

PARMA[®]

ROLLAHARROW

Rigid Model

OWNERS MANUAL

Manual Number 01032010-RRH

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INTRODUCTION

This manual has been prepared to acquaint you with the operation and maintenance of your **PARMA Rollaharrow**, and to provide important safety information. We urge you to read this manual carefully. The recommendations will help assure the safe and trouble free operation of your machine.

When it comes to service, keep in mind that your dealer knows your Rollaharrow well and is interested in your complete satisfaction. Your dealer invites you to call him for your service needs both during and after the warranty period.

We thank you for choosing a PARMA product and want to assure you of our continuing interest in your satisfaction. You have purchased a very good machine and with proper care it will give you good service.



SAFETY: THE MOST IMPORTANT SUBJECT OF ALL....YOU CAN LIVE WITH IT!

The Following safety instructions are provided to help assure that all operators of this equipment are trained in its operation and are familiar with the importance of safety in its use.



WITH OWNERSHIP COMES RESPONSIBILITY!

Many times the owner of this equipment is not the operator. The manufacturer delivers the equipment to a dealer, who in turn sells it to an owner. The owner may then assign another person to operate it. With each of these steps it is the duty of the one in possession of the equipment to be sure that the safe operation of the machine is fully explained to the person, or persons, actually operating it. **Do not allow this machine to be used until the following safety material has been reviewed.**

REMEMBER: One of the most common causes of injury or death around this type of equipment is because the operator does not shut the tractor engine off and remove the key when maintenance, adjustments, or cleaning of the machine is conducted!



SAFETY.... YOU CAN LIVE WITH IT!

SAFETY PRECAUTIONS

TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGH OUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY AND THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.



THIS SYMBOL MEANS

-ATTENTION!

-BECOME ALERT!

- YOUR SAFETY IS INVOLVED!

SIGNAL WORDS:

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

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components for which functional purposes cannot be guarded.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices, and potential for equipment damage.

If you have questions not answered in this manual or require additional copies or the manual is damaged, please contact your dealer.

SAFETY.... YOU CAN LIVE WITH IT



SAFETY.... YOU CAN LIVE WITH IT



EQUIPMENT SAFETY GUIDELINES

Safety of the operator is one of the main concerns in designing and developing a new piece of equipment. Designers and manufacturers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury, study the following precautions and insist those working with you, or for you, follow them.

In order to provide maximum safety to the operator or other persons around this machine, various shields and covers have been installed. Keep all shields and covers in place. If shield removal becomes necessary for repairs or any other reason, replace the shield prior to use.

Replace any CAUTION, WARNING, DANGER or instruction safety decal that is not readable or is missing. Location of such decals is indicated in this manual.

Do not attempt to operate this equipment under the influence of drugs or alcohol.

Review the safety instructions with all users annually.

This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible adult familiar with farm machinery and trained in this equipment's operations. **Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how it works.**

Do not paint over, remove or deface any safety signs or warning decals on your equipment. Observe all safety signs and practice the instructions on them.

Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely is in question -- **DON'T TRY IT.**



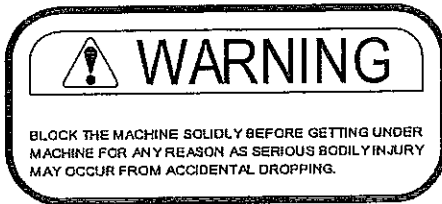
LIGHTING AND MARKING

It is the responsibility of the customer to know the lighting and marking requirements of the local highway authorities and to install and maintain the equipment to provide compliance with the regulations. Add extra lights when transporting at night or during periods of limited visibility.

Lighting kits are available from your dealer or from the manufacturer.

SAFETY SIGN LOCATIONS

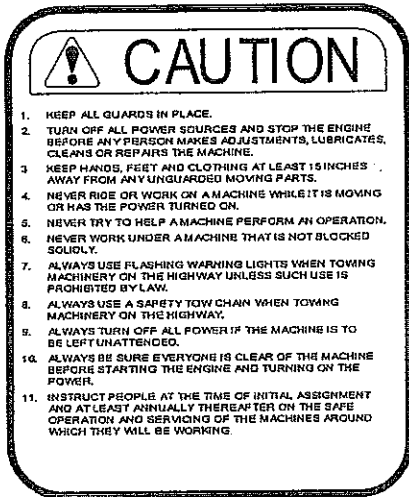
The types of Safety Sign on the equipment are shown below. Their locations are shown in the parts section of this manual. Good safety requires that you familiarize yourself with the various Safety Signs, the type of warning and the area, or particular function related to that area that requires your SAFETY AWARENESS.



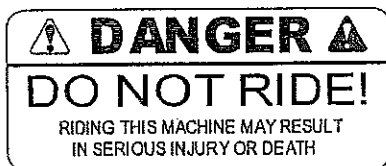
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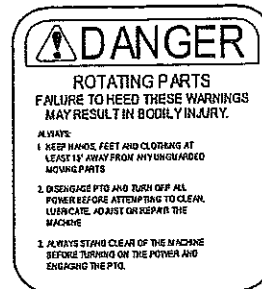
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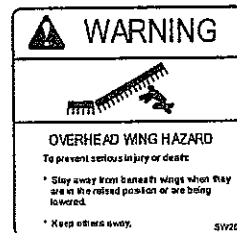
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100408



522457

REMEMBER: If Safety Signs have been damaged, removed, become illegible or parts replaced without decals, new decals must be applied. New decals are available from your authorized dealer or manufacturer.



SAFETY SIGN CARE

- Keep safety signs clean and legible at all times
- Replace safety signs that are missing or have become illegible
- Replaced parts that displayed a safety sign should also display the current sign
- Safety signs are available from your Dealer Parts Department or the Manufacturer

How to Install Safety Signs:

- 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



REMEMBER!

Your best assurance against accidents is a careful and responsible operator. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer.



BEFORE OPERATING:

- Carefully study and understand this manual
- Do not wear loose-fitting clothing which may catch in moving parts
- Always wear protective clothing and substantial shoes
- Assure that agricultural implement tires are inflated evenly
- Inspect the unit for any loose bolts, worn parts or cracked welds, and make necessary repairs. Follow the maintenance safety instructions included in this manual
- Be sure that there are no tools lying on or in the equipment
- Do not use the unit until you are sure that the area is clear, especially children and animals

- Don't hurry the learning process or take the unit for granted. Ease into it and become familiar with you new equipment
- Practice operation of your equipment and its attachments, Completely familiarize yourself and other operators with its operation before using



DURING OPERATION:

- **NO PASSENGERS ALLOWED** – Do not allow any passengers to ride on the equipment at any time
- Keep hands and clothing clear of moving parts
- Do not clean, lubricate or adjust your equipment while it is in motion
- When halting operation, even periodically, disengage the PTO, **shut off the tractor engine and remove the ignition key**
- Be especially observant of the operating area and terrain – watch for holes, rocks or other hidden hazards.
- **DO NOT** work under raised components or attachments unless securely positioned and blocked
- Keep all bystanders, pets and livestock clear of the work area
- As a precaution, always recheck the hardware on equipment following every 100 hours of operation. Correct all problems. Follow the maintenance safety procedures



FOLLOWING OPERATION:

- Following operation, or when unhitching, stop the tractor, set the brakes, disengage the PTO, **shut off the engine and remove the ignition key**
- Store the unit in an area away from human activity
- Do not permit children to play on or around the stored unit
- Make sure all parked machines are on a hard, level surface and engage all safety devices



HIGHWAY AND TRANSPORT OPERATIONS:

- Adopt safe driving practices:

Always drive at a safe speed relative to local conditions and ensure that your speed is low enough for an emergency to stop to be safe and secure. Keep speed to a minimum

Reduce speed prior to turns to avoid the risk of overturning



Highway and Transport Operations Cont....

Always keep the tractor in gear to provide engine braking when going downhill. Do not coast

Do not drink and drive!

- Comply with state and local laws governing highway safety and movement of farm machinery on public roads
- Use Transport Locks as provided
- Use approved accessory lighting flags and necessary warning devices to protect operators of other vehicles on the highway, during daylight and nighttime transport, in accordance with State Department of Transportation specifications. Various safety lights and devices are available from your Dealer
- The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use. Local laws should be checked for all highway lighting and marking requirements
- Be a safe and courteous driver. **Always** yield to oncoming traffic in all situations, including narrow bridges, intersections, etc
- Be observant of bridge loading ratings. Do not cross bridges rated lower than the gross weight at which you are operating. **Always** be aware of bridge width and machine width
- Watch for obstructions overhead and to the side while transporting
- Always operate equipment in a position to provide maximum visibility at all times.



PERFORMING MAINTENANCE:

- Good maintenance is your responsibility. Poor maintenance is an invitation to trouble
- Before working on this machine, disengage the PTO, **shut off the tractor engine and remove the ignition key**
- Be certain all moving parts have come to a complete stop before attempting to perform maintenance
- **Always** use a safety support. Never use a jack to support the machine
- Always use the proper tools or equipment for the job at hand
- Use extreme caution when making adjustments
- Follow the torque chart in this manual when tightening bolts and nuts
- **Never** use your hands to locate a hydraulic leak on attachments. Use a small piece of cardboard or wood. Hydraulic fluid escaping under pressure can penetrate the skin



Performing Maintenance Cont....

- When disconnecting hydraulic lines, shut off hydraulic supply and relieve all hydraulic pressure
- Openings in the skin and minor cuts are susceptible to infection from hydraulic fluid. **If injured by escaping hydraulic fluid, see a doctor at once. Gangrene can result. Without immediate medical treatment, serious infection and reactions can occur**
- Replace **all shields and guards** after servicing and before moving
- After servicing, be sure all tools, parts and service equipment are removed
- Never replace hex bolts with less than grade five bolts unless otherwise specified. Refer to bolt torque chart for head identification marking
- Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts are recommended to restore your equipment to original specifications. The manufacturer will not claim responsibility for use of unapproved parts and/or accessories and other damages as a result of their use
- If equipment has been altered in any way from original design, the manufacturer does not accept any liability for injury or warranty

CUSTOMER AND DEALER CHECKLIST

After the machine has been completely assembled, inspect it thoroughly to be certain it is in operating condition before delivering it to a customer. The following checklist is a reminder of points to inspect. Check off each item as it is found satisfactory or after proper adjustment is made.

PRE-DELIVERY:

- ___ **The pressure required to lift the wings on the unit is 2750 PSI MINIMUM. Be sure the customer is aware of this and the tractor he uses is capable of this requirement.**
- ___ Check all bolts and nuts to be sure they are tight. **Double check the carrier wheel lug bolts.**
- ___ Make sure all bearing lock collars are set correctly and tightened (see pg.12).
- ___ Inspect and, if necessary, grease at all lubrication points; making sure all bearings are taking grease (see pg.5).
- ___ Check all moving parts for smooth operation.
- ___ Check to see that all hydraulic fittings and cylinders are tight and free of leaks (see pg.12).

DELIVERY:

- ___ Complete the Delivery and Warranty Registration Forms, listing the serial number of the machine.
- ___ **Remove all transport locks on cylinders.**

Delivery Check List Cont....

- ___ Explain adjustments and the importance of proper lubrication (see pg.11).
- ___ Give the operator's manual to the customer and ask him to familiarize himself with all sections of it.
- ___ Explain to the customer that when the equipment is transported on a road or highway at night or during the day, accessory lights and devices should be used for adequate warning to operators of other vehicles per local regulations.
- ___ Explain and show the customer the transport locks and the removal of them for field use. Remind them the roller bearings are not designed to handle side loads whether turning the machine or working center pivots.

BEFORE EACH SEASON:

- ___ Check all cast rings for breakage.
- ___ Check s-tine chisel points for normal wear.
- ___ Check all adjustable components for correct setting.
- ___ Perform complete lubrication of machine (see pg.11).
- ___ With equipment operating, observe operation of moving parts. Watch for faulty operation, overheated bearings, and unusual sounds.
- ___ Read safety precautions.
- ___ Read operating instructions.
- ___ Perform daily checklist.

DAILY CHECKLIST:

- ___ Remove all debris from s-tines, leveling bar, and rollers.
- ___ Lubricate (as instructed) all lubrication points (see pg.11).
- ___ Check for loose or missing bolts or parts (**especially on S-Tines**).
- ___ Check for undue or excessive wear of parts.

WARRANTY POLICY

PARMA COMPANY warrants to each purchaser from an authorized dealer of new equipment manufactured by PARMA COMPANY, that such equipment is, at the time of delivery to such purchaser, free from defects in material and workmanship under normal use, if serviced in accordance with the recommendations of the Operator's Manual. All PARMA COMPANY'S *harvesting equipment products* are warranted for 120 days from the first day of use or 800 acres, whichever occurs first. All PARMA COMPANY *soil preparation* products are warranted for 120 days from first day of use or 1600 acres, whichever occurs first. All PARMA COMPANY *water and waste pump products* are warranted for one year from date of purchase. Warranty on defective parts purchased by PARMA COMPANY or produced by other manufacturers for PARMA COMPANY may be allowed only after the approval of the vendor or manufacturer.

PARMA COMPANY'S obligation under this warranty is limited to repairing, or at it's option, replacing any part, that in PARMA COMPANY'S judgment, proved defective. Under the terms of the warranty, PARMA COMPANY assumes no responsibility for labor or travel costs involved in removal of defective parts, of installation of new parts, or of any shop supplies or service charges.

All warranty claims are to be initiated through the authorized PARMA COMPANY dealer and must be submitted within 30 days of the date of failure. PARMA COMPANY may ask for defective parts to be returned to the factory; therefore, hold all warranty claim parts until advised if the parts are needed by your dealer.

To make the warranty effective, the owner's **Warranty Registration Form** must be on file at PARMA COMPANY, Parma, Idaho at the time of receipt of the warranty claim.

DISCLAIMER OF ALL OTHER WARRANTIES AND CONSEQUENTIAL DAMAGES

THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND THERE ARE NO WARRANTIES, WHICH EXTEND BEYOND THE DESCRIPTION OF THE PRODUCTS. THE LIABILITY OF PARMA COMPANY IS EXPRESSLY LIMITED TO REPAIRING, OR AT ITS OPTION, REPLACING ANY PART THAT IS RETURNED, TRANSPORTATION PREPAID, TO PARMA COMPANY, PARMA, IDAHO, THAT IN PARMA'S JUDGEMENT PROVED DEFECTIVE DURING THE WARRANTY PERIOD. NO REPRESENTATIVE OF PARMA COMPANY, NO DEALER OR DEALER'S REPRESENTATIVE OR ANY OTHER PERSON HAS AUTHORITY TO WAIVE, ALTER, VARY OR ADD TO THE TERMS HEREOF WITHOUT PRIOR APPROVAL IN WRITING SIGNED BY AN OFFICER OF PARMA COMPANY. PARMA COMPANY WILL NOT BE LIABLE FOR ANY OTHER EXPENSE, INJURY, LOSS OR DAMAGE WHETHER DIRECT OR CONSEQUENTIAL, ARISING IN CONNECTION WITH THE SALE OR USE OF OR INABILITY TO USE, ANY PRODUCT OF THE COMPANY FOR ANY PURPOSE.

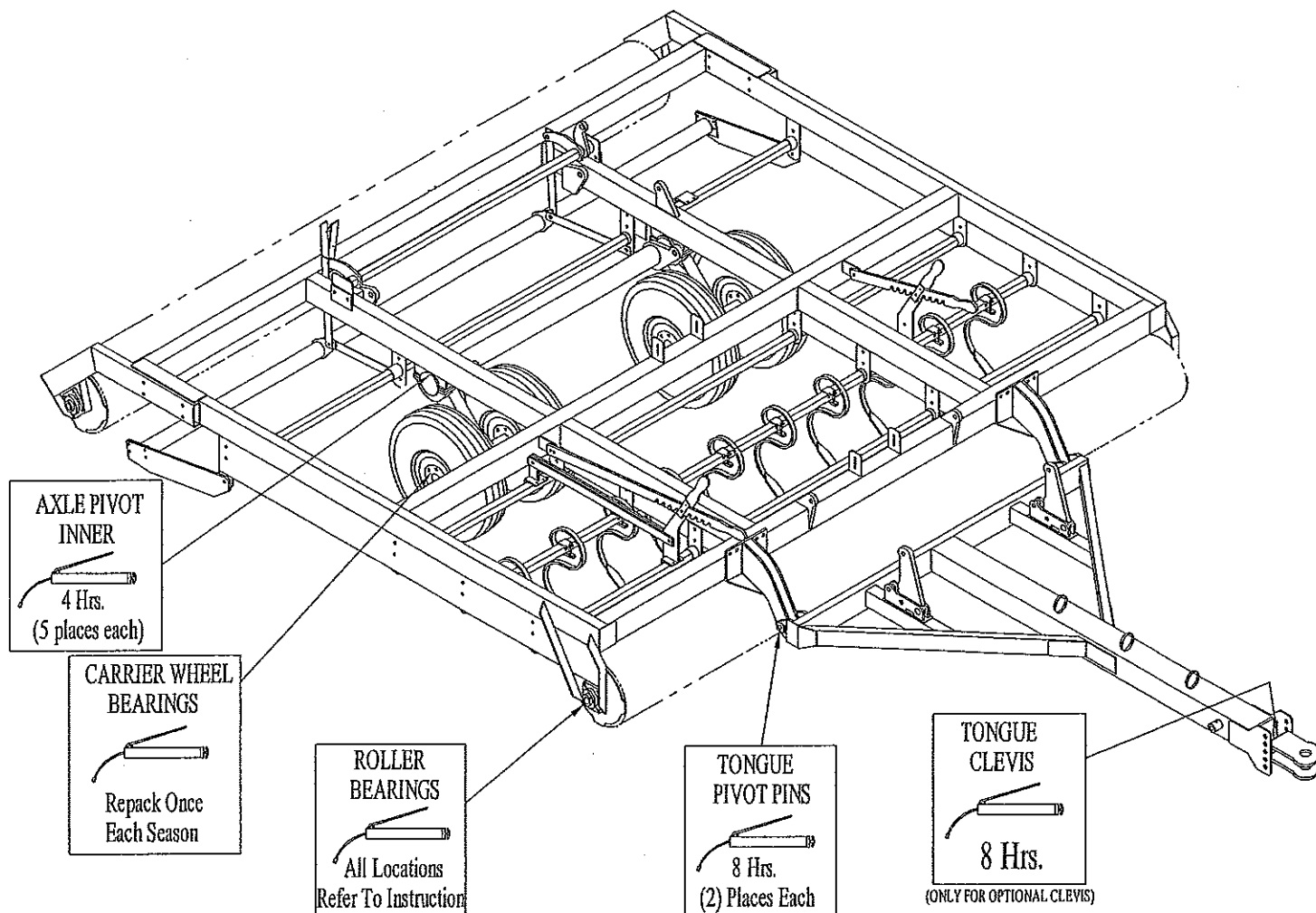
MAINTENANCE AND FIELD ADJUSTMENTS

LUBRICATION

The Rollaharrow flanged bearing units are factory pre-lubricated and do not require supplemental grease before service life begins. Re-lubrication, when administered correctly, can increase the life of a bearing substantially. **Bearing manufacturers recommend that all these bearings be greased weekly,** considering the environmental condition that these machines are exposed to. **NOTE: Over lubrication is a major cause of bearing failures. Please re-lubricate conservatively.** When selecting a bearing lubrication use any lithium based NLGI #2 grease. The following illustration shows the lubrication points on the Rollaharrow.

