



BRIDGEVIEW MFG. INC.



BALE KING
VR683 SuperSteer
Hay Rake
Operator's & Parts Manual

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Your Authorized Dealer
Serial Number
(Optional) Kicker Serial Number

The Serial Number is located on the left side of the hitch beam beside the hydraulic bulkhead.
The Kicker Serial Number is located in front of the cylinder on the left side of the kicker frame.

A black and white illustration of an open manual with a hand pointing to a page.	<p>! WARNING</p> <p>Failure to read and understand operator's manual & all safety signs could result in serious injury. Manual must remain with machine.</p>
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TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	Safety Precautions	2
1.2	Highway Transport.....	3
1.2.1	Dimensions	3
1.2.2	Safety Chain & Jack.....	3
1.2.3	Lights and Marking.....	3
1.2.4	Rake Wheel Safety Locks	4
1.2.5	Transport Safety Locks	4
1.2.6	Wheels & Caster Brakes	5
1.2.7	Steering Axles.....	6
2	FEATURES AND OPERATION	7
2.1	Hydraulics	7
2.2	Electrical	7
2.3	Implement Tongue.....	8
2.4	Field Operation.....	8
2.5	Adjustments.....	9
2.5.1	Lift Cylinder Stroke Limiter Nut.....	9
2.5.2	Individual Spring Adjusters.....	9
2.6	Rear Width Auto-Recovery (VR683 Exclusive).....	10
2.7	Optional 2- or 4-Wheel Extension Kit.....	12
2.8	Optional Kicker Wheel	12
2.9	Optional Floatation Caster Kit	14
2.10	Trouble-Shooting Guide	15
2.11	Specifications	16
3	MAINTENANCE & LUBRICATION.....	17
3.1	Wheels and Tires	18
3.2	Greasing	17
3.3	Tine Replacement.....	19
3.4	Steering Alignment.....	20
4	PARTS BOOK.....	21



1 INTRODUCTION

Thank you for purchasing your new **Bale King hay rake** from Bridgeview Manufacturing. With the proper operation and service as outlined in this manual, this rake will provide years of trouble free operation.

The VR683 SuperSteer hay rake is an 18-wheel, V-style rake specially suited for mowed hay. An optional 20 or 22-wheel extension kit is available, if more coverage is desired. A full coverage kicker wheel (683 exclusive) is also available, for turning every blade of grass in your hay field.

A parallel linkage system controls the axles at the center of the frame, allowing the rake to make extremely tight turns and corners. However, for road transport, the rear axles should be locked (and the center axles unlocked), to provide better towability for long trips between hay fields.

The rear windrow width is hydraulically adjustable for ease of use. The patented width compensation system ensures maximum raking width, no matter what the windrow width is set at. The new width recovery system (VR683 exclusive) will remember the rear width setting and automatically return to the same setting the next time the rake is opened.

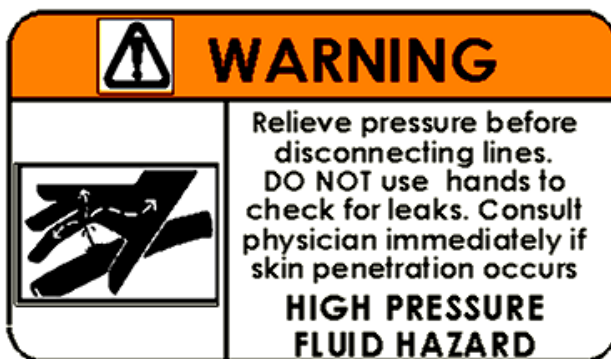
This is a complete safety, operation, and parts manual for the Bale King hay rake. This manual covers in detail how to safely and effectively use the rake and these steps should be followed to ensure safety and the longevity of the machine. The parts section covers all of the parts you may need to order in case of accident or breakdown.



1.1 Safety Precautions

The following safety precautions **MUST** be followed to ensure the safe operation of the **Bale King** hay rake.

- This trailed machine was designed and intended for on-farm use only. **Tow at speeds not exceeding 20 miles/hour** (32 km/h). Slow down for hills, curves, rough area, and in advance of braking to prevent loss of control and possible injury or death.
- Read and follow the **Highway Transport** section before towing on public roads.
- **Always** turn off tractor and ensure parking brake is applied before leaving the operating platform.
- **Stand clear** of the rake while in operation.
- **Do not** stand near or inside the rake during opening or closing. Ensure that there is enough room to open the rake in an area before doing so.
- **Beware** of pinch points at all articulating joints.



WARNING: Pressurized hydraulic fluid can cause serious injury

- When working with hydraulic equipment, eye and hand protection should be worn.
- Do not test for leaks with bare hands.
- Relieve hydraulic pressure before removing a hose or fitting.
- Never work under components raised by hydraulic equipment unless supported externally.



1.2 Highway Transport

When transporting the Bale King hay rake on public roads, there are a number of safety precautions that must be taken to ensure safety to everyone on the road.

1.2.1 Dimensions

	18	18K	20	20K	22	22K
Transport Width	14'6"					
Transport Height	9'-11"					
Transport Length	40'-8"	43'-6"	43'-6"	43'-6"	46'-4"	46'-4"
Gross Weight	9000 lb	9900 lb	9500 lb	10 200 lb	10 600 lb	11 300 lb
Tongue Weight	1100 lb	1750 lb	1250 lb	1750 lb	1400 lb	1900 lb

Ensure that road restrictions do not prohibit these dimensions, and that the towing vehicle and hitch are properly rated for the weight (both gross and tongue).

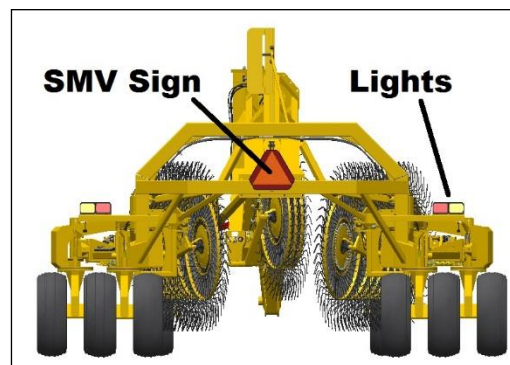
DO NOT EXCEED 20 mph (32 km/h) DURING TRANSPORT.

1.2.2 Safety Chain & Jack

Make sure that the safety chain is properly attached to the towing vehicle. There should be enough slack that the trailer can turn freely, but not so much that the chain drags on the ground. The jack should be stored on the underside of the gooseneck hitch to avoid damage. The chain is rated for 11,000 lb.

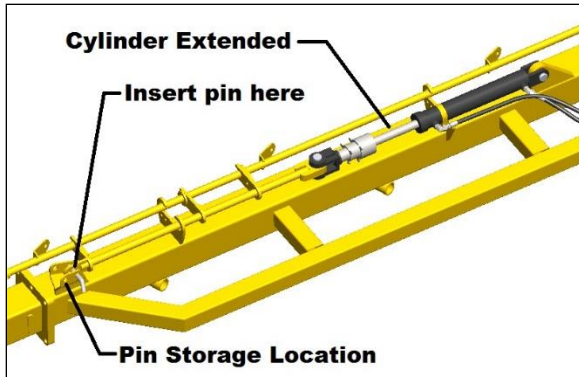
1.2.3 Lights and Marking

The Bale King hay rake comes standard with a light kit for better visibility. The lights can be plugged into the standard 7-pin round trailer plug on a tractor. The lights function as flashing amber lights, with solid red tail lights and brake lights, along with enhanced turn signal functionality. Ensure that everything is functioning properly before towing. Ensure that the SMV (Slow Moving Vehicle) sign is in place and visible.





1.2.4 Rake Wheel Safety Locks

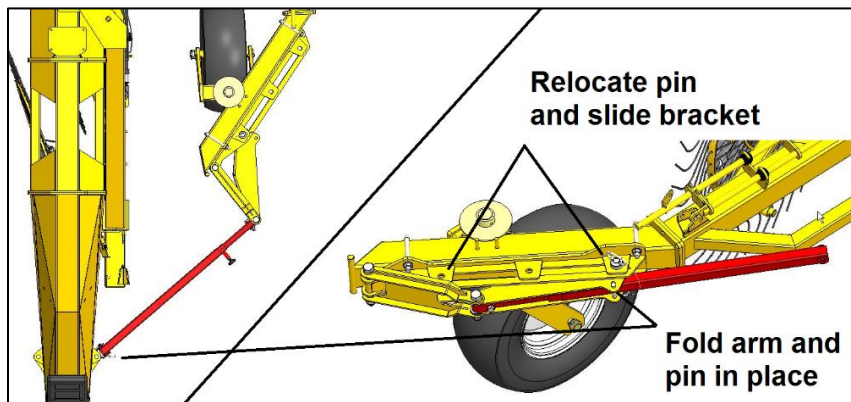
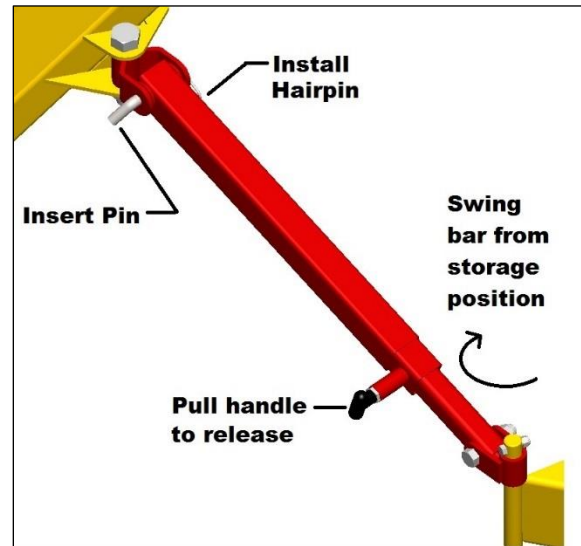


The lift rods (located on the left and right boom arms) should be locked in place to keep the rake wheels from touching the ground during transport. To insert the safety locks, raise the rake wheels to their highest position, then insert the pin as shown. **Make sure that this is done for all lift rods.** Place pin in storage hole when during normal operation.

1.2.5 Transport Safety Locks

Close the rake into its folded position by closing the boom arms until the front caster wheels are brought in near the hitch.

Swing the red transport locks out from their storage position along the boom arms and connect to the pivot on the gooseneck. Pull out the self-locking pin (black handle) to lengthen or shorten as required. Secure with the 5/8" pin and hairpin. Finally, adjust the boom width so that the self-locking pin snaps into place. **Ensure that both sides are locked.**



The 18-wheel Kicker version includes an additional folding mechanism and a longer swing bar. This is because the kicker wheel requires a hitch extension. There is one extra pin to be dealt with when hooking up this type.



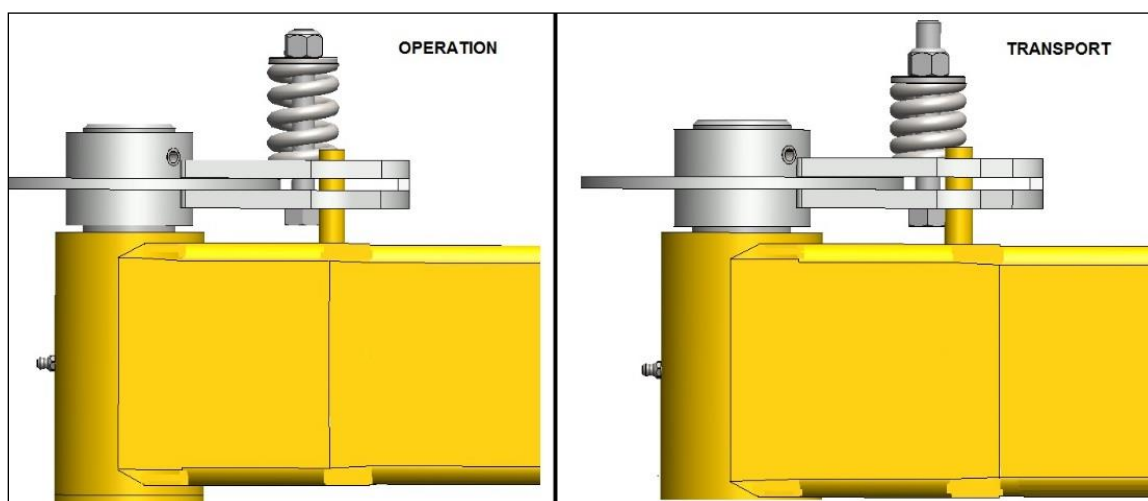
1.2.6 Wheels & Caster Brakes

Check tire pressure and wheel nut torque of all wheels regularly.

Tire Pressure	25 psi
Wheel Bolt Torque	90 ft-lb

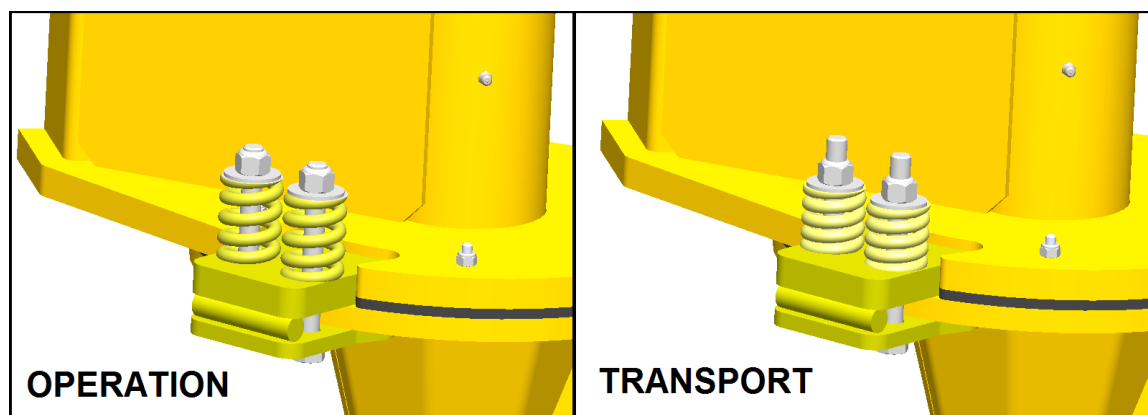
Drive straight forward several feet until all caster wheels are aligned with the direction of travel (angled rearwards). Tighten the brake springs so there is about 1/16" between the coils. This will prevent the casters from whipping.

If the casters continue to whip, first SLOW DOWN. Do not exceed 20 mph (32 km/h). If this does not help, tighten the brakes further until the problem no longer occurs.



FRONT AXLES <ABOVE>

MID / REAR AXLES <BELOW>



IMPORTANT: Ensure that the spring is loosened back off before operation or the rake will be very difficult to turn or back up.

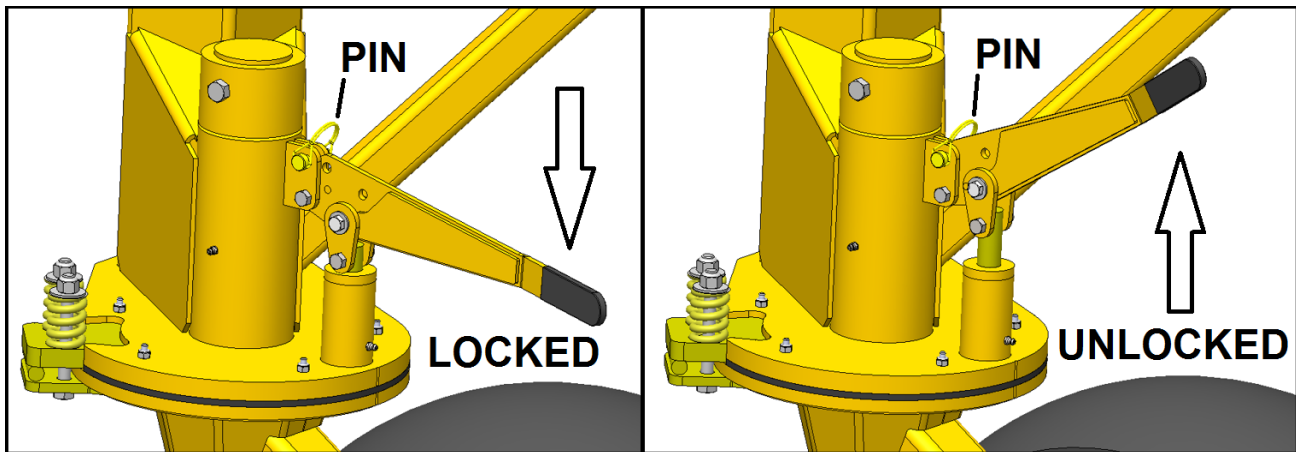


1.2.7 Steering Axles

The VR683 SuperSteer can be set up with either the center axles or the rear axles locked. This means that the rake can make very sharp turns when the center axles are locked or provide the stable towing of a long wheel base when the rear axles are locked. It is recommended that for long trips the rear axles be locked for more stable towing.

To lock the axles, drive straight forward until all wheels are angled straight backwards. Remove the pin on the unlocked handle and allow it to spring down and lock the caster. If it doesn't lock immediately, continue to drive forward until both sides pop into place. Once the rear axles are locked, insert the safety pin, then unlock the mid axles by pulling the handle up and inserting the lock pin. **Always make sure that 2 axles are locked, and 2 are unlocked.**

Once you arrive at the field, it may be beneficial to open the rake to operating width before locking the mid axles.





2 FEATURES AND OPERATION

2.1 Hydraulics

There are three sets of hydraulic hoses to connect to the tractor. Each hose has a coloured marker to identify its function. They should be connected at best convenience for the tractor's controls. Note that the hoses are paired by colour and the following table shows the operation when pushing oil into the hose with the longer marker.

Once the windrow width is set, it will stay at that setting until changed. This means that the blue hoses may be disconnected if using a tractor with only 2 remotes. If 2 remote control is desired, an optional Diverter Kit is available to run the rake using only 2 remotes, with an electric switch to switch between red and blue functions.

	Standard	Diverter Kit # 29298	
Function	3-Remote	2-Remote	Control Box
Open rake, kicker	Red Extend	Red Extend	Main
Increase windrow width	Blue Extend		Rear Width
Lift rake wheels	Yellow Extend	Yellow Extend	

2.2 Electrical

In order to achieve the proper functionality of the VR683, electric solenoid valves are used to control the hydraulics. For these to operate, the 7-pin tractor plug must provide auxiliary power to the center pin, and the plug must be connected to the tractor. If this is not possible, then the black wire inside the 7-pin plug, must be connected to +12V (through ignition switch) and the white wire must be connected to -12V. The brown, green, yellow, red, and white wires power the lights as below.



An adaptor kit is available which will allow you to run power directly from the battery to the 7-pin plug. However, this will not allow the lights to function. When the rake is closed, no power should be drained, but otherwise the plug should be disconnected from the tractor when not in use.

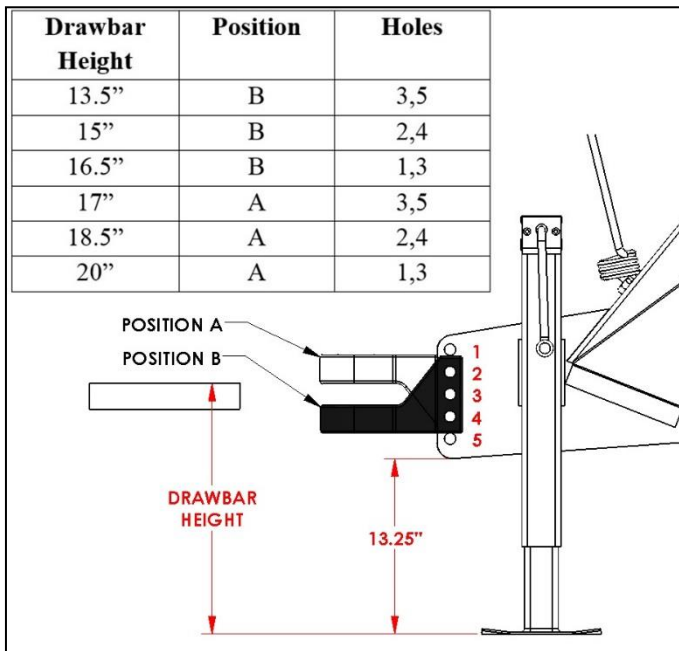
VR683	7-pin Plug Adaptor Kit	29608
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2.3 Implement Tongue

The adjustable hitch on the Bale King hay rake features a single cast tongue with optional clevis insert. This allows for use with tractors equipped with a hammer strap, or a single drawbar. It also allows the machine to move independently over rough terrain without bending the draw pin.

Make sure that the hitch height is adjusted to match your tractor's particular drawbar height. The hitch beam should sit level when connected to the tractor. This is especially important when using a kicker wheel.



DO NOT install the clevis insert if the tractor also has a hammer strap. This could cause the hitch pin to bend or break. Also, DO NOT install clevis option if hitch is installed in position B.

VR683	Clevis Hitch Insert	25540
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IMPORTANT: For maximum turning radius, ensure that the tractor's drawbar is in its most extended position. If the pin still does not stick out past the tires, a drawbar extension may be required.

2.4 Field Operation

The MAXIMUM recommended raking speed is 8 mph (13 km/h), depending on field conditions. Rougher land and heavier hay require slower operation. This will prevent damage to the rake tines and premature wear.

For faster operating conditions, rake wheel spring pressure can be increased to prevent excess bouncing of the tines. Heavier tine pressure will also help in rolling terrain. Under normal conditions, the rake wheel pressure should be approximately 15 lb. Heavier tine pressures will result in increased wearing of tines, as well as allowing more dirt and rocks to be scratched up into the hay.

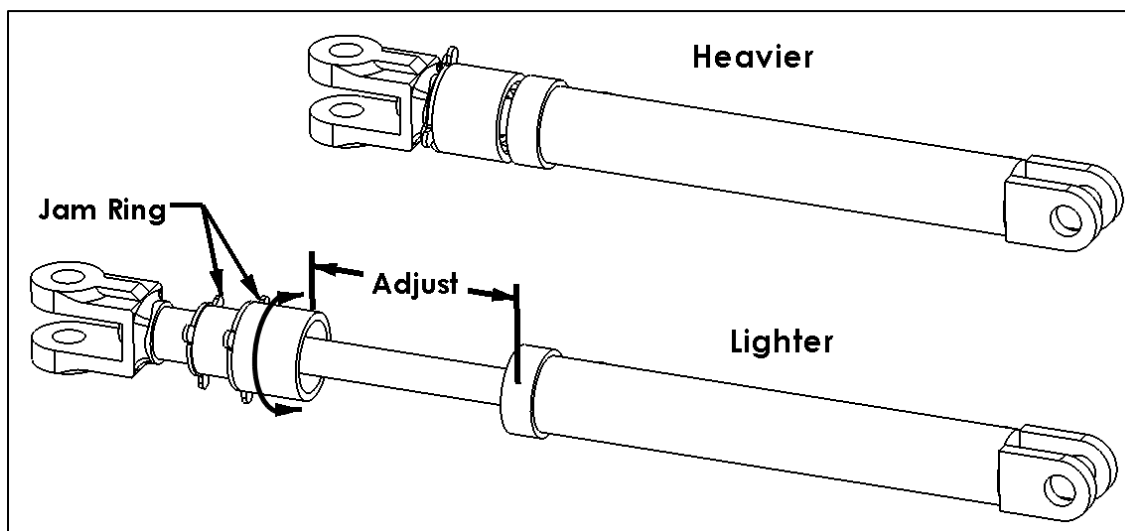
It is recommended to lock the mid casters during operation. This will make turning a lot easier and leave a better windrow around corners. See section 1.2.7 for information on switching between mid axle and rear axle locks.



2.5 Adjustments

Optimum rake performance is achieved when the rake wheels are lightly scratching the ground (10 – 15 lb). This is controlled by the springs on each individual wheel. If the spring tension is set too heavy, premature rake tine wear could occur. Also, dirt and rocks could be picked up and mixed in with the hay. If spring tension is too light, the hay will not be properly picked up. If the tension in the spring arms needs to be adjusted, there are two ways to accomplish this.

2.5.1 Lift Cylinder Stroke Limiter Nut



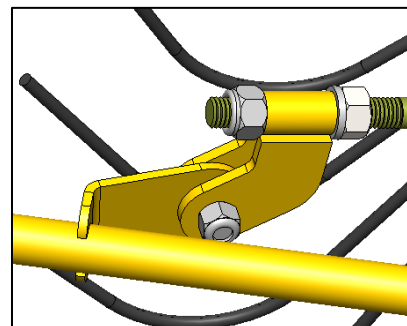
The primary adjustment is the lift cylinder stroke limiter nut. This will change the tine pressure for all wheels mounted to each individual boom. There are 4 of these cylinders on a VR683, plus 1 for the kicker wheels. The lift cylinders are located near the back of each individual boom arm. When the cylinder is retracted, the rake wheels touch the ground.

The 2-stage nut located on the cylinder shaft can be turned to adjust the cylinder stroke. If the rake wheel pressure is too high, increase the length of the nut. Adjust one boom at a time (using the transport lock on others), find the desired wheel weight with hydraulics, then turn the nut until it bottoms out on the cylinder. Lastly, spin the jam rings up against the nut to keep it from turning.

2.5.2 Individual Spring Adjusters

If the spring tension for only one wheel needs to be adjusted, then the adjustment can be done on the individual spring. There are two nuts near the end of the spring (see left) that allow the spring to be loosened or tightened.

NOTE: The factory setting is 3/8" of thread at the end.



