

**DR12X2 ROW
HOPPER PLANTER
Operator's Manual**

Part #125-087-03-EN-OM



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Chapter 1

Introduction

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To the Dealer

This instruction contains important information for unloading of custom integral planters. Read instructions carefully before attempting to unload. While the custom integral planter is considered a factory assembled product, some components may have been removed from the machine to prevent damage during shipping, or to allow for consolidated shipments. Make sure all components are properly installed.

Inspect the implement thoroughly after assembly to be certain it is functioning properly before delivering it to the customer. The following checklist is a reminder of points to cover. Check off each item as it is found satisfactory or after proper adjustment is made.

Pre-Delivery Checklist	
	All hardware is properly tightened.
	Lubrication of grease fittings has been completed.
	All decals are properly located and readable.
	All implement tools and options are installed and set.
	Check overall condition of implement.
	Make sure operator's manual is included.
Date set up:	
Signature:	

Delivery

At the time the machine is delivered, the following checklist is a reminder of information which should be conveyed directly to the customer. Check off each item as it is fully explained to customer.

Delivery Checklist	
	Introduce the machine to the customer. Give the customer the operator's manual and encourage them to read it.
	Make the customer aware of all the safety precautions that must be exercised when using and transporting the machine.
	Make customer aware of the different tooling options available.
	The machine does not come set to run in the field from the factory. See Chapter 5, "Operation and Field Settings" to help set the machine for optimal performance. Explain all operating adjustments.
	Explain to the customer that the life expectancy of this machine depends on regular maintenance as directed in the operator's manual.
	Tell the customer to use the proper tools for service and inform them of Orthman parts availability.
	Review recommended procedures for attaching and detaching planter from tractor.
	Inform the customer of safety precautions that must be observed when transporting.
	When the machine is transported on a road or highway at night or during the day, accessory lights and devices should be used for adequate warning to operators of other vehicles. In this regard, tell customer to check local governmental regulations.
	Write machine model number and serial number in the spaces provided below.
	To the best of my knowledge, this machine has been delivered ready for field use and the customer has been fully informed as to proper operation and care.
Date delivered:	Model number:
Signature:	Serial number:

NOTE: After signing, copy this page. Keep signed delivery checklist in machine file at the dealership.

Product Description

Orthman is known as a worldwide leader in versatile stacking toolbars because we continually strive to meet and exceed the changing needs of our customers. The DR12x2 Row Hopper Planter provides rugged durability and exceptional maneuverability, while offering greater productivity with 36 in, 38 in, and 40 in row spacing.

The DR12x2 Row Hopper Planter features a dual-mount hitch to accommodate for twin row or single row operation. As part of the unique dual-mount hitch, the hitch top link has two mounting locations for the tractor 3-point hitch.

An internal toolbar vacuum circuit has been designed into the DR12x2 Row Hopper Planter. The vacuum air for the seed meters is routed from each row unit to the internal space of the toolbar, which is then connected to a vacuum fan via a flex hose connected to another internal toolbar vacuum outlet.

Purpose of This Manual

This manual is considered to be an integral component of the DR12x2 Row Hopper Planter and is designed to educate the owner and operators regarding safety, operation, maintenance, troubleshooting, and component identification.

All personnel involved in the operation of the DR12x2 Row Hopper Planter are responsible for reading and understanding the entire contents of this manual. This manual is designed to keep the operator safe and knowledgeable as well as prolong the life of the product, minimize downtime, and maximize field efficiency. This manual should accompany the product if it is ever sold.

We would like to thank you for placing your confidence in Orthman Mfg., Inc. Your DR12x2 Row Hopper Planter is manufactured to meet the highest standards and is built with Orthman precision and strength to increase your agricultural operation's dependability and profitability.

Warranty

Orthman Manufacturing, Inc. ("OMI") warrants each new whole good product to be free from defects in manufactured components and workmanship. This warranty is applicable only for the normal service life expectancy of the product or components, not to exceed twenty-four (24) consecutive months from date of purchase of the new OMI product to the original purchaser.

Purchased components installed by OMI (blades, bearings, controls, hoses, wheels, coulters, cylinders, fittings, points, etc.) shall be warranted by their respective manufacturer for a period of twelve (12) consecutive months from date of purchase of the new OMI product to the original purchaser.

A completed online Warranty Registration for the original purchaser must have been received by OMI to activate warranty coverage. Non receipt of warranty registration may void OMI warranty coverage. OMI warranty is non-transferable.

Genuine OMI replacement parts and components will be warranted for ninety (90) days from date of purchase or the remainder of the original equipment warranty period; whichever is greater.

All warranty work is to be performed by an authorized OMI dealer at the repairing dealer's location unless otherwise approved by Orthman Manufacturing, Inc. – Lexington, Nebraska.

Under no circumstances shall warranty cover any merchandise or component thereof, which, in the opinion of OMI, has been subjected to misuse, unauthorized modifications or alteration, accident, collision with obstruction/ground, or if repairs have been made with parts other than those approved by OMI. If the seal on the cylinder is broke (cylinder opened), it will void all warranty for cylinder.

OMI warranty policies do not cover travel expenses, after hours field/service time, overnight expenses, or expenses not related to that of regular shop labor rates or parts replaced during actual warranty repair. OMI reserves the right to adjust warranty labor credits so as not to exceed believed normal repair times as directed by warranty governing laws.

OMI obligation under this warranty shall be limited to repairing or replacing, free of charge to the purchaser, any part, in our judgment, showing evidence of such defect, provided further that such part shall be returned within thirty (30) days from the date of repair to OMI through the dealer or distributor from whom the product was purchased or repaired; transportation charges prepaid.

This warranty shall not be interpreted to render OMI liable for injury or damages of any kind or nature to person or property. This warranty does not extend to the loss of crops, loss of delay in harvesting/planting, or any expense or loss incurred for labor, substitute machinery, rental, or any subsequent reasons thereof.

Except as set forth above, OMI shall have no obligation or liability of any kind on account of its equipment and shall not be liable for special or consequential damages. OMI makes no other warranty, expressed or implied, and, specifically, OMI disclaims any implied warranty or merchantability or fitness for a particular purpose. Some sates or provinces do not permit limitations or exclusions of implied warranties or incidental or consequential damages, so the limitations or exclusion in this warranty may not apply.

This warranty is subject to any existing conditions of supply, which may directly affect OMI ability to obtain materials or manufacture replacement parts.

OMI reserves the right to make improvements in design or changes in specifications at any time, without incurring any obligation to owners of units previously sold.

No one person is authorized to alter, modify or enlarge this warranty nor the exclusions, limitations and reservations. For more information, please visit OMI website www.orthman.com.

Information subject to change without notice.

Provided warranty policy information supersedes all previous warranty considerations.

Orthman Manufacturing, Inc. – Lexington, NE

Rev. Date - 8/1/2021

Chapter 2

Safety Information

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Farm Safety

Contrary to the popular image of fresh air and peaceful surroundings, a farm is not a hazard-free work setting. Every year, thousands of farm workers are injured and hundreds more die in farming accidents. According to the National Safety Council, agriculture is the most hazardous industry in the nation.

How You Can Improve Farm Safety

You can start by increasing your awareness of farming hazards and making a conscious effort to prepare for emergency situations including fires, vehicle accidents, electrical shocks from equipment and wires, and chemical exposures. Be especially alert to hazards that may affect children and the elderly. Minimize hazards by carefully selecting the products you buy to ensure that you provide good tools and equipment. Always use seat belts when operating tractors, and establish and maintain good housekeeping practices. Here are some other steps you can take to reduce illnesses and injuries on the farm:

- Read and follow instructions in equipment operator's manuals and on product labels.
- Inspect equipment routinely for problems that may cause accidents.
- Discuss safety hazards and emergency procedures with your workers.
- Install approved rollover protective structures, protective enclosures, or protective frames on tractors.
- Make sure that guards on farm equipment are replaced after maintenance.
- Review and follow instructions in material safety data sheets (MSDSs) and on labels that come with chemical products and communicate information on these hazards to your workers.

High Risk Factors on Farms

The following factors may increase risk of injury or illness for farm workers:

- Age — Injury rates are highest among children age 15 and under and adults over 65.
- Equipment and Machinery — Most farm accidents and fatalities involve machinery. Proper machine guarding and performing equipment maintenance according to manufacturers' recommendations can help prevent accidents.
- Protective Equipment — Using protective equipment such as seat belts on tractors and personal protective equipment (PPE) (safety gloves, coveralls, boots, hats, aprons, goggles, and face shields) could significantly reduce farming injuries.
- Take precautions to prevent entrapment and suffocation caused by unstable surfaces of grain storage bins, silos, or hoppers. Never "walk the grain."
- Be aware that methane gas, carbon dioxide, ammonia, and hydrogen sulfide can form in unventilated grain silos and manure pits and can suffocate or poison workers or explode.
- Take advantage of safety equipment, such as bypass starter covers, power take-off master shields, and slow-moving vehicle emblems.
- Medical Care — Hospitals and emergency medical care are typically not readily accessible in rural areas near farms.

The Benefits of Improved Safety and Health Practices

Orthman Manufacturing provides this document in the hope that everyone that has a job to do, does it SAFELY. Our goal and yours should be to end each day in the best possible health. Better safety and health practices reduce fatalities, injuries, and illnesses as well as associated costs such as workers' compensation insurance premiums, lost production, and medical expenses. A safer and more healthful workplace improves morale and productivity.

Health and Safety Hazards on Farms

Farm workers including farm families and migrant workers are exposed to hazards such as the following:

Danger	Potential Effect or Injury	Prevention
Chemicals/ Pesticides	Skin and respiratory injury or death	Review material safety data sheets (MSDSs) and manufacturers' data sheets, and use proper personal protective equipment (PPE).
Cold	Illness, frostbite, or death	Dress properly for the day.
Dust	Respiratory injury or explosive combinations	Be aware of your surroundings and activity.
Electricity	Shock, burns, fire, or death	Use a qualified professional for wiring dangerous electrical devices. Never overload a circuit. Replace damaged electrical devices or cords. Electrical tape will not insulate you from injury.
Grain bins/Silos	Entrapment or suffocation Explosion from formation of dangerous gases and poisoning	Make sure the bin is properly ventilated and maintained. Never "walk the grain."
Hand tools	Injury including cuts, abrasions, electrocution, strains, sprains, or death	Make sure hand tools are in good condition. Never leave a damaged tool accessible for someone else to use.
Highway traffic	Collisions resulting in injury or death	Follow regulations and stay alert. Avoid alcohol use and the use of communication devices while driving.
Lifting/ Lifting devices	Back injury, sprains, or strains Falling material resulting in being struck or crushed by heavy material	Use proper lifting technique. Get help when the load is too heavy. Inspect all lifting chains, straps, or cables routinely to make sure they are in good condition.
Livestock handling	Serious injury or death resulting from being pinned, struck, or trampled	Always make sure you have adequate room and an escape route.
Machinery/ Equipment	Cuts, abrasions, amputations, or death	Thoroughly read and understand your Owners Equipment Manual (OEM). Never operate the equipment without guards in place. Make sure the equipment can not be energized or otherwise put into operation during repair or maintenance.
Manure pits	Suffocation or poisoning Explosion from formation of dangerous gases and poisoning	Keep proper maintenance.
Mud	Sprains, strains, entrapment, or suffocation. Eye injury and skin irritation.	Use proper PPE. In some conditions a "spotter" may be needed.
Noise	Hearing damage	Use proper PPE.
Ponds	Drowning	Put on a life preserver and make sure help is readily available.
Slips/Trips/Falls	Sprains, strains, back and neck injury, bone breaks, or death	Keep work area free from clutter and organized. If working on anything elevated, make sure you have appropriate guarding and/or fall protection such as a harness and lanyard.
Sun/Heat	Sun burn, heat stroke, shock, or death	Use common sense on excessively hot days. Use sun screen, put on a hat, and stay hydrated.
Toxic gases	Skin and respiratory injury or death Explosion	Review MSDSs and manufacturers' data sheets, and use proper PPE.
Tractors	Cuts, abrasions, amputations, or death	Thoroughly read and understand your OEM. Never operate the equipment without guards in place or anti-roll over devices.
Wells	Electrocution, amputation, or death	Avoid contact with water while working on an electrical device. Make sure the equipment can not be energized or otherwise put into operation during repair or maintenance. Make sure all guarding is in place.
Severe weather	Electrocution, "struck by" injuries, or death	Move to a safe place. Lightening, hail, and tornadoes are unpredictable.

Orthman Manufacturing, Inc. does not limit the potential effects or injuries nor prevention measures to those listed above. They are provided solely as a guideline to making your farm life safer. Always consult your Owner/Operators Manual for specific tool and equipment safety requirements.

Safety Alert Symbol



This safety alert symbol warns of potential hazards to personal safety and that extra precautions must be taken.

When you see this symbol, carefully read the message(s) that follow. Follow all recommended precautions and safe operating practices in this manual.

Hazard control and accident prevention are dependent upon the safety awareness and proper training of personnel involved in the operation of this implement.

Be Aware of Signal Words

Signal words designate a degree or level of hazard seriousness. These signal words include:

DANGER

DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury. **DANGER** is limited to extreme situations, typically for machine components which for functional purposes cannot be guarded.

WARNING

WARNING indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. **WARNING** includes hazards that are exposed when safety guards are removed. **WARNING** may also be used to alert against unsafe practices.

CAUTION

CAUTION indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. **CAUTION** may also be used to alert against unsafe practices.

Shutdown and Storage

DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Make sure all personnel are clear of the implement before lowering.

Lower the implement to the ground, place the tractor in park, turn off the engine, and remove the key.

DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Use bar stands and cylinder stops to support the implement.

Store the implement on a clean, dry, and level surface. An uneven surface could cause the implement to shift or fall, resulting in injury or death as well as implement damage. Securely support all implement components that must be raised. Store the implement away from human activity.

For Your Protection

CAUTION

Read and understand the entire contents of this manual before operating or servicing the implement.

Read and understand all operator manuals for the machinery used in conjunction with the DR12x2 Row Hopper Planter.

Carefully read all safety decals in this manual as well as on the implement. Keep the implement clean so decals are easily visible. Keep all safety decals in good, clean, and legible condition. Immediately replace damaged and/or missing decals. Replacement decals are available from your Orthman dealer.

Learn to operate the implement and all components properly. Do not let others operate the implement without proper instruction. Unauthorized implement modifications may impair function and safety. If you do not understand any content in this manual or need assistance, contact your Orthman dealer.

Equipment Safety Guidelines

Operator safety is the primary concern when designing an Orthman implement. Orthman integrates as many safety features into the implement as possible. You can avoid many hazards and possible accidents by observing precautions in this safety section.

Insist that yourself and personnel working with and around you follow all safety precautions. Be cautious when working with or around the implement to avoid injury.

Safe Transport

Use the following guidelines for safe transport:

- Engage transport locking devices and cylinder stops prior to transport.
- Plan your route to avoid traffic. Yield to traffic in all situations.
- Various conditions will require reduced speed. Travel at speeds that allow for adequate control of stopping and steering.

DANGER

Avoid electrocution. Failure to follow this information will result in death or serious injury. Be aware of overhead power lines.

- Use extreme care when operating the implement near power lines. Contact or close proximity to power lines can result in injury or death.
- Know the transport height and gross weight of the implement. Avoid overhead obstructions not allowing your transport height. Do not use bridges rated below the gross weight of the implement.
- Make sure a slow moving vehicle (SMV) placard is mounted to the implement and is easily visible to other motorists. See “Slow Moving Vehicle (SMV)” on page 2-7.
- Make allowances for implement size when transporting. Sudden braking can cause a towed load to swerve and/or rollover. Never use independent braking with the implement in tow as loss of control and/or rollover can result. Reduce speed if the towed implement is not equipped with brakes.
- Do not coast. Always keep the tractor or towing device in gear to provide engine braking when traveling downhill.
- Comply with state and local laws governing implement transport.

Safe Operation

CAUTION

Read and understand the entire contents of this manual before operating or servicing the implement.

The implement is to be operated by qualified personnel only. Never let children operate the implement. A complete understanding of safety precautions, operation, and maintenance is mandatory before implement use.

DANGER

Avoid electrocution. Failure to follow this information will result in death or serious injury. Be aware of overhead power lines.

Use extreme care when operating the implement near power lines. Contact or close proximity to power lines can result in injury or death.

Know the transport height and gross weight of the implement. Avoid overhead obstructions not allowing your transport height. Do not use bridges rated below your gross weight.

DANGER

Avoid rollover. Failure to follow this information will result in death or serious injury. Do not fold or unfold the implement when on a hillside and avoid sharp turns, as shift of weight could cause rollover.

Operate the implement at a safe distance from terrain irregularities and other obstructions that could cause rollover.

WARNING

Avoid being struck by the implement. Failure to follow this information could result in death or serious injury. Make sure all personnel are clear of the implement at all times when the implement is in motion.

Be aware of obstructions above, below, and around the implement when in operation or transport.

Warning and Safety Lights

Oversized implements and slow moving vehicles create a hazard when transported on public roads. Use safety lighting when traveling on public roads day and night.

Make sure all warning lights, safety lights, and turning signals are working and clean. Replace missing or damaged lights immediately. Comply with state and local laws governing implement safety lighting.

Rear View of Toolbar

See Figure 2-1.

NOTES:

- Two-sided amber lights (2) must be visible from the front and rear of the implement.
- Red light assemblies (7) are one-sided and must be visible from the rear of the implement.

