Operator's Manual

QX² / XL²

Wil-Rich Field Cultivators

4000361195-en-us; 25.07.2024 01

Operator's Manual

WIL-RICH®

VÄDERSTAD

4000361195-en-us; 25.07.2024

Dealer Portal PDI Link

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 QX2 Field Cultivator 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	Employee's Signature

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1 Introduction

Wil-Rich QX² & XL² Field Cultivators

Congratulations on the choice of a Wil-Rich Field Cultivator to complement the farming operation. These implements have been designed and manufactured to meet the agricultural industry's needs for accurate, secondary tillage systems.

All persons authorized to operate this implement should read and understand the contents of this Operator's Manual, especially the Safety Section. The owner or operator (user) should seek assistance from the dealer, distributor or manufacturer for any information not fully understood regarding the safe operation adjustment, maintenance, or repair of this implement.

Keep this Operator's Manual in a clean, dry place that is easily accessible for reference when more detailed information is required to perform tasks related to the operation, adjustment, maintenance, or repair of this implement. It is further recommended that the contents of this Operator's Manual be reviewed at least annually by persons operating, adjusting, maintaining, or repairing this implement, and any time a new person is assigned to any of the above mentioned tasks.

Any information in this Operator's Manual that is not fully understood should be clarified by contacting the dealer, distributor, or manufacturer and requesting assistance.

The contents of this Operator's Manual are accurate up to the time of printing.

It is the policy of Väderstad Inc. to improve its products whenever possible and practical to do so. Väderstad Inc. reserves the right to make changes, improvements and modifications at any time without incurring obligation to make such changes, improvements on any equipment sold previously.

Address inquiries to:

- Väderstad Inc. PO Box 1030, Wahpeton, ND 58074
- PH (701) 642-2621

1.1 Description of the Machine

Wil-Rich cultivators are the industry leaders for strength and performance. They're designed for the demands of today's agriculture with two hitch options to meet the needs of many farming operations.

QX² models are equipped with a floating hitch to provide accurate depth control in uneven terrain.

XL² models are equipped with the field-proven and time-tested level lift hitch that allows weight transfer to the tractor. Designed for level field conditions, this hitch style creates a seedbed that is planter ready.

1.2 Intended Use

Wil-Rich Field Cultivators are intended to be used as secondary tillage option that provides consistent tillage across the width of the machine. The Split-the-Middle shank pattern eliminates residue windrowing and decreases plugging. The design also maximizes sweep life and provides superior incorporation of fertilizer and chemicals.

All references to "LEFT" and "RIGHT", as used throughout this manual, are determined by facing the direction of the machine's normal forward travel when in use.

Some pictures in this Operator's Manual show the machine with shields removed to better show the subject of the picture. The implement must NEVER be operated with any of the shields either opened or removed. Ensure that ALL shields are attached, closed and in good working condition prior to operating the Wil-Rich implement.

1.3 Illustrations of the Machine

Figure 1.1 QX²–55–60F

Figure 1.2 XL²–55–60F

1.4 Machine Serial Number

Refer to Section "2.13.1 Location of Safety Signs on page 13" for more information on the location of the safety decals and the serial number plate.

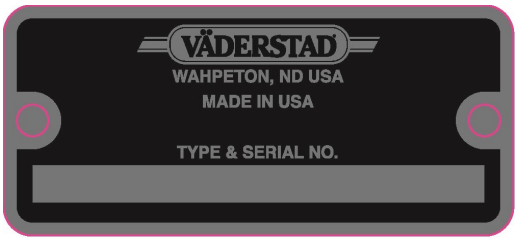


Figure 1.3 Serial No. Decal

1.4.1 Serial Number Data Sheet

Record the machine model and serial number in the spaces provided below. Use these numbers when contacting the dealer for repair parts, warranty or service assistance.

Serial Number(s)

Implement(s) Serial Range: 0000000000 - 0000000000		
Implement	**Model**	**Serial Number(s)**
Cultivator		
Other		

1.5 Technical Data Sheet

1.5.1 QX² Field Cultivator

Table 1.1 Technical Data Sheet: QX² I

XL² (Level Lift Hitch)						
Model	**13 QX² 32**	**13 QX² 32–34**	**13 QX² 32–42**	**13 QX² 32–45**	**13 QX² 37**	**13 QX² 37–39**
Number of Shanks	55	59	73	77	63	67
Cutting Width	32.1 ft (6.4 m)	34.4 ft (10.5 m)	42.6 ft (13 m)	44.9 ft (13.7 m)	36.75 ft (11.2 m)	39.1 ft (11.9 m)
Inner Wing	9.3 ft (2.8 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	11.7 ft (3.6 m)	11.6 ft (3.5 m)
Outer Wing	-	-	5 ft (1.5 m)	6 ft (1.8 m)	-	-
Number of Tires	12	12	14	14	12	12
Transport Width	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)
Transport Height	12.75 ft (3.9 m)	13.8 ft (4.2 m)	13.4 ft (4.1 m)	13.4 ft (4.1 m)	14.9 ft (4.5 m)	15.9 ft (4.8 m)
Weight	13,500 lbs (6,123 kg)	13,700 lbs (6,214 kg)	16,300 lbs (7,394 kg)	16,500 lbs (7,484 kg)	14,300 lbs (6,486 kg)	14,500 lbs (6,577 kg)
Horsepower Requirement	225 — 290	235 — 300	245 — 375	315 — 405	260 — 335	270 — 345

Table 1.2 Technical Data Sheet: QX² II

XL² (Level Lift Hitch)					
Model	**13 QX² 37–42**	**13 QX² 37–50**	**13 QX² 46–60**	**13 QX² 55**	**13 QX² 55–60**
Number of Shanks	73	85	87	95	103
Cutting Width	42.6 ft (13 m)	49.6 ft (15.1 m)	50.75 ft (15.5 m)	55.4 ft (16.9 m)	60.1 ft (18.3 m)
Inner Wing	11.7 ft (3.6 m)	11.7 ft (3.6 m)	9.3 ft (2.8 m)	11.7 ft (3.6 m)	11.7 ft (3.6 m)
Outer Wing	-	6 ft (1.8 m)	7 ft (2.1 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)
Number of Tires	12	14	18	18	18
Transport Width	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)
Transport Height	15.5 ft (4.7 m)	15.5 ft (4.7 m)	13.5 ft (4.1 m)	15.5 ft (4.7 m)	15.5 ft (4.7 m)
Weight	16,500 lbs (7,484 kg)	17,300 lbs (7,847 kg)	20,500 lbs (9,299 kg)	21,600 lbs (9,798 kg)	22,000 lbs (9,979 kg)
Horsepower Requirement	295 — 375	350 — 450	350 — 450	385 — 495	425 — 540

1.5.2 XL² Field Cultivator

Table 1.3 Technical Data Sheet: XL² I

XL² (Level Lift Hitch)							
Model	**11 XL² 25**	**11 XL² 25–27**	**11 XL² 30–32**	**11 XL² 30–39**	**11 XL² 32**	**11 XL² 32–34**	**11 XL² 32–42**
Number of Shanks	43	47	55	67	55	59	73
Cutting Width	25.1 ft (7.6 m)	27.4 ft (8.4 m)	32.1 ft (6.4 m)	39.1 ft (11.9 m)	32.1 ft (6.4 m)	34.4 ft (10.5 m)	42.6 ft (13 m)
Inner Wing	7 ft (2.1 m)	7 ft (2.1 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)
Outer Wing	7 ft (2.1 m)	7 ft (2.1 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	-	-	5 ft (1.5 m)
Number of Tires	8	8	10	12	10	10	12
Transport Width	16.1 ft (4.9 m)	16.1 ft (4.9 m)	16.1 ft (4.9 m)	16.1 ft (4.9 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)
Transport Height	10.4 ft (3.2 m)	11.6 ft (3.5 m)	13.8 ft (4.2 m)	12.75 ft (3.9 m)	12.75 ft (3.9 m)	13.8 ft (4.2 m)	13.4 ft (4.1 m)
Weight	8,800 lbs (3,992 kg)	9,000 lbs (4,082 kg)	11,500 lbs (5,216 kg)	13,500 lbs (6,123 kg)	12,500 lbs (5,670 kg)	12,700 lbs (5,761 kg)	15,200 lbs (6,895 kg)
Horsepower Requirement	225 — 290	193 — 245	225 — 290	275 — 350	225 — 290	235 — 300	245 — 375

Table 1.4 Technical Data Sheet: XL² II

XL² (Level Lift Hitch)								
Model	**13 XL² 32–45**	**13 XL² 37**	**13 XL² 37–39**	**13 XL² 37–42**	**13 XL² 37–50**	**13 XL² 46–50**	**13 XL² 55**	**13 XL² 55–60**
Number of Shanks	77	63	67	73	85	87	95	103
Cutting Width	44.9 ft (13.7 m)	36.75 ft (11.2 m)	39.1 ft (11.9 m)	42.6 ft (13 m)	49.6 ft (15.1 m)	50.75 ft (15.5 m)	55.4 ft (16.9 m)	60.1 ft (18.3 m)
Inner Wing	9.3 ft (2.8 m)	11.7 ft (3.6 m)	11.6 ft (3.5 m)	11.7 ft (3.6 m)	11.7 ft (3.6 m)	9.3 ft (2.8 m)	11.7 ft (3.6 m)	11.7 ft (3.6 m)
Outer Wing	6 ft (1.8 m)	-	-	-	6 ft (1.8 m)	7 ft (2.1 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)
Number of Tires	12	10	10	10	12	16	16	16
Transport Width	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)
Transport Height	13.4 ft (4.1 m)	14.9 ft (4.5 m)	15.9 ft (4.8 m)	15.5 ft (4.7 m)	15.5 ft (4.7 m)	13.5 ft (4.1 m)	15.5 ft (4.7 m)	15.5 ft (4.7 m)
Weight	15,400 lbs (6,985 kg)	13,200 lbs (5,987 kg)	13,400 lbs (6,078 kg)	15,500 lbs (7,031 kg)	16,200 lbs (7,348 kg)	19,800 lbs (8,981 kg)	20,800 lbs (9,435 kg)	21,300 lbs (9,662 kg)
Horsepower Requirement	315 — 405	260 — 335	270 — 345	295 — 375	350 — 450	350 — 450	385 — 495	425 — 540

1.6 Notes

2 Safety

2.1 Safety Alert Symbols

2.1.1 Safety Information

The Safety Alert Symbol(s) are intended to direct the attention of the machine user to important safety information both published in the Operator's Manual and applied to the machine. Any time Safety Alert Symbol(s) are seen, it means that associated information is provided for recognizing, appropriately responding to and avoiding potentially hazardous situation(s).

A triangle shape surrounding an exclamation point indicates a potentially hazardous situation. Information included in a safety sign or printed in the Operator's Manual describes the hazardous situation and indicates appropriate response(s) and / or avoidance procedures.

This Safety Alert Symbol means:

Attention Be Alert!

DANGER! Indicates an imminently hazardous situation that, if not avoided, WILL result in death or serious injury if the proper precautions are not taken.

WARNING! Indicates a potentially hazardous situation that, if not avoided, COULD result in death or serious injury if the proper precautions are not taken.

CAUTION! Indicates a potentially hazardous situation that, if not avoided, MAY result in minor or moderate injury if the proper practices are not taken, or, serves as a reminder to follow appropriate safety practices.

NOTE! Used to clarify information.

IMPORTANT! The information next to this symbol may be worth noting since it is a hint containing particularly useful information on how to handle the machine. Failure to follow these notices may result in damage to the machine.

2.2 Safety Sign Information

Safety Sign Legibility: All safety signs applied to the implement must be visible and legible. Keep dust and dirt cleared from safety signs and ensure that visibility is not obscured.

Safety Sign Replacement: Safety signs may be ordered through the dealer or distributor. Contact Väderstad Inc. if unable to obtain replacement safety signs from a dealer or distributor.

Damaged or Deteriorated Safety Signs: Remove and replace any safety signs that have either been damaged or show signs of deterioration.

Safety Signs on Replacement Parts: Ensure that parts or components that are replaced on the implement that had a safety sign attached originally include a safety sign.

For parts and decal replacement, contact your local dealer parts department.

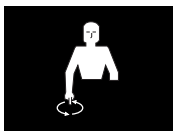
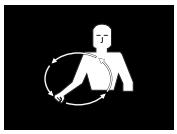
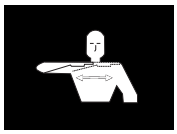
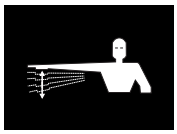
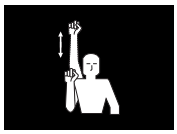
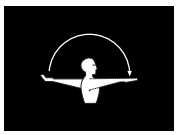
Affixing Safety Signs to the Implement

1. Ensure proper position and orientation before installing.
2. Ensure installation area is clean and dry.
3. Ensure ambient temperature is above 50°F (10°C).
4. Remove backing material to expose label adhesive.
5. Place one edge of label to machine surface.
6. Slowly press the label onto the surface.
7. Ensure no air pockets are present or become trapped under surface or label. To remove air pocket, pierce the bubble in the label with a pin, this will let the trapped air out, and then press the label down.

2.3 Hand Signals

Hand signals are an important means of communication on farms where noise levels and distance can hinder regular communication between workers. These 11 hand signals were created so that two or more persons can communicate effectively and safely.