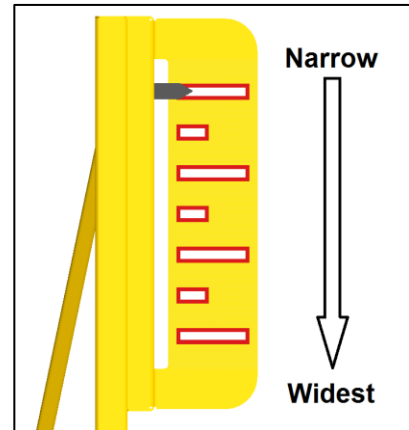


2.6 Rear Width Auto-Recovery (VR683 Exclusive)

The rear opening of the Bale King hay rake is adjustable using the windrow width adjustment cylinder. Widening the rear opening will space the wheels farther apart, creating a wider windrow. Pulling the rear opening closer together will create a tighter windrow. This allows the operator to adjust the width of the windrow to suit field conditions and to accommodate different sized baler pickups.

An indicator is provided to show you how wide the rear end is set. This will allow you to consistently set the machine to your desired windrow width. The needle moves down to indicate a wider windrow, while the top position indicates the narrowest windrow setting.

The windrow width can only be adjusted with the rake open.



The rear windrow width will close when folding into transport mode to achieve as narrow a width as possible. However, it will “remember” the last windrow width setting and return to it automatically the next time the rake is **fully opened**. The limit switch on the scissor cylinder allows the operator to partially close the front end of the rake without affecting the windrow width, making tight spaces easier to manoeuvre.

The auto-recovery feature also means that if the rear windrow width does not constantly need to be adjusted (depending of field conditions), the blue hydraulic lines do not need to be used at all, allowing operation using only 2 sets of hydraulic remotes.

In order to achieve the proper functionality, the 7-pin tractor plug must provide auxiliary power to the center pin, and the plug must be connected to the tractor. See the Electrical section for further details.



2.7 Optional Rubber Mounted Tine (RMT) Rake Wheel

The Bale King hay rake can be outfitted with optional rubber mounted tine rake wheels. These wheels provide better performance under tough raking conditions by getting under the thatch more aggressively and breaking up the loose material. This is especially useful on hay that has been rained on heavily with lots of regrowth.



These wheels are a direct replacement to the standard wheels, and can be replaced at any time (in any quantity).

Model		Kit #
VR683	RMT Rake Wheel - Left	*
VR683	RMT Rake Wheel - Right	*

* Consult factory



2.8 Optional 2- or 4-Wheel Extension Kit

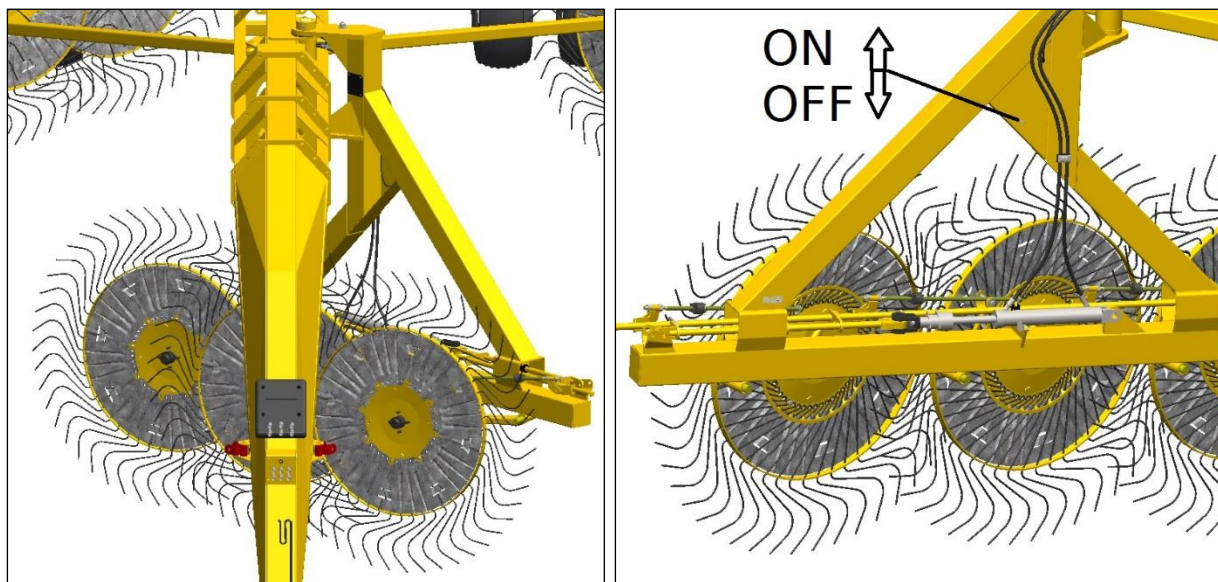
The Bale King hay rake can be outfitted with an extension kit to add 1 or 2 rake wheels to each side, allowing the rake to cover a wider area. This kit can be purchased from Bridgeview Manufacturing or a registered dealer. Each kit will allow for approximately 4 feet of additional coverage.

Model	Size	Kit #
VR683	18 to 20-wheel	29269/29271
VR683	20 to 22-wheel	29270/29271

2.9 Optional Kicker Wheel

The VR683 rake has an available full coverage center kicker wheel. This will allow every blade of grass to be turned, whether for mowed hay, or raking 3 windrows together. The kicker wheel will automatically fold/unfold when opening or closing the rake. It can also be deactivated by locking the rake wheels in the up position and cycling the switch to the off position.

In order to activate the kicker wheel, the 7-pin tractor plug must provide auxiliary power to the center pin, and the plug must be connected to the tractor. See the Electrical section for further details.



VR683	Kicker Wheel	29302
VR683	Hitch Extension Kit *	29271
VR683	Extended Transport Lock Kit *	29274

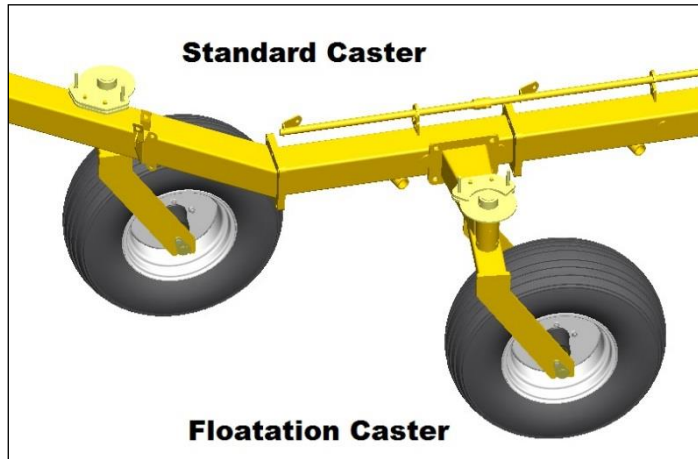
***NOTE:** A hitch extension and an extended transport lock kit are only required to install a kicker wheel on an 18-wheel rake.





2.10 Optional Floatation Caster Kit

The VR683 rake has an available caster wheel to bolt onto the front outside rake booms. This allows the rake to more smoothly float over ditches and irrigation pivot ruts. It is only available on the 20 or 22-wheel versions.



VR683	Floatation Caster Kit	29272
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2.11 Trouble-Shooting Guide

Problem	Possible Cause	Remedy
Rake plugging at rear end	Windrow width too narrow	Increase windrow width (indicator needle moves downward)
	Too much material	Close rake booms slightly to catch less material
Missing hay	Tine pressure too light	Increase spring pressure
Rake wheels not turning	Tine pressure too light	Increase spring pressure
	Wheel angle too steep	Close rake booms slightly
A single wheel not turning	Tine pressure too light	Adjust individual spring pressure
	Hub or arm not greased	Grease full machine
Rake tines breaking excessively	Tine pressure too heavy	Decrease spring pressure
	Too fast or rough ground	Slow down
	Tires low	Check tire pressure
Caster wheels wobbling during transportation	Caster brakes not tightened	Tighten caster brakes (loosen for operation)
	Driving too fast	Slow down
Rake not trailing straight with center axles locked	Wheels not aligned	Perform wheel alignment (see section 3.4)
Tires wearing unevenly	Wheels not aligned	Perform wheel alignment (see section 3.4)
	Tire pressures not equal	Check tire pressures
Lights not functioning properly	Loose plug connectors	Check plug connectors (one at each light, one under center of rear frame)
	Wrong tractor connector	Make sure tractor and trailer use the same connector
Kicker wheel not unfolding	Push button switch turned “off”	Push button switch to “on” (illuminates)
	No power to actuator valve	Connect 7-pin plug to tractor and make sure center pin has auxiliary power
	Limit switch not actuating	Adjust limit switch
Rear width changing when closing booms	No power to actuator valve	Connect 7-pin plug to tractor and make sure center pin has auxiliary power
	Limit switch not actuating	Adjust limit switch
Caster wheel pins not locking	No power to actuator valve	Connect 7-pin plug to tractor and make sure center pin has auxiliary power
	Limit switch not actuating	Adjust limit switch



2.12 Specifications

Operation	18 Wheel	18 Kicker	20 Wheel	20 Kicker	22 Wheel	22 Kicker
Raking Width	34 ft		38 ft		42 ft	
Windrow Width	4 ft – 6.5 ft					
Rake Wheel	62" Diameter, 48 Tines					
Transport						
Width	14'-2"					
Height	9'-11"					
Length	40'-8	43'-6"	43'-6"	43'-6"	46'-4"	46'-4"
Weight (Total)	9000 lb	9900 lb	9500 lb	10 200 lb	10 600 lb	11 300 lb
Weight (Tongue)	1100 lb	1750 lb	1250 lb	1750 lb	1400 lb	1900 lb
Tires						
Size	11L-15SL, 8 ply					
Pressure	25 psi					
Wheel Nut Torque	90 ft-lb					



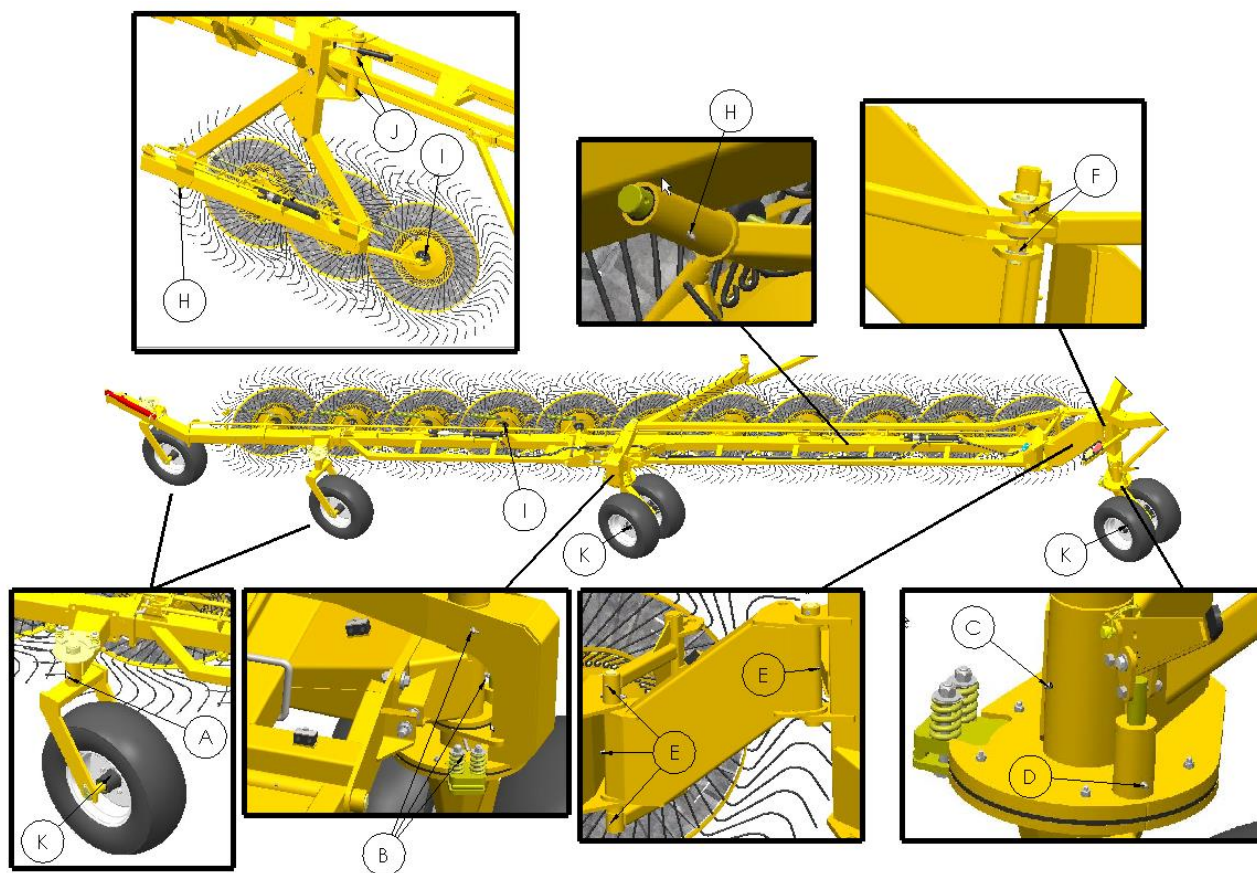
3 MAINTENANCE & LUBRICATION

General maintenance of your Bale King hay rake should be done on a regular basis. This includes checking all bolts to ensure they are tight, ensuring all joints are properly greased, and that all moving parts are functioning correctly.

Before the raking season, a full inspection of the rake should be done, ensuring that the wheel hubs are tight and fully greased, any broken tines replaced, and no hydraulic leaks are present.

3.1 Greasing

The VR683 hay rake is fitted with a number of grease zerks. It is important that these locations are sufficiently lubricated.





3.1 Greasing

	Location	QTY	QTY Kicker	QTY Caster Option	Timeline
A	Front Caster Pivot	2		2	10 hr
B	Mid Caster Pivot	6			
C	Rear Caster Pivot	2			
D	Caster Lock Pin	4			
E	Rear Pivot	8			
F	Parallel Linkage Pivot	4			
G	Boom Arm Pivot	4			
H	Rake Wheel Pivot	18/20/22	3		
I	Rake Wheel Hub	18/20/22	3		200 hours or seasonal
J	Kicker Wheel Pivot		2		
K	Wheel Hub	10		2	

3.2 Wheels and Tires

Maintaining proper tire pressure will help to alleviate puncture problems on rough terrain. Check tires for wear and tear on a regular basis.

Tire Size	11L-15SL, 8-ply
Tire Pressure	25 psi
Wheel Bolt Torque	90 ft-lb

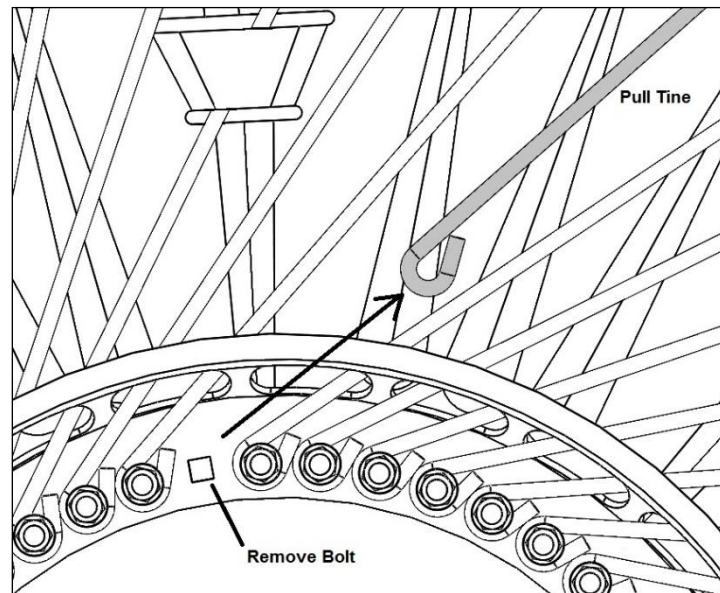
Warranty does not cover damaged rims and hubs due to loose wheel bolts. Tire warranty is covered by the tire manufacturer. See your local tire dealer for service and replacement.



3.3 Tine Replacement

Occasionally during operation, a rake wheel tine will break. The following procedure can be used to replace a tine without removing the rake wheel from the machine.

- Remove the corresponding bolt for the broken tine.
- Pull the tine out of the center disk.
- Pull the tine out of the wind guard tab (if necessary).
- Slide the tine out of the hole in the outer ring by pushing it inwards and rotating.
- Insert the replacement tine in the opposite way from removal.
- Reinsert bolt and tighten.

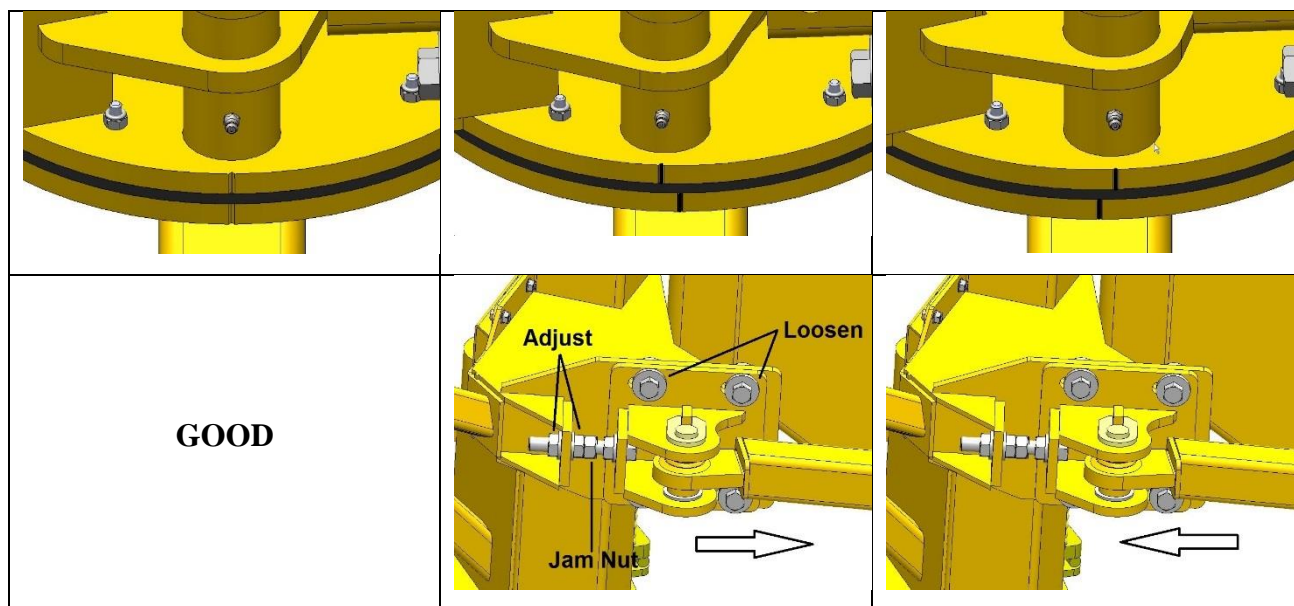




3.4 Steering Alignment

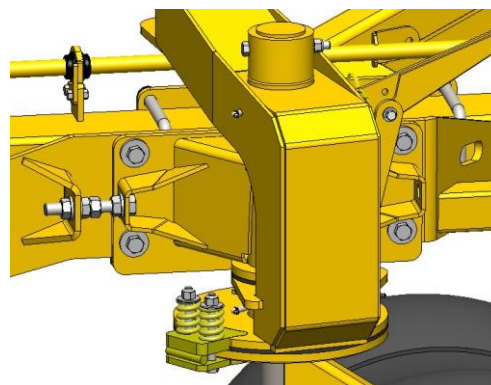
If excessive “dog-tracking” or tire wear is occurring, a wheel alignment can be performed to correct this issue. There are 2 locations where adjustments can be made: the mid caster mounting bracket, and the rear linkage mounting bracket.

1. Loosen mid axle brakes to allow them to spin freely. Lock rear axles and unlock mid axles.
2. Fully open rake on flat, smooth, level ground. Drive straight forward until the mid axles are in a natural trailing position. Make sure rake wheels are lifted.
3. Check notch positions along the mid axle disks. If they line up, wheel alignment is OK. If they do not line up, adjust the rear linkage adjuster until they do.



NOTE: Left side shown. Required adjustments will be opposite for right hand side.

4. Close rake and recheck notch alignment. Again drive straight ahead until wheels are in a natural trailing position.
5. If notches are still aligned, tighten bolts. If notches are misaligned, the side adjustment will need to be used.
6. Mark the current notch location on the bottom disk. Then adjust the center adjuster until the notch is halfway between the original mark and the cut notch. Fix the remainder using the rear adjustment.
7. Reopen and check. Repeat as necessary until notch aligns in all situations. However, it is most important for notch to align in field position, as the mid axle should be unlocked for transport.





4 PARTS BOOK

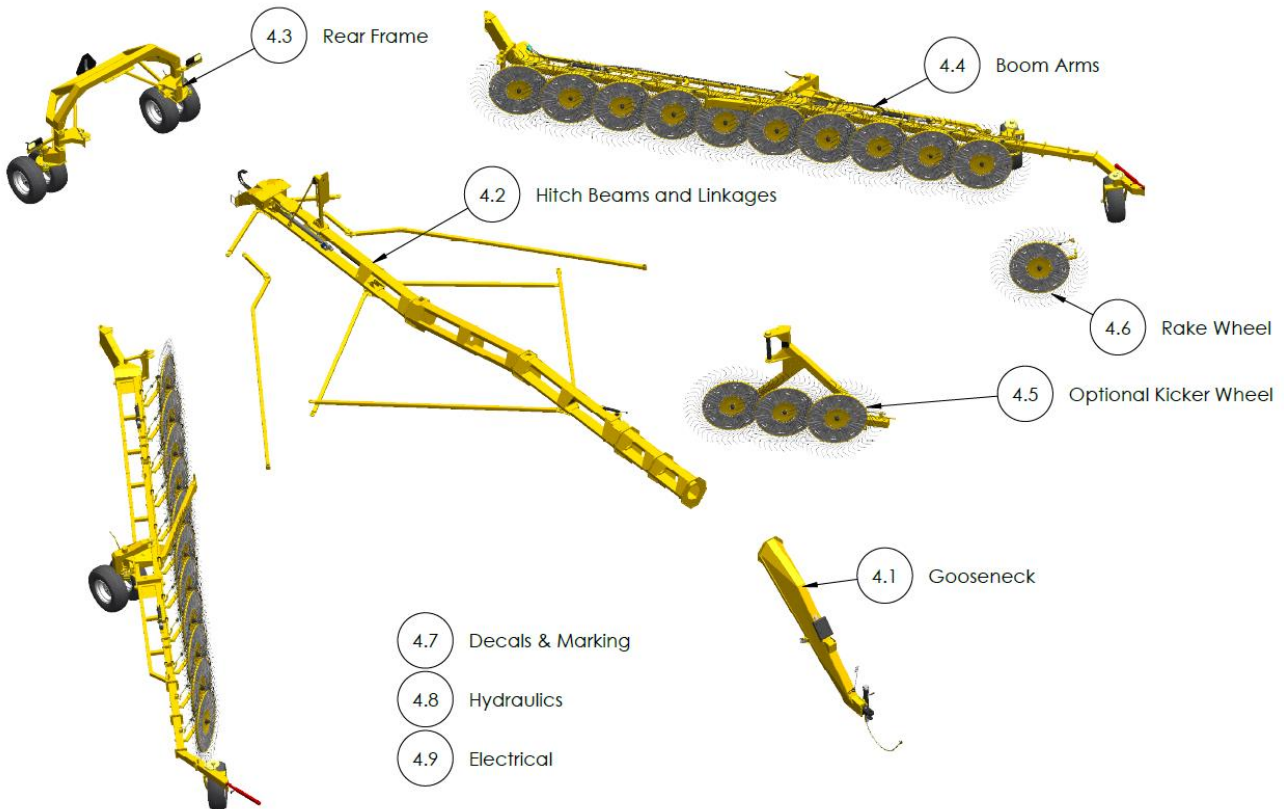
4.1	Gooseneck Assembly.....	23
4.2	Hitch Beams and Linkages	25
4.2.1	Sliders.....	29
4.2.2	Linkages	31
4.3	Rear Frame Assembly.....	33
4.3.1	Rear Axle.....	35
4.3.2	Slow Moving Vehicle (SMV) Sign Kit.....	36
4.4	Boom Arm Assembly	37
4.4.1	Lift Rod Details	41
4.4.2	Steering Horn.....	42
4.4.3	Caster Wheel and Hub	42
4.4.4	Transport Lock	44
4.5	Kicker Wheel.....	45
4.6	Rake Wheel and Arm.....	47
4.6.1	Rake Wheel Assembly	48
4.6.2	Spring Assembly.....	50
4.7	Decals.....	52
4.8	Hydraulic Components	53
4.9	Electrical Components.....	57



The following diagrams show the part numbers for ordering any replacement parts on a VR683. Some components may not look exactly as shown.

