OPERATOR'S MANUAL

ASSEMBLY, OPERATOR & PART'S

PT2200 FWD PLANTER BAR

WIL-RICH
PO BOX 1030
Wahpeton, ND 58075
Ph 701-642-2621
Fax 701-642-3372
WWW.WIL-RICH.COM

Printed in USA

(74277) WR-12/10

WIL-RICH, LLC

WARRANTY

Wil-Rich's products are warranted to the original non-commercial purchaser to be free from defects in material and workmanship for a minimum period of twelve (12) months from the original date of purchase.

Additional Field Cultivator Warranty: Wil-Rich warrants to the original purchaser of each new Wil-Rich Field Cultivator unit (Excel and QuadX), and Disk Field Cultivators that the product be free from defects in material and workmanship for the period of three (3) years on the main frames and shank assemblies. All other components are covered by the twelve (12) month warranty period.

Commercial Use: Warranty for commercial, rental or custom use of any Wil-Rich product is limited to 90 days, parts and labor.

We warrant products sold by us to be in accordance with our published specifications or those specifications agreed to by us in writing at time of sale. Our obligation and liability under this warranty is expressly limited to repairing, or replacing, at our option, within 12 months after date of retail delivery, any product not meeting the specifications. ***We make no other warranty, express or implied and make no warranty of merchantability or of fitness for any particular purpose.*** If requested by us, products or parts for which a warranty claim is made are to be returned transportation prepaid to our factory. Any improper use, operation beyond rated capacity, substitution of parts not approved by us, or any alteration or repair by others in such manner as in our judgment affects the product materially and adversely shall void this warranty. ***No employee or representative is authorized to change this warranty in any way or grant any other warranty.***

Wil-Rich reserves the right to make improvement changes on any of our products without notice.

When warranty limited or not applicable: Warranty on hydraulic hoses, hydraulic cylinders, hubs, spindles, engines, valves, pumps or other trade accessories are limited to the warranties made by the respective manufactures of these components. Rubber tires and tubes are warranted directly by the respective tire manufacturer only, and not by Wil-Rich.

This warranty shall not be interpreted to render Wil-Rich liable for injury or damages of any kind or nature to person or property. This warranty does not include claims for, or extend to the loss or damage of crops, loss because of delay in seeding/planting or harvesting, or any expense or loss incurred for labor, substitute machinery, rental, and transportation expense or for any other reason.

A Warranty Validation and Delivery Report Form must be filled out and received by Wil-Rich to initiate the warranty coverage.

WARRANTY CLAIMS PROCEDURE

1. The warranty form must be returned to Wil-Rich within thirty (30) working days from the repair date.

2. Parts returned to Wil-Rich without authorization will be refused. The parts must be retained at the dealership for ninety (90) days after the claim has been filed. If the Service Department would like to inspect the parts, a packing slip will be mailed to the dealer. The packing slip must be returned with the parts. The parts must be returned prepaid within thirty (30) days of receiving authorization. After the parts are inspected and warranty is verified, credit for the return freight will be issued to the dealer.

3. Parts that will be scrapped at the dealership will be inspected by a Wil-Rich Sales Representative, District Sales Manager or Service Representative within the ninety (90) day retaining period.

TO THE OWNER

It is the responsibility of the user to read the Operator's Manual and comply with the safe and correct operating procedures as pertains to the operation, lubrication and maintenance of the product according to the information outlined in the Operator's Manual.

If this machine is used by an employee or is loaned or rented, make certain that the operator(s), prior to operating, is instructed in safe and proper use and reviews and understands the Operator's Manual.

The user is responsible for inspecting his/her machine and for having parts repaired or replaced when continued use of this product would cause damage or excessive wear to the other parts. The word NOTE is used to convey information that is out of context with the manual text; special information such as specifications, techniques, reference information of supplementary nature.

WIL-RICH LLC
Wahpeton, ND

Serial Number: _____

Made in USA

When in need of parts, always specify the model and serial number. Write this number in the space provided. The serial number plate is on the left main toolbar located on the left side of the lower 7x7.

MODIFICATIONS

It is the policy of Wil-Rich to improve its products whenever possible and practical to do so. We reserve the right to make changes, improvements and modifications at any time without incurring obligation to make such changes, improvements on any equipment sold previously.

TRADEMARKS

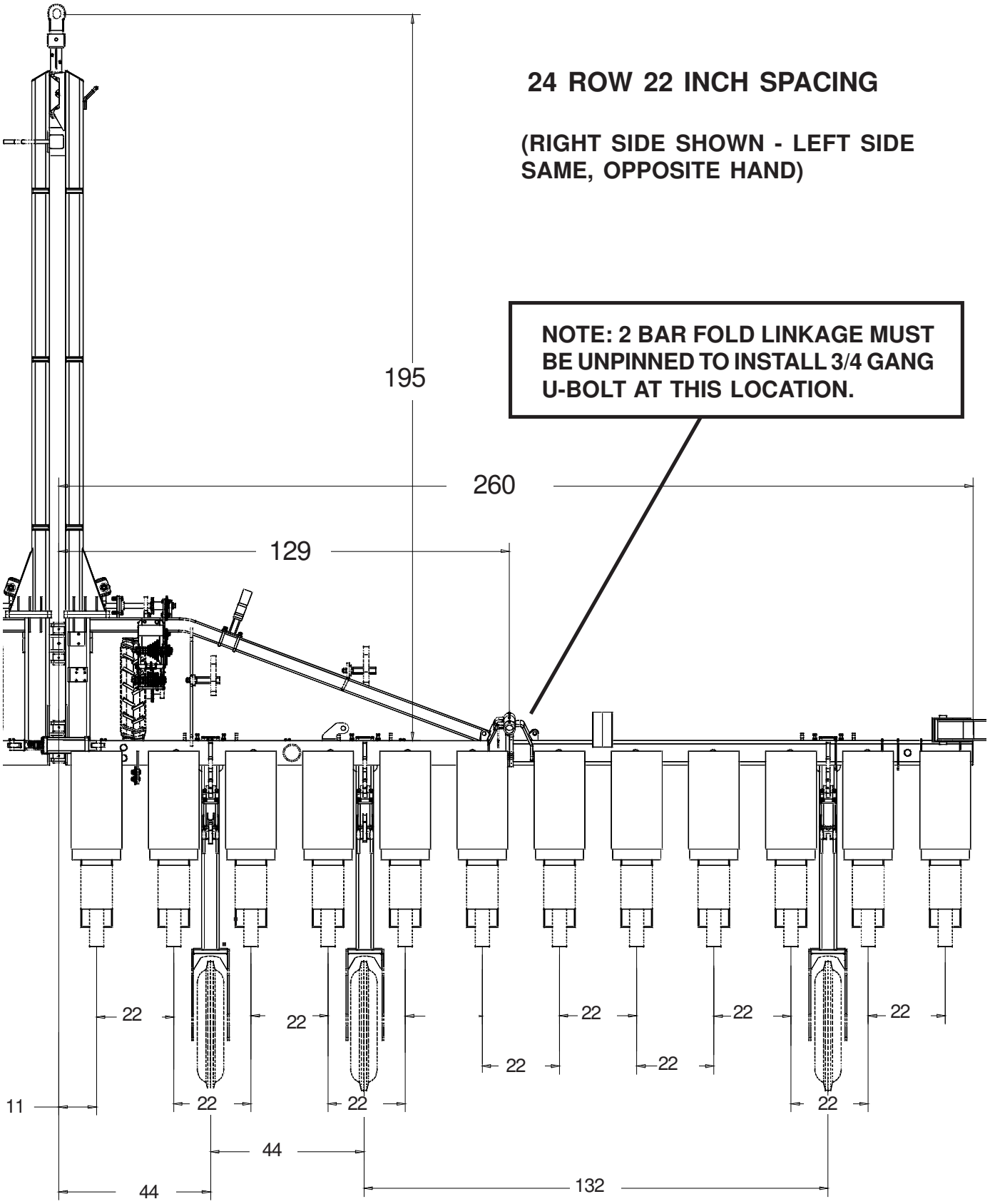
Other product and company names mentioned herein may be trademarks of their respective owners. The use of these names are for reference only, Wil-Rich uses the names only to aid in distinguishing different setups of the Planter Bar.

CONTENTS

ROW UNIT PLACEMENT INFORMATION

24 ROW 22 INCH SPACING

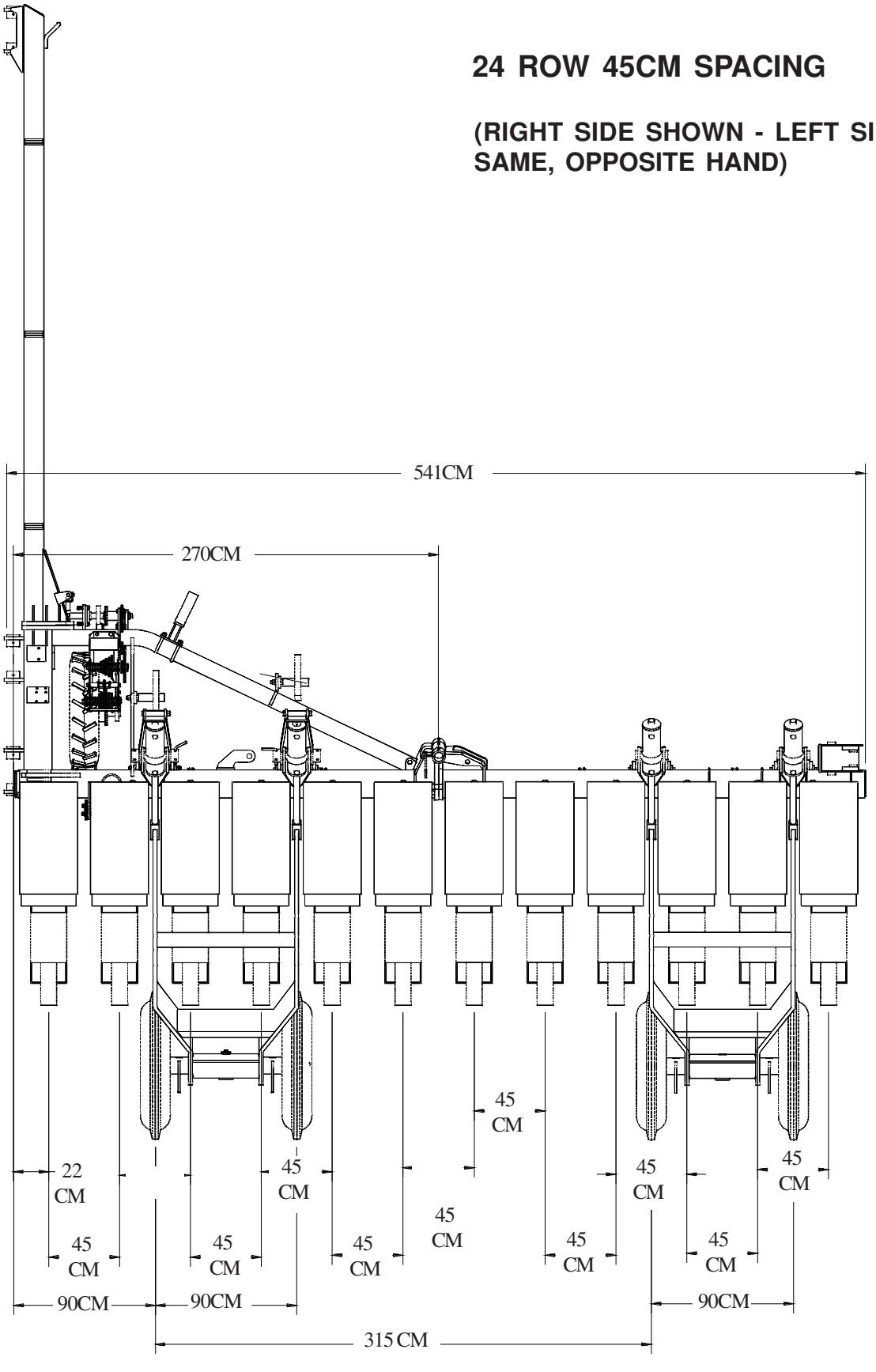
(RIGHT SIDE SHOWN - LEFT SIDE SAME, OPPOSITE HAND)



24R22 MARKER DOWNGANG

24 ROW 45CM SPACING

(RIGHT SIDE SHOWN - LEFT SIDE SAME, OPPOSITE HAND)

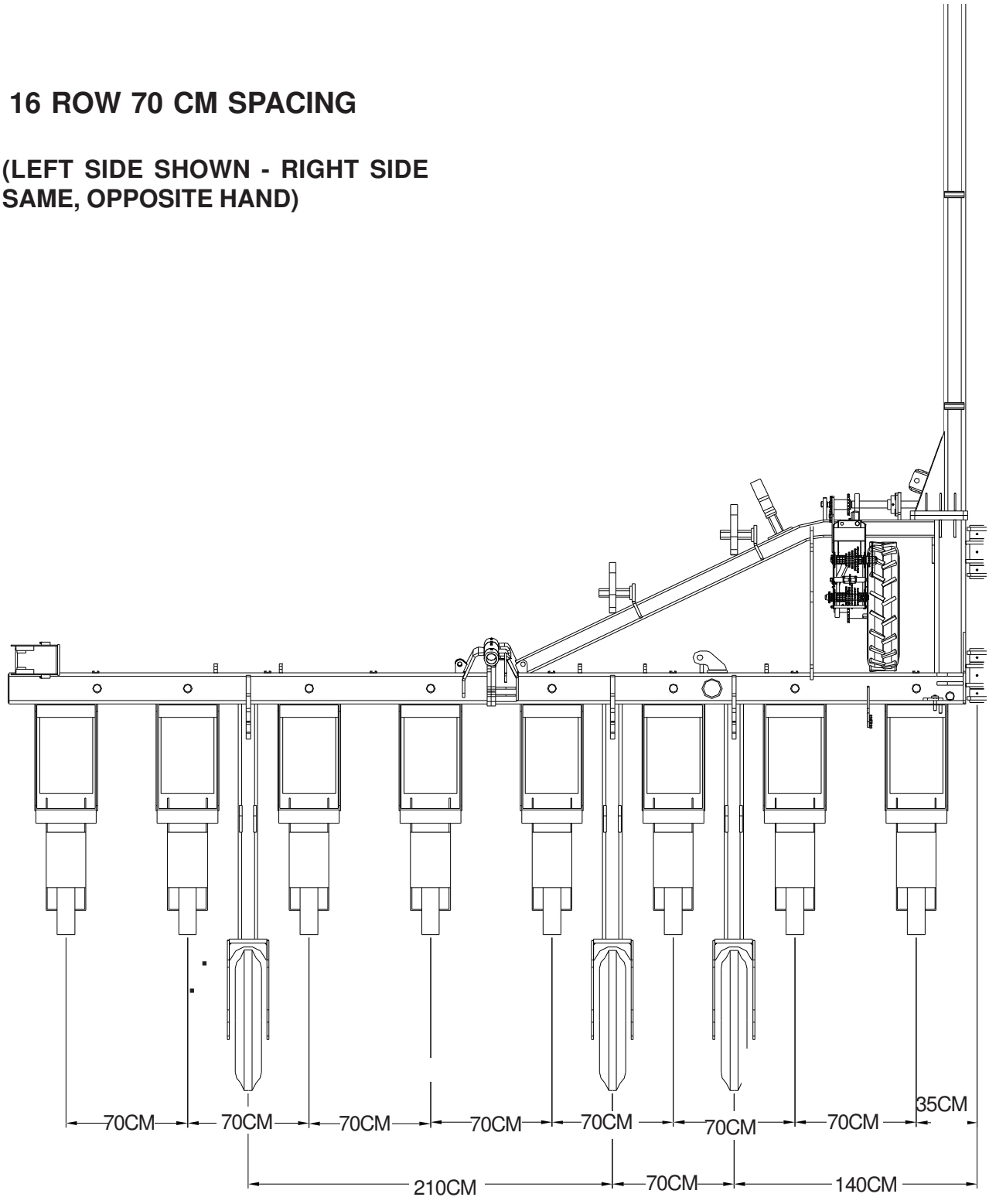


LAYOUT1A

ROW UNIT PLACEMENT INFORMATION

16 ROW 70 CM SPACING

(LEFT SIDE SHOWN - RIGHT SIDE SAME, OPPOSITE HAND)



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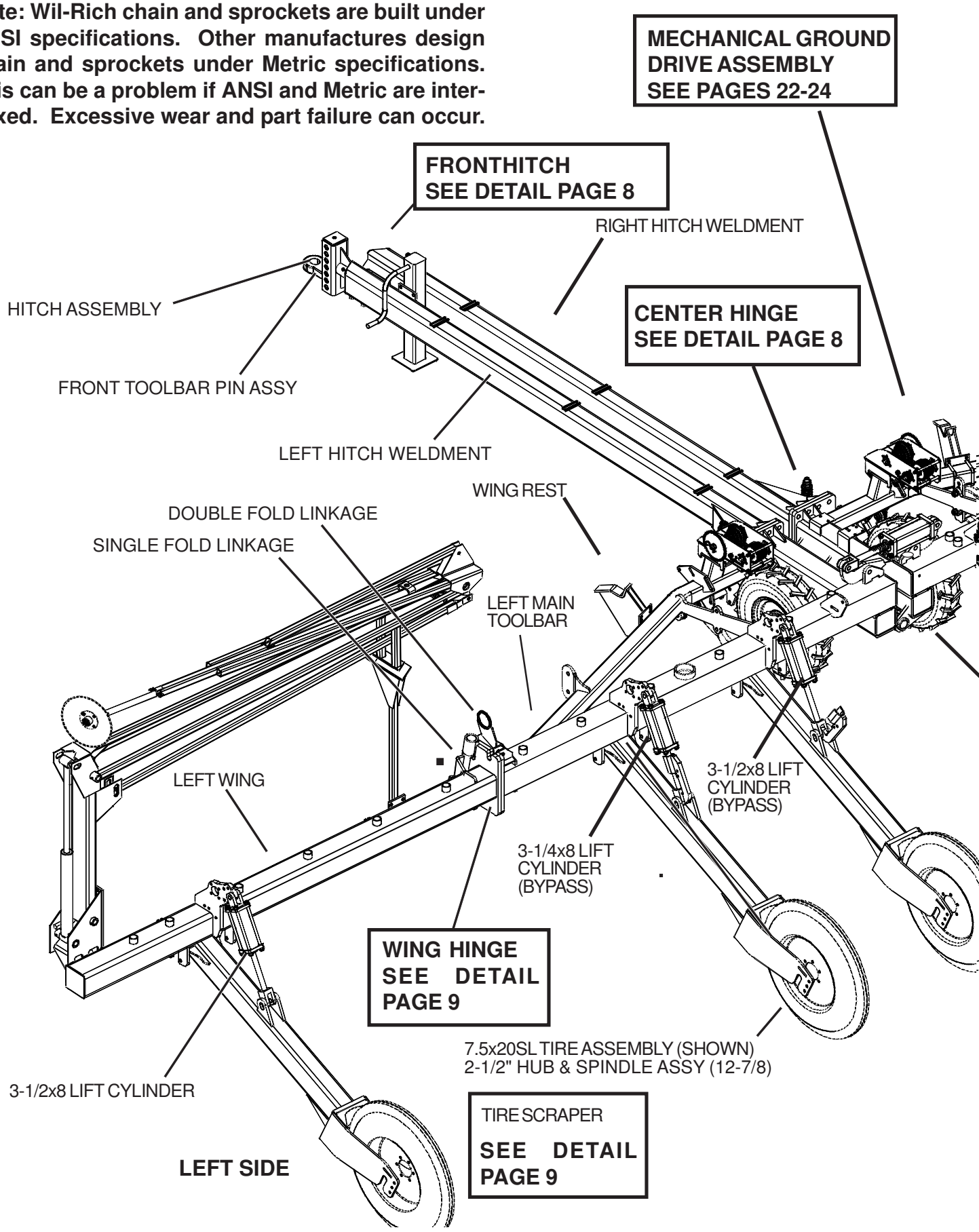
ASSEMBLY INFORMATION

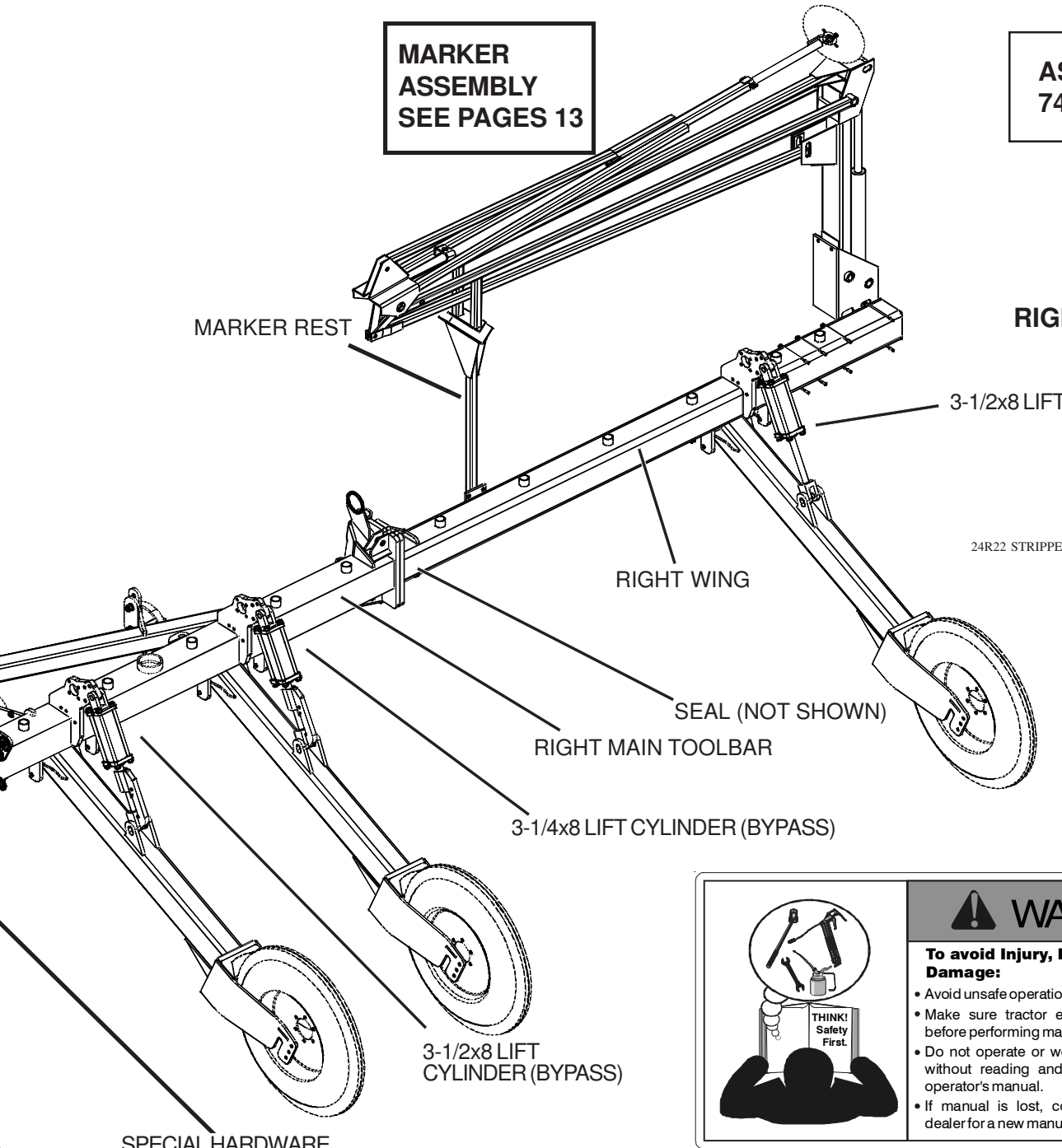
Note: Wil-Rich chain and sprockets are built under ANSI specifications. Other manufactures design chain and sprockets under Metric specifications. This can be a problem if ANSI and Metric are intermixed. Excessive wear and part failure can occur.

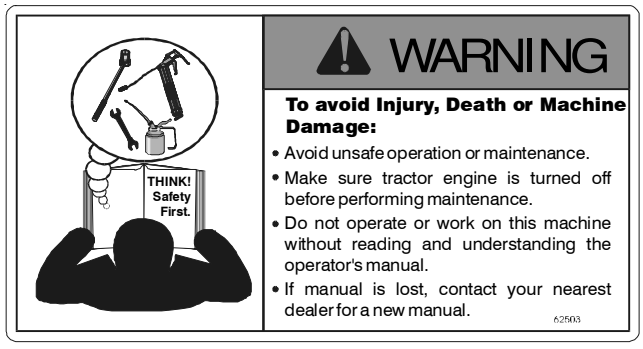


MARKER ASSEMBLY SEE PAGES 13

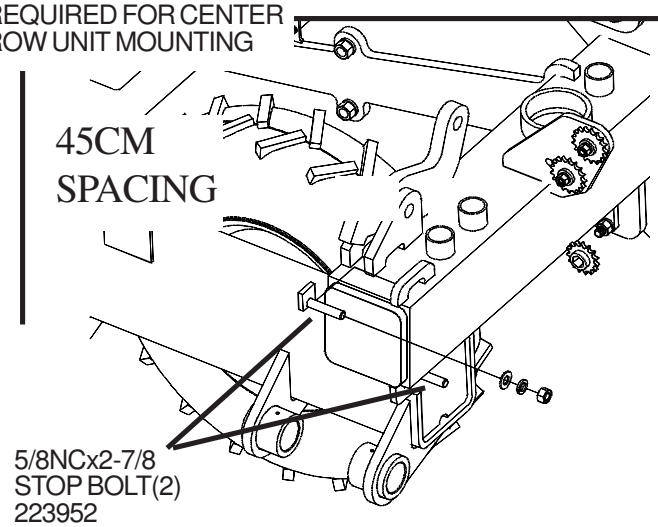
ASSY HDWR 74277-4

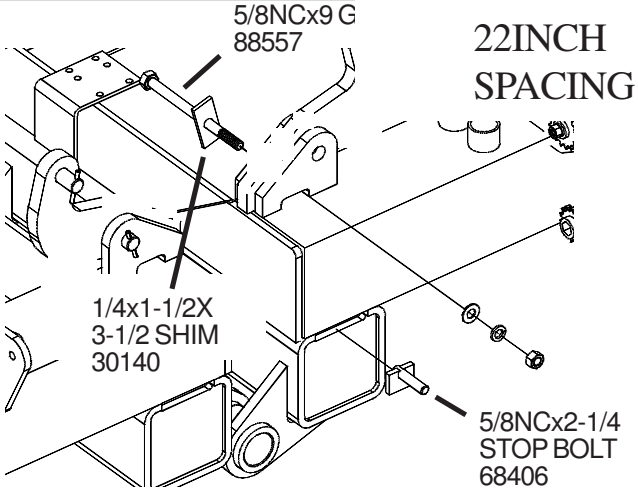
RIGHT SIDE





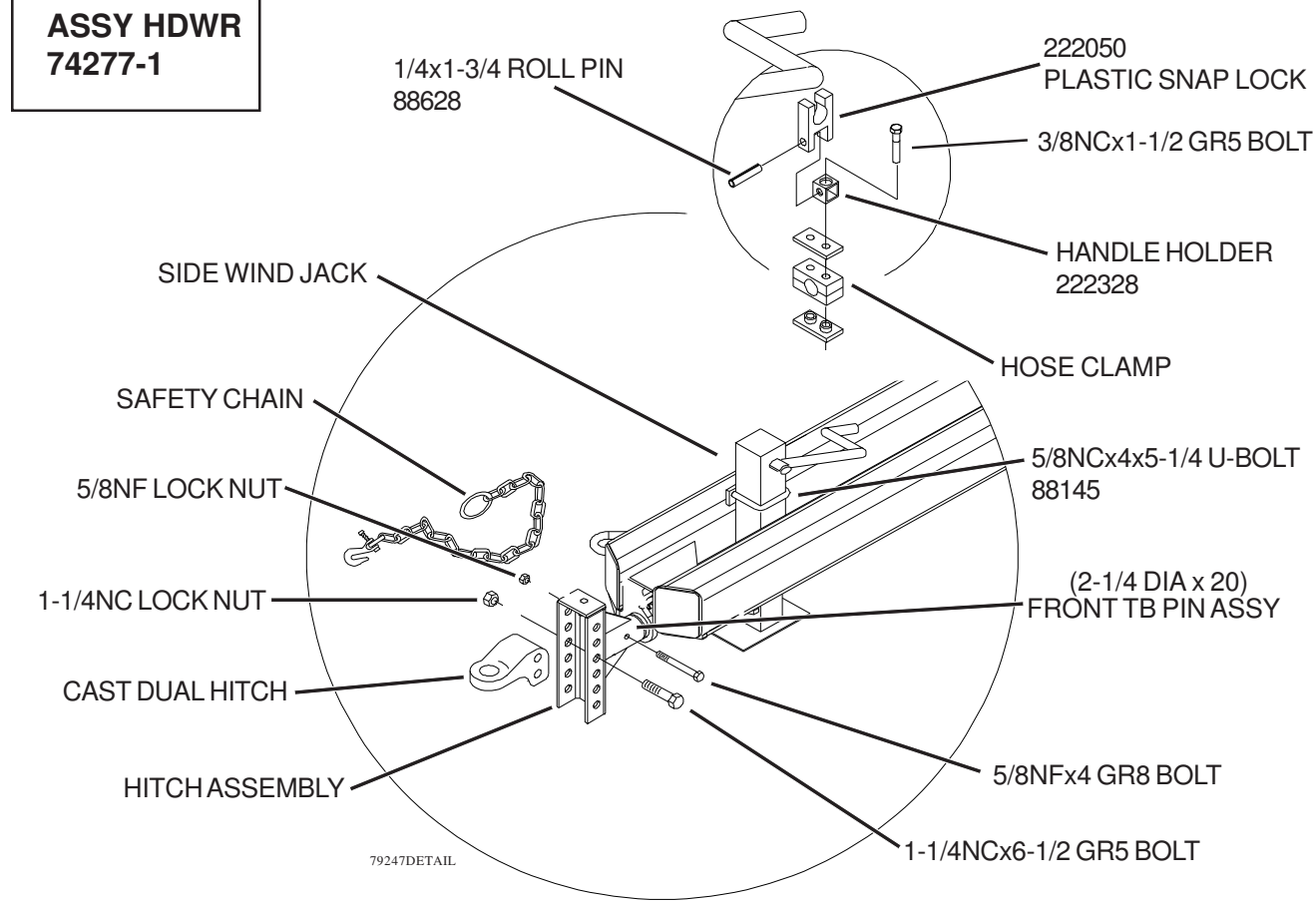
SPECIAL HARDWARE REQUIRED FOR CENTER ROW UNIT MOUNTING

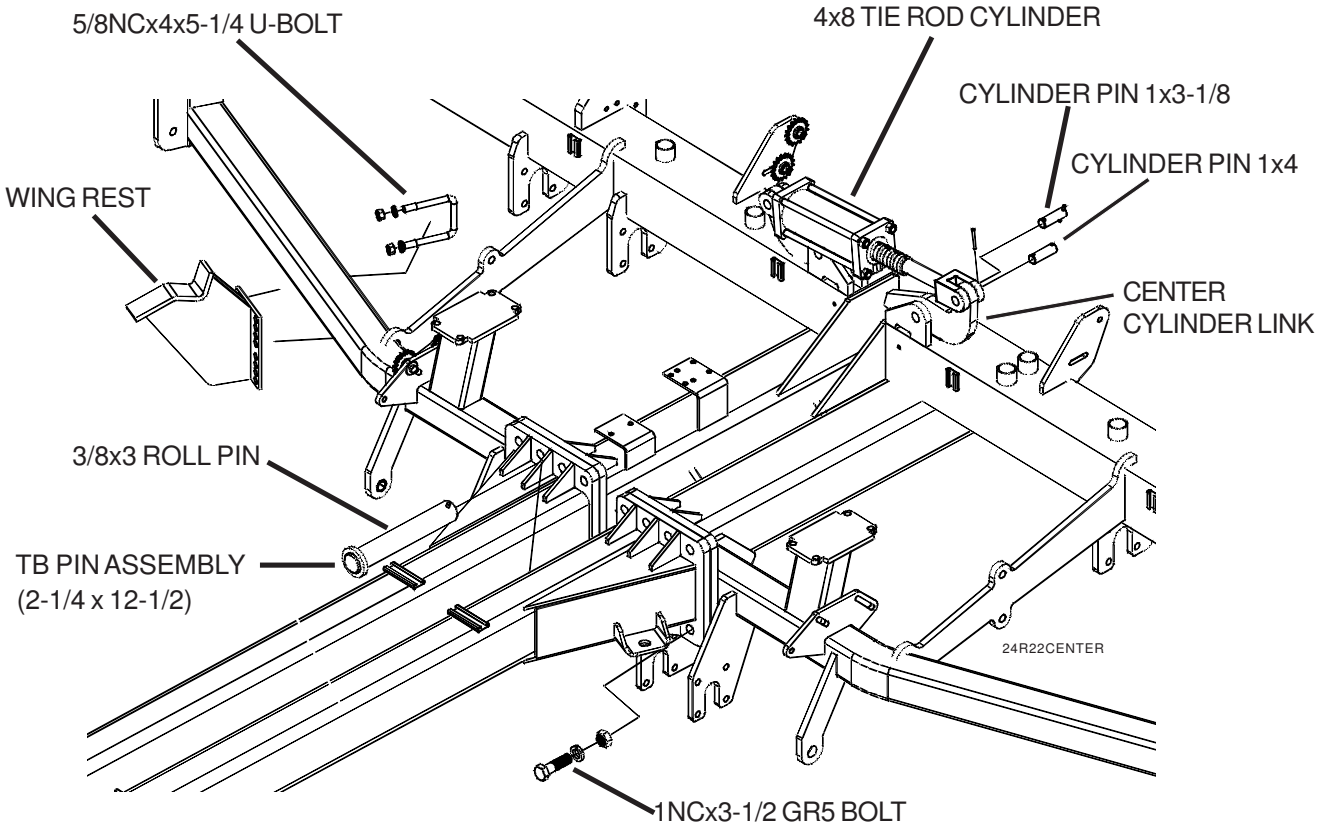




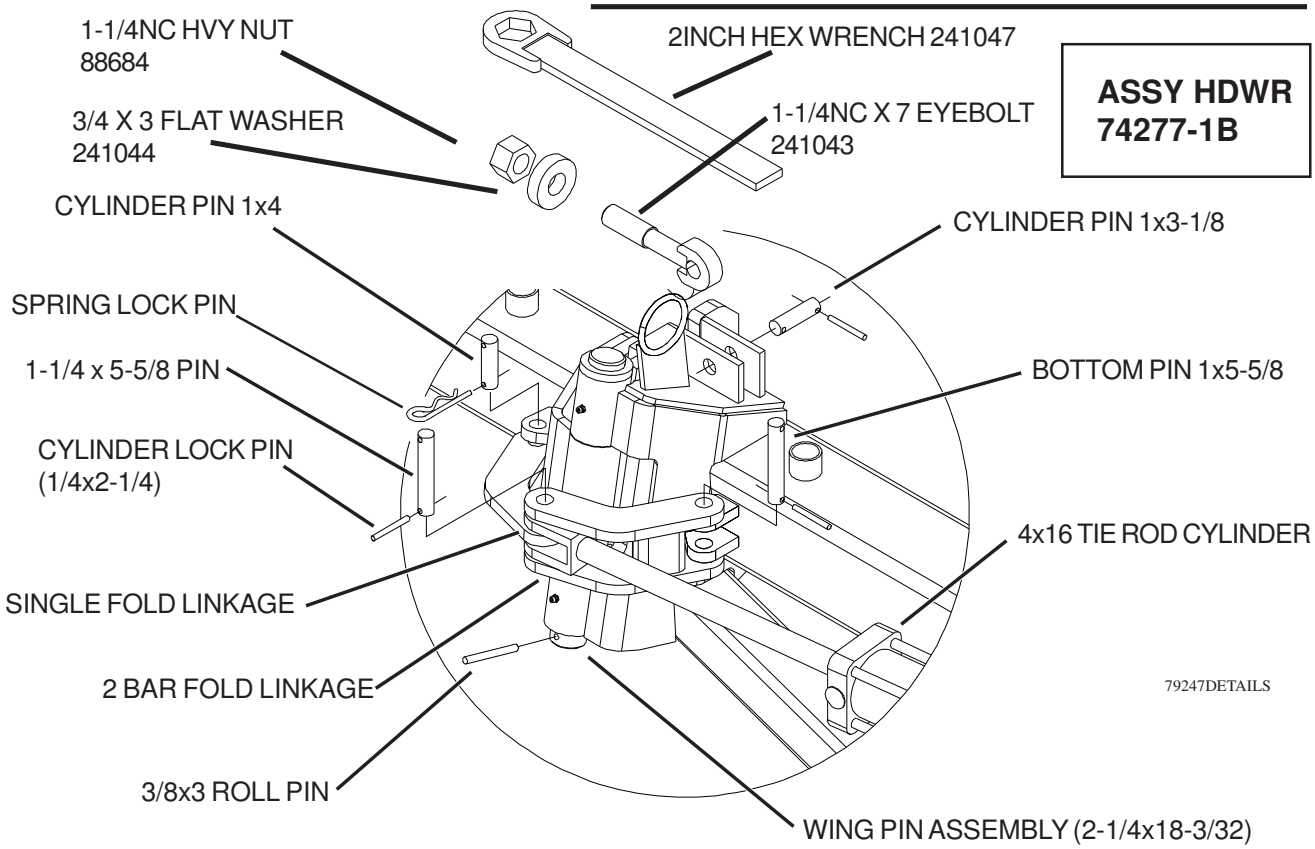
HITCH & CENTER HINGE

ASSY HDWR
74277-1



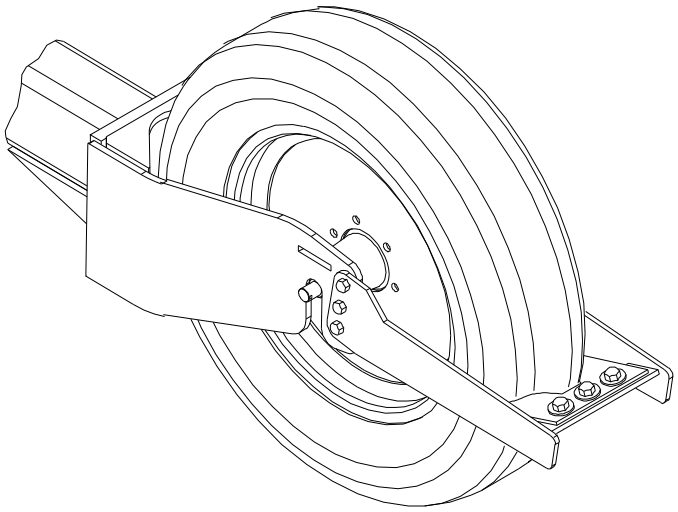


WING HINGE & MUD SCRAPER



ASSY HDWR 74277-1B

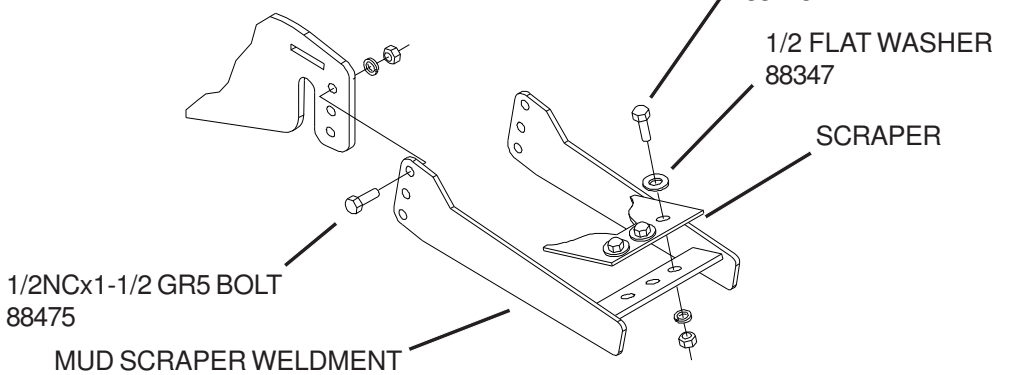
79247DETAILS



YOKE HUB ASSEMBLY INSTRUCTIONS

TIGHTEN SLOTTED HEX NUT UNTIL THERE'S A SLIGHT DRAG WHEN THE TIRE IS ROTATED BY HAND. THEN, BACK OFF TO THE CLOSEST CROSS HOLE AND INSERT COTTER PIN.