Table 2.1 Hand Signals

	Lower Equipment: Make a circular motion with either hand pointing to the ground.		Raise Equipment: Make a circular motion with either hand at head level.
	Come to me: Raise the arm vertically overhead, the palm to the front, and rotate in large horizontal circles.		This far to go: Place palms at ear level facing the head and move laterally inward to indicate remaining distance to go.
	START THE ENGINE: Simulate cranking of vehicles by moving arm in a circular motion at waist level.		STOP THE ENGINE: Draw right hand, palm down, across the neck in a ‘‘throat cutting’’ motion from left to right.
	Slow it down / decrease speed: Extend the arm horizontally to the side, palm down, and wave arm downward 45 degree minimum, repeat.		Speed it up / increase speed: Raise the hand to the shoulder, fist closed, thrust the fist upward to the full extent of the arm and back to the shoulder rapidly, repeat several times.
	Move-Out: Face the desired direction of movement, hold the arm extended to the rear; swing it overhead, forward in the direction of the desired movement until it is horizontal, palm down.		Move toward me / follow me: Point toward person(s), vehicle(s), or unit(s) beckon by holding the arm horizontally to the front, palm up, and motioning toward the body.
	Stop: Raise hand upward to the full extent of the arm, palm to the front. Hold that position until the signal is understood.		To perform any / or all of these signals, stand out of the pathway of the moving implement.

2.4 Operator Responsibilities

Responsibility for the safe operation, adjustment, maintenance and repair of this machine falls to the main user. It is the responsibility of the owner, or authorized person in charge, to ensure all persons who operate, adjust, maintain and/or repair this implement be familiar with the information provided in this Operator's Manual before performing any other tasks listed above.

A safe user is the key to safety. Good safety practices not only protect the user, but also persons who may be in the vicinity of the implement. Make good safety practices a part of the farming operation. Ensure that all persons operating, adjusting, maintaining and/or repairing this implement are familiar with the procedures recommended in this manual.

Always read safety warnings and follow recommended safety precautions to avoid hazardous situations. DO NOT risk personal injury or death by ignoring safety warning and safety precautions.

2.4.1 Key Safety Reminders

The most important safety device is a safe and qualified user.

A safe and qualified user is one who has read and understands the contents of the Operator's Manual prior to performing any tasks related to the machine. Owners have a responsibility to provide training to persons who may operate, adjust, maintain and/ or repair the implement prior to performing any of these tasks.

DO NOT perform any unauthorized modifications to the implement or use the implement for any purpose other than what is described in the contents of this Operator's Manual.

Owners must give operating instructions to operators and employees before allowing them to operate the implement, and at least annually thereafter per OSHA regulation 1928.57.

2.5 General Safety

Read and understand the contents of this Operator's Manual prior to operating, adjusting, maintaining and/or repairing the implement. Review at least annually thereafter.

Locate, read and understand all safety signs applied to the implement before performing any tasks.

Review the contents of this Operator's Manual at least annually, and, any time a new person is assigned to perform any tasks with the implement.

Ensure that all bystanders, especially small children, and pets/animals are kept at a safe distance while performing any tasks with the implement. Keep all personnel away from moving parts.

Do not stand between the tractor and implement to install the hitch pin while the tractor engine is running.

DO NOT allow riders on any part of the implement.

When parking, park the machine and the tractor on a solid level surface. Put all controls in neutral and apply the tractor park brake. Stop the tractor engine and take the key with you.

Always lower the machine when not in use and relieve the pressure in the hoses and cylinders.

Ensure all guards and shields are intact and in place prior to operating the implement.

Keep hands, feet, hair and loose clothing away from moving and/or rotating parts.

Stop the engine, lower the implement, set the parking brake, remove the ignition key, and allow time for moving parts to stop prior to adjusting, maintaining, and/ or repairing the implement.

Ensure that all implement lighting and marking is intact, secure, clean and operating properly prior to traveling on public roads. Check with local highway authorities to confirm implement is properly equipped for highway travel.

Provide a fully stocked First-Aid Kit in a highly visible and easily accessible location.

Ensure a fire extinguisher is available for use should the need arise and that the operator is familiar with its proper use.

Clear the implement of any and all foreign objects before beginning operation.

Ensure that the implement is securely blocked and supported prior to working underneath.

Do not work with the machine during thunderstorms and when there is a risk of lightning strikes. Do not stand on or next to the machine.

Always wear suitable ear protection for prolonged exposure to excessive noise.

Use caution when working around high pressure hydraulic systems.

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

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

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

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

In the event of a fire in a crop / field setting, use a water type fire extinguisher or other water source. For fires involving anything other than crop, such as oil or electrical components. Use a dry chemical fire extinguisher with an ABC rating.

2.6 Maintenance Safety

Read and understand all information provided in the Operator's Manual covering operation, adjustment, maintenance and repair prior to performing any of these tasks. Plan work to ensure proper tools, equipment, and personal protective equipment is available prior to working on implement.

Wear appropriate clothing when performing tasks around implement. Ill-fitting and/or frayed clothing as well as loose or dangling items should not be worn when working near the implement.

Stop the engine, lower the implement, set the parking brake, remove the ignition key, and allow time for moving parts to stop prior to adjusting, maintaining, and/or repairing the implement.

Ensure that all moving parts have come to a complete stop before performing adjustments, maintenance and/or repairs.

Ensure that hydraulic oil pressure in hoses, lines, and components is fully relieved prior to performing any maintenance, and/or repairs.

Ensure that wings are either fully lowered or fully raised and secured using transport/cylinder locks (if equipped) or securely block the wings if raised to perform adjustments, maintenance and/or repairs as needed.

Securely block main frame and/or wings (any raised components) if adjustments, maintenance, and/or repairs are required.

Wear personal protective equipment, such as gloves, eye protection, etc. when inspecting the hydraulic system for leaks. Use a small piece of cardboard or wood to detect leaks.

Ensure that all guards and shields are intact and in place after performing adjustments, maintenance and/or repairs prior to operating implement.

Store flammable fluids in approved containers and store out of access by unauthorized persons, especially children.

Replace the safety chain if one or more links or end fittings are broken, stretched or otherwise damaged or deformed.

Do not allow children or other unauthorized persons within the implement operational area.

Do not modify the equipment or substitute parts in any way. Unauthorized modification may impair the function and / or safety of the machine.

Use a suitable lifting device for components which could cause personal injury by pinching, crushing or weight. Be sure lifting device is rated to handle the weight.

Always inspect lifting chains and slings for damage or wear.

Ensure all hydraulic connectors are cleaned of any dirt or debris regularly to ensure proper connection to tractor.

2.7 Hydraulic Safety

Always place all tractor hydraulic controls in neutral before dismounting.

Ensure that all hydraulic system components are kept clean and in proper working condition.

Relieve pressure before working on hydraulic system.

Use a piece of cardboard or wood to check for hydraulic leaks.

Wear personal protective equipment, such as gloves, eye protection, etc. if unsure if residual pressure may exist in hydraulic components during troubleshooting and/or making repairs.

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.

Check hydraulic hoses regularly for wear and tighten/replace as needed. Contact your local Dealer parts department to purchase replacement hoses specifically designed for Wil-Rich machines.

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

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.

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

Always contact the nearest Wil-Rich dealer or service professional when replacing hydraulic hoses.

When replacing hoses always route hoses the same as the one being replaced to ensure that the part is not subjected to wear, rubbing, kinking, etc. Make repairs following instructions provided by the manufacturer.

Ensure all fittings, couplings, and other hydraulic connections are intact and properly tightened before operating implement hydraulic system.

DO NOT touch pressurized hose assembles with any part of the body. If fluid punctures the skin, seek immediate medical attention.

Hydraulic fluids are highly flammable. Always keep open flames and ignition sources away from hydraulic fluids.

2.8 Electrical Safety

Ensure that the machinery is shut off and all electrical components are disconnected before doing any work on the machine. Ensure all live connections are not receiving power.

Check electrical wires regularly for wear related to usage and weathering. Replace any damaged wires or components immediately.

Use insulated tools whenever performing service to any electrical system or components and always wear proper protective equipment.

2.9 Transport & Towing Safety

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

DO NOT allow riders on any part of the implement.

Ensure that implements are attached to the tractor properly.

Ensure transport cylinder locks are in place and functioning properly (if equipped).

Ensure safety tow chain is securely attached and retaining clip is securely locked in place.

Ensure all lighting and implement marking devices are intact and visible.

Ensure implement is properly marked according to local road regulations.

Read and follow all local road traffic regulations.

DO NOT exceed recommended transport speeds *(Maximum: 20 mile/hr / 32 km/hr for wheel-driven machines, 15 mile/hr / 24 km/hr for track-driven machines).* The implements are not designed for high speed use. Ensure all local traffic rules/regulations are followed. Reduce speed and use caution when making corners and meeting traffic.

Make sure you understand the speed, steering, stability and load characteristics of this machine before you travel on public roads. Use good judgement when traveling on public roads. Maintain complete control of the machine at all times. Never coast down hills.

Be aware that the implement is wider than the tractor when transporting. Always have the wings completely folded (if equipped) when transporting on public roads.

Watch for overhead wires and other obstructions. Avoid contact with electrical power lines. Contact with electrical power lines can cause electrical shock, resulting in very serious injury or death.

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.

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.

Frequently check for traffic, especially during turns.

2.10 Storage Safety

Store the implement away from areas of human activity.

DO NOT allow children to play on or around the implement(s).

Store the implement on a dry, stable, and level surface away from areas of human activity. Support with planks if required.

2.11 Tire Safety

Ensure tire inflation pressure is maintained per specifications.

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

Follow proper procedures for tire repairs, especially when mounting tire to the rim.

Seek assistance from a trained person for tire repairs or mounting, especially if specialized equipment is required.

2.12 Hazards

The key is to recognize hazards while working or living on a farm; avoid dangerous situations or at least minimize the exposure to them.

This section deals with danger points on agricultural equipment; those areas which can entangle, pinch, crush, or shear clothing and limbs. Possible danger points could be wing fold points, hydraulic cylinders and hydraulic lines on many types of equipment.

A slow-moving hydraulic arm can be as hazardous as a rapidly rotating power take-off shaft.

Recognize the dangers!

The first step to avoiding danger is to recognize that hazards exist. Identify the specific hazards associated with the equipment.

The next step is to consider how to use the equipment. Using it for tasks it was meant to perform? Following all safety precautions recommended by the manufacturer?

Most machinery accidents result from human error. The operator either forgot something, took a shortcut, ignored a warning, wasn't paying close attention, or failed to follow safety rules. Be familiar with the operator manual, know the limitations of the equipment, and follow safety measures automatically.

Carefully evaluate the operation of each implement for safety before starting work.

Check equipment guards.

Check guards on all equipment as part of a routine maintenance schedule. During seasons when equipment is used heavily, check guards more often.

Equipment guards cannot eliminate all injuries.

A transport lock will only work if it is engaged prior to road transport, and will not prevent accidents if it is not engaged.

Recognize secondary hazards.

Many farm injury victims recognize hazardous situations, but they misjudge the seriousness of the hazard because of secondary factors.

For example, spilled grain or debris in an unloading area could cause someone to slip and fall into the intake auger. Icy, muddy, or manure-covered surfaces make the work area slick and increase the risk of injury. Bystanders or children in the work area can distract the operator, or limit operator vision.

Never stand near the machine during operation. Debris can be thrown from the machine during operation possibly resulting in injury.

Be careful when operating along the side of a road or building. Rocks or other debris can be thrown from the machine during operation possibly resulting in injury.

High pressure hydraulic oil is a major hazard. Any leaks in the hydraulic system must be treated as a dangerous situation and should be dealt with accordingly.

Consider human factors.

Farm operators can overestimate their ability to stop or avoid a dangerous situation. This is common when operators work around powerful equipment every day and become comfortable with their ability to control the machinery.

Operators are also limited by their reaction time. Human reaction time is not quick enough to avoid an injury with machinery.

Gravity as well is faster than human reaction. For example, it is very dangerous to reach underneath the wing of a machine if the transport/safety locks are not correctly in place. If a hydraulic line breaks, gravity could pull the machine wings to the ground very quickly, crushing the operator.

Manufacturers have built safeguards into equipment but all hazards cannot be removed. Take a realistic approach to equipment safety and think about these principles for the operation of all machinery.

- Be aware of the dangers. Read the operator manuals and think about how to use the equipment.
- Regularly repair and replace protective guards or shields on all implements.
- Look for and remove secondary hazards, such as spilled grain or debris.
- Recognize the limitations of the user and the equipment.

Farm Machinery Safety: What to do?

- A few simple actions can reduce the risk of danger around farm machinery.
- Collect operator manuals for all farm equipment and place in a central location. Read the safety section in each manual.
- Evaluate how to anticipate using each implement and identify potential safety hazards not mentioned in the manual.
- Check condition of intake guards and shields on grain augers and other implements.
- Remove debris from grain unloading areas. Shut down equipment when other people enter the area.

