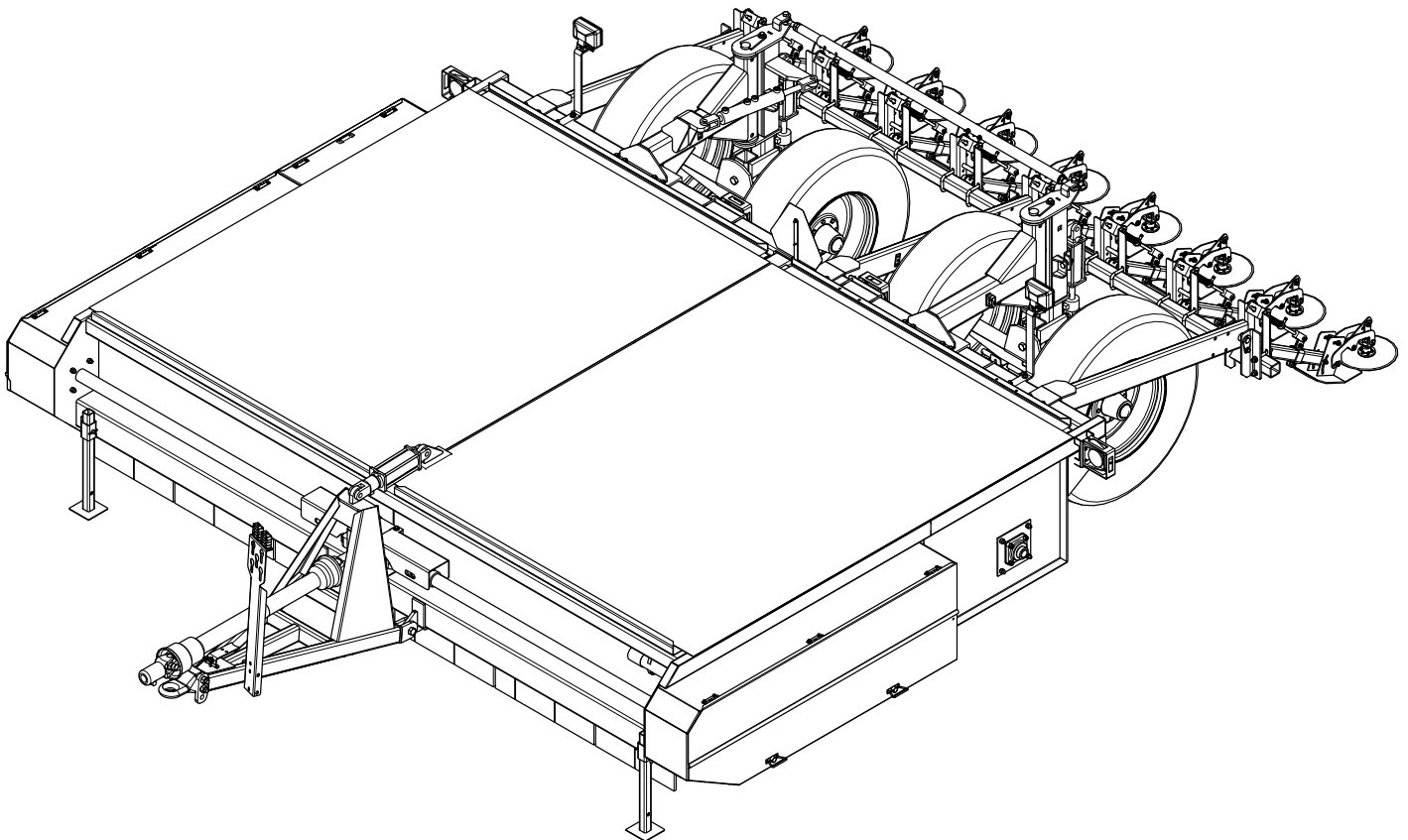


# **BEET DEFOLIATOR**



## **OPERATOR'S MANUAL**

## TO THE DEALER:

Assembly and proper installation of this product is the responsibility of the Alloway dealer. Read manual instructions and safety rules. Make sure all items on the Dealer's Pre-Delivery and Delivery Check Lists in the Operator's Manual are completed before releasing equipment to the owner.

The dealer must complete the Warranty Registration included in this manual. Both dealer and customer must sign the registration which certifies that all Dealer Check List items have been completed. The dealer is to return the prepaid postage portion to Alloway, give one copy to the customer, and retain one copy.

**Note: Warranty credit is subject to this form being completed and returned.**

## TO THE OWNER:

Read this manual before operating your Alloway equipment. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all the adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your dealer.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the equipment.

For service, your authorized Alloway dealer has trained mechanics, genuine Alloway service parts, and the necessary tools and equipment to handle all your needs.

Use only genuine Alloway service parts. Substitute parts will void the warranty and may not meet standards required for safe and satisfactory operation. Record the model number and serial number of your equipment in the spaces provided:

**Model:** \_\_\_\_\_ **Date of Purchase** \_\_\_\_\_

**Serial Number: (see Safety Decal section for location)** \_\_\_\_\_

Provide this information to your dealer to obtain correct repair parts.

Throughout this manual, the term **IMPORTANT** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION**, **WARNING** and **DANGER** are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety.



This Safety-Alert Symbol indicates a hazard and means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.



**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



**CAUTION**

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

**IMPORTANT**

Indicates that failure to observe can cause damage to equipment.

**NOTE**

Indicates helpful information.

**ALLOWAY**

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## GENERAL INFORMATION

The purpose of this manual is to assist you in operating and maintaining your Beet Defoliator. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance. These instructions have been compiled from extensive field experience and engineering data. Some information may be general in nature due to unknown and varying operating conditions. However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.

The illustrations and data used in this manual were current at the time of printing, but due to possible inline production changes, your machine may vary slightly in detail. We reserve the right to redesign and change the machines as may be necessary without notification.



### WARNING

- **Some illustrations in this manual show the Beet Defoliator with safety shields removed to provide a better view. The Beet Defoliator should never be operated with any safety shielding removed.**

Throughout this manual, references are made to right and left direction. These are determined by standing behind the equipment facing the direction of forward travel.



# SAFETY RULES

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said *"The best safety device is an informed, careful operator."* We ask you to be that kind of an operator.

### TRAINING

- Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals are available from dealer). Failure to follow instructions or safety rules can result in serious injury or death.
- If you do not understand any part of this manual and need assistance, see your dealer.
- Know your controls and how to stop engine and attachment quickly in an emergency.
- Operators must be instructed in and be capable of the safe operation of the equipment, its attachments and all controls. Do not allow anyone to operate this equipment without proper instructions.
- Keep hands and body away from pressurized lines. Use paper or cardboard, not body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.
- Make sure that all operating and service personnel know that in the event hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury, or gangrene, serious injury or death will result. **CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**
- Never allow children or untrained persons to operate equipment.

### PREPARATION

- Check that all hardware is tight and properly installed. Always tighten to torque chart specifications unless instructed otherwise in this manual.
- Air in hydraulic systems can cause erratic operation and allows loads or equipment components to drop unexpectedly. Before operating or allowing anyone to approach the equipment, purge any air in the system by operating all hydraulic functions several times after connecting equipment, connecting hoses, or doing any hydraulic maintenance.
- Make sure all hydraulic hoses, fittings and valves are in good condition and not leaking before starting power unit or using equipment. Check and route hoses carefully to prevent damage. Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts. Operate moveable components through full operational range to check clearances. Replace any damaged hoses immediately.
- 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; and respirator or filter mask where appropriate.
- Ensure implement is properly attached, adjusted and in good operating condition.
- Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.
- Before starting power unit, check all equipment driveline guards for damage and make sure they rotate freely on all drivelines. Replace any damaged guards. If guards do not rotate freely on drivelines, repair and replace bearings before operating.

(Safety Rules continued on next page)



# SAFETY RULES

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



*(Safety Rules continued from previous page)*

- Power unit must be equipped with ROPS or ROPS CAB and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS systems in “locked up” position at all times.
- Connect PTO driveline directly to power unit PTO shaft. Never use adapter sleeves or adapter shafts. Adapters can cause driveline failures due to incorrect spline or incorrect operating length and can result in personal injury or death.
- Inspect rubber flaps and swing rod before each use. Replace if damaged or missing. Flaps must pivot and hang freely so there are no gaps. Do not put equipment into service until repaired.
- Remove accumulated debris from this equipment, tractor and engine to avoid fire hazard.
- Ensure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)
- Ensure shields and guards are properly installed and in good condition. Replace if damaged.
- A minimum 20% of tractor and equipment weight must be on tractor front wheels when attachments are in transport position. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires or front tractor weights. When attaining the minimum 20% weight on the front wheels, you must not exceed the Roll Over Protection Structure (ROPS) weight certification. Weigh the tractor and equipment. Do not estimate.
- Make sure hydraulic hoses and cylinders are fully purged of air before operating. Keep all persons away and fill the system by raising and lowering all functions several times. Air in the system can allow components to fall unexpectedly.
- Inspect and clear area of stones, branches, or other hard objects that might be thrown, causing injury or damage.

## TRANSPORTING

- Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS systems in “locked up” position at all times.
- Always sit in power unit seat when operating controls or starting engine. Securely fasten seat belt, place transmission in neutral, engage brake, and ensure all other controls are disengaged before starting power unit engine.
- A minimum 20% of tractor and equipment weight must be on the tractor front wheels when attachments are in transport position. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires or front tractor weights. Weigh the tractor and equipment. Do not estimate.
- Always attach safety chain to tractor drawbar when transporting unit.
- Always raise unit and install transport locks before transporting. Leak down or failure of mechanical or hydraulic system can cause equipment to drop.
- Never exceed 20 MPH during transport. See the Speed vs. Weight Ratio Table in "Field Operation, Transporting the Unit" for proper tow vehicle to machine weight ratios.
- Watch for hidden hazards on the terrain.
- Always comply with all state and local lighting and marking requirements.
- Never allow riders on power unit or attachment.
- Do not operate PTO during transport.
- Look down and to the rear and make sure area is clear before operating in reverse.
- Do not operate or transport on steep slopes.

*(Safety Rules continued on next page)*



# SAFETY RULES

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



*(Safety Rules continued from previous page)*

- Use extreme care and reduce ground speed on slopes and rough terrain.
- Do not operate or transport equipment while under the influence of alcohol or drugs.

---

## OPERATION

- Equipment may be pictured with covers open for instructional purposes. Never operate equipment with covers open.
- Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.
- Do not allow anyone to stand between tractor and unit when backing up to unit.
- Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death. Follow Operator's Manual instructions for working underneath and blocking requirements or have work done by a qualified dealer.
- Keep bystanders away from equipment.
- Do not operate or transport equipment while under the influence of alcohol or drugs.
- Operate only in daylight or good artificial light.
- Avoid contact with electrical wires.
- Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.
- Always comply with all state and local lighting and marking requirements.

- Never allow riders on power unit or attachment.
- Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS systems in "locked up" position at all times.
- Always sit in power unit seat when operating controls or starting engine. Securely fasten seat belt, place transmission in neutral, engage brake, and ensure all other controls are disengaged before starting power unit engine.
- Operate tractor PTO at the RPM speed stated in "Specifications" section.
- Do not operate PTO during transport.
- Look down and to the rear and make sure area is clear before operating in reverse.
- Do not operate or transport on steep slopes.
- Do not stop, start, or change directions suddenly on slopes.
- Use extreme care and reduce ground speed on slopes and rough terrain.
- Watch for hidden hazards on the terrain during operation.
- Stop power unit and equipment immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.
- Never work on scalper attachment in the raised position. Lower scalpors to the ground and service each unit individually.
- Always raise scalper arms before going in reverse.
- Always connect safety chain from equipment to towing vehicle when transporting.

*(Safety Rules continued on next page)*



# SAFETY RULES

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



*(Safety Rules continued from previous page)*

### ■ AVOID INJURY OR DEATH FROM POWER LINES:

- Stay away from power lines.
- Electrocutation can occur without direct contact.
- Check clearances before raising implement.
- Do not leave the operator's seat if any part of the tractor or implement contacts electric lines.

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

■ Before working underneath a raised implement, read and follow all Operator's Manual instructions and safety rules. Implement must be attached to tractor. Lift cylinder locks must be installed and lift cylinders lowered against locks. Hydraulic system leak down, hydraulic system failures, or movement of control levers can cause equipment to drop unexpectedly and cause severe injury or death.

---

## MAINTENANCE

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

■ Before working underneath a raised implement, read and follow all Operator's Manual instructions and safety rules. Implement must be attached to tractor. Lift cylinder locks must be installed and lift cylinders lowered against locks. Hydraulic system leak down, hydraulic system failures, or movement of control levers can cause equipment to drop unexpectedly and cause severe injury or death.

■ Service and maintenance work not covered in OWNER SERVICE must be done by a qualified dealership. Special skills, tools, and safety procedures may be required. Failure to follow these instructions can result in serious injury or death.

■ Do not modify or alter or permit anyone else to modify or alter the equipment or any of its components in any way.

■ Your dealer can supply original equipment hydraulic accessories and repair parts. Substitute parts may not meet original equipment specifications and may be dangerous.

■ 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; and respirator or filter mask where appropriate.

■ Do not allow other people in the area when operating, attaching, removing, assembling or servicing equipment.

■ Never go underneath equipment lowered to the ground or raised, unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death. Follow Operator's Manual instructions for working underneath and blocking requirements, or have work done by a qualified dealer.

■ Ensure implement is properly attached, adjusted and in good operating condition.

■ Never perform service or maintenance with engine running.

■ Make sure hydraulic hoses and cylinders are fully purged of air before operating. Keep all persons away and fill the system by raising and lowering all functions several times. Air in the system can allow components to fall unexpectedly.

■ Keep all persons away from operator control area while performing adjustments, service or maintenance.

*(Safety Rules continued on next page)*



# **SAFETY RULES**

## **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



*(Safety Rules continued from previous page)*

- **Make certain all movement of implement components has stopped before approaching for service.**
- **Do not handle blades with bare hands. Careless or improper handling may result in serious injury.**
- **Tighten all bolts, nuts and screws to torque chart specifications. Check that all cotter pins are installed securely to ensure equipment is in a safe condition before operating.**
- **Ensure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)**

- **Ensure shields and guards are properly installed and in good condition. Replace if damaged.**

- **Do not disconnect hydraulic lines until machine is securely blocked or placed in lowest position and system pressure is released by operating all valve control levers.**

---

## **STORAGE**

- **Follow manual instructions for storage.**
- **Keep children and bystanders away from storage area.**

*(Safety Rules continued on next page)*

# CHECK LISTS

## PRE-DELIVERY CHECK LIST

(DEALER'S RESPONSIBILITY)

Inspect the equipment thoroughly after assembly to ensure it is set up properly before delivering it to the customer.

The following check lists are a reminder of points to inspect. Check off each item as it is found satisfactory or after proper adjustment is made.

- Check that all safety decals are installed and in good condition. Replace if damaged.
- Check that shields and guards are properly installed and in good condition. Replace if damaged.
- Check that PTO shaft is properly installed.
- Properly attach implement to tractor and make all necessary adjustments.
- Check all bolts to be sure they are tight.
- Check wheel bolts for proper torque.
- Check that all cotter pins and safety pins are properly installed. Replace if damaged.
- Check and grease all lubrication points as identified in "Service, lubrication information."
- Check the level of gearbox fluids before delivery. Service, if required, as specified in the "Service, lubrication information."
- Check that tractor hydraulic reservoir has been serviced and that hydraulic system and all functions have been operated through full cylinder stroke to purge air from system.
- After pressurizing and operating all Defoliator functions, stop tractor and make sure there are no leaks in the hydraulic system. Follow all safety rules when checking for leaks.

## DELIVERY CHECK LIST

(DEALER'S RESPONSIBILITY)

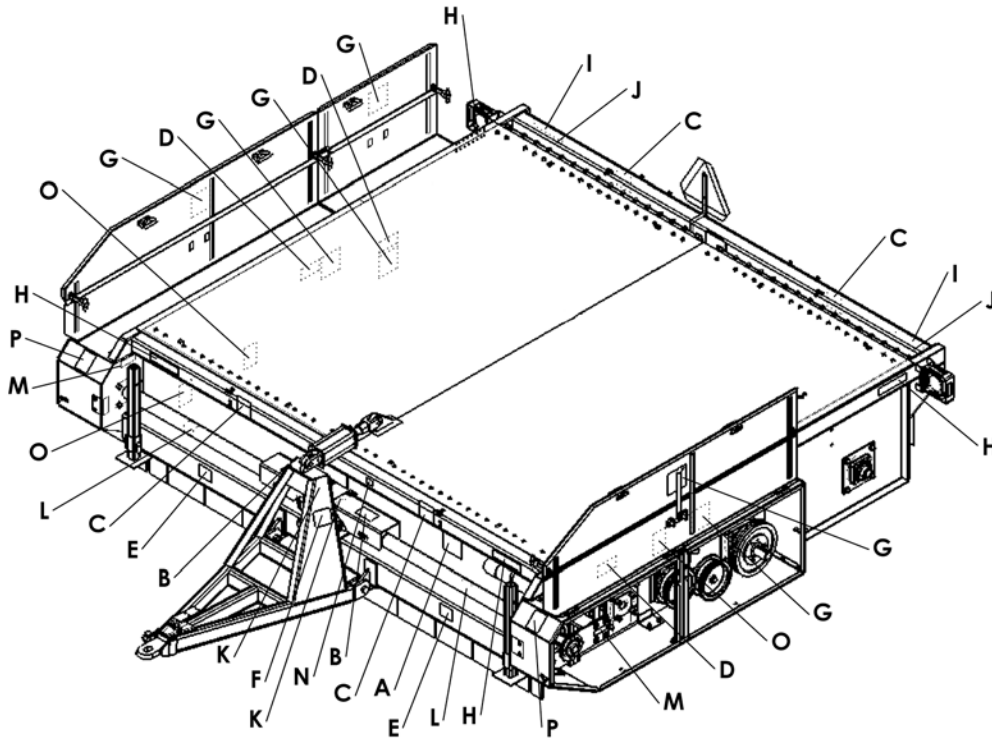
- Check that all safety decals are installed and in good condition. Replace if damaged.
- Show customer how to make adjustments and select proper PTO speed.
- Show customer how to make adjustments.
- Instruct customer how to lubricate and explain importance of lubrication.
- Point out the safety decals. Explain their meaning and the need to keep them in place and in good condition. Emphasize the increased safety hazards when instructions are not followed.
- Present Operator's Manual and request that customer and all operators read it before operating equipment. Point out the manual safety rules, explain their meanings and emphasize the increased safety hazards that exist when safety rules are not followed.
- Show customer how to make sure driveline is properly installed and that spring-activated locking pin or collar slides freely and is seated in groove on tractor PTO shaft.
- Show customer the safe, proper procedures to be used when mounting, dismounting, and storing equipment.
- Explain to customer that when equipment is transported on a road or highway, safety devices should be used to give adequate warning to operators of other vehicles.
- Explain to customer that when equipment is transported on a road or highway, a Slow Moving Vehicle (SMV) sign should be used to provide adequate warning to operators of other vehicles.
- Explain to customer that when towing on a public road to comply with all state and local lighting/ marking laws and to use a safety tow chain.
- Make customer aware of optional equipment available so that customer can make proper choices as required.
- Point out all guards and shields. Explain their importance and the safety hazards that exist when not kept in place and in good condition.



# SAFETY & INSTRUCTIONAL DECALS

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately If Damaged!



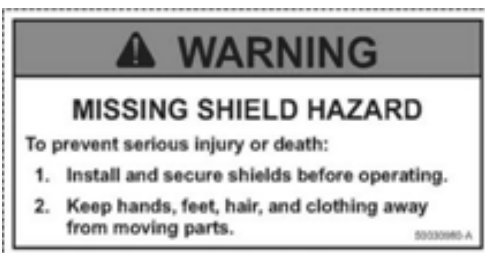
A. 500-3-0977 Caution (1-11)



B. 100-3-1367 Safety Guard



C. 500-3-0981 Rotating Flails



D. 500-3-0980 Missing Shields Warning



E. 500-3-0982 Rotating Flails



F. 500-3-0978 Rotating PTO



# SAFETY & INSTRUCTIONAL DECALS

**ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**  
**Replace Immediately If Damaged!**



G. 500-3-0979 Rotating Part



H. 200-3-4004 Amber Reflector 9 x 2



I. 200-3-4005 Red Reflector 9 x 2



J. 200-3-4034 Orange Fluorescent Reflector 9 x 2



K. 506-3-0194 Shield Missing Warning



M. 500-3-1149 Belt Tension



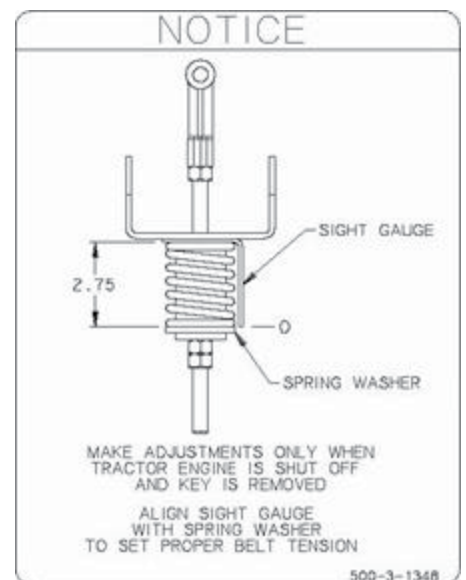
N. 200-3-1366 Serial Number Tag



P. 500-3-1690 Do Not Walk / Stand



L. 903-17456 Driveline Safety Sign



O. 500-3-1348 Belt Tension

## OPERATOR SIGN-OFF RECORD

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by an operator's single careless act.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, judgement, and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said “The best safety device is an informed, careful operator.” We ask you to be that kind of operator.

Alloway Equipment Company follows the general safety standards 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 Beet Defoliator must read and clearly understand all Safety, Operating, and Service & Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until this information has been reviewed. Review this information annually, before the season start-up. Make periodic reviews of the Safety and Operation sections a standard practice for those using any of your equipment.

Use the following Operator Sign-off Record to verify that each operator has read and understood the information in this manual and has been instructed in the safe operation of the defoliator.

[illegible]

# OPERATION

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by an operator's single careless act.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, judgment, and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said "The best safety device is an informed, careful operator." We ask you to be that kind of operator.

The Alloway Beet Defoliator is designed to efficiently remove the foliage from sugar beets. A series of rubber or steel flails on three drums cleans the top of the beet, leaving the exposed crown.

Be familiar with the defoliator before starting.

The owner is responsible for training operators in the safe operation of the defoliator.



## WARNING

- Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals are available from your dealer). Failure to follow instructions or safety rules can result in serious injury or death.
- Never allow children or untrained persons to operate equipment.
- Make sure shields and guards are properly installed and in good condition. Replace if damaged.
- Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.
- Keep bystanders away from equipment.
- Operate tractor PTO at the RPM speed stated in "Specifications" section.
- Before dismounting power unit or performing any service or maintenance, follow these steps: disengage power to implement, lower the hitch and all raised components to the ground, operate valve levers to release any hydraulic pressure, set parking brake, stop engine, remove key, and unfasten seat belt.



## WARNING

- Keep bystanders away from equipment.
- Never allow riders on power unit or attachment.
- Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.
- Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.



## CAUTION

- Always sit in tractor seat when operating controls or starting engine. Securely fasten seat belt, place transmission in neutral, engage brake, and ensure all other controls are disengaged before starting tractor engine.
- Always comply with all state and local lighting and marking requirements.
- 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.

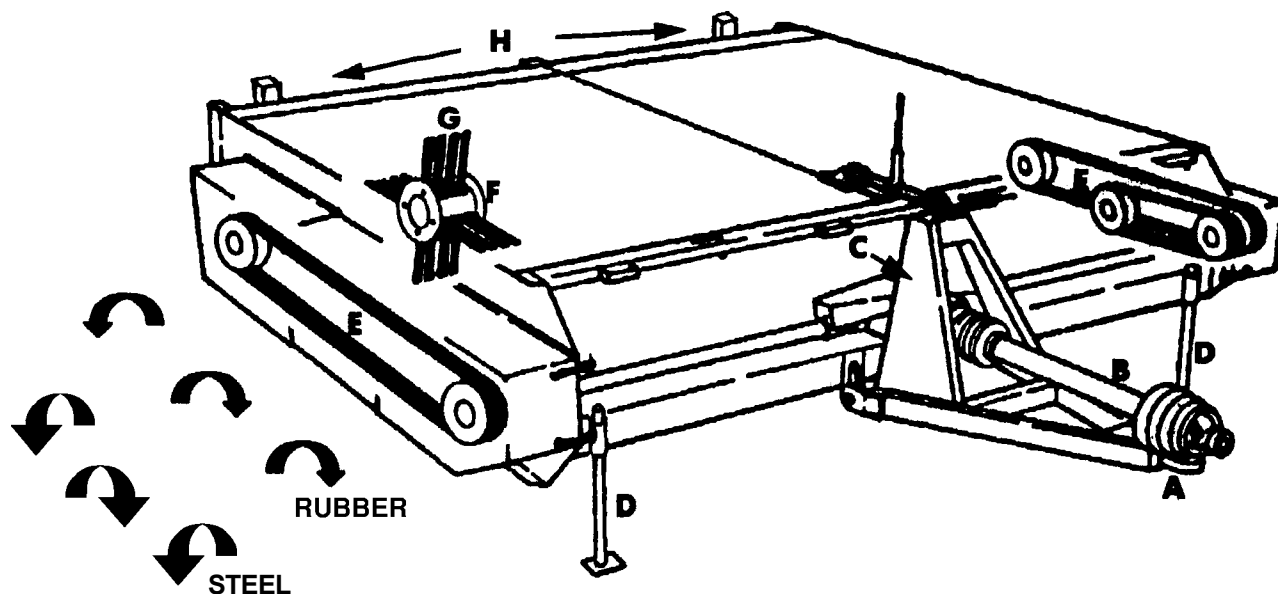
## Operation Continued

### PRINCIPAL COMPONENTS

The Alloway Beet Defoliator consists of three rotating drums that have steel or rubber flails. The flails remove the foliage from the plant. Rotational power to

the drums is provided from the tractor PTO through a series of belts on each side of the machine.

An optional scalper package is available on the back of the machine to cut off the top of the remaining beet.



A. Hitch  
E. Belt

B. Input Driveline  
F. Rotor

C. Gearbox  
G. Flails

D. Stands  
H. Wheels

**Figure 1.** Beet Defoliator Principal Components

## Operation Continued

### BEET DEFOLIATOR BREAK-IN

The following should be observed when operating the unit for the first time:

1. Attach PTO shaft. Remove grease zerks to gain access to the set screws for tightening on unit.

#### After operating for 1/2 hour or after completing five acres

2. Check all nuts, bolts, and other fasteners. Tighten to specifications given in the Bolt Torque Chart, page 66.
3. Check and re-torque on flail mounting bracket fasteners
4. Tighten wheel bolts to specifications given in the Bolt Torque Chart, page 66.
5. Check that the flails are in good condition and swing freely,
6. Check oil level in the gearbox. Add oil as required.
7. Check that the PTO driveline shield turns freely.
8. Lubricate all grease points.

#### After operating for 5 hours

9. Repeat Steps 1 through 6 above.
10. Check the tension of the drive belts. Refer to the Service and Maintenance section for the procedure. Adjust as required.

#### After operating for 10 hours

11. Repeat steps 1 through 6.
12. Check tension of drive belts. Adjust as required.

#### After operating for 15, and 20 hours

13. Check tension of drive belts. Adjust as required.

### PRE-OPERATION CHECK LIST

(OWNER'S RESPONSIBILITY)

#### IMPORTANT

- **This Pre-Operation Check List is provided for the operator. It is important to follow for both personal safety and maintenance of the beet defoliator.**

- Check that all safety decals are installed and in good condition. Replace if damaged.
- GENL-LUBE--Check all lubrication points and grease as instructed in Lubrication Schedule.
- Use only a tractor of adequate power and weight to pull the unit.
- Check that the unit is properly attached to the tractor. On pull-type unit, be sure there is a mechanical retainer through the drawbar pin and the safety chain is installed.
- Check oil level in gearbox. Add oil as required.
- Check that the PTO driveline turns freely and that the driveline can telescope easily.
- Check tire pressure. Bring to specified level.
- Check flails. Inspect for damage or breakage. Make sure they swing freely on their mount. Repair or replace as required.
- Check the condition of all drive belts. Align as required. Replace those that are frayed or broken. Refer to Belt Replacement.
- Check the condition of the scalpers. Adjust or repair as required. Refer to Scalpers.
- Inspect all hydraulic lines, hoses, couplers, and fittings. Tighten, repair, or replace any leaking or damaged components.
- Close and secure all guards, doors, and covers.

## Operation Continued

### CHOOSING THE CORRECT EQUIPMENT

To ensure safe and reliable operation of the beet defoliator, use a tractor with the correct specifications. Use the following guidelines to select the correct tractor.

#### PTO

The defoliator is equipped with a PTO driveline yoke to fit a 1-3/8" 21 spline shaft on the tractor. An optional 1-3/4" 20 spline yoke is available from the factory if required. Be sure to match the yoke to your tractor shaft.

#### IMPORTANT

- **Do not use an adapter on the tractor shaft. It will alter the drawbar dimension and can affect the strength of the shaft.**

#### DRAWBAR

The tractor drawbar must be set to provide 16" (406mm) between the end of the PTO shaft and the center of the drawbar pin.

#### IMPORTANT

- **Do not use PTO shaft adapters. They will change the drawbar dimension and can cause driveline failures.**

**NOTE:** Verify that no driveline interference occurs through all phases of operation (bottoming out).

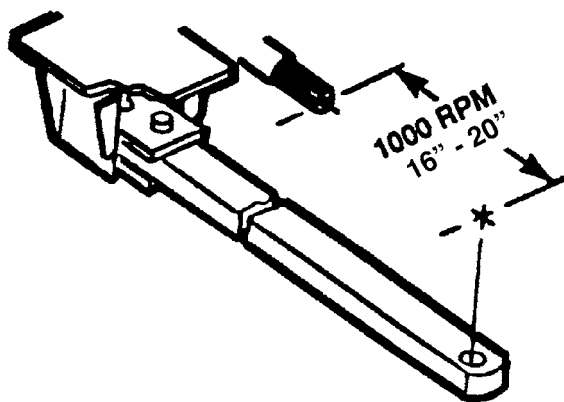


Figure 2a. Drawbar Dimension



Figure 2b. PTO Driveline

#### HYDRAULIC SYSTEM

The tractor hydraulic system must be capable of 8 gpm (22 lpm) at 2,500 psi (1700 kPa). Either closed-centered or open-centered system can be used. A remote outlet is required for each circuit.

## Operation Continued

### ATTACHING THE DEFOLIATOR TO THE TRACTOR

Place unit on a level, dry area free of debris and other foreign objects



#### WARNING

■ **Keep bystanders away from equipment.**

1. Clear the area of all bystanders.
2. Provide enough clearance to back the tractor safely into the unit.



#### CAUTION

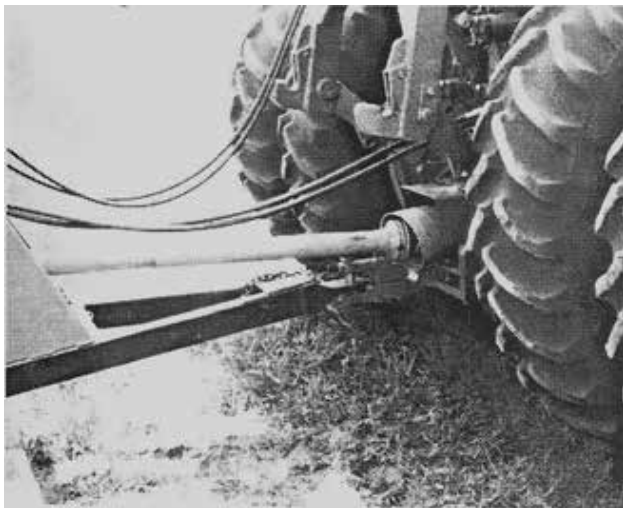
■ **Do not allow anyone to stand between tractor and unit when backing up to the unit.**

3. Back slowly and align the drawbar with the hitch.
4. Shut off the tractor, place all controls in neutral, set the parking brake, remove the key, and wait for all moving parts to stop.
5. Use the ratchet on top of the hitch A-frame to set the height (9 row model and smaller). The operator must supply his own hydraulic cylinder on the 12-row model.
6. On the 12-row defoliator, connect the hoses from the hitch cylinder to the tractor hydraulics to raise or lower the hitch.
7. Use the hardened drawbar pin with provisions for a mechanical retainer. Install a retainer, such as a Klik pin.
8. Be sure the drawbar is pinned in its center position.
9. Attach the safety chain around the drawbar or cage to prevent unexpected separation. Provide sufficient slack for turning.
10. Connect the PTO driveline.
11. Check that the driveline telescopes easily and that the shield rotates freely with no interference.
12. Attach the driveline to the tractor by retracting the locking collar; slide the yoke over the shaft and push on the yoke until the lock collar clicks into position. Be sure the yoke is locked in position.
13. Attach the anchor chain on the driveline shield to the frame.

## Operation Continued

### CONNECT THE HYDRAULICS

1. Use a clean cloth or paper towel to clean the couplers on the end of the hoses and the area around the couplers on the tractor.
2. Insert the male ends into the couplers on the tractor. Be sure they are locked in place.
3. Route the hoses along the hitch and secure in position with clips, tape, or plastic ties. Provide sufficient slack for turning.



**Figure 3.** Driveline and Hydraulics Attached



### WARNING

- Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.
- Make sure all hydraulic hoses, fittings, and valves are in good condition and not leaking before starting power unit or using equipment. Check and route hoses carefully to prevent damage. Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts. Operate moveable components through full operational range to check clearances. Replace any damaged hoses immediately.

### COMPLETE ATTACHMENT

1. Use ratchet or hydraulic cylinder on the hitch to lower the hitch and transfer the weight to the drawbar. See Figure 4.
2. Unpin the front frame stands. Raise the stands and pin them in their stowed positions. See Figure 5.

### REMOVING THE DEFOLIATOR FROM THE TRACTOR

Reverse the above procedure when unhooking from the tractor.



**Figure 4.** Hitch Cylinder



**Figure 5.** Parking Stand

## Operation *Continued*

### MACHINE SETTINGS

The machine can give its best performance only if it is properly set to work in the existing condition. It may be necessary to change the machine settings during the working day if the machine is moved to a new field, or the operating conditions change.

Review this section to be familiar with the adjustments available to match the machine to the working conditions.

### MACHINE LEVELING

The frame must be set level when working in the field to be sure that the flails contact the plants evenly at any place under the frame. Set when the machine is on firm, level ground. Use a tape to measure the distance between the frame and the ground, or place a level on top of the frame.

1. Use the ratchet or hydraulic cylinder on the hitch (Figure 4) to level the frame in the direction of travel.
2. Turn the adjustment crank on the rear wheels (Figure 7) to level the machine from side to side. Loosen the "U" bolt on the wheel strut, turn the crank and re-tighten the bolt.



**Figure 6.** Hitch Cylinder



**Figure 7.** Rear Wheels

*(Machine Settings continued on next page)*

# Operation Continued

(Machine Settings continued from previous page)

## FLAIL HEIGHT

Best results are obtained when the flails contact the sugar beets approximately 1/2 inch (12 mm) below the crown. This will allow the flails to remove the foliage from the beets during a pass.

Set the height of the flails by changing the height of the machine from the ground. Machine height is set with the ratchet or hydraulic cylinder on the hitch and the height of the rear wheels.

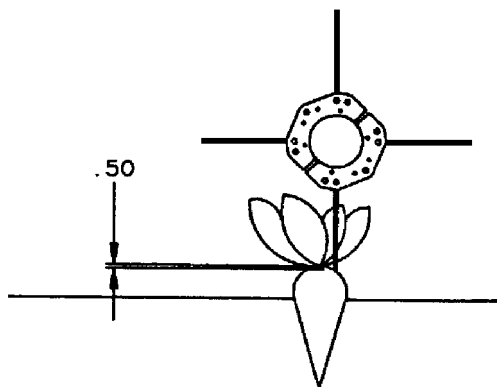
## IMPORTANT

- **Maintain a level machine at all times.**

In soft or wet conditions, the tires will sink into the soil and the machine should be raised to maintain the flail contact line of 1/2 inch (12 mm) below the crown.

In crop conditions where the beet crown extends above the ground and can be knocked over, the flails can be set so that they just contact the crown.

Do not allow the flails to contact the ground. They will pick up dirt, sticks, stones and other material that can be thrown out and cause injury. This will also cause rapid wear or breakage.



**Figure 8.** Flail Height



**Figure 9.** Machine Height

## FLAIL SPACING

Set flail position on the drum to follow beet rows exactly and to clean the low foliage from both sides of the crown. Change spacing of flail sets by loosening the clamping bolts on the head, and sliding the entire assembly to its new position on the rotor



**Figure 10.** Flail Assembly

(Machine Settings continued on next page)

# Operation Continued

(Machine Settings continued from previous page)

## WHEEL SPACING

The rear wheels must be set to track directly between the rows. Any other positions can lead to beet contact and damage or knocking the beet out of the ground.

Change the wheel assembly position by jacking up the machine, loosening the top mounting bolts (Figure 11), and sliding the assembly to its desired position. Re-tighten the bolts and remove jacks.



**Figure 11.** Wheel Mounting Bolts

## STABILIZER WHEEL POSITION

Stabilizer wheels located on the front corners of the 12 row machine (Figure 12). They must be set to the correct height to prevent dipping, thus preventing machine and plant damage.



**Figure 12a.** Stabilizer Wheel Mount Plate



**Figure 12b.** Stabilizer Wheel Mounting Position

## Operation *Continued*

### SCALPER SETTINGS (Optional)

Three types of scalpers are available:

- Knife (Figure 14)
- Circular (parallel arms) - (not shown; refer to Parallel Arm Rotary Scalper)
- Circular (arms) - (not shown, refer to Rotary Scalper Long Arm)

Scalpers cut the top of the crown and are positioned on the back of the machine.

The shoe, ahead of the cutting surface, must be set at the proper angle. This will allow sufficient space for the knives to cut the green portion of the beets without tipping them over.

#### **IMPORTANT**

- **Severe equipment damage may occur if attempting to go in reverse with the scalper arms down. Always raise scalper arms before going in reverse.**



**Figure 14.** Knife Scalpers

# FIELD OPERATION

The Alloway beet defoliator is designed with the flexibility to operate well in almost any kind of crop and terrain conditions. However, the operator is responsible for being familiar with all operating and safety procedures and following them.

Each operator should review this Field Operation section at the start of the season and as often as required to be familiar with the unit.

Operators should also review the Pre-Operation Check List, Attaching the Defoliator to the Tractor, and Transporting the Unit.



## WARNING

- Operators must be instructed in and be capable of the safe operation of the equipment, its attachments, and all controls. Do not allow anyone to operate this equipment without proper instructions.
- Always comply with all state and local lighting and marking requirements.
- 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 bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.
- Never allow riders on power unit or attachment.
- Before dismounting power unit or performing any service or maintenance, follow these steps: disengage power to implement, lower the 3-point hitch and all raised components to the ground, operate valve levers to release any hydraulic pressure, set parking brake, stop engine, remove key, and unfasten seat belt.
- Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.
- Make sure shields and guards are properly installed and in good condition. Replace if damaged.
- Never allow children or untrained persons to operate equipment.



## WARNING

- Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals are available from dealer. Failure to follow instructions or safety rules can result in serious injury or death.
- Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.
- Inspect and clear area of stones, branches, or other hard objects that might be thrown, causing injury or damage.
- Operate tractor PTO at the RPM speed stated in “Specifications” section.



## CAUTION

- Always sit in tractor seat when operating controls or starting engine. Securely fasten seat belt, place transmission in neutral, engage brake, and ensure all other controls are disengaged before starting tractor engine.

## Field Operation *Continued*

### TRANSPORTING THE UNIT



#### WARNING

■ **Never allow riders on power unit or attachment.**



#### CAUTION

■ **Always comply with all state and local lighting and marking requirements.**

1. Be sure all bystanders are clear of the unit.
2. Be sure center cutter is disengaged and has stopped turning (if so equipped).
3. Be sure the unit is securely attached to the tractor and all retainer pins are installed.
4. Be sure safety chain is installed on pull-type model.
5. Raise the machine.
6. Clean the SMV emblem, lights, and reflectors and be sure they are working.
7. Be sure you are in compliance with all applicable lighting and marking regulations when transporting. Check with your local authorities.
8. Never transport the unit faster than 20 mph (32 km/h). The ratio of the tractor weight to the defoliator weight plays an important role in defining acceptable travel speed. Table 1 summarizes the recommended travel speed-to-weight ratio.

**Table 1: Speed vs. Weight Ratio**

| Road Speed             | Fully equipped or loaded implement(s) weight relative to towing machine weight |
|------------------------|--------------------------------------------------------------------------------|
| Up to 32 km/h (20 mph) | 1 to 1 or less                                                                 |
| Up to 16 km/h (10 mph) | 2 to 1 or less                                                                 |
| Do not tow             | more than 2 to 1                                                               |

### PREPARING FOR OPERATION

1. Attach the machine to the tractor
2. Lubricate the machine.
3. Review and follow the pre-operation checklist. See Pre-Operation Check List.
4. Review Transporting the Unit, before transporting to the field.
5. Pull into the field and line up with the first set of rows.
6. Determine the machine parameters that require setting before starting use. See Machine Settings.
7. Close and secure all guards, covers and access doors.

### STARTING THE MACHINE

1. Start the tractor engine and run at low idle.
2. Slowly engage the tractor PTO.

#### IMPORTANT

■ **Engage and disengage the PTO at low idle engine RPM to minimize shock loads to the drive train.**

3. Slowly increase engine speed to the rated PTO speed of 1000 RPM.
4. Put the tractor in gear and proceed down the field.