CHECK AFTER FIRST DAY USE AND SEASONLY AFTER THAT

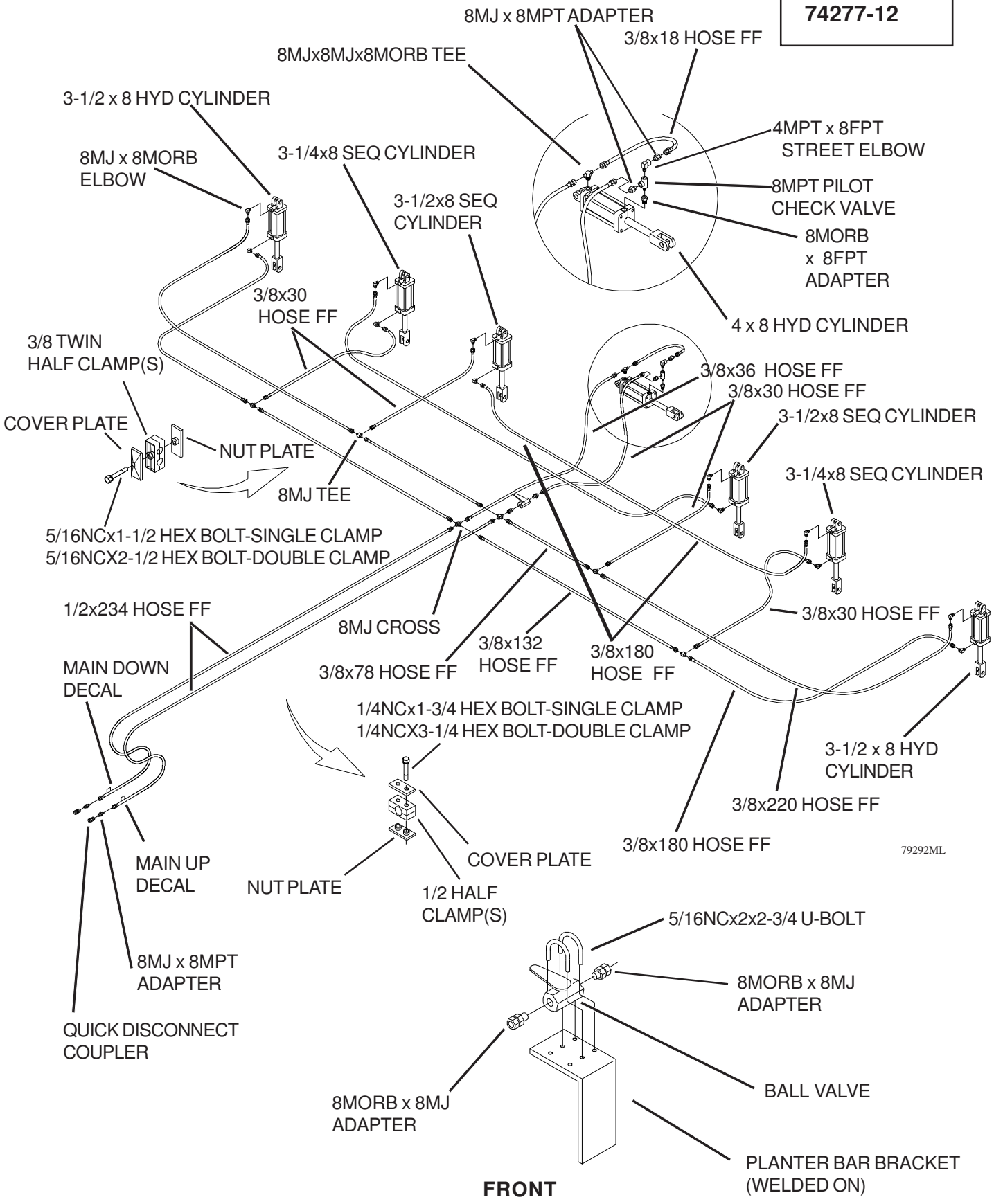


ASSY HDWR 74277-5

79246SCRAPER

24R22 LIFT HYDRAULICS

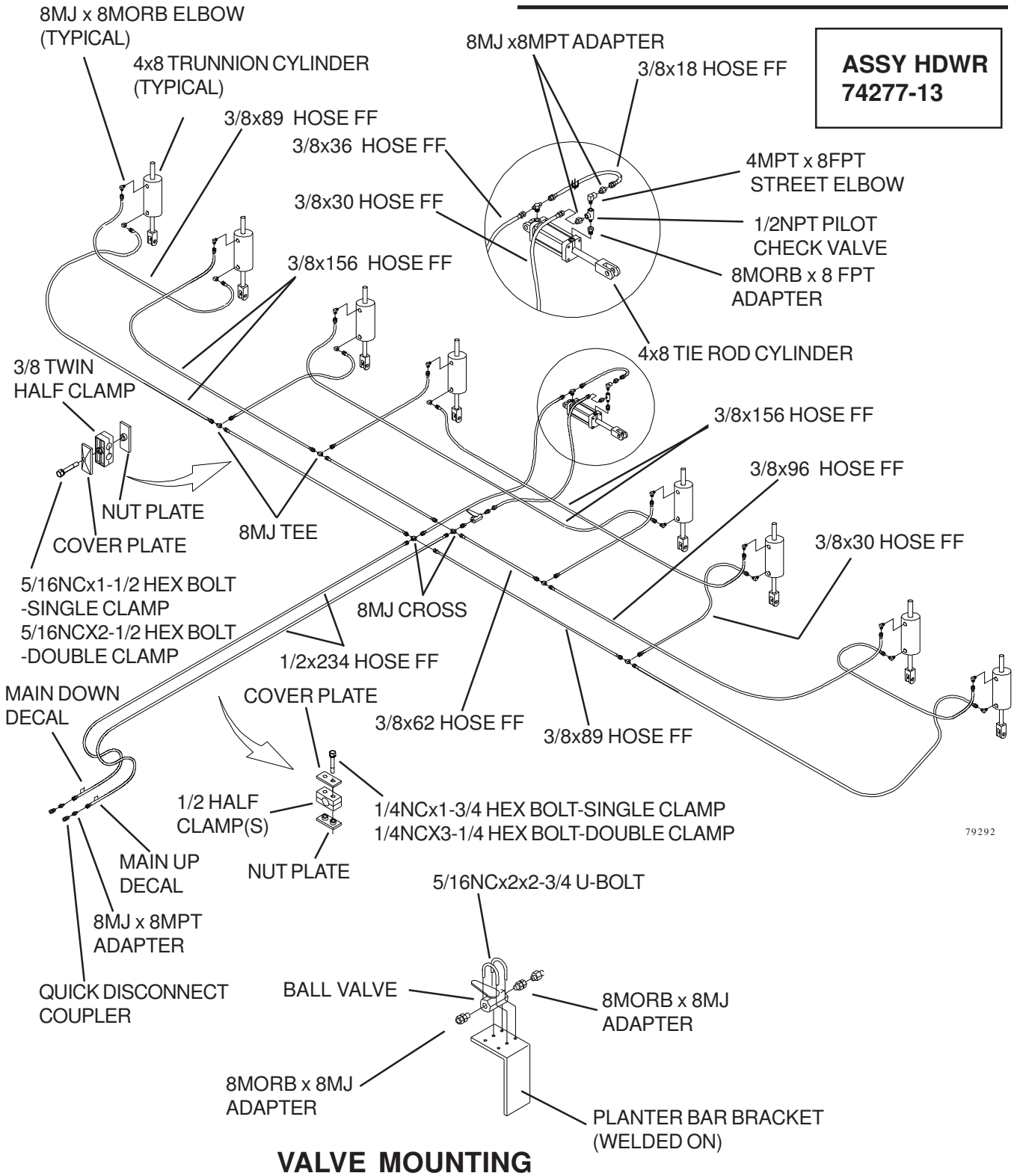
ASSY HDWR 74277-12



VALVE MOUNTING

24R45CM LIFT HYDRAULICS

ASSY HDWR 74277-13

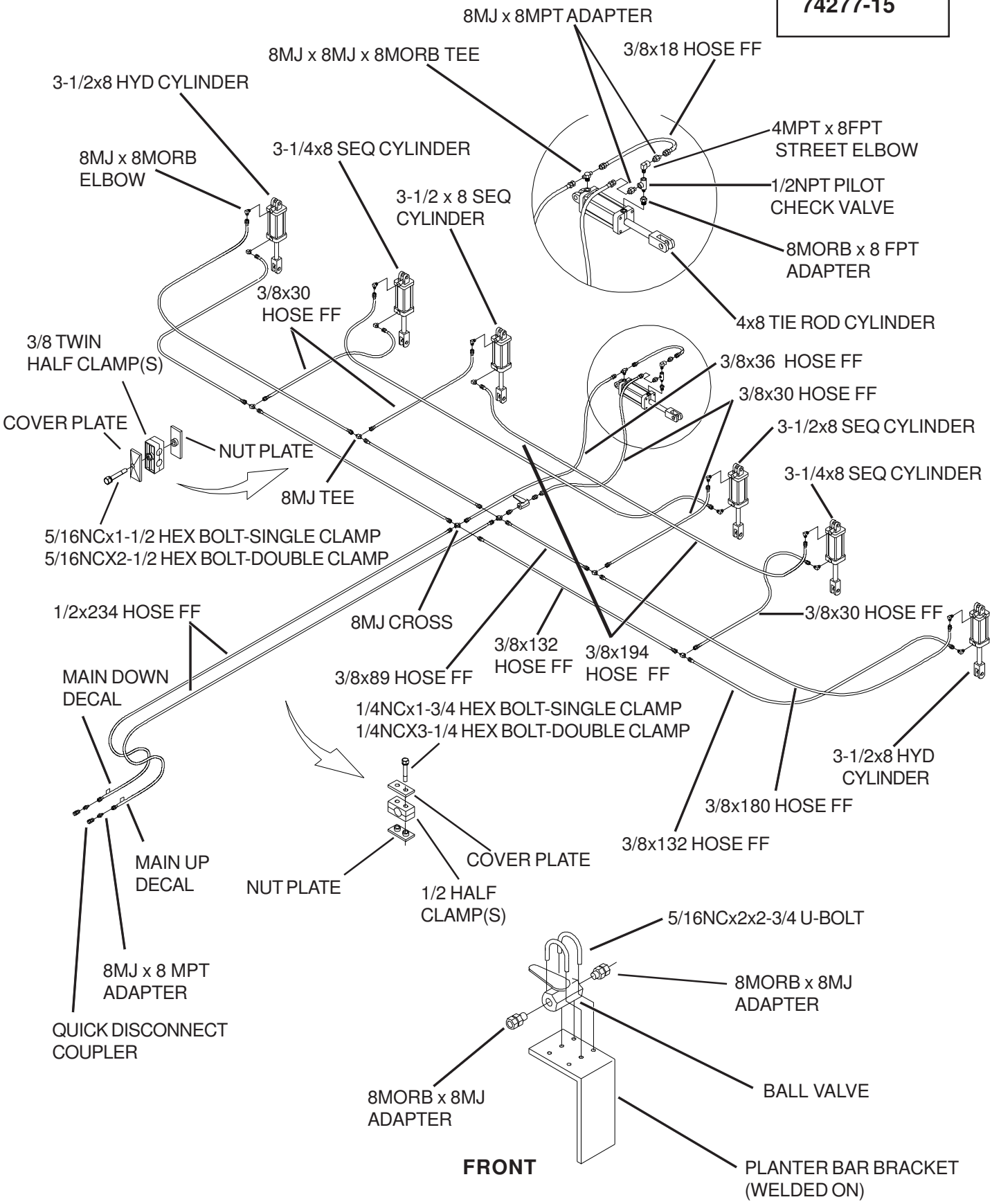


VALVE MOUNTING

FRONT

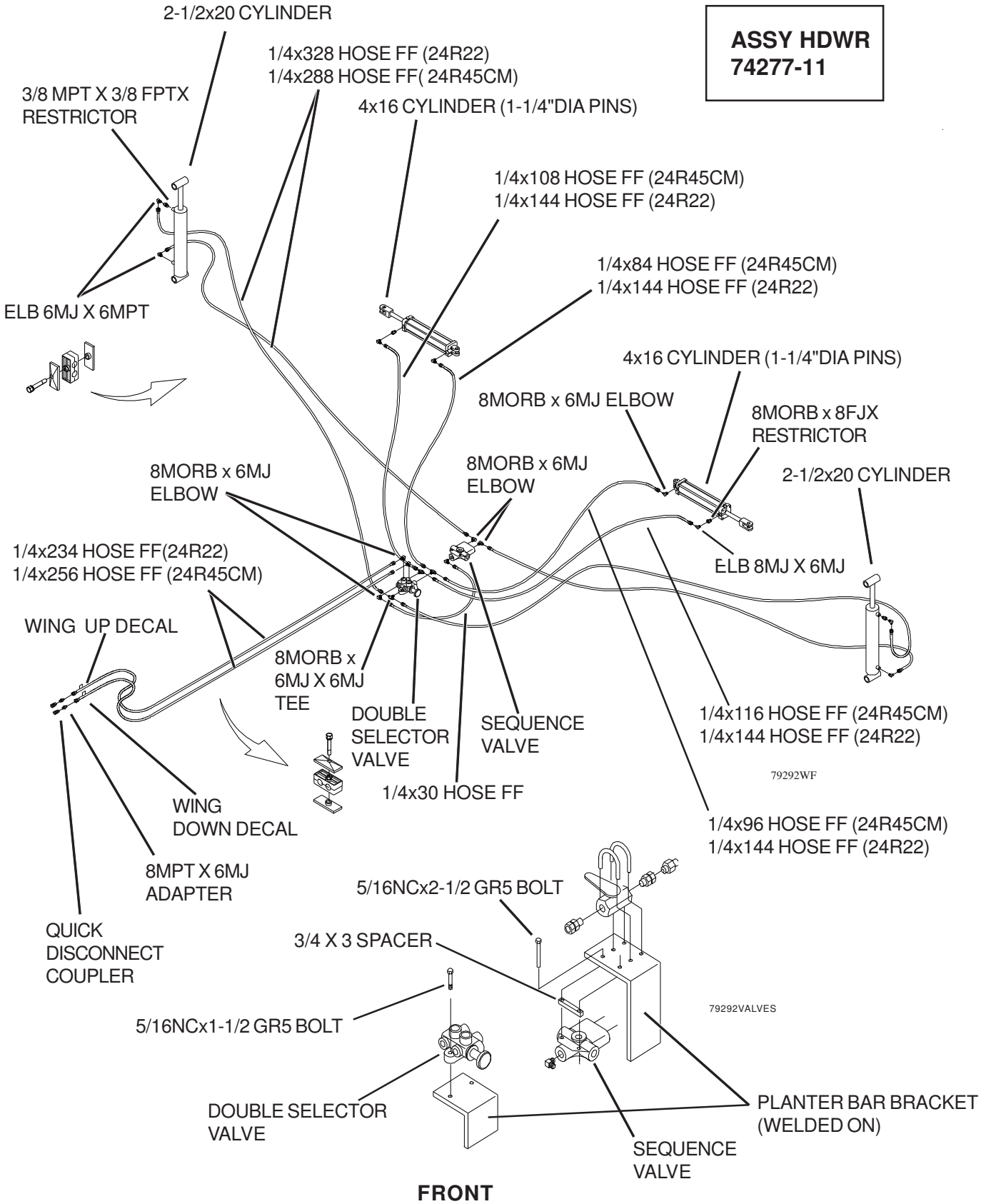
16R70CM LIFT HYDRAULICS

ASSY HDWR 74277-15



VALVE MOUNTING

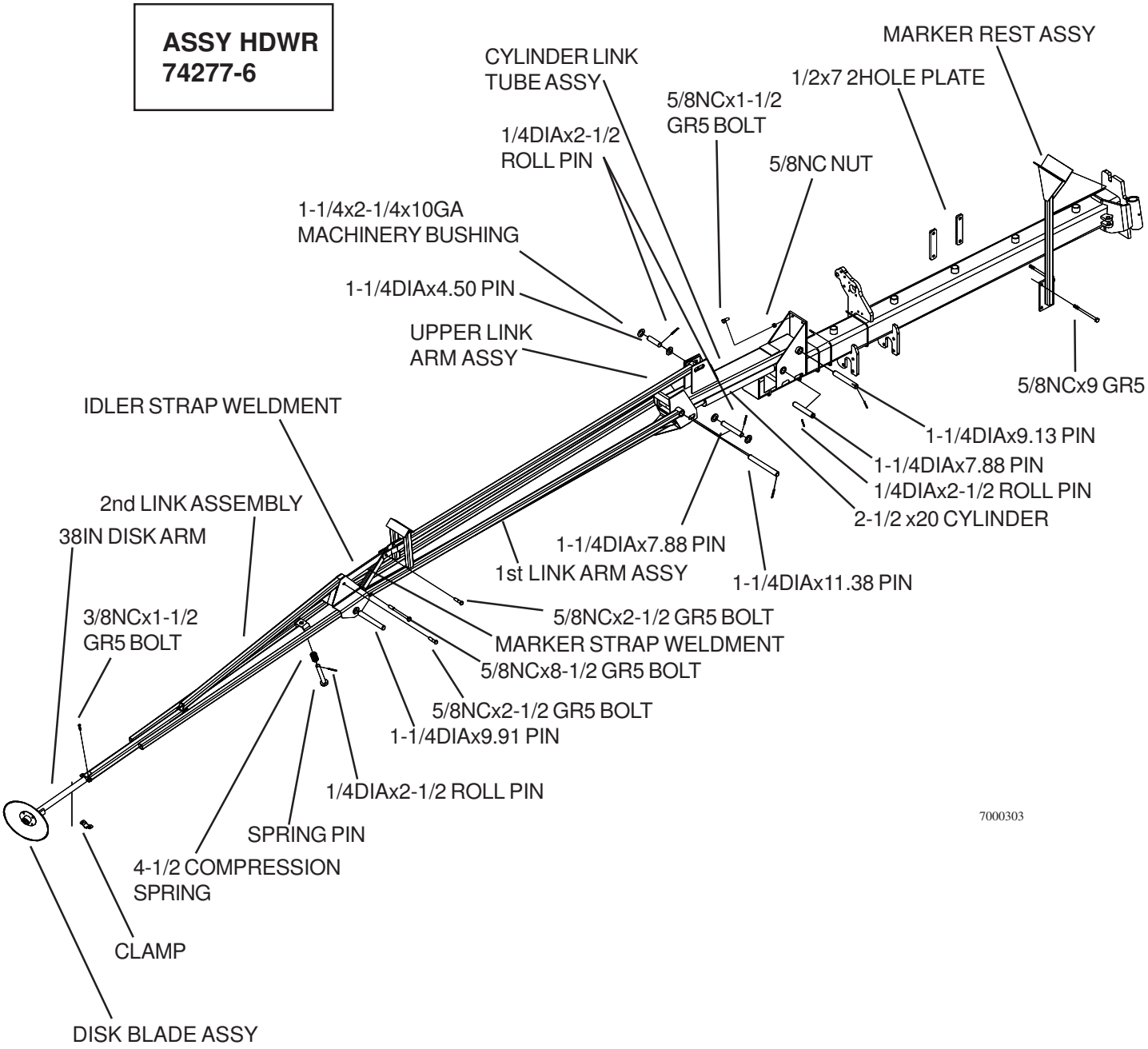
WING FOLD AND MARKER HYDRAULICS



VALVE MOUNTING

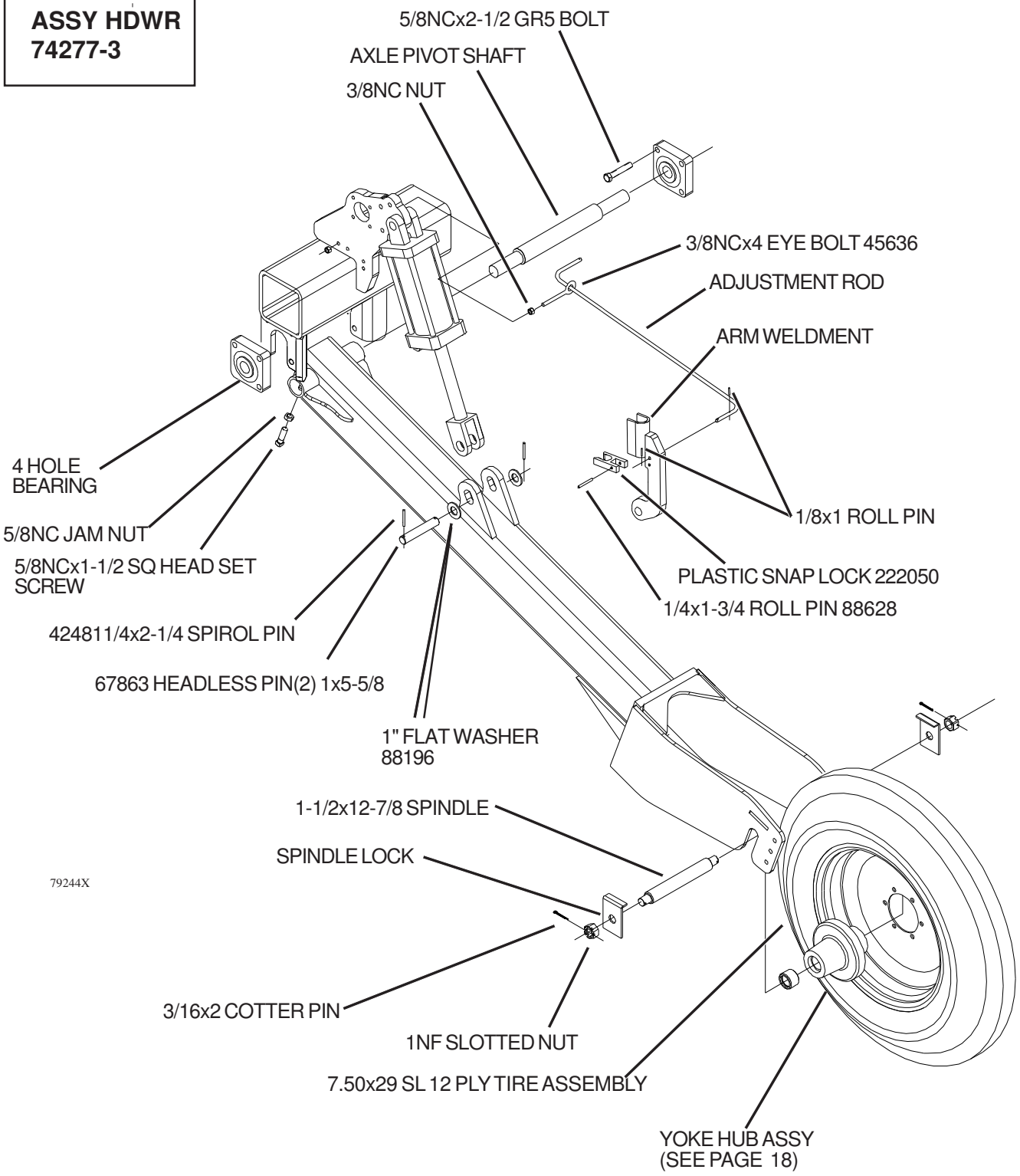
MARKER

ASSY HDWR
74277-6

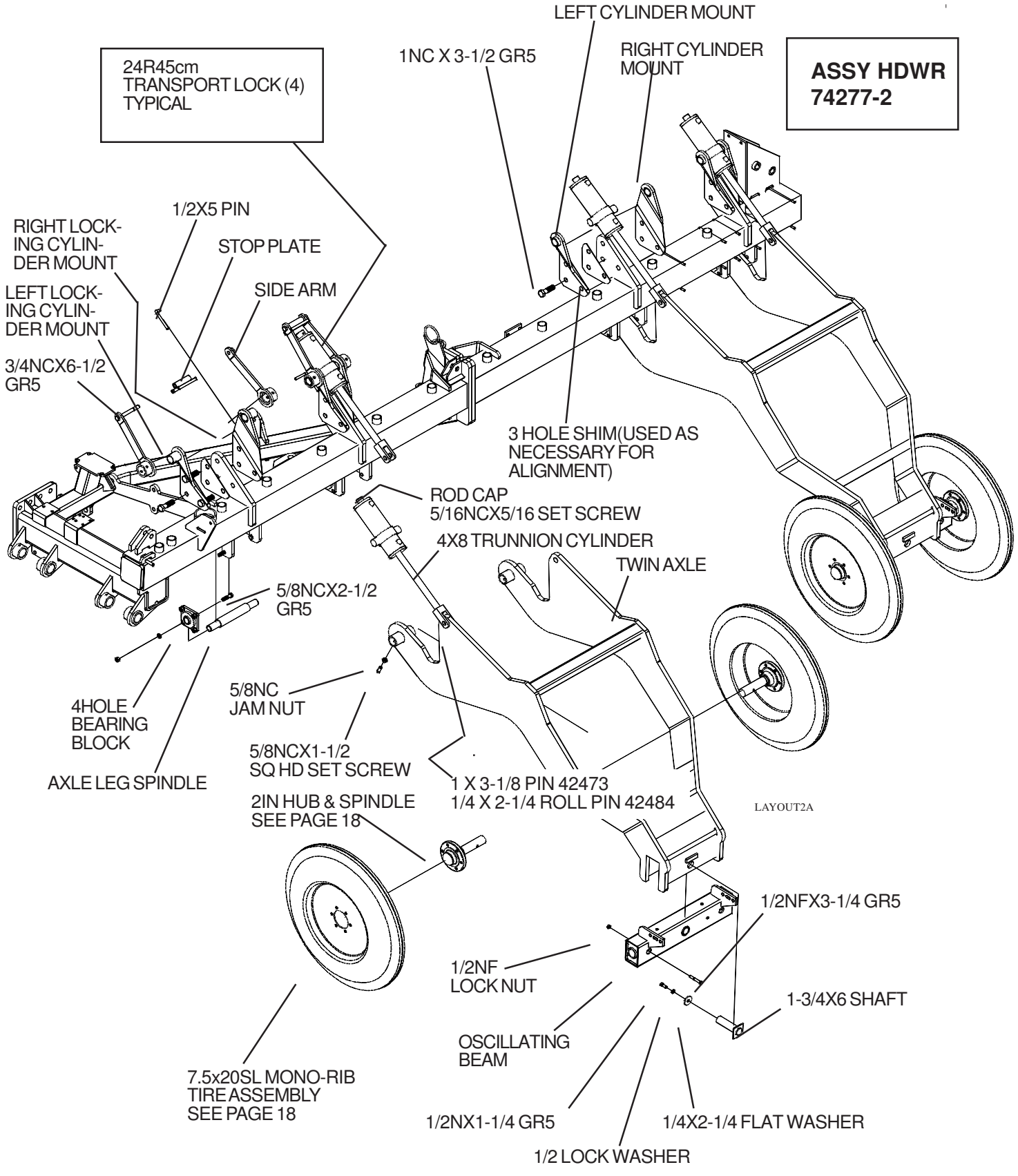


24R22in LIFT AXLE ASSEMBLY

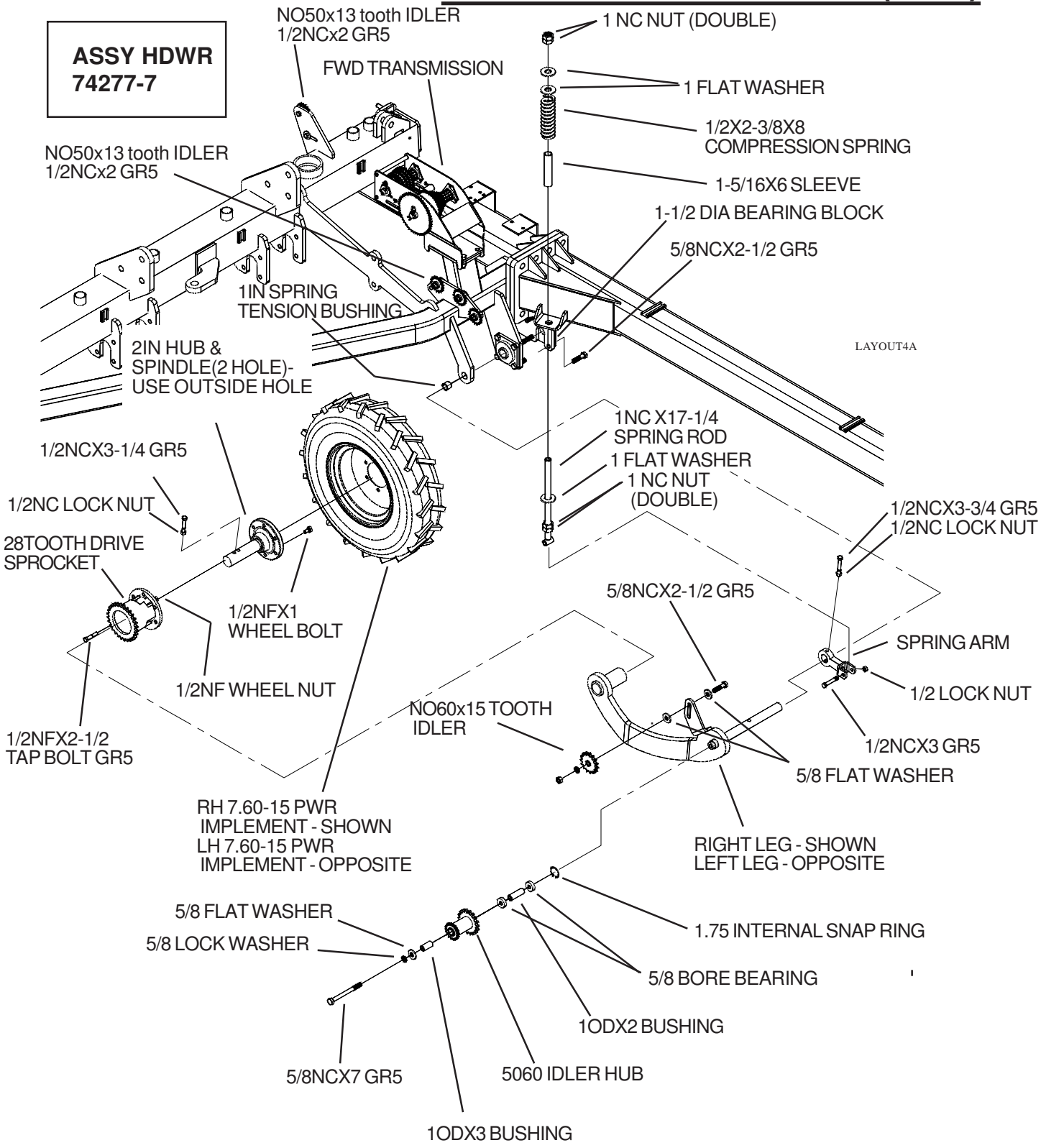
ASSY HDWR 74277-3



24R45cm - LIFT AXLE ASSEMBLY



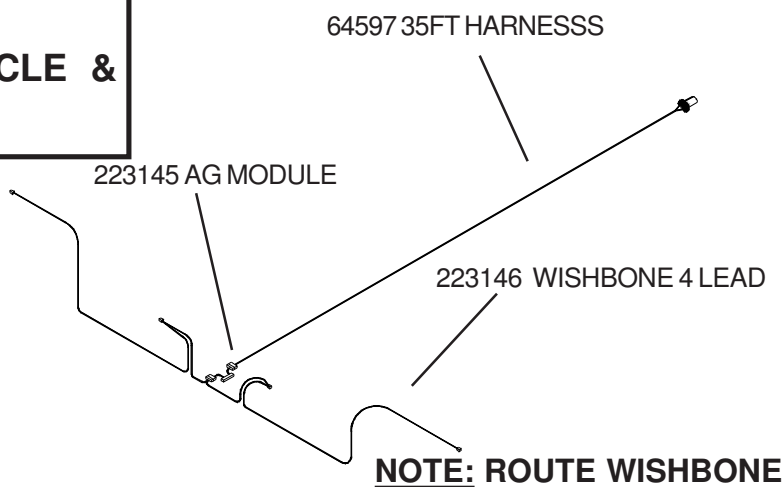
FORWARD WHEEL DRIVE (FWD)



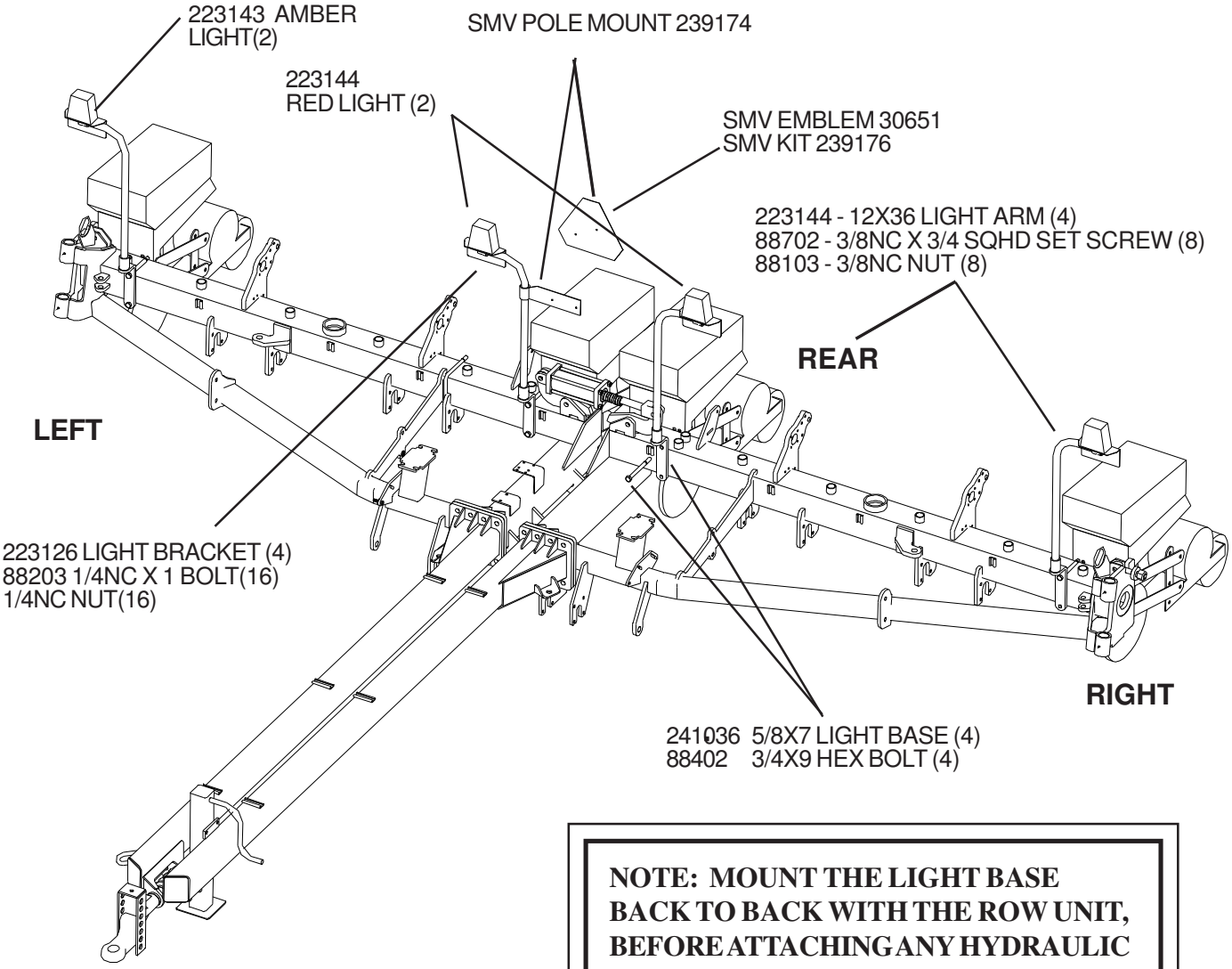
SAFETY LIGHT ASSEMBLY

FWD PLANTER BAR
(SMV) SLOW MOVING VEHICLE & LIGHT PLACEMENT

NOTE: MOUNT AMBER LIGHTS AS WIDE AS POSSIBLE. THE AMBER LIGHTS MUST BE MOUNTED NO MORE THAN 16" FROM THE IMPLEMENT EXTREMITIES.



