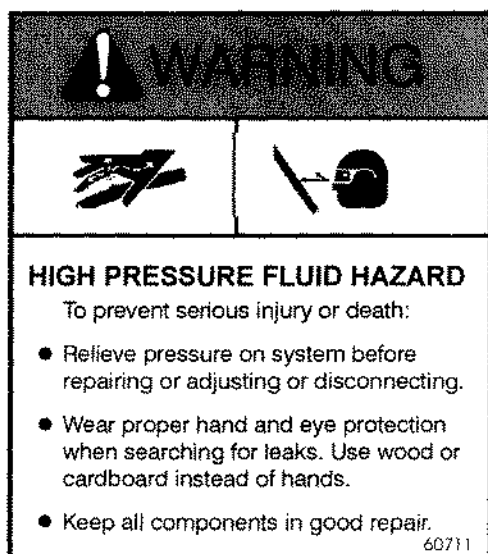
Attach a safety chain before moving.

Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the road shoulder, if permitted by law.



Always use hazard warning flashers on tractor when transporting unless prohibited by law.

Do not allow riders.

Do not exceed 20 mph during transport.



**! WARNING**

**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.

60711



## **STORAGE SAFETY**

Store unit in an area away from human activity.

Do not permit children to play around the stored unit.

Store in a dry, level area. Support the base with planks if required.

## **TIRE SAFETY**

Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.

Have a qualified tire dealer or repair service perform required tire maintenance.

## **SAFETY DECALS**

Keep safety decals and signs clean and legible at all times.

Replace safety decals and signs that are missing or have become illegible.

Replaced parts that displayed a safety sign should also display the current sign.

Safety decals or signs are available from your Dealer Parts Department.

How to install Safety Decals:

Be sure that the installation area is clean and dry.

Decide on the exact position before you remove the backing paper.

Remove the smallest portion of the split backing paper.

Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.

Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.

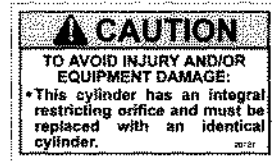
Small air pockets can be pierced with a pin and smoothed out using the piece of decal backing paper.



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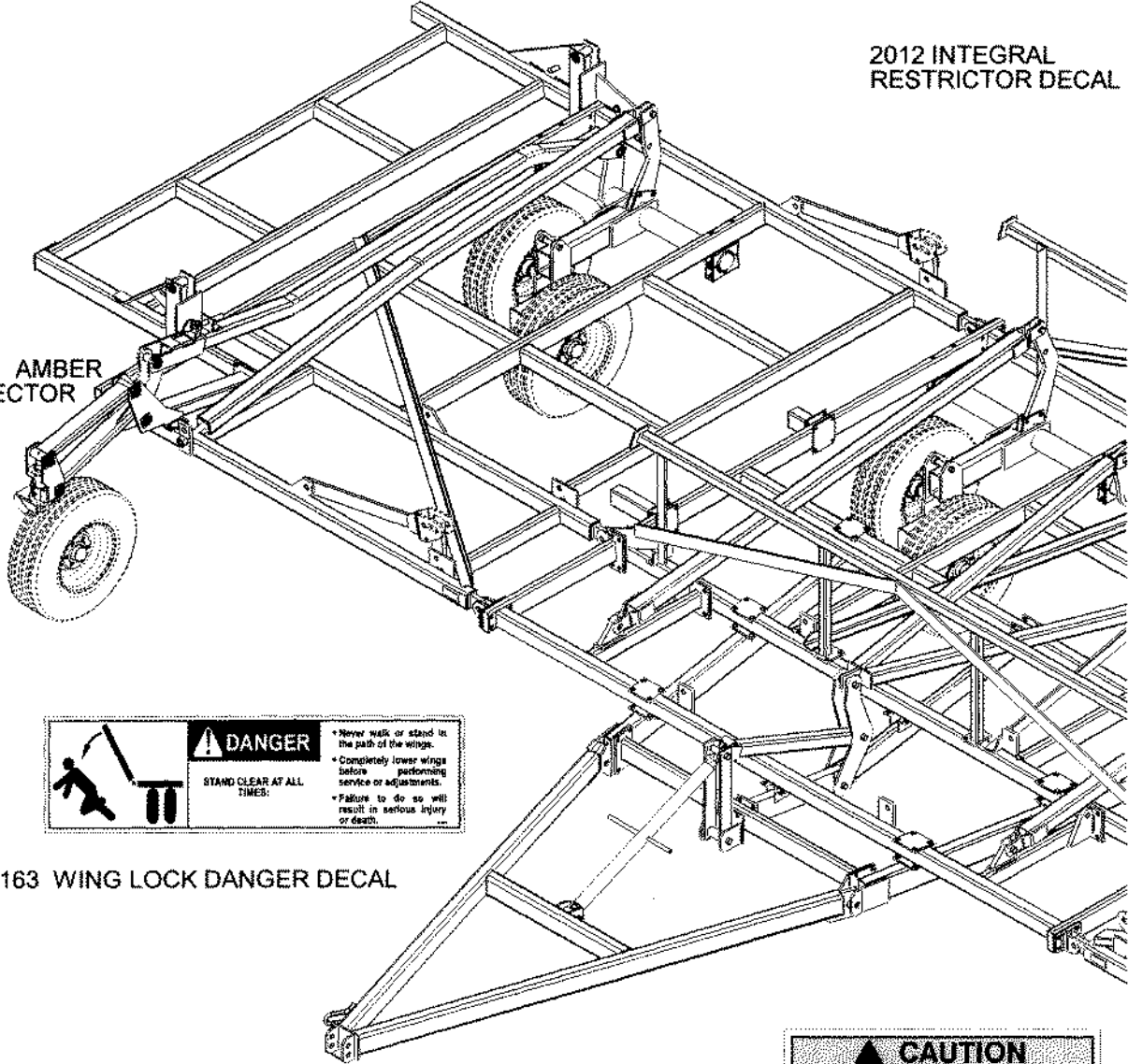
# SAFETY DECALS

