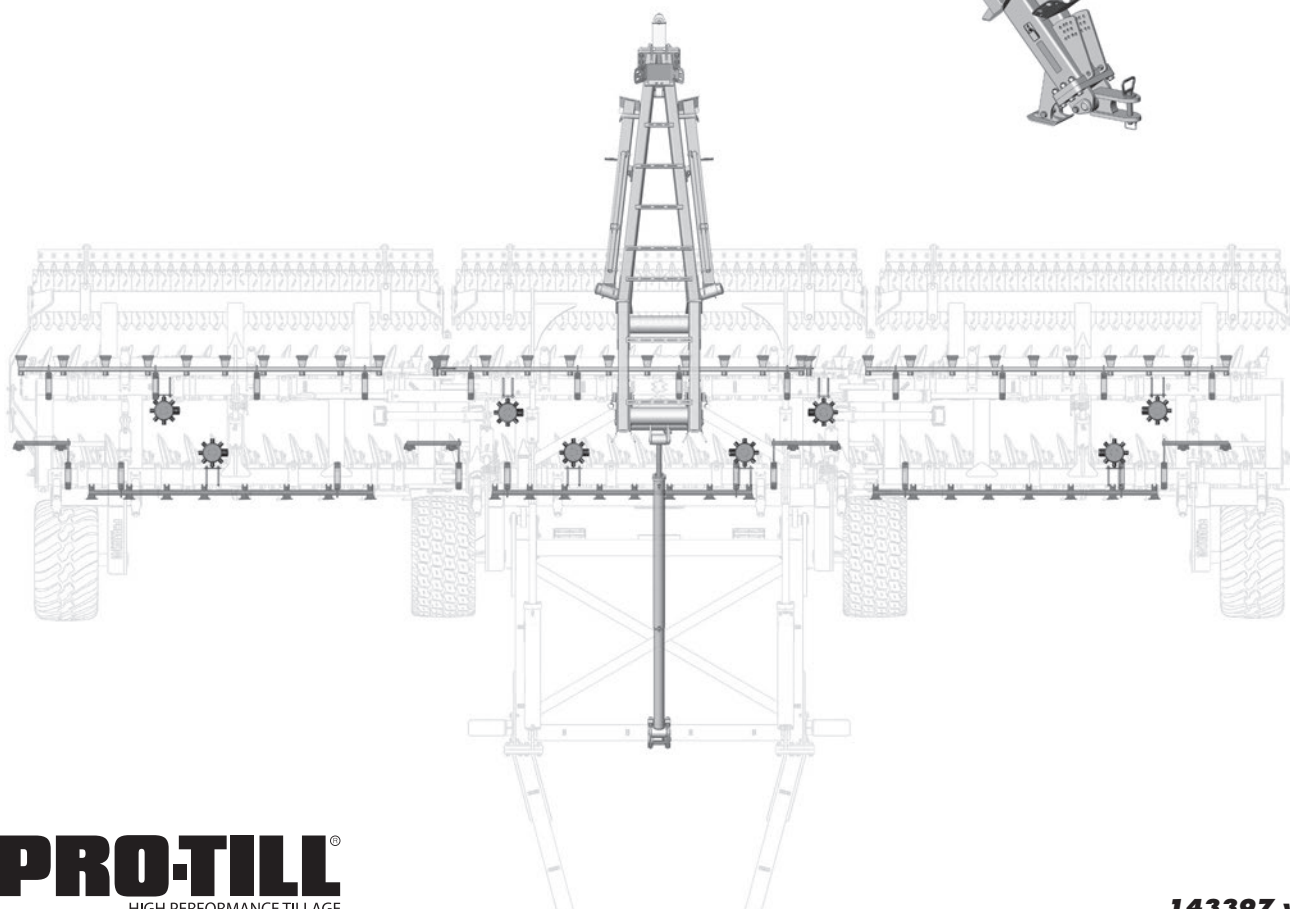
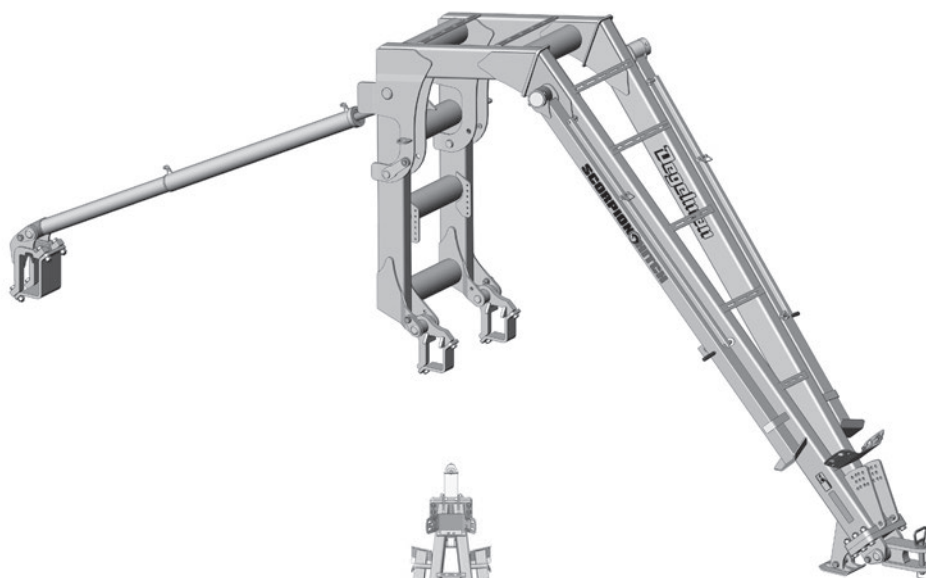


# SCORPION HITCH



**PRO-TILL®**  
HIGH PERFORMANCE TILLAGE

143397 v1.2

**DEGELMAN INDUSTRIES LP**  
BOX 830-272 INDUSTRIAL DRIVE,  
REGINA, SK, CANADA, S4P 3B1  
FAX 306.543.2140 PH 306.543.4447  
1.800.667.3545 DEGELMAN.COM

**SCORPION HITCH  
REAR TOW HITCH  
FOR PRO-TILL 33/40**



## SCORPION HITCH

*\* Reference Sheet Quick-Start Guide*

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#### **Maintenance Free Pins & Bushings**

##### **⚠ IMPORTANT: INSTALL DRY**

Do NOT use any oil/grease/lubricant on pin or bushing surfaces when installing the maintenance free pins into composite bushings.





# Introduction

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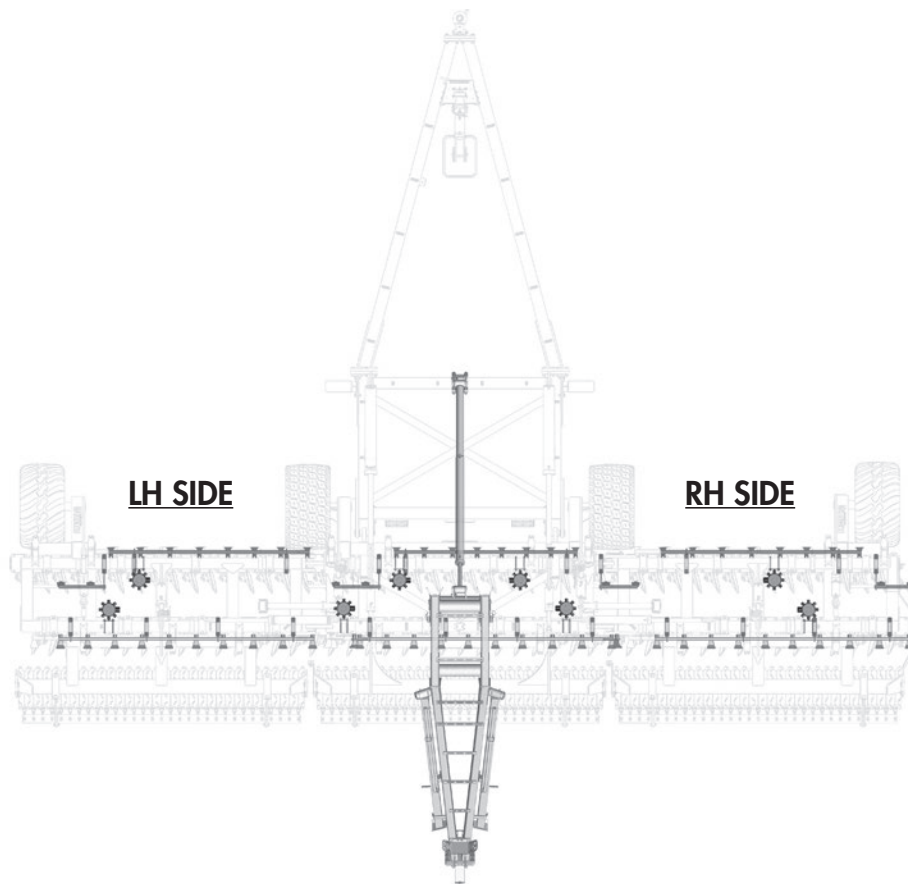
## SCORPION HITCH

**CONGRATULATIONS** on your choice of a Degelman PRO-TILL Scorpion Hitch to complement your farming operation. It has been designed and manufactured to meet the needs of a discerning agricultural market. Degelman PRO-TILL Scorpion Hitch allows application of seed and fertilizer in conjunction with the high-speed tillage of the PRO-TILL in a single pass by connecting a tow behind air cart with either single shoot or double shoot distribution configurations. Use this manual as your first source of information about this attachment.

**TO THE NEW OPERATOR OR OWNER** - Safe, efficient and trouble free operation of your Degelman PRO-TILL Scorpion Hitch attachment requires that you and anyone else who will be operating or maintaining it, read and understand the Safety, Operation, Maintenance and Troubleshooting information contained within this manual.

By following the operating instructions in conjunction with a good maintenance program your machine will provide many years of trouble-free service. Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Degelman Dealer if you need assistance, information, or additional copies of the manual.

**OPERATOR ORIENTATION** - The directions left, right, front and rear, as mentioned throughout the manual, are as seen from the tractor drivers' seat and facing in the direction of travel.



## Why is **SAFETY** important to **YOU**?

### 3 **BIG** Reasons:

- **Accidents Can Disable and Kill**
- **Accidents Are Costly**
- **Accidents Can Be Avoided**



### **SAFETY ALERT SYMBOL**

---

The **Safety Alert Symbol** identifies important safety messages applied to the PRO-TILL Scorpion Hitch and in this manual. When you see this symbol, be alert to the possibility of **injury or death**. Follow the instructions provided on the safety messages.

The **Safety Alert Symbol** means:

**ATTENTION!**  
**BECOME ALERT!**  
**YOUR SAFETY IS INVOLVED!**

### **SIGNAL WORDS**

---

Note the use of the Signal Words: **DANGER**, **WARNING**, and **CAUTION** with the safety messages. The appropriate Signal Word has been selected using the following guidelines:



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



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



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

## SAFETY

**YOU** are responsible for the safe operation and maintenance of your PRO-TILL Scorpion Hitch.

**YOU** must ensure that you and anyone else who is going to operate, maintain or work around the PRO-TILL Scorpion Hitch be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be adhered to while operating this equipment.

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

- PRO-TILL Scorpion Hitch owners must give operating instructions to operators or employees before allowing them to operate the PRO-TILL Scorpion Hitch, and at least annually thereafter per OSHA regulation 1928.51.
- The most important safety device on this equipment is a SAFE operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. All accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Think SAFETY! Work SAFELY!

## GENERAL SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, maintaining or adjusting.



2. Install and properly secure all shields and guards before operating. Use hitch pin with a mechanical locking device.

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

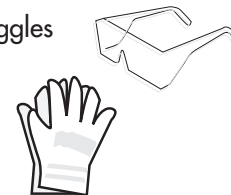


4. Have a fire extinguisher available for use should the need arise and know how to use it.



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
- Heavy gloves
- Wet weather gear
- Hearing protection
- Respirator or filter mask



6. Clear the area of people, especially small children, and remove foreign objects from the machine before starting and operating.
7. Do not allow riders.
8. Stop tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
9. Review safety related items with all operators annually.

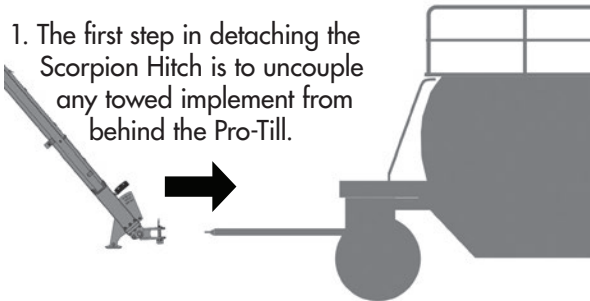
# Detaching Scorpion Hitch Rear Frame

## DETACHING SCORPION HITCH REAR FRAME

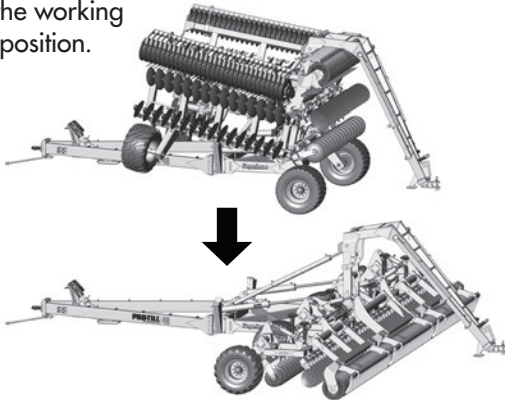
The Scorpion Hitch should always be parked on a level, dry area that is free of debris and foreign objects. The following procedure outlines how to detach the Scorpion Hitch rear frame assembly unit from your Pro-Till.

### Follow this procedure to Detach:

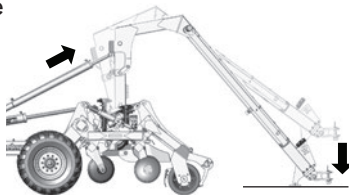
1. The first step in detaching the Scorpion Hitch is to uncouple any towed implement from behind the Pro-Till.