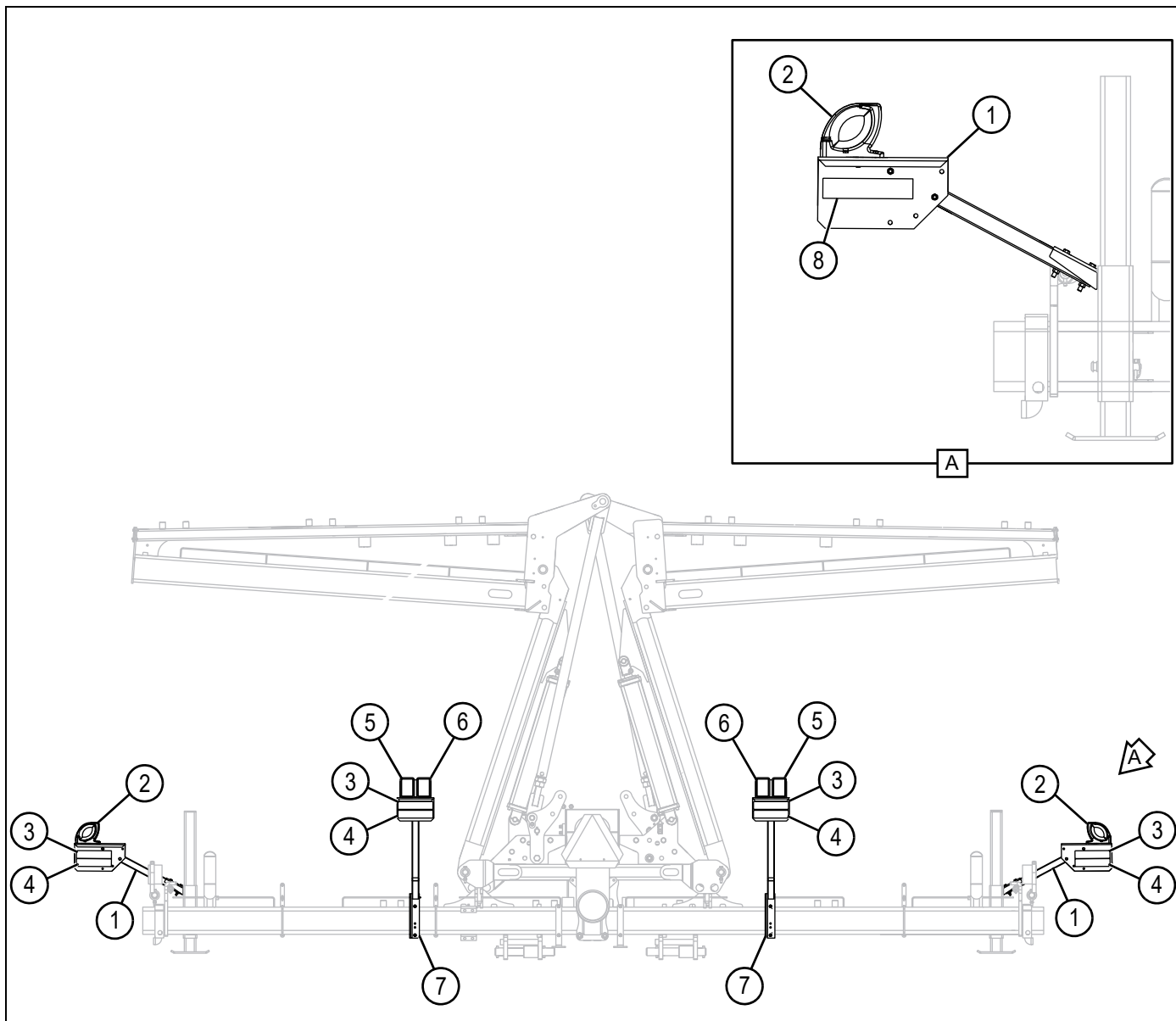


Figure 2-1

ORM000115

- | | |
|---|--------------------------------------|
| 1) Amber light assembly (2 used) | 5) Amber light (2 used) |
| 2) Two-sided amber light (2 used) | 6) Red light (2 used) |
| 3) Orange fluorescent non-reflective decal (4 used) | 7) Red/amber light assembly (2 used) |
| 4) Red retroreflective decal (4 used) | 8) Yellow reflective decal (2 used) |

Slow Moving Vehicle (SMV)

The slow moving vehicle (SMV) placard (1) is mounted to the implement to alert other motorists that the machine is traveling below posted speed limits. The SMV placard is highly reflective and must be mounted to the implement where it is easily visible to other motorists when the implement is in motion.

Also mounted with the SMV is the speed identification symbol (SIS) (2). The SIS displays the vehicle's max speed in miles per hour (mph) or kilometers per hour (kph).

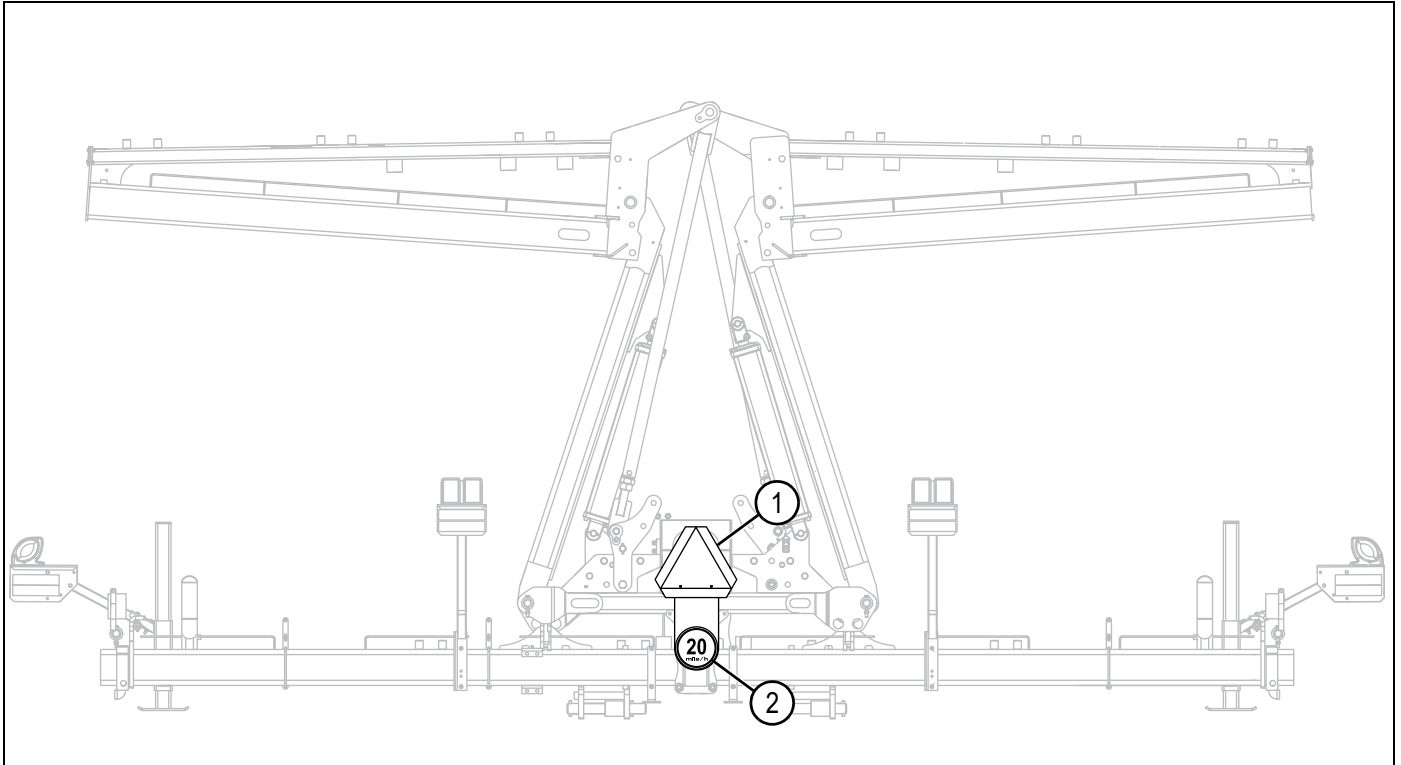


Figure 2-2

ORM000116

1) Slow moving vehicle (SMV) placard

2) Speed identification symbol (SIS)

No Riders

WARNING

Never allow riders on the tractor or implement. Failure to follow this information could result in death or serious injury.

Riders hinder operator visibility and can be thrown from the implement and/or be struck by foreign objects resulting in injury or death.

Practice Safe Maintenance

Proper maintenance is your responsibility. Maintenance neglect and/or poor maintenance practices can result in injury or death. Always use the proper tools to maintain the implement.

DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Make sure all personnel are clear of the implement before lowering.

Lower the implement to the ground, place the tractor in park, turn off the engine, and remove the key.

DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Use bar stands and cylinder stops to support the implement.

Store the implement on a clean, dry, level surface. An uneven surface could cause the implement to shift or fall, resulting in injury or death as well as implement damage. Securely support all implement components that must be raised. Store the implement away from human activity.

DANGER

Avoid entanglement. Failure to follow this information will result in death or serious injury. Never lubricate or service the implement when in motion.

Keep away from power driven parts when in motion. Disengage power sources prior to maintaining the implement. Injury or death can result from contact with power driven parts when in motion.

DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Do not stand between the tractor and implement when connecting or disconnecting the implement.

Always place the tractor in park and turn off the engine before connecting or disconnecting the implement. Injury or death can result from being trapped between the tractor and implement.

DANGER

Avoid high-pressure fluid hazards. Failure to follow this information will result in death or serious injury. Relieve hydraulic pressure before servicing or disconnecting hoses.

Escaping pressurized hydraulic fluid can penetrate the skin, resulting in injury or death. Relieve hydraulic system pressure before connecting or disconnecting the tractor.

Never use hands to check for hydraulic leaks. Use cardboard or wood. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, see a doctor immediately for proper treatment.

Never operate a combustion engine in an enclosed area. Make sure there is adequate ventilation. Exhaust fumes can cause asphyxiation.

Service tires safely. Tire and rim separation can result in serious injury or death. Do not over inflate tires. Only mount or dismount tires if you possess the proper equipment, otherwise contact a trained professional. Always maintain correct tire pressure. Inspect tires and wheels daily. Do not operate tires with inadequate pressure, cuts, visible damage, or missing hardware.

CAUTION

Be extremely careful working around unshielded sharp edges. Injury may result from contact with sharp edges.

Keep all parts in good condition and properly installed. Replace damaged or missing parts immediately.

Remove tools and unused parts prior to implement operation.

Prepare for Emergencies

Be prepared for a fire. Keep a readily accessible fire extinguisher at all times.

Keep a readily accessible stocked first aid kit and emergency phone numbers for your doctor, hospital, ambulance, and fire department.

Wear protective clothing and equipment. Wear clothing appropriate for the situation. Protect your eyes, ears, hands, and feet with the use of protective goggles, ear plugs, gloves, boots, etc.

Anhydrous Ammonia (NH₃) and Liquid Fertilizer

⚠ DANGER

Avoid direct exposure to anhydrous ammonia (NH₃) and liquid fertilizer. Failure to follow this information will result in death or serious injury.

Use extreme care when working with anhydrous ammonia (NH₃) and liquid fertilizer.

Keep a clean supply of water readily accessible in case of exposure to NH₃ or liquid fertilizer.

Wear protective goggles and gloves when working with NH₃ or liquid fertilizer. Be sure all persons involved in the operation are properly trained concerning the dangers and precautions involved in the application of NH₃ or liquid fertilizer.

If you choose to apply NH₃ or liquid fertilizer, it is advisable to consult documented information regarding safe handling and application of NH₃ or liquid fertilizer. Information is available from the following recognized sources:

- American National Standards Institute (ANSI): www.ansi.org - (212) 642-4900
- Material Safety Data Sheets (MSDS): www.msds-online.com
- National Safety Council: www.nsc.org/necas
- The Fertilizer Institute: www.tfi.org
- United States Department of Transportation (USDOT): www.dot.gov
- Compressed Gas Association: www.cganet.com

Safety Never Hurts

⚠ CAUTION

Read and understand the entire contents of this manual before operating or servicing the implement.

Use the following safety practices:

- Understand all implement functions.
- Never stand between the tractor and implement when connecting or disconnecting the implement.
- Be aware of all surroundings before you move the implement.
- Operate the implement from operator's seat only.
- Never mount or dismount a moving tractor.
- Never leave the engine running when the implement is unattended.
- Keep away from power driven parts when in motion.
- Make sure all personnel are clear before lowering implement to the ground.

Orthman Serial Number Plate

The Orthman serial number plate contains valuable information. The model number (1) and serial number (2) provide Orthman dealers and the Orthman service department with the exact specifications of your implement if any warranty or service issues need to be addressed.

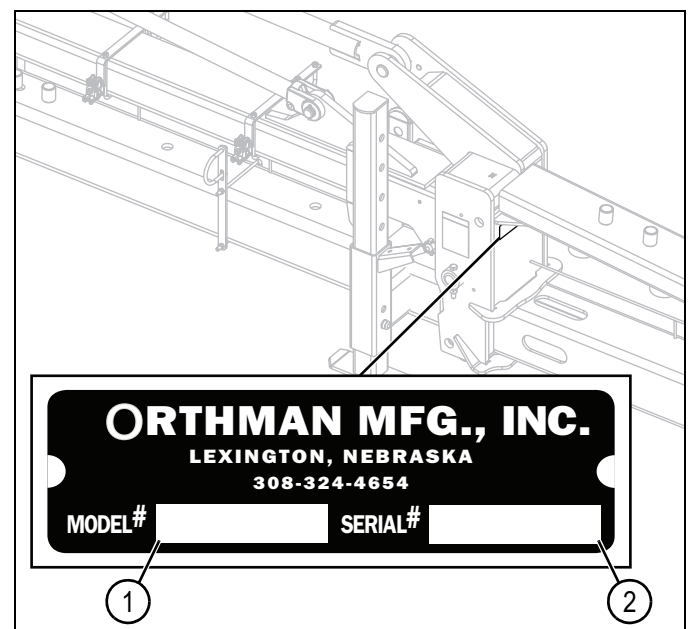


Figure 2-3

ORM000117

1) Model number

2) Serial number

Safety Decals

Safety decals promote awareness and knowledge concerning safe operation and maintenance of the implement. Carefully read all safety decals in this manual as well as on the implement.

Keep the implement clean so decals are easily visible. Keep all decals in good, legible condition. Immediately replace damaged and/or missing decals.

Orthman Right Side Decals

NOTE: The 36 in row spacing planter is shown. The 38 in row spacing planter and 40 in row spacing planter are similar.

NOTE: Replacement decals are available from your Orthman dealer. When replacing decals, thoroughly clean the area where the decal is to be placed and attach the decal void of bubbles.

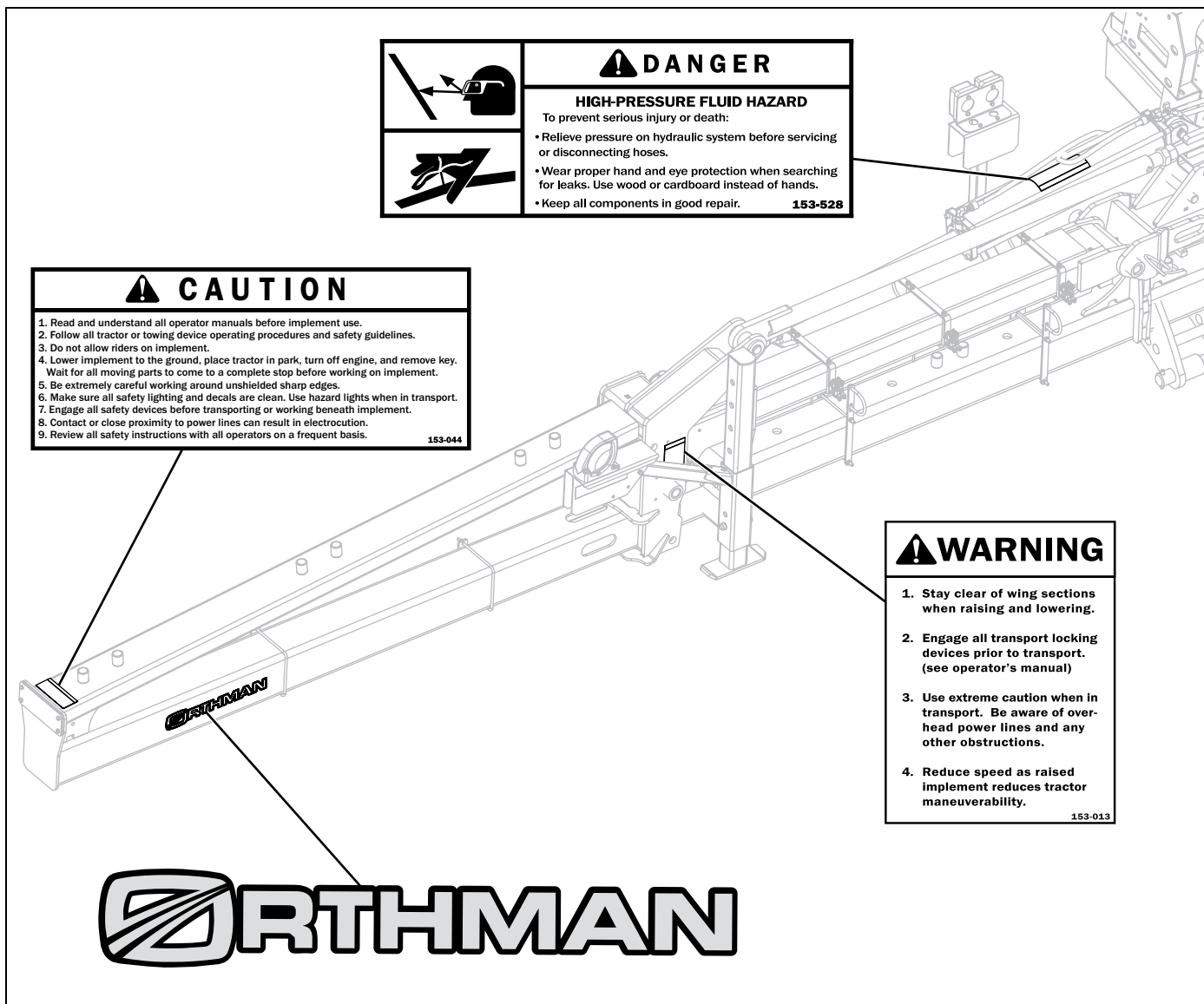


Figure 2-4

ORM000119

Orthman Left Side Decals

NOTE: The 36 in row spacing planter is shown. The 38 in row spacing planter and 40 in row spacing planter are similar.