22371 RED REFLECTOR



2012 INTEGRAL RESTRICTOR DECAL

22372 AMBER REFLECTOR



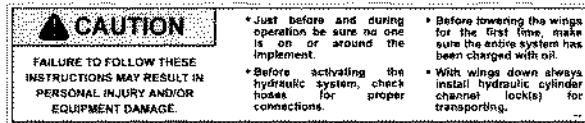
49163 WING LOCK DANGER DECAL



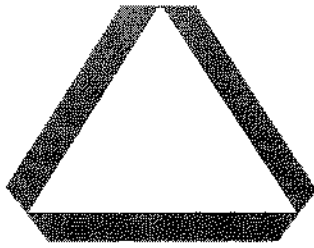
23325 CAUTION DECAL - READ

WINGS UP	WINGS DOWN	MAIN UP	MAIN DOWN
WINGS UP	WINGS DOWN	MAIN UP	MAIN DOWN
WINGS UP	WINGS DOWN	MAIN UP	MAIN DOWN
WINGS UP	WINGS DOWN	MAIN UP	MAIN DOWN
WINGS UP	WINGS DOWN	MAIN UP	MAIN DOWN
WINGS UP	WINGS DOWN	MAIN UP	MAIN DOWN

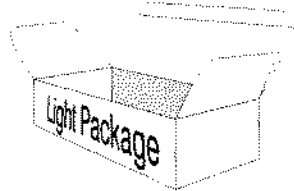
- 54900 WINGS UP DECAL
- 54901 WINGS DOWN DECAL
- 54902 MAIN UP DECAL
- 54903 MAIN DOWN DECAL



49165 CAUTION DECAL



41345 SMV KIT



64594 CLEARANCE LIGHT PACKAGE

	<b>⚠ DANGER</b> STAND CLEAR AT ALL TIMES:	<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>	<b>ASSEMBLE SO DECAL IS READ FROM THE IMPLEMENT REAR.</b>
	<small>©2017</small>		

41508 WING LOCK DANGER DECAL

<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> </ul>	<ul style="list-style-type: none"> <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> </ul>	<ul style="list-style-type: none"> <li>• With wings down always install hydraulic cylinder channel lock(s) for transporting.</li> </ul>
<small>©2017</small>				