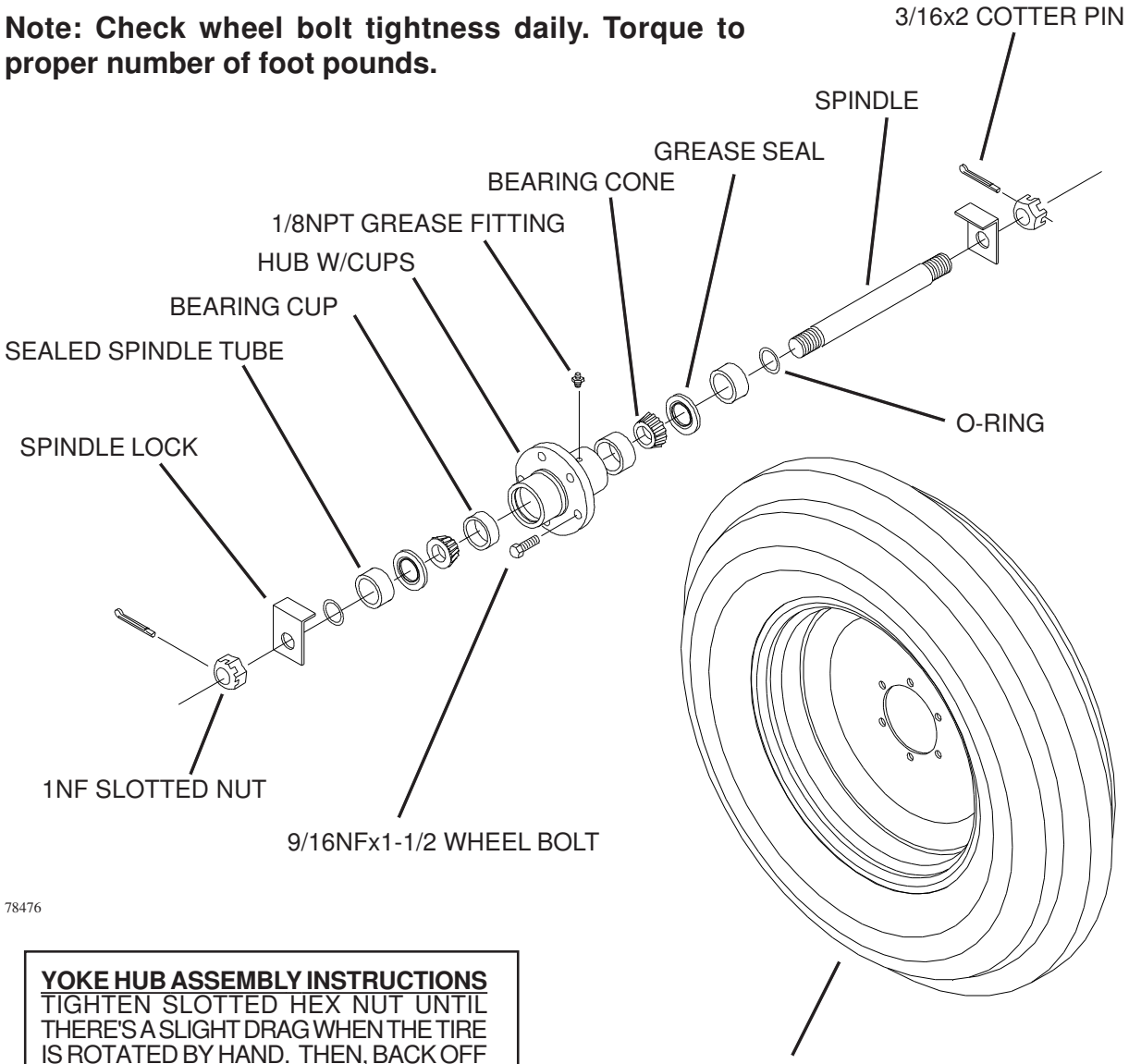
NOTE: ROUTE WISHBONE THRU LIGHT ARMS



NOTE: MOUNT THE LIGHT BASE BACK TO BACK WITH THE ROW UNIT, BEFORE ATTACHING ANY HYDRAULIC HOSES OR ELECTRICAL WIRES.

2-1/2" HUB & SPINDLE W/7.50x20 SL TIRE ASSY

Note: Check wheel bolt tightness daily. Torque to proper number of foot pounds.



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YOKE HUB ASSEMBLY INSTRUCTIONS
TIGHTEN SLOTTED HEX NUT UNTIL THERE'S A SLIGHT DRAG WHEN THE TIRE IS ROTATED BY HAND. THEN, BACK OFF TO THE CLOSEST CROSS HOLE AND INSERT COTTER PIN.
CHECK AFTER FIRST DAY USE AND SEASONLY AFTER THAT

Tire pressure should be checked regularly and maintained as follows:

7.50x20 SL (12PLY) Tire Assy - 72 PSI

Note: MAXIMUM SPEED for 7.50x20 Single Rib Tire is 20 M.P.H.

Wherever the terms "left" and "right" are used, it must be understood to mean from a position behind and facing the machine.

Lubricate all bearings and moving parts as you proceed and make sure they work freely.

Loosely install all bolts connecting mating parts before final tightening.

When tightening bolts, they must be torqued to the proper number of foot-pounds as indicated in the table unless specified. It is important that all bolts be kept tight.

On new machines, all nuts and bolts must be re-checked after a few hours of operation.

When replacing a bolt, use only a bolt of the same grade or higher. Except in shear bolt applications, where you must use the same grade bolt.

GRADE 2		GRADE 5			GRADE 8		
							
TORQUE IN FOOT POUNDS							
BOLT DIA		3/8	1/2	5/8	3/4	7/8	1
HEX HEAD		9/16	3/4	15/1	1-1/8	1-5/1	1-1/2
UNC	GR2	18	45	89	160	252	320
UNC	GR5	30	68	140	240	360	544
UNC	GR8	40	100	196	340	528	792
UNF	GR2	21	51	102	178	272	368
UNF	GR5	32	70	168	264	392	572
UNF	GR8	48	112	216	368	792	840

TORQUE.EPS

Bolts with no markings are grade 2

Grade 5 bolts furnished with the machine are identified by three radial lines on the head.

Grade 8 bolts furnished with the machine are identified by six radial lines on the head.

All U-bolts are grade 5.

REQUIREMENTS

Wil-Rich will supply:
Planter Bar
Markers
Hydraulics for bar components

Purchaser will supply:
Planting Units w/accessories
Vacuum Gauges
Transmission - 2
Vacuum Blower - 2
Vacuum Hoses (25 for 24 row)
Hinge Drive couplers (7/8 Hex) 4 - 2/Hinge
Monitoring equipment
7/8 Hex shaft for Seed Drive
(4 pieces at approx.130" each)

⚠ CAUTION

TO AVOID POSSIBLE INJURY:

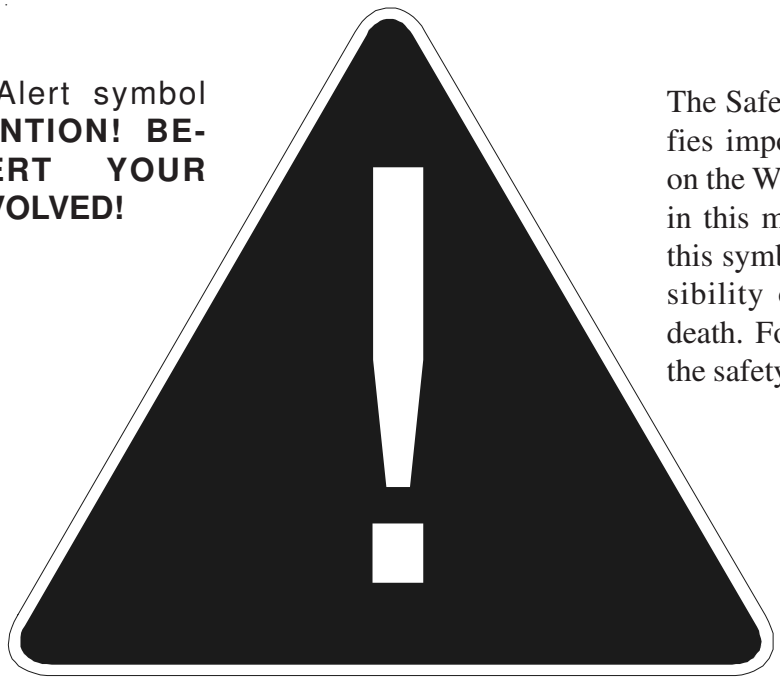
- **Always lower implement to the ground for servicing or when not in use.**
- **Never allow anyone to ride on implement.**
- **Keep everyone clear of tractor and implement while in use or while tractor is running.** 31926

49165.EPS

PERSONAL SAFETY IS IMPORTANT!

ALL PERSONNEL INVOLVED WITH THE ASSEMBLY AND/OR OPERATION OF THIS EQUIPMENT MUST BE INFORMED OF PROPER SAFETY PROCEDURES. OPERATOR'S/ ASSEMBLY MANUALS PROVIDE THE NECESSARY INFORMATION. IF THE MANUAL IS LOST FOR A PARTICULAR IMPLEMENT, ORDER A REPLACEMENT AT ONCE. OPERATOR'S AND ASSEMBLY MANUALS ARE AVAILABLE AT NO CHARGE UPON REQUEST.

This Safety Alert symbol means **ATTENTION! BECOME ALERT YOUR SAFETY IS INVOLVED!**



The Safety Alert symbol identifies important safety messages on the Wil-Rich Planter Bar and in this manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons

Accidents Disable and Kill
Accidents Cost
Accidents Can Be Avoided

SIGNAL WORDS:

Note the use of the signal words **DANGER, WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guidelines:

DANGER

An immediate and specific hazard which WILL result in severe personal injury or death if the proper precautions are not taken.

WARNING

A specific hazard or unsafe practice which COULD result in severe personal injury or death if the proper precautions are not taken

CAUTION

Unsafe practices which COULD result in personal injury if proper practices are not taken, or as a reminder of good safety practices.

ADDRESS INQUIRIES TO: WIL-RICH PO BOX 1030
WAHPETON, ND 58074
PH (701) 642-2621 FAX (701) 642-3372

SAFETY

YOU are responsible for SAFE operation and maintenance of your Wil-Rich Planter Bar. You must ensure that you and anyone else who is going to operate, maintain or work around the Planter Bar be familiar with the operating and maintenance procedures and related safety information contained in this manual. This manual will take you step by step through your working day, alerts you to all good safety practices that should be adhered to while operating this equipment.

Remember, YOU are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that EVERYONE operating this equipment is familiar with the recommended operating and maintenance procedures and follows all safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

PT 2200 owners must give operating in structions to operators and employees before allowing them to operate the Planter Bar, and at least annually thereafter per OSHA regulation 1928.57.

The most important safety device on this equipment is a safe operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.

A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes themselves and bystanders to possible serious injury or death.

Do not modify the equipment in any way. Unauthorized modifications may impair the function and/or safety and could affect the life of the equipment.

Think SAFETY! Work SAFELY!

General Safety

Read and understand the operator's manual and all safety signs before operating, maintaining or adjusting the PT 2200.

Install and properly secure all shields and guards before operating.

Have a first-aid kit available for use should the need arise and know how to use it.

Have a fire extinguisher available for use should the need arise and know how to use it.

Clear the area of people and remove foreign objects from the machine before starting and operating.

Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing and head.

Do not allow riders.

Wear suitable ear protection for prolonged exposure to excessive noise.

Stop tractor engine, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

Review safety related items with all operators annually

⚠ WARNING

TO AVOID INJURY OR MACHINE DAMAGE:

- **BEFORE OPERATING; Study Operators Manual, safety messages and safe operating procedures, read safety signs on this machine.**
- **Transport on public roads - Observe Federal, State and Local regulations; display SMV emblem: Attach proper strength implement safety chain; and limit maximum speed to 20mph (32km/h).**
- **Lower or block all elevated components before servicing or leveling this machine.**

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HYDRAULIC SAFETY

Always place all tractor hydraulic controls in neutral before dismounting.

Make sure that all components in the hydraulic system are kept in good condition and are clean.

Relieve pressure before working on hydraulic system.

Replace any worn, cut, abraded, flattened or crimped hoses and metal lines.

Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

Wear proper hand and eye protection when searching for high pressure leaks. Use a piece of cardboard as a backstop instead of hands to isolate and identify a leak.

If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develope from hydraulic fluid piercing the skin surface.

Before applying pressure to the system, make sure all components are tight and that lines, hoses and couplings are not damaged.

Think SAFETY! Work SAFELY!

TRANSPORT SAFETY

Read and understand ALL the information in the Operator's Manual regarding procedures and SAFETY when moving Planter Bar in the field/ yard or on the road.

Check with local authorities regarding transportation on public roads. Obey all applicable laws and regulations.

Always travel at a safe speed. Use caution when making corners or meeting traffic.

Make sure SMV (Slow Moving Vehicle) emblem and all lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic

Use a drawbar pin with provisions for a mechanical retainer.

Attach a safety chain before moving.

Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the road shoulder, if permitted by law.

Always use hazard warning flashers on tractor when transporting unless prohibited by law.

Do not allow riders.

Do not exceed 20 mph during transport.

STORAGE SAFETY

Store unit in an area away from human activity.

Do not permit children to play around the stored unit.

Store in a dry, level area. Support the base with planks if required.

TIRE SAFETY

Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.

Have a qualified tire dealer or repair service perform required tire maintenance.

SAFETY DECALS

Keep safety decals and signs clean and legible at all times.

Replace safety decals and signs that are missing or have become illegible.

Replaced parts that displayed a safety sign should also display the current sign.

Safety decals or signs are available from your Dealer Parts Department.

How to install Safety Decals:

Be sure that the installation area is clean and dry.

Decide on the exact position before you remove the backing paper.

Remove the smallest portion of the split backing paper.

Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.

Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.

Small air pockets can be pierced with a pin and smoothed out using the piece of decal backing paper.

SIGN-OFF FORM

WIL-RICH follows the general standard specified by the American Society of Agricultural Engineers (ASAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the PT 2200 Planter Bar must read and understand ALL Safety, Operation, and Maintenance information presented in this manual.

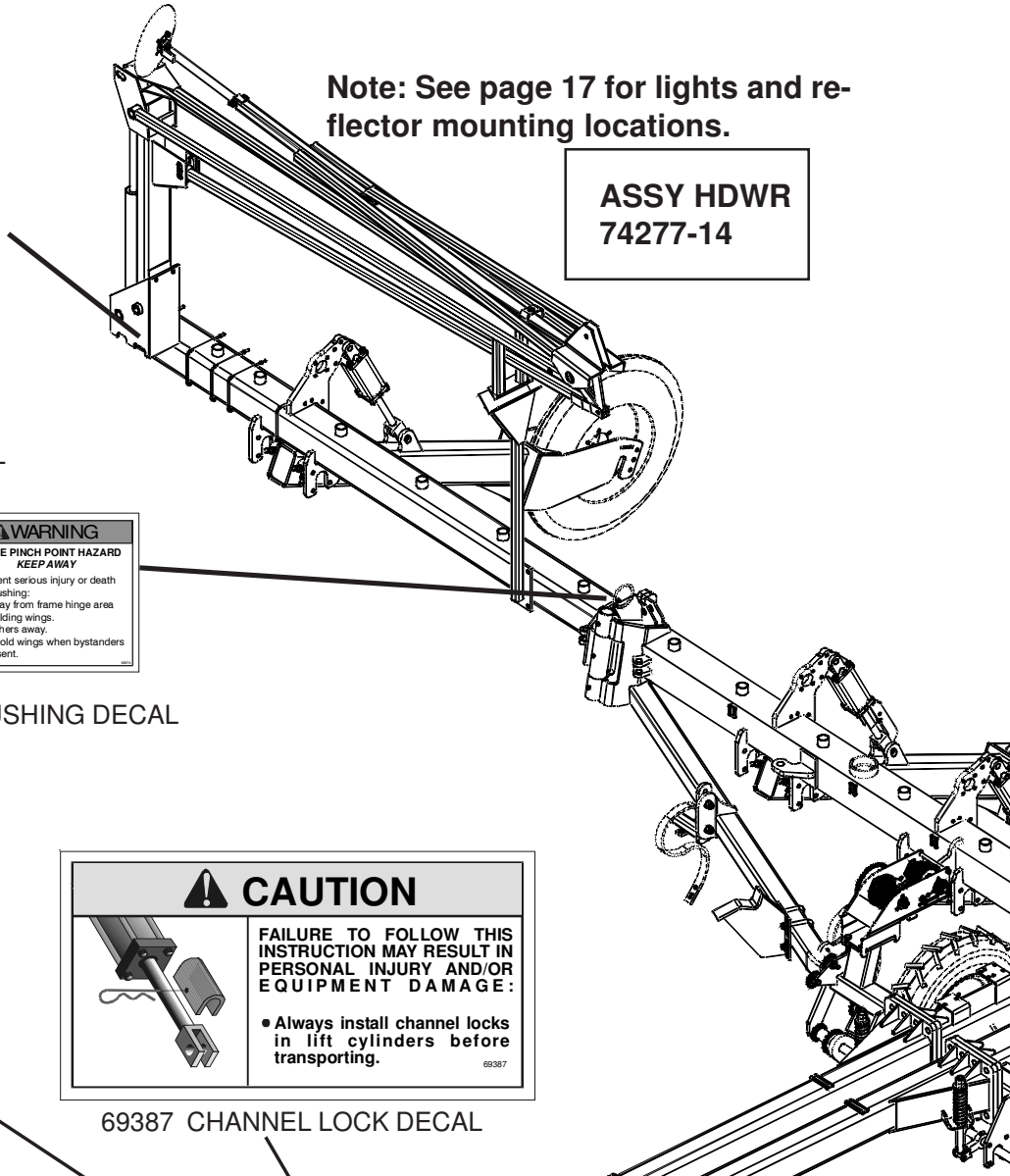
Do not operate or allow anyone else to operate this equipment until such information is reviewed. Annually review this information before the season start-up.

Make periodic reviews of SAFETY and OPERATION a standard practice for all your equipment. We feel that an untrained operator is unqualified to operate this machine.

A sign-off sheet is provided for all personnel who will be working with equipment have read and understood the information in the operators Manual and have been instructed in the operation of the equipment.

Date	Employee's Signature	Employer's Signature

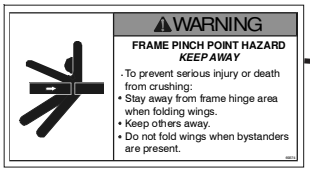
SAFETY DECAL LOCATIONS



Note: See page 17 for lights and reflector mounting locations.

ASSY HDWR 74277-14

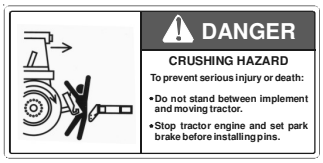
221572 MARKER DECAL



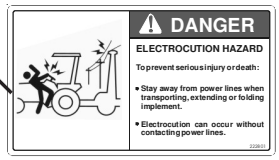
69374 CRUSHING DECAL

69387 CHANNEL LOCK DECAL

31928 CAUTION DECAL

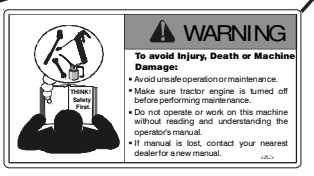


222802 CRUSHING DECAL



222801 ELECTROCUTION DECAL

31942 CAUTION DECAL

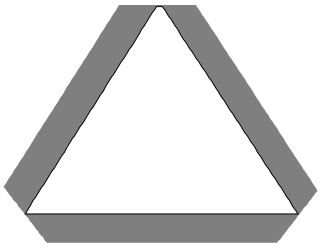


62503 SERVICE DECAL

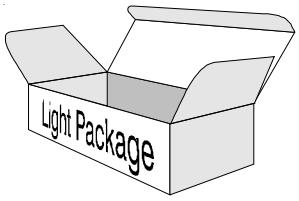
62558 HIGH PRESSURE FLUID

ASSY HDWR
74277-14

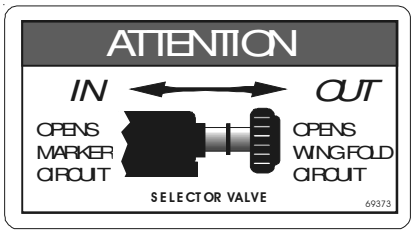
62557 GREASE FITTING DECAL
(SEE LUBRICATION PAGE)



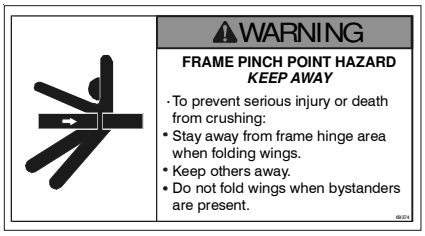
41345 SMV KIT



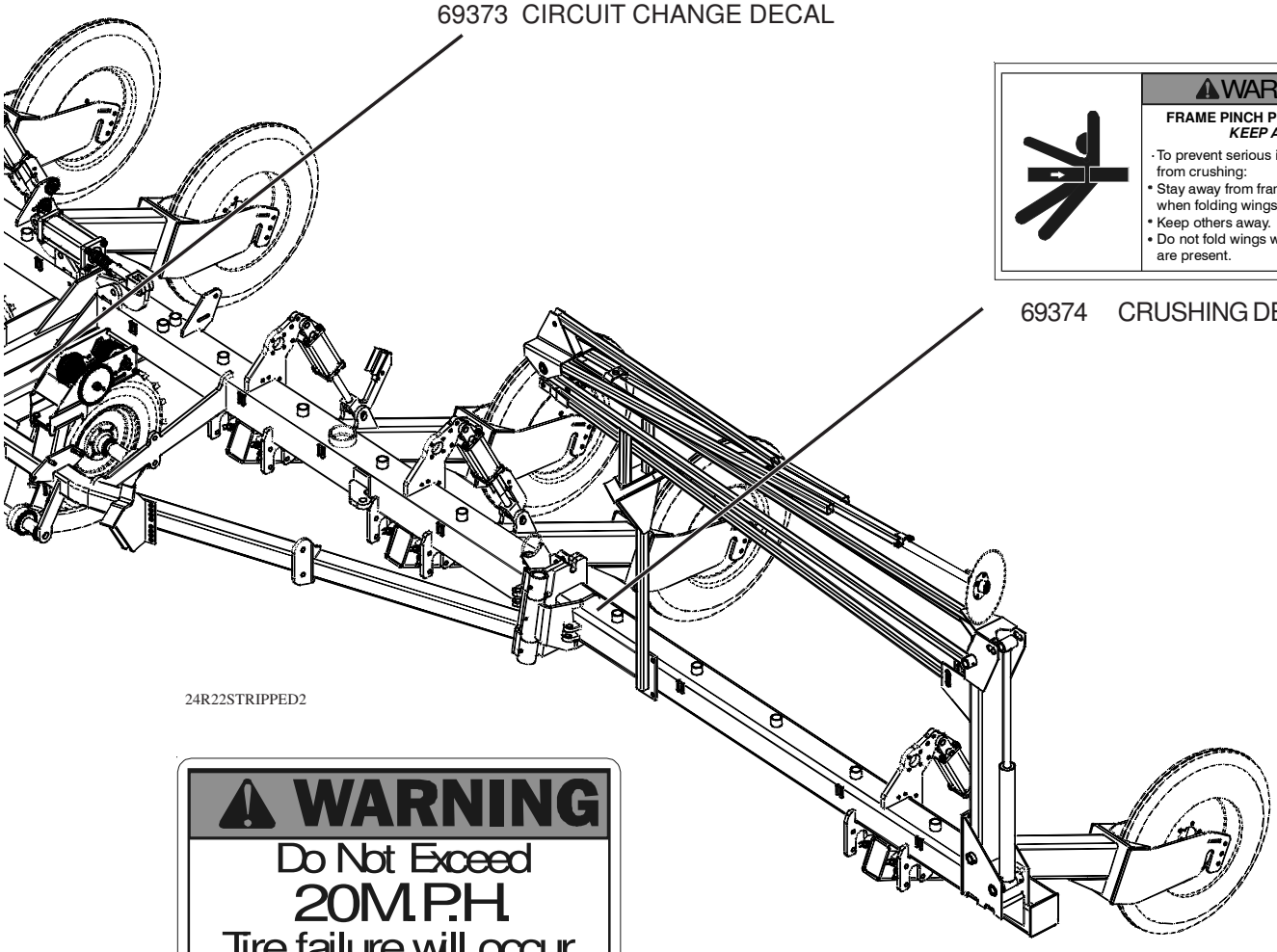
CLEARANCE LIGHT PACKAGE
(SEE PAGE 17 FOR ASSEM-
BLY)



69373 CIRCUIT CHANGE DECAL



69374 CRUSHING DECAL



221480 SPEED DECAL

TIRE PRESSURE

Tire pressure should be checked regularly and maintained as follows:

7.5x20 SL (12PLY) Tire Assy - 72 PSI

Note: MAXIMUM SPEED for 7.50x20 Single Rib Tire is 20 M.P.H.

TRANSMISSION ADJUSTMENT

See your Planter Operation Manual for seed rate charts.

SOWING DISTANCES

See your Planting unit Operation Manual.

OPERATING SPEED

See your Planting unit Operation Manual.

PLANTER PREPARATION

For initial preparation of the planter, lubricate the planter bar and planter units as outlined in the lubrication section of this manual and as outlined in the planter units manual. Make sure all tires are properly inflated, and all chains have the proper tension, alignment and lubrication.

TRACTOR PREPARATION

Consult your dealer for information on the minimum tractor horse power requirements and tractor capability. Tractor requirements will vary with planter options, tillage and terrain. Your tractor may require a hitch support to carry the weight of the planter bar. The front hitch weight at the drawbar is approximately 5500lbs.

PLANTER ATTACHMENT TO TRACTOR

Adjust the tractor drawbar so it is 15" to 20" above the ground. Make sure the drawbar is fixed in a stationary position.

Raise or lower the planter bar hitch clevis to match the drawbar height of the tractor (see Leveling Procedure). Back the tractor to the planter and connect with a hitch pin. Lower planter bar onto drawbar with jack. Make sure the hitch pin is secured with a locking pin or cotter pin.

Clean off all hose ends to remove any dirt before connecting to the tractor. Connect the hydraulic hoses to the tractor port in sequence which is both familiar and comfortable to the operator.

Raise the jack to the storage position.

Using the hydraulics, lower the planter to the planting position and check the level of the planter front to back and side to side. If the hitch height is too low or too high, disconnect the planter and adjust the clevis in an up or down position as necessary.

LEVELING THE PLANTER

For proper operation of the planter and planting units, it is important that the unit operate level.

Unless the tractor drawbar is adjustable for height, the fore and aft level adjustment must be maintained by the position of the hitch clevis. Holes in the hitch bracket allow the clevis to be raised or lowered. When installing clevis mounting bolts, tighten to proper torque settings.

With the planter lowered to proper operating depth and the center 4x8 Tie Rod Cylinder extended, check to be sure the frame is level fore and aft (front to back and side to side). Recheck once planter is in the field.

Wil-Rich includes a package of stop collars for height adjustment of each lift cylinder.

Note: The single rib tire will sink into the soil, depending on soil conditions a height adjustment may need to be made from field to field.

It is important for the planter to operate level laterally. Tire pressure must be maintained at pressures specified.

The Wil-Rich Planter bar leveling will depend on the type and model of planting unit you are using. Most manufactures require the parallel arms of the planting unit to run parallel with the ground. Check your planting units operation manual for this specification.

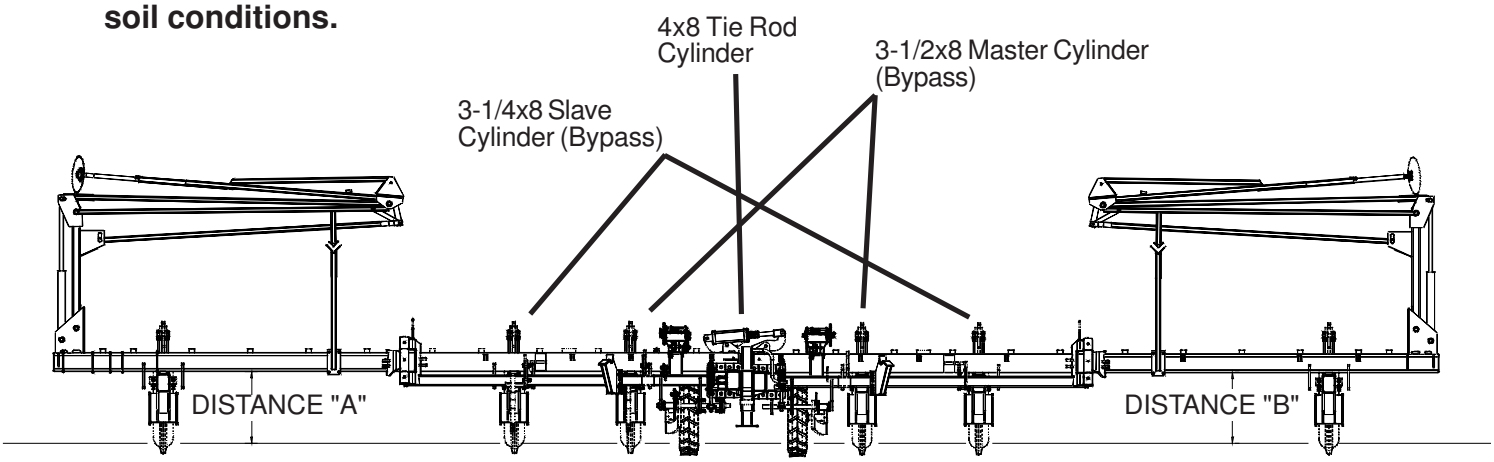
Leveling Procedure

1. Set planter bar on hard level surface at its lowest position. Center 4x8 Tie Rod Cylinder must be extended before leveling.

Note: If planter bar is being setup on a shop floor, the bar will set 2" to 4" higher than in the field, depending on soil conditions.

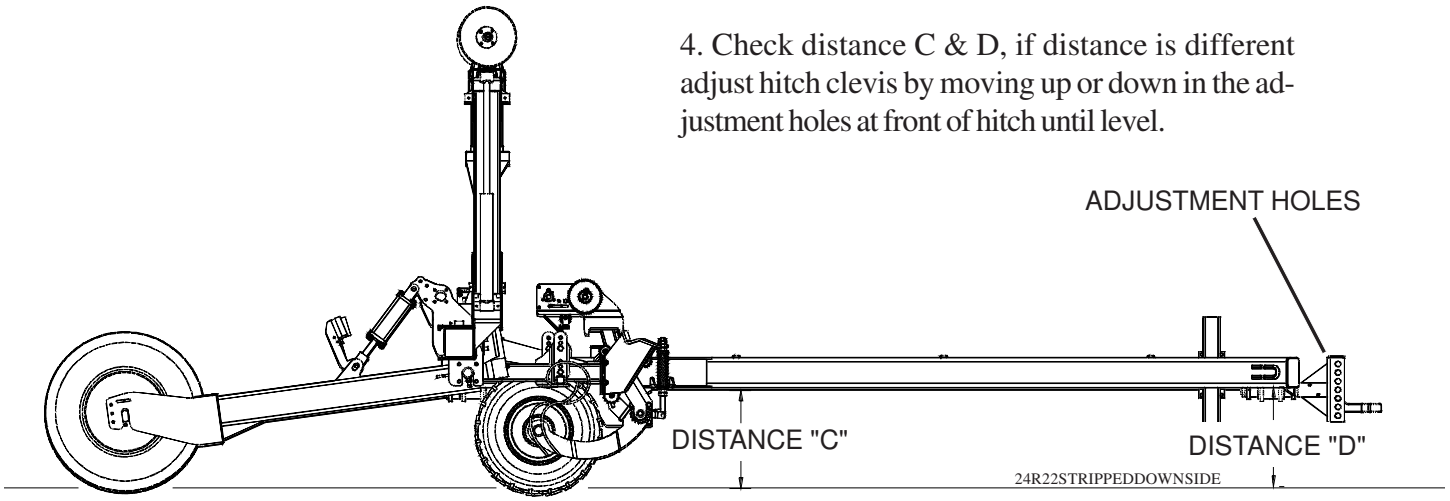
2. Set distance A & B to the same height. Fully extending the lift cylinders will level the bar side to side. Use the stop collars provided to set retracted length. Use the same combination of stop collars on all cylinders. If height is different; check tire pressure (72lbs) and/or check stop collars.

3. When height is obtained put stop collars in all cylinders to prevent settling. All cylinders must be set the same.



24R22STRIPPEDDOWNFRONT

4. Check distance C & D, if distance is different adjust hitch clevis by moving up or down in the adjustment holes at front of hitch until level.



24R22STRIPPEDDOWNSIDE

Note: With 6" to 8" of travel (4" up & 4" down) in the various types of planting units, all the distance above can be approximate.

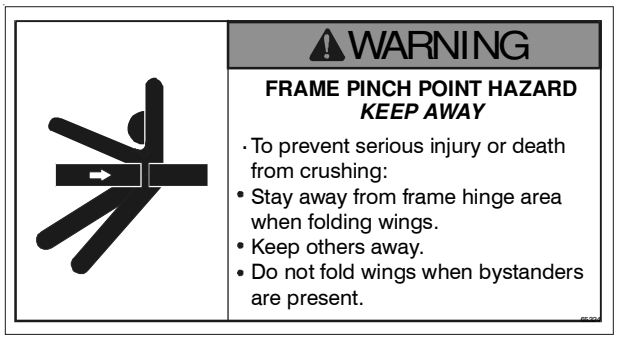
WING FOLD CIRCUITRY

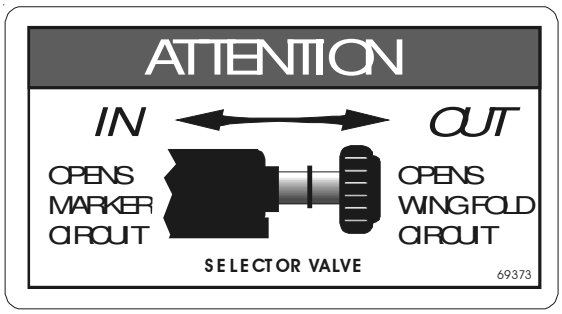
The Wil-Rich planter bars use hydraulic cylinders to fold the wings for road transport.

