

WSP GRAIN BELT SWATHER



John Deere Models W235 and W260



Honey Bee

**Honey Bee Manufacturing Ltd.
2015 John Deere W235/260 Swather
Operator's Manual and Reference Guide**



Honey Bee

Important Notice

This manual covers John Deere models W235 &
W260 ONLY

Review the sections of this manual regarding adjustments, settings, leveling, and table height before attempting to operate this swather.

Without proper adjustment, damage to the swather may occur.

Please wash this equipment after transporting

Honey Bee Manufacturing will not be responsible for any paint deterioration resulting from salt or harsh chemical corrosion if this equipment is not properly washed after transport. Use a mild soap solution, then rinse thoroughly.

If this equipment is stored near salted roadways through the winter months, it should be cleaned each spring.



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1.0 – Hydraulic Readings

Use this page to record any specific hydraulics readings and/or settings done upon initial dealer inspection. See Installation and Hydraulics sections of this manual for reference.

Pump flow setting (at normal working engine rpm): _____ GPM

Manifold Block pressure gauge (when checking relief pressure): _____ PSI

Knife Drive speed (at normal working engine RPM): _____ RPM

Draper Flow Control pressure gauge (at normal working engine RPM): _____ PSI

Manifold Block pressure gauge (at normal working engine RPM): _____ PSI

Other Settings: _____



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1.1 - Purchase Information

Dealers Name: _____

Address: _____

Phone: () _____

Purchase Date: _____

Model: _____

Serial Number: _____

Delivery Date: _____

Modification Record	
Date	Modification

Improvements:

Honey Bee Manufacturing Limited is continually striving to improve its products. We reserve the right to make improvements or changes when it becomes practical and possible to do so, without incurring any obligation to make changes or additions to the equipment sold previously.



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1.2 - Warranty

Honey Bee Manufacturing Ltd. (Honey Bee) warrants your new Swather to be free of defects in material and workmanship, under normal use and service. Obligations under this warranty shall extend for a period of 1 year (12 months) following the date of first use to the original purchaser and shall be limited to, at the option of Honey Bee, replacement or repair of any parts found, upon inspection by Honey Bee, to be defective.

Warranty Claims

The purchaser claiming under this warranty shall report a warranty claim to his Authorized Dealer. The dealer shall complete the claim, on the prescribed form, for inspection by an authorized company representative. Warranty claims must be made within 60 days of warranty expiration on the Honey Bee Manufacturing Ltd Claim Form (CFI).

Limitations of Liability

This warranty is expressly in lieu of all other warranties expressed or implied and all other obligations or liabilities on our part of any kind or character, including liabilities for alleged representations or negligence. We neither assume nor authorize any person to assume, on our behalf, any liability in connection with the subsequent sale of the Swather.

This warranty shall not apply to any Swather table which has been altered outside the factory in any way so as in the judgment of Honey Bee to affect its operation or reliability, or which has been subject to misuse, neglect, or accident.

Operator's Manual

The purchaser acknowledges having received training in the safe operation of the Swather and further acknowledges that Honey Bee does not assume any liability resulting from the operation of the Swather in any manner other than described in this manual.



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2 - Safety

In this manual, the safety conventions used are as follows:

Safety Terms



Indicates an imminently hazardous situation that if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.



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



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



Warns of potential damage to the machine if procedures are not followed.



Provides instructions to help you avoid unnecessary strain on, or possible damage to the machine.

Shields

Shields are provided to protect you from injury. Make sure they are in place and secured before starting the machine.



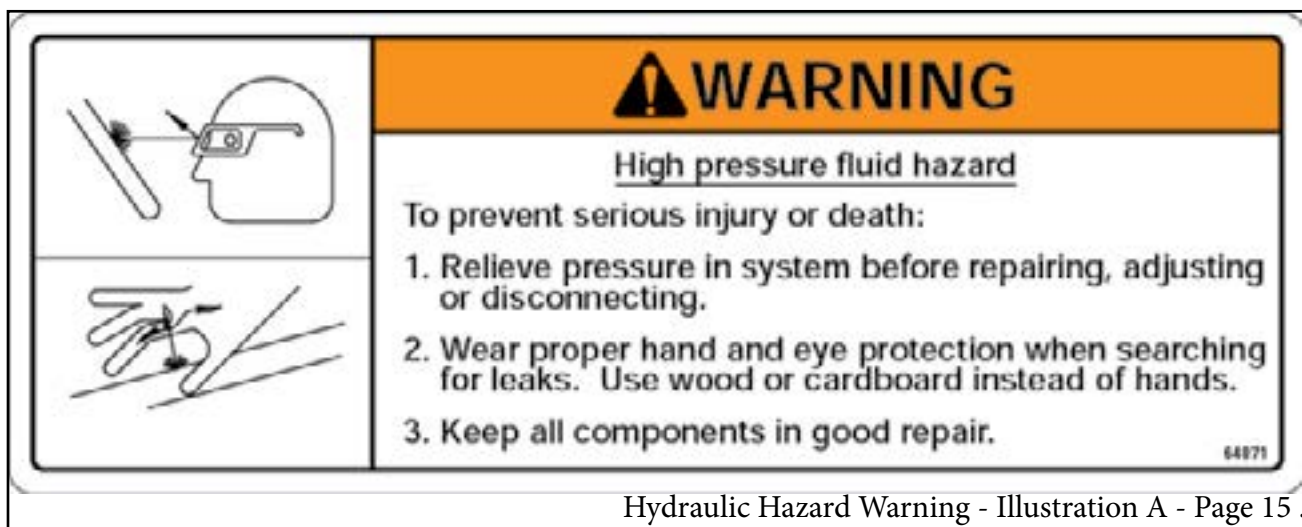
Names given here for parts of the swather are those in use at the time of design.

Hydraulic Safety



This machine is powered and run by hydraulic oil under high pressure. Caution must be taken around the machine because high pressure hydraulic fluid can penetrate the skin causing serious injury and possibly death. When looking for a hydraulic leak, always hold a piece of cardboard up to the suspected area. Never use your unprotected hands to locate a leak.

Always wear eye protection, gloves and long sleeve clothing when working near hydraulics. Small leaks can be completely invisible.



Hydraulic Hazard Warning - Illustration A - Page 15

You can reduce this hazard by relieving the system pressure before disconnecting hydraulic lines. Once finished, tighten all connections to specifications before re-applying pressure.



If a hydraulic-related accident occurs, see a doctor immediately. Any hydraulic fluid injected into the body must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.



Operation and Maintenance Requirements

You are responsible for the safe operation and maintenance of your Honey Bee Swather. You must ensure that you and anyone else, who is going to operate, maintain or work around the swather be familiar with the operating and maintenance procedures and related safety information contained in this manual.

Remember you are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

Operating instructions for this swather should be reviewed by each operator at least once a year per OSHA regulations 1928.57. The meaning of each decal should be understood, and their locations should be known prior to operating the swather.

General Safety

1. Maintain moving parts, hydraulics and motors clear of chaff and straw to prevent the possibility of fire.
2. Carry a multipurpose fire extinguisher in the windrower and know how to use it. Check the extinguisher regularly and keep it fully charged.
3. Provide a first aid kit in the cab for emergencies and know how to use it.
4. Do not wear loose clothing or jewelry around moving parts.
5. Wear appropriate protective gear. This list includes but is not limited to:
 - A hard hat
 - Protective shoes with slip-resistant soles
 - Protective glasses or goggles
 - Leather gloves
 - Hearing protection
 - Respirator or filter mask
6. Do not allow any one to ride on the swather while it or the windrower is in motion.
7. Make certain that the park brake is engaged, and the windrower is in neutral before starting the engine.
8. Clear the area of bystanders, especially small children before starting the windrower.
9. Do not allow anyone to operate the swather who has not been instructed in how to operate the machine.
10. All operators should familiarize themselves with the SAFETY section in the windrower Operators Manual.
11. Some pictures or illustrations in this manual may not show protective shields in place. This is done in order to make important components visible. Make certain that all protective shields are secured in place before operating the machine.

Operating Safety – Good Practices

1. STOP the windrower, engage the parking brake, place the windrower in neutral, remove the key, and wait until all moving parts stop before leaving the cab.
2. Either lower both the table and the reel, or raise the swather to its full height and set the platform lock before servicing the swather. If working under reel, set the reel cylinder locks. A loss of hydraulic pressure could cause the swather and reel to lower unexpectedly.
3. NEVER operate machinery while tired, sick or otherwise impaired.
4. Do not operate the swather in crowded or confined areas.



Do not stand between the windrower and the swather while raising or lowering the swather.

Maintenance Safety

1. Before undertaking any maintenance, engage the park brake, either lower the reel and swather, or raise and lock the swather using the platform lock and shut off the engine of the windrower. Make sure there is no pressure being supplied to the hydraulic lines.
2. Hydraulic leaks can penetrate the skin causing serious injuries. Small leaks can be invisible and are the most dangerous. Use some kind of object, such as cardboard, to find the leak -- DO NOT USE YOUR HAND.
3. Ensure that all the pressure is released from the hydraulic lines before starting a repair. Replace or repair damaged hoses immediately.
4. Care should be taken when maintaining the knife. Sickles are very sharp and can easily cause severe injury. Use heavy leather or canvas gloves when working with the knife. Always ensure everyone is well clear before moving the knife, manually or under power.



Transport Safety

1. Transport the swather with the SMV (Slow Moving Vehicle) sign displayed on the rear of the swather and use your hazard lights if the law permits. Check local road laws before transporting.
2. When transporting the swather on roads, always be aware of the width of the swather.
3. For long - distance transporting completely install the full transport assembly. (see dismount section).
4. Do not transport the machine at night, at dawn, or at dusk.
5. Ensure hitch is firmly attached and secured with hitch pins before moving.
6. Attach the hitch safety chain before moving.
7. Do not exceed 40 kph (25 mph) during transport.
8. Ensure you display the Slow Moving Vehicle sign during transport on roadways.

Before Transport Checklist

1. Do a complete walk-around and check to be sure there are no loose parts or components.
2. Check:
 - All reel mounting, reel drive and adapter assembly bolts to be sure no bolts/nuts are loose.
 - Wheel bolts to make sure they are tight.
 - Transport tire pressure. Recommended pressure is 80 psi (552 kPa)
 - Spindle and hitch lock pins to make sure they are in place and securely fastened.
3. Inspect all hoses. Ensure they are secured so they will not pinch or drag during transport.
4. Ensure hitch tongue and safety chain are fastened securely to the swather and to the transporting vehicle.
5. Make sure that all transport lights are properly connected and in their transport position.

During Transport Checks

1. Stop after the first 5 to 10 kilometers (2 to 6 miles) and check to make sure the wheel bolts are tight and the wheel hubs are not hot. Make periodic checks every 50 to 60 km (30 -40 miles) if towing the swather long distances.
2. Check the hitch bolt and safety chain periodically to make sure they are secure.

In-Field Checks

The Installation and Operation sections of your operator's manual cover the adjustments which may be required on your swather. Read these sections carefully before using your machine. Make the necessary adjustments before operating your swather, and check these adjustments periodically as required.

Storage

Store the swather on firm ground away from areas of human activity. If the storage location exposes the swather to road salt during the winter months, thoroughly wash the swather in spring time. It is recommended to rotate the drapers so that the seam of the join is located underneath the table. This will improve drainage, thus reducing the possibility of ice buildup damaging the draper material.



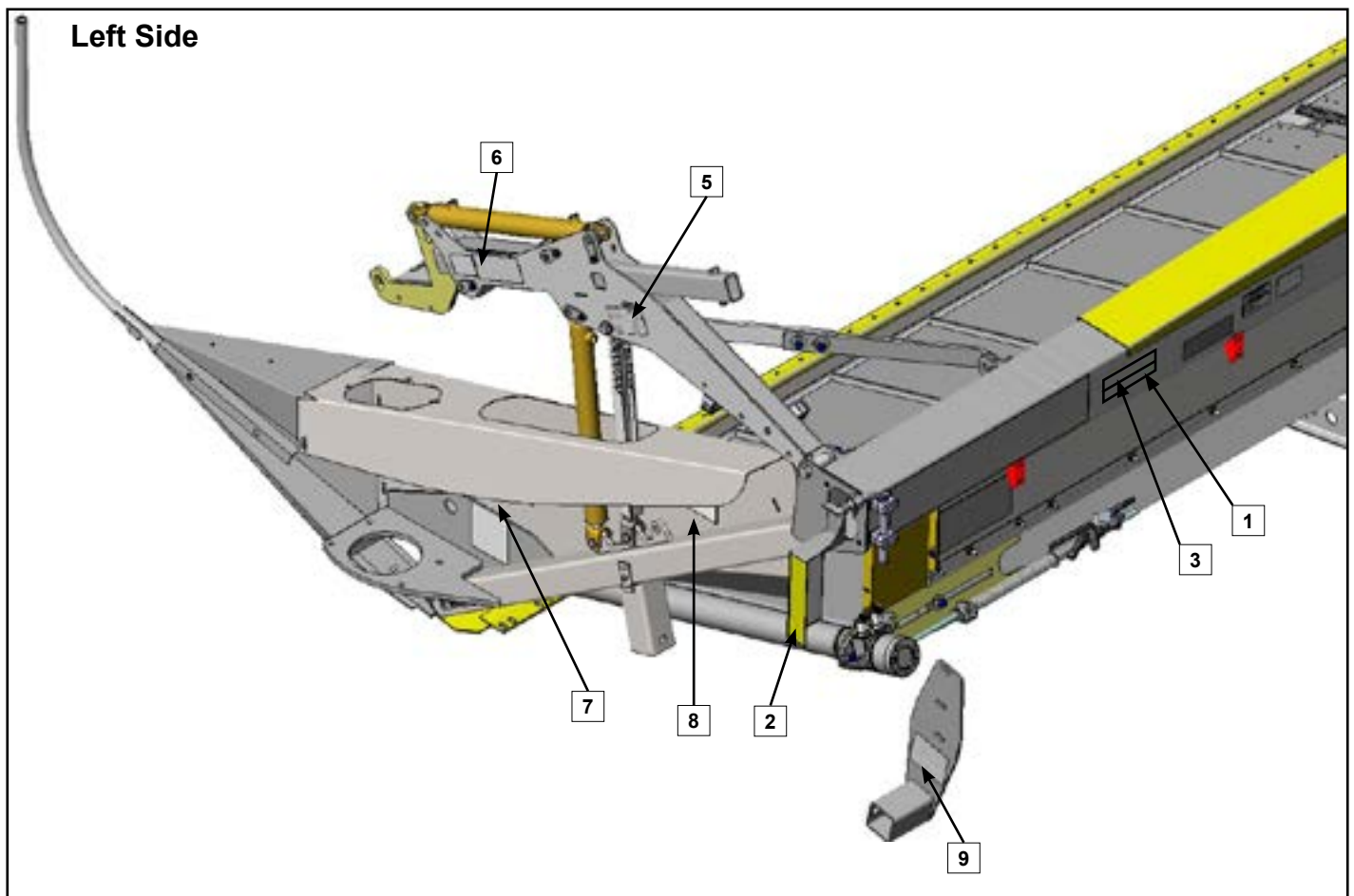
Safety Decal Locations

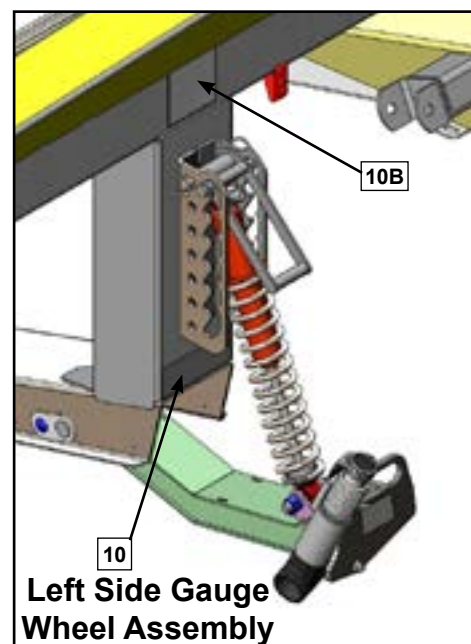
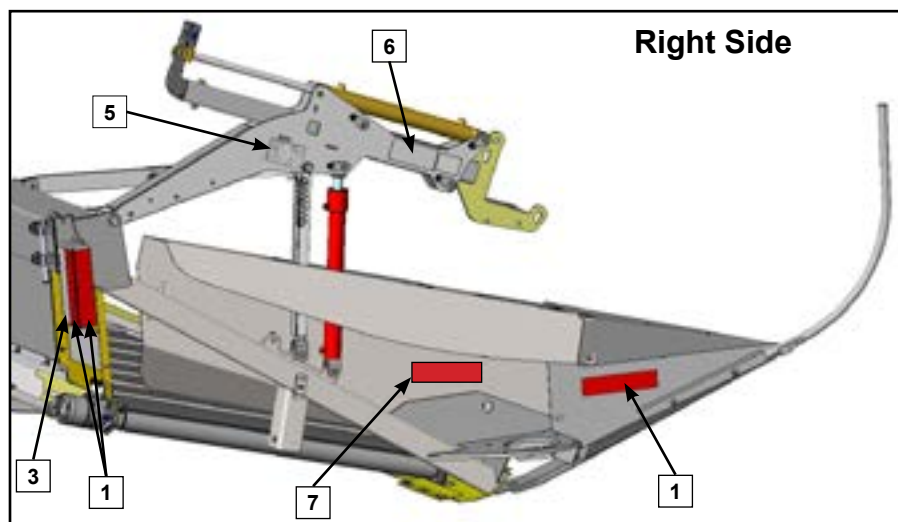
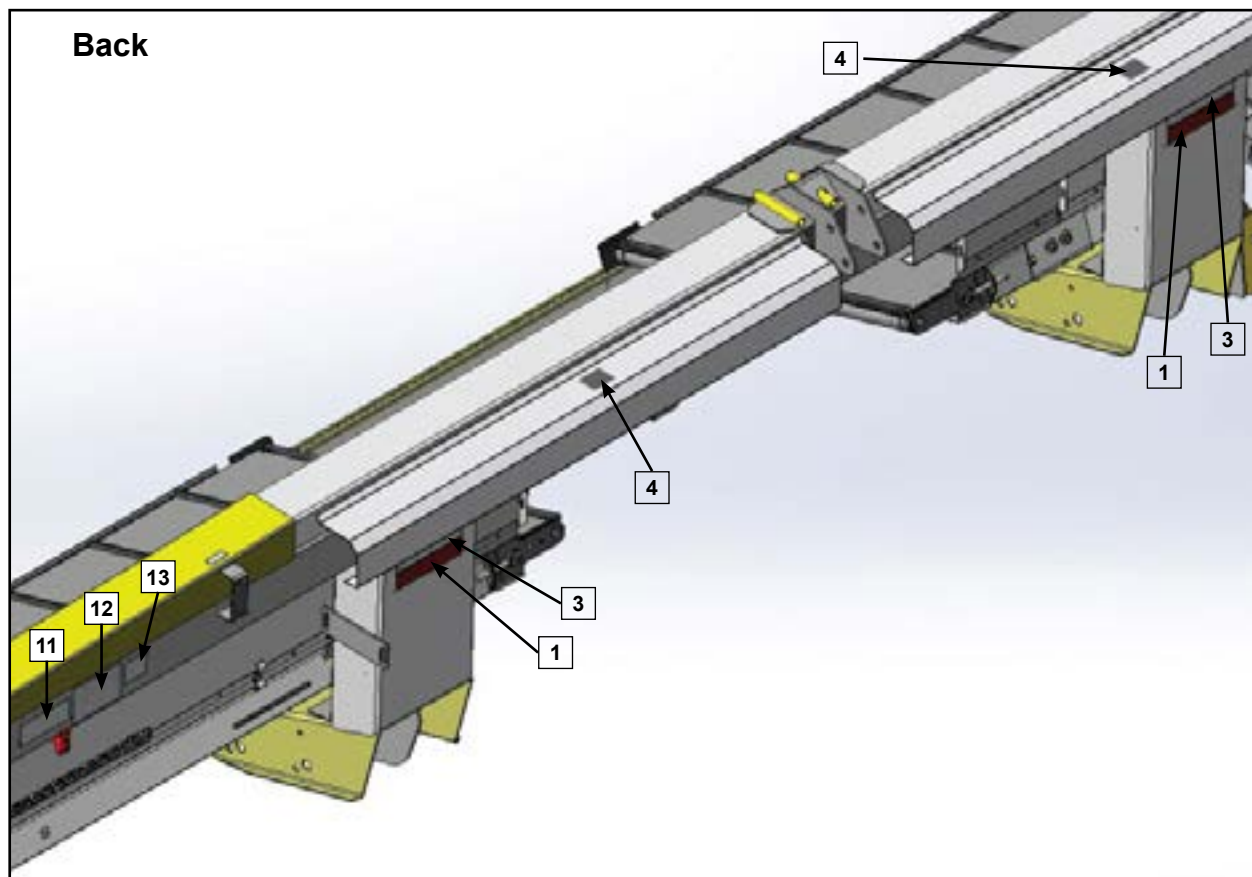
The following safety decals have been placed on your machine in the areas indicated. They are intended for your safety, and the safety of those working with you. Please take this manual, walk around your machine and familiarize yourself with the locations and content of these warning signs and labels. Review this information, and the operating instructions in this manual with your machine operators. Keep decals legible. If they are not, we suggest you obtain replacements from your Honey Bee dealer.

1. Keep them clean.
2. Know the location and meaning of all decals. Cross reference the numbers on the diagram below with the chart on the following pages to help identify the labels.

For continued safe operation of this machinery, it is recommended that you replace damaged safety decals immediately. You may purchase replacement decals from your dealer.

The following illustration indicates the location of all labels on your swather. Match the number indicated in this diagram to the numbered illustrations provided.







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Safety-Related Labels

NOTE!

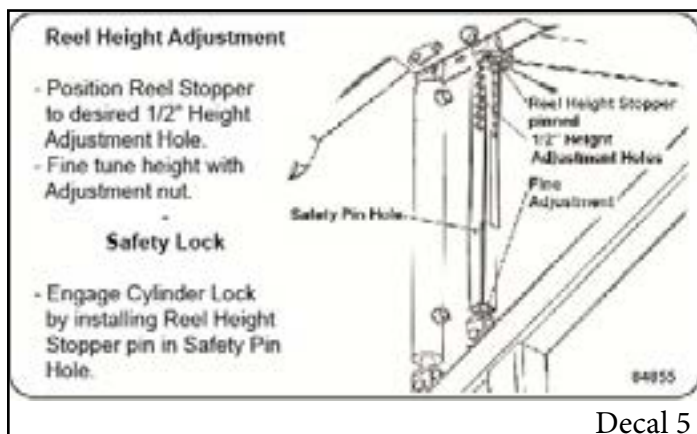
Labels shown are not the actual size.

Vehicle Marking Reflectors:
(not shown on illustration)

1. Red (2x9) - 7 Locations
2. Yellow (2x9) - 3 Locations
3. Red-Orange (2x9) - 6 Locations



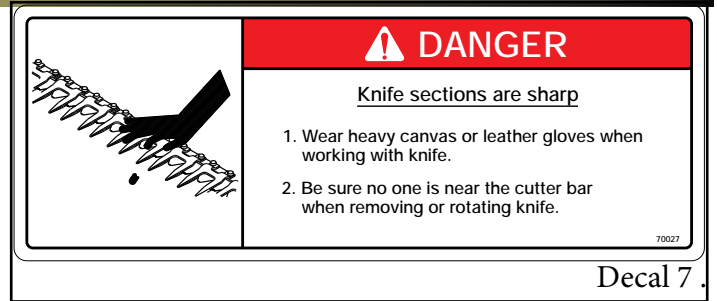
Decal 4



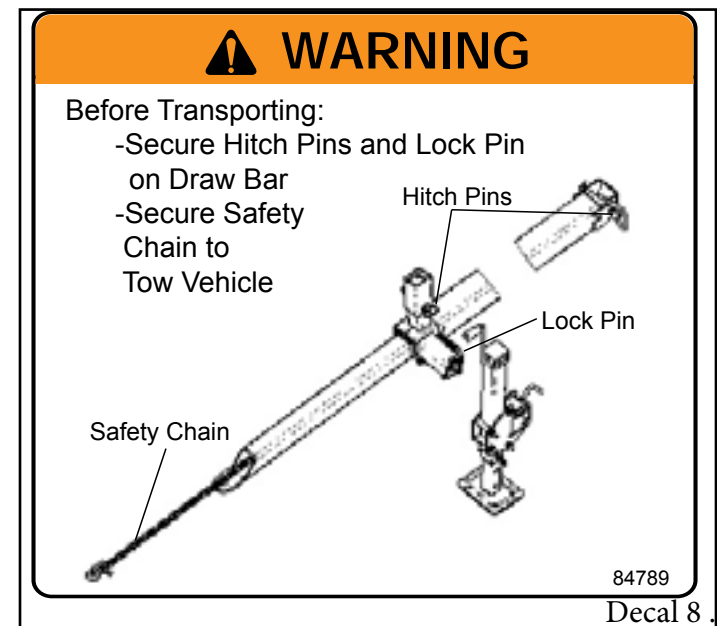
Decal 5



Decal 6



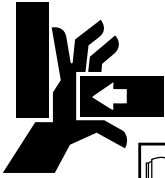
Decal 7



Decal 8



Decal 9



⚠ WARNING

PINCH AREA
Keep Away!
Failure to comply could
result in death or serious
injury.

Decal 10

⚠ CAUTION

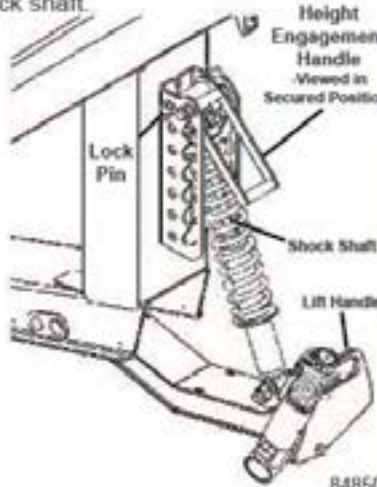
1. Read operators manual before using machine.
2. Stop power unit, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.
3. Close and secure all guards before starting.
4. Keep hands, feet, hair, and clothing away from moving parts.
5. Securely attach hitch tube and safety chain before transporting.
6. Do not allow riders.
7. Install feeder housing and/or cylinder locks before transporting or working under the header.
8. Keep all hydraulic components in good condition.
9. Travel only at recommended speeds.
10. Locate SMV sign on rear of header before transporting.
11. Add clearance light bar or use pilot vehicle when transporting on the highway.
12. Train all operators in the safe and correct operation of the header.
13. Review safety instructions before each operating season.

Decal 12

⚠ WARNING

- DO NOT adjust so that shock runs with less than 3" of exposed shock shaft.

- WARNING - Have full control of both handles when Height Engagement Handle is not secured!



Decal Location 10B

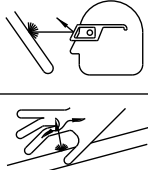
⚠ WARNING

BEFORE SERVICING

Engage park brake on the power unit, shut engine down and wait for all moving parts to stop.

70051

Decal 13



⚠ WARNING

High pressure fluid hazard

To prevent serious injury or death:

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

Decal 11

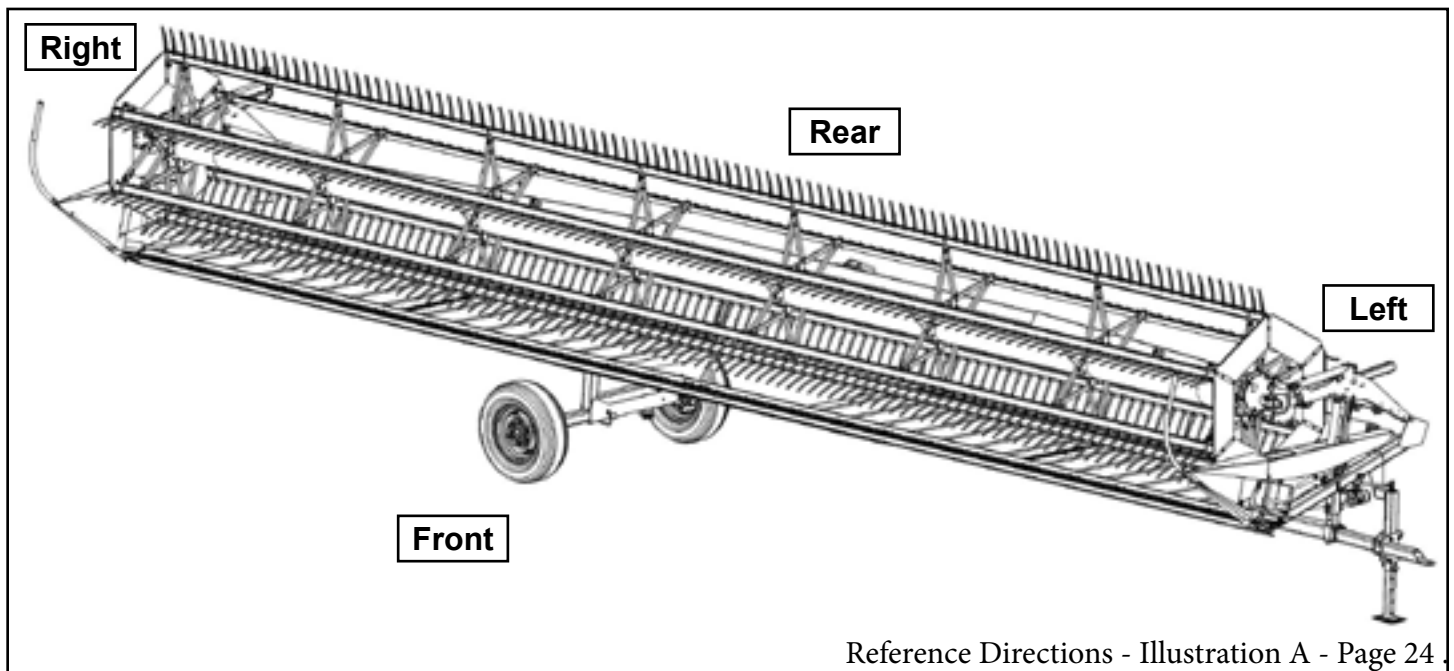


3 - Installation Instructions

This information is designed for first-time installation, but will be valuable every time you are re-mounting the swather to the windrower. It is suggested that you follow the instructions in the order that they are given to avoid difficulties. Use the check lists at the end of this section to ensure that the swather is mounted properly and ready for the field.

Mounting and Dismounting Terminology

Windrower:	Front	Lift arm end of the windrower
	Back or Rear	Engine end of the windrower
	Right and Left	As seen when sitting in the driver's seat facing the swather.
Swather Table:	Front	Cutter bar side
	Back or Inside	Lift arm mount side
	Right and Left	As seen when sitting in the driver's seat facing the swather when it is mounted on the windrower.



Reference Directions - Illustration A - Page 24

Preliminary Leveling

The 2015 W235 & W260 Windrowers have Independent Float Suspension that uses two accumulators. This gives the operator the ability to adjust the float pressure on either side independently, eliminating issues from the past when only using a single accumulator float system.

See the Levelling section of this manual for details.

The 2014 W235 Windrower still had a single accumulator float system. An upgrade kit is available from John Deere that will convert to independent Float Suspension. It is strongly recommended that this kit is applied to the 2014 windrower.

“Honey Bee Ready” Windrower Identification

It is important to identify which model of Windrower you have.

The W235 Windrower is available as a “Draper” or “Rotary” version. The W260 is available as a “Rotary” version only.

“Draper” or “Rotary” refers to which **John Deere** platform that the Windrower is compatible with.

Note: the Honey Bee **WSP** Swather Table is designed to be compatible with the “Rotary” versions of the W235 and W260 Windrowers ONLY.

The Honey Bee **WSP** Swather Table requires quick-couplers on the ends of the Windrower Platform drive hoses and Tilt Cylinder hoses for proper hydraulic hookup.

The Honey Bee **WSP** Swather Table has its own Drive motor and Tilt Cylinder arrangement, so it does NOT use the standard John Deere platform Drive motor or Tilt Cylinder. Mating quick-couplers are provided for the standard John Deere platform Drive motor and Tilt Cylinder, so that either the WSP Table or the John Deere Rotary platform can be easily attached or detached.

A special “Honey Bee Ready” version of the W235 and W260 Windrowers is NOT available like it was for previous models of Windrowers.

The W235 and W260 Windrowers DO have a selectable custom pump flow setting specifically for Honey Bee **WSP** Swather Tables, but electrical switches for specific Swather Table functions are NOT provided by John Deere installed in the cab console.

A specific Switch Box with the required electrical switches for the specific Swather Table functions is provided by Honey Bee to mount in the cab.



Windrower Preparation

Hydraulic

The Honey Bee Swather unit is designed to be quickly interchangeable with the JD Rotary Mower. By adding Quick Couplers to the Hydraulic Lines for the Rotary Mower Motor, and the Tilt Cylinder, you have an easily exchangeable system.

Rotary Mower Motor - See Illustration A on the next page.

1. Lower Rotary Mower so that it is resting on the ground or floor.
2. Gather all necessary tools including a container to catch escaping oil.
3. Remove Hydraulic Pressure Line from Port "A" on Rotary Mower Motor. Catch escaping oil.
4. Install a Nipple (16MF-12MB) <1>, and 3/4 Flat Face Female Quick Coupler <2> onto the Hydraulic Pressure Line.
5. Install a 90° Elbow (12MF-16MB) <3>, a Swivel Adapter (12MB-12FFX) <4>, and a 3/4 Flat Face Male Quick Coupler <5> to the "A" Port on the Rotary Mower Motor.
6. Remove Hydraulic Return Line from Port "B" on Rotary Mower Motor.
7. Install a Nipple (16MF-12MB) <1>, and a 3/4 Flat Face Male Quick Coupler <5> onto the Hydraulic Return Line.
8. Install a 90° Elbow (12MF-16MB) <3>, a Swivel Adapter (12MB-12FFX) <4>, and a 3/4 Flat Face Female Quick Coupler <2> to the "B" Port on the Rotary Mower Motor.
9. Remove the Hydraulic Drain Hose from the Rotary Mower Motor.
10. Install a Swivel Adapter (12MF-10FFX) <6>, a Nipple (10MF-10MB) <7>, and a 1/2 Flat Face Male Quick Coupler <8> onto the Hydraulic Drain Hose.
11. Install a Nipple (12MB-10MF) <9>, a Swivel Adapter (10MB-10FFX) <10>, and a 1/2 Flat Face Female Quick Coupler <11> onto the Hydraulic Drain Line Port on the Rotary Mower Motor.

Tilt Cylinder - See Illustration B on the next page.

12. Remove the Rod End Hydraulic Line (Pressure Line) <1> from the Tilt Cylinder <17> (catch escaping oil).
13. Install a Nipple (4MF-6MB) <2>, a 1/4 Male Quick Coupler Dust Cap <3>, and a 1/4 Male Quick Coupler <4> on the Hydraulic Line.
14. Install a 90° Elbow (6MB-6MF) <5>, a Swivel Adapter (6MB-6FFX) <6>, a 1/4 Female Quick Coupler Dust Plug <7>, and a 1/4 Female Quick Coupler <8> into the Rod End Port of the Tilt Cylinder.
15. Remove the rear Hydraulic Line (Return Line) <9> from the Tilt Cylinder.
16. Install a Nipple (4MF-6MB) <10>, a 1/4 Female Quick Coupler Dust Cap <11>, and a 1/4 Female Quick Coupler <12> on the Hydraulic Line.
17. Install a 90° Elbow (6MB-6MF) <13>, a Swivel Adapter (6MB-6FFX) <14>, a 1/4 Male Quick Coupler Dust Cap <15>, and a 1/4 Male Quick Coupler <16> into the remaining port of the Tilt Cylinder.

The Rotary Mower can now be removed and stored as its Operators Manual states.

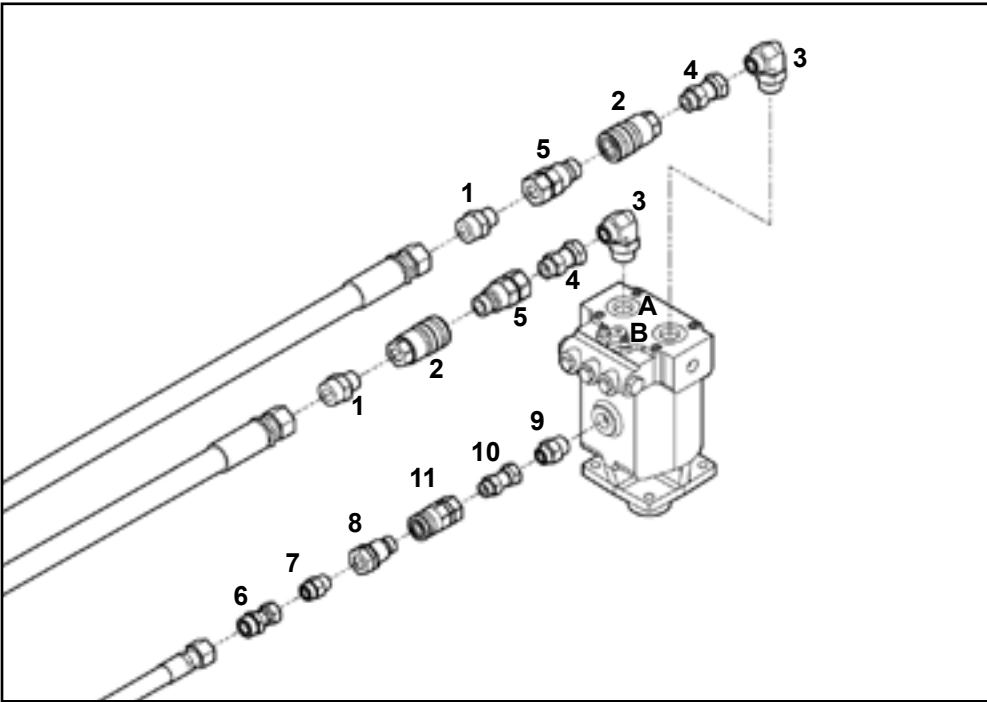


Illustration A - Page 27 .

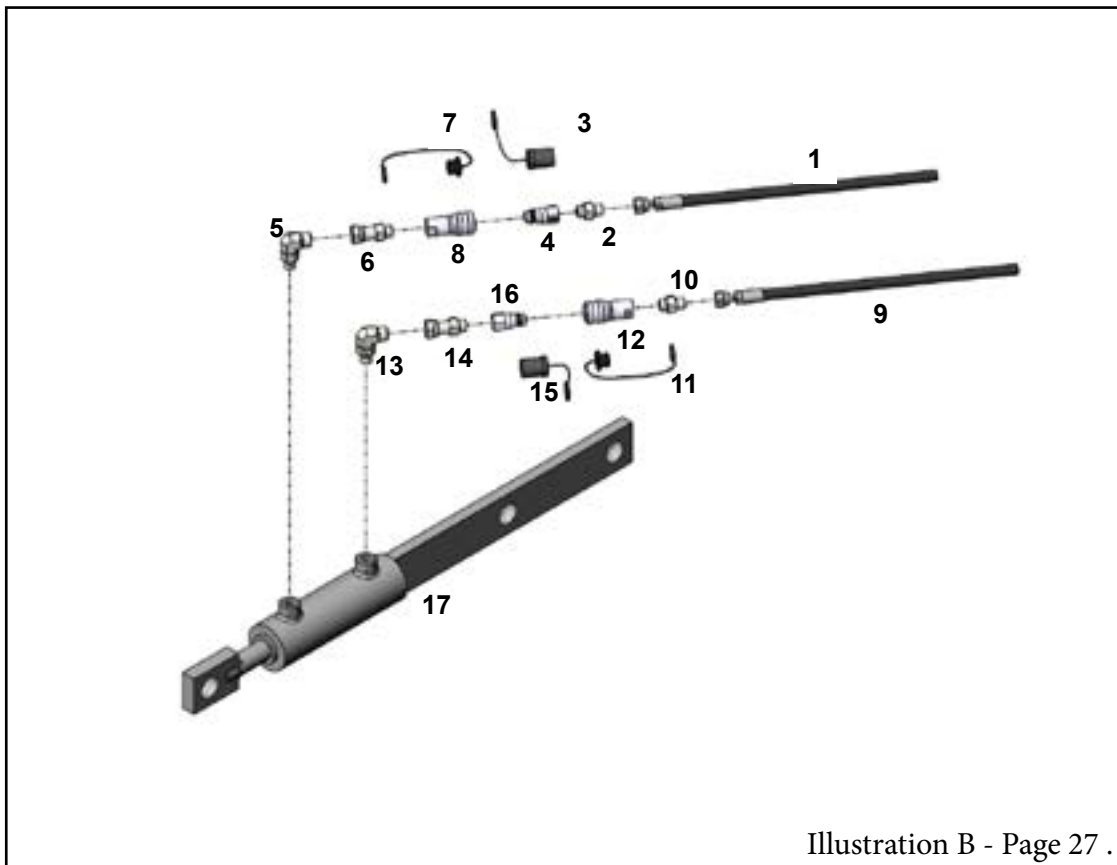


Illustration B - Page 27 .

After removing the Rotary Mower from the Windrower you need to prepare to mount the Hydraulic and Electrical components necessary for the swather.

Start by removing four bolts from the Right Hand Front Cab Brace (**see Illustration A**). Keep these bolts for use on the Header Tilt Cylinder Mount later.

Fasten the Cab Reel Lift Bracket to the Cab Brace reusing the existing nuts along with four new m12x50 flange head bolts (supplied).

Remove hose clamp from JD Header Tilt Mount Assembly Top Plate. Detach Top Plate and set aside with bolts.

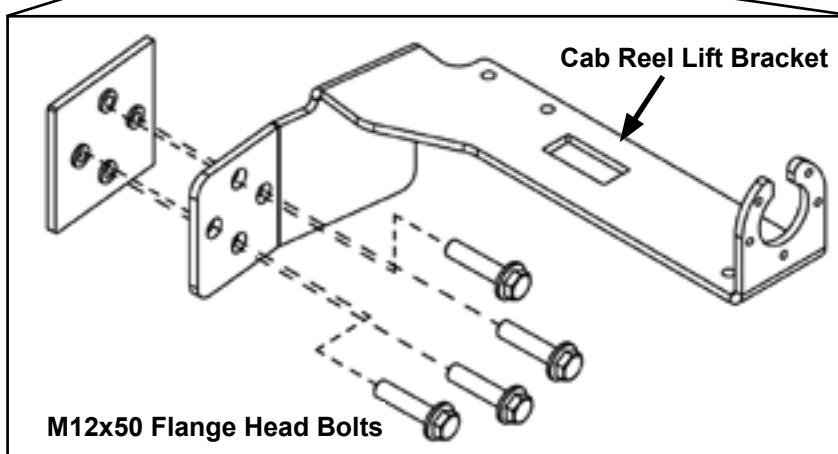
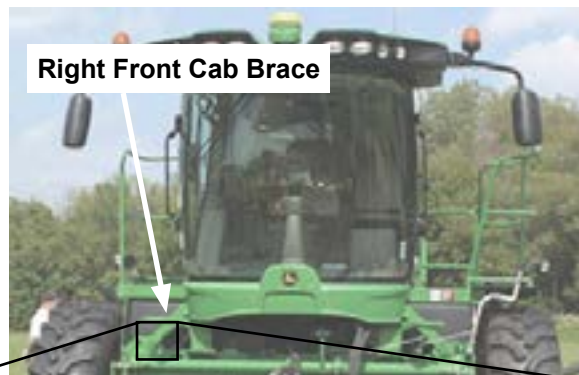


Illustration A - Page 28

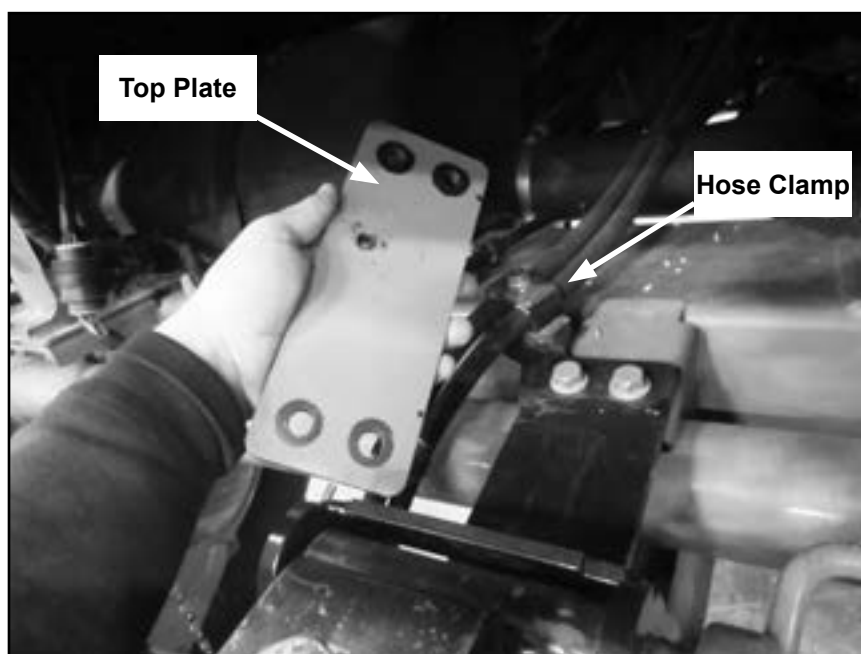


Illustration B - Page 28

Next, install the Honey Bee Header Tilt Mount. Retrieve the bolts that were removed from the Right hand Front Cab Brace.

