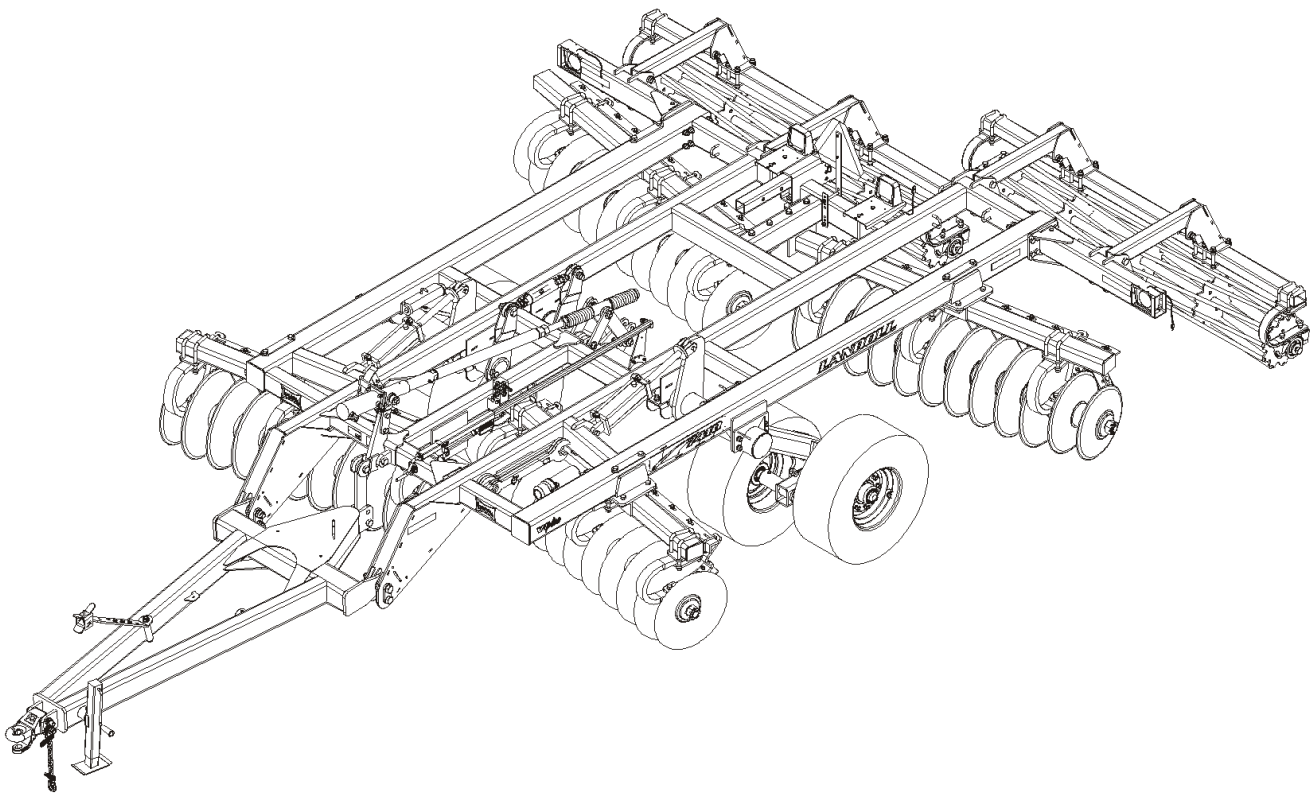




Model 7410 VT Plus Operator's Manual



LANDOLL COMPANY, LLC

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Manuals for the 7410 VT Plus

MANUAL NUMBER	MANUAL NAME
F-586	7410 VT Plus Operator's Manual
F-587	7410 VT Plus Parts Manual

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Introduction and Safety Information

Introduction

The Landoll Model 7410 VT Plus 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 7410 VT Plus. 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. 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 CORPORATION
1900 NORTH STREET
MARYSVILLE, KANSAS 66508**

PHONE # (785) 562-5381 or (800) 428-5655

OR

FAX # (888) 527-3909

- CHAPTER 5** Is a troubleshooting guide to aid in diagnosing and solving problems with the VT Plus
- PARTS MANUAL** 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 CORPORATION
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 7410 VT Plus.

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

IMPORTANT

It is the responsibility of the owner/operator to comply with all state and local laws.

1. When transporting the implement on a road or highway, use adequate warning symbols, reflectors, lights and slow moving vehicle sign as required. Slow moving tractors and towed implements can create a hazard when driven on public roads. They are difficult to see, especially at night.



2. Do not tow an implement that, when fully loaded, weighs more than 1.5 times the weight of the towing vehicle.
3. Carry reflectors or flags to mark the tractor and implement in case of breakdown on the road.

4. Do not transport at speeds over 20 MPH under good conditions. Never travel at a speed which does not allow adequate control of steering and stopping. Reduce speed if towed load is not equipped with brakes
5. Avoid sudden stops or turns because the weight of the implement may cause the operator to lose control of the tractor. Use a tractor heavier than the implement.
6. Use caution when towing behind articulated steering tractors; fast or sharp turns may cause the implement to shift sideways.
7. Keep clear of overhead power lines and other obstructions when transporting. Know the transport height and width of your 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.

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. A second 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.

Replace the chain if any links or end fittings are broken, stretched or damaged

Standard Specifications

Introduction

This manual is compiled as a guide for owners and operators of the 7410 VT Plus. 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

To be eligible for Warranty, registration must be on file at Landoll Company, LLC. It is the responsibility of the dealer to register the machine within 10 days of purchase or lease. Check with the dealer to verify the machine has been registered.

NOTE: IMPROPER ASSEMBLY, MODIFICATION, OR MAINTENANCE OF YOUR LANDOLL MACHINE CAN VOID YOUR 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 its 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).

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 non-seasonal 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 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 be returned by the purchaser to Landoll Company, LLC with transportation and freight charges prepaid within thirty (30) 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 defective.

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.

...continued on following page.

Figure 2-2: Landoll Tillage Product Warranty (1 of 2)

LANDOLL TILLAGE PRODUCT THREE YEAR LIMITED WARRANTY

...continued from previous page.

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 product 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 Dconnection 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.

Figure 2-3: Landoll Tillage Product Warranty (2 of 2)

General Torque Specifications

LANDOLL
FASTENER TORQUE SPECIFICATIONS
(Rev. 23/04)

This chart provides general torque specifications for Standard Nuts and Caps Screws (as received condition) that are not called out on processes or drawings.




This **DOES NOT** apply if special lubrication such as graphite moly-disulfide or other extreme pressure lubricants are used.

Add 33% to the listed torque specification if the fastener is dry (solvent cleaned).

Cap screw grades are indicated by markings on the head, these vary among manufacturers.

Thick Nuts must be used on grade 8 cap screws.




SAE TORQUE SPECIFICATIONS (FOOT-POUNDS)
[] Indicates specifications for Prevailing Torque Nuts.

UNC Size	 Grade 2	 Grade 5	 Grade 8
1/4 - 20	4 [5]	6 [7]	9 [11]
5/16 - 18	8 [10]	13 [16]	18 [22]
3/8 - 16	15 [19]	23 [29]	35 [43]
7/16 - 14	24 [30]	35 [43]	55 [62]
1/2 - 13	35 [43]	55 [62]	80 [100]
9/16 - 12	55 [62]	80 [100]	110 [137]
5/8 - 11	75 [94]	110 [137]	170 [212]
3/4 - 10	130 [162]	200 [250]	280 [350]
7/8 - 9	125 [156]	320 [400]	460 [575]
1 - 8	190 [237]	408 [506]	680 [850]
1-1/8 - 7	270 [337]	600 [750]	960 [1200]
1-1/4 - 7	380 [475]	840 [1050]	1426 [1782]
1-3/8 - 6	490 [612]	1100 [1375]	1780 [2225]
1-1/2 - 6	650 [812]	1460 [1825]	2360 [2950]

See back side for SAE UNF and Metric torques.

Form No. F-257-0322

SAE TORQUE SPECIFICATIONS (FOOT POUNDS)
[] Indicates specifications for Prevailing Torque Nuts.

UNF Size	 Grade 2	 Grade 5	 Grade 8
1/4 - 28	5 [6]	7 [9]	10 [12]
5/16 - 24	9 [11]	14 [17]	20 [25]
3/8 - 24	17 [21]	25 [31]	35 [44]
7/16 - 20	27 [34]	40 [50]	60 [75]
1/2 - 20	40 [50]	65 [81]	90 [122]
9/16 - 18	60 [75]	90 [112]	130 [162]
5/8 - 18	85 [106]	130 [162]	180 [225]
3/4 - 16	150 [188]	220 [275]	320 [400]
7/8 - 14	140 [175]	360 [450]	500 [625]
1 - 14	210 [263]	540 [675]	760 [950]
1-1/8 - 12	300 [375]	660 [825]	1080 [1350]
1-1/4 - 12	420 [525]	920 [1150]	1500 [1875]
1-3/8 - 12	560 [700]	1260 [1575]	2010 [2512]
1-1/2 - 12	730 [912]	1640 [2050]	2660 [3325]

METRIC TORQUE SPECIFICATIONS
This chart provides torque specification for phosphate coated, Rockwell "C" 38-45 Metric Coarse Thread Class 10.9 Fasteners, Class 10.0 Nuts and Harden Flat Washers.

[] Indicates specifications for Prevailing Torque Nuts.

MM Size	Newton - Meters	Foot-Pounds
6	10 [14]	7 [10]
7	16 [22]	12 [16]
8	23 [32]	17 [24]
10	46 [60]	34 [47]
12	80 [101]	60 [75]
14	125 [155]	90 [115]
16	200 [240]	150 [180]
18	275 [330]	205 [245]
20	385 [450]	290 [335]
24	670 [775]	500 [625]
27	980 [1105]	730 [825]
30	1330 [1470]	990 [1090]
33	1790 [1950]	1730 [1870]
36	2325 [2515]	1730 [1870]
39	3010 [3210]	2240 [2380]

See front side for SAE UNC and notes.

Figure 2-4: General Torque Specifications

Hydraulic Fitting Torque Specifications

LANDOLL
HYDRAULIC FITTING TORQUE
SPECIFICATIONS
 (REV. 23/04)
AEROQUIP BRAND FITTINGS
 37° JIC; ORS & ORB

This chart provides torque specifications for Plated Carbon Steel and Stainless Steel Fittings (as received condition) that are not called out on processes or drawings.

This **DOES NOT** apply if special lubrication such as graphite moly-disulfide or other extreme pressure lubricants are used.

Minus 65% from the listed torque specification for Brass Fittings.

TORQUE SPECIFICATIONS
(FOOT-POUNDS)

[] Indicates specifications for Prevailing Torque Nuts.

DASH Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-12	10-12	14-16
-5	15-16	-----	18-20
-6	18-20	18-20	24-26
-8	38-42	32-35	50-60
-10	57-62	46-50	72-80
-12	79-87	65-70	125-135
-14	-----	-----	160-180
-16	108-113	92-100	200-220
-20	127-133	125-140	240-280
-24	158-167	150-165	270-360
-32	245-258	-----	-----

FORM NO. F-263-2304 (1 of 3)

LANDOLL
HYDRAULIC FITTING TORQUE
SPECIFICATIONS
 (REV. 23/04)
GATES BRAND FITTINGS
 37° JIC; ORS & ORB

This chart provides torque specifications for Plated Carbon Steel and Stainless Steel Fittings (as received condition) that are not called out on processes or drawings.

This **DOES NOT** apply if special lubrication such as graphite moly-disulfide or other extreme pressure lubricants are used.

Minus 65% from the listed torque specification for Brass Fittings.

TORQUE SPECIFICATIONS
(FOOT-POUNDS)

[] Indicates specifications for Prevailing Torque Nuts.

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	-----	-----

FORM NO. F-263-2304 (2 of 3)

LANDOLL
HYDRAULIC FITTING TORQUE
SPECIFICATIONS
 (REV. 23/04)
PARKER BRAND FITTINGS
 37° JIC; ORS & ORB

This chart provides torque specifications for Plated Carbon Steel and Stainless Steel Fittings (as received condition) that are not called out on processes or drawings.

This **DOES NOT** apply if special lubrication such as graphite moly-disulfide or other extreme pressure lubricants are used.

Minus 65% from the listed torque specification for Brass Fittings.

TORQUE SPECIFICATIONS
(FOOT-POUNDS)

[] Indicates specifications for Prevailing Torque Nuts.

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
-14	-----	-----	-----
-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

FORM NO. F-263-2304 (3 of 3)

Figure 2-5: Hydraulic Fitting Torque Specifications

Model Specifications

7410VT Plus	
Model Number	7410-14
Working Width	13-10"
Transport Width	15'-3"
Blade Diameter	22"
Number of Blades	22/24
Number of Bearings	6-6
Tire Size And Ply	320/70R15
Spindle Size	2-1/4"
Wheel Bolt Pattern	8 Bolt
Estimated Weight (W/6 Ga. Blade Option)	10,900 lbs.
NOTE: Specifications Are Subject To Change Without Prior Notification	

Tire Inflation			
Tire Size	Tire Manufacturer	Ply/Load Rating	Inflation Pressure (Psi) (Max.)
12.5L X 15	Firestone	12 Ply/3,860 lbs.	52psi
320/70R15	Firestone	Load Index 144/6,150 lbs @ 40 mph.	70 psi

Specific Bolt Torques	
Lug Bolts & Nuts	Torque (FT. LBS.)
5/8-18 (Heavy Duty Disc)	85-100 Ft./Lbs.

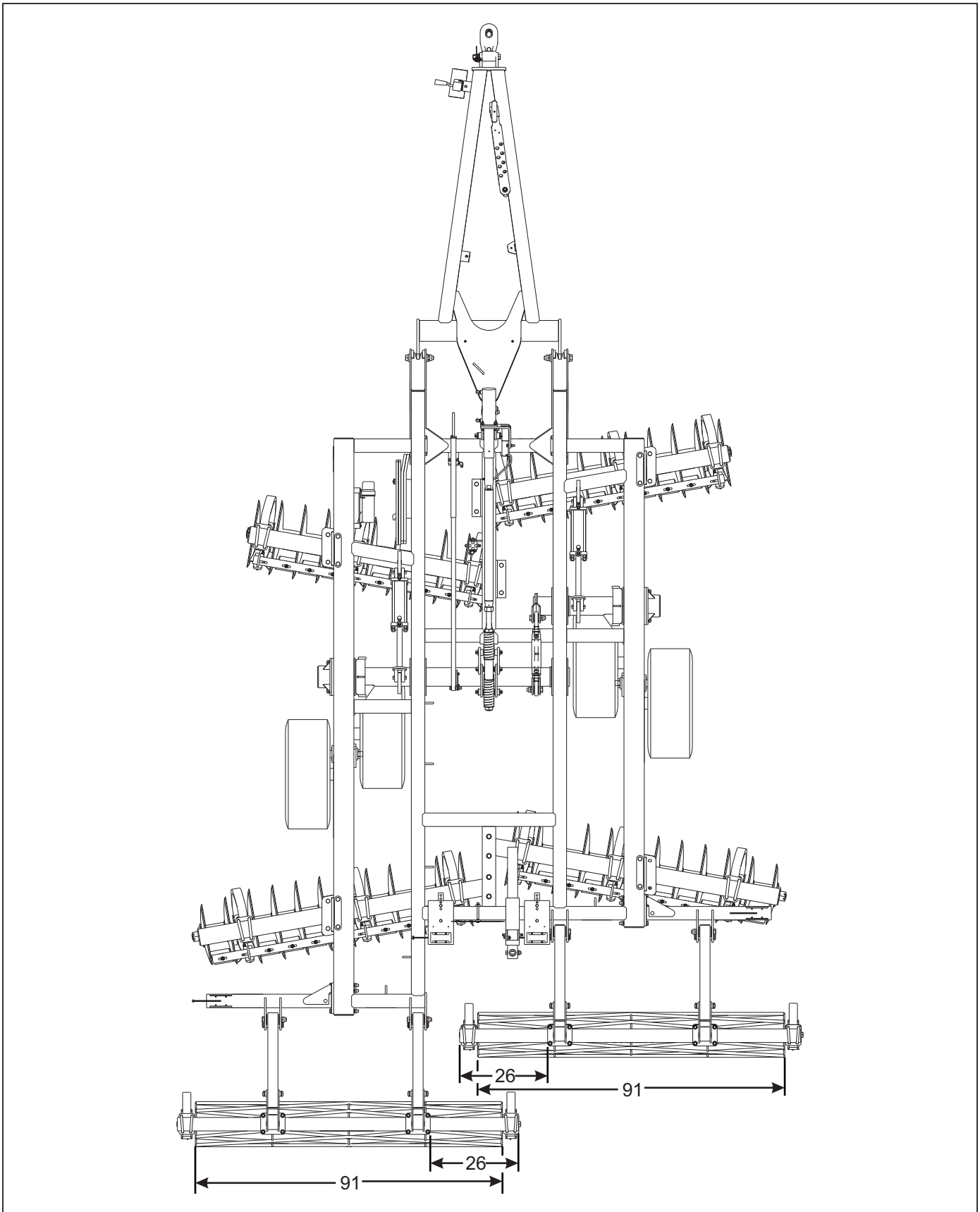


Figure 2-6: Wing Stabilizer and Light Bracket Placement 7410-14'