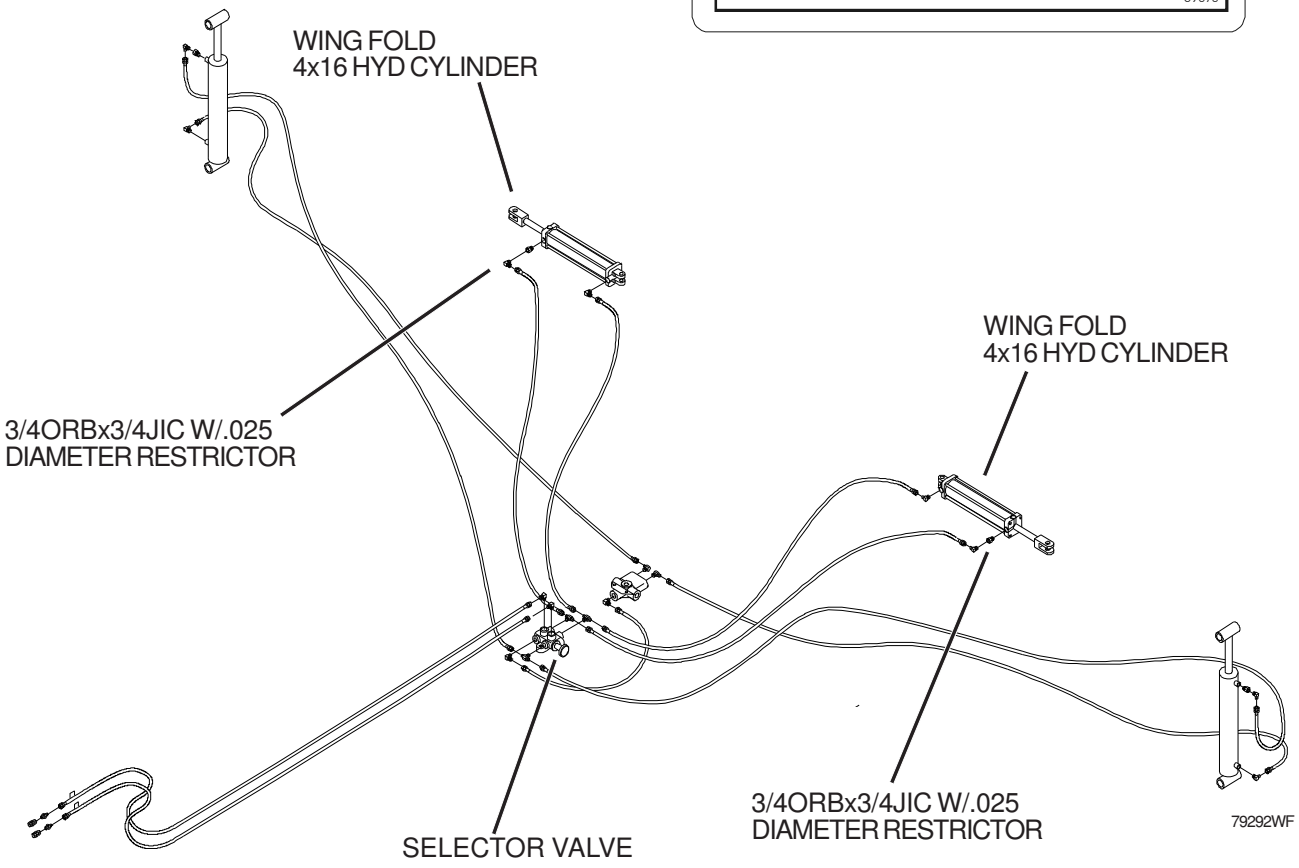
Wing fold cylinders have a .025 restrictor in the rod end cylinder port. This allows the wings to fold at a slower rate and prevents the wing from swinging too fast causing equipment damage and/or injury.

The wing fold and markers share a hydraulic circuit. The selector valve located the middle of the center frame must be pulled out to activate the wing fold circuit.

See pages 32-33 for marker operation.







24R22 - LIFT CONTROL CIRCUITRY

The Planter Bar lift system consists of 6 cylinders, 4 on the center frame and 1each wing.

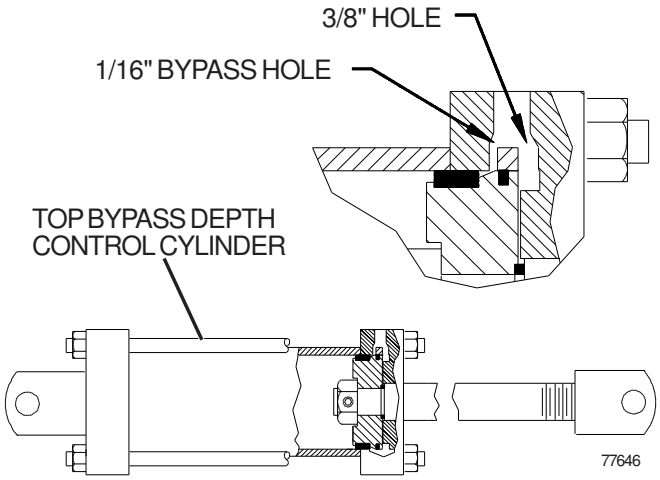
The lift cylinders on the center frame are hooked in series. Each cylinder is a top bypass cylinder and when fully extended will pass oil by the piston into the next cylinder, charging the system.

The center cylinders supply oil to the outside cylinders on the center frame. For this reason they are referred to as the master and the outside cylinders are slave.

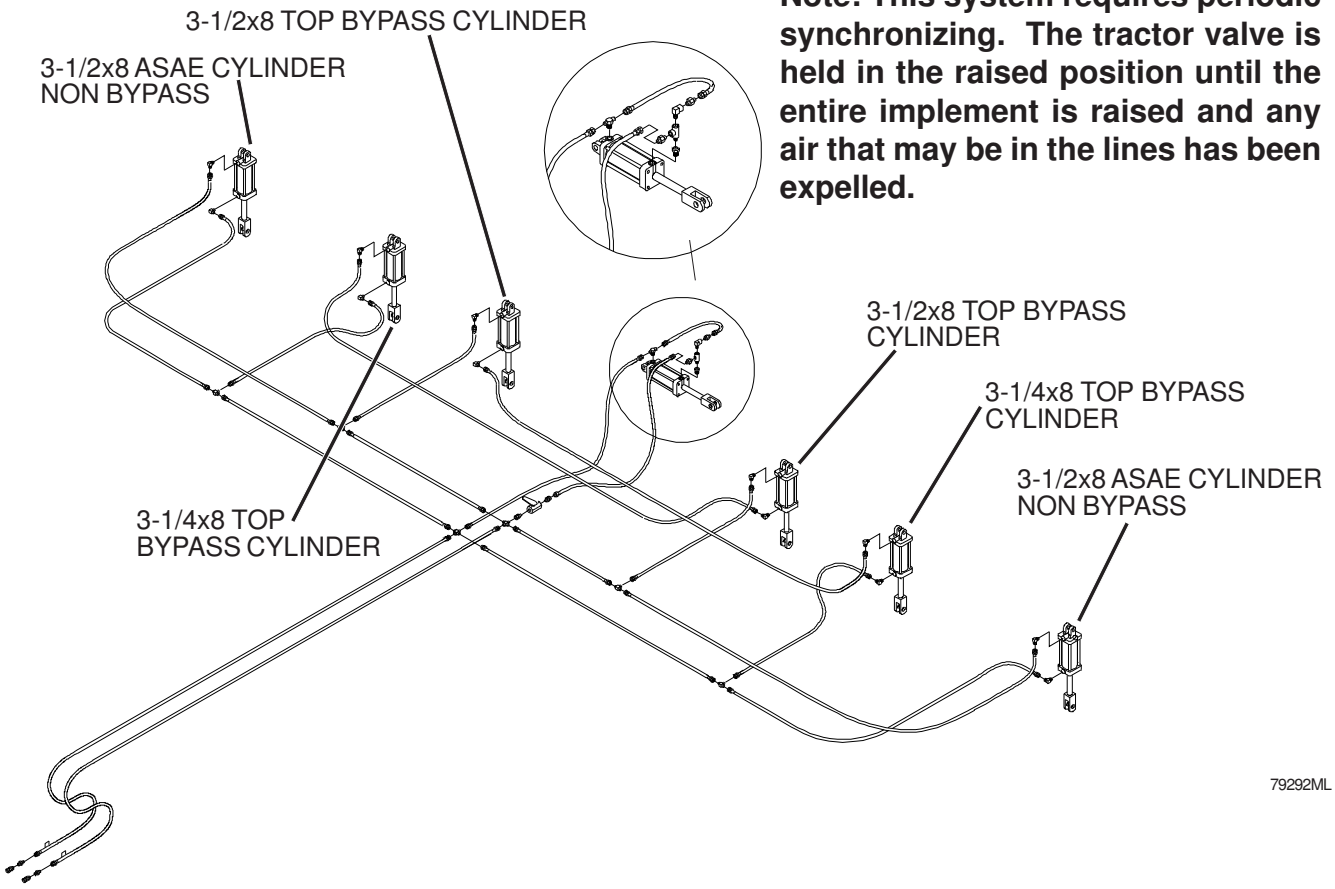
Note: To more equally distribute the center frame load. The inside & outside cylinders from opposite sides of the center frame are hooked in series.

The wing cylinder is hooked in parallel with the main frame and is NOT a bypass cylinder. The wing lift cylinders will extend & retract independent from the center frame.

This bypass condition will exist when the implement is raised to maximum ground clearance. At this time oil will pass through the 1/16" dia bypass hole and go on to the next cylinder.



Note: This system requires periodic synchronizing. The tractor valve is held in the raised position until the entire implement is raised and any air that may be in the lines has been expelled.



LIFT CONTROL CIRCUITRY - 24R45CM

This lift system consists of eight cylinders, (4) on the center frame and (2) on each wing. These lift cylinders are special trunnion mounted hydraulic cylinders. They have a cylinder rod extending from each end of the barrel. Having a rod on both sides of the piston is important in that it assure an equal oil displacement in either direction. This is critical when plumbing in series, where equal rod movement between hydraulic cylinders is the goal.

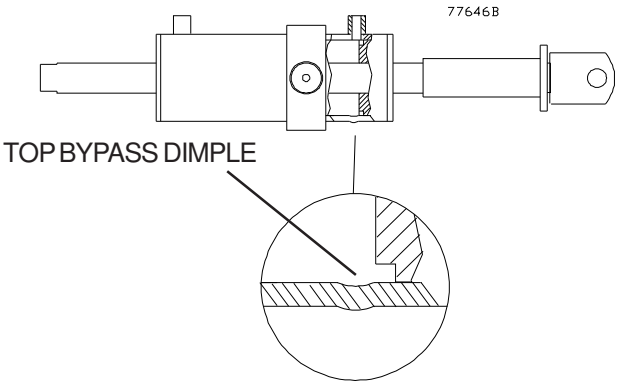
Each cylinder is a top bypass cylinder and when fully extended will pass oil by the piston into the next cylinder, charging the system.

Note: All eight of the lift cylinders are the same. Location of a particular cylinder is not important.

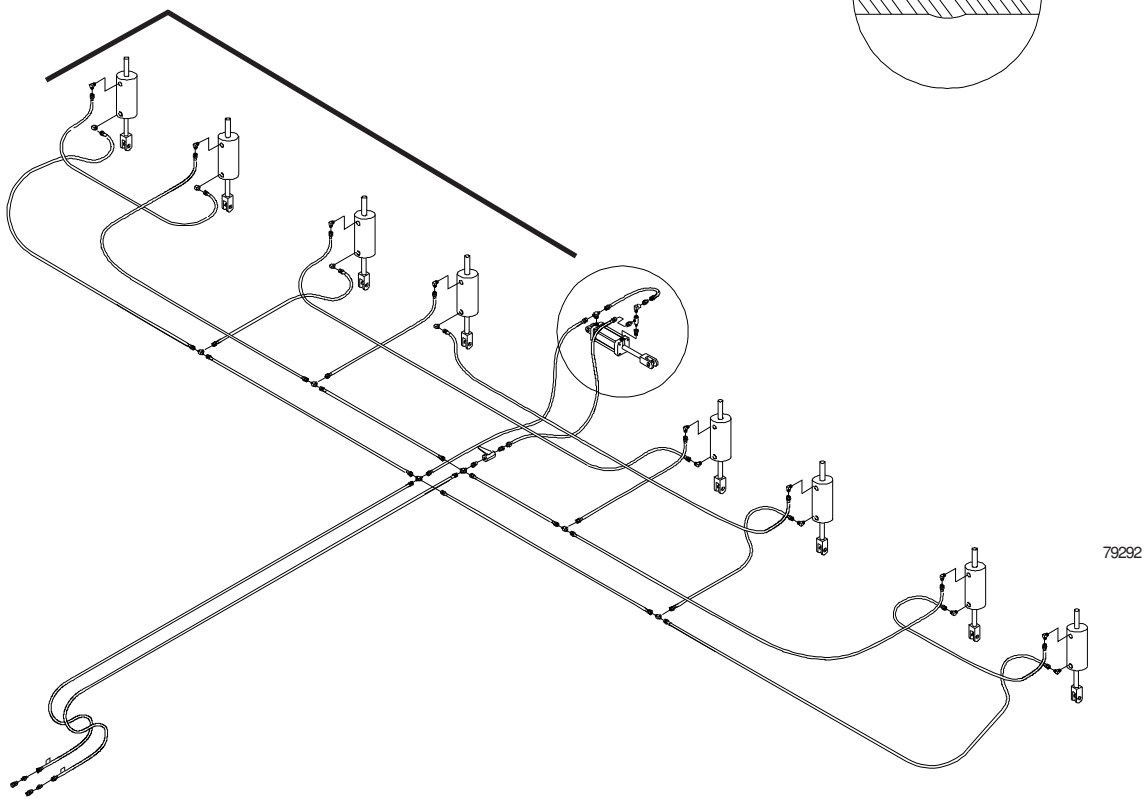
Note: This system requires periodic synchronizing. The tractor valve is held in the raised position until the entire implement is raised and any air that may be in the lines has been expelled.

The wing lift cylinders are connected in series, but in parrallel to the center frame cylinders. This is necessary because before folding the wings for transport, the wing lift cylinders must be retracted, raising the tires so they do not drag.

Note: This system requires periodic synchronizing. The tractor valve is held in the raised position until the entire implement is raised and any air that may be in the lines has been expelled.



4x8 TRUNNION
HYDRAULIC CYLINDERS - ALL THE SAME



Center Cylinder Operation

The Wil-Rich Planter Bar uses a 4x8 Tie Rod Cylinder in the center of the bar, plumbed in parallel with the lift circuit.

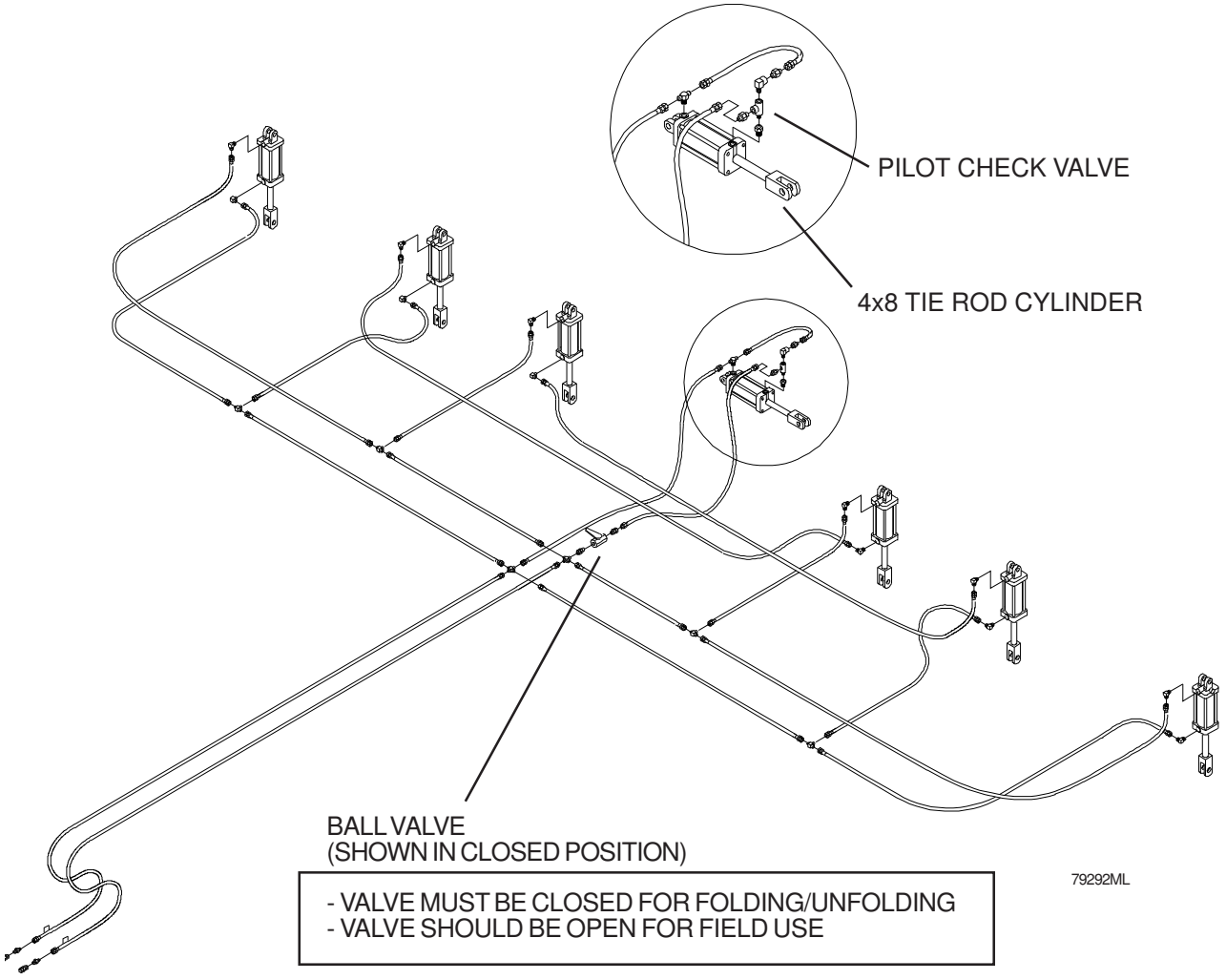
This cylinder is extended to a float position when bar is in the working position. This allows each half of the bar to float independently over rolling terrain when planting.

This cylinder is retracted to make the toolbar rigid for folding/unfolding. Stop collars are added to hold the toolbar straight when the wing axles are off the ground for folding/unfolding.

A pilot check valve is installed in this circuit to hold the cylinder in a certain position. Whether it be held completely retracted when raised on row ends or extended when lowered for field use.

This circuit also has a ball valve. This valve is used to lock the center cylinder, so that it is not affected when the toolbar is raised or lowered. It is necessary to close this valve when the toolbar is raised for folding or unfolding.

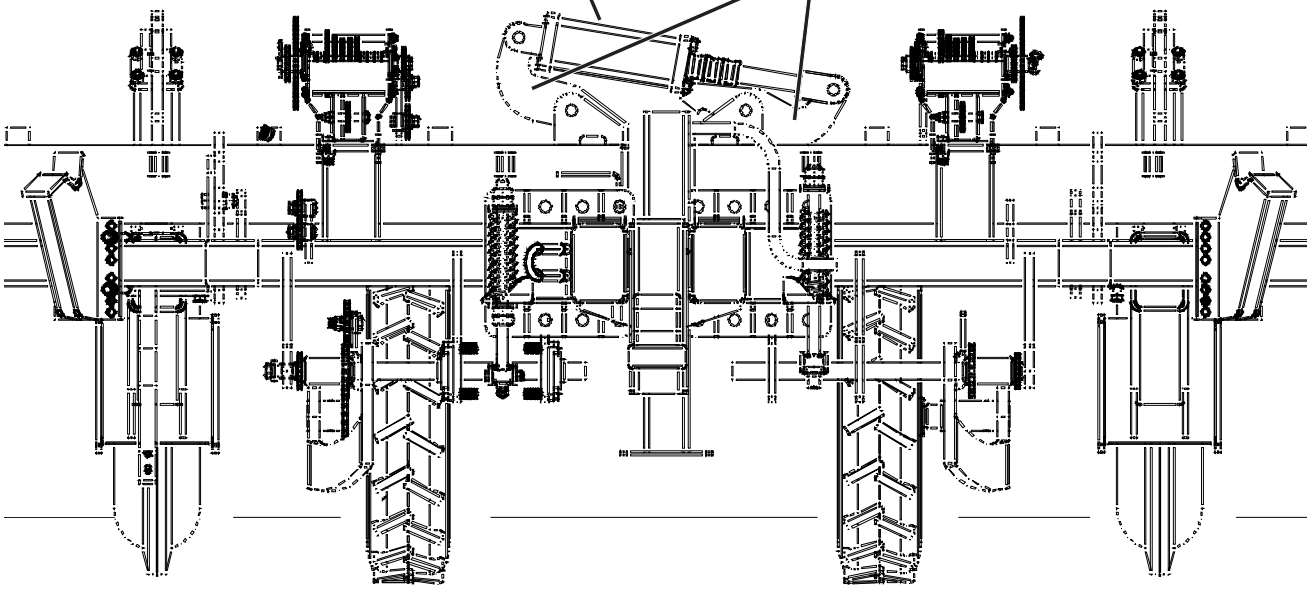
Note: Planter Bar operation requires that the center cylinder retracts before the lift cylinders are extended to raise the implement.
The center cylinder automatically retracts when the lift circuit is activated.
The ball valve should be open.



CENTER CYLINDER OPERATION

WORKING POSITION (EXTENDED)

Arms are shown in the float (working) position.

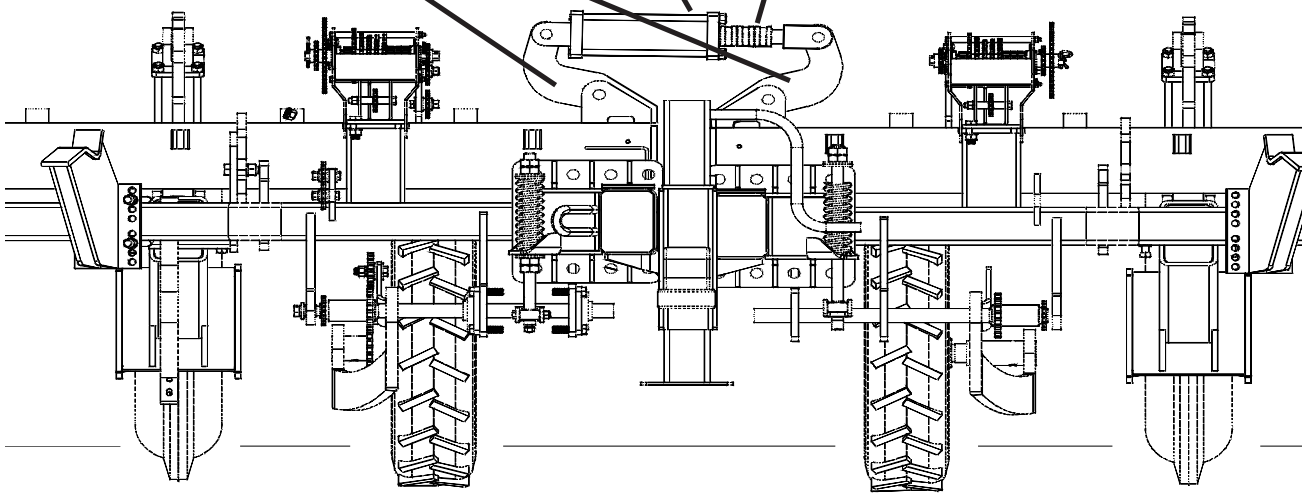


24R22STRIPPEDDOWNWORK

Arms are shown in the rigid position. The cylinder retracts when the toolbar is raised.

RIGID POSITION (RETRACTED)

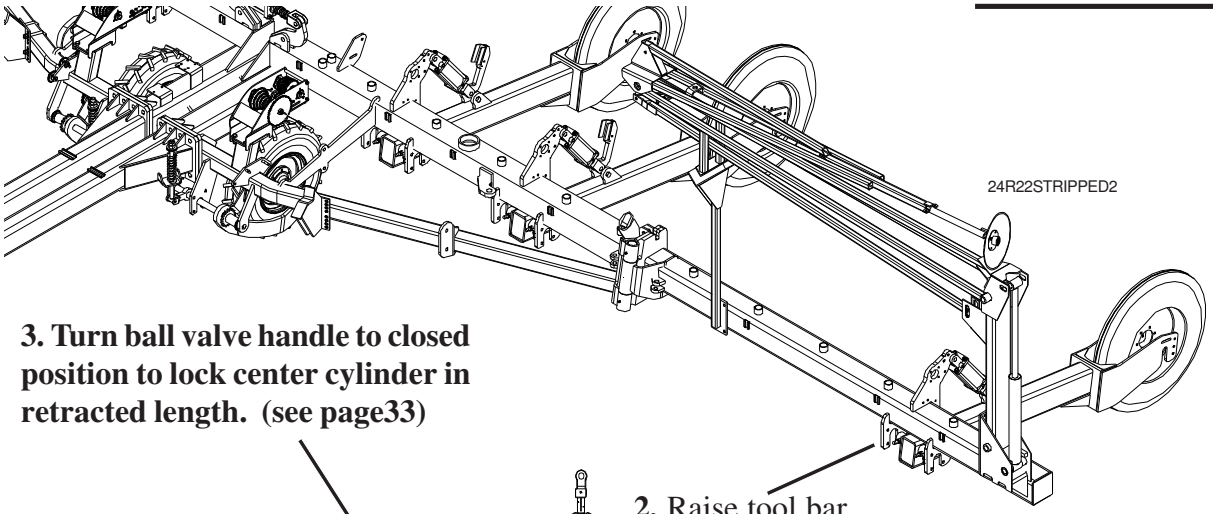
Use stop collars to adjust retracted length



24R22STRIPPEDDOWN RO D

WING FOLD

1). Place planter on a level surface.

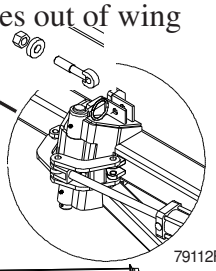


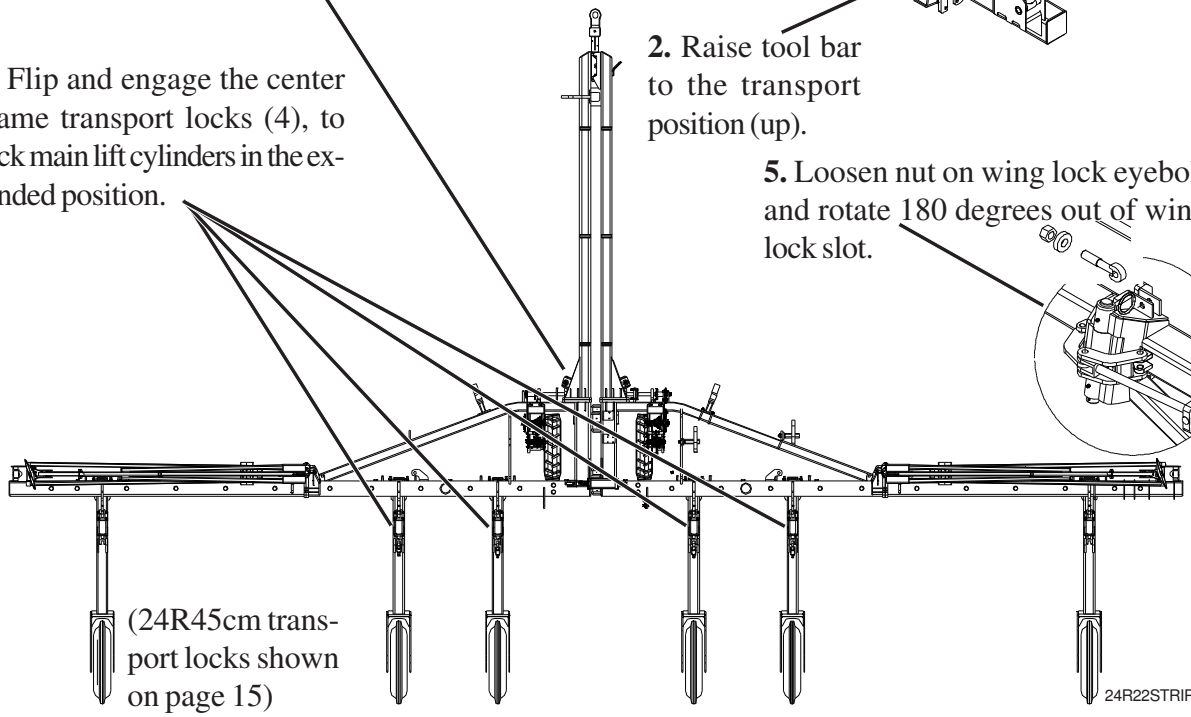
3. Turn ball valve handle to closed position to lock center cylinder in retracted length. (see page33)

2. Raise tool bar to the transport position (up).

4. Flip and engage the center frame transport locks (4), to lock main lift cylinders in the extended position.

5. Loosen nut on wing lock eyebolt and rotate 180 degrees out of wing lock slot.

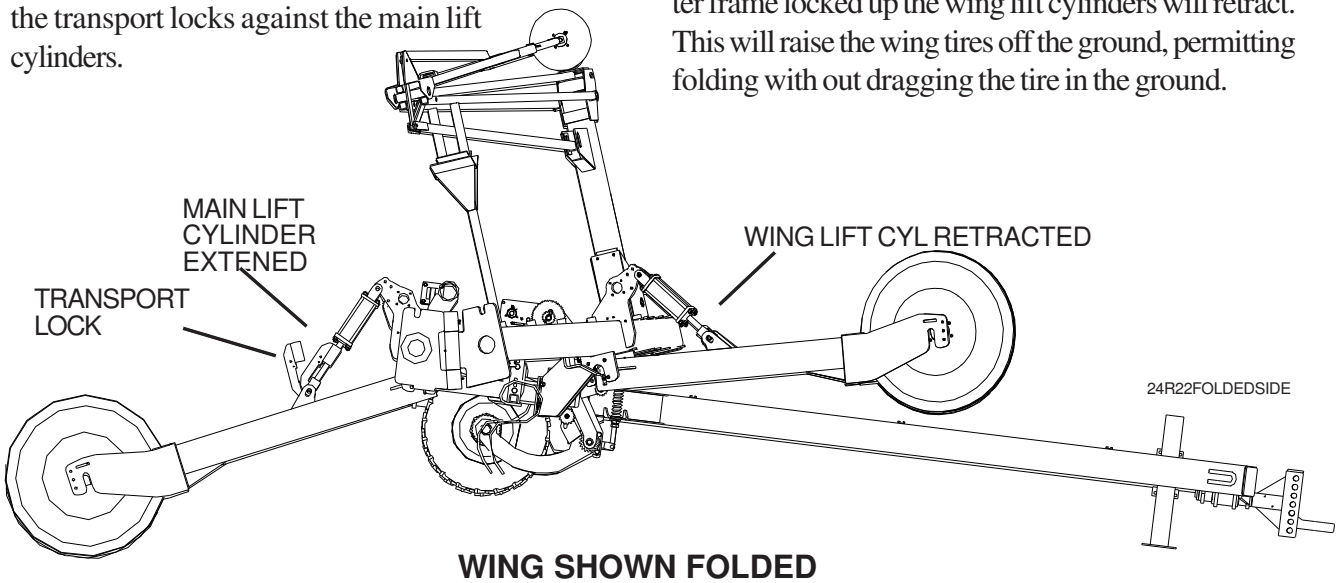




(24R45cm transport locks shown on page 15)

6. Lower the bar slightly, this will tighten the transport locks against the main lift cylinders.

7. Continue to retract the lift cylinders. With the center frame locked up the wing lift cylinders will retract. This will raise the wing tires off the ground, permitting folding with out dragging the tire in the ground.

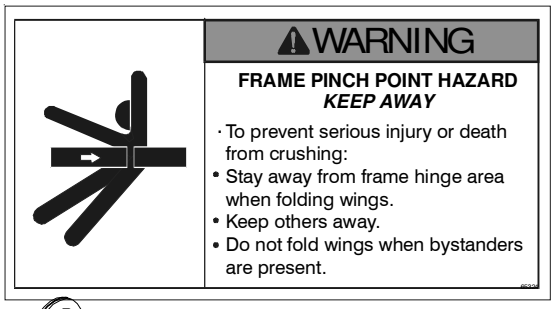


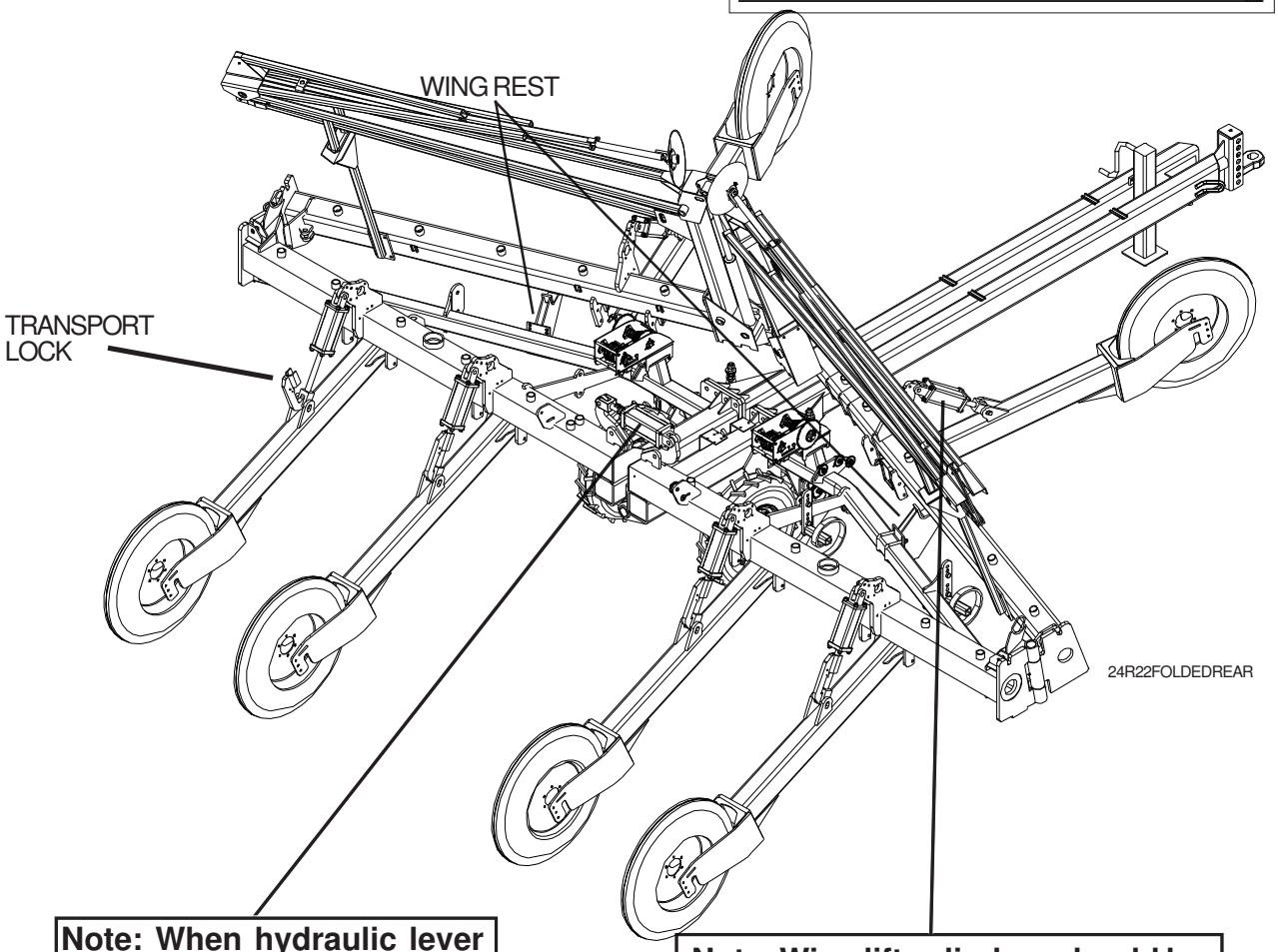
WING SHOWN FOLDED

8). Move hydraulic lever to fold the wings into transport position. Fold wing slowly to avoid sudden swings.

DO NOT stand in path of wing.

Note: Check Wing Rest heights after bolting Planting Units to Planter Bar and filling with seed. Adjustments may be required.





Note: When hydraulic lever is moved to lift tool bar the center pivot cylinder will retract to lock both halves of planter bar rigid.

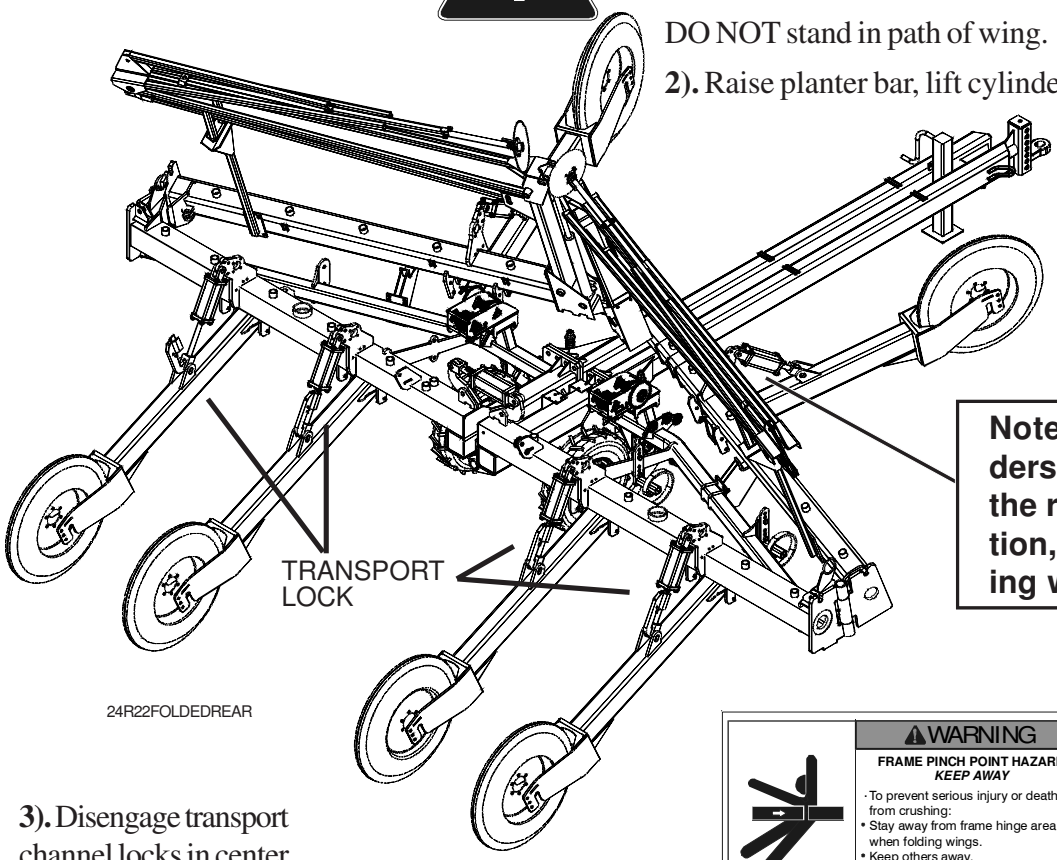
Note: Wing lift cylinders should be in the retracted position, when folding wing.

