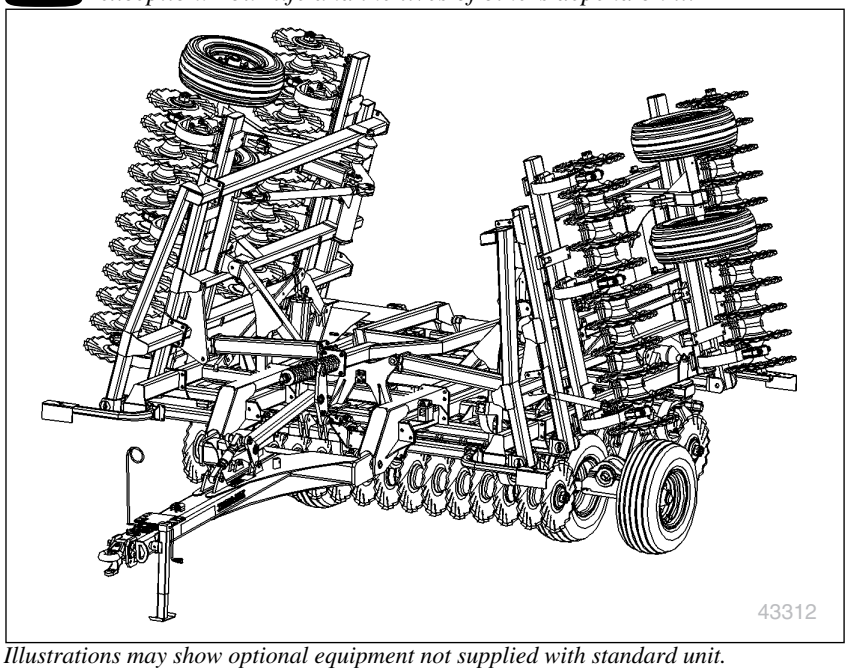
Assembly Manual

1800TM, 2400TM & 3000TM
Turbo Max

Great Plains
Manufacturing, Inc.
www.greatplainsmfg.com

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

EN

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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.

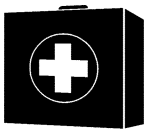
CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Use Adequate Lifting Means

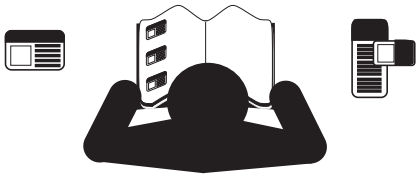
The frame sections and gangs of this machine are extremely heavy. If using multiple lifters, make sure each is rated for at least its share of the load.

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.

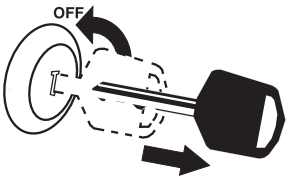
- ▲ *Use flashing warning lights and turn signals whenever driving on public roads.*
- ▲ *Use lights and devices provided with implement.*

Keep Riders Off Machinery

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

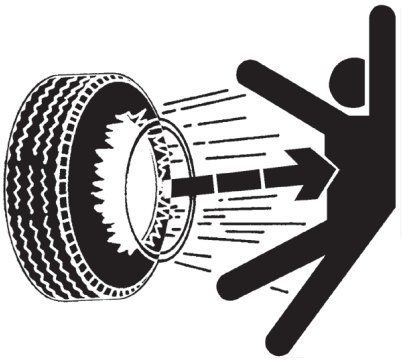
- ▲ *Never allow children to operate equipment.*
- ▲ *Keep all bystanders away from machine during operation.*

Shutdown and Storage



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

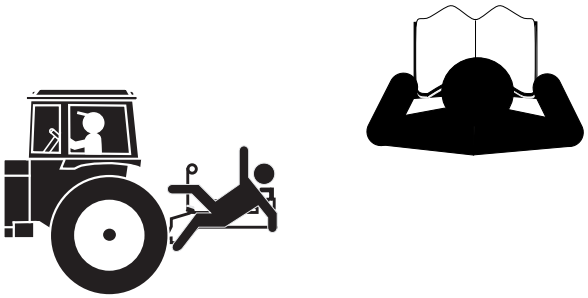
Tire Safety



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 Turbo Max 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 1800-3000TM Turbo Max is a three section “vertical” tillage tool. Working width ranges from 18 to 30 feet. The implement is designed to cut and size residue, till soil for faster seedbed warming, break up soil crust on hard dried fields while eliminating compaction layers. The front and rear gangs may be adjusted from 0-6 degree angle, depending on the aggressiveness desired. Various finishing attachments are also available to further smooth, redistribute residue, kill weeds, and break clods.

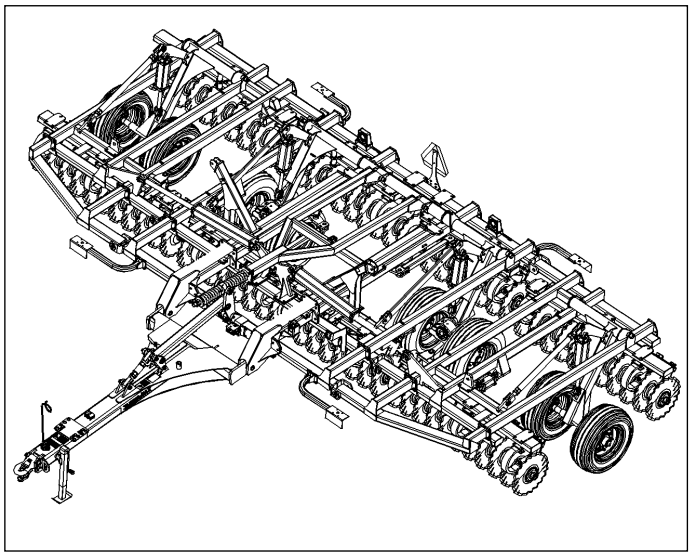


Figure 1
2400 Turbo Max

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Models Covered

1800TM	18’ (7.5in) spacing
2400TM	24’ (7.5in) spacing
3000TM	30’ (7.5in) spacing

Document Family

586-536Q	Pre-Delivery Manual
586-536M	Operator Manual
586-536P	Parts Manual
586-536E	Assembly Manual (this document)

Tools Required

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

Pre-assembly Checklist

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

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.

Note: Useful information related to the preceding topic.

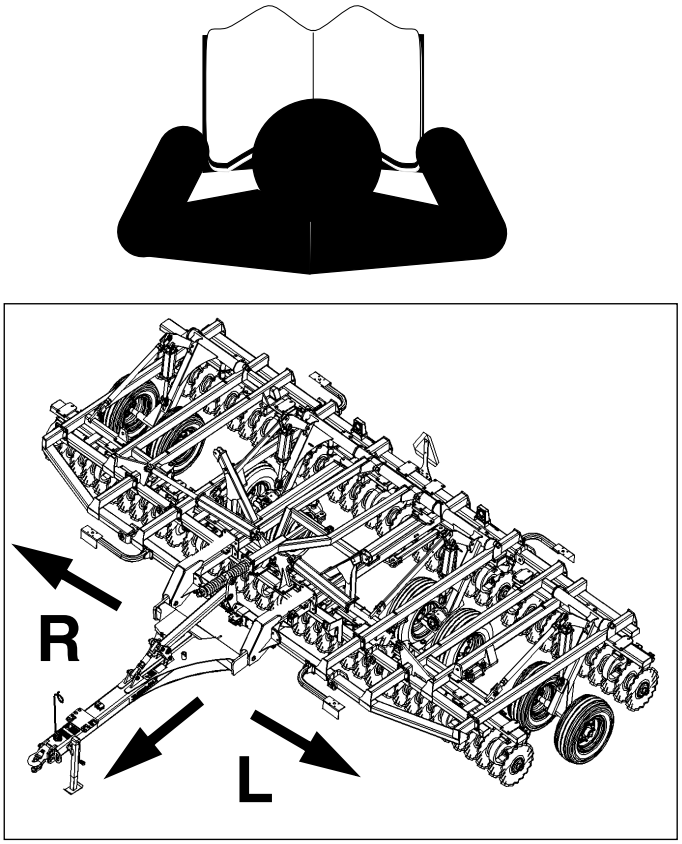

Figure 2
Right / Left

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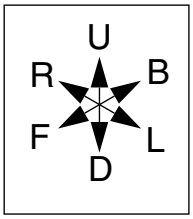
Right-hand and left-hand as used in this manual are determined by facing the direction the machine will travel while in use unless otherwise stated. An orientation rose in some line art illustrations shows the directions of: Up, Back, Left, Down, Front, Right.



Shipping Inventory

The machine 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 gang assemblies, reel and rolling harrow attachment assemblies.

Refer to Figure 3

- All frame sections, hitch and torque tubes will be shipped in shipping container rack.
- Small parts and bolts will be shipped in boxes.

Figure 3 42967
Shipping Rack & Box

Refer to Figure 4

- Rear attachments and gang assemblies will be shipped in shipping container rack.
- Shipping containers or racks do not need to be returned to Great Plains.

Figure 4 42968
Shipping Gangs & Attachments

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

1. the tire wheel assemblies,
2. the smaller items

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

3. Carefully unload the frames and hitch out of shipping rack

Unpacking Boxes

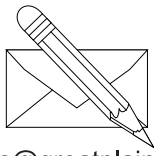
1. Carefully remove banding and lids from boxes.
2. Locate and identify all components before assembling.

Assembly and Setup Assistance

To order additional copies of pre-delivery instructions or 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 any assembly or setup questions, assistance is available. Contact:

Product Support
Great Plains Mfg. Inc., Service Department
PO Box 5060
Salina, KS 67402-5060



gp_web_cs@greatplainsmfg.com

(800)255-9215

Assembly

Center Frame & Lift Assembly

Refer to Figure 5

Note: Once the center frame has been uncrated and put on stands, the brace bar may be installed. See "Parts Manual" for part numbers and description of parts.

3. Align holes in plates of the center brace bar ① with holes on front of center frame ②, secure with 3/4 x 2 hex bolts ③, 3/4 lock washers and 3/4 nuts.
4. Carefully lower the torque tube ④ (models 2400 or 3000) or torque tube ⑤ (model 1800) with an overhead hoist until holes are aligned with the holes on top of center frame ② and secure with 1 1/4 x 7 pins ⑥, 3/8 x 2 1/4 Gr. 8, special thread bolts ⑦ and 3/8 top lock nuts.
5. Align hole in lift strap ⑧ and cylinder mount plate ⑨ in proper orientation shown in drawing ⑩. Secure lift strap ⑧ with 1 x 3 1/2 hex bolts ⑩ and 1 lock nuts, rear of cylinder mount plate ⑨ to plates of torque tube ④ or ⑤ with 1 x 4 hex bolt ⑪ and 1 lock nut.
6. Install the cylinders ⑫ using 1 x 3 1/8 pins ⑬, 1.5 x 1.0 x.075 machine washers and 3/16 x 2 cotter pin.
7. Install cylinder transport locks ⑭ to cylinders ⑫ using 3/8 x 3 pins ⑮ and clip pins
8. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "**Torque Values Chart**" on page 38.

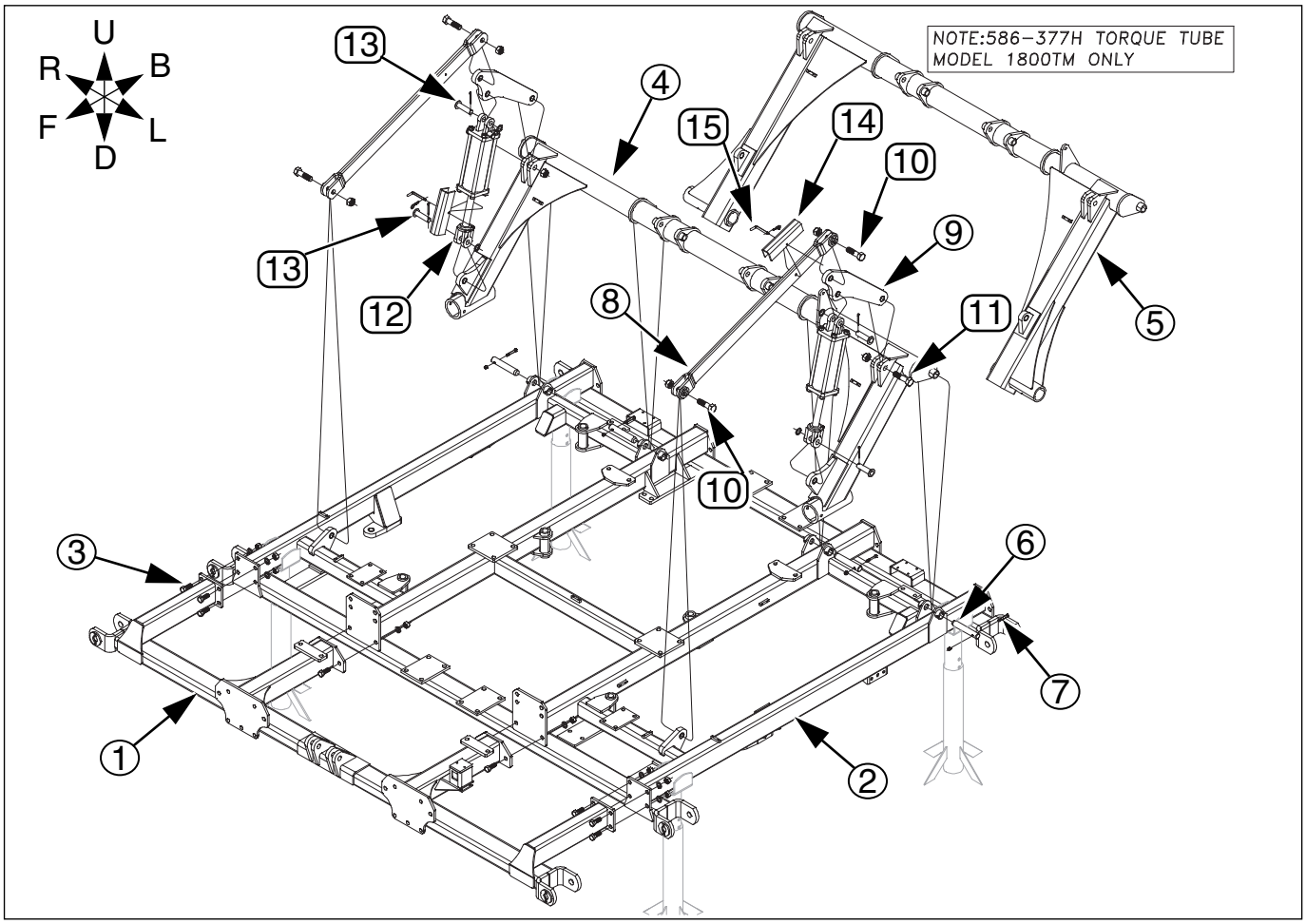


Figure 5
Center Frame & Lift Assembly

42951

Center Transport 1800

Refer to Figure 6

9. Slide hub/spindle assembly ① into torque tube ② and align holes. Secure with 1/2 x 4 1/2 hex bolts ③ and 1/2 top lock nut.
10. Attach tire/wheel assembly ④ with 5/8 lug nuts ⑤.
11. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "**Torque Values Chart**" on page 38.

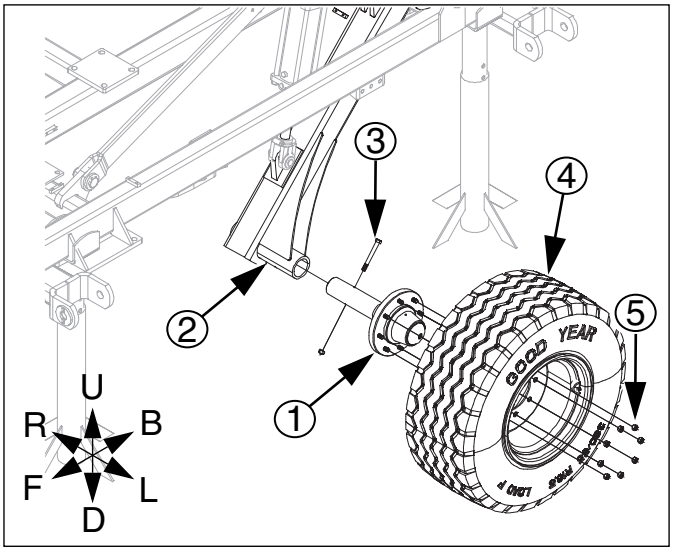


Figure 6 42952
Center Transport 1800

Center Transport 2400-3000

Refer to Figure 7

12. Slide walking beam assembly ① into torque tube ② and align holes. Secure with 1/2 x 6, Gr. 8 hex bolts ③ and 1/2 top lock nut.
13. Slide hub/spindle assemblies ④ into walking beam assembly ① and align holes. Secure with 1/2 x 5 hex bolts ⑤ and 1/2 top lock nut.
14. Attach tire/wheel assemblies ⑥ with 5/8 lug nuts ⑦.
15. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "**Torque Values Chart**" on page 38.

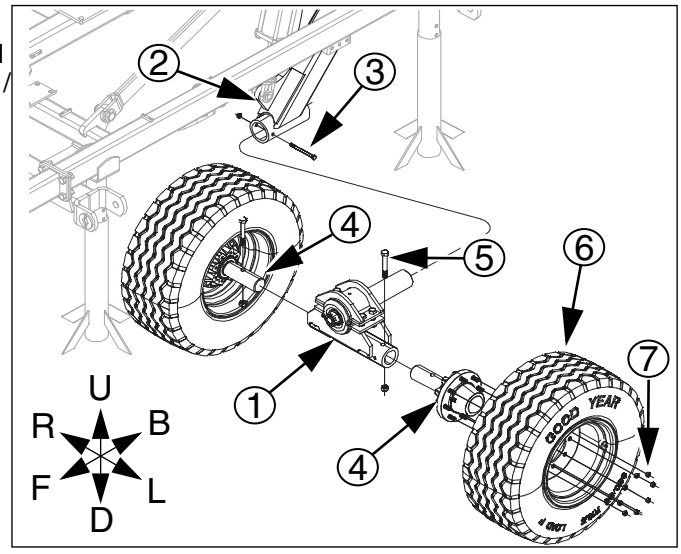


Figure 7 42953
Center Transport 2400-3000

Rear Trusses & Fold Brackets

Refer to Figure 8

16. Attach rear truss bars ① to plates on center frame with 3/4 x 2 1/2 hex bolt ② (front plate), 3/4 x 2 hex bolt ③ (rear plate), 3/4 lock washers and 3/4 nuts.
17. Install front and rear (model 3000 only) fold brackets ④ with 3/4 x 2 hex bolt ③ (rear plate), 3/4 lock washers and 3/4 nuts.
18. Install double block tees ⑤ in locations shown below with 5/16 x 5 1/2 hex bolt ⑥, 5/16 x 2 1/2 hex bolt ⑦, 5/16 x 4 hex bolt ⑧, 5/16 lock washers and 5/16 nuts.
19. Attach outside plates of wing stops ⑨ with 5/8 x 1 1/2 hex bolts ⑩, 5/8 lock washers and 5/8 nuts. Secure inside plate to rear truss bars ① with 5/8 x 4 1/32 x 5 1/2 u-bolts ⑪, 5/8 lock washers and 5/8 nuts.
20. Attach 3/4 x 3 hitch pin ⑫ to tube wing stops ⑨.
21. Bolts may be tightened to specs, See "**Torque Values Chart**" on page 38 and all cotter pins may be bent.

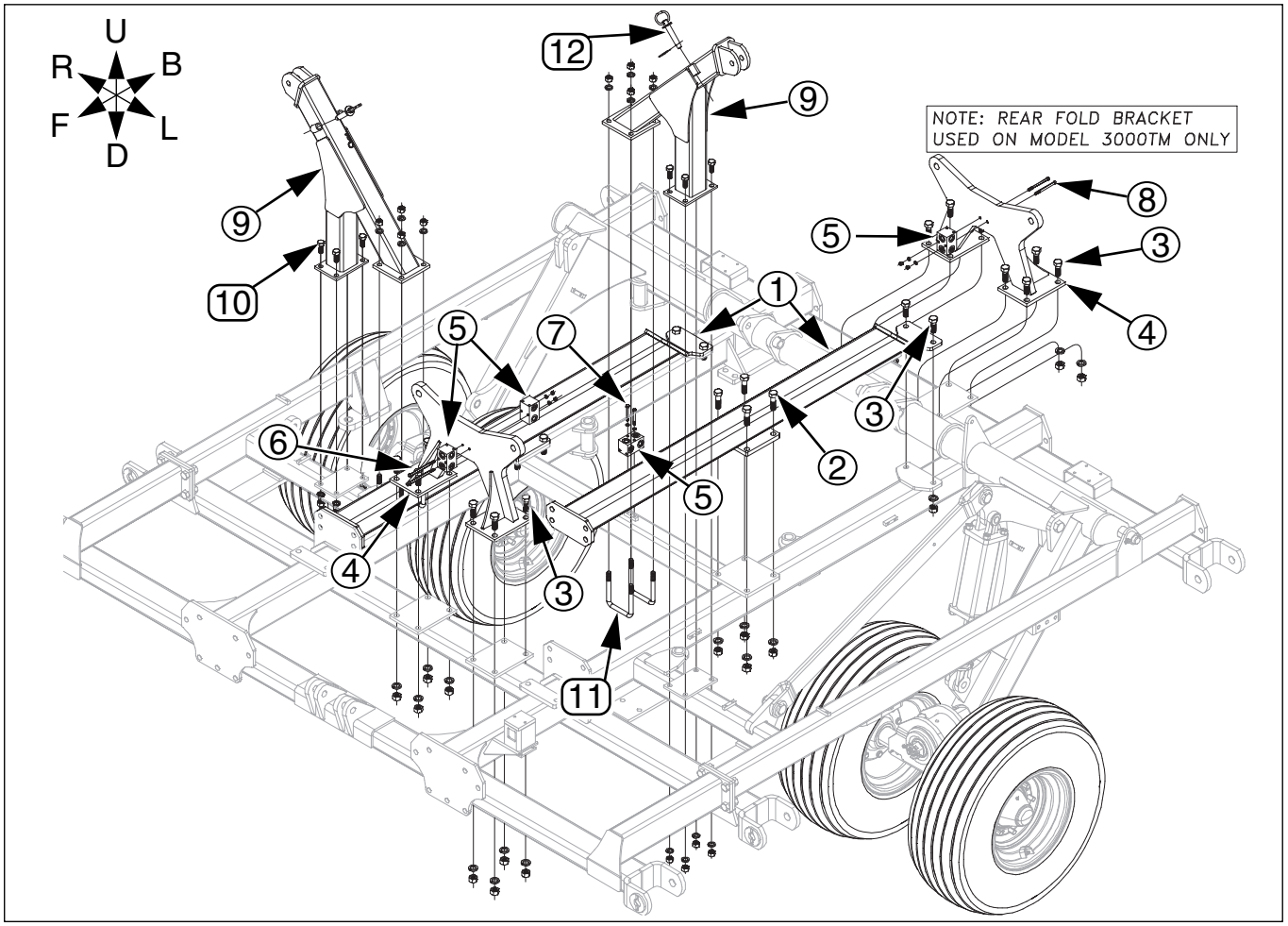


Figure 8
Rear Trusses & Fold Brackets

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Front Trusses & Level Bar

Refer to Figure 9

22. Install rear level bar ① to torque tube with 1 x 9 1/2 pins ②, 3/8 x 2 1/4, Gr. 8 hex bolts ③ and 3/8 nylon lock nut.
23. Install h-bracket assembly ④ to front of rear level bar ① with 3/4 x 2, Gr. 8 hex bolts ⑤, 3/4 lock washers and 3/4 nuts.
24. Install bottom of h-bracket assembly ④ to center brace bar with 1 x 3 1/4 clevis pin ⑥, 1.5 x 1.00 x.075 machine washer ⑦ and 3/16 x 2 cotter pin.
25. Attach front hitch trusses ⑧ with 3/4 x 2 hex bolt ⑨ (front plate), 3/4 x 2 1/2 hex bolt ⑩ (rear plates), 3/4 lock washers and 3/4 nuts.
26. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "**Torque Values Chart**" on page 38.