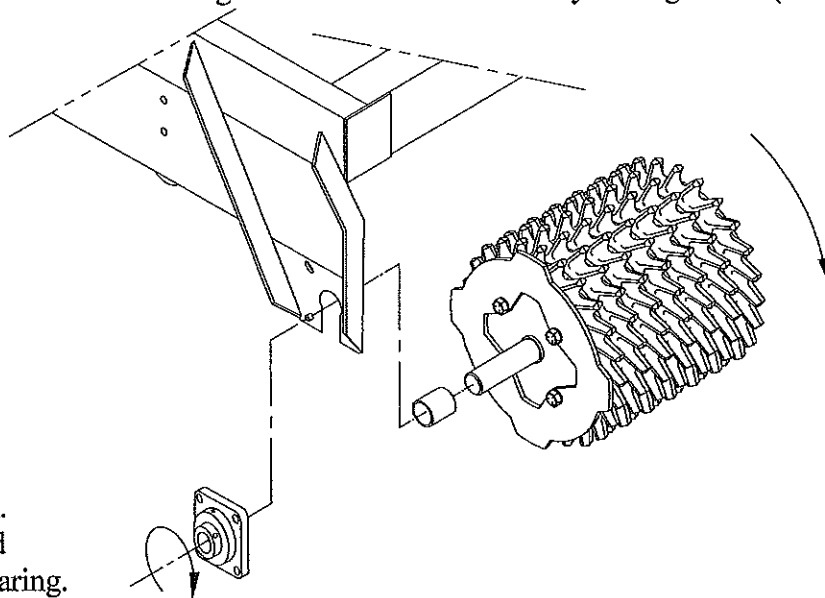


Always perform maintenance with the tractor engine shut off and the ignition key removed!



BEARINGS

When replacing bearings, make sure all bearing lock collars are set correctly and tightened (see below).



NOTE:

To avoid loosening of the lock collar, always set it in the direction of shaft rotation.

Be sure the spacer is installed between the roller and the bearing.

Ball bearings used on the rollers will not withstand radial or side load, including working around pivot circles. **ALWAYS** raise the machine before turning, or failure will result.

HYDRAULIC COMPONENTS

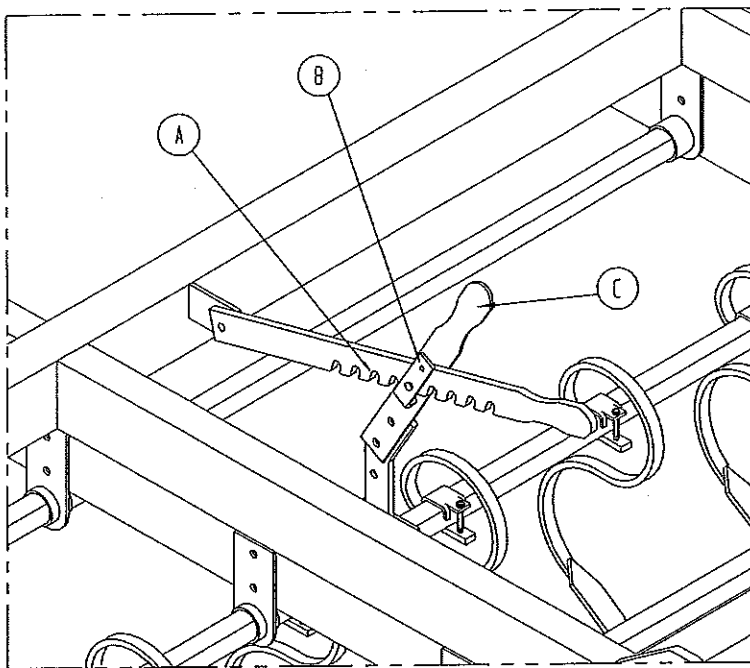
Before operating your PARMA Rollaharrow, check all hydraulic components and connections to make sure they are secure and fitting properly. If for any reason you need to replace a hydraulic cylinder or line, before reinstalling the component, make sure the hoses/cylinders are free from any foreign materials. If foreign material is in the line, rinse thoroughly and blow it out.

When you are installing replacement cylinders, check the closed and open dimensions against the other parts on the unit. If, after reinstalling the components, they do not work, recheck to make sure everything is connected properly. If, after checking, the hydraulic components still do not work, you may have air in the hydraulic lines. To release the air, loosen a fitting slightly at a cylinder, send a small amount of fluid through the lines and then re-tighten. You may have to repeat this process several times. If the problem persists, check or replace the Quick Couplers. Before loosening any fittings, be sure all pressure is relieved and the machine cannot drop.

S-TINES

Under normal usage, the S-Tines may last for several years. Each S-Tine has a removable point that is reversible. Inspect these points regularly to see that they do not wear excessively. Before the worn end reaches the S-Tine, reverse the point for double wear. Always replace the point before damage to the S-Tine occurs. Check bolt tightness regularly to prevent the tines from moving or sliding.

The depth of the S-Tines is set by moving the tool bar control handle (Item C) to the desired notch in the tool bar control ratchet (Item A). **When operating your Rollaharrow in the field, the safety snap pin (Item B) must be removed to prevent damage to the tine bars and linkages in the event the Rollaharrow is backed up with the S-Tines down** (See the illustration next page).



For the correct positioning of the S-Tines on the Rollaharrow, refer to pages 16.

****Never lower and park the Rollaharrow on the S-Tines. Damage to the curl of the S-Tine will occur.**

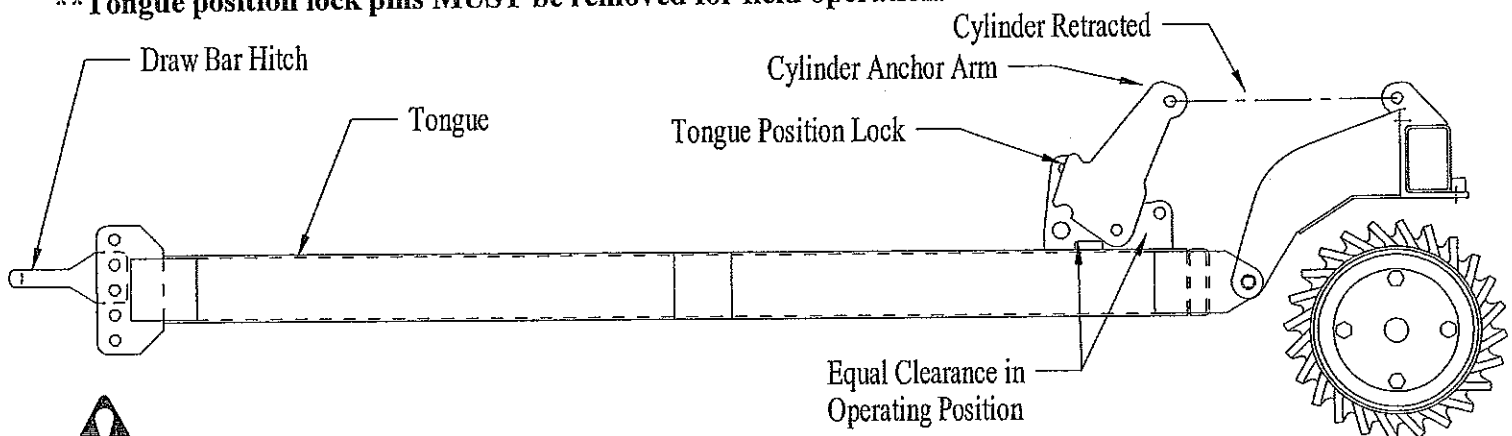
TONGUE ADJUSTMENT

When connecting your Rollaharrow to the tractor, make sure the tongue can move freely up and down with the tongue cylinder fully retracted.

After connecting the machine to the tractor and with the lift cylinder retracted, the cylinder anchor on the tongue should be positioned so there will be equal movement both forward and back to allow the machine to float during operation. If necessary, adjust the front hitch ring up or down to obtain the correct position. In some conditions, soil will build up under this hydraulic cylinder anchor on the tongue. When this occurs, remove the buildup.

The cylinder anchor arm position can be locked into place to allow the rear of the machine to rise during transport when auxiliary attachments are mounted to the frame. To do this, extend the hydraulic cylinder until the notch in the arm aligns with the hole in the tongue, then insert the pin. This pin is not furnished with the machine from the factory. Do not use the pin if auxiliary attachments are not used.

****Tongue position lock pins MUST be removed for field operation.**

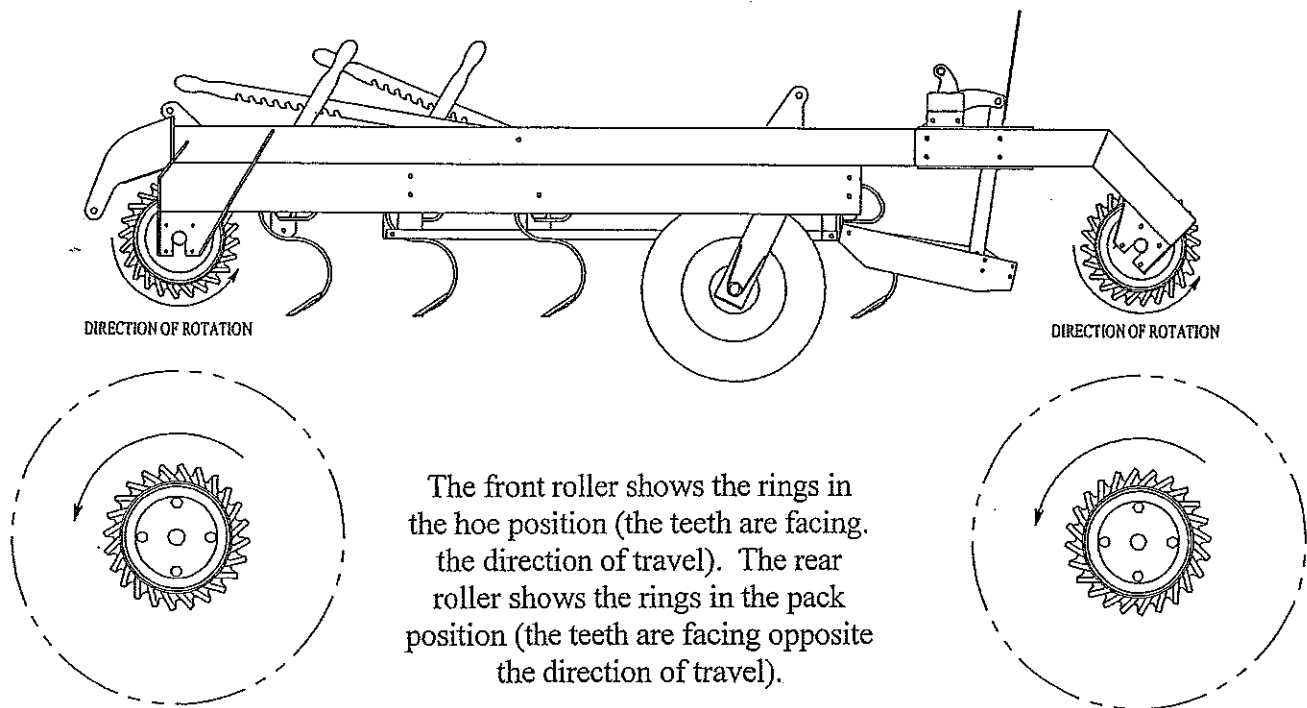


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ROLLER RINGS

After some usage of your machine, the side of roller rings will wear, creating a gap between the rings on the roller tube. When this occurs, simply add enough new rings to fill this gap. If you do not add more rings to fill in the gap, your existing rings will wear out at an accelerated rate and breakage will be more frequent. **When adding the rings, leave some gap so the rings can move freely.**

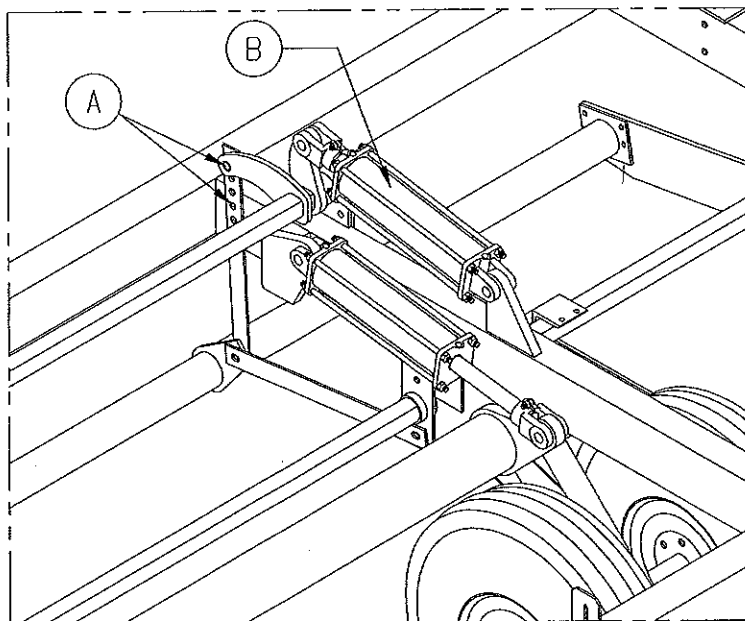
The roller rings can be positioned to mulch (hoe) the soil or to pack the soil. The front ring roller is normally set to mulch (hoe) the soil and the rear ring roller is normally set to pack the soil, however, this can be changed to accommodate different needs. See illustration below.



AVOID SERIOUS INJURY – EXERCISE CARE WHEN LIFTING HEAVY PARTS

LEVELING BAR

During operation, the leveling bar height should be set to smooth out ridges and carry enough dirt to fill low spots only. **NEVER “dig” below** the soil surface or damage to the bar and linkage may occur, and we will leave piles of dirt upon lifting the unit. See the illustration on the next page.



LEVELING BAR ADJUSTMENT

To adjust the leveling bar height, position the lift arm (Item A) to the desired hole by activating the hydraulic cylinder (Item B).

OPERATING INSTRUCTIONS

Under normal conditions (after plowing or disking) you can pull your PARMA Rollaharrow through the field at speeds up to 6mph.

Recommended minimum air pressure is 70 PSI in the tires.

Do not use the tires and wheels on your Rollaharrow as gauge wheels while operating the machine in the field. They are designed for transporting the machine only.

Always lift your Rollaharrow before turning. **Failure to lift the machine while turning causes excessive side thrust on rollers and bearings, resulting in the breakage of parts. Bearing failures will result!!!**

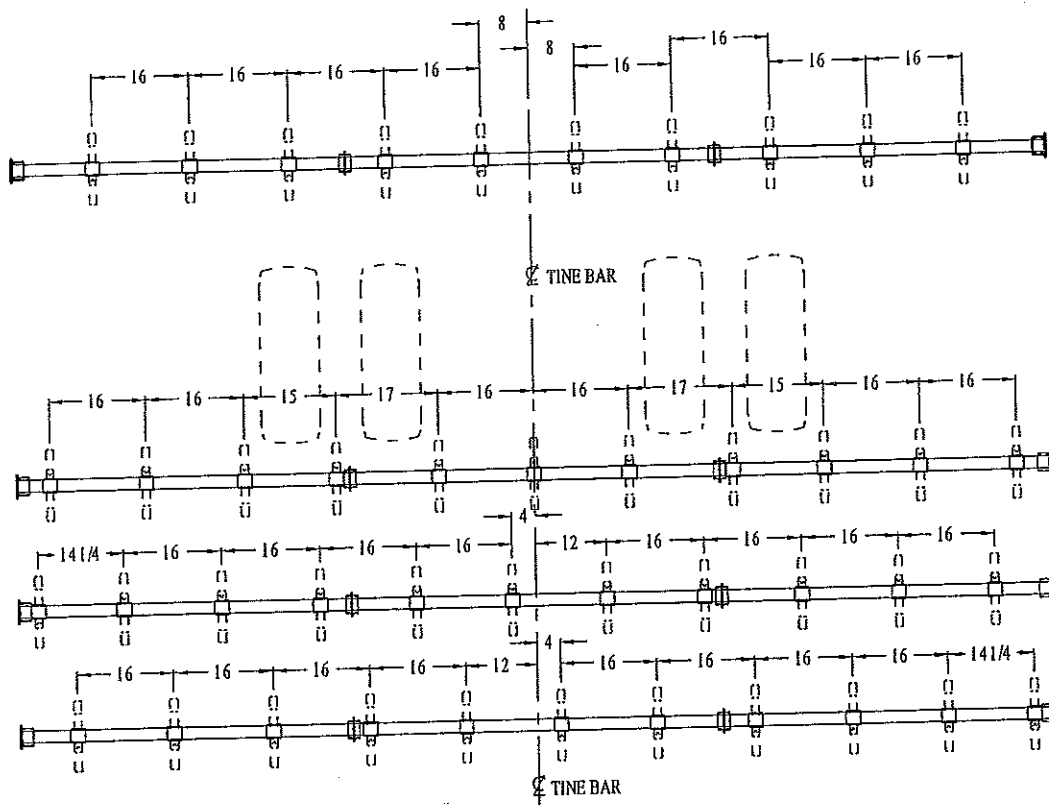
Always lift your Rollaharrow before backing up. **Failure to do so can result in the damage of the s-tine bars and control linkages.**

Always transport your Rollaharrow at speeds less than 20 mph. **The implement rated tires are for minimal transportation use only.** Not doing so can result in premature tire failure.