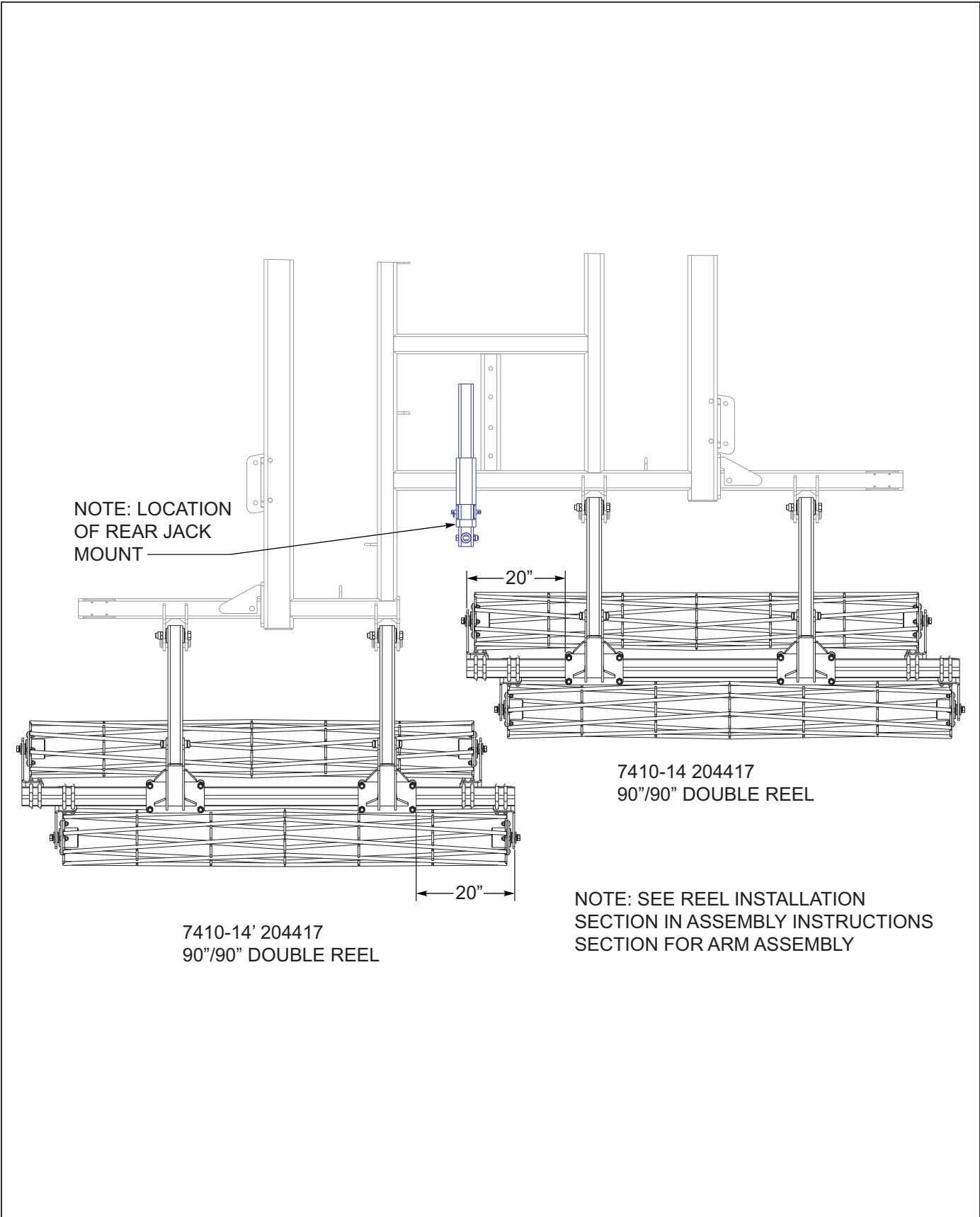


Figure 2-7: Double Round Reel Placement 7410-14'

Assembly Instructions

It is very important that your new 7410 VT Plus be properly assembled, adjusted and lubricated before use. Illustrations to assist with the assembly process are provided in “**Standard 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 (See “**General Torque Specifications (rev. 4/97)**” on page 2-2.)



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.



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.

7410 VT Plus Frame and Hitch Assembly

IMPORTANT

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 machine 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 weldment to the front of the center frame using 1-1/8-7 x 7-1/2 hex head cap screws, machine bushings, hitch mounting plates, and hex lock nuts (**See Figure 3-1.**) 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. See "Hitch Adjustment" on page 4-9 for proper adjustment.

3. Move the tongue jack to the forward mounting tube and rotate to parking position to support the front of the hitch.
4. Insert a 3/4-10 x 7 hex head cap screw 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 prevailing 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 screw and secure with another 3/4 prevailing torque flange nut.
6. Install a 3/8-16 x 3-1/2 all-thread screw in the front of the hose holder bracket and secure with a 3/8-16 hex nut.
7. Slide the hose holder clamp over the 3/8" screw and loosely start the wing nut on top of the clamp. Hydraulic hoses will be routed through the clamp after assembly.
8. Install hose holder clamp at rear of hitch w/ 1/2-13 x 11 hex head cap screws and hex 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.

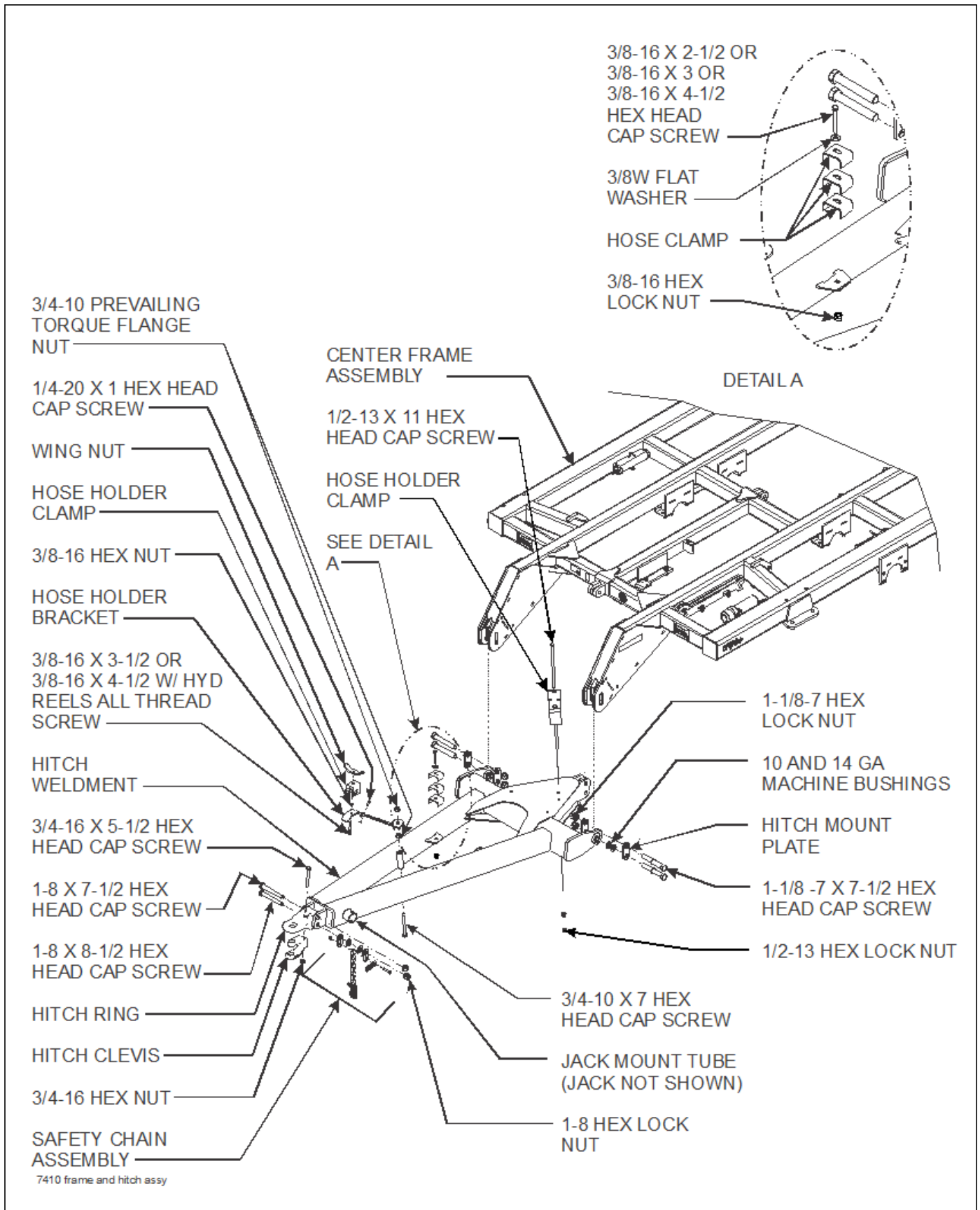


Figure 3-1: Frame and Hitch Assembly Installation

Leveler Assembly

1. Install a hardened steel wear bushing in the leveler L link (**See Figure 3-2.**)
2. Attach the leveler L link to the front mount of the center frame with a 1-8 x 4-1/2 hex head cap screw and hex lock nut.
3. With a 1-8 x 4 hex head cap screw and hex 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 1-8 x 4-1/2 hex head cap screw and hex 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. **See “Hitch Adjustment” on page 4-9** for proper adjustment.*

5. Slide one end of the 13” link over the leveler screw assembly. Slide the large end of the 8” link over the other link and secure with a 1” flat washer and 5/16” x 2-1/2 spring slotted pin. Repeat this for the other side of the leveler screw assembly.
6. Attach the bottom end of the 8” leveler links to center frame mount located in the middle of the frame using 1” x 7-7/8” leveler pin, washers, and 5/16” x 2-1/2” spring slotted pins.
7. Secure the rear of the 13” leveler links in the third hole down from the top of the mounting plates located on the center lift using 1” x 7-7/8” leveler pin, washers, and 5/16” x 2-1/2” spring slotted pins.

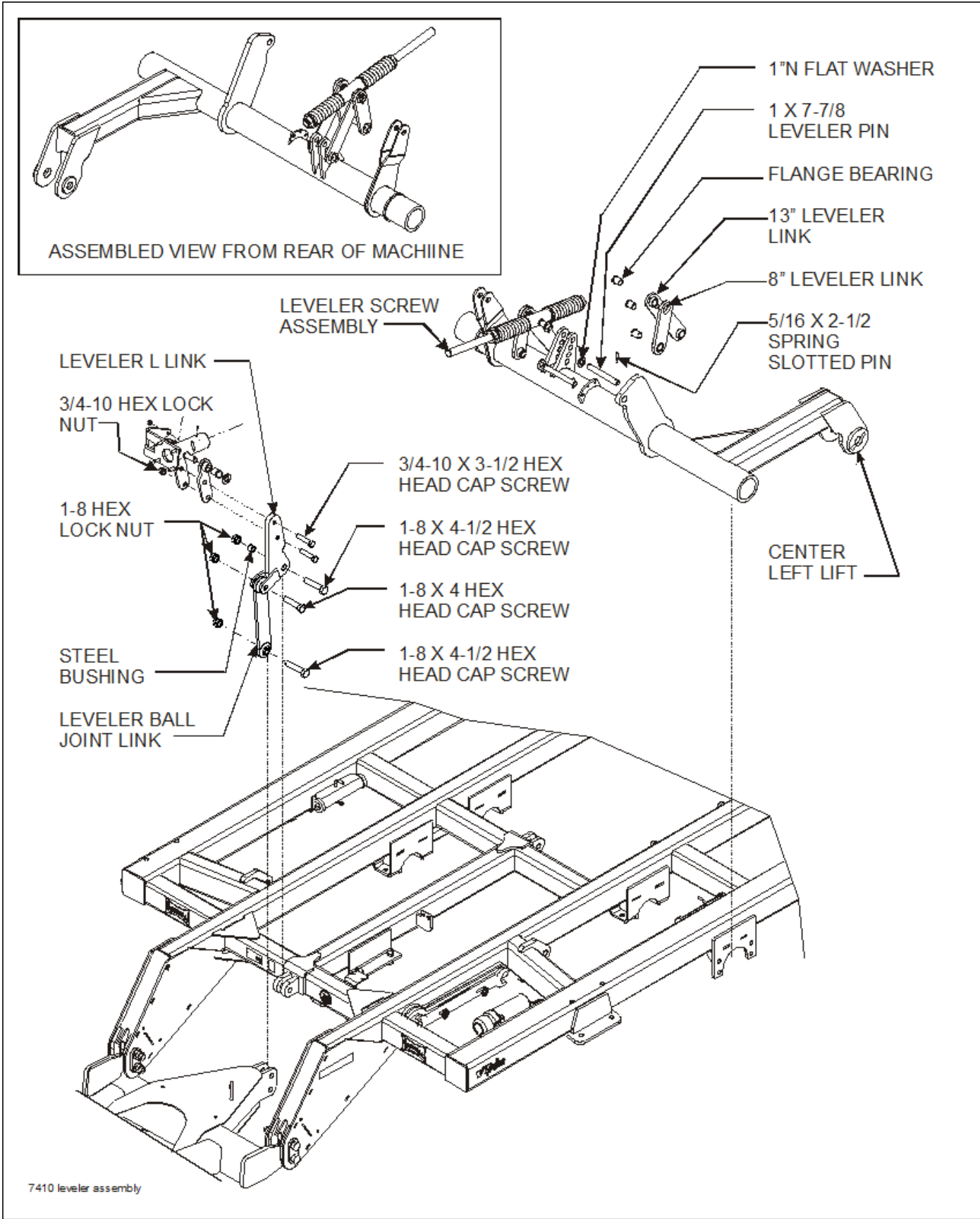


Figure 3-2: Leveler Assembly Installation

Manual Leveler

1. Using the manual leveler, screw the leveler tube onto the leveler screw assembly (**See Figure 3-3.**) Initially leave approximately 3" 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 5/8-11 x 3-1/2 hex head cap screws and hex lock nuts. Insert a plastic wear 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 washers and 5/16" x 2-1/2" spring slotted pins.
3. Attach the leveler cross brackets to the top of the leveler L link using 3/4-10 x 3-1/2 hex head cap screws and hex lock nuts.
4. Install a grease zerk in the threaded end of the leveler tube.

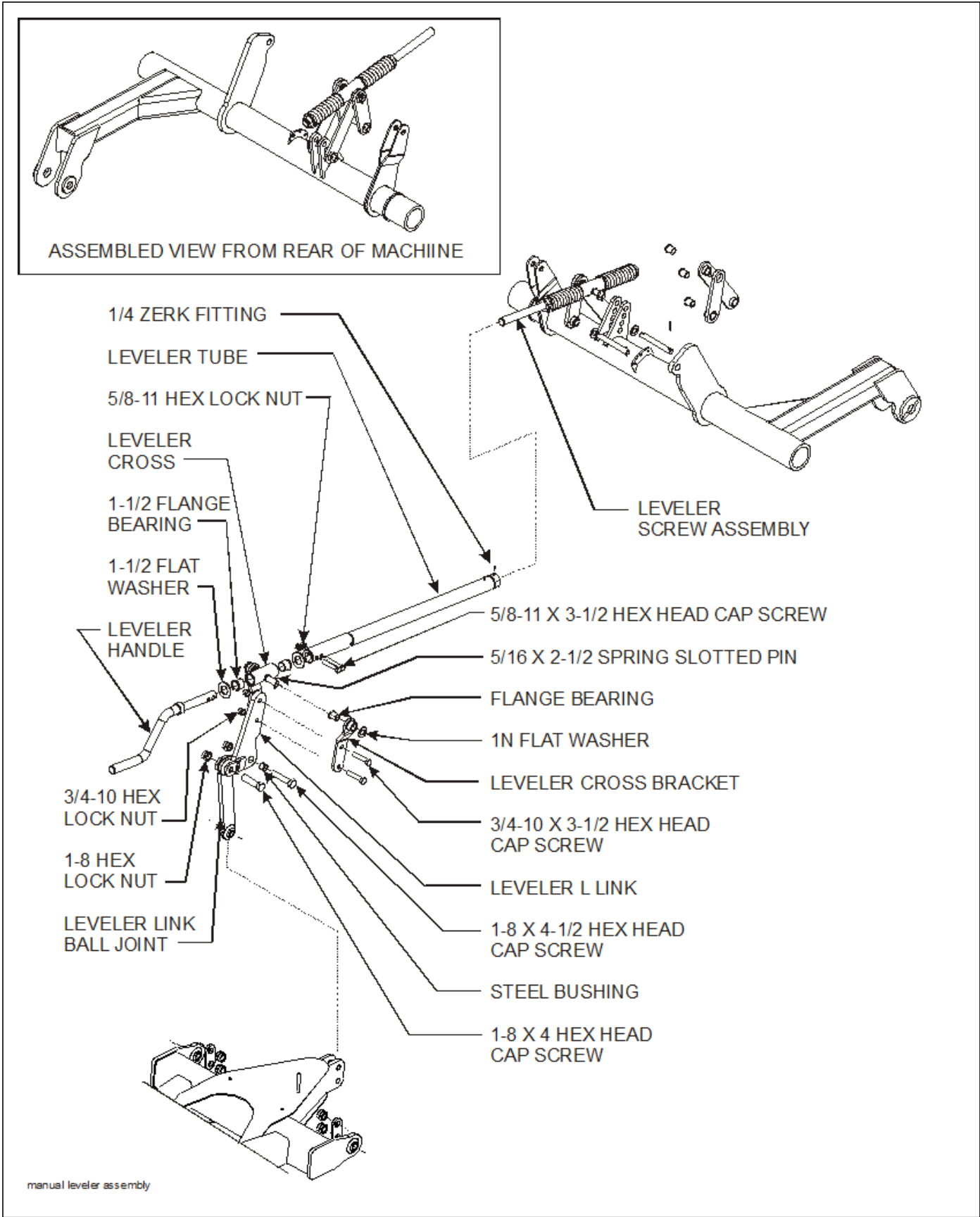


Figure 3-3: Manual Leveler Installation

Hydraulic Leveler (Option)

1. Thread a 1-1/2-6 hex nut onto the leveler screw assembly (**See Figure 3-5.**) Initially leave approximately 7" of threads visible between the 1-1/2-6 hex 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.
4. Insert the 3-1/2 x 6 hydraulic leveler cylinder into the front end of the leveler tube and pin using two 5/8" steel leveler pins. Rotate the cylinder so the hydraulic ports point to the left side of the implement.
5. Slide the leveler cylinder cross up to the cylinder and secure with 1/2-13 x 2 hex head cap screws and hex lock nuts. Install the screws 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. Slide the leveler cross brackets onto the leveler cylinder cross and secure with washers and 5/16" x 2-1/2" spring slotted pins.
7. Attach the leveler cross brackets to the top of the leveler L link using 3/4-10 x 3-1/2 hex head cap screws and hex lock nuts.
8. Install grease zerks in the threaded end of the leveler tube and the leveler cylinder cross.
9. With a 1/2-13 x 2 hex head cap screw and hex lock nut, attach the leveler indicator gauge to the leveler cylinder cross. Do not over tighten this screw, as the indicator gauge must be free to pivot about this joint.
10. Rotate the 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 1-1/2-6 hex lock nut to prevent the leveler tube from rotating further.
11. 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 3/8-16 hex lock nut.