Place the Tilt Mount so that the bolt holes line up with those that the JD Top Plate used.

Insert the 1" x 6 1/4" hitch pin through the side of the tilt mount and secure with hairpin. Fasten the tilt mount in place using JD bolts (see illustration A).

The 1" hitch pin should be free to slide in and out of the tilt mount hole.

Re-attach the hose clamp to the tilt mount as shown.

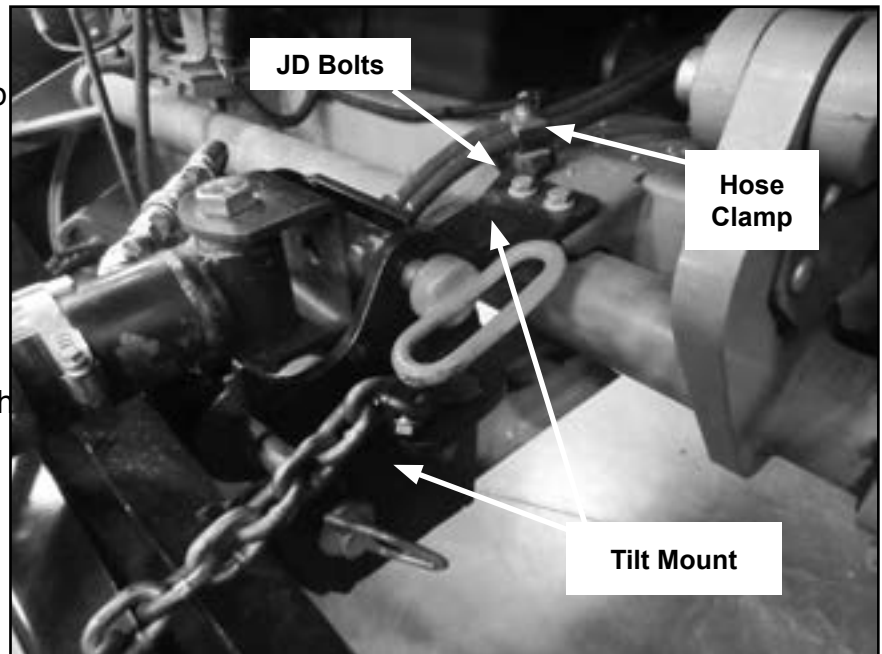


Illustration A - Page 29



Illustration B - Page 29



In order to be able to control the speed that the Table is lowered or raised a Needle Valve is plumbed into the JD Windrower's main Lift Cylinder.



Ensure that you relieve the pressure in the float system prior to disconnecting any hoses (see windrower operators manual)

1. Pre-assemble a nipple (6MB-8MF) into each end of the needle valve.
2. Remove the JD Platform Lift Hose from the Rod End of the JD Center Lift Cylinder. You will find this cylinder under the cab.
3. Install a 90° Elbow (8MB-8FFX) in the cylinder port facing up.
4. Attach the Needle Valve assembly to the 90° elbow, with the Control Knob facing the Left Side of the cab.
5. Thread another Nipple (same as first) into the Needle Valve.
6. Reattach the JD Platform Lift Hose to the needle valve assembly.

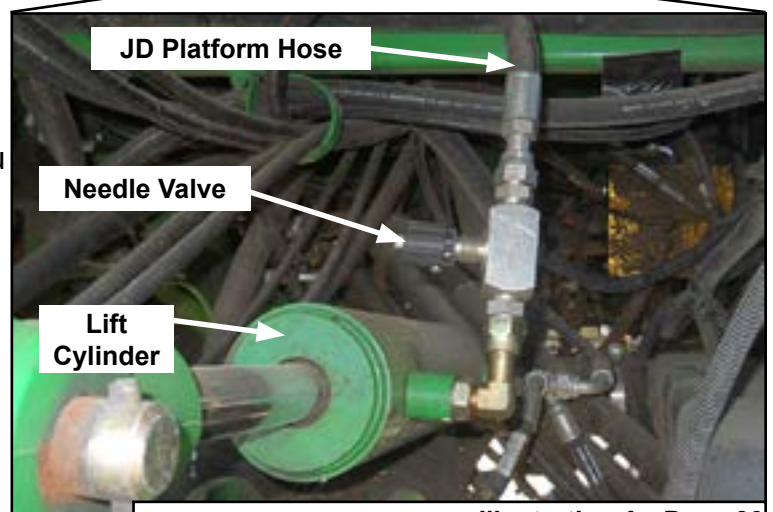
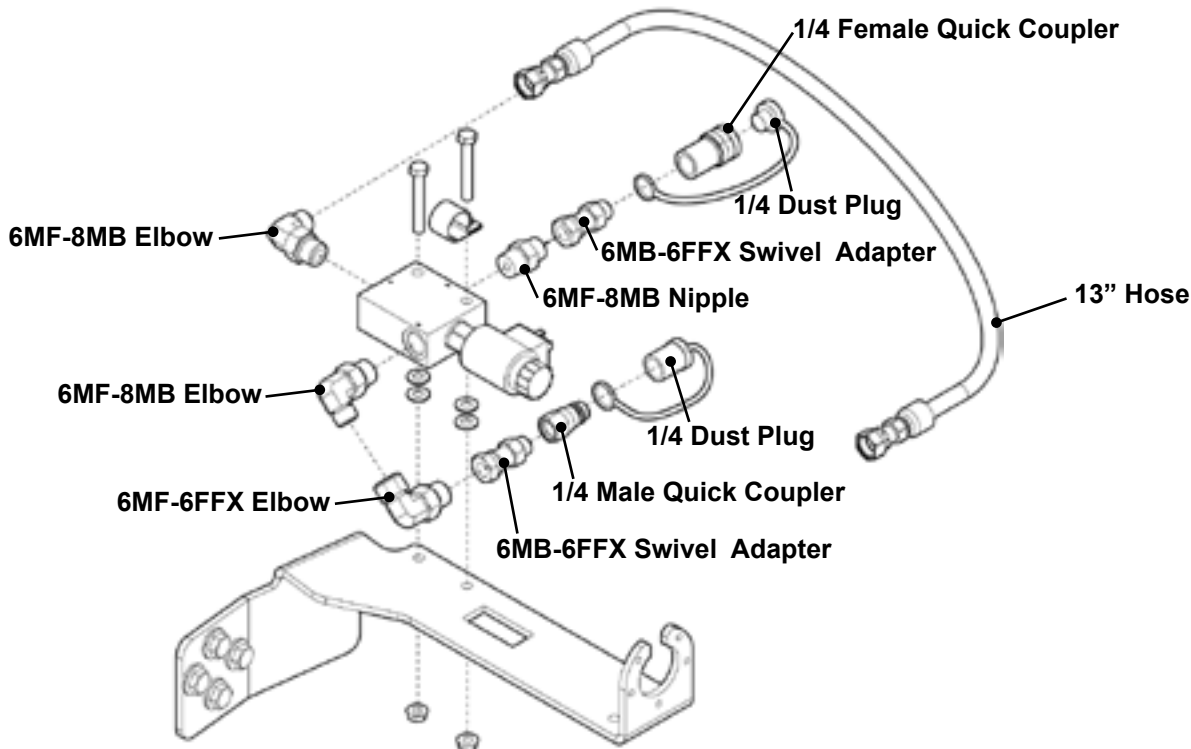


Illustration A - Page 30

A Selector Valve is used to switch between Reel Lift and Header Tilt Hydraulic Circuits. It is installed onto the top of the Cab Reel Lift Bracket.

Assemble the Selector Valve and its Hydraulic Fittings before attaching it to the bracket.

1. Orientate the valve as shown on this page. This will allow you to see how to adjust the direction that each fitting will be aimed.
2. Install a 90° Elbow (6MF-8MB) into Port 1, and aim it towards the Port 2 side.
3. Attach the 13" Hydraulic Hose to this Elbow.
4. Install a Nipple (6MF-8MB), Swivel Adapter (6MB-6FFX), Quick Coupler Dust Plug (1/4 Female), and a Quick Coupler (1/4 Female) into Port 2. This will attach to the JD Tilt Cylinder Pressure.



5. Install a 90° Elbow (6MF-8MB) into Port 3 aiming it do **Illustration A - Page 31**, cab.
6. Continue with a 90° Elbow (6MF-6FFX) aimed towards the center of the Windrower.
7. Then add a Swivel Adapter (6MB-6FFX), a Quick Coupler Cap (1/4 Male), and a Quick Coupler (1/4 Male).
8. Now attach the Selector Valve to the Cab Reel Lift Bracket. Use two sets of 5/16 X 2-1/4 Bolts, two 5/16 Flat Washers (both sets on top of the bracket but underneath the valve), and 5/16 flange lock nuts.

Leave the front-most bolt loose for now in order to attach a cable clamp for the electrical cable later.

Ensure that the selector valve is oriented with the solenoid facing forward and Port 2 facing towards the center of the windrower.



9. Install a 90° Elbow (6MB-6MF) to the end of the quick coupler with the yellow handle, with the elbow lined up with the swivel point of the yellow handle.
10. Fasten the Quick Coupler underneath the bracket with a U-bolt (5/16 X 1-13/32 X 2-3/16), two Washers, and two C/Lock Nuts. One of the Washers will be a 3/8 Fender Washer, and will have a Quick Coupler Plug (1/4 Female) between it and the bracket.
- Ensure the quick coupler body is allowed to slide freely in the portion secured by the u-bolt.
11. Attach the open end of the 13" hose to the elbow installed on the quick coupler

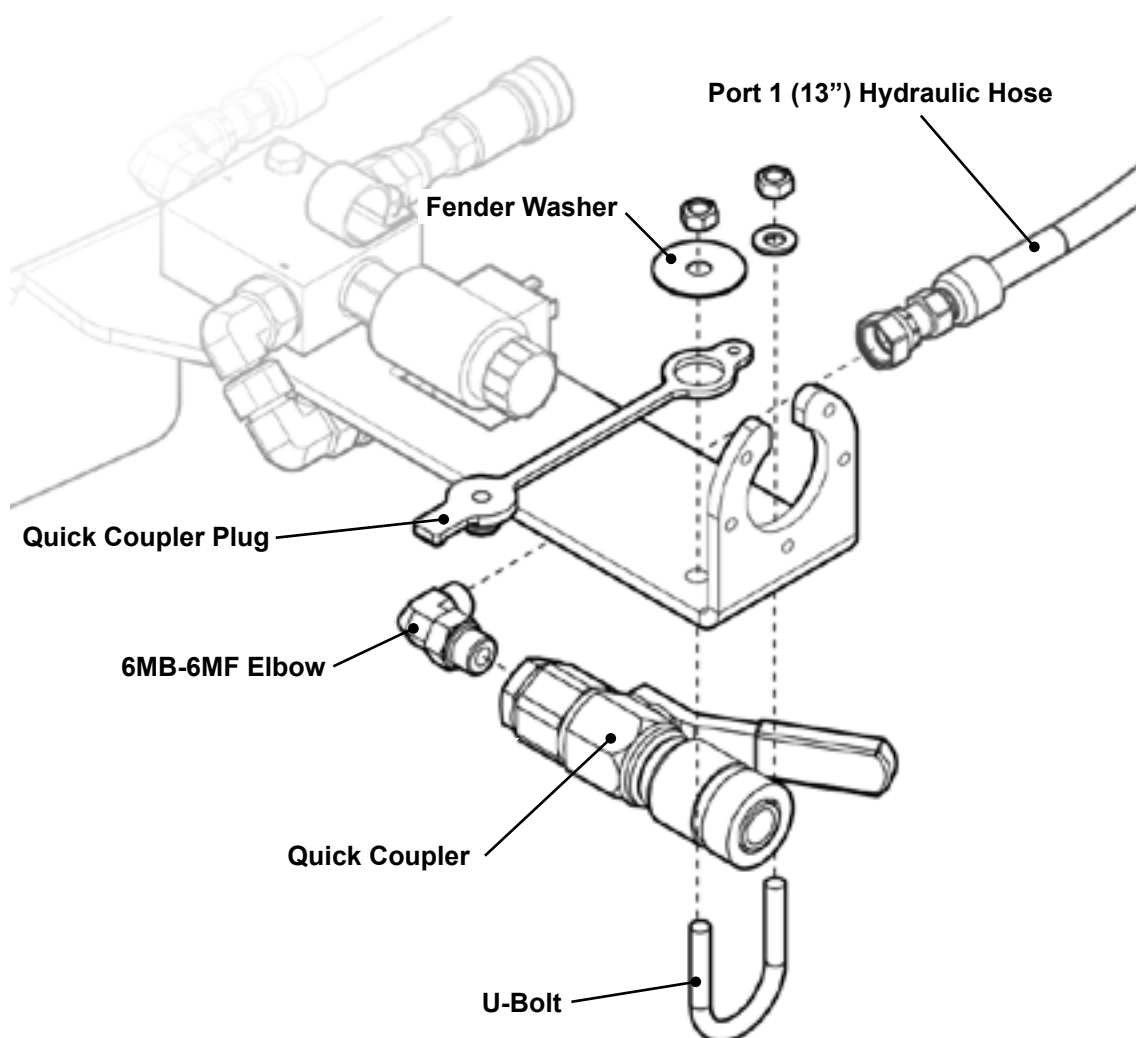


Illustration A - Page 32

Tilt Cylinder Installation

1. Secure the tilt mount support plate to the header tilt mount using carriage bolts (5/16 x1) and c/lock nuts (5/16) (see **illustration A**).
2. Secure the Tilt Cylinder Pivot Weldment to the Header Tilt Mount using a Hitch Pin (3/4 x 6-1/2). **See Illustration B.**
3. Attach Tilt Cylinder to the Tilt Cylinder Pivot Weldment by inserting the Rubber Bushing into the Barrel End Sleeve of the cylinder, then fasten the cylinder and weldment together with a Bolt (3/4 x 4-1/2), a Lock Washer (3/4), and a Nut (3/4). **See Illustration C.** The bolt must be inserted from below.
4. Insert the grooved steel bushing into the rod end of the cylinder and install snap rings (1 1/4) into the grooves to secure in place. **See illustration D.**

The Tilt Cylinder can be stored permanently on the machine, when not in use, by swinging it to the Left Side of the cab and placing it in the tilt mount support plate.

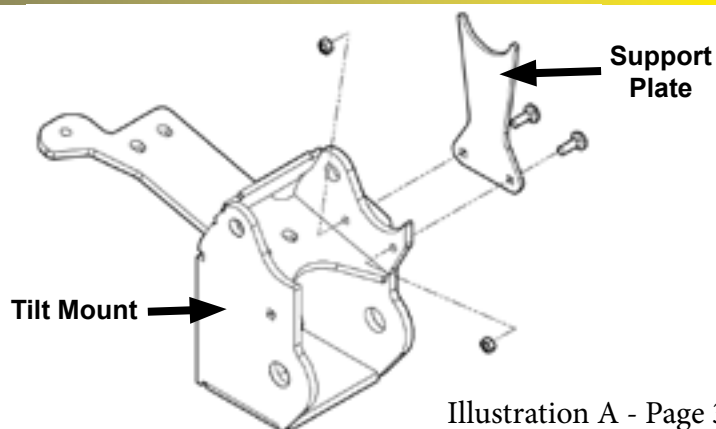


Illustration A - Page 33

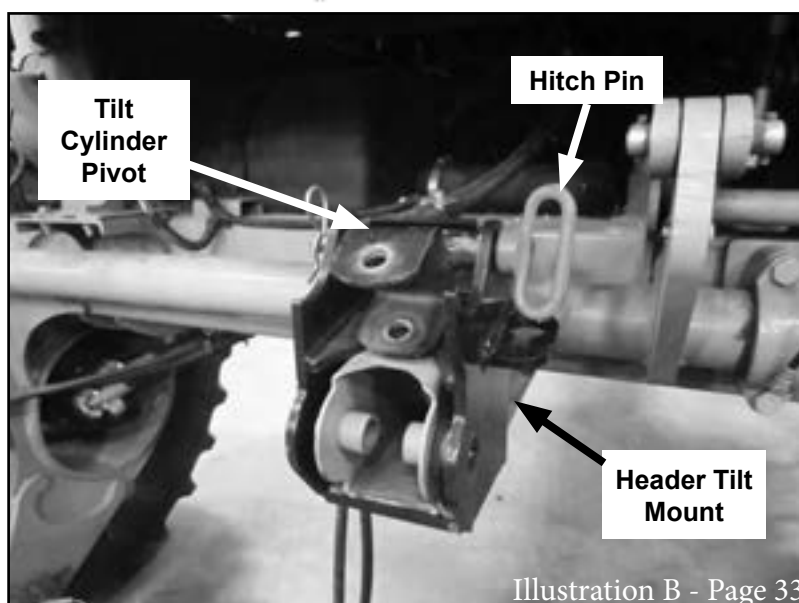


Illustration B - Page 33

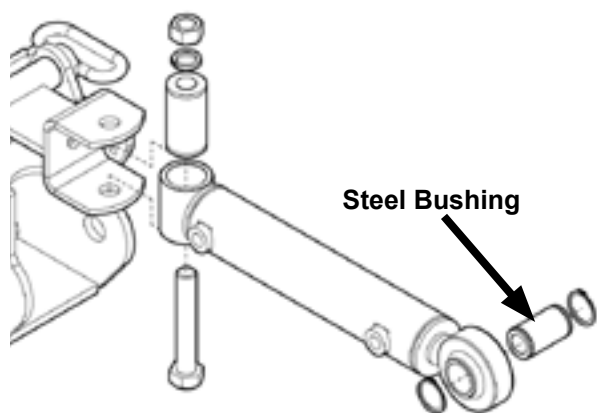


Illustration D - Page 33

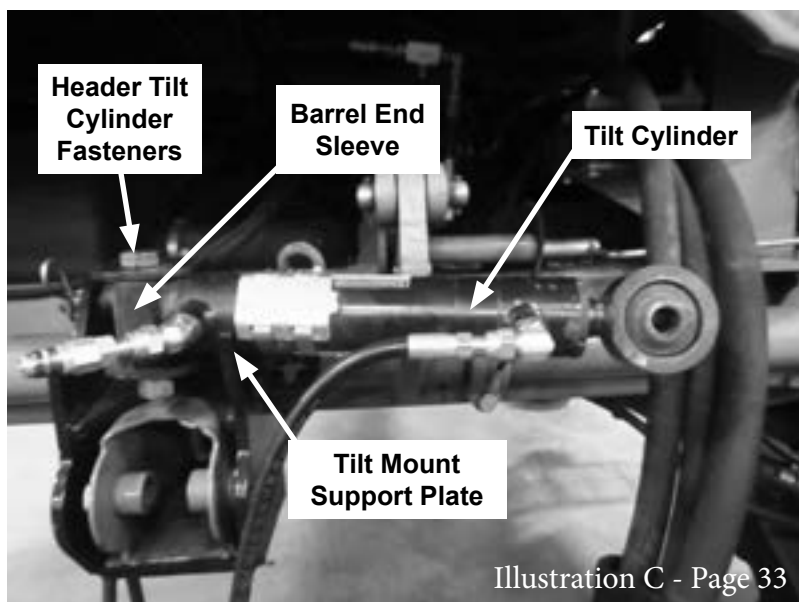


Illustration C - Page 33



Hydraulic connections for the Honey Bee Tilt Cylinder

1. In the Barrel End Port of the Tilt Cylinder (2 X 8) install a 45° Elbow (6MB-6MF), a Swivel Adapter (6MB-6FFX), a Quick Coupler Dust Cap (1/4 Male), and a Quick Coupler (1/4 Male). This will connect to the JD Tilt Cylinder Hose (Return).
2. Starting at the Rod End Port install a 90° Elbow (6MB-6MF), a 44" Hydraulic Hose (6FFX-6FFX), a Nipple (6MB-6MF), a Quick Coupler Dust Plug (1/4 Female), and a Quick Coupler (1/4 Female). This will connect to the Selector Valve Port 3 Quick Coupler.
3. Attach the tilt indicator (with decal) to the tilt cylinder using two gearclamps (1-13/16 x 2-3/4). Place the tilt cylinder in the storage position to check the tilt indicator clearance with the cab cowling. Re-adjust the indicator position as necessary.

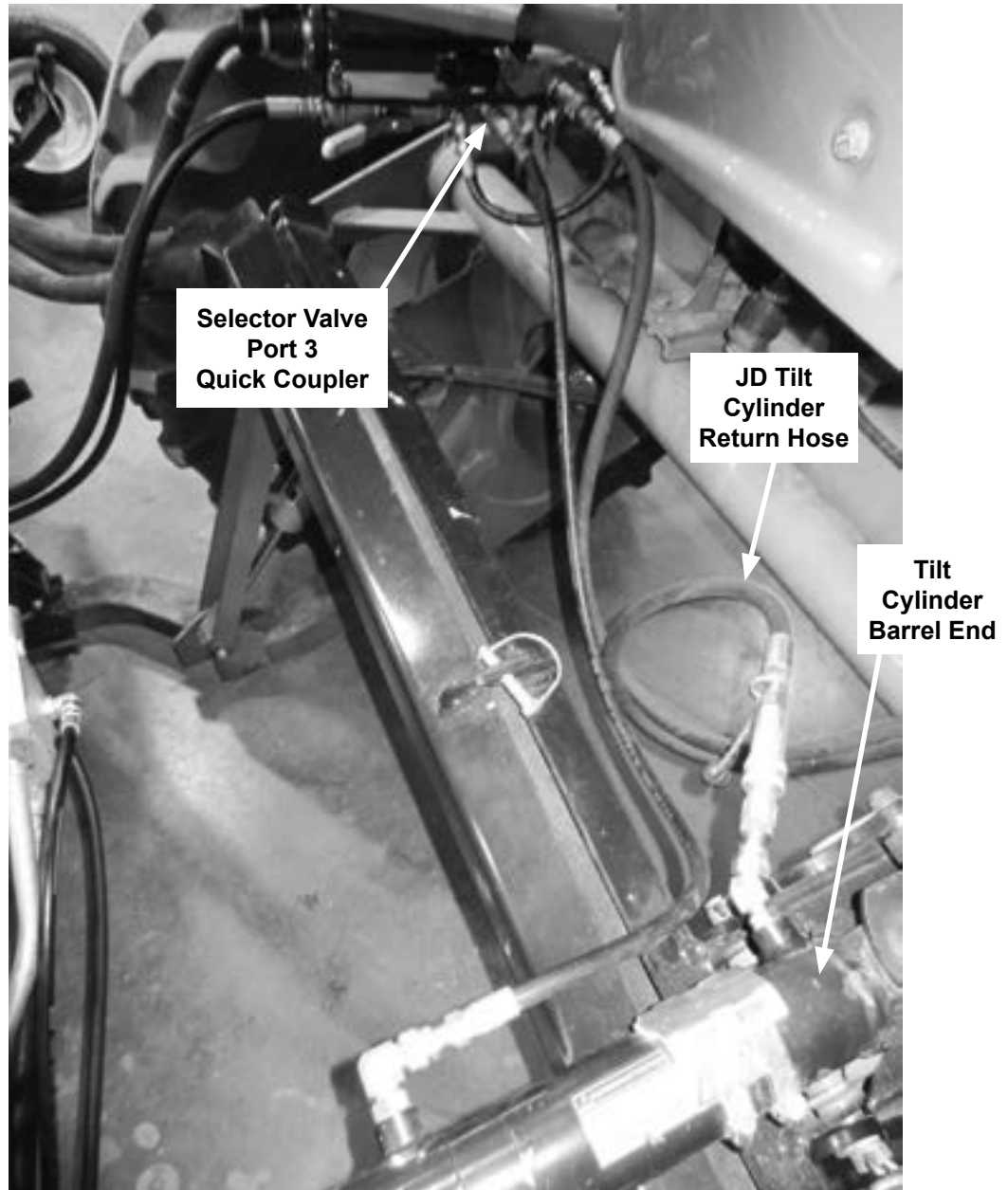


Illustration A - Page 34

Electrical

Control of the Honey Bee Swather is accomplished through the JD Windrower controls and an additional Switch Box supplied by Honey Bee mounted in the cab. A cab mount is available from John Deere, and must be purchased from the dealership.



Illustration A - Page 35

Illustration A shows the Honey Bee Switch Box mounted with the JD Cab Mount. It is located in the right hand window of the cab. **Illustration B** shows the components that come with the Honey Bee Switch Box (switches are included already assembled in the box).

The Switch Box comes with three cables. One cable is to be connected to the JD Windrower Power Supply (**see Illustration C**), which is located on the floor to the right of the Operators Seat.

Another cable is for the switch box connections. The third cable is for the connections outside the cab.



Illustration B - Page 35

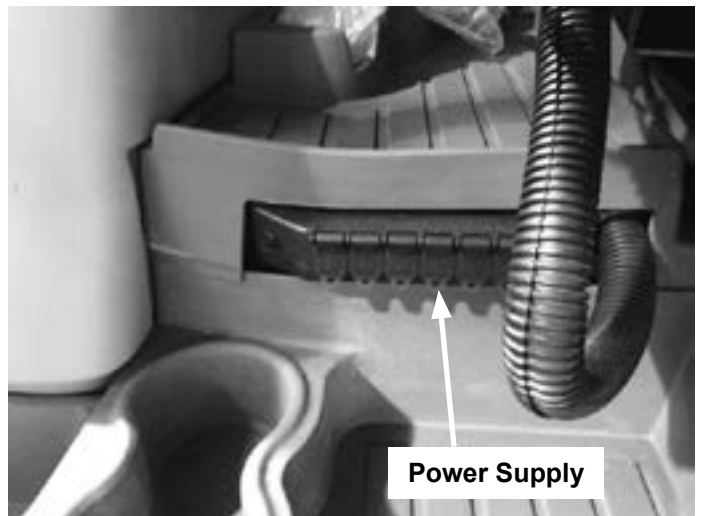


Illustration C - Page 35



The Switch Box Cable (**Illustration A**) has a plug for the back of the Box, one that connects to the Power Supply Cable (**Illustration B**), and one that goes to the Bulkhead Plate in the back of the Cab (**Illustration C**).

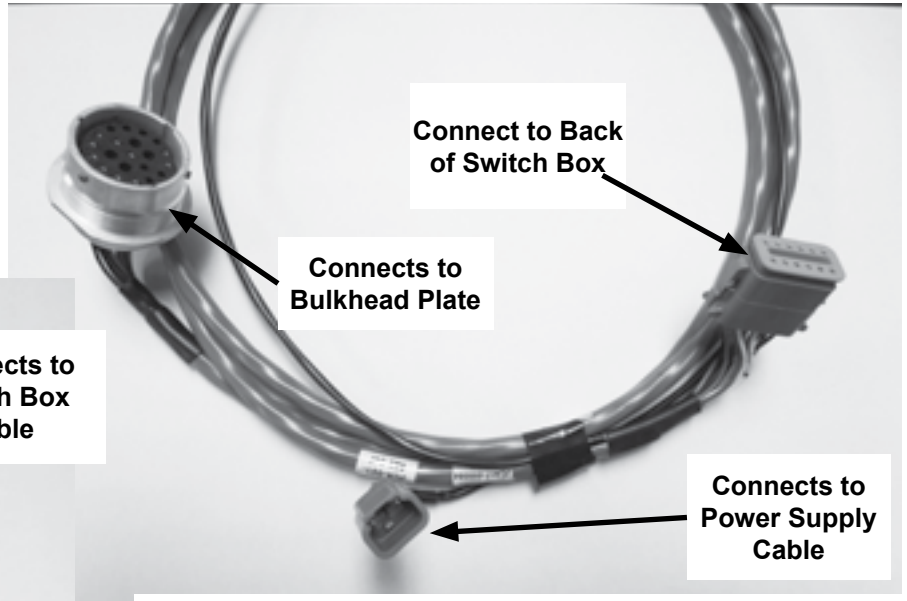


Illustration A - Page 36



Illustration B - Page 36

To route the Switch Box Cable in the cab, first remove the Bulkhead Plate (**Illustration C**) from the Outer Right Rear of the cab.



Illustration C - Page 36

In the cab, remove the cover for the controller compartment (at the right-back corner of the cab) to gain access.

Run the Switch Box Connector and the Power Supply Connector through the hole at the rear of the cab as shown in **Illustration A**.

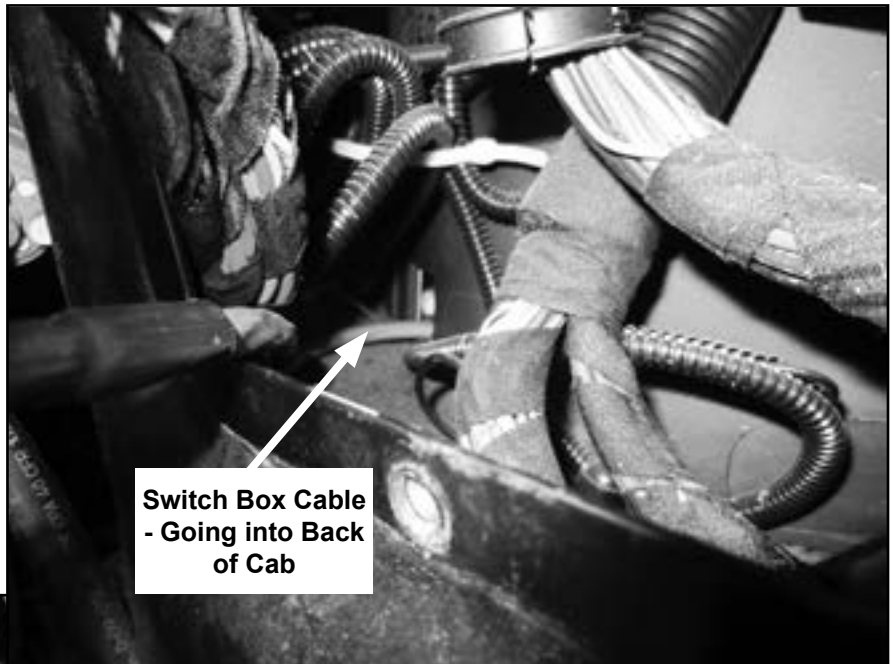


Illustration A - Page 37

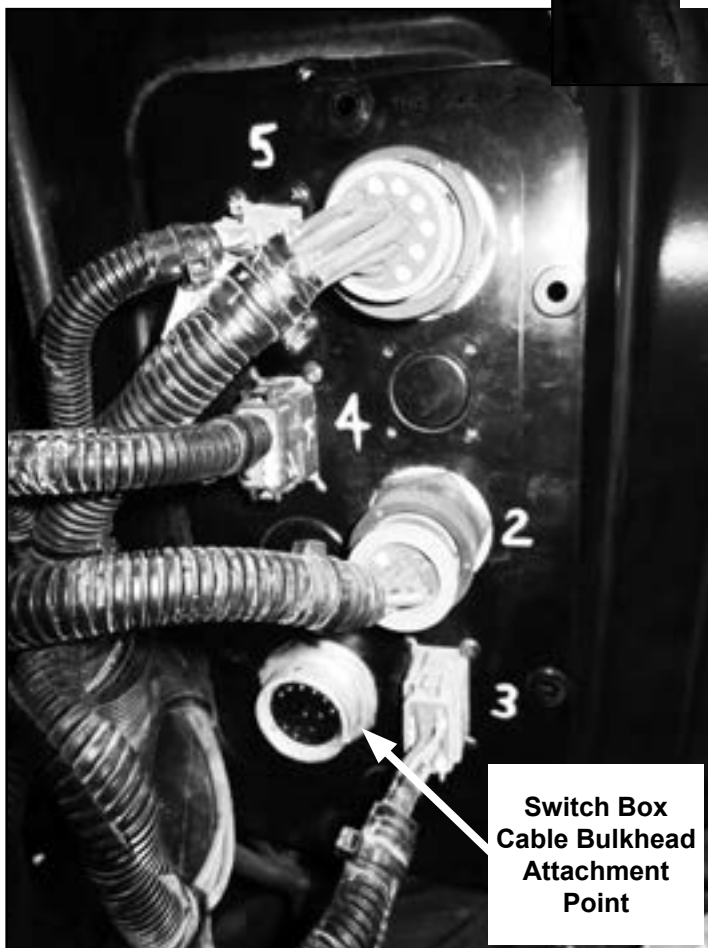


Illustration C - Page 37

Before attaching the Switch Box Cable to the lowest round hole in the Bulkhead Plate, you must remove the Knockout. To do this, take a Utility Knife and score the outline of the Knockout then use a hammer to remove it. Attach the cable to the Bulkhead with the Cable Connector Nut and lock washer provided.

Bolt Bulkhead Plate back onto the cab.



The branch of the Switch Box Cable which goes to the Bulkhead is threaded through the Right Hand Back Corner of the cab at the floor. **See Illustration A.**

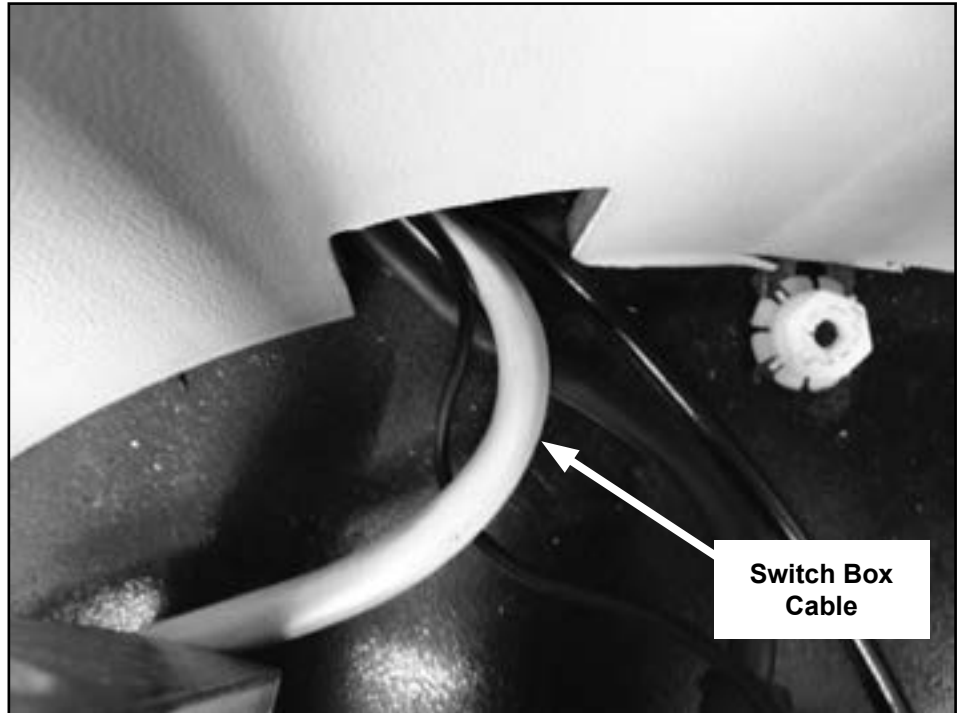


Illustration A - Page 38

The cable should then be routed through the JD Windrower Controller compartment (**See Illustration B**).

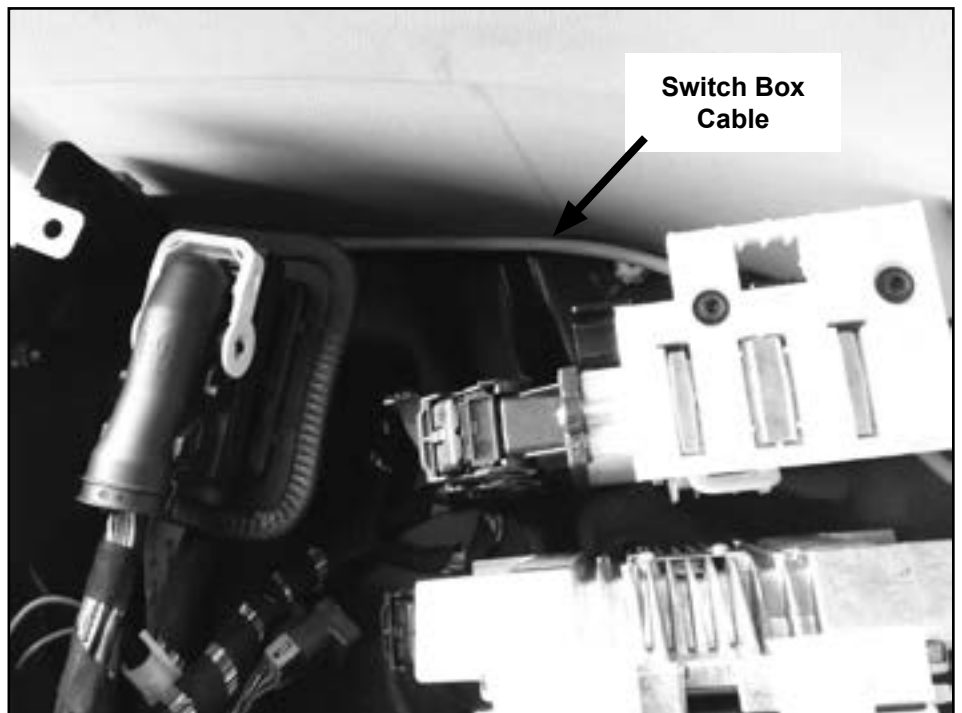


Illustration B - Page 38

The Switch Box Cable is shown exiting the Controller Compartment then travelling up to the Switch Box. **See Illustration A.**

Connect the switch box cable to the back of the switch box and to the power supply cable

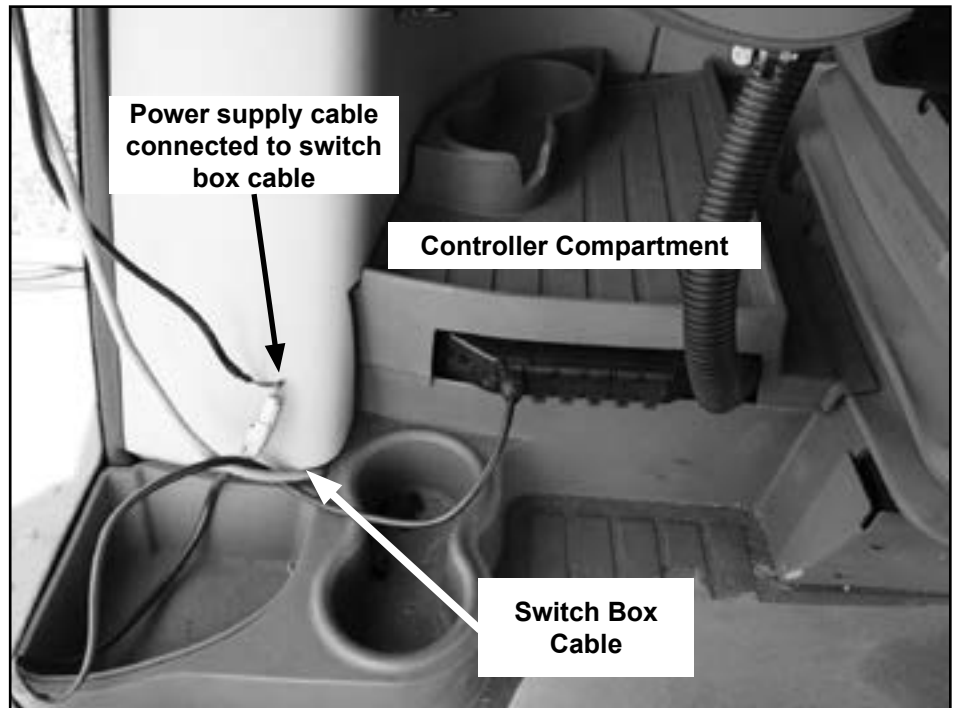


Illustration A - Page 39

In the Premium Cab Option the Side Storage Compartment will require that the Switch Box Cable be routed around it then up to the Switch Box.

Replace the cover fro the controller compartment once routing of the cable is complete.

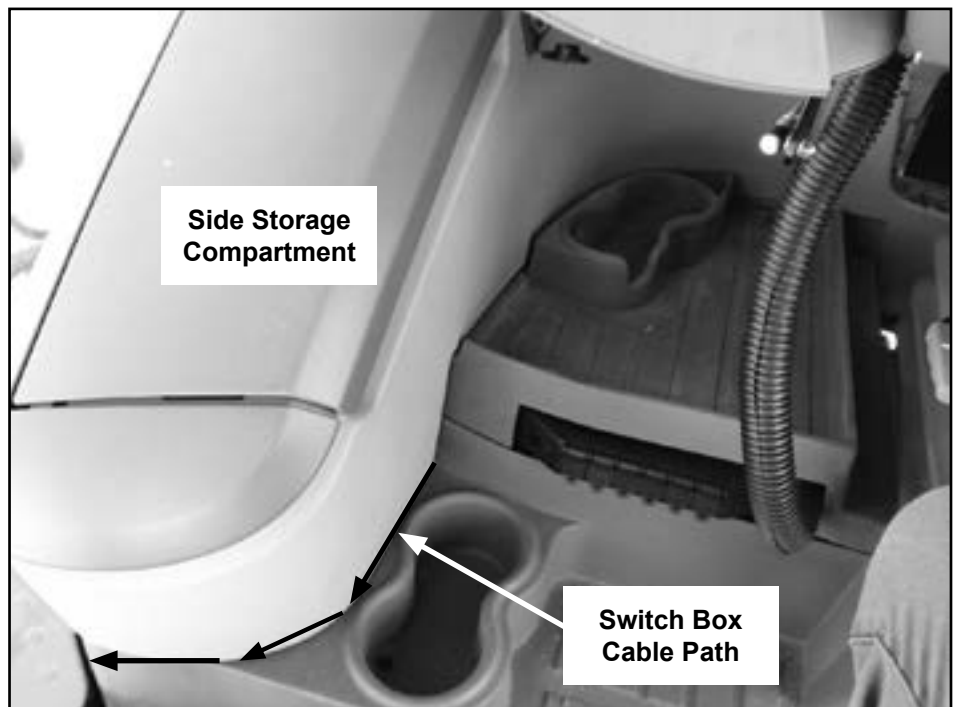


Illustration B - Page 39



The last cable connects to the Switch Box Cable at the Bulkhead then follows an existing JD cable to the front of the Windrower. At the first "Y" of this cable, the 14 Pin Plug ties into the JD system. Using Cable Ties, keep this section suspended as shown in **Illustration A**.

The rest of the cable goes to the Mount Bracket (**Illustration B**) with the 21 Pin Plug mounted on the front, and the Hirshmann Plug connected to the Selector Valve solenoid.

