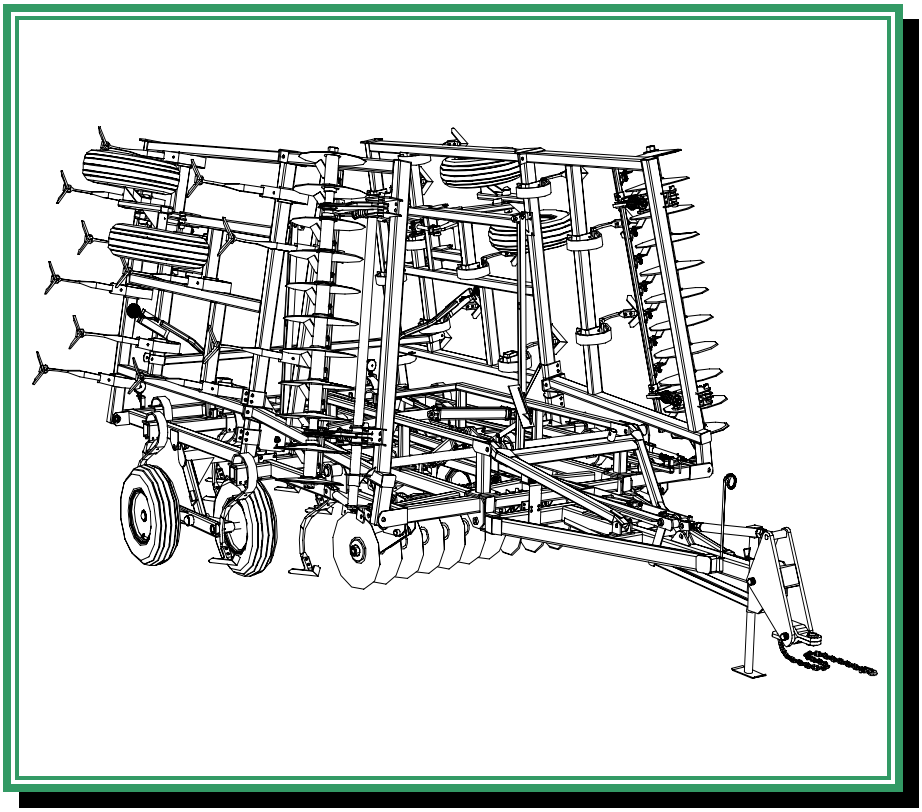
Operator's Manual

Discovator (Disc & Coulter)

Series VII 5110, 5315, 6112,
6318, 6320, 6324

Great Plains
Manufacturing, Inc.

Read the operator's manual entirely. When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it.



Cover illustration may show optional equipment not supplied with standard unit.

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Important Safety Information

Look for Safety Symbol

The SAFETY ALERT SYMBOL indicates there is a potential hazard to personal safety involved and extra safety precaution must be taken. When you see this symbol, be alert and carefully read the message that follows it. In addition to design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

Be Aware of Signal Words

Signal words designate a degree or level of hazard seriousness.

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

DANGER

WARNING indicates a potentially hazardous situation, which, 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.

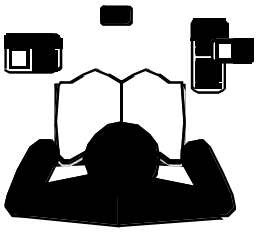
WARNING

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

CAUTION

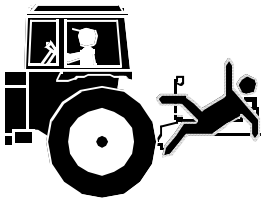
Be Familiar with Safety Decals

- Read and understand “Safety Decals,” page 7, thoroughly.
- Read all instructions noted on the decals.



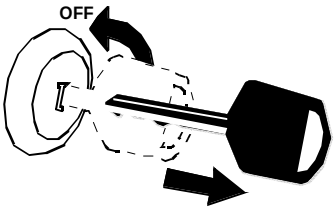
Keep Riders Off Machinery

- Riders obstruct the operator’s view. Riders could be struck by foreign objects or thrown from the machine.
- Never allow children to operate equipment.
- Keep all bystanders away from machine during operation.



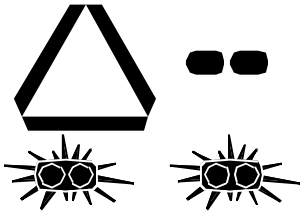
Shutdown and Storage

- Lower Series VII Discovator, put tractor in park, turn off engine, and remove the key.
- Secure Series VII Discovator using blocks and supports provided.
- Detach and store Series VII Discovator in an area where children normally do not play.



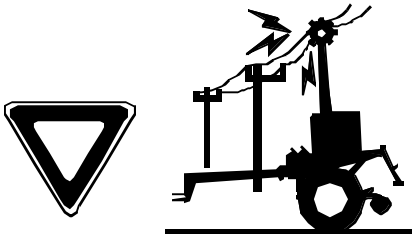
Use Safety Lights and Devices

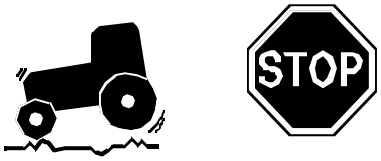
- Slow-moving tractors and towed implements can create a hazard when driven on public roads. They are difficult to see, especially at night.
- Use flashing warning lights and turn signals whenever driving on public roads.
- Use lights and devices provided with implement.



Transport Machinery Safely

Maximum transport speed for implement is 20 mph. Some rough terrains require a slower speed. Sudden braking can cause a towed load to swerve and upset.

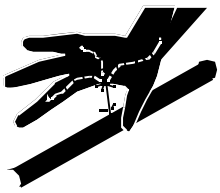




- Do not exceed 20 mph. Never travel at a speed which does not allow adequate control of steering and stopping. Reduce speed if towed load is not equipped with brakes.
- Comply with state and local laws.
- Do not tow an implement that, when fully loaded, weighs more than 1.5 times the weight of towing vehicle.
- Carry reflectors or flags to mark tractor and implement in case of breakdown on the road.
- Keep clear of overhead power lines and other obstructions when transporting. Refer to transport dimensions under "Specifications and Capacities," page 69.
- Do not fold or unfold the wings while the tractor is moving.

Avoid High Pressure Fluids

Escaping fluid under pressure can penetrate the skin, causing serious injury.



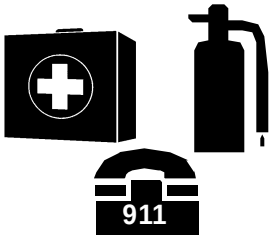
- Avoid the hazard by relieving pressure before disconnecting hydraulic lines.
- Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks.
- Wear protective gloves and safety glasses or goggles when working with hydraulic systems.
- If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

Practice Safe Maintenance

- Understand procedure before doing work. Use proper tools and equipment. Refer to this manual for additional information.
- Work in a clean, dry area.
- Lower the Series VII Discovator, put tractor in park, turn off engine, and remove key before performing maintenance.
- Make sure all moving parts have stopped and all system pressure is relieved.
- Inspect all parts. Make sure parts are in good condition and installed properly.
- Remove buildup of grease, oil or debris.
- Remove all tools and unused parts from Series VII Discovator before operation.

Prepare for Emergencies

- Be prepared if a fire starts.
- Keep a first aid kit and fire extinguisher handy.
- Keep emergency numbers for doctor, ambulance, hospital and fire department near phone.



Wear Protective Equipment

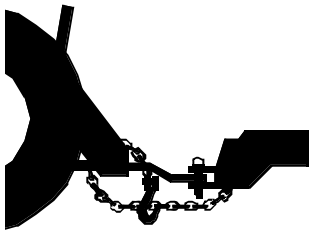
- Wear protective clothing and equipment.
- Wear clothing and equipment appropriate for the job. Avoid loose-fitting clothing.
- Because prolonged exposure to loud noise can cause hearing impairment or hearing loss, wear suitable hearing protection such as earmuffs or earplugs.
- Because operating equipment safely requires your full attention, avoid wearing radio headphones while operating machinery.

Handle Chemicals Properly

- Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil and property.
- Read and follow chemical manufacturer's instructions.
- Wear protective clothing.
- Handle all chemicals with care.
- Avoid inhaling smoke from any type of chemical fire.
- Store or dispose of unused chemicals as specified by chemical manufacturer.

Use A Safety Chain

- Use a safety chain to help control drawn machinery should it separate from tractor drawbar.
- Use a chain with a strength rating equal to or greater than the gross weight of towed machinery.
- Attach chain to tractor drawbar support or other specified anchor location. Allow only enough slack in chain to permit turning.
- Replace chain if any links or end fittings are broken, stretched or damaged.
- Do not use safety chain for towing.

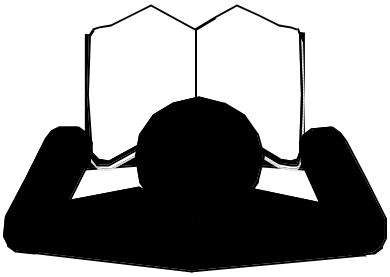


Tire Safety

- Tire changing can be dangerous and should be performed by trained personnel using correct tools and equipment.
- When inflating tires, use a clip-on chuck and extension hose long enough to you to stand to one side–not in front of or over tire assembly. Use a safety cage if available.
- When removing and installing wheels, use wheel-handling equipment adequate for weight involved.

Safety Rules

- Thoroughly read and understand the instructions in this manual before operation. Read all instructions noted on the safety decals.
- Be familiar with all Series VII Discovator functions.
- Operate machinery from the driver's seat only.
- Do not leave Series VII Discovator unattended with tractor engine running.
- Do not transport Series VII Discovator until the transport pins and all wing locks are installed.
- Limit transport speed to 20 m.p.h.
- Know the transport height of your unit and be extremely careful of overhead electrical and telephone lines when transporting the unit.
- Know the transport width of your machine and the width of bridges, etc… on the transport route.
- Make sure that no one is near the machine during field operation and folding or unfolding of wing sections.
- Prior to removing any lift cylinders from the machine, lower implement to the ground, shut off the tractor and release the pressure in the lines.
- Do not depend on cylinders to hold the weight of machine during storage; use the transport locks.
- Do not walk or stand on any part of the machine. Never allow anyone to ride on the Series VII Discovator.
- Use extreme care when hitching or unhitching the machine from the tractor. In some situations with a heavy finishing attachment, the machine may tip backward causing the hitch to rise rapidly.
- Never stand with feet under any part of the machine.

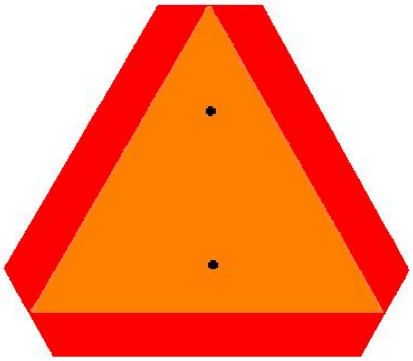


- Never allow anyone to walk between the tractor and Series VII Discovator while machine is in operation.
- Keep hands and feet away from turbo blades. They are quite sharp.
- Any moving piece of equipment is potentially dangerous. Do not operate until you are absolutely sure the area is clear of children, pets and irresponsible persons.
- Escaping hydraulic fluid under pressure can have sufficient force to penetrate the skin, causing serious injury. To prevent injury when working with hydraulics, follow the instructions on page 3.
- Before transporting the unit on public roads, check to make sure the safety reflectors are clean and visible, and not missing or damaged. Turn on tractor warning lights when transporting.
- Make sure all safety signs are clean, readable and not damaged. Contact Great Plains Mfg. for free replacements if necessary.

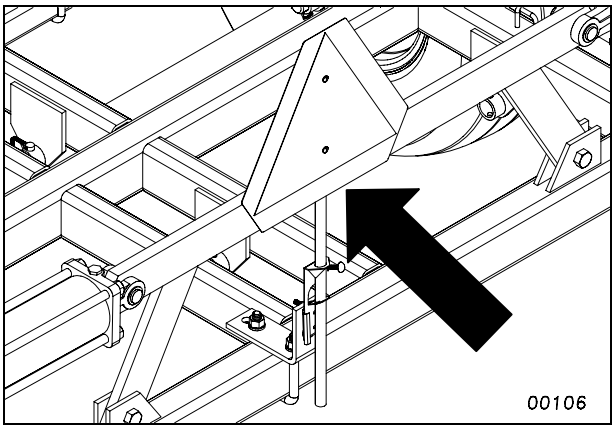
Safety Decals

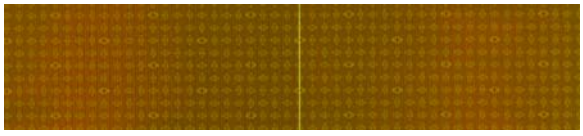
Your implement comes equipped with all safety decals in place. They were designed to help you safely operate your implement.

- Read and follow decal directions.
- Keep all safety decals clean and legible.
- Replace all damaged or missing decals. Order new decals from your Great Plains dealer. Refer to this section for proper placement.
- When ordering new parts or components, also request corresponding safety decals.
- To install new decals:
  1. Clean the area on which the decal is to be placed.
  2. Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.

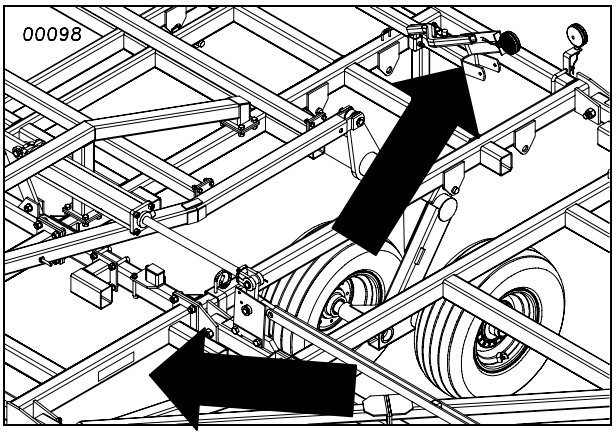


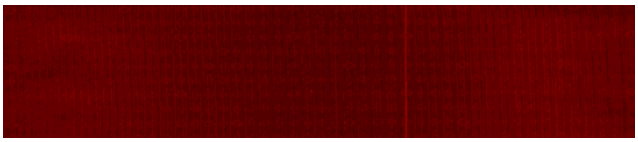
Slow Moving Vehicle Emblem
818-055C
Quantity 1



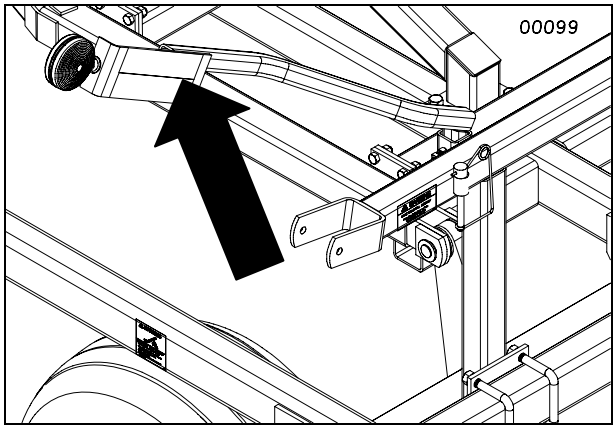


Reflector – Amber
838-615C
Quantity 8: Two on light bracket, two on center brace bar and 2 on center frame. Two on rear of finishing attachment (not shown), visible from side while folded for transport.





Reflector – Red
838-614C
Quantity 2:



Reflector – Florescent Orange
838-603C
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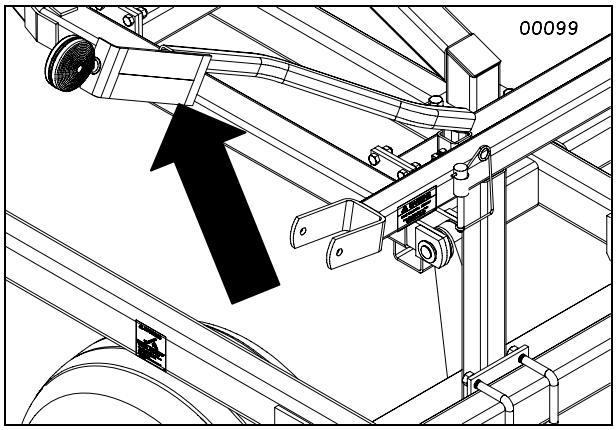
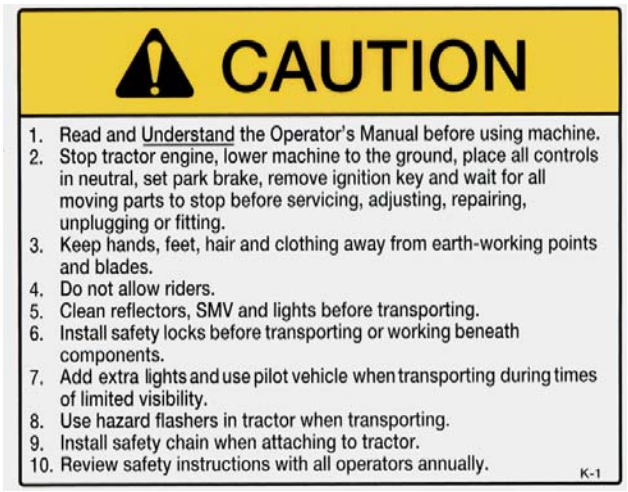
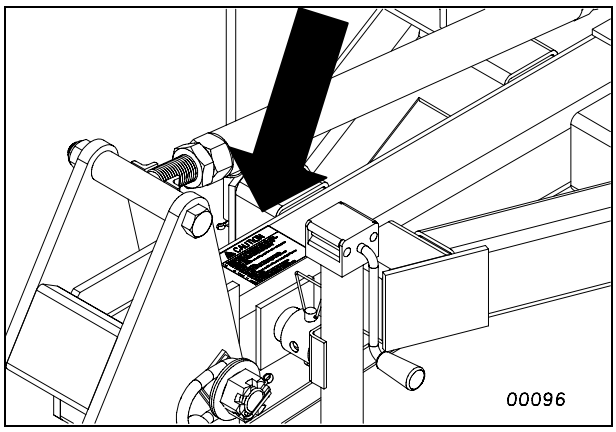
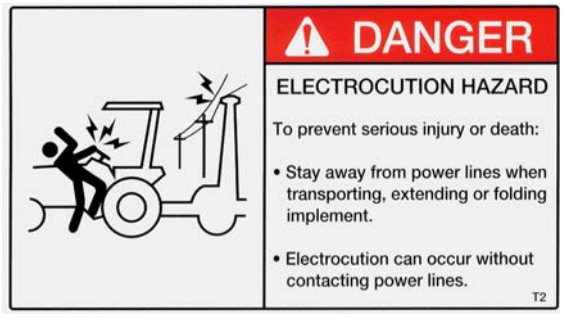


