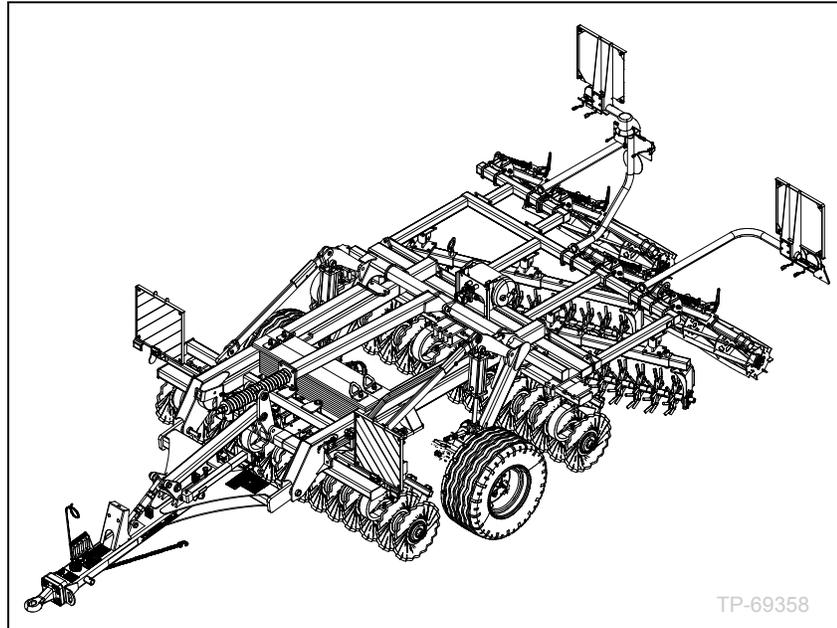


# Assembly Manual

Turbo Max  
3.0M



*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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588-154Q-ENG





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## Introduction

Great Plains' Turbo-Max is a pull-type unit designed for tilling and working soil. Every Turbo-Max we build is designed and built with care using only quality materials. For the best installation experience, read this manual and follow all instructions carefully. These pages will guide you through the unloading process and contain tips for easier assembly.

All information in this manual is current as of publication. Information contained within is subject to change to ensure top performance.

### Description of Unit

The 3.0M Turbo-Max is a one section "vertical" tillage tool. Working width is 3 meters. 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. See "**Specifications and Capacities**" on page 85 for precise swath information.

### Turbo-Max Models Covered

### Pre-assembly Checklist

- Before assembling, read and understand "**Safety Information**" on page 2 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 surface).
- Check that all major components, fasteners, and pins are accounted for.

### Tools Required

The following tools are required for installation:

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

Refer to "**Torque Values Chart**" on page 21 when tightening machine hardware.

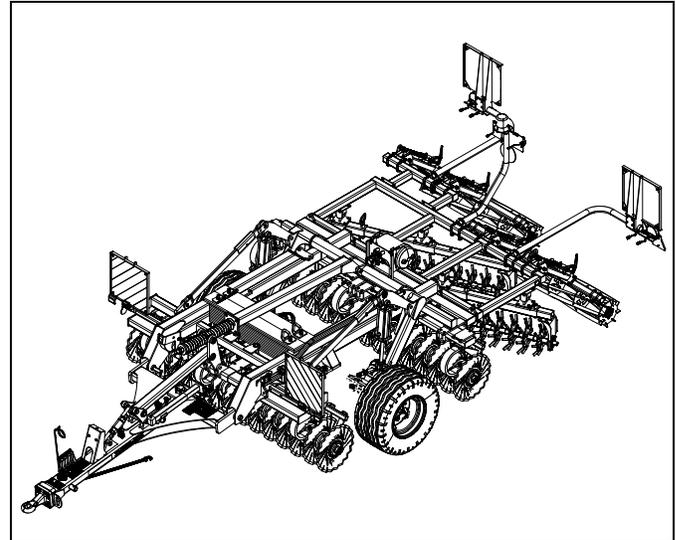


Figure 1  
3.0M Turbo Max

TP-69358

### Document Family

588-154M	Operator Manual
588-154Q-ENG	Assembly Manual (this manual)
588-154P	Parts Manual

### Further Assistance

For additional help with understanding these assembly instructions or for any other assembly or setup related questions, please contact our service department at the following address:

**Great Plains Service Department**  
**1525 E. North St.**  
**P.O. Box 5060**  
**Salina, KS 67402-5060**

Or call us at **(800) 270-9302** to speak over the phone with a service representative.

Copies of this machine's operator manual are available by mail or online. Please visit [www.greatplainsag.com](http://www.greatplainsag.com) and follow the product link for information on your machine.



## Safety Information

### Look for Informational Symbols



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.



NOTE indicates useful, but not crucial, information for machine operation, assembly, or adjustment. It may also direct you towards additional information.

### Be Aware of Signal Words

Signal words designate a degree or level of hazard seriousness. The signal words are:



**DANGER** indicates an imminent hazard 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.

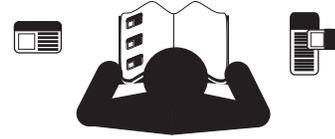
**WARNING** indicates a potential hazard which, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

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



**NOTICE** indicates a potential hazard which, if not avoided, may result in moderate to severe damage to your machine, machine parts, or nearby property.

### Be Familiar with Safety Decals



1. Thoroughly read and understand “Safety Decals” section of the Operator Manual.
2. Read all instructions noted on the decals.
3. Keep decals clean. Replace damaged, faded and illegible decals.

### Wear Protective Equipment



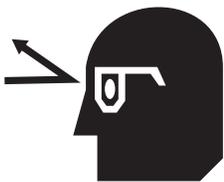
1. Wear protective clothing and equipment appropriate for the job, such as safety glasses, hard hat, and ear plugs.
2. Clothing must fit snug without fringes and pull strings to avoid entanglement with moving parts.
3. Avoid using distracting multimedia devices, such as audio that requires headphones, tablet, or smart phone, while operating machinery.

### Use A Safety Chain



1. A safety chain will help control drawn machinery if the machinery separates from tractor draw-bar.
2. Use a chain with a strength rating equal to or greater than the gross weight of towed machinery.
3. Attach chain to tractor draw-bar support or other specified anchor location. Allow only enough slack in chain to permit turning.
4. Replace chain if any links or end fittings are broken, stretched or damaged.
5. Do not use safety chain for towing.

## Avoid High Pressure Fluids



### NOTE

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

1. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.
2. Avoid the hazard by relieving pressure before disconnecting hydraulic lines or performing any work on the system.
3. Wear protective gloves and safety glasses or goggles when working with hydraulic systems.
4. Escaping fluid under pressure can penetrate the skin causing serious injury.
5. Use a piece of paper or cardboard, **NOT BODY PARTS**, to check for suspected leaks.
6. **DO NOT DELAY.** If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury. Any fluid injected into the skin or eyes must be treated within a few hours or gangrene can result.

## Tire Safety



### NOTE

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

1. 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.
2. When removing and installing wheels, use wheel-handling equipment adequate for weight involved.

## Use Safety Lights and Devices



### NOTE

Slow-moving tractors and towed machinery can create a hazard when driven on public roads. They are difficult to see, especially at night.

1. If equipped, use flashing warning lights and turn signals whenever driving on public roads.
2. Use safety devices provided with implement.
3. Keep safety lights and signs clean and visible from rear of the machine.

## Keep Riders Off Machinery



### NOTE

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

1. Never carry riders or use machinery as a personal lift.
2. Riders obstruct the operators view.
3. Riders can be struck by foreign objects or thrown from the machine.
4. Never allow children to operate equipment.
5. Keep all bystanders away from machine during operation.

## Transport Machinery Safely



### NOTE

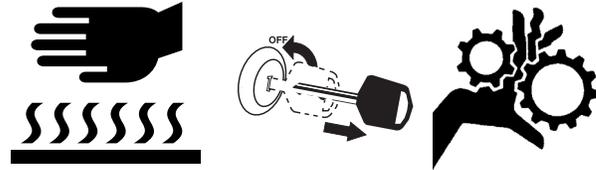
Maximum Transport speed for implement is 30 kph (20 mph). Some rough terrains require a slower speed. Sudden braking can cause a towed load to swerve and upset.

1. Comply with state and local laws.
2. Carry reflectors or flags to mark machinery in case of breakdown on the road.
3. Keep clear of overhead power lines and other obstructions when transporting.
4. Do not fold or unfold the implement while the tractor is moving.
5. Do not tow an implement that, when fully loaded, weighs more than 1.5 times the weight of towing vehicle.
6. Turning tractor too tight can cause implement to tip over.
7. When towing on a trailer, secure implement with tie downs and chains.
8. When towing on a trailer, sudden braking can cause a trailer to swerve and upset. Reduce speed if trailer is not equipped with brakes.

## Shutdown and Storage

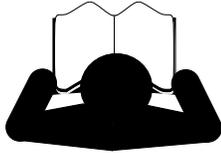
1. Park the tractor and implement on a solid, level surface where children normally do not play.
2. Raise the wings, put tractor in park or set park brake. Turn off engine and remove switch key to prevent unauthorized starting.
3. Wait for all components to come to a complete stop before leaving the operator's seat.
4. Turn lockout valve and wing lock levers to locked position to prevent the wings from lowering.
5. Install transport locks to relieve pressure on hydraulic hoses.
6. Detach the tractor. Secure the implement using blocks and supports.

## Practice Safe Maintenance



1. Understand procedure before doing work. Use proper tools and equipment. Refer to this manual.
2. Work in a clean, dry area.
3. Lower the implement. Put tractor in Park, turn off engine. To prevent unauthorized starting, remove key before performing maintenance or service work.
4. If work must be performed with wings raised, turn lockout valve and wing lock levers to the locked position.
5. Make sure all moving parts have stopped and all system pressure is relieved.
6. Disconnect lighting harness from the tractor before servicing or adjusting electrical systems.
7. Welding: Disconnect lighting harness from the tractor. Protect hydraulic lines. Avoid fumes from heated paint.
8. Inspect all parts. Make sure parts are in good condition and installed properly.
9. Do not alter this machine in a way which will adversely affect its performance.
10. Remove buildup of grease, oil or debris.
11. Remove all tools and unused parts from implement before operation.

## Safety At All Times

**NOTE: Read Operator Manual**

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

**NOTE: Do Not Use Untrained Operators**

Do not allow anyone to operate this equipment who has not fully read and comprehended this manual and who has not been properly trained in the safe operation of the equipment.

1. The operator must not use drugs or alcohol as they can change the alertness or coordination of that person while operating equipment. If over-the-counter drugs are used, seek medical advice on whether you can safely operate equipment.
2. Operator must be familiar with all functions of the tractor and attachments, and be able to handle emergencies quickly.
3. Make sure all guards and shields are in place and secured before operating the implement.
4. Keep all bystanders away from equipment and work area.
5. Operator must start tractor and operate controls from the driver's seat only, never from the ground.
6. Dismounting from a moving tractor can cause serious injury or death.
7. Be familiar with all functions of the implement.
8. Do not leave implement unattended with tractor engine running.
9. Do not stand between the tractor and the implement during hitching.
10. Watch out for wires, trees, etc., when folding and raising the implement.
11. Turning tractor too tight can cause hitched implement to ride up on wheels. This can result in injury or equipment damage.