12. Install 1/32" restrictor fittings in the leveler cylinder.
13. Install adapters into each port of check valve (**See Figure 3-5.**)
14. Install check valve to hose clamp holder on hitch using 3/8-16 x 2 hex head cap screws and hex 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 3-5.**)

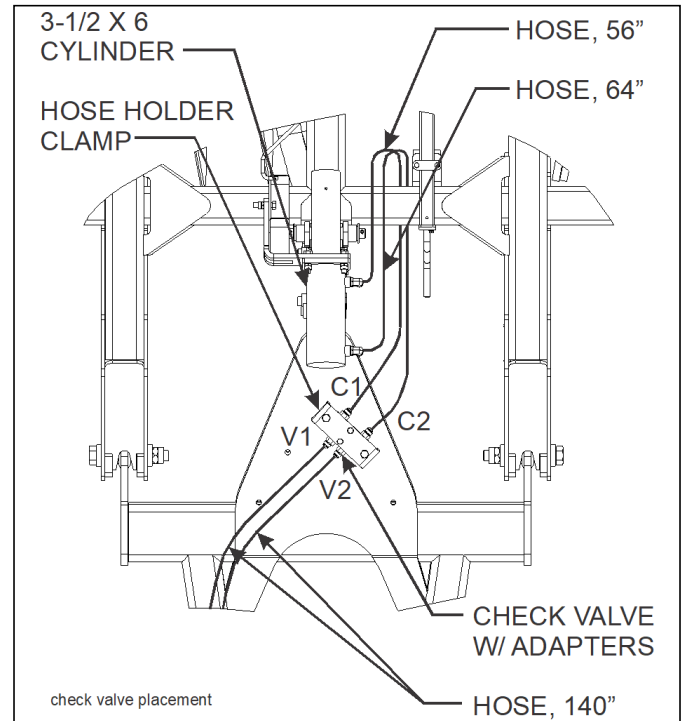


Figure 3-4: Check Valve Placement

15. Assemble 56" and 64" hoses from the 3-1/2 x 6 cylinder to the check valve,
16. Attach (2) 140" hoses from the check valve to the tractor

Center Frame Tires

1. Install the tire and wheel assemblies on the machine.
2. Torque wheels 85 to 100 ft./lbs.

NOTE

All tire/wheel assemblies are mounted with the valve stem facing outward.

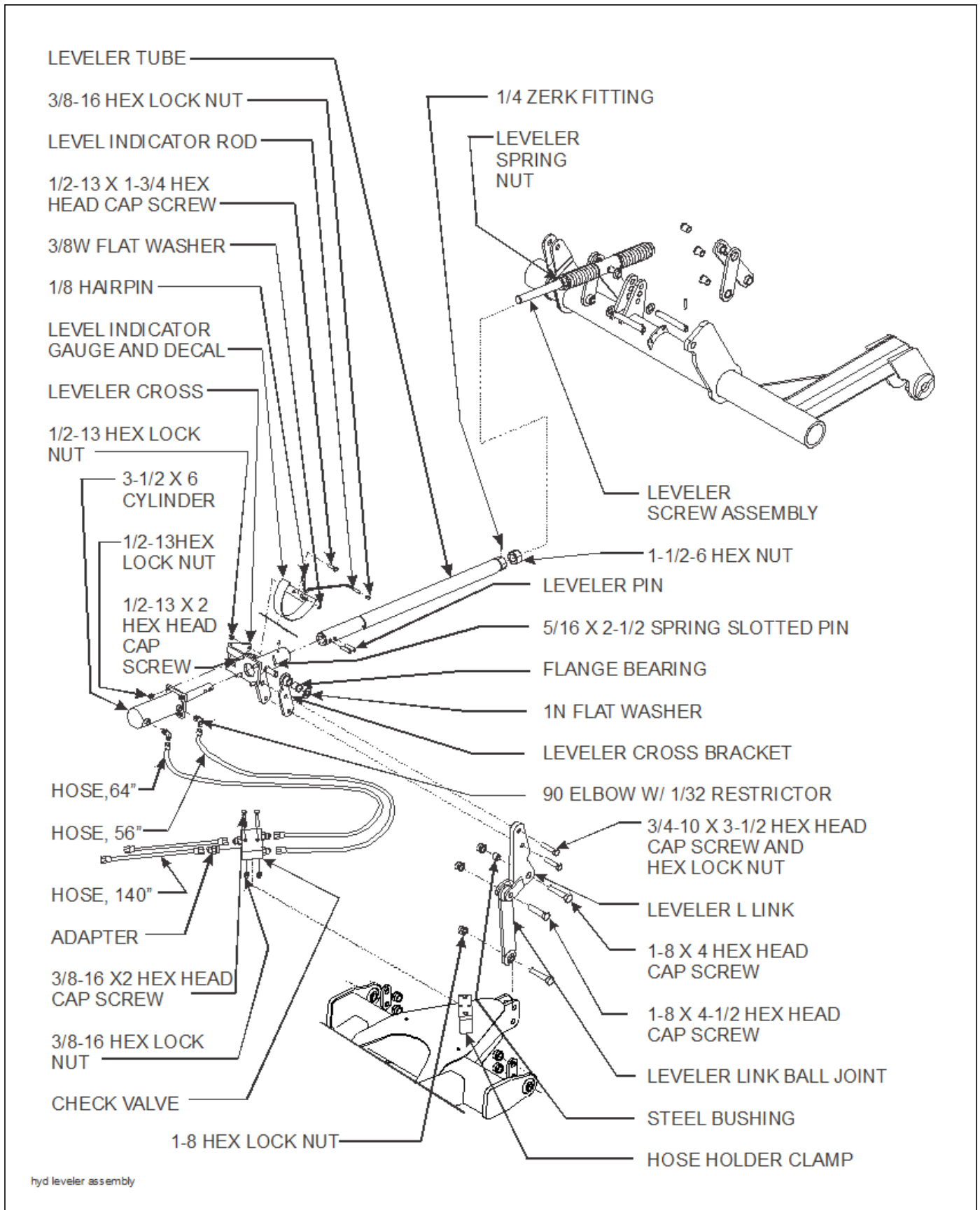


Figure 3-5: Hydraulic Leveler Installation

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. Loosely attach the disc gang assemblies to the frame using clamp plates, 3/4-10 x 2 grade 8 hex head cap screws, 3/4-10 x 8 grade 8 hex head cap screws, 3/4-10 x 8-1/2 grade 5 hex head cap screws, flat washers, and hex lock nuts (**See Figure 3-6.**)
2. Once disc gang assemblies are bolted properly to the frame, tighten all screws according to torque specifications as shown in **page 2-2.**

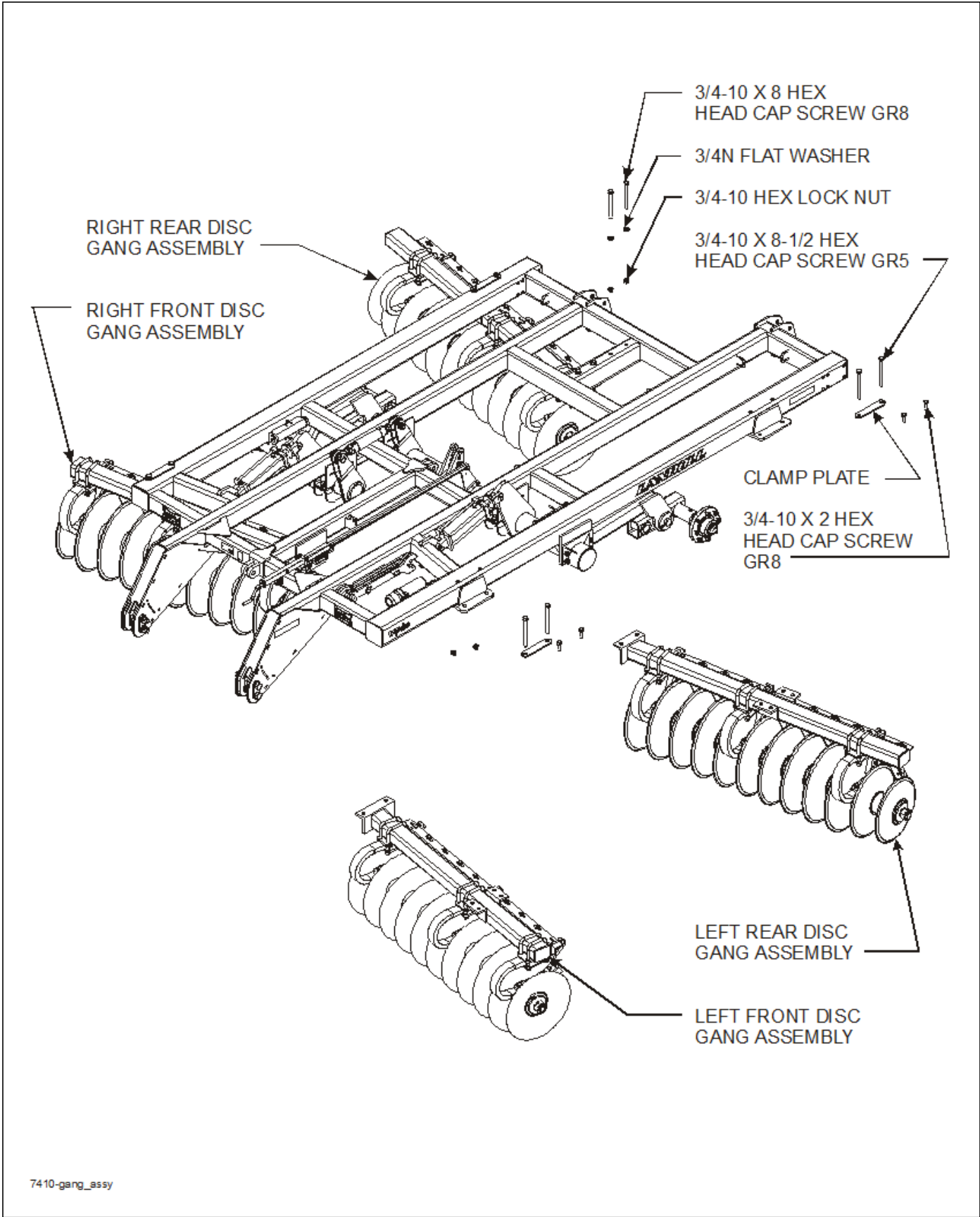


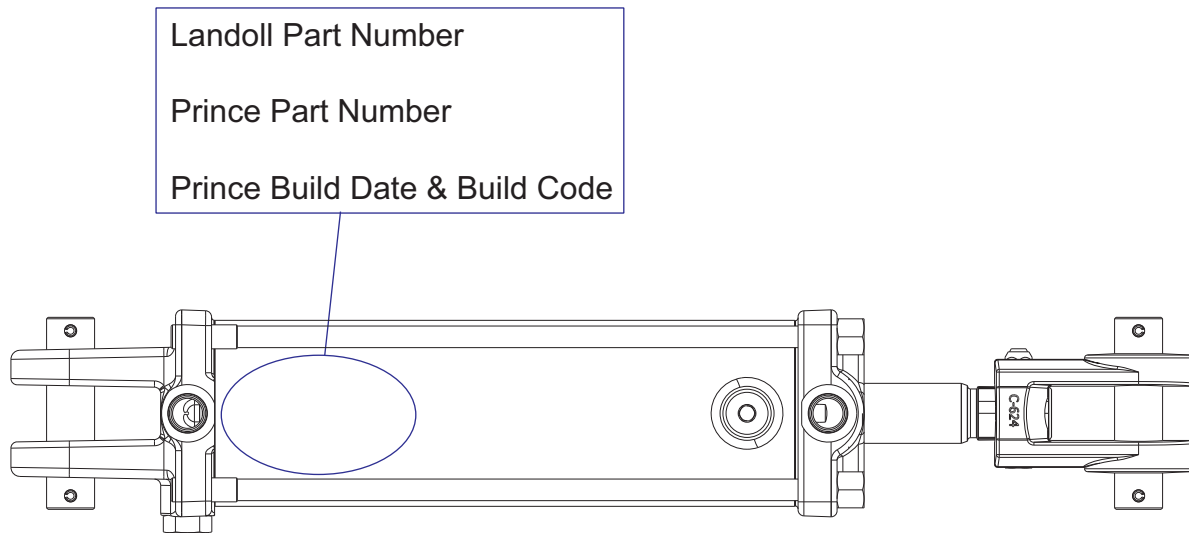
Figure 3-6: Disc Gang Installation

Rephasing Hydraulic Cylinder Change

As of January 1st, 2024, the **REPHASING** cylinders that Landoll purchases from Prince Manufacturing have been modified by Prince Manufacturing. These changes have required Landoll to assign new part numbers for the cylinders and corresponding service items, i.e. packing kits, glands, clevis ends, etc.

During assembly and service of your Landoll equipment it is important to know which cylinders you are dealing with. During the modification process listed above, Landoll requested that the below two changes be implemented to help aid our customers in identifying the cylinder:

1. Engrave the Landoll part number into the barrel of the cylinder.



2. Remove spring bushings in both the butt end and rod clevises. Change both clevises to an Austempered Ductile Iron (ADI) material for improved strength and wearability.

NOTE: When ordering parts, please make sure the correct cylinder part number has been identified, ensuring that you receive the correct parts. Record the information from the identification plate (See Figure 1-1) to assist with ordering parts.

Figure 3-7: Rephasing Hydraulic Cylinder Change

Cross Reference Matrix For Model 7410 VT Plus

Old Landoll Part Number	New Landoll Part Number	Landoll Part Description
140470	247547	Cylinder, 4 x 10, Rephase

Hydraulic Installation

NOTE

Refer to Figure 3-8 for lift hydraulic diagram for 7410-14 model.

1. Install 90 degree regular adapter fittings in both ends of all lift cylinders.
2. Install the manifold to the manifold bracket on the front center gang using 1/2-13 x 3-1/2 hex head cap screws and hex lock nuts.
3. Install lift system hoses per **Figure 3-8**. Wrap lift system hoses with blue hose wrap.
4. Install restrictors, hoses and couplers in the optional hydraulic leveler if so equipped (**See “Hydraulic Leveler (Option)” on page 3-8.**) Wrap hydraulic leveler hoses with black hose wrap.
5. Install plugs from lift cylinders in any remaining open manifold, valve, or cylinder ports.

