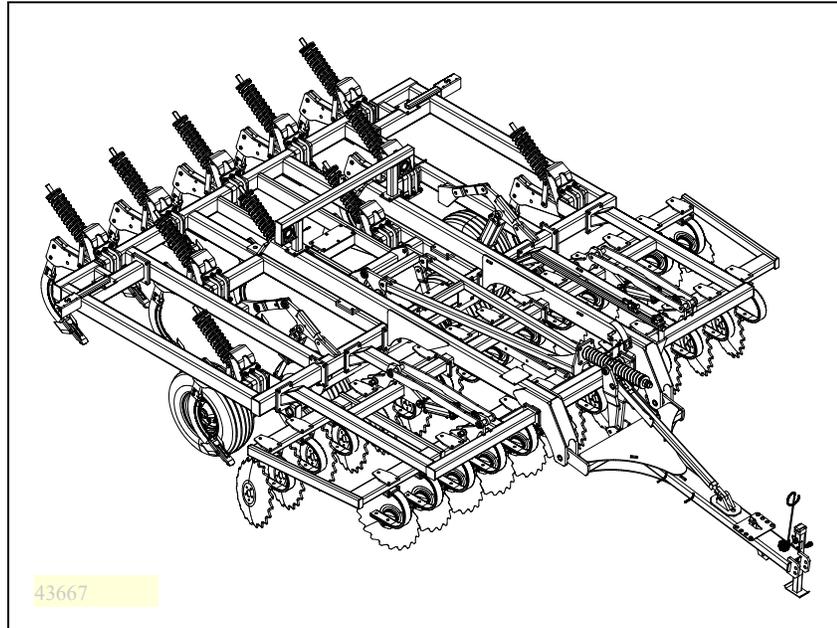


# Assembly Manual

MC5109, 5111, 5313 & 5315  
Max Chisel



*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!*



Illustrations may show optional equipment not supplied with standard unit.

ORIGINAL INSTRUCTIONS



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566-242Q-ENG

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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.

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.

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.

### Use Adequate Lifting Means

The frame sections and gangs of this machine are extremely heavy. If using multiple lifters, make sure each is rated for at least its share of the load.

### 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.*

### Be Familiar with Safety Decals

- ▲ *Read and understand the “Safety Decals” section of the Operators Manual.*
- ▲ *Read all instructions noted on the decals.*
- ▲ *Keep decals clean. Replace damaged, faded and illegible decals.*



## Wear Protective Equipment

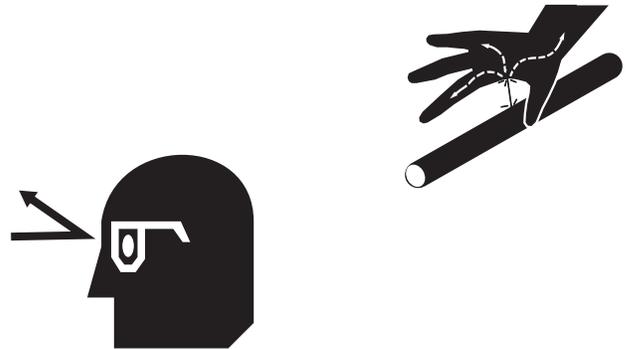
- ▲ *Wear protective clothing and equipment.*
- ▲ *Wear clothing and equipment appropriate for the job. Avoid loose-fitting clothing.*
- ▲ *Because prolonged exposure to loud noise can cause hearing impairment or hearing loss, wear suitable hearing protection such as earmuffs or earplugs.*
- ▲ *Because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



## 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, seek immediate medical assistance from a physician familiar with this type of injury.*



## 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



## Keep Riders Off Machinery

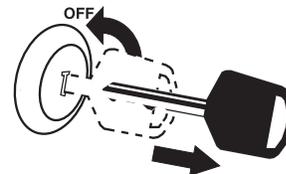
Riders obstruct the operator's view. Riders could be struck by foreign objects or thrown from the machine.

- ▲ *Never allow children to operate equipment.*
- ▲ *Keep all bystanders away from machine during operation.*



## Shutdown and Storage

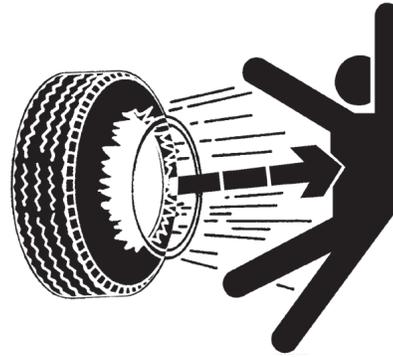
- ▲ *Lower implement, put tractor in park, turn off engine, and remove the key.*
- ▲ *Secure Max Chisel using blocks and supports provided.*
- ▲ *Detach and store Max Chisel in an area where children normally do not play.*



## Tire Safety

Tire changing can be dangerous and should be performed by trained personnel using correct tools and equipment.

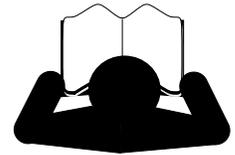
- ▲ *When inflating tires, use a clip-on chuck and extension hose long enough for you to stand to one side—not in front of or over tire assembly. Use a safety cage if available.*
- ▲ *When removing and installing wheels, use wheel-handling equipment adequate for weight involved.*



## Safety At All Times

Thoroughly read and understand the instructions in this manual before operation. Read all instructions noted on the safety decals.

- ▲ *Be familiar with all machine functions.*
- ▲ *Operate machinery from the driver's seat only.*
- ▲ *Do not leave machine unattended with tractor engine running.*
- ▲ *Do not stand between the tractor and machine during hitching.*
- ▲ *Keep hands, feet and clothing away from power-driven parts.*
- ▲ *Wear snug-fitting clothing to avoid entanglement with moving parts.*
- ▲ *Watch out for wires, trees, etc., when folding and raising machine. Make sure all persons are clear of working area.*





## Introduction

The Max Chisel has been designed with care and built by skilled workers using quality materials. Proper setup, maintenance, and safe operating practices will help the customer get years of satisfactory use from the machine.

### Description of Unit

The MC5109-5315 Max Chisel is a one or three-section “vertical” tillage tool. Working width ranges from 11’ 6” to 19’. The implement is designed to cut, size and bury residue. It can work up to 11” deep, will dislodge rootballs and leave the field smooth enough for “one pass” finishing in Spring. For optimum leveling of your machine, it should be equipped with either a Chopper Reel or Buster Bar attachment.

### Models Covered

MC5109	11-Foot 1-section
MC5111	14-Foot 1-section
MC5313	16-Foot 3-section
MC5315	19-Foot 3-section

### Document Family

566-242Q-ENG	Assembly Manual (this document)
566-242Q	Pre-Delivery Manual
566-242M	Operator Manual
566-242P	Parts Manual

### Tools Required

- Basic Hand Tools
- Torque Wrench
- Fork Truck, Overhead Hoist or Loader

### Pre-assembly Checklist

1. Before assembling, read and understand “Important Safety Information” in front part of this manual.
2. Have at least two people on hand while assembling.
3. Make sure area is level and free of obstructions (preferably an open concrete area).
4. Have all major components
5. Have all fasteners and pins shipped with machine.

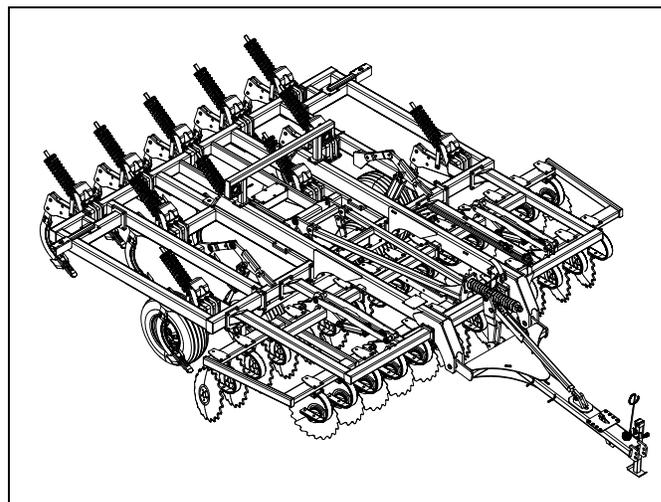


Figure 1  
Max Chisel

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## Using This Manual

This manual was written to help you assemble and prepare the new machine for the customer. The manual includes instructions for assembly and setup. Read this manual and follow the recommendations for safe, efficient and proper assembly and setup.

An operator's and parts manual is also provided with the new machine. Read and understand "**Important Safety Information**" and "**Operating Instructions**" in the operator's manual before assembling the machine. Refer to the parts manual for proper part's identification. As a reference, keep the operator's and part's manual on hand while assembling.

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.

#### NOTICE

*A crucial point of information related to the preceding topic. Read and follow the directions to remain safe, avoid serious damage to equipment and ensure desired field results.*

 Useful information related to the preceding topic.

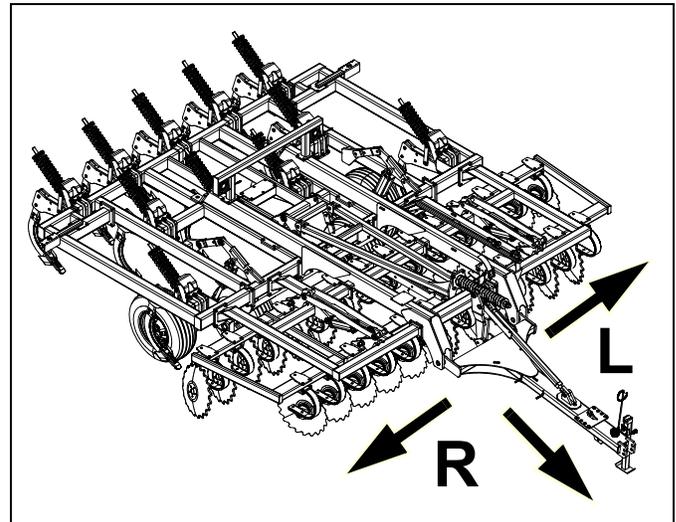
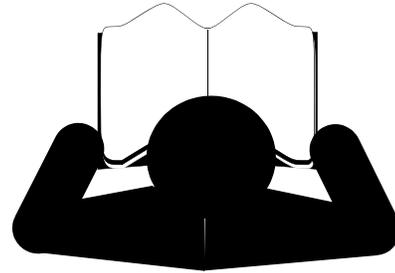
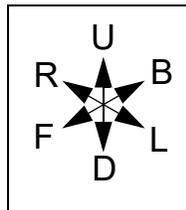


Figure 2  
Right / Left

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Right-hand and left-hand as used in this manual are determined by facing the direction the machine will travel while in use unless otherwise stated. An orientation rose in some line art illustrations shows the directions of: Up, Back, Left, Down, Front, Right.



## Shipping Inventory

The Max Chisel will be shipped unassembled as shown in a big shipping rack and shipping boxes on pallets. The only parts that will be assembled are the turbo gang assemblies and reel attachment assemblies. The reel attachments (if equipped) will be banded together with the gang assemblies on pallet.

Refer to Figure 3

- All frame sections, hitch and torque tubes will be shipped in shipping container.



Figure 3  
Shipping Rack

41356

Refer to Figure 4

- Shank parts (mount assembly and shank assembly), small parts and bolts will be shipped in boxes. Rear attachment big parts will be banded to attachment smaller parts box.

Shipping containers do not need to be returned to Great Plains.



Figure 4  
Shipping Boxes

41621

## Unloading

Once everything is unloaded from “storage pod” you may proceed with taking parts out of shipping containers. Carefully move everything to level site and prepare to un pack items.

## Unpacking Components

Be sure you have read and understood the Important Safety Information, starting on page 1 of this manual, before you start unpacking components.

### Centering components:

Be sure and center fork truck or chains (overhead hoist) on components so they won’t slide and cause injury.

Carefully un-band components.

Now unload individual components one at a time using a fork truck or overhead hoist.

Move each component out of the way so you have plenty of room to remove the next one.

## Unload Smaller Items First

Unloading the frames is a potentially dangerous operation.

Reduce risk and complication by first unloading

6. the tire wheel assemblies,
7. the smaller items

Place these components well out of the maneuvering area needed for unloading the gang assemblies and frames.

8. Carefully unload the Frames and hitch out of shipping rack

## Unpacking Boxes

9. Carefully remove banding and lids from boxes.
10. Locate and identify all components before assembling.

## Further Assistance

Great Plains Manufacturing, Inc. wants you to be satisfied with your new Turbo Chisel Narrow. If for any reason you do not understand any part of this manual or are otherwise dissatisfied with the product please contact:

**Great Plains Service Department  
1325 E. North St.  
PO Box 5060  
Salina, KS 67402-5060**

Or go to [www.greatplainsag.com](http://www.greatplainsag.com) and follow the contact information at the bottom of your screen for our service department.



# Assembly

## Center Transport

Refer to Figure 5 & Refer to Figure 6

11. Once the center Frame has been uncrated, carefully turn the center frame upside down and set on blocks to assemble torque tube/walking beam assembly.
  12. Carefully raise the torque tube assembly ① with an overhead hoist and secure with 1.25 x 7.59 pins ②,  $\frac{3}{8}$  x  $2\frac{1}{4}$  Gr. 8 special thread hex bolts ③ and  $\frac{3}{8}$  top lock nut.
  13. Locate walking beams ⑧ and install on to the center torque tube using center pivot spindle ⑨ and spindle sleeve ⑩, 2 machine washers ⑪ which are to be installed on the outside of the walking beam, secure the spindle with  $1\frac{1}{2}$  slotted hex nut ⑫ and  $\frac{1}{4}$  cotter pin.
  14. Install pre-assembled hub assembly ④ into torque tube/walking beam assembly ①. Align hole in spindle with hole in torque tube/walking beam assembly, secure with  $\frac{1}{2}$  x  $4\frac{1}{2}$  hex bolt ⑤ and  $\frac{1}{2}$  top lock nut.
  15. Attach the tire/wheel assembly ⑥ to hub assembly ④ and secure with  $\frac{5}{8}$  lug nuts ⑦.
16. All bolts may be tightened to specs, See “**Torque Values Chart**” on page 24.
-  Fasten the bottom of the torque tube to frame with chain or straps so it does not swing down and hit something while turning center frame over. Carefully use hoist to turn center frame over and set on stands to finish assembling components.

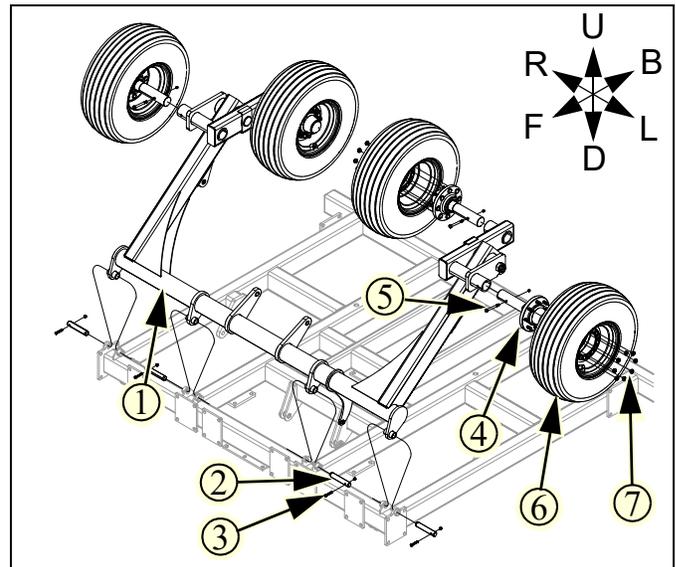


Figure 5  
Center Transport

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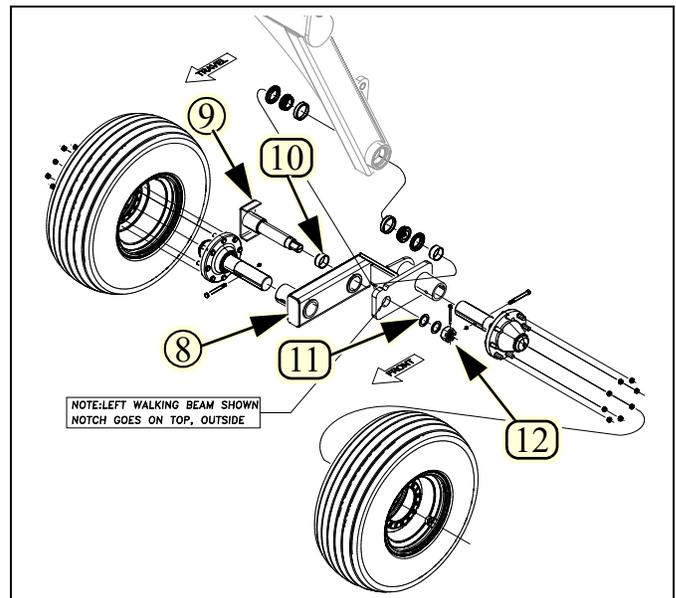


Figure 6  
Center Transport

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**NOTICE**

To make installing the gang frames easier leave them off and out of the way until the hydraulics have been routed, hooked up and purged of air. This way you can use the hydraulics to lower the machine down to install pins.

**Trusses & Brace Bars**

Refer to Figure 7

17. With the rear section of the center frame on assembly stands attach the left and right frame trusses (18), using  $1\frac{1}{4}$  x  $8\frac{1}{2}$  Gr. 8 Special Thread Bolt (19), lock washers and hex nuts, to the rear section of the frame.
18. Bolt the truss cross braces (20), to the inside of the center trusses (18), using  $\frac{5}{8}$  x 2 Gr. 5 bolts (20), lock washers and hex nuts.
19. Using  $\frac{5}{8}$  x 2 Gr. 5 bolts (21), lock washers and hex nuts, install the left (22) and right (23) brace bars to the center trusses.
20. Secure the Center Cylinder Lift Bracket (24), and the rear sub frame lift brackets (25) to the left and right center frame brace bars (22 & 23) using  $1\frac{1}{4}$  x  $6\frac{3}{4}$  hardened pins (26),  $\frac{1}{2}$  x  $2\frac{5}{8}$  Gr. 8 special thread bolts (27), and top locks.
21. Install the hydraulic cylinders (28), to lift brackets using clevis pin, washer and cotter pin, before connecting lift straps to the center cylinder lift bracket.
22. Bolts may be tightened to specs, See “Torque Values Chart” on page 24.