### STOPPING THE MACHINE

1. Take the tractor out of gear.
2. Slowly decrease engine speed down to the idle RPM.
3. Slowly disengage PTO clutch.

#### IMPORTANT

■ **Disengage clutch slowly. On newer tractors the PTO brake will stop the shaft in less than one revolution and create shock loads in the drive train if the clutch is not disengaged slowly.**

## Field Operation *Continued*

4. Stop engine and set park brake before dismounting.

### GROUND SPEED

The defoliator works well at 3 to 6 mph (5 to 10 Km/h) depending on type of job. The operator is responsible for checking the condition of the beets and setting the speed required for the best defoliating. For best results:

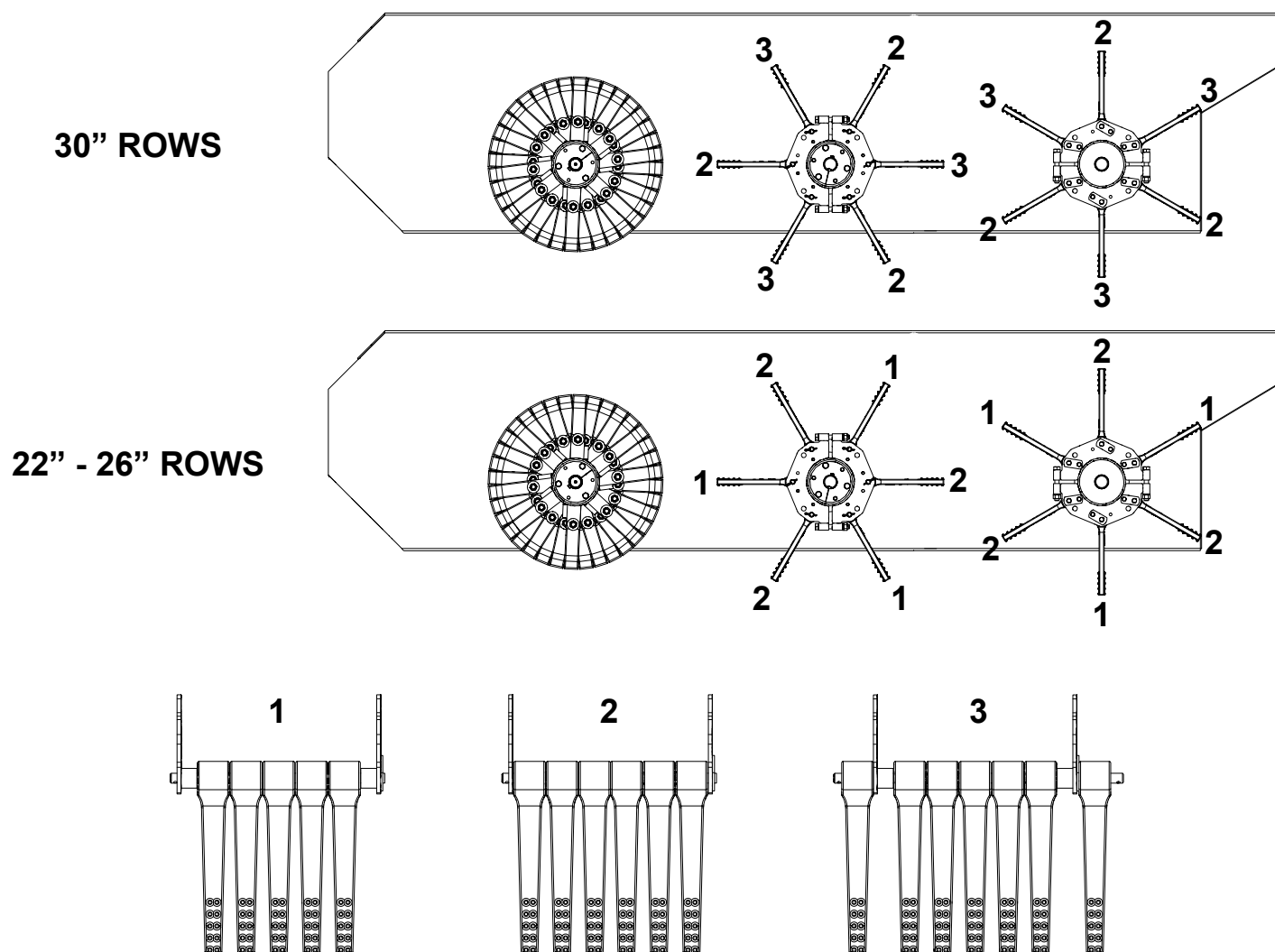
1. Increase speed if the beet tops are completely cleaned of foliage.
2. Increase speed if beets are being pulled out of the ground (or raise the flails).

3. Decrease speed if foliage is left on the crown or on the sides (or lower flails).

### FLAIL PATTERNS

When delivered from the factory, the flail patterns are set as shown in Figure 15. Maintain this pattern at all times.

Do not allow the flails to hit the ground where they might pick up dirt, sticks, stones and other debris that can be thrown out and cause injury. This will also cause rapid wear or breakage.



## Field Operation *Continued*

### OPERATING THE DEFOLIATOR

1. Operate the machine at its rated speed of 1000 rpm at all times. Effective removing of beet tops depends on the flail tip speed. A slower speed can result in foliage being left on the beets.
2. Operate the machine at rated speed at the end of the row until the last drum has passed over the beets.
3. When turning at the end of the field, it may be necessary to skip a machine width of rows before turning back into the field. This will depend on the width of the machine, the width of the headland, and the turning radius of the tractor.
4. Although the driveline may be equipped with an optional constant velocity (CV) joint, turning angles are limited. (See Figure 16.) Do not exceed the working angles. Turn off the machine when making sharp turns.
5. When starting a new field, or when operating conditions change:
  - a. Travel 50 feet into the field.
  - b. Shut off the tractor, place all controls in neutral, set the parking brake, remove the key, and wait for all moving parts to stop.
  - c. Go behind the machine and inspect the beets.
  - d. Check the flail spacing, wheel spacing, machine height, and scalper setting (if so equipped.)
  - e. Adjust as needed.

### TURNING

The front universal is equipped with a constant velocity (CV) joint to allow for turning. Although the CV joint allows for sharper turns than a regular driveline, it does have some limitations. Refer to Figure 16.

CV joint angle should not exceed 80 degrees in either operating or standstill condition of the driveline. Larger angles will damage the joint.

The angle should never exceed 35 degrees when the driveline is under full load.

### IMPORTANT

- Disengage PTO when making sharp turns.

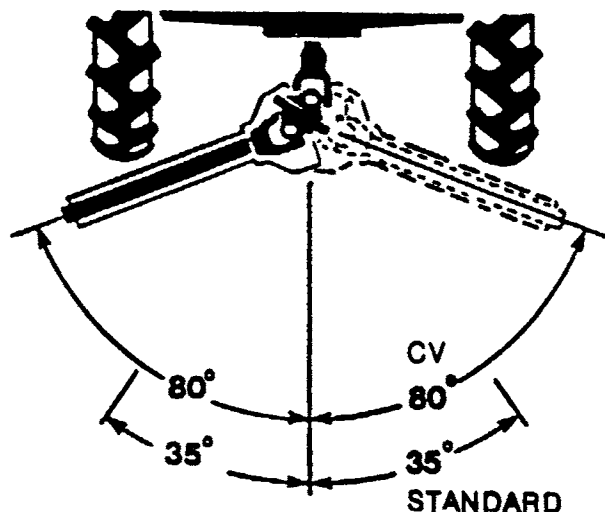


Figure 16. Driveline Angles

### HAZARD AREA



### WARNING

- Make certain all movement of implement components has stopped before approaching for service.

Stay away from front, side and rear of unit while it is running. Flails can pick up stones, sticks, wire, and other debris and throw it out with enough force to severely injure bystanders.

Keep out of shaded area shown in Figure 17.

Shut down unit and wait for moving parts to stop before approaching.

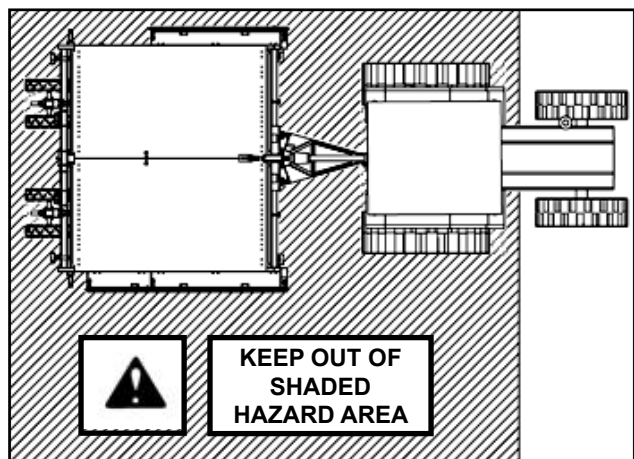


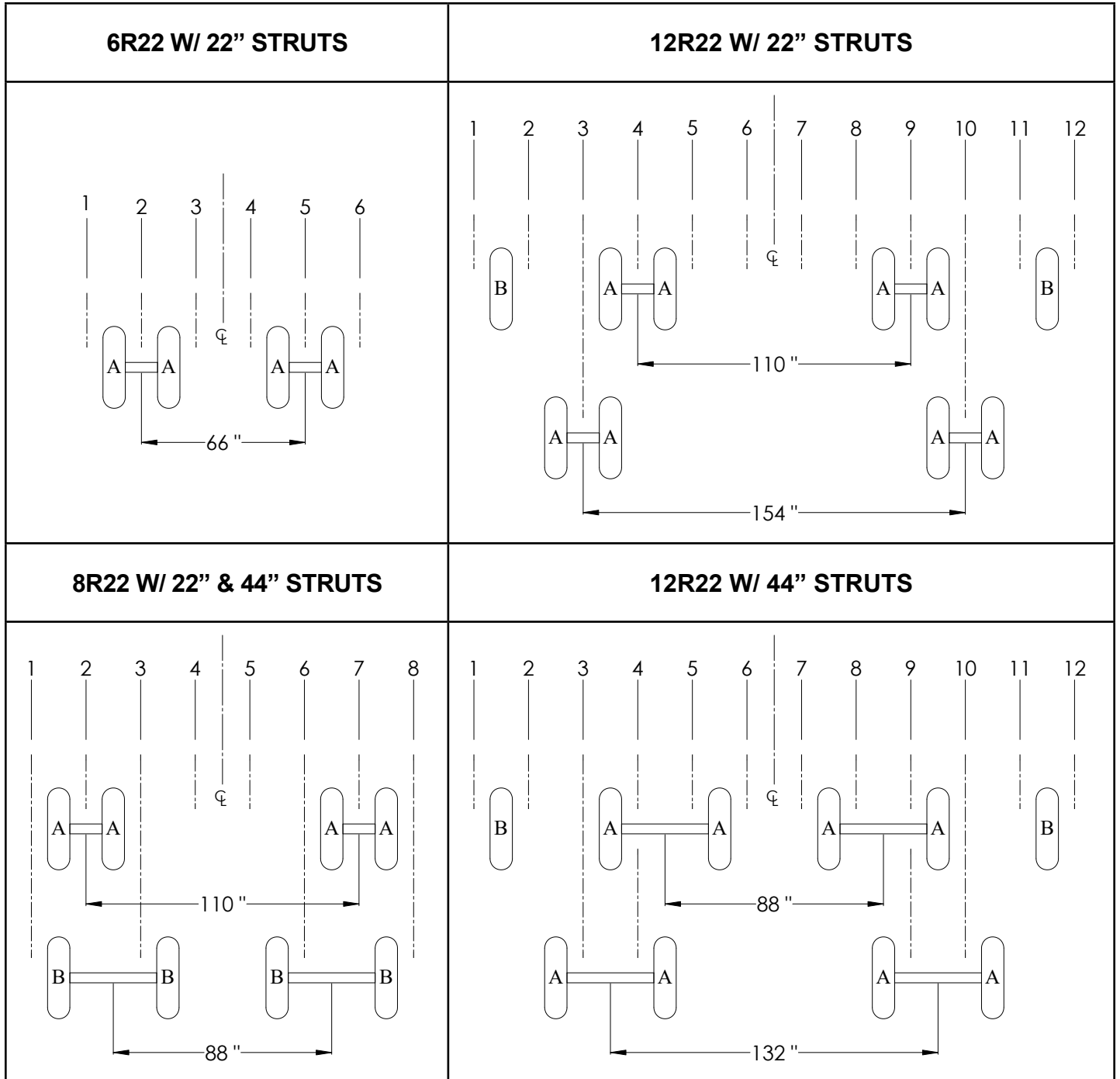
Figure 17. Hazard Area

# ADDITIONAL EQUIPMENT (Optional)

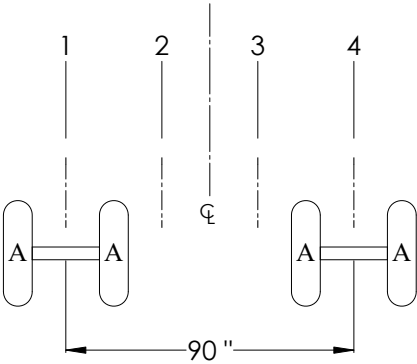
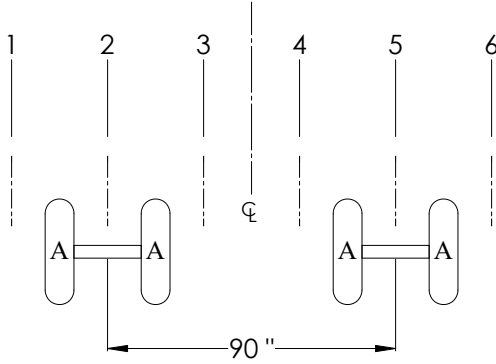
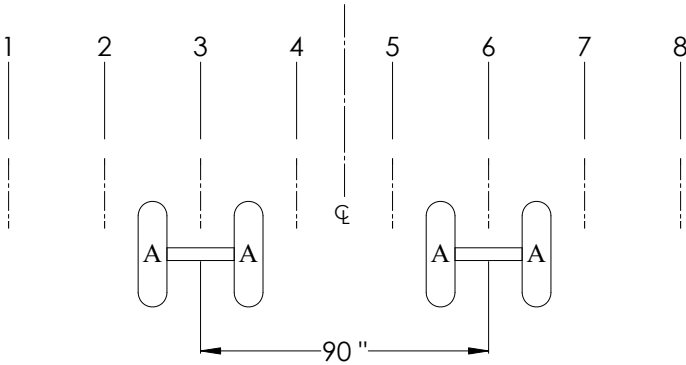
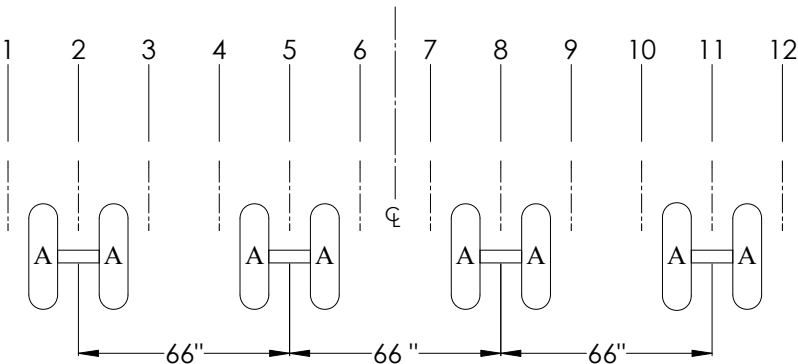
## REAR STEER

1. Mount rear steer components to back of defoliator body. Refer to Rear Steer Components, and Rear Steer Plumbing Components, in the parts section for hardware and assembly instructions.

2. Attach the sight gauge on defoliator and the hose clamp to adjustable bar. Be sure the sight gauge and hose clamp are aligned when wheels are straight.

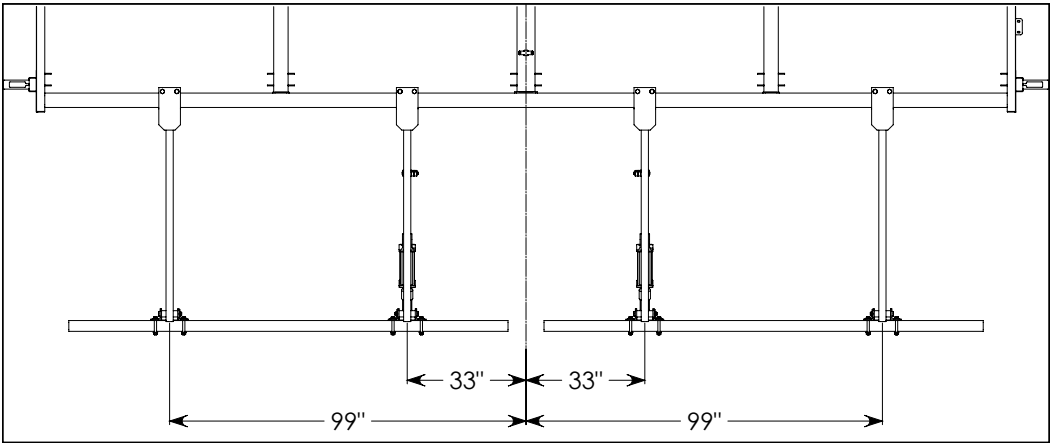


Additional Equipment *Continued*

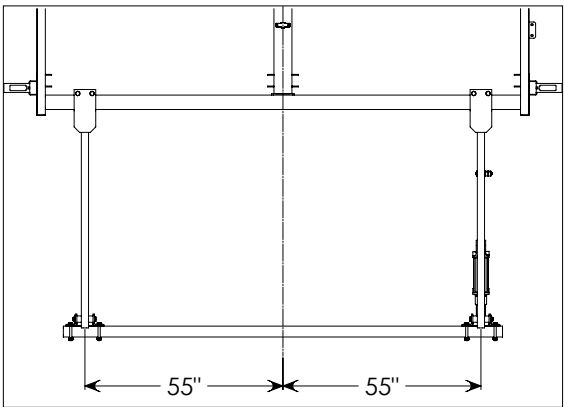
|                            |                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>4R30 W/ 30" STRUTS</b>  |  <p>Diagram showing the layout for 4R30 W/ 30" STRUTS. It features two pairs of struts, each labeled 'A'. The struts are positioned 90 inches apart. Vertical lines 1, 2, 3, and 4 are shown above the struts, with line 3 passing through the center of the struts.</p>                                |
| <b>6R30 W/ 30" STRUTS</b>  |  <p>Diagram showing the layout for 6R30 W/ 30" STRUTS. It features two pairs of struts, each labeled 'A'. The struts are positioned 90 inches apart. Vertical lines 1, 2, 3, 4, 5, and 6 are shown above the struts, with line 3 passing through the center of the struts.</p>                         |
| <b>8R30 W/ 30" STRUTS</b>  |  <p>Diagram showing the layout for 8R30 W/ 30" STRUTS. It features two pairs of struts, each labeled 'A'. The struts are positioned 90 inches apart. Vertical lines 1, 2, 3, 4, 5, 6, 7, and 8 are shown above the struts, with line 3 passing through the center of the struts.</p>                  |
| <b>12R22 W/ 22" STRUTS</b> |  <p>Diagram showing the layout for 12R22 W/ 22" STRUTS. It features four pairs of struts, each labeled 'A'. The struts are positioned 66 inches apart. Vertical lines 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12 are shown above the struts, with line 6 passing through the center of the struts.</p> |

Additional Equipment *Continued*

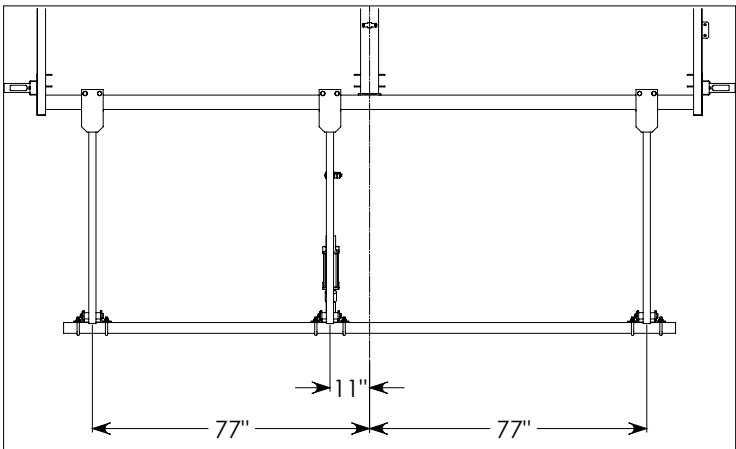
**RECOMMENDED SCALPER LOCATIONS**  
(Depending on Additional Equipment)



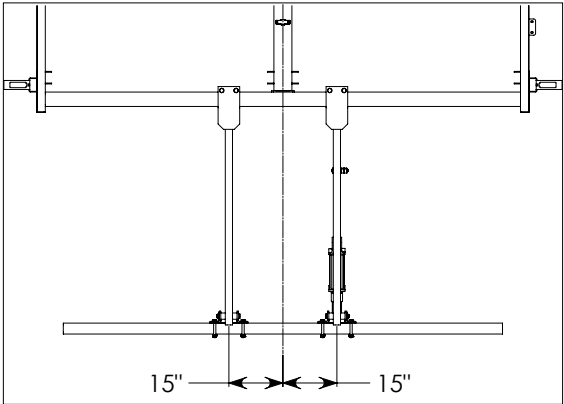
**12 ROW 22" SPACING**



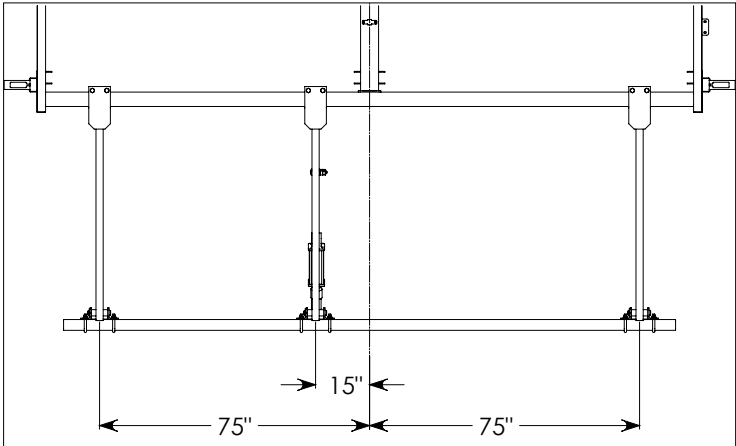
**6 ROW 22" SPACING**



**8 ROW 22" SPACING**



**4 ROW 30" SPACING**

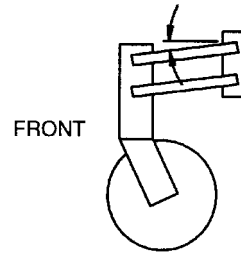


**6 ROW 30" SPACING**

## Additional Equipment *Continued*

### STABILIZER STRUTS

1. Mount stabilizer struts to the front of defoliator. Refer to Stabilizer Wheel Components, in the parts section, for assembly.
2. Adjust up and down so the parallel linkage is low in the front in operating position. See Figure 19. This allows maximum upward travel when operating. Pin #10 limits the downward travel of the wheel for road transport. This may be left installed when operating.



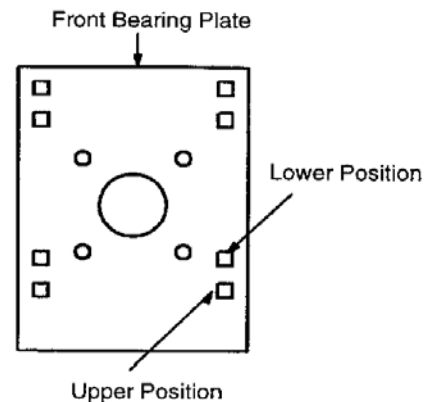
**Figure 19a.** Stabilizer Strut

### STEEL FLAIL UNITS

Adjust seasonally.

**NOTE:** This is not a field adjustment, but rather a seasonal adjustment.

Set the front drum in either the upper or lower position that best accommodates the variety of sugar beet you are defoliating. The machine is shipped from the factory with the drum in the upper (normal) position. This setting has the steel flail tips 4" higher than the rubber flail tips. The lower setting would put the steel flails only 2" higher than the rubber flails.



**Figure 19b.** Steel Flail Adjustment

## Additional Equipment *Continued*

### DOOR OPENER

The Door Opener is designed to make door opening quick and safe. The Door Opener share hydraulics with the hitch lift.

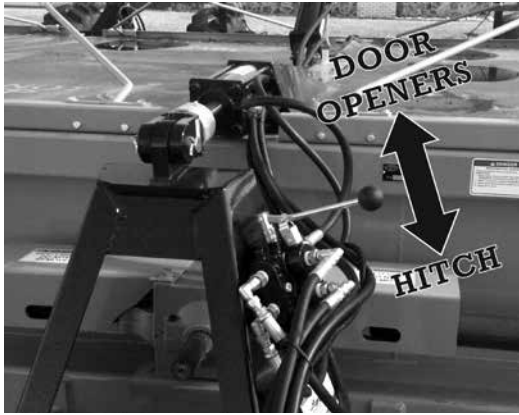


Figure 20a. Valve Control

To Open Doors :

1. On selector valve, located on hitch, move lever to the upper position. (Figure 20a)
2. Move lever on Tractor to raise doors.

To Close Doors :

1. Reverse steps stated above.

### IMPORTANT

- Always make sure valve is in hitch position when not controlling door opener, to prevent doors from lifting while defoliating.



Figure 20b. Doors Closed



Figure 20c. Doors Opened

# STORAGE



## WARNING

- **Keep children and bystanders away from storage area.**

## IMPORTANT

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

After the season's use, inspect all major components of the defoliator. Repair or replace any worn or damaged components to prevent unnecessary downtime at the start of next season.

To assure a long, trouble-free life, follow this procedure when preparing the unit for storage:

1. Open all access doors and canvas covers. Be sure the prop rods are in place and secured with pins



## WARNING

- **Equipment may be pictured with covers open for instructional purposes. Never operate equipment with covers open.**

2. Thoroughly wash the machine using a pressure washer to remove all dirt, mud, debris and residue.
3. Inspect the flails, flail assemblies, and drums for damage or entangled material. Repair or replace damaged parts. Remove all entangled material.
4. Inspect all hydraulic hoses, line, couplers and fittings. Tighten any loose fittings. Replace any hose that is badly cut, nicked, abraded, or is separating from the crimped end of a fitting.
5. Inspect drive belts. Replace any that are damaged. Adjust any not to the specified tension.
6. Lubricate all grease fittings. Make sure that all grease cavities have been filled with grease to remove any water residue from the washing.
7. Touch up paint nicks and scratches to prevent rusting.
8. Close and secure access doors and canvas covers.

9. Move to storage area.

10. Select an area that is dry, level and free of debris.

11. Unhook from tractor (see Removing the Defoliator from the Tractor, page 15).

12. Lower the scalpers to the ground for storage.

13. Store the machine in an area away from human activity.

14. Do not allow children to play on or around the stored machine.



**Figure 21. Open Covers**



**Figure 22. Scalper Storage**

# SERVICE & MAINTENANCE



## WARNING

- Keep children and bystanders away from storage area.
- Operators must be instructed in and be capable of the safe operation of the equipment, its attachments, and all controls. Do not allow anyone to operate this equipment without proper instructions.
- Equipment may be pictured with covers open for instructional purposes. Never operate equipment with covers open.
- Keep all persons away from operator control area while performing adjustments, service, or maintenance.
- Make sure shields and guards are properly installed and in good condition. Replace if damaged.
- Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off.

Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death. Follow Operator's Manual instructions for working underneath and blocking requirements or have work done by a qualified dealer.

■ Do not handle blades with bare hands. Careless or improper handling may result in serious injury.

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



## CAUTION

■ 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; and respirator or filter mask where appropriate.

■ Make certain all movement of equipment components has stopped before approaching for service.

### LUBRICANTS

Use the Lubrication Service Record (Page 36), to keep a record of all scheduled maintenance.

#### 1. Grease

Use and SAE multi-purpose high temperature grease with extreme pressure (EP) performance. A SAE multi-purpose lithium-based grease is also acceptable.

#### 2. Gearbox Oil

Use an SAE 85W90 gear oil for all operating conditions. Capacity: 2-1/2 U.S. quarts (2.13 liters).

#### 3. Storing Lubricants

Your unit can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contaminants.

### GREASING

Use the Lubrication Service Record (Page 31), to keep a record of all scheduled maintenance.

1. Use a hand-held grease gun for all greasing.

2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.

3. Replace and repair broken fittings immediately.

4. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

## Service & Maintenance *Continued*

### LUBRICATION SCHEDULE

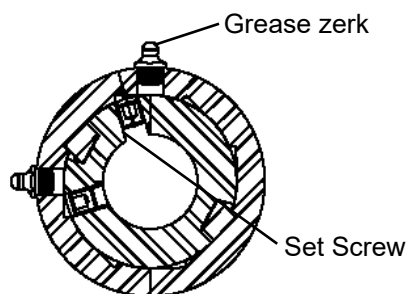
The period recommended is based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication or oil changes. Refer to Figure 24 for details.

#### DAILY OR 10 HOURS

1. Lubricate PTO driveline, position A, Figure 22 and Figure 24.
2. Use dipstick to check gearbox oil level.

#### 20 HOURS

1. Lubricate bearing zerk with one shot of grease at each B position (13 positions). See Figure 25.
2. Lubricate couplers with 10 shots of grease at each C position.



For PTO installation, remove grease zerks to gain access to the set screws for locking PTO onto gearbox.

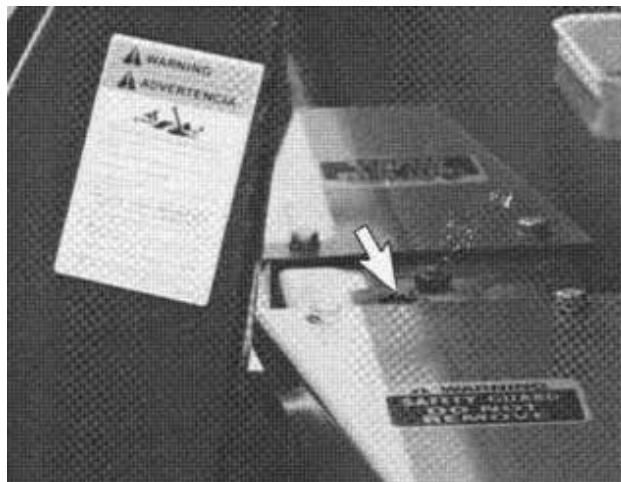


Figure 23. Dipstick

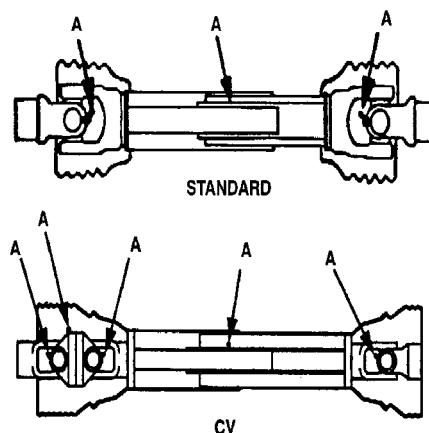


Figure 22. Driveline

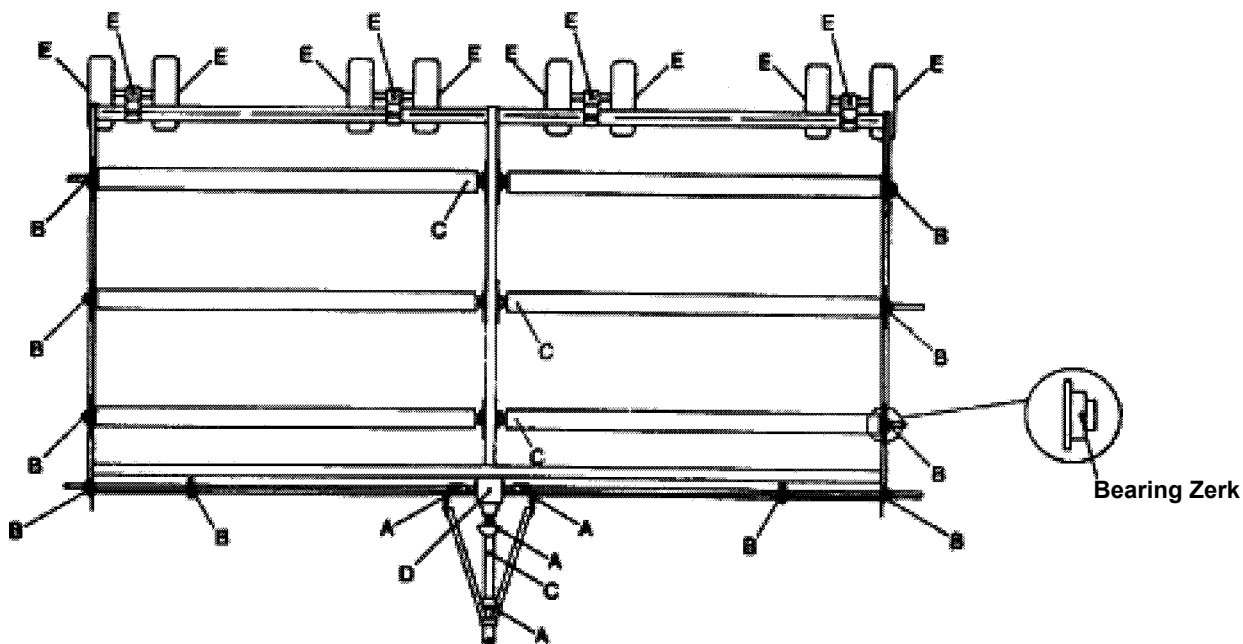


Figure 24. Lubrication Diagram

## Service & Maintenance *Continued*

If you remove the flail tube from 9 - 12 row defoliators, thoroughly clean both halves of the drive couplers and apply new grease to all gear teeth. You must remove grease zerk C when replacing the flail tube to allow air to purge from the coupler assembly. Then replace the grease zerk and follow lubrication schedule.

### 40 HOURS

1. Lubricate PTO driveline (1 location).
2. Lubricate scalper pivot bearings (4 locations each scalper).

### ANNUALLY

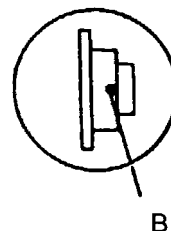
1. Change gearbox oil.
2. At the start and end of the season, lubricate the scalper and hitch screw jacks (1 location each screw jack).
3. At the start and end of the season, lubricate the trailing wheel pivots - position E (1 location each pivot).

### CHANGING GEARBOX OIL

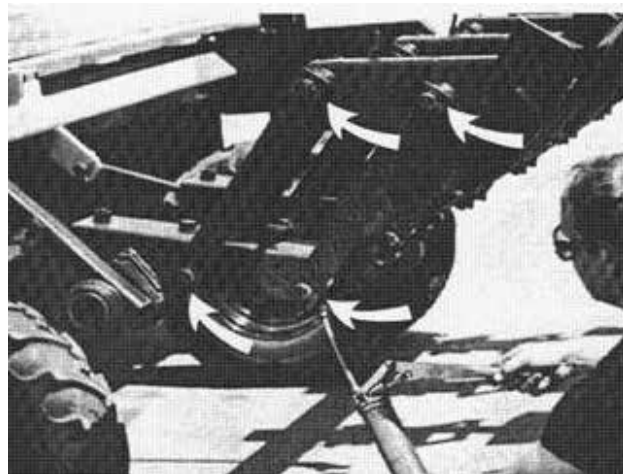
Although the oil in the gearbox never wears out, dust, dirt and moisture can enter through the breather when the oil heats up and cools down during operation. These contaminants must be removed on a regular basis to ensure a long life for the working components. In very dusty or dirty conditions, change the oil twice a year.

To change oil, follow this procedure:

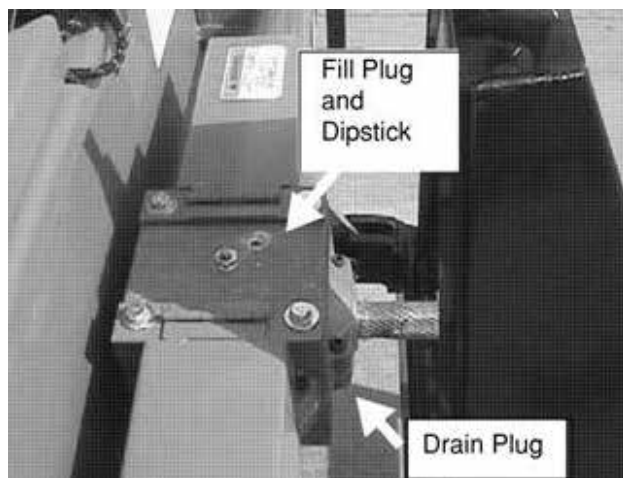
1. Shut off tractor, place all controls in neutral, set parking brake, remove key, and wait for all moving parts to stop.
2. Clear the area of all bystanders.
3. Place a pan under the drain plug. Remove the drain, fill, and level plugs.
4. Allow the gearbox to drain for 10 minutes.  
**NOTE:** It is best to drain the oil when the gearbox is hot to remove the most contaminants. Use a stiff probe to clean the breather hole in the fill plug.
5. Install and tighten the drain plug.



**Figure 25.** Position B



**Figure 26.** Scalper Pivot Bearings



**Figure 27.** Gearbox, Fill & Drain Plugs

6. Dispose of the used oil in an approved container.
7. Add 1 quart of SAE 85W90 gear oil through the fill plug. Check, using the dipstick.
8. Install and tighten the level and fill plugs

## Service & Maintenance *Continued*

## Lubrication Service Record

**NOTE:** See prior pages for details.  
Copy this page to continue service record.

✓ = CHECK  
L = LUBRICATE

**C** = CHANGE  
**R** = REPACK

[illegible]

## Service & Maintenance *Continued*

### WHEEL SPACING

The rear wheels are designed to move along the frame to align them with the rows. To adjust the spacing of the wheels, follow this procedure:

1. Shut off tractor, place all controls in neutral, set parking brake, remove key, and wait for all moving parts to stop.
2. Clear the area of all bystanders.
3. Use a jack with sufficient capacity to lift the frame. Place planks under the jack for extra support if required.
4. Measure from the centerline of the machine to determine the required spacing. Mark the position on the frame.
5. Lift the frame until the wheels have cleared the ground.
6. Loosen the wheel assembly mounting bolts.



**Figure 28.** Wheel Mounting Bolts (Small Tires)

7. Slide the assembly along the frame to the required position.
8. Tighten the mounting bolts to their specified torque levels.
9. Lower frame and remove jack.

### FLAIL SPACING

The flails are mounted to an assembly or head that clamps to the rotating drum. To adjust the head position, follow this procedure:

1. Shut off tractor, place all controls in neutral, set parking brake, remove key, and wait for all moving parts to stop.
2. Clear the area of all bystanders.
3. 3. Disconnect driveline from the tractor.
4. 4. Open the canvas covers.
5. 5. Measure from the center line of the machine to determine the required spacing.
6. 6. Loosen the assembly clamping nuts.



**Figure 29.** Rubber Flails

7. Slide or tap assembly to the desired position
8. Tighten clamping bolts to their specified torque level.
9. Repeat with other head assemblies as required.
10. Close and secure canvas covers.
11. Attach driveline to the tractor.



### CAUTION

■ Equipment may be pictured with covers open for instructional purposes. Never operate equipment with covers open.

## Service & Maintenance *Continued*

### FLAIL REPLACEMENT

The flails swing on pins through the head. When replacing damaged or broken flails, follow this procedure:

1. Shut off tractor, place all controls in neutral, set parking brake, remove key, and wait for all moving parts to stop.
2. Clear the area of all bystanders.
3. Disconnect driveline from tractor.
4. Open canvas covers.
5. Remove the mounting bolt and cotter pin.
6. Slide pin out to release flails.
7. Replace with new flail. Be sure to assemble the spacers and bushings in their appropriate positions. See Parts Section and Flail Patterns.
8. Re-install bolt and cotter pin. Tighten bolt to specified torque.
9. Repeat with other flails as required.



### CAUTION

■ Equipment may be pictured with covers open for instructional purposes. Never operate equipment with covers open.

10. Remove 5/8 locknut.
11. Tap out 5/8 x 3 1/2 carriage bolt.
12. Remove flails and bushing.
13. Install new bushing and flail.
14. Install bolt and nut.
15. Tighten bolt and nut.
16. Close and secure access doors and covers and install secure guards before resuming work.
17. Attach driveline to tractor.



Figure 30. Steel Flails

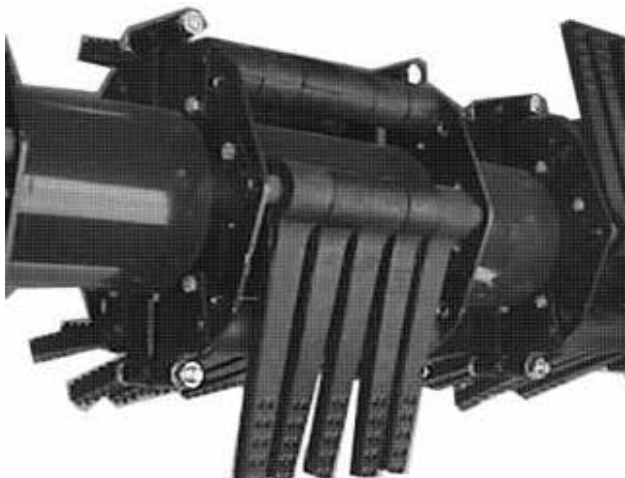


Figure 31. Flail Assembly

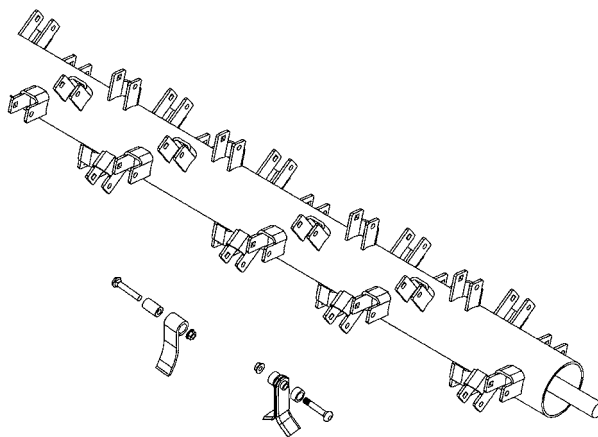


Figure 32. Steel Flails

## Service & Maintenance *Continued*

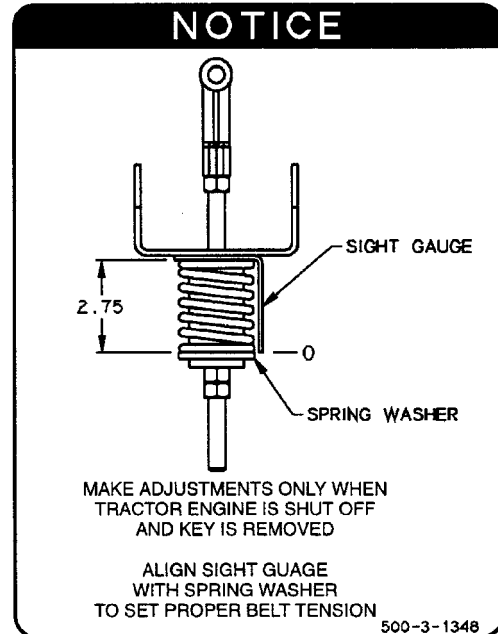
### BELT TENSION

The drive belts transmit power to turn the drums and flails. Belt tension must be maintained to insure proper machine performance. Overtightening will cause belts and pulleys to run hot; loose belts will allow slipping. Either condition will cause rapid wear and failure.