Secure the cable clamp and flip-up dust cap.

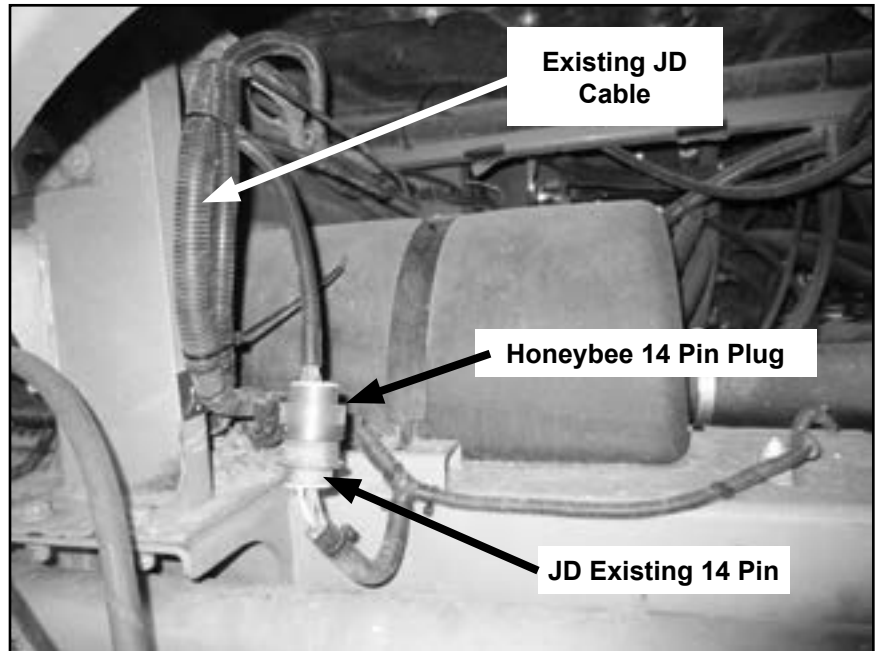


Illustration A - Page 40

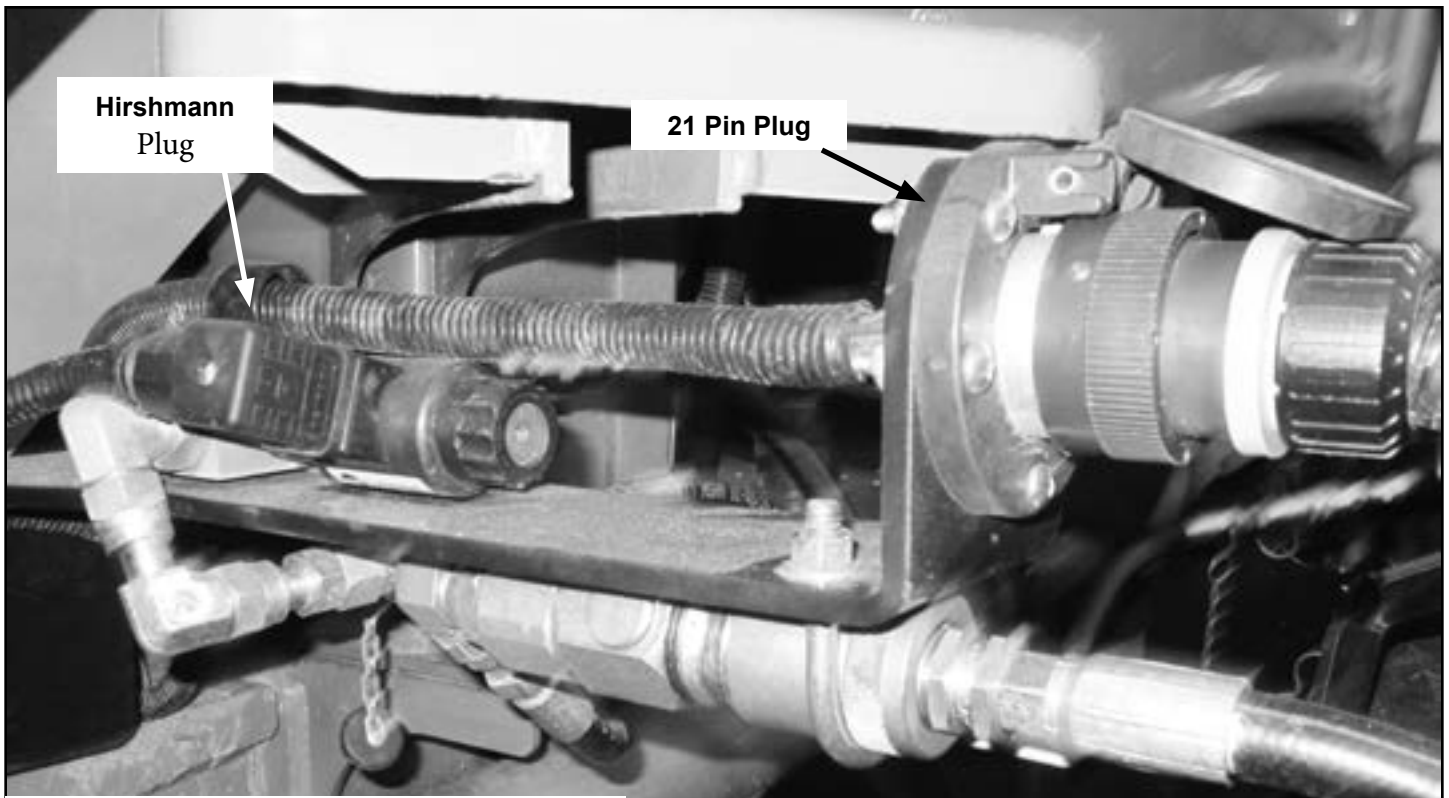


Illustration B - Page 40

Lift-Arm Extensions

Place each of the lift arm extensions on the windrower lift arms. Secure each extension in place using the following parts:

- a) M24-3.0 x 170mm Bolt
- b) Four 1" SAE washers
- c) M24 Nylock nut.

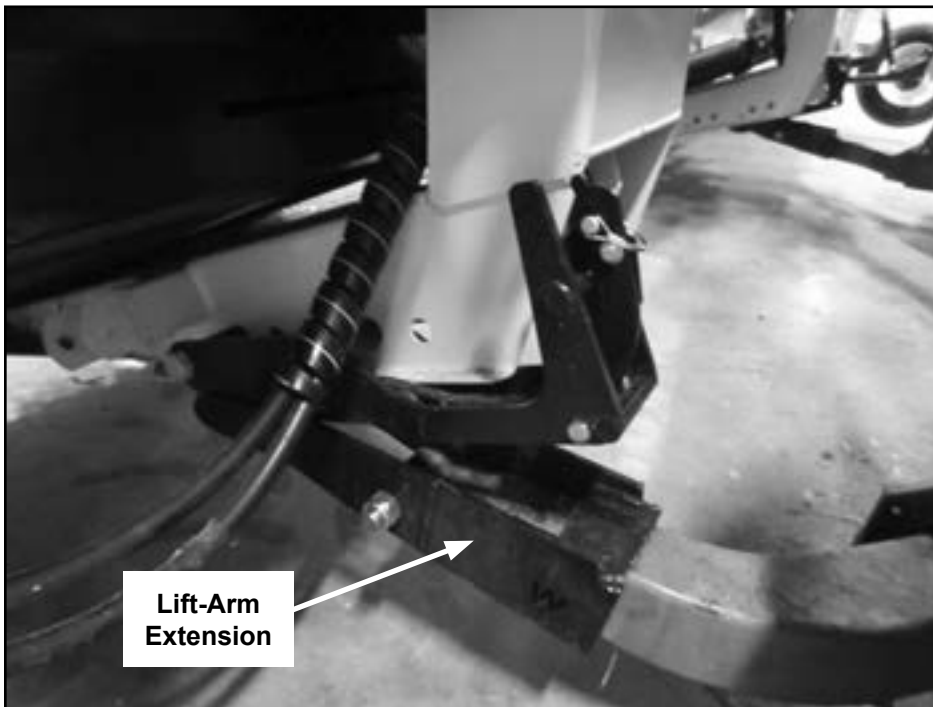
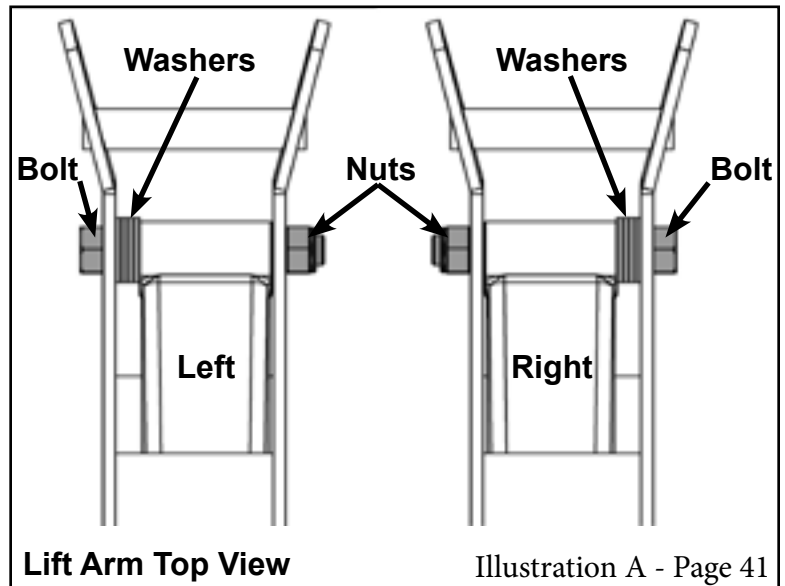


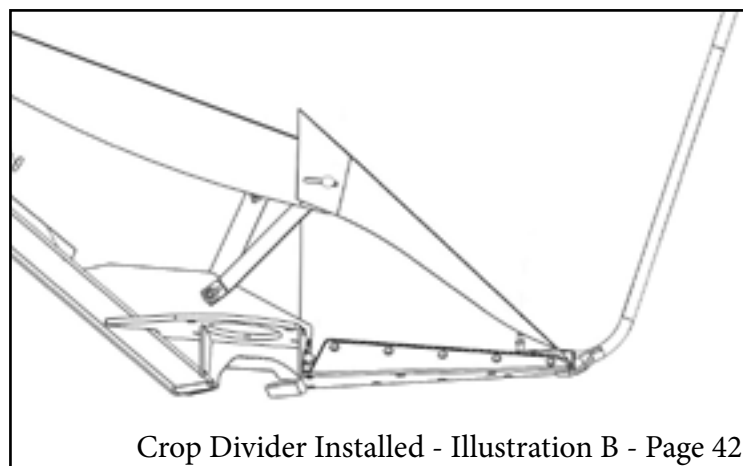
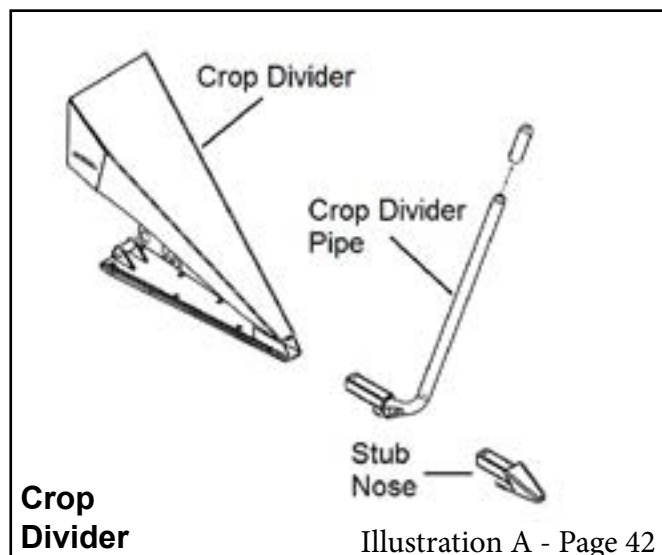
Illustration B - Page 41

NOTE!

Ensure the Lift Arm Extensions are pushed towards the outside ends of the table by the four washers as shown above.

Crop Divider Installation

1. Park the Swather on flat, hard, and level ground. Support the hitch end of the unit by extending the hitch jack until the swather is sitting level.
2. Install the crop dividers, and crop divider pipes (or snub nose) to the ends of the table. The crop divider and pipes are not installed at the factory for shipping purposes. Once installed, operators should be aware of the assembled width of the swather, and should check local regulations before transporting on public roadways.
3. The crop divider is fastened, and pivots, on one (1) 1/2"x5" carriage-head bolt through a tube on the bottom rear of the divider and two lugs on the bottom front of the frame. Secure the bolt with a 1/2" lock nut, keeping it loose enough so that the divider will still pivot freely on the bolt. The top of the crop divider is held in place with two (2) 3/8" x 1" carriage-head bolts connecting the top rear of the divider with the top front of the deflector. They are held in place using the supplied locking textured washers and 3/8 locking nuts. The top bolts have an arched slot, for variable positioning, in the top of the divider. This allows the divider to be adjusted to approximately run parallel with the ground.
4. When properly positioned, the crop divider overlaps the outside of the crop deflector to provide a smooth transition for the crop.
5. Insert the crop divider pipe (or snub nose) into the nose of the crop divider. Tighten the 3/8" x 1 1/2" bolt with lock nut against the divider pipe base and secure with the lock nut.



NOTE!

The divider is designed to be adjusted in order to run without trampling the crop. This will provide good crop separation, and will help prevent crop plugging in the corners. The crop divider pipe is intended to be used when cutting off the ground, and the stub nose is to be used when cutting on the ground.

Install Strut Mounting Boots

When installing Strut Mounting Boots, use the forward mount holes in the frame.

1. Each mounting boot should be installed flush against the edge closest to the middle of the table on each of the two center struts of the swather as shown in the illustrations on this page.
2. Each mounting boot should be held against the outside wall of the strut with the following parts:
 - a) Bolt – 1" x 12"
 - b) Spacer – 1½" x 3 5/16"
 - c) Spacer – 1½" x 5 ¾"
 - d) Nylock Nut – 1"



NOTE!

Strut mounting boots will already be installed on the table from factory

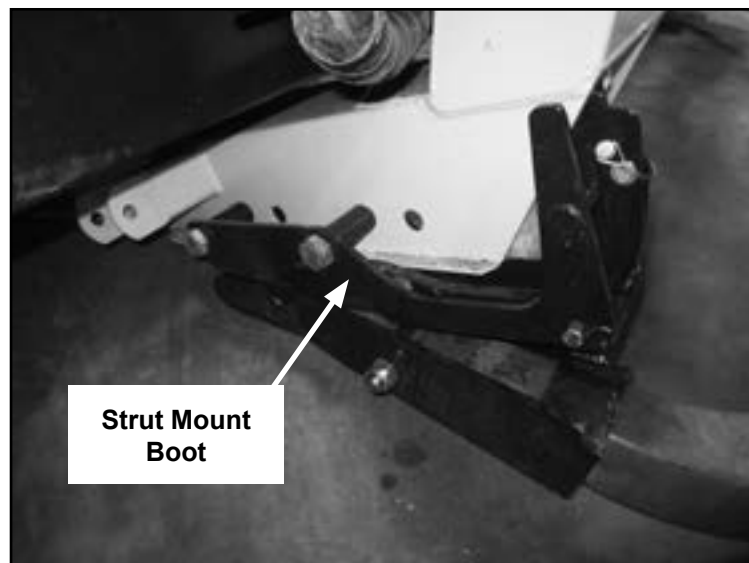


Illustration A - Page 43

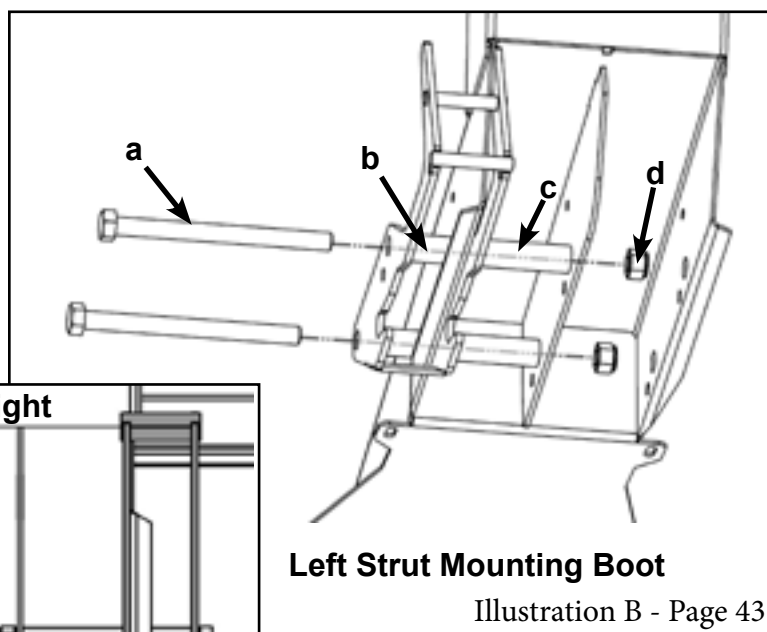
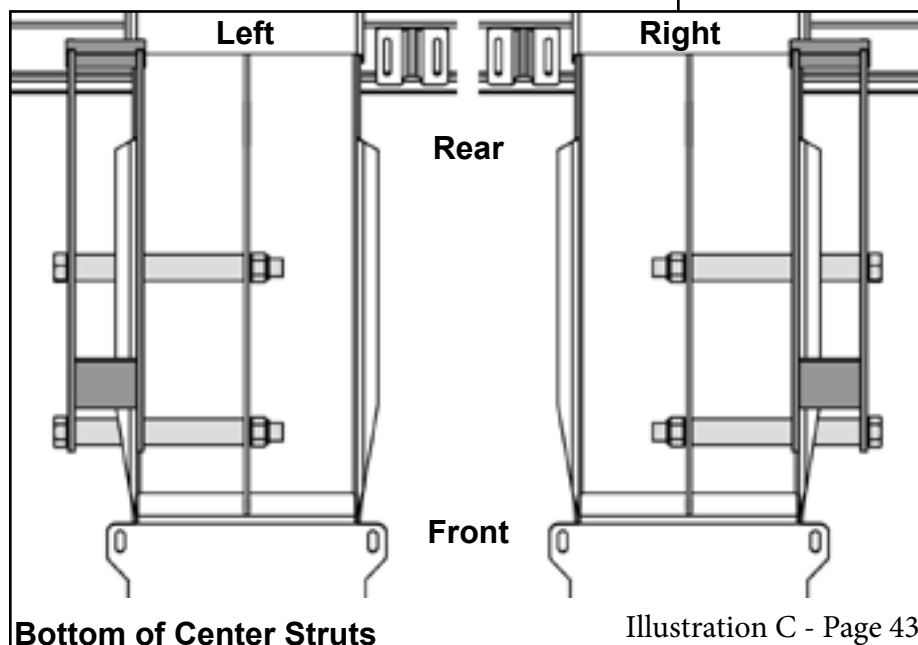


Illustration B - Page 43



Bottom of Center Struts

Illustration C - Page 43

Install the Hose Hanger

A bracket and canvas loop are provided to store the hydraulic hoses when not in use. Use of this hanger will prevent damage to the hoses and connections from being run over, or trailed on the ground.

The bracket is installed on the vertical cab railing on the right side of the cab, 10" below the middle horizontal tube.

The hydraulic hoses are fed through the canvas loop.

When the hydraulic hoses are not in use, ensure they are placed in a location where they will not become damaged or contaminated by dirt.



Illustration A - Page 44

Hose Carrier Installation

1. Pre-assemble the two halves of the hose carrier together using bolts (3/8x1") and c/ Lock nuts (3/8"), lining up the two sets of hinges on both halves of the hose carrier.

NOTE!

The Hose carrier must be removed before using the JD mower

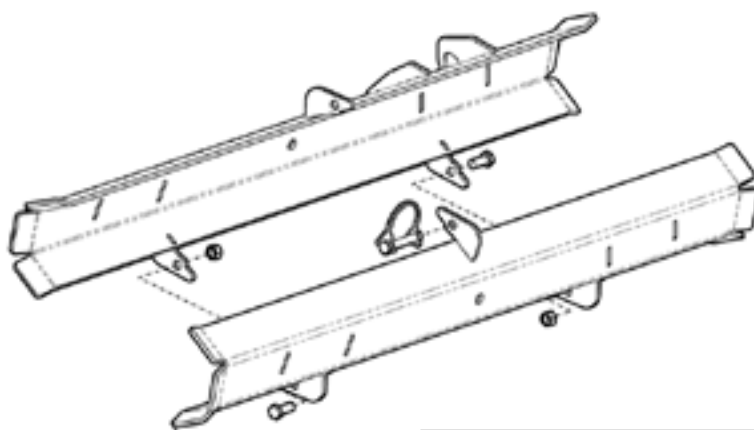


Illustration B - Page 44

2. Pin the hose carrier (illustration C) to the header tilt mount and windrower, with the hitch pin (1x6-1/4").
3. Set the three rotary mower motor hoses into the carrier (illustration D).
4. Close the carrier and secure with a quick pin (3/8x2")

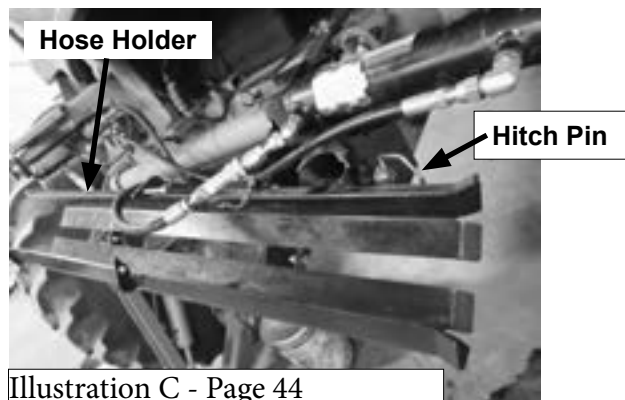


Illustration C - Page 44

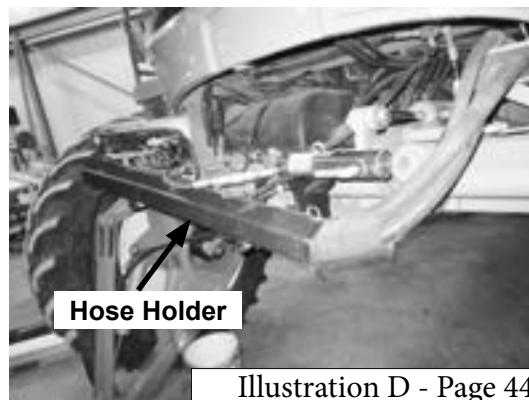


Illustration D - Page 44

Setting Header Table Width

Setting the pump flow for the W235 or W260 does not require adding any physical brackets to the windrower or adjusting physical linkages.

The pump flow is automatically set at 42 gpm when the 'Draper' icon box on the 'Windrower Setup' screen has been 'checked'.



NOTE!

When changing back to a JD Rotary Mower, the same icon box should get 'unchecked'.

See the windrower operators manual for more details.

The Dealer should also check with the JD Software Delivery System (SDS) that the installed software version is correct for the windrower.

Setting Header Table Width

The table width should be adjusted to the correct width for the attached table so that GPS and acreage values are calculated accurately.

Set the 'Width' value on the 'Header Setup' screen to the size of the table being used.

Leave the 'Width Change' value as '1.0' ft.



NOTE!

When changing back to a JD Rotary Mower, the 'Width' value should be reset to the proper size. See your windrower operators manual for details.



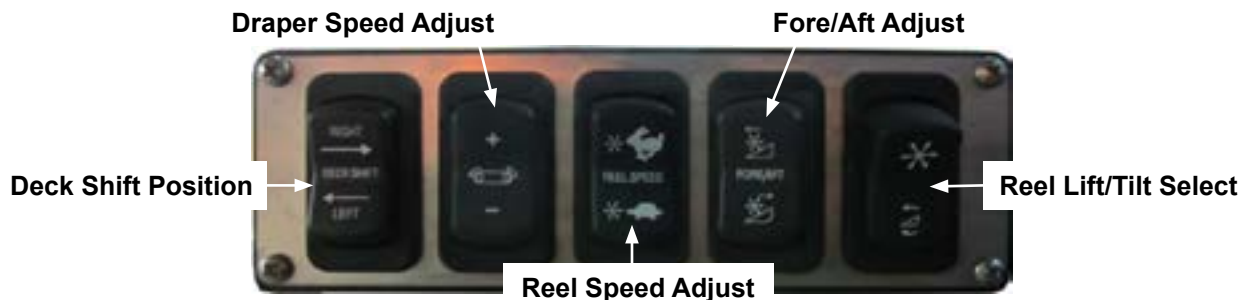
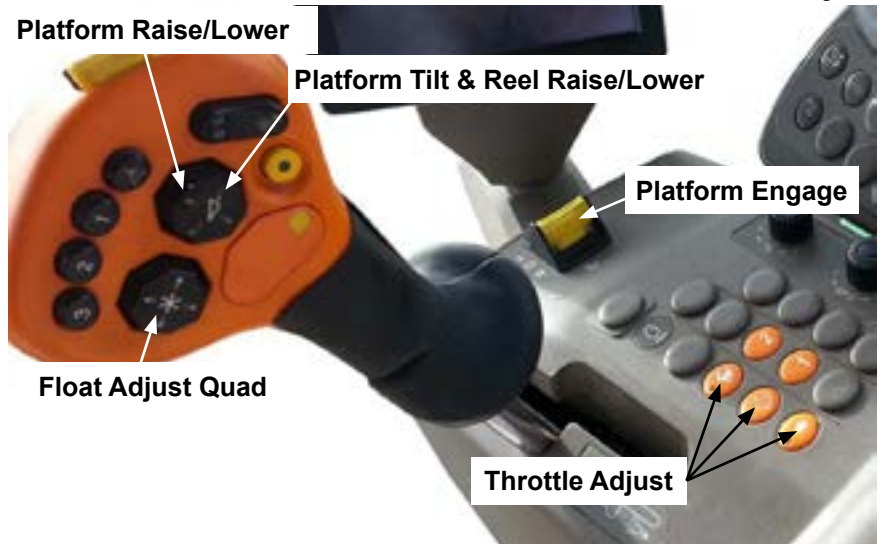
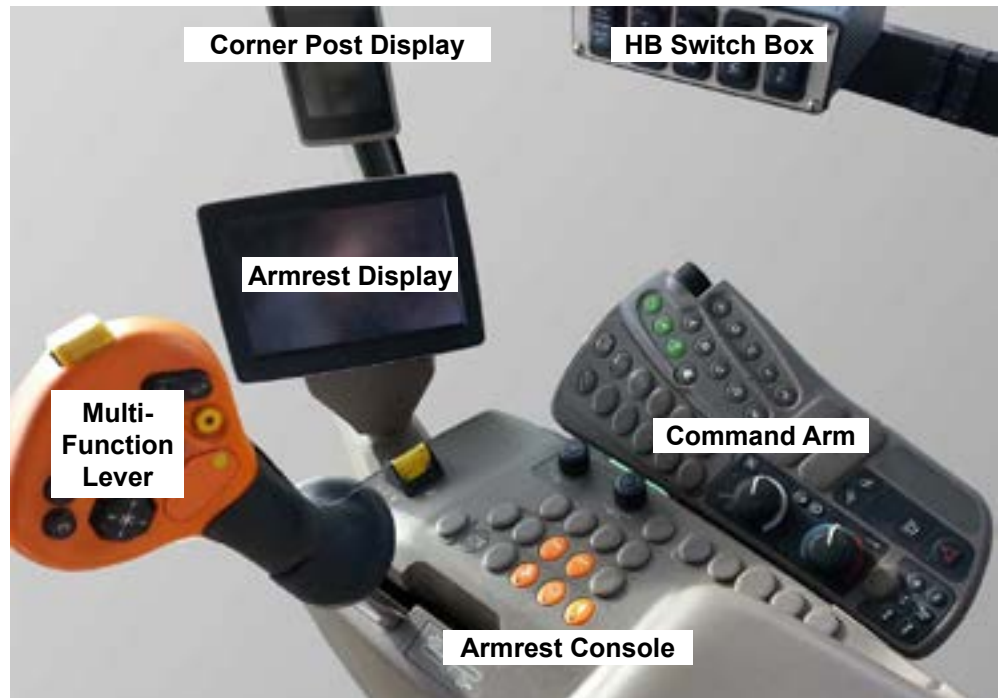
Basic Windrower Controls

Basic function controls are located on the multi-function lever, cab console, and Honey Bee Switch Box.

Throttle RPM (mid) and Float are adjustable using the rotary selection dial on the JD Command Arm.

See the windrower operators manual for more details.

See the Operation and Leveling sections for specific Reel Lift/Tilt and Float functions.



Mounting the Swather to the Windrower

1. Park the swather on firm, level ground, where it will be easily accessible for the windrower operator to pick up. Ensure the swather is level.
2. Lower the screw jack, located on the side of the transport axle, and raise the axle until the wheel assembly clears the ground.
3. Remove the quick pin securing the hub and spindle, and remove the wheel assembly. Store the wheel assembly in an appropriate location, or if the gauge wheel option has been purchased, install the wheel into one of the gauge wheel mounts and secure with the quick pin.
4. On each of the mount boots, remove the pin holding the locking arms in place and lift the lock arms into the 'mounting' position as shown (**See Illustration "C"**).



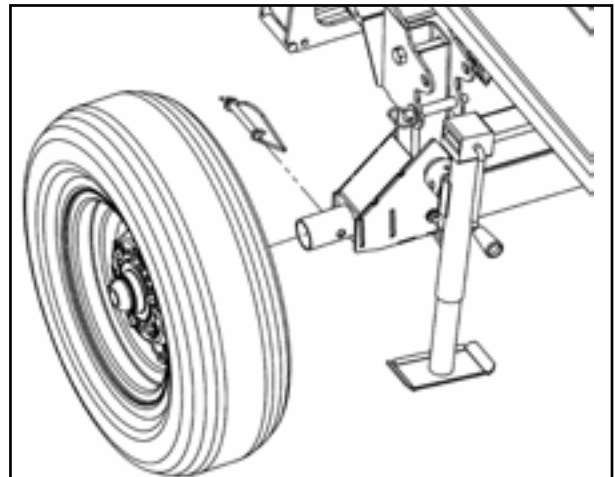
WARNING

Failure to adjust the lock arm properly will result in damage to the mount boots and the lock arms.

5. Release windrower float pressure by unloading pressure from the accumulators (see windrower operators manual). Start the windrower. Test the lift-arm controls to ensure smooth operation.

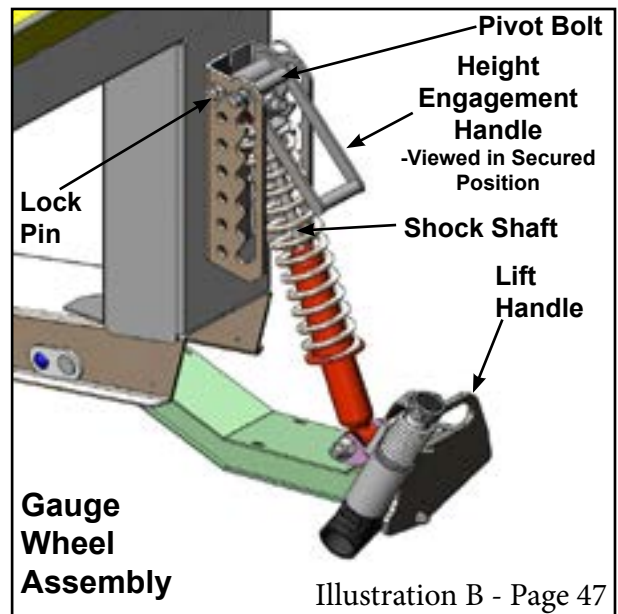
NOTE!

If the lift arms move too abruptly, reduce the flow of oil at the needle valve as shown in "**Needle Valve**" on page 30.



Extend Jack & Remove Wheel

Illustration A - Page 47



Gauge Wheel Assembly

Illustration B - Page 47

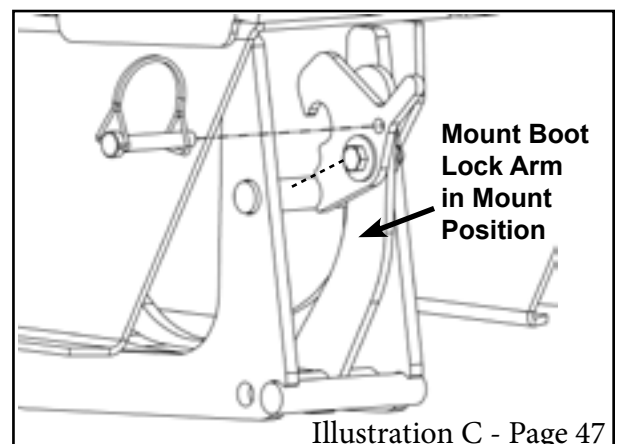
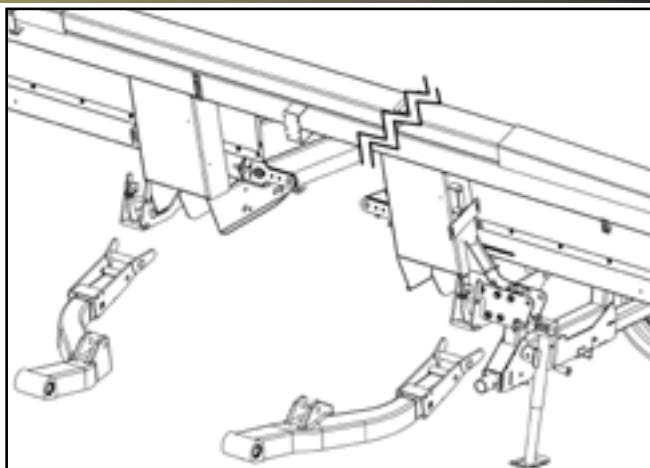


Illustration C - Page 47

6. Move the Windrower into position, lining up the lift arm extensions with the mounting boots. Ensure the arms are low enough to move under the boots.



Lift Arm Line Up

Illustration A - Page 48

7. Slowly raise the lift arms and move forward until the arm extensions are firmly set into the mounting boots (see illustration B). Ensure the end of the extension arm has fully engaged the mounting boot and the locking arm has dropped into the proper position. Do not lift the table any higher at this point.

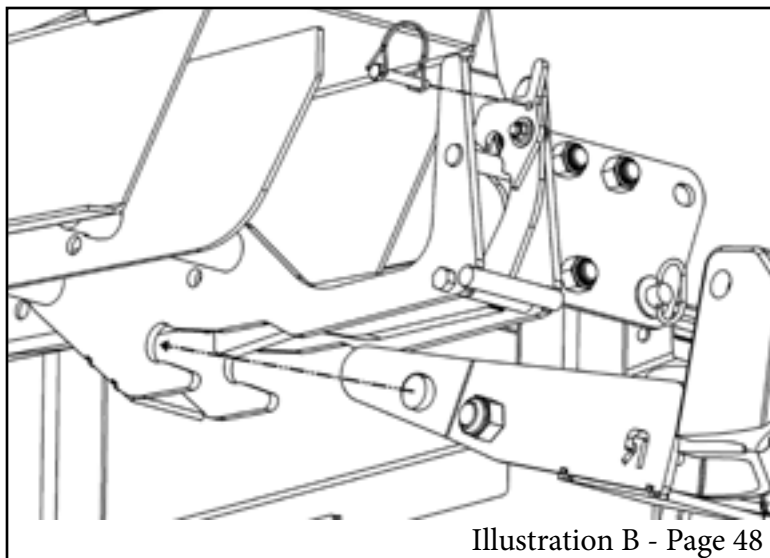


Illustration B - Page 48



Shut the engine down and wait for all moving parts to stop before leaving the cab. Ensure the park brake is set.

8. If the arms are located correctly, secure the lock arms in their "locked" position with the pin as shown to the right.

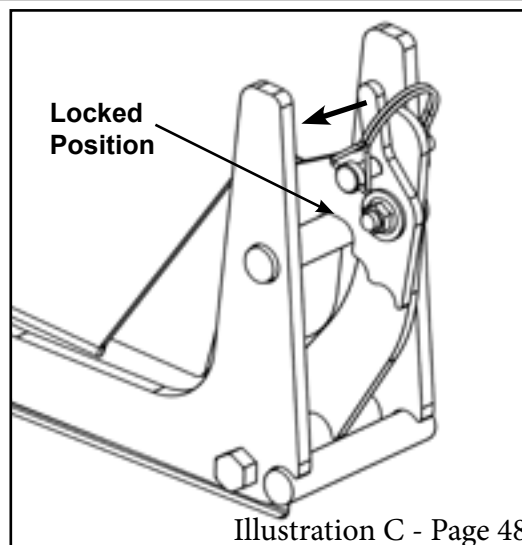


Illustration C - Page 48

9. Attach the Safety Chain to the Header Tilt Mount. The Indicator Bolt on the chain marks the minimum length of chain to be used. Do not remove this bolt (**see Illustration B**).



Do not attempt to lift the swather until the safety chain is attached.

10. Remove the Cylinder Mounting Bracket Swivel Pin so that the linkage can swivel up and down to line up with the Tilt Cylinder (**see Illustration A**).
11. Secure the Tilt Cylinder to the Cylinder Mounting Bracket with a Hitch Pin (3/4 x 4-1/2) (**see Illustration C**).
12. Start Windrower and raise table to full height.

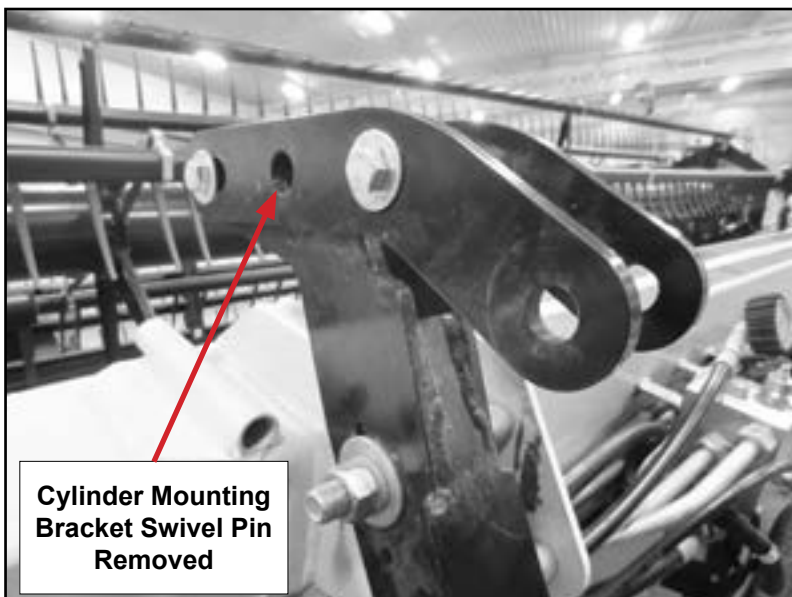


Illustration A - Page 49

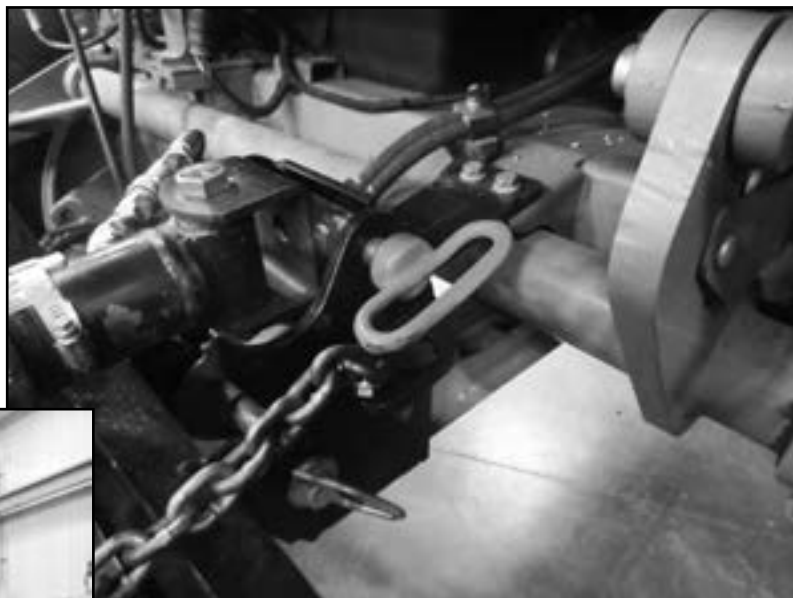


Illustration B - Page 49

NOTE!

To raise table to full height, windrower float pressure must be increased.

CAUTION

Shut the engine down and wait for all moving parts to stop before leaving the cab. Ensure the park brake is set.



Illustration C - Page 49



13. Engage Windrower Table Lift Lock (see Illustration A).

14. Re-install Cylinder Mounting Bracket Swivel Pin (see Illustration B).



Failure to re-install Swivel Pin will result in breakage of power unit windshield during operation.

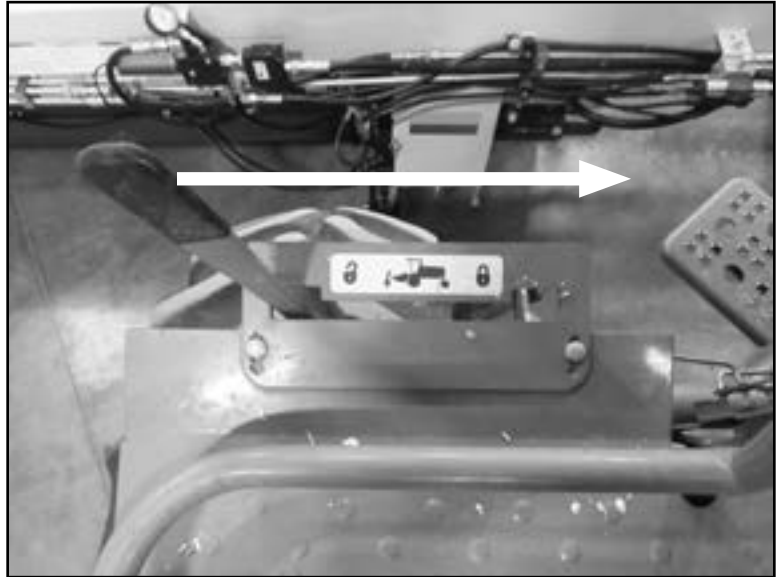


Illustration A - Page 50



Illustration B - Page 50

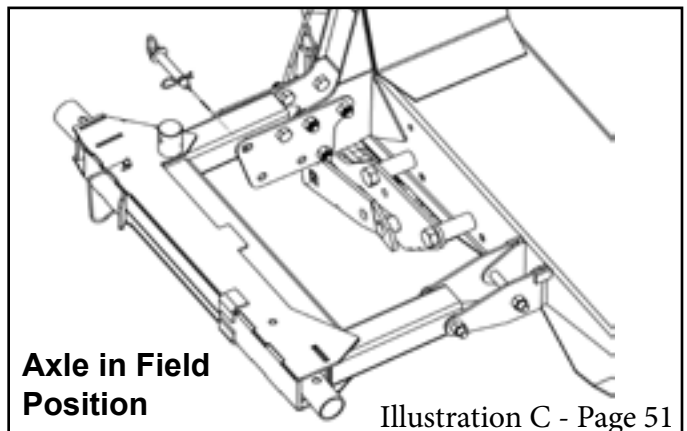
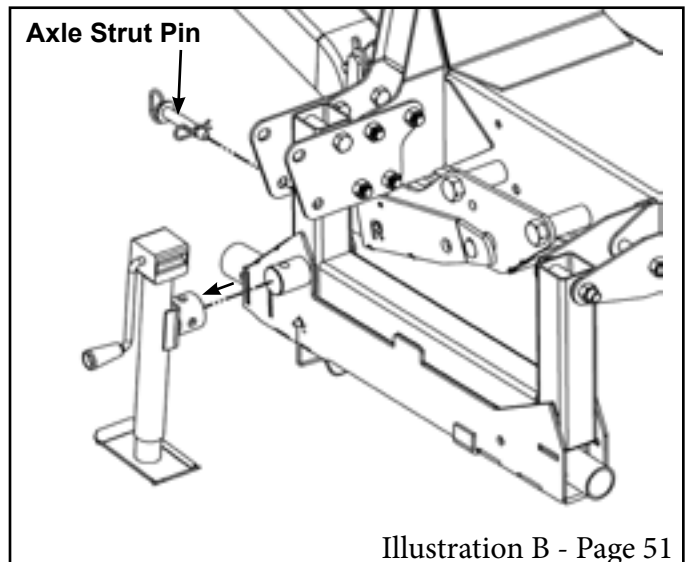
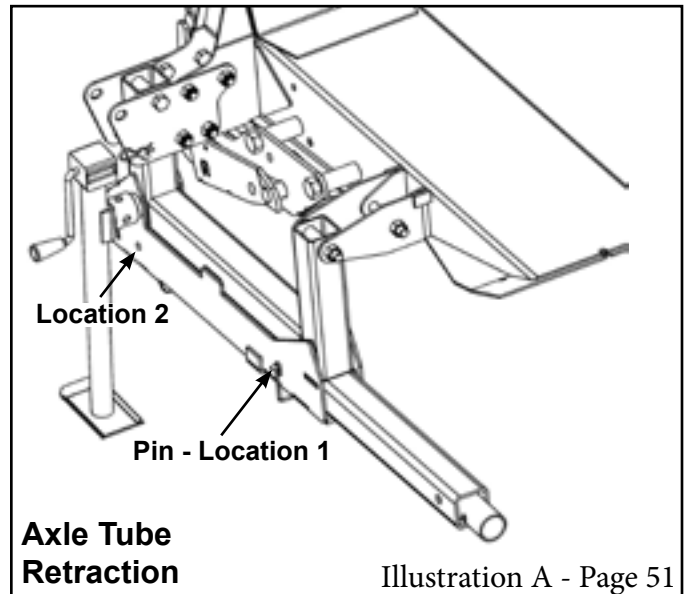
Store the Transport Axle

1. Remove the wheel assembly from the cutter-bar side of the table, and store in an appropriate location, or install onto the remaining gauge wheel mount
2. Remove the jack.
3. Remove the pin which holds the axle extension in place, from location #1 and slide the axle into the housing.
4. Secure the axle in the housing by re-inserting the pin in location #2 as shown.
5. Remove the jack and remove the pin holding the axle strut in the vertical position.



