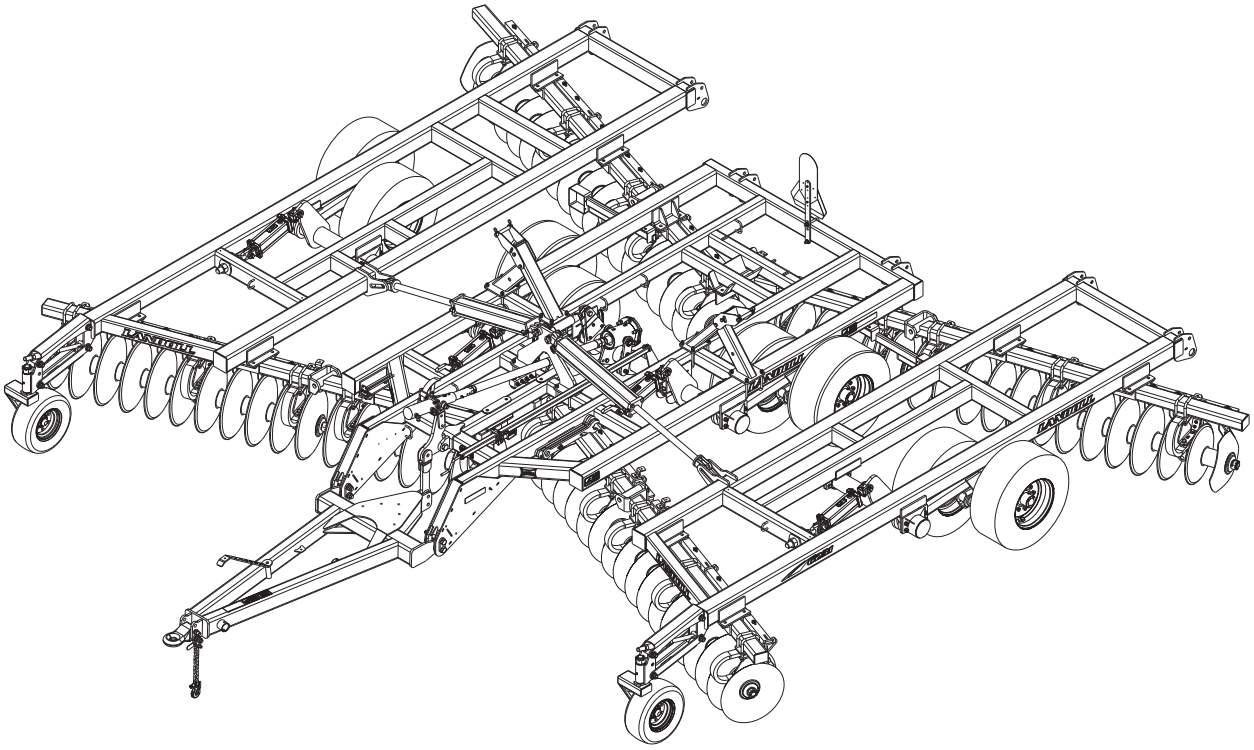
Model 6231
Disc
Operators Manual



LANDOLL COMPANY, LLC
1900 North Street
Marysville, Kansas 66508
(785) 562-5381
800-428-5655 ~ WWW.LANDOLL.COM

Instructions for Ordering Parts

**** Repair parts must be ordered through an Authorized Dealer ****

DEALER INSTRUCTIONS FOR ORDERING PARTS FROM LANDOLL PARTS DISTRIBUTION CENTER

Phone #: 800-423-4320 or 785-562-5381 **Fax #: 888-527-3909**
Order online: dealer.landoll.com

IDENTIFICATION PLATE

The identification plate, which lists the model number and serial number, is located on the front of the frame.

SERIAL NUMBER

The serial number is located on the identification plate.
The Following information will help decode the 6231 Disc serial number

62H23100100 = xxmyyssss

QR CODE DECAL

The 5000 series QR code decal, may be scanned to link you to the most current manuals, located on the front of the frame *See Figure 1-1*

xx	= model series (i.e. 62 for Disc)
m	= month of manufacture (ex. “H” means October. The letter I is not used.)
yy	= year manufactured (ex. “23” means 2023)
SSSSS	= Sequential number used to track warranty and service information.

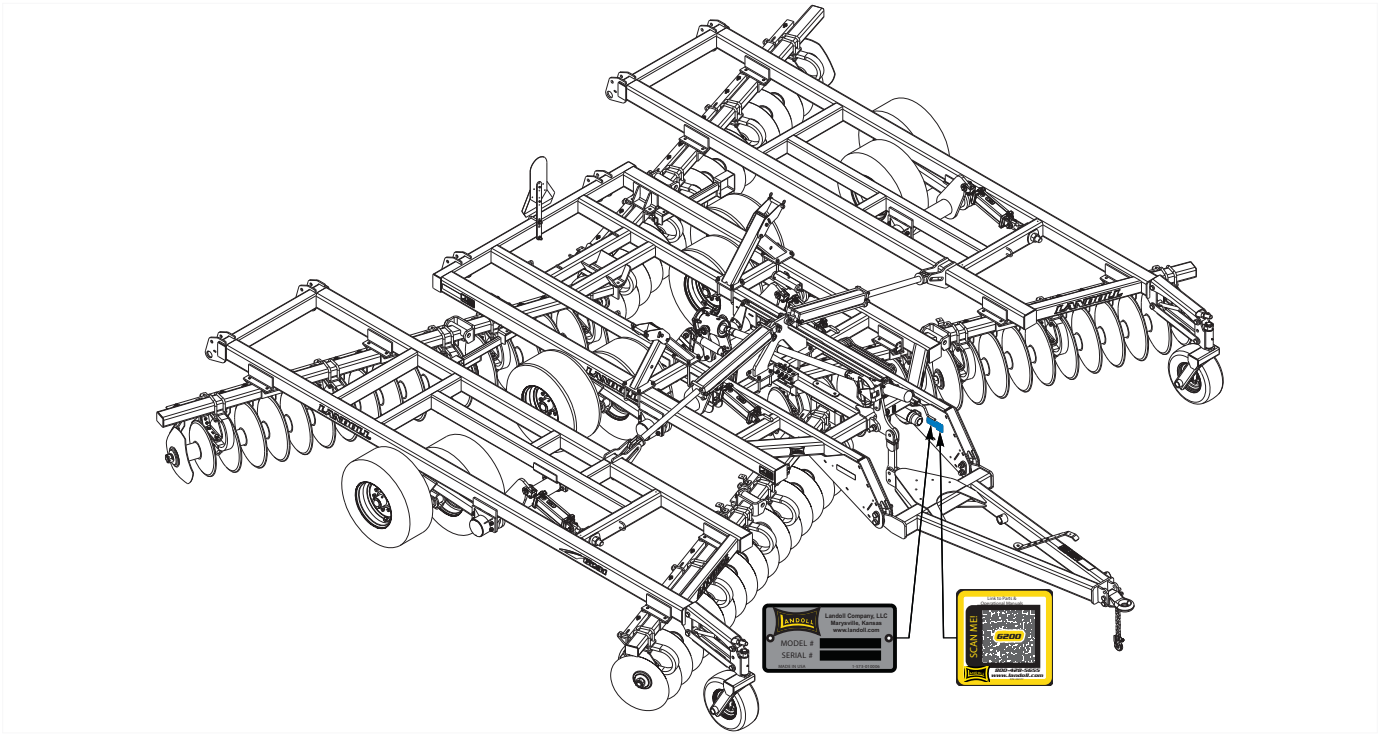


Figure 1-1: Identification Plate and Location

Manuals for 6231 Disc

Manual Number	Manual Type
F-832	Operator’s Manual
F-833	Parts Manual

DANGER

DO NOT operate or perform any maintenance tasks on this equipment until you have completed the following:

1. **Receive proper training to operate this equipment safely.**
2. **Read and understand the operator's manual.**
3. **Be thoroughly trained on inspection and repair procedures.**

Failure to comply with this warning may result in serious injury or possibly death.

Table of Contents

Chapter 1

Introduction and Safety Information

The Landoll Model 6231 Disc is a quality product designed to give years of trouble free performance. By following each section of this manual, your system will perform as designed for you and your operation.

CHAPTER 1 Gives basic instructions on the use of this manual and understanding the safety statements.

CHAPTER 2 Gives product specifications for the equipment. These specifications supply lengths and measures for your equipment. A Standard Bolt Torque Table is provided to give guidelines for bolt torques to be used when servicing this product.

CHAPTER 3 Contains assembly instructions for your equipment. When these procedures are correctly followed, your equipment should provide you years of trouble-free operation and service.

CHAPTER 4 Instructs how to operate your equipment before using it, and describes adjustments needed.

CHAPTER 5 Instructs how to operate your equipment before using it, and describes adjustments needed. Gives practical advice for the care and maintenance of your Landoll equipment. Drawings in this section locate adjustment points on the equipment.

IF YOU HAVE ANY QUESTIONS CONTACT:
LANDOLL COMPANY, LLC
1900 NORTH STREET
MARYSVILLE, KANSAS 66508

PHONE # (785) 562-5381 or (800) 428-5655
OR
FAX # (888) 527-3909

CHAPTER 6 Is a troubleshooting guide to aid in diagnosing and solving problems with the equipment.

PARTS LIST Is a separate manual showing the various assemblies, subassemblies, and systems. Refer to that manual when ordering Landoll replacement parts. Order parts from your Landoll dealer.

WARRANTY The Warranty Registration form is included with the product documents. Fill it out and mail it within 15 days of purchase.
NOTE: IMPROPER ASSEMBLY, MODIFICATION, OR MAINTENANCE OF YOUR LANDOLL MACHINE CAN VOID YOUR WARRANTY.

COMMENTS Address comments or questions regarding this publication to:

LANDOLL COMPANY, LLC
1900 NORTH STREET
MARYSVILLE, KANSAS 66508
ATTENTION: PUBLICATIONS - DEPT. 55

Understanding Safety Statements

You will find various types of safety information on the following pages and on the machine signs (decals) attached to the vehicle. This section explains their meaning.

The Safety Alert Symbol means ATTENTION! YOUR SAFETY IS INVOLVED!

NOTE

Means that failure to follow these instructions could cause damage to the equipment or cause it to operate improperly.

NOTICE

Special notice - read and thoroughly understand

CAUTION

Caution means serious equipment or other property damage can occur if instructions on this label are not properly followed.

WARNING

Warning means serious injury or death can occur if safety measures or instructions on this label are not properly followed.

DANGER

Danger means a life-threatening situation exists. Death can occur if safety measures or instructions on this label are not properly followed.

NOTE

Make sure you read and understand the information contained in this manual and on the machine signs (decals) before you attempt to operate or maintain this vehicle.

The safety statements contained in this manual relate to the operation of the Model 6231 Disc.

Decal Safety

1. Examine safety decals and be sure you have the correct safety decals for the implement.
2. Keep these signs clean so they can be observed readily. It is important to keep these decals cleaned more frequently than the implement. Wash with soap and water or a cleaning solution as required.
3. Replace decals that become damaged or lost. Also, be sure that any new implement components installed during repair include decals which are assigned to them by the manufacturer.
4. When applying decals to the implement, be sure to clean the surface to remove any dirt or residue. Where possible, sign placement should protect the sign from abrasion, damage, or obstruction from mud, dirt, oil etc.

DANGER

- **Do not allow anyone to ride on the tractor or implement. Riders could be struck by foreign objects or thrown from the implement.**
- **Never allow children to operate equipment.**
- **Keep bystanders away from implement during operation.**

Transporting Safety

1. Thoroughly read and understand all operating procedures contained in this manual before attempting to transport this implement.
2. ***It is the responsibility of the operator to understand and comply with all federal, state, and local requirements before transporting the Disc.***
3. When transporting the implement on road or highway, use adequate warning symbols, reflectors, lights, SIS, and slow moving vehicle signs as required. Verify that all symbols and lights are clearly visible and functioning before transporting. Transport during daylight hours whenever possible. Slow moving tractors and implements can create a hazard when driven on public roads and can be difficult to see especially at night.
4. Do not tow an implement that when fully loaded, weighs more than 1.5 times the weight of the towing vehicle. Never tow the implement with a motor vehicle. Tow the implement only with a properly ballasted tractor.
5. Use a locking-style hitch pin that properly fits the tractor drawbar and the implement hitch. Lock the tractor drawbar in the center position to prevent loss of steering control.

6. Attach the safety chain to the tractor recommended drawbar support. Provide only enough slack in the chain for turning. Do not attach the safety chain to an intermediate support. Safety chain must have rating greater than the gross weight of the towed implement(s). Replace the safety chain if it is worn or damaged in any way.
7. Verify that all hydraulic hoses and electrical wiring between the tractor and implement are safely routed to avoid damage.
8. Check implement tire pressure for correct inflation. Verify that lug nuts are properly torqued before transporting.
9. Install all transport locks and pins before transporting.
10. Never allow riders on the implement.
11. ***Maximum transport speed for the Disc is 20 mph, regardless of the tractor capabilities***. Excessive speed may result in loss of control of the tractor and implement, reduced braking, or failure of the implement tires and/or structure. Slow down when road surface conditions are poor or rough, or when driving on inclines. Reduce speed when turning, on curves and slopes, to avoid tipping. Equipment altered other than the place of manufacture, may further reduce the maximum transport speed.
12. Avoid overhead power lines. Serious injury or death can result. Electrocution can occur without direct contact. Know the transport height and width of the implement before transporting. Attachments can increase the height and width of the implement.

Attaching, Detaching, and Storage

1. Do not stand between the tractor and implement when attaching or detaching implement unless both are not moving.
2. Block implement so it will not roll when unhitched from the tractor.
3. Store in an area where children normally do not play.

Maintenance Safety

1. Understand the procedure before doing the work. Use proper tools and equipment.
2. Make sure all moving parts have stopped.
3. Do not make adjustments or lubricate implement while it is in motion.
4. Block the implement so it will not roll when working on or under it to prevent injury.
5. Install hydraulic cylinder lockouts, or lower equipment to the ground before servicing.

High Pressure Fluid Safety

1. Escaping fluid under pressure can be nearly invisible and have enough force to penetrate the skin causing serious injury. Use a piece of cardboard, rather than hands, to search for suspected leaks.
2. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.
3. Avoid the hazard by relieving pressure before disconnecting hydraulic lines.

Protective Equipment

1. Wear protective clothing and equipment.
2. Wear clothing and equipment appropriate for the job. Avoid loose fitting clothing.

3. Because prolonged exposure to loud noise can cause hearing impairment or hearing loss, wear suitable hearing protection, such as earmuffs or earplugs.

Chemical Safety

1. Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil and property.
2. Read chemical manufacture's instructions and store or dispose of unused chemicals as specified.
3. Handle chemicals with care and avoid inhaling smoke from any type of chemical fire.
4. Store or dispose of unused chemicals as specified by the chemical manufacturer.

Prepare for Emergencies

1. Keep a First Aid Kit and Fire Extinguisher handy.
2. Keep emergency numbers for doctor, ambulance, hospital and fire department near the phone.

Tire Safety

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

Safety Chain

1. Use a chain with a strength rating equal to or greater than the gross weight of towed machinery, which is 10,100 pounds minimum in accordance with ASAE S338.2 specifications. If two or more implements are pulled in tandem, a larger chain may be required. Chain capacity must be greater than the TOTAL weight of all towed implements.
2. Additional safety chain should be used between each implement.
3. Attach the chain to the tractor drawbar support or specified anchor location. Allow only enough slack in the chain to permit turning. The distance from hitch pin to attachment point or intermediate support point should not exceed 9 inches.
4. Replace the chain if any links or end fittings are broken, stretched or damaged.
5. Do not use a safety chain for towing.

Safety Decals and Reflectors

The 6231 Disc is equipped with all safety signs installed for safe operation.

For you safety:

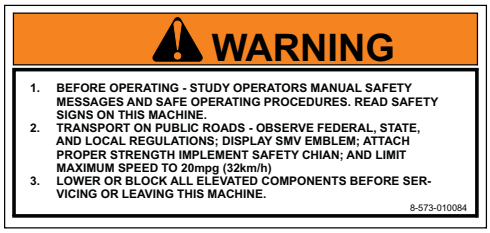
- Carefully read and follow safety sign directions.
- Keep the safety signs clean and visible.
- Replace damaged, missing, or illegible safety signs.
- Be sure any new equipment or repair parts include safety signs.

New safety signs may be ordered from your Landoll dealer. Refer to this section for parts and proper safety sign placement.

To Install new safety signs:

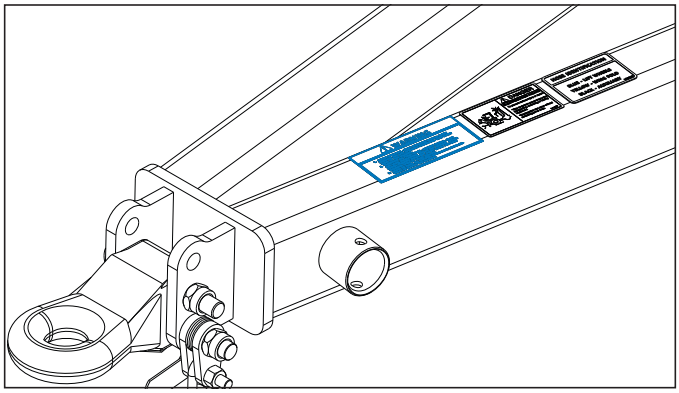
1. Remove the old damaged safety sign if still present.
2. Clean placement area to remove any dirt or grease.
3. Remove backing from new safety sign.
4. Apply the safety sign starting from one end pressing firmly and working across the safety sign being careful not to create any air bubbles.

P/N 8-573-010084
Warning: Before Operating

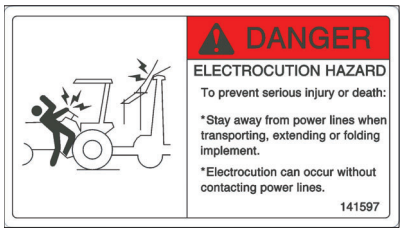


Front of hitch, 1st from left

QTY. 1

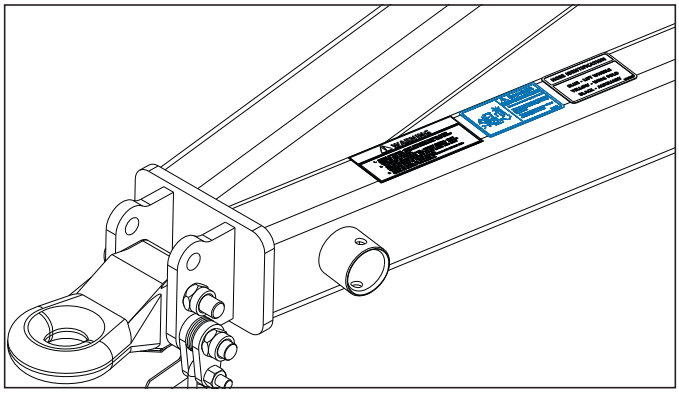


P/N 141597
Danger: Electrocution Hazard

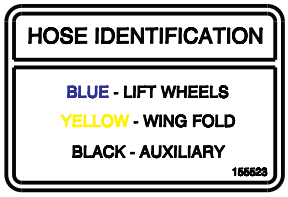


Front of hitch, 2nd from left

QTY. 1

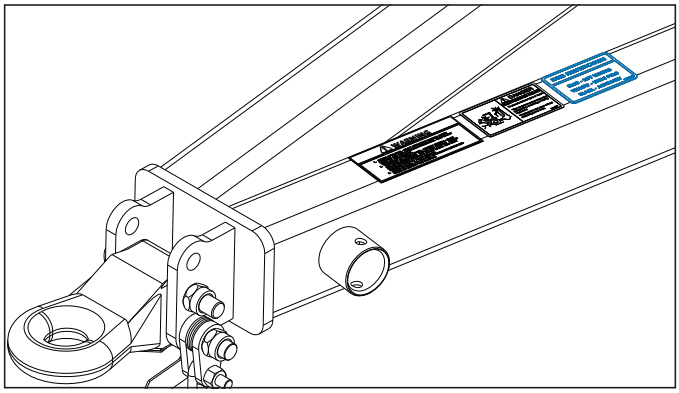


P/N 155523
Hose Identification



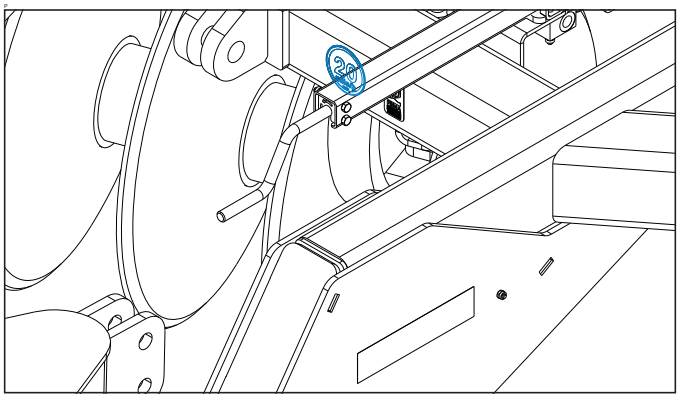
Front of hitch, 3rd from left

QTY. 1

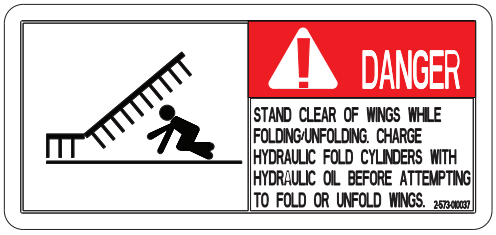


P/N 144193
SIS 20MPH

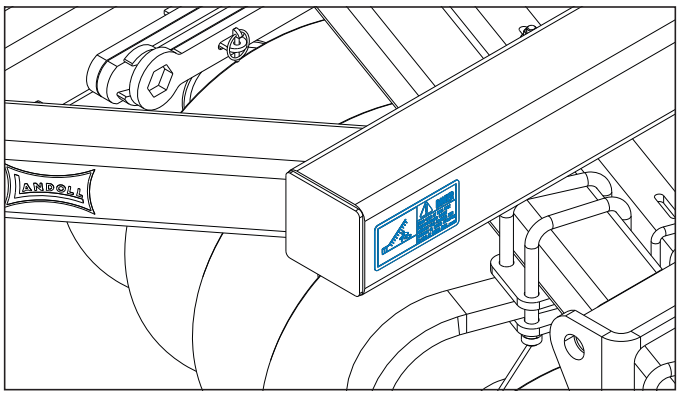
Front of center frame, middle
QTY. 1



P/N 2-573-010037
Danger: Folding wing



Front side, center frame both sides
QTY. 2



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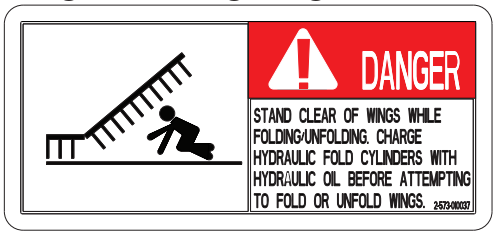
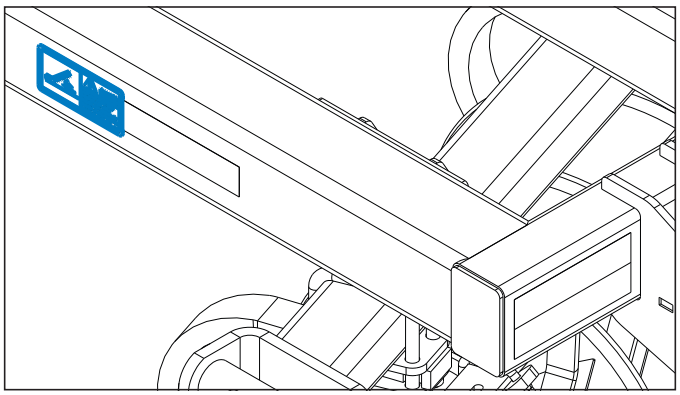
Danger: Folding wing

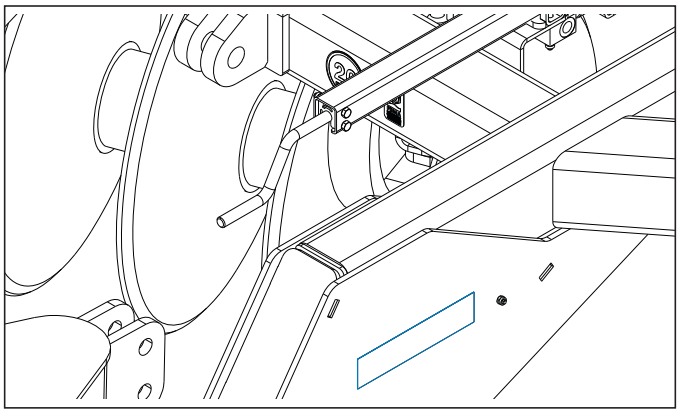


Back side, rear hinge plate, center frame, both sides
QTY. 2



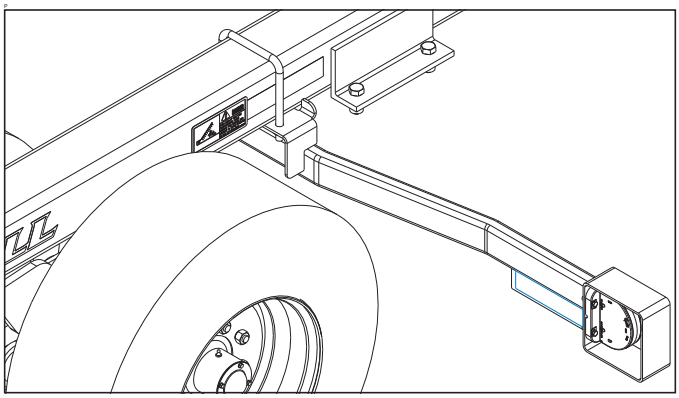
P/N 528934
Yellow Reflector

Left front, center frame, both sides
QTY. 2



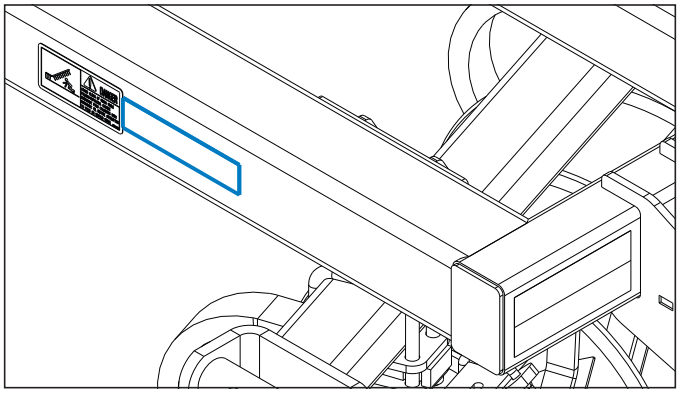
P/N 528934
Yellow Reflector

Left front, amber light bracket, both sides
QTY. 2



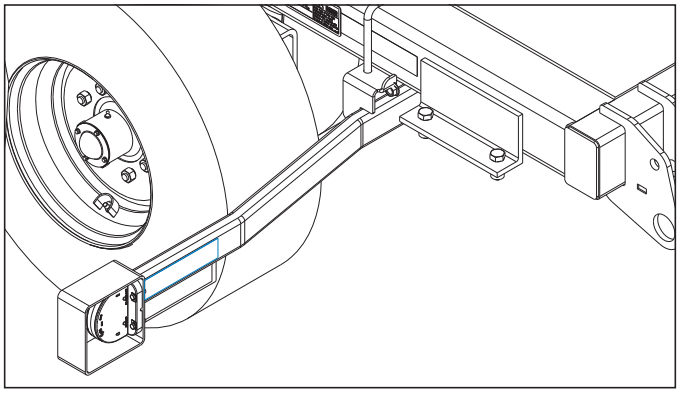
P/N 528934
Yellow Reflector

Left rear, center frame, both sides
QTY. 2



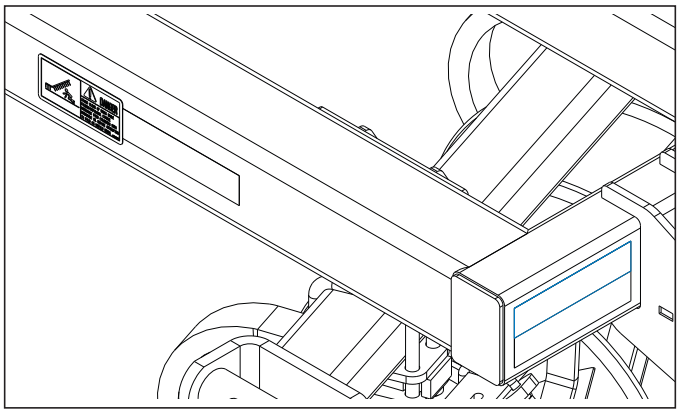
P/N 528938
Orange Reflector

Back side, light brackets, top, both sides
QTY. 2



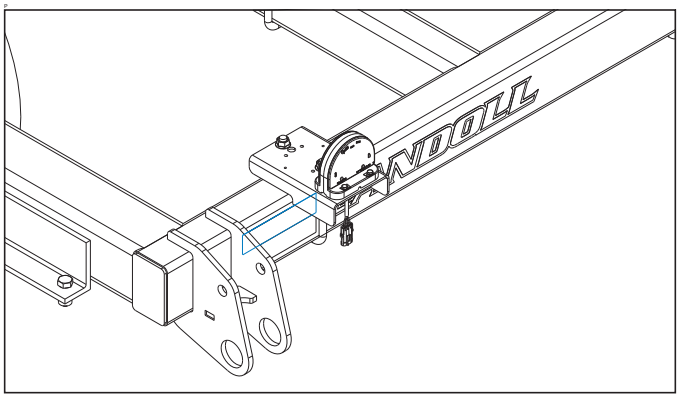
P/N 528938
Orange Reflector

Back side, center frame, top, 6231-21'-29' both sides
QTY. 2



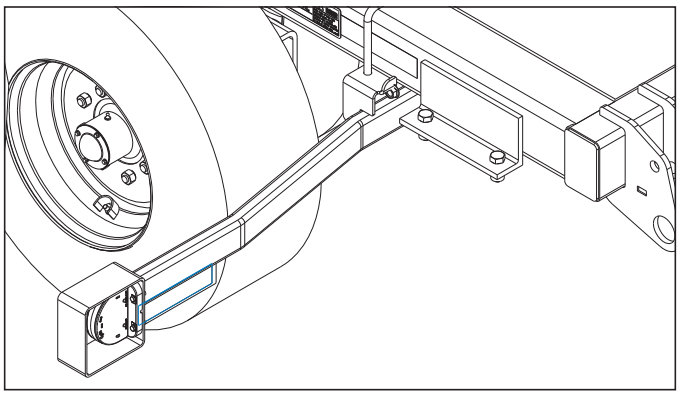
P/N 528938
Orange Reflector

Back side, center frame, top, 6231-30’-36’ both sides
QTY. 2



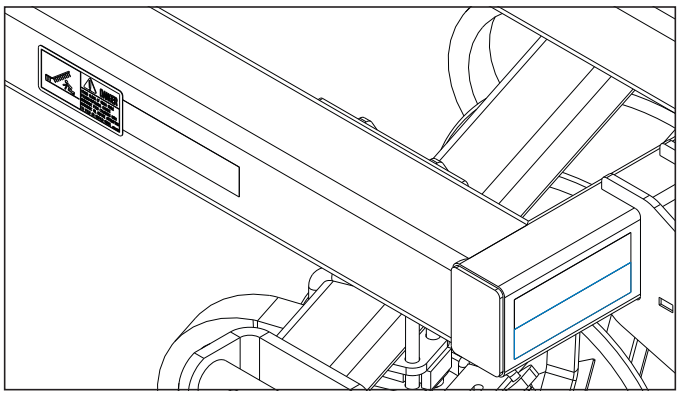
P/N 528933
Red Reflector

Back side, light brackets, bottom, both sides
QTY. 2



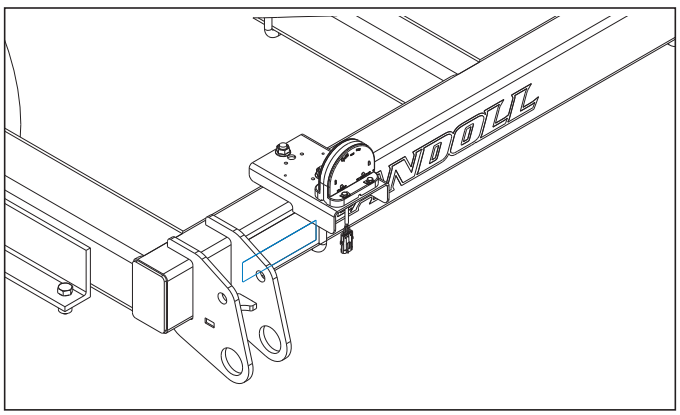
P/N 528933
Red Reflector

Back side, center frame, bottom, 6231-21’-29’ both sides
QTY. 2



P/N 528933
Red Reflector

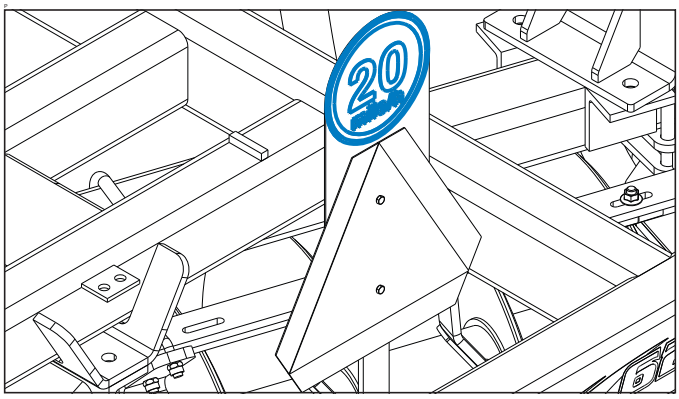
Back side, center frame, bottom, 6231-30’-36’ both sides
QTY. 2



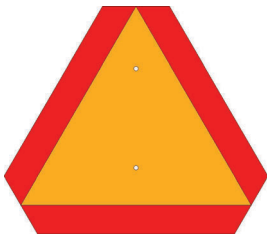
P/N 224589
SIS 20 mile/h

Back side of SIS 20MPH mount plate

QTY. 1

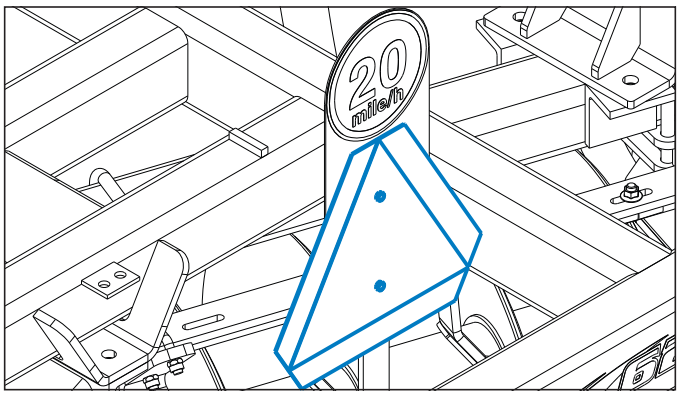


P/N 70260977
SMV Emblem



Back side, SMV mount plate

QTY. 1



P/N 528934
Yellow Reflector

Right side, rear tow hitch, both sides

QTY. 2

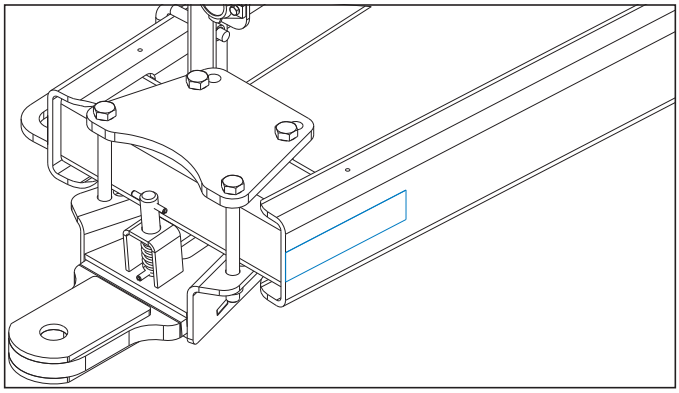


Table provided for general use.

NOTES:

Chapter 2

Specifications

Introduction

This manual is compiled as a guide for owners and operators of the 6231 Disc. Read it carefully so as to be able to follow the suggestions made. Please take time to understand the proper maintenance schedule and SAFE operation of your equipment.

In the event that a new and inexperienced operator is placed in charge of running the equipment, they should read and understand, that part of the manual for proper maintenance and SAFE operation, and to be trained in regard by an experienced operator.

Owner Assistance

If customer service or repairs are needed, contact your Landoll dealer. They have trained personnel, parts and service equipment specially designed for Landoll products. Your machine's parts should only be replaced with Landoll parts. Have the Serial Number and complete Model Number available when ordering parts from your Landoll dealer. ***See Figure 2-1***

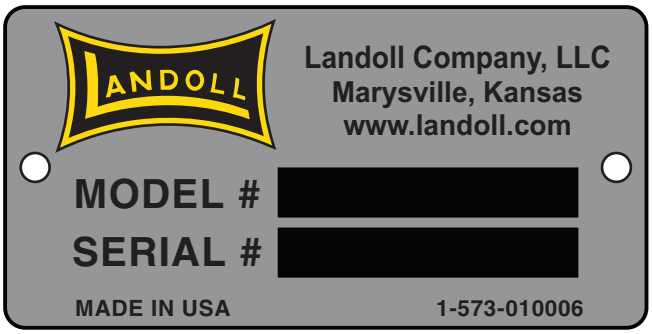


Figure 2-1: ID Plate

Warranty Registration

Be certain to register the machine Online registration at *www.landoll.com* within 10 days of purchase or lease, in order to be on file at Landoll and eligible for Warranty.

Take time to read and understand the Warranty for this product, ***See Page 2-2*** and ***See Page 2-3.***

Landoll reserves the right to make changes and/or add improvements to it's products at any time without obligation to previously manufactured equipment.

Please take time to complete the following information for your personal reference, should you need to contact your Dealer with questions or parts needs.

MODEL_____

SERIAL #_____

DATE OF PURCHASE_____

DEALER NAME_____

We at Landoll wish to thank you for purchasing our product. We have spent considerable time and effort to research, design, test and develop this machine and are confident it will serve you in the use for which it was designed.

LANDOLL TILLAGE PRODUCT THREE YEAR LIMITED WARRANTY

Landoll Company, LLC warrants each new serial numbered Whole Good Tillage product, when properly assembled, adjusted, serviced, and normally operated, to be free from defects in materials and workmanship for a period of three (3) years, unless otherwise noted, from the date of delivery. Date of delivery shall be the date the Dealer places the product in the possession of the original retail purchaser, and must be confirmed by the Dealer submitting a properly completed Landoll Company, LLC Warranty Registration Form to the Landoll Company, LLC Warranty Department. Warranty starts the day the product is rented or leased. This limited warranty shall be transferable until the expiration date.

Landoll Company, LLC shall repair, or at its option, replace any part(s) of the product determined, by Landoll Company, LLC, to be defective. Landoll Company, LLC may request the return of part(s), freight prepaid via a carrier approved by the Landoll Warranty Staff, to Landoll Company, LLC for further evaluation. If the part is determined to be defective, Landoll Company, LLC will refund the freight charges incurred in returning the defective part(s), and will prepay replacement part(s) freight charges.

This limited warranty requires pre-authorization by the Landoll Company, LLC Warranty Staff of any warranty related utilization of components or labor, and is subject to specific exclusions and does not apply to any product which has been: 1) subjected to or operated in a manner which, at any time, have exceeded the product design limits: 2) repaired or altered outside our factory in any way so as, in the judgment of Landoll Company, LLC , to affect its stability or reliability: 3) subject to misuse, negligence, accident, or has been operated in a manner expressly prohibited in the instructions; or not operated in accordance with practices approved by Landoll Company, LLC . Operating the product in soils containing rocks, stumps or obstructions may void the warranty in its entirety. Excessive acres, consistent with nonseasonal very large farming operations, and, non-agricultural activities, may further limit the terms of this warranty.

The sole obligation of Landoll Company, LLC under this warranty shall be limited to repairing or replacing, at its option, part(s) which shall be identified to Landoll Company, LLC by way of a pre-authorized Landoll Company, LLC e-mail Warranty Claim Form Warranty, expressed or implied, will be denied on any product not properly registered with the Landoll Company, LLC Warranty Department within ten (10) days of the first retail sale. As stated above, Landoll Company, LLC Warranty Staff will identify components listed on a Warranty Claim required to be returned for further analysis. All parts returned to Landoll Company, LLC must be shipped with a Return Materials Authorization (RMA) provided by the Landoll Company, LLC Warranty Staff. Defective components must returned by the purchaser to Landoll Company, LLC with transportation and freight charges prepaid within fifteen (15) days after receipt of the RMA. The examination conducted by Landoll Company, LLC of returned parts shall disclose to its satisfaction the extent the component may be detective.

All parts and labor warranty MUST be pre-authorized by Landoll Company, LLC Warranty Staff. Failure to do so may result in no warranty payment of any kind. Labor will be reimbursed in accordance with published shop rates pre-approved by the Landoll Company, LLC Warranty Staff. Time authorized for specific work will be limited, where appropriate, to the hours listed in the Landoll Company, LLC authorized Labor Rate Guide.

LANDOLL TILLAGE PRODUCT THREE YEAR LIMITED WARRANTY (Continued)

USER'S OBLIGATION:

1. Read the Operator's Manual
2. Understand the safe and correct operating procedures pertaining to the operation of the product.
3. Lubricate and maintain the product according to the maintenance schedule in the Operator's Manual.
4. Inspect machine and have parts repaired or replaced when continued use of the produce would cause damage or excessive wear to other parts.
5. Contact the Landoll Company, LLC Dealer for repair or replacement of defective parts. Mileage incurred by the Landoll Company, LLC Dealer is the customer's responsibility.

This 3-Year Limited Warranty SHALL NOT APPLY TO:
(See Warranty Procedure Manual for details.)

1. Ground Engaging Tools
2. Vendor Warranty Only Parts

WARRANTY LABOR:

1. Considered during the first year of warranty only.
2. During the second and third year:
   - Warranty labor is not covered. Customer is responsible for removing, replacing and returning the defective part(s) to the Landoll Dealer

THIS WARRANTY IS EXPRESSIVELY IN LIEU OF ALL OTHER WARRANTIES OF MATERIAL, WORKMANSHIP, DESIGN, APPLICATION OR OTHERWISE WITH RESPECT TO ANY EQUIPMENT, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND LANDOLL COMPANY, LLC SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND ON ACCOUNT OF ANY LANDOLL PRODUCT.

NO EMPLOYEE OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY, VERBALLY OR IN WRITING, OR GRANT ANY OTHER WARRANTY. LANDOLL COMPANY, LLC, WHOSE POLICY IS ONE OF CONTINUOUS IMPROVEMENT, RESERVES THE RIGHT TO MAKE CHANGES WITHOUT OBLIGATION TO MODIFY PREVIOUSLY PRODUCED EQUIPMENT.

This warranty does not expand, enlarge upon or alter in any way, the warranties provided by the original manufacturers and suppliers of component parts and accessories. This warranty excludes such parts or accessories which are not defective, but may wear out and have to be replaced during the warranty period, including, but not limited to, light bulbs, paint, and the like. (Tire Warranties are expressly excluded from Landoll Company, LLC warranty herein.) Purchaser is expected to pay all repairs or replacement costs, in connection with this Agreement, including sales and other taxes immediately upon completion of work performed.

LIMITATION OF LIABILITY: Landoll Company, LLC shall not be liable to purchaser for any incidental or consequential damages suffered by the purchaser, including, but not limited to, any commercially reasonable charges, expenses or commissions incurred in connection with effecting cover or any other reasonable expense incident to the delay or other breach of warranty by Landoll Company, LLC, loss of anticipated profits, transportation expenses due to repairs, non-operation or increased expense of operation costs of purchased or replaced equipment, claim of customers, cost of money, any loss of use of capital or revenue, equipment rental, service trips, or for any special damage or loss of any nature arising at any time or from any cause whatsoever.

LIMITATION OF REMEDY: In the event of Landoll Company, LLC failure to repair the product subject to the warranty contained herein, the purchaser's sole and exclusive remedy against Landoll Company, LLC shall be for the repair or replacement of any defective part or parts of the product subject to work or repair within the time period and manner set forth herein.

This exclusive remedy shall not be deemed to have failed of its essential purpose so long as Landoll Company, LLC is willing and able to repair or replace defective parts in the prescribed manner.

General Torque Specifications (rev. 4/97)

TORQUE SPECIFIED IN FOOT POUNDS

This chart provides tightening torques for general purpose applications when special torques are not specified on process or drawing. Assembly torques apply to plated nuts and cap-screws assembled without supplemental lubrication (as received condition). They do not apply if special graphite moly-disulfide or other extreme pressure lubricants are used. When fasteners are dry (solvent cleaned) add 33% to as received condition torque. Bolt head identification marks indicate grade and may vary from manufacturer to manufacturer. Thick nuts must be used on grade 8 cap-screws. Use value in [ ] if using prevailing torque nuts.

UNC SIZE	SAE Grade 2	SAE Grade 5	SAE Grade 8	UNF SIZE	SAE Grade 2	SAE Grade 5	SAE Grade 8
1/4-20	4 [5]	6 [7]	9 [11]	1/4-28	5 [6]	7 [9]	10 [12]
5/16-18	8 [10]	13 [13]	18 [22]	5/16-24	9 [11]	14 [17]	20 [25]
3/8-16	15 [19]	23 [29]	35 [42]	3/8-24	17 [21]	25 [31]	35 [44]
7/16-14	24 [30]	35 [43]	55 [62]	7/16-20	27 [34]	40 [50]	60 [75]
1/2-13	35 [43]	55 [62]	80 [100]	1/2-20	40 [50]	65 [81]	90 [112]
9/16-12	55 [62]	80 [100]	110 [137]	9/16-18	60 [75]	90 [112]	130 [162]
5/8-11	75 [94]	110 [137]	170 [212]	5/8-18	85 [106]	130 [162]	180 [225]
3/4-10	130 [162]	200 [250]	280 [350]	3/4-16	150 [188]	220 [275]	320 [400]
7/8-9	125 [156]	320 [400]	460 [575]	7/8-14	140 [175]	360 [450]	500 [625]
1-8	190 [237]	480 [506]	680 [850]	1-14	210 [263]	540 [675]	760 [950]
1-1/8-7	270 [337]	600 [750]	960 [1200]	1-1/8-12	300 [375]	660 [825]	1080 [1350]
1-1/4-7	380 [475]	840 [1050	1426 [1782]	1-1/4-12	420 [525]	920 [1150]	1500 [1875]
1-3/8-6	490 [612]	1010 [1375]	1780 [2225]	1-3/8-12	560 [700]	1260 [1575]	2010 [2512]
1-1/2-6	650 [812]	1460 [1825]	2360 [2950]	1-1/2-12	730 [912]	1640 [2050]	2660 [3325]
1-3/4-5	736 [920]	1651 [2063]	2678 [3347]	1-3/4-12	920 [1150]	2063 [2579]	3347 [4183]

METRIC:

Coarse thread metric class 10.9 fasteners and class 10.0 nuts and through hardened flat washers, phosphate coated, Rockwell “C” 38-45. Use value in [ ] if using prevailing torque nuts.

Nominal thread diameter (mm)	Newton Meters (Standard Torque)	Foot Pounds (Standard Torque)	Nominal Thread Diameter (mm)	Newton Meters (Standard Torque)	Foot Pounds (Standard Torque
6	10 [14]	7 [10]	20	385 [450]	290 [335]
7	16 [22]	12 [16]	24	670 [775]	500 [625]
8	23 [32]	17 [24]	27	980 [1105]	730 [825]
10	46 [60]	34 [47]	30	1330 [1470]	990 [1090]
12	80 [125]	60 [75]	33	1790 [1950]	1340 [1450]
14	125 [155]	90 [115]	36	2325 [2515]	1730 [1870]
16	200 [240]	150 [180]	39	3010 [3210]	2240 [2380]
18	275 [330]	205 [245]	----------	----------	----------

Table 2-1: General Torque Specifications

Hydraulic Fitting Torque Specifications

TORQUE IS SPECIFIED IN FOOT POUNDS- 37° JIC, ORS, & ORB (REV. 10/97)

This chart provides tightening torques for general purpose applications when special torques are not specified on process or drawing. Assembly torques apply to plated nuts and capscrews assembled without supplemental lubrication (as received condition). They do not apply if special graphite moly-disulfide or other extreme pressure lubricants are used. When fasteners are dry (solvent cleaned) add 33% to as received condition torque. Bolt head identification marks indicate grade and may vary from manufacturer to manufacturer. Thick nuts must be used on grade 8 capscrews. Use value in [ ] if using prevailing torque nuts.

Parker Brand Fittings

Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-13	15-17	13-15
-5	14-16	----------	21-23
-6	20-22	34-36	25-29
-8	43-47	58-62	40-44
-10	55-65	100-110	58-62
-12	80-90	134-146	75-85
-16	115-125	202-218	109-121
-20	160-180	248-272	213-237
-24	185-215	303-327	238-262
-32	250-290	----------	310-340

Gates Brand Fittings

Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	10-11	10-12	14-16
-5	13-15	----------	----------
-6	17-19	18-20	24-26
-8	34-38	32-40	37-44
-10	50-56	46-56	50-60
-12	70-78	65-80	75-83
-14	----------	65-80	----------
-16	94-104	92-105	111-125
-20	124-138	125-140	133-152
-24	156-173	150-180	156-184
-32	219-243	----------	----------

Aeroquip Brand Fittings

Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-12	10-12	14-16
-5	15-16	----------	16-20
-6	18-20	18-20	24-26
-8	38-42	32-35	50-60
-10	57-62	46-50	75-80
-12	79-87	65-70	125-135
-14	----------	----------	160-180
-16	108-113	92-100	200-220
-20	127-133	125-140	210-280
-24	158-167	150-165	270-360
-32	245-258	----------	----------

Table 2-2: Hydraulic Fitting Torque Specifications

Model Specifications

6231 Disc										
Model Number	Working Width	Transport Width	Transport Height	Blade Diamaeter	No. of Blades	No. of Bearings	Tire Size & Ply	Spindle & Size	Wheel Bolt Pattern	Estimated
6231-21	20'-7"	14'-0"	9'-11"	24"	28/30		12.5L x 15 LRF	3"	8 Bolt	13,020
6231-23	23'-4"	14'-0"	11'-3"	24"	32/34		12.5L x 15 LRF	3"	8 Bolt	14,480
6231-26	26'-2"	14'-0"	12'-6"	24"	36/38		380/55R - 16.5	3"	8 Bolt	15,010
6231-29	28'-11"	14'-0"	13'-10"	24"	40/42		380/55R - 16.5	3"	8 Bolt	16,362
6231-30	30'-4"	17'-7"	12'-9"	24"	42/44		410/50R - 16.5	3"	8 Bolt	18,251
6231-33	33'-1"	17'-7"	14'-0"	24"	46/48		410/50R - 16.5	3"	8 Bolt	19,987
6231-36	35'-10"	17'-7"	15'-4"	24"	50/52		410/50R - 16.5	3"	8 Bolt	20,360
NOTE: Specifications Are Subject To Change Without Prior Notification										

Tire Inflation			
Tire Size	Tire Manufacturer	Ply/Load Rating	Inflation Pressure (Psi) (Max.)
IF 320/70 R15	Firestone	Load Index 144, 6,150 LBS. @40 MPH	70 psi.
380/55R - 16.5	Goodyear	Load Index 150A8/B7400 LBS. @30 MPH	74 psi.
380/55R - 16.5 IMP	BKT	Load Index 150A8/B7400 LBS. @30 MPH	74 psi.
20.5 x 8.0 - 10		Load Range D/1,320 LBS.	70 psi.
410/50R X 16.5 IMP	BKT	LOAD INDEX 153A8/B/8,050 LBS. @ 30MPH	73psi

Recommended Torque Specification For Lug Bolts and Nuts	
Bolt Size	Torque (FT. LBS.)
5/8-18 (Heavy Duty Disc)	85 - 100 FT. LBS.
Disc Gang Shaft	1250 - 1500 FT. LBS.

Table provided for general use.