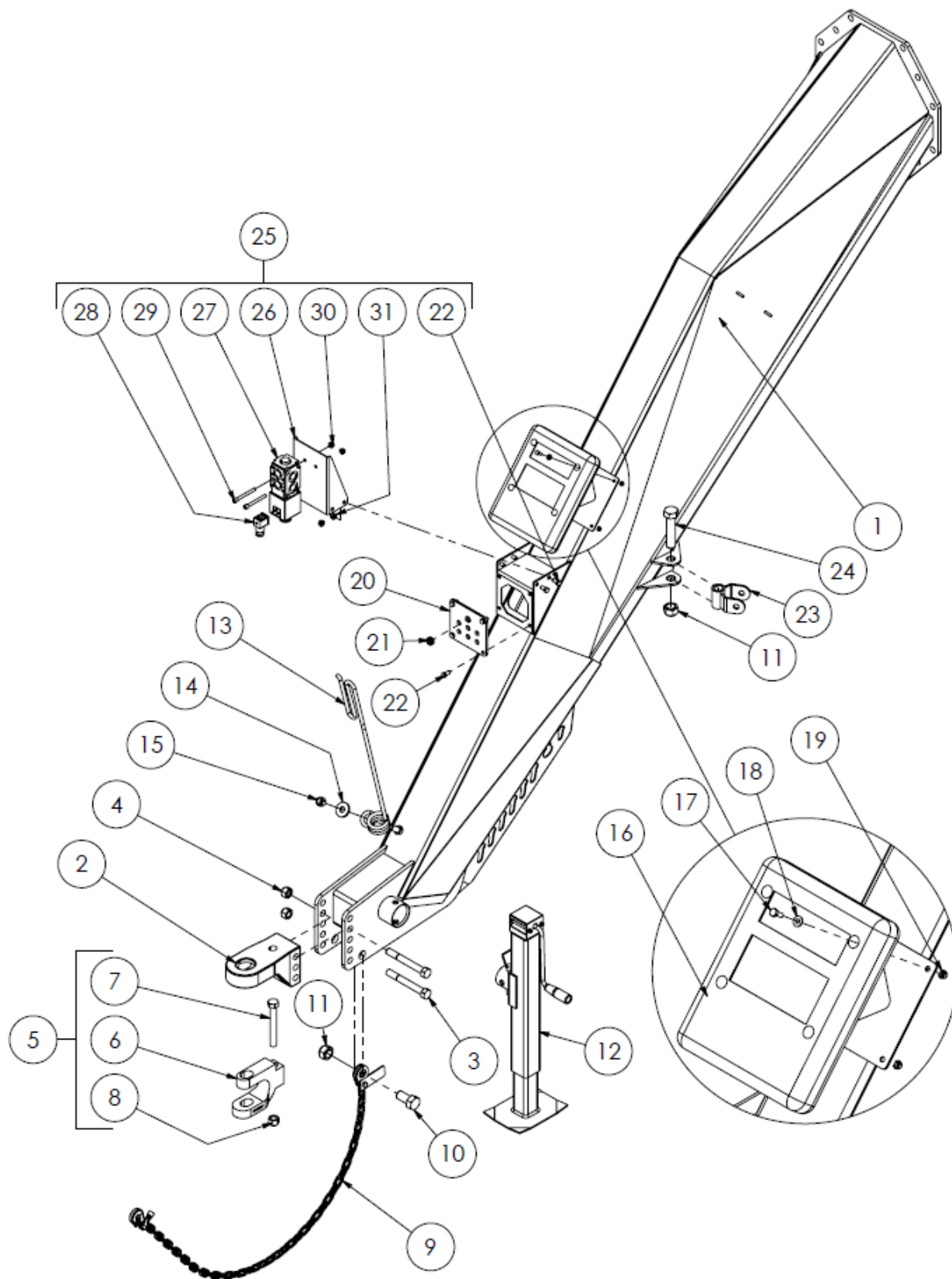
Quantities are listed for as shown, and some components are optional. The total quantities will vary depending on model and size. The diagrams should be referenced to find the part number, and order quantities should be based on what is required, not necessarily by the quantity on the table.

Left and right as used in the parts book is as viewed from the rear of the rake looking in the direction of travel.





4.1 Gooseneck Assembly



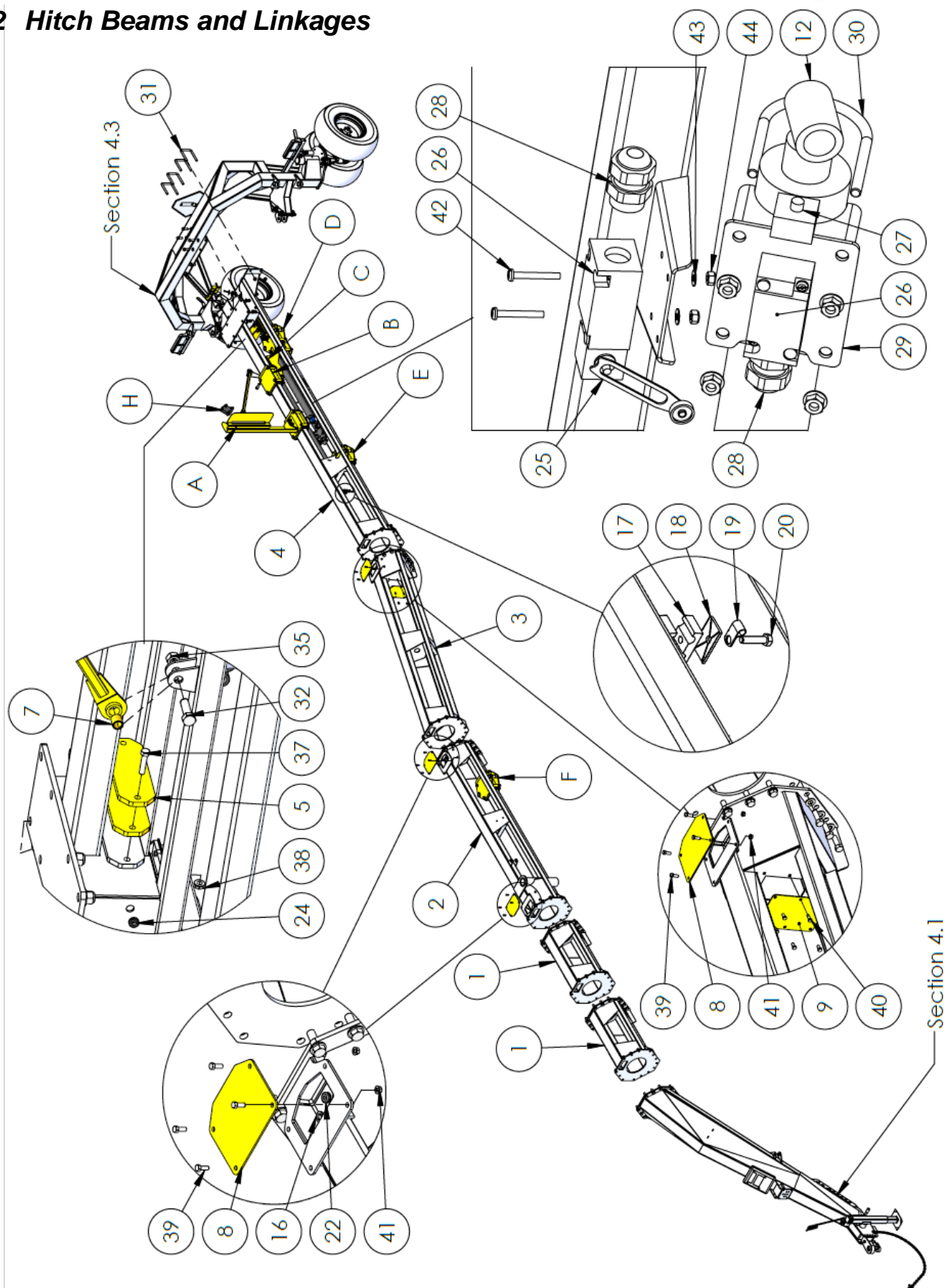


4.1 Gooseneck Assembly

	Description	ID #	QTY		Description	ID #	QTY
1	Gooseneck 683	29492	1	17	Bolt, 1/4" x 3/4"	11809	4
2	Clevis Hitch	22440	1	18	Washer, 1/4" Flat	11666	4
3	Bolt, 3/4" x 6"	23170	2	19	Nut, 1/4" Nylon Lock	11664	4
4	Nut, 3/4" Stover Lock	30008	2	20	Front Bulkhead 683	29495	1
5	Clevis Hitch Option	25540	1	21	Rubber Grommet 7/16 ID	21428	1
6	Hitch Clevis	22441	1	22	3/8" x 3/4" Bolt	11816	8
7	Bolt, 3/4" x 5-1/2"	26406	1	23	Transport Lock Knuckle 683	29303	2
8	Nut, 3/4" Stover Lock	11823	1	24	Bolt, 1" x 4-1/2" Bolt	15581	2
9	Safety Chain 11,000 lb	21715	1	25	Diverter Kit	29298	1
10	Bolt, 1" x 2"	18992	1	26	Diverter Valve Stand 683	29300	1
11	Nut, 1" Stover Lock	21746	3	27	Electric Diverter Valve	11743	1
12	Jack, 7000lb Sidewind	23677	1	28	Diverter Valve Plug	13657	1
13	Spring Hose Holder	18080	1	29	Bolt, 5/16 x 3" Socket Head	11783	2
14	Washer, 5/8" Heavy Flat	21390	1	30	Nut, 5/16" Serrated Flange	11814	2
15	Nut, 5/8" Nylon Lock	10364	1	31	Nut, 3/8" Serrated Flange	10271	4
16	Operator Manual Box	22409	1				



4.2 Hitch Beams and Linkages





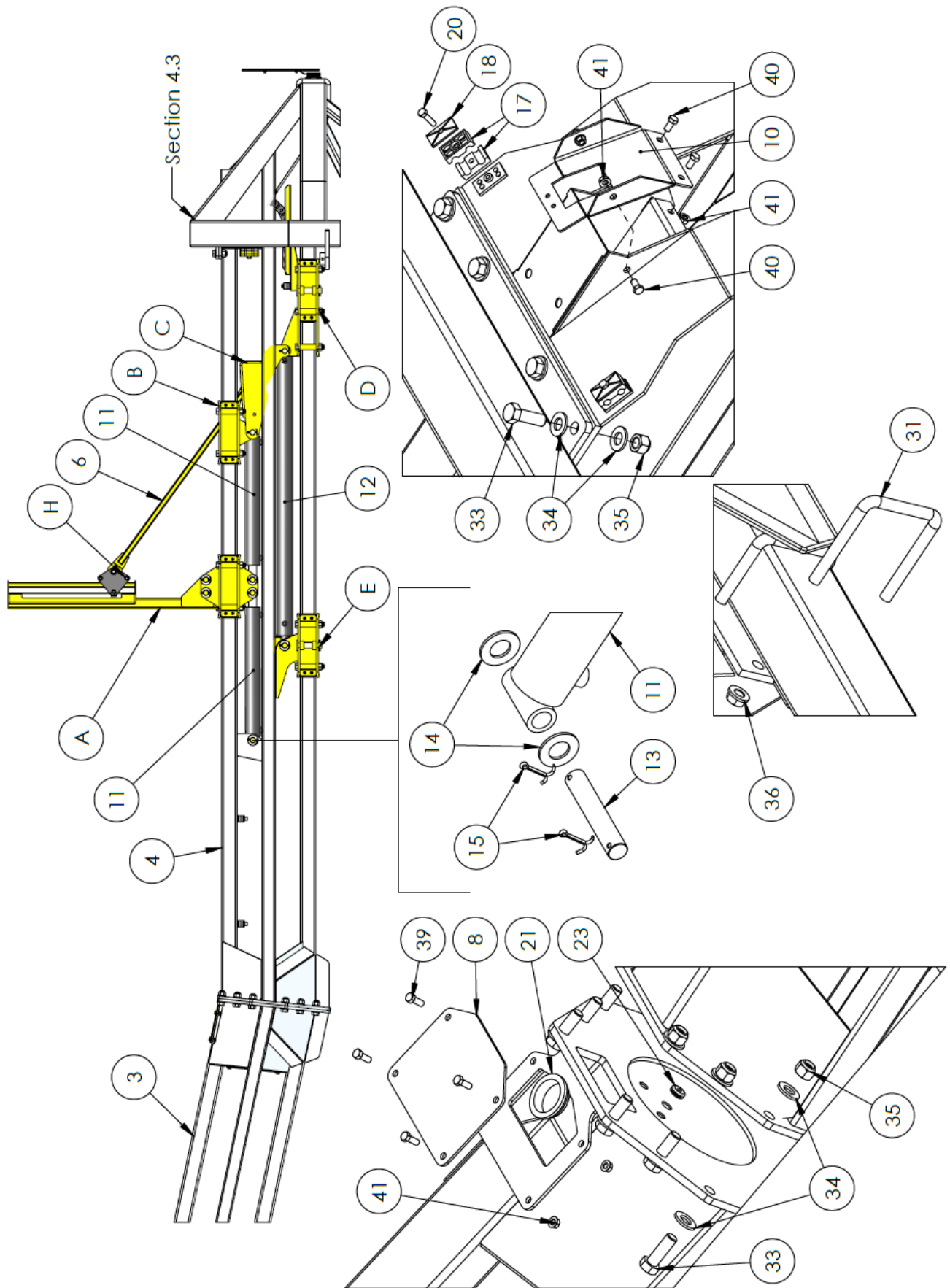
4.2 Hitch Beams and Linkages

	Description	ID #	QTY		Description	ID #	QTY
1	Hitch Extension &	29291	2	27	Limit Switch Push Button Head	28949	1
2	Hitch Beam Front	29493	1	28	1/2" Strain Relief Electrical Connector	27328	2
3	Hitch Beam Center	29490	1	29	Limit Switch Cylinder Mount	29056	1
4	Hitch Beam Rear	29491	1	30	U-Bolt, 3/8 x 2-7/8" ID @	29050	2
5	Slider Stopper Plate	29059	2	31	U-Bolt, 3/4 x 5 x 6"	16091	4
6	Width Indicator Linkage	29140	1	32	Bolt, 3/4" x 2-1/2"	14470	1
7	Width Indicator Linkage Bushing	29063	1	33	Bolt, 3/4" x 2" Gr. 8	21243	78
8	Bulkhead Cover Plate	29497	3	34	Washer, 3/4" Flat Gr. 8	20687	154
9	Center Bulkhead Door	30981	1	35	Nut, 3/4" Stover Lock	30008	77
10	Rear Cover Plate	31038	1	36	Nut, 3/4" Serrated Flange	16076	8
11	Hydraulic Cylinder, 2.5 x 20 x 1.5	17328	2	37	Bolt, 1/2" x 2-1/4"	11820	2
12	Hydraulic Cylinder, 2.5 x 48 x 1.5	17331	1	38	Nut, 1/2" Serrated Flange	10273	2
13	Pin, 1 x 4-15/16" Usable	26430	1	39	Bolt, 3/8" x 1"	13806	12
14	Washer, 1" Flat	14472	2	40	Bolt, 3/8" x 3/4"	11816	12
15	Cotter Pin, 3/16" x 1-1/2"	10072	2	41	Nut, 3/8" Serrated Flange	10271	16
16	Washer, 9/16" Lock	23369	4	42	Screw, #10-24 x 1-1/2" Pan Head	22447	4
17	Hose Clamp, 1/4"	28585	10	43	Washer, #10 Flat	25600	4
18	Hose Clamp Top, 1/4"	22182	5	44	Nut, #10" Nylon Lock	31110	4
19	Wiring Clamp	13629	2	A	Width Indicator Slider Assembly	-	1
20	Bolt, 5/16 x 1-3/8"	22183	5	B	Rear Top Slider Assembly	-	1
21	Rubber Hose Grommet 2-1/4 ID x 1/4"	16397	1	C	Slider Tie Bar Assembly	-	1
22	Rubber Grommet 5/16 ID x 1 OD x 1/4	13179	1	D	Rear Bottom Slider Assembly	-	1
23	Rubber Grommet 5/16 ID x 1 OD x 1/8	21439	1	E	Mid Slider Assembly	-	1
24	Rubber Grommet 7/16 ID x 1 OD x 1/4	21428	4	F	Front Slider Assembly	-	1
25	Limit Switch with Swing Arm *	14943	1	G	Slider Side Plate		10
26	Limit Switch Body	29024	1	H	Width Indicator Roller	-	1

* **NOTE:** Includes body (26)

@ **NOTE:** Comes with nuts and spacer plate

& **NOTE:** Not required for all models





4.2 Hitch Beams and Linkages

	Description	ID #	QTY		Description	ID #	QTY
1	Hitch Extension &	29291	2	27	Limit Switch Push Button Head	28949	1
2	Hitch Beam Front	29493	1	28	1/2" Strain Relief Electrical Connector	27328	2
3	Hitch Beam Center	29490	1	29	Limit Switch Cylinder Mount	29056	1
4	Hitch Beam Rear	29491	1	30	U-Bolt, 3/8 x 2-7/8" ID @	29050	2
5	Slider Stopper Plate	29059	2	31	U-Bolt, 3/4 x 5 x 6"	16091	4
6	Width Indicator Linkage	29140	1	32	Bolt, 3/4" x 2-1/2"	14470	1
7	Width Indicator Linkage Bushing	29063	1	33	Bolt, 3/4" x 2-1/4" Gr. 8	29824	78
8	Bulkhead Cover Plate	29497	3	34	Washer, 3/4" Flat Gr. 8	20687	154
9	Center Bulkhead Door	30981	1	35	Nut, 3/4" Stover Lock	30008	78
10	Rear Cover Plate	31038	1	36	Nut, 3/4" Serrated Flange	16076	8
11	Hydraulic Cylinder, 2.5 x 20 x 1.5	17328	2	37	Bolt, 1/2" x 2-1/4"	11820	2
12	Hydraulic Cylinder, 2.5 x 48 x 1.5	17331	1	38	Nut, 1/2" Serrated Flange	10273	2
13	Pin, 1 x 4-15/16" Usable	26430	1	39	Bolt, 3/8" x 1"	13806	12
14	Washer, 1" Flat	14472	2	40	Bolt, 3/8" x 3/4"	11816	12
15	Cotter Pin, 3/16" x 1-1/2"	10072	2	41	Nut, 3/8" Serrated Flange	10271	16
16	Washer, 9/16" Lock	23369	4	42	Screw, #10-24 x 1-1/2" Pan Head	22447	4
17	Hose Clamp, 1/4"	28585	10	43	Washer, #10 Flat	25600	4
18	Hose Clamp Top, 1/4"	22182	5	44	Nut, #10" Nylon Lock	31110	4
19	Wiring Clamp	13629	2	A	Width Indicator Slider Assembly	-	1
20	Bolt, 5/16 x 1-3/8"	22183	5	B	Rear Top Slider Assembly	-	1
21	Rubber Hose Grommet 2-1/4 ID x 1/4"	16397	1	C	Slider Tie Bar Assembly	-	1
22	Rubber Grommet 5/16 ID x 1 OD x 1/4	13179	1	D	Rear Bottom Slider Assembly	-	1
23	Rubber Grommet 5/16 ID x 1 OD x 1/8	21439	1	E	Mid Slider Assembly	-	1
24	Rubber Grommet 7/16 ID x 1 OD x 1/4	21428	4	F	Front Slider Assembly	-	1
25	Limit Switch with Swing Arm *	14943	1	G	Slider Side Plate	-	10
26	Limit Switch Body	29024	1	H	Width Indicator Roller	-	1

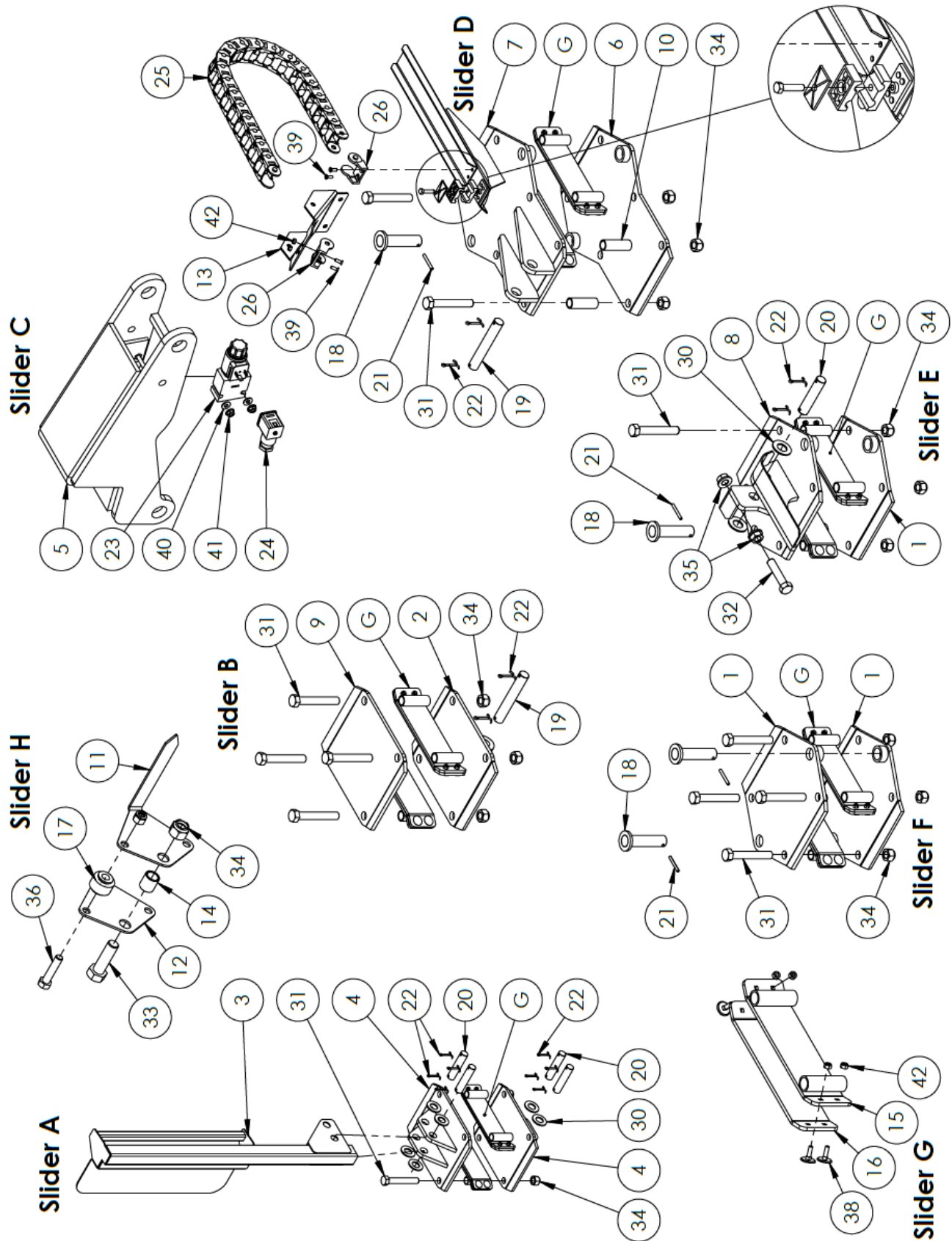
* **NOTE:** Includes body (26)