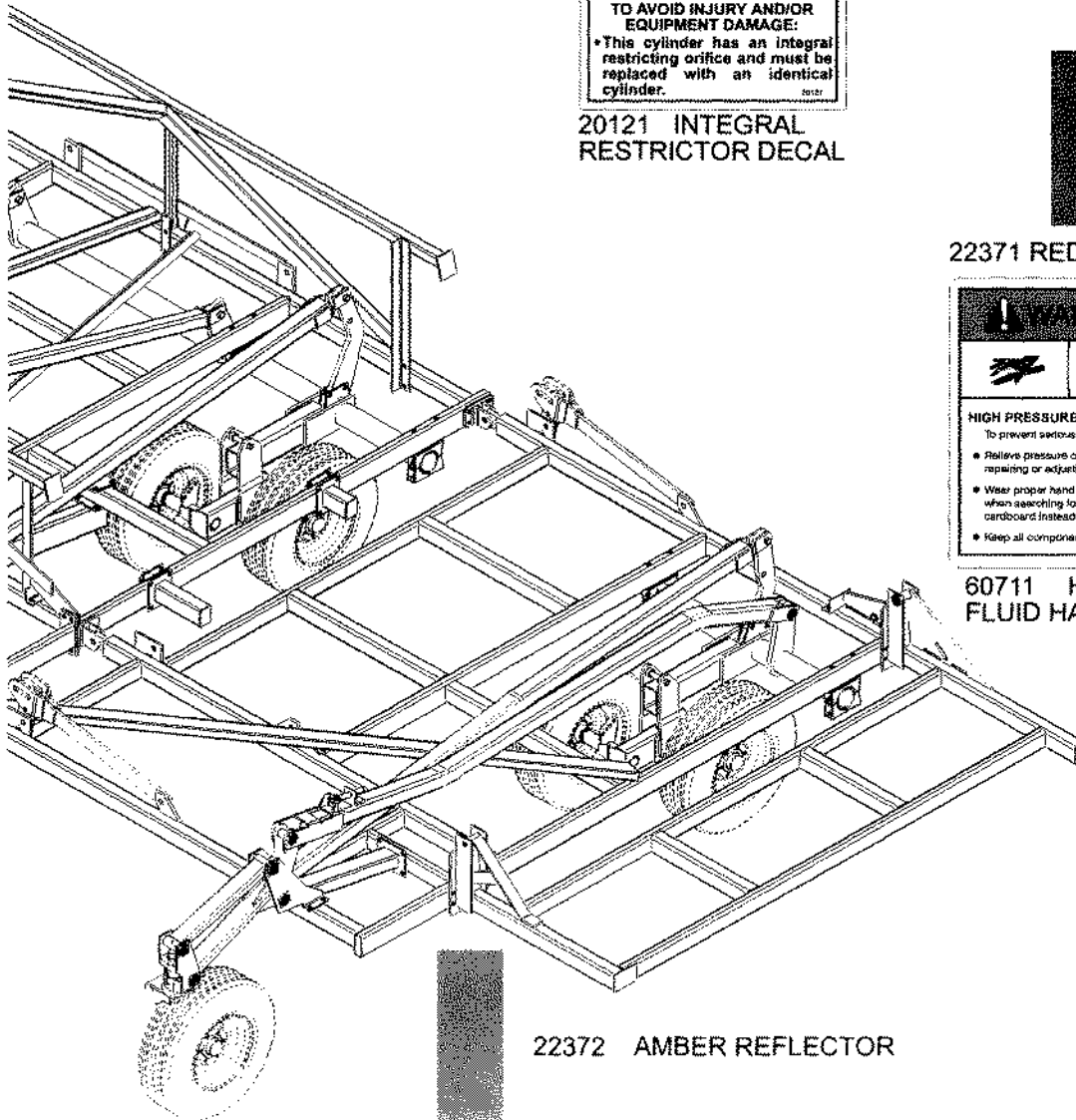
53334 CAUTION DECAL

<b>⚠ CAUTION</b> TO AVOID INJURY AND/OR EQUIPMENT DAMAGE: <ul style="list-style-type: none"> <li>• This cylinder has an integral restricting orifice and must be replaced with an identical cylinder.</li> </ul>
<small>©2017</small>

20121 INTEGRAL RESTRICTOR DECAL



22371 RED REFLECTOR



<b>⚠ WARNING</b>	
<b>HIGH PRESSURE FLUID HAZARD</b> To prevent serious injury or death:	
<ul style="list-style-type: none"> <li>• Relieve pressure on system before repairing or adjusting or disconnecting.</li> <li>• Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.</li> <li>• Keep all components in good repair.</li> </ul>	
<small>©2017</small>	

60711 HIGH PRESSURE FLUID HAZARD



22372 AMBER REFLECTOR

# MAIN FRAME DEPTH ADJUSTMENT

The main frame depth on the WIL-RICH eXcel field cultivator is controlled by a pair of 12.6" stroke bypass cylinders. These cylinders are located at the rear of the unit, above the main frame lift axles. The cylinders are tied to the main axle and to the main axle mast. The main axle mast is nonadjustable and pinned to the front of the main frame through the main axle tie tube. See Fig 1.

The top bypass cylinders have adjustable mechanical screw collars. These screw collars are rotated on the cylinder rod to vary the retracted length of the cylinder, providing the means to adjust the working depth of the unit.

The main frame depth is mechanically set by turning the screw collar "DOWN" the cylinder rod to decrease the working depth or "UP" the cylinder rod to increase the working depth. An add-on stop collar is provided for situations where the screw stop collar does not allow a shallow enough setting.