NOTES:

Wing Stabilizer & Light Bracket Placement

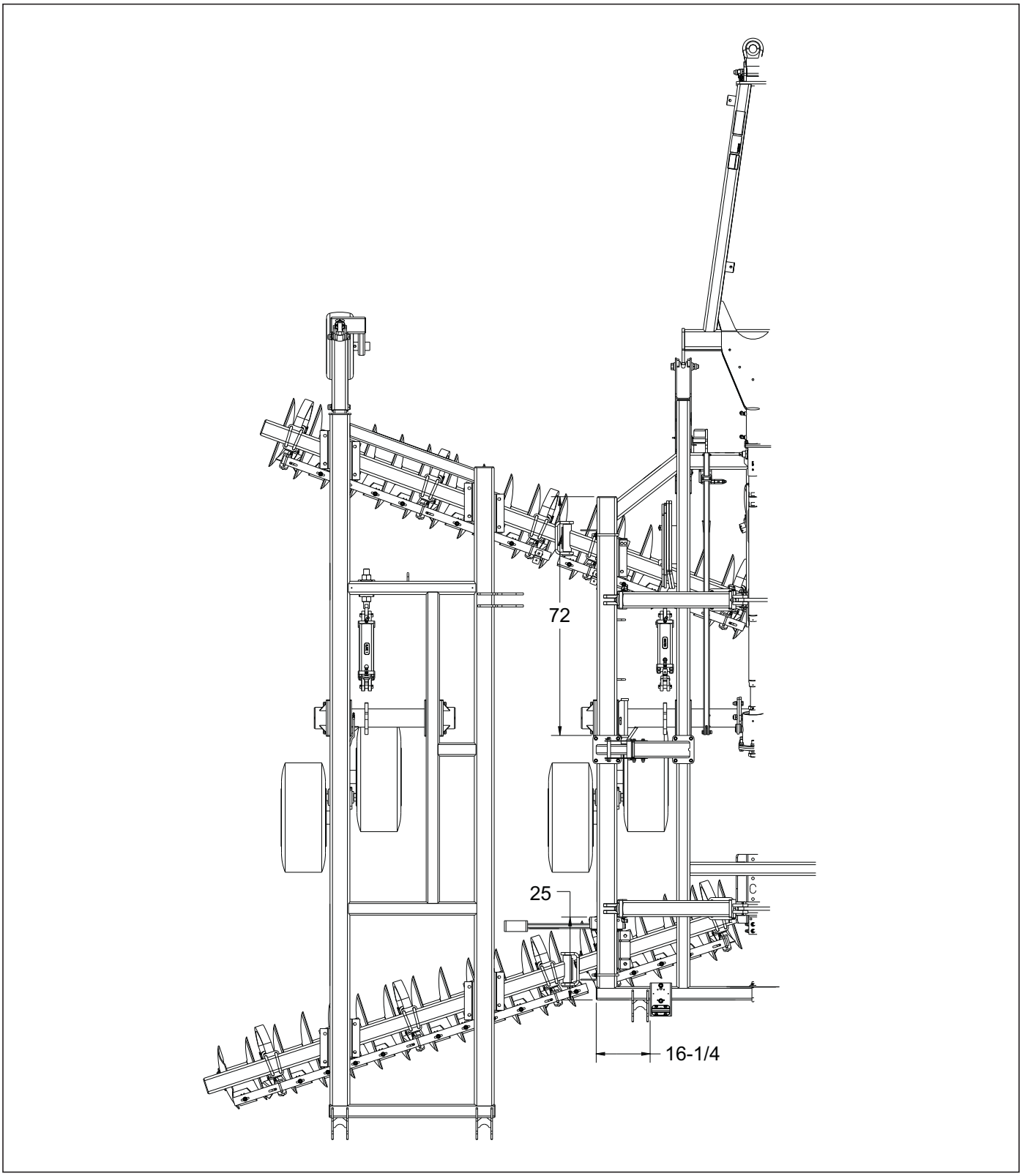


Figure 2-2: Wing Stabilizer and Light Bracket Placement - 21' - 29' (Left Half)

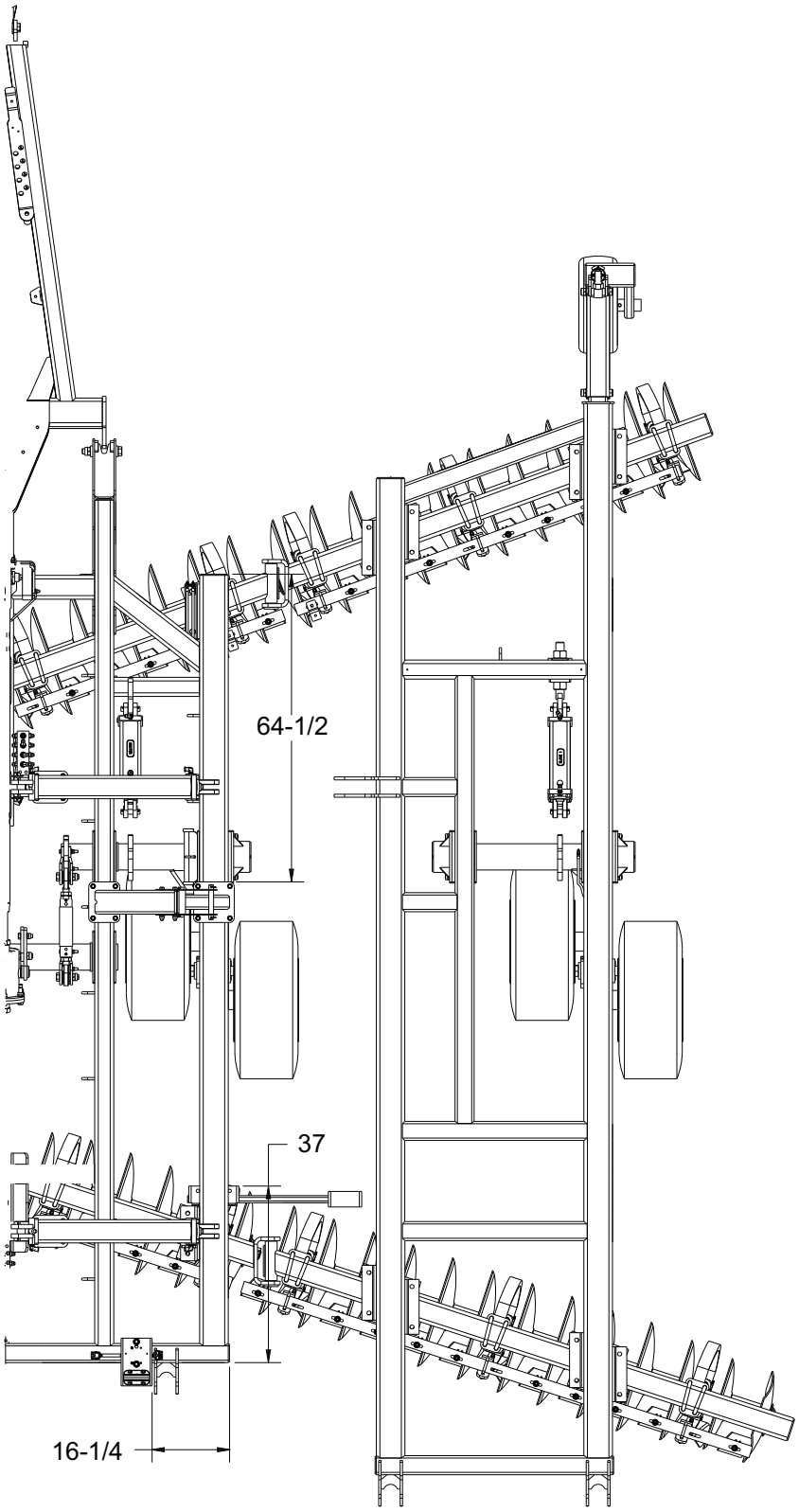


Figure 2-3: Wing Stabilizer and Light Bracket Placement - 21' - 29' (Right Half)

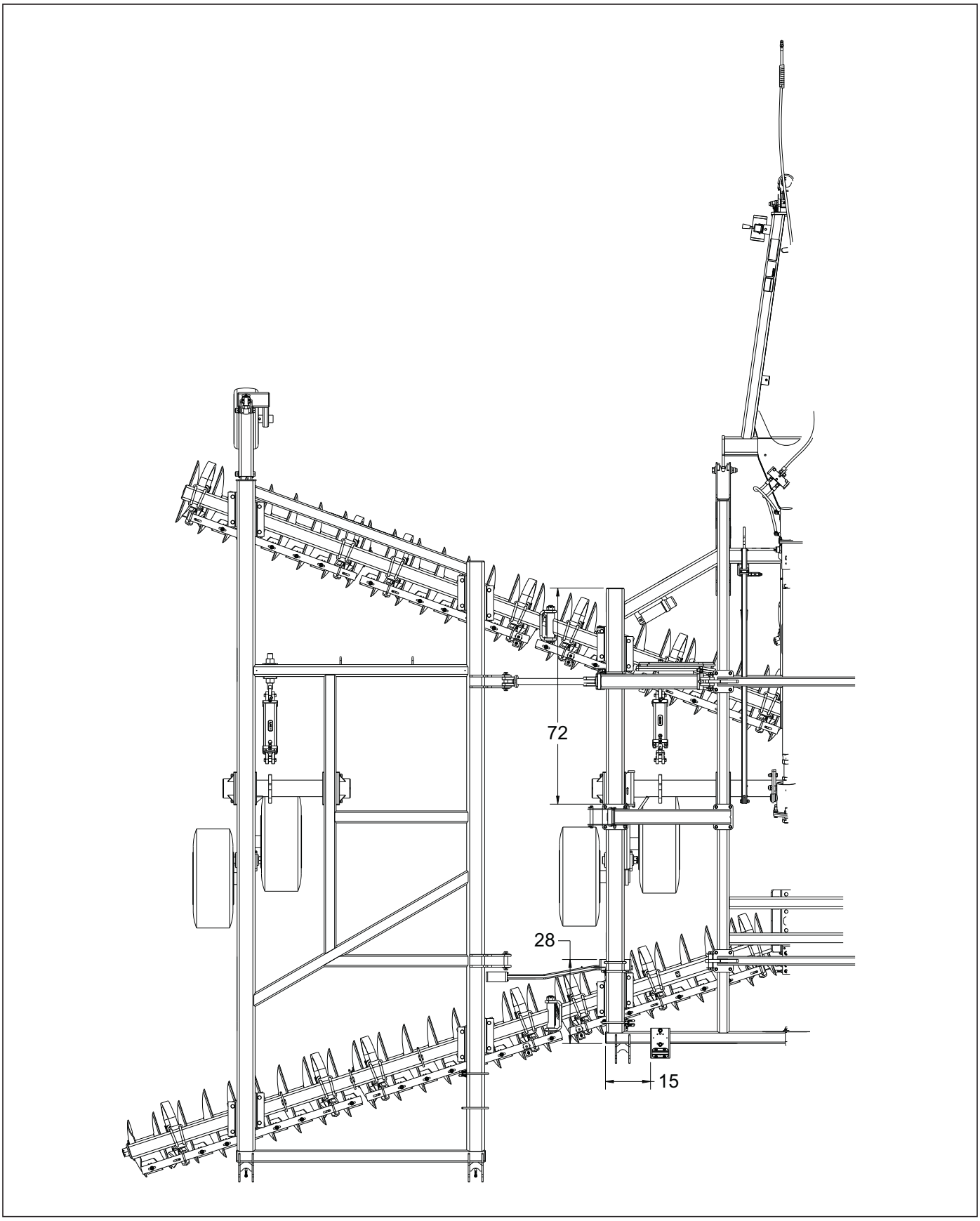


Figure 2-4: Wing Stabilizer and Light Bracket Placement - 30’-36' (Left Half)

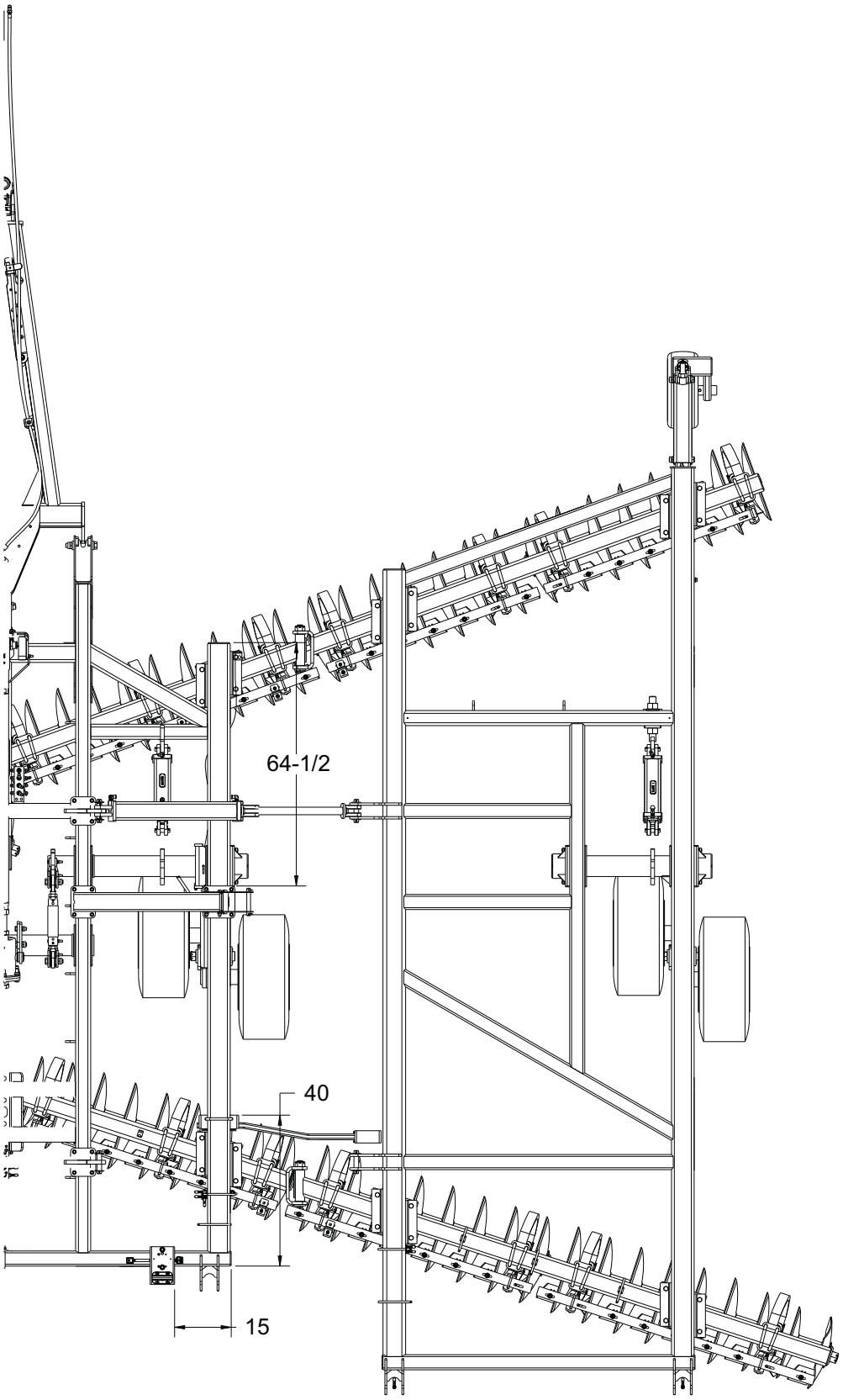


Figure 2-5: Wing Stabilizer and Light Bracket Placement - 30’-36' (Right Half)

3 Row Coil Tine Harrow Placement

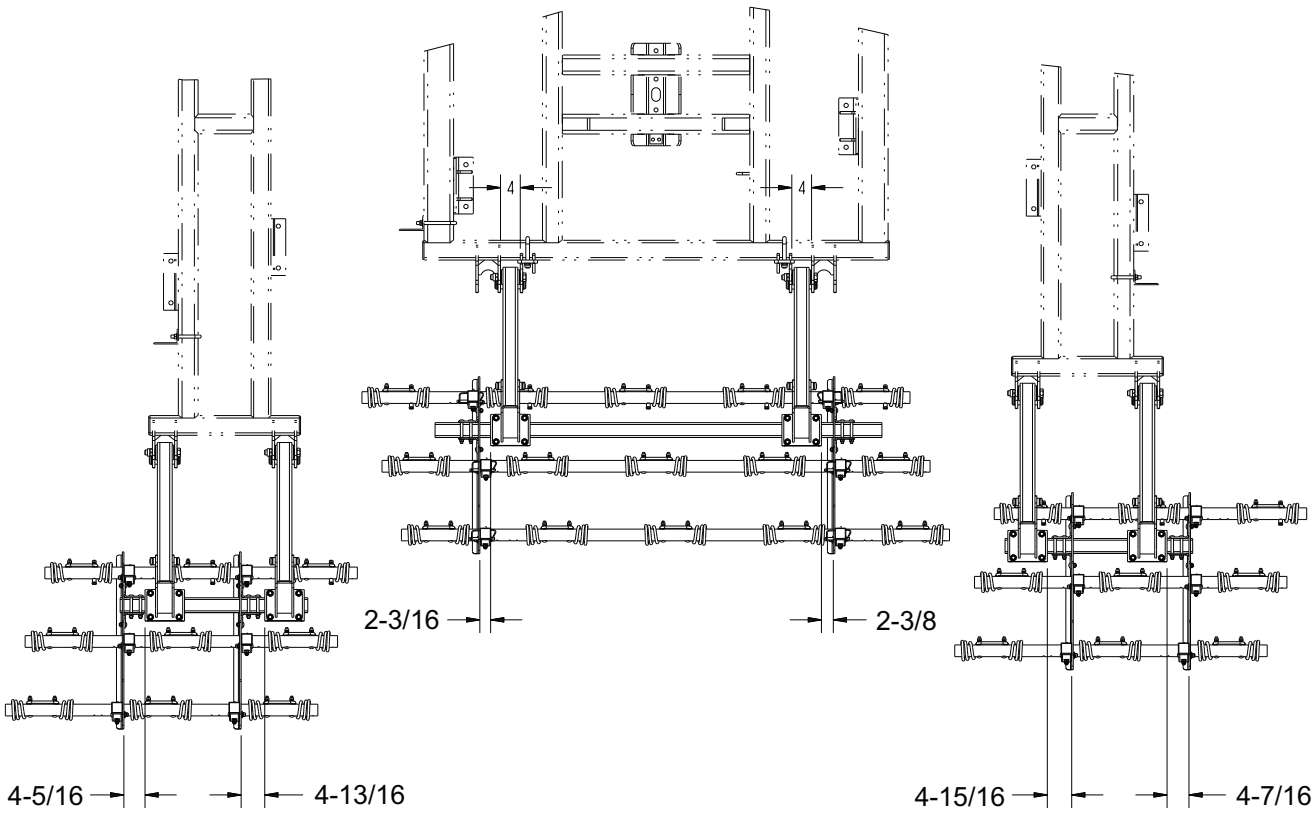


Figure 2-6: 3 Row Coil Tine Harrow Placement - 21'

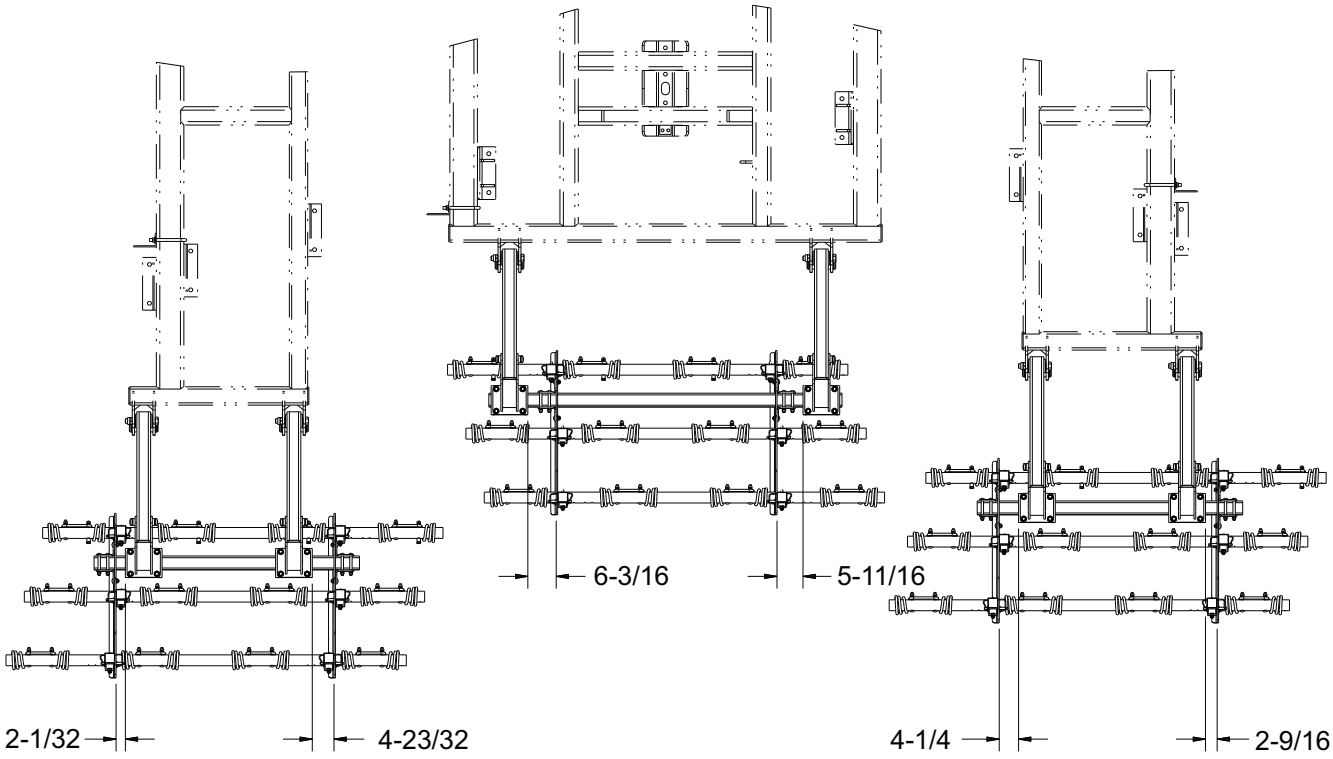


Figure 2-7: 3 Row Coil Tine Harrow Placement - 23'

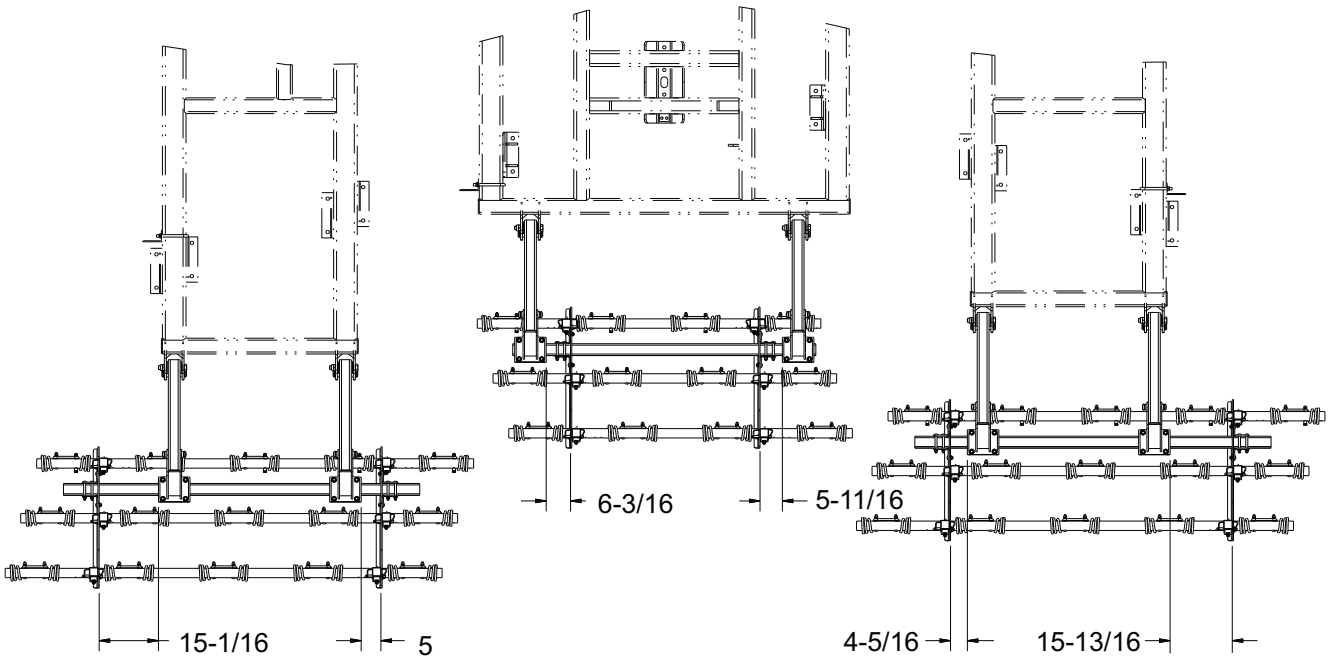


Figure 2-8: 3 Row Coil Tine Harrow Placement - 26'

Table provided for general use.

NOTES:

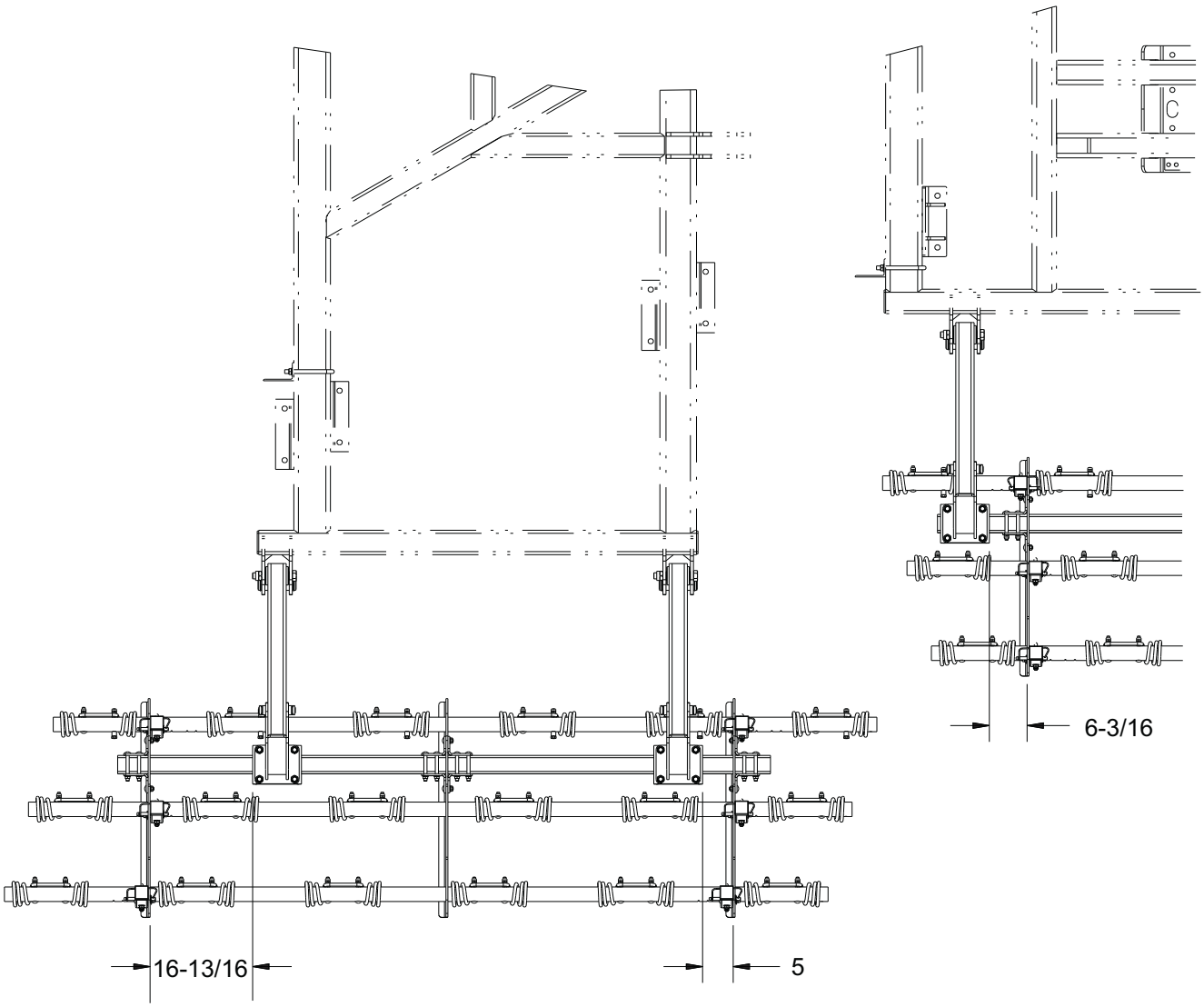


Figure 2-9: 3 Row Coil Tine Harrow Placement - 29' (Left Half)

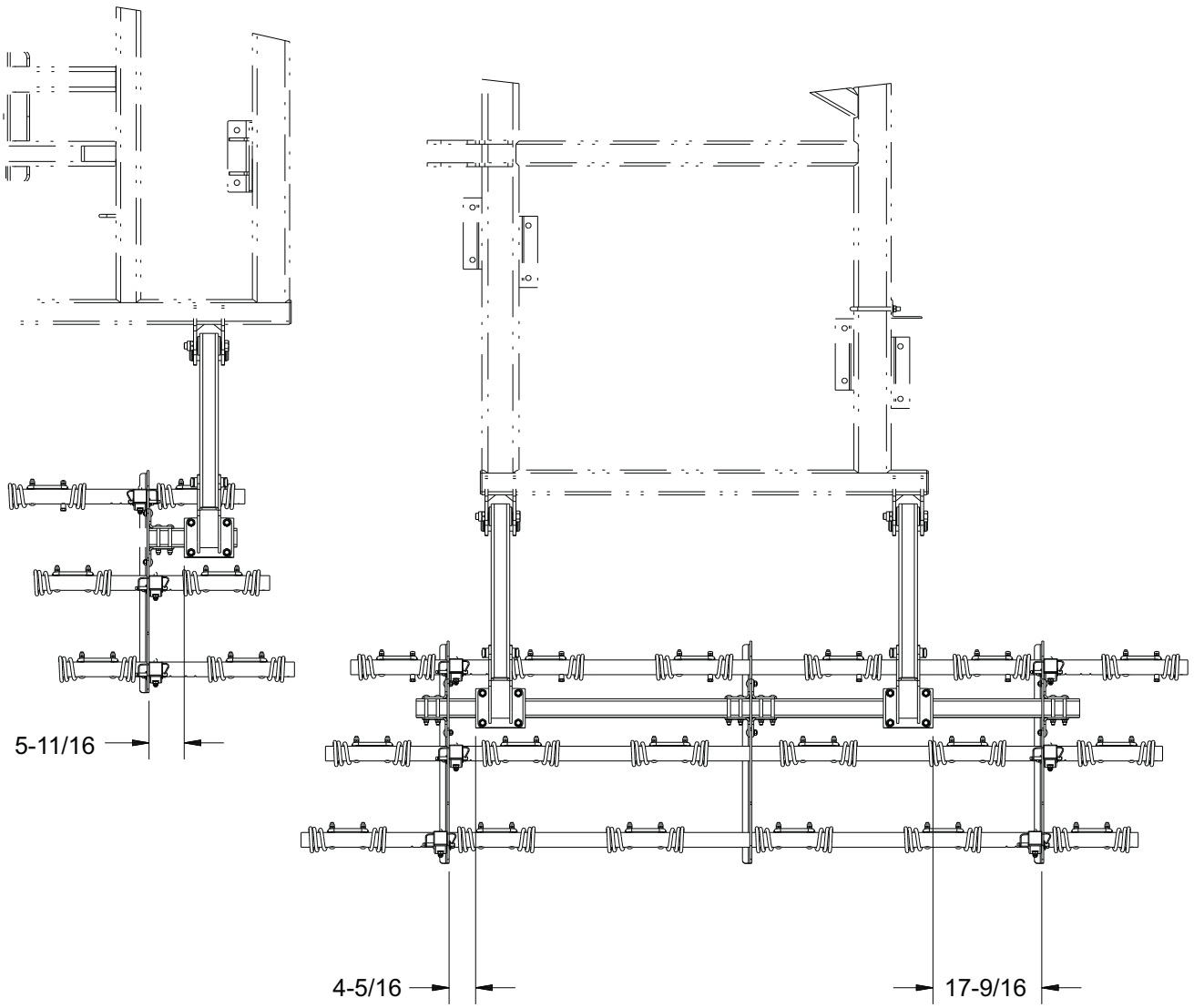


Figure 2-10: 3 Row Coil Tine Harrow Placement - 29' (Right Half)

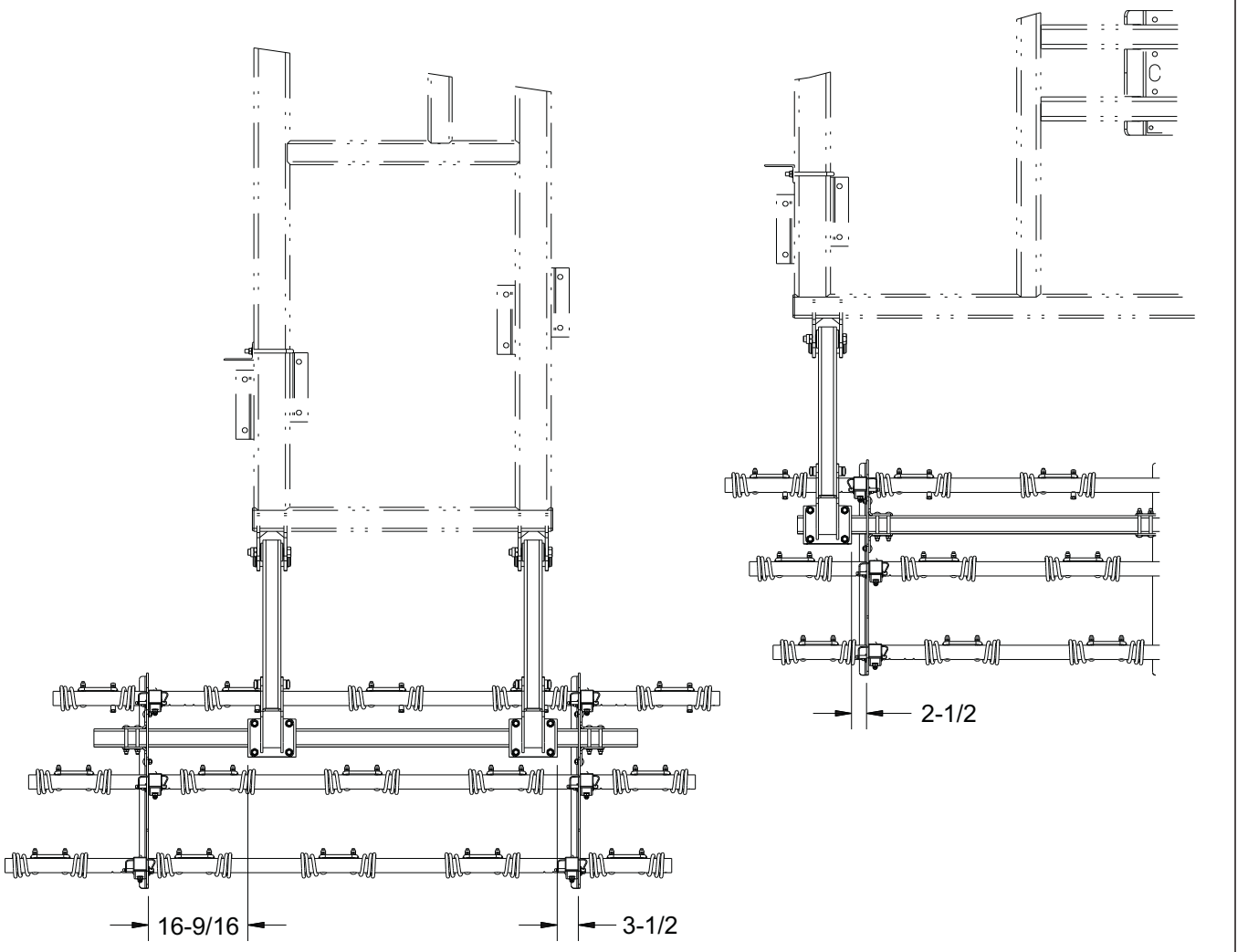


Figure 2-11: 3 Row Coil Tine Harrow Placement - 30' (Left Half)

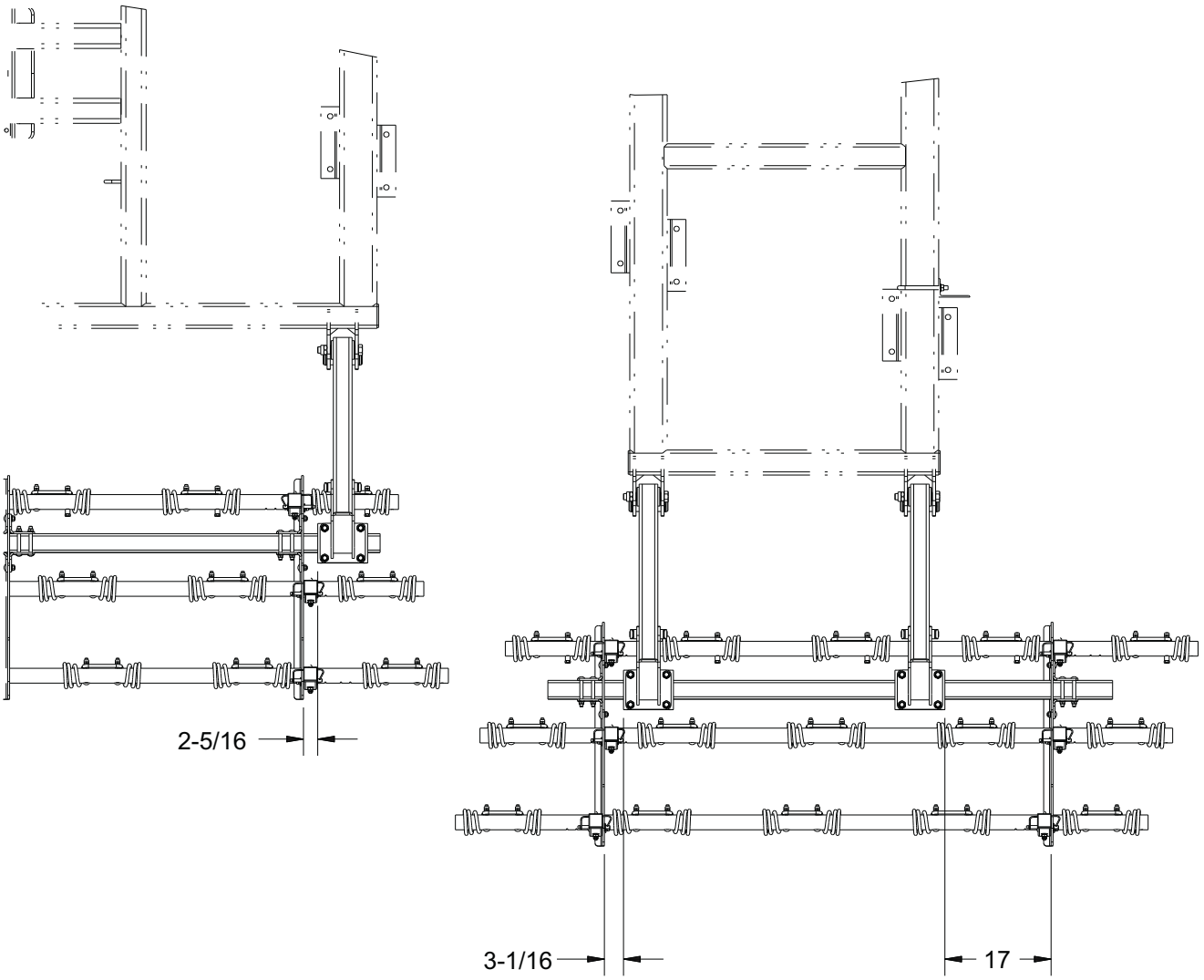


Figure 2-12: 3 Row Coil Tine Harrow Placement - 30' (Right Half)

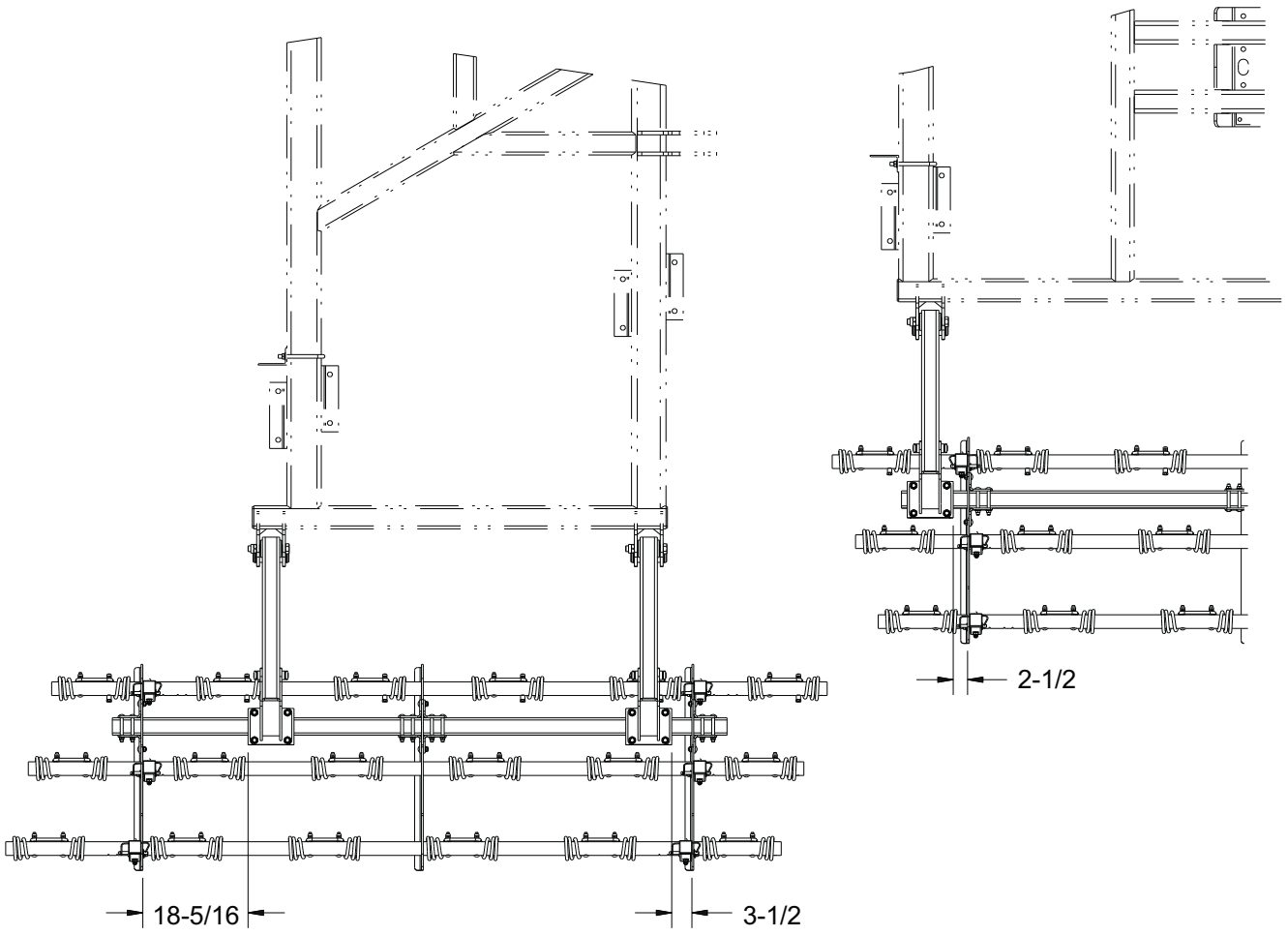


Figure 2-13: 3 Row Coil Tine Harrow Placement - 33' (Left Half)

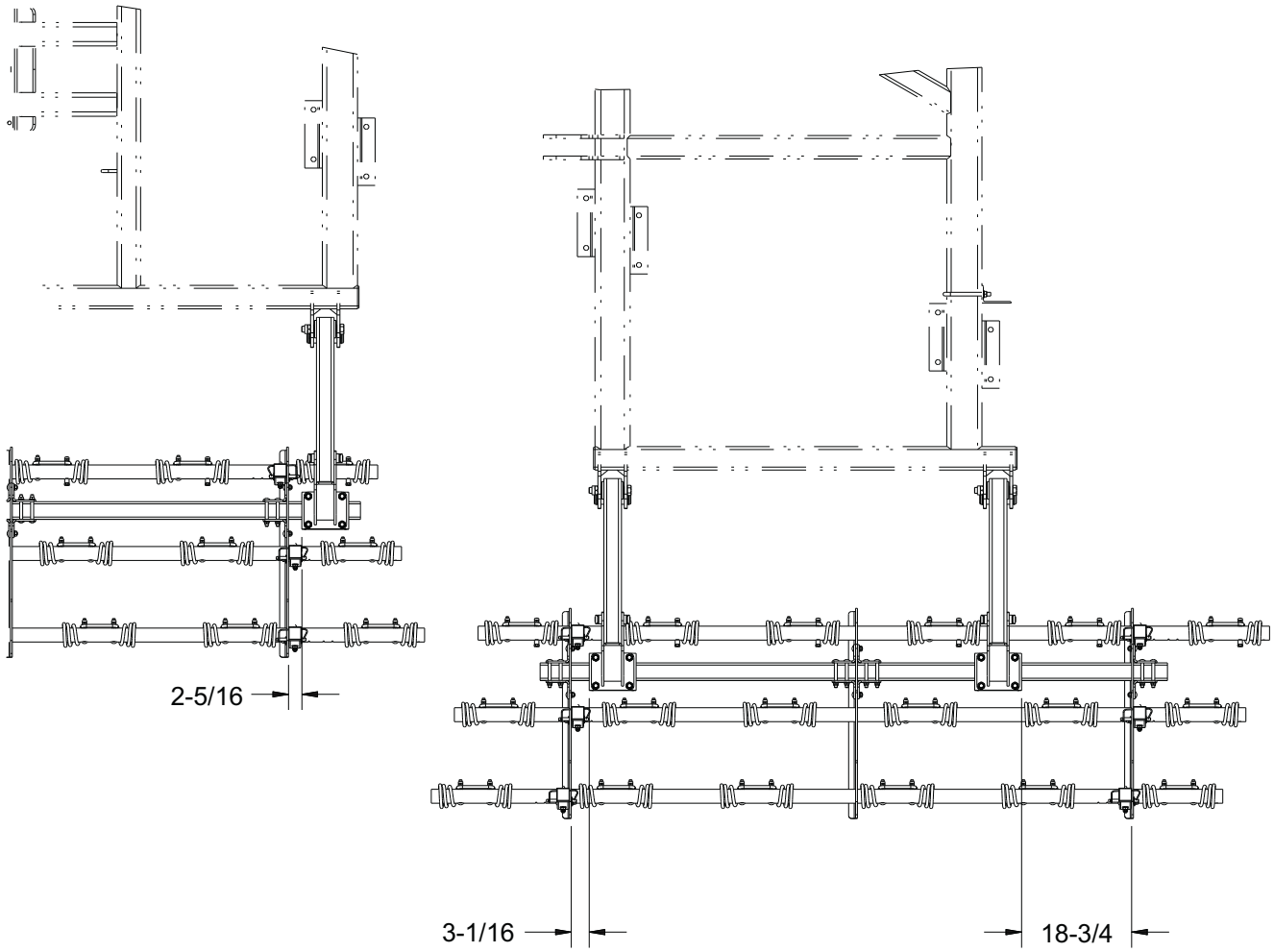


Figure 2-14: 3 Row Coil Tine Harrow Placement - 33' (Right Half)

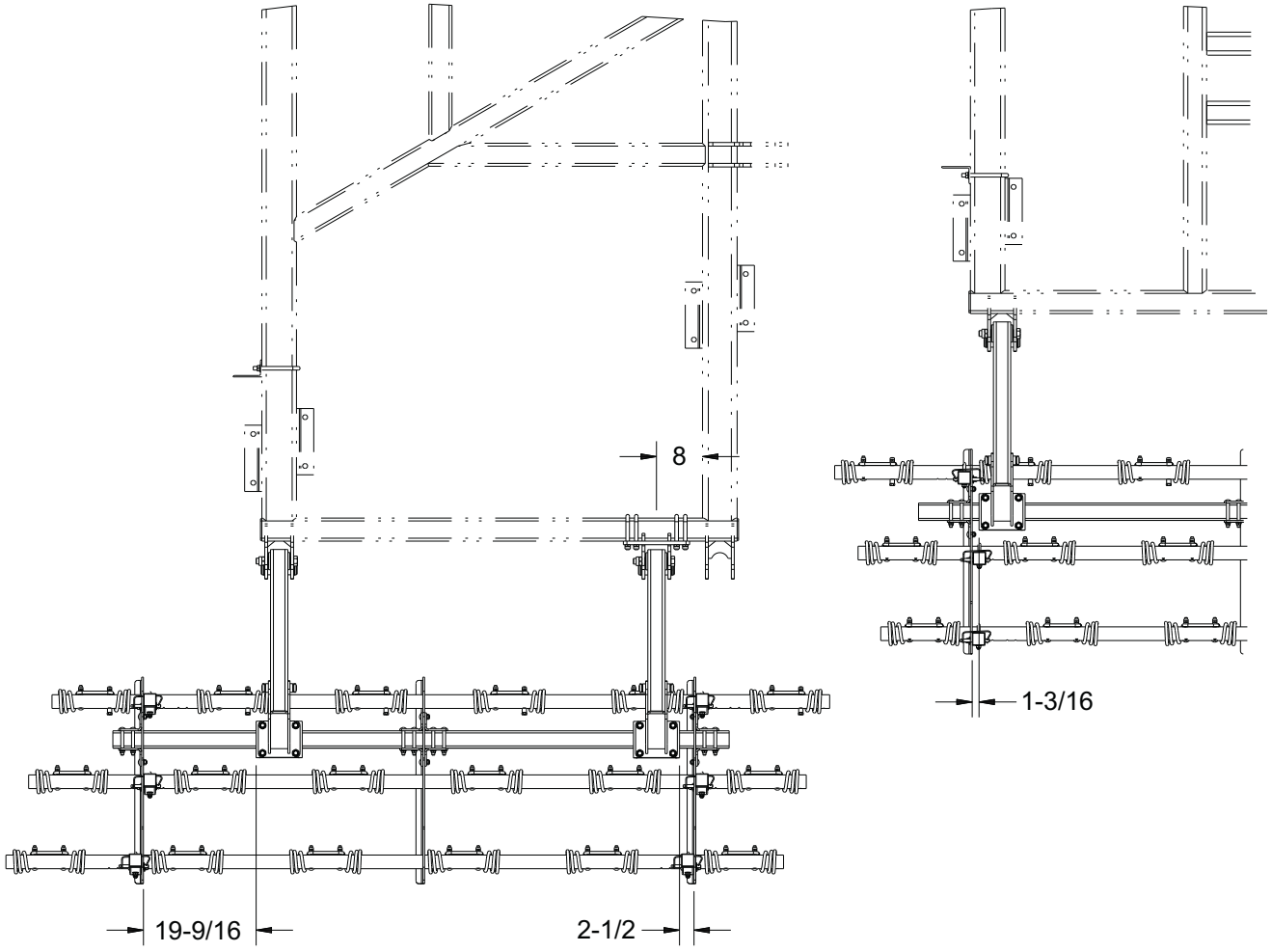


Figure 2-15: 3 Row Coil Tine Harrow Placement - 36' (Left Half)

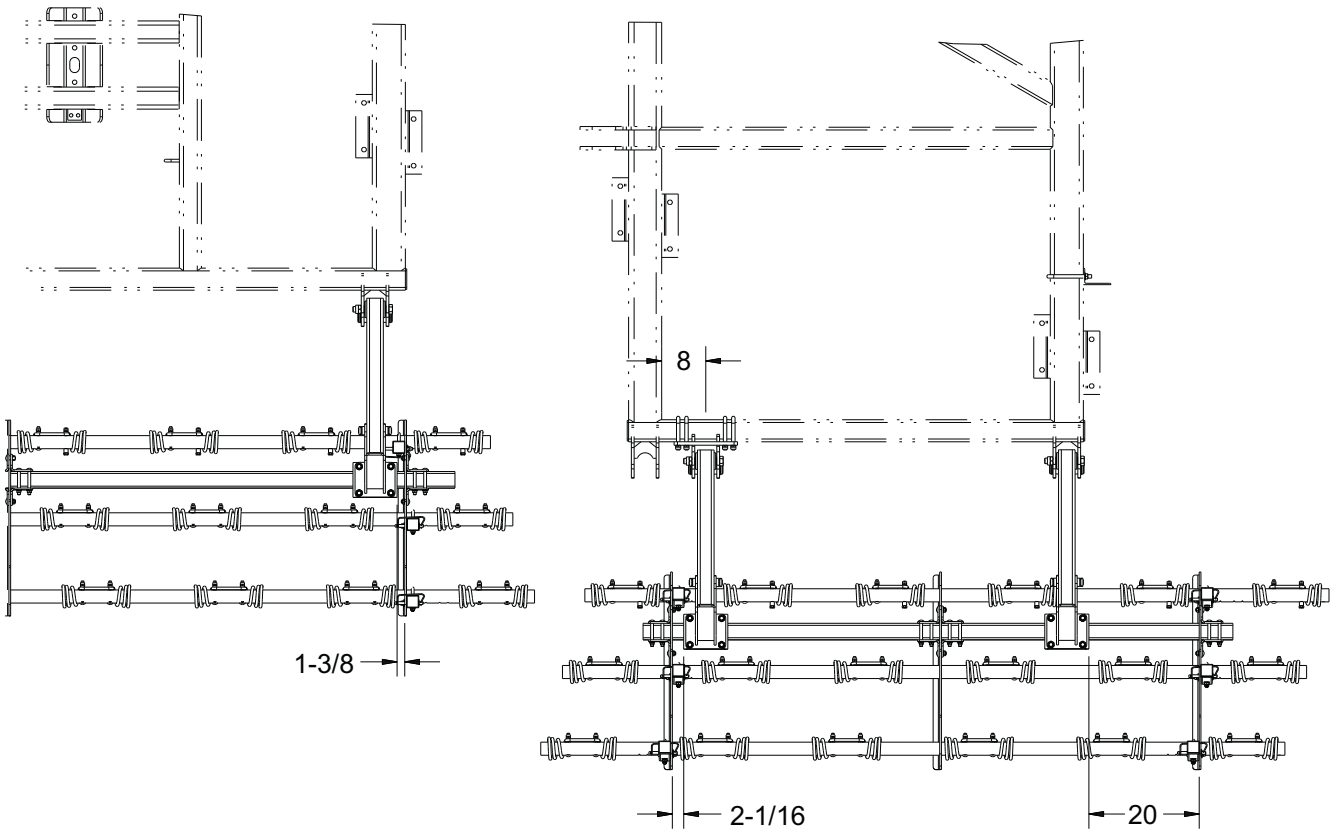
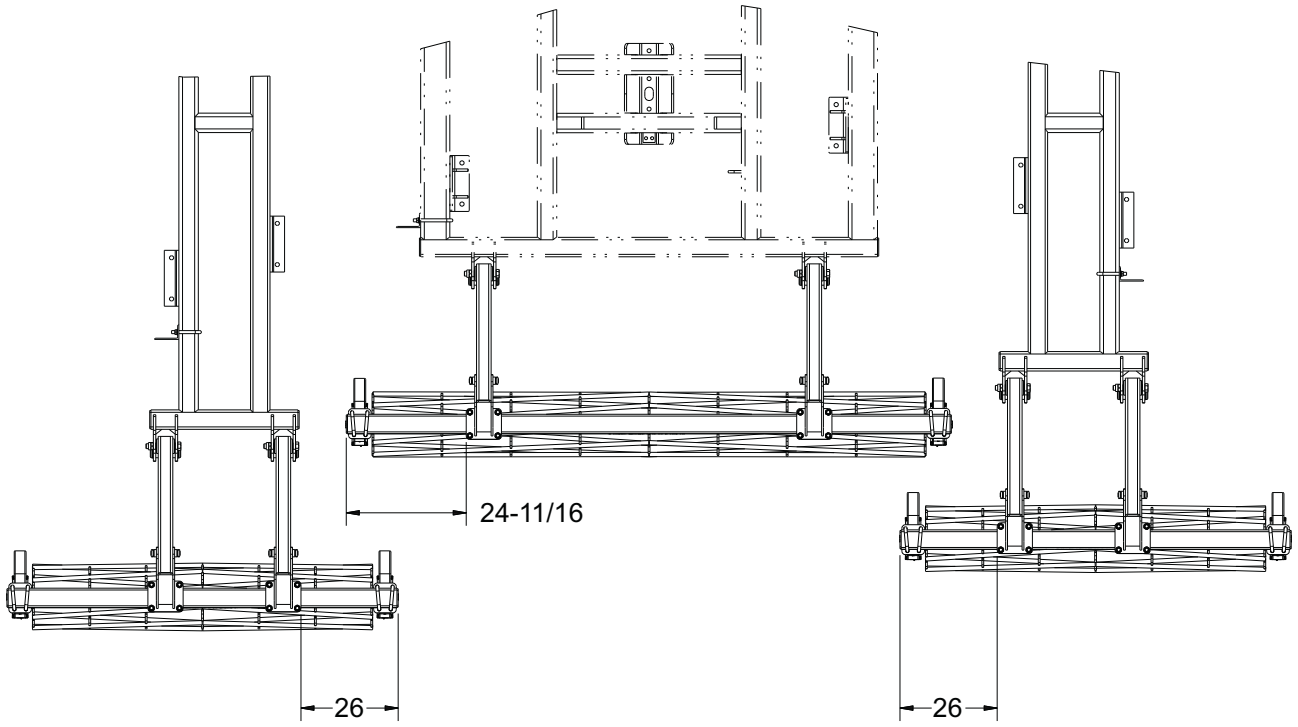


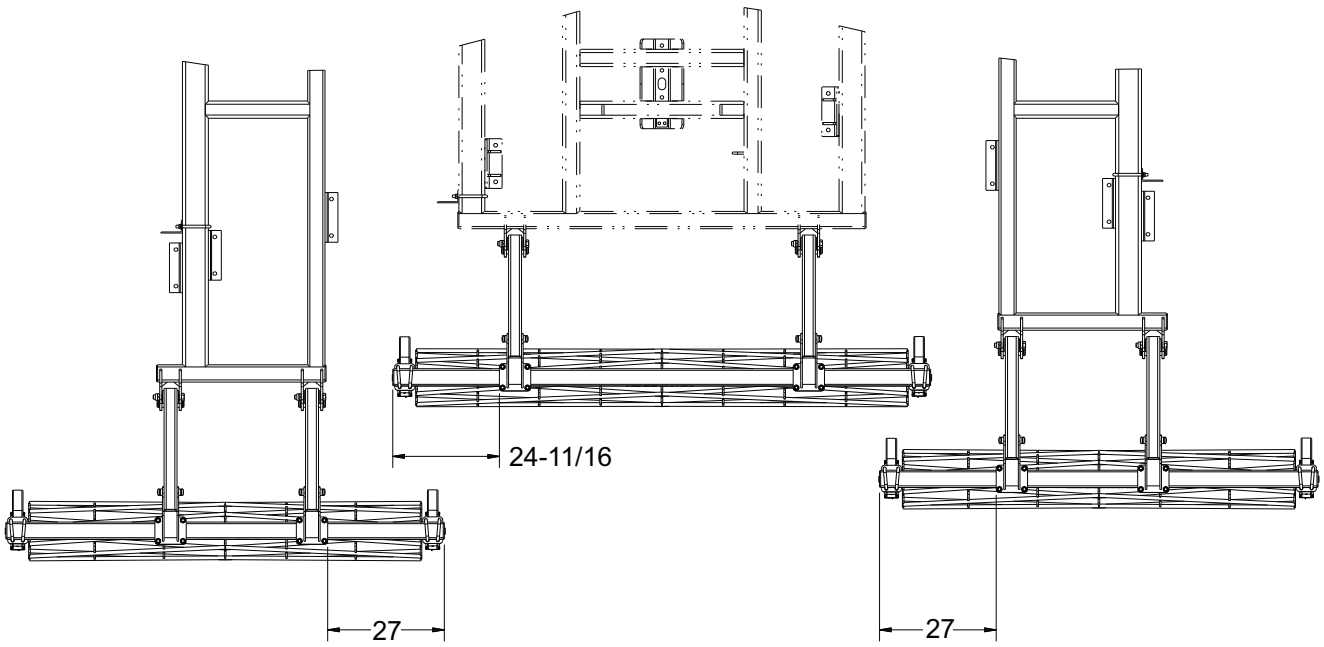
Figure 2-16: 3 Row Coil Tine Harrow Placement - 36' (Right Half)

Conditioner Reel Placement



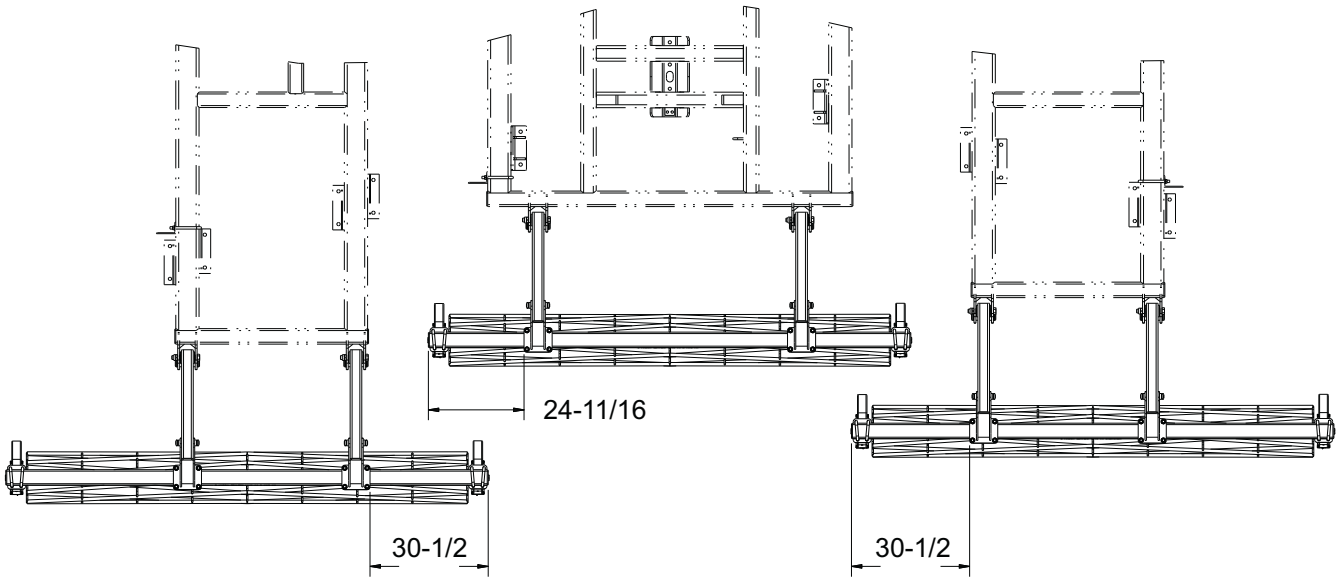
82” REEL ASSEMBLY **114” REEL ASSEMBLY** **82” REEL ASSEMBLY**

Figure 2-17: Conditioner Reel Placement - 21'



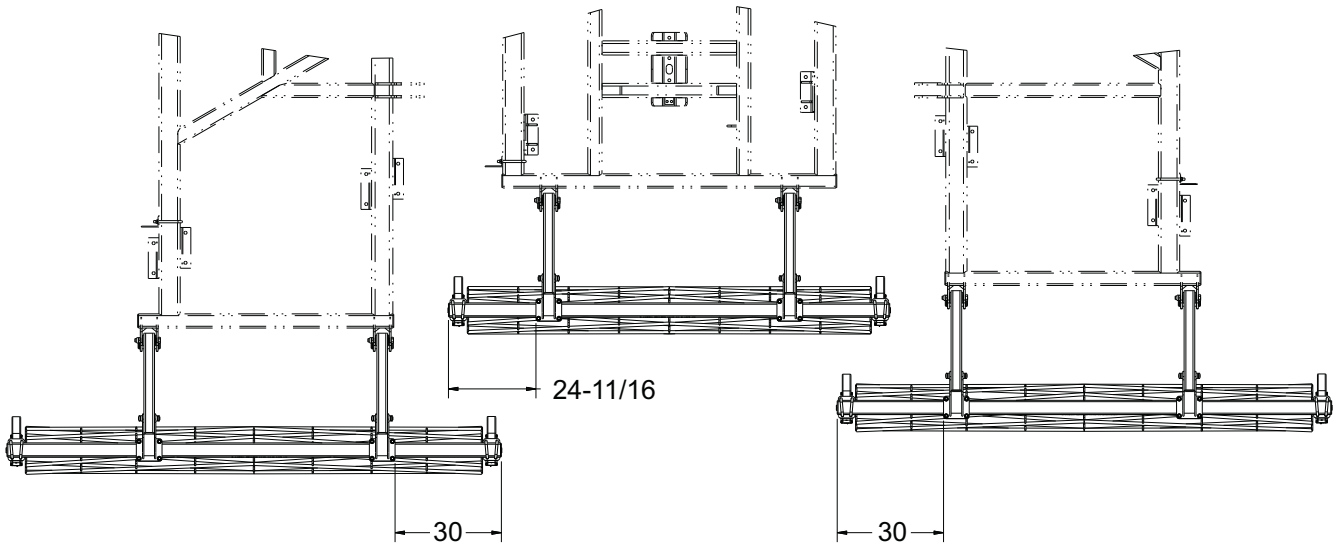
91” REEL ASSEMBLY **114” REEL ASSEMBLY** **91” REEL ASSEMBLY**

Figure 2-18: Conditioner Reel Placement - 23'



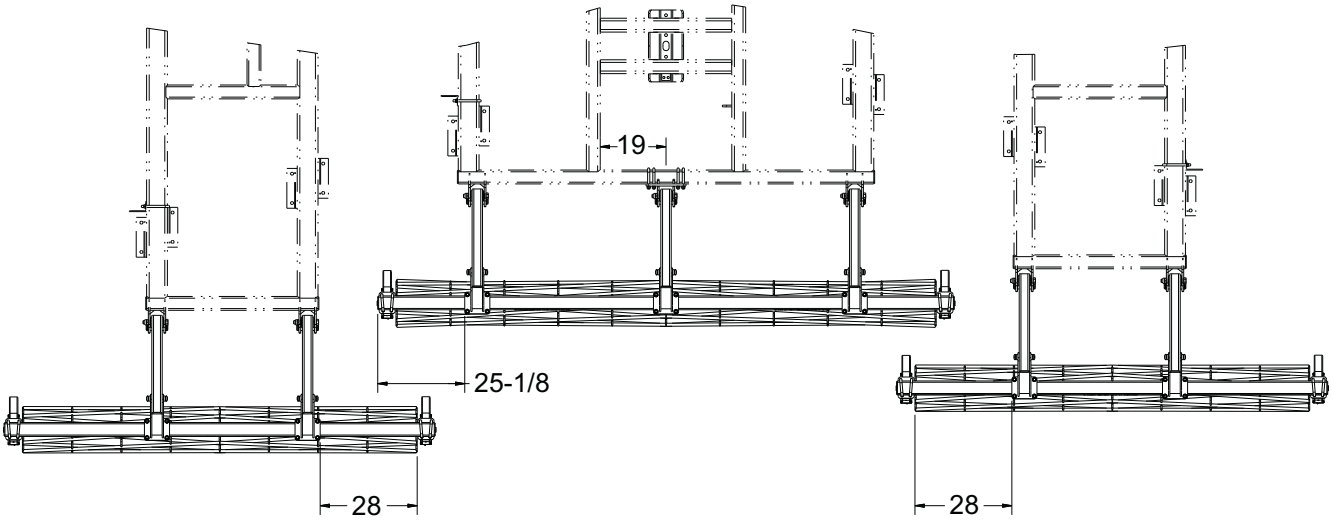
114” REEL ASSEMBLY **114” REEL ASSEMBLY** **114” REEL ASSEMBLY**

Figure 2-19: Conditioner Reel Placement - 26'



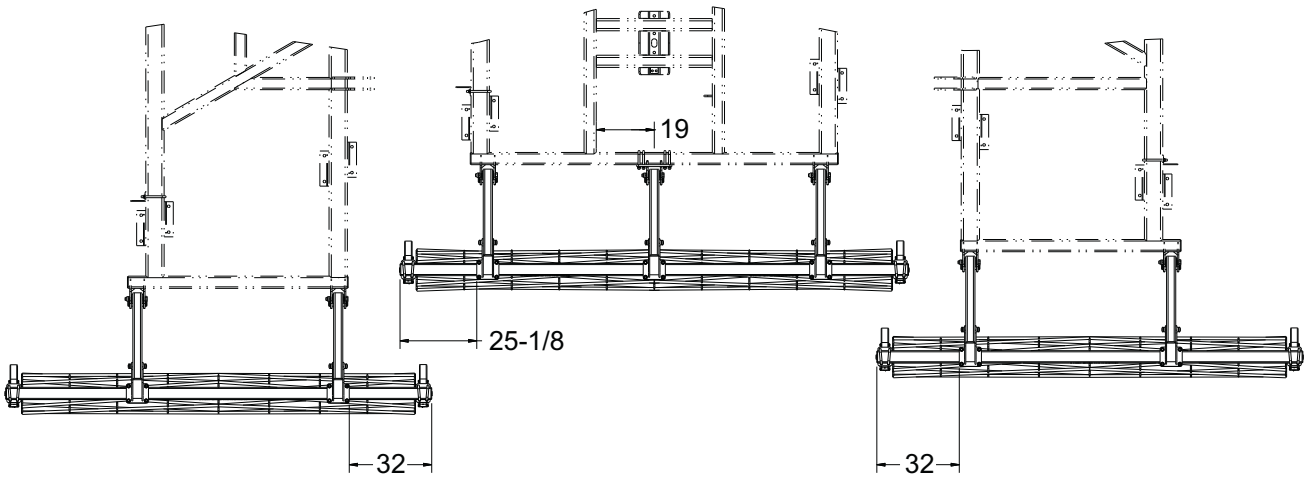
129” REEL ASSEMBLY **114” REEL ASSEMBLY** **129” REEL ASSEMBLY**