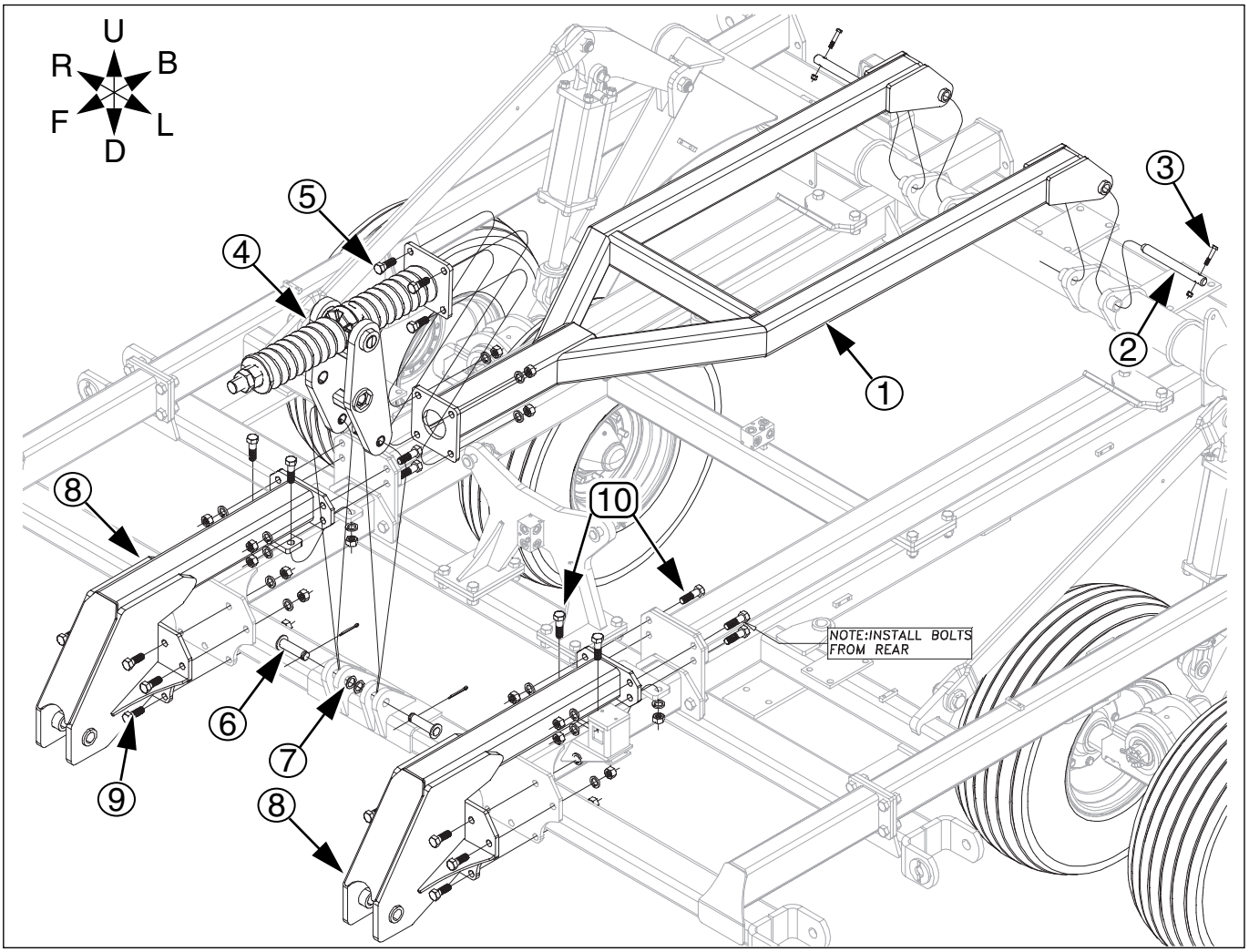

Figure 9
Front Trusses & Level Bar

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Valve Brackets & Valves

Refer to Figure 10

Note: Bolts needed in these next steps will be bolted on parts or located in a bag on front of center frame.

27. Remove the 1/2 x 3 1/32 x 6 u-bolts ④ from the valve brackets ① and ②, Attach bypass and counterbalance valve bracket ① and lock valve bracket ② to center brace bar ③ in proper locations, shown, See “Valve Brackets & Hoses” below, with the same 1/2 x 3 1/32 x 6 u-bolts ④, 1/2 lock washers and 1/2 nuts.
28. Be sure hoses are routed as shown in, See “Valve Brackets & Hoses” below.
29. Install bypass valve ⑤ on top of valve bracket ① with 5/16 x 3 Gr. 5 hex bolts ⑥, 5/16 lock washers and 5/16 nuts.
30. Fasten the counter balance valve ⑦ to side of valve bracket ① with 5/16 x 4 Gr. 5 hex bolts ⑧, 5/16 lock washers and 5/16 nuts.
31. Install the lock valve ⑨ to the top of the valve bracket ② with 1/4 x 2 Gr. 5 hex bolts ⑩, 1/4 lock washers and 1/4 nuts.
32. Fasten the two way fold valve ⑪ to top of plate on tube of center brace bar ③ with 5/16 x 1 3/8 x 2 3/16 u-bolts ⑫ and 5/16 top lock nuts.
33. Attach depth control valve ⑬ to top of depth stop bracket (plunger forward), with 5/16 x 2 Gr. 5 hex bolts ⑭ and 5/16 lock washers.
34. Bolts may be tightened to specs, See “**Torque Values Chart**” on page 38.

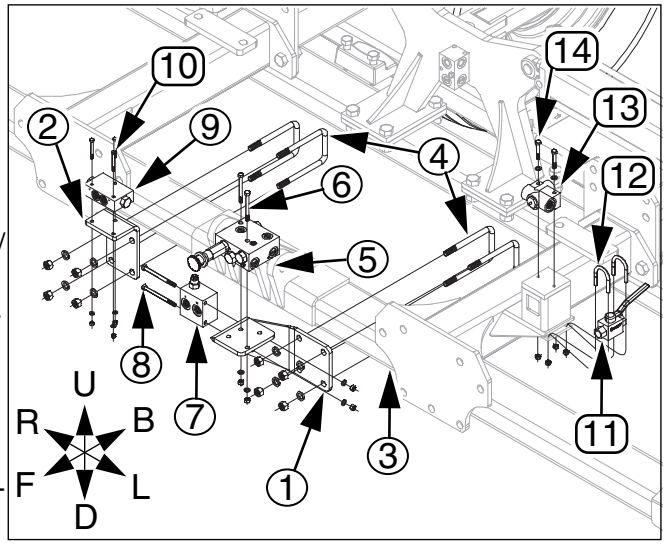

Figure 10
Valve Brackets & Valves
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Valve Brackets & Hoses

Refer to Figure 11

Note: The hoses will be shipped hooked up to valves and cylinders. The front valves and hoses (that will need routed through front brace bar, trusses and up hitch to tractor) will be rolled up and tied to front of center frame during shipping. The wing fold two way ①, bypass ② and lock valves ③ will need mounted in proper location as shown and hoses routed correctly before front trusses ④ and hitch are installed so front weight kits may be installed or removed without taking hoses or valves loose. The hoses need to route in locations shown with arrows, on top of wing brace ⑤ to outside of tubes then back to inside. Install front trusses ④ on top of hoses as shown. The two valve plates will be mounted in correct location but will need turned around 180 degrees on tube so they are facing forward on machine. Set them 1” from truss plates as shown. See “Valve Brackets & Valves” above, for proper mounting instructions.

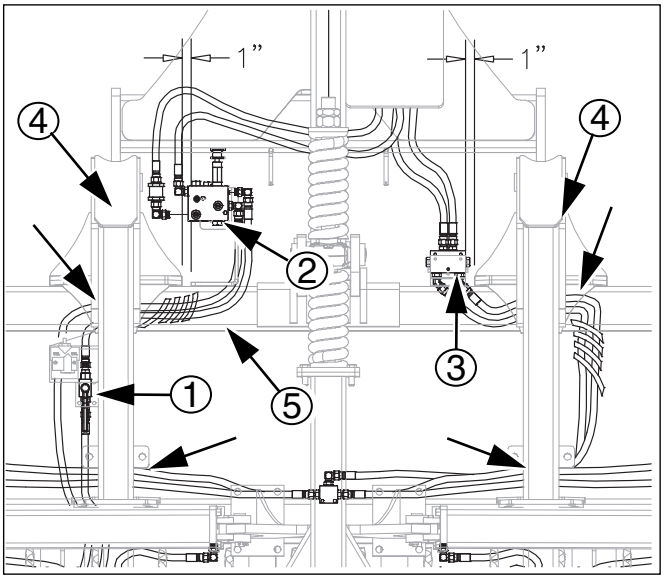

Figure 11
Valve Brackets & Hoses
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Hitch

Refer to Figure 12

35. Bolt the hitch frame ① to front trusses with the 1 1/4 x 8 Gr. 8 bolts ②, 1 1/4 flat washer ③ (one side of uniball to take up space) and 1 1/4 top lock nuts. Tighten bolts snug, do not torque, as the hitch must pivot freely.
36. Install jack ④ on front outside of hitch to support the front of hitch ① for the rest of assembly.
37. Attach h-bracket in orientation shown below with 1 x 2 29/64 clevis pins ⑥, 1.5 x 1.00 x 0.075 machine washers and 3/16 x 2 cotter pins.
38. Attach level bar tube ⑦ with 1 1/4 x 8 1/2 Gr. 8 special thread bolts ⑧, rear bolt from left side, front bolt from right side and secure with 1 1/4 top lock nuts.
39. Attach rear of level turnbuckle ⑩ with 1 x 8 Gr. 8 special thread bolt ⑨, front with 1 x 6, Gr. 8 special thread bolt ⑪ and 1 top lock nuts.
40. Attach two, 1 3/4 gang wrenches ⑫ and one, 2 5/16-1 15/16 turnbuckle wrench ⑬ over pegs on back of hitch, secure with 3/16 w/cotter/chain ⑭.
41. Install the spring hose holder ⑮ to welded nut on front of hitch with 1/2 x 1 Gr. 5 bolt ⑯, 1/2 lock washer and 1/2 flat washer.
42. Align holes in hitch base ⑰ with holes on front of hitch frame ①. Align holes of safety chain support ⑱ in orientation shown, secure with two, 1 x 8 Gr. 8 special thread bolts ⑨, six, 1 flat washers ⑲ (4 right side, 2 left side), 1 lock washers and 1 nuts.
43. Attach safety chain ⑳ to bottom side of hitch frame ①, secure with 7/8 x 3 hex bolt ㉑, 7/8 flat washer, 7/8 lock washer and 7/8 nut.
44. Mount manual pack ㉒ with 1/4 x 1 hex bolts ㉓, mini end wheel press wheels ㉔, 1/4 lock washers and 1/4 nuts.
45. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See “**Torque Values Chart**” on page 38.

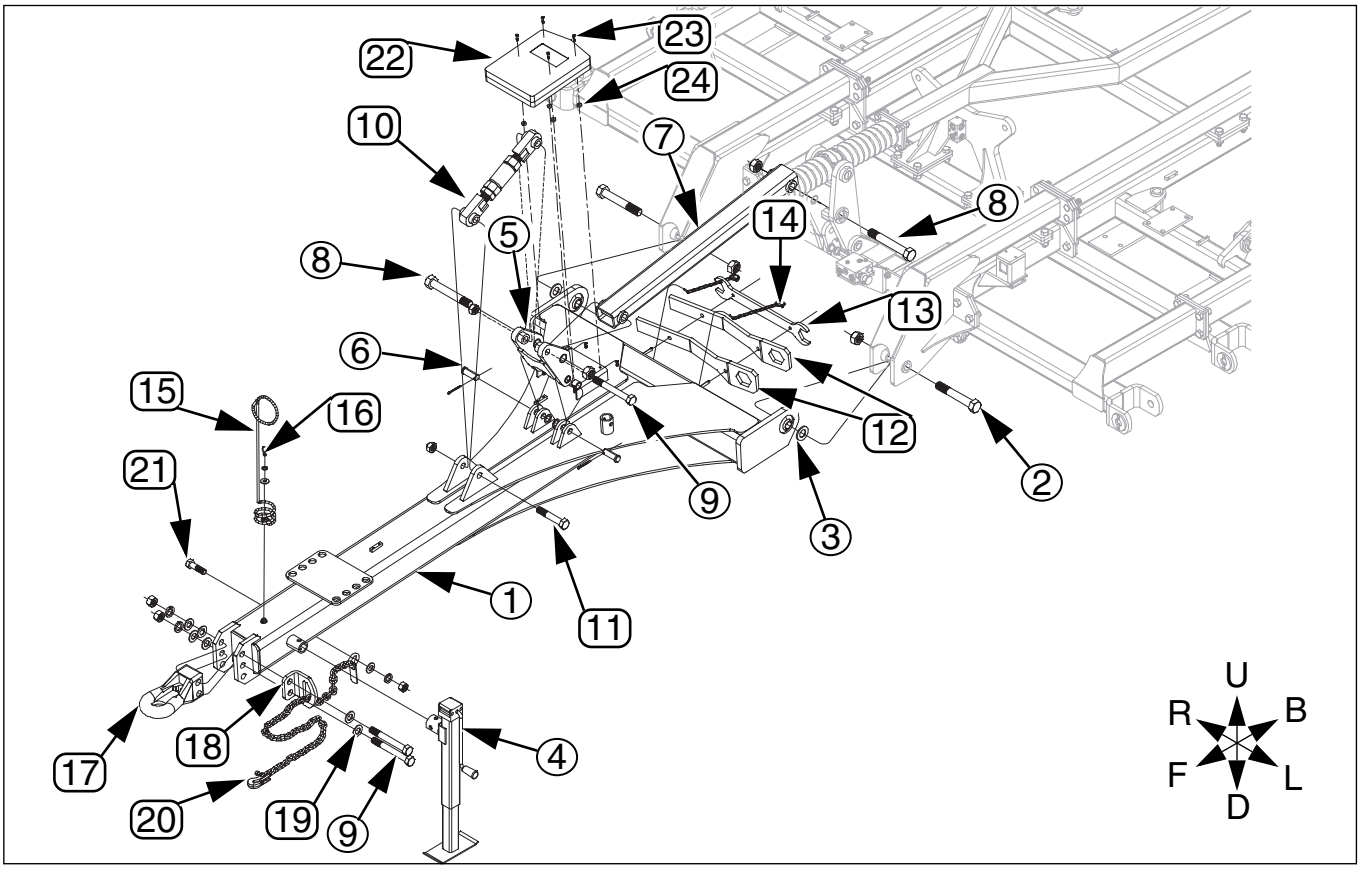


Figure 12
Hitch

42958

Wing & Lift Assembly

Refer to Figure 13

46. Attach wing brace ① to wing frame ② with 3/4 x 2 hex bolts ③, 3/4 lock washers and 3/4 nuts.
47. Attach wing brace ① and wing frame ② to center frame with wing hinge pins ④, 1 1/4 flat washers ⑤ (rear side of wing hinge tubes only, do not use washer on wing brace bar) and 1 lock nuts.
48. Install lh and rh wing wheel arms ⑥ with 1 x 7 pins ⑦, 3/8 x 2 1/4, Gr. 8, special thread hex bolts ⑧ and 3/8 nylon lock nut.

Note: Be sure turnbuckle assembly ⑨ is preset at 45 3/4" before installing as shown below. See gang angle adjustment in "Operator Manual" before going to field.

49. Install wing wheel turnbuckles ⑨ to front, top hole, of cylinder mount plate ⑩ with 1 x 4 hex bolts ⑪ and 1 lock nuts.
50. Install rear hole of cylinder mount plate ⑩ to inside of plates of wing wheel arms ⑥ with 1 x 4 hex bolts ⑪ and 1 lock nuts.
51. Secure front of wing wheel turnbuckles ⑨ to plate on wing frame ② with 1 x 4 hex bolts ⑪ and 1 lock nuts.
52. Install wing lift cylinders ⑫ (base end to cylinder mount plate ⑩) with 1 x 3 1/8 pins ⑬, 1.5 x 1.0 x.075 machine washers and 3/16 x 2 cotter pin.
53. Attach wing stop brackets ⑭ to plate of wing frame ② with 5/8 x 1 1/2 hex bolts ⑮, 5/8 lock washers and 5/8 nuts.
54. Now the base end of fold cylinders ⑯ may be hooked up with the 1 x 3 1/8 clevis pin ⑬, 1.5 x 1.00 x 0.075 machine washer and 3/16 x 2 cotter pin.
55. Do not hook up rod end of fold cylinder ⑯ until system is purged of air. See "**Purging Hydraulic System**" on page 18.
56. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "**Torque Values Chart**" on page 38.

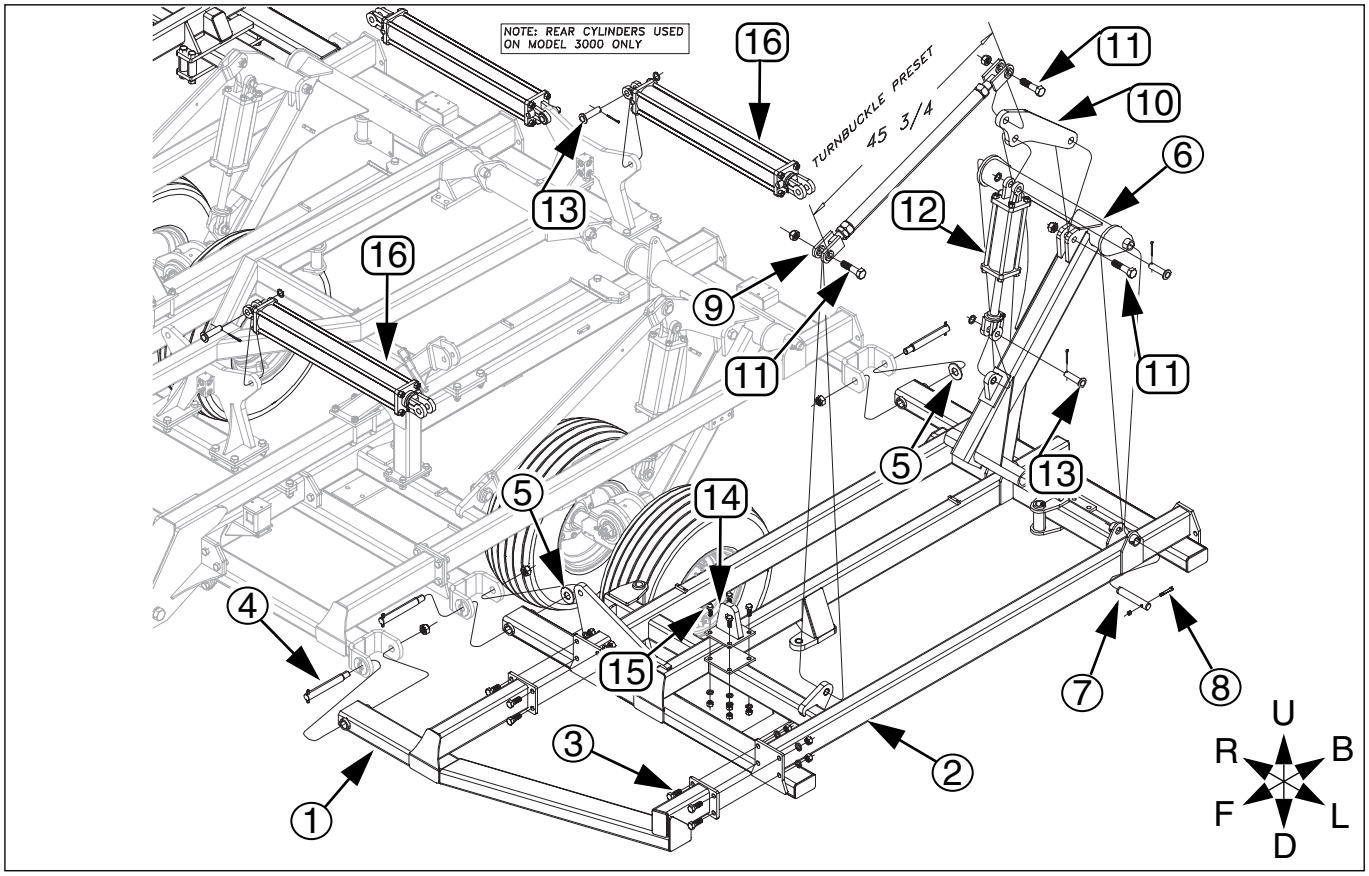


Figure 13
Wing & Lift Assembly

42959

Wing Transport

Note: Model 1800 does not use tire/wheel on inside of wheel arm.

Refer to Figure 14

57. Slide hub/spindle assembly ① into torque tube ② and align holes. Secure with 5/16 x 3 1/2 hex bolts ③ and 5/16 top lock nut.
58. Attach tire/wheel assembly ④ with 5/8 lug nuts ⑤.
59. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "**Torque Values Chart**" on page 38.

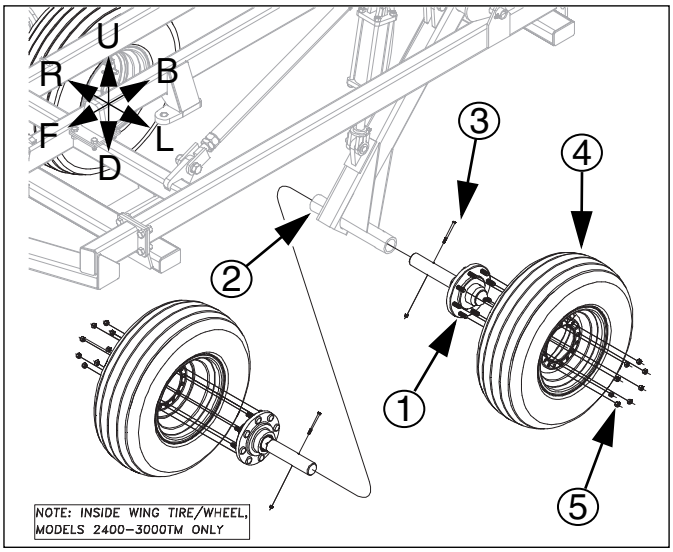


Figure 14 42960
Wing Transport

Depth Stop & Angle Gauge

Refer to Figure 15

Note: See machine layout drawings in Appendix for proper gang gauge placement for each model.

