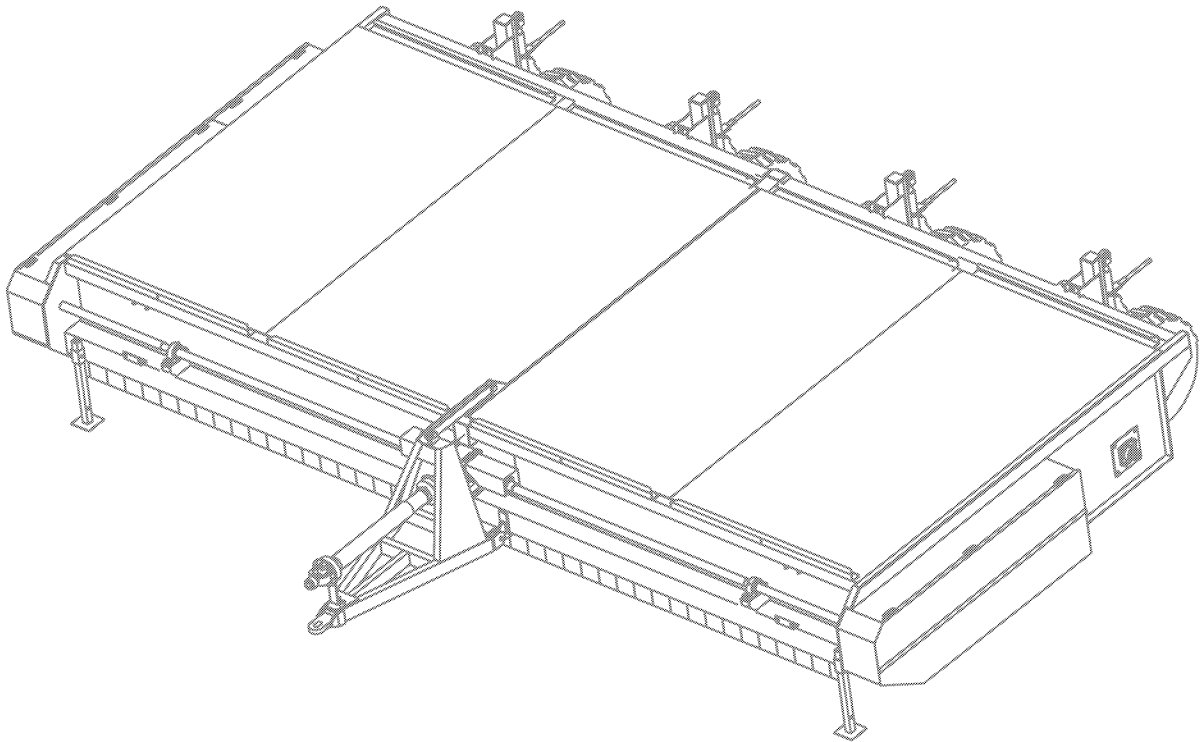




BEET DEFOLIATOR

630
822
922
1222



500-3-1351

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 or, in the United States and Canada, by calling 1-877-275-8714.

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!**

 **DANGER**

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.

STANDARD
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.

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 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.

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 or, in the United States and Canada, call 1-877-275-8714.) 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 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 that all operating and service personnel know that if 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 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. When connecting equipment or hoses or performing any hydraulic maintenance, purge any air in hydraulic system by operating all hydraulic functions several times. Do this before putting into service or allowing anyone to approach the equipment.**

■ **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.**

■ **Make sure attachment is properly secured, 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. Replace any damaged guards. Make sure all guards rotate freely on all drivelines. If guards do not rotate freely on drivelines, repair and replace bearings before putting equipment into service.**

■ **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.**

SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



- 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, power unit, and engine to avoid fire hazard.
- Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)
- Make sure shields and guards are properly installed and in good condition. Replace if damaged.
- 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.
- Make sure hydraulic hoses and cylinders are fully purged of air before putting into service. Keep all persons away. 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.
- 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.
- Never walk, stand, or place yourself or others under a raised wing or in the path of a lowering wing. Hydraulic system leak-down, hydraulic system failures, mechanical failures, or movement of control levers can cause wings to drop unexpectedly and cause severe injury or death.

SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



- 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.
- Before raising or lowering wings, front hitch/lift and rear wheel/lift cylinders must be fully extended and all four cylinder locks installed. This prevents rotor and bearing support damage that can result from ground contact.
- 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 scalpings to the ground and service each unit individually.

- Always connect safety chain from equipment to towing vehicle when transporting.
- **AVOID INJURY OR DEATH FROM POWER LINES:**
 - Stay away from power lines.
 - Electrocuting 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.



SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



- 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 bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.
- Make sure attachment is properly secured, adjusted, and in good operating condition.
- 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.
- Never perform service or maintenance with engine running.
- Make sure hydraulic hoses and cylinders are fully purged of air before putting into service. Keep all persons away. 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.
- Make certain all movement of equipment 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 putting unit into service.
- Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)
- Make sure 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 valve levers.

STORAGE

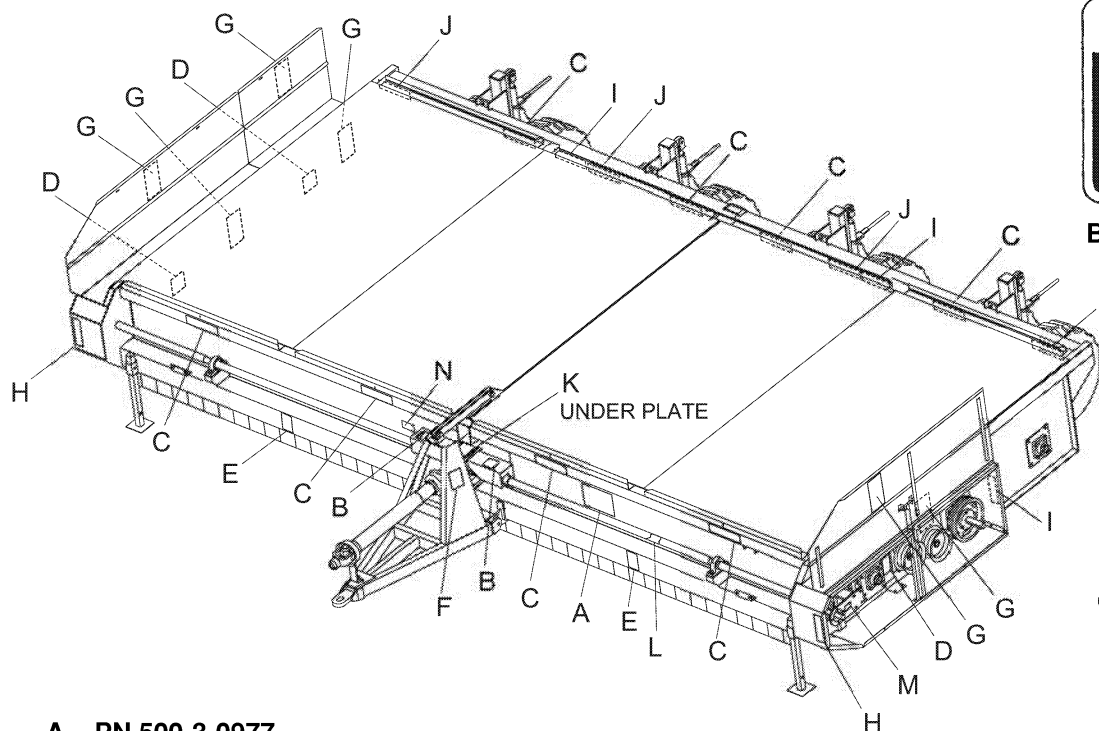
- Follow manual instructions for storage.
- Keep children and bystanders away from storage area.



SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately If Damaged!



B – PN 100-3-1367

00203042

A – PN 500-3-0977



CAUTION

1. Read Operator's Manual before starting.
2. Stop tractor engine, place all controls in neutral, lower machine to the ground, set park brake, remove ignition key, and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.
3. Keep all guards and access doors closed and secured before operating.
4. Keep hands, feet, hair, and clothing away from moving parts.
5. Do not allow riders.
6. Do not enter rotor area when engine is running.
7. Never exceed a safe travel speed when transporting.
8. Use hazard flashers when transporting.
9. Use drawbar pin with retainer and attach safety pin.
10. Wear appropriate hearing protection for prolonged exposure to excessive noise.
11. Review safety instructions annually.



PRECAUCION

1. Lea el Manual del Operario antes de empezar.
2. Pare el motor del tractor, ponga todos los controles en neutro, baje la máquina hasta el suelo, ponga el freno de estacionamiento, quite la llave del encendido, y espere a que todas las piezas móviles hayan parado antes de dar servicio, hacer ajustes, reparaciones, o de desatascar.
3. Mantenga cerrados y asegurados todos los protectores y las compuertas antes de poner a funcionar la máquina.
4. Mantenga retirados de las piezas móviles, las manos, los pies, el pelo, y la ropa.
5. No permita que nadie vaya con usted en la máquina.
6. No entre en el área del rotor mientras el motor está en marcha.
7. Nunca sobrepase la velocidad segura cuando viaja con la máquina.
8. Use luces intermitentes de aviso cuando viaja con la máquina.
9. Use el pasador de la barra de tiro con fiador y enganche la cadena de seguridad.
10. Use un protector apropiado para los oídos cuando esté expuesto a ruido excesivo por un tiempo prolongado.
11. Revise anualmente las instrucciones de seguridad.

50030977-A



SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately If Damaged!



! PELIGRO

PELIGRO CON LAS CUCHILLAS CORTADORAS ROTATIVAS

Para evitar heridas graves o la muerte causadas por las cuchillas rotativas:

1. Pare el motor, quite la llave del encendido y espere hasta que las piezas móviles hayan parado, antes de abrir la tapa.
2. Abrir completamente la tapa para evitar que ésta se cierre accidentalmente.
3. Nunca entre en el área de las cuchillas, estando el motor en marcha.
4. No permita que otra gente se acerque.

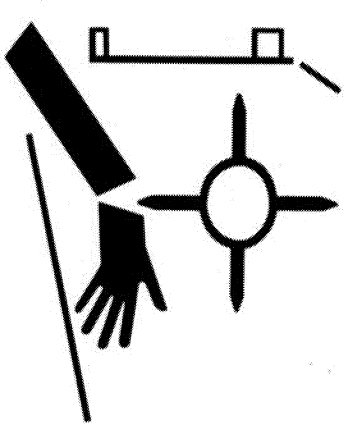
500-3-0981

! DANGER

ROTATING FLAIL HAZARD

To prevent serious injury or death from rotating flails:

1. Stop engine, remove ignition key and wait for moving parts to stop before opening cover.
2. Open cover fully to prevent accidental closing.
3. Never enter flail area when engine is running.
4. Keep others away.



C – PN 500-3-0981

! DANGER



**GUARD MISSING.
DO NOT OPERATE.**

! DANGER



**GUARD MISSING.
DO NOT OPERATE.**

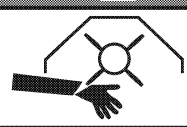
33347E

! DANGER

L – PN 903-17456

! DANGER

! PELIGRO




ROTATING FLAIL HAZARD

To prevent serious injury or death from rotating flails:

1. Stop engine, remove ignition key, and wait for moving parts to stop before servicing.
2. Keep hands and feet away from flails when engine is running.
3. Keep other people away.

PELIGRO CON LAS CUCHILLAS CORTADORAS ROTATIVAS

Para evitar heridas graves o la muerte causadas por las cuchillas rotativas:

1. Pare el motor, quite la llave del encendido y espere hasta que las piezas móviles hayan parado antes de dar servicio.
2. Mantenga las manos y los pies retirados de las cuchillas estando el motor en marcha.
3. No permita que otra gente se acerque.

50030982-A

E – PN 500-3-0982

D – PN 500-3-0980

! WARNING

! ADVERTENCIA

MISSING SHIELD HAZARD

To prevent serious injury or death:

1. Install and secure shields before operating.
2. Keep hands, feet, hair, and clothing away from moving parts.

PELIGRO POR FALTA DEL PROTECTOR

Para evitar heridas graves o la muerte:

1. Instalar y asegurar los protectores, antes de poner a funcionar la máquina.
2. Mantenga retirados de las piezas móviles, las manos, los pies, el pelo y la ropa.

50030980-A



SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately If Damaged!



**H – PN-200-3-4004 AMBER
REFLECTOR**

**I – PN-200-3-4005 RED
REFLECTOR**

**J – PN-200-3-4034 RED-ORANGE
FLUORESCENT REFLECTOR**



K – PN 506-3-0194

F – PN 500-3-0978

WARNING

ADVERTENCIA

ROTATING DRIVELINE HAZARD
To prevent serious injury or death from rotating driveline:

1. Keep all guards in place when operating.
2. Operate only at 1000 RPM.
3. Keep hands, feet, clothing and hair away from moving parts

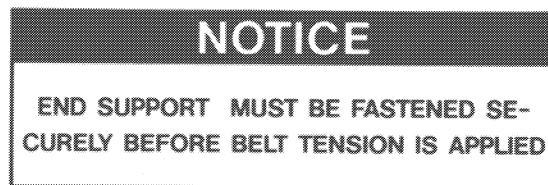
PELIGRO CON EL MOVIMIENTO ROTATIVO DEL EJE MOTRIZ
Para evitar heridas graves o la muerte a causa de la rotación del eje motriz:

1. Mantenga todos los protectores en su puesto mientras esté funcionando la máquina.
2. Hágala funcionar únicamente a 1000 RPM.
3. Mantenga retirados de las piezas móviles, las manos, los pies, la ropa y el pelo.

500-3-0978

N – SERIAL NUMBER PLATE

MODEL NO.	SERIAL NO.	MASS (KG)
ID NO.		YR OF MFG.



M – PN 500-3-1149

G – PN 500-3-0979

WARNING

ADVERTENCIA

ROTATING PART HAZARD
To prevent serious injury or death from rotating parts:

1. Close and secure guard before operating.
2. Shut off engine and wait for moving parts to stop before opening to adjust, service, lubricate, or unplug.
3. Keep hands, feet, hair, and clothing away from moving parts.

PELIGRO CON LAS PIEZAS ROTATIVAS
Para evitar heridas graves o la muerte a causa de las piezas rotativas:

1. Cierre y asegure los protectores, antes de poner en marcha la máquina.
2. Apague el motor y espere hasta que las piezas móviles hayan parado, antes de abrir para hacer ajustes, dar servicio, lubricar o desatascar.
3. Mantenga las manos, los pies, la pelo y la ropa, retirados de las piezas móviles.

50030979-A

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.

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.

Alloway Equipment Company follows the general safety standards specified by the American Society of

[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, 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.

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 dealer or, in the United States and Canada, call 1-800-319-6637.) 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 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.**

WARNING

- **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.**

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.

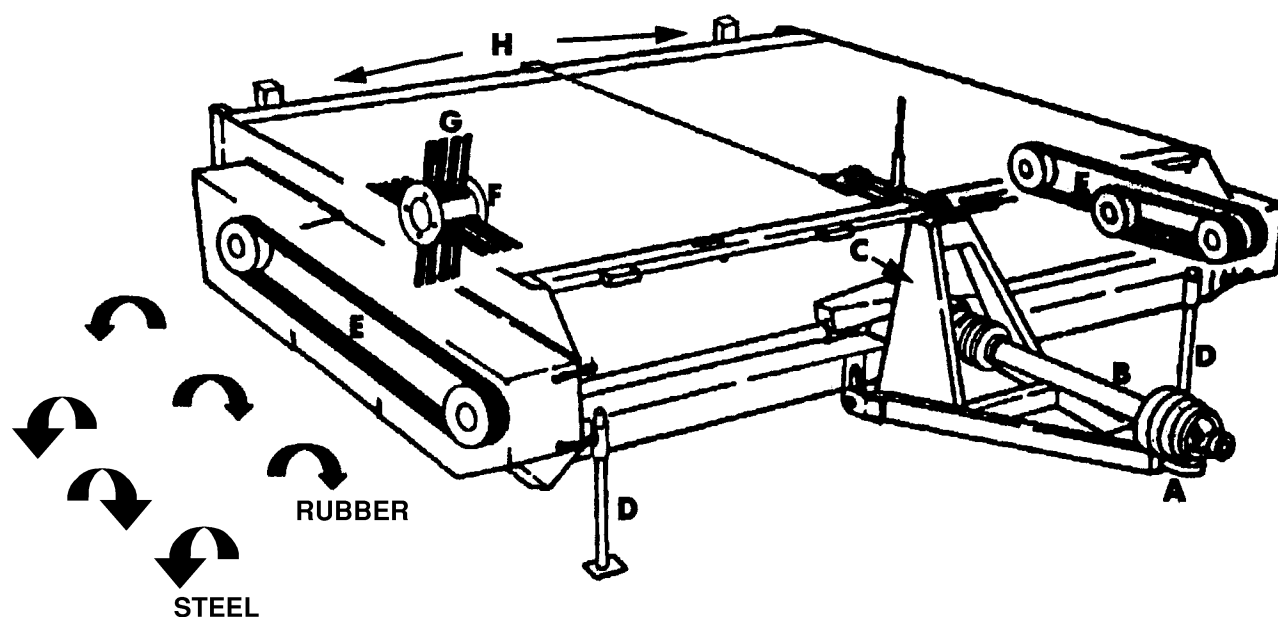


Figure 1 Beet Defoliator Principal Components

- A. Hitch
- B. Input Driveline
- C. Gearbox
- D. Stands

- E Belts
- F Rotor
- G Flails
- H Wheels

Operation *Continued*

Break-in of the Beet Defoliator

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

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

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

After operating for 5 hours

8. Repeat Steps 1 through 6 above.
9. 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

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

After operating for 15, and 20 hours

12. 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.

- ___ GENL-LUBE--Check all lubrication points and grease as instructed in Lubrication Schedule on page 29.
- ___ 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 the 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, page 37.
- ___ Check the condition of the scalpels. Adjust or repair as required. Refer to Scalpels, page 38.
- ___ 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.

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.

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.

Drawbar

The tractor drawbar must be set to provide 16" (406 mm) 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).

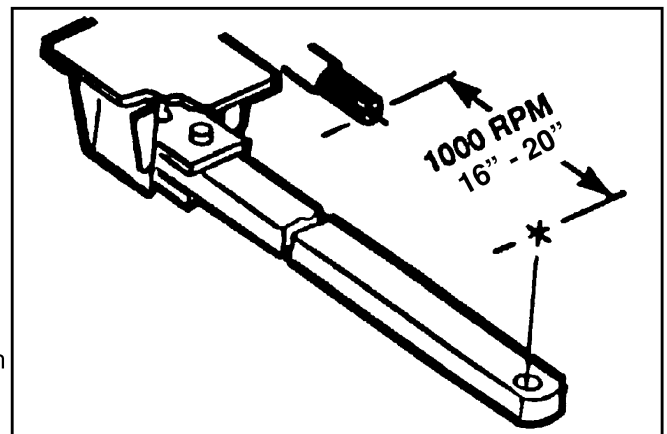


Figure 2 Drawbar Dimension

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.

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.

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.