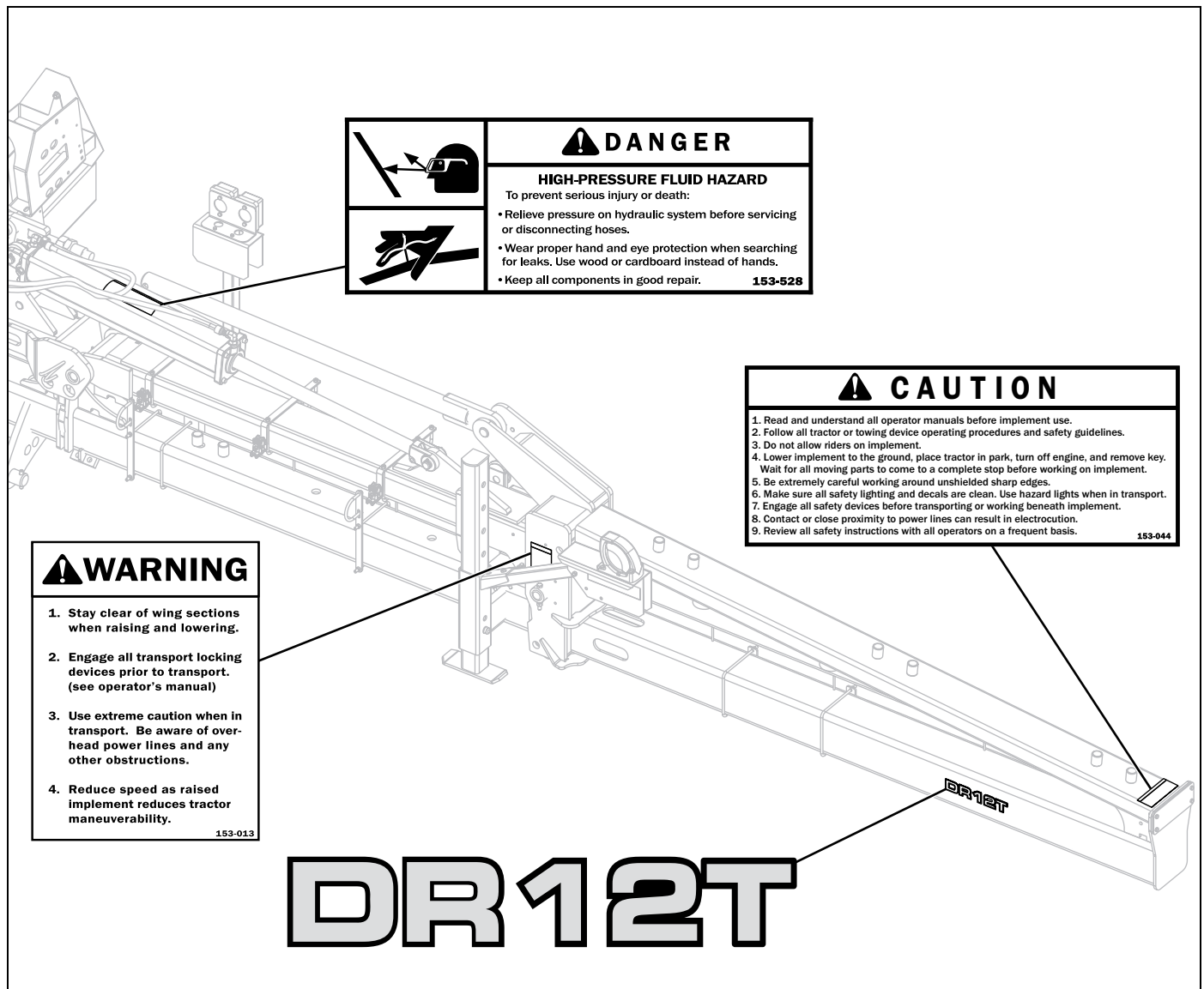


Figure 2-5

ORM000118

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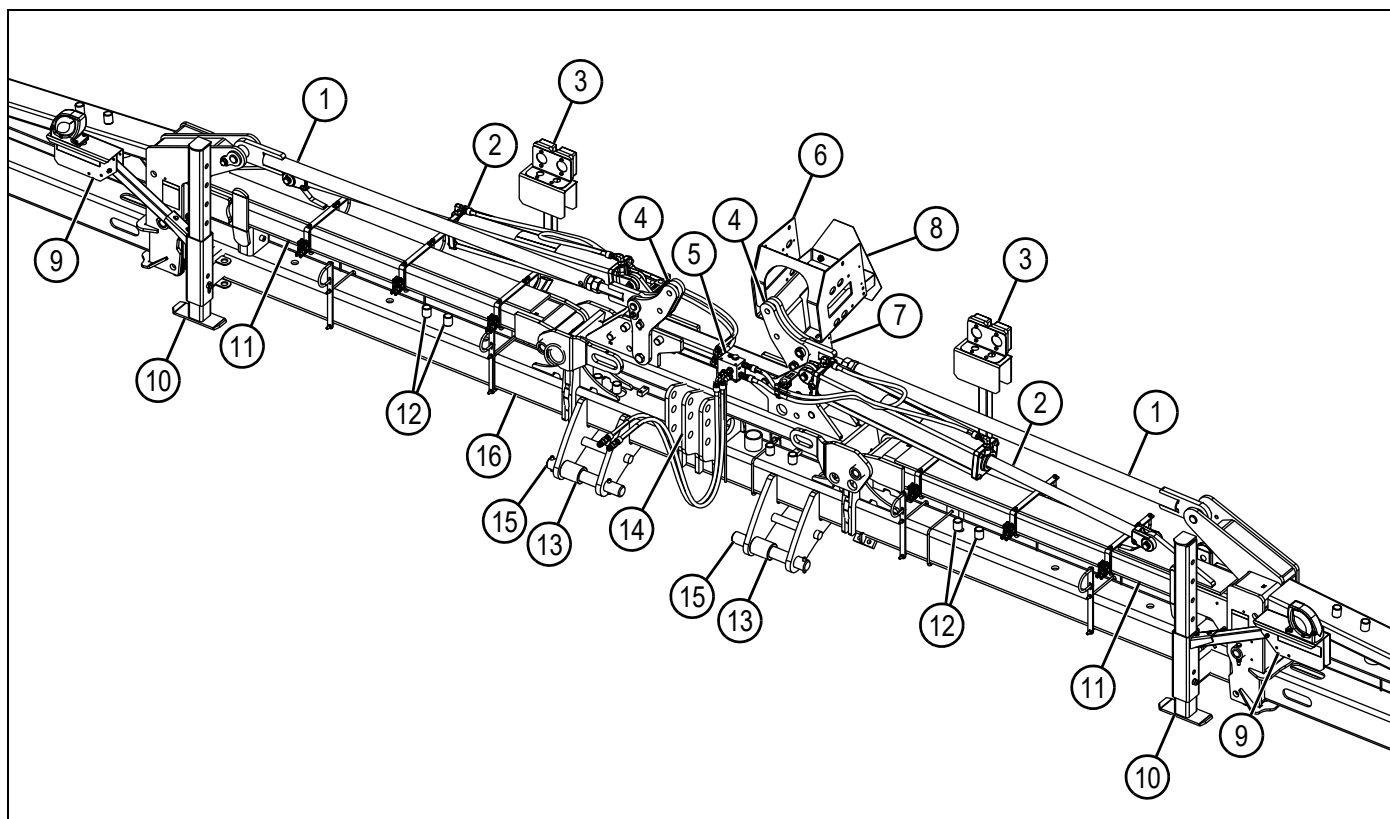
Chapter 3

Major Components

Center	3-2
Wing	3-3

Center

NOTE: The 36 in row spacing planter is shown. The 38 in row spacing planter and 40 in row spacing planter are similar.



ORM000120

Figure 3-1

- | | | |
|--|--------------------------------------|--|
| 1) Wing strut (2 used) | 6) Compressor mount | 12) Row unit vacuum port (8 used) |
| 2) Wing fold hydraulic cylinder (2 used) | 7) Center arm | 13) Dual mount hitch tug spacer (2 used) |
| 3) Red/amber light assembly (2 used) | 8) Slow moving vehicle (SMV) placard | 14) Dual mount hitch top link |
| 4) Float link (2 used) | 9) Amber light assembly (2 used) | 15) Hitch tug pin (2 used) |
| 5) Fold control manifold | 10) Bar stand (2 used) | 16) Center section |
| | 11) Swing truss (2 used) | |

Wing

NOTE: The 36 in row spacing planter left wing is shown.
The 36 in row spacing planter right wing, 38 in row spacing planter wings, and 40 in row spacing planter wings are similar.

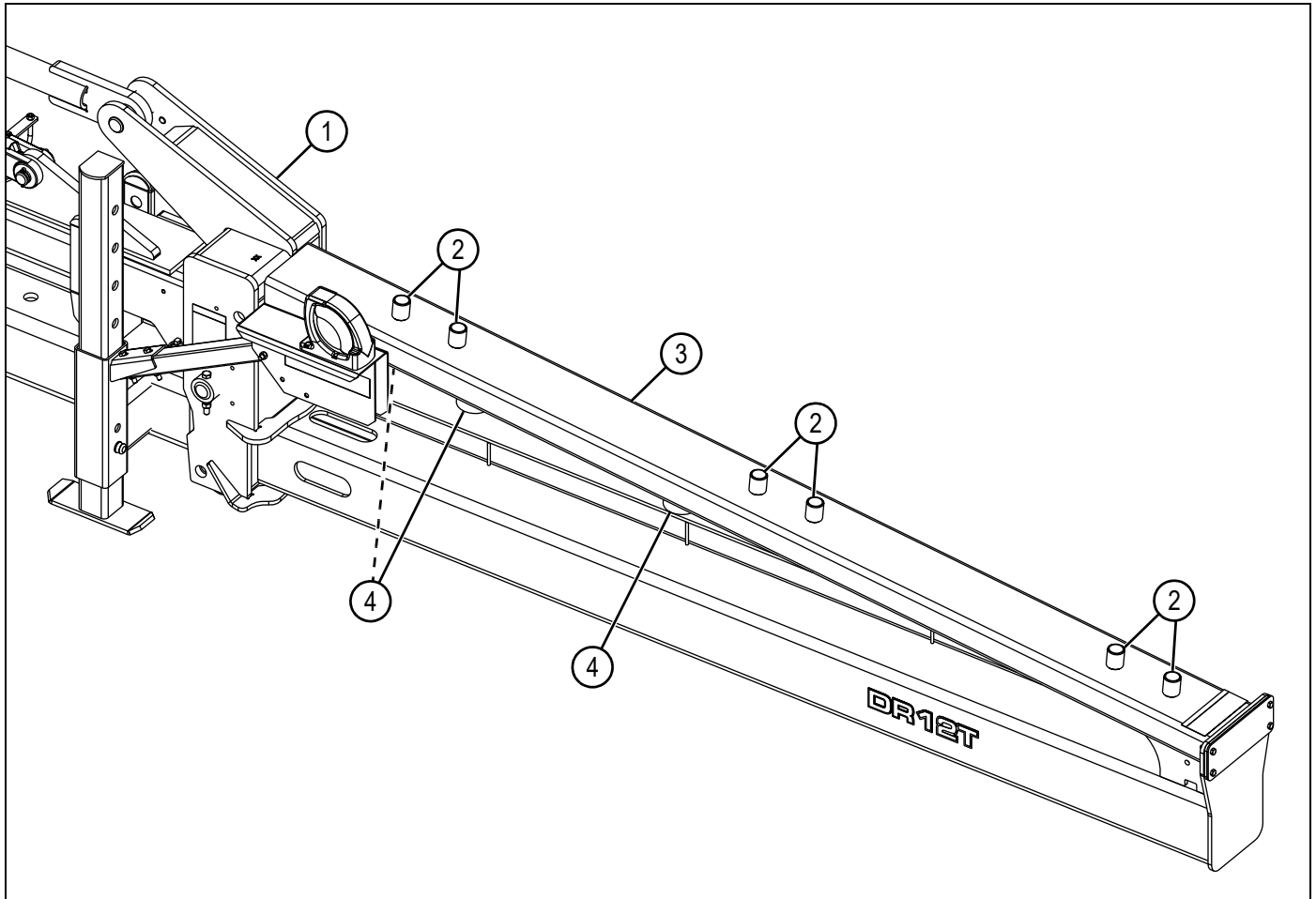


Figure 3-2

ORM000121

- 1) Wing head 2) Row unit vacuum port (6 used) 3) Wing 4) Vacuum from blower port (3 used)

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Chapter 4

Preparation and Setup

Prevent Hydraulic System Contamination	4-2
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CAUTION

Do not attempt to fold the toolbar until you have read **Chapter 4, "Preparation and Setup"**. Failure to follow this information may result in minor or moderate injury or cause implement damage.

Prevent Hydraulic System Contamination

Cleanliness is very important when working on hydraulic system. Prevent hydraulic system contamination by assembling cylinders, hoses, couplers, and valves in a clean area of shop.

Leave protective caps (1) on fluid openings until ready to make connection. When charging system, use a tractor or other source that contains clean oil that is free of abrasive materials. Keep couplers clean. Abrasive particles, like sand or metal fragments, can damage seals, barrels, and pistons causing internal leakage.

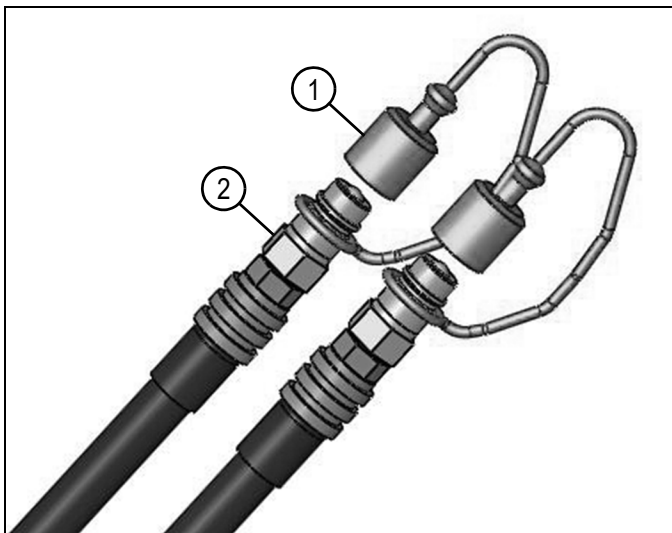


Figure 4-1

ORM000122

1) Cap

2) Hydraulic hose

In order to help keep couplers clean, always place in storage position when not attached to tractor.

DANGER

Avoid high-pressure fluid hazards. Failure to follow this information will result in death or serious injury. Relieve hydraulic pressure before servicing or disconnecting hoses.

When disconnecting hydraulic system for service, protect hose ends, tubing, and components from contamination with clean caps and plugs.

Before installing cylinders, flush inside of cylinders with clean diesel fuel or petroleum solvent for 10 seconds minimum. Do not use water, water soluble cleaners, or compressed air.

Importance of Lubrication

The purpose of lubrication on machines with moving parts is to prevent metal-on-metal contact. Metal-on-metal contact creates premature wearing of the connective components. Premature wearing of connective components can lead to non-warrantable, catastrophic failure of a machine.

During the off-season, moisture and dust can contaminate grease in moving points of a machine that are not sealed, such as pins. This can also lead to seized pins. For this reason, machine lubrication points should always be re-lubricated with grease before first time use.

Always use clean, high-quality grease for lubricating machine. The grease should be selected on the basis of the environment the machine will operate in, such as temperature, humidity, etc.

Chains also need adequate lubrication. Lubrication allows a chain to move smoothly with reduced friction and prevents premature stretching of the chain.

For grease point locations, see "Lubrication" on page 7-4.

Preparing the Toolbar

1. Read and understand the operator's manual for all tooling options used in conjunction with the DR12x2 Row Hopper Planter.
2. Make sure that all decals are in good, clean, and legible condition. Make sure each decal is correctly placed according to the safety section of this operator's manual. See "Safety Decals" on page 2-10 for more information.
3. Make sure that the hydraulic system of the tractor is in working order. Orthman DR12x2 Row Hopper Planter hydraulic systems are designed for a 3000 psi (207 bar) system.
4. Make sure that the hydraulic tips and outlets are free of foreign material. Foreign material can ruin hydraulic components, which results in adverse toolbar operation. See "Prevent Hydraulic System Contamination" on page 4-2.
5. Be sure toolbar float link and lock pins are in the proper position. Pin position for toolbar transport differs from recommended pin position for field use. See "Toolbar Float" on page 5-2.

DANGER

Avoid rollover. Failure to follow this information will result in death or serious injury. Stacking one wing at a time causes the center of gravity to shift. This results in rocking and unbalanced equipment. Use extreme caution when you move unbalanced equipment, as the tractor and implement are more likely to tip.

6. Before folding the toolbar, review "Wing Fold" on page 4-7.
7. Be sure to lubricate all grease points on machine. See "Lubrication" on page 7-4.

DANGER

Avoid high-pressure fluid hazards. Failure to follow this information will result in death or serious injury. Relieve hydraulic pressure before servicing or disconnecting hoses.

8. Relieve hydraulic system pressure before connecting or disconnecting the tractor. Attach hydraulic hoses to the tractor according to the operator preferences.
9. Before each use, check all hardware for wear and the proper torque. Replace missing hardware with hardware of an identical grade in order to restore the implement to original specifications.

Implement-to-Tractor Connection

The DR12x2 Row Hopper Planter features a dual-mount hitch to dictate whether using twin row or single row operation. As part of the unique dual-mount hitch, the hitch top link has two mounting locations for the tractor 3-point hitch. For more information, see “Hitch Pin Position” on page 4-11.

See the tractor operator’s manual for more information on properly connecting the implement.

The tractor’s hydraulic system must be able to support 3000 psi (207 bar) of working pressure, and have a minimum 2250 psi (155 bar). The hydraulic system capacity should be 2 gal (7.5 L) minimum.