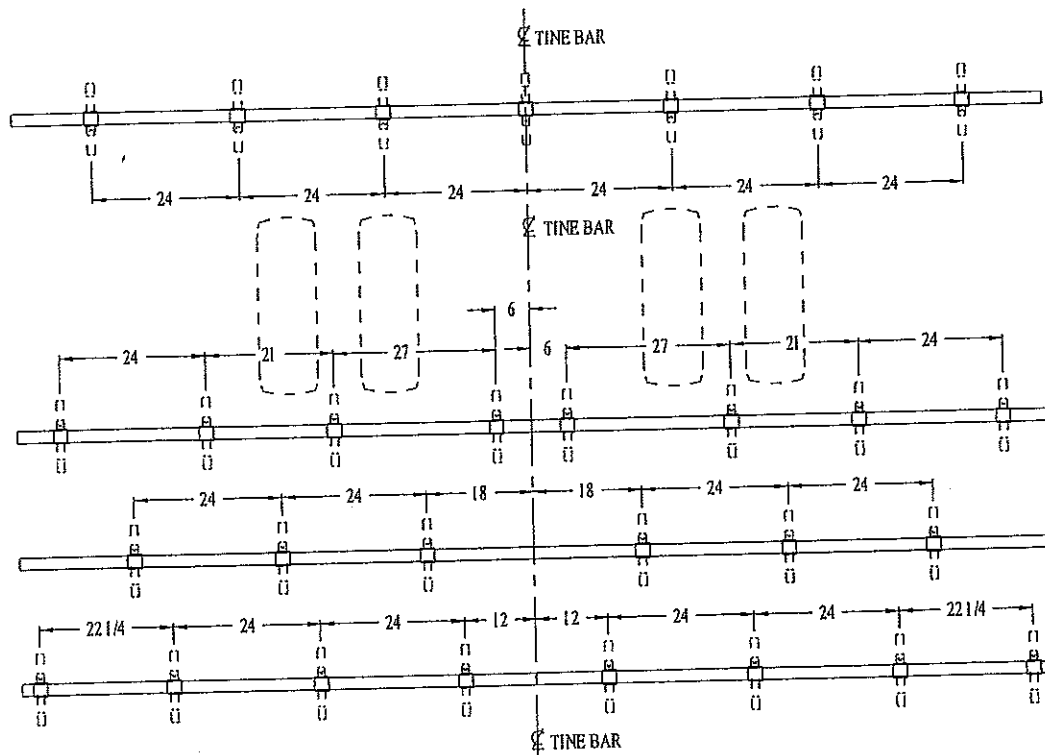
Always remember to remove the transport lock bars from the axle and flip tongue cylinder locks over when done transporting the machine. Failure to do this will damage the axles and cylinders when they are activated.



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TYPICAL 4-BAR TIME SPACING AT 4"
(1'4" WIDTH SHOWN)



TYPICAL 4-BAR TIME SPACING AT 6"
(1'4" WIDTH SHOWN)

NOTES

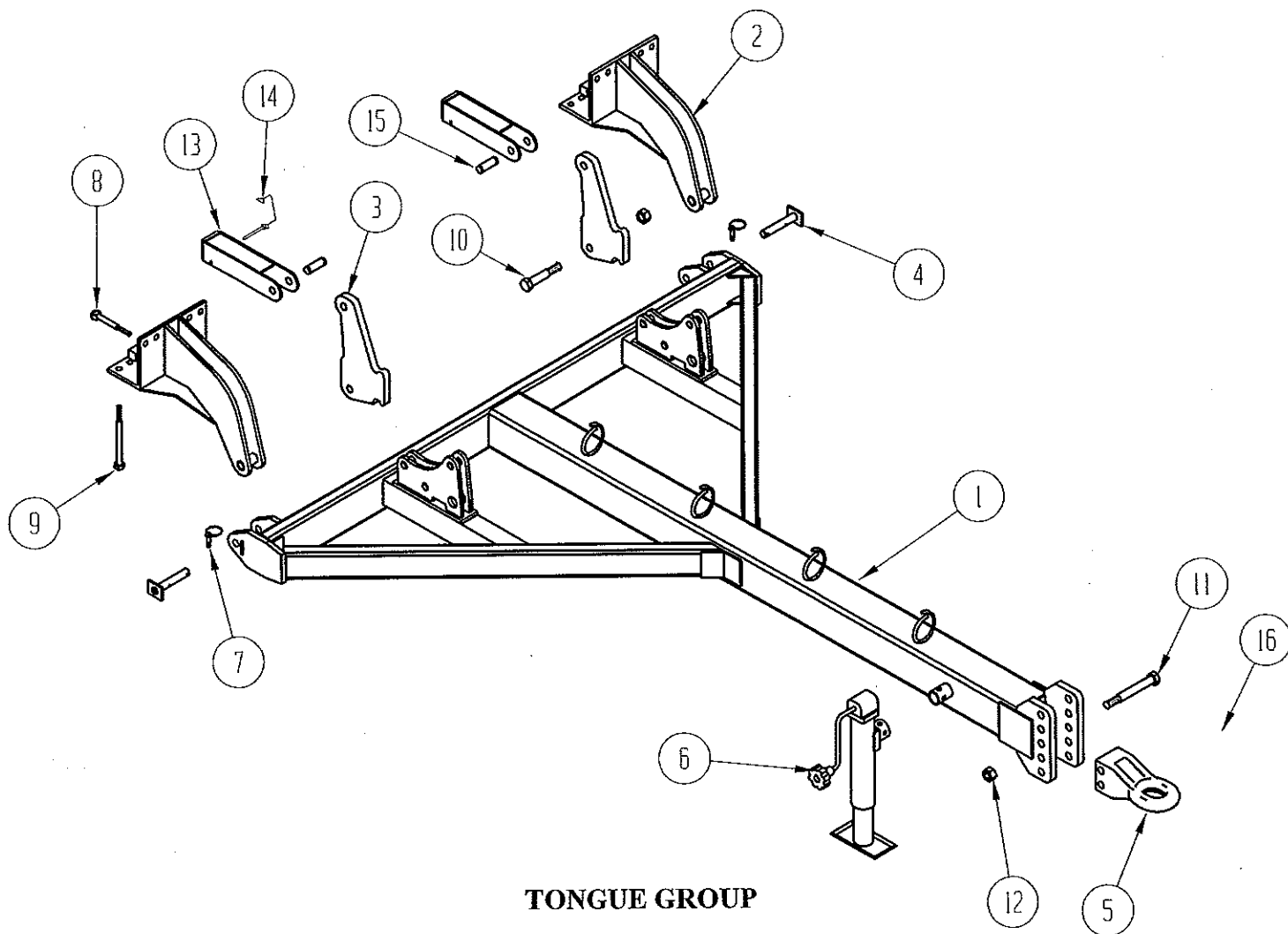


Rigid Rollaharrow

PARTS SECTION

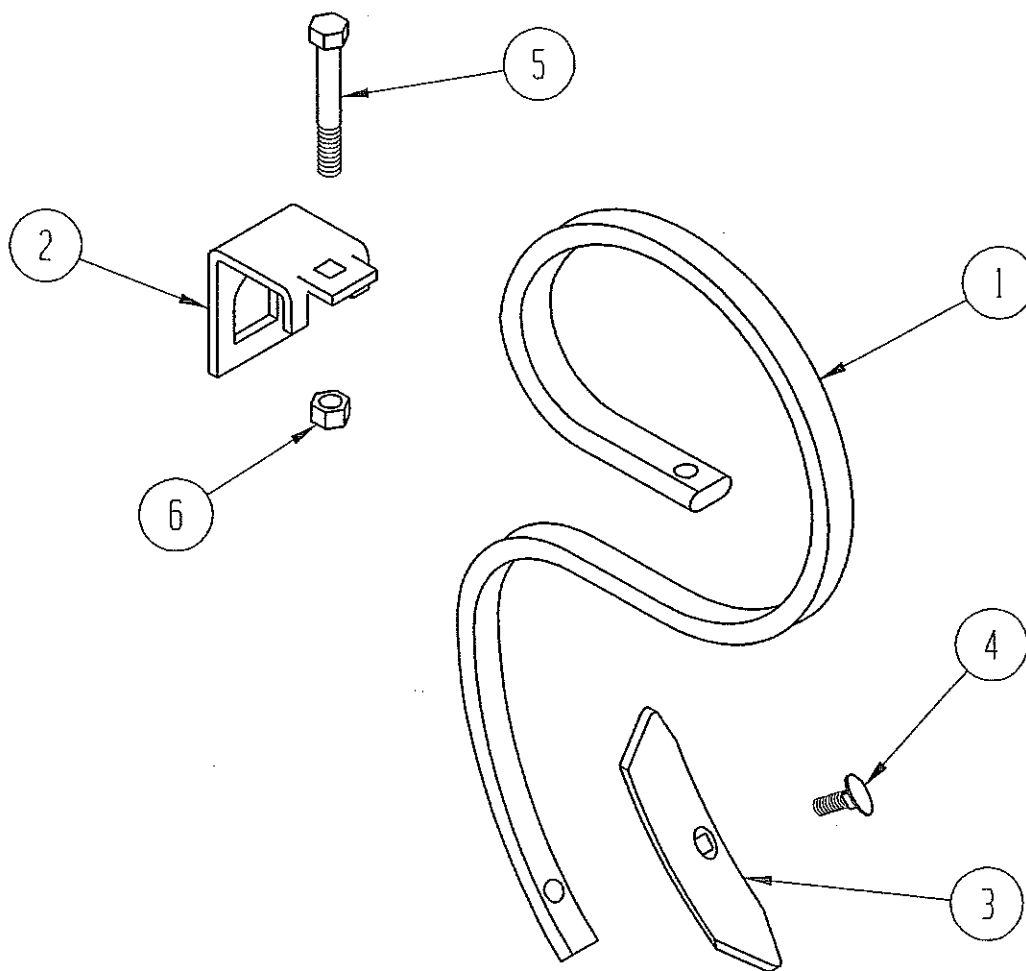
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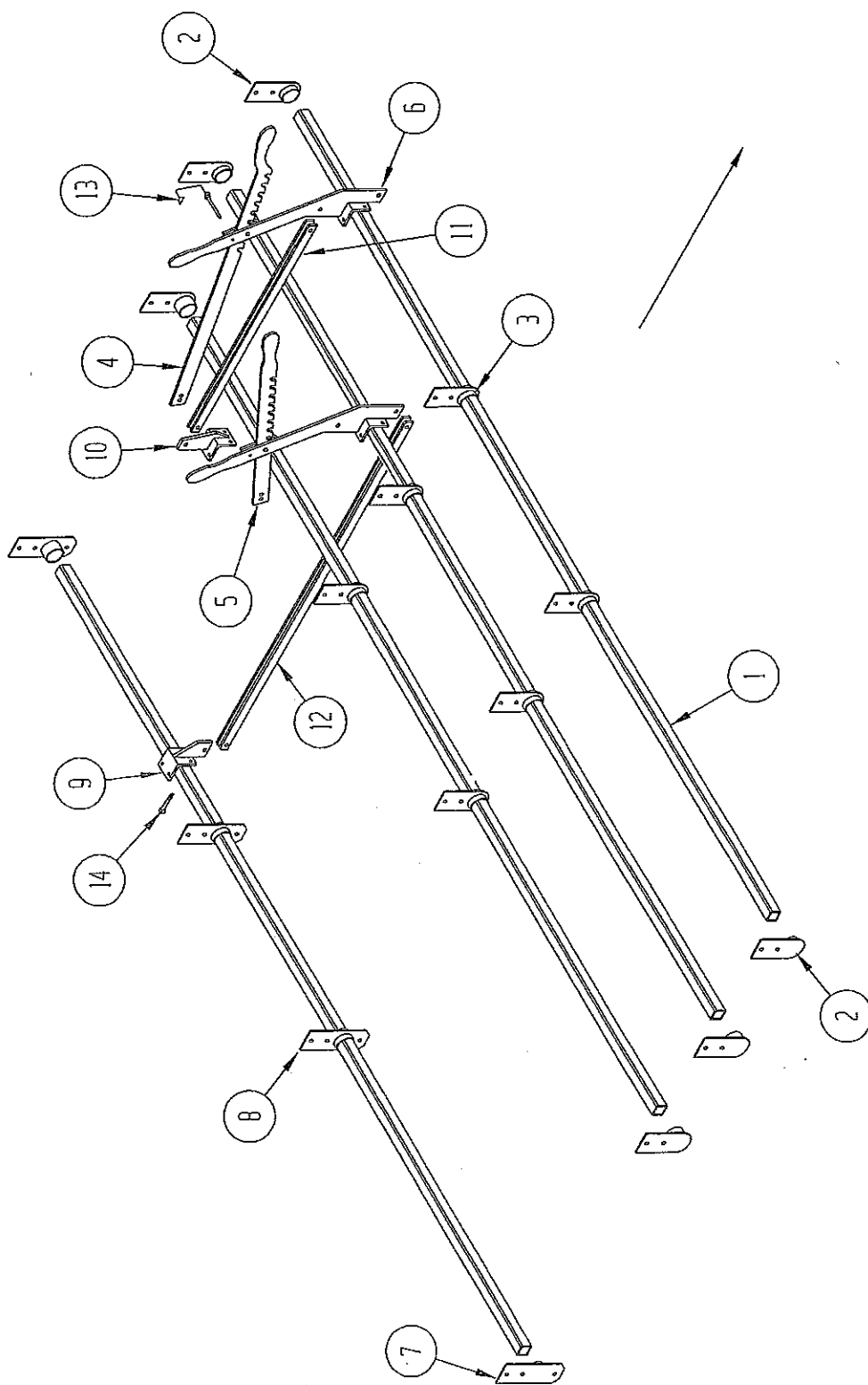
TONGUE GROUP

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	1	523118	Tongue Weldment
2	2	523124	Tongue Pull Bracket
3	2	523312	Cylinder Anchor
4	2	523159	Tongue Pin
5	1	521104	Ring Hitch, Category 3
6	1	701324	Jack
7	1	524570	Jack Mount Assembly
8	2	530053	Lynch Pin
9	8	997903	Eye Bolt, 3/4 x 6
10	2	-----	Hex Bolt, 3/4 x 8 1/2 Grade 5
11	2	-----	Hex Bolt, 1" x 4 Grade 5
12	2	-----	Hex Bolt, 1" x 7 1/2 Grade 5
13	4	-----	Hex Locknut, 1"
14	2	523152	Lift Stop
15	2	523279	Safety Lock Pin
16	2	524208	Cylinder Pin
	1	524923	Safety Chain(not shown)



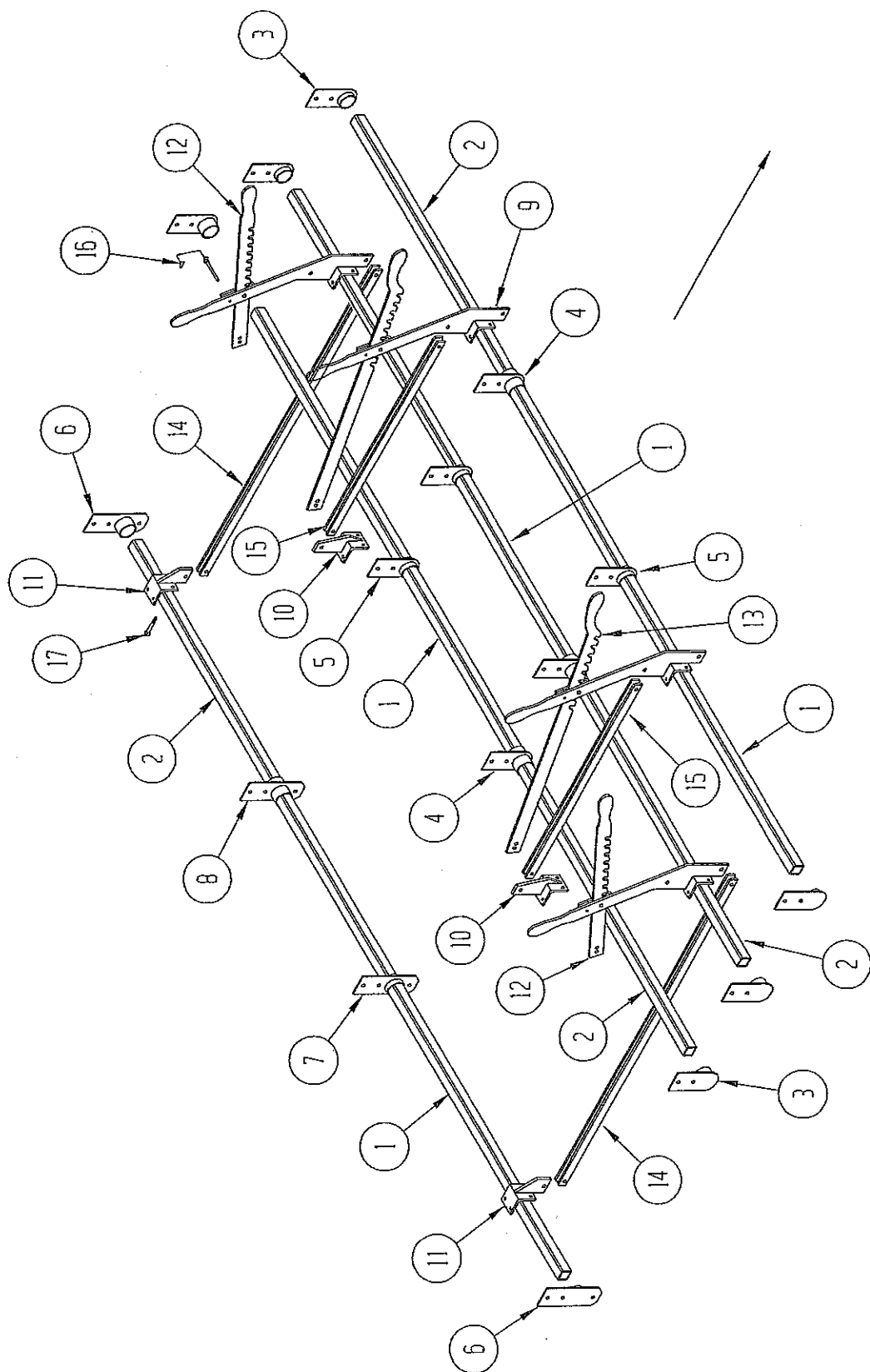
S-TINE GROUP

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	1	521483	S-tine, Std.
2	1	521485	S-tine Clamp
3	1	521484	Chisel Point
		521560	Chisel Point, Heavy Duty (Optional)
4	1	530052	Cultivator Bolt, 3/8 x 1 1/2
5	1	-----	Hex Bolt, 1/2 x 3 1/2
6	1	-----	Hex Locknut, 1/2"