2.13 Safety Signs

2.13.1 Location of Safety Signs

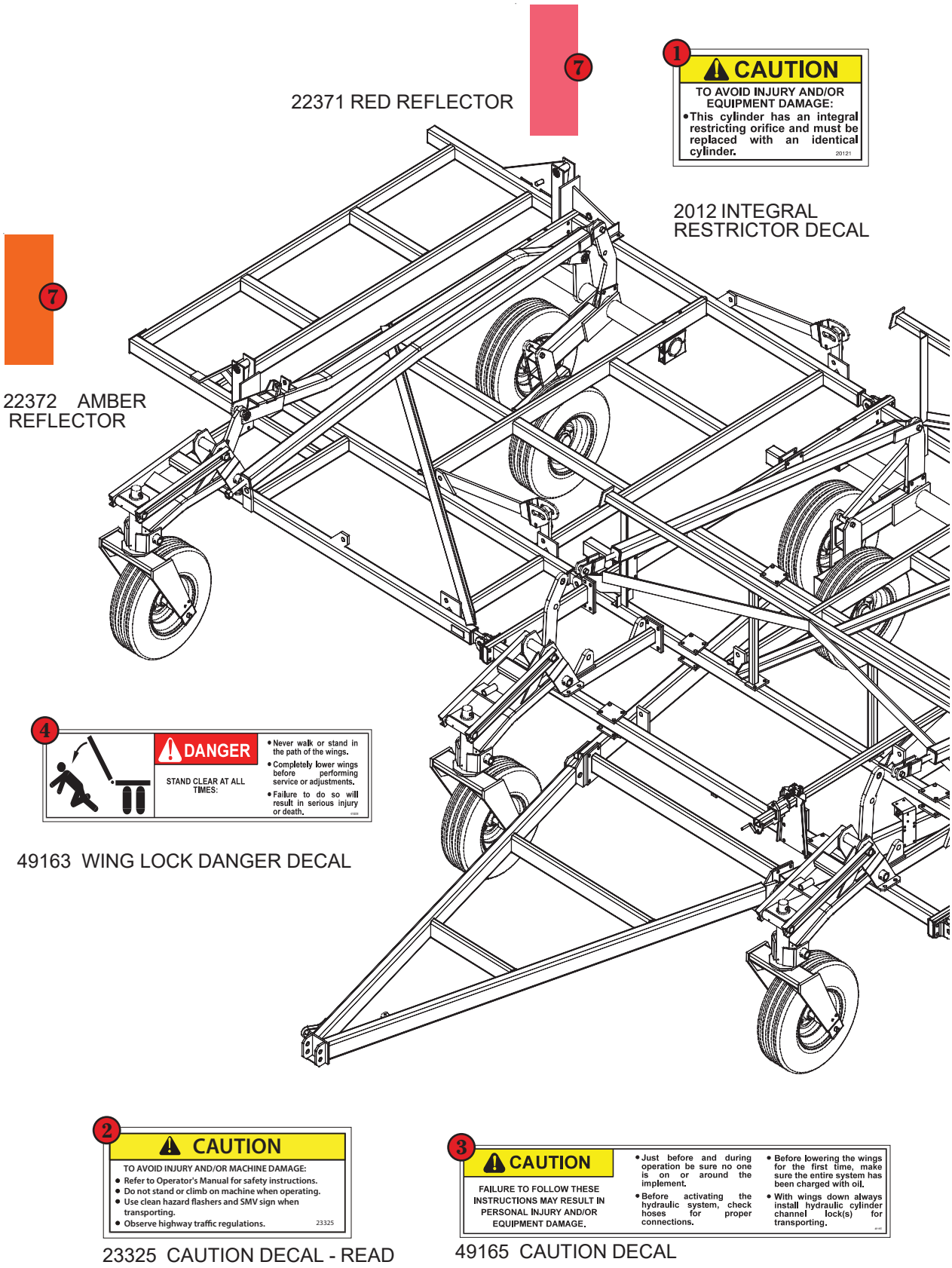
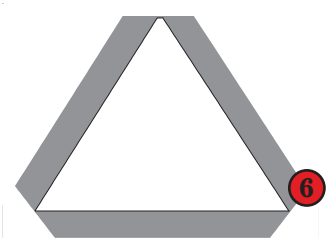
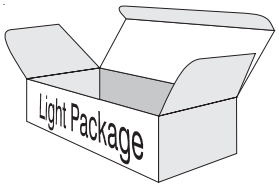


Figure 2.1 QX² Safety Signs I

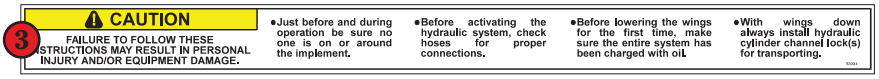


41345 SMV KIT

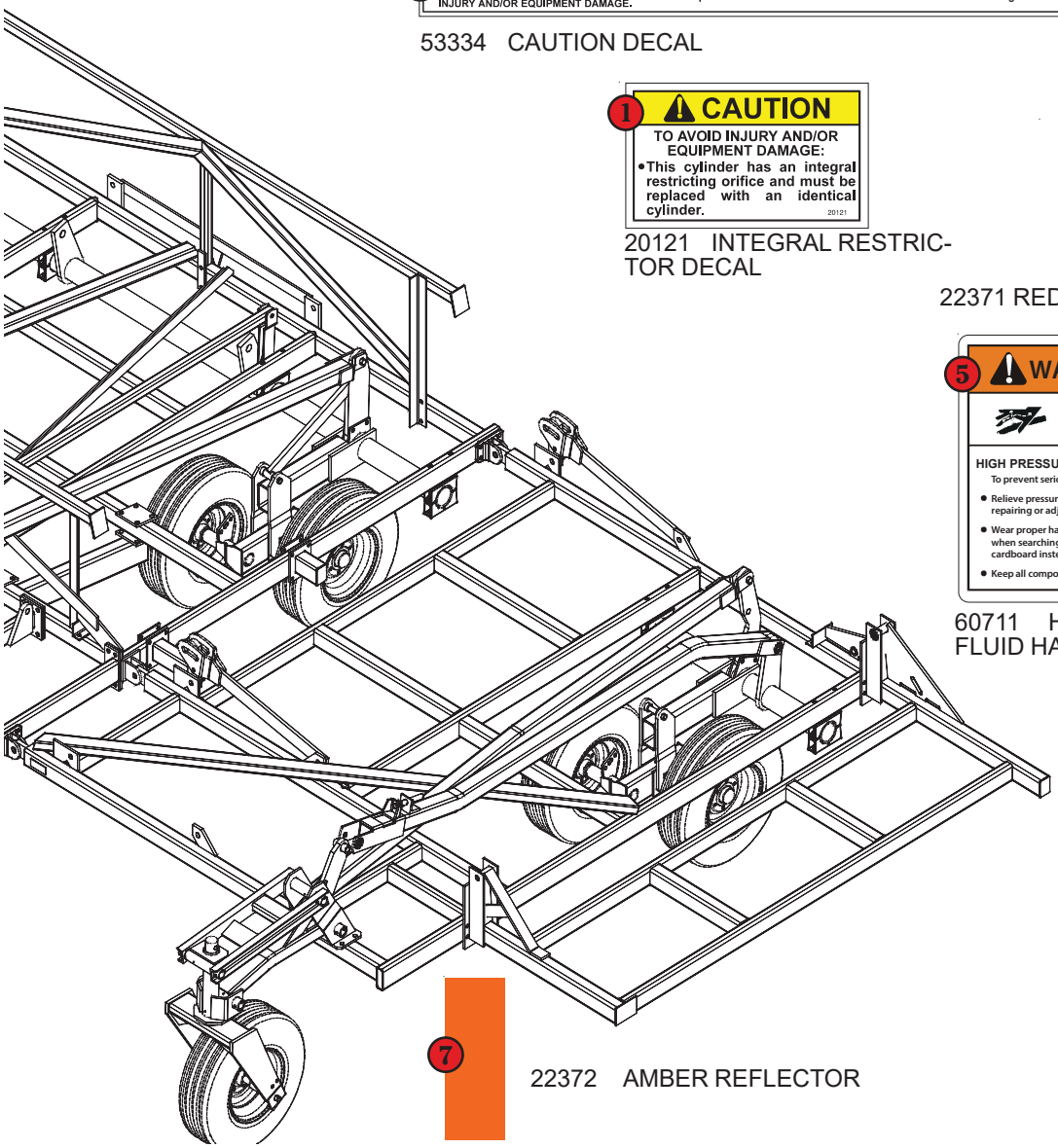


64594 CLEARANCE LIGHT PACKAGE

41508 WING LOCK DANGER DECAL



53334 CAUTION DECAL



20121 INTEGRAL RESTRICTOR DECAL

22371 RED REFLECTOR

60711 HIGH PRESSURE FLUID HAZARD

22372 AMBER REFLECTOR

Figure 2.2 QX² Safety Signs II

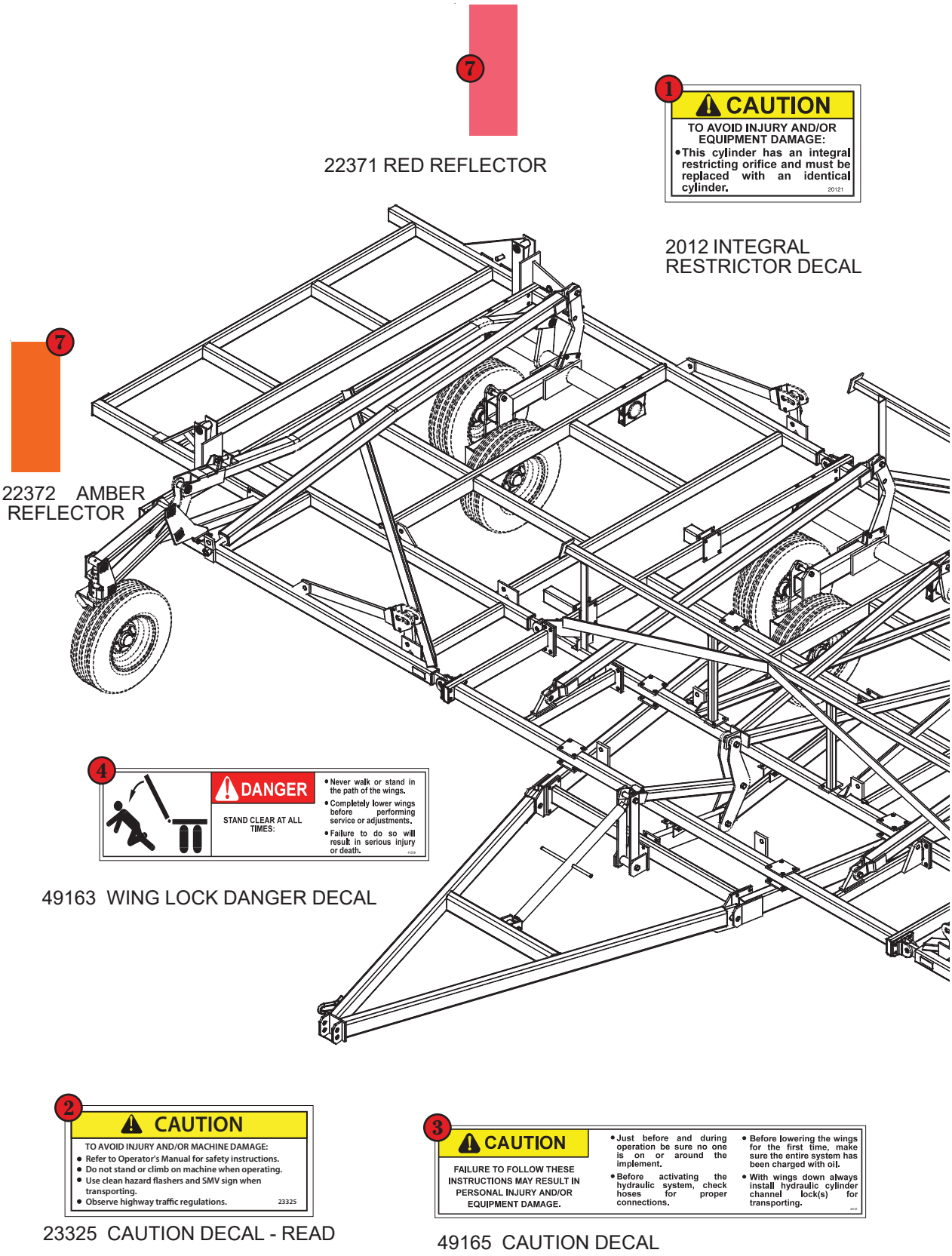
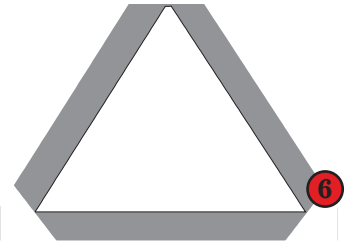
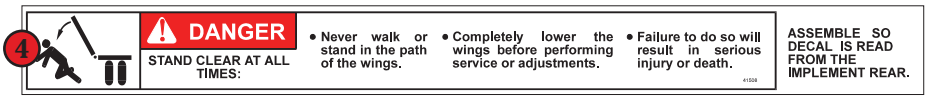