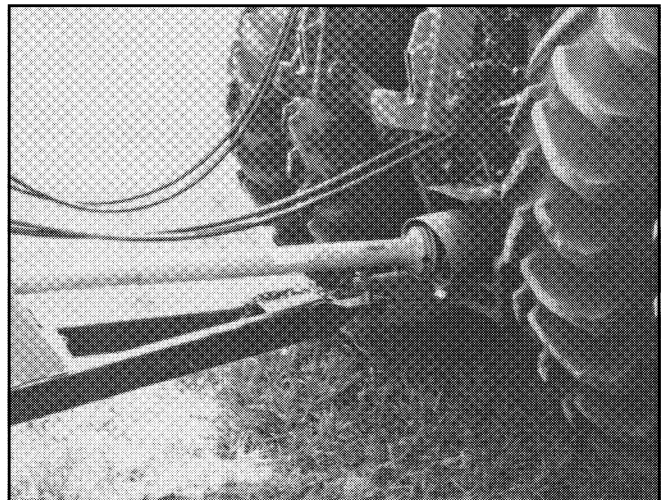


Figure 3 Driveline and hydraulics attached

3. Route the hoses along the hitch and secure in position with clips, tape, or plastic ties. Provide sufficient slack for turning

Operation *Continued*

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.

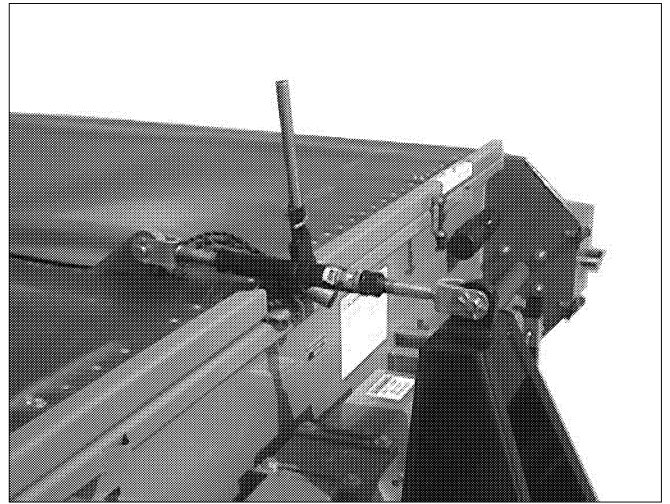


Figure 4 Hitch Ratchet

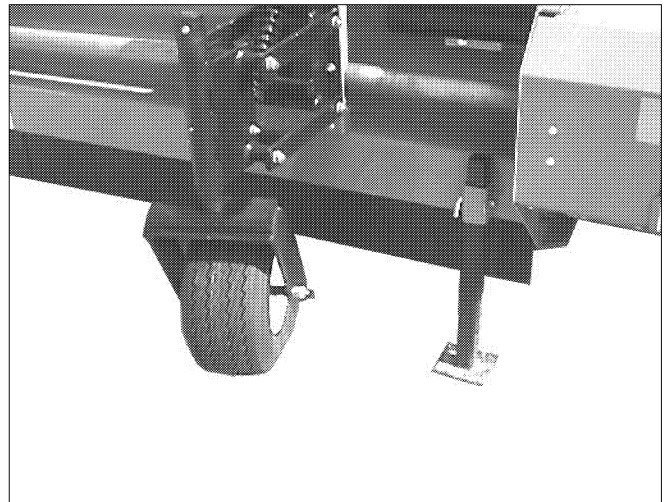


Figure 5 Stand

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.

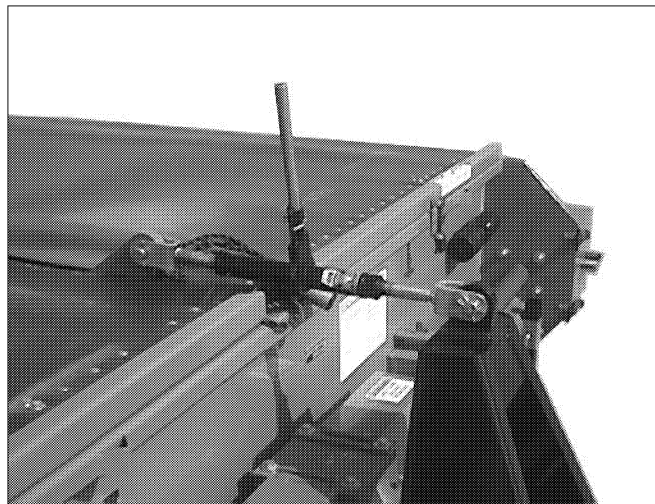


Figure 6 Hitch Ratchet

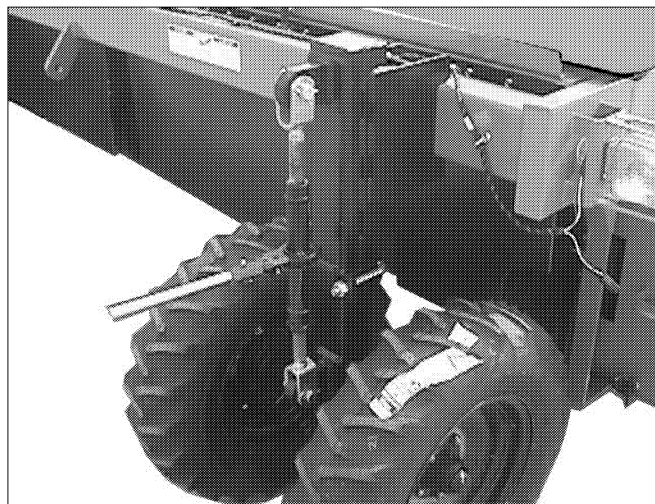


Figure 7 Rear Wheels

Machine Settings (continued)

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.

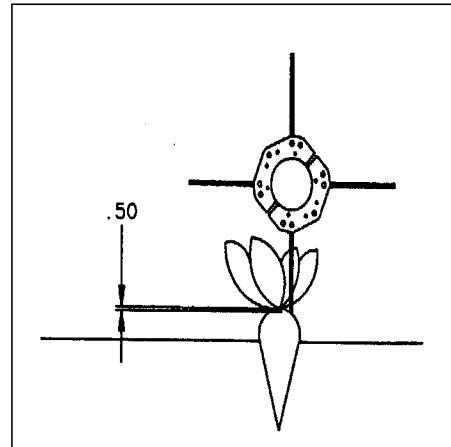


Figure 8 Flail Height

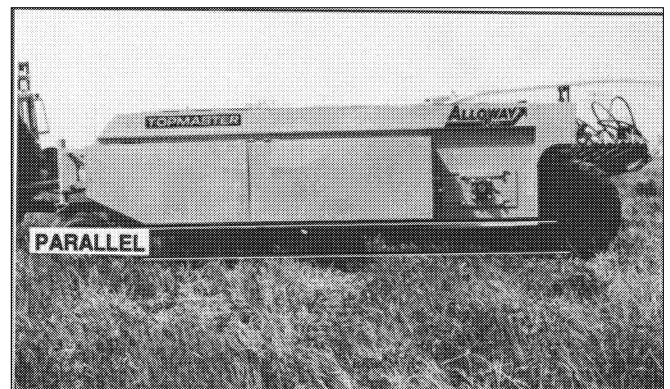


Figure 9 Machine Height

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.

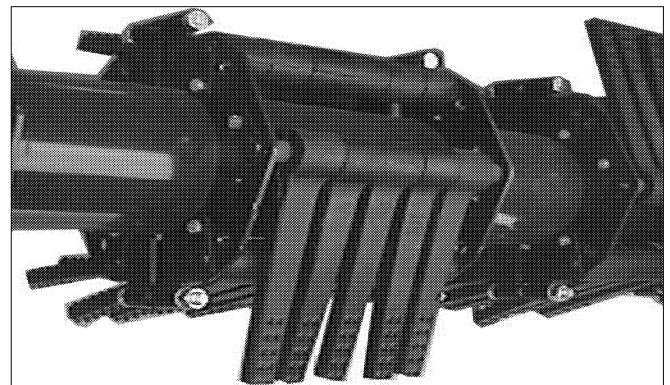


Figure 10 Flail Assembly

Machine Settings (continued)

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.

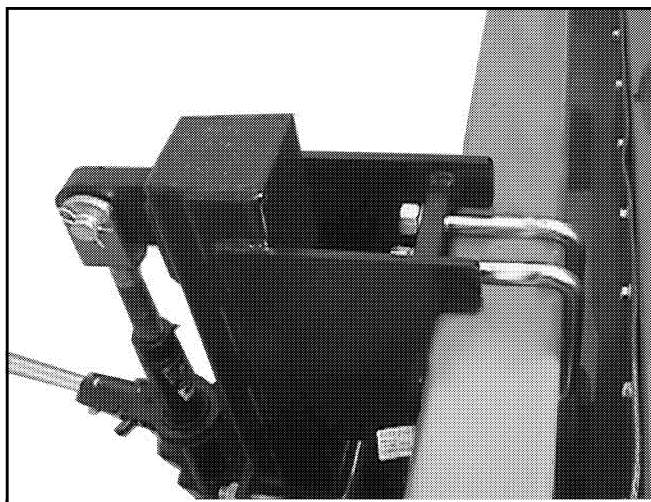


Figure 11 Wheel Mounting Bolts

Stabilizer Wheel Position

Stabilizer wheels located on the front corners of the machine (Figure 12) must be set to run in the center of the rows to prevent plant damage.

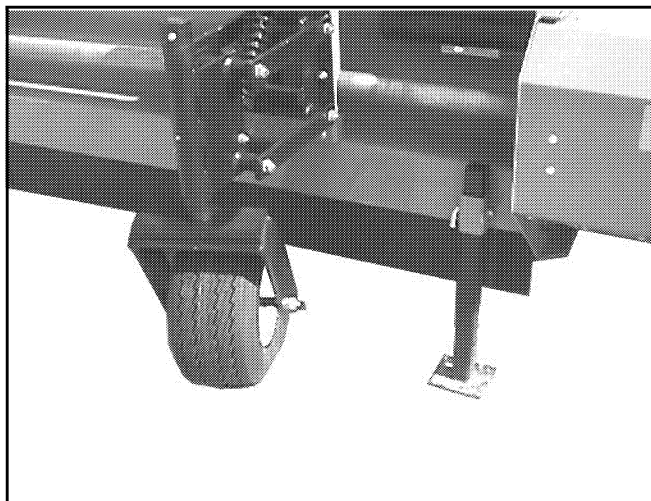


Figure 12 Stabilizer Wheel Position

Scalper Settings (Optional)

Three types of scalpers are available:

- knife (Figure 14)
- circular (parallel arms)
(not shown; refer to Parallel Arm Rotary Scalper, page 53)
- circular (arms)
(not shown, refer to Rotary Scalper Long Arm, page 56)

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.

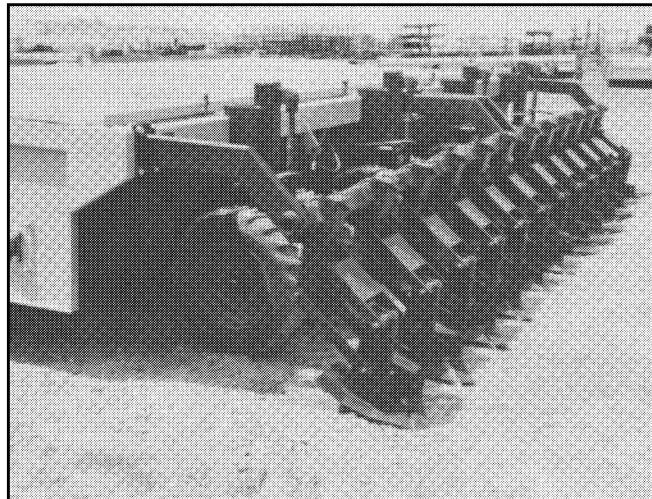


Figure 14 Knife Scalper

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, page 12, Attaching the Defoliator to the Tractor, page 14, and Transporting the Unit, page 21.

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 or, in the United States and Canada, call 1-877-275-8714.) 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.

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 kmph). 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, page 12.
4. Review Transporting the Unit, page 21, 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, page 16.
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.**

4. Stop engine and set park brake before dismounting.

Ground Speed

The defoliator works well at 3 to 6 mph (5 to 10 Kmph) 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.

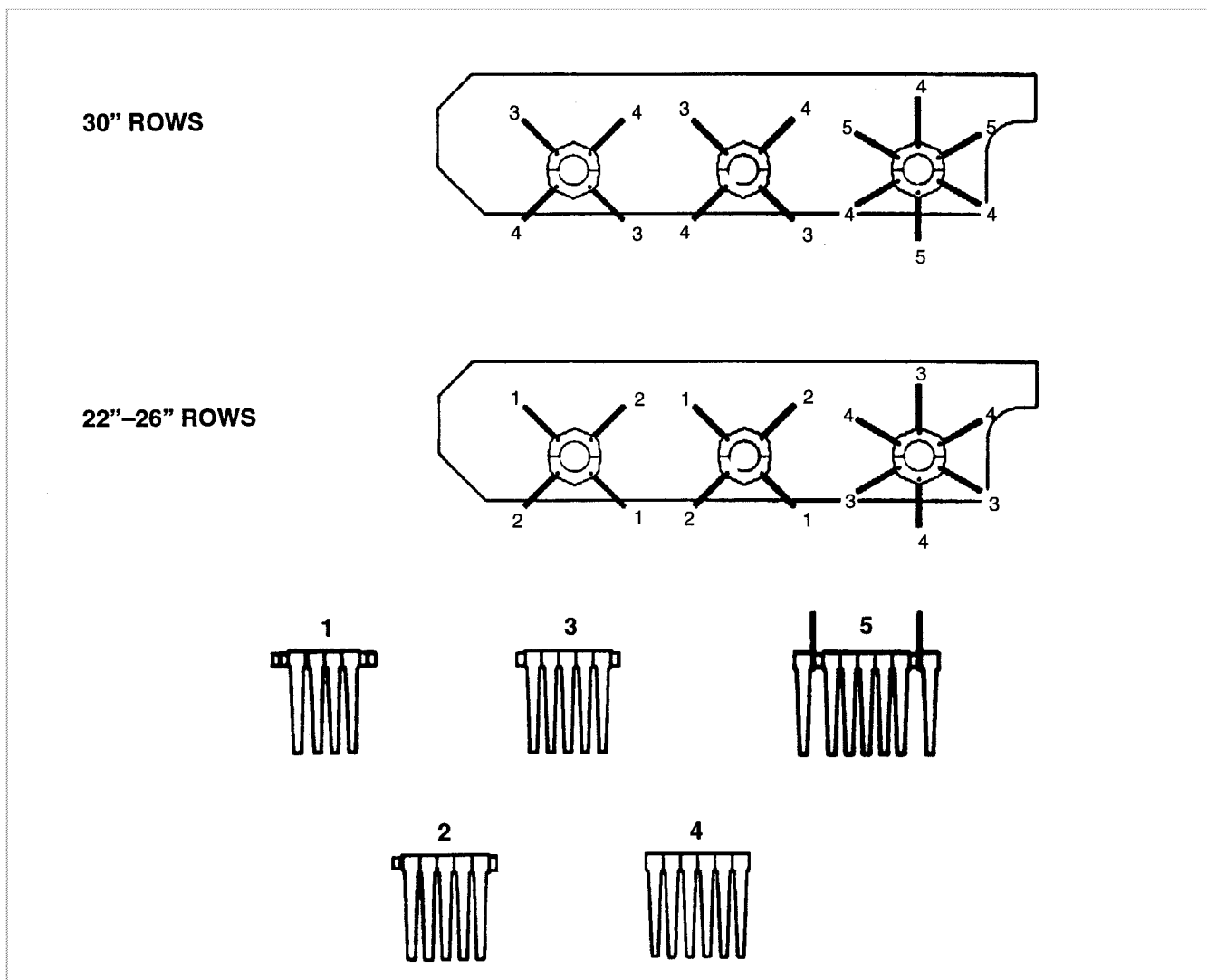


Figure 15 Flail Patterns

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.

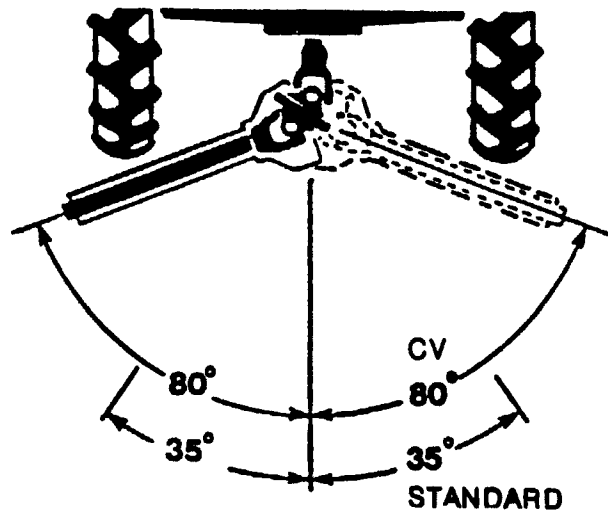


Figure 16 Driveline Angles

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.

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.

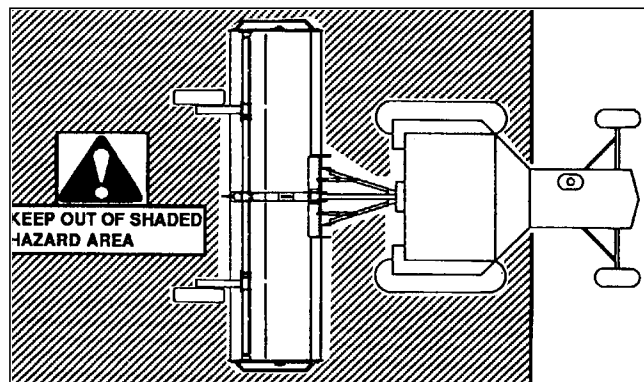


Figure 17 Hazard Area

ADDITIONAL EQUIPMENT (Optional)

Rear Steer

1. Mount rear steer components to back of defoliator body. Refer to Rear Steer Components, page 60, and Rear Steer Plumbing Components, page 61 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.

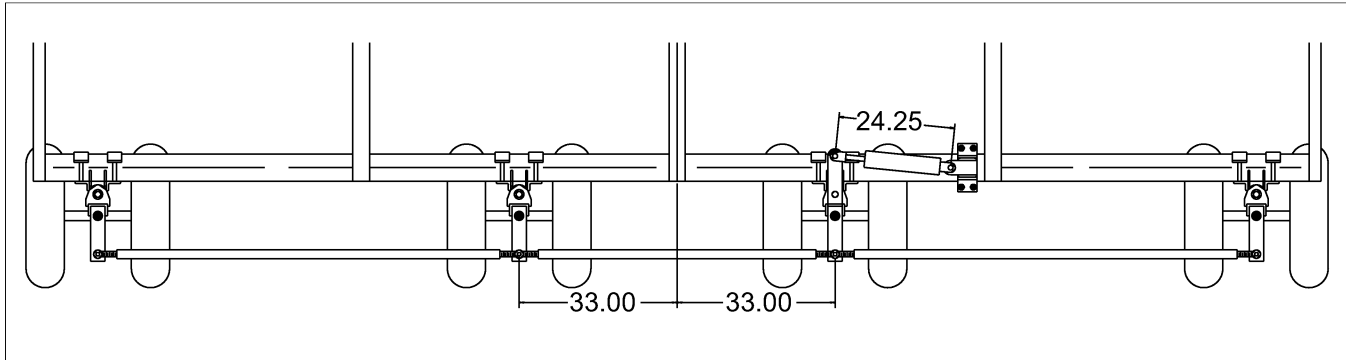


Figure 18 Rear Steer (12 Row 22)

Stabilizer Struts

1. Mount stabilizer struts to the front of defoliator. Refer to Stabilizer Wheel Components, page 52, 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.

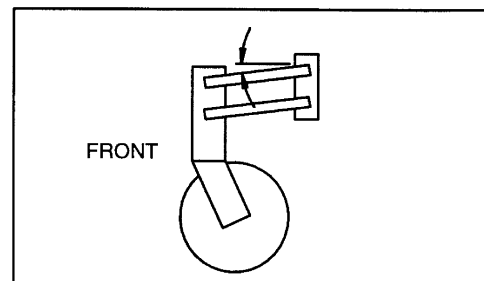


Figure 19 Stabilizer Strut

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.