60. Slide depth stop tube ① from rear of machine under left wing stop through square hole on depth control bracket on center wing brace. Align rear holes over lever on torque tube, secure with 1/2 x 3 hex bolt ②, 1/2 top lock nut.
61. Fasten depth stop assembly ③ on top of depth stop tube with 1/2 x 2 1/2 hex bolts ④, 1/2 lock washers and nuts.
62. Attach angle gauge bracket assembly ⑤ to front of center frame with 1/2 x 3 1/32 x 6 u-bolts ⑥, 1/2 lock washers and 1/2 nuts.
63. Attach gauge link ⑦ to ear on front of center frame and gauge bracket assembly ⑤, secure with 3/8 x 1 1/4 hex bolts ⑧ and 3/8 top lock nuts.
64. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "**Torque Values Chart**" on page 38.

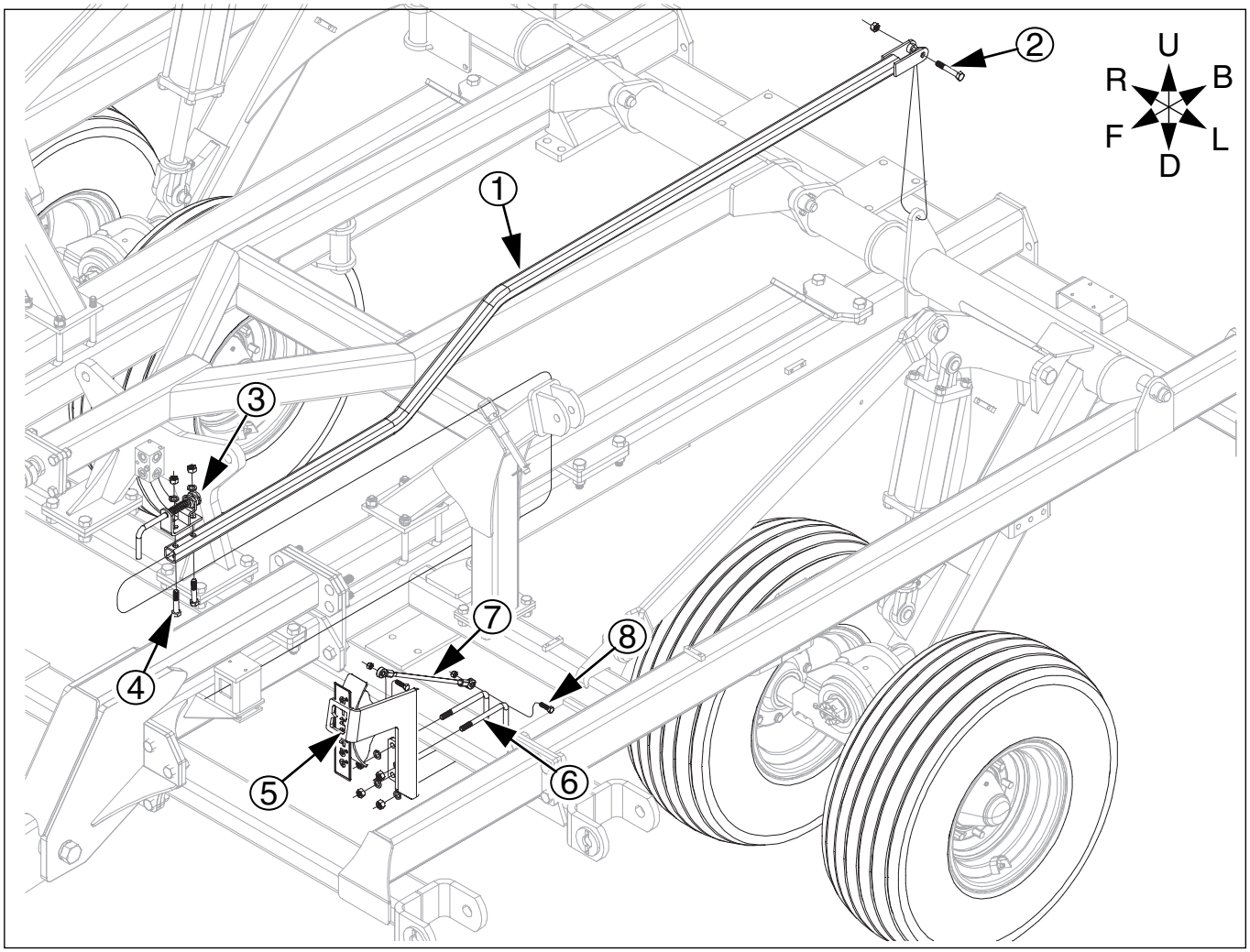


Figure 15
Depth Stop & Angle Gauge

42971

Attach Hose Clamps and Hose Wraps

Note: Refer to hydraulic layouts in “Appendix” section of this manual for proper lift and fold hose routing on center and wings. Do not clamp hoses on hitch until gang hoses are hooked up, See “**Gang Cylinder Purging**” on page 31. See “**Hydraulic Connector ID**” on page 40 for proper fitting installation.

Refer to Figure 16

65. When all the lift and fold hoses are hooked up and tightened properly, put hose clamps on hoses as shown.
66. Install hose wraps on hoses as needed.

Note: 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.

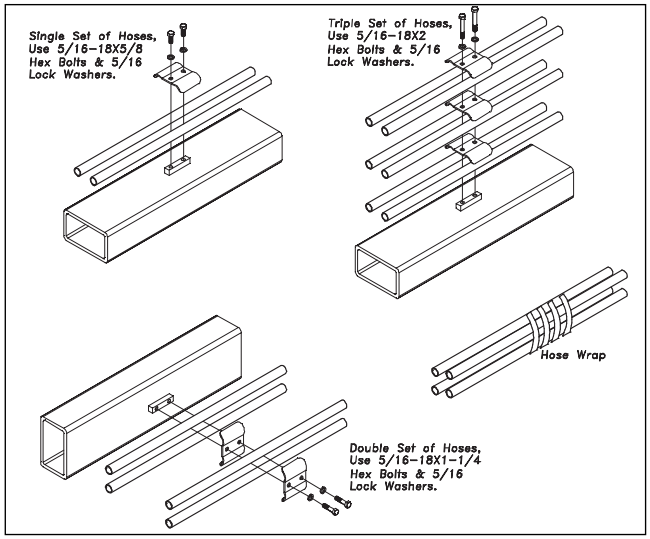


Figure 16 41583
Hose Clamp Assembly

Hydraulic Hose Hookup

67. 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 Adjustment (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 17

68. 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.
69. Once all hoses are tightened, hook hoses to tractor.

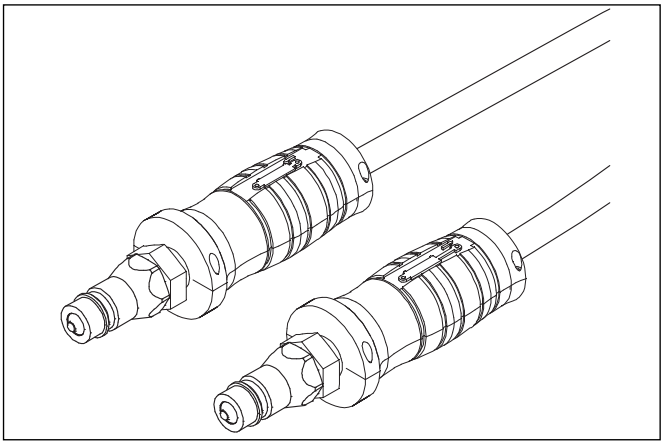


Figure 17 41552
Hose Handles

Purging Hydraulic System

Note: When lift and fold hoses are routed and hooked up to cylinders and valves the systems will need purged of air. Purging the lift and fold system now will allow the wings to be folded and unfolded. The machine may also be raised up or down for ease of gang assembly installation.

Refer to Figure 18

70. 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 store on lift straps ③. Raise and lower the lift system several times to purge air from system. Watch for leaks and retighten fittings if necessary.
71. You may now charge the fold system. Before charging the fold cylinders ④, make sure the rod end of the cylinders are un-bolted or un-pinned and block ⑥ is placed under cylinders 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 several times to purge air from the system.
72. Now the rod end of fold cylinders ④ may be hooked up to wing with the 1 x 3 1/8 usable pin ⑤, 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin. Bend cotter pin over to secure.

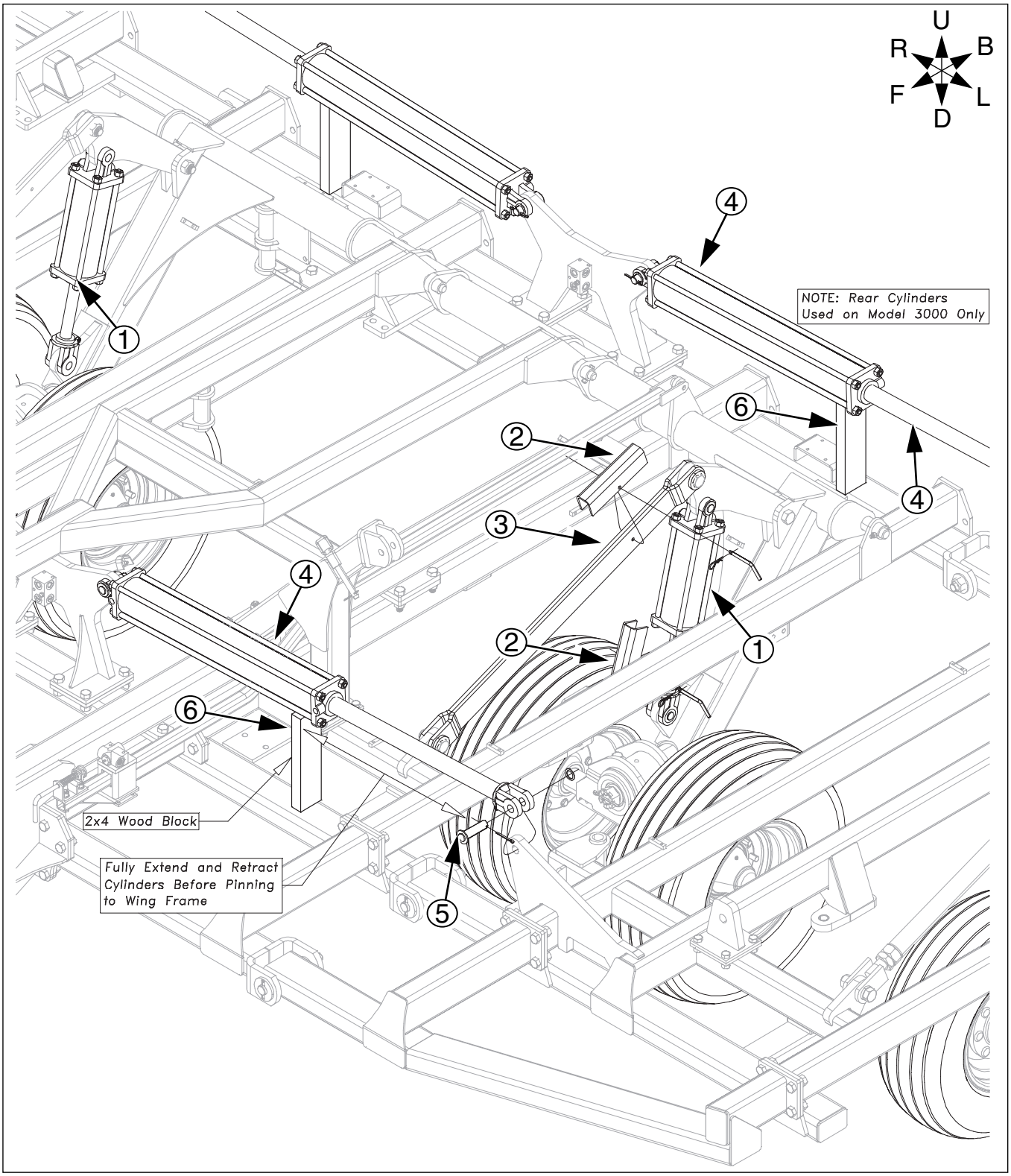


Figure 18
Purging Hydraulic System

Center Gang Bar 1800

Note: Refer to center gang bar assembly in “Parts Manual” for correct part numbers of all components.

Refer to Figure 19

73. Position gang assemblies ① in proper locations. Install the gang pivot bolt ② through tubes of gang bars and tubes on center frame, secure with 1 1/4 flat washers ③ (one on top and one on bottom), 1 1/4 slotted nut ④ (one on top and one on bottom). Tighten bolts snug, torque to 350 to 400ft-lbs. Install the 3/16 x 2 cotter pins ⑤ through 1 1/4 slotted nuts ④ and bend over to secure.

Note: Be sure turnbuckle assembly ⑥ is preset at 62” before installing as shown below. See gang angle adjustment in “Operator Manual” before going to field.

74. Install turnbuckle assembly ⑥, adjustable end on ear on front of rear gang bars and fixed end on ear of front gang bars. Secure with 1 x 3 1/4 clevis pin ⑦, 1.5 x 1.00 x 0.075 machine washer ⑧ and 3/16 x 2 cotter pin ⑤.

    Refer to machine layout drawings in this manual for correct gang assembly placement.

75. Install the round tubes ⑪ (two on each gang bar) between bottom front plate ⑨ (slotted hole toward rear), rear plates ⑩ and plates on center frame. Install the 3/4 x 6 hex bolts ⑫, 3/4 lock washers and 3/4 nuts. Attach other ends of plates ⑨ and ⑩ to bottom of center frame with 3/4 x 2 hex bolts ⑬ and 3/4 lock washers.

76. Install bracket ⑭ on bottom side of gang bar plate, secure with 5/8 x 3 1/2 hex bolts ⑮, 5/8 lock washers and 5/8 nuts.

77. Now the gang cylinders ⑯ may be hooked up with the 1 x 3 1/8 clevis pin ⑰, 1.5 x 1.00 x 0.075 machine washer ⑧ and 3/16 x 2 cotter pin ⑤.

78. Bolts may be tightened to specs, See “**Torque Values Chart**” on page 38 and all cotter pins may be bent.

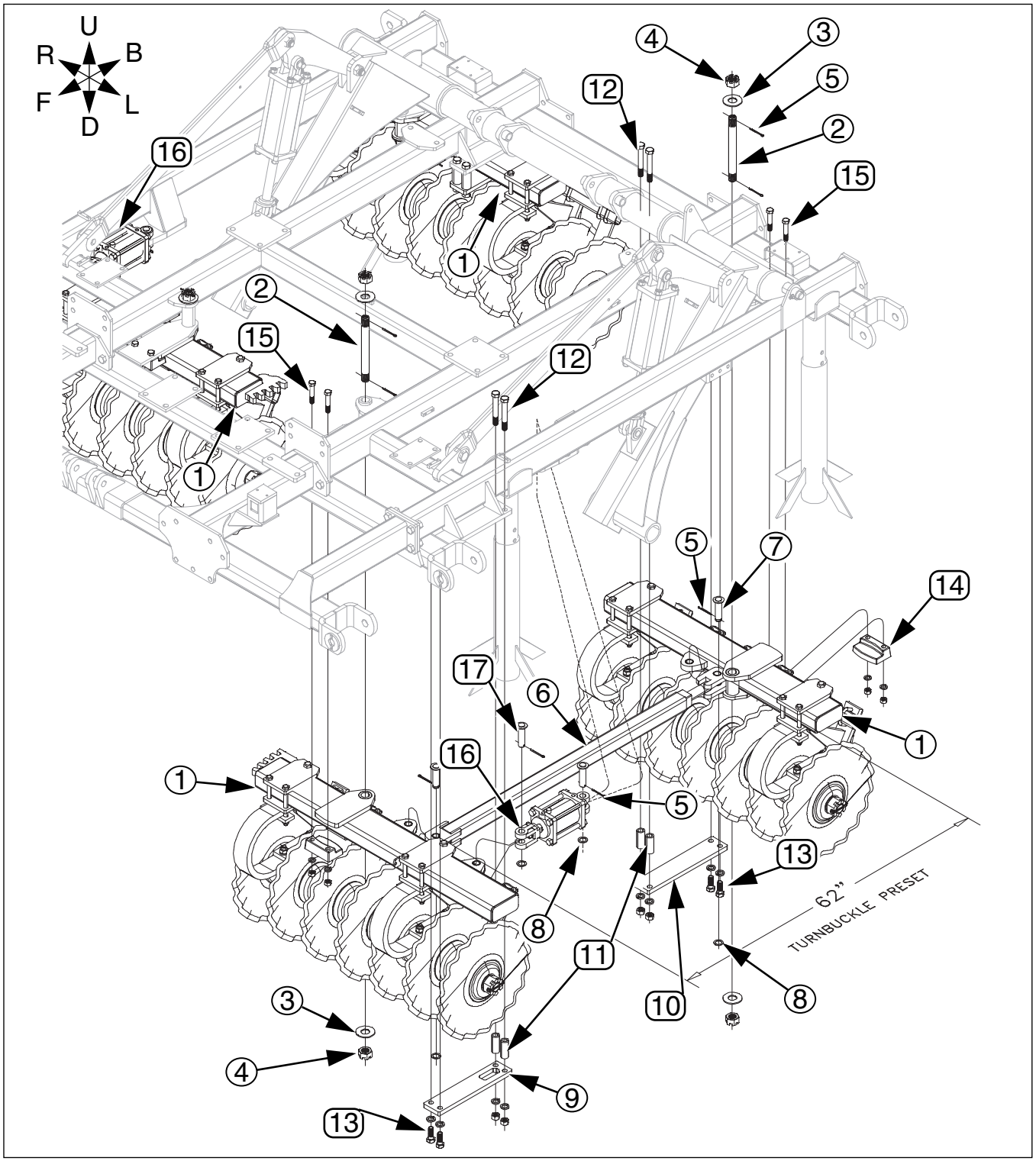


Figure 19
Center Gang Bar 1800

42954

Center Gang Bar 2400-3000

Note: Refer to center gang bar assembly in “Parts Manual” for correct part numbers of all components.

Refer to Figure 20

79. Position gang assemblies ① in proper locations. Install the gang pivot bolt ② through tubes of gang bars and tubes on center frame, secure with 1 1/4 flat washers ③ (one on top and one on bottom), 1 1/4 slotted nut ④ (one on top and one on bottom). Tighten bolts snug, torque to 350 to 400ft-lbs. Install the 3/16 x 2 cotter pins ⑤ through 1 1/4 slotted nuts ④ and bend over to secure.

Note: Be sure turnbuckle assembly ⑨ is preset at 30 1/4” before installing as shown below. See gang angle adjustment in “Operator Manual” before going to field.

80. Install rocker arm ⑥ to tube on center frame with 1 1/4 x 10 special thread bolt ⑦, secure with 1 1/4 top lock nut.

81. Install link ⑧ with 1 x 3 1/4 clevis pin ⑩, 1.5 x 1.00 x 0.075 machine washer ⑪ and 3/16 x 2 cotter pin ⑤.

82. Install turnbuckle assembly ⑨, adjustable end on ear on front of rear gang bars and fixed end on rear of rocker arm ⑥. Secure with 1 x 3 1/4 clevis pin ⑩, 1.5 x 1.00 x 0.075 machine washer ⑪ and 3/16 x 2 cotter pin ⑤.

    Refer to machine layout drawings in this manual for correct gang assembly placement.

83. Install the round tubes ⑭ (two on each gang bar) between bottom front plate ⑫ (slotted hole toward rear), rear plates ⑬ and plates on center frame. Install the 3/4 x 6 hex bolts ⑮, 3/4 lock washers and 3/4 nuts. Attach other ends of plates ⑫ and ⑬ to bottom of center frame with 3/4 x 2 hex bolts ⑮ and 3/4 lock washers.

84. Install bracket ⑯ on bottom side of gang bar plate, secure with 5/8 x 3 1/2 hex bolts ⑰, 5/8 lock washers and 5/8 nuts.

85. Now the gang cylinders ⑱ may be hooked up with the 1 x 3 1/8 clevis pin ⑲, 1.5 x 1.00 x 0.075 machine washer ⑪ and 3/16 x 2 cotter pin ⑤.

86. Hook gang cylinder hoses to gang cylinders, be sure all fittings are tightened to specs, See “**Hydraulic Connector ID**” on page 40. Now the gang system may be purged of air, See “**Purging Hydraulic System**” on page 19.

87. Bolts may be tightened to specs, See “**Torque Values Chart**” on page 38 and all cotter pins may be bent.

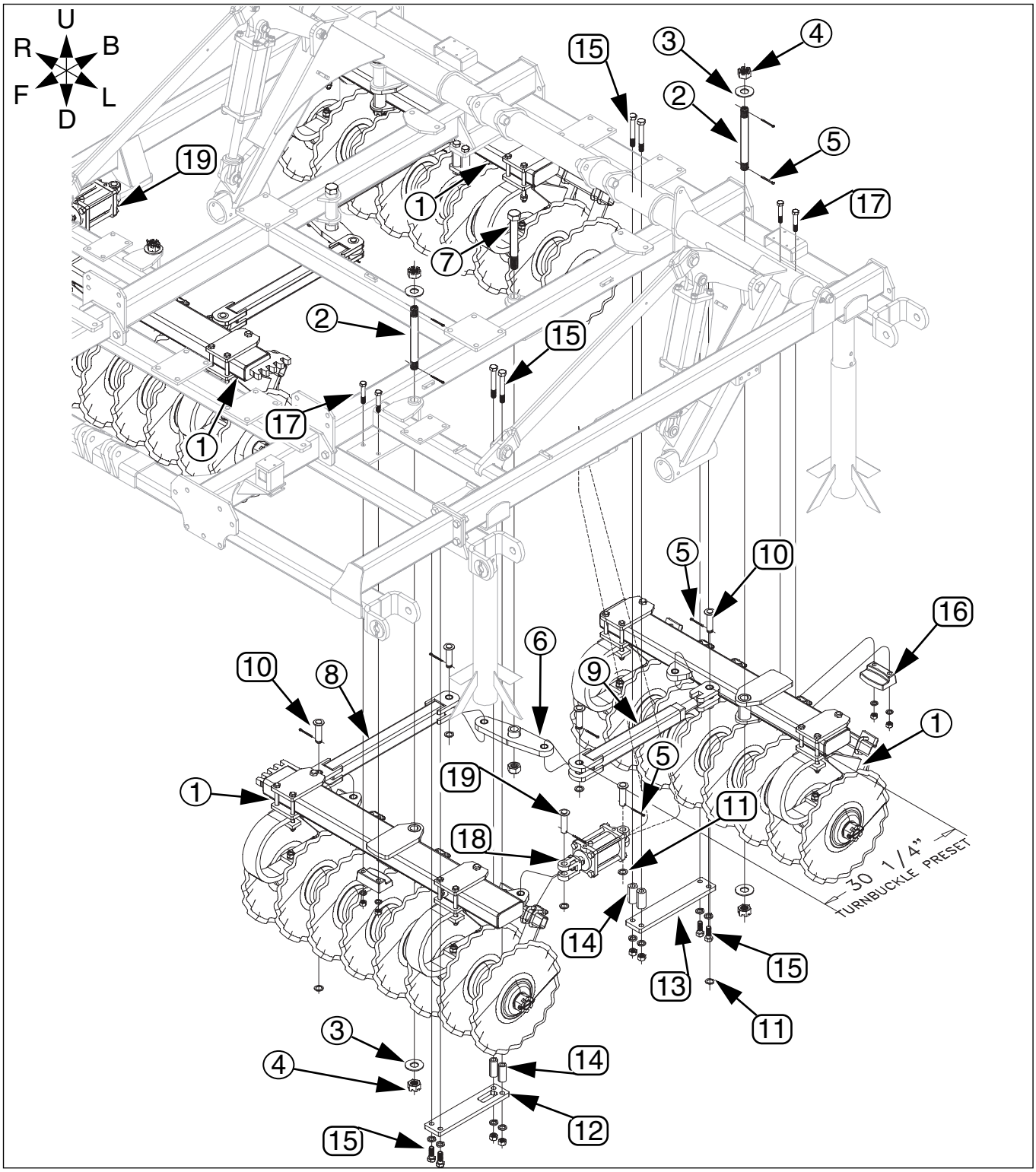


Figure 20
Center Gang Bar 2400-3000

42955

Wing Gang Bar 1800-2400

Note: Refer to center gang bar assembly in “Parts Manual” for correct part numbers of all components.