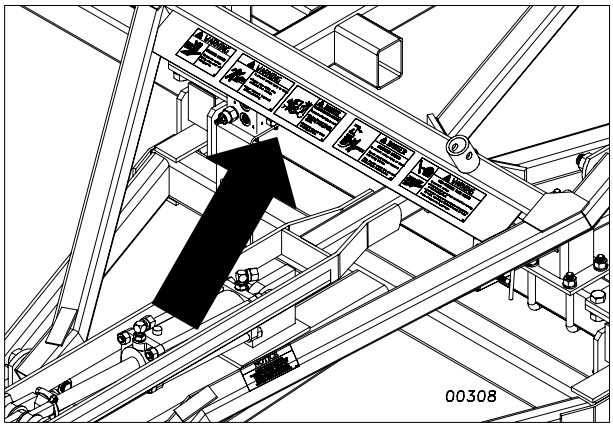


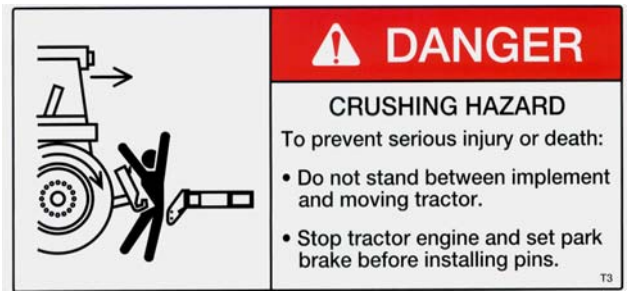
Caution
838-598C
Quantity 1



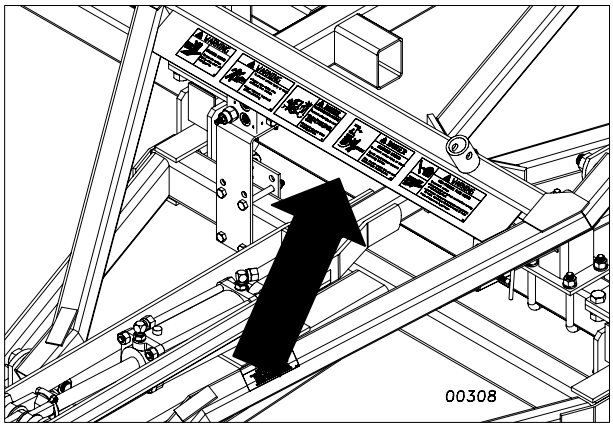


Danger Electrocution Hazard
838-599C
Quantity 1

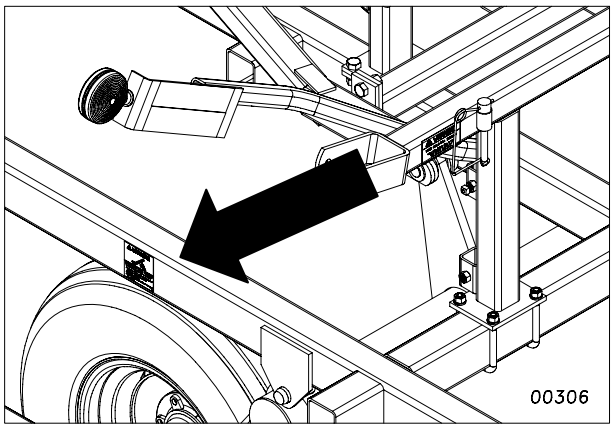


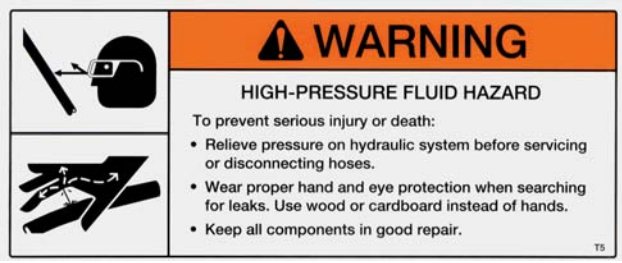


Danger Crushing Hazard
838-600C
Quantity 1

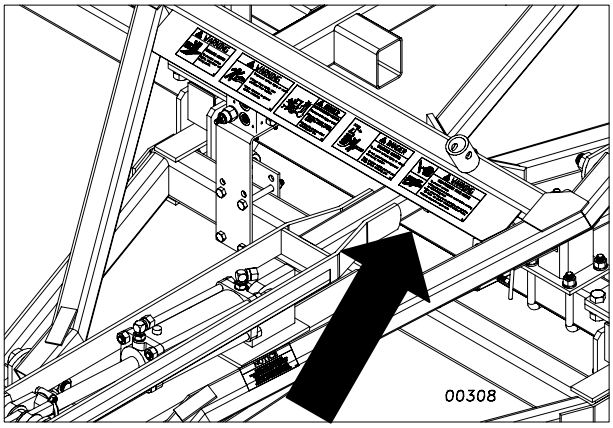


Warning Overhead Wing Hazard
838-602C
Quantity 4: 5315, 6318, 6320 & 6324

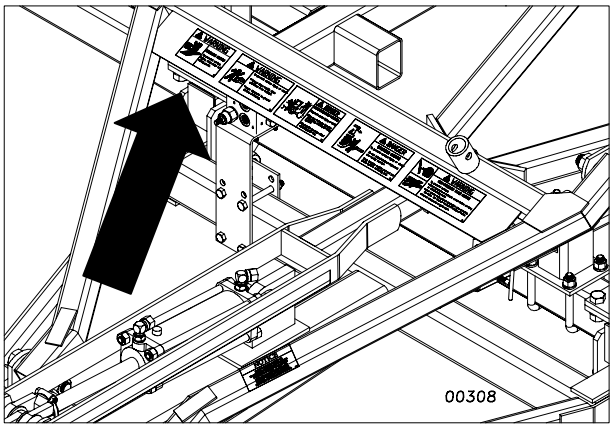


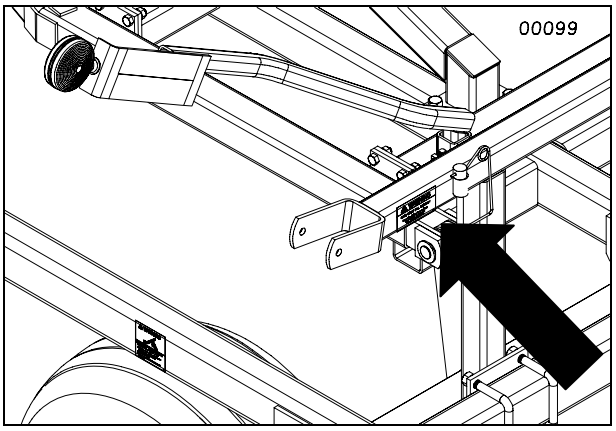


Warning High Pressure Fluid Hazard
838-094C
Quantity 1

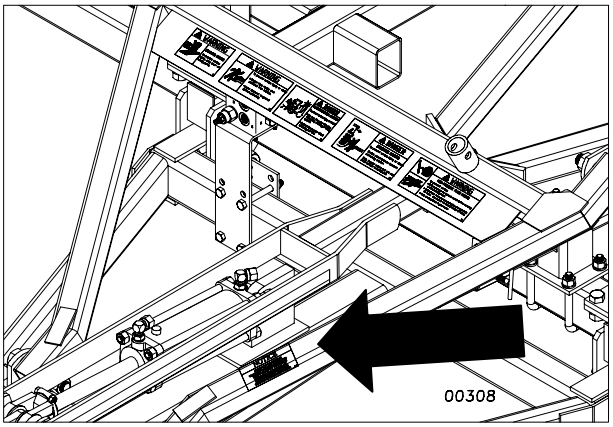


Warning Crushing Hazard
838-611C
Quantity 1





Warning Wing Falling Hazard
838-612C
Quantity 2: 5315, 6318, 6320 & 6324



Notice
838-613C
Quantity 1

Introduction

Great Plains welcomes you to its growing family of new product owners. This implement has been designed with care and built by skilled workers using quality materials. Proper assembly, maintenance and safe operation will help you get years of satisfactory machine use from your machine. To ease the assembly task and produce a properly working machine, read this entire manual before assembling or setting up new equipment.

Description of Unit

The Series VII 5110-6324 Discovator is a three or five-section field finishing, one-pass tillage tool. Working width ranges from 10 to 24 feet. The implement is designed to combine discing/slicing, cultivating, harrowing and herbicide incorporation in a single pass. Various finishing attachments are available to customize your tillage and residue requirements for your operation.

Using This Manual

This manual will familiarize you with safety, assembly, operation, adjustment, troubleshooting and maintenance. Read this manual and follow the recommendations to help ensure safe and efficient operation.

The information in this manual is current at printing. Some parts may change to assure top performance.

Definitions

The following terms are used throughout this manual.

Right and left as used in this manual are determined by facing the direction the machine will travel while in use unless otherwise stated.

IMPORTANT: A crucial point of information about the preceding topic. For safe and correct operation, read and follow the directions provided before continuing.

NOTE: Useful information about the preceding topic.

Owner Assistance

If customer service or repairs are needed, contact your Great Plains dealer. They have trained personnel, parts and service equipment specially designed for Great Plains products.

Your machine's parts should only be replaced with Great Plains parts. Always use the serial and model number when ordering parts from your Great Plains dealer. The serial-number and patent plates are located on the center section of the implement on the front frame tube as shown in Figure A.

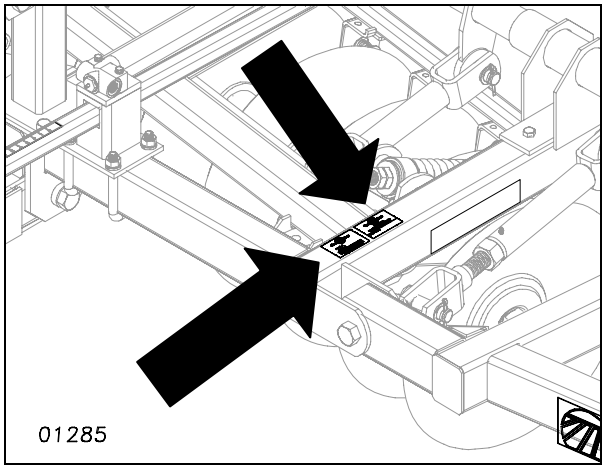


Figure A
Serial Number & Patent Plate

Record your implement model and serial numbers here for quick reference.

Model Number: _____

Serial Number: _____

Your Great Plains dealer wants you to be satisfied with your new machine. If you do not understand any part of this manual or are not satisfied with the service received, please take the following actions:

1. Discuss the matter with your dealer's service manager. Make sure they are aware of any problems so they can assist you.
2. If you are still not satisfied, seek out the dealership owner or general manager.
3. For further assistance, write to:

Product Support

Great Plains Mfg. Inc., Service Department

PO Box 5060

Salina, KS 67402-5060

gp_web_cs@greatplainsmfg.com

(800)255-9215

Assembly and Setup Assistance

To order additional copies of operator's and parts manuals, write to the following address. Include model numbers in all correspondence.

If you do not understand any part of this manual or have other assembly or setup questions, assistance is available. Contact

Product Support

Great Plains Mfg. Inc., Service Department

PO Box 5060

Salina, KS 67402-5660

Pre-Assembly Checklist

- Before assembling, read and understand "Important Safety Information**,"** beginning on page 1.
- Have at least two people on hand while assembling.
- Make sure assembly area is level and free of obstructions (preferably an open concrete area).
- Have all major components.
- Have all fasteners and pins shipped with Series VIII Discovator.
- IMPORTANT: If a pre-assembled part or fastener is temporarily removed, remember where it goes. Keep the parts separated.
- Have a copy of the parts manual on hand. If unsure of proper placement or use of any part or fastener, refer to the parts manual.
- Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.

Assembly

This section covers the proper assembly of the implement. The reference numbers on the figures give you an indication of the order of assembly. For a complete breakdown of any part not shown in this assembly section, refer to the parts manual for proper location. Refer to the Appendix for proper bolt torque values.

Center Frame, Torque Tube & Transport Assembly

After uncrating the machine, place the center frame (1) Figure 1, in the center of your work area on stands. Pin the torque tube (2) to the center frame with the 1 1/4 x 6 pins (3) and 1 1/4 x 7 pin (4) in center. Secure them with 3/8 x 2 1/4 Gr. 8 hex bolts (5) & lock nuts.

Slide the spindle of the center transport (6) into the sleeve at the end of the torque tube wheel arm (see section 3 for your model). It is a good idea to put some form of anti-seize on the spindle before you insert it. Line up the hole in the spindle with the hole in the sleeve and secure with 5/16 x 3 clevis pin (7) secure with 1/8 x 1 cotter.

When both transport spindles/walking beams have been installed, bolt on the center transport tires (8), using 1/2" lug bolts or 1/2" lug nuts (9). See Section 3 Replacement Parts for proper transport parts and sizes for your machine model.

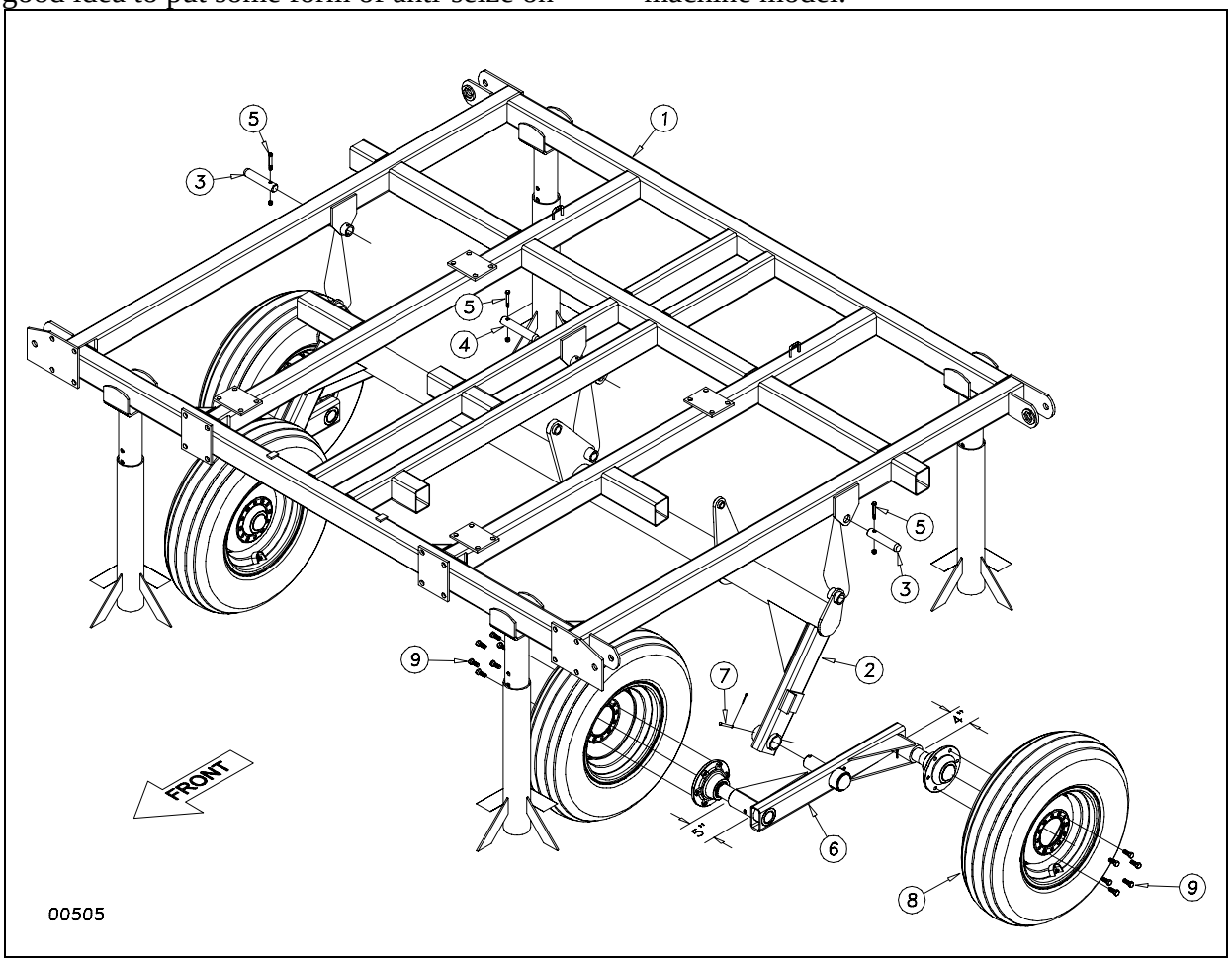


Figure 1

Wing and Wheel Arm Assembly

Bolt the wing frames (1) Figure 2, to the center frame with two 1 x 6 hex bolts (2) with nylon lock nuts (3). Draw the nuts down tight but ***do not torque***.

Once the wings are attached, insert the wheel arm bracket (4) into the wing frame hangers and secure it just as you did on the center with 1 1/4 x 6 pins (5). Secure the pins with 3/8 x 2 1/4 Gr.8 hex bolts (6) & lock nuts.

Install the wing transport or walking beam assembly (7) as shown in Figure 2. (see parts manual for parts differences). Use anti-seize material on the spindles. Secure the spindles in the sleeve with the 5/16 x 3 clevis pin (8) and 1/8 x 1 cotter.

Bolt the 9.5L x 15, 8-ply tire (9) in place with the 1/2 x 1 1/4 lug bolts (10), or 1/2" lug nuts for heavy hub option.

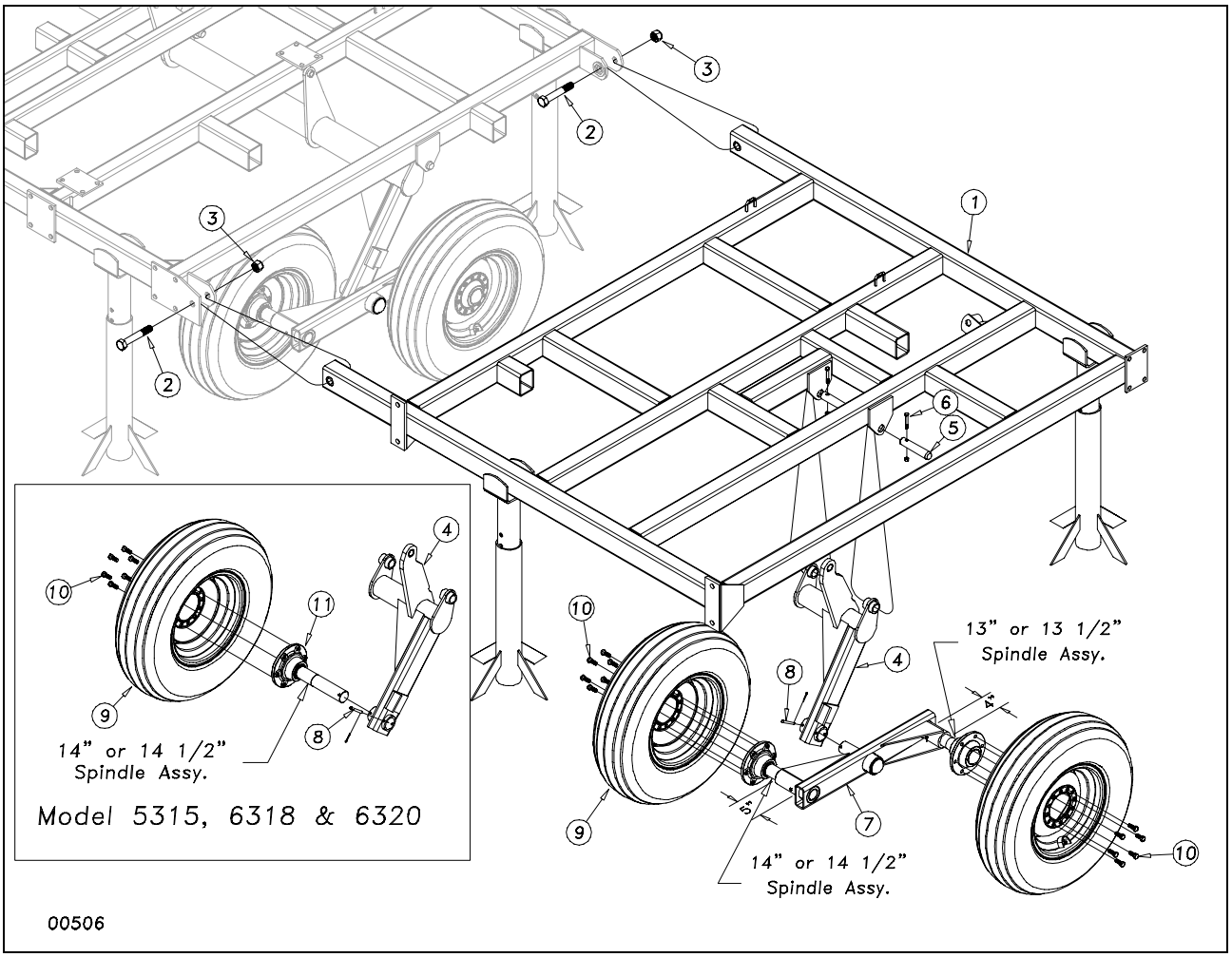


Figure 2

Brace Bar, Wing Brace & Rocker Bracket Assembly

On 3-section models, install the 1 x 7 1/2 eye bolt (1) Figure 3, in the mounting bracket at the back of the wing with a 1" jam nut on each side of the bracket. Install the 3 3/4 x 8 rephasing wing cylinder (2) and 3 1/2 x 8 wing cylinder (3) between the eyebolt and the lever on the wheel bracket. Secure the cylinders with 1 x 3 clevis pins, 1" machine washer and 3/16 x 2 cotter pins.