@ **NOTE:** Comes with nuts and spacer plate

& **NOTE:** Not required for all models



4.2.1 Sliders



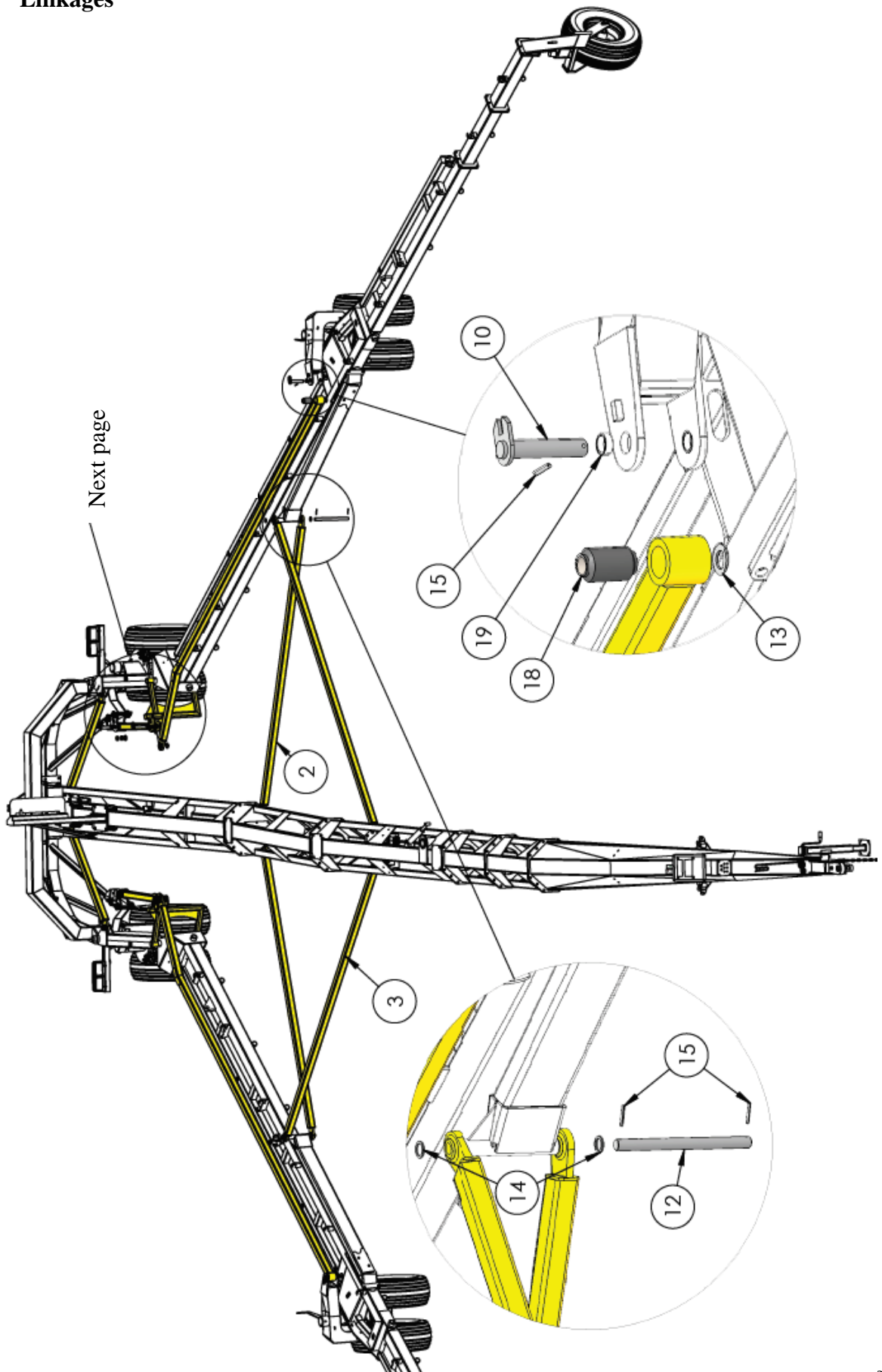


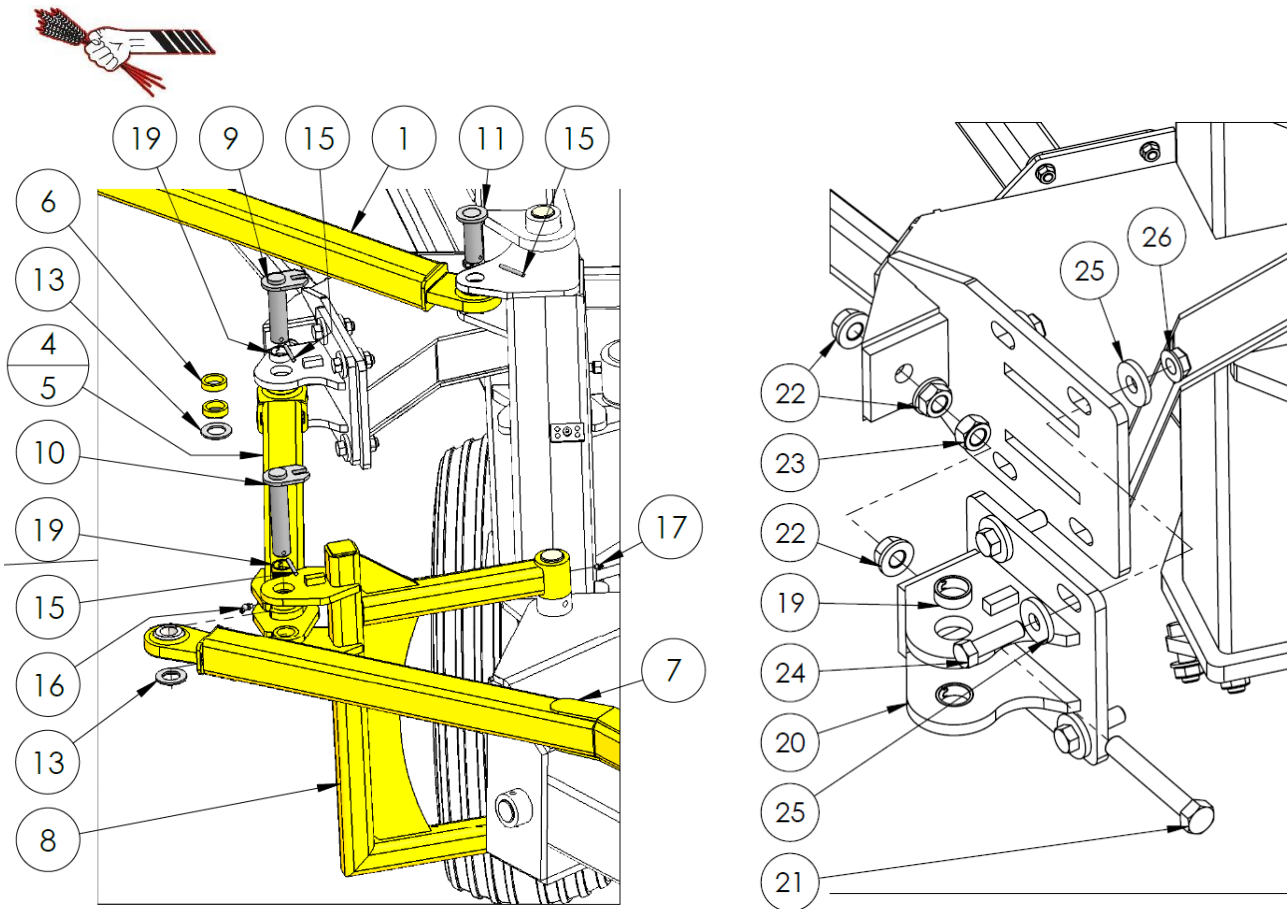
4.2.1 Sliders

	Description	ID #	QTY		Description	ID #	QTY
1	Slide Plate, Plain	22242	3	22	Cotter Pin, 3/16" x 1-1/2"	10072	14
2	Slide Plate, Bottom Square	23122	1	23	Electric Check Valve (1->2) N.O.	28943	1
3	Width Indicator Tower	29066	1	24	Diverter Valve Plug	13657	1
4	Slide Plate, Width Cylinder	29070	2	25	Hose Carrier	28836	20
5	Slider Tie Bar 683	29072	1	26	Hose Carrier End	28837	2
6	Slide Plate, 683 Rear Bottom	29111	1	27	Hose Clamp, 1/4"	28585	2
7	Slide Plate, 683 Rear Top	29113	1	28	Hose Clamp Top, 1/4"	22182	1
8	Slide Plate, Limit Switch Brackets	29133	1	29	Bolt, 5/16 x 1-3/8"	22183	1
9	Slide Plate, Top Square	23130	1	30	Washer, 1" Flat	14472	10
10	Slide Plate Spacer	25764	2	31	Bolt, 3/4" x 5"	17826	22
11	Width Indicator Roller Plate A	32025	1	32	Bolt, 3/4" x 3-1/2"	26901	1
12	Width Indicator Roller Plate B	32027	1	33	Bolt, 3/4" x 2-1/2"	14470	1
13	Rear Cover Plate 683	31038	1	34	Nut, 3/4" Stover Lock	30008	22
14	Width Indicator Linkage Bushing	29063	1	35	Nut, 3/4" Serrated Flange	16076	2
15	Slider Side Plate	22246	10	36	Bolt, 1/2" x 2-1/4"	11820	3
16	Plastic Slide	18011	10	37	Nut, 1/2" Nylon Lock	10241	3
17	2 Piece Nylon Roller	11637	3	38	Elevator Bolt, 1/4 x 1"	17970	40
18	Pin, 1-1/8 x 4" Usable	22244	6	39	Screw, #14 x 3/4"	29052	4
19	Pin, 1" x 5-5/8" Usable	27534	2	40	Washer, 1/4" Flat	11666	2
20	Pin, 1" x 3-3/4" Usable	20788	5	41	Nut, 1/4" Serrated Flange	11812	2
21	Roll Pin, 1/4" x 2"	15872	6	42	Nut, 1/4" Nylon Lock	11664	42



4.2.2 Linkages



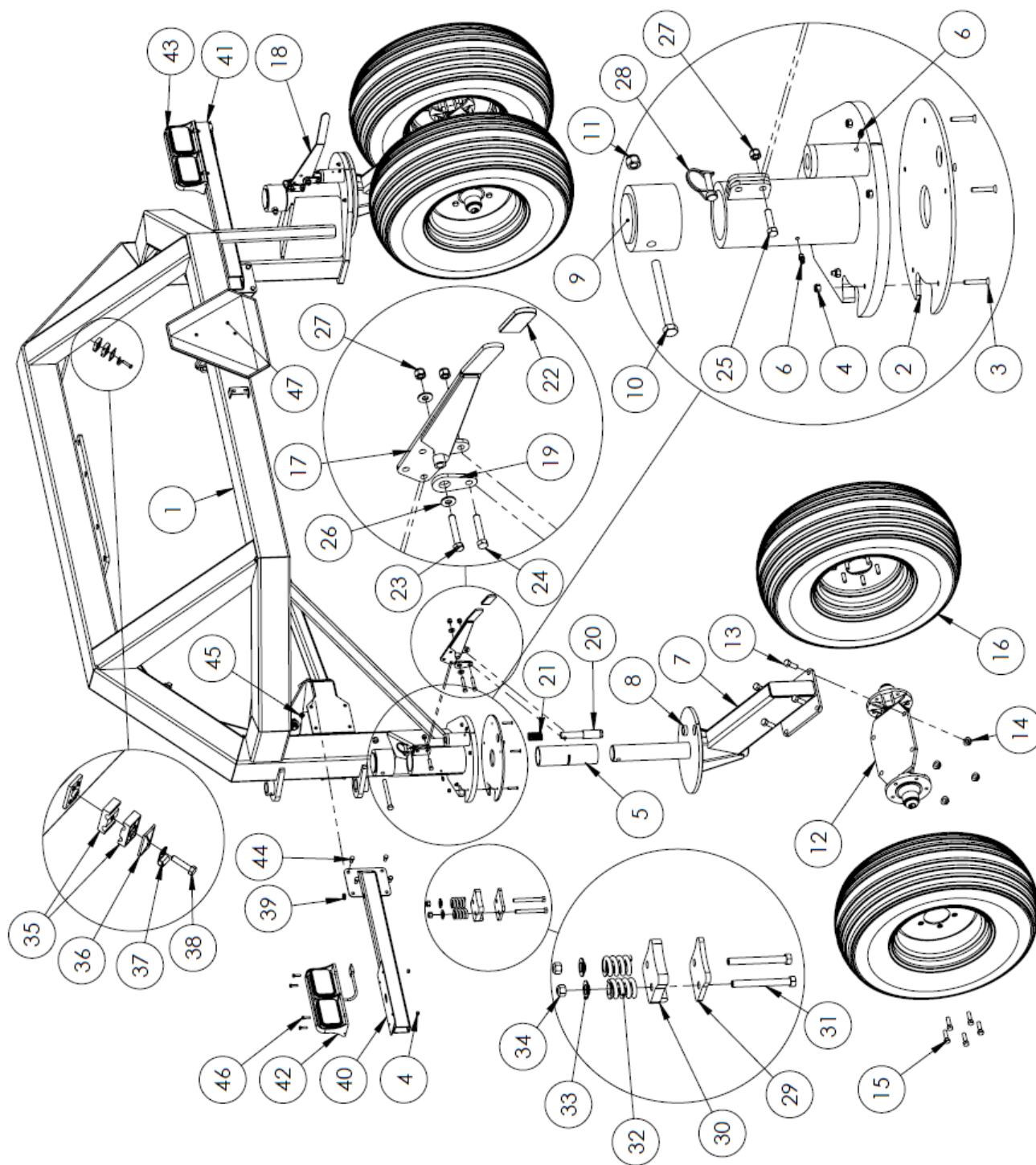


4.2.2 Linkages

	Description	ID #	QTY		Description	ID #	QTY
1	Width Adjustment Linkage	29563	2	14	Riser Arm Pin Washer	26450	4
2	Rear Scissor Linkage	29564	2	15	Roll Pin, 1/4" x 2"	15872	12
3	Front Scissor Linkage	29803	2	16	Grease Zerk, 45 degrees	20888	4
4	Parallel Linkage Rear Left	29129	1	17	Grease Zerk	16364	4
5	Parallel Linkage Rear Right	29131	1	18	Rubber Equalizer Bushing	28838	2
6	Rear Parallel Linkage Bar Spacer	31039	4	19	Spring Bushing, 1-1/8 x 1/2"	28945	12
7	Parallel Linkage Long	29565	2	20	Parallel Linkage Rear Adjustment	29127	1
8	Parallel Linkage Box Pivot	29566	2	21	Bolt, 3/4 x 5"	28953	1
9	Headed Pin, 1-1/8 x 3-5/8" Usable	27546	2	22	Nut, 3/4" Smooth Flange	28954	3
10	Headed Pin, 1-1/8 x 5" Usable	27549	4	23	Nut, 3/4"	10283	1
11	Pin, 1-1/8 x 2-3/4" Usable	25652	2	24	Bolt, 5/8 x 2-1/4"	20910	4
12	Scissor Pin 683	27530	2	25	Washer, 5/8" Heavy Flat	21390	8
13	Washer, 1-1/8" Flat	16736	6	26	Nut, 5/8" Serrated Flange	11614	4



4.3 Rear Frame Assembly





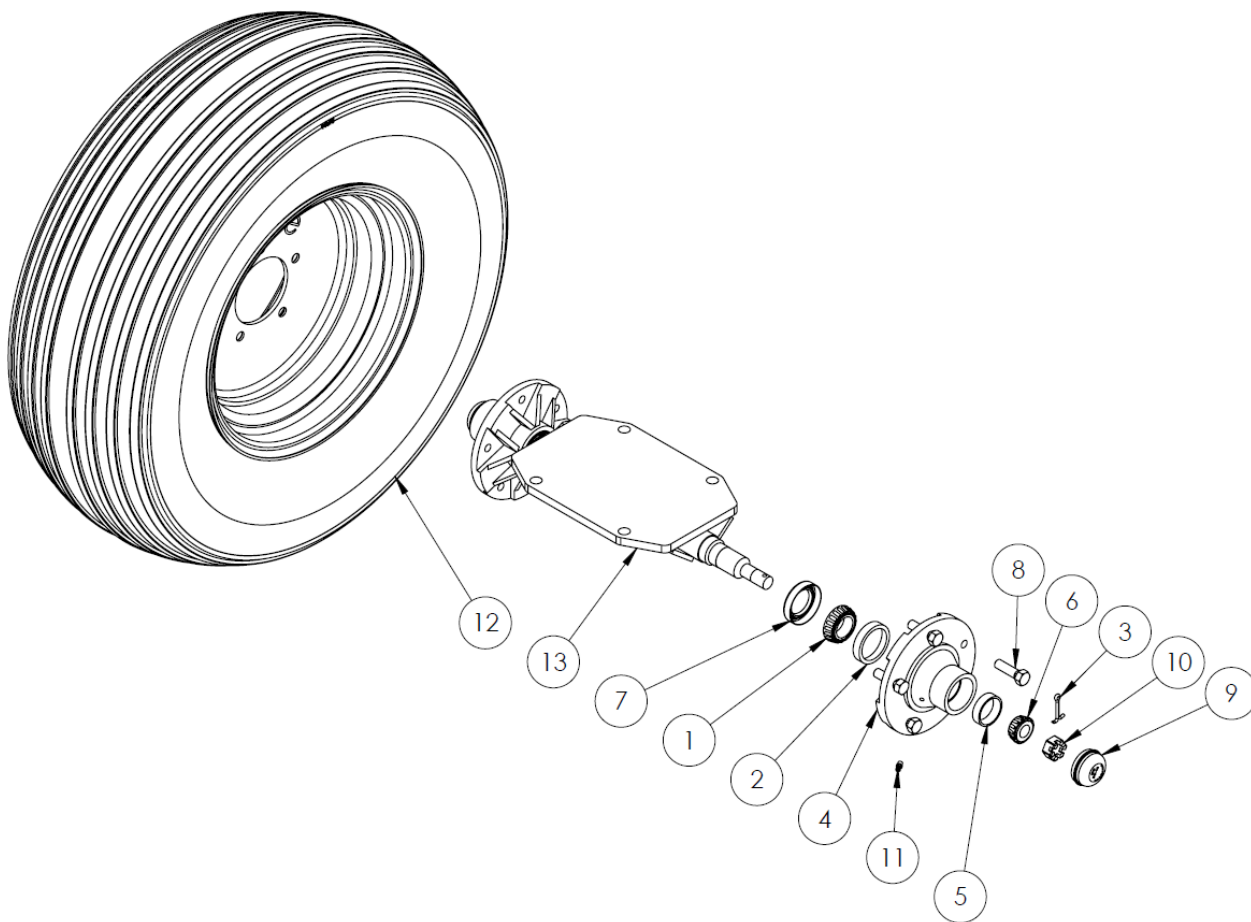
4.3 Rear Frame Assembly

	Description	ID #	QTY		Description	ID #	QTY
1	Rear Frame 683	29123	1	25	Bolt, 3/8" x 1-1/2"	11660	2
2	Caster Wheel Wear Plate	29251	2	26	Washer, 3/8" Flat	11667	4
3	Screw, #14 x 1-1/2"	29688	10	27	Nut, 3/8" Nylon Lock	10806	6
4	Nut, 1/4" Nylon Lock	11664	16	28	Lock Pin, 3/8" x 1-3/8"	13951	2
5	Caster Bushing Long	28948	2	29	Double Caster Brake Pad – Bottom #	28847	2
6	Grease Zerk	16364	4	30	Double Caster Brake Pad Top	28855	2
7	Caster Axle 683 Rear	29560	2	31	Bolt, 1/2" x 4-1/2" #	15574	4
8	1-1/4" Wear Bushing	27499	2	32	Rake Brake Spring	16093	4
9	Caster Axle Lock Bushing	29101	2	33	Brake Spring Washer	16322	4
10	Bolt, 1/2" x 5"	15400	2	34	Nut, 1/2" Stover Lock	14393	4
11	Nut, 1/2" Nylon Lock	10241	2	35	Hose Clamp, 1/4"	28585	4
12	683 Tandem Axle	4.3.1	2	36	Hose Clamp Top, 1/4"	22182	2
13	Bolt, 5/8" x 1-3/4"	12379	8	37	Wiring Clamp	13629	2
14	Nut, 5/8" Serrated Flange	11614	12	38	Bolt, 5/16 x 1-3/8"	22183	2
15	Wheel Stud Bolt	16307	20	39	Grommet	23327	2
16	11L-15 Tire and Rim	28795	4	40	Light Arm - 683 Left	29135	1
17	Caster Lock Handle Left	29119	1	41	Light Arm - 683 Right	29138	1
18	Caster Lock Handle Right	29121	1	42	Dual Light Assembly Left	31087	1
19	Caster Lock Linkage Rear	29060	4	43	Dual Light Assembly Right	31088	1
20	Caster Lock Pin	28841	2	44	Bolt, 3/8" x 3/4"	11816	8
21	Caster Lock Spring	28842	2	45	Nut, 3/8" Serrated Flange	10271	8
22	Rubber Handle	10297	2	46	Bolt, 1/4" x 1"	11810	8
23	Bolt, 3/8 x 2-1/4"	11661	2	47	SMV Sign	4.3.2	1
24	Bolt, 3/8" x 2"	10279	2				

NOTE: Replacement bottom plates come with bolts welded to them



4.3.1 Rear Axle



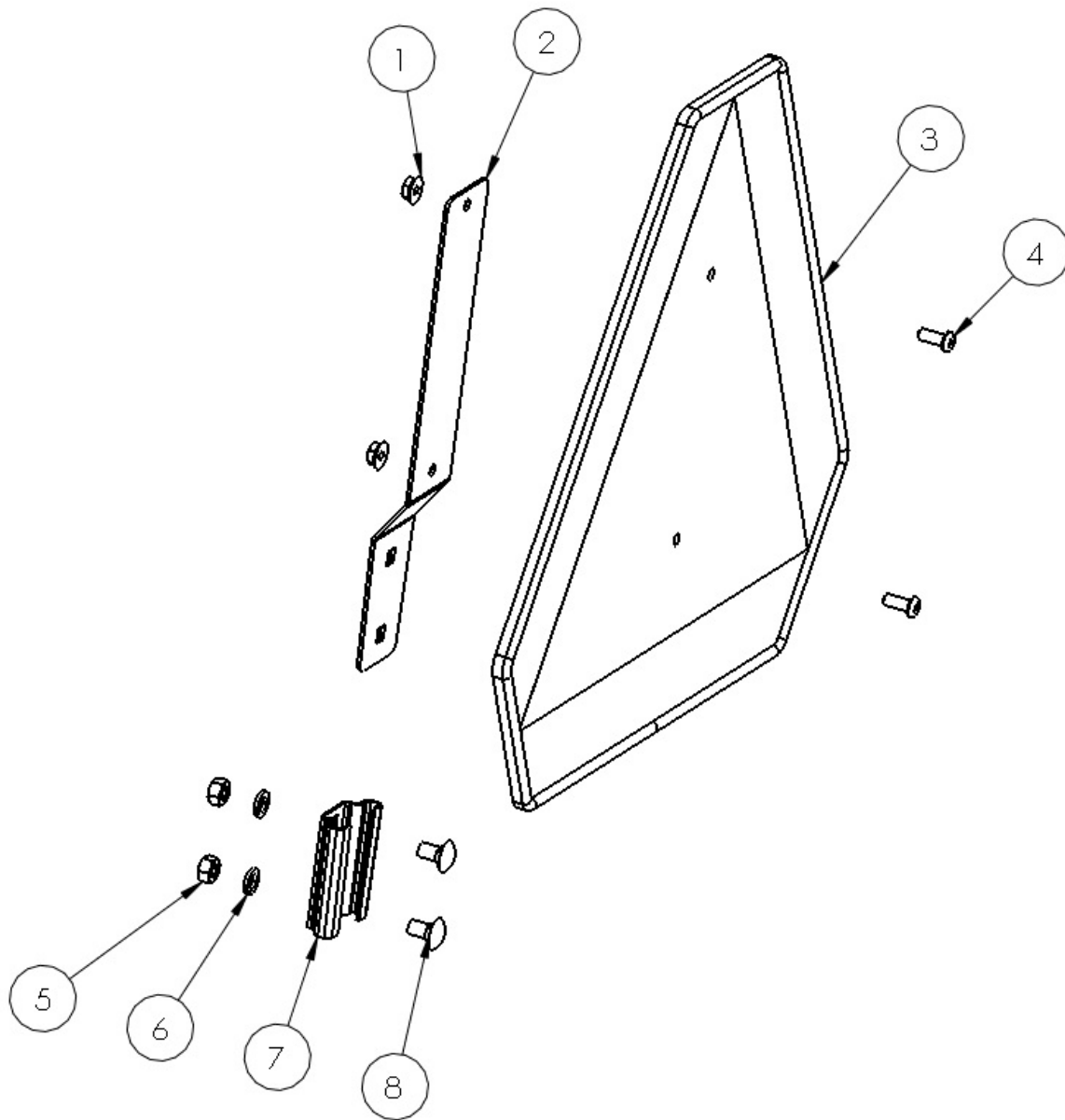
	Description	ID #	QTY		Description	ID #	QTY
1	Inner Bearing, ID 1-1/4" LM67048	10082	2	8	Wheel Stud Bolt, 1/2" x 1-3/4"	16307	5
2	Bearing, Inner Cup LM67010	10083	2	9	Dust Cap	16308	2
3	Cotter Pin, 3/16 x 1-1/4"	11669	2	10	Castle Nut, 3/4"-16	16358	2
4	Rear Wheel Hub *	16724	2	11	Grease Zerk	16364	2
5	Bearing, Outer Cup LM11910	16304	2	12	Rim, 15 x 8", 5 on 5.5"	28944	2
6	Outer Bearing, ID 3/4" LM11949	16305	2		Tire, 11L-15 8 ply	#	
7	Oil Seal SE11	16306	2	13	683 Tandem Axle	28939	1

* NOTE: Hub (4) comes with grease zerk (11) and bearing cups (2,5) installed

NOTE: See local tire dealership for replacement or repairs



4.3.2 Slow Moving Vehicle (SMV) Sign Kit

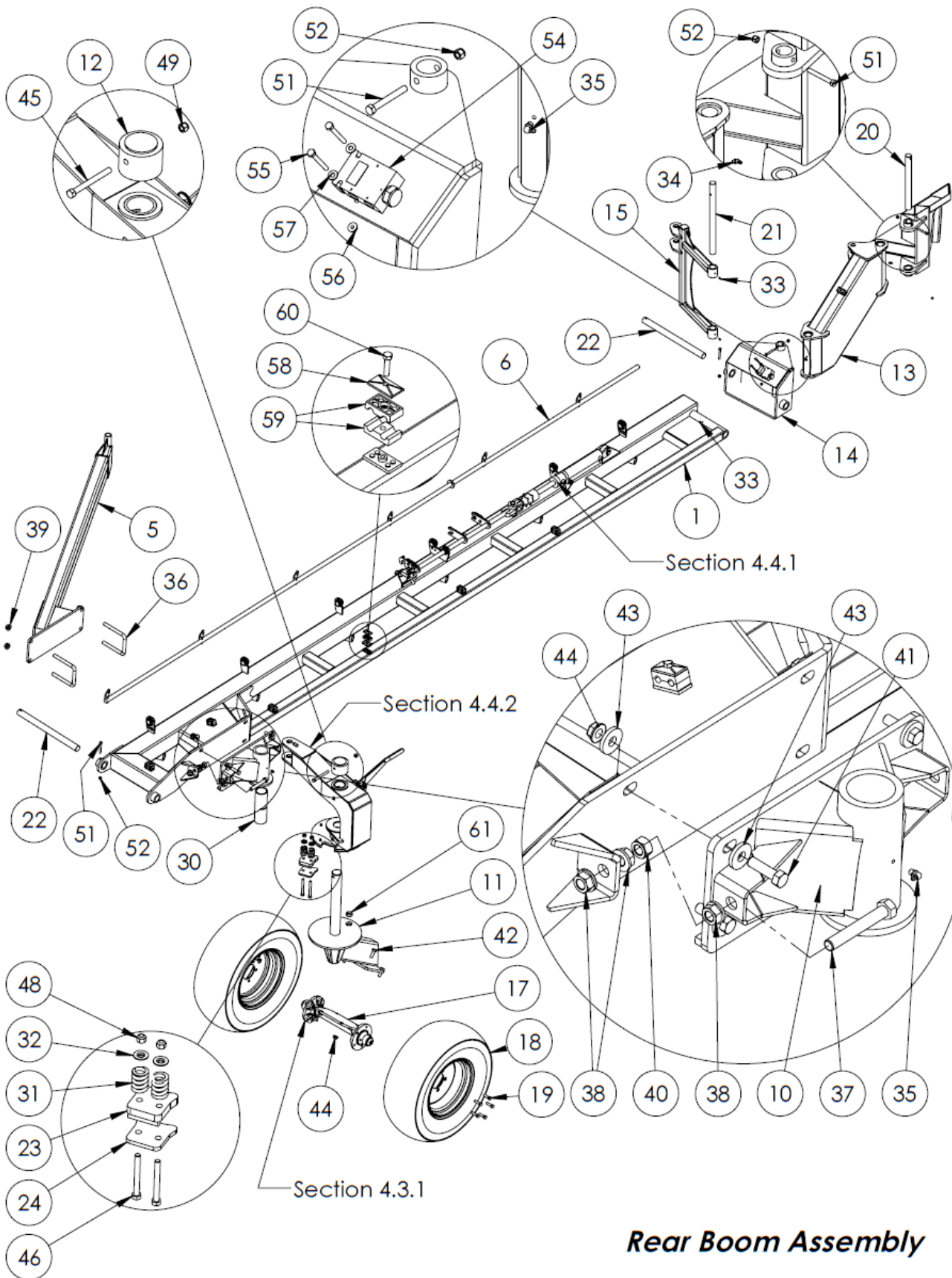


	Description	ID #	QTY		Description	ID #	QTY
	<i>Complete Kit</i>	22411	1	5	Nut, 5/16"	*	2
1	Nut, 1/4" Nylon Lock	11664	2	6	Lock Washer, 5/16"	*	2
2	Sign Mounting Bracket	*	1	7	Tapered Mounting Bracket	*	1
3	Plastic Sign	*	1	8	Carriage Bolt, 5/16 x 5/8"	*	2
4	Screw, 1/4 x 5/8"	*	2				