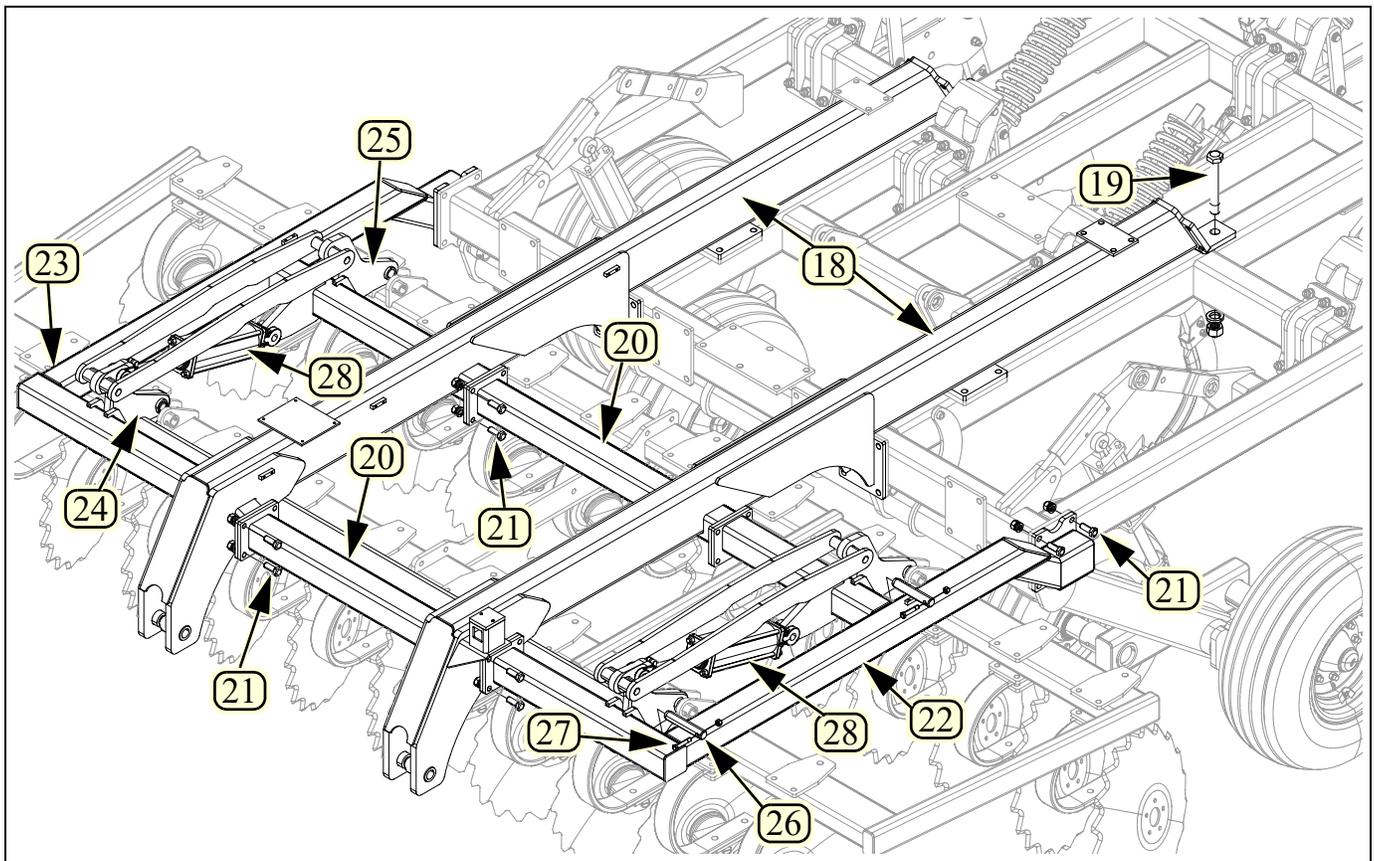


Figure 7  
Trusses & Brace Bars

43731

## Lift Straps

Refer to Figure 8

 Be sure to connect hydraulic cylinders to the Center Cylinder Lift Bracket, before installing lift straps.

23. Attach the left gang frame lift strap ①, & strap ②, to the rear sub frame lift brackets ③ and the Center Cylinder Lift Bracket ④ using 1 x 7<sup>3</sup>/<sub>4</sub> Gr. 8 Special Thread Bolt ⑤ and top lock nuts. Repeat this for the right side.
24. Now the hydraulic cylinders ⑥ may be attached to the left and right center frame brace bars ⑦ using clevis pin, washer, and cotter pin.
25. Bolts may be tightened to specs, See “**Torque Values Chart**” on page 24.

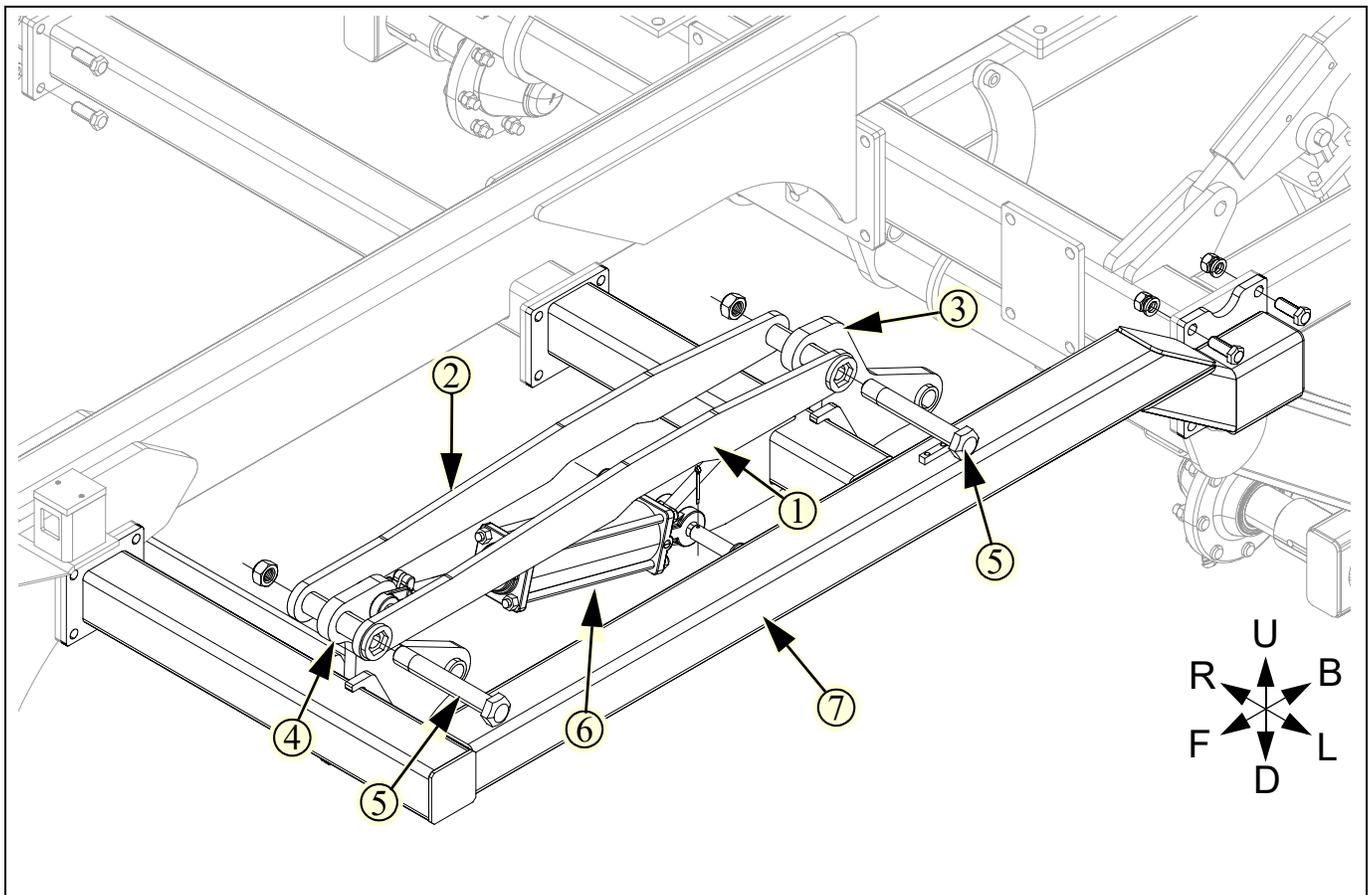


Figure 8  
Lift Straps

43730

## Hitch & Level Bar Assembly

Refer to Figure 9

26. Attach hitch assembly (10) to front of trusses (11) with  $1\frac{1}{4}$  x 8 Gr. 8 hex bolts (12),  $1\frac{1}{4}$  flat washers (13) and  $1\frac{1}{4}$  lock nuts. Be sure to insert the two  $1\frac{1}{4}$  flat washers (13) (one on each side of hitch uni-ball) to ensure tight fit. Bolts need to be tightened securely, but do not torque as the hitch needs to pivot.
  27. Slide the level bar assembly (14) into place. On folding models slide the level bar assembly (14) under fold cylinders (as this will be attached to the leveling h-bracket as shown).
  28. The leveling h-bracket (15) will be installed on the center frame. Use 1 x 4 Gr. 8 special thread hex bolts (16), top lock, and nuts to secure the level bar assembly to the leveling h-bracket (15).
  29. Attach the level bar spring rod (17), to the level bar assembly (14) with  $\frac{3}{4}$  x  $1\frac{1}{2}$  Gr. 8 hex bolts (18), lock washers and hex nuts.
  30. With the level bar spring rod in place, remove the  $1\frac{1}{2}$  jam nut (19),  $1\frac{1}{2}$  hex nut (20), spring guide (21) and front half of compression spring (22). Slide the h-bracket (23) onto the level bar spring rod (17), and reinstall spring (22), spring guide (21), hex nut (20) and jam nut (19).
  31. Install the h-bracket (23), to the rear of the hitch using 1 x 7 Gr 8 hex bolt (24), and top lock nut, do not torque as this needs to pivot. Connect the hitch turnbuckle (25) (with the turnbuckle lock in place) to the h-bracket with  $1\frac{1}{4}$  x  $8\frac{1}{2}$  Gr. 8 Special Thread bolt (26), and top lock. Use a 1 x 3.63 clevis pin (27), washer and cotter pin to connect the turnbuckle to the hitch.
  32. The Level Bar Spring nuts should be tightened so that the dimension from the spring guide to the back of the level bar is  $28\frac{1}{4}$ " (see illustration inset.)
-  Tongue jack may be adjusted up or down to get holes to align up to install pin through the turnbuckle.
33. Tighten all bolts securely but do not torque as the level bar assembly needs to pivot.

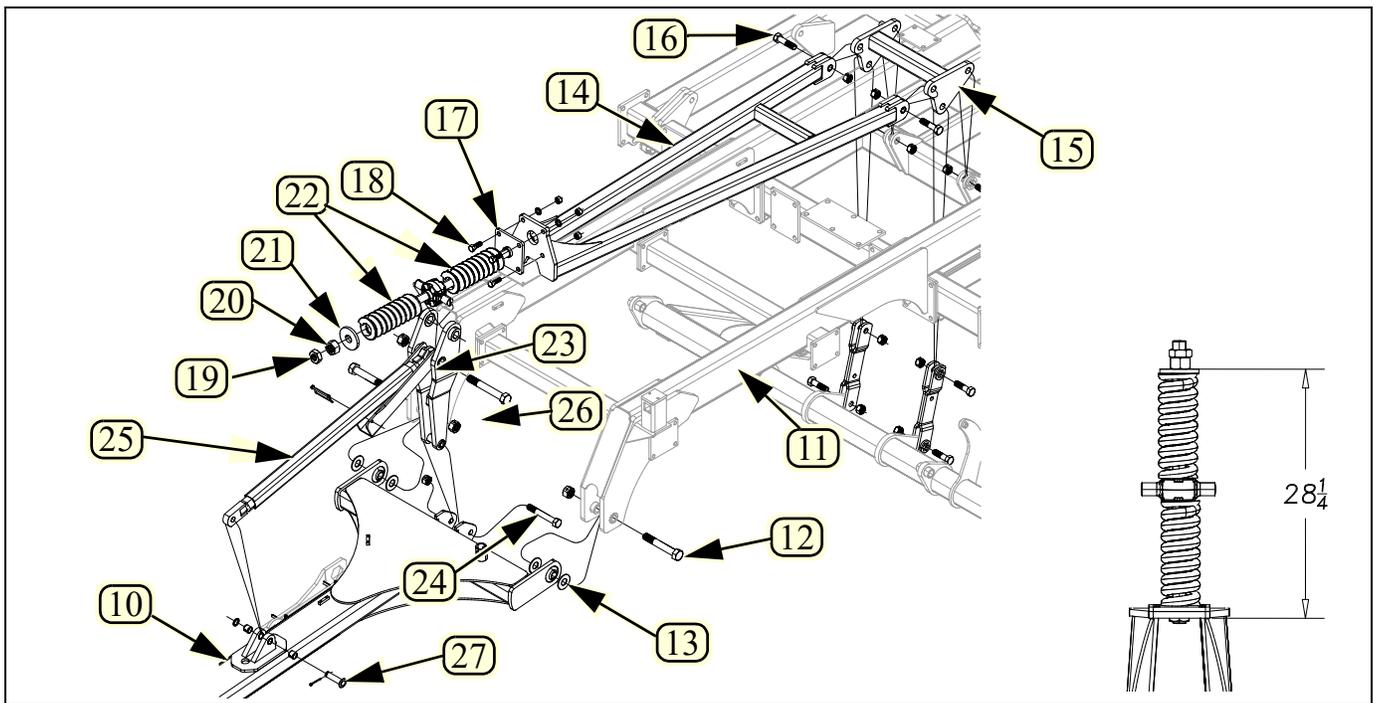


Figure 9  
Hitch & Level Bar

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### Center Fold

Refer to Figure 10

34. On Models 5313 -5315 install center fold bracket ① and rebound valve bracket ② to front center frame plate with  $\frac{3}{4}$  x  $2\frac{1}{2}$  hex bolts ③,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts.
35. Attach center wing stop ④ (Models 5313 & 5315 only) to truss plates with  $\frac{5}{8}$  x  $1\frac{1}{2}$  hex bolts ⑤,  $\frac{5}{8}$  lock washers and  $\frac{5}{8}$  nuts.
36. Attach bolt on wing pivots ⑥ on side of center frame with  $\frac{3}{4}$  x  $2\frac{1}{4}$  hex bolts ⑦,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts.
37. Attach 12ga ⑧ 16ga ⑨ shim's as needed with  $\frac{3}{4}$  x  $1\frac{1}{2}$  hex bolts ⑩,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts to level wings.
38. Models 5109-5115 attach rigid smv & light bracket ⑫ to rear truss plates with  $\frac{5}{8}$  x  $1\frac{1}{2}$  hex bolts ⑤,  $\frac{5}{8}$  lock washers and  $\frac{5}{8}$  nuts.
39. Attach SMV sign ⑬ to either center wing stop ④ or rigid smv & light bracket ⑫ with  $\frac{1}{4}$  x  $\frac{3}{4}$  pan head screws ⑭,  $\frac{1}{4}$  lock washers and  $\frac{1}{4}$  hex nuts.
40. Models 5313-5315 attach rebound valve ⑮ with  $\frac{5}{16}$  x 4 hex bolts ⑩,  $\frac{5}{16}$  lock washers and  $\frac{5}{16}$  nuts.
41. Attach double block tee ⑱ with  $\frac{5}{16}$  x  $3\frac{1}{2}$  hex bolts ⑩,  $\frac{5}{16}$  lock washers and  $\frac{5}{16}$  nuts.
42. Tighten all bolts to specs, See "Torque Values Chart" on page 24.

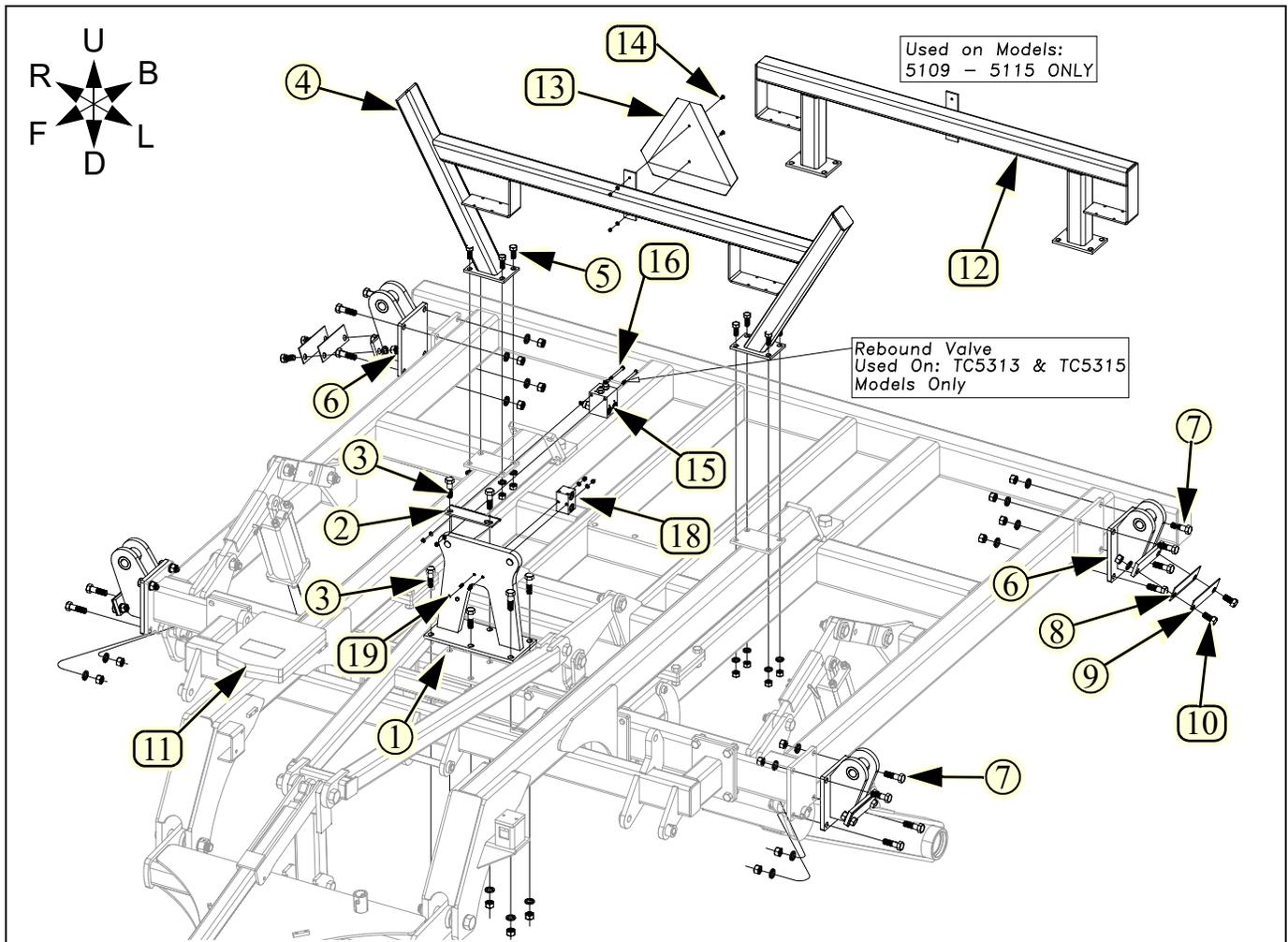


Figure 10  
5109-5315 Center Fold  
Refer to Figure 11

42680

### 5313-5315 Wings

43. Carefully align holes in wing frame LH and RH ① with holes on center frame hinges. Secure with  $1\frac{1}{4}$  x 8 Gr. 8 hex bolt ② and  $1\frac{1}{4}$  top lock nut.
- 📖 Tighten bolts snug but do not over-tighten as wings need to pivot freely.
44. Attach left or right wing brace bar ③ to wing frame plates with  $\frac{3}{4}$  x 2 hex bolts ④,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  hex nuts.
45. Attach the LH or RH Center Brace bar ⑨ to the front of the center frame using  $\frac{3}{4}$  x 2 hex bolts ⑧,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  hex nuts.
- 📖 Wing shank mounts ⑤ are only used on some models, see machine and attachment layout drawings in Appendix for proper placement.
46. Install wing shank mounts ⑤ to wing frame plate with  $\frac{3}{4}$  x  $2\frac{1}{2}$  hex bolts ⑥,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts.
47. Attach base end of the 4 x 30 x 2 fold cylinders ⑦ to center fold bracket with 1 x  $3\frac{3}{8}$  pins ⑧, 1.5 x 1.0 x .075 machine washer and  $\frac{3}{16}$  x 2 cotter pin.
- 📖 Do not attach rod end of the 4 x 30 x 2 fold cylinders ⑦ to wing cylinder lug ⑤ until fold cylinders have been purged of air, See “**Purging Hydraulic System**” on page 20.
- Tighten all bolts to specs, See “**Torque Values Chart**” on page 24.