When the machine is new, or after installing new belts, tension should be checked and adjusted as required every 4 to 5 hours for 2 to 3 days - until belts have "run in."

To check belt tension, follow this procedure:

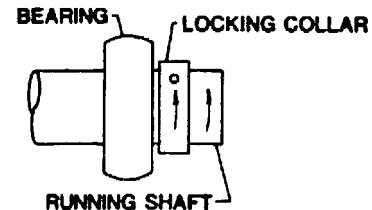
1. Shut off tractor, place all controls in neutral, set parking brake, remove key, and wait for all moving parts to stop.
2. Clear the area of all bystanders.
3. Disconnect driveline from tractor.
4. Open belt access doors and fasten prop rods.
5. Align sight gauge with spring washer to set proper belt tension. Do not over-tighten.
6. Close and secure access doors and covers and install secure guards before resuming work.
7. Attach driveline to tractor.



**Figure 33.** Belt Tension Gauge

### BEARING LOCK COLLARS

Bearings are held on the shaft by locking collars. Always install locking collars in the direction of shaft rotation.



**Figure 34.** Locking Collar

## Service & Maintenance *Continued*

### BELT REPLACEMENT

Belts must be maintained in good condition at the proper tension to obtain expected performance. When they fray or separate, they must be replaced. Do not use belt dressings at any time. Keeping the belts at the required tension will prevent slippage.

To replace belts, follow this procedure:

1. Shut off tractor, place all controls in neutral, set parking brake, remove key, and wait for all moving parts to stop.
2. Clear the area of all bystanders.
3. Disconnect driveline from tractor.
4. Open the belt access doors.
5. Loosen the bolts on the belt tensioner arm.

6. Remove belt.

7. Install new belt. Do not force belt over pulley and damage the cords.

### IMPORTANT

**Use only genuine Alloway replacement parts**

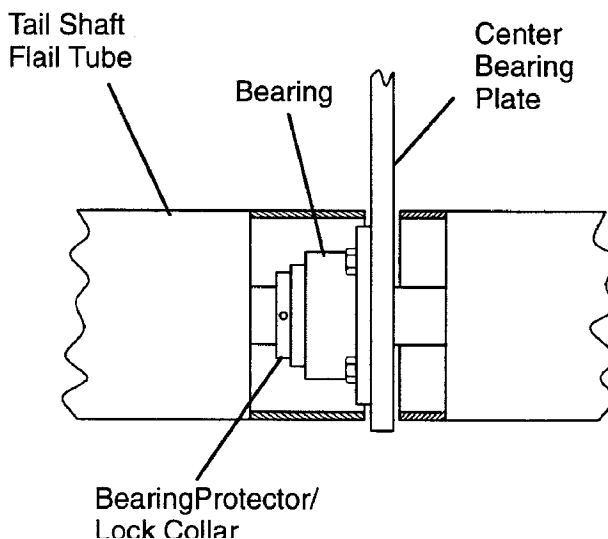
8. Tension the belt. See Belt Tension, page 34.
9. Check that all pulleys are aligned.
10. Check the tension of the new belt every 4 to 5 hours the first 2 or 3 days of operation. Adjust as required.
11. Close and secure access doors and covers and install secure guards before resuming work.
12. Attach driveline to the tractor.

### FLAIL TUBE HANGER BEARING

**Flail tube hanger bearings on 6 row, 9 row, and 12 row:** 30" steel machines require annual maintenance (lubrication) and inspection.

Follow this procedure:

1. Shut off tractor, place all controls in neutral set parking brake, remove key, and wait for all moving parts to stop.
2. Clear the area of all bystanders.
3. A rolling floor jack is required to slide the flail tube away from the bearing hanger plate for annual greasing and inspection.
4. Locate the bearing. The hanger bearing is located on the tail shaft flail tube (tube without a drive sheath attached).
5. Support center hanger plate with floor jack.
6. Remove the four 5/8 x 1 -1/2 carriage bolts from the tail shaft bearing plate and 3/4 hanger plate bolt.
7. Lower and move back until tubes can be separated.
8. Remove the bearing protector lock/collar.



**Figure 35.** Hanger Bearings

9. Wipe the bearing clean and inspect the grease seal.
10. Lubricate bearing zerk with 3 to 4 shots of grease.
11. Slide tube back onto coupler and re-attach tail shaft bearing.
12. Repeat for all three hanger bearings.

**NOTE: Do not lube new bearings.**

## Service & Maintenance *Continued*

### SCALPERS

Scalpers must be set for each crop and operating condition. The scalper should be set to cut off only the green portion of the beet.

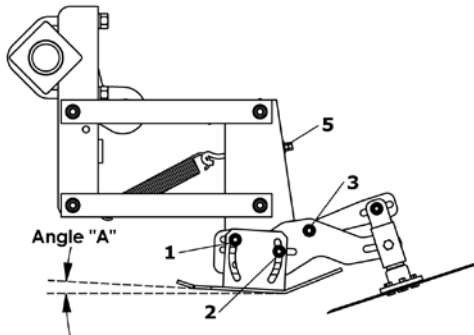
Set the shoe angle:

- a. Loosen bolts (1) and (2), Figures 36a, 36b & 36c.
- b. Move shoe to desired angle.
- c. Tighten bolts to specified torque level.

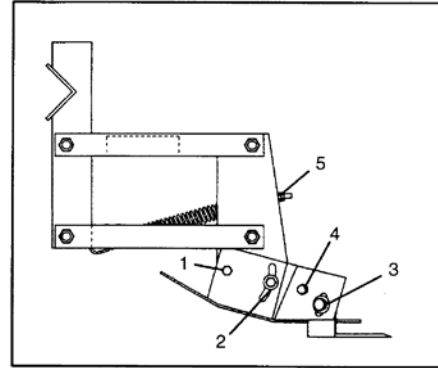
### KNIFE SCALPER

To adjust the knife scalper, follow this procedure:

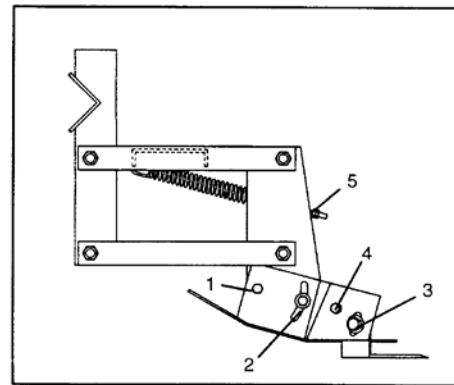
1. Set the cutting edge of the knife at the lowest portion of the assembly to prevent skipping over the beets.
2. Set knife height and angle:
  - a. Loosen bolts (3) and (4), Figures 36a & 36b.
  - b. Move knife to desired height and angle.
  - c. Tighten bolts to specified torque level.
3. Down pressure position:
  - a. Increase spring tension to decrease skipping (5).
  - b. Decrease spring tension if scalper pulls beets out of ground.
4. Float position:
  - a. Increase spring tension for less pressure on shoe (5).
  - b. Decrease spring tension for more pressure on shoe.



**Figure 36c.** Circular Scalper



**Figure 36a.** Knife Scalper (Down Pressure)



**Figure 36b.** Knife Scalper (Float)

### CIRCULAR SCALPER

To adjust the circular scalper, follow this procedure:

1. Set the angle of the assembly so the cutting edge of the disc is the lowest portion of the scalper. This will prevent skipping the beets.

### IMPORTANT

**The shoe angle "A" should be set as small as possible without pushing beets over.**

2. Set disc height:
  - a. Move disc assembly to desired height.
  - b. Tighten bolts (1), (2) and (3) to specified torque level.

### IMPORTANT

**Do not set disc to run on or below ground level.**

3. Use the spring bolt to set spring tension (5).
  - a. Increase tension to minimize skipping.
  - b. Decrease tension if disc pulls beet over.

# TROUBLE SHOOTING

The Alloway Beet Defoliator uses rubber or steel flails on drums to remove foliage from the tops of sugar beets. It is a simple and reliable system that requires minimal maintenance. The following table lists problems, causes, and solutions that you may

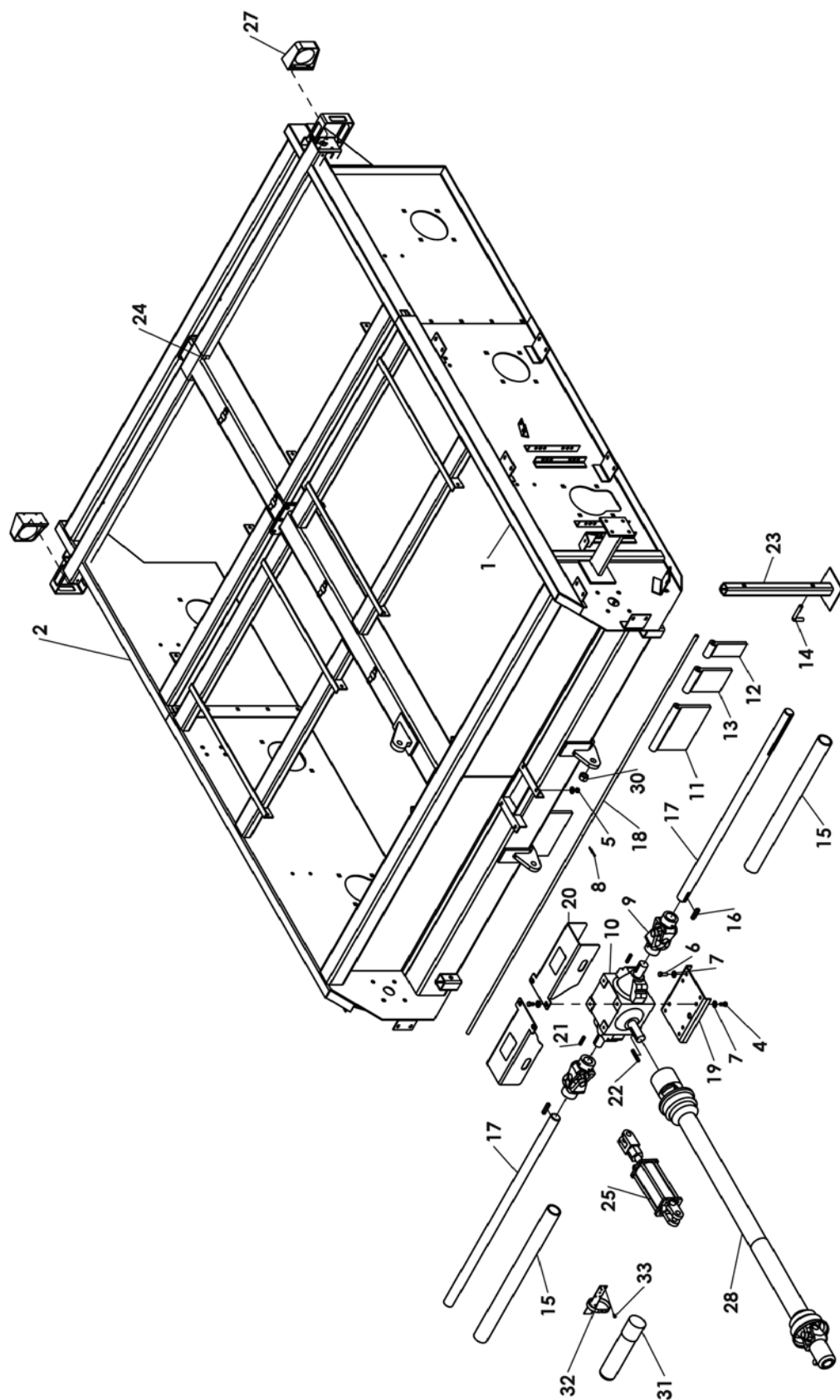
encounter. If you encounter a problem that is difficult to solve even after reading through this table, please call your local Alloway dealer. When calling, please have this manual and your unit's serial number ready.

| PROBLEM                            | CAUSE                                                                                                                  | SOLUTION                                                                                                                                                 |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drums won't turn                   | Tractor PTO defective<br>Broken cross shaft or drive coupler on central hanger bearing                                 | Repair tractor PTO<br>Replace (9 or 12 row units only)                                                                                                   |
| Rapid belt wear                    | Machine plugged<br>Pulleys out of alignment<br>Loose or overtightened belts<br>Overloaded/Running too low              | Unplug machine<br>Align pulleys<br>Adjust belt tension<br>Raise unit or slow down                                                                        |
| Flails breaking                    | Machine too low<br>Hitting rocks or other debris                                                                       | Raise machine<br>Clean field better before planting                                                                                                      |
| Tires don't turn                   | Mud buildup                                                                                                            | Adjust tire pressure to 15-20 psi                                                                                                                        |
| Beet crown not clean               | Machine too high<br>Flails broken<br>Traveling too fast<br>Running slow (tractor)<br>Need a scalper<br>Scalper bounces | Lower the machine<br>Replace broken flails<br>Slow down<br>Increase speed to rated PTO RPM<br>Install and set scalper<br>Increase scalper spring tension |
| Beets are pulled out of the ground | Machine too low<br>Machine too slow<br>Scalper pulling beets out of ground                                             | Raise machine<br>Increase ground speed<br>Adjust scalper                                                                                                 |
| Defoliator vibrates                | Driveline doesn't telescope<br>Flail tube out of balance                                                               | Remove, disassemble, and clean telescoping joint<br>Balance tube                                                                                         |

**BEET DEFOLIATOR**

|                                                       |         |
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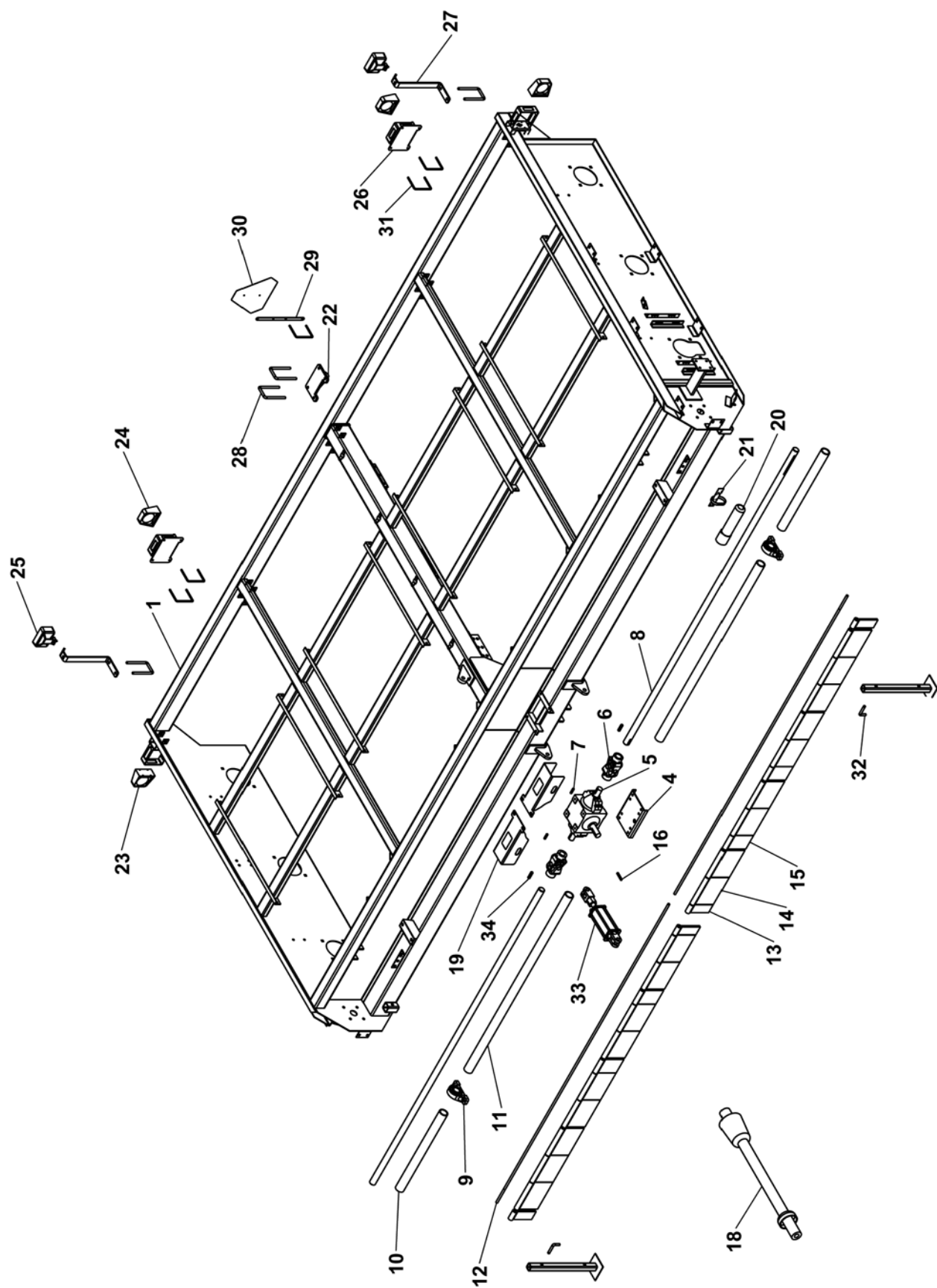
# FRAME COMPONENTS (430, 6R45cm, 622, 624)



## FRAME COMPONENTS (430, 6R45cm, 622, 624)

| ITEM NO. | PART NUMBER | DESCRIPTION                                  | QTY. |
|----------|-------------|----------------------------------------------|------|
| 1        | 500-2-1031  | FRONT BODY WELD, 120" WIDE, (430 NARROW)     | 1    |
|          | 500-2-0964  | FRONT BODY WELD, 132" WIDE, (430 WIDE, 622)  |      |
|          | 500-2-1033  | FRONT BODY WELD, 144" WIDE, (624)            |      |
|          | 500-2-1059  | FRONT BODY WELD, (6R45cm)                    |      |
| 2        | 500-2-1032  | REAR BODY WELD, 120" WIDE, (430 NARROW)      | 1    |
|          | 500-2-0967  | REAR BODY WELD, 132" WIDE, (430 WIDE, 622)   |      |
|          | 500-2-1034  | REAR BODY WELD, 144" WIDE, (624)             |      |
|          | 500-2-1051  | REAR BODY WELD, (6R45cm)                     |      |
| 3        | 900-01527   | 1 NC X 4 HEX BOLT GR5 ZP                     | 2    |
| 4        | 900-01221   | 1/2 NC X 1 HEX BOLT                          | 2    |
| 5        | 900-06009   | 1/2 NC HEX NUT                               | 1    |
| 6        | 900-01225   | 1/2 NC X 1-1/2 HEX BOLT GR5                  | 1    |
| 7        | 900-11035   | 1/2 FLAT WASHER                              | 4    |
| 8        | 900-23043   | 3/16 X 1-1/2 COTTER PIN                      | 1    |
| 9        | 903-05038   | U-JOINT - 1.75 X 2 KEYED 44R                 | 2    |
| 10       | 903-15399   | GEAR BOX - SUPERIOR 615AKF                   | 1    |
| 11       | 505-3-1089  | FLAP SHIELD 12"                              | 6    |
| 12       | 505-3-0868  | FLAP SHIELD 3-1/2"                           | 2    |
| 13       | 505-3-1097  | FLAP SHIELD 6"                               | 4    |
| 14       | 505-3-0279  | PIN, PARK STAND                              | 2    |
| 15       | 500-3-1668  | SHIELD TUBE, (430 NARROW) 41.50" LONG        | 2    |
|          | 500-3-1656  | SHIELD TUBE, (622), (430 WIDE) 47.50" LONG   | 2    |
|          | 500-3-1664  | SHIELD TUBE, (624) 53.50" LONG               | 2    |
|          | 500-3-2252  | SHIELD TUBE, (6R45cm) 53.50" LONG            | 2    |
| 16       | 500-3-1662  | KEY - 1/2 X 2-1/2 SQUARE                     | 2    |
| 17       | 500-3-1667  | CROSS SHAFT, (430 NARROW) 58" LONG           | 2    |
|          | 500-3-1666  | CROSS SHAFT, (622), (430 WIDE) 64" LONG      | 2    |
|          | 500-3-1665  | CROSS SHAFT, (624) 70" LONG                  | 2    |
|          | 500-3-2253  | CROSS SHAFT, (6R45cm) 70" LONG               | 2    |
| 18       | 500-3-1138  | ROD, FLAP (430 NARROW) 122-1/2" OAL          | 1    |
|          | 500-3-1136  | ROD, FLAP (622) 134-1/2" OAL                 | 1    |
|          | 500-3-1139  | ROD, FLAP (624) 146-1/2" OAL                 | 1    |
|          | 500-3-2254  | ROD, FLAP (6R45cm) 146-1/2" OAL              | 1    |
| 19       | 500-3-1178  | GEARBOX PLATE                                | 1    |
| 20       | 500-2-0537  | SHIELD WITH DECAL                            | 2    |
| 21       | 100-3-3333  | KEY, 3/8 X 3/8 X 2                           | 2    |
| 22       | 120-3-0192  | KEY, 3/8 X 3/8 X 3                           | 1    |
| 23       | 500-2-0531  | PARK STAND                                   | 2    |
| 24       | 500-3-1207  | REAR CROSS CHANNEL                           | 2    |
| 25       | 905-21400   | HYDRAULIC CYLINDER - 3.5 X 8                 | 1    |
|          | 905-21380   | - SEAL KIT ( <b>PRINCE CYLINDERS ONLY</b> )  |      |
|          | 905-21401   | - SEAL KIT ( <b>MONARCK CYLINDERS ONLY</b> ) |      |
| 27       | 904-01154   | AMBER LAMP                                   | 2    |
| 28       | 903-18088   | PTO SHAFT (STD) 1-3/8" (SEE PAGE 82)         | 1    |
|          | 903-18089   | PTO SHAFT (STD) 1-3/4" (SEE PAGE 82)         | 1    |
|          | 903-17621   | PTO SHAFT, C.V. 1-3/8" (SEE PAGE 83)         | 1    |
|          | 903-17754   | PTO SHAFT, C.V. 1-3/4" (SEE PAGE 83)         | 1    |
| 30       | 900-06019   | 1 NC HEX NUT ZP                              | 2    |
| 31       | 100-3-3957  | TUBE MANUAL STORAGE                          | 1    |
| 32       | 100-3-3958  | CLAMP MANUAL STORAGE                         | 1    |
| 33       | 900-17110   | 1/4 NF X 5/8 HEX WASHER HEAD SET SCREW       | 2    |

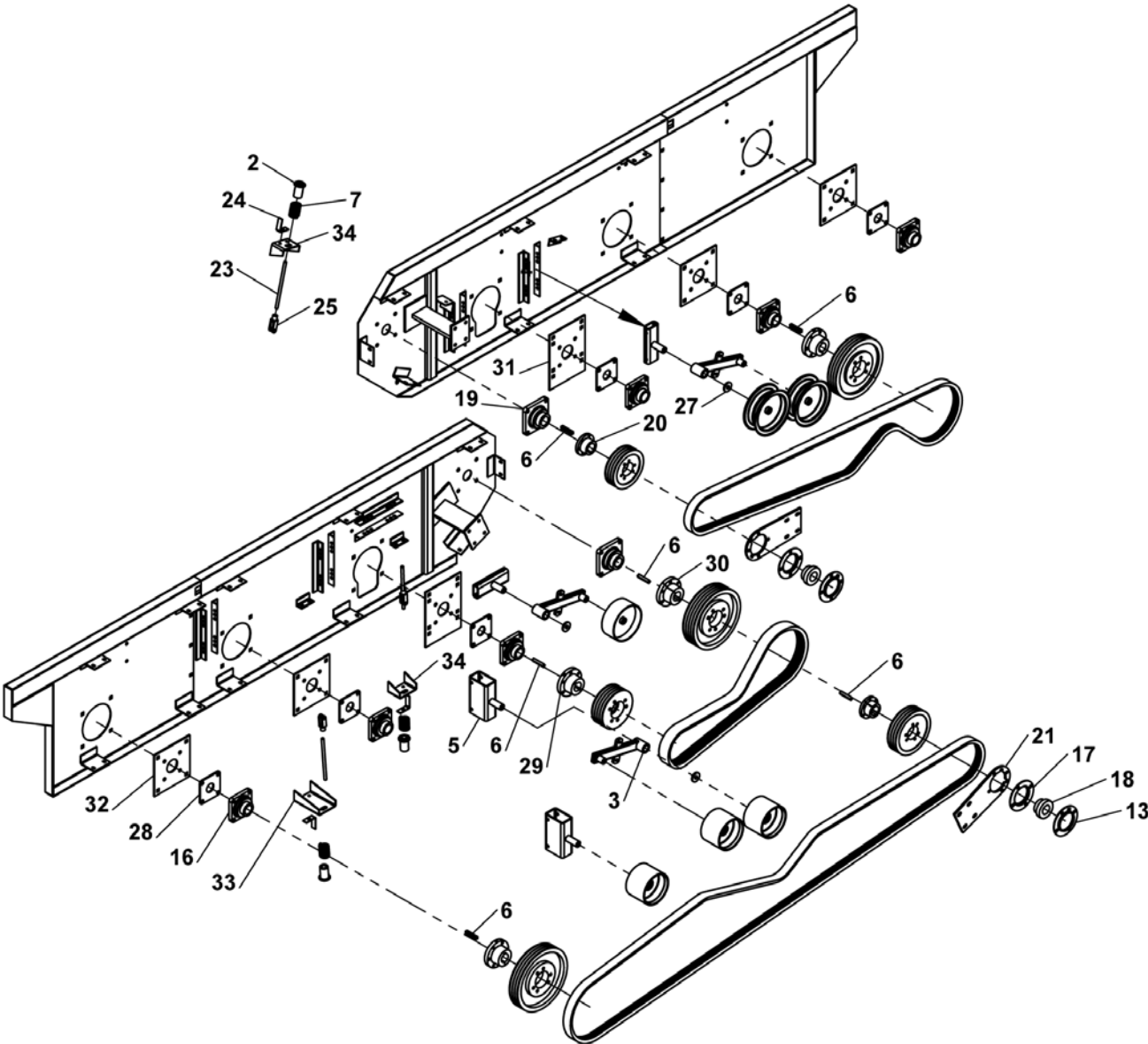
# FRAME COMPONENTS (630, 822, 922, 1222)



## FRAME COMPONENTS (630, 822, 922, 1222)

| ITEM NO. | PART NUMBER | DESCRIPTION                                  | QTY. |
|----------|-------------|----------------------------------------------|------|
| 1        | 500-2-0573  | BODY WELD (1222)                             | 1    |
|          | 500-2-0964  | FRONT BODY WELD (430 / 622)                  | 1    |
|          | 500-2-0967  | REAR BODY WELD (430 / 622)                   | 1    |
|          | 500-2-0591  | BODY WELD (822 / 630)                        | 1    |
| 3        | 500-2-0531  | PARKING STAND                                | 2    |
| 4        | 500-3-1178  | GEARBOX PLATE                                | 1    |
| 5        | 903-15399   | GEARBOX                                      | 1    |
| 6        | 903-05038   | U-JOINT - 1.75 X 2                           | 2    |
|          | 903-17710   | YOKE, 2"                                     | 2    |
|          | 903-17525   | REPAIR KIT                                   | 2    |
| 7        | 100-3-3333  | KEY - 3/8 X 3/8 X 2                          | 2    |
| 8        | 500-3-0988  | CROSS SHAFT 130 5/8" (1222)                  | 2    |
|          | 500-3-1661  | CROSS SHAFT 88" (822 / 630)                  | 2    |
|          | 500-3-1666  | CROSS SHAFT 64" (430 / 622)                  | 2    |
| 9        | 901-01142   | PILLOW BLOCK BEARING 2"                      | 2    |
| 10       | 500-3-0866  | TUBE, SHIELD 34" (1222)                      | 2    |
| 11       | 505-3-0867  | TUBE, SHIELD 78" (1222)                      | 2    |
|          | 500-3-1660  | TUBE, SHIELD 71 1/2" (822 / 630)             | 2    |
|          | 500-3-1656  | TUBE, SHIELD 47 1/2" (430 / 622)             | 2    |
| 12       | 500-3-1142  | ROD, FLAP 132 11/16" (1222)                  | 2    |
|          | 500-3-1140  | ROD, FLAP 89" (822 / 630)                    | 2    |
|          | 500-3-1136  | ROD, FLAP 134 1/2" (430 / 622)               | 1    |
| 13       | 505-3-0868  | FLAP SHIELD 3-1/2"                           | -    |
| 14       | 505-3-1089  | FLAP SHIELD 12"                              | -    |
| 15       | 505-3-1097  | FLAP SHIELD 6"                               | -    |
| 16       | 120-3-0192  | KEY 3/8 X 3/8 X 3                            | 1    |
| 18       | -----       | PTO SHAFT (SEE PAGES 74, 75)                 | 1    |
| 19       | 500-2-0537  | SHIELD WITH DECAL                            | 2    |
| 20       | 100-3-3957  | TUBE MANUAL STORAGE                          | 1    |
| 21       | 100-3-3958  | CLAMP MANUAL STORAGE                         | 1    |
| 22       | 500-2-0795  | EAR WELDMENT                                 | 1    |
| 23       | 904-01154   | AMBER LAMP                                   | 2    |
| 24       | 904-01155   | RED LAMP                                     | 2    |
| 25       | 500-3-1721  | LIGHT, FIELD                                 | 2    |
| 26       | 500-2-0930  | RED LIGHT BRACKET                            | 2    |
| 27       | 500-3-1720  | BRACKET, FIELD LIGHT                         | 2    |
| 28       | 200-3-0017  | U-BOLT 5/8 X 4 X 7.5 X 1.5                   | 4    |
| 29       | 500-3-2091  | SMV MOUNT                                    | 1    |
| 30       | 500-3-1696  | SMV SIGN                                     | 1    |
| 31       | 900-35000   | U-BOLT 3/8 X 6 X 5 X 1.5                     | 5    |
| 32       | 505-3-0279  | PIN PARK STAND                               | 2    |
| 33       | 905-21400   | HYDRAULIC CYLINDER - 3.5 X 8                 | 1    |
|          | 905-21380   | - SEAL KIT ( <b>PRINCE CYLINDERS ONLY</b> )  |      |
|          | 905-21401   | - SEAL KIT ( <b>MONARCK CYLINDERS ONLY</b> ) |      |
| 34       | 500-3-1662  | KEY - 1/2 X 2-1/2 SQUARE                     | 2    |

BELT DRIVE COMPONENTS (630, 822, 922, 1222)

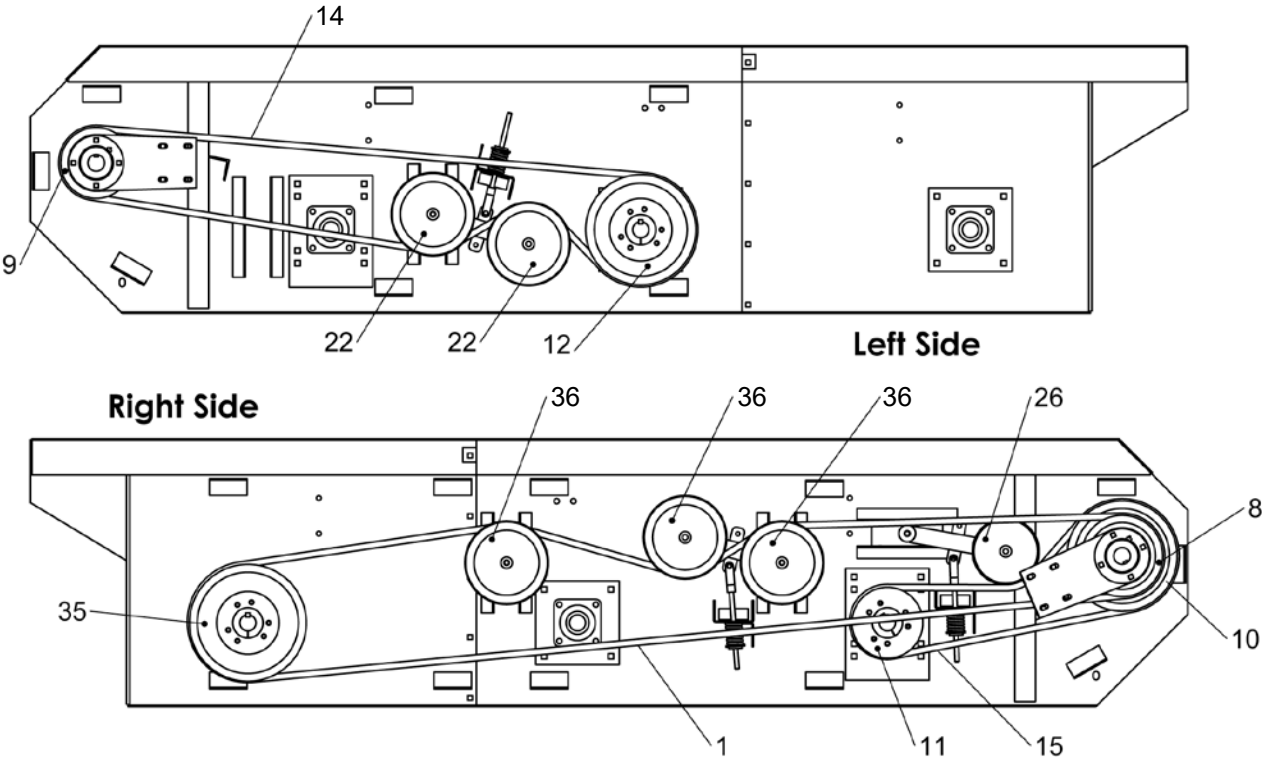


## BELT DRIVE COMPONENTS (630, 822, 922, 1222)

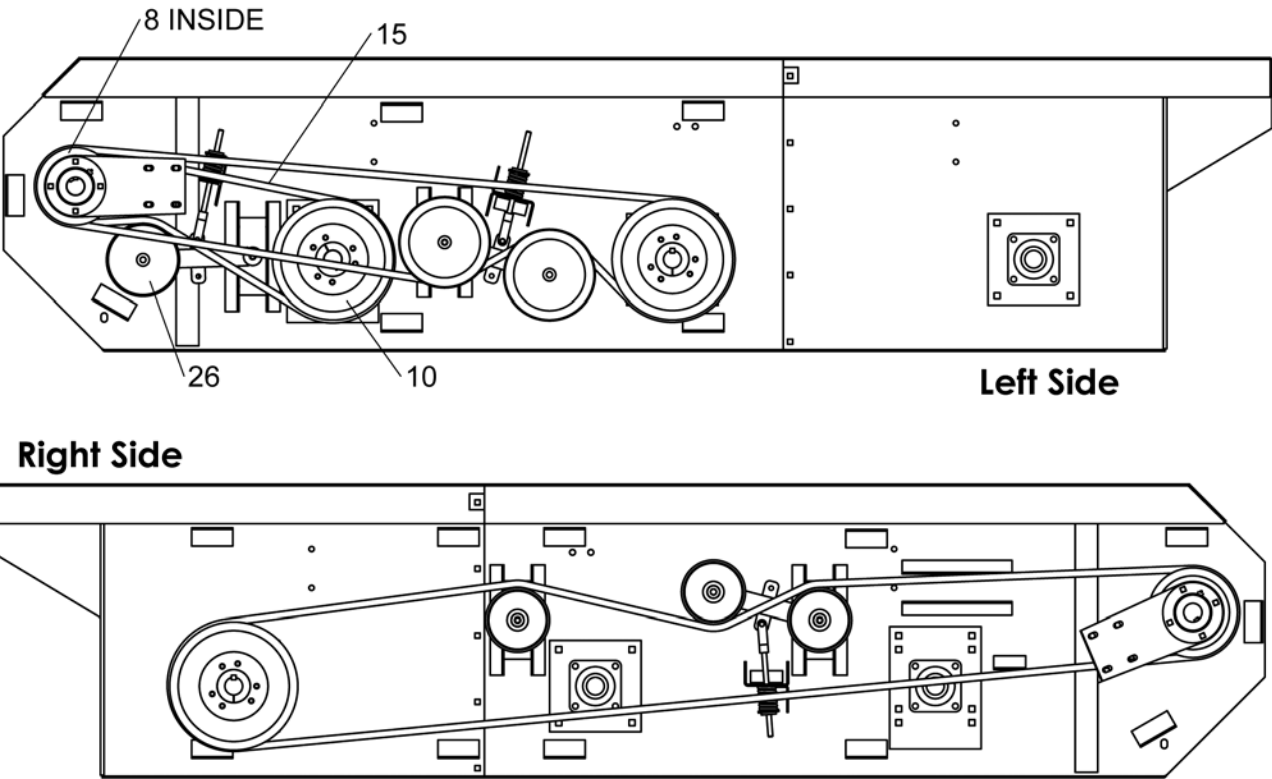
| ITEM NO. | PART NUMBER | DESCRIPTION                                        | QTY. |
|----------|-------------|----------------------------------------------------|------|
| 1        | 903-01436   | BELT - 5/5V2500 (1222 / 822 / 630)                 | 1    |
|          | 903-01428   | BELT - 3/5V2500 (622 / 624)                        | 1    |
| 2        | 500-2-0580  | SPRING SUPPORT WELD                                | 3    |
| 3        | 500-2-0574  | PIVOT ARM ASSEMBLY                                 | 3    |
| 4        | 500-2-0564  | PIVOT BASE WELD SHORT                              | 2    |
| 5        | 500-2-0565  | PIVOT BASE WELD LONG                               | 2    |
| 6        | 100-3-3331  | KEY - 1/2 X 1/2 X 3                                | 6    |
| 7        | 905-14005   | SPRING - 2.25 OD X .25 WIRE X 5.25 FL X 7.25 COILS | 3    |
| 8        | 903-08438   | PULLEY 5/5V975 - (1222 / 822 / 630)                | 1    |
|          | 903-08398   | PULLEY - 3/5V975 (622 / 624)                       | 1    |
| 9        | 903-08389   | PULLEY - 4/5V850 (1222 / 822 / 630)                | 1    |
|          | 903-08399   | PULLEY - 35V850 (622 / 624)                        | 1    |
| 10       | 903-08391   | PULLEY - 5/5V1320 (1222 / 822 / 630)               | 1    |
|          | 903-08388   | PULLEY - 4/5V1320 (622 / 624)                      | 1    |
| 11       | 903-08390   | PULLEY - 5/5V850 (1222 / 822 / 630)                | 1    |
|          | 903-08389   | PULLEY - 4/5V850 (622 / 624)                       | 1    |
| 12       | 903-08388   | PULLEY - 4/5V1320 (1222 / 822 / 630)               | 1    |
|          | 903-08397   | PULLEY - 3/5V1320 (622 / 624)                      | 1    |
| 13       | 901-01315   | FLANGE 4 HOLE 100MM PF211H LUBE                    | 2    |
| 14       | 903-01424   | BELT 4/5V1700 (1222 / 822 / 630)                   | 1    |
|          | 903-01427   | BELT 3/5V1700 (622 / 624)                          | 1    |
| 15       | 903-01426   | BELT 5/5V950 (1222 / 822 / 630)                    | 1    |
|          | 903-01429   | BELT 4/5V950 (622 / 624)                           | 1    |
| 16       | 901-01282   | BEARING - NANFS 210-31 1.9375                      | 6    |
| 17       | 901-01314   | FLANGE 4 HOLE 100MM PF211H                         | 2    |
| 18       | 901-01079   | 2.00 INSERT BEARING NA-211-32                      | 2    |
| 19       | 901-01008   | BEARING - NANFS 211-32 2.00                        | 2    |
| 20       | 500-3-1060  | HUB 2" TYPE E (1222 / 822 / 630)                   | 2    |
|          | 500-3-1659  | HUB 2" TYPE SF (622 / 624)                         | 2    |
| 21       | 500-3-1653  | BEARING PLATE 2"                                   | 2    |
| 22       | 500-3-1249  | FLANGED PULLEY, 3.25" WIDE (1222 / 822 / 630)      | 2    |
|          | 500-3-1295  | FLANGED PULLEY, 3.25" WIDE (622 / 624)             | 2    |
| 23       | 500-3-1250  | THREADED ROD                                       | 3    |
| 24       | 500-3-1255  | SIGHT GAGE                                         | 3    |
| 25       | 500-3-1247  | CLEVIS                                             | 3    |
| 26       | 500-3-1248  | 8" OD FLAT PULLEY                                  | 1    |
| 27       | 500-3-1246  | SPECIAL WASHER                                     | 3    |
| 28       | 500-3-0990  | PLASTIC SHIELD                                     | 6    |
| 29       | 500-3-1062  | HUB 1 15/16" TYPE E                                | 3    |
| 30       | 500-3-1060  | HUB 2" TYPE E                                      | 1    |
| 31       | 500-3-1201  | BEARING PLATE FRONT                                | 2    |
| 32       | 500-3-1202  | BEARING PLATE REAR                                 | 4    |
| 33       | 500-3-1221  | BRACKET SPRING MOUNT LONG                          | 1    |
| 34       | 500-3-1222  | BRACKET SPRING MOUNT SHORT                         | 2    |
| 35       | 903-08439   | PULLEY - 5/5V1400 (1222 / 822 / 630)               | 1    |
|          | 903-08396   | PULLEY - 3/5V1400 (622 / 624)                      | 1    |
| 36       | 500-2-0777  | 7" OD FLAT PULLEY (1222 / 822 / 630)               | 3    |
|          | 500-3-1295  | FLANGED PULLEY, 3.25" WIDE (622 / 624)             | 3    |