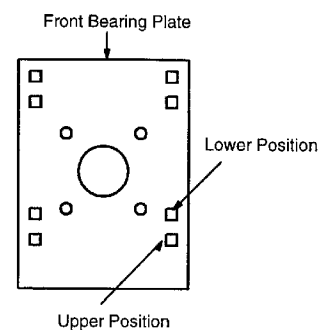


Figure 20 Steel Flail Adjustment

STORAGE

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.

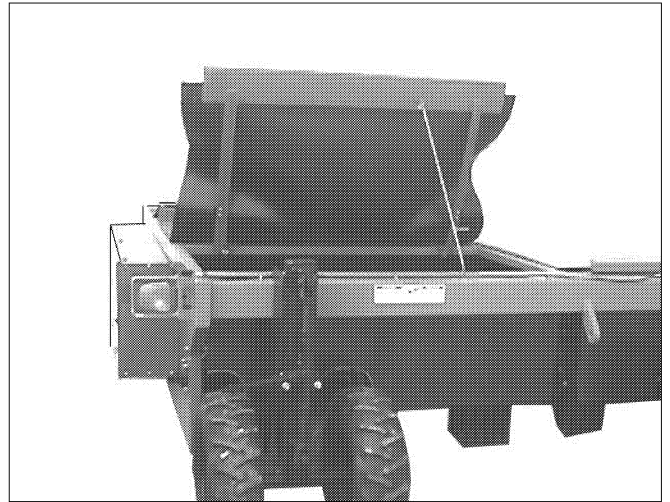


Figure 21 Open Covers

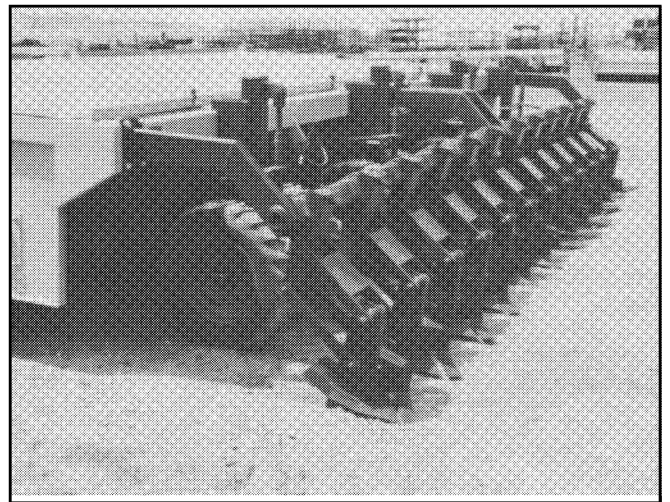


Figure 22 Scalper Storage

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.

SERVICE & MAINTENANCE

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.
- 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

1. Grease

Use an SAE multi-purpose high temperature grease with extreme pressure (EP) performance. An 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

NOTE: 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.

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.

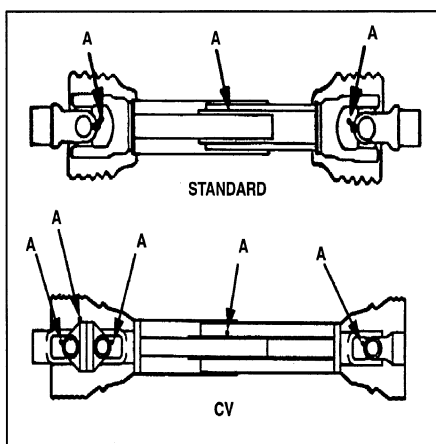


Figure 22 Driveline

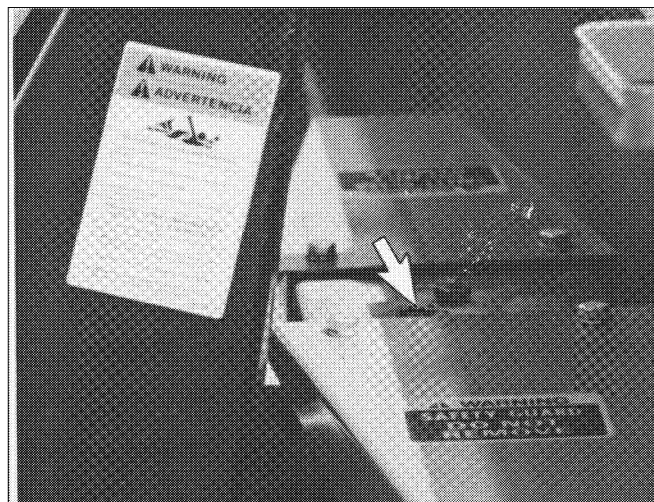


Figure 23 Dipstick

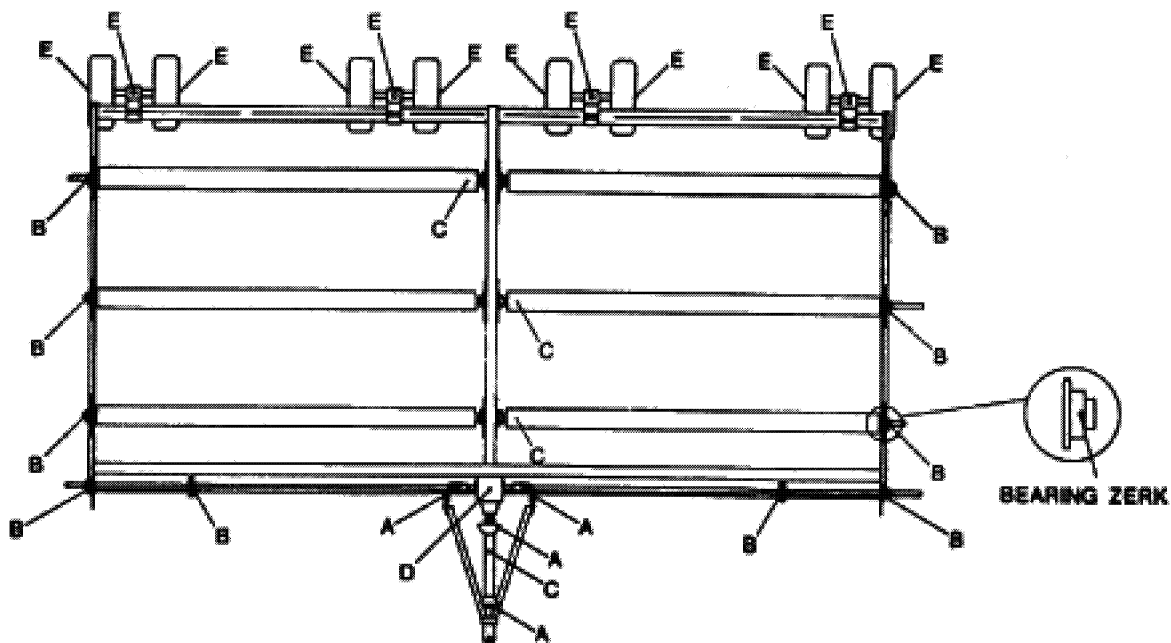


Figure 24 Lubrication Diagram

Service & Maintenance *Continued*

20 Hours

See Figure 24 for positions identification.

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.

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.

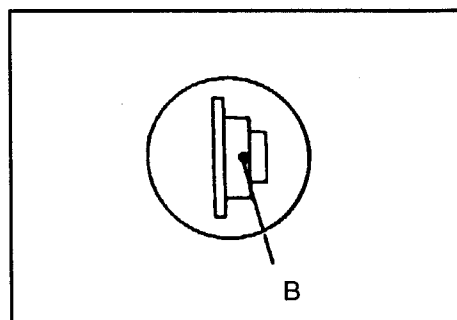


Figure 25 Position B

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).

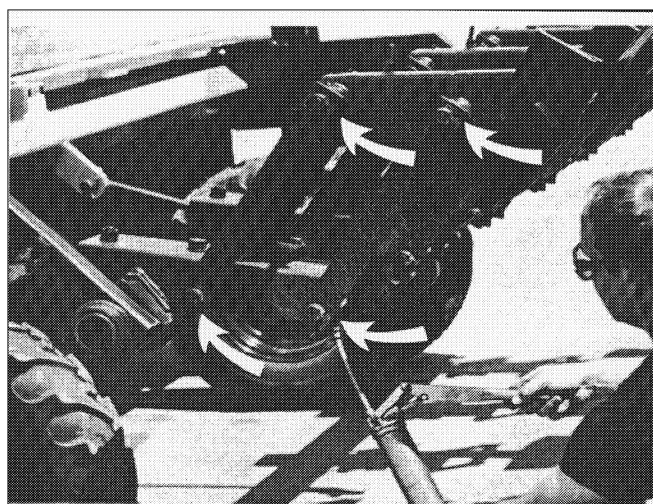


Figure 26 Scalper pivot bearings

Service & Maintenance *Continued*

Lubrication Service Record

✓ = CHECK

C = CHANGE

NOTE: See page 29 through page 30 for details.
Copy this page to continue service record.

L = LUBRICATE

R = REPACK

HOURS OF SERVICE																	
SERVICED BY																	
10 Hours or daily																	
L PTO Driveline (8)																	
✓ Gearbox oil level																	
20 Hours																	
L PTO Driveline telescope section																	
L Rotor splined couplers																	
L Wheel mounting tube bearings																	
40 Hours																	
L Rotor end bearing																	
L U-Joint (1)																	
L Overrunning clutch (1)																	
Annually																	
C Gearbox oil																	
R Wheel bearings																	
L Ratchets																	

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.
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

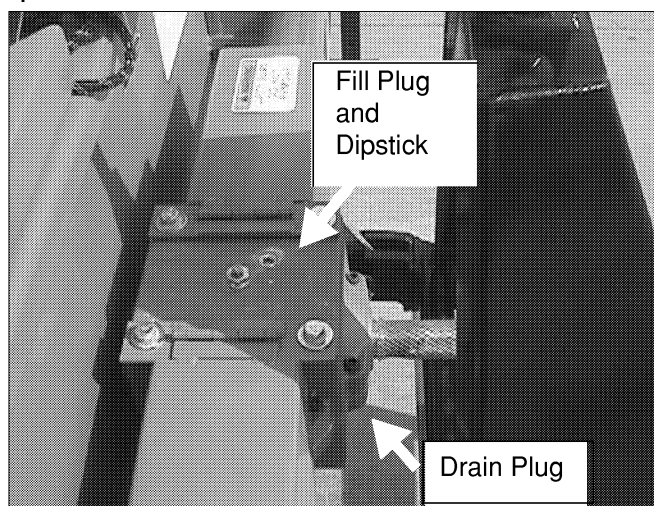


Figure 27 Gearbox, fill and drain plugs

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.
7. Slide the assembly along the frame to the required position.
8. Tighten the mounting bolts to their specified torque levels.
9. Tighten the mounting bolts at 2 to 10 hours to their specified torque levels.
10. Lower frame and remove jack.

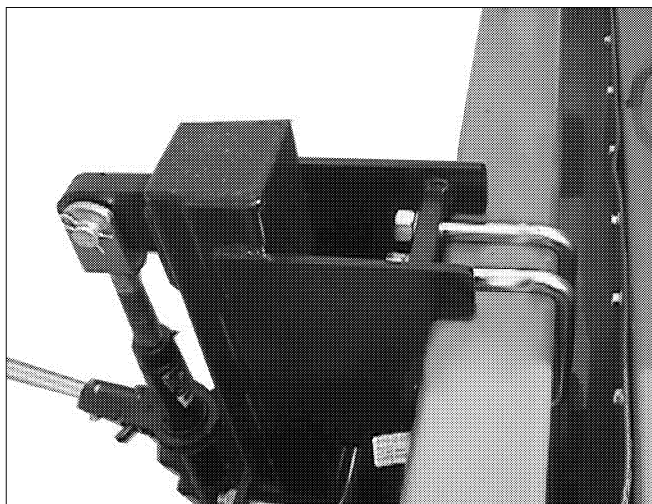


Figure 28 Wheel Mounting Bolts

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. Disconnect driveline from the tractor.
4. Open the canvas covers.
5. Measure from the centerline of the machine to determine the required spacing.
6. Loosen the assembly clamping nuts.

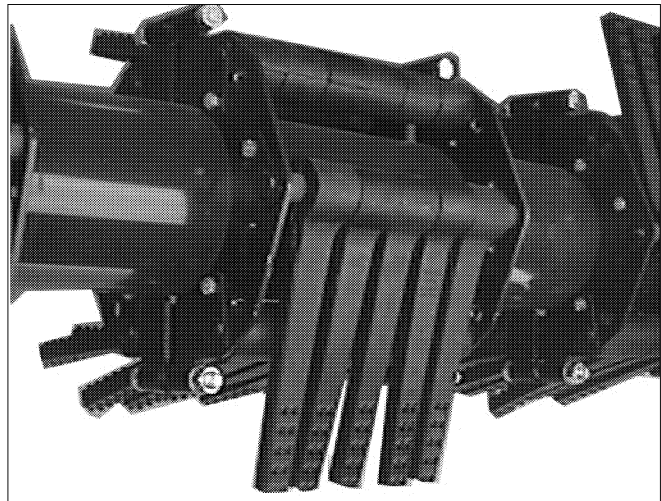


Figure 29 Rubber Flails

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 in. Tighten bolt to specified torque.
9. Repeat with other flails as required.



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.

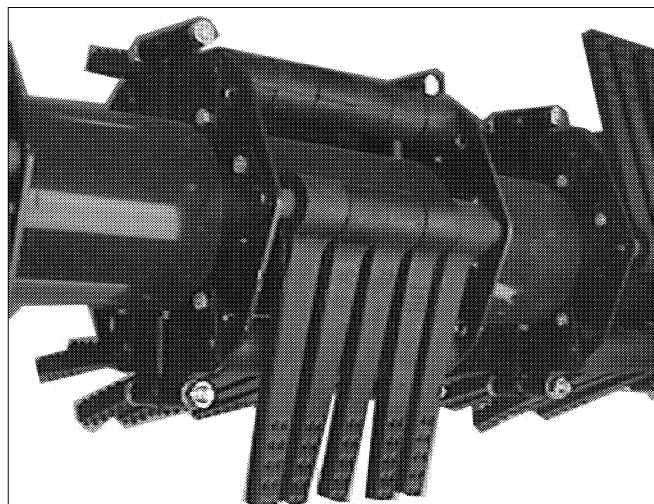


Figure 30 Flail Assembly

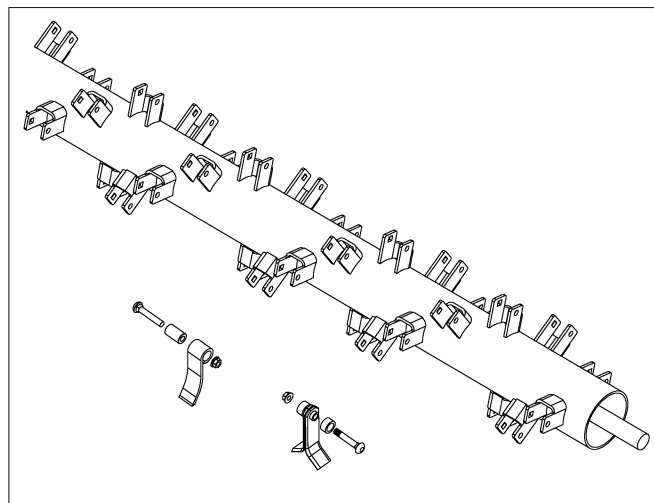


Figure 31 Steel Flails

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.

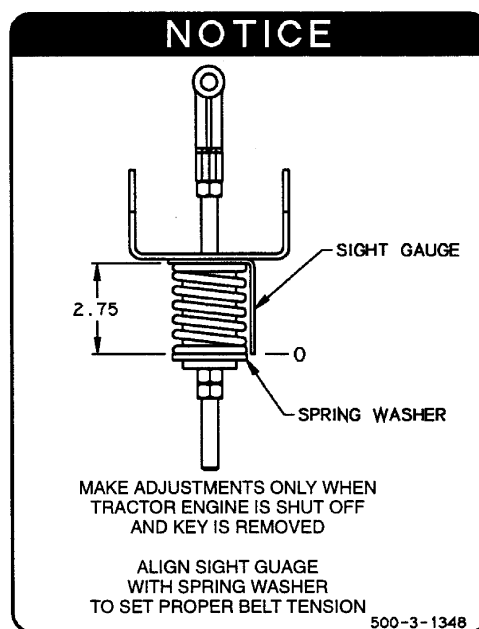


Figure 32 Belt Tension Gauge

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 36.
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.
9. Wipe the bearing clean and inspect the grease seal.
10. Lubricate bearing zerk with 3 to 4 shots of grease.

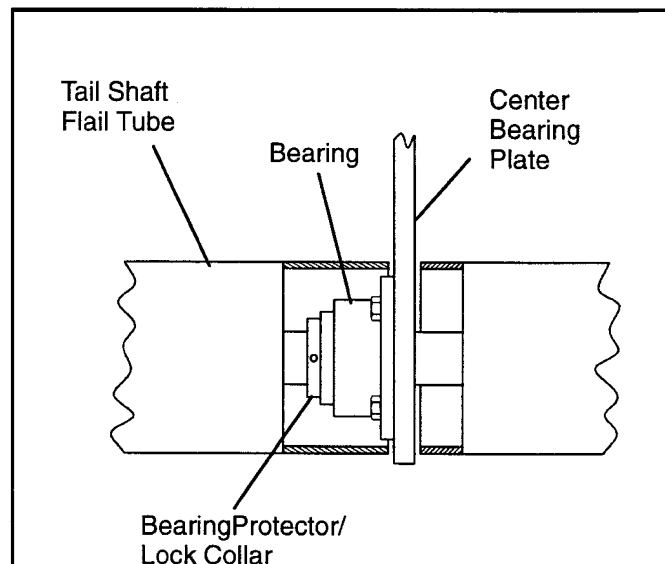


Figure 33 Hanger bearing

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.

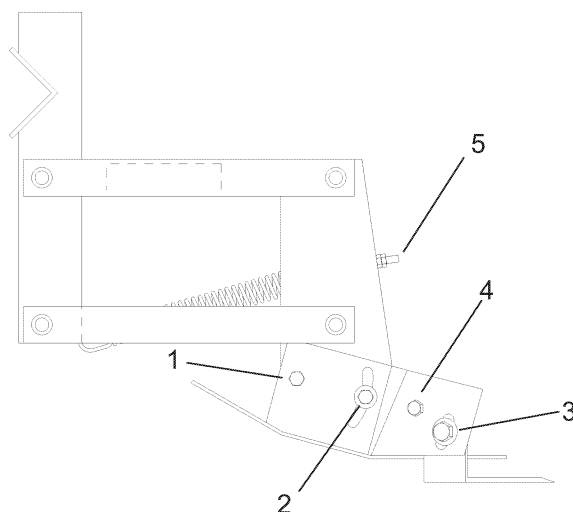
Scalpers

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.