Figure 2-20: Conditioner Reel Placement - 29'



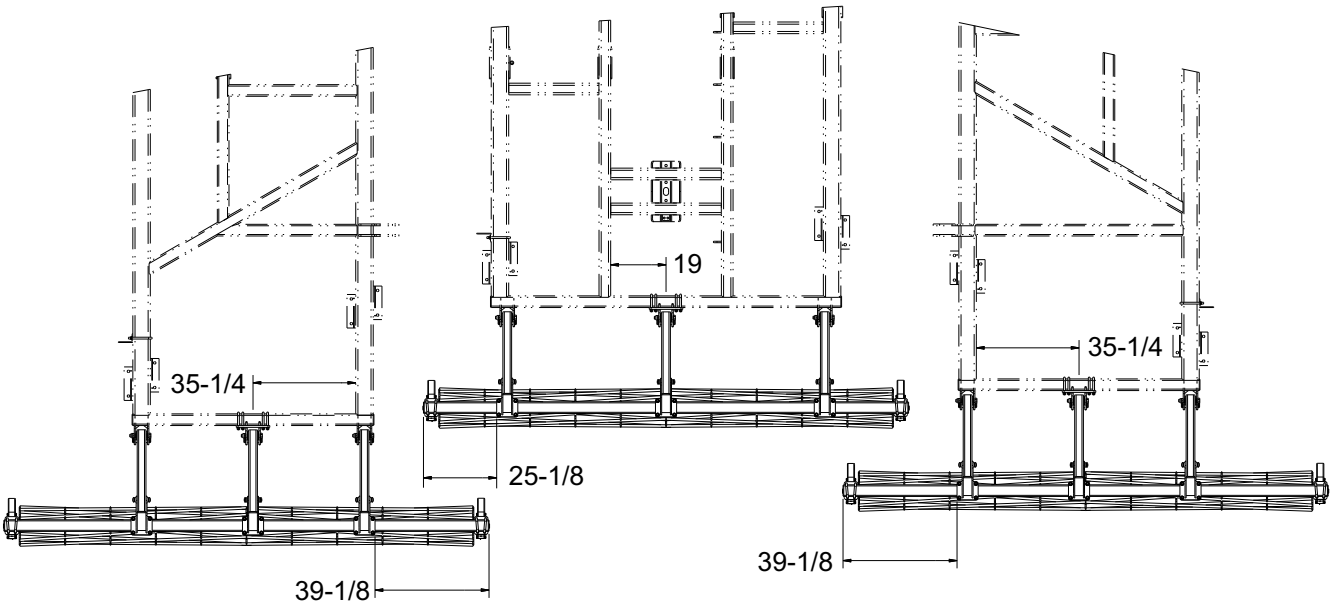
114” REEL ASSEMBLY **156” REEL ASSEMBLY** **114” REEL ASSEMBLY**

Figure 2-21: Conditioner Reel Placement - 30'



138” REEL ASSEMBLY **156” REEL ASSEMBLY** **138” REEL ASSEMBLY**

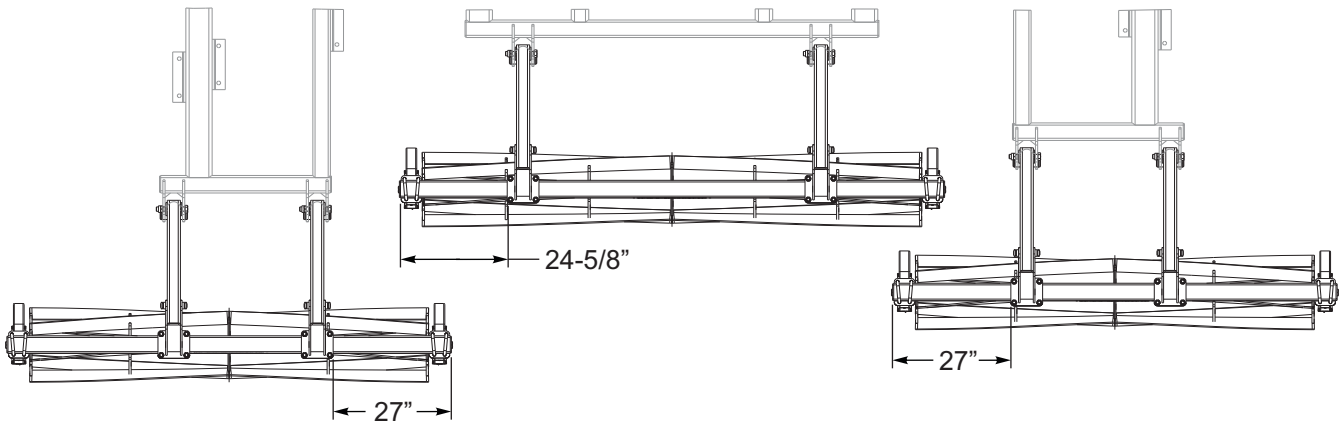
Figure 2-22: Conditioner Reel Placement - 33'



156” REEL ASSEMBLY **156” REEL ASSEMBLY** **156” REEL ASSEMBLY**

Figure 2-23: Conditioner Reel Placement - 36'

Chevron Flat Bar Reel Placement

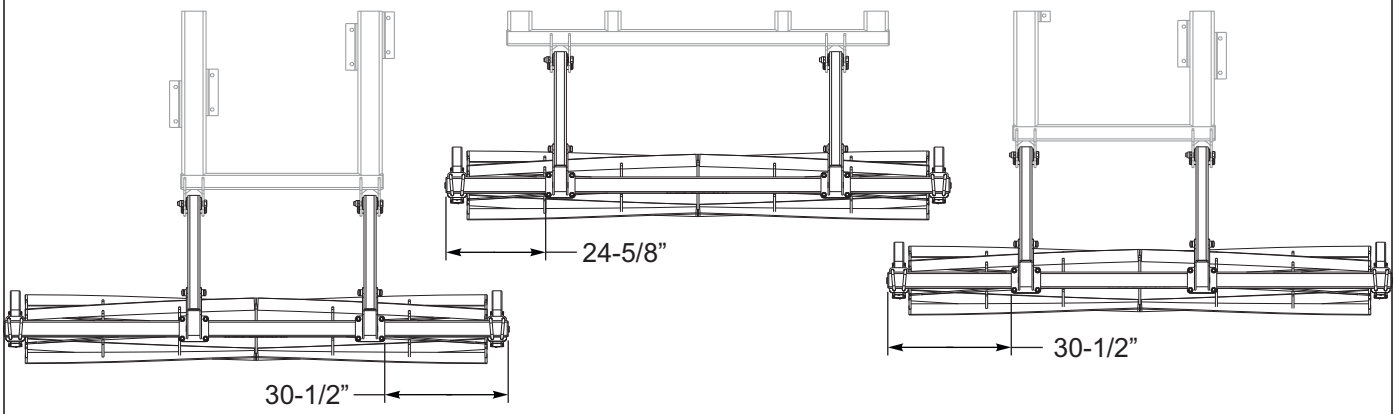


91” CHEVRON REEL/GANGBAR ASSEMBLY

114” CHEVRON REEL/GANGBAR ASSEMBLY

91” CHEVRON REEL/GANGBAR ASSEMBLY

Figure 2-24: Chevron Flat Bar Reel Placement - 23

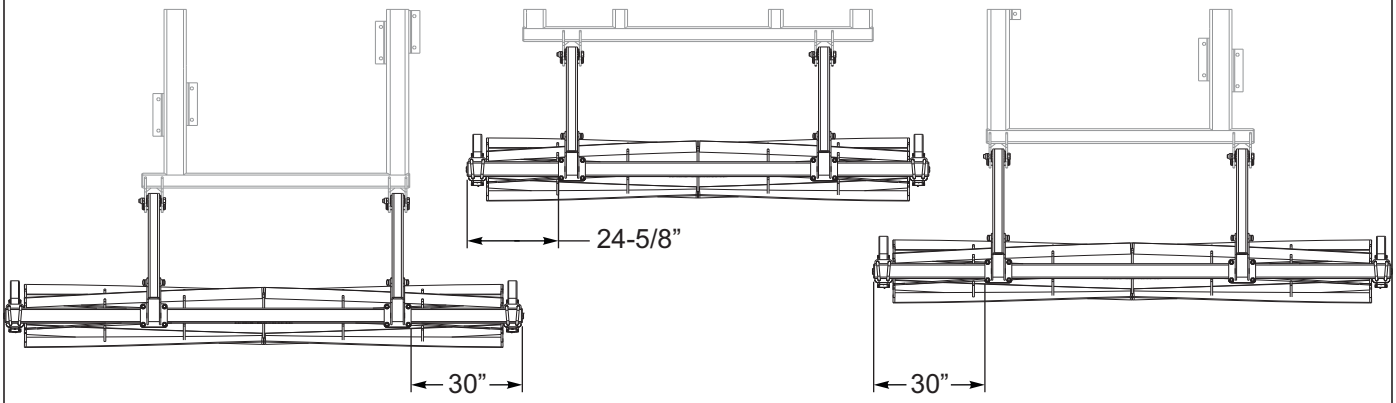


114” CHEVRON REEL/GANGBAR ASSEMBLY

114” CHEVRON REEL/GANGBAR ASSEMBLY

114” CHEVRON REEL/GANGBAR ASSEMBLY

Figure 2-25: Chevron Flat Bar Reel Placement - 26'

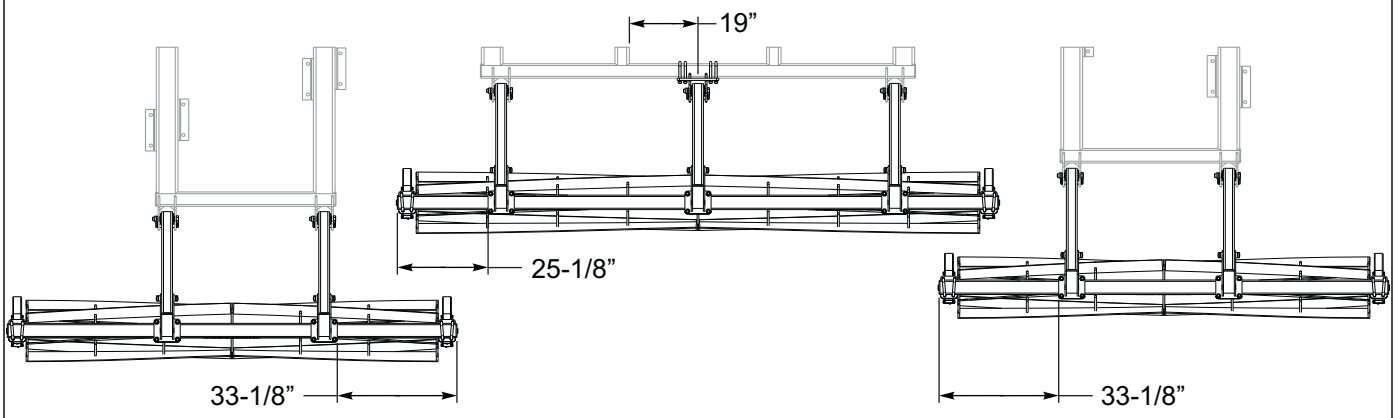


129” CHEVRON REEL/GANGBAR ASSEMBLY

114” CHEVRON REEL/GANGBAR ASSEMBLY

129” CHEVRON REEL/GANGBAR ASSEMBLY

Figure 2-26: Chevron Flat Bar Reel Placement - 29'

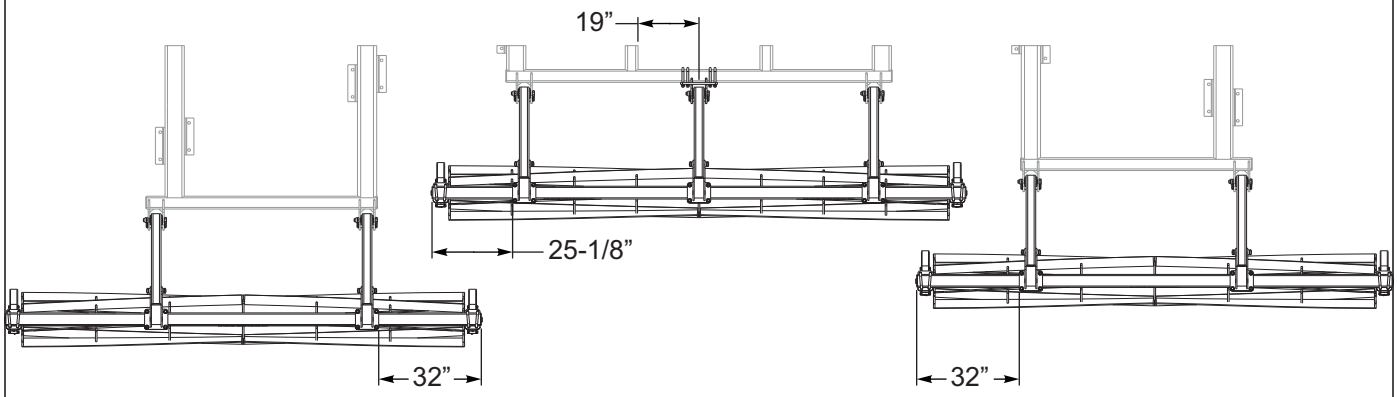


114” CHEVRON REEL/GANGBAR ASSEMBLY

156” CHEVRON REEL/GANGBAR ASSEMBLY

114” CHEVRON REEL/GANGBAR ASSEMBLY

Figure 2-27: Chevron Flat Bar Reel Placement - 30'

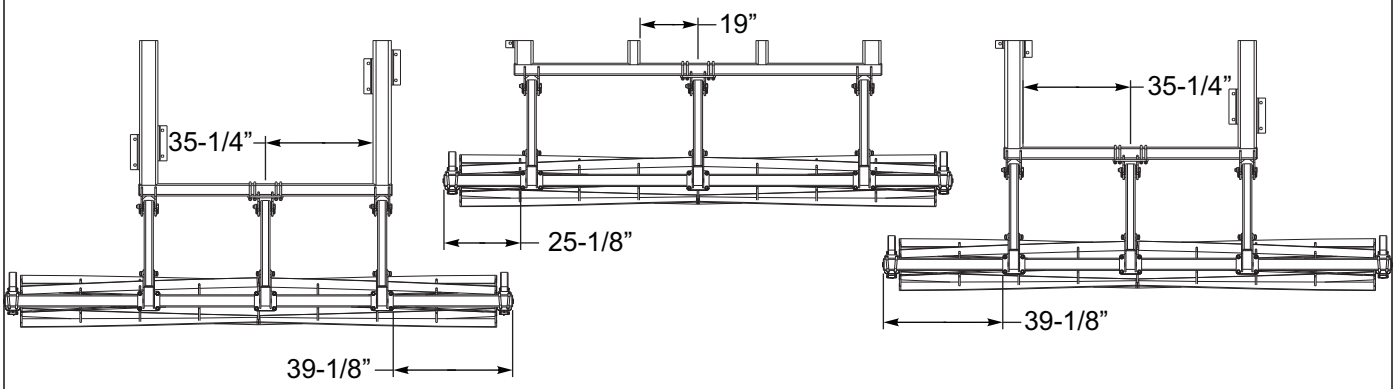


138” CHEVRON REEL/GANGBAR ASSEMBLY

156” CHEVRON REEL/GANGBAR ASSEMBLY

138” CHEVRON REEL/GANGBAR ASSEMBLY

Figure 2-28: Chevron Flat Bar Reel Placement - 33'



156” CHEVRON REEL/GANGBAR ASSEMBLY

156” CHEVRON REEL/GANGBAR ASSEMBLY

156” CHEVRON REEL/GANGBAR ASSEMBLY

Figure 2-29: Chevron Flat Bar Reel Placement - 36'

Double Round Reel Placement

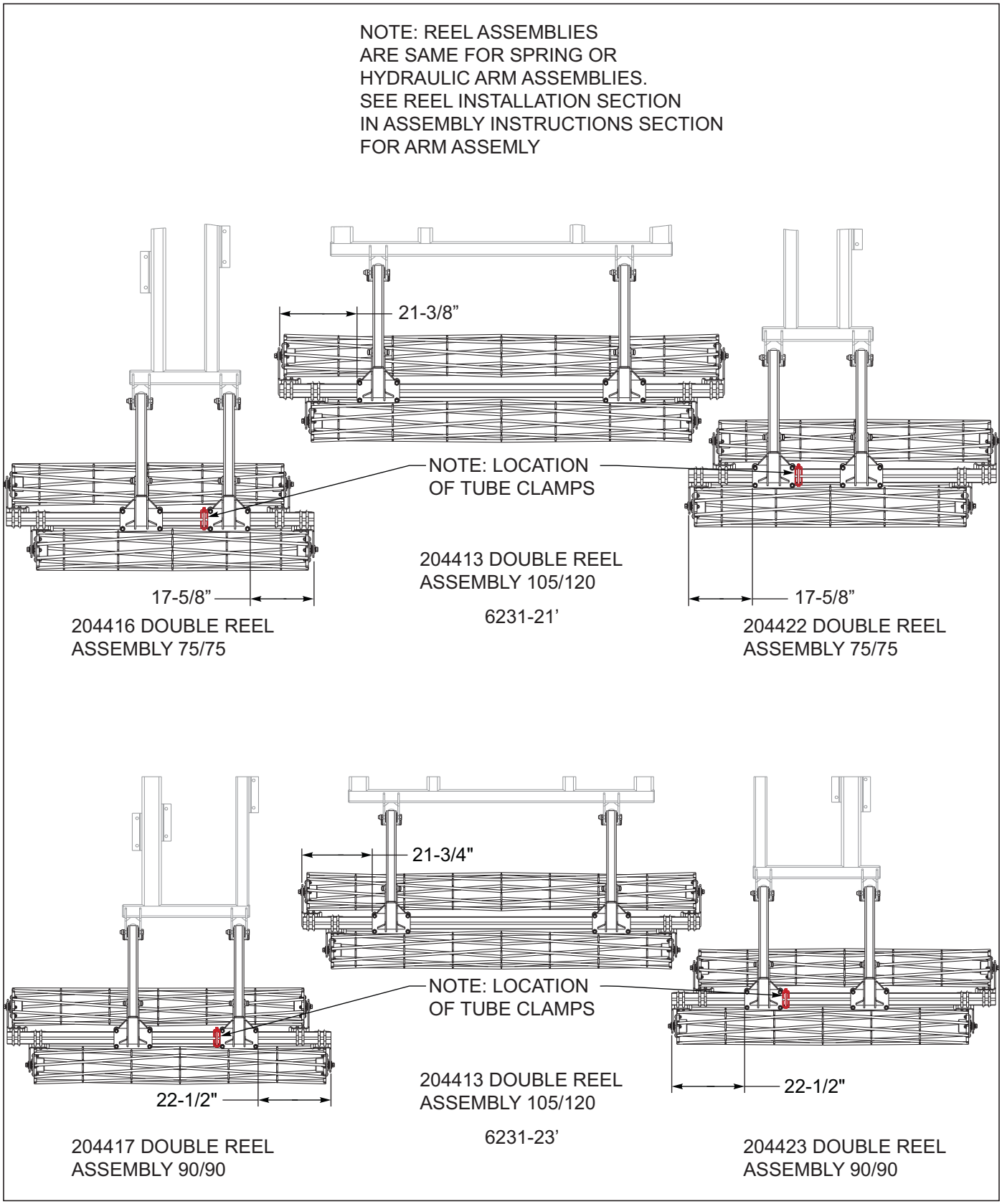


Figure 2-30: Double Round Reel Placement - 21’-23’

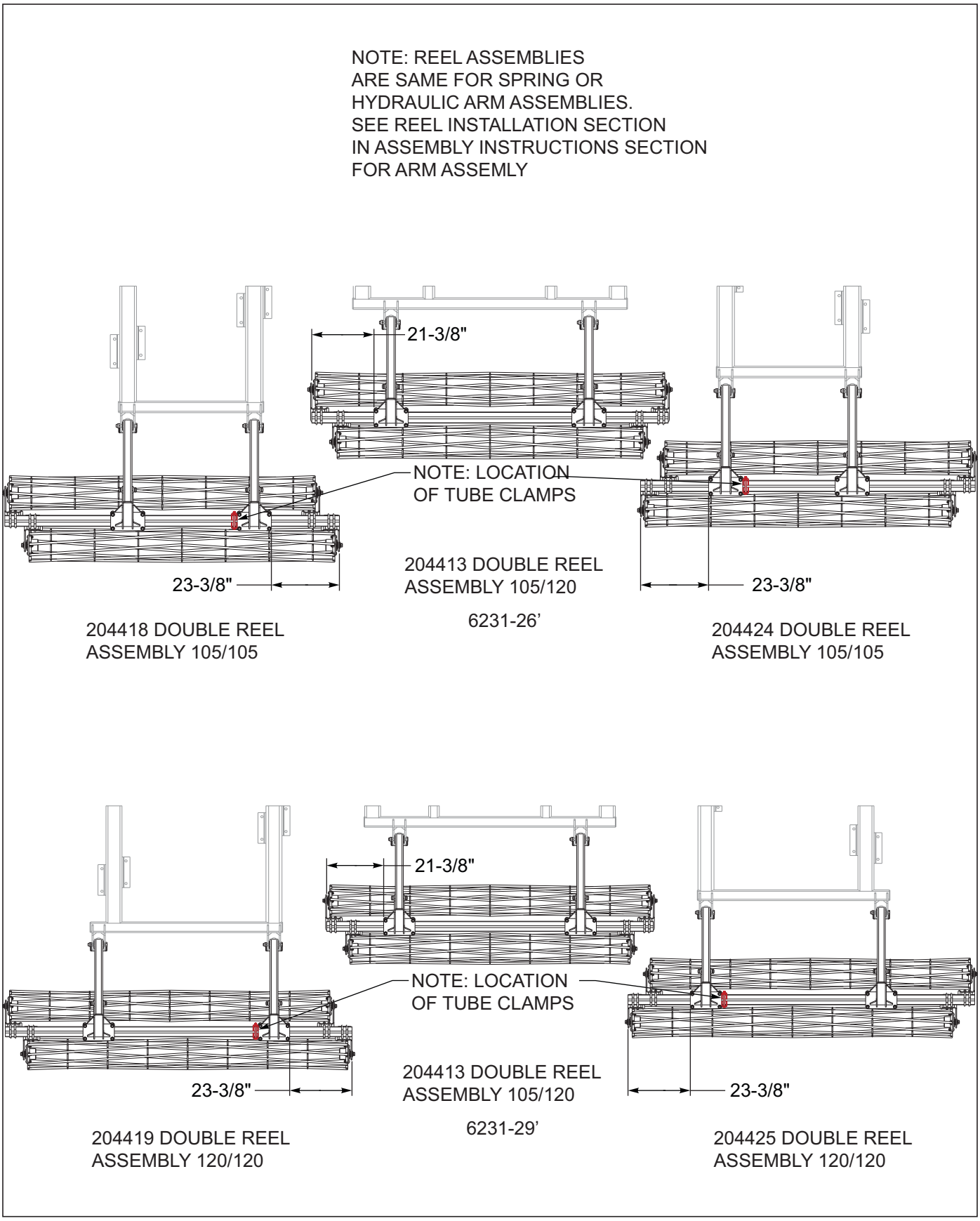


Figure 2-31: Double Round Reel Placement - 26'-29'

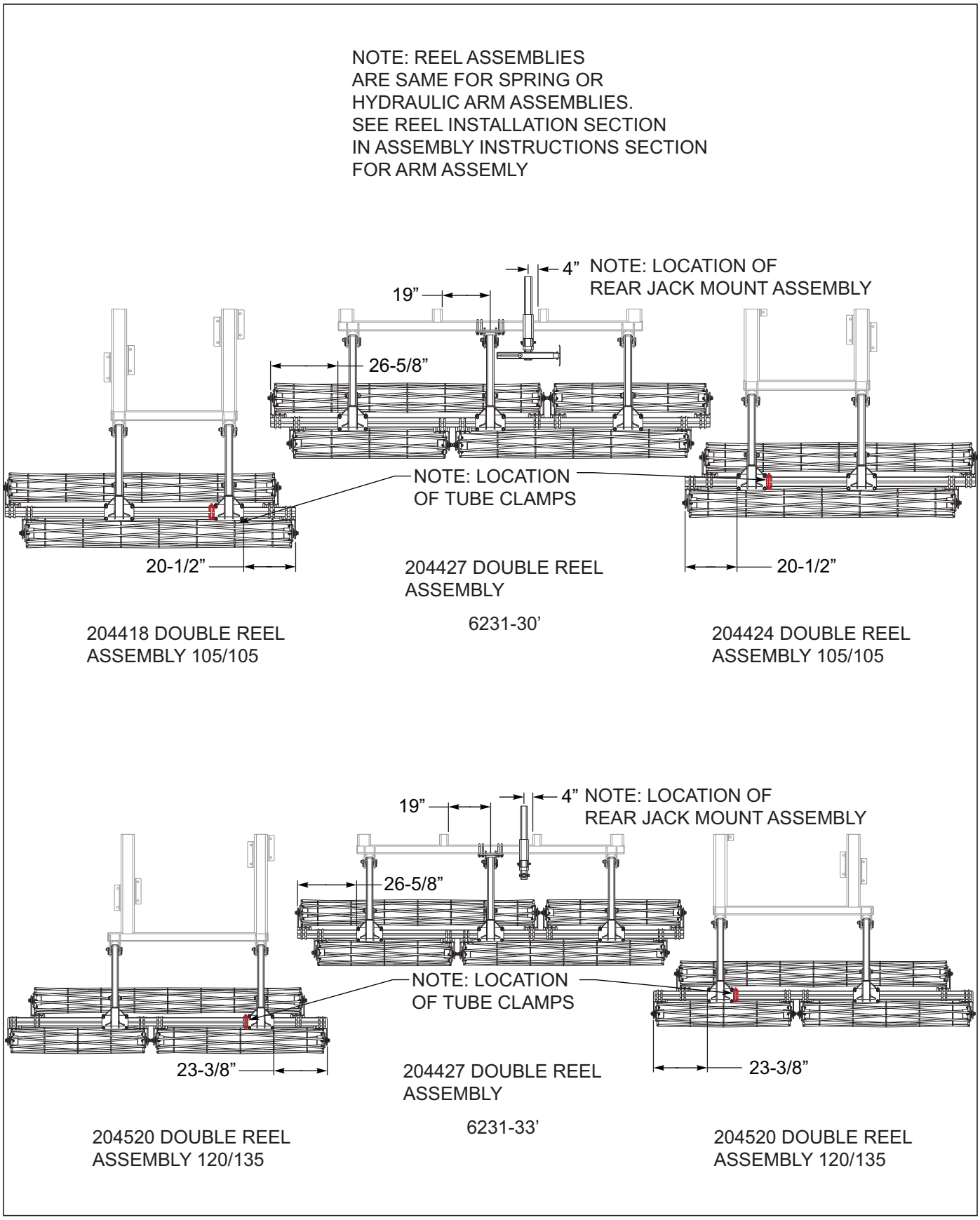


Figure 2-32: Double Round Reel Placement - 30'-33'

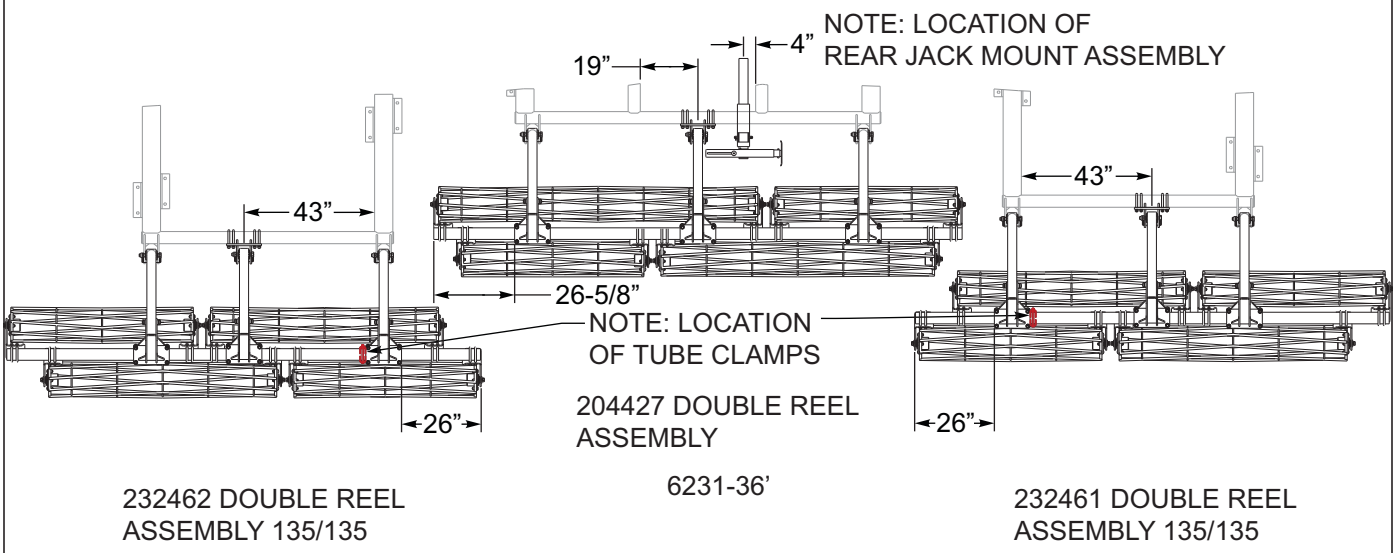


Figure 2-33: Double Round Reel Placement - 36’

Double Flat Reel Placement

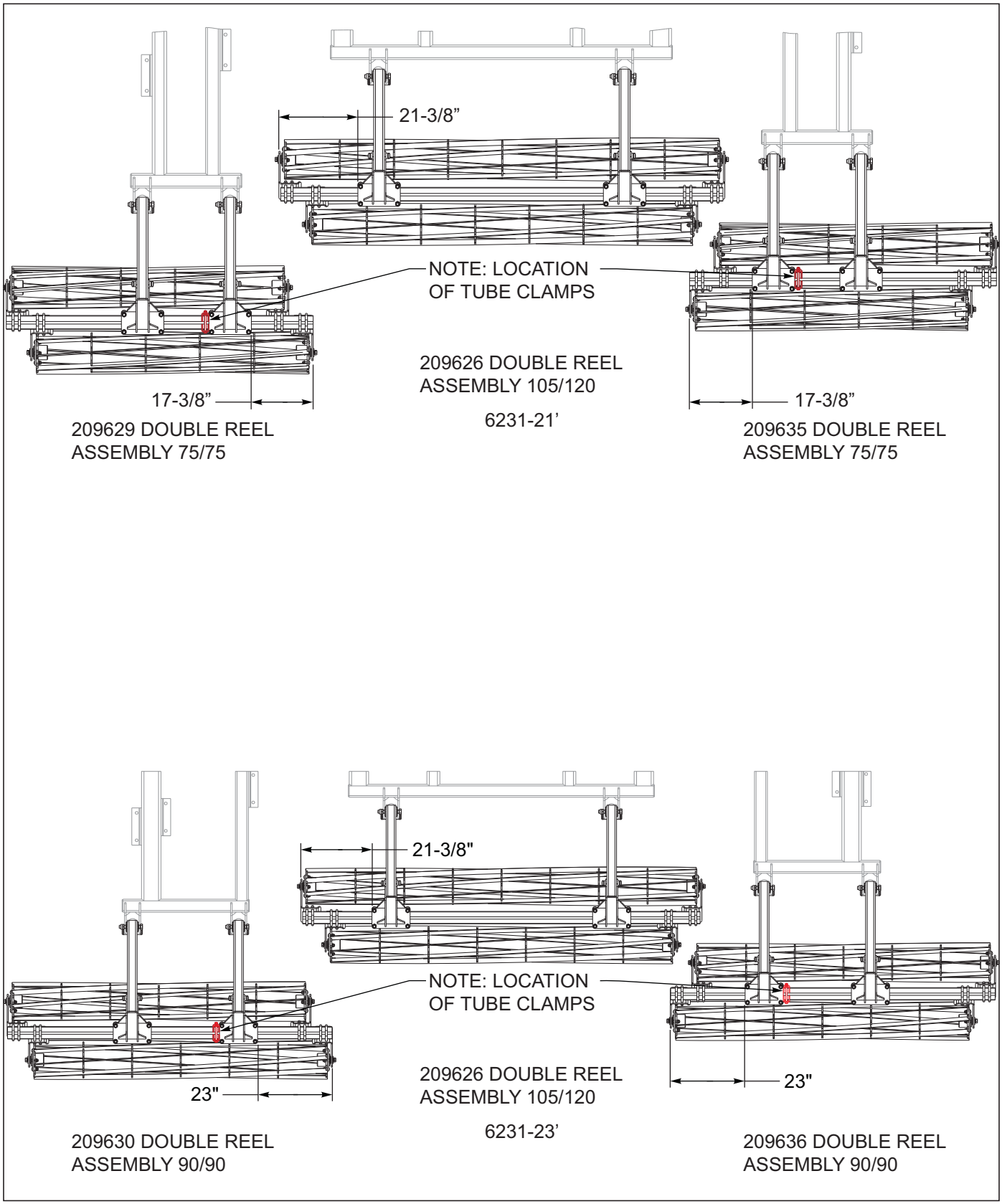


Figure 2-34: Double Flat Reel Placement - 21’-23’

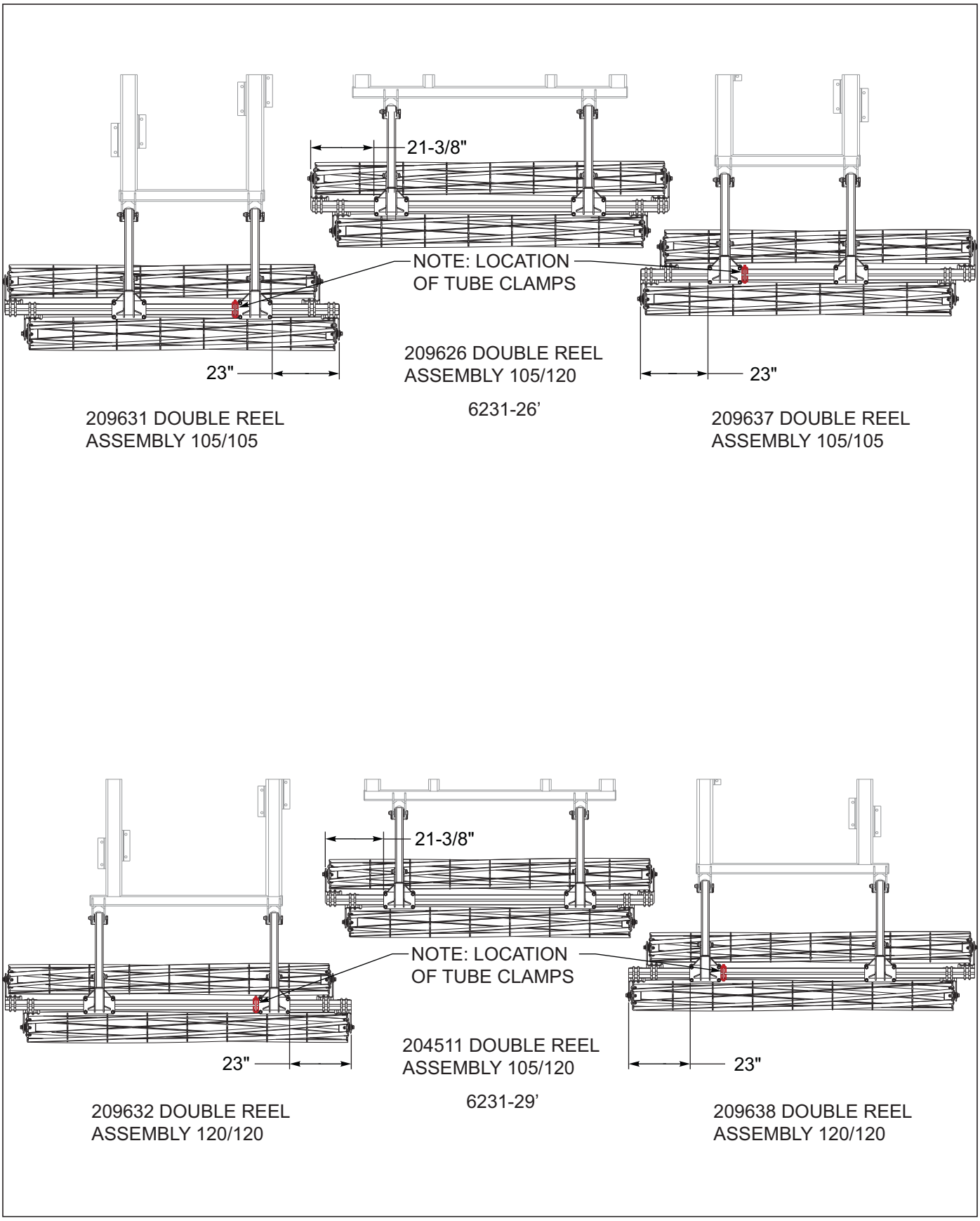


Figure 2-35: Double Flat Reel Placement - 26'-29'

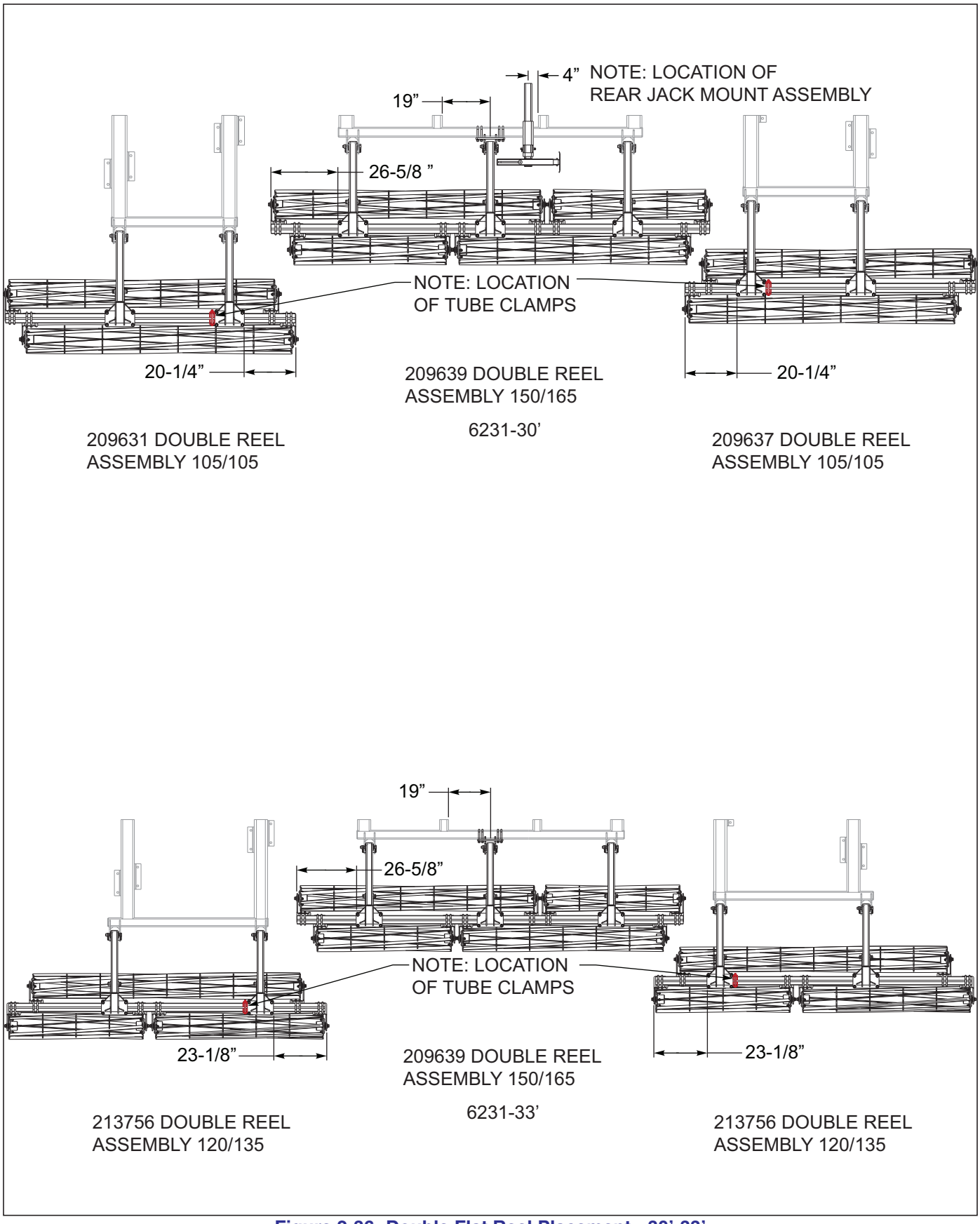


Figure 2-36: Double Flat Reel Placement - 30’-33’

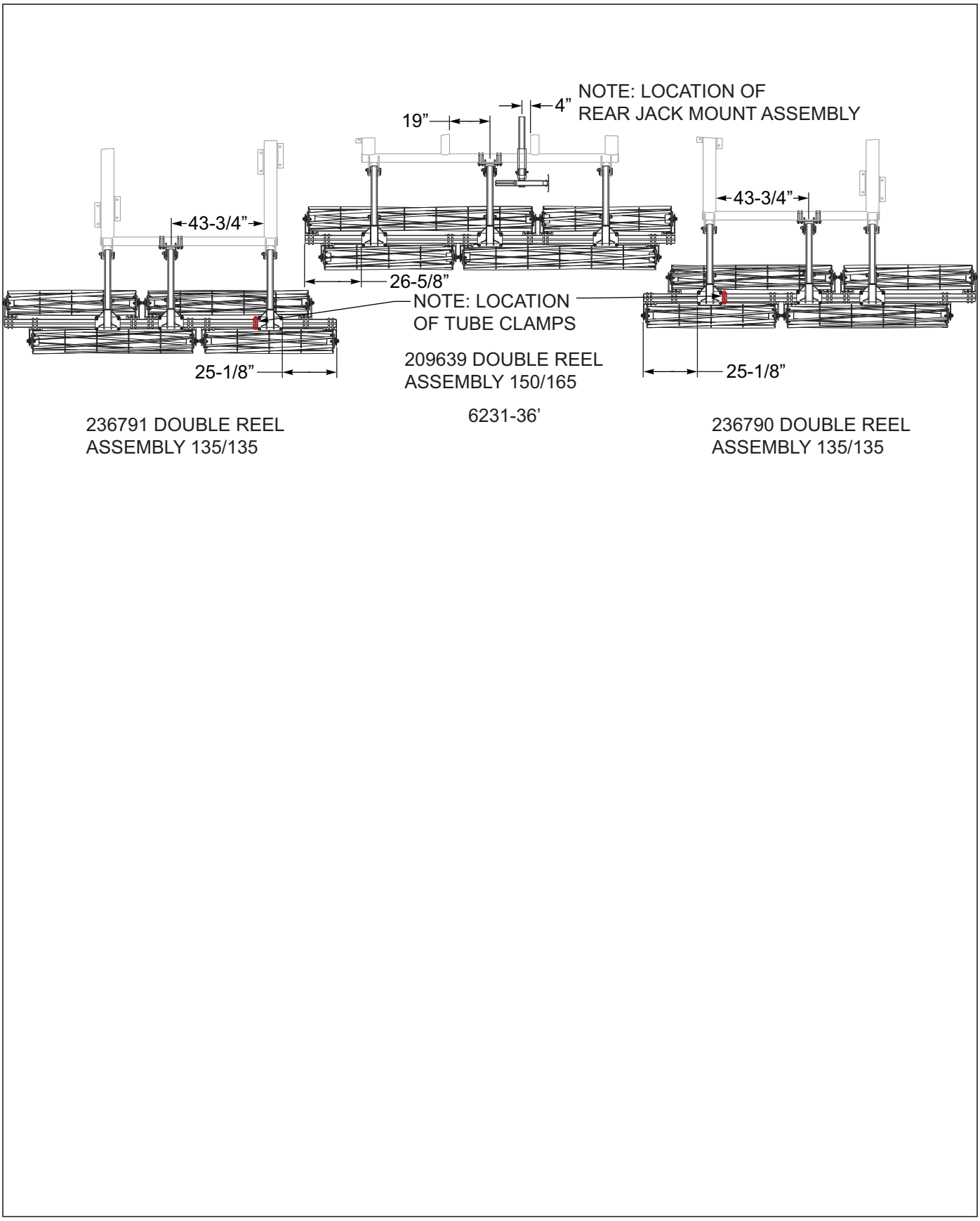


Figure 2-37: Double Flat Reel Placement - 36’

Chapter 3

Assembly Instructions

It is very important that your new 6231 Disc be properly assembled, adjusted and lubricated before use. Illustrations to assist with the assembly process are provided in *"Specifications" on page 2-1*. They show proper disc gang, wing stabilizer bracket, and light mounting bracket spacing. Illustrations in this section show proper assembly procedures. Remove paint from grease fittings. Replace any grease fittings that are damaged or missing. Be sure to return screws, clips, etc., to their original locations.

To insure alignment of assemblies, **leave the nuts loose until completion** of final assembly. Use lock washers or flat washers as specified. Spread all cotter pins.

After completion of final assembly, tighten all nuts evenly to prevent misalignment, distortion or binding. Tighten all screws and nuts to the recommended torques shown in *Table 2-1*.

DANGER

Disc blades are extremely sharp. Exercise extreme care when working on or near disc blades. Do not allow discs to roll over or fall onto any bodily part. Do not allow wrenches to slip when working near disc blades. Never push wrenches toward disc blades. Do not climb over machine above disc blades. Failure to stay clear of disc blade edges can cause serious personal injury or death.

WARNING

Do not attempt to lift heavy parts (such as the frame, disc gangs, rock shaft, and pull hitch) manually. Use a hoist or a fork lift to move these parts into position.

DANGER

To prevent accidental lowering:

1. **All hydraulically elevated equipment must be locked out using the cylinder lockouts.**
2. **Lower equipment to the ground while servicing or when it is idle.**

Failure to take measures to prevent accidental lowering may result in serious personal injury or death.

CAUTION

Be sure to bleed the hydraulic system of all air in lines after installation. Failure to bleed the system of all air can result in improper machine operation.

CAUTION

Incorrect adjustment of disc adjust rods will cause permanent equipment damage.

Center Frame Walker Assembly

1. On Models 6231-30', 33'-36', units will be shipped with the walking tandems not being installed on the lift legs due to the center frame assembly being over height.
2. The walkers are universal and can be installed on either side, there is not a left or right side weldment.
3. ***See Figure 3-1*** for the correct orientation of the walkers, the inside tire should be leading and the outer tire trailing on both sides. This will keep the tires away from the disc blades in field operation.
4. To install walker, verify there is a hardened steel bushing installed into the bottom pin hole on the lift legs. There should be one on each side of the pin hole.
5. Remove the 3/8-16 x 1" flange head cap screws from the side of the walker and take off the cap plates. There will be a gasket between the cap and the walker bushing. Remove the 3/4-10 x 5-1/2" hex bolt so the chrome pin can be slid out of the walker.
6. Place walker under the lift leg and carefully hold a thrust washer on each side while lifting the walker up into line with the pin hole on the axle leg.

NOTE

Note that walker is orientated correctly for the side being installed.

7. Slide in chrome pin with aligning the cross hole to the lift leg. If needed use a small dead blow hammer, do not use a steel headed hammer on pin. Install the 3/4-10 x 5-1/2" hex bolt and tighten the nut to 150 ft-lbs.
8. The walker should now pivot on the pin. Reinstall the gaskets and endcaps with the 3/8-16 x 1" flange head cap screws. Torque the 3/8 cap screws to 28 ft-lbs.
9. Grease both sides of the walker until grease is visibly purged out and cavity is full.
10. Install the hub/spindle assemblies into the walkers with 1/2-13 x 5" bolts and nuts to secure them. Install the spindle into the inner hole of the walker.
11. The rest of the machine may now be assembled.

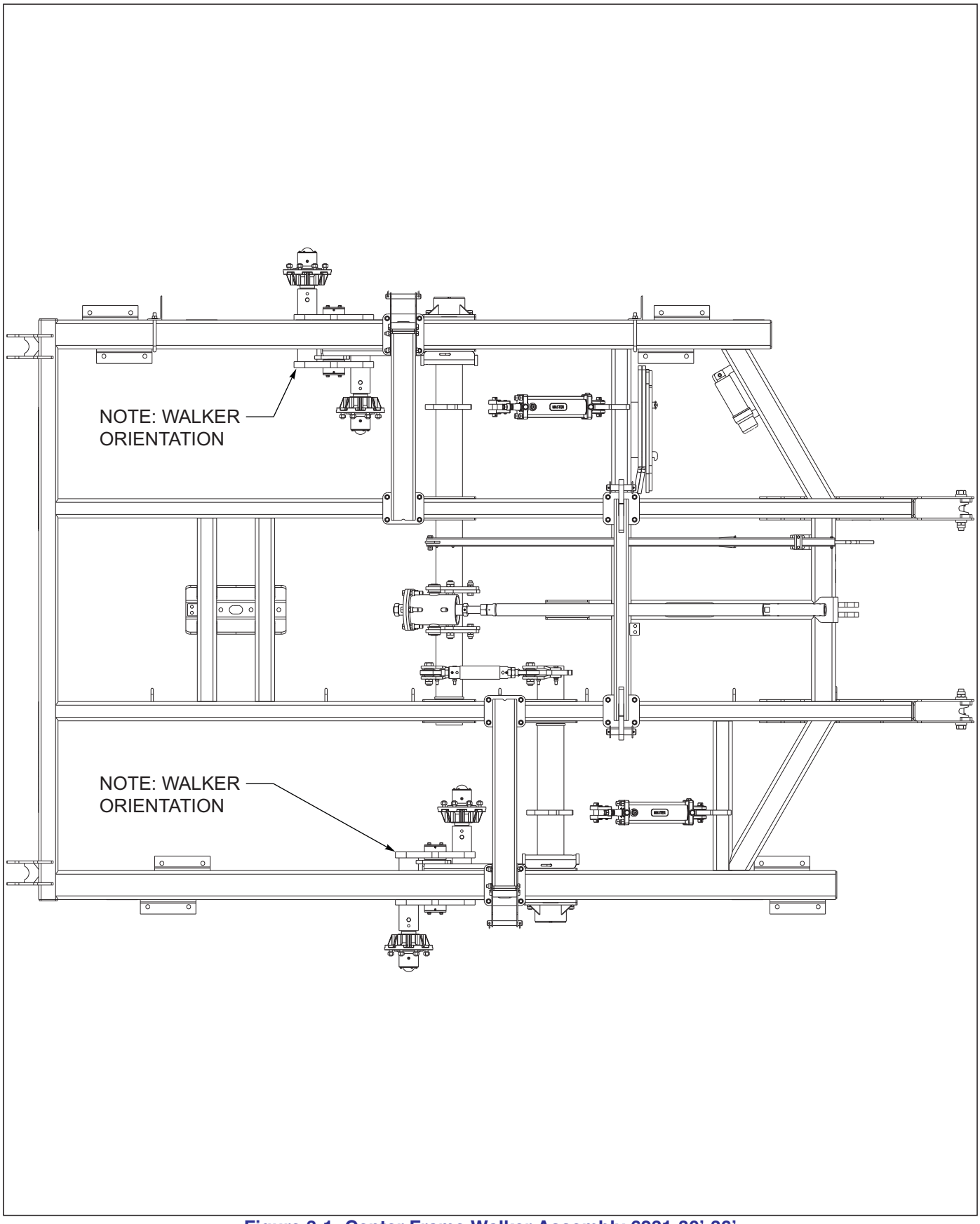


Figure 3-1: Center Frame Walker Assembly 6231-30'-36'

6231 Disc Frame and Hitch Assembly

Read all safety precautions at the front of the section before attempting any of the following procedures.

1. Place the center frame assembly on stands approximately 36” high. The assembly area should be a large level area of sufficient size to accommodate the disc when fully assembled.

WARNING

Do not attempt to lift heavy parts (such as the frame, disc gangs, rock shaft, and pull hitch) manually. Use a hoist or a fork lift to move these parts into position.

2. Attach the hitch assembly to the front of the center frame using 1-1/8 x 7-1/2 bolts, machine bushings, hitch mounting plates, and 1-1/8 lock nuts ***See Figure 3-2*** Machine bushings are provided to remove the slack on each side of the ball joints and center the hitch. Use bushings as required.

NOTE

*The hitch may be assembled in the upper or lower position depending on matching tractor drawbar height. **“Hitch Adjustment” on page 4-11** for proper adjustment.*

3. Move the jack to the forward mounting tube and rotate to parking position to support the front of the hitch.
4. Insert a 3/4 x 7 bolt into the hose holder tube on the right side of the hitch from the bottom side so the threads point upward. Hold in place with a 3/4 torque flange nut with the flange pointing upward as well. Do not tighten this cap screw, so the hose holder bracket may pivot freely in this joint.
5. Slide the hose holder bracket over the 3/4 x 7 bolt and secure with another 3/4 flange nut.
6. Install a 3/8 x 3-1/2 all-thread in the front of the hose holder bracket and secure with a 3/8 lock nut.
7. Slide the hose holder clamp over the 3/8 x 3-1/2 all-thread and loosely start the wing nut on top of the clamp. Hydraulic hoses will be routed through the clamp after assembly.
8. Install the stor-a-away harness to the bottom side of hose holder bracket with 1/4 x 1 bolts and 1/4 lock nuts.

NOTE

The clamp has two sides, so that extend hoses can be located on one side and retract hoses can be located on the other side for reference.

9. Attach the double pilot check valve on the bottom side of hose holder clamp in orientation shown in Detail A with V1 and V2 ports towards front of machine secure with 3/8 x 2 bolts and 3/8 lock nuts. Install hose holder clamp at rear of hitch with 1/2 x 11 bolts and 1/2 lock nuts.

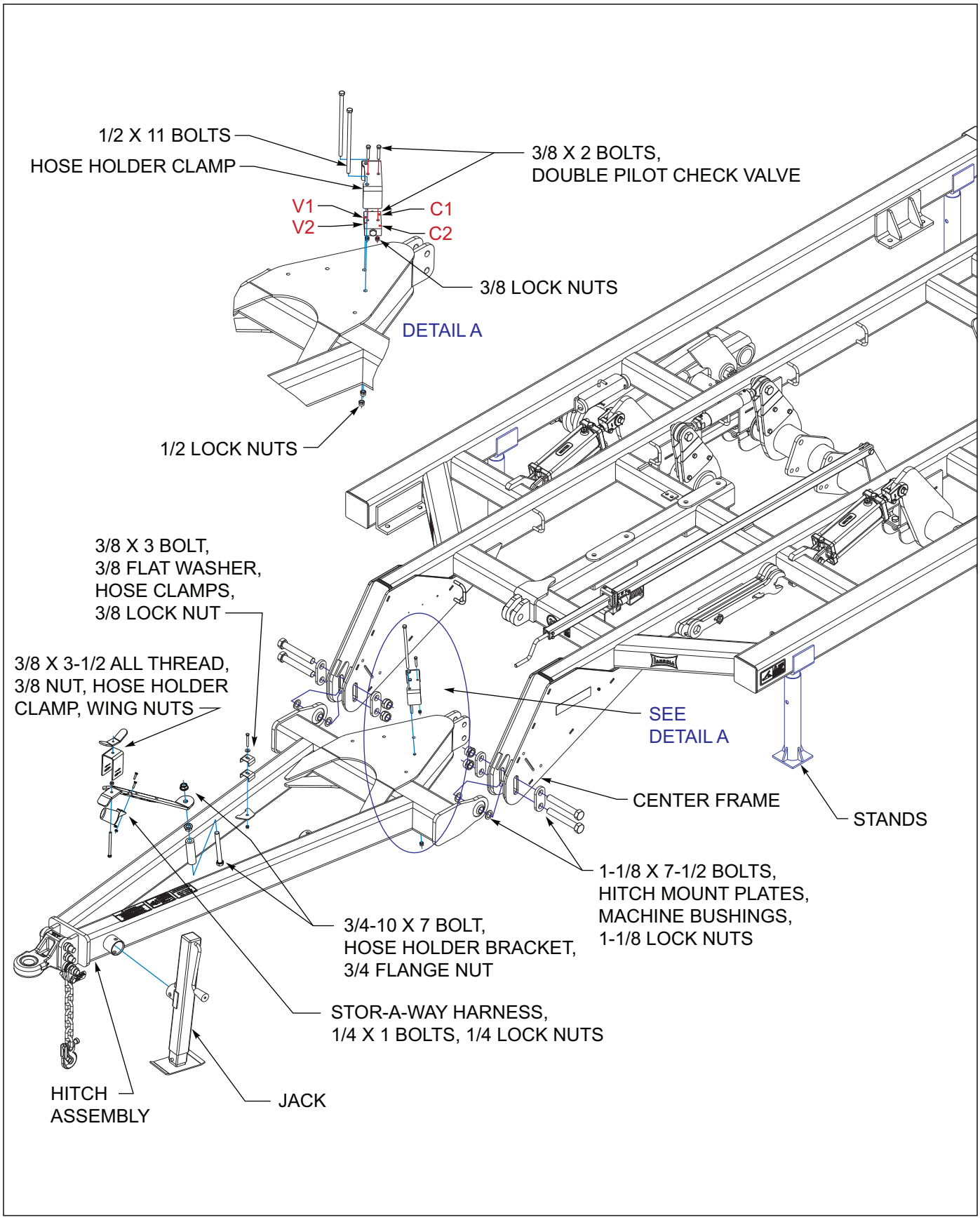


Figure 3-2: Frame and Hitch Assembly

Leveler Assembly

1. Install a 1-5/8 x 1-1/4 x 1 bushing in the leveler L link ***See Figure 3-3*****.**
2. Attach the leveler l link to the front mount of the center frame with a 1-1/4 x 6 hex head cap screw and hex lock nut.
3. With a 1 x 4-1/2 bolt and 1 lock nut attach the leveler ball joint link to the leveler l link.
4. Connect the bottom end of the leveler ball joint link to the rear mounting holes of the hitch using a 1 x 4-1/2 bolt and 1 lock nut.

NOTE

When the hitch is in the upper mounting position, the leveler ball joint link is mounted in the lower holes. When the hitch is in the lower position, the link is mounted in the top mounting holes. "Hitch Adjustment" on page 4-11 for proper adjustment.

5. Install a 1-1/2 flange bearing in leveler spring mounts.
6. Slide a 1-1/2 Thrust Washer over each side of trunnion of the leveler spring tube assembly.
7. Slide a leveler spring mount over each side Trunnion of the leveler spring assembly.

NOTE

The 1-1/2 plastic flange bearing should install towards the center of the disc against the 1-1/2 thrust washer.

8. Install the leveler spring tube assembly and mounts to the ears to the center lift assembly pates, using 1 x 2-1/2 bolts and 1 lock nuts in the top hole of lift. Install the screws so the nuts are on the outside.
9. Attach the bottom hole of the leveler spring mount with 3/4 x 2-1/2 bolts and 3/4 lock nuts. Install the bolts in the lower (closet to the pipe) bolt holes.

NOTE

If using a harrow attachment, "Variable Ratio Leveler Adjustment" on page 4-10 on which mounting hole to use.