**BELT DRIVE COMPONENTS (630, 822, 922, 1222)**

**PULLEY PLACEMENT (STEEL)**



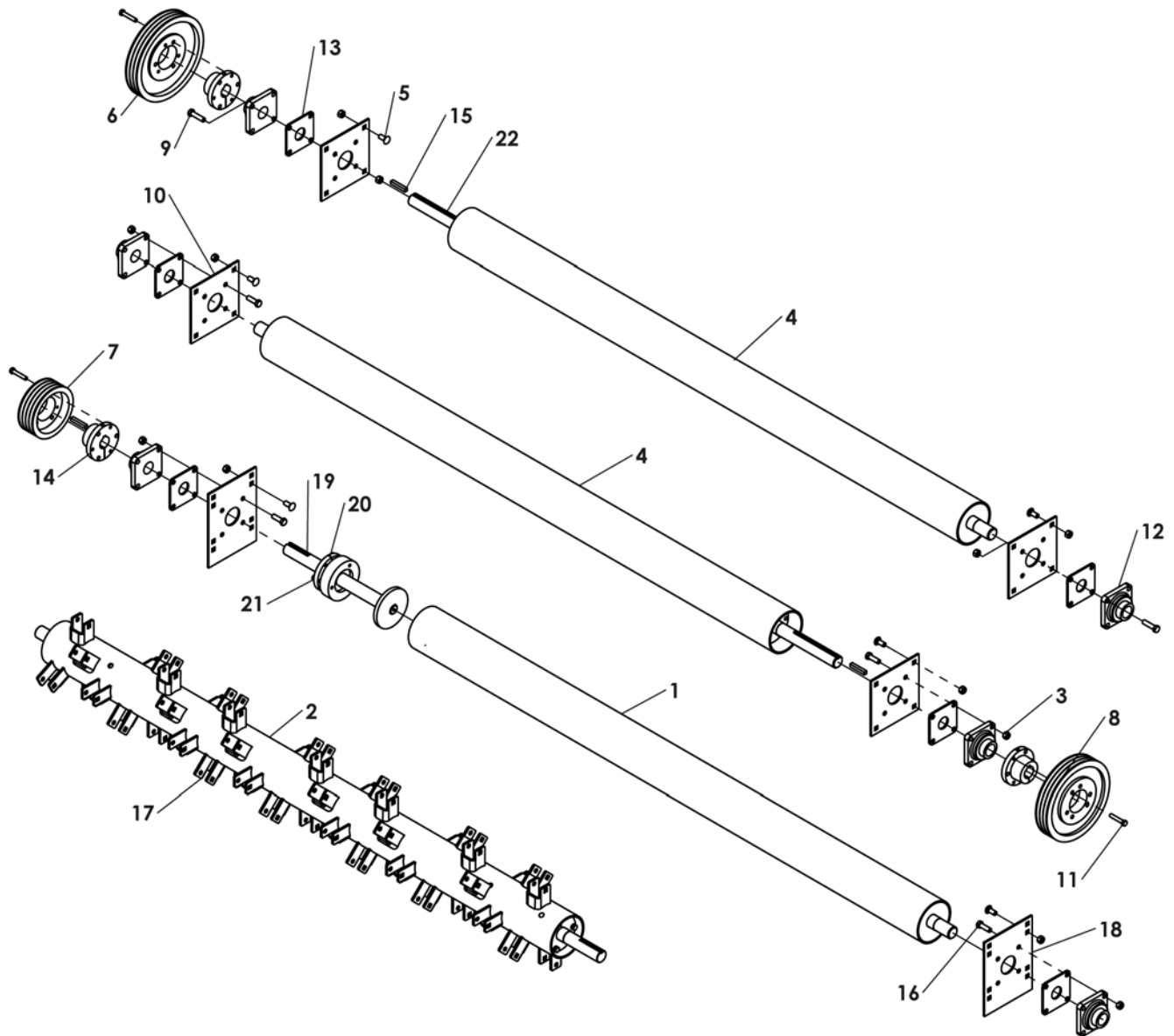
**PULLEY PLACEMENT (ALL RUBBER)**



## BELT DRIVE COMPONENTS (630, 822, 922, 1222)

| ITEM NO. | PART NUMBER | DESCRIPTION                                        | QTY. |
|----------|-------------|----------------------------------------------------|------|
| 1        | 903-01436   | BELT - 5/5V2500 (1222 / 822 / 630)                 | 1    |
|          | 903-01428   | BELT - 3/5V2500 (622 / 624)                        | 1    |
| 2        | 500-2-0580  | SPRING SUPPORT WELD                                | 3    |
| 3        | 500-2-0574  | PIVOT ARM ASSEMBLY                                 | 3    |
| 4        | 500-2-0564  | PIVOT BASE WELD SHORT                              | 2    |
| 5        | 500-2-0565  | PIVOT BASE WELD LONG                               | 2    |
| 6        | 100-3-3331  | KEY - 1/2 X 1/2 X 3                                | 6    |
| 7        | 905-14005   | SPRING - 2.25 OD X .25 WIRE X 5.25 FL X 7.25 COILS | 3    |
| 8        | 903-08438   | PULLEY 5/5V975 - (1222 / 822 / 630)                | 1    |
|          | 903-08398   | PULLEY - 3/5V975 (622 / 624)                       | 1    |
| 9        | 903-08389   | PULLEY - 4/5V850 (1222 / 822 / 630)                | 1    |
|          | 903-08399   | PULLEY - 35V850 (622 / 624)                        | 1    |
| 10       | 903-08391   | PULLEY - 5/5V1320 (1222 / 822 / 630)               | 1    |
|          | 903-08388   | PULLEY - 4/5V1320 (622 / 624)                      | 1    |
| 11       | 903-08390   | PULLEY - 5/5V850 (1222 / 822 / 630)                | 1    |
|          | 903-08389   | PULLEY - 4/5V850 (622 / 624)                       | 1    |
| 12       | 903-08388   | PULLEY - 4/5V1320 (1222 / 822 / 630)               | 1    |
|          | 903-08397   | PULLEY - 3/5V1320 (622 / 624)                      | 1    |
| 13       | 901-01315   | FLANGE 4 HOLE 100MM PF211H LUBE                    | 2    |
| 14       | 903-01424   | BELT 4/5V1700 (1222 / 822 / 630)                   | 1    |
|          | 903-01427   | BELT 3/5V1700 (622 / 624)                          | 1    |
| 15       | 903-01426   | BELT 5/5V950 (1222 / 822 / 630)                    | 1    |
|          | 903-01429   | BELT 4/5V950 (622 / 624)                           | 1    |
| 16       | 901-01282   | BEARING - NANFS 210-31 1.9375                      | 6    |
| 17       | 901-01314   | FLANGE 4 HOLE 100MM PF211H                         | 2    |
| 18       | 901-01079   | 2.00 INSERT BEARING NA-211-32                      | 2    |
| 19       | 901-01008   | BEARING - NANFS 211-32 2.00                        | 2    |
| 20       | 500-3-1060  | HUB 2" TYPE E (1222 / 822 / 630)                   | 2    |
|          | 500-3-1659  | HUB 2" TYPE SF (622 / 624)                         | 2    |
| 21       | 500-3-1653  | BEARING PLATE 2"                                   | 2    |
| 22       | 500-3-1249  | FLANGED PULLEY, 3.25" WIDE (1222 / 822 / 630)      | 2    |
|          | 500-3-1295  | FLANGED PULLEY, 3.25" WIDE (622 / 624)             | 2    |
| 23       | 500-3-1250  | THREADED ROD                                       | 3    |
| 24       | 500-3-1255  | SIGHT GAGE                                         | 3    |
| 25       | 500-3-1247  | CLEVIS                                             | 3    |
| 26       | 500-3-1248  | 8" OD FLAT PULLEY                                  | 1    |
| 27       | 500-3-1246  | SPECIAL WASHER                                     | 3    |
| 28       | 500-3-0990  | PLASTIC SHIELD                                     | 6    |
| 29       | 500-3-1062  | HUB 1 15/16" TYPE E                                | 3    |
| 30       | 500-3-1060  | HUB 2" TYPE E                                      | 1    |
| 31       | 500-3-1201  | BEARING PLATE FRONT                                | 2    |
| 32       | 500-3-1202  | BEARING PLATE REAR                                 | 4    |
| 33       | 500-3-1221  | BRACKET SPRING MOUNT LONG                          | 1    |
| 34       | 500-3-1222  | BRACKET SPRING MOUNT SHORT                         | 2    |
| 35       | 903-08439   | PULLEY - 5/5V1400 (1222 / 822 / 630)               | 1    |
|          | 903-08396   | PULLEY - 3/5V1400 (622 / 624)                      | 1    |
| 36       | 500-2-0777  | 7" OD FLAT PULLEY (1222 / 822 / 630)               | 3    |
|          | 500-3-1295  | FLANGED PULLEY, 3.25" WIDE (622 / 624)             | 3    |

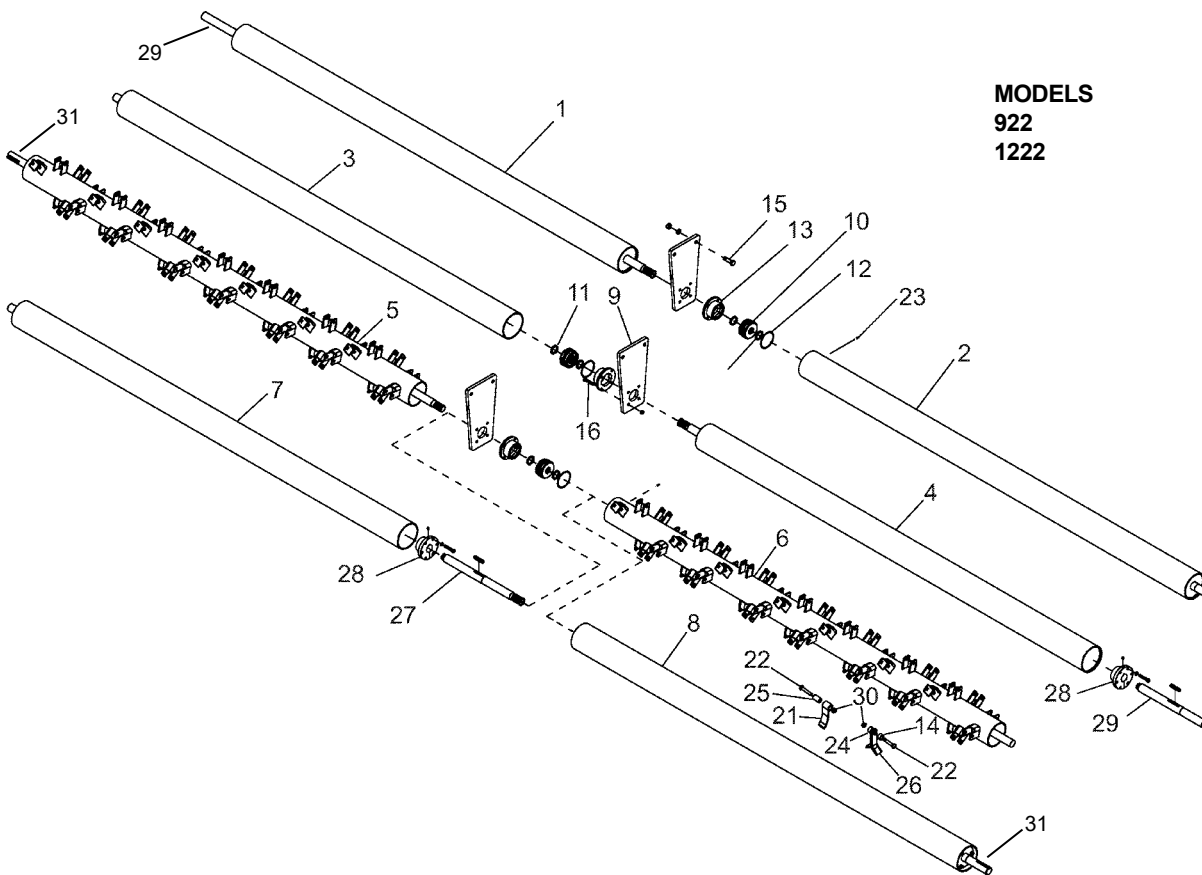
## FLAIL TUBE COMPONENTS (430, 622, 624)



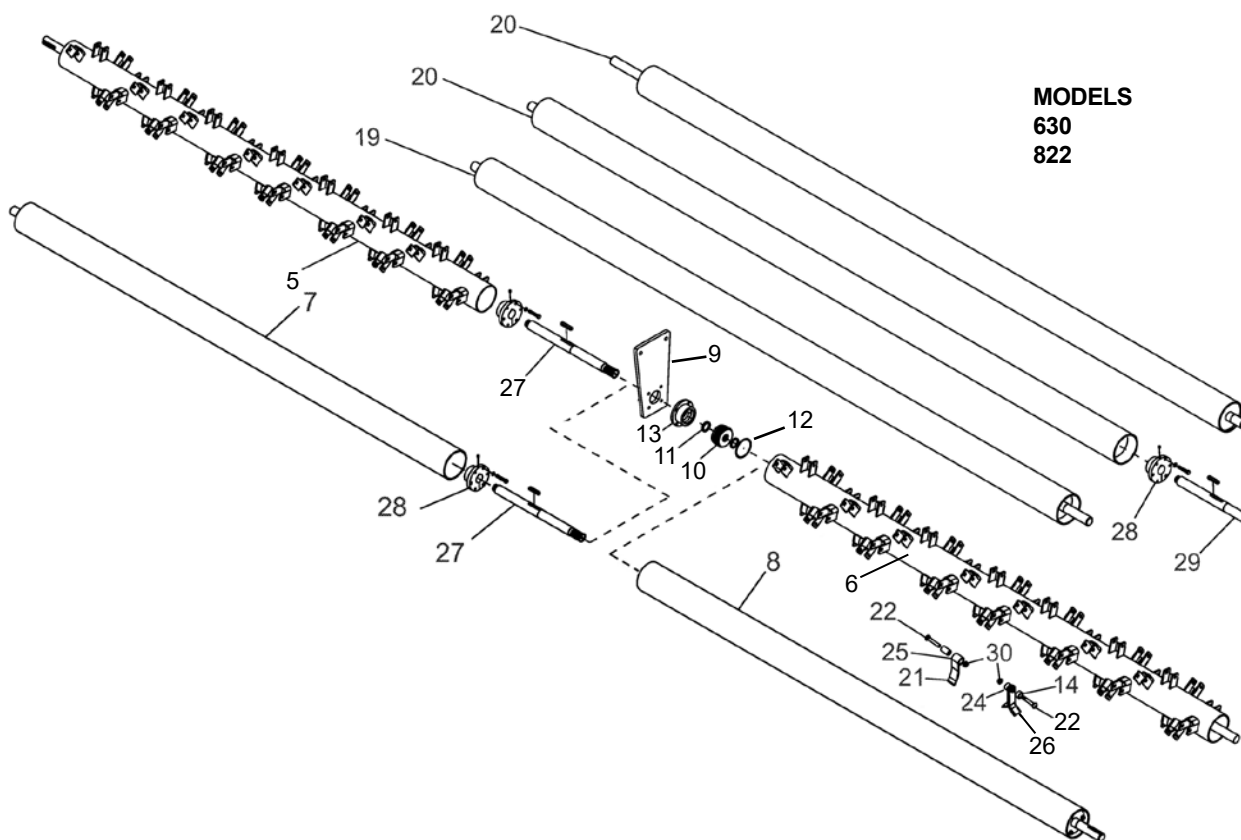
## FLAIL TUBE COMPONENTS (430, 622, 624)

| ITEM NO. | PART NUMBER | DESCRIPTION                                    | QTY. |
|----------|-------------|------------------------------------------------|------|
| 1        | 500-2-0378  | TUBE WELDMENT, FRONT, 430 NARROW               | 1    |
|          | 500-2-0308  | TUBE WELDMENT, FRONT, 622 AND 430 WIDE         | 1    |
|          | 500-2-0380  | TUBE WELDMENT, FRONT, 624                      | 1    |
| 2        | 500-2-0734  | TUBE WELDMENT, 430 (L-KNIFE / CUP KNIFE)       | 1    |
|          | 500-2-0629  | TUBE WELDMENT, 622 (L-KNIFE / CUP KNIFE)       | 1    |
|          | 500-2-0735  | TUBE WELDMENT, 624 (L-KNIFE / CUP KNIFE)       | 1    |
|          | 500-2-1064  | TUBE WELDMENT, 6R45CM (L-KNIFE / CUP KNIFE)    | 1    |
| 3        | 900-06013   | 5/8 NC HEX NUT                                 | 12   |
| 4        | 500-2-0379  | TUBE WELDMENT, CENTER & REAR, 430 NARROW       | 2    |
|          | 500-2-0214  | TUBE WELDMENT, CENTER & REAR, 622 AND 430 WIDE | 2    |
|          | 500-2-0381  | TUBE WELDMENT, CENTER & REAR, 624              | 2    |
|          | 500-2-0214  | TUBE WELDMENT, CENTER & REAR, 6R45CM           | 2    |
| 5        | 900-01784   | 5/8 NC X 1-1/2 CARRIAGE BOLT                   | 6    |
| 6        | 903-08396   | PULLEY - 35V1400E                              | 1    |
| 7        | 903-08366   | PULLEY, 4C13 (RUBBER)                          | 1    |
|          | 903-08372   | PULLEY, 4C10 (STEEL CUP)                       | 1    |
|          | 903-08365   | PULLEY, 4C8.5 (STEEL L KNIFE)                  | 1    |
|          | 903-08389   | PULLEY - 45V850E                               | 1    |
| 8        | 903-08397   | PULLEY - 4B80SK                                | 1    |
| 9        | 900-03147   | 5/8 NC X 2-1/2 HEX BOLT                        | 2    |
| 10       | 500-3-1202  | BEARING PLATE REAR                             | 4    |
| 11       | 900-02526   | 1/2 NC X 2-3/4 F.T. TAP BOLT                   | 6    |
| 12       | 901-01282   | BEARING ASSEMBLY, W/SEAL                       | 6    |
| 13       | 500-3-0990  | PLASTIC BEARING SHIELD                         | 6    |
| 14       | 500-3-1059  | HUB, 1-15/16" TYPE E                           | 3    |
| 15       | 100-3-3331  | KEY, 1/2X1/2X3                                 | 4    |
| 16       | 900-01345   | 5/8 NC X 2 HEX BOLT                            | 4    |
| 17       | 500-3-1734  | CLIP, L / CUP                                  | -    |
| 18       | 500-3-1201  | BEARING PLATE FRONT                            | 2    |
| 19       | 500-3-0865  | SHAFT, SHORT                                   | 1    |
| 20       | 500-3-1060  | HUB, 2" TYPE E W/KW                            | 1    |
| 21       | 900-11013   | 1/2 LOCK WASHER                                | 3    |
| 22       | 500-3-0863  | SHAFT, LONG                                    | 1    |

# FLAIL TUBE COMPONENTS ( 630, 822, 922, 1222)



**MODELS**  
**922**  
**1222**

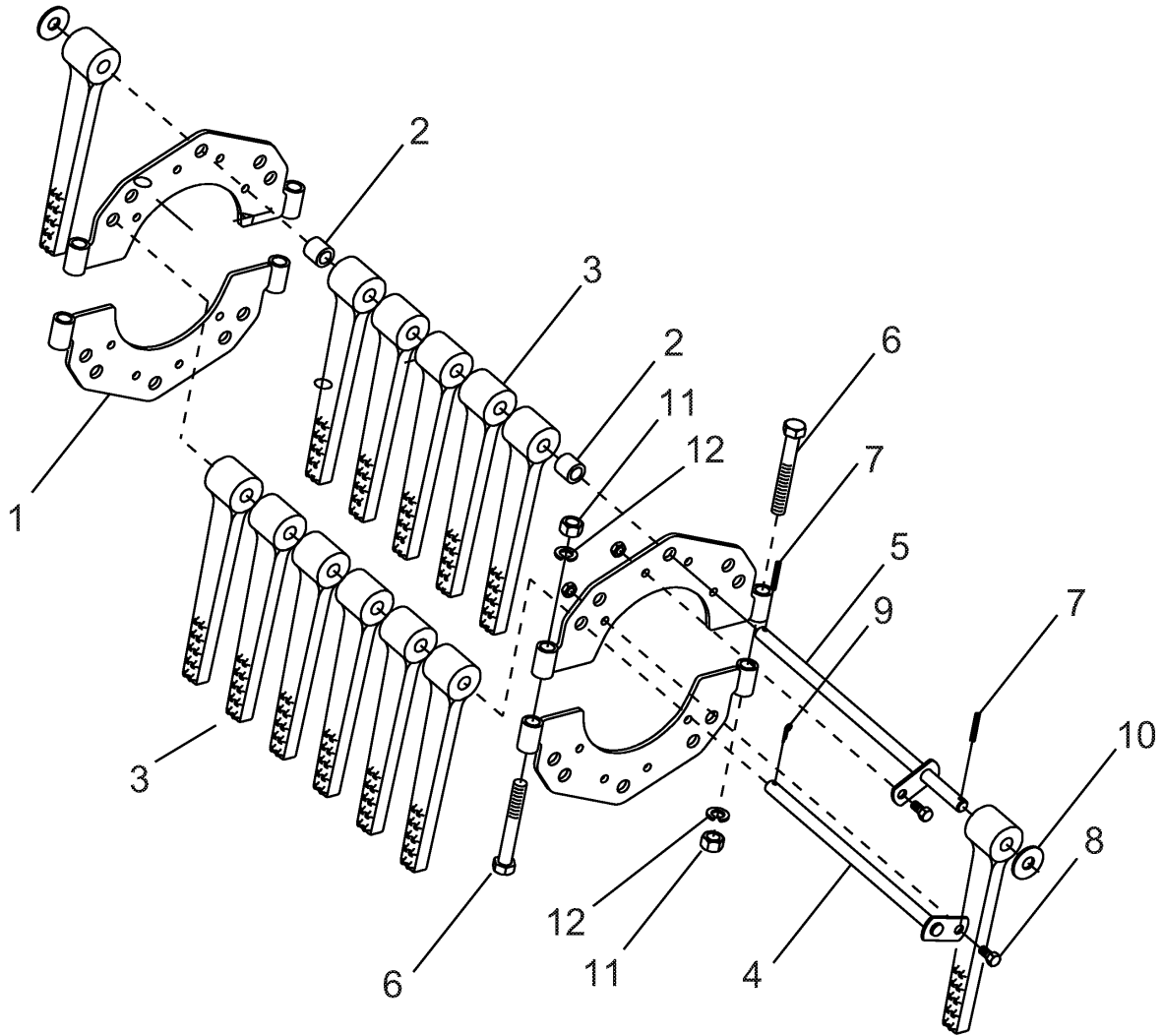


**MODELS**  
**630**  
**822**

## FLAIL TUBE COMPONENTS ( 630, 822, 922, 1222)

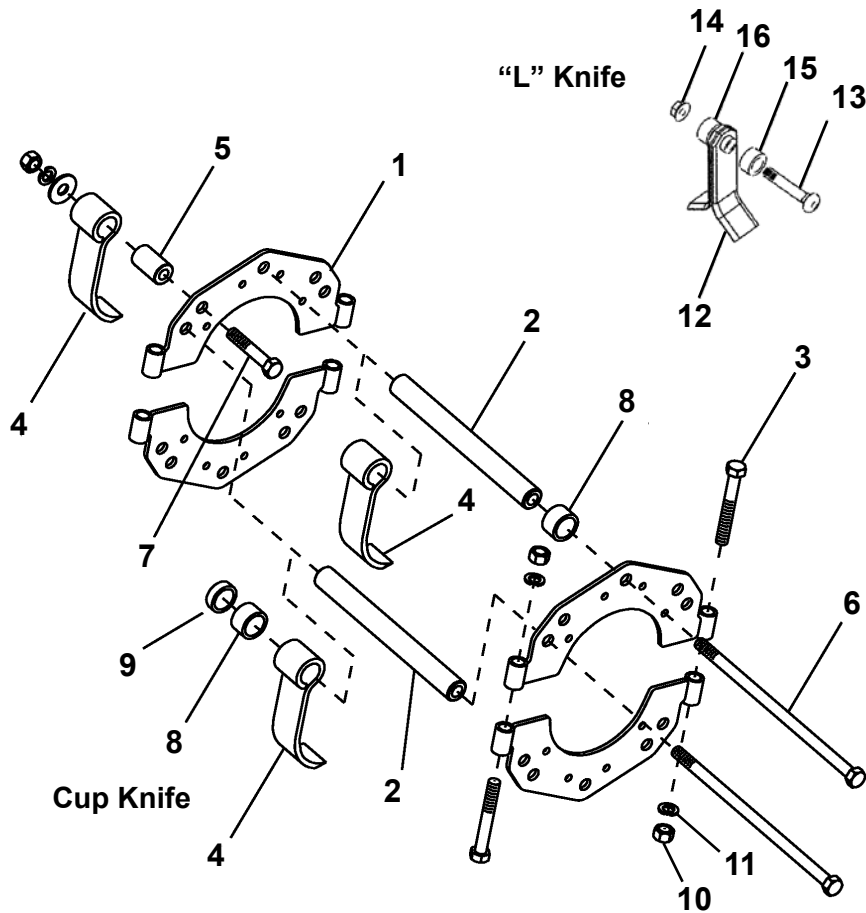
| ITEM NO. | PART NUMBER | DESCRIPTION                              | QTY. |
|----------|-------------|------------------------------------------|------|
| 1        | 500-2-0556  | FLAIL TUBE WELDMENT, DRIVE (1222)        | 1    |
| 2        | 500-2-0555  | FLAIL TUBE WELDMENT (1222)               | 1    |
| 3        | 500-2-0555  | FLAIL TUBE WELDMENT (1222)               | 1    |
| 4        | 500-2-0556  | FLAIL TUBE WELDMENT, DRIVE (1222)        | 1    |
| 5        | 500-2-0779  | FRONT FLAIL TUBE "L/CUP" DRIVE (1222)    | 1    |
|          | 500-2-0775  | FRONT FLAIL TUBE "L/CUP" DRIVE (630/822) | 1    |
| 6        | 500-2-0780  | FRONT FLAIL TUBE "L/CUP" DRIVEN (1222)   | 1    |
|          | 500-2-0776  | FLAIL TUBE "L/CUP" DRIVEN (630, 822)     | 1    |
| 7        | 500-2-0555  | FLAIL TUBE WELD (1222) RUBBER            | 1    |
| 8        | 500-2-0557  | FRONT FLAIL TUBE WELDMENT, RUBBER        | 1    |
| 9        | 500-2-0633  | CENTER BEARING PLATE WELD                | -    |
| 10       | 500-3-0338  | DRIVE HUB                                | -    |
| 11       | 900-39030   | SNAP RING                                | 6    |
| 12       | 901-09126   | O-RING                                   | -    |
| 13       | 500-2-0598  | BEARING ASSEMBLY                         | -    |
|          | 901-01300   | HOUSING                                  | -    |
|          | 901-01280   | INSERT BEARING                           | -    |
|          | 901-01281   | 90 MM BEARING PROTECTOR                  | -    |
| 14       | 500-3-1736  | SPACER                                   | -    |
| 15       | 900-01409   | 3/4 X 2-3/4 HEX BOLT                     | -    |
| 16       | 900-01233   | 1/2X2-1/2 HEX BOLT                       | -    |
| 18       | 500-2-0776  | FLAIL TUBE "L/CUP" DRIVEN (630, 822)     | 1    |
| 19       | 500-2-0632  | FRONT FLAIL TUBE WELD (630, 822) RUBBER  | 1    |
| 20       | 500-2-0383  | FLAIL TUBE WELDMENT (630, 822)           | 2    |
| 21       | 505-3-0972  | STEEL CUP KNIFE                          | -    |
| 22       | 900-01792   | 5/8 NC X 3-1/2 CARRIAGE BOLT             | -    |
| 23       | 905-15001   | ZERK, 1/8 NPT STRAIGHT                   | 3    |
| 24       | 500-3-1733  | BUSHING, "L" KNIFE                       | -    |
| 25       | 505-3-0405  | BUSHING, CUP                             | -    |
| 26       | 500-3-1735  | "L" KNIFE                                | -    |
| 27       | 500-3-0785  | CENTER SHAFT                             | -    |
| 28       | 500-3-1060  | TYPE E HUB                               | -    |
| 29       | 500-3-0863  | SHAFT, LONG                              | -    |
| 30       | 900-06145   | 5/8 SPIRALOCK FLANGE NUT 6V8             | -    |
| 31       | 500-3-0865  | SHAFT, SHORT                             | -    |

## RUBBER FLAIL COMPONENTS



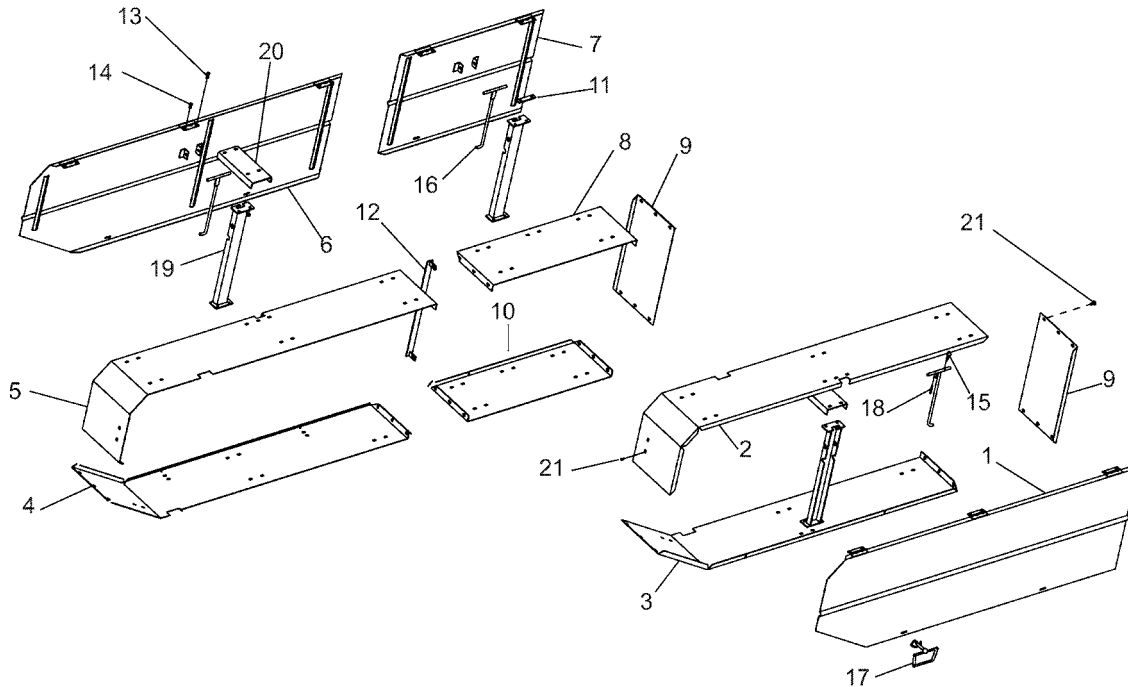
| ITEM NO. | PART NUMBER | DESCRIPTION                | QTY. |
|----------|-------------|----------------------------|------|
| 1        | 500-2-0067  | FLAIL MOUNTING BRACKET     | -    |
| 2        | 500-3-0151  | 1" SPACER                  | -    |
| 3        | 500-3-0316  | RUBBER FLAIL               | -    |
| 4        | 500-2-0068  | RUBBER FLAIL PIN           | -    |
| 5        | 500-2-0069  | RUBBER FLAIL PIN EXTENSION | -    |
| 6        | 900-01363   | 5/8 NCX 4-1/2 HEX BOLT     | -    |
| 7        | 900-29153   | ROLL PIN, 7/32X1-1/2       | -    |
| 8        | 900-01105   | 3/8 NC X 3/4 HEX BOLT      | -    |
| 9        | 900-23041   | 3/16X1 COTTER PIN          | -    |
| 10       | 900-11131   | WASHER, NYLON 5/8 ID       | -    |
| 11       | 900-06014   | 5/8 NC HEX NUT             | -    |
| 12       | 900-11015   | 5/8 LOCKWASHER             | -    |

## CUP KNIFE / L-KNIFE FLAIL COMPONENTS



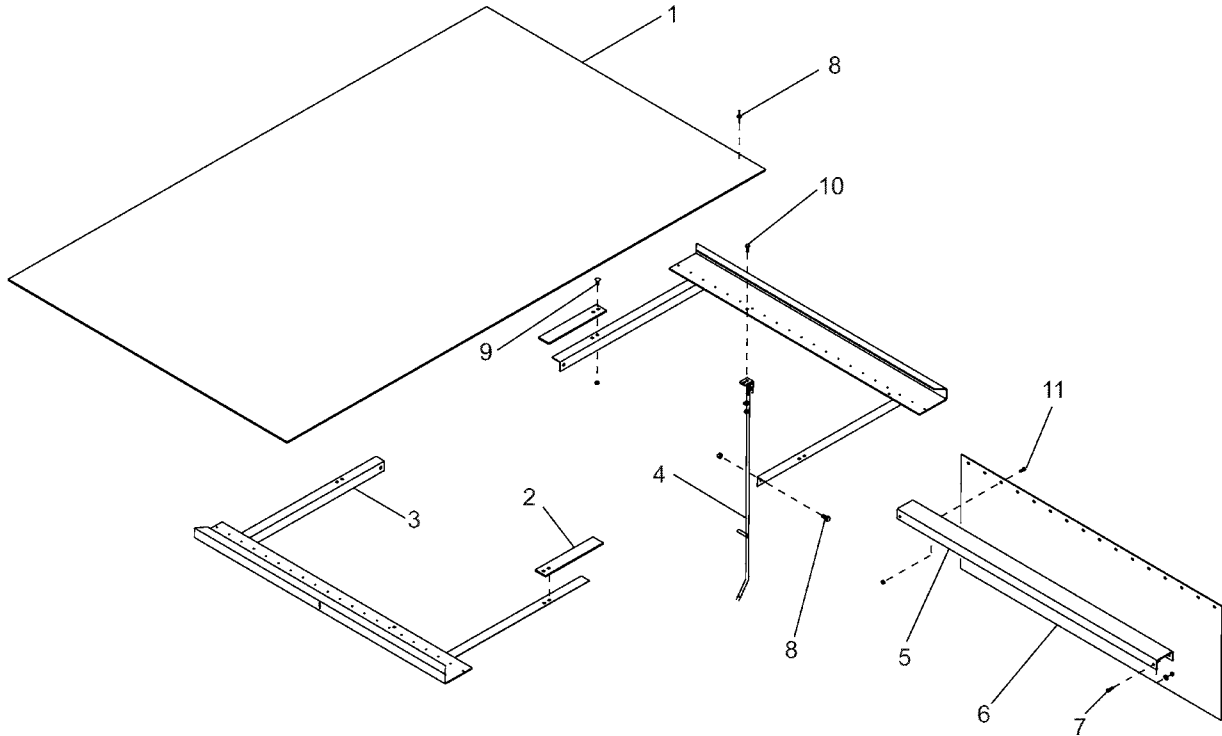
| ITEM NO. | PART NUMBER | DESCRIPTION                          | QTY. |
|----------|-------------|--------------------------------------|------|
| 1        | 500-2-0067  | FLAIL MOUNTING BRACKET               | -    |
| 2        | 500-3-1065  | BUSHING, LONG                        | -    |
| 3        | 900-01363   | 5/8 NCX 4-1/2 HEX BOLT               | -    |
| 4        | 505-3-0004  | STEEL FLAIL                          | -    |
|          | 505-3-0972  | STEEL FLAIL (2001-2006 PRODUCTION)   | -    |
| 5        | 505-3-0405  | BUSHING, WEAR                        | -    |
| 6        | 900-03036   | 5/8 NCX 14 HEX BOLT                  | -    |
| 7        | 900-01357   | 5/8 NCX 3-1/2 HEX BOLT               | -    |
| 8        | 500-3-1066  | 1" SPACER                            | -    |
| 9        | 500-3-1067  | 1/2" SPACER                          | -    |
| 10       | 900-06014   | 5/8 NC HEX NUT                       | -    |
| 11       | 900-11015   | 5/8 LOCKWASHER                       | -    |
| 12       | 505-3-0001  | STEEL "L" KNIFE                      | -    |
| 13       | 900-03064   | 5/8-11 NC X 3.75 CARRIAGE BOLT, GD 8 | -    |
| 14       | 900-06508   | 5/8 NC TOP LOCK HEX NUT              | -    |
| 15       | 500-3-2134  | SPACER                               | -    |
| 16       | 900-11037   | 5/8 FLAT WASHER                      | -    |

## BELT COVER COMPONENTS



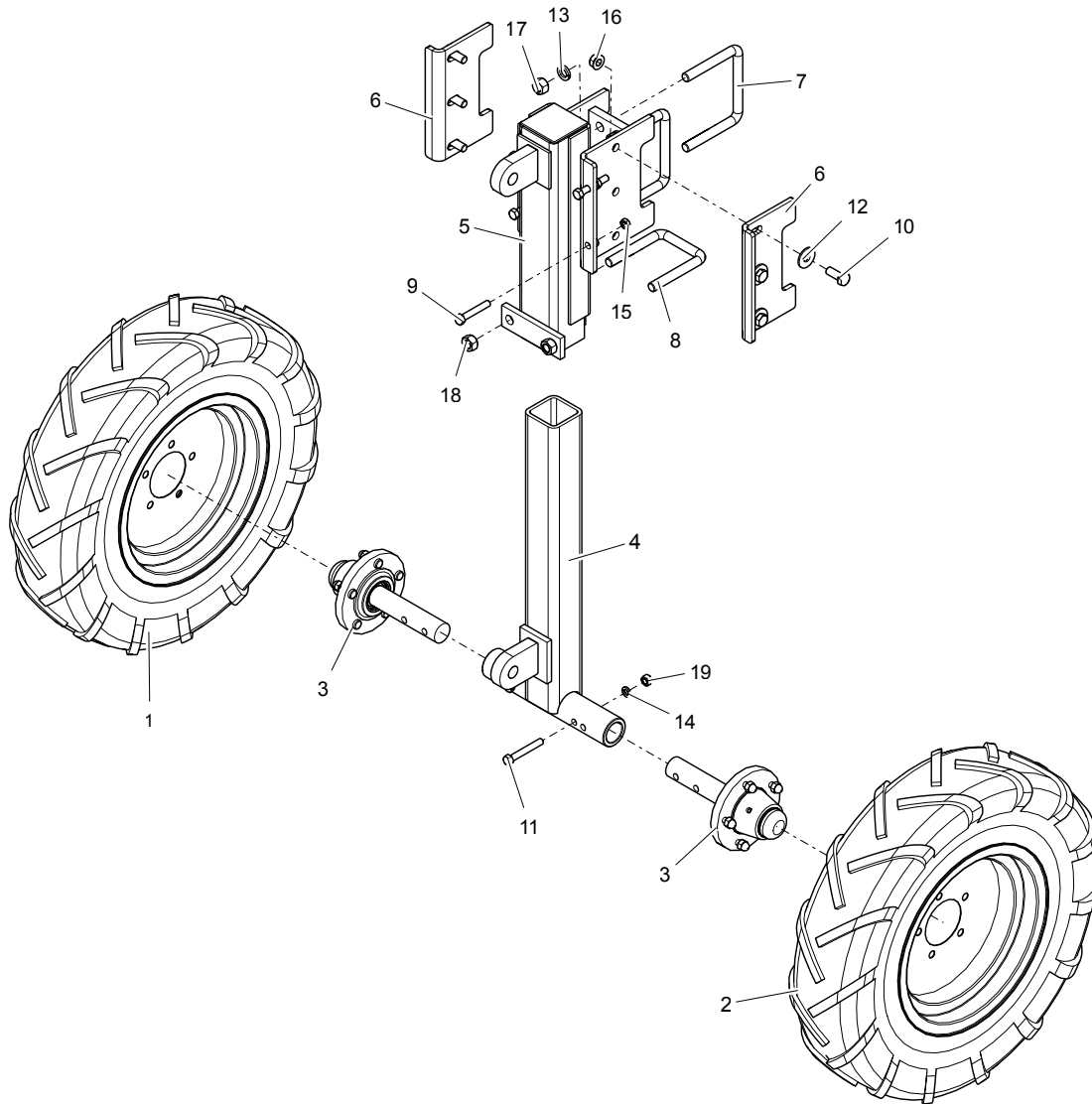
| ITEM NO. | PART NUMBER | DESCRIPTION                           | QTY. |
|----------|-------------|---------------------------------------|------|
| 1        | 500-2-0581  | FRONT DOOR WELD (LH)                  | 1    |
| 2        | 500-3-1256  | TOP SIDE SHIELD (LH)                  | 1    |
| 3        | 500-3-1258  | BOTTOM SIDE SHIELD (LH)               | 1    |
| 4        | 500-3-1259  | BOTTOM SIDE SHIELD (RH)               | 1    |
|          | 500-3-1738  | BOTTOM SIDE SHIELD EXT RH (1222)      | 1    |
| 5        | 500-3-1257  | TOP SIDE SHIELD (RH)                  | 1    |
|          | 500-3-1737  | TOP SIDE SHIELD EXT RH (1222)         | 1    |
| 6        | 500-2-0582  | FRONT DOOR WELD (RH)                  | 1    |
| 7        | 500-2-0583  | REAR DOOR WELD                        | 1    |
| 8        | 500-3-1284  | REAR TOP SHIELD (RH)                  | 1    |
|          | 500-3-1739  | REAR TOP SIDE SHIELD RH EXT (1222)    | 1    |
| 9        | 500-3-1260  | BACK SIDE SHIELD (LH)                 | 2    |
|          | 500-3-1740  | REAR BOTTOM SIDE SHIELD RH EXT (1222) | 1    |
| 10       | 500-3-1261  | REAR BOTTOM SIDE SHIELD               | 1    |
|          | 500-3-1741  | BACK SIDE SHIELD EXT (1222)           | 1    |
| 11       | 500-3-1277  | SPACER SUPPORT CHANNEL                | 1    |
| 12       | 500-2-0587  | DOOR SUPPORT                          | 1    |
| 13       | 900-01109   | 3/8 X 1 HEX BOLT                      | -    |
| 14       | 900-01105   | 3/8 X 3/4 HEX BOLT                    | -    |
| 15       | 900-25004   | 1/8" HAIR PIN                         | 3    |
| 16       | 500-2-0585  | PROP ROD WELD                         | 3    |
| 17       | 905-04032   | SPRING LATCH                          | 2    |
| 18       | 900-29126   | 3/16X3/4 ROLL PIN                     | 3    |
| 19       | 500-2-0584  | SUPPORT WELDMENT, SIDE COVER          | 3    |
| 20       | 500-3-1269  | TOP SUPPORT CHANNEL                   | 2    |
|          | 500-3-1742  | TOP SUPPORT CHANNEL EXT (1222)        | 1    |
| 21       | 900-01694   | 3/8 X 3/4 CARRIAGE BOLT               | -    |
| -        | 500-3-0407  | BRACKET, RUBBER LATCH                 | -    |
| -        | 905-04019   | RUBBER LATCH                          | -    |
| -        | 905-04025   | HOOD BRACKET                          | -    |