Bolt the center brace bar (4) and wing brace bars, on 3-section models, (5) to the front of the center frame and wing frame with 3/4 x 2 hex bolts (6) with lock washers and hex nuts. **Do not** tighten bolts. Use a 1 x 6 hex bolt (7) and nylon lock nut in the hinge. Draw nut tight but ***do not torque***. Tighten all other bolts evenly to prevent bind at hinge.

On 3-section models, Bolt the center fold bracket (8) to the center frame with four 3/4 x 5 hex bolts (9) with lock washer and hex nuts. Bolt the rocker brackets (10) to the wings using four 3/4 x 5 hex bolts (11) with lock washers and hex nuts. On model 6324, u-bolt the tie strap bracket (12) to the wing frame with two 1/2 x 3 x 5 u-bolts (13) with lock washers and hex nuts. Bolt the 53 3/4 connecting link (14) between the rocker bracket (10) and the tie strap bracket (12) with two 1 x 3 hex bolts (15) using 1" hex lock nuts.

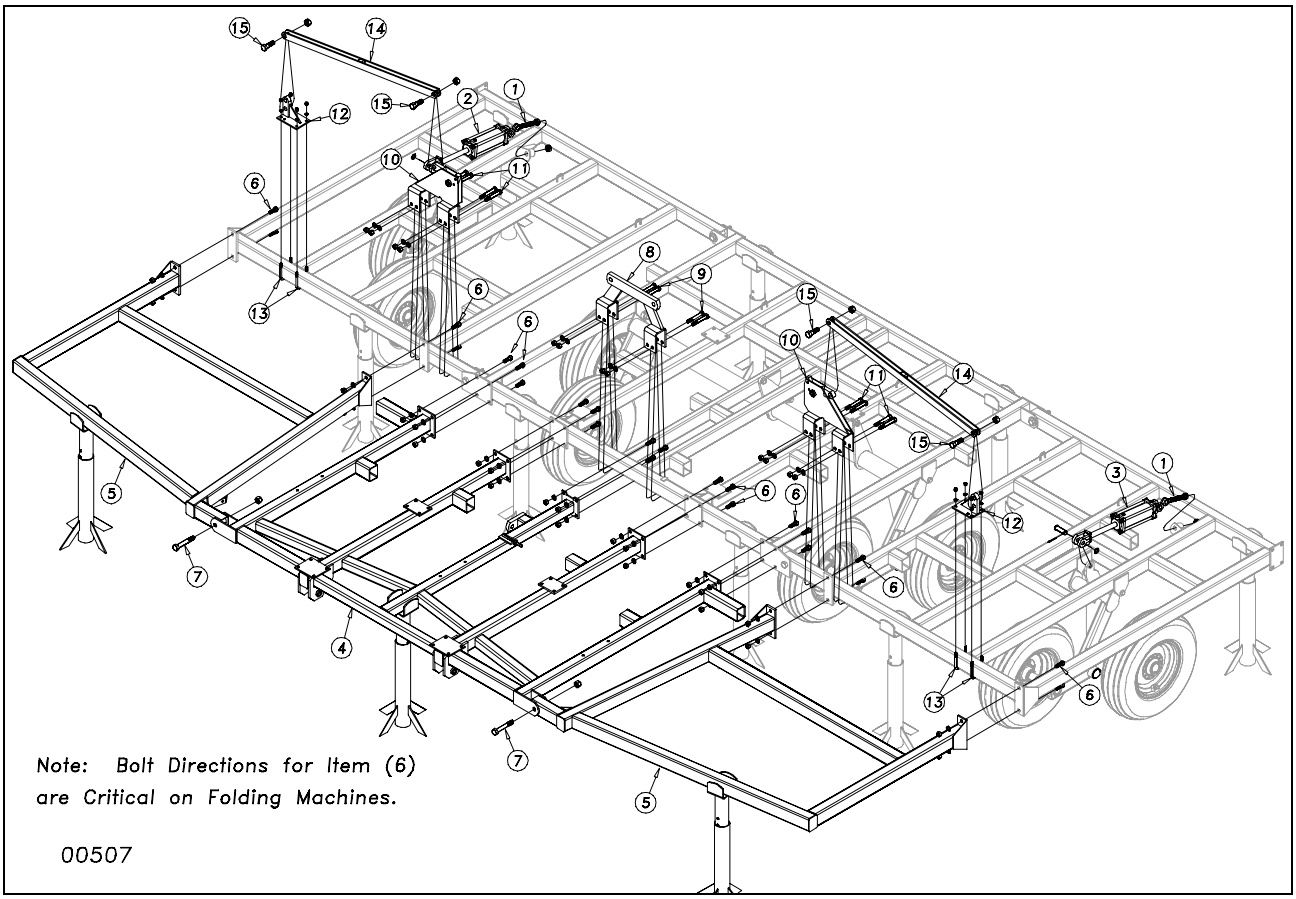


Figure 3

Center Gang & Gang Hanger Assembly

At this time it is best to hang the center gangs and gang hanger tubes before you install the hitch and hitch strut assembly, Figure 4.

U-bolt the center right and left gang hanger tubes (1) & (2) to the center brace bar with 5/8 x 3 x 5 1/2 u-bolts or 5/8 x 3 x 4 1/2 u-bolts (3), with lock washers and hex nuts. Pin the preassembled center gangs (4) & (5) to the gang hanger tubes (1) & (2) with the 1 x 5 1/2 pins (6). Secure with 3/8 x 2 clevis pins & 1/8 x 1 cotter pins. Slide the spring washer (8) & spring (9) on to the gang spring bolt (7) as shown and slide it up into the cast swivel on the gang hanger tubes. Place a 1" flat washer on the spring bolt and thread the 1" hex nut and 1" jam nut onto the spring bolt (7). Pin the other end to the gang with 3/4 x 2 1/2 clevis pins (10), secure with 1/8 x 1 1/2 cotter pins. Finally tighten down the nuts on the spring bolt until the spring has a preload length of 8 3/4".

On disc models, bolt the center gang rockshaft (11) to the center brace bar with 1/2 x 4 1/2 hex bolts (12) & 1/2 x 5 1/2 hex bolts (13) using lock nuts. Attach the short and long turnbuckles (14) & (15) to the gangs with 1 x 3 3/8 usable pin clevis, machine washers and 3/16 x 2 cotter pins.

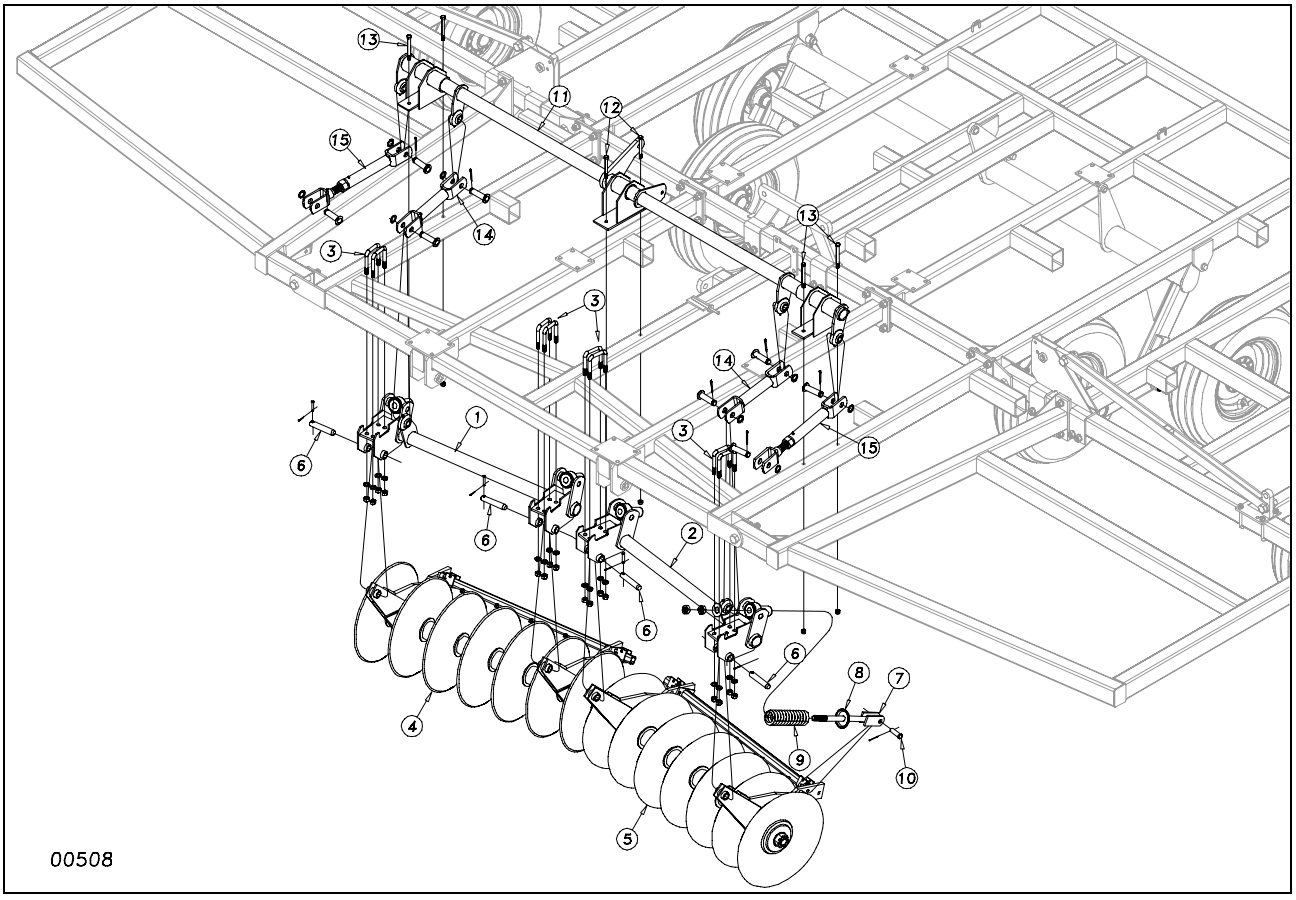


Figure 4

Center Truss, Hitch and Strut Assembly

Bolt the center frame truss (1) Figure 5, to the top side of the center frame and brace bar using 5/8 x 1 1/2 bolts (2), lock washers and hex nuts. Slide the back of the hitch (3) between the plates at the front of the brace bar as shown. Use two 1 x 7" Gr.5 bolts (4) and 1" lock washers and hex nuts to secure the hitch. Mount the tongue jack (5) to the front of the hitch to support it.

Use 1 x 5 1/2 bolts (7) to attach the hitch strut (6) between the front of the truss and the hitch. Use lock washers and hex nuts on these bolts.

Slide the hose support (8) rod into the tube at the front of the hitch and secure it with a 1/8 x 1 1/2 cotter pin. Attach the rebound valve mounting bracket (9) and valve mounting bracket plate (10) with four 1/2 x 4 1/2 bolts (11) using lock washers and hex nuts.

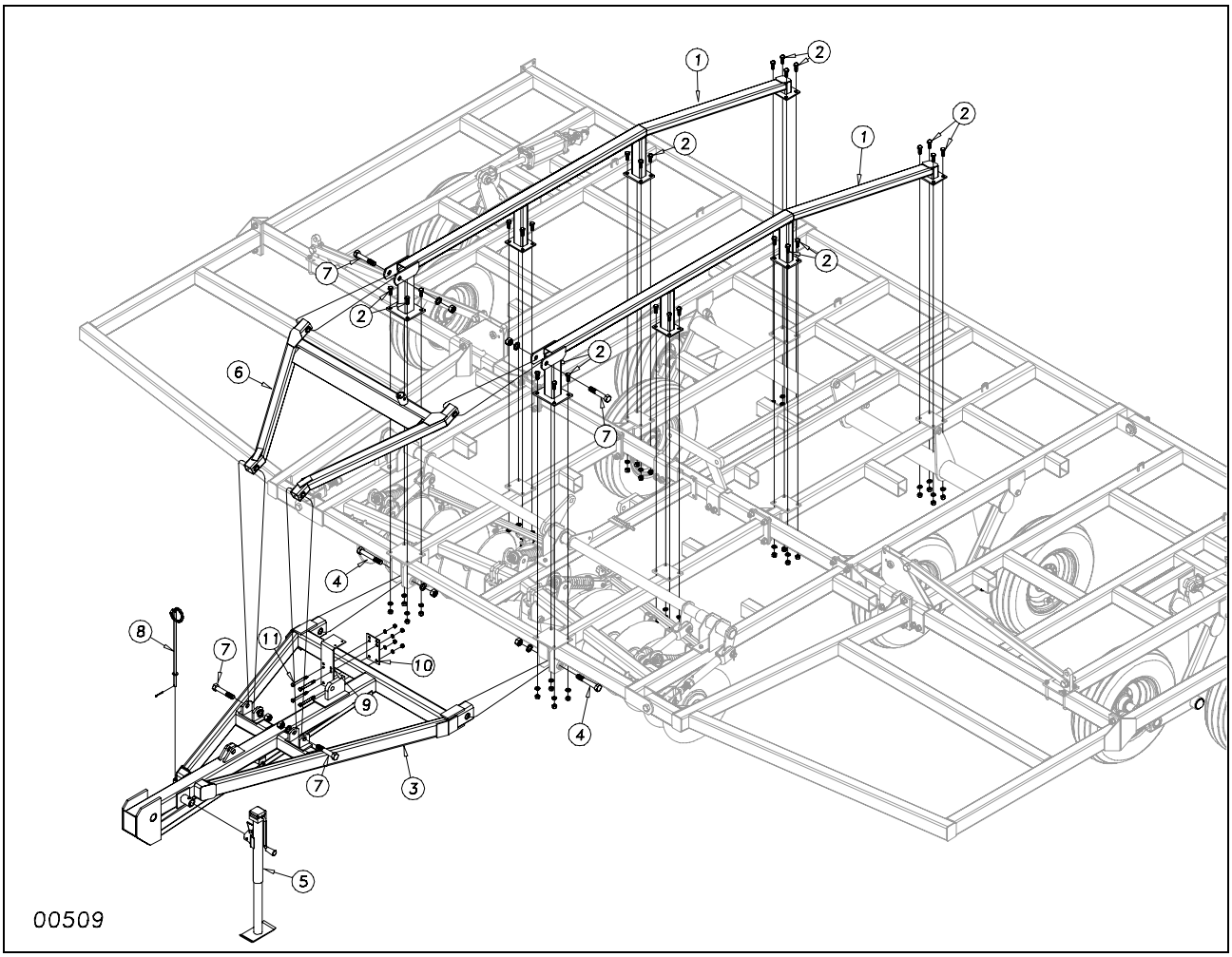


Figure 5

Hitch Tongue, Side Plate and Level Bar Assembly

Pin the level bar (1) to the torque tube with a 1 x 3 3/8 usable clevis pin (2), secure with 1" machine washer and 3/16 x 2 cotter pin, as shown in Figure 6. Slide the H-bracket (3) down over the hitch pole and bolt in place with a 3/4 x 6 bolt (4) and 3/4" lock nut. Draw this nut up but ***do not torque***, as this part must pivot.

Install the 1 x 9 Gr. 8 bolt (5) through the level bars and H-bracket. Draw up snug with a 1 1/4 top lock nut (***do not torque***).

Slide the side plate weldment (6) over the end of the hitch and bolt in place as shown with the 1 1/2 x 11 safety chain hitch bolt (7). Secure with 1 1/2 slotted hex nut and 1/4 x 3 cotter pin. Use the 1 1/2 machine washers as needed for proper fit. Connect the turnbuckle (8) between the side plate assembly and the H-bracket (3). Use a 1 x 2 3/4 usable clevis pin (9) with machine washer and 3/16 x 2 cotter pin at the back end of turnbuckle. Use a 1 x 8 Gr.8 bolt (10) with a nylon lock nut at the tee end of the turnbuckle. Snug, but ***do not torque*** nylon lock nut.

Insert the hitch clevis (11) into the front of the side plate weldment (6) and bolt in place with a 1 1/2 x 8 3/8 hitch bolt (12). Secure with slotted hex nut, machine washers and 1/4 x 3 cotter pin, using the 1 1/2 machine washers again as needed for proper fit. Insert Transport Pin (13) in holder at the front end of level bar (1).

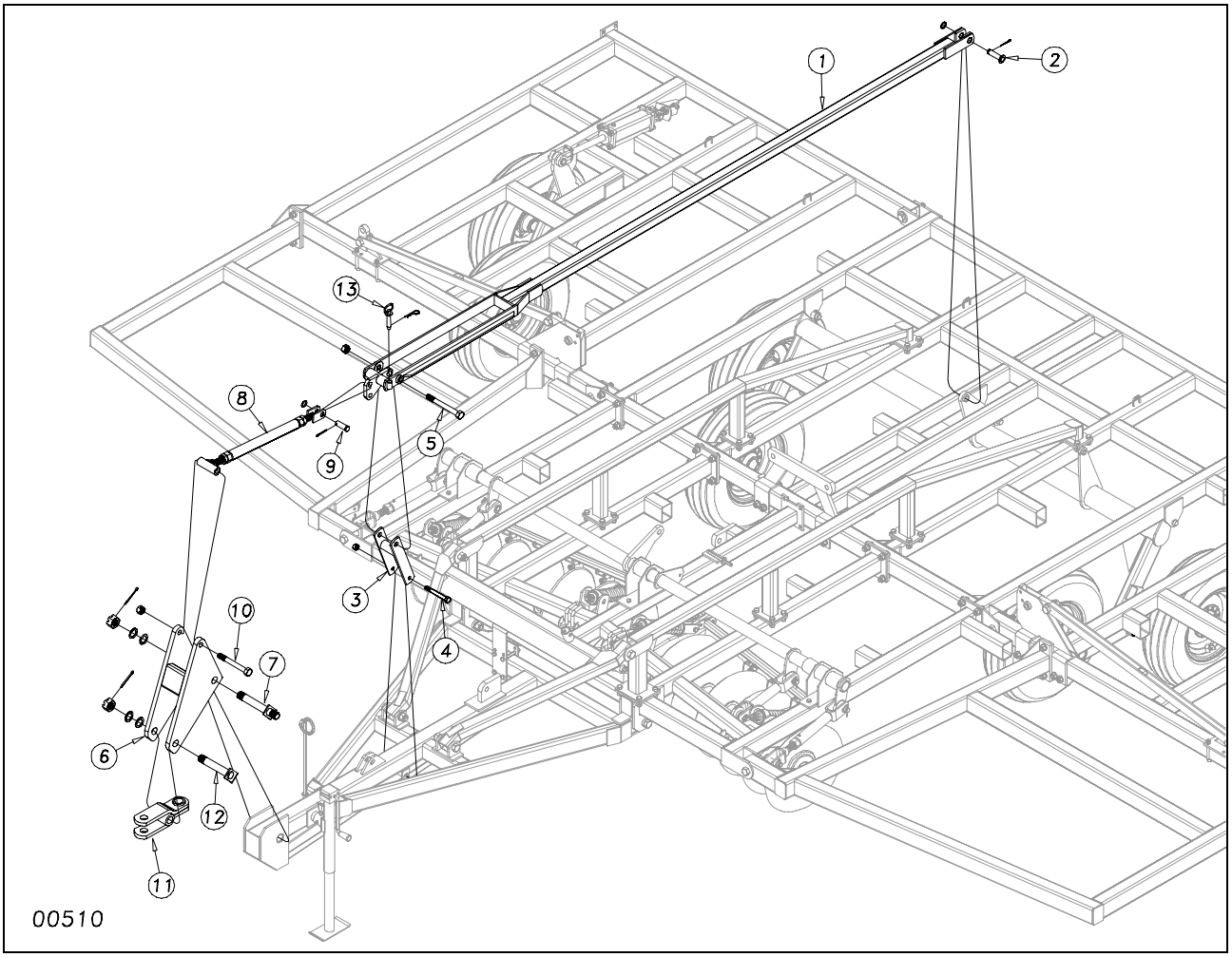


Figure 6

Center Lift Cylinder, Rest Pads and Hydraulic Valves Assembly

Connect the 4 x 8 main lift cylinder (1) to the center hitch pole as in Figure 7. Connect the rod end to the lug on the H-bracket. Place a 1" flat washer on each side of the lug on the H-bracket to keep the hardened bushings from coming out.