## Pre-Assembly Preparation

### Shipping

The Turbo-Max will be shipped partially pre-assembled.

- The center frames will be shipped partially pre-assembled.
- The hitch will be assembled with hydraulic, lighting wire and brake hoses attached, these will need to be connected or routed to the center frame.
- The h-bracket and the turnbuckle are in place on the hitch but will need to be attached to each other.
- The gangs will be fully assembled but not assembled to machine.
- The attachment frames (if equipped) will be bolted to the primary rack.
- Finishing attachments (if equipped), will be shipped with mounting brackets assembled, reel assemblies assembled and all bolts will be in a bag or placed back in their proper locations used for assembly.
- Remove unit from shipping stands (if equipped), after machine is lowered to ground and carefully remove bands from all components.
- The shipping stands do not need to be returned to Great Plains.

### Unloading



#### **NOTE: Choose an Appropriate Work Surface**

Be sure the truck is on level ground. Work is made easier if the ground is concrete.

#### **Centering Components**



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



Unloading the Turbo-Max is a potentially dangerous operation. Reduce risk and complications by first unloading the gangs, finishing attachments, and other miscellaneous components. Place these components well out of the maneuvering area needed for unloading the Turbo-Max frames.

### Unload Turbo-Max

1. Once everything is unloaded from "storage pod" you may proceed with taking parts off of the shipping stands. Carefully move everything to level site and prepare to unpack items
2. Secure the frame sections or part to be removed with a hoist or fork truck, so part does not fall.
3. Remove any hardware that is used to secure the part to the primary rack.
4. Slowly lift the Turbo-Max frames off the shipping rack.
5. Move to location for assembly.

### Unpacking Boxes



#### **NOTE: Choose an Appropriate Work Area**

Position boxes in area that you can maneuver components up to machine to assembly.

1. Carefully remove banding from boxes.
2. Locate and identify all components before assembling.
3. Hardware used to secure parts to the shipping rack is not used in the assembly. All hardware that is used for assembly is either in a bag or in its used location on the unit.

## Removing Machine Components from Container



**Center Frame**



**Center Axle**



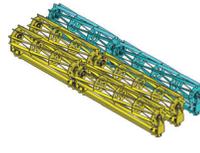
**Drag Frames**



**Coulter  
Gangs**



**Rolling  
Harrows**



**Heavy Reels**



**Components**



**NOTE: Tongue Installation and Center Frame Hardware**

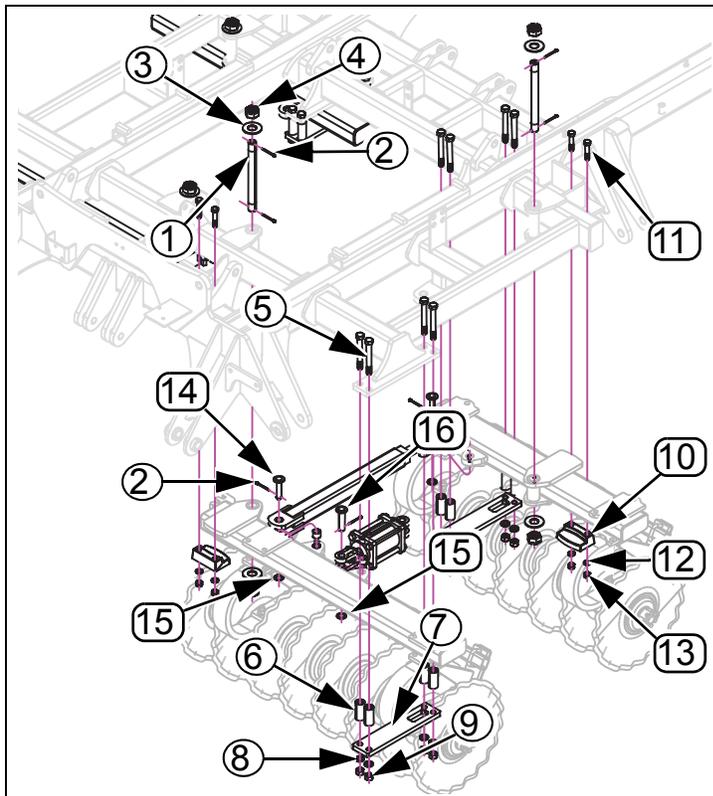
The tongue of this machine and its adjoining hardware, hydraulic hoses, and brake lines come factory installed. Hydraulic hoses that connect from the center to the wings will need to be hooked together at the bulkhead fittings. All hydraulic hoses come color-coded. Match the hydraulic hose color with the corresponding color when hooking up hydraulic lines.



**NOTE: Center Frame Shipping Hardware**

Hardware used to secure parts to the rack during shipping is not used to assemble the machine. Any hardware used to secure parts to each other or a machine frame will be reused to assemble the machine. Un-rack tires, crated tires, and all machine frames. Use a hoist or forklift to move large components. Set the smaller drag frames aside to keep clear of assembly area.

## Gang Assembly - Center Frame



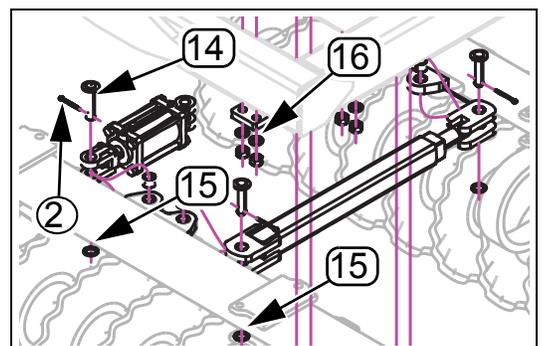
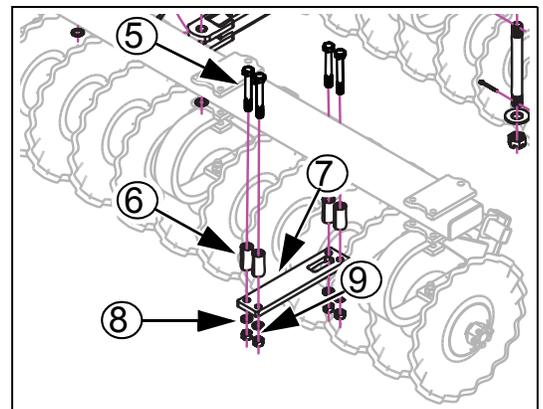
Callout	Part No.	Part Description	Quantity
1	586-589D	BOLT - 1 1/4 X 12 1/8	4
2	805-058C	PIN COTTER 3/16	4
3	804-035C	WASHER FLAT 1 1/4	4
4	803-079C	NUT HEX 1 1/4 - 7	4
5	802-070C	HHCS 3/4-10X6 GR5	16
6	586-542D	SPACER	16
7	586-544D	BOTTOM PLATE	4
8	804-023C	WASHER LOCK 3/4	16
9	803-027C	NUT HEX 3/4-10 PLT	16
10	812-402C	BRACKET	4
11	802-162C	HHCS 5/8-11X3 1/2	8
12	804-022C	WASHER LOCK 5/8	8
13	803-021C	NUT HEX 5/8-11 PLT	8
14	805-498C	PIN CLVS 1X3	4
15	804-192C	WASHER MACH	4
16	805-396C	PIN CLEVIS 1X3 1/8	



### SAFTEY: Blades are Sharp

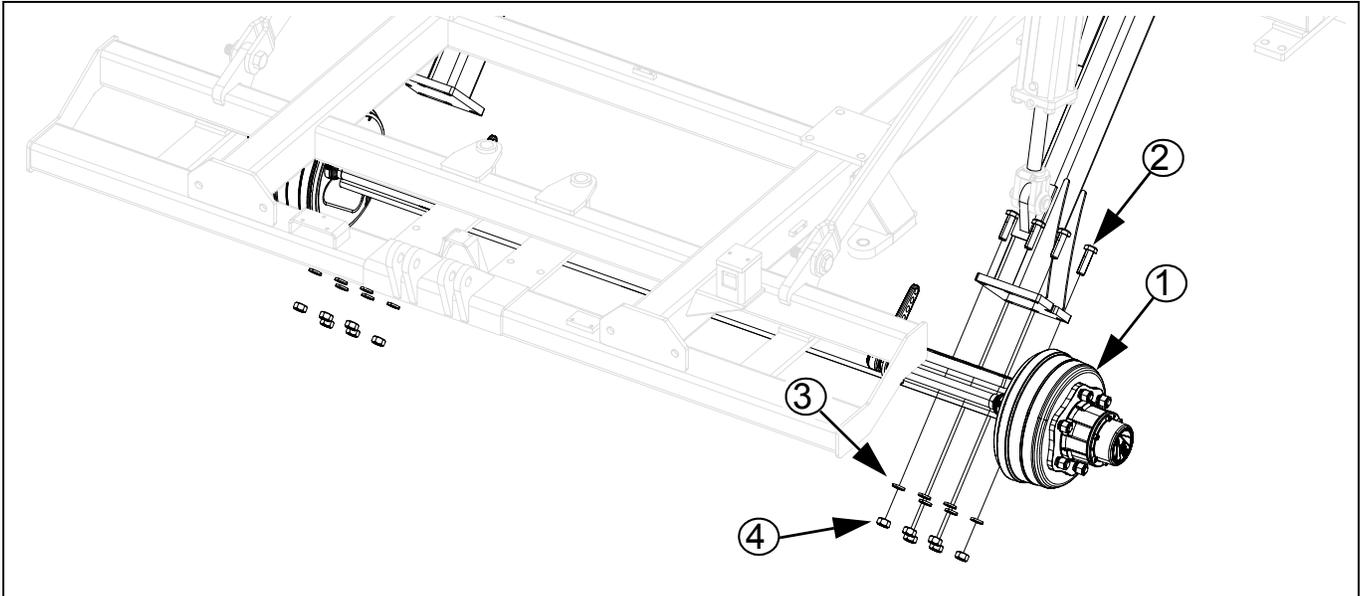
Be sure to wear protective gloves when handling the blades. Keep feet away from blades may cut foot.

1. Position gang assemblies in correct location on floor or ground with a hoist or lift truck.
2. Attach the front to rear gang turnbuckles (17) using clevis pins (14), cotter pins (2), and washers (15). this will keep the gangs in place with correct front to back spacing.
3. Attach gang bars to machine using 1 1/4" bolts (1), cotter pins (2), flat washers (3), and nuts (4). These bolts, plates and brackets will be in place on the center frame in the correct locations.
4. Next install 3/4" bolts (5) through aligned tubes (6) and plates (7), and secure with lock washers (8) and nuts (9). This hardware will be in place on the center frame.
5. Finally install brackets (10) using 5/8" bolts (11), lock washers (12), and nuts (13). This hardware will be in place on the center frame
6. Secure hydraulic cylinder to front gang bar using clevis pin (16), cotter pin (2), and washer (15).