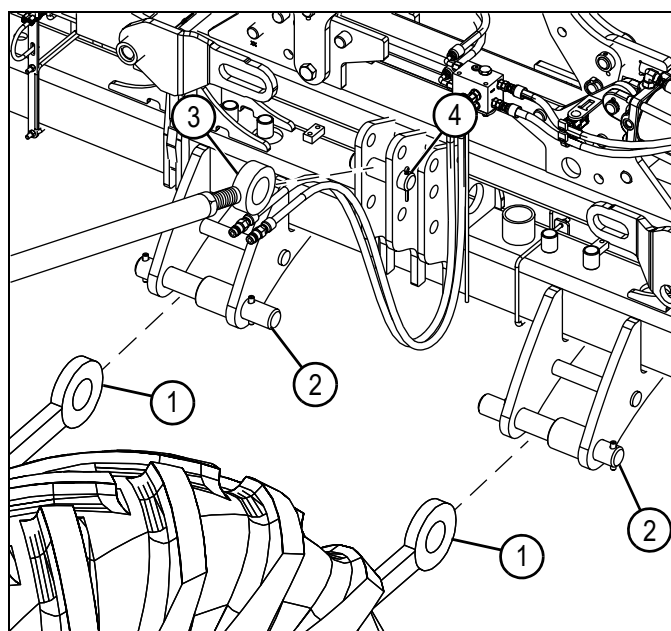
⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Make sure all personnel are clear of the implement before lowering.

⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Do not stand between the tractor and implement when connecting or disconnecting the implement.

1. Back up tractor to the implement hitch. Place the tractor in park, turn off the engine, and remove the key before connecting the implement. Injury or death can result from being trapped between the tractor and implement.
2. Set tractor’s three-point hitch lift links. Hitch lift links should be adjusted to the operating depth dimensions indicated in the tractor operator’s manual.
3. Set tractor’s three-point hitch lateral float pins. Lateral float pins should be placed in the lower holes to allow machine to “float” and follow the ground surface.
4. Set tractor’s three-point hitch sway blocks. Sway blocks and bumpers should be installed if no implement guidance is being utilized with machine.
5. Connect the tractor’s lower three-point hitch points (1) to the lower hitch tug pins (2) on the implement.
6. Adjust the tractor’s upper three-point hitch point (3) as necessary to connect the hitch point to the upper hitch pin (4) on the implement.



ORM000126

Figure 4-2: Single Row Planting Hitch Pin Position

- | | |
|---|----------------------------------|
| 1) Lower three-point hitch point (2 used) | 3) Upper three-point hitch point |
| 2) Hitch tug pin (2 used) | 4) Hitch Pin |

NOTE: Single row planting hitch position is shown. For twin row planting hitch position, see “Hitch Pin Position” on page 4-11.

⚠ DANGER

Avoid high-pressure fluid hazards. Failure to follow this information will result in death or serious injury. Relieve hydraulic pressure before servicing or disconnecting hoses.

7. Relieve hydraulic system pressure before connecting the tractor. Attach hydraulic hoses to the tractor according to the operator preferences.
8. Attach toolbar controller electrical connections and toolbar safety lights to the tractor.
9. Make sure all electrical and hydraulic lines are plumbed over the hitch to the tractor to avoid wear or damage.
10. Raise bar stands to highest point and install stay pins.

Quick-Hitch Tractor Connection

See the tractor operator's manual for more information on properly connecting the implement.

⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Make sure all personnel are clear of the implement before lowering.

⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Do not stand between the tractor and implement when connecting or disconnecting the implement.

1. Back up tractor to the implement hitch. Place the tractor in park, turn off the engine, and remove the key before connecting the implement. Injury or death can result from being trapped between the tractor and implement.
2. Install category 3 center link hook (1) on the quick-hitch (2).
3. Raise latch handles (3).
4. Lower the rockshaft until the center link hook and quick-hitch hooks (4) are lower than the implement hitch pins.

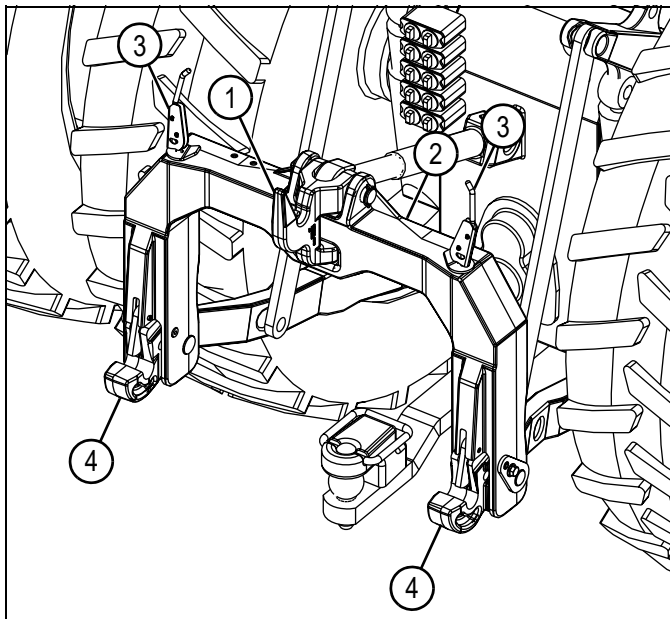


Figure 4-3

ORM000089

- | | |
|---------------------|--------------------------|
| 1) Center link hook | 3) Latch handle (2 used) |
| 2) Quick-hitch | 4) Hook (2 used) |
5. Check the drawbar clearance. Turn the drawbar offset to the shortest possible position to avoid contact with the coupler and implement.

⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Do not stand between the tractor and implement when connecting or disconnecting the implement.

6. Slowly back the tractor towards the toolbar until the quick-hitch hooks are aligned with the implement hitch pins. Place the tractor in park, turn off the engine, and remove the key before connecting the implement. Injury or death can result from being trapped between the tractor and implement.
7. Raise the rockshaft until the center link hook (1) and quick-hitch hooks (4) engage with the implement hitch pins (5).
8. Push latch handles (3) down to lock the quick-hitch (2) to the implement.

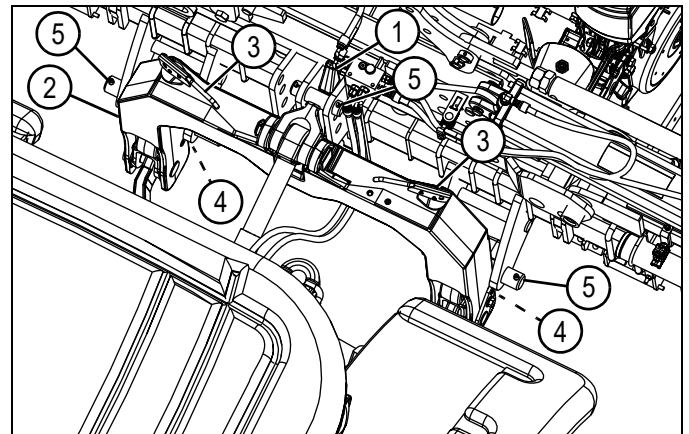


Figure 4-4

ORM000127

- | | |
|--------------------------|-----------------------|
| 1) Center link hook | 4) Hook (2 used) |
| 2) Quick-hitch | 5) Hitch pin (3 used) |
| 3) Latch handle (2 used) | |

⚠ DANGER

Avoid high-pressure fluid hazards. Failure to follow this information will result in death or serious injury. Relieve hydraulic pressure before servicing or disconnecting hoses.

9. Relieve hydraulic system pressure before connecting the tractor. Attach hydraulic hoses to the tractor according to the tractor operator's manual.
10. Attach toolbar controller electrical connections and toolbar safety lights to the tractor.
11. Make sure all electrical and hydraulic lines are plumbed over the hitch to the tractor to avoid wear or damage.
12. Raise the bar stands to highest point and install stay pins.

Disconnecting Implement From Tractor

See the tractor operator's manual for more information on properly disconnecting the implement.

1. Park implement on a clean, level surface; strong enough to support the weight of the machine.
2. Unfold the toolbar. See "Wing Fold" on page 4-7.
3. Install the float link lock pins (1) into the rigid positions (2) to lock the wings in place. Adjust the hydraulic cylinders to align pin holes in the wing fold link plates.

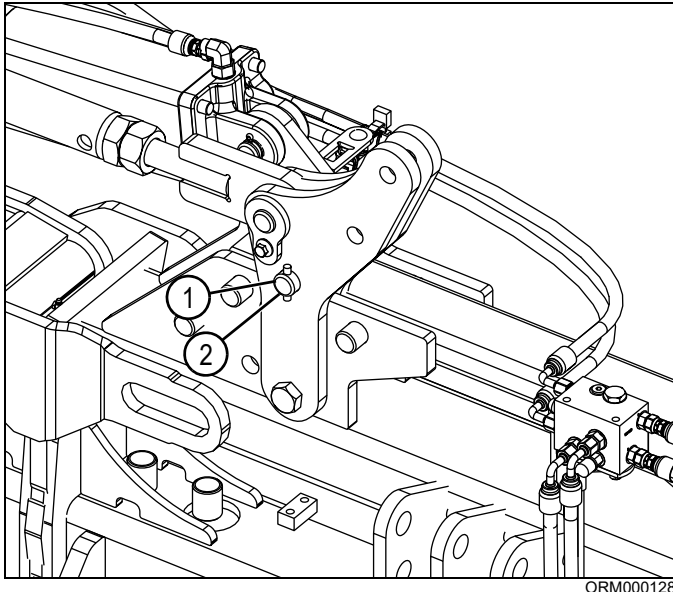


Figure 4-5: Right Wing

- 1) Float link lock pin (2 used)
- 2) Rigid position (2 used)

⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Use bar stands and cylinder stops to support the implement.

4. Lower the bar stands (3) and install stay pins (4).

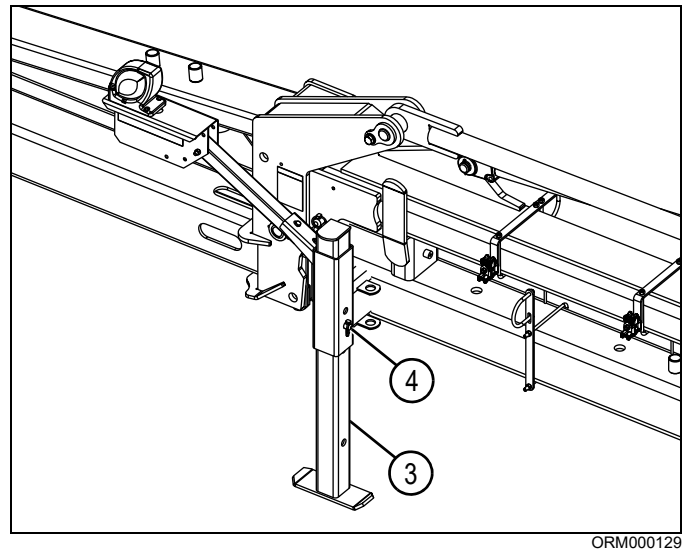


Figure 4-6: Right Wing

- 3) Bar stand (2 used)
- 4) Stay pin (2 used)

⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Make sure all personnel are clear of the implement before lowering.

5. Lower the implement onto the bar stands by placing the tractor three-point hitch into the "float" position.

⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Do not stand between the tractor and implement when connecting or disconnecting the implement.

6. Place the tractor in park, turn off the engine, and remove the key before disconnecting the implement.

⚠ DANGER

Avoid high-pressure fluid hazards. Failure to follow this information will result in death or serious injury. Relieve hydraulic pressure before servicing or disconnecting hoses.

7. Relieve hydraulic system pressure before disconnecting the tractor. Disconnect hydraulic hoses from tractor selective control valve (SCV).
8. Disconnect all machine electrical connections from tractor.
9. Disconnect tractor three-point hitch points from the implement hitch pin and tug pins. If tractor quick-hitch is used, lower the quick-hitch until the hooks are below the implement hitch pin and tug pins and the machine is safely on the ground.

Wing Fold

⚠️ WARNING

Avoid being struck by the implement. Failure to follow this information could result in death or serious injury. Make sure all personnel are clear of the implement at all times when the implement is in motion.

During the fold process, the wing fold cylinders (1) retract simultaneously to pull the swing trusses (2) upward. As the swing trusses raise, the wings (3) pivot at the wing head pivot points (4) to keep the wings level as they stack on the toolbar.

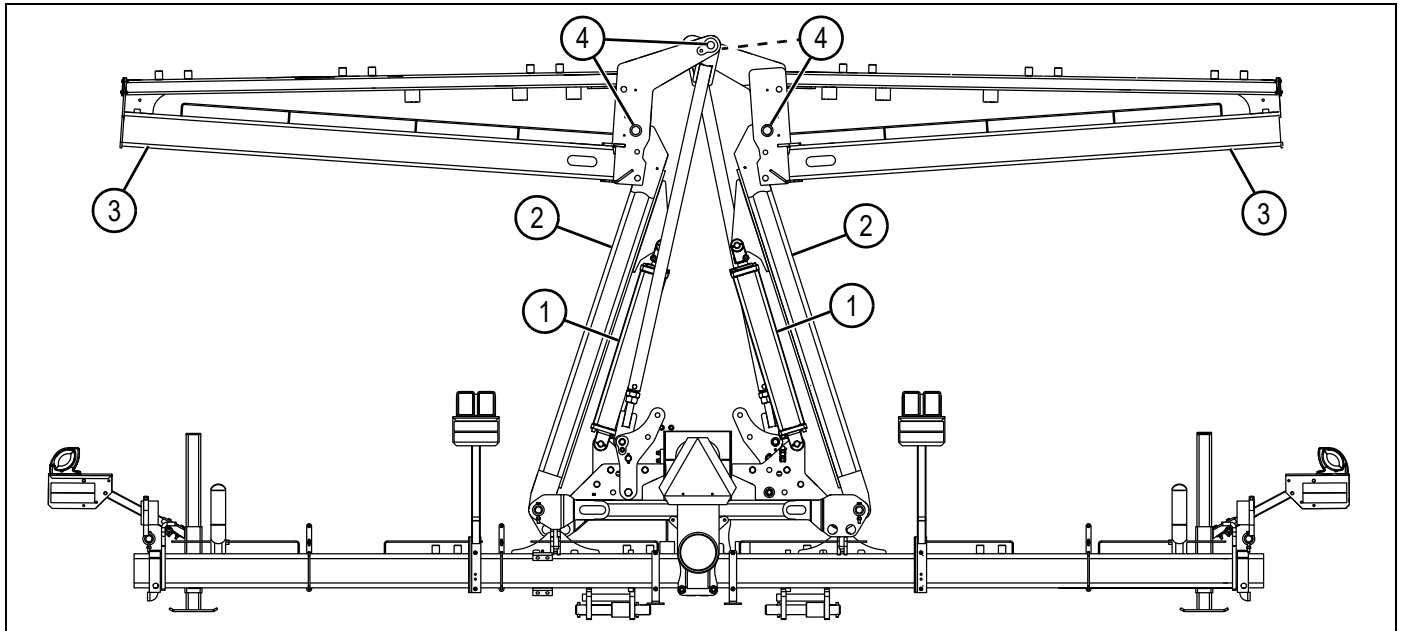


Figure 4-7

ORM000141

- 1) Wing fold cylinder (2 used) 2) Swing truss (2 used) 3) Wing (2 used) 4) Pivot point (4 used)

⚠️ CAUTION

Avoid implement damage. Remove the wing fold lock pin and the swing truss lock pin from the rigid position before folding the wings.

Before folding wings, be sure to remove the wing lock pins (5) and the swing truss lock pins (6) from the rigid positions (7) and place them in the storage positions (8).

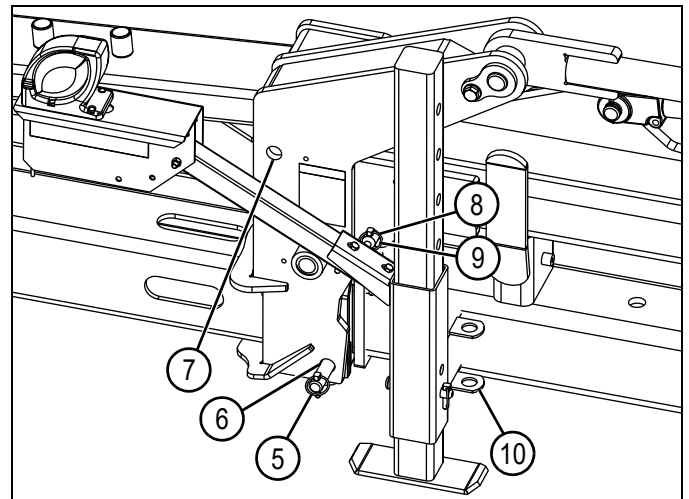


Figure 4-8: Right Wing

ORM000142

- 5) Wing lock pin (2 used) 8) Swing truss lock pin (2 used)
 6) Wing lock pin rigid position (2 used) 9) Swing truss rigid position (2 used)
 7) Wing lock pin storage position (2 used) 10) Swing truss storage position (2 used)

Leveling the Wings

When row units are added to the mid and outer wings, the additional weight may cause the wings to no longer be level with the center section. Check the levelness of the wings over the life of the toolbar to ensure proper performance.

Before adjusting the wings, inspect implement for damaged or broken parts. Remove any buildup of grease, oil, or debris.

NOTE: Left side wing leveling procedure is shown. Right side wing leveling procedure is similar.

Tools
• 3-1/8 in Wrench
• 9/16 in Wrench (2 used)
• 3/4 in Wrench
• Level or angle finder

1. Install the float link lock pin (1) into the float link rigid position to lock the wing in the rigid position. The wing fold hydraulic cylinder (2) must be partially extended to align pin holes in the wing float link plates (3).