2. The second step is to unfold and lower the Pro-Till into the working field position.

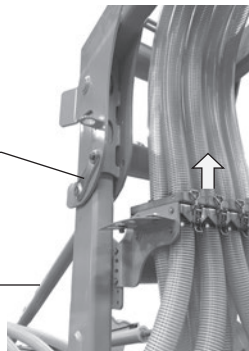


3. The third step is to extend the Scorpion Hitch hydraulic cylinder until the Scorpion Hitch parking skid plate touches down onto the ground. The objective is to balance the hitch weight and cylinder pressure so that the force is relieved from the locking pins.

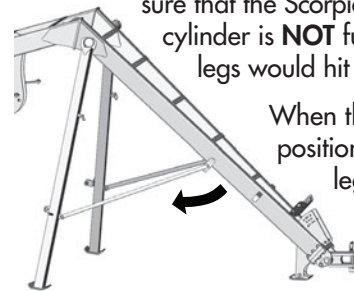


4. The fourth step is to disconnect all the "Air Cart to Scorpion Hitch" quick couplers for the product hoses and hydraulic hoses. Use caps, plugs, or covers to prevent dirt from filling the hose couplers.

5. The fifth step is to remove the Scorpion Hitch locking pins. A heavy hammer and pry-bar are likely necessary. Slight adjustments to the Scorpion Hitch hydraulic cylinder also help to loosen the pins for removal.



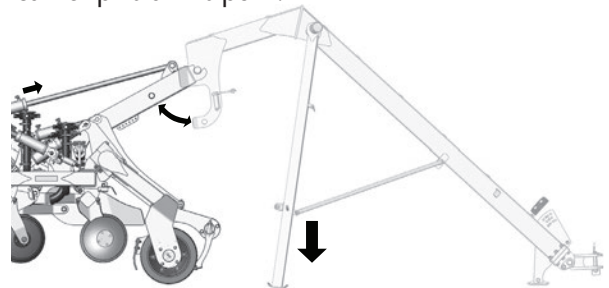
6. The sixth step is to swing the Scorpion Hitch parking legs down into position. The trick here is to make sure that the Scorpion Hitch hydraulic cylinder is **NOT** fully extended, since the legs would hit the ground if it was.



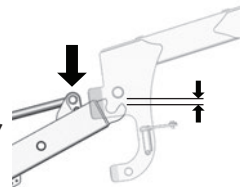
When the Scorpion Hitch is positioned high enough, the legs can swing forward and the braces can be unclipped from their storage positions.

Pin the braces into the appropriate holes to hold the parking legs in the forward position.

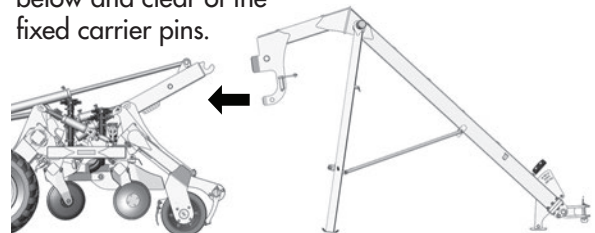
7. The seventh step is to fully extend the Scorpion Hitch hydraulic cylinder, which will lower the tow hitch until the parking legs touch the ground. The clevis hooks might not fully disengage from the fixed carrier pins at this point.



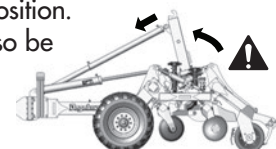
8. The eighth step is to lower the back of the Pro-Till by raising the packer rollers. If the wheels across the front are fully lowered, then the packers can be fully raised without any worry about the discs touching the ground.



9. The ninth step is to drive away if the clevis hooks are below and clear of the fixed carrier pins.



**⚠ IMPORTANT:** Once the hitch is fully separated, the Scorpion Hitch cylinder **MUST** be fully retracted, or else there will be damage when folding the machine into transport position. The Pro-Till rollers can also be lowered to fully raise the discs off the ground.





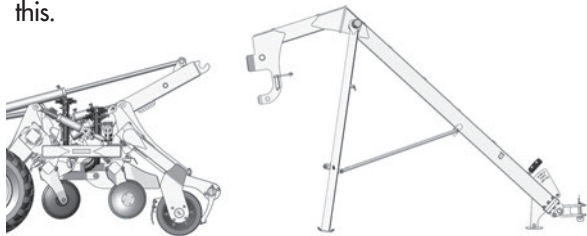
# Attaching Scorpion Hitch Rear Frame

## ATTACHING SCORPION HITCH REAR FRAME

The Scorpion Hitch should always be parked on a level, dry area that is free of debris and foreign objects. The following procedure outlines how to attach the Scorpion Hitch rear frame assembly unit onto your Pro-Till.

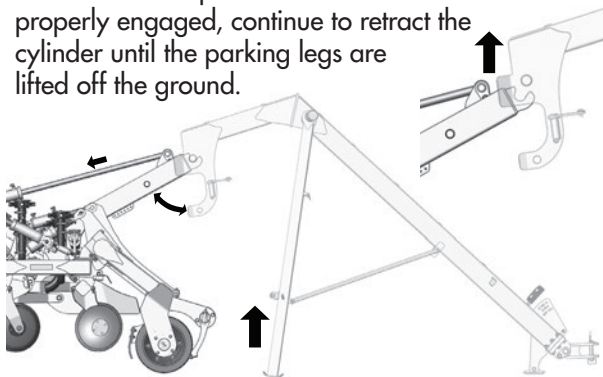
### Follow this procedure to attach the Scorpion Hitch Rear Frame to the Mounted Frame :

1. With the Pro-Till unit in field position, the first step is to extend the Scorpion Hitch Cylinder lowering the clevis hooks into the proper position to connect to the rear frame section. Check to ensure the height of the clevis hooks are low enough to engage the rear frame. May may need to slightly lower the back of the Pro-Till by raising the packer rollers to accomplish this.

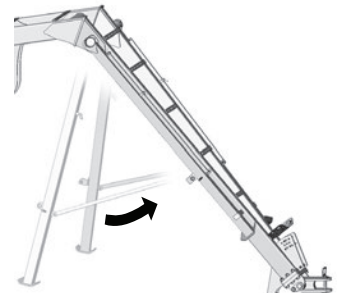


2. The second step is to back-up to the rear frame section, making sure that the Pro-Till approaches the parked hitch as straight as possible. It is difficult for the clevis hooks to pick up the fixed carrier pins if both of them don't make contact at the same time.

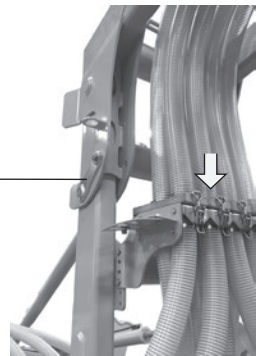
3. The next step is to retract the Scorpion Hitch hydraulic cylinder, which will raise the clevis hooks to engage the fixed carrier pins. When the clevis hooks are properly engaged, continue to retract the cylinder until the parking legs are lifted off the ground.



4. The forth step is to unclip and place the parking leg braces and the parking legs into storage position.

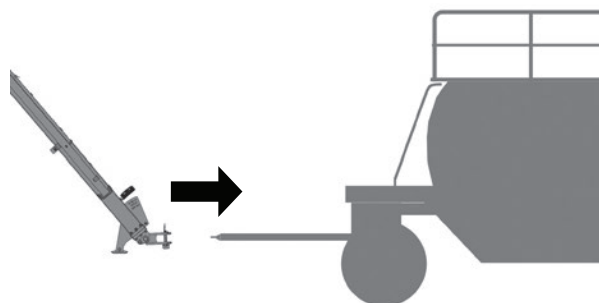
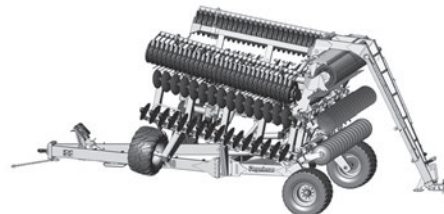


5. The fifth step is to continue retracting the Scorpion Hitch Cylinder until the rear frame is fully engaged and properly positioned to install the Scorpion Hitch locking pins.



6. The next step is to connect all the "Air Cart to Scorpion Hitch" quick couplers for the product hoses and hydraulic hoses.

7. The Scorpion Hitch Rear frame should now be attached and secured to the mounted frame and ready for connecting to an Air Cart.



# Hook-Up Air Cart

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## Procedure to Hook-up Scorpion Hitch:

In order to hook-up the detached rear frame of the Scorpion Hitch, simply reverse the steps listed for the detaching procedure found on the previous page.

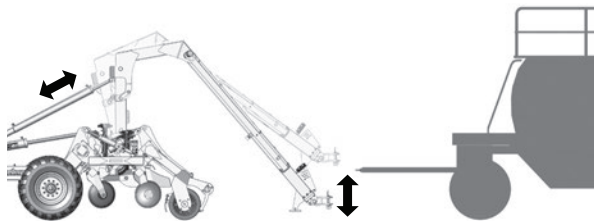
**NOTE:** One precaution when hooking-up is to make sure that the Pro-Till approaches the parked hitch as straight as possible. It is difficult for the clevis hooks to pick up the fixed carrier pins if both of them don't make contact at the same time.

## HOOK-UP TO AIR CART HITCH

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After the Scorpion hitch has been properly attached and connected onto the Pro-Till, you can proceed to hook-up and connect the cart.

1. Using the Scorpion Hitch hydraulic cylinder, adjust the clevis hitch to the height of the cart hitch, backup and connect the cart.



2. After the cart has been properly connected, the Scorpion Hitch Cylinder should be "locked-out". If there are not enough tractor ports available for it to remain connected, another option is to disconnect the cylinder hoses for the Scorpion Hitch. In this case, the hoses should be capped and secured properly as not to interfere with the operation of the Pro-Till.
3. Ensure the Air Cart hitch pin is secured properly in place. Continue to connect the necessary quick couplers for the product hoses, hydraulic hoses, or other necessary Air Cart components for your specific configuration.

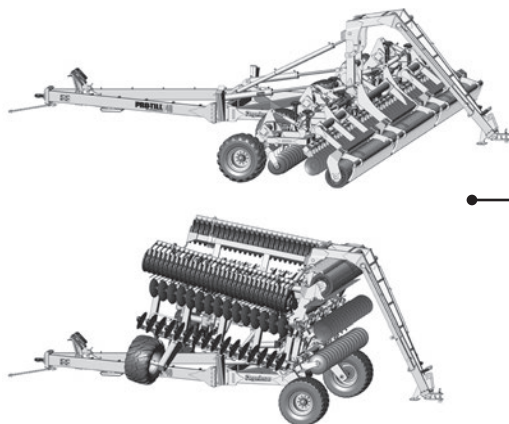
# Transport

## TRANSPORT SAFETY

1. Read and understand ALL the information in the Operator's Manual regarding procedures and SAFETY when operating the PRO-TILL in the field/yard or on the road.
2. Check with local authorities regarding machine transport on public roads. Obey all applicable laws and regulations.
3. Always travel at a safe speed. Use caution when making corners or meeting traffic.
4. Make sure the SMV (Slow Moving Vehicle) sign, and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic. Be sure to check with local highway authorities and comply with their lighting and transport requirements.
5. Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the road shoulder, if permitted by law.
6. Always use hazard warning flashers on tractor when transporting unless prohibited by law.
7. Always use a pin with provisions for a mechanical retainer and a safety chain when attaching to a tractor or towing vehicle.

## FOLDING INTO TRANSPORT POSITION

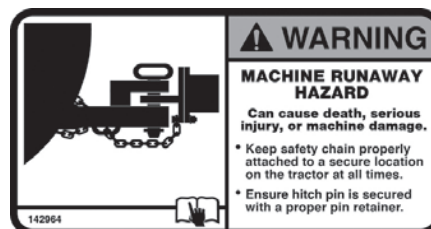
The Scorpion Hitch can be folded into and out-of transport position using the standard procedure for the Pro-Till. The first time after the Scorpion Hitch has been installed, you may wish to proceed slowly and watch carefully to ensure the hoses have been routed safely and secured properly as not to be pinched, stretched, or interfere with the folding of the wings.



## TRANSPORTING

Use the following guidelines while transporting:

1. Use a safety chain and a pin with provisions for a mechanical retainer.
2. Ensure Pro-Till is in the full transport position with the wing rollers secure and properly in place.



3. Ensure debris that may fall or become dislodged during transport is removed.
4. Be sure hazard lights are flashing and SMV decal is visible.
5. MAXIMUM RECOMMENDED TRANSPORT SPEED: **MAX 40 km/h or 25 mph.** (Road Conditions, Field speeds may be lower.)  
  
Due to weight of the machine and tire ratings, do not exceed the recommended maximum speeds or severe tire damage / excessive wear may occur.
6. Check that the transport tires are properly inflated.

**! IMPORTANT:** Under NO CIRCUMSTANCES should there ever be riders while the Pro-Till is in transport.



**! IMPORTANT**  
**DO NOT Extend**  
**the Hitch Cylinder**  
**During Fold/Unfold, or**  
**Mechanical Damage**  
**Will Occur.**

The Scorpion Hitch cylinder is purely for removing the hitch from the machine and doing fine adjustments to seeder cart height and then leaving the hitch at that height.