## Center Axle (Braked Option)

If your Turbo-Max has the braked option then it may ship with the center frame's axle and tires pre-assembled but separate from the center frame of the machine. The center frame will need to be lifted using a hoist (or appropriate forklift) to get the axle underneath the frame. Rest center frame on stands strong enough to support 6,000 lbs. of total weight.

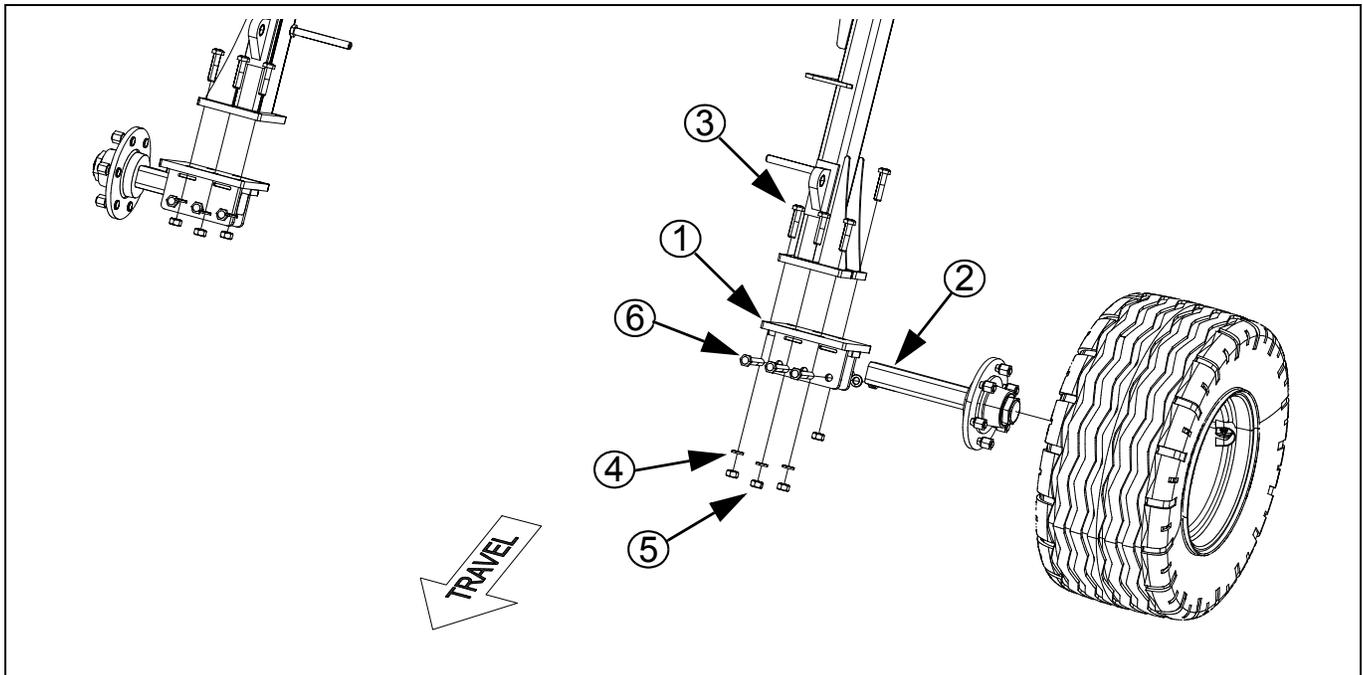


Callout	Part No.	Part Description	Quantity
1	815-584C	3.0M TM AXLE	1
2	802-383C	HHCS 3/4-10X3 GR5	12
3	804-023C	WASHER LOCK SPR	12
4	803-027C	NUT HEX 3/4-10	12

1. With machine raised on stands, slide the axle (1) underneath the center frame using a hoist (or appropriate forklift).
2. Attach axle (1) to torque tube using  $\frac{3}{4}$ " bolts (2), lock washers (3), and nuts (4).
3. Install wheel and tire assemblies.

## Center Transport Hubs (Non-Braked Option)

If your Turbo-Max is equipped with the non braked option it will be shipped with the hub assembly mounts and hubs attached to the center torque tube. The tires will be pre-assembled but separate from the center frame of the machine and will need to be installed on the hubs.



Callout	Part No.	Part Description	Quantity
1	588-163H	HUB ASSY MOUNT BKT 3.0M-TM	2
2	815-553C	HUB ASSY 6-BOLT 350MM	2
3	802-383C	HHCS 3/4-10X3 GR5	12
4	804-023C	WASHER LOCK SPR	18
5	803-027C	NUT HEX 3/4-10	18
6	802-192C	HHCS 3/4-10X4 1/2 GR5	6

1. Leave the shipping bracket in place on the torque tube until you have installed the tires. This will keep the torque tube up off the ground for installing tires.
2. Attach hub mount (1) to torque tube using  $\frac{3}{4}$ " bolts (2), lock washers (3), and nuts (4).
3. Slide hub shaft into the mount and secure with  $\frac{3}{4}$ " bolts, lock washers, and nuts.

## Trusses & Level Bar

### Refer to Figure 2

4. Attach hitch trusses (1) with  $\frac{3}{4}$  x 2 hex bolt (2) (front & rear plates),  $\frac{3}{4}$  x  $2\frac{1}{2}$  hex bolt (3) (middle plates),  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts.
5. Install level bar (4) to torque tube with 1.0 x 8.67 USBL hardened pin (5),  $\frac{3}{8}$  x  $2\frac{1}{4}$  Gr. 8 hex bolts (6) and  $\frac{3}{8}$  nylon lock nut.
6. If your machine is equipped with weight pack you may now install them before attaching the h-bracket to the center frame. See "**Weight Package Assembly (optional)**" on page 18.
7. Install h-bracket assembly (7) to front of level bar (4) with  $\frac{3}{4}$  x 2, Gr. 8 hex bolts (8),  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts.
8. Install bottom of h-bracket assembly (7) to front of center frame with 1 x  $3\frac{1}{4}$  clevis pin (9), 1.5 x 1.00 x.075 machine washer (10) and  $\frac{1}{16}$  x 2 cotter pin.
9. 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 21.

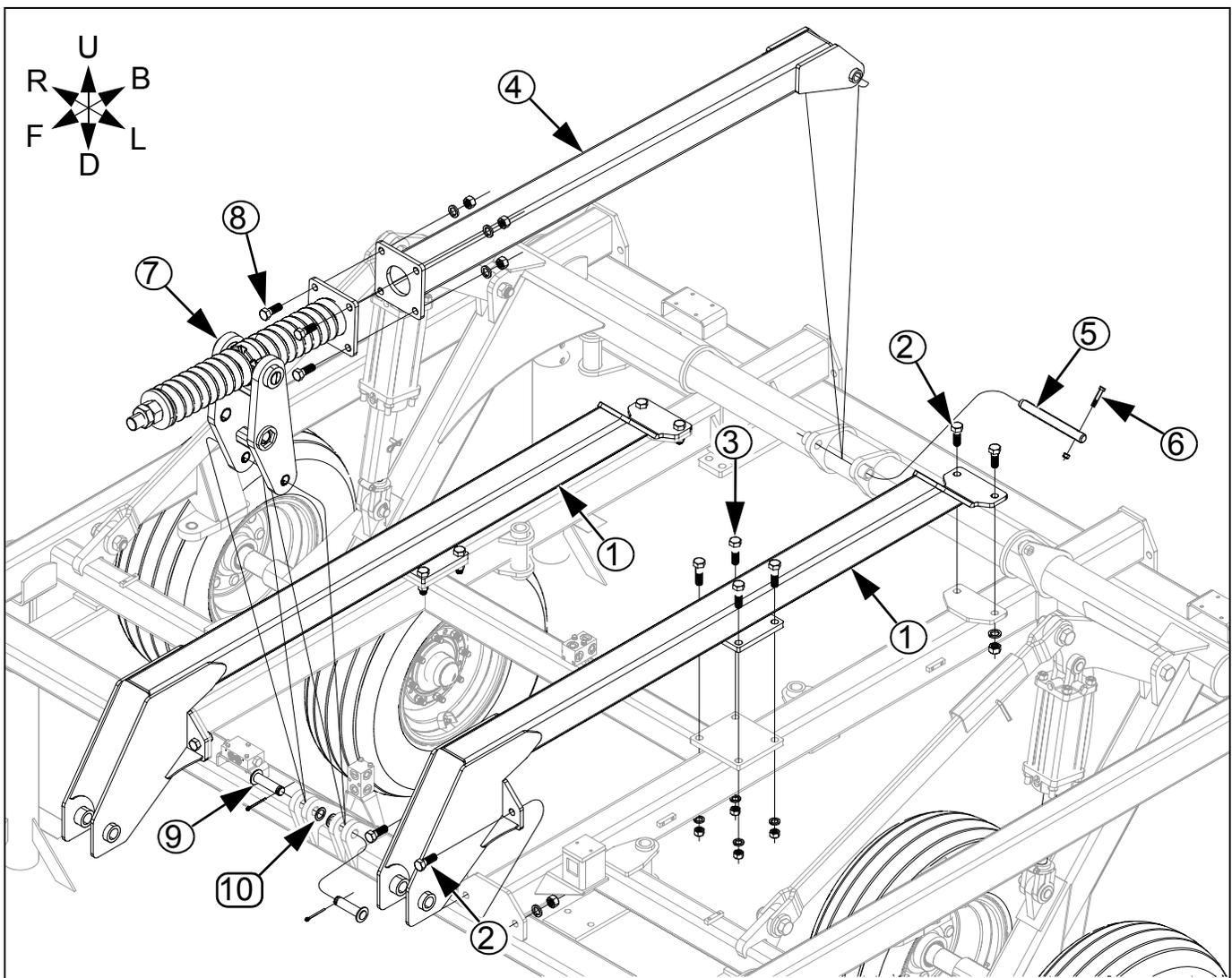


Figure 2  
Trusses & Level Bar

42982

## Hitch

### Refer to Figure 3

10. Bolt the hitch frame (1) to front trusses with the  $1\frac{1}{4}$  x 8 Gr. 8 bolts (2),  $1\frac{1}{4}$  flat washer (3), and  $1\frac{1}{4}$  top lock nuts. Tighten bolts snug, do not torque, as the hitch must pivot freely.
11. Attach h-bracket (4) to hitch turnbuckle (5) with 1 x 8" Gr. 8 bolt (6) and top locks.
12. Attach level bar tube (7) with  $1\frac{1}{4}$  x  $8\frac{1}{2}$  Gr. 8 special thread bolts (8), rear bolt from left side, front bolt from right side and secure with  $1\frac{1}{4}$  top lock nuts.
13. Install the spring hose holder (9) to welded nut on front of hitch with  $\frac{1}{2}$  x 1 Gr. 5 bolt (10),  $\frac{1}{2}$  lock washer and  $\frac{1}{2}$  flat washer.
14. Align holes in clevis base (11) with holes on front of hitch frame (1). Use 20Mx2.5x70 Gr 8. bolts (12), and 20M washers to assemble to hitch.
15. If your machine is equipped with brakes the shunt mount bracket (13) may need installed, use  $\frac{5}{16}$  x  $\frac{3}{4}$  bolts (14) and  $\frac{5}{16}$  washers to secure to hitch.
16. Tighten all bolts with top lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See "Torque Values Chart" on page 21.
17. You may now connect the hydraulic hoses at the valves located on the center frame.