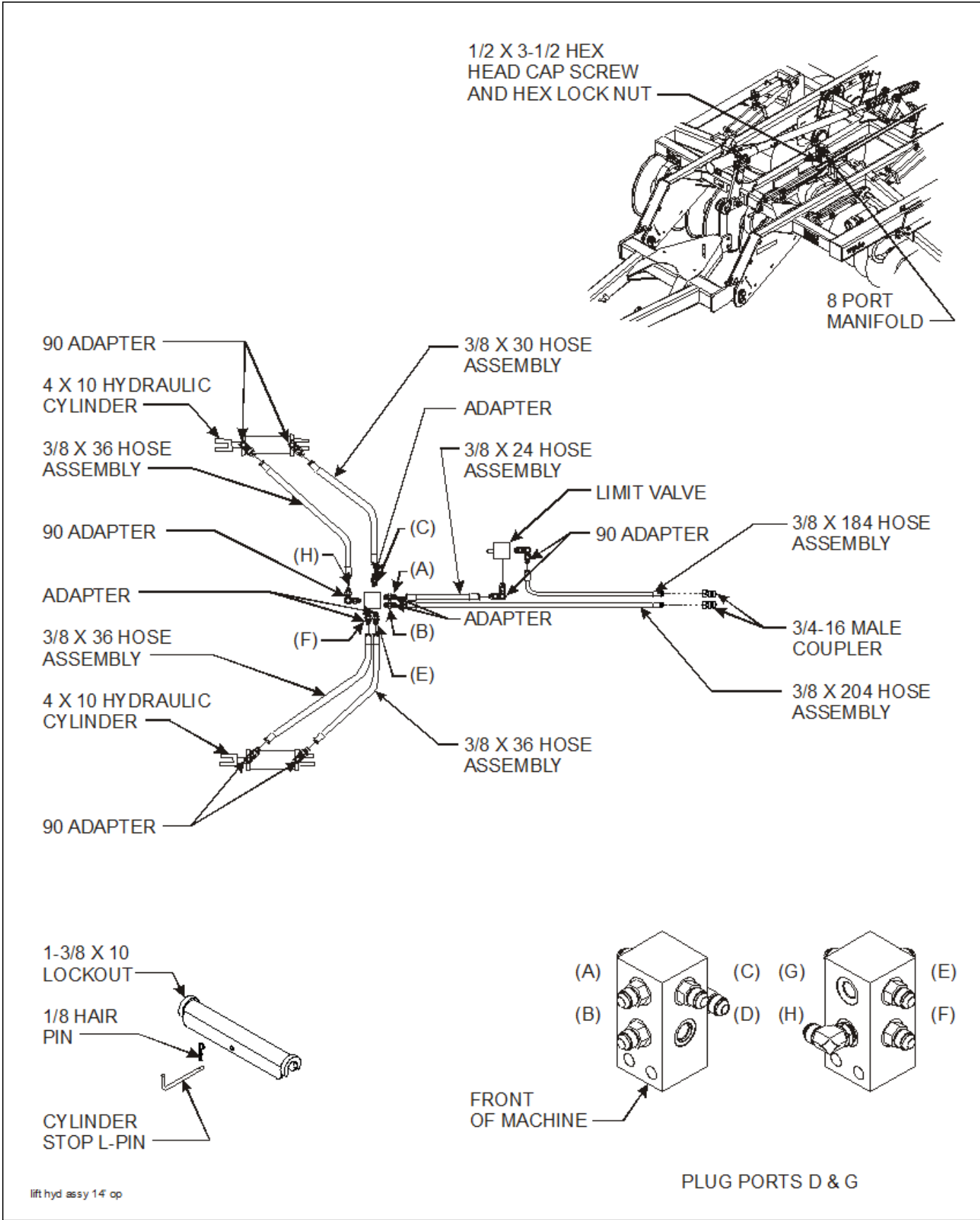


Figure 3-8: Lift Hydraulic Installation (14' Model)

Light and SMV Bracket Installation (Prior to August, 2013)

1. Attach lights and reel extensions to the frames using 3/4-10 x 8 hex head cap screws, 1/2-13 x 8-1/2 hex head cap screws, and hex lock nuts (**See Figure 3-9.**) Refer to **Figure 2-6** for light bracket placements.
2. Attach amber single lamps into reel extension brackets using 1/4-20 x 1-1/4 hex head cap screws.
3. Mount enhanced lighting module on right hand tail light bracket using #8-32 x 1/2 pan head slotted screw and nuts. Connect rear harness to module and connect the right/left side lights accordingly. Route main wire harness through hose holder on hitch, down the left side of the center frame and across the back to the enhanced lighting module plug.
4. Connect light harness to lights.
5. Attach SMV emblem and mounting bracket to rear center frame bar using 1/2-13 x 5-1/2 hex head cap screws, 1/4-20 x 3/4 hex head cap screws, and hex lock nuts. The SMV sign should be centered on the back bar of the frame.

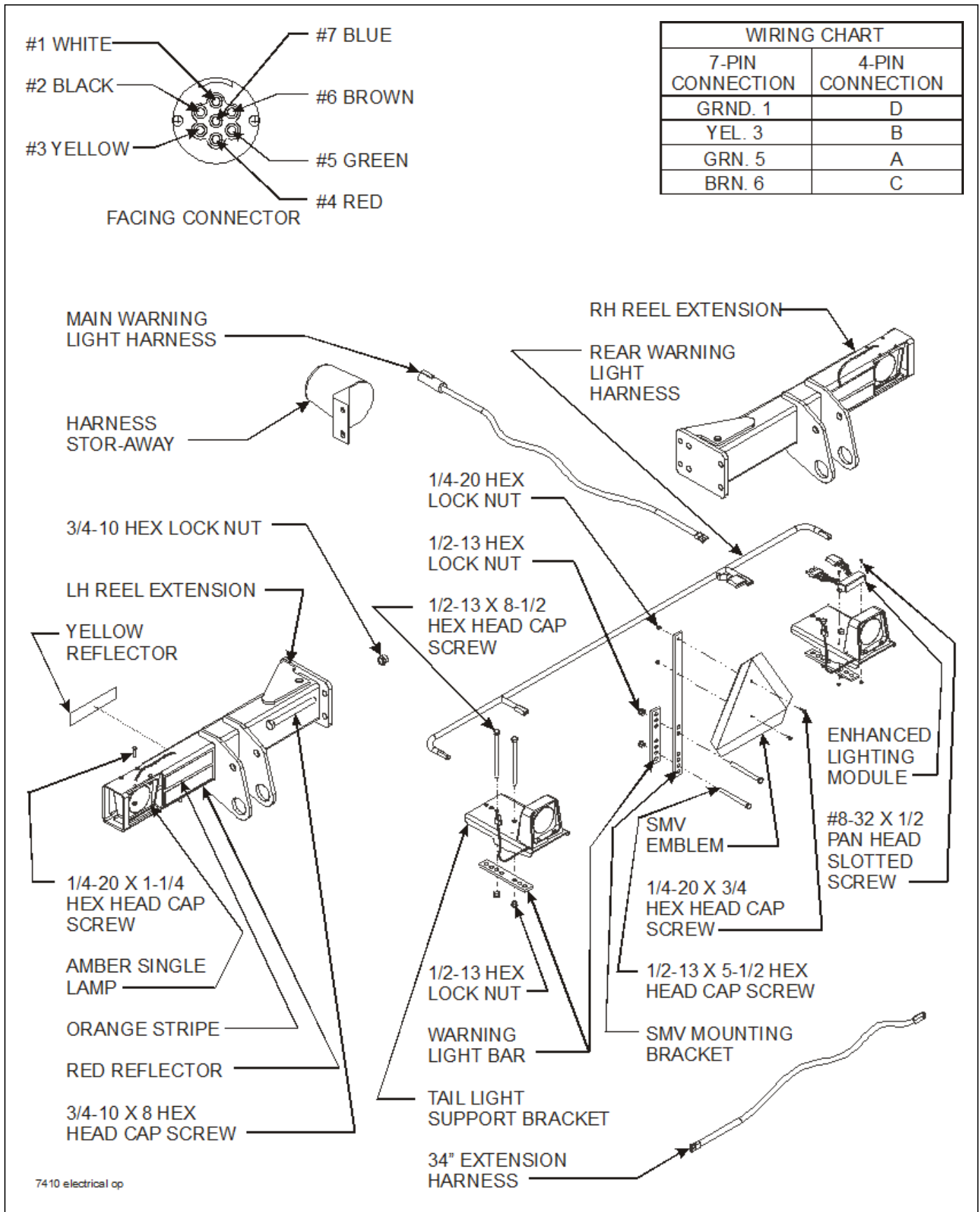


Figure 3-9: Light and SMV Bracket Installation (Prior to August, 2013)

Light and SMV Bracket Installation (After August, 2013)

NOTE

Refer to page 2-8 for light bracket placement.

1. Attach left and right extension reels with reflectors to frame using 3/4-10 x 8 hex head cap screws and hex lock nuts (**See Figure 3-11.**)
2. Attach ag amber single LED lamps to light brackets using 1/4-20 x 1-1/4 hex head cap screws and hex lock nuts.
3. Attach left tail light mount to frame assembly using u-bolt and 5/8-11 flange head serrated nuts.
4. Attach right tail light mount and ag flasher control module to frame assembly using u-bolt and 5/8-11 flange head serrated nuts. Be sure that the control module is set so that the 6 pin connector faces the right side of the machine.
5. Attach the ag red single LED lamps to tail light mounts using 1/4-20 x 1-1/4 hex head cap screws and hex lock nuts.

IMPORTANT

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

6. 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 Figure 3-10 for LED harness wire designations.**
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. Install the stor-away holder to hose holder on hitch with 1/4-20 x 3/4 hex head cap screws and hex lock nuts.
10. Attach SMV emblem and mounting bracket to rear center frame bar using u-bolt, 1/4-20 x 3/4 hex head cap screws, and hex lock nuts. The SMV sign should be centered on the back bar of the frame.

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

FRONT WARNING HARNESS

REAR WARNING HARNESS

m177034 elect wire designations op

Figure 3-10: LED Light Wire Designations (After August, 2013)

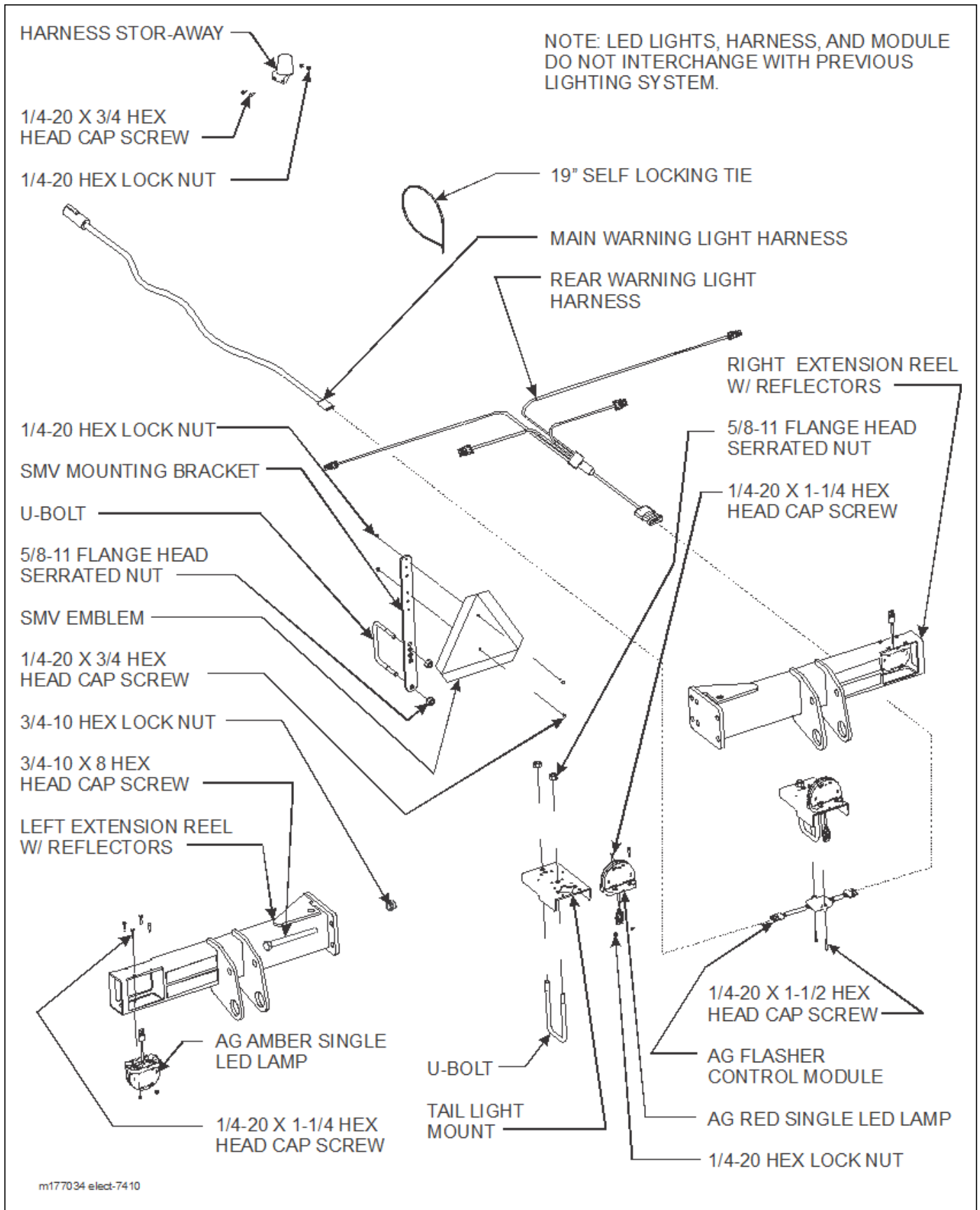


Figure 3-11: Light and SMV Bracket Installation (After August, 2013)

Conditioner Reel Spring Installation (Option)

NOTE

Refer to *Conditioner Single Reel Installation* shown in **Figure 3-12** for single reel installation or *Conditioner Double Reel Installation* shown in **Figure 3-13** for double reel installation.

1. Slide the adjustment pin through the rear plates of center and wing frames, secure with (2) 2-1/2 snap rings.
2. Assemble the 1-8 x 9 adj bolt through adjustment pin on frame, 1" lock washer, (2) 1-8 hex nuts, and 17" heavy 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 1-8 x 6-1/2 hex head cap screw and hex lock nut.

5. Assemble 17" heavy spring assembly to reel arm using 1" pivot pin, and 5/16 x 1-1/2" spring slotted pins. Set pin centers to 21" dimension as shown in **Figure 3-12**.



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.

6. Attach single reel/gang bar assembly to reel arms using gang bar mount plate, 3/4-10 x 6 hex head cap screws and double hex lock nuts as shown in **Figure 3-12**. Refer to **page 2-8** for single reel gang bar placement locations.
7. Attach double reel/gang bar assembly to reel arms using gang bar mount plate, (2) clamp tubes, (4) spring torsion rubber, secure with 3/4-10 x 8-1/2 hex head cap screws and double hex lock nuts as shown in **Figure 3-13**. Refer to **page 2-9** for double reel gang bar placement locations.