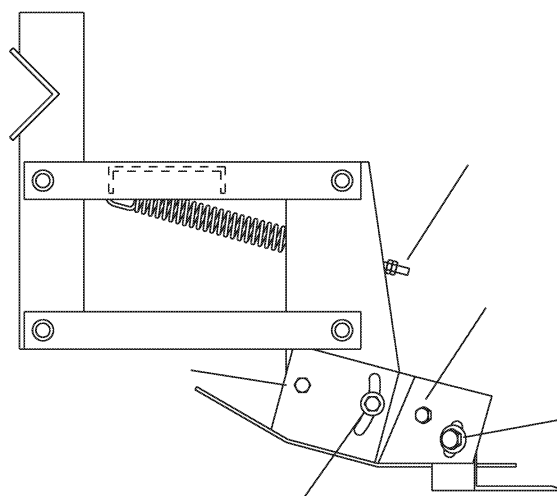
Knife Scalper

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 the shoe angle:
 - a. Loosen bolts (1) and (2), Figure 34.
 - b. Move shoe to desired angle.
 - c. Tighten bolts to specified torque level
3. Set knife height and angle:
 - a. Loosen bolts (3) and (4), Figure 34.
 - b. Move knife to desired height and angle.
 - c. Tighten bolts to specified torque level.
4. Down pressure position:
 - a. Increase spring tension to decrease skipping (5).
 - b. Decrease spring tension if scalper pulls beets out of ground.
5. Float position:
 - a. Increase spring tension for less pressure on shoe (5).
 - b. Decrease spring tension for more pressure on shoe.



Knife Scalper (Down Pressure)



Knife Scalper (Float)

Figure 34 Scalper Setting

Bearing Lock Collars

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

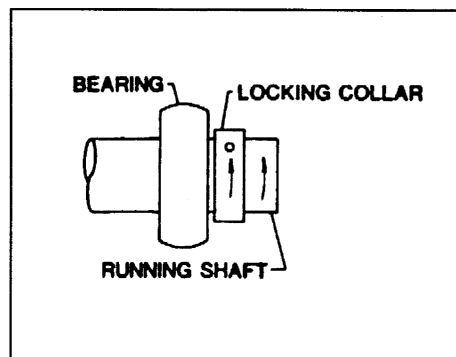


Figure 36 Locking Collar

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

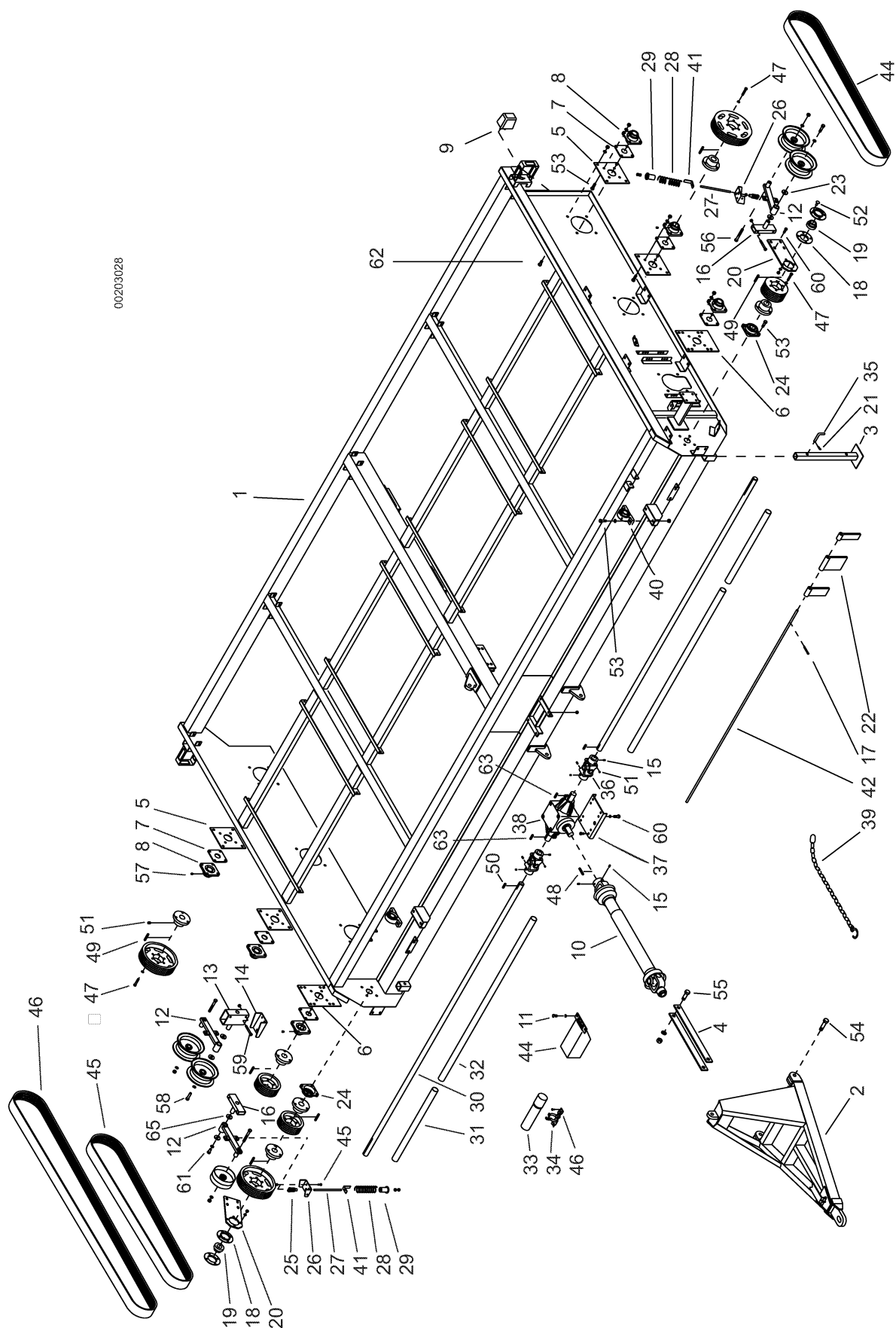
encounter. If you encounter a problem that is difficult to solve even after reading through this table, please call your local Alloway dealer. When calling, please have this manual and your unit's serial number ready.

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

BEET DEFOLIATOR 630, 822, 922, 1222

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BEET DEFOLIATOR FRAME ASSEMBLY



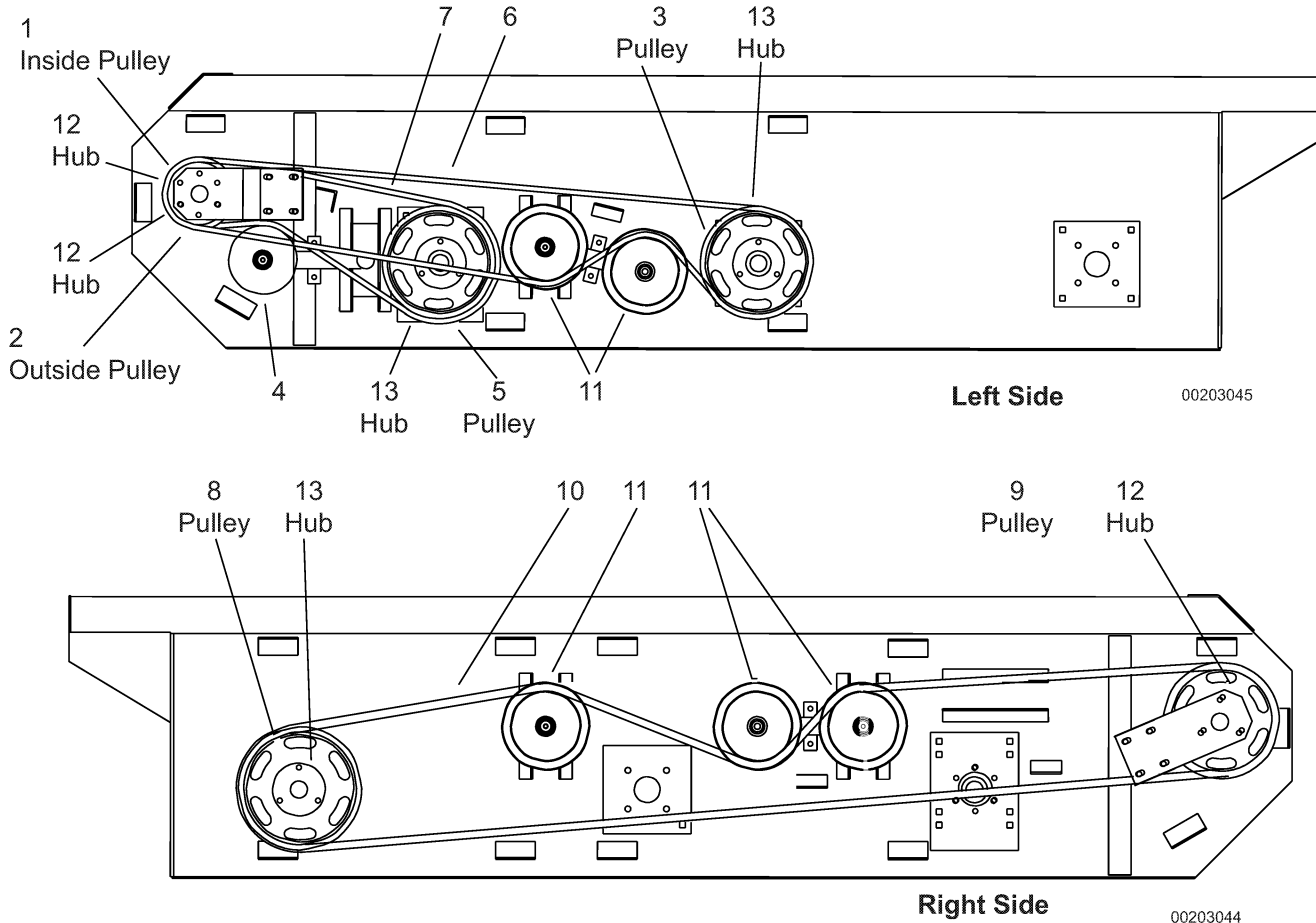
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BEET DEFOLIATOR FRAME PARTS LIST

REF		QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-2-0591	1	Body Weldment (630 and 822)	31	500-3-0866	2	Shaft Shield, 34" (1222, 922 only)
1	500-2-0604	1	Body Weldment (922)				
1	500-2-0573	1	Body Weldment (1222)	32	505-3-0867	2	Shaft Shield, 78" (1222)
2	500-2-0036	1	Hitch Weld (630, 822, 1222)	32	500-3-1660	2	Shaft Shield, 71-1/2" (630, 822)
2	500-2-0540	1	Hitch Weld (922)	32	500-3-1657	1	Shaft Shield, 37-1/2" (922)
3	500-2-0531	2	Parking Stand	32	500-3-1656	1	Shaft Shield, 47-1/2" (922)
4	500-3-0944	2	Strap, Transport	33	100-3-3957	1	Tube, Manual Storage
5	500-3-1202	4	Bearing Plate, Rear	34	100-3-3956	1	Clamp
6	500-3-1201	2	Bearing Plate, Front	35	505-3-0279	2	Pin
7	500-3-0990	6	Plastic Bearing Shield	36	903-05038	2	U-Joint, 1-3/4" x 2"
8	901-01282	6	1-15/16" Bearing Assy.	36	903-17710	2	Yoke, 2"
8	901-01280	1	1-15/16" Bearing Insert	36	903-17525	2	Repair Kit
9	904-01132	2	Light Assembly	37	500-3-1178	1	Gearbox Plate
9	901-01133	2	Light Bulb #3157	38	903-15399	1	Gearbox
10		1	PTO Shaft (See Page 63, 64)	39	905-07112	1	Towchain
11	900-01221	2	1/2 x 1 Hex Bolt	40	901-01142	2	Pillow Block Bearing, 2"
12	500-2-0563	3	Pivot Arm Weld	41	500-3-1255	3	Sight Gauge
12	500-2-0574	3	Pivot Arm Assy. w/bushings	42	500-3-1142	2	Rod, Flaps, 132-11/16" (1222)
13	500-2-0565	1	Pivot Base Weld, Long	42	500-3-1140	2	Rod, Flaps, 89" (630, 822)
14	500-3-1221	1	Bracket, Spring Mount (Long)	42	500-3-1141	1	Rod, Flaps, 90-1/2" (922)
15	900-16255	6	3/8 x 3/4 Socket Set Screw	42	500-3-1148	1	Rod, Flaps, 114-5/8" (922)
16	500-2-0564	2	Pivot Base Weld, Short	43	901-01122	6	Oilite Bushing
17	900-23043	2	3/16 x 1-1/2 Cotter Pin	44	500-3-1082	2	Shield, Gearbox
18	901-01314	4	4 Hole Flangette, 100MM	45	900-01109	3	3/8 x 1 Hex Bolt
19	901-01079	2	2" Insert Bearing	46	900-17110	2	1/4 x 1/2 Hex Head Set Screw
20	500-3-1653	2	Bearing Plate	47	900-02526	18	1/2 x 2-3/4 Bolt
21	900-25004	2	1/8 Hair Pin Cotter	48	120-3-0192	1	3/8 x 3 Sq. Key
22	505-3-0739	A/R	Flap, 6"	49	100-3-3331	6	1/2 x 3 Sq. Key
22	505-3-0741	A/R	Flap, 2-1/2"	50	500-3-1622	2	1/2 x 2-1/2 Sq. Key
22	505-3-0868	A/R	Flap, 3-1/2"	51	900-16251	10	3/8 x 3/8 Socket Set Screw
23	500-3-1246	3	Special Washer, .69 ID x 2 OD x .25 Thk	52	900-01750	8	1/2 x 1-1/4 Carriage Bolt
				53	900-01345	36	5/8 x 2 Hex Bolt
24	901-01008	2	2" Bearing	54	900-01527	2	1 x 4 Hex Bolt
25	500-3-1247	3	Clevis Pin	55	900-01519	2	1 x 3 Hex Bolt
26	500-3-1222	2	Bracket, Spring Mount (short)	56	900-01363	3	5/8 x 4-1/2 Hex Bolt
27	500-3-1250	3	Threaded Rod	57	905-15001	3	Zerk, 1/8 NPT
28	905-14005	3	Spring	58	900-01349	2	5/8 x 2-1/2 Hex Bolt
29	500-2-0580	3	Spring Support Weld	59	900-01245	6	1/2 x 4 Hex Bolt
30	500-3-0988	2	Cross Shaft, 130-5/8" (1222)	60	900-01225	12	1/2 x 1-1/2 Hex Bolt
30	500-3-1661	2	Cross Shaft, 88" (630, 822)	61	900-01339	1	5/8 x 1-1/4 Hex Bolt
30	500-3-1654	1	Cross Shaft, 101-1/2" (922)	62	900-01784	24	5/8 NC x 1-1/2 Carriage Bolt
30	500-3-1655	1	Cross Shaft, 90-1/2" (922)	63	100-3-3333	2	3/8 Sq. x 2" Key

A/R = As Required

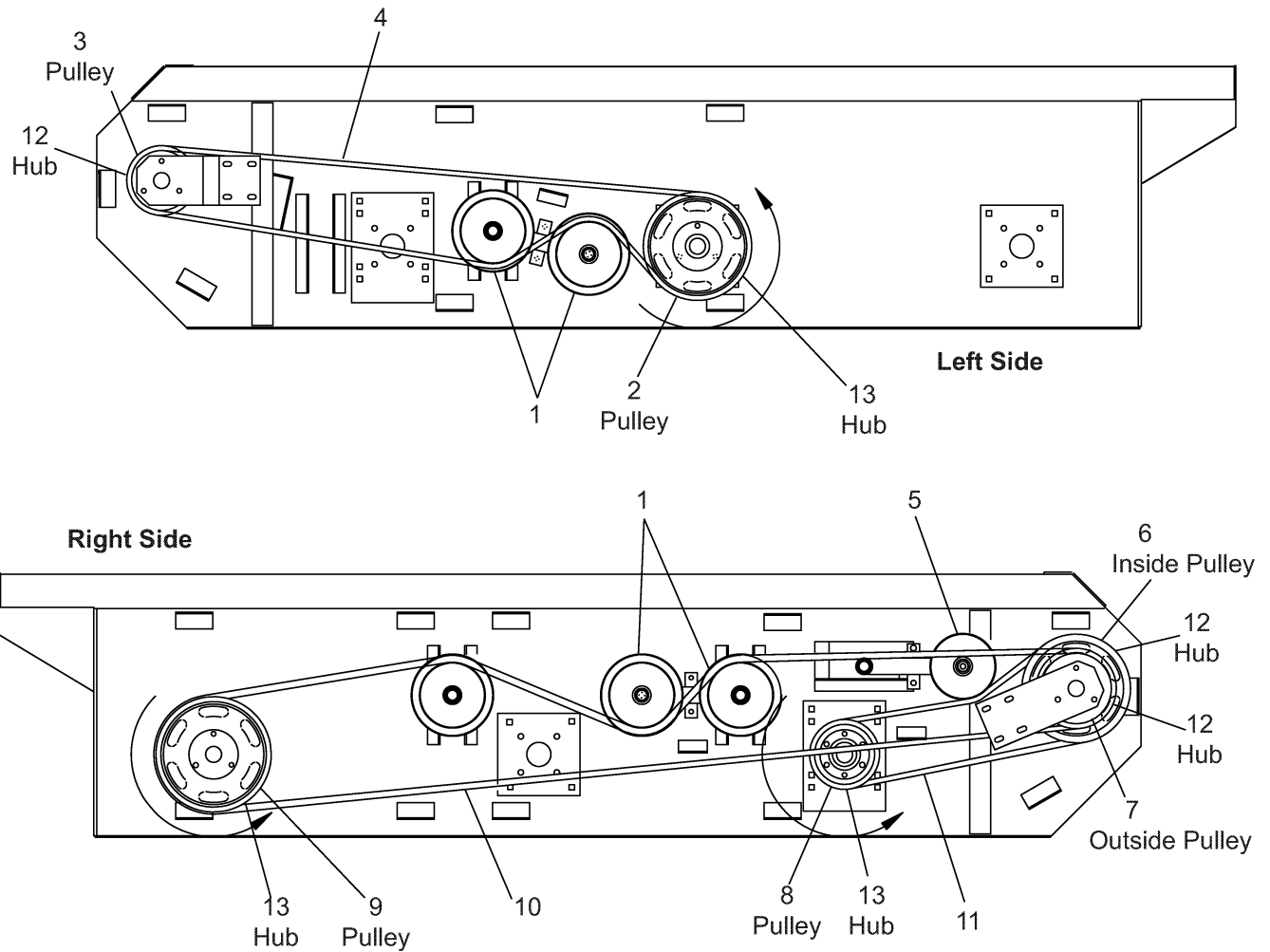
PULLEY PLACEMENT (ALL RUBBER)



REF	PART	QTY	DESCRIPTION
1	903-08389	1	Pulley, 4/5v850 (630-822)
1	903-08390	1	Pulley, 5/5v850 (922-1222)
2	903-08399	1	Pulley, 3/5v850 (630-822)
2	903-08389	1	Pulley, 4/5v850 (922-1222)
3	903-08397	1	Pulley, 3/5v1 320 (630-822)
3	903-08388	1	Pulley, 4/5v1 320 (922-1222)
4	500-3-1248	1	Pulley, Flat, 8"
5	903-08388	1	Pulley, 4/5v1 320 (630-822)
5	903-08391	1	Pulley, 5/5v1 320 (922-1222)
6	903-01427	1	Belt, 3/5v1 700 (630-822)
6	903-01424	1	Belt, 4/5v1 700 (922-1222)
7	903-01429	1	Belt, 4/5v 950 (630-822)
7	903-01426	1	Belt, 5/5v 950 (922-1222)
8	903-08396	1	Pulley, 3/5v1 400 (630-822)
8	903-08392	1	Pulley, 4/5v1 400 (922-1222)