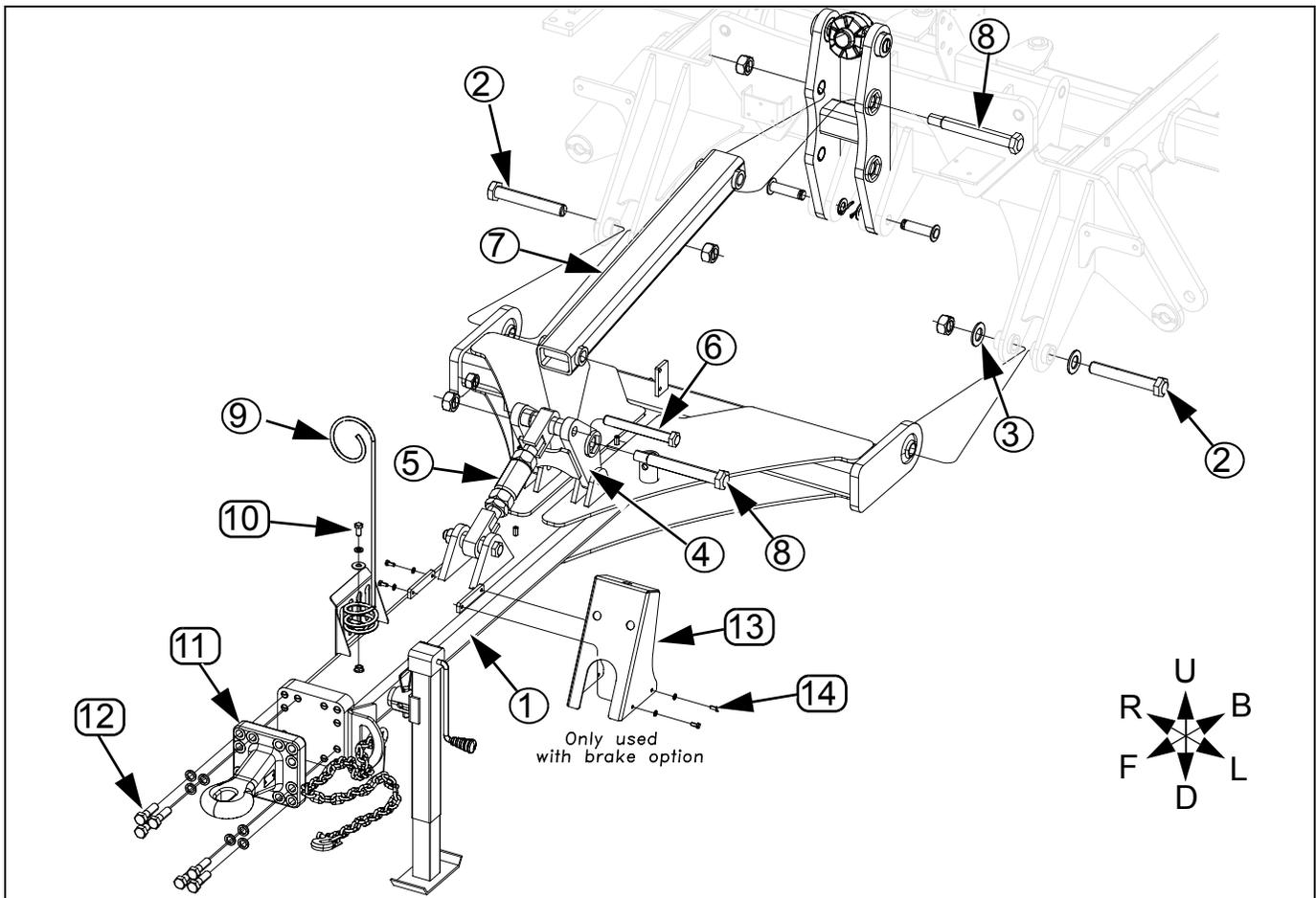


Figure 3  
Hitch

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## Depth Stop & Angle Gauge

Refer to Figure 4

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

18. Slide depth stop tube (1) from rear of machine through square hole on depth control bracket on center wing frame. Align rear holes over lever on torque tube, secure with  $\frac{1}{2}$  x 3 hex bolt (2),  $\frac{1}{2}$  top lock nut.
19. Fasten depth stop assembly (3) on top of depth stop tube with  $\frac{1}{2}$  x  $2\frac{1}{2}$  hex bolts (4),  $\frac{1}{2}$  lock washers and nuts.
20. Attach angle gauge bracket assembly (5) to front of center frame with  $\frac{1}{2}$  x  $3\frac{1}{32}$  x 6 u-bolts (6),  $\frac{1}{2}$  lock washers and  $\frac{1}{2}$  nuts.
21. Attach gauge link (7) to gauge bracket assembly (5) with  $\frac{3}{4}$  x  $1\frac{1}{4}$  hex bolt (8) and  $\frac{3}{8}$  top lock nut.
22. Attach depth control valve (9) to top of depth stop bracket (plunger forward), with  $\frac{5}{16}$  x 2 hex bolts (10) and  $\frac{5}{16}$  lock washers.



### NOTE: Degree Decal Missing

If degree decal is not on the gauge bracket assembly, locate and apply to the gauge bracket's contoured face with numbers aligned upwards.

23. Retract cylinders to straighten gangs. Adjust gauge link (7) until angle gauge plate (11) points to  $0^\circ$ .
24. 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 21.

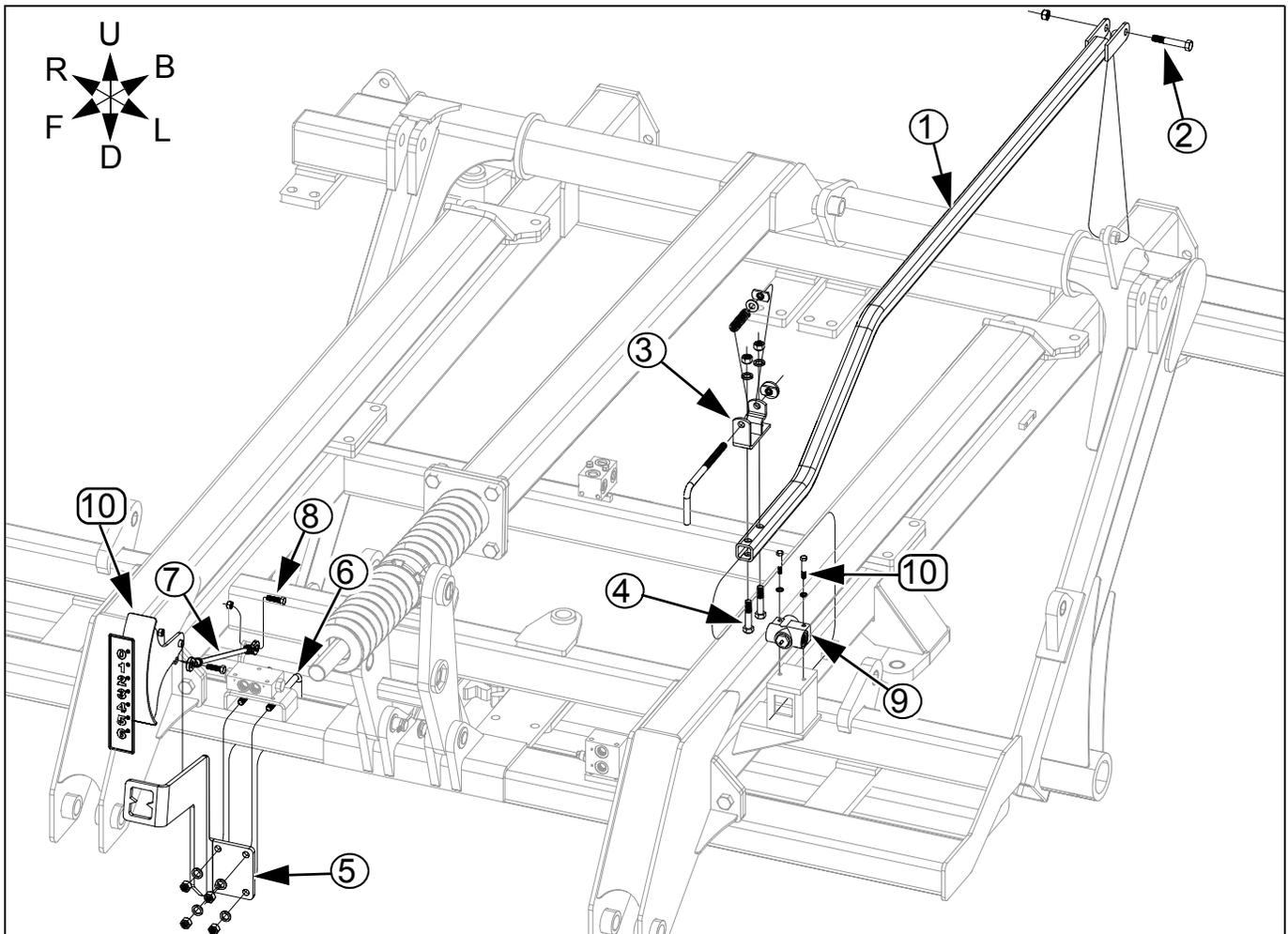


Figure 4  
Depth Stop & Angle Gauge

43907

## Attach Hose Clamps and Hose Wraps

 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 “**Purging Hydraulic System**” on page 15.

### Refer to Figure 5

25. When all the lift and fold hoses are hooked up and tightened properly, put hose clamps on hoses as shown.
26. Install hose wraps on hoses as needed.
27. 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.

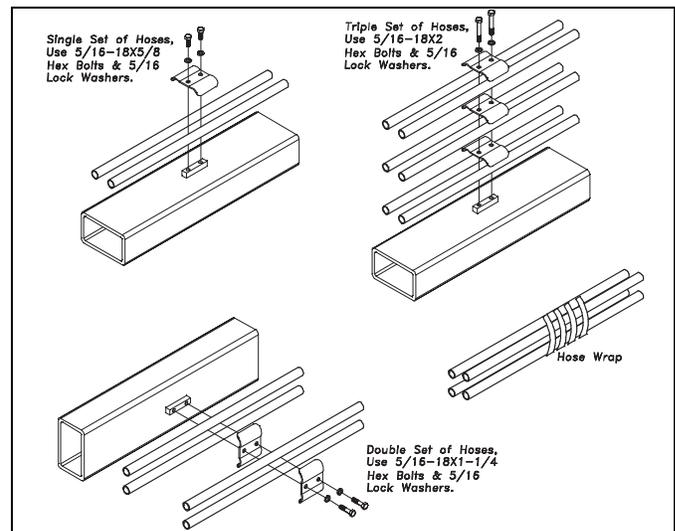


Figure 5  
Hose Clamp Assembly

41583

## Hydraulic Hoses

 **NOTE: Hydraulic Hose Routing**  
The hydraulic hoses are routed and attached to the frame assemblies. They will also be fastened to correct center frame cylinders, valves, double block tees and hydraulic fittings. Connect hydraulic hoses at the hydraulic fittings. Be sure hose ends and fittings are clean before assembling hoses.