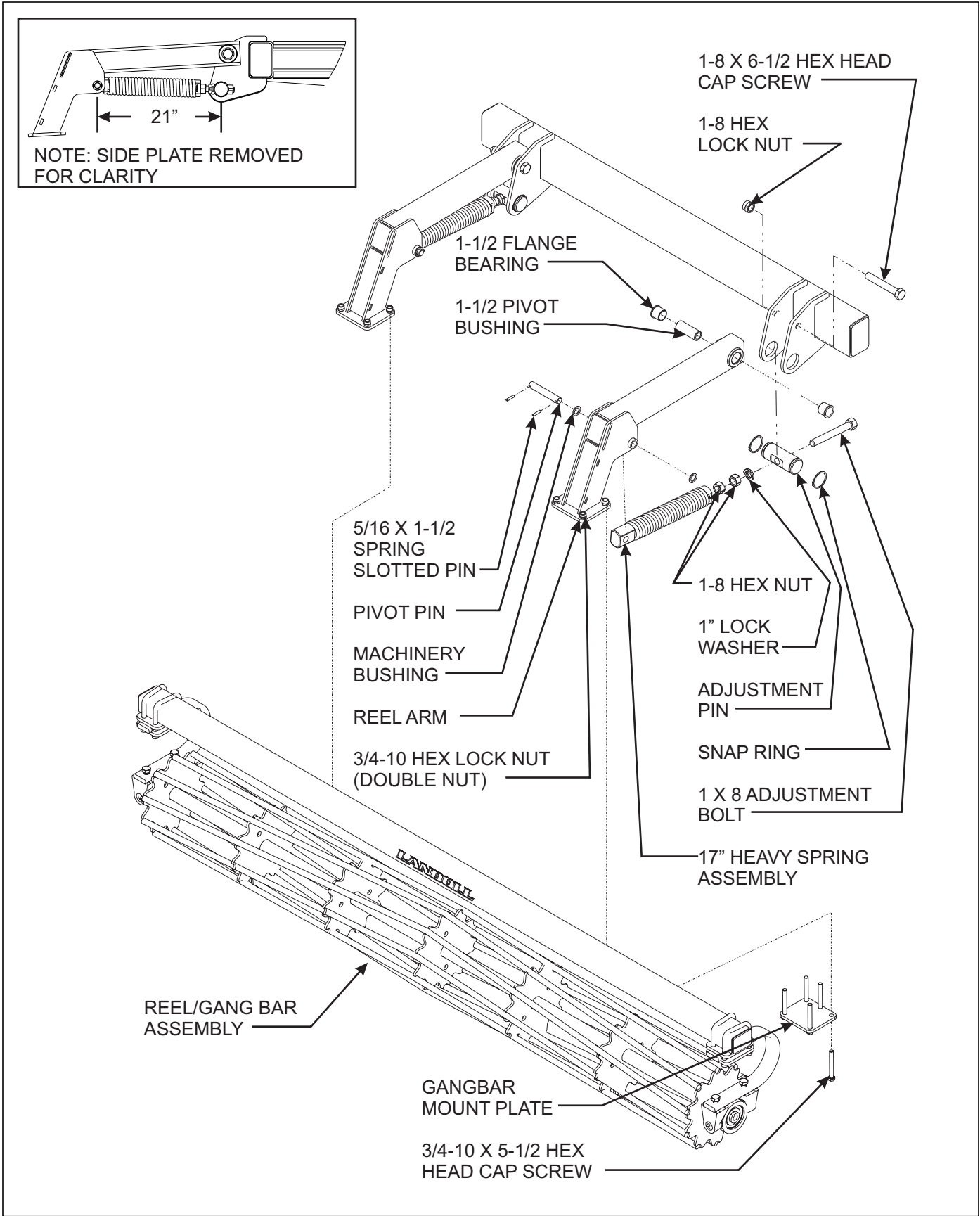


Figure 3-12: Conditioner Single Reel Installation

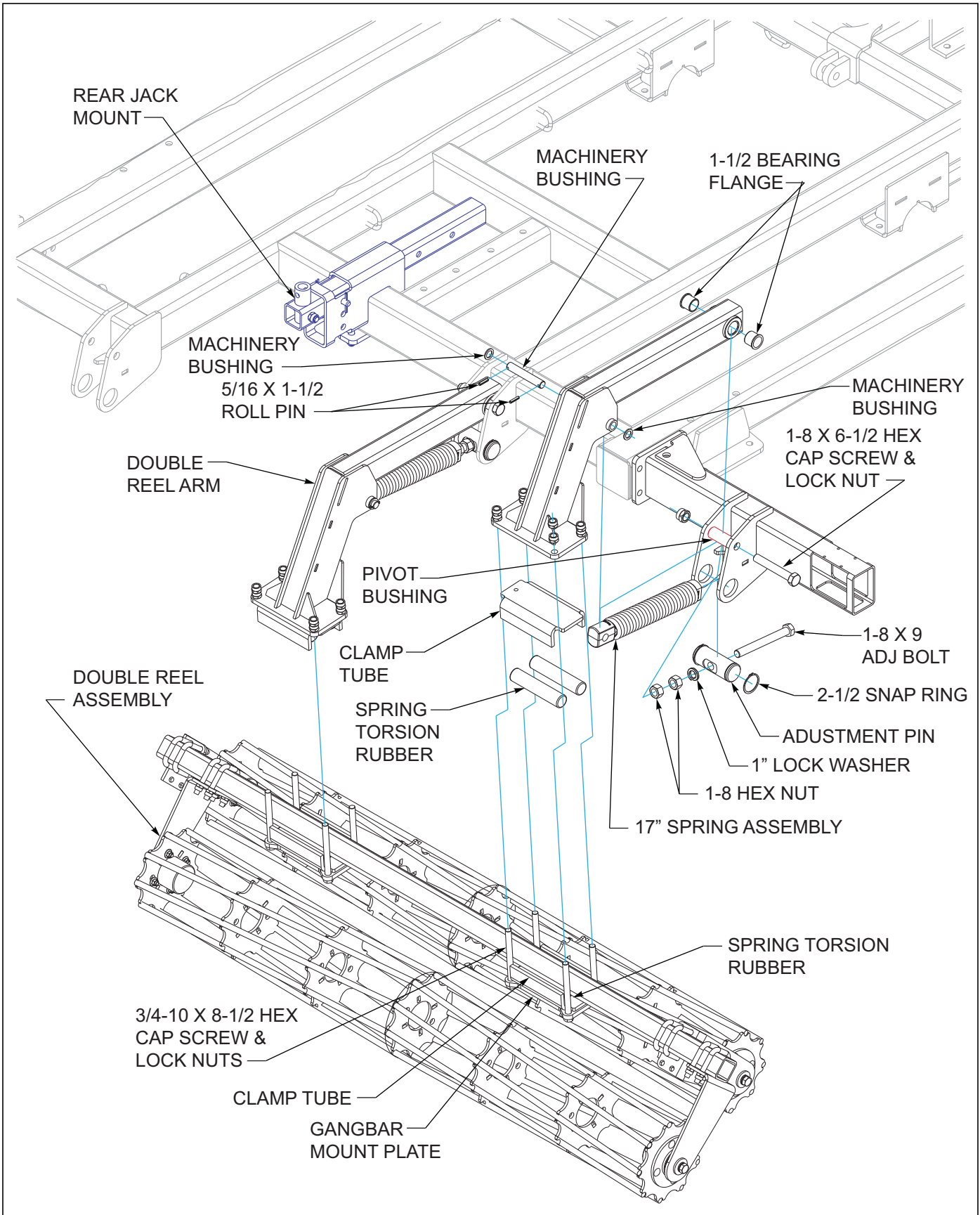
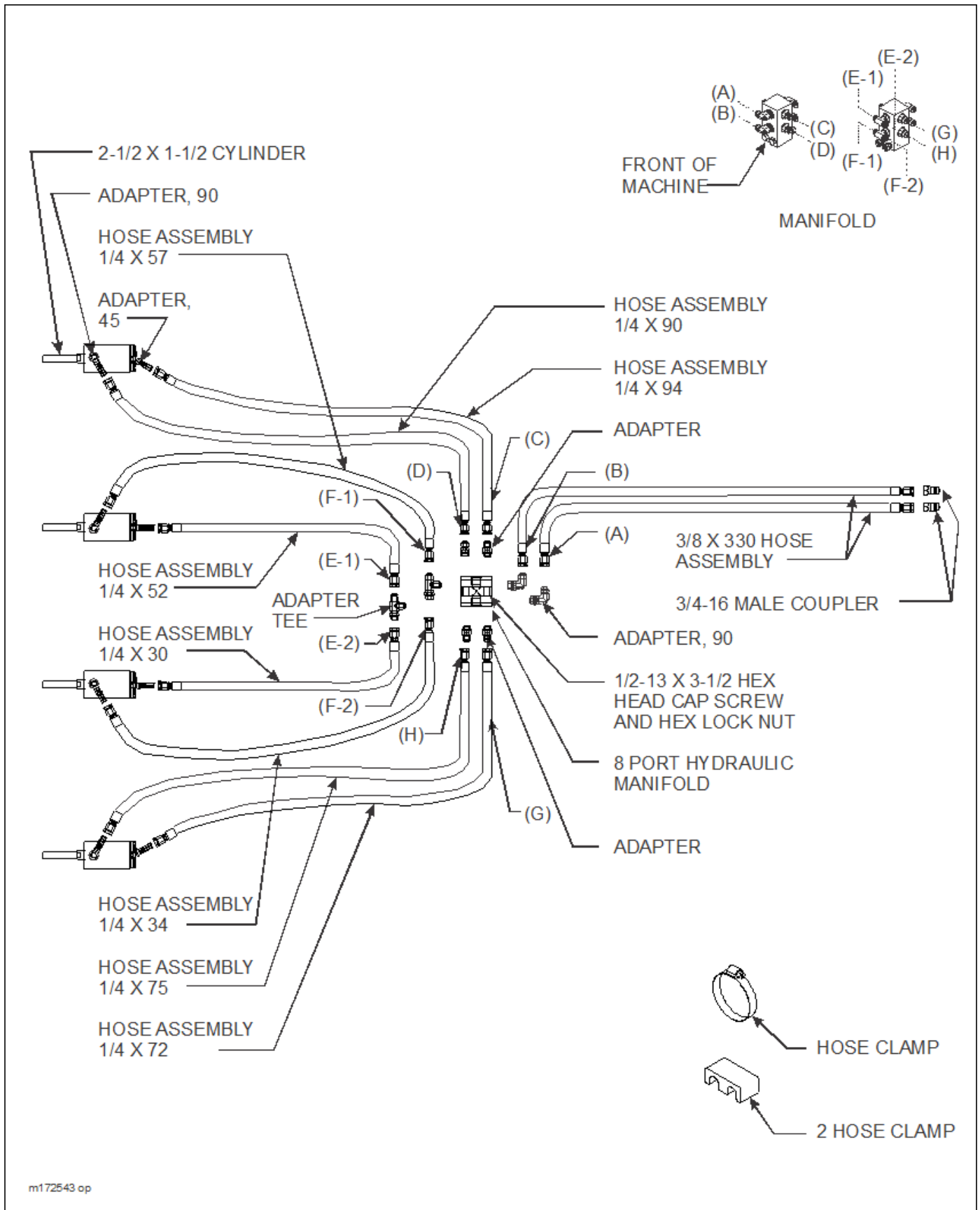


Figure 3-13: Conditioner Double Reel Installation



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Figure 3-14: Finishing Reel Hydraulic Installation

Finishing Hydraulic Conditioner Reel Installation (Option)

NOTES

Refer to **Figure 3-14** for hydraulic diagram.

1. Attach reel arm assemblies to rear frame in top hole using 1-8 x 6-1/2 hex head cap screw, pivot bushing, flange bearings, and hex lock nut (**See Figure 3-16.**) for single reel or (**See Figure 3-17.**) for double reel.
2. Attach 17" spring assembly and 1-1/2 hydraulic cylinder to lower hole on rear frame using cylinder trunnion, cylinder trunnion stop, 1/2-13 x 1-1/2 hex head cap screw, and split lock washer.
3. Install the manifold to the manifold bracket on the frame using 1/2-13 x 3-1/2 hex head cap screws and hex lock nuts.
4. Install fittings into manifold according to **Figure 3-14.**
5. Install hoses per **Figure 3-14.**
6. Install hose clamps onto frame (**See Figures 3-14 and 3-15.**)
7. Install steel plugs in any remaining open manifold or valve ports.
8. Attach conditioner reel/gang bar assembly to reel arm assemblies using gang bar mount plates, 3/4-10 x 5-1/2 hex head cap screws, and double hex lock nuts..

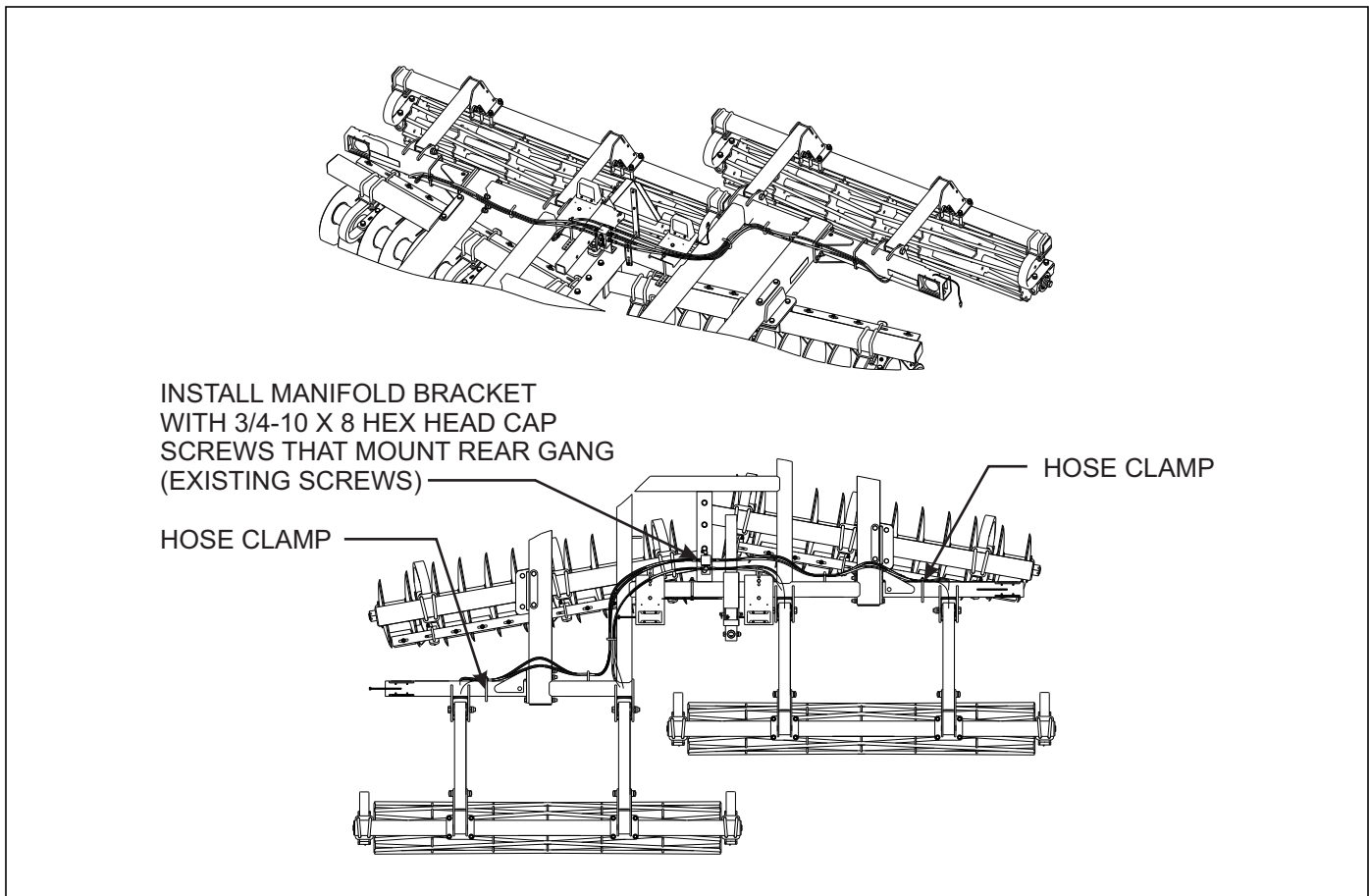


Figure 3-15: Finishing Hydraulic Conditioner Reel Hose and Clamp Installation (Option)

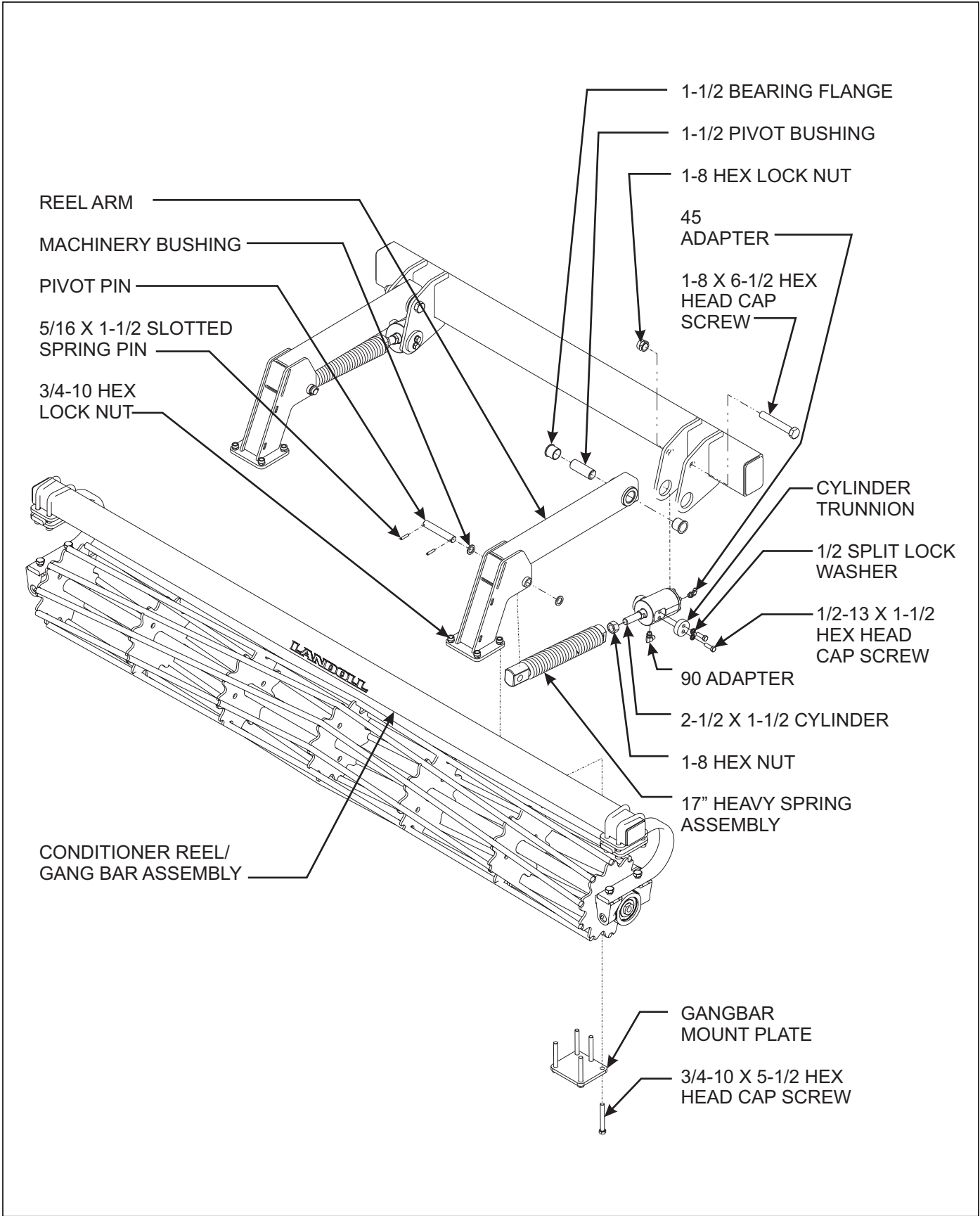


Figure 3-16: Finishing Hydraulic Conditioner Single Reel Installation (Option)