Secure the cylinder with a 1 x 3 1/2" clevis pin (2), 1" machine washers and 3/16 x 2 cotter pins and the previously installed 1 x 9 Gr.8 bolt (3). Mount the rebound valve (4) as shown with the V1 port to the front and top using two 5/16 x 4 hex bolts (5) with lock washers and hex nuts.

Install the depth stop mounting bracket (6) to the center brace bar using either 5/8 x 3 x 5 1/2, (6112, 6318, 6320 & 6324) or 5/8 x 3 x 4 1/2 (5110 & 5315) u-bolts (7), lock washers and hex nuts. Bolt the depth stop valve (8) on top of the bracket using the 5/16 x 2 hex bolts with lock washers. Insert the depth stop tube (9) into the mounting bracket (6) and attach to the torque tube with 3/4 x 2 1/2" clevis pin (10), 3/4" flat washer and 1/8 x 1 1/2 cotter pin. Bolt the depth stop assembly (11) onto depth stop tube (9) with two 1/2 x 2 1/2 hex bolts (12) using 1/2" lock washers and hex nuts.

On 3-section models, U-bolt the 3" cylinder rest pads (13) on the center bar as shown, using a 1/2 x 3 x 5 u-bolts (14) with lock washers and hex nuts (see machine layout drawing for exact placement).

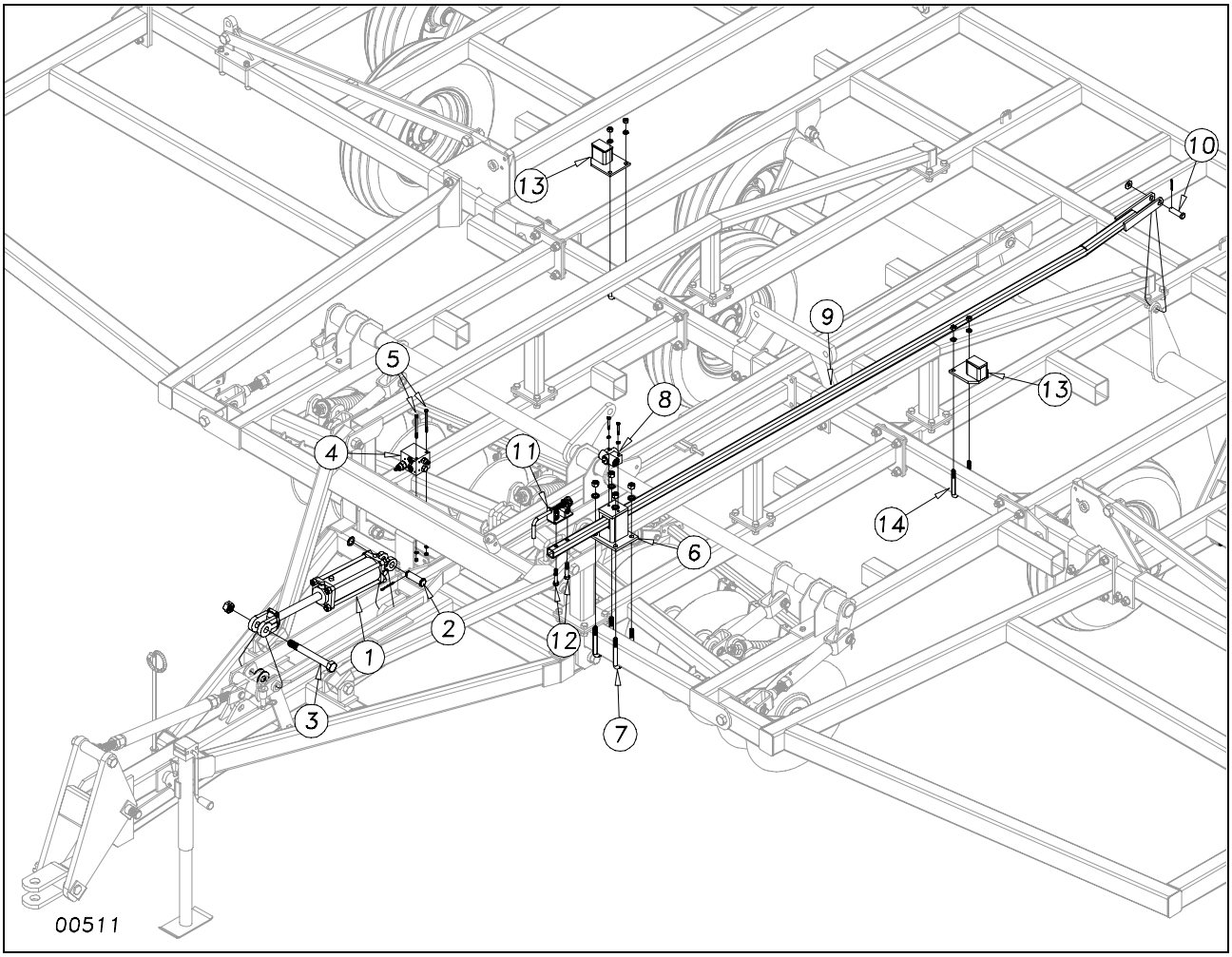


Figure 7

Fold Cylinders and Rocker Arm Assembly

Connect the center fold cylinders (1) to the center fold bracket as shown in Figure 8. Use the 1" x 3 1/2clevis pin (2) with 1" machine washer and 3/16 x 2 cotter pin. Attach the rocker (3) to rocker bracket with 1 x 3 Headed Pin (4) using 1" machine washer and 3/16 x 2 cotter. **Do Not Connect Rod End Of Cylinders To Rockers Before They Are Charged With Oil**.

Place a support block of wood under the cylinders, as shown, so they clear the rockers in the extended position. You are now ready to connect the hydraulic hoses to the cylinders and charge the fold system (see hydraulic layout).

Once the fold cylinders are fully charged and free of air, connect them to the rockers.

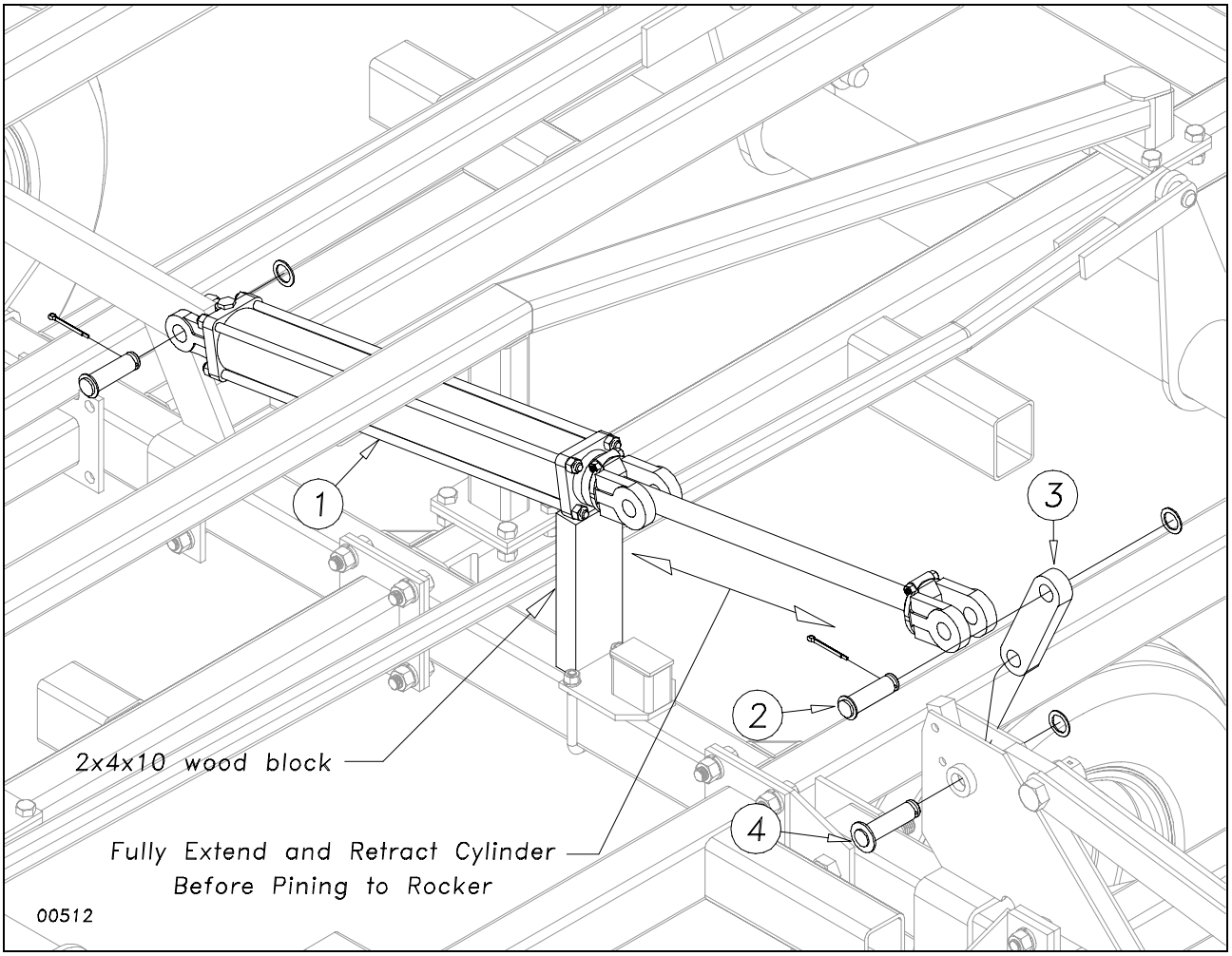


Figure 8

Center Wing Stop Assembly

U-bolt the center wing stop (1) to the second bar from the rear on the center frame as shown in Figure 9. Use 1/2 x 3 x 5 u-bolts (2) with lock washers and hex nuts. Center the wing stop from side to side. Insert the 1/2 x 4 1/2 transport lock quick pins (3) in the holders on the wing stop.

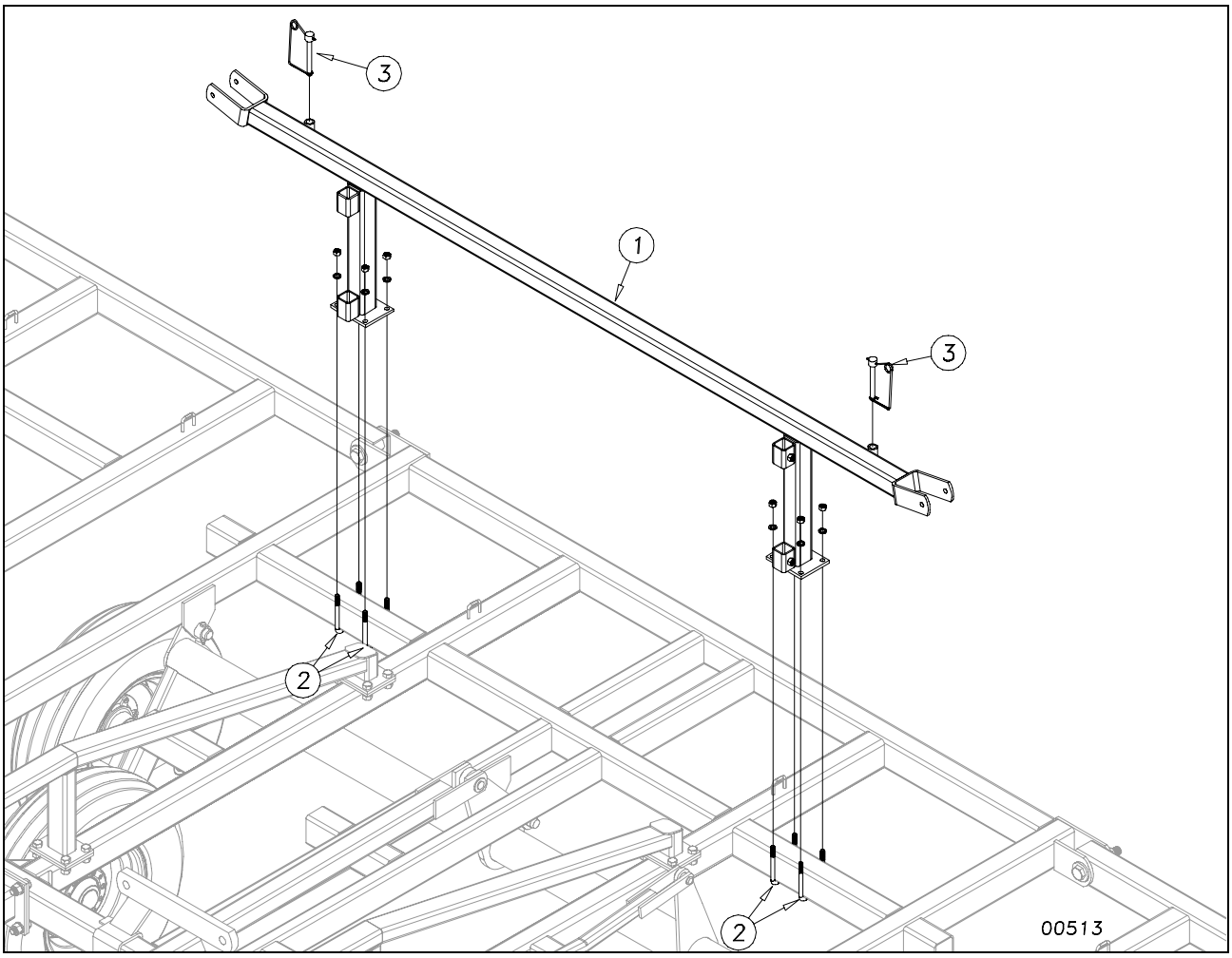


Figure 9

Completing Setup

Install the plastic end caps into all the open ends of all the 4x3 frame tubes.

You should now be ready to add shanks and the remaining gangs to the machine. If the machine has a finishing attachment you would install it last. See the machine layout Section 4 for proper shank and gang locations for your unit. The parts manual shows the individual shank assemblies and parts for both the K-flex and magnum shanks along with gang parts and identification drawings.

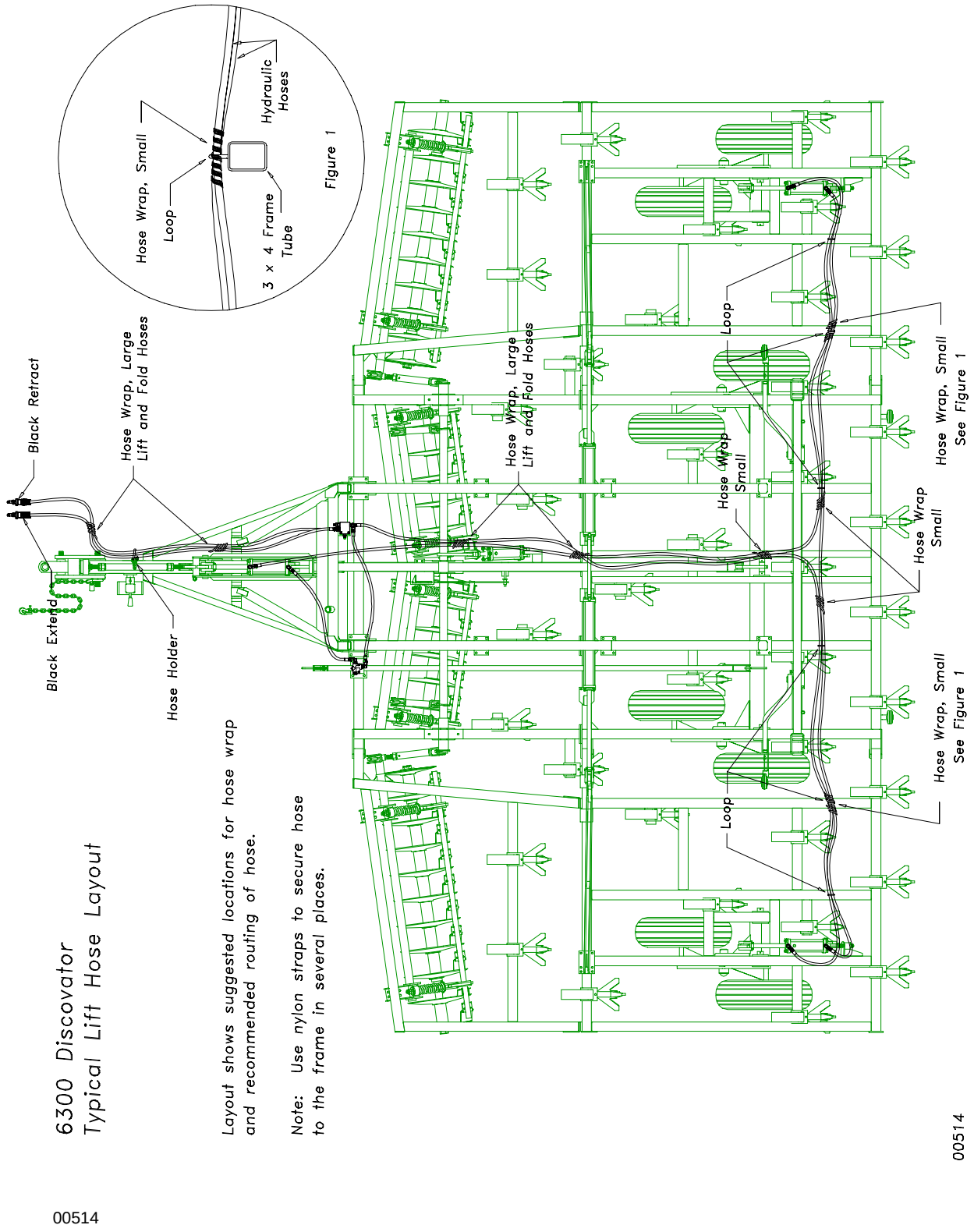
Once the shanks and gangs are installed and all of the hydraulic procedures have been completed, you may fold the machine to check for clearance and proper shank placement. Slowly fold the machine while watching that hoses do not become pinched or kinked and watch that shanks clear all obstructions.

Once the machine is folded completely, begin to unfold slowly. **Be Sure No One Is Under The Wings When You Unfold The Machine**. Once the machine is unfolded, add the safety decals and the product decals. Refer to the Important Safety Information (page 7) for the proper placement of safety decals.