Figure 2.3 XL² Safety Signs I

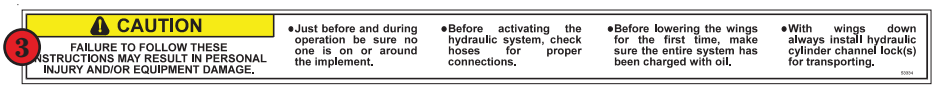


41345 SMV KIT

64594 CLEARANCE LIGHT PACKAGE



41508 WING LOCK DANGER DECAL

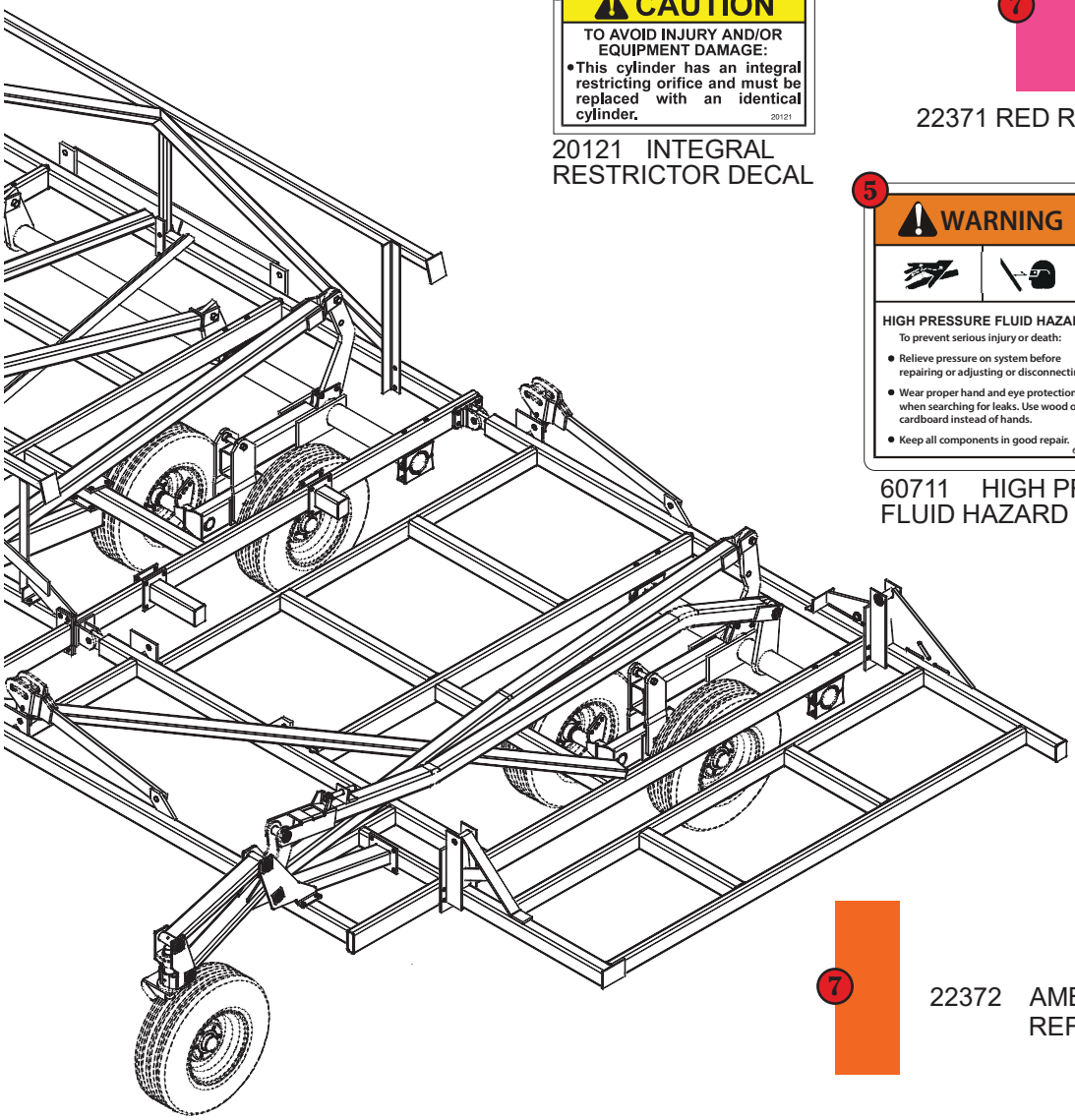


53334 CAUTION DECAL

20121 INTEGRAL RESTRICTOR DECAL

22371 RED REFLECTOR

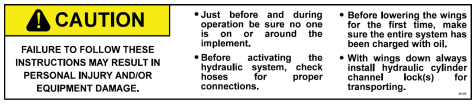
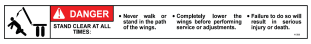
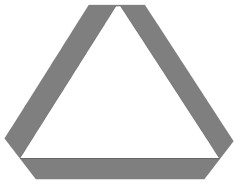
60711 HIGH PRESSURE FLUID HAZARD



22372 AMBER REFLECTOR

Figure 2.4 XL² Safety Signs II

2.13.2 Decals

Decal Image	Decal Name	Pin	Description
	**CAUTION** Integral Restriction Decal	**(1)**	Identifies cylinder as having an integral restricting orifice and must be replaced with an identical cylinder.
	**CAUTION** Read to Avoid Injury Decal	**(2)**	Red operator's manual, do not stand on machine while operating. Use clean hazard flashers and SMV sign during transport and observe traffic regulations.
	**CAUTION** Instructions Decal	**(3)**	Follow instructions. **Variations:** 
	**DANGER** Wing Lock Danger Decal	**(4)**	Falling wing hazard. Never walk in the path of the wings. **Variations:** 
	**WARNING** High Pressure Fluid Hazard Decal	**(5)**	Relive pressure on system before repairing, adjusting or disconnecting.
	**SMV** Slow Moving Vehicle Indicator	**(6)**	Identifies machines as a slow moving vehicle during transport.
	Red Reflector	**(7)**	**Variations:** 

2.14 Notes

3 Operation

3.1 Hydraulic Connections

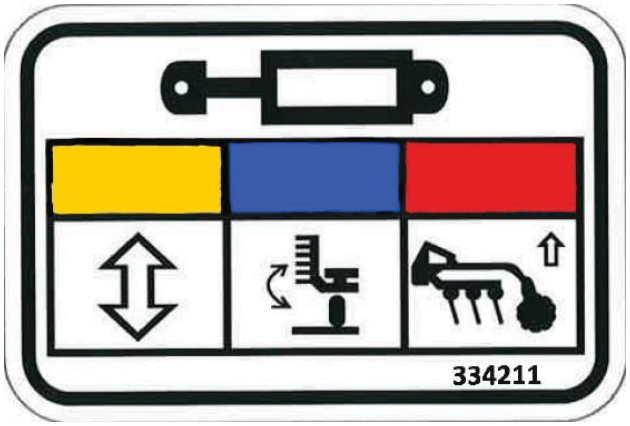


Figure 3.1 Hydraulic Connections Decal

3.2 Preparation

3.2.1 General Unpacking Information

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

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

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.

Refer to Section "6.2 Standard Bolt Torques on page 39" for torque specifications.

3.2.2 Torque Check

Before using the implement a careful inspection must become routine.

Check to be sure that all hardware is securely tightened and moving parts properly lubricated.

Refer to Section "6.2 Standard Bolt Torques on page 39" for torque specifications.

3.2.3 Tractor Preparation

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

3.2.4 Hydraulics

On all new machines check the hydraulic system to be sure all fittings are tight.

Refer to Section "6.3 Hydraulic Connection Torques" for hydraulic fitting torque specifications.

3.2.5 Lubrication

Verify that implement lubrication has been kept up according to the information provided in the maintenance section of this manual.

Refer to Section "5.2 Lubrication Points on page 35" for more information.

3.2.6 Wheel Preparation

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

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

Do not over-inflate tires!

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

It is recommended that all wheel nuts be checked for tightness after first day of use. Check periodically to be sure the wheel nuts are tight. Paint or rust can work out causing the wheel to become loose.

3.3 Connecting the Implement

Never allow anyone between the tractor and implement when connecting or disconnecting until the implement is completely supported on the 3–point hitch, the engine is stopped and the park brake is applied.

1. Use the jack **(A)** to align the implement tongue **(B)** with the tractor drawbar **(C)**. Slowly back the tractor onto the tongue **(B)** and install the pin **(D)**.
2. Retract the jack until the implement tongue and hitch are supported by the tractor. Remove the pin **(E)** and remove the jack.

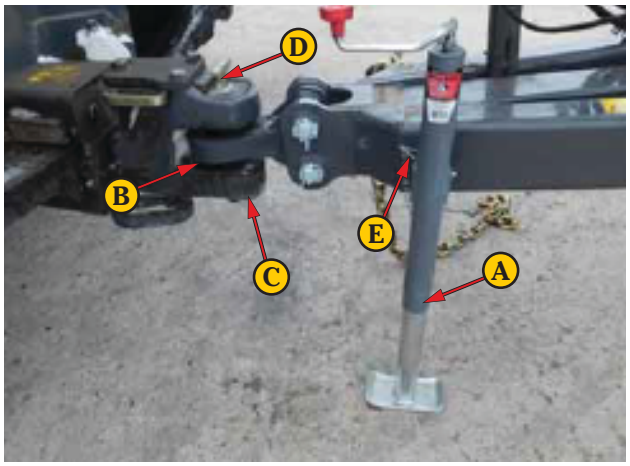


Figure 3.2 Connecting the Implement I

Be sure the pin mechanical lock device is in place. The device may be a pin lock plate as shown or a cross pin on the drop pin.

3. Install the jack **(F)** in the storage position on the drawbar as shown. Secure with the pin **(G)**.

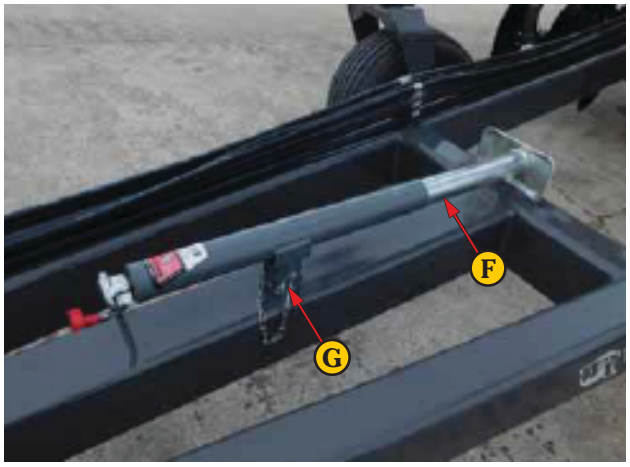


Figure 3.3 Connecting the Implement II

4. Install the safety chain **(H)** as shown.

Be sure the safety chain lock **(I)** is secured.

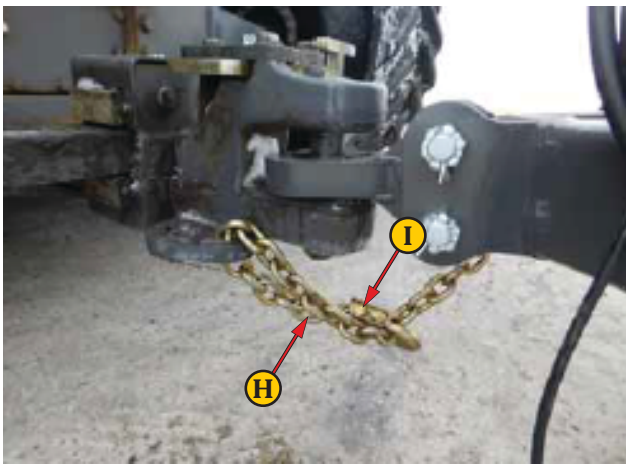


Figure 3.4 Connecting the Implement III

5. Install the wing lift, shank lift, wheel lift and rolling basket cylinder hoses on the tractor. Be sure the hose couplers are secured in the tractor couplers.

Figure 3.5 Connecting the Implement IV

6. Install the safety light connector **(J)** on the tractor.

Figure 3.6 Connecting the Implement V

3.4 Transporting

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

   Be sure all safety lights are working. Obey all local, state and federal laws for lighting requirements.

Figure 3.7 Transporting I

2. Always fold the wings up before transporting.

If the implement has been stored or out of operation for months or if hydraulic wing cylinders have recently been replaced perform the following procedure.

Fold and unfold the wings several times and hold the hydraulic lever in the extended position for 30 seconds each time to purge air from the system.

Figure 3.8 Transporting II

3. Be sure the wings are resting securely on the wing supports **(A)**.

Figure 3.9 Transporting III

4. Raise the implement. Shut off the engine, apply the park brake and remove the key from the tractor. Install the cylinder locks **(B)** on both main frame wheel lift cylinders. Install the pins **(C)** in the cylinder locks **(B)**.
5. Start the engine and lower the main frame onto the cylinder locks **(B)**.