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

**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 screw collar is rotated to ensure they are set the same.**

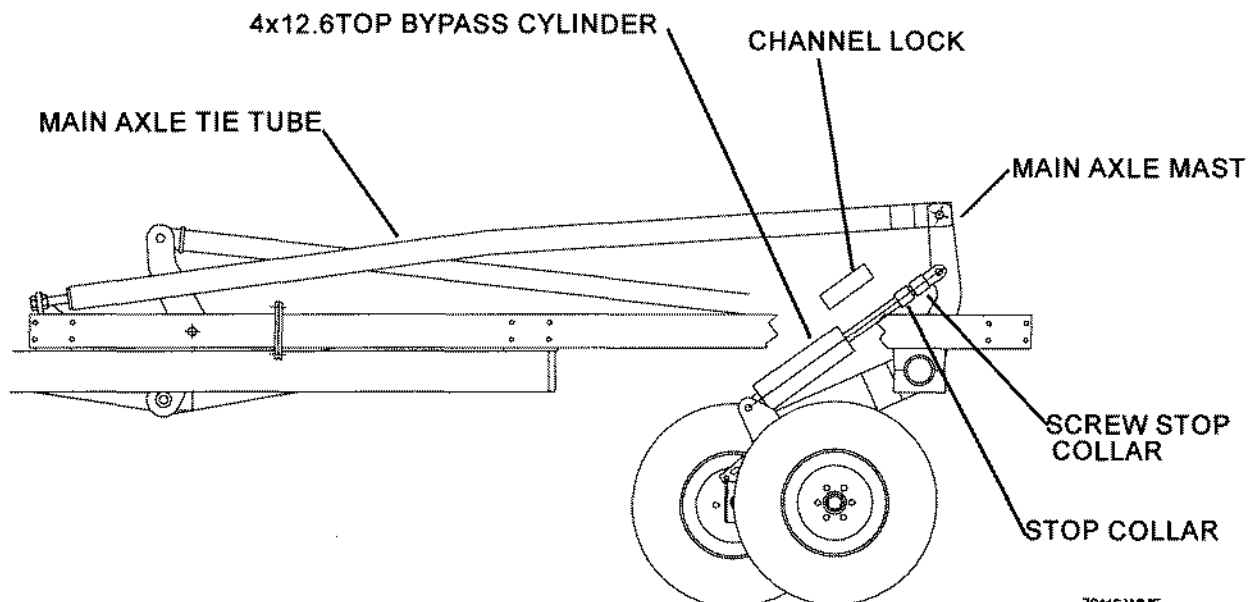


FIG1.

79116W/MF

## WING DEPTH ADJUSTMENT

The operational depth of the wing is controlled by use of a 10.8" stroke slave cylinder located above the wing axle. These cylinders are connected in series with the main frame lift cylinders. The cylinders are attached to the wing axle mast, through the wing axle tie tube and to the front of the wing. See Fig. 2.

**NOTE:** The screw collars and stop collars are used to set the depth of the wing. Adjustments to level the wing relative to the main frame are made at the front of the unit.

By adjustment of the wing adjust bolt the wing can be adjusted to the main frame. To set the wing axle, the wing adjust rod is made shorter or longer. Lengthening the adjustment rod (counter clockwise rotation as viewed from the front of the machine) will lower the wing and adjusting the rod (clockwise rotation as viewed from the rear of the machine) to a shorter position will raise the wing. To maintain the front to rear level of the wing the front gage wheel will also need to be adjusted. Refer to the preliminary and field settings for additional setting information.