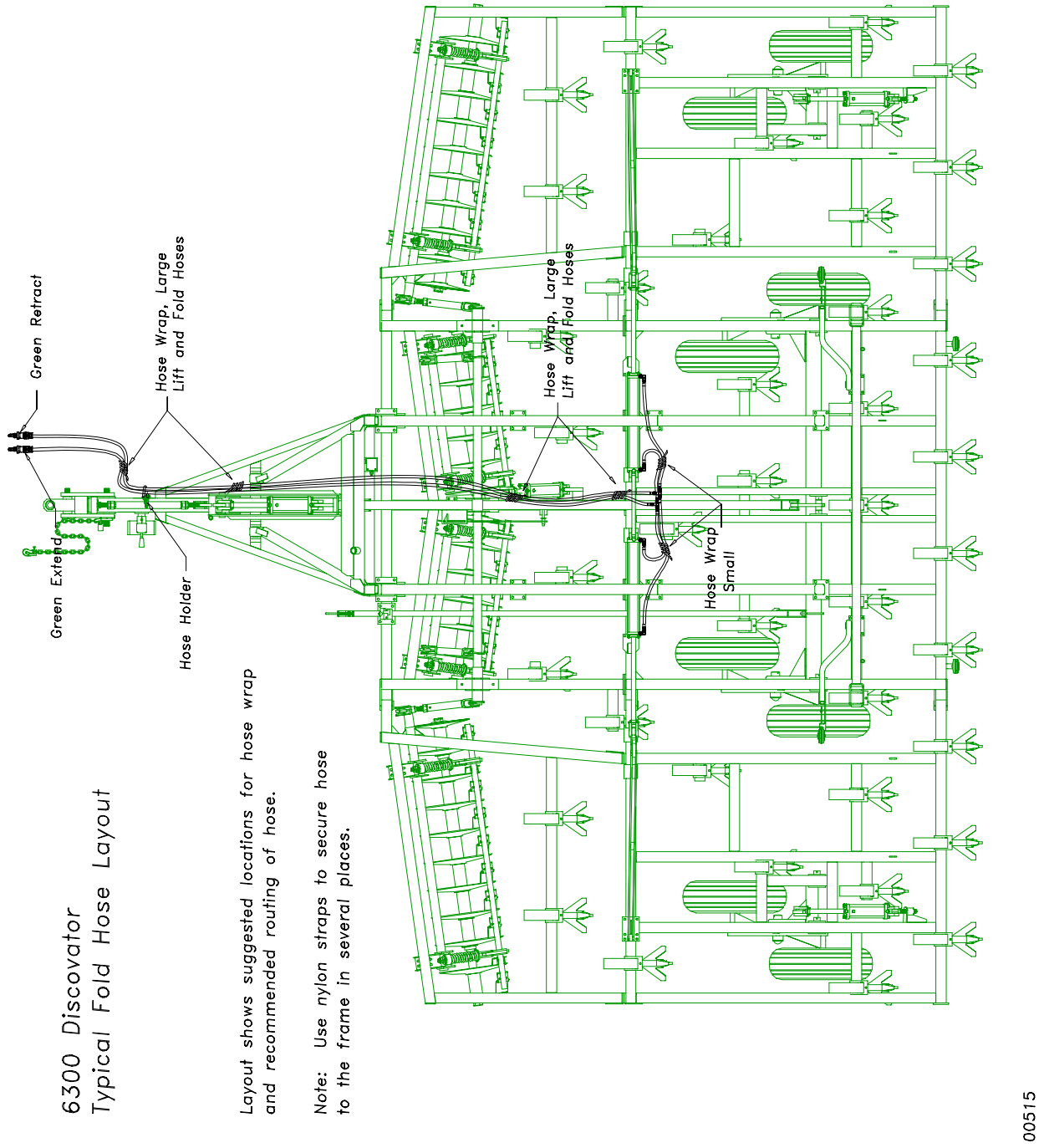
Install the safety chain, SMV sign & safety lights in accordance with local and state laws. See parts manual (Section 6: Safety) for assembly drawings and parts list.

At this point, set up of the machine is complete and you are ready to add any finishing attachment, rear hitches, etc… to the machine. Be sure to consult the operating instructions, Section 4, for the first time field adjustments before going to the field for the first time.

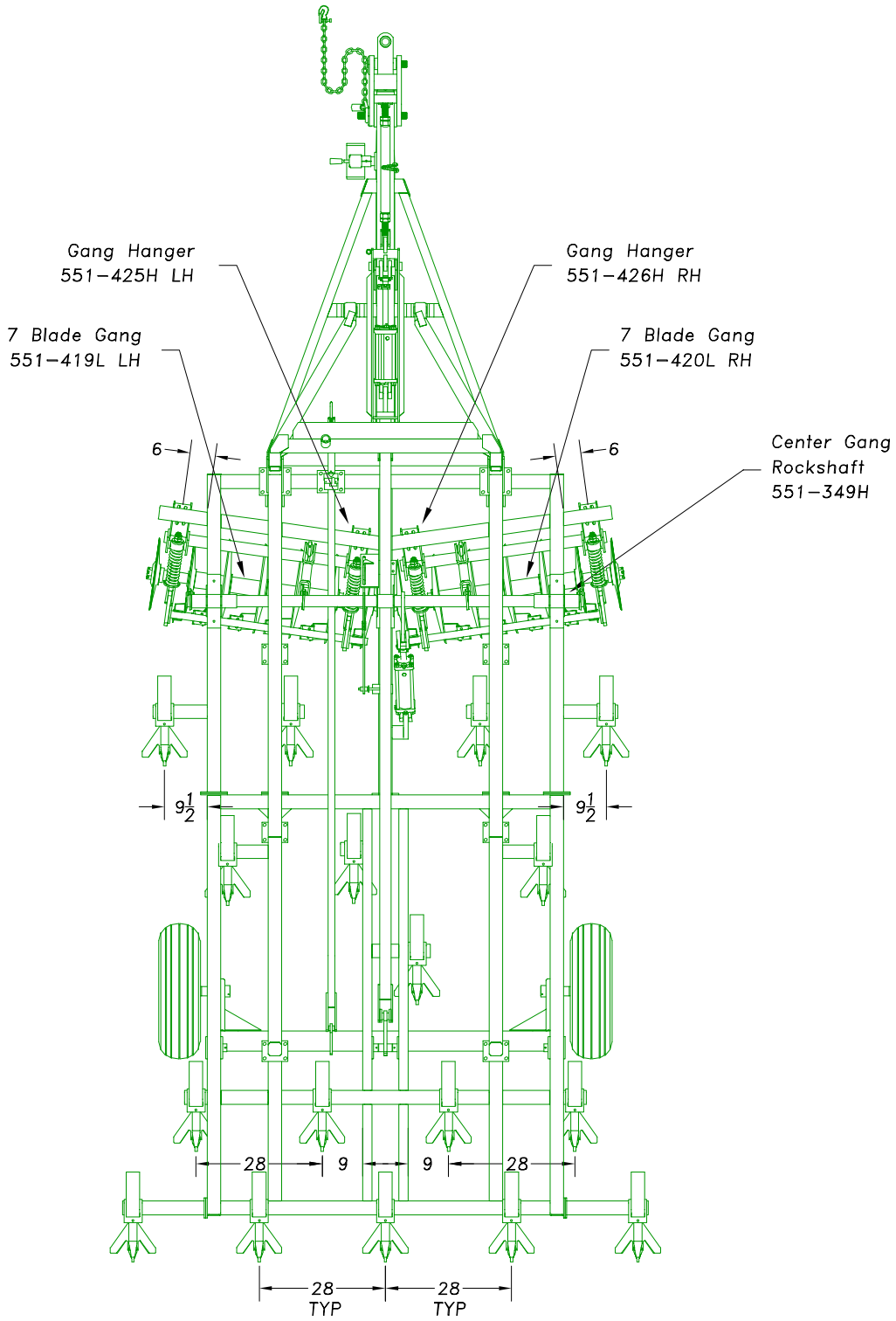
Typical Lift Hose Layout



Typical Fold Hose Layout



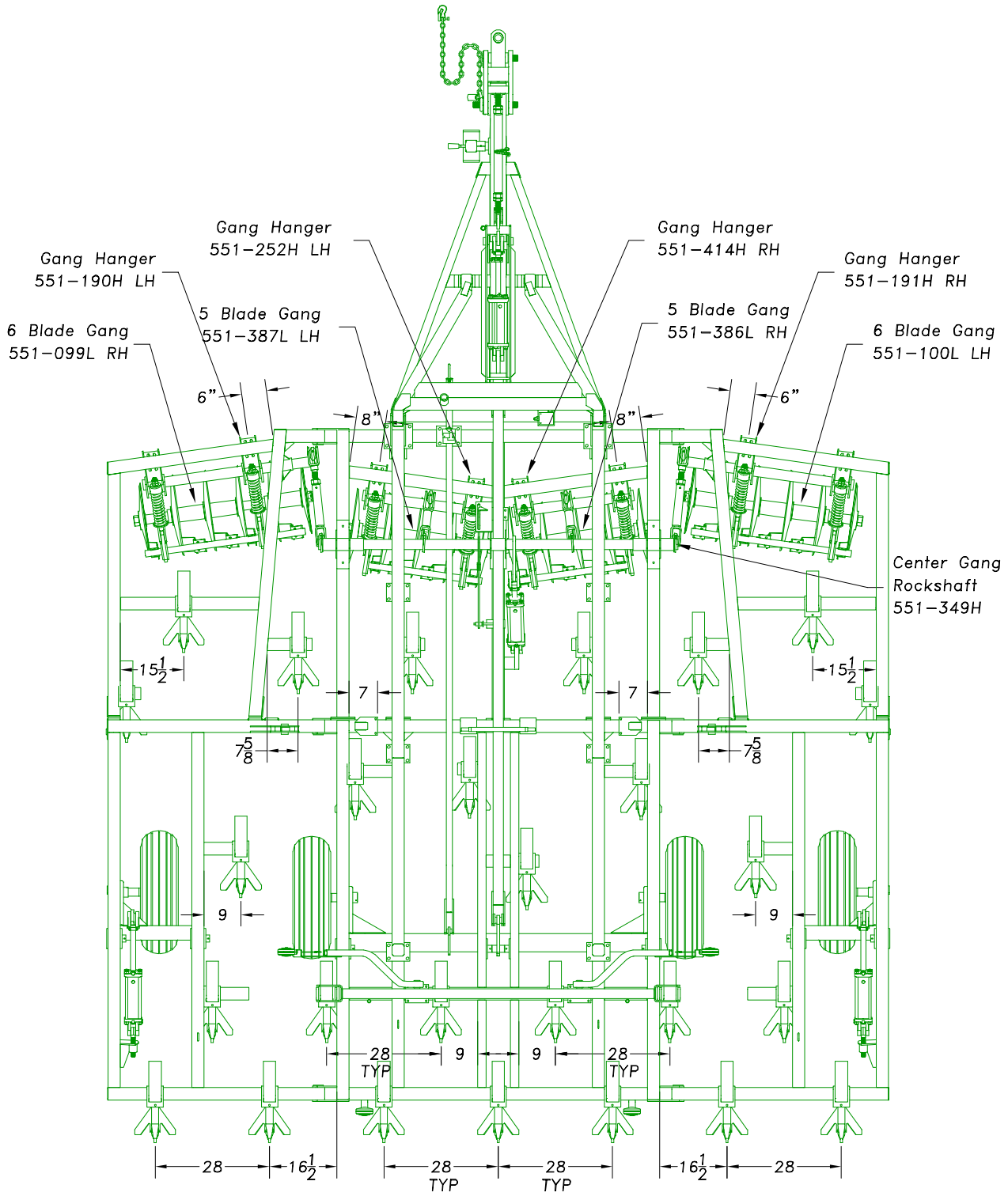
5110D Machine Layout, Disc



5110D Discovator (Constant Level)
Shank Layout 7" K–Flex Shown

00494

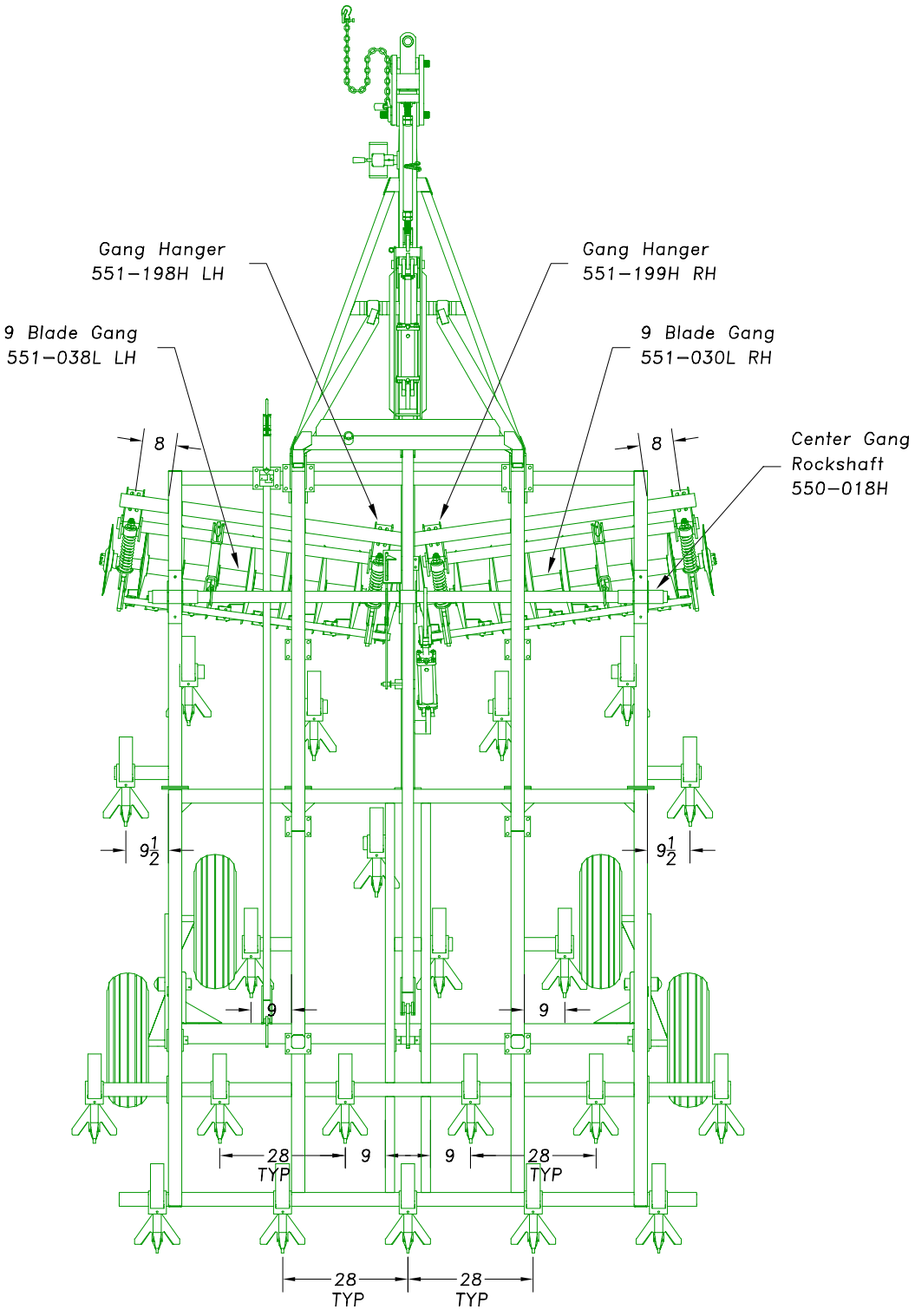
5315D Machine Layout, Disc



5315D Discovator (Constant Level)
Shank Layout 7" K–Flex Shown

00495

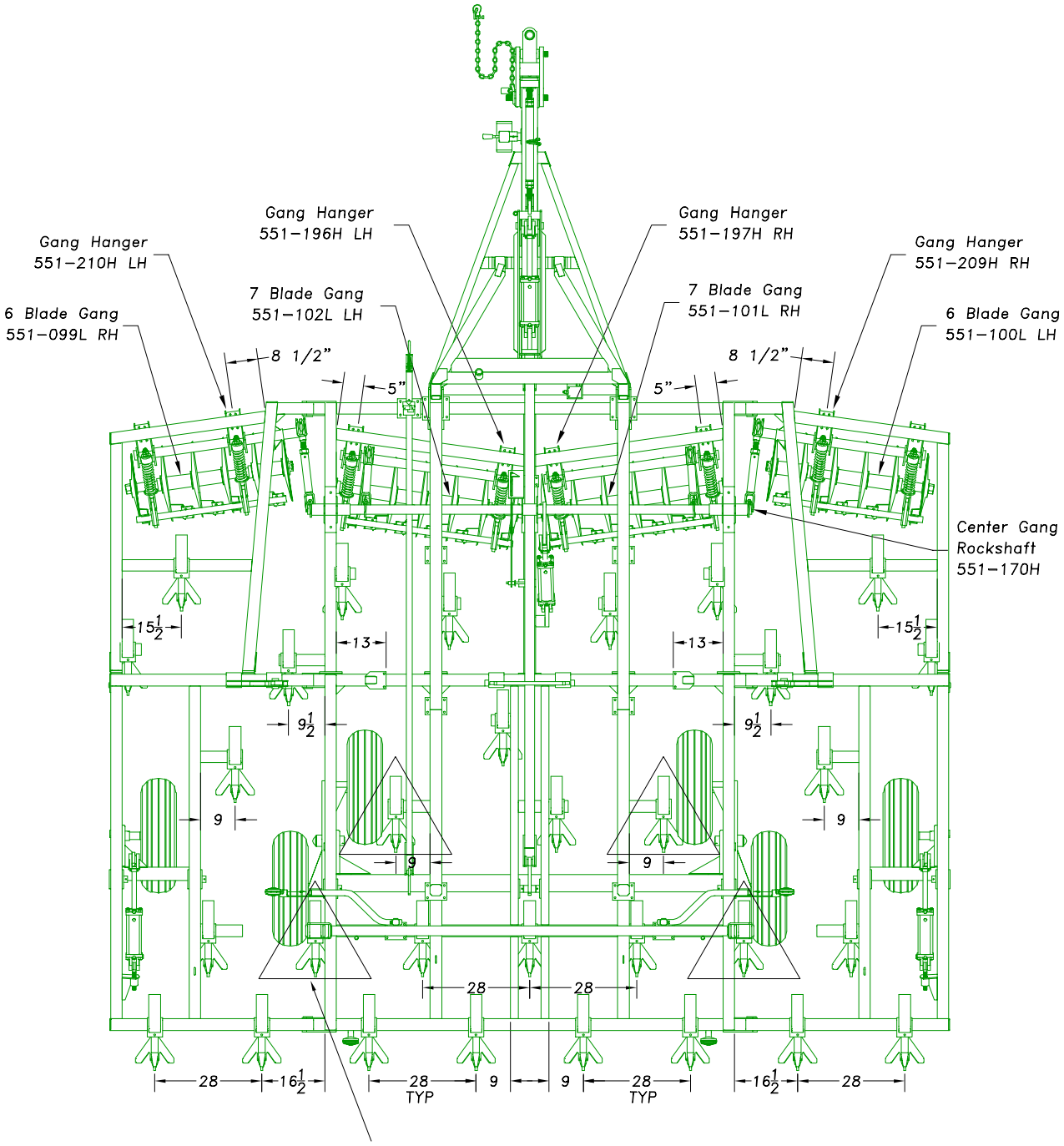
6112D Machine Layout, Disc



6112D Discovator (Constant Level)
Shank Layout 7" K–Flex Shown

00496

6318D Machine Layout, Disc

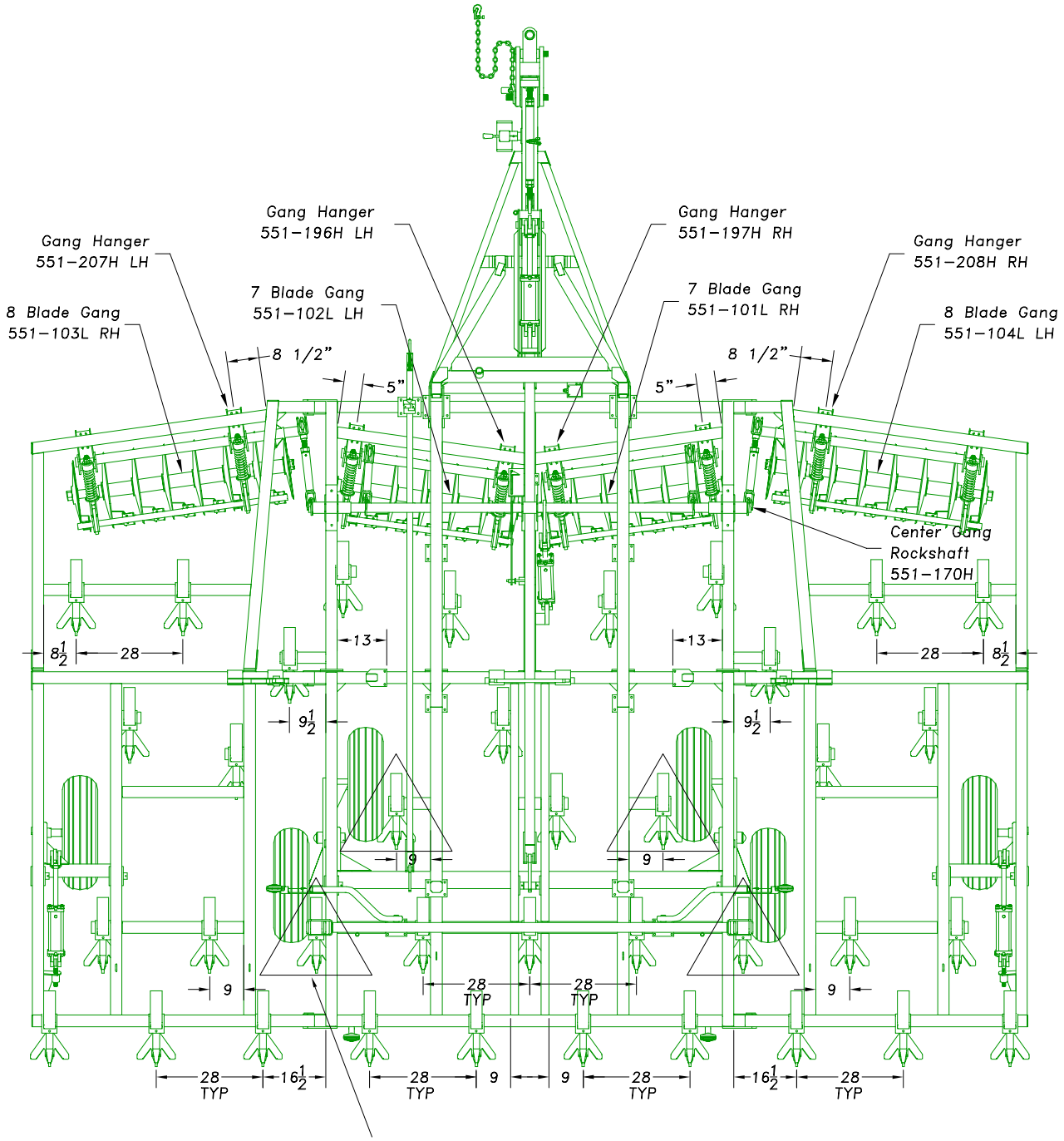


Note: Triangled Shanks Require 2" Rear Offset Shanks for Some Sweep Sizes.