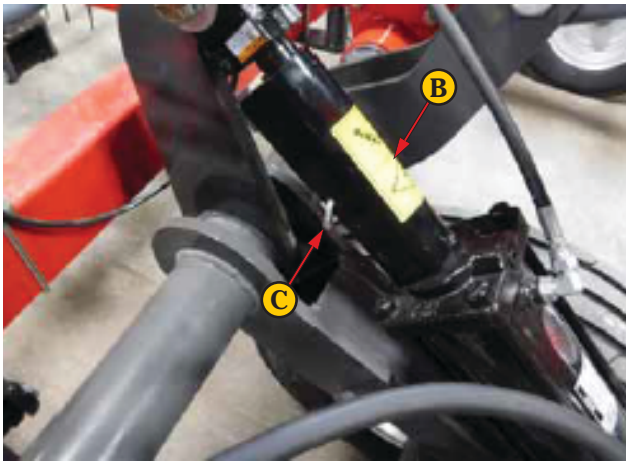


Figure 3.10 Transporting IV

3.4.1 Proper Transport Position

Wing Rest (3–Section) Legend

- **(A)** Wing Rest
- **(B)** Wing rest must match angle of wing
- **(C)** Wing rest must go over center
- **(D)** Ensure decals read from the rear of the machine

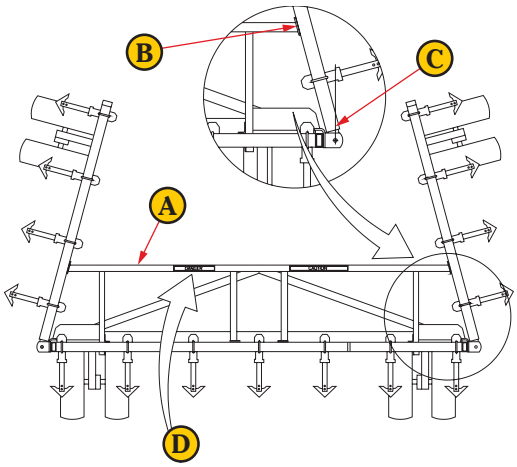


Figure 3.11 Wing Rest (3–Section)

Wing Rest (5–Section) Legend

- **(A)** Wing Rest
- **(B)** Raise to 90° (Center of gravity over-centered)

Figure 3.12 Wing Rest (5–Section) I

5-Section Only: Ensure the outer wings make contact with the wing rests before continuing to raise the inner wings.

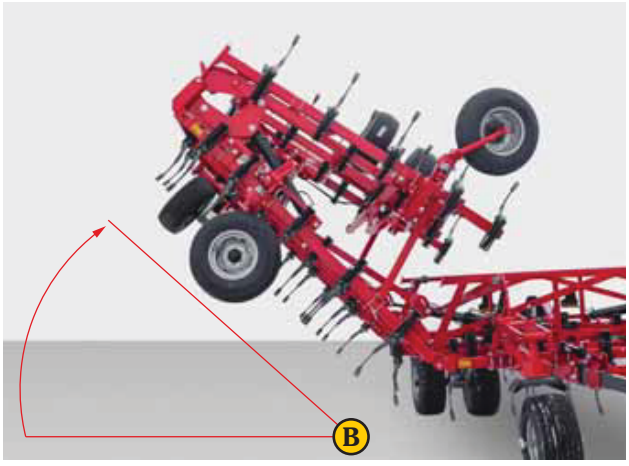


Figure 3.13 Wing Rest (5–Section) II

3.5 Main Frame Caster Brake (QX² Only)

QX2 Field Cultivators feature a brake assembly on all main-frame casters that improves caster stability at high speeds. These brake assemblies use an adjustable tensioning spring that allows the operator to fine tune the amount of friction applied to the caster from the brake. Greater tension will result in less play and reduce wobble from the affected caster.

Adjustment of the spring-tensioning brake should be completed at the start of the season and should allow the casters to pivot freely without resulting in wobble at transport speeds. *Wil-Rich recommends the spring be tightened until it reaches a total length of 4-1/4" (107.95 mm).*

Ensure the brake damper pad is free of grease at all times.

Caster Brake Legend

- **(A)** Caster Brake Adjustment Spring
- **(B)** Gauge Wheel

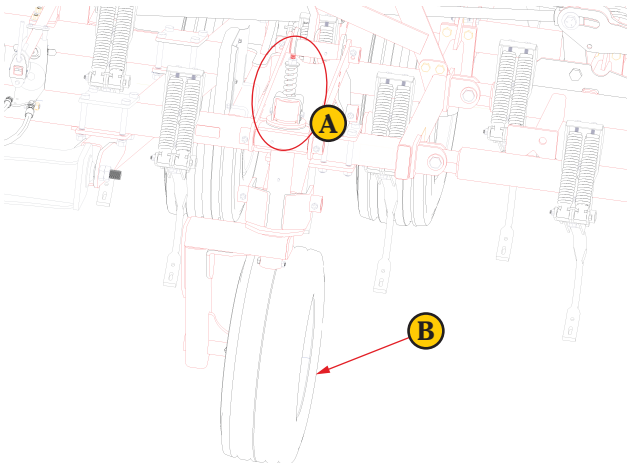


Figure 3.14 Caster Brake

Failure to raise the unit fully can cause transport stability issues.

3.6 Wing Lift Circuitry

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

Wing lift cylinders are equipped with an integral restricter on the rod end cylinder port *(See "Figure 3.15 Wing Lift Cylinder")*. This allows the wings to lower at a slower rate and prevents the wings from falling to fast should there be some type of hydraulic failure.

Wing Lift Cylinder Legend

- **(A)** 1/16" hole restricts the flow of oil
- **(B)** Wing Lift Cylinder

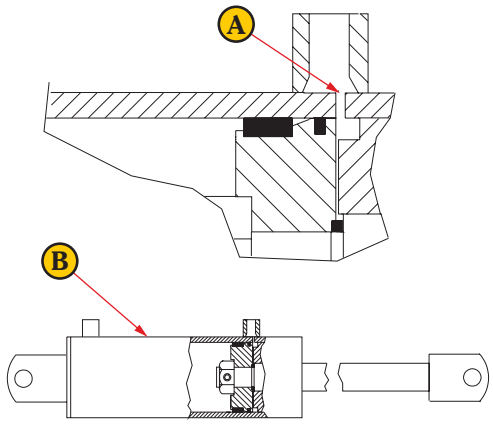


Figure 3.15 Wing Lift Cylinder

"Figure 3.16 Two Cylinder Wing Lift Circuit" shows a simple two (2) cylinder circuit used to fold a pair of wings. This system is used on Wil-Rich cultivators with a single pair of folding cylinders.

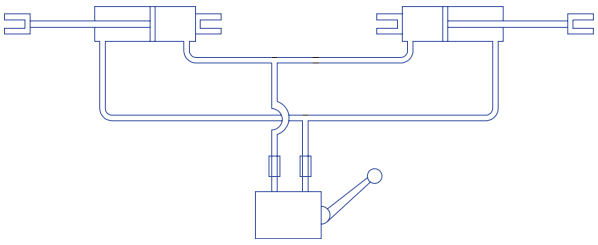


Figure 3.16 Two Cylinder Wing Lift Circuit

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

When raising the wings be sure the wing rest is properly positioned to allow the wings to fold.

Fold the main wings until they contact the wing rest.

"Figure 3.17 Four Cylinder Wing Lift Circuit" shows a simple four (4) cylinder circuit used to fold a pair of wings. This system is used on Wil-Rich QX2 field cultivators with a single pair of 9'4" (2.84 m) or 11'8" (3.56 m) folding wings.

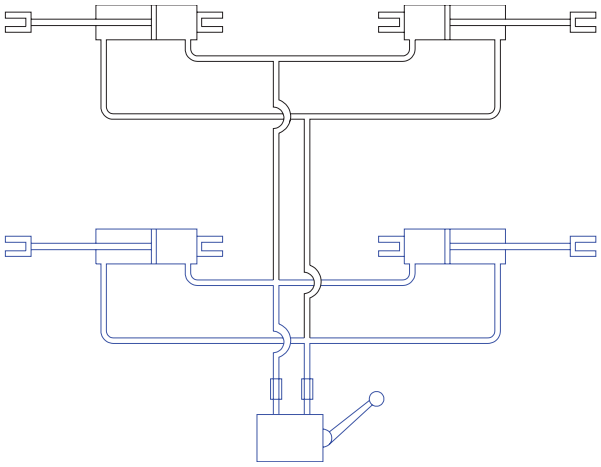


Figure 3.17 Four Cylinder Wing Lift Circuit

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

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

Units equipped with a folding outer stub wing require a sequencing valve in the hydraulic fold circuitry *(See "Figure 3.18 Four Cylinder Wing Lift Circuitry w/ Two Cylinder Outer Wing Circuitry")*.

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

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

The sequencing valve should not effect the folding of the inner and outer wings. If the outer wings start to unfold before the inner wings have completely folded the valve needs to be adjusted.

Loosen the valve adjustment locking nut on the valve and using an Allen wrench, turn the adjust bolt in or clockwise. This will raise the pressure needed to sequence the valve. Readjust valve as needed to ensure complete unfolding of the inner wing before the outer wings unfold. Secure setting with the lock nut.

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

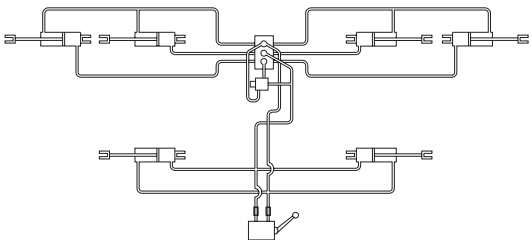


Figure 3.18 Four Cylinder Wing Lift Circuitry w/ Two Cylinder Outer Wing Circuitry

3.7 Main Frame Depth Adjustment

Adjust the adjustment crank on the single point depth control to adjust the operating depth.

3.7.1 Single Point Depth Control

On machines equipped with single point depth control **(A)**, the stroke control valve **(B)** is used to control the depth of the unit. This stroke control valve controls the amount of oil in the main lift cylinders. The stop collars on all cylinders can be put as close as possible to the clevis end of the cylinder. To set a maximum depth of the unit, adjust the stop collars to the maximum depth setting to function as a backup for a possible single point depth control malfunction.

Ensure all cylinders are equipped with the same width stop collars.

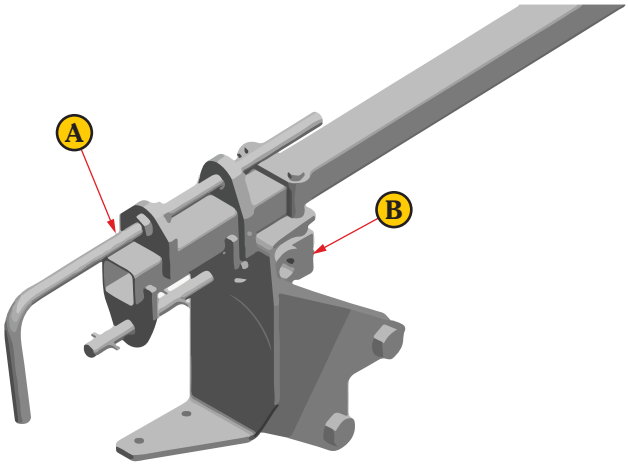


Figure 3.19 Single Point Depth Control I

Adjusting Single Point Depth Control

In the field lower the implement to the ground and run a test strip. Use the lift wheels to change soil penetration depth until desired depth is achieved.

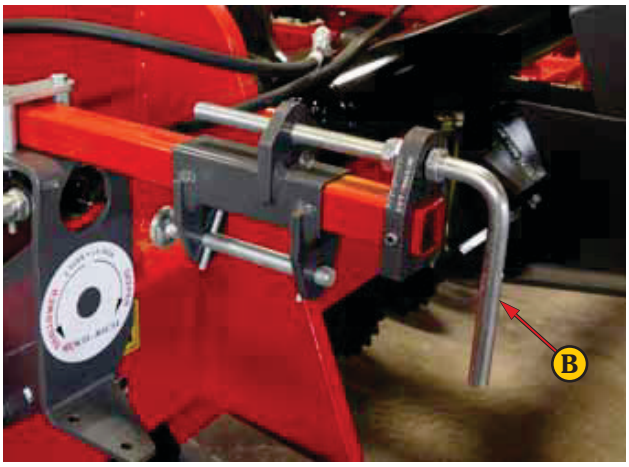


Figure 3.20 Single Point Depth Control II

Stop the tractor and check the worked soil depth. Use the depth control adjuster **(B)** to fine tune the depth setting.

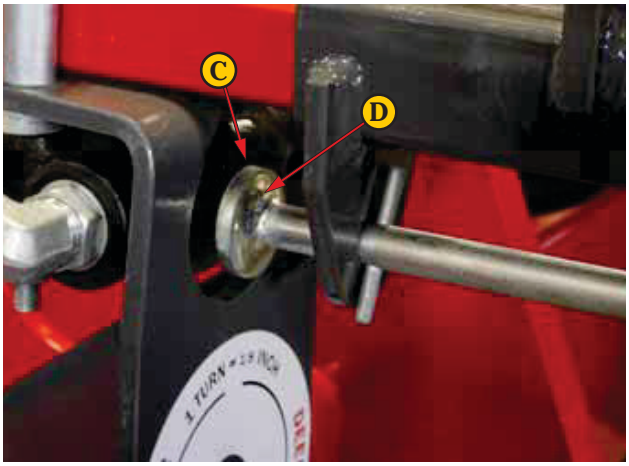


Figure 3.21 Single Point Depth Control III

Turn the depth control adjuster clockwise until the adjuster stop **(D)** contacts the lift wheel depth control valve **(C)**. Turning the depth control adjuster clockwise will increase depth and counterclockwise will decrease the depth of the implement. The depth can be fine tuned 1/8 inch (3.2 mm) with one full turn of the adjuster handle.