WARNING The axle is heavy!

6. Swing the axle up, and secure using the pin. Replace the jack as shown and secure with the pin.



Store the Transport Hitch

1. The swather should still be lifted from the ground at this point, with the table safety lock in place.
2. Fully retract the jack leg on the left end of the table by turning the jack handle, and by collapsing the lower section to the first hole.
3. Release the hitch clamp and small quick pin, remove the chain and slide the jack off the hitch mount. Store the jack as shown in Illustration "C", and tighten the clamp.
4. Pull the Lock Pin on the hitch tube and slide the tube into the storage sleeve. Refer to **Illustration "A"**. Attach the hitch safety chain to the storage stub as shown in Illustration "C".



NOTE!

If excessive vibration occurs, extend the jack until it contacts the hitch tube storage sleeve, as shown.

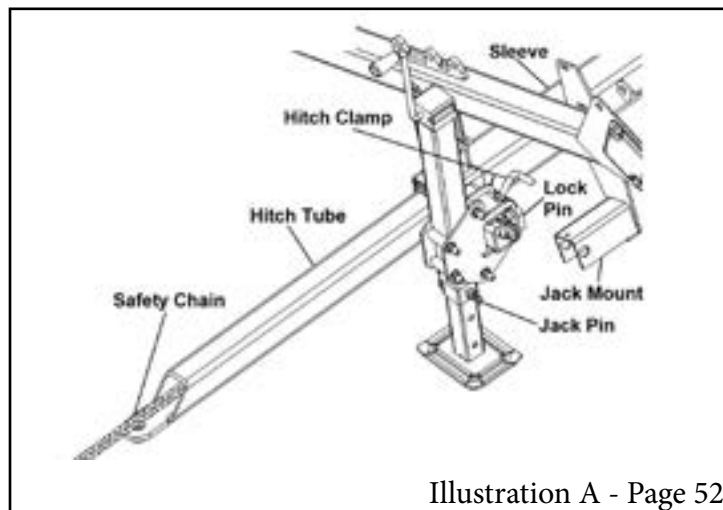


Illustration A - Page 52

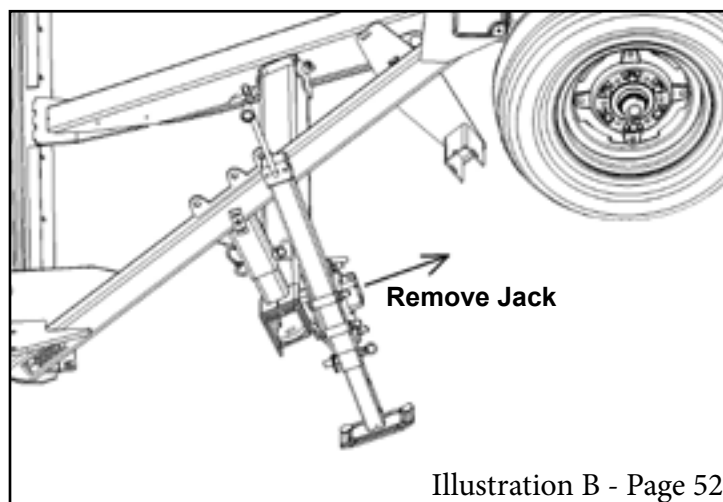


Illustration B - Page 52

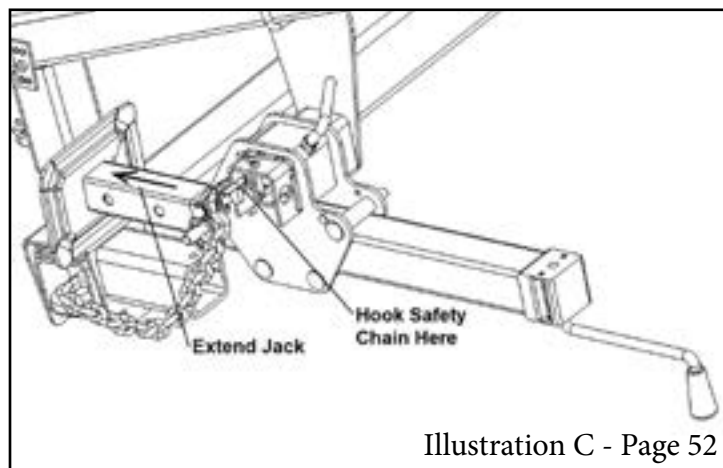


Illustration C - Page 52

Connect Electrical and Hydraulic Systems

1. Release the table lock, start the windrower engine and carefully lower the table.

NOTE!

Windrower float pressure must be decreased in order to lower the table.

CAUTION

Shut the engine down and engage the parking brake. Ensure all moving parts have come to a stop before exiting the cab.

2. Connect hydraulics for Pressure, Return, and Case Drain to the swather (**see Illustration B**).
3. Connect the electrical harness, and the hydraulic reel lift/tilt hose at the plug mount, located on the right-hand side of the cab.
4. Open the valve to the reel lift/tilt cylinder (curved arrow).

NOTE!

If you need to refer to hydraulic schematics, see "Appendix C - Hydraulic System Schematics" on page 121.

When the swather is being stored, the separate table case drain hose should be left connected to relieve pressure in the closed hydraulic system, thus avoiding potential damage to system components.

When in the field, a velcro strap is provided to secure the separate table case drain hose that is loose.



Illustration A - Page 53

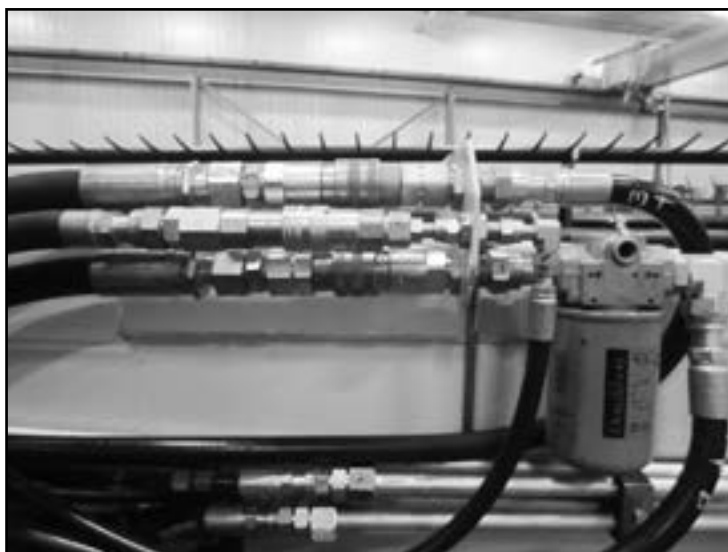


Illustration B - Page 53



Mounting Checklist

	Lift arm extensions installed securely to lift arms of windrower
	Strut mounting boots installed securely in table
	Lift arm extensions seated in boots and locked in place by lock arms
	Cylinder mount bracket installed securely to center of table
	Cylinder mount bracket swivel pin installed
	Header tilt mount, cylinder pivot, and tilt cylinder installed securely to center of table
	Safety chain installed
	Tilt cylinder connected to table
	Transport axle and hitch tube in storage (field) position
	Transport parts stored for future use
	Gauge wheels installed and secured (if equipped)
	Main hydraulic hoses connected to table quick couplers
	Reel lift hose connected to tilt circuit
	Selector valve, tilt cylinder, and needle valve hydraulic connections complete
	All electrical connections complete
	Reel tie down straps/wires removed
	Deck support bars removed
	Crop dividers and divider pipes installed
	Swather table leveled

System Tests

Once all installations have been completed, and checked, the entire system should be tested to ensure everything is operating correctly. If a fault is detected, troubleshoot, and correct as needed.



NOTE!

If possible, the following tests should be completed with an observer present at a safe location outside, with a clear line of sight to the operator. If this is not possible, complete the tests with the cab door open, so the operator can more easily detect unusual noises.

Hydraulics, Electric, and Mechanical Checklist

	Check all fluid levels and top up if needed.
	Start the windrower, run the engine at low idle. Raise and lower the swather and adjust the needle valve to achieve a suitable rate of movement, given the present engine speed. Advance engine RPM to normal operating range, test the rate again, and adjust as necessary.
	Return the engine to idle RPM. Engage each of the swather controls, one by one, to test the electrical and hydraulic connections. For each system you activate, monitor its readings on the display to ensure they are accurate.
	Engage all systems, and slowly advance throttle to normal operating RPM. Check that all systems are running at normal speed with no signs of problems or interference.
	Stop all systems, turn the engine off. Inspect the swather to ensure everything is secure, and there are no signs of abnormal operating conditions. Make adjustments as required, and re-test as necessary.
	Check hydraulic fluid levels and top up if necessary.



4 - Operation

Initial Start-up



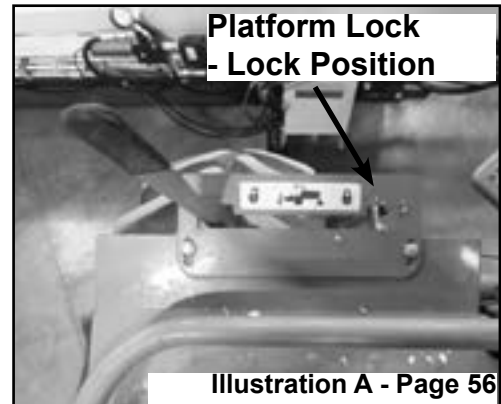
Keep bystanders, especially children, away from the machine during these operations.

Before attempting these steps, complete the mounting checklist to assure the swather is securely mounted, and be familiar with all cab controls.

1. Unlock the lift arms by disengaging the platform lock as per windrower manual.
2. Start the windrower (see operators manual) and lower the swather to the ground.



Engage the parking brake on the windrower, shut the engine down, and wait for all moving parts to stop before leaving the cab.



3. With the swather completely lowered, (in full contact with the ground) inspect the swather for damaged or loose parts, nuts and bolts. Repair or replace any such parts as required.
4. Check hydraulic reservoir oil level on the windrower. Fill to recommended level according to instructions in windrower owner's manual.
5. Ensure that all protective shields are in place and properly secured.
6. Check that transport/gauge wheel tires are inflated to the recommended pressure of 80 psi. (550 kPa).
7. Check all hydraulic hoses and fittings to be sure they are tight, properly connected, and that no hose damage has occurred during mounting. Repair or replace any damaged parts before re-starting the machine.



Do not operate this machinery with defective hoses or fittings. Ensure hydraulic pressure is released before checking or attempting repairs. Pressurized hydraulics can cause serious injury.

8. Lubricate the swather. See service points in the Lubrication section of this manual.
9. Restart the windrower (see windrower Operators Manual). Engage the Park Brake.

Reel Lift Controls

Depress the Right Hand switch on the Honey Bee Switch Box to engage Reel Lift mode. Depress the platform tilt button, on the JD multi-function lever to raise the Reel until the cylinders are fully extended. Hold the button on momentarily, then drop the reel to its lowest position (cylinder fully retracted). Complete this cycle at least twice to ensure the system is working properly.

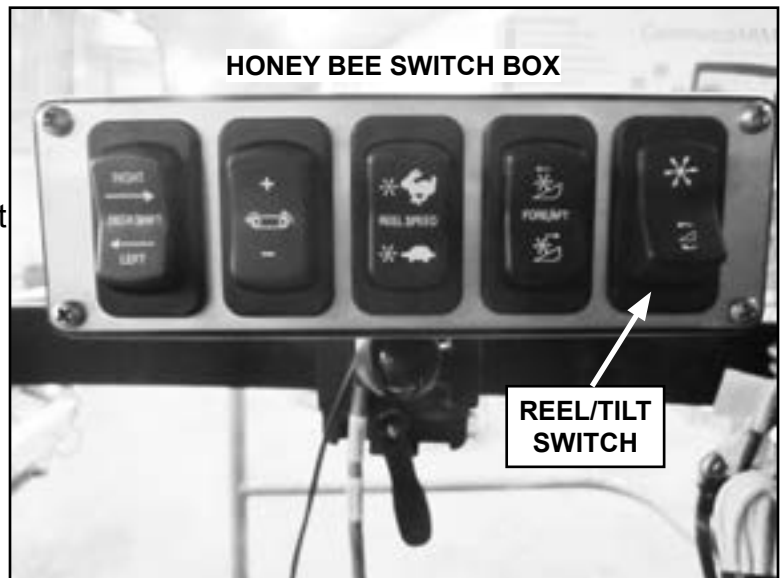


Illustration A - Page 57



The Reel Adjust Quad is used for float adjust, it is not used for reel position adjustment. See the levelling section for details

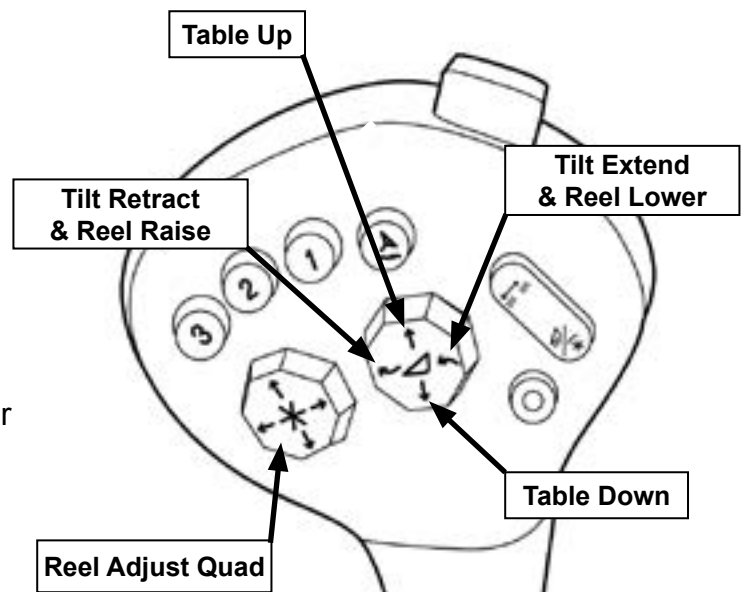


Illustration B - Multifunction Lever - Page 57



Bleeding Air Out Of Reel Lift Circuit

If the reel does not go up or down evenly, it may be necessary to bleed the slave cylinder. Complete this procedure only when the swather drive is disengaged and the swather is resting on the ground. Lower the reel to the bottom of the cylinder stroke. The reel cylinders have a center to center collapsed length of 18". Fully extended cylinder length is 28".

Cycle the reel to the top of the stroke, then lower the reel until about 2" of cylinder rod remains exposed. Shut the windrower down. Wait for 10 to 15 minutes to allow the air bubbles in the oil to dissipate. Loosen the bleed port cap on the slave cylinder (far left hand cylinder). Air and oil will escape, and the reel will settle. Tighten the bleed screw (cap) and cycle the reel again. If needed, repeat this procedure.

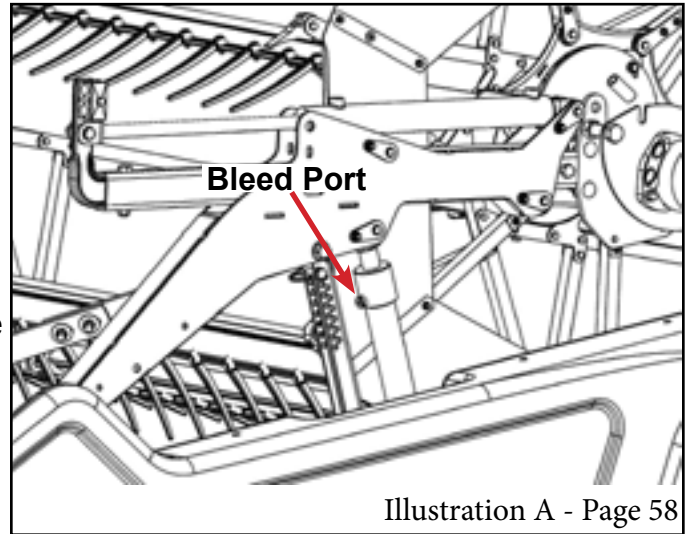


Illustration A - Page 58

NOTE!

Because of expansion in hydraulic lines, it is normal for the slave cylinder to lag slightly when lifting the reel

Single Reel Lift Circuit

When the operator opens the valve in the windrower, oil is forced into the barrel end of the left hand master cylinder, as the cylinder piston rises, oil on the top side of the piston is forced out of the rod end port, into the port on the slave cylinder.

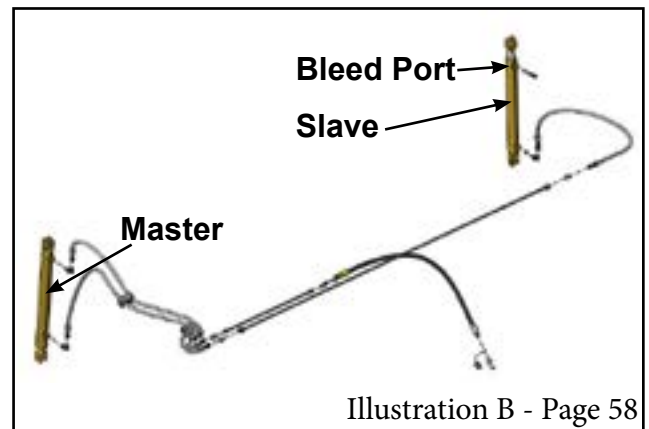


Illustration B - Page 58

Additional Checks:

1. Unlock the platform, as shown previously.



If the windrower will not lift the swather table, see the Troubleshooting section of this manual.



Be certain no one is standing near the machine while you are raising or lowering the swather.

2. Raise and lower the swather table to ensure the lift cylinders are working properly.
3. With swather lowered to the ground, and the windrower shut down, check the tension on each draper. If adjustments are required, see the Draper section of this manual.
4. Re-start the windrower, engage the parking brake. Engage platform drive switch (see windrower Operator's Manual) with windrower at low idle.



If any leaks appear, shut the unit down, and switch off the engine immediately. Locate the source of the leak, and repair before re-starting.

5. Increase engine speed, until the windrower is at normal operating engine rpm, check and set the following:
 - Reel speed.
 - Draper speed.
 - Draper tracking.
6. If changes are required see the appropriate section of this, or the windrower manual.
7. With the swather lowered to approximately 2 inches (5 cm) from the ground, stop the windrower, shut the engine down, and check the following:
 - Swather leveling (end to end).
 - Swather cutting angle.
 - Gauge wheel height.
 - Reel mount bolts.
 - Knife head section bolts, Knife head bearing bolt, and bearing block bolt.
 - Knife drive support/crank bolts.
 - Connector bar bolts on knife back.
 - Knife drive mounting bolts.



Problems frequently encountered during start-up and break in period

High Hydraulic Pressures - Cold Oil

- Sticky Draper
- Sticky or Tight Knife
- Draper Too Tight

Reel Will Not Raise

- Low Oil Volume from windrower
- Line Restriction
- Valve not open

Full Dismount



IMPORTANT Park the windrower on a hard, level surface. Engage the park brake.

1. With the windrower running, lower the reel to its lowest position. Lower the swather to the ground.



NOTE!

Unload accumulator so the arms can be lowered to disengage. See JD operators manual for detail.



CAUTION

Shut the engine down and wait for all moving parts to stop before leaving the cab. Ensure the park brake is set.

2. Uncouple all wires running from the windrower to the swather (21 pin connector).
3. Uncouple all hydraulic hoses connecting swather to the windrower. Secure the main hydraulic hoses with the Hose Hanger (**see “Install the Hose Holder” on page 44**) so that they will not interfere with the windrower or the swather when the windrower is being backed away from the swather (**see Illustration A**).

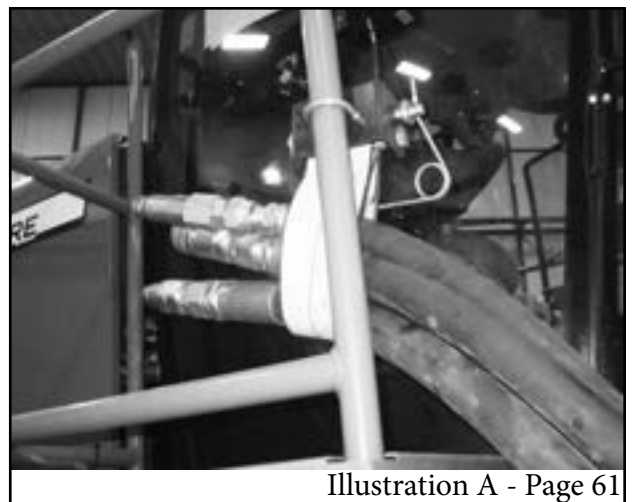


Illustration A - Page 61

4. Start the engine, lift the table to its fully raised position.



NOTE!

To raise table to full height, windrower float pressure will need to be increased.

5. Lock platform in fully raised position as described previously, and in your windrower Operator's Manual.



CAUTION

Shut the engine down and wait for all moving parts to stop before leaving the cab. Ensure the park brake is set.

Self Storing Hitch – Transport Position

6. To convert the hitch from storage to transport mode, remove the safety chain from the storage stub. Release the pressure on the jack, loosen the hitch clamp, and slide the jack off of the stub.
7. Pull the lock pin on hitch tube sleeve, and then pull the hitch tube out of the hitch tube sleeve. Reinsert the lock pin to secure the tube.
8. Install the jack onto the Hitch Sleeve jack mount tube, and tighten the hitch clamp on the jack mount.
9. Extend the lower leg of the jack to a suitable hole.
10. The swather should still be lifted from the ground at this point with the table safety lock in place.

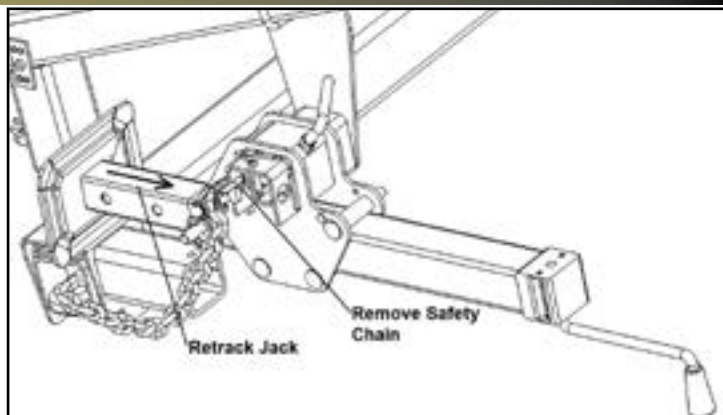


Illustration A - Page 62

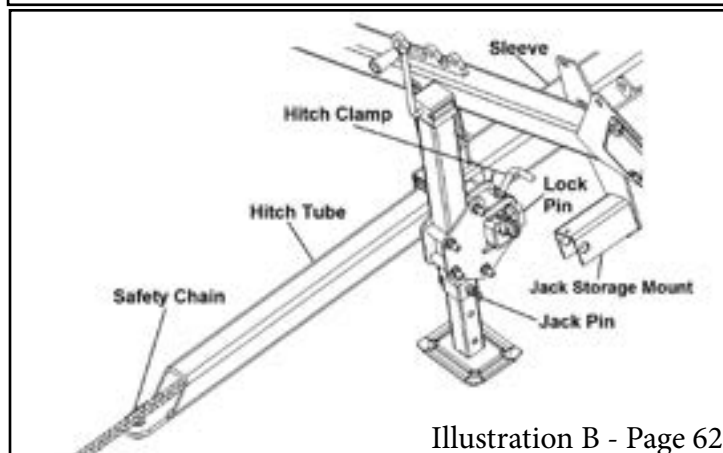


Illustration B - Page 62

Install Transport Axle

11. Carefully lower the axle from the field position to the transport position. Ensure the hitch pin has been inserted back into the bracket in the transport position.



The axle is heavy!

12. Remove the hitch pin securing the extension inside the axle. Pull out the extension and relocate the pin to secure for transport.

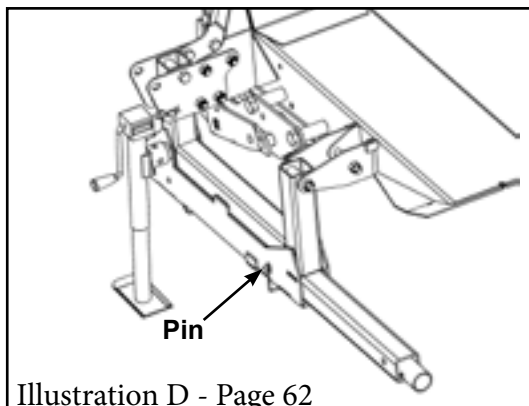


Illustration D - Page 62

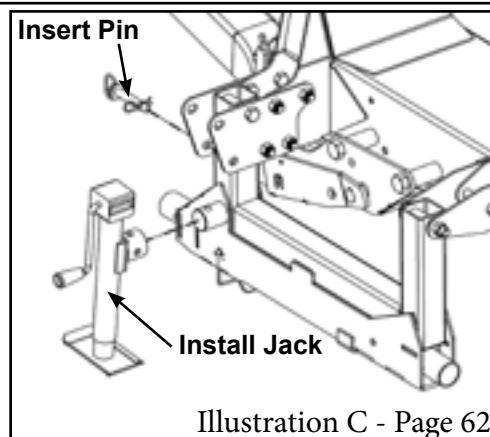


Illustration C - Page 62

13. Install the wheel assembly onto the extension on the cutterbar side of the table, insert lock pin into spindle mount and secure with safety clip.
14. Install the transport axle jack to support the weight at the rear of the table.

15. Remove Cylinder Mounting Bracket Swivel Pin to allow the bracket to swivel (**see Illustration A**).

NOTE!

As long as the table is still fully raised, there won't be any pressure on the pin.

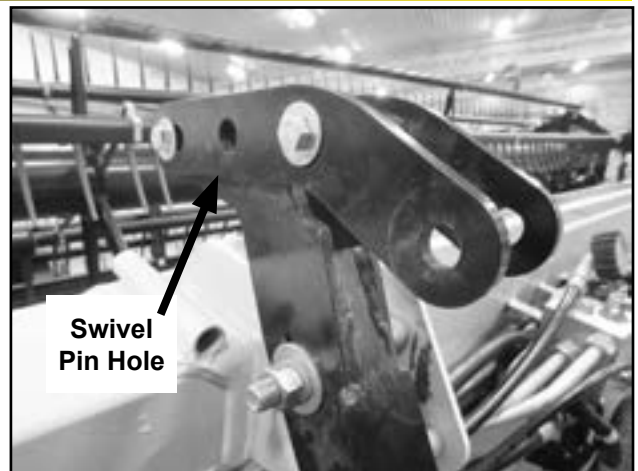


Illustration A - Page 63

16. Place the platform lock in the unlock position, as shown previously and in the windrower operator's manual.
17. Restart the windrower. Carefully lower the swather until the front transport axle wheel, transport screw jack and hitch tube jack just touch the ground. The lift arms should still be firmly set in the strut mounting boots.

NOTE!

Windrower float pressure must be decreased in order to lower the table

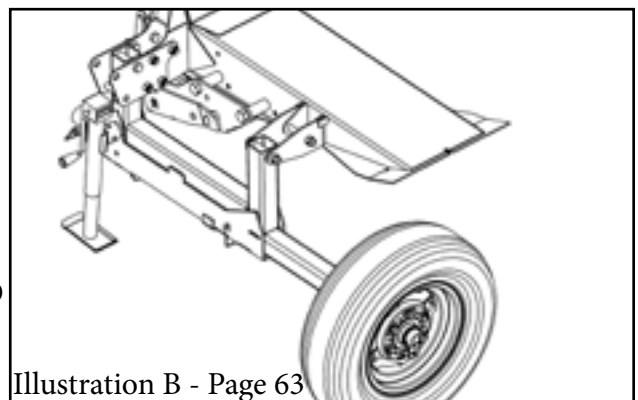


Illustration B - Page 63

CAUTION

Shut the engine down, wet the parking brake and wait for all moving parts to stop before leaving the cab.

18. Reduce the amount of float pressure to minimum and carefully lower the swather until the weight is fully on the transport wheel, transport jack and hitch jack.
19. Block transport axle tires so the swather will not move once the windrower has been removed from the swather.



Store Hydraulic Tilt Cylinder

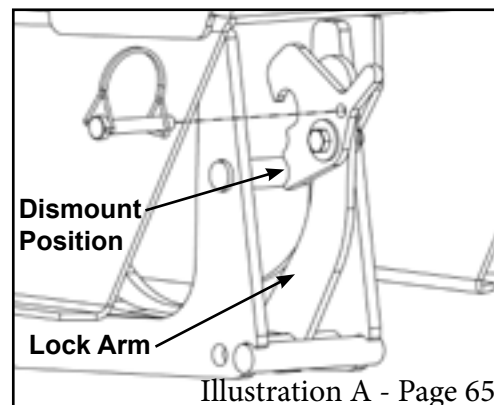
20. Disconnect the hydraulic tilt cylinder from the swather, and place the cylinder in it's storage position (**see Illustration A**).
21. Disconnect the safety chain.



Illustration A - Page 64

Final Dismounting Steps.

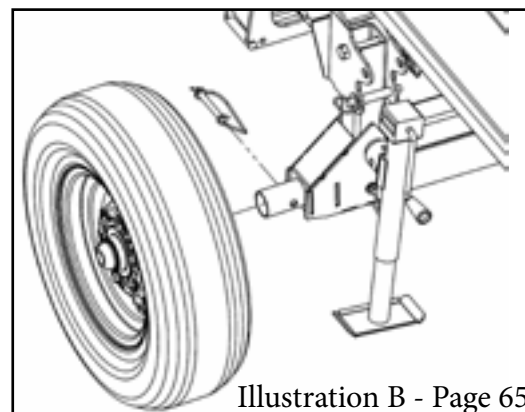
22. Remove the pins keeping the lock arms in the 'locked' position and reposition the lock arms on each of the mounting boots to the 'dismount' position as shown.
23. Release windrower float pressure by unloading pressure from the accumulators (see windrower operators manual).
Restart the windrower and lower the lift arms while slowly backing away until the lift arms are clear of the table.



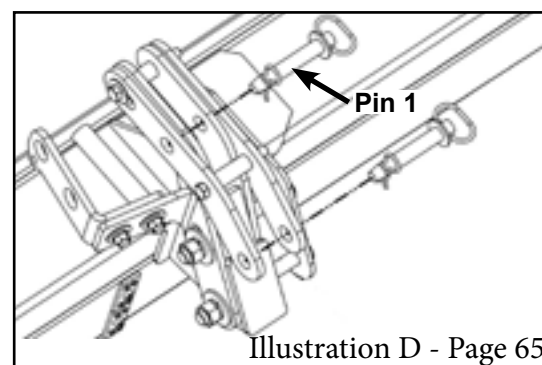
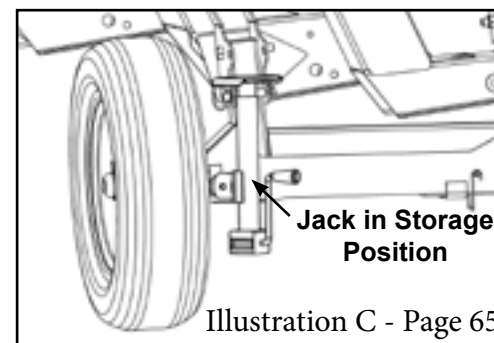
If the swather moves, stop immediately and find the cause.



Once clear of the swather, engage the park brake. Shut the engine down and wait for all moving parts to stop before leaving the cab.



24. Attach the rear wheel and secure with the hitch pin (**Illustration "B"**).
25. Lower the jack, remove it and re-install it in the storage position (**Illustration "C"**).
26. Check that the swather is level. If necessary adjust the height of the hitch jack.
27. Re-install the pins for the mounting boot lock arms (**Illustration "A"**).
28. Re-install Pin 1 to secure the cylinder mounting bracket in place (**Illustration "D"**).





5 - Reel

Reel Drive

Depending on your table model, the reel is driven by either one or two hydraulic motors with a direct drive coupler to the reel.

Check coupler bolts and motor mount bolts regularly for tightness. Check alignment of motor to reel tube, and shim the mounting bolts if needed.



Reel motors are capable of bi-directional operation. As installed on the swather they run in one direction only and are supplied with unidirectional hydraulic oil flow. For this reason, it is important to mark the lines and their corresponding motor ports whenever you are removing hydraulic lines.

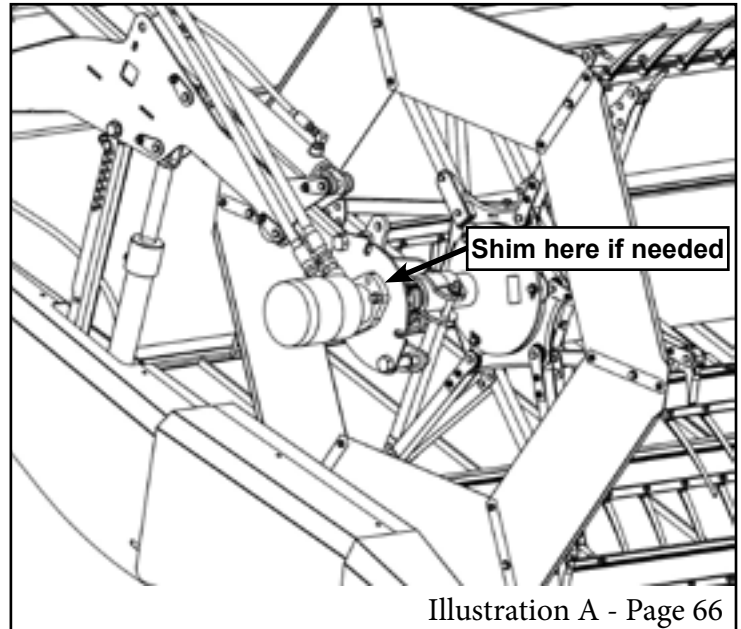


Illustration A - Page 66

Reel Speed Adjustment

There are two diameters of reel used on the swather. The 42" UII Reel should rotate from 12% to 15% faster than the ground speed. The 44" HCC Reel should rotate from 10% to 12% faster than the ground speed. "Down" crops will require a somewhat higher speed than standing crops. Reel speed is determined by a control in the windrower. Adjust the reel speed so that the reel has the appearance of "pulling" the windrower through the field.

- If reel speed is set too slow, the crop will not be pushed against the cutter bar and swept onto the draper. This can result in a portion of the cut crop being pushed forward onto the ground. Slow reel speed may also cause a wrapping of the reel with cut crop, as it bunches along the front of the cutter bar. It is very important that the reel gently guides the crop onto the cutter bar, then sweeps it onto the draper.
- If reel speed is too high, the crop may be stripped or shelled out by the impact of the reel. The crop may also be pushed down before it can be cut, leaving uncut grain in the field. Excessive reel speed may also cause cut crop to wrap onto the reel, as the crop does not get a chance to fall onto the draper.
- In general, hay crops can be cut using higher reel speeds.

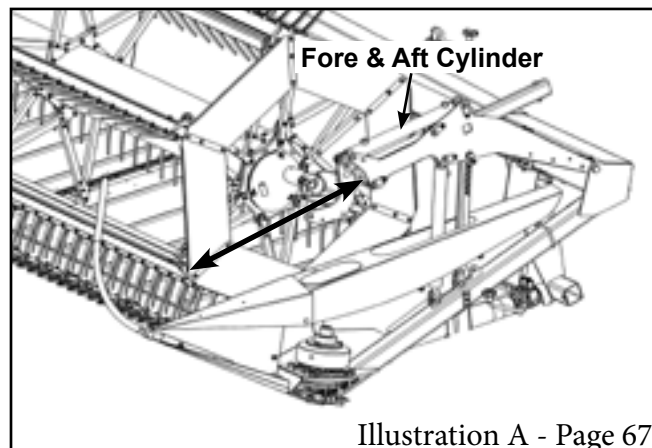
Reel Position

Hydraulic Fore & Aft

All swather reels are equipped with hydraulic fore and aft, controlled from the windrower. This feature allows the operator to move the reel assembly forward and backward.

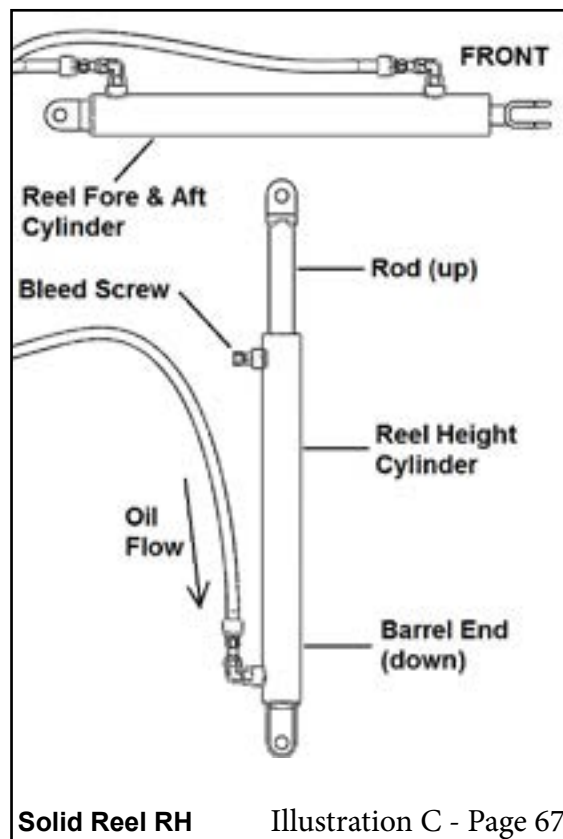
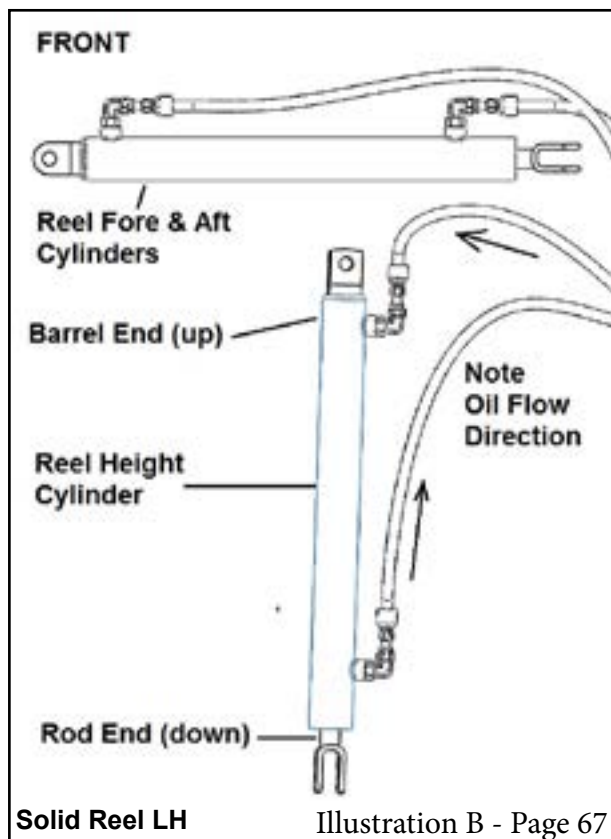
NOTE!

The windrower must be equipped with the fore/aft control to make this option functional.



Solid Reel Hydraulic Circuit

Pressure from the windrower feeds the barrel end of the left-hand cylinder. As the cylinder barrel rises, oil below the piston is displaced. The volume of the rod on the left cylinder matches the volume of the barrel on the right cylinder. The displaced oil causes the right cylinder to raise. This cylinder has a vent to bleed air from the system.





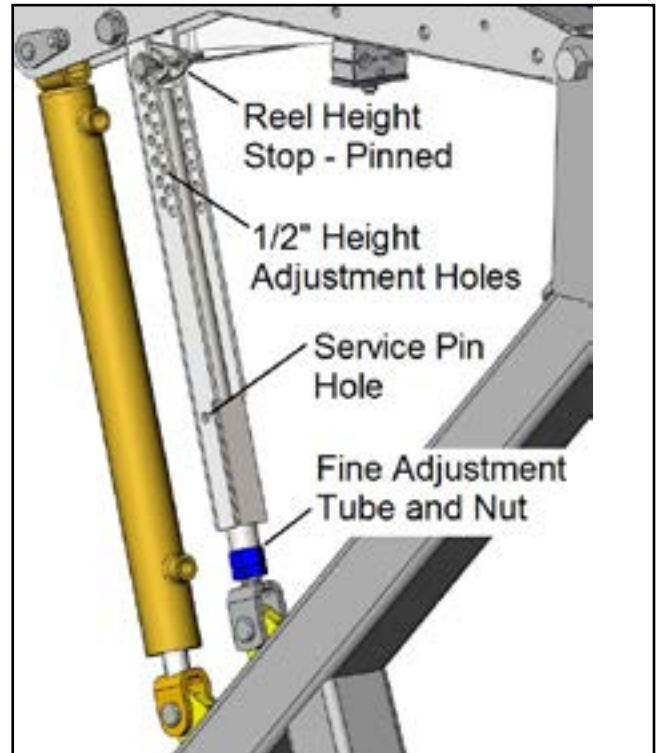
Reel Arm Leveling and Height Adjustment

Reel Height Adjustment

Swathers are equipped with adjustable reel height stops, which limit how much the reel can be lowered. These stops are located behind the reel lift cylinders, and use coarse adjustment lock pin holes and a fine adjustment threaded tube.