# Troubleshooting - Scorpion Hitch

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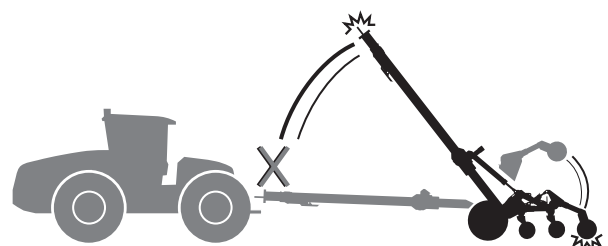
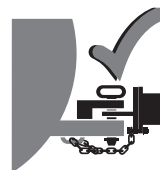

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## MAINTENANCE SAFETY

1. Review the Operator's Manual and all safety items before working with, maintaining or operating the PRO-TILL.
2. Stop the tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Keep hands, feet, clothing and hair away from all moving and/or rotating parts.
4. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments.
5. Place safety stands or large blocks under the frame before removing tires or working beneath the machine.
6. Be careful when working around or maintaining a high-pressure hydraulic system. Wear proper eye and hand protection when searching for a high pressure hydraulic leak. Use a piece of wood or cardboard as a backstop when searching for a pin hole leak in a hose or a fitting.
7. Always relieve pressure before disconnecting or working on hydraulic system.
8. Never disconnect Pro-Till from tractor if rear sections of machine are partially raised. See warning below:



**⚠ WARNING/DANGER:** *Never disconnect Pro-Till from tractor if rear sections of machine are partially raised. **Negative Hitch Weight** may result, the hitch pole may suddenly raise and the rear section would come crashing down. Only disconnect when unit is on level ground in the proper transport or field position.*



# Service & Maintenance

## HARDWARE SPECIFICATIONS



**Note:** Unless stated otherwise, hardware is typically:  
Hex, Plated GR5 UNC or P8.8 (metric)

## TORQUE SPECIFICATIONS



**TORQUE**

### Checking Bolt Torque

The tables below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check the tightness of bolts periodically, using these bolt torque charts as a guide. Replace hardware with the same strength (Grade/Class) bolt.

### IMPERIAL TORQUE SPECIFICATIONS

(Coarse Thread - based on "Zinc Plated" values)



SAE-5



SAE-8

Size	Grade 5 lb.ft (N.m)	Grade 8 lb.ft (N.m)
1/4"	7 (10)	10 (14)
5/16"	15 (20)	20 (28)
3/8"	25 (35)	35 (50)
7/16"	40 (55)	60 (80)
1/2"	65 (90)	90 (120)
9/16"	90 (125)	130 (175)
5/8"	130 (175)	180 (245)
3/4"	230 (310)	320 (435)
7/8"	365 (495)	515 (700)
1"	550 (745)	770 (1050)
1-1/8"	675 (915)	1095 (1485)
1-1/4"	950 (1290)	1545 (2095)
1-3/8"	1250 (1695)	2025 (2745)
1-1/2"	1650 (2245)	2690 (3645)

### METRIC TORQUE SPECIFICATIONS

(Coarse Thread - based on "Zinc Plated" values)



8.8



10.9

Size	Class 8.8 lb.ft (N.m)	Class 10.9 lb.ft (N.m)
M6	7 (10)	10 (14)
M8	16 (22)	23 (31)
M10	30 (42)	45 (60)
M12	55 (75)	80 (108)
M14	90 (120)	125 (170)
M16	135 (185)	195 (265)
M18	190 (255)	270 (365)
M20	265 (360)	380 (515)
M22	365 (495)	520 (705)
M24	460 (625)	660 (895)
M27	675 (915)	970 (1315)
M30	915 (1240)	1310 (1780)
M33	1250 (1695)	1785 (2420)
M36	1600 (2175)	2290 (3110)

## HYDRAULIC SAFETY



- Make sure that all components in the hydraulic system are kept in good condition and are clean.
- Replace any worn, cut, abraded, flattened or crimped hoses and metal lines.
- Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.
- Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.
- If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.
- Before applying pressure to the system, make sure all components are tight and that lines, hoses and couplings are not damaged.



## HYDRAULIC HOSE SPECIFICATIONS



**Note:** Unless otherwise stated, Hydraulic Hoses are either 3/8 or 1/2 with ORF female swivel ends.

## HYDRAULIC HOSE INSTALLATION TIPS



The following tips are to help you identify some possible problem areas in the installation of hydraulic hoses.

1. Installation should be completed in a clean environment clear of dust and contaminants. Hoses and fittings should be capped if not installed.
2. Ensure hoses are not twisted during installation as this may weaken the hose. Also, the pressure in a twisted hose may loosen fittings or connections.
3. Allow sufficient bend radius in hoses when installing to prevent lines from collapsing and flow becoming restricted.
4. When installing hoses in an area of movement or flexing, allow enough free length for motion and to ensure fitting connections are not stressed.
5. Ensure hoses are properly clamped and secured in position after routing is complete to provide a cleaner installation and prevent possible damage or hazards.



# Service & Maintenance

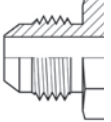
## HYDRAULIC FITTING INSTALLATION



The following info is to help you identify and properly install some of our standard hydraulic fittings.

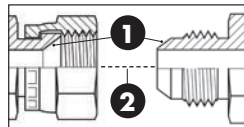
### SAE (JIC) 37° Flare

JIC fittings - Metal-to-metal sealing type fittings featuring a 37° flare (angle of sealing surface) and straight UNF (Unified National Fine) Threads.

(Lubricated Values)	Dash	Thread Size	Torque - lb.ft (N.m)
	-4	7/16 - 20	9-12 (12-16)
	-6	9/16 - 18	14-20 (19-27)
	-8	3/4 - 16	27-39 (37-53)
	-10	7/8 - 14	36-63 (50-85)
	-12	1-1/16 - 12	65-88 (90-119)

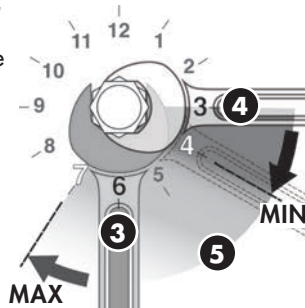
### Tightening JIC 37° Flare Type Fittings

1. Check flare and flare seat for defects that might cause leakage.
2. Align fittings before tightening. Lubricate connections & hand tighten swivel nut until snug.
3. Using two wrenches, torque to values shown in table.



#### Alternate Installation Method

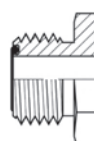
3. Using two wrenches. Place one wrench on the fixed connector body at a clock position of 6 o'clock.
4. Place the second wrench on the second connection as close to the 3 o'clock position as possible.
5. Tighten by rotating the second connection firmly to at least the 4 o'clock position, but no more than the 7 o'clock position. Typically, the larger the fitting size the less rotation required.



### ORFS (O-Ring Face Seal)

ORFS fittings use an O-ring compression method to seal. This method offers a high level of sealing along with good vibration resistance. Male fittings include an O-ring located in a groove on the flat face. Female fittings feature a flat face and UNF straight threaded swivel nut.

The **Torque** method is recommended for ORFS installation.

	Dash	Thread Size	Torque - lb.ft (N.m)
	-4	9/16 - 18	18 (25)
	-6	11/16 - 16	30 (40)
	-8	13/16 - 16	40 (55)
	-10	1 - 14	60 (80)
	-12	1-3/16 - 12	85 (115)

### Tightening ORFS (O-Ring Face Seal) Fittings

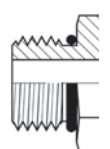
1. Inspect components and ensure the O-Ring seal is undamaged and properly installed in the groove of the face seal. Replacing the O-Ring may be necessary.
2. Align, thread into place and hand tighten.
3. Tighten to proper torque from the table shown above.

**Note:** A **DASH** size refers to a diameter of a hose (*inside*) or of a tube (*outside*) measured in 1/16" increments. For example, a **Hose** specified as **dash 8** or **-8** would have an **inside** diameter of 8/16" or 1/2".

Alternatively, a **Tube** specified as **dash 8** or **-8** would have an **outside** diameter of 8/16" or 1/2".

### ORB (O-Ring Boss)

Male ORB fittings have straight UNF threads, a sealing face and an O-ring. The female fittings are generally found in the ports of machines and feature straight threads, a machined surface, and a chamfer to accept the O-ring. Sealing is achieved through the compression of the male O-ring against the chamfered sealing face of the female fitting.

(Lubricated Values)	Dash	Thread Size	Torque Non-Adjustable lb.ft (N.m)	Torque Adjustable lb.ft (N.m)
	-4	7/16 - 20	30 (40)	15 (20)
	-6	9/16 - 18	35 (46)	35 (46)
	-8	3/4 - 16	60 (80)	60 (80)
	-10	7/8 - 14	100 (135)	100 (135)
	-12	1-1/16 - 12	135 (185)	135 (185)

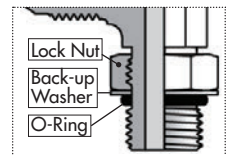
### Tightening ORB (O-Ring Boss) Fittings

#### Non-adjustable Port End Assembly

1. Inspect the components to ensure that male and female threads and sealing surfaces are free of nicks, burrs, scratches, or any foreign material.
2. Ensure O-Ring seal is properly installed and undamaged.
3. Lubricate threads and O-ring to help the O-ring slide past the port entrance corner and avoid damaging it.
4. Screw the fitting into position tighten to proper torque value from the table shown above.

#### Adjustable Port End Assembly

1. Inspect the components to ensure male & female threads and sealing surfaces are free of nicks, burrs, scratches, or any foreign material.
2. Ensure O-Ring seal is properly installed and undamaged.
3. Lubricate threads and O-ring to help the O-ring slide smoothly into the port and avoid damage.
4. Loosen back the lock nut as far as possible. Make sure back-up washer is not loose and is pushed up as far as possible.
5. Screw the fitting into port until the back-up washer or the retaining ring contacts face of the port. Light wrenching may be necessary. Over tightening may damage washer.
6. To align the end of the fitting to accept incoming tube or hose assembly, unscrew the fitting by the required amount, but not more than one full turn.
7. Using two wrenches, hold the fitting in desired position and tighten the locknut to the proper torque value from the table located above.
8. Inspect to ensure that O-ring is not pinched and that washer is seated flat on the face of the port.



# Service & Maintenance

## HYDRAULIC CYLINDER REPAIR

### PREPARATION

When cylinder repair is required, clean off unit, disconnect hoses and plug ports before removing cylinder.

When removed, open the cylinder ports and drain the cylinder's hydraulic fluid.

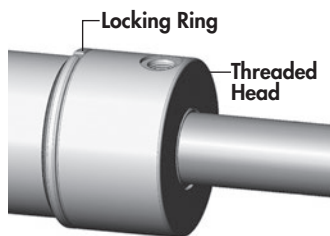
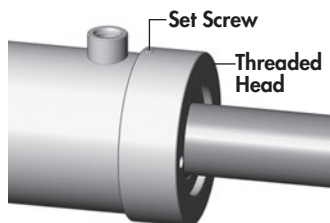
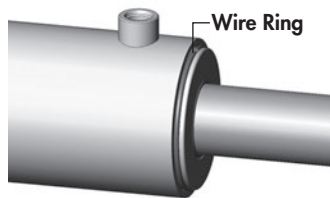
Examine the type of cylinder. Make sure you have the correct tools for the job.

You may require the following tools:

- Proper **Seal Kit**
- Rubber Mallet
- Screwdriver
- Punch
- Pliers
- Emery cloth
- Torque Wrench

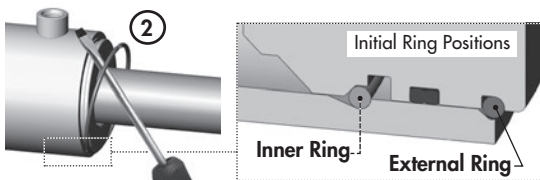
### Types of Cylinders

(Wire Ring / Threaded Head)



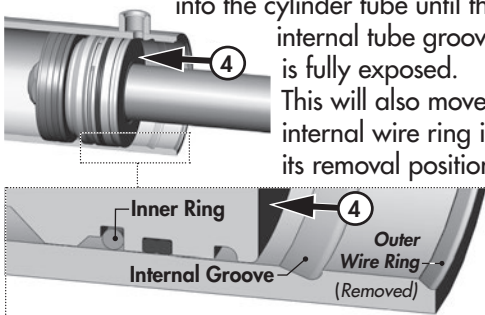
## REPAIRING A WIRE RING CYLINDER

1. Retract the rod assembly.
2. Remove the external steel wire ring.

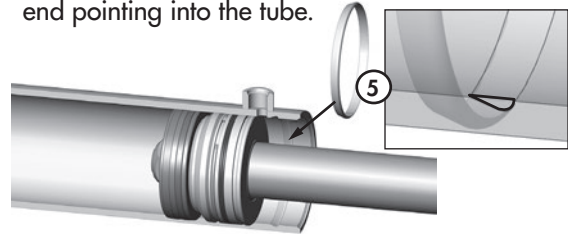


3. Remove any dirt that may have accumulated on the cylinder head.

4. Using the mallet and punch, push the head into the cylinder tube until the internal tube groove is fully exposed. This will also move the internal wire ring into its removal position.



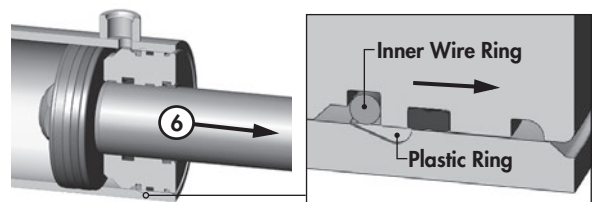
5. Take the plastic removal ring from the seal kit:
  - a) Straighten the ring and remove any kinks or excessive curl to make installation easier and prevent it from falling out.
  - b) Insert the removal ring into the internal groove with the feathered end pointing into the tube.



- c) Use a screwdriver or a finger to hold one end of the ring in the groove while fitting the other end of the ring into the groove. The tips should snap in together. Ensure it is secure and fully seated before the next step.

**IMPORTANT:** It is important to ensure the removal ring is completely in the groove before pulling the rod out. If the ring sticks out it will get stuck between the head and tube.

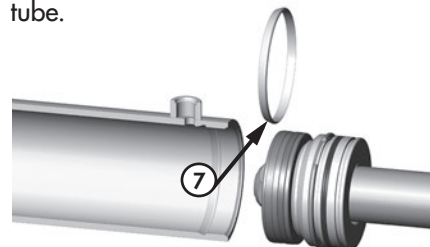
6. a) Extend the rod to pull head out of tube. If the rod does not pull out easily, push the head back in and ensure the ring is properly in the groove. Replace ring if necessary.