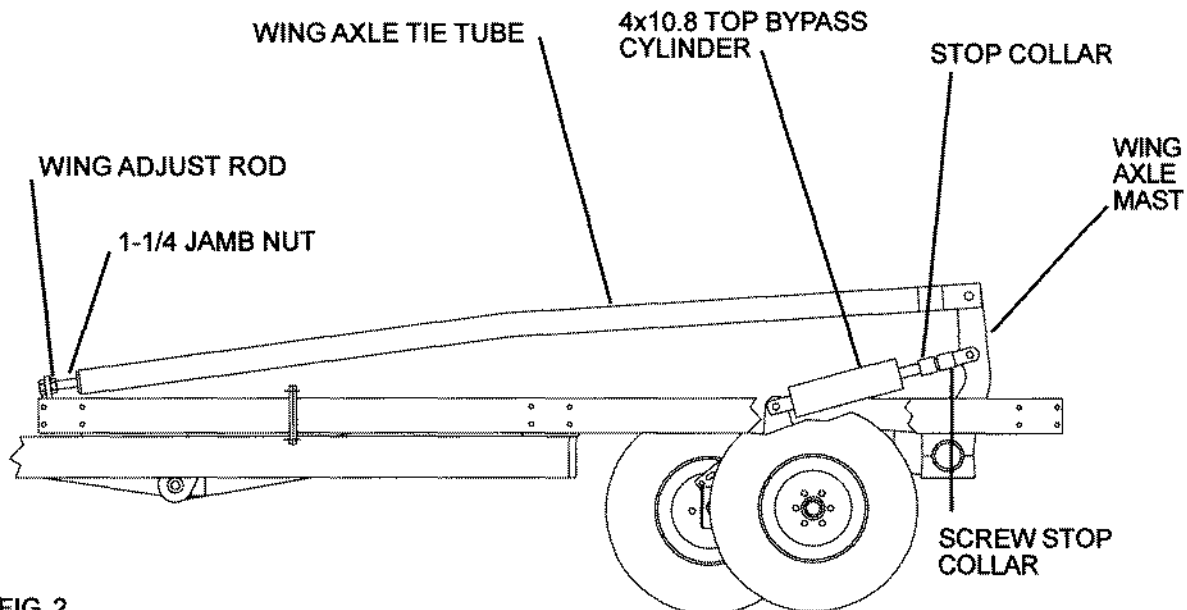


FIG. 2.

79116-1.WMF

# 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 a 1/16" dia hole and go on to the next cylinder. See Fig. 3.

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

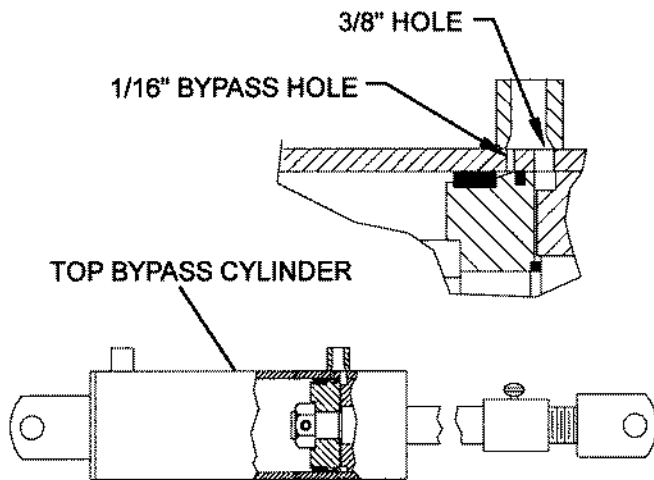


FIG.3.

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

## LEVELING

The operational leveling of the field cultivator 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 setting can be completed in the yard to speed up the field setting operation.

The front to rear level of the main frame is controlled by the main axle lift wheels and the setting of the main hitch. The front to rear level of the wing is controlled by the wing axle lift wheels and the hydraulic front gage wheel. Both the main frame and the wings will need to be adjusted correctly for proper operation.

## PRELIMINARY SETTINGS

Proper preliminary and field settings will require use of a measuring device. Once the unit has been properly assembled and hitched to the tractor that will be used for field operation, make certain the hydraulic system has been properly 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 the unwanted air from the circuit.**

Lower the unit to the ground so that the front row of shanks on the main frame are 1"-2" above the ground.

Measure the main frame height from the ground to the top of the outer frame tube and compare to the distance measured from the ground to the top of this outer frame tube at the rear of the machine. See fig 4.