Refer to Figure 21

88. Position gang assemblies ① in proper locations. Install the gang pivot bolt ② through tubes of gang bars and tubes on center frame, secure with 1 1/4 flat washers ③ (one on top and one on bottom), 1 1/4 slotted nut ④ (one on top and one on bottom). Tighten bolts snug, torque to 350 to 400ft-lbs. Install the 3/16 x 2 cotter pins ⑤ through 1 1/4 slotted nuts ④ and bend over to secure.

Note: Be sure turnbuckle assembly ⑥ is preset at 62” before installing as shown below. See gang angle adjustment in “Operator Manual” before going to field.

89. Install turnbuckle assembly ⑥, adjustable end on ear on front of rear gang bars and fixed end on ear of front gang bars. Secure with 1 x 3 1/4 clevis pin ⑦, 1.5 x 1.00 x 0.075 machine washer ⑧ and 3/16 x 2 cotter pin ⑤.

90. Install the round tubes ⑪ (two on each gang bar) between bottom front plate ⑨ (slotted hole toward rear), rear plates ⑩ and plates on wing frame. Install the 3/4 x 6 hex bolts ⑫, 3/4 lock washers and 3/4 nuts. Attach other ends of plates ⑨ and ⑩ to bottom of wing frame with 3/4 x 2 hex bolts ⑬ and 3/4 lock washers.

    Refer to machine layout drawings in this manual for correct gang assembly placement.

91. Install bracket ⑭ on bottom side of gang bar plate, secure with 5/8 x 3 1/2 hex bolts ⑮, 5/8 lock washers and 5/8 nuts.

92. Now the gang cylinders ⑯ may be hooked up with the 1 x 3 1/8 clevis pin ⑰, 1.5 x 1.00 x 0.075 machine washer⑧ and 3/16 x 2 cotter pin ⑤.

93. Hook gang cylinder hoses to gang cylinders, be sure all fittings are tightened to specs, See “**Hydraulic Connector ID**” on page 40. Now the gang system may be purged of air, See “**Purging Hydraulic System**” on page 19.

94. Bolt may be tightened to specs, See “**Torque Values Chart**” on page 38 and all cotter pins may be bent.

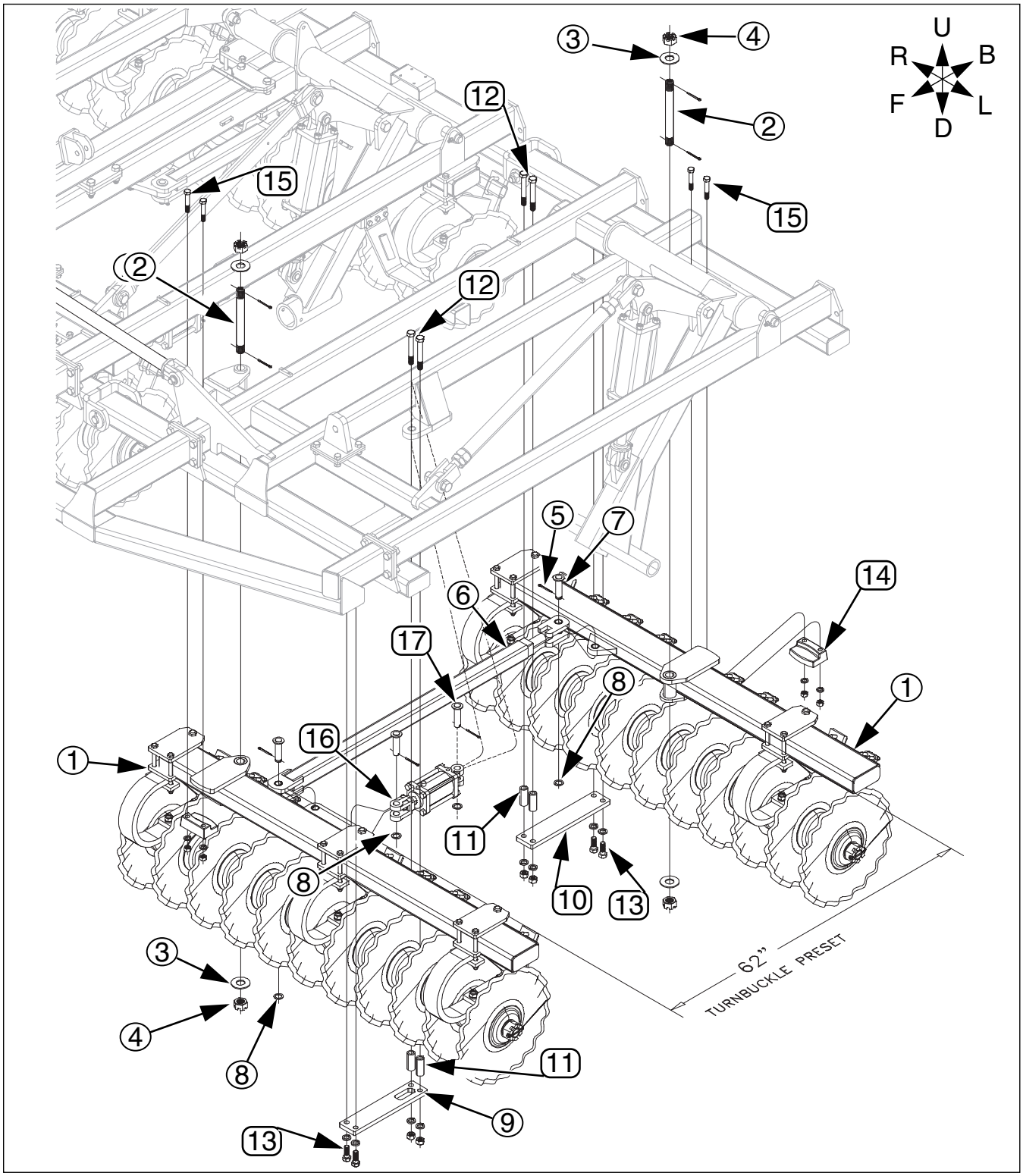


Figure 21
Wing Gang Bar 1800-2400

42961

Wing Gang Bar 3000

Note: Refer to center gang bar assembly in “Parts Manual” for correct part numbers of all components.

Refer to Figure 22

95. Position gang assemblies, front ① and rear ② in proper locations. Install the gang pivot bolt ③ through tubes of gang bars and tubes on center frame, secure with 1 1/4 flat washers ④ (one on top and one on bottom), 1 1/4 slotted nut ⑤ (one on top and one on bottom). Tighten bolts snug, torque to 350 to 400ft-lbs. Install the 3/16 x 2 cotter pins ⑥ through 1 1/4 slotted nut ⑤ and bend over to secure.

Note: Be sure turnbuckle assembly ⑦ is preset at 62” before installing as shown below. See gang angle adjustment in “Operator Manual” before going to field.

96. Install turnbuckle assemblies ⑦, adjustable end on ear on front of rear gang bars and fixed end on ear of front gang bars. Secure with 1 x 3 1/4 clevis pin ⑧, 1.5 x 1.00 x 0.075 machine washer ⑨ and 3/16 x 2 cotter pin ⑥.

97. Install the round tubes ⑫ (two on each gang bar) between bottom front plate ⑩ (slotted hole toward rear), rear plates ⑪ and plates on wing frame. Install the 3/4 x 6 hex bolts ⑬, 3/4 lock washers and 3/4 nuts. Attach other ends of plates ⑩ and ⑪ to bottom of wing frame with 3/4 x 2 hex bolts ⑭ and 3/4 lock washers.

    Refer to machine layout drawings in this manual for correct gang assembly placement.

98. Install bracket ⑮ on bottom side of gang bar plate, secure with 5/8 x 3 1/2 hex bolts ⑯, 5/8 lock washers and 5/8 nuts.

99. The 3.50 x 2.5 x 1.25 gang cylinders ⑰ and 3.25 x 2.5 x 1.25 gang cylinders ⑱ may be hooked up with the 1 x 3 1/8 clevis pin ⑲, 1.5 x 1.00 x 0.075 machine washer⑨ and 3/16 x 2 cotter pin ⑥.

100. Hook gang cylinder hoses to gang cylinders, be sure all fittings are tightened to specs, See “**Hydraulic Connector ID**” on page 40. Now the gang system may be purged of air, See “**Purging Hydraulic System**” on page 19.

101. Bolt may be tightened to specs, See “**Torque Values Chart**” on page 38 and all cotter pins may be bent.

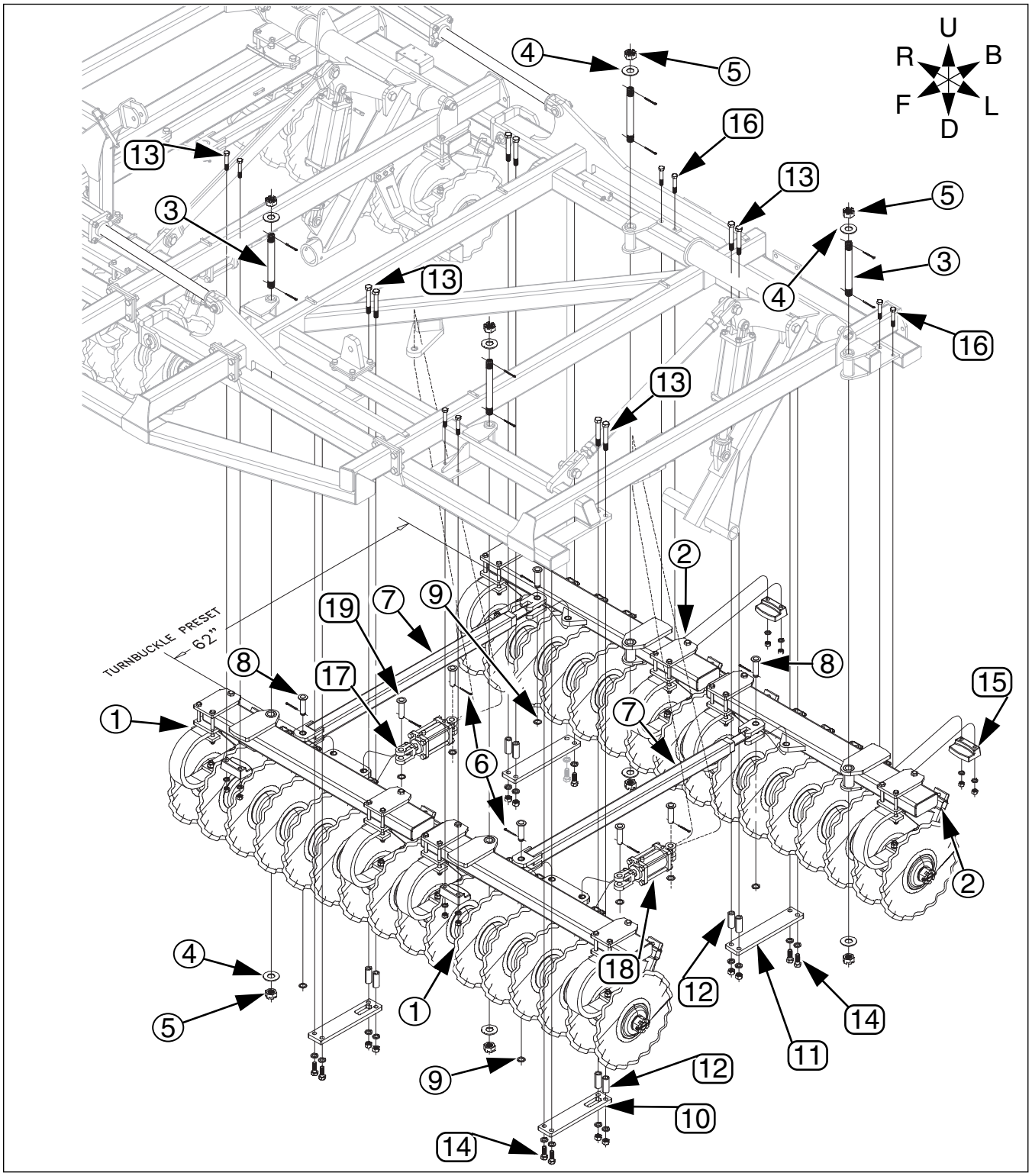


Figure 22
Wing Gang Bar 3000

42962

Front Light Assembly

Refer to Figure 23

102. Fasten LH ① and RH ② light brackets to center brace bar with 1/2 x 3 1/32 x 6 u-bolts ③, 1/2 lock washers and 1/2 huts.

103. Route light harness lead w/valve ④ from front of hitch (tractor plug to front), along same route as hydraulic hose (fasten in same clamps and hose wraps as hoses) to center brace bar. Plug one end of enhance light harness ⑤ to small end of light harness lead w/valve ④. Plug bigger end of light harness dual amber ⑥ into other end of enhance light module ⑤. Route shorter leads over towards (marked left and right) the front light mounting brackets as shown. Route long lead ⑥ along hoses on center frame tube to rear of machine. This lead will be hooked up as shown in, See "**Rear Lights & SMV**" on page 29.

104. Mount amber lamp lights ⑦ to top of light brackets ① and ②, with 1/4 x 1 Gr. 5 hex bolts ⑧ and 1/4 lock nuts. Plug lead of amber lamp lights ⑦ into leads of light harness dual amber ⑥.

105. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "**Torque Values Chart**" on page 38. 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 ⑨.

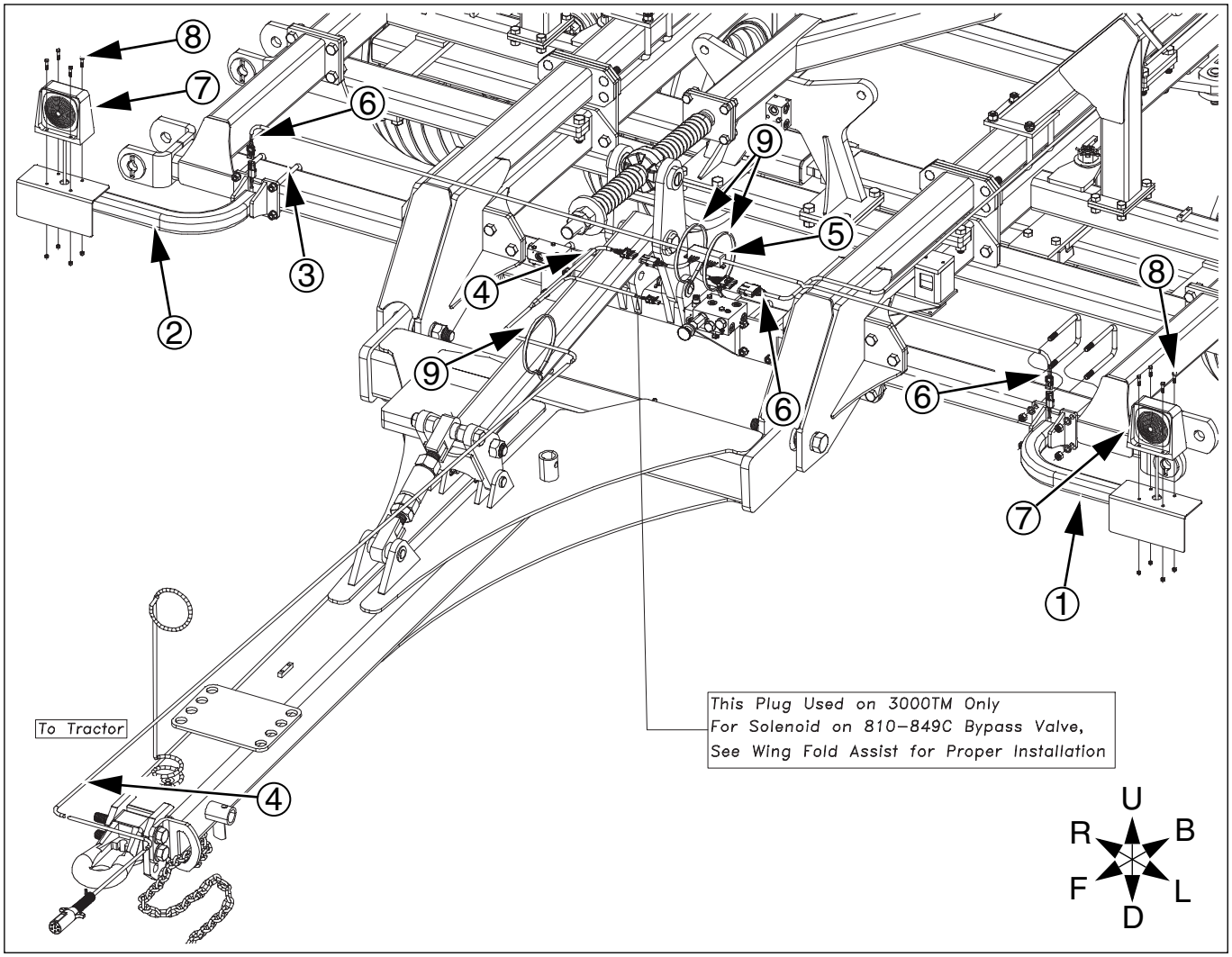


Figure 23
Front Lights

43129

Rear Lights and SMV Assembly

Refer to Figure 24

106. Fasten LH ① and RH ② light brackets to rear of center frame ④ or center drag frame ⑤ (if equipped) with 3/4.x 2 hex bolts ③, 3/4 lock washers and 3/4 huts.

107. Route light harness dual amber ⑥ along rear tube of center frame and outer amber leads to light brackets (either on rear of center frame or center drag frame).

108. - Mount amber lamp lights ⑦ to top of light brackets ① and ②, with 1/4 x 1 Gr. 5 hex bolts ⑧ and 1/4 lock nuts. Plug leads of amber lamp lights ⑦ to amber leads of light harness dual amber ⑥.

109. Mount red lamp lights ⑨ to center frame plates with 1/4 x 1 Gr. 5 hex bolts ⑧ and 1/4 lock nuts. Plug leads of red lamp lights ⑨ to red leads of light harness dual amber ⑥.

110. Attach smv mount ⑩ to rear tube of center frame ④, with 1/2 x 3 1/32 x 6 u-bolts ⑪, 1/2 lock washers and 1/2 huts. Attach smv sign ⑫ to back side of smv mount ⑩, secure with 1/4 x 3/4 pan head screws ⑬, 1/4 lock washers and 1/4 nuts.

111. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "**Torque Values Chart**" on page 38. 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 ⑭.

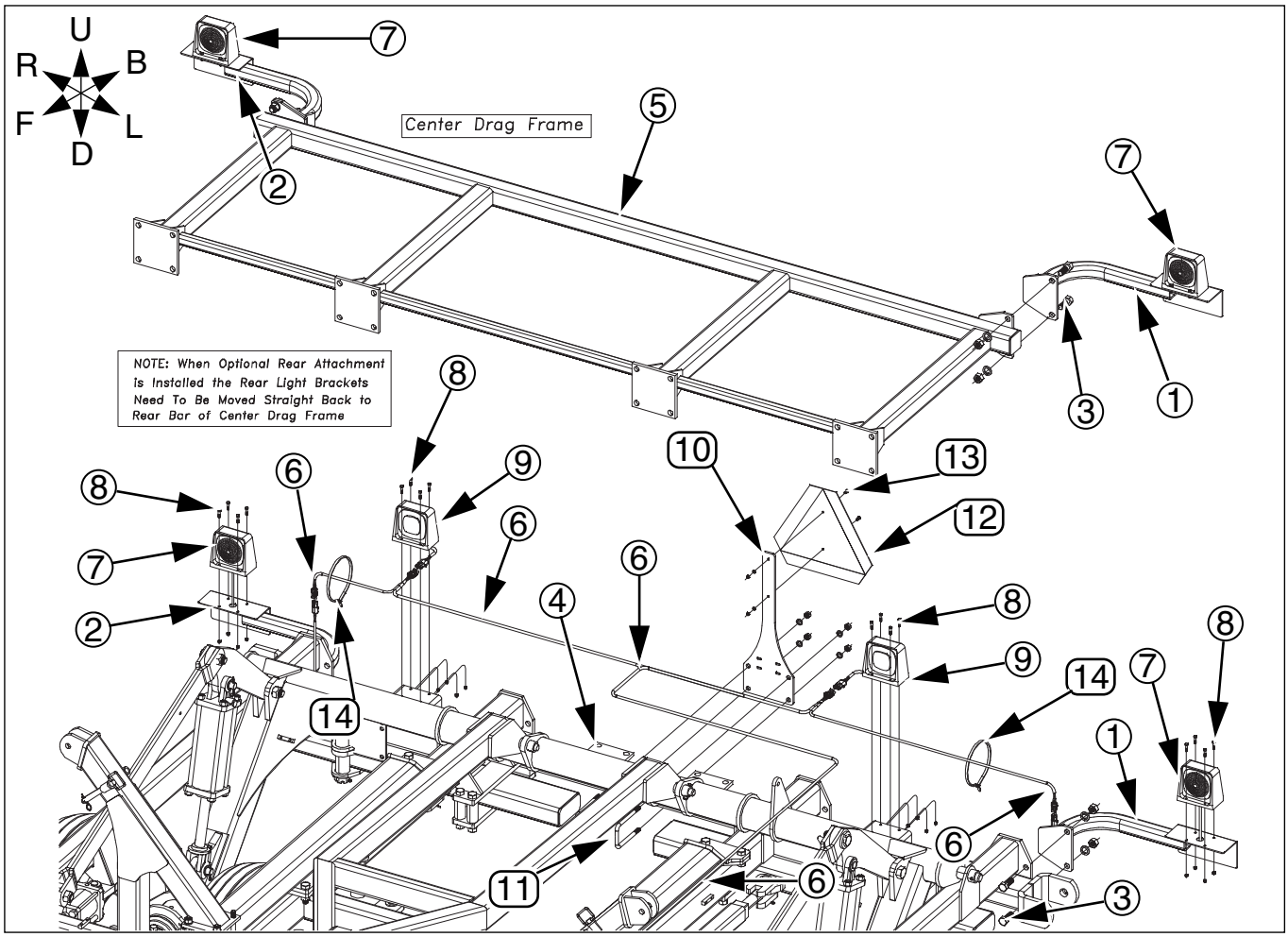


Figure 24
Rear Lights & SMV

42964

3000 Wing Fold Assist

Refer to Figure 25

Note: Wings need to be folded up when installing the proximity sensor ④ to prevent damage to sensor and brackets. Be sure wing safety lock pins are installed.