REF	PART	QTY	DESCRIPTION
9	903-08398	1	Pulley, 315v975 (630-822)
9	903-08386	1	Pulley, 3/5v975 (922-1222)
9	903-08398	1	Pulley, 315v975 (630-822)
9	903-08386	1	Pulley, 3/5v975 (922-1222)
10	903-01428	1	Belt, 3/5v2500 (630-822)
10	903-01425	1	Belt, 4/5v2500 (922-1222)
11	500-3-1295	4	Flanged Pulley, Narrow 2-5/8" (630-822)
11	500-3-1249	4	Flanged Pulley, Wide 3-1/4" (922-1222)
12	500-3-1060	3	Hub, 2" Type E, W/Bolts
13	500-3-1062	3	Hub, 1-15/16", Type E, W/Bolts (All Flail Tubes)

PULLEY PLACEMENT (STEEL & "L")



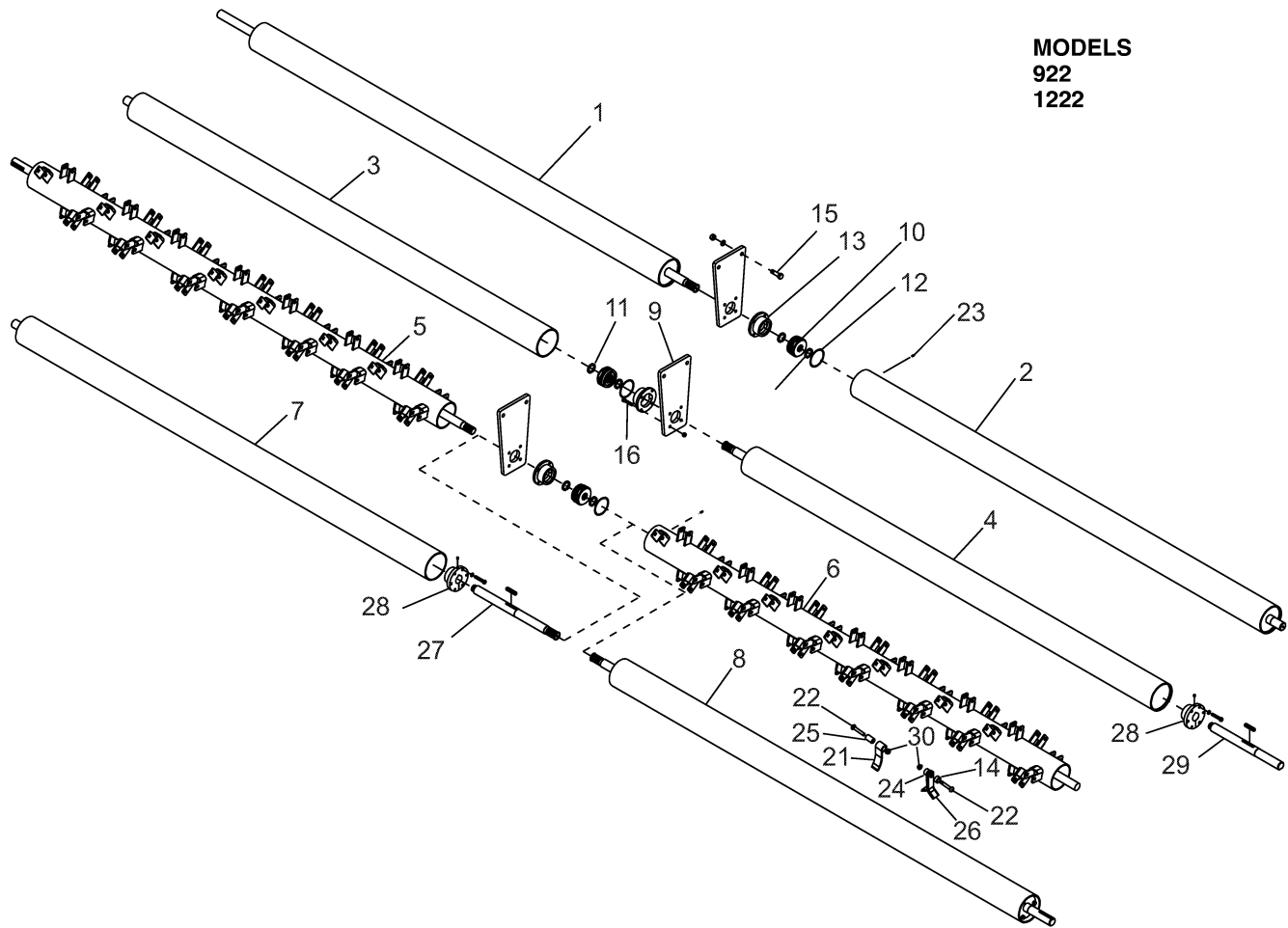
REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-3-1295	4	Flanged Pulley, Narrow, 2-5/8" (630 - 822)	8	903-08389	1	Pulley, 4/5v850 (630-822)
1	500-3-1249	4	Flanged Pulley, Wide, 3-1/4" (922)	8	903-08390	1	Pulley, 5/5v850 (922-1222)
1	500-3-0777	4	Pulley, 5/5v975 (1222)	9	903-08396	1	Pulley, 3/5v1 400 (630-822)
2	903-08387	1	Pulley, 3/5v1 320 (630-822)	9	903-08392	1	Pulley, 4/5v1 400 (922)
2	903-08388	1	Pulley, 4/5v1 320 (922-1222)	9	903-08439	1	Pulley, 5/5v1 400 (1222)
3	903-08399	1	Pulley, 3/5v850 (630-822)	10	903-01428	1	Belt, 3/5v2500 (630-822)
3	903-08389	1	Pulley, 4/5v850 (922-1222)	10	903-01425	1	Belt, 4/5v2500 (922)
4	903-01427	1	Belt, 3/5v1 700 (630-822)	10	903-01436	1	Belt, 5.5v2500 (1222)
4	903-01424	1	Belt, 4/5v1 700 (922-1222)	11	903-01429	1	Belt, 4/5v950 (630-822)
5	500-3-1248	1	Pulley, 8" OD Flat	11	903-01426	1	Belt, 5/5v950 (922-1222)
6	903-08388	1	Pulley, 4/5v1 320 (630-822)	12	500-3-1060	3	Hub, 2" Type E, W/Bolts (Front Cross Shaft Coming from Gearbox)
6	903-08391	1	Pulley, 5/5v1 320 (922-1222)	13	500-3-1062	3	Hub, 1-15/16", Type E, W/Bolts (All Flail Tubes)
7	903-08398	1	Pulley, 3/5v975 (630-822)				
7	903-08386	1	Pulley, 4/5v975 (922)				
7	903-08438	1	Weld Pulley (1222)				

FLAIL TUBE COMPONENTS

MODELS

922

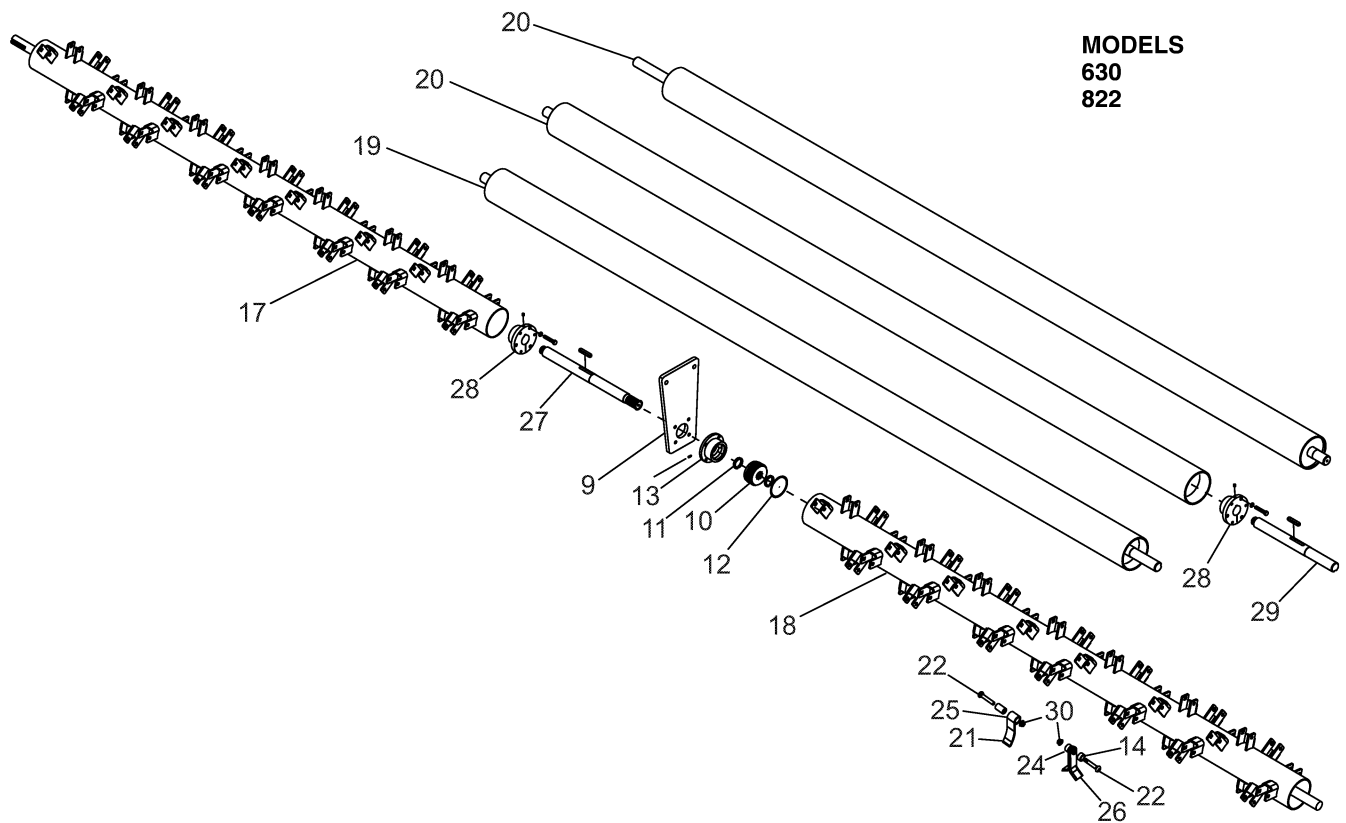
1222



MODELS

630

822



46 Parts

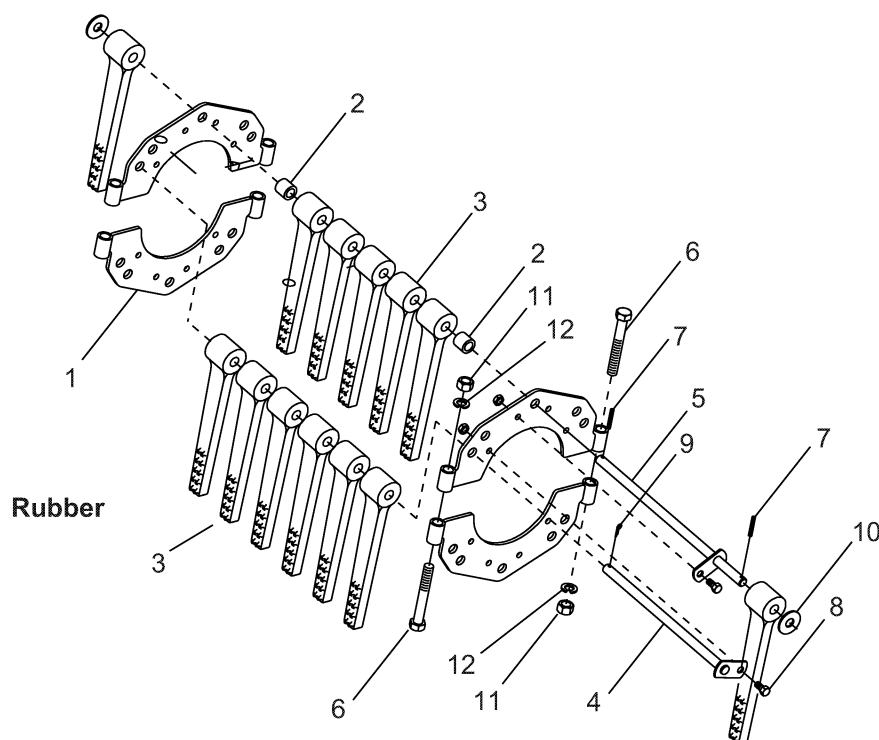
PN-500-3-1351 (1/04)

FLAIL TUBE COMPONENTS PARTS LIST

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-2-0556	1	Flail Tube Weldment, Drive (1222)	12	901-09126	A/R	O-Ring
1	500-2-0607	1	Flail Tube Weldment, Drive (922)	13	500-2-0598	A/R	Bearing Assembly
2	500-2-0555	1	Flail Tube Weldment (1222)	13	901-01300	A/R	Housing
2	500-2-0610	1	Flail Tube Weldment, Long (922)	13	901-01280	A/R	Insert Bearing
3	500-2-0555	1	Flail Tube Weldment (1222)	13	901-01281	A/R	90 mm Bearing Protector
3	500-2-0609	1	Flail Tube Weldment, Short (922)	14	500-3-1736	A/R	Spacer
4	500-2-0556	1	Flail Tube Weldment, Drive (1222)	15	900-01409	A/R	3/4 x 2-3/4 Hex Bolt
4	500-2-0608	1	Flail Tube Weldment, Drive (922)	16	900-01233	A/R	1/2 x 2-1/2 Hex Bolt
5	500-2-0779	1	Front Flail Tube "L/Cup" Drive (1222)	17	500-2-0775	1	Flail Tube "L/Cup" (630, 822)
5	500-2-0781	1	Front Flail Tube "L/Cup" Drive (922)	18	500-2-0776	1	Flail Tube "L/Cup" Driven (630, 822)
6	500-2-0780	1	Front Flail Tube "L/Cup" (1222)	19	500-2-0632	1	Front Flail Tube Weld (630, 822) Rubber
6	500-2-0782	1	Front Flail Tube "L/Cup" (922)	20	500-2-0383	2	Flail Tube Weldment (630, 822)
7	500-2-0555	1	Flail Tube Weld (1222) Rubber	21	505-3-0972	A/R	Steel Cup Knife
7	500-2-0609	1	Flail Tube Weld (922) Rubber	22	900-01792	A/R	5/8 NC x 3-1/2 Carriage Bolt
8	500-2-0557	1	Front Flail Tube Weldment, Rubber	23	905-15001	3	Zerk, 1/8 NPT Straight
8	500-2-0612	1	Front Flail Tube Weldment, Drive (922) Rubber	24	500-3-1733	A/R	Bushing, "L" Knife
9	500-2-0633	A/R	Center Bearing Plate Weld	25	505-3-0405	A/R	Bushing, Cup
10	500-3-0338	A/R	Drive Hub	26	500-3-1735	A/R	"L" Knife
11	900-39030	6	Snap Ring	27	500-3-0785	A/R	Center Shaft
				28	500-3-1060	A/R	Type E Hub
				29	500-3-0863	A/R	Stub Shaft
				30	900-06145	A/R	5/8 Spiralock Flange Nut 6v8

A/R = As Required

FLAIL COMPONENTS

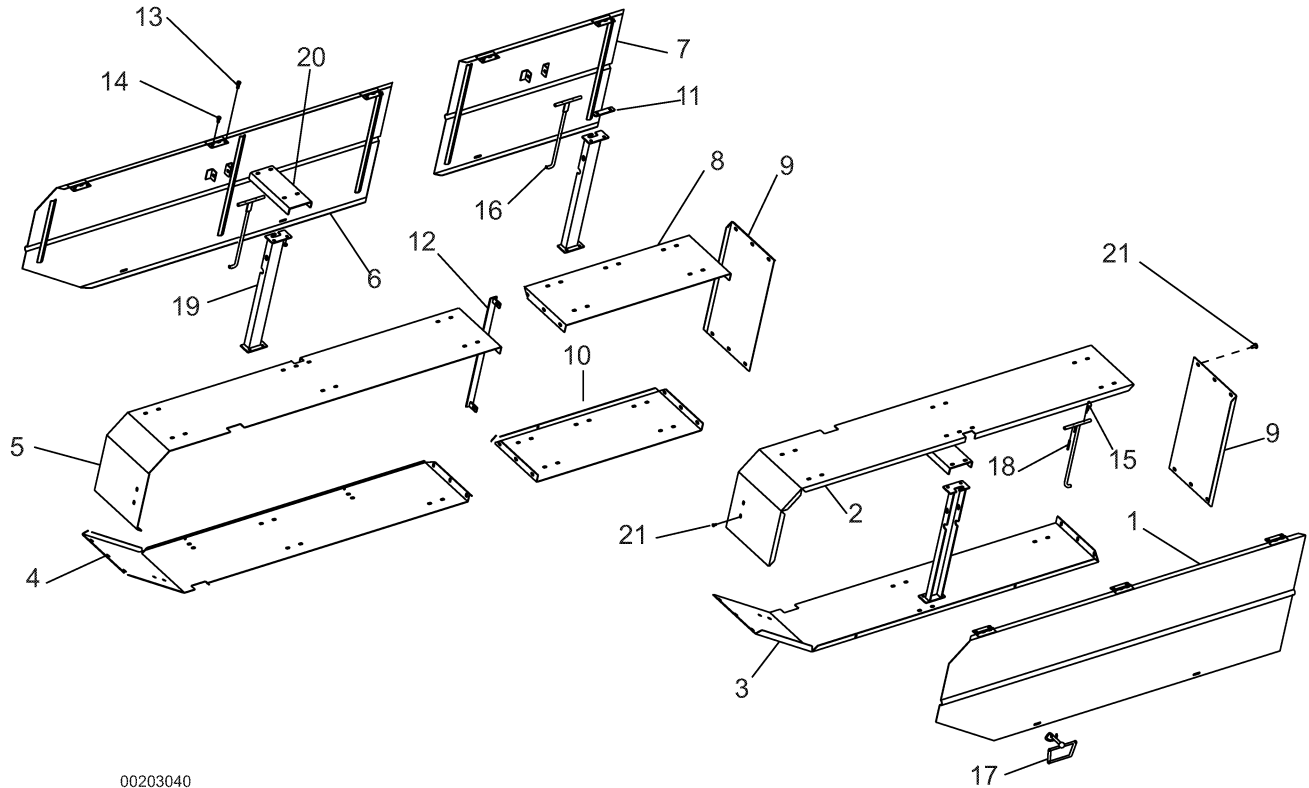


00203020

REF	PART	QTY	DESCRIPTION
1	500-2-0067	A/R	Flail Mounting Bracket
2	500-3-0151	A/R	1" Spacer
3	500-3-0316	A/R	Rubber Flail
4	500-2-0068	A/R	Rubber Flail Pin
5	500-2-0069	A/R	Rubber Flail Pin Extension
6	900-01363	A/R	5/8 NC x 4-1/2 Hex Bolt
7	900-29153	A/R	Roll Pin, 7/32 x 1-1/2
8	900-01105	A/R	3/8 NC x 3/4 Hex Bolt
9	900-23041	A/R	3/16 x 1 Cotter Pin
10	900-11131	A/R	Washer, Nylon 5/8 ID
11	900-06014	A/R	5/8 NC Hex Nut
12	900-11015	A/R	5/8 Lockwasher