6318D Discovator (Constant Level)
Shank Layout 7" K–Flex Shown

00497

6320D Machine Layout, Disc

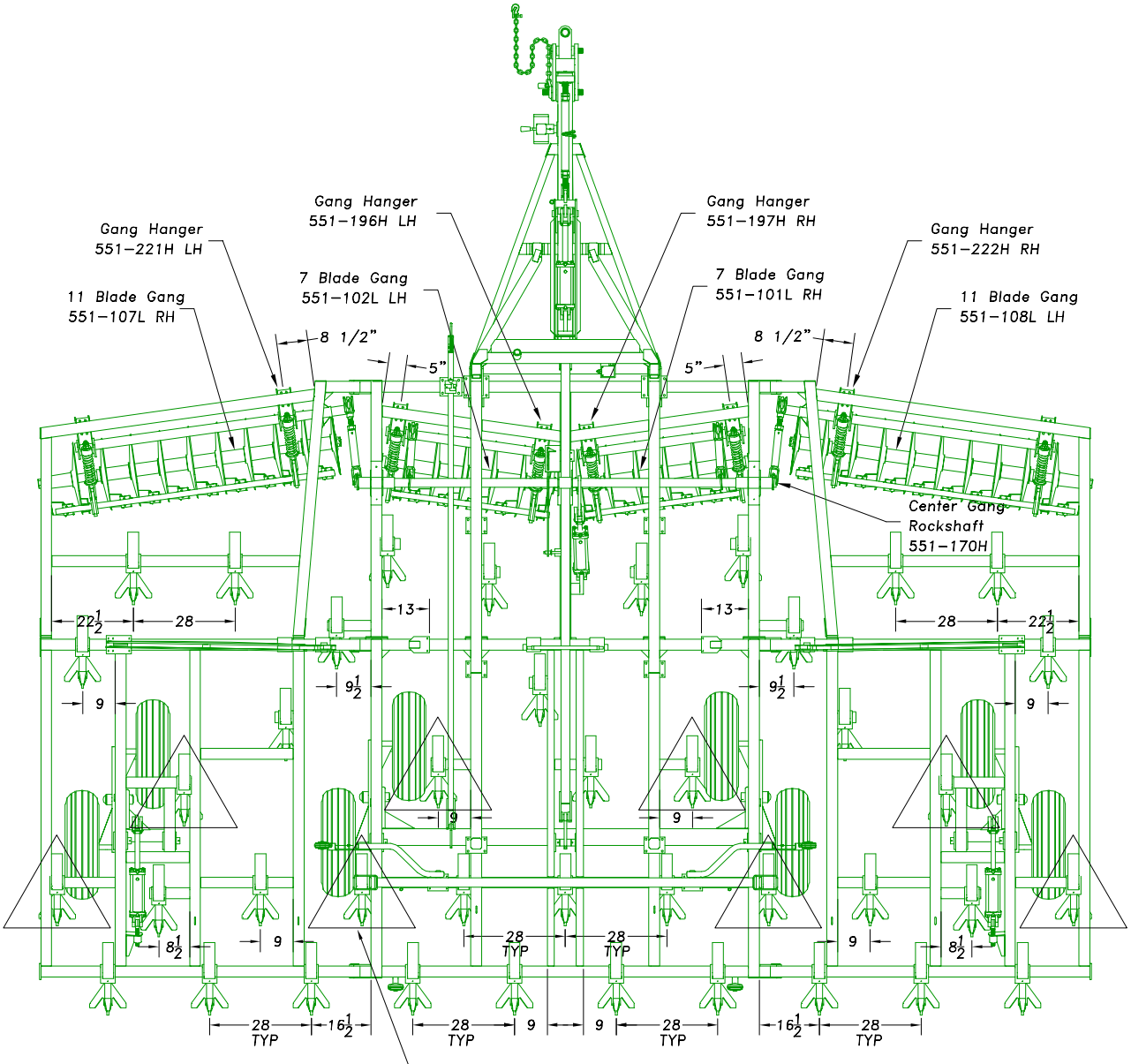


Note: Triangled Shanks Require 2" Rear Offset Shanks for Some Sweep Sizes.

6320D Discovator (Constant Level)
Shank Layout 7" K–Flex Shown

00498

6324D Machine Layout, Disc



Note: Triangled Shanks Require 2" Rear Offset Shanks for Some Sweep Sizes.

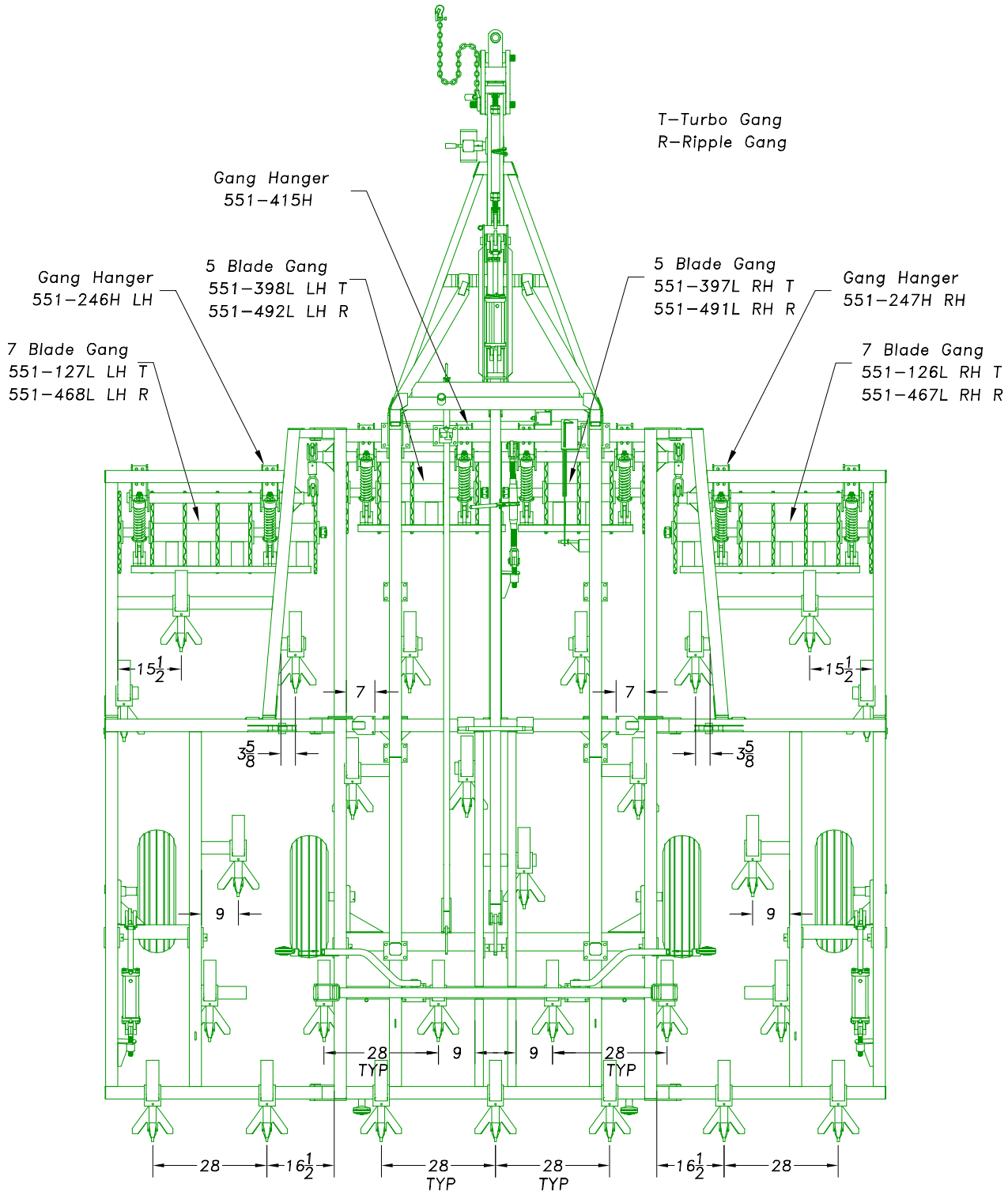
6324D Discovator (Constant Level)
Shank Layout 7" K–Flex Shown

00499

5110C Machine Layout, Coulter

No Coulter Machine for this size

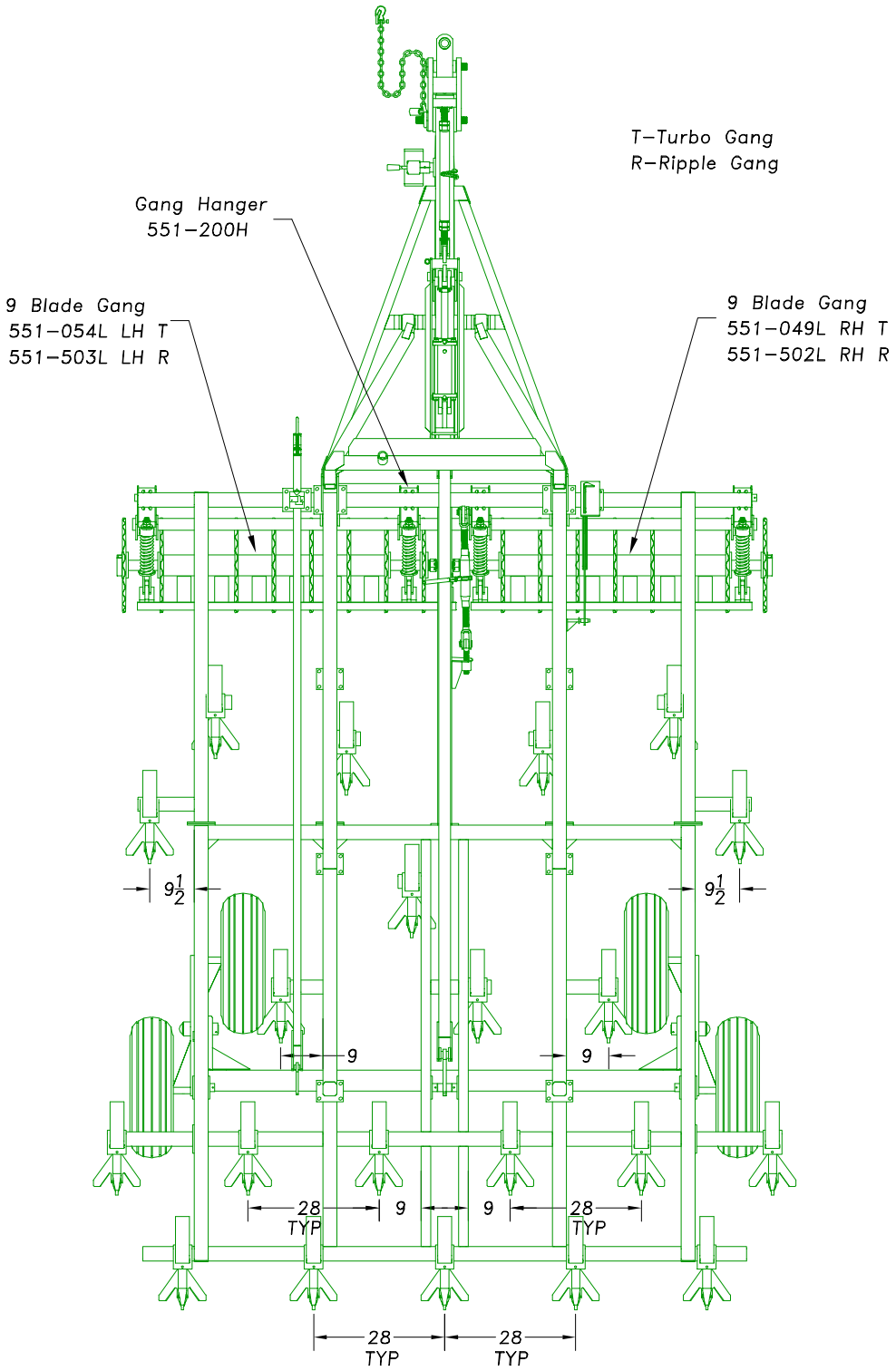
5315C Machine Layout, Coulter



5315C Discovator (Constant Level)
Shank Layout 7" K–Flex Shown

00500

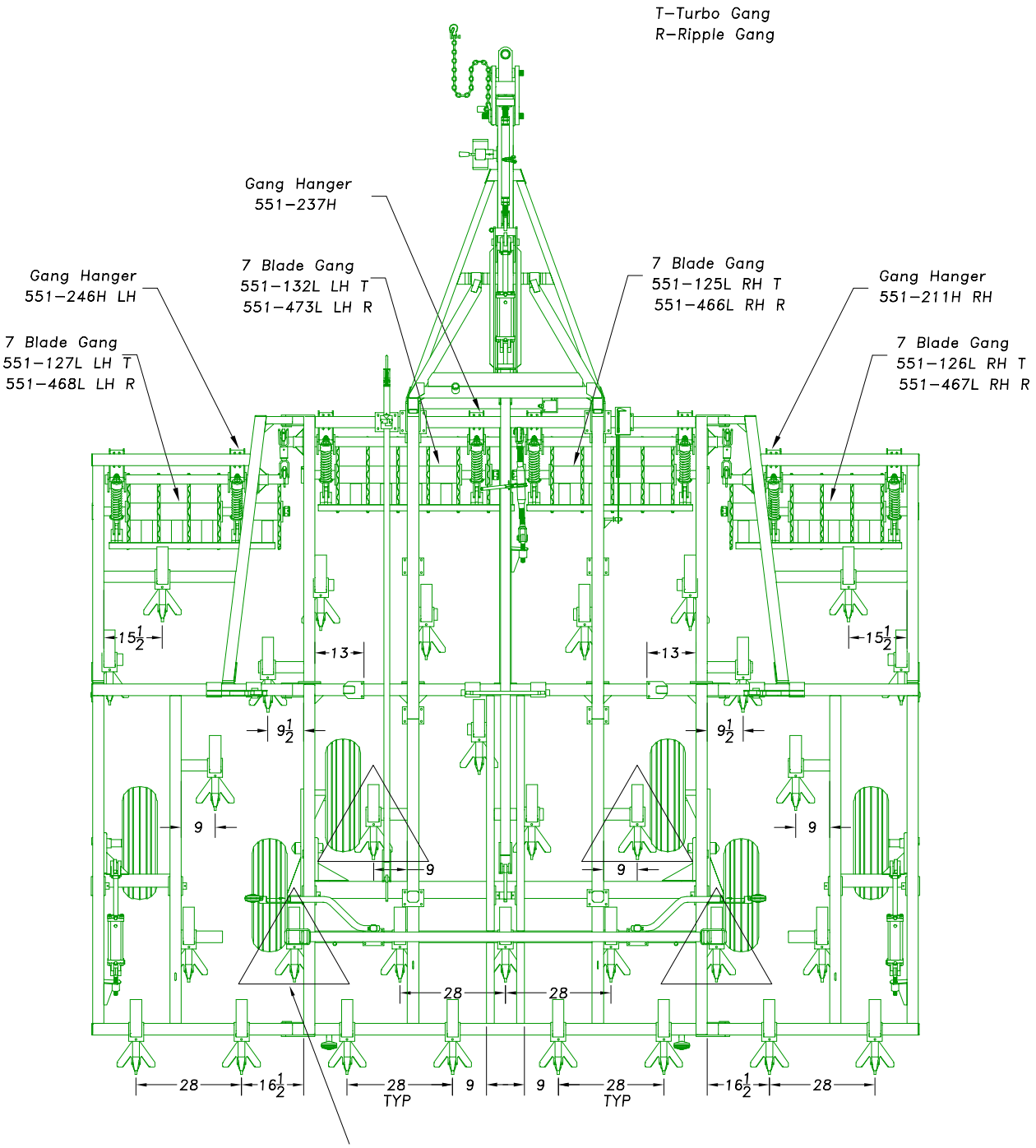
6112C Machine Layout, Coulter



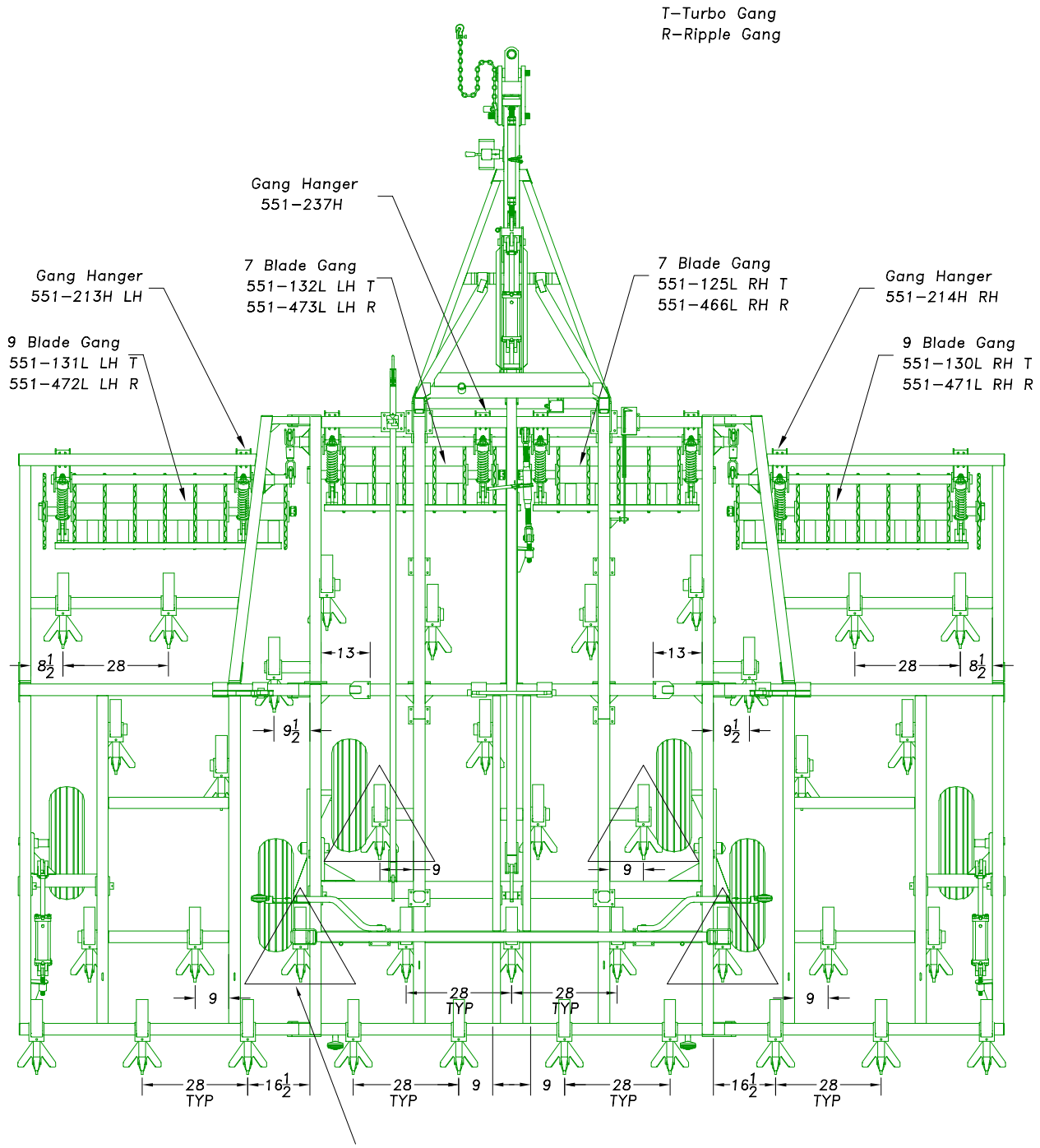
6112C Discovator (Constant Level)
Shank Layout 7" K–Flex Shown