112. Slide proximity mount bracket ① over hinge pin ② in orientation shown, secure with 1 lock nut ③. Tighten 1 lock nut ③ snug but do not torque.

113. Slide proximity sensor ④ through inside, big hole of proximity mount bracket ① from rear. Be sure there is a nut ⑤ on back side of bracket and secure with a nut ⑤ on front side. Route leads of proximity sensor ④ towards center of machine on front tube of center frame as shown.

114. Plug short leads of the fold assist harness ⑥, one end to the light harness lead w/valve ⑦ and the other end into the lead from the bypass down pressure valve solenoid ⑧.

115. Route the rest of fold assist harness ⑥ as shown back to front tube of center frame and attach plugs to the proximity sensor ④ leads.

116. 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 ⑨.

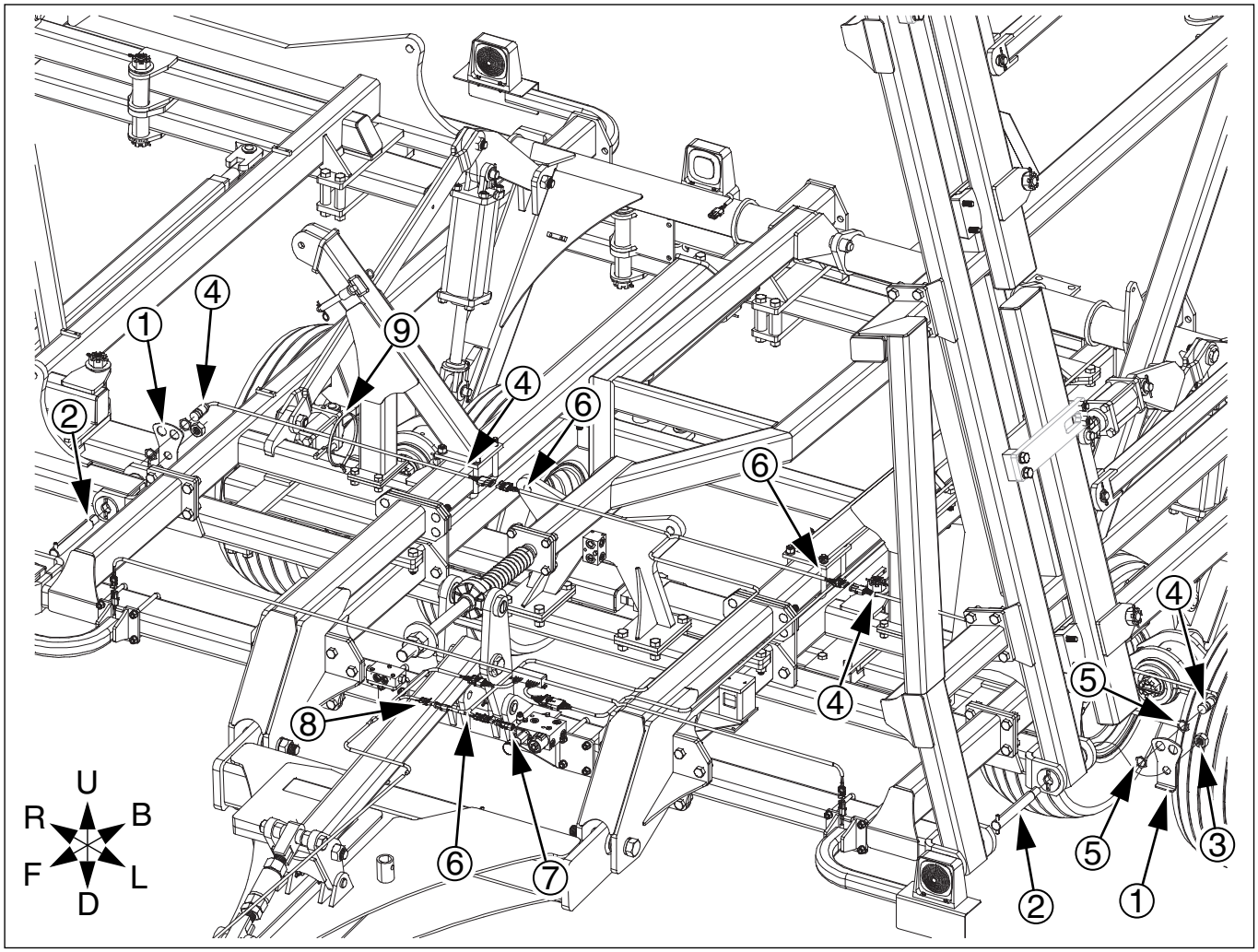


Figure 25
3000 Wing Fold Assist

43130

Proximity Sensor Adjustment

Refer to Figure 26

Note: Wings need to be folded up when adjusting the proximity sensor ① to prevent damage to sensor and bracket. Be sure and adjust proximity sensors before unfolding. Be sure wing safety lock pins are installed

117. Loosen nuts ② (one on front and one on back side of sensor bracket, adjust the proximity sensor ① to 1/8" to 1/4", from front of proximity sensor ③ to rear of wing tube ④ as shown.

118. Re-tighten nuts ② to secure proximity sensor ①.

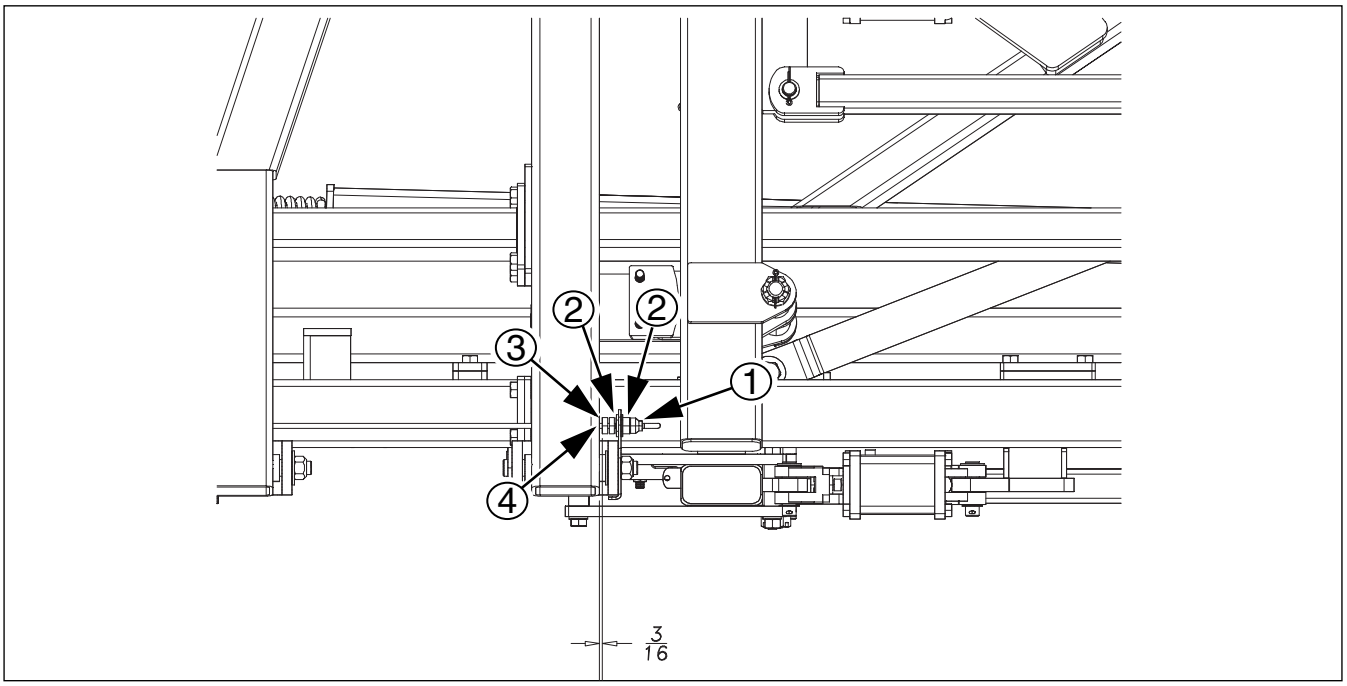


Figure 26
Priority Sensor Adjustment

43015

Gang Cylinder Purging

Refer to Figure 27

Note: Refer to hydraulic layouts in "Appendix" section of this manual for proper gang hose routing on center and wings. See "**Hydraulic Connector ID**" on page 40 for proper fitting installation. See "**Hose Clamp Assembly**" on page 17 for proper clamping of hoses.

119. Retract and extend the gang system ① (Red Handles) several times to purge air from system. Watch for leaks and retighten fittings if necessary.

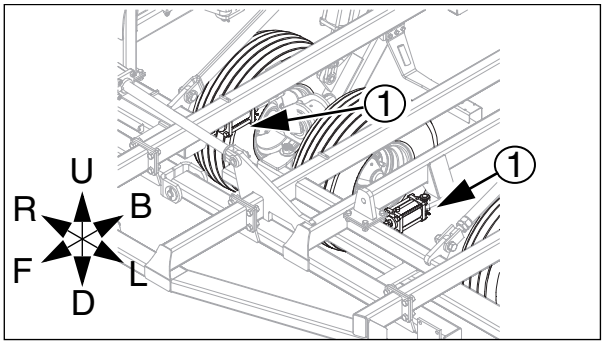


Figure 27
Gang Cylinder Purging

42978

Hose Routing Hitch

Refer to Figure 28

120.Route hydraulic hoses ① from valves ②, on center brace bar, gang hoses and light harness, under manual pak bracket ③, under front of hitch turnbuckle ④ along all hose clamp blocks and through spring hose holder loop ⑤ to front of hitch ⑥ as shown. Secure hoses with hose clamps ⑦, 5/16 hex bolts and 5/16 lock washers.

Note: Be sure all hose clamp bolts are tight. Attach hose wraps ⑧ as needed. Check that all hoses on machine are fastened properly and they won't get pinched at hinge points or drag on ground. Check all connections again for leaks.

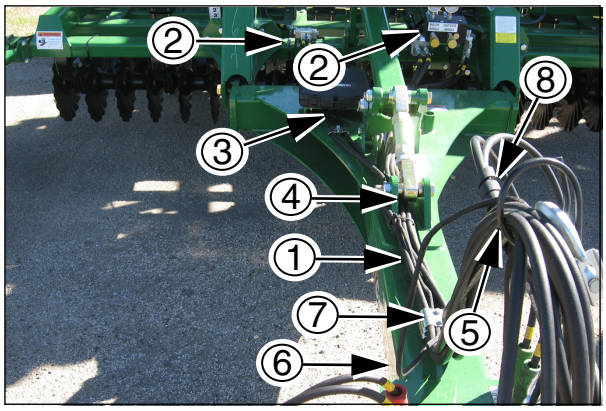


Figure 28 42945
Hose Routing Hitch

Gauge Wheel (optional)

Refer to Figure 29

121.Model 2400, install gauge angle mount ① to wing brace with 5/8 x 3 1/32 x 6 1/2 u-bolts ②, 5/8 lock washers and 5/8 nuts

122.Install wheel arm mount ③ to gauge angle mount ① on wing brace with 5/8 x 2 hex bolts (Model 2400) or wing frame with 5/8 x 3 1/32 x 6 1/2 u-bolts ② (Models 1800 & 3000), secure with 5/8 lock washers and 5/8 nuts.

123.Attach screw jack ⑤ to wheel arm mount ③ with 1/2 x 1 1/4 hex bolts ⑥, 1/2 top lock nuts.

124.Slide gauge wheel spindle reciever ⑦ into wheel arm mount ③, secure with 3/4 x 4 hex bolts ⑧, 3/4 lock washers and 3/4 nuts. Install the 5/8 x 1 1/4 hex bolts ⑨ to the wheel arm mount ①.

125.Align hole in 6-bolt hub/spindle assembly ⑩ with hole in gauge wheel spindle reciever ⑦, secure with 5/16 x 2 13/16 clevis pin ⑪ and 1/8 x 1 cotter pin.

126.Attach wheel/tire assembly ⑫ to 6-bolt hub/spindle assembly ⑩ with 9/16 lug nuts ⑬.

127.Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "**Torque Values Chart**" on page 38.

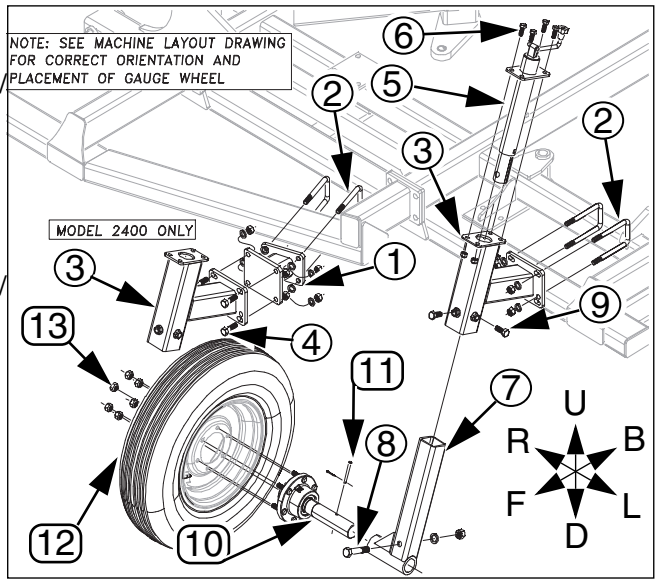


Figure 29 43134
Gauge Wheel

Rolling Harrow (optional)

Note: It is very important to install the rolling harrow assembly in the order shown below and go to the rolling harrow placement drawing, see “Layout Section” of this manual for proper dimensions where it is marked xxx in drawing below. The rolling harrow bracket ③ dimensions are coming off of rear, front tube of drag frame ① to front of plate of rolling harrow bracket ③. The ball joint bracket ⑥ is dimensioned off of end of rolling spike tube ⑧ to side of plate on ball joint bracket ⑥ (dimensions in layout drawings may come off either end of tube). For complete parts breakdown see “Attachment Section” of Parts Manual.

Refer to Figure 30

128. Start by installing the drag frames ① with 3/4 x 2 hex bolts ②, 3/4 lock washers and 3/4 nuts. Torque bolts to 265 ft-lb.

129. Attach rolling harrow brackets ③ in appropriate location with 5/8 x 3 1/32 x 4 1/2 u-bolts ④, secure with 5/8 lock washers and 5/8 nuts. Adjust the bracket to dimensions shown in layout drawings and torque u-bolts to 150 ft-lb.

130. Attach ball joint brackets ⑥ and ⑦ to rolling spike tube assembly ⑧ with 5/8 x 3 1/32 x 4 1/2 u-bolts ④, secure with 5/8 lock washers and 5/8 nuts. Place left ball joint brackets ⑥ in proper location from layout drawing and torque u-bolts to 150 ft-lb. Leave right ball joint bracket ⑦ loose, as it may need move a little to bolt up to right rolling harrow bracket ③.

131. Align ball joint brackets ⑥ and ⑦ to rolling harrow brackets ③, secure with 1 x 4 hex bolts ⑤ and 1 nylon lock nut. Torque bolts to 645 ft-lb. Also torque the 5/8 x 3 1/32 x 4 1/2 u-bolts ④ in right ball joint brackets ⑦ to 150 ft-lb.

132. Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See “**Torque Values Chart**” on page 38.

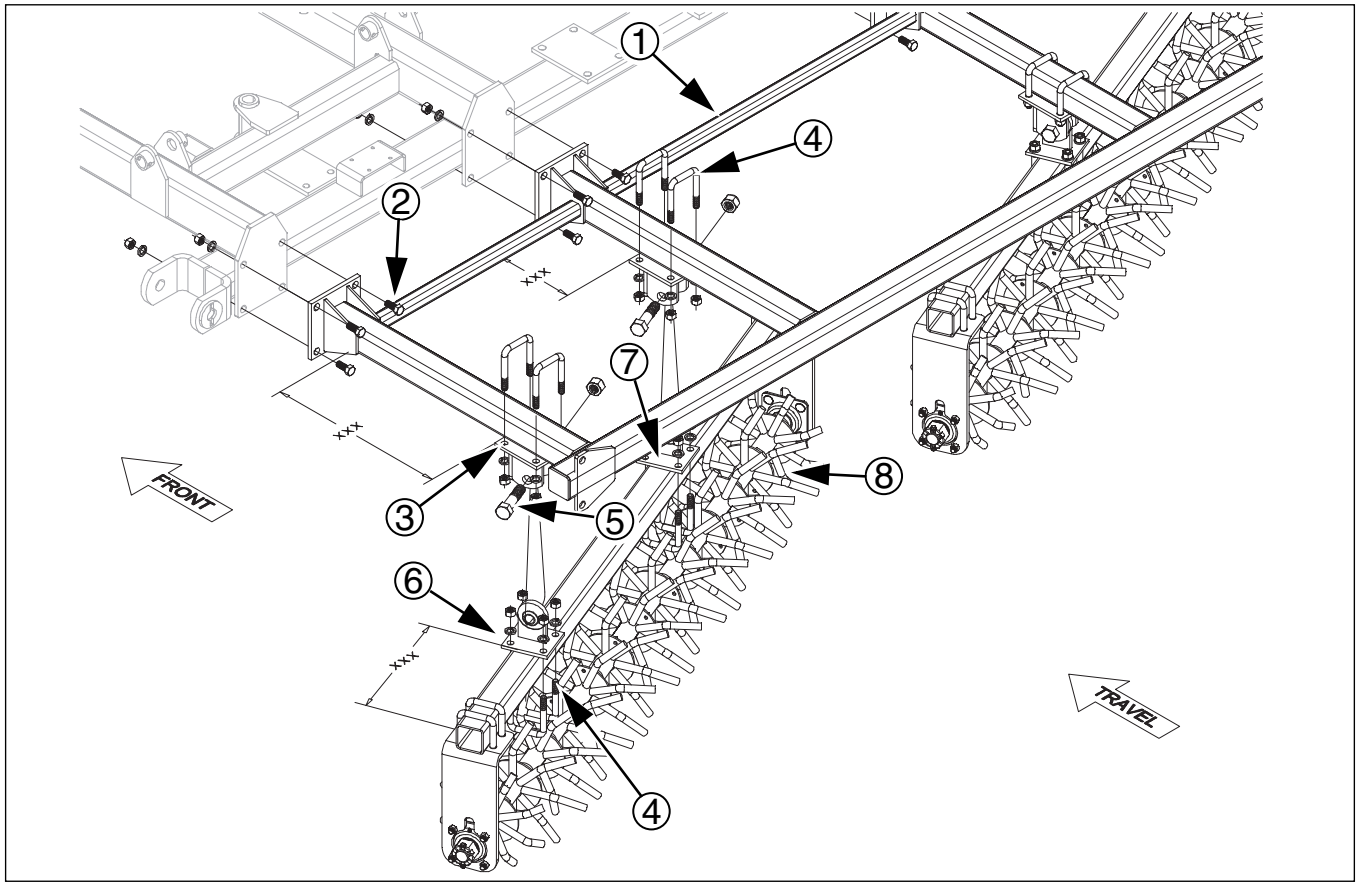


Figure 30
Rolling Harrow

43135

Reel Following Rolling Harrow (optional)

Note: It is very important to install the reel assembly in the order shown below and go to the rolling harrow placement drawing, see “Layout Section” of this manual for proper dimensions where it is marked xxx in drawing below. The reel arm assemblies ① dimensions are coming off of rear tube of drag frame to side of plate of reel arm assemblies ①. The reel tube assemblies ③ are dimensioned off of end of reel tube to side of plate on reel arm assembly ① (dimensions in layout drawings may come off either end of tube). For complete parts breakdown see “Attachment Section” of Parts Manual.

Refer to Figure 31

133. Install mounting reel arm assemblies ① in position shown in reel following rolling harrow placement drawing with 5/8 x 3 1/32 x 4 1/2 u-bolts ②, 5/8 lock washers and 5/8 nuts. Torque u-bolts to 150ft-lb.

134. Attach reel tube assemblies ③ in direction shown in circle and place them in position shown (with arrow towards machine) with 5/8 x 2 17/32 x 3 1/2 u-bolts ④, secure with 5/8 lock washers and 5/8 nuts. Torque u-bolts to 150ft-lb.