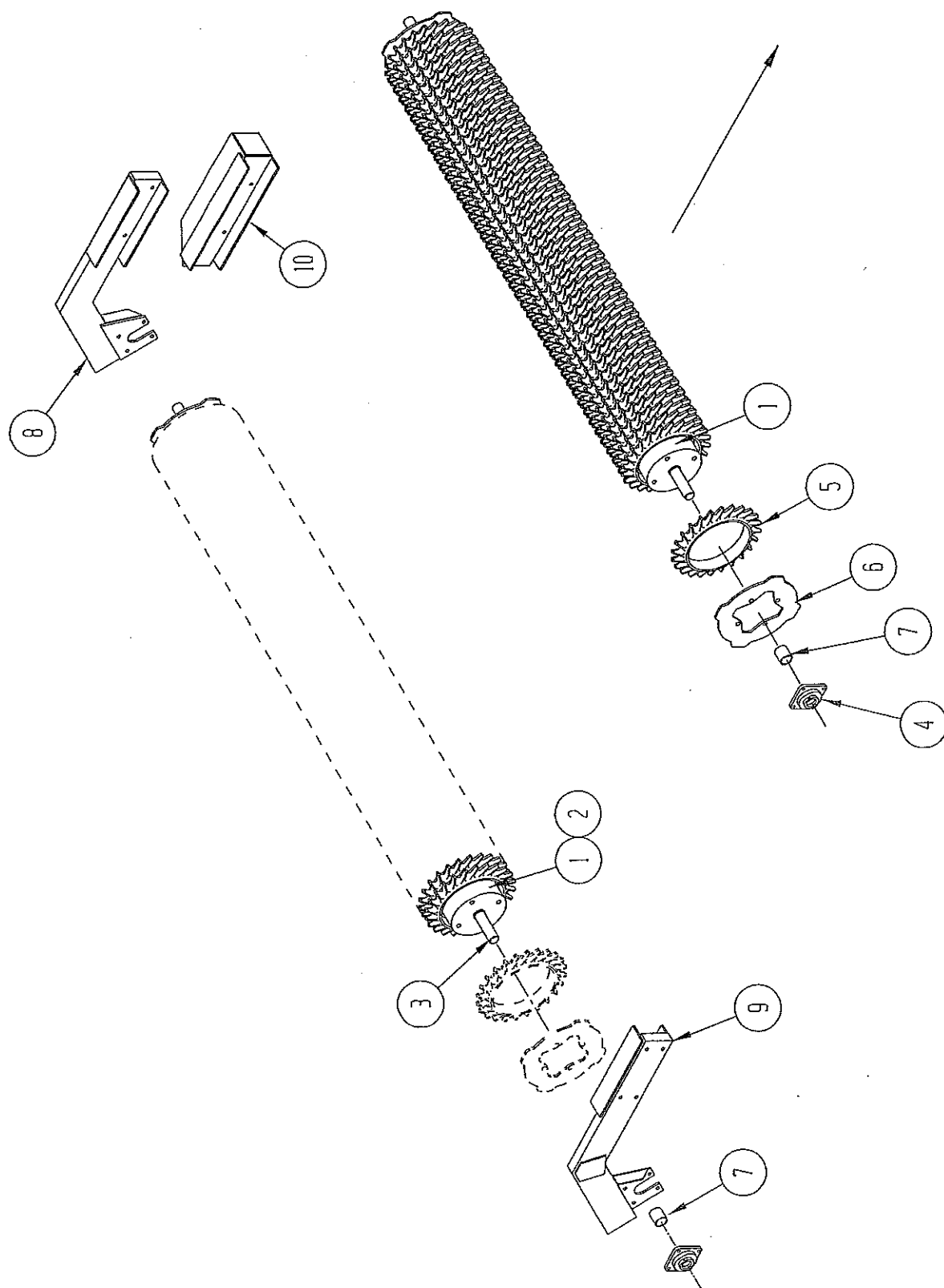
TINE BAR GROUP 12' & 14'
(4 Bar)

ITEM NO.	QTY 12'	QTY 14'	PART NO.	DESCRIPTION
1	4		522329	Tine Bar, 146 3/4"
		4	521571	Tine Bar, 170 3/4"
2	6	6	524536	Mounting Bracket, Outer
3	6	6	524535	Mounting Bracket, Inner
4	1	1	524554	Ratchet Handle, Long
5	1	1	524553	Ratchet Handle, Short
6	2	2	522038	Control Handle
7	2	2	524538	Mounting Bracket, Outer
8	2	2	524537	Mounting Bracket, Inner
9	1	1	521513	Control Clamp
10	1	1	521495	Control Clamp
11	1	1	521489	Control Linkage, 44" Overall
12	1	1	523129	Control Linkage, 76" Overall
13	2	2	521442	Safety Snap Pin
14	8	8	521099	Eye Bolt, 1/2 x 3 1/2



TINE BAR GROUP 16' - 24'
(4 Bar)

ITEM NO.	QTY 16'	QTY 18'	QTY 20'	QTY 24'	PART NO.	DESCRIPTION
1	1				522082	Tine Bar, 128 1/8"
		1			522092	Tine Bar, 140 1/8"
			1		522125	Tine Bar, 152 1/8"
				1	522152	Tine Bar, 176 1/8"
2	1				522083	Tine Bar, 66 5/8"
		1			522093	Tine Bar, 78 5/8"
			1		522126	Tine Bar, 90 5/8"
				1	522153	Tine Bar, 114 5/8"
3	6	6	6	6	524536	Mounting Bracket, Outer
4	3	3	3	3	524539	Mounting Bracket, Inner
5	3	3	3	3	524535	Mounting Bracket, Inner
6	2	2	2	2	524538	Mounting Bracket, Outer
7	1	1	1	1	524537	Mounting Bracket, Inner
8	1	1	1	1	524540	Mounting Bracket, Inner
9	4	4	4	4	522038	Control Handle
10	2	2	2	2	521495	Control Clamp
11	2	2	2	2	521513	Control Clamp
12	2	2	2	2	524553	Ratchet Handle, Short
13	2	2	2	2	524554	Ratchet Handle, Long
14	2	2	2	2	523129	Control Linkage, 76" Overall
15	2	2	2	2	521489	Control Linkage, 44" Overall
16	4	4	4	4	521442	Safety Snap Pin
17	16	16	16	16	521099	Eye Bolt, 1/2 x 3 1/2



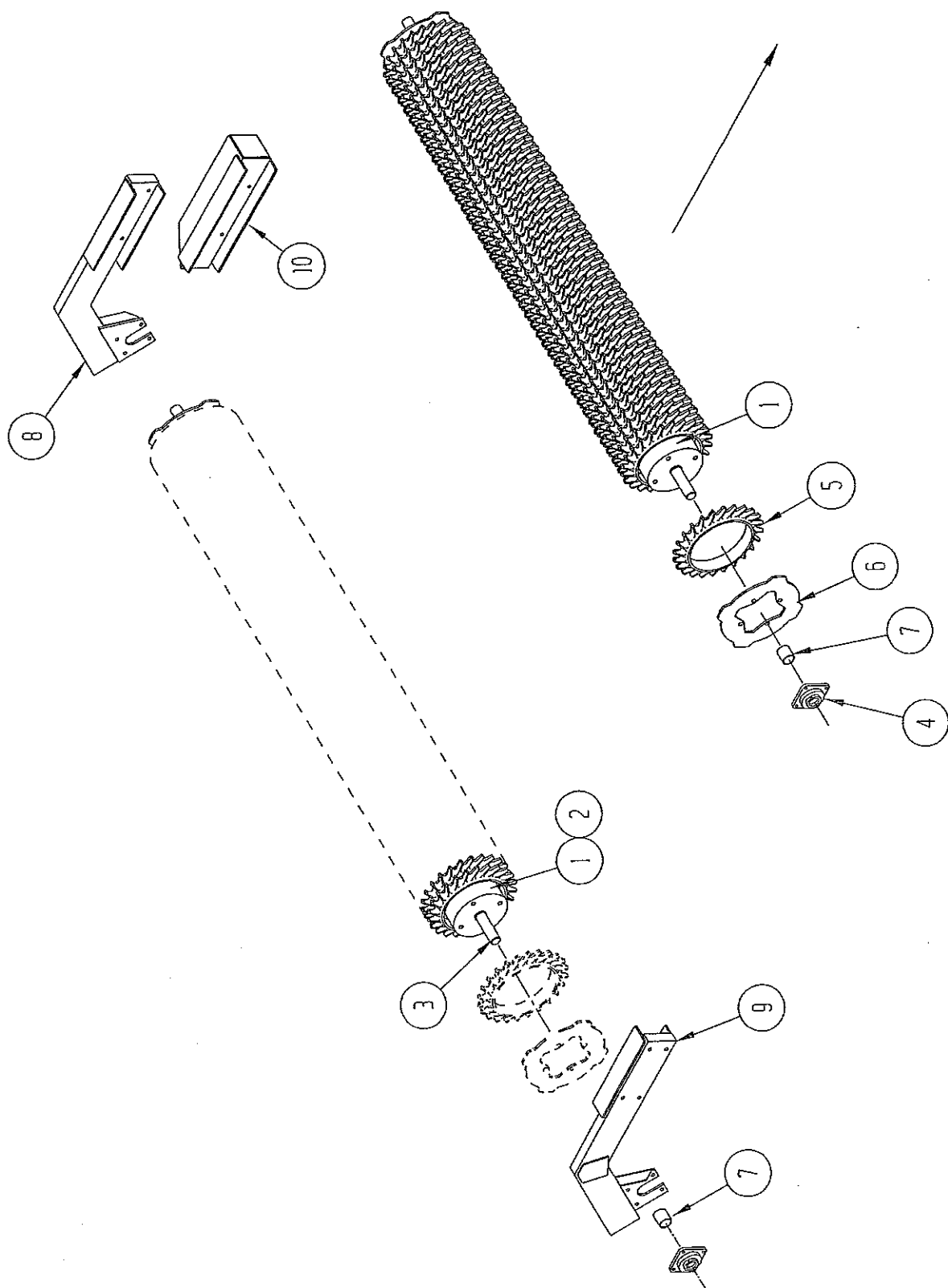
10" ROLLER ASSEMBLIES 12' – 16'

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	2	523343	Roller Weldment, 12' Standard
	2	523345	Roller Weldment, 14' Standard
	2	523347	Roller Weldment, 16' Standard
2	1	523344	Roller Weldment, 13' (With Extensions)
	1	523346	Roller Weldment, 15' (With Extensions)
	1	523348	Roller Weldment, 17' (With Extensions)
3	(REF)	523327	Stub Shaft, Long (Weld In)
4	4	980827	Bearing, 4 Bolt Flange 2 3/16
5	**	521566	Cast Ring, 10-12-16 Standard
	**	521639	Cast Ring, 10-12-16 Ductile
	**	521640	Cast Ring, 10-12-16 Domestic
	**	521590	Cast Ring, 10-12-17 Standard
	**	521641	Cast Ring, 10-12-17 Ductile
	**	521642	Cast Ring, 10-12-17 Domestic
6	12	521496	Roller End Plate
7	4	523896	Spacer, Roller
8	1	523803	Roller Arm, LH
9	1	523804	Roller Arm, RH
10	2	522071	Frame Extension (Optional)

** See table for approximate quantities due to rough castings

ROLLER LENGTH	CAST RING QUANTITY
12'	56
13'	61
14'	66
15'	71

DO NOT PACK ROLLERS TIGHT!



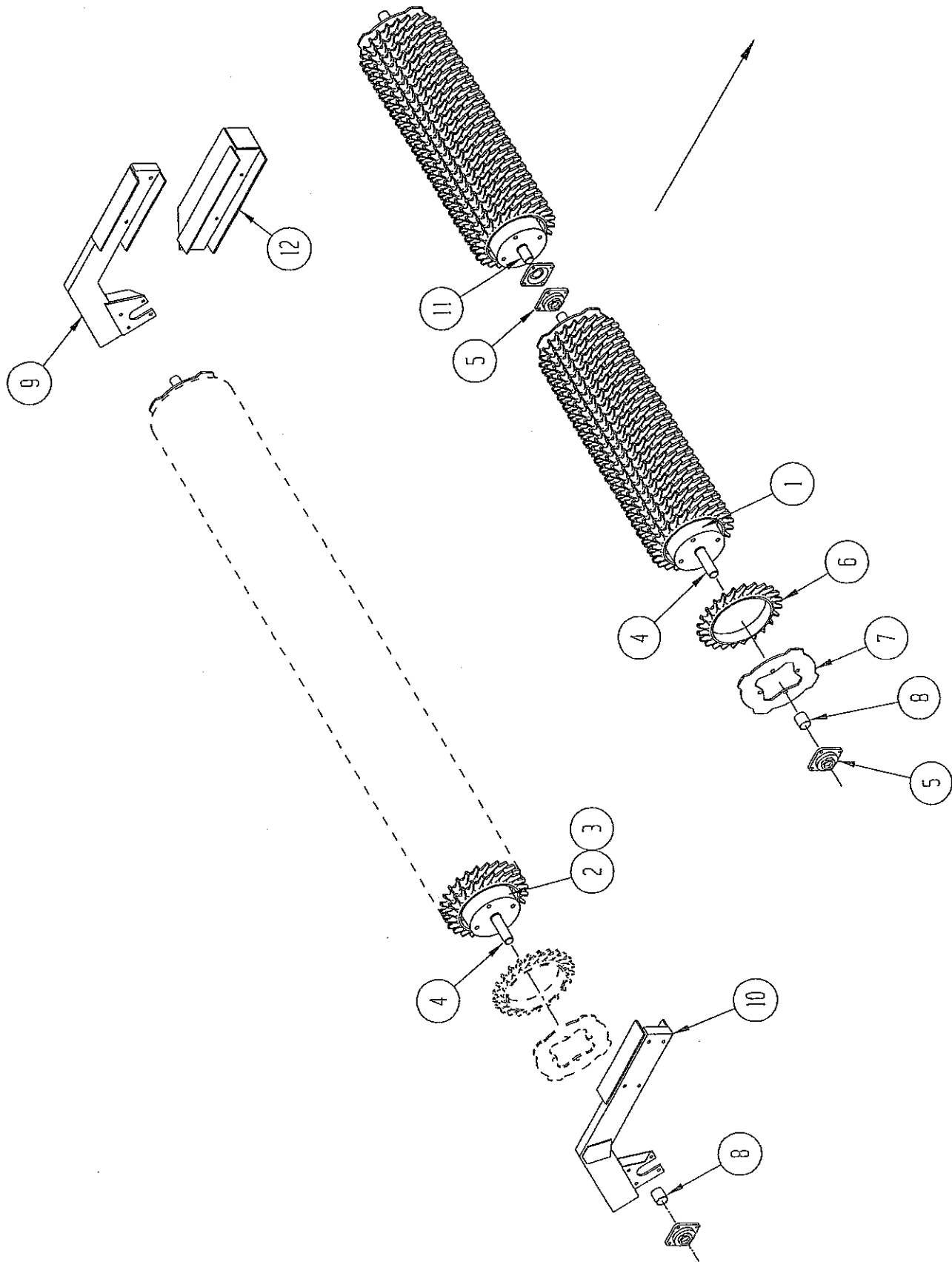
12" ROLLER ASSEMBLIES 12' – 16'

TEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	2	523378	Roller Weldment, 12' Standard
	2	523380	Roller Weldment, 14' Standard
	2	523382	Roller Weldment, 16' Standard
2	1	523379	Roller Weldment, 13' (With Extensions)
	1	523381	Roller Weldment, 15' (With Extensions)
	1	523383	Roller Weldment, 17' (With Extensions)
3	(REF)	523364	Stub Shaft, Long (Weld In)
4	4	980827	Bearing, 4 Bolt Flange 2 3/16
5	**	521592	Cast Ring, 12-14-20 Standard
	**	521643	Cast Ring, 12-14-20 Ductile
	**	521644	Cast Ring, 12-14-20 Domestic
6	12	521447	Roller End Plate
7	4	523896	Spacer, Roller
8	1	523803	Roller Arm, LH
9	1	523804	Roller Arm, RH
10	2	522071	Frame Extension (Optional)

** See table for approximate quantities due to rough castings

ROLLER LENGTH	CAST RING QUANTITY
12'	56
13'	61
14'	66
15'	71

DO NOT PACK ROLLERS TIGHT!