**Note:** Excessive force will not overcome a jammed ring and could damage the cylinder.

- b) Completely remove rod and head from tube.

7. Remove plastic removal ring from the cylinder tube.





# Service & Maintenance

## REPLACING A PRESSED BUSHING

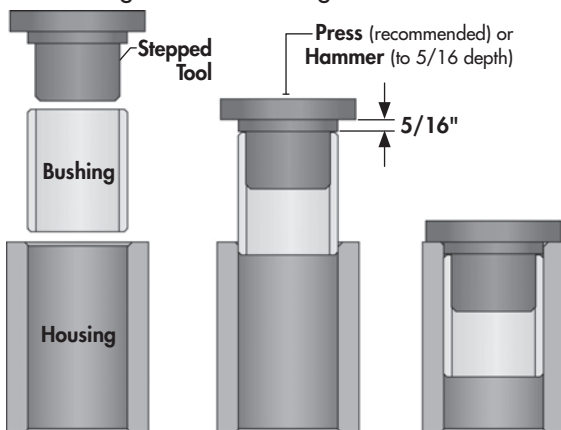
**NOTE:** You may need the following tools:  
Press, hammer, punch, pry-bar, "Step-Tool"

Use the following as a guideline for repair:

1. Ensure the area and frame are properly secured, supported, and safe to work on. Safely remove the pin(s), cylinder, and/or components necessary in order to access and work on the damaged bushing.
2. Remove the existing bushing using required tools. In some instances, you may need to cut the damaged bushing in order for easier removal (use proper safety precautions and try not to damage other components if using this method).
3. With the bushing removed, clean and prepare the location for the new bushing insert. **Note:** A mixture of "Dish Soap and Water" is recommended to use as a lubricant on the outside of the composite bushing.

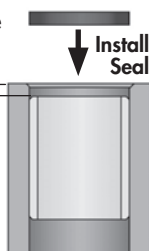
**⚠ IMPORTANT: DO NOT** use oil or grease on outside or inside of composite bushings.

4. Use a stepped tool to ensure the edge of the bushing is not damaged when inserting.



5. Ensuring the bushing is properly aligned, press into hole (preferred method) or hammer into position by striking the stepped tool.
6. Continue to install until the bushing edge is recessed in to a distance of 5/16" to allow for the outer seal to be properly installed. Do not exceed this depth.
7. Repeat steps 4-6 for opposite bushing (if applicable).
8. When both bushings are installed to the proper depth, install the new seals.
9. Re-assemble all other necessary components.

**⚠ IMPORTANT: DO NOT** use oil or grease on pins or bushing surfaces when re-installing.



## STORAGE

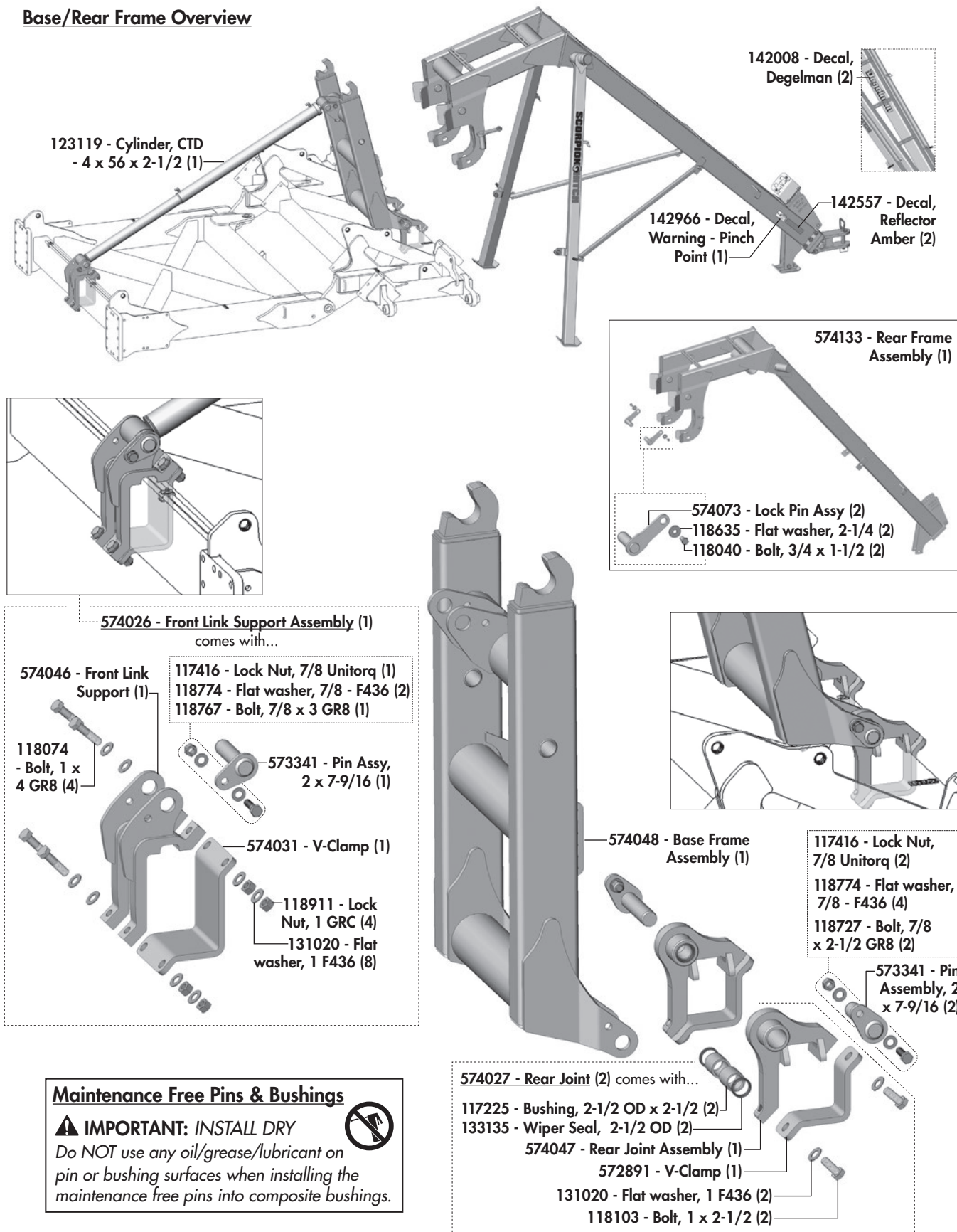
The PRO-TILL should be carefully prepared for storage to ensure that all dirt, mud, debris and moisture has been removed.

Follow this procedure when preparing to store:

1. Wash the entire machine thoroughly using a water hose or pressure washer to remove all dirt, mud, debris or residue.
2. Inspect all parts to see if anything has become entangled in them. Remove entangled material.
3. Lubricate hub and spindle grease fittings to remove moisture
4. Inspect all hydraulic hoses, fittings, lines and couplers. Tighten any loose fittings. Replace any hose that is badly cut, nicked or abraded or is separating from the crimped end of the fitting.
5. Touch up all paint nicks and scratches to prevent rusting.
6. Select an area that is dry, level and free of debris.
7. Store in either Transport or Field position.
8. Use hydraulic cylinder jack.
9. Oil any exposed chrome shafts on the hydraulic cylinders to prevent rusting.

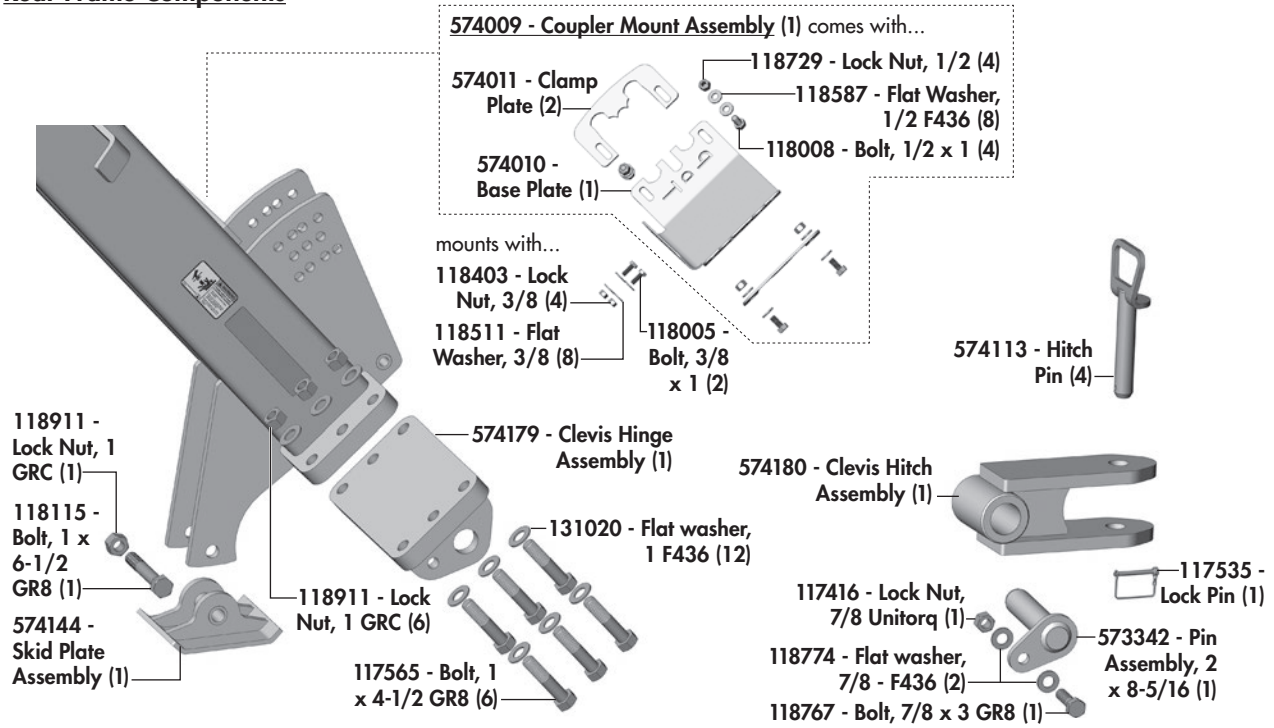
# Base / Rear Frame Components

## Base/Rear Frame Overview

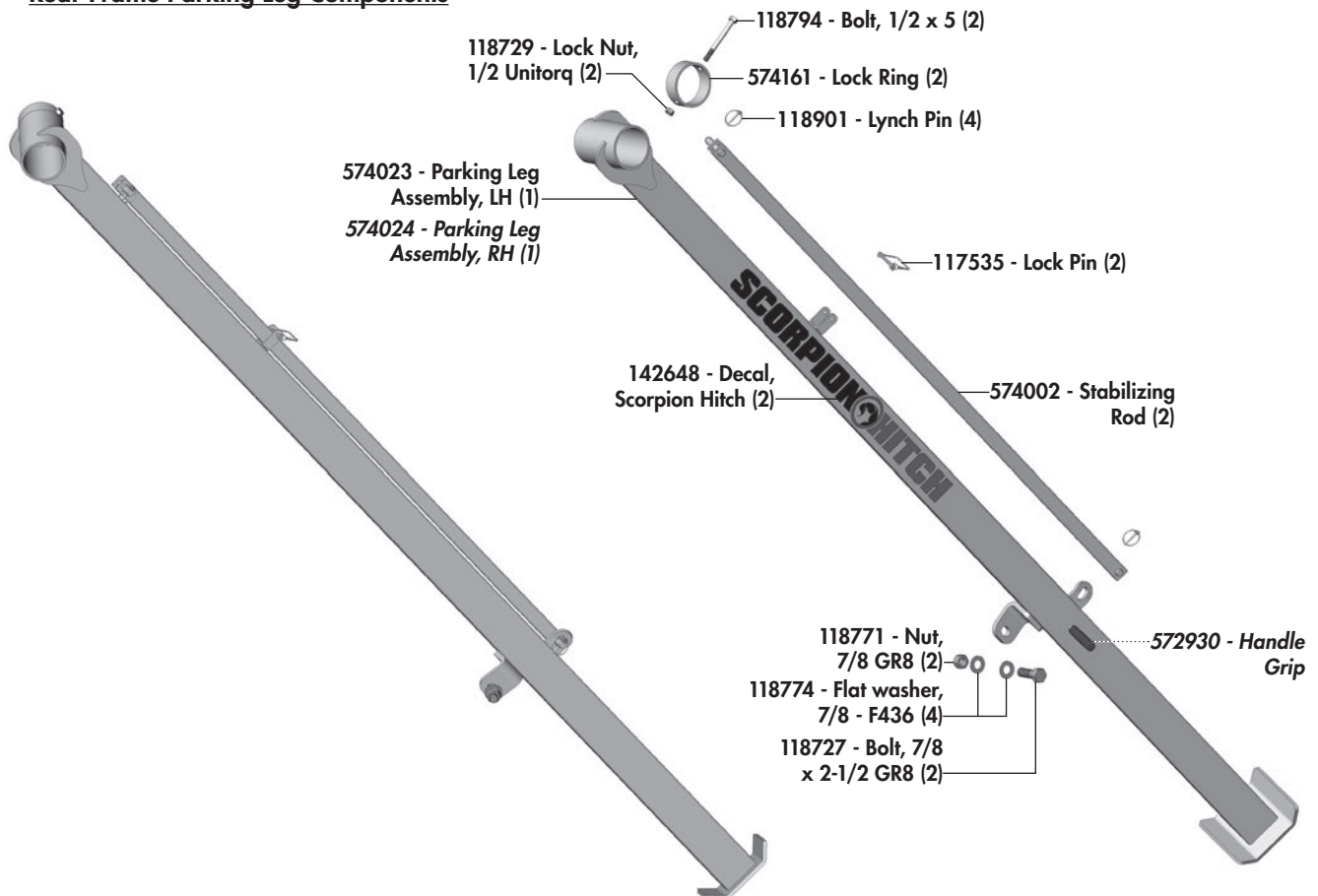


# Base / Rear Frame Components

## Rear Frame Components



## Rear Frame Parking Leg Components

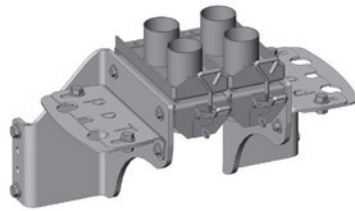


# Common Kit Components

## Quick Connector Kit Options

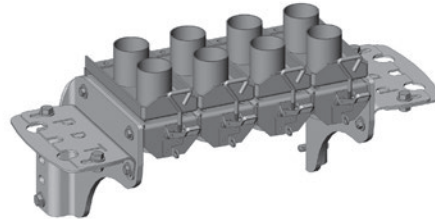
### Single Shoot - 2.5" (4 Port)