*** NOTE: Individual parts not sold separately. Not all parts in kit are used.**



4.4 Boom Arm Assembly



Rear Boom Assembly



4.4 Boom Arm Assembly – Left Hand Shown

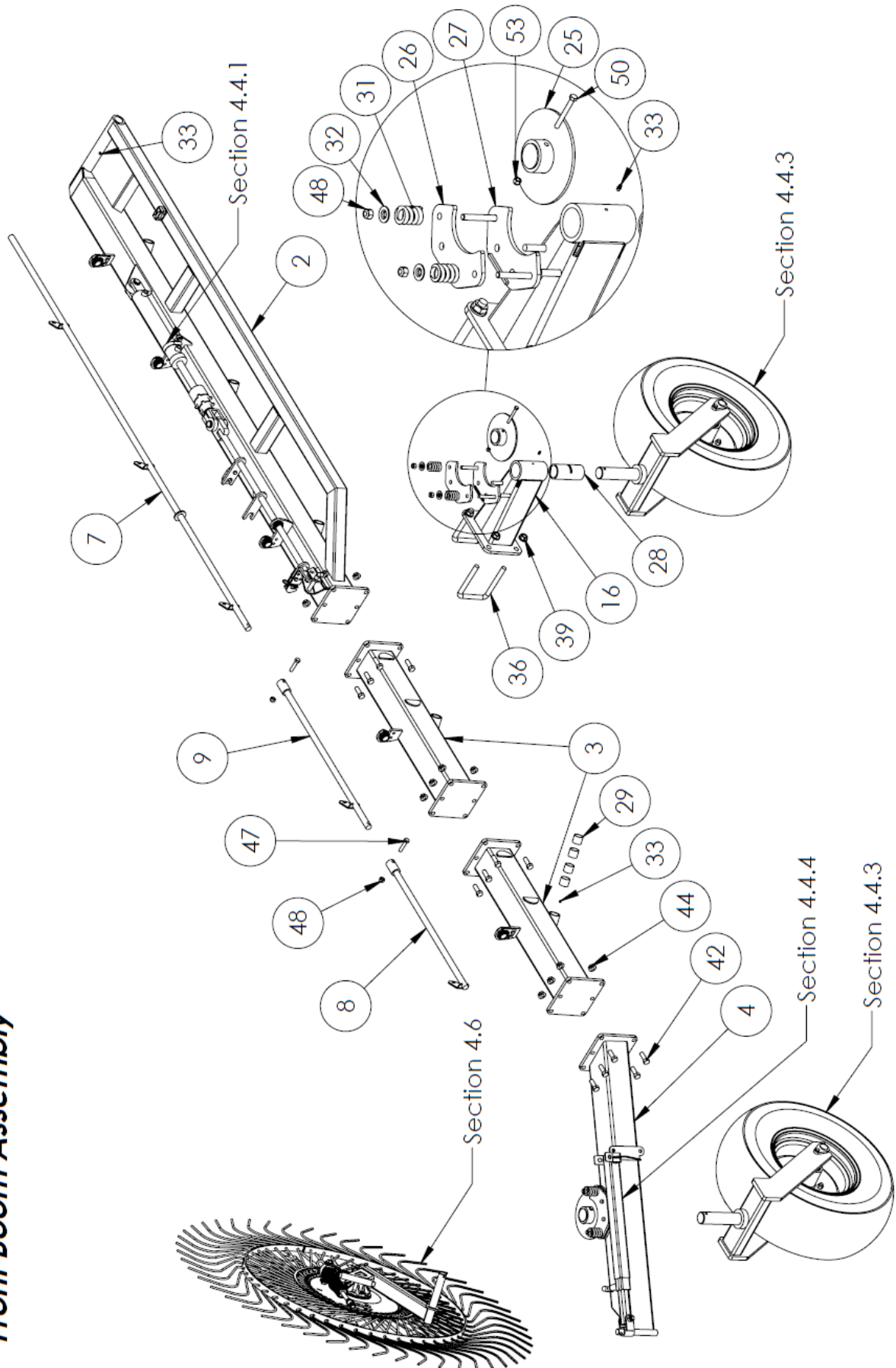
	Description	ID #	QTY		Description	ID #	QTY
1	Rear Boom Arm 683 Left	29551	1	28	Caster Bushing	21150	2
	Rear Boom Arm 683 Right	29552		29	Rake Arm Bushing	16096	44
2	Front Boom Arm 683 Left	29078	1	30	Caster Bushing Long	28948	1
	Front Boom Arm 683 Right	29553		31	Rake Brake Spring	16093	6
3	Boom Arm Extension 683 Left *	25573	2	32	Brake Spring Washer	16322	6
	Boom Arm Extension 683 Right *	25572		33	Grease Zerk	16364	17
4	Front Caster Mount 683 Left	29496	1	34	Grease Zerk, 45°	20888	1
	Front Caster Mount 683 Right	29489		35	Grease Zerk, 90°	16389	2
5	Riser Arm 683 Left	29554	1	36	U-Bolt, 3/4 x 5 x 6"	16091	4
	Riser Arm 683 Right	29555		37	Bolt, 3/4" x 5" (Full Thread)	28953	1
6	Lift Rod - 583 Rear	26599	1	38	Nut, 3/4" Smooth Flange	28954	3
7	Lift Rod - 583 Front	26600	1	39	Nut, 3/4" Serrated Flange	16076	8
8	Lift Rod Extension 34" *	25581	1	40	Nut, 3/4"	10283	1
9	Lift Rod Extension - 22 Wheel *	29068	1	41	Bolt, 5/8" x 2-1/4"	20910	4
10	Center Caster Pivot Mount 683	29082	1	42	Bolt, 5/8" x 1-3/4"	12379	22
11	Caster Axle 683 Mid	29096	1	43	Washer, 5/8" Heavy	21390	8
12	Caster Axle Lock Bushing	29101	1	44	Nut, 5/8" Serrated Flange	11614	26
13	Box Pivot 683 Left	29558	1	45	Bolt, 1/2 x 5"	15400	1
	Box Pivot 683 Right	29559		46	Bolt, 1/2" x 4-1/2" #	15574	2
14	Knuckle 683 Left	29556	1	47	Bolt, 1/2" x 2-1/4"	11820	2
	Knuckle 683 Right	29557		48	Nut, 1/2" Stover Lock	14393	8
15	Parallel Linkage Box Pivot	29566	1	49	Nut, 1/2" Nylon Lock	10241	1
16	Side Caster Support *	29125	1	50	Bolt, 3/8" x 3-1/4"	23325	2
17	683 Tandem Axle	28939	1	51	Bolt, 3/8" x 3"	20905	4
18	11L-15 Tire and Rim	28795	2	52	Nut, 3/8" Nylon Lock	10806	4
19	Wheel Stud Bolt, 1/2" x 1-3/4"	16307	10	53	Nut, 3/8" Stover Lock	17586	2
20	Knuckle Pin 2	26446	1	54	Flow Divider Valve	11742	1
21	Extended Knuckle Pin	27536	1	55	Bolt, 1/4" x 2-1/4"	27931	2
22	Boom Arm Pivot Pin	27538	2	56	Nut, 1/4" Serrated Flange	11812	2
23	Double Caster Brake Pad Top	28855	1	57	Washer, 1/4" Flat	11666	2
24	Double Caster Brake Pad – Bottom	28847	1	58	Hose Clamp Top, 1/4"	22182	8
25	Caster Brake Disk 8"	28858	2	59	Hose Clamp, 1/4	28585	16
26	Caster Brake Pad 8"	28849	2	60	Bolt, 5/16 x 1-3/8"	22183	8
27	Caster Brake Pad 8" Bottom #	28860	2	61	Spring Bushing	27499	1

NOTE: Replacement bottom plates come with bolts welded to them

* NOTE: Not required for all models. Replace as necessary.



Front Boom Assembly





4.4 Boom Arm Assembly

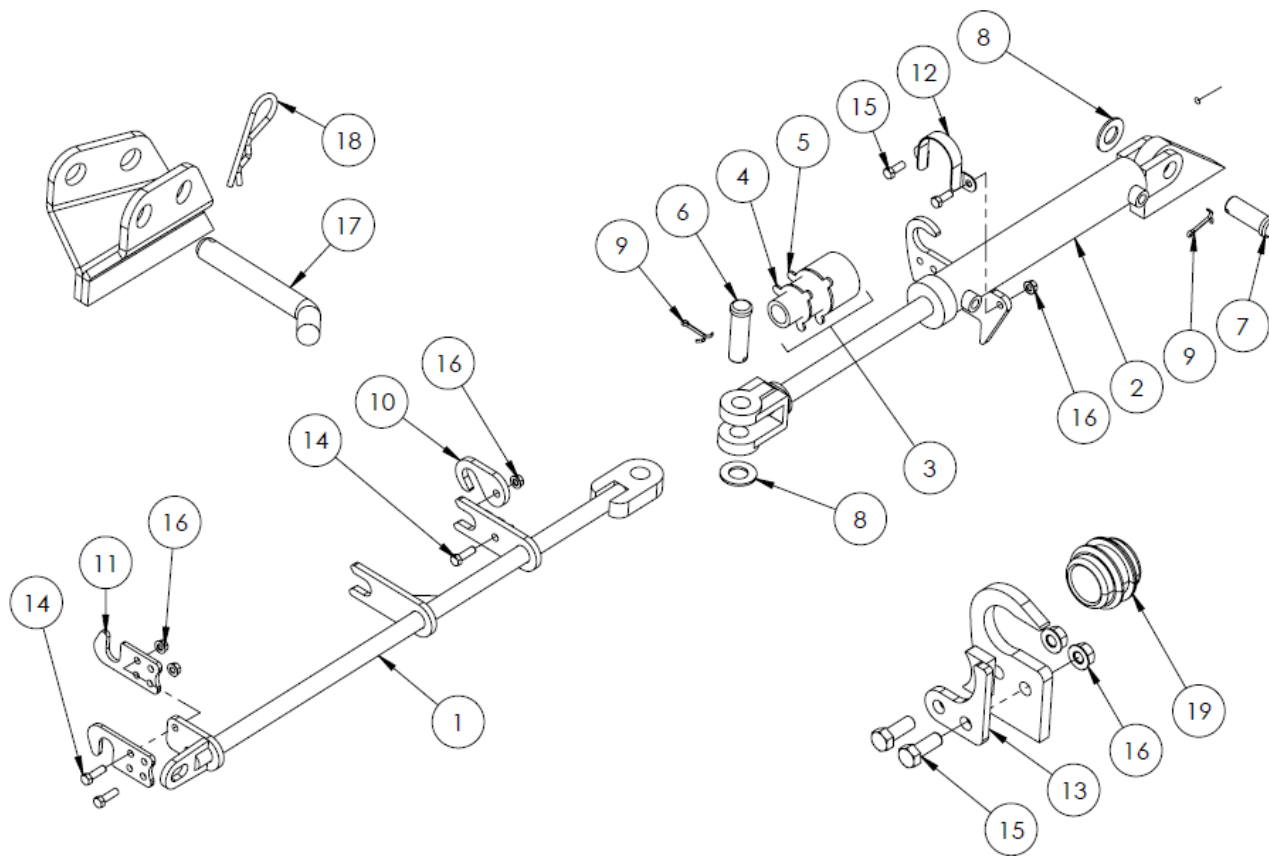
	Description	ID #	QTY		Description	ID #	QTY
1	Rear Boom Arm 683 Left	29551	1	28	Caster Bushing	21150	2
	Rear Boom Arm 683 Right	29552		29	Rake Arm Bushing	16096	44
2	Front Boom Arm 683 Left	29078	1	30	Caster Bushing Long	28948	1
	Front Boom Arm 683 Right	29553		31	Rake Brake Spring	16093	6
3	Boom Arm Extension 683 Left *	25573	2	32	Brake Spring Washer	16322	6
	Boom Arm Extension 683 Right *	25572		33	Grease Zerk	16364	17
4	Front Caster Mount 683 Left	29496	1	34	Grease Zerk, 45°	20888	1
	Front Caster Mount 683 Right	29489		35	Grease Zerk, 90°	16389	2
5	Riser Arm 683 Left	29554	1	36	U-Bolt, 3/4 x 5 x 6"	16091	4
	Riser Arm 683 Right	29555		37	Bolt, 3/4" x 5" (Full Thread)	28953	1
6	Lift Rod - 583 Rear	26599	1	38	Nut, 3/4" Smooth Flange	28954	3
7	Lift Rod - 583 Front	26600	1	39	Nut, 3/4" Serrated Flange	16076	8
8	Lift Rod Extension 34" *	25581	1	40	Nut, 3/4"	10283	1
9	Lift Rod Extension - 22 Wheel *	29068	1	41	Bolt, 5/8" x 2-1/4"	20910	4
10	Center Caster Pivot Mount 683	29082	1	42	Bolt, 5/8" x 1-3/4"	12379	22
11	Caster Axle 683 Mid	29096	1	43	Washer, 5/8" Heavy	21390	8
12	Caster Axle Lock Bushing	29101	1	44	Nut, 5/8" Serrated Flange	11614	26
13	Box Pivot 683 Left	29558	1	45	Bolt, 1/2 x 5"	15400	1
	Box Pivot 683 Right	29559		46	Bolt, 1/2" x 4-1/2"	15574	2
14	Knuckle 683 Left	29556	1	47	Bolt, 1/2" x 2-1/4"	11820	2
	Knuckle 683 Right	29557		48	Nut, 1/2" Stover Lock	14393	8
15	Parallel Linkage Box Pivot	29566	1	49	Nut, 1/2" Nylon Lock	10241	1
16	Side Caster Support *	29125	1	50	Bolt, 3/8" x 3-1/4"	23325	2
17	683 Tandem Axle	28939	1	51	Bolt, 3/8" x 3"	13770	4
18	11L-15 Tire and Rim	28795	2	52	Nut, 3/8" Nylon Lock	10806	4
19	Wheel Stud Bolt, 1/2" x 1-3/4"	16307	10	53	Nut, 3/8" Stover Lock	17586	2
20	Knuckle Pin 2	26446	1	54	Flow Divider Valve	11742	1
21	Extended Knuckle Pin	27536	1	55	Bolt, 1/4" x 2-1/4"	27931	2
22	Boom Arm Pivot Pin	27538	2	56	Nut, 1/4" Serrated Flange	11812	2
23	Double Caster Brake Pad Top	28855	1	57	Washer, 1/4" Flat	11666	2
24	Double Caster Brake Pad - Bottom	28847	1	58	Hose Clamp Top, 1/4"	22182	8
25	Caster Brake Disk 8"	28858	2	59	Hose Clamp, 1/4"	28585	16
26	Caster Brake Pad 8"	28849	2	60	Bolt, 5/16 x 1-3/8"	22183	8
27	Caster Brake Pad 8" Bottom	28860	2	61	Spring Bushing	27499	1

Left Hand Shown

* NOTE: Not required for all models. Replace as necessary.



4.4.1 Lift Rod Details



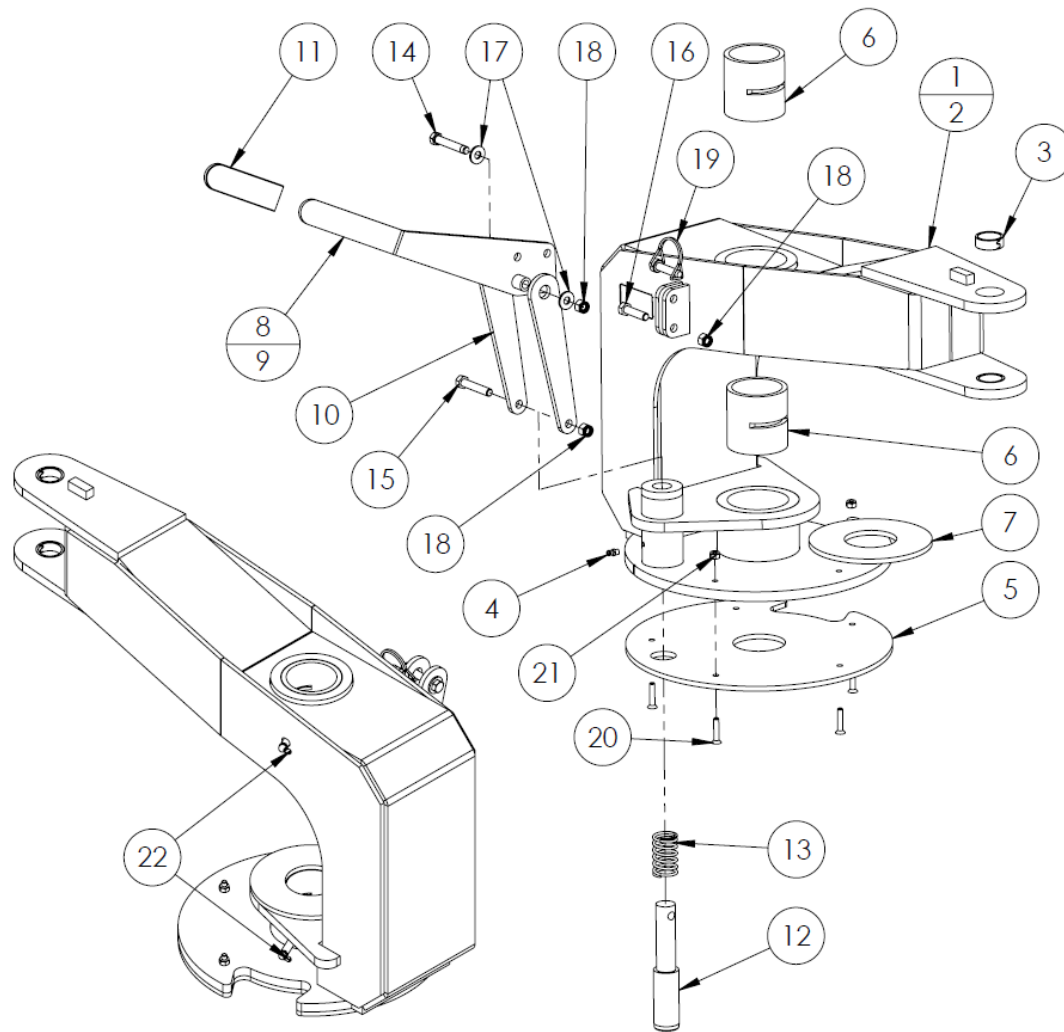
	Description	ID #	QTY		Description	ID #	QTY
1	Lift Rod Push Bar	26368	1	10	Lift Rod Lock	21303	1
2	2" Lift Rod Cylinder *	26379	1	11	Lift Rod Spacer	30999	2
	Seal Kit	26641		12	Cylinder Clamp	26373	1
3	Stroke Adjuster Nut	26459	1	13	Lift Rod Bushing Lock	22257	1
4	Small Jam Nut	28671	1	14	Bolt, 3/8 x 1-1/4"	10253	3
5	Large Jam Nut	28670	1	15	Bolt, 3/8 x 1"	13806	4
6	Pin, 1 x 2-7/8" Usable	28844	1	16	Nut, 3/8" Serrated Flange	10271	5
7	Pin, 1 x 2-1/2" Usable	28843	2	17	Lock Pin, 5/8 x 3-1/2" #	16339	1
8	Flat Washer, 1"	14472	3	18	Hairpin	16363	1
9	Cotter Pin, 3/16 x 1-1/2"	10072	3	19	Lift Rod Bushing	16099	1

* NOTE: (2) Comes with adjuster nut (3). Adjuster nut comes with jam nuts (4) and (5)

NOTE: Comes with hairpin



4.4.2 Steering Horn – Left Hand Shown

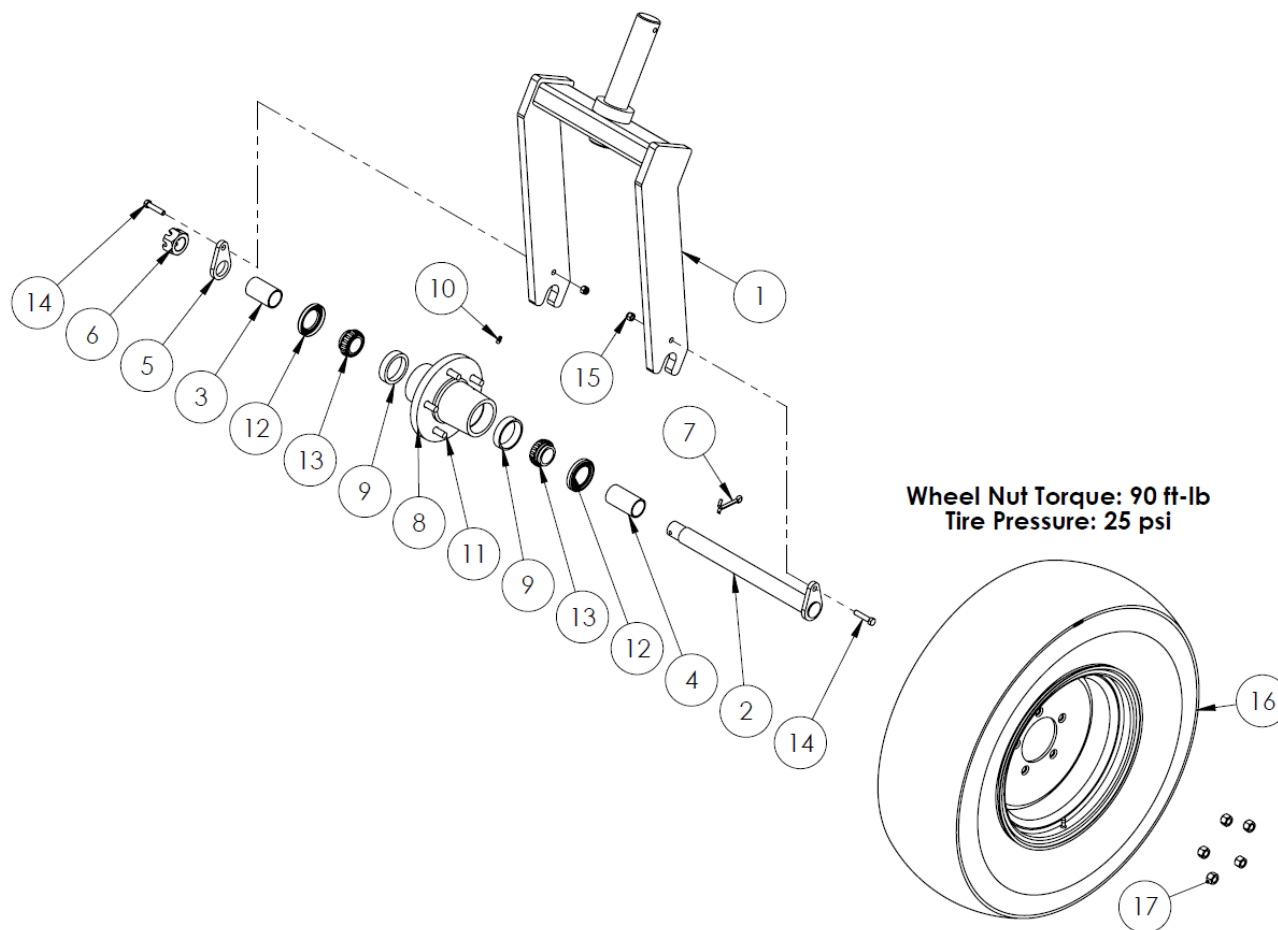


Description	ID #	QTY	Description	ID #	QTY	
1 Steering Horn Left	29561	1	12 Caster Lock Pin	28841	1	
2 Steering Horn Right	29562		13 Caster Lock Spring	28842	1	
3 Spring Bushing, 1-1/8" ID	28945	2	14 Bolt, 3/8 x 2-1/4"	11661	1	
4 Grease Zerk	16364	1	15 Bolt, 3/8" x 2"	10279	2	
5 Caster Wheel Wear Plate	29251	1	16 Bolt, 3/8" x 1-1/2"	11660	1	
6 Caster Bushing Short	28947	2	17 Washer, 3/8" Flat	11667	2	
7 Parallel Linkage Wear Plate	29062	1	18 Nut, 3/8" Nylon Lock	10806	3	
8 Caster Lock Handle Left	29119	1	19 Pin, 3/8" x 1-3/8"	13951	1	
9 Caster Lock Handle Right	29121		20 Screw, #14 x 1-1/4"	28946	5	
10 Caster Lock Linkage Mid	29061	2	21 Nut, 1/4" Nylon Lock	11664	4	
11 Rubber Handle	10297	1	22 Grease Zerk, 65°	*	23356	2