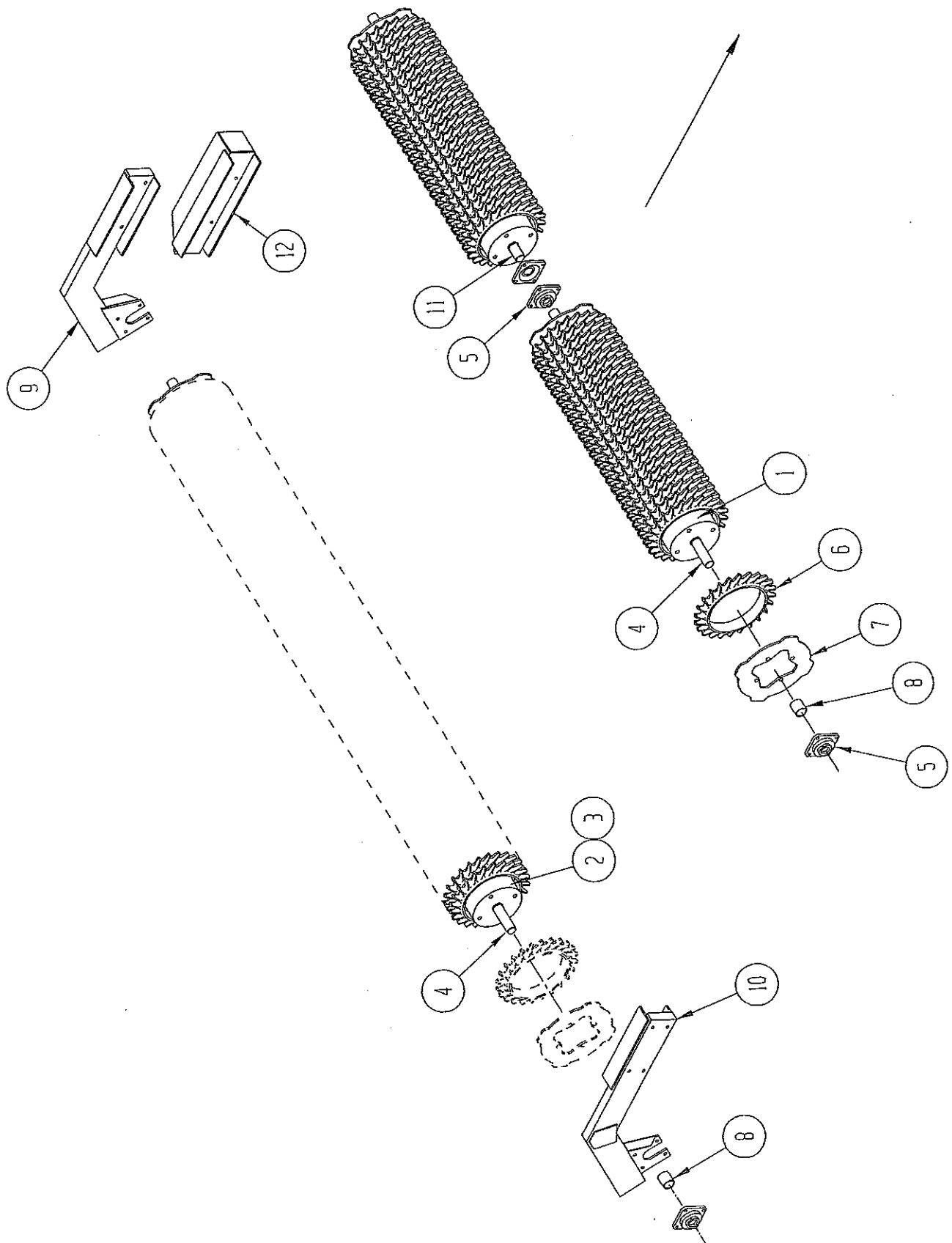
10" ROLLER ASSEMBLIES 18' – 20'

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	2	523356	Split Roller Weldment, 18'
	2	523358	Split Roller Weldment, 20'
2	1	523349	Roller Weldment, 18' (Standard)
	1	523351	Roller Weldment, 20' (Standard)
3	1	523350	Roller Weldment, 19' (With Extensions)
	1	523352	Roller Weldment, 21' (With Extensions)
4	(REF)	523327	Stub Shaft, Long (Weld In)
5	6	980827	Bearing, 4 Bolt Flange 2 3/16
6	**	521566	Cast Ring, 10-12-16 Standard
	**	521639	Cast Ring, 10-12-16 Ductile
	**	521640	Cast Ring, 10-12-16 Domestic
	**	521590	Cast Ring, 10-12-17 Standard
	**	521641	Cast Ring, 10-12-17 Ductile
	**	521642	Cast Ring, 10-12-17 Domestic
7	12	521496	Roller End Plate
8	4	523896	Spacer, Roller
9	1	523803	Roller Arm, LH
10	1	523804	Roller Arm, RH
11	(REF)	523357	Stub Shaft, Short (Weld In)
12	2	522071	Frame Extension (Optional)

** See table for approximate quantities due to rough castings

ROLLER LENGTH	CAST RING QUANTITY
18' Split	82
20' Split	90
18'	85
19'	90
20'	95
21'	99

DO NOT PACK ROLLERS TIGHT



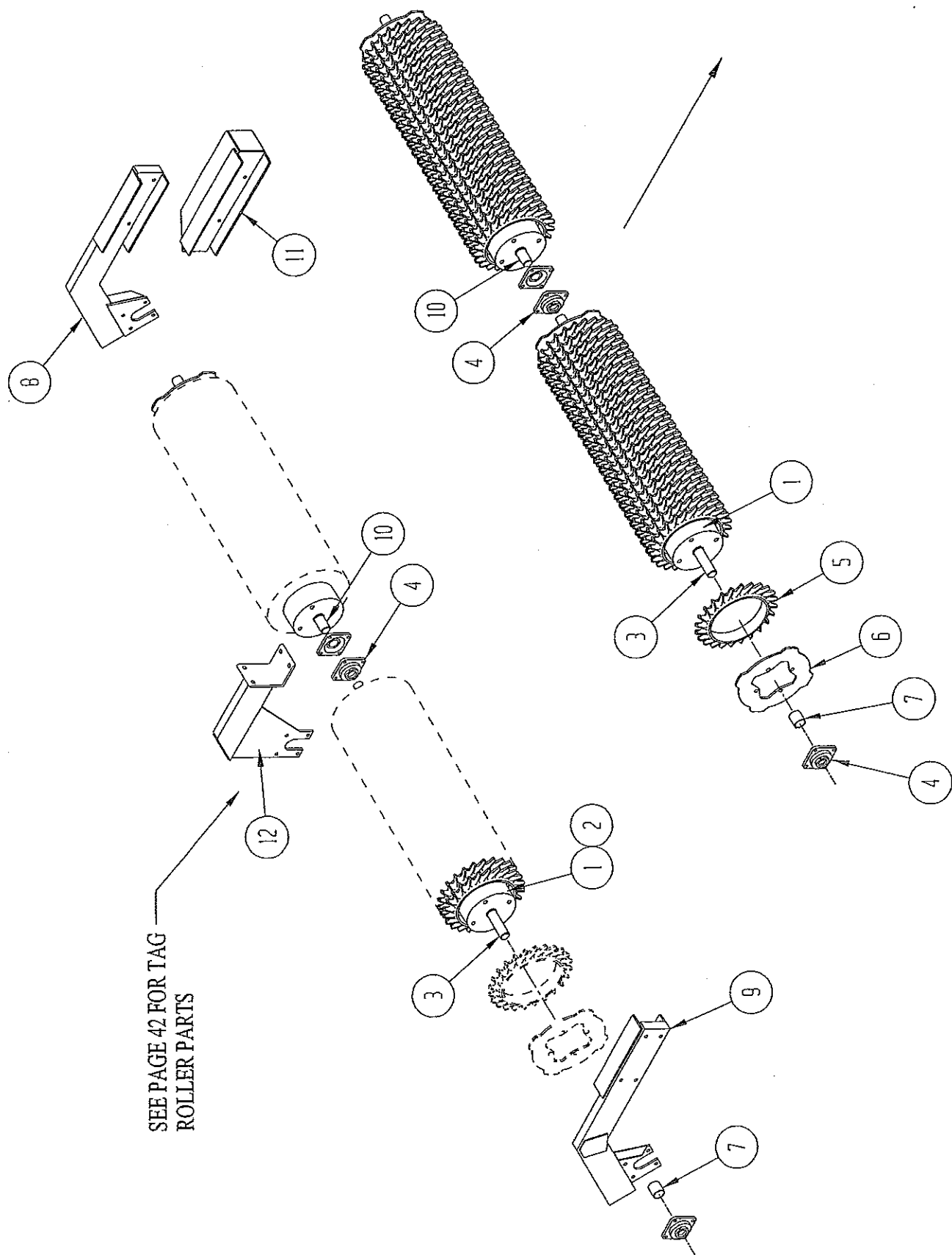
12" ROLLER ASSEMBLIES 18' – 20'

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	2	523391	Split Roller Weldment, 18'
	2	523393	Split Roller Weldment, 20'
2	1	523384	Roller Weldment, 18' (Standard)
	1	523386	Roller Weldment, 20' (Standard)
3	1	523385	Roller Weldment, 19' (With Extensions)
	1	523387	Roller Weldment, 21' (With Extensions)
4	(REF)	523364	Stub Shaft, Long (Weld In)
5	6	980827	Bearing, 4 Bolt Flange 2 3/16
6	**	521592	Cast Ring, 12-14-20 Standard
	**	521643	Cast Ring, 12-14-20 Ductile
	**	521644	Cast Ring, 12-14-20 Domestic
7	12	521447	Roller End Plate
8	4	523896	Spacer, Roller
9	1	523803	Roller Arm, LH
10	1	523804	Roller Arm, RH
11	(REF)	523392	Stub Shaft, Short (Weld In)
12	2	522071	Frame Extension (Optional)

** See table for approximate quantities due to rough castings

ROLLER LENGTH	CAST RING QUANTITY
18' Split	82
20' Split	90
18'	85
19'	90
20'	95
21'	99

DO NOT PACK ROLLERS TIGHT!



SEE PAGE 42 FOR TAG
ROLLER PARTS

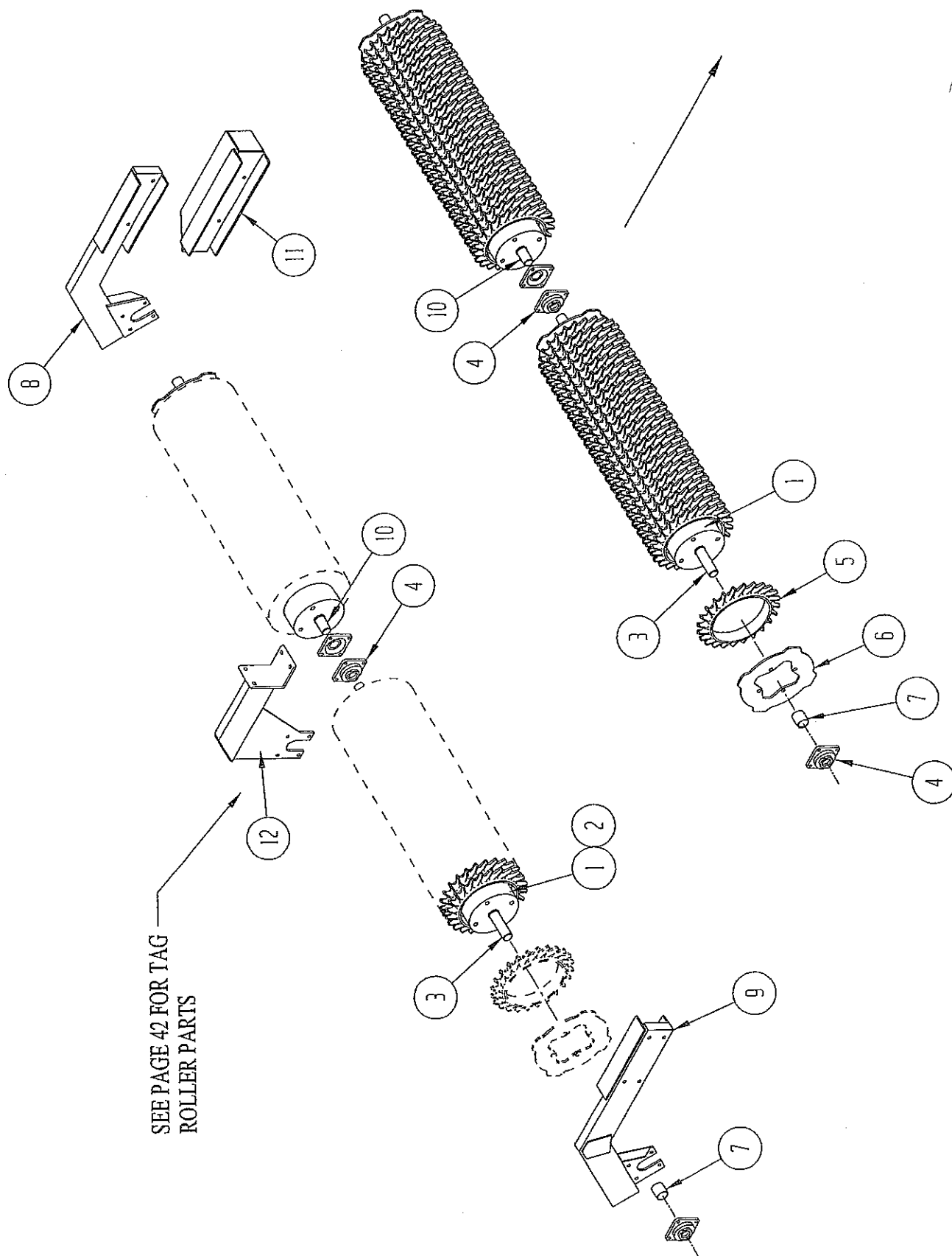
10" ROLLER ASSEMBLIES 24'

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	4	523361	Split Roller Weldment, 24' (Standard)
2	2	523362	Split Roller Weldment, 25' (With Extensions)
3	(REF)	523350	Stub Shaft, Long (Weld In)
4	8	980827	Bearing, 4 Bolt Flange 2 3/16
5	**	521566	Cast Ring, 10-12-16 Standard
	**	521639	Cast Ring, 10-12-16 Ductile
	**	521640	Cast Ring, 10-12-16 Domestic
	**	521590	Cast Ring, 10-12-17 Standard
	**	521641	Cast Ring, 10-12-17 Ductile
	**	521642	Cast Ring, 10-12-17 Domestic
6	12	521496	Roller End Plate
7	4	523896	Spacer, Roller
8	1	523803	Roller Arm, LH
9	1	523804	Roller Arm, RH
10	(REF)	523357	Stub Shaft, Short (Weld In)
11	2	522071	Frame Extension (Optional)
12	1	524034	Rear Roller Mount

** See table for approximate quantities due to rough castings

ROLLER LENGTH	CAST RING QUANTITY
24' Split	110
25' Split	114

DO NOT PACK ROLLERS TIGHT!



SEE PAGE 42 FOR TAG
ROLLER PARTS

12" ROLLER ASSEMBLIES 24'

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	4	523396	Split Roller Weldment, 24' (Standard)
2	2	523397	Split Roller Weldment, 25' (With Extensions)
3	(REF)	523364	Stub Shaft, Long (Weld In)
4	8	980827	Bearing, 4 Bolt Flange 2 3/16
5	**	521592	Cast Ring, 12-14-20 Standard
	**	521643	Cast Ring, 12-14-20 Ductile
	**	521644	Cast Ring, 12-14-20 Domestic
6	12	521447	Roller End Plate
7	4	523896	Spacer, Roller
8	1	523803	Roller Arm, LH
9	1	523804	Roller Arm, RH
10	(REF)	523392	Stub Shaft, Short (Weld In)
11	2	522071	Frame Extension (Optional)
12	1	524034	Rear Roller Mount

** See table for approximate quantities due to rough castings

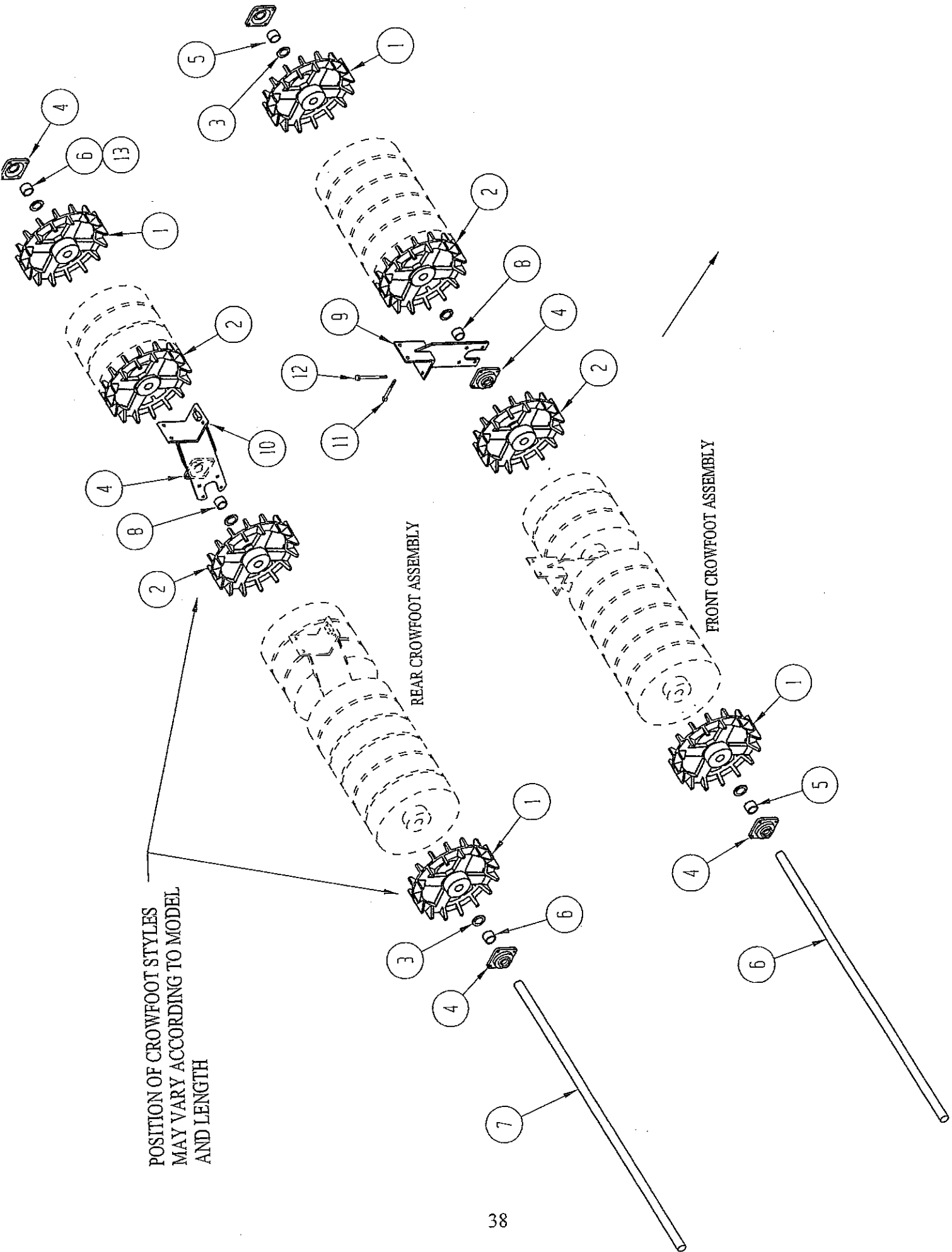
ROLLER LENGTH	CAST RING QUANTITY
24' Split	110
25' Split	114

DO NOT PACK ROLLERS TIGHT!