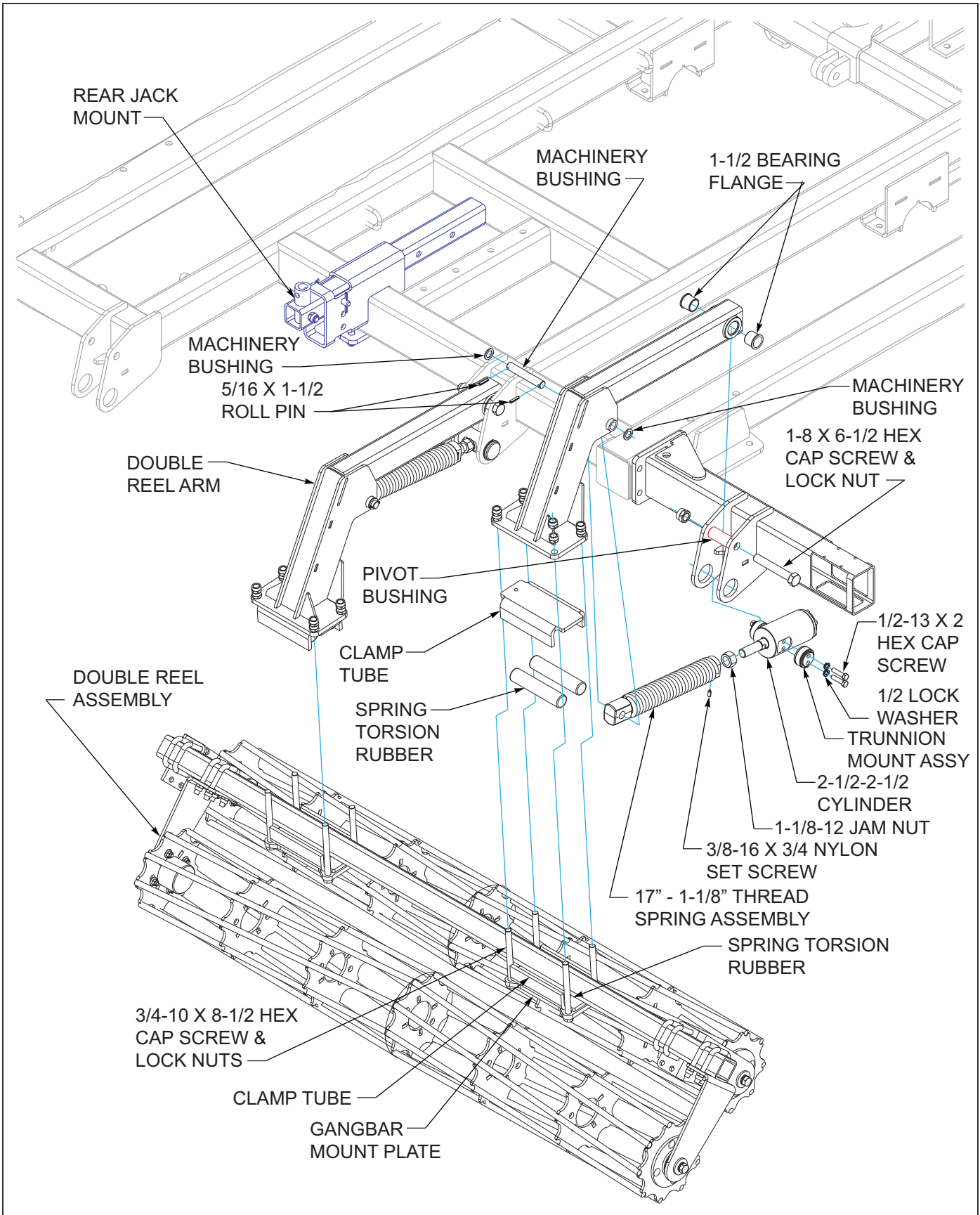


Figure 3-17: Finishing Hydraulic Conditioner Double Reel Installation (Option)

Rear Jack Installation

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

IMPORTANT

The rear jack tube should be located to the rear of the VT Plus 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 VT Plus near the center of the frame (**See Figure 3-18.**)
2. Slide rear plate onto 3/4-10 x 4 hex head cap screws beneath rear frame tube and hold in place with 3/4-10 hex lock nuts.

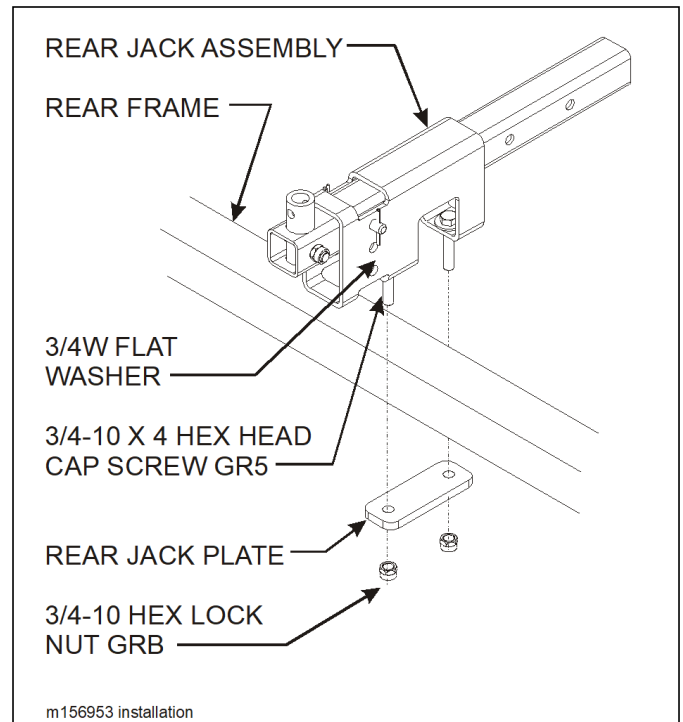


Figure 3-18: Rear Jack Installation

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. **See “Hydraulic Leveler Adjustment” on page 4-8** for any further adjustments.
4. Connect lights to the tractor and verify operation.
5. Check tires for proper inflation
6. Level the machine from side to side as described in **“Leveling (Side to Side)” on page 4-6.**
7. Inspect the final implement assembly, and verify that all bolts have been tightened, cotter pins spread, and that there are no leaking hydraulic connections.
8. Rotate each disc gang to verify that each gang rotates freely. Adjust any scrapers that may have shifted during shipment or assembly.
9. Lubricate the machine at all locations (**See “Lubrication Maintenance” on page 4-17.**)
10. Touch up with paint any areas that may have been scratched during moving, handling, or assembly.
11. Thoroughly read and understand the operating section before using the machine.

Rear Tow Hitch

1. Attach rear tow assembly to center frame using clamp plates, 5/8 x 10-3/4 u-bolts, 1 x 7 u-bolts and the necessary lock nuts. **See Figure 3-19.** Position the hitch in the center of the frame from side to side, and the hitch brace tube will fit over the center frame tubes setting the front to rear location. Install u-bolts and clamp plates, the 1" u-bolt will have 2 clamp plates per side and lock nuts. Tighten all u-bolts evenly to secure hitch to frame. **NOTE:** 1" u-bolt will have 2 clamp plates per side on the top of the hitch.
2. Route the hydraulics through the left side of the hitch tube and on up through the hose loops provided on the frame, on towards the front of the 7410 just like the rest of the hoses in the tractor. A union will connect hoses to make them long enough.
3. Connect a 34" extension to each end of the rear tow tandem adapter at the rear of the hitch. Route the wires up through the right side of the tow hitch and out the front. Disconnect the main harness from the ag flasher module control, and connect each side to the rear tow tandem harness as applicable.
4. Remove rear jack from mount and install on the tow hitch rear stand.

NOTE: REELS REMOVED FOR CLARITY

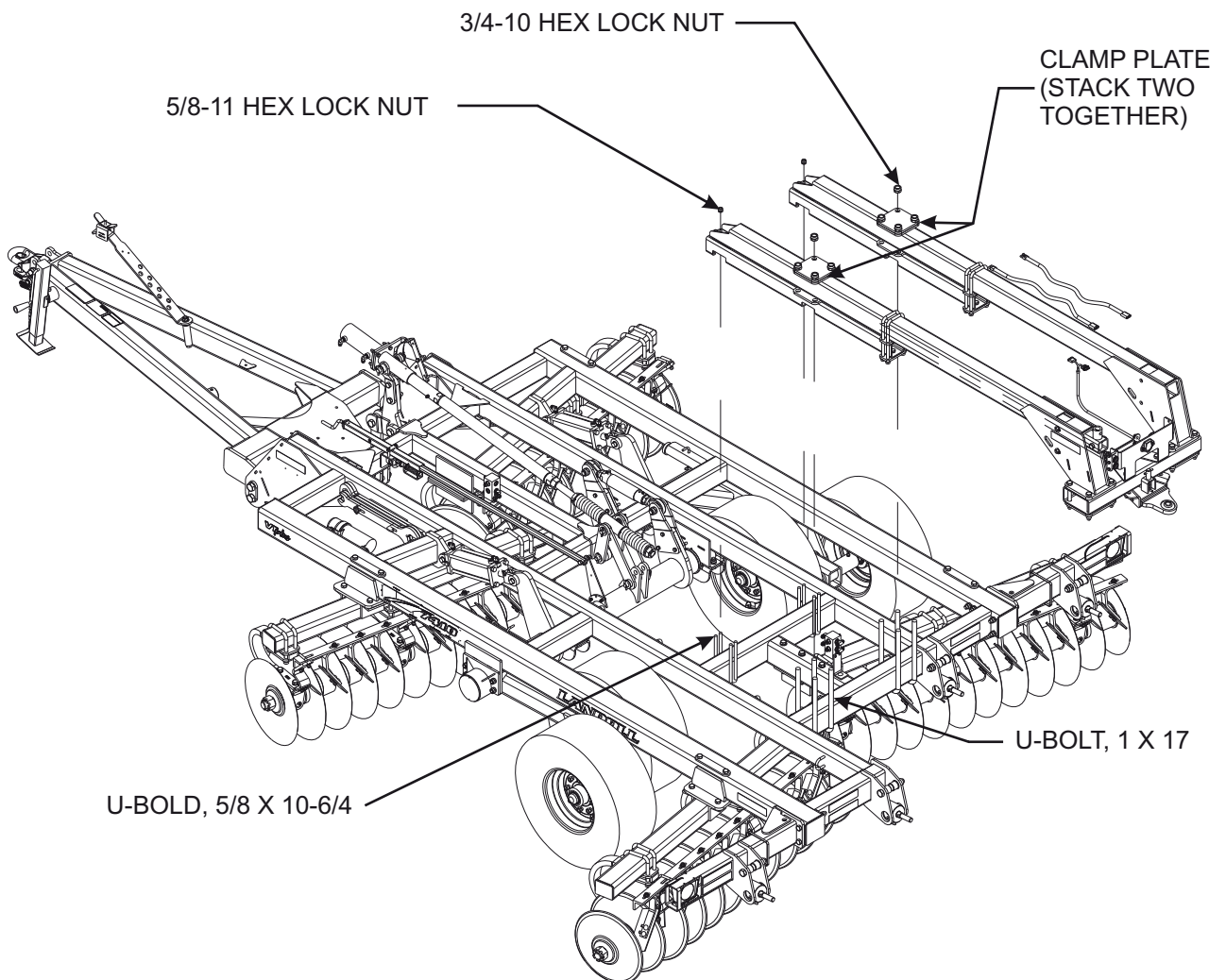


Figure 3-19: Rear Hitch Assembly

Operation and Maintenance



DANGER

Never allow anyone to ride on the 7410 VT Plus at any time. Allowing a person to ride on the machine can inflict serious personal injury or death to that person.



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

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.



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.



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.



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 7410 VT Plus 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. If your VT Plus is equipped with the clevis option, this should be removed. The clevis option is only for transport use.

An optional welded double hitch clevis (p/n 161550) is available for use with tractors with single lip hitch.

Before attaching the VT Plus, 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.

VT Plus Preparation

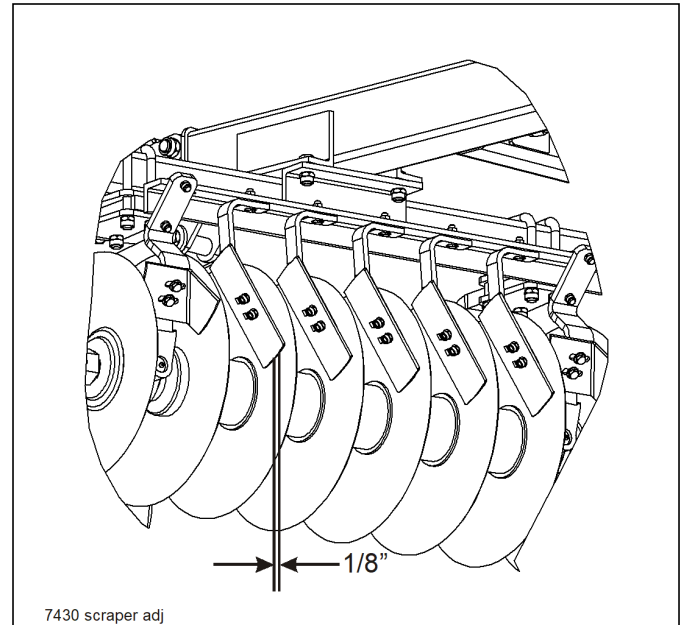


Figure 4-1: Disc Scraper to Disc Blade

1. Prior to operating the 7410 VT Plus, 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 as shown in "**Lubrication Maintenance**" on page 4-17 **(See Figure 4-17.)**

Attaching to the Tractor

1. Align the tractor drawbar with the machine. Raise or lower the unit ring hitch, as needed, using the swivel jack. Attach the unit with proper size hitch pin.
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. Attach safety chain to tractor allowing plenty of movement for turning both directions. The safety chain should latch securely to prevent it coming loose.
5. 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.

NOTE

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

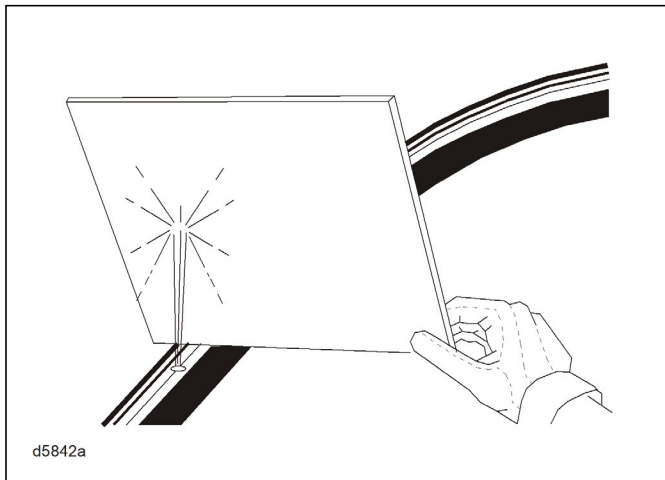


Figure 4-2: Hydraulic Leak Detection



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.

OPERATION AND MAINTENANCE

- The hydraulic system is not filled with oil and should be purged of air before transporting and field operations. Carefully hitch the VT Plus to the tractor and connect the hydraulic lift hoses. 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. 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. With all cylinders fully extended, install the 1-3/8 X 10 transport lockouts (**See Figure 4-3.**) Storage location for lockouts (**See Figure 4-4.**)
- 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 frame sections level when operating.

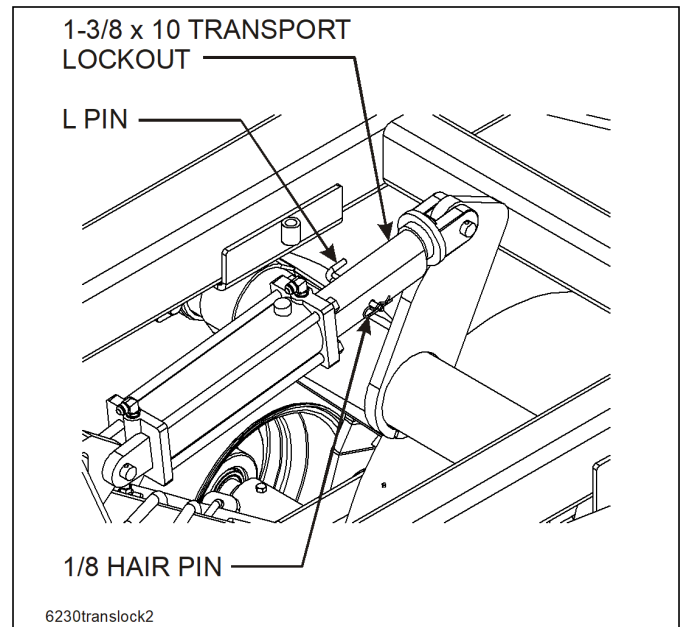


Figure 4-3: Installed Transport Locks

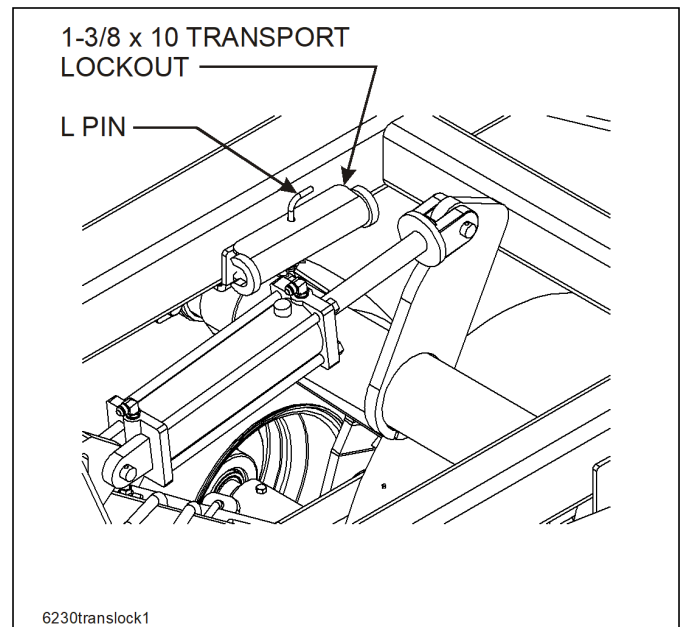


Figure 4-4: Stored Transport Locks

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 6 - 9 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 cannot 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 VT Plus 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.)**

Leveling (Side to Side)

1. An adjustable radius rod connects the center frame lifts together to keep them operating in unison. The radius rod does not level the center frame lift. The radius rod length is determined initially by fully retracting the lift cylinders and adjusting the radius rod until it is loose and tightening the jam nuts.