## COVER COMPONENTS



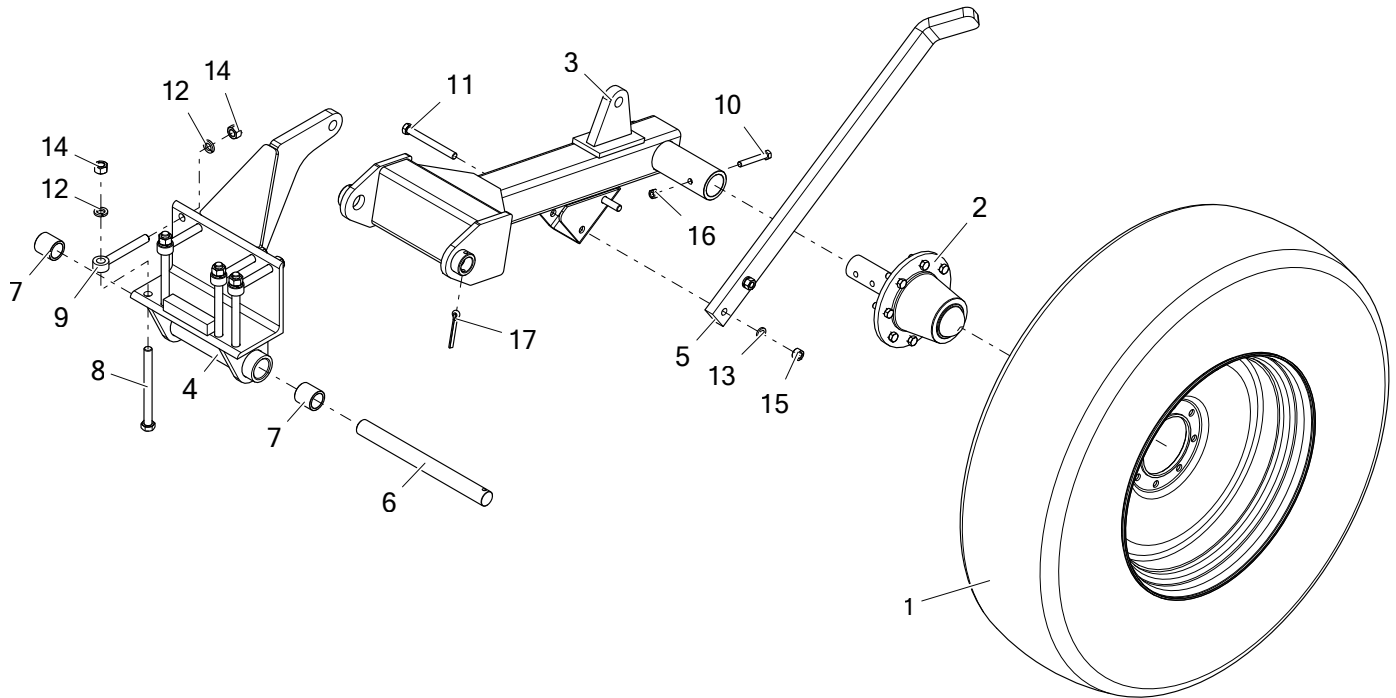
| ITEM NO. | PART NUMBER | DESCRIPTION                                    | QTY. |
|----------|-------------|------------------------------------------------|------|
| 1        | 500-3-0746  | COVER, 430                                     | 2    |
|          | 500-3-0747  | COVER, 622, 430 WIDE AND 1222                  | 2    |
|          | 500-3-0748  | COVER, 624                                     | 2    |
|          | 500-3-0749  | COVER, 630 AND 822                             | 2    |
|          | 500-3-1233  | PINCH PROTECTOR                                | 4    |
| 3        | 500-2-0715  | PIVOT BRACKET WELDMENT, 430                    | 4    |
|          | 500-2-0575  | PIVOT BRACKET WELDMENT, 430 WIDE, 622 AND 1222 | 4    |
|          | 500-2-0714  | PIVOT BRACKET WELDMENT, 624                    | 4    |
|          | 500-2-0594  | PIVOT BRACKET WELDMENT, 630 AND 822            | 4    |
| 4        | 500-2-0586  | PROP ROD WELD TOP COVER                        | 8    |
| 5        | 500-3-0960  | CROSS CHANNEL, 430                             | 2    |
|          | 500-3-1207  | CROSS CHANNEL, 430 WIDE, 622 AND 1222          | 3    |
|          | 500-3-0962  | CROSS CHANNEL, 624                             | 2    |
|          | 500-3-1292  | CROSS CHANNEL, 630 AND 822                     | -    |
|          | 500-3-1317  | CROSS CHANNEL, 922 SHORT                       | 2    |
|          | 500-3-1318  | CROSS CHANNEL, 922 LONG                        | 1    |
| 6        | 500-3-0734  | REAR FLAP, 430                                 | 2    |
|          | 500-3-0969  | REAR FLAP, 430 WIDE, 622 AND 1222              | 2    |
|          | 500-3-0736  | REAR FLAP, 624                                 | 2    |
|          | 500-3-0737  | REAR FLAP, 630                                 | 2    |
| 7        | 900-01139   | 3/8 NC X 5-1/2 HEX BOLT                        | 4    |
| 8        | 900-01221   | 1/2 NC X 1 HEX BOLT                            | -    |
| 9        | 900-01695   | 3/8 X 1 CARR. BOLT                             | -    |
| 10       | 900-01109   | 3/8 X 1 HEX BOLT                               | -    |
| 11       | 900-03419   | 5/16 NC X 3/4 WHIZ LOCK HEX BOLT               | -    |
| -        | 500-3-0407  | BRACKET, RUBBER LATCH                          | -    |
| -        | 905-04019   | RUBBER LATCH                                   | -    |
| -        | 905-04025   | BRACKET HOOD                                   | -    |

## REAR STRUT - DUAL SMALL TIRE COMPONENTS



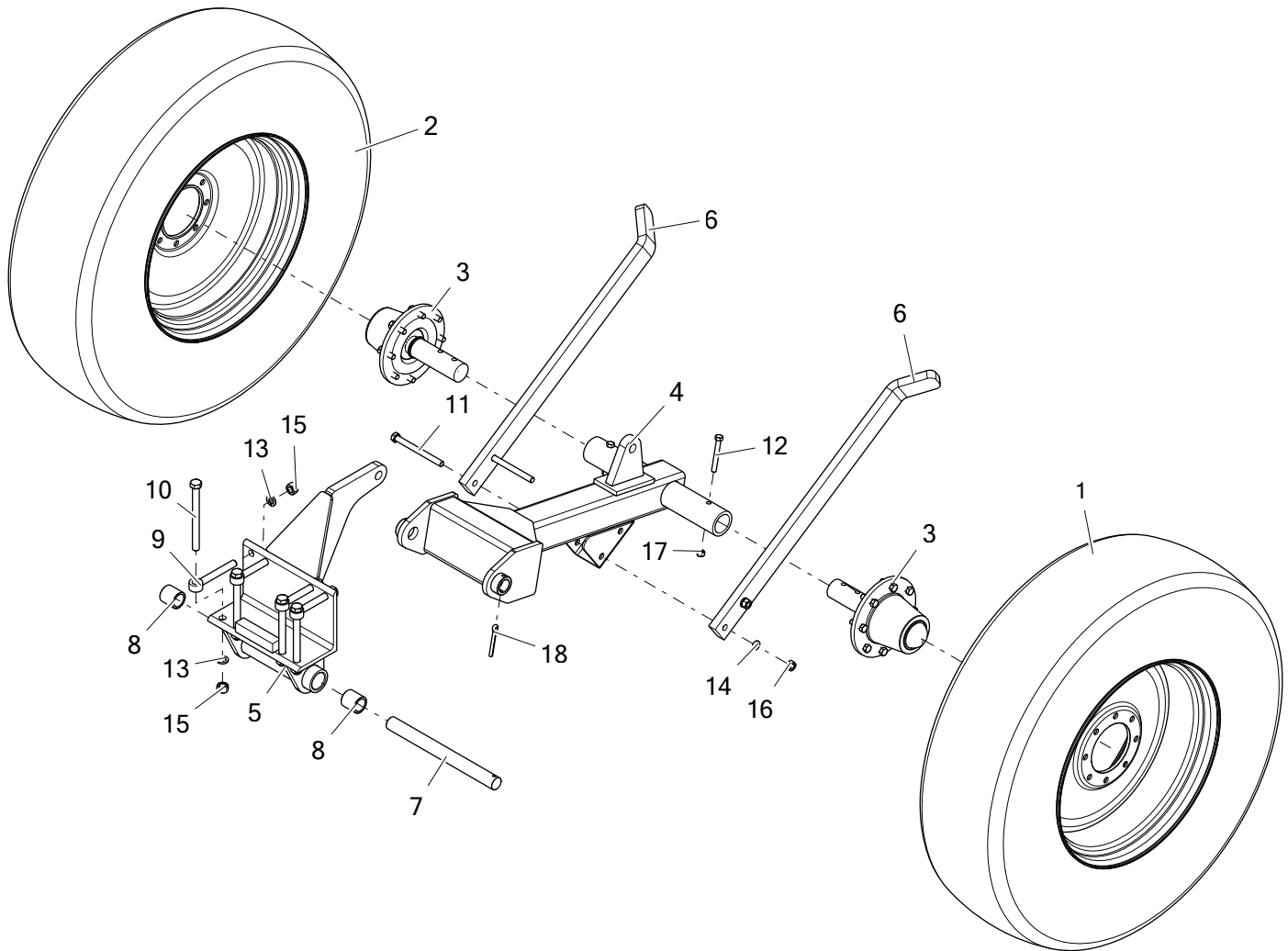
| ITEM NO. | PART NUMBER | DESCRIPTION                | QTY. |
|----------|-------------|----------------------------|------|
| 1        | 500-2-0157  | TRACTION TIRE ASSY (RH)    | 1    |
|          | 905-09100   | - TIRE, 7.6 x 15           |      |
|          | 905-09078   | - RIM, 15 x 6 x 5 BOLT     |      |
| 2        | 500-2-0158  | TRACTION TIRE ASSY (LH)    | 1    |
|          | 905-09100   | - TIRE, 7.6 x 15           |      |
|          | 905-09078   | - RIM, 15 x 6 x 5 BOLT     |      |
| 3        | 500-2-0972  | HUB & SPINDLE ASSY         | 2    |
| 4        | 500-2-0973  | LOWER STRUT (22")          | 1    |
|          | 500-2-0595  | LOWER STRUT (30")          |      |
| 5        | 500-2-0576  | UPPER STUT                 | 1    |
| 6        | 200-3-0024  | U-BOLT, 3/4 NC x 6 x 5-1/2 | 2    |
| 7        | 200-3-1440  | U-BOLT, 3/4 NC x 4 x 5-1/2 | 1    |
| 8        | 500-3-2421  | ADJUSTMENT PLATE           | 2    |

## REAR STRUT - SINGLE LARGE TIRE COMPONENTS



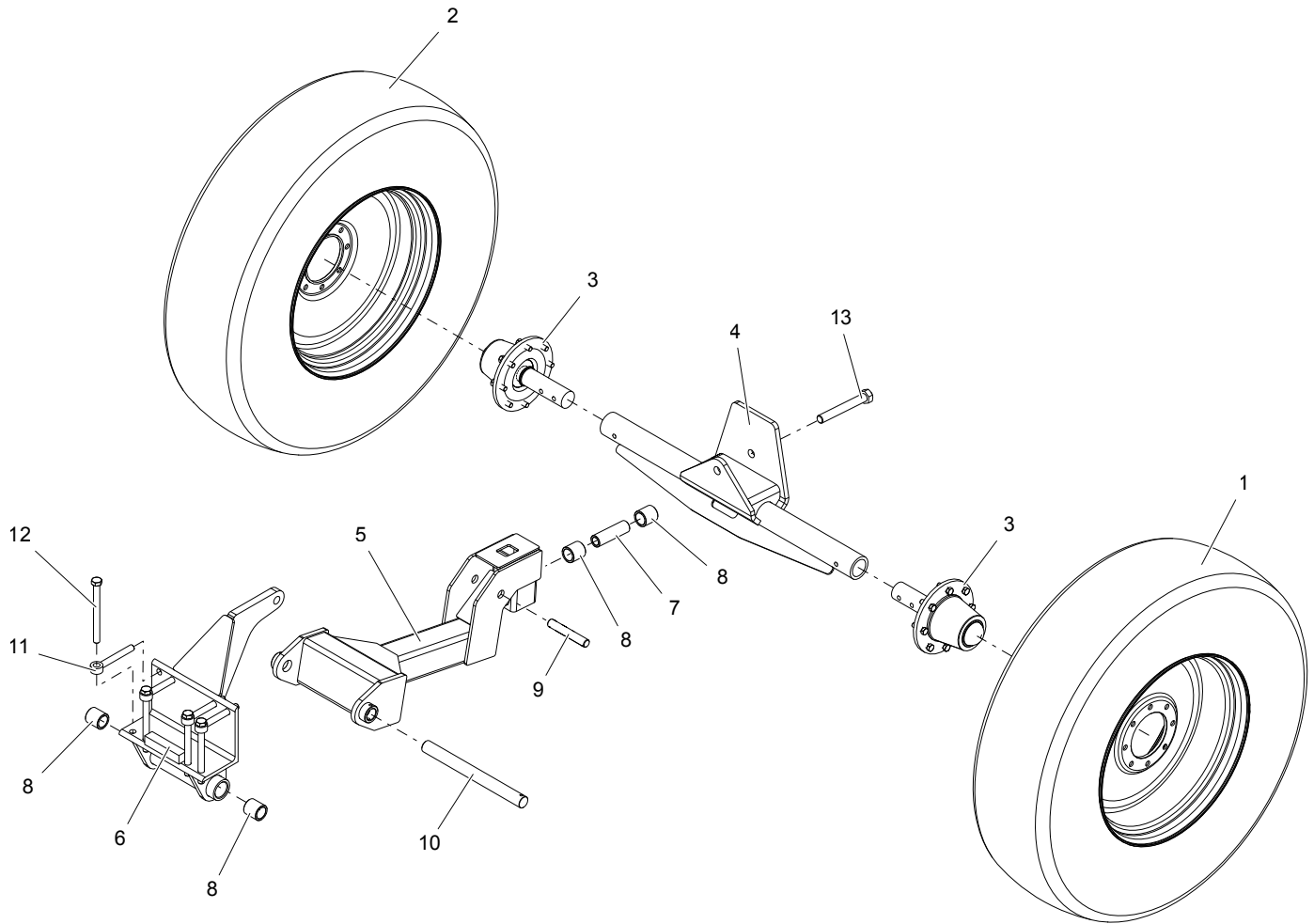
| ITEM NO. | PART NUMBER | DESCRIPTION                    | QTY. |
|----------|-------------|--------------------------------|------|
| 1        | 700-2-0168  | TRACTION TIRE ASSY (RH)        | 1    |
|          | 905-09130   | - TIRE, 12.4 X 24              |      |
|          | 905-09127   | - RIM, 24 x 10 x 8 BOLT        |      |
|          | 700-2-0167  | TRACTION TIRE ASSY (LH)        |      |
|          | 905-09130   | - TIRE, 12.4 X 24              |      |
|          | 905-09127   | - RIM, 24 x 10 x 8 BOLT        |      |
| 2        | 700-2-0165  | HUB & SPINDLE ASSY             | 1    |
| 3        | 500-2-0993  | SINGLE REAR STRUT (RH)         | 1    |
|          | 500-2-1065  | SINGLE REAR STRUT (LH)         |      |
| 4        | 500-2-1046  | MOUNTING ANGLE                 | 1    |
| 5        | 500-3-2259  | WHEEL SCRAPER (12.4 x 24 TIRE) | 1    |
| 6        | 500-3-1328  | PIVOT PIN                      | 1    |
| 7        | 500-3-1151  | BUSHING                        | 2    |
| 8        | 900-01437   | BOLT, 3/4 NC x 8-1/2           | 4    |
| 9        | 900-03463   | EYE BOLT, 3/4 NC x 6           | 4    |

## REAR STRUT - DUAL LARGE TIRE COMPONENTS



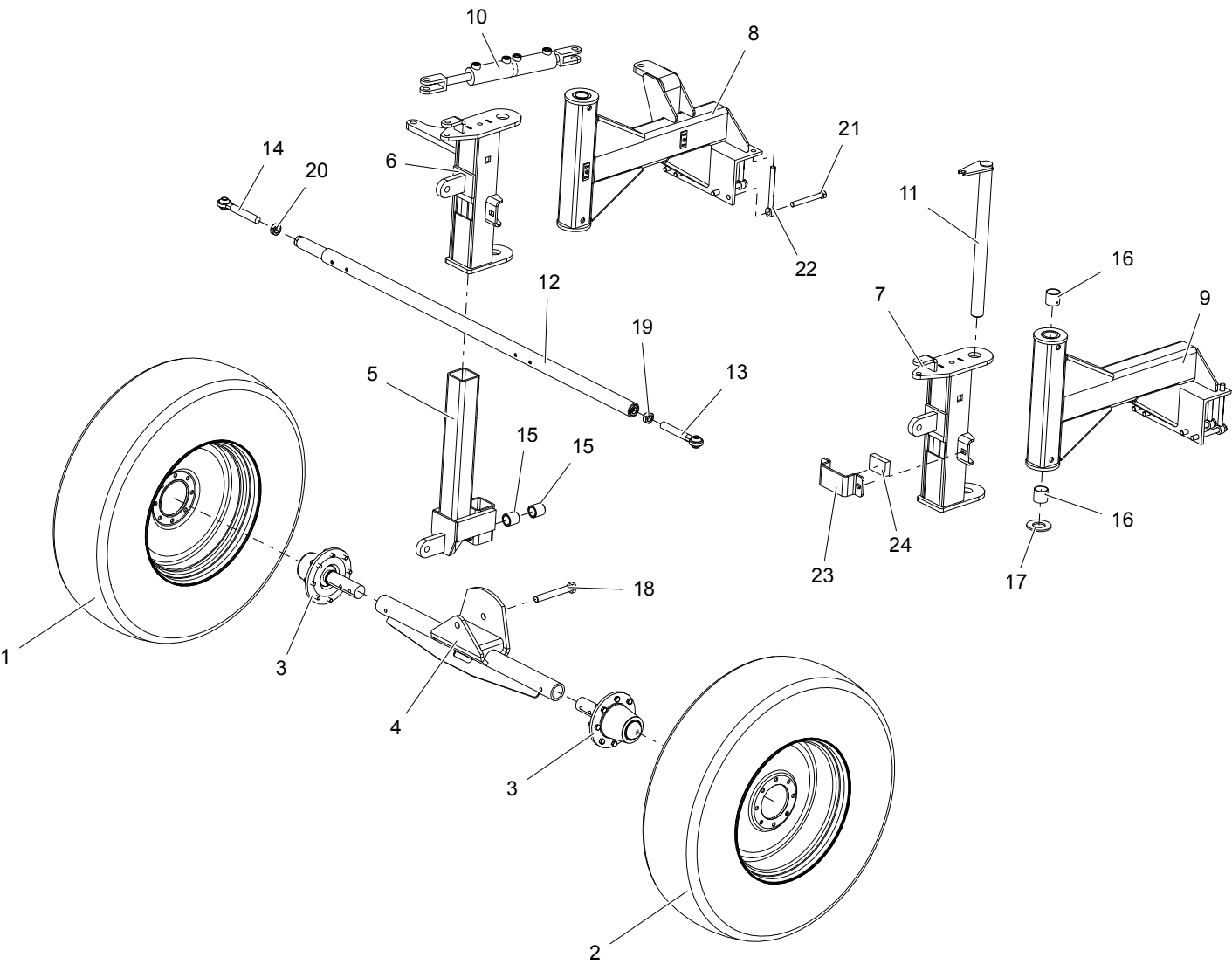
| ITEM NO. | PART NUMBER                          | DESCRIPTION                                                             | QTY. |
|----------|--------------------------------------|-------------------------------------------------------------------------|------|
| 1        | 700-2-0167<br>905-09130<br>905-09127 | TRACTION TIRE ASSY (RH)<br>- TIRE, 12.4 X 24<br>- RIM, 24 x 10 x 8 BOLT | 1    |
| 2        | 700-2-0168<br>905-09130<br>905-09127 | TRACTION TIRE ASSY (LH)<br>- TIRE, 12.4 X 24<br>- RIM, 24 x 10 x 8 BOLT | 1    |
| 3        | 700-2-0165                           | HUB & SPINDLE ASSY                                                      | 2    |
| 4        | 500-2-0998<br>500-2-1023             | DUAL REAR STRUT (22")<br>DUAL REAR STRUT (30")                          | 1    |
| 5        | 500-2-1046                           | MOUNTING ANGLE                                                          | 1    |
| 6        | 500-3-2259                           | WHEEL SCRAPER (12.4 x 24 TIRE)                                          | 2    |
| 7        | 500-3-1328                           | PIVOT PIN                                                               | 1    |
| 8        | 500-3-1151                           | BUSHING                                                                 | 2    |
| 9        | 900-03463                            | EYE BOLT, 3/4 NC x 6                                                    | 4    |
| 10       | 900-01437                            | BOLT, 3/4 NC x 8-1/2                                                    | 4    |

## REAR STRUT - DUAL LARGE TIRE (PIVOT) COMPONENTS



| ITEM NO. | PART NUMBER | DESCRIPTION             | QTY. |
|----------|-------------|-------------------------|------|
| 1        | 700-2-0167  | TRACTION TIRE ASSY (RH) | 1    |
|          | 905-09130   | - TIRE, 12.4 X 24       |      |
|          | 905-09127   | - RIM, 24 x 10 x 8 BOLT |      |
| 2        | 700-2-0168  | TRACTION TIRE ASSY (LH) | 1    |
|          | 905-09130   | - TIRE, 12.4 X 24       |      |
|          | 905-09127   | - RIM, 24 x 10 x 8 BOLT |      |
| 3        | 700-2-0165  | HUB & SPINDLE ASSY      | 2    |
| 4        | 500-2-1072  | SPINDLE HOLDER (44")    | 1    |
|          | 500-2-1239  | SPINDLE HOLDER (30")    |      |
| 5        | 500-2-1071  | REAR DUAL PIVOT STRUT   | 1    |
| 6        | 500-2-1046  | MOUNTING ANGLE          | 1    |
| 7        | 500-3-2236  | PIVOT BUSHING           | 1    |
| 8        | 500-3-1151  | BUSHING                 | 4    |
| 9        | 500-3-2270  | CYLINDER PIN            | 1    |
| 10       | 500-3-1328  | PIVOT PIN               | 1    |
| 11       | 900-03463   | EYE BOLT, 3/4 NC x 6    | 4    |
| 12       | 900-01437   | BOLT, 3/4 NC x 8-1/2    | 4    |
| 13       | 900-01541   | BOLT, 1 NC x 7-1/2      | 1    |

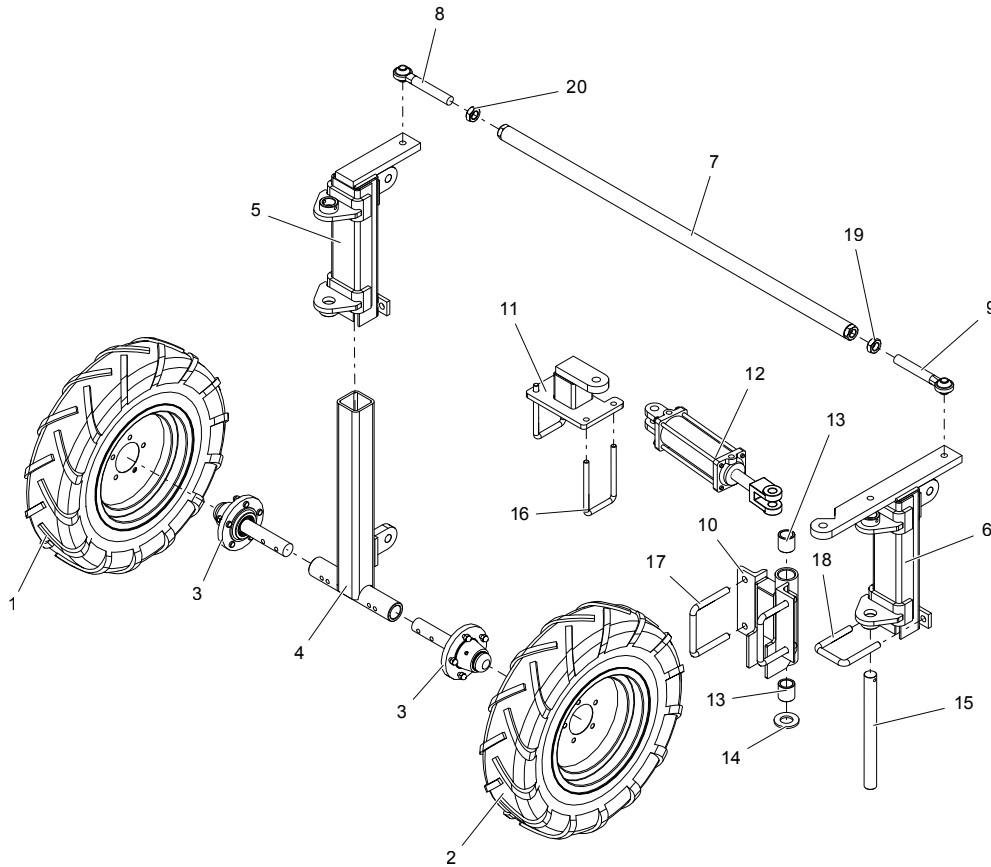
REAR STEER - DUAL LARGE TIRE (PIVOT) COMPONENTS



## REAR STEER - DUAL LARGE TIRE (PIVOT) COMPONENTS

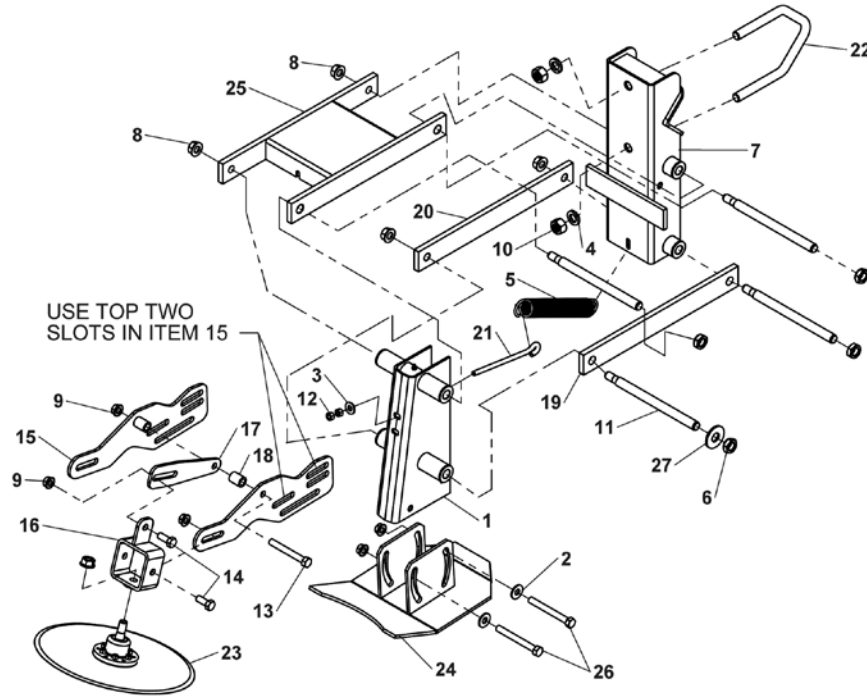
| ITEM NO. | PART NUMBER | DESCRIPTION                  | QTY. |
|----------|-------------|------------------------------|------|
| 1        | 700-2-0167  | TRACTION TIRE ASSY (RH)      | 2    |
|          | 905-09130   | - TIRE, 12.4 X 24            |      |
|          | 905-09127   | - RIM, 24 x 10 x 8 BOLT      |      |
| 2        | 700-2-0168  | TRACTION TIRE ASSY (LH)      | 2    |
|          | 905-09130   | - TIRE, 12.4 X 24            |      |
|          | 905-09127   | - RIM, 24 x 10 x 8 BOLT      |      |
| 3        | 700-2-0165  | HUB & SPINDLE ASSY           | 4    |
| 4        | 500-2-1042  | SPINDLE HOLDER (30")         | 2    |
|          | 500-2-1151  | SPINDLE HOLDER (44")         |      |
| 5        | 500-2-1153  | LOWER STRUT                  | 2    |
| 6        | 500-2-2448  | LOWER PIVOT (W/ EAR)         | 1    |
| 7        | 500-2-1220  | LOWER PIVOT (W/O EAR)        | 1    |
| 8        | 500-2-1209  | UPPER STRUT (W/ EAR)         | 1    |
| 9        | 500-2-1219  | UPPER STRUT (W/O EAR)        | 1    |
| 10       | 905-21452   | CYLINDER 1-1/4 x 2-1/2 x 4   | 1    |
| 11       | 500-2-0828  | PIN                          | 2    |
| 12       | 500-2-1200  | TIE ROD (66" SPACING)        | 1    |
|          | 500-2-1205  | TIE ROD (88" - 154" SPACING) |      |
| 13       | 903-05031   | PIVOT LINK (RH)              | 1    |
| 14       | 903-05030   | PIVOT LINK (LH)              | 1    |
| 15       | 500-3-1151  | BUSHING                      | 4    |
| 16       | 200-3-4081  | BUSHING                      | 4    |
| 17       | 901-01145   | BUSHING (OILITE)             | 2    |
| 18       | 900-01541   | BOLT, 1 NC x 7-1/2           | 2    |
| 19       | 900-06288   | JAM NUT, 1-1/8 NC (RH)       | 1    |
| 20       | 900-06310   | JAM NUT, 1-1/8 NC (LH)       | 1    |
| 21       | 900-01429   | BOLT, 3/4 NC x 6-1/2         | 8    |
| 22       | 900-03462   | EYE BOLT, 3/4 NC x 8         | 8    |
| 23       | 500-3-2517  | PRESSURE PLATE               | 2    |
| 24       | 500-3-2519  | WEAR                         | 2    |

## REAR STEER - DUAL SMALL TIRE COMPONENTS



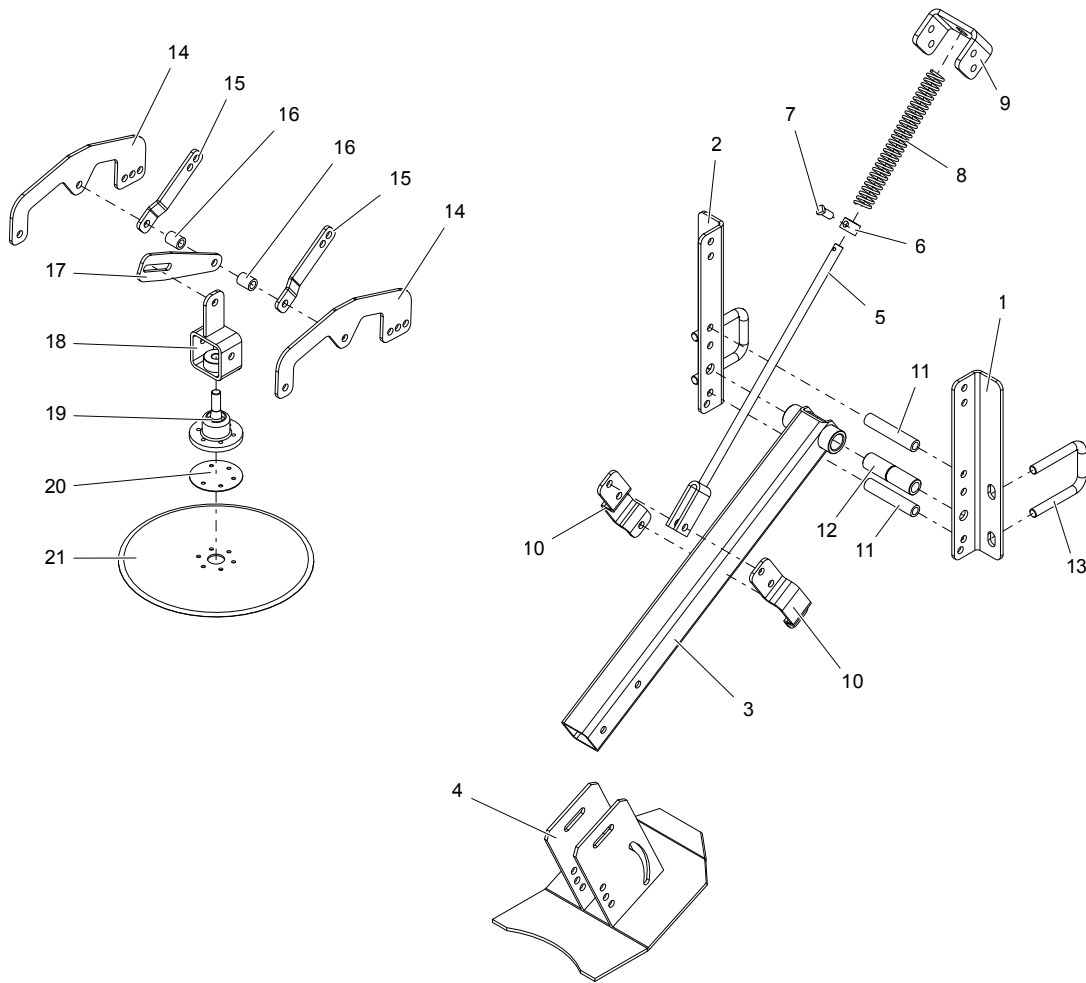
| ITEM NO. | PART NUMBER | DESCRIPTION                  | QTY. |
|----------|-------------|------------------------------|------|
| 1        | 500-2-0158  | TRACTION TIRE ASSY (LH)      | -    |
|          | 905-09100   | - TIRE, 7.6 x 15             |      |
|          | 905-09078   | - RIM, 15 x 6 x 5 BOLT       |      |
| 2        | 500-2-0157  | TRACTION TIRE ASSY (RH)      | -    |
|          | 905-09100   | - TIRE, 7.6 x 15             |      |
|          | 905-09078   | - RIM, 15 x 6 x 5 BOLT       |      |
| 3        | 500-2-0972  | HUB & SPINDLE ASSY           | -    |
| 4        | 500-2-0973  | LOWER STRUT (22")            | -    |
|          | 500-2-0596  | LOWER STRUT (30")            |      |
| 5        | 500-2-0625  | UPPER STRUT (W/O EAR)        | -    |
| 6        | 500-2-0624  | UPPER STRUT (W/ EAR)         | -    |
| 7        | 500-2-1200  | TIE ROD (66" SPACING)        | -    |
|          | 500-2-1205  | TIE ROD (88" - 154" SPACING) |      |
| 8        | 903-05030   | PIVOT LINK (LH)              | -    |
| 9        | 903-05031   | PIVOT LINK (RH)              | -    |
| 10       | 500-2-0622  | PIVOT BASE                   | -    |
| 11       | 500-2-0621  | CYLINDER MOUNT               | 1    |
| 12       | 905-21302   | CYLINDER 3-1/2 x 8           | 1    |
| 13       | 500-3-1151  | BUSHING                      | -    |
| 14       | 500-3-0538  | SPACER BUSHING               | -    |
| 15       | 500-3-1328  | PIVOT PIN                    | -    |
| 16       | 200-3-0017  | U-BOLT, 5/8 NC x 4 x 7-1/4   | -    |
| 17       | 200-3-0024  | U-BOLT, 3/4 NC x 6 x 5-1/2   | -    |
| 18       | 200-3-1440  | U-BOLT, 3/4 NC x 4 x 5-1/2   | -    |
| 19       | 900-06288   | JAM NUT, 1-1/8 NC (RH)       | -    |
| 20       | 900-06310   | JAM NUT, 1-1/8 NC (LH)       | -    |

## CIRCULAR KNIFE SCALPER - PARALLEL ARM



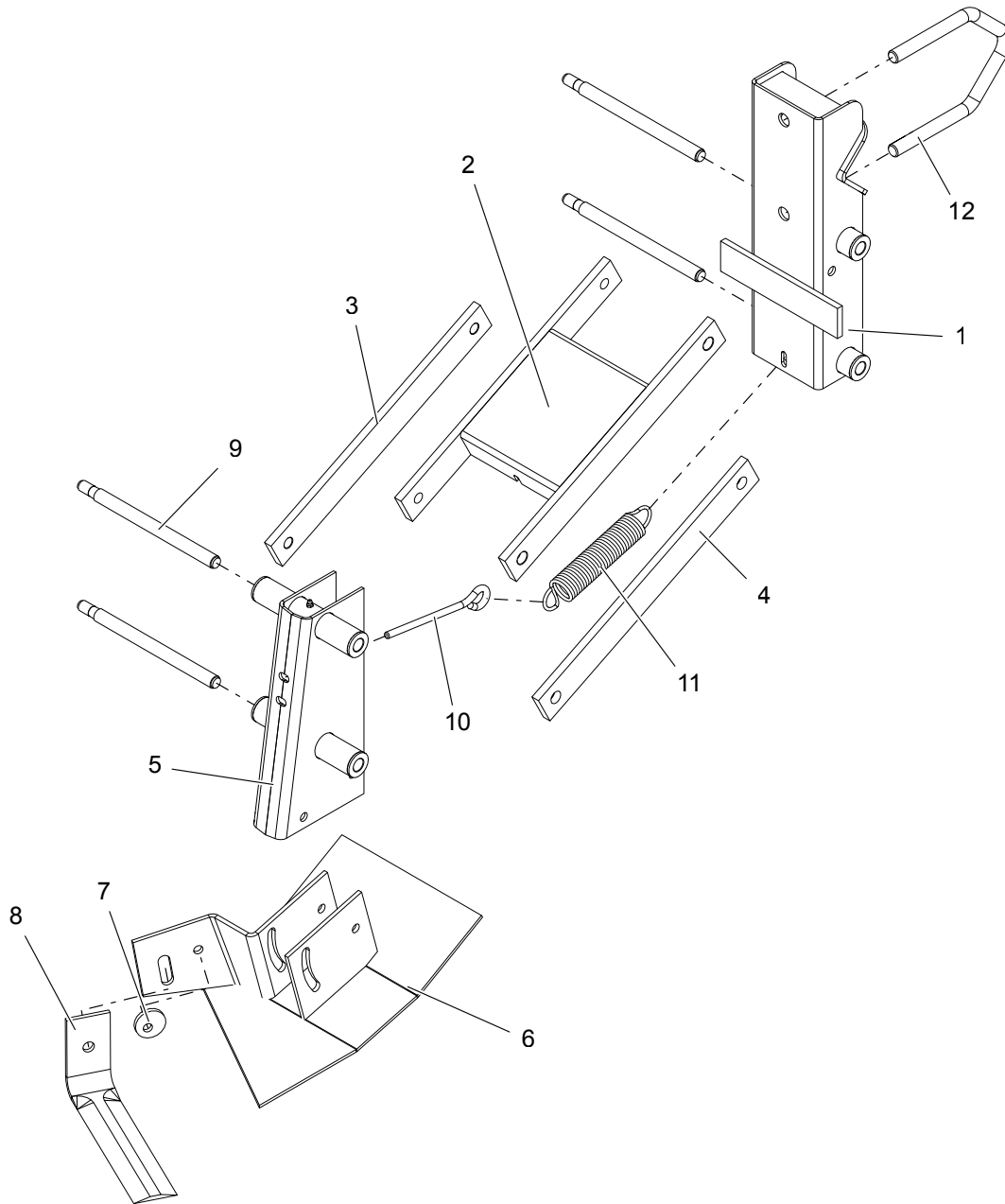
| ITEM NO. | PART NUMBER | DESCRIPTION                 | QTY. |
|----------|-------------|-----------------------------|------|
| 1        | 500-2-0338  | UPRIGHT WELD                | 1    |
| 2        | 900-11035   | 1/2 FLAT WASHER, ZP         | 2    |
| 3        | 900-11033   | 3/8 FLAT WASHER, ZP         | 1    |
| 4        | 900-11017   | 3/4 LOCK WASHER             | 2    |
| 5        | 400-3-0263  | SPRING, GM AND ALLOWBOOM    |      |
| 6        | 900-06510   | 3/4 NC TOP LOCK NUT, ZP     | 4    |
| 7        | 500-2-0330  | MOUNT WELD                  | 1    |
| 8        | 900-06145   | 5/8 NC SPIRALOCK FLANGE NUT | 5    |
| 9        | 900-06143   | 1/2 NC SPIRALOCK FLANGE NUT | 6    |
| 10       | 900-06015   | 3/4 NC HEX NUT ZP           | 2    |
| 11       | 200-3-2631  | PIN, PLATED                 | 4    |
| 12       | 900-06005   | 3/8 NC HEX NUT, ZP          | 2    |
| 13       | 900-01245   | 1/2 NC X 4 HEX BOLT, GR5    | 1    |
| 14       | 900-01223   | 1/2 NC X 1-1/4 HEX BOLT     | 3    |
| 15       | 500-3-1563  | PLATE, BRACKET, REAR TOP    | 2    |
| 16       | 500-2-0774  | BRACKET, PIVOT              | 1    |
| 17       | 500-3-1557  | STRAP, TOP REAR, ADJ.       | 1    |
| 18       | 500-3-1556  | REAR SPACER TUBE            | 2    |
| 19       | 500-3-0992  | BAR, 3/4 HOLES              | 1    |
| 20       | 500-3-0991  | BAR, 5/8 HOLES              | 1    |
| 21       | 500-3-0675  | 3/8 EYE BOLT X 8" LONG      | 1    |
| 22       | 500-3-0635  | A-BOLT, 3/4 X 4 X 4         | 1    |
| 23       | 500-2-0762  | HUB ASSY, SCALPER           | 1    |
|          | 500-3-1582  | DISC                        | 1    |
|          | 901-09219   | HUB ASSY                    | 1    |
|          | 901-09220   | HUB REPAIR KIT              | 1    |
| 24       | 500-2-0704  | SCALPER SHOE WELD           | 1    |
| 25       | 500-2-0518  | H-WELD                      | 1    |
| 26       | 900-01247   | 1/2 NC X 4-1/2 HEX BOLT GR5 | 2    |