POSITION OF CROWFOOT STYLES
MAY VARY ACCORDING TO MODEL
AND LENGTH

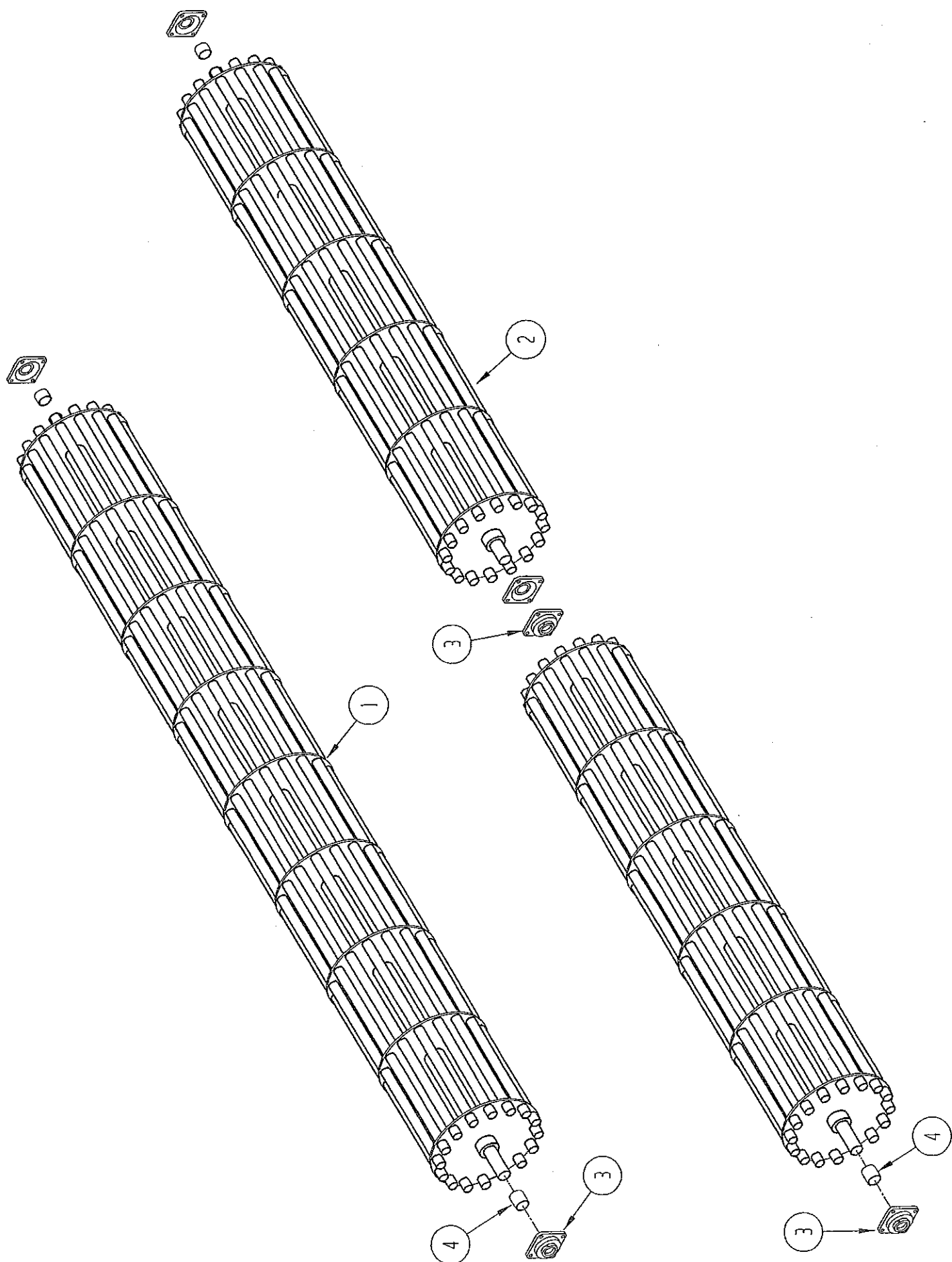
REAR CROWFOOT ASSEMBLY

FRONT CROWFOOT ASSEMBLY



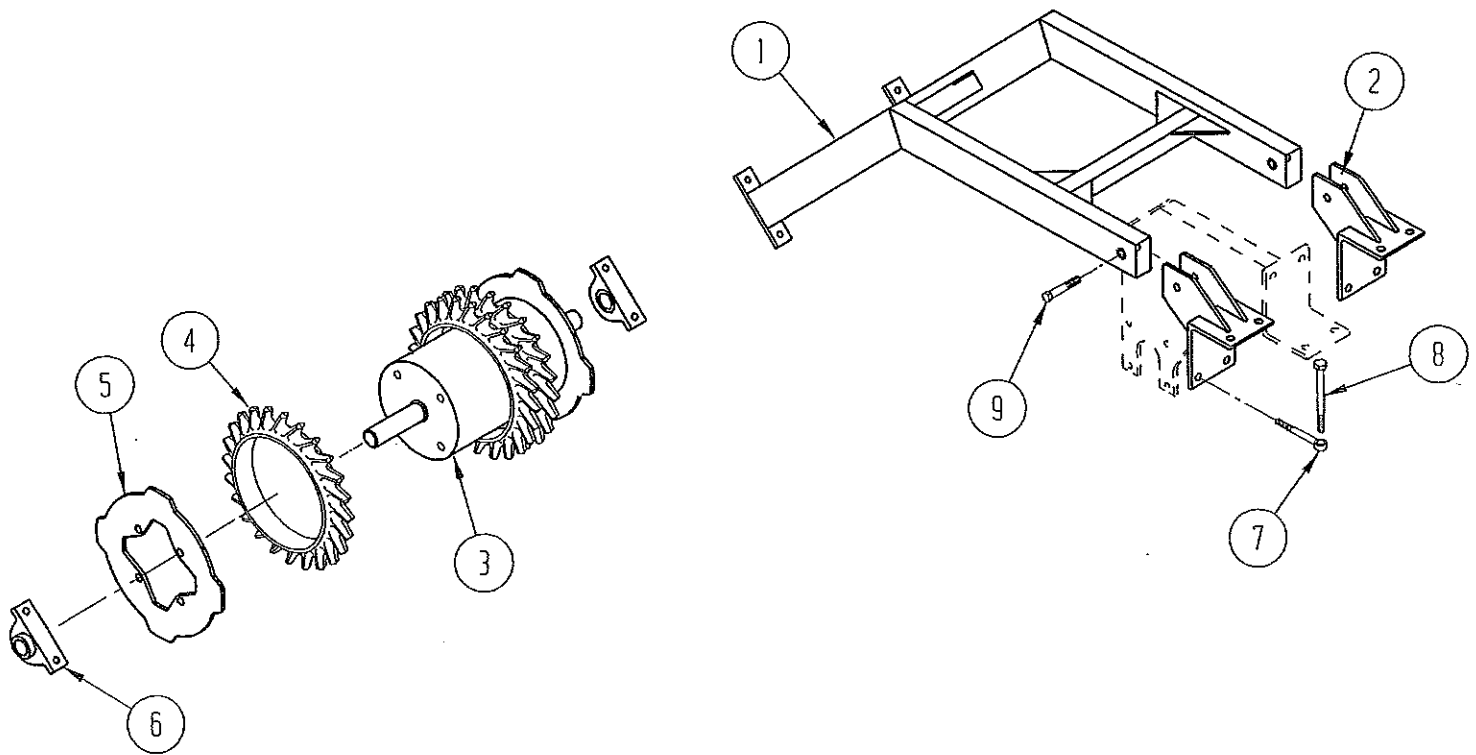
CROWFOOT ROLLER ASSEMBLIES

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	As Req'd	524242	Crowfoot, 20" x 5 5/8" Hub Length
2	As Req'd	524243	Crowfoot, 20" x 4" Hub Length
3	As Req'd	524452	Spacer
4	As Req'd	980827	Bearing, 2 3/16", 4-Hole Flanged
5	4	524451	Spacer (12' Frame, Front & Rear)
	2	524468	Spacer (20' Frame, Front Only)
	4	524458	Spacer (14' & 16' Frame, Front & Rear)
	2	524463	Spacer (18' Frame, Front Only)
	4	524473	Spacer (24' Frame, Front & Rear)
6	2	524453	Shaft (12' Frame, Front & Rear)
	2	524459	Shaft (14' Frame, Front Only)
	2	524464	Shaft (16' Frame, Front Only)
	2	524465	Shaft (18' Frame, Front Only)
	2	524468	Shaft (20' Frame, Front Only)
	2	524472	Shaft (24' Frame, Front Only)
7	1	524456	Shaft, LH Rear (14' Frame)
	1	524457	Shaft, RH Rear (14' Frame)
	1	524461	Shaft, LH Rear (16' Frame)
	1	524462	Shaft, RH Rear (16' Frame)
	1	524466	Shaft, LH Rear (18' Frame)
	1	524467	Shaft, RH Rear (18' Frame)
	1	524469	Shaft, LH Rear (20' Frame)
	1	524470	Shaft, RH Rear (20' Frame)
	1	524475	Shaft, LH Rear (24' Frame)
	1	524476	Shaft, RH Rear (24' Frame)
8	4	524450	Spacer, Inside (12', 14', 16', & 18' Frames)
	8	524471	Spacer, Inside (20', & 24' Frames)
9	2	524448	Shaft Support, Front (12' & 18' Frames)
	3	524448	Shaft Support, Front (14' & 16' Frames)
	4	524448	Shaft Support, Front (20' & 24' Frames)
10	2	524454	Shaft Support, Rear (12' Frame)
	3	524454	Shaft Support, Rear (14', 16' & 18' Frames)
	5	524454	Shaft Support, Rear (20' & 24' Frames)
11	As Req'd	997903	Eye Bolt, 3/4 x 6 1/2
12	As Req'd	-----	Hex Bolt, 3/4 x 8 1/2
13	2	524473	Spacer (18' & 20' Frames, Rear Only)



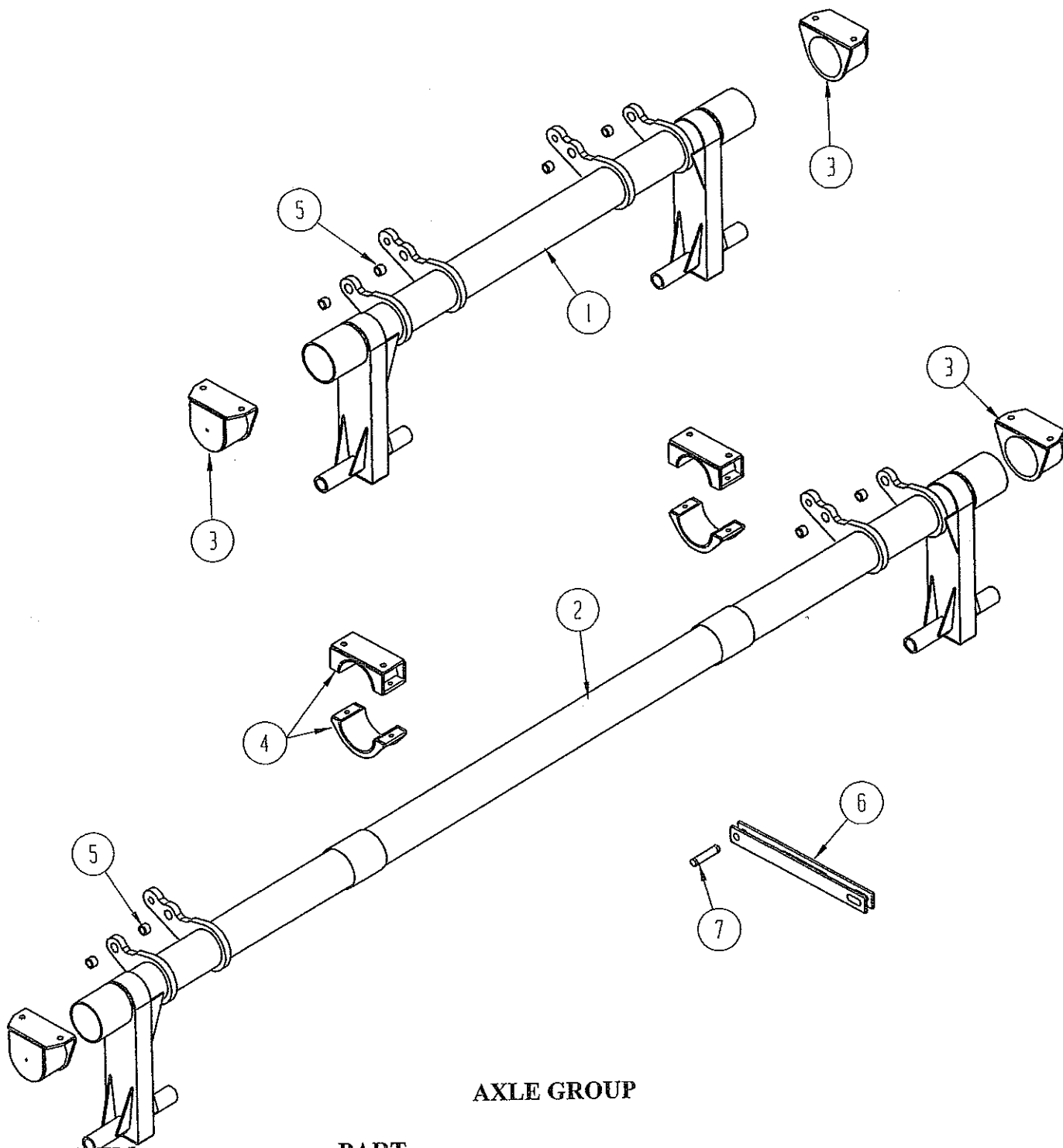
PIPE ROLLER ASSEMBLIES

ITEM NO.	QTY	PART NO. 16"	PART NO. 20"	DESCRIPTION
1	2	523808	523818	Pipe Roller, 12'
	2	523872	523882	Pipe Roller, 13'
	2	523809	523819	Pipe Roller, 14'
	2	523873	523883	Pipe Roller, 15'
	2	523810	523820	Pipe Roller, 16'
	2	523874	523884	Pipe Roller, 17'
	2	523811	523821	Pipe Roller, 18'
	2	523875	523885	Pipe Roller, 19'
	2	523812	523822	Pipe Roller, 20'
	2	523876	523886	Pipe Roller, 21'
2	2	524021	524022	Split Pipe Roller, 18'
	2	523985	523986	Split Pipe Roller, 20'
3	As Req'd	980827	980827	Bearing, 4 Bolt Flange 2 3/16
4	4	523807	523807	Spacer



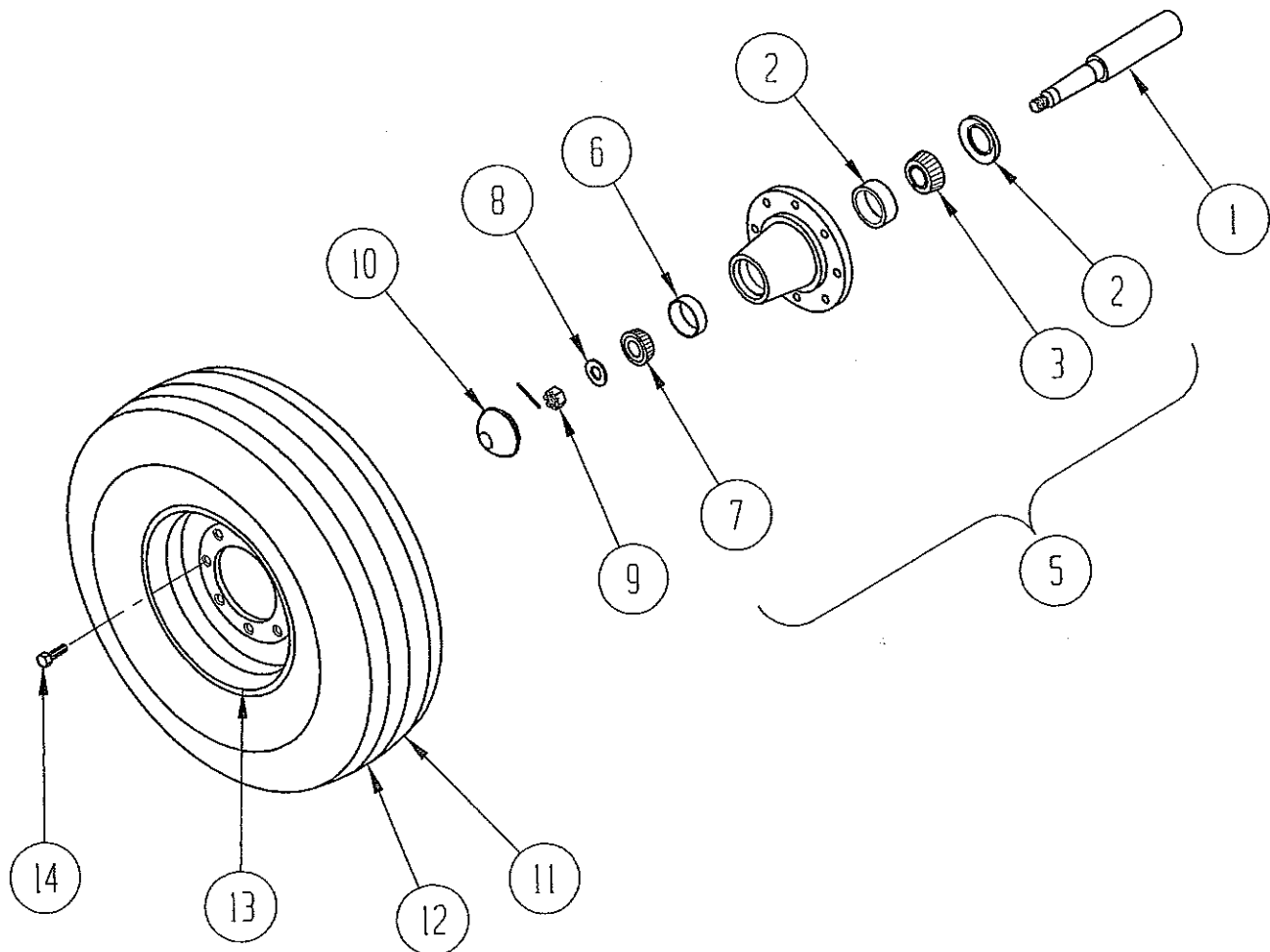
TAG ALONG ROLLER ASSEMBLY 24'

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	1	522410	Roller Frame
2	2	522407	Hinge Bracket
3	1	522397	Tag Along Roller, 10"
	1	522427	Tag Along Roller, 12"
4	6	** See Previous Pages for 10" & 12" Cast Rings	
5	2	521496	Roller End Plate, 10"
	2	521447	Roller End Plate, 12"
6	2	980020	Pillow Block Bearing, 1 15/16"
7	4	997903	Eye Bolt, 3/4 x 6 1/2
8	4	-----	Hex Bolt, 3/4 x 8 1/2
9	2	-----	Hex Bolt, 3/4 x 4