WING UNFOLD

1). With the bar up in transport position, move hydraulic lever in tractor to unfold the wings into the working position. Unfold wing slowly to avoid sudden swings.

DO NOT stand in path of wing.

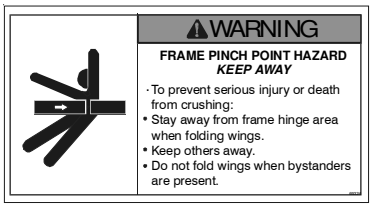
2). Raise planter bar, lift cylinders fully extended.



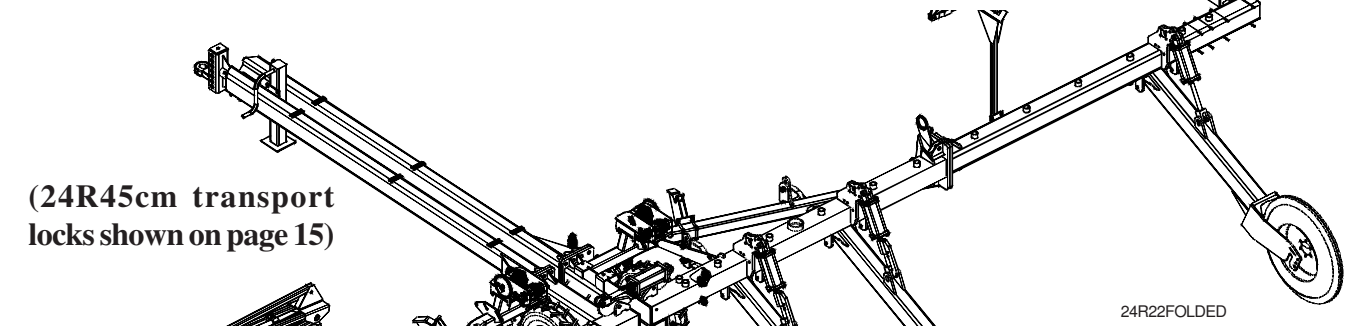
24R22FOLDEDREAR

Note: Wing cylinders should be in the retracted position, when unfolding wing.

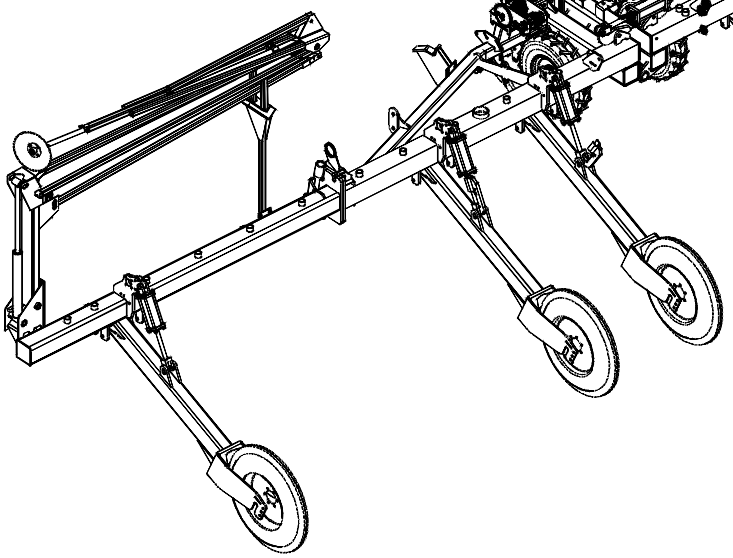
3). Disengage transport channel locks in center 4 lift cylinders.



(24R45cm transport locks shown on page 15)



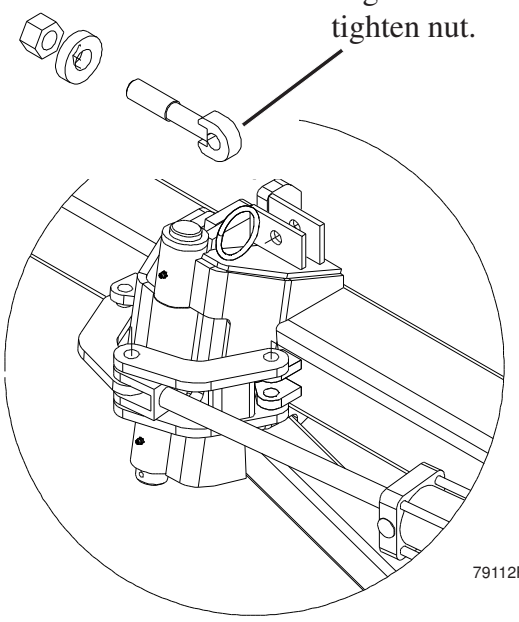
24R22FOLDED



24R22STRIPPED

4). Lower tool bar to working position (down). **Open ball valve for field use.**

5). Rotate wing lock eyebolt 180 degrees into wing lock slot and tighten nut.



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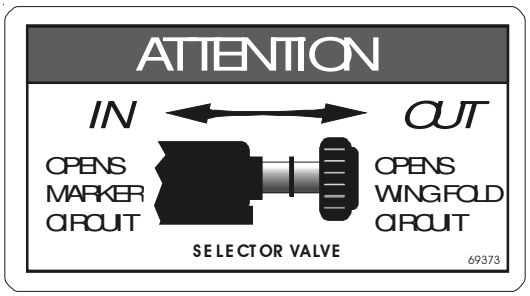
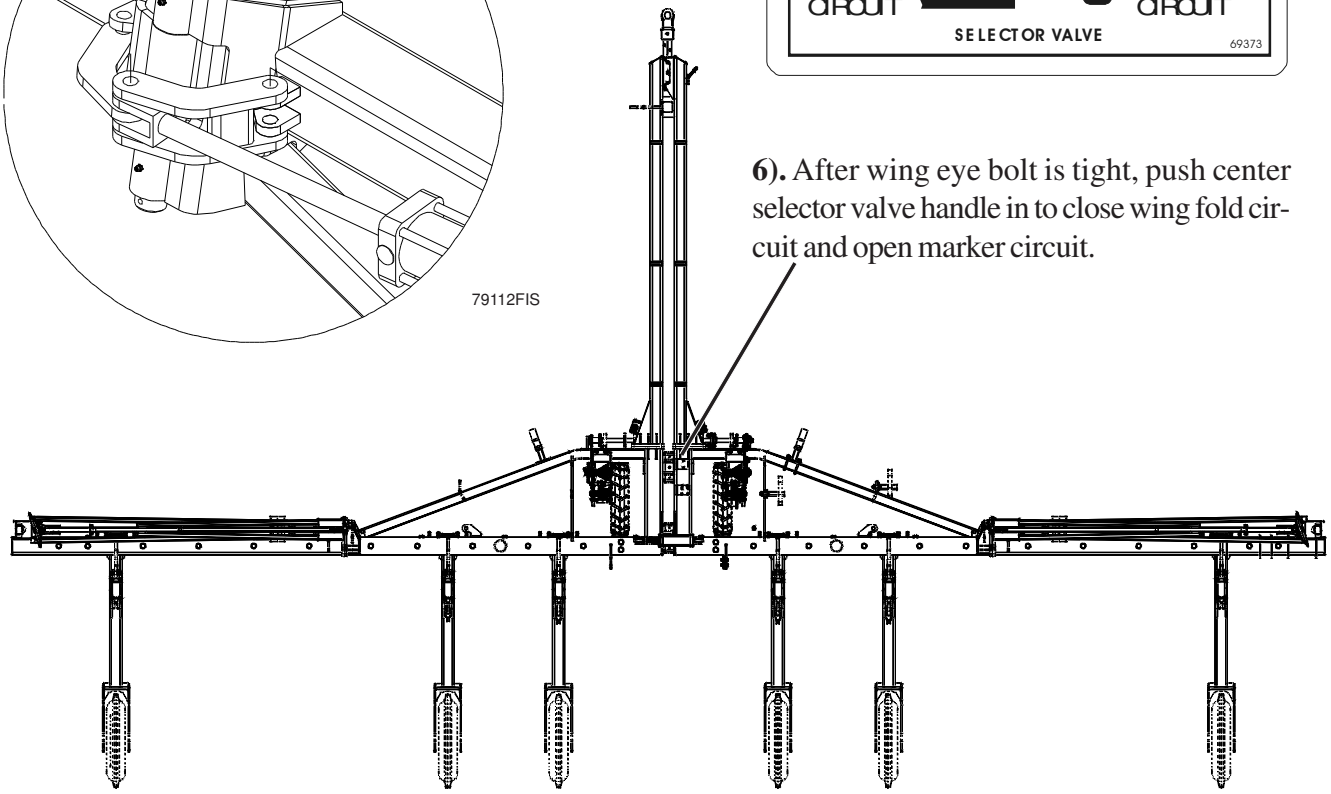
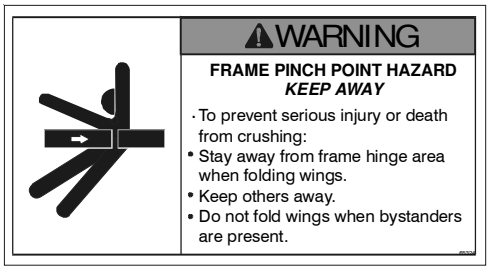


6). After wing eye bolt is tight, push center selector valve handle in to close wing fold circuit and open marker circuit.

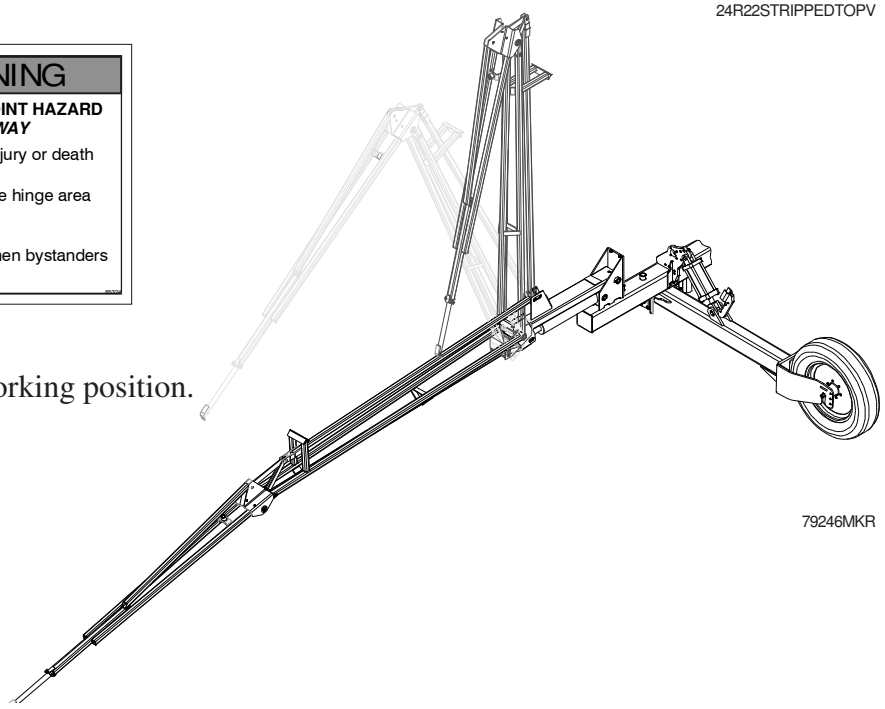


24R22STRIPPEDTOPV



7). Unfold markers to their working position.

8). Plant.



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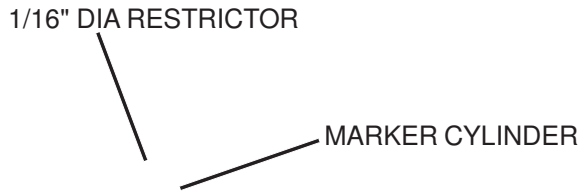
MARKER CIRCUIT

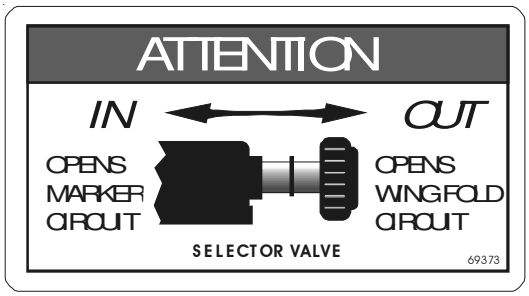
The marker circuit and the wing fold circuit are separated by a flow selector valve. The handle must be pushed in to open the marker circuit.

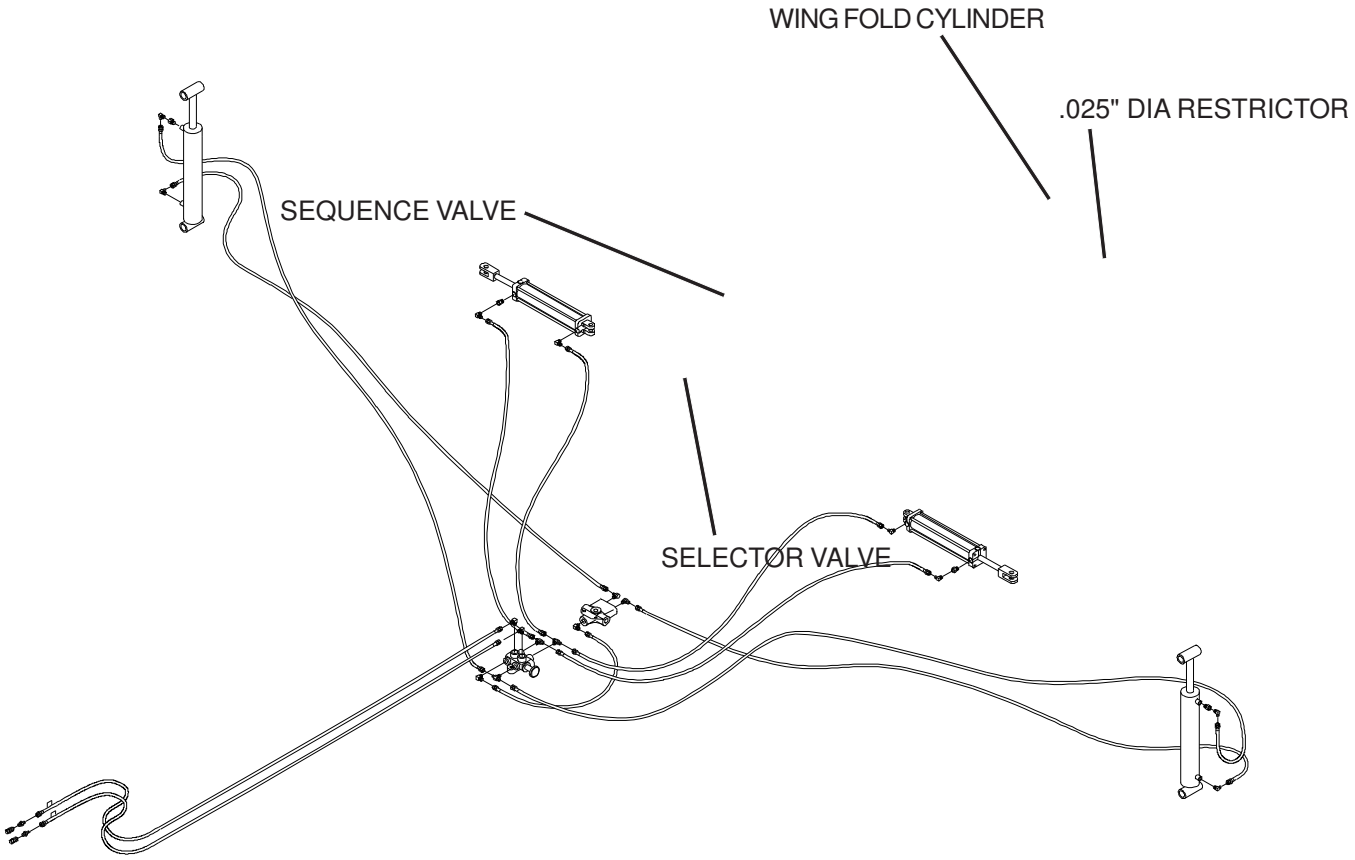
The Wil-Rich planter bar uses a dual valve hydraulic system. This means every time a marker is raised, the sequencing valve will direct the flow to lower the opposite marker once the raising marker is in place.

The sequence valve has a built in restrictor to slow down hydraulic flow (speed) and a 1/16" dia. restrictor in the rod end of each marker cylinder. This 1/16" dia. restrictor (cylinder) can be changed if marker does not move slow or fast enough for your application.

Flow controls are set at the factory at a speed which will not be dangerous and/or damage the marker assembly.







MARKER ADJUSTMENT

OPERATING

Both markers can be used at the same time if desired. To do this, lower the marker that has been selected. Move the tractor control lever to the raise position and immediately return it to the lower position. This will shift the marker control valve and the remaining marker will be lowered. This is useful in planting when striking out in a field.

SETTING LENGTH

To determine the correct length to set the marker assemblies, multiply the number of rows by the row spacing in inches. This provides the total planting width. Adjust the marker extension so the distance from the marker blade to the center line of the planter is equal to the total planting width previously obtained.

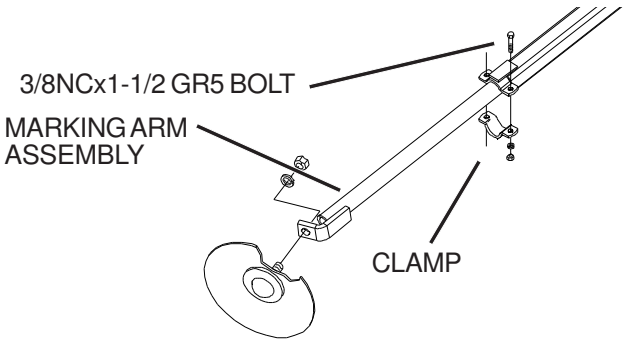
Both the planter and the marker assembly should be lowered to the ground when measurements are taken. The measurement should be taken from a point where the blade contacts the ground.

The marker length is figured as follows: Number of rows (24) x Row spacing inches (22)= 528 " between planter center and marker blade.

Adjust right and left marker assemblies equally and securely tighten clamping bolts.

Note: If you change the working height of the planter bar, the marker may need to be adjusted.

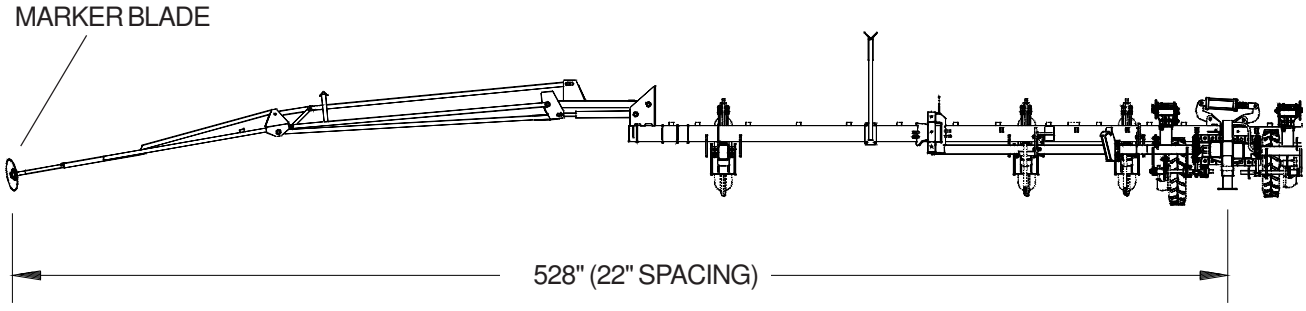
The marker blade is installed so the convex side of the blade is outward to throw dirt away from the disk hub. The marking arm assembly is angled to make the blade more or less aggressive depending on the type of mark required.



To adjust the angle loosen the marking arm assembly bolts and rotate tube and blade to the desired angle.

Retighten bolts to specified torque.

Note: Setting the marker blade to an aggressive angle will increase stress to the entire marker assembly and shorten bearing and blade life.



2FRMARKERDOWN

FORWARD WHEEL GROUND DRIVE (FWD)

The drive line is made up of three chains. These chains are held tight by an idler sprocket(s).Chain description and location:

1st chain - The ground drive chain is #60 x 65-1/4". It is heavier than the other chains for wear reasons. Because this chain runs closer to the ground. (See figure A).

2nd chain - The transmission input chain is #50 x 85". This chain is used with the "high" and "low" range sprocket. The chain length doesn't have to be change ,it is simply routed differently.(See figure B & C).

3rd chain -The transmission output chain is #50x90". Two #50-15tooth, 7/8 hex bore spockets are provided for this chain. We provide 15 tooth sprockets, but 15 to 17 tooth sprockets can be used, depending on the clearance available. It is only important that both sprockets have the same number of teeth. Dependent on the row unit used, this chain length may have to be altered.(See figure D).

Seed rates are determined by sprocket selection in the Wil-Rich transmission and the High/Low sprocket position (See figure B &C).

Depending on the row unit used, application rates can vary significantly. Unique seed rate charts are made up at Wil-Rich to tie a particular row units with the Wil-Rich transmission. Contact Wil-Rich engineering if rate charts are needed.

Note: Seed population must be checked in the field to insure accuracy. See checking Seed Population in the row unit Operation Manual.

ASSY HDWR 74277-9

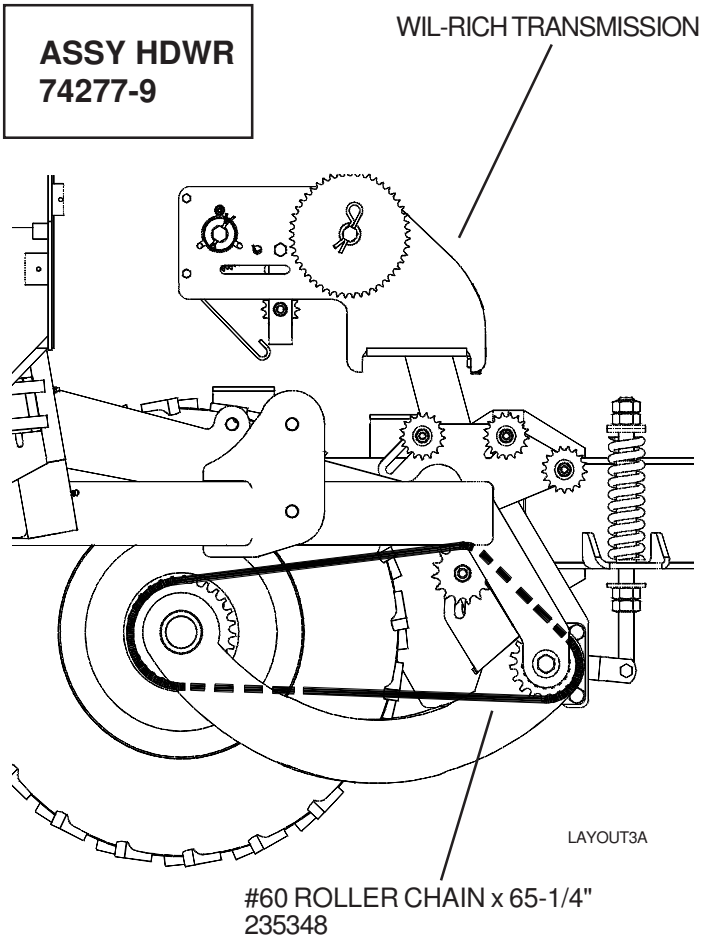


Figure A Ground drive chain

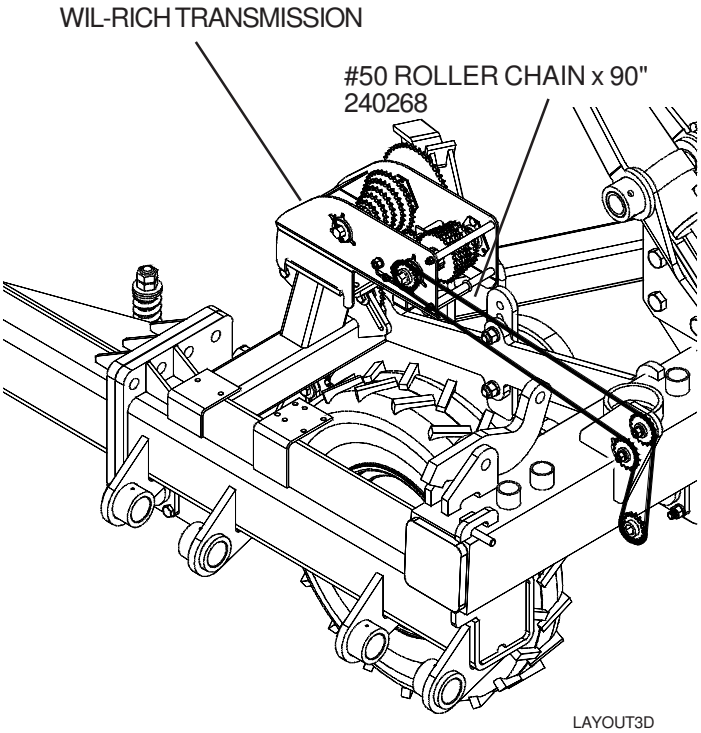
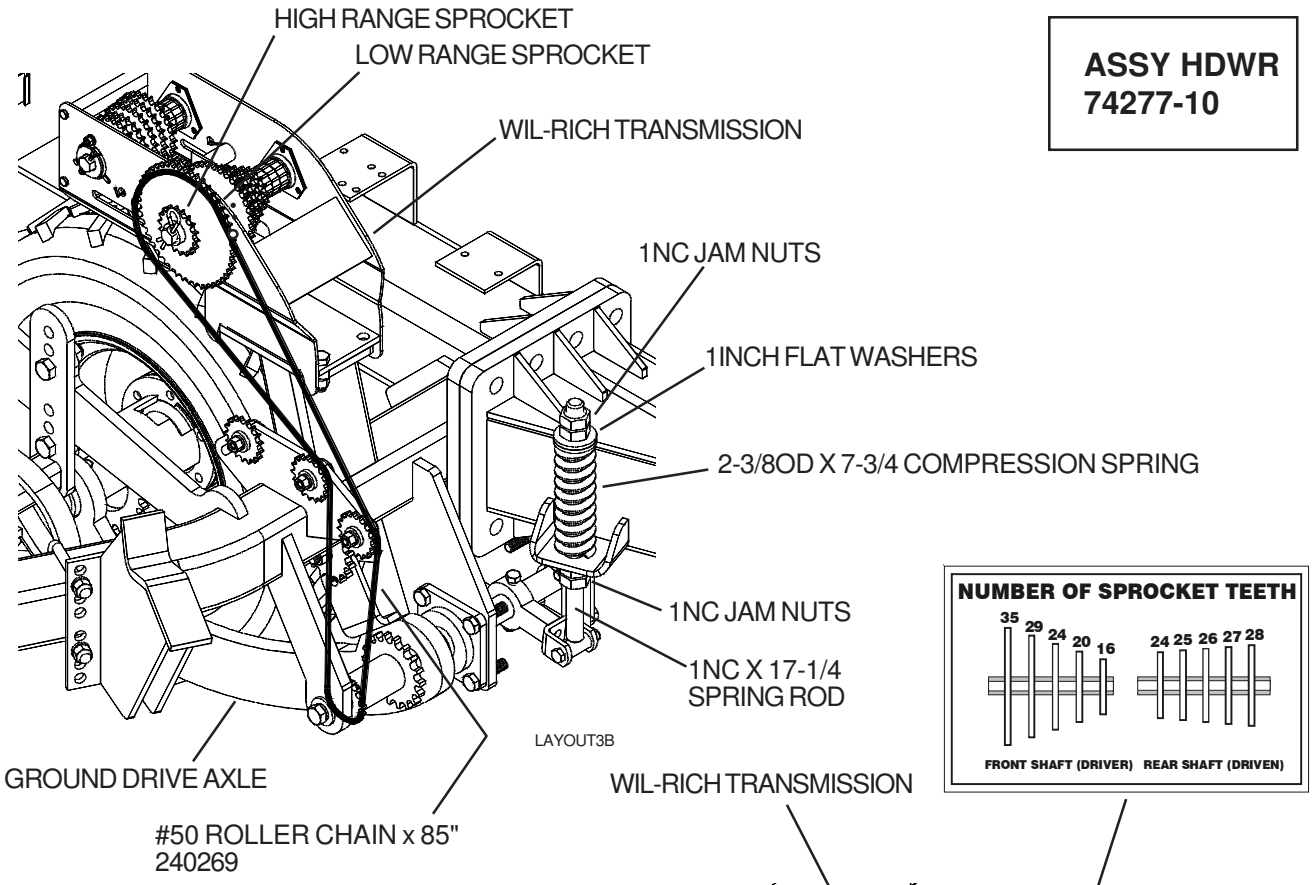


Figure D Transmission output chain



ASSY HDWR
74277-10

Figure B Low-range chain

The amount of tire contact with the ground is set with a 1nc x 17-1/4 spring rod on the front side of the ground drive axle (See Figure B).

Turning the jam nuts onto the spring rod will lower the ground drive tire, making contact with the ground earlier, as the bar is lowered for field use.

A 2-3/8OD x 7-3/4 compression spring is included to increase down pressure and provide a cushion if an obstacle is encountered. Initially, set the jam nuts to compress the spring to a 7-1/2" length. Compress the spring further to increase tire down pressure, if tire slippage is suspected.

There is a 6-1/2 " sleeve assembled inside the spring hold the assembly straight. If additional spring compression is required, the sleeve can be shortened to 5-5/8".

The tire should be set low enough and the compression spring tight enough to assure a positive contact with the ground and slippage kept to a minimum.

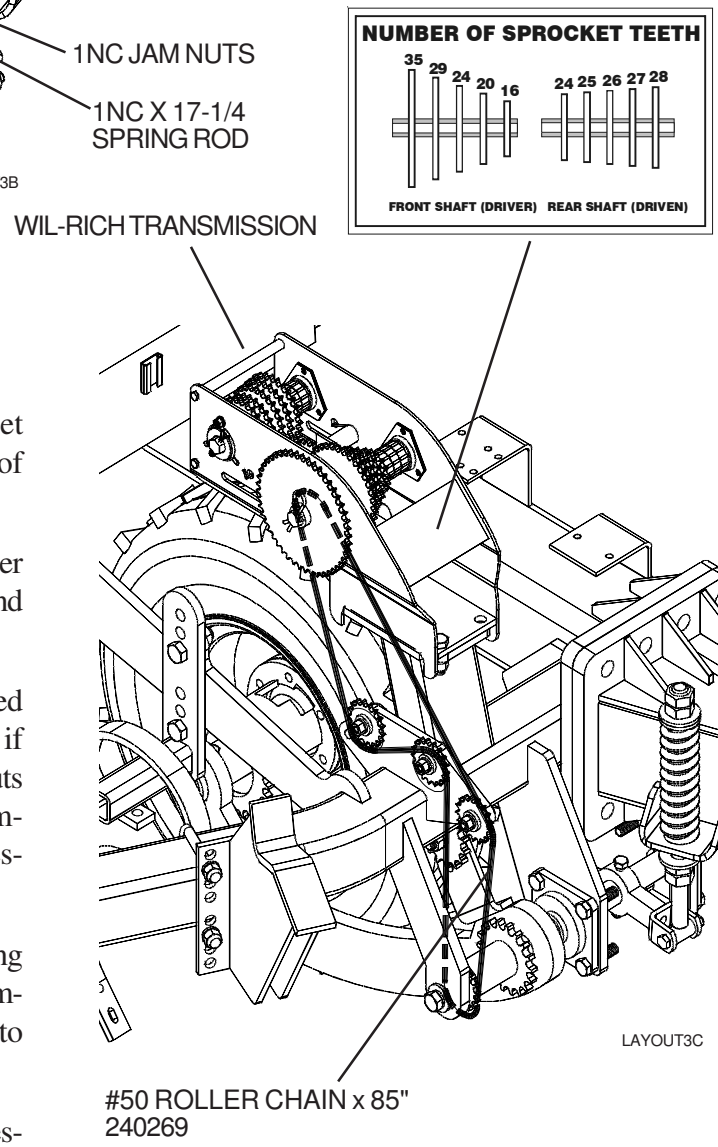
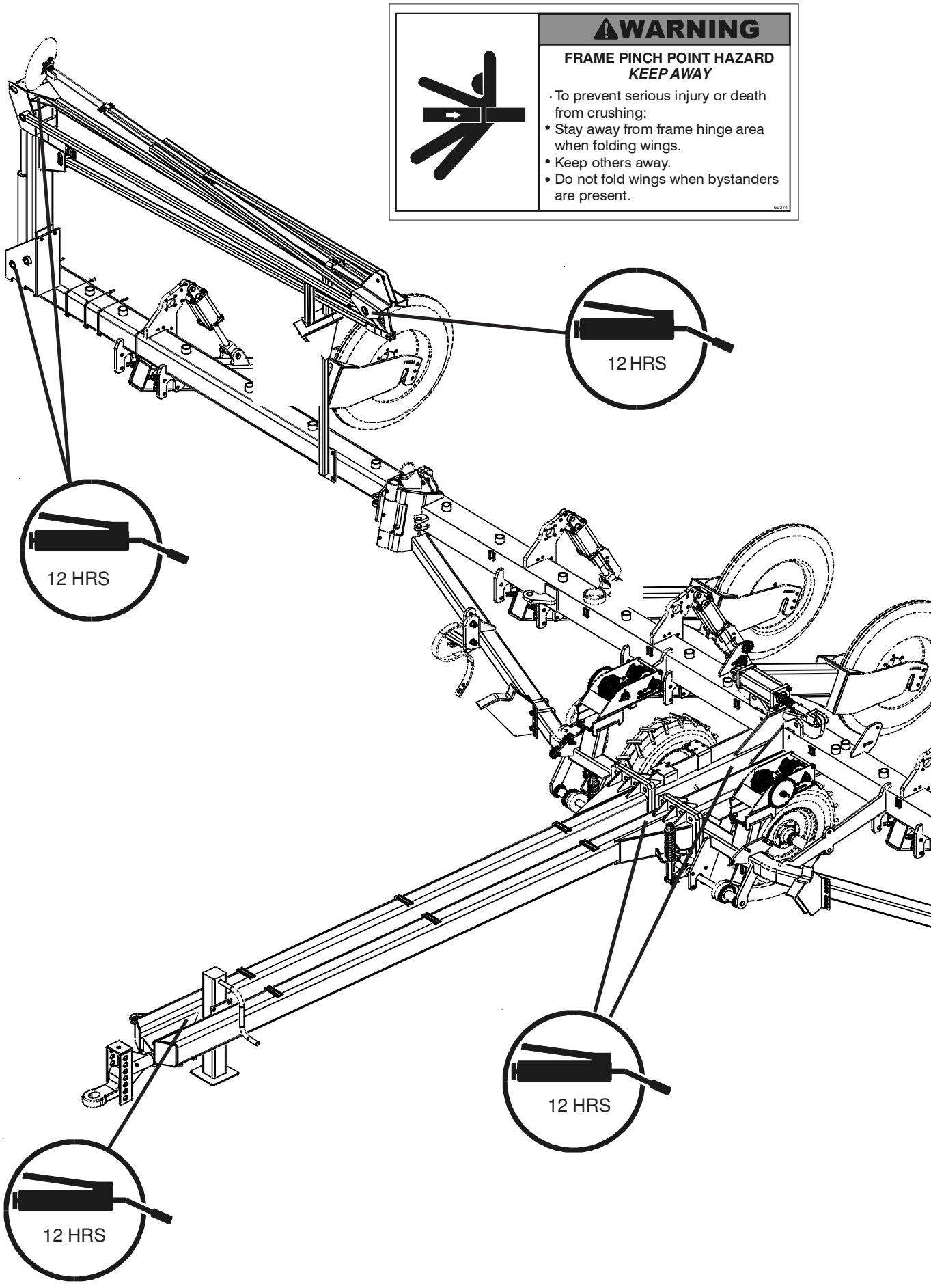
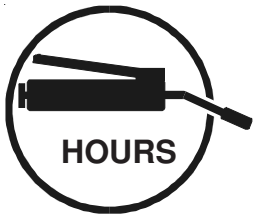


Figure C High-range chain


WARNING
FRAME PINCH POINT HAZARD
KEEP AWAY
· To prevent serious injury or death from crushing:
• Stay away from frame hinge area when folding wings.
• Keep others away.
• Do not fold wings when bystanders are present.
69374
12 HRS
12 HRS
12 HRS
12 HRS

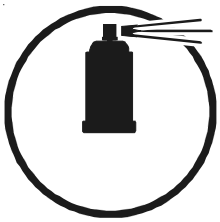
LUBRICATION



Lubricate with grease at hourly interval indicated on symbol.

The most effective roller chain lubrication routine varies, depending on the environmental conditions and/or condition of the chain. The goal is to maintain complete freedom at every chain link joint.

Lubricate all planter roller chains (planting units and ground drive, if equipped) with a multipurpose Spray Lube, at intervals sufficient to maintain free chain movement.