00501

6318C Machine Layout, Coulter



6320C Machine Layout, Coulter

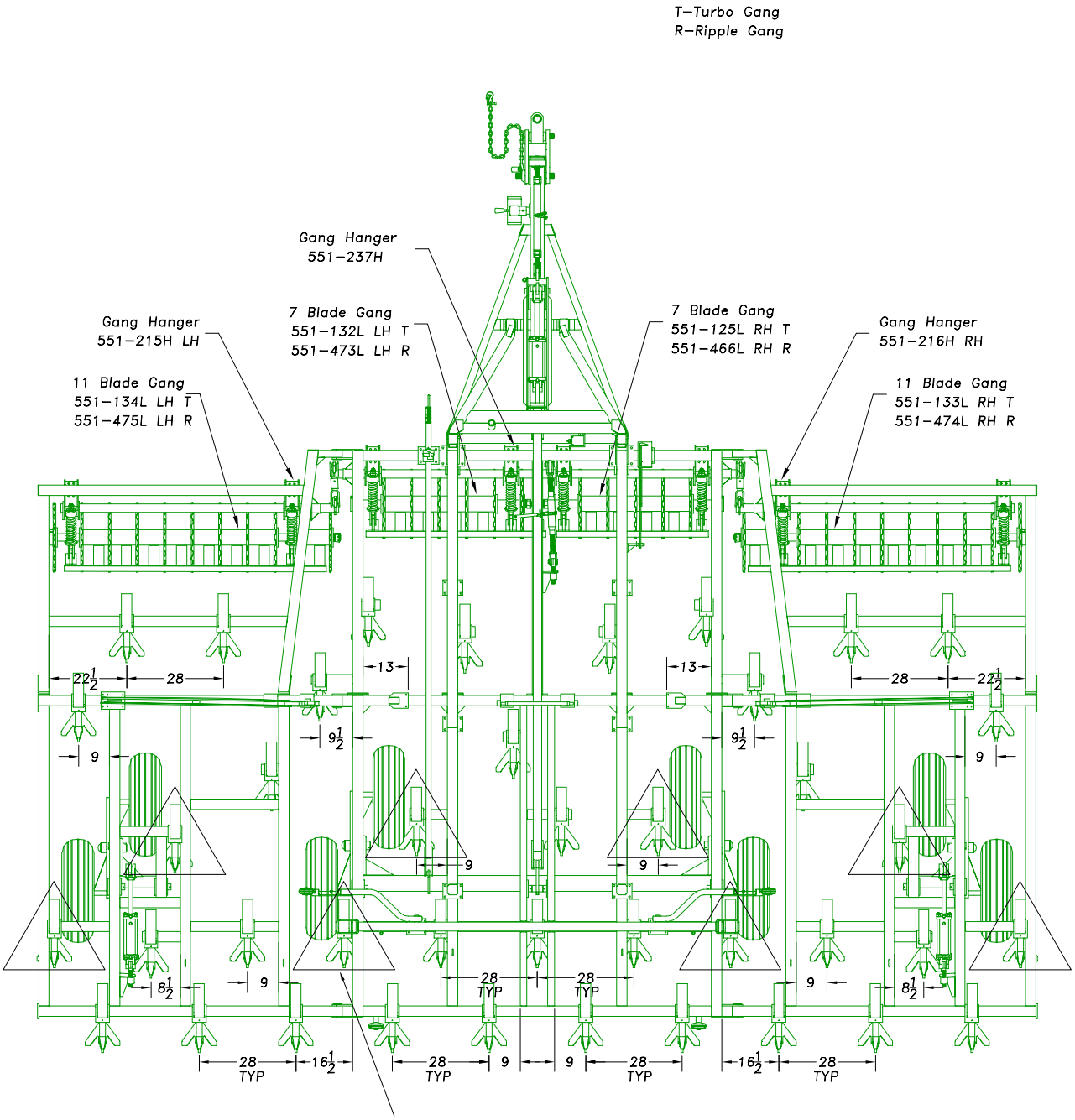


Note: Triangled Shanks Require 2" Rear Offset Shanks for Some Sweep Sizes.

6320C Discovator (Constant Level) Shank Layout 7" K–Flex Shown

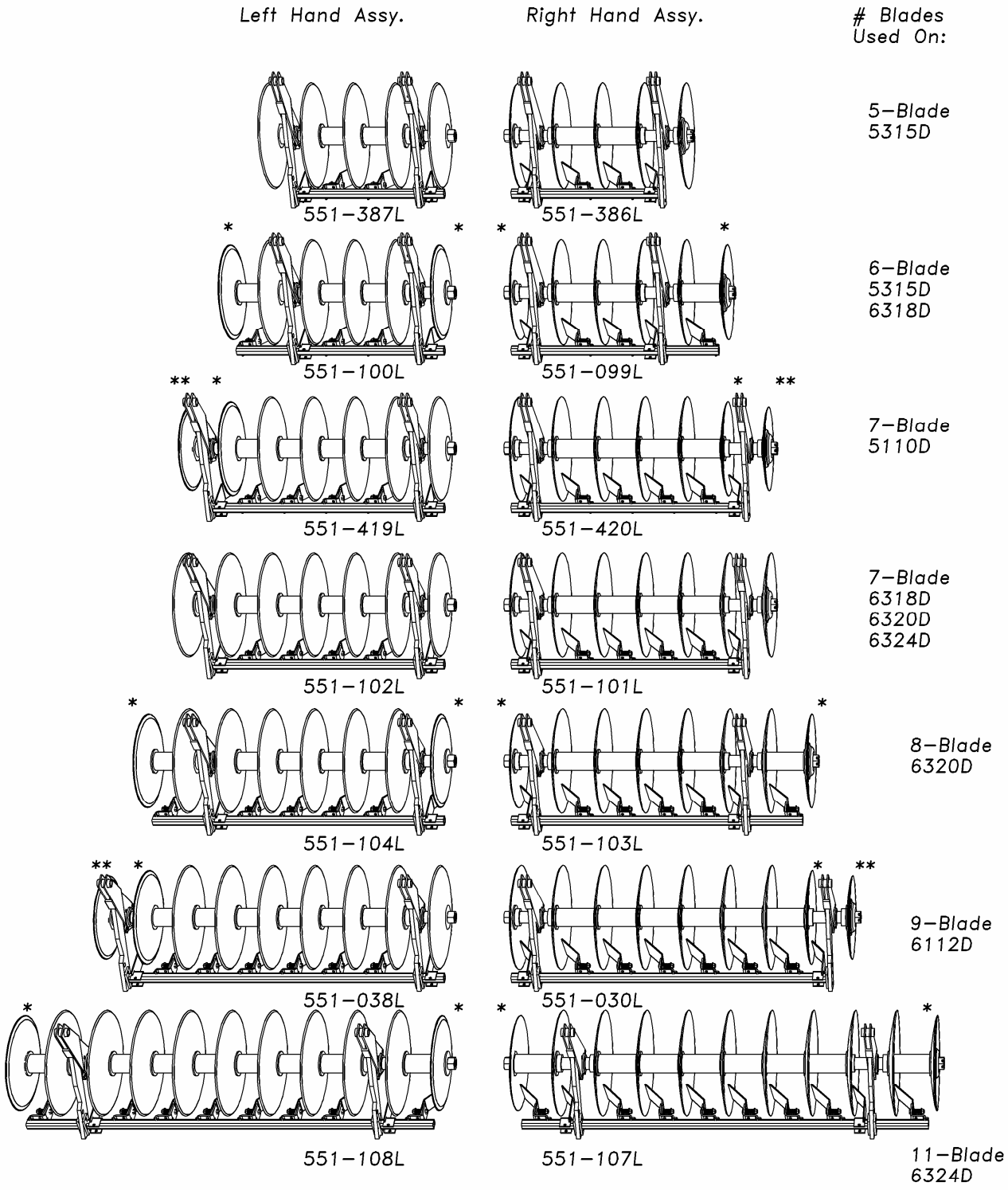
00503

6324C Machine Layout, Coulter



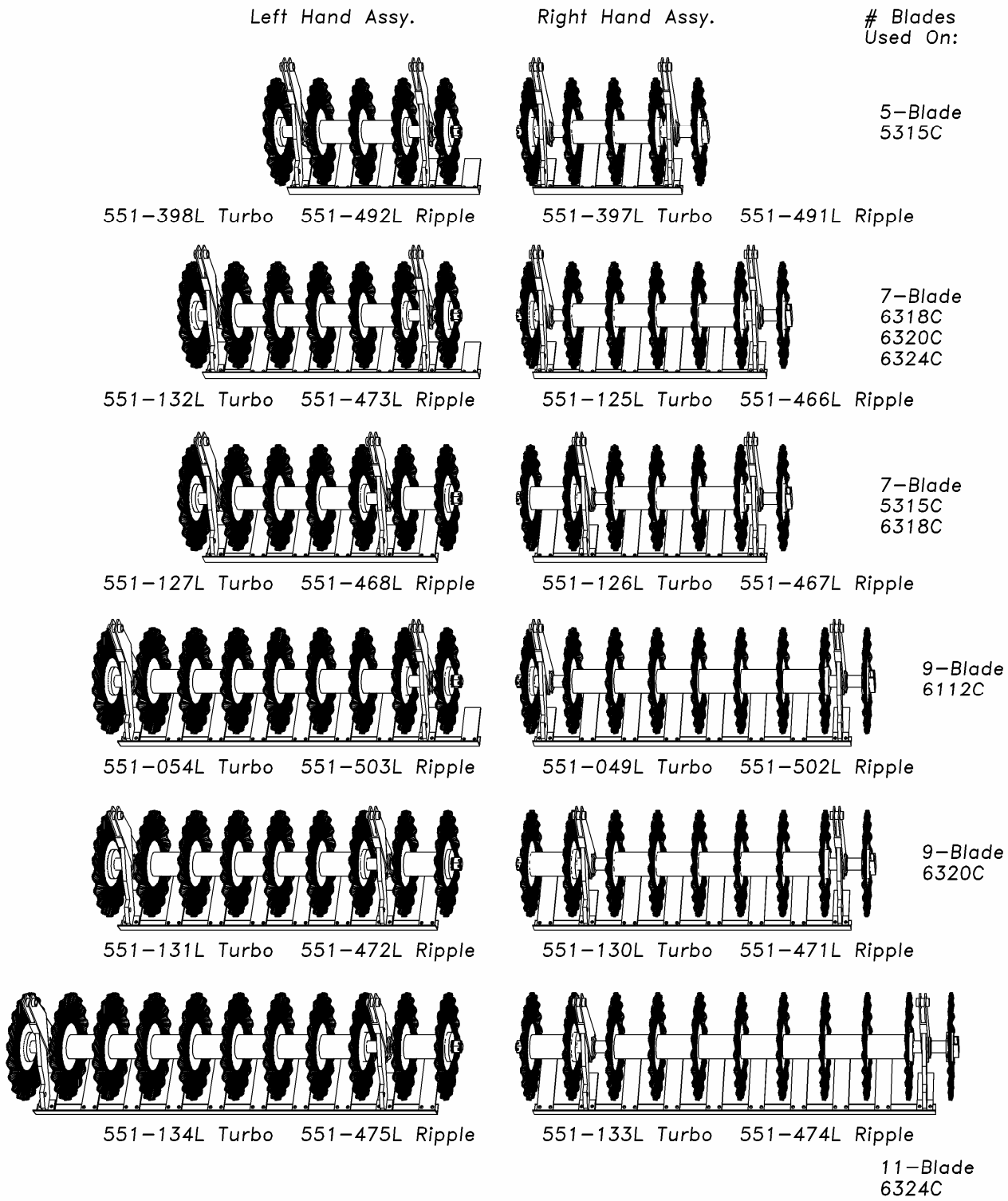
00504

Disc Gang Identification



00489

Coulter Gang Identification



00490

Operating and Maintenance

Prior to Going to the Field:

1. **IMPORTANT!!** If you have not thoroughly read and understood the safety section at the front of this manual, do so at this time. **DO NOT** proceed without fully understanding the safety considerations of this machine.

2. Make sure your tractor horsepower matches the implement you are pulling. This is important so the implement can do the best possible job.

3. Hitch the tractor to the Discovator using the block or yoke clevis determined by the tractor drawbar. Use the correct size pin for clevis or block.

4. For TWO-WHEEL DRIVE and MFWD tractors, pin drawbar in fixed center position for field and transport**. For FOUR-WHEEL DRIVE and TRAC-DRIVE tractors, leave one hole clearance on each side of drawbar for field position, hitch damage may occur if pinned solid. Pin in center position for transport to maintain maximum steering control.**

5. Clean all hydraulic couplings and connect to tractor. Each hydraulic coupling has a colored handle on it and is marked with a cylinder, either extending or retracting.

6. If machine is folded, remove the transport pins from the wing stops. (**DO NOT** remove pins if the wing is leaning against the pins or putting pressure on the pins. Use the hydraulics to pull the wings in completely before unpinning them.) Once the pins are removed, slowly unfold the unit. Make sure no one is under the wings during the unfolding process. Check again for hydraulic leaks and watch that hoses do not get pinched in hinges, wings stops, etc.

7. After the machine is completely unfolded, raise and lower the Discovator several times to purge air from the hydraulic system. Again check for hydraulic leaks and tighten or replace if necessary.

8. Check safety chain hookup. Make sure all warning lights are hooked up and functioning correctly.

9. Check the tire pressure for proper inflation and check the tightness of the lug bolts and lug nuts. See tire inflation chart in the appendix section of this manual.

10. Check for any bolts that may need tightened or retightened. Grease all the hinge points. The hubs come pre-greased and will not need more grease at this time.

11. Put transport lock in place and refold the machine slowly. Put wing stop pins in place. Always use the transport pins when moving from field to field. You are now ready to go to the field.

First Time Machine Setup and Adjustments:

1. Pre-leveling of machine can be done on a concrete slab or good level surface. Lower machine so sweeps are 2-3” off of ground on the center frame. Adjust the turnbuckle (Figure 1) at the front of machine to level it from front to back. (Shorten to bring front down, extend to bring front up.) Level machine with the front row shanks just slightly deeper or lower than the back.

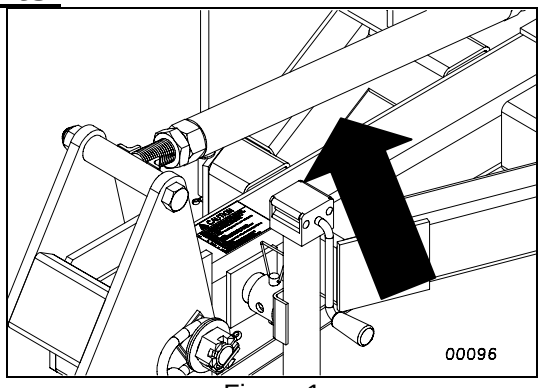


Figure 1

2. Set the wings to match the depth of the center. This is done by adjusting the lift cylinder eyebolt on each wing (see Figure 2). Lengthen the bolt to run shallower, shorten the bolt to run deeper.

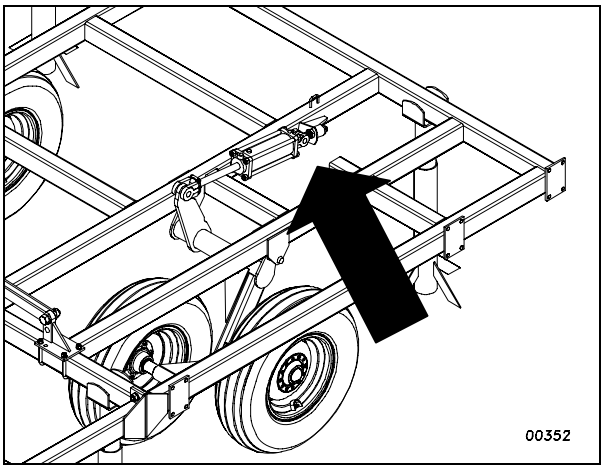


Figure 2

In some conditions the wings will need to be set slightly lower than the center as the center may tend to run deeper behind the tractor tires.

3. Calibrate the depth gauge pointer by extending the ratchet jack or cylinder until the under frame clearance of the 20" blades is 4 - 1/2½ (see Figure 3). Place the decal on the stand with the pointer at '0'.

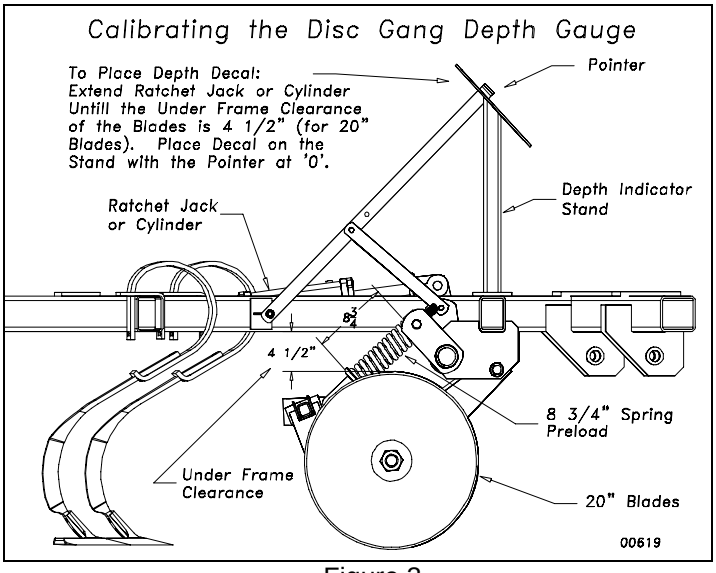


Figure 3

4. Adjust the disc or coulter gangs to run 1/2" to 1" shallower than the cultivator sweeps by using mechanical stops on the two inside gang cylinders or by changing the ratchet jack length. The pointer on the gauge should read +1/2" to +1". Running the disc gangs slightly above the sweeps allows the sweeps to work in firm ground which improves trash flow and incorporation as well as leaving a smoother, more level seed bed (see Figure 4).