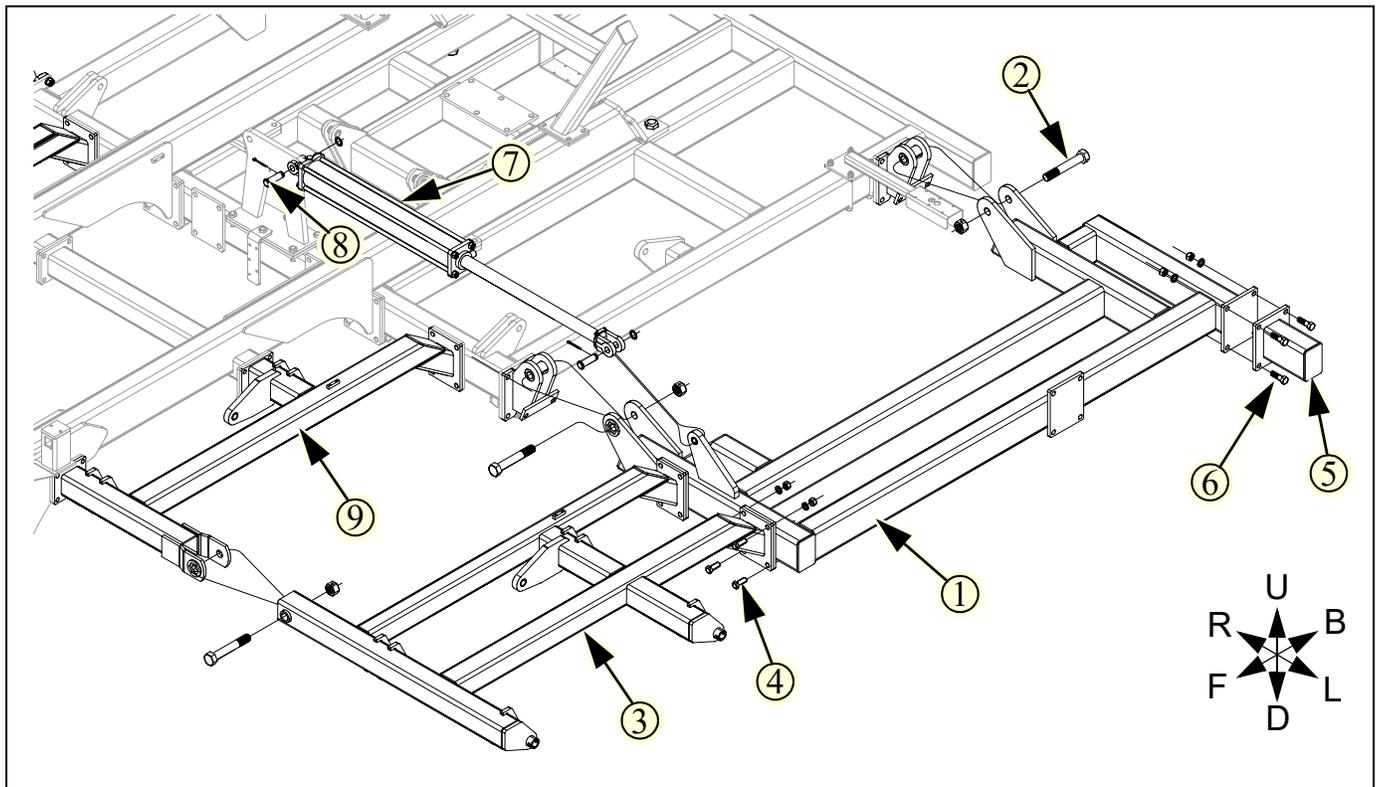


Figure 11  
5313-5315 Wings

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## 569-190S Shank

See machine layouts in Appendix for proper shank placement. The shank mount assemblies will be shipped pre assembled from factory in two parts in boxes. There will be a mount assembly and a shank assembly.

Refer to Figure 12

48. Install the mount assembly ① to the rear side of tubes. Install front mount bracket ② on front of tubes, align holes, secure with  $\frac{3}{4}$  x  $2\frac{1}{2}$  hex bolts ③,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts. Slide these two parts over frame tube in proper location.
49. Attach the upper hole of shank assembly ④ with  $\frac{3}{4}$  x 4 hex bolts ⑤,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts. Attach the lower hole of shank assembly ④ with  $\frac{5}{8}$  x 4 hex bolts ⑥,  $\frac{5}{8}$  lock nut.
50. Tighten all bolts to specs, See “**Torque Values Chart**” on page 24.

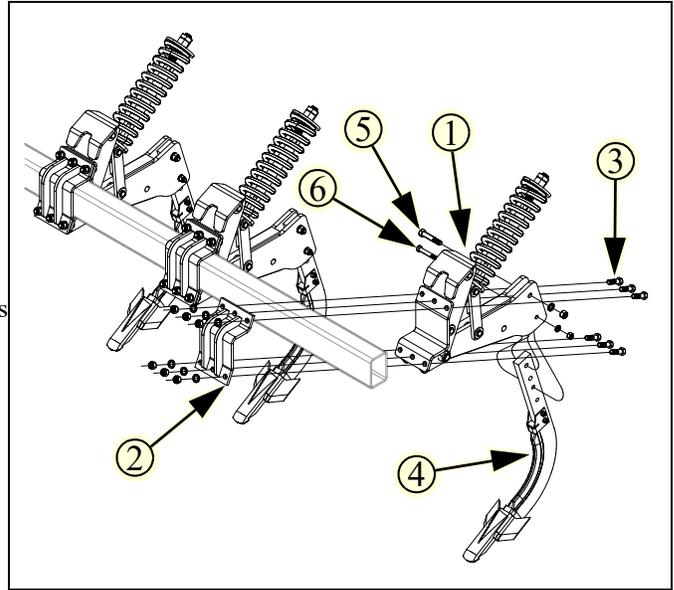


Figure 12  
569-190S Shank

42011

## 569-196S Shank

Refer to Figure 13

51. Install the mount assembly ① to the rear side of tubes. Install front mount bracket ② on front of tubes, align holes, secure with  $\frac{3}{4}$  x  $2\frac{1}{2}$  hex bolts ③,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts. Slide these two parts over frame tube in proper location.
52. Attach the shank assembly ④ with  $\frac{5}{8}$  x  $4\frac{1}{2}$  hex bolt ⑤,  $\frac{5}{8}$  lock washer and  $\frac{5}{8}$  nut (rear hole),  $\frac{1}{2}$  x 3 hex bolt ⑥,  $\frac{1}{2}$  lock washer and  $\frac{1}{2}$  nut (front hole).
53. Tighten all bolts to specs, See “**Torque Values Chart**” on page 24.

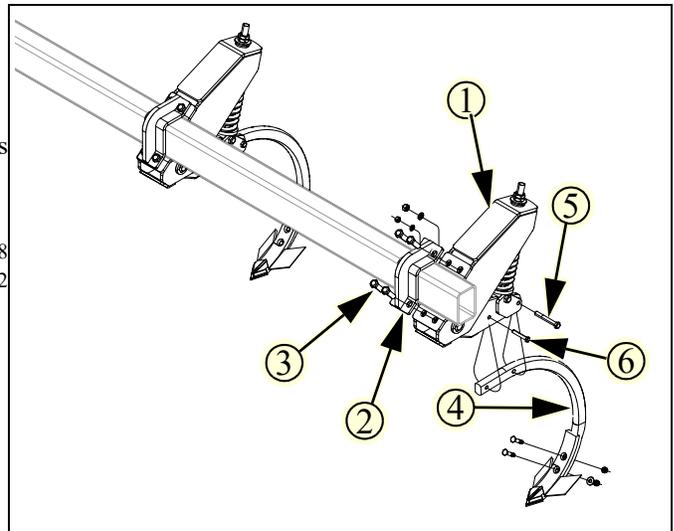


Figure 13  
569-196S Shank

42012

## Hydraulic Hose Assembly

📖 No hoses will be attached to this machine they will be shipped in one of the boxes. See “**Appendix**” on page 24 for hose routing. All the hydraulic hoses will need to be routed underneath the turnbuckle on the hitch. Use metal hose clamps and  $\frac{5}{16}$  bolts to secure hoses to the hose clamp brackets that are welded along the machine frame. The electrical wires need to be routed on the outside of the turnbuckle bracket on the hitch and secured to the hydraulic hoses with zip ties.

## Depth Gauge

Refer to Figure 14

54. Install the depth gauge bracket ① to the center frame with  $\frac{1}{2}$  x  $4\frac{1}{32}$  x  $5\frac{1}{4}$  u-bolts ②,  $\frac{1}{2}$  lock washers and  $\frac{1}{2}$  nuts.
- 📖 See “**MC5109-5111 Hydraulic Gang Layout**” on page 28 for correct depth gauge bracket placement.
55. Attach the gang depth gauge link assembly ③, to the depth gauge ①, and the center lift bracket ④, with  $\frac{5}{16}$  x  $1\frac{1}{4}$  hex bolts ⑤, and top locks.
- 📖 The level indicator decal may need to be applied to the depth gauge.
56. Tighten all u-bolts to specs, See “**Torque Values Chart**” on page 24. Tighten the three lock nuts up snug, but be sure the links will pivot.

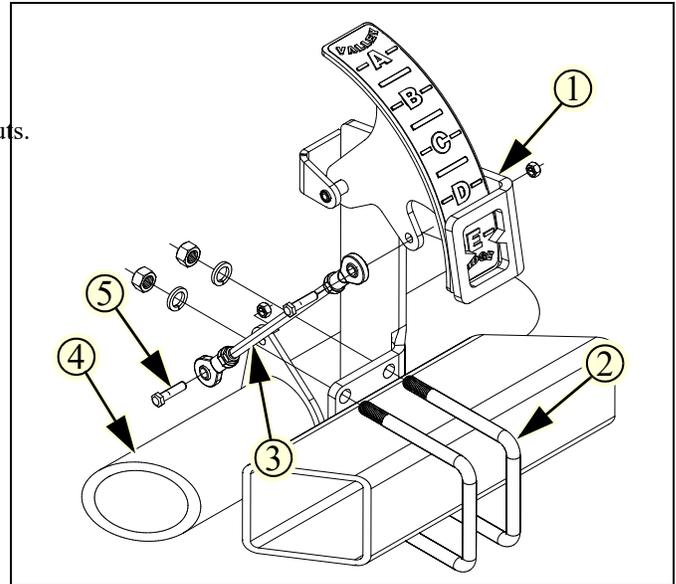


Figure 14  
Depth Gauge

43721

## Hydraulic Valve Bracket

Refer to Figure 15

- 📖 The hydraulic valve bracket will be installed in place on the front of the center frame, but will need to be reoriented so it hangs down.
57. Remove the hydraulic valve bracket ①, & reorient it so that it hangs down from the center frame mounting plate ②, reinstall the  $\frac{3}{4}$  x 2 Gr. 5 hex bolt ③, lock washer and hex nut. The double hydraulic tee block ④, and the lock valve ⑤, will already be installed on the bracket.
58. The hydraulic lift and gang frame hoses that are routed from the hitch will need to be hooked to the correct valves.
59. See “**MC5109-MC5315 Hydraulic Lift Layout**” on page 26 for hose routing and hook up.

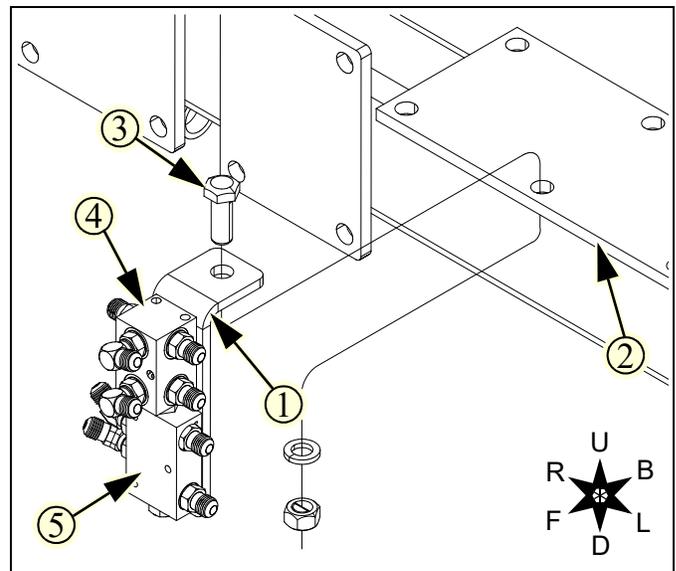


Figure 15  
Hydraulic Valve Bracket

43668

## Install Depth Control Valve and O-Ring Fittings

Refer to Figure 16

 Some hydraulic hoses will already be routed and installed. The following procedure is for any hoses that have not been connected, or have needed repair.

60. Inspect all components for damage or contamination during shipping.
61. Lubricate o-ring and threads on fitting.
62. Thread straight (non-adjustable stud) fittings into ports finger tight.
63. Thread elbow (adjustable stud) fitting ③ into side port of depth stop valve ①. Thread straight (non-adjustable stud) fittings ② into front port of depth control valve ①. Be sure there is an  $\frac{3}{4}$  metal o-ring plug ④ in the side that is not connected to a hose.

 Do not over tighten as this could cause damage to valves. Tighten as shown, See "**Torque Values Chart**" on page 24 or proper torque value.

64. Route hoses as shown in layout section in Appendix.
65. When the JIC hoses are routed, follow the following procedure for hooking up and tightening.
  - a. Inspect for possible contamination or damage from shipping or handling. Sealing surface should be smooth. Annular tool marks of (100uin) concentric with thread permissible.
  - b. Lubricate the threads and the entire surface of the cone with hydraulic fluid or a light lubricant.
  - c. Align mating components for hand connection and turn flare nut until sealing surfaces make full contact.
  - d. Torque nut to the values shown in "Torque Value Chart" page 23. If a wrench pad is provided next to nut, place a second wrench on pad to prevent flare from rotating while being torqued.
  - e. When torquing nut onto a straight flared fitting, it may be necessary to also place a wrench on the flared fitting wrench pad to prevent it from turning during assembly.
66. Alternate Assembly Method for JIC.
  - a. If torqued method not possible, then proceed to steps b-e.
  - b. Lightly wrench tighten the nut until there is firm resistance.
  - c. Place a wrench on wrench pad next to nut as near the 6 o'clock position as possible.
  - d. Place second wrench on nut as near the 3 o'clock position as possible.
  - e. Turn nut clockwise to no less than the 4 o'clock position and no more than the 6 o'clock position.

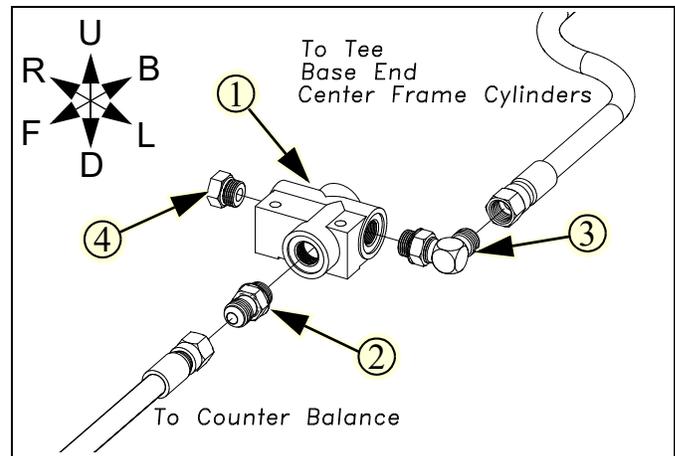


Figure 16  
Depth Control Valve Fittings

41671

Required rotation generally decreases as size increases.

## Valve, Fitting and Hose Assembly

Refer to hydraulic layouts in Appendix for complete hose routings

Refer to Figure 17

### Depth Stop

67. Align holes in depth control valve ① to top of depth stop valve mounting bracket using  $\frac{5}{16}$  x 2 hex bolts ② and  $\frac{5}{16}$  lock washers.
68. Slide one end of (with 2 holes) depth stop tube ③ through slotted hole in depth stop valve mounting bracket. Slide other end of depth stop tube ③ over lever on torque tube, secure with  $\frac{1}{2}$  x 3 hex bolt ④,  $\frac{1}{2}$  lock washer and  $\frac{1}{2}$  nut.
69. Bolt depth stop screw assembly ⑤ to front of depth stop tube ③ with  $\frac{1}{2}$  x  $2\frac{1}{2}$  hex bolts ⑥,  $\frac{1}{2}$  lock washers and  $\frac{1}{2}$  nuts.
70. Tighten all u-bolts to specs, See “**Torque Values Chart**” on page 24.

Install all hydraulic fittings as shown in steps below. See hydraulic layouts in Appendix for proper hose routing.

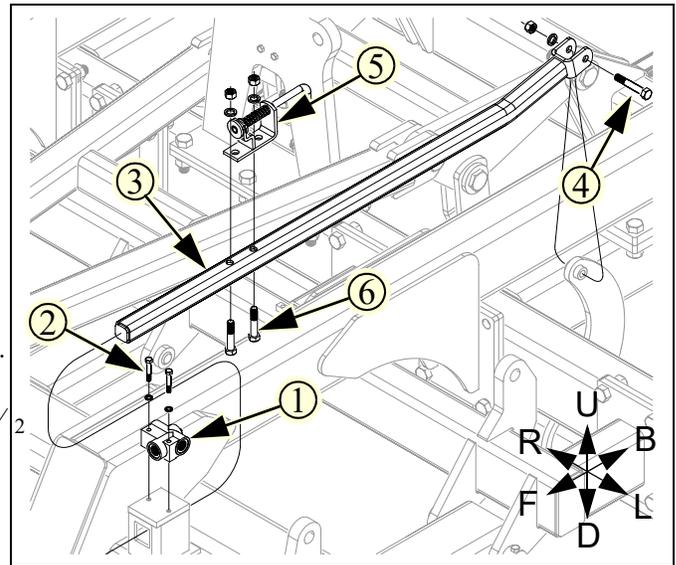


Figure 17  
Depth Stop

42684

### Install Rebound Valve and O-Ring Fittings

On Models MC5313 & 5315 Only

Refer to Figure 18

71. Thread straight (non-adjustable stud) fittings ③ into ports V1, V2 and C2 of rebound valve ①.
- ⓘ Tighten as shown below. Do not over tighten as this could cause damage to valves.
- a. Inspect all components for damage or contamination during shipping.
  - b. Lubricate o-ring and threads on fitting.
  - c. Turn fitting into port until finger tight, See “**Fittings Torque Values**” on page 25.
72. Thread elbow (adjustable stud) fitting ② into port C1 of rebound valve ①.
    - a. Follow steps a and b from the foregoing instructions, then proceed with the following steps below.
      - b. Looking at fitting from end with nut/washer/o-ring assembly, turn nut clockwise as far as possible.
    - a. Using wrench, turn fitting into port until the washer touches the port spot face. Continue turning fitting until washer touches thread nearest wrench pad.
    - b. Back off fitting counterclockwise not exceeding one revolution until it is oriented in the correct position.
    - c. Place wrench on the wrench pad of fitting to keep fittings from turning, See “**Fittings Torque Values**” on page 25,

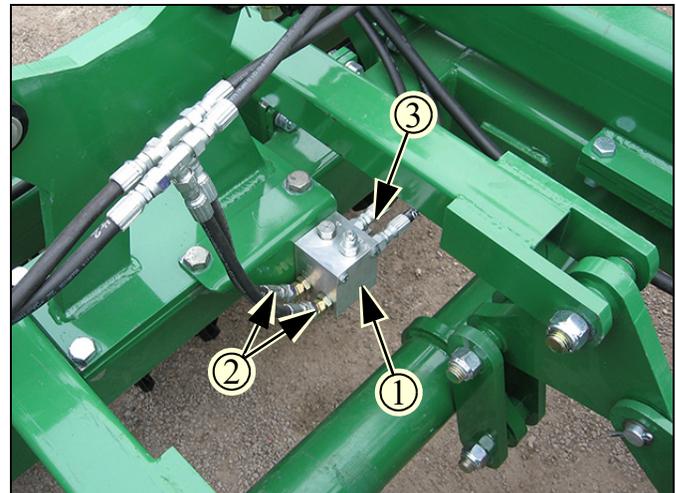


Figure 18  
Rebound Valve Fittings

42621

## Install Hose Handle and JIC Fittings

Refer to Figure 19

 Hose handles are color coded. See “**Hydraulic Hose Hookup**” on page 19 for proper placement on hoses.