***NOTE: Remove zerk from extension pipe**



4.4.3 Caster Wheel and Hub

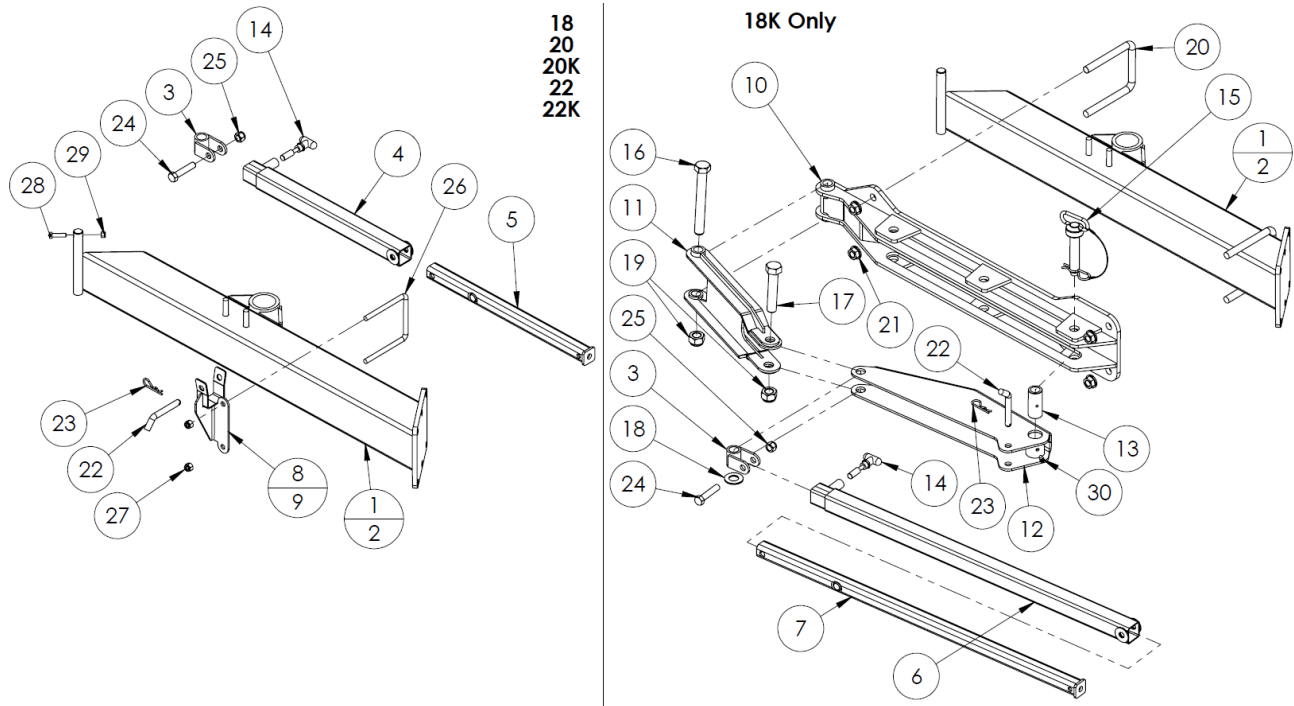


	Description	ID #	QTY	Description	ID #	QTY
1	Caster Fork	22270	1	10 Grease Zerk	16364	1
2	Caster Axle	26443	1	11 Stud	16391	5
3	Caster Spacer, 2-9/16"	22271	1	12 Seal SE13	16297	2
4	Caster Spacer, 2-15/16"	22272	1	13 Bearing Cone 14136A	16296	2
5	Caster Teardrop	26477	1	14 Bolt, 3/8 x 1-3/4"	16040	2
6	Castle Nut	16299	1	15 Nut, 3/8" Nylon Lock	10806	2
7	Cotter Pin	10580	1	16 Tire & Rim, 11L-15 Rim, 15 x 8", 5 on 5.5"	#	1
8	Caster Wheel Hub *	18819	1		28944	1
9	Bearing Cup LM14276	16295	2	17 Wheel Nut	16356	5

***NOTE:** Hub (8) comes with wheel studs (11), grease zerk (10), and bearing cups (9) installed
NOTE: See local tire dealership for replacement or repairs. Not available from factory.
 Quantities are per assembly as shown. Left side shown. For right side, install fork opposite direction.
 Wheel nuts installed with cone IN, air valve same side as wheel nuts.



4.4.4 Transport Lock

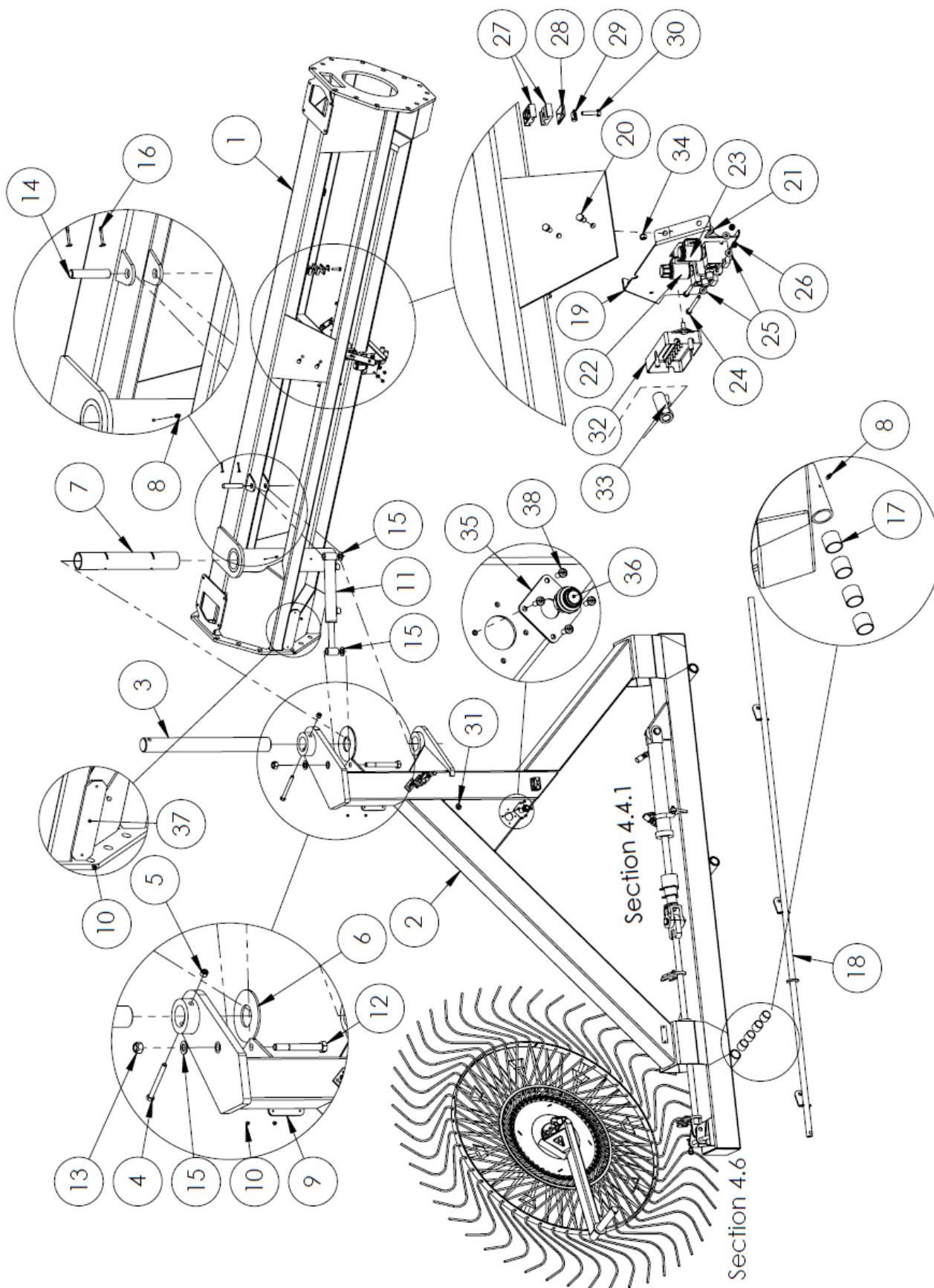


	Description	ID #	QTY		Description	ID #	QTY
1	Front Caster Mount Left	29496	1	16	Bolt, 1" x 8" *	20661	1
2	Front Caster Mount Right	29489	2	17	Bolt, 1" x 5" *	15431	1
3	Transport Lock Knuckle	25645	2	18	Bolt, 1" Flat Washer *	14472	1
4	Transport Lock Sleeve	29282	1	19	Nut, 1" Nylon Lock *	15436	2
5	Transport Lock Bar	29283	1	20	U-bolt, 3/4" x 5 x 6" *	16091	2
6	Transport Lock Sleeve 18K *	29287	1	21	Nut, 3/4" Serrated Flange *	16076	4
7	Transport Lock Bar 18K *	29288	1	22	Pin, 5/8" x 3" #	16339	2
8	Transport Lock Storage Bracket Left	29284	1	23	Hair Pin #	16363	2
9	Transport Lock Storage Bracket Right	29285	2	24	Bolt, 5/8" x 3"	20907	2
10	Transport Lock 18K Slider Bracket *	31193	1	25	Nut, 5/8" Nylon Lock	10364	2
11	Transport Lock 18K Linkage A *	31194	1	26	U-Bolt, 1/2 x 5 x 6"	11834	1
12	Transport Lock 18K Linkage B *	31195	1	27	Nut, 1/2" Nylon Lock	10241	2
13	T-Lock 18K Slider Pin *	31214	1	28	Bolt, 3/8" x 1-1/2"	11660	1
14	Spring Lock Pin	21246	2	29	Nut, 3/8" Nylon Lock	10806	1
15	Headed Pin, 1 x 4-1/2" Usable	31185	1	30	Bolt, 5/16 x 3/8" Socket Head *	31186	2

***18K NOTE:** 18-wheel rakes with kicker wheels require different transport locks
NOTE: Comes with hairpin



4.5 Kicker Wheel



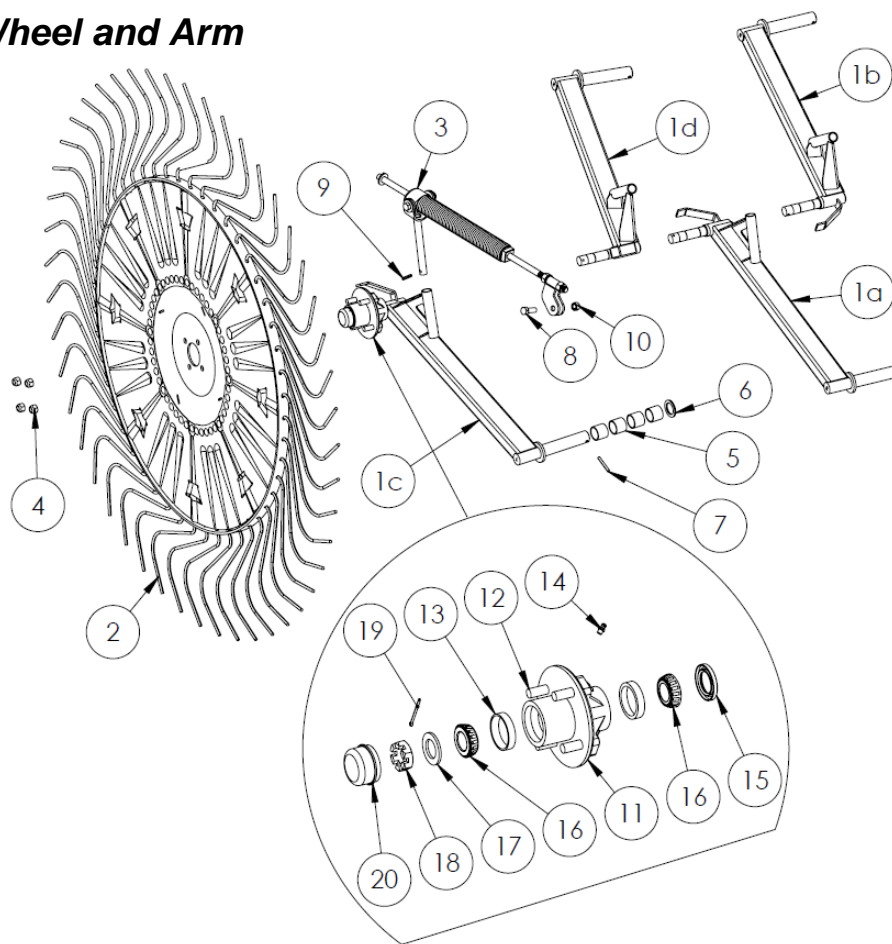


4.5 Kicker Wheel

	Description	ID #	QTY		Description	ID #	QTY
1	Hitch Beam 683 Front	29493	1	20	Bolt, 3/8" x 3/4"	11816	4
2	Kicker Frame 683	29434	1	21	Nut, 3/8" Serrated Flange	10271	4
3	Kicker Pivot Pin	27532	1	22	Electric Check Valve (1->2) N.O.	28943	1
4	Bolt, 1/2" x 5"	15400	1	23	Electric Check Valve (1->2) N.C.	28950	1
5	Nut, 1/2" Nylon Lock	10241	1	24	Bolt, 1/4" x 3-1/4"	29314	2
6	Parallel Linkage Wear Plate	29062	1	25	Washer, 1/4" Flat	11666	4
7	Kicker Wheel Bushing	28951	1	26	Nut, 1/4" Nylon Lock	11664	2
8	Grease Zerk	16364	5	27	Hose Clamp, 1/4"	28585	8
9	Kicker Stopper Plate	29448	1	28	Hose Clamp, 1/4" Top	22182	4
10	Pop Rivet, 3/16 x 3/8"	20963	6	29	Wiring Clamp	13629	3
11	Hydraulic Cylinder, 1-1/2 x 3-5/8"	30513	1	30	5/16 x 1-3/8" Bolt	22183	4
12	Bolt, 3/4" x 6"	23170	1	31	Rubber Grommet 5/16 ID x 1 OD x 1/8	21439	1
13	Nut, 3/4" Stover Lock	30008	1	32	Junction Box 7 pin	13668	1
14	Cylinder Pin, 3/4 x 3" Usable	22007	1	33	Bolt, 5/16" x 3/4"	20903	2
15	Washer, 3/4" Flat	13717	3	34	Nut, 5/16" Nylon Lock	11815	2
16	Cotter Pin, 3/16 x 1-1/4"	11669	2	35	Kicker Wheel Switch Mount Plate	31005	1
17	Rake Arm Bushing	16096	12	36	Push Button Switch	30572	1
18	Lift Rod - 583 Front	26600	1	37	Kicker Stopper Plate	31298	1
19	Kicker Diverter Valve Gusset	29450	1	38	Bolt, #10 x 1/2" *S/N 3377 & Higher Pop Rivet, 3/16" *S/N 3376 & Lower	17035 20963	4



4.6 Rake Wheel and Arm



	Description	ID #	QTY		Description	ID #	QTY
1a	Rake Wheel Arm Left #	28877	1	10	Nut, 1/2" Stover Lock	14393	1
1b	Rake Wheel Arm Right #	28878		11	Rake Wheel Hub *	16413	1
1c	Rake Wheel Arm Rear Left #	28879		12	Stud	16391	2
1d	Rake Wheel Arm Rear Right #	28880		13	Bearing Cup <i>L44610</i>	16081	1
2	Rake Wheel Assembly (Standard)	4.6.1	1	14	Grease Zerk	16364	1
	Rake Wheel Assembly (RMT)	4.6.2		14	Grease Zerk, 45° (RMT)	20888	
3	Spring Assembly	4.6.3	1	15	Seal <i>SE10</i>	16083	1
4	Rake Wheel Nut	16085	4	16	Bearing <i>L44643</i>	16082	2
5	Rake Arm Pivot Bushing	16096	4	17	Washer	16088	1
6	Rake Arm Pivot Washer	16650	1	18	Castle Nut	16087	1
7	Roll Pin, 1/4 x 2"	15872	1	19	Cotter Pin	30658	1
8	Bolt, 1/2 x 1-1/2"	10174	1	20	Dust Cap	16084	1
9	Roll Pin, 1/4 x 1-1/4"	16021	1				

* **NOTE:** Hub (11) comes with wheel studs (12), bearing cups (13), and grease zerk (14) installed.

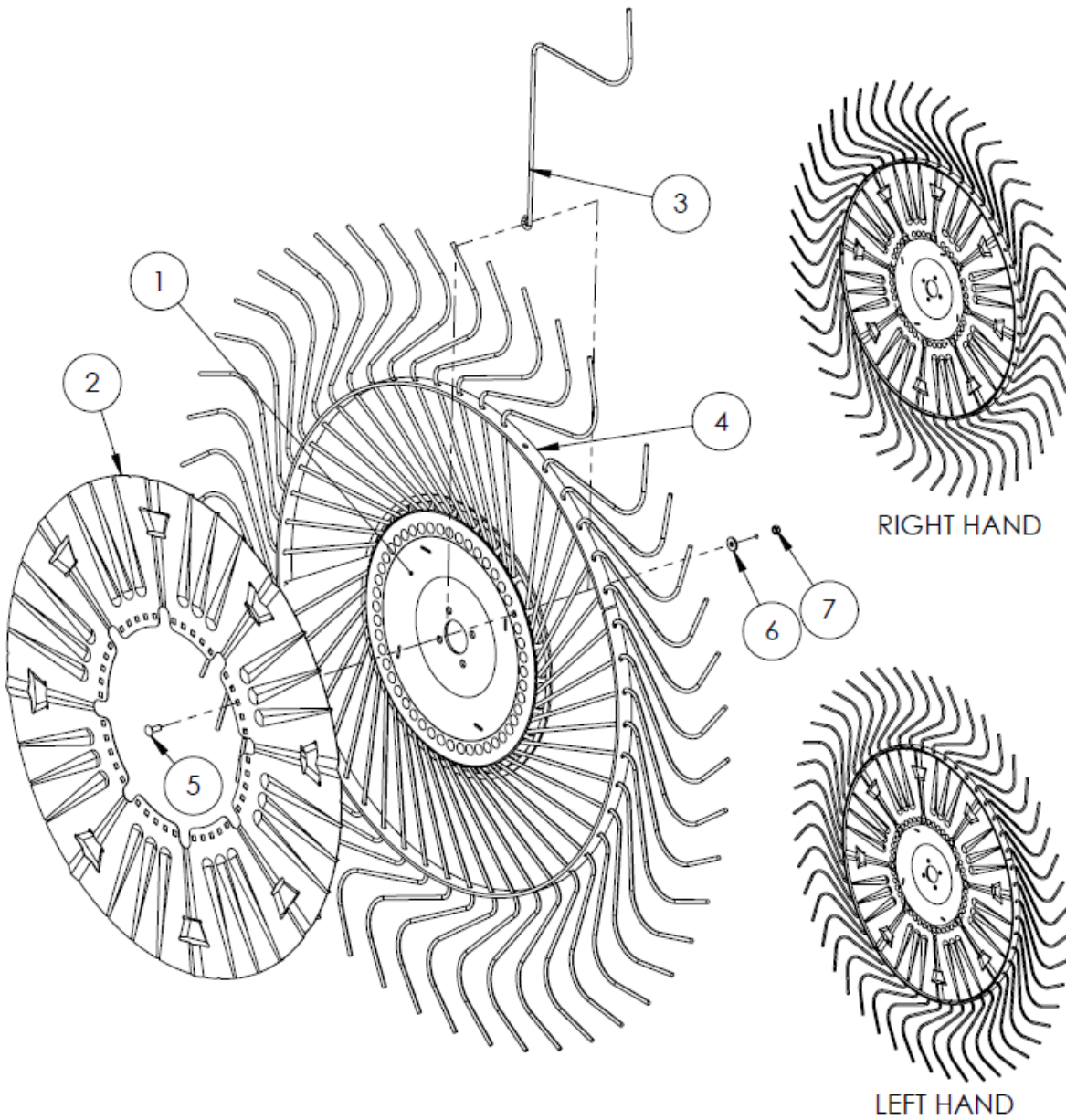
NOTE: Rear arms have angled twine guards. Standard arm has straight twine guards.

Quantities are per hub assembly as shown.

Torque wheel nuts to 90 ft-lb



4.6.1 Rake Wheel Assembly (Standard Tine)

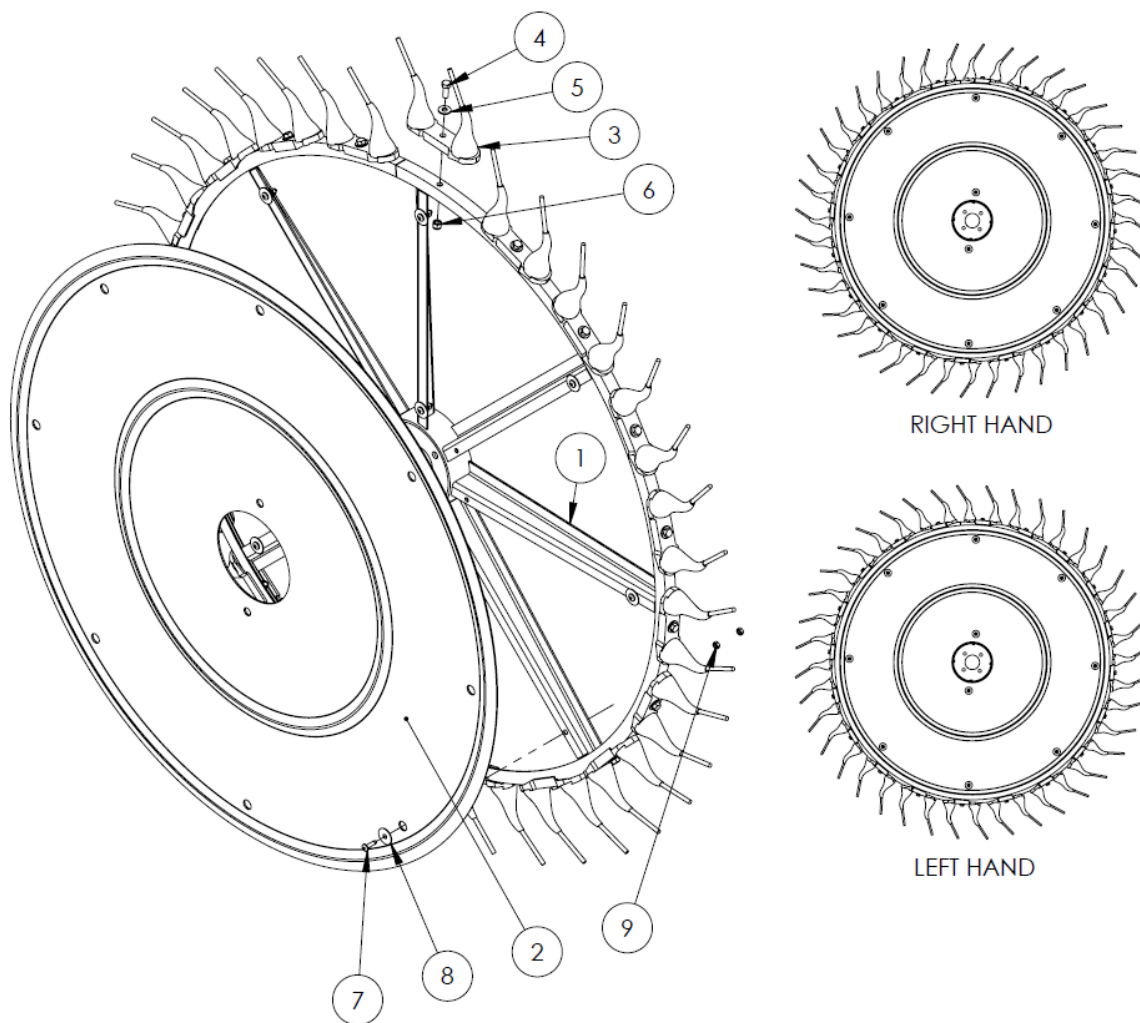


	Description	ID #	QTY		Description	ID #	QTY
1	Center Disk Left	22053	1	4	Outer Ring	22055	1
	Center Disk Right	22731		5	Bolt, 3/8 x 1" Carriage	15718	48
2	Wind Guard	22054	1	6	Washer, 3/8" Heavy #	33189	48
3	Rake Tine	16092	48	7	Nut, 3/8" Stover #	17586	48

NOTE: Left hand shown. Quantities are for each wheel.
 Complete wheel assemblies not available for sale
 # S/N VR3407 & below uses flange nut #17844 without a washer.
 If desired, this can be replaced with washer #33189 and nut #17586