## CIRCULAR KNIFE SCALPER - STRAIGHT ARM



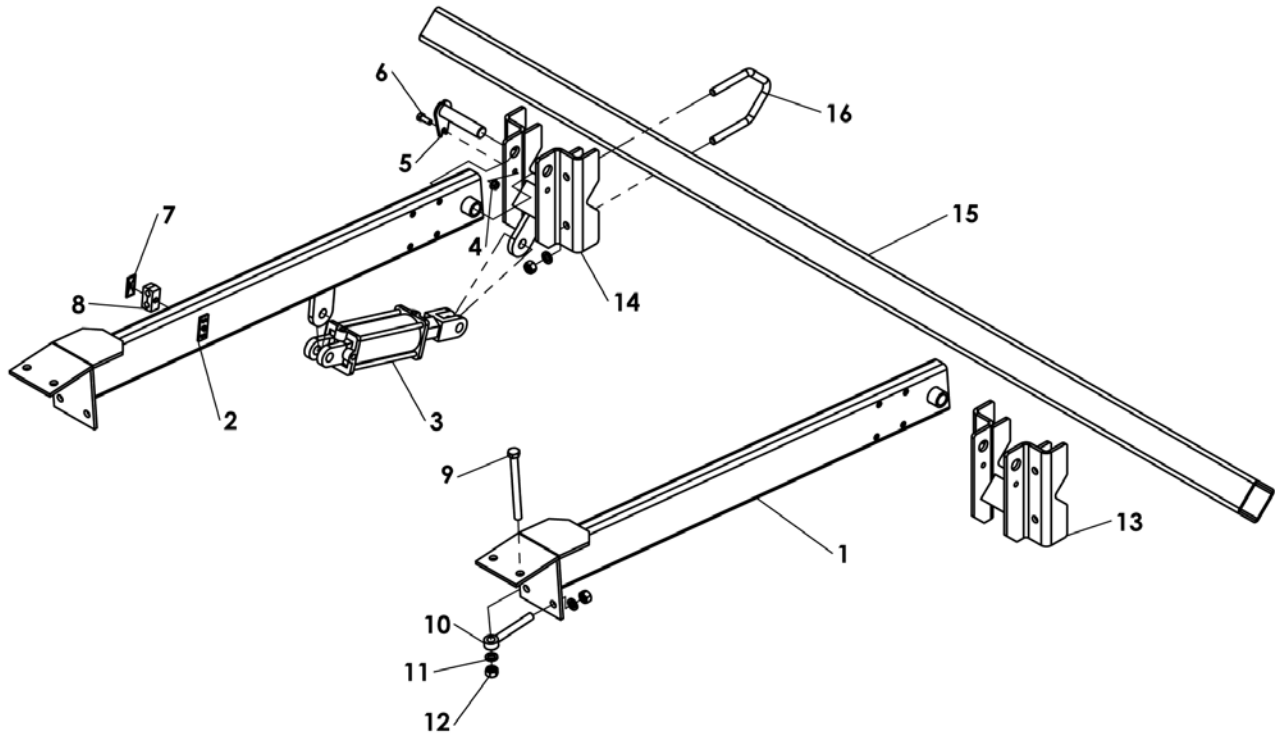
| ITEM NO. | PART NUMBER | DESCRIPTION                | QTY. |
|----------|-------------|----------------------------|------|
| 1        | 500-3-1754  | MOUNT (RH)                 | 1    |
| 2        | 500-3-1755  | MOUNT (LH)                 | 1    |
| 3        | 500-2-1139  | PIVOT ARM                  | 1    |
| 4        | 500-2-1068  | SCALPER SHOE               | 1    |
| 5        | 500-2-0072  | LIFT ROD                   | 1    |
| 6        | 500-3-0172  | RETAINING COLLAR           | 1    |
| 7        | 900-16063   | SET SCREW, 1/2 N x 1-1/4   | 1    |
| 8        | 500-3-0157  | SPRING                     | 1    |
| 9        | 500-3-1756  | SPRING RETAINER            | 1    |
| 10       | 500-3-1757  | LIFT ROD CLAMP             | 2    |
| 11       | 500-3-1561  | MOUNT SPACER               | 2    |
| 12       | 500-3-2411  | PIVOT BUSHING              | 1    |
| 13       | 900-35026   | U-BOLT, 5/8 NC x 3 x 4-1/2 | 2    |
| 14       | 500-3-2507  | SHOE LINK BAR              | 2    |
| 15       | 500-3-2265  | SHOE ADJUSTMENT ARM        | 2    |
| 16       | 500-3-1556  | DISC SPACER                | 2    |
| 17       | 500-3-1557  | DISC ADJUSTMENT ARM        | 1    |
| 18       | 500-2-1138  | DISC MOUNT                 | 1    |
| 19       | 905-09178   | ROTARY DISC HUB            | 1    |
| 20       | 500-3-1940  | DISC COVER                 | 1    |
| 21       | 500-3-1582  | ROTARY DISC                | 1    |

## STRAIGHT KNIFE SCALPER - PARALLEL ARM



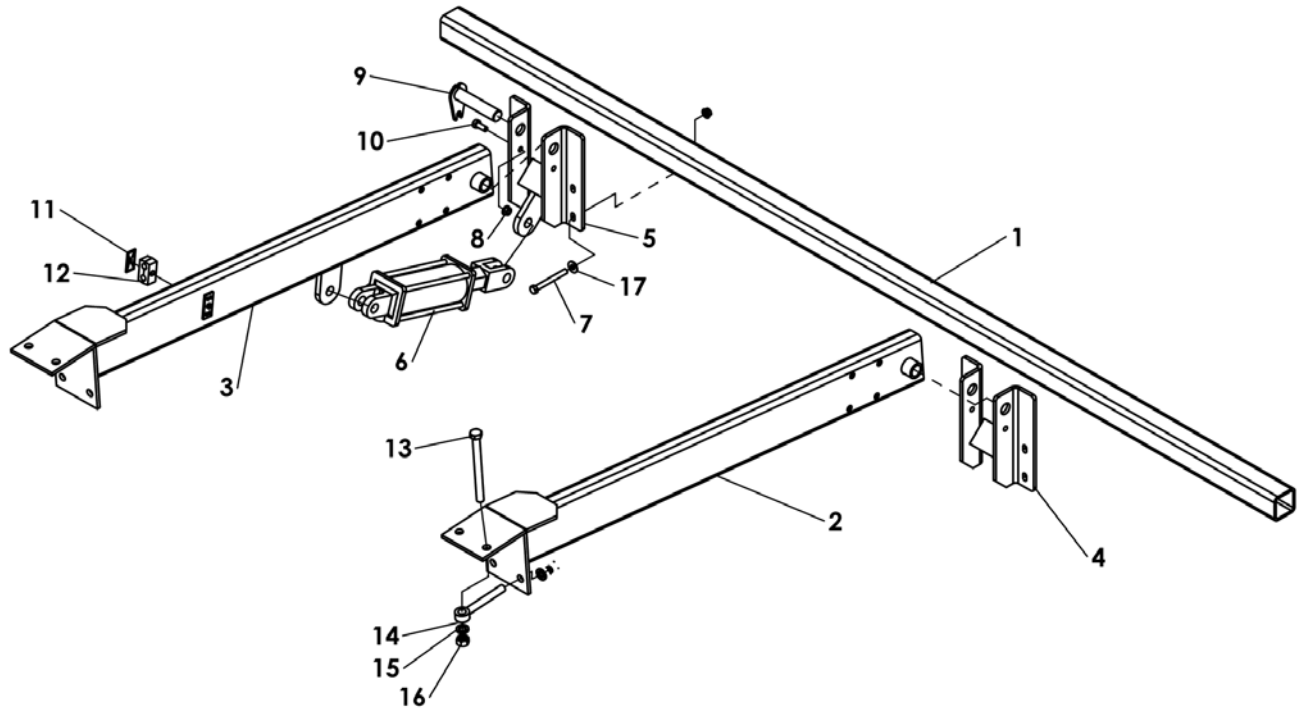
| ITEM NO. | PART NUMBER | DESCRIPTION            | QTY. |
|----------|-------------|------------------------|------|
| 1        | 500-2-0330  | UPPER MOUNT            | 1    |
| 2        | 500-2-0518  | "H" LINKAGE ARM        | 1    |
| 3        | 500-3-0991  | LINKAGE ARM (LH)       | 1    |
| 4        | 500-3-0992  | LINKAGE ARM (RH)       | 1    |
| 5        | 500-2-0338  | LOWER SHOE MOUNT       | 1    |
| 6        | 500-2-0335  | SHOE (LH)              | 1    |
| 7        | 500-2-0336  | SHOE (RH)              | 1    |
| 8        | 500-3-0201  | ECCENTRIC SPACER       | 1    |
| 9        | 500-3-0910  | KNIFE SCALPER          | 1    |
| 9        | 200-3-2631  | PIN                    | 4    |
| 10       | 500-3-0675  | EYE BOLT, 3.8 x 8      | 1    |
| 11       | 400-3-0263  | EXTENSION SPRING       | 1    |
| 12       | 500-3-0635  | A-BOLT, 3/4 NC x 4 x 4 | 1    |

## SCALPER TOOLBAR COMPONENTS - PARALLEL ARM



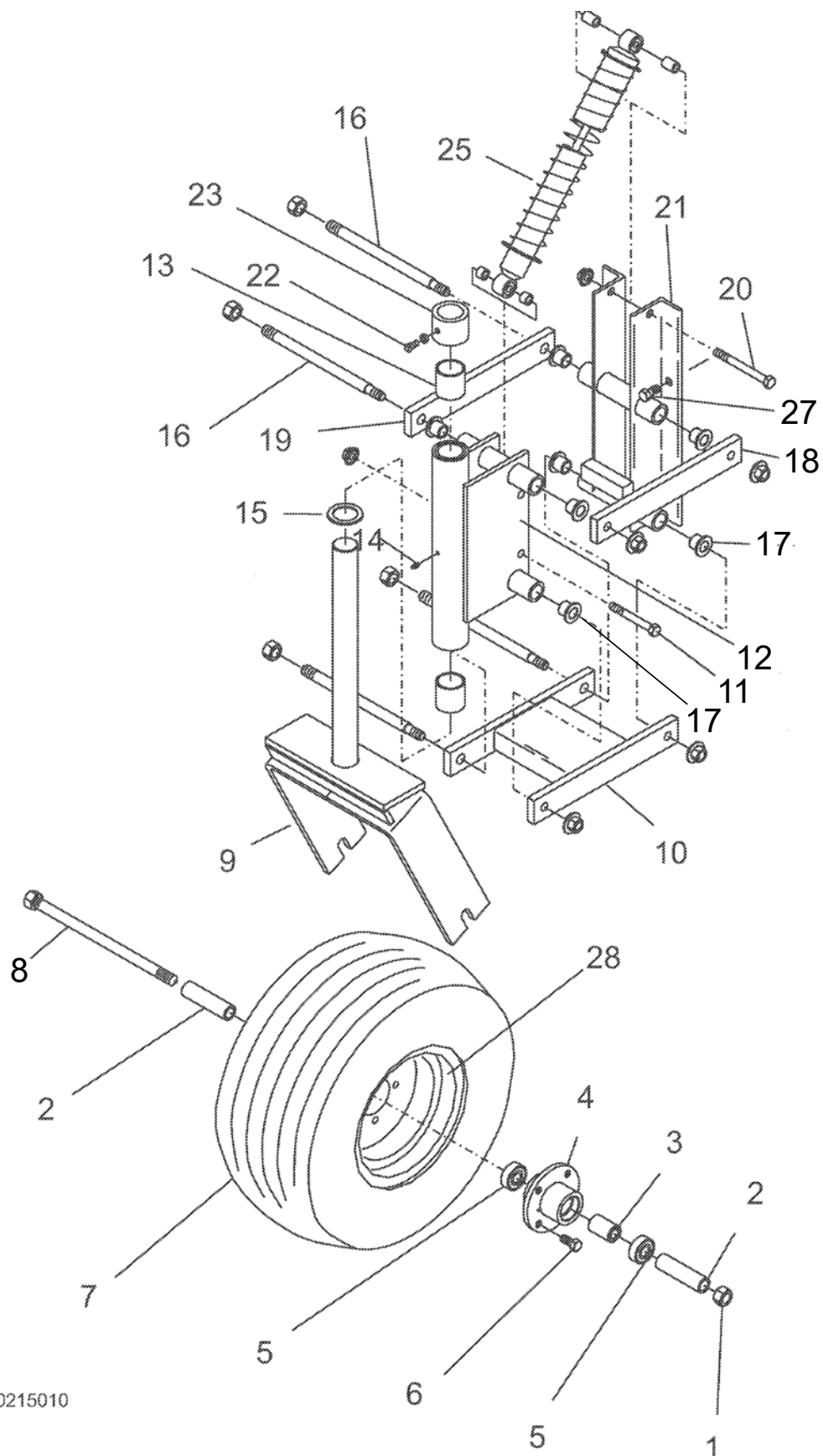
| ITEM NO. | PART NUMBER | DESCRIPTION                                  | QTY. |
|----------|-------------|----------------------------------------------|------|
| 1        | 500-2-0692  | OUTER SETBACK ARM WELDMENT (LARGE TIRES)     | -    |
|          | 500-2-1040  | OUTER SETBACK ARM WELDMENT (SMALL TIRES)     | -    |
| 2        | 500-2-0691  | INNER SETBACK ARM WELDMENT (LARGE TIRES)     | -    |
|          | 500-2-1041  | INNER SETBACK ARM WELDMENT (SMALL TIRES)     | -    |
| 3        | 905-21400   | HYDRAULIC CYLINDER - 3.5 X 8                 | -    |
|          | 905-21380   | - SEAL KIT ( <b>PRINCE CYLINDERS ONLY</b> )  | -    |
|          | 905-21401   | - SEAL KIT ( <b>MONARCK CYLINDERS ONLY</b> ) | -    |
| 4        | 900-06143   | 1/2 NC SPIRAL LOCK NUT ZP GR5                | -    |
| 5        | 500-2-0684  | 1-1/4" PIN WELDMENT                          | -    |
| 6        | 900-01223   | 1/2 NC X 1-1/2 HEX BOLT GR 5                 | -    |
| 7        | 900-31068   | COVER PLATE AND BOLT                         | -    |
| 8        | 900-31069   | CLAMP BODY                                   | -    |
| 9        | 900-01437   | HEX BOLT - 3/4 NC X 8-1/2 GR5                | -    |
| 10       | 900-03463   | 3/4-10 EYE BOLT                              | -    |
| 11       | 900-11017   | 3/4 LOCK WASHER                              | -    |
| 12       | 900-06015   | HEX NUT - 3/4 NC                             | -    |
| 13       | 500-2-0942  | SCALPER MOUNT OUTER                          | -    |
| 14       | 500-2-0941  | SCALPER MOUNT INNER                          | -    |
| 15       | 500-3-2094  | SCALPER TUBE (430, 622)                      | 1    |
|          | 500-3-2094  | SCALPER TUBE (1222)                          | 2    |
|          | 500-3-2183  | SCALPER TUBE (630, 822)                      | 1    |
|          | 500-3-2184  | SCALPER TUBE (922)                           | 1    |
| 16       | 500-3-0635  | 3/4-10 X 4 A BOLT                            | -    |

## SCALPER TOOLBAR COMPONENTS - STRAIGHT ARM



| ITEM NO. | PART NUMBER | DESCRIPTION                                  | QTY. |
|----------|-------------|----------------------------------------------|------|
| 1        | 500-3-1579  | SCALPER TUBE (430, 622)                      | 1    |
|          | 500-3-1579  | SCALPER TUBE (1222)                          | 2    |
|          | 500-3-2181  | SCALPER TUBE (630, 822)                      | 1    |
|          | 500-3-2182  | SCALPER TUBE (922)                           | 1    |
| 2        | 500-2-0692  | OUTER SETBACK ARM WELDMENT (LARGE TIRES)     | -    |
|          | 500-2-1040  | OUTER SETBACK ARM WELDMENT (SMALL TIRES)     | -    |
| 3        | 500-2-0691  | INNER SETBACK ARM WELDMENT (LARGE TIRES)     | -    |
|          | 500-2-1041  | INNER SETBACK ARM WELDMENT (SMALL TIRES)     | -    |
| 4        | 500-2-0696  | SCALPER MOUNT OUTER                          | -    |
| 5        | 500-2-0695  | SCALPER MOUNT INNER                          | -    |
| 6        | 905-21400   | HYDRAULIC CYLINDER - 3.5 X 8                 | -    |
|          | 905-21380   | - SEAL KIT ( <b>PRINCE CYLINDERS ONLY</b> )  | -    |
|          | 905-21401   | - SEAL KIT ( <b>MONARCK CYLINDERS ONLY</b> ) | -    |
|          | 900-01247   | 1/2 NC X 4-1/2 HEX BOLT GR 5 ZP              | -    |
| 8        | 900-06143   | 1/2 NC SPIRAL LOCK NUT ZP GR5                | -    |
| 9        | 500-2-0684  | 1-1/4" PIN WELDMENT                          | -    |
| 10       | 900-01223   | 1/2 NC X 1-1/2 HEX BOLT GR 5                 | -    |
| 11       | 900-31068   | COVER PLATE AND BOLT                         | -    |
| 12       | 900-31069   | CLAMP BODY                                   | -    |
| 13       | 900-01437   | HEX BOLT - 3/4 NC X 8-1/2 GR5                | -    |
| 14       | 900-03463   | 3/4-10 EYE BOLT                              | -    |
| 15       | 900-11017   | 3/4 LOCK WASHER                              | -    |
| 16       | 900-06015   | HEX NUT - 3/4 NC                             | -    |
| 17       | 900-11035   | 1/2 FLAT WASHER                              | -    |

# STABILIZER WHEEL COMPONENTS

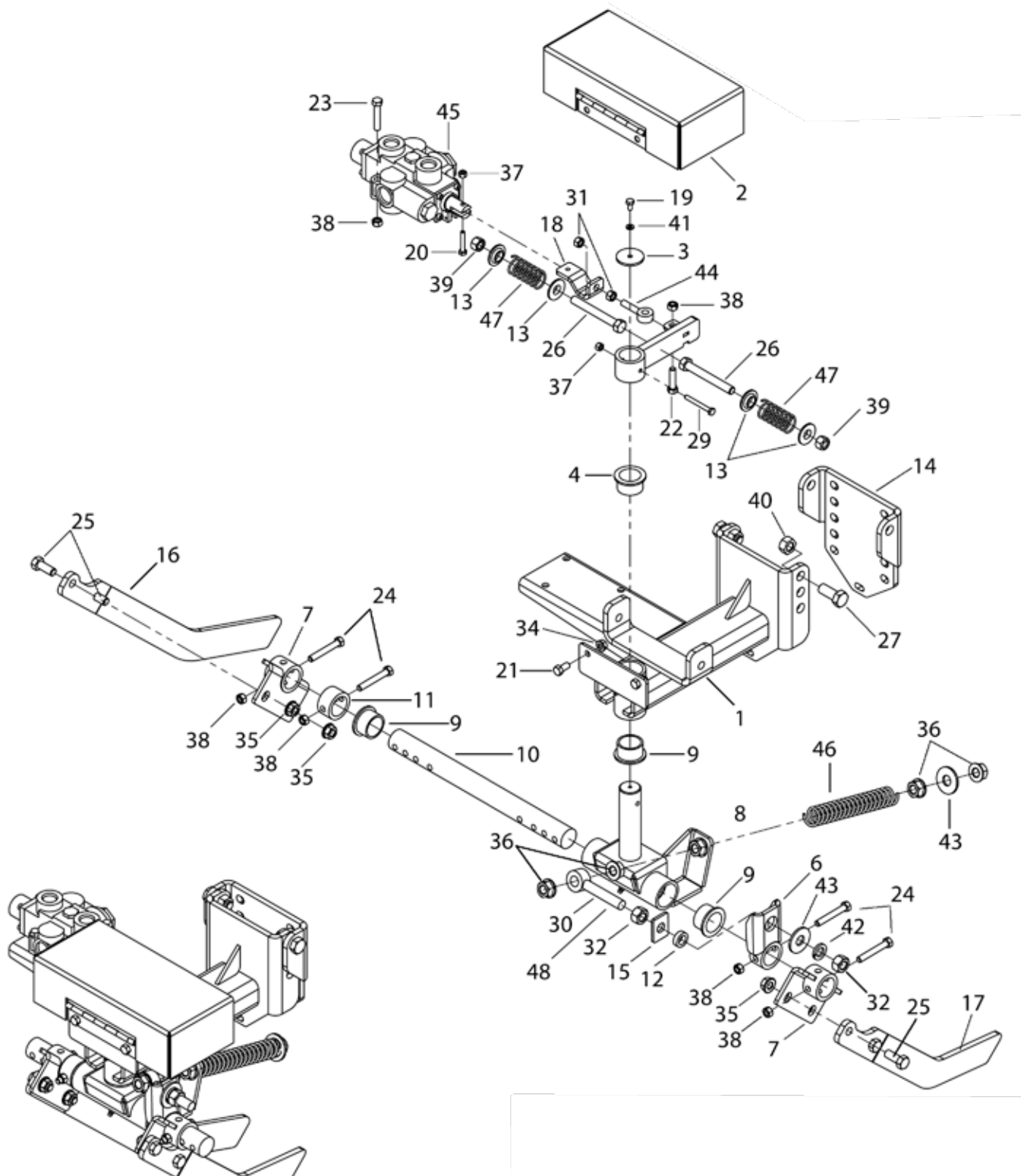


00215010

## STABILIZER WHEEL COMPONENTS

| ITEM NO. | PART NUMBER | DESCRIPTION                     | QTY. |
|----------|-------------|---------------------------------|------|
| 1        | 900-06510   | TOP LOCK NUT                    | 1    |
| 2        | 505-3-0817  | SPACER, AXLE                    | 2    |
| 3        | 505-3-0796  | AXLE TUBE                       | 1    |
| 4        | 505-2-0406  | HUB ASSEMBLY                    | 1    |
| 5        | 901-01278   | BEARING, PEER                   | 2    |
| 6        | 905-09010   | 1/2 NF X 1-1/16 WHEEL BOLT      | 4    |
| 7        | 905-09121   | WHEEL AND TIRE ASSEMBLY         | 1    |
| 8        | 505-2-0400  | BOLT WELDMENT                   | 1    |
| 9        | 505-2-0398  | CASTER WELDMENT                 | 1    |
| 10       | 200-2-1412  | H-WELDMENT                      | 1    |
| 11       | 900-01245   | 1/2 X 4 HEX BOLT                | 1    |
| 12       | 505-2-0396  | TUBE WELDMENT                   | 1    |
| 13       | 901-01261   | OILITE BUSHING                  | 2    |
| 14       | 905-15024   | GREASE ZERK, 1/4-28 STRAIGHT    | 1    |
| 15       | 901-01259   | THRUST BEARING                  | 1    |
| 16       | 200-3-2631  | PIN, PLATED                     | 4    |
| 17       | 200-3-0877  | OILITE FLANGE BUSHING           | 8    |
| 18       | 200-3-2628  | PARALLEL ARM, LH                | 1    |
| 19       | 200-3-2629  | PARALLEL ARM, RH                | 1    |
| 20       | 900-01249   | 1/2 X 5 HEX BOLT                | 1    |
| 21       | 505-2-0402  | MOUNTING ANGLE WELDMENT         | 1    |
| 22       | 900-16031   | 3/8 X 3/4 SQUARE HEAD SET SCREW | 1    |
| 23       | 500-3-0928  | COLLAR                          | 1    |
| 24       | 505-3-0816  | SPACER TUBE, BOTTOM             | 2    |
| 25       | 500-3-1047  | SHOCK                           | 1    |
| 26       | 505-3-0815  | SPACER TUBE, TOP                | 2    |
| 27       | 900-01221   | 1/2 NC X 1 HEX BOLT             | 4    |
| 28       | 905-09123   | RIM                             | 1    |
| -        | 500-2-0552  | STRUT MOUNT                     | 1    |

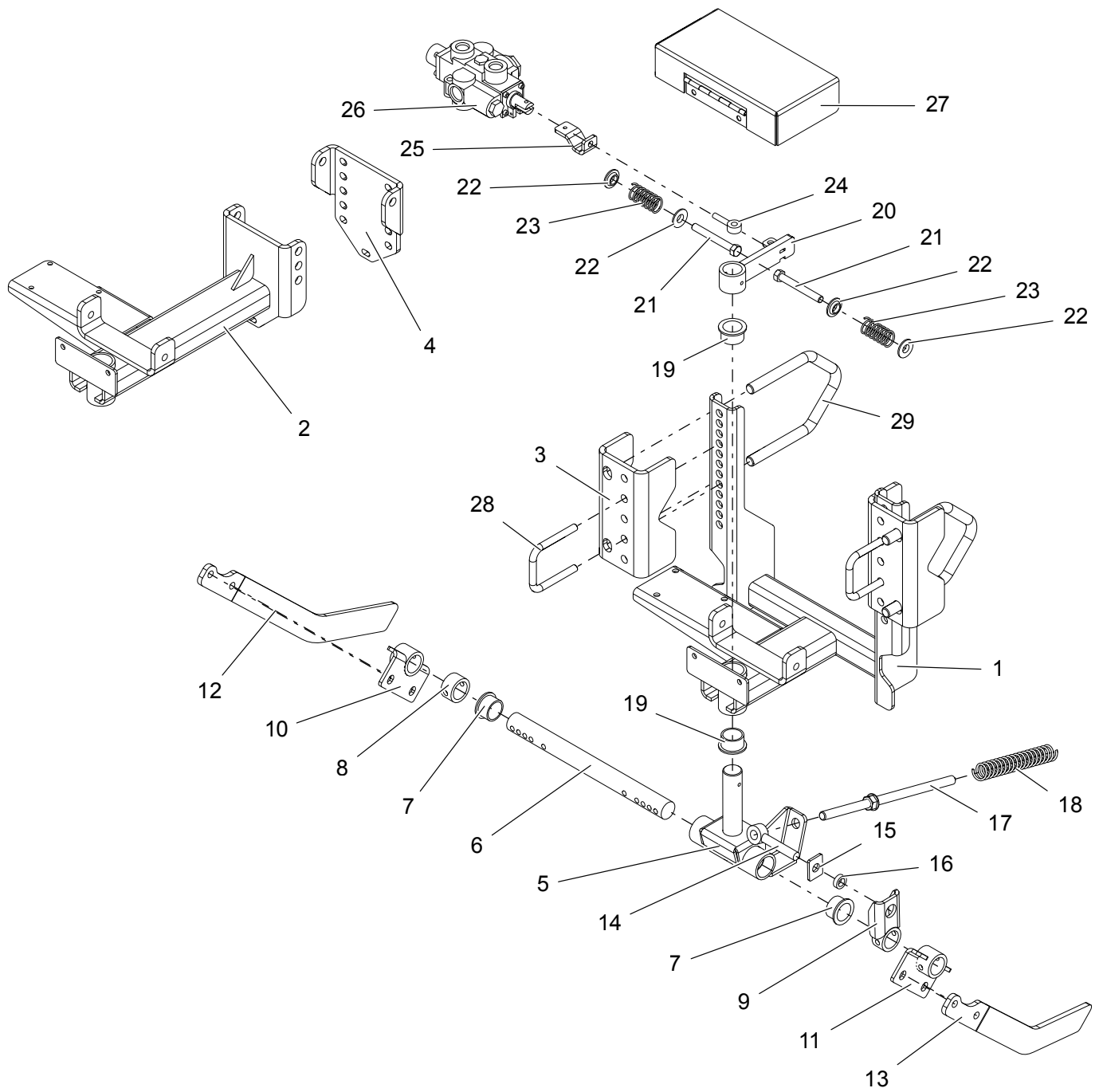
## ROW FINDER COMPONENTS



## ROW FINDER COMPONENTS

| ITEM NO. | PART NUMBER | DESCRIPTION                 | QTY. |
|----------|-------------|-----------------------------|------|
| 1        | 500-2-1249  | PIVOT MOUNT                 | 1    |
| 2        | 700-3-2186  | INNER PIVOT MOUNT           | 1    |
| 3        | 700-2-0851  | BOTTOM PIVOT                | 1    |
| 4        | 700-3-2170  | PIVOT SHAFT                 | 1    |
| 5        | 700-3-0383  | BUSHING (OILITE)            | 4    |
| 6        | 700-3-2182  | LOCK COLLAR                 | 1    |
| 7        | 700-2-0853  | SPRING TENSIONER            | 1    |
| 8        | 700-2-0854  | FINGER MOUNT                | 2    |
| 9        | 700-3-2188  | FINGER (LH)                 | 1    |
| 10       | 700-3-2189  | FINGER (RH)                 | 1    |
| 11       | 900-03465   | EYE BOLT                    | 1    |
| 12       | 700-3-2187  | INSIDE WASHER               | 1    |
| 13       | 700-3-2183  | BUSHING (TENSIONER)         | 1    |
| 14       | 700-2-0856  | TENSIONER ROD               | 1    |
| 15       | 905-14007   | TENSIONER SPRING            | 1    |
| 16       | 700-2-0850  | STEERING PADDLE             | 1    |
| 17       | 903-05044   | ROD END EYE BOLT            | 1    |
| 18       | 700-3-2343  | ADJUSTMENT PLATE            | 1    |
| 19       | 905-03262   | CONTROL VALVE               | 1    |
| 20       | 900-01245   | BOLT, 1/2 NC x 4            | 2    |
| 21       | 700-3-2185  | SPRING RETAINER             | 4    |
| 22       | 905-14022   | SPRING                      | 2    |
| 23       | 500-2-1250  | TOP COVER                   | 1    |
| -        | 500-2-1248  | ROWFINDER COMPLETE ASSEMBLY | -    |

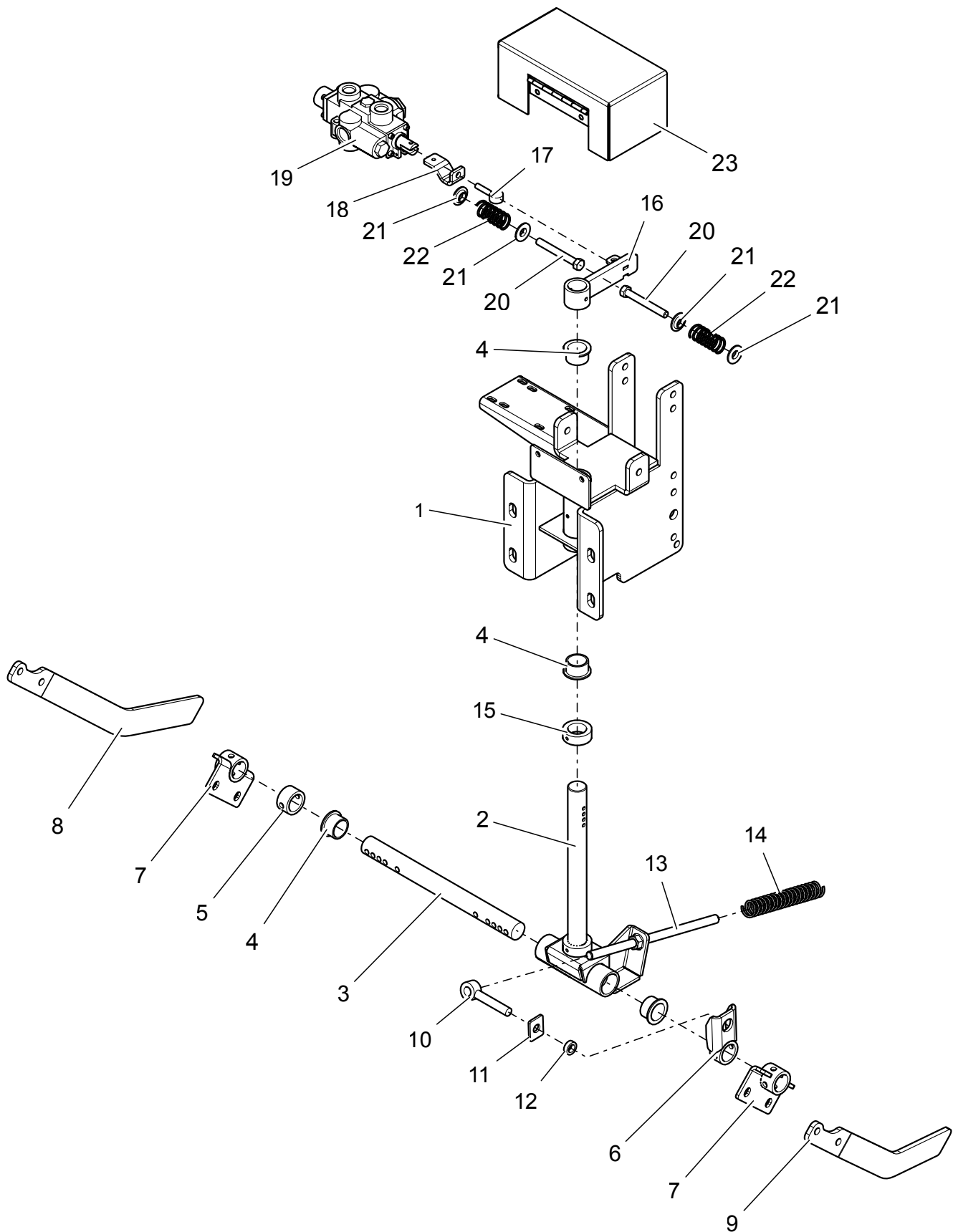
## TOOLBAR ROW FINDER COMPONENTS



## TOOLBAR ROW FINDER COMPONENTS

| ITEM NO. | PART NUMBER | DESCRIPTION                 | QTY. |
|----------|-------------|-----------------------------|------|
| 1        | 500-2-1168  | PIVOT MOUNT                 | 1    |
| 2        | 700-2-0851  | BOTTOM PIVOT                | 1    |
| 3        | 700-3-2170  | PIVOT SHAFT                 | 1    |
| 4        | 700-3-0383  | BUSHING (OILITE)            | 4    |
| 5        | 700-3-2182  | LOCK COLLAR                 | 1    |
| 6        | 700-2-0853  | SPRING TENSIONER            | 1    |
| 7        | 700-2-0854  | FINGER MOUNT                | 2    |
| 8        | 700-3-2188  | FINGER (LH)                 | 1    |
| 9        | 700-3-2189  | FINGER (RH)                 | 1    |
| 10       | 700-2-0856  | TENSIONER ROD               | 1    |
| 11       | 905-14007   | TENSIONER SPRING            | 1    |
| 12       | 700-3-2187  | INSIDE WASHER               | 1    |
| 13       | 700-3-2183  | BUSHING (TENSIONER)         | 1    |
| 14       | 900-03465   | EYE BOLT                    | 1    |
| 15       | 700-2-0850  | STEERING PADDLE             | 1    |
| 16       | 500-3-1578  | U-BOLT, 1/2NC x 3 x 4       | 2    |
| 17       | 500-3-0635  | A-BOLT, 3/4NC x 4 x 4       | 2    |
| 18       | 903-05044   | ROD END EYE BOLT            | 1    |
| 19       | 700-3-2343  | ADJUSTMENT PLATE            | 1    |
| 20       | 905-03262   | CONTROL VALVE               | 1    |
| 21       | 900-01245   | BOLT, 1/2 NC x 4            | 2    |
| 22       | 700-3-2185  | SPRING RETAINER             | 4    |
| 23       | 905-14022   | SPRING                      | 2    |
| 24       | 500-3-2548  | ADAPTER MOUNT               | 2    |
| 25       | 700-2-0908  | TOP COVER                   | 1    |
| -        | 500-2-1169  | ROWFINDER COMPLETE ASSEMBLY | -    |

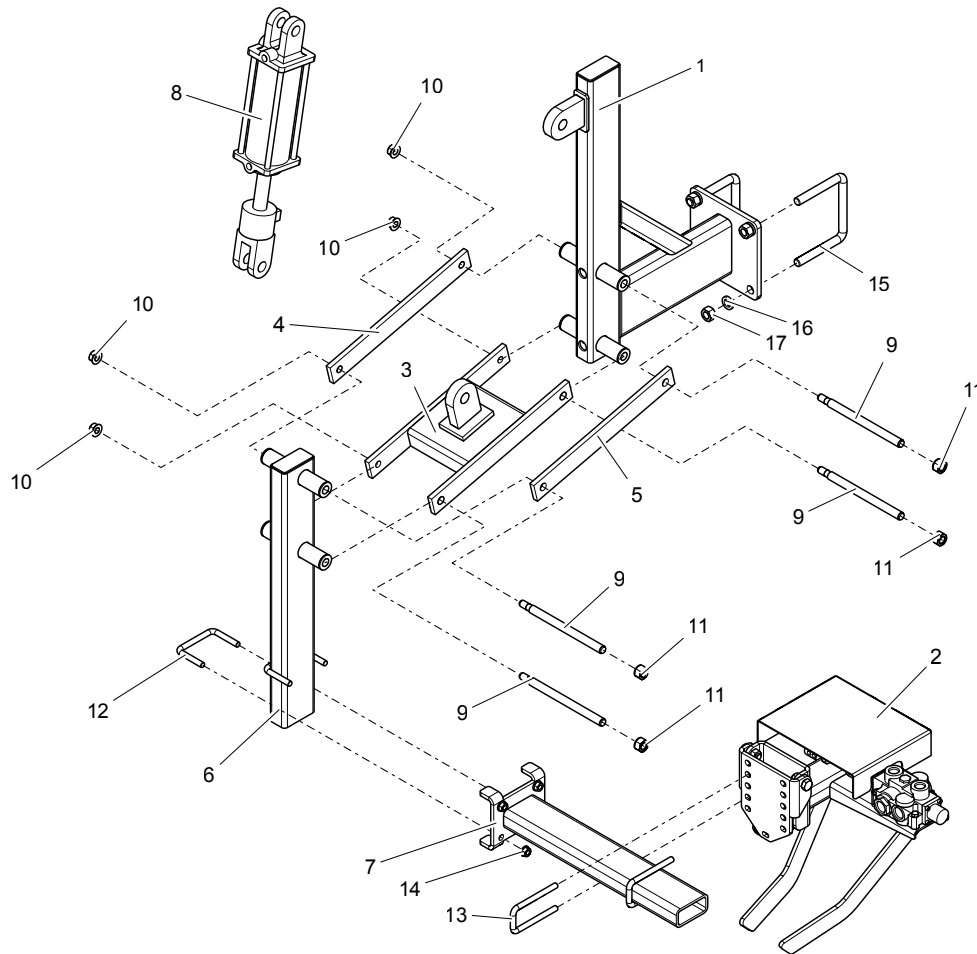
# SCALPER ROW FINDER COMPONENTS



## SCALPER ROW FINDER COMPONENTS

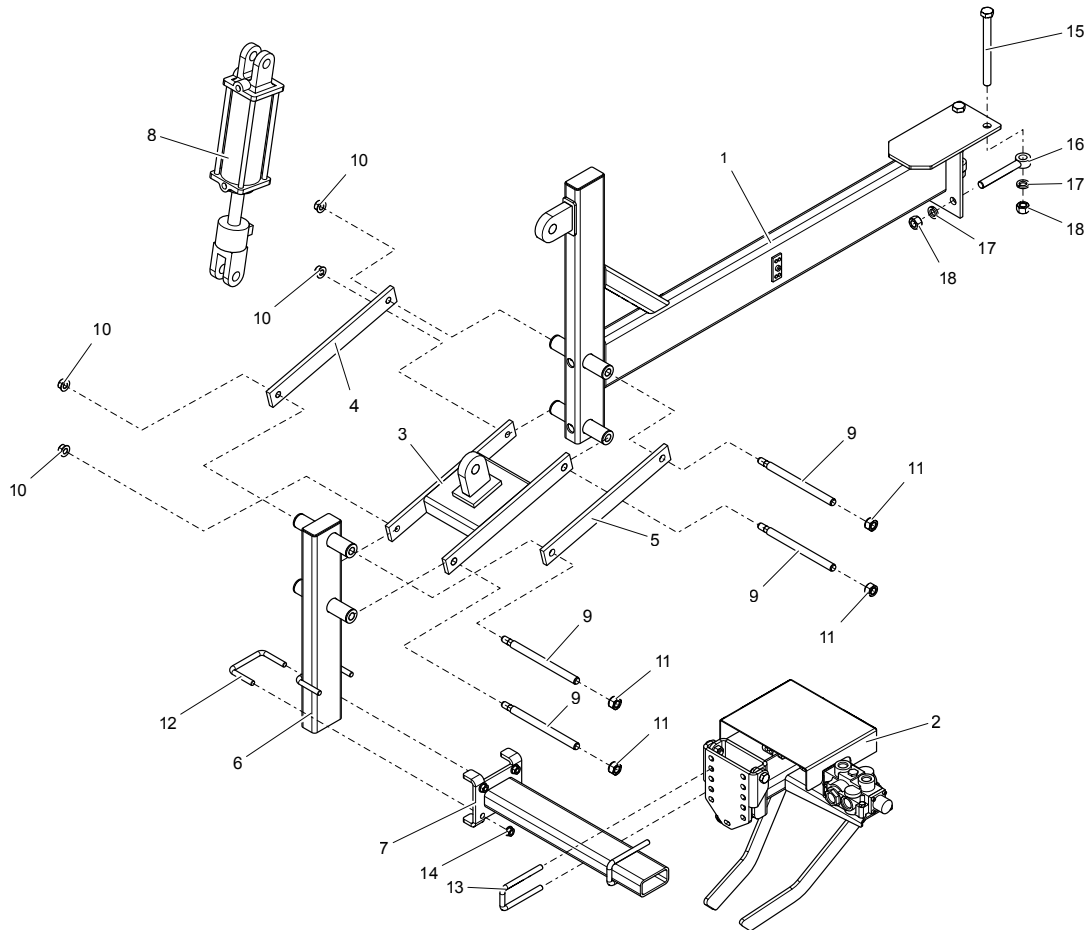
| ITEM NO. | PART NUMBER | DESCRIPTION                 | QTY. |
|----------|-------------|-----------------------------|------|
| 1        | 500-2-1259  | PIVOT MOUNT                 | 1    |
| 2        | 500-2-1258  | BOTTOM PIVOT                | 1    |
| 3        | 700-3-2170  | PIVOT SHAFT                 | 1    |
| 4        | 700-3-0383  | BUSHING (OILITE)            | 4    |
| 5        | 700-3-2182  | LOCK COLLAR                 | 1    |
| 6        | 700-2-0853  | SPRING TENSIONER            | 1    |
| 7        | 700-2-0854  | FINGER MOUNT                | 2    |
| 8        | 700-3-2188  | FINGER (LH)                 | 1    |
| 9        | 700-3-2189  | FINGER (RH)                 | 1    |
| 10       | 900-03465   | EYE BOLT                    | 1    |
| 11       | 700-3-2187  | INSIDE WASHER               | 1    |
| 12       | 700-3-2183  | BUSHING (TENSIONER)         | 1    |
| 13       | 700-2-0856  | TENSIONER ROD               | 1    |
| 14       | 905-14007   | TENSIONER SPRING            | 1    |
| 15       | 901-01323   | LOCK COLLAR, 1-3/8"         | 1    |
| 16       | 700-2-0850  | STEERING PADDLE             | 1    |
| 17       | 903-05044   | ROD END EYE BOLT            | 1    |
| 18       | 700-3-2343  | ADJUSTMENT PLATE            | 1    |
| 19       | 905-03262   | CONTROL VALVE               | 1    |
| 20       | 900-01245   | BOLT, 1/2 NC x 4            | 2    |
| 21       | 700-3-2185  | SPRING RETAINER             | 4    |
| 22       | 905-14022   | SPRING                      | 2    |
| 23       | 500-2-1269  | ROP COVER                   | 1    |
| -        | 500-2-1257  | ROWFINDER COMPLETE ASSEMBLY | -    |