3.8 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" (1.57 mm) diameter hole and go on to the next cylinder. *(See "Figure 3.22 Top Bypass Cylinder") (See "Figure 3.23 Lift Hydraulic Circuit")*

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

Top Bypass Cylinder Legend

- **(A)** 3/8" Hole (9.53 mm)
- **(B)** 1/16" Bypass Hole (1.59 mm)
- **(C)** Top Bypass Cylinder

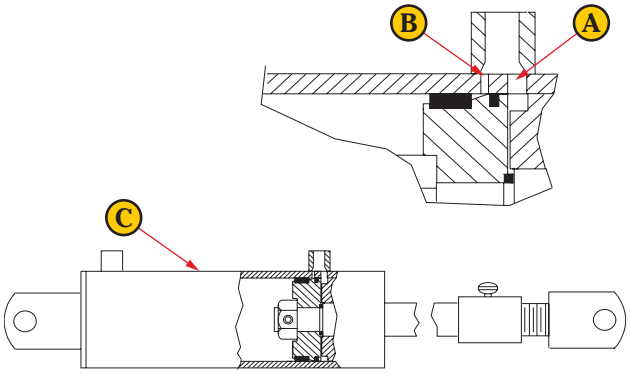


Figure 3.22 Top Bypass Cylinder

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.

Lift Hydraulic Circuit Legend

- **(A)** 4" x 12" (101.6 mm x 304.8 mm) Top Bypass Main Frame Depth Control Cylinders
- **(B)** 3–3/4" x 12" (95.25 mm x 304.8 mm) Top Bypass Main Frame Depth Control Cylinders

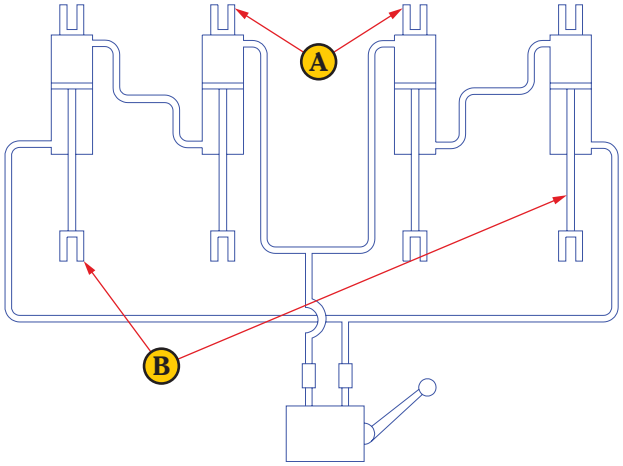


Figure 3.23 Lift Hydraulic Circuit

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

3.9.1 Preliminary Settings

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

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

Cycle the main lift hydraulic system a number of times to remove air from the circuit. Holding the hydraulic lever in the "RAISE" position for a 1-2 minute period should remove unwanted air.

Remove the stop collars from all cylinders and turn the screw stop collars up to the clevis end of the cylinders. Lower the unit so that the main frame front shovels are 1"-2" (25.4 - 50.8 mm) above the ground. Measure the frame height from the ground to the top of the front main frame tube. Compare this to the distance from the ground to the top of the rear tube on the rear bar of the main frame. *(See "Figure 3.24 Shank Settings")*

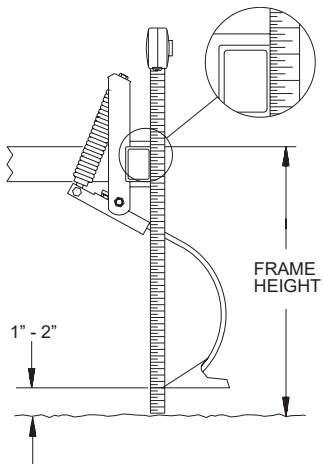


Figure 3.24 Shank Settings

3.9.2 Level Center Frame — Front to Rear

Before Starting the Procedure: The machine must be connected to a tractor that is the correct size for operation. See the information for the minimum tow vehicle weight.

Level Lift Hitch Procedure

1. Find a solid, level surface large enough for the machine when unfolded.
2. Unfold the machine and fully raise the machine. Continue holding the hydraulic lever to let the oil cycle through the lift system.
3. Hold the lift cylinder hydraulic level in the raised position for 1 - 5 minutes, to make sure all cylinders are bled of air and fully extended.
4. Stop the tractor engine, apply the park brake and take the key with you.
5. Remove the transport locks.
6. Remove the stop collars from all of the main lift cylinders.
7. Use the tractor hydraulics to lower the machine so the front shovels or the spikes are 1 - 2 in. (25.4 - 50.8 mm) above the ground.
8. Measure and record the frame height at the front corners from the ground to the bottom of the frame tube.
9. Measure and record the frame height at the rear corners from the ground to the bottom of the frame tube.
10. Compare the front and rear measurements.
11. Set front frame height to the same as the rear frame height.
    a. Loosen the jam nut **(A)** to raise the front.
    b. Shorten the lift tube to lower the front.

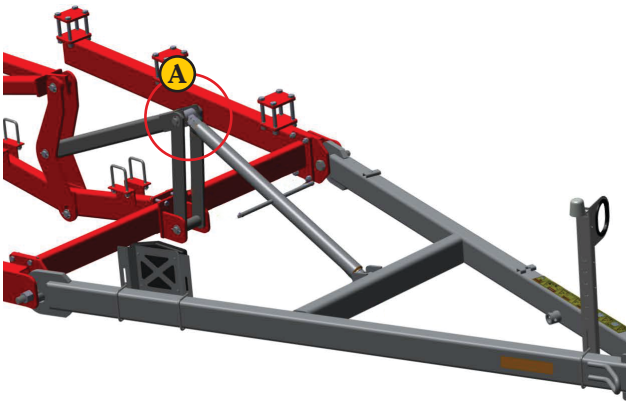


Figure 3.25 Level Lift Hitch

12. Check the measurements again and adjust as necessary.
13. Tighten the adjusting nuts.
14. Check the machine level is in the working position and adjust as necessary.

Floating Hitch (A-Style / T-Style) Procedure

1. Find a solid, level surface large enough for the machine when unfolded.
2. Unfold the machine and fully raise the machine. Continue holding the hydraulic lever to let the oil cycle through the lift system.
3. Hold the lift cylinder hydraulic lever in the raised position for 1 - 5 minutes to make sure all cylinders are bled of air and fully extended.
4. Stop the tractor engine, apply the park brake and take the key with you.
5. Remove the transport locks.
6. Remove the stop collars from all of the main lift cylinders and turn the screw stop collars up to the clevis end of the cylinders.
7. Use the tractor hydraulics to lower the machine so the front shovels or the spikes are 25 - 51 mm (1 - 2 in.) above the ground.
8. Measure and record the frame height at the front corners from the ground to the bottom of the frame tube.
9. Measure and record the frame height at the rear corners from the ground to the bottom of the frame tube.
10. Compare the front and rear measurements.
11. Set front frame height to the same as the rear frame height.
    a. If the front of the machine is higher than the rear, turn the adjusting screw **(B)** counterclockwise.
    b. If the front of the machine is lower than the rear, turn the adjusting screw clockwise.
    c. Make sure both front adjusting screws are set to the same length.
    d. The gauge wheels will carry the weight of the machine.

Adjustment screw **(B)** locations are common across both A-Style & T-Style Floating Hitch options.

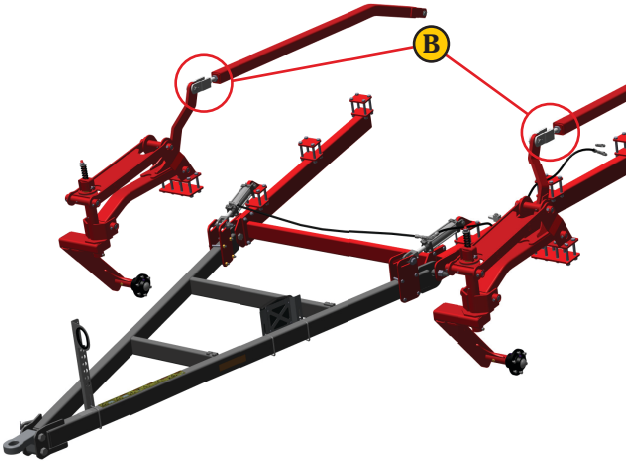


Figure 3.26 Floating Hitch

12. Check the measurements again and adjust as necessary.
13. Tighten the jam nut.
14. Check the machine level in the operating position and adjusted as necessary.

3.9.3 Level Wing Frame — Front to Rear & Side to Side

Before Starting the Procedure

The machine must be connected to a tractor that is the correct size for operation. See the information for the minimum tow vehicle weight.

The wheels of the machine must always be in contact with the ground during field operation to operate correctly.

Wing Frame Adjustment Legend

- **(A)** Gauge Tube Adjust Bracket
- **(B)** Wing Gauge Wheel
- **(C)** Front Caster Gauge Wheel Adjustment Rod
- **(D)** Wing Tube
- **(E)** Top Bypass Cylinder
- **(F)** Stop Collar
- **(G)** Screw Stop Collar
- **(H)** Adjust Arm Tube
- **(I)** Rear Axle Adjustment Rod
- **(J)** Wing Axle
- **(K)** Jam Nut

Wing Frame Adjustment Procedure

1. Find a solid, level surface large enough for the machine when unfolded.
2. Unfold the machine and fully raise the machine. Continue holding the hydraulic lever to let the oil cycle through the lift system.
3. Hold the lift cylinder hydraulic lever in the raised position for one to five minutes to make sure all cylinders are bled of air and fully extended.
4. Stop the tractor engine, apply the park brake and take the key with you.
5. Remove the transport locks.
6. Measure and record the height from the ground to the bottom of the wing frame tubes on the outer-front and outer-rear of the wing.
7. Compare the measurements of wing to the main frame. If the measurement for the wing is more than the main frame measurement, lower the wing. If the measurement is less than the main frame measurement, raise the wing.
8. Adjust rod **(I)** to raise or lower the wings rear axle until level with the main frame.
   a. To raise the wing, loosen the jam nut **(K)** and turn the adjustment rod clockwise.
   b. To lower the wing, loosen the jam nut and turn the adjustment rod counterclockwise.
9. Tighten the jam nut.
10. Adjust rod **(C)** to raise or lower the front caster gauge until level with the main frame.
    a. To raise the wing, loosen the jam nut **(K)** and turn the adjustment rod clockwise.
    b. To lower the wing, loosen the jam nut and turn the adjustment rod counterclockwise.
11. Tighten the jam nut.
12. Follow the same procedure (steps 6 - 11) for the wing on the other side of the machine.

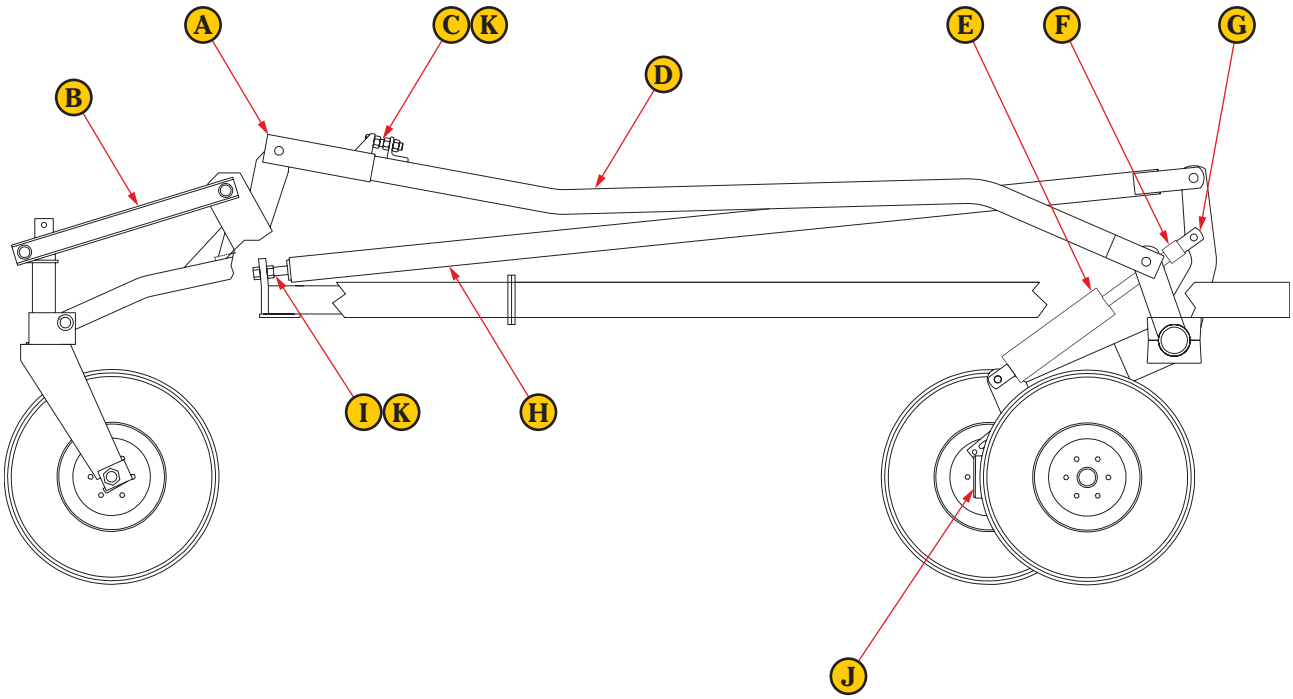


Figure 3.27 Wing Frame Adjustment

3.9.4 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. Changing field conditions, loading of the shanks and attachments will impact the functional level and working of the unit.

