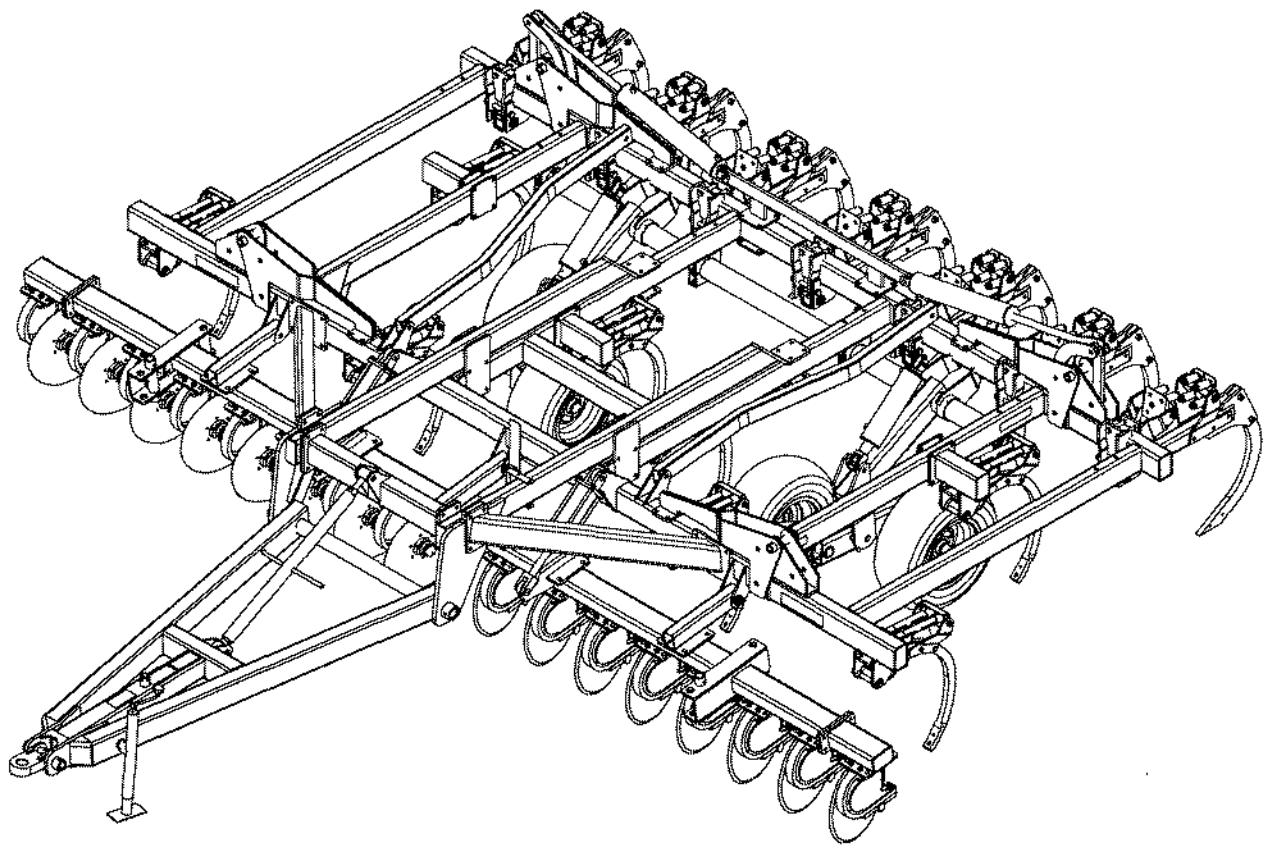




OPERATOR'S MANUAL



For serial number 456654 and up

657 DISK CHISEL RIPPER

Printed in USA (74262) WIL-RICH 657 DCR OPERATOR'S MANUAL 1/07

 **WIL-RICH**

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

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.

CONTENTS

TO THE OWNER	4
SERIAL NUMBER BREAK.....	4
MODIFICATIONS.....	4
PREPARATION.....	4
GENERAL INFORMATION	5
FASTENERS.....	5
TIRE INFLATION	5
WHEEL BOLTS	5
LUBRICATION.....	5
HYDRAULICS.....	5
TRACTOR REQUIREMENTS	6
WHEELS AND TIRES.....	6
METERING VALVES	6
FRONT BALLAST	6
TRANSPORTING	6
BEARING ASSEMBLIES	6
SAFETY	7-13
PERSONAL SAFETY	7
INFORMATION	8
GENERAL SAFETY INFORMATION	8
HYDRAULIC SAFETY	9
STORAGE SAFETY	9
TIRE SAFETY	9
TRANSPORT SAFETY.....	10
SMV.....	10
SAFETY CHAINS	11
SAFETY DECALS	11
SAFETY DECAL PLACEMENT	12-13
SIGN-OFF FORM.....	14
WING REST	15-16
WING LIFT CIRCUITRY	17
DEPTH CONTROL CIRCUITRY	18

OPERATIONAL ADJUSTMENTS	19-23
PRELIMINARY SETTINGS.....	19
MAIN FRAME LEVELING	
FRONT TO REAR.....	19
WING LEVELING	
Front to Rear & Side to Side	20
FIELD SETTINGS	21
SEQUENCE CYLINDER	
OPERATION	22-23
MAINTENANCE	24-26
RIPPER SHANK	24
CYLINDER SHAFTS	24
AXLE CAPS.....	24
HUB AND SPINDLE ASSEMBLIES	24
WALKING TANDEM ASSEMBLIES	25
HYDRAULICS.....	25
STORAGE	25
LUBRICATION CHART.....	26-27
OPTIONAL ATTACHMENTS	28-30
RIPPER POINTS.....	28
CHISEL SPIKES	29
HARROW.....	30
GENERAL	
TROUBLE SHOOTING	31

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.

SERIAL NUMBER BREAK

Every implement has a serial number located on the forward left corner of the main frame. (See page 13) 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.

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

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

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.



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

PREPARATION

Before operating the **WIL-RICH 657 DCR**, a careful inspection must become routine. A check must be made to ensure that all hardware and fasteners are securely tightened and moving parts properly lubricated.

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.

GENERAL INFORMATION

FASTENERS

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 rechecked 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.

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 sidewall area.

If the tire buckles or wrinkles, the air pressure must be increased to the point where the sidewall remains 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.

	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

Note: Do not inflate tires beyond the specified tire pressure.

WHEEL BOLTS

It is recommended that all wheel bolts be checked for tightness before using and again after one day of use. Check periodically to be sure the wheel bolts are tight.

LUBRICATION

Make sure the 657 DCR is properly lubricated. It is recommended to use **Wil-Rich 460ep Tillage Lubricant** in your 657 DCR. It is specifically designed for the loads and conditions encountered in heavy tillage.

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.



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.

TRACTOR REQUIREMENTS

The **WIL-RICH 657 DCR** requires approximately 11 to 18 horsepower per foot. Three remote cylinder outlets and controls are required.

WHEELS AND TIRES

Dual tractor rear wheels are recommended for use with the 657 DCR. 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 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

Tractor front end stability is necessary for safe and efficient operation. Therefore, it is important that the proper amount of weight be installed on the front of the tractor as recommended in your tractor operator's manual.



Note: Ballast recommendations provide for adequate transport stability at recommended speeds. Additional front ballast may be required for satisfactory field operation due to sudden or extreme forces on the 657 DCR. These forces may occur when removing the 657 DCR from the ground and turning at rows end, or during field transport over very rough ground.

TRANSPORTING

A SMV (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.

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.

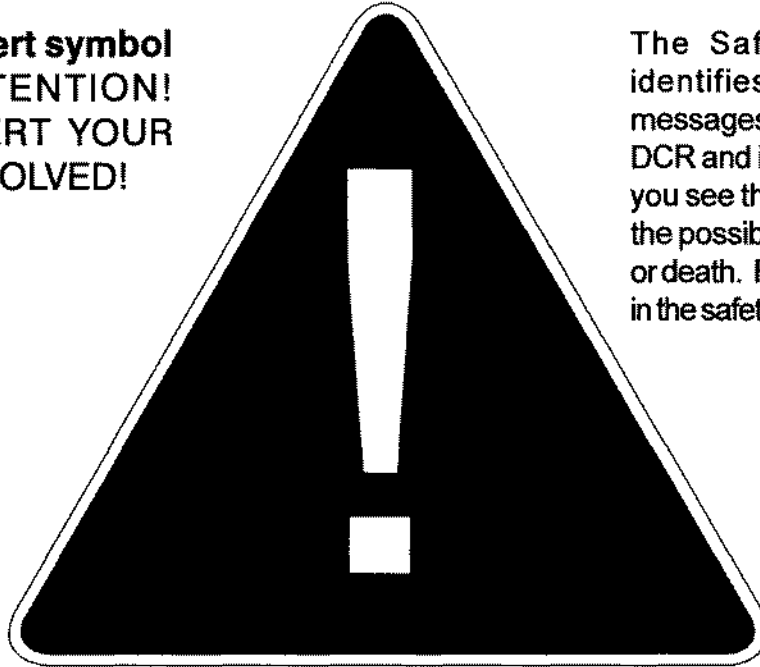
Road transport and field working will seat the bearings and will require additional adjustment. After 20 hours of machine operation remove the grease cap and check the bearing tightness.