574012 - Quick Connector Kit - 2.5" SS (1)



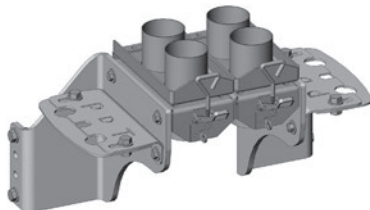
### Double Shoot - 2.5" (8 Port)

574013 - Quick Connector Kit - 2.5" DS (1)



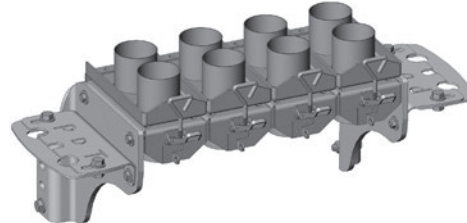
### Single Shoot - 3.0" (4 Port)

574017 - Quick Connector Kit - 3.0" SS (1)



### Double Shoot - 2.5" (8 Port)

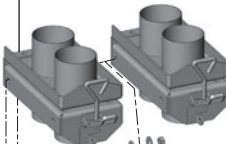
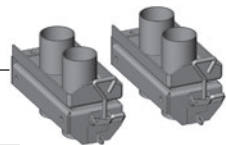
574018 - Quick Connector Kit - 3.0" DS (1)



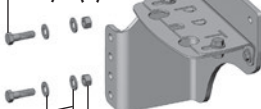
## Single Shoot Kit Components

101000 - Quick Connector Assembly, 2 Port - 2.5 (2)  
- or -

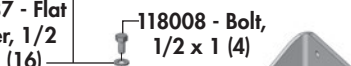
101002 - Quick Connector Assembly, 2 Port - 3.0 (2)



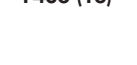
118292 - Bolt, 1/2 x 1-3/4 (4)



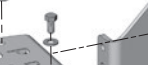
118729 - Lock Nut, 1/2 (4)



118587 - Flat Washer, 1/2 - F436 (16)



118008 - Bolt, 1/2 x 1 (4)



118417 - Lock Nut, 3/8 (10)

118511 - Flat Washer, 3/8 (20)

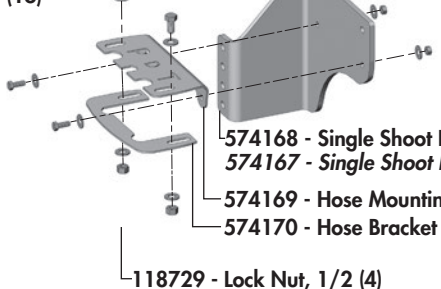
118005 - Bolt, 3/8 x 1 (10)



574168 - Single Shoot Bracket -LH (1)  
574167 - Single Shoot Bracket -RH (1)

574169 - Hose Mounting Plate (2)  
574170 - Hose Bracket Clamp (2)

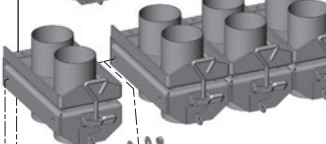
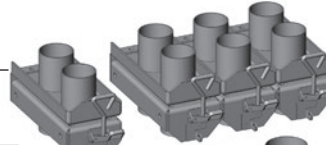
118729 - Lock Nut, 1/2 (4)



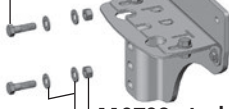
## Double Shoot Kit Components

101000 - Quick Connector Assembly, 2 Port - 2.5 (4)  
- or -

101002 - Quick Connector Assembly, 2 Port - 3.0 (4)



118292 - Bolt, 1/2 x 1-3/4 (4)



118729 - Lock Nut, 1/2 (4)

118587 - Flat Washer, 1/2 - F436 (16)



118008 - Bolt, 1/2 x 1 (4)



118417 - Lock Nut, 3/8 (14)

118511 - Flat Washer, 3/8 (28)

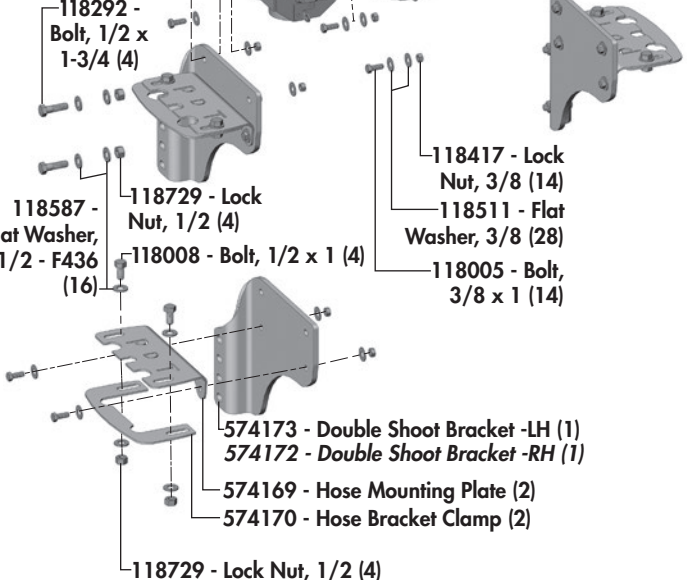
118005 - Bolt, 3/8 x 1 (14)



574173 - Double Shoot Bracket -LH (1)  
574172 - Double Shoot Bracket -RH (1)

574169 - Hose Mounting Plate (2)  
574170 - Hose Bracket Clamp (2)

118729 - Lock Nut, 1/2 (4)

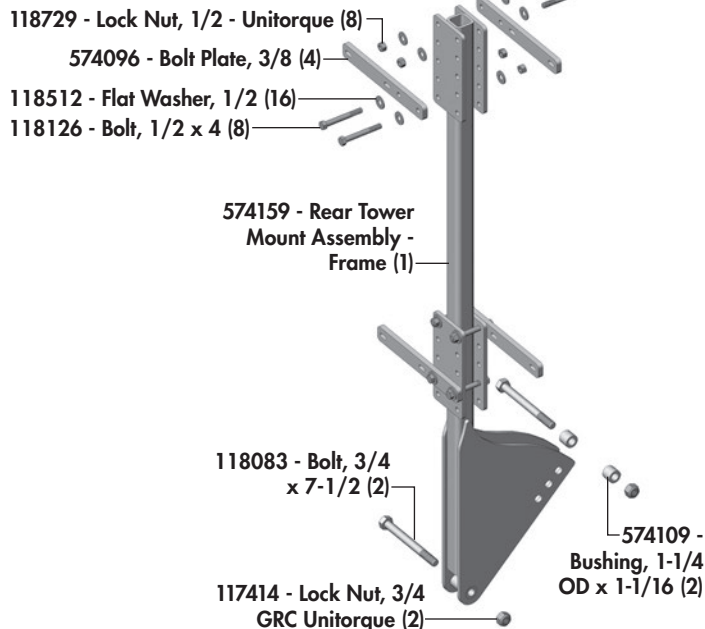




# Common Kit Components

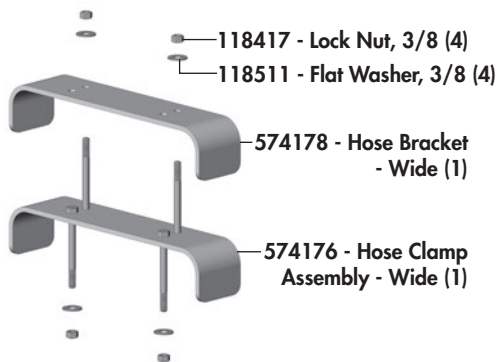
## Rear Tower Mount Assembly Components

**574158 - Rear Tower Mount Assembly (1)**  
comes with...



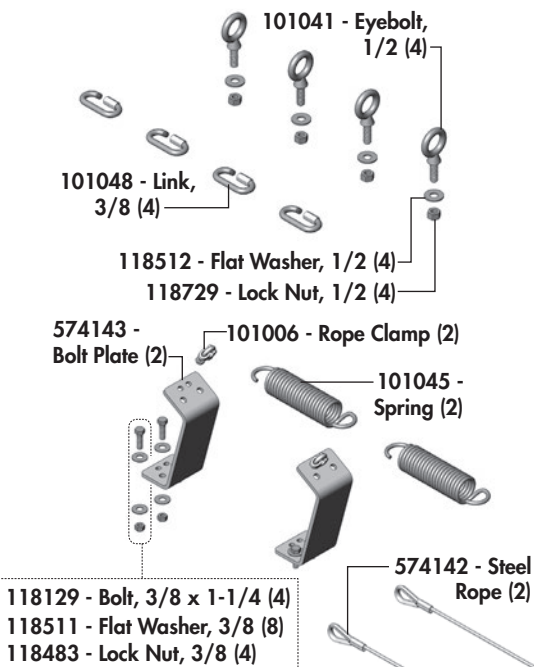
## Rear Hitch Mounted Hose Clamp Assembly

**574175 - Rear Hitch Hose Clamp Assembly - Wide (3)**  
comes with...

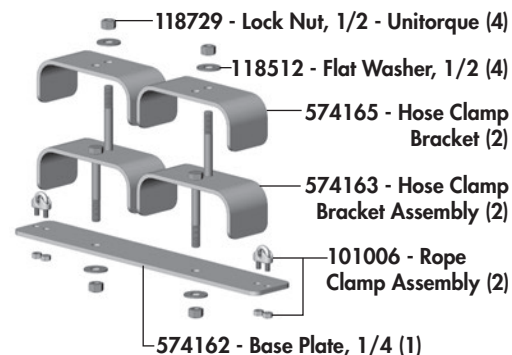


## Rear Hitch Floating Hose Mount Components

**574114 - Suspended DS Hose Mount Kit (1)**  
comes with...

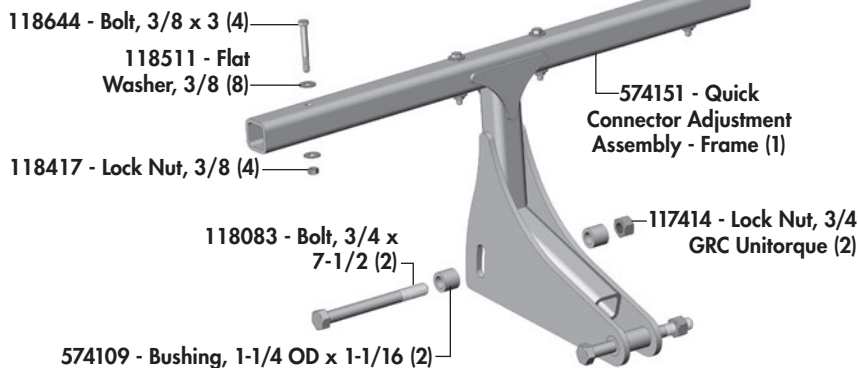


**FLOATING: 574164 - Rear Hitch Hose Clamp Assembly (3)** comes with...



## Quick Connector Adjustment Assembly

**574148 - Quick Connector Adjustment Assembly (1)**  
comes with...



**4 Port Quick Connector**  
as required...

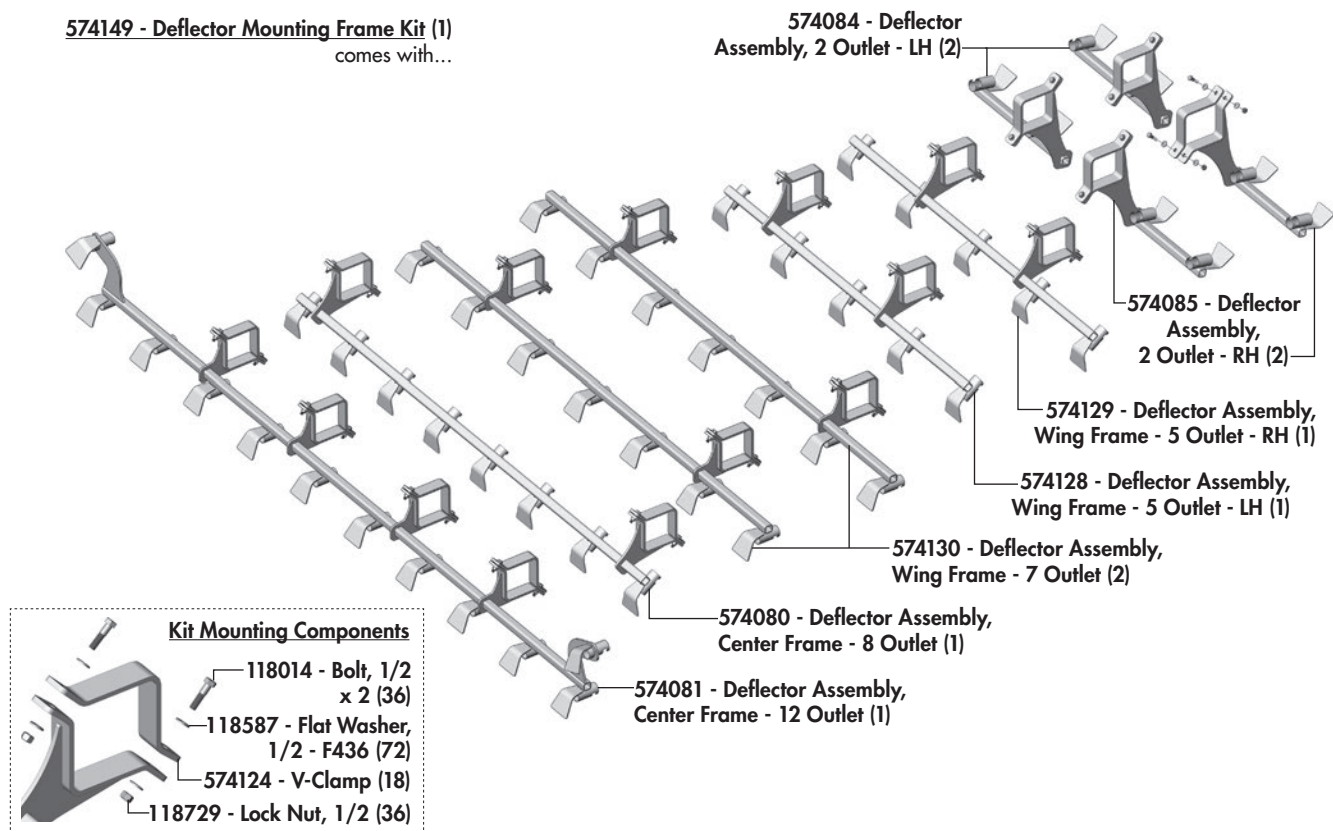
101001 - Quick Connector Assembly, 4 Port - 2.5