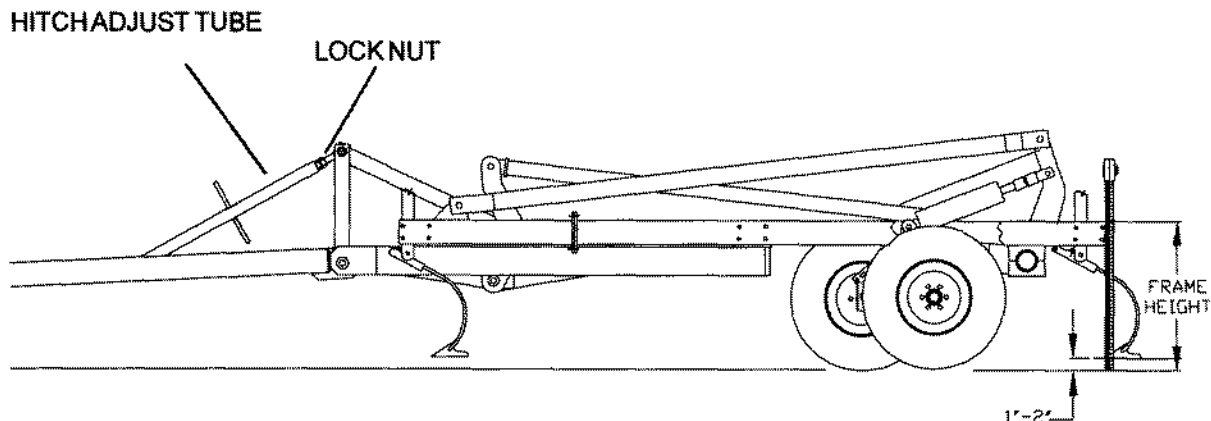


FIG. 4.

If the front dimension is larger (front of frame is higher than the rear) you will need to adjust the hitch adjust tube to drop the front of the unit. Loosen the locking nut and turn the adjust tube to shorten the overall tube length. Re-measure the front and rear dimension and adjust the hitch adjust tube as required to maintain a front to rear level main frame. Once the frame is level front to rear, tighten the lock nut on the hitch adjust tube. Note: the adjustment tube may need to be readjusted in the field.

If the front dimension is less (front of frame is lower than the rear) you will need to lengthen the hitch adjust tube and adjust as required.

**NOTE: If the hitch adjust tube is difficult to turn, lower the unit to the ground to remove the weight from the adjust tube.**

Once the main frame is level front to rear, cycle the main lift hydraulics and lower the unit to the ground. Measure the frame height at the rear corner of the main frame and at the rear corner of the wing. If the rear of the wing is low, loosen the lock nut on the wing adjust rod at the front of the wing (See Fig. 2) By turning the adjust rod into the wing axle tie tube you will raise the rear of the unit. Conversely if the rear of the unit is high you will need to turn the adjust rod out (counterclockwise) to drop the rear corner of the wing. When the rear corner of the wing is at the same height the wing the adjustment rod lock nut can be tightened securely.

Repeat the above procedure for the opposite wing. Note: the adjustment tube may need to be readjusted in the field.

The eXcel field cultivator is equipped with a hydraulically controlled front gage wheel on each wing. This gage wheel provides support to the wing while transporting the unit with the wings lowered and maintains the level of the front of the wing while working. When adjusting the level of the wing to the main frame this wheel should be set also. Once the rear of the wing has been set to match the main frame loosen the adjustment nuts on the lower link arm. By adjusting these nuts the gage wheel can be raised or lowered and will adjust the front corner of the wing. Measure to ensure that the front of the wing is level with the rear as shown in fig. 5.

On smaller wings when adjusting in the yard there may be sufficient rigidity in the wing for either the rear axle or the front gage wheel to carry the complete wing. For example – if you have attempted to adjust the rear axle down to level the wing with the main frame and the wing does not seem to drop, check to see if the front gage wheel is holding the wing up. Once properly adjusted the front gage wheel will raise and lower the wing in sequence with the rear axle movement.

The gage wheel contains a braking feature that may need periodic adjustment. Refer to Fig 5. This brake is to maintain control of the rotation of the gage wheels. As the unit is operating the loading on this gage wheel will vary as conditions change. While operating observe the gage wheel – if it tends to rotate rapidly back and forth (oscillate) the brake may need to be tightened. This will place a slight drag on the rotation of the gage wheel and stabilize the wheel.

**Note: Only tighten the brake pad sufficiently to dampen rotation, do not over tighten and restrict rotation. If the wheel tends to push while turning the brake may be to tight. Loosen the adjustment bolts.**