73. Install fittings ② to end of hoses ① running to front of hitch. Attach poppet fittings ③ to fittings ②.
74. Tighten as shown in steps 102, 103.
75. Align the grooves in the front of the hose handles ④ with the ribs in the fittings ② as shown and install the self threading screws ⑤ through holes.
76. Route hoses as shown in layout section in Appendix.
77. When the JIC hoses are routed, follow the following procedure for hooking up and tightening.
  - a. Inspect for possible contamination or damage from shipping or handling. Sealing surface should be smooth. Annular tool marks of (100uin) concentric with thread permissible.
  - b. Lubricate the threads and the entire surface of the cone with hydraulic fluid or a light lubricant.
  - c. Align mating components for hand connection and turn flare nut until sealing surfaces make full contact.
  - d. Torque nut to, See “**Torque Values Chart**” on page 24. If a wrench pad is provided next to nut, place a second wrench on pad to prevent flare from rotating while being torqued.
  - e. When torquing nut onto a straight flared fitting, it may be necessary to also place a wrench on the flared fitting wrench pad to prevent it from turning during assembly.
78. **Alternate Assembly Method for JIC.**
  - a. If torqued method not possible, then proceed to the steps below.
  - b. Lightly wrench tighten the nut until there is firm resistance.
  - c. Place a wrench on wrench pad next to nut as near the 6 o'clock position as possible.
  - d. Place second wrench on nut as near the 3 o'clock position as possible.
  - e. Turn nut clockwise to no less than the 4 o'clock position and no more than the 6 o'clock position. Required rotation generally decreases as size increases.

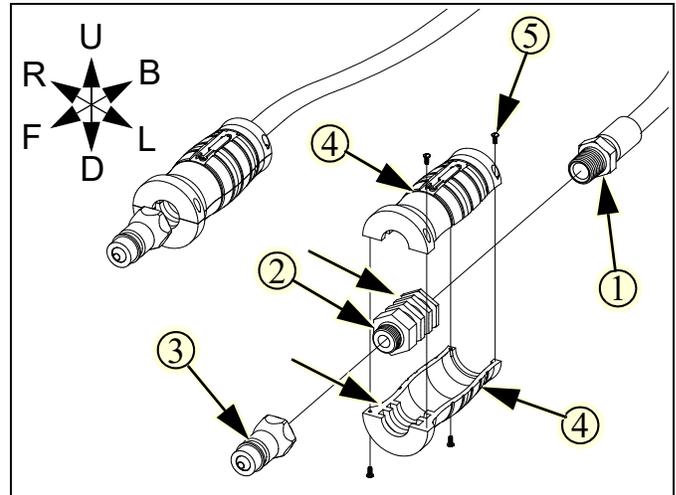


Figure 19  
Hose Handle

41672

### Attach Hose Clamps and Hose wraps

Refer to Figure 20

- 79. When all the hoses are hooked up and tightened properly, put hose clamps on hoses as shown.
- 80. Install hose wraps on hoses as needed.
-  Be sure and get hoses and light wiring harness fastened properly so they do not drag. Check to be sure there is enough slack in hinge area when folding machine the first time.

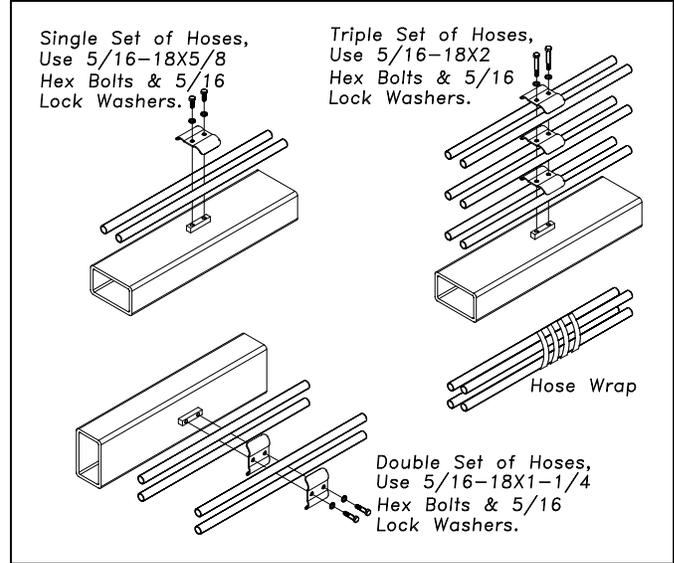


Figure 20  
Hose Clamp

41583

### Hydraulic Hose Hookup

- 81. Great Plains hydraulic hoses are color coded to help you hookup hoses to your tractor outlets. Hoses that go to the same remote valve are marked with the same color.

Color	Hydraulic Function
Black	Lift (2 hoses)
Green	Fold (2 hoses)
Red	Gang (2 hoses)

### WARNING

#### High Pressure Fluid Hazard:

Relieve pressure before disconnecting hydraulic lines. Use paper or cardboard, NOT BODY PARTS, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury. Only trained personnel should work on system hydraulics.



### Hose Handles

Refer to Figure 21

- 82. To distinguish hoses on the same hydraulic circuit, refer to hose handles. The hose under an extended-cylinder symbol feeds a cylinder base end. The hose under a retracted-cylinder symbol feeds a cylinder rod end.
- 83. Once all hoses are tightened, hook hoses to tractor

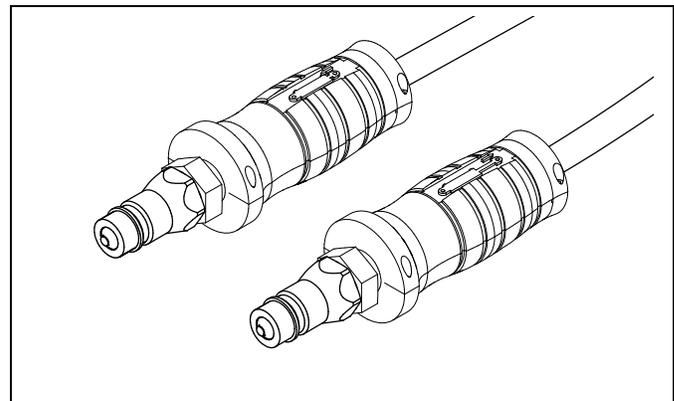


Figure 21  
Hose Handles

41552

## Purging Hydraulic System

Refer to Figure 22

84. Charge the lift system first. Extend the lift cylinders ① (black handles) until the center section is fully raised. Remove the cylinder transport locks ② and install in storage position. Raise and lower the lift system several times to purge air from system. Watch for leaks and re-tighten fittings if necessary.
85. The gang frame system ③ (red handles), will need purged. If your machine is a 3 section model the wing gangs will not start to rise until the center cylinders are fully extended and the master cylinders begin to bypass oil through the rephasing ports, to the wing cylinders. Continue to pump oil to the gang system until the wing gang cylinders are also fully extended. At this point, reverse the flow and lower the gangs, retracting all cylinders. Repeat this procedure several times until all the air is purged out of the system.
86. If your machine is a 3 section model you may now charge the fold system. Before charging the fold cylinders ④ make sure the rod end of the cylinders are un-pinned and block is under cylinder as shown, so that when the rod is extended, it will clear the wing fold brackets. Extend the fold cylinders ④ (green ends) completely and then close them. Extend and retract the cylinders to purge air from the system. Now the cylinders may be extended far enough to be connected to the wing fold brackets. Remove wood block and install the  $1 \times 3\frac{3}{8}$  clevis pin,  $1.5 \times 1.0 \times .075$  machine washer and  $\frac{3}{16} \times 2$  cotter pin.

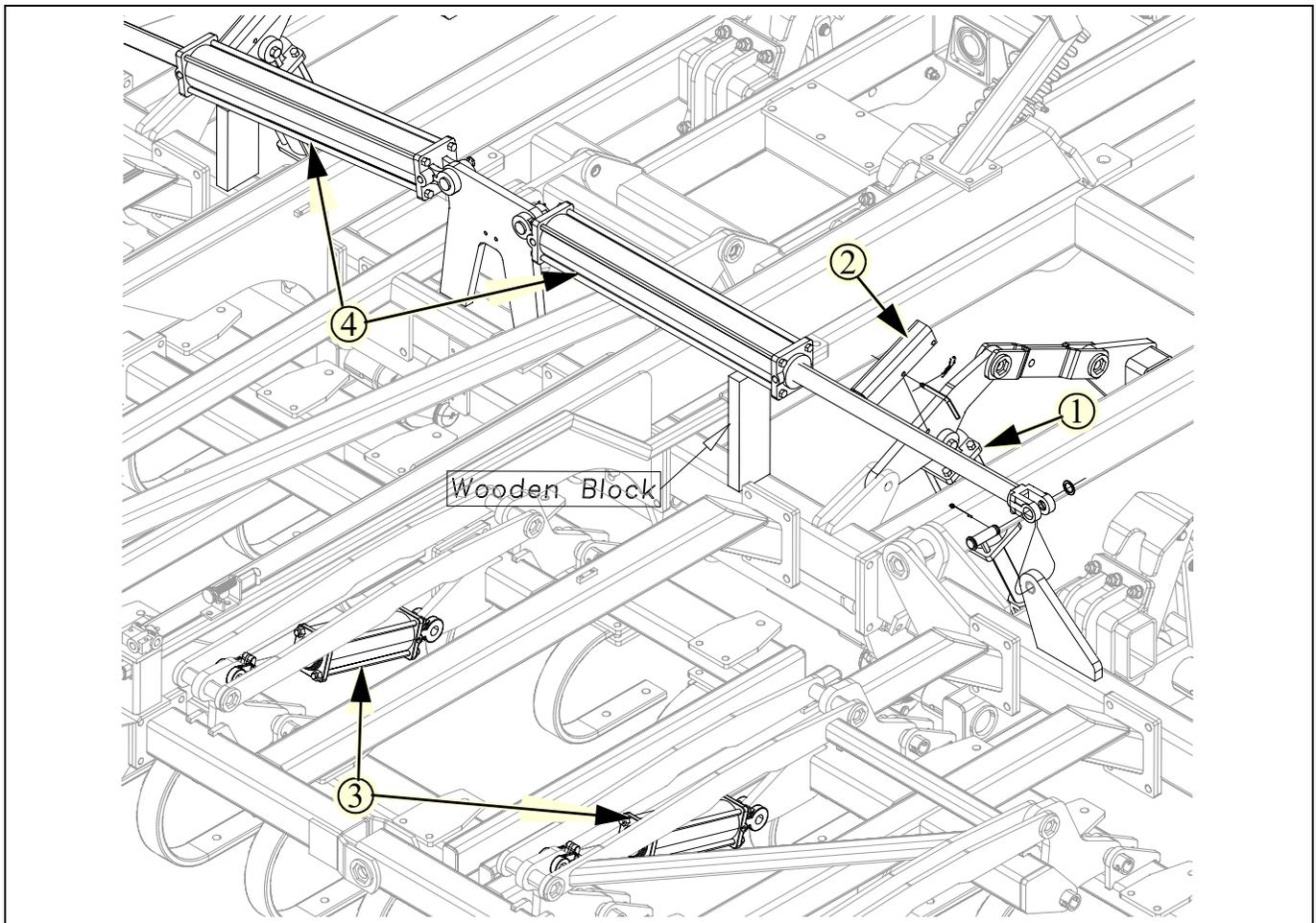


Figure 22  
Hydraulic Purging

43733

## Gang Frames

Refer to Figure 23

87. Carefully move the gang frames (10), & (11) into place in front of the center section, by slightly lifting with a fork truck and maneuvering them in from the side underneath the trusses.
88. For models MC5109 and MC5111 bolt the gang frames together using,  $\frac{5}{8}$  x  $2\frac{1}{2}$  Gr. 5 hex bolt (12),  $\frac{5}{8}$  lock washers and  $\frac{5}{8}$  hex nuts. Models MC5113-5315 will not need to be bolted together, the gang frame is 1 piece on these machines.
89. With the center cylinder lift bracket (13), lift straps (14), hydraulic cylinders (15) and rear sub frame lift brackets (16) already assembled and installed on the brace bars, use  $1\frac{1}{4}$  x  $6\frac{3}{4}$  hardened pin (17),  $1\frac{1}{2}$  x  $2\frac{5}{8}$  Gr. 8 special thread bolt (18), and top lock to secure the gang frames to the center frame brace bars. If the hydraulics have already been installed and purged of air this can be done more easily by lowering the machine down on to the gang frame.
90. Attach hydraulic cylinders (15), to the rear of the gang frames (10) & (11), with clevis pin, washer, and cotter pin.
91. Repeat with wing gang frames if your machine has wings.
-  Be sure to connect hydraulic cylinders to center cylinder lift bracket, before installing lift straps.
92. Bolt may be tightened to specs, See “**Torque Values Chart**” on page 24.

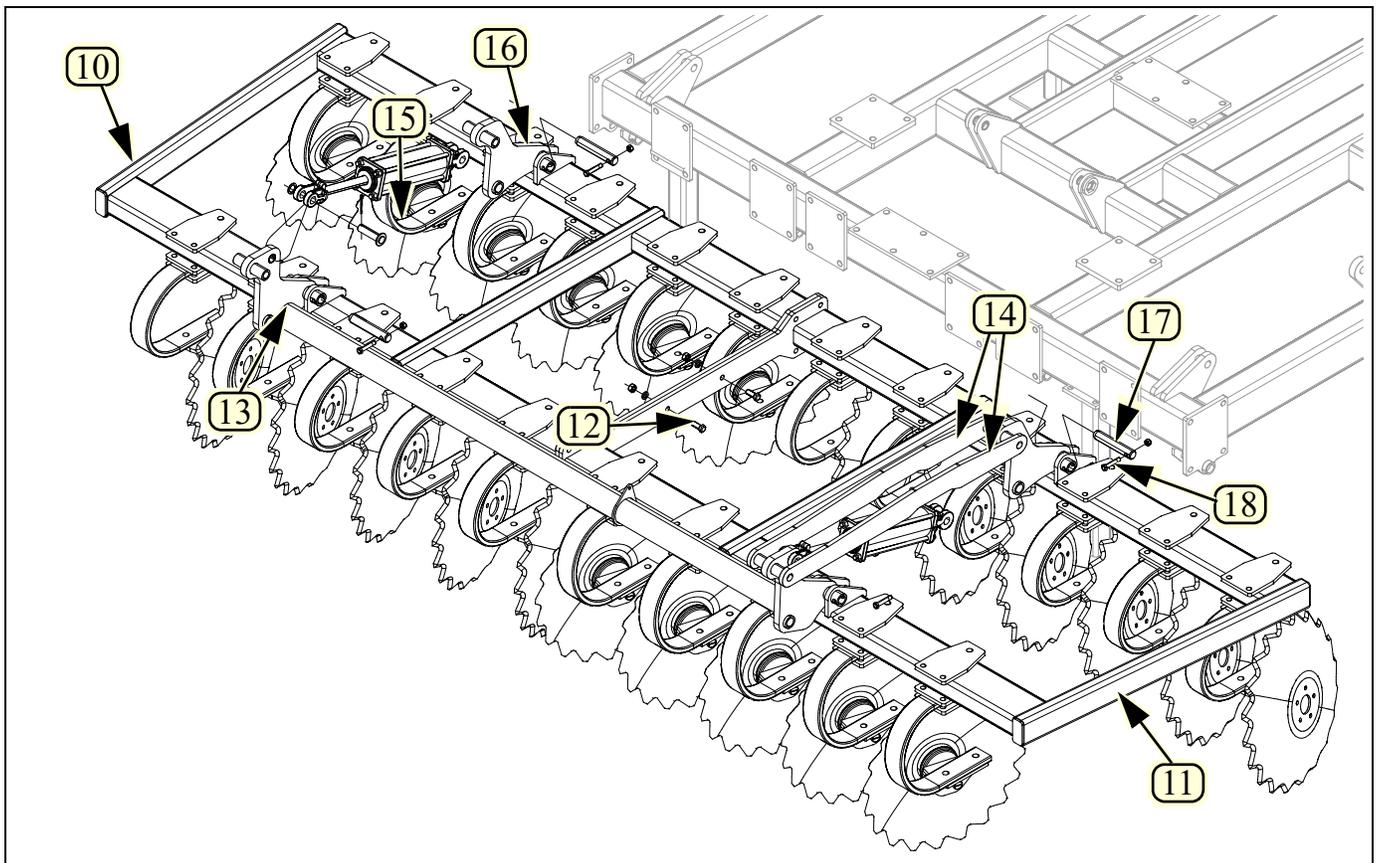


Figure 23  
Gang Frames

43729

## Lights

Refer to Figure 24

93. Route light harness 30' lead ① from front of hitch (tractor plug to front), along same route as hydraulic hose (fasten in same clamps and hose wraps as hoses). Plug one end of enhance light module ② to small end of light harness 30' lead ①. Plug bigger end of wishbone light harness ③ into other end of enhance light module ②. Route other ends over towards (marked left and right) the light mounting brackets as shown.
94. Mount red lamp lights ④ to mounting plates of wing stop or rigid smv and light bracket, with  $\frac{1}{4}$  x 1 hex bolts ⑤ and  $\frac{1}{4}$  lock nuts.
95. Mount amber lamp lights ⑥ to top of light brackets with  $\frac{1}{4}$  x 1 hex bolts ⑤ and  $\frac{1}{4}$  lock nuts.
96. Tighten all bolts to specs, See “**Torque Values Chart**” on page 24. Be sure and get all wiring harnesses fastened up securely with hose wraps or clamps (if routed close to hydraulic hoses) or use cable ties.

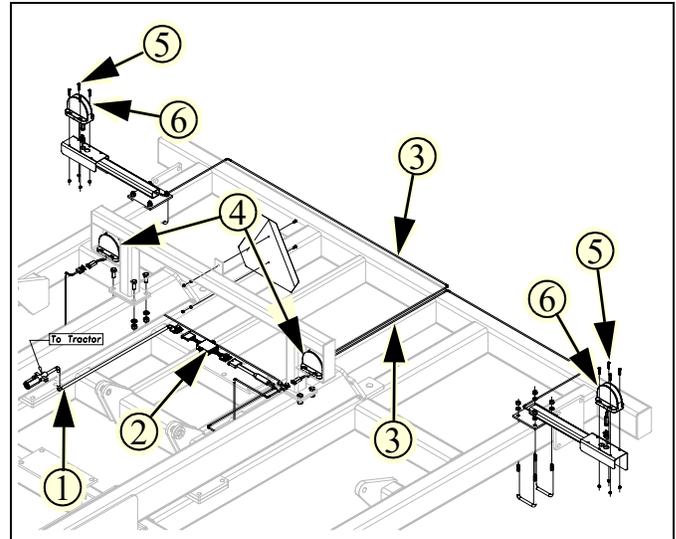


Figure 24  
Lights

43846

## Attachments

### Chopper Reel Attachment (optional)

Refer to Figure 25

-  Chopper Reels will be shipped already installed on the mounting tubes but will need to be attached to the Chopper Reel Arms. Chopper arms will be shipped on the floor of the shipping rack.
97. Align the chopper mounting brackets ① in the proper location on the rear of the frame. Install on the frame using  $\frac{3}{4}$  x  $4\frac{1}{2}$  x 5 u-bolts ②,  $\frac{3}{4}$  lock washers and nuts.
  98. Align chopper reel mounting tube ③ with reel arm and use  $\frac{5}{8}$  x  $3\frac{1}{32}$  x  $4\frac{1}{2}$  special thread u-bolt ④,  $\frac{5}{8}$  lock washers and nuts to attach to reel arm. See “**Appendix**” on page 24 for proper location of chopper reel arms and chopper assemblies.