To adjust the height limits:

1. Start the windrower, and with the swather fully lowered, raise the reel to maximum height.
2. Engage the emergency brake, shut the windrower down, and allow all moving parts to come to a complete stop before exiting the cab.
3. Move Reel Height Stop in left side Reel Height Control arm into the desired location (hole). Fully insert Stop into the arm and orientate flat side down. Ensure that lock pin is fully installed and locked in place with the safety clasp. Perform fine adjustment to height by turning the Adjuster Tube either clockwise or counter-clockwise and securing in place with lock nut. Take note of the exact hole location of the lock pin, and thread count underneath the lock nut.
4. Repeat this procedure for right side of the swather, ensuring that lock pin is inserted at the same hole location height as the left side, and the thread count matches.
5. Restart the windrower, and slowly lower the reel to it's lowest position. Ensure the reel tines will not contact any part of the deck, draper, or cutter bar.



Reel Height Stop

Illustration A - Page 68



Illustration B - Page 68



Ill C - Page 68

NOTE!

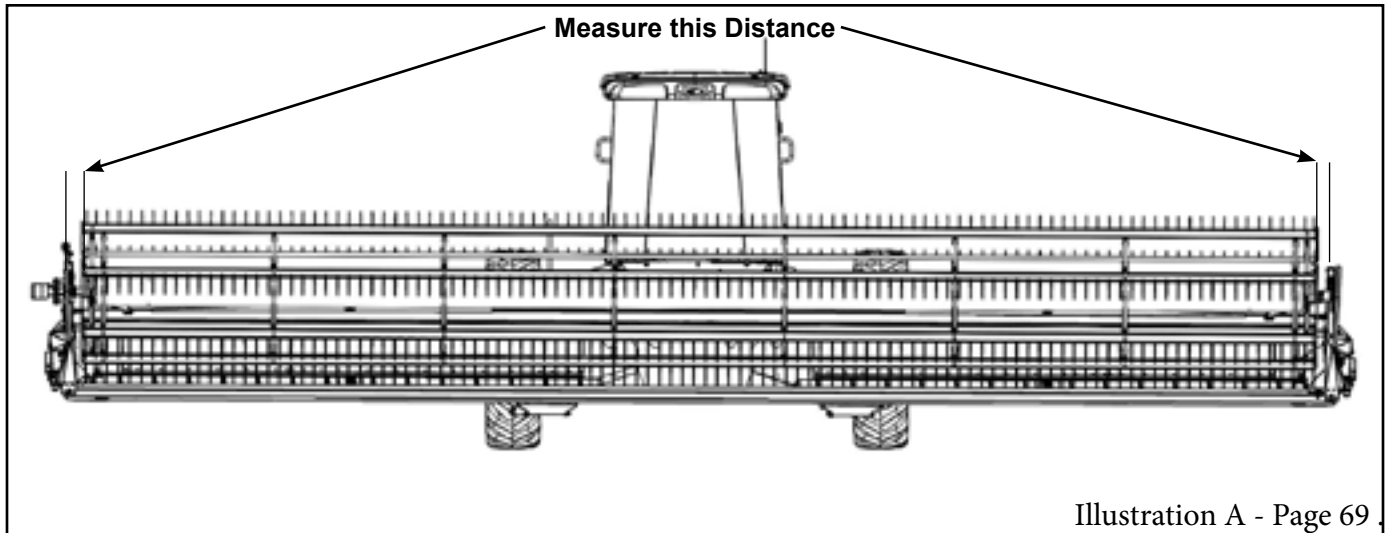
If slightly different heights for each end are desired, perform fine adjustment only, keeping the lock pin hole locations the same on both ends.



When servicing the reel, it is necessary to have the reel locked into the servicing (highest) position, with the lock pins securely in place.

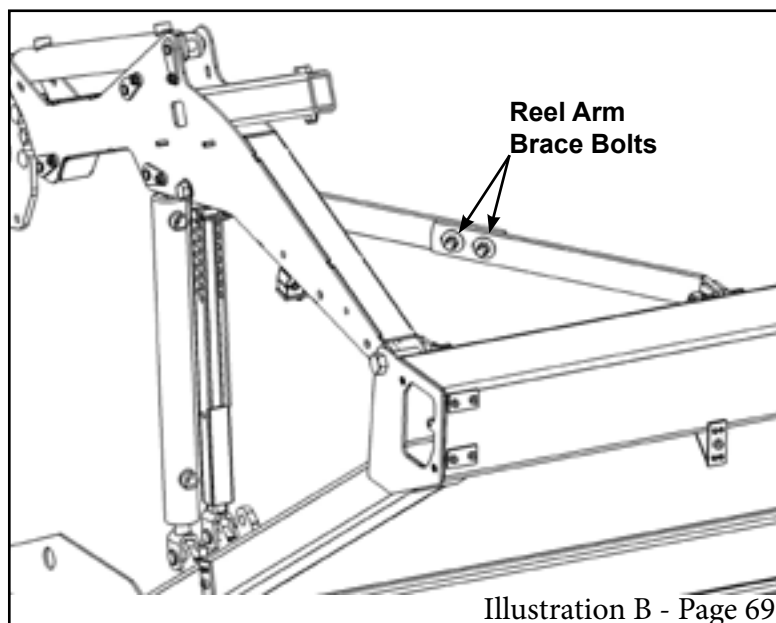
Reel Centering

Measure the clearance from the end shield on the reel to the crop divider on each end of the swather. See the illustration below.



If the reel is not centered on the swather, proceed as follows:

1. Fully lower the table and reel, and engage parking brake.
2. Turn the windrower off. All moving parts must come to a complete stop before exiting the cab.
3. Loosen the carriage bolts that secure the reel arm braces on both ends of the reel.
4. Push the reel arms until reel is centered.
5. Tighten bolts when centered.

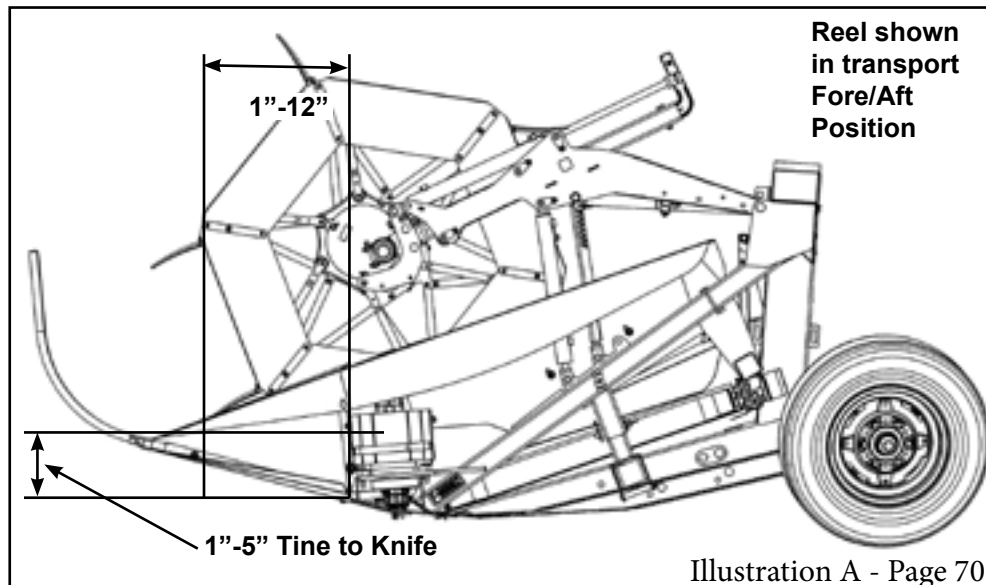




Placement of the Reel on the Swather

The distance from the tip of the guard to the center of the Reel Tube can be adjusted from 0" to 12" (300 mm) depending on the crop.

- Normally the more "down" the crop, the further ahead the reel should be set. See next section.
- Setting the reel too far ahead will not push the crop into the knife, nor will it efficiently deliver it onto the draper.
- Set the reel tines the same distance from the guards on both ends.
- Adjust the reel height stops so that the tine tips miss the guards and sickle by at least 1" with the cutter bar fully raised, to avoid cutting tines, and breaking knife sections. Wider tables will require more clearance due to increased flexing.
- Normally the more "down" the crop; the closer the tines will need to be placed to the cutter bar, down to this 1" minimum.



Reel Position in Down Crops

- The reel height in down crops should be low enough that the tines can lift the crop up and onto the cutter bar.
- The tines should be adjusted so they pick up the crop and lift it onto the cutter bar with a minimum of the crop carrying around the reel.
- The fore and aft position of the reel should be adjusted so the reel center tube is about 12 inches (300 mm) in front of the cutter bar so the crop is lifted before it gets to the cutter bar.



Care must be taken to ensure that the reel tines do not come in contact with the cutter bar. Tine contact will cause damage to the tines, knife sections, and guards. At no time should the reel tines contact the ground. Contact with the ground or with rocks will cause damage to the reel.

Reel Position in Standing Crops

The reel height on standing crops is usually correctly adjusted when the reel bats contact the crop about midway between the cutoff point and the top.

The reel should be adjusted fore and aft so the reel center tube is slightly ahead of the cutter bar. If the reel is too far forward, the crop will not be pushed against the cutter bar and a portion of the cut crop will fall to the ground. If the reel is too far back, the crop is pushed down too low when it is cut and some of the heads will be missed.

Universal – Ull Pick-Up Reel: Tine Pitch Adjustment

Plastic reel tines are attached to the leading side of the reel bats with 1/4" bolts and nuts. To adjust the pitch of the tines, proceed as follows:

1. Loosen the bolts (shown right) at both ends of the reel and insert a suitable tool into the tube.
2. Partially rotate the control ring assembly, noting the change in tine pitch on the tines nearest the cutting bar.
 - To increase the pitch of the tines, turn the ring in the direction of reel rotation.
 - To decrease the pitch of the tines, turn in the opposite direction to reel rotation.
3. Re-tighten bolts at BOTH ends of the reel.

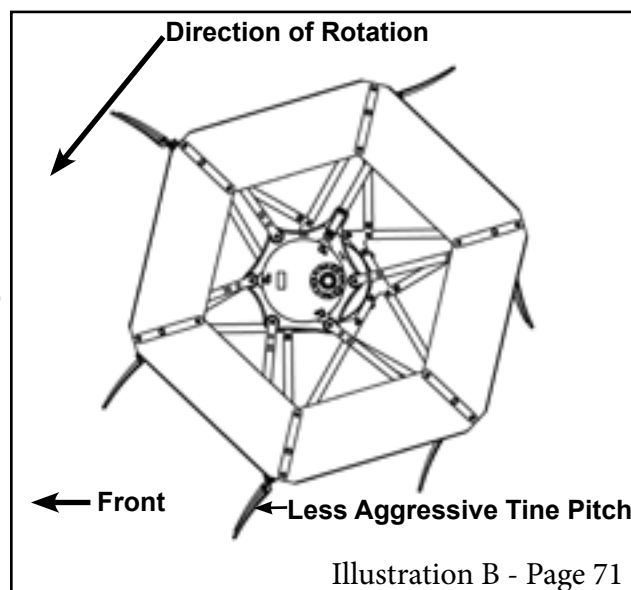
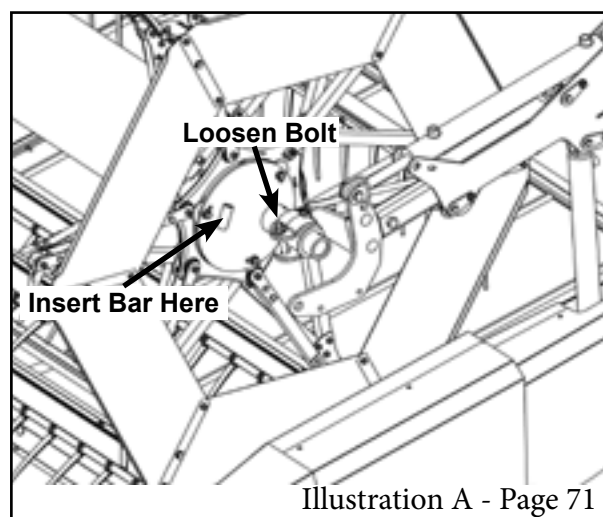
Adjust tine pitch initially so tines are perpendicular to the cutter bar. Too great a pitch may cause the cut crop to be scooped up and carried around the reel.

For crops that are down or lodged, adjust reel so that center of reel is ahead of cutter bar, and adjust tines to be more aggressive, lifting the crop, yet dropping it onto the draper decks after cutting.

If the crop starts to wrap around reel, this indicates the need to adjust the tines to a less aggressive setting.

Tine pitch is critical to the operation of the swather.

Adjust the tines to suit your individual needs and make note of the best settings for each of the crop conditions you encounter.



Tine pitch must be the same at both ends of the reel. This applies to Ull or HCC reels.

NOTE!

If crop is building up in the center of a split reel, the fingers/tines may be heated and bent slightly to ensure the crop does not build up at the gap.

Hart-Carter (HCC) Reel

The HCC reels supplied with the swather are 6-bat reels, with plastic tines.

The tines are fastened around steel bat tubes using 7/32" metal screws. The bats pivot within plastic bearings that are located at the ends of each reel arm (spoke).

To adjust the pitch of the tines, refer to the illustrations and instructions below.

HCC Reel – Tine Pitch Adjustment

1. Locate the tine pitch adjustment levers, and tine-pitch adjustment bolts, located at both ends of the reel.
2. Loosen the adjustment bolts, and then move the adjustment levers accordingly to set the desired pitch. (*Hint: Start reel with a pitch of about 5° as shown.)
3. Re tighten the adjustment bolt, securing the pitch setting.

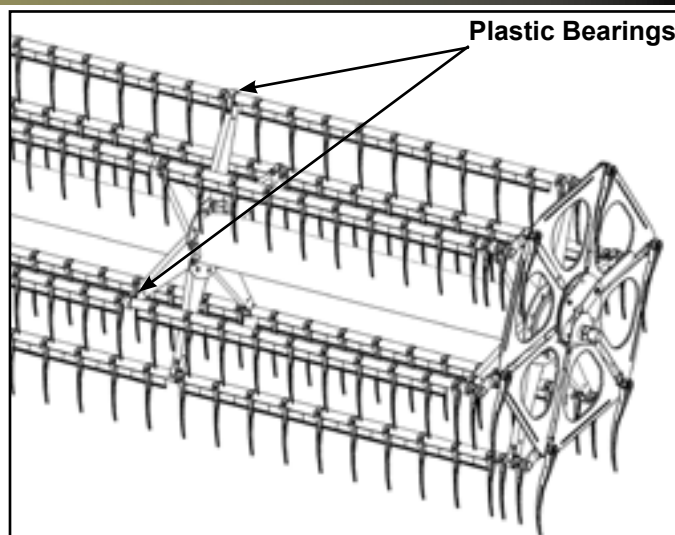


Illustration A - Page 72

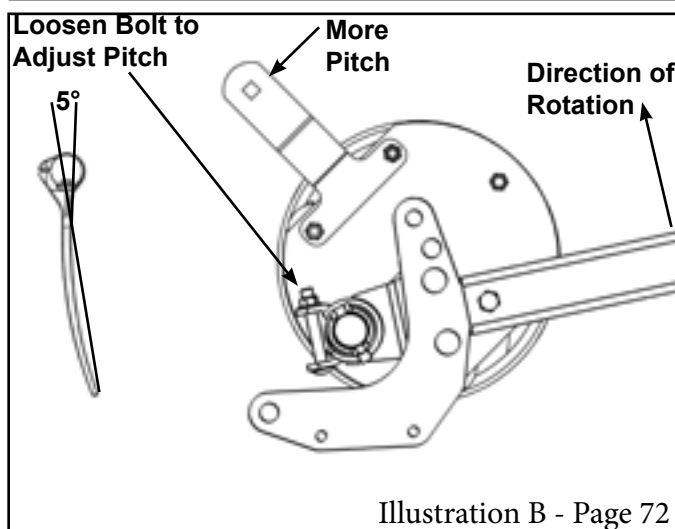


Illustration B - Page 72



Tine pitch must be the same at both ends of the reel.
This applies to Ull or HCC reels.



Ensure that the adjustment bolts & levers are set to the same relative position for each side. Too great a pitch causes reel to wind with cut crop because the tines do not release the crop after it is cut.

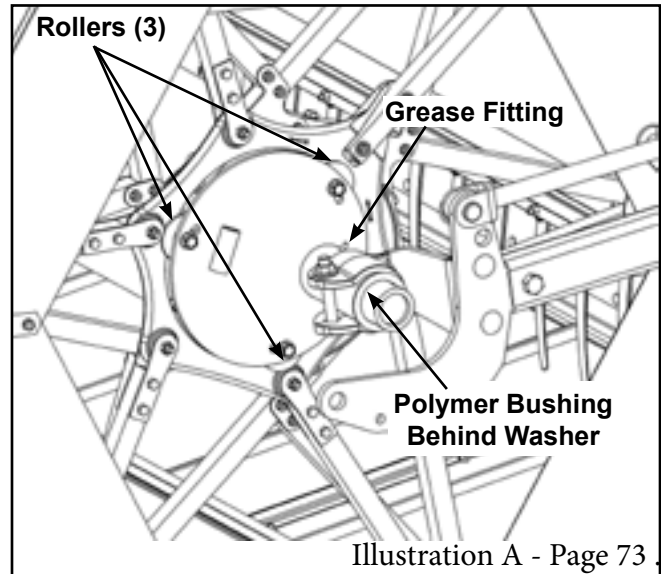
Lubrication – Reel Shaft Bearings

Lubricate every 10 hours of operation (or daily) with multi-purpose lithium base type grease. Lubricate the grease fitting at each end of the reel shaft, and also at the center on double reel models.

Annually, remove and examine the polymer liners in the control plate tubes. Replace if worn.

NOTE!

Initial lubrication of the plastic bat bearings (HCC Reels only) with a light film of oil will improve the break-in and service life of the bearings.



Control Rings (U-II Reels only)

The control ring assemblies each have three rollers mounted in adjusting slots. To compensate for wear to the control ring, the rollers may be adjusted outward in the slots so that all three rollers are lightly in contact with the control ring.

NOTE!

All three rollers at each end of the reel must be moved the same amount relative to each other, so that all three roller bolts are in the same position in the slot. Do not move only one roller.

Check Points Before Operation:



WARNING

Always engage reel lift cylinder locks and table lift cylinder locks before working under or around raised reel. Do not rely on the power unit hydraulic system for support. A rupture or a leak in any part of the system will cause the table and reel to drop if the proper stops are not in place.

- All bolts are tight.
- Reel turns, by hand, without binding. (With some resistance from hydraulics.)
- Tines uniformly clear the knife.
- Reel arms are aligned. (No bow in the bat shaft or pivot bracket bat assemblies.)
- Auxiliary fingers have adequate clearance with side shields.
- Tine pitch has been set for the current application, and is uniform across swather.
- Hydraulic cylinders are functioning smoothly.
- Minimum reel height has been set correctly on the reel height control arms.
- Fore & aft hydraulic cylinders extend and retract fully.
- Vertical distance from the knife to the reel center is set for the current application.
- Reel is horizontally centered in the swather opening.



6 – Draper and Decks

There are two lateral drapers on the table which move the crop to the opening. All drapers must be set, and maintained properly to perform well. Quick release adjusters with spring tensioning allow easy access for cleaning, and maintain proper draper tension. Unpack the draper. Check the size to ensure it is correct for the size of the deck.



ATTENTION Lower the swather to the ground or onto stable blocks, whichever provides the most comfortable working height. Raise the reel to its maximum height and place the locks on the reel lift cylinders to prevent the reel from falling.

Lining Up the Idler Roller

Prior to installing the draper, ensure that the idler roller (the draper roller without the motor) is properly aligned. This is done by setting the end of the offset plate flush with the c-channel of the deck. Adjust the eye bolt until the end of the idler plate contacts the stop on the offset plate if not so already.

Once extended, you should make sure that everything is parallel. The easiest way to do this, is to measure the distance between the roller and the closest cross brace on the draper deck. Make sure measurement "A" is the same distance as measurement "B". If it still does not line up, you may adjust the eye bolt again.

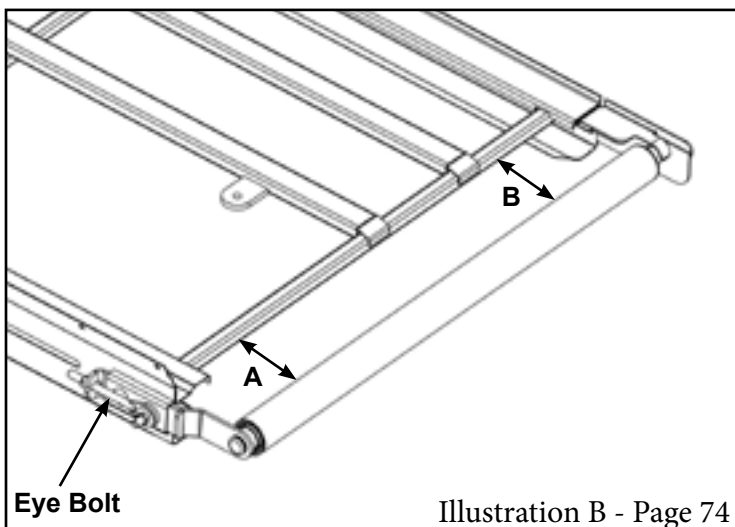


Illustration B - Page 74

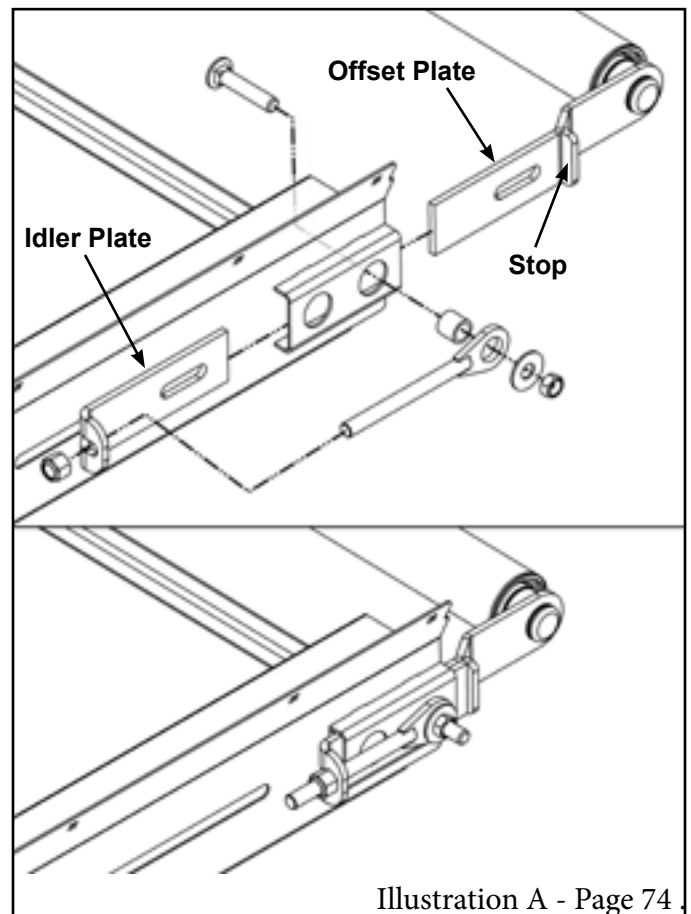
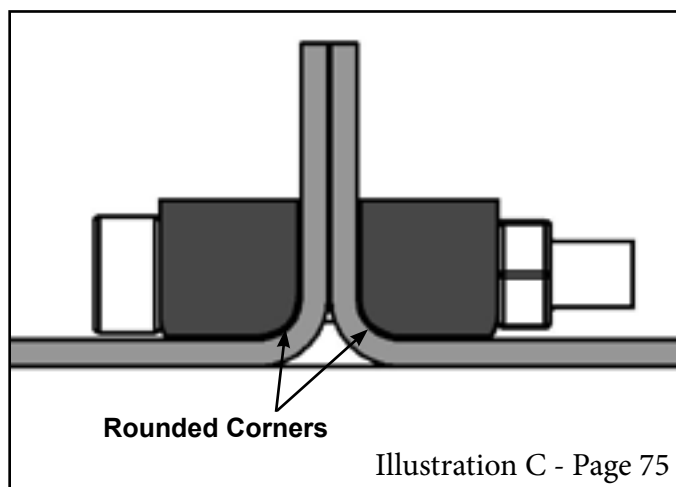
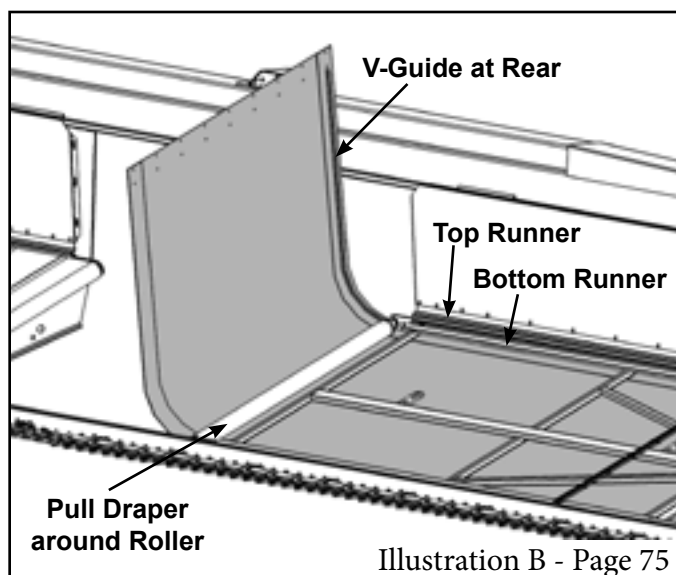
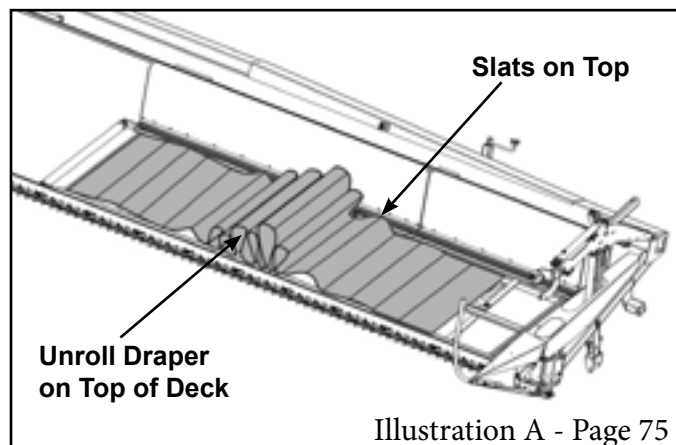


Illustration A - Page 74

Draper Installation

1. Make sure that the quick release lever is in the open position prior to installing the draper on the deck. The location of the lever is shown in the illustration titled 'Deck Tensioning' located on the bottom of the following page.
2. Place draper bundle on the top of deck runners, and unroll with the slats facing up. Be sure to align the v-guide with the notched side of the roller toward the rear end of the swather.
3. Wrap draper around one of the rollers and feed draper into the bottom runner of the deck. The bottom runners will support the draper, and prevent it from hanging down.
4. Pull draper through bottom runner, and wrap around the other roller. Pull the ends of the draper together. Install a connector bar to close the joint. Take note of the position of the rounded corners on the connector bar.
5. The heads of the screws for the connector bar should be installed from the centre opening side. This helps prevent the crop being caught on the screws. Complete the installation by adjusting tension and tracking as described on the following pages.
6. Once the draper is installed on the draper deck, close the quick release lever (shown on following page) to apply tension to the draper.





Tensioning

Proper tension must be maintained on the draper to prevent slipping on the drive rollers. The draper tension is changed by adjusting the drive roller of each deck.

Spring Tension Indicator

The spring tensioners are equipped with a spring length indicator to show the proper amount of tension that should be applied when the decks are tensioned, prior to field operation.

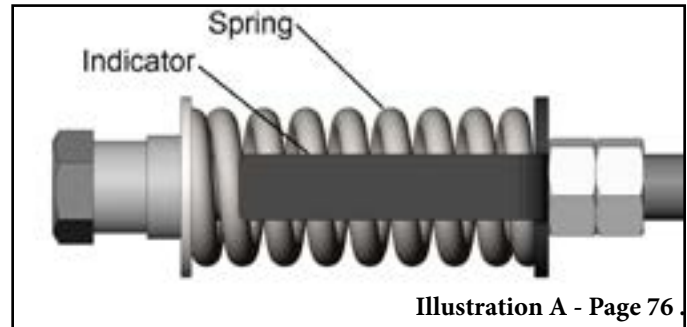


Illustration A - Page 76 .

NOTE!

For proper tension, the tip of the indicator should be even with the end of the spring. This allows for good draper tension, while still having spring compression left over for crop loads on the draper.

To check if tensioning is required:

- Engage the windrower drive with the engine at low idle.
- Observe from the cab how the drapers are tracking.



CAUTION

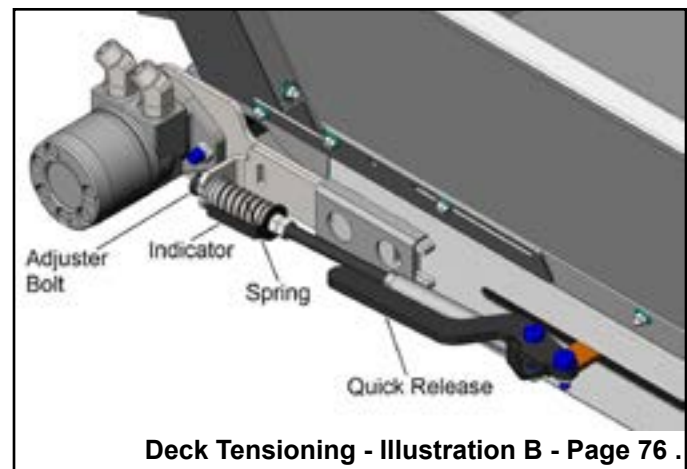
If adjustment is required, lower the swather to the ground, raise the reel and lock in place. Shut down the swather, and turn off the engine before exiting the cab.

If tensioning is still required:

- Adjust the tension by turning the adjuster bolt (Quick Release doesn't need to be released when adjusting).
- Turn the adjuster bolt clockwise (shorten the bolt) to decrease tension, or counter-clockwise (lengthen the bolt) to increase tension.

NOTE!

When increasing tension, do not compress the spring past the indicator tip.



Deck Tensioning - Illustration B - Page 76 .

Restart the windrower and repeat the running test. Re-adjust as necessary.

NOTE!

When adjusting the draper tension and tracking, check the clearance between the draper deck slats and the end strut.

ATTENTION

Draper tension should be just enough to prevent slipping. Do not overtighten as it may cause failure to the bearings, draper rollers and/ or draper belts.

CAUTION

The draper may be damaged if it, or deck parts contact the end strut.

A minimum of 2" (50 mm) clearance is recommended. If necessary, loosen the deck restrainer and slide deck over.

Tracking

The draper must track properly on the rollers to avoid damage to the drapers. The draper decks allow for approximately $\frac{1}{4}$ " clearance on each side.

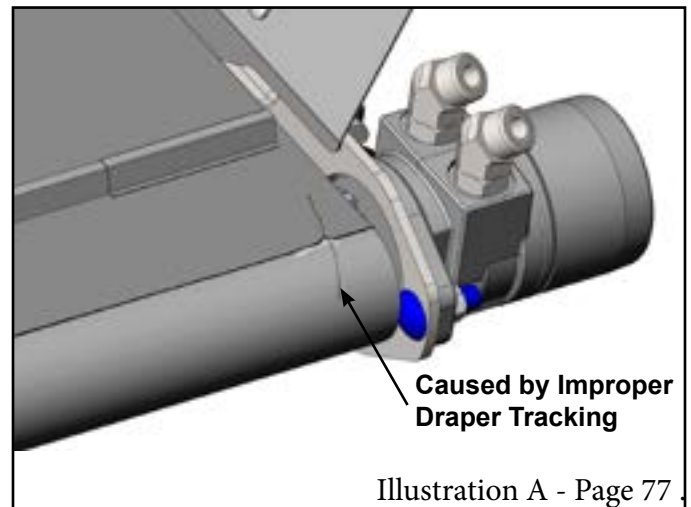
Idler Roller Tracking Adjustment

This roller is fixed at the cutter bar, so it is adjustable only at the back panel. If the draper is tracking toward the back panel, tighten the nut on the eye bolt (shorten the eye bolt). This will push the idler mount plate and idler roller at the back panel end out, creating more slack in the draper at the cutter bar.

If the draper tracks toward the cutter bar, lengthen the eye bolt. This will pull the idler mount plate and idler roller in, creating slack in the draper at the back panel end.

NOTE!

The draper will track to the slack side.



Drive Roller Tracking Adjustment

There is no direct adjustment for tracking on the drive roller end. It is self tracking by way of the v-guide in the drive roller and tensioning system

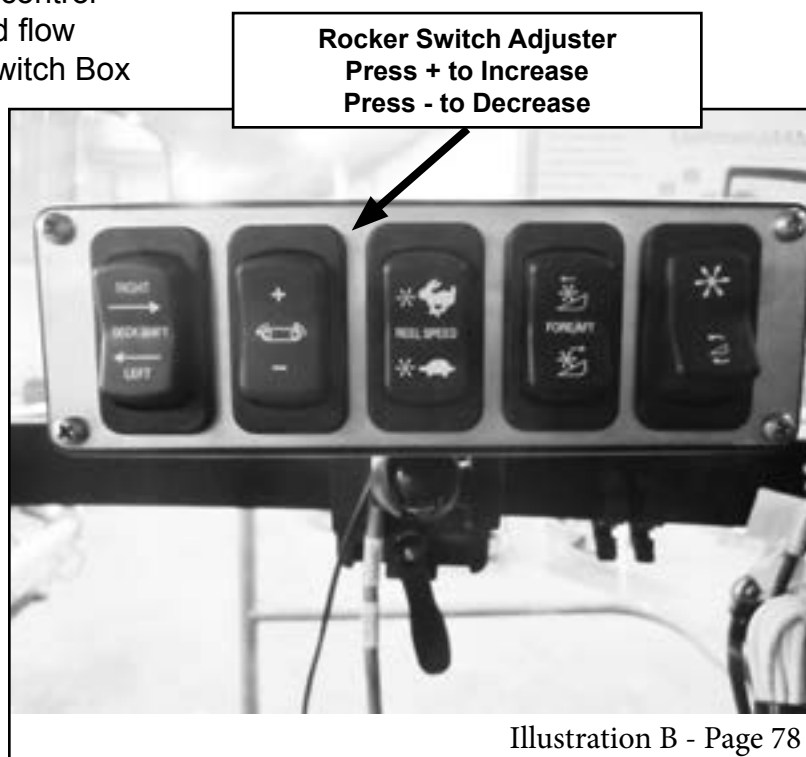
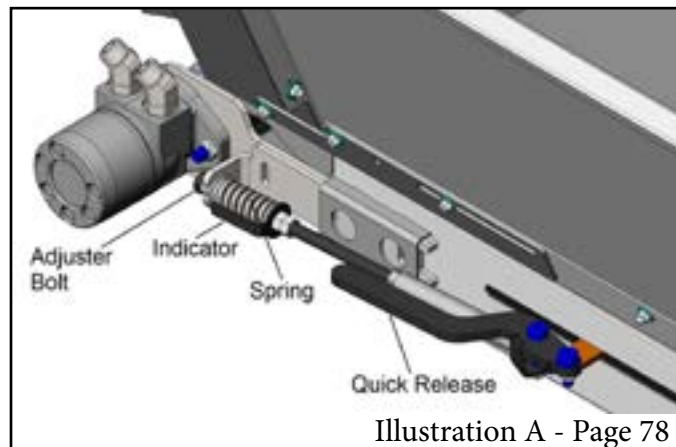
Draper Speed

Proper draper speed is critical to the performance of your Swather. The draper speed should be set to match the field speed of the swather and to deliver the material smoothly to the center opening. The speed of the lateral draper is controlled by an adjustable flow control. Adjusting the flow control will affect decks equally. The draper speed flow control is managed from the Honey Bee Switch Box (see Illustration B).

Additional Draper Speed

When swathing, the draper speed should be set to form a good windrow, removing material from the cutter bar, and delivering the material smoothly to the opening.

Experiment with various draper speeds to determine the best swath formation for the existing cutting conditions. It may be necessary to make further adjustments as crop and moisture conditions change.



ATTENTION

Excessive draper speed will cause abnormal wear, and will shorten the service life of the draper.

Draper Splicing

Honey Bee Mfg. strives to provide top quality draper material on their products. Our draper is made from rubberized polyester with fiberglass reinforced slats. Regular maintenance will extend the life of your draper. Proper tension and tracking are very important. If material builds up inside the deck, it will wrap around the idler and drive rollers causing the draper to tighten. As the draper tightens, additional stress is put on the motor and the draper. If this condition is not corrected, it will result in failure of the drive roller motor or the draper. Tears in the draper can be caused by poor tracking, foreign materials, or from careless use. If only a portion of draper is damaged, a splice may be installed.

Before beginning this repair, you will need an additional connector bar set and a section of draper that is at least 2 ½" longer than the piece to be removed.



NOTE!

If the damaged section is not near an existing connector bar, you will need 2 connector bar sets and a piece of draper 5" longer than the damaged piece.

1. Raise swather table and install lift cylinder locks. (If this is too high for comfortable access, the table can be set on blocks or lowered to the ground.)
2. Raise the reel and place the locks on the lift cylinders to prevent the reel from falling.



CAUTION

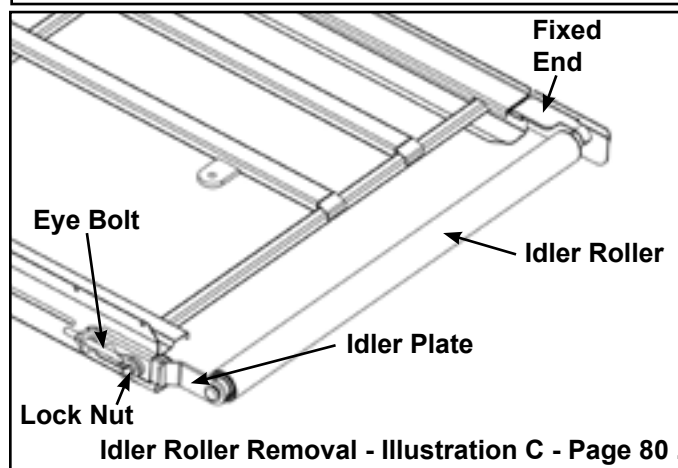
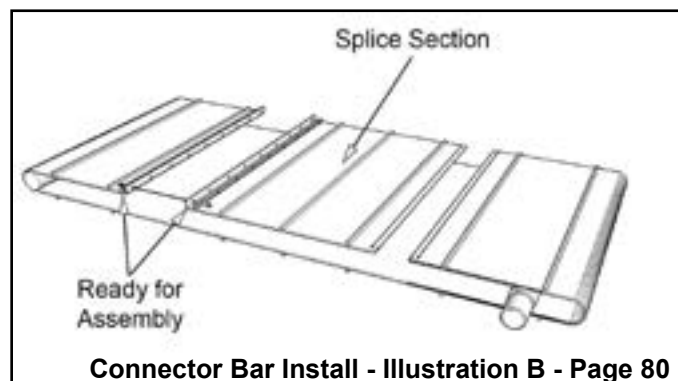
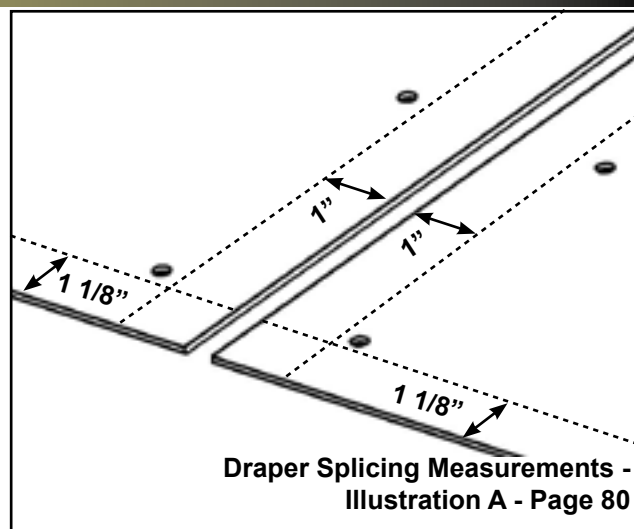
Engage the park brake on the windrower, shut the engine down, and wait for all moving parts to stop before leaving the cab.

3. Release the draper tension.
4. Remove draper connecting bar.
5. Correct the cause of the draper failure.
6. The draper should be cut midway between two slats to provide ample material for the new join. With a measuring tape, measure, and mark a line six inches from a slat on a good portion of the draper. Place a board directly under the line you have marked, to support the section you will be cutting. With a utility knife and a straight edge cut the draper along the marks. This cut must be accurate, and square, to assure that the draper will track properly. Repeat this step on the other side of the damaged area.
7. Lay the piece you have removed flat, and measure the width, then add 3 1/2 inches. The total will be the length of material you require for the splice. (If you need two new connector bar sets, add 5".)

8. To mark the location for holes, measure 1" from each edge to be joined, and mark a line parallel to the cut edges.
9. On each of these lines, measure 1-1/8" from the front edge of the draper, and make a mark for the first hole.
10. Drill 3/16" holes through each mark.
11. Place the backs of the draper together, lining up these drilled holes.
12. Place a connector bar on each side, line up the holes, and secure with a machine screw and nut.
13. Match up the edges of the draper and drill a hole at the opposite end on the 1" line, using the connector bar as a template. Insert a screw and secure in place. Drill the remaining holes through the holes in the connector bar, insert screws and secure.
14. Adjust draper tension. Trim all joins to 1/2" above connector bar.
15. Adjust tracking.

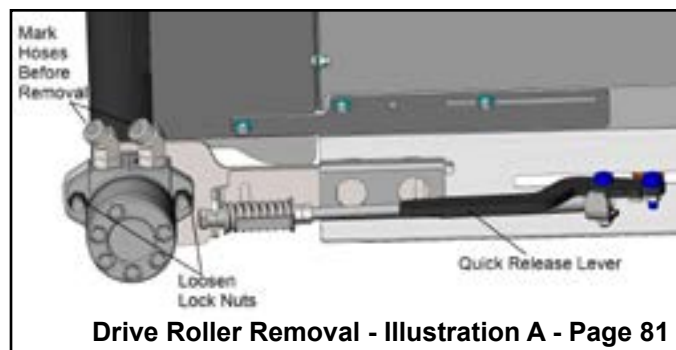
Idler Roller Removal

1. Relieve draper tension using the quick release lever.
2. Remove the nut, washer, spacer and bolt that holds the eye bolt and idler plates in place.
3. Slide the idler plate with the eye bolt out of the c-channel as far as possible.
4. Pull the offset plate away from the roller end, letting the roller drop down.
5. Pull the idler roller out of the deck.
6. Check bearings on each end and remove any material build-up on the roller.
7. Re-assemble in reverse order. See ***"Lining Up the Idler Roller"*** on page 74, adjust tension and tracking as necessary.



Drive Roller Removal

1. Relieve the draper tension using the quick release lever.
2. Mark hydraulic hoses on draper motor. Remove hoses. Insert plugs into hoses and caps on the motor to reduce oil loss and to prevent contamination.
3. Remove the lock nuts that secure the motor onto the motor plate. It is not necessary to remove the adjuster bolt from the motor plate.
4. Pull the motor with drive roller through the hole in the motor plate.
5. Check bearing in end of roller, and remove any build up of material on roller.