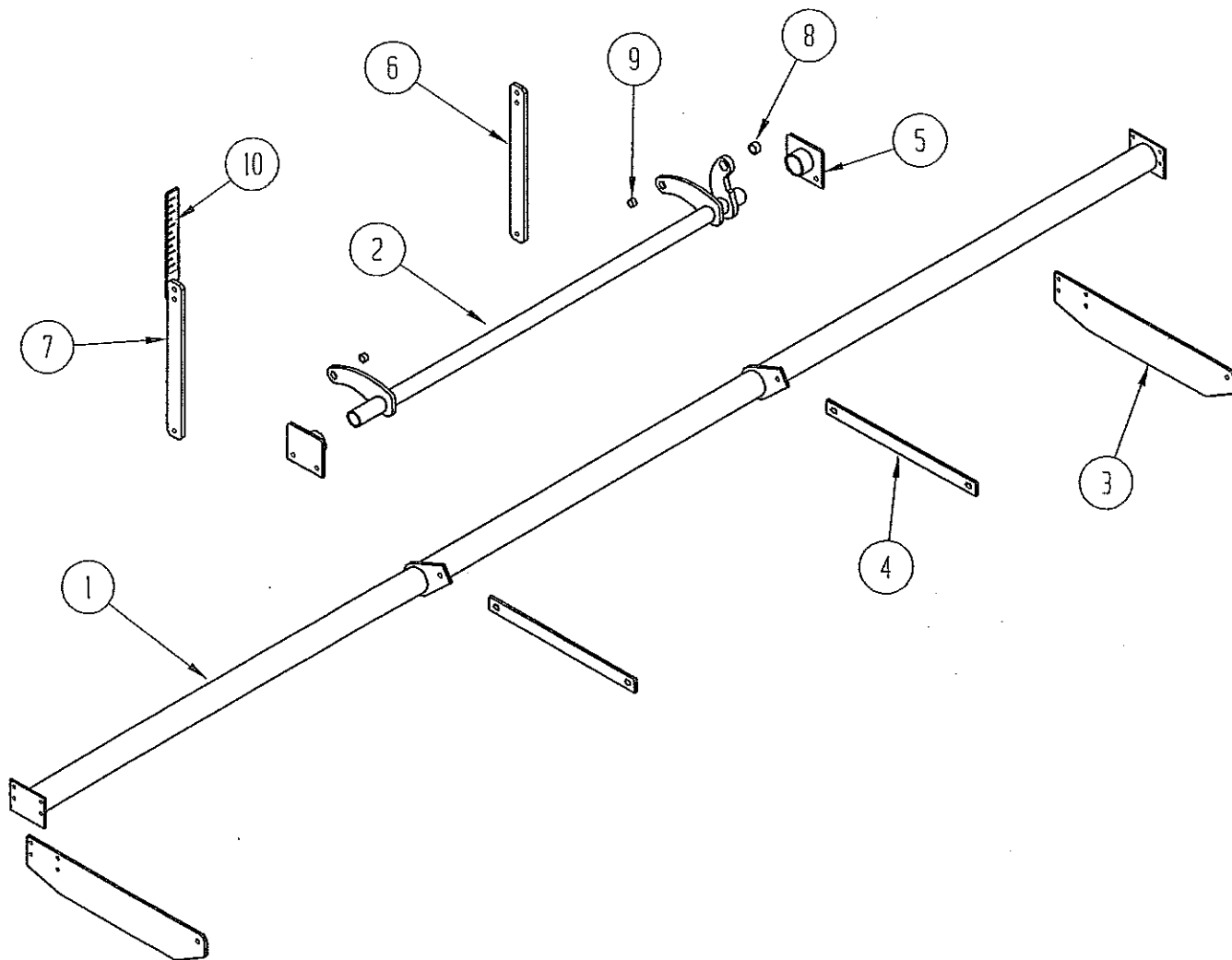
AXLE GROUP

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	1	523799	Axle Weldment (12', 14', & 16' Frames)
2	1	523908	Axle Weldment (18', 20', & 24' Frames)
3	2	523107	Axle Bracket, Outer
4	2	522099	Axle Bracket, Inner (Includes top and bottom)
5	4	521391	Hardened Bushing
6	2	523149	Transport Lock
7	4	523163	Cylinder Pin



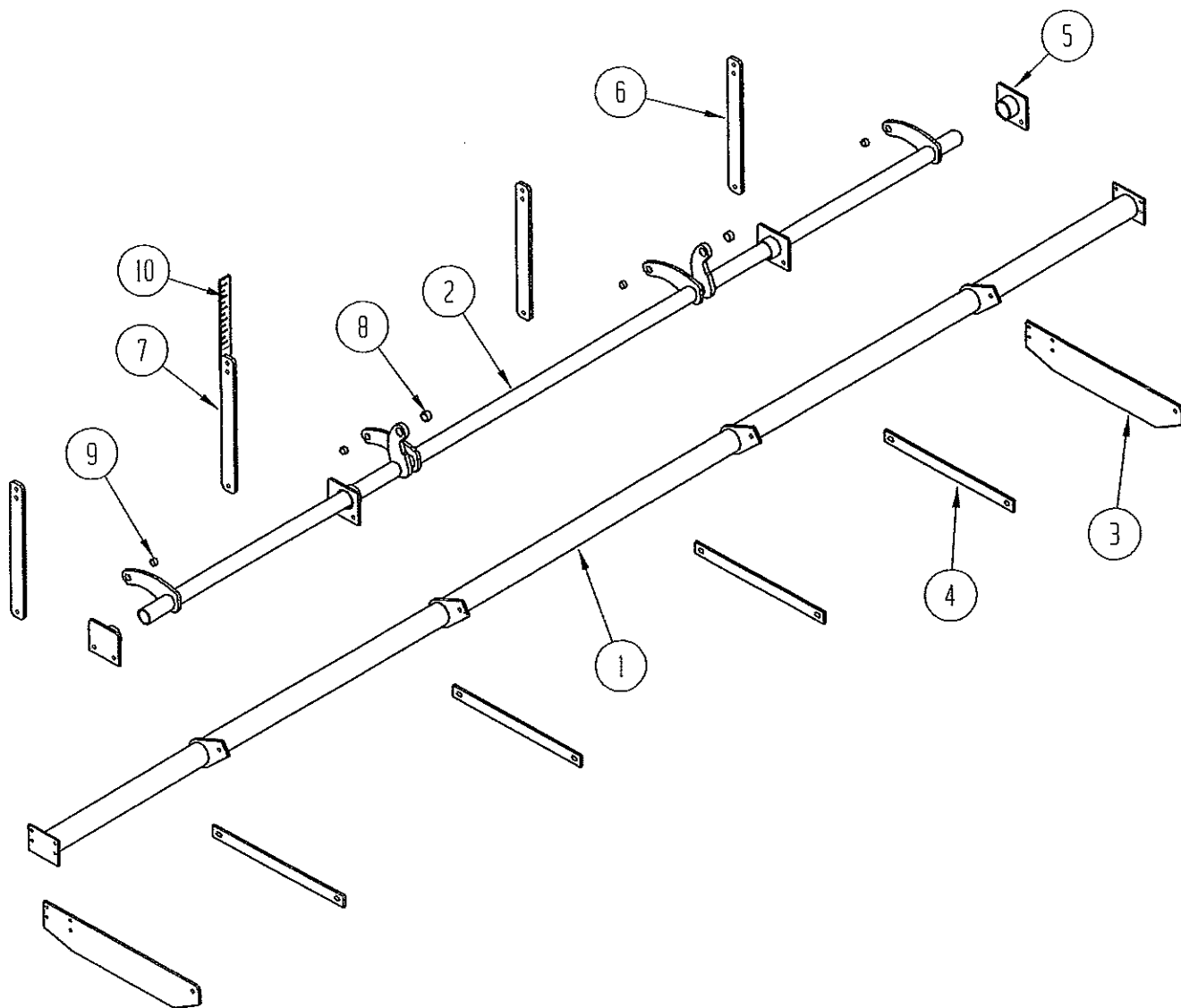
HUB & WHEEL ASSEMBLY

ITEM NO.	QTY	PART NO. 521315	PART NO. 522620	DESCRIPTION
		12', 14' & 16'	18', 20' & 24'	
1	1	521328	521328	Heavy Duty Spindle
2	1	990094	990094	Seal
3	1	990000	990000	Bearing Cone, Inner
4	1	990001	990001	Bearing Cup, Inner
5	1	999981	999981	Hub Asm, complete w/Bearings, Seal, Hub Cap, & Lug Bolts
6	1	990003	990003	Bearing Cup, Outer
7	1	990002	990002	Bearing Cone, Outer
8	1	999965	999965	Flat Washer - 7/8
9	1	999960	999960	Slotted Nut - 7/8
10	1	999952	999952	Hub Cap
11	1	999977	-----	Tire, 9.50L x 15 8 Ply
	1	-----	521910	Tire, 11L x 15FI 12-Ply
12	1	999977-99	999974-99	Tube, 15"
13	1	999986	999986	Wheel, 15" 8 Hole
14	8	997905	997905	Lug Bolt



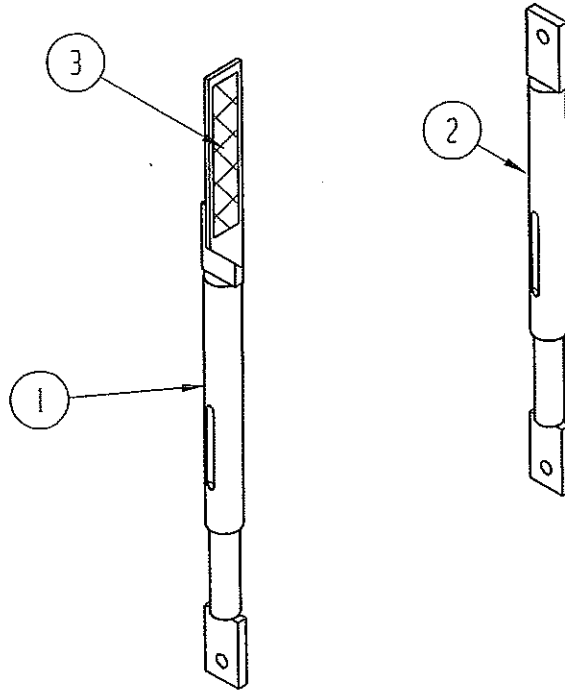
LEVELING BAR & LIFT GROUP (12' - 16')

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	1	522046	Leveling Bar (12')
	1	522052	Leveling Bar (14')
	1	522079	Leveling Bar (16')
2	1	524761	Lifting Bar Weldment (Includes Bushings)
3	2	521375	Side Link
4	2	521374	Pull Link, Inner
5	2	524764	Lift Bar Bracket
6	1	521488	Lift Link
7	1	522029	Lift Link Weldment
8	1	521391	Hardened Bushing
9	2	360098	Spacer Bushing
10	1	522301	Depth Indicator Decal



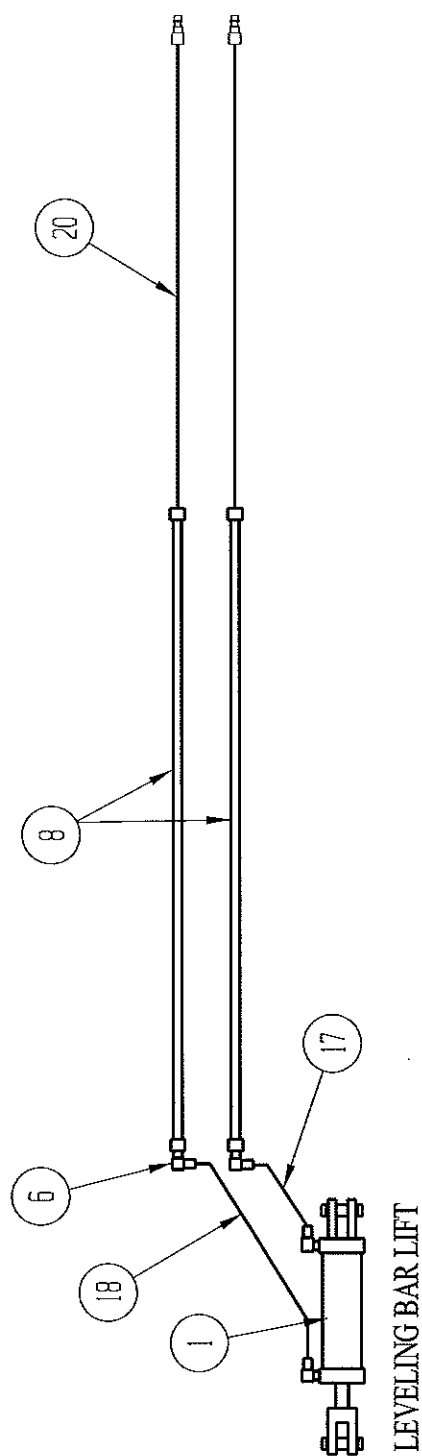
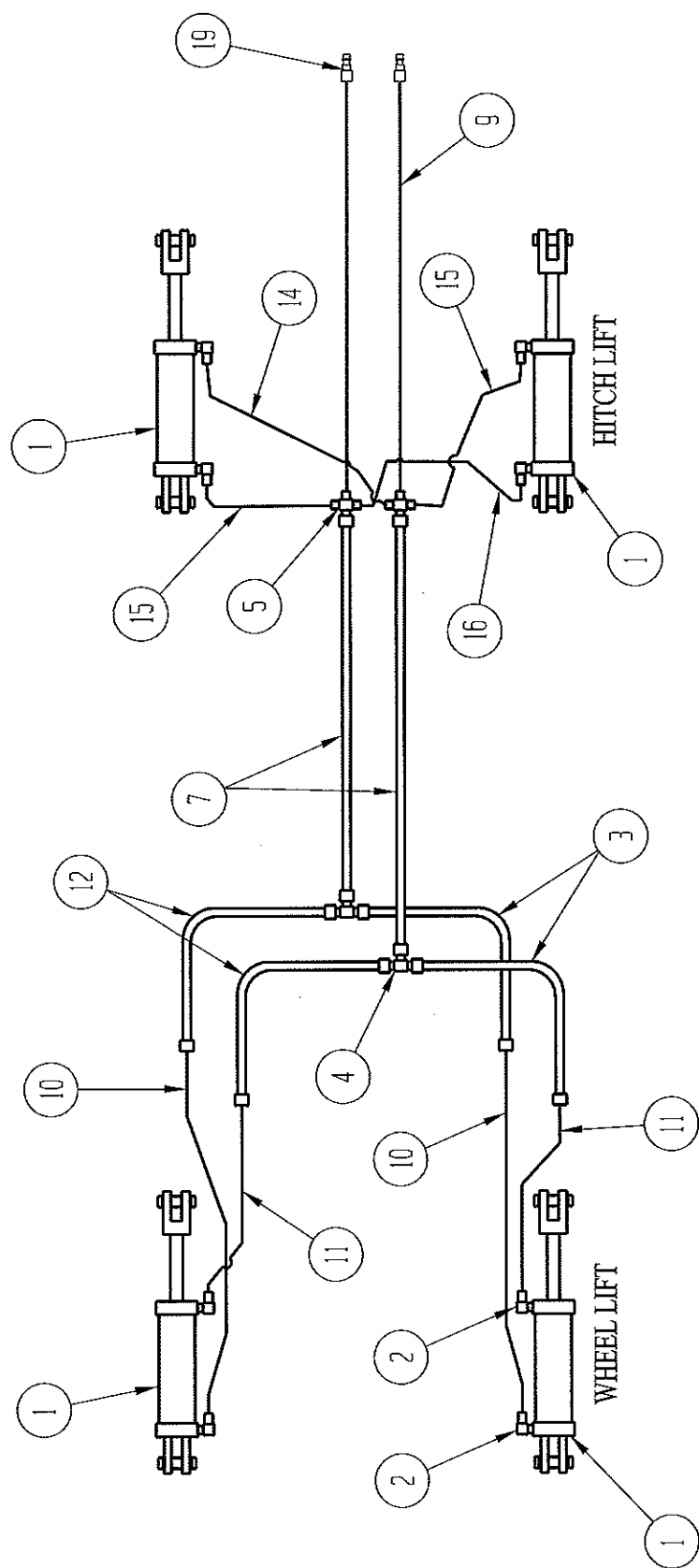
LEVELING BAR & LIFT GROUP (18' - 24')

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	1	522089	Leveling Bar (18')
	1	522129	Leveling Bar (20')
	1	522149	Leveling Bar (24')
2	1	524765	Lifting Bar Weldment (Includes Bushings)
3	2	521375	Side Link
4	4	521374	Pull Link, Inner
5	2	524764	Lift Bar Bracket
6	3	521488	Lift Link
7	1	522029	Lift Link Weldment
8	2	521391	Hardened Bushing
9	4	360098	Spacer Bushing
10	1	522301	Depth Indicator Decal



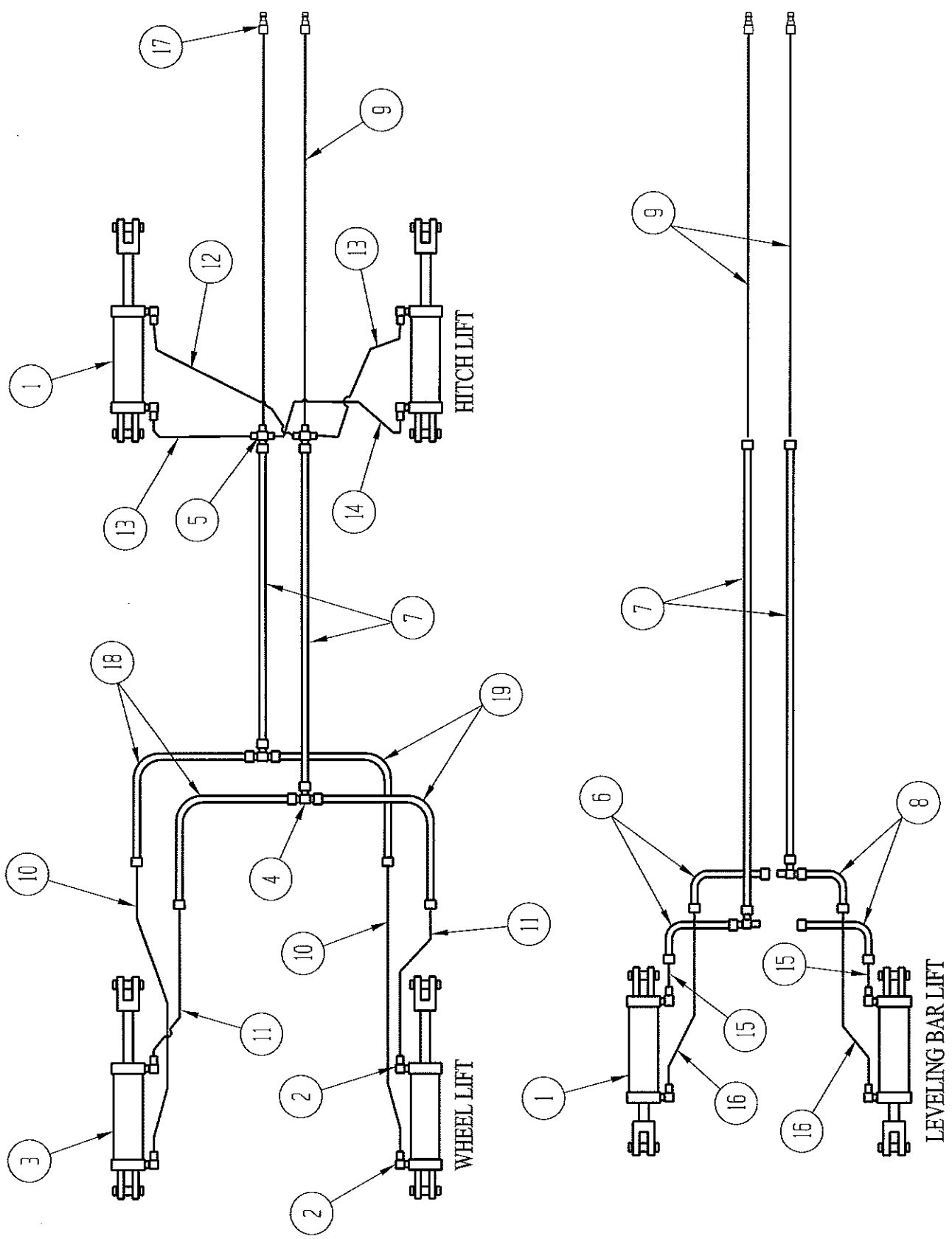
LEVELING BAR ROCK PROTECTION KIT

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	3	521300	Link Assembly w/ Depth Indicator
2	3	521291	Link Assembly
3	3	522301	Decal Indicator Decal