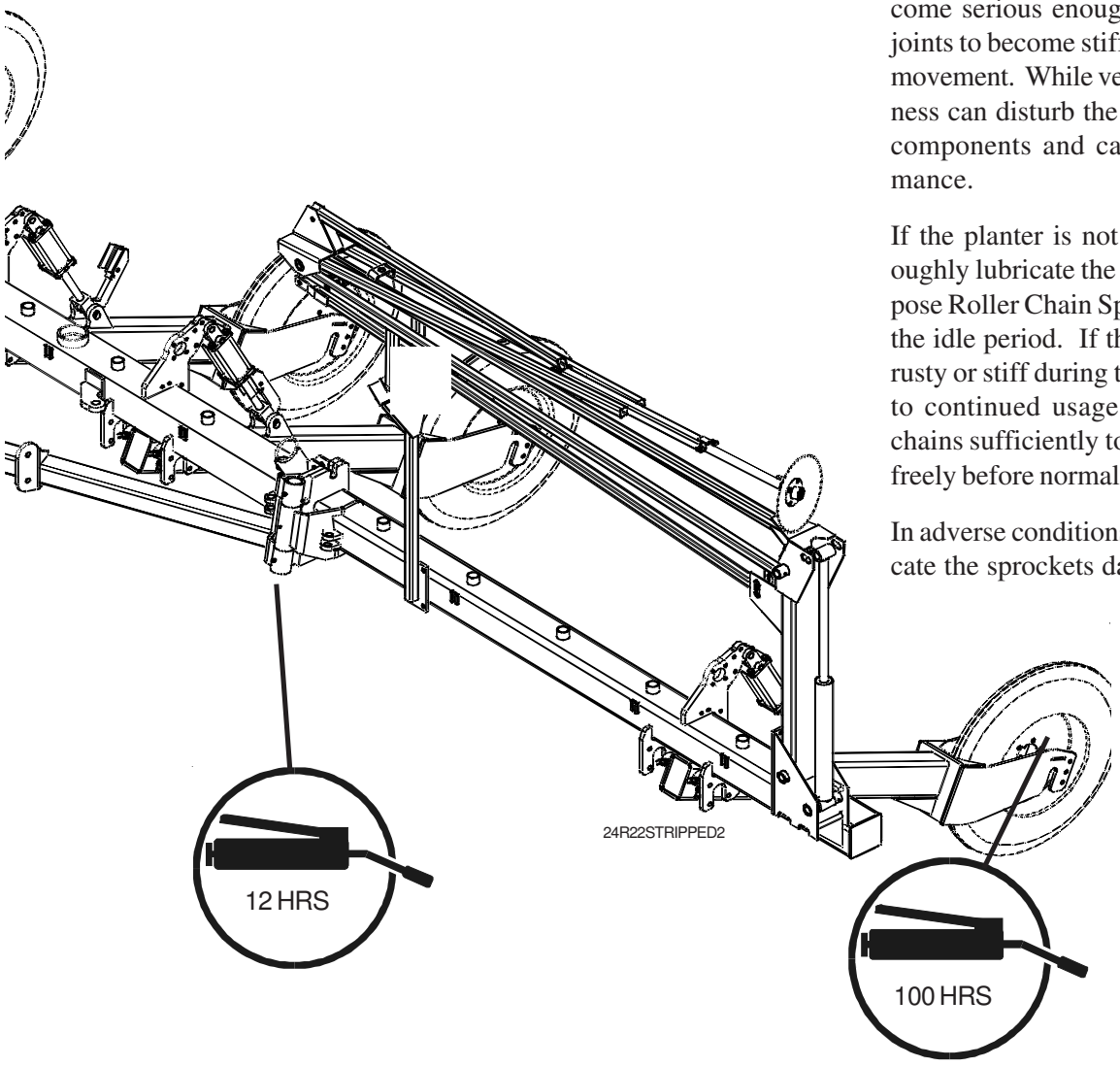


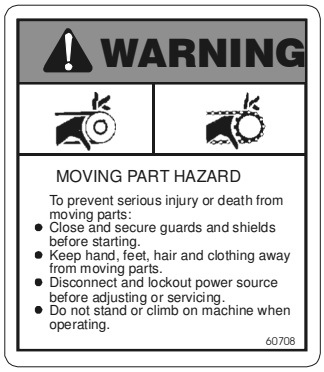
Lubricate roller chains with a Multi-Purpose spray.

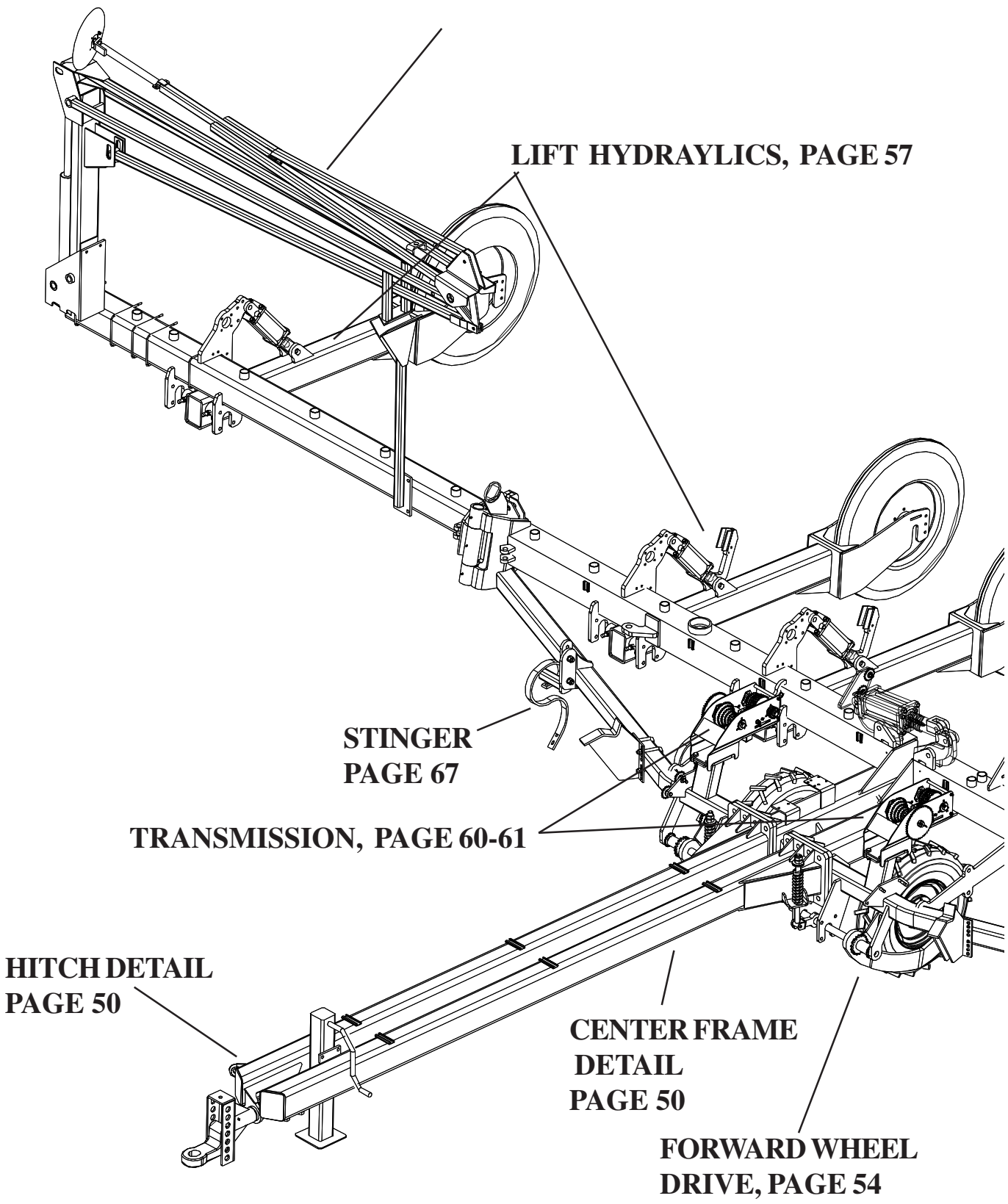
When roller chains remain unused for several days, moisture in the air will accumulate on the chain, causing the chain to rust. This can and will become serious enough in time to cause the chain joints to become stiff, restricting their normal free movement. While very difficult to detect, this stiffness can disturb the smooth rotation of metering components and cause deterioration in performance.

If the planter is not used for several days, thoroughly lubricate the chains with a good Multipurpose Roller Chain Spray Lube, at the beginning of the idle period. If the roller chains have become rusty or stiff during the idle period, lubricate prior to continued usage and operate or "work" the chains sufficiently to ensure all chain joints move freely before normal planter operation is resumed.

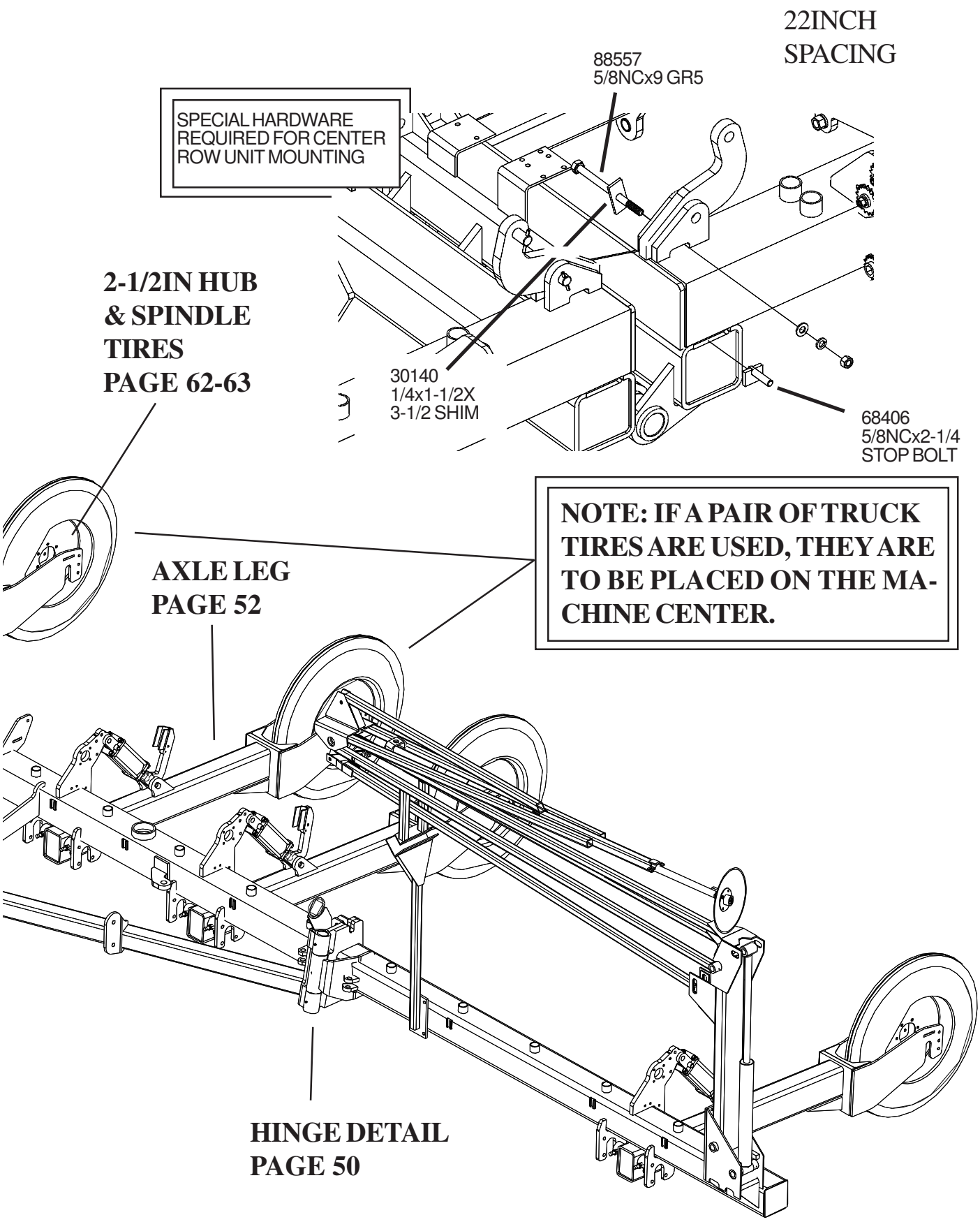
In adverse conditions it may be necessary to lubricate the sprockets daily.

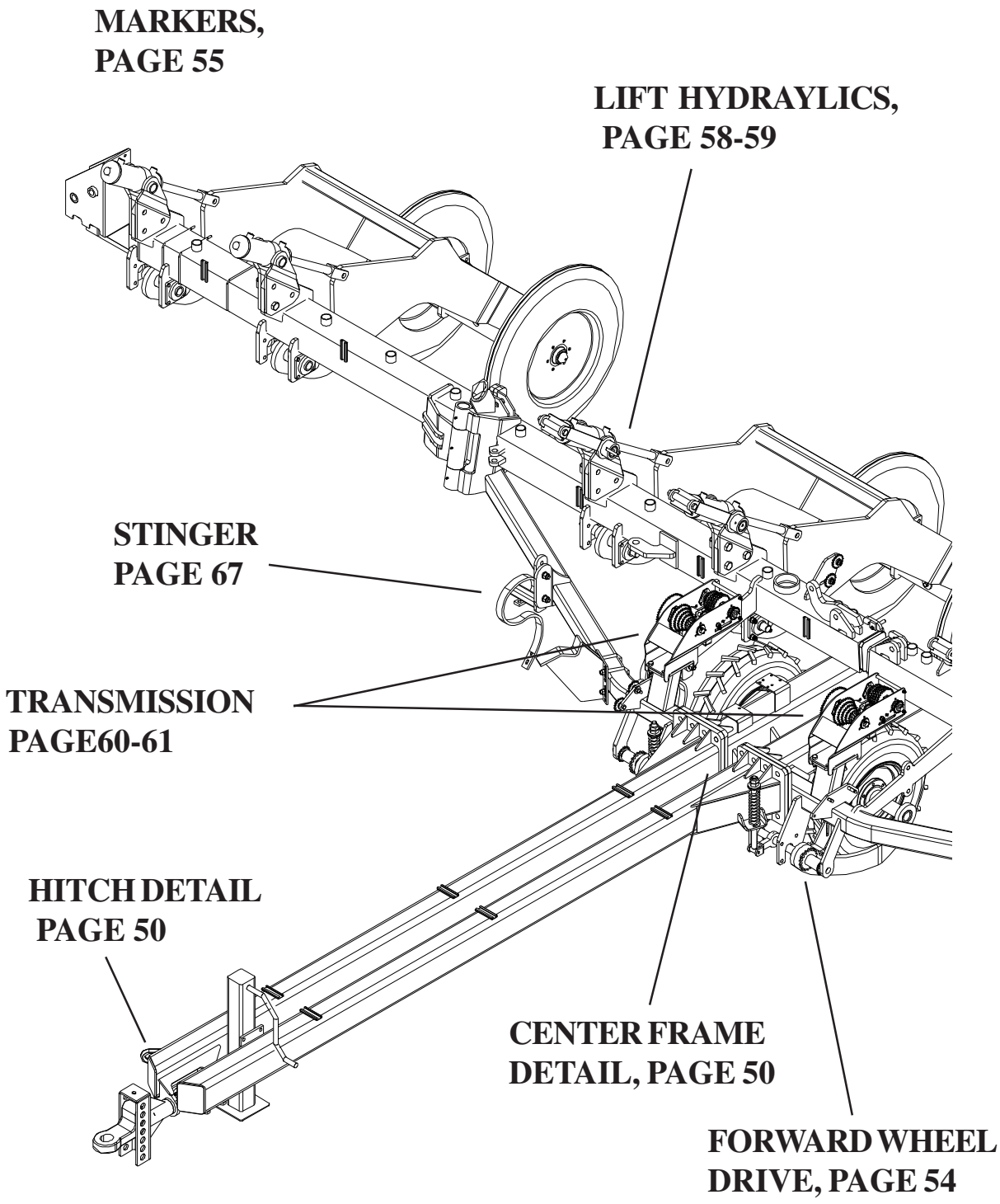





MARKERS, PAGE 55
LIFT HYDRAYLICS, PAGE 57
STINGER
PAGE 67
TRANSMISSION, PAGE 60-61
HITCH DETAIL
PAGE 50
CENTER FRAME
DETAIL
PAGE 50
FORWARD WHEEL
DRIVE, PAGE 54

24 ROW 22INCH TOOLBAR




MARKERS,
PAGE 55
LIFT HYDRAYLICS,
PAGE 58-59
STINGER
PAGE 67
TRANSMISSION
PAGE60-61
HITCH DETAIL
PAGE 50
CENTER FRAME
DETAIL, PAGE 50
FORWARD WHEEL
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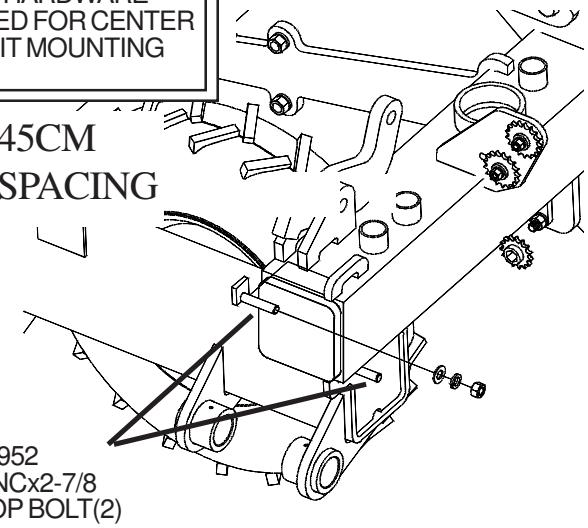
WING FOLD & MARKER
HYDRAULICS, PAGE 56

24 ROW 45CM TOOLBAR

HAZARD LIGHTS
PAGE 64

SPECIAL HARDWARE REQUIRED FOR CENTER ROW UNIT MOUNTING

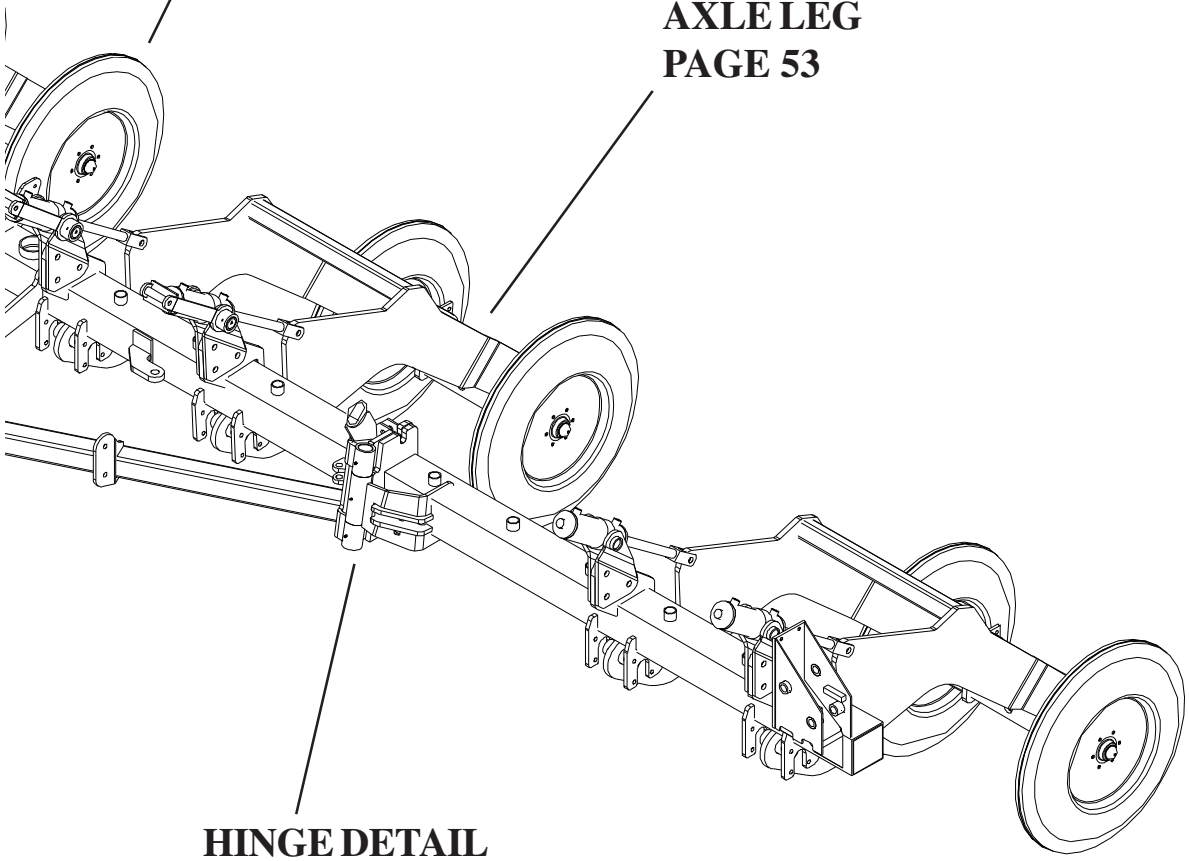
45CM
SPACING



223952
5/8NCx2-7/8
STOP BOLT(2)

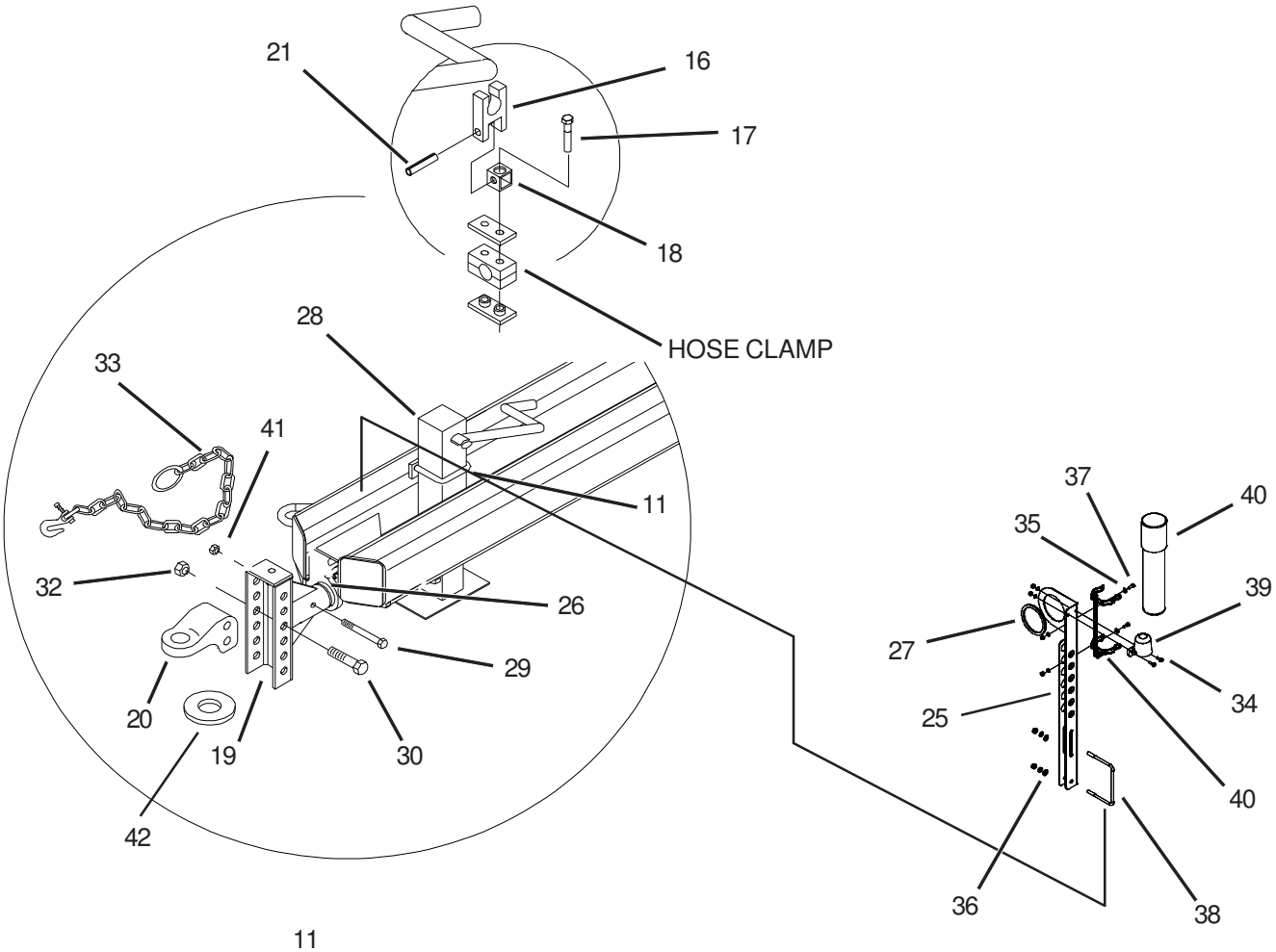
2IN HUB & SPINDLE
TIRES
PAGE 62-63

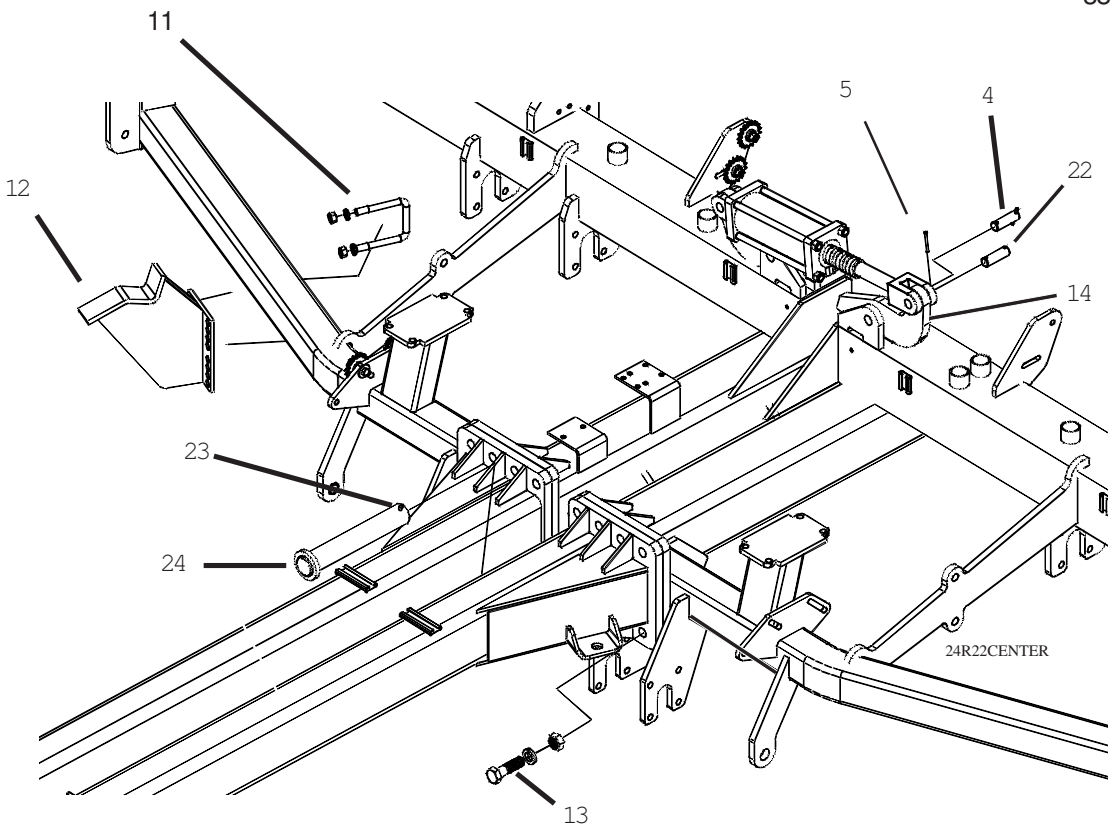
AXLE LEG
PAGE 53

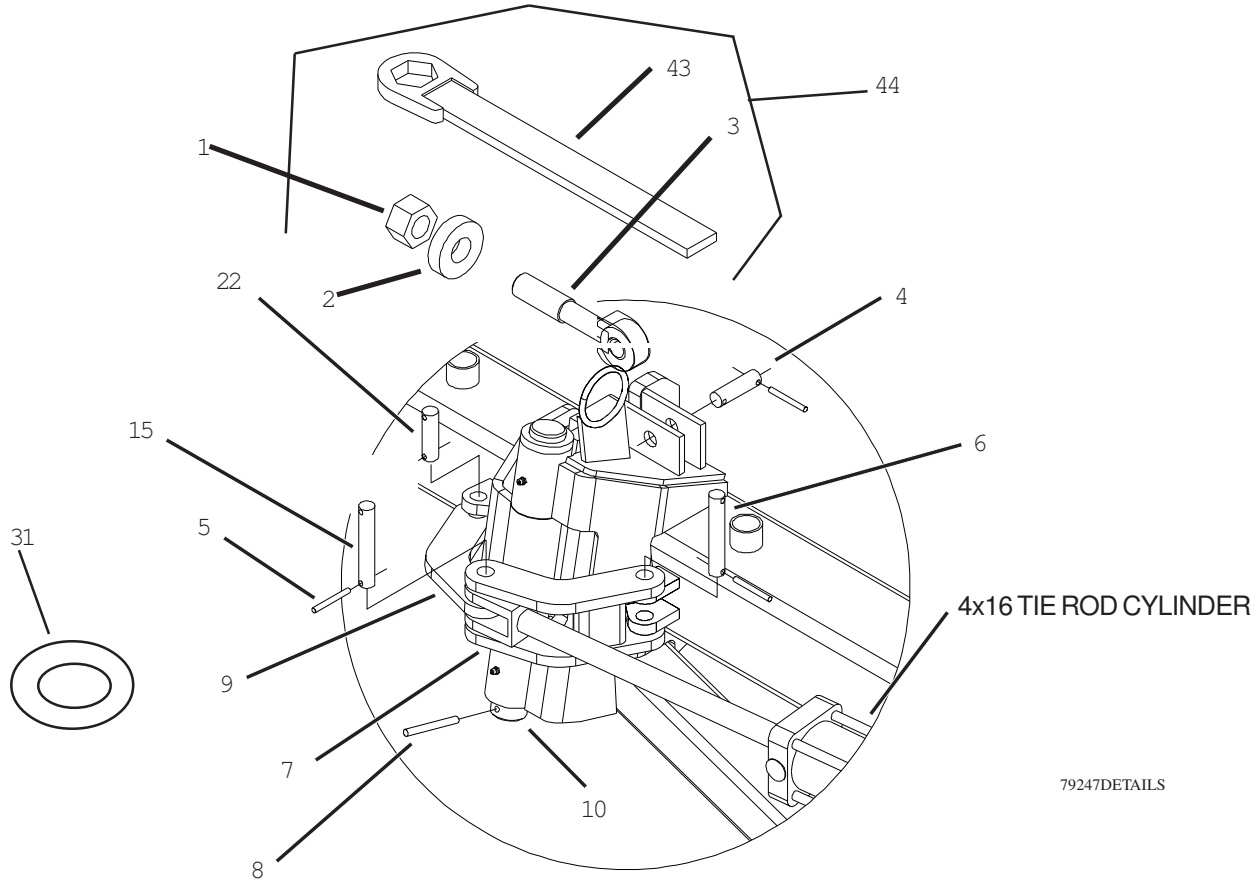


HINGE DETAIL
PAGE 50

TOOLBAR ASSEMBLY DETAILS



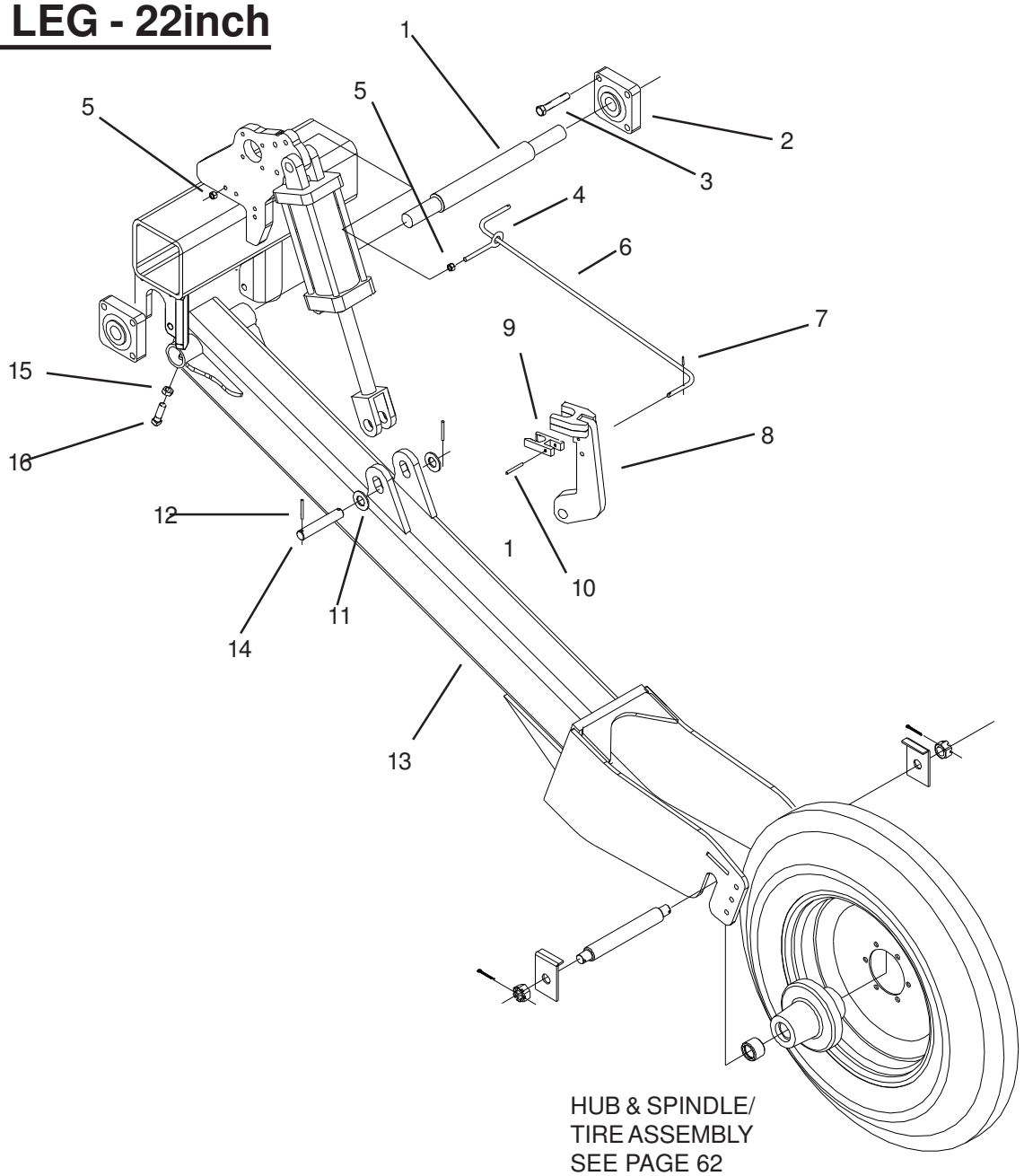




ITEM	PART NO	DESCRIPTION
1	88684	1NC NUT
2	241044	1 FLAT WASHER
3	241043	1NCx6 EYEBOLT
4	42473	HEADLESS PIN(2) 1X3-1/8
5	42484	CYLINDER LOCK PIN (1/4x2-1/4)
6	67863	HEADLESS PIN(2) 1X5-5/8
7	222692	2 BAR FOLD LINKAGE
8	88771	3/8x3 ROLL PIN
9	222695	SINGLE FOLD LINKAGE
10	69006	WING PIN ASSEMBLY (2-1/4x18-3/32)
11	88145	5/8NCx4x5-1/4 U-BOLT
12	221557	WING REST ASSY
13	88447	1NCx3-1/2 GR5 BOLT
14	69607	CENTER CYLINDER LINK
15	222689	HEADLESS PIN(2) 1-1/4X5-5/8
16	222050	PLASTIC SNAP LOCK
17	88553	3/8NCx1-1/2 GR5 BOLT
18	222328	HANDLE HOLDER
19	222618	HITCH ASSEMBLY
20	18236	CAST CLEVIS HITCH
21	88628	1/4x1-3/4 ROLL PIN
22	68796	HEADLESS PIN(2) 1X4
23	88771	3/8 X 3 ROLL PIN
24	67853	TB PIN ASSEMBLY
25	236142	HYD HOSE BRACKET
26	67855	FRONT TB PIN ASSY
27	236092	RUBBER EDGE
28	222324	SIDE WIND JACK
29	88857	5/8NFX4 GR8 BOLT

ITEM	PART NO	DESCRIPTION
30	88349	1-1/4NCX6-1/2 G R5 BOLT
31	220425	SEAL 7ODX4IDX3/8THK
32	88430	1-1/4NC LOCK NUT
33	24459	20K SAFETY CHAIN
34	88203	1/4NCX 1 GR5 BOLT
35	88261	1/4 FLAT WASHER
36	88282	3/8 FLAT WASHER
37	88993	1/4NCX3/4 GR5 BOLT
38	89406	3/8NCX6X4-3/4 U-BOLT
39	223329	PLUG HOLDER
40	235313	STORAGE TUBE & BRACKET
41	89273	5/8NF LOCK NUT
42	236172	DONUT
43	241047	2IN WRENCH
44	241045	1-1/4X7 EYEBOLT KIT (CONTAINS 2 EYEBOLTS)