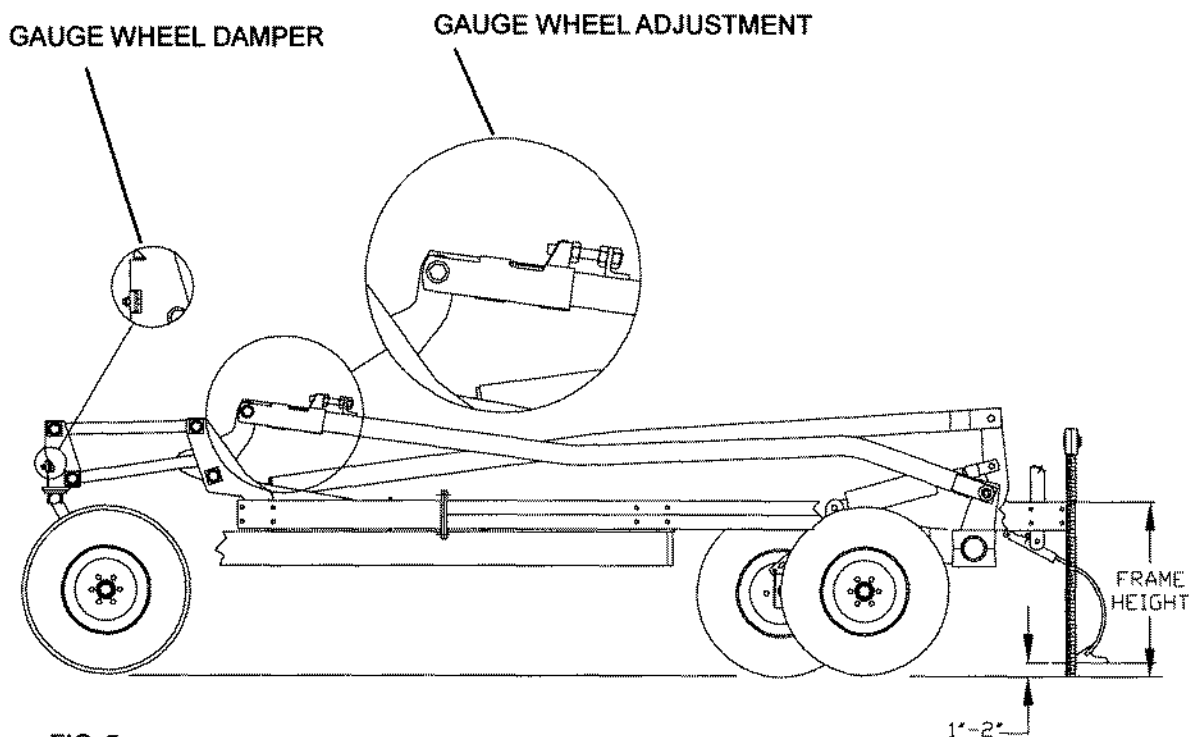


FIG. 5.

## FIELD SETTINGS

Once the preliminary settings have been made in the yard there should be minimal field adjustments required once the unit is taken to the field. It should not be assumed that since the unit is level in the yard it will be level in the field. Variations in ground conditions and loading will impact the functioning and setting of the unit. All final adjustments should be made in the field.

Move to the field, unfold the wings and remove the transport channel locks front the main lift cylinders. Turn all screw collars on the main and wing lift cylinders up to the clevis end of the cylinder rod. Cycle the hydraulics a number of times to clear out any trapped air. Lower the cultivator into the ground and move forward for a short distance. Stop and check the depth of the shanks at the front and rear of the main frame.

By use of the screw stops and stop collars provided, set the main frame rear axle cylinders in position at the desired operating depth. Set the screw collars the same on both main frame lift cylinders. Check the depth of the front shanks with a tape measure or a yardstick. Adjust the front relative to the rear as required by adjusting the front hitch tube. (See Fig 4) Once the front and rear depth is close, raise the unit out of the ground, cycle the hydraulics and drop unit into the ground while moving forward. After moving a short distance recheck the front to rear level of the unit. Adjust either the screw collars on the lift cylinders or the front hitch tube to refine the depth settings.

Once the main frame is operating level at the desired depth move to the wings. While the unit is stopped in the field at operating depth, check the operating depth of the shanks at the front and rear of the wing. If the wing requires adjustment loosen the jam nut securing the wing adjust rod at the front of the wing (See Fig 2). By rotating the wing adjust rod as noted in the Preliminary Settings you can set the operational depth of the wing. Set each wing as required and secure the lock nut to the wing adjustment rod. Follow the same process while adjusting the other wing.

After the wings have been properly adjusted cycle the hydraulics and lower the unit into the ground until the screw collars of the main lift cylinder's contact the cylinder end plates. Move to the wing and turn the screw stop collars on the wing cylinders down until they contact the end plates. Turn the screw collars one-half turn away from the end plates. Cycle the hydraulics and check to ensure that the main frame cylinders are fully retracted and that the wing cylinders are not bottoming out first.

If the front gage wheels on the wings were set properly during the preliminary setting procedure there may be no additional adjustment required. It should be noted that the normal loading on a field cultivator would tend to rotate the frame down at the front of the machine. The extent of this frame rotation is related to the depth of operation, soil conditions, rear attachments and operating speed. This main frame rotation load is carried through the main hitch and to the tractor. The rotation of the wings is controlled by the connection through the wing hinges to the main frame and by the front hydraulic gage wheels. On units with smaller wings a significant part of the rotation will be carried by the main frame hitch. On larger winged units the setting of the front gage wheel is more critical.