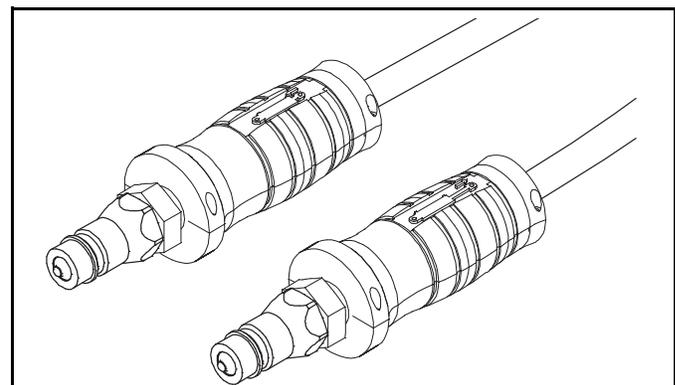
 **WARNING: High Pressure Fluid Hazard:**  
Relieve pressure before disconnecting hydraulic lines. Use paper or cardboard, NOT BODY PARTS, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. Escaping fluid under pressure can have sufficient pressure 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.

## Hydraulic Hose Hookup

Great Plains hydraulic hoses are color coded to help you hookup hoses to your tractor outlets.

Color	Hydraulic Function
Black	Lift (2 hoses)
Red	Gang Adjustment (2 hoses)

For complete hydraulic hose installation, see hydraulic diagrams starting on page 23.



## Purging Hydraulic System



### Purging Lift System

When lift hoses are routed and hooked up to cylinders and valves the systems will need purged of air. Purging the lift system now will allow the machine to be raised up or down for ease of gang assembly installation.

#### Refer to Figure 6

28. Charge the lift system first. Extend the lift cylinders (1) (black handles) until the center section is fully raised. Remove the  $\frac{3}{8}$  x 3 transport lock pins (2) from transport locks (3) and store on lift straps (4). Raise and lower the lift system several times to purge air from system. Watch for leaks and re-tighten fittings if necessary.
29. The gang angle system may not be purged until after hoses and valves are hooked up when gang assemblies and cylinders are installed, See "**Gang Cylinder Purging**" on page 15 for purging gang system.

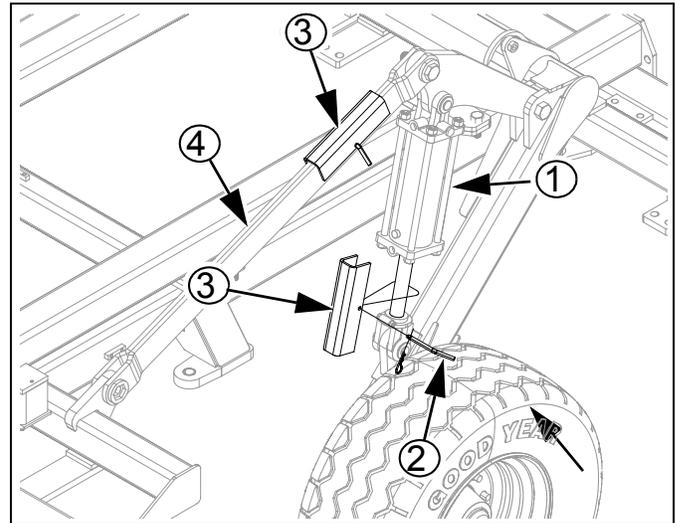


Figure 6  
Purging Lift System

43933

## Gang Cylinder Purging



### Refer to Figure 7

Refer to hydraulic layouts in "Appendix" section of this manual for proper gang hose routing on the center frame. See "**Hydraulic Connector ID**" on page 22 for proper fitting installation. See "**Attach Hose Clamps and Hose Wraps**" on page 14 for proper clamping of hoses.

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

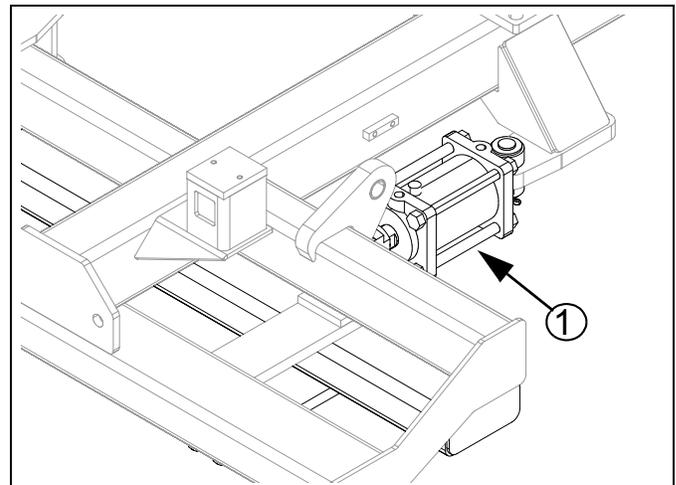


Figure 7  
Gang Cylinder Purging

43935

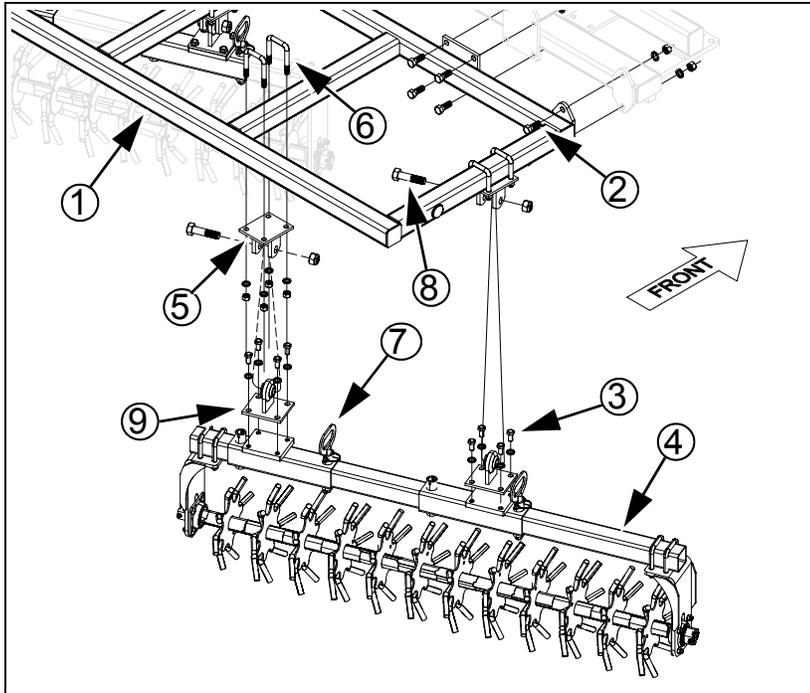
## Rolling Harrow and Reel (Option)



### NOTICE: Dimensions By Model Will Vary

Distances marked with an 'xxx' denotes a variable distance between. Distance varies based on make and model of machine. For more detailed specifications and layouts on page 26.

### Drag Frames and Rolling Harrow



Callout	Part No.	Part Description	Quantity
1	586-574H	CENTER DRAG FRAME	1
2	802-064C	HHCS 3/4-10X2	12
3	802-050C	HHCS 5/8-11X1 1/4	16
4		ROLLING HARROW ASSEMBLY	
5	589-220H	BALL JOINT BRACKET TOP	12
6	806-183C	U-BOLT 5/8-11X3	24
7		ADJUSTMENT PIN W/ QUICK PINS	2
8	802-098C	HHCS 1-8X4 1/2	12
9	589-064H	BALL JOINT BRACKET BOTTOM	12

1. Start by installing the rear drag frames (1) with  $\frac{3}{4}$  x 2 hex bolts (2),  $\frac{3}{4}$  lock washers and nuts. Torque bolts to 265 ft-lb.
2. Attach top ball joint assemblies (5) in appropriate location with  $\frac{5}{8}$  x  $3\frac{1}{32}$  x  $4\frac{1}{2}$  u-bolts (6) and secure with  $\frac{5}{8}$  lock washers and  $\frac{5}{8}$  nuts. Adjust the brackets to dimensions shown in layout drawings and torque u-bolts to 150 ft-lb.
3. Attach the bottom ball joint brackets (9) to sliding rolling spike tube assemblies with  $\frac{5}{8}$  x  $1\frac{1}{4}$  Gr. 5 hex bolt (3), secure with  $\frac{5}{8}$  lock washers and  $\frac{5}{8}$  nuts. Place left ball joint brackets (9) in proper location from layout drawing and torque u-bolts to 150 ft-lb. Leave right ball joint bracket (9) loose, as it may need move a little to bolt up to right rolling harrow bracket (4).
4. Carefully lower machine down or use fork lift (if available) to raise rolling harrow assemblies (4) to attach ball joint brackets (9) & (5). Align to and bottom ball joint bracket assemblies. Secure with 1 x 4 hex bolts (8) and 1 nylon lock nut.



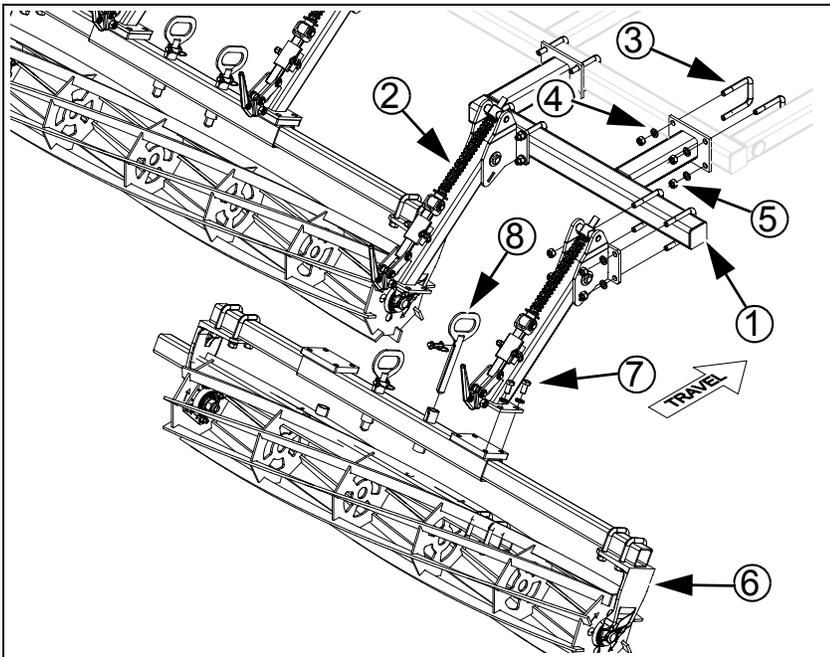
Tighten the 1 x 4 hex bolt, only until the lock nut is against side of bracket. If over tightened damage to the ball joint will occur.