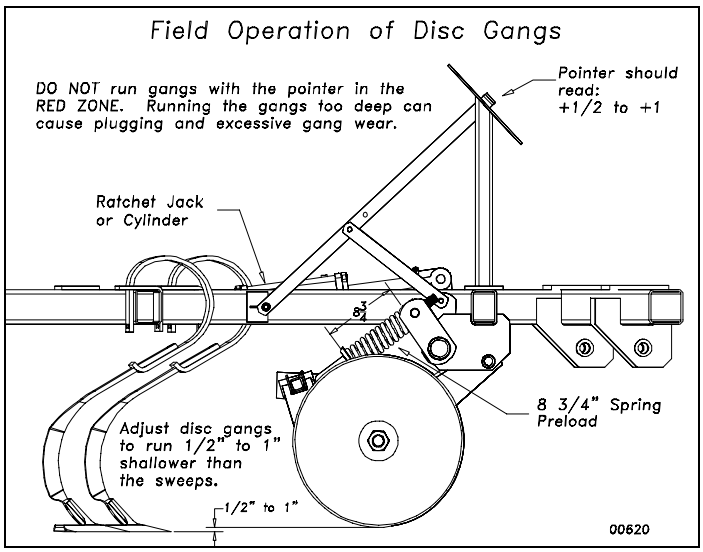


Figure 4

5. DO NOT run the disc or coulter gangs in the **Red Zone**. Running the disc gangs too deep will cause plugging of trash as well as excessive wear on the gangs, gang springs and Discovator frame. Running disc gangs too deep may also tend to hold the front of the entire machine out of the ground. (The disc gangs should only be run in the **Red Zone** when using 18" blades that are nearing the end of their wear life).

6. You are ready to operate the machine in the field at this point. You should have someone observe the machine during operation for levelness, front to rear and side to side. When you lower the machine to the desired working depth, set the cylinder depth stop at the front of the unit to maintain a constant depth after raising and lowering.

7. Make any fine tuning adjustments on the leveling of the machine.

General Operation Instructions and In-Field Adjustments

1. Remove the transport pins and unfold the machine. Make sure the fold cylinders are fully extended to allow the wings to fully flex in the field.

2. If possible have someone observe the machine during first time operation for levelness—front to rear and wings to center frame. Adjust each as needed. For front to rear, either extend or shorten the length of the turnbuckle on the self-leveling. Never run the machine with the back lower (deeper) than the front. To adjust the machine from side to side, use the eyebolt on each wing. Adjust the inside wings first and then the outside wings. The gauge wheels should be set in field position to be 1/2" to 1 1/2" off the ground.

3. The ideal working speed for the Discovator is 5 1/2 to 6 1/2 mph. Working too slow may cause plugging, poor incorporation or mixing of crop residue and reduced weed kill. Running too fast may cause streaks in chemical incorporation and ridging.

4. The Discovator is designed as a secondary tillage tool and is designed to leave a finished seedbed following some form of fall or spring tillage. For best results, if at all possible, run the machine at a slight angle to the rows. This will improve trash flow and help spread the residue more evenly throughout the field.

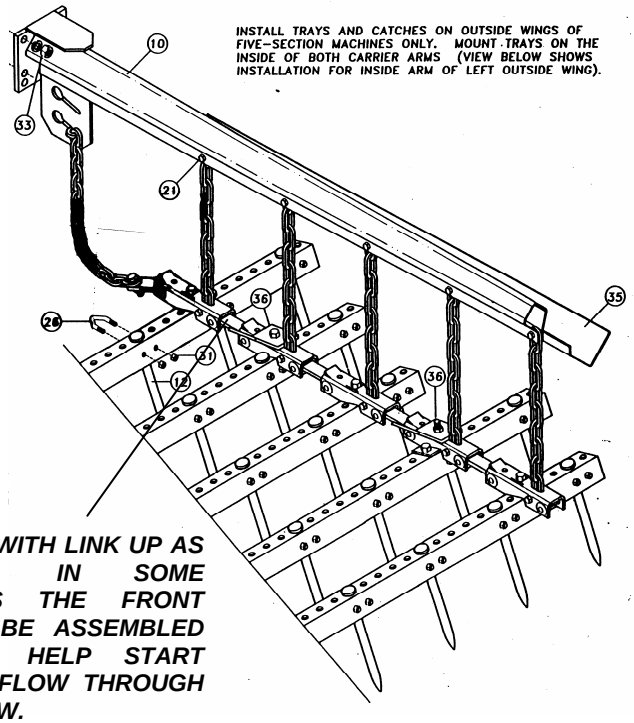
5. When you have the machine set to the desired working depth, set the depth stop slide on the depth control bar. This is located at the front of the machine on the brace bar. This will maintain a constant depth each time after raising and lowering the machine.

6. If after setting the depth stop, the detent on the tractor kicks out before the stop contacts the button on the depth stop, slow the hydraulic flow speed down. If this problem still persists, contact the factory service representative for other possible adjustments. **Do not try to adjust the rebound valve without first contacting the factory service rep.**

7. Adjust the drag to leave the desired results while maintaining the trash flow through the drag.

a.) On the spike drag, start with 5 links hanging from the chain in drag arm bottom slot. (This is the starting point for worst conditions.) The cleaner the ground, the shorter the pull chain may be pulled up. On the spike drag, one of the links in the first row of angles is turned over. This allows the trash to start flowing through the drag easier by changing the angle of the first row of teeth. Always make sure that the drag is never pulling off the hang chains. If so, shorten pull chains.

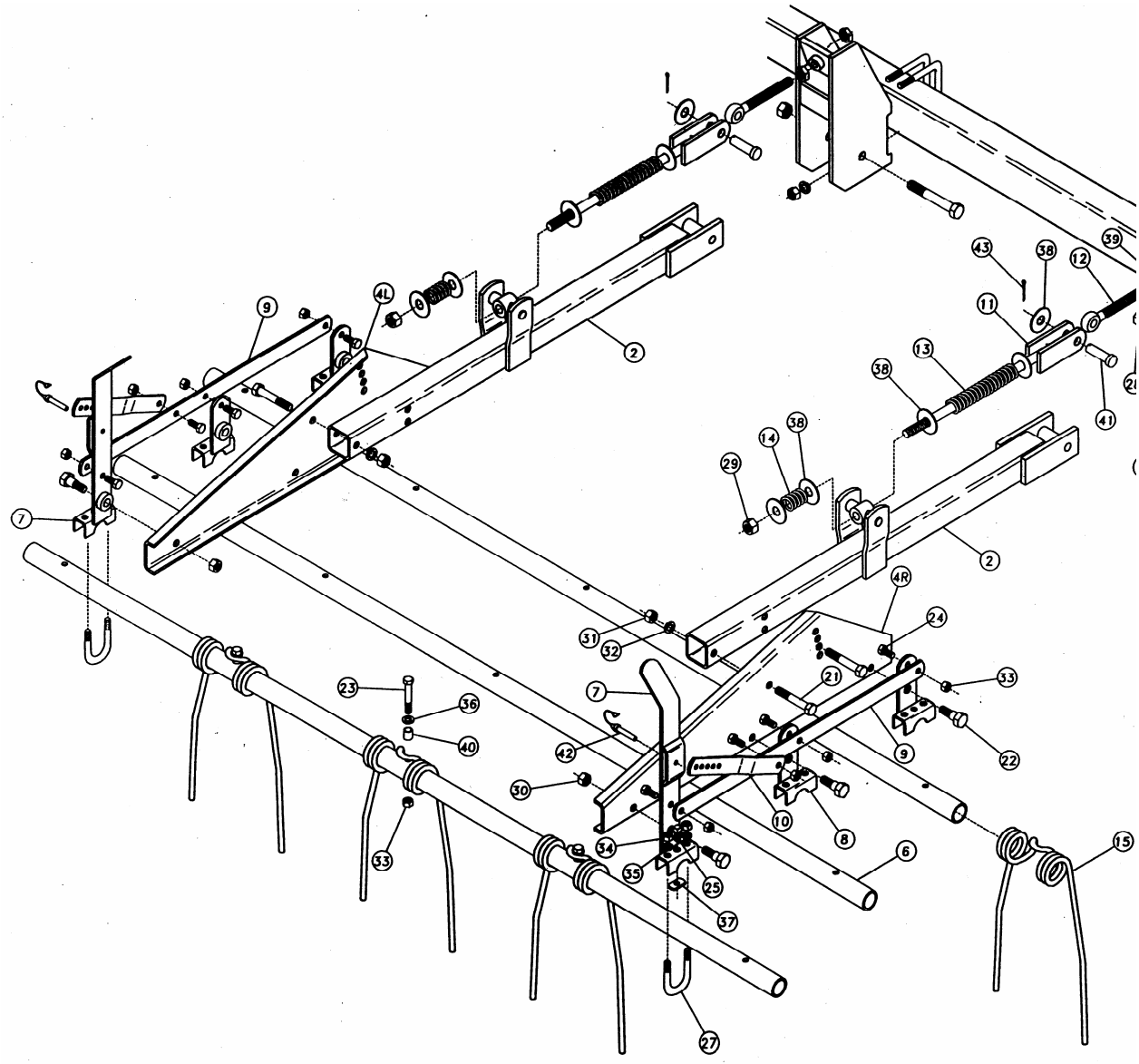
b.) On coil tine drags, start with the top eyebolt (12) centered. Then level drag mainframe (4R and 4L) by changing position of leveling bolt (21). There are two holes in the arm and four in the mainframe. One of these will get you where you need to be to level. To lay the teeth back, remove the clip pin (42) on each end and move strap adjustment by pushing the handle (7) forward. This strap has 5 holes and will let you lay the teeth back several degrees. If it is desired to set one row, usually the first, different than the rest as far as the angle is concerned, it can be adjusted individually by loosening the U-bolt and set- screw on each end of the



ASSEMBLE WITH LINK UP AS SHOWN. IN SOME CONDITIONS THE FRONT LINK MAY BE ASSEMBLED DOWN TO HELP START TRASH TO FLOW THROUGH THE HARROW.

drag bar. Down pressure on the drag is achieved by lengthening the eyebolt (12) on the top bracket. Depending on the amount of down pressure, you may need to relevel the mainframe.

c.) If a basket is added, adjust the amount of down pressure by either shortening the eyebolt for less pressure or lengthening the eyebolt for more pressure.



Maintenance and Lubrication

1. Always use the transport lock when working on or doing maintenance to the Discovator. If folded, be sure your wing stop pins are in place. Read and understand all safety decals on your equipment.

2. During the first season of operation, and periodically after that, check your bolts for tightness. Check shank pivot bolts on the spring-loaded shank; these must remain tight to prevent excessive wear on the shank assembly.

3. Replace or rotate worn parts as needed—hinge bolts, clevis pins, bearings, sweeps, shanks, etc...

4. Check and tighten or replace any hydraulic leaks. Check hoses for any leaks. It is important that there are no leaks on the equipment.

5. **Grease wheel bearings and walking beams sparingly**. Over greasing may cause damage to seals and reduce the life of the bearing. Grease hinge points periodically.

6. Check drag bolts and parts for looseness or excessive wear. Replace broken or bent teeth. Your drag is an important part of the tillage operation.

7. If machine is stored outdoors over the winter months it is a good idea to fold the machine then set it down on the ground so all of the cylinders are retracted to protect the cylinder rods. This will extend the life of the cylinder seals and reduce internal and external leaks.

By following and maintaining a routine service and lubrication program, your tillage equipment will give you many years of service.

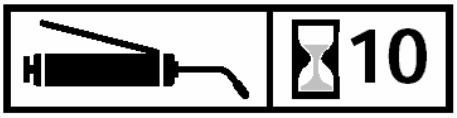
For more information on operating, adjusting or maintaining your Great Plains Discovator contact your local Great Plains dealer or call:

Great Plains Mfg. at (800) 255-9215

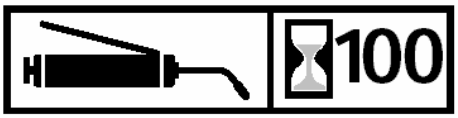
For the most current manual information visit the web site at: www.greatplainsmfg.com

Wheel Bearings
Grease every 50 hours (sparingly) and check for endplay.

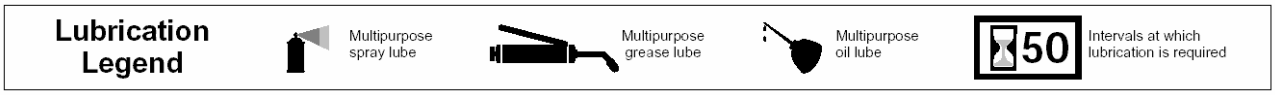
All Hinge Points
Grease every 10 hours.



Walking Beam Pivot Bearings
Grease every 100 hours (sparingly) and check for endplay.



Disc & Coulter Gang Bearings
Grease every 50 hours (sparingly).



Specifications and Capacities

Discovator Specifications

Model No.	Tilliage Width Sweep	Tilliage Width Disc	Number of Sweeps	Number of Disc	Section Size Center	Section Size 1st	Section Size 2nd	Transport Height	Transport Width	Approx. Weight	Aprox. Horsepower
5110	10' 1"	8' 6"	17	14	6 1/2'				10' 2"	4,550	80-100
5315	15' 11"	15' 2"	27	22	6 1/2'	4 1/2'		8' 5"	10' 3"	6,910	115-135
6112	12' 5"	11' 10"	21	18	10'				12' 5"	5,030	90-110
6318	18' 3"	17' 10"	31	26	10'	4'		7' 3"	13' 9"	8,190	135-155
6320	21' 9"	20' 6"	37	30	10'	6 1/2'		9' 7"	13' 9"	8,830	165-185
6324	24' 1"	23' 2"	41	36	10'	7'		10' 9"	13' 9"	10,380	180-200
6326	26' 5"	25' 10"	45	38	10'	8 1/2'		11' 11"	13' 9"	11,050	215-235
6328	28' 9"	28' 6"	49	42	10'	9 1/2'		13' 1"	13' 9"	11,890	255-275
6536	35' 9"	35'	61	52	10'	8 1/2'	4'	12' 10"	13' 9"	14,670	275-295
6542	42' 9"	42' 6"	73	62	10'	9 1/2'	6 1/2'	13' 1"	13' 9"	17,390	330-350
7333	33' 5"	32' 4"	57	48	12'	10 1/2'		13' 5"	16' 1"	13,020	260-280
7336	35' 9"	35'	61	52	12'	12'		15' 8"	16' 1"	13,940	275-295
7548	47' 5"	46' 10"	81	70	12'	10 1/2'	6 1/2'	14' 3"	16' 1"	20,200	370-390
7552	52' 1"	51' 6"	89	76	12'	10 1/2'	9'	14' 3"	16' 8"	21,050	390+

With a continued commitment to constantly improving our products, these specifications are subject to change without notice.

Appendix

Torque Values Chart for Common Bolt Sizes

Bolt Size (inches)	Bolt Head Identification: Grade 2		Grade 5		Grade 8	
in-tpi[1]	N · m[2]	ft-lb[3]	N · m	ft-lb	N · m	ft-lb
1/4" - 20	7.4	5.6	11	8	16	12
1/4" - 28	8.5	6	13	10	18	14
5/16" - 18	15	11	24	17	33	25
5/16" - 24	17	13	26	19	37	27
3/8" - 16	27	20	42	31	59	44
3/8" - 24	31	22	47	35	67	49
7/16" - 14	43	32	67	49	95	70
7/16" - 20	49	36	75	55	105	78
1/2" - 13	66	49	105	76	145	105
1/2" - 20	75	55	115	85	165	120
9/16" - 12	95	70	150	110	210	155
9/16" - 18	105	79	165	120	235	170
5/8" - 11	130	97	205	150	285	210
5/8" - 18	150	110	230	170	325	240
3/4" - 10	235	170	360	265	510	375
3/4" - 16	260	190	405	295	570	420
7/8" - 9	225	165	585	430	820	605
7/8" - 14	250	185	640	475	905	670
1" - 8	340	250	875	645	1230	910
1" - 12	370	275	955	705	1350	995
1-1/8" - 7	480	355	1080	795	1750	1290
1 1/8" - 12	540	395	1210	890	1960	1440
1 1/4" - 7	680	500	1520	1120	2460	1820
1 1/4" - 12	750	555	1680	1240	2730	2010
1 3/8" - 6	890	655	1990	1470	3230	2380
1 3/8" - 12	1010	745	2270	1670	3680	2710
1 1/2" - 6	1180	870	2640	1950	4290	3160
1 1/2" - 12	1330	980	2970	2190	4820	3560

Bolt Size (metric)	Bolt Head Identification: Class 5.8		Class 8.8		Class 10.9	
mm x pitch[4]	N · m	ft-lb	N · m	ft-lb	N · m	ft-lb
M 5 X 0.8	4	3	6	5	9	7
M 6 X 1	7	5	11	8	15	11
M 8 X 1.25	17	12	26	19	36	27
M 8 X 1	18	13	28	21	39	29
M10 X 1.5	33	24	52	39	72	53
M10 X 0.75	39	29	61	45	85	62
M12 X 1.75	58	42	91	67	125	93
M12 X 1.5	60	44	95	70	130	97
M12 X 1	90	66	105	77	145	105
M14 X 2	92	68	145	105	200	150
M14 X 1.5	99	73	155	115	215	160
M16 X 2	145	105	225	165	315	230
M16 X 1.5	155	115	240	180	335	245
M18 X 2.5	195	145	310	230	405	300
M18 X 1.5	220	165	350	260	485	355
M20 X 2.5	280	205	440	325	610	450
M20 X 1.5	310	230	650	480	900	665
M24 X 3	480	355	760	560	1050	780
M24 X 2	525	390	830	610	1150	845
M30 X 3.5	960	705	1510	1120	2100	1550
M30 X 2	1060	785	1680	1240	2320	1710
M36 X 3.5	1730	1270	2650	1950	3660	2700
M36 X 2	1880	1380	2960	2190	4100	3220

[1] in-tpi = nominal thread diameter in inches-threads per inch

[2] N· m = newton-meters

[3] ft-lb= foot pounds

[4] mm x pitch = nominal thread diameter in millimeters x thread pitch

Torque tolerance + 0%, -15% of torquing values. Unless otherwise specified use torque values listed above.

Tire Inflation Chart

Tire Size	Inflation PSI
6.70 x 15" 4-Ply	32
7.50 x 10" 10-Ply	80
9.5L x 15" 8-Ply Rib Implement	44
9.5L x 15" 12-Ply Rib Implement	64

Tire Size	Inflation PSI
11L x 15" 8-Ply Rib Implement	36
11L x 15" 12-Ply Rib Implement	52
11L x 15" F-Ply Rib Implement	90
12.5L x 15" F-Ply Rib Implement	90

Warranty

Great Plains Manufacturing, Incorporated warrants to the original purchaser that this tillage equipment will be free from defects in material and workmanship for a period of one year from the date of original purchase when used as intended under normal service conditions for personal use; 90 days for commercial or rental purposes. This Warranty is limited to the replacement of any defective part by Great Plains Manufacturing, Incorporated and the installation by the dealer of any such replacement part. Great Plains reserves the right to inspect any equipment or part which are claimed to have been defective in material or workmanship. This Warranty does not apply to any part or product which in Great Plains' judgment shall have been misused or damaged by accident or lack of normal maintenance or care, or which has been repaired or altered in a way which adversely affects its performance or reliability, or which has been used for a purpose for which the product is not designed. This Warranty shall not apply if the product is towed at a speed in excess of 20 miles per hour.

Claims under this Warranty must be made to the dealer which originally sold the product and all warranty adjustments must by made through such dealer. Great Plains reserves the right to make changes in materials or design of the product at any time without notice. This Warranty shall not be interpreted to render Great Plains liable for damages of any kind, direct, consequential, or contingent, to property. Furthermore, Great Plains shall not be liable for damages resulting from any cause beyond its reasonable control. This Warranty does not extend to loss of crops, losses caused by harvest delays or any expense or loss for labor, supplies, rental machinery or for any other reason.

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 Warranty is not valid unless registered with Great Plains Manufacturing, Incorporated within 10 days from the date of original purchase.