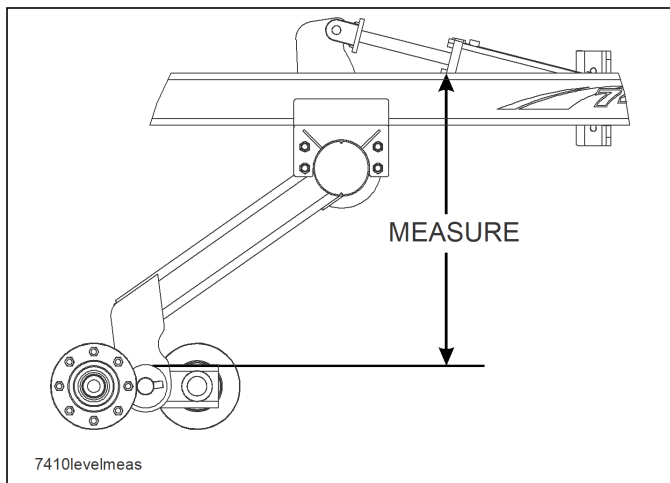


Figure 4-5: Leveling from Side to Side

2. To level the center frame:
 - a. Verify that all of the tires are properly inflated.
 - b. Raise it to fully extend the lift cylinders and continue holding the tractor lever 30-60 seconds to insure the cylinders are fully extended and the rephrasing lift system has been purged of air.
 - c. Lower the unit so the disc blades are 1" off the ground.
 - d. Measure the distance from the walking beam spindle to the top of the frame on both sides (**See Figure 4-5.**) If there is a difference, it needs to be adjusted by turning the cylinder rods with the wrench flats provided at the clevis end (**See Figure 4-6.**)
 - e. Let the machine down onto the ground to relieve any pressure, but do not fully retract the cylinders. Remove 1-8 x 4 hex head cap screws from radius rod assembly and remove from frame.
 - f. Loosen the cross bolt on the clevis. If the difference is 1/4" this requires turning the rod of the short side one full revolution to lengthen the cylinder. If the difference is 1/2" this requires turning the rod of the short side out one full turn and the rod of the tall side in one full revolution. Any differences of less than a 1/4" are acceptable for operating.
3. After adjusting the cylinder rod or rods, the radius rod needs to be adjusted back to a neutral position. This is accomplished by fully retracting the lift cylinders and adjusting the radius rod until there is no load on it, and then tightening the jam nuts on each end. Reinstall 1-8 x 4 hex head cap screw, tighten jam nuts, and 1/2-13 x 1-1/4 square head cup point set screw to prevent radius rod from turning.

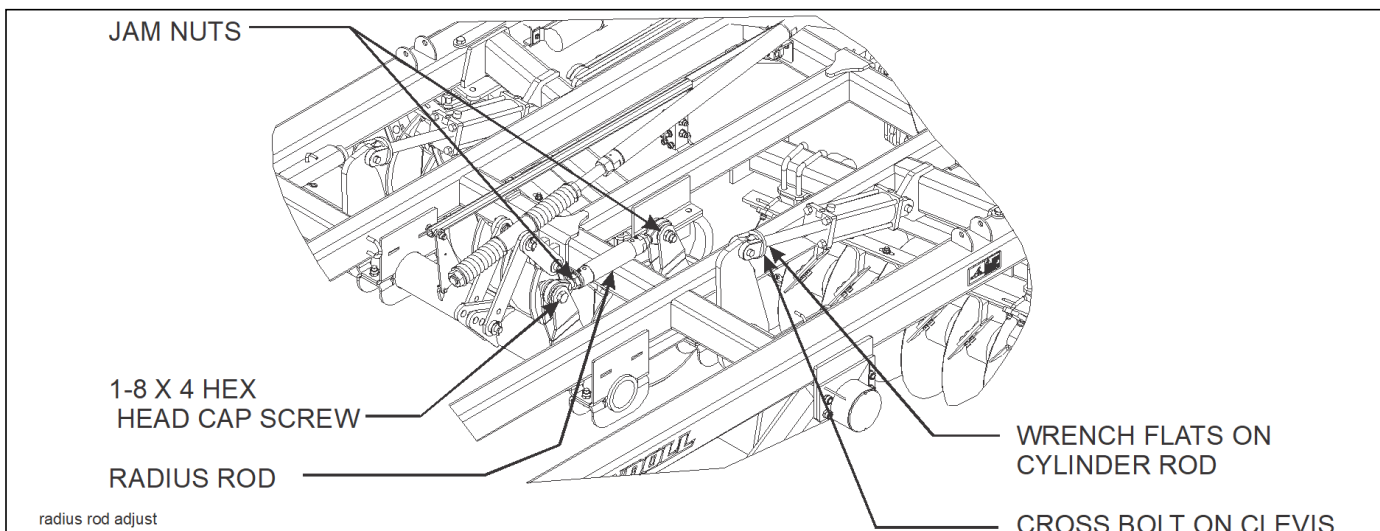


Figure 4-6: Leveling the Center Frame

Leveling (Front-to-Rear)

1. The leveling feature on the VT Plus is used to keep the machine 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 machine 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 4-7.**) 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.

NOTE

On the 7410, the variable link option is not available and should not be adjusted. **See Figure 4-8** for proper location of leveler link. Set in 3rd hole down from top.

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.

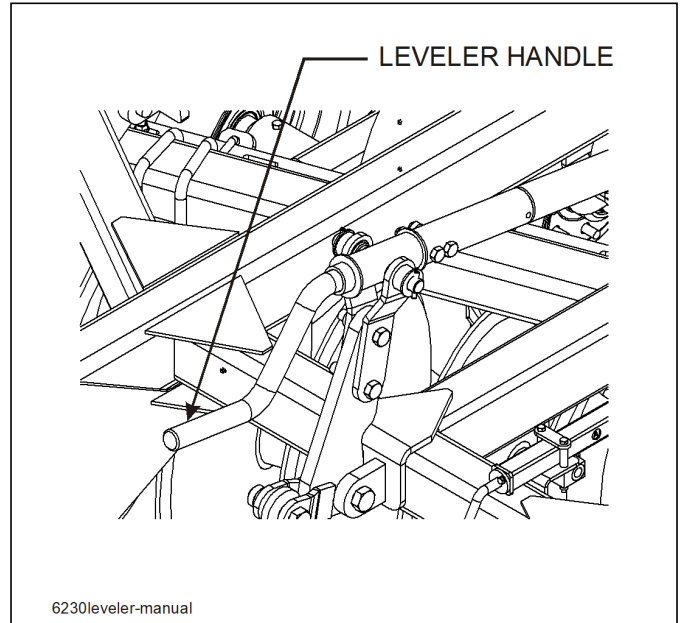


Figure 4-7: Manual Leveler Adjustment

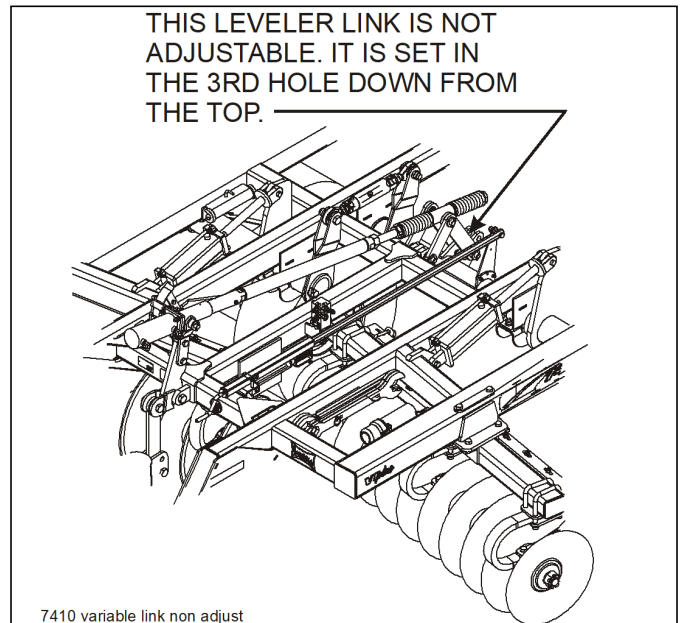


Figure 4-8: Variable Link Non-Adjustment

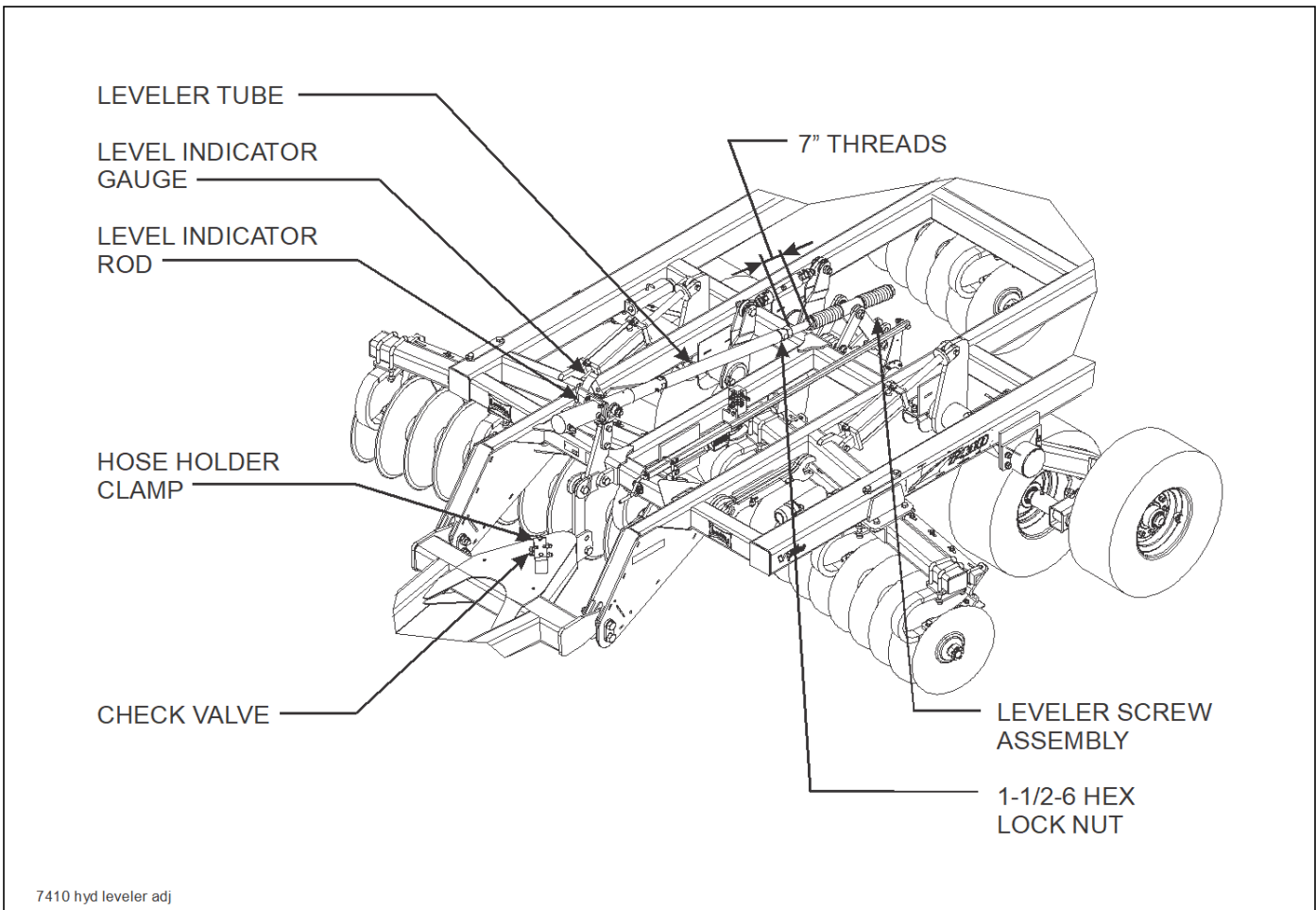


Figure 4-9: Hydraulic Leveler Adjustment

Hydraulic Leveler Adjustment

If a unit is equipped with an optional hydraulic leveler, adjust to the following dimensions for most field conditions.

1. Lower the machine to the ground to remove the load on the leveler assembly.
2. Remove the level indicator rod from the leveler tube (See Figure 4-9.)
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 out to approximately 7" for all models.
5. Install the level indicator rod in the leveler tube and level indicator gauge.
6. The check valve is not adjustable. It prevents movement of the leveler assembly unless the tractor remote is activated.

Hitch Adjustment

1. It is important for the VT Plus 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 VT Plus is equipped with an adjustable hitch to help insure a proper draft line with the tractor.
2. Generally tractor drawbars greater than 17" tall will require the hitch to be in the upper position. 17" drawbars and below should be in the lower position. Operating conditions may also influence the hitch adjustment. The hitch is most commonly located in the upper position.
3. A hitch adjustment that is too high will leave a center furrow, as the front of the VT Plus will operate too deep. A low hitch adjustment can cause a center ridge, regardless of leveler setting.

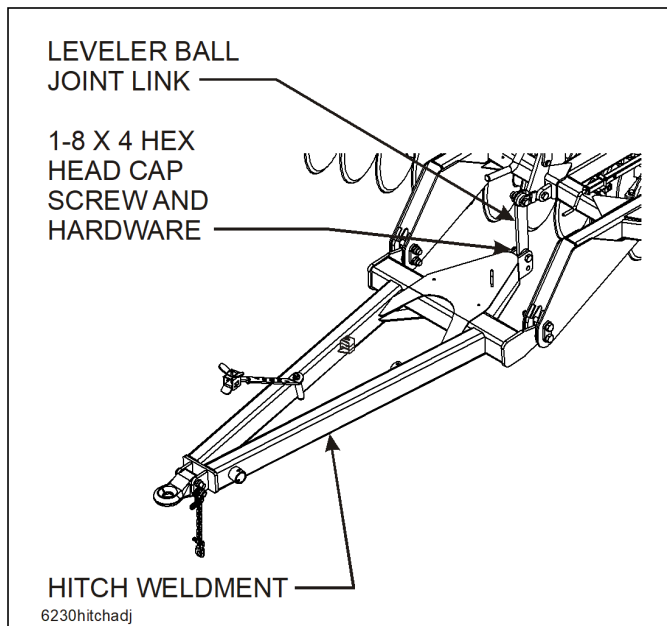


Figure 4-10: Hitch Adjustment

4. To adjust the hitch (See Figure 4-10.):
 - a. Lower the VT Plus to the ground.
 - b. Adjust the leveler screw (manual or hydraulic) in or out until the pressure is relieved on the leveling system (See "Leveling (Side to Side)" on page 4-6 and "Leveling (Front-to-Rear)" on page 4-7).
 - c. Remove the 1-8 X 4 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. Retighten all hitch bolts.
 - i. Install the bolt in the leveler ball joint link in the new position at the rear of the hitch and retighten.

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.

Scraper Adjustment

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

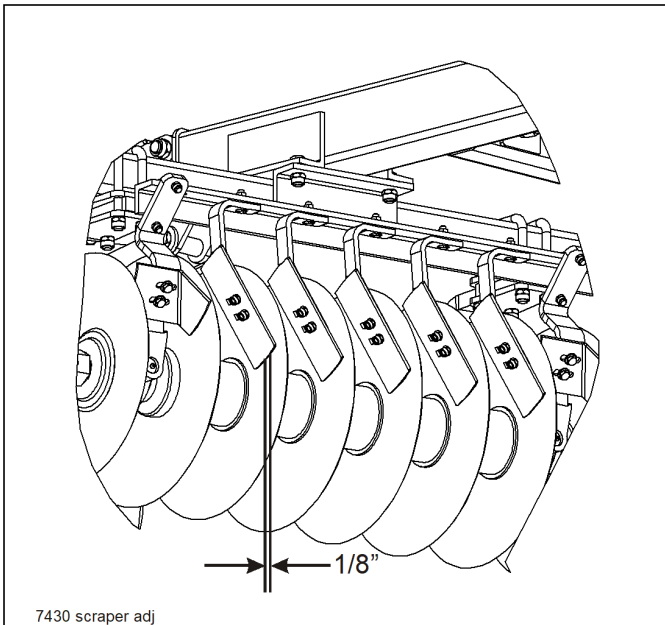


Figure 4-11: Scraper Adjustment

1. Rigid scrapers should be set initially as close to the disc blade as possible without rubbing (approximately 1/8") (See Figure 4-11.) 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 front position to position scraper closer to the spool. This position will perform better in wet and heavier residue conditions. The blade may be moved back 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.

Disc Blades

1. The 7410 VT Plus is equipped with 22" -6 ga. (.197"), 22" -4 ga. (.256), or 22" -4 ga. (.256) rollable low concavity disc blades on both front and rear. The use of other concavity blades can give unpredictable results and is not recommended.
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.



CAUTION

Tighten all 1-3/4" nuts to 1,250 foot-pounds of torque (See Figure 4-12.)