In order to meet 3.0M transport width requirements, the rolling harrow must be adjusted inward and pinned in place before transporting.

5. During transport the rear attachments need to be slid in towards the center of the machine. Remove the pins (7) and slide the reel tube assemblies toward the inside of the machine, reinstall the pins in the correct hole to keep reel assembly in place. Be sure to reinstall the quick pins to keep the adjustment pin in place.

## Reel Following Rolling Harrow



Callout	Part No.	Part Description	Quantity
1	589-687H	HR EXT WELDMENT	1
2	589-491L	REELARMASSEMBLY	9
3	806-183C	U-BOLT 5/8-11 X 3 1/32 X 4 1/2	12
4	804-022C	WASHER LOCK SPRING	40
5	803-021C	NUT HEX 5/8-11 PLT	36
6		REEL ASSEMBLY	2
7	802-050C	HEX BOLT 5/8-11X1 1/4	16
8		ADJUSTMENT PIN W/ QUICK PINS	4

6. Attach the drag frame extensions on the right hand side of drag frame. This is where the reel arms and light brackets will be attached.
7. Measure from the end of the drag frame (1) as specified on layouts on page 18. Install mounting reel arm assemblies (2) in position shown with  $\frac{5}{8}$  x  $4\frac{1}{32}$  x  $4\frac{3}{4}$  u-bolts (3),  $\frac{5}{8}$  lock washers (4), and  $\frac{5}{8}$  nuts (5). Torque u-bolts to 150ft-lb.
8. Attach reel tube assemblies (6) in direction shown. Measure out specified amount from the end of the tube assembly to attach first arm. Secure into position shown with  $\frac{5}{8}$  x  $1\frac{1}{4}$  Gr. 5 hex bolt (7),  $\frac{5}{8}$  lock washers (4), and  $\frac{5}{8}$  nuts (5). Torque u-bolts to 150ft-lb.
9. Check to see that all bolts have been tightened to specs. See **"Torque Values Chart"** on page 21.
10. During field work the reels need to be set wide enough to cover the tracks of the transport wheels. Pull up on the pins (8) and slide the reel tube assemblies to the outside of the machine until the needed width is reached and reinstall the pins and cotter keys to keep the pins in place.
 

 In order to meet 3.0M transport width requirements, the reel baskets must be adjusted inward and pinned in place before transporting.
11. During transport the rear attachments need to be slide in towards the center of the machine. Remove the pins (8) and slide the reel tube assemblies toward the inside of the machine, reinstall the pins in the correct hole to keep reel assembly in place. Be sure to reinstall the quick pins to keep the adjustment pin in place.

## Weight Package Assembly (optional)

### Refer to Figure 8



Up to 1 set of weights (2 weights) may be used in positions shown.

Lower machine until coulters are on ground and pressure is off leveling system.

12. Start by removing the  $\frac{3}{4}$  x 2 Gr. 8 bolts (1) from level bar assembly.
13. Pivot level bar (2) up so there will be clearance to set the 750 pound weight assemblies (4) into place.
14. Pivot level bar spring assembly (3) forward.
15. Carefully lower the 750 pound weight assemblies (4) onto center frame trusses (5).
16. 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  $\frac{1}{2}$  x  $4\frac{1}{32}$  x  $5\frac{1}{4}$  u-bolt (7),  $\frac{1}{2}$  lock washers and  $\frac{1}{2}$  nuts.
17. Torque u-bolts to 85 ft-lbs.

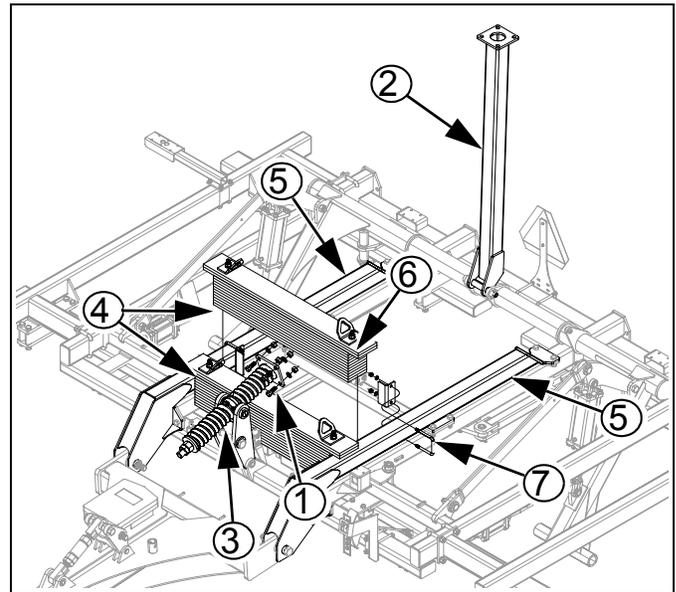


Figure 8  
Weight Package

43105

### Refer to Figure 9

18. Pivot level bar (2) and the level bar spring assembly (3) until holes in plates are aligned.
19. Re-install  $\frac{3}{4}$  x 2 Gr. 8 bolts (1), secure with  $\frac{3}{4}$  lock washers and  $\frac{3}{4}$  nuts.
20. Torque  $\frac{3}{4}$  x 2 Gr. 8 bolts (1) to 375 ft lbs to be sure bolts do not work loose and cause damage to machine.

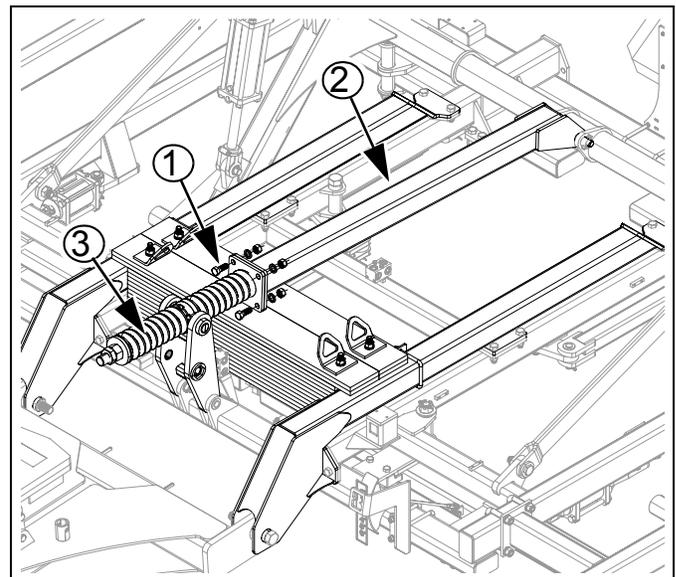


Figure 9  
Level Bar

43106

## Lights

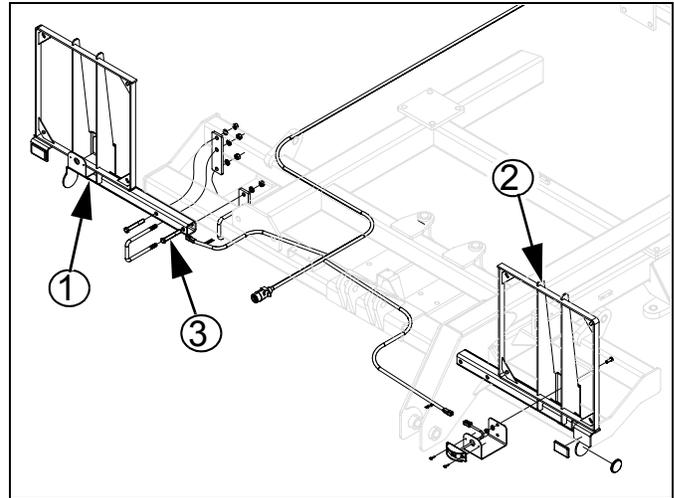


### NOTE: Lighting Layout

See layout drawings in Appendix for proper light bracket placement. If machine is equipped with a rear attachment the rear light brackets will need to be mounted to the rear tube of the drag frames.

### Front & SMV

1. Install the RF/LR (1) and LF/RR (2) light brackets with the  $\frac{1}{2}$  bolt (3), lock washers, and nuts.



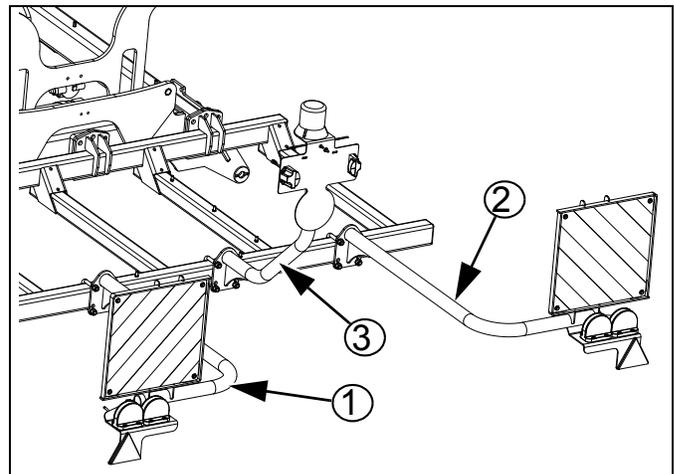
### Rear Lights



### NOTE: Option Lighting

If your machine comes with the rolling harrow and reel option, rear lights are installed on center drag frame.

1. Remove u-bolts from light brackets. Install the RF/LR (1) and LF/RR (2) light brackets and the rear beacon bracket (3) with the  $\frac{5}{8}$  u-bolts, lock washers, and nuts.



## Install Decals



### NOTE: Clean Frame Before Decal Installation

The center brace bar decals will need installed in locations shown. Clean the area on which the decal is to be placed. Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.

All decals should be installed on the machine prior to shipping. If decals are not placed on machine in full or in part, refer to the machine's operator and parts manual for decal placement.

## Completing Setup

2. The decals may now be installed.
  3. See appropriate pages for decals in the “Parts Manual” for decal placement.
  4. 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.
    - c. Slowly peel away top protective covering being careful not to pull decal from implement.
  5. If machine has an optional finishing attachment or rear hitch, refer to the “Parts Manual” for parts break down and attachment layout drawings of this manual.
-  Be sure to consult the operating instructions, in “Operator’s Manual”, for the first time field adjustments before going to the field.