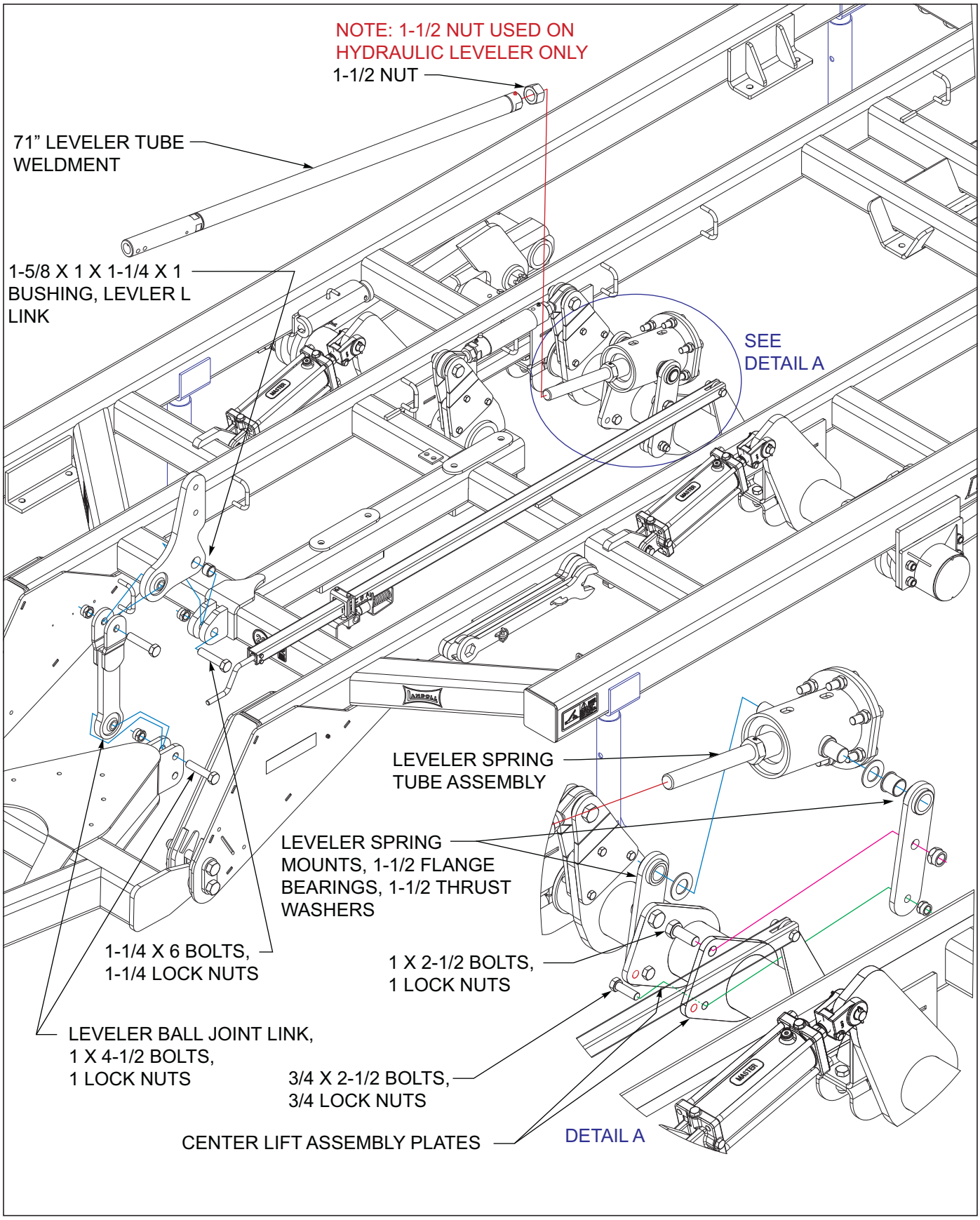


Figure 3-3: Leveler Assembly Installation

Manual Leveler

1. Using the manual leveler, screw the 71” leveler tube onto the leveler screw assembly ***See Figure 3-3***. Initially leave approximately 1” of threads visible, further adjustment may be required. Rotate the tube so that the zerk hole in the threaded end is pointing upward.
2. Install the manual leveler handle assembly into the front end of the leveler tube and fasten with two 5/8 x 3-1/2 bolts and 5/8 lock nuts ***See Figure 3-5***. Insert a flange bearing into the flat side of each leveler cross bracket. Slide the brackets over each side of the manual leveler cross and secure with 1n flat washers and 5/16 x 2-1/2 spring pins.
3. Attach the leveler cross brackets to the top of the leveler L link using 3/4 x 3-1/2 bolts and 3/4 lock nuts.
4. Install a 1/4 zerk in the threaded end of the leveler tube.

Hydraulic Leveler (Option)

1. Thread a 1-1/2 nut onto the leveler screw assembly ***See Figure 3-5*** Initially leave approximately ” of threads visible between the 1-1/2 nut and the leveler spring nut. Further adjustment may be required.
2. Thread the leveler tube onto the leveler screw assembly until it contacts the 1-1/2-6 hex nut. Rotate the tube so the grease zerk hole in the threaded end points upward.
3. Slide the leveler cross over the front end of the leveler tube ***See Figure 3-5***.
4. Insert the 3-1/2 x 6 cylinder into the front end of the leveler tube and pin using two 5/8 leveler pins. Rotate the cylinder so the hydraulic ports point to the left side of the implement.
5. Slide the leveler cross up to the cylinder and secure with 1/2 x 2 bolts and hex lock nuts. Install the bolts from the back of the leveler cylinder cross, pointing forward for proper operating clearance. The indicator window of the leveler cylinder cross should point to the right side of the implement.
6. Insert a flange bearing in each leveler cross bracket. Install the plastic wear flange bearing from the tube side of the bracket.
7. Slide the leveler cross brackets onto the leveler cylinder cross and secure with washers and 5/16 x 2-1/2 spring slotted pins.
8. Attach the leveler cross brackets to the top of the leveler L link using 3/4 x 3-1/2 bolts and 3/4 lock nuts.
9. Install grease 1/4 zerk in the threaded end of the leveler tube and the leveler cylinder cross.
10. With a 1/2 x 2 bolt and 1/2 lock nut, attach the leveler indicator gauge to the leveler cross. Do not over tighten this screw, as the indicator gauge must be free to pivot about this joint. Attach the level indicator decal to the front of the level indicator gauge.
11. Rotate the 71” leveler tube so the cross-hole for the level indicator rod is horizontal. Wrench-flats are provided at the threaded end of the leveler tube to make this adjustment. Secure the 1-1/2 nut to prevent the leveler tube from rotating further.
12. Insert the threaded end of the leveler indicator rod through the leveler tube cross-hole and the other rod end through the bottom leveler indicator hole. Secure the indicator rod with a 3/8 lock nut.
13. Install 90° elbow w/1/32” restrictor fittings in the leveler cylinder.

NOTE

These are smaller restrictor fittings than those used in the fold system.

14. Install (4) #8 adapter fittings into each port of check valve ***See Figure 3-5.***
15. Install check valve to hose clamp holder on hitch using 3/8 x 2 bolts and 3/8 lock nuts. Note that ports C1/C2 go to the 3-1/2 x 6 cylinder and ports V1/V2 go to the tractor ***See Figure 3-4.***
16. Assemble 56” and 54” hoses from the 3-1/2 x 6 cylinder to the check valve,
17. Attach (2) 140” hoses from the check valve to the tractor.

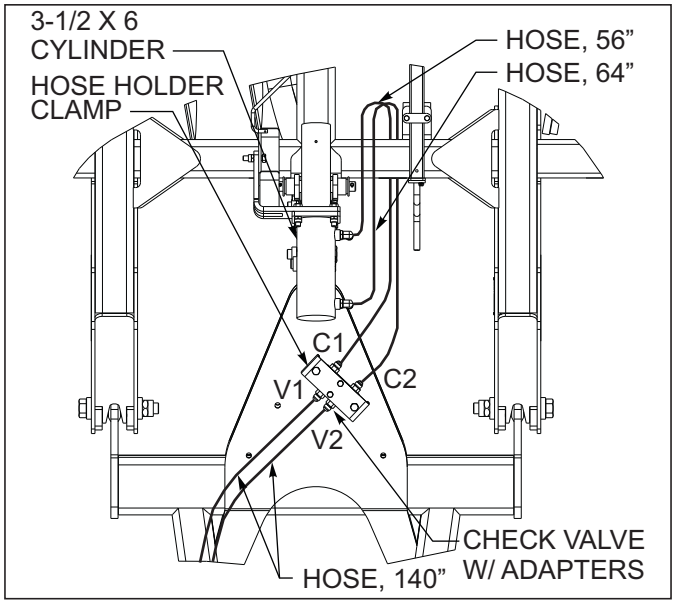


Figure 3-4: Check Valve Placement

10. Wrap hydraulic leveler hoses with black hose wrap ***See Figure 3-5***.

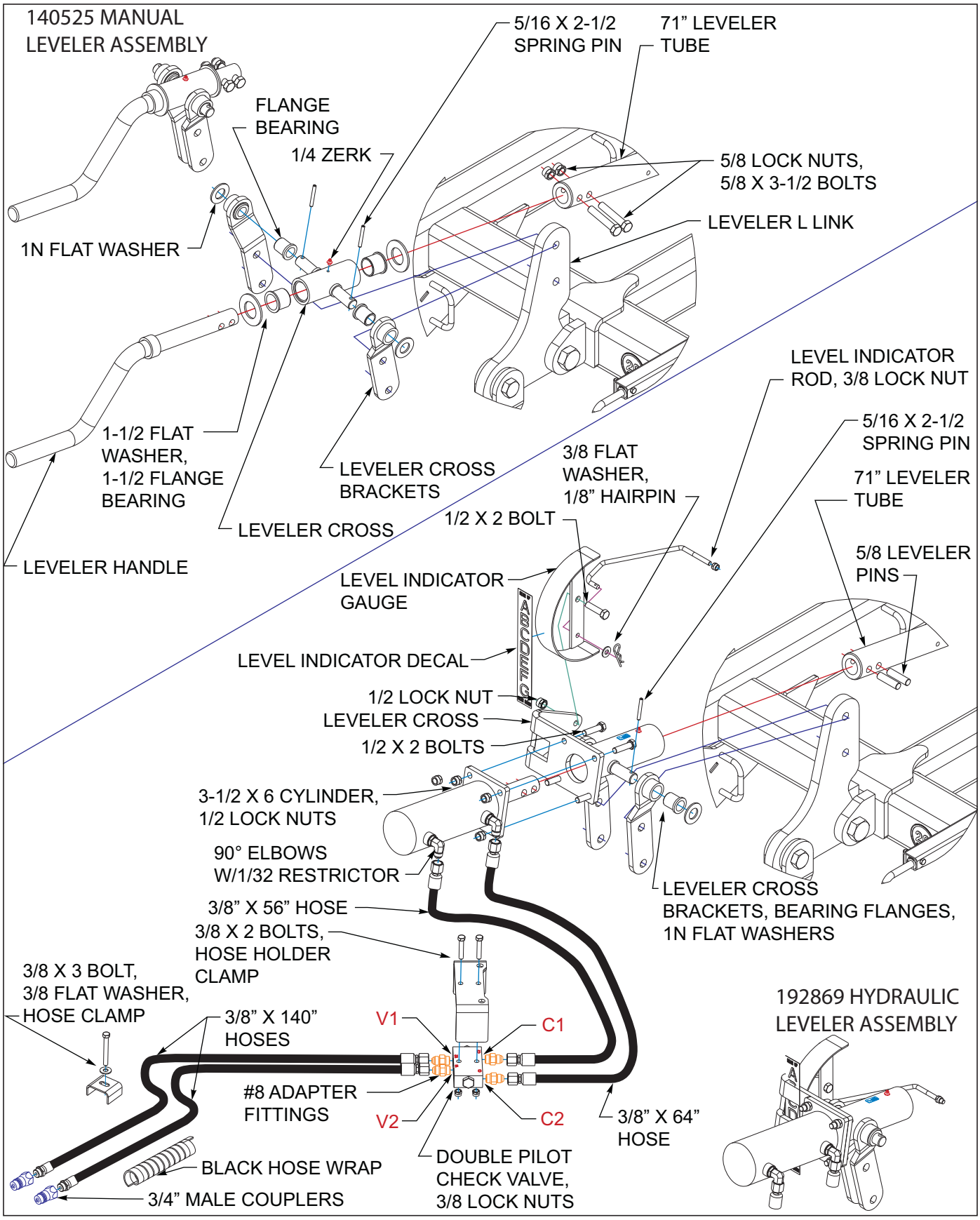


Figure 3-5: Manual/Hydraulic Leveler Installation

Fold Cylinder Mount

1. For 21’- 26’ models, assemble the fold cylinder mount to the middle cross bar of the center frame (over the leveler spring assembly) using 5/8 x 4 x 6-1/2 u-bolts and hex lock nuts ***See Figure 3-6*****.**
2. For 29’ models, assemble two fold cylinder mounts to the center frame using 5/8 x 4 x 6-1/2 u-bolts and hex lock nuts ***See Figure 3-6***. Place one mount on the middle cross bar over the leveler spring assembly, and the other mount over the rear cross bar where the center rear gang meets.
3. For 30’ models, install the fold cylinder mount over the middle center frame cross bar over the leveler spring assembly ***See Figure 3-6***. Attach using 5/8 x 4 x 7-3/4 u-bolts and hex lock nuts.
4. For 33’-36’ models, assemble two fold cylinder mounts to the center frame using 5/8 x 4 x 7-3/4 u-bolts and hex lock nuts. Place one mount on the middle cross bar over the leveler spring assembly, and the other mount behind the rear cross bar where the center rear gangs meet. For proper placement, ***See Figure 3-6*****.**

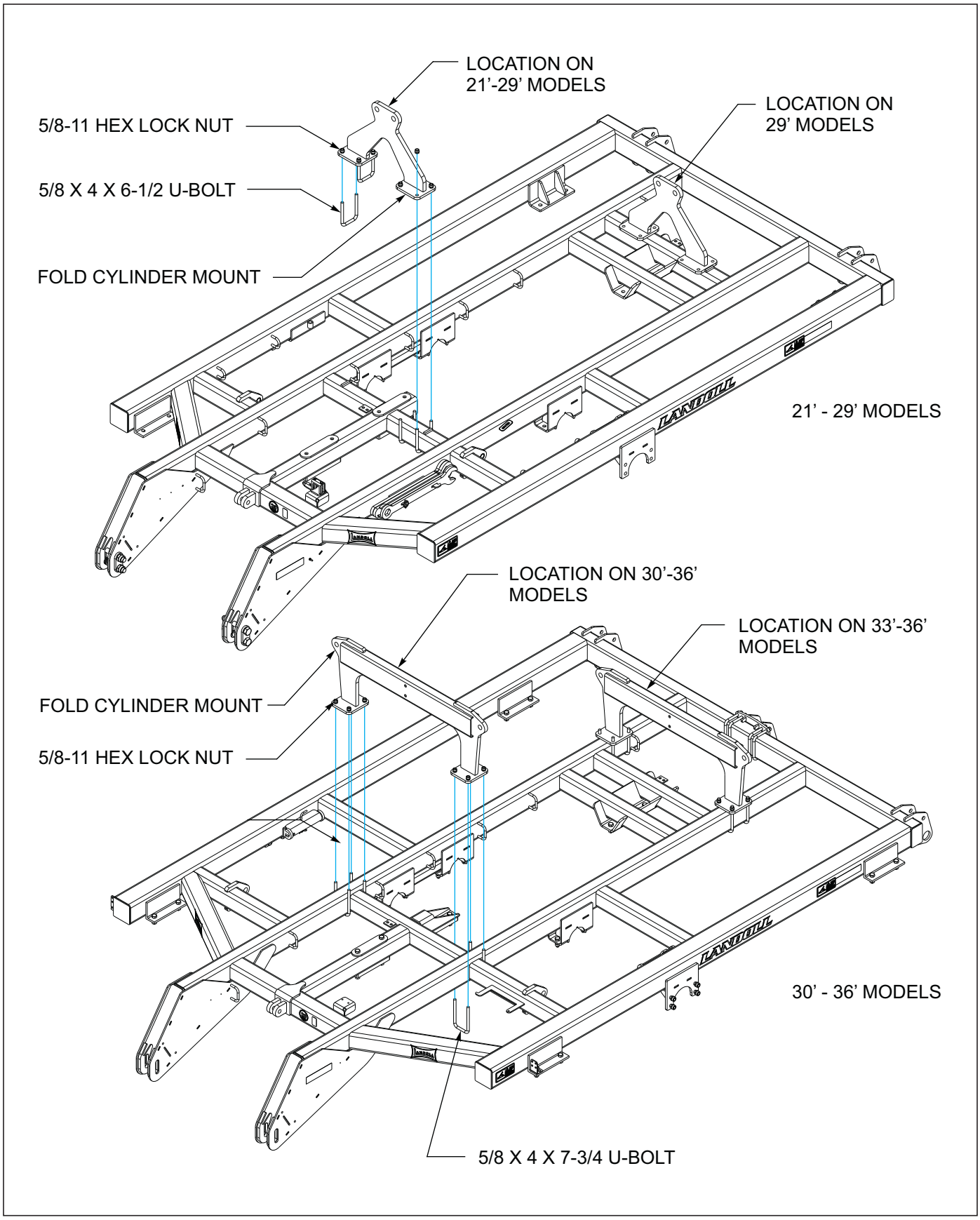


Figure 3-6: Fold Cylinder Mount Installation

Center Frame Tires

Install the tire and wheel assemblies on the center section.

Disc Gangs

DANGER

Disc blades are extremely sharp. Exercise extreme care when working on or near disc blades. Do not allow discs to roll over or fall onto any bodily part. Do not allow wrenches to slip when working near disc blades. Never push wrenches toward disc blades. Do not climb over machine above disc blades. Failure to stay clear of disc blade edges can cause serious personal injury or death.

1. Attach the disc gang assemblies to the center section using 3/4-10 x 2 grade 8 hex head cap screws and hex lock nuts ***See Figure 3-7***. Use a 3/4-10 x 2-1/2 grade 8 hex head cap screw, lubrication bracket and hex lock nut on each center front screws of the left and right front disk gangs.
2. 21'-29' models require a 3/4-10 x 8 grade 8 hex head cap screw, and hex lock nut at the center of the front gang.
3. On 30'-36' models, use 3/4-10 x 3-3/4 and 8 grade 8 hex head cap screws at the center of the front gang.
4. Insert plastic flange bearings into each end of round tube ends of the center and wing frame disc gang assemblies.
5. Install a 1/2 x 2-1/4 grooved alloy pin in the end of each hinge pin.
6. Assemble each wing gang to the center frame gang using the hinge pin, 1-1/2 thrust washer, 1-1/2 slotted nut and 3/8 x 2-1/4 spring pin.

NOTE

The thrust washer is positioned on the front side of the hinge on the front gangs, and on the rear side of the hinge on the rear gangs.

7. Place the outer ends of the gang bars on stands so the wing gangs are level with the center section.

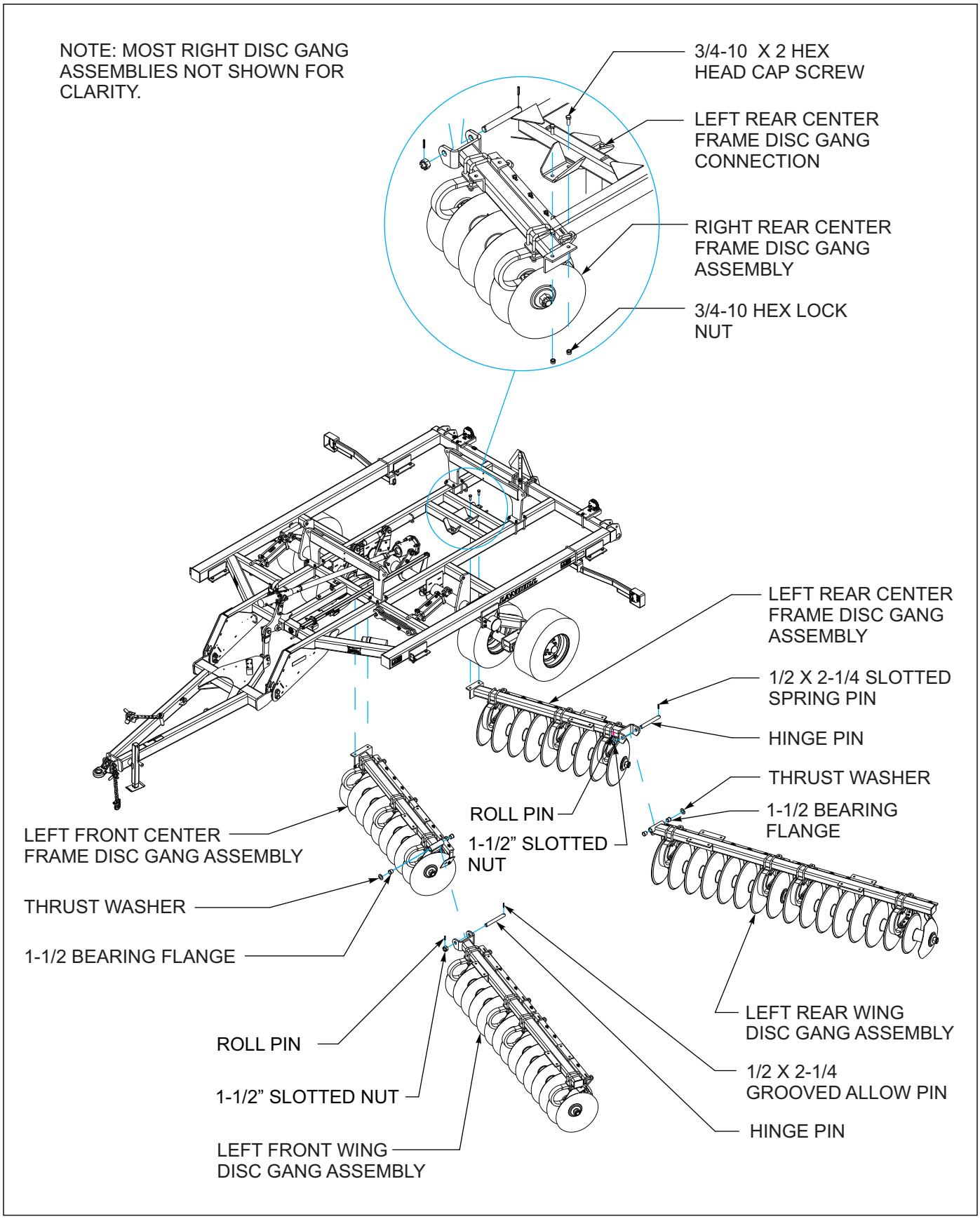


Figure 3-7: Disc Gang Installation

Wing Frames

1. Place the wing frames on top of the wing gang assemblies and attach using 3/4-10 x 2 hex head cap screws and hex lock nuts ***See Figure 3-8***.
2. Assemble the tire and wheel assemblies to the wing frames.
3. Attach the front gauge wheel assemblies to the wing frames using 1-8 x 6 hex head cap screws, gauge wheel spacers, and hex lock nuts. Securely tighten the mounting screws to eliminate any slack and unnecessary wear.

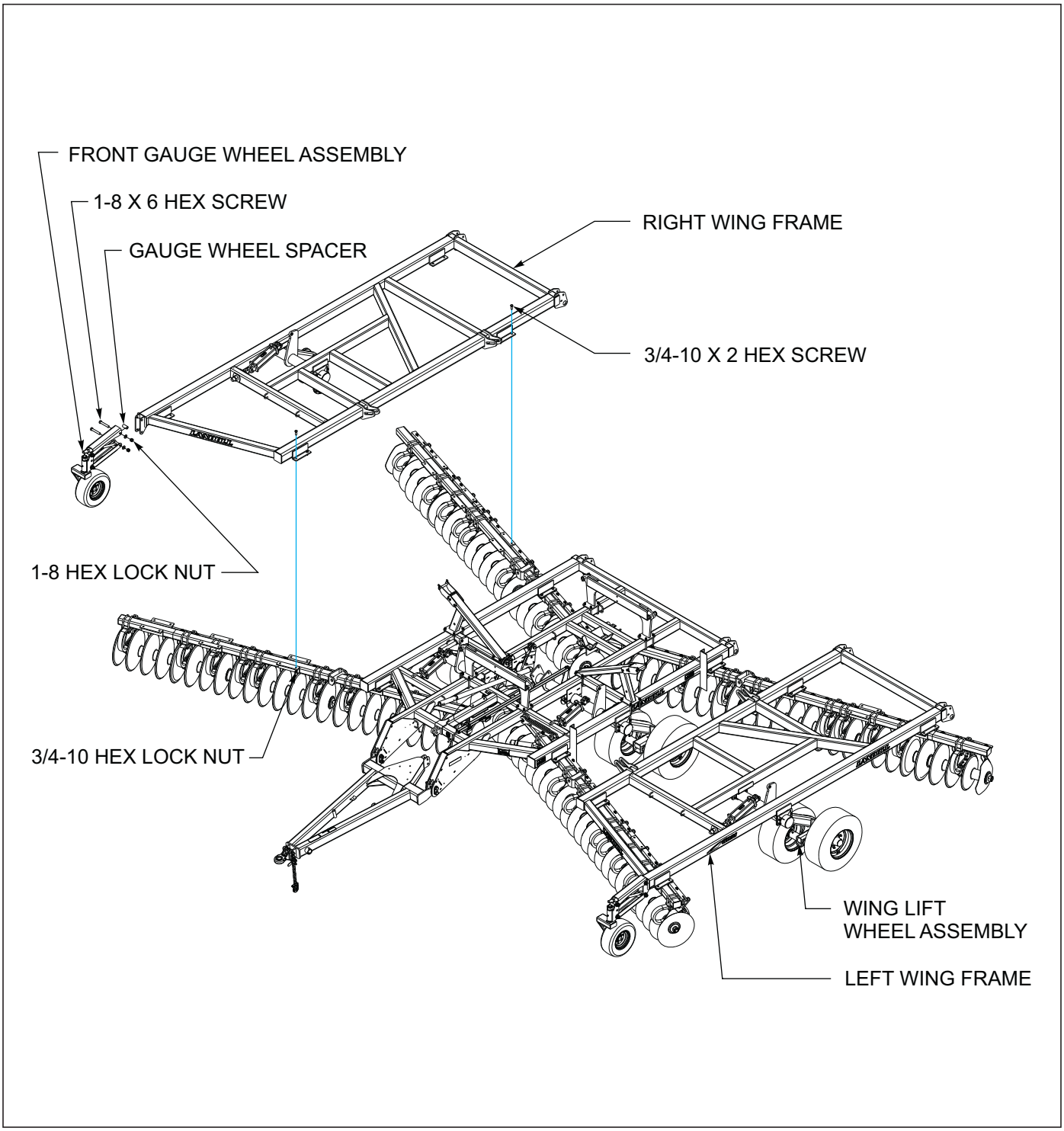


Figure 3-8: Wing Frame Installation

Hydraulic Installation

NOTE

*Refer to **See Figure 3-10 through 3-24** for lift and fold hydraulic diagrams for each disc model.*

1. Attach the base end of the 4-1/2 x 30 fold cylinder to the fold cylinders mounts on the center frame with the pins and roll pins provided. Position the cylinders so the hydraulic ports point forward. Model 6231-29' rear fold cylinders, the ports point rearward.
2. Using a 1-1/4 x 6-1/8 fold pin, flat washers, and 5/16 x 2-1/2 roll pins, attach the rod end of the 4-1/2" x 30" cylinders to the slotted mounts on the wing frames.
3. Install 90 degree restrictor fittings in the rod end of each 4-1/2" x 30" cylinder.

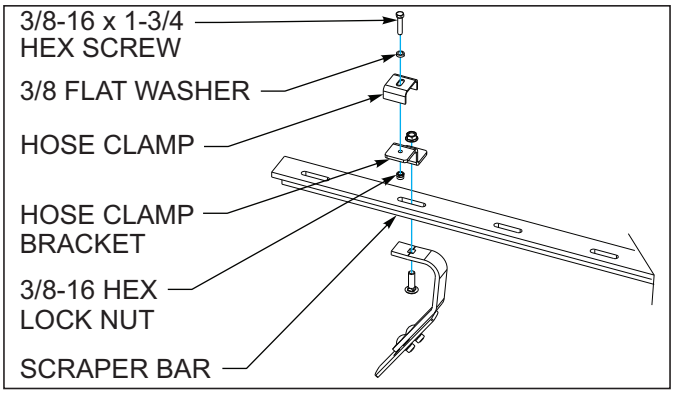


Figure 3-9: Hose Clamp Assembly

CAUTION

Restrictors are installed to prevent uncontrolled dropping of wings. Removal of these restrictors, or improper installation can result in serious damage to the implement.

4. Install 90 degree regular adapter fittings in the base end of the 4-1/2" x 30" cylinders and both ends of all lift cylinders.
5. Assemble fittings and plugs to the 16-port manifold. Install the front manifold to the manifold bracket on the center frame using 1/2-13 x 3-1/2 hex head cap screws and hex lock nuts.
6. On 29', 33', & 36' models, attach the 8 port manifold to the rear manifold brackets on the implement using 1/2-13 x 3-1/2 hex head cap screws and hex lock nuts.
7. Install lift system hoses per ***Figures 3-10* through *3-17***.
8. Attach hose clamp brackets to the second slotted hole in each scraper bar from the hinge joint ***See Figure 3-9***. Secure hoses to the brackets with hose clamps, 3/8-16 x 1-3/4 hex head cap screws, and hex lock nuts.
9. Install fold system hoses per ***Figures 3-18* through *3-24***.
10. Install plugs in any remaining open manifold, valve, or cylinder ports.
11. Refer to ***See Figure 3-16*** for lift hydraulic layout and ***Figures 3-22* through *3-23*** for fold hydraulic layout.

Hydraulic Conditioner Reel Assembly (Optional)

1. Refer to ***See Figure 3-45* through *See Figure 3-51*** for proper manifold, fittings and hose installation for each model.

Lift Hydraulic Installation

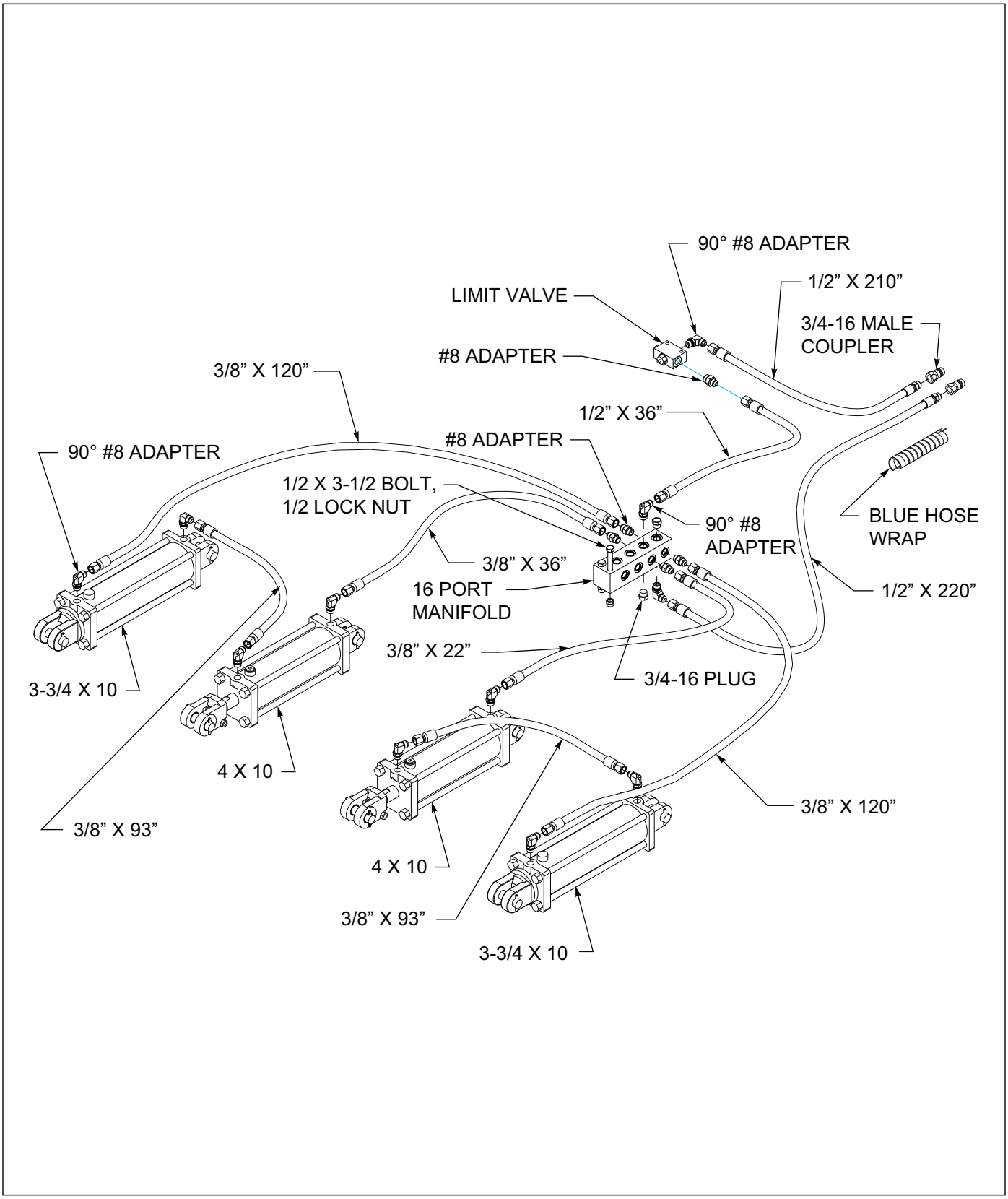


Figure 3-10: Lift Hydraulic Installation - 21'

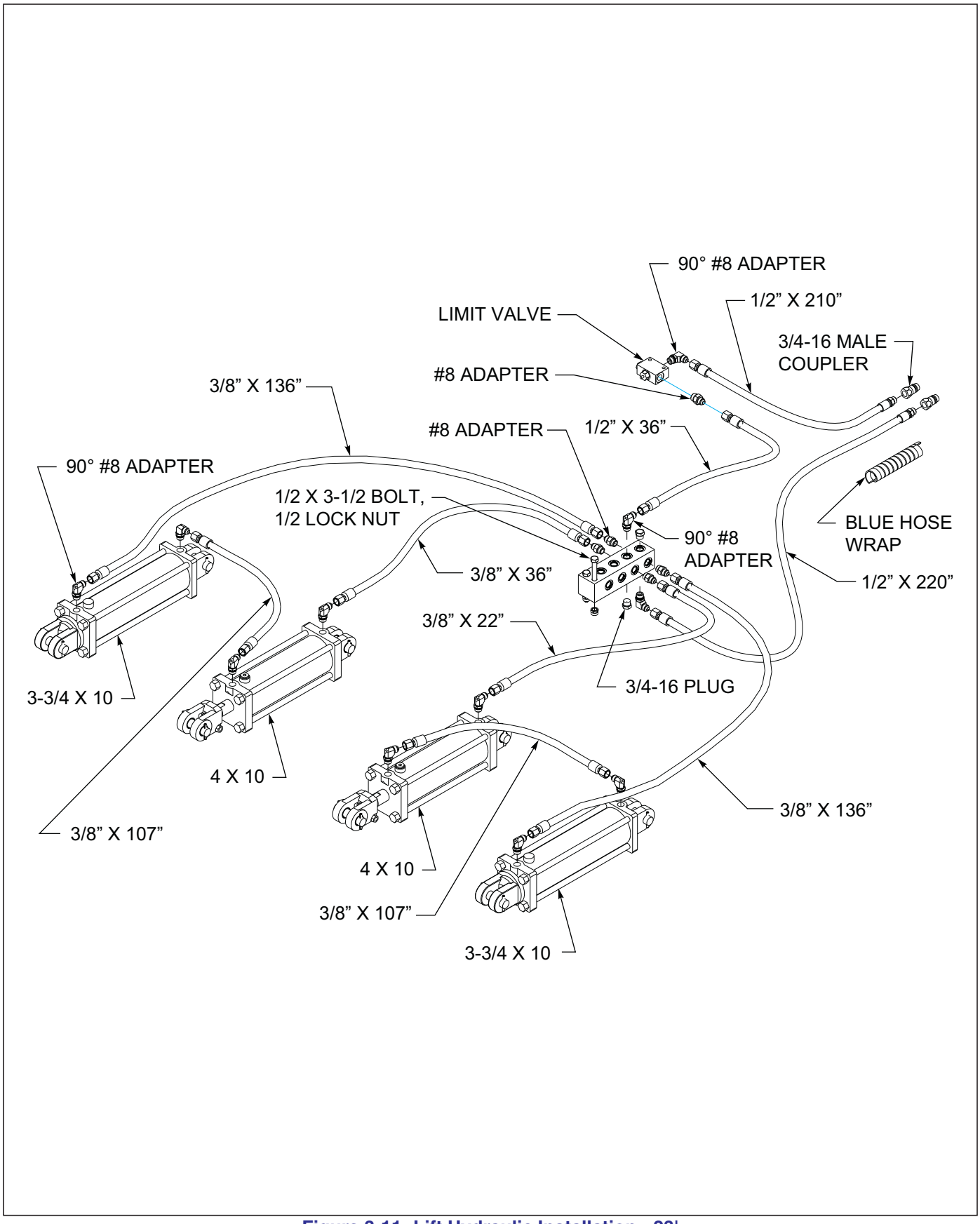


Figure 3-11: Lift Hydraulic Installation - 23'

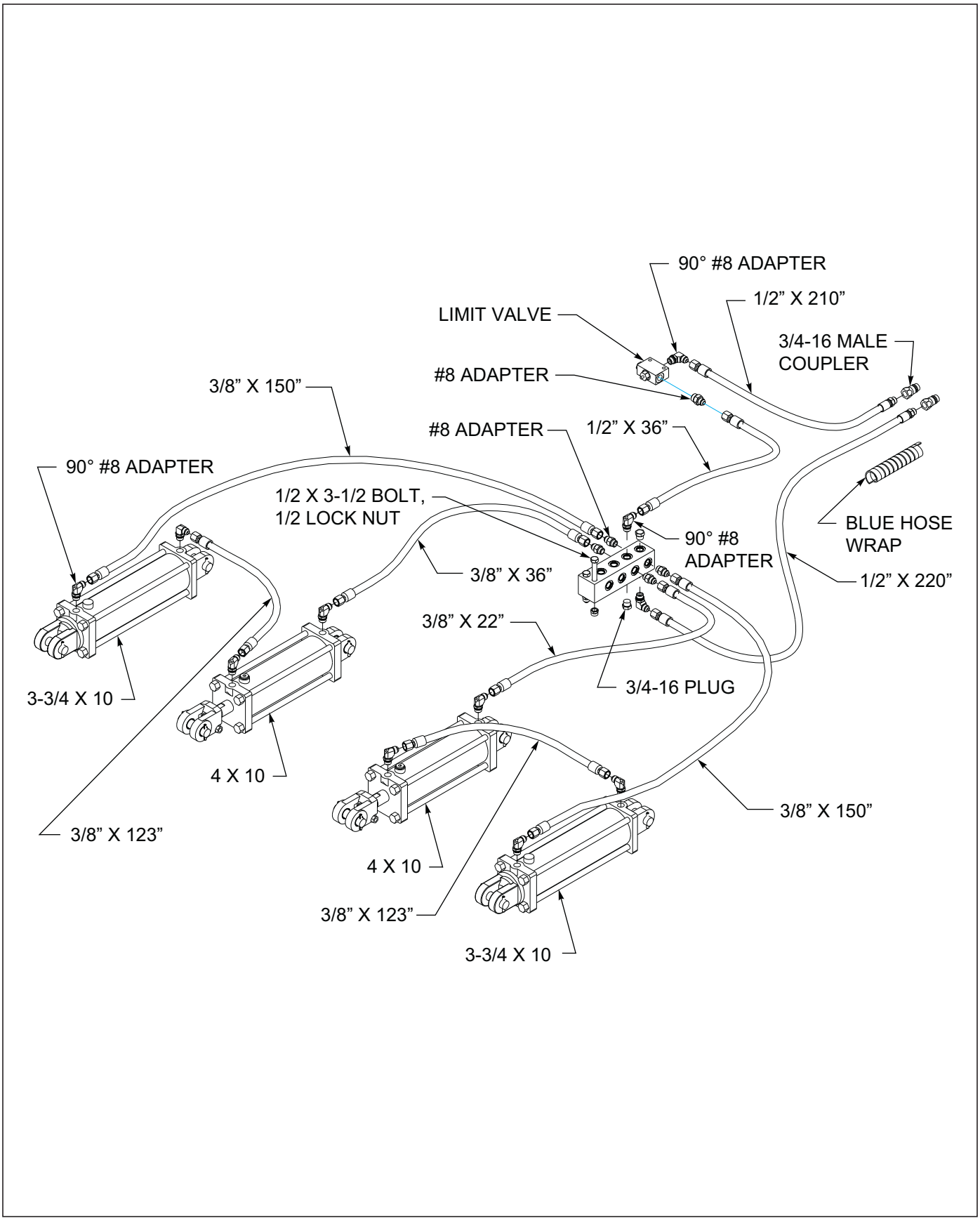


Figure 3-12: Lift Hydraulic Installation - 26'

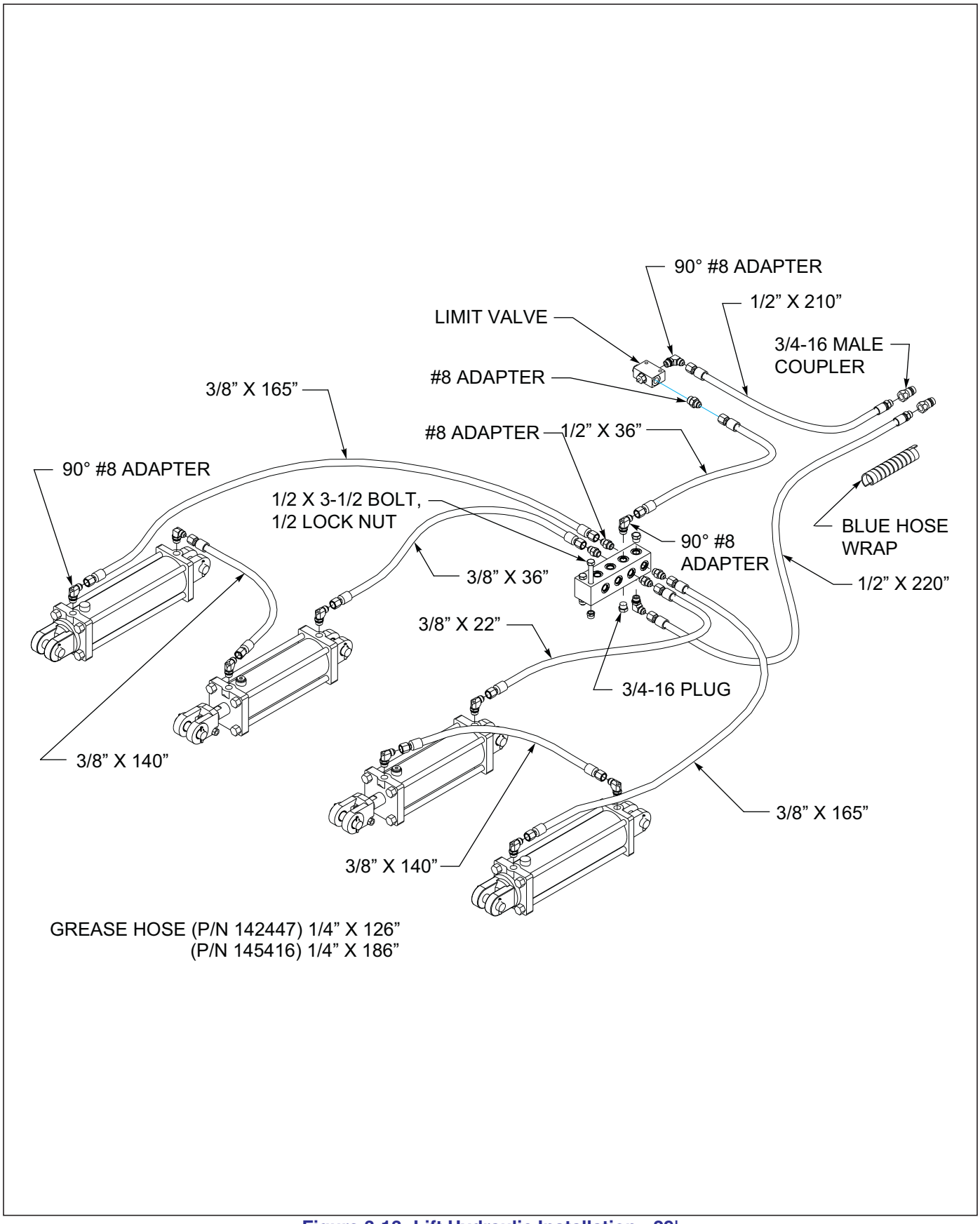


Figure 3-13: Lift Hydraulic Installation - 29'

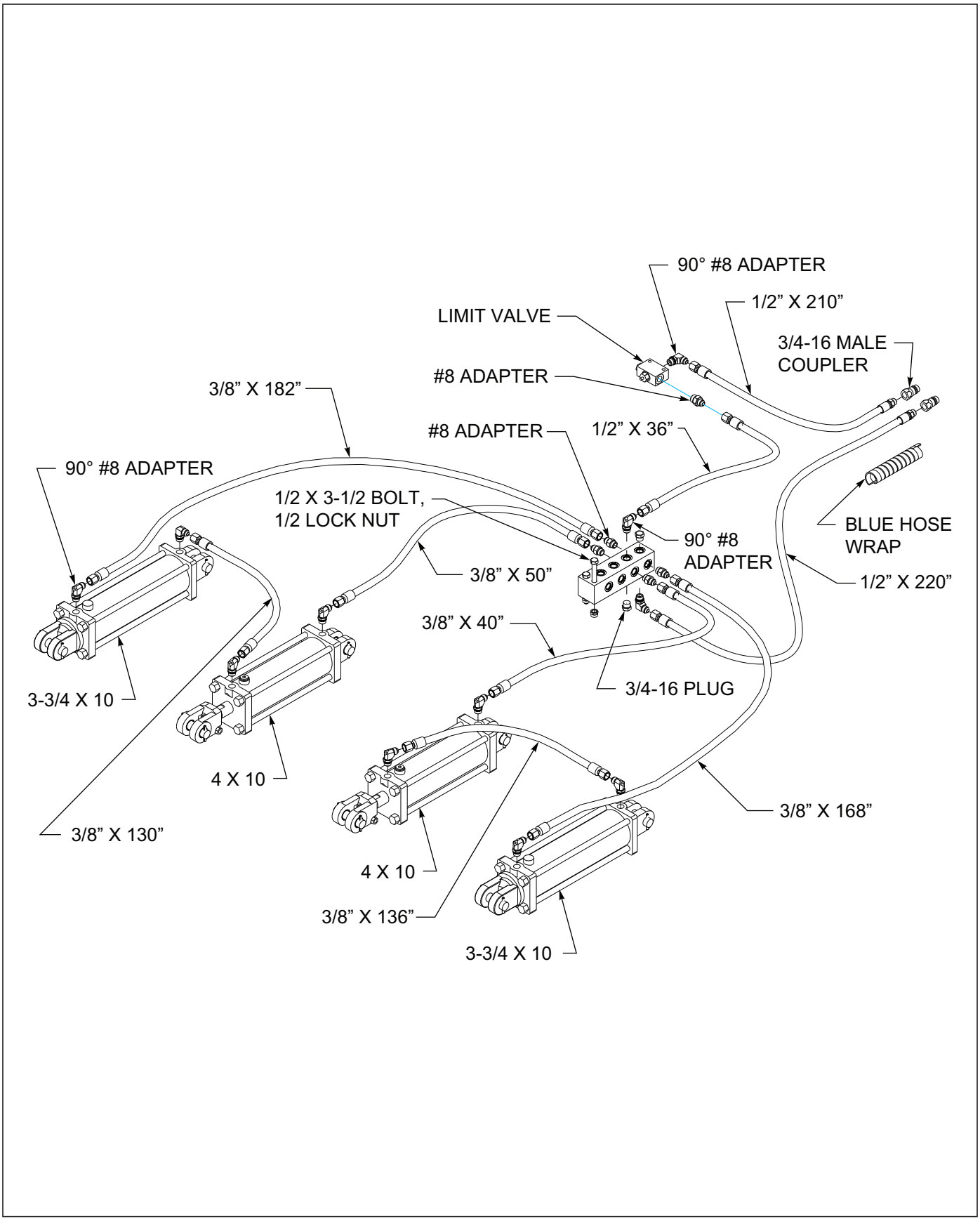


Figure 3-1: Lift Hydraulic Installation - 30'

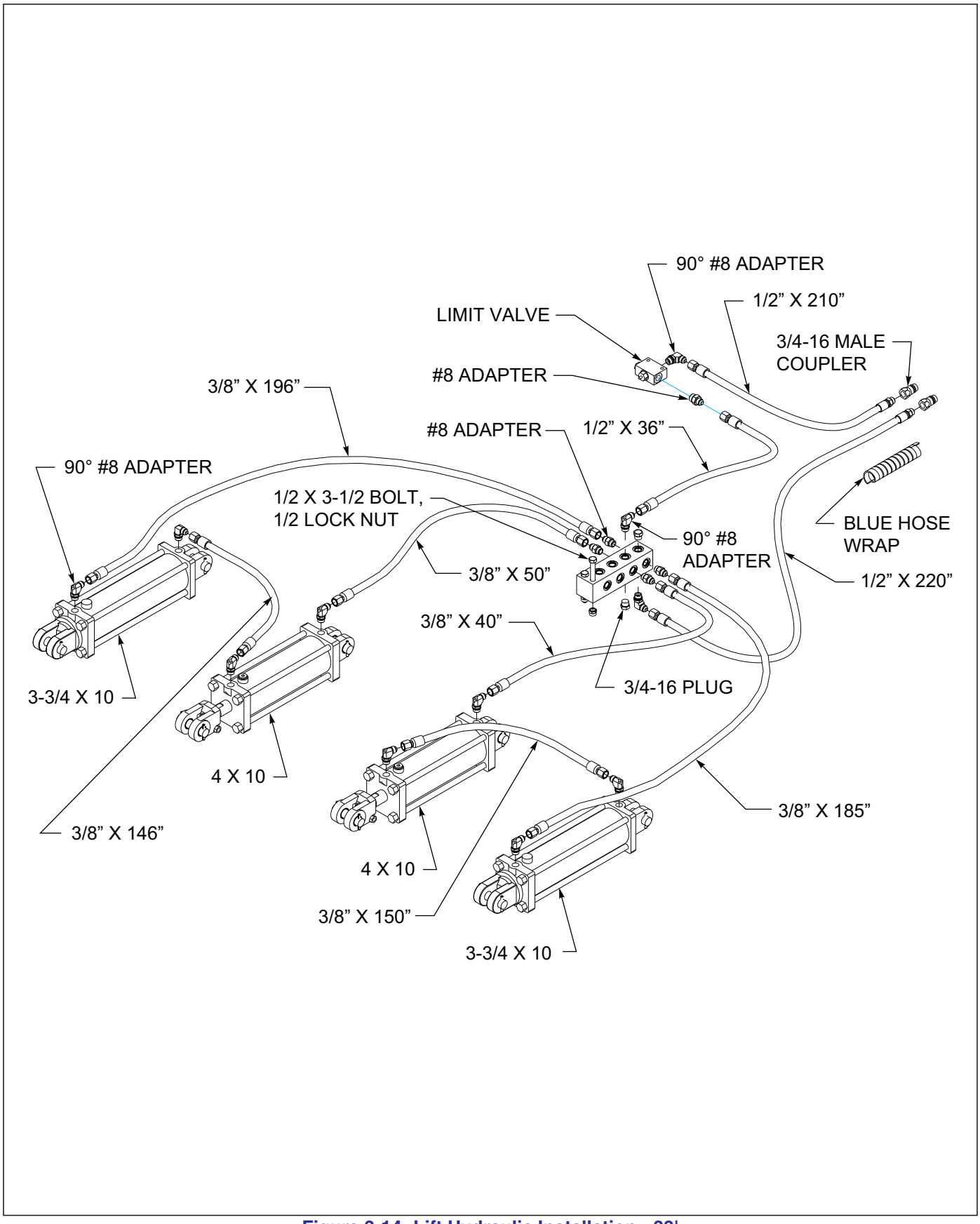


Figure 3-14: Lift Hydraulic Installation - 33'

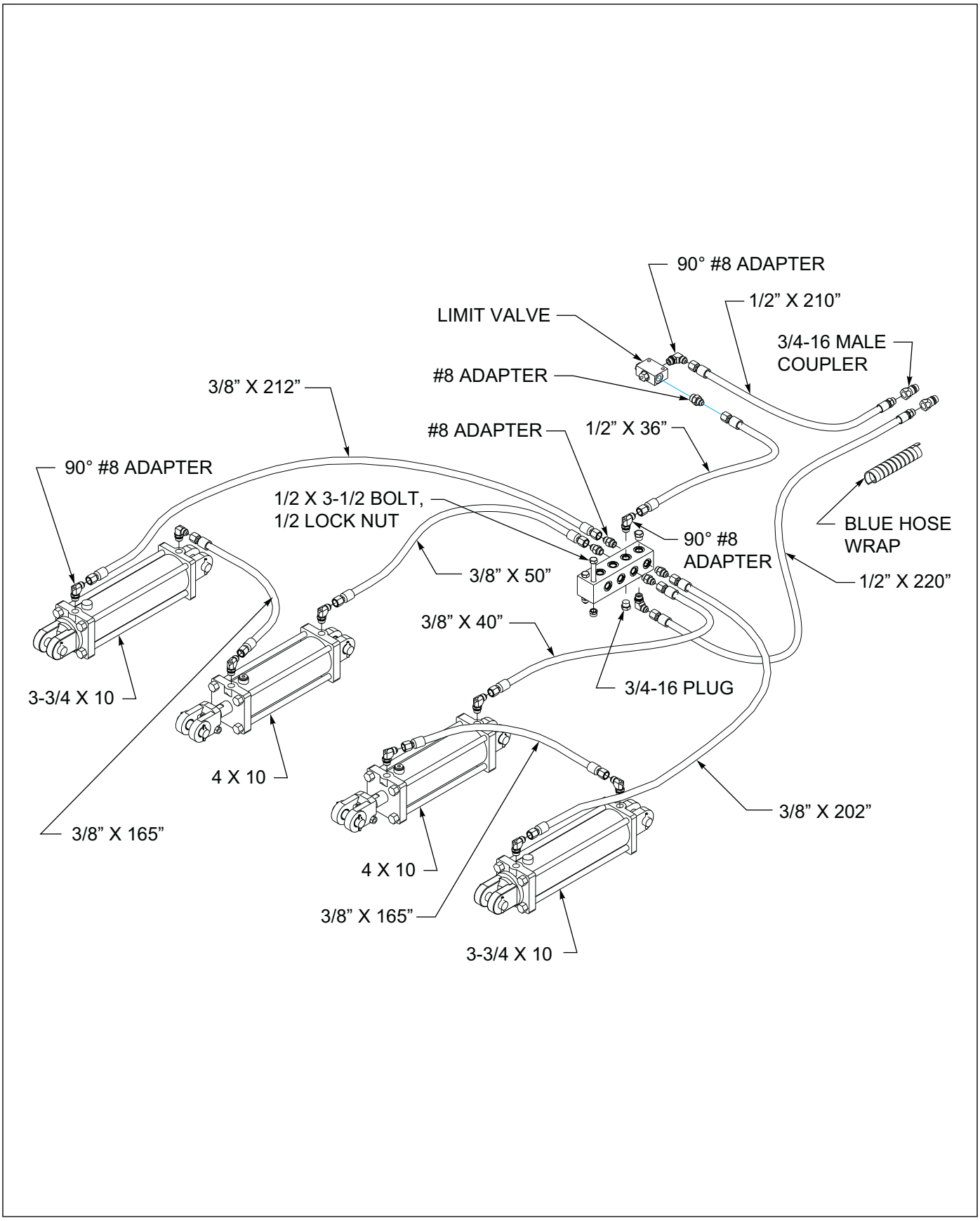


Figure 3-15: Lift Hydraulic Installation - 36'

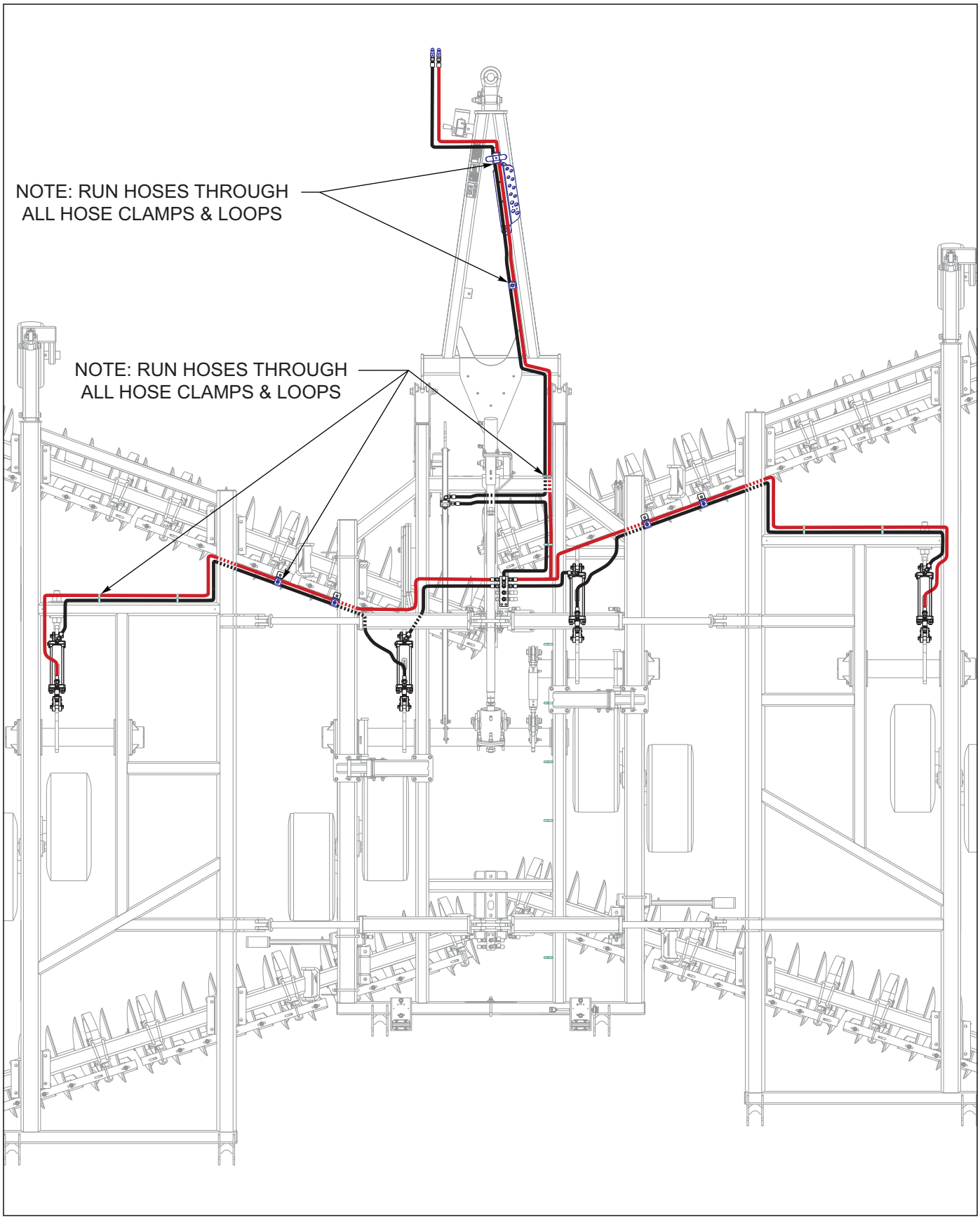


Figure 3-16: Lift Hydraulic Layout 6231-21'-29'

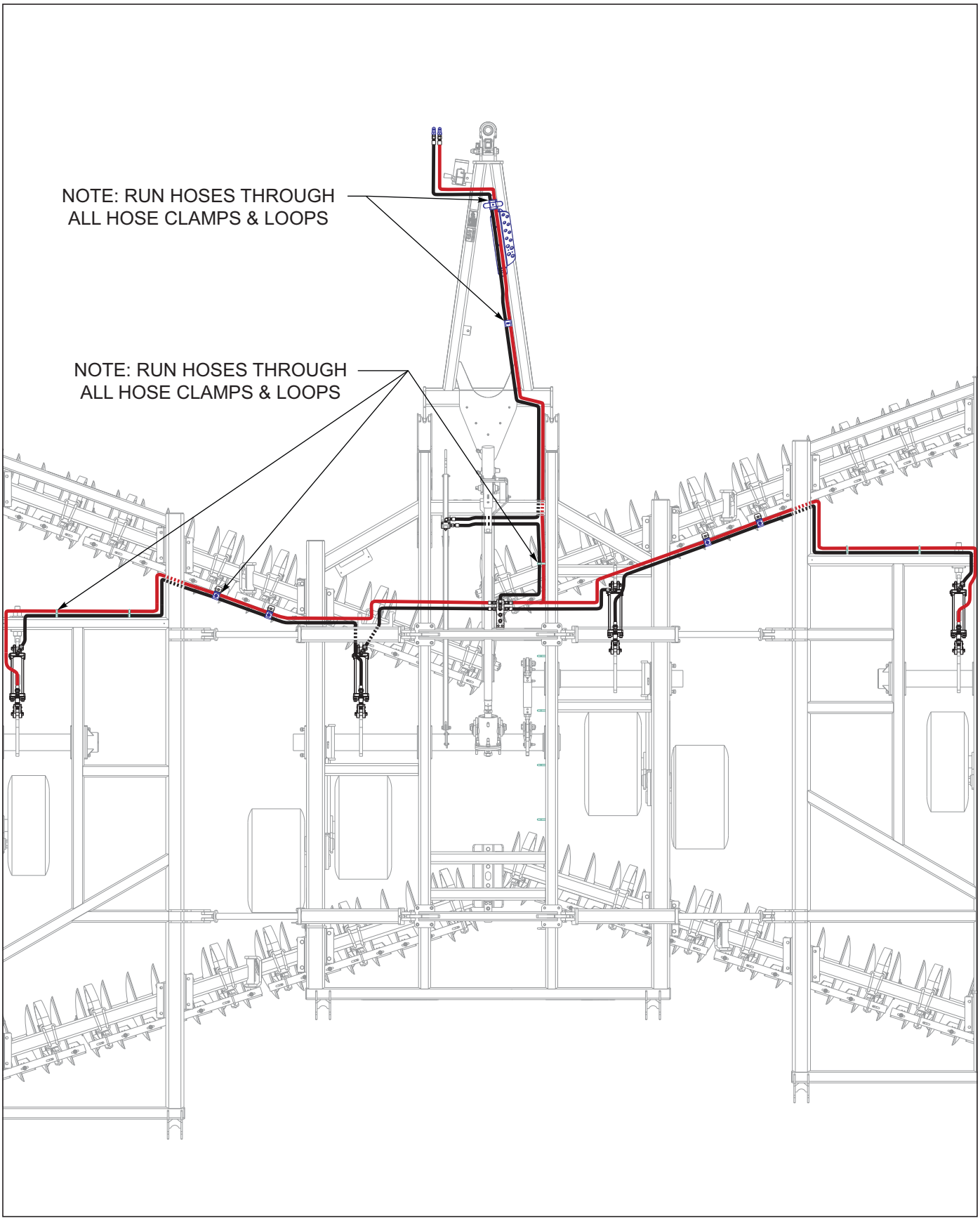


Figure 3-17: Lift Hydraulic Layout 6231-30'-36'