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.

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 657 DCR 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 guidelines:

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

INFORMATION

YOU are responsible for SAFE operation and maintenance of your Wil-Rich 657 DCR. YOU must ensure that anyone who is going to operate, maintain or work around the 657 DCR 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.

657 DCR owners must give operating instructions to operators and employees before allowing them to operate the 657 DCR, 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 BEFORE OPERATING

Read and understand the operator's manual and all safety signs before operating, maintaining or adjusting the 657 DCR.

Review safety related items with all operators annually.

Use extreme care when making adjustments.

When working under or around the machine, always lower the 657 DCR to the ground.

After servicing, install and properly secure all shields and guards before operating. Remove all tools, parts, and service equipment from the machine.

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, and head. 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 serviceing, adjusting, repairing or unplugging. Do not attempt to remove any obstruction while machine is in motion.

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.

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

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.

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.

TRANSPORT SAFETY

Read and understand ALL the information in the Operator's Manual regarding procedures and SAFETY when moving the 657 DCR 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. Reduce speed and 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 (see safety chain information.)

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.

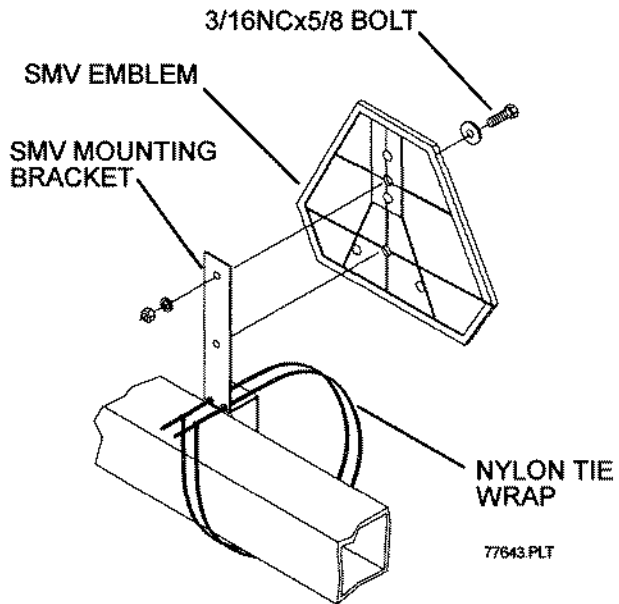
Do not exceed 20 m.p.h. during transport.

SMV

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

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

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

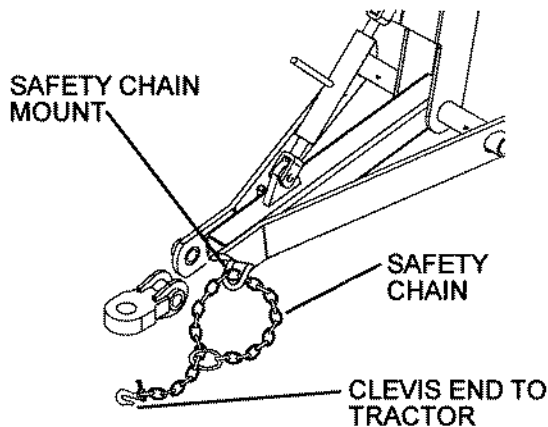


Keep safety decals clean. Replace any safety decals that are damaged, destroyed, missing, painted over or can no longer be read. Replacement safety decals are available through your dealer.

SAFETY DECALS

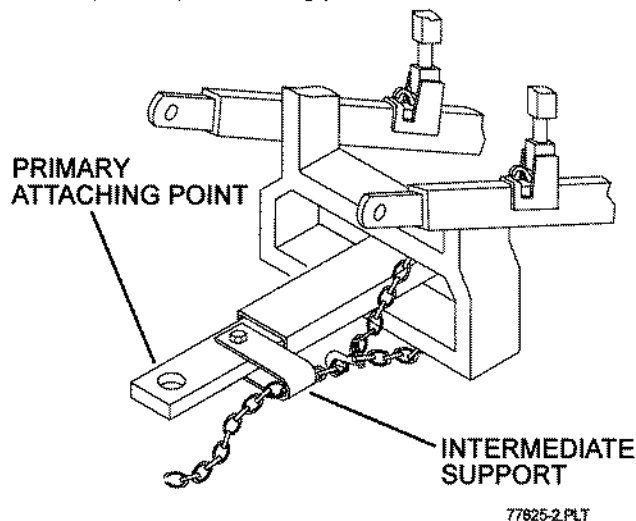
SAFETY CHAINS

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 illustration below.)

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. Replace any decal that becomes worn, damaged, painted over or difficult to read.

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.

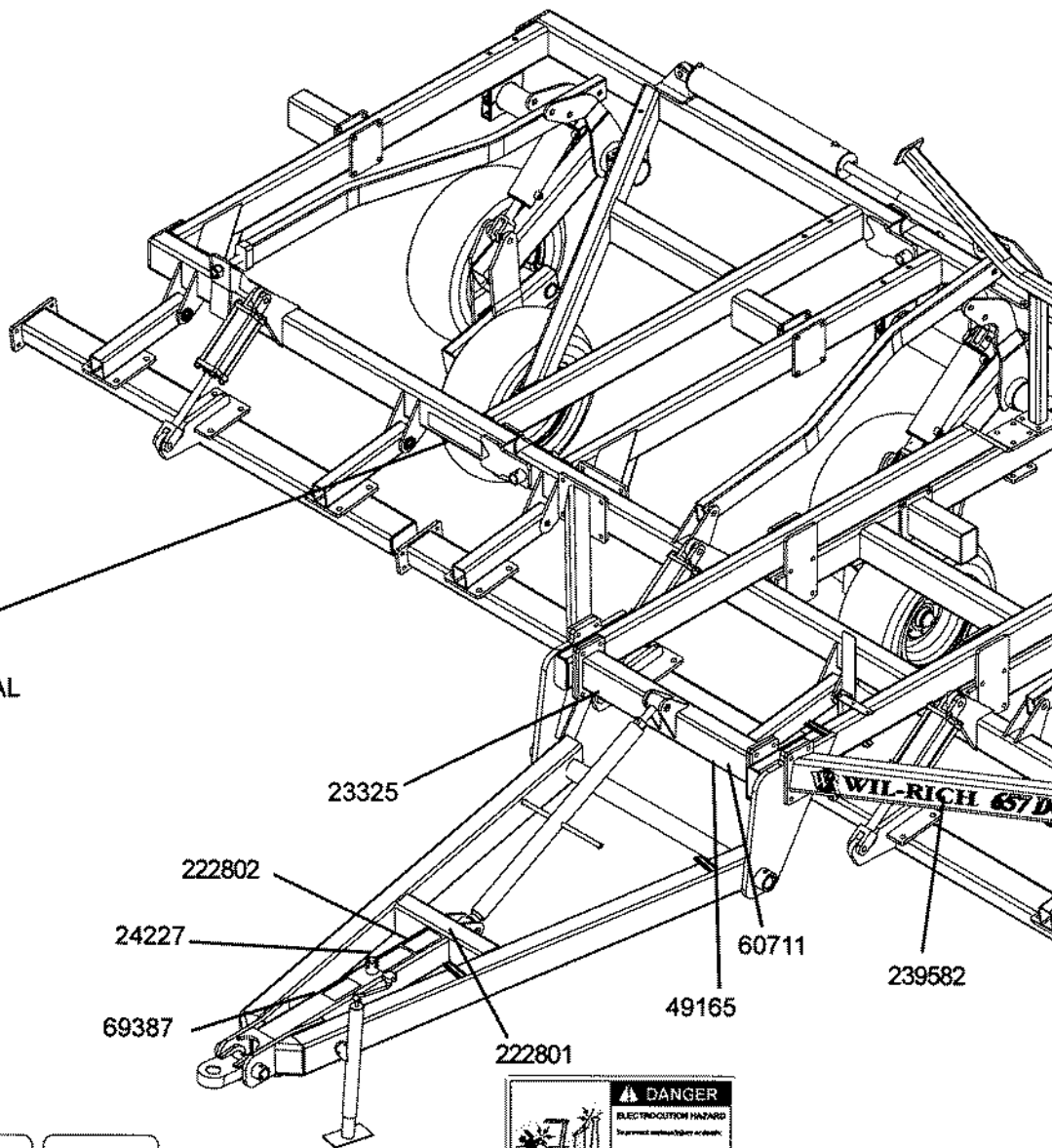
Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.