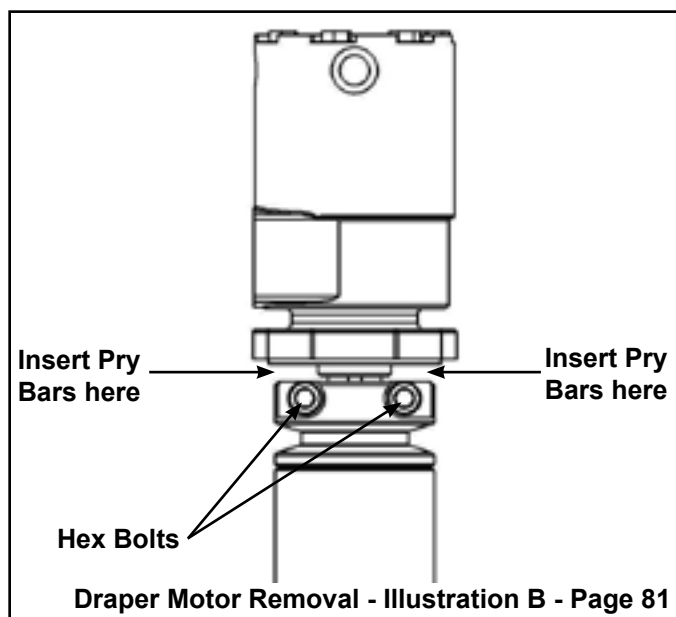


NOTE!

Check and remove any built up material from the draper deck runners. If necessary, split draper at connector bar to gain access to inside of the deck. To re-install drive roller, reverse above procedure. Adjust tension and tracking as necessary.

Removing Draper Motor

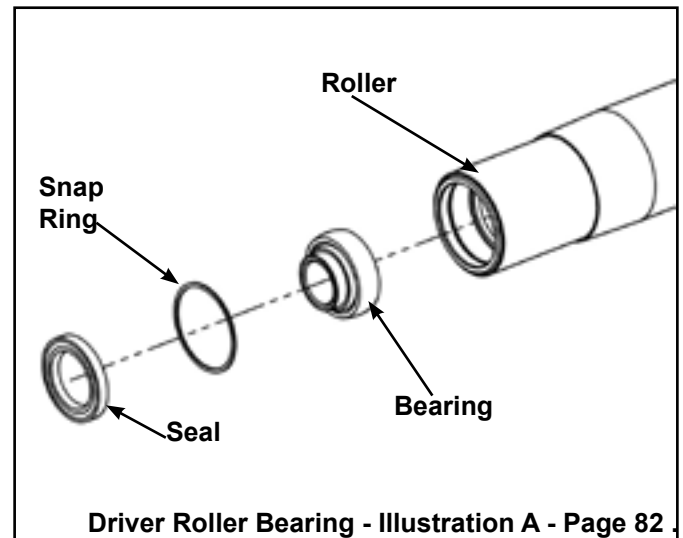
1. Remove Hex Bolt set screws.
2. Insert two pry bars one on each side of motor, and pry motor out of drive roller. Do not hammer on the housing flanges of the motor. Damage to motor will void warranty.
3. If motor does not move, insert a 7/8" or 3/4" rod through the center of drive roller and apply force directly to the shaft of the motor.



Replace Bearings on Drive Roller

The roller bearings are pressed into the rollers with a friction fit and held in place with a retaining ring.

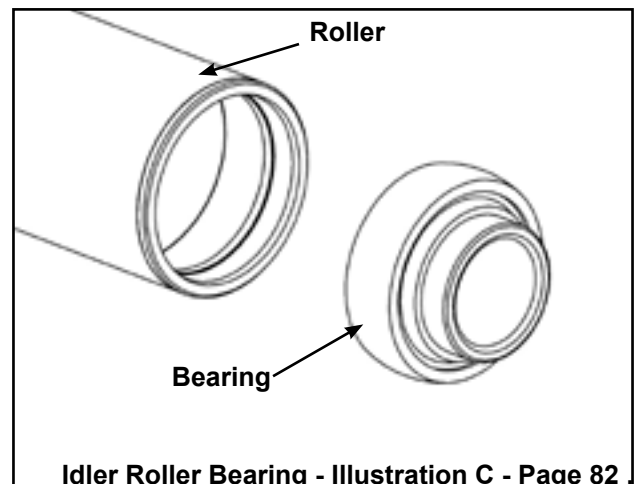
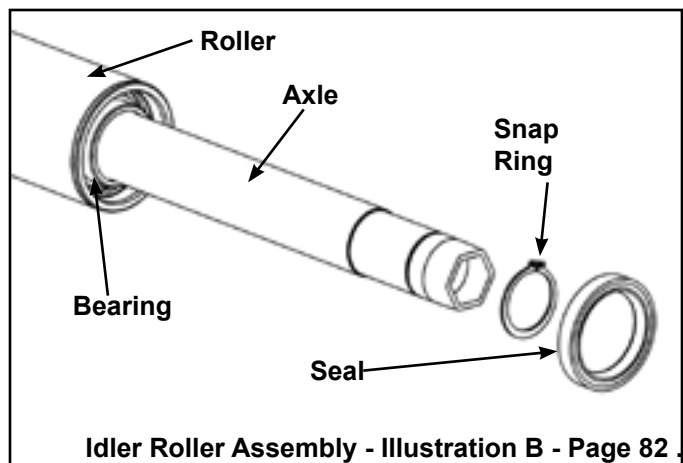
1. Remove seal that holds the bearing assembly in place. Be prepared to replace the seal with a new one upon replacement.
2. Remove the snap ring that secures the bearing in place.
3. On the opposite end of the roller from the bearing to be removed, insert a small rod through the inside of the roller and push the bearing out.
4. Drive bearing out with the rod.
5. Install new bearing, and replace the retaining ring and seal.



Replace Bearings on Idler Rollers

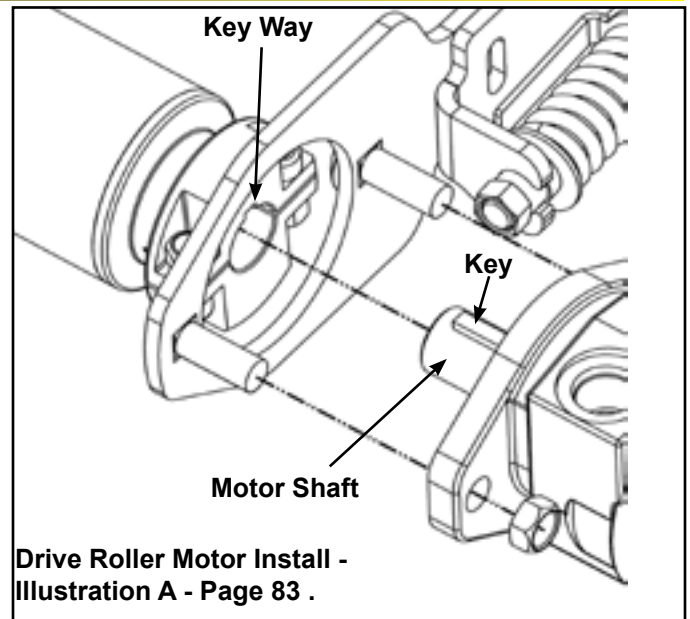
The roller bearings are pressed into the rollers with a friction fit and held in place with a retaining ring.

1. Remove seal that holds the axle and bearing assembly in place. Be prepared to replace the seal with a new one upon replacement.
2. Remove the snap ring that secures the bearing and axle in place.
3. Grab the axle and pull it out of the roller, ensure that you pull the side with the hexagon end out first.
4. On the opposite end of the roller from the bearing to be removed, insert a small rod through the inside of the roller and push the bearing out.
5. Install new bearing, and replace the axle, snap ring and seal.



Installing Draper Motor

1. Clean motor shaft and hub of drive roller.
Apply anti-seize to shaft.
2. Insert key in motor shaft.
3. Insert motor into hub, lining key on shaft with the key-way in the hub. Do not use a hammer on housing flange; damage of this nature to the motor will void warranty. Use a soft blow or rubber hammer to apply force to end of motor.
4. Tighten set screws.



Draper Deck Maintenance:

1. Remove draper connector bar.
2. Remove draper - clean draper of debris, both sides.
3. Store draper indoors.
4. Clean debris from rollers, deck channels, and runners.
5. Check and bend down corners of deck runners so draper does not get caught.
6. Clean adjusters; lubricate guide tubes and adjuster tubes. Adjusters should move freely inside the guide tube.
7. Check idler roller bearings; they should spin freely.
8. Check drive roller bearings.
9. Check bearing stubs.



NOTE!

If you elect to store the swather outside with draper installed, position the connector bar on the underside to aid water drainage. Ice build-up underneath could cause draper to sag and drop out of the lower runner. If this is not noticed and corrected, damage may occur to draper on start-up.



7 - Cutting System

All cutter bar components must be maintained in good condition to obtain acceptable field performance. Inspect the cutter bar daily for damaged and broken parts before starting work. Repair or replace parts as required.



When working with or around the knife, take the following precautions to avoid death or serious injury.

1. Raise the table, raise the reel, stop the engine, set the park brake, and remove the ignition key.
2. Wait for all moving parts to stop before dismounting.
3. Install the reel and table lift cylinder locks.
4. Clear the area of bystanders, especially children.
5. Wear heavy canvas or leather gloves when working with the knife.

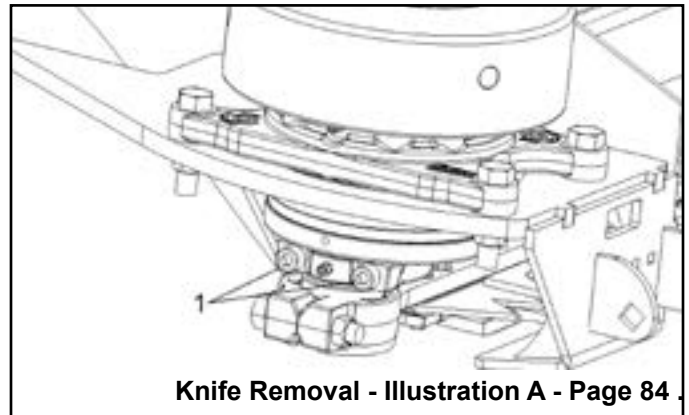
Knife Speed

See *“Knife Drive Speed Adjustment” on page 96*

Removing the Knife

Remove the two socket head cap screws (1) on the knife head block. Slide the knife out of the cutter bar.

Reverse the procedure when installing the knife. Apply a small amount of thread lock solution to cap screws (1) before installation. Torque to recommended specifications - 59 ft-lb (80 Nm).



Knife Removal - Illustration A - Page 84

Guards

EasyCut guards are manufactured from heat treated spring steel with beveled cutting edges at the top and bottom which make the guards cut well and last longer.

When replacing guards always mount the new guard with the SCH stamp to the top. Be sure the spacer bar is on top of the cutter bar. The crimp-lock nut on the guard bolt should always be on top. Alignment is critical. Before tightening the guard bolts, push the spacer bar as far back on the cutter bar as possible and pull the guard ahead as far as possible. Sight down the cutter bar to be sure the guards are aligned. Tighten guard bolts.

Sickle Sections

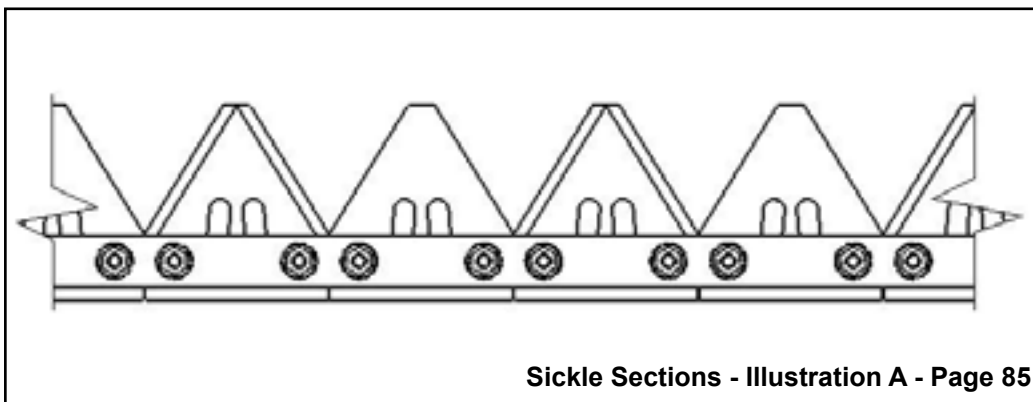
The sickle sections of the knife are installed with alternating cutting surfaces. One section will have the cutting surface on the top and the next will have the cutting surface on the bottom. They must be in good condition to obtain proper cutting.

Replace a Section:

- | | | |
|--|------|--|
| 1. Remove the guard to expose the section. | -OR- | 1. Turn the knife by hand until one section bolt is exposed. |
| 2. Unbolt the section and install a new one. | | 2. Remove the bolt. |
| 3. Tighten the section bolts and nuts. | | 3. Turn the knife until the other bolt is exposed. |
| 4. Install the guard. | | 4. Remove it, and install a new section by reversing this procedure. |
| | | 5. Tighten section bolts and nuts. |



Always alternate the sickle sections, one with the serrations facing up, the next, facing down.



Sickle Sections - Illustration A - Page 85



Knife Drive/Knife Head

Proper maintenance of the knife drive and the knife head is critical to the performance of your swather. Check the knife drive hold down bolts daily. Tighten to the specified torque as needed.

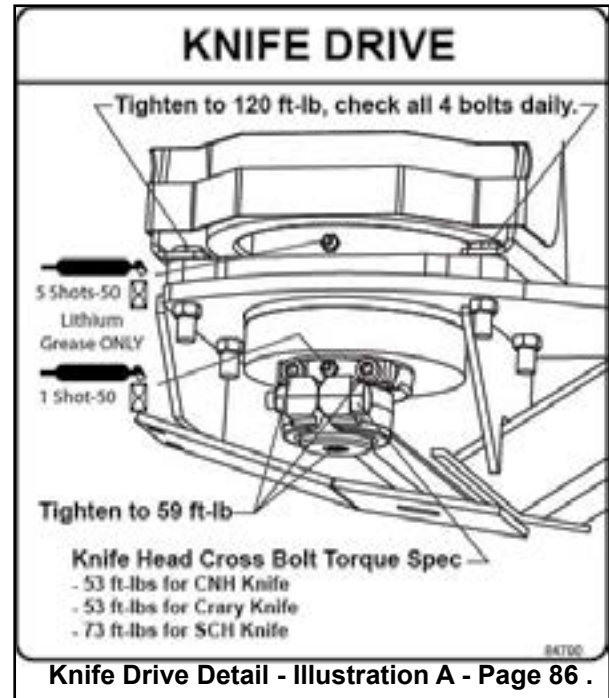
Check the knife head bearing daily. If the bearing is loose, check the tightness of the bolt. If the bolt is tight, check the condition of the bearing and sleeve. If any parts are defective, replace them immediately to avoid damage to the drive.

Check the knife head locking bolt and the socket head cap screws daily. Rotate the knife drive by hand after tightening the knife head bolt to be sure the bearings rotate freely.

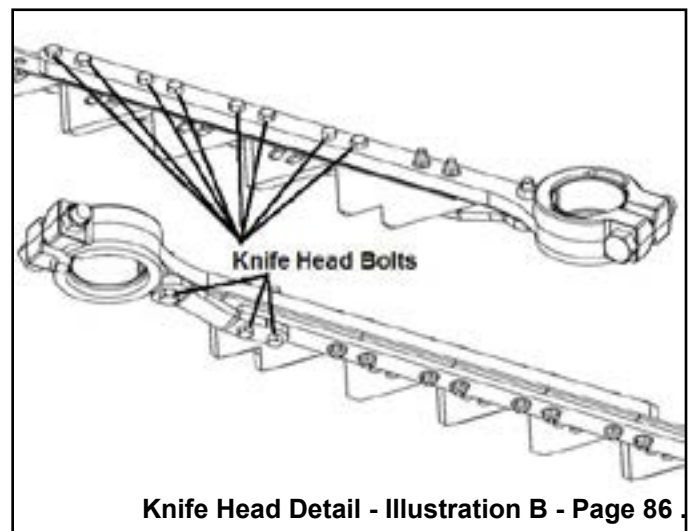
NOTE!

Knife drives should always rotate counter-clockwise to keep the bottom cap screw from coming loose.

Check the knife head bolts which attach the knife head to the knife back daily. The bolts should be tightened to 120 in lbs., (13.5 Nm), (9.96 ft lbs.)



Knife Drive Detail - Illustration A - Page 86 .

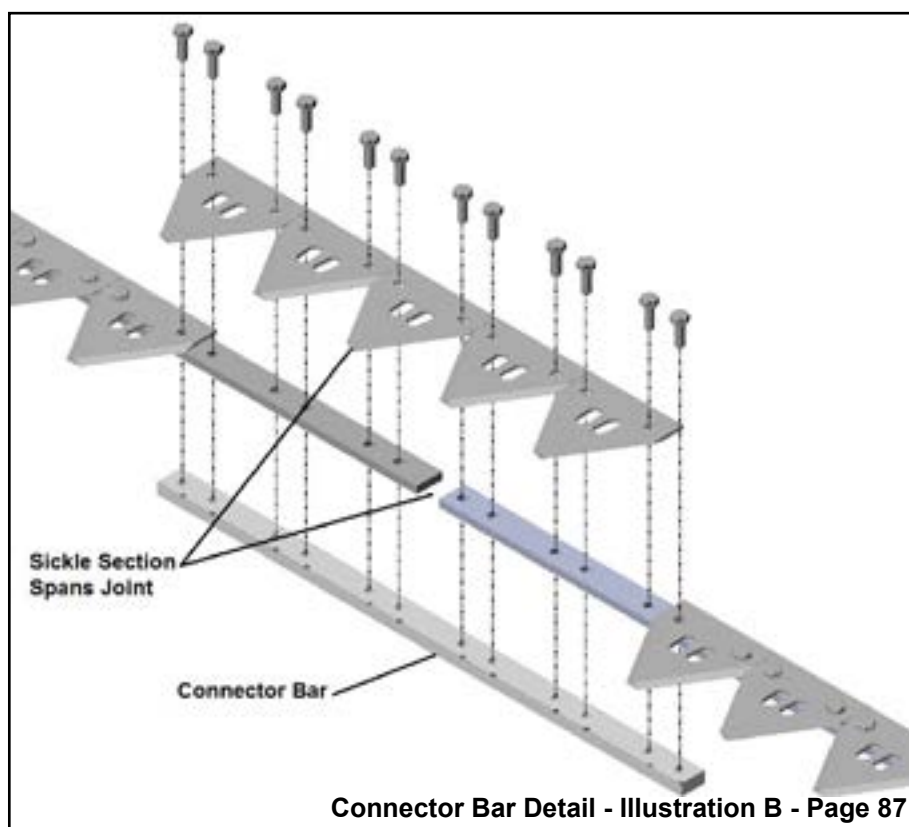
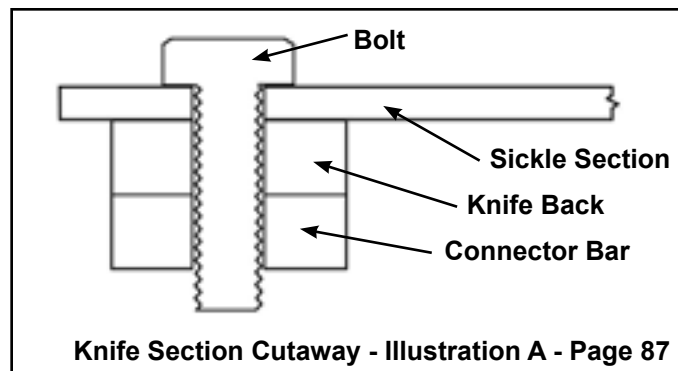


Knife Head Detail - Illustration B - Page 86 .

Connector Bar

On some models of Honey Bee swathers a connector bar is used to join two sections of knife back. The sickle sections are bolted to the knife back. The connector bar is attached to the underside of the knife back with eight threaded inserts installed into the bar which protrude slightly on the side that contacts the knife back. The knife back is punched with slightly tapered holes to accommodate the sickle sections.

The knife sections must be installed on the top side of the knife back (the side stamped "TOP") so that the protruding inserts of the connector bar will fit snugly into the tapered section holes. As the section bolts are tightened, the inserts in the connector bar are drawn into the knife back forcing them to clamp down on the bolt. The bolts should be tightened to 120 - 150 in-lbs, (13.5 - 17 Nm).

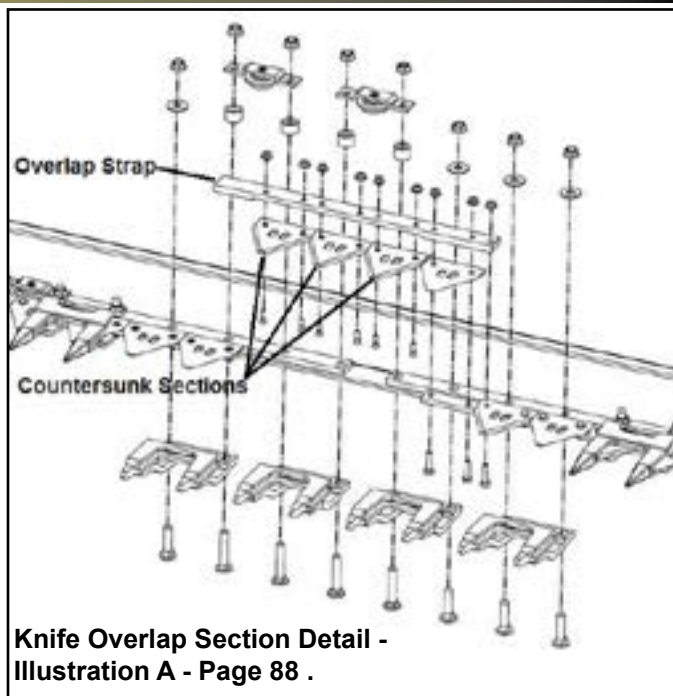


Do not grind the inserts flush with the connector bar. This will defeat their function, and may cause a knife failure. Check tightness of bolts daily; replace broken and worn sections as required.

Overlap Kit

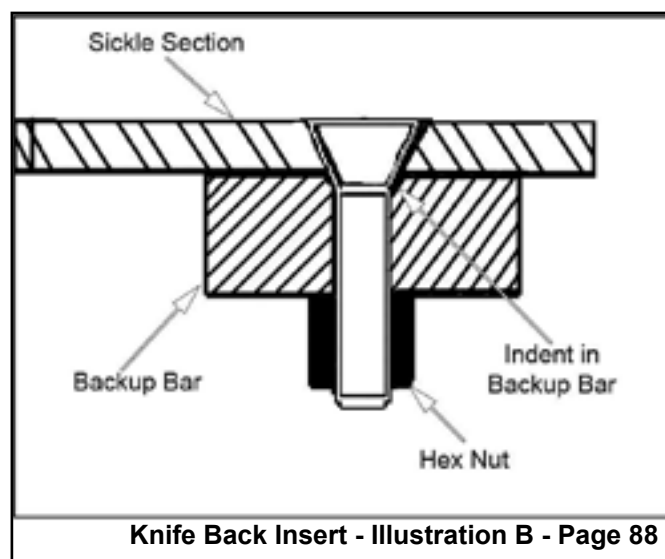
The overlap kit is used on swathers equipped with double knife drives. The fasteners in the overlapping portion of the knife are countersunk to provide a smooth-sliding surface. The overlap guards are open on top, and are deeper to provide room for the double thickness of the knife. The overlap strap bolted to the left-hand knife will slide over the countersunk sections where the knives overlap. If knives are noisy or are over heating, check to see if the overlap guards have been properly installed.

The knife sections that are on the overlap strap and the right hand knife back need to be snugged down to the back up bar when the countersink bolts are tight.



If the sections are loose:

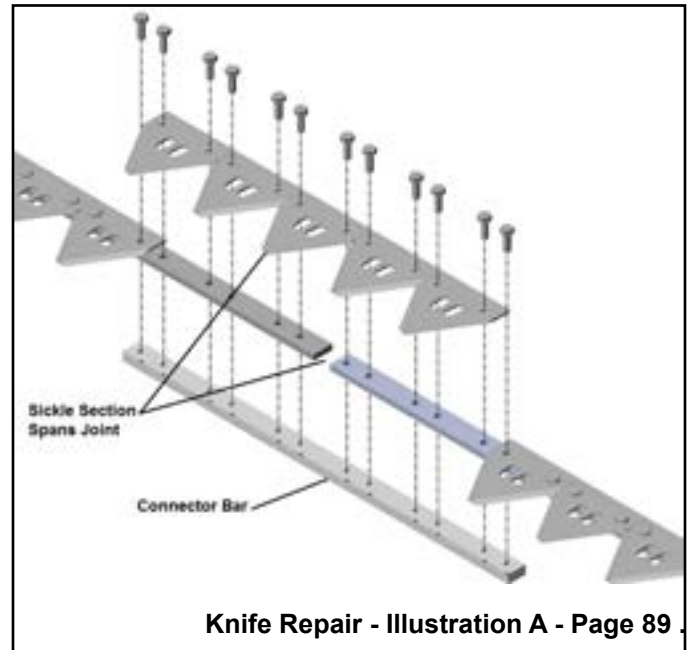
1. Remove the countersink bolts.
2. Inspect the holes drilled into the knife back or overlap strap for a countersunk depression. This allows the tapered head of the bolt to draw down fully, seating in the knife section.
3. If no countersink is found, drill them in (about 1/32" deep) with a 9/32" drill bit.



Repair Broken Knife Back

If the knife breaks during use, repairs can usually be made using a connector bar. Typically, the knife back will break across a sickle section bolt hole. The damaged section needs to be cut out and/or a section of knife removed. If the knife breaks close to the knife head end, remove that section of knife, reconnect the knife head, then add the new piece to the far end of the knife where there is less mechanical stress on the knife.

The join must be directly under the center of a sickle section, not where two sickle sections join. Inspect the knife for dull/damaged guards and sections and built up crop residues. These are the most common causes of knife breakage.



IMPORTANT Correct any of these cause factors before resuming operation.

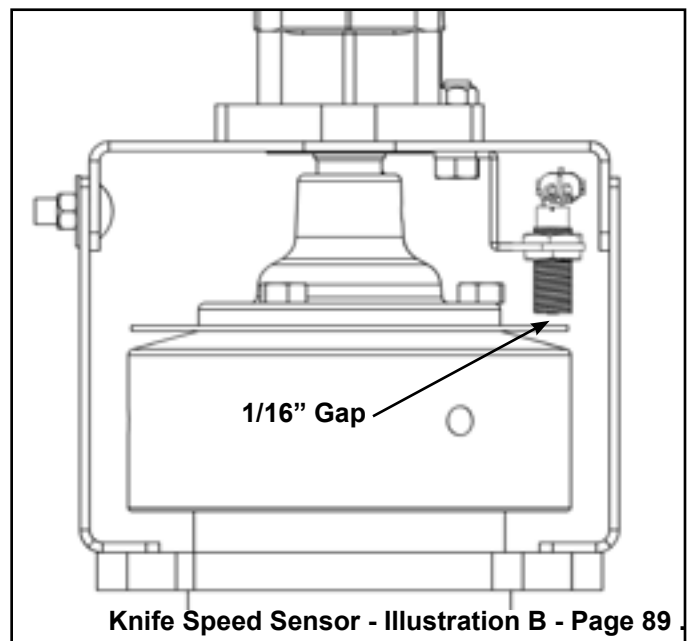
Knife Speed Sensor

The table is equipped with a sensor, located on the knife drive motor, which provides the ability to monitor and calibrate knife speed.

The sensor should be positioned so that there is a gap of 1/16" between the pulse wheel and the sensor.

Monitoring Knife Speed

Knife speed can be displayed on the CommandTouch Corner Post of the Windrower. It will be seen as Platform Speed. Optimal Knife Speed is preset to 720 rpm.



8 - Leveling

Forward Angle Adjustment – Hydraulic Tilt Cylinder

Once all the proper hydraulic connections are made, you can tilt the table by setting the Honey Bee Switch Box to Tilt (see **Illustration A**), and then using the Tilt Button on the JD Multi-function Lever (see **Illustration B**).

Table Angle

These views of the windrower and table show the results of adjustments to the tilt cylinder.

Illustration “C” shows the tilt cylinder fully retracted, drawing the top of the table back. The draper decks will run more horizontal to the ground.

Illustration “D” shows the tilt cylinder fully extended, tilting the table forward. The draper decks will run at a steeper angle to the ground.

***Remember** that the above examples represent the extreme range of adjustment.

Experiment within this range of adjustment to determine the best setting for your operating conditions and for the type of swath you want.

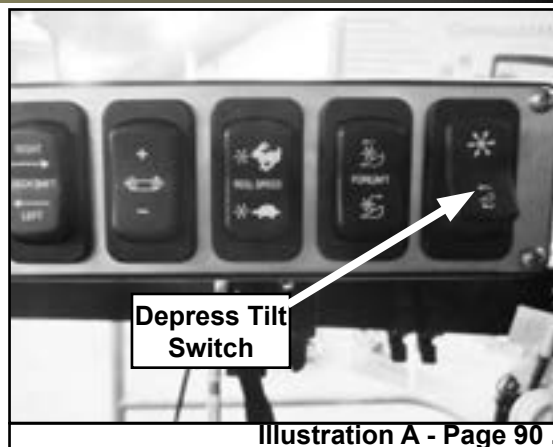


Illustration A - Page 90 .

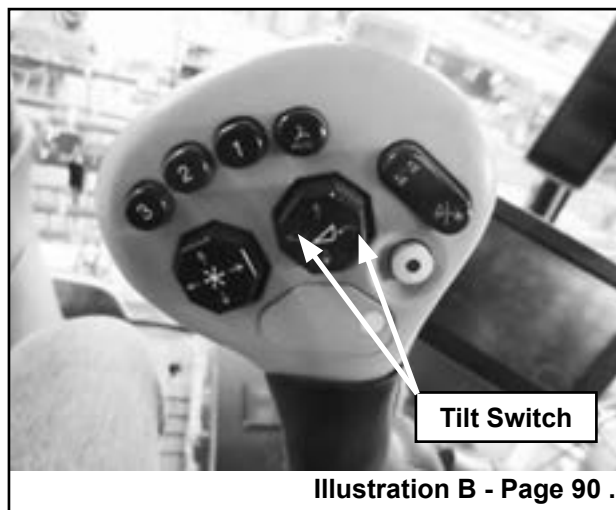
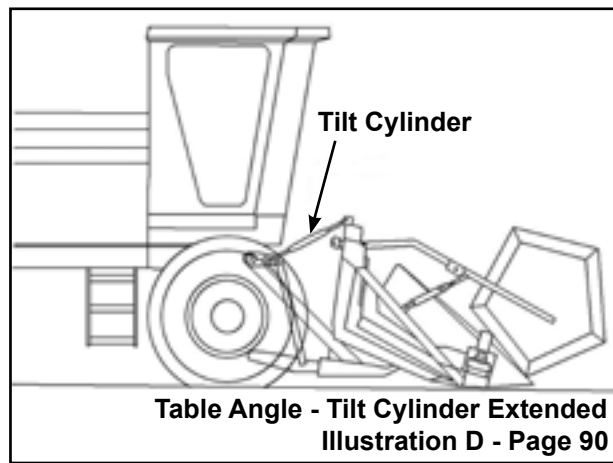
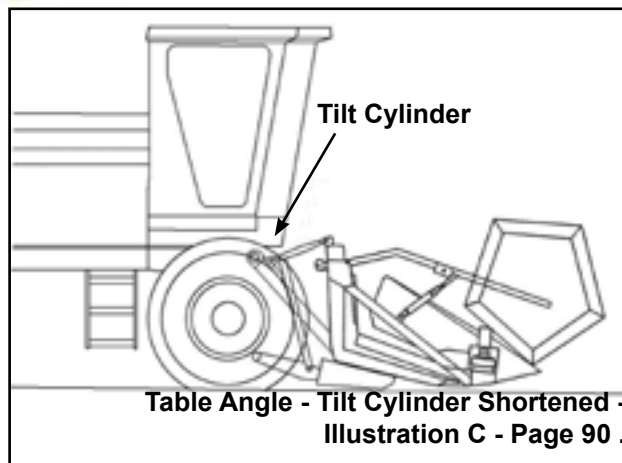


Illustration B - Page 90 .

NOTE!

In rocky conditions, with a short crop, it may be beneficial to keep the guard tips up. Try shortening the tilt cylinder. In bushy crops, such as mustard, you may want to tip the swather forward to maximize the opening.



Adjusting Independent Table Float

The Independent Float Feature allows the operator to tilt the Honey Bee Swather Table laterally to match the terrain that they are cutting on, or to level the table due to weight imbalance.

NOTE!

See Windrower Operators Manual for all details.

1. Park swather on level ground, lower table so it rests on the ground, then set engine to operating speed.
2. To enable float adjustment, press any direction on the reel adjust quad on the multifunction lever
3. Once enabled, press Up or Down to adjust float setting values. Press Left or Right to scroll through Left, Average and Right float selections.
4. The Left, Average and Right float values are shown on the armrest display (once float adjustments has been enabled).
5. The average float value is also shown on the corner post display.
6. Set the float pressure to obtain desired table float. The pressure will adjust in 10 psi increments.
7. Check the platform float by lifting at each end of the table. Normally it should require less than 150 lbs. (68kg) to lift the end of the table.

Float values can also be adjusted using the armrest display (if equipped as a touchscreen), or using the selection dial on the CommandARM (once enabled with the Reel Adjust Quad).

Once the platform has been set, the system will retain the setting after the swather has been stopped.



Illustration A - Windrower Controls



NOTE!

- At light float settings, if table has been in raised position for any length of time, when lowered, table may lower slowly or may not lower completely to the ground. This is due to temperature difference in the Accumulator. Once the table has lowered and operation has begun, float function will operate normally.
- To avoid table lowering slowly, lower table to ground when machine operation is stopped for any length of time.
- The higher the float pressure, the lighter the table. Use highest pressure float setting to allow the table to remain firmly on the ground without bouncing. Table must follow uneven ground without gouging or scraping.

The chart below shows approximate Float Settings for the different sizes of Honey Bee WSP Swathers. You will want to adjust the settings for your specific situation. Addition of equipment options will require different settings.

TABLE SIZE	SUGGESTED PRESSURE
25 ft	TBD kPa (bar) (psi)
30 ft	TBD kPa (bar) (psi)
36 ft	8274 kPa (82.7 bar) (1200 psi)

NOTE!

If it is difficult to get the float settings right, you may need to adjust the float cylinder connection. Depending on your setup, it may be necessary move the float cylinders to position #3.

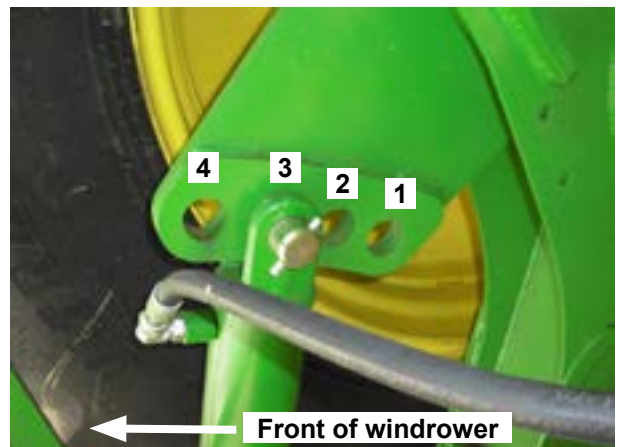


Illustration B - Float Cylinder Connection

9 - Hydraulics

The Swather uses windrower hydraulics to power the various systems. Hydraulic pressure flows to the manifold block, which regulates the flow by sending the primary flow to the knife drive. An additional smaller secondary flow is directed to the 50/50 flow divider which splits the flow equally between the draper and reel circuits. The system is protected by a pressure relief valve which should be set to 3000 psi. Return-flow oil is filtered before returning to the windrower.

See Appendix C on page 118 for hydraulic schematics

Manifold Block Cartridge Locations

Identification stamps can be found on individual parts as well as port stamps on the Manifold Block itself.

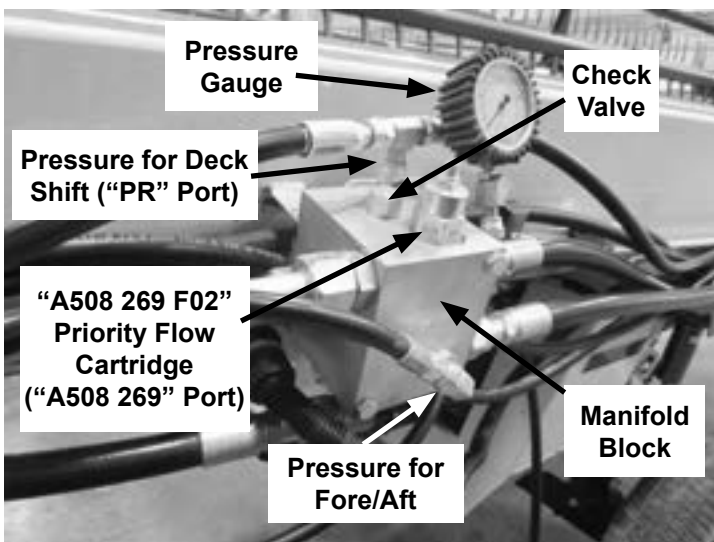


Illustration A - Page 93 .

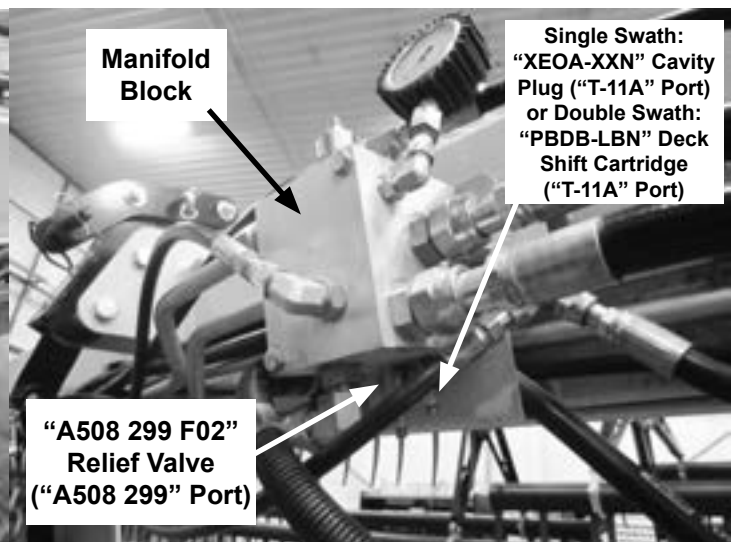


Illustration B - Page 93 .

Flow Controls

An 11 GPM (41.6 LPM) flow control is used for the drapers, while an 18 GPM (68.1 lpm) flow control is used for the reel. The "R" (control flow) port of the draper flow control goes to the draper motors. The "R" (control flow) port of the reel flow control goes to the reel motor. The "T" (excess flow) port of both flow controls diverts oil directly to the return circuit.

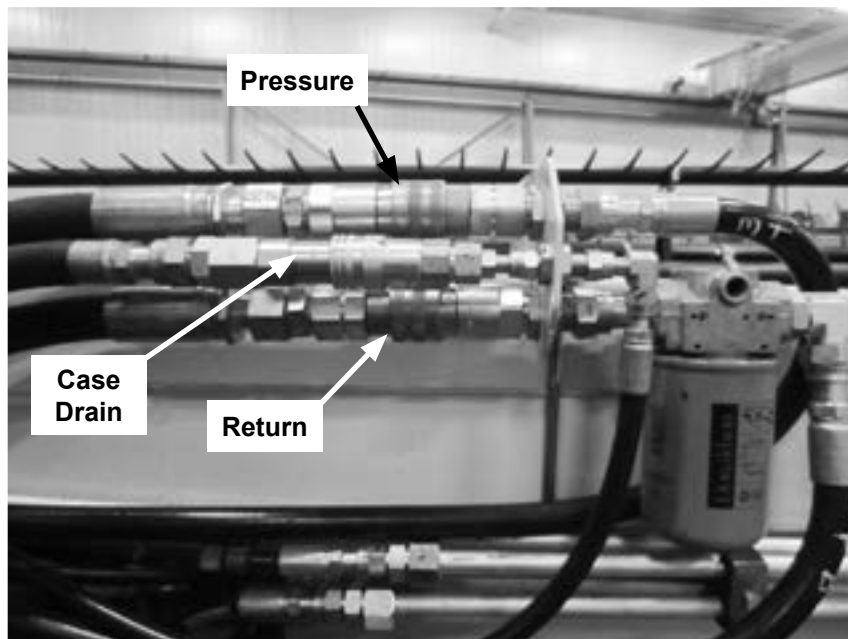
The windrower relief valve is set to 5000 psi. Care must be used when working around pressurized hydraulic systems.

Quick couplers must be securely connected before the windrower is started, and power is applied to the swather. Serious injury, and/or damage to equipment may result from poor connections.



Hydraulic Connection Points

Connect the hydraulic hoses from the windrower to the couplers shown to the right.



Hydraulic Connections - Illustration A - Page 94 .

Operating Pressure - Knife Circuit

The pressure gauge, located on the manifold block, indicates the total hydraulic pressure required to run the knife.

Normal operating pressure should range between 1000 and 1500 psi for double knife when the windrower is operating at normal working rpm, and the oil is at operating temperature.

It's normal for pressure to fluctuate while cutting, due to crop conditions. Other factors that will affect pressure include the condition of the cutting system, and ground speed.

Checking or Adjusting Knife Relief Pressure



Set the park brake, shut the engine down, and wait for all moving parts to stop before leaving cab.

Be certain all bystanders are away from the machine prior to engaging the pump. Only stall the knife long enough to obtain accurate readings. Prolonged operation in this condition could cause damage.

1. Jam a wood block tightly in the knife, between a guard and cutting section.
2. Restart windrower. Raise the reel, and insert the cylinder lock.
3. Engage the hydraulic pump drive, bring the engine rpm to the normal working range, and check the pressure on the gauge. If the reading is 3000 psi, shut the windrower down, remove the wood block, and reel cylinder stop.

If adjustments are required, shut the windrower down, and continue with the following:

1. Locate the relief valve on the bottom of the manifold block-"A508 299" Port (**see Illustration A**). Adjust the relief screw; turning clockwise increases, and counter-clockwise decreases pressure setting.

If using a double swath table, do not adjust the deck shift cartridge ("T-IIA" port) by mistake.

3. With the knife jammed as described previously, restart the windrower, engage the hydraulic pump drive, and re-check the pressure reading.



Relief Valve (Single Swath)
- Illustration A - Page 95 .



Knife Drive Speed Adjustment

The optimal knife speed is preset at the factory to 720 RPM, it is suggested that you not change this setting.



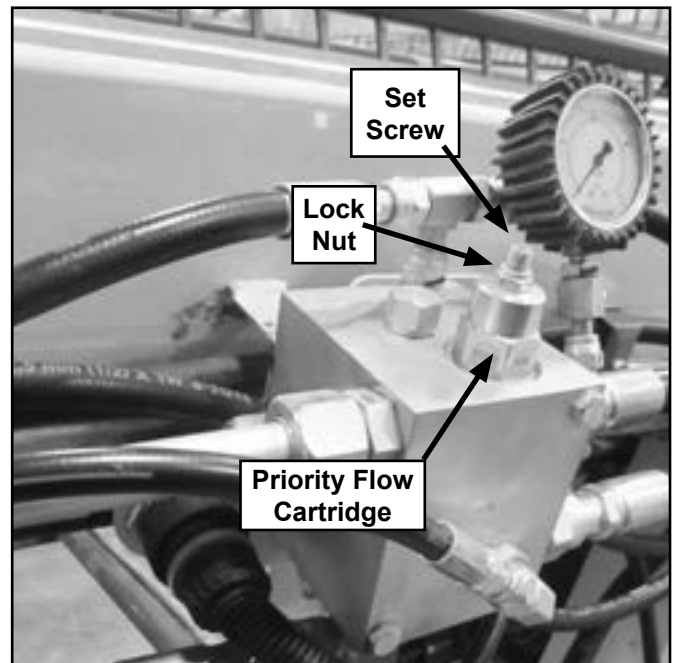
Increasing the knife speed beyond 720 RPM increases the chance of extra wear, additional breakage and/or damage to the cutting system.



Ensure that all equipment is off and has stopped moving before attempting to adjust the knife speed.
Do not adjust the knife speed beyond 720 RPM.