Fold Hydraulic Installation

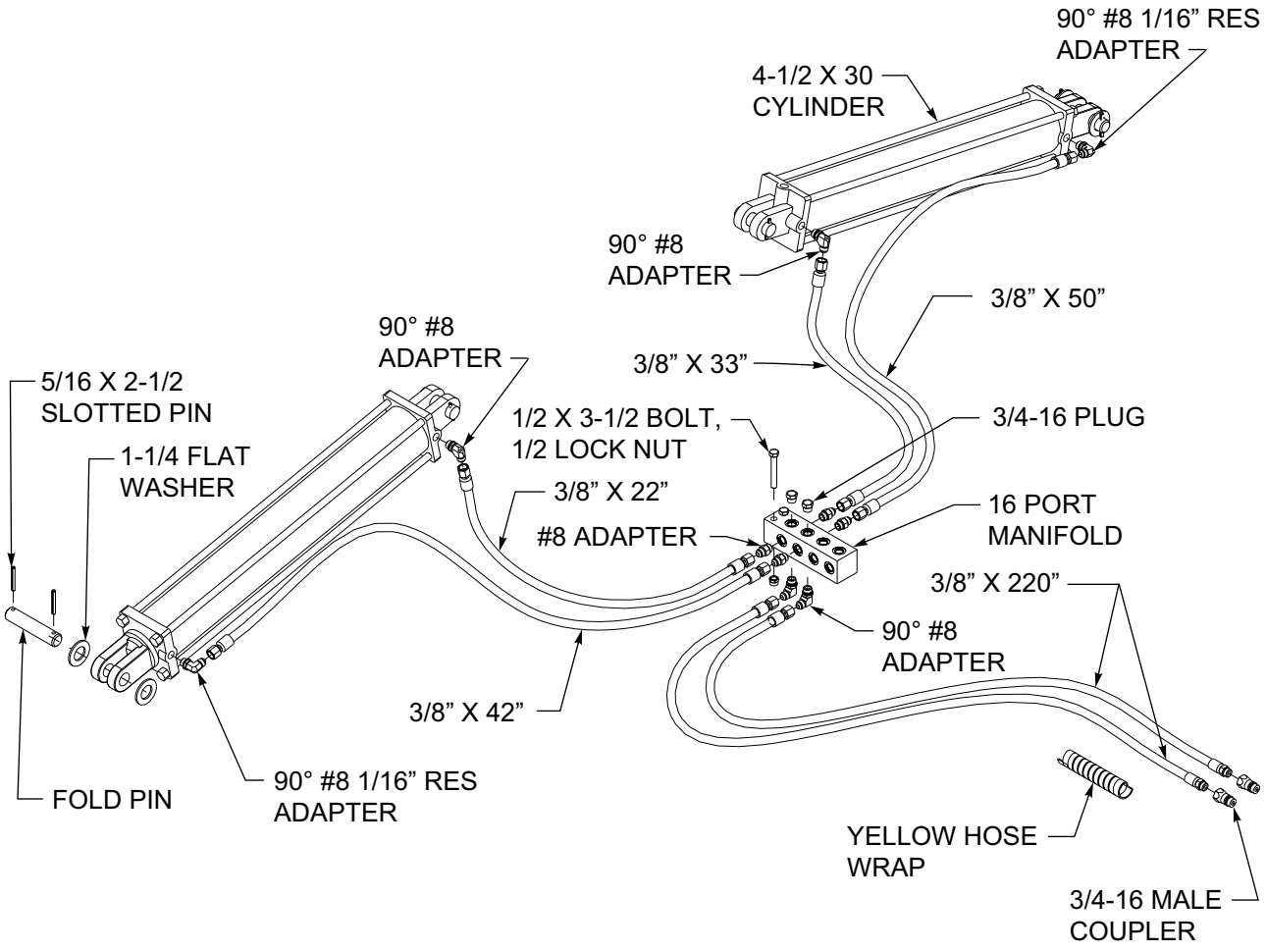


Figure 3-18: Fold Hydraulic Installation - 21', 23', & 26' (Single)

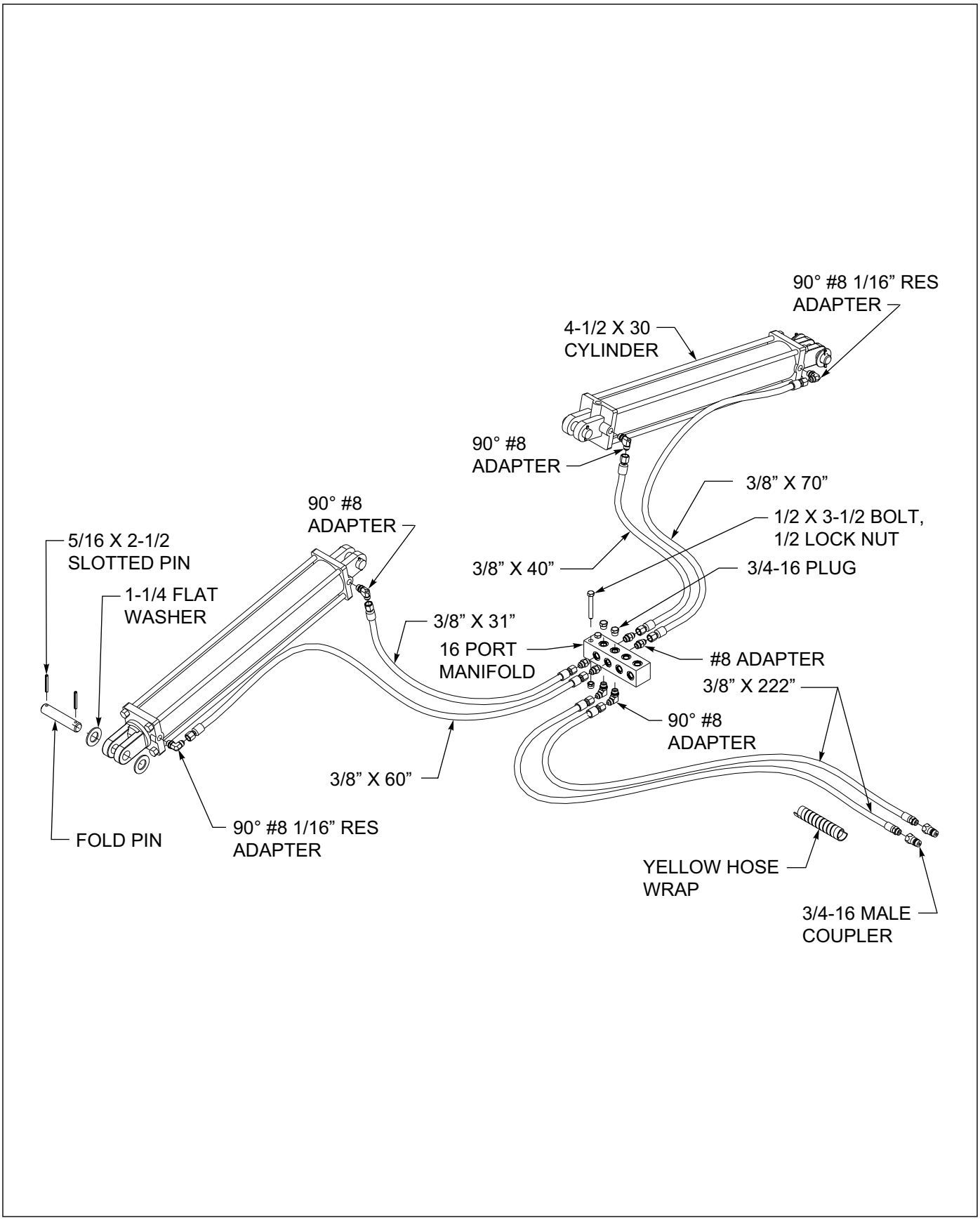


Figure 3-19: Fold Hydraulic Installation - 30' (Single)

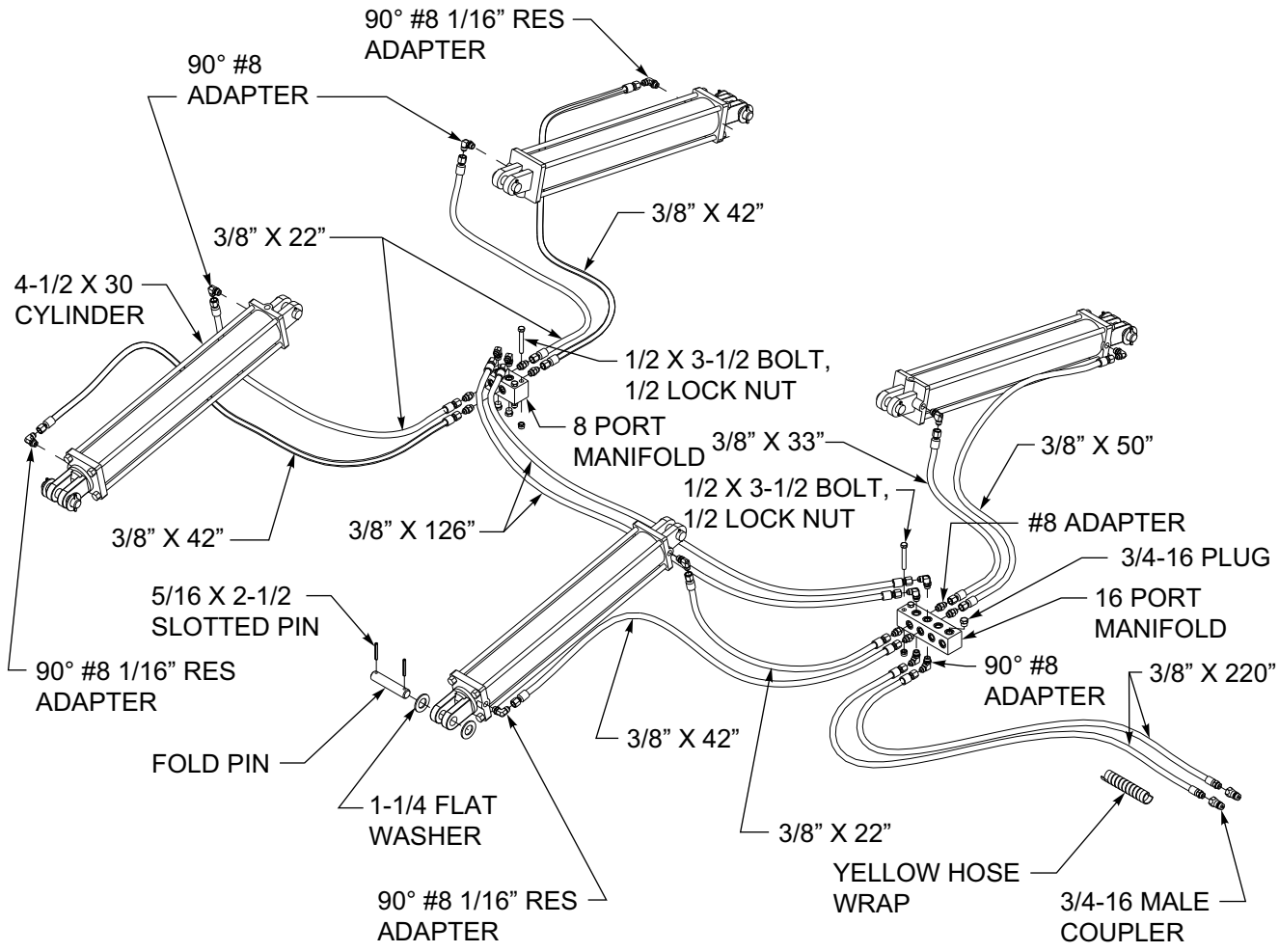


Figure 3-20: Fold Hydraulic Installation - 29' (Double)

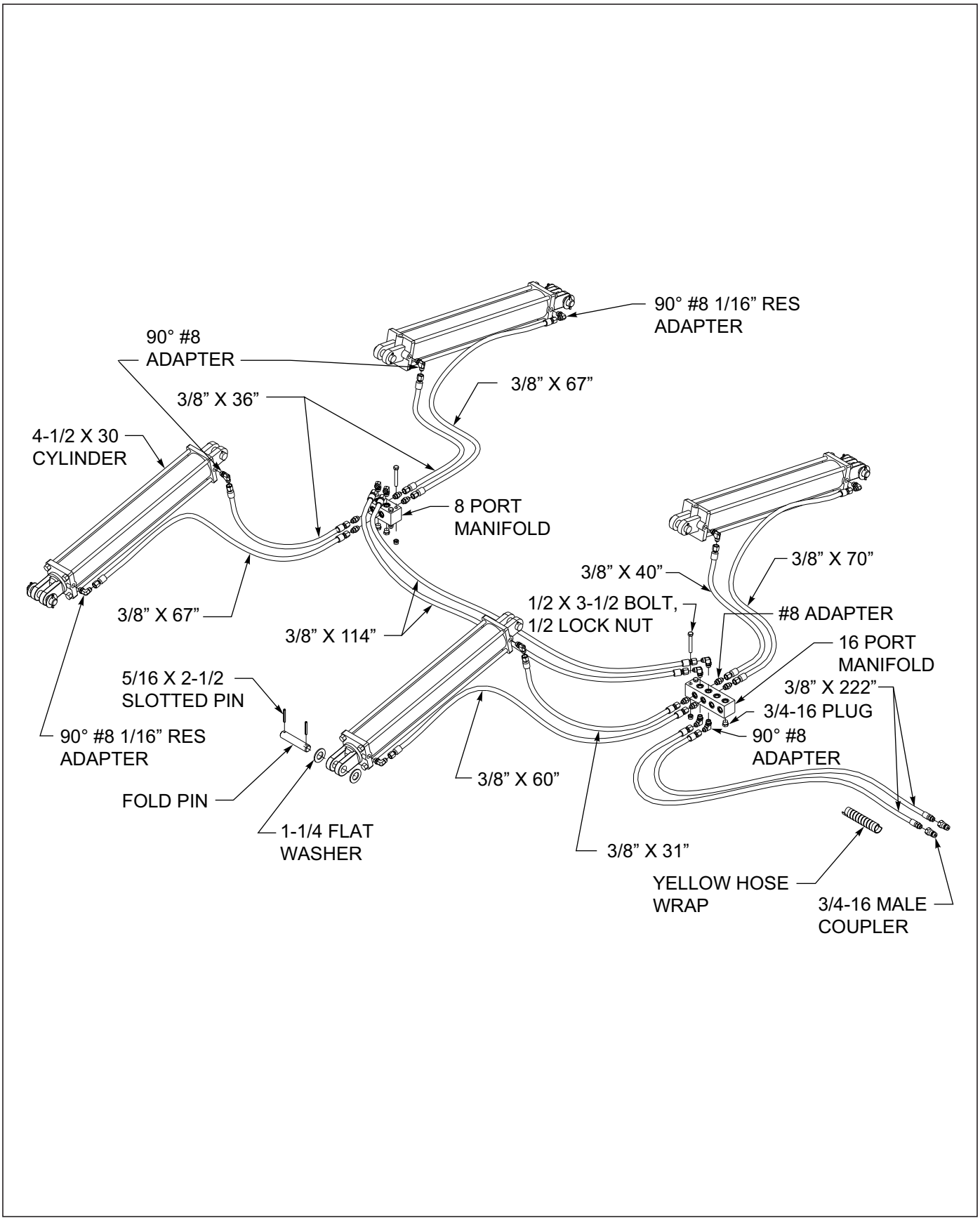


Figure 3-21: Fold Hydraulic Installation - 33' & 36' (Double)

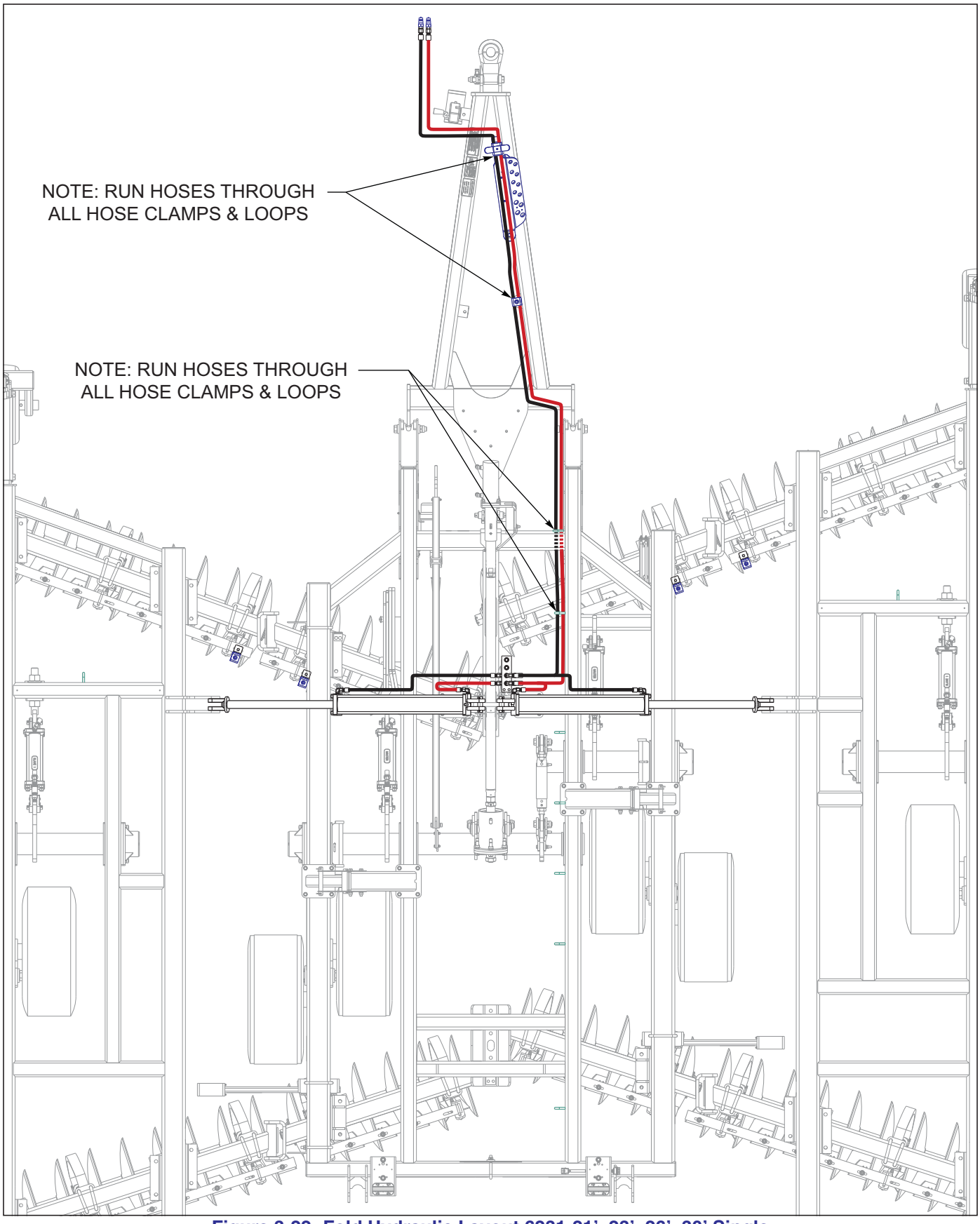


Figure 3-22: Fold Hydraulic Layout 6231-21', 23', 26', 30' Single

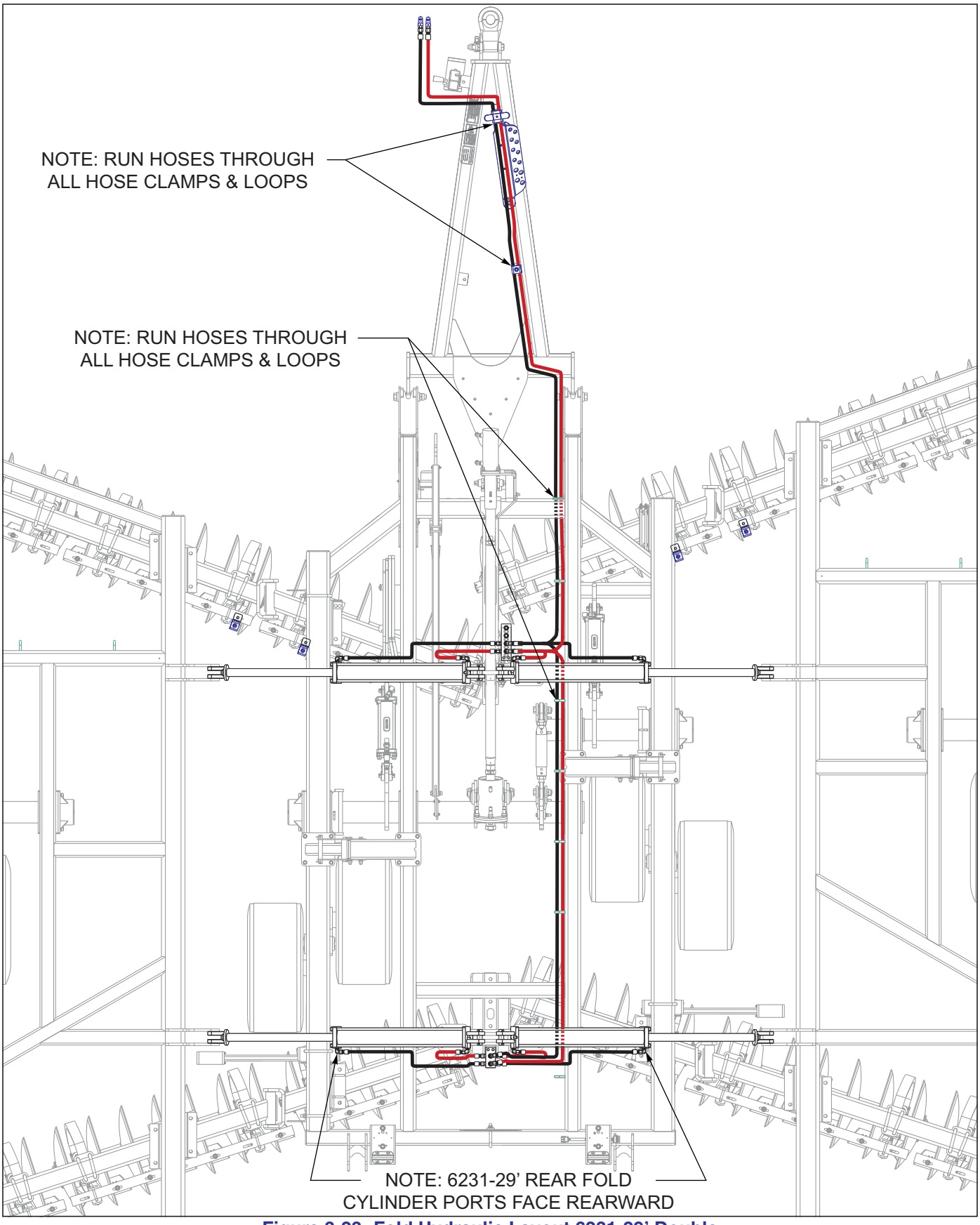


Figure 3-23: Fold Hydraulic Layout 6231-29' Double

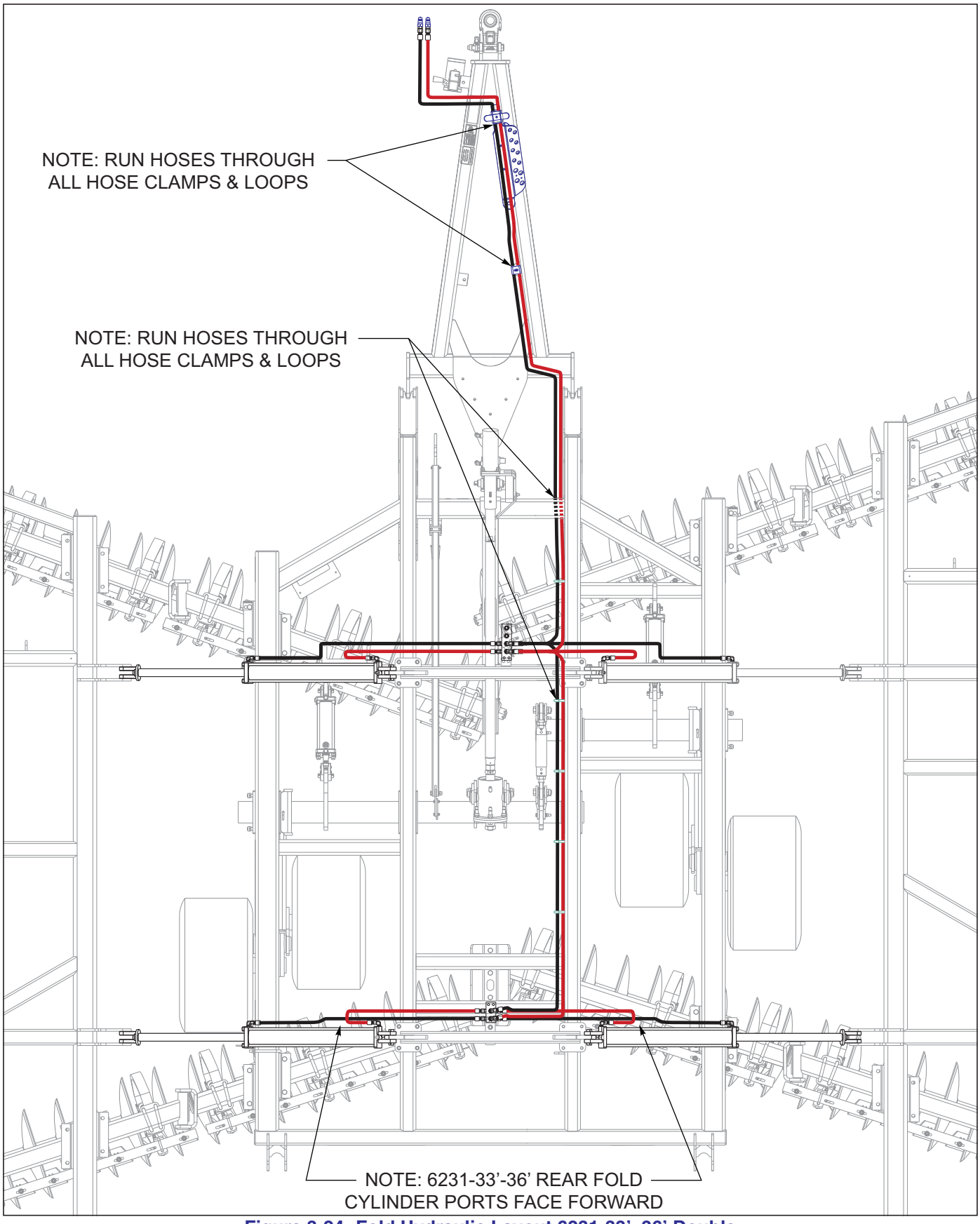


Figure 3-24: Fold Hydraulic Layout 6231-33', 36' Double

7-PIN CONN.	4-PIN TOWER	CIRCUIT	WIRE COLOR
1	D	GROUND	WHITE
2	–	WORK LAMPS	BLACK
3	B	LEFT FLASHING & TURN	YELLOW
4	–	STOP LAMPS	RED
5	A	RIGHT FLASHING & TURN	GREEN
6	C	TAIL LAMPS	BROWN
7	–	SWITCHED POWER (12 V)	BLUE

MAIN WARNING LIGHT HARNESS - WIRING CHART

	RIGHT AMBER	RIGHT RED		LEFT RED	LEFT AMBER
	2-PIN TOWER	3-PIN TOWER	6-PIN SHROUD	3-PIN TOWER	2-PIN TOWER
BLACK LEFT TURN			A	C	
WHITE GROUND	A	A	B	A	A
BROWN TAIL LIGHT		B	C	B	
YELLOW LEFT TURN			D		B
GREEN RIGHT TURN	B		E		
RED RIGHT TURN		C	F		

REAR WARNING LIGHT HARNESS - WIRING CHART

Figure 3-25: LED Light Harness Wire Designations

LED Light and SMV Bracket Installation

NOTE

See Figure 3-27 for light bracket, smv mounting bracket placement and wiring harness routing.

1. Attach light bracket LH and RH assemblies w/reflector to center frame using 5/8 x 6-11/16 x 7-1/2 u-bolts and 5/8 flange nuts ***See Figure 3-26*.**
2. Attach left tail light mount to frame assembly using 5/8 x 4-11/16 x 8-1/4 u-bolt and 5/8 flange nuts.
3. Attach right tail light mount and ag flasher control module to frame assembly using 5/8 x 4-11/16 x 8-1/4 u-bolt and 5/8 flange head serrated nuts. Install the ag flasher control module to bottom side of right tail light mount with 1/4 x 1-1/2 bolts and 1/4 lock nuts, be sure that the ag flasher control module is set so that the 6 pin connector faces the right side of the machine. Route connector to the front of the disc.
4. Attach the ag red single LED lamps to tail light mounts using 1/4 x 1-1/4 bolts and 1/4 lock nuts.

IMPORTANT

Make sure lights are positioned for maximum visibility from the rear.

5. Install the rear warning light harness to the frame. Connect 2 pin and 3 pin ends to each of the warning lights. Connect 6 pin to the ag flasher control module. ***See "LED Light Harness Wire Designations" on page 3-32*.**
6. Attach ag amber single LED lamps to light brackets using 1/4 x 1-1/4 bolts and 1/4 lock nuts.
7. Attach main warning harness to frame. Connect 4 pin end to the ag flasher control module.
8. Insure that the harnesses are clear of any moving parts and secure the harnesses with tie wraps provided.
9. Attach SMV mounting bracket to rear center frame bar using 5/8 x 5-11/16 x 5-1/2 u-bolt and 5/8 flange nuts. Attach SMV emblem, SIS mount, SIS 20mph decal to SMV mounting bracket with 1/4 x 1 bolts and 1/4 lock nuts. The SMV sign should be centered on the back bar of the frame.

NOTE

Route the harness through the hose loops and hose holders along the frame and hitch. Slide main harness connector plug into store-a-way harness already installed to bottom side of hose holder bracket on front of hitch when not connected to tractor. Use tie straps as needed to keep wiring harness's clear of moving parts.

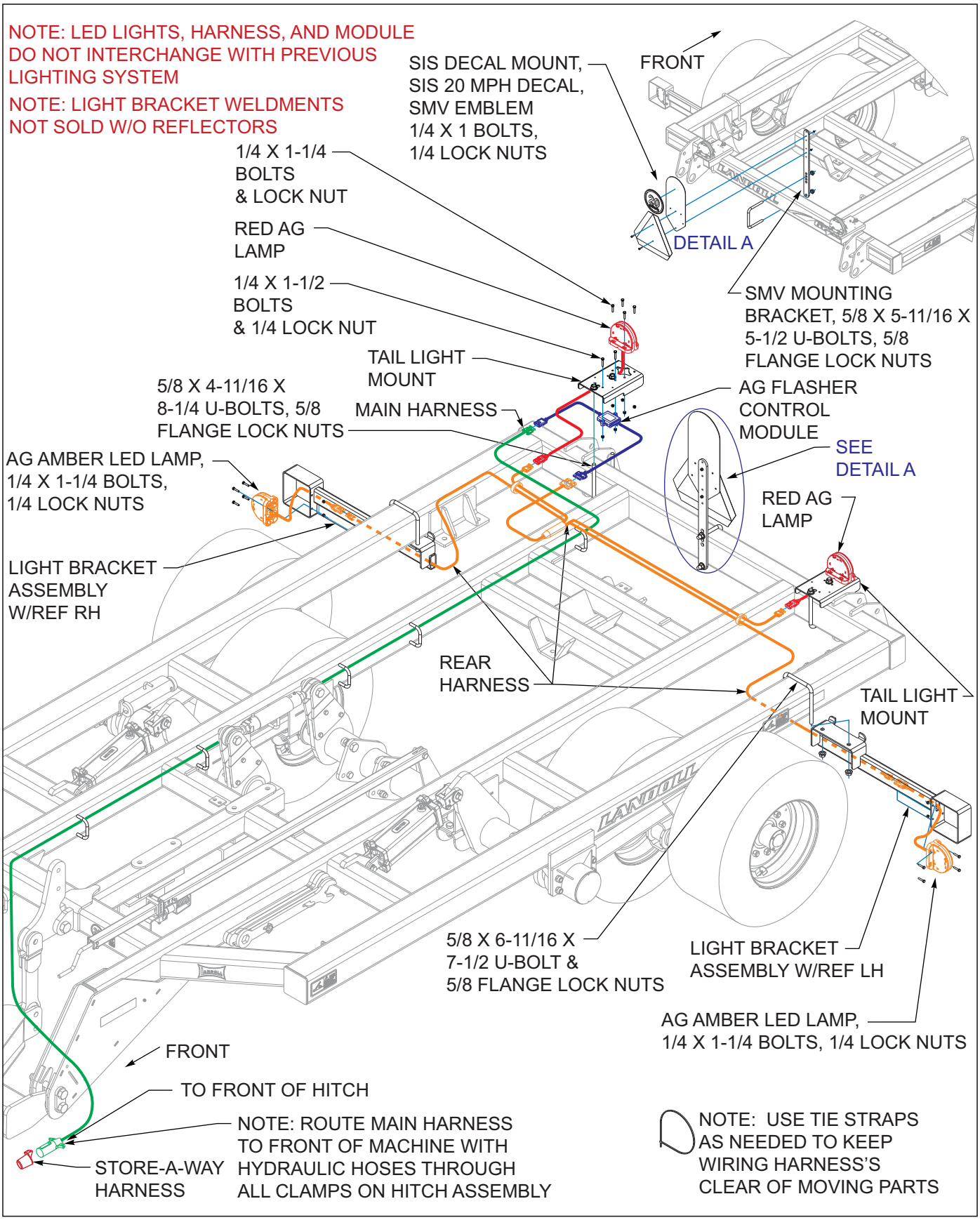


Figure 3-26: LED Light Installation

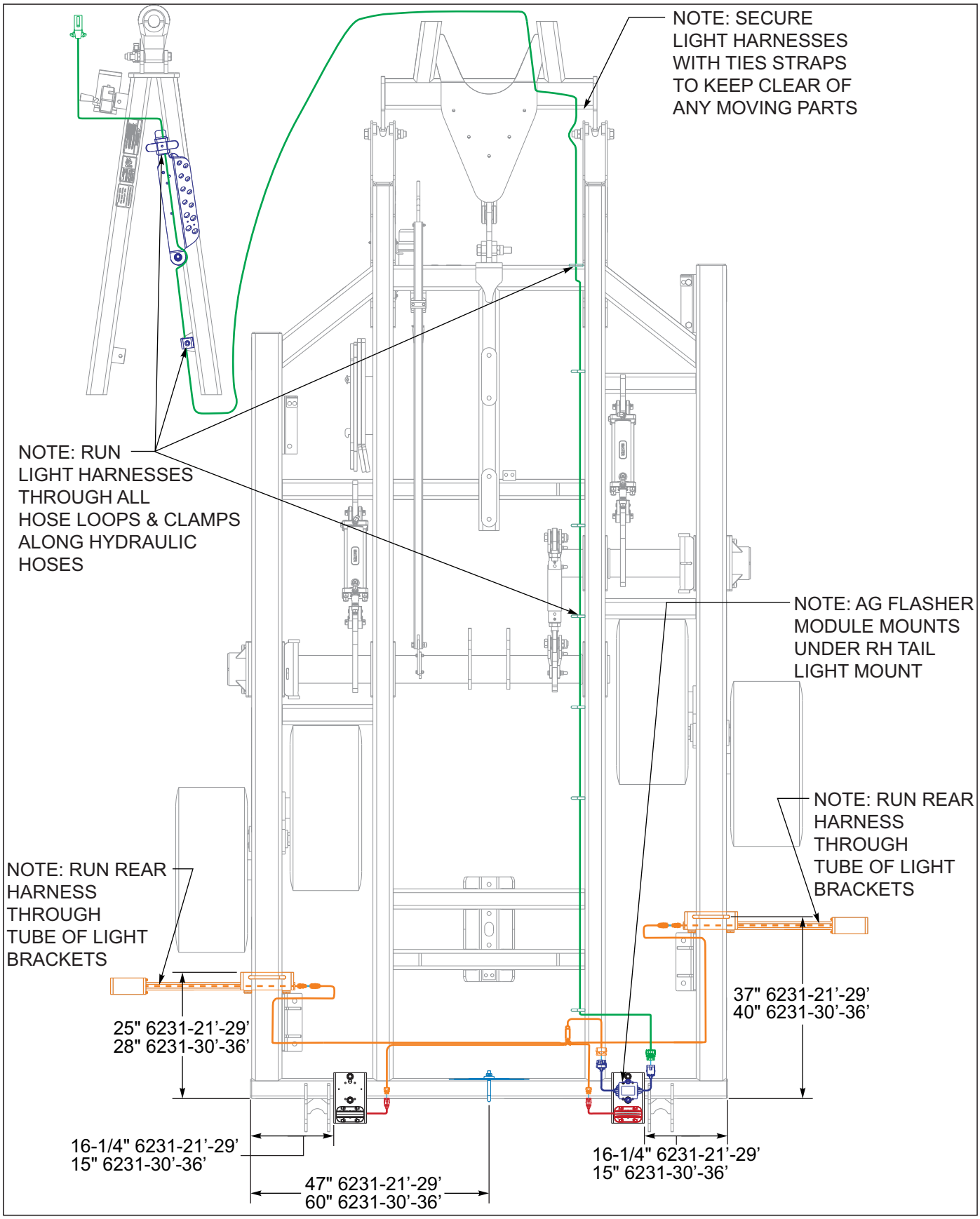


Figure 3-27: LED Light Layout

6231 Coil Tine Assembly

See Figure 2-6 **through** ***2-16*** for harrow placement dimensions.

1. Install the 2-1/2 adjustment pin in the lower hole of each harrow mount ***See Figure 3-29***. Secure with snap rings on each side of the mount. Insert a 1 x 9 adjusting bolt through the 2-1/2 dia pin and loosely secure with a 1” lock washer and hex nut. Loosely install a second 1” nut onto each adjusting bolt.
2. Thread a spring assembly onto each 1 x 9 adjusting bolt of each of the harrow mounts.
3. Insert the plastic wear bushings into each side of the reel arms.
4. Insert the steel pivot bushing through the plastic wear bushings of each reel arm.
5. Attach each reel arm to the harrow mounts on the back of the disc using 1 x 6-1/2 bolts and 1” lock nuts.
6. Connect the other end of the spring assembly to the reel arm using 1” pivot pins, 1” machine bushings, and 5/16 x 1-1/2 spring pins.
7. Turn the 1 x 9 adjustment bolt in or out to the desired reel height for initial setting ***See Figure 3-28***. Lock cylinder shaft in place with the 1” nut against the adjustment pin. Lock the 1” nut against the front end of the spring. Repeat for each conditioner reel arm and set all spring lengths the same for even reel heights.

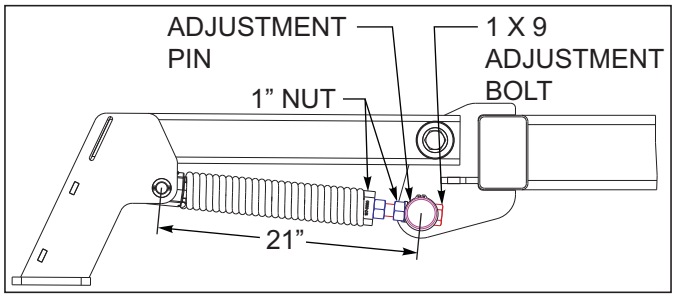


Figure 3-28: Spring Adjustment

8. Mount the harrow sections to the bottom of the reel arms using gangbar mount plates, clamp tubes, 3/4 x 7 screws, and 3/4 lock nuts. Install a second 3/4 lock nut on the mounting bolts to secure the clamps.

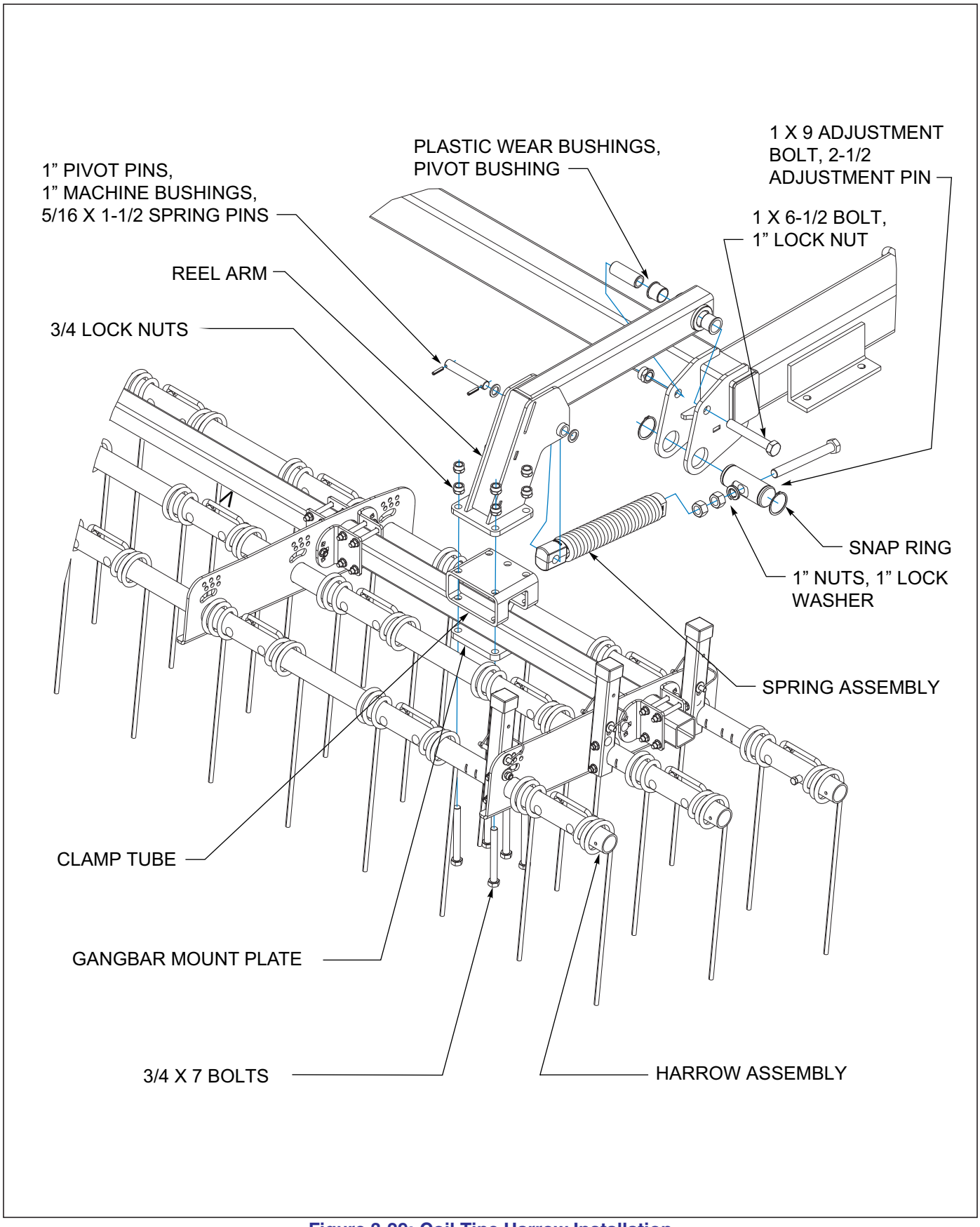


Figure 3-29: Coil Tine Harrow Installation

Conditioner Reel Spring Installation (Option)

Refer to Conditioner Single Reel Installation ***See Figure 3-34*** for single reel installation or Models 6231-21'-29' *Conditioner Double Reel Installation* ***See Figure 3-35***, Models 6231-30'-36' *Conditioner Double Reel Installation* ***See Figure 3-36*** for double reel installation.

1. Slide the adjustment pin through the rear plates and harrow mounts of center and wing frames, secure with (2) 2-1/2 snap rings.
2. Assemble the 1 x 9 adj bolt through adjustment pin on frame, 1 lock washer, (2) 1 hex nuts, and 17" spring assembly.
3. Install 1-1/2 flange bearing into reel arm. Slide in 1-1/2 pivot bushing.
4. Attach reel arm to upper hole on rear center or wing frame or double mount using 1 x 6-1/2 bolt and lock nut.
5. Assemble 17" spring assembly to reel arm using pivot pin, machinery bushings and 5/16 x 1-1/2 spring pins ***See Figure 3-34*** through ***3-35***. Set pin centers to 21" dimension ***See Figure 3-30***.
6. Turn the 1 x 9 adjustment bolt in or out to the desired reel height for initial setting ***See Figure 3-30***. Lock cylinder shaft in place with the 1" nut against the adjustment pin. Lock the 1" nut against the front end of the spring. Repeat for each conditioner reel arm and set all spring lengths the same for even reel heights.

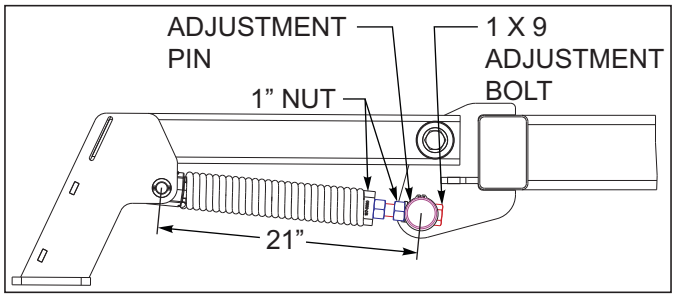


Figure 3-30: Spring Adjustment

WARNING

Do not attempt to lift heavy parts (such as the frame, disc gangs, lift, pull hitch, or reel/gang bar assembly manually. Use a hoist or a forklift to move these parts into position.

7. Attach single conditioner reel/gang bar or chevron flat reel assemblies to reel arms using gang bar mount plate, 3/4 x 5-1/2 bolts and 3/4 lock nuts ***See Figure 3-34***. ***See Figure 2-17*** **through** ***2-29*** for single reel gang bar placement locations.
8. Attach chevron flat bar reels with angled blades as shown ***See Figure 3-31***

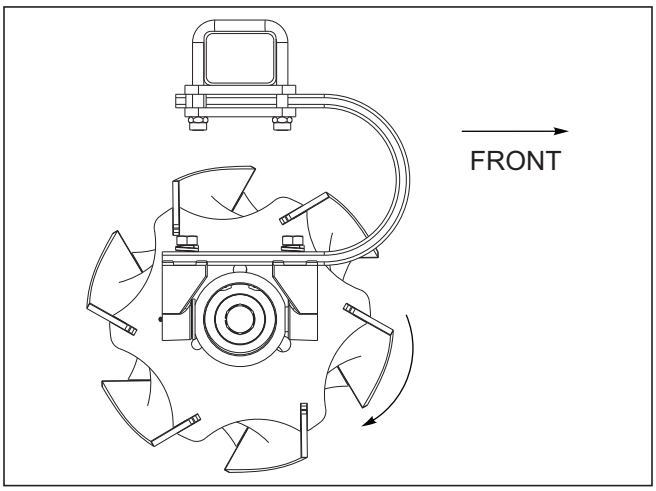


Figure 3-31: Chevron Reel Direction

9. Models 6231-21'-29' attach double reel/gang bar assembly to reel arms using gang bar mount plate, (2) clamp tubes, (4) spring torsion rubber, secure with 3/4 x 8-1/2 bolts and (2) 3/4 lock nuts ***See Figure 3-35***. ***See Figure 2-30*** **through** ***2-31*** for double reel gang bar placement locations.
10. Models 6231-30'-36' 6" coil tine mount on rear tube of center and wing frames with 5/8 x 6-11/16 x 5-1/2 u-bolts and 5/8 lock nuts. Attach double reel/gang bar assembly to reel arms using gang bar mount plate, (2) clamp tubes, (4) spring torsion rubber, secure with 3/4 x 8-1/2 bolts and (2) 3/4 lock nuts ***See Figure 3-36***. ***See Figure 2-32*** **through** ***2-33*** for double reel gang bar placement locations.
11. ***See Figure 2-34*** through ***2-37*** for double flat bar reel placement. Double flat bar reels mount to reel arms the same as round reel.

12. Attach flat bar reels with angled blades as shown ***See Figures 3-32***.

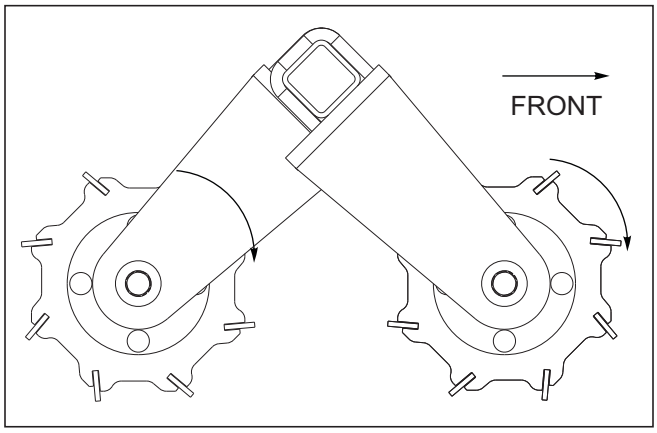


Figure 3-32: Double Reel Direction

13. Install (2) clamp tubes on front and back of double gang bar, secure with 1/2 x 5-1/2 bolts and 1/2 lock nuts. ***See Figure 3-35*** through ***3-36*** for clamp tube locations. Each set (2 total) should be slid against gangbar mount plate on outside of inner wing arm assemblies.

14. Models 6231-30'-33'-36' attach the rear jack mount to the rear tube of center frame with 3/4 x 4 bolts, 3/4 flat washers, rear jack plate and 3/4 lock nuts ***See Figure 3-33***. Slide rear jack tube into rear jack mount secure with 3/4 x 6 pin, 3/16 hair pin and 1/4 x 3 roll pin. Attach jack mount tube to rear jack tube with 3/4 x 4 bolt and 3/4 lock nut. Attach jack to jack mount tube.

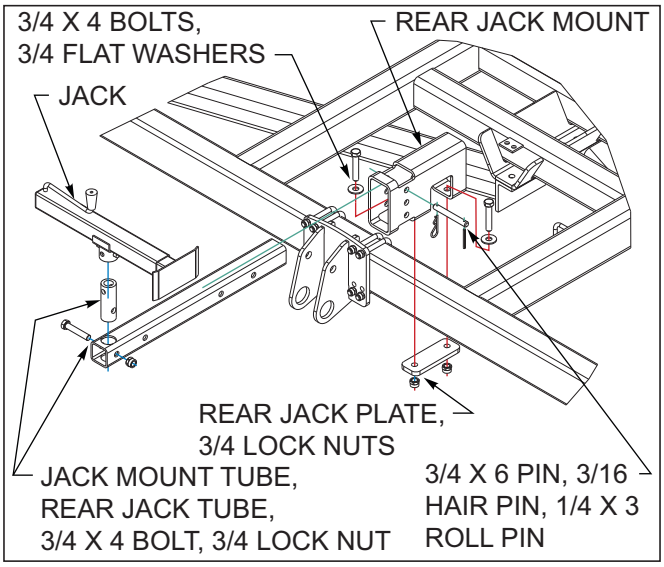


Figure 3-33: Rear Jack Mount Installation

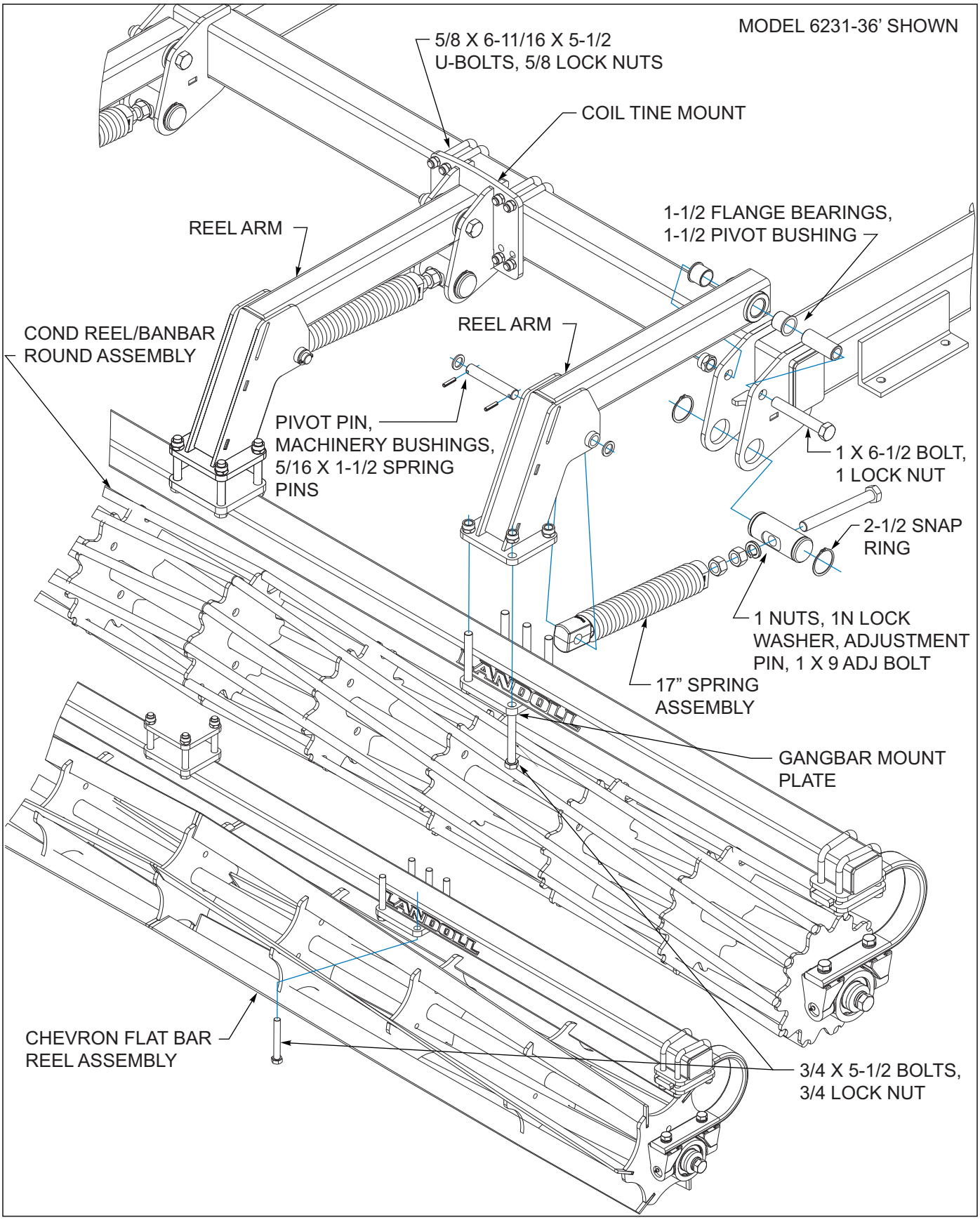


Figure 3-34: Conditioner Single Reel Installation

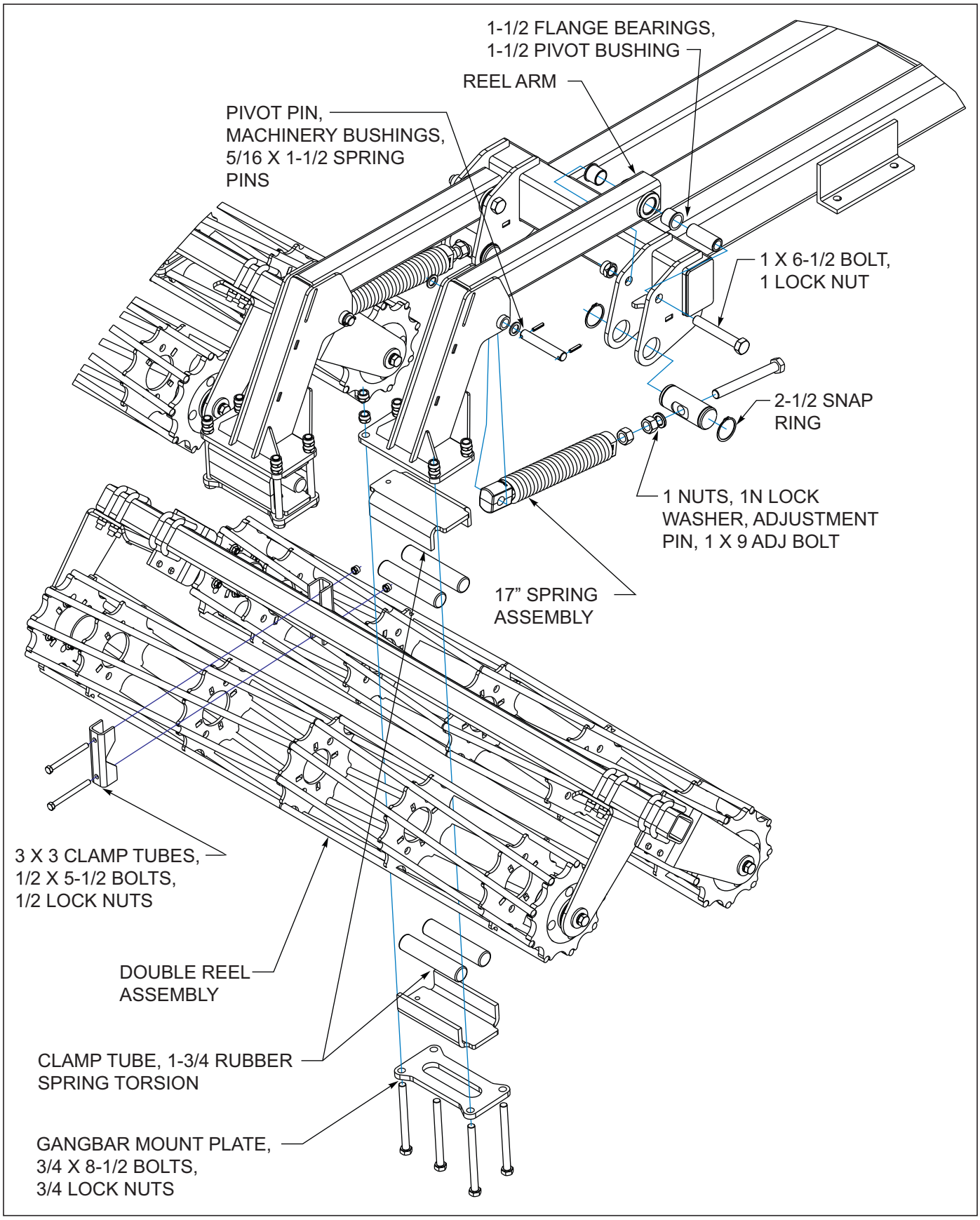


Figure 3-35: Conditioner Double Reel Installation 6231-21'-29'

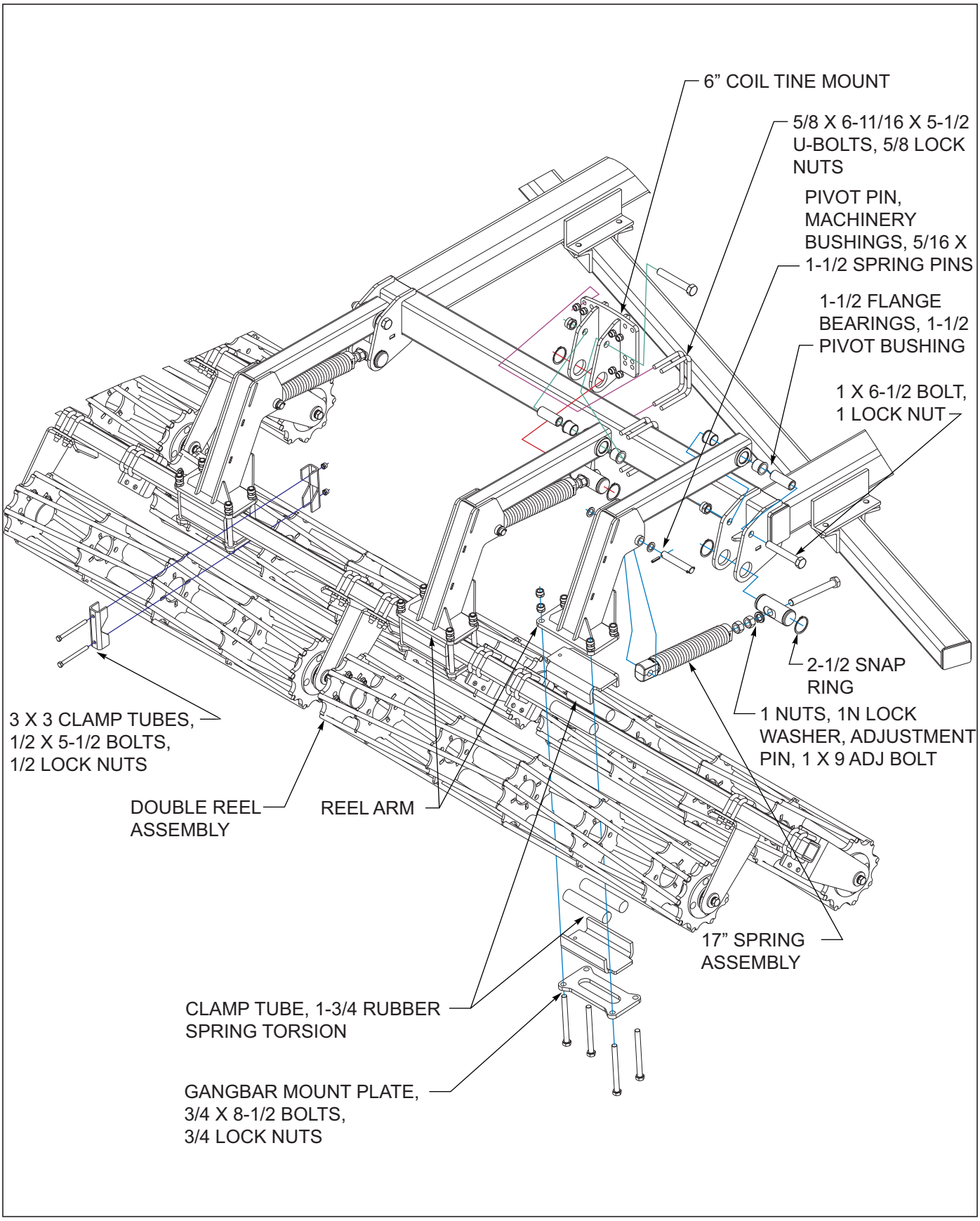


Figure 3-36: Conditioner Double Reel Installation 6231-30’-36’

Hydraulic Conditioner Reel Installation (Option)

Refer to Hydraulic Conditioner Single Reel Installation ***See Figure 3-39*** for single reel installation, Models 6231-21'-29'*Hydraulic Conditioner Double Reel Installation* ***See Figure 3-40*** or ***See Figure 3-41*** Models 6231-30'-36'*Hydraulic Conditioner Double Reel Installation*.