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

SAFETY DECAL PLACEMENT

WIL-RICH 657 DCR

239582 657 DCR DECAL



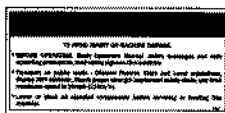
222800 DANGER DECAL



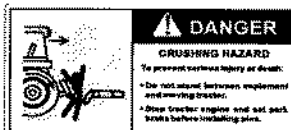
69387 WARNING DECAL-OPERATING

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

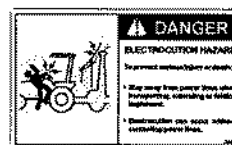
54900 WINGS UP DECAL
54901 WINGS DOWN DECAL
54902 MAIN UP DECAL
54903 MAIN DOWN DECAL



24227 WARNING DECAL-OPERATING



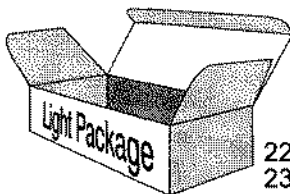
222802 CRUSHING DECAL



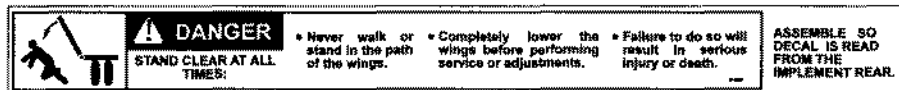
222801 ELECTROCUTION DECAL



41345 SMV KIT



223189 FOR RIGID UNITS
236569 FOR FOLDING UNITS



41508 WING LOCK DANGER DECAL

LOCATION OF
SERIAL NUMBER

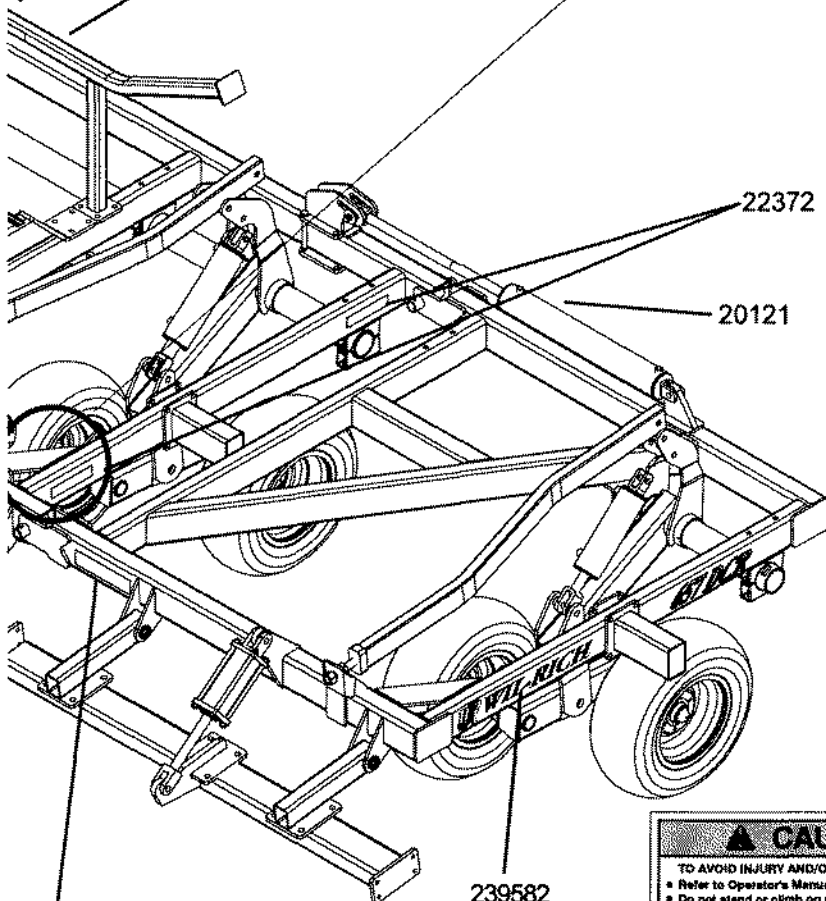


20121 INTEGRAL RESTRICTOR DECAL

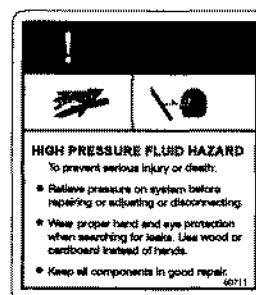
22371 RED DEFLECTOR



22372 AMBER DEFLECTOR



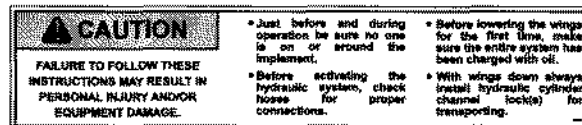
23325 CAUTION DECAL - READ



60711 HIGH PRESSURE FLUID HAZARD



222800 DANGER DECAL



49165 CAUTION DECAL

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 657 DCR 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.

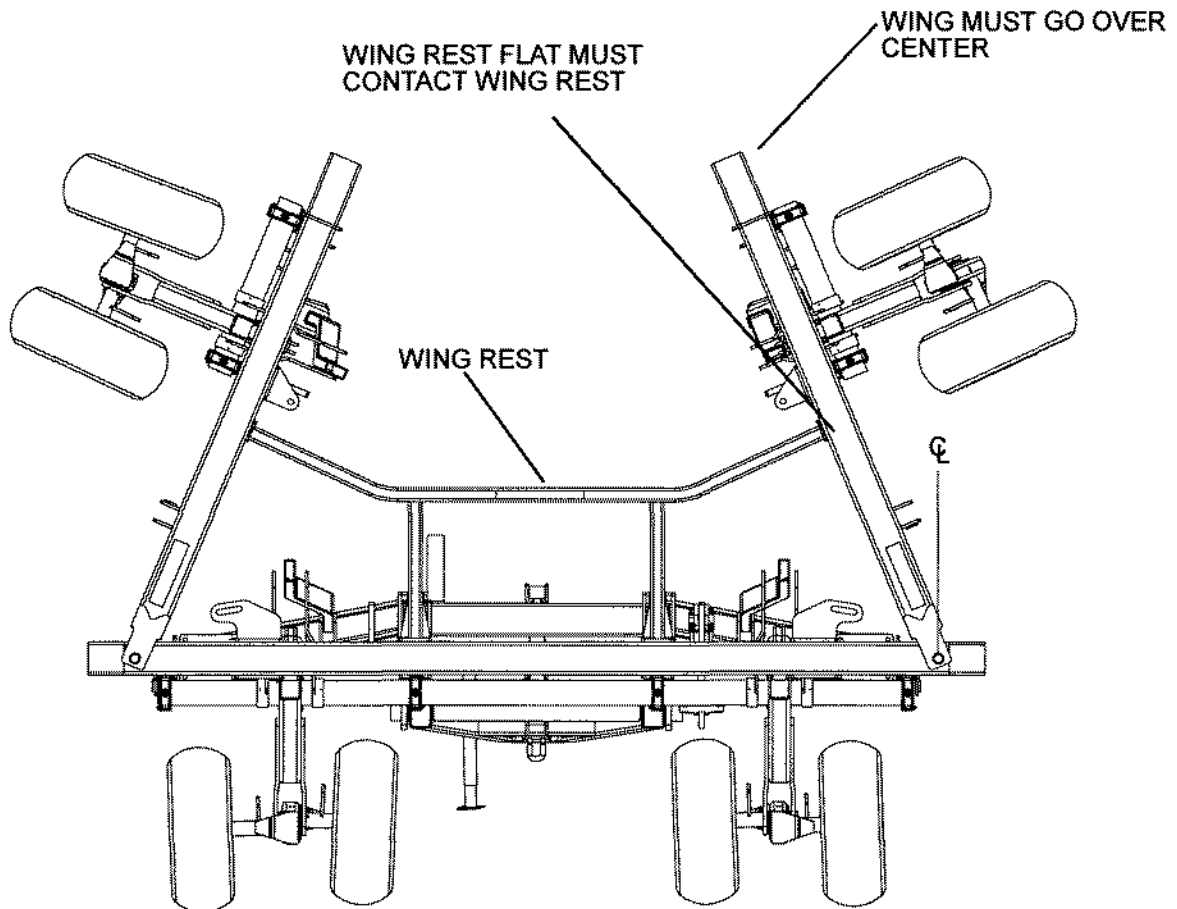
A sign-off sheet is provided for all personnel who will be working with equipment have read and understood the information in the operators manual and have been instructed in the operation of the equipment.

DATE	EMPLOYEE'S SIGNATURE	EMPLOYER'S SIGNATURE

SIZE 28 WING REST


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

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



Note: Assemble so decal is read from the implement rear.