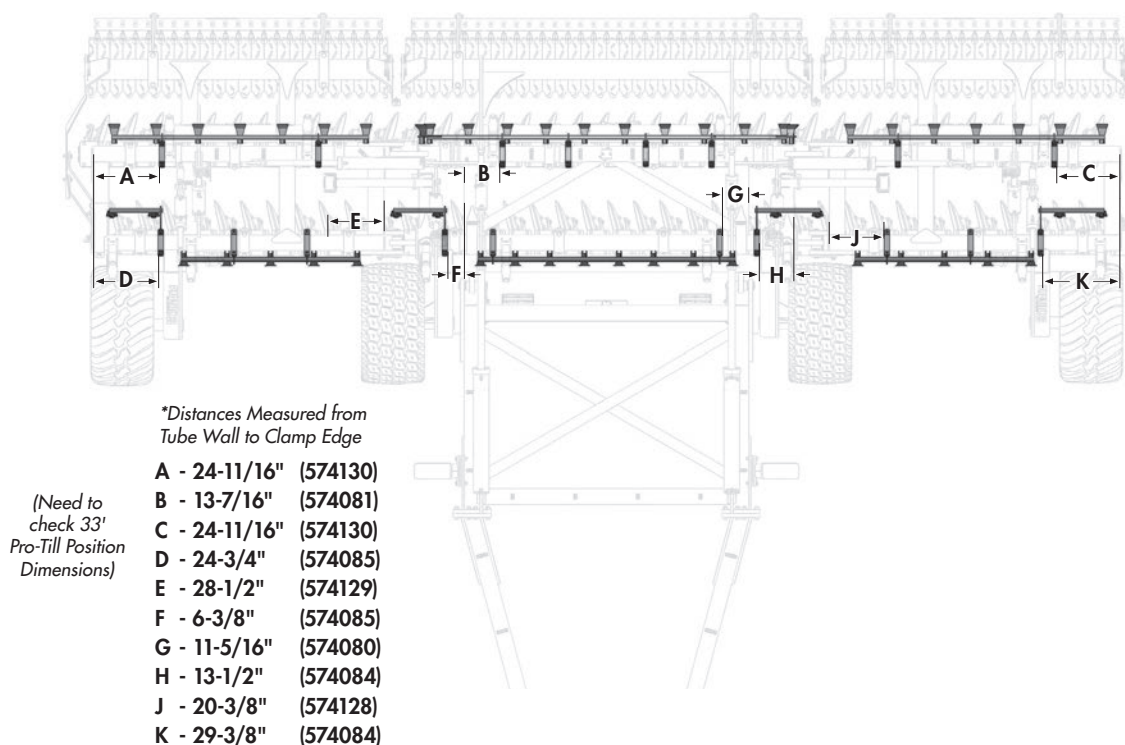
# Deflector Mounting Frame Kit for Pro-Till 33

## Deflector Mounting Frame Kit Components

**574149 - Deflector Mounting Frame Kit (1)**  
comes with...



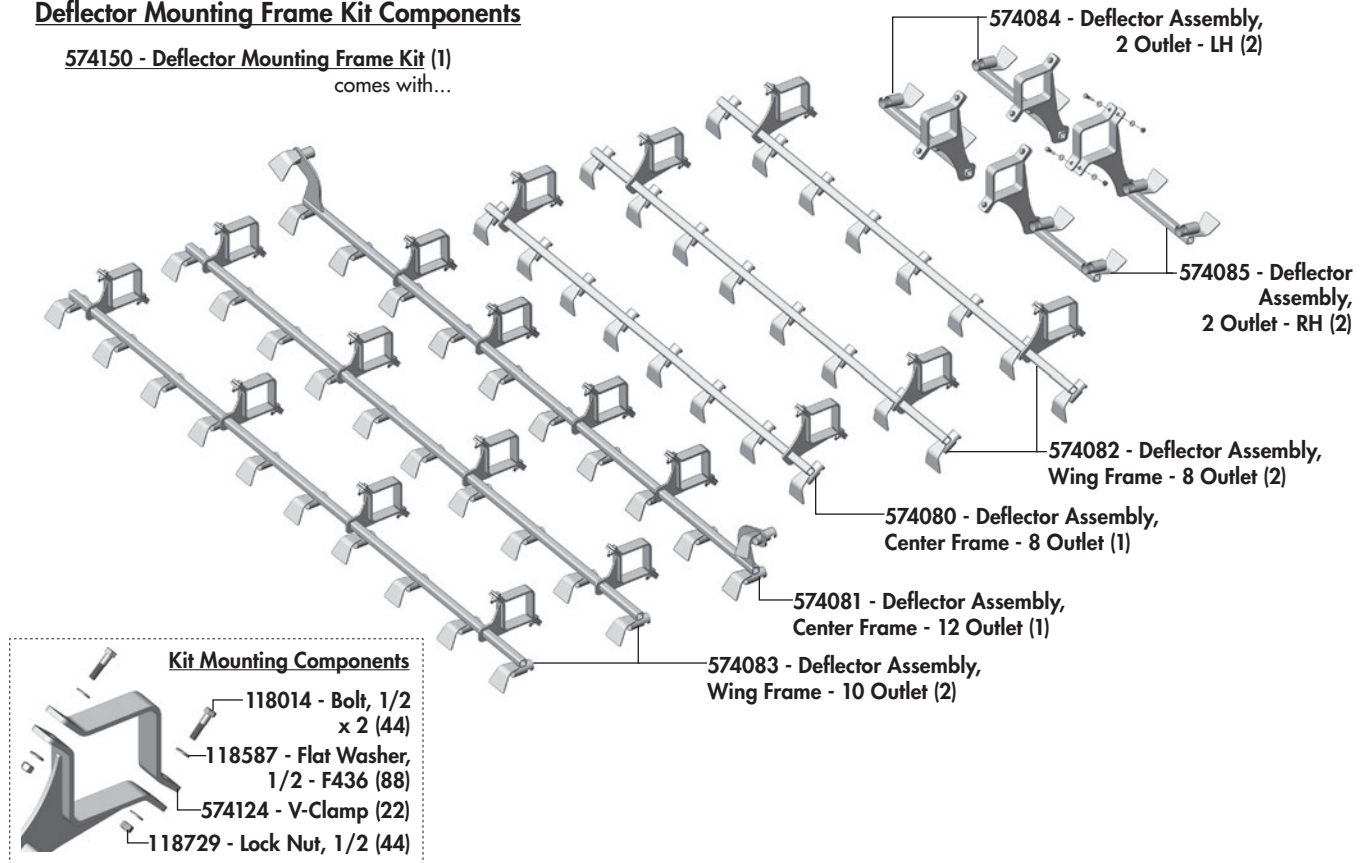
## Deflector Mounting Frame Location Overview - 33'



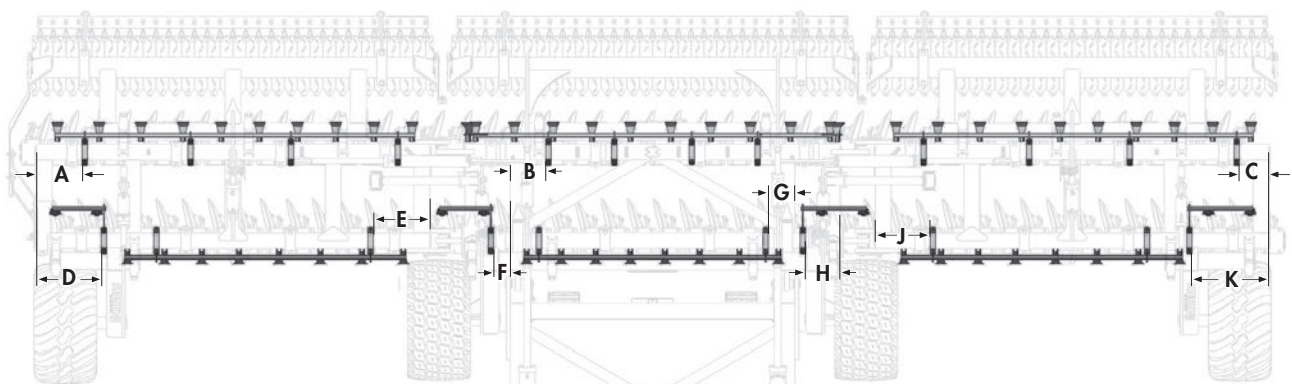
# Deflector Mounting Frame Kit for Pro-Till 40

## Deflector Mounting Frame Kit Components

**574150 - Deflector Mounting Frame Kit (1)**  
comes with...



## Deflector Mounting Frame Location Overview - 40'



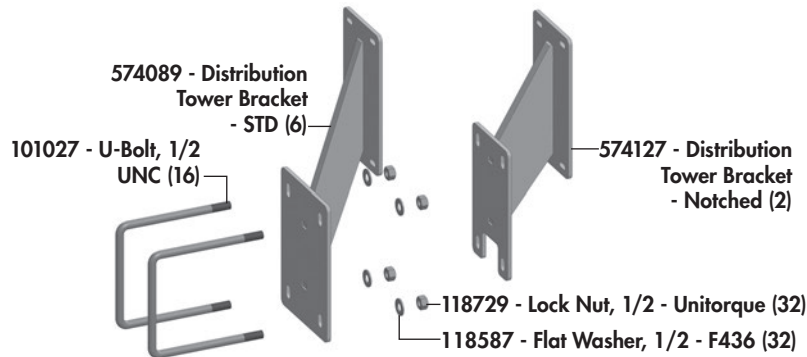
*\*Distances Measured from  
Tube Wall to Clamp Edge*

- A - 17-1/2" (574083)
- B - 13-7/16" (574081)
- C - 11-1/4" (574083)
- D - 24-3/4" (574085)
- E - 21-5/8" (574082)
- F - 6-3/8" (574085)
- G - 11-5/16" (574080)
- H - 13-1/4" (574084)
- J - 21" (574082)
- K - 29-3/8" (574084)

# Common Kit Components

## Secondary Tower Kit Components

**574087 - Secondary Tower Mounting Kit (1)**  
comes with...

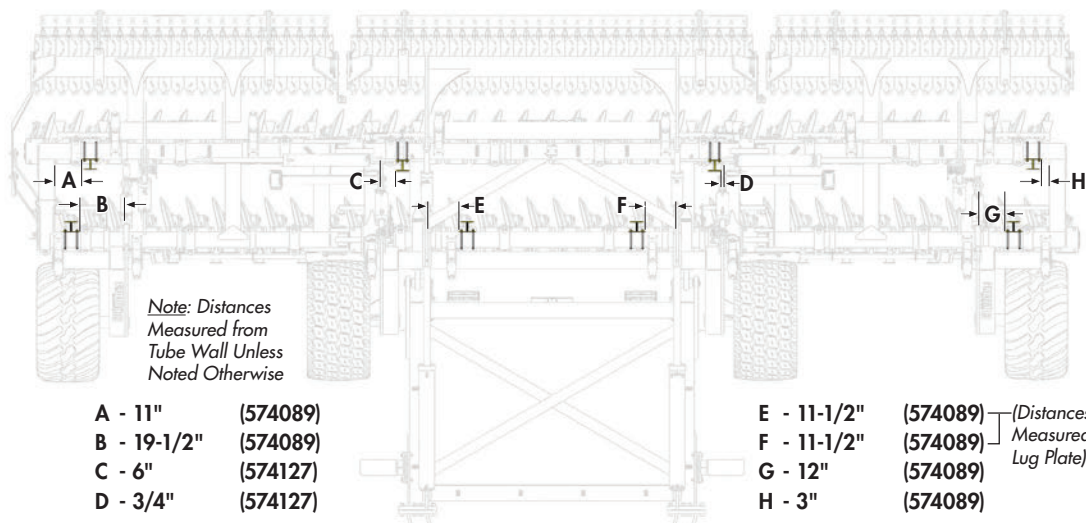


**574142 - Secondary Riser Clamping Kit (1)**  
comes with...

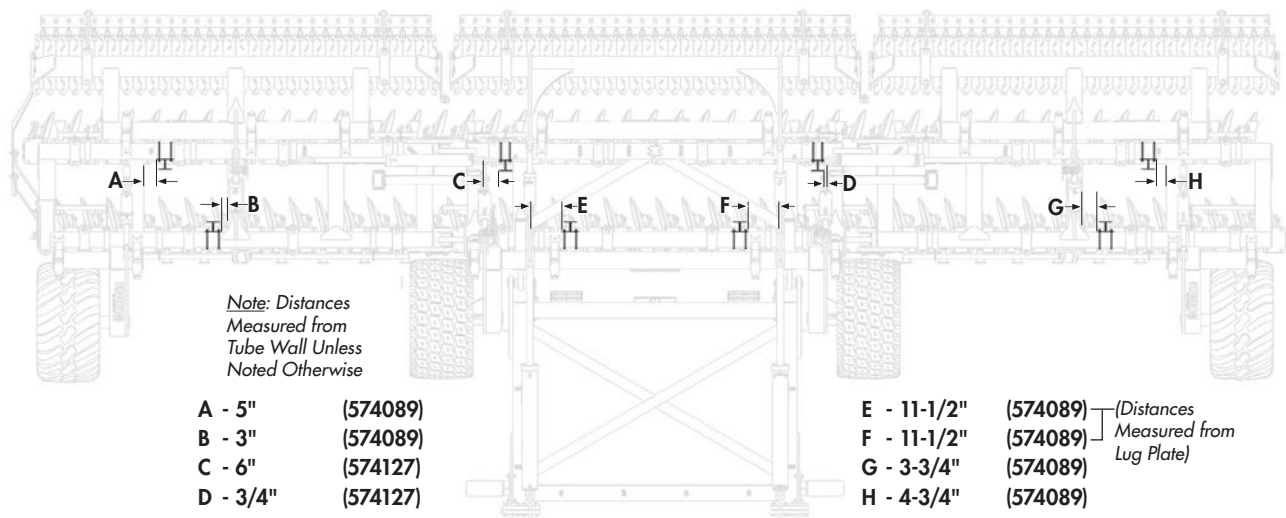
101046 - U-Bolt, Clamp (24)