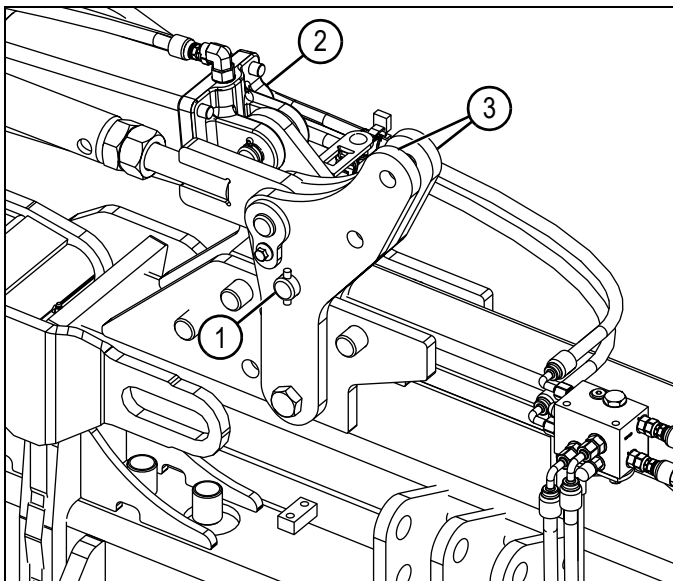


Figure 4-9

ORM000128

- | | |
|---------------------------------|--------------------------|
| 1) Float link lock pin | 3) Wing float link plate |
| 2) Wing fold hydraulic cylinder | (2 used) |

2. Park the toolbar on a level surface in the raised position and check the levelness of the rear toolbar center section. This will be the reference point for leveling the wing.

NOTE: For the greatest accuracy, the wing row units should have all attachments and be fully loaded during leveling.

3. Place the level or angle-finder (4) on the top of the wing (5) and note its levelness. Compare that levelness to the reference taken from the center section (6). The wing must be from 0° to +2° of level with the center section for proper toolbar function. If the wing angle is lower than or more than 2° of the center section, adjust it using the following steps 4–11.

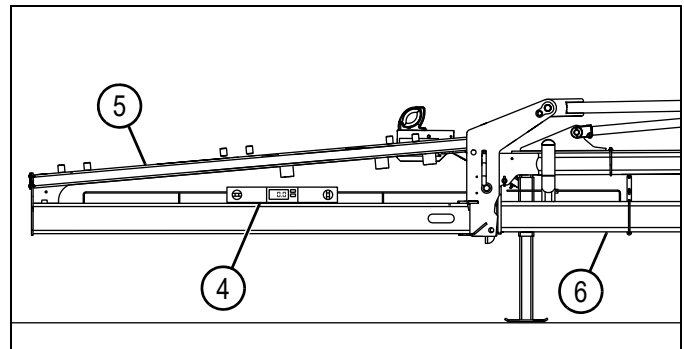


Figure 4-10

ORM000137

- | | |
|-----------------|-------------------|
| 4) Angle-finder | 6) Center section |
| 5) Wing | |

⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Use appropriate stands to support the implement.

4. Support the wing (5) with a minimum 5-ton stand (7) and lower machine.

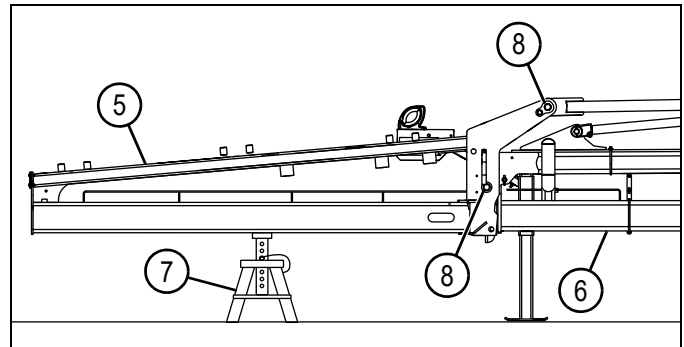


Figure 4-11

ORM000138

- | | |
|-------------------|-------------------------|
| 5) Wing | 7) Stand |
| 6) Center section | 8) Pivot point (2 used) |

5. Loosen jam nut (9) and nut (10).
6. Remove strut pin (11) and centering pin (12), and disconnect the strut (15) from the float links (13).

NOTE: The wing fold cylinder (14) can be manipulated to reduce the tension on the pins and make it easier during removal.

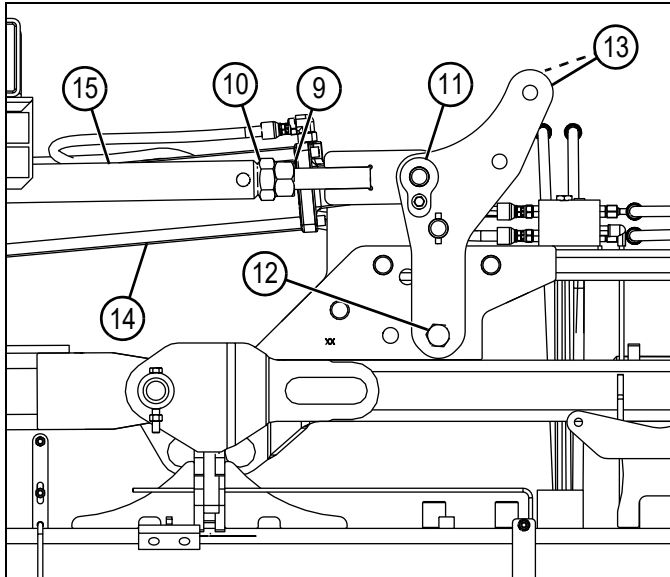


Figure 4-12

- | | |
|-------------------|-------------------------|
| 9) Jam nut | 13) Float link (2 used) |
| 10) Nut | 14) Wing fold cylinder |
| 11) Strut pin | 15) Strut |
| 12) Centering pin | |

7. With the strut (15) disconnected from the float links, screw the threaded end (16) clockwise to raise the wing or counterclockwise to lower the wing. Each full turn of the strut end results in approximately a 0.5° change to the wing. Use the previously noted levelness measurements to make the adjustments.

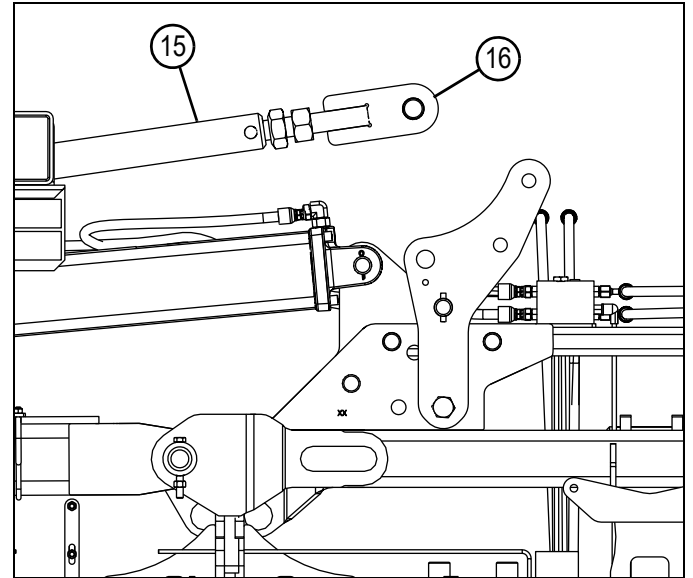


Figure 4-13

- | | |
|-----------|------------------|
| 15) Strut | 16) Threaded end |
|-----------|------------------|

8. Install strut pin and centering pin, and connect the strut to the float links.

NOTE: The wing fold cylinder can be manipulated to reduce the tension on the pins and make it easier during installation.

9. Raise the machine and check the levelness of the wing compared to the center section.
10. If the wing angle is still lower than or more than 2° of the center section, repeat leveling procedure.
11. If the wing is within the levelness range, tighten the nut and jam nut.

Fold Control Manifold

The DR12x2 Row Hopper Planter is equipped with a manifold for controlling the toolbar fold from one selective control valve (SCV). The fold control manifold (1) directs hydraulic fluid to each wing folding cylinder evenly. A flow divider (2) keeps the wings balanced when folding.

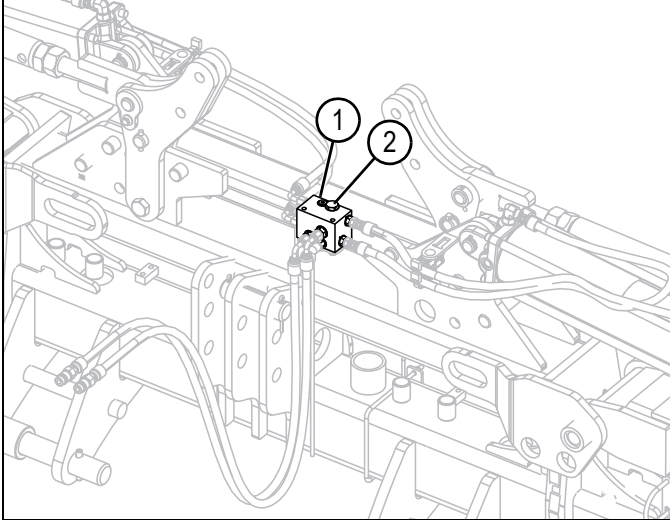


Figure 4-14

ORM000133

- 1) Fold control manifold 2) Flow divider

Manifold Connections

Front Side of Manifold

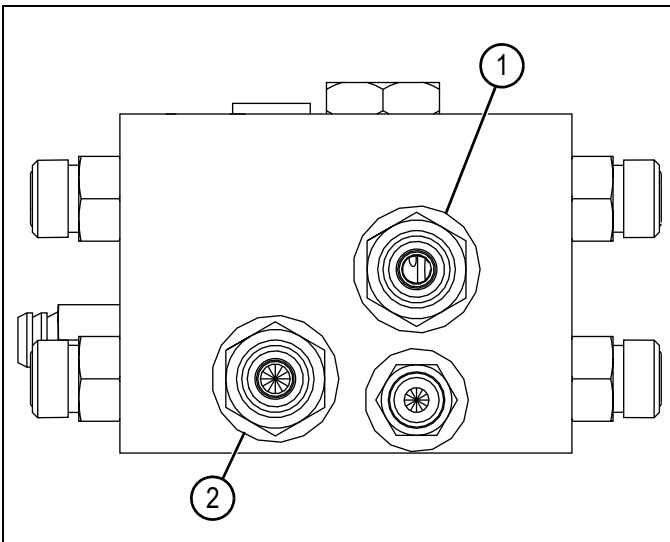


Figure 4-15

ORM000134

- 1) Fold supply/unfold return hose from tractor
2) Unfold supply/fold return hose from tractor

Left Side of Manifold

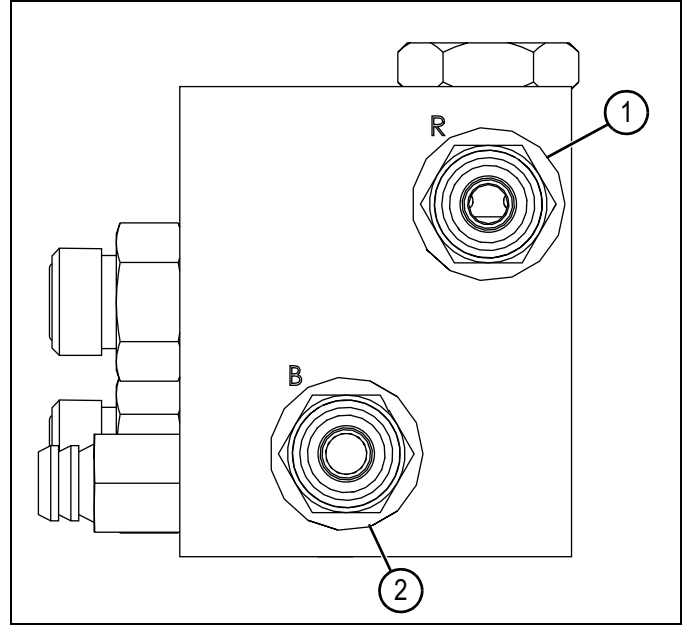


Figure 4-16

ORM000135

- 1) Left wing fold cylinder fold pressure/unfold return hose (R)
2) Left wing fold cylinder unfold pressure/fold return hose (B)

Right Side of Manifold

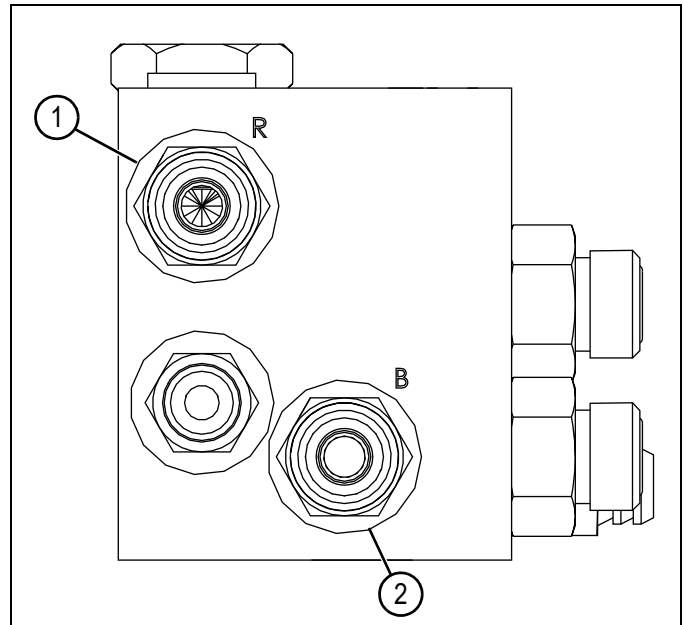


Figure 4-17

ORM000136

- 1) Right wing fold cylinder fold pressure/unfold return hose (R)
2) Right wing fold cylinder unfold pressure/fold return hose (B)

Internal Toolbar Vacuum Circuitry

An internal toolbar vacuum circuit has been designed into the DR12x2 Row Hopper Planter. The vacuum air for the seed meters is routed from each row unit (1) to the internal space of the toolbar, which is then connected to a vacuum fan (3) via a flex hose connected to another internal toolbar vacuum inlet (4).

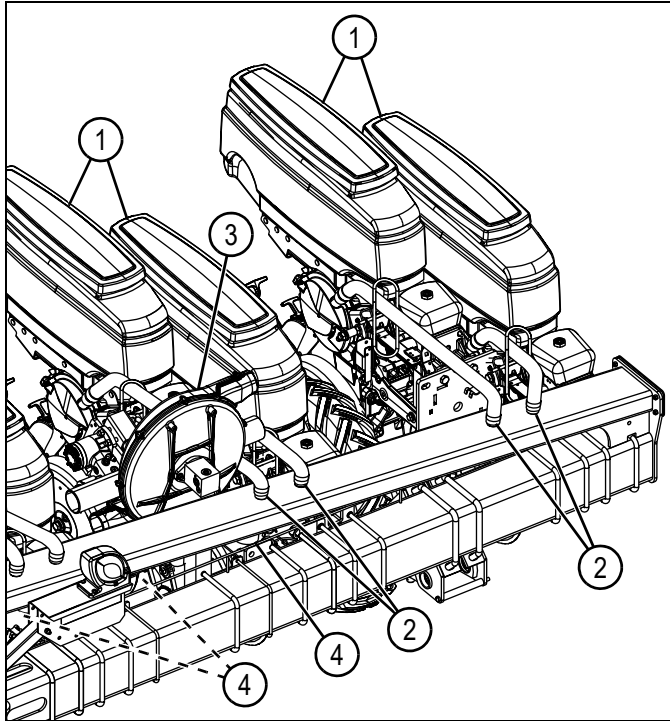


Figure 4-18

ORM000132

- | | |
|------------------------------------|---|
| 1) Row unit (24 used) | 3) Vacuum fan (3 used) |
| 2) Row unit vacuum inlet (24 used) | 4) Internal toolbar vacuum inlet (6 used) |

At the ends of each toolbar section (wings and center) on the bottom face, there are rubber plugs fitted on slots to seal the toolbar. The slots are machined out of the toolbar to serve as a means of access to the inner space of the toolbar if necessary.

Hitch Pin Position

The DR12x2 Row Hopper Planter can be configured for single row or twin row planter operation. See the tractor operator's manual for properly setting the row units for each operation. Attach the tractor to the appropriate hitch pin location for each setting. See "Implement-to-Tractor Connection" on page 4-4.

Single Row Planter

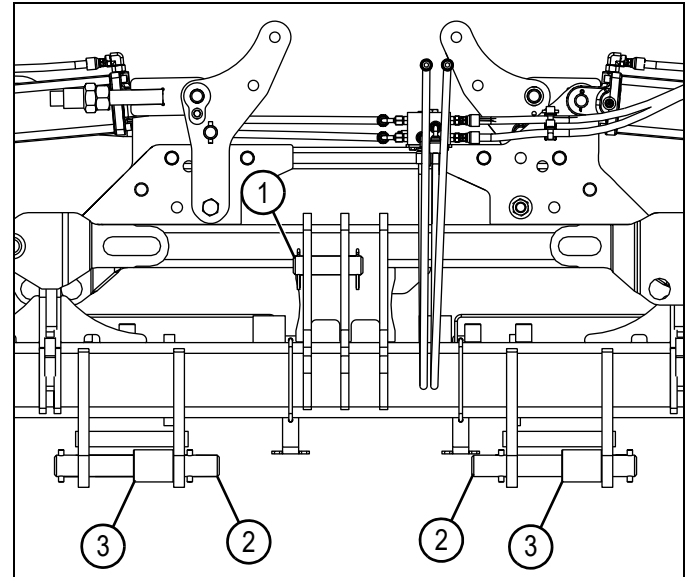


Figure 4-19

ORM000125

- | | |
|---------------------------|---|
| 1) Hitch pin | 3) Dual mount hitch tug spacer (2 used) |
| 2) Hitch tug pin (2 used) | |

Twin Row Planter

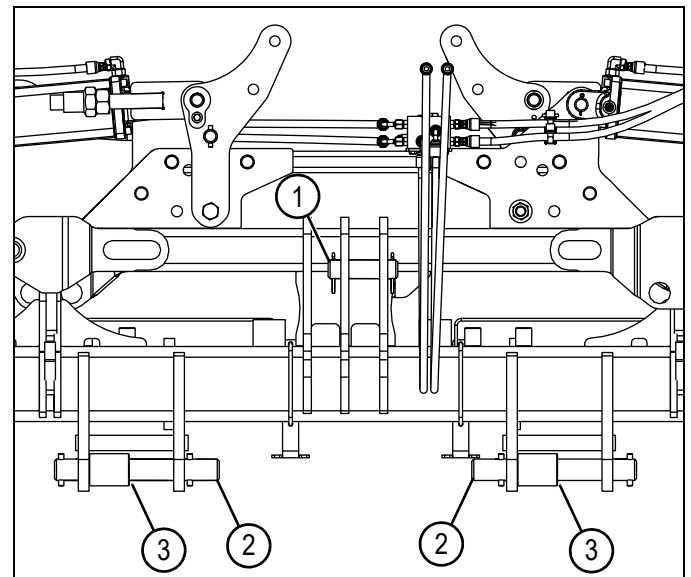


Figure 4-20

ORM000124

- | | |
|---------------------------|---|
| 1) Hitch pin | 3) Dual mount hitch tug spacer (2 used) |
| 2) Hitch tug pin (2 used) | |

Preparation for Planter Transport

1. See “Safe Transport” on page 2-5 for safe operation of tractor during transport.
2. Place the planter in the raised position with the wings folded. See “Wing Fold” on page 4-7.
3. Do not attempt to transport the machine fully loaded.