AXLE LEG - 22inch

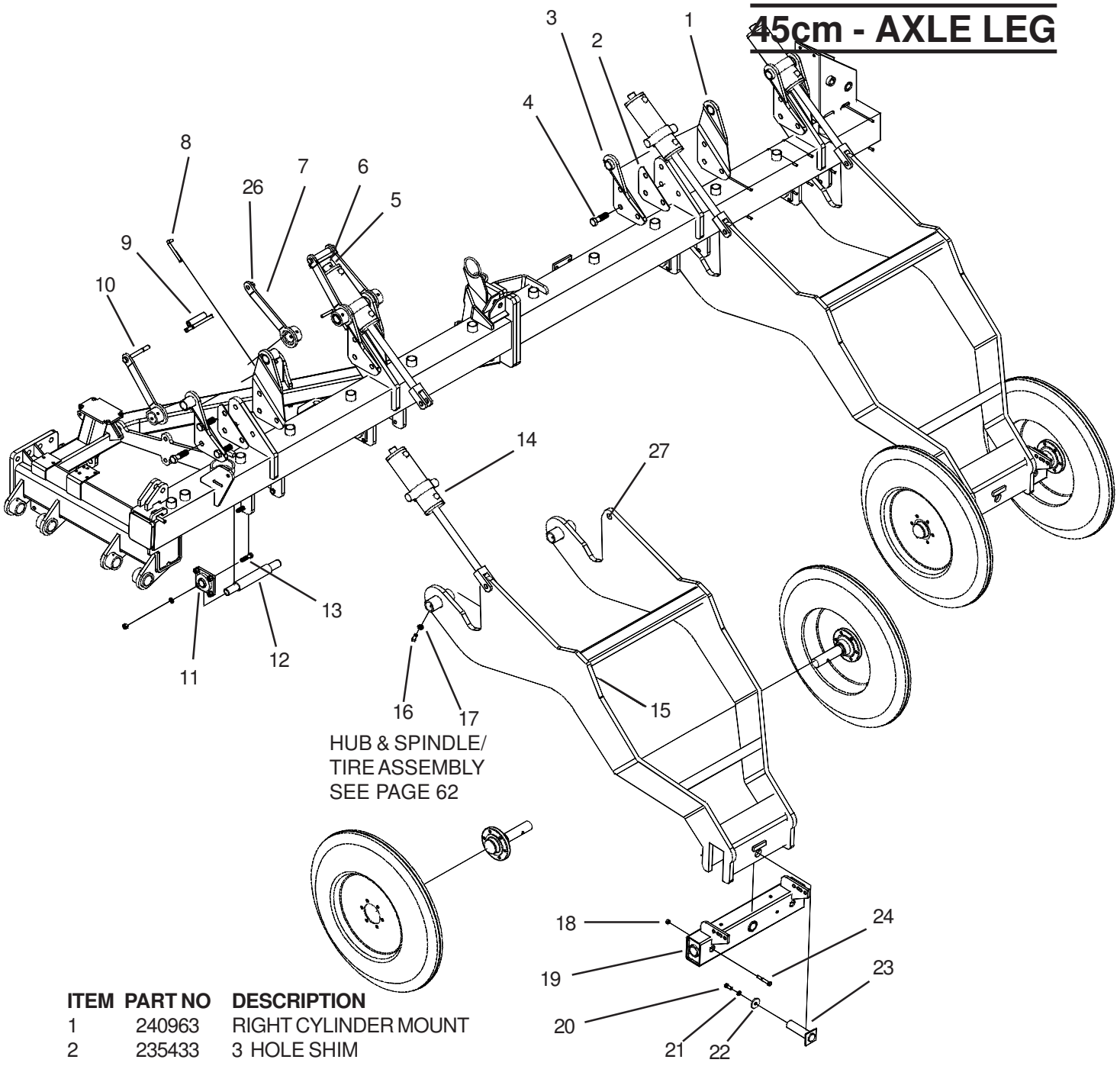


HUB & SPINDLE/
TIRE ASSEMBLY
SEE PAGE 62

ITEM	PART NO	DESCRIPTION
1	223891	AXLE LEG SHAFT
2	223955	4BOLT BEARING BLOCK
3	88409	5/8NCx2-1/2 GR5 BOLT
4	45636	3/8 EYE BOLT
5	88103	3/8NC NUT
6	222051	ADJUSTMENT ROD
7	89018	1/8 DIA x 1 ROLL PIN
8	241039	BLACK TRANSPORT LOCK(12)

ITEM	PART NO	DESCRIPTION
9	222050	PLASTIC SNAP
10	88628	1/4 DIA x 1-3/4 ROLL PIN
11	88196	1" FLAT WASHER
12	42484	CYLINDER LOCK PIN
13	222774	LIFT WHEEL ARM ASSY (RED)
14	67863	HEADLESS PIN (1x4-7/8)
15	88774	5/8NC JAM NUT
16	88977	5/8NCx1-1/2 SQ HD SET SCREW

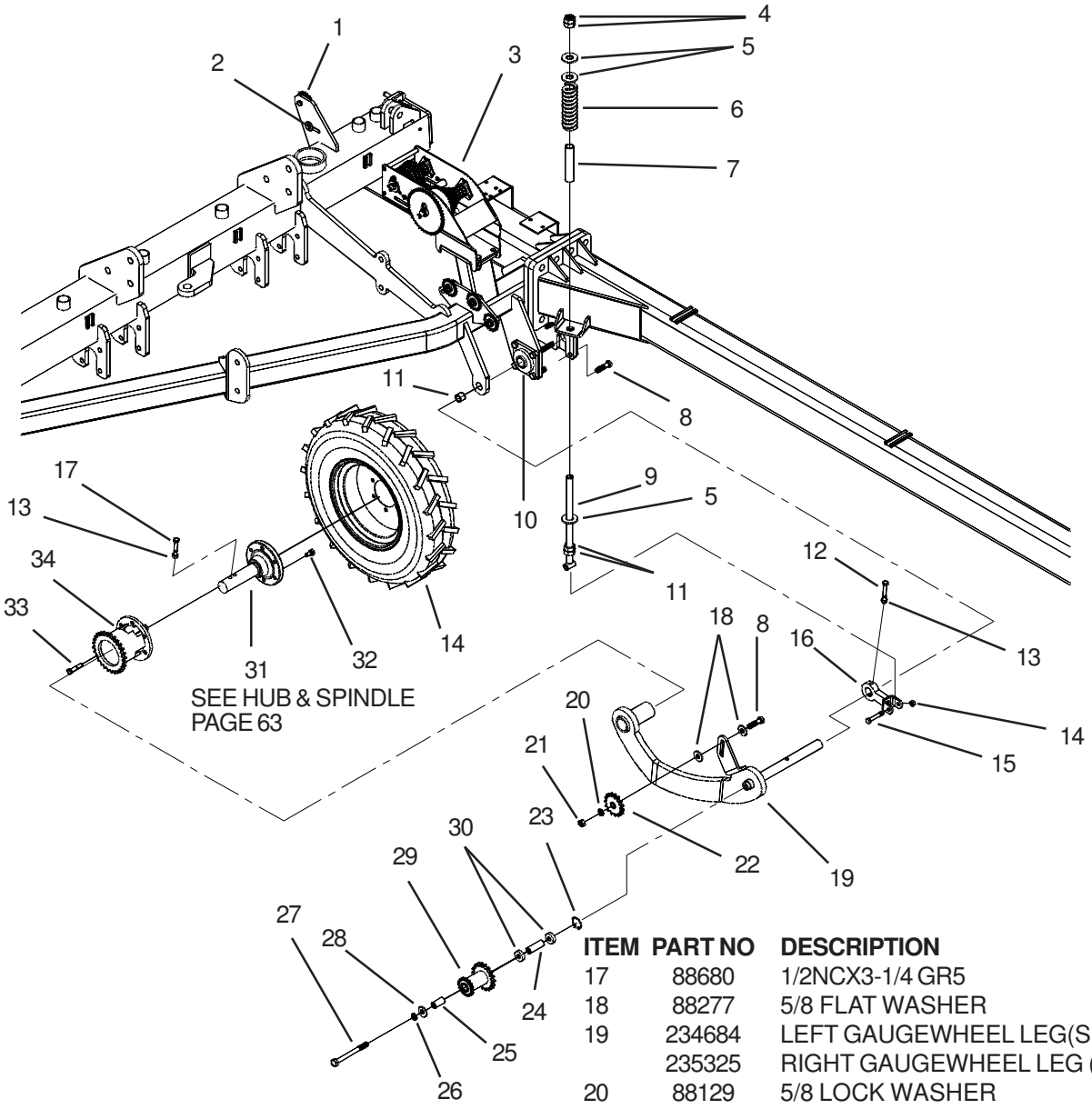
45cm - AXLE LEG



ITEM	PART NO	DESCRIPTION
1	240963	RIGHT CYLINDER MOUNT
2	235433	3 HOLE SHIM
3	240962	LEFT CYLINDER MOUNT
4	88447	1NC X 3-1/2 GR5
5	235342	ROD CAP
6	88706	5/16NC X 5/16 SET SCREW
7	235427	SIDE ARM
8	70843	1/2 X 5 PIN
9	235431	STOP PLATE
10	89130	3/4NC X 6-1/2 GR5
11	223955	4 HOLE BEARING BLOCK
12	235333	AXLE LEG SPINDLE(45CM)
13	88409	5/8NC X 2-1/2 GR5
14	234679	4X8 TRUNION CYLINDER
15	234660	TWIN AXLE
16	88977	5/8NC X 1-1/2 SQ HD
17	88774	5/8 NC JAM NUT

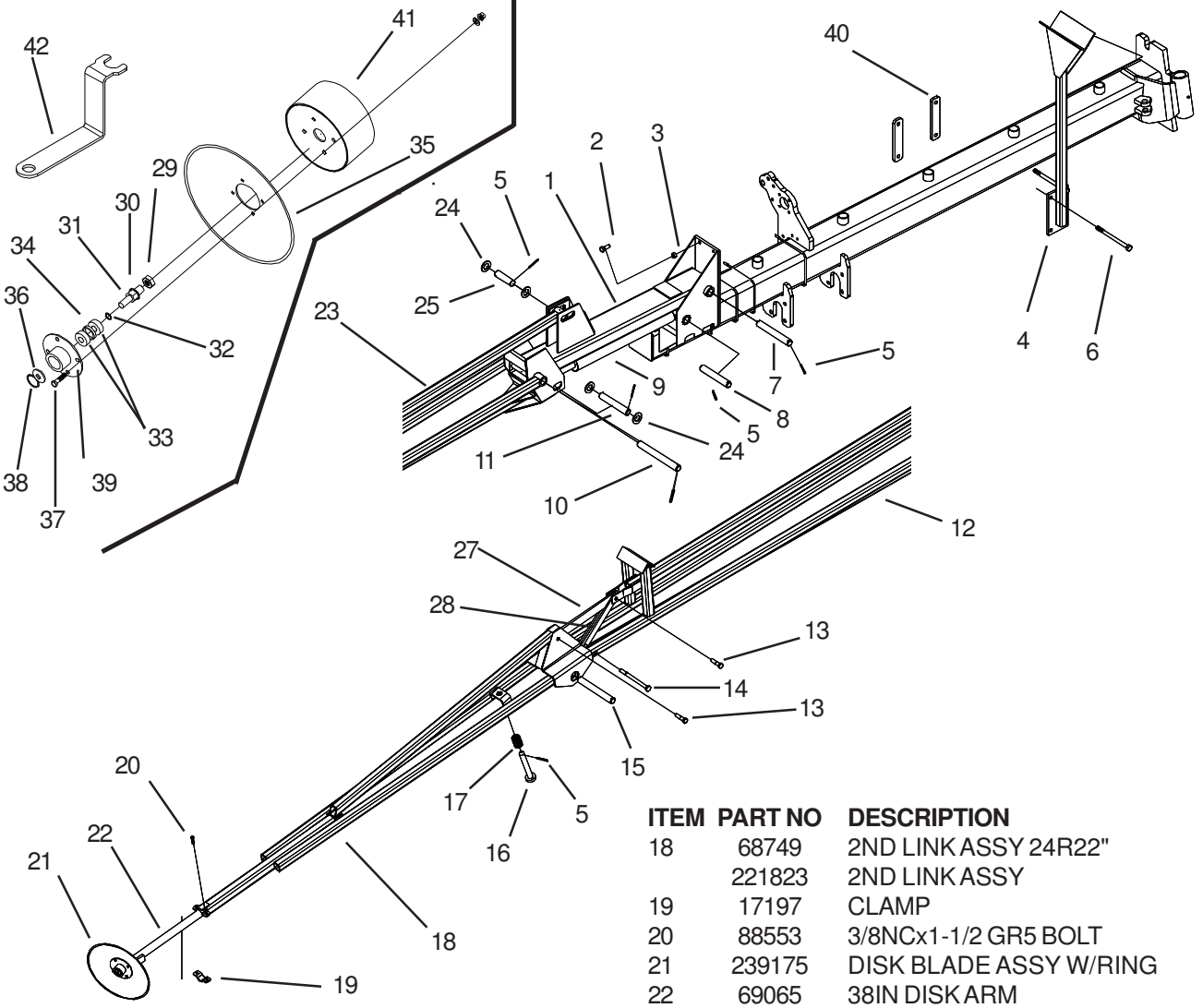
ITEM	PART NO	DESCRIPTION
18	88304	1/2NF LOCK NUT
19	234669	OSCILLATING BEAM
20	88554	1/2NC X 1-1/4 GR5
21	88303	1/2 LOCK WASHER
22	71145	1/4X9/16X2-1/4 FLAT WASHER
23	220178	1-3/4 X 6 SHAFT
24	240965	RIGHT LK CYLINDER MOUNT
25	240964	LEFT LK CYLINDER MOUNT
26	235427	SIDE ARM
27	33515	SPRING TENSION BUSHING

FORWARD WHEEL DRIVE ASSEMBLY



ITEM	PART NO	DESCRIPTION
	67990	40-17 IDLER SPROCKET
		SERIAL NO. 456800 & BELOW
2	88679	1/2NC X 2 GR5
3	240187	FWD TRANSMISSION
4	88125	1NC NUT
5	88196	1 FLAT WASHER
6	239169	2-3/8X8 COMP SPRING
7	239165	1-5/16X6-1/2 SLEEVE
8	88409	5/8NCX2-1/2 GR5
9	239168	1NCX17-1/4 SPRING ROD
10	223955	4 HOLE BEARING BLOCK
11	33515	1IN SPRING TENSION BUSHING
12	88543	1/2NCX3-3/4 GR5
13	88363	1/2NC LOCK NUT
14	A56987	RH 760-15 6PLY (SHOWN)
	A63994	LH 760-15 6PLY (OPPOSITE)
15	223691	1/2NCX3 GR5
16	235307	SPRING ARM
17	88680	1/2NCX3-1/4 GR5
18	88277	5/8 FLAT WASHER
19	234684	LEFT GAUGEWHEEL LEG(SHOWN)
	235325	RIGHT GAUGEWHEEL LEG (OPP)
20	88129	5/8 LOCK WASHER
21	88126	5/8 LOCK WASHER
22	71526	#60 15TOOTH IDLER
23	235334	INTERNAL SNAP RING 1.75 BORE
24	235300	1ODX2LG- S/N:456999&BELOW
	241053	2-1/2LG - S/N:457000&UP
25	235326	1ODX3LG- S/N:456999&BELOW
	241053	2-1/2LG - S/N:457000&UP
26	88129	5/8 LOCK WASHER
27	88383	5/8NCX7 GR5
28	88277	5/8 FLAT WASHER
29	240267	5060 IDLER HUB
		S/N:456801 & UP
	234697	4060 IDLER HUB
		SERIAL NO. 456800 & BELOW
30	71461	5/8 DIA BORE BRG(1633DC)
31	235457	2IN HUB ASSEMBLY(2HOLE)
32	88142	1/2NFX1 WHEEL BOLT
33	237139	1/2NFX2-1/2 GR5 TAP BOLT
34	235344	28T HUB DRIVE SPROCKET

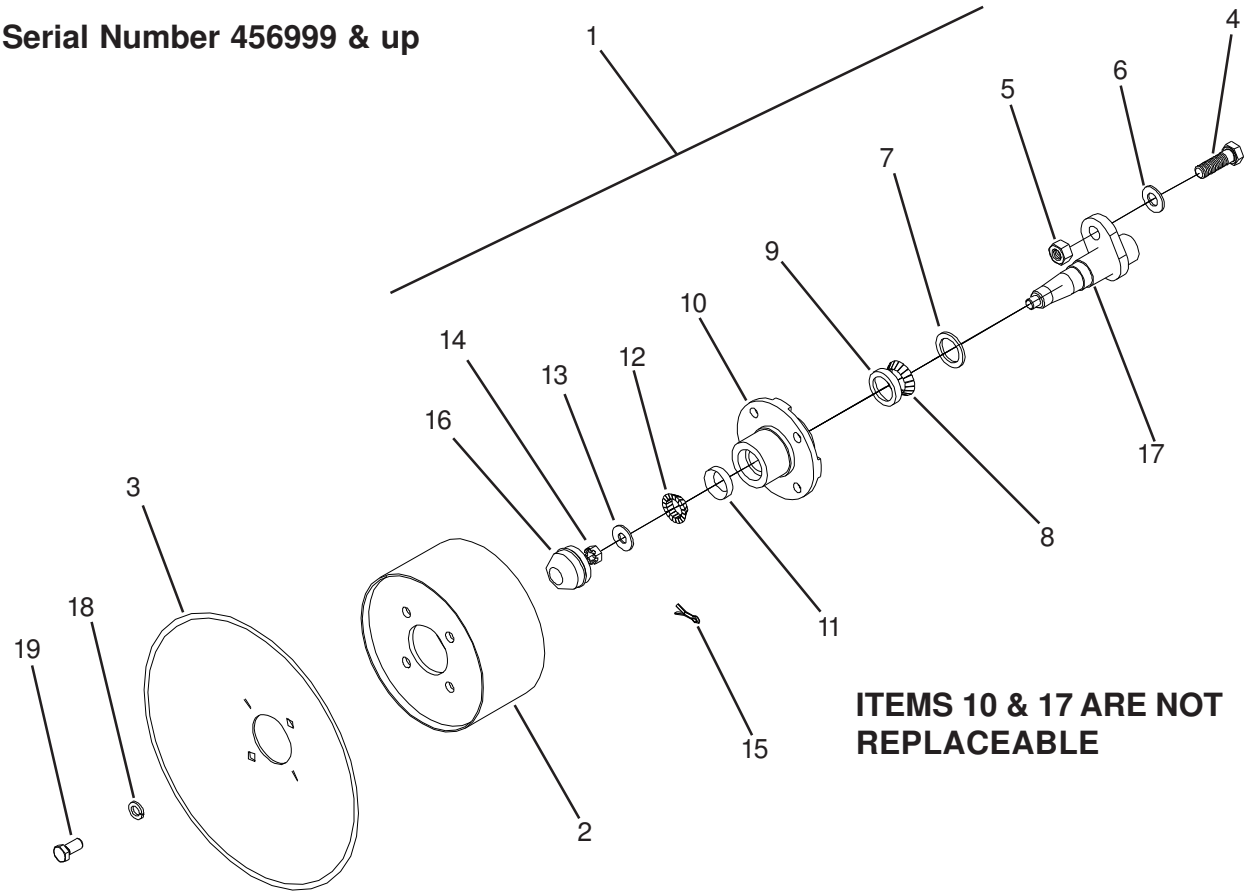
MARKER



ITEM	PART NO	DESCRIPTION
1	68725	CYLINDER LINK TUBE ASSY
2	88577	5/8NCx1-1/2 GR5 BOLT
3	88126	5/8NC NUT
4	237138	MARKER REST ASSY 24R22"
	235447	RIGHT MARKER REST 24R45CM
	235448	LEFT MARKER REST 24R45CM
5	88767	1/4DIAx2-1/2 ROLL PIN
6	88557	5/8NCX9 GR5
7	68384	1-1/4DIAx9.13 PIN
8	68399	1-1/4DIAx7.88 PIN
9	68822	2-1/2 x20 CYLINDER
10	67851	1-1/4DIAx11.38 PIN
11	68399	1-1/4DIAx7.88 PIN
12	68732	1st LINK ARM ASSY 24R22"
	222363	1st LINK ARM ASSY 24R45CM
13	88409	5/8NCx2-1/2 GR5 BOLT
14	89098	5/8NCx8-1/2 GR5 BOLT
15	69049	1-1/4DIAx9.91 PIN
16	69059	SPRING PIN
17	69091	4-1/2 COMPRESSION SPRING
18	68749	2ND LINK ASSY 24R22"
	221823	2ND LINK ASSY
19	17197	CLAMP
20	88553	3/8NCx1-1/2 GR5 BOLT
21	239175	DISK BLADE ASSY W/RING
22	69065	38IN DISK ARM
23	68742	UPPER LINK ARM ASSY 24R22"
	222367	UPPER LINK ARM ASSY 24R45CM
24	88439	1-1/4x2-1/4x10 GA MACHINERY BUSHING
25	67854	1-1/4DIAx4.50 PIN
26	88369	5/8NC LOCK NUT
27	68966	IDLER STRAP WELDMENT
28	69084	MARKER STRAP WELDMENT
29	88562	3/4NC JAM NUT
30	88754	3/4 INTERNAL LOCK WASHER
31	64225	SPINDLE
32	64229	EXTERNAL SNAP RING
33	64227	BEARING 17MM ID X 40MM OD
34	64226	SPACER
35	23205	DISC
36	64228	HUB CAP
37	89034	3/8NC X 1 HEX BOLT GR5
38	64348	INTERNAL SNAP RING
39	64224	MACHINED HUB
40	240233	2HOLE PLATE 1/2X7
41	239172	MARKER DEPTH WHEEL
42	239204	DISK BLADE WRENCH

MARKER DISC HUB

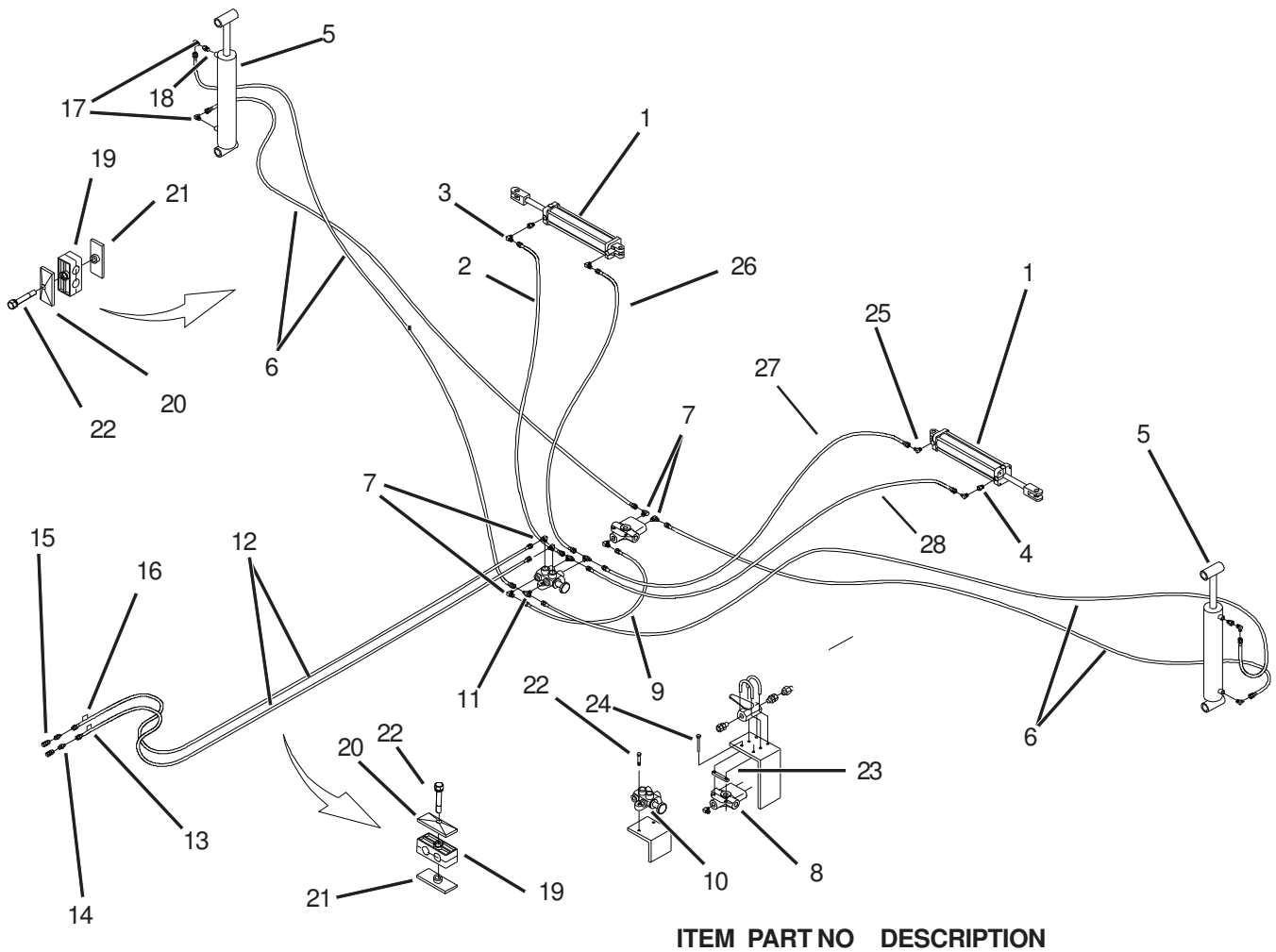
Serial Number 456999 & up



ITEMS 10 & 17 ARE NOT REPLACEABLE

ITEM	PART NO	DESCRIPTION
1	19337	1-1/4 HUB & SPINDLE
2	241071	MARKER DEPTH WHEEL
3	242502	14 INCH MARKER DISC
4	88294	5/8NC X 2 GR5 HEX BOLT
5	88369	5/8NC LOCK NUT
6	88630	5/8 SAE FLAT WASHER
7	19347	GREASE SEAL
8	23109	BEARING CONE 1"ID(L44643)
9	23114	BEARING CUP 1.980OD (L44610)
10	19337	1-1/4IN HUB & SPINDLE
11	19351	BEARING CUP 1.57OD(LM11710)
12	19346	BEARING CONE 11/16ID (LM11749)
13	19383	SPINDLE FLAT WASHER
14	19384	SLOTTED NUT
15	19382	COTTER PIN
16	19348	BEARING CAP
17	19344	MARKER SPINDLE
18	88303	1/2 LOCK WASHER
19	89290	1/2NF X 1 GR5 HEX BOLT

WING FOLD & MARKER HYDRAULICS



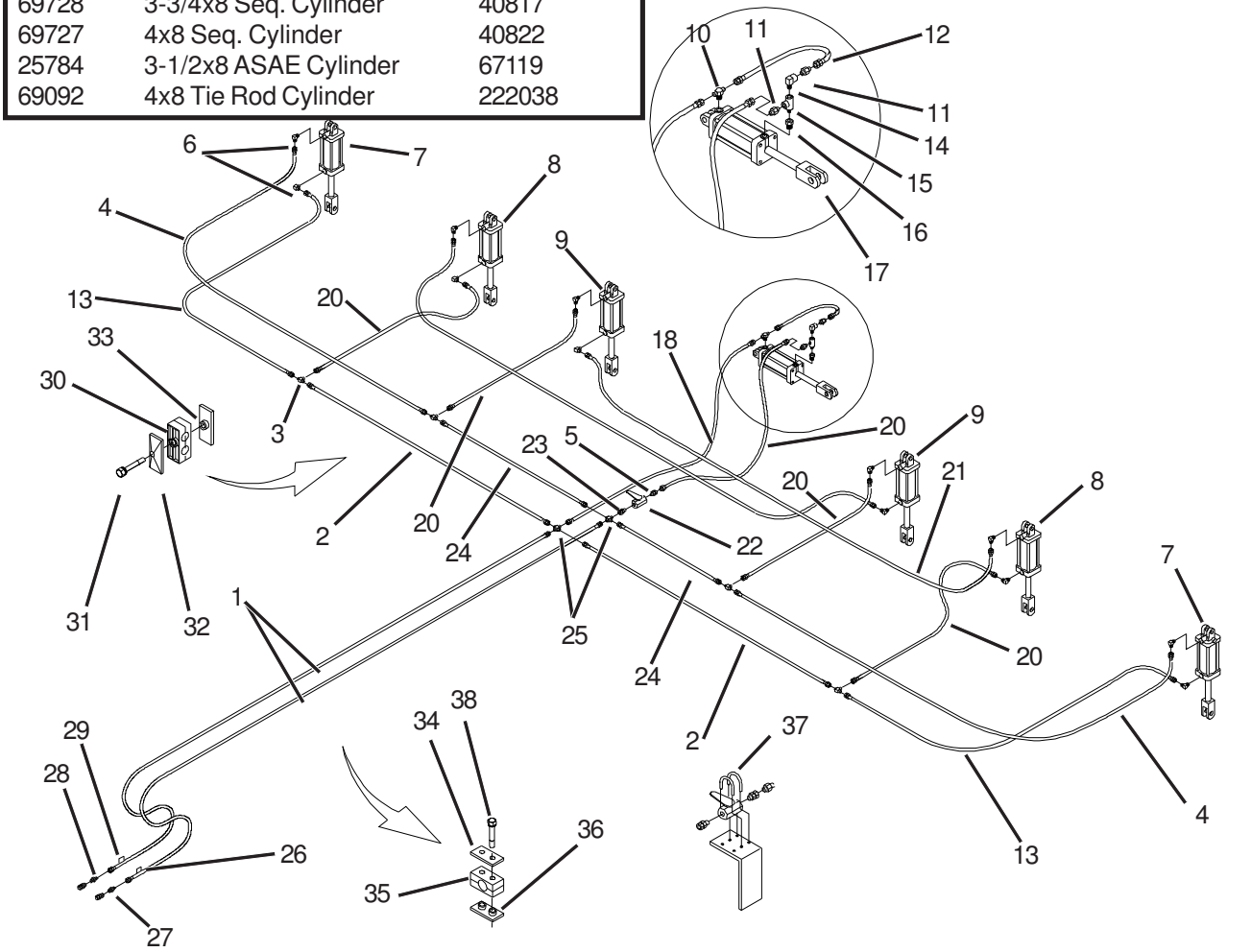
ITEM	PART NO	DESCRIPTION
1	51200	4x16 CYLINDER (1-1/4"DIA PINS)
2	65168	1/4x144 HOSE FF (24R22)
	63723	1/4x108 HOSE FF (24R45CM)
3	234938	3/4JICx9/16JIC(M) ELBOW
4	69389	3/4ORBx3/4JIC RESTRICTOR
5	68822	2-1/2x20 CYLINDER
6	221719	1/4x328 HOSE FF (24R22)
	221587	1/4x288 HOSE FF(24R45CM)
7	24104	3/4ORBx9/16JIC ELBOW
8	64356	SEQUENCE VALVE
9	58575	1/4x30 HOSE FF

Cylinder#	Description	Seal Kit #
68822	2-1/2x20 Cylinder	222039
68789	3-1/2x16 Tie Rod Cylinder	69581
51200	4x16 Tie Rod Cylinder	24353

ITEM	PART NO	DESCRIPTION
10	222028	DOUBLE SELECTOR VALVE
11	234943	3/4ORBx9/16JIC TEE
12	237263	1/4x234 HOSE FF(24R22)
	221585	1/4x256 HOSE FF(24R45CM)
13	54900	WING UP DECAL
14	58690	6MJx8MPT ADAPTER
15	60640	QUICK DISCONNECT COUPLER
16	54901	WING DOWN DECAL
17	58539	9/16JICx3/8NPT ELBOW
18	14267	3/8 CYL PORT W/ RESTRICTOR
19	221444	1/4 TWIN CLAMP HALF
20	221445	COVER PLATE
21	221443	TWIN PLATE
22	88479	5/16NC X 1-1/2 BOLT GR5
23	223979	3/4SQ X 3 SPACER
24	89004	5/16NC X 2-1/2 BOLT GR5
25	24104	3/4ORB X 9/16JIC(M)ELBOW
26	65168	1/4x144 HOSE FF (24R22)
	58538	1/4x84 HOSE FF (24R45CM)
27	65168	1/4x144 HOSE FF (24R22)
	63791	1/4x96 HOSE FF (24R45CM)
28	65168	1/4x144 HOSE FF (24R22)
	235395	1/4x116 HOSE FF (24R45CM)

24R22 - LIFT HYDRAULICS

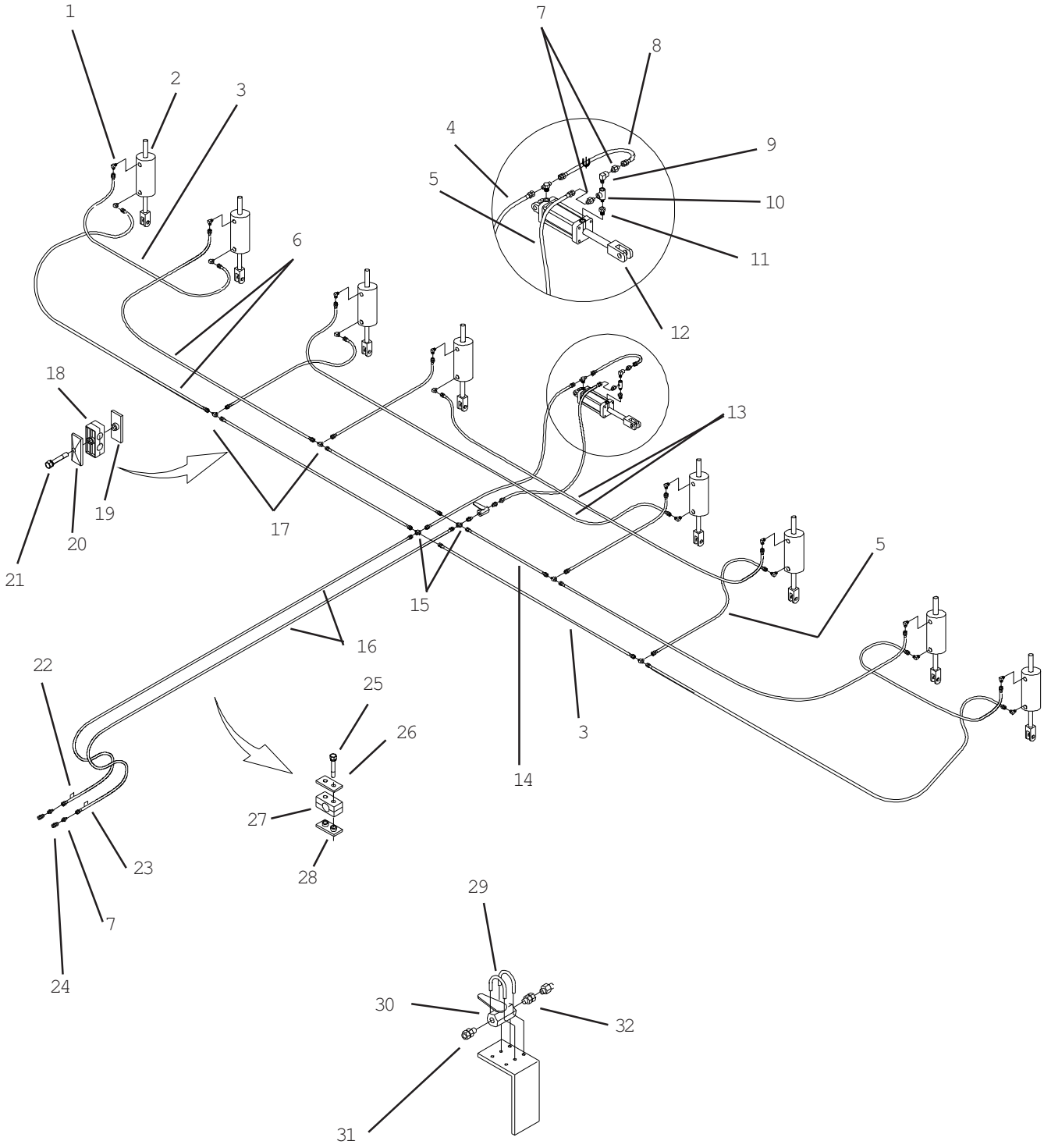
Cylinder#	Description	Seal Kit #
222200	3-1/4x8 Seq. Cylinder	40806
69729	3-1/2x8 Seq. Cylinder	40812
69728	3-3/4x8 Seq. Cylinder	40817
69727	4x8 Seq. Cylinder	40822
25784	3-1/2x8 ASAE Cylinder	67119
69092	4x8 Tie Rod Cylinder	222038



ITEM	PART NO	DESCRIPTION
1	237264	1/2x234 HOSE FF
2	67634	3/8x132 HOSE FF
3	13238	3/4JIC TEE
4	234939	3/8x220 HOSE FF
5	24024	8MORBx8MJ ADAPTER
6	25580	ELBOW 8MORBx8MJ
7	25784	3-1/2x8 ASAE HYD CYLINDER
8	222200	3-1/4x8 SEQ. CYLINDER
9	69729	3-1/2x8 SEQ. CYLINDER
10	56534	8MJx8MJx8MORB TEE
11	13234	8MJx8MPT COUPLER
12	14850	3/8x18 HOSE FF
13	233689	3/8x180 HOSE FF
14	69082	4MPTx8FPT STREET ELBOW
15	69686	VALVE
16	222855	ADAPTER (8MORBx8FPT)
17	69092	4x8 TIE ROD CYLINDER
	59185	CYLINDER STOP PACKAGE
18	14644	3/8x36 HOSE FF