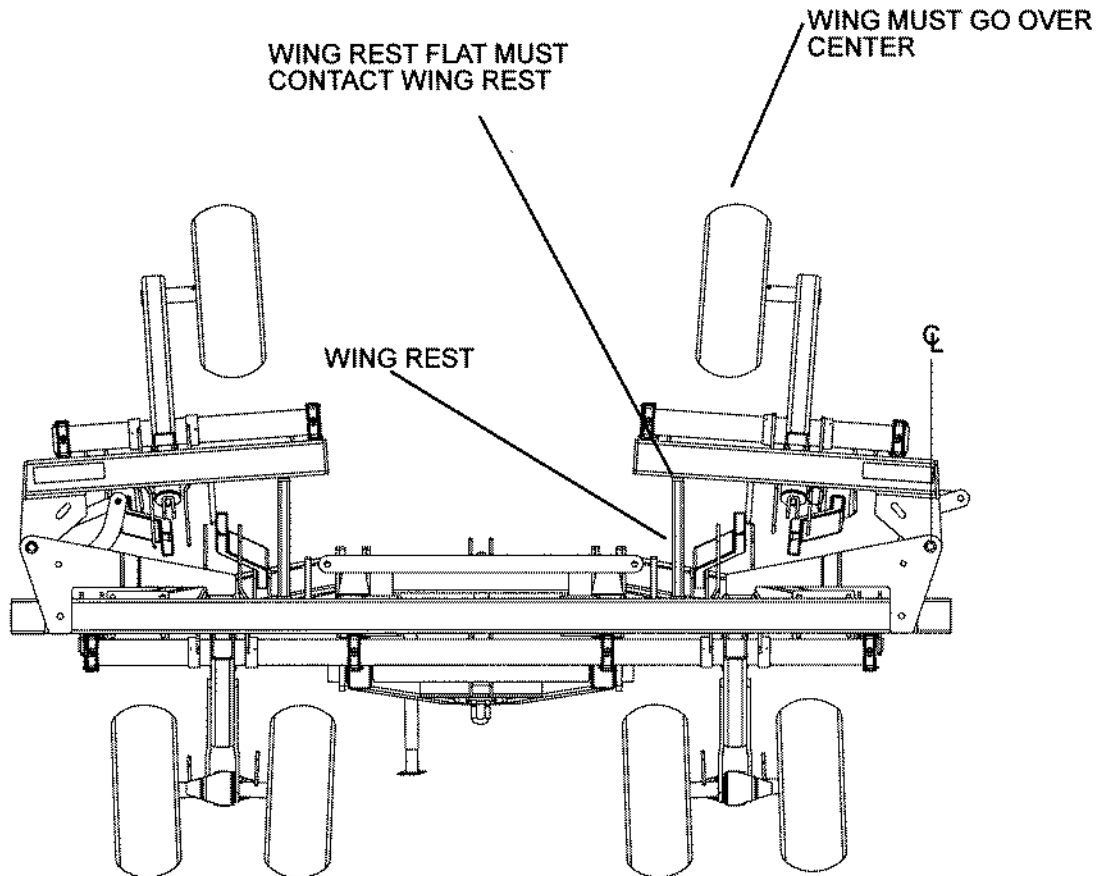
Fig. 1 Wing Rest

	⚠ DANGER STAND CLEAR AT ALL TIMES:	<ul style="list-style-type: none">• 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.
---	--	---	--

SIZE 23 WING REST


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

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



Note: Assemble so decal is read from the implement rear.

Fig. 1 Wing Rest

	! DANGER STAND CLEAR AT ALL TIMES:	<ul style="list-style-type: none">• 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.
---	--	---	--

WING LIFT CIRCUITRY

Wil-Rich 657 DCR equipped with folding wings have hydraulic wing lift cylinders to fold the implement for road transport.

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

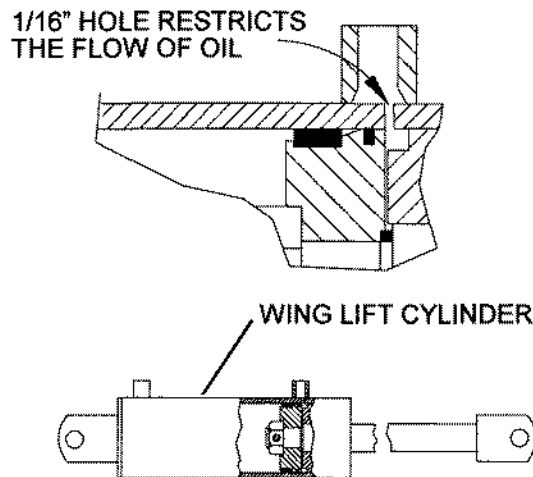


Fig.2 Wing Lift Cylinder

77851

Fig. 3 shows a simple two (2) cylinder circuit used to fold a pair of wings. This system is used on Wil-Rich 657 DCR's with a single pair of folding cylinders.

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.

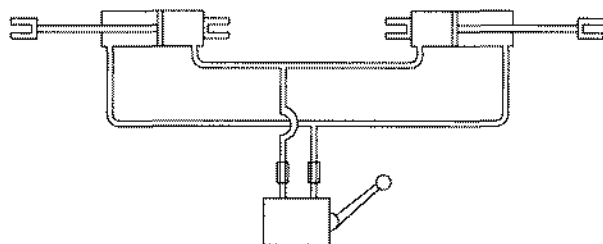


Fig. 3 Two Cylinder Wing Lift Circuit

77827_2



CAUTION

TO AVOID INJURY AND/OR EQUIPMENT DAMAGE:

- This cylinder has an integral restricting orifice and must be replaced with an identical cylinder.

20121

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. 6 & 7.

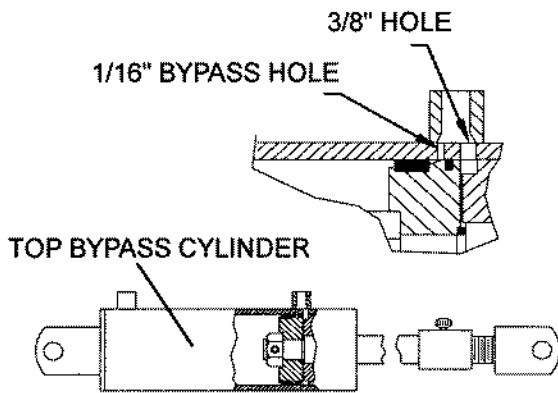
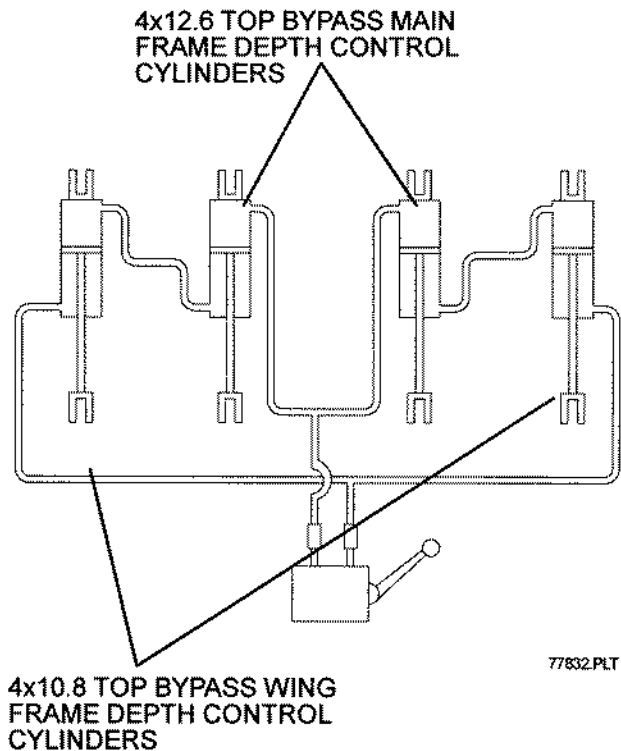


Fig. 6 Top Bypass Cylinder

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

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.



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Fig. 7 Lift Hydraulic Circuit

OPERATIONAL ADJUSTMENTS

The preliminary operational setting of the unit can be completed in the yard or a level area of a field. Final front to rear and side to side adjustments must be made at operational depth.

PRELIMINARY SETTINGS

Proper preliminary and field settings will require the use of a measuring device. Once the unit has been properly assembled and hitched to the tractor that will be powering the unit, **make certain all hydraulic circuits have been charged and cycled a number of times.**

Position the unit on a level surface and unfold the wing, **checking to ensure that there are no obstructions or personnel in the path of the wings.**

NOTE: Cycle the main lift hydraulic circuit a number of times to purge air from the circuit. Hold the hydraulic control lever in the "RAISE" position for a 1-3 minute period to clear air from the circuit.

Remove the stop collars from all main lift cylinders and turn the screw stop collars up to the clevis end of the cylinders. Lower the unit so that the front shovels or spikes are 1" –2" above the ground. Measure the frame height at the front corners from the ground to the top of the frame tube. Compare this to the distance from the ground to the top of the frame tube at the rear of the unit. See Fig. 8.

Main Frame Leveling Front to Rear

Front to rear leveling of the main frame is controlled by the screw jack located at the front hitch (see Fig. 8.) If the front of the unit is higher than the rear you need to lower the front by adjusting the screw jack to a shorter length, lengthen the screw jack to raise the front of the frame. Adjust jack as required, measure and compare the front and rear frame heights and re-adjust the jack as needed.