NOTE: Seed load must be at half capacity before machine is transported.

4. Enable tractor safety lights. See “Warning and Safety Lights” on page 2-6.
5. Do not exceed 20 mph (32 kph) when transporting the planter.

Preparation for Planter Operation

1. Inspect implement for worn or damaged parts. See “Implement Inspection” on page 7-7.
2. Be sure all mechanical, hydraulic, and electronic connections are in place and free of making contact with other moving parts.
3. Make sure cab hydraulic control configuration is easily accessible and set to the preference of the primary operator.
4. Make sure tractor is adequately ballasted for safe operation. See the tractor operator’s manual for more information on proper ballasting instructions.

⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Do not stand between the tractor and implement when connecting or disconnecting the implement.

5. Connect implement to tractor. See “Implement-to-Tractor Connection” on page 4-4.
6. Raise bar stands (1) to highest point and install stay pins (2).

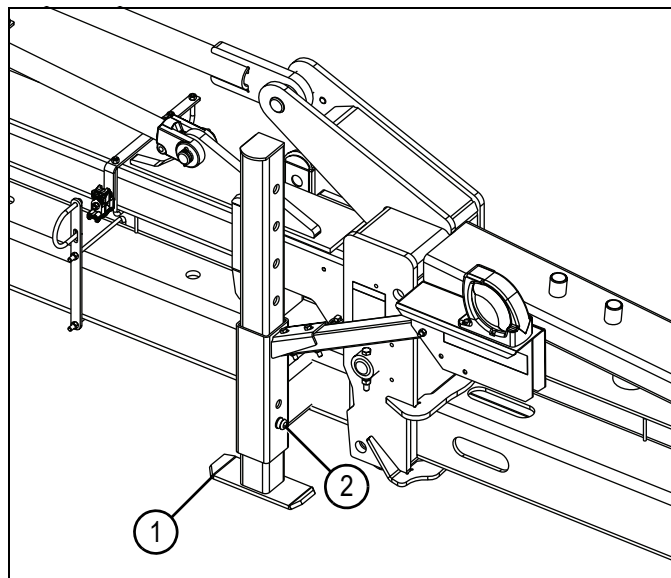


Figure 4-21

ORM000123

- 1) Bar stand (2 used) 2) Stay pin (2 used)
7. Review the toolbar settings and features in **Chapter 5, “Operation and Field Settings”**. Make any necessary adjustments.

Chapter 5

Operation and Field Settings

Toolbar Float	5-2
Float Linkage Component Identification	5-2
Toolbar Flex	5-3
Flex Settings	5-4
Up-Flex-Only Settings	5-5
Wing Fold Hydraulics	5-6
Toolbar Height and Orientation	5-7
Raised Position	5-7
Field Position	5-8

Toolbar Float

The DR12x2 Row Hopper Planter is designed to “float” over uneven field terrain. This is achieved through the toolbar’s ability to flex at each wing hinge. Flexing of the toolbar is limited to $\pm 8^\circ$ from horizontal by way of the wing float link plates (4) coming into contact with welded-on stops.

CAUTION

Avoid implement damage. Remove the float link lock pins from the rigid positions.

To allow the toolbar to “float”, remove the float link lock pins (5) from the rigid pin positions (6) and place the pin in the storage pin positions (11) before field operation.

Float Linkage Component Identification

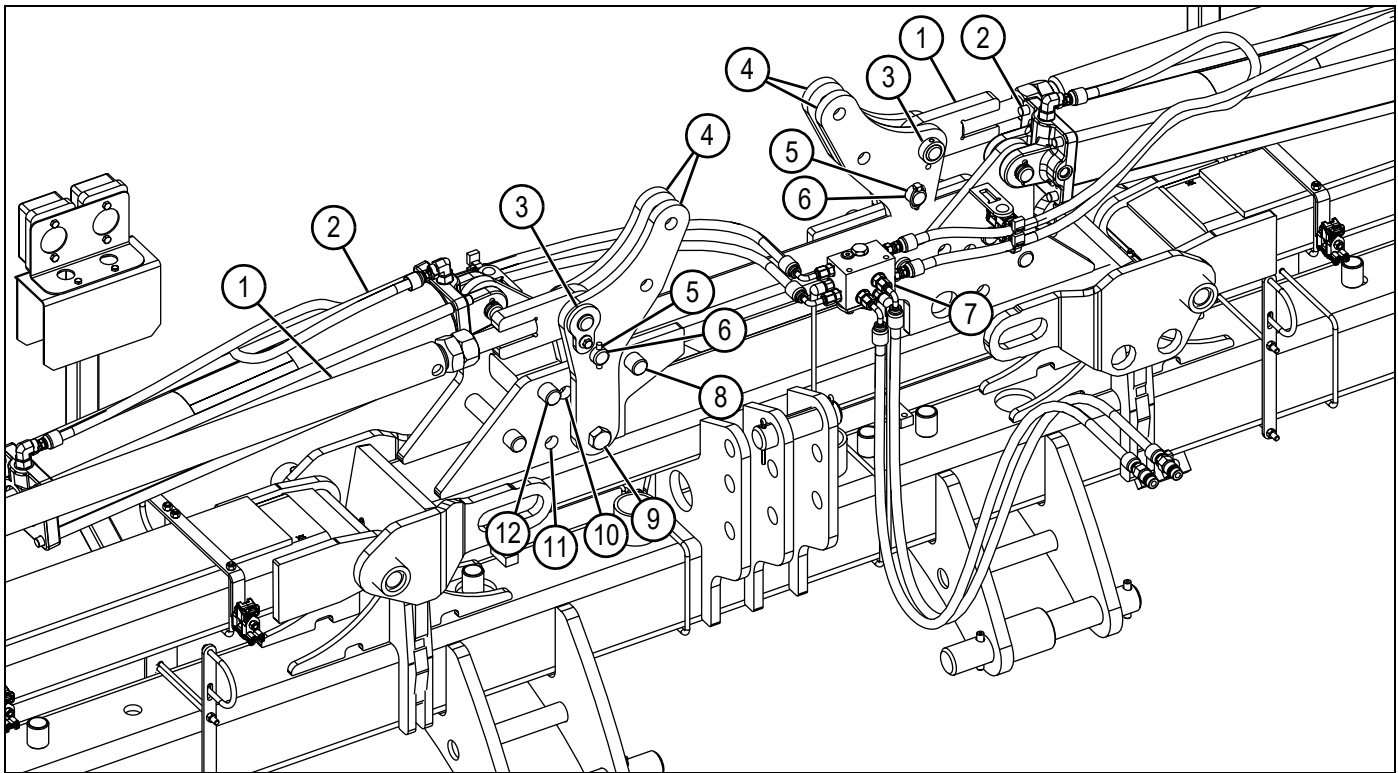


Figure 5-1

ORM000143

- | | | |
|-----------------------------------|---------------------------------|--|
| 1) Strut (2 used) | 5) Float link lock pin (2 used) | 9) Centering pin (2 used) |
| 2) Wing fold cylinder (2 used) | 6) Rigid pin position (2 used) | 10) Up-flex-only pin position (2 used) |
| 3) Pin (2 used) | 7) Fold control manifold | 11) Storage pin position (2 used) |
| 4) Wing float link plate (4 used) | 8) Wing up stop (2 used) | 12) Wing down stop (2 used) |

Toolbar Flex

⚠️ WARNING

Avoid being struck by the implement. Failure to follow this information could result in death or serious injury. Make sure all personnel are clear of the implement at all times when the implement is in motion.

When in the field position, the toolbar flexes in three sections with the wings (1) able to flex $\pm 8^\circ$ individually.

⚠️ CAUTION

Avoid implement damage. Remove the float link lock pins from the fixed position.

To allow for toolbar flex, remove the float link lock pins (3) from the rigid pin positions (4) and place in the storage pin positions (5).

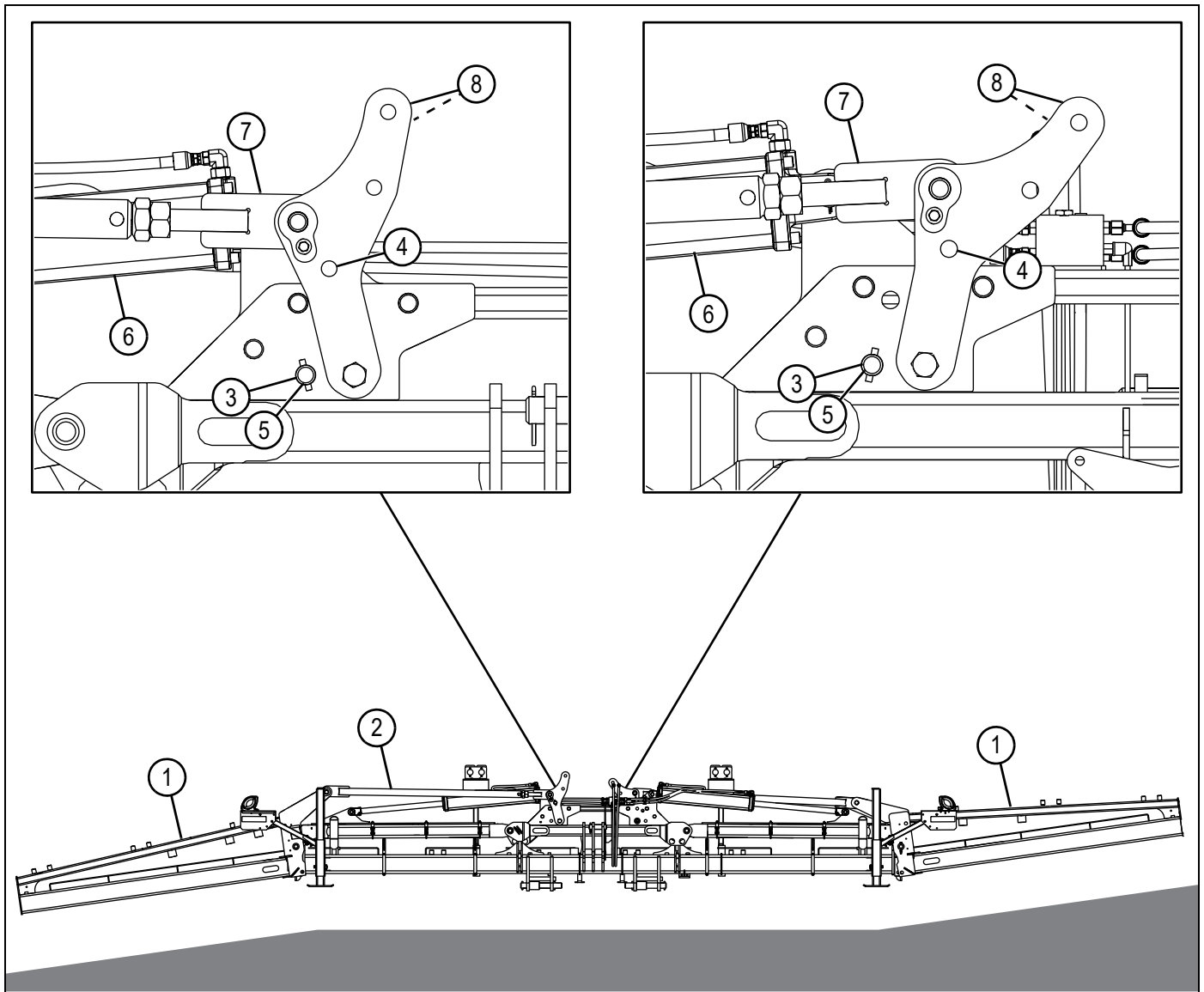


Figure 5-2

ORM000153

- | | | |
|---------------------------------|----------------------------------|-----------------------------------|
| 1) Wing (2 used) | 4) Rigid pin position (2 used) | 7) Strut (2 used) |
| 2) Center section | 5) Storage pin position (2 used) | 8) Wing float link plate (4 used) |
| 3) Float link lock pin (2 used) | 6) Wing fold cylinder (2 used) | |

Flex Settings

NOTES:

- Left side wing procedure is shown. Right side wing procedure is similar.
- When the toolbar is placed in the “flex” setting, this allows the toolbar wings to pivot freely about the wing hinge in order to “float” over uneven field terrain. Because of this, when the machine is raised at the end of the field, the toolbar wings will “droop” down approximately 8 degrees, reducing ground clearance for turning the machine around. The ground clearance should be adequate for turning the machine around at the end of the field in the “flex” setting; however, if this is not desired, you may place the toolbar in the “up-flex-only” setting to not allow the toolbar wings to flex down, only up. See “Up-Flex-Only Settings” on page 5-5.

1. Park implement on a clean, level surface; strong enough to support the weight of the machine.

⚠ DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Use appropriate stands to support the implement.

2. Support the wing (1) with a minimum 5-ton stand (3) and lower machine until tension is taken off the float link lock pins.

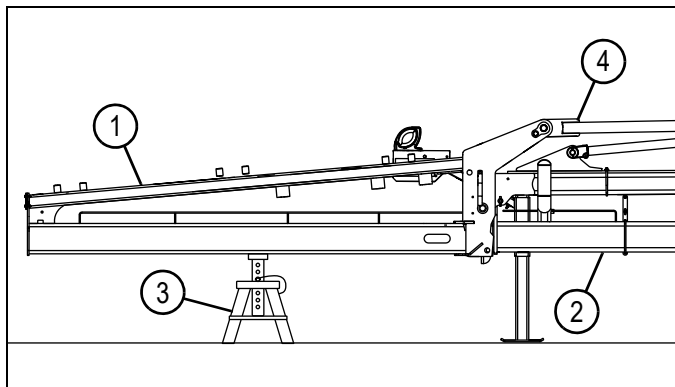


Figure 5-3

ORM000138

- | | |
|-------------------|----------|
| 1) Wing | 3) Stand |
| 2) Center section | 4) Strut |

⚠ CAUTION

Avoid pinch points. Failure to follow this information may result in minor or moderate injury. Potential pinch points are created when changing implement setting.

3. Remove lynch pin (6) and remove float link lock pin (7) from the rigid position (8).
4. Place the float link lock pin in the storage position (9) and install lynch pin.

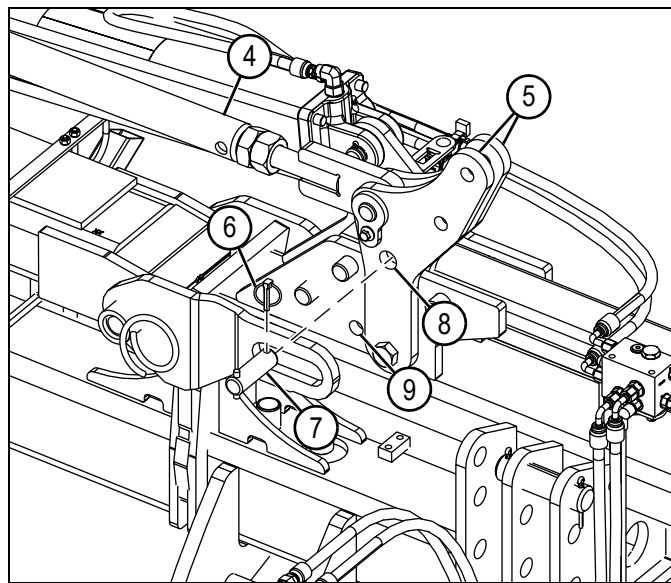


Figure 5-4

ORM000144

- | | |
|------------------------------|------------------------|
| 4) Strut | 7) Float link lock pin |
| 5) Float link plate (2 used) | 8) Rigid position |
| 6) Lynch pin | 9) Storage position |

Up-Flex-Only Settings

NOTES:

- Left side wing procedure is shown. Right side wing procedure is similar.
- When the toolbar is in the “up-flex-only” setting, the toolbar wings will not be allowed to “float” down. This will cause the toolbar to only “float” over uneven field terrain in certain situations, such as driving the tractor through a depression in the field, but not when driving the tractor over the crown of a hill.

1. Park implement on a clean, level surface; strong enough to support the weight of the machine.

DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Use appropriate stands to support the implement.

2. Support the wing (1) with a minimum 5-ton stand (3) and lower machine until tension is taken off the float link lock pins.

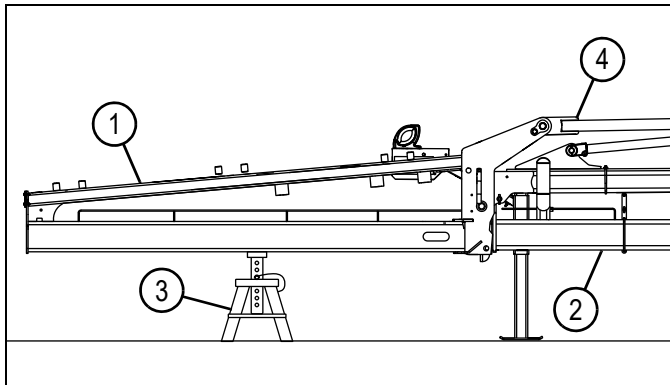


Figure 5-5

ORM000138

- | | |
|-------------------|----------|
| 1) Wing | 3) Stand |
| 2) Center section | 4) Strut |

CAUTION

Avoid pinch points. Failure to follow this information may result in minor or moderate injury. Potential pinch points are created when changing implement setting.