To adjust knife speed:

1. Locate the priority flow cartridge on the top of the manifold block-"A508 269" Port (**see Illustration A**).
2. Loosen the lock nut on the cartridge.
3. Adjust the set screw in half-turn increments as required:
 - Turn clockwise to increase knife speed.
 - Turn counterclockwise to decrease knife speed
4. After each half-turn, tighten the lock nut, restart the equipment and check the knife speed. If more adjustment is required, ensure the equipment is turned off.

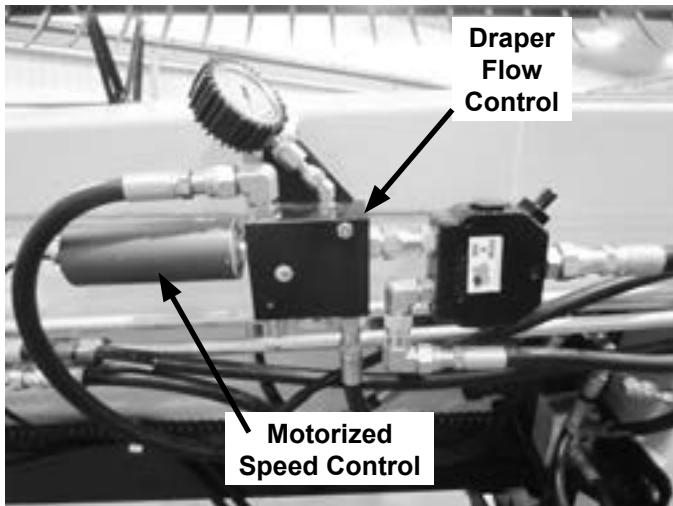


Knife Speed - Illustration A - Page 96 .



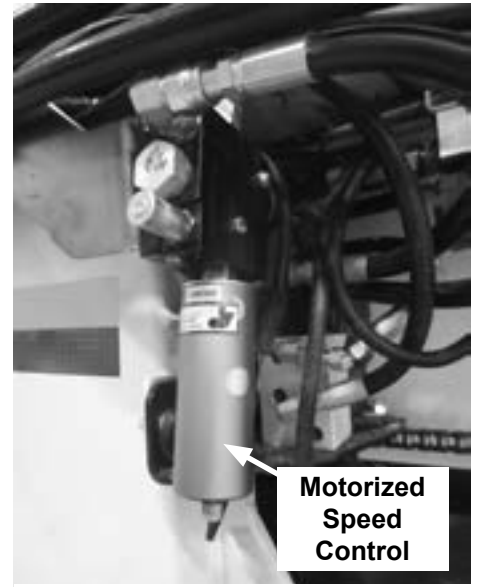
Adjusting the set screw only sets the maximum knife speed limit.
The pump flow is set by the windrower software.

Draper and Reel Flow Controls



Draper Speed Control - Illustration A - Page 97 .

The reel circuit flow control is located on the side of the strut on the right-hand end of the table (see Illustration "B").



Reel Speed Control .
Illustration B - Page 97 .

NOTE!

Both flow controls are equipped with a tamper-proof preset relief valve and a motorized speed control. Each relief valve is preset at 3000 psi (206.9 bar) and is non-adjustable. Each speed control is electrically adjustable by corresponding draper speed and reel controls in the cab.

Return Line Filter

This filter cleans the oil as it returns to the windrower. Change this filter after the first 50 hours of operation, and seasonally thereafter. The OEM filter is a Donaldson P164375. A partially plugged oil filter can adversely affect the flow of oil in the system.

Compatible Replacement Filters:

- Fleetguard HF6510
- LHA SPE15 – 10
- Gresen K-2202
- Fram P1653A
- NAPA 51551
- Stauff SF6520



Return Oil Filter - Illustration C
- Page 97 .



10 - Optional Equipment

Caster Gauge Wheels

The gauge wheels are part of the system that keeps the table aligned with the profile of the ground while cutting. They provide improved lateral flotation of the swather in rough and uneven ground conditions by using shock absorbers. The gauge wheels are designed to caster, so it is normally not necessary to raise the swather when cornering. The adjustment of the gauge wheel assembly relative to the cutting height is essential to effective terrain following.

Lift the swather table and gauge wheels off the ground when backing up the windrower. Damage to caster wheels can also result from making sharp turns with the windrower. The sharp turning radius of the windrower can cause one of the wheels to be dragged backwards, potentially causing damage to the wheel.



NOTE!

The swather should be leveled and parked on level ground before attempting to adjust gauge wheel height.

Gauge wheel height adjustment must be checked with the knife set at field operating height. Normal adjustment compresses the shock assembly of the gauge wheels so that a recommended 5" of the shock shaft is left exposed to allow for additional field operation compression. Height adjustment is made by placing the top end of the shock assembly in one of the mounting holes on the frame.

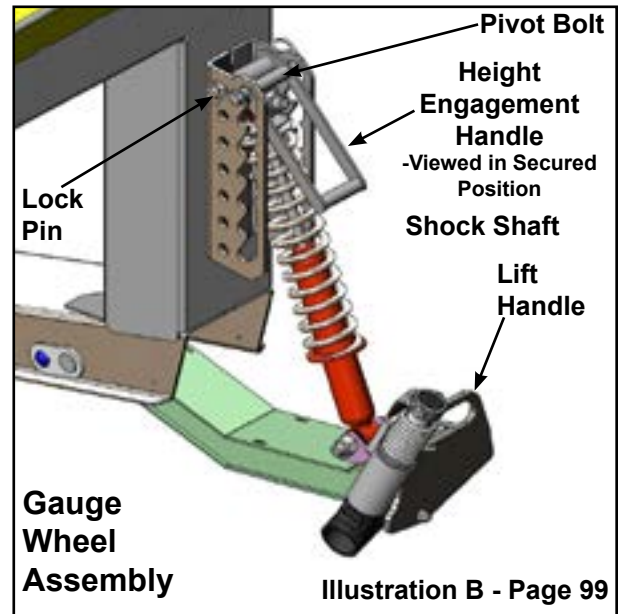
The height engagement handle can pivot freely when not locked in place by the lock pin. **Always keep the handle under control.**



Do not attempt to adjust gauge wheel height when there is compressive load on the shock assembly.

Gauge Wheel Height Adjustment

1. Park windrower on a level surface, and engage the park brake. Raise the swather table up to its locking position, and lock it in place.
2. Remove the lynch pin from the end of the Lock Pin.
3. While grasping the Height Engagement Handle, push it slightly down towards the shock assembly to release pressure on the Lock Pin, remove the Lock Pin from the frame mounting hole, and let the handle slowly come up under control.
4. While still grasping the Height Engagement handle, use your other hand to grab the Lift Handle and lift the Gauge Wheel Assembly so that the Pivot Bolt comes out of the current slot location on the frame. Lift or lower the Gauge Wheel Assembly to the desired height and place the Pivot bolt in the corresponding slot location.



The Gauge Wheel Assembly is Heavy!

5. Push the Height Engagement Handle down towards the shock assembly until the frame mounting hole lines up. Ensure that the Pivot Bolt stays fully seated in the slot while pushing down. Insert the Lock Pin into the mounting hole to lock the Height engagement Handle in place. Secure Lock Pin with the lynch pin.
6. Repeat steps 2 through 5 on the other Gauge Wheel Assembly, using the same height setting.
7. Lower the swather table until it is at field operation height. Check exposed Shock Shaft length to see if it matches the recommended 5". Re-adjust Gauge Wheel height as needed.

NOTE!

To avoid bottoming out the shock assembly during field operation, it is recommended that the exposed Shock Shaft length be no less than 3". Adjusting table tilt and/or table floatation will affect the amount of compression in the shock assembly. Further adjustments to the Gauge Wheel height will be necessary.

WARNING

Never operate with the shock assembly fully compressed during field operation. This will result in damage to the shock assembly. Excessive compression of the shock assembly will add stress to the top link, causing premature wear.

IMPORTANT

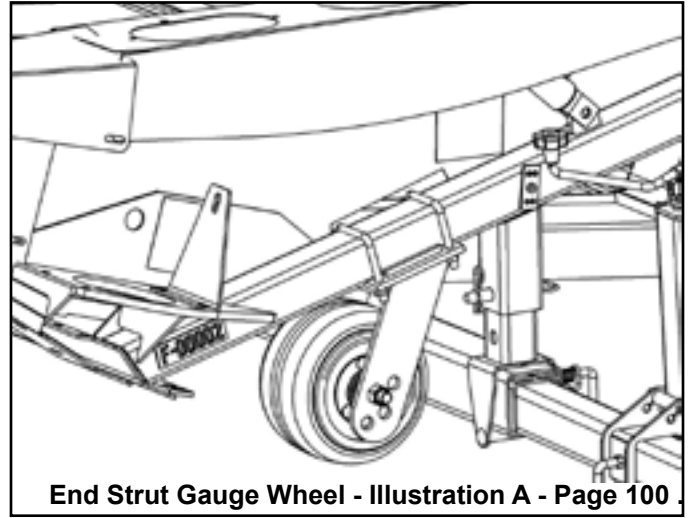
Gauge wheels are not designed to support the weight of the swather table.



End Strut Gauge Wheels

End strut gauge wheels are mounted at the outboard ends of the main table frame to enhance the ability to closely follow the contour of the ground with the cutter bar.

Holes drilled in the wheel mount provide height adjustment by relocating the axle shaft as needed.



NOTE!

The draper decks will need to be moved to allow **at least 1"** of clearance from the end strut gauge wheels.

Vertical Crop Cutters

Vertical crop cutters are offered by a variety of third party vendors. They are designed to cut in a vertical direction for use in cutting entangled crops such as canola and peas and preventing the crop from being entangled on the ends of the cutter bar.

The crop cutters must operate in series from the **last** reel drive motor in the circuit. The circuit flows from the last reel motor return port to the power inlet of the right hand crop cutter motor, to the power inlet of the left hand crop cutter motor, to the main return line of the swather.

End-to-end plumbing is supplied standard on every swather table so that the operator can then add custom end plumbing for their particular cutter setup.

Cross Auger

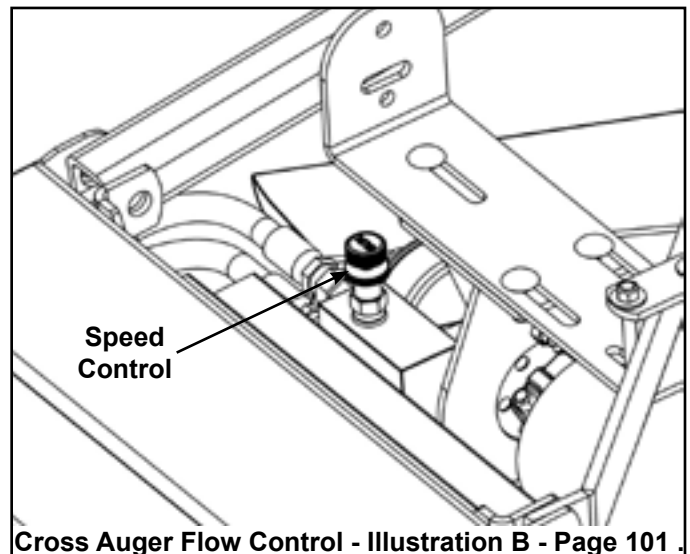
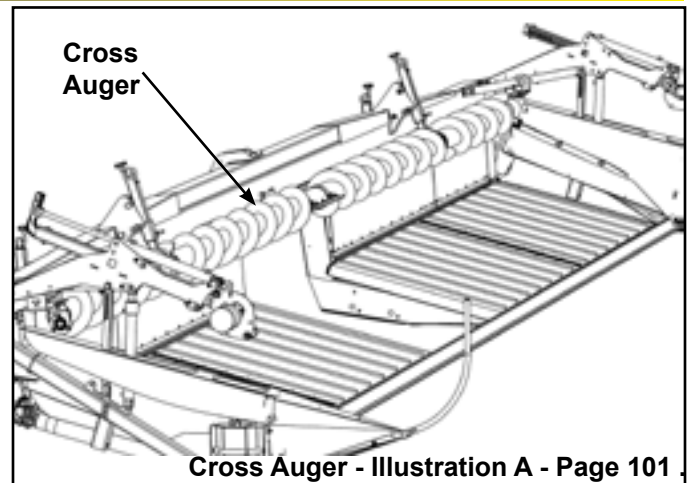
The cross auger can improve the cutting of specialty crops such as peas, canola, mustard, safflower, and lupins. Many of these crops are not heavy enough to keep them firmly on the draper. Bushy or vine crops tend to slide on the draper, causing them to fall into the windrow in bunches or wads.

The left and right hand flighting on the cross auger gently pushes the crop down onto the draper, assisting its movement toward the windrow.

Some cross auger models include jacks where the cross auger mounts onto the frame. These jacks allow you to raise or lower the cross auger to account for different crop conditions.

The cross auger is plumbed into the draper circuit with a manual speed control (needle valve). The rotation speed should be adjusted no faster than necessary to keep the crop moving evenly. If set to rotate too quickly, the crop may wrap onto the flighting.

The cross auger can be left in position even if it is not being used, such as when harvesting cereal grains. The cross auger can be turned off by fully opening the needle valve. Draper speed should not be affected.



Double Swath Option – 21, 25, 30, and 36 Foot Tables

Honey Bee Swathers can be equipped with a double swath option. This option allows the operator to lay two swaths. The first swath will be delivered to the opening on the right end of the swather. On the next round, the decks can be shifted to the right, creating an opening on the left end of the swather. This places the second swath beside the first. This option is useful in light crop conditions.

The decks are shifted using hydraulic motors on a chain and sprocket assembly.

The reverser valve (**see Illustration B**) reverses the flow through the output ports when activated. The valve is located under the Left Side Hydraulics Shield (**see Illustration A**).

The deck shift and the draper reverser are electrically controlled in parallel, so that when the deck arrives in its new position, the deck shift motor stops and the draper motor will be running in the opposite direction.

The deck shift roller chains are located on the back of the rear panel (**see Illustration C**).

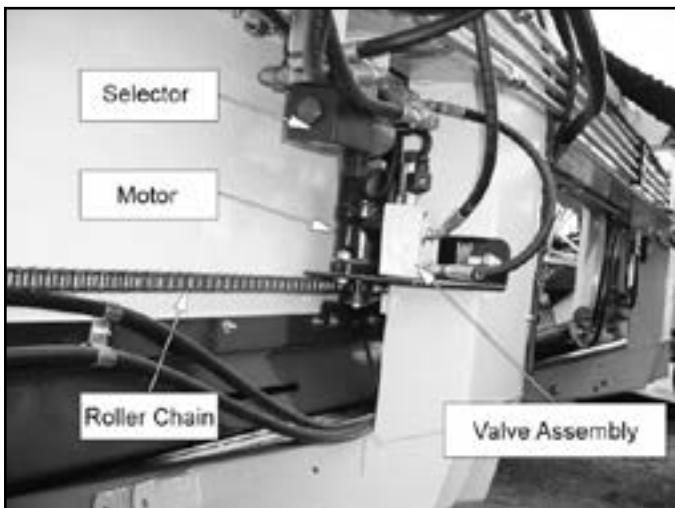
Adjuster bolts at either end of the chain are used to adjust tension.

The chains should not have too much slack, nor should they be too tight.

Excess tension will cause the decks to warp.



Deck Shift System - Illustration A - Page 102 .



Deck Shift System - Illustration B - Page 102 .



Roller Chain Tensioner - Illustration C - Page 102 .

Deck shift stops are installed on each chain. Before adjusting these stops, determine how much the deck needs to be shifted. Then move the appropriate stop.

To have a deck move further/less to the left, the right hand stop will need to be moved, conversely, for the deck to move further/less to the right, the left hand stop will need to be moved.

The stop should be set so that the deck does not hit against the other draper decks or the swather frame. Allow approximately **1"** of space between the extreme points of the decks.

Check all hose clearances on hydraulic motors after shifting the deck, to ensure they are not pinched or stretched.

Check draper tracking and adjust if required. See Draper Adjustment section of this manual for assistance.



Deck Shift Stops-
Illustration A - Page 103



Setting Deck Gap-
Illustration B - Page 103

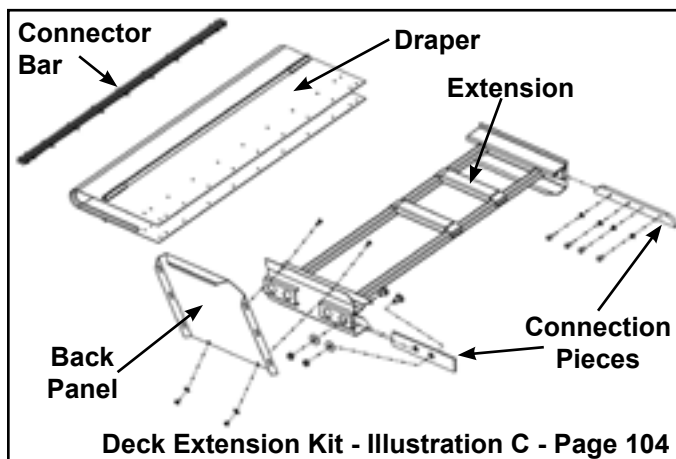
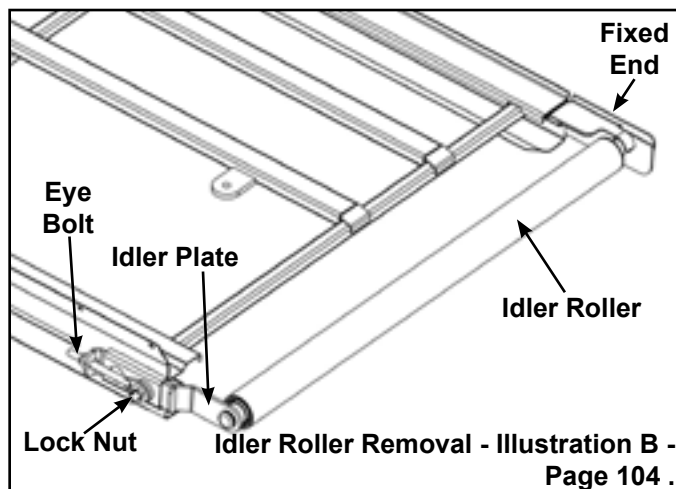


When shifting the deck for the double swath option, you must disconnect the cross auger motor from the hydraulic circuit using the quick couplers provided. The cross auger motor is connected in series with the draper motor, therefore the hydraulic lines will become damaged if the draper motor is moved while still connected to the cross auger motor.

Draper Extension for Swathing

When swathing in light crop conditions, it may be necessary to narrow the opening in order to lay a tight swath. One option is to add the 14 inch deck extension kit to the idler end of a deck, and add to or replace the existing draper with a longer one.

1. Remove the connector bar and open the draper to expose the idler roller.
2. Remove the lock nut and washer that hold the idler plate in place.
3. Remove the idler plate, idler roller, and fixed end.
4. Install the 14" back panel to the 14" extension deck.
5. Install extension deck and back panel onto the end of the deck being extended.
6. Install the front connector and the rear connector.
7. Install the fixed end, idler roller, and idler plate.
8. Join the 30" draper extension to the regular draper with a connector bar.
9. Wrap draper around the rollers and connect ends together with the connector bar.
10. Adjust draper tension and tracking.

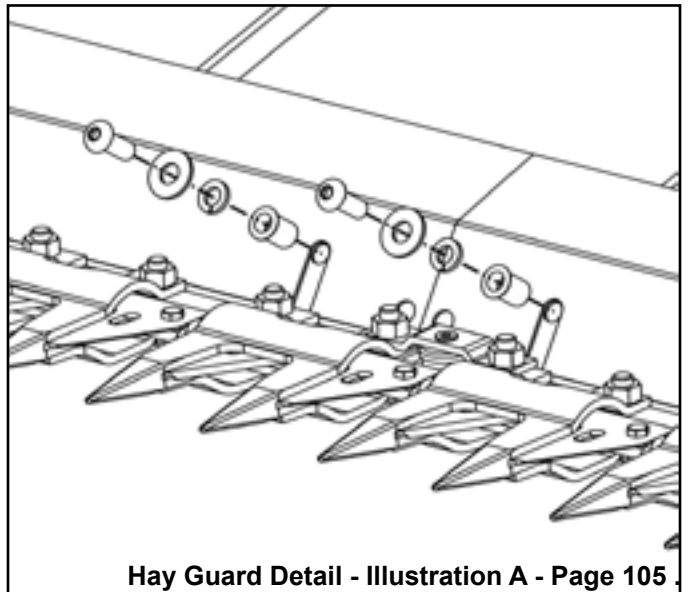


Hay Guard / Short Crop Guard

Lay out Hay Guard starting at the end of the cutter bar. Install the longest section at the ends. The hay guard/ short crop guard butt together end to end.

The hay guard should fit tight against the rise of the cutter bar leaving approximately $\frac{1}{4}$ " clearance between the ribs of the draper and the underside of the hay guard.

Secure the first hay guard in place using the threaded inserts, lock washers, flat washers and $\frac{3}{8}$ " x 1" bolts as shown to the right. Install the next section of hay guard, butting it up to the first section. Continue until all sections of hay guard are installed.



Hay Guard Detail - Illustration A - Page 105

SCH Crop Lifters

Install the lifter spools to the underside of the guards using the longer bolts supplied in the kit. The spools should be spaced equally along the cutter bar, one per foot is recommended.

The socket of the lifter has three locking pin positions for adjusting the lifter angle. The lock pin can be placed in any of the three holes. For additional adjustment, flat washers can be added between the guard and the crop lifter spool.

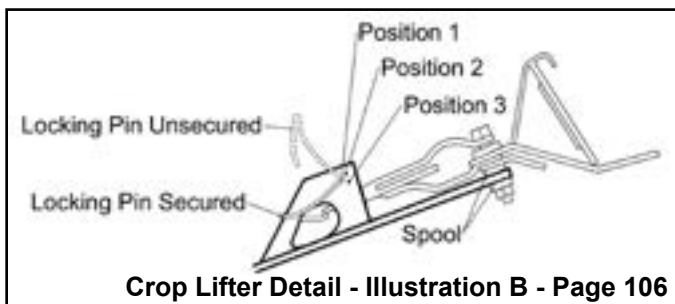
For crop lifters to work properly the bottom runners must be parallel to the ground when the platform is in cutting position. Illustration "C": Crop Lifter Orientation shows the correct position of a standard crop lifter.

The bottom runner of the Special Series lifter should be parallel to the ground. To find the correct setting of the lifters for a given platform, drive on to a smooth, flat surface. Mount one lifter in the middle of the platform.

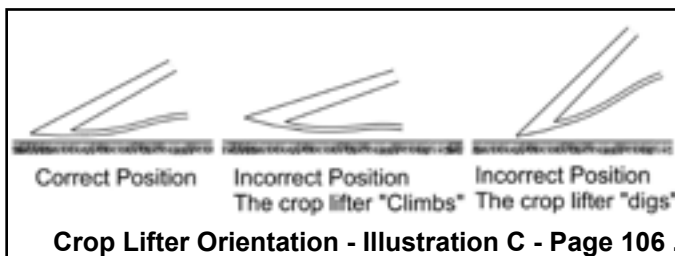
Lower platform until crop lifter just touches the ground. The runner of the lifter should be parallel to the ground. If it is not, change lock pin positions and if necessary, vary number of flat washers until the correct position is achieved.



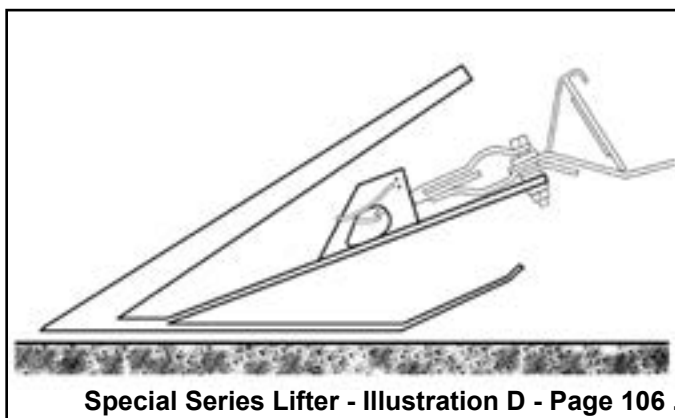
Crop Lifters Installed - Illustration A - Page 106



Crop Lifter Detail - Illustration B - Page 106



Crop Lifter Orientation - Illustration C - Page 106



Special Series Lifter - Illustration D - Page 106

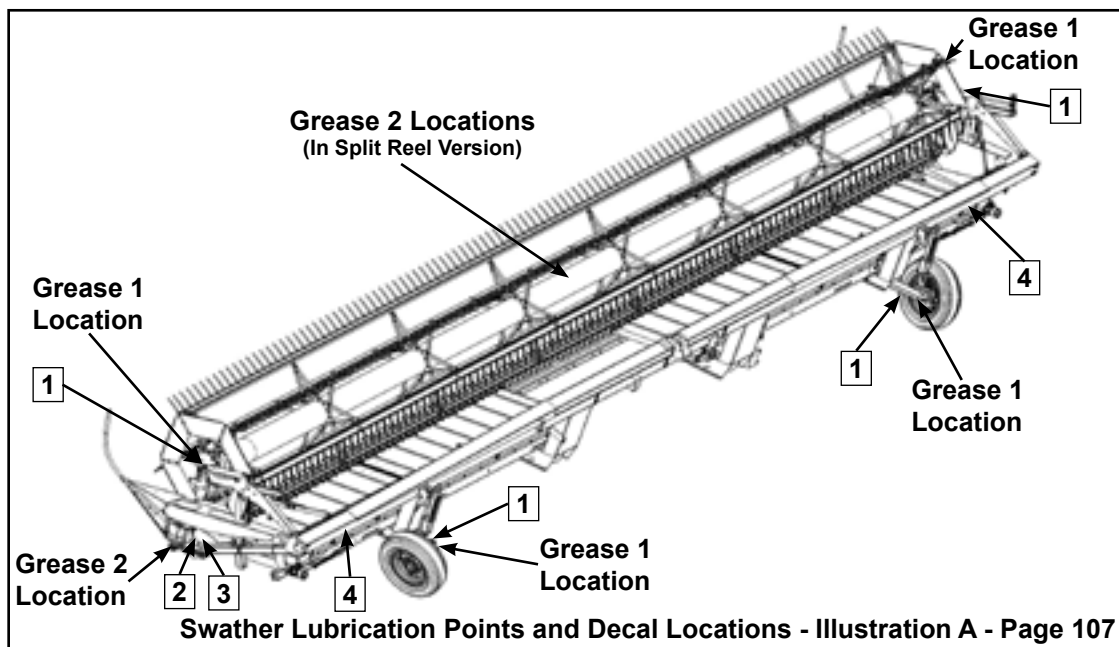
11 - Lubrication & Maintenance



Use good quality, general purpose grease, unless otherwise noted.

Component	Lubricant	Frequency/Notes
Knife Drives	Grease	Five(5) shots every 50 hours(fitting on side of knife drive)
Knife Head Bearing	Grease	One(1) shot every 50 hours(fitting above knife head)
Knife	Diesel	Soak with diesel or clean with a pressure washer
Reel Bearings	Grease	10 hours
Gauge Wheels – King Pin	Grease	10 hours
Wheel Bearings	Grease	Disassemble and re-pack yearly.
Hydraulic Return Line Filter	n/a	Change after first 50 hours of operation and seasonally thereafter. (Filter: HB - 27281/Donaldson – P164375) Refer to page 94 for a list of compatible filters.

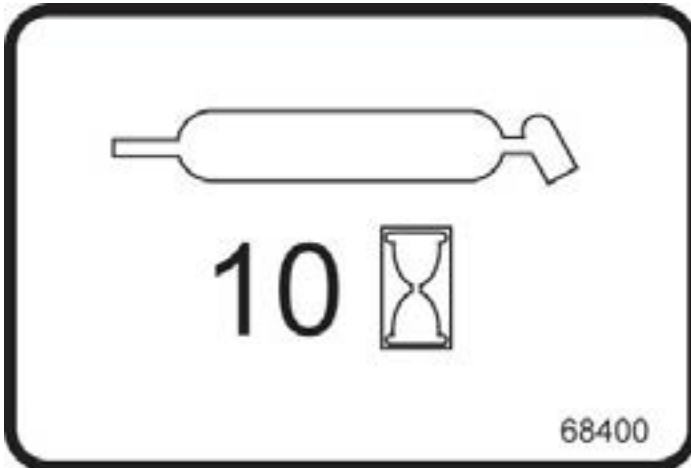
The following maintenance decals and lubrication locations have been placed on your machine in the areas indicated. Please take this manual, walk around your machine and familiarize yourself with the lubrication locations and content of these decals. Review this information, with your machine operators. Please keep decals legible.





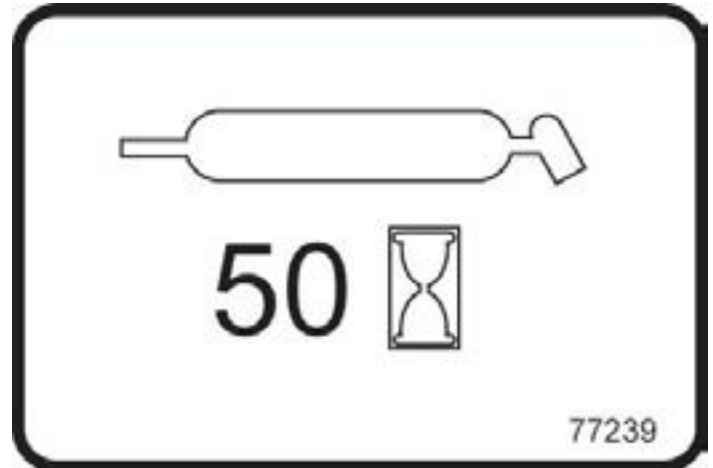
Maintenance Related Decals

1



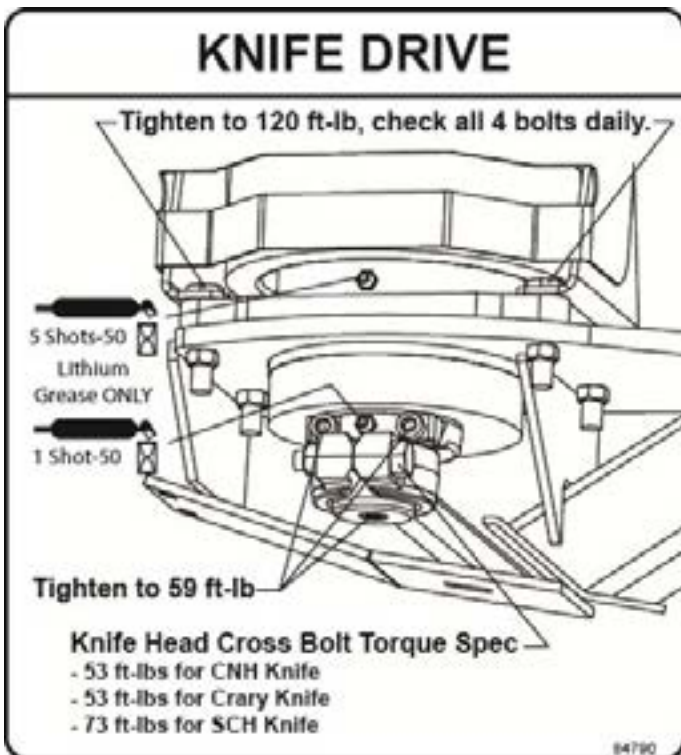
Grease every 10 Hrs - Illustration A - Page 108 .

2



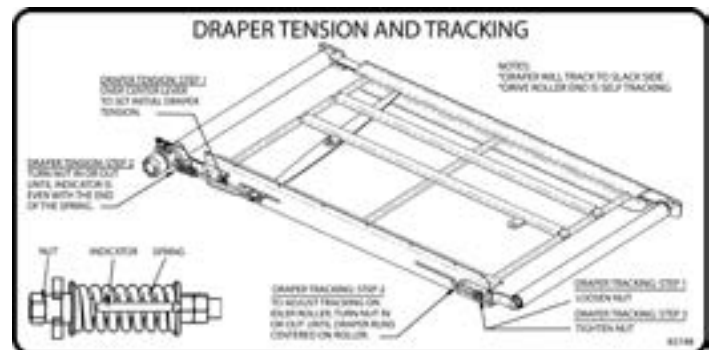
Grease every 50 Hrs - Illustration B - Page 108 .

3



Torque & Grease Requirements -
Illustration C - Page 108 .

4



Draper Tension and Tracking -
Illustration D - Page 108 .

12 - Troubleshooting

Problem	Possible Cause	Solution
Reel		
Reel won't hold height.	Leaking hose or fitting.	Repair or replace.
	Valve in windrower leaking.	See windrower Manual.
Reel won't hold level.	Leaking hose or fitting.	Repair or replace.
	Air in system.	Bleed slave cylinder.
	Faulty master cylinder.	Repair or replace.
Reel raises or lowers erratically.	Reel cylinders binding.	Replace cylinder.
	Arms bent or binding.	Repair or replace.
	Low hydraulic oil.	See windrower Manual.
Reel won't raise.	Hydraulic couplers don't match.	Install correct couplers.
	Valve is not open.	Open Valve.
	Faulty windrower hydraulics.	See windrower Manual.
	Reel not plumbed into tilt circuit.	Check plumbing schematic.
Damage to center of reel.	Reel set too low.	Adjust height.
	Reel tube bent.	Replace.
Reel hitting at end.	Reel not centered.	Adjust centering.
Reel will not turn or turns erratically.	Flow control set too low.	Advance setting.
	Draper flow set too high.	Reduce draper speed.
	Faulty relief valve.	Clean or replace.
	Seized bearing(s).	Replace bearing(s).
	Faulty drive motor.	Replace motor.
	Reel Tied Down.	Release Reel.
Reel Speed cannot be adjusted.	Poor electrical connection.	Check connections and cable.
	Defective reel speed motor.	Replace motor.
	Circuit breaker open or burnt out.	Replace.

Knife

Knife won't run.	Low hydraulic oil.	Add oil. Determine cause of oil loss.
	Cutter Bar jammed.	Check for damaged guards or sections.
	Faulty drive motor.	Repair or replace motor.
	Faulty knife drive.	Repair or replace.
	Faulty hydraulic pump.	Repair or replace.
	Knife gummed	Clean cutter bar.



Problem	Possible Cause	Solution
Knife (continued)		
Knife Stalls Easy	Type of material being cut.	Reduce ground speed
	Low pressure at knife motor.	Check system pressure
	Bent guards or cutter bar.	Repair or replace
	Faulty knife drive.	Check for loose crank shaft
	Seized knife head bearing.	Replace
	Knife head out of alignment.	Adjust knife head bearing
Unloaded system pressure too high	Faulty draper motor.	Repair or replace
	Relief valve set too low (3000 psi).	Adjust
	Relief valve stuck open.	Remove and clean or replace cartridge
	Wrong type of hydraulic oil.	Change windrower hydraulic oil
	Flow control set low.	Set control higher
	Low oil level.	Add oil, locate cause and repair
	Relief valve stuck open.	Remove and clean or replace cartridge
	Low oil volume.	Reset volume, 19.5 gpm required
	Wrong motor size.	Check with manufacturer
	Worn pump or motor.	Repair or replace
Excessive vibration	Knife speed is too high.	Reduce knife speed
	Loose bearings in drive.	Replace bearings
	Loose knife head bolts.	Tighten knife head bolts
	Damaged sickles or guards.	Replace
Excessive noise	First guard bent or out of alignment	Straighten or replace
	Knife drive bearing faulty	Replace
	Knife drive loose	Tighten bolts and check for damage to housing
	Knife head out of adjustment	Adjust Knife Head bearing
Knife leaves strip of crop standing	Excessive ground speed	Slow down
	Bent or broken guard	Straighten or replace
	Broken knife section	Replace
	Plugged guard	Clean
Connector Bar breaks	Damaged sections or guards	Repair or replace
	Knife gummed up	Soak with diesel fuel, or wash with pressure washer
	Section bolts not tight	Tighten or replace
	Section or Knife Back installed on wrong side	Remove sections, turn Knife over and replace sections

Problem	Possible Cause	Solution
Knife (continued)		
Knife Head breaks	Section bolts not tight.	Tighten and/or replace bolts.
	Knife gummed up.	Soak with diesel fuel, or wash with pressure washer.
	Damaged sections or guards.	Repair and/or replace.
	Sickle sections dull.	Replace sections.
	Tough crop.	Reduce ground speed.
	Knife drive running too fast.	Check speed with photo tach.

Draper

Draper not tracking straight	Drive or idler roller out of alignment.	Adjust draper tracking.
	Draper splice not cut straight.	Re-punch connector bar holes in draper.
	Material building up on rollers.	Clean rollers.
Draper slipping	Draper too loose.	Adjust draper tension.
	Draper is snagging.	Check alignment. Look for obstructions.
Draper not turning	Draper is snagged or caught.	Check for interference.
	Flow control is shut off.	Adjust flow control.
	Oil flow is being by-passed.	Check relief valve setting.
		Remove and clean relief cartridge.
	Windrower RPM too low.	Increase windrower RPM.
Draper oil pressure is excessive	Material build up on rollers.	Clean rollers.
	Faulty bearing in roller.	Replace bearing.
	Faulty draper motor.	Check motor temperature, check for oil leaking from shaft seal.
		Replace motor.

Decks

Decks creep sideways	Restrainer bars not installed or have fallen off.	Install or replace bars.
Decks lift out of position	Deck is not locked under rear edge of cutter bar.	Place deck in proper position.
	Hold down clips on back panels are loose or are not installed.	Tighten or replace.
Decks will not shift	Poor electrical connections.	Trace and repair.
	Electrical cable not plugged into windrower or control box.	Check connections.
	Decks or back panels jammed or binding.	Check decks and clean out debris.



Problem	Possible Cause	Solution
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Decks (continued)

Heads shattering or breaking off.	Reel speed too fast.	Reduce reel speed.
	Ground speed too high.	Reduce ground speed.
	Crop over-ripe.	Cut earlier in morning or late at night when humidity is higher.
Cut grain falling off cutter bar.	Reel set too high.	Lower reel.
	Table set too high.	Lower table.
	Reel too slow for ground speed.	Increase reel speed.
Does not pick up lodged crop.	Table too high.	Lower table.
	Reel too high.	Lower reel.
	Reel too far back.	Move reel forward.
	Ground speed too fast for reel speed.	Reduce ground speed or increase reel speed.
	Crop lying too flat for guards to pickup.	Install optional SCH Crop Lifters.

Hydraulic Oil

Temperature is too high.	Excessive oil going over reliefs.	Check reliefs on flow controls.
	Faulty pump or motors.	Repair or replace.
	Draper too tight or not tracking.	Adjust draper alignment.
	Oil too light.	Refill with correct grade.

Leveling

Swather not level.	Float pressure too low.	Adjust float pressure.
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Table Angle

Draper running too flat or too steep.	Tilt cylinder out of adjustment.	Adjust.
---------------------------------------	----------------------------------	---------

Raising and lowering the Swather

Swather will not lift.	Windrower lift capacity.	Check system pressure
		Check the needle valve, table lift circuit.
		Increase needle valve opening.
Swather table lifts and lowers too slowly.	Needle valve set too low.	Adjust needle valve on lift circuit.

Problem	Possible Cause	Solution
Lift and Float Systems		
Platform Does Not Follow Ground Contour. NOTE: If float pressure is set too high platform will feel light and bouncy. If float pressure is too low, the platform will feel heavy and unresponsive. It should require less than 150 lbs. to lift the end of the platform.	Platform float pressure too high, making platform feel light.	Check windrower operator's manual. Adjust float pressure.
	Field/Road switch in the Road Position.	Set switch to Field position.
	Faulty Relay.	Replace Relay.
	Accumulator pre-charge pressure too low.	See your John Deere dealer.
Platform Digs Into Ground and Pushes Hard.	Guards digging into ground.	Adjust guard angle, with hydraulic tilt cylinder.
	Platform float pressure too low, making platform feel too heavy.	Adjust float pressure.
	Accumulator pre-charge pressure too high.	See your John Deere Dealer
Platform Drops Too Fast or Does Not Lower Smoothly.	Platform float pressure too low, making platform too heavy.	Adjust platform float.
	Accumulator pre-charge pressure too high.	Adjust needle valve.
		See your John Deere Dealer.
Platform Will Not Lift or Lifts Too Slow.	Needle valve set too low.	Adjust needle valve.
	Binding lift linkage.	Replace bent or worn parts.
	Platform float pressure too low, making platform too heavy.	Adjust platform Float.
	Worn lift pump.	See your John Deere dealer.
	Low Relief valve setting.	See your John Deere dealer.
	Excessive charge oil flow to pumps.	See your John Deere dealer.
	Faulty switch or relay.	Replace.
	Faulty solenoid or valve cartridge.	Replace.



13 - Lighting

The lighting system incorporates two circuits; the transport running lights for use when moving the swather via the transport hitch and the warning flashers which are used when operating the swather in the field.

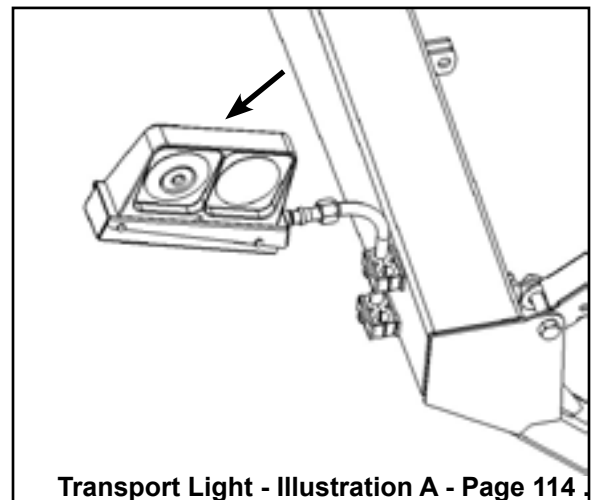
Transport Lights:

- The transport lights consist of two wiring harnesses and two (tail, signal, and stop) lights.
- The 52ft (15.84m) Harness extension with a male (Universal Trailer Connector, 4 Pole) leads to the towing equipment. It is the transporters' responsibility to ensure proper connection to towing equipment.
- The 9.8ft (3m) Harness wishbone with male (Universal Trailer Connector, 4 Pole) that connects to the female end of the 52 ft (15.84m) extension harness. The plugs on the other end connect directly to the pig tail of the lights.

Warning Flashers:

- The warning flasher light wiring consists of a 12.5 ft (3.81m) pigtail harness that attaches from the windrower to the warning flasher harness. The adaptor plug (JD - 7 - way connector) is installed at factory with the reel speed wiring plug.
- The warning flasher harness is a total of 45 ft (13.73m) in length and connects the warning flasher lights to the windrower.

All swathers are equipped with clearance lights as well as signal and brake lights. Ensure that all lights are in good working order, and that you swing them out to their transport positions before transporting the header.