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 region. Activate the main lift hydraulics and remove the transport channel locks from the main frame lift cylinders. Make a visual inspection of the unit to ensure that all hardware is tight, hoses are clear and that the unit is ready for field operation.

Stop collars should have been removed for yard adjustment and all screw stop collars should be turned to the clevis end. Cycle the hydraulics a couple of 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 depth of operation of the shanks at the front of the main frame. By use of the screw stop and stop collars on the main frame lift cylinder set the desired depth of the unit. You may need to set a depth, pull forward through the field, stop, check and adjust the depth a number of times.

Once the rear has been set, measure the front shank depth and adjust the clevis adjust rod on the main mast tubes to raise or lower the front of the unit. Once the main frame is level tighten all jam nuts or screw stop thumbscrews to hold the position.

Raise the unit out of the ground, cycle the main lift hydraulics and drop the unit back to operating depth. Move to the rear corner of the wing and check the operating depth relative to the main frame depth.

If the wing needs to be raised you need to shorten the adjust arm by turning the adjuster rod into the adjust arm tube. To lower the wing, lengthen the adjust tube by adjusting the rod out.

Move to the front corner of the wing and check the operating depth relative to the main frame. If the front of the wing needs to be raised, lengthen the wing tube by changing the adjust rod at the gage tube adjust bracket. To lower the front of the wing, shorten the wing tube at the gauge tube adjust bracket.

Follow the same process to adjust the opposite wing. Recheck all depth settings and tighten all adjustment nuts. As conditions change the level of the unit may need to be altered as required.

On units equipped with single point depth control the setting process is all contained to a single point.

Install the shanks in their proper location and securely tighten U-bolt nuts.

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

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

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

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.

Wheel Damper Legend

- **(A)** Spring Adjust Bolt
- **(B)** 5/8” NC x 4” x 4” — 1/8” U-bolt (15.8 mm NC x 101.6 mm x 101.6 mm — 3.18 mm)
- **(C)** Pivot Bolt
- **(D)** Spring

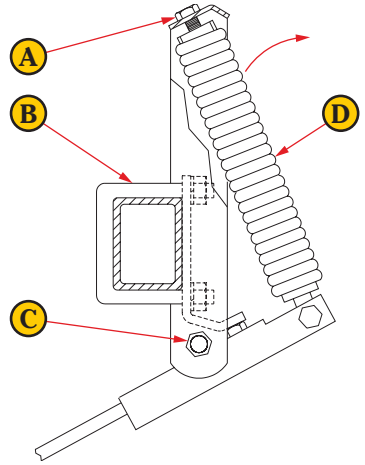


Figure 3.28 Wheel Damper

Maintain adequate tire/ shovel clearance on shanks located in or around the wheel well when machine is fully raised or lowered.

3.10 Notes

4 Troubleshooting

4.1 Troubleshooting the Cultivator

Table 4.1 Troubleshooting: Cultivator

Possible Cause	Solutions
Poor or uneven penetration	
Incorrect leveling adjustments on main frame or wings.	*Refer to Section "3.9 Leveling on page 27".*
Sweeps with incorrect stem angle.	Swap out for proper sweeps.
Hydraulic malfunction — air in lines, cylinders or hoses leaking or not installed properly.	Check for oil leakage in cylinders, hoses and fittings. Make sure all hydraulic cylinders and hose are properly connected.
Tires are not equally inflated.	See tire inflation.
Settling of entire implement from raised position	
Leaking cylinder.	Replace cylinder seals or cylinder assembly.
Leaking tractor hydraulic control valve.	See tractor manual.
Machine will not pull straight (skewing)	
Cultivator not level.	*Refer to Section "3.9 Leveling on page 27".*
Incorrect shank placement.	Check shanks for proper location. *Refer to FC Assembly Manual.*
Shovels wore.	Replace shovels.
Tires not equally inflated.	*Refer to Section "3.2.6 Wheel Preparation on page 19".*
Wings unfolding to rapidly	
Incorrect cylinder installed, should have 1/16" (1.59 mm) diameter integral restricter cylinder.	See wing lift circuitry and in-stall correct cylinder.
Wings running at different depths after settling	
Wings out of adjustment.	Reset wing height and tighten jam nut.

4.2 Notes

5 Maintenance

5.1 Maintenance Schedules

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.

5.1.1 Cylinder Shafts

If possible, retract cylinder shafts before storing. 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.

5.1.2 Axle Caps

All axle caps must be greased every 40 hours with a good quality grease. Lower machine onto the shovel points to relieve pressure on the caps which will make greasing easier.

5.1.3 Hub & 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.

5.1.4 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.

5.1.5 Hydraulics

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

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

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

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

5.1.6 Storage

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.

5.2 Lubrication Points

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

Field Cultivator Lubrication Points Legend

- **(A)** Bearing Cap
  - Lubricate every 40 hours.
- **(B)** Gauge Wheel Pivots (5 / Wheel)
  - Lubricate seasonally.
- **(C)** Hubs & Walker
  - Lubricate seasonally.

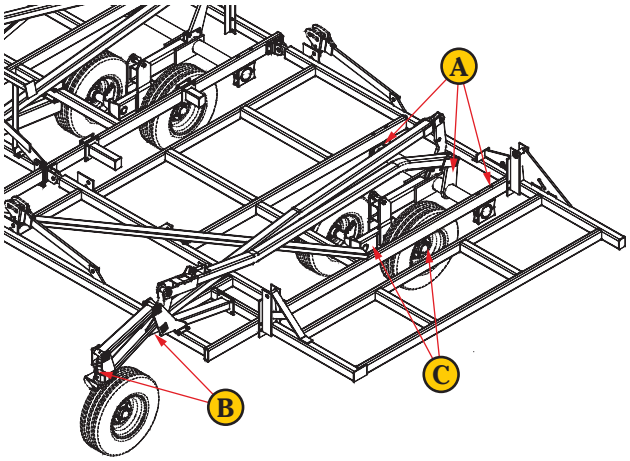


Figure 5.1 Field Cultivator (Common) Lubrication Points

5.2.1 QX² Cultivator Specific

QX² Lubrication Points Legend

- **(A)** Gauge Wheel Pivots (5 / Wheel)
  - Lubricate seasonally.

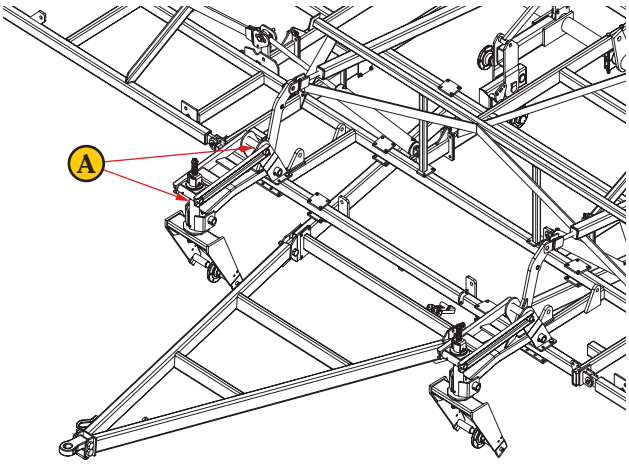


Figure 5.2 QX² Lubrication Points

5.2.2 XL² Cultivator Specific

XL² Lubrication Points Legend

- **(A)** Lift Linkage
  - Lubricate every 20 hours.

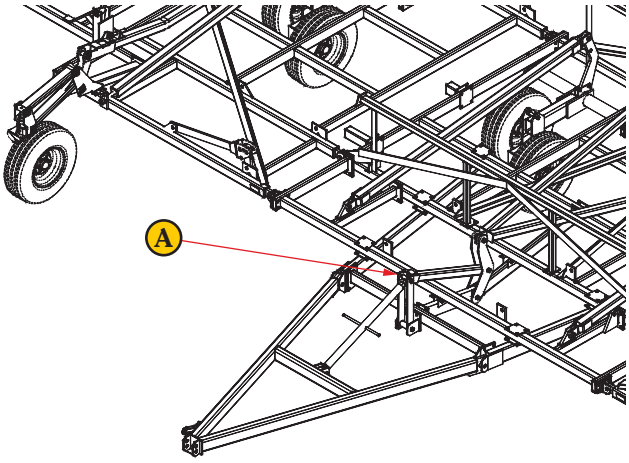


Figure 5.3 XL² Lubrication Points

5.3 Notes

6 Specifications

6.1 Implement Specifications

6.1.1 QX² Field Cultivator

Table 6.1 Technical Data Sheet: QX² I

XL² (Level Lift Hitch)						
Model	**13 QX² 32**	**13 QX² 32–34**	**13 QX² 32–42**	**13 QX² 32–45**	**13 QX² 37**	**13 QX² 37–39**
Number of Shanks	55	59	73	77	63	67
Cutting Width	32.1 ft (6.4 m)	34.4 ft (10.5 m)	42.6 ft (13 m)	44.9 ft (13.7 m)	36.75 ft (11.2 m)	39.1 ft (11.9 m)
Inner Wing	9.3 ft (2.8 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	11.7 ft (3.6 m)	11.6 ft (3.5 m)
Outer Wing	-	-	5 ft (1.5 m)	6 ft (1.8 m)	-	-
Number of Tires	12	12	14	14	12	12
Transport Width	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)
Transport Height	12.75 ft (3.9 m)	13.8 ft (4.2 m)	13.4 ft (4.1 m)	13.4 ft (4.1 m)	14.9 ft (4.5 m)	15.9 ft (4.8 m)
Weight	13,500 lbs (6,123 kg)	13,700 lbs (6,214 kg)	16,300 lbs (7,394 kg)	16,500 lbs (7,484 kg)	14,300 lbs (6,486 kg)	14,500 lbs (6,577 kg)
Horsepower Requirement	225 — 290	235 — 300	245 — 375	315 — 405	260 — 335	270 — 345

Table 6.2 Technical Data Sheet: QX² II

XL² (Level Lift Hitch)					
Model	**13 QX² 37–42**	**13 QX² 37–50**	**13 QX² 46–60**	**13 QX² 55**	**13 QX² 55–60**
Number of Shanks	73	85	87	95	103
Cutting Width	42.6 ft (13 m)	49.6 ft (15.1 m)	50.75 ft (15.5 m)	55.4 ft (16.9 m)	60.1 ft (18.3 m)
Inner Wing	11.7 ft (3.6 m)	11.7 ft (3.6 m)	9.3 ft (2.8 m)	11.7 ft (3.6 m)	11.7 ft (3.6 m)
Outer Wing	-	6 ft (1.8 m)	7 ft (2.1 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)
Number of Tires	12	14	18	18	18
Transport Width	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)
Transport Height	15.5 ft (4.7 m)	15.5 ft (4.7 m)	13.5 ft (4.1 m)	15.5 ft (4.7 m)	15.5 ft (4.7 m)
Weight	16,500 lbs (7,484 kg)	17,300 lbs (7,847 kg)	20,500 lbs (9,299 kg)	21,600 lbs (9,798 kg)	22,000 lbs (9,979 kg)
Horsepower Requirement	295 — 375	350 — 450	350 — 450	385 — 495	425 — 540

6.1.2 XL² Field Cultivator

Table 6.3 Technical Data Sheet: XL² I

XL² (Level Lift Hitch)							
Model	**11 XL² 25**	**11 XL² 25–27**	**11 XL² 30–32**	**11 XL² 30–39**	**11 XL² 32**	**11 XL² 32–34**	**11 XL² 32–42**
Number of Shanks	43	47	55	67	55	59	73
Cutting Width	25.1 ft (7.6 m)	27.4 ft (8.4 m)	32.1 ft (6.4 m)	39.1 ft (11.9 m)	32.1 ft (6.4 m)	34.4 ft (10.5 m)	42.6 ft (13 m)
Inner Wing	7 ft (2.1 m)	7 ft (2.1 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)
Outer Wing	7 ft (2.1 m)	7 ft (2.1 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)	-	-	5 ft (1.5 m)
Number of Tires	8	8	10	12	10	10	12
Transport Width	16.1 ft (4.9 m)	16.1 ft (4.9 m)	16.1 ft (4.9 m)	16.1 ft (4.9 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)
Transport Height	10.4 ft (3.2 m)	11.6 ft (3.5 m)	13.8 ft (4.2 m)	12.75 ft (3.9 m)	12.75 ft (3.9 m)	13.8 ft (4.2 m)	13.4 ft (4.1 m)
Weight	8,800 lbs (3,992 kg)	9,000 lbs (4,082 kg)	11,500 lbs (5,216 kg)	13,500 lbs (6,123 kg)	12,500 lbs (5,670 kg)	12,700 lbs (5,761 kg)	15,200 lbs (6,895 kg)
Horsepower Requirement	225 — 290	193 — 245	225 — 290	275 — 350	225 — 290	235 — 300	245 — 375

Table 6.4 Technical Data Sheet: XL² II

XL² (Level Lift Hitch)								
Model	**13 XL² 32–45**	**13 XL² 37**	**13 XL² 37–39**	**13 XL² 37–42**	**13 XL² 37–50**	**13 XL² 46–50**	**13 XL² 55**	**13 XL² 55–60**
Number of Shanks	77	63	67	73	85	87	95	103
Cutting Width	44.9 ft (13.7 m)	36.75 ft (11.2 m)	39.1 ft (11.9 m)	42.6 ft (13 m)	49.6 ft (15.1 m)	50.75 ft (15.5 m)	55.4 ft (16.9 m)	60.1 ft (18.3 m)
Inner Wing	9.3 ft (2.8 m)	11.7 ft (3.6 m)	11.6 ft (3.5 m)	11.7 ft (3.6 m)	11.7 ft (3.6 m)	9.3 ft (2.8 m)	11.7 ft (3.6 m)	11.7 ft (3.6 m)
Outer Wing	6 ft (1.8 m)	-	-	-	6 ft (1.8 m)	7 ft (2.1 m)	9.3 ft (2.8 m)	9.3 ft (2.8 m)
Number of Tires	12	10	10	10	12	16	16	16
Transport Width	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)	18.4 ft (5.6 m)
Transport Height	13.4 ft (4.1 m)	14.9 ft (4.5 m)	15.9 ft (4.8 m)	15.5 ft (4.7 m)	15.5 ft (4.7 m)	13.5 ft (4.1 m)	15.5 ft (4.7 m)	15.5 ft (4.7 m)
Weight	15,400 lbs (6,985 kg)	13,200 lbs (5,987 kg)	13,400 lbs (6,078 kg)	15,500 lbs (7,031 kg)	16,200 lbs (7,348 kg)	19,800 lbs (8,981 kg)	20,800 lbs (9,435 kg)	21,300 lbs (9,662 kg)
Horse-power Re-quirement	315 — 405	260 — 335	270 — 345	295 — 375	350 — 450	350 — 450	385 — 495	425 — 540

6.2 Standard Bolt Torques

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.