A/R = As Required

BELT COVER COMPONENTS



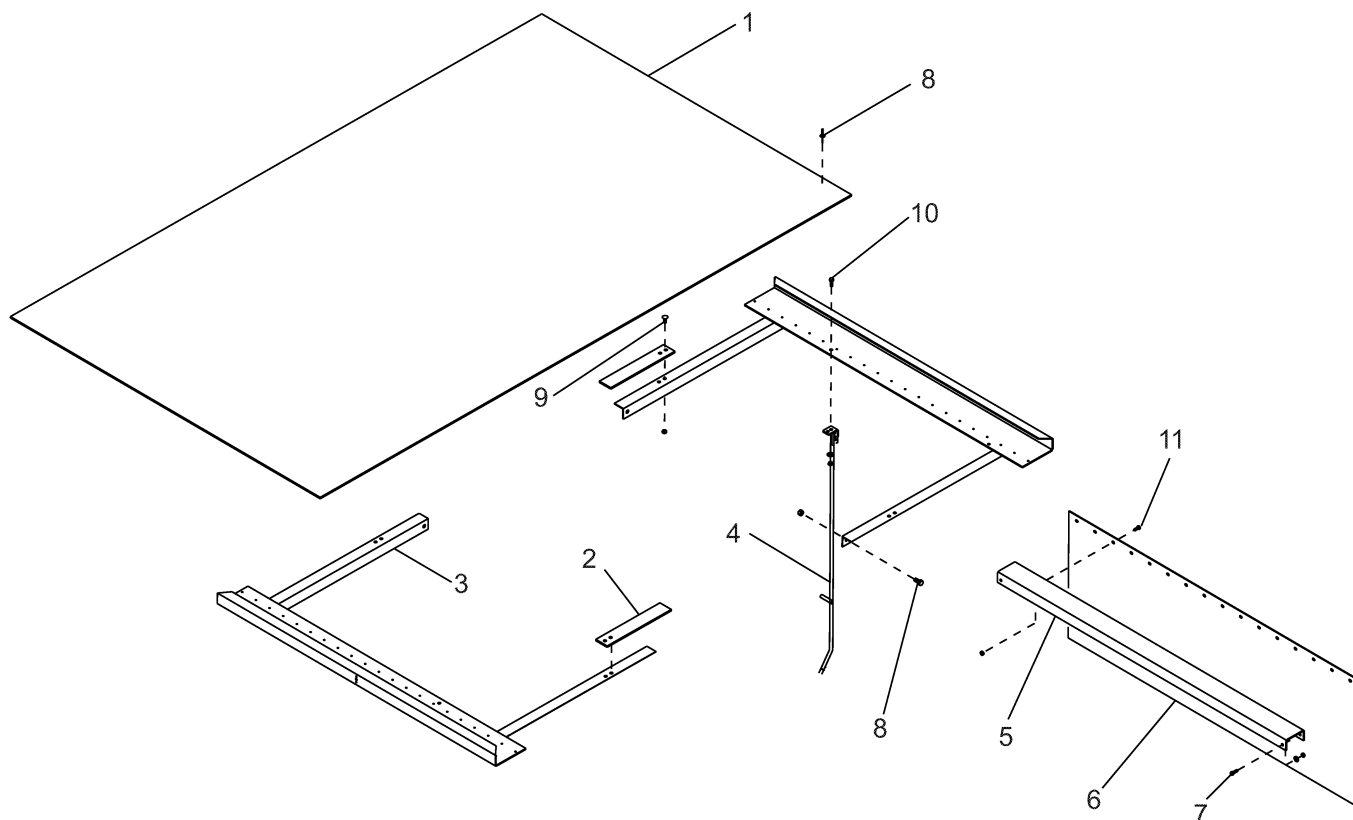
00203040

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-2-0581	1	Front Door Weld (LH)	12	500-2-0587	1	Door Support
2	500-3-1256	1	Top Side Shield (LH)	13	900-01109	A/R	3/8 x 1 Hex Bolt
3	500-3-1258	1	Bottom Side Shield (LH)	14	900-01105	A/R	3/8 x 3/4 Hex Bolt
4	500-3-1259	1	Bottom Side Shield (RH)	15	900-25004	3	1/8" Hair Pin
4	500-3-1738	1	Bottom Side Shield Ext RH (1222)	16	500-2-0585	3	Prop Rod Weld
5	500-3-1257	1	Top Side Shield (RH)	17	905-04032	2	Spring Latch
5	500-3-1737	1	Top Side Shield Ext RH (1222)	18	900-29126	3	3/16 x 3/4 Roll Pin
6	500-2-0582	1	Front Door Weld (RH)	19	500-2-0584	3	Support Weldment, Side Cover
7	500-2-0583	1	Rear Door Weld	20	500-3-1269	2	Top Support Channel
8	500-3-1284	1	Rear Top Shield (RH)	20	500-3-1742	1	Top Support Channel Ext (1222)
8	500-3-1739	1	Rear Top Side Shield RH Ext (1222)	21	900-01694	A/R	3/8 x 3/4 Carriage Bolt
9	500-3-1260	2	Back Side Shield (LH)	NS	500-3-0407		Bracket, Rubber Latch
9	500-3-1740	1	Rear Bottom Side Shield RH Ext (1222)	NS	905-04019		Rubber Latch
10	500-3-1261	1	Rear Bottom Side Shield	NS	905-04025		Hood Bracket
10	500-3-1741	1	Back Side Shield Ext (1222)				
11	500-3-1277	1	Spacer Support Channel				

A/R = As Required

NS = Not Shown

COVER COMPONENTS



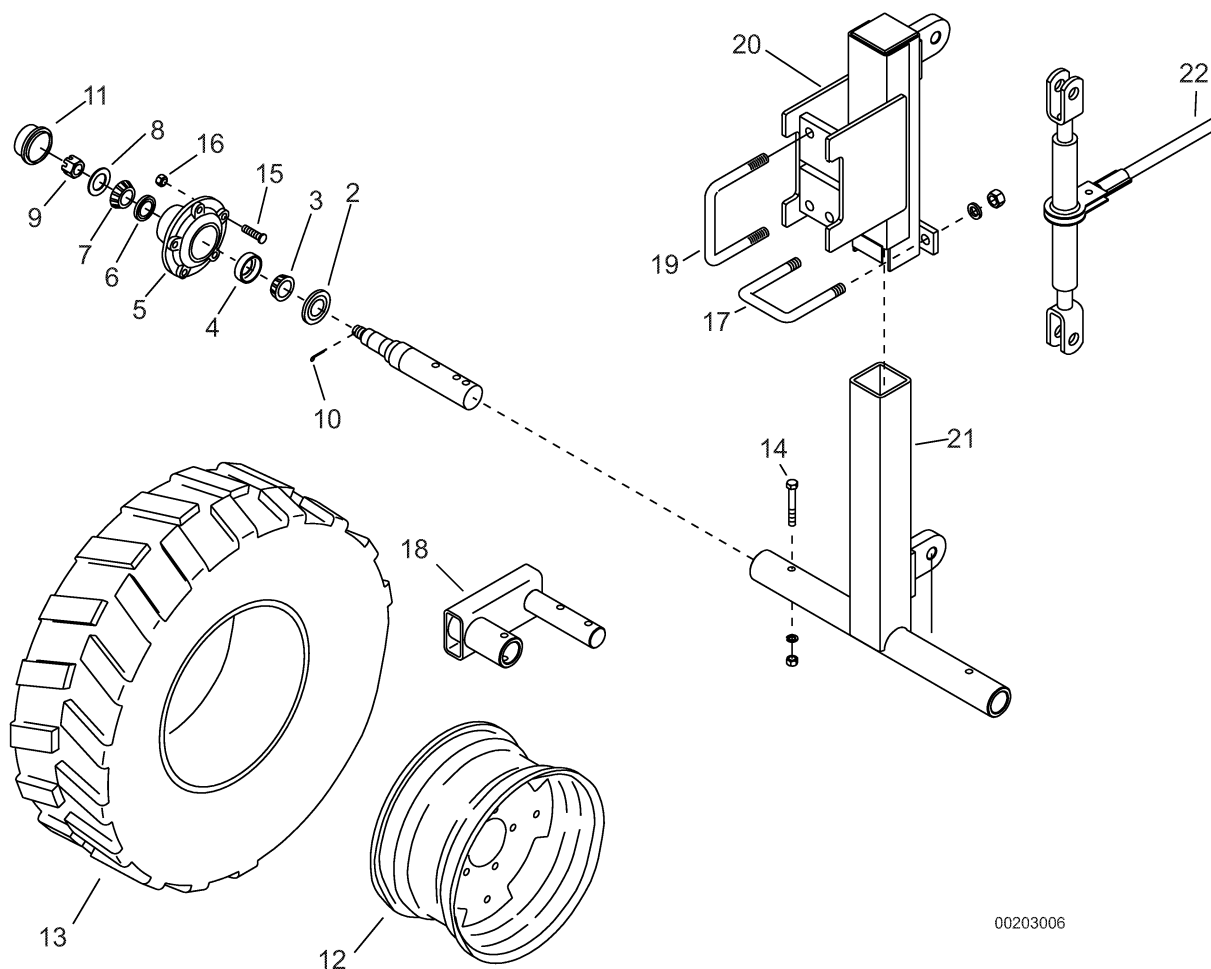
00203033

REF	PART	QTY	DESCRIPTION
1	500-3-0749	2	Cover, 630 and 822
1	500-3-1311	2	Cover, 922 Narrow
1	500-3-1312	2	Cover, 922 Wide
1	500-3-0747	1	Cover, 1222
2	500-3-1233	4	Pinch Protector
3	500-2-0594	A/R	Pivot Bracket Weldment, 630 and 822
3	500-2-0613	4	Pivot Bracket Weldment, 922 Narrow
3	500-2-0614	4	Pivot Bracket Weldment, 922 Wide
3	500-2-0575	2	Pivot Bracket Weldment, 1222
4	500-2-0586	8	Prop Rod Weld Top Cover
5	500-3-1292	A/R	Cross Channel, 630 and 822
5	500-3-1317	2	Cross Channel, 922 short
5	500-3-1318	1	Cross Channel, 922 long

REF	PART	QTY	DESCRIPTION
5	500-3-1207	3	Cross Channel, 1222
6	500-3-0737	4	Rear Flap, 630
6	500-3-1315	2	Rear Flap, 922 long
6	500-3-1316	3	Rear Flap, 922 short
6	500-3-0969	1	Rear Flap, 1222
7	900-01139	4	3/8 NC x 5-1/2 Hex Bolt
8	900-01221	A/R	1/2 NC x 1 Hex Bolt
9	900-01695	A/R	3/8 x 1 Carr. Bolt
10	900-01109	A/R	3/8 x 1 Hex Bolt
11	900-03419	A/R	5/16 NC x 3/4 Whiz Lock Hex Bo
NS	500-3-0407	A/R	Bracket, Rubber Latch
NS	905-04019	A/R	Rubber Latch
NS	905-04025	A/R	Bracket Hood

A/R = As Required
NS = Not Shown

REAR STRUT COMPONENTS



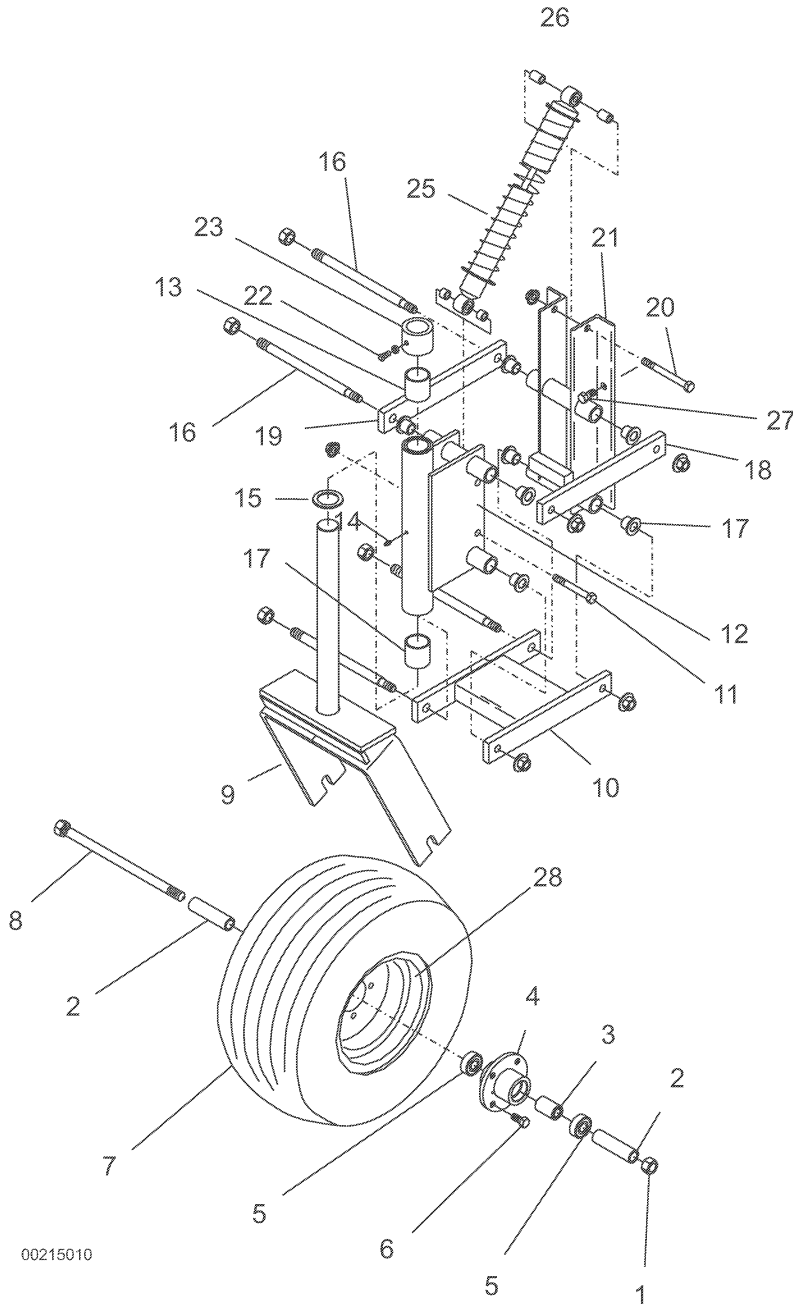
00203006

REF	PART	QTY	DESCRIPTION
1	500-3-0136	1	Spindle
2	901-09002	1	Seal
3	901-01023	1	Bearing Cone
4	901-01022	1	Bearing Cup, Inner
5	905-09003	1	Hub with Cups, 517
6	901-01016	1	Bearing Cup, Outer
7	901-01015	1	Bearing Cone
8	905-09067	1	Washer
9	900-06060	1	7/8 NF Slotted Hex Nut
10	900-23043	1	Cotter Pin, 3/16 x 1-1/2
11	905-09009	1	Dust Cap
12	905-09078	1	Rim, 15" x 6" x 5 Bolt
13	905-09100	1	Traction Tire, 7.50 x 15
14	900-01241	2	1/2 NC x 3-1/2 Hex Bolt
15	905-09117	5	Stud Bolt, 1/2 NF x 1-7/8
16	905-09011	5	Wheel Nut, 1/2 NF

REF	PART	QTY	DESCRIPTION
17	200-3-1440	1	U-Bolt, 3/4 x 4 x 4
18	500-2-0533	2	Pivot Weldment
19	200-3-0024	2	U-Bolt, 3/4 NC x 6 x 5-1/2 Long
20	500-2-0576	1	Upper Strut Weld
21	500-2-0577	1	Lower Strut Weldment 22"
21	500-2-0595	1	Lower Strut Weldment 30"
22	200-2-0705	1	Ratchet Jack W/Pipe
NS	900-12043	1	3/16 x 1-1/2 Cotter Pin
NS	500-2-0157	2	Tire and Rim Assembly, Right
NS	500-2-0158	2	Tire and Rim Assembly, Left
NS	500-2-0161	1	Hub and Spindle Assembly (Ref 1-11)
NS	100-2-1051	1	Hub Assembly (Ref. 2, 3, 4, 5, 6, 7, and 11)