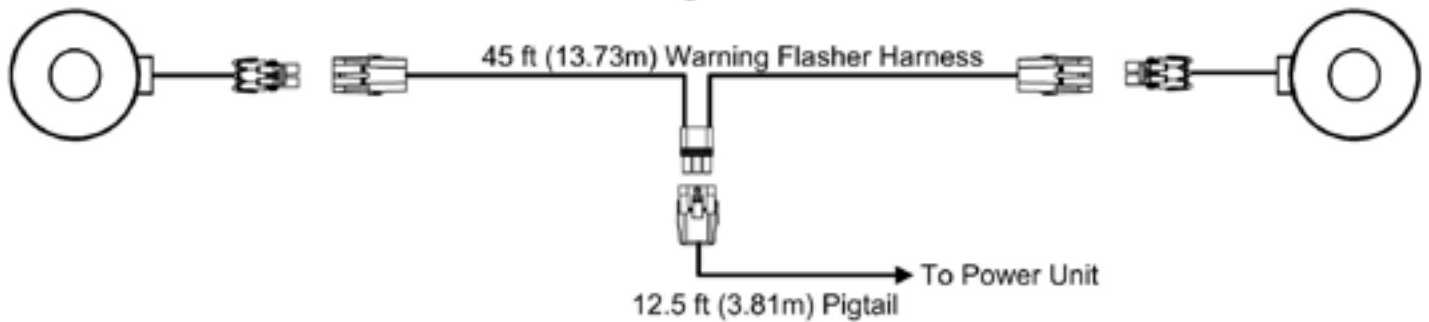


Transport Light - Illustration A - Page 114

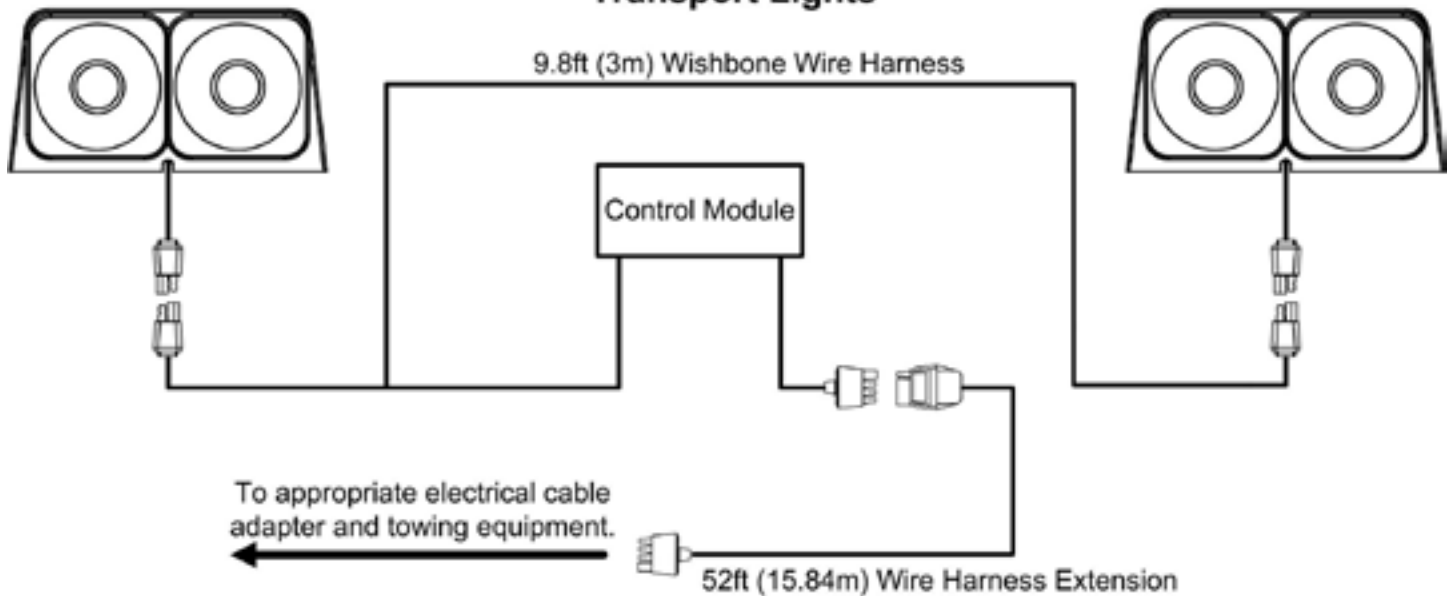
Wiring

1. Amber - Warning Flasher
2. Red/Amber - Tail. Signal and Stop

Warning Flashers



Transport Lights



The lights operate on two circuits:

1. Transport lights.
2. Warning flashers.

Transport Lights

Transport lights should be used at all times when the swather is towed on public roads. Connect to the tow vehicle using the proper plugs.

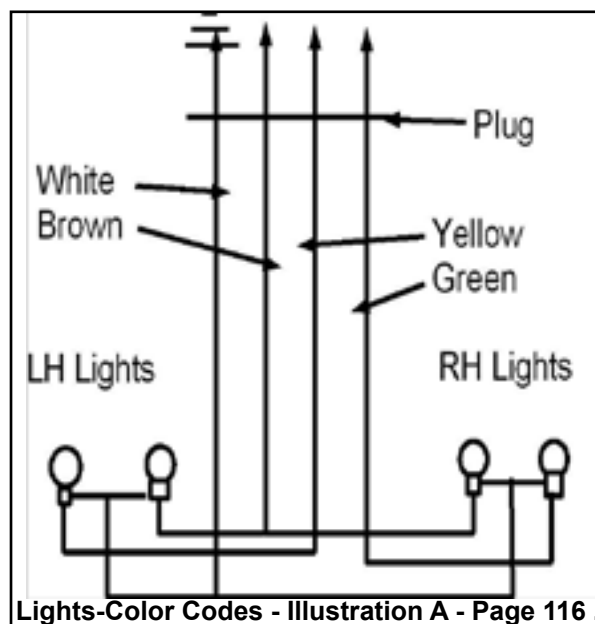
Wiring color code:

White - Ground

Brown - Tail Lamps

Green - Right Hand Stop / Turn signal

Yellow - Left Hand Stop / Turn signal



Warning Flashers

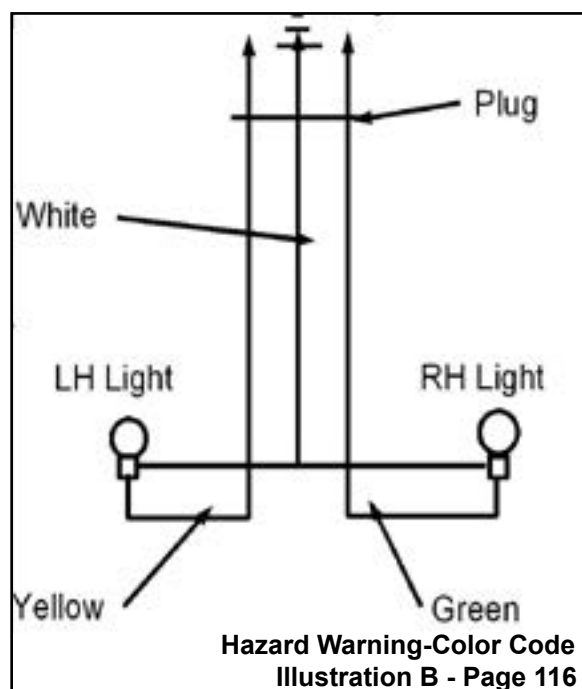
When transporting the swather while it is mounted to the windrower, hazard warning lights must be connected and operating. The amber warning lamps must be visible from both the front and the rear.

Wiring Layout:

White - Ground

Green - Right Flasher

Yellow - Left Flasher



Be Seen. Be Safe!

14 - Appendix

Appendix A - Hydraulic Fitting Naming Standards

There will be a number of different hydraulic fittings used in this manual. The naming standards can be a little confusing, however this section should clear up any questions you may have.

A standard 2 sided hydraulic fitting is named in the following format:

- ##XX-##XX

The information on each side of the hyphen represents its respective end of the fitting. The '#' is the size designation. The 'X' denotes the type of end on that side of the fitting, this information is divided into a prefix and a suffix. The prefix indicates either male or female, and the suffix indicates the type of connection.

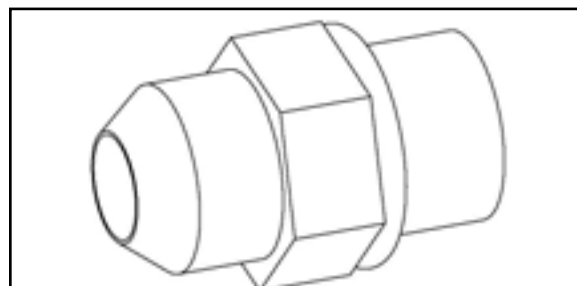
A 'T' fitting will be named in the following format:

- ##XX-##XX-##XX

The center set of characters describes the middle port on the 'T' fitting.

The size designations denotes which fittings go together. For example, a 10FJ fitting will fit with a 10MJ fitting, but not a 12MJ.

Hydraulic Fitting Types		
Prefix	Suffix	Description
M or F	J	JIC 37° flared connectors
M or F	F	Face Seal
M or F	P	Pipe Fitting
M or F	B	O-Ring Boss
F only	X	Swivel (no image shown)
M or F	STC	Snap To Connect



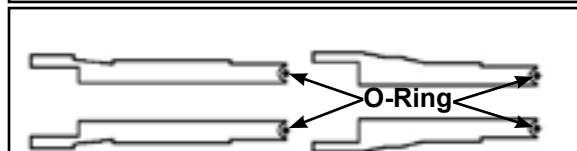
10MJ-10MB

Illustration A - Page 117



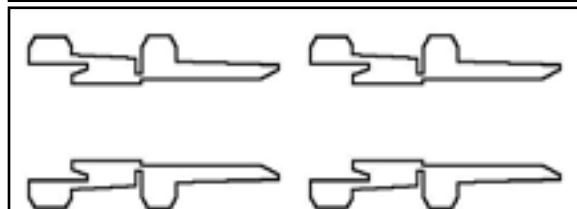
JIC 37° Fitting

Illustration B - Page 117



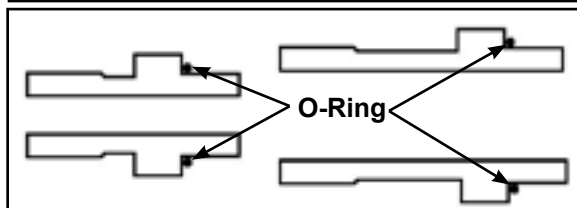
Face Seal Fitting

Illustration C - Page 117



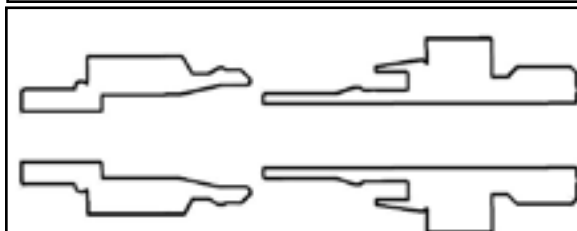
Pipe Fitting

Illustration D - Page 117



O-Ring Boss

Illustration E - Page 117



STC Fitting

Illustration F - Page 117



21 Pin Plug

J H X W V U T S R P N M X W T R P F C B G A E D L K

LH Flasher
RH Flasher
Butt Connectors for Light

Manual Reel Speed

Knife Speed

Auto Reel Speed

Draper Speed

RH Deck Shift

Fore/Aft

LH Deck Shift

Common Ground

Appendix B-2 - Common 21 Pin Plug Features

Cavity	Circuit Reference
A	Power Ground
B	
C	LH header Flashing Light
D	
E	
F	RH header Flashing Light
G	Recog Jumper to V
H	Header Speed Sensor
I	
J	Auto Reel Speed (decrease)
K	Auto Reel Speed (increase)
L	Knife Speed
M	Draper Speed (decrease)
N	Draper Speed (increase)
O	
P	Manual Reel Speed (decrease)
R	Manual Reel Speed (increase)
S	LH Deck Shift*
T	RH Deck Shift*
U	
V	Recog Jumper to G
W	Fore/Aft (Aft)
X	Fore/Aft (Fore)

*Double swath header only

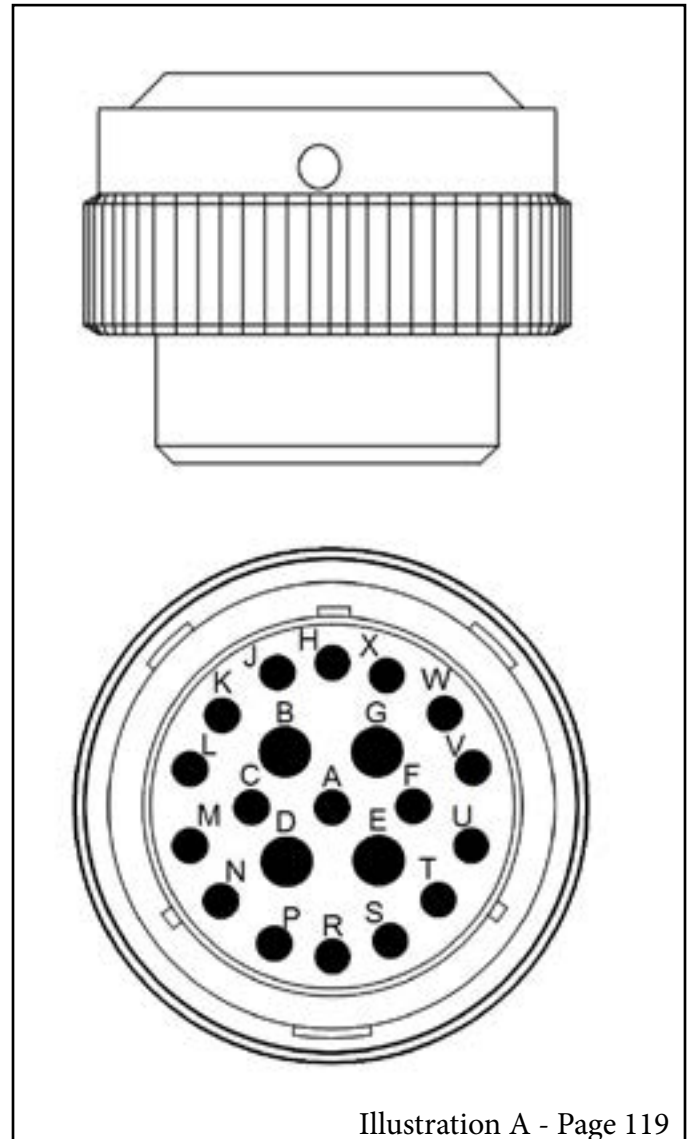


Illustration A - Page 119

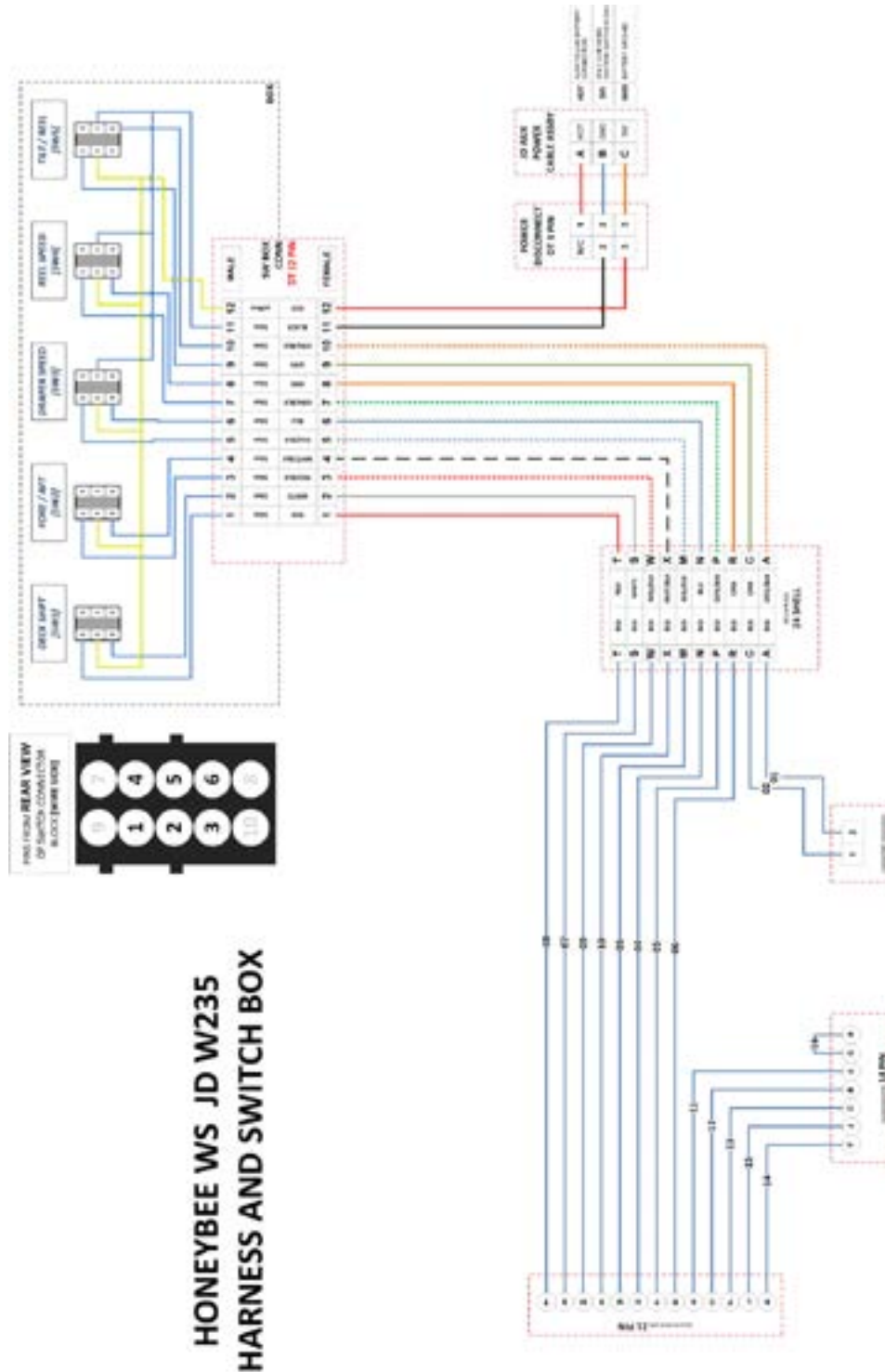


NOTE!

Pins G, J, K, and V do not apply to Honey Bee swathers.






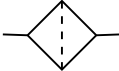






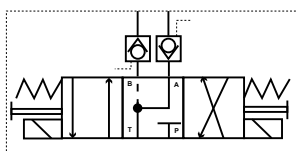
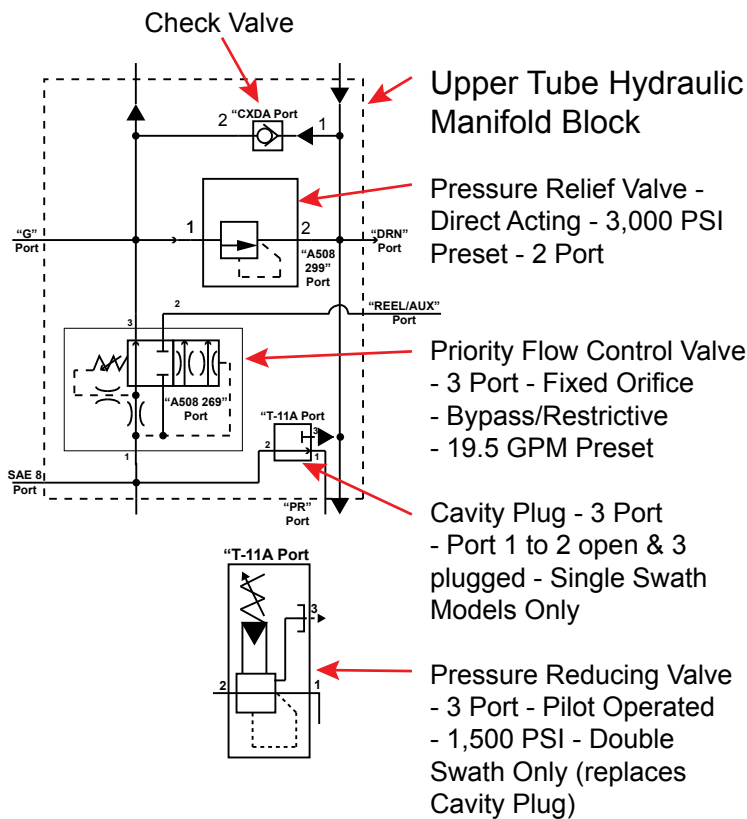
Appendix B-4 - JD A400 and R450 Swather Adapter Wiring Schematic



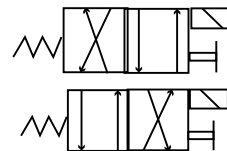
Appendix C - Hydraulic System Schematics

Appendix C-1 - Hydraulic System Schematic Symbols

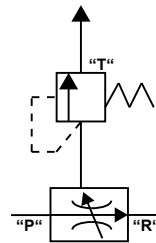
	Oil Flow - Bi-Directional		Hydraulic Motor - Fixed Displacement and Reversible
	Oil Flow - Uni-Directional		Hex-head Captivity Plug
	Bypass Flow/Drainage Line		Oil Filter (Donaldson - 10 HMK)
	Motor Rotation - Bi-Directional		Pressure Gauge (0 - 4,000 PSI)
	Motor Rotation - Uni-Directional		Quick Coupler



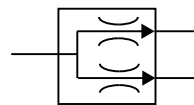
4 Port, 3 Position,
Solenoid Operated
Directional Spool
Valve



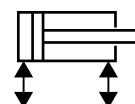
4 Port, 2 Position, Solenoid
Operated Directional Spool
Valve



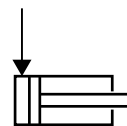
Flow Control Valve (Delta 11
GPM with Relief for Drapers,
and Delta 18 GPM with Relief
for Reel)



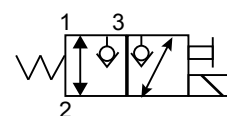
50/50 Flow Divider



Double-acting Hydraulic
Cylinder



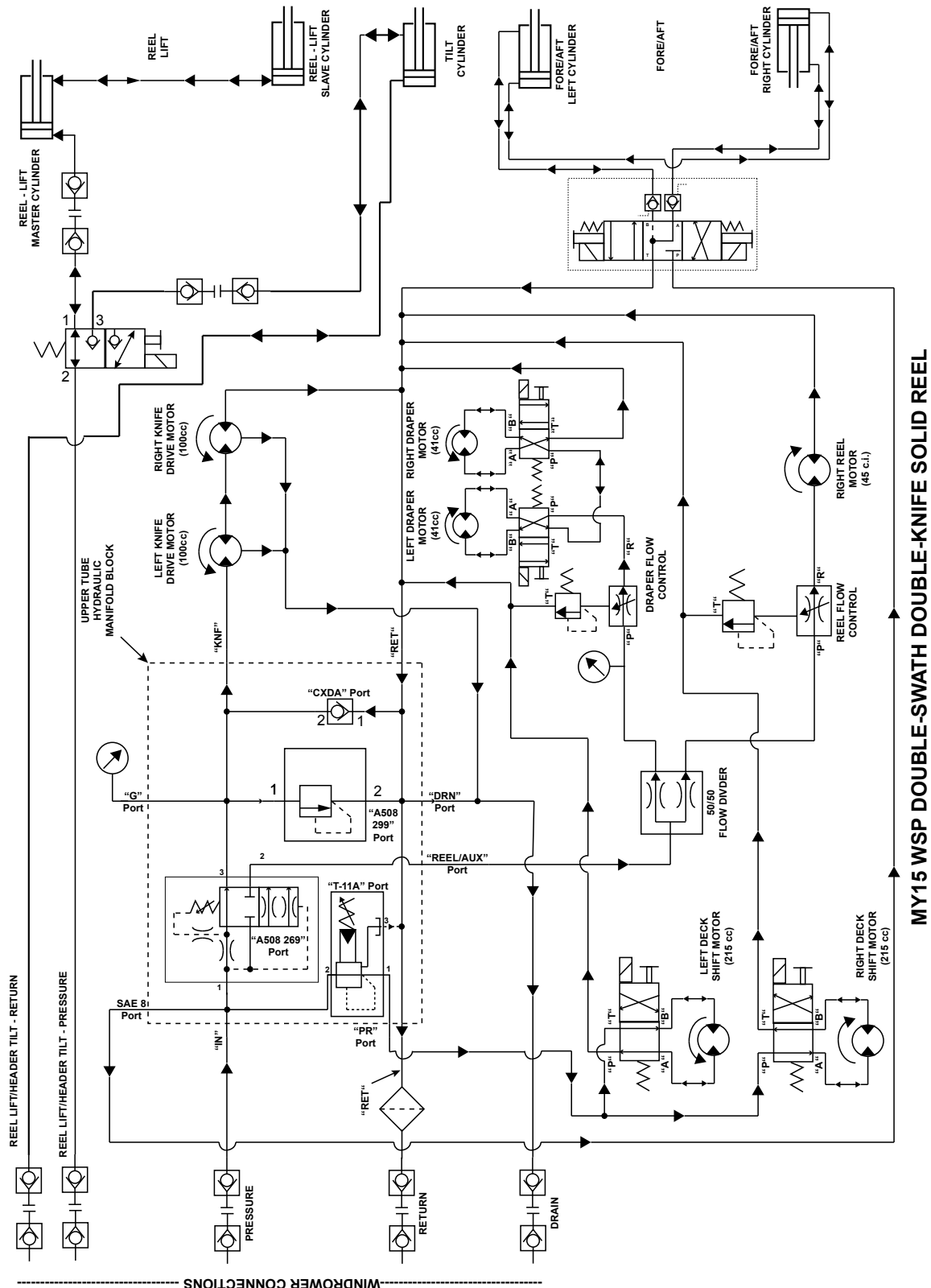
Single-acting Hydraulic
Cylinder



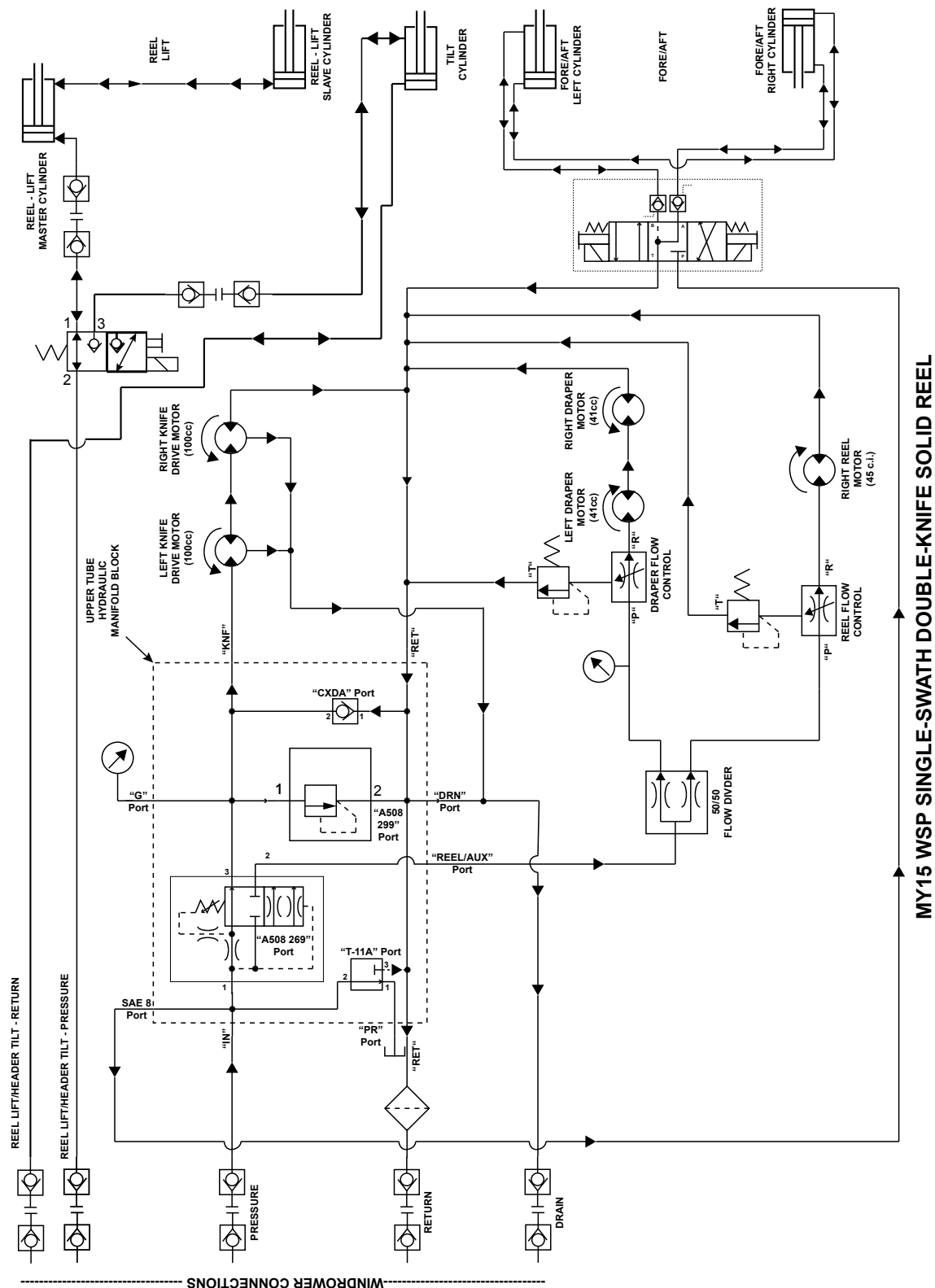
3 Port, 2 Position, Solenoid
Operated Directional Spool
Valve



Appendix C-2 - Double Swath Double Knife Solid Reel System Hydraulic Schematic



Appendix C-3 - Single Swath Double Knife Solid Reel System Hydraulic Schematic



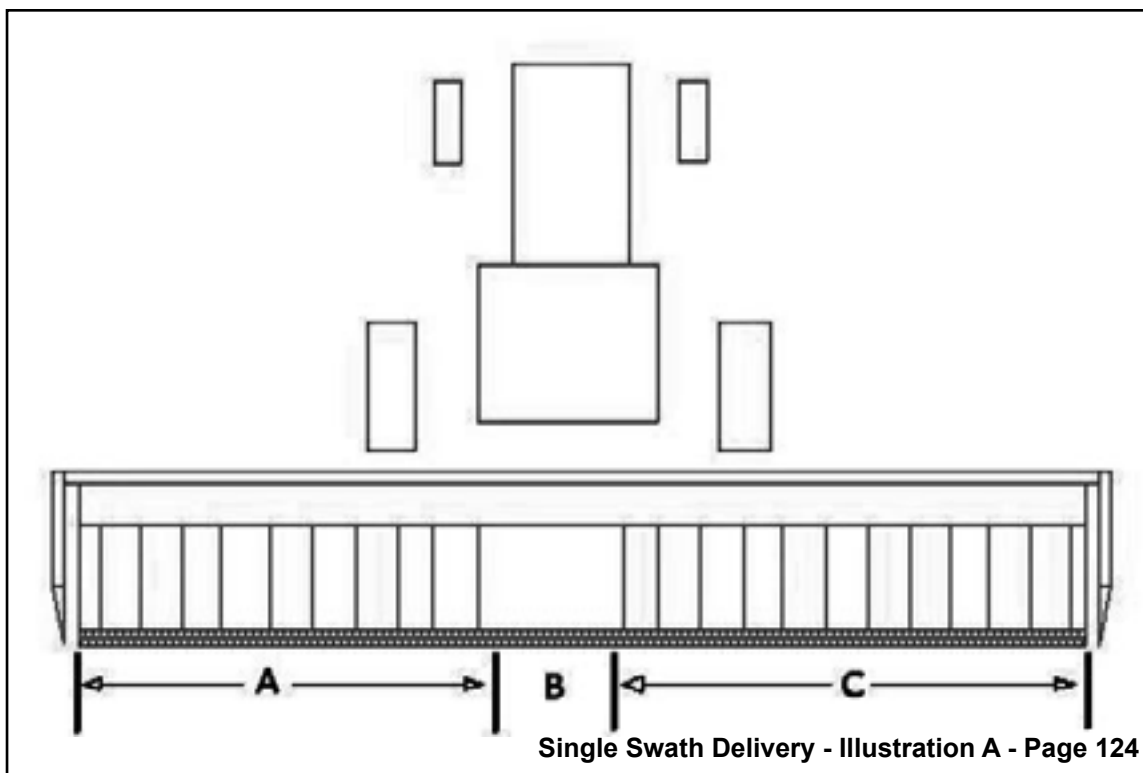


Appendix D - Dimensions - Single Swath Delivery

Refer to the illustration below for the following dimensions:

Model (ft/m)	A (in/cm)	B (in/cm)	C (in/cm)
21HB (21/6.4)	99/257	50/130	99/257
25HB (25/7.6)	104/270	80/208	104/270
	104/270	68/177	118/307*
	118/307*	56/146	118/307*
30HB (30/9.1)	136/354	80/208	136/354
	136/354	68/177	150/390*
	150/390*	56/146	150/390*
36HB (36/11)	175/450	80/208	175/450
	175/450	68/177	189/486*
	189/486*	56/146	189/486*

* Indicates the addition of one 14" deck



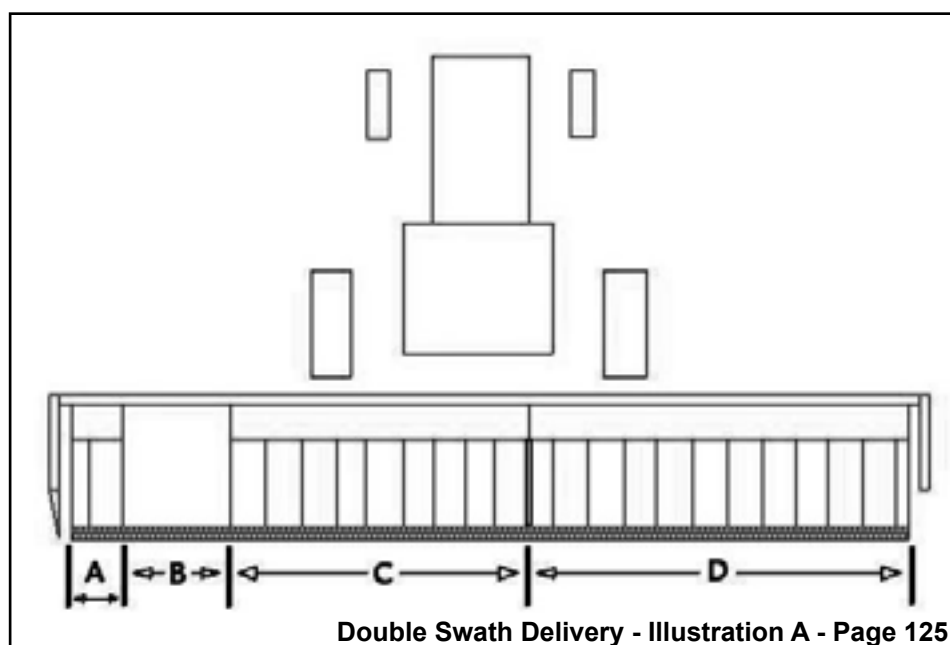
Appendix E - Dimensions - Double Swath Delivery

Refer to the illustration below for the following dimensions:

Model	A (in/cm)	B (in/cm)	C (in/cm)	D (in/cm)
21HB (21/6.4)	6/16	45/114	99/257	99/257
	-	50/130 (X)	99/257	99/257
25HB (25/7.6)	6/16	54/140	118/307	118/307
	-	56/142 (X)	118/307	118/307
	-	68/172 (X)	118/307	104/264 *
	-	80/208 (X)	104/264 *	104/264 *
30HB (30/9.1)	6/16	50/130	150/390	150/390
	-	56/142 (X)	150/390	150/390
	-	68/172 (X)	150/390	136/345 *
	-	80/208 (X)	136/345 *	136/345 *
36HB (36/10.9)	6/16	48/158	189/480	189/480
	-	56/142 (X)	189/480	189/480
	-	68/172 (X)	189/480	175/445 *
	-	80/208 (X)	175/445 *	175/445 *

(X) - Indicates only available with centre delivery.

* - Indicates the the removal of one 14" deck.





Appendix F - Windrow Type

Several factors affect windrow formation: Ground speed, draper speed, type of crop, reel speed, table angle, and stubble height. This manual will give the operator some guidelines in how machine settings can affect windrow formation. It is the operator's responsibility to adjust the settings for the type of windrow desired.

Windrow Formations

Herringbone: The ideal formation for weathering and ease of pick up. The crop needs to be standing straight or leaning uniformly in one direction.

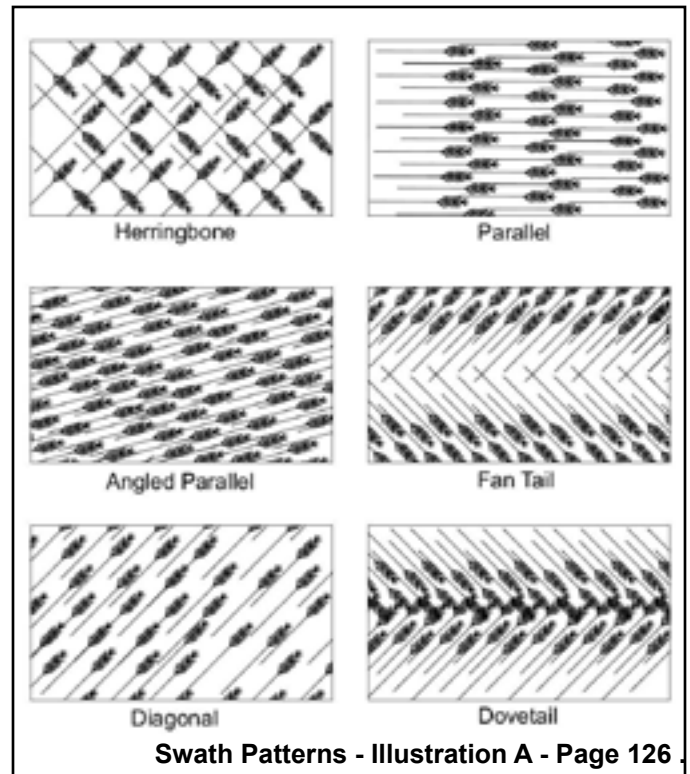
Parallel: A good windrow that is easier to form.

Angled Parallel (75 Degree Diagonal): A good windrow but not as good as the parallel.

Fan Tail: Good weathering ability and easy to pick up, but not as good as the first three types.

Diagonal (45 Degrees): This swath is less desirable, because the heads are concentrated on one side of the swath. It is more difficult to pick up and is more easily affected by wind or rain.

Dovetail: Also less desirable, because heads are concentrated in the middle of the swath. More difficult to pick up and more easily affected by wind or rain.



Ground Speed

Use windrow quality as a guide to travel speed. Cut at lower speeds when terrain is rough and when crops are lodged or tangled. Excessive speed may be indicated by a ragged cut in the stubble.

Stubble Height

For most crop types, best results are obtained when the table is adjusted for a stubble height of 6" to 8" or (150 to 200 mm). This height of stubble should have strength to support the windrow and to provide air flow underneath. Also, the windrow should be easier to pick up.

Appendix G - Specifications/Features

Weights

Weights are given in lbs/kg format.

Model	WSP21	WSP25	WSP30	WSP36
Width	21'	25'	30'	36'
Weight	1980/900	2280/1036	2710/1232	3207/1458

- Weight includes - Swather assembly c/w decks and attached hydraulic components.
- Weight does not include - Double swath decks or lift arms.

Component	WSP21	WSP25	WSP30	WSP36
Pick-up Reel -UII Universal	562/255	624/283	720/327	980/446
Pick-up Reel HCC	566/257	625/284	718/326	884/401
Transport Axle	206/93	206/93	206/93	206/93

Knife Drive Availability

Model	WSP21	WSP25	WSP30	WSP36
Single Knife	n/a	n/a	n/a	n/a
Double Knife	standard	standard	standard	standard



Technical Specifications

- Knife Drive - SCH epicyclic 3 5/16" stroke, hydraulically driven, 1100-1400 strokes per minute. (2 strokes = 1 RPM)
- Cutting System - SCH Easy Cut, spring steel guards and bolted sections.
- V-Guided Draper - 42" Rubberized polyester, fiberglass reinforced, tie bar connectors.
- Draper Speed - adjustable in cab, 0-760 fpm.
- Reel Speed - adjustable in cab.
- Adjustable cutting angle.
- Standard single swath opening is approximately 81" +/- 3".
- Standard double swath opening is approximately 46" +/- 6".
- Swath opening may be decreased for WSP25, WSP30, WSP36 tables by inserting 14" Deck extensions.



NOTE!

Specifications are subject to change without notice or obligation.

Options

- Pickup Reel - 6 bat, 42" diameter Universal U-II Pickup Reel, plastic fingers.
- Pickup Reel - 6 bat, 44" diameter HCC Level-II Pickup Reel, plastic fingers, Flip-over
- Steel Fingers for U-II Pickup Reel.
- End Strut Gauge Wheels
- 14" Deck Extension Kit
- Cross Auger Kit (Not available for WS21)
- Swath Delivery Kits - Hydraulic deck shift.
- Crop Lifters for cereals and/or specialty crops.

Included in Standard Swather

- Storage Axle and Hitch
- Remote Draper Speed Control + Reel Speed Control
- Hay Guard
- UHMW Poly Skid Plate
- Casting Gauge Wheels - WSP30, WSP36
- Tires/Wheels/Hubs/Spindles
- Fore/Aft Hydraulic Reel Adjustment
- Hydraulic Tilt

Bolt Torque

The tables shown below give correct torque values for various bolts and cap screws. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Always replace fasteners with the same strength rating and size.

Unified Torque Specifications				
Grade	SAE 5		SAE 8	
Size	Nm	Lb-ft	Nm	Lb-ft
1/4"	12	9	17	12
5/16"	25	19	36	27
3/8"	45	33	63	45
7/16"	72	53	100	75
1/2"	110	80	155	115
9/16"	155	115	220	165
5/8"	215	160	305	220
3/4"	390	290	540	400
7/8"	570	420	880	650
1"	915	675	1320	970

Metric Torque Specifications				
Grade	8.8		10.9	
Size	Nm	Lb-ft	Nm	Lb-ft
M6	11	8.5	17	12
M8	28	20	40	30
M10	55	40	80	60
M12	95	70	140	105
M14	150	110	225	165
M16	240	175	350	255
M18	330	250	475	350
M20	475	350	675	500
M22	650	475	925	675
M24	825	600	1150	850



NOTE!

Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual. When using locking elements increase torque values by 5%.



Hydraulic Fitting Torque

Tightening Flare Type Tube Fittings

- Check flare and flare seat for defects that might cause leakage.
- Align tube with fitting before tightening.
- Lubricate connection and hand tighten swivel nut until snug.
- To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

Hydraulic Torque Fitting Table					
Tube OD Size	Nut Size	Torque Value	Torque Value	Flats to tighten	Turns to tighten
Inches	Inches	Nm	lb-ft	-	-
3/16"	7/16"	8	6	1	1/6
1/4"	9/16"	12	9	1	1/6
5/16"	5/8"	16	12	1	1/6
3/8"	11/16"	24	18	1	1/6
1/2"	7/8"	46	34	1	1/6
5/8"	1"	62	46	1	1/6
3/4"	1-1/4"	102	75	3/4	1/8
7/8"	1-3/8"	122	90	3/4	1/8



NOTE!

The torque values shown are based on lubricated connections as will be found in reassembly.

Tightening O-ring Fittings

- Inspect O-ring and seat for dirt or obvious defects.
- On angle fittings, back the lock nut off until washer bottoms out at top of groove.
- Hand tighten fitting until back-up washer or washer face (if straight fitting) bottoms on face and O-ring is seated.
- Position angle fittings by unscrewing no more than one turn.
- Tighten straight fittings to torque shown.
- Tighten angle fittings to torque shown while holding body of fitting with a wrench.

O-ring Fitting Values					
OD Thread	Nut Size	Torque Value	Torque Value	Flats to Tighten	Turns to Tighten
Inches	Inches	Nm	Lb-ft	-	-
3/8	1/2	8	6	2	1/3
7/16	9/16	12	9	2	1/3
1/2	5/8	16	12	2	1/3
9/16	11/16	24	18	2	1/3
3/4	7/8	46	34	2	1/3
7/8	1/2	62	146	1-1/2	1/4
1-1/16	1-1/4	102	75	1-1/2	1/6
1-3/16	1-3/8	122	90	1-1/2	1/6
1-5/16	1-1/2	142	105	3/4	1/8
1-5/8	1-7/8	190	140	3/4	1/8
1-7/8	2-1/8	217	160	1/2	1/12



NOTE!

The torque values shown are based on lubricated connections as will be found in reassembly.



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