When tightening bolts, they must be torqued to the proper number (ft-lbs) 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.

Bolt Grades

- **(A)** Bolts with no marking are grade 2.
- **(B)** Grade 5 bolts furnished with the machine are identified by three radial lines on the head.
  - All U-bolts are grade 5.
- **(C)** Grade 8 bolts furnished with the machine are identified by six radial lines on the head.

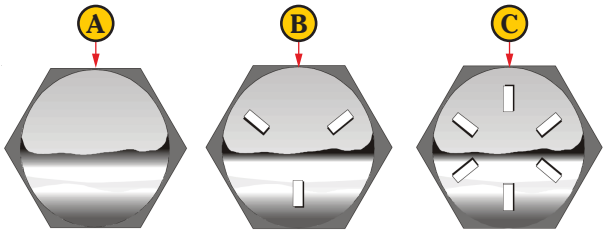


Figure 6.1 Bolt Grades

Table 6.5 Bolt Torques

Bolt Diameter	**3/8” (9.53 mm)**	**1/2” (12.7 mm)**	**5/8” (15.88 mm)**	**3/4” (19.05 mm)**	**7/8” (22.23 mm)**	**1” (25.4 mm)**
Hex Head	**9/16” (14.3 mm)**	**3/4” (19.05 mm)**	**15/16” (23.83 mm)**	**1–1/8” (28.58 mm)**	**1–5/16” (33.34 mm)**	**1–1/2” (38.1 mm)**
Torque | ft/lbs (N.m)						
UNC GR2	18 (24.40)	45 (61.01)	89 (120.67)	160 (216.93)	252 (341.67)	320 (433.86)
UNC GR5	30 (40.67)	68 (92.19)	140 (189.81)	240 (325.39)	360 (488.09)	544 (737.56)
UNC GR8	40 (54.23)	100 (135.58)	196 (165.74)	340 (460.98)	528 (715.87)	792 (1073.81)
UNF GR2	21 (28.47)	51 (69.15)	102 (138.29)	178 (241.34)	272 (368.78)	368 (498.94)
UNF GR5	32 (43.39)	70 (94.91)	168 (227.78)	264 (357.94)	392 (531.48)	572 (775.53)
UNF GR8	48 (65.08)	112 (151.85)	216 (292.86)	368 (498.94)	792 (1073.81)	840 (1138.89)

6.3 Hydraulic Connection Torques

Hydraulic Connection Torques Legend

- **(1)** Straight Thread O-ring Boss (ORB)
  - Example: 12MB — 12MJ is —12 male ORB to —12 male JIC
- **(2)** SAE 37°C (JIC)
  - Example: 8FJ — 8FJ is —08 female JIC

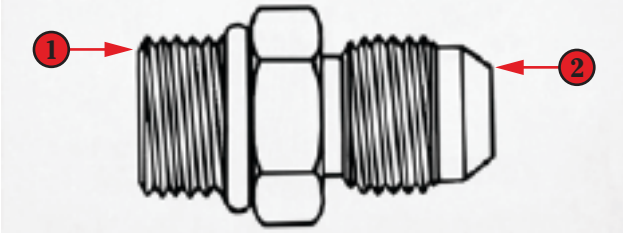


Figure 6.2 Hydraulic Connection Torques

SAE 37° fittings can be damaged if over torqued. Use caution when tightening these fittings.

Table 6.6 Straight Thread O-ring Boss (ORB)

Dash Size	Jam Nut or Straight Fitting Torque	
	ft/lbs	Newton Meters
-04	13 — 15	18 — 20
-05	14 — 15	19 — 21
-06	23 — 24	32 — 33
-08	40 — 43	55 — 57
-10	43 — 48	59 — 64
-12	68 — 75	93 — 101

Table 6.7 SAE 37°C (JIC)

Dash Size	Jam Nut or Straight Fitting Torque	
	ft/lbs	Newton Meters
-04	11 — 12	15 — 16
-05	15 — 16	20 — 22
-06	18 — 20	24 — 28
-08	38 — 42	52 — 58
-10	57 — 62	77 — 85
-12	79 — 87	108 — 119

6.4 Notes

7 Aftermarket

7.1 Warranty

Väderstad Inc. Limited Warranty Terms and Conditions — United States and Canada, Effective for Equipment Retailed and Delivered after May 21, 2021.

7.1.1 What is Warranted

Väderstad Inc. warrants it's new equipment to be free of defects in material and workmanship at time of delivery to the first retail purchaser, renter or lessee. These terms apply to all 10K, Amity, Concord, Wil-Rich and Wishek brands of new equipment originally marketed in the United States and Canada.

7.1.2 Warranty Period

- 12 months from the date of delivery to the first retail purchaser, renter or lessee.
- **483 Disk Chisel, Field Cultivator and Disk Cultivators:** 3 years on main frames, wing frames and shank assemblies.

7.1.3 Exceptions from this Warranty

- **Freight Charges:** This warranty does not cover freight charges.
- **Improvements, Changes, or Discontinuance:** Väderstad Inc. reserves the right to make changes and improvements in design or changes in specifications at any time to any product without incurring any obligations to owners of products previously sold.
- **Satellite Outages:** Interruptions in satellite interfaces and satellite communications are outside the control of this product and are not covered by this warranty. The company is not responsible for issues or degradation of system performance resulting from such interruptions in satellite interfaces and satellite communications where the issues are not related to defects in this product.
- **Repairs and Maintenance Not Covered Under Warranty:** This warranty does not cover conditions resulting from misuse, natural calamities, use of non-Väderstad Inc. parts, negligence, alteration, accident, use of unapproved attachments, usage which is contrary to the intended purposes, or conditions caused by failure to perform required maintenance. Replacement of wear or maintenance items (unless defective) such as but not limited to, filters, hoses, belts, lubricants, light bulbs, wheel alignment, tightening of nuts, belts, bolts and fittings, service tune-up, computer parameter adjustments and general adjustments which may from time to time be required are not covered.
- **Rubber Tire Warranty:** Rubber tires are warranted directly by the respective manufacturer only and not by Väderstad Inc.

7.1.4 Owners Obligation

It is the responsibility of the owner to transport the equipment or parts to the service shop of an authorized Väderstad Inc. dealer or alternatively to reimburse the dealer for any travel or transportation expense involved in fulfilling this warranty. This warranty does NOT cover rental of replacement equipment during the repair period, damage to products which have been declared a total loss and subsequently salvaged, overtime labor charges, freight charges for replacement parts, or special handling requirements (such as, but not limited to, the use of cranes).

7.1.5 Exclusive Effect of Warranty and Limitation of Liability

This warranty is in lieu of all warranties of merchantability, fitness for a purpose or other representations, warranties or conditions, expressed or implied.

The remedies of the owner set forth herein are exclusive. The company neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the sale of covered machines. Correction of defects, in the manner and for applicable period of time provided above, shall constitute fulfillment of all responsibilities of Väderstad Inc. to the owner, and Väderstad Inc. shall not be liable for negligence under contract or in any manner with respect to such machines.

In no event shall the owner be entitled to recover for incidental, special or consequential damages such as but not limited to, loss of crops, loss of profits or revenue, other commercial losses, inconvenience or cost of rental or replacement equipment.

Some states or provinces do not permit limitations or exclusions of implied warranties or incidental or consequential damages, so the limitations or exclusions in this warranty may not apply.

Väderstad Inc. as referred to herein with respect to sales in:

United States & Canada:

- Väderstad Inc.
- PO Box 1030
- Wahpeton, ND 58074

7.1.6 Additional Warranty Information

New Equipment Warranty

Equipment is eligible for warranty service only if it qualifies under the provisions of the new equipment warranty. The selling dealer will deliver this warranty to the original retail purchaser at the time of sale, and the dealer will register the sale and warranty with Väderstad Inc.

Subsequent Owners

This warranty covers the first retail purchaser and all subsequent owners of the equipment during the specified warranty period.

Should the Väderstad Inc. dealer sell this equipment to a subsequent owner, the dealer must deliver the warranty document to the subsequent owner so the subsequent owner can register ownership with Väderstad Inc. and obtain the remaining warranty benefits, if available, with no intermission in the warranty period. Subsequent owner procedure will apply. It is the responsibility of the subsequent owner to transport the equipment to the service shop of an authorized Väderstad Inc. dealer or alternatively to reimburse the dealer for any travel or transportation expense involved in fulfilling this warranty. This warranty does NOT cover charges for rental or replacement equipment during the repair period, products which have been declared a total loss and subsequently salvaged, overtime labor charges, freight charges for replacement parts, or units sold at auction.

Warranty Service

To be covered by warranty, service must be performed by an authorized Väderstad Inc. It is recommended that you obtain warranty service from the dealer who sold you the equipment because of that dealer's continued interest in you as a valued customer. In the event this is not possible, warranty service may be performed by any other authorized Väderstad Inc. dealers in the United States or Canada. It is the responsibility of the owner to transport the equipment to the service shop of an authorized Väderstad Inc. dealer or alternatively to reimburse the dealer for any travel or transportation expense involved in fulfilling this warranty.

Maintenance Service

The owner's manual furnished to you with the equipment at the time of delivery contains important maintenance and service information. You must read the manual carefully and follow all the maintenance and service recommendations. Doing so will result in greater satisfaction with your equipment and help avoid service and warranty problems. Please remember that failures due to improper maintenance of your equipment are not covered by warranty.

Maintenance Inspections

To insure the continued best performance from your agricultural equipment, we recommend that you arrange to make your equipment available to your selling dealer for a maintenance inspection 30 days prior to warranty expiration.

7.2 Aftermarket Options

7.2.1 Shovels

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

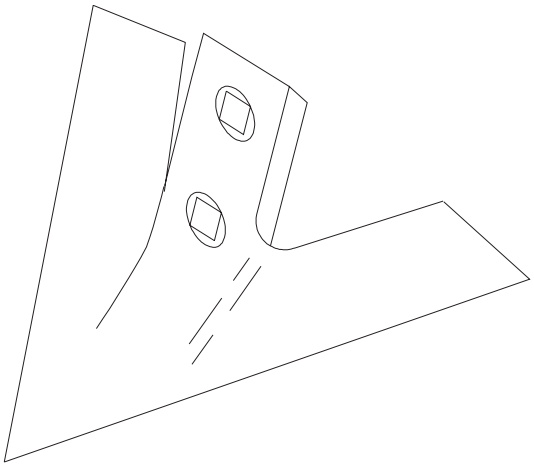


Figure 7.1 Shovel

7.2.2 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.

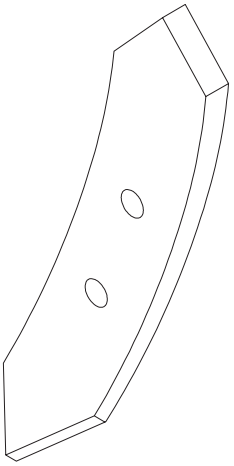


Figure 7.2 Spike

7.2.3 Shovel Extension

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

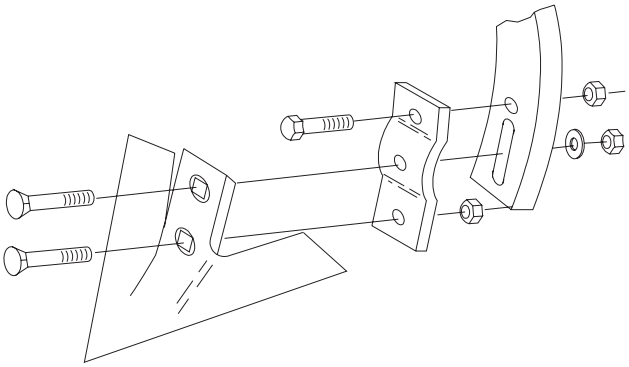


Figure 7.3 Shovel Extension

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