NS = Not Shown

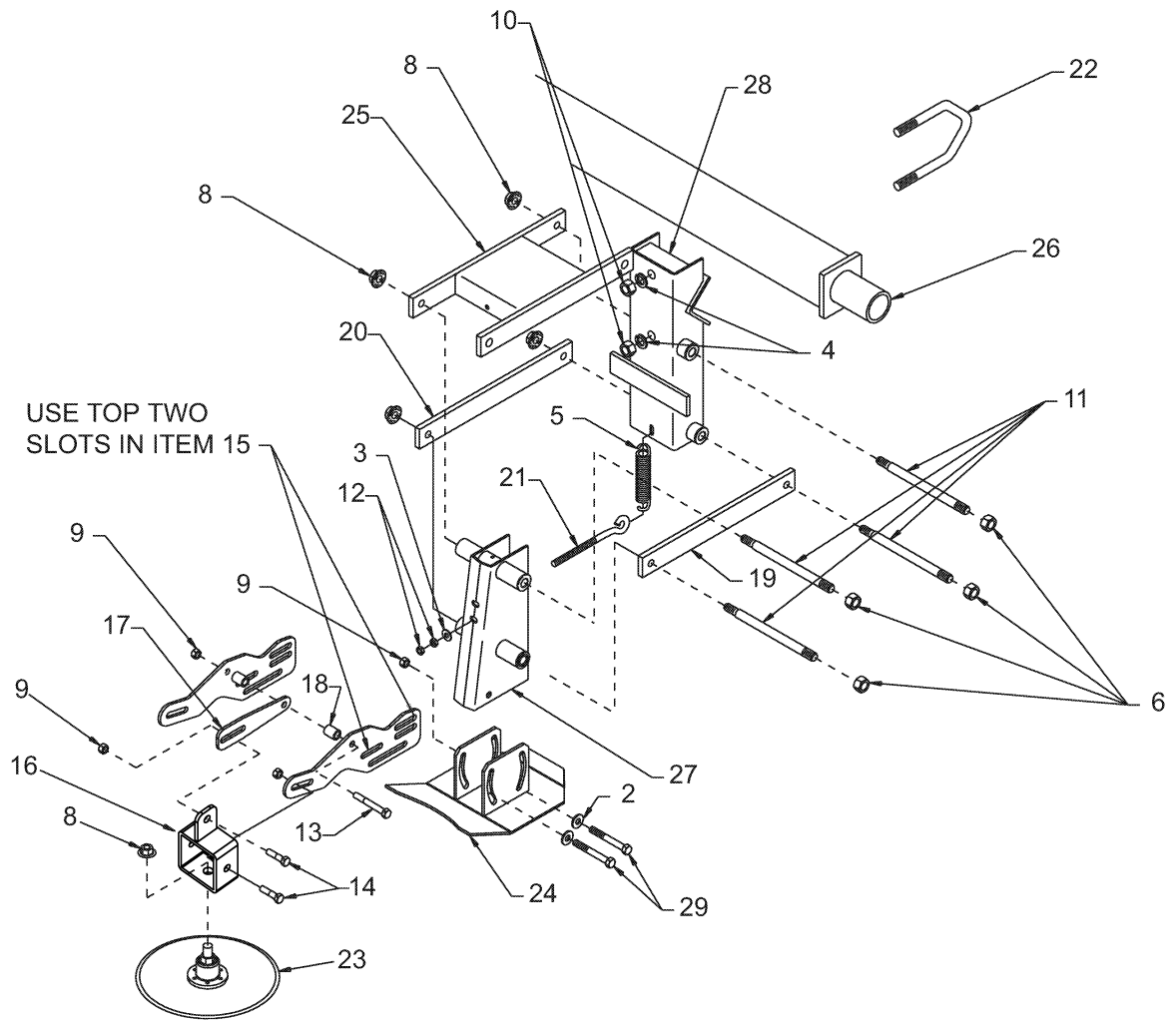
STABILIZER WHEEL COMPONENTS



00215010

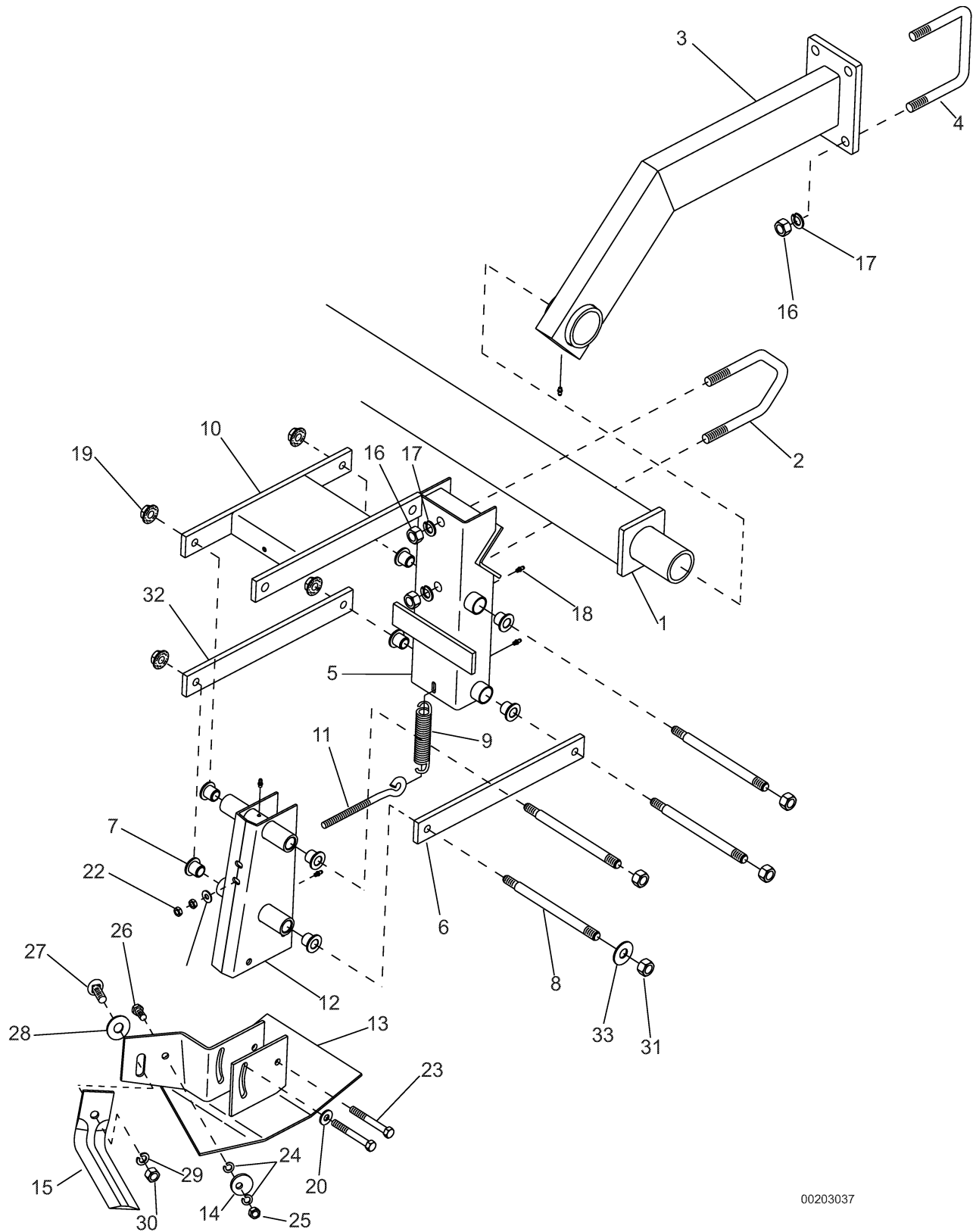
REF	PART	QTY	DESCRIPTION
1	900-06510	1	Top Lock Nut
2	505-3-0817	2	Spacer, Axle
3	505-3-0796	1	Axle Tube
4	505-2-0406	1	Hub Assembly
5	901-01278	2	Bearing, Peer
6	905-09010	4	1/2 NF x 1-1/16 Wheel Bolt
7	905-09121	1	Wheel and Tire Assembly
8	505-2-0400	1	Bolt Weldment
9	505-2-0398	1	Caster Weldment
10	200-2-1412	1	H-Weldment
11	900-01245	1	1/2 x 4 Hex Bolt
12	505-2-0396	1	Tube Weldment
13	901-01261	2	Oilite Bushing
14	905-15024	1	Grease Zerk, 1/4-28 Straight
15	901-01259	1	Thrust Bearing
16	200-3-2631	4	Pin, Plated
17	200-3-0877	8	Oilite Flange Bushing
18	200-3-2628	1	Parallel Arm, LH
19	200-3-2629	1	Parallel Arm, RH
20	900-01249	1	1/2 x 5 Hex Bolt
21	505-2-0402	1	Mounting Angle Weldment
22	900-16031	1	3/8 x 3/4 Square Head Set Screw
23	500-3-0928	1	Collar
24	505-3-0816	2	Spacer Tube, Bottom
25	500-3-1047	1	Shock
26	505-3-0815	2	Spacer Tube, Top
27	900-01221	4	1/2 NC x 1 Hex Bolt
28	905-09123	1	Rim
NS	500-2-0552	1	Strut Mount (not shown)

PARALLEL ARM ROTARY SCALPER



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
2	900-11035	2	1/2 Flat Washer, ZP	19	500-3-0992	1	Bar, 3/4 Holes
3	900-11033	1	3/8 Flat Washer, ZP	20	500-3-0991	1	Bar, 5/8 Holes
4	900-11017	2	3/4 Lock Washer	21	500-3-0675	1	3/8 Eye Bolt x 8" Long
5	400-3-0263		Spring, GM and Allowboom	22	500-3-0635	1	A-Bolt, 3/4 x 4 x 4
6	900-06510	4	3/4 NC Top Lock Nut, ZP	23	500-2-0762	1	Hub Assy, Scalper
8	900-06145	5	5/8 NC Spiralock Flange Nut		500-3-1582	1	Disc
9	900-06143	6	1/2 NC Spiralock Flange Nut		901-09219	1	Hub Assy
10	900-06015	2	3/4 NC Hex Nut ZP		901-09220	1	Hub Repair Kit
11	200-3-2631	4	Pin, Plated	24	500-2-0704	1	Scalper Shoe Weld
12	900-06005	2	3/8 NC Hex Nut, ZP	25	500-2-0518	1	H-Weld
13	900-01245	1	1/2 NC x 4 Hex Bolt, GR5	26	500-2-0408	1	Toolbar, Scalper (12 - 22)
14	900-01223	3	1/2 NC x 1-1/4 Hex Bolt	26	500-2-4010	1	Toolbar, Scalper (6 - 30)
15	500-3-1563	2	Plate, Bracket, Rear Top	26	500-2-0448	1	Toolbar, Scalper (5 - 22)
16	500-2-0774	1	Bracket, Pivot	27	500-2-0338	1	Upright Weld
17	500-3-1557	1	Strap, Top Rear, Adj.	28	500-2-0330	1	Mount Weld
18	500-3-1556	2	Rear Spacer Tube	29	900-01247	2	1/2 NC x 4-1/2 Hex Bolt GR5

KNIFE SCALPER COMPONENTS



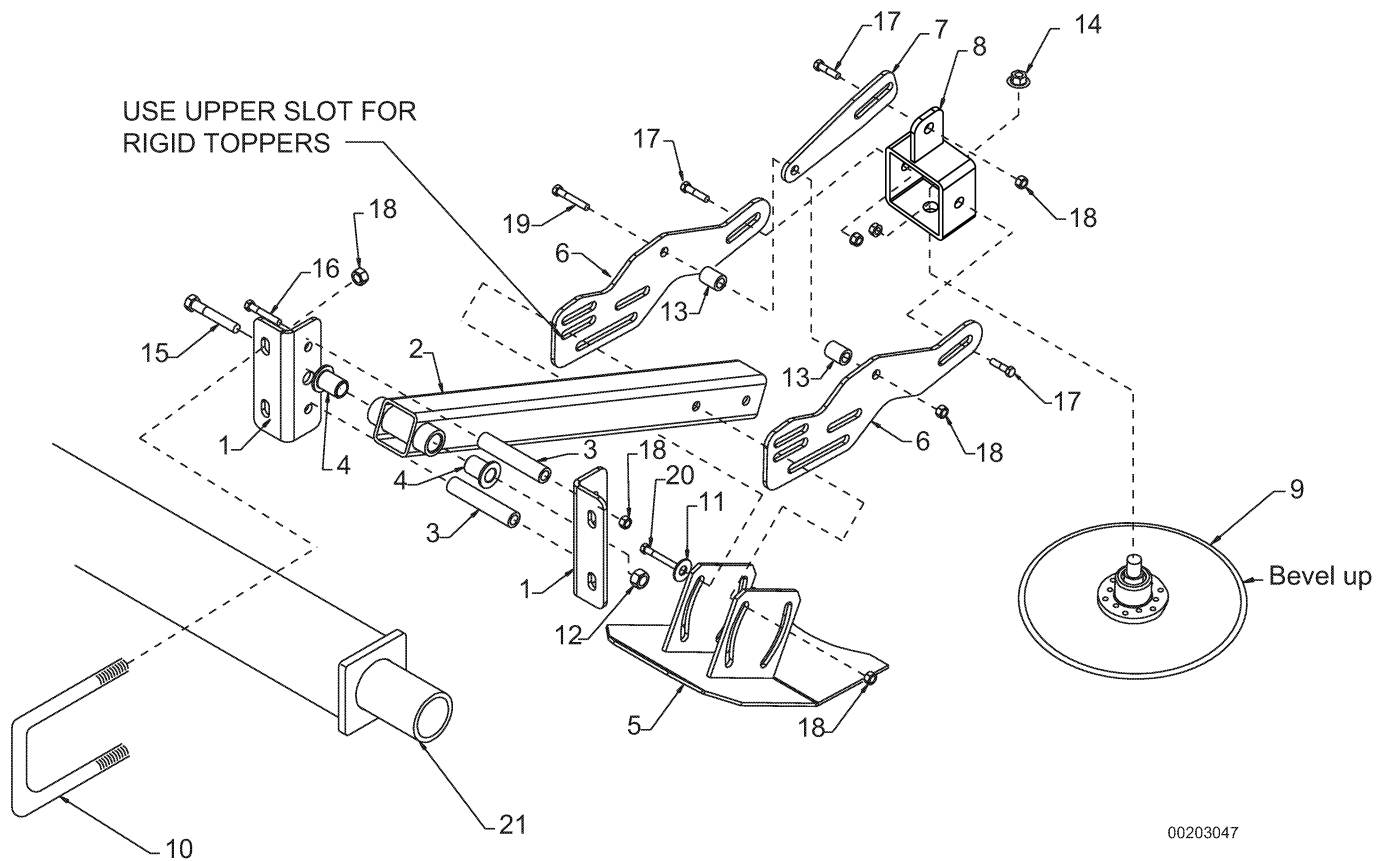
00203037

KNIFE SCALPER COMPONENTS PARTS LIST

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-2-0408	1, 2	Toolbar Weldment, 120" long Tube, 1222	16	900-06015	2	3/4 NC Hex Nut
1	500-2-0410	1	Toolbar Weldment, 168" long Tube, 630	17	900-11017	2	3/4" Lock Washer
1	500-2-0448	1	Toolbar Weldment, 96" long Tube, 522	18	905-15024	6	1/4 UNF Straight Zerk
2	500-3-0635	1	A-Bolt, 3/4 x 4 x 4	19	900-06145	4	5/8 NC Whiz Nut
3	500-2-0566	2	Mounting Arm Scalper	20	900-11035	2	1/2 Flat Washer
4	200-3-0024	4	U-Bolt, 3/4 NC x 6 x 5-1/2 Long	21	900-11033	1	3/8 Flat Washer
5	500-2-0330	1	Mount Weldment with Bushings and Zerks	22	900-06005	2	3/8 Hex Nut
6	500-3-0992	1	Pivot Arm, 3/4" Holes	23	900-01245	2	1/2 NC x 4 Hex Bolt
7	200-3-0877	8	Flanged Bushing	24	900-11013	4	1/2 Lock Washer
8	200-3-2631	4	Pin	25	900-06009	3	1/2 NC Hex Nut
9	400-3-0263	1	Spring	26	900-01223	1	1/2 NC x 1-1/4 Hex Nut
10	500-2-0518	1	H-Weldment	27	900-01784	1	5/8 x 1-1/2 Carriage Bolt
11	500-3-0675	1	Eye Bolt, 3/8 NC x 8 long	28	900-11038	1	3/4 Flat Washer
12	500-2-0338	1	Upright Weldment with Bushings and Zerks	29	900-11015	1	5/8 Lock Washer
13	500-2-0335	1	Shoe Weldment, Left (shown)	30	900-06013	1	5/8 NC Hex Nut
13	500-20336	1	Shoe Weldment, Right	31	900-06510	4	3/4 NC Lock Nut
14	500-3-0201	1	Eccentric Spacer	32	500-3-0991	1	Pivot Arm, 5/8" Holes
15	500-3-0910	1	Knife Scalper	33	905-09066	A/R	Washer, SAE 3/4"

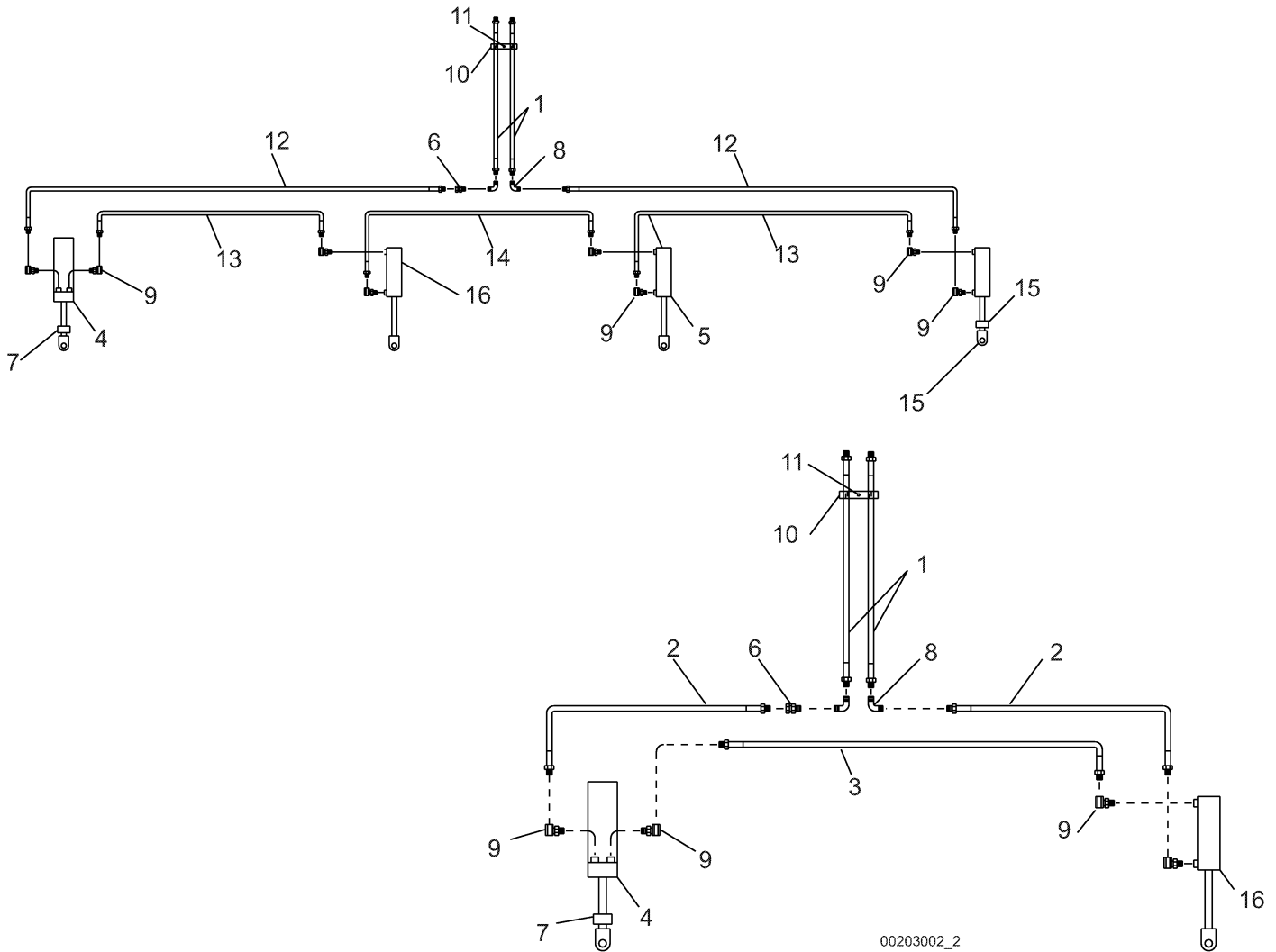
A/R = As Required

ROTARY SCALPER LONG ARM



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-3-1560	2	Plate Bracket	10	500-3-1578	2	U-Bolt
2	500-2-0705	1	Tube Weld	11	900-11035	2	1/2 Flat Washer
3	500-3-1561	2	Tube, Front Spreader	12	900-06510	1	3/4 NC Top Lock nut
4	200-3-3544	2	Bushing, Steel	13	500-3-1556	2	Rear Spacer Tube
5	500-2-0704	1	Scalper Shoe	14	900-06145	1	5/8 NC Spirallock Flange Nut
6	500-3-1563	2	Plate, Bracket, Rear Top	15	900-01427	1	3/4 NC X 6 Hex Bolt
7	500-3-1557	1	Top Rear Adjusting Strap	16	900-01251	2	1/2 NC X 5-1/2 Hex Bolt
8	500-2-0774	1	Bracket, Pivot	17	900-01223	3	1/2 NC X 1-1/4 Hex Bolt
9	500-2-0762	1	Hub Assembly, Scalper	18	900-06143	12	1/2 NC Whiz Nut
	500-3-1582	1	Disc	19	900-01245	1	1/2 NC X 4 Hex Bolt
	901-09-219	1	Hub Assy	20	900-01247	2	1/2 NC X 4-1/2 Hex Bolt
	901-09-220	1	Hub Repair Kit	21	500-2-0745	2	Tool Bar (12 - 22)