# Appendix - Reference Information

## Torque Values Chart

Bolt Size in-tpi <sup>a</sup>	Bolt Head Identification						Bolt Size mm x pitch <sup>c</sup>	Bolt Head Identification					
	Grade 2		Grade 5		Grade 8			Class 5.8		Class 8.8		Class 10.9	
	N-m <sup>b</sup>	ft-lb <sup>d</sup>	N-m	ft-lb	N-m	ft-lb		N-m	ft-lb	N-m	ft-lb	N-m	ft-lb
1/4-20	7.4	5.6	11	8	16	12	M 5 X 0.8	4	3	6	5	9	7
1/4-28	8.5	6	13	10	18	14	M 6 X 1	7	5	11	8	15	11
5/16-18	15	11	24	17	33	25	M 8 X 1.25	17	12	26	19	36	27
5/16-24	17	13	26	19	37	27	M 8 X 1	18	13	28	21	39	29
3/8-16	27	20	42	31	59	44	M10 X 1.5	33	24	52	39	72	53
3/8-24	31	22	47	35	67	49	M10 X 0.75	39	29	61	45	85	62
7/16-14	43	32	67	49	95	70	M12 X 1.75	58	42	91	67	125	93
7/16-20	49	36	75	55	105	78	M12 X 1.5	60	44	95	70	130	97
1/2-13	66	49	105	76	145	105	M12 X 1	90	66	105	77	145	105
1/2-20	75	55	115	85	165	120	M14 X 2	92	68	145	105	200	150
9/16-12	95	70	150	110	210	155	M14 X 1.5	99	73	155	115	215	160
9/16-18	105	79	165	120	235	170	M16 X 2	145	105	225	165	315	230
5/8-11	130	97	205	150	285	210	M16 X 1.5	155	115	240	180	335	245
5/8-18	150	110	230	170	325	240	M18 X 2.5	195	145	310	230	405	300
3/4-10	235	170	360	265	510	375	M18 X 1.5	220	165	350	260	485	355
3/4-16	260	190	405	295	570	420	M20 X 2.5	280	205	440	325	610	450
7/8-9	225	165	585	430	820	605	M20 X 1.5	310	230	650	480	900	665
7/8-14	250	185	640	475	905	670	M24 X 3	480	355	760	560	1050	780
1-8	340	250	875	645	1230	910	M24 X 2	525	390	830	610	1150	845
1-12	370	275	955	705	1350	995	M30 X 3.5	960	705	1510	1120	2100	1550
1 1/8-7	480	355	1080	795	1750	1290	M30 X 2	1060	785	1680	1240	2320	1710
1 1/8-12	540	395	1210	890	1960	1440	M36 X 3.5	1730	1270	2650	1950	3660	2700
1 1/4-7	680	500	1520	1120	2460	1820	M36 X 2	1880	1380	2960	2190	4100	3220
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							

- 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

Torque Values Chart	
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	5/8"-18 (85-100ft-lbs)

## Tire Inflation Chart

Tire Inflation Chart		
Wheel	Tire Size	Inflation
Transport	15.0/55-17 14 Ply	54 psi (372 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.	
<a href="#">Manufacturer Web site</a> Firestone <a href="http://www.firestoneag.com">www.firestoneag.com</a> Gleason <a href="http://www.gleasonwheel.com">www.gleasonwheel.com</a> Titan <a href="http://www.titan-intl.com">www.titan-intl.com</a> Galaxy <a href="http://www.atgtire.com">www.atgtire.com</a> BKT <a href="http://www.bkt-tire.com">www.bkt-tire.com</a>	

## Hydraulic Connectors and Torque

### Refer to Figure 10 (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)  
 3 Note straight threads (6) and elastomer O-Ring (7). Prior to installation, to prevent abrasion during tightening, lubricate O-Ring with clean hydraulic fluid. 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.

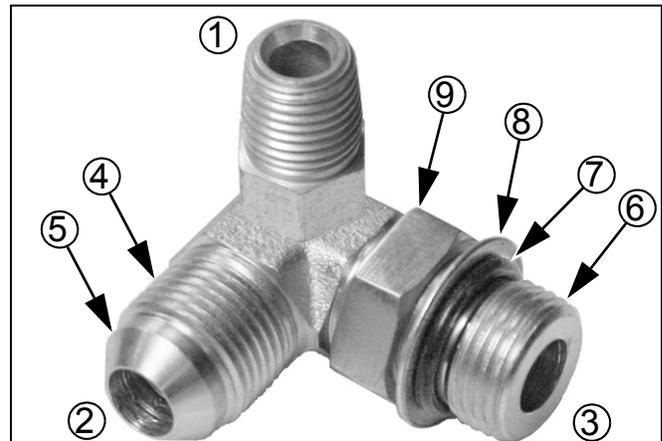
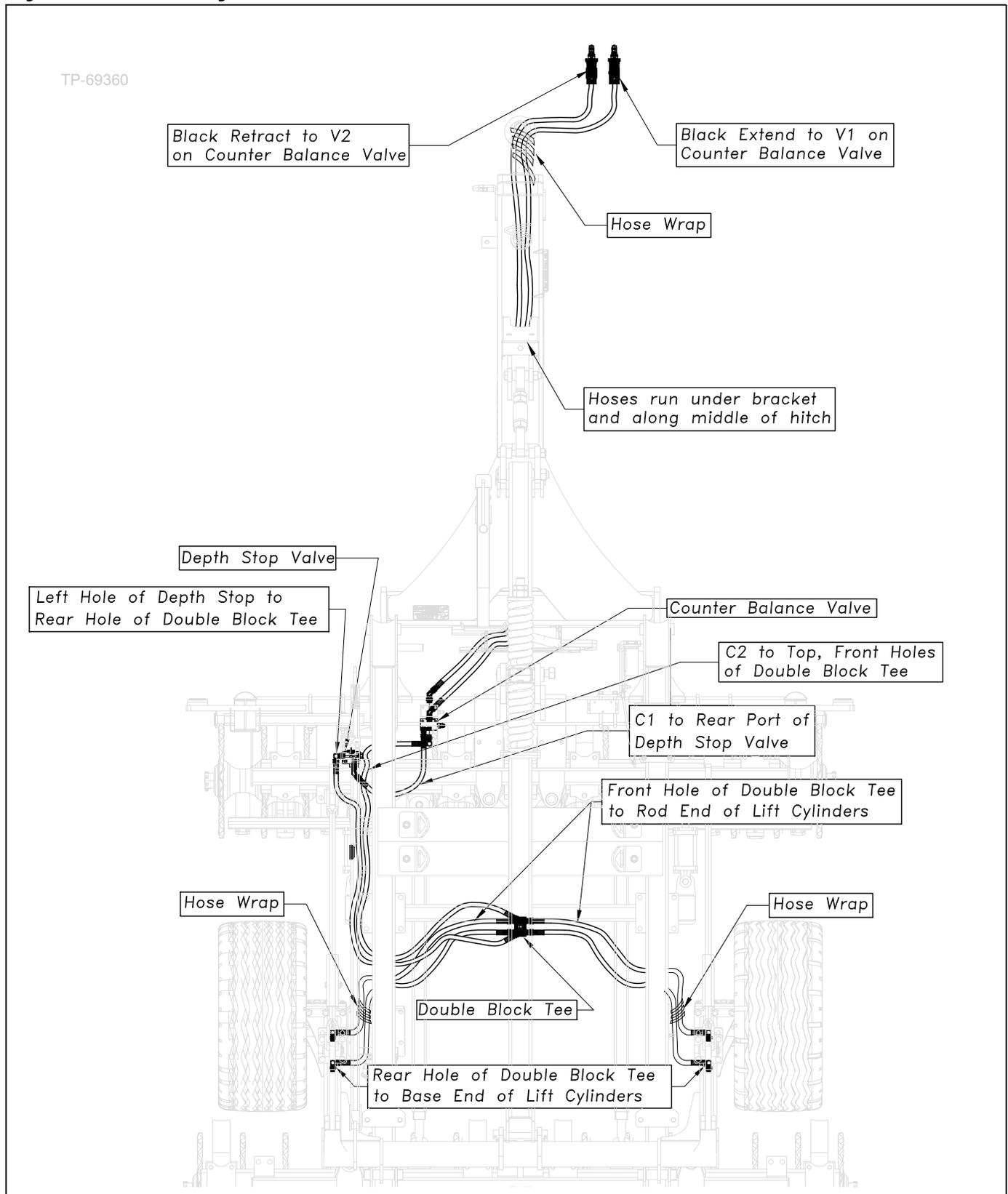