3. Remove lynch pin (6) and remove float link lock pin (7) from the rigid position (8).
4. Place the float link lock pin in the down flex stop position (9) and install lynch pin.

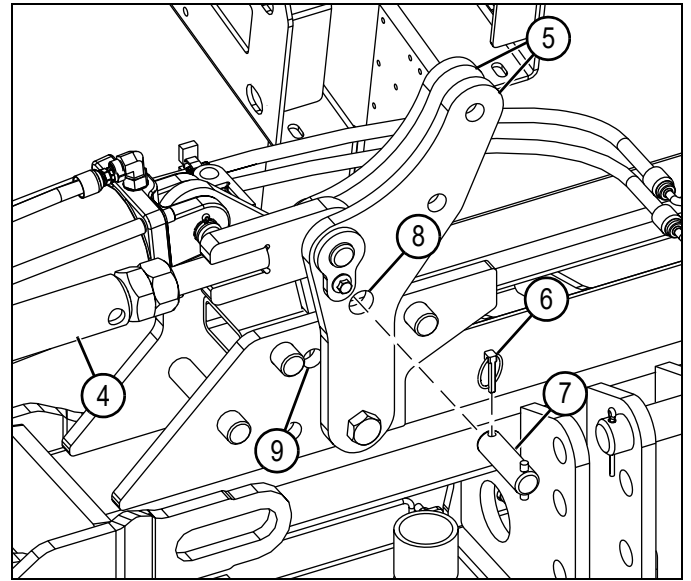


Figure 5-6

ORM000145

- | | |
|------------------------------|----------------------------|
| 4) Strut | 7) Float link lock pin |
| 5) Float link plate (2 used) | 8) Rigid position |
| 6) Lynch pin | 9) Down flex stop position |

Wing Fold Hydraulics

⚠ WARNING

Avoid being struck by the implement. Failure to follow this information could result in death or serious injury. Make sure all personnel are clear of the implement at all times when the implement is in motion.

The wing fold cylinders (1) are controlled by the fold control manifold (2). The fold control manifold is connected to the tractor's hydraulic system. For more information on the fold control manifold, see "Fold Control Manifold" on page 4-10.

The rod port (3) on the right wing fold cylinder connects to the right side of the manifold at the port labeled R. The base port (4) on the right wing fold cylinder connects to the right side of the manifold at the port labeled B.

The rod port (5) on the left wing fold cylinder connects to the left side of the manifold at the port labeled R. The base port (6) on the left wing fold cylinder connects to the left side of the manifold at the port labeled B.

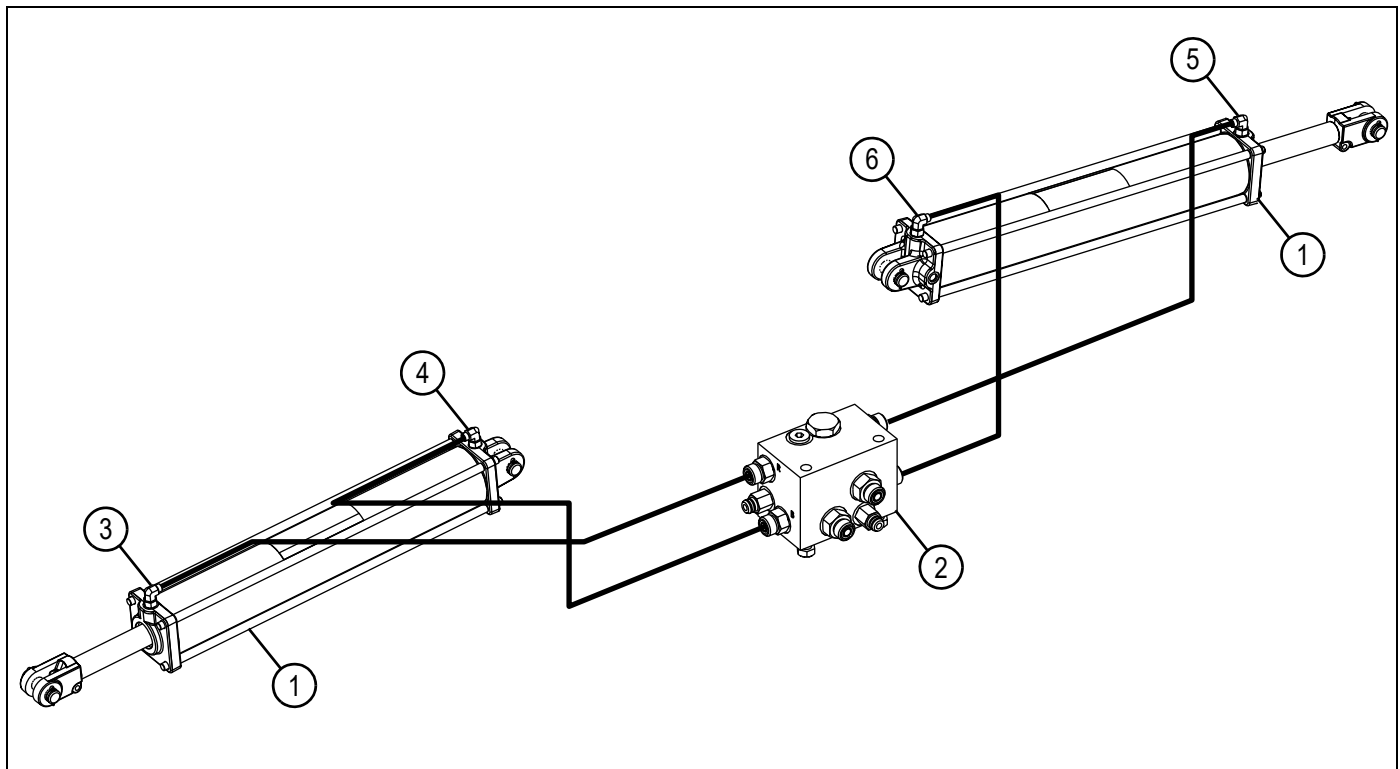


Figure 5-7

ORM000150

- 1) Wing fold cylinder (2 used)
- 2) Fold control manifold

- 3) Rod port
- 4) Base port

- 5) Rod port
- 6) Base port

Toolbar Height and Orientation

Raised Position

1. Connect the implement hitch (1) to the tractor. See “Implement-to-Tractor Connection” on page 4-4.
2. Raise the tractor three-point hitch to its highest point. The hitch should have an approximate height of 49 in (124 cm) (2) of clearance from the ground surface. The row units (4) should have a minimum height of 23 in (58 cm) (3) clearance from the ground surface.

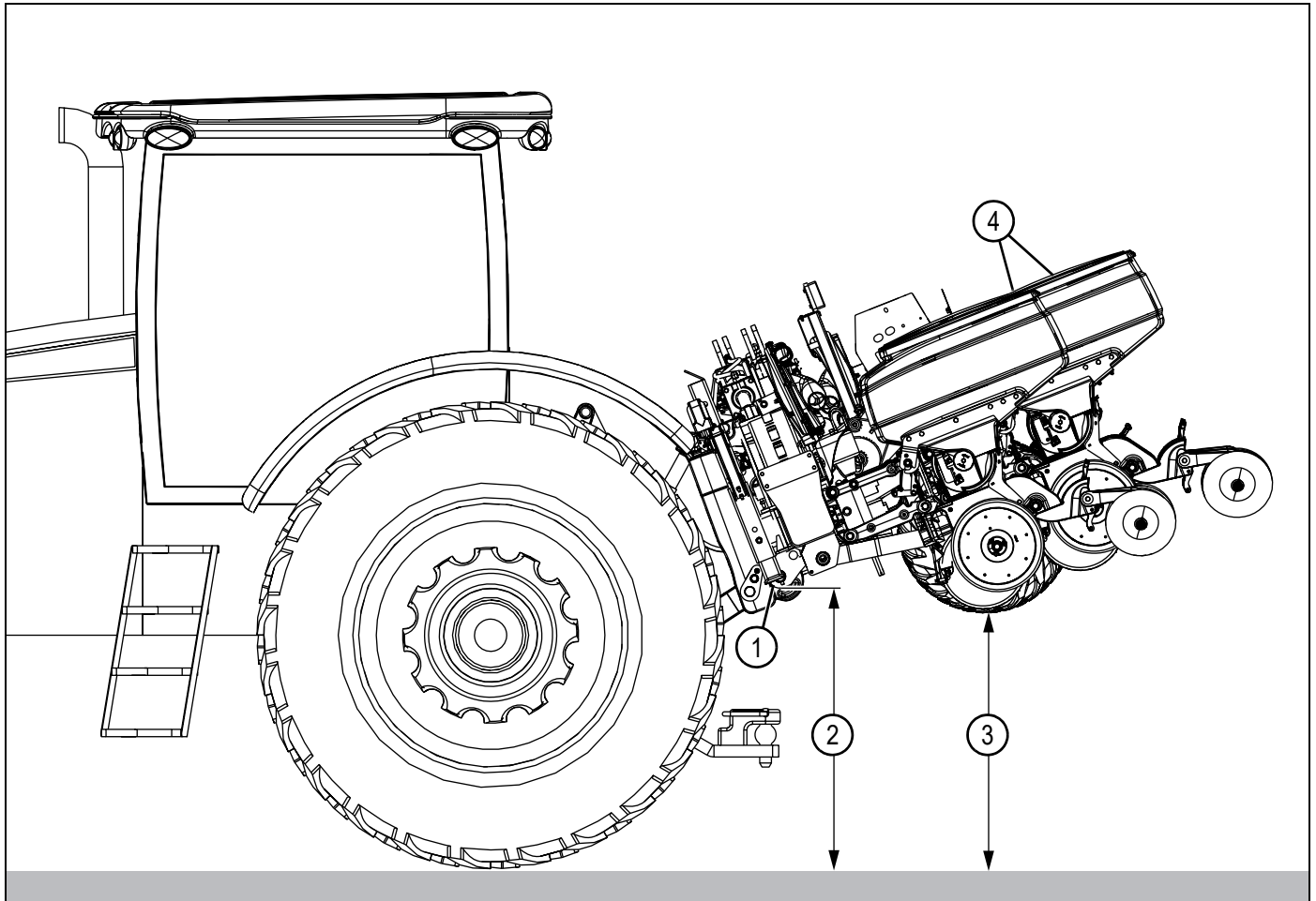


Figure 5-8

ORM000151

1) Hitch

2) Approximate height
49 in (124 cm)

3) Minimum height
23 in (58 cm)

4) Row unit (24 used)

Field Position

1. Connect the implement hitch (1) to the tractor. See “Implement-to-Tractor Connection” on page 4-4.
2. Set the tractor three-point hitch lowering limit so the toolbar is parallel with the terrain. See the tractor operator’s manual for more information on adjusting the tractor hitch.
3. Place tractor selective control valve (SCV) remote in the “float” position to allow the planter to “float” over the ground surface and ensure consistent operating depth.
4. Row units (2) parallel linkage arms should run parallel with the ground surface. Refer to row unit operator’s manual for setting instructions.
5. Planter gauge wheels on the toolbar wings should be set to operate the planter at an approximate height of 20–22 in (52–56 cm) (3) of clearance from the ground surface to the bottom of the toolbar. Refer to planter gauge wheel operator’s manual for setting instructions.
6. Depending on the particular planter and field conditions, it may be necessary through a process of trial and error, to manipulate tractor hitch settings and planter gauge wheels in order to achieve optimum planter operating height.

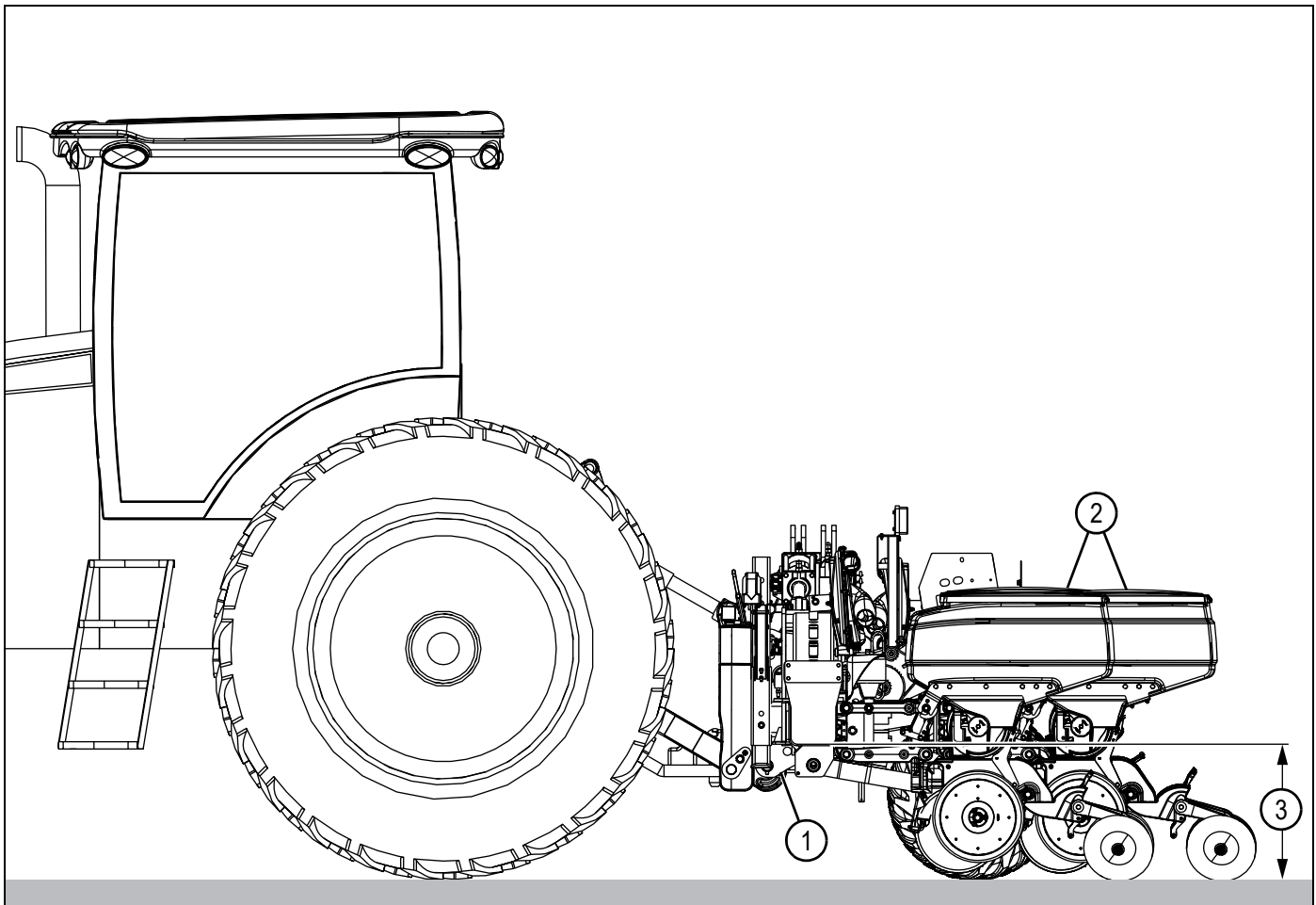


Figure 5-9

ORM000152

1) Hitch

2) Row unit (24 used)

3) Approximate height 20–22 in (52–56 cm)

Chapter 6

Troubleshooting

Preventative Measures	6-2
Troubleshooting	6-2
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Toolbar Will Not Float Properly	6-3
Toolbar Does Not Operate Level With the Ground	6-3
Tractor Will Not Attach to Toolbar	6-3
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Preventative Measures

CAUTION

Avoid implement and hydraulic system damage. Always perform the following preventative measures to prevent damage:

- Lubricate all load bearing points.
- All hardware should be checked for tightness before operation.
- Be sure all hydraulic hoses are securely connected and all fittings are tight.
- Be sure all hydraulic hoses are secured in a manner that keeps them away from sharp edges and moving objects that can rupture a hose.
- Be sure the case drain hose connected to all hydraulic motors of the machine (such as the vacuum fans) is connected to the case drain port of the tractor.
- The case drain allows hydraulic oil to flow out of the motor casing and back into the tractor sump when hydraulic fluid is no longer being sent to the motor. If this fluid is not able to escape the motor casing, damage may occur to the internal components of the hydraulic motor when motor is stopped suddenly and not allowed to slow down gradually. As a good practice, the tractor selective control valve (SCV) controlling the hydraulic motor should always be placed in "float" when the hydraulic motor is intended to be stopped.
- Be sure the tractor hydraulic system has the proper amount of hydraulic fluid.

Troubleshooting

DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Make sure all personnel are clear of the implement before lowering.

Lower the implement to the ground, place the tractor in park, turn off the engine, and remove the key.

DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Use bar stands and cylinder stops to support the implement.

Store the implement on a clean, dry, level surface. An uneven surface could cause the implement to shift or fall, resulting in injury or death as well as implement damage. Securely support all implement components that must be raised. Store the implement away from human activity.

- Remove buildup of grease, oil, and debris before you adjust the implement.

DANGER

High-pressure fluid can penetrate eyes and skin. Relieve pressure on hydraulic system before servicing or disconnecting hoses. Wear proper hand and eye protection. When searching for leaks, use cardboard or wood instead of hands.

Wings Do Not Fold or Unfold

DANGER

High-pressure fluid can penetrate eyes and skin. Relieve pressure on hydraulic system before servicing or disconnecting hoses. Wear proper hand and eye protection. When searching for leaks, use cardboard or wood instead of hands.

- Remove wing lock pins and swing truss lock pins from locked positions and place them in the storage position. See “Wing Fold” on page 4-7.
- Check to see if the hydraulic tips are installed correctly in the tractor selective control valve (SCV).
- Check to see if the fold control manifold is adjusted correctly. See “Internal Toolbar Vacuum Circuitry” on page 4-11.
- Check to make sure that the wings are level. Adjust wings to level position. See “Leveling the Wings” on page 4-8.
- Check to see if the cylinder seals are bad.
- Check to see if there is enough tractor hydraulic pressure.

Toolbar Will Not Float Properly

Check to see if the float linkage pins are in the correct position. See “Toolbar Float” on page 5-2.