1. Attach reel arm assemblies to rear frame in top hole using 1 x 6-1/2 bolt, pivot bushing, 1-1/2 flange bearings, and 1-1/8" lock nut ***See Figure 3-39*** through ***See Figure 3-41***.
2. Attach 17" spring assembly, 1-1/8 nut and 2-1/2 x 2-1/2 cylinder to lower hole on rear frame using trunnion mount assembly, 1/2 x 2 bolts, and 1/2 lock washers. Set pin centers to 21" ***See Figure 3-37***.
3. Turn the cylinder shaft using the wrench flats on the shaft, in or out to the desired reel height ***See Figure 3-37*** for initial setting. Lock the 1-1/8" nut against the front end of the spring. Repeat for each conditioner reel arm and set all spring lengths the same for even reel heights. Lock cylinder shaft in place with the 3/8 x 3/4 set screw.

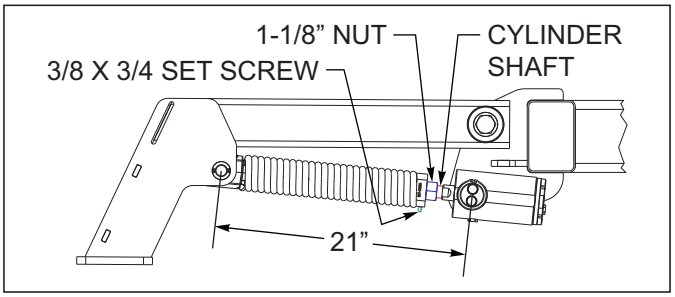


Figure 3-37: Hydraulic Spring Adjustment

WARNING

Do not attempt to lift heavy parts (such as the frame, disc gangs, lift, pull hitch, or reel/gang bar assembly manually. Use a hoist or a forklift to move these parts into position.

4. Attach single reel/gang bar assembly to reel arms using gang bar mount plate, 3/4 x 5-1/2 bolts and lock nuts ***See Figure 3-39***. ***See Figure 2-17*** through ***See Figure 2-23*** for single reel gang bar placement locations.
5. Models 6231-21'-29' attach double reel/gang bar assembly to reel arms using gang bar mount plate, (2) clamp tubes, (4) spring torsion rubber, secure with 3/4 x 8-1/2 bolts and (2) lock nuts ***See Figure 3-40***. ***See Figure 2-30*** through ***See Figure 2-31*** for double reel gang bar placement locations.
6. Models 6231-30'-36' attach 6" coil tine mount to rear tube of center and wing frames with 5/8 x 6-11/16 x 5-1/2 u-bolts and 5/8 lock nuts ***See Figure 3-41***. Attach double reel assembly to reel arms using gang bar mount plate, (2) clamp tubes, (4) spring torsion rubber, secure with 3/4 x 8-1/2 bolts and (2) lock nuts. ***See Figure 2-32*** through ***See Figure 2-33*** for double reel placement locations.

7. Install (2) 3 x 3 clamp tubes on front and back of double gang bar, secure with 1/2 x 5-1/2 bolts and 1-2 lock nuts.***See Figure 2-32*** through ***See Figure 2-33*** for clamp tube locations. Each set (2 total) should be slid against gangbar mount plate on outside of inner wing arm assemblies.
8. Models 6231-30'-33'-36' attach the rear jack mount to the rear tube of center frame with 3/4 x 4 bolts, 3/4 flat washers, rear jack plate and 3/4 lock nuts ***See Figure 3-38***. Slide rear jack tube into rear jack mount secure with 3/4 x 6 pin, 3/16 hair pin and 1/4 x 3 roll pin. Attach jack mount tube to rear jack tube with 3/4 x 4 bolt and 3/4 lock nut. Attach jack to jack mount tube.

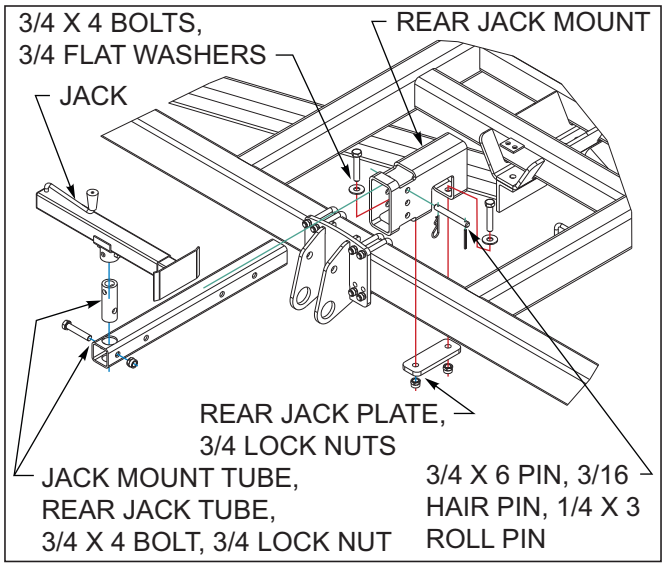


Figure 3-38: Rear Jack Mount Installation

See Figure 3-45 *through* ***3-51*** *for hydraulic single reel installation.*

See Figure 3-52 *through* ***3-55*** *for hydraulic double reel installation.*

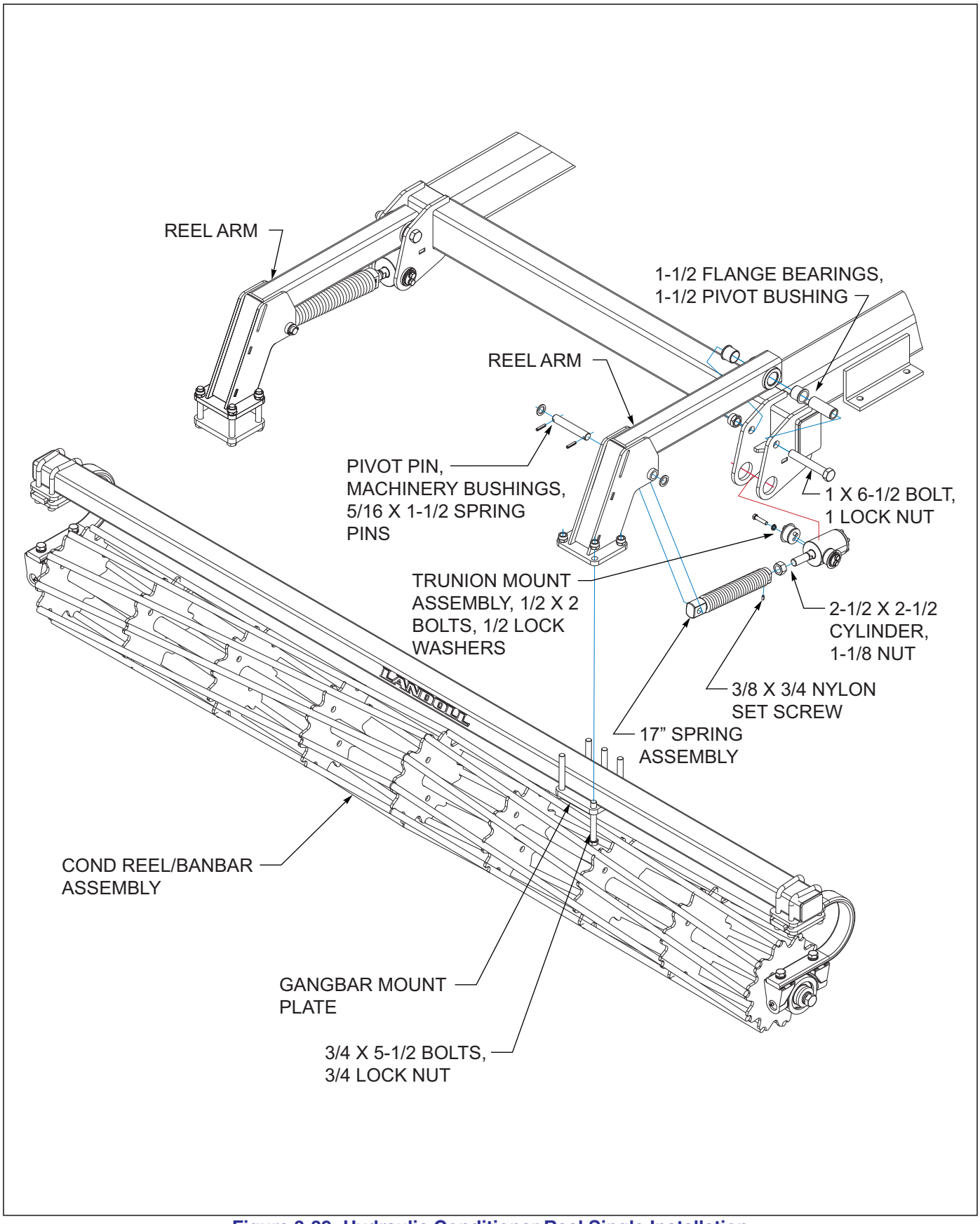


Figure 3-39: Hydraulic Conditioner Reel Single Installation

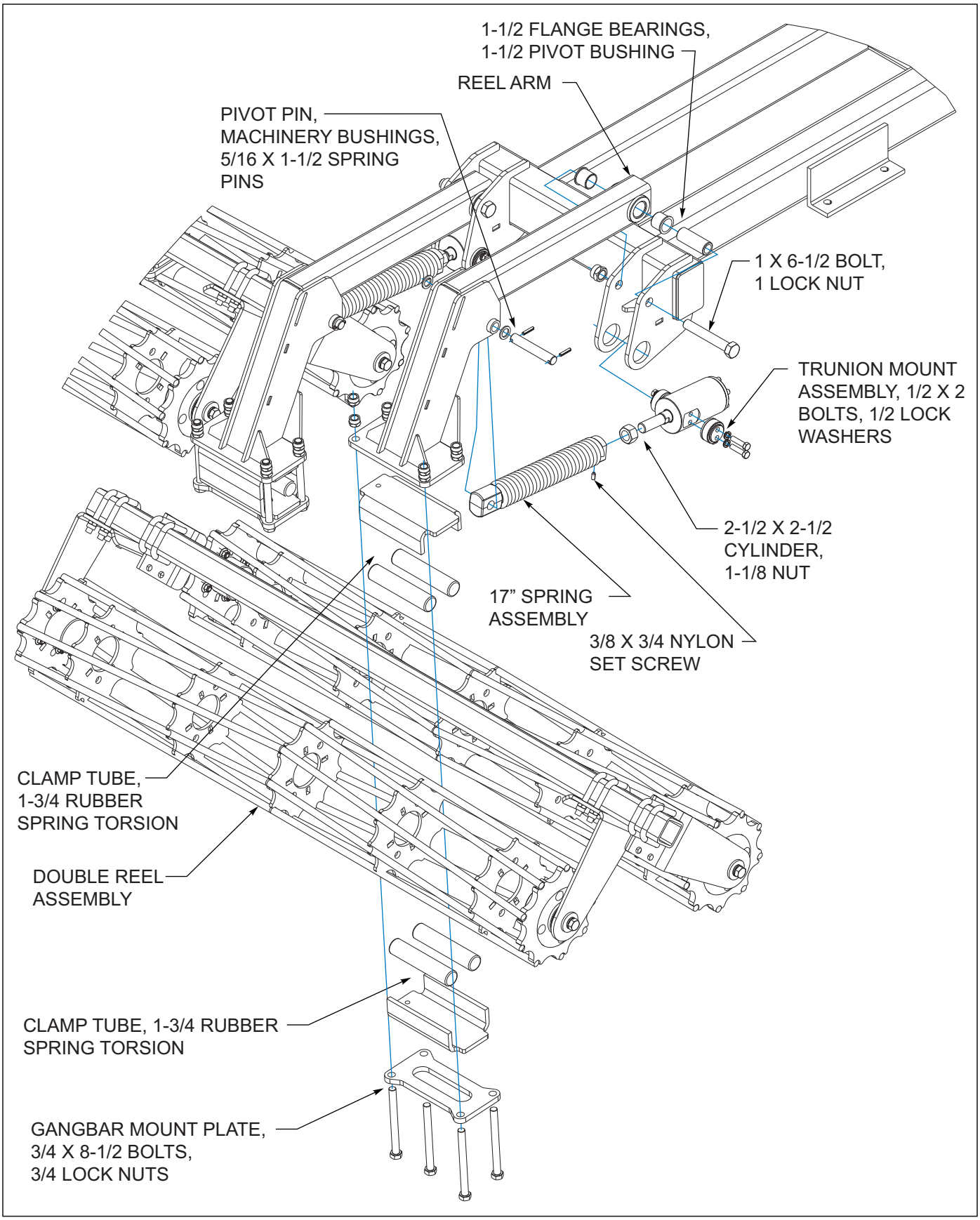


Figure 3-40: Hydraulic Conditioner Double Reel Installation 6231-21'-29'

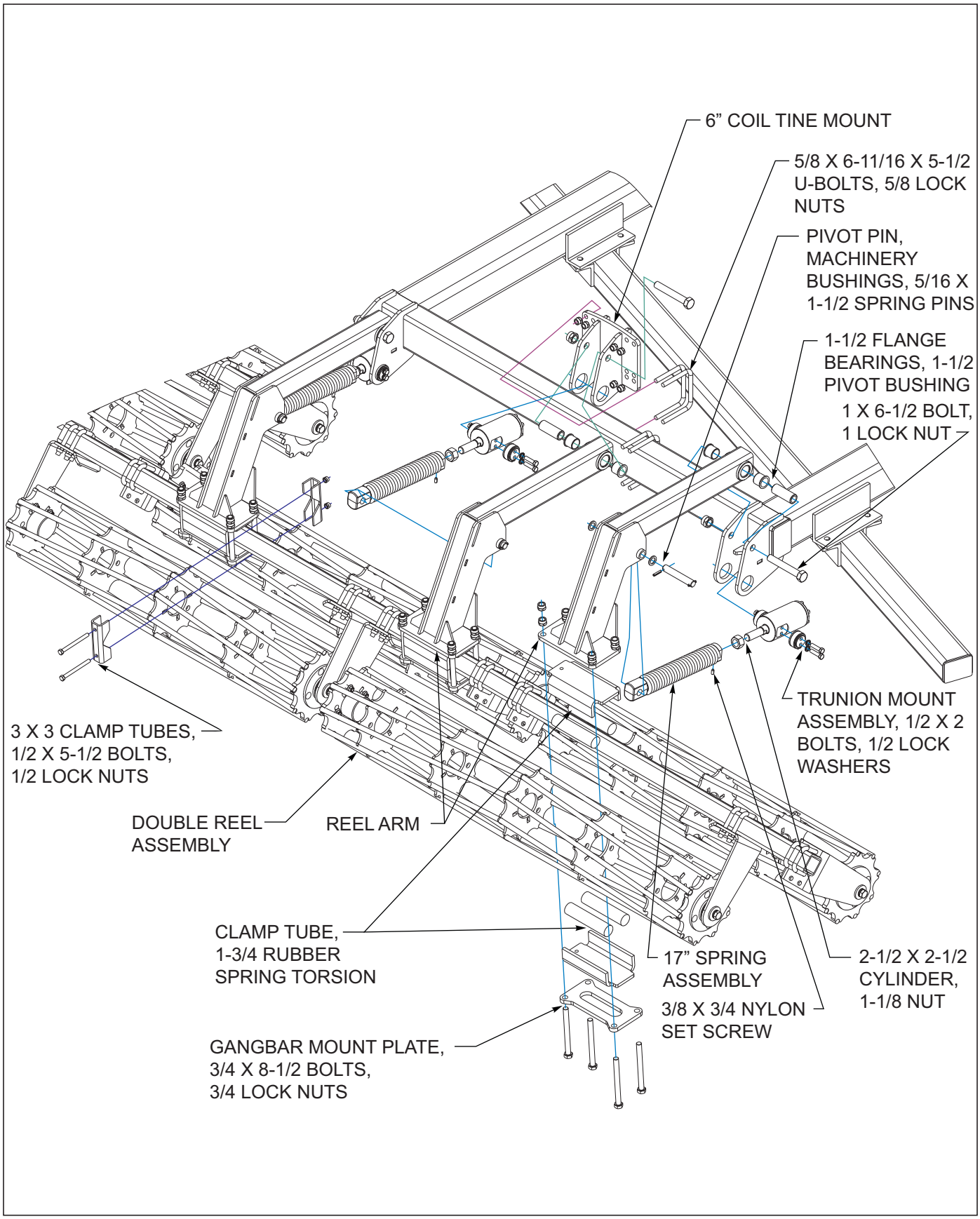


Figure 3-41: Hydraulic Conditioner Double Reel Installation 6231-30’-36’

9. Models 6231-21'-26', 30' install the 8 port manifold ***See Figure 3-42*** to the manifold bracket on the rear of center frame with 1/2 x 3-1/2 bolts and 1/2 lock nuts.

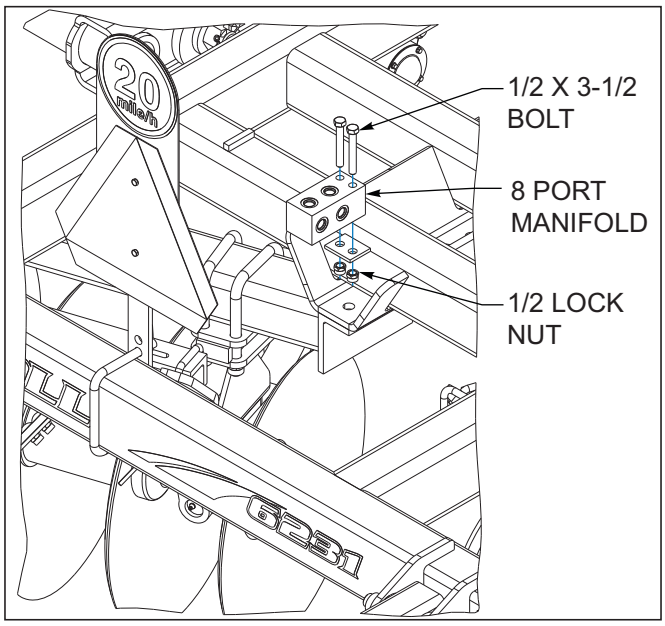


Figure 3-42: 8 Port Manifold Installation 21'-26', 30'

10. Models 6231-26', 33, 36' install the 8 port manifold ***See Figure 3-43*** to the manifold bracket on the rear of center frame with 1/2 x 3-1/2 bolts and 1/2 lock nuts.

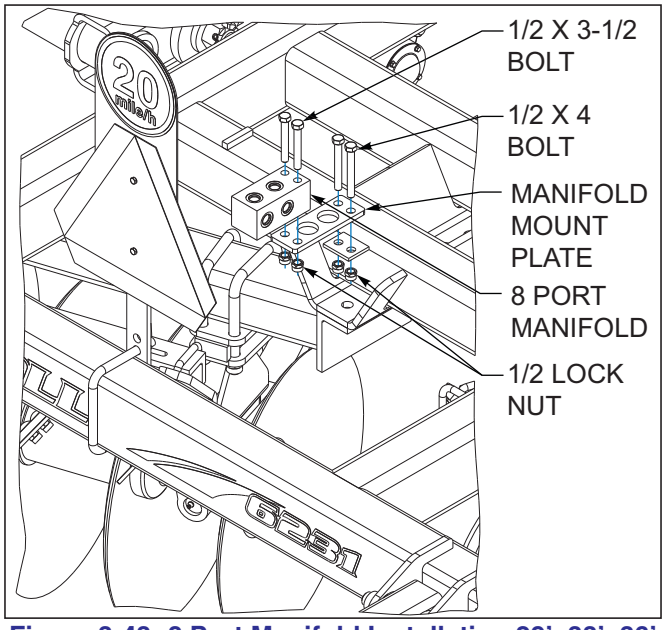


Figure 3-43: 8 Port Manifold Installation 29', 33', 36'

11. Install cylinders, fittings and hoses ***See Figure 3-52*** through ***3-55*****.**
12. Install bulkhead plates, hose clamp brackets to rear tubes of wing frame with 4-1/2 x 6-1/2 #096 and 2--1/2 x 8-1/2 #128 hose clamps. Attach the #6 bulkhead tee's to bulkhead plates, secure with bulkhead nut provided with tee in positions shown in Detail B ***See Figure 3-52*** through ***3-55***.
13. Install hose clamp bracket to scraper bars with 1/2 x 1-3/4 square head bolt and 1/2 flange lock nut ***See Figure 3-44***. Attach hose clamp to hose clamp bracket with 3/8 x 1-1/2 bolt and 3/8 flange lock nut.

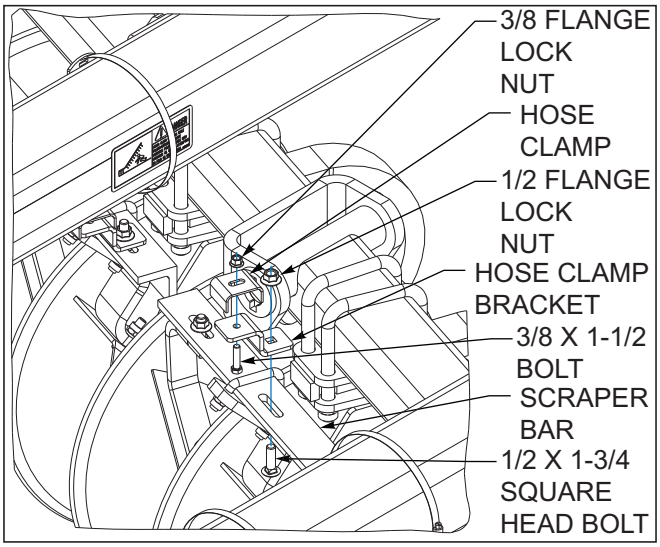


Figure 3-44: Hydraulic Reel Hose Clamp Installation

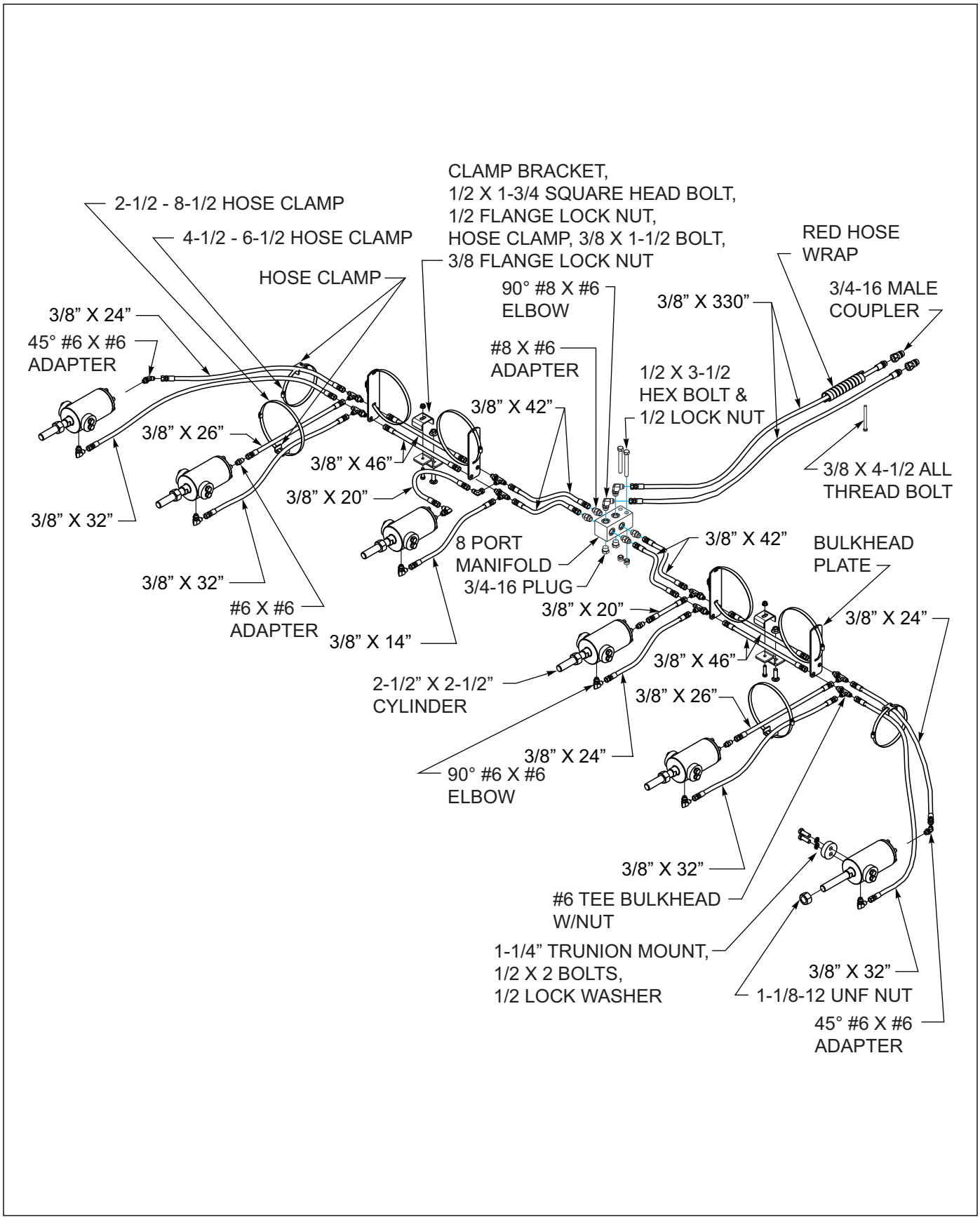


Figure 3-45: Hydraulic Single Reel Installation - 21'

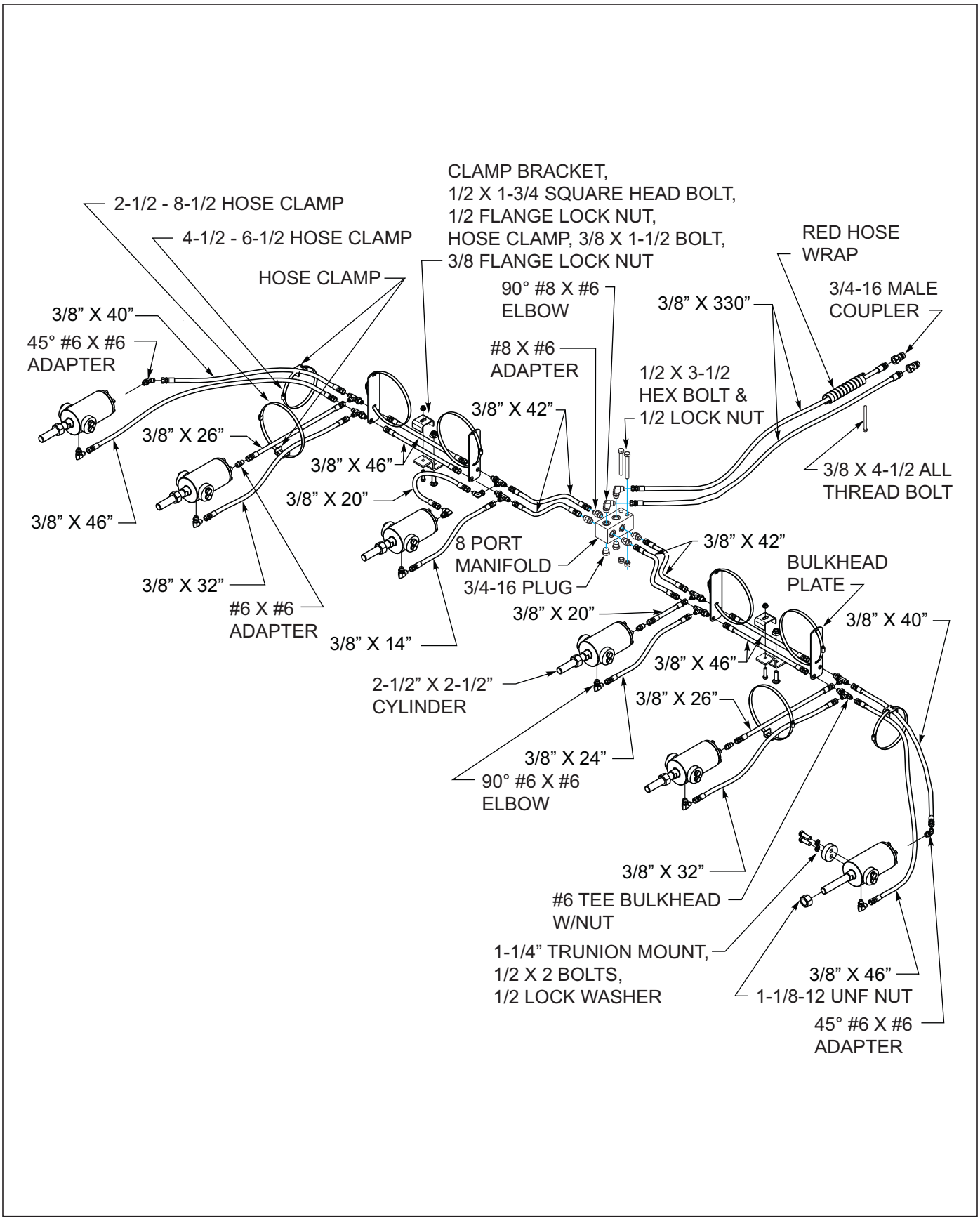


Figure 3-46: Hydraulic Reel Single Installation - 23'

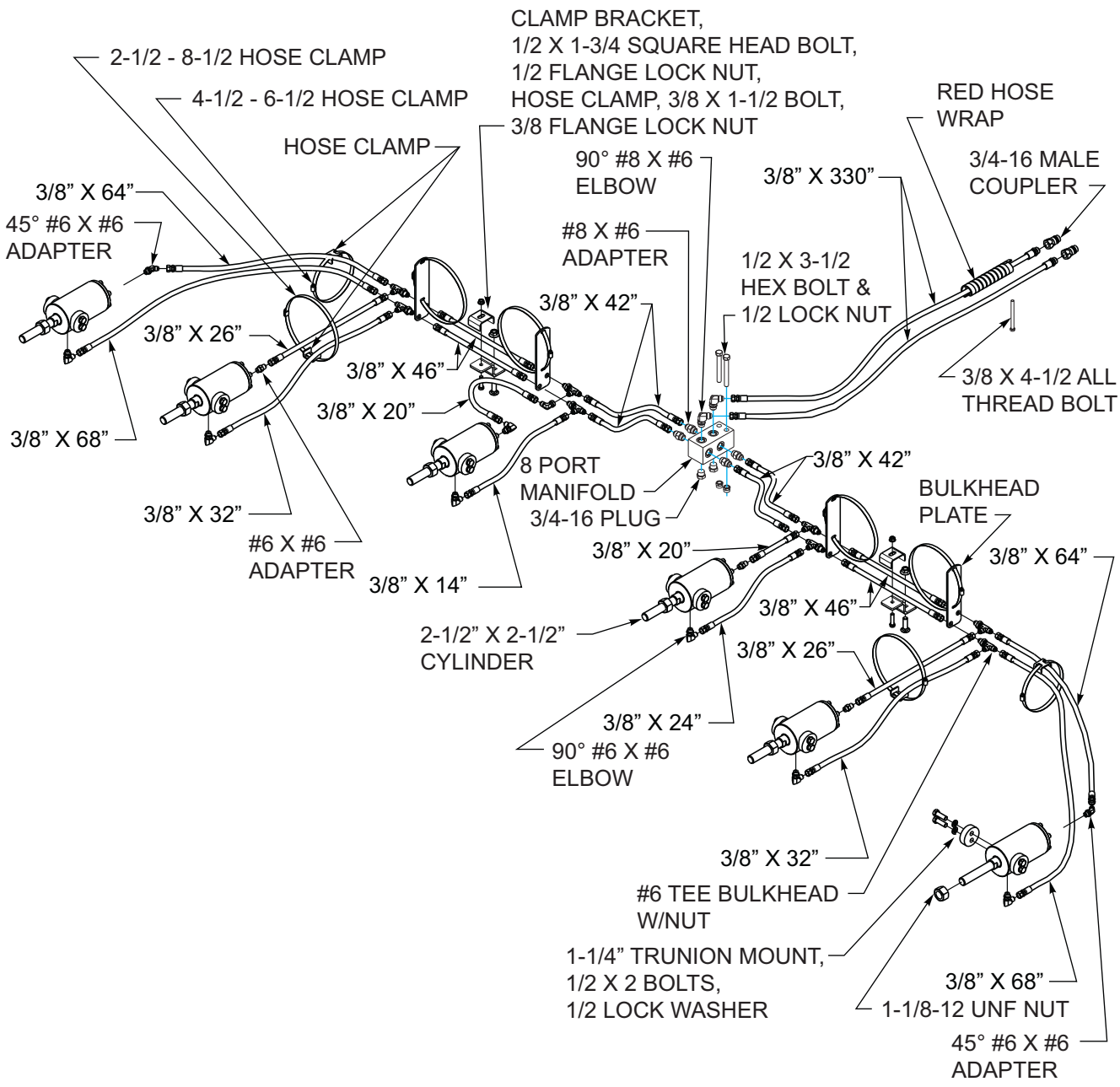


Figure 3-47: Hydraulic Single Reel Installation - 26'

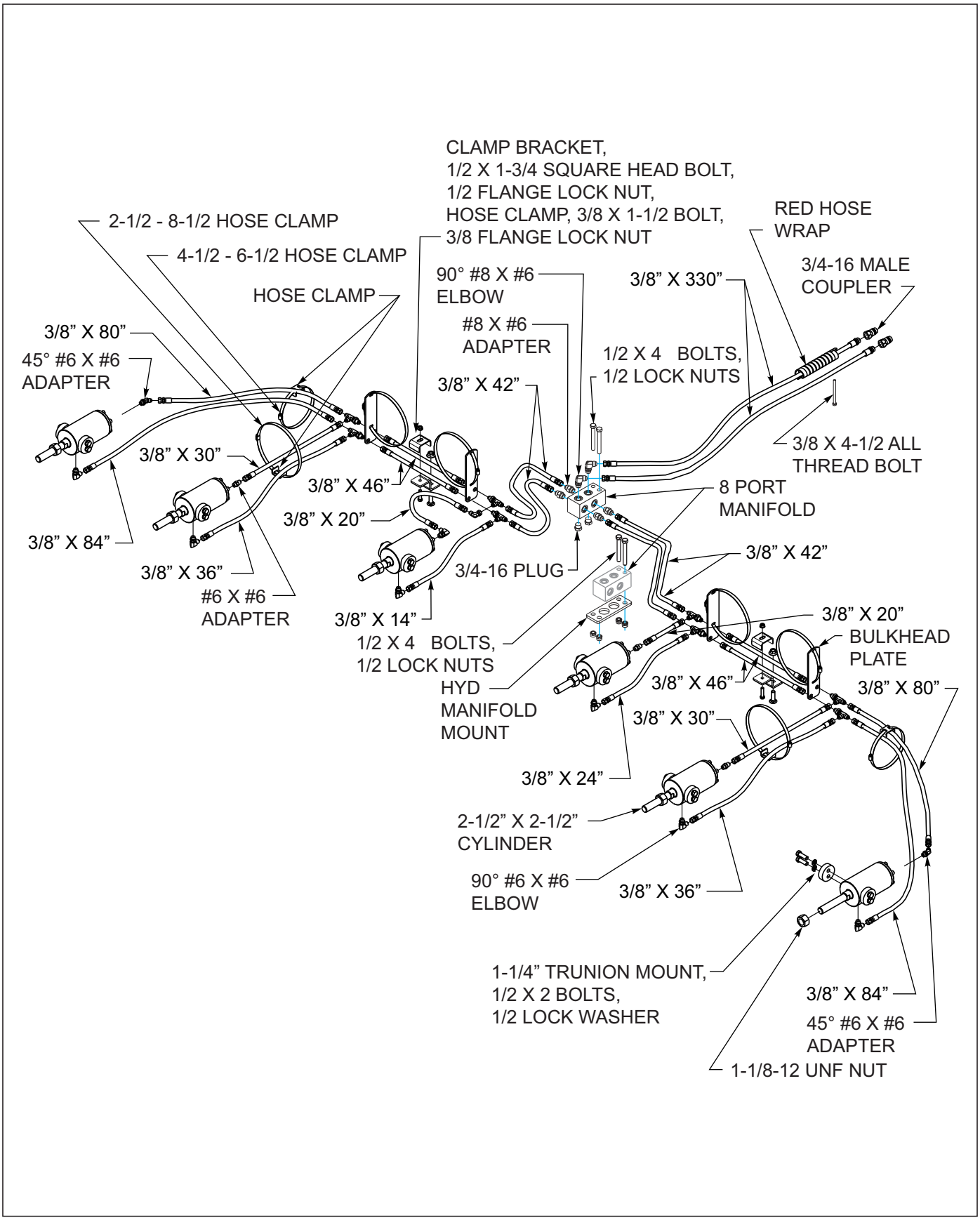


Figure 3-48: Hydraulic Single Reel Installation - 29'

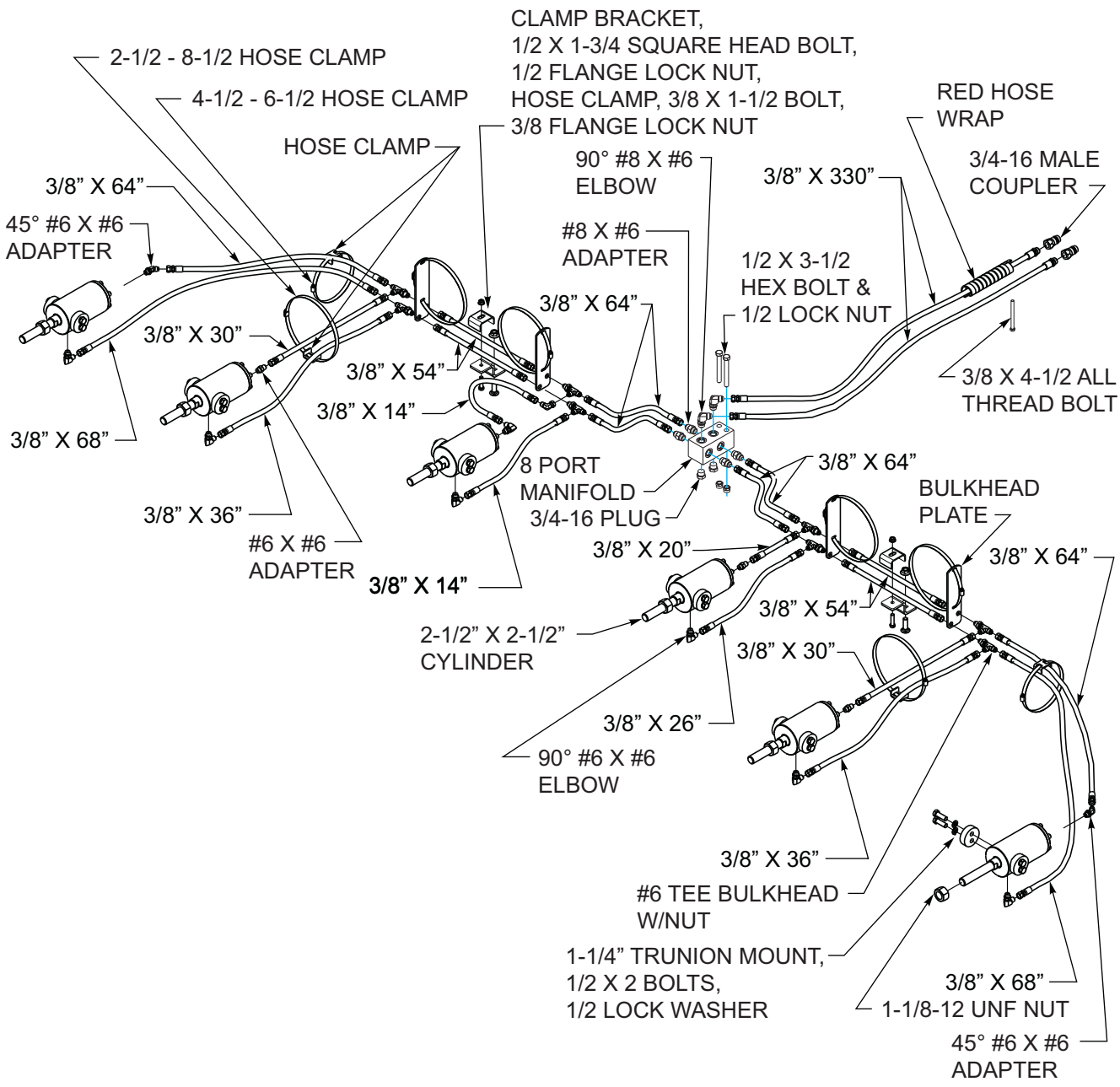


Figure 3-49: Hydraulic Single Reel Installation - 30'

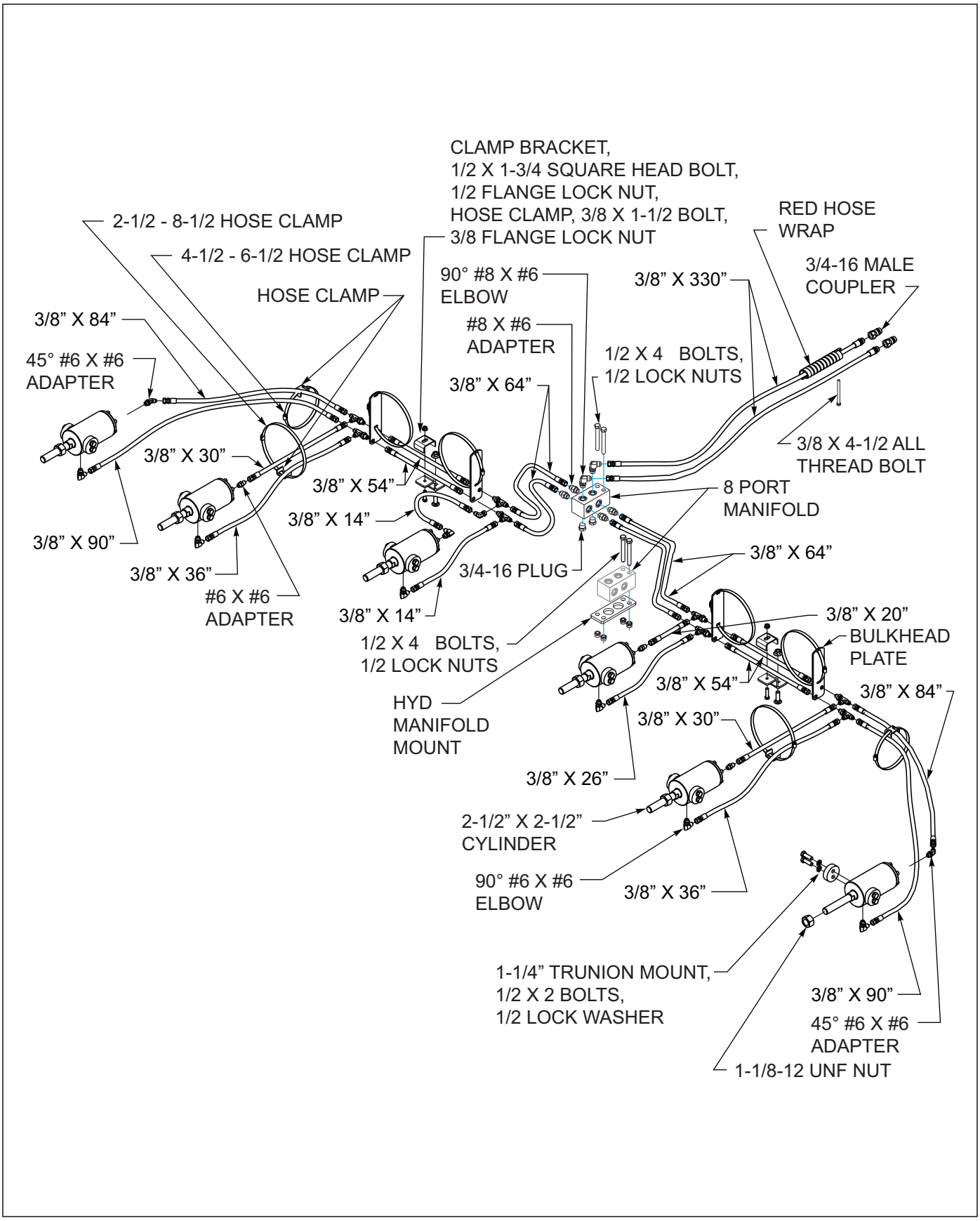


Figure 3-50: Hydraulic Single Reel Installation - 33'

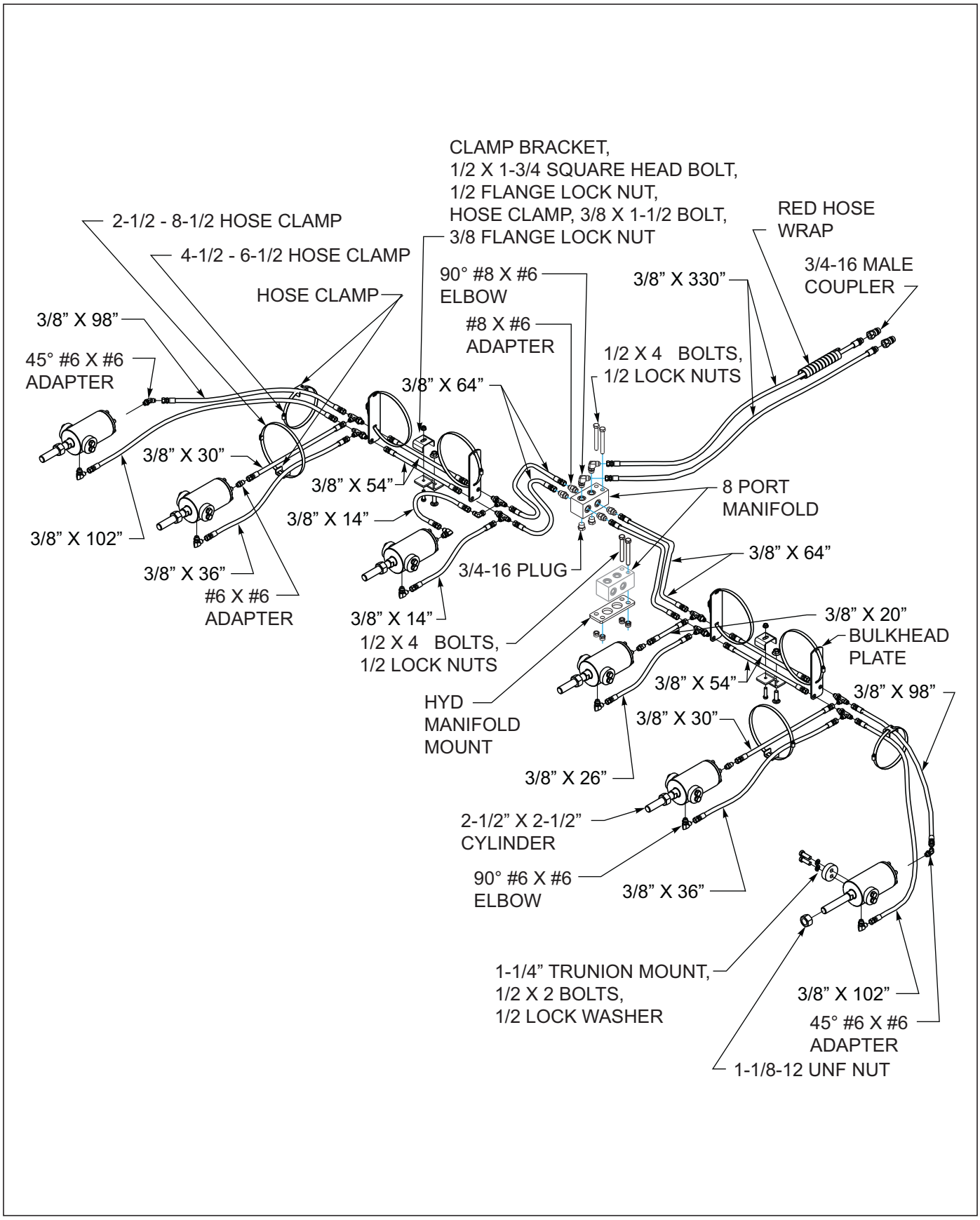


Figure 3-51: Hydraulic Single Reel Installation - 36'

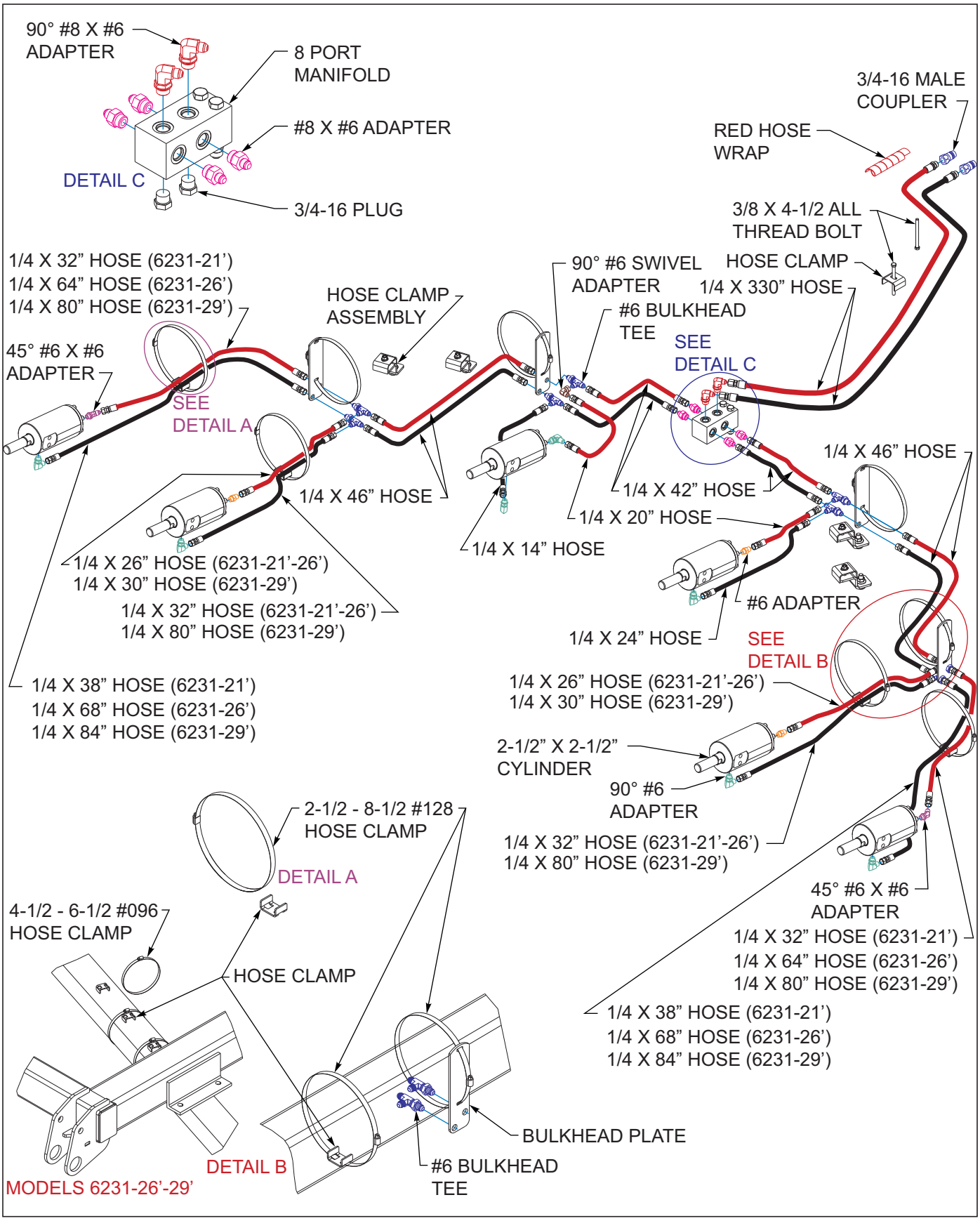


Figure 3-52: Hydraulic Double Reel Assembly 6231-21', 26', 29'

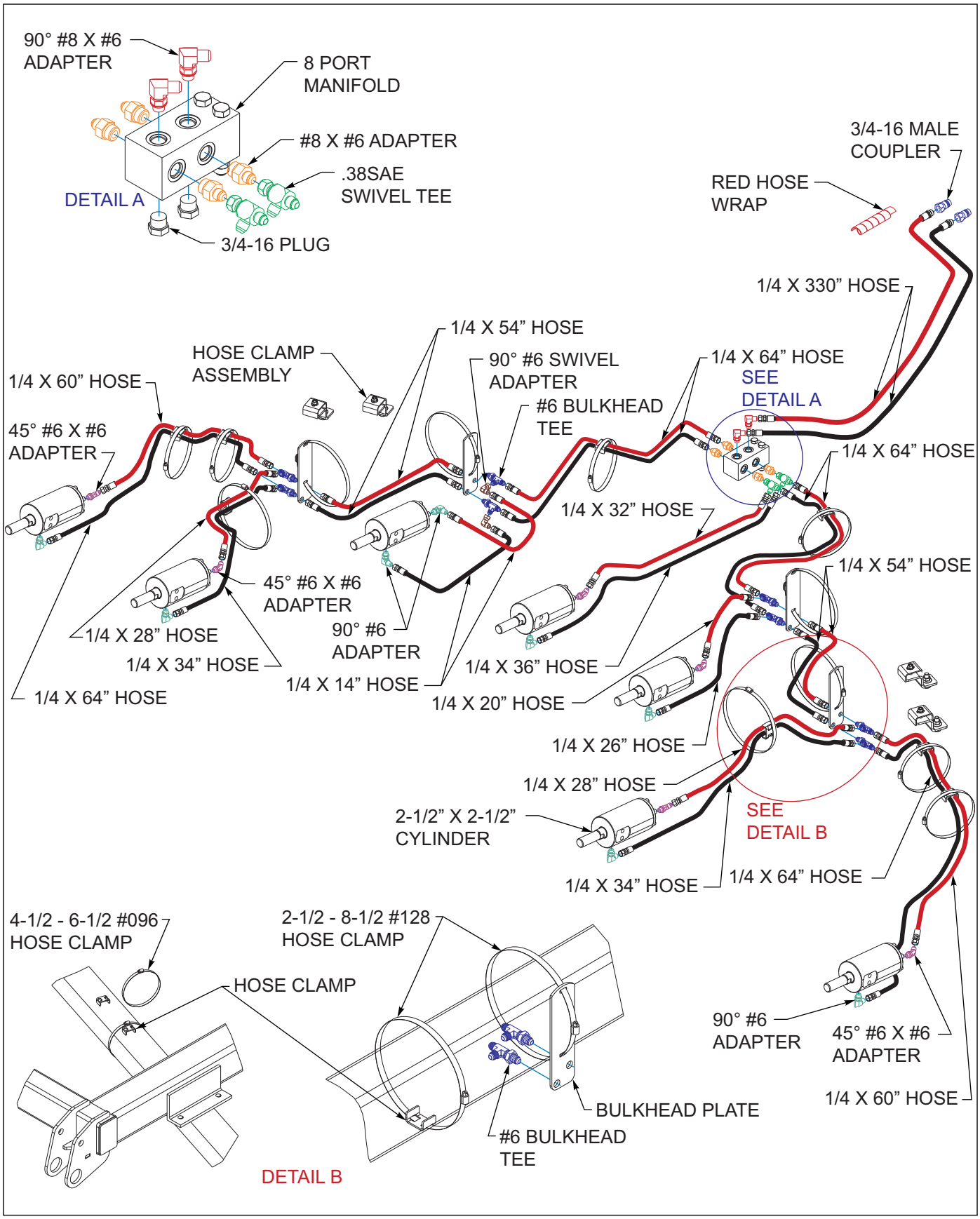


Figure 3-53: Hydraulic Double Reel Assembly 6231-30'

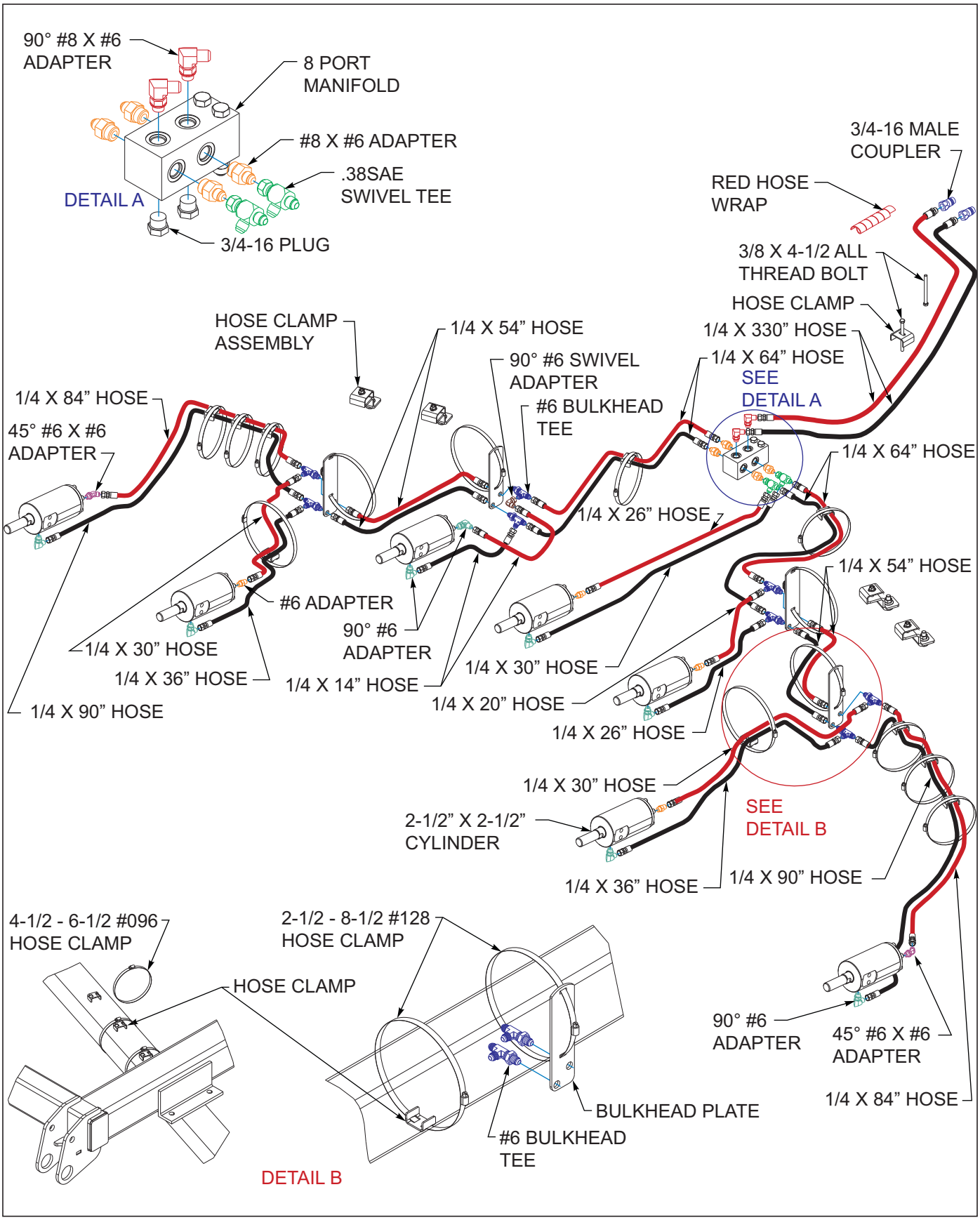


Figure 3-54: Hydraulic Double Reel Assembly 6231-33'

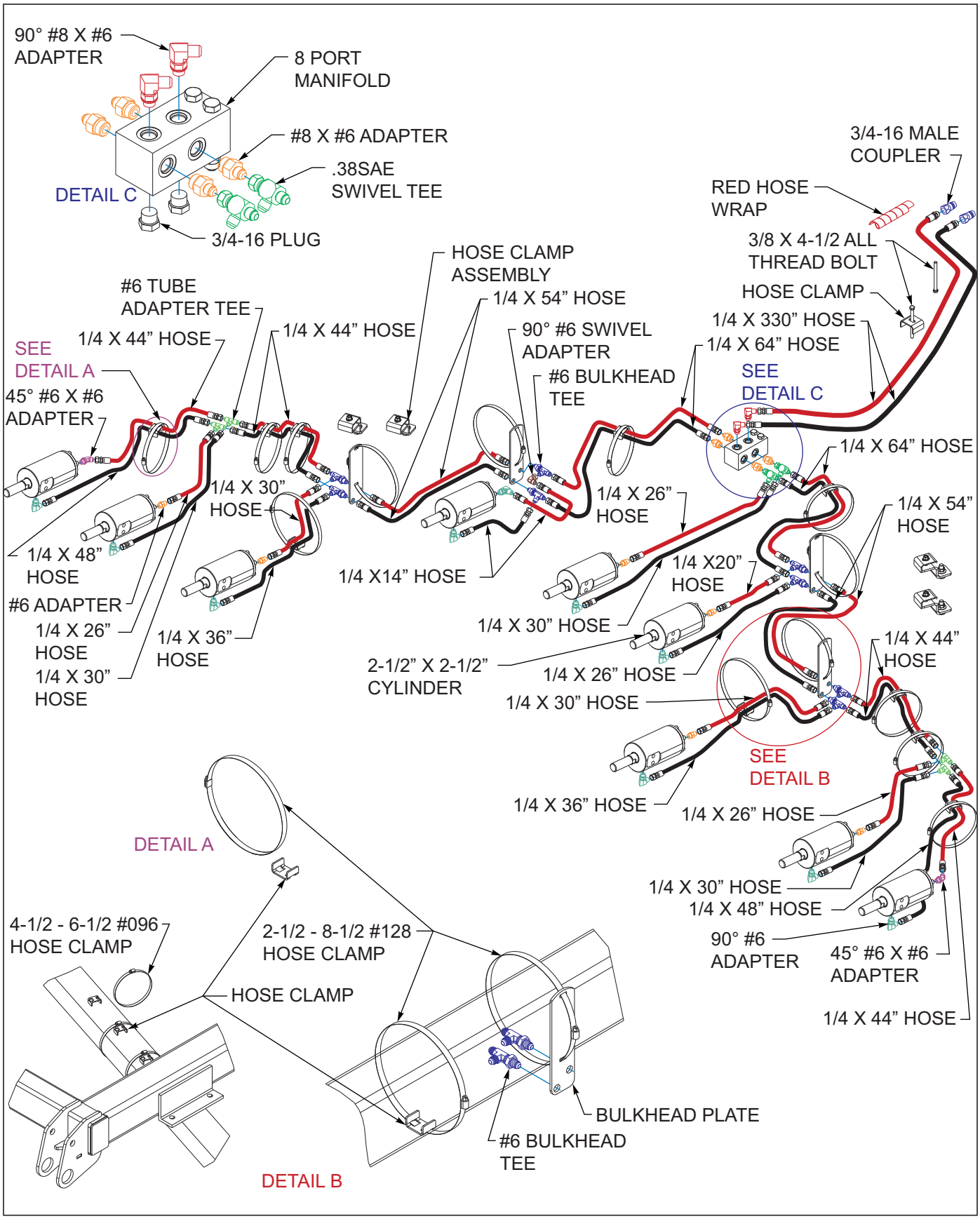


Figure 3-55: Hydraulic Double Reel Assembly 6231-36'

Spare Tire Installation 6231-21'-29' (Option)

The spare tire for the 6231-21'-29' is mounted on the right front corner of the center frame to leave access the depth control, owner's manual and wrenches ***See Figure 3-57***.