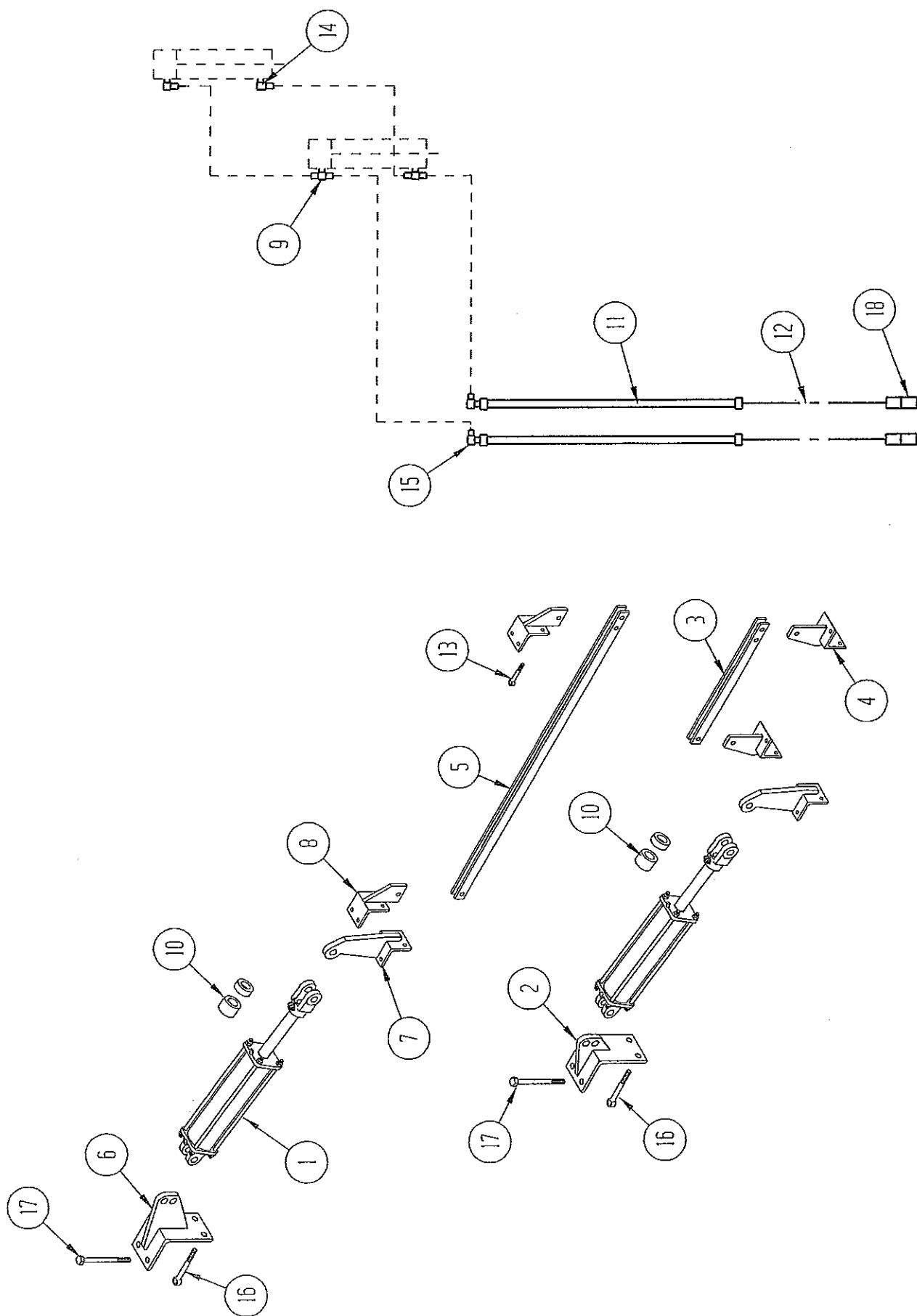
HYDRAULIC SCHEMATIC 12' – 16'

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	5	267835	Hydraulic Cylinder, 3 x 8
2	10	295043	Straight Thread Elbow, 1/2 x 1/2 O-Ring
3	2	-----	Hydraulic Tube Asm, 5/8x47 90°
4	2	295046	Union Tee, 5/8
5	2	295085	Cross, 5/8
6	2	295035	Union Elbow, 5/8
7	2	-----	Hydraulic Tube Asm, 5/8 x 70 Straight
8	2	-----	Hydraulic Tube Asm, 5/8 x 96 Straight
9	2	-----	Hydraulic Hose, 1/2 x 192 w/ 1/2 NPT & 5/8 JIC Female Ends
10	2	-----	Hydraulic Hose, 1/2 x 32 w/ 1/2 Male & 5/8 JIC Male Ends
11	2	-----	Hydraulic Hose, 1/2 x 21 w/ 1/2 Male & 5/8 JIC Male Ends
12	2	-----	Hydraulic Tube Asm, 5/8 x 58 90°
13	-	-----	-----
14	1	-----	Hydraulic Hose, 1/2 x 45 w/ 1/2 & 5/8 JIC Male Ends
15	2	-----	Hydraulic Hose, 1/2 x 34 w/ 1/2 & 5/8 JIC Male Ends
16	1	-----	Hydraulic Hose, 1/2 x 23 w/ 1/2 & 5/8 JIC Male Ends
17	1	-----	Hydraulic Hose, 1/2 x 17 w/ 1/2 & 5/8 JIC Male Ends
18	1	-----	Hydraulic Hose, 1/2 x 28 w/ 1/2 & 5/8 JIC Male Ends
19	4	291027	Quick Coupler, Male End
20	2	-----	Hydraulic Hose, 1/2 x 216 w/ 1/2 NPT & 5/8 JIC Female Ends
	(REF)	998389	Rod End Clevis w/Hardened Bushing
	(REF)	264704	Hydraulic Tube Clamps, Dbl



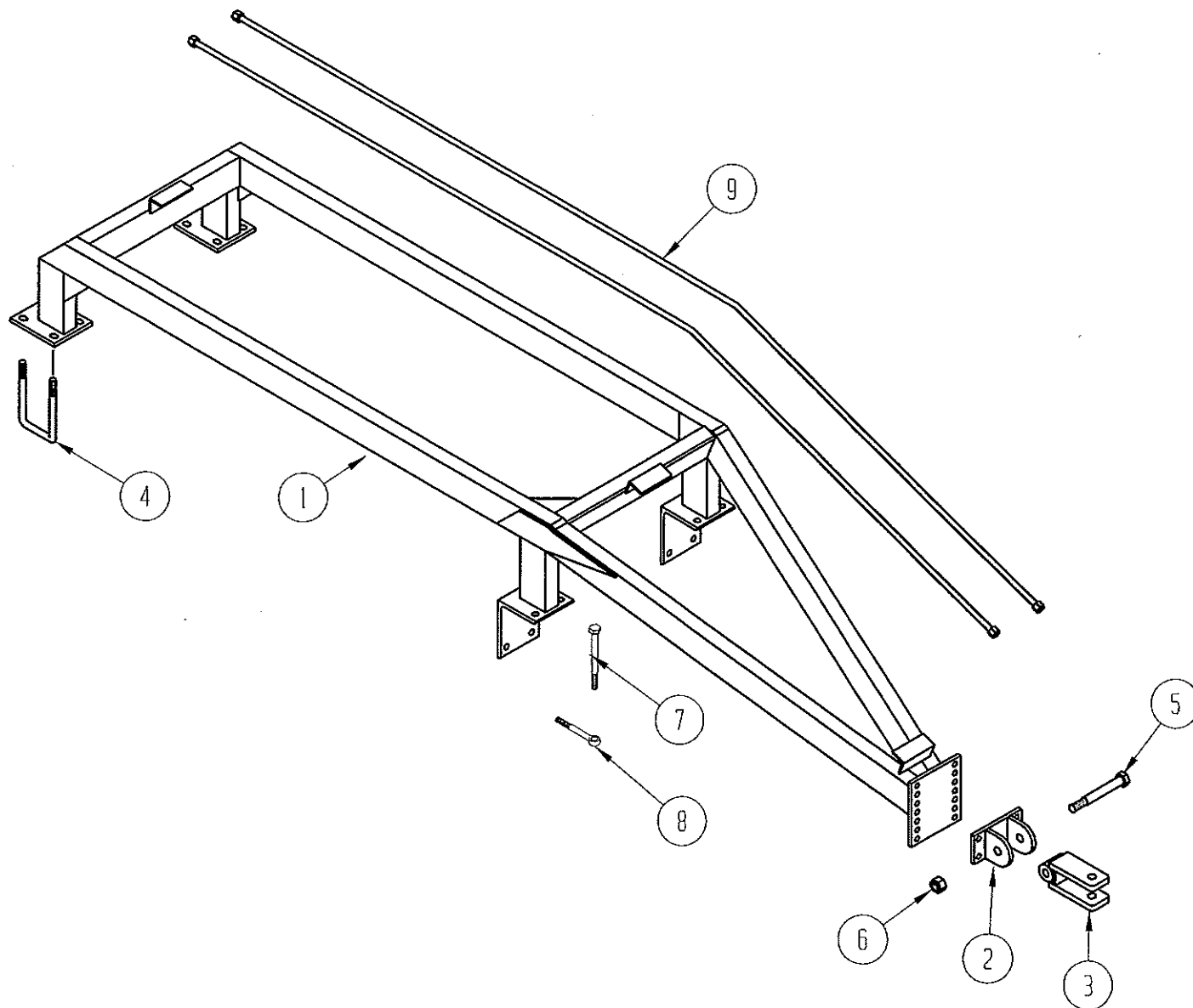
HYDRAULIC SCHEMATIC 18' – 24'

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	4	267835	Hydraulic Cylinder, 3 x 8 w/ Hrdnd Clevis
2	12	295043	Straight Thread Elbow, 1/2 x 1/2 O-Ring
3	2	267836	Hydraulic Cylinder, 3-1/2 x 8 w/ Hrdnd Clevis
4	4	295046	Union Tee, 5/8
5	2	295085	Cross, 5/8
6	2	-----	Hydraulic Tube, 5/8 x 58 90°
7	4	-----	Hydraulic Tube, 5/8 x 70 Straight
8	2	-----	Hydraulic Tube, 5/8 x 47 90°
9	2	-----	Hydraulic Hose, 1/2 x 192 w/ 3/8 MPT & 5/8 JIC Female Ends
10	2	-----	Hydraulic Hose, 1/2 x 32 w/ 1/2 Male & 5/8 JIC Female Ends
11	2	-----	Hydraulic Hose, 1/2 x 21 w/ 1/2 Male & 5/8 JIC Female Ends
12	1	-----	Hydraulic Hose, 1/2 x 45 w/ 1/2 & 5/8 JIC Male Ends
13	1	-----	Hydraulic Hose, 1/2 x 34 w/ 1/2 & 5/8 JIC Male Ends
14	1	-----	Hydraulic Hose, 1/2 x 23 w/ 1/2 & 5/8 JIC Male Ends
15	2	-----	Hydraulic Hose, 1/2 x 17 w/ 1/2 Male & 5/8 JIC Female Ends
16	2	-----	Hydraulic Hose, 1/2 x 28 w/ 1/2 Male & 5/8 JIC Female Ends
17	4	291027	Quick Coupler, Male End
18	2	-----	Hydraulic Tube Asm, 5/8 x 107 90°
19	2	-----	Hydraulic Tube Asm, 5/8 x 96 90°
	(REF)	267837	Austempered Hardened Rod Clevis
	(REF)	998389	Rod End Clevis w/ Hardened Bushing
	(REF)	264704	Hydraulic Tube Clamps, Dbl



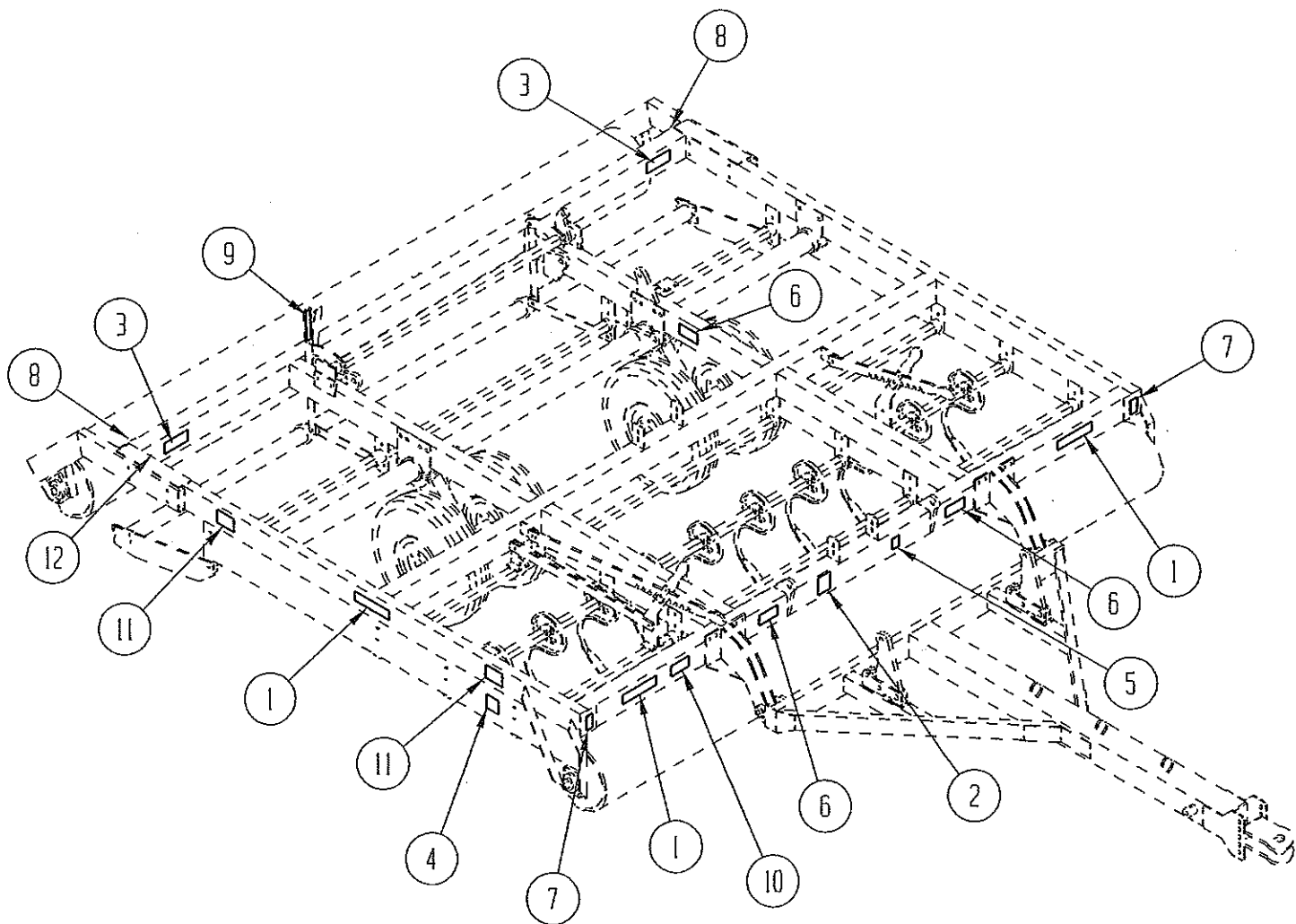
HYDRAULIC TINEBAR CONTROL

ITEM NO.	QTY (12' & 14')	QTY (16' - 24')	PART NO.	DESCRIPTION
1	2	4	998165	Hydraulic Cylinder, 3 x 10
2	1	2	524559	Cylinder Bracket
3	1	2	521260	Control Linkage
4	1	2	521495	Control Clamp
5	1	2	523157	Control Linkage
6	1	2	524560	Cylinder Bracket
7	2	4	523000	Cylinder Ear
8	1	2	521513	Control Clamp
9	2	4	295050	Branch Tee, 1/2 JIC x 1/2 O-Ring
10	2	4	522012	Stroke Control Kit
11	2	2	-----	Hydraulic Tube Asm, 5/8 x 70
12	2	2	-----	Hydraulic Hose, 1/2 x 192 w/ 3/8 MPT & 5/8 JIC Female Ends
13	12	24	-----	Eye Bolt, 1/2 x 3 1/2
14	2	4	295043	Straight Thread Elbow, 1/2 x 1/2 O-Ring
15	2	4	295035	Union Elbow, 5/8
16	4	8	522012	Eye Bolt, 3/4 x 6
17	4	8	-----	Hex Bolt, 3/4 x 8 1/2
18	2	2	291027	Quick Coupler, Male End
	(REF)	(REF)	264704	Hydraulic Tube Clamp, Dbl



GRAIN DRILL

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	1	524005	Grain Drill Hitch Weldment
2	1	523174	Clevis Mount
3	2	521139	Hitch Clevis
4	4	522154	U-bolt
5	1	-----	Hex Bolt, 1" x 6
6	1	-----	Hex Lock Nut, 1"
7	4	-----	Hex Bolt, 3/4 x 8-1/2"
8	4	997903	Eye Bolt, 3/4 x 6-1/2"
9	2	521613	Hydraulic Tubing Asm
	(REF)	264704	Hydraulic Tube Clamp, Dbl



DECAL GROUP

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	6	264797	Decal, Parma
2	1	100406	Decal, General Caution
3	4	100404	Decal, Block Machine
4	2	100311	Decal, Rotating Parts
5	1	100423	Decal, FEMA
6	4	100408	Decal, Hydraulics Pressurized
7	2	264515	Reflector, Amber
8	2	264516	Reflector, Red
9	1	522301	Decal, Depth Indicator
10	1	521000	Decal, Lift
11	4	265933	Decal, Do Not Ride
12	1	521268	Warning Light Kit

NOTES