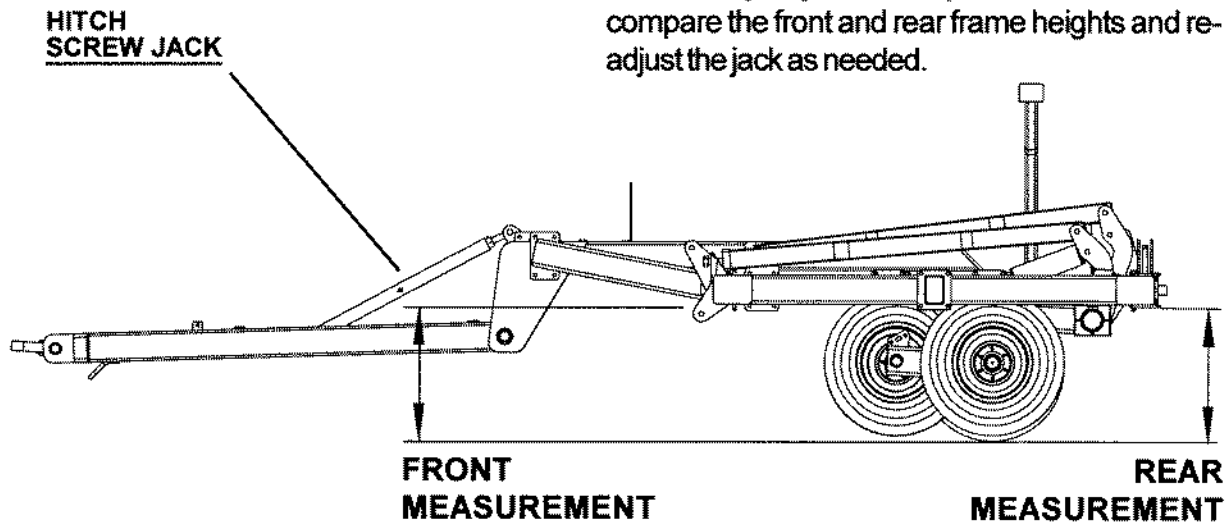


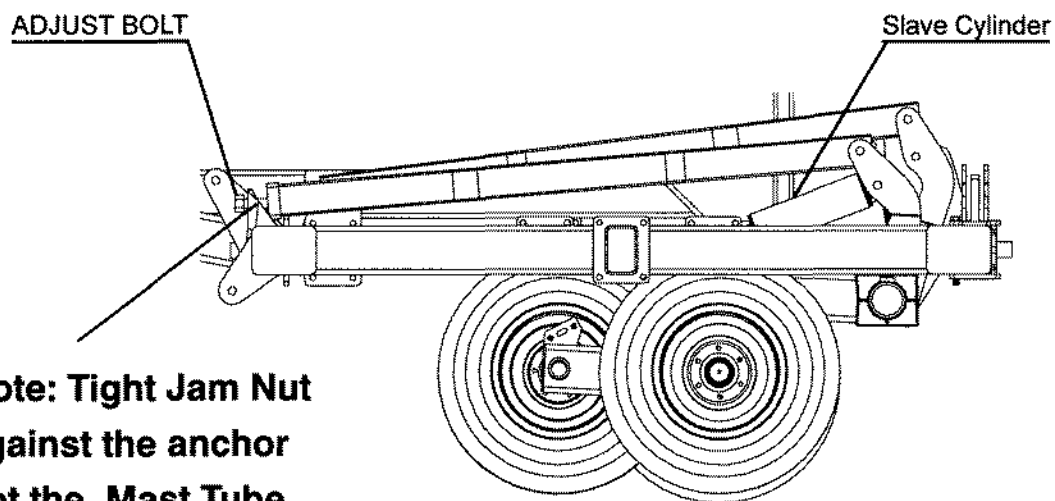
Fig. 8

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Wing Leveling Front to Rear & Side to Side

There is limited front to rear leveling that needs to be done at this point. The only adjustments that need to be made are to adjust the depth of the wing relative to the main frame, referred to as "Side to Side" leveling. With the main frame set level, measure from the ground to the top of the wing frame tubes on the front and rear of the wing. Compare to the measurements set for the main frame, if the distance is greater you need to lower the wing.

Adjust the front adjust bolt to a longer length to lower the wing. Conversely if the wing needs to be raised to match the main frame, shorten the adjust bolts as needed. Re-measure and adjust as required. Repeat procedure to level the remaining wing. See Fig. 9 & 10.



**Note: Tight Jam Nut
against the anchor
not the Mast Tube.**

Fig. 9

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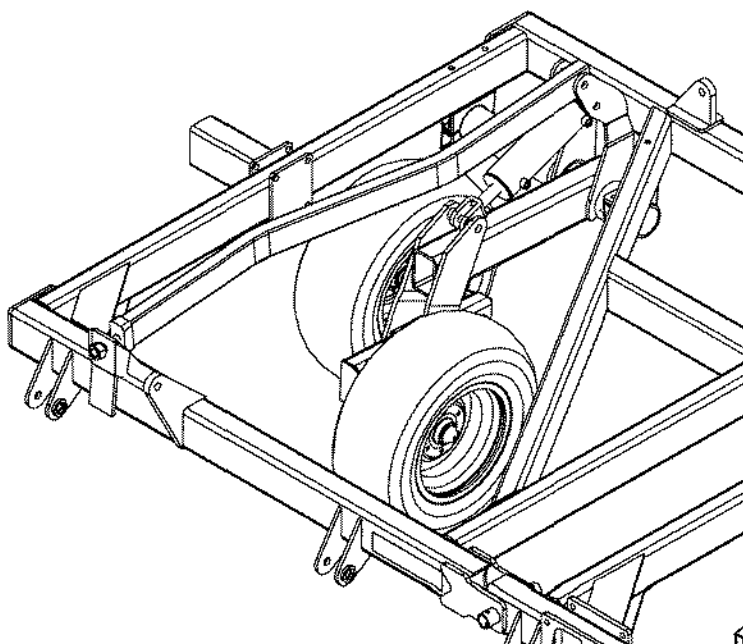


Fig. 10

FIELD SETTINGS

Even if the unit has been leveled in the yard, it should never be assumed that the unit would operate level in the field without checking or adjustments. Changing field conditions, loading of the shank and attachments will impact the functional level and working in the field.

Move to the field and stop the unit in a level area. Unfold the wings; making certain that there is adequate room, with no person or obstruction in the wing fold area. Activate the main lift hydraulics and remove the transport channel locks from the main lift cylinders. Make a visual inspection of the unit to ensure that all hardware is properly tightened, hoses are clear and that the unit is ready for field operation. Stop collars should have been removed for yard adjustment and all screw collars should be turned to the clevis end. Cycle the main lift hydraulics a few times to purge any air from the system.

Move forward in the field at a moderate speed and lower the unit into the ground. Stop and measure the frame height at the rear of the main frame. As noted in Fig. 11, the working depth is equal to the overall height minus the frame height. By use of the screw stop and stop collars on the main frame lift cylinders set the desired working depth. You may need to set a depth, pull forward through the field, stop, check the depth and adjust the depth a number of times. Once the rear shanks are at the required depth measure the frame height at the front of the main frame. By adjusting the front hitch screw jack the hitch can be raised or lowered to adjust the depth of the front of the main frame and level the unit.

Once the main frame has been leveled by adjusting the screw stop and hitch screw jack move into the field at operational depth and stop the unit. Measure the frame height of the wing at the rear of the wing and compare to the frame height at the main frame. Adjust the front wing adjustment bolt to level the wing to the main frame. Repeat the same procedure for the opposite wing.

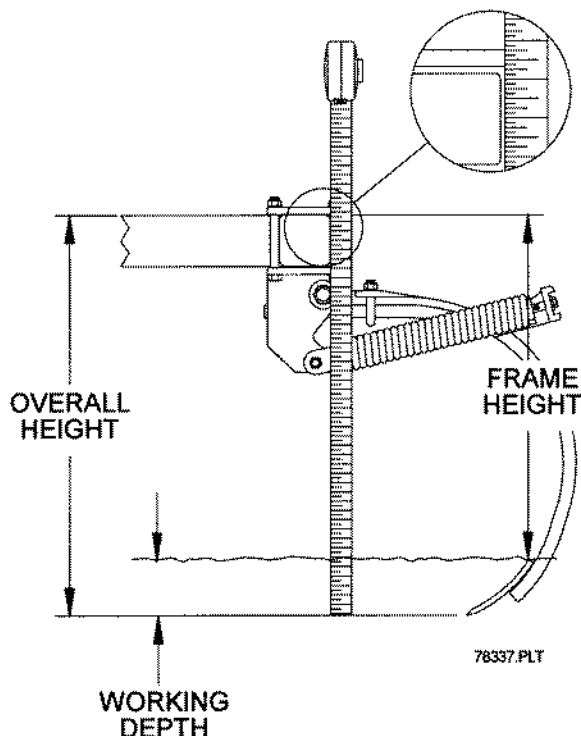


Fig. 11 Shank Settings

SEQUENCE CYLINDER OPERATION

This unit is equipped with a lift system that utilizes sequencing cylinders. In a sequencing system the cylinders are sized to operate in series and provide a level lift to the unit. The WIL-RICH sequencing system utilizes 4" bore cylinders with varying stroke length. On this unit the main lift cylinders have a 12.6" stroke length with a 10.8" stroke wing cylinder.

See Fig. 12.

The cylinders are connected in series with hydraulic hoses. The rod end of the main (MASTER) cylinders are connected to the base end of the wing cylinders. Because of the rod in the main cylinder there is less volume in the rod end versus the base end. The next cylinder in the series (SLAVE) needs to be shorter because of the less volume, hence the 10.8" stroke.