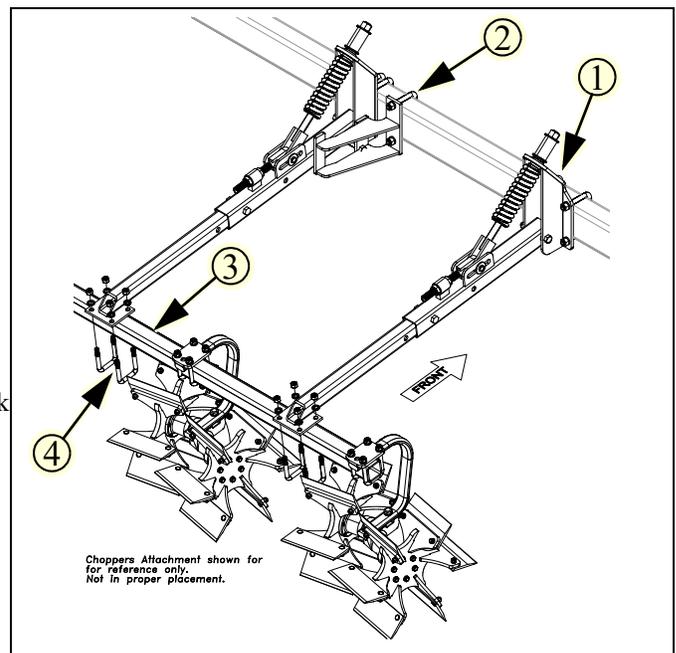


Figure 25  
Chopper Reel Assembly

43850

## Install Rear Hitch (optional)

 The rear tow hitch will be shipped with big components banded together and bolts will be in a box. Carefully un-band the components.

Refer to Figure 26

99. Attach rear hitch trusses ① to rear of hitch arms with  $\frac{3}{4}$  x  $2\frac{1}{2}$  hex bolts ②,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts. Attach middle of rear hitch arms to tubes on center frame with  $\frac{3}{4}$  x  $8\frac{1}{2}$  bolts ③,  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts and 2 hole plate ⑦.

100. Attach 56" cross arm ④ to bottom side of rear hitch arm plates with  $\frac{5}{8}$  x  $3\frac{1}{32}$  x  $4\frac{1}{2}$  u-bolts ⑤, secure with  $\frac{5}{8}$  lock washers and  $\frac{5}{8}$  nuts.

 Do not tighten any bolts until every thing is installed.

 The bolt on sleeve assembly with rigid or flex slide ⑥ may be fastened using  $\frac{5}{8}$  x  $3\frac{1}{32}$  x  $4\frac{1}{2}$  u-bolt ⑤, secure with  $\frac{5}{8}$  lock washers and  $\frac{5}{8}$  nuts.

 Tighten all bolts to specs, See "**Torque Values Chart**" on page 24.

 If machine is equipped with optional rear hitch accessory kit may be installed as shown in "Parts Manual".

 Route hoses and light harness along hitch and frame with hose clamps and hose wraps, provided. Be sure hoses and light harness is fastened securely so they don't drag or get pinched.

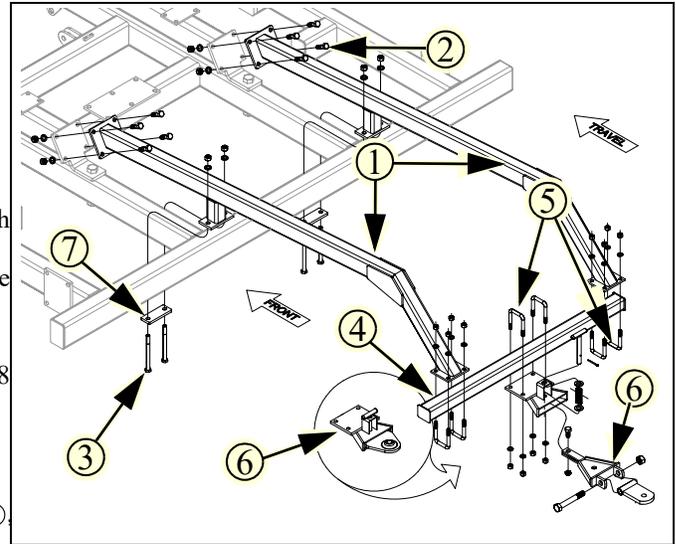


Figure 26  
Rear Hitch

43845

## Completing Setup

101. Be sure all bolts are tightened to specs, See "**Torque Values Chart**" on page 24

102. The decals may now be installed.

103. See appropriate pages for decals in the "Parts and Operator's Manual" for decal placement.

104. To install new decals:

- a. Clean the area on which the decal is to be placed.
- b. Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.

105. If machine has an optional finishing attachment or, refer to the "Parts Manual" for parts break down and attachment layout drawings of this manual.

## NOTICE

*If machine is equipped with a rear attachment, be sure you install the optional rear jack stand, see "Parts Manual (Rear Jack Stand)" so machine doesn't tip backwards when unhooking machine from tractor.*

106. Once the options are installed and all of the hydraulic procedures have been completed, you may fold and raise/

lower the machine to check for clearance and interferences.

107. Be sure to consult the operating instructions, "Operator's Manual", for the first time field adjustments before going to the field.



# Appendix

## Torque Values Chart

Bolt Size in-tpi <sup>a</sup>	Bolt Head Identification					
	Grade 2		Grade 5		Grade 8	
	N-m <sup>b</sup>	ft-lb <sup>d</sup>	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 mm x pitch <sup>c</sup>	Bolt Head Identification					
	Class 5.8		Class 8.8		Class 10.9	
	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

- a. in-tpi = nominal thread diameter in inches-threads per inch
- b. N·m = newton-meters
- c. mm x pitch = nominal thread diameter in mm x thread pitch
- d. ft-lb = foot pounds

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

Torque Values Chart	
Wheel Bolt Torque Values	1/2"-20 (75-85ft-lbs)
Wheel Bolt Torque Values	5/16"-18 (80-90ft-lbs)
Wheel Bolt Torque Values	5/8"-18 (85-100ft-lbs)
Chopper Hub Spindle Values	7/8"-9 (350 ft-lbs)

## Tire Inflation Chart

Tire Inflation Chart		
Wheel	Tire Size	Inflation
Transport	12.5L x 15" F-Ply	620 kPa 90 psi
Transport/ Wings	12.5L x 15" 12-Ply	379 kPa 55 psi

## Tire Warranty Information

All tires are warranted by the original manufacturer of the tire. Tire warranty information is found in the brochures included with your Operator's and Parts Manuals or online at the manufacturer's web sites listed below. For assistance or information, contact your nearest Authorized Farm Tire Retailer.

Manufacturer Web site

- Firestone [www.firestoneag.com](http://www.firestoneag.com)
- Gleason [www.gleasonwheel.com](http://www.gleasonwheel.com)
- Titan [www.titan-intl.com](http://www.titan-intl.com)
- Galaxy [www.atgtire.com](http://www.atgtire.com)
- BKT [www.bkt-tire.com](http://www.bkt-tire.com)

## Hydraulic Connectors and Torque

Refer to Figure 27 (a hypothetical fitting)

Leave any protective caps in place until immediately prior to making a connection.

**NPT** - National Pipe Thread

Note tapered threads, no cone/flare, and no O-ring.

- ① Apply liquid pipe sealant for hydraulic applications. Do not use tape sealant, which can clog a filter and/or plug an orifice.

**JIC** - Joint Industry Conference (SAE J514)

- ② Note straight threads ④ and the 37° cone ⑤ on "M" fittings (or 37° flare on "F" fittings). Use no sealants (tape or liquid) on JIC fittings.

**ORB** - O-Ring Boss (SAE J514)

Note straight threads ⑤ and elastomer O-Ring ⑦. Prior to installation, to prevent abrasion during tightening, lubricate O-Ring with clean hydraulic fluid.

- ③ ORB fittings that need orientation, such as the ell depicted, also have a washer ⑧ and jam nut ⑨ ("adjustable thread port stud"). Back jam nut away from washer. Thread fitting into receptacle until O-Ring contacts seat. Unscrew fitting to desired orientation. Tighten jam nut to torque specification.

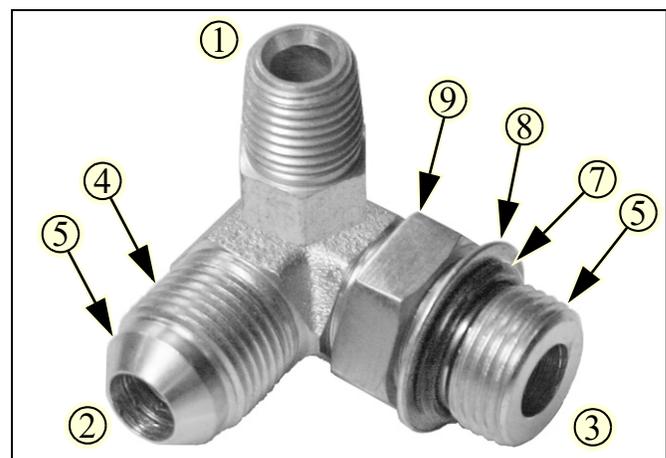


Figure 27  
Hydraulic Connector ID

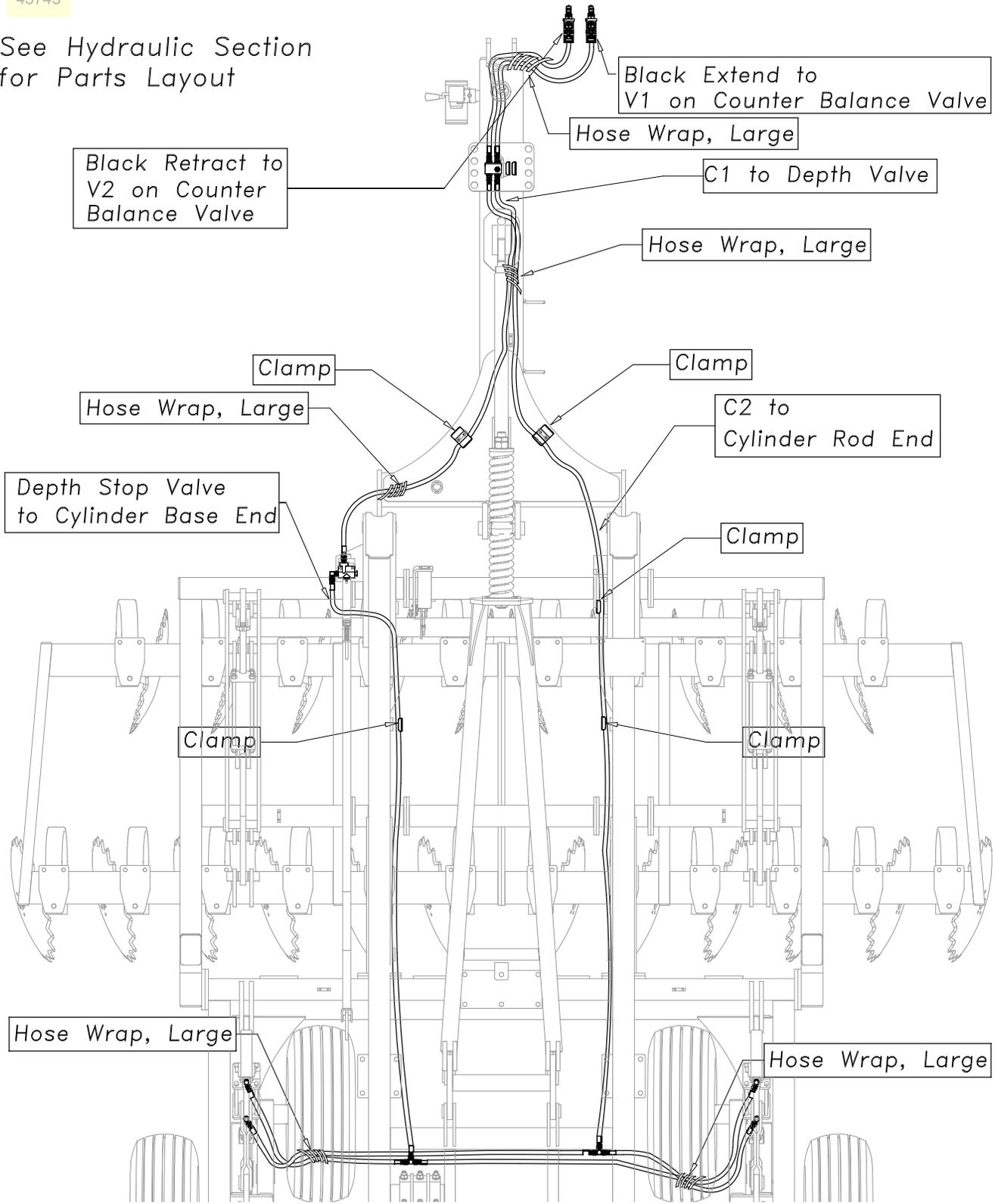
31282

Fittings Torque Values			
Dash Size	Fitting	N-m	Ft-Lbs
-4	1/4-18 NPT	1.5-3.0 turns past finger tight	
-5	1/2-20 JIC	19-20	14-15
-5	1/2-20 ORB w/jam nut	12-16	9-12
-5	1/2-20 ORB straight	19-26	14-19
-6	5/16-18 JIC	24-27	18-20
-6	5/16-18 ORB w/jam nut	16-22	12-16
-6	5/16-18 ORB straight	24-33	18-24
-8	3/4-16 JIC	37-53	27-39
-8	3/4-16 ORB w/jam nut	27-41	20-30
-8	3/4-16 ORB straight	37-58	27-43

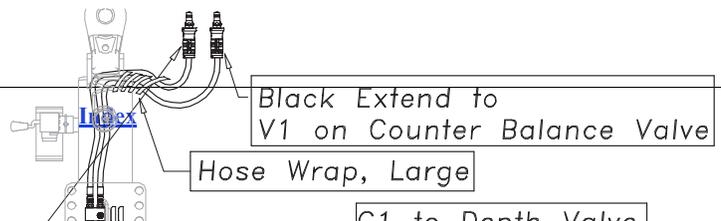
### MC5109-MC5315 Hydraulic Lift Layout

43743

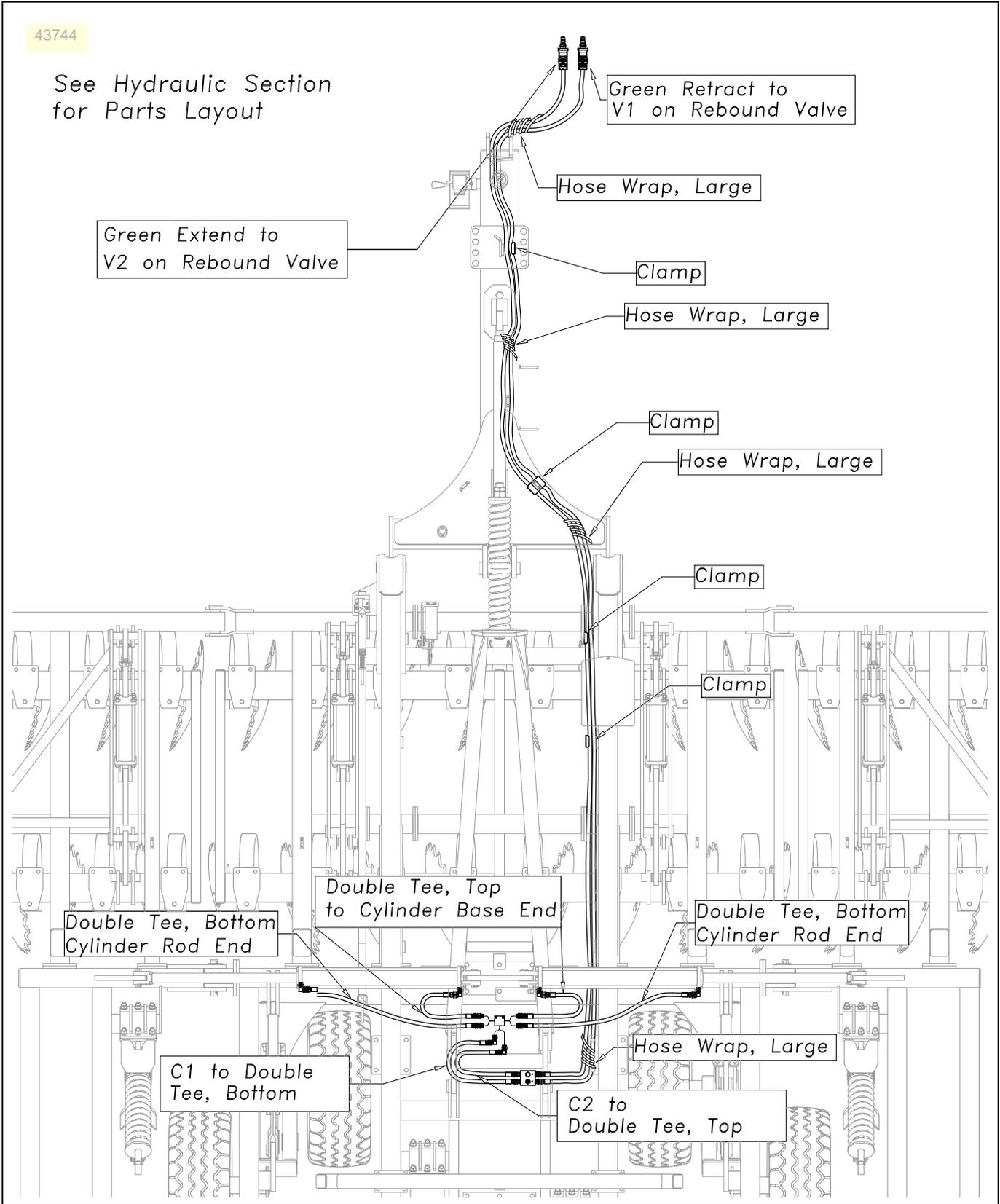
See Hydraulic Section  
for Parts Layout