Check to make sure wing lock pins and swing truss lock pins are in the storage position. See “Wing Fold” on page 4-7.

Toolbar Does Not Operate Level With the Ground

The levelness of the toolbar is governed by the settings of the lifting gauge wheels and the tractor hitch.

First make sure that the lifting gauge wheels are set for the correct height following procedures in “Field Position” on page 5-8. Then adjust the lower stops on the tractor hitch until the toolbar is level.

Consult the tractor operator’s manual for information on setting the hitch.

Tractor Will Not Attach to Toolbar

See “Implement-to-Tractor Connection” on page 4-4.

Toolbar Wings Are Not Level or Straight

Adjust wings to the level position. See “Leveling the Wings” on page 4-8.

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Chapter 7

Maintenance and Specifications

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Practice Safe Maintenance

Proper maintenance is your responsibility. Maintenance neglect and/or poor maintenance practices can result in injury or death. Always use the proper tools to maintain the implement. For more information on practicing safe maintenance, see “Practice Safe Maintenance” on page 2-8.

Torque Specifications

Standard Fasteners

Unified bolt and screw torque values:

Bolt or Screw Size (inches)	SAE Grade 1				SAE Grade 2				SAE Grade 5, 5.1, or 5.2				SAE Grade 8 or 8.2			
	Lubricated		Dry		Lubricated		Dry		Lubricated		Dry		Lubricated		Dry	
	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N•m	lb-ft	N•m	lb-ft
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N•m	lb-ft	N•m	lb-ft				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N•m	lb-ft	N•m	lb-ft	N•m	lb-ft								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N•m	lb-ft														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	308	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade. Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel

bolts, or wheel nuts, unless different instructions are given for the specific application.

Grade 2 applies to hex cap screws (not hex bolts) up to 6 in (152 mm) long. Grade 1 applies to hex cap screws over 6 in (152 mm) long, and for all other types of bolts and screws of any length.

“Lubricated” means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C zinc flake coating.

“Dry” means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B zinc flake coating.

Metric Fasteners

Metric bolt and screw torque value:

Bolt or Screw Size (mm)	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated		Dry		Lubricated		Dry		Lubricated		Dry		Lubricated		Dry	
	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	195	172
									N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
M8	11.5	102	14.5	128	22	194	27.5	243	32	23.5	40	29.5	37	27.5	47	35
			N•m	lb-ft	N•m	lb-ft	N•m	lb-ft								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N•m	lb-ft														
M12	40	29.5	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	46	80	59	120	88	150	110	175	130	220	165	205	150	260	190
M16	100	74	125	92	190	140	240	175	275	200	350	255	320	235	400	300
M18	135	100	170	125	265	195	330	245	375	275	475	350	440	325	560	410
M20	190	140	245	180	375	275	475	350	530	390	675	500	625	460	790	580
M22	265	195	330	245	510	375	650	480	725	535	920	680	580	625	1080	800
M24	330	245	425	315	650	480	820	600	920	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1580	1160	2000	1475
M30	660	490	850	625	1290	950	1630	1200	1850	1350	2300	1700	2140	1580	2700	2000
M33	900	665	1150	850	1750	1300	2200	1625	2500	1850	3150	2325	2900	2150	3700	2730
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2770	4750	3500

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts, or wheel nuts, unless different instructions are given for the specific application.

"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C zinc flake coating.

"Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B zinc flake coating.

Lubrication

Grease all zerks on the DR12x2 Row Hopper Planter using a high-quality, multi-purpose grease. Follow the recommended hourly service intervals illustrated here. Grease more frequently dependent upon the frequency of folding.

Lubrication Service Intervals		
	Total Zerks	Interval (Hours)
Swing truss pivot pin (2 used) (See Figure 7-1 on page 7-4.)	2	50
Wing fold pivot pin (2 used) (See Figure 7-2 on page 7-4.)	2	50

Swing Truss Grease Locations

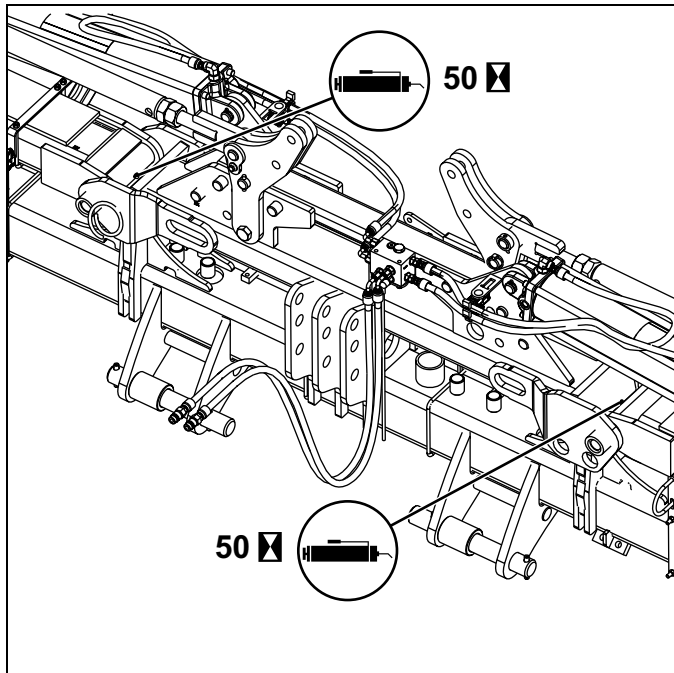


Figure 7-1

ORM000130

Wing Fold Grease Locations

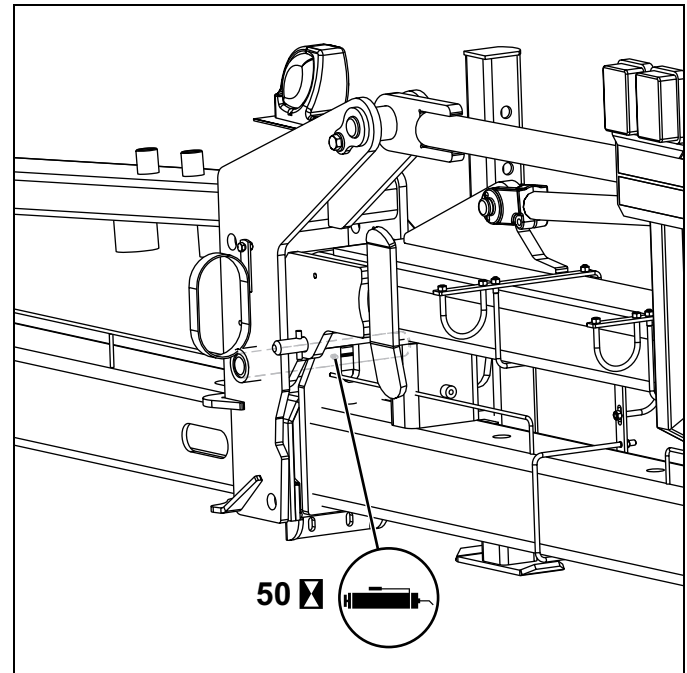


Figure 7-2: Left Wing

ORM000131

Wing Fold Cylinder Removal

NOTE: Left wing fold cylinder removal procedure shown.
Right wing fold cylinder removal procedure is similar.

1. Park implement on a clean, level surface.
2. Unfold wings and lower implement to the ground.

⚠ DANGER

Avoid high-pressure fluid hazards. Relieve hydraulic pressure before servicing or disconnecting hoses. Failure to follow this information could result in death or serious injury.

3. Relieve hydraulic system pressure.
4. Install identification tags and disconnect two hydraulic hoses (1) from wing fold cylinder (2). Close all openings using caps and plugs.

⚠ DANGER

Use an appropriate lifting device to support and lift wing fold cylinder. Failure to follow this information could result in death or serious injury.

5. Use an appropriate lifting device to support wing fold cylinder.

6. Remove two cotter pins (3), two pins (4), and wing fold cylinder.

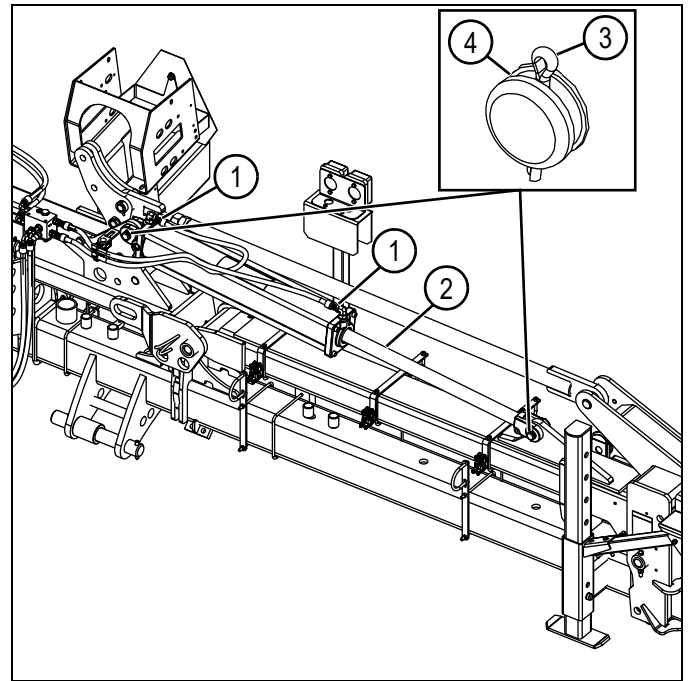


Figure 7-3

ORM000148

- | | |
|----------------------------|------------------------|
| 1) Hydraulic hose (2 used) | 3) Cotter pin (4 used) |
| 2) Wing fold cylinder | 4) Pin (2 used) |
7. Clean and inspect parts. Repair or replace as necessary.
 8. Installation is done in reverse order of removal.
 - Bleed wing fold cylinder. See “Hydraulic Component Air Bleed Procedure” on page 7-6.

Hydraulic Component Air Bleed Procedure

This procedure is required after replacement of hydraulic component or if hydraulic oil has been drained from the hydraulic system.

⚠ WARNING

Prevent hydraulic system damage. Perform the hydraulic component air bleed procedure correctly. Failure to follow this procedure could cause hydraulic system damage.

1. Park implement on a clean, level surface.
2. Unfold wings and lower implement to the ground.

⚠ DANGER

Use an appropriate lifting device to support left and right wing fold cylinders. Failure to follow this information could result in death or serious injury.

3. Use an appropriate lifting device to support left wing fold cylinder (1).
4. Remove cotter pin and pin on rod end of left wing fold cylinder. See "Wing Fold Cylinder Removal" on page 7-5.
5. Position and support left wing fold cylinder with a block of wood (2) as shown in Figure 7-4.
6. Repeat steps 3–5 for right wing fold cylinder.

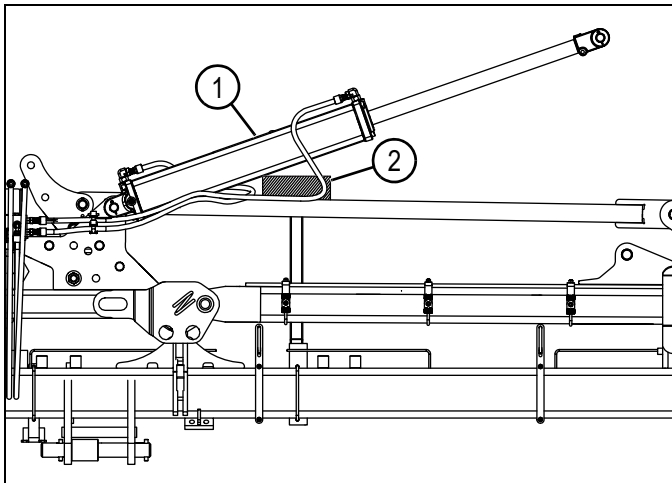


Figure 7-4: Left Wing Fold Cylinder

ORM000149

- 1) Left wing fold cylinder 2) Block of wood

7. Check hydraulic oil level in tractor and add oil as necessary.
8. Start tractor and run at 1800 revolutions per minute (RPM).

NOTE: If performing hydraulic component air bleed procedure on machines running different than 1800 rpm, bleed rate times must be adjusted to a 113 liters per min (LPM), or 30 gallons per min (GPM).

⚠ DANGER

High-pressure fluid can penetrate eyes and skin. Relieve pressure on hydraulic system before servicing or disconnecting hoses. Wear proper hand and eye protection. When searching for leaks, use cardboard or wood instead of hands.

9. Check for leaks.
10. Fully extend and retract left and right wing fold cylinders at least two times, maintaining hydraulic pressure at full extension for at least 30 seconds.
11. Extend cylinders one more time, maintaining hydraulic pressure at full extension for 1 minute.
12. Check for leaks.
13. Check hydraulic oil level in tractor and add oil as necessary.
14. Install cotter pin and pin on rod end of left and right wing fold cylinders.

Implement Inspection

Before each use, inspect implement for damaged or broken parts. Replace broken or worn parts immediately. When replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used in order to restore the implement to original specifications. Contact your Orthman dealer for replacement parts.

During break-in (40 hours), check hardware for proper torque every 10 to 20 hours. See “Torque Specifications” on page 7-2. Before each use, check hardware for wear and proper torque. Replace damaged or missing hardware with hardware of an identical grade to restore the implement to original specifications.

Remove any buildup of grease, oil, and debris.

Replace all shields and guards. Be sure all tools, parts, and service equipment are removed before you operate the implement.

Implement Storage

Prior to storing the implement for a long period of time, perform the following:

- Clean and touch up paint seasonally to avoid corrosion and rust. Contact your Orthman dealer for touch up paint.
- Inspect all safety decals and replace if missing or damaged. Contact your Orthman dealer for replacement decals. See “Safety Decals” on page 2-10.
- Grease all zerks regardless of hourly interval. See “Lubrication” on page 7-4.
- Check all hardware according to torque specifications. See “Torque Specifications” on page 7-2.
- Inspect implement for damaged or broken parts. Replace parts as necessary.
- Remove any buildup of grease, oil, and debris.

Store inside if possible. Storing the implement inside will prolong the life of the DR12x2 Row Hopper Planter components.

DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Use bar stands and cylinder stops to support the implement.

Store the implement on a clean, dry, level surface. An uneven surface could cause the implement to shift or fall, resulting in injury or death as well as implement damage. Securely support all implement components that must be raised. Store the implement away from human activity.

DANGER

Avoid crushing. Failure to follow this information will result in death or serious injury. Make sure all personnel are clear of the implement before lowering.

Lower the implement to the ground, place the tractor in park, turn off the engine, and remove the key.

Specifications

General Specifications

Toolbar Specifications	
12-Twin Row (24 Total Units) 36 /38 /40 in (91/97/102 cm)	
Frame	Stack fold
Frame flex	±8 degrees
Type of lift	Fully integral, three-point
Hitch	CAT 4
Tires (gauge wheels)	7.60-15 6 ply-traction 40 psi (276 kPa) (2.8 bar)
Hydraulic Requirements	
Standby pressure	2250 psi (15 513 kPa) (190 bar)
Working pressure	3000 psi (20 684 kPa) (207 bar)
Capacity (minimum)	2 gal (7.5 L)
Horsepower	Minimum 250 hp (186 kw) with MFWD
Row spacing	36 /38 /40 in (91/97/102 cm)
Empty weight	13 500 lb (6124 kg)
Full weight	16 620 lb (7540 kg)

Machine Dimensions

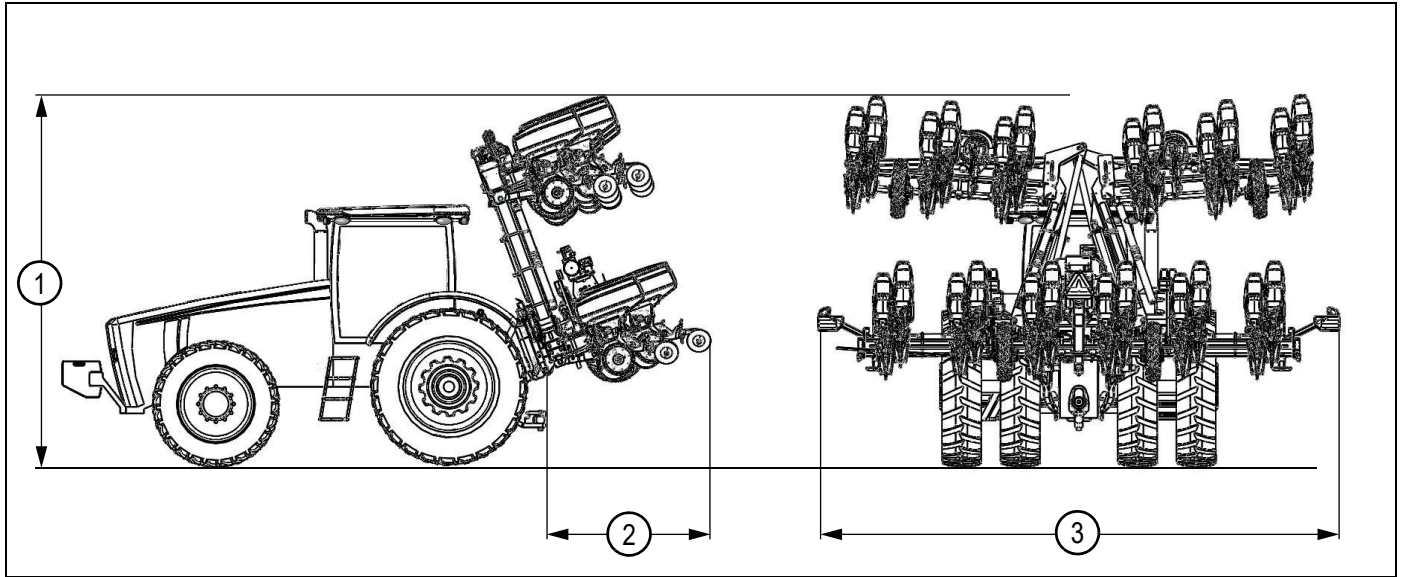


Figure 7-5

ORM000146

1) 14.9 ft (4.5 m)

2) 7.2 ft (2.2 m)

3) 20 ft (6.1 m)

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Anhydrous ammonia. See Liquid fertilizer

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