## ROWFINDER PARALLEL LINK MOUNT



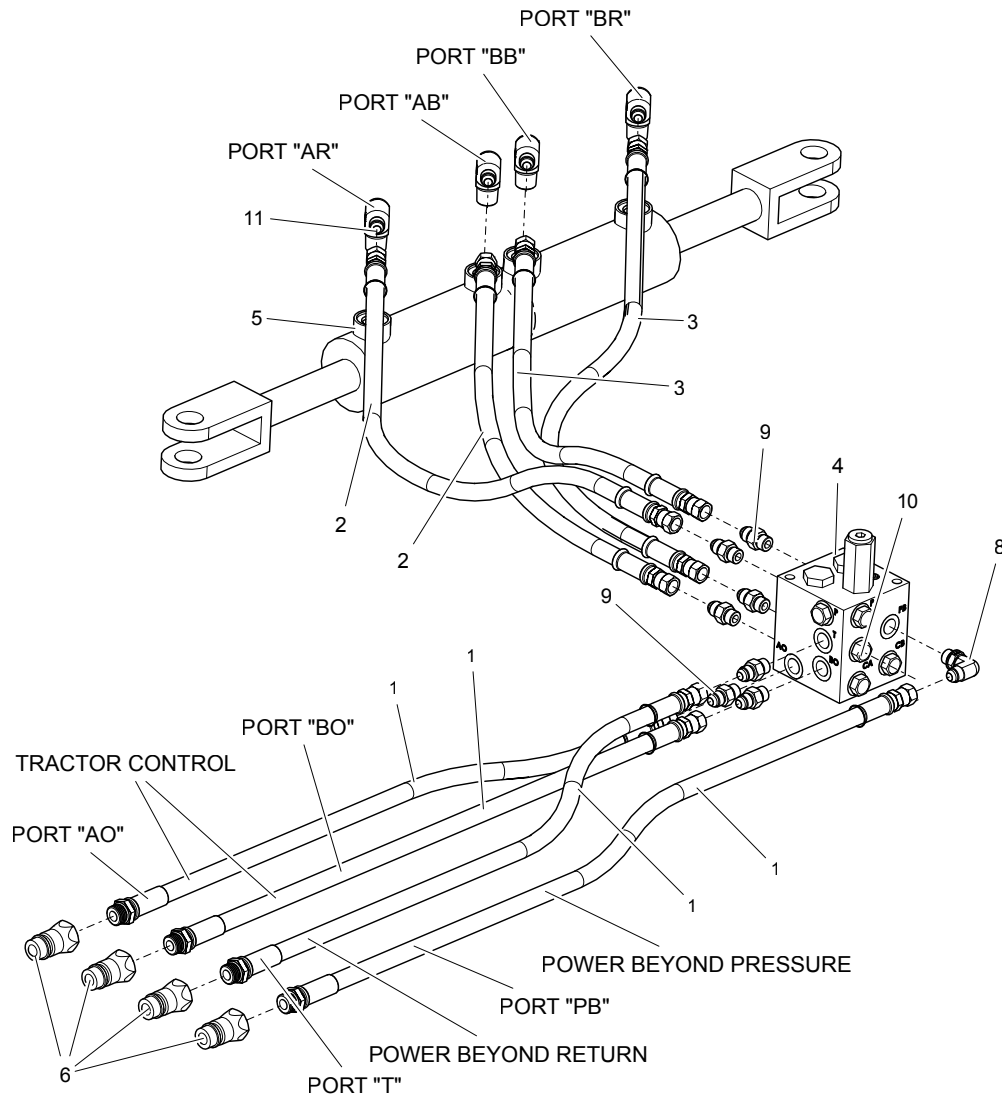
| ITEM NO. | PART NUMBER | DESCRIPTION                                  | QTY. |
|----------|-------------|----------------------------------------------|------|
| 1        | 500-2-1080  | UPPER MOUNT                                  | 1    |
| 2        | 500-2-1248  | ROWFINDER                                    | 1    |
| 3        | 500-2-1081  | H-ARM                                        | 1    |
| 4        | 500-3-0991  | CONNECTING ARM (5/8" HOLES)                  | 1    |
| 5        | 500-3-0992  | CONNECTING ARM (3/4" HOLES)                  | 1    |
| 6        | 500-2-1079  | LOWER MOUNT                                  | 1    |
| 7        | 500-2-1029  | HORIZONTAL MOUNT                             | 1    |
| 8        | 905-21400   | CYLINDER, 3-1/2 x 8                          | 1    |
|          | 905-21380   | - SEAL KIT ( <b>PRINCE CYLINDERS ONLY</b> )  |      |
|          | 905-21401   | - SEAL KIT ( <b>MONARCK CYLINDERS ONLY</b> ) |      |
| 9        | 200-3-2631  | PARALLEL LINK PIN                            | 4    |
| 10       | 900-06145   | SPIRALOCK NUT, 5/8 NC                        | 4    |
| 11       | 900-06510   | TOP LOCK NUT, 3/4 NC                         | 4    |
| 12       | 200-3-1445  | U-BOLT, 1/2 NC x 4 x 3                       | 2    |
| 13       | 200-3-1447  | U-BOLT, 1/2 NC x 2 x 5-1/4                   | 2    |
| 14       | 900-06143   | SPIRALOCK NUT, 1/2 NC                        | 8    |
| 15       | 200-3-0024  | U-BOLT, 3/4 NC x 6 x 5-1/2                   | 2    |
| 16       | 900-11017   | LOCK WASHER, 3/4                             | 4    |
| 17       | 900-06015   | NUT, 3/4 NC                                  | 4    |
| -        | 500-1-0182  | ROW FINDER REAR TUBE MOUNT KIT               | -    |

## ROWFINDER PARALLEL LINK MOUNT (44" STRUTS)



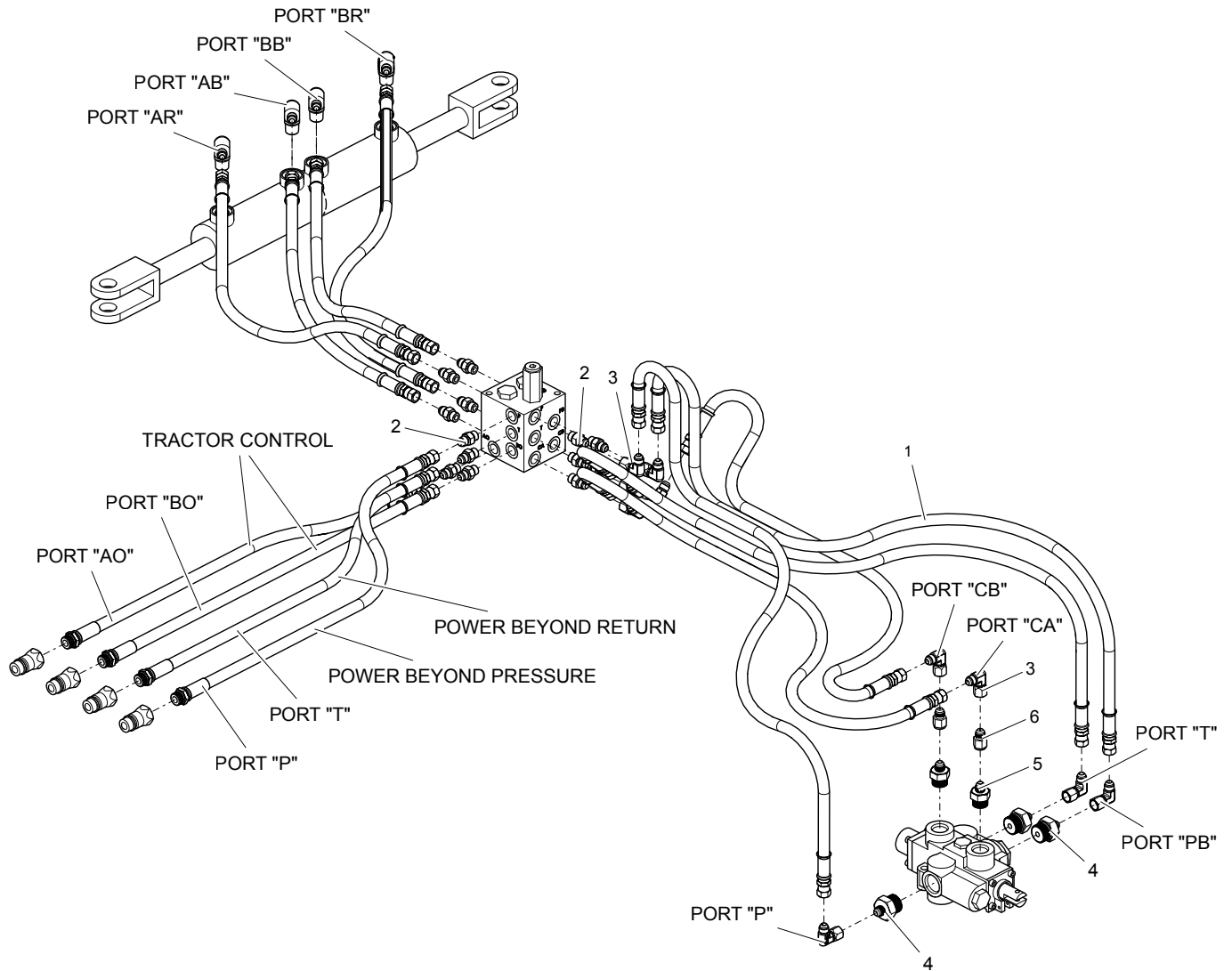
| ITEM NO. | PART NUMBER | DESCRIPTION                                  | QTY. |
|----------|-------------|----------------------------------------------|------|
| 1        | 500-2-1254  | UPPER MOUNT                                  | 1    |
| 2        | 500-2-1248  | ROW FINDER                                   | 1    |
| 3        | 500-2-1081  | H-ARM                                        | 1    |
| 4        | 500-3-0991  | CONNECTING ARM (5/8" HOLES)                  | 1    |
| 5        | 500-3-0992  | CONNECTING ARM (3/4" HOLES)                  | 1    |
| 6        | 500-2-1255  | LOWER MOUNT                                  | 1    |
| 7        | 500-2-1029  | HORIZONTAL MOUNT                             | 1    |
| 8        | 905-21400   | CYLINDER, 3-1/2" x 8                         | 1    |
|          | 905-21380   | - SEAL KIT ( <b>PRINCE CYLINDERS ONLY</b> )  |      |
|          | 905-21401   | - SEAL KIT ( <b>MONARCK CYLINDERS ONLY</b> ) |      |
| 9        | 200-3-2631  | PARALLEL LINK PIN                            | 4    |
| 10       | 900-06145   | SPIRALOCK NUT, 5/8 NC                        | 4    |
| 11       | 900-06510   | TOP LOCK NUT, 3/4 NC                         | 4    |
| 12       | 200-3-1445  | U-BOLT, 1/2 NC x 4 x 3                       | 2    |
| 13       | 200-3-1447  | U-BOLT, 1/2 NC x 2 x 5-1/4                   | 2    |
| 14       | 900-06143   | SPIRALOCK NUT, 1/2 NC                        | 8    |
| 15       | 900-01437   | BOLT, 3/4 NC x 8-1/2                         | 2    |
| 16       | 900-03463   | EYE BOLT, 3/4 NC x 6                         | 2    |
| 17       | 900-11017   | LOCK WASHER, 3/4                             | 4    |
| 18       | 900-06015   | NUT, 3/4 NC                                  |      |
| -        | 500-1-0366  | ROW FINDER REAR TUBE MOUNT KIT (44" STRUTS)  | -    |

## REAR STEER PLUMBING COMPONENTS



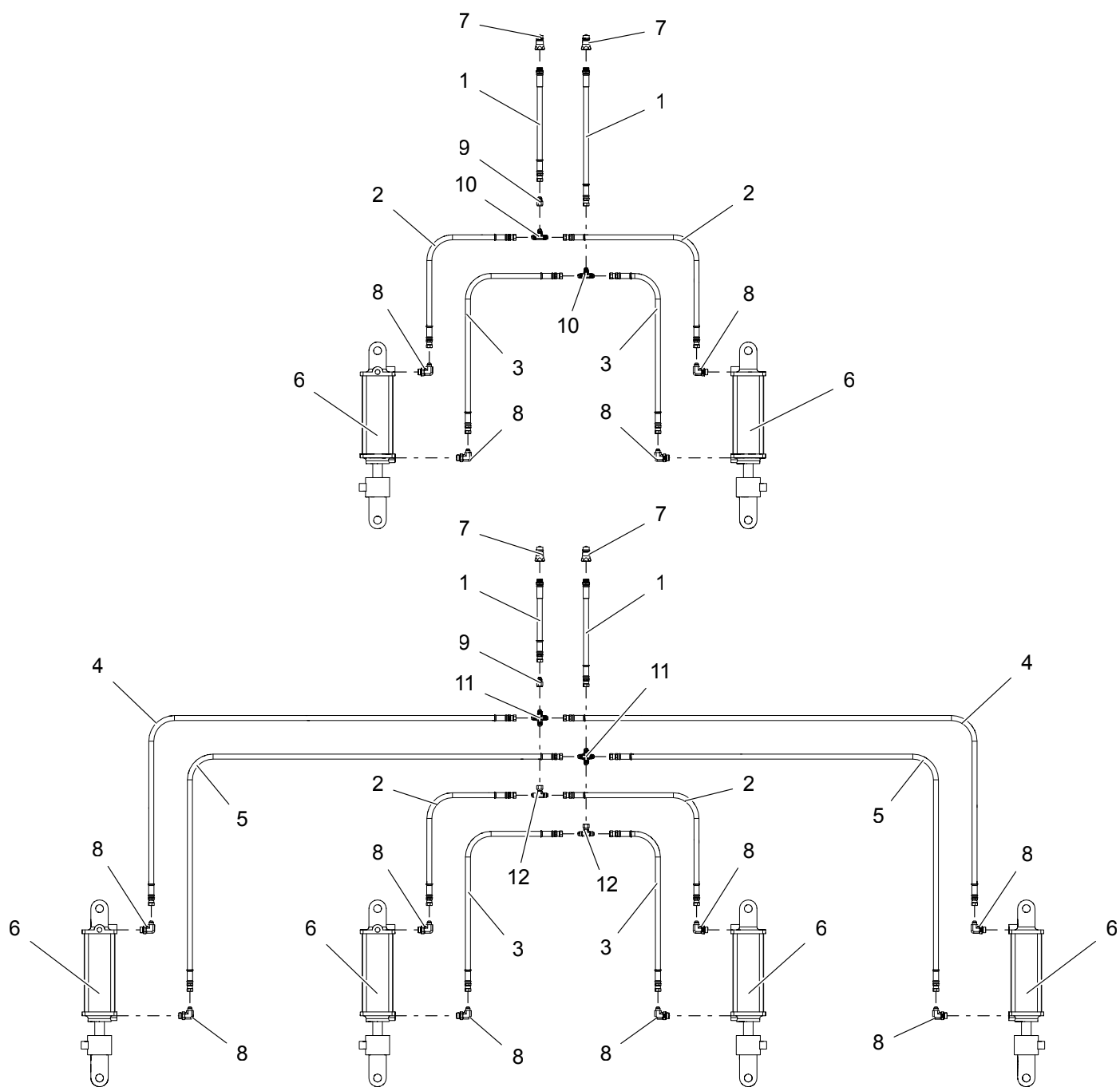
| ITEM NO. | PART NUMBER | DESCRIPTION                                            | QTY. |
|----------|-------------|--------------------------------------------------------|------|
| 1        | 905-19180   | 3/8 HOSE, 8MB x 6FJX 252" LENGTH                       | 1    |
| 2        | 905-19255   | 3/8 HOSE, 6FJX x 6FJX (NARROW STRUTS) 76" LENGTH       | 1    |
|          | 905-19193   | 3/8 HOSE, 6FJX x 6FJX (WIDE STRUTS) 106" LENGTH        |      |
| 3        | 905-19152   | 3/8 HOSE, 6FJX x 6FJX (NARROW STRUTS) 84" LENGTH       | 1    |
|          | 905-19182   | 3/8 HOSE, 6FJX x 6FJX (WIDE STRUTS) 114" LENGTH        |      |
| 4        | 905-03263   | MANIFOLD BLOCK                                         | 1    |
| 5        | 905-21452   | DOUBLE CYLINDER                                        | 1    |
| 6        | 905-19126   | QUICK COUPLER                                          | 1    |
| 7        | 905-03163   | 90° ELBOW ADAPTER, 6MJ x 6FJX                          | 2    |
| 8        | 905-03264   | 90° ELBOW ADAPTER, 6MJ x 8MB                           | 6    |
| 9        | 905-03120   | STRAIGHT ADAPTER, 6MJ x 6MB                            | 4    |
| 10       | 905-03265   | PLUG ADAPTER, 6MB                                      | 4    |
| 11       | 905-03117   | 90° ELBOW ADAPTER, 6MJ x 8MP                           | 1    |
|          | 500-1-0332  | HOSE KIT, NARROW MOUNT STRUTS<br>* INCLUDES #1 - #11 * | -    |
|          | 500-1-0341  | HOSE KIT, WIDE MOUNT STRUTS<br>* INCLUDES #1 - #11 *   | -    |

## ROW FINDER HYDRAULIC COMPONENTS



| ITEM NO. | PART NUMBER | DESCRIPTION                         | QTY. |
|----------|-------------|-------------------------------------|------|
| 1        | 905-19155   | HOSE, 3/8 x 120.0", 6FJX x 6FJX     | 5    |
| 2        | 905-03120   | ADAPTER, STRAIGHT, 6MJ x 6MB        | 6    |
| 3        | 905-03163   | ADAPTER, 90° ELBOW, 6MJ x 6FJX      | 10   |
| 4        | 905-03210   | ADAPTER, STRAIGHT, 6MJ x 12MB       | 3    |
| 5        | 905-03198   | ADAPTER, STRAIGHT, 6MJ x 10MB       | 2    |
| 6        | 905-03220   | ADAPTER, 1/16 RESTRICTOR, 6FJ x 6MJ | 1    |
| -        | 500-1-0393  | ROW FINDER HOSE KIT                 | -    |

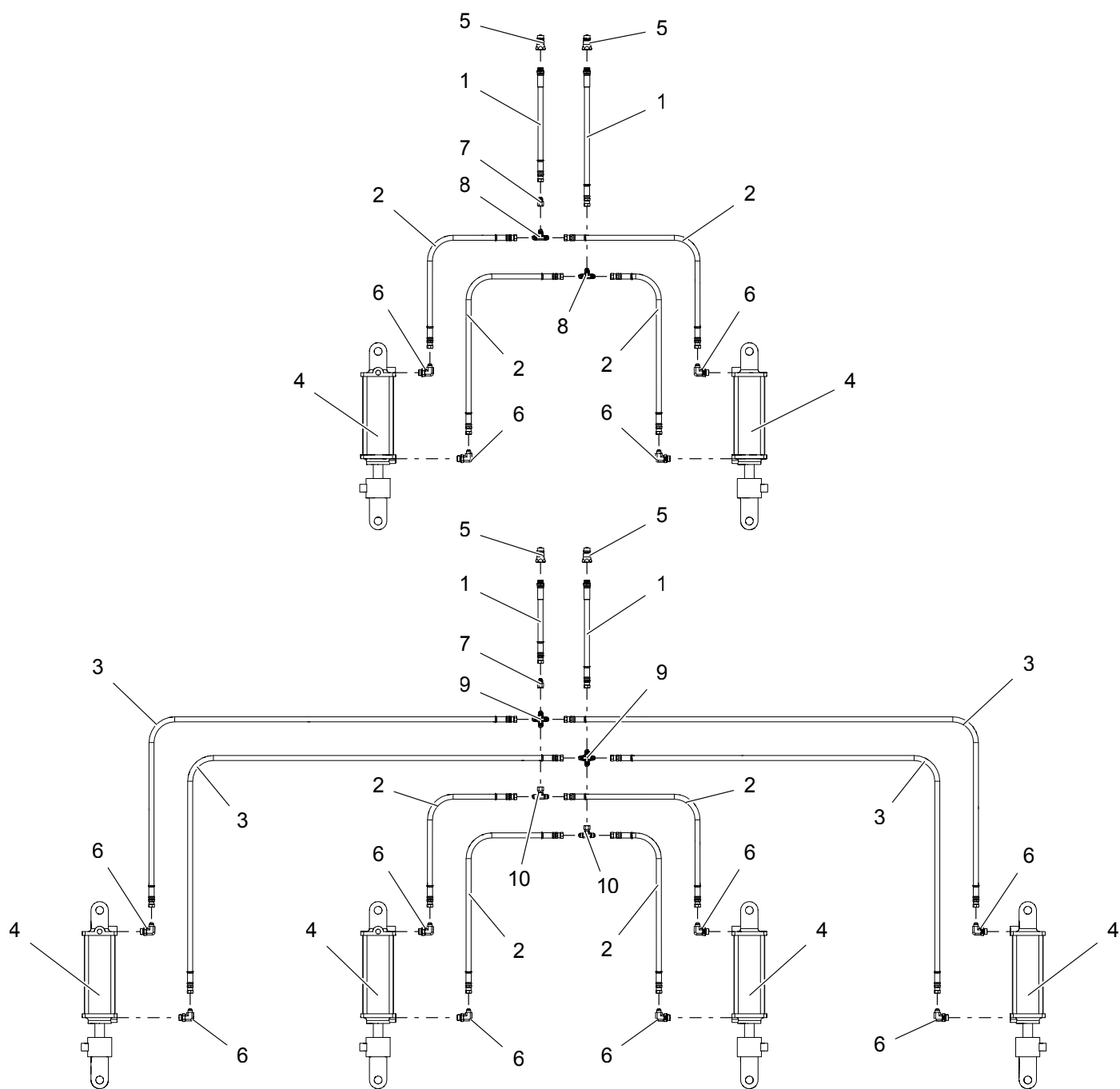
# RIGID STRUT PLUMBING COMPONENTS - SAE



## RIGID STRUT PLUMBING COMPONENTS - SAE

| ITEM NO. | PART NUMBER | DESCRIPTION                                                                 | QTY.        |
|----------|-------------|-----------------------------------------------------------------------------|-------------|
| 1        | 905-19180   | 3/8 HOSE, 8MB x 6FJX                                                        | 252" LENGTH |
| 2        | 905-19169   | 3/8 HOSE, 6FJX x 6FJX <b>(66" STRUTS)</b>                                   | 54" LENGTH  |
|          | 905-19255   | 3/8 HOSE, 6FJX x 6FJX <b>(88" - 110" STRUTS)</b>                            | 76" LENGTH  |
|          | 905-19193   | 3/8 HOSE, 6FJX x 6FJX <b>(132" - 154" STRUTS)</b>                           | 106" LENGTH |
| 3        | 905-19125   | 3/8 HOSE, 6FJX x 6FJX <b>(66" STRUTS)</b>                                   | 62" LENGTH  |
|          | 905-19152   | 3/8 HOSE, 6FJX x 6FJX <b>(88" - 110" STRUTS)</b>                            | 84" LENGTH  |
|          | 905-19182   | 3/8 HOSE, 6FJX x 6FJX <b>(132" - 154" STRUTS)</b>                           | 114" LENGTH |
| 4        | 905-19214   | 3/8 HOSE, 6FJX x 6FJX <b>(OUTSIDE STRUTS)</b>                               | 126" LENGTH |
| 5        | 905-19151   | 3/8 HOSE, 6FJX x 6FJX <b>(OUTSIDE STRUTS)</b>                               | 134" LENGTH |
| 6        | 905-21400   | CYLINDER W/ DEPTH STOP, 3-1/2 x 8                                           | 2 - 4       |
|          | 905-21380   | - SEAL KIT <b>(PRINCE CYLINDERS ONLY)</b>                                   |             |
|          | 905-21401   | - SEAL KIT <b>(MONARCK CYLINDERS ONLY)</b>                                  |             |
| 7        | 905-19126   | QUICK COUPLER                                                               | 2           |
| 8        | 905-03114   | 90° ELBOW ADAPTER, 6MJ x 8MB                                                | 4 - 8       |
| 9        | 905-03220   | 1/16 RESTRICTOR ADAPTER, 6FJ x 6MJ                                          | 1           |
| 10       | 905-03112   | TEE ADAPTER, 6MJ x 6MJ x 6MJ                                                | 0 - 2       |
| 11       | 905-03141   | CROSS ADAPTER, 6MJ                                                          | 0 - 2       |
| 12       | 905-03127   | TEE ADAPTER, 6MJ x 6MJ x 6FJX                                               | 0 - 2       |
|          | 500-1-0360  | HOSE KIT, 66" SPACED STRUTS<br>* INCLUDES #1 - #3, #7 - #10 *               | -           |
|          | 500-1-0314  | HOSE KIT, 88" - 110" SPACED STRUTS<br>* INCLUDES #1 - #3, #7 - #10 *        | -           |
|          | 500-1-0361  | HOSE KIT, 132" - 154" SPACED STRUTS<br>* INCLUDES #1 - #3, #7 - #10 *       | -           |
|          | 500-1-0362  | HOSE KIT, SINGLE OUTSIDE STRUTS (1222)<br>* INCLUDES #4, #5, #8, #11, #12 * | -           |

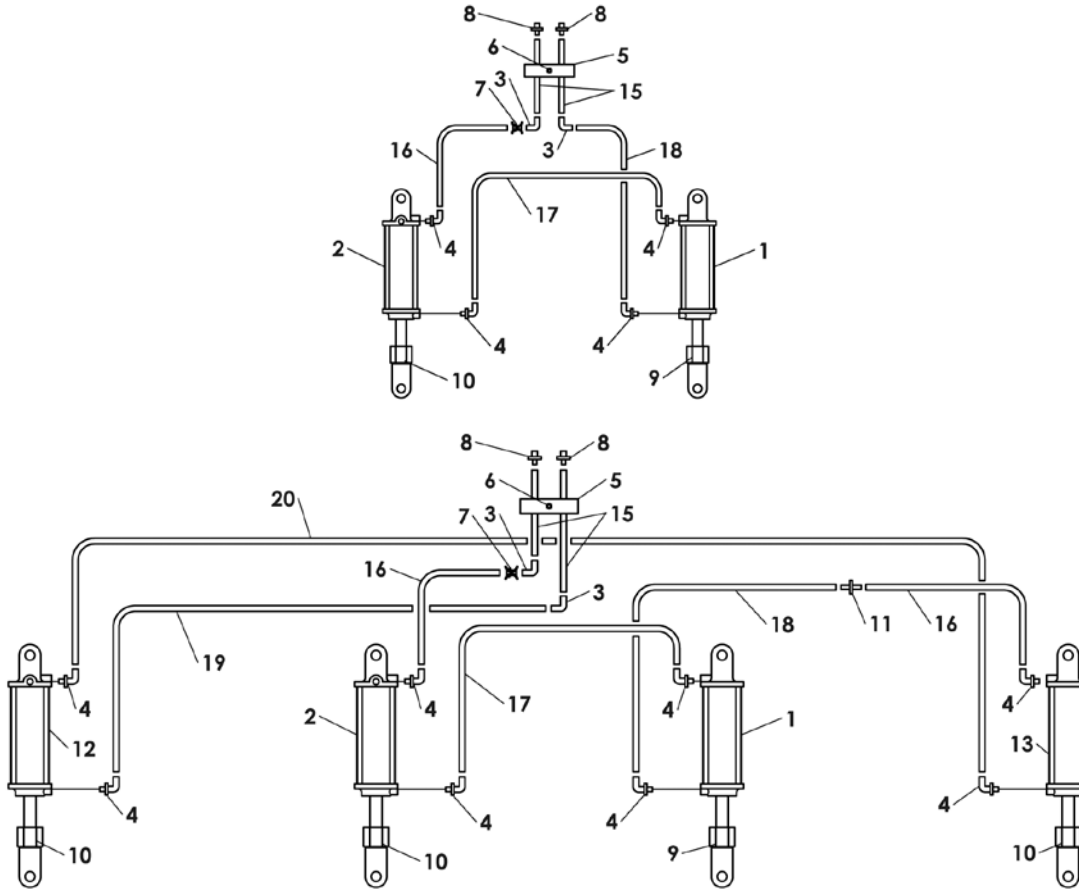
# STEERABLE STRUT PLUMBING COMPONENTS - SAE



## STEERABLE STRUT PLUMBING COMPONENTS - SAE

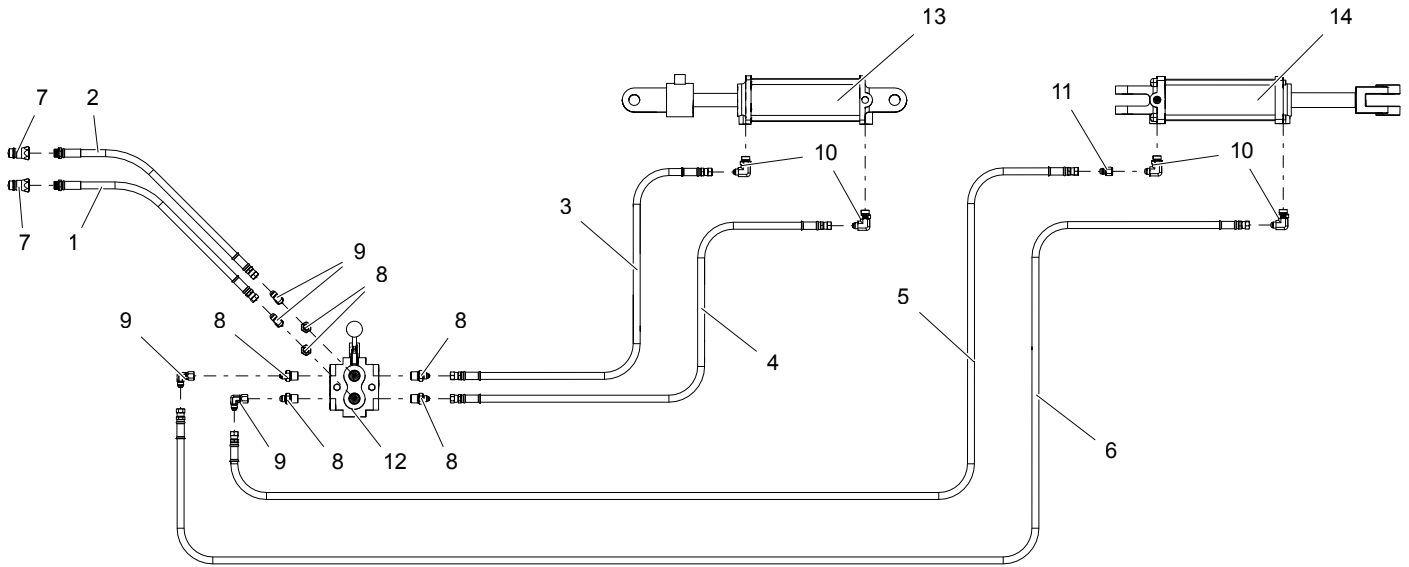
| ITEM NO. | PART NUMBER | DESCRIPTION                                                                       | QTY.        |
|----------|-------------|-----------------------------------------------------------------------------------|-------------|
| 1        | 905-19180   | 3/8 HOSE, 8MB x 6FJX                                                              | 252" LENGTH |
| 2        | 905-19196   | 3/8 HOSE, 6FJX x 6FJX <b>(66" STRUTS)</b>                                         | 72" LENGTH  |
|          | 905-19226   | 3/8 HOSE, 6FJX x 6FJX <b>(88" - 110" STRUTS)</b>                                  | 96" LENGTH  |
|          | 905-19155   | 3/8 HOSE, 6FJX x 6FJX <b>(132" - 154" STRUTS)</b>                                 | 120" LENGTH |
| 3        | 905-19175   | 3/8 HOSE, 6FJX x 6FJX <b>(OUTSIDE STRUTS)</b>                                     | 144" LENGTH |
| 4        | 905-21400   | CYLINDER W/ DEPTH STOP, 3-1/2 x 8                                                 | 2 - 4       |
|          | 905-21380   | - SEAL KIT <b>(PRINCE CYLINDERS ONLY)</b>                                         |             |
|          | 905-21401   | - SEAL KIT <b>(MONARCK CYLINDERS ONLY)</b>                                        |             |
| 5        | 905-19126   | QUICK COUPLER                                                                     | 2           |
| 6        | 905-03114   | 90° ELBOW ADAPTER, 6MJ x 8MB                                                      | 4 - 8       |
| 7        | 905-03220   | 1/16 RESTRICTOR ADAPTER, 6FJ x 6MJ                                                | 1           |
| 8        | 905-03112   | TEE ADAPTER, 6MJ x 6MJ x 6MJ                                                      | 0 - 2       |
| 9        | 905-03141   | CROSS ADAPTER, 6MJ                                                                | 0 - 2       |
| 10       | 905-03127   | TEE ADAPTER, 6MJ x 6MJ x 6FJX                                                     | 0 - 2       |
|          | 500-1-0332  | HOSE KIT, 66" SPACED STRUTS<br>* INCLUDES #1, #2, #5 - #8 *                       | -           |
|          | 500-1-0341  | HOSE KIT, 88" - 110" SPACED STRUTS<br>* INCLUDES #1, #2, #5 - #8 *                | -           |
|          | 500-1-0341  | HOSE KIT, 132" - 154" SPACED STRUTS<br>* INCLUDES #1, #2, #5 - #8 *               | -           |
|          | 500-1-0341  | HOSE KIT, 4 PAIR SMALL TIRE STRUTS (1222)<br>* INCLUDES #1 #3, #5 - #7, #9, #10 * | -           |

## HYDRAULIC STRUT PLUMBING COMPONENTS - REPHASING



| ITEM NO. | PART NUMBER | DESCRIPTION                                 | QTY. |
|----------|-------------|---------------------------------------------|------|
| 1        | 905-21290   | HYDRAULIC CYLINDER - 3.5 X 8R               | 1    |
| 2        | 905-21398   | HYDRAULIC CYLINDER - 3.75 X 8R              | 1    |
| 3        | 905-03163   | ELBOW 90, 1/2 NPT                           | 2    |
| 4        | 905-03114   | ELBOW 90, 6MJIC X 3/4 MOP                   | -    |
| 5        | 210-3-0199  | HOSE HOLDER                                 | 1    |
| 6        | 900-16964   | TEK SCREW, 1/4-14UNC X 1-1/2                | 1    |
| 7        | 905-03220   | RESTRICTOR 1/16" 6FJIC X 6MJIC              | 1    |
| 8        | 905-19126   | QUICK COUPLER                               | 2    |
| 9        | 905-21407   | LARGE MECHANICAL DEPTH STOP NUT             | 1    |
| 10       | 905-21305   | MECHANICAL DEPTH STOP NUT                   | -    |
| 11       | 905-03111   | NIPPLE, 6MJIC X 6MJIC                       | 1    |
| 12       | 905-21292   | HYDRAULIC CYLINDER - 3 X 8R                 | 1    |
| 13       | 905-21291   | HYDRAULIC CYLINDER - 3.25 X 8R              | 1    |
| 14       | 905-07091   | 32" NYLON CABLE TIE (NOT SHOWN)             | 6    |
| 15       | 905-19180   | 3/8 HOSE, 8MORB X 6FJIC X 252"              | 2    |
| 16       | 905-19170   | 3/8 HOSE, 6FJIC X 6FJIC X 64" (6 OR 8 ROW)  | 1    |
|          | 905-19170   | 3/8 HOSE, 6FJIC X 6FJIC X 64" (12 ROW)      | 2    |
| 17       | 905-19151   | 3/8 HOSE, 6FJIC X 6FJIC X 134"              | 1    |
| 18       | 905-19196   | 3/8 HOSE, 6FJIC X 6FJIC X 72"               | 1    |
| 19       | 905-19122   | 3/8 HOSE, 6FJIC X 6FJIC X 175"              | 1    |
| 20       | 905-19187   | 3/8 HOSE, 6FJIC X 6FJIC X 288"              | 1    |
|          | 500-1-0191  | HYDRAULIC HOSE KIT, SINGLE OUTSIDE STRUTS   |      |
|          | 500-1-0140  | HYDRAULIC HOSE KIT, 2 PAIR BIG WHEELS 12R22 |      |

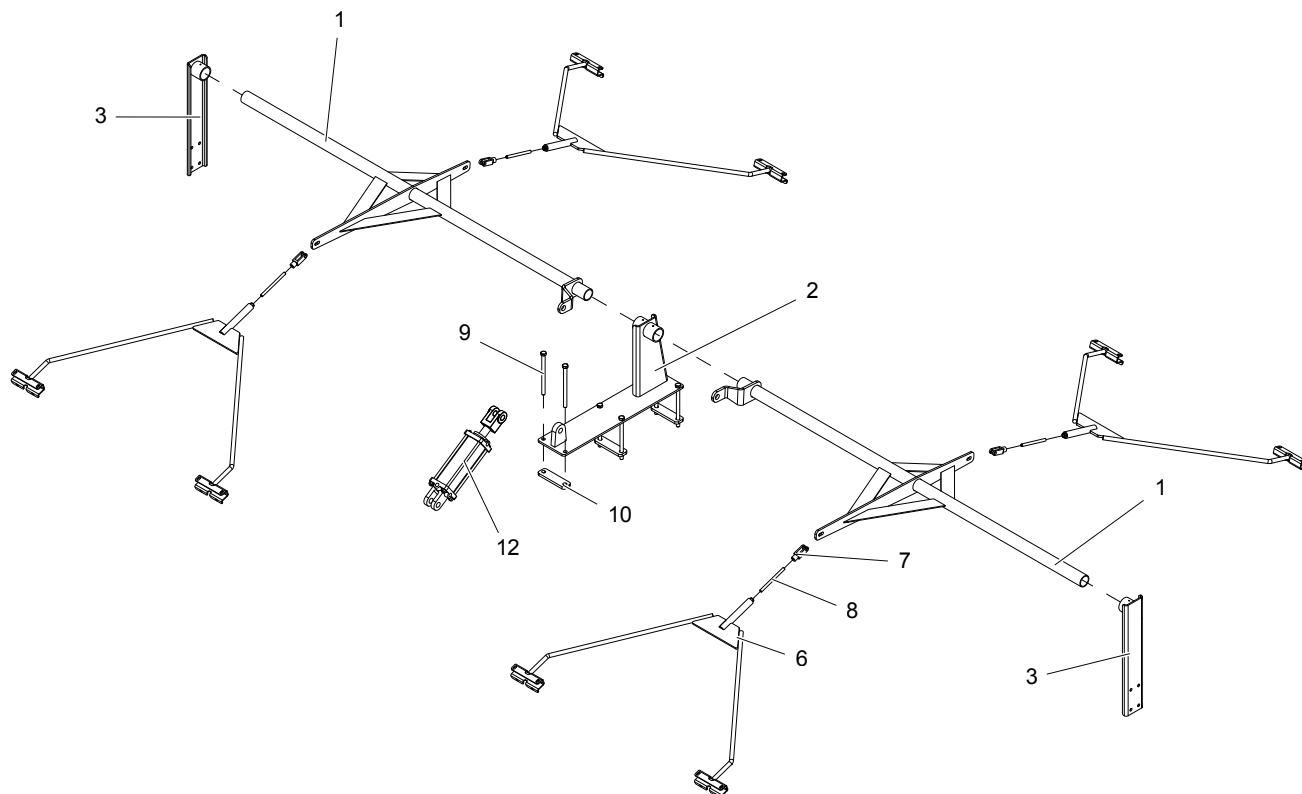
## DOOR OPENERS PLUMBING COMPONENTS



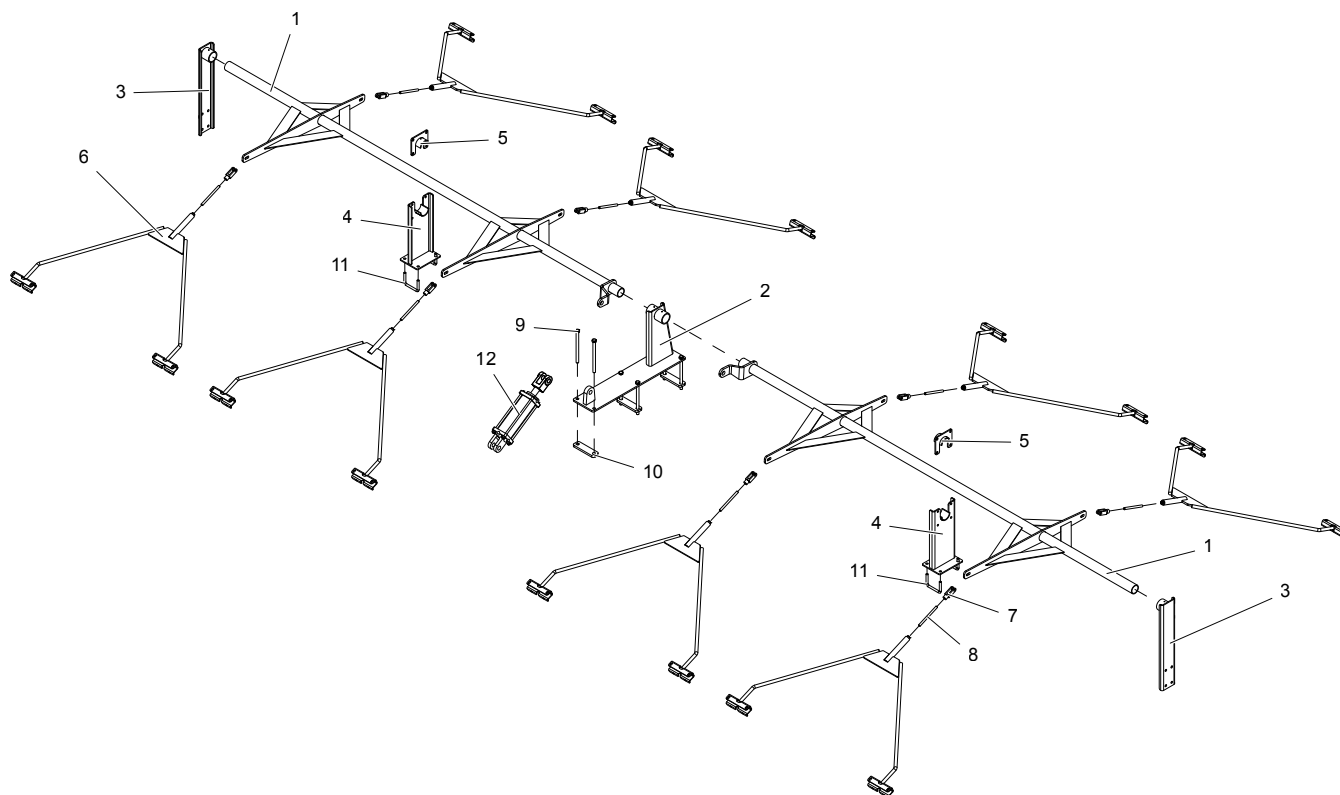
| ITEM NO. | PART NUMBER |                                             | DESCRIPTION   |             | QTY. |
|----------|-------------|---------------------------------------------|---------------|-------------|------|
| 1        | 905-19154   | 3/8 HOSE, 8MB x 6FJX                        | (SHORT HITCH) | 115" LENGTH | 1    |
|          | 905-19151   | 3/8 HOSE, 8MB x 6FJX                        | (LONG HITCH)  | 134" LENGTH |      |
| 2        | 905-19176   | 3/8 HOSE, 8MB x 6FJX                        | (SHORT HITCH) | 105" LENGTH | 1    |
|          | 905-19175   | 3/8 HOSE, 8MB x 6FJX                        | (LONG HITCH)  | 144" LENGTH |      |
| 3        | 905-19124   | 3/8 HOSE, 6FJX x 6FJX                       |               | 25" LENGTH  | 1    |
| 4        | 905-19156   | 3/8 HOSE, 6FJX x 6FJX                       |               | 32" LENGTH  | 1    |
| 5        | 905-19196   | 3/8 HOSE, 6FJX x 6FJX                       |               | 72" LENGTH  | 1    |
| 6        | 905-19194   | 3/8 HOSE, 6FJX x 6FJX                       |               | 90" LENGTH  | 1    |
| 7        | 905-19126   | QUICK COUPLER                               |               |             | 2    |
| 8        | 905-03110   | STRAIGHT ADAPTER, 6MJ x 8MP                 |               |             | 6    |
| 9        | 905-03163   | 90° ELBOW ADAPTER, 6MJ x 6FJX               |               |             | 4    |
| 10       | 903-03114   | 90° ELBOW ADAPTER, 6MJ x 8MB                |               |             | 4    |
| 11       | 905-03220   | 1/16 RESTRICTOR ADAPTER, 6FJ x 6MJ          |               |             | 1    |
| 12       | 905-03252   | DOUBLE SELECTOR VALVE                       |               |             | 1    |
| 13       | 905-21400   | CYLINDER W/ DEPTH STOP, 3-1/2 x 8           |               |             | 1    |
|          | 905-21380   | - SEAL KIT ( <b>PRINCE CYLINDERS ONLY</b> ) |               |             |      |
|          | 905-21401   | - SEAL KIT ( <b>MONARCH CYINDERS ONLY</b> ) |               |             |      |
|          | 905-21441   | CYLINDER W/O DEPTH STOP, 3-1/2 x 8          |               |             |      |
| 14       | 905-21441   | CYLINDER W/O DEPTH STOP, 3-1/2 x 8          |               |             | 1    |
|          | 905-21441   | CYLINDER W/O DEPTH STOP, 3-1/2 x 8          |               |             |      |
|          | 500-1-0338  | HOSE KIT, DOOR OPENERS                      |               |             | -    |
|          |             | * INCLUDES #3 - #6, #8 - #12, #14 *         |               |             |      |
|          | 500-2-0789  | HOSE KIT, SHORT HITCH                       |               |             | -    |
|          |             | * INCLUDES #1, #2, #7, #10, #13 *           |               |             |      |
|          | 500-2-1243  | HOSE KIT, LONG HITCH                        |               |             | -    |
|          |             | * INCLUDES #1, #2, #7, #10, #13 *           |               |             |      |