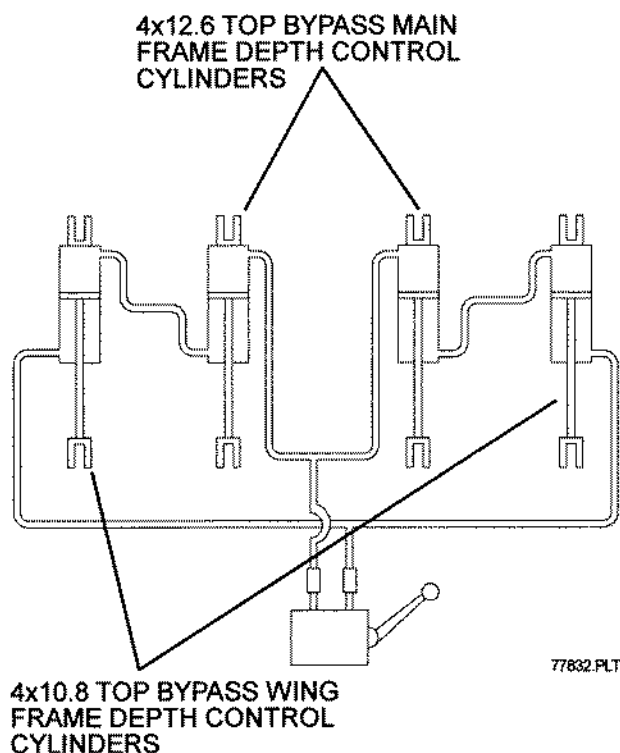


Fig. 12 Sequencing Lift Hydraulic System

As the main cylinder extends the oil is forced out of the rod end and into the base end of the wing cylinder. If there were an additional wing with a 9.4" stroke cylinder the oil would be routed from the rod end of the 10.8" stroke cylinder to the base of the 9.4" cylinder.

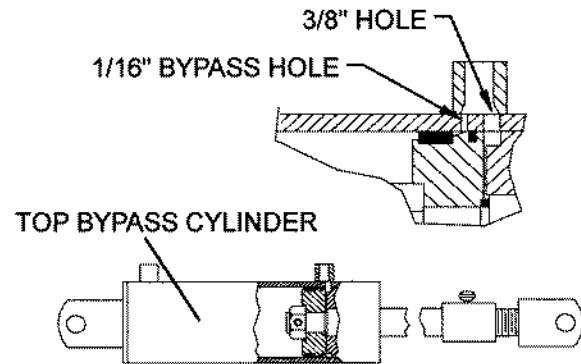


Fig. 13 Top Bypass Cylinder

As hydraulic oil is pumped into the base end of the master cylinders, oil is forced out of the rod ends of these cylinders to the base ends of the first slave cylinder. The oil forced out of the rod ends of the first slave cylinder goes to the base ends of the next slave cylinder or back to the tractor.

As the machine is raised and the cylinders are completely extended, the slave cylinders will become sequenced with the master cylinder. Because of the varying stroke lengths the cylinder anchor positions on the lift mast and axles is designed to provide even rotation of the axle and a level lift.

Synchronization is accomplished by allowing oil to pass from the base end of the cylinder to the rod end through a small orifice at the rod end of each cylinder. When the piston seal passes by the orifice (cylinder fully extended) oil passes from the base of the BASE end of the master cylinder to the base

end of the slave cylinders. When the slave cylinder rods are fully extended, oil passes from the BASE end of the slave cylinders back to the tractor.

For synchronization to be accomplished, depth control must be held for a few seconds with the cylinders fully extended, to allow passage of oil through the system.

After oil has “rephased” the system, leave depth control in neutral position at least three seconds to allow cylinders far enough to close the rephase passages and completely synchronize the system.

NOTE: The depth of the unit is controlled by the screw stop settings of the main lift cylinders.

Depth will be reached when the main lift cylinder screw collars contact the cylinder end plate. Follow the main frame setting instructions noted above to set the operational depth and level. Once the mainframe screw stops have been set you can turn the screw collars on the wing cylinders down to just contact the wing cylinders end plates. This provides a backup to maintain a consistent unit depth if the seals should leak. Do not use the wing cylinder screw stops collars to control the overall depth of the unit. For example – if a wing is low, you cannot turn the screw stop on that wing cylinder to hold the wing; you will need to adjust the front screw jack to raise the wing. With a sequencing lift system, the first cylinder to be stopped will stop the movement of all cylinders in the system. If a wing needs to be adjusted side to side to be level with the main frame, the adjustment must be made at the front screw jack on the wing, not at the wing cylinder screw stops.

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

The mounting 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.

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

Note: Grease fitting decals are included in the hardware kit. Locate grease fitting points and place decals in position to indicate a grease fitting.

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.

RIPPER SHANK MAINTENANCE

Grease daily when operating with moderate to heavy tripping and every other day with light tripping.

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 shank assembly for loose or broken parts and adjust or replace as necessary.

NOTE: A 3/4NFX3-1/2 GR8 Fine Thread Bolt is used to attach shank to frame in the upper attaching position and a 3/4NCx3-1/2 GR5 Coarse Thread Tap Bolt is used in the lower attaching position. **DO NOT INTERCHANGE!** The 3/4NCx3-1/2 GR5 Bolt is used as a shear bolt.

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.

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. *See note below for lubricating.

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

***Note:** Transport wheel hubs and walking tandem hubs are not fully filled with grease when assembled. Though these hubs are usually equipped with grease fittings, pumping a few shots of grease on a regular interval into these hubs will not ensure that the grease enters or flushes

WALKING TANDEM ASSEMBLIES

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

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 657 DCR 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 657 DCR's 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.

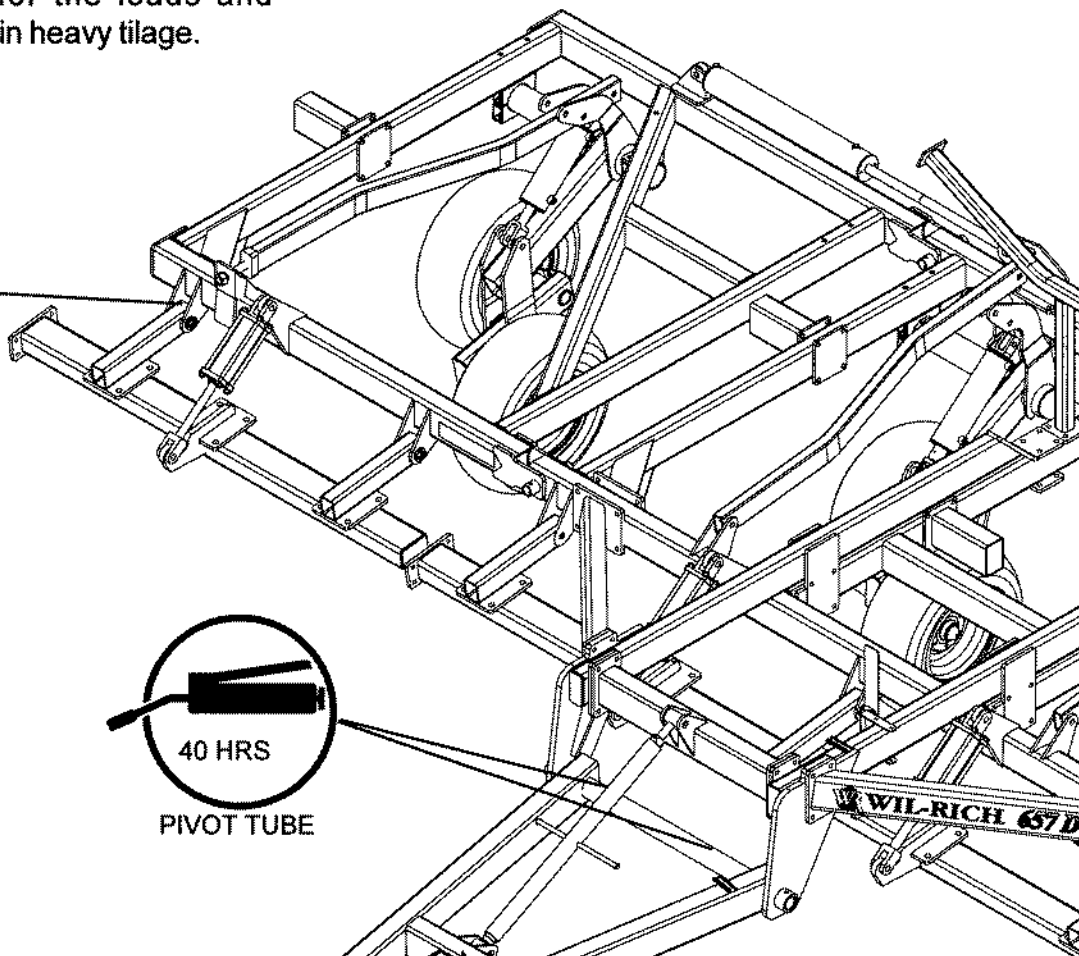
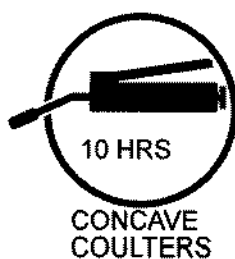
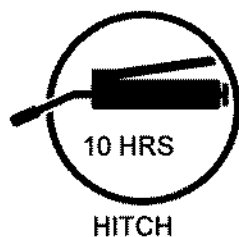
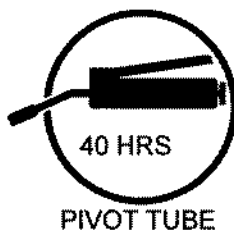
Avoid possible damage to the hydraulic system by lowering the machine onto the shanks and relieve the pressure on the system. Doing this will also prevent damage to the tires by removing the field cultivator's weight.