ITEM	PART NO	DESCRIPTION
20	13261	3/8x30 HOSE FF
21	233689	3/8x180 HOSE FF
22	222120	BALL VALVE (3000PSI)
23	24004	HYD FITTING ADAPTER (8MORBx8FJX)
24	13268	3/8x78HOSE FF
25	15910	3/4JIC CROSS
26	54902	MAIN UP DECAL
27	60640	QUICK DISCONNECT COUPLER
28	13234	8MJx8MPT ADAPTER
29	54901	MAIN DOWN DECAL
30	220645	3/8 TWIN CLAMP HALF
31	88479	5/16NC X 1-1/2 BOLT GR5
32	221445	COVER PLATE
33	221443	TWIN PLATE
34	B112492	COVER PLATE
35	B112479	1/2 CLAMP HALF
36	B112498	NUT PLATE TWIN
37	88498	5/16NC X 2 X 2-3/4U-BOLT
38	88997	1/4NC X 1-3/4 BOLT GR5

24R45cm - LIFT HYDRAULICS

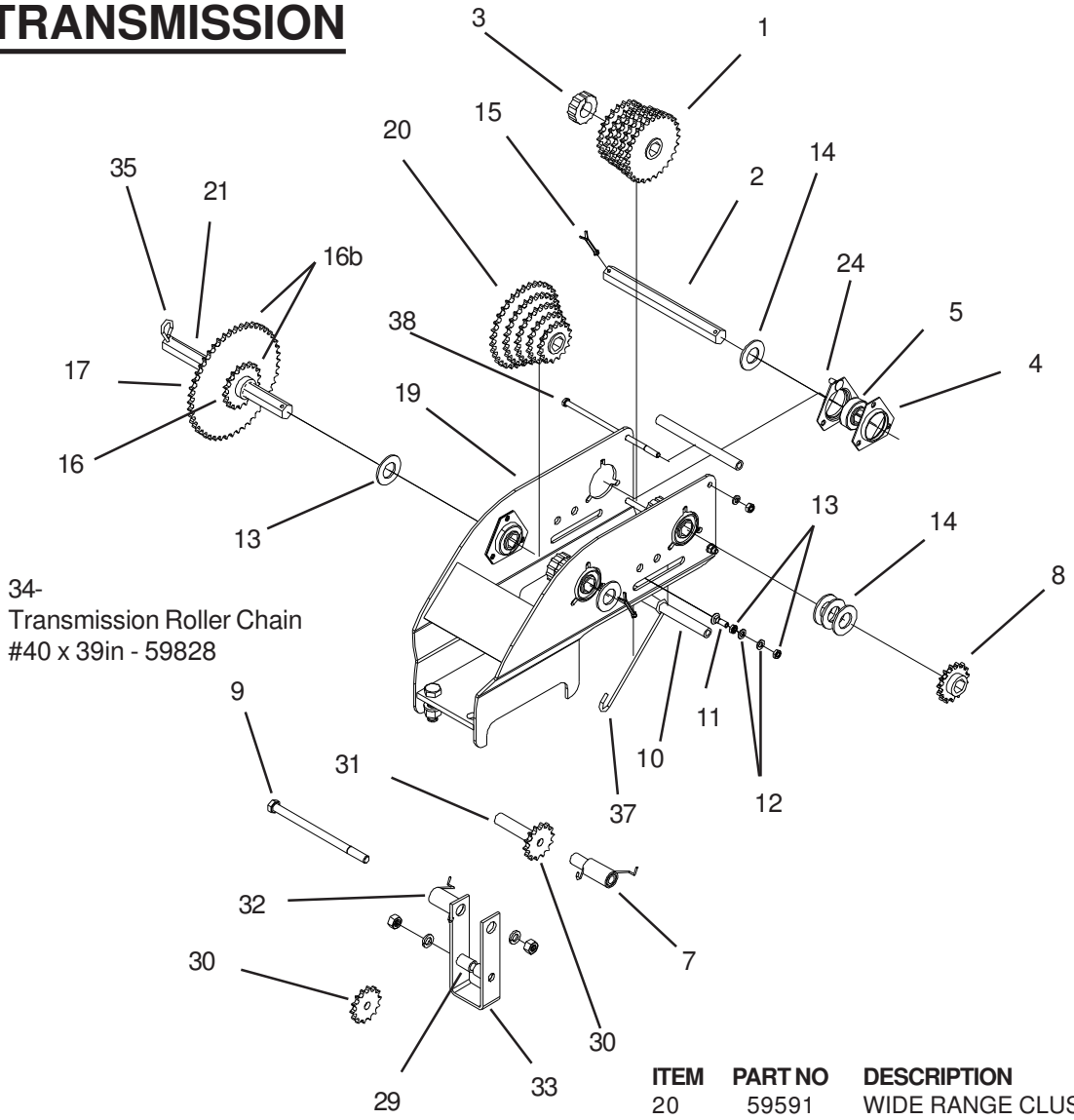


VALVE MOUNTING

FRONT

ITEM	PART NO	DESCRIPTION
1	25580	ELB 8MORB x 8MJ
2	234679	4x8 TRUNNION CYLINDER
	240101	SEAL KIT #SKC40-152A
3	25604	HSE 3KPSI 3/8x83 8FJX-8FJX
4	14644	HSE 3KPSI 3/8x36 8FJX-8FJX
5	13261	HSE 3KPSI 3/8x30 8FJX-8FJX
6	13484	HSE 3KPSI 3/8x156 8FJX-8FJX
7	13234	ADP 8MJ x 8MPT
8	14850	HSE 3KPSI 3/8x18 8FJX-8FJX
9	69082	ELB 4MPT x 8FPT
10	69686	PILOT CHECK VAVLE 8FPT BLACK
11	222855	ADP 8MORB x 8FPT
12	69092	4x8 TIE ROD CYLINDER
13	13580	HSE 3KPSI 3/8x96 8FJX-8MJ
	15515	HSE 3KPSI 3/8x62 8FJX-8FJX
14	56539	HSE 3KPSI 3/8x50 8FJX-8FJX
15	15910	CROSS 8MJ (4)
16	237264	HSE 3KPSI 1/2x234 8FJX-8FJX
17	13238	TEE 8MJ (3)
18	220645	CLAMP HALF 3/8 TWIN
19	221443	TWIN PLATE
20	221445	COVER PLATE
21	88479	BLT HEX 5/16-18NCx1-1/2
22	54901	MAIN DOWN DECAL
23	54900	MAIN UP DECAL
24	60640	QUICK DISCONNECT COUPLER
25	88285	BLT 1/4-20NCx3
26	B112492	COVER PLATE
27	B112479	CLAMP HALF 1/2
28	B112498	HUT PLATE TWIN
29	88498	BLT-U 5/16-18x2x2-3/4
30	222120	BALL VALVE (3000PSI)
31	24004	ADP 8MORB x 8FJX
32	24024	ADP 8MORB x 8MJ

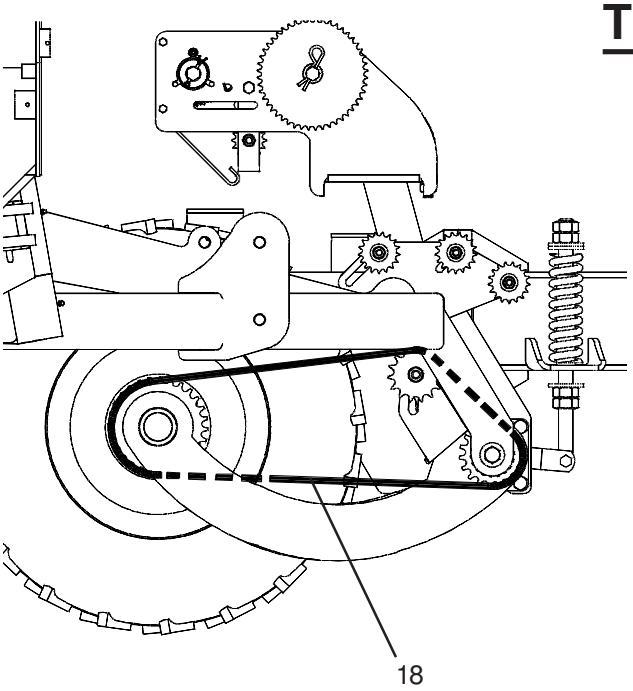
TRANSMISSION

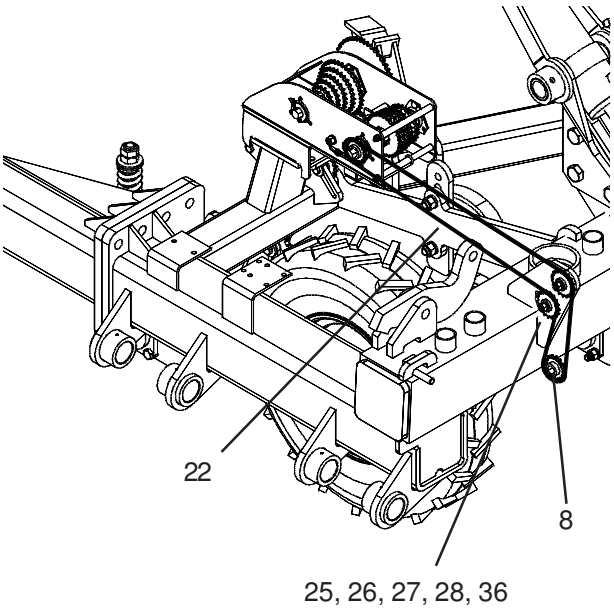


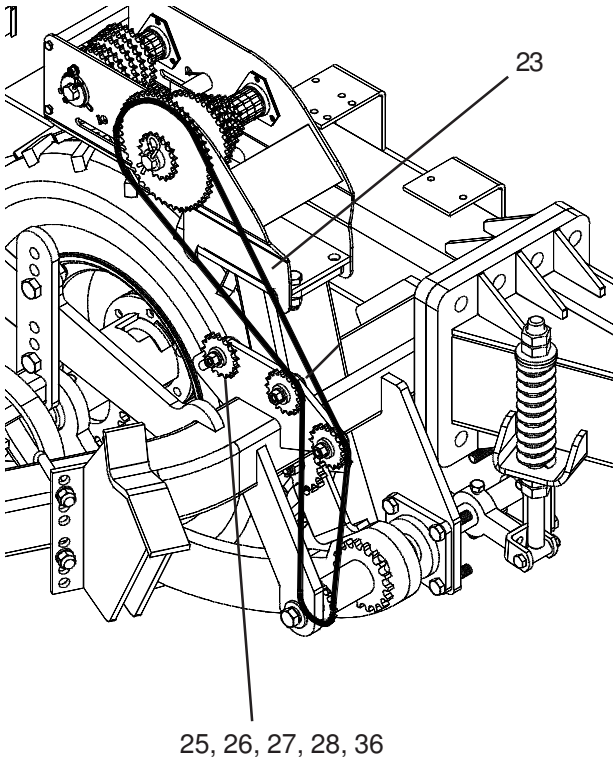
ITEM	PART NO	DESCRIPTION
1	59592	NARROW RANGE CLUSTER
2	59584	7/8HEXx9.81 SHAFT
3	59508	GEAR SPACER
4	59893	TRIANGLE FLANGETTE
5	59892	7/8 HEX BORE BEARING
6	88595	1/2NCx4 GR5 BOLT
7	60648	LEFT TORSION SPRING
8	237065	50C15 SPROCKET
	234650	40-15 SPROCKET(HARDENED)
		SERIAL NO. 456800 & BELOW
10	59887	5/8ODX7 SPACER TUBE
11	88519	5/16NCX1 CARRIAGE BOLT
12	88278	5/16 FLAT WASHER
13	89255	5/16NC JAM NUT
14	88738	1 SAE FLAT WASHER
15	88301	3/16X1-1/2 COTTER PIN
16	240265	50C18 SPROCKET ASSEMBLY
16b	59612	HI-LO CLUSTER
		SERIAL NO. 456800&BELOW
17	240266	50C48 SPROCKET ASSEMBLY
18	235348	#60x65.25 ROLLER CHAIN
19	220474	TRANY WELDMENT

ITEM	PART NO	DESCRIPTION
20	59591	WIDE RANGE CLUSTER
21	59583	7/8HEX x 10.50 SHAFT (22")
22	240268	#50X90 ROLLER CHAIN
	235350	#40X87 ROLLER CHAIN
		SERIAL NO. 456800 & BELOW
23	240269	#50X85 ROLLER CHAIN
	235349	#40X81 ROLLER CHAIN
		SERIAL NO. 456800 & BELOW
24	89000	5/16NCX3/4 CARRIAGE BOLT
25	237067	5013E IDLER SPROCKET
	67990	40-17 IDLER SPROCKET
		SERIAL NO. 456800 & BELOW
26	88679	1/2NCX2 GR5
27	88347	1/2 FLAT WASHER
28	88104	1/2NC NUT
29	59883	3/4ODx1.12 SPACER BUSHING
30	59684	14 TOOTH IDLER
31	60639	3/4ODx3.25 SPACER BUSHING
32	60647	RIGHT TORSION SPRING
33	59589	TRANSMISSION IDLER BRACKET
34	59828	#40 ROLLER CHAIN (39")
35	42721	1/4x5 SPRING LOCK PIN
36	88303	1/2 LK WASHER
37	59585	LOCKOUT ROD
38	89099	5/16NCx8 GR5 BOLT

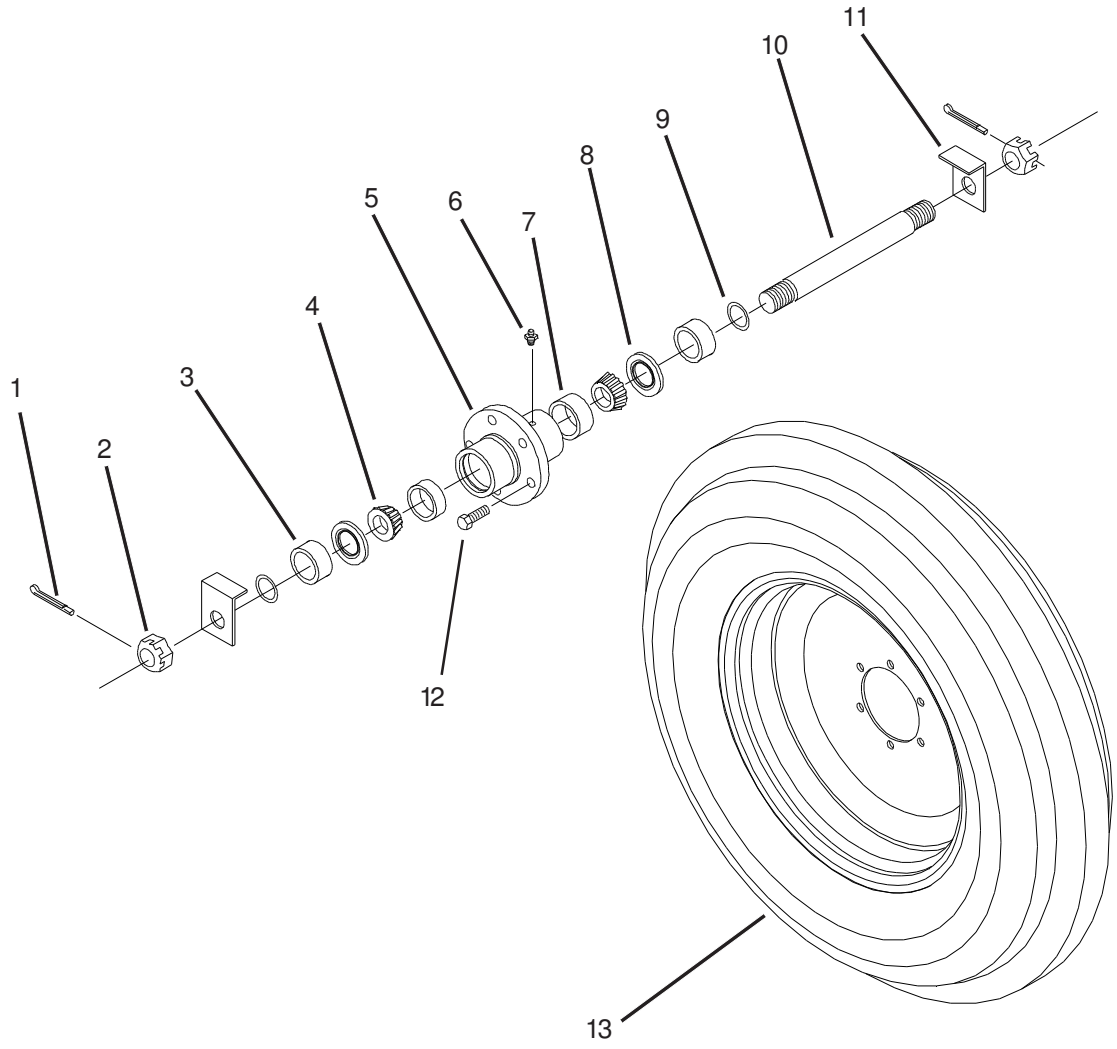
TRANSMISSION DRIVE CHAIN







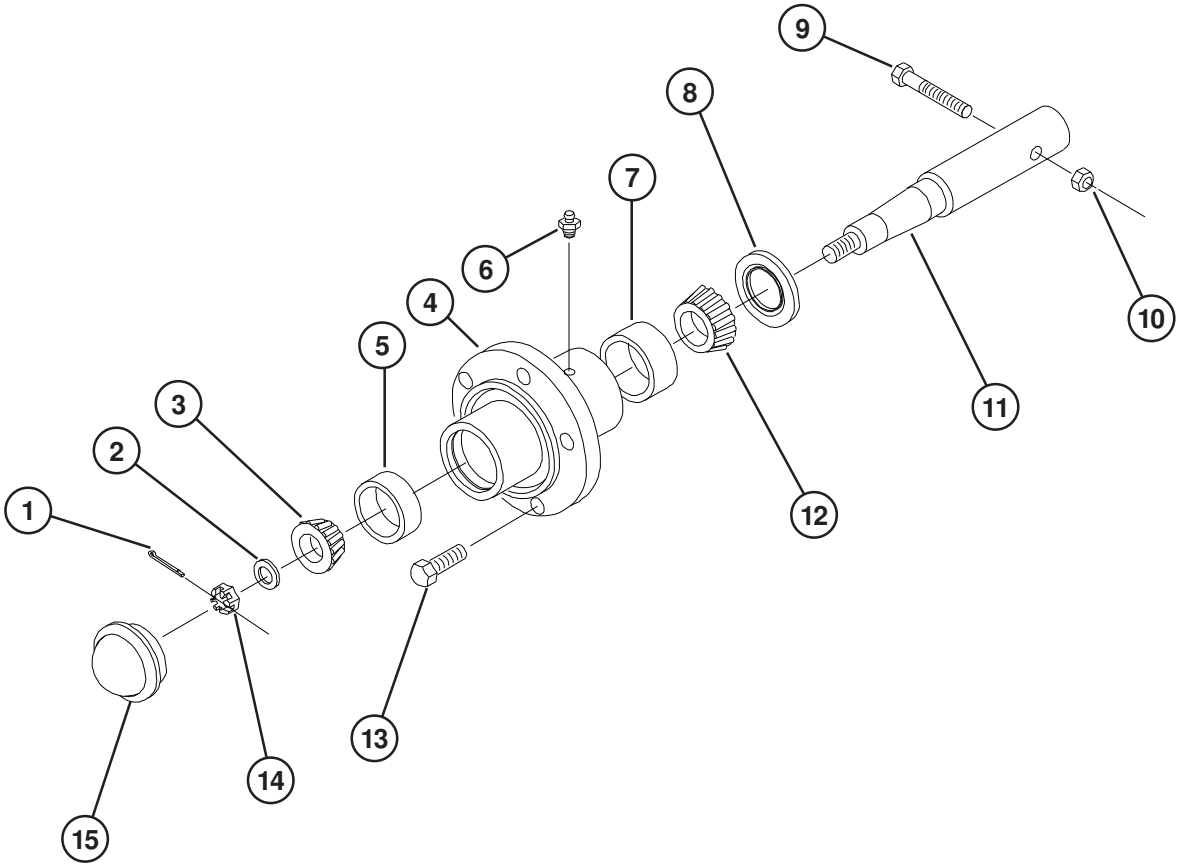
2-1/2IN HUB, SPINDLE & TIRE



ITEM	PART NO	DESCRIPTION
	220477	YOKE HUB ASSY (12-7/8")
1	88133	3/16x2 COTTER PIN
2	88299	1NF SLOTTED NUT
3	220478	2ODx1-5/8 SEALED TUBE
	67971	2ODx1-1/2 SEALED TUBE ('99)
4	54731	1.50 BORE BEARING CONE
5	54729	6 BOLT PRESSED HUB
6	88263	1/8NPT GREASE FITTING
7	16082	BEARING CUP
8	208981	2" INTERNAL TRIPLE LIP SEAL
9	12456	SHAFT SEAL
10	220415	GW SPINDLE (1-1/2x12-7/8)
11	55150	SPINDLE LOCK
12	63831	9/16NFX1-1/8 WHEEL BOLT

ITEM	PART NO.	DESCRIPTION
13	67967	7.50x20SL MONO TIRE ASSY(SHOWN)
	68843	7.50x20SL (12PLY) MONO TIRE
	68844	20x5.5 RIM
	69067	7.5x20 TUBE W/R15 VALVE STEM
	234588	7.50x20 4RIB IMP. TIRE ASSY
	234587	7.50x20 4RIB W/T99 IMP TIRE
	68844	20x5.5 RIM
	69067	7.5x20 TUBE W/R15 VALVE STEM
	235471	7.50x20 10P TRUCK TIRE ASSY
	235470	7.50x20 PK 10PLY PK TIRE
	68844	20x5.5 RIM
	69067	7.5x20 TUBE W/R15 VALVE STEM

6-BOLT HUB & 2IN SPINDLE



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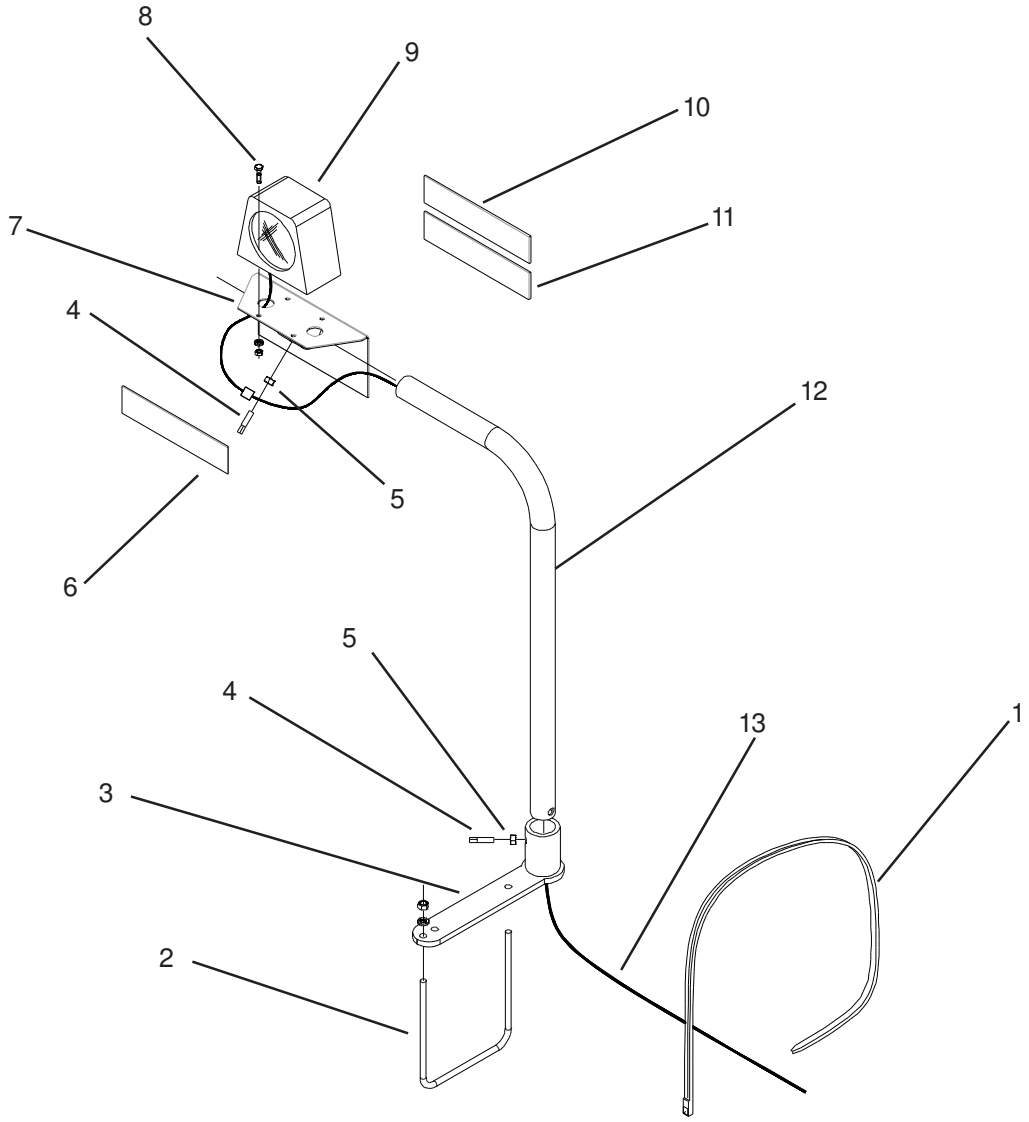
ITEM	PART NO.	DESCRIPTION
	235457	2IN HUB & SPINDLE (2HOLE)
	14131	2IN HUB & SPINDLE (INCLUDES 1-8 &11-15)
1	88301	PIN COT 3/16DIAx1-1/2
2	16094	SPINDLE WASHER 7/8ID
3	10345	BEARING CONE 1-1/4ID (LM67048)
4	24097	6-BOLT HUB W/CUPS
5	10344	BEARING CUP 2.328 OD (LM67010)
6	88263	FTG GRS 1/8NPT 1610-BL(11/16")
7	14249	BEARING CUP 2.891 OD (LM501310)
8	58546	2" TRIPLE LIP SEAL
9	88429	1/2NFx3-1/4 GR5 BOLT
10	88304	NUT 2POSLK 1/2NF
11	14251	2IN SPINDLE
	237186	2IN SPINDLE(2HOLE)
12	14248	BEARING CONE 1-5/8ID (LM501349)
13	88142	WHEEL BOLT 1/2NFx1 (13/16 HEAD)
14	88340	NUT SLTD 7/8NF
15	11381	DUST CAP

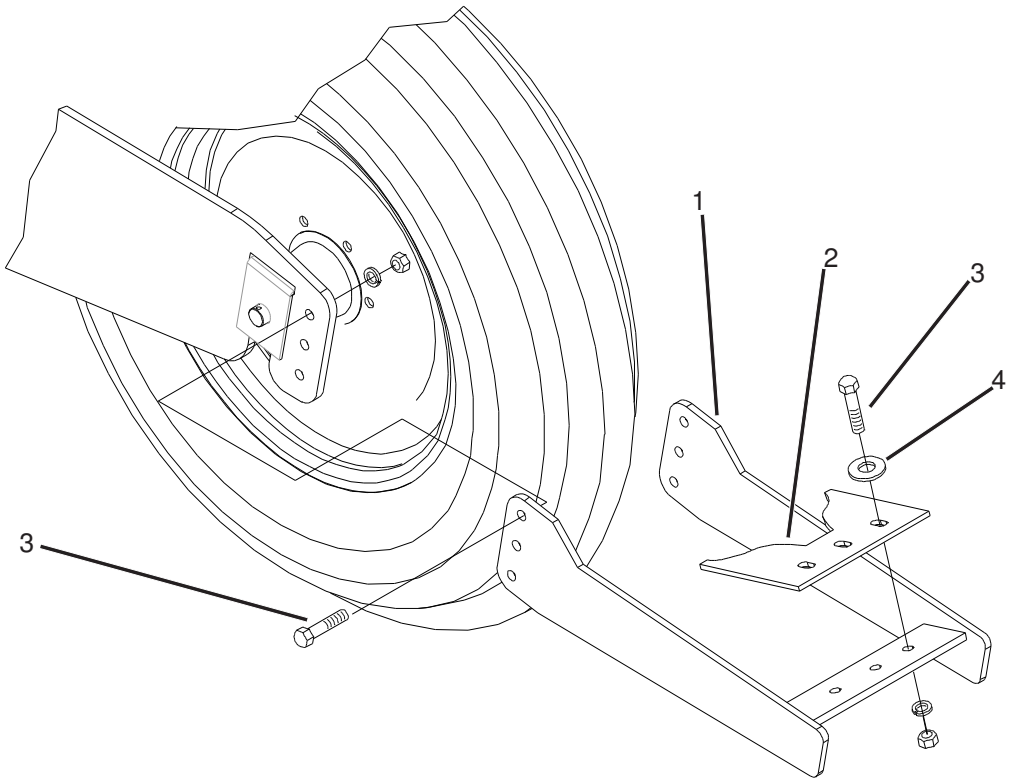
HAZARD LIGHTS



ITEM	PART NO	DESCRIPTION
	223165	LIGHTING KIT
1	13479	4" SQUARE TIE LOOP
	33096	TIE WRAP (30IN)
2	89277	3/8NCx7x8-1/4 U-BOLT
3	223131	LONG BASE PIVOT
4	88702	3/8NCx3/4 SQ HEAD SET SCREW
5	88103	3/8NC NUT
6	22372	YELLOW DECAL
7	223126	LIGHT/REFLECTOR BRACKET (INCLUDES 6,10&11)
8	88203	1/4NCx1 BOLT
9	223143	AMBER LIGHT
	223144	RED LIGHT
10	22371	RED DECAL

ITEM	PART NO	DESCRIPTION
11	223118	RED/ORANGE FLUORESCENT DECAL
12	223158	12x26 LIGHT ARM
	235460	12x36 LIGHT ARM
13	223145	AG MODULE
	223146	WISHBONE 4 LEAD
	223147	10FT EXTENSION
	64597	30FT WIRING HARNESS
	239177	30FT EUROPEAN WIRING HARNESS

MUD SCRAPER

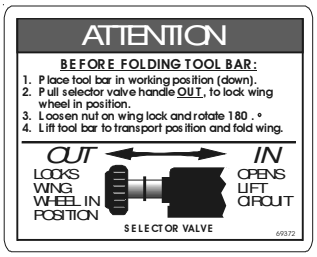


ITEM	PART NO	DESCRIPTION
1	236686	MUD SCRAPER BRACKET
2	69614	SCRAPER (SINGLE RIB TIRE)(SHOWN)
	235485	SCRAPER (TRUCK)
	222022	SCRAPER (4RIB IMPLEMENT TIRE)
3	88475	1/2NCx1-1/2 GR5 BOLT
4	88347	1/2 FLAT WASHER

DECALS

65342 WIL-RICH DECAL(3-5/8x23-7/8)

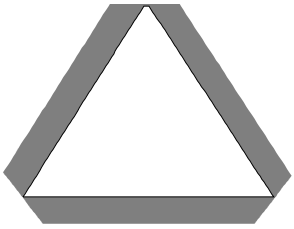
69386 PT 2200 DECAL



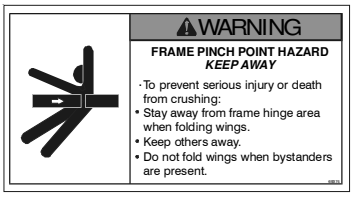
69372 PB FOLDING DECAL

22371 RED REFLECTOR
223118 FLUORESCENT ORANGE

22372 AMBER REFLECTOR



41345 SMV KIT

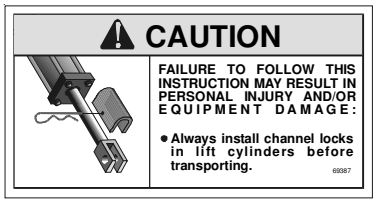


69374 CRUSHING DECAL

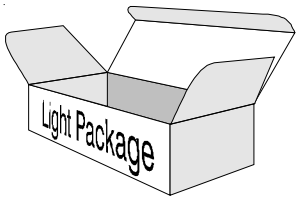
31928 CAUTION DECAL

221480 SPEED DECAL

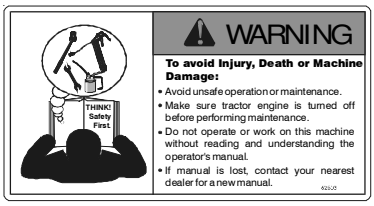
31942 CAUTION DECAL



69387 CHANNEL LOCK DECAL



235459 CLEARANCE LIGHT PACKAGE

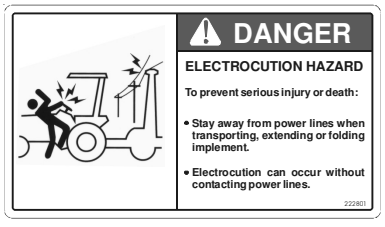


62503 SERVICE DECAL

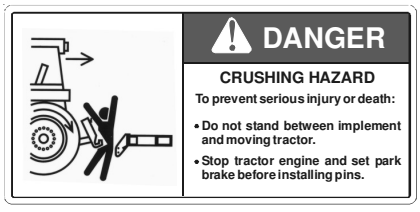
62500 MOVING PART DECAL

62558 HIGH PRESSURE FLUID

62557 GREASE FITTING DECAL



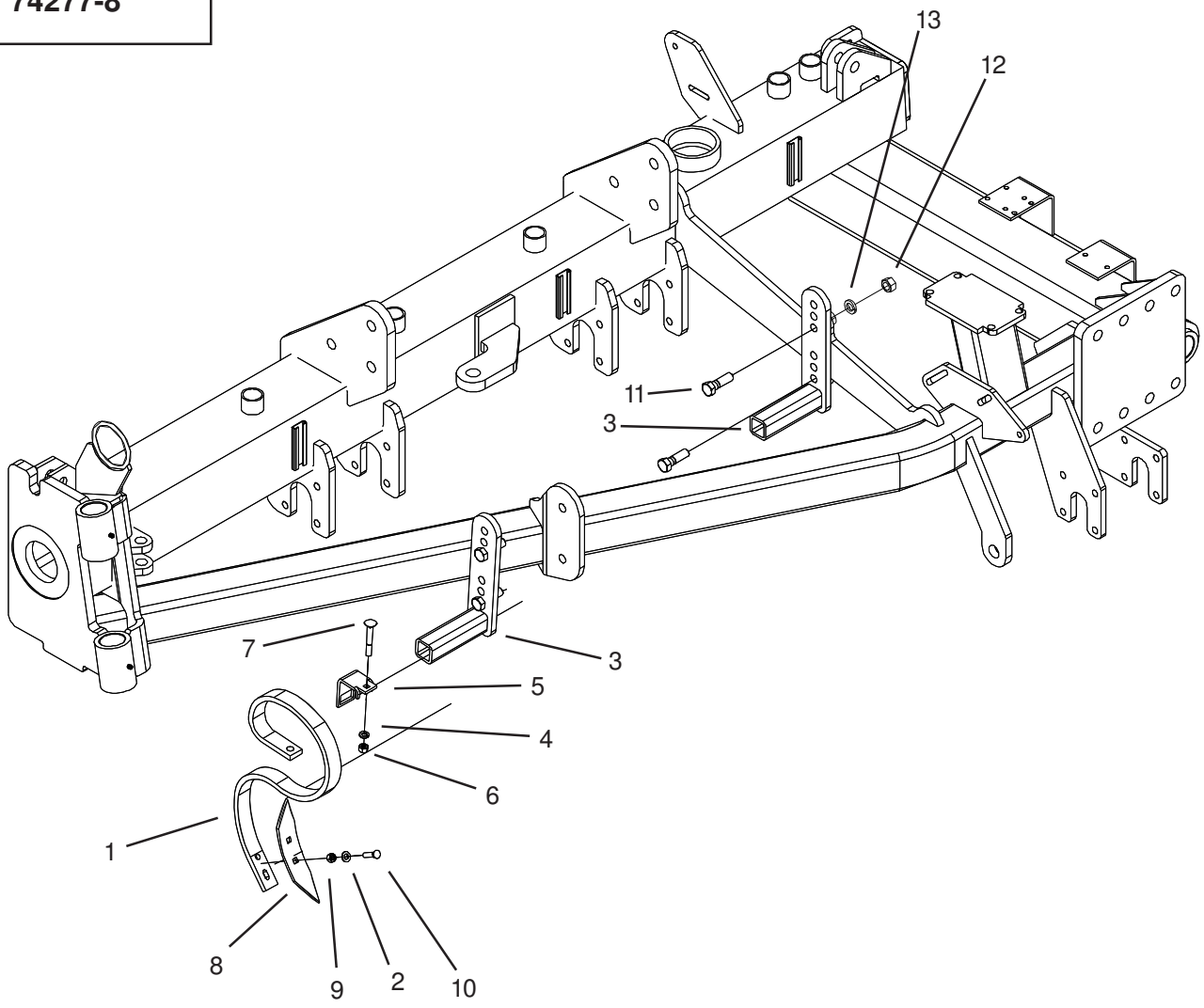
222801 ELECTROCUTION DECAL



222802 CRUSHING DECAL

ASSY HDWR
74277-8

STINGER



ITEM	PART NO	DESCRIPTION
1	220484	STINGER TINE W/HDWE (INCLUDES 4-7)
	220485	STINGER TINE (TINE ONLY)
2	88152	7/16 FLAT WASHER
3	235424	TINE BRACKET
4	88303	1/2 LOCK WASHER
5	220487	STINGER MOUNT BRACKET
6	88104	1/2NC NUT
7	88844	1/2NC X 3-1/2 CARRIAGE BOLT
8	11952	2IN REVERSIBLE SPIKE
9	88344	7/16NC HEAVY NUT
10	88849	7/16NC X 1-3/4 PLOW BOLT
11	88404	3/4NC X 2-1/2 HEX BOLT GR5
12	88110	3/4NC NUT
13	88130	3/4 LOCK WASHER