Adjust the front wing gage wheels to carry the wing in a level attitude (See Fig. 5). Loading on the front gage wheels and main carrying wheels should be about equal while operating. The best way to determine loading is to operate the unit at the desired depth and speed and observe the functioning. If the wings seem to be carrying the front gage wheel or appears that these wheels are not sinking into the ground you may need to lower the front gage wheels. If the front gage wheels always seem to be pushing into the ground you may be carrying too much wing weight. Adjust the gage wheels to carry less weight.

Once the unit is adjusted level, operate the unit for a period of time and watch the operation. Re-adjust as required and securely tighten any adjustment rods or locking nuts.

Each shank comes fully assembled from the factory. Install the shanks in their proper location and securely tighten u-bolt nuts.

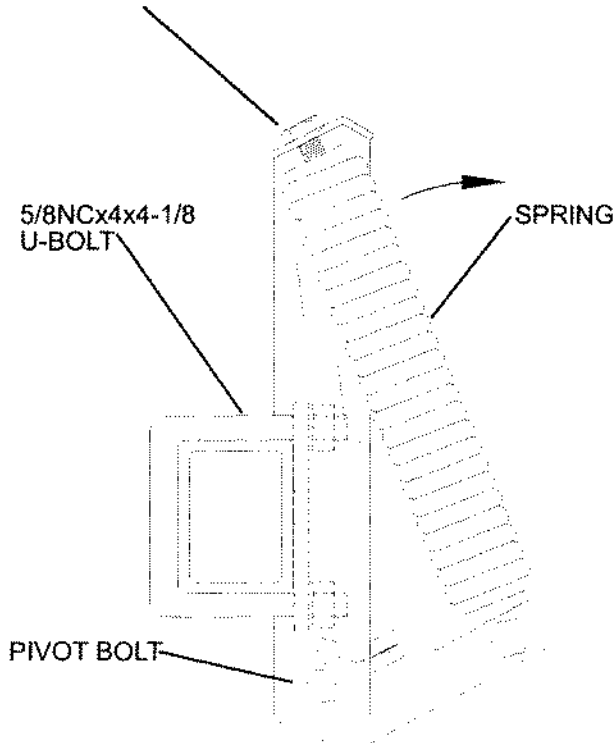
It is recommended that a 47° stem angle be used on all shank assemblies.

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

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

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

SPRING ADJUST BOLT



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.

**Note: Be sure to maintain adequate tire/shovel clearance on shanks located in or 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 the cylinder shafts are left exposed for any extended period of time, they should be coated with grease to protect them from rust and corrosion.

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## 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 the caps which will make greasing easier.

## 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 usage. Caution - do not over grease

Clean and repack hub and spindle bearings once each season.

Tighten spindle nut so that there is a slight drag on the wheel when turned by hand.

## 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.

The spindle nut should be tightened to allow a heavy drag when assembly is rotated by hand.

## 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 overtighten 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 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, seed-bed preparation and weed control.

4" shovel (924)

7" High Crown Shovel

9" High Crown Shovel

9" Dura-Face Shovel

7" Low Crown Shovel (924)

9" Low Crown Shovel (924)

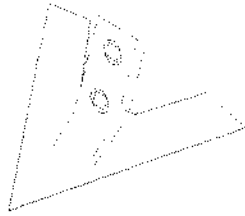
10" Low Crown Shovel (924)

12" Low Crown Shovel (924)

10" High Crown Shovel

12" High Crown 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 general tillage. These spikes are reversible for longer wear.



## SHOVEL EXTENSION

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



## TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
<p>Poor or uneven penetration.</p>	<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</p> <p>See page 46</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 hose are properly connected.</p> <p>See tire inflation.</p>
<p>Settling of entire implement from raised position.</p>	<p>Leaking cylinder.</p> <p>Leaking tractor hydraulic control valve.</p>	<p>Replace cylinder seals</p> <p>See tractor Manual.</p>
<p>Wings unfolding to rapidly.</p>	<p>Incorrect cylinder installed, should have 1/16" dia. integral restrictor cylinder.</p>	<p>See wing lift circuitry and install correct cylinder.</p>
<p>Machine will not pull straight, (skewing).</p>	<p>Cultivator not level.</p> <p>Incorrect shank placement.</p> <p>Shovels wore.</p> <p>Tires not equally inflated.</p>	<p>See leveling</p> <p>Check shanks for proper location, see assembly.</p> <p>Replace shovels.</p> <p>See tire inflation.</p>
<p>Wings running at different depths after setting</p>	<p>Wings out of adjustment.</p>	<p>Reset wing height and tighten jam nut.</p>