4.6.2 Rake Wheel Assembly (Rubber Mounted Tine)

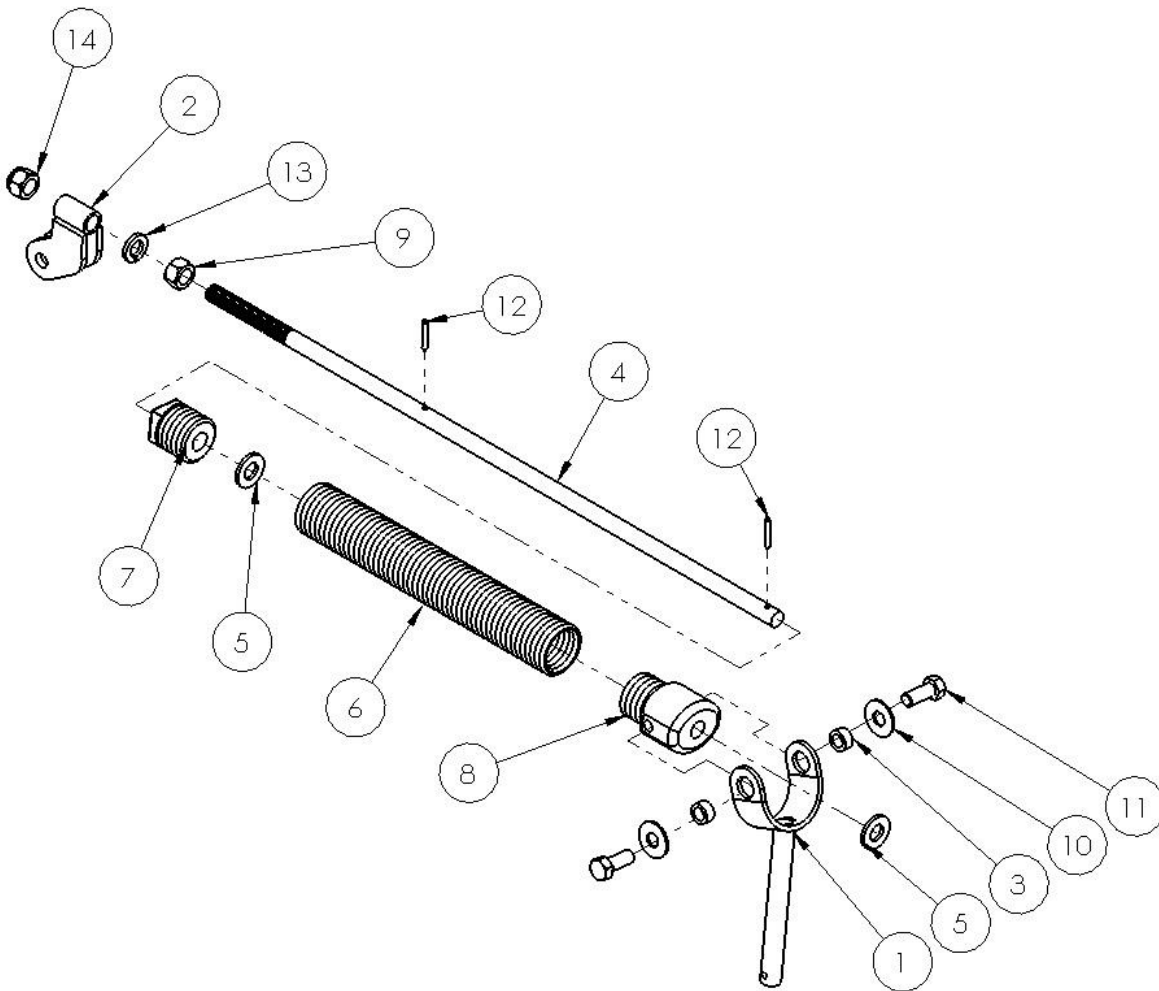


	Description	ID #	QTY		Description	ID #	QTY
	Complete Left Wheel			5	Washer, 3/8" Flat	11667	20
	Complete Right Wheel			6	Nut, 3/8" Nylon Lock	10806	20
1	RMT Wheel Frame	31291	1	7	Bolt, 1/4 x 1" Truss-Head	32146	10
2	Wind Guard	32106	1	8	Washer, 5/16" Fender	32148	10
3	RMT Tine	31234	20	9	Nut, 1/4"	12904	20
4	Bolt, 3/8 x 1"	13806	20				

NOTE: Left hand shown. Quantities are for each wheel.



4.6.3 Spring Assembly



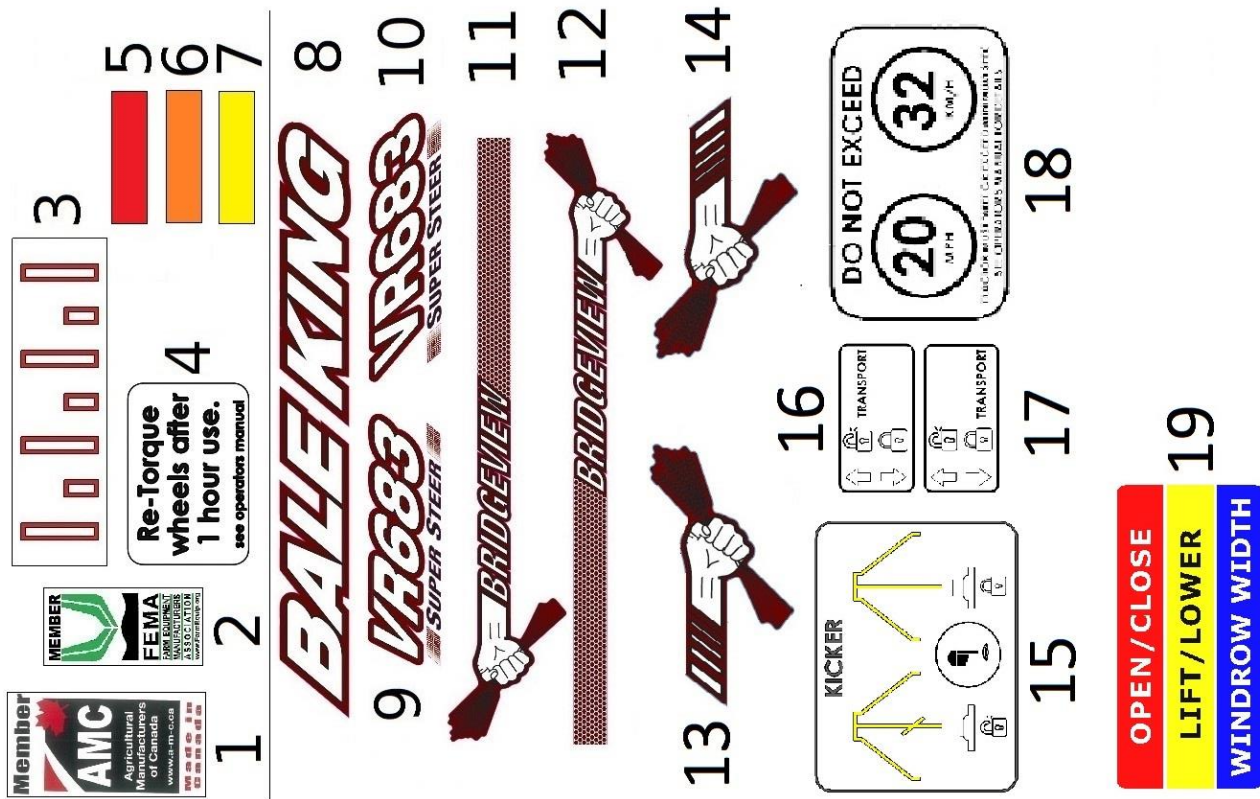
	Description	ID #	QTY		Description	ID #	QTY
1	Spring Yoke	22049	1	8	Spring Retainer Pivot	16101	1
2	Offset Spring Clevis	25881	1	9	Nut, 5/8"	11614	1
3	Spring Yoke Bushing	16290	2	10	Flat Washer, 1/2"	11668	2
4	Spring Slide Rod	29834	1	11	Bolt, 1/2 x 1-1/4"	10240	2
5	Flat Washer, 5/8"	16652	2	12	Roll Pin, 3/16 x 1-1/4"	10302	2
6	Rake Wheel Spring	16095	1	13	Lock Washer, 5/8"	10276	1
7	Spring Retainer Block	16100	1	14	Nut, 5/8" Nylon Lock	10364	1

NOTE: Quantities are per assembly.
Assembled springs not available for sale.





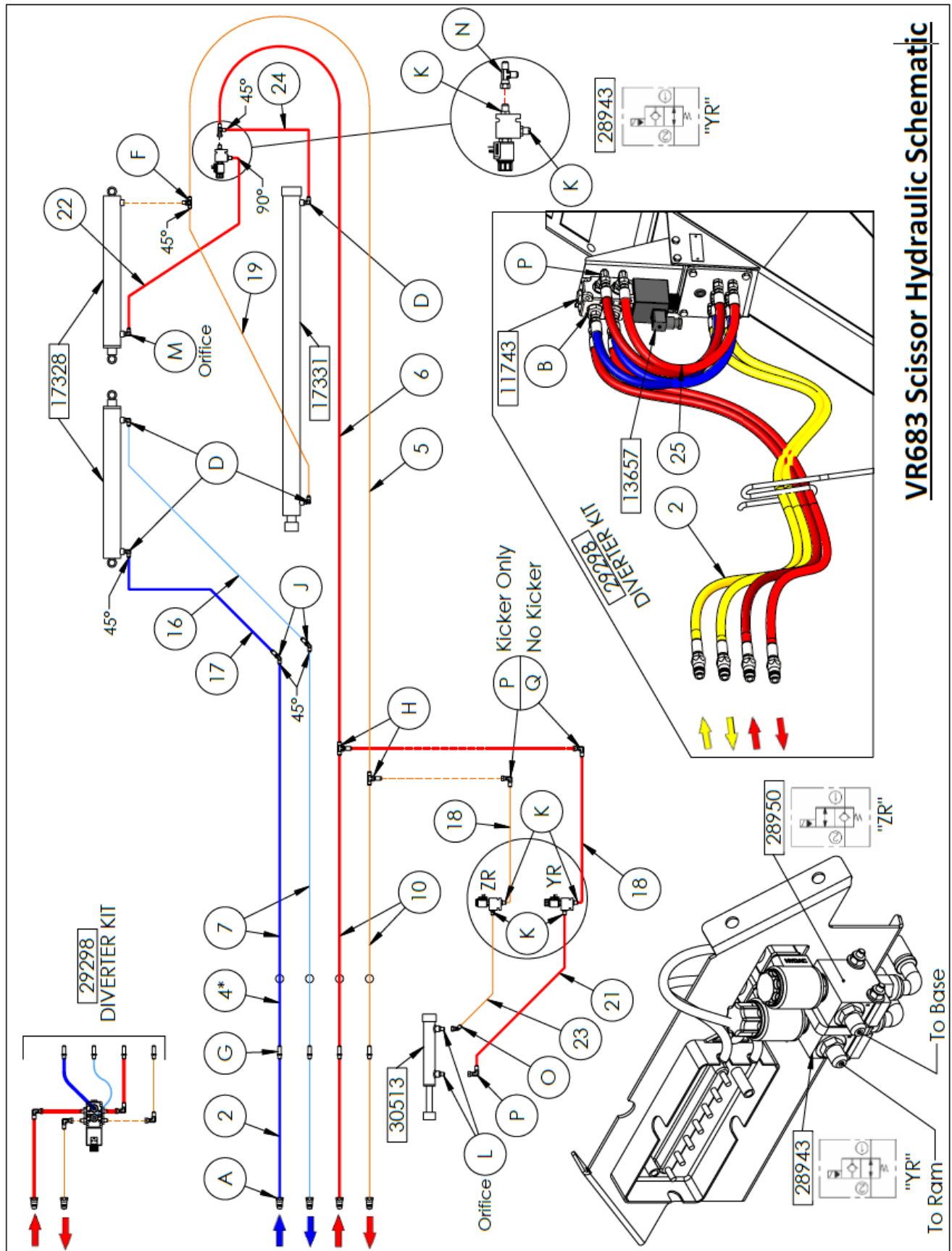
4.7 Decals



	Description	ID #	QTY		Description	ID #	QTY
1	PIMA/AMC	12239	1	11	"Bridgeview" Left	24554	1
2	FEMA	25347	1	12	"Bridgeview" Right	24552	1
3	Width Indicator	23011	1	13	Wheatfist Left	31274	1
4	Wheel Torque Reminder	28385	10	14	Wheatfist Right	31275	1
5	Red Reflector	28383	2	15	Kicker Switch	31308	1
6	Orange Reflector	28386	2	16	Caster Lock Mid	31305	2
7	Amber Reflector	28384	12	17	Caster Lock Rear	31306	2
8	"BALE KING"	22162	2	18	Transport Lock	33159	1
9	"VR683" Left	27725	1	19	Hydraulic Functions – 3 Remote	33147	1
10	"VR683" Right	27726	1		Hydraulic Functions – 2 Remote	33146	



4.8 Hydraulic Components





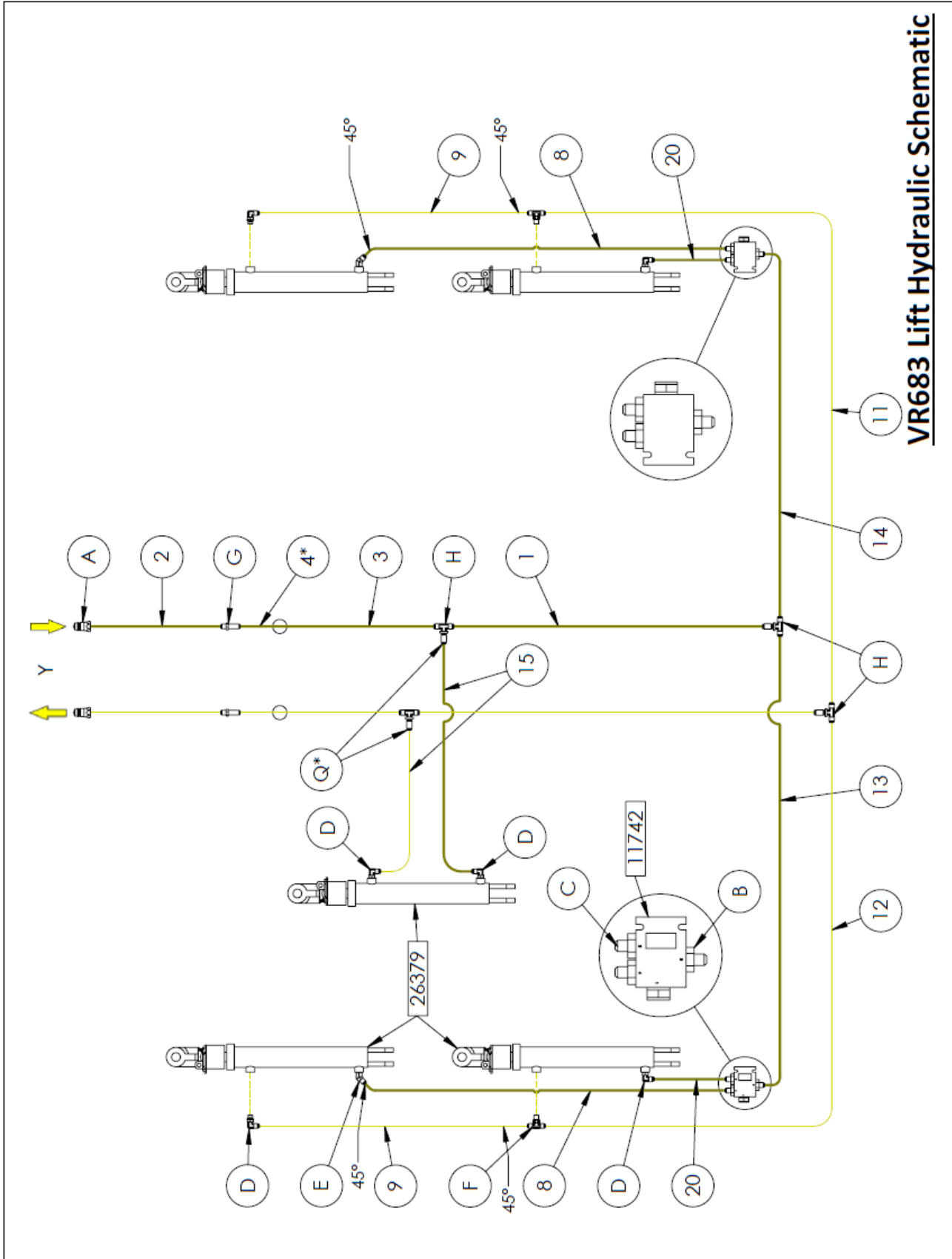
**VR683 HAY RAKE
HYDRAULIC HOSE AND FITTING LIST**

HOSES

1	3/8"	366" OAL	6FJX-6FJX90	Bulkhead B - Bulkhead E	2
2	3/8"	90" OAL	6FJX-8MB	Front Bulkhead - Tractor	6
3	3/8"	86" OAL	6FJX-6FJX	Bulkhead A - Bulkhead B	2
4	3/8"	34" OAL	6FJX-6MJ	Add Inside Front Bulkhead	6
5	1/4"	339" OAL	6FJX-6FJX	Bulkhead C Left - 20" Cyl Base	1
6	1/4"	329" OAL	6FJX-6FJX	Bulkhead C Right - Width Valve 1	1
7	1/4"	300" OAL	6FJX-6FJX45	Bulkhead A - Bulkhead D	2
8	1/4"	251" OAL	6FJX-6FJX	FDV Outlet - Front Lift Cyl Base	2
9	1/4"	213" OAL	6FJX-6FJX45	Rear Lift Cyl Ram - Front Lift Cyl Ram	2
10	1/4"	182" OAL	6FJX-6FJX	Bulkhead A - Bulkhead C	2
11	1/4"	148" OAL	6FJX-6FJX	Bulkhead E Left- Lift Cyl Ram Right	1
12	1/4"	144" OAL	6FJX-6FJX	Bulkhead E Left- Lift Cyl Ram Left	1
13	1/4"	99" OAL	6FJX-6FJX	Bulkhead E Right - Valve Inlet Left	1
14	1/4"	95" OAL	6FJX-6FJX	Bulkhead E Right - Valve Inlet Right	1
15	1/4"	94" OAL	6FJX-6FJX90	Kicker Lift Cyl - Bulkhead B	2
16	1/4"	76" OAL	6FJX-6FJX	Width Cylinder Ram - Bulkhead D	1
17	1/4"	53" OAL	6FJX-6FJX45	Width Cylinder Base - Bulkhead D	1
18	1/4"	51" OAL	6FJX-6FJX90	Kicker Valve #1 - Bulkhead C	2
19	1/4"	33" OAL	6FJX-6FJX45	20" Cyl Base - 48" Cyl Ram	1
20	1/4"	33" OAL	6FJX-6FJX	FDV Outlet - Rear Lift Cyl Base	2
21	1/4"	32" OAL	6FJX-6FJX	Kicker Angle Cyl Ram - Left Valve #2	1
22	1/4"	28" OAL	6FJX-6FJX90	Width Valve 2 - 20" Cyl Ram	1
23	1/4"	25" OAL	6FJX-6FJX	Kicker Angle Cyl Base - Right Valve #2	1
24	1/4"	8.5" OAL	6FJX-6FJX45	Width Valve 1 - 48" Cyl Base	1
25	3/8"	24" OAL	6FJX-6FJX	Diverter Valve Kit	4

ADAPTERS

A	17379	Pioneer Tip, 8FB		6
B	11739	10MB-6MJ		8
C	11740	8MB-6MJ		4
D	10201	6MB-6MJ90		10
E	10216	6MB-6MJ45		2
F	27678	6MBL-6MJT		3
G	11767	6MJBH		6
H	10188	6MJBHL-6MJT		6
J	21319	6MJBH45		2
K	10162	6MB-6MJ		4
L	17436	6MB-6MJ (.031 Orifice)		2
M	16386	6MB-6MJ90 (.063 Orifice)		1
N	15760	6FJXR-6MJT		1
O	12160	6MJ-6FJX45		1
P	12162	6MJ-6FJX90		7
Q	26474	#6 JIC Cap	No Kicker Only	4



VR683 Lift Hydraulic Schematic



**VR683 HAY RAKE
HYDRAULIC HOSE AND FITTING LIST**

HOSES

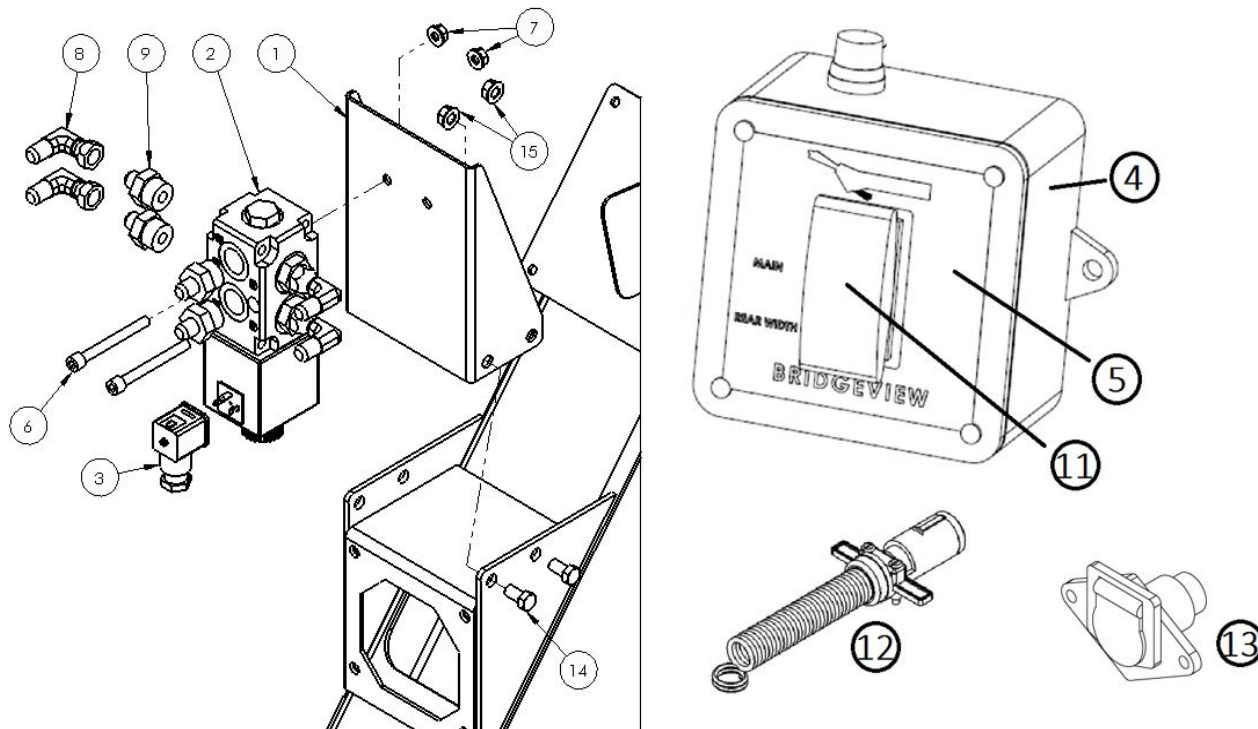
1	3/8"	366" OAL	6FJX-6FJX90	Bulkhead B - Bulkhead E	2
2	3/8"	90" OAL	6FJX-8MB	Front Bulkhead - Tractor	6
3	3/8"	86" OAL	6FJX-6FJX	Bulkhead A - Bulkhead B	2
4	3/8"	34" OAL	6FJX-6MJ	Add Inside Front Bulkhead	6
5	1/4"	339" OAL	6FJX-6FJX	Bulkhead C Left - 20" Cyl Base	1
6	1/4"	329" OAL	6FJX-6FJX	Bulkhead C Right - Width Valve 1	1
7	1/4"	300" OAL	6FJX-6FJX45	Bulkhead A - Bulkhead D	2
8	1/4"	251" OAL	6FJX-6FJX	FDV Outlet - Front Lift Cyl Base	2
9	1/4"	213" OAL	6FJX-6FJX45	Rear Lift Cyl Ram - Front Lift Cyl Ram	2
10	1/4"	182" OAL	6FJX-6FJX	Bulkhead A - Bulkhead C	2
11	1/4"	148" OAL	6FJX-6FJX	Bulkhead E Left- Lift Cyl Ram Right	1
12	1/4"	144" OAL	6FJX-6FJX	Bulkhead E Left- Lift Cyl Ram Left	1
13	1/4"	99" OAL	6FJX-6FJX	Bulkhead E Right - Valve Inlet Left	1
14	1/4"	95" OAL	6FJX-6FJX	Bulkhead E Right - Valve Inlet Right	1
15	1/4"	94" OAL	6FJX-6FJX90	Kicker Lift Cyl - Bulkhead B	2
16	1/4"	76" OAL	6FJX-6FJX	Width Cylinder Ram - Bulkhead D	1
17	1/4"	53" OAL	6FJX-6FJX45	Width Cylinder Base - Bulkhead D	1
18	1/4"	51" OAL	6FJX-6FJX90	Kicker Valve #1 - Bulkhead C	2
19	1/4"	33" OAL	6FJX-6FJX45	20" Cyl Base - 48" Cyl Ram	1
20	1/4"	33" OAL	6FJX-6FJX	FDV Outlet - Rear Lift Cyl Base	2
21	1/4"	32" OAL	6FJX-6FJX	Kicker Angle Cyl Ram - Left Valve #2	1
22	1/4"	28" OAL	6FJX-6FJX90	Width Valve 2 - 20" Cyl Ram	1
23	1/4"	25" OAL	6FJX-6FJX	Kicker Angle Cyl Base - Right Valve #2	1
24	1/4"	8.5" OAL	6FJX-6FJX45	Width Valve 1 - 48" Cyl Base	1
25	3/8"	24" OAL	6FJX-6FJX	Diverter Valve Kit	4