## Secondary Tower Bracket Location Overview - 33'



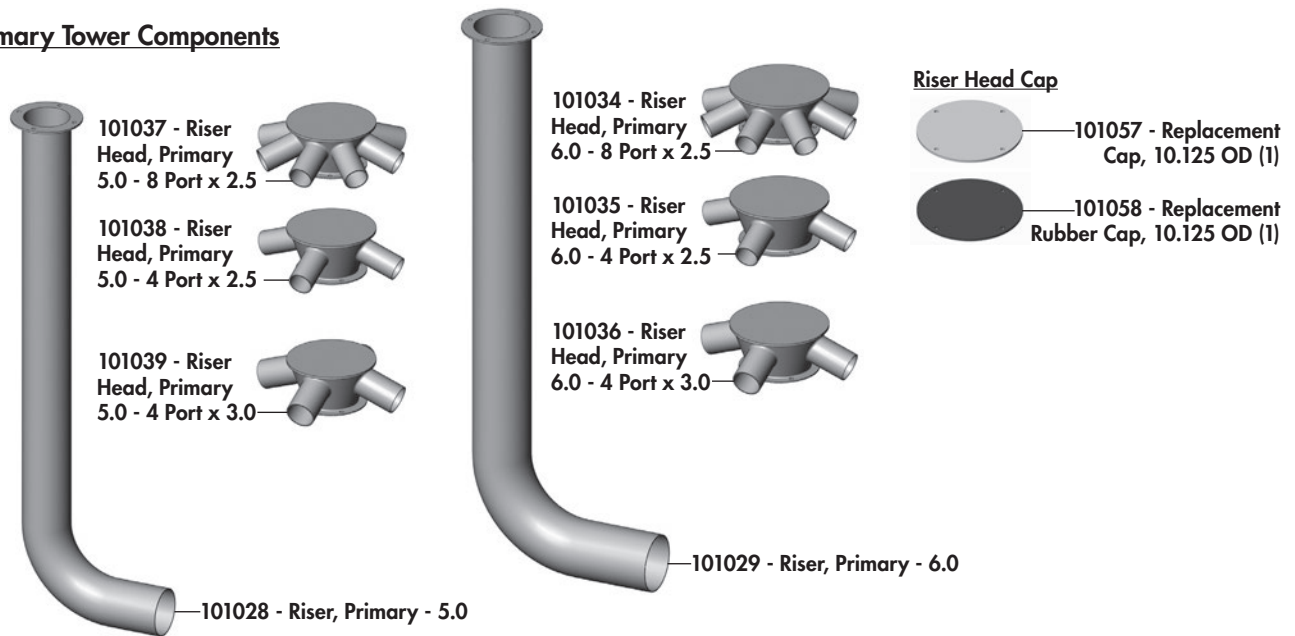
## Secondary Tower Bracket Location Overview - 40'



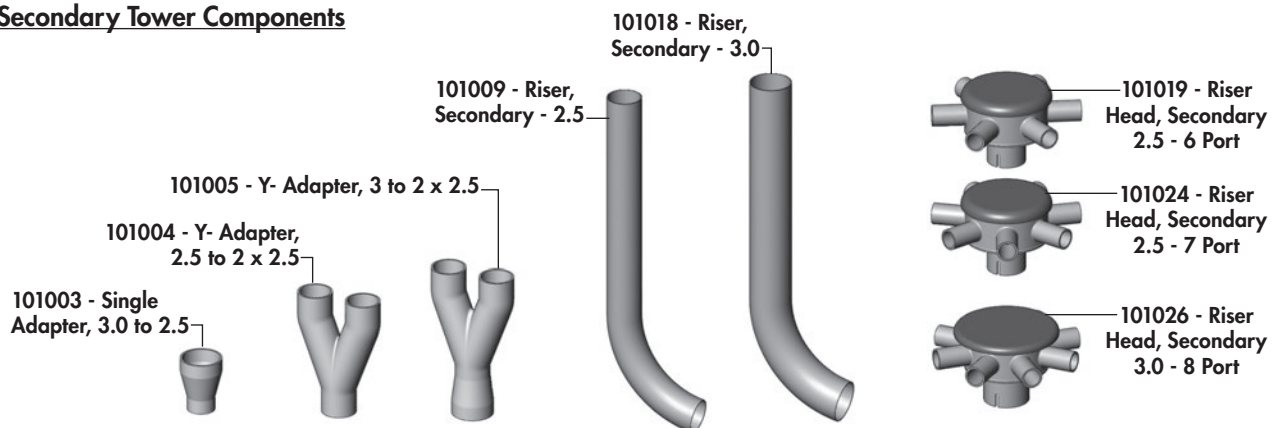


# Common Kit Components

## Primary Tower Components



## Secondary Tower Components



### Secondary Tubing

- 101049 - Air Seeder Hose - 3" x 100' Roll (model specific)
- 101050 - Air Seeder Hose - 2.5" x 100' Roll (model specific)

### Tertiary Tubing

- 101051 - Air Seeder Hose - 1.5" x 100' Roll (4)

### 574115 - 40' Hose Clamp Kit (1)

comes with...

- 101044 - Hose Clamp, up to 2 (128)
- 101043 - Hose Clamp, up to 3-1/2 (32)

### 574196 - 33' Hose Clamp Kit (1)

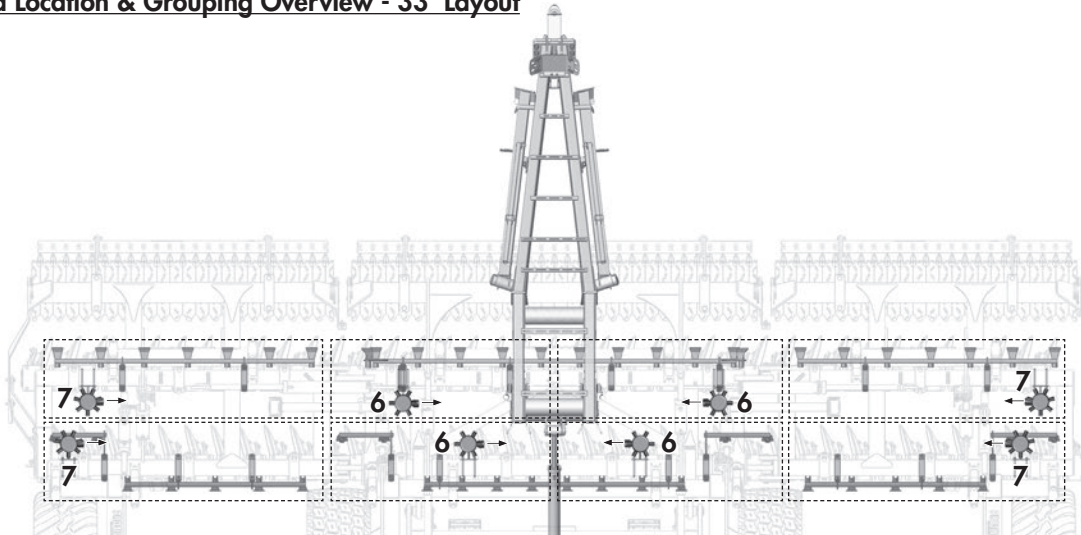
comes with...

- 101044 - Hose Clamp, up to 2 (104)
- 246992 - Hose Clamp, up to 2-1/2 (40)

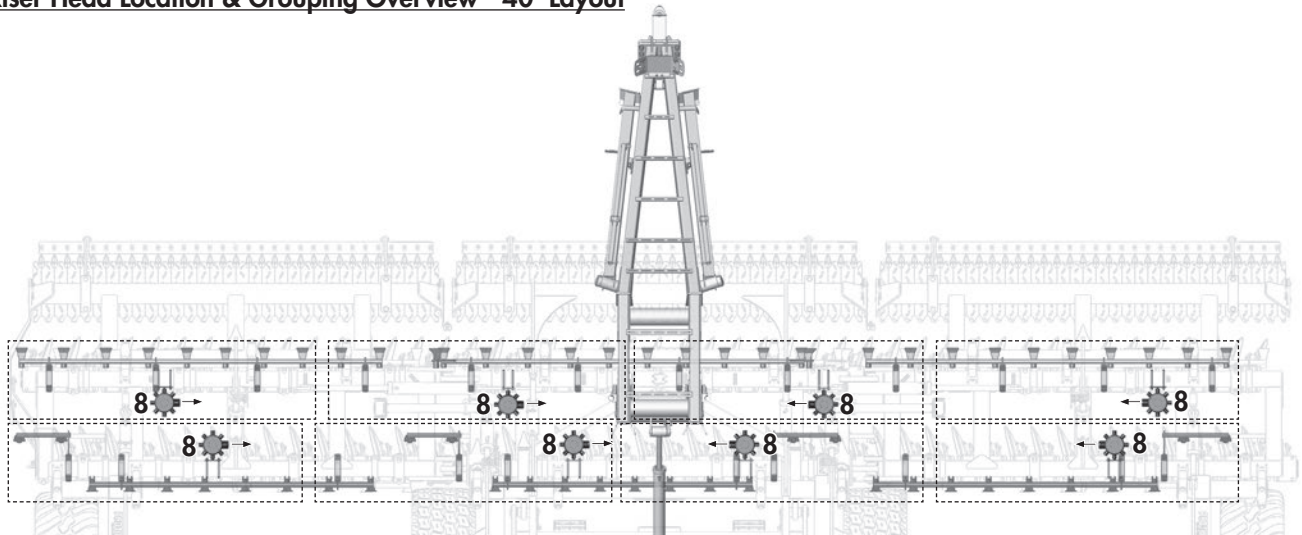
# Tubing Layout Overview

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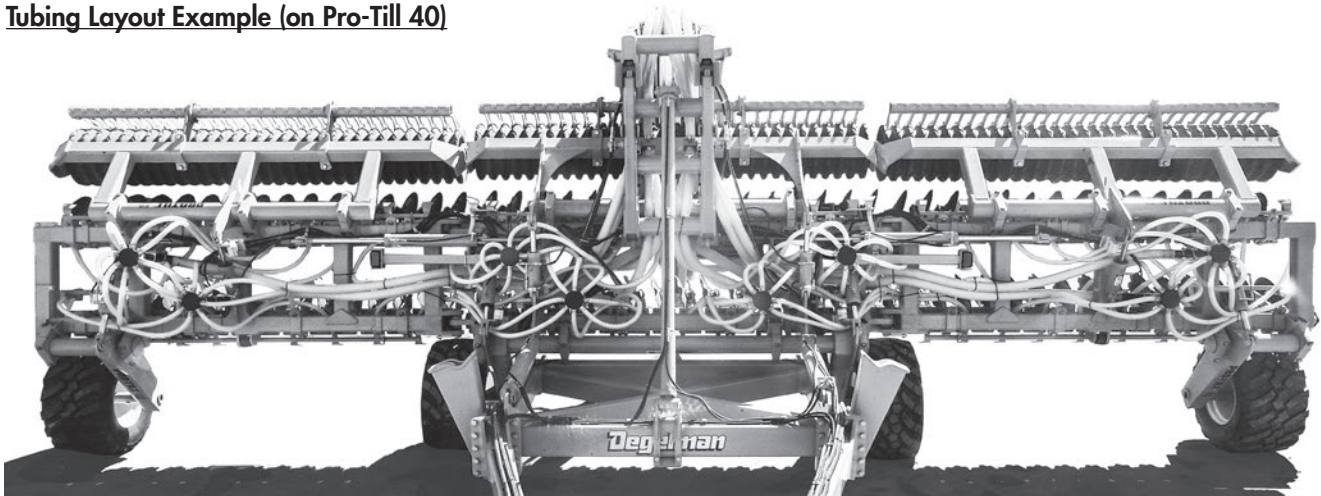
Riser Head Location & Grouping Overview - 33' Layout



Riser Head Location & Grouping Overview - 40' Layout



Tubing Layout Example (on Pro-Till 40)