See Hydraulic Section  
for Parts Layout



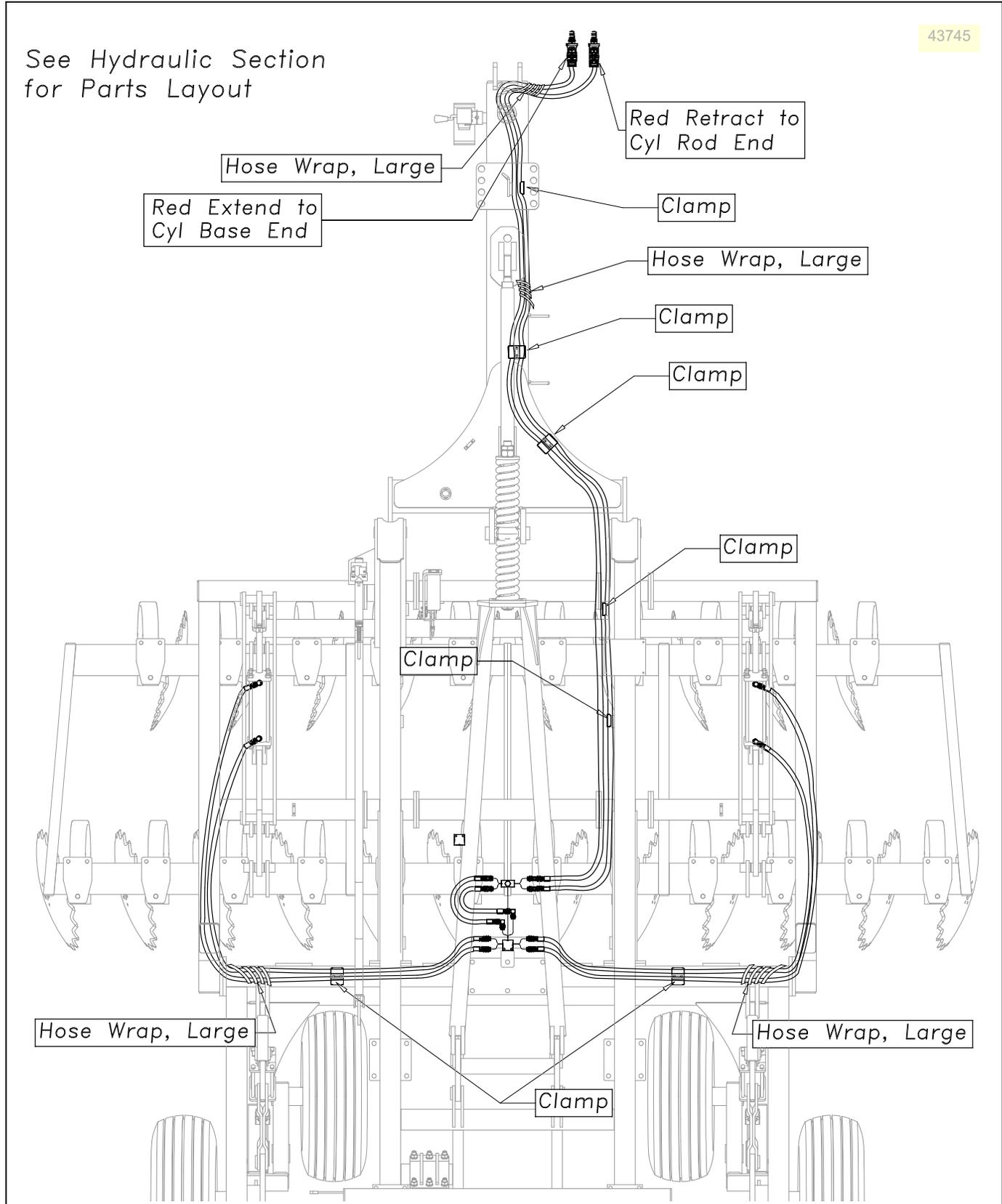
### MC5313-MC5315 Hydraulic Fold Layout



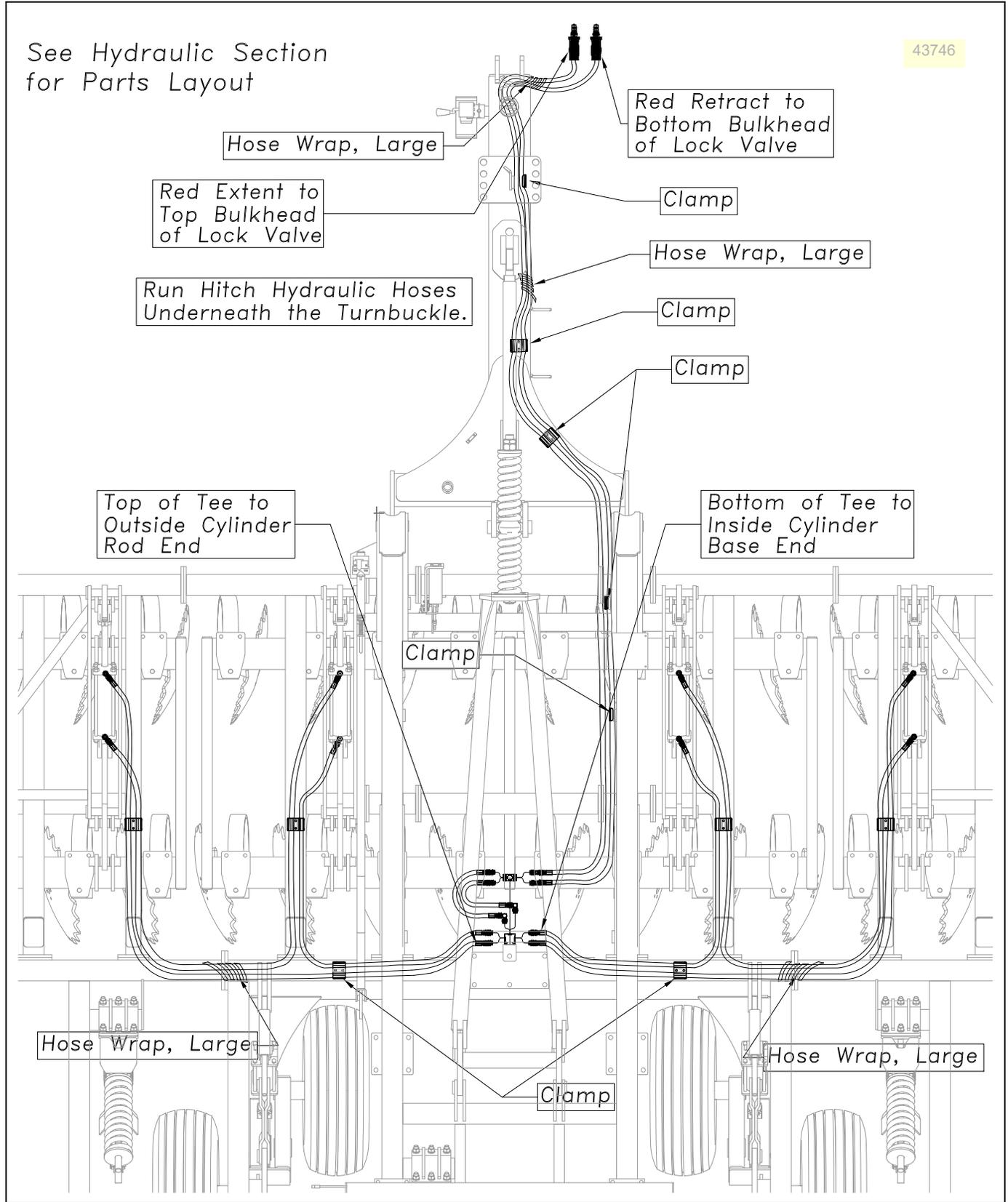
### MC5109-5111 Hydraulic Gang Layout

43745

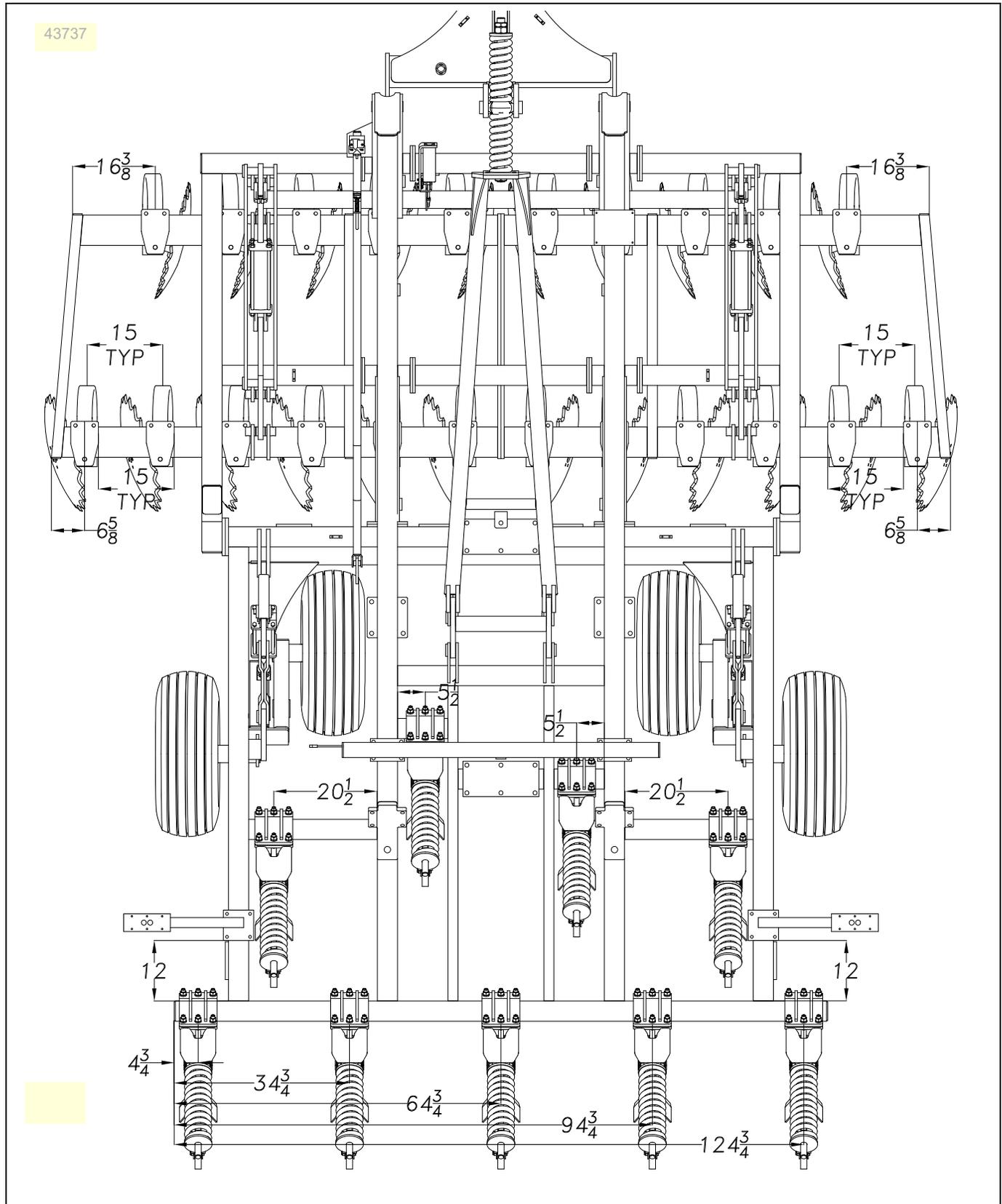
See Hydraulic Section  
for Parts Layout