135. Check to see that all bolts have been tightened to specs, See “**Torque Values Chart**” on page 38.

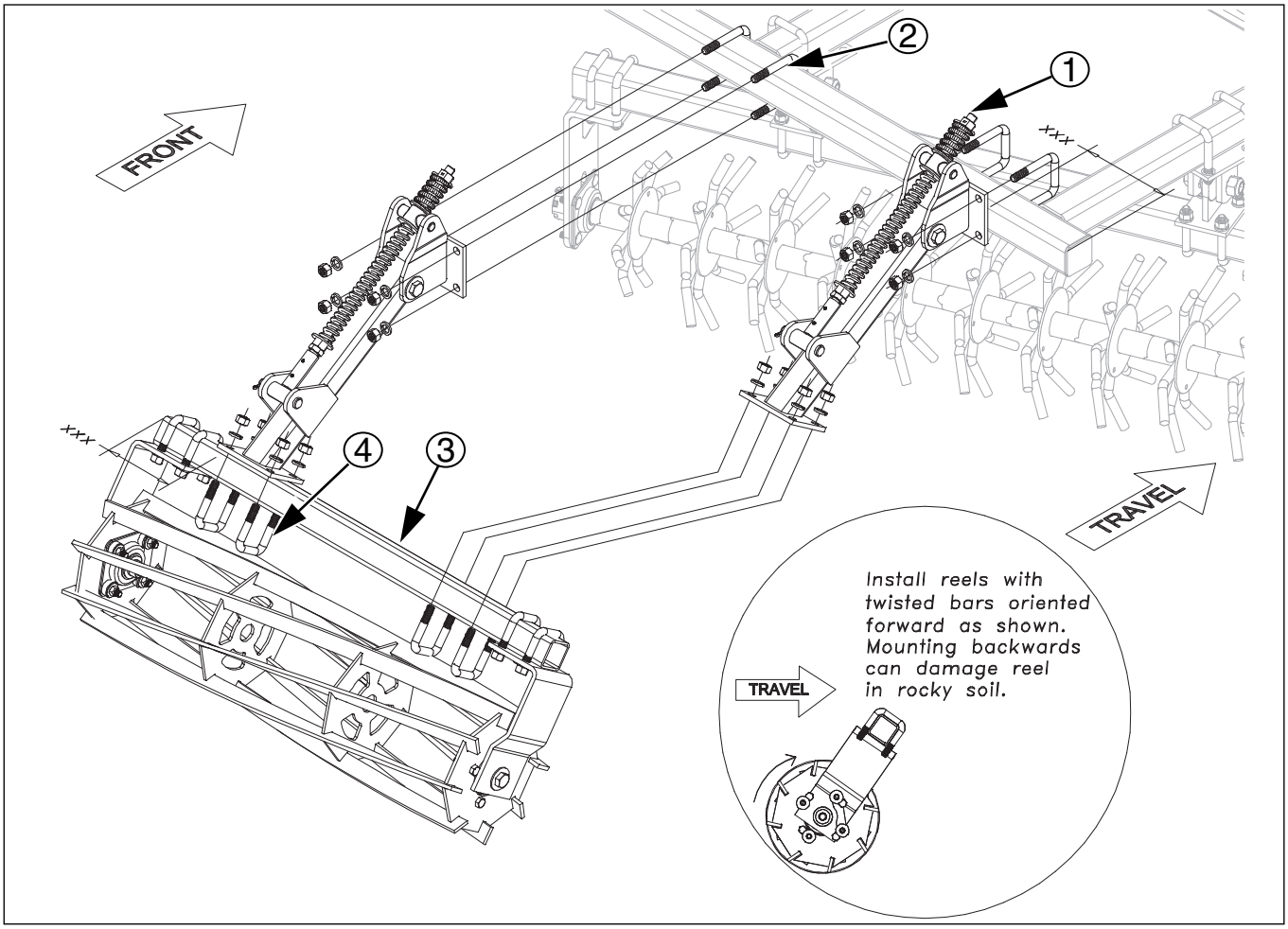


Figure 31
Reel Following Rolling Harrow

42969

Install Rear Hitch (optional)

Note: Carefully un-band the components. There are two different types of rear hitches, rear hitch extended or a-frame style. See appropriate mounting directions listed below.

Extended Rear Hitch

Refer to Figure 32

136. Attach middle of rear hitch arms ① to rear tube of drag frame with 5/8 x 3 1/32 x 4 1/2 u-bolts ②, 5/8 lock washers and 5/8 nuts. Attach front plates of rear hitch arms ① to rear tube of center frame with 3/4 x 5 1/32 x 4 1/2 u-bolts ③, 3/4 lock washers and 3/4 nuts.

137. Attach 46" cross arm ④ to bottom side of rear hitch truss plates with 5/8 x 3 1/32 x 4 1/2 u-bolts ②, secure with 5/8 lock washers and 5/8 nuts.

Note: Do not tighten any bolts until every thing is installed.

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

139. If machine is equipped with rolling harrow only, attach rigid or flex slide ⑦ to rear tube of drag frame, with 5/8 x 3 1/32 x 4 1/2 u-bolts ②, secure with 5/8 lock washers and 5/8 nut.

140. Tighten all bolts to specs, See "**Torque Values Chart**" on page 38.

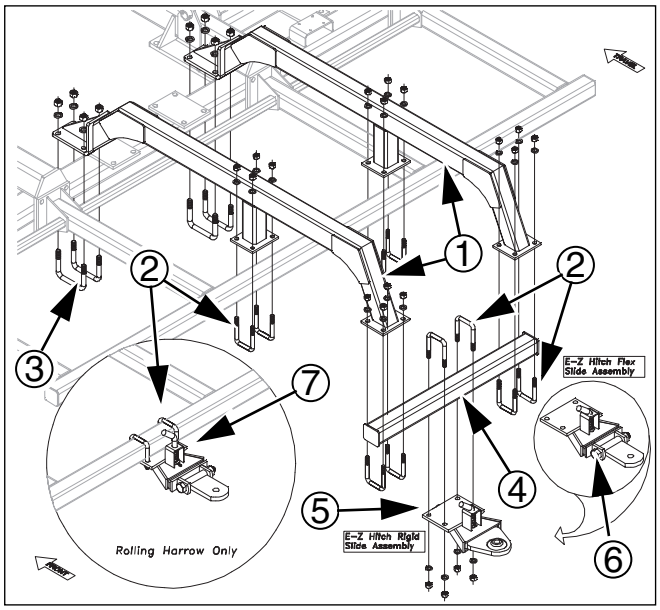


Figure 32
Extended Rear Hitch
42076

A-Frame Hitch

Refer to Figure 33

141. Attach rear mounting bar ① to rear of center frame with 3/4 x 2 bolts ②, 3/4 lock washers and 3/4 nuts.

142. Attach a-frame hitch ③ to rear of center frame with 5/8 x 4 1/32 x 4 1/4 u-bolts ④, 5/8 lock washers and 5/8 nuts.

143. Hitch will have either the flex slide assembly ⑤ or the rigid slide assembly ⑥. There will be a 3/4 x 1 1/2 hex bolt ⑦ and 3/4 jam nut in front hole of assembly to keep the slide assembly from sliding clear out.

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

145. Tighten all bolts to specs, See "**Torque Values Chart**" on page 38.

146. Route hoses and light harness along hitch and frame with hose clamps and hose wraps, provided.

Note: Be sure hoses and light harness are fastened securely so they don't drag or get pinched.

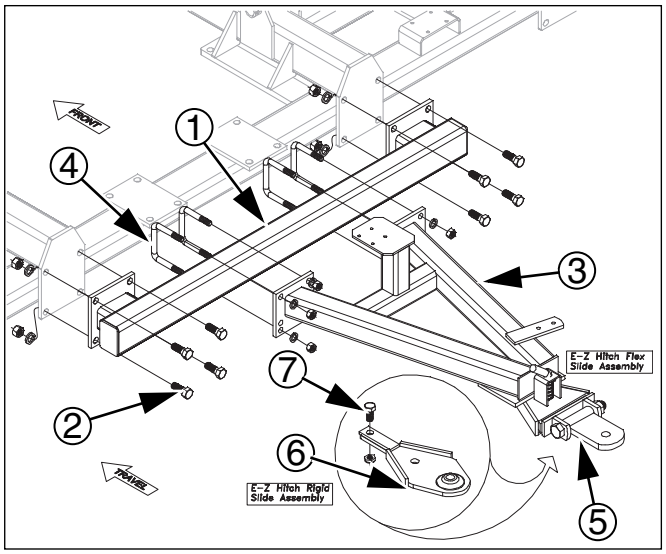


Figure 33
A-Frame Hitch
42441

Rear Stand

Refer to Figure 34

NOTICE

If machine is equipped with a rear attachment, be sure you install the rear jack stand so machine doesn't tip backwards when unhooking machine from tractor.

147.Attach the rear stand bracket ① to the center of, the rear tube of the drag frame with 5/8 x 3 1/32 x 4 1/2 u-bolts ②, 5/8 lock washers and 5/8 nuts.

148.Tighten u-bolts specs, See "**Torque Values Chart**" on page 38.

149.Slide the rear stand ③ through the rear stand bracket ①, secure with the 3/4 x 5 1/4 pin ④ and retainer.

150.Once the options are installed, fold the Turbo Max to check for clearance and interferences, also watch that hoses do not get pinched.

Note: Double check that all bolts are tightened to specs, See "**Torque Values Chart**" on page 38.Consult the "Operator's Manual", for the first time field adjustments before going to the field.

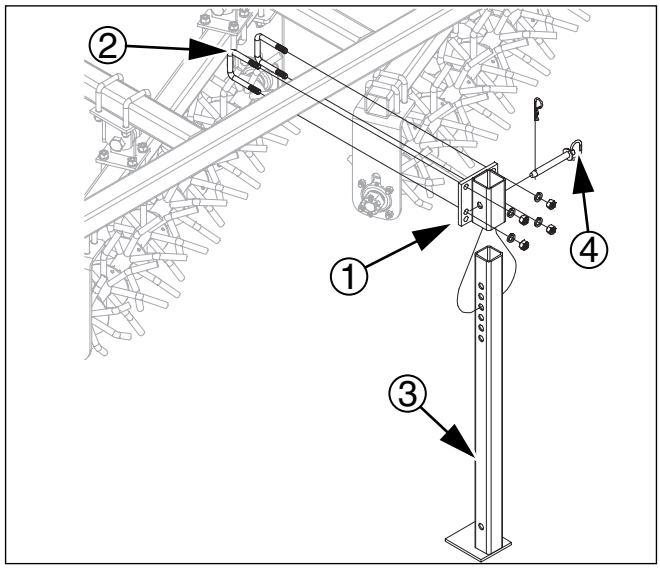


Figure 34
Rear Stand
42438

Weight Package Assembly (Optional)

Refer to Figure 35

CAUTION

Lower machine until coulters are on ground and pressure is off leveling system. Do not add weights to 1800TM.

Note: Models 2400TM-3000TM, up to 2 sets of weights (4 weights) may be installed in positions shown.

151. Start by removing the 3/4 x 2 Gr. 8 bolts ① from level bar assembly.

152.Pivot level bar ② up so there will be clearance to set the 750 pound weight assemblies ④ into place.

153.Pivot level bar spring assembly ③ forward.

154.Carefully lower the 750 pound weight assemblies ④ (4 maximum) onto center frame trusses ⑤, two on front side of fold cylinders and two on rear side of fold cylinders.

155.Slide rear weights as far forward as possible and install weight box stops ⑥ on inside of trusses as close to weight as possible (rear weights), secure with 1/2 x 4 1/32 x 5 1/4 u-bolt ⑦, 1/2 lock washers and 1/2 nuts.

156.Torque bolts to 85 ft-lbs.

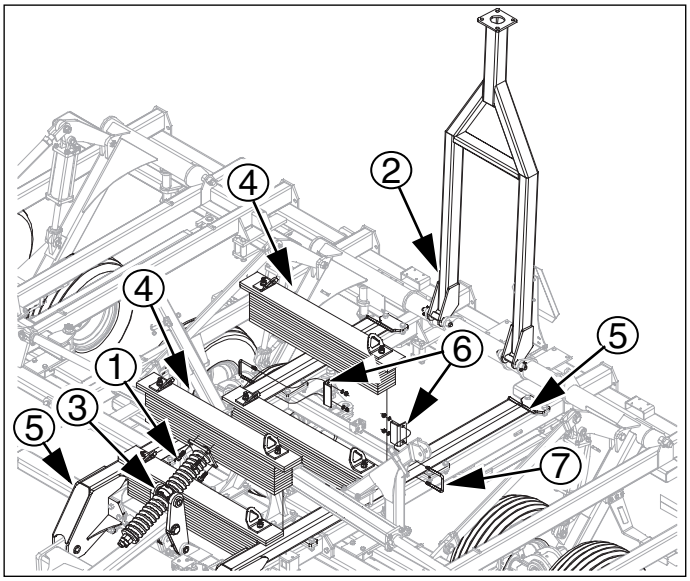


Figure 35
Weight Package
42407

Refer to Figure 36

157. Pivot level bar ① and the level bar spring assembly ③ until holes in plates are aligned.

158. Re-install 3/4 x 2 Gr. 8 bolts ①, secure with 3/4 lock washers and 3/4 nuts.

159. Torque 3/4 x 2 Gr. 8 bolts ① to 375 ft-lbs to be sure bolts do not work loose and cause damage to machine.

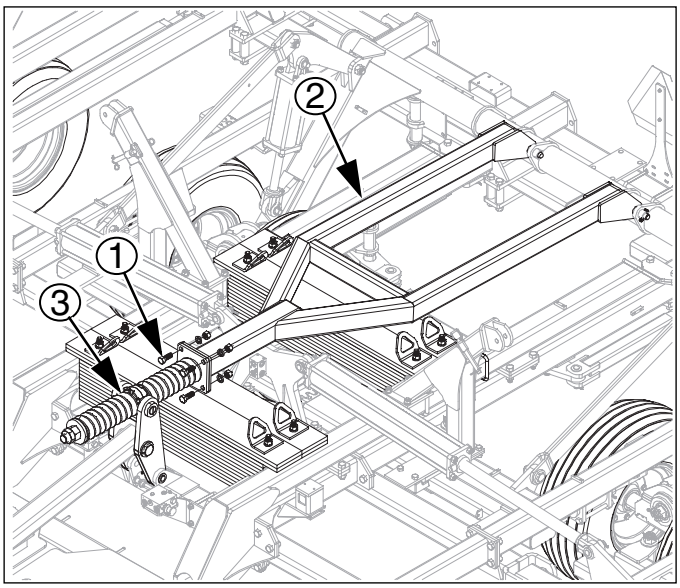


Figure 36 42408
Level Bar

Appendix - Reference Information

Torque Values Chart

Bolt Size	Bolt Head Identification					
	Grade 2		Grade 5		Grade 8	
in-tpi[a]	N-m[b]	ft-lb[d]	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	Bolt Head Identification					
	5.8 Class 5.8		8.8 Class 8.8		10.9 Class 10.9	
mm x pitch[c]	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. 25199

Gang Bolt Torque 1 3/4”-5 **850 Foot-pounds (165 lbs on 5’ cheater).**

Rolling Harrow Spike Bolt 1 1/2”-6 **650-750 Foot-pounds (175 lbs on 4’ cheater).**

Wheel Bolt Torque Values **1/2”-20 (75-85 ft-lbs) 9/16”-18 (80-90 ft-lbs) 5/8”-18 (85-100 ft-lbs).**

Tire Inflation Chart

Tire Inflation Chart		
Wheel	**Tire Size**	**Inflation**
Gauge Wheel	9.5L x 15” 8-Ply	44 psi (303 kPa)
Transport/ Center	12.5Lx16.5 Load G Galaxy	105 psi (724 kPa)
Transport/ Center	380/55R x 16.5 Load F RI	73 psi (503 kPa)
Transport/ Wings	11L-15SL 12-Ply	52 psi (359 kPa)
Transport/ Wings	12.5L x 15” 12-Ply	55 psi (379 kPa)

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
Gleason	www.gleasonwheel.com
Titan	www.titan-intl.com
Galaxy	www.atgtire.com
BKT	www.bkt-tire.com

Hydraulic Connectors and Torque

Refer to Figure 37 (a hypothetical fitting)
Leave any protective caps in place until immediately prior to making a connection.

① **NPT** - National Pipe Thread
Note tapered threads, no cone/flare, and no O-ring.

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

② **JIC** - Joint Industry Conference (SAE J514)
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.

③ **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. Use no sealants (tape or liquid) on ORB fittings.

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.

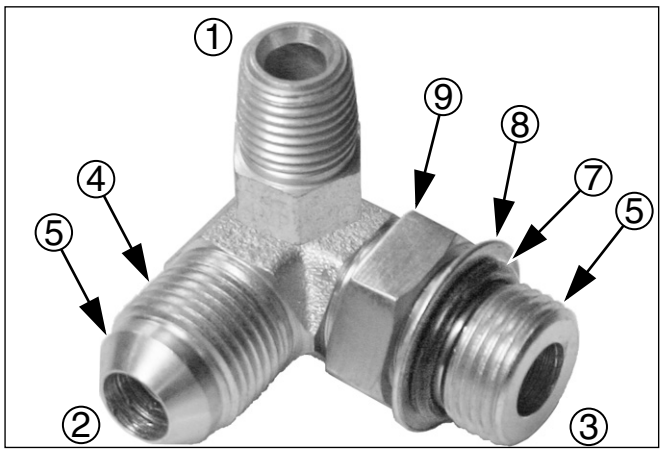
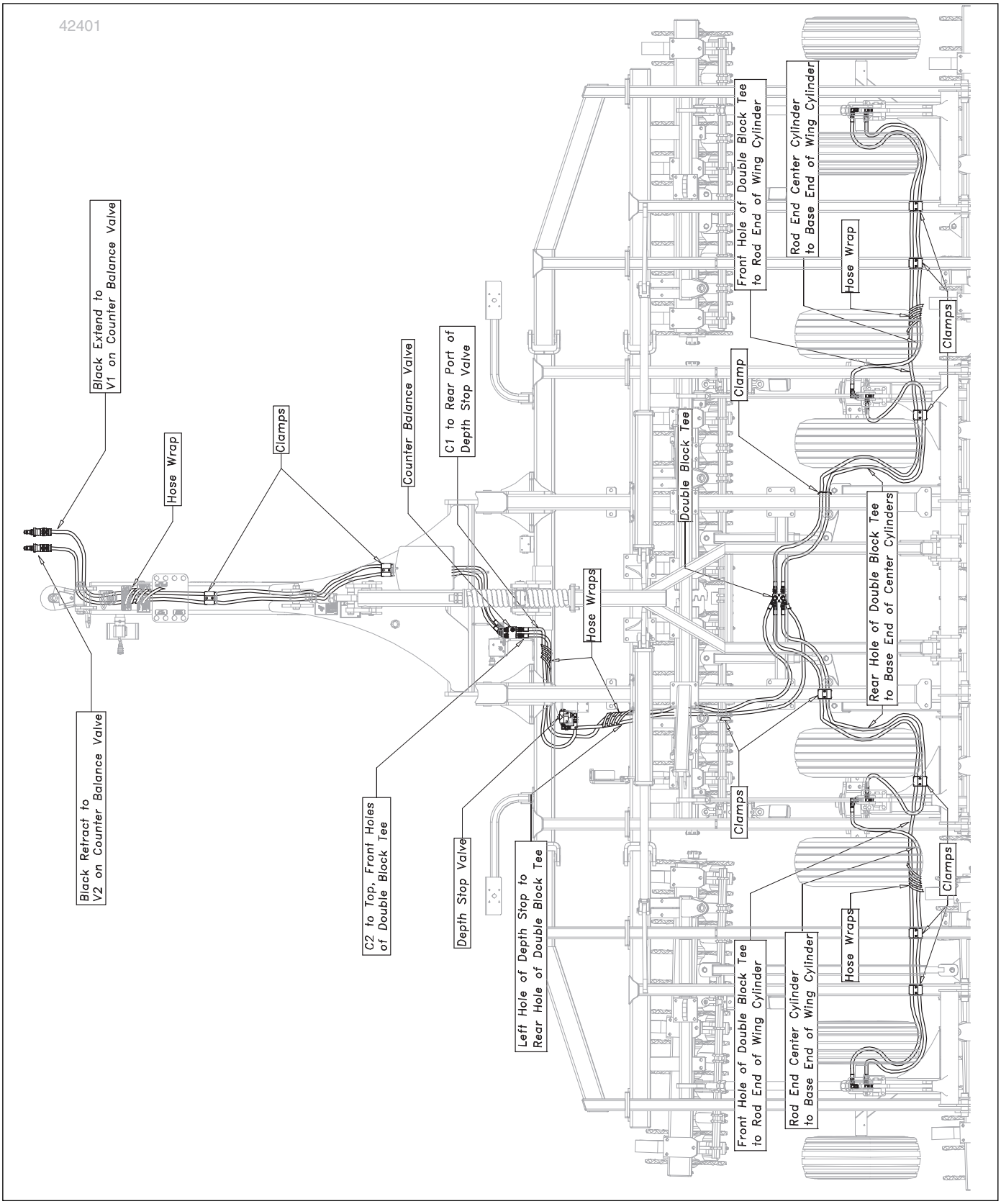