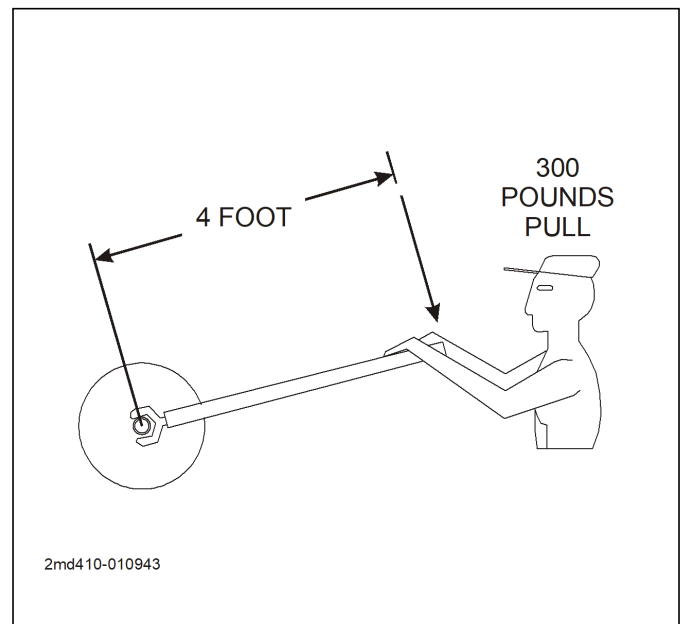


Figure 4-12: 1,250 Foot-Pounds of Torque

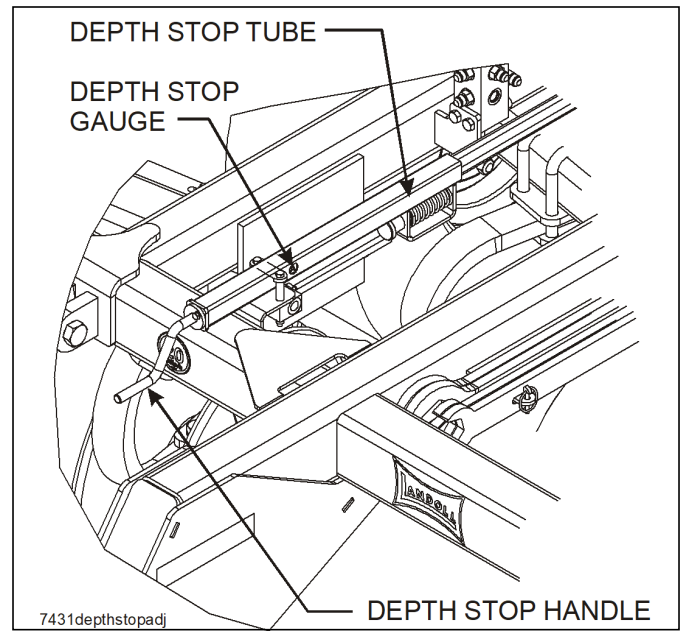
Depth Stop Adjustment (Manual)

The operating depth of the VT Plus 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 4-13.**) Turn the handle out (counter-clockwise) to decrease operating depth. One turn will equal approximately 3/16" adjustment in depth.
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.



7431depthstopadj

Figure 4-13: Depth Stop Adjustment (Manual)

Wheel Bearing Maintenance

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 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. Torque spindle nut to 50 ft. lbs. Rotate hub both directions a minimum of one quarter turn to set bearings. Back off spindle nut until loose and torque to 27 ft. lbs. If necessary, back off spindle nut until the nut slot is lined up with the cotter pin hole. Do not back off more than one flat of nut. Install new cotter pin. Bend cotter pin to secure spindle nut.
10. Install a new hub cap. Coat inside of cap with grease.

NOTE

The seals should point away from the hub to keep contaminants out and allow grease to pass.

11. Position seal over seal bore. Rotate seal in an inward motion to ensure sealing surfaces are facing away from the hub. Install seal flush with seal bore casting surface.
12. When greasing hubs, fill hub until grease is purged from seal.

Hydraulic Maintenance

1. Check the tractor hydraulic fluid level per tractor owner's 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

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** on how to purge the hydraulic systems.

Transport

1. Check and follow all federal, state, and local requirements before transporting the VT Plus.
2. The 7410 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 7410 is 20 mph for the implement and is designated on the speed identification symbol located on the front of the implement (See Figure 4-14.)



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 4-14.) 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.
 - 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.

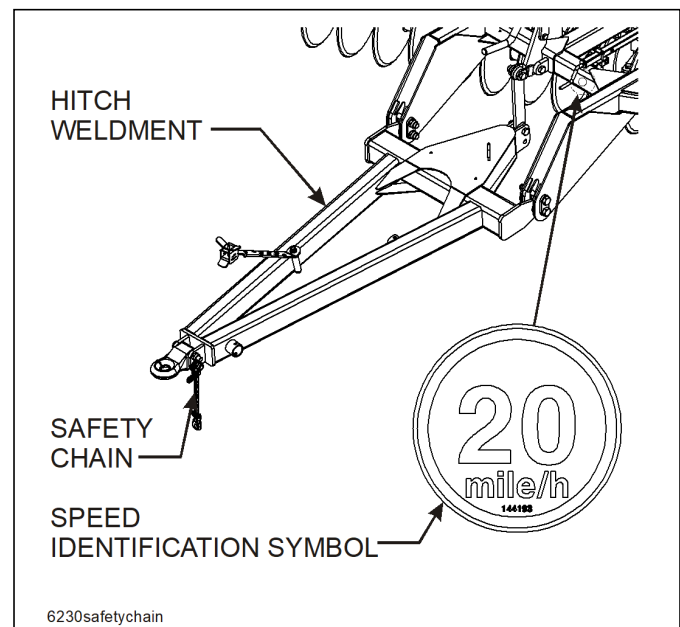


Figure 4-14: Hitch, Speed Identification Symbol, and Safety Chain

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 lift system. Do not depend solely on implement hydraulics for transport. (See Figure 4-15.)



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 4-16 before moving machine.
13. To increase stability and reel clearance on center frame, use hydraulic leveler to roll the unit forward.

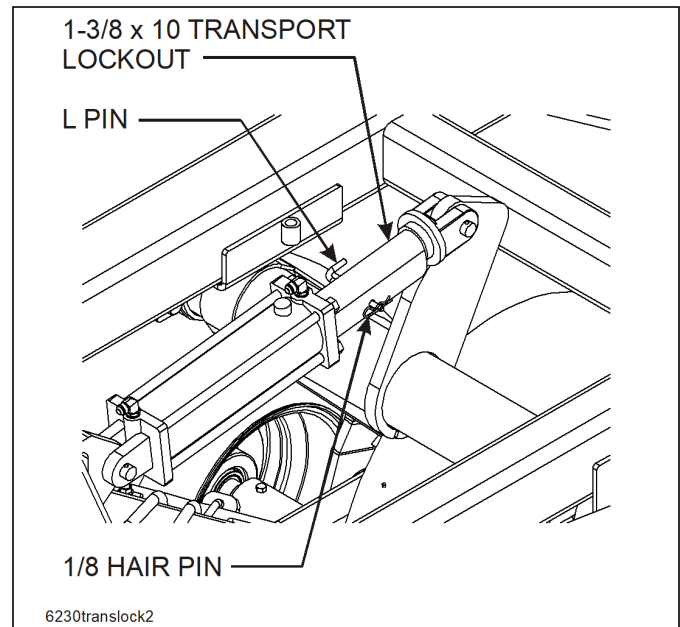


Figure 4-15: Installed Transport Locks

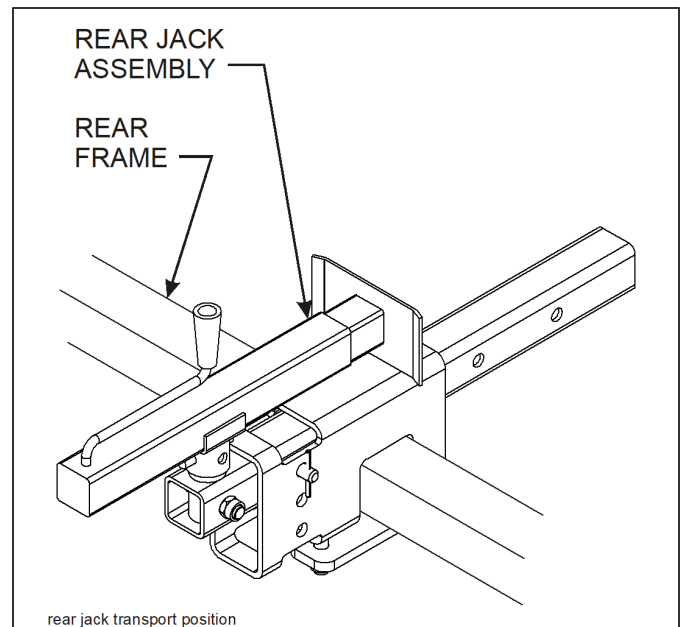


Figure 4-16: Rear Jack Transport Position

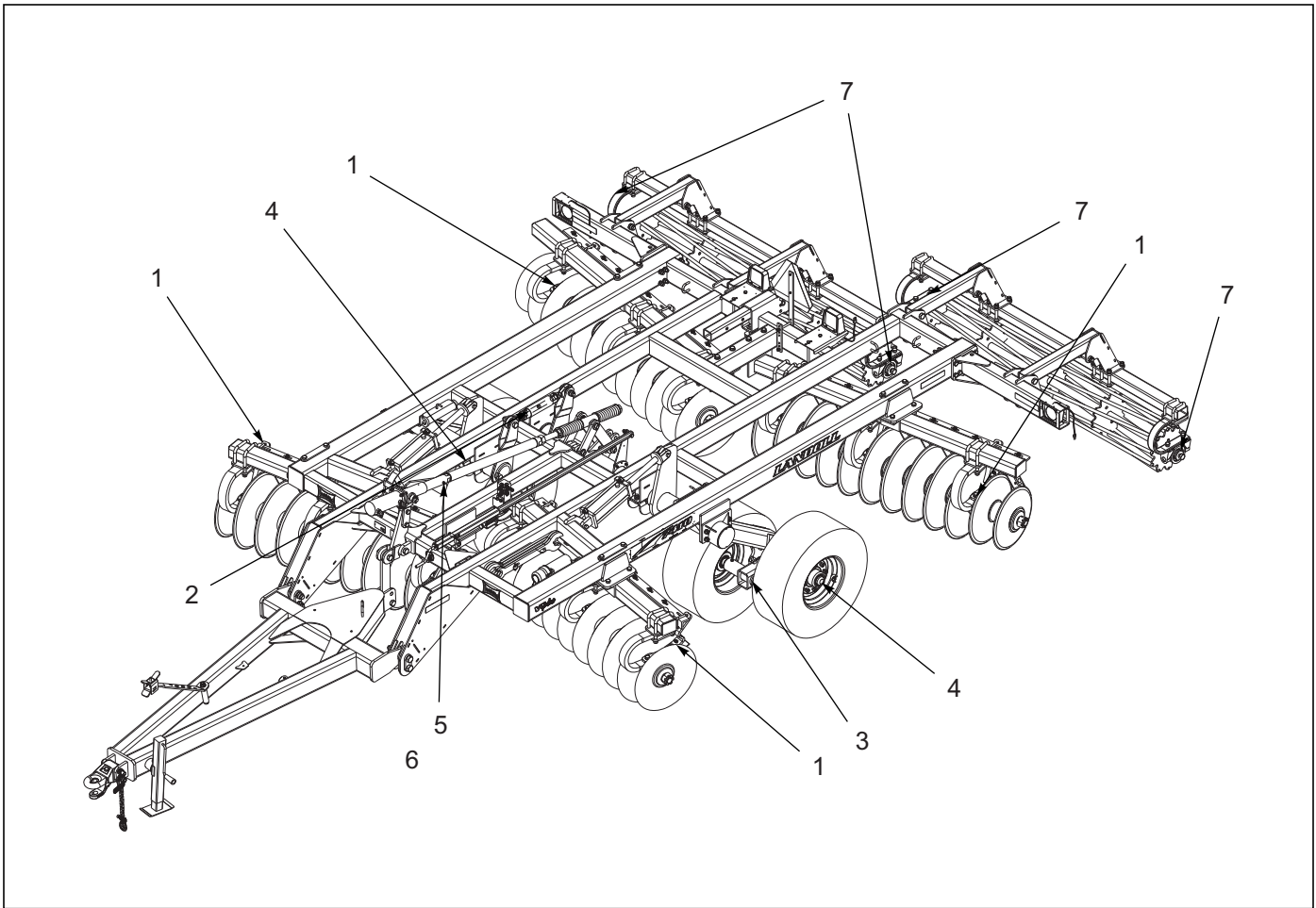


Figure 4-17: Lubrication Schedule

LUBRICATION TABLE			
ITEM	DESCRIPTION	NO. OF LUBE POINTS	INTERVAL (Hours Unless Stated)
1	Disc Gang Bearings	1 each	10
2	Radius Rod	2	50
3	Walking Tandem Hubs	1 each	50
4	Wheel Hubs	1 each	50
5	Manual Leveler Tube	1	50
6	Hydraulic Leveler Tube (Optional)	1	50
7	Conditioner Reel Bearings	1 each	10

Table 4-1: Lubrication Table

Lubrication Maintenance

1. **Table 4-1** specifies the number and the period of lubrication points on the 7410 VT Plus. Proper maintenance of your machine will, under normal operating conditions, help to keep it operating at or near its peak performance for an extended period of time. Proper maintenance is also a condition of keeping your warranty in good status (**See Figure 4-17.**)
2. When lubricating the VT Plus, 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. Disc gang and conditioner reel bearings are equipped with seals that will let grease pass and not harm the seal. Regular lubrication will maintain a full grease cavity and help purge any contaminants. Grease the bearings before long periods of storage to prevent moisture buildup within the bearing cavity.
4. Wheel seals and walking tandem seals, when properly installed, will allow grease to pass without harm to seals. Regular lubrication will extend service life, particularly in severe operating conditions.
5. The VT Plus is equipped with maintenance-free bearings in the lifts, leveler, wing hinges and gauge wheel casters. These areas require no lubrication.

Storage

1. The service life of the VT Plus 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 is worn off.
 - d. Grease all exposed metal surfaces of shanks, points and discs.
 - e. Apply a light coating of oil or grease to exposed cylinder rods to prevent them from rusting.
 - f. Lubricate each point of the machine as stated in **“Lubrication Maintenance”** on page 4-17.
2. 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.
3. Slide the rear jack tube from transport position and into slot from bottom of rear jack mount. Pin jack tube in position. Attach jack to rear jack tube and pin in position. Crank jack until the rear of the machine is supported (**See Figure 4-18.**)

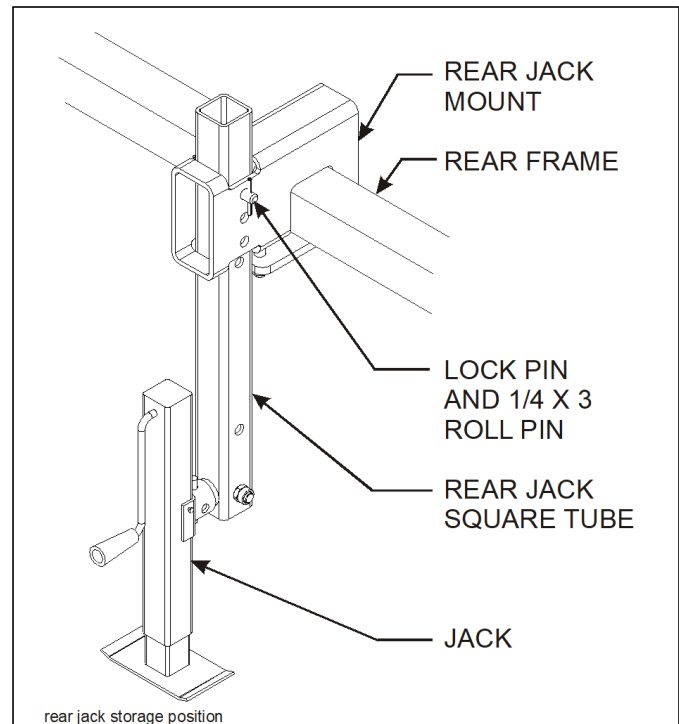


Figure 4-18: Rear Jack Transport Position

Troubleshooting Guide

The Troubleshooting Guide, shown below, is included to help you quickly locate problems that can happen using your 7410 VT Plus. Follow all safety precautions stated in the previous sections 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
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.
	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.
UNEVEN DEPTH	Frame not level side to side	Level center frame side to side.
	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
	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.
WHEEL BEARING FAILURE	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.
	Hoses not properly connected:	Check hose routing
HYDRAULIC - ONE SIDE OF CENTER LIFT CYLINDERS NOT FULLY EXTENDING	Center lifts not properly timed.	Remove 1" bolt from adjustable radius rod on lifts and fully retract lift cylinders, reinstall radius rod bolt adjusting it to fit the lifts in the position. Check center frame level as described in " Leveling (Side to Side) " on page 4-6.

TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	SOLUTION
HYDRAULIC - CANNOT INSTALL ONE TRANSPORT LOCK	Center lifts not properly timed.	Remove 1” bolt from adjustable radius rod on lifts and fully retract lift cylinders, reinstall radius rod bolt adjusting it to fit the lifts in the position. Check center frame level as described in (See “Leveling (Side to Side)” on page 4-6.)
HYDRAULIC - ENTIRE UNIT SETTLING	Depth stop valve not working	Repair valve
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.
CONDITIONER REELS PLUGGING	Excessive down pressure	Raise reels w/ adjustment bolt
LIGHTS DO NOT WORK	Harness or lamp connection unplugged	Check all harness/lamp connections to verify that everything is properly connected.

Document Control Revision Log:

Date	Revision	End Item #	Improvement(s) Description and Comments
04/29/11	F-586-0111	7431	Initial Release
11/07/18	F-586-1118	7431	Updated lube table,
01/03/25	F-586-2501	7431	Prince cylinder update,



intertek

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

Model 7410 VT Plus Operator's Manual

Re-Order Part Number F-586

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