# DOOR OPENER COMPONENTS

## 6 - 8 ROW



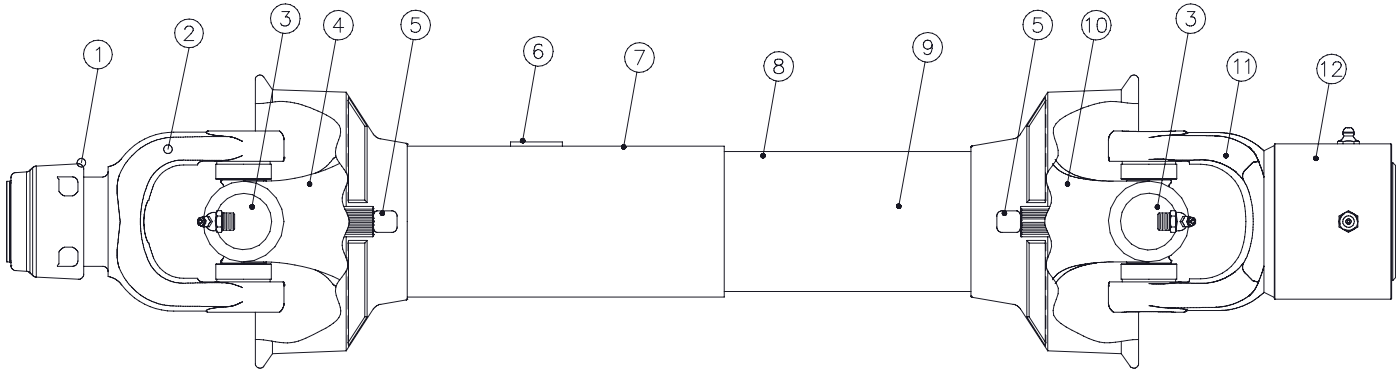
## 12 ROW



## DOOR OPENER COMPONENTS

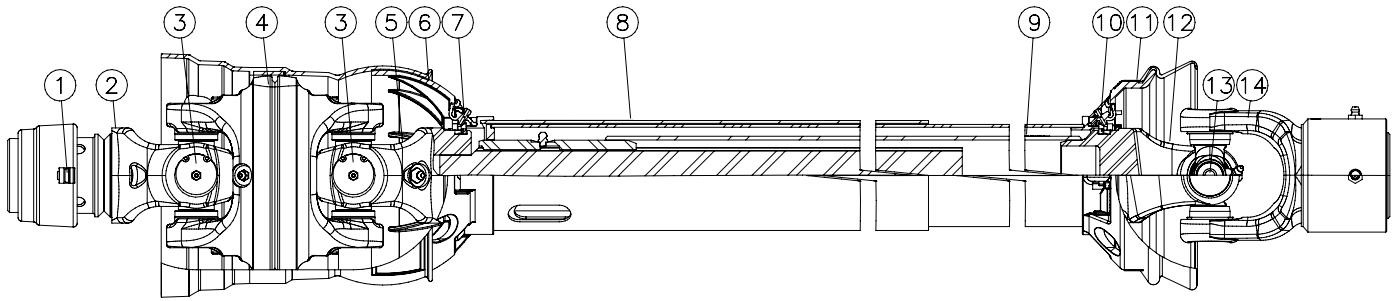
| ITEM NO. | PART NUMBER | DESCRIPTION                                  | QTY. |
|----------|-------------|----------------------------------------------|------|
| 1        | 500-2-1157  | CROSS BAR (12 ROW)                           | 2    |
|          | 500-2-1164  | CROSS BAR (6 - 8 ROW)                        |      |
| 2        | 500-2-1158  | CYLINDER MOUNT                               | 1    |
| 3        | 500-2-1159  | END SUPPORT BRACKET                          | 2    |
| 4        | 500-2-1162  | INTERMEDIATE SUPPORT (12 ROW)                | 2    |
| 5        | 500-2-1163  | INTERMEDIATE SUPPORT CAP (12 ROW)            | 2    |
| 6        | 500-2-1221  | PULL ARMS (6 - 8 ROW)                        | 4    |
|          | 500-2-1221  | PULL ARMS (12 ROW)                           | 8    |
| 7        | 900-42053   | CLEVIS 1/2 NC (6 - 8 ROW)                    | 4    |
|          | 900-42053   | CLEVIS 1/2 NC (12 ROW)                       | 8    |
| 8        | 500-3-2465  | ADJUSTMENT ROD (6 - 8 ROW)                   | 4    |
|          | 500-3-2465  | ADJUSTMENT ROD (12 ROW)                      | 8    |
| 9        | 900-01381   | BOLT, 5/8 NC x 9                             | 6    |
| 10       | 500-3-2469  | CYLINDER MOUNT STRAP                         | 3    |
| 11       | 200-3-1445  | U-BOLT, 1/2 NC x 4 x 3 (12 ROW)              | 4    |
| 12       | 905-21441   | CYLINDER                                     | 1    |
|          | 905-21380   | - SEAL KIT ( <b>PRINCE CYLINDERS ONLY</b> )  |      |
|          | 905-21401   | - SEAL KIT ( <b>MONARCK CYLINDERS ONLY</b> ) |      |
|          | 500-1-0338  | DOOR OPENER HOSE KIT                         |      |
|          | 500-1-0299  | 6 - 8 ROW TOP DOOR OPENERS, COMPLETE KIT     |      |
|          | 500-1-0300  | 12 ROW TOP DOOR OPENERS, COMPLETE KIT        |      |

## PTO DRIVE SHAFT COMPONENTS



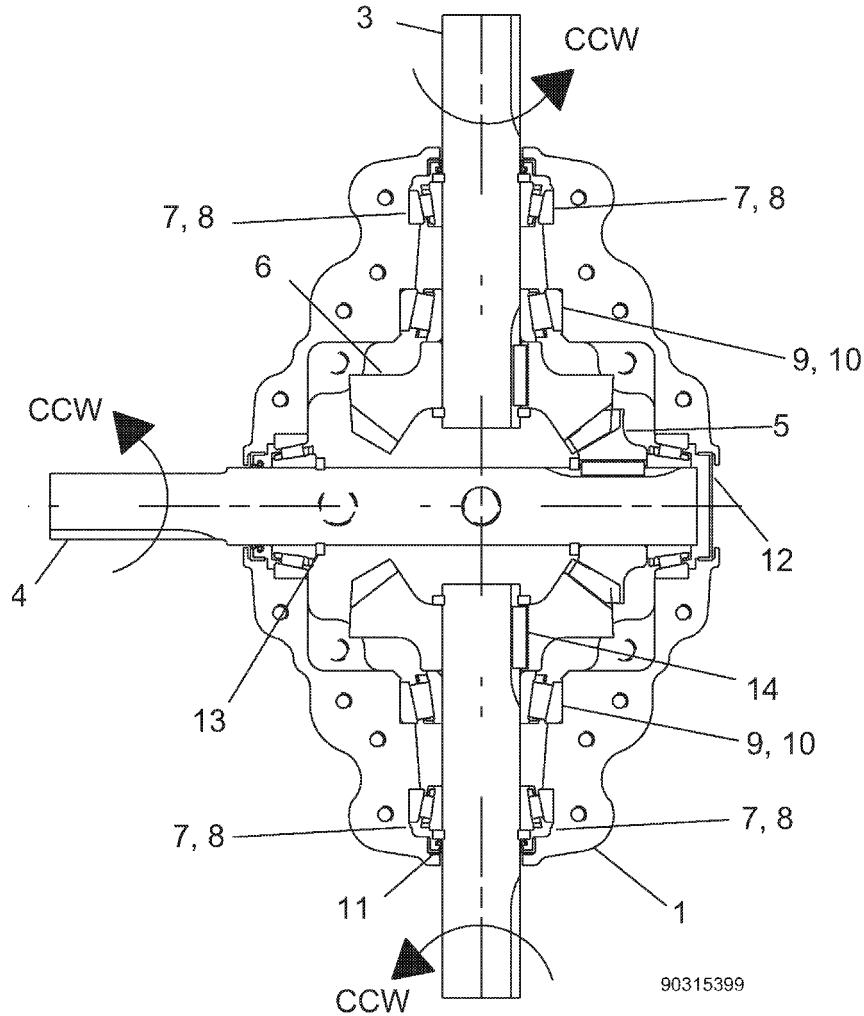
| ITEM NO. | PART NUMBER | DESCRIPTION                               | QTY. |
|----------|-------------|-------------------------------------------|------|
| 1        | 903-18106   | SAFETY SLIDE LOCK REPAIR KIT, 1-3/8"      | 1    |
|          | 903-17772   | SAFETY SLIDE LOCK REPAIR KIT, 1-3/4"      |      |
| 2        | 903-18116   | SAFETY SLIDE LOCK YOKE, 1-3/8"            | 1    |
|          | 903-18108   | SAFETY SLIDE LOCK YOKE, 1-3/4"            |      |
| 3        | 903-17525   | 44R CROSS & BEARING KIT                   | 1    |
| 4        | 903-18109   | YOKE & SHAFT (1.69-20 SPLINE)             | 1    |
| 5        | 903-17774   | NYLON REPAIR KIT                          | 2    |
| 6        | 903-17455   | SAFETY SIGN                               | 1    |
| 7        | 903-18110   | OUTER GUARD                               | 1    |
| 8        | 903-11111   | INNER GUARD                               | 1    |
| 9        | 903-17456   | SAFETY SIGN                               | 1    |
| 10       | 903-18112   | YOKE, TUBE, & SLIP SLEEVE                 | 1    |
| 11       | 903-17721   | OVERRUNNING CLUTCH                        | 1    |
| 12       | 903-18210   | OVERRUNNING CLUTCH REPAIR KIT             | 1    |
|          | 903-18088   | COMPLETE PTO DRIVE SHAFT, COMPLETE 1-3/8" |      |
|          | 903-18089   | COMPLETE PTO DRIVE SHAFT, COMPLETE 1-3/4" |      |

## PTO DRIVE SHAFT COMPONENTS (CONSTANT VELOCITY)



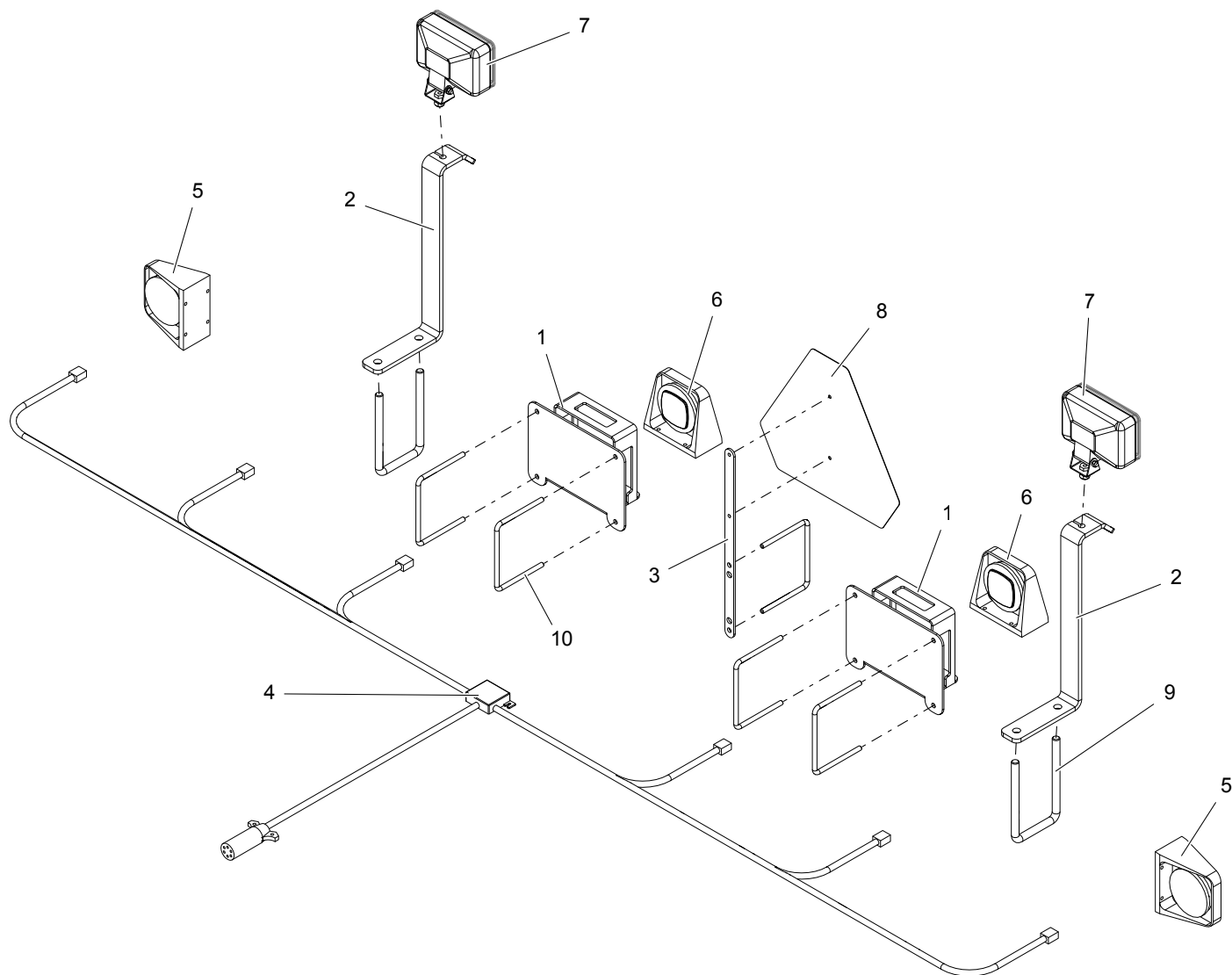
| ITEM NO. | PART NUMBER | DESCRIPTION                               | QTY. |
|----------|-------------|-------------------------------------------|------|
| 1        | 903-17427   | SSL / AUTO-LOK REPAIR KIT, 1-3/8"         | 1    |
|          | 903-17772   | SSL / AUTO-LOK REPAIR KIT, 1-3/4"         |      |
| 2        | 903-18334   | WWCV AUTO-LOK YOKE, 1-3/8"                | 1    |
|          | 903-18327   | WWCV AUTO-LOK YOKE, 1-3/4"                |      |
| 3        | 903-18328   | AB8/AW24/CAT 6 80° PBL CROSS KIT          | 1    |
| 4        | 903-18329   | WWCV CENTER HOUSING                       | 1    |
| 5        | 903-18405   | WWCV YOKE & SHAFT (1.69-20 SPLINE)        | 1    |
| 6        | -           | OUTER GUARD                               | 1    |
| 7        | 903-18395   | GUARD REPAIR KIT                          | 2    |
| 8        | 903-17455   | SAFETY SIGN                               | 1    |
| 9        | 903-17456   | SAFETY SIGN                               | 1    |
| 10       | 903-18248   | GUARD REPAIR KIT                          |      |
| 11       | -           | INNER GUARD                               | 1    |
| 12       | 903-17718   | YOKE, TUBE, & SLIP SLEEVE                 | 1    |
| 13       | 903-17525   | 44E CROSS & BEARING KIT                   | 1    |
| 14       | 903-17721   | OVERRUNNING CLUTCH                        | 1    |
|          | 903-17717   | GUARD SET<br>* INCLUDES #6, #10 *         |      |
|          | 903-18406   | COMPLETE PTO DRIVE SHAFT, COMPLETE 1-3/8" |      |
|          | 903-18407   | COMPLETE PTO DRIVE SHAFT, COMPLETE 1-3/4" |      |

## GEAR BOX COMPONENTS



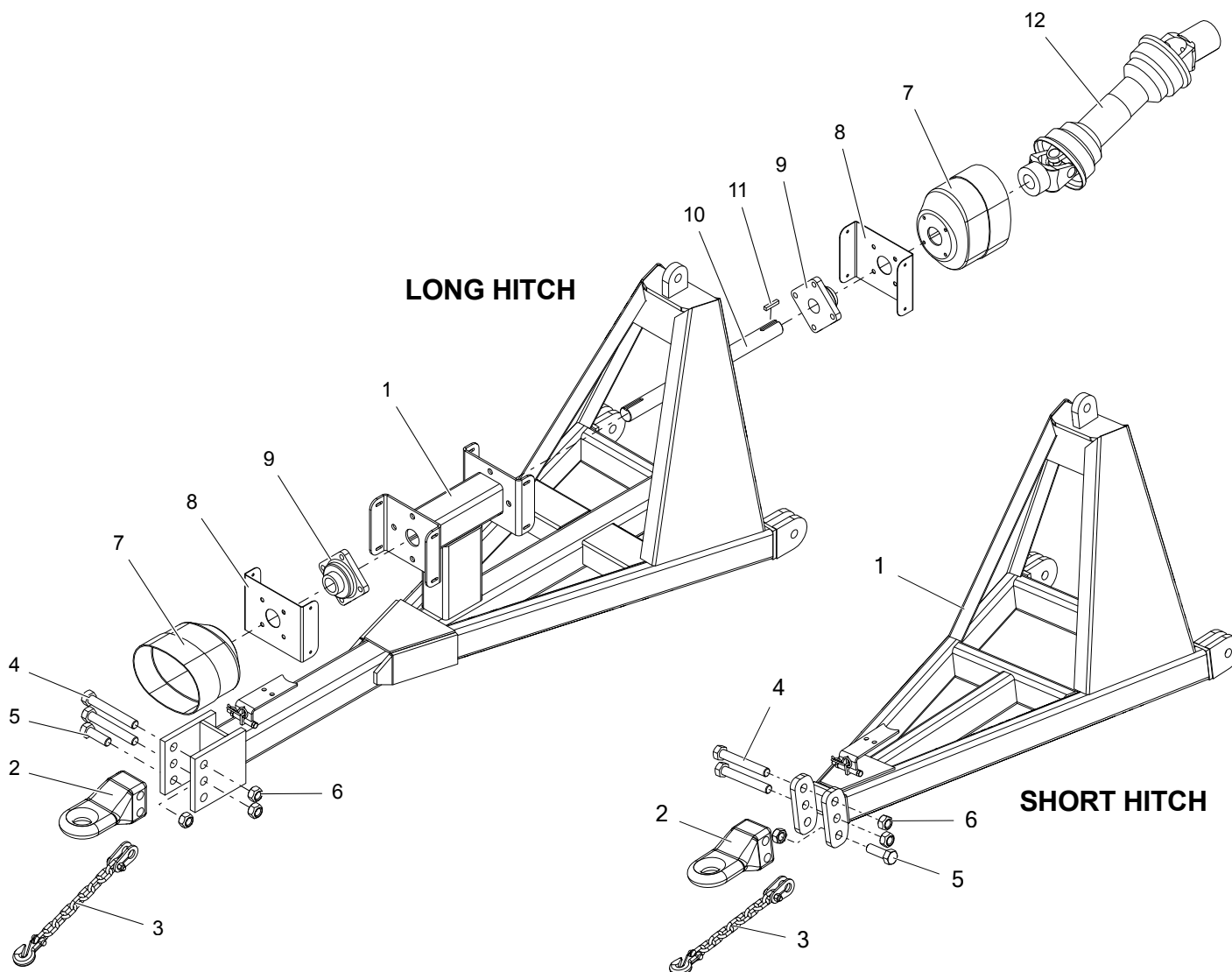
| ITEM NO. | PART NUMBER | DESCRIPTION                      | QTY. |
|----------|-------------|----------------------------------|------|
| 1        | 903-15291   | CASTING, MACHINE BOTTOM THREADED | 1    |
| -        | 903-15292   | CASTING, MACHINE TOP HALF        | 1    |
| 3        | 903-15398   | SHAFT, PINION 600100 1.75/2.0 K  | 2    |
| 4        | 903-15393   | SHAFT, CROSS 600100 1.50/3.0 K   | 1    |
| 5        | 903-15321   | GEAR, 1.5:1, 20 TOOTH, #651010   | 1    |
| 6        | 903-15320   | GEAR, 1.5:1, 30 TOOTH, #651030   | 2    |
| 7        | 901-01150   | BEARING CONE 25581               | 4    |
| 8        | 901-01152   | BEARING CUP 25520                | 4    |
| 9        | 901-01151   | BEARING CONE 3782                | 2    |
| 10       | 901-01153   | BEARING CUP 3720                 | 2    |
| 11       | 901-09125   | SEAL, TC-1.750-2.437-.312        | 3    |
| 12       | 903-15397   | END PLUG, BPC-.328-SMBR          | 1    |
| 13       | 900-39030   | RETAINING RING, 1.750            | 6    |
| 14       | 903-15343   | KEY                              | 3    |
| -        | 900-03033   | BOLT, 3/8-16 X 2.25 SHCS         | 16   |
| -        | 905-01159   | PLUG, 1/2-1/8 NPT SCHD W/3M      | 1    |
| -        | 903-15411   | DIP STICK                        | 1    |
| -        | 905-03080   | PLUG, VENT 5 PSI                 | 1    |
| -        | 903-15359   | BUSHING, 1/2 NPT TO 1/4 NPT      | 1    |
|          |             | GEAR BOX, COMPLETE, KEYED        | 1    |

## LIGHT KIT COMPONENTS



| ITEM NO. | PART NUMBER | DESCRIPTION                                       | QTY. |
|----------|-------------|---------------------------------------------------|------|
| 1        | 500-2-0930  | RED LIGHT BRACKET                                 | 2    |
| 2        | 500-3-1720  | FIELD LIGHT BRACKET                               | 2    |
| 3        | 500-3-2091  | SMV MOUNT                                         | 1    |
| 4        | 500-3-2168  | WIRE HARNESS (4R30 - 8R22)                        | 1    |
|          | 500-3-2201  | WIRE HARNESS (8R30 - 12R22)                       |      |
| 5        | 904-01154   | AMBER LAMP                                        | 2    |
| 6        | 904-01155   | RED LAMP                                          | 2    |
| 7        | 500-3-1721  | FIELD LIGHT                                       | 2    |
| 8        | 500-3-1696  | SMV SIGN                                          | 1    |
| 9        | 200-3-0017  | U-BOLT, 5/8 NC x 4 x 7-1/4                        | 2    |
| 10       | 900-35000   | U-BOLT, 3/8 NC x 6 x 5                            | 5    |
|          | 500-1-0109  | FIELD LIGHT BRACKET KIT<br>* INCLUDES #2, #9 *    | -    |
|          | 500-1-0185  | LIGHT KIT (4R30 - 8R22)<br>* INCLUDES #1 - #10 *  | -    |
|          | 500-1-0184  | LIGHT KIT (8R30 - 12R22)<br>* INCLUDES #1 - #10 * | -    |

## HITCH COMPONENTS



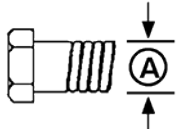
| ITEM NO. | PART NUMBER | DESCRIPTION                   | QTY. |
|----------|-------------|-------------------------------|------|
| 1        | 500-2-1165  | LONG HITCH FRAME              | 1    |
|          | 500-2-0036  | SHORT HITCH FRAME             |      |
| 2        | 505-3-0831  | HITCH, CAT-3                  | 1    |
| 3        | 905-07123   | SAFETY CHAIN                  | 1    |
| 4        | 900-02930   | BOLT, 1 NC x 7                | 2    |
| 5        | 900-01519   | BOLT, 1 NC x 3                | 1    |
| 6        | 900-06514   | LOCK NUT, 1 NC                | 3    |
| 7        | 903-18007   | PTO BELL                      | 2    |
| 8        | 500-3-2164  | GUARD BRACKET                 | 2    |
| 9        | 901-01185   | BEARING, 4-BOLT FLANGE, 1-3/4 | 2    |
| 10       | 500-3-2165  | PTO TRANSFER SHAFT            | 1    |
| 11       | 100-3-3333  | KEY, 3/8 x 3/8 x 2            | 1    |
| 12       | 903-18387   | JUMPER DRIVE SHAFT            | 1    |
|          | 500-2-1216  | SHORT HITCH, COMPLETE KIT     |      |
|          | 500-2-1166  | LONG HITCH, COMPLETE KIT      |      |

# BOLT TORQUE CHART

## SAE Series Torque Chart

Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application. Fasteners must always be replaced with the same grade as specified in the manual parts list.

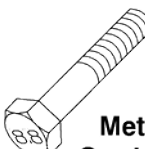
Make sure fastener threads are clean and you properly start thread engagement.

| SAE Bolt Head Identification |                | <br>SAE Grade 2<br>(No Dashes) |        | <br>SAE Grade 5<br>(3 Radial Dashes) |        | <br>SAE Grade 8<br>(6 Radial Dashes) |        |
|------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------|--------|
| Ⓐ<br>Diameter<br>(Inches)    | Wrench<br>Size | MARKING ON HEAD                                                                                                 |        |                                                                                                                       |        |                                                                                                                         |        |
|                              |                | SAE 2                                                                                                           |        | SAE 5                                                                                                                 |        | SAE 8                                                                                                                   |        |
|                              |                | ft./lb.                                                                                                         | (Nm)   | ft./lb.                                                                                                               | (Nm)   | ft./lb.                                                                                                                 | (Nm)   |
| 1/4"                         | 7/16'          | 6                                                                                                               | (8)    | 10                                                                                                                    | (13)   | 14                                                                                                                      | (18)   |
| 5/16'                        | 1/2"           | 12                                                                                                              | (17)   | 19                                                                                                                    | (26)   | 27                                                                                                                      | (37)   |
| 3/8"                         | 9/16"          | 23                                                                                                              | (31)   | 35                                                                                                                    | (47)   | 49                                                                                                                      | (67)   |
| 7/16"                        | 5/8"           | 36                                                                                                              | (48)   | 55                                                                                                                    | (75)   | 78                                                                                                                      | (106)  |
| 1/2"                         | 3/4"           | 55                                                                                                              | (75)   | 85                                                                                                                    | (115)  | 120                                                                                                                     | (163)  |
| 9/16"                        | 13/16"         | 78                                                                                                              | (106)  | 121                                                                                                                   | (164)  | 171                                                                                                                     | (232)  |
| 5/8"                         | 15/16"         | 110                                                                                                             | (149)  | 170                                                                                                                   | (230)  | 240                                                                                                                     | (325)  |
| 3/4"                         | 1-1/8"         | 192                                                                                                             | (261)  | 297                                                                                                                   | (403)  | 420                                                                                                                     | (569)  |
| 7/8"                         | 1-5/16"        | 306                                                                                                             | (416)  | 474                                                                                                                   | (642)  | 669                                                                                                                     | (907)  |
| 1"                           | 1-1/2"         | 350                                                                                                             | (475)  | 680                                                                                                                   | (925)  | 1020                                                                                                                    | (1383) |
| 1-1/8"                       | 1-11/16"       | 450                                                                                                             | (610)  | 885                                                                                                                   | (1200) | <div>Bolt Diameter</div>            |        |
| 1-1/4"                       | 1-7/8"         | 600                                                                                                             | (815)  | 1255                                                                                                                  | (1700) |                                                                                                                         |        |
| 1-3/8"                       | 2-1/16"        | 675                                                                                                             | (915)  | 1620                                                                                                                  | (2200) |                                                                                                                         |        |
| 1-1/2"                       | 2-1/4'         | 920                                                                                                             | (1250) | 2200                                                                                                                  | (2900) |                                                                                                                         |        |

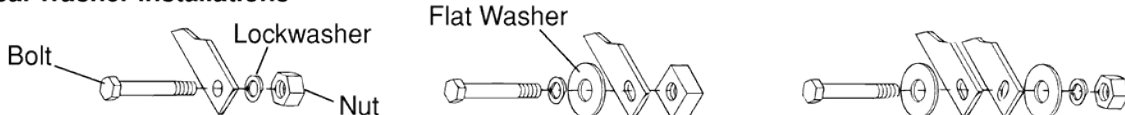
## Metric Series Torque Chart

Use only metric tools on metric hardware. Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application. Fasteners must always be replaced with the same grade.

Make sure fastener threads are clean and you properly start thread engagement.

| Ⓐ<br>Diameter<br>& Thread<br>Pitch<br>(Millimeters) | Wrench<br>Size | COARSE THREAD   |         |             |         | FINE THREAD     |         |             |         | Ⓐ<br>Diameter<br>& Thread<br>Pitch<br>(Millimeters) | Metric<br>Bolt Head<br>Identification                                                                                 |
|-----------------------------------------------------|----------------|-----------------|---------|-------------|---------|-----------------|---------|-------------|---------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
|                                                     |                | MARKING ON HEAD |         |             |         | MARKING ON HEAD |         |             |         |                                                     |                                                                                                                       |
|                                                     |                | Metric 8.8      |         | Metric 10.9 |         | Metric 8.8      |         | Metric 10.9 |         |                                                     |                                                                                                                       |
|                                                     |                | Nm              | ft./lb. | Nm          | ft./lb. | Nm              | ft./lb. | Nm          | ft./lb. |                                                     |                                                                                                                       |
| 6x1.0                                               | 10 mm          | 8               | 6       | 11          | 8       | 8               | 6       | 11          | 8       | 6x1.0                                               | <br><b>Metric<br/>Grade 8.8</b>  |
| 8x1.25                                              | 13 mm          | 20              | 15      | 27          | 20      | 21              | 16      | 29          | 22      | 8x1.0                                               |                                                                                                                       |
| 10x1.5                                              | 16 mm          | 39              | 29      | 54          | 40      | 41              | 30      | 57          | 42      | 10x1.25                                             |                                                                                                                       |
| 12x1.75                                             | 18 mm          | 68              | 50      | 94          | 70      | 75              | 55      | 103         | 76      | 12x1.25                                             |                                                                                                                       |
| 14x2.0                                              | 21 mm          | 109             | 80      | 151         | 111     | 118             | 87      | 163         | 120     | 14x1.5                                              | <br><b>Metric<br/>Grade 10.9</b> |
| 16x2.0                                              | 24 mm          | 169             | 125     | 234         | 173     | 181             | 133     | 250         | 184     | 16x1.5                                              |                                                                                                                       |
| 18x2.5                                              | 27 mm          | 234             | 172     | 323         | 239     | 263             | 194     | 363         | 268     | 18x1.5                                              |                                                                                                                       |
| 20 x 2.5                                            | 30 mm          | 330             | 244     | 457         | 337     | 367             | 270     | 507         | 374     | 20x1.5                                              |                                                                                                                       |
| 22 x 2.5                                            | 34 mm          | 451             | 332     | 623         | 460     | 495             | 365     | 684         | 505     | 22 x 1.5                                            |                                                                                                                       |
| 24 x 3.0                                            | 36 mm          | 571             | 421     | 790         | 583     | 623             | 459     | 861         | 635     | 24 x 2.0                                            |                                                                                                                       |
| 30 x 3.0                                            | 46 mm          | 1175            | 867     | 1626        | 1199    | 1258            | 928     | 1740        | 1283    | 30 x 2.0                                            |                                                                                                                       |

## Typical Washer Installations



8/9/00

# ABBREVIATIONS

AG .....Agriculture  
 ASAE ..... American Society of Agricultural Engineers  
 ATF ..... Automatic Transmission Fluid  
 BSPP ..... British Standard Pipe Parallel  
 BSPTM ..... British Standard Pipe Tapered Male  
 CV ..... Constant Velocity  
 CCW ..... Counter-Clockwise  
 CW ..... Clockwise  
 DIA ..... Diameter  
 EP ..... Extreme Pressure  
 F ..... Female  
 FB ..... Female O-Ring Boss  
 FJ ..... Female Boss  
 FJX ..... Female Swivel JIC  
 FP ..... Female Pipe  
 ft./lb ..... Foot Pound  
 GA ..... Gauge  
 GR (5, etc.) ..... Grade (5, etc.)  
 HHCS ..... Hex Head Cap Screw  
 HT ..... Heat Treated  
 in ..... Inch  
 JIC ..... Joint Industry Council 37° Flare  
 kg ..... Kilogram  
 km/h ..... Kilometers Per Hour  
 lb ..... Pound  
 LH ..... Left Hand  
 LT ..... Left  
 in ..... Inches  
 m ..... Meter  
 mm ..... Millimeter  
 M ..... Male  
 MB ..... Male O-Ring Boss  
 MJ ..... Male JIC  
 MJX ..... Male Swivel JIC  
 MP ..... Male Pipe  
 MPa ..... Mega Pascal  
 MPH ..... Miles Per Hour  
 N ..... Newton

NC ..... National Course  
 NF ..... National Fine  
 NPSM ..... National Pipe Straight Mechanical  
 NPT ..... National Pipe Tapered  
 NPT SWF ..... National Pipe Tapered Swivel Female  
 Nm ..... Newton Meter  
 OSHA... Occupational Safety and Health Administration  
 P ..... Pitch  
 PBY ..... Power Beyond  
 psi ..... Pounds per Square Inch  
 PTO ..... Power Take Off  
 QD ..... Quick Disconnect  
 RH ..... Right Hand  
 ROPS ..... Roll Over Protection Structure  
 RPM ..... Revolutions Per Minute  
 RT ..... Right  
 SAE ..... Society of Automotive Engineers  
 SMV ..... Slow Moving Vehicle  
 UNC ..... Unified Coarse  
 UNF ..... Unified Fine  
 UNS ..... Unified Special  
 ZP ..... Zinc Plate

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# WARRANTY

Please Enter Information Below and Save For Future Reference.

Date Purchased: \_\_\_\_\_ From (Dealer): \_\_\_\_\_

Model Number: \_\_\_\_\_ Serial Number: \_\_\_\_\_

ALLOWAY STANDARD, d/b/a ALLOWAY, warrants this product to be free from defect in material and workmanship for TWELVE (12) MONTHS COMMENCING ON THE DATE OF DELIVERY OF THE PRODUCT TO THE ORIGINAL PURCHASER.

Under no circumstances will this Warranty apply in the event that the product, in the good faith opinion of ALLOWAY, has been subjected to improper operation, improper maintenance, misuse, or an accident. This Warranty does not apply in the event that the product has been materially modified or repaired by someone other than ALLOWAY, a ALLOWAY authorized dealer or distributor, and/or a ALLOWAY authorized service center; This Warranty does not cover normal wear or tear, or normal maintenance items. This Warranty also does not cover repairs made with parts other than those obtainable through ALLOWAY.

This Warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. There are no third party beneficiaries of this Warranty.

ALLOWAY makes no warranty, express or implied, with respect to tires or other parts or accessories not manufactured by ALLOWAY. Their respective manufacturers, if any, provide warranties for these items, separately. ALLOWAY'S obligation under this Warranty is limited to, at ALLOWAYS' option, the repair or replacement, free of charge, of the product if ALLOWAY, in its sole discretion, deems it to be defective or in noncompliance with this Warranty. The product must be returned to ALLOWAY with proof of purchase within thirty (30) days after such defect or noncompliance is discovered or should have been discovered, routed through the dealer and distributor from whom the purchase was made, transportation charges prepaid. ALLOWAY shall complete such repair or replacement within a reasonable time after ALLOWAY receives the product. THERE ARE NO OTHER REMEDIES UNDER THIS WARRANTY. THE REMEDY OF REPAIR OR REPLACEMENT IS THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY.

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ALLOWAY shall not be liable for any incidental or consequential losses, damages or expenses, arising directly or indirectly from the product, whether such claim is based upon breach of contract, breach of warranty, negligence, strict liability in tort or any other legal theory. Without limiting the generality of the foregoing. Alloway specifically disclaims any damages relating to (i) lost profits, business, revenues or goodwill; (ii) loss of crops; (iii) loss because of delay in harvesting; (iv) any expense or loss Incurred for labor, supplies, substitute machinery or rental; or (v) any other type of damage to property or economic loss.

This Warranty is subject to any existing conditions of supply, which may directly affect ALLOWAYS' ability to obtain materials or manufacture replacement parts.

No agent, representative, dealer, distributor, serviceperson, salesperson, or employee of any company; including without limitation, ALLOWAY, its authorized dealers, distributors, and service centers, is authorized to alter, modify, or enlarge this Warranty.

This Warranty is effective only if the warranty registration card is returned within ten (10) days.

Answers to any questions regarding warranty service and locations may be obtained by contacting:

Alloway  
4230 14<sup>th</sup> Ave.NW  
Fargo, North Dakota 58102  
701-356-4983



## WARRANTY

ALLOWAY STANDARD, d/b/a ALLOWAY, warrants this product to be free from defect in material and workmanship for a period of One (1) year, ninety (90) days for Service Parts, from the date of delivery of the product to the original purchaser.

Under no circumstances will this Warranty apply in the event that the product, in the good faith opinion of ALLOWAY, has been subjected to improper operation, improper maintenance, misuse, or an accident. This Warranty does not cover normal wear or tear, or normal maintenance items.

This Warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. There are no third party beneficiaries of this Warranty.

ALLOWAY'S obligation under this Warranty is limited to, at ALLOWAY'S option, the repair or replacement, free of charge, of the product. If ALLOWAY, in its sole discretion, deems it, to be defective or in noncompliance with this Warranty. The product must be returned to ALLOWAY with proof of purchase within thirty (30) days after such defect or noncompliance is discovered or should have been discovered, routed through the dealer and distributor from whom the purchase was made, transportation charges prepaid. ALLOWAY shall complete such repair or replacement within a reasonable time after ALLOWAY receives the product. THERE ARE NO OTHER REMEDIES UNDER THIS WARRANTY. THE REMEDY OF REPAIR OR REPLACEMENT IS THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY.

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ALLOWAY shall not be liable for any incidental or consequential losses, damages or expenses, arising directly or indirectly from the product, whether such claim is based upon breach of contract, breach, of warranty, negligence, strict liability in tort or any other legal theory. Without limiting the generality of the foregoing, Alloway specifically disclaims any damages relating to (i) lost profits, business, revenues or goodwill; (ii) loss of crops; (iii) loss because of delay in harvesting; (iv) any expense or loss incurred for labor, supplies, substitute machinery or rental; or (v) any other type of damage to property or economic loss.

This Warranty is subject to any existing conditions of supply, which may directly affect ALLOWAYS' ability to obtain materials or manufacture replacement parts.

No agent, representative, dealer, distributor, service person, salesperson, or employee of any company, including without limitation, ALLOWAY, Its authorized dealers, distributors, and service centers, IS authorized to alter, modify, or enlarge this Warranty.

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4230 14<sup>th</sup> Ave.NW  
Fargo, North Dakota 58102  
701-356-4983



**PART NUMBER**  
**500-5-0029**

**ALLOWAY** 

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Alloway Standard Industries  
4230 14th Avenue NW  
Fargo, North Dakota 58102

Local/Intl: 1-701-356-4983  
Toll Free: 1-877-275-8714  
Fax: 1-701-356-4985