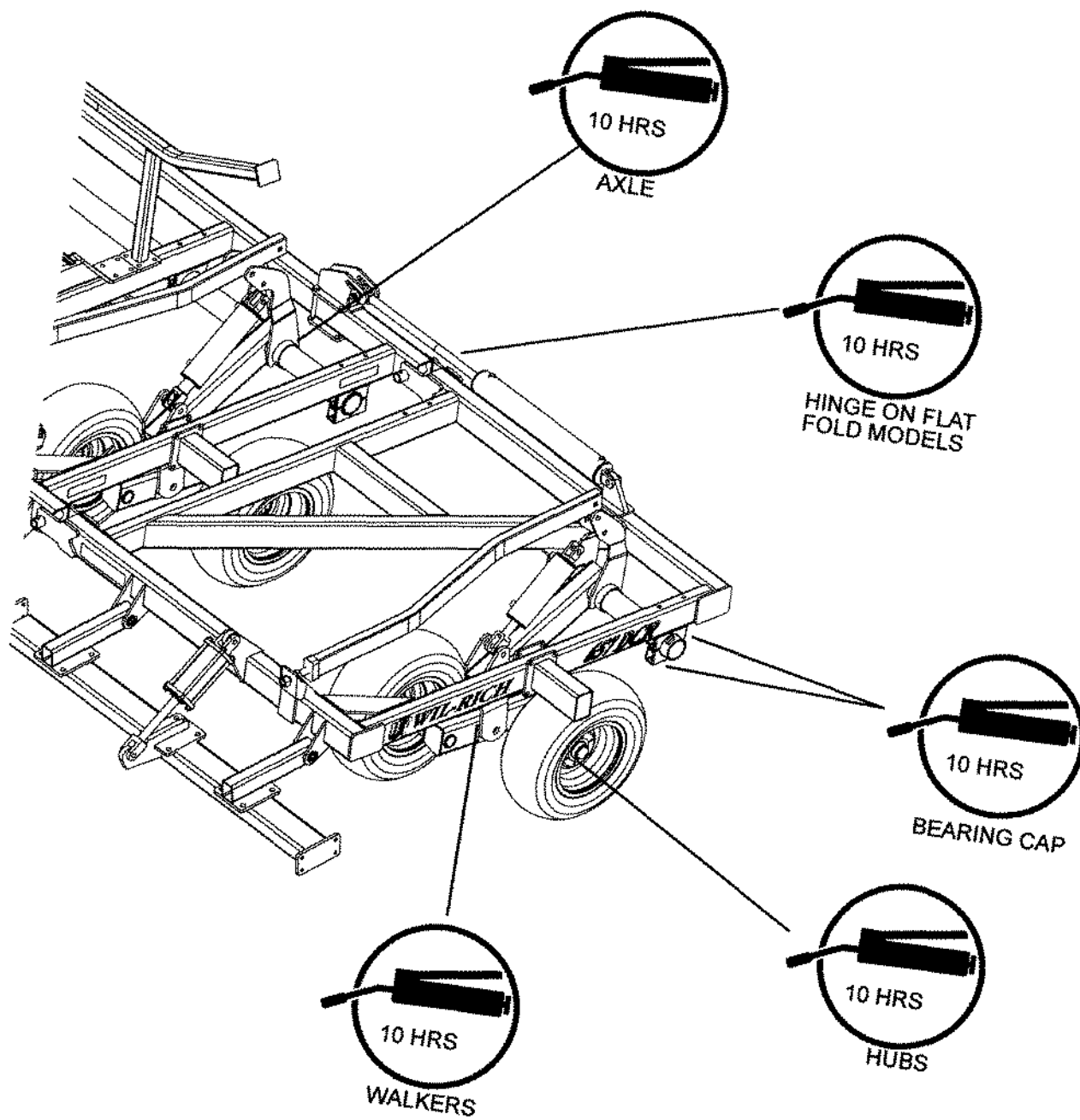
Coat the shovels with grease and place boards under the points to prevent the shovels from settling into the ground.

LUBRICATION

LUBRICATION

Make sure the 657 DCR is properly lubricated. It is recommended to use **Wil-Rich 460ep Tillage Lubricant** in your 657 DCR. It is specifically designed for the loads and conditions encountered in heavy tillage.





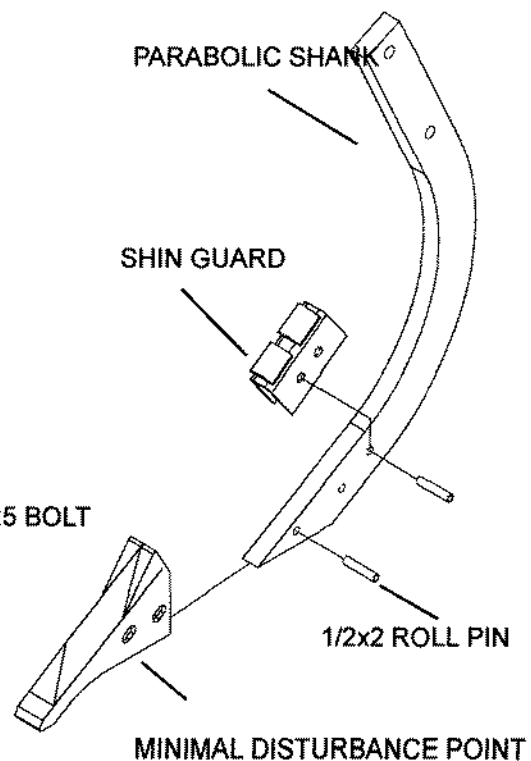
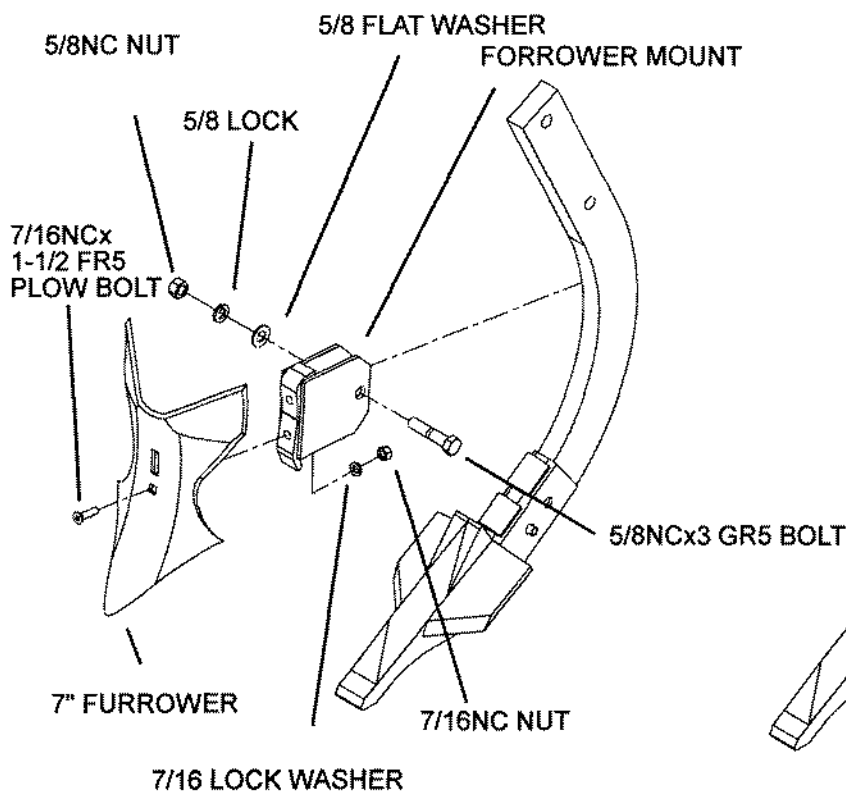
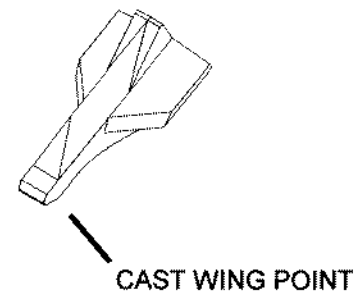
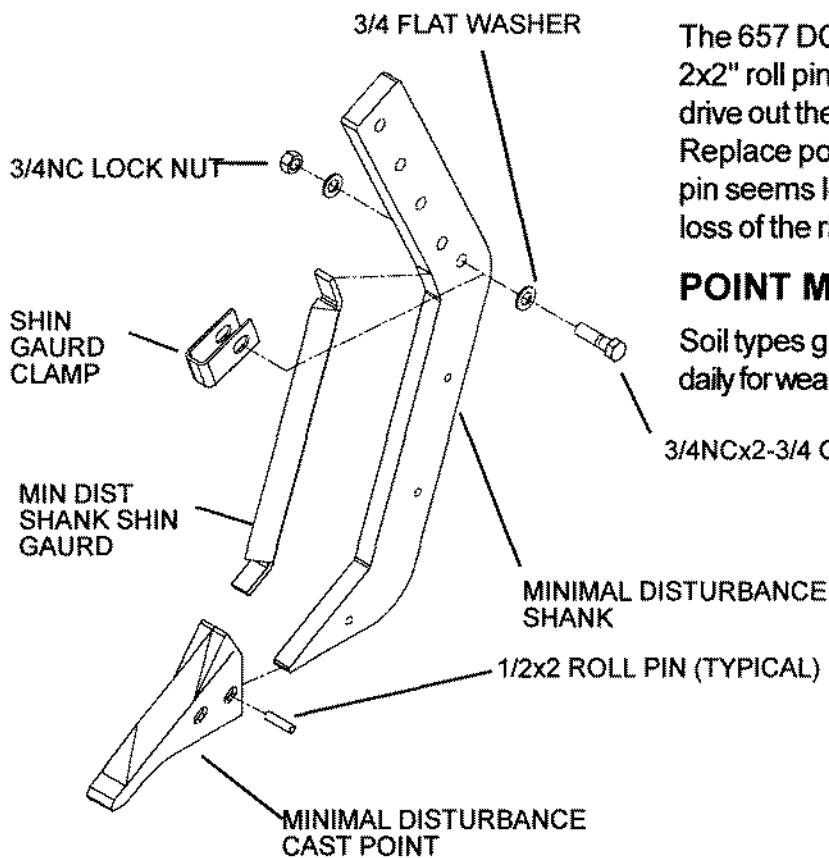
OPTIONAL ATTACHMENTS