If the disc is equipped with a hydraulic leveler, the leveler indicator will need flipped over and positioned on the left side of the leveler for clearance to mount the spare tire.

1. Lower the disc to the ground to relief any weight on the leveling system. If there is still weight on the self-leveler, extend or retract the leveler cylinder until all weight is relieved.
2. Remove the 3/8 locknut, washer, and hair pin clip holding the level indicator rod and remove the rod ***See Figure 3-56***.
3. Remove the (4) 1/2 x 2 bolts that hold the leveler cylinder to the leveler cross. Do not disconnect any hoses or fittings.
4. Place a wood block under the front of the leveler tube to help support the weight of the leveler
5. Remove the two 3/4 x 3-1/2 bolts from the leveler cross brackets.

NOTE

The leveler cross brackets do not need removed from leveler cross, removed for clarity.

6. The leveler cross and brackets should now be loose from disc. Rotate the leveler cross and brackets 180 degrees, so the level indicator gauge is now on the left-hand side of the disc.
7. Reinstall the 3/4 x 3-1/2 bolts in the leveler cross brackets.
8. Attach the leveler cylinder to the leveler cross with the (4) 1/2 x 2 screws and lock nuts. Lock nuts must be on the front side of the cylinder.
9. Install the level indicator rod on the left side of the self-leveler with the 3/8 flat washer, hair pin clip and 3/8 locknut.
10. Carefully install the new level indicator decal on the level indicator gauge so the gauge letters are right side up.

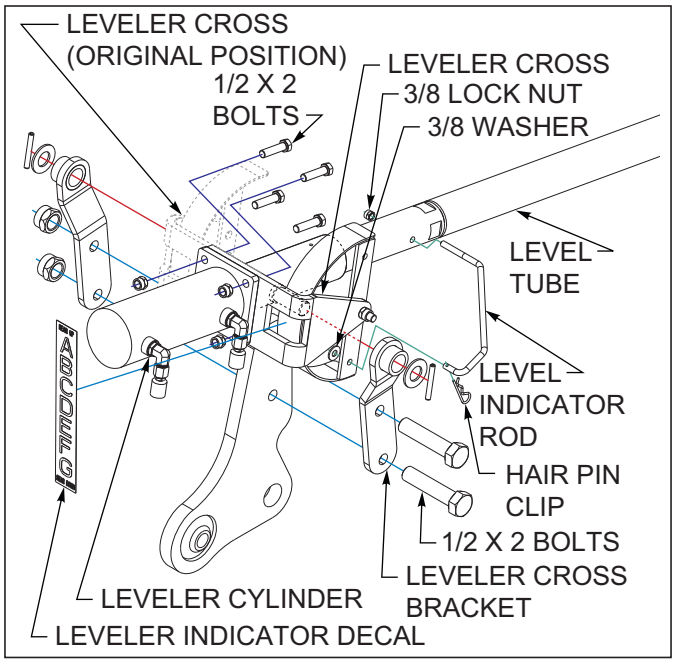


Figure 3-56: Leveler Indicator Re-Locate

11. ***See Figure 3-57*** placement for the 8-bolt spare tire mount and install using 5/8 x 4-11/16 x 7-3/4 u-bolts and flange 5/8 lock nuts.
12. Install (3) 5/8 x 2-1/2 bolts and nuts in the spare tire mount (threads point up) and secure with 5/8 flange lock nuts.
13. Install the spare tire to the mount and screws and secure with (3) additional 5/8 lock nuts.
14. Verify there is no interference with spare tire and self-leveler or hydraulic lift cylinder.

Spare Tire Installation 6231-21'-29' (Option)

1. ***See Figure 3-58*** placement for the 8-bolt spare tire mount and install using 3/4 x 5-25/32 x 7-1/ 4 u-bolts and 5/8 lock nuts.
2. Install (3) 5/8 x 2-1/2 bolts and nuts in the spare tire mount (threads point up) and secure with 5/8 lock nuts.
3. Install the spare tire to the mount and screws and secure with (3) additional 5/8 lock nuts.
4. Verify there is no interference with spare tire and self-leveler or hydraulic lift cylinder.

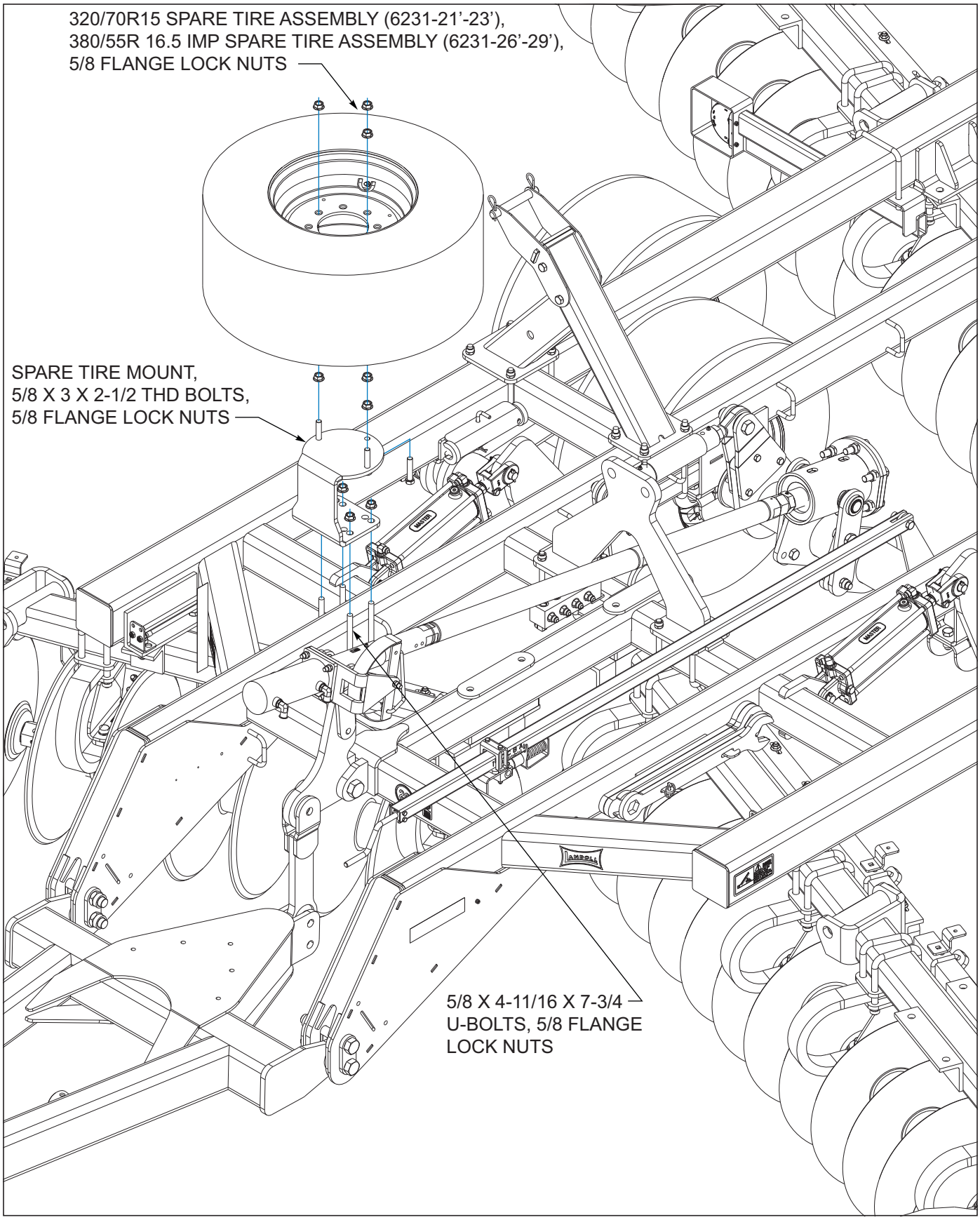


Figure 3-57: Spare Tire Installation 6231-21'-29'

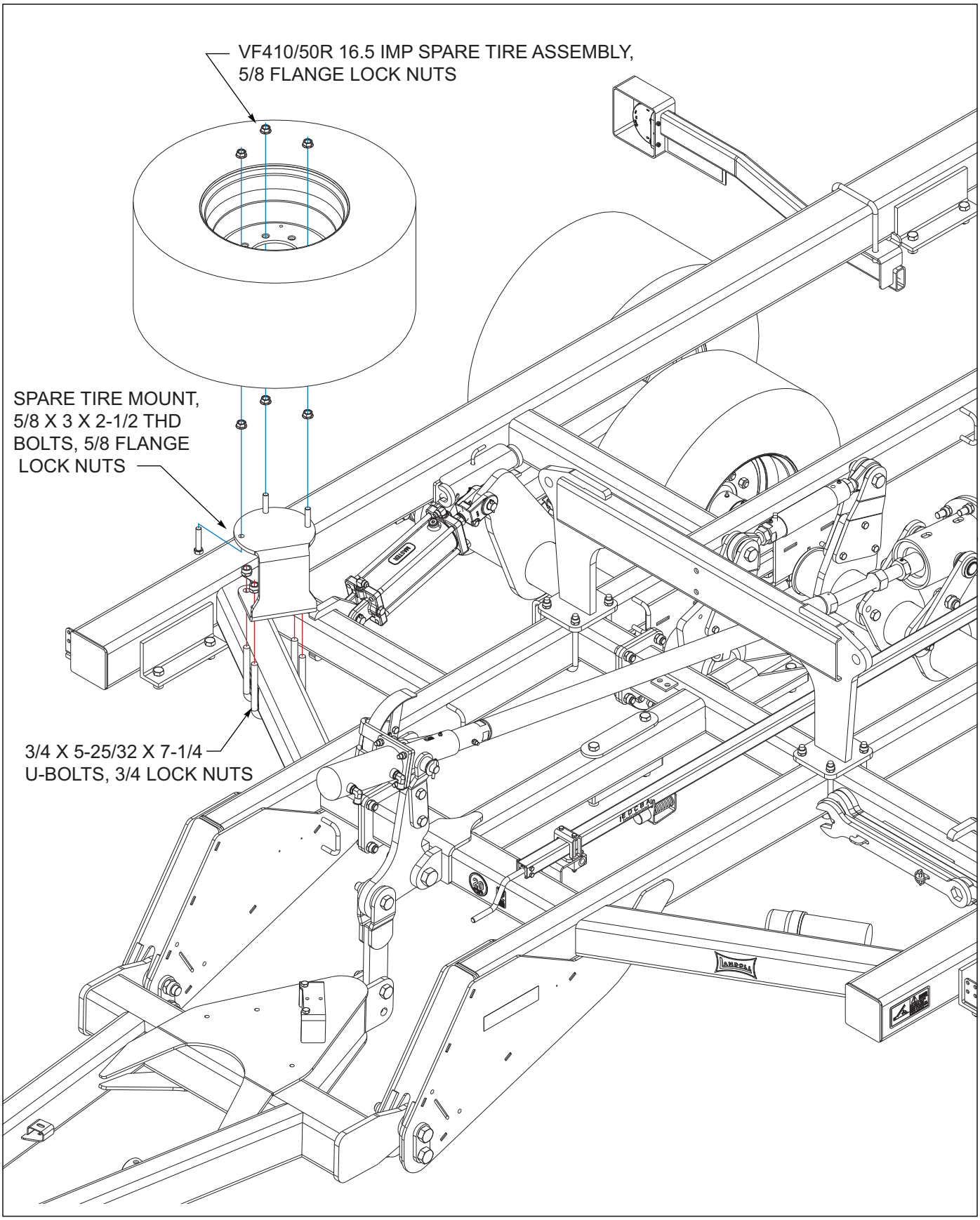


Figure 3-58: Spare Tire Installation 6231-30'-36'

Rear Tow Hitch Short (Option)

1. Attach the rear tow hitch assembly to the rear bar of the center frame using rear tow hitch mounting plates, 3/4 x 6-1/2 bolts, and 3/4 lock nuts ***See Figure 3-59***. The tow hitch should be centered on the back bar of the frame.
2. Connect the tandem adapter harness to the main warning light harness and ag flasher control module located under the right tail light mount ***See Figure 3-60*****.**
3. The hydraulic hoses will route along the left side of the rear tow hitch, over the top of the back frame tube on the disc and then follow the rest of the hoses and hose loops to the front of the disc so they can plug directly into the tractor.

Rear Tow Hitch Short Drop (Option)

1. Attach the rear tow hitch assembly to the rear bar of the center frame using rear tow hitch mounting plates, 3/4 x 6-1/2 bolts, and 3/4 lock nuts ***See Figure 3-59***. The tow hitch should be centered on the back bar of the frame.

Rear Tow Hitch Long (Option)

1. Models 26', 33', 36' unfold and unpin the rear fold cylinders. Models 33', 36', remove the rear fold cylinder mount.
2. Attach the long rear tow hitch to the back and top of the center frame with u-bolts and 5/8 lock nuts ***See Figure 3-59***.
3. Connect the tandem adapter harness to the main warning light harness and ag flasher control module located under the right tail light mount ***See Figure 3-60***.
4. The hydraulic hoses will route along the left side of the rear tow hitch, over the top of the back frame tube on the disc and then follow the rest of the hoses and hose loops to the front of the disc so they can plug directly into the tractor.
5. Models 33', 36' install the rear fold cylinder mount. Models 29', 33', 36' reconnect the rear fold cylinders.

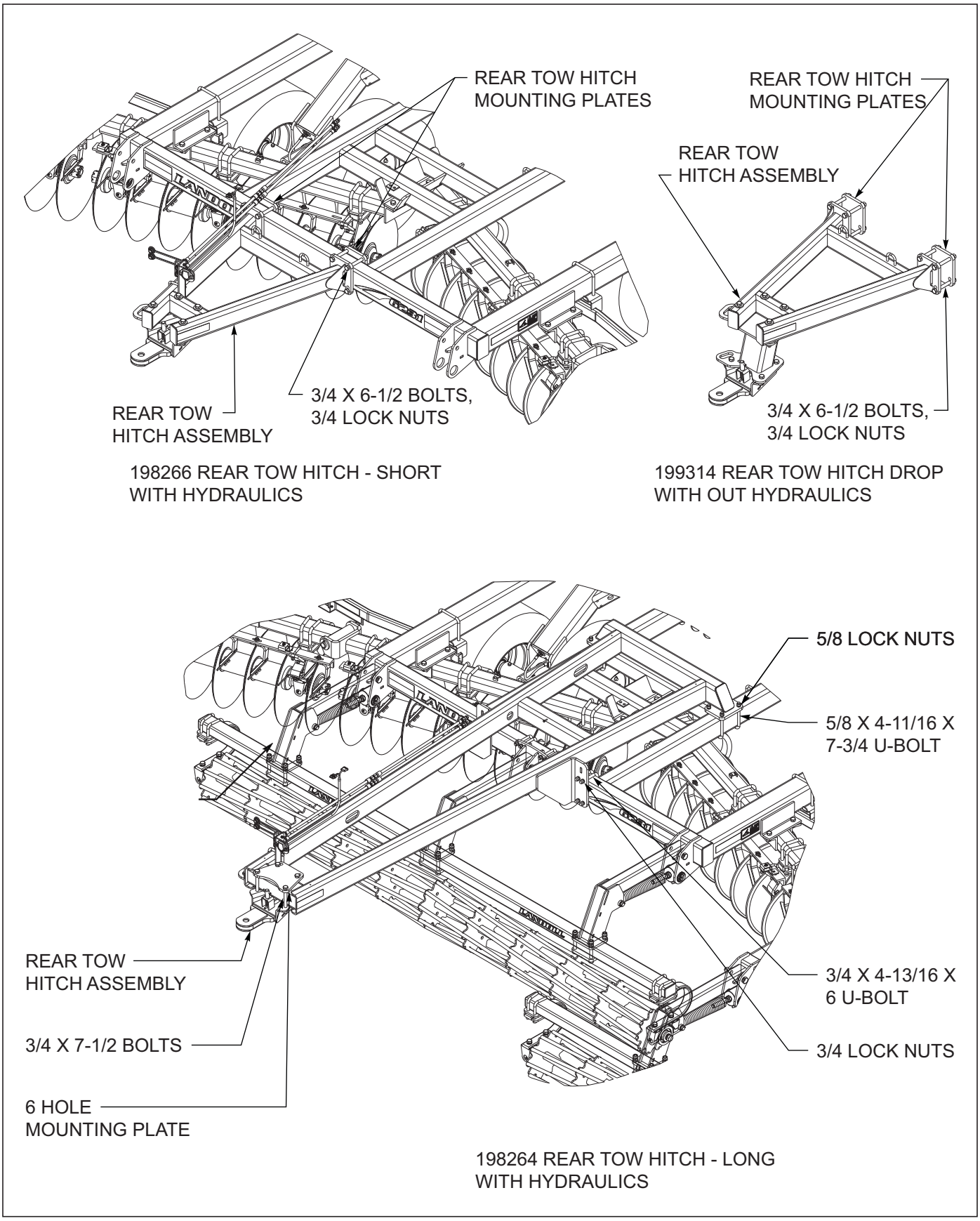
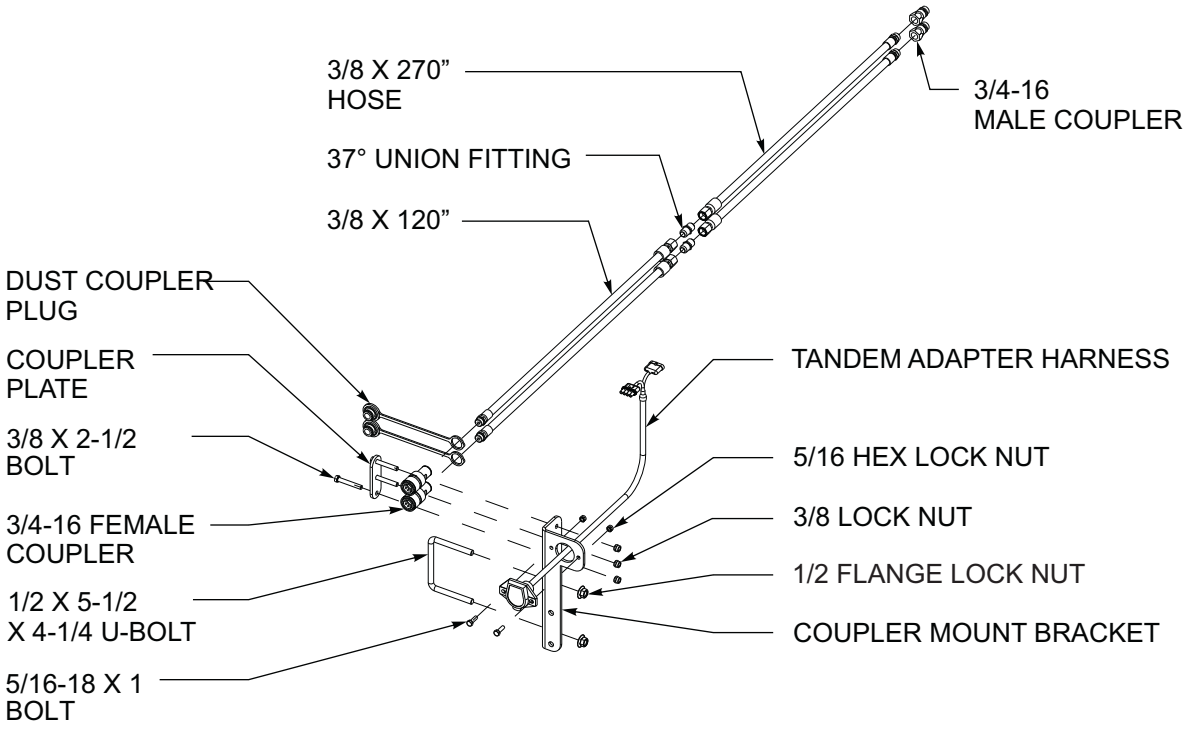
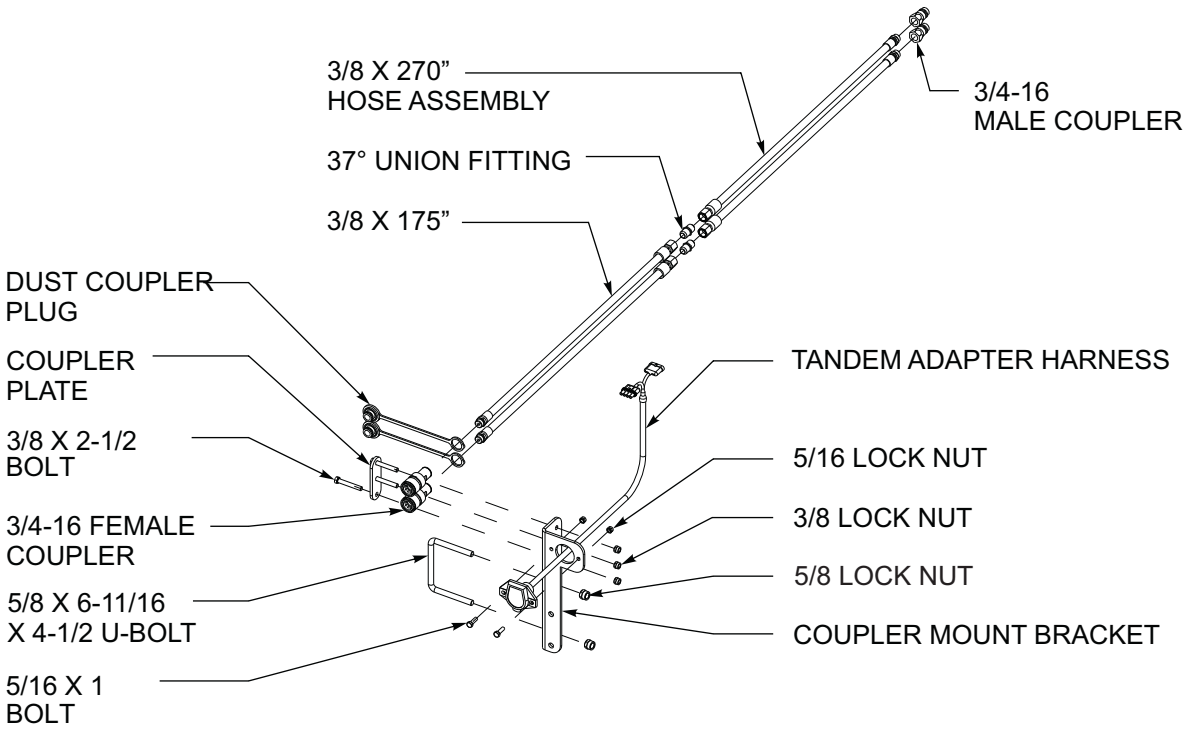


Figure 3-59: Rear Tow Hitch Installation



REAR TOW HITCH HYDRAULIC INSTALLATION - SHORT



REAR TOW HITCH HYDRAULIC INSTALLATION - LONG

Figure 3-60: Rear Tow Hitch Hydraulic Installation

Rear Jack Installation

A rear jack assembly is available for use on the rear of the disc.

IMPORTANT

The rear jack tube should be located to the rear of the disc near the center of the frame, but not interfering with the visibility of the SMV sign.

1. Slide rear jack assembly over rear frame of the disc near the center of the frame ***See Figure 3-61*.**
2. Slide rear jack mount plate onto 3/4 x 4 bolts beneath rear frame tube and hold in place with 3/4 lock nuts.

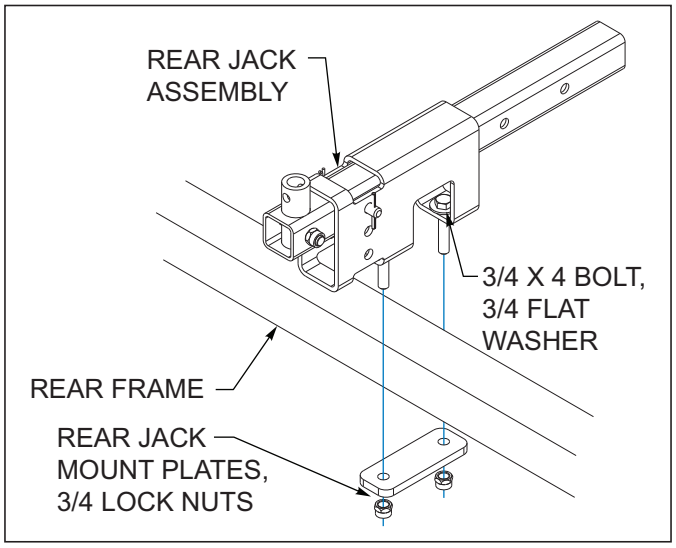


Figure 3-61: Rear Jack Installation

Final Assembly

1. Attach a tractor to the implement and charge the lift system hydraulics as described in ***"Hydraulic Lift System" on page 4-3*.**
2. Install the transport locks on both 4 x 10 master cylinders on the center frame.
3. Connect the hydraulic hoses on the optional hydraulic leveler to the tractor (if equipped). Fully extend and retract the hydraulic leveler several times to remove any air. ***"Hydraulic Leveler Gauge Adjustment" on page 4-9*** for any further adjustments.
4. The fold system must be purged of air and filled with oil BEFORE attempting to fold the implement. Air in the system will allow the wings to fall uncontrollably and may result in implement damage. Follow instructions for charging the hydraulic fold system ***"Hydraulic Fold System" on page 4-5***
5. Connect lights to the tractor and verify operation.
6. Check tires for proper inflation.
7. Level the disc from side to side as described in ***"Leveling (Side To Side)" on page 4-7***
8. Inspect the final implement assembly, and verify that all bolts have been tightened, cotter pins spread, and that there are no leaking hydraulic connections.
9. Rotate each disc gang to verify that each gang rotates freely. Adjust any scrapers that may have shifted during shipment or assembly.
10. Lubricate the disc at all locations as shown in ***"Lubrication Points" on page 5-3***
11. Touch up with paint any areas that may have been scratched during moving, handling, or assembly.
12. Thoroughly read and understand the operating section before using the disc.

Chapter 4

Operation

DANGER

Never allow anyone to ride on the 6231 Disc at any time. Allowing a person to ride on the machine can inflict serious personal injury or death to that person.

DANGER

Disc blades are extremely sharp. Exercise extreme care when working on or near disc blades. Do not allow discs to roll over or fall onto any bodily part. Do not allow wrenches to slip when working near disc blades. Never push wrenches toward disc blades. Do not climb over machine above disc blades. Failure to stay clear of disc blade edges can cause serious personal injury or death.

WARNING

All hydraulically elevated equipment must have cylinder lockouts installed or be lowered to the ground, when servicing or when equipment is idle. Failure to take preventive measures against accidental lowering can result in serious personal injury.

DANGER

Always lock the tractor drawbar in the center position when transporting the unit. Failure to do so can result in serious injury or death and cause damage to the equipment.

DANGER

When transporting the unit, place cylinder lockouts in the transport lock position after fully extending the cylinders. Insert the lockout pins to secure the cylinder lockouts. Failure to lockout the cylinders can cause the unit to settle during transport, which can result in serious injury or death and cause damage to the equipment.

CAUTION

When transporting farm implements on public roads, it is the responsibility of the operator to abide by state and local laws concerning wide loads, speed, safety emblems and safety lighting equipment. Drive at safe speeds, particularly when rounding corners, crossing rough ground or driving on hillsides, to prevent tipping the tractor.

Tractor Preparation

The Landoll 6231 Disc is designed to be pulled by tractor equipped with a double lip or clevis type hitch. If your tractor is not equipped as such, you need to purchase the hitch from your local tractor dealer. Before attaching the Disc, prepare the tractor as follows:

1. Inflate the rear tractor tires equally and add ballast according to the tractor operator's manual.
2. Lock the tractor drawbar in the center position.

Disc Preparation

1. Prior to operating the 6231 Disc, inspect it thoroughly for good operating condition.
2. Replace worn or missing parts.
3. When the machine is new, check the bolt tightness after a few hours of operation. Tighten any loose nuts or bolts. Check the lift wheel lug bolts daily.
4. Check the lift wheel tire inflation. Inflate all tires equally to avoid side draft. Follow the tire manufacturer's recommended pressures listed on the sidewall of the tires.
5. Check disc scrapers for proper adjustment to the disc blade ***See Figure 4-1***
6. Lubricate the machine ***See Figure 5-3*** **.**

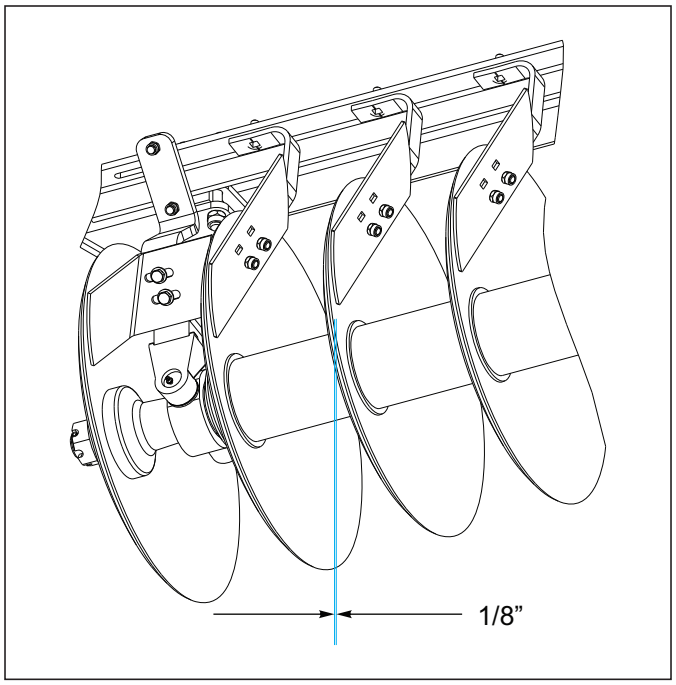


Figure 4-1: Disc Scraper Adjustment to Disc Blade

Attaching To The Tractor

1. Align the tractor drawbar with the machine. Raise or lower the disc ring hitch, as needed, using the swivel jack. Attach the unit with proper size hitch pin. Use a locking-style hitch pin that properly fits the tractor drawbar and implement hitch.
2. Always place the swivel jack on the interior mount before setting the machine in motion.
3. Clean all hydraulic couplings and attach to the tractor.
4. Fully extend the hydraulic lift wheel cylinders, and place both cylinder lockouts in the transport lock position over the cylinder rods. Secure the lockouts with the lockout pins.
5. Attach safety chain to tractor allowing plenty of movement for turning both directions. The safety chain should latch securely to prevent it coming loose.
6. Plug in the 7-pin connector for the lights.
   a. The tractor should have a good clean receptacle, free of dirt and corrosion.
   b. Make sure the 7-pin connector is inserted all the way in, and allows the cover to latch over the keyway to secure it in place.

The lighting system requires a good ground connection and if the lights do not seem to work right check the installation of the 7-pin connector and the condition of the pins.

Hydraulic Lift System

The disc is equipped with a rephasing hydraulic lift system to raise and lower the unit in the field.

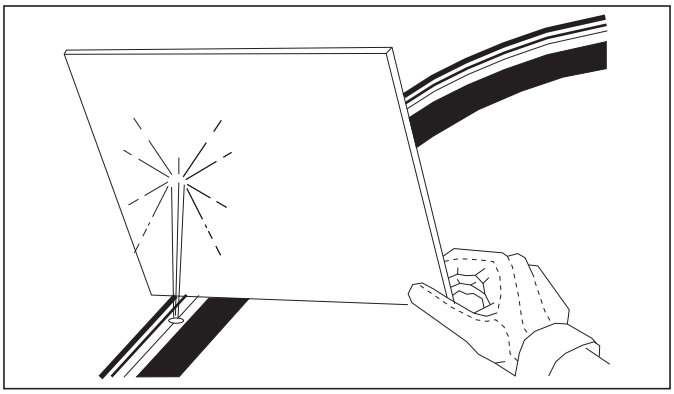


Figure 4-2: Hydraulic Leak Detection

WARNING

Escaping hydraulic fluid can cause serious personnel injury. Relieve system pressure before repairing, adjusting, or disconnecting. Wear proper hand and eye protection when searching for leaks. Use cardboard instead of hands *See Figure 4-2*. Keep all components (cylinders, hoses, fittings, etc.) in good repair.

1. The rephasing hydraulic lift system contains smaller wing frame cylinders plumbed in series with larger center frame cylinders. It is important that the cylinders be connected in the proper series for the lift system to operate correctly. When the cylinders are fully extended and held in this position, oil is able to flow through the cylinders (or rephase) and allow the cylinders to operate in sync. This also allows the system to purge any air that may enter the system without having to loosen or crack hydraulic lines.

2. The hydraulic system is not filled with oil and should be purged of air before transporting and field operations. Carefully hitch the disc to the tractor and connect the hydraulic lift hoses.
3. Check to make sure the tractor hydraulic reservoir is full of the manufacturer's recommended oil. Slowly raise the machine, and continue to hold the hydraulic lever until all lift cylinders are fully extended.
4. With all cylinders fully extended, remove the 1-3/8 x 10 transport lockouts ***See Figure 4-3*** Store transport lockouts as shown in ***See Figure 4-4*****.**
5. Lower and raise the unit to verify that all cylinders are working simultaneously throughout the stroke. If the cylinders are not working evenly or together, fully extend the lift cylinders and continue to hold the lever to purge any remaining air. Do not loosen any hoses or fittings. Recheck tractor reservoir to make sure it is within operating limits.
6. Always fully extend the cylinders and hold the lever to ensure the cylinders are rephased before starting any field operation. This will keep all cylinders in time and level when operating.

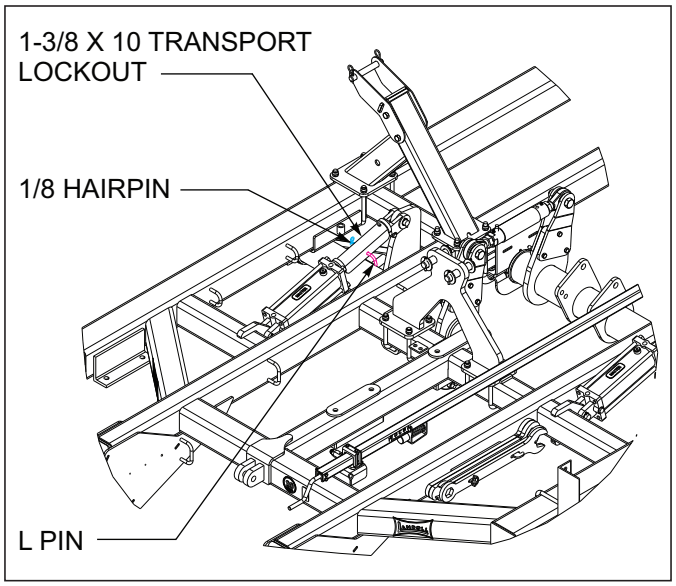


Figure 4-3: Installed Transport Locks

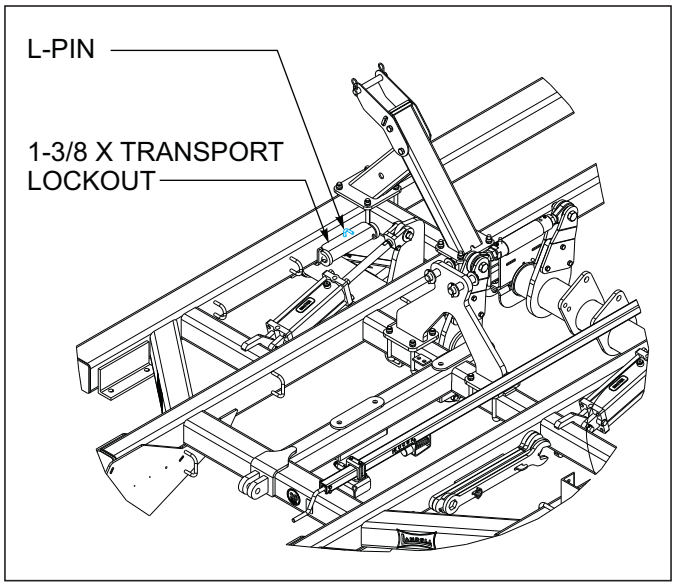


Figure 4-4: Stored Transport Locks

Hydraulic Fold System

1. The disc is equipped with a hydraulic fold system to raise and lower the wing frames for narrow transport.
2. Be sure the system is fully charged with hydraulic oil before attempting to fold/unfold the unit. Air in the system can allow uncontrolled dropping of the wing frames causing serious personal injury or machine damage. The system needs to be charged with oil initially and any time the system has been opened for repair such as cylinder, hose, or fitting replacement/repair.
3. To charge the system, carefully hitch the disc to the tractor. Unpin the end(s) of the fold cylinders, and position them so they can extend and retract without contacting any frames or other parts. Check the tractor hydraulic fluid level to make sure it is full of the manufacturer's recommended hydraulic fluid. Connect the cylinder hoses to the tractor and fully extend and retract the cylinders several times. The cylinder rod travel should be smooth and positive when all air has been purged from the system. Due to large amounts of hydraulic oil required, recheck the tractor fluid level to make sure it is within proper operating limits.
4. The hydraulic fold system is equipped with restrictors in the rod end of cylinders to prevent uncontrolled falling of wing frames when unfolding. Removal or improper assembly of these restrictors can cause the machine to fold improperly and result in serious machine damage.

⚠ WARNING

Escaping hydraulic fluid can cause serious personnel injury. Relieve system pressure before repairing, adjusting, or disconnecting. Wear proper hand and eye protection when searching for leaks. Use cardboard instead of hands *See Figure 4-2* Keep all components (cylinders, hoses, fittings, etc.) in good repair.

5. To fold/unfold the disc, find a level area large enough to accommodate the disc when it is fully unfolded. The tractor should be stopped and not moving with the unit fully raised. Remove the transport lock pins from the mounts and install them in the storage locations ***See Figure 4-5*** **and** ***4-6*****.)**

IMPORTANT

Failure to remove the lock pins when unfolding will result in serious damage to the implement. Be sure other people and pets are a safe distance away.

6. Slowly engage the tractor lever and fold/unfold the wing frames. When the wings are unfolded, continue holding the tractor lever to fully extend all fold cylinders. This will allow the wings to fully flex in the field.
7. When the unit is fully folded, remove the transport lock pins from the storage location and install in the mounts provided on each side of the machine.

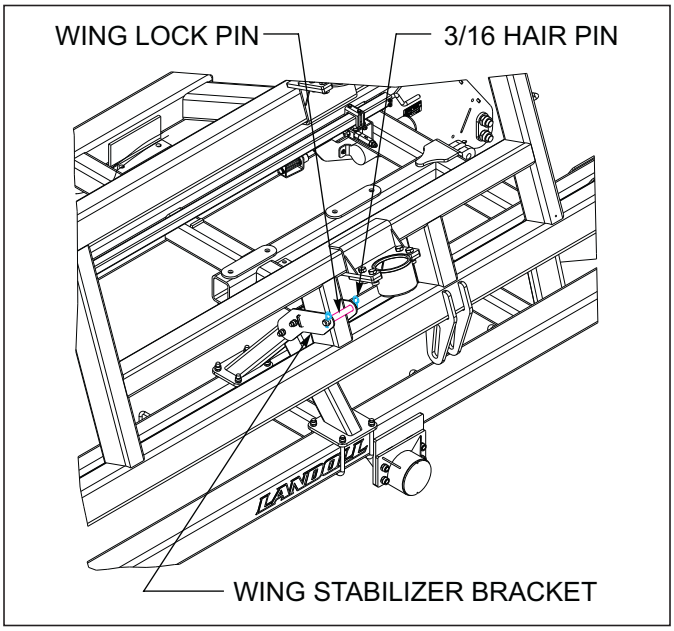


Figure 4-5: Installed Position of Transport Locks

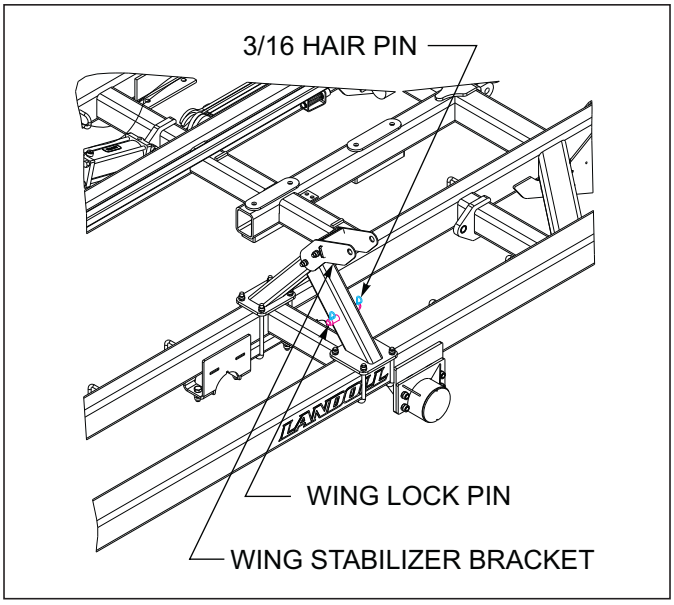


Figure 4-6: Stored Position of Transport Locks

General Operation

1. The horsepower requirements are typically 8-10 horsepower per foot of cut. This will vary widely due to speed, depth, moisture, residue and types of soils. Local dealers can help in making recommendations for your areas.
2. Operating speed is typically 4.5-6 mph. Excessive speed can cause the unit to bounce, uneven depth, and create a ridge on the outside edges. Too low of speed may not allow the unit to properly fill in the center furrow.
3. Lift wheels must always be in contact with the ground and carrying some implement weight. Lift wheels are used to gauge the depth of each frame section and to control the leveling feature. Maximum discing depth can not be achieved by raising the lift wheels off the ground. Little or no weight on the lift wheels will cause the frame sections to gouge, side-draft, and buckle producing inconsistent cutting depth.
4. Do not turn with the disc in the ground, this can put excessive side load on the gangs and hitch. Raise the unit slightly when making turns to prevent gouging and pushing a ridge.

Field Operation

1. Raise the unit to take the weight off of the transport locks. Remove the transport locks from the lift cylinders (on the main frame only.) Store the transport locks on the retainers above the main lift ***See Figure 4-4***.
2. Remove the wing lock pins and store in the extra hole in the wing stabilizer. Unfold the wings and extend the fold cylinders completely ***See Figure 4-6***.

⚠ CAUTION

Failure to remove wing lock pins before unfolding wings will cause permanent equipment damage.

3. Fully raise the unit and hold tractor lever 30 seconds to rephase lift cylinders before starting field operation.
4. Check unit for level side to side and front to rear.
5. Set depth control. Do not raise lift wheels completely off ground. Lift wheel, gauge depth for each section and control front to rear level.
6. Adjust front gauge wheels depth.

Leveling (Side To Side)

Leveling the disc from side-to-side, involves leveling the center section side-to-side, then leveling the wings to the center section. This will insure that all sections are operating evenly and consistent depth. The unit should be level side-to-side when operating in the field.

NOTE

Do not attempt to level the center frame by only adjusting the radius rod.

1. To level the center section, lower the unit to the ground, and remove the adjustable radius rod between the main lifts on the center section.
2. Fully raise the implement and hold the hydraulic lever for approximately 1 minute to rephase all lift cylinders. Then lower the implement to the ground and fully retract the cylinders. (Note: The depth stop will need to be adjusted out of the way to allow the cylinders to fully retract.) The two master cylinders on the center frame should measure 22-1/4" at the pin centers, and should not be any visible plated shaft showing.
3. Lay a straight edge across the top of the frame and measure from the top of the frame to the top of the walking beam spindle of both center frame axles. If the measurements are more than 1/4" different, the cylinders will need adjusted.
4. To adjust the cylinders, loosen the locking bolts through the end of the cylinder clevises. Use a wrench (on the flats behind the cylinder clevis) to turn the cylinder rod thus extending/retracting the cylinder clevis. Adjust the clevises equally. By turning one cylinder out one turn and turning the other cylinder rod in one turn will change the lift wheel measurement approximately 1/4".
5. Verify that the cylinders are still fully retracted and check the measurement from the walking beam spindle to the top of the frame. Adjust the cylinder rods until the measurement is within 1/4".
6. Retighten the locking bolts through the ends of both cylinder clevises.
7. With the cylinders still fully retracted, install the adjustable radius rod between the two main lifts. This will insure the lifts are properly timed and not binding. The radius rod centers will be approximately 21" long ***See Figure 4-7***.

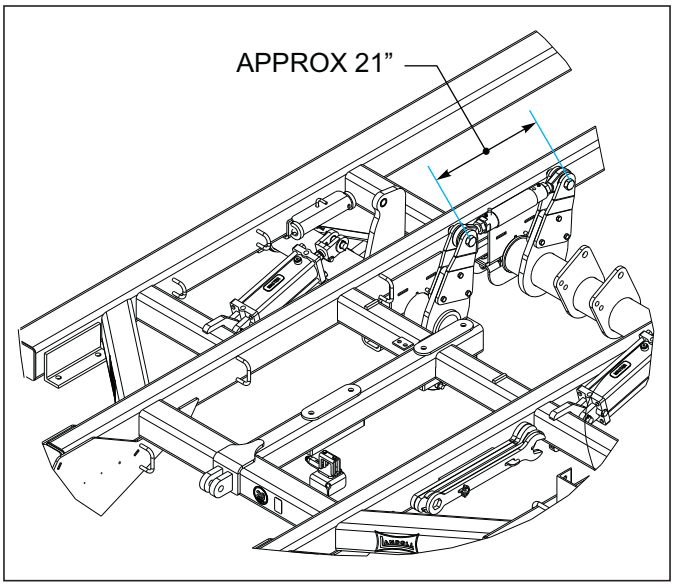


Figure 4-7: Radius Rod Measurement

8. When the center frame has been leveled side-to-side, the wings may be leveled to the center frame. Fully raise the implement and hold the cylinders extended for approximately 1 minute to again rephase the lift cylinders.
9. Lower the implement until the disc blades are approximately 1" above the ground. Measure the distance from the walking beam spindle to the top of the frame on the right center frame and right wing ***See Figure 4-8***. The dimension should be the same.

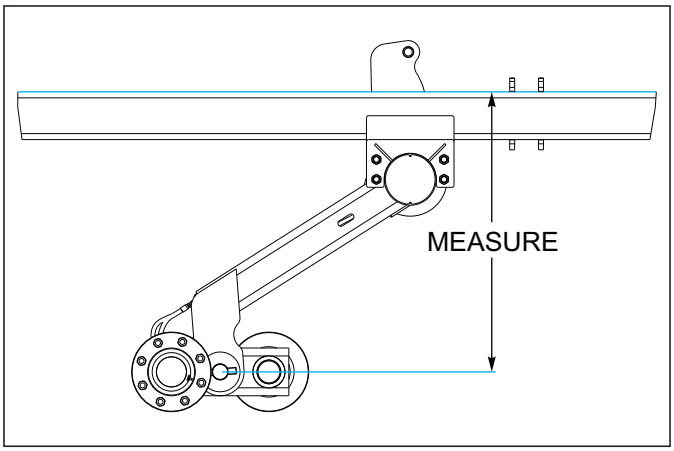


Figure 4-8: Leveling from Side to Side

NOTE

If the tire size is different on the center than the wing, the cylinders will need to be adjusted differently. A 2" taller tire on the center will require the wing spindle-to-frame height to be 1" greater than the center frame.

10. To raise or lower the wing cylinders, adjust the anchor bolt that goes through the wing frame at the base end of the wing cylinder. An adjusting wrench is provided to make this adjustment ***See Figure 4-9***.

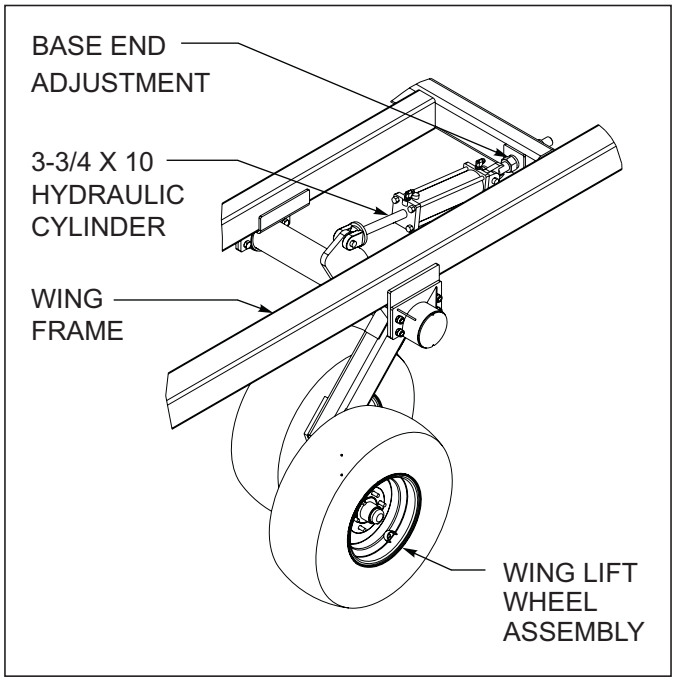


Figure 4-9: Wing Lift Adjustment

NOTE

It may be necessary to lower the implement to the ground to relieve the weight on the cylinder anchor to make this adjustment. After making any adjustments, fully raise the implement, lower to just above the ground, and re-verify measurements. Repeat as necessary and securely tighten the cylinder anchor when complete.

11. Repeat wing adjustment for the left wing.

Leveling (Front-to-Rear)

1. The leveling feature on the disc is used to keep the disc level when raising the unit from a working position to a transport position. The leveling feature is also used to level the unit from front-to-rear to perform a level discing operation in the field.
2. The unit should be level from front to rear and the soil behind the disc should be level without furrows or ridges. If there is a presence of a center ridge from the rear gangs, the rear gangs are too deep. If there is a furrow left from the rear gangs the front gangs are too deep.
3. On machines with manual leveler adjustment, turn the leveler handle in or out to adjust the front-to-rear level ***See Figure 4-10***. By turning the leveler handle in (clockwise) will lower the rear gangs in deeper. By turning the leveler screw out (counter-clockwise) will raise the rear gangs.

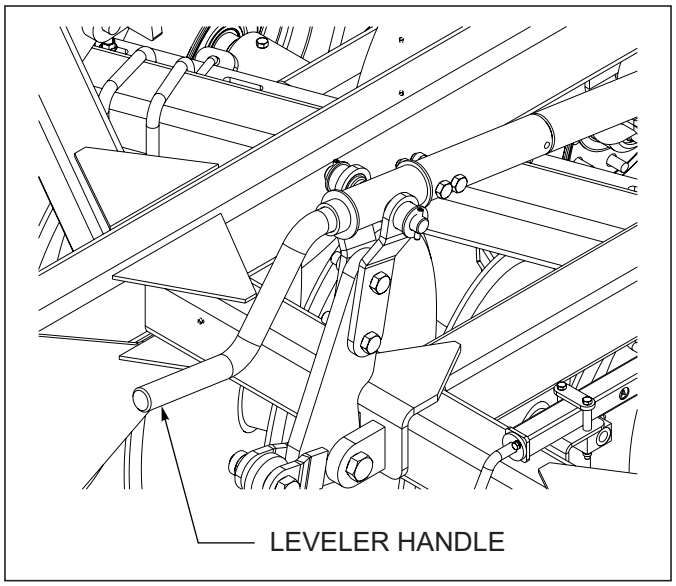


Figure 4-10: Manual Leveler Adjustment

4. Implements with the optional hydraulic leveler, can make adjustments on-the-go from the tractor. A reference gauge is provided on the implement for a guide.

IMPORTANT

Improperly set gauge wheels can prevent the leveler from functioning properly. Large adjustments, either manually or hydraulically will require adjustment of gauge wheels.

Hydraulic Leveler Gauge Adjustment

If a unit is equipped with an optional hydraulic leveler, and the unit is level in the field, but the reference gauge is not in the middle of the adjustment range, the gauge may be adjusted.

1. Lower the disc to the ground to remove the load on the leveler assembly.
2. Remove the level indicator rod from the leveler tube ***See Figure 4-11***.
3. Loosen the 1-1/2-6 hex lock nut at the rear of the leveler tube (an adjustment wrench is provided for this.)
4. Screw the leveler tube in or out. Insert the indicator rod to check if the reference gauge is centered. Adjust as required to center the reference gauge. Make sure the hole for the indicator rod is horizontal and tighten the locking nut on the leveler screw.
5. Install the level indicator rod in the leveler tube and level indicator gauge.
6. Re-tighten the 1-1/2-6 nut at the rear of the leveler tube. The check valve is not adjustable. It prevents movement of the leveler assembly unless the tractor remote is activated.

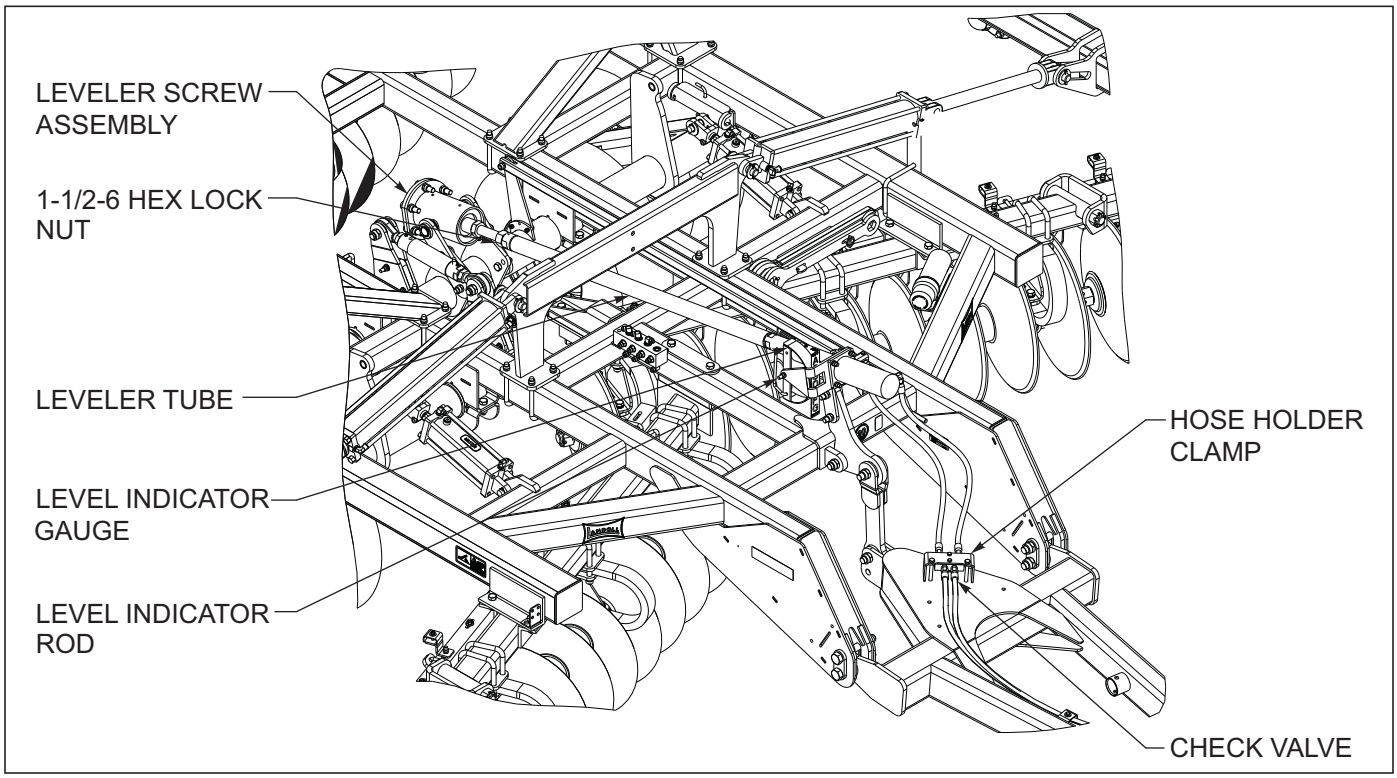


Figure 4-11: Hydraulic Leveler Gauge Adjustment

Variable Ratio Adjustment

The leveler is also equipped with a variable ratio adjustment. This is located at the rear of the leveler and above the center lift. Connect the leveler spring mount to the lower holes of the center lift mount for normal discing operations. If using an extremely heavy attachment or an attachment and rear tow hitch combination, and the rear of the machine tends to droop; then move the leveler spring mounts to the upper heavy setting position. This will reduce the leveler ratio and cause the harrow attachment to raise faster.