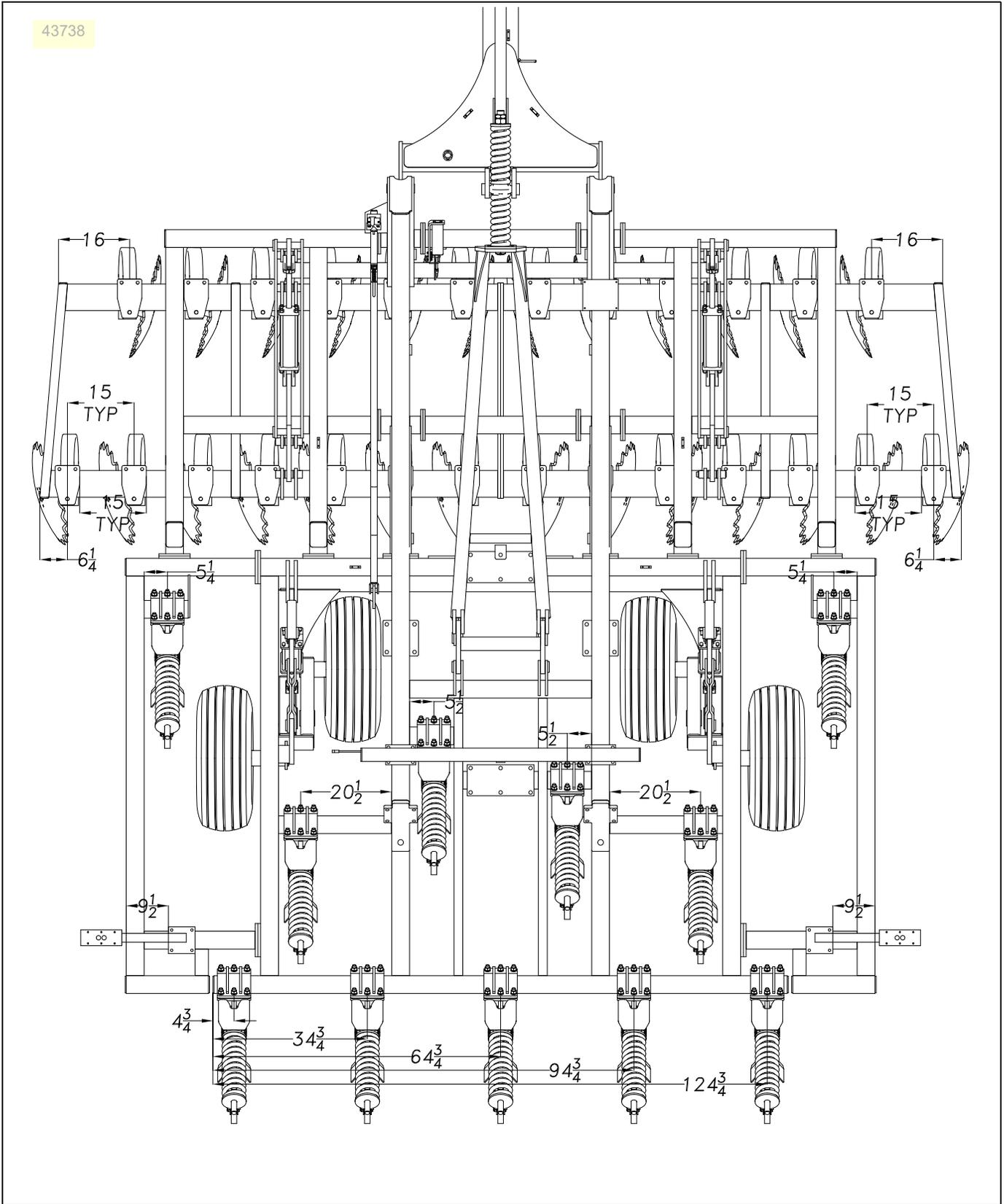
### MC5113-MC5315 Hydraulic Gang Layout



# MC5109 Machine Layout



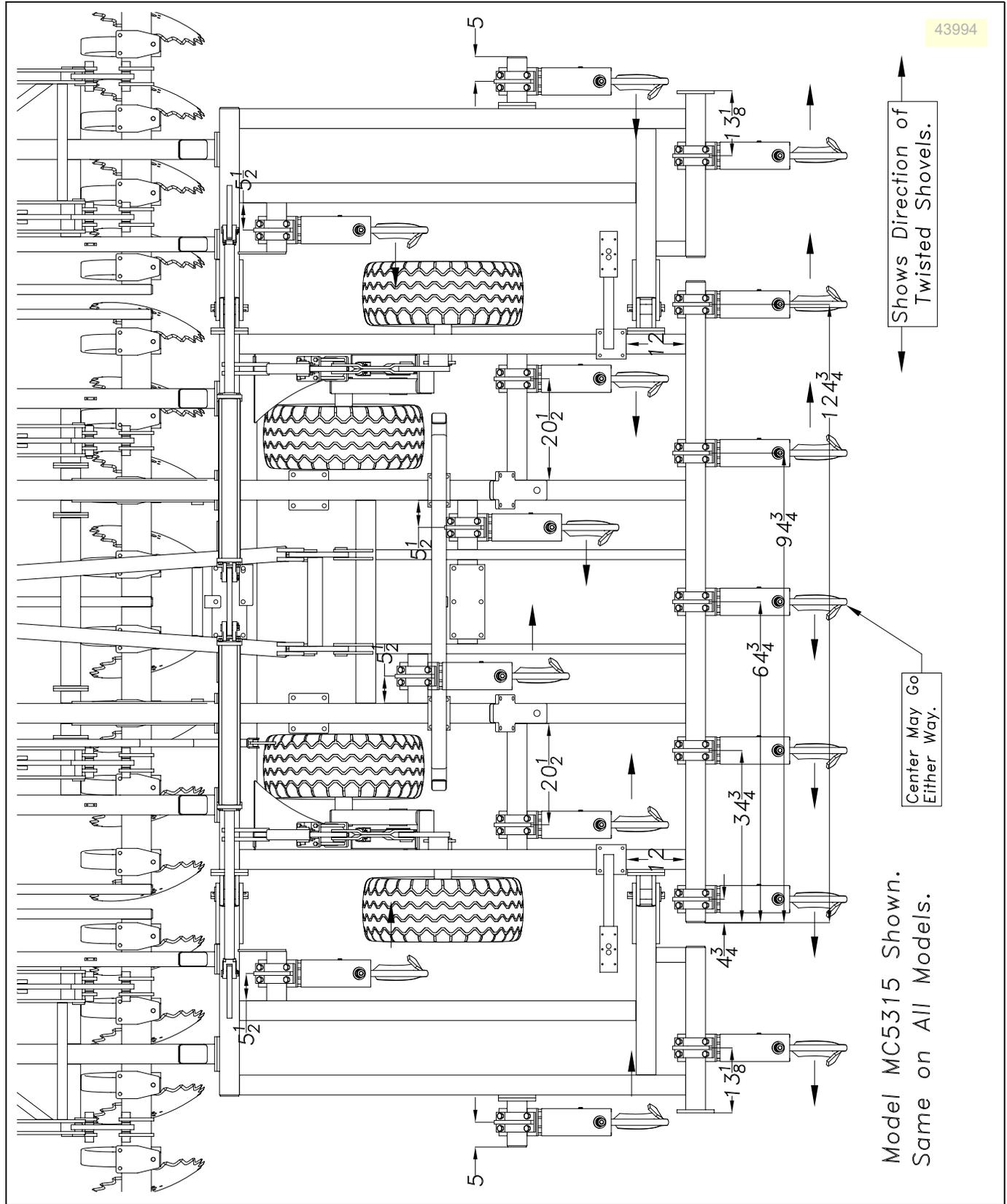
# MC5111 Machine Layout





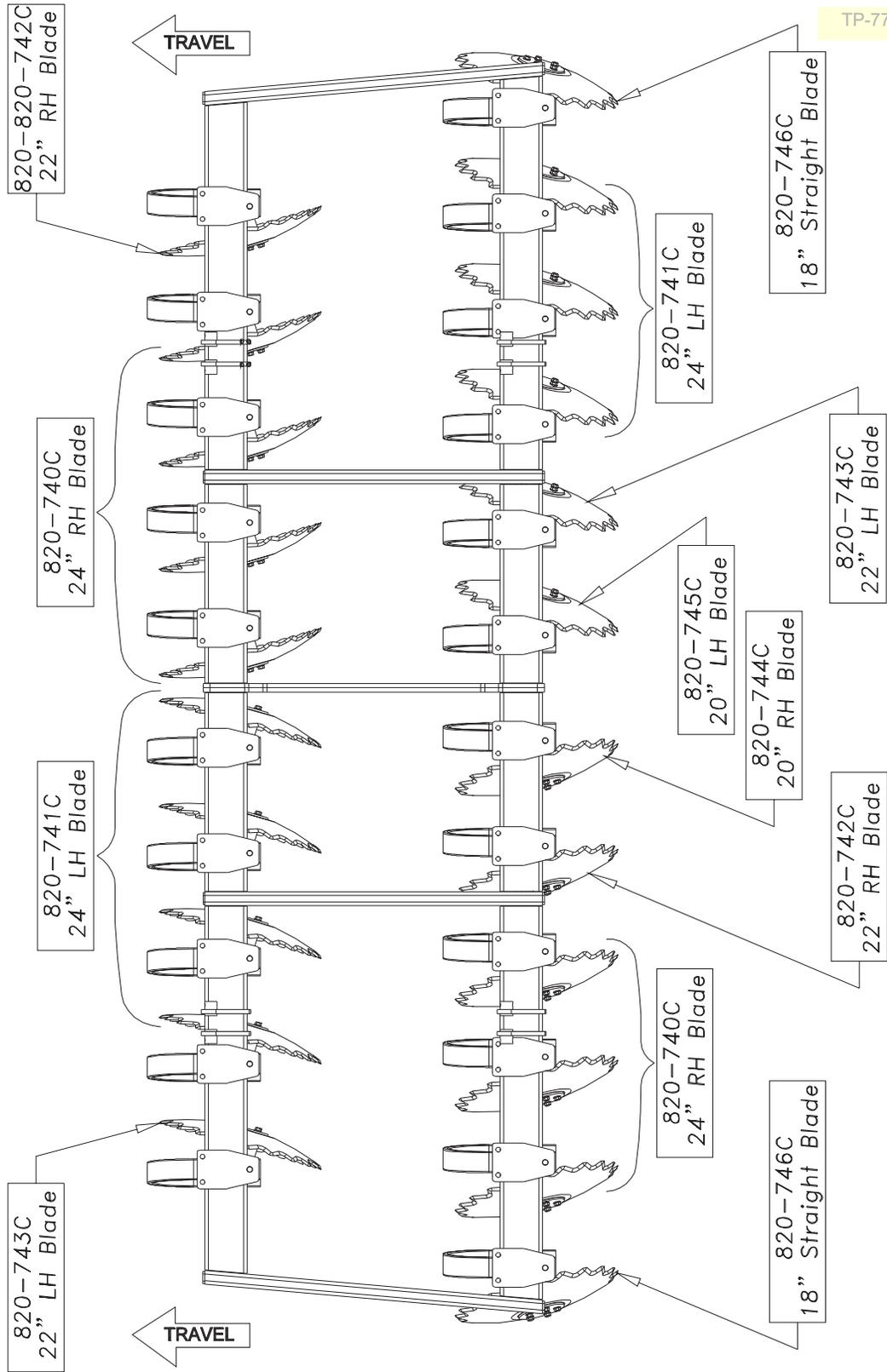


# Twisted Shovel Layout



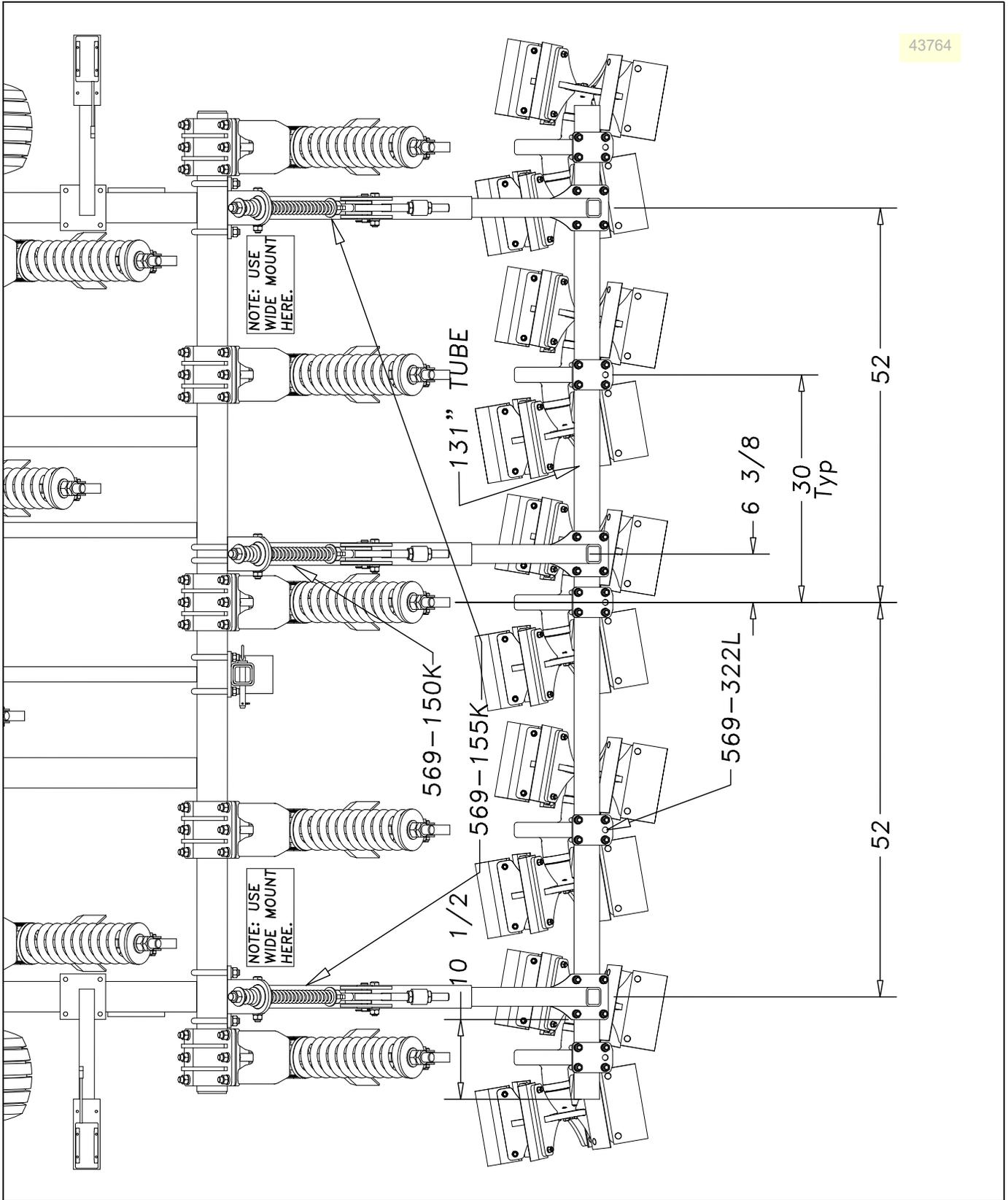
### Blade Layout (S/N GP-D1265E+)

All Models will have these blades with this placement 5/8" hub bolts.  
Depending on the Model the number of 24" blades will change.