POINTS FOR RIPPER SHANKS

The 657 DCR points are held to the shank by a 1/2x2" roll pin. To Remove the point use a punch to drive out the roll pin and slip the point off the shank. Replace point and drive roll pin in place. If the roll pin seems loose replace with a new pin or risk the loss of the ripper point.

POINT MAINTENANCE

Soil types greatly effect the point life. Check points daily for wear, damage and loose mounting hardware.



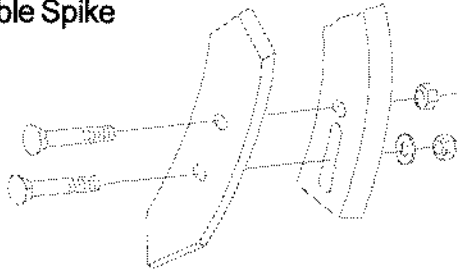
OPTIONAL ATTACHMENTS

SPIKES FOR CHISEL SHANKS

Moldboards and Spikes are recommended for deep penetration, hard soil conditions, killing off quack grass and other grassy weeds. For turning more soil over, use the moldboards.

2" Reversible Spike

5/8x2x15:



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3" (RH & LH)

Twisted Spike

1/2x3x22:

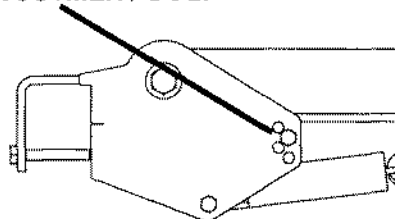


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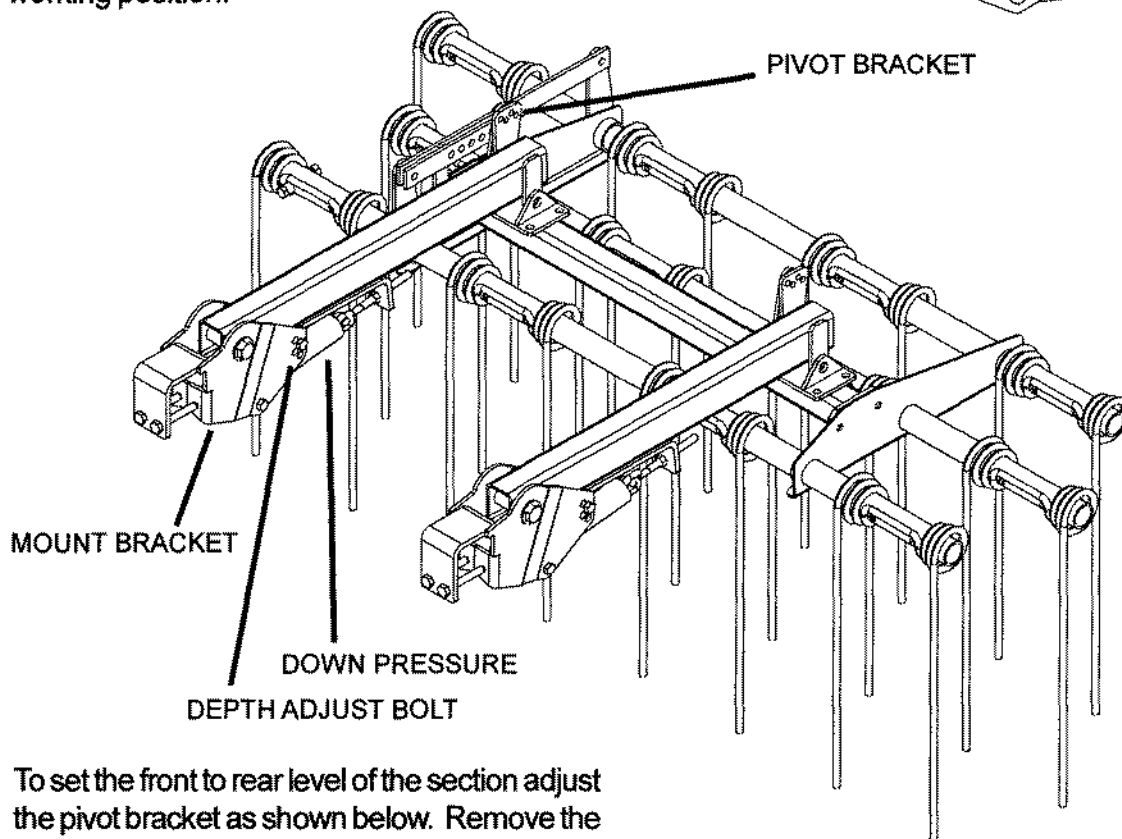
HARROW OPERATION

To set the harrow working depth, first set the 657 DCR to its working position. Remove the 5/8NCx5 GR5 bolt and relocate as required. The section should be set to run 3" to 5" deep in the working position.

DEPTH ADJUSTMENT BOLT

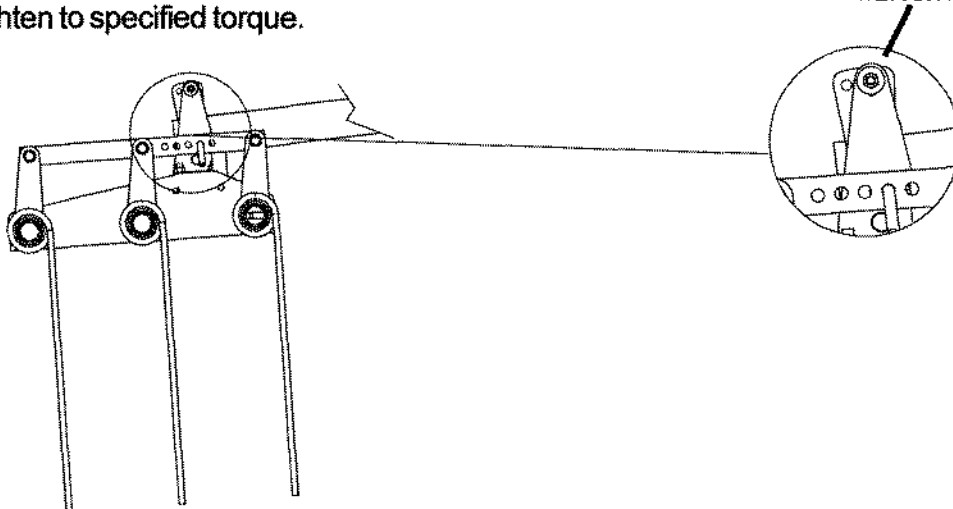


PIVOT BRACKET



To set the front to rear level of the section adjust the pivot bracket as shown below. Remove the 1/2NCx1-1/2 GR5 bolts and rotate the section until the section is level. Reinstall bolts and retighten to specified torque.

1/2NCx1-1/2 GR5 BOLT



GENERAL TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Machine will not pull straight (skewing or dog tracking.)	657 DCR not level. Incorrect shank placement. Tires not equally inflated.	See leveling page. Check shanks for proper location, see assembly manual. See tire inflation.
Settling of entire implement from raised position.	Leaking cylinder. Leaking tractor hydraulic control valve.	Replace cylinder seals (see locating leaking cylinders.) See tractor manual.
Wings lowering too rapidly.	Incorrect cylinder installed, should have 1/16" dia. integral restrictor cylinder.	See wing lift circuitry and install correct cylinder.
Poor or uneven penetration. Cylinders are getting out of synch.	Incorrect leveling adjustments on main frame or wings. Hydraulic malfunction - air in lines, cylinders or hoses leaking, or hydraulic cylinders and hoses are not installed properly. Worn shovel points. Tires not equally inflated	See leveling page. 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. Resynchronize cylinders. Adjust stop collar of main lift cylinder(s) to compensate for wear. Replace shovels if wear is severe. See tire inflation.