1. To change the variable ratio adjustment, lower the implement to the ground and relieve the load on the lift system.
2. Extend or retract the leveler assembly (manual or hydraulic), until the load is removed from the leveler assembly ***See Figure 4-12***.
3. Loosen, but do not remove the 1 x 2-1/2 bolts in the leveler spring mount. Remove the 3/4 x 2-1/2 bolts.
4. Reinstall the 3/4 x 2-1/2 bolts with the leveler spring mounts in the desired position. The leveler (manual or hydraulic) assembly will require some adjustment to connect to the new position.

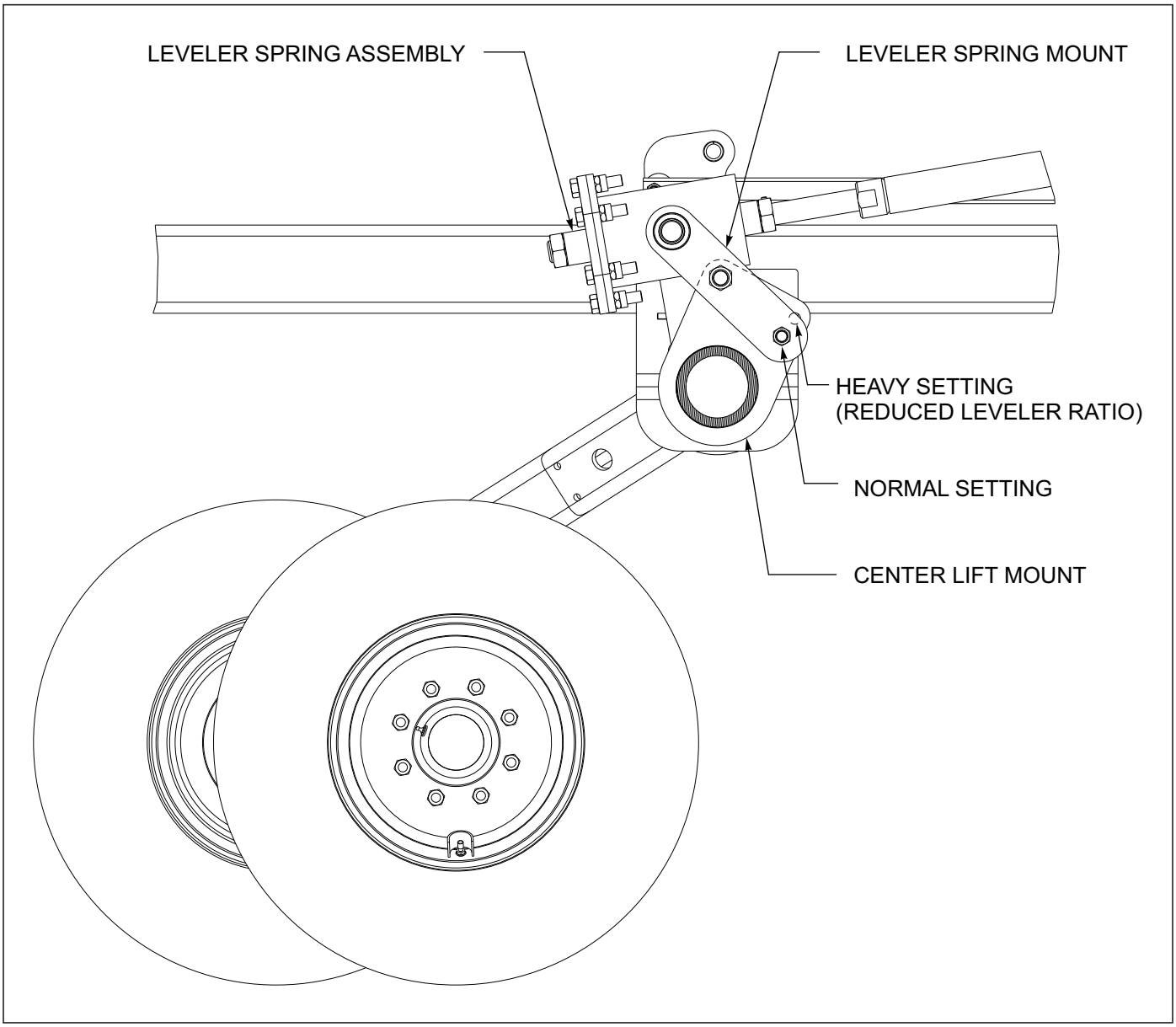


Figure 4-12: Variable Ratio Leveler Adjustment

Hitch Adjustment

1. It is important for the disc to maintain a proper draft line with the tractor to do a level job of discing. The draft line will vary depending on soil conditions and tractor drawbar height. The disc is equipped with an adjustable hitch to help insure a proper draft line with the tractor.
2. Generally tractor drawbars greater than 20” tall will require the hitch to be in the upper position. Drawbars 20” and below should be in the lower position. Operating conditions may also influence the hitch adjustment.
3. A hitch adjustment that is too high will leave a center furrow, as the front of the disc will operate too deep. A low hitch adjustment can cause a center ridge, regardless of leveler setting.

IMPORTANT

Excessive down pressure with gauge wheels can also create a center ridge regardless of hitch and leveler settings.

4. To adjust the hitch ***See Figure 4-13*****.**
   a. Lower the disc to the ground.
   b. Adjust the leveler screw (manual or hydraulic) in or out until the pressure is relieved on the leveling system. ***“Leveling (Front-to-Rear)” on page 4-8*** **and** ***“Variable Ratio Adjustment” on page 4-10*****.**
   c. Remove the 1-8 x 4 -1/2 hex head cap screw and hardware from the leveler ball joint link at the center rear of the hitch weldment.
   d. Loosen, but do not remove the bolts that pass through the ball joint connections at the outer rear connections of the hitch.
   e. Remove the bolt through the two hole clamp plates (above or below) the rear connections of the hitch ball joint.
   f. Vertically raise or lower the hitch to the desired operating position.
   g. Reinstall the bolt through the two-hole clamp plates to secure the hitch in the new position.
   h. Re-tighten all hitch bolts.
   i. Install the bolt in the leveler ball joint link in the new position at the rear of the hitch and re-tighten.

IMPORTANT

When the hitch is in the lower position, the leveler ball joint link will be in the upper mounting hole at the rear of the tongue. If the hitch is in the raised mounting position, the leveler ball joint link will be in the lower hole at the rear of the tongue.

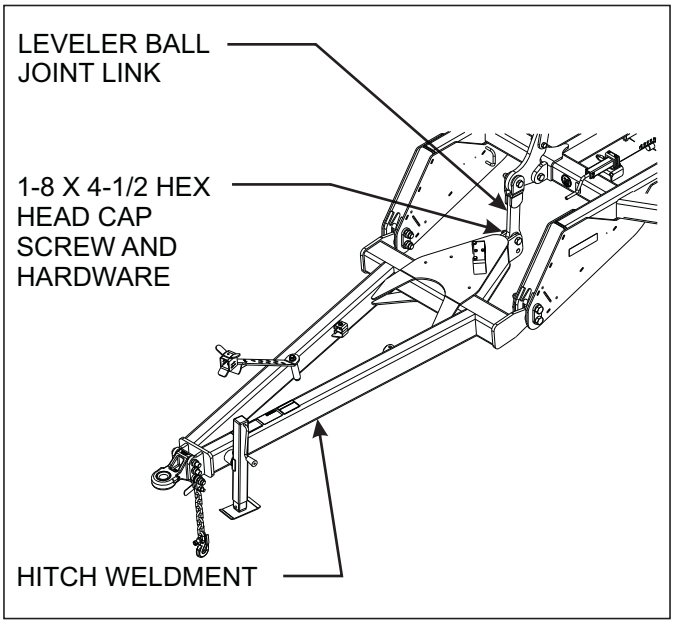


Figure 4-13: Hitch Adjustment

Scraper Adjustment

The disc is equipped with rigid scrapers at regular spools with dual scrapers at the disc bearings.

1. Rigid scrapers should be set initially as close to the disc blade as possible without rubbing approximately 1/8” ***See Figure 4-14***. A slotted hole at the top of each scraper is provided for individual adjustment. Adjustments may be made for entire gangs, by loosening the u-bolts around the angle-iron scraper bars and sliding the whole bar. Scraper arms are made of spring steel. In wet conditions, the scraper may be set against the disc blade and will function as a spring-loaded scraper.
2. Scraper blades have two positions and are reversible. The blades are initially set in the rear position to position scraper closer to the outer edge of the disc blade. This position will perform better in wet and heavier residue conditions. The blade may be moved forward for dryer conditions and climates where less scraper action is needed.
3. Dual scrapers are provided at the bearing locations to scrape the disc blade and to limit the amount of soil and residue carried into the bearing hanger. Scrapers can be individually adjusted in or out from the concave side of the disc blade.

CAUTION

Tighten all 1-3/4” nuts to a minimum of 1,250 foot-pounds of torque *See Figure 4-15*.

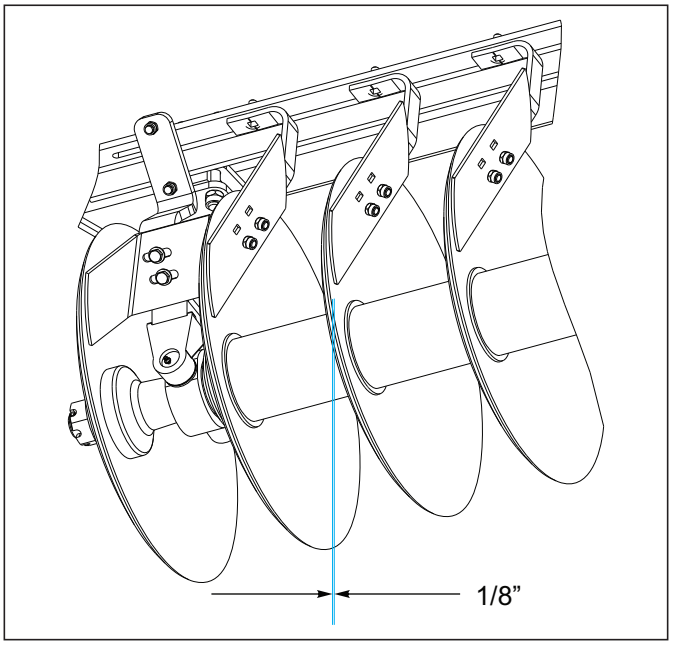


Figure 4-14: Scraper Adjustment

Disc Gang Assembly

1. The disc gangs are assembled using 1-3/4” diameter gang shaft. Spring-loaded end collars are used on each end of the disc gangs to maintain clamping force of the gang shaft. Slotted hex nuts are installed at both ends of the disc gangs to allow service from either end.
2. When disassembling a disc gang, note the locations of the bearings and tapered blades. Remove the 3/8 roll pin from the end of the gang shaft and clean any remaining soil or debris from the gang shaft threads. Closed-end gang shaft wrenches are provided on the center frame to fit the gang nuts. An additional extension or cheater pipe may be required to loosen the gang shaft.
3. When reassembling the disc gang, remove any soil or mud from the disc blades and spools to ensure a clean surface when tightening the gang.Clean the gang threads and install the gang nut. Torque the disc gang shaft to a minimum of 1250 ft-lbs ***See Figure 4-15***.

DANGER

Disc blades are extremely sharp. Exercise extreme care when working on or near disc blades. Do not allow discs to roll over or fall onto any bodily part. Do not allow wrenches to slip when working near disc blades. Never push wrenches toward disc blades. Do not climb over machine above disc blades. Failure to stay clear of disc blade edges can cause serious personal injury or death.

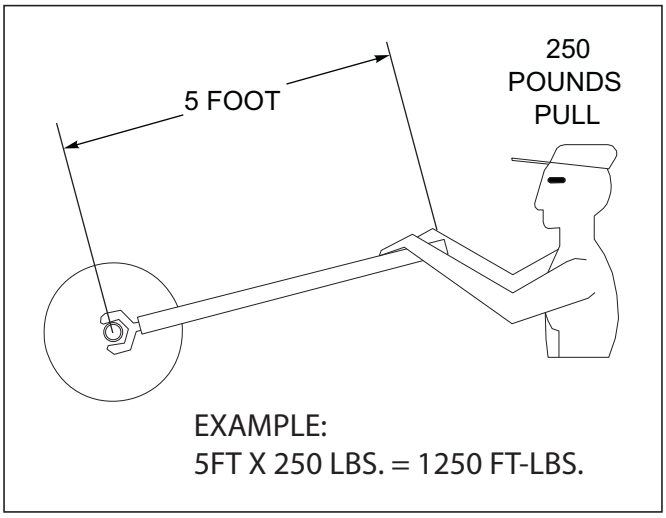


Figure 4-15: 1,250 Foot-Pounds of Torque

Coil Tine Harrow

The coil tine harrow is an optional attachment used for additional soil and residue leveling. It features 3 rows of 1/2” x 22” spring steel tines on 12” centers with 4” overall spacing. Tine rows are spaced 14” between bars with individual angle adjustment per row. Each tine tooth is individually mounted for flexibility and backup protection. All harrow sections have two mounting arms with spring-loaded down pressure.

⚠ CAUTION

The coil tine harrow adds significant amount of weight to the rear of implement and can create negative hitch weight. Be careful when unhitching the implement, as the implement hitch may rise suddenly. Before unhitching the implement, lower any rear jack stands to support the rear of the implement. Do not straddle or lean over the hitch when unpinning implement from the tractor drawbar.

⚠ WARNING

Know and verify the actual implement height and width before transporting. Attachments may increase the overall transport height and width of the implement. Use caution when operating near power lines. Electrocution can occur without direct contact.

Coil Tine Maintenance

1. The coil tine harrow does not have any lubrication points. Harrow arms pivot on maintenance-free bearings. Keep the harrow clean from residue and excess soil. Thoroughly clean the entire harrow before long term storage.

⚠ CAUTION

Coil tine teeth wear very sharp. Use caution when working near the coil tine harrow attachment.

Operation/Adjustment

1. When adding an attachment to the rear of the Landoll disc, the leveler linkage on the disc may need to be repositioned to the upper hole above the center lift. This will help the disc to better carry the additional weight of the harrow and maintain transport height ***(See “Hydraulic Leveler Gauge Adjustment” on page 4-9)***
2. In general the harrow should run level front to rear behind the disc. The tines depth should be adjusted so the tips are approximately even with the bottom of the disc blades at the desired tine angle.

NOTE

The tines will hang straight down when the implement is raised and be slightly lower than the disc blades.

3. Adjust the harrow gang bar plate (p/n 154993) angle by removing 1/2-13 x 1-1/4 round head square neck screws as shown in ***See Figure 4-16***. Rotate the harrow section to the desired level position and reinstall the bolts in the appropriate mounting holes to hold the harrow section level.
4. Entire harrow sections may be leveled for height and side-to-side. Sections heights may be leveled for all sections across the back of the implement, or individually for side-to-side levelness. To adjust the section heights ***See Figure 4-16***. Loosen the locking nuts on the 1 x 9 spring bolt, and then rotate the bolt head to raise or lower the section. Retighten the bolts when finished.
5. The tine tooth angle may be adjusted for a steeper more aggressive tooth angle or for a lower or flatter tooth angle. Use steeper tooth angles for clean or minimal residue conditions. A flatter tooth angle will allow the harrow to clear heavier and/or wetter residue. The tine tooth angle is set for each row by removing the spring clip pin at each tine angle adjustment handle and positioning to the desired hole.

IMPORTANT

In some conditions it may be desirable to run the tine rows at slightly different tine angles.

Example: Lower tine angle on the front row may help to start heavy residue under the harrow.

6. For initial harrow settings for the disc, refer to ***See Figure 4-16*****.** These are initial settings to get started. Actual field conditions (soil types, residue, moisture, etc.) may require additional adjustment. For best results, adjust one section until the desired finish is obtained. Then set the rest of the harrow sections to match.

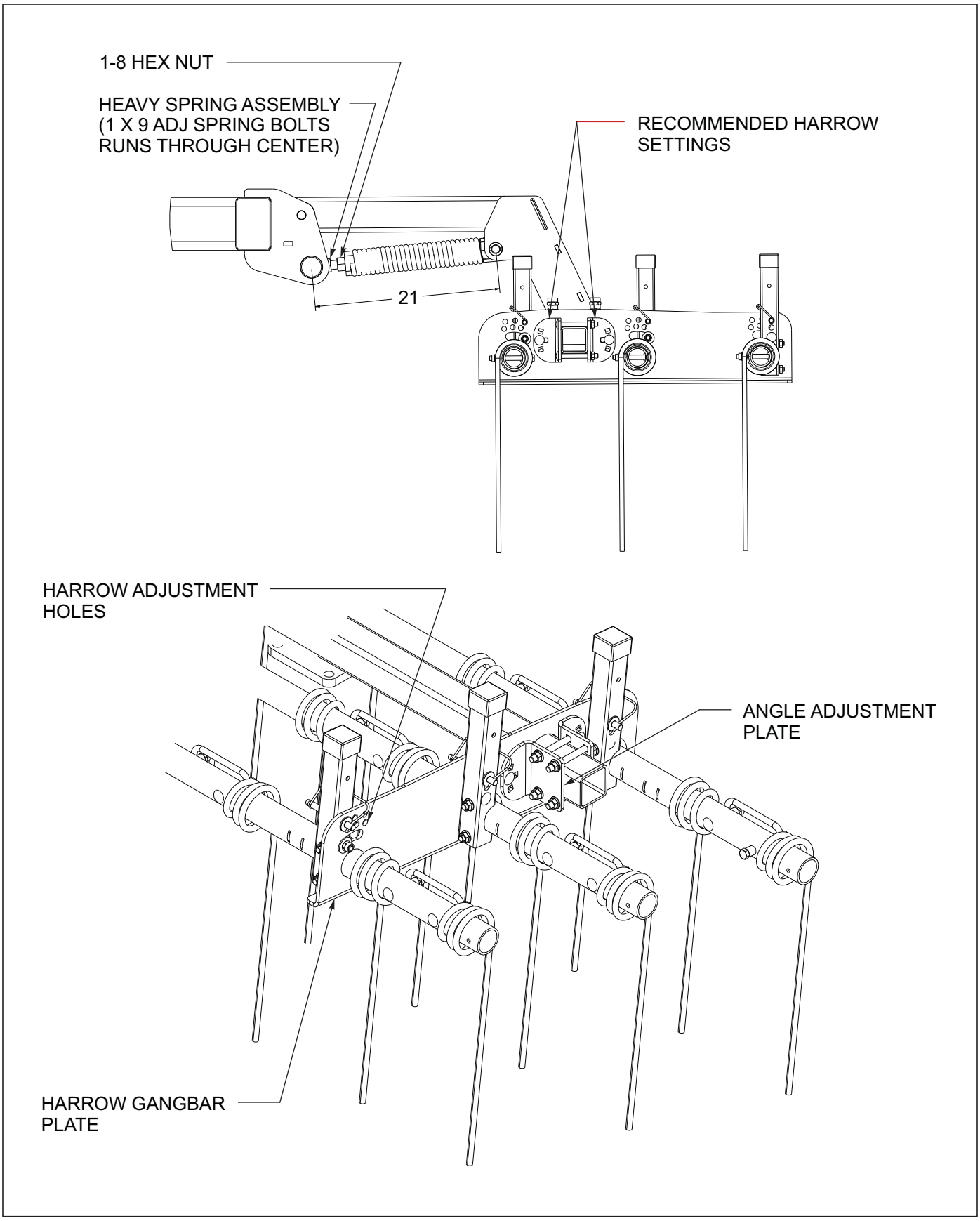


Figure 4-16: Harrow Adjustment and Settings

Conditioner Single Reels

The 6231 disc may be equipped with optional conditioner reel attachment. The conditioner reels will help to firm the soil profile, while mixing and breaking up soil clods. It can create excellent seed beds in finishing passes, and help anchor residue in primary operations.

Chevron Flat Bar Reels

The 6231 may be equipped with optional chevron flat bar reels. Chevron flat bar reels consist of 6 large 5/16 x 3" blades, formed in a chevron shape. The chevron shape helps to provide a smooth consistent roll. These reels are recommended to help chop and break up larger clods and mix with finer soil particles. Chevron flat bar reels are not recommended for wet or rocky conditions. Avoid excessive reel depth to prevent plugging and pushing soil.

1. Initially set the depth of the conditioner reel with the bottom of the reel approximately 1" above the bottom of the disc gang blades. This will be approximately 21" spring centers (for 24" disc blades) ***See Figure 4-17***.
2. To adjust the reel height, loosen the locking 1" hex nut at the front of the spring assembly. Also loosen the 1" nut on the back side of the 2-1/2" diameter front spring pin.

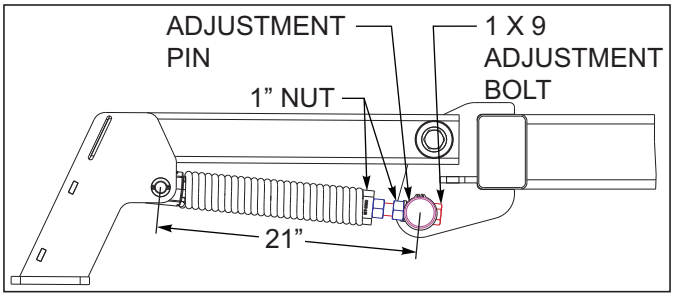


Figure 4-17: Conditioner Reel Spring Setting

3. Turn the 1 x 9 adjusting bolt in or out to the desired height, then retighten both locking nuts. Repeat for each conditioner reel arm, and set all spring lengths the same.
4. Use a shallower depth setting when operating in lighter soils or wetter conditions. This will avoid plugging of the conditioner reel. Raising of the entire disc when working in a wet spot will reduce reel plugging as well. For heavier or dryer soils, an increased reel depth may be used ***See Figure 4-18***.

NOTE

Excessive reel down pressure will try to roll the disc over on the front gangs causing the front to dip.

5. Level the disc front-to-rear after changes in reel depth or field conditions. Avoid lower operating speeds when working in wet conditions. Conditioner reels will clean out better at 5-6mph vs. 4 mph.

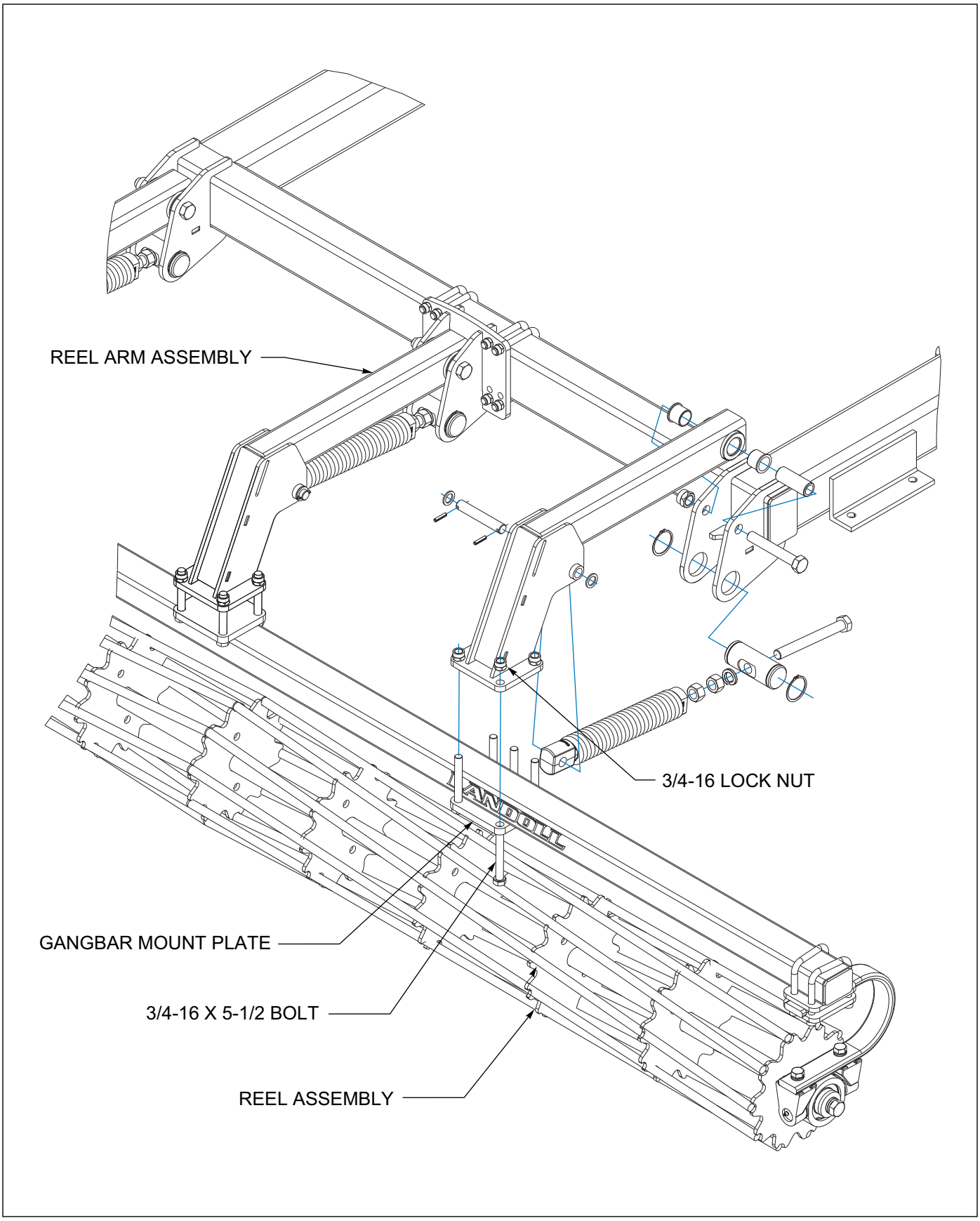


Figure 4-18: Conditioner Single Reel Installation

Conditioner Double Reels

The 6231 disc may be equipped with optional double reel attachment . The double reels will help to firm the soil profile, while mixing and breaking up soil clods. It can create excellent seed beds in finishing passes, and help anchor residue in primary operations. Reels may be either round bar or flat bar.

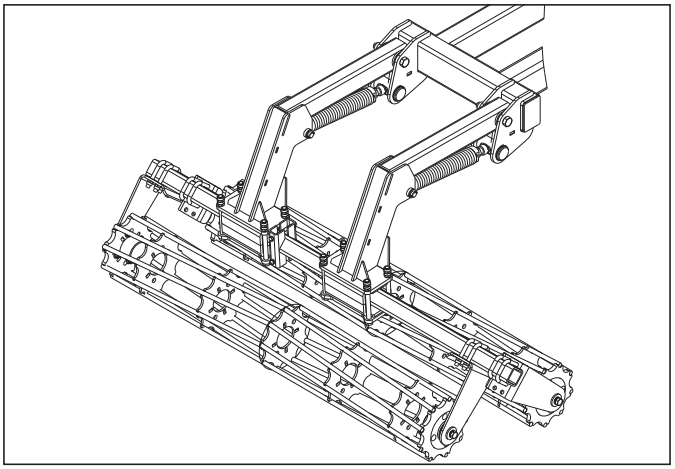


Figure 4-19: Double Reel

1. Initially set the depth of the reel with the bottom of the reel approximately 1” above the bottom of the disc gang blades. This will be approximately 21” spring centers (for 24” disc blades) ***See Figure 4-20***.
2. To adjust the reel height, loosen the locking 1” hex nut at the front of the spring assembly. Also loosen the 1” nut on the back side of the 2-1/2” diameter front spring pin.

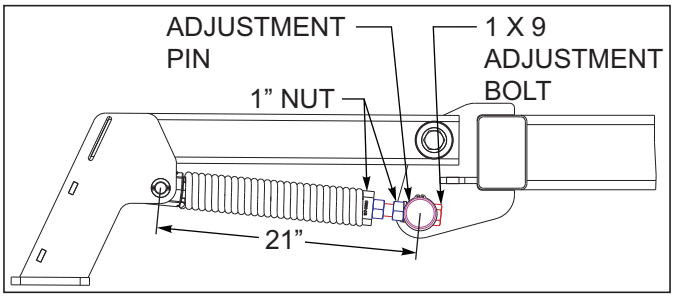


Figure 4-20: Double Reel Spring Setting

3. Turn the 1 x 9 adjusting bolt in or out to the desired height, then re-tighten both locking nuts. Repeat for each conditioner reel arm, and set all spring lengths the same.
4. Use a shallower depth setting when operating in lighter soils or wetter conditions. This will avoid plugging of the conditioner reel. Raising of the entire disc when working in a wet spot will reduce reel plugging as well. For heavier or dryer soils, an increased reel depth may be used.
5. The flat bar reels with angled blades will be attached as shown ***See Figures 4-21.*** The front reel typically has the blades angled forward to mix and chop the soil. The rear reel blades typically angled backward to pack and firm the soil. Flat bar reel, blade direction may be changed as desired to be more or less aggressive.

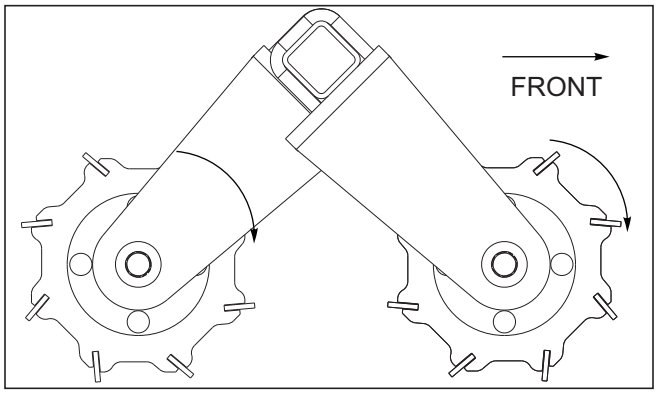


Figure 4-21: Double Reel Direction

NOTE

Excessive reel down pressure will try to roll the disc over on the front gangs causing the front to dip.

6. Level the disc front-to-rear after changes in reel depth or field conditions. Avoid lower operating speeds when working in wet conditions. Conditioner reels will clean out better at 5-6mph vs. 4 mph.

Hydraulic Conditioner Reels

An optional hydraulic controlled single or double reel option is available for the 6231 disc. The hydraulic reel functions similar to the non-hydraulic reel. *(See "Conditioner Single Reels" on page 4-15)* or *(See "Conditioner Double Reels" on page 4-17)* for recommended depth settings.

The hydraulic conditioner reel operates on a separate hydraulic circuit. The reels may be raised or lowered hydraulically from the operator seat. This can be very useful when working around a wet area to prevent plugging. The reels may be operated all the way up, or all the way down. There is no intermediate working depth.

1. Maximum reel working depth is set by adjusting the spring on each reel arm. To adjust the conditioner reel spring, with the disc raised, lower the hydraulic reels, and relieve any reel system pressure.
2. Loosen the 1" locking hex nut at the front of the spring assembly.
3. Using the flats on the rod end of the hydraulic cylinder, turn the cylinder shaft in or out to the desired spring setting.
4. Retighten the locking hex nut, and repeat for each conditioner reel arm.
5. If operating the conditioner reels in the raised position for extended lengths of time, the disc front-to-rear level may need to be adjusted to account for the extra weight now being carried by the rear of the disc. Likewise excessive reel down pressure will try to roll the disc over on the front disc gangs, requiring the disc to be leveled.

Front Gauge Wheels

1. The disc is equipped with castering gauge wheels at the outer front corners of each wing. These gauge wheels are used to limit depth of the wings, and prevent gouging and buckling of wing frames.
2. Gauge wheels are not intended to carry the wing, but prevent excessive depth. Adjust the wheels to carry some weight, but not enough to hold the wing from reaching operating depth set with the main lift hydraulics.

IMPORTANT

Excessive gauge wheel down pressure can cause the implement to throw a center ridge.

3. To adjust the gauge wheel depth, loosen and adjust the nuts on each side of the gauge wheel cross *See Figure 4-22*. A wrench is provided on the implement for this adjustment. All other connections should remain tight. Securely tighten the adjusting nuts when complete. Both gauge wheel assemblies should be set the same. Verify adjustment by measuring the length of the bolt centers of the gauge wheel adjustment rod.

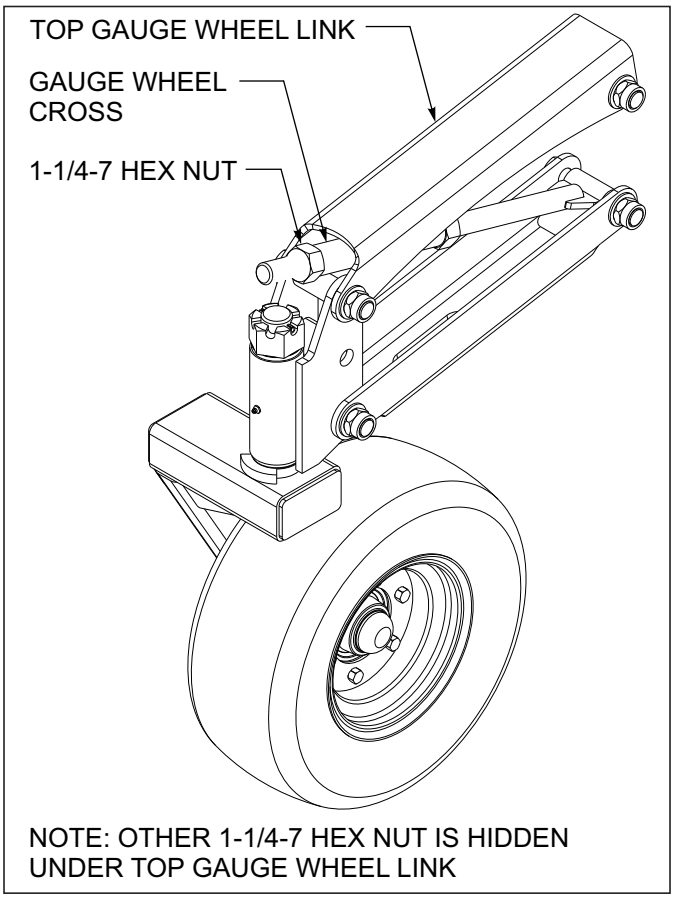


Figure 4-22: Front Gauge Wheel Adjustment

Disc Blades

1. Standard disc blades for the 6231 are 24” diameter, 4ga, and 3” concavity disc blades on both front and rear. The 6231 disc has a variety of disc blade options, for particular operations.
2. **Sharpening** – In some cases there is a desire to sharpen disc blades for improved cutting. There are several people who roll-sharpen disc blades. Most disc blades used today are made of chrome-boron steel. The chrome-boron steel has a higher hardness than traditional carbon-steel blades for increased wear. Higher hardness makes roll sharpening more difficult often with mixed results, and is not covered by warranty. Disc blade manufacturers will not cover any alterations to blades other than the place of manufacture. Results from roll-sharpening damage may not be immediate, and may take more than a season to be noticeable. If you choose to sharpen disc blades, check with local dealers for reputable experienced sharpeners that will stand behind their work.

DANGER

Disc blades are extremely sharp. Exercise extreme care when working on or near disc blades. Do not allow discs to roll over or fall onto any bodily part. Do not allow wrenches to slip when working near disc blades. Never push wrenches toward disc blades. Do not climb over machine above disc blades. Failure to stay clear of disc blade edges can cause serious personal injury or death.

3. Disc blades may be either “rollable” or “non-rollable”. Rollable disc blades will be stamped as “Rollable” Landoll does not recommend blade sharpening “non-rollable blades”.

Depth Stop Adjustment (Manual)

The operating depth of the disc is controlled by a single-point depth stop. The stop is located at the center front of the machine.

1. Adjust the depth stop by turning the handle in (clockwise) to increase operating depth ***See Figure 4-22*** Turn the handle out (counter-clockwise) to decrease operating depth. One turn will equal approximately 3/16” adjustment in depth.

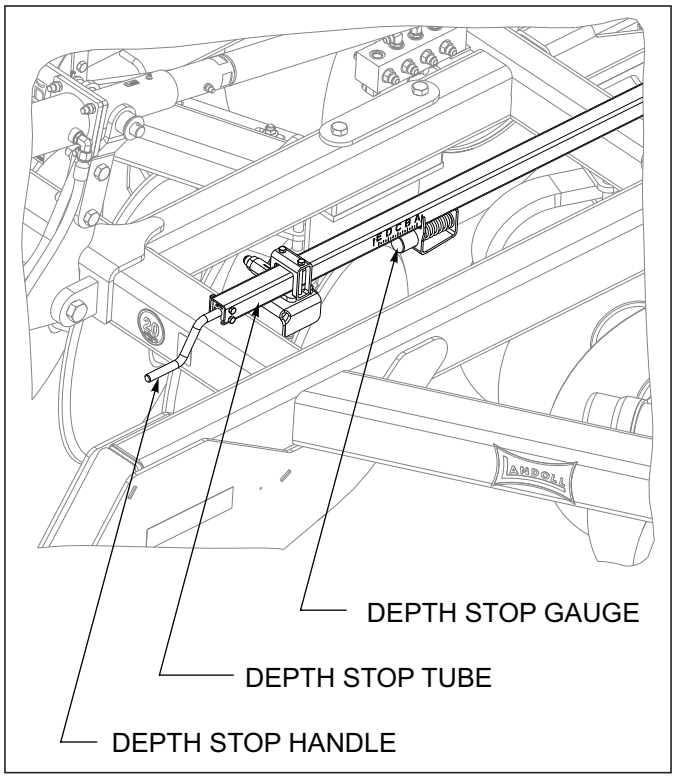


Figure 4-23: Depth Stop Adjustment (Manual)

2. The gauge on the side of the depth stop tube gives a reference for depth setting. The “A“ setting refers to maximum operating depth.

IMPORTANT

For maximum operating depth, the lift wheels must be in contact with the ground and carry some of the machine weight. Raising the lift wheels off the ground, permits uncontrolled depth of each frame section and does not allow the leveler to function properly. Discing depth and leveling will be unpredictable and uneven.

Transport

1. Check and follow all federal, state, and local requirements before transporting the disc.
2. The disc should be transported only by tractor required for field operation. The implement weight should not exceed more than 1.5 times the tractor weight. Maximum transport speed for the Disc is 20 mph for the implement and is designated on the SIS 20 mph decal located on the front and rear of the implement ***See Figure 4-24***.

⚠ CAUTION

Excessive speed may result in loss of control of the tractor and implement, reduced braking ability, or failure of the implement tire or structure. Do not exceed the implement maximum specified ground speed regardless of the capability of the maximum tractor speed.

3. When towing equipment in combination, the maximum equipment ground speed shall be limited to the lowest specified ground speed of any of the towed implements.
4. Maximum transport speed shall be the lesser of travel speed specified in the operator's manual, speed identification symbol, information sign of towed equipment, or limit of road conditions.
5. Slow down when driving on rough roads. Reduce speed when turning, or on curves and slopes to avoid tipping. Equipment altered other than the place of manufacture may reduce the maximum transport speed. Additional weight, added tanks, harrowing attachments, etc. may reduce implement load carrying capabilities.
6. A safety chain is provided with the implement to insure safe transport.
   a. The safety chain should have a tensile strength equal to or greater than the gross weight of the implement. The chain is attached to the lower hitch clevis hole with two flat washers between the clamp plates to assure a tight connection. Always use a 1” diameter Grade 8 bolt for this connection.
   b. Attach the safety chain to the tractor drawbar ***See Figure 4-24*** Provide only enough slack in the chain for turning. Do not use an intermediate chain support as the attaching point for the chain on the tractor. Do not pull the implement by the safety chain.

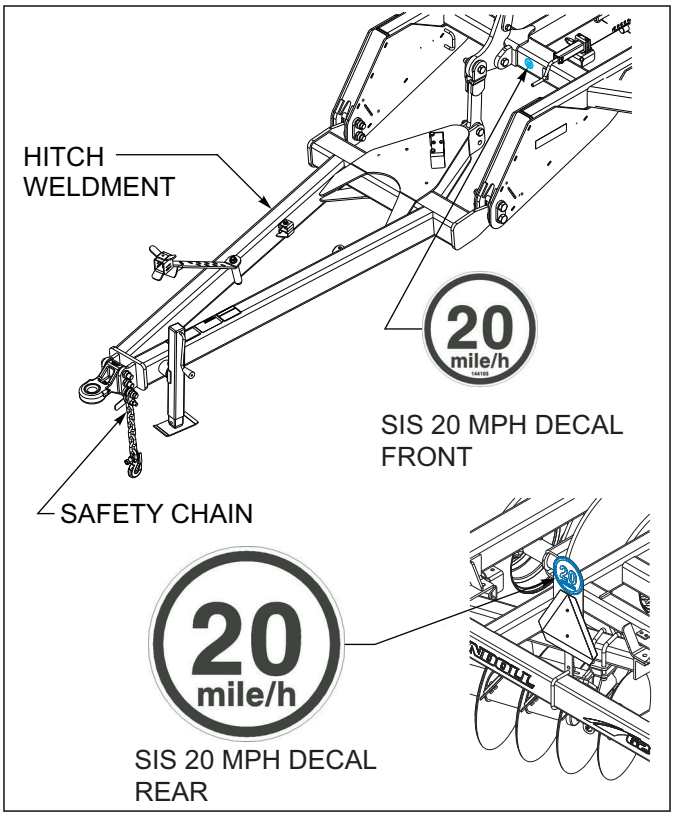


Figure 4-24: Hitch, Speed Identification Symbol, and Safety Chain

   c. When unhitching from the tractor attach the hook end of the chain to a free link close to the hitch clevis for storage. This will keep the hook off the ground, reducing corrosion and keep the hook functioning properly.
   d. Regularly inspect the safety chain for worn, stretched, or broken links and ends. Replace the safety chain if it is damaged or deformed in any way.
7. Check that tires are of proper size, load rating, and inflated to manufacture specifications before transporting. Check wheel lug bolts to insure tightness.
8. Know the transport heights and widths of the unit before transporting. Attachments such as leveling harrows can increase the transport dimensions of the implement. Use caution when transporting near bridges and power lines.

⚠ WARNING

Electrocution can occur without direct contact.

9. Raise the unit to full transport height.
10. Install transport locks on both lift and fold systems. Do not depend solely on implement hydraulics for transport ***See Figure 4-25***.

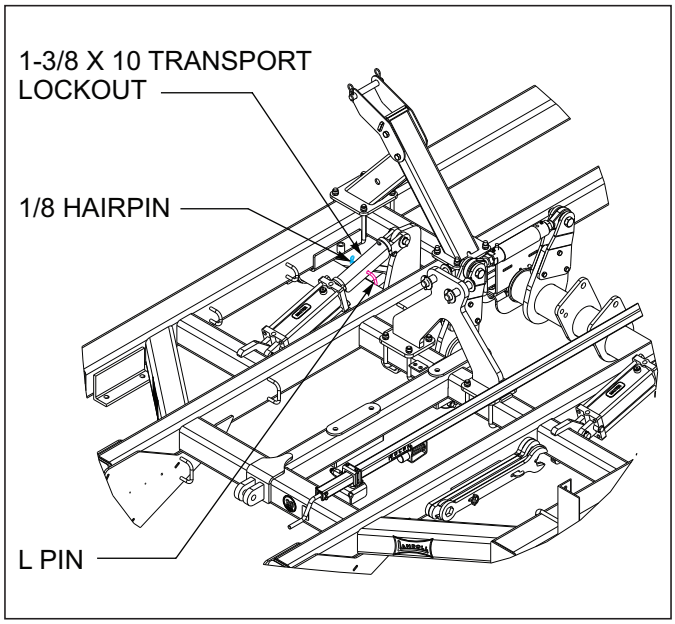


Figure 4-25: Installed Transport Locks

WARNING

Failure to use transport lock pins during transport may result in permanent equipment damage, serious injury, or death.

11. Transport during daylight hours whenever possible. Always use flashing warning lights, except where such use is prohibited by law. Make sure lights, reflectors and SMV emblem are clearly visible and operating. Remove any obstructions such as dirt, mud, stalks or residue that restricts view before transporting.
12. Be sure to disassemble rear jack assembly and move into transport position. ***See Figure 4-26*** before moving machine.

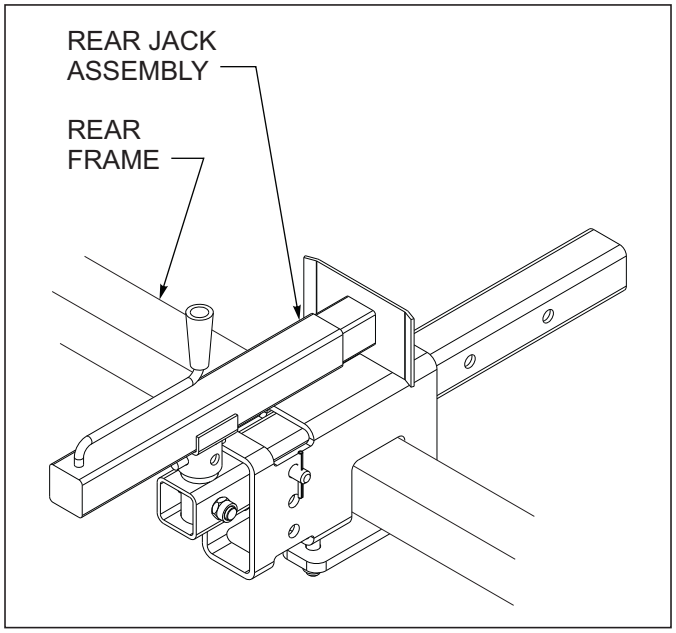


Figure 4-26: Rear Jack Field Position

Wheel Bearing Maintenance – Non Triple-Lip

Transport tires use a self-contained seal with multiple lips. The seal fits tight on both the spindle and wheel hub. The seal when properly installed will rotate internally and freely. This seal is will also allow grease to pass when lubricating the hub.

Wheel bearing maintenance should be preformed at the beginning of every season of use. Check the wheel bearings periodically for excessive end play.If needed, adjust or replace them using the following procedure:

1. Place the frame on blocks or stands sufficiently to lift the tire clear of the ground.
2. Remove the tire.
3. Remove the dust cap, gasket, cotter pin, slotted nut, and washer.
4. Remove the hub assembly from the spindle. Clean and inspect the bearings and hub cavity. Replace any worn or defective parts.
5. Repack the bearings using a high-quality wheel bearing grease.
6. Install the inner bearing into the hub and install the grease seal. Use a driver to install the seal, to avoid damaging the outer edge of the seal. Drive the seal squarely into the hub to avoid any seal distortion.
7. Slide the hub, bearing, and seal onto a clean spindle
8. Install the outer bearing, washer, and slotted nut.
9. Tighten the slotted nut while rotating the hub until there is a slight resistance to hub rotation. Then back the slotted nut off one notch, until the hub rotates freely without end play.
10. Install the cotter pin, dust cap and gasket.
11. Install the gasket and dust cap. Do not over tighten the dust cap screws causing the gasket to come out.
12. Through the zerk, give 6-8 more pumps of grease. It is not necessary to purge grease seal, as they are filled ***See Figure 5-1***.

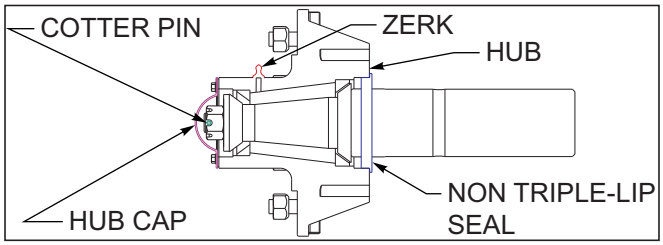


Figure 5-1: Non-Triple Lip-Seal

Wheel Bearing Maintenance -- Triple-Lip

Wheel bearing maintenance should be performed at the beginning of every season of use. Check the wheel bearings periodically for excessive end play. If needed, adjust or replace them using the following procedure:

1. Place the frame on blocks or stands sufficient to lift the tire clear of the ground.
2. Remove the tire.
3. Remove the hub cap, cotter pin, slotted nut and washer.
4. Remove the hub. Clean and inspect the bearings and hub cavity. Replace any worn or defective parts.
5. Repack the bearings using a high-quality wheel bearing grease.
6. Slide the triple-lip seal onto the spindle. Do not install the seal into the hub.
7. Slide the inner bearing cone and hub onto the spindle.
8. Install the outer bearing cone, washer and slotted nut.
9. Tighten the slotted nut while rotating the hub until there is a slight resistance to wheel rotation. Then, back the slotted nut off one notch, until the wheel rotates freely without end play.
10. Slide the triple-lip seal to the hub and install the seal in the hub.

NOTE

The triple-lip seals should point away from the hub to keep contaminants out and allow grease to pass See Figure 5-2.

13. Install a new cotter pin and replace the hub cap. ***See Figure 5-2.***

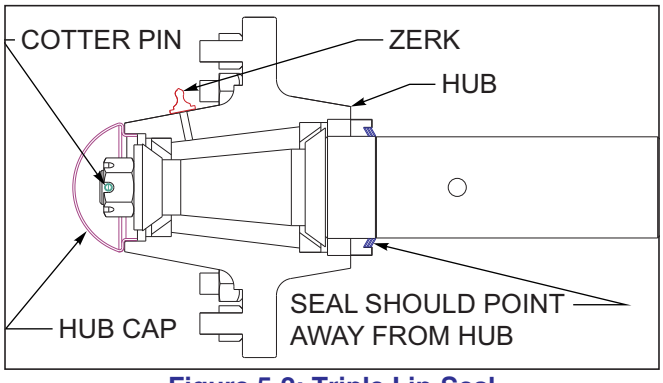


Figure 5-2: Triple Lip-Seal

Hydraulic Maintenance

1. Check the tractor hydraulic fluid level per tractor owners manual and after any leakage. Check fluid level with the cylinders in the retracted position.
2. If a cylinder or valve leaks, disassemble the parts to determine the cause of the leak. Any time a cylinder is opened up, or whenever any seal replacement is necessary, it is advisable to clean all parts and replace all seals. Seal kits are available from your Landoll dealer.
3. Check all hydraulic hoses weekly. Look for binding or cracking. Replace all worn or defective parts immediately.

IMPORTANT

Unfold, lower the unit to the ground, and relieve hydraulic pressure before attempting to service any hydraulic component.

4. Transport locks are provided to hold the implement in a raised position. Do not attempt to perform any service work under the implement without first installing the transport locks. Before servicing any hydraulic component, lower the implement to the ground and relieve all system pressure. If a hydraulic component is disconnected, repaired, or replaced, it will be necessary to purge the system of air before operation. ***(See "Hydraulic Lift System" on page 4-3)*** **and** ***(See "Hydraulic Fold System" on page 4-5)*** on how to purge the hydraulic systems.

Lubrication

1. A proper maintenance schedule will insure a long operating life and peak performance. Performing the following lubrication will ensure maximum operating life of the Disc ***See Figure 5-3*** **and** ***See Table 5-1*****.**
2. When lubricating the Field Cultivator, SAE multi-purpose EP grease, or EP grease with 3-5% molybdenum sulfide is recommended. Wipe soil from fittings before greasing. Replace any lost or broken fittings immediately.
3. Wheel seals, when properly installed, will allow grease to pass without harm to seals. Regular lubrication will extend service life, particularly in severe operating conditions.
4. The Disc is equipped with maintenance-free bearings in the wheel lifts, and wing hinges. These areas require no lubrication.

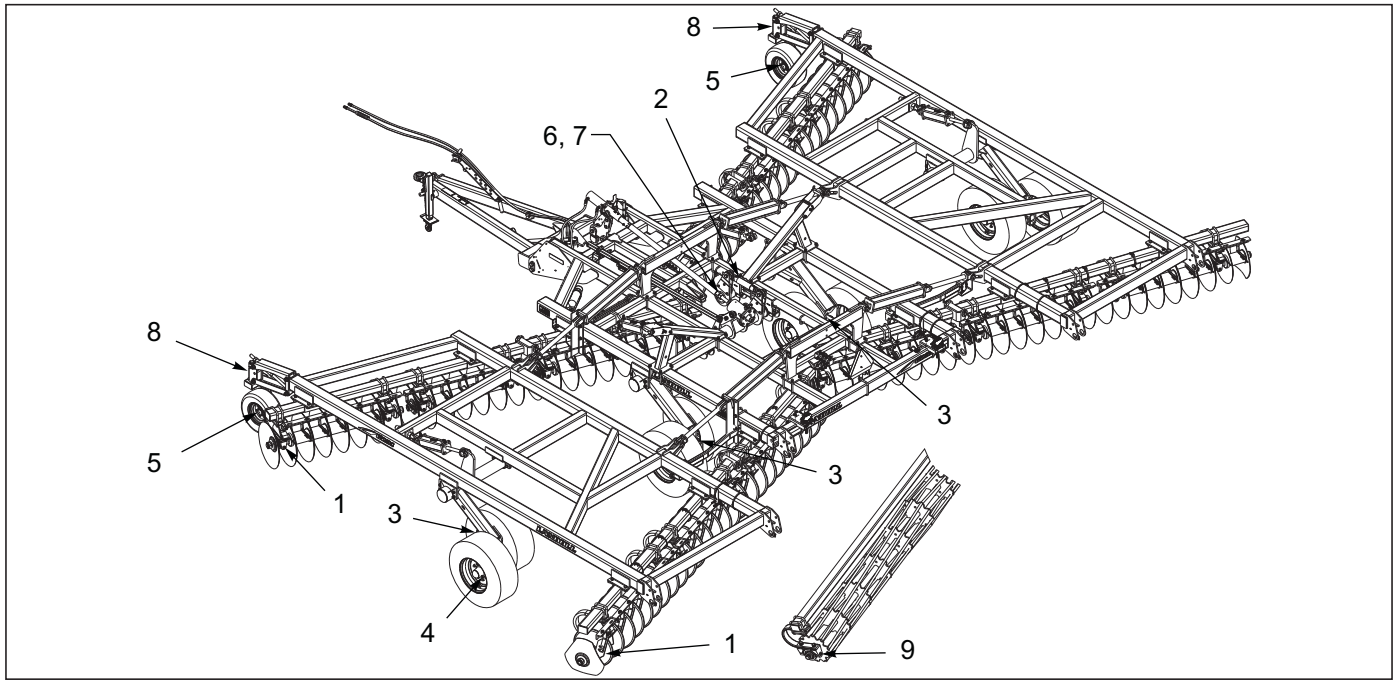


Figure 5-3: Lubrication Points

LUBRICATION TABLE			
ITEM	**DESCRIPTION**	**NO. OF LUBE POINTS**	**INTERVAL (Hours Unless Stated)**
1	Disc Gang Bearings	1 each	10
2	Radius Rod	1	50
3	Walking Tandem Pivot	1 each	50
4	Wheel Hubs	1 each	50
5	Front Gauge 6 Bolt Wheel Hubs	1 each	50
6	Manual Leveler Tube	1	50
7	Hydraulic Leveler Tube (Optional)	1	50
8	Front Gauge Wheel Caster Hub	1 each	10
9	Conditioner Reel	1 each	10
Lube all points with high grade multi-purpose grease.			

Table 5-1: Lubrication Table

Storage

1. The service life of the Field Cultivator will be extended by proper off-season storage practices. Prior to storing the unit, complete the following procedures:
   a. Completely clean the unit.
   b. Inspect the machine for worn or defective parts. Replace as needed.
   c. Repaint all areas where the original paint film is worn off.
   d. Grease all exposed metal surfaces of shanks, points.
   e. Lubricate each point of the machine as stated in ***"Lubrication" on page 5-3*****.**
   f. Store the unit in a shed or under a tarpaulin to protect it from the weather. The ground tools and tires should rest on boards, or some other object, to keep them out of the soil ***"Hydraulic Fold System" on page 4-5*** .

Chapter 6

Troubleshooting Guide

The Troubleshooting Guide, shown below, is included to help you quickly locate problems that can happen using your 6231 Disc. Follow all safety precautions stated in the previous when making any adjustments to your machine.

PROBLEM	PROBABLE CAUSE	SOLUTION
UNIT NOT LEVEL, LEAVING CENTER RIDGE	Leveler not adjusted properly	Adjust leveler, lower front gang
	Hitch adjustment too low	Raise implement hitch point
	Gauge wheels carrying too much weight	Raise gauge wheels
UNIT NOT LEVEL, LEAVING CENTER FURROW	Leveler not adjusted properly	Adjust leveler, raise front gang
	Hitch adjustment too high	Lower implement hitch point
UNIT NOT LEVEL, LEAVING RIDGE ON OUTSIDE OF UNIT	Unit not level front to rear, front running too deep	Adjust unit to be level
	Wings not level with center frame	Adjust side to side level. Wings should typically be set even with or slightly higher than center section
	Operating speed too fast, front gang moving soil past rear gang	Slow down to proper operating speed for field conditions.
	Hitch adjustment too high	Lower implement hitch point
	Gauge wheels too high, allowing wings to go too deep	Properly reset gauge wheels
UNEVEN DEPTH	Frame not level side to side	Level center frame side to side
	Wing frames and center frame not level	Level wing frames to center frame
	Lift cylinders not in phase	Fully extend lift cylinders and hold hydraulic lever until all cylinders are fully extended
	Lift wheels not carrying enough weight	Adjust depth stop and raise implement
	Fold cylinders not fully extended to allow wings to flex	Extend fold cylinders fully.
	Tire pressure too low	Check inflation
	Unit not level front to rear	Adjust unit to be level
UNIT SIDE DRAFTS OR MOVES SIDE TO SIDE	Lift wheels not carrying enough weight	Adjust depth stop and raise implement
	Unit not level front to rear	Adjust unit to be level
	Level unit side to side	Level center frame and wing frame to center frame side to side
	Gauge wheels too high, allowing wings to go to deep	Properly reset gauge wheels
FRAMES BUCKLING, NOT EVEN	Lift wheels not carrying enough weight	Adjust depth stop and raise implement
	Wing frames and center frame not level to each other	Level wing frames to center frame
	Gauge wheels not set correctly or uneven	Set gauge wheels properly
WHEEL BEARING FAILURE	Triple-lip seals not installed correctly	Install seals with the lips pointing outward away from the hub.
HYDRAULIC - LIFT CYLINDERS NOT FULLY EXTENDING	Lift cylinders not in phase	Fully extend cylinders and hold hydraulic lever until all cylinders are fully extended
	Cylinders not installed in proper series	Wing cylinders are smaller diameter than center cylinders. Reinstall cylinders properly
	Hoses not properly connected	Check hose routing
HYDRAULIC - ENTIRE UNIT SETTLING	Depth stop valve not working	Repair valve

PROBLEM	PROBABLE CAUSE	SOLUTION
HYDRAULIC - UNIT SETTLING, ONE WING RAISING	Center frame cylinder leaking internally on side of unit that wing is raising	Repair center master cylinder
HYDRAULIC - WING SETTLING	Wing cylinder leaking	Repair cylinder
DISC GANG PLUGGING	Scrapers set too far from disc blade	Adjust scrapers to meet disc blade closer and evenly
	Operating depth too deep	Raise unit
	Conditions too wet	Wait until conditions more favorable
	In drier conditions, set scraper farther away from disc blade to improve residue flow	
DISC GANG WILL NOT TURN OR PUSHES SOIL	Scrapers set too tight	Readjust scrapers
	Depth set too deep for loose or wet conditions	Raise implement or wait until conditions are more favorable
	Gang bearing failure	Replace bearing
DISC GANG BEARING SNAP RING POPS OUT	Gang bearings installed incorrectly	Install bearings with snap ring away from concave side of disc blade
SCRAPERS BUILD UP WITH EXCESSIVE SOIL/RESIDUE	Scrapers set too far from disc blade	Readjust scrapers
DISC BLADES LOOSE AND/OR SHEARING ROLL PIN	Gang not tightened properly	Retighten gang shafts to 1250-1500 ft-lbs. If gangs have ran loose, gangs may require disassembly to remove soil to properly torque gang shafts. Replace any worn components, shafts/spools, etc.
HARROW PLUGGING	Harrow height set too low	Raise harrow height.
	Tine angle too steep	Use lower tine tooth angle
HARROW BUNCHING RESIDUE	Harrow too aggressive	Use lower tine tooth angle and/or raise harrow
HARROW DRAGS GROUND WHEN TRANSPORTING	Operating depth set too low	Raise harrow height
	Disc leveler linkage not set correctly	Reposition in lower leveler hole
LIGHTS DO NOT WORK	Harness or lamp connection unplugged	Check all harness/lamp connections to verify that everything is properly connected.
	7 prong Connector	Fully Insert on clean connection
CONDITIONER REELS PLUGGING	Excessive Down pressure	Raise Reel

Document Control Revision Log:

Date	Form #	Improvement(s): Description and Comments
02/05/2016	F-832-0116	Initial Release
11/09/2018	F-832-1118	Lubrication table update
05/27/2020	F-832-0520	Updated tire/wheel assembly in TOC, hydraulic reel manifolds.
03/23/2022	F-832-0322	Added QR decal, SIS 20mph to rear of machine, updated tire in specs.
07/18/2023	F-832-2307	Updated frame, lift, hitch and hydraulic pages, added new electrical drawing with frame, added new double reel and chevron flat reel attachments, added spare tire assembly drawings

Equipment from Landoll Company, LLC is built to exacting standards ensured by ISO 9001 registration at all Landoll manufacturing facilities.

Model 6231

Disc

Re-order Part Number F-832

LANDOLL COMPANY, LLC
1900 North Street
Marysville, Kansas 66508
(785) 562-5381
800-428-5655 ~ WWW.LANDOLL.COM

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