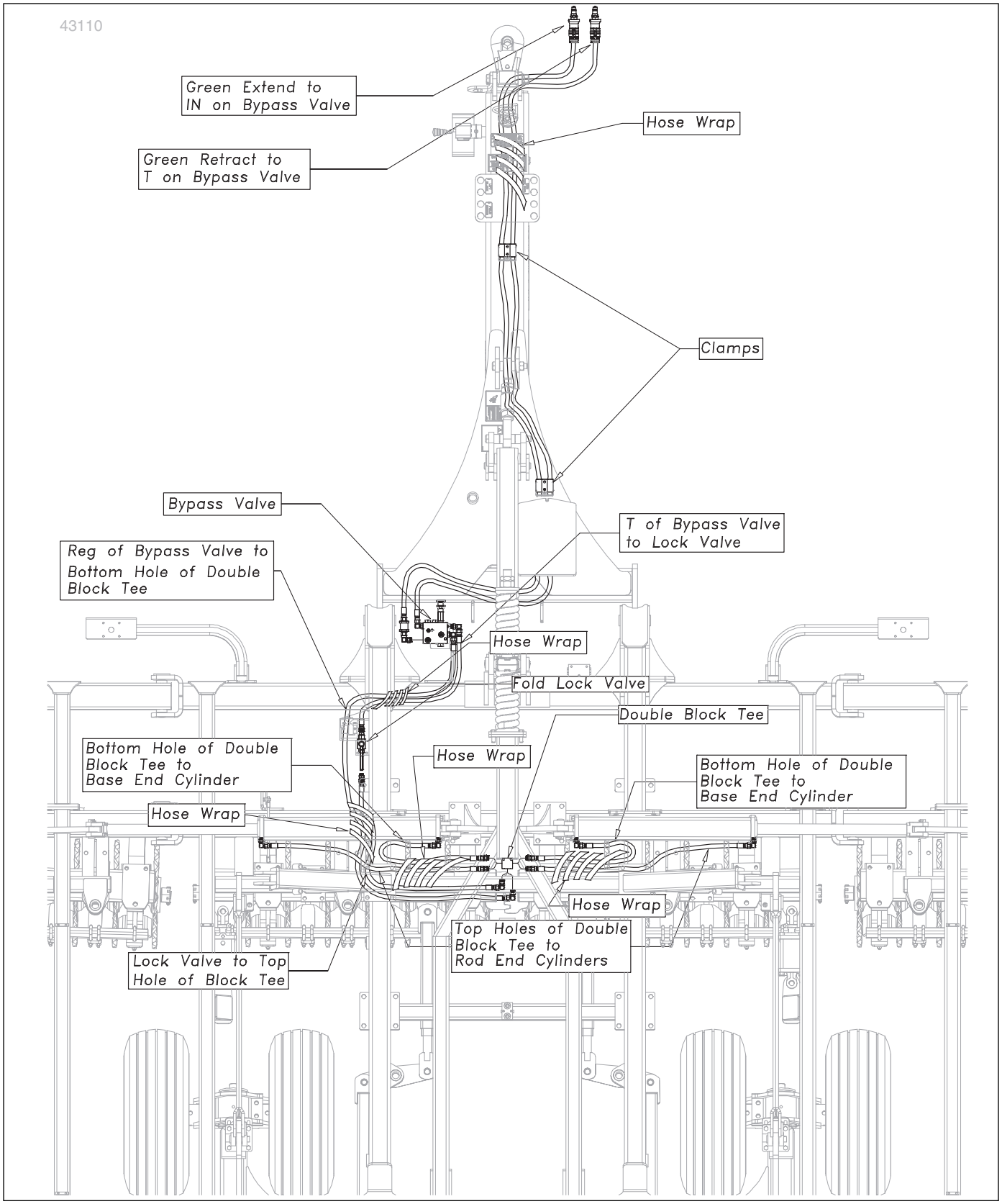
Figure 37
Hydraulic Connector ID
31282

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

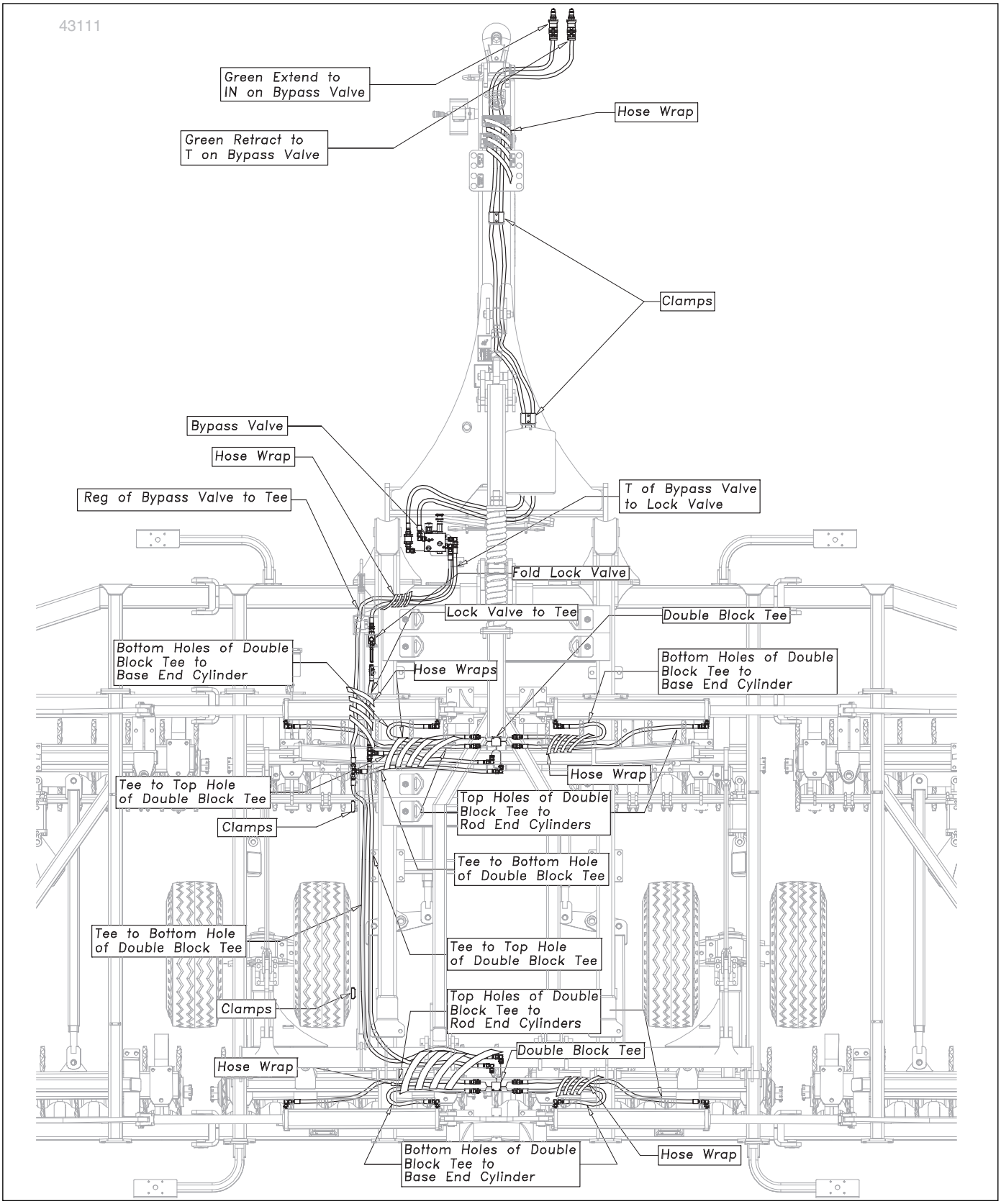
Hydraulic Lift Layout



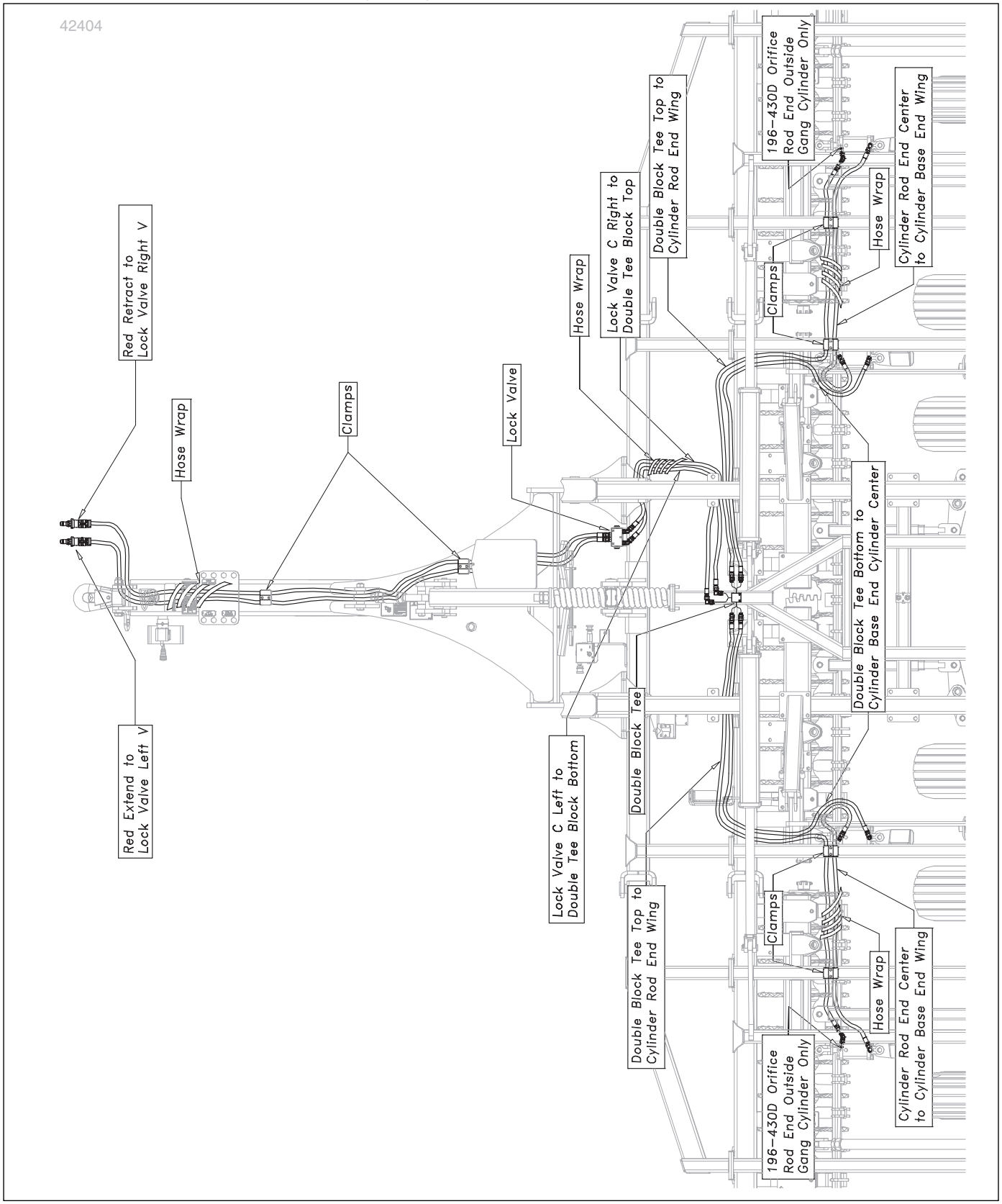
1800-2400TM Hydraulic Fold Layout



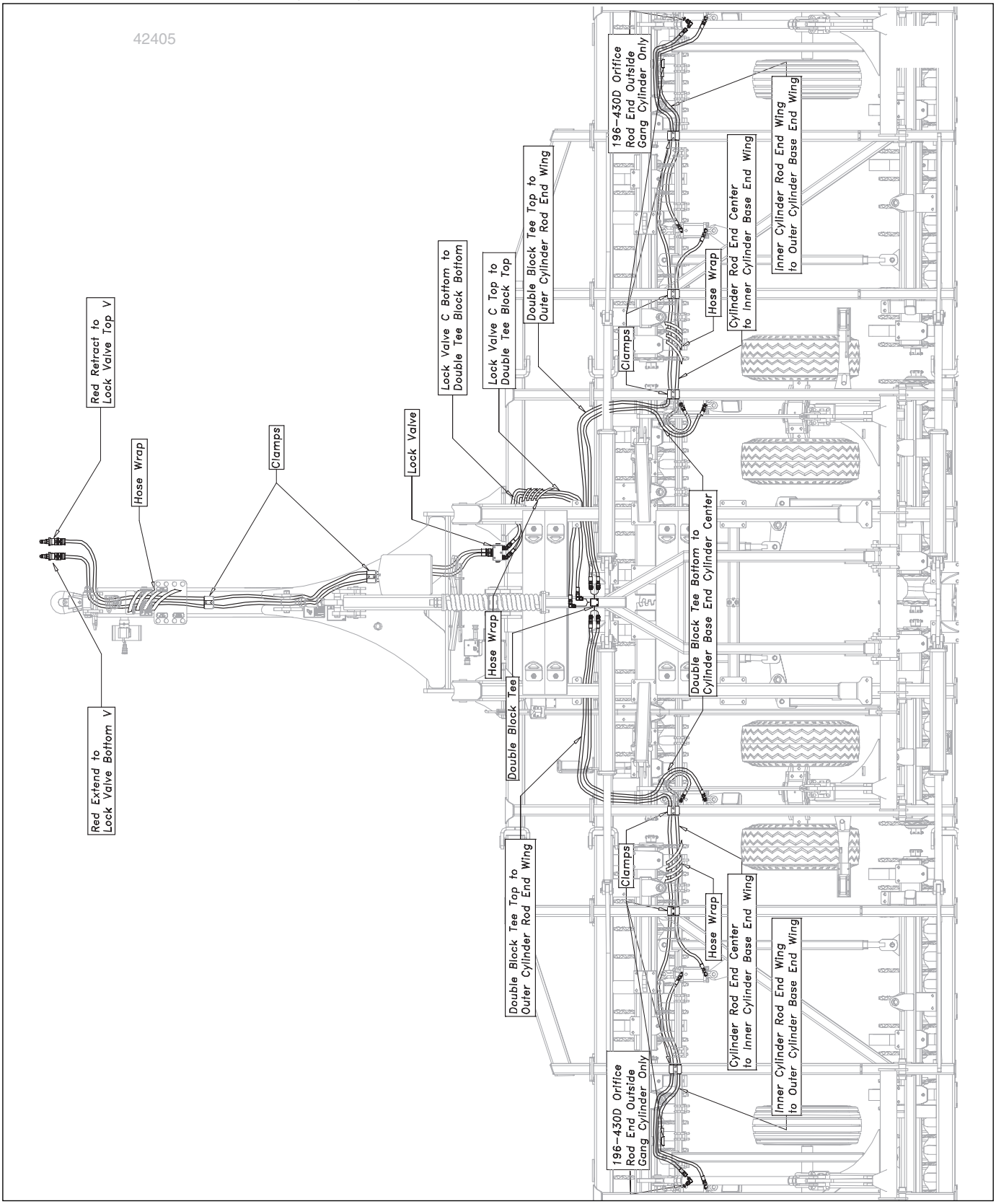
3000TM Hydraulic Fold Layout



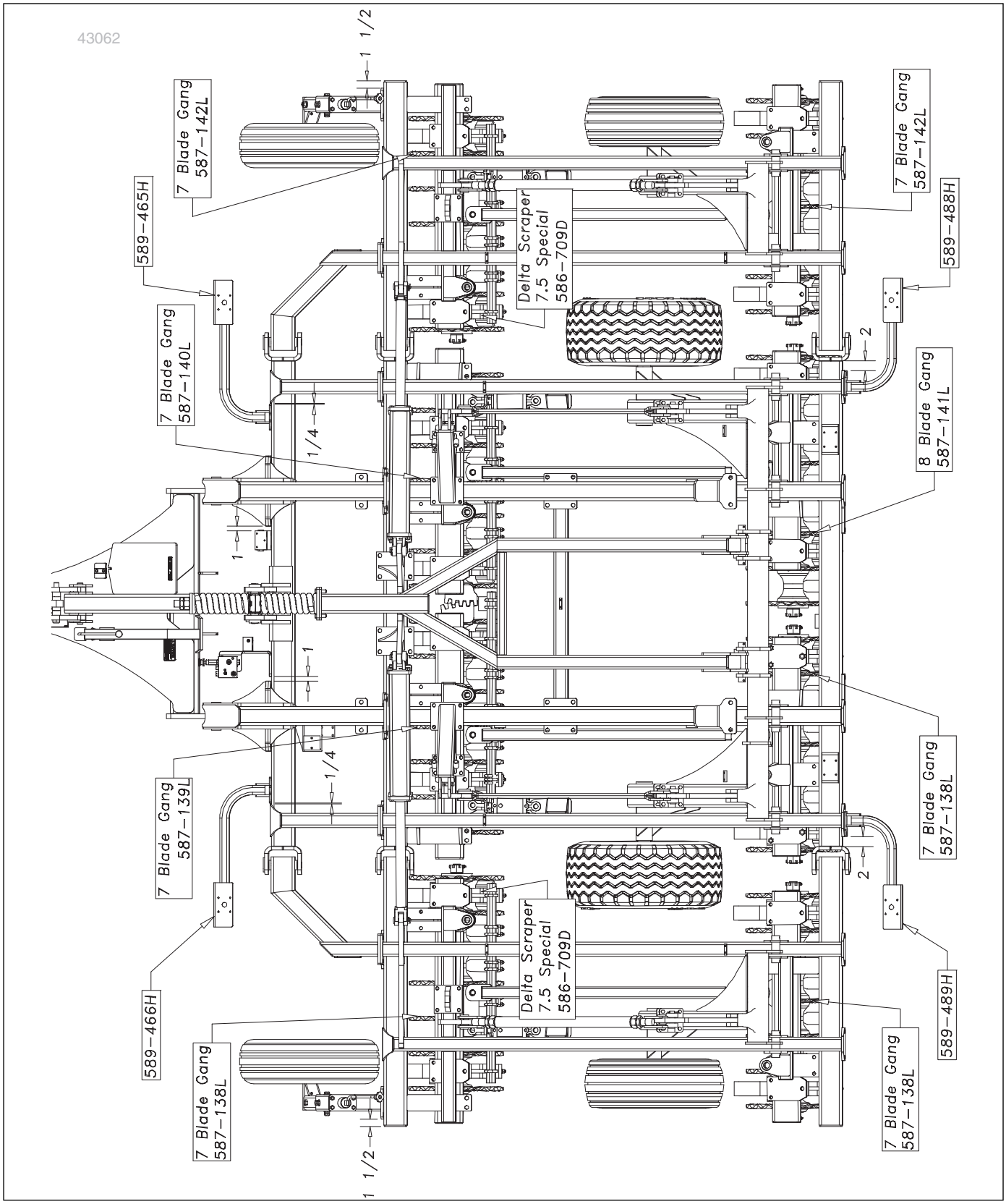
1800-2400TM Hydraulic Gang Angle Layout



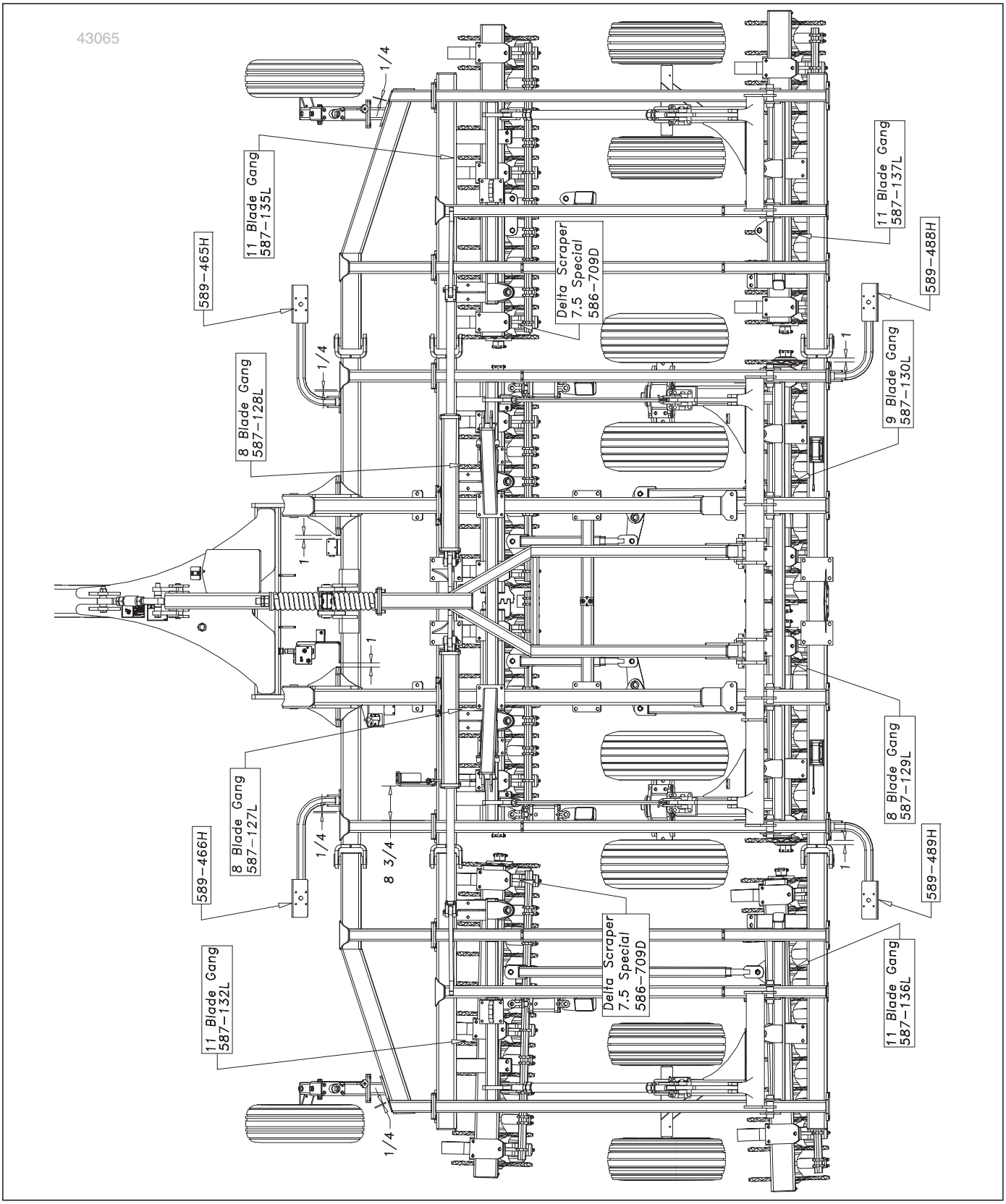
3000TM Hydraulic Gang Angle Layout



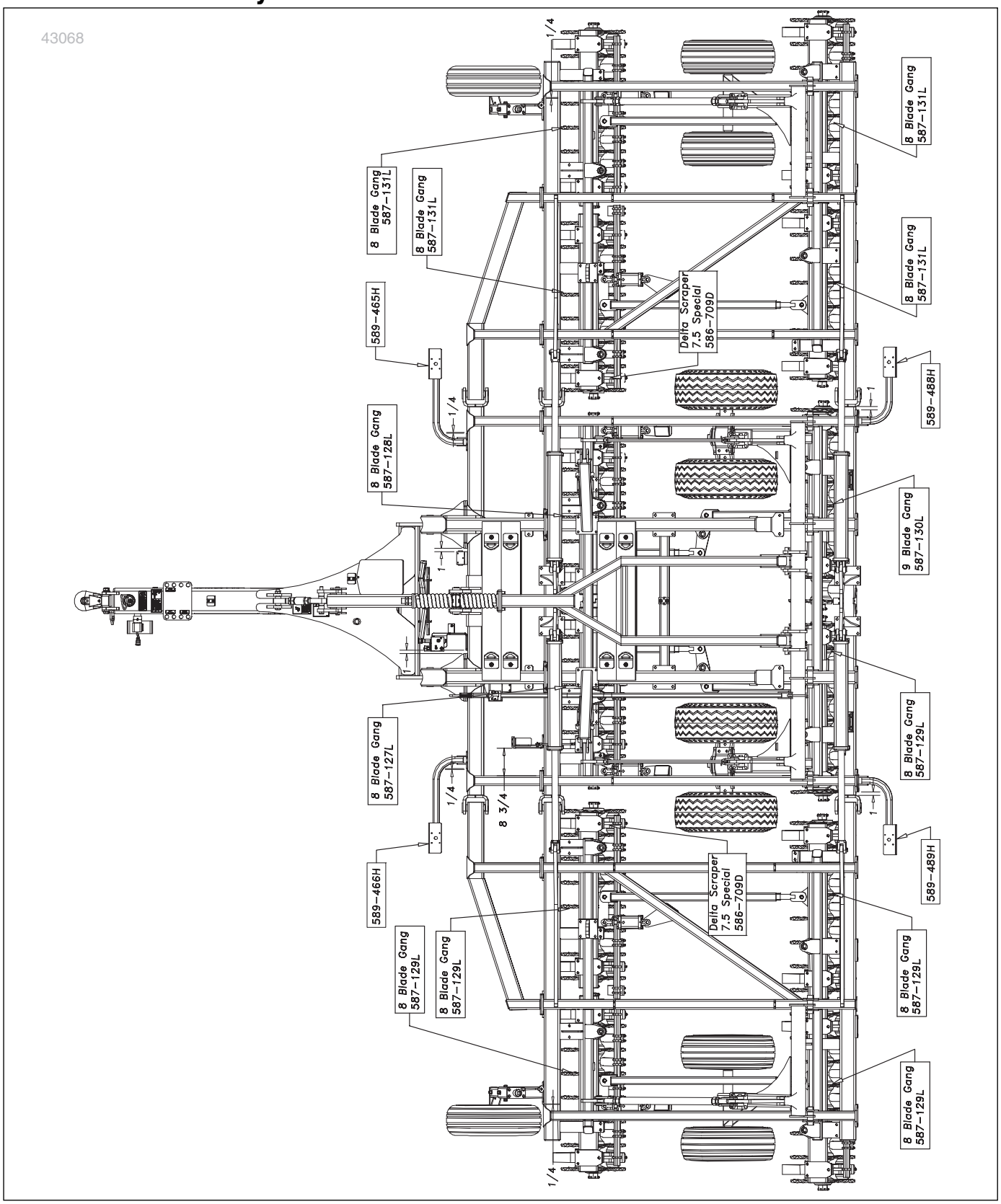
1800TM Machine Layout