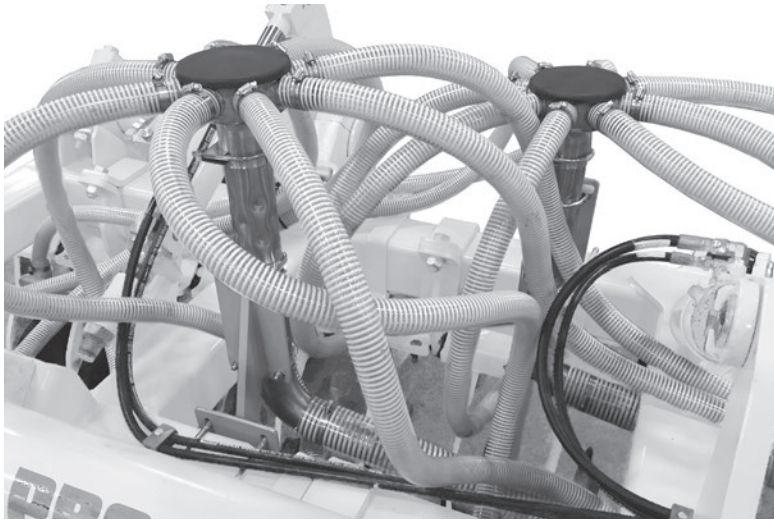




# Tubing Layout Overview

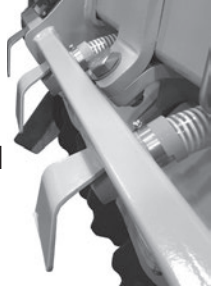
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## Tubing Layout Example - LH Wing (on Pro-Till 40)

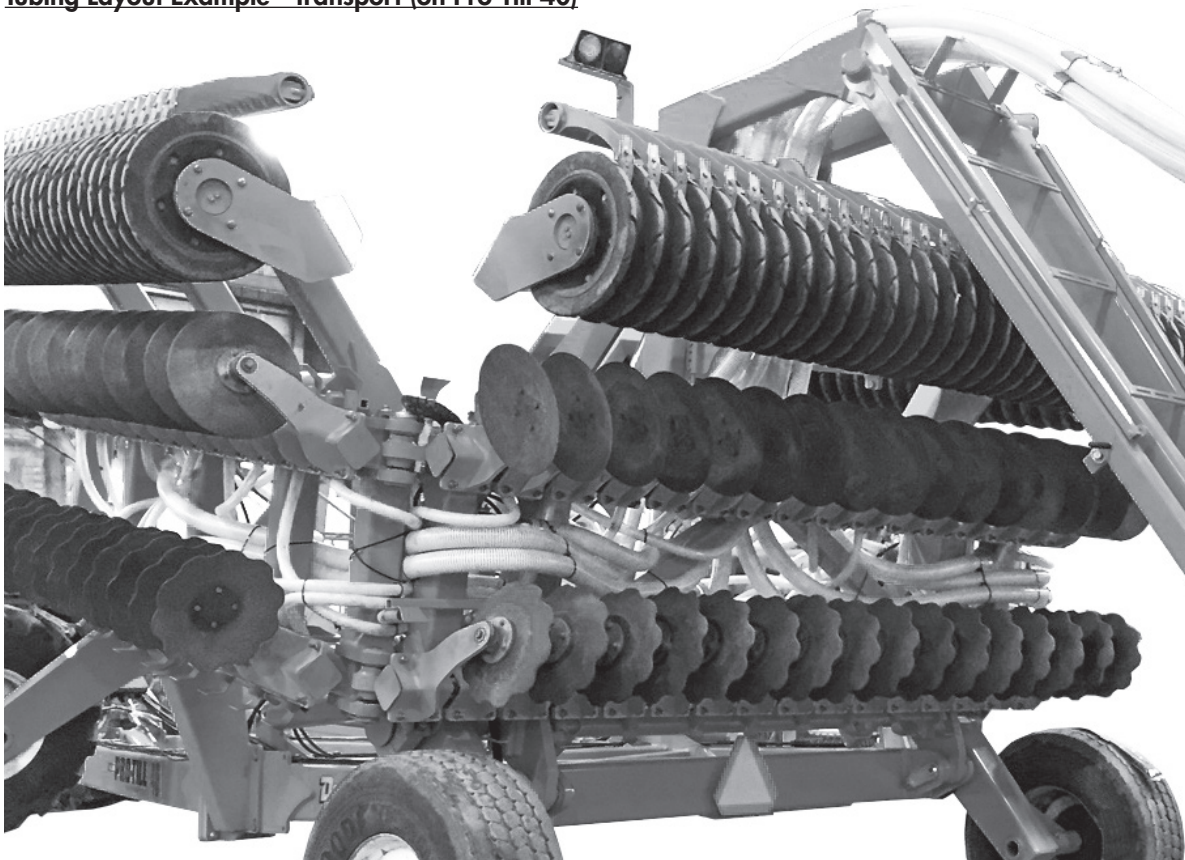


## Tubing Installation Overview

- Tubing is provided in large rolls for both secondary (2.5" or 3") and tertiary (1.5") distribution routing. Tubing is to be routed and cut-to-length as needed.
- When routing both secondary and tertiary tubing, the tubing must be secured out of the way to prevent being pinched or damaged when folding the Pro-Till into or out of transport position.
- Secondary tubing (2.5" or 3") are secured with the large 101043 Hose clamps and the tertiary (1.5") tubing are secured with the smaller 101044 Hose clamps.









## Tubing Layout Example - Transport (on Pro-Till 40)



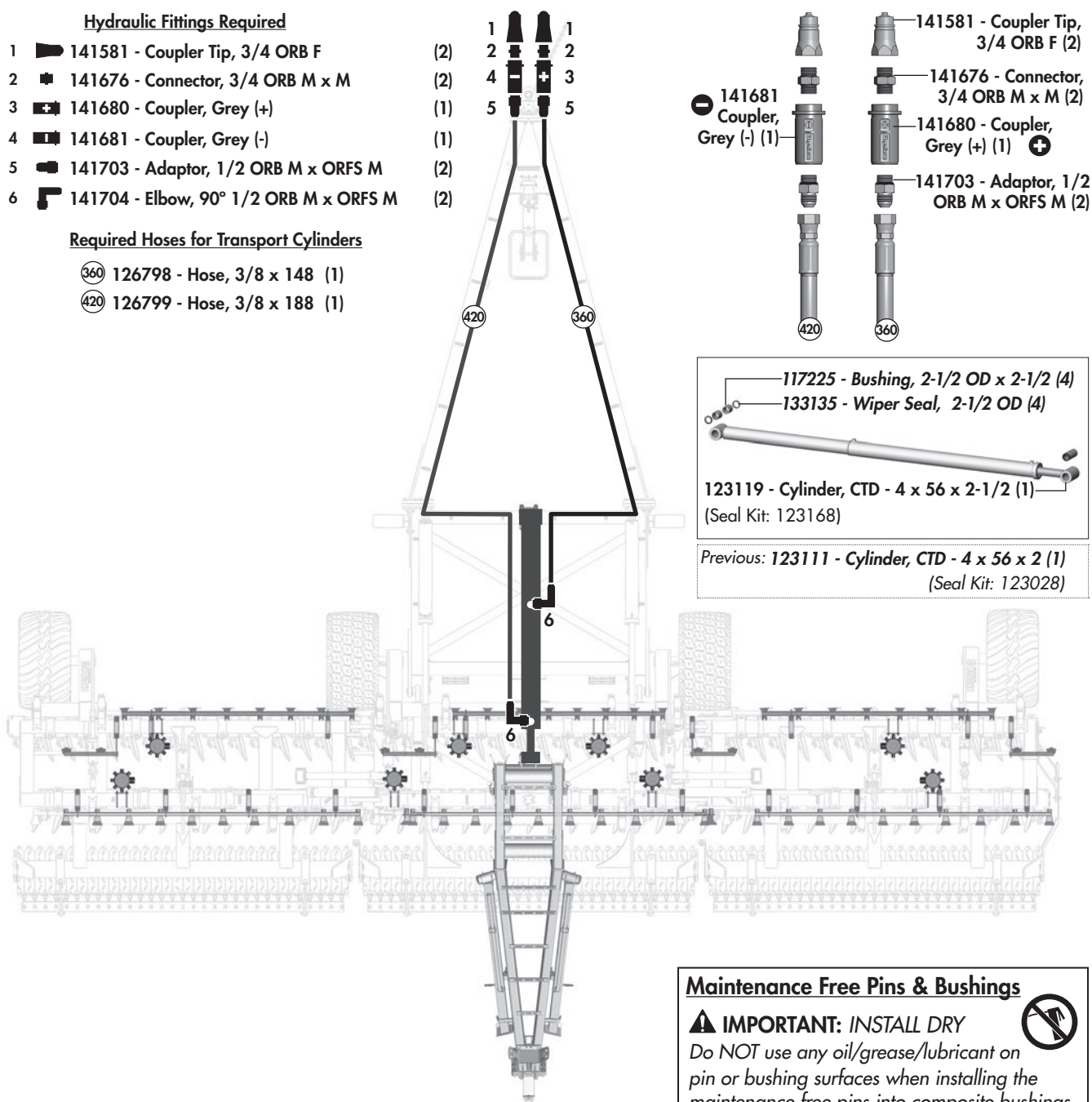
# Hydraulic Layout

## Hydraulic Fittings Required

- 1  141581 - Coupler Tip, 3/4 ORB F
- 2  141676 - Connector, 3/4 ORB M x M
- 3  141680 - Coupler, Grey (+)
- 4  141681 - Coupler, Grey (-)
- 5  141703 - Adaptor, 1/2 ORB M x ORFS M
- 6  141704 - Elbow, 90° 1/2 ORB M x ORFS M

## Required Hoses for Transport Cylinders

- 360 126798 - Hose, 3/8 x 148 (1)
- 420 126799 - Hose, 3/8 x 188 (1)



# Warranty

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## **2 Year** **Limited Warranty - Agricultural Products**

Degelman Industries LP ("Degelman") warrants to the original purchaser of any new Degelman equipment, purchased from an authorized Degelman dealer, that the equipment will be free from defects in material and workmanship for a period of two (2) years from the date of delivery, for non-commercial use (including farm, institutional, government, and municipality) and (1) year from the date of delivery for commercial use. The obligation of Degelman to the purchaser under this warranty is limited to the repair or replacement of defective parts in the first year and to the provision, but not the installation of replacement parts in the second year. Degelman reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

This warranty limits its replacement or repair coverage to what is consistent with the warranty of Degelman's suppliers of purchased components.

Replacement or repair parts installed in the equipment covered by this limited warranty are warranted for ninety (90) days from the date of delivery of such part or the expiration of the applicable new equipment warranty period, whichever occurs later. Warranted parts shall be provided at no cost to the user at an authorized Degelman dealer during regular working hours. Warranted replacement parts will either be replaced or rebuilt at Degelman's discretion.

### ***Disclaimer of implied warranties & consequential damages***

This warranty shall not be interpreted to render Degelman Industries LP liable for injury, death, property damage or damages of any kind, whether direct, consequential, or contingent to property. Without limiting the generality of the foregoing, Degelman shall not be liable for damages resulting from any cause beyond its reasonable control, including, without limitation, loss of crops, any expense or loss of labour, supplies, rental machinery or loss of use.

No other warranty of any kind whatsoever, express or implied is made with respect to this sale; and all implied warranties of merchantability and fitness for a particular purpose which exceed the obligations set forth in this written warranty are hereby disclaimed and excluded from this sale. This exclusion shall not apply in any jurisdiction where it is not permitted by law.

### ***This limited warranty shall not apply:***

1. If, in the sole opinion of Degelman, the unit has been subjected to misapplication, abuse, misuse, negligence accident or incorrect off-site machine set-up.
2. To any goods that have sustained damage or deterioration attributable to a lack of routine maintenance (eg. Check and Re-torque of fastening hardware, Hydraulic fluid purities, drive train alignments, and clutch operation)
3. If parts not made or supplied by Degelman have been used in the connection with the unit, if, in the sole judgement of Degelman such use affects its performance, safety, stability or reliability.
4. If the unit has been altered or repaired outside of an authorized Degelman dealership in a manner which, in the sole judgement of Degelman, affects its performance, safety, stability or reliability.
5. To expendable or wear items such as (eg. Harrow tines, Rock Picker and Rock Rake wear teeth and replaceable bushings and pins.) and any other items that in the company's sole judgement are a wear item.

No employee or representative of Degelman Industries LP is authorized to change this limited warranty in any way or grant any other warranty unless such change is made in writing and signed by the Degelman Service Manager.

This limited warranty is subject to any future availability of supply, which may directly affect Degelman's ability to obtain materials or manufacture replacement parts.

Degelman reserves the right to make improvements in design or changes in specifications at any time, without incurring obligations to owners of equipment previously delivered.

This limited warranty is subject to compliance by the customer to the enclosed *Retail Customer's Responsibility Under Degelman Warranty*.

# Warranty

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## ***Retail Customer's Responsibility Under Degelman Warranty.***

It is the retail customer and/or Operator's responsibility to read the Operator's Manual, to operate, lubricate, maintain and store the equipment in accordance with all instructions and safety procedures. Failure of the operator to read the operators manual is a misuse of this equipment.

It is the retail customer and/or operators responsibility to inspect the product and to have any part(s) repaired or replaced when continued operation would cause damage or excessive wear to other parts or cause safety hazard.

It is the retail customer's responsibility to deliver the product to the authorized Degelman dealer, from whom he purchased it, for service or replacement of defective parts, which are covered by warranty. Repairs to be submitted for warranty consideration must be made within forty-five days of failure.

It is the Retail Customer's responsibility for any cost incurred by the dealer for hauling of the product for the purpose of performing a warranty obligation or inspection.

## **WARRANTY INFORMATION**

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**Make certain the warranty registration card has been forwarded to:**

**Degelman Industries LP  
Box 830 -272 Industrial Dr.  
Regina, SK, Canada  
S4P 3B1**

Always give your dealer the serial number of your Degelman product when ordering parts or requesting service or other information.

The serial number is located on the machine as shown in the diagram below. In the space provided record the model number, the serial number and the date of purchase to assist your dealer in providing you with prompt and efficient service.

SERIAL NUMBER: \_\_\_\_\_

MODEL NUMBER: \_\_\_\_\_

DATE OF PURCHASE: \_\_\_\_\_