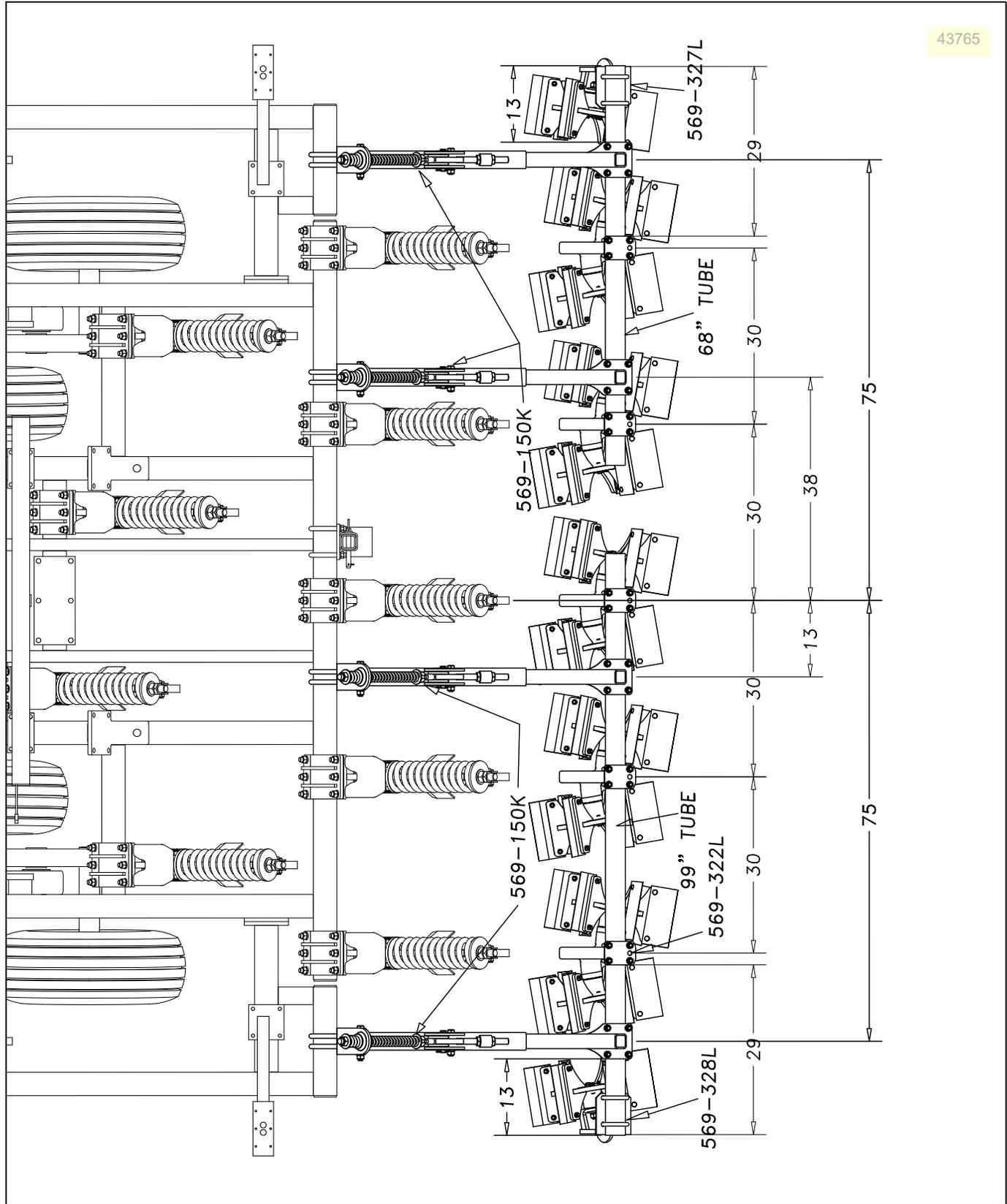


# MC5109 Chopper Reel Layout

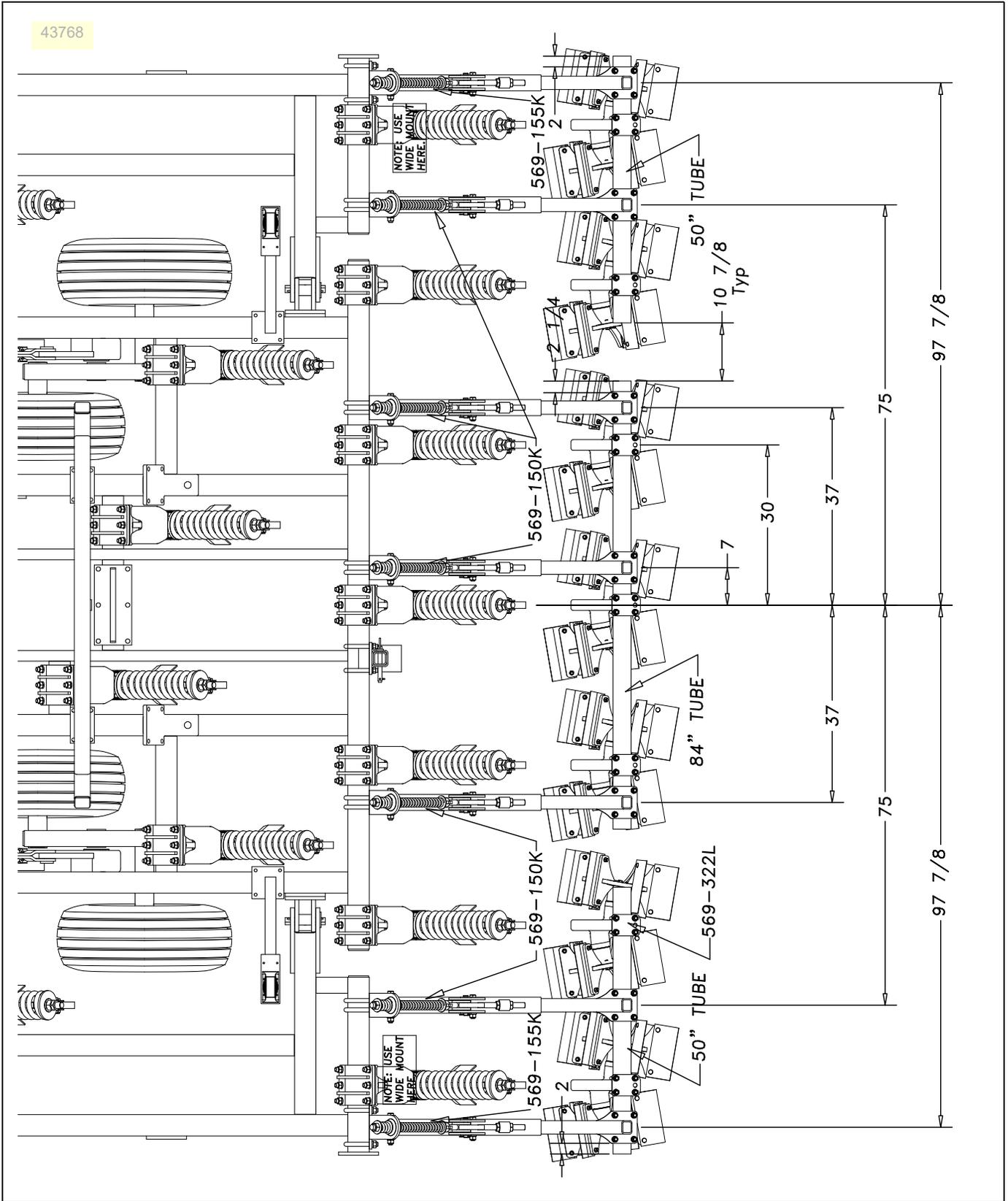


# MC5111 Chopper Reel Layout

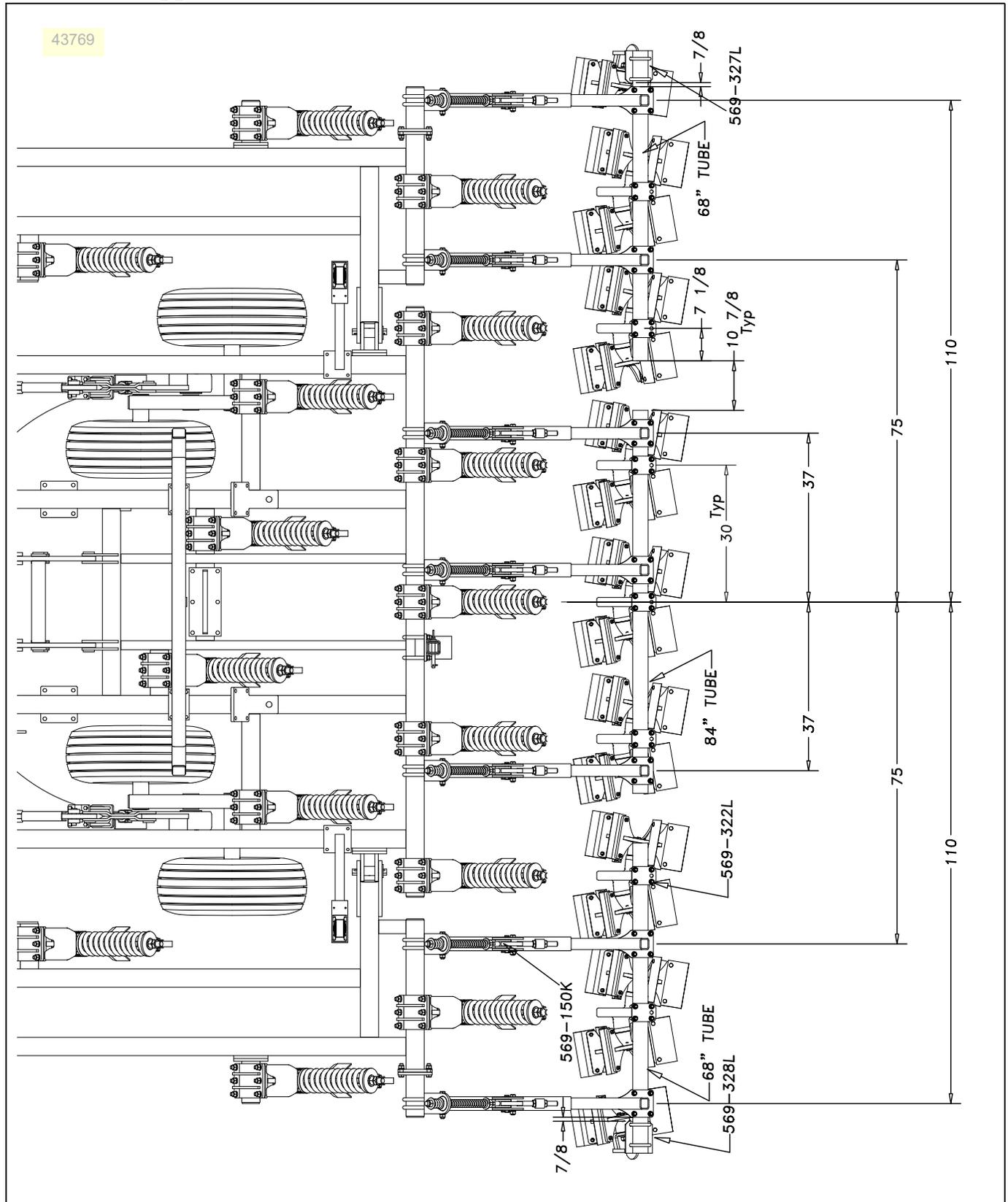
43765



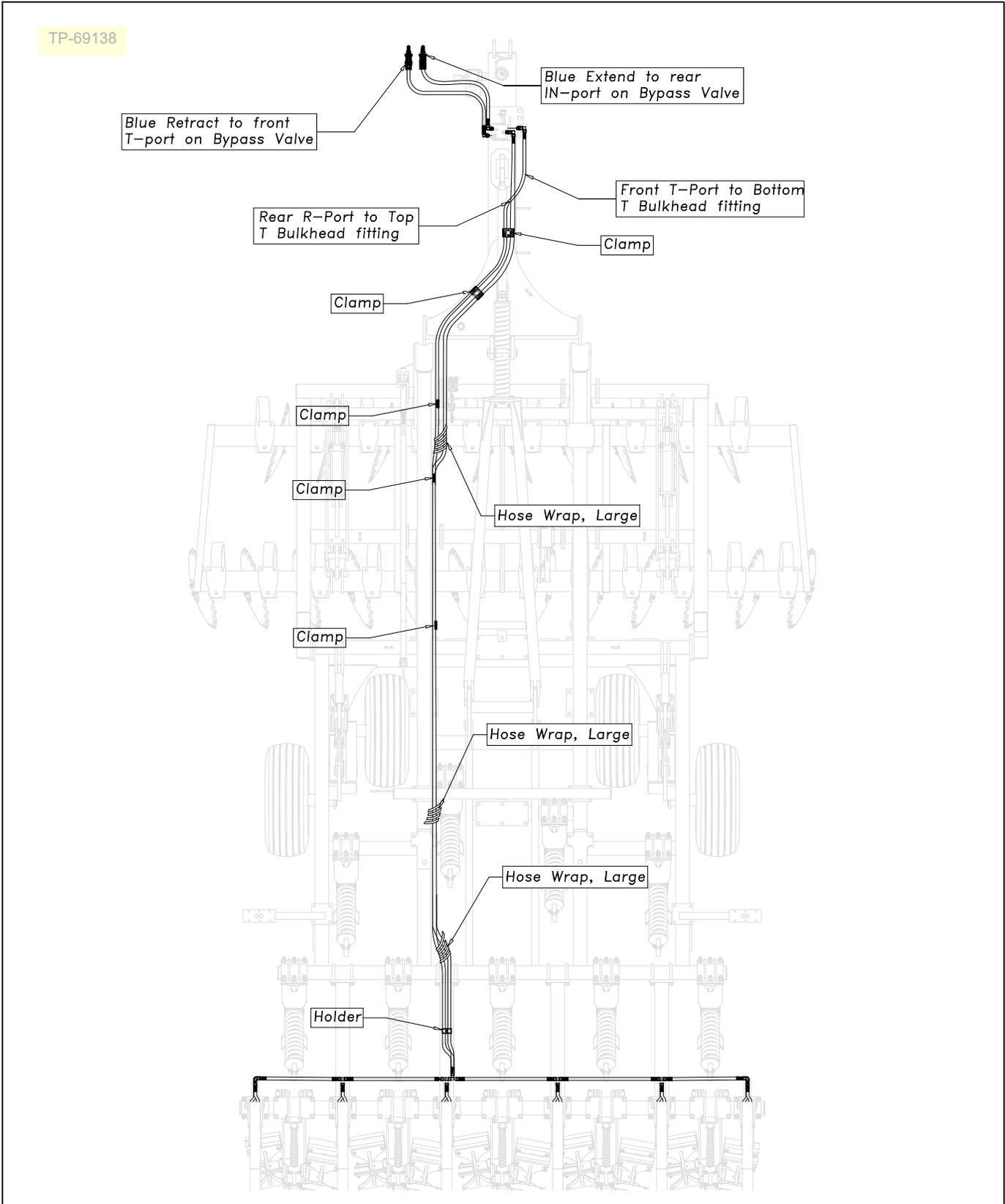
# MC5313 Chopper Reel Layout



# MC5315 Chopper Reel Layout

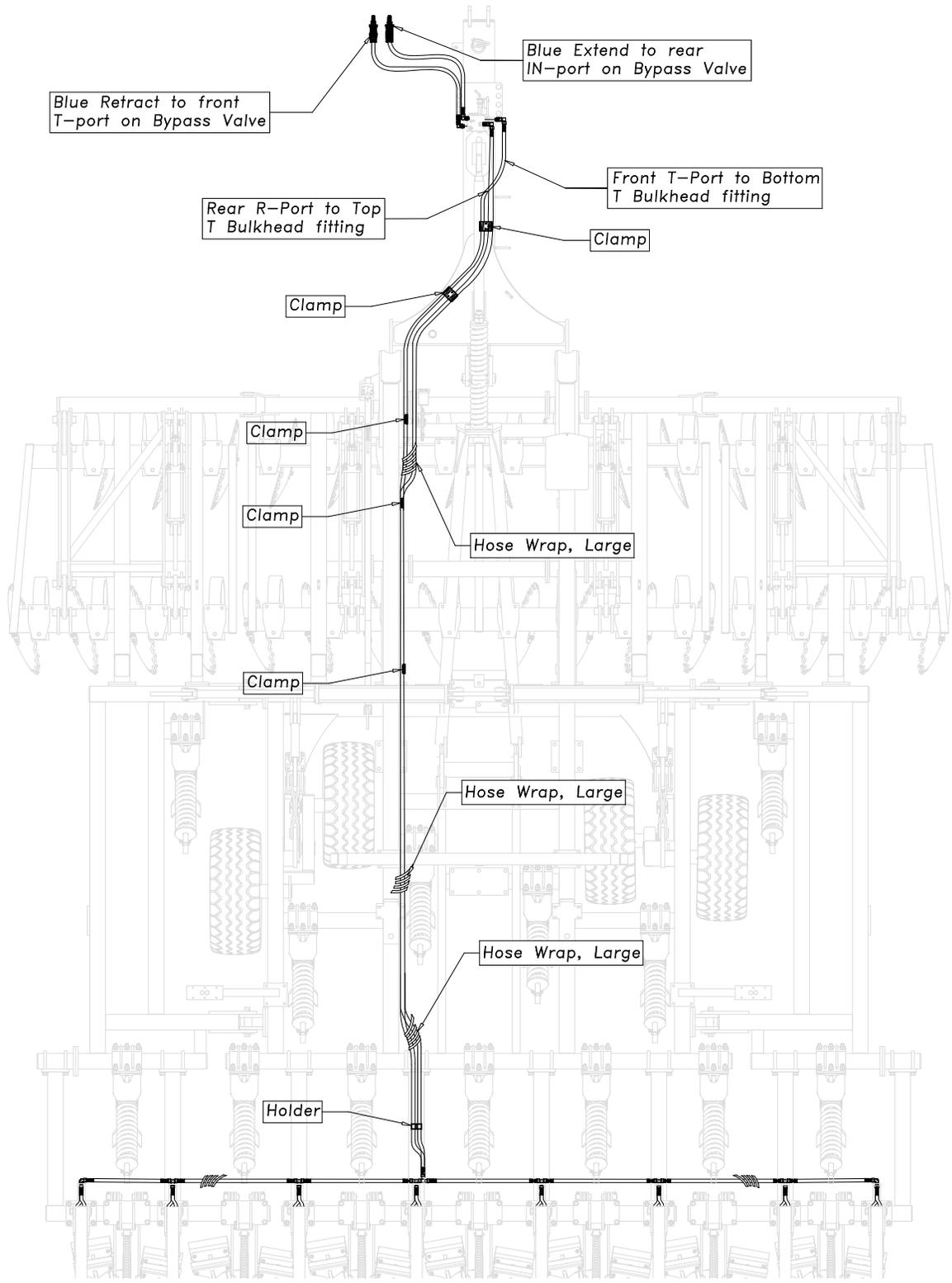


# MC5109 & MC5111 Chopper/ML Roller Hydraulic Layout

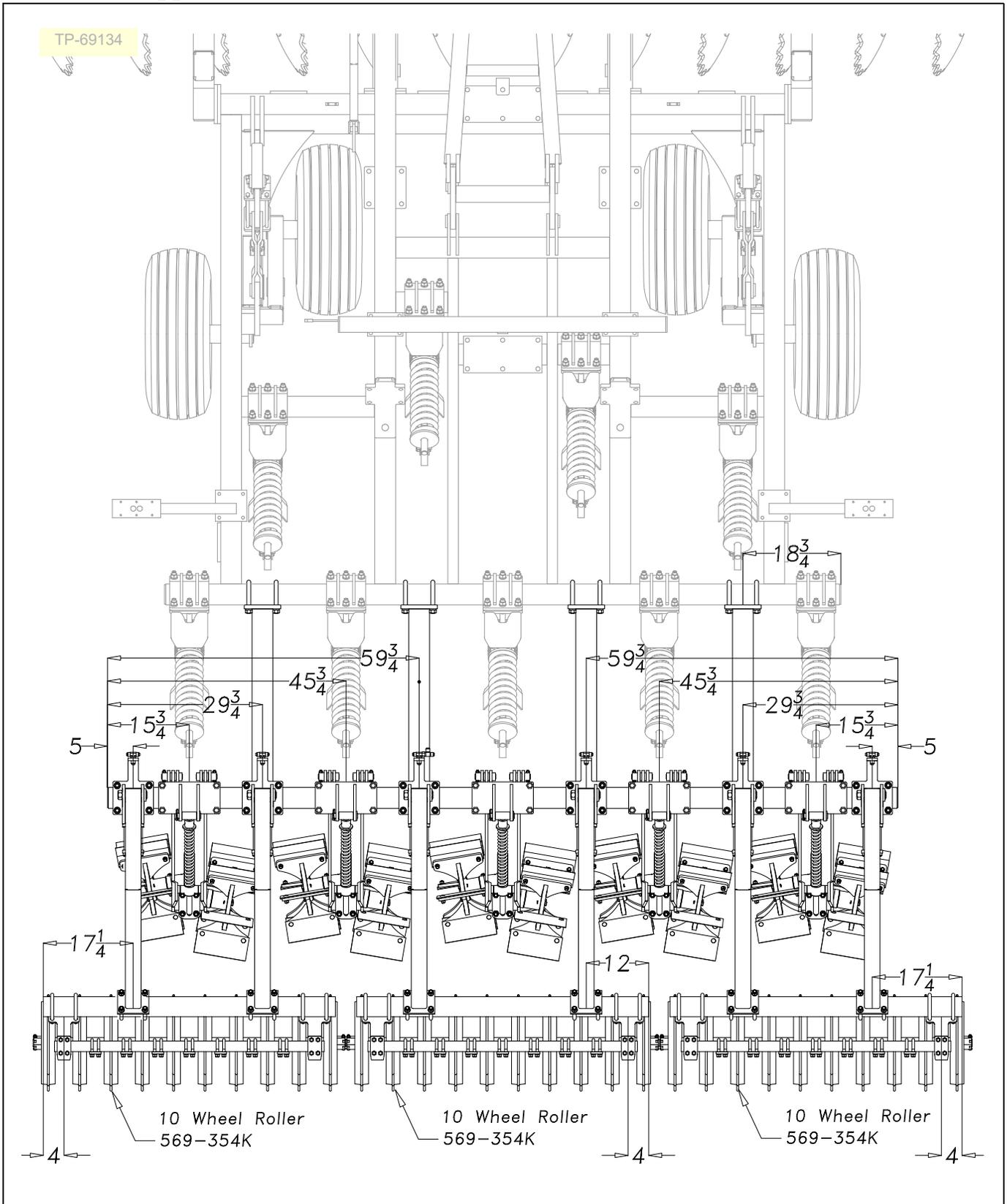


# MC5313 & MC5315 Chopper/ML Roller Hydraulic Layout

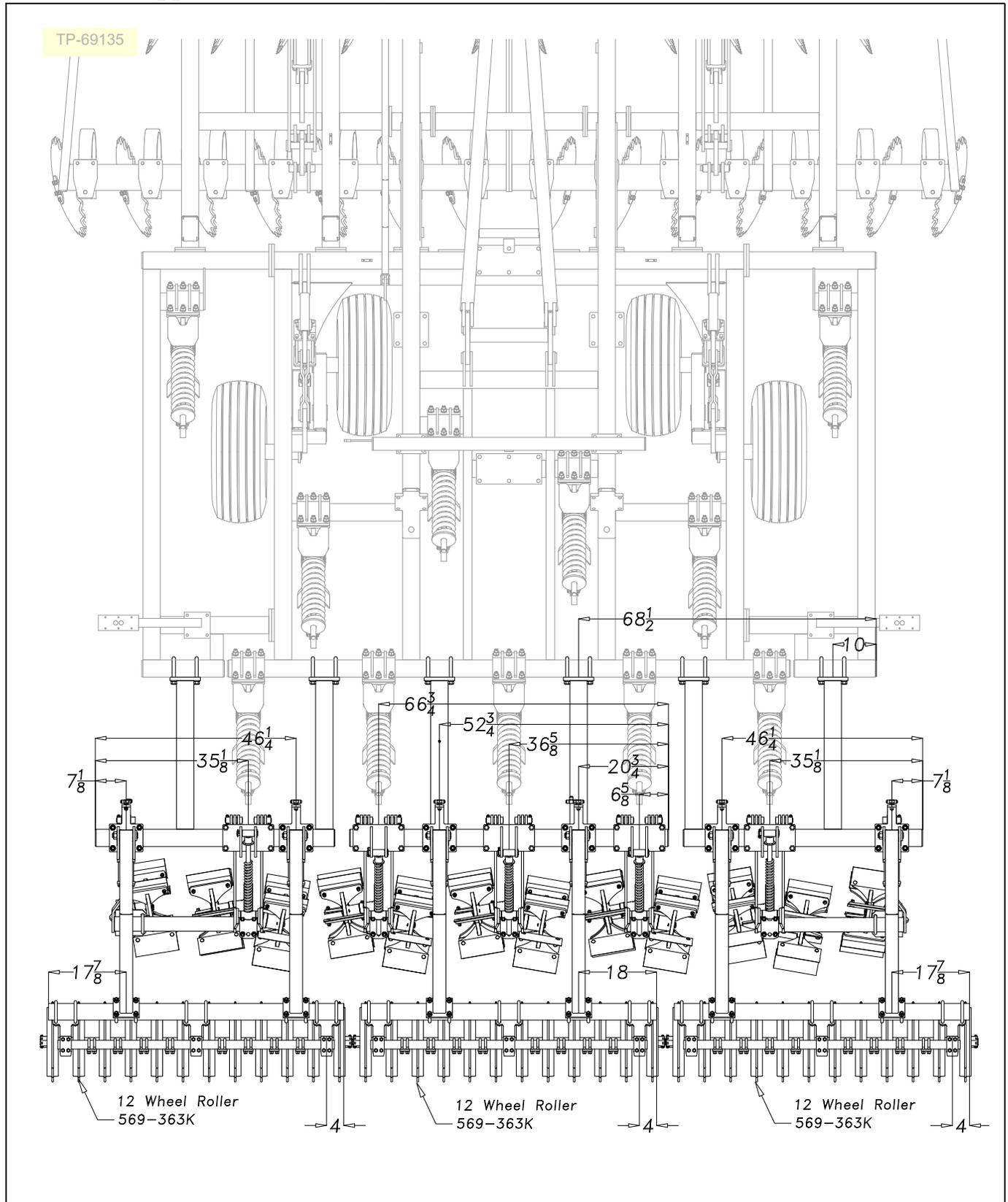
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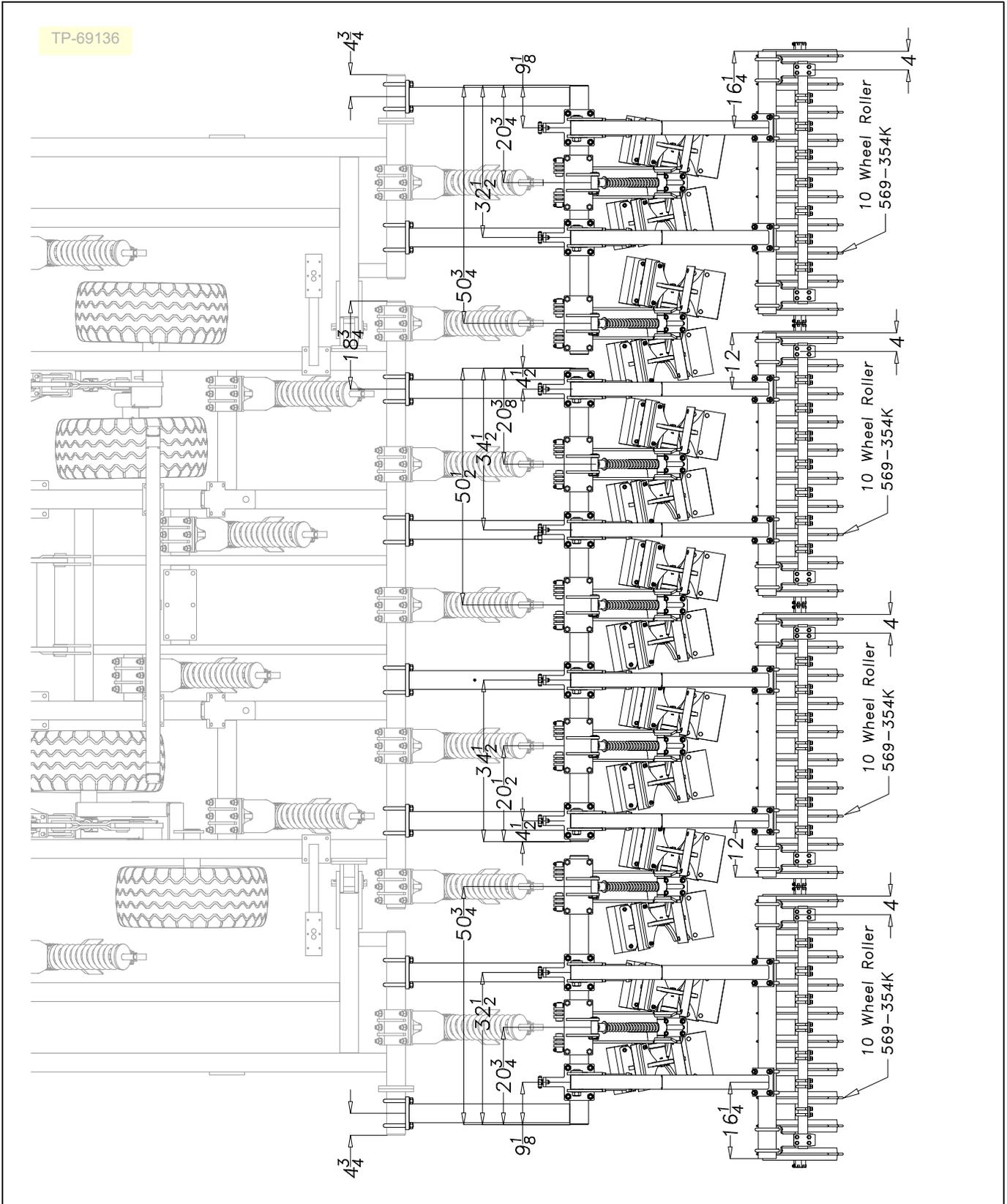
# MC5109 Chopper/ML Roller Layout



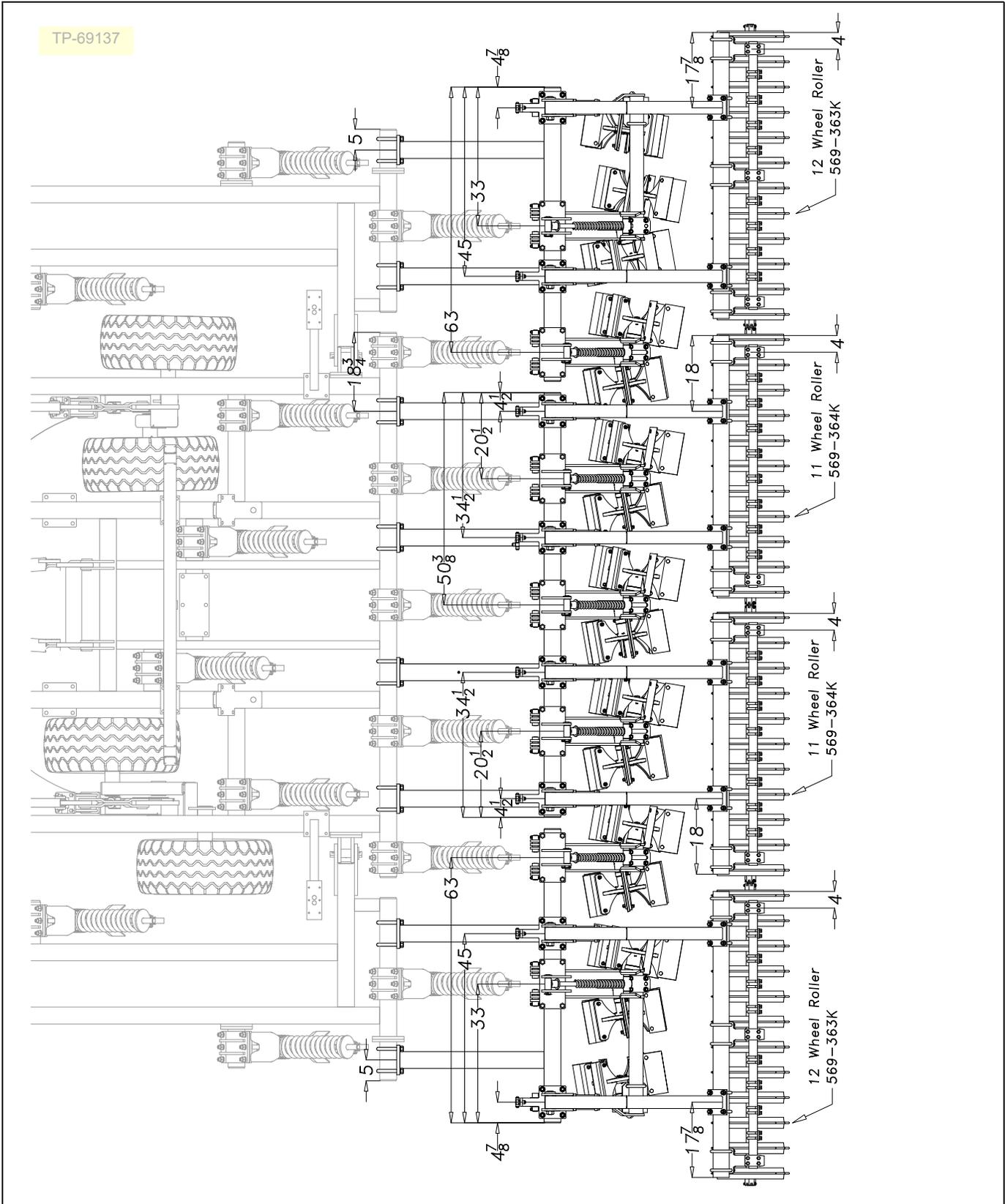
# MC5111 Chopper/ML Roller Layout



# MC5313 Chopper/ML Roller Layout



# MC5315 Chopper/ML Roller Layout





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