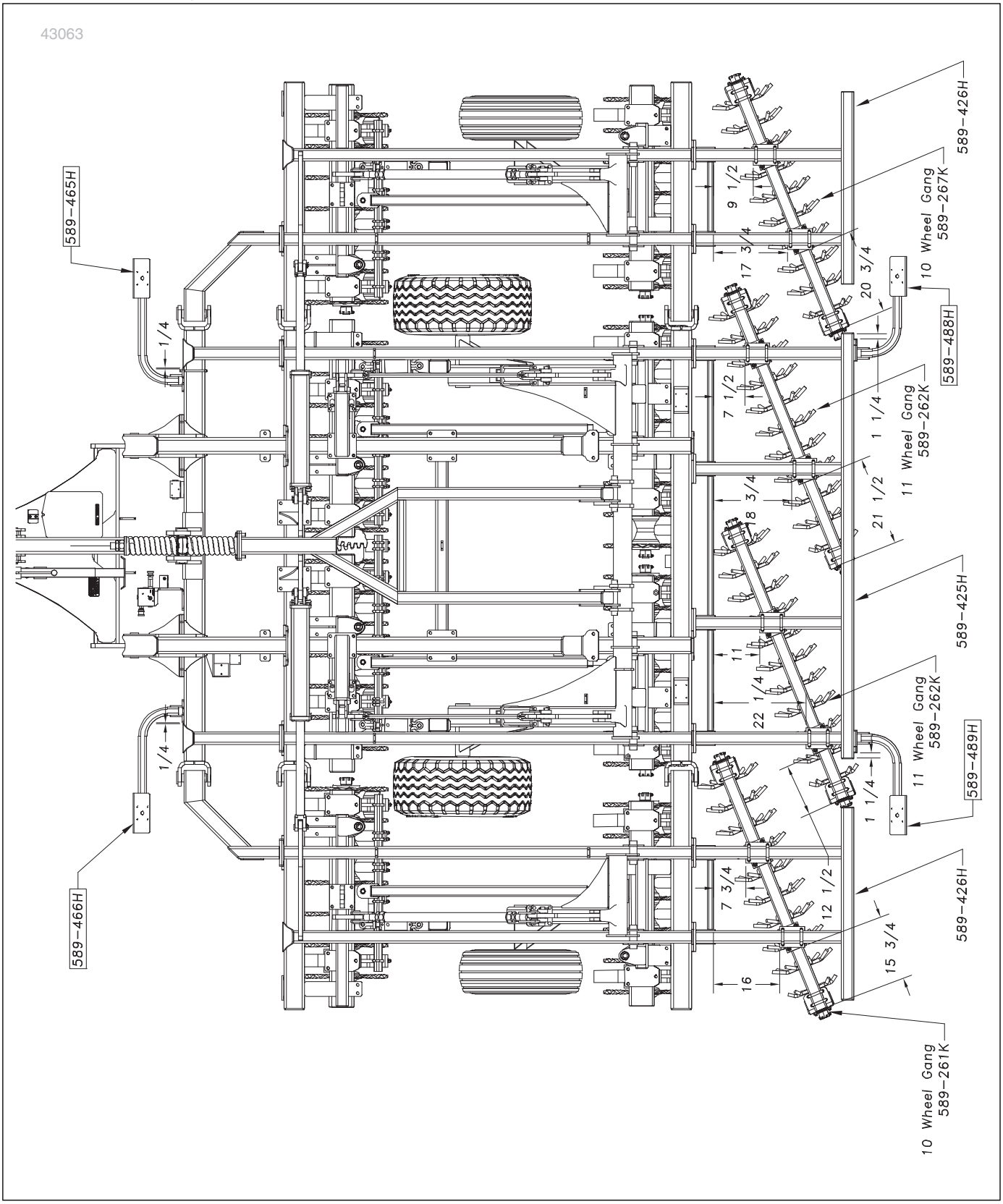
2400TM Machine Layout



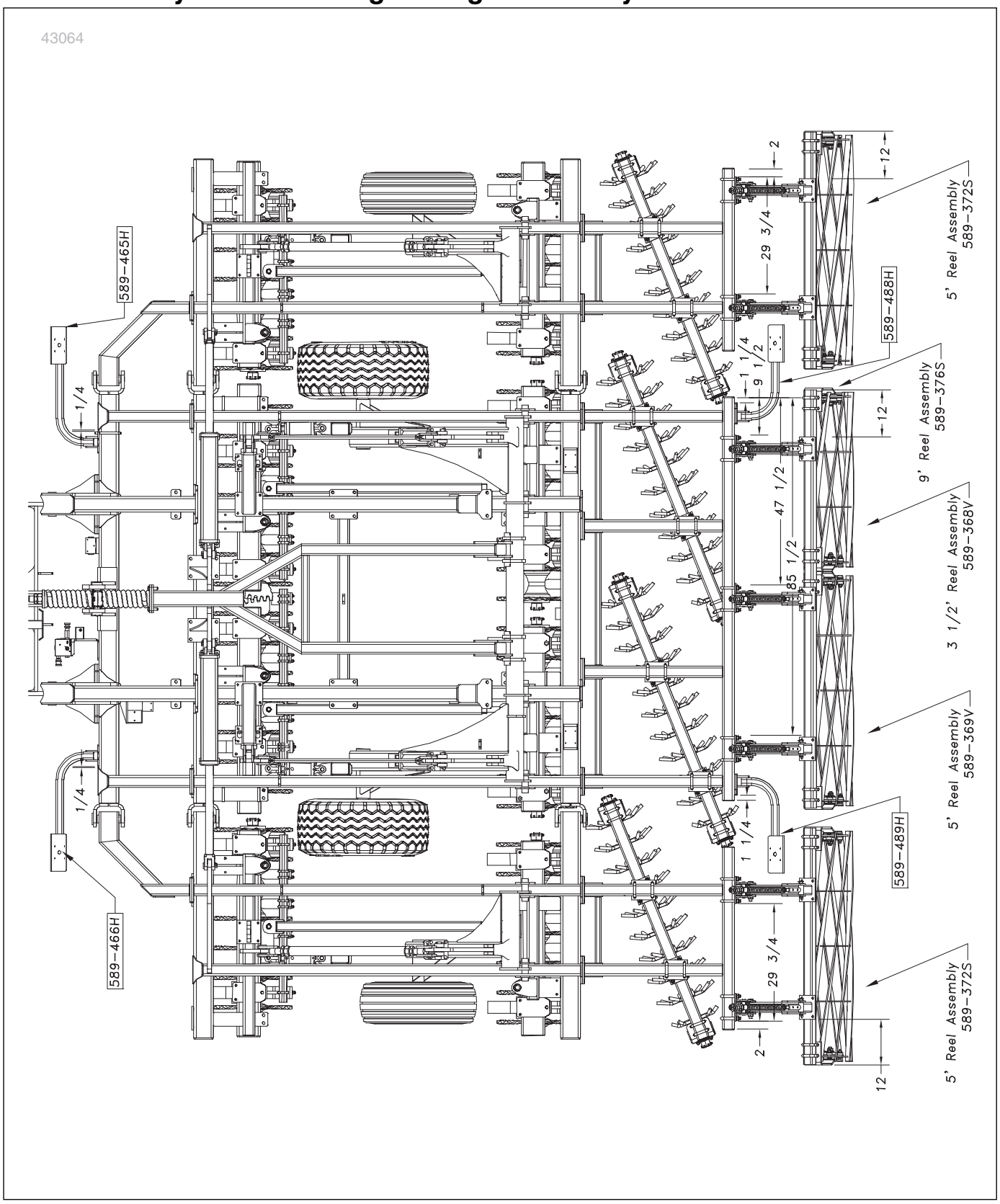
3000TM Machine Layout



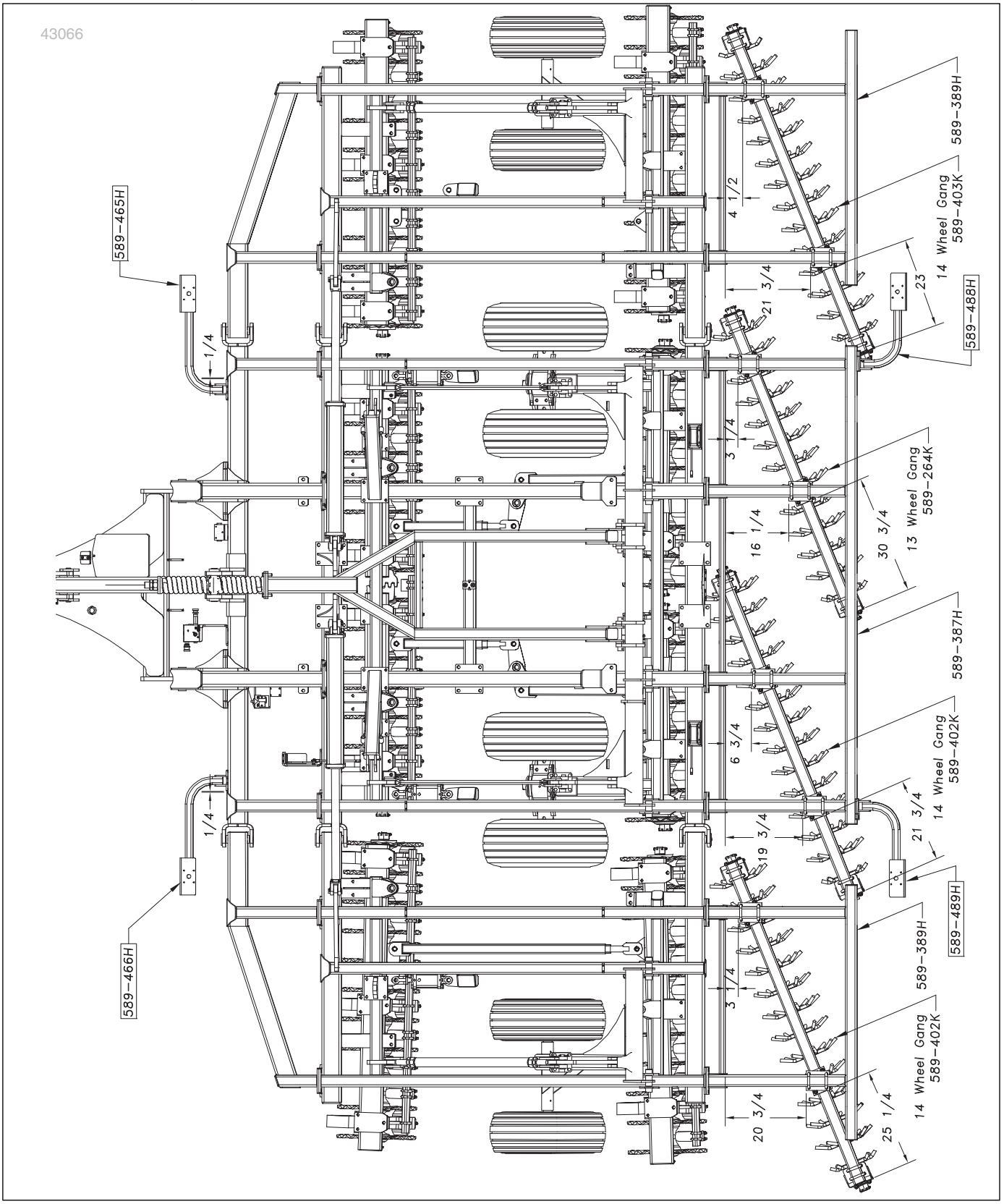
1800TM Rolling Harrow Layout



1800TM Heavy Reel Following Rolling Harrow Layout



2400TM Rolling Harrow Layout



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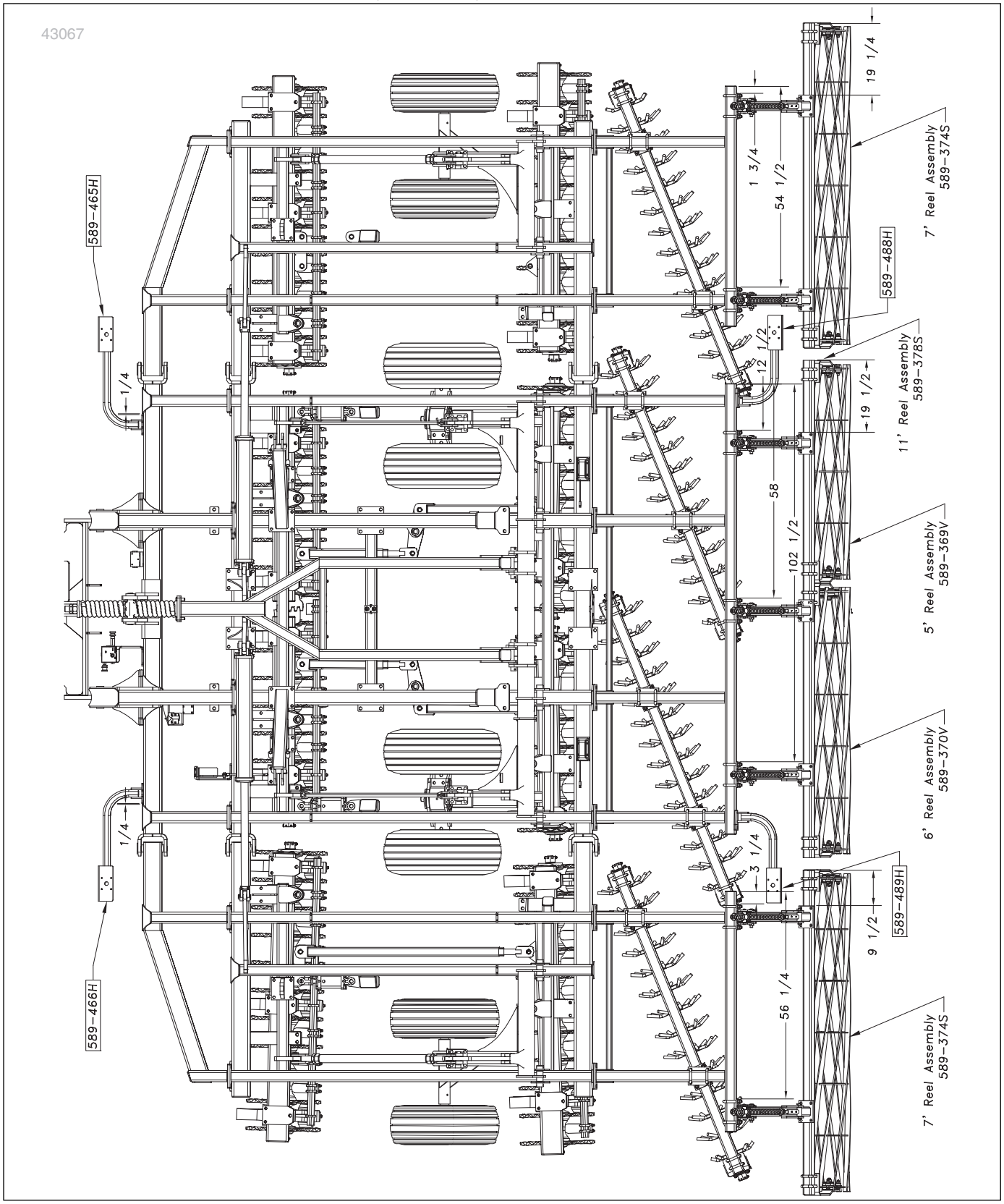
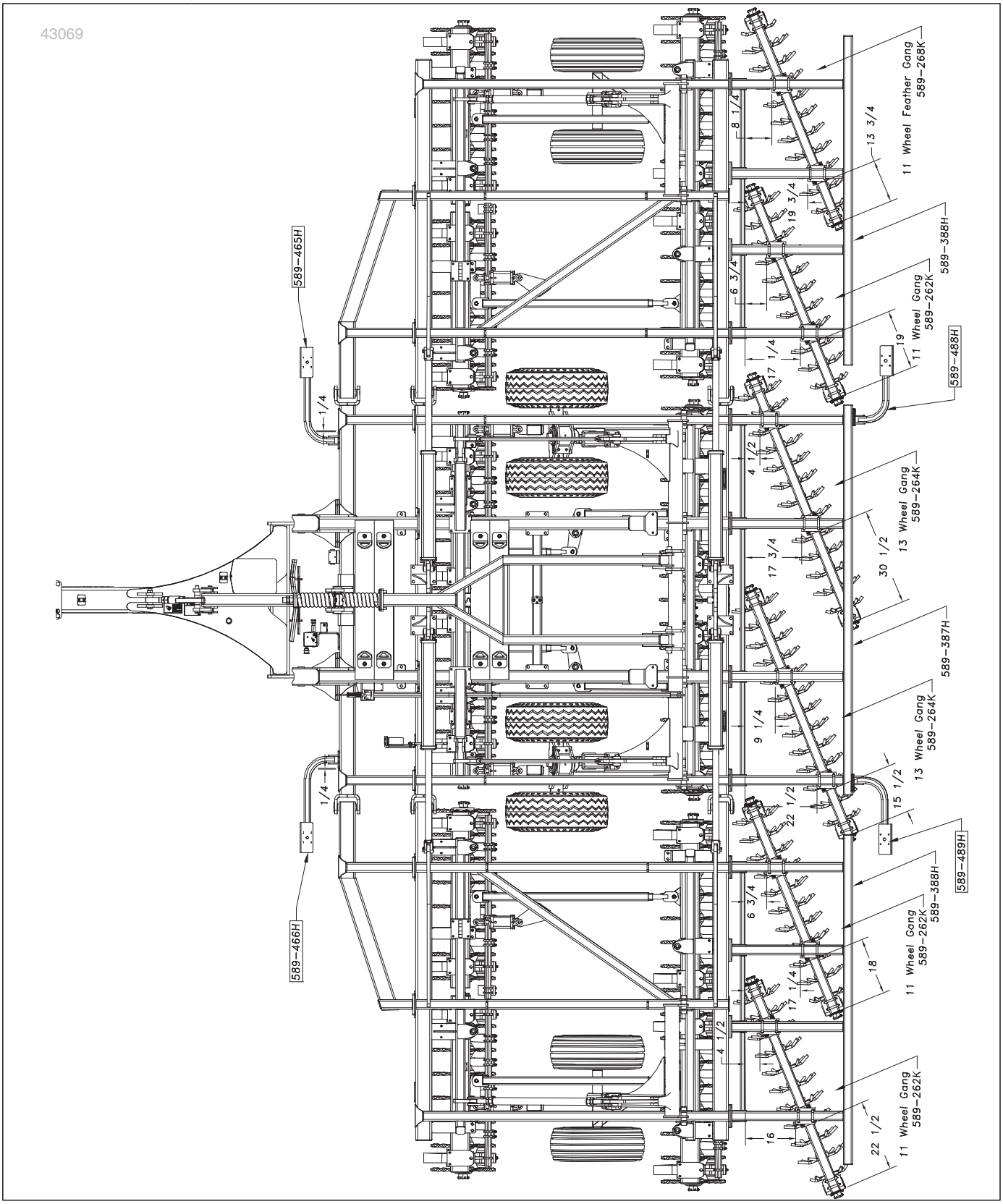
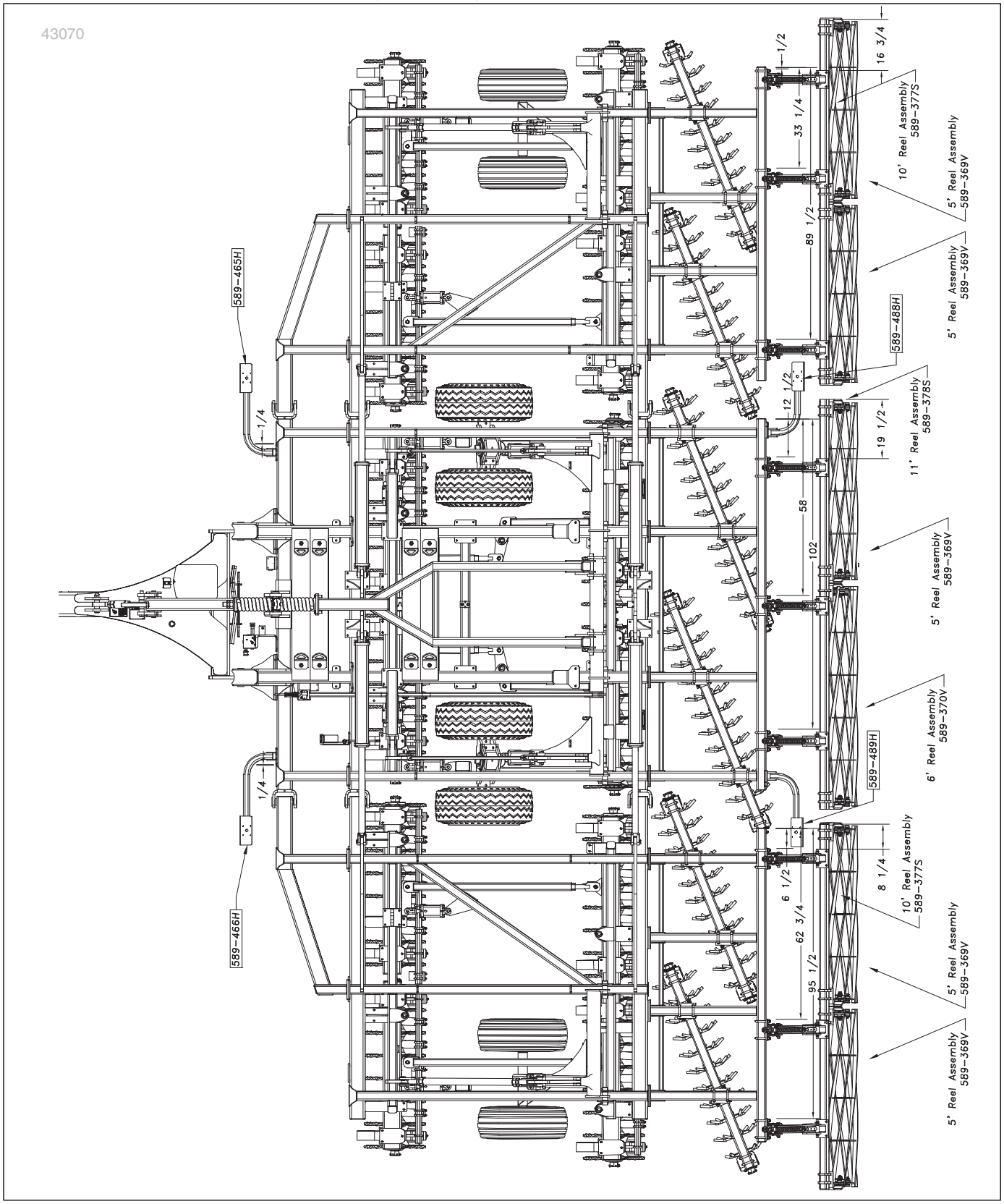


3000TM Rolling Harrow Layout



3000TM Heavy Reel Following Rolling Harrow Layout



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