Figure 10  
Hydraulic Connector ID

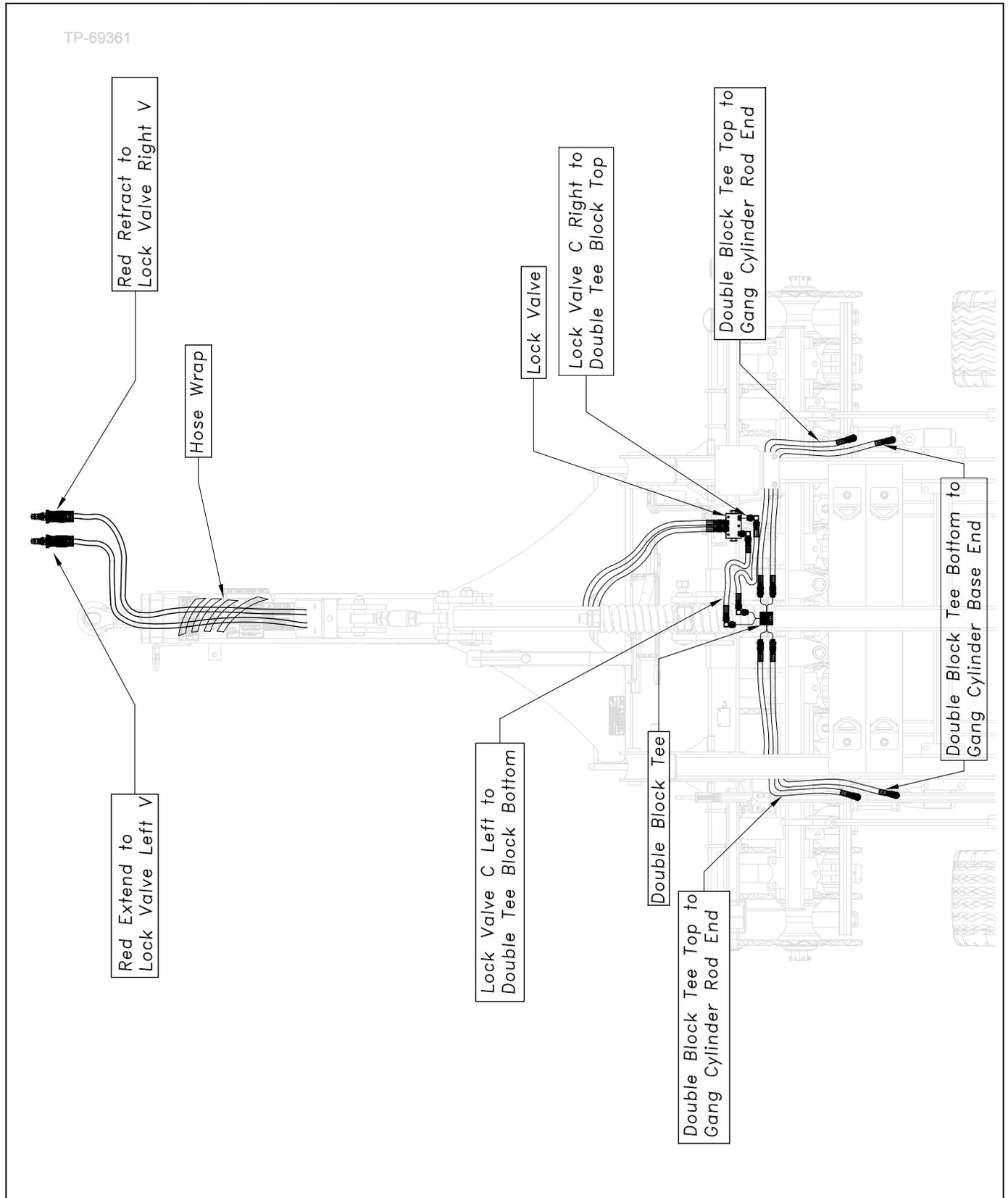
31282

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

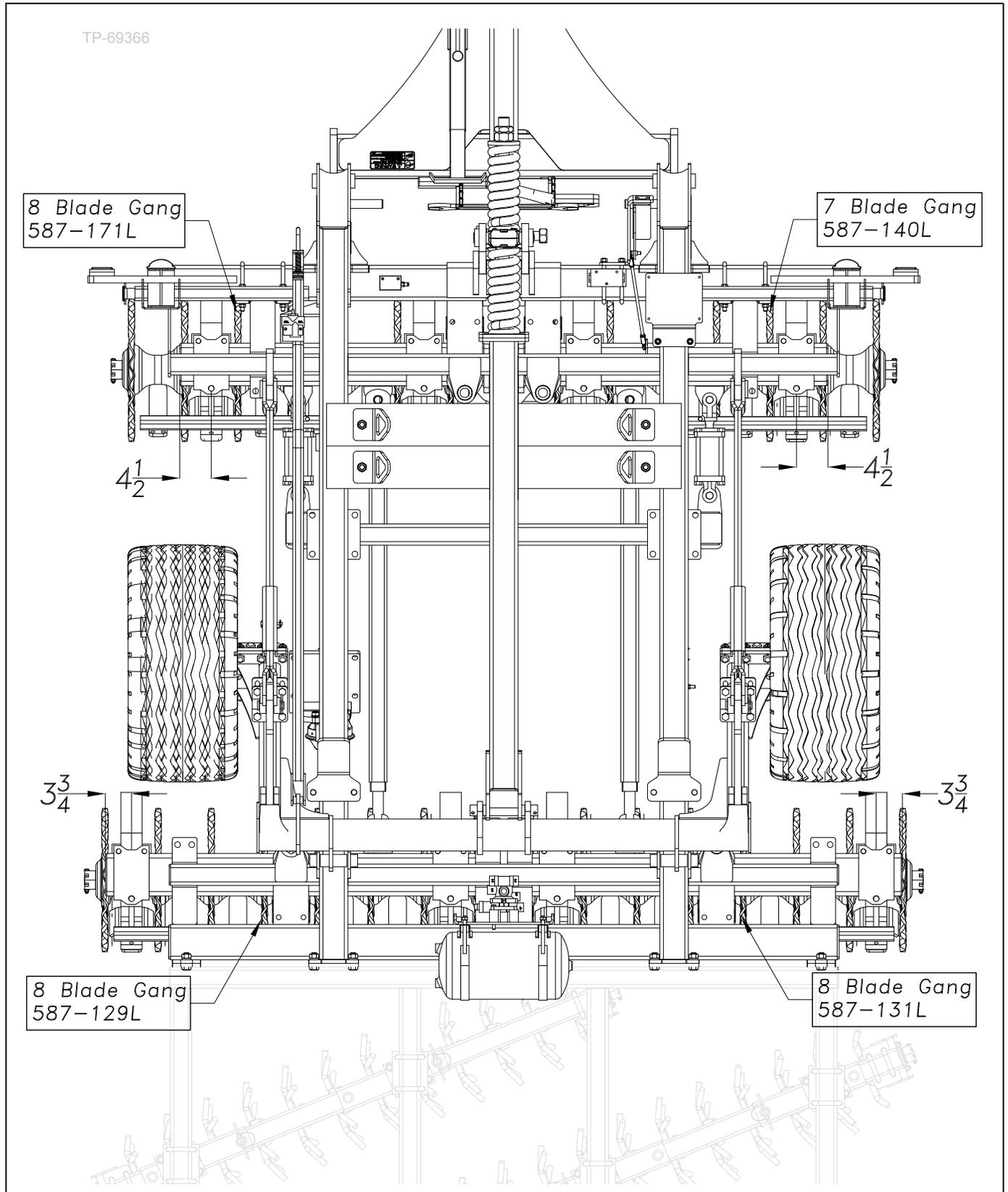
# Hydraulic Lift Layout



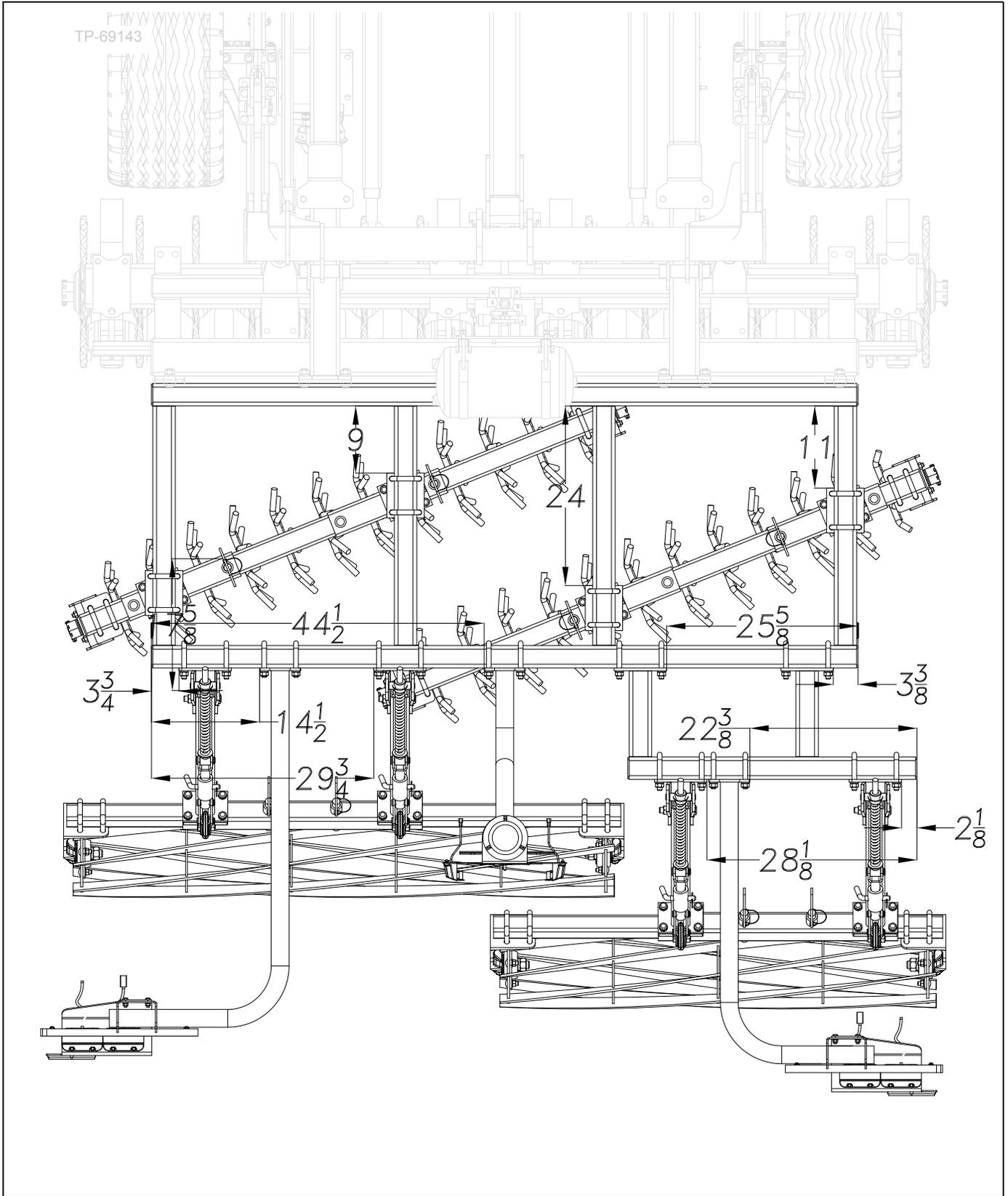
# Hydraulic Gang Angle Layout



### 3.0M TM Machine Layout



### Heavy Reel Following Rolling Harrow Layout





<b>A</b>		NPT .....	22
angle gauge .....	13	<b>O</b>	
<b>B</b>		ORB .....	22
banding .....	6	orientation rose .....	6
<b>C</b>		O-Ring Boss .....	22
CAUTION, defined .....	2	owner assistance .....	2
children .....	3	<b>P</b>	
clothing .....	2	protective equipment .....	2
color code, hose .....	14	purging	
components .....	6	lift system .....	15
covered models .....	1	<b>R</b>	
<b>D</b>		riders .....	3
DANGER, defined .....	2	rolling harrow .....	17
decals .....	20	rose, orientation .....	6
center brace .....	19	<b>S</b>	
speed		SAE J514 .....	22
30km per hr .....	1	safety chain .....	2
depth stop .....	13	safety symbol .....	2
directions .....	6	shutdown .....	4
<b>F</b>		storage .....	4
finishing attachments .....	6, 20	symbol, safety .....	2
fork truck .....	6	<b>T</b>	
fumes .....	4	tables	
<b>G</b>		document family .....	1
gangs .....	6	fittings torque .....	22
<b>H</b>		hose color code .....	14
headphones .....	2	models covered .....	1
high pressure fluids .....	3	torque values .....	21
hose clamps .....	14	tire inflation .....	22
hydraulic connectors .....	22	tires .....	3
Hydraulic Hoses .....	14	torque value chart .....	21
hydraulic safety .....	3	torque values chart (wheel bolts) .....	21
<b>I</b>		transport speed .....	4
inflation .....	22	<b>U</b>	
<b>J</b>		URLs, tires .....	22
JIC .....	22	<b>W</b>	
Joint Industry Conference .....	22	WARNING, defined .....	2
J514 .....	22	warranty .....	22
<b>L</b>		weight package .....	18
layout		welding .....	4
heavy reel following rolling harrow ..		www .....	22
26		<b>Numerics</b>	
hydraulic gang angle .....	24	15.0/55-17 14 PLY .....	22
hydraulic lift layout .....	23	20 mph .....	4
3.0M TM Machine .....	25	30 kph .....	4
leaks .....	3		
lights .....	3		
<b>M</b>			
maintenance safety .....	4		
medical assistance .....	3, 14		
<b>N</b>			
National Pipe Thread .....	22		







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