ADAPTERS

A	17379	Pioneer Tip, 8FB		6
B	11739	10MB-6MJ		8
C	11740	8MB-6MJ		4
D	10201	6MB-6MJ90		10
E	10216	6MB-6MJ45		2
F	27678	6MBL-6MJT		3
G	11767	6MJBH		6
H	10188	6MJBHL-6MJT		6
J	21319	6MJBH45		2
K	10162	6MB-6MJ		4
L	17436	6MB-6MJ (.031 Orifice)		2
M	16386	6MB-6MJ90 (.063 Orifice)		1
N	15760	6FJXR-6MJT		1
O	12160	6MJ-6FJX45		1
P	12162	6MJ-6FJX90		7
Q	26474	#6 JIC Cap	No Kicker Only	4



4.8.1 Diverter Valve Kit

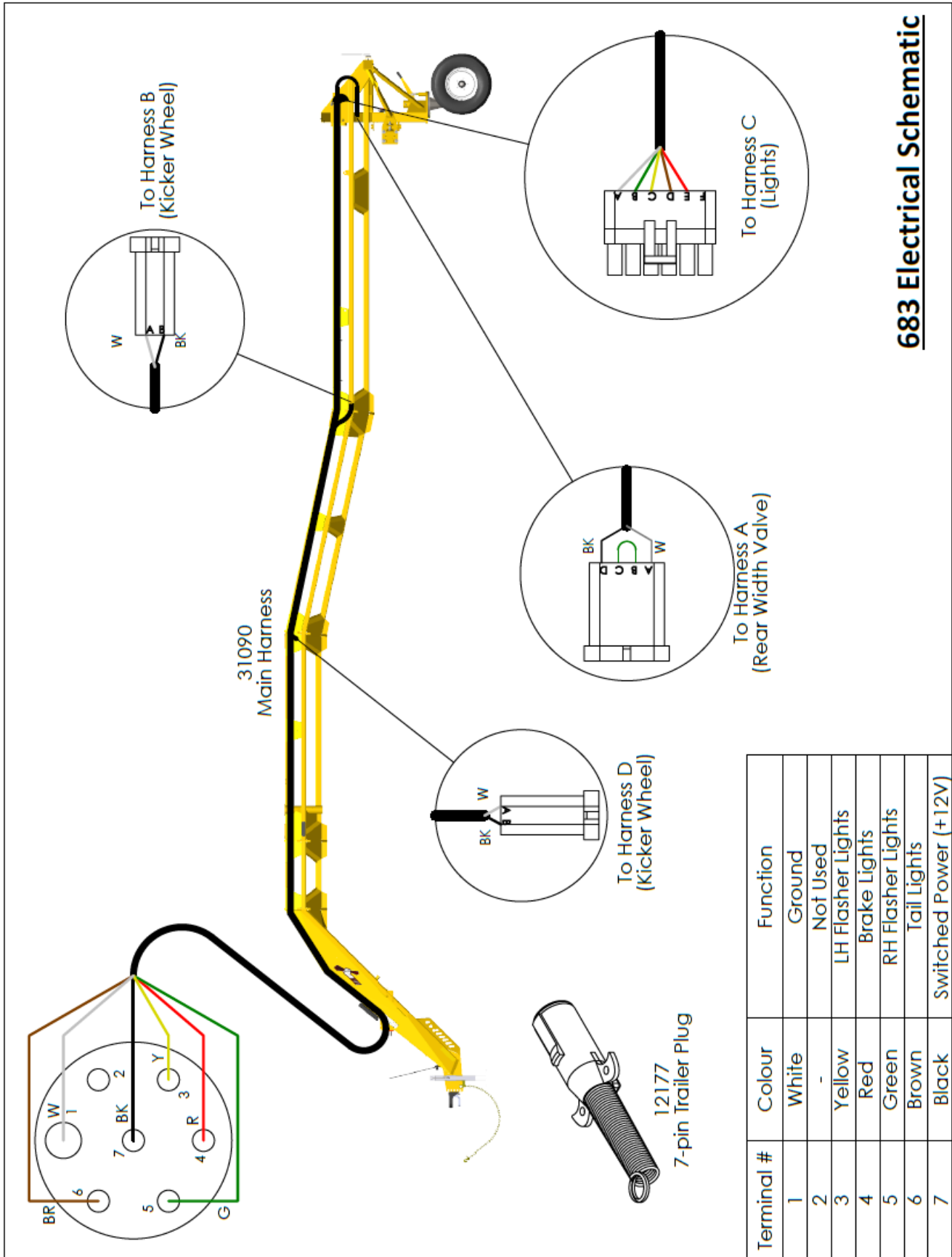


4.8.1 Diverter Valve Kit							
	Description	ID #	QTY		Description	ID #	QTY
-	Complete Kit	29298	-	9	Fitting, 10MB-6MJ	11739	6
1	Diverter Valve Bracket	29300	1	10	Hose, 3/8" x 24" OAL, 6FJX-6FJX	29268	4
2	Diverter Valve	11743	1				
3	Diverter Valve Plug	13657	1	11	Control Box Switch	13561	*
4	Control Box w/ Harness	30942	1	12	4-pin Trailer Plug	24691	*
5	Rake Control Box Decal	23296	1	13	4-pin Tractor Plug	24690	*
6	5/16 x 3" Socket Head Bolt	11783	2	14	3/8 x 3/4" Bolt	11816	2
7	5/16" Serrated Flange Nut	11814	2	15	3/8" Serrated Flange Nut	10271	2
8	Fitting, 6MJ-6FJX90	12162	4				

*NOTE: Control box (4) comes with switch (11), and plugs (12),(13).



4.9 Electrical Components

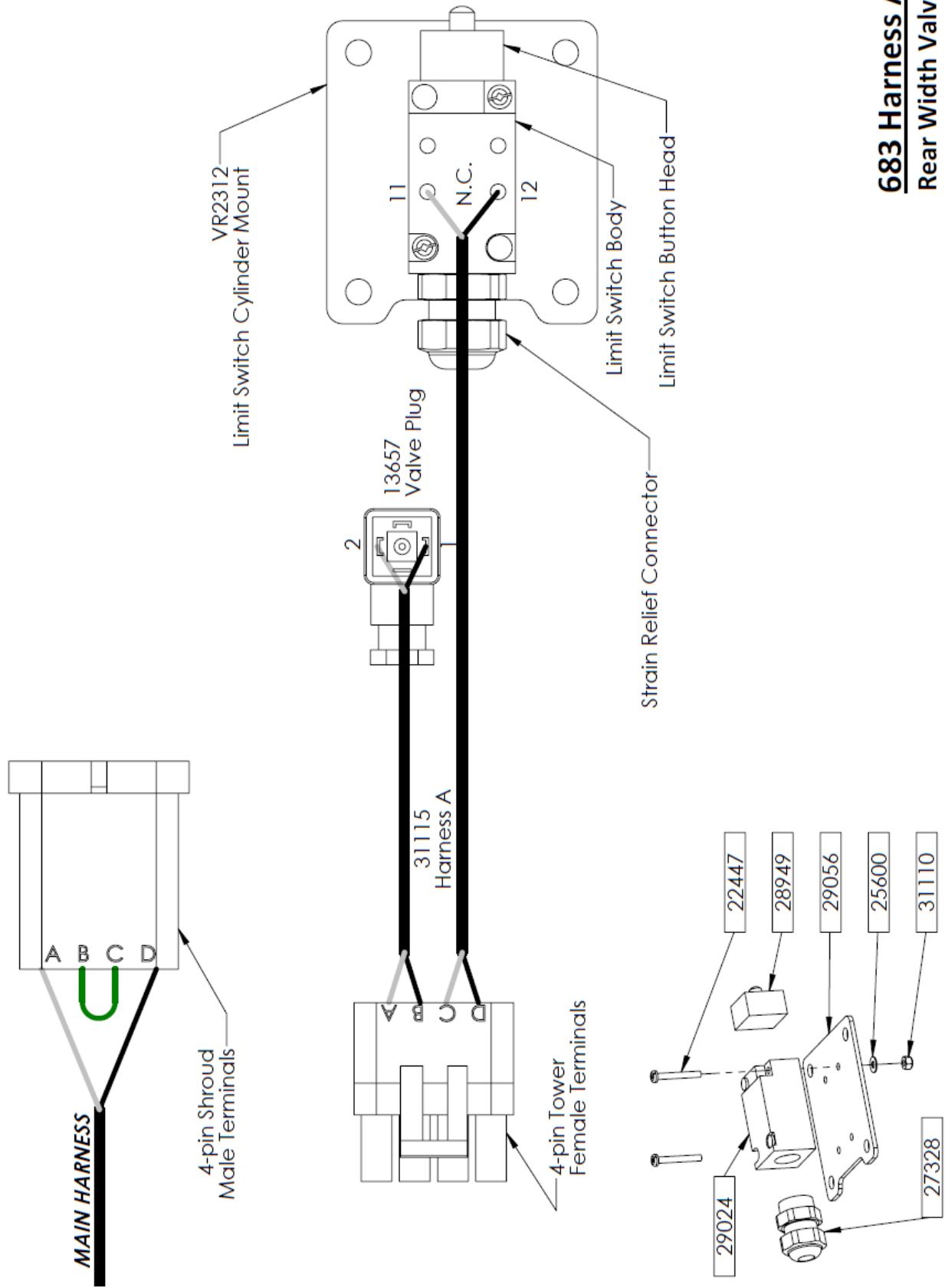


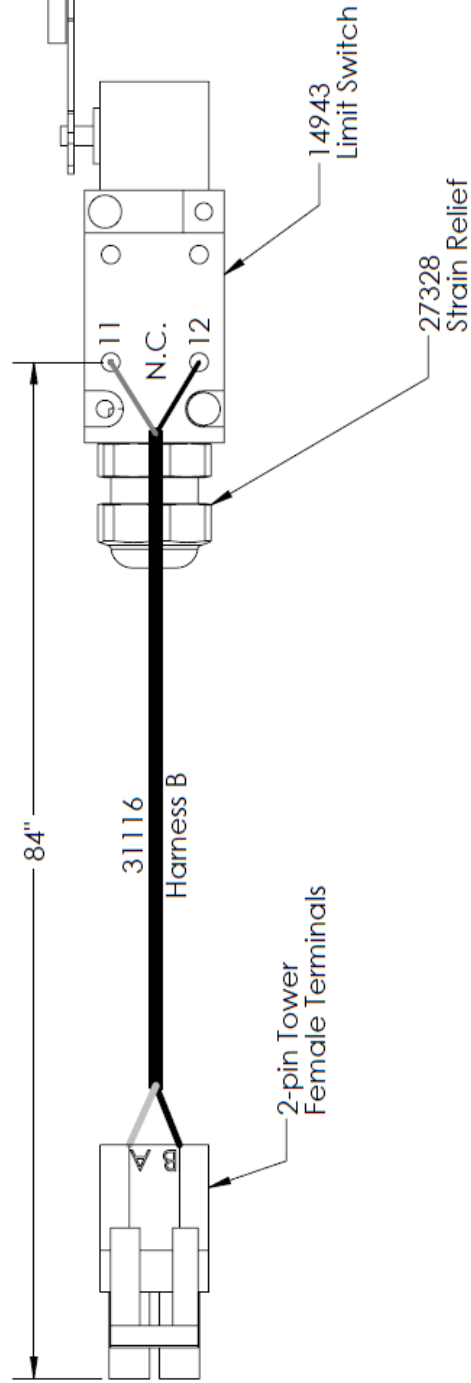
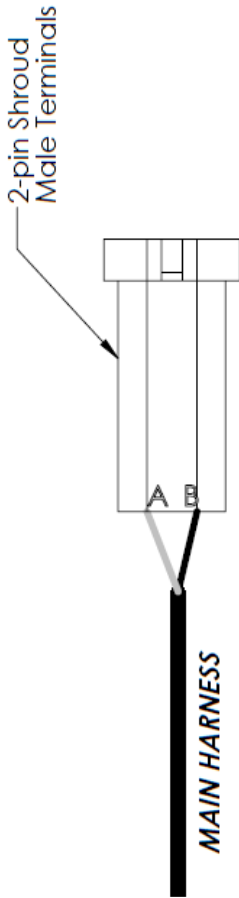
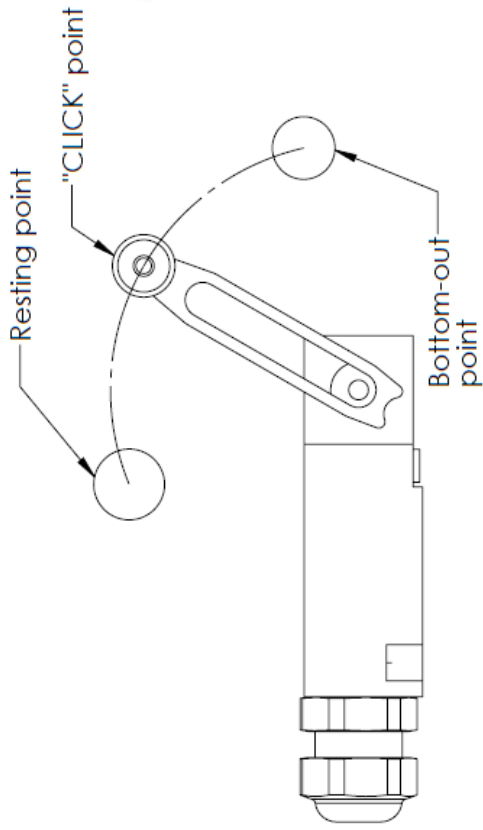
683 Electrical Schematic



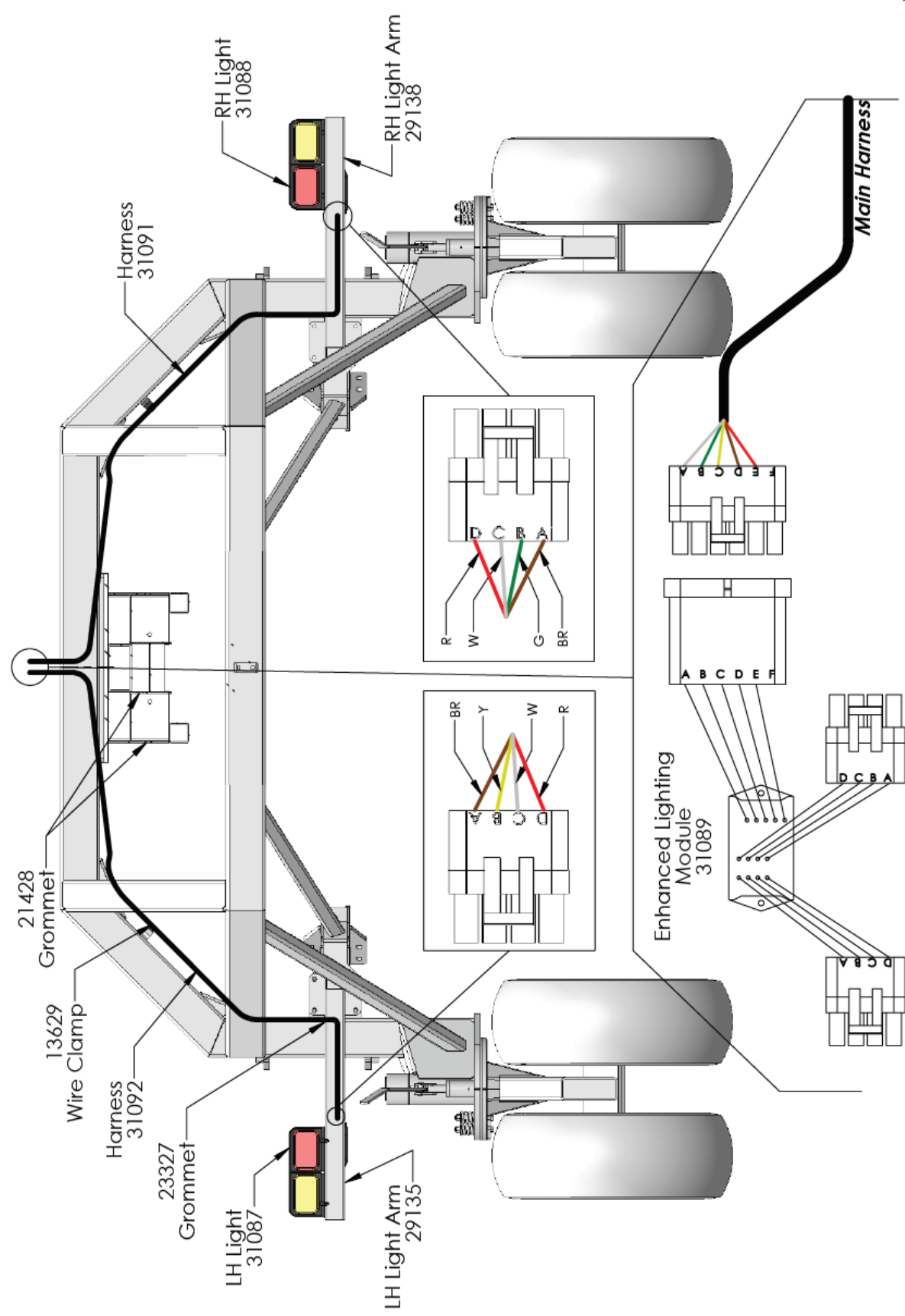
683 Harness A Rear Width Valve

Do not install shroud until AFTER routing





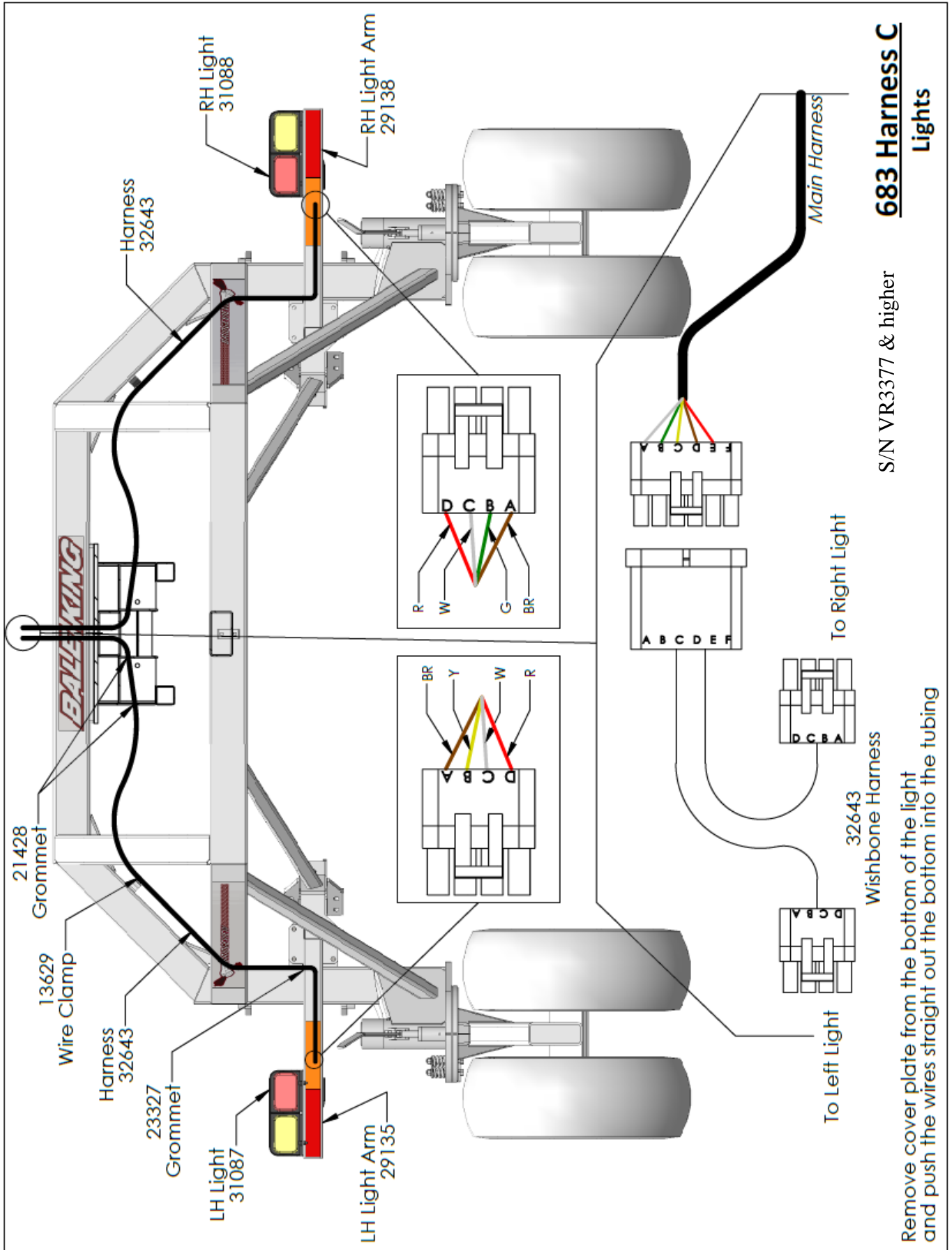
683 Harness B
Kicker Wheel Only

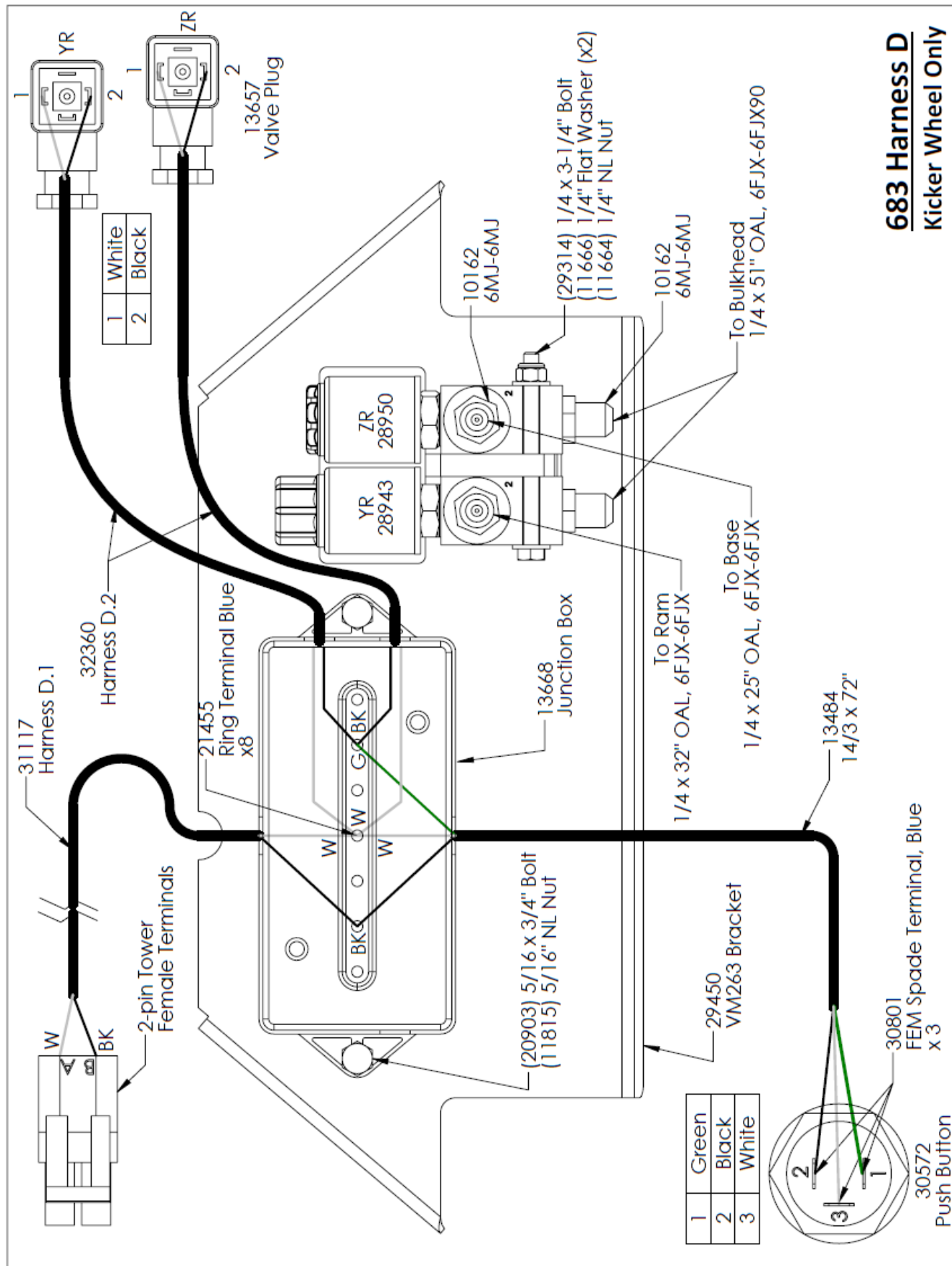


683 Harness C

S/N VR3376 & lower Lights

Remove cover plate from the bottom of the light and push the wires straight out the bottom into the tubing





683 Harness D
Kicker Wheel Only