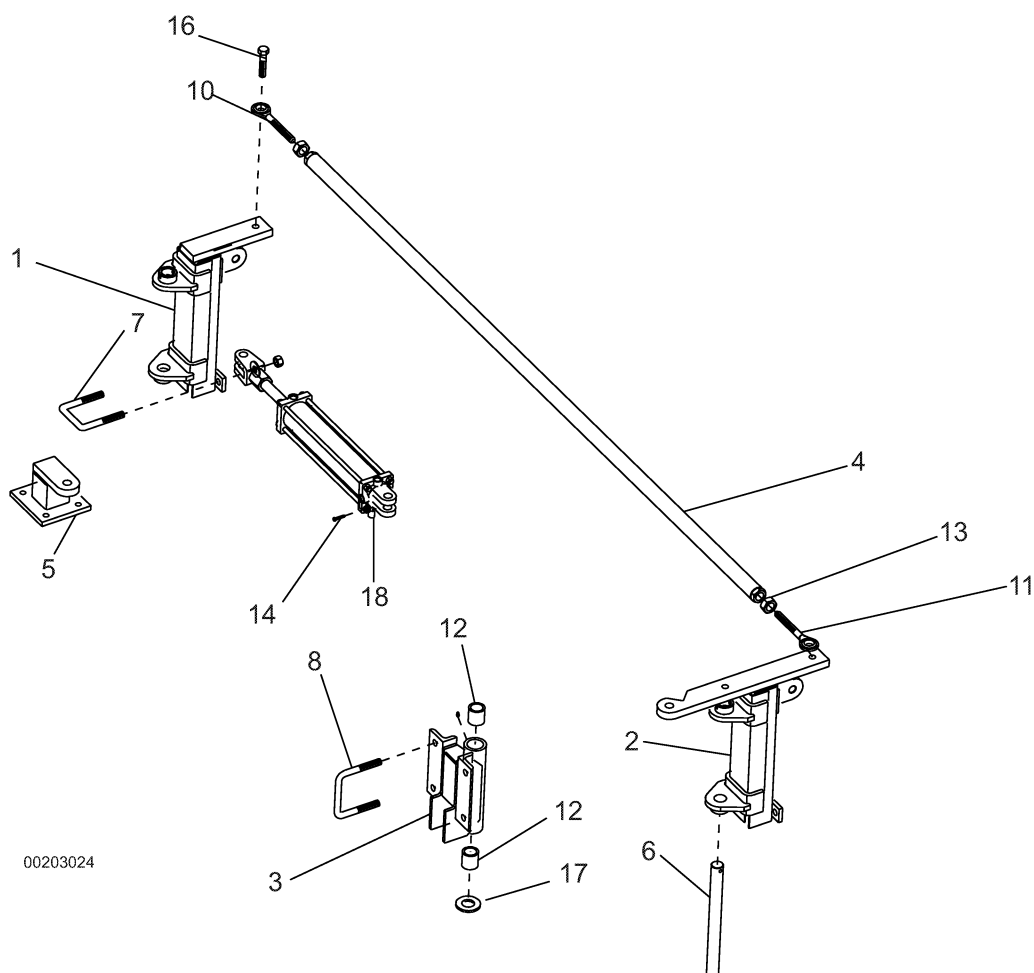
HYDRAULIC STRUT PLUMBING COMPONENTS



00203002_2

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	210-2-0179	2	3/8 Hose, 1/2MP x 1/2MP x 220	9	905-01528	4	Elbow, 3/4 MORB x 1/2 FPT x 90 Deg.
2	210-2-0174	2	3/8 Hose, 1/2 MP x 1/2 MP x 73	10	210-3-0199	4	Hose Holder
3	210-2-0185	1	3/8 Hose, 1/2 MP x 1/2 MP x 160	11	900-16964	4	1/4 x 1-1/2 Tek Screw
4	500-2-0721	1	Hydraulic Cylinder Assy., 3-3/4 x 8R	12	210-2-0175	2	3/8 Hose, 1/2 MP x 1/2 MP x 142
4	905-21398	1	Hydraulic Cylinder, (With Depth Stop Nut)	13	210-2-0172	2	3/8 Hose, 1/2 MP x 1/2 MP x 134
4	905-21405	1	Seal Kit, 3-3/4 x 8R	14	210-2-0181	1	3/8 Hose, 1/2 MP x 1/2 MP x 122
7	905-21407	1	Depth Stop Nut	15	905-21292	1	Hydraulic Cylinder, 3 x 8R
5	905-21291	1	Hydraulic Cylinder, 3.25 x 8R	15	905-21373	1	Seal Kit, 3 x 8R
5	905-21372	1	Seal Kit, 3.25 x 8R	15	905-21305	1	Stop nut
6	905-01531	1	1/2 Swivel Restrictor, 1/16	16	905-21290	1	Hydraulic Cylinder, 3-1/2 x 8R
8	905-01004	2	Elbow, 1/2 NPT x 90 Deg	16	905-21371	1	Seal Kit, 3-1/2 x 8R

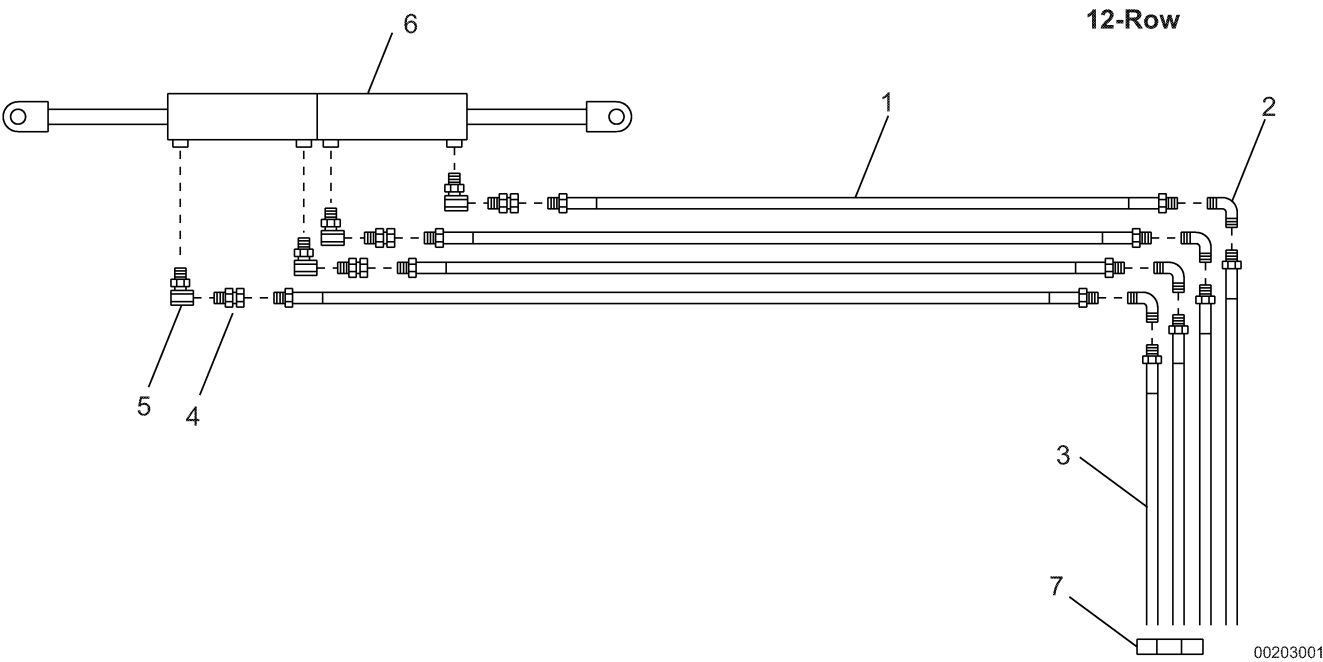
REAR STEER COMPONENTS



REF	PART	QTY	DESCRIPTION
1	500-2-0625	1	Tube Weldment (RH)
2	500-2-0624	1	Tube Weldment (LH)
3	500-2-0623	2	Pivot Tube Assy.
4	500-2-0412	1	Adjustment Tube, 102" Long Tube
4	500-2-0524	2	Adjustment Tube, 80" Long Tube (12 Row)
4	500-2-0238	1	Adjustment Tube, 58" Long Tube (12 Row)
5	500-2-0621	1	Cylinder Mount Weldment
6	500-3-1328	2	Pin, Pivot
7	200-3-0017	2	U-Bolt, 5/8 NC x 4 x 7-1/2
8	200-3-0024	8	U-Bolt, 3/4 NC x 6 x 5-1/2
9	210-3-0199	3	Hose Holder
10	903-05030	1	Pivot Link, 3/4" Uni-Ball, LH Thread

REF	PART	QTY	DESCRIPTION
11	903-05031	1	Pivot Link, 3/4" Uni-Ball, RH Thread
12	901-01146	4	Bronze Bushing
13	900-06288	1	1-1/8 NC Jam Nut (RH)
13	900-06310	1	1-1/8 NC Jam Nut (LH)
14	900-16964	3	1/4 x 1-1/4 Tek Screw
15	900-23084	2	3/8 x 3-1/2, Cotter Pin
16	900-01415	2	3/4 NC x 3-1/2 Hex Bolt
16	900-01425	2	3/4 NC x 5-1/2 Hex Bolt (12 Row Only)
17	500-3-0538	2	Spacer Bushing
18	905-21369	1	Cylinder Rear Steer

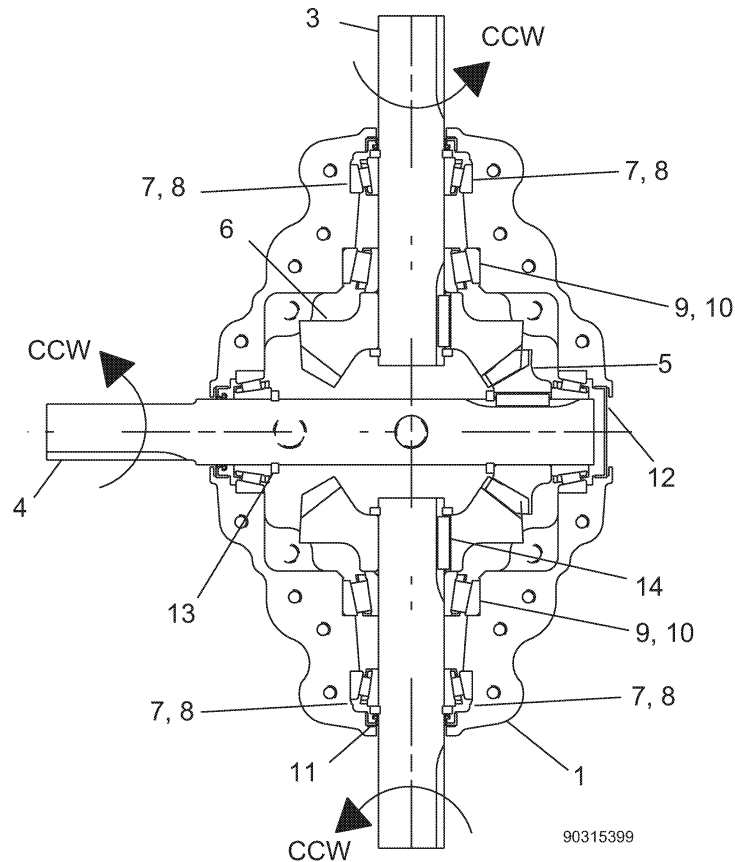
REAR STEER PLUMBING COMPONENTS



REF	PART	QTY	DESCRIPTION
1	210-2-0183	4	3/8 Hose, 1/2 MP x 1/2 MP x 60
2	905-01004	4	Elbow, 1/2 NPT x 90 Deg.
3	210-2-0201	4	3/8 Hose, 1/2 MP x 1/2 MP x 235
4	905-01531	4	1/2 Swivel Restrictor, 1/16
5	905-01528	4	Elbow, 3/4 MORB x 1/2 FPT x 90 Deg

REF	PART	QTY	DESCRIPTION
6	905-21369	1	Rear Steer Cylinder
7	210-3-0199		AR Hose Holder

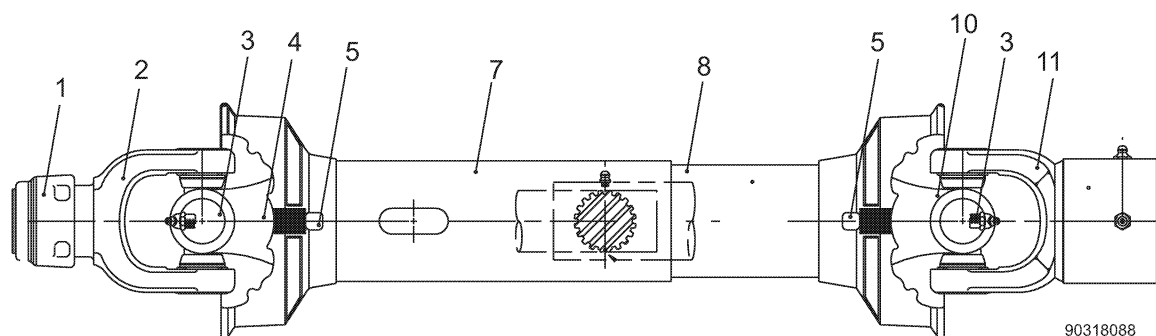
GEAR BOX (SUPERIOR)



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	903-15291	1	Casting, Machine bottom threaded	11	901-09125	3	Seal, TC-1.750-2.437-.312
NS	903-15292	1	Casting, Machine top half	12	903-15397	1	End Plug, BPC-.328-SMBR
3	903-15398	2	Shaft, Pinion 600100 1.75/2.0 K	13	900-39030	6	Retaining Ring, 1.750
4	903-15393	1	Shaft, Cross 600100 1.50/3.0 K	14	903-15343	3	Key
5	903-15321	1	Gear, 1.5:1, 20 Tooth, #651010	NS	900-03033	16	Bolt, 3/8-16 x 2.25 SHCS
6	903-15320	2	Gear, 1.5:1, 30 Tooth, #651030	NS	905-03078	1	Plug, 1/2-1/4 NPT SCHD w/3M
7	901-01150	4	Bearing Cone 25581	NS	905-15411	1	Dip Stick
8	901-01152	4	Bearing Cup 25520	NS	905-03080	1	Plug, Vent 5 PSI
9	901-01151	2	Bearing Cone 3782	NS	905-15359	1	Bushing, 1/2 NPT to 1/4 NPT
10	901-01153	2	Bearing Cup 3720			1	Gear Box, Complete, Keyed

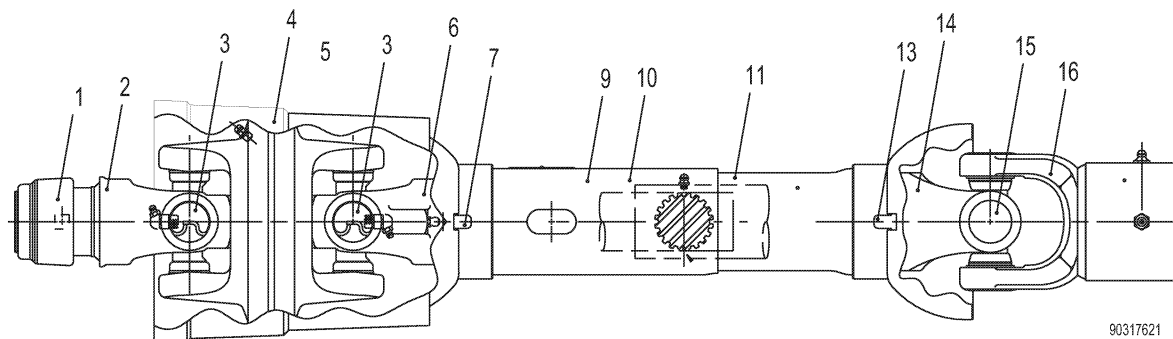
NS = Not Shown

PTO SHAFT (WEASLER)



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	903-18106	1	Safety Slide Lock Repair Kit, 1-3/4"	5	903-17774	2	Nylon Repair Kit (Not Shown)
1	903-17772	1	Safety Slide Lock Repair Kit, 1-3/8"	7	903-18110	1	Outer Guard
2	903-18116	1	Safety Slide Lock Yoke Assembly, 1-3/4"	8	903-18111	1	Inner Guard
2	903-18108	1	Safety Slide Lock Yoke Assembly, 1-3/8"	10	903-18112	1	Yoke, Tube and Slip Sleeve
3	903-17525	2	44R Cross and Bearing Kit	11	903-17721	1	Overrunning Clutch Assembly
4	903-18109	1	Yoke and Shaft (1 .69-20 Spline)		903-18088	1	PTO Shaft, Complete 1-3/8"
					903-18089	1	PTO Shaft, Complete 1-3/4"
					903-18113	1	Tractor Half w/Guard 1-3/4"
					903-18115	1	Tractor half 1-3/8
					903-18114	1	Implement half 1-3/8

PTO SHAFT (WEASLER) (CONSTANT VELOCITY)



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
	903-17987		Tractor half 1-3/8"	NS		1	Centralizer (Not shown, included in item 4)
	903-17990		Implement half	10	903-17717	1	Outer Guard
1	903-17427	1	Safety Slide Lock Repair Kit, 1-3/8"	11	903-17719	1	Inner Guard
1	903-17772	1	Safety Slide Lock Repair Kit, 1-3/4"	NS	903-17774	1	Nylon Repair Kit (Not shown)
2	903-17711	1	Safety Slide Lock Yoke Assy, 1-3/8"	14	903-17718	1	Yoke, Tube & Slip Sleeve
2	903-17771	1	Safety Slide Lock Yoke Assy, 1-3/4"	15	903-17525	1	44R Cross & Bearing Kit
3	903-17712	2	Cat. 5 Cross & Bearing Kit	16	903-17721	1	Overrunning Clutch Assy
4	903-17714	1	Bell Ext. w/Nylon Centralizer		903-17621	1	PTO Shaft, Complete 1-3/8"
5	903-17713	1	C.V. Center Housing Assy		903-17754	1	PTO Shaft, Complete 1-3/4"
6	903-17715	1	Yoke & Shaft (1.69-20 Spline)		903-17986	1	Tractor Half, 1-3/4"
NS	903 17773	1	Nylon Repair Kit (Not shown)				

BOLT TORQUE CHART

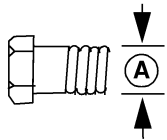
Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.

Fasteners must always be replaced with the same grade as specified in the manual parts list.

Always use the proper tool for tightening hardware: SAE for SAE hardware and Metric for metric hardware.

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

All torque values are given to specifications used on hardware defined by SAE J1701 & J1701M JUL96.



SAE SERIES TORQUE CHART



SAE Bolt Head
Identification

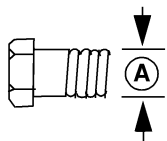


SAE Grade 5
(3 Radial Dashes)

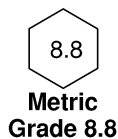


SAE Grade 8
(6 Radial Dashes)

A Diameter (Inches)	Wrench Size	MARKING ON HEAD					
		SAE 2		SAE 5		SAE 8	
		Lbs.-Ft.	N-m	Lbs.-Ft.	N-m	Lbs.-Ft.	N-m
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"	467	634	722	979	1020	1383

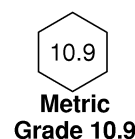


METRIC SERIES TORQUE CHART



Metric
Grade 8.8

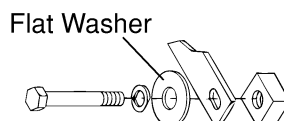
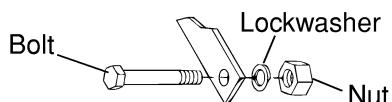
Metric Bolt Head
Identification



Metric
Grade 10.9

Ⓐ Diameter & Thread Pitch (Millimeters)	Wrench Size	COARSE THREAD				FINE THREAD				Ⓐ Diameter & Thread Pitch (Millimeters)
		MARKING ON HEAD				MARKING ON HEAD				
		Metric 8.8		Metric 10.9		Metric 8.8		Metric 10.9		
		N-m	Lbs.-Ft.	N-m	Lbs.-Ft.	N-m	Lbs.-Ft.	N-m	Lbs.-Ft.	
6 x 1.0	10 mm	8	6	11	8	8	6	11	8	6 x 1.0
8 x 1.25	13 mm	20	15	27	20	21	16	29	22	8 x 1.0
10 x 1.5	16 mm	39	29	54	40	41	30	57	42	10 x 1.25
12 x 1.75	18 mm	68	50	94	70	75	55	103	76	12 x 1.25
14 x 2.0	21 mm	109	80	151	111	118	87	163	120	14 x 1.5
16 x 2.0	24 mm	169	125	234	173	181	133	250	184	16 x 1.5
18 x 2.5	27 mm	234	172	323	239	263	194	363	268	18 x 1.5
20 x 2.5	30 mm	330	244	457	337	367	270	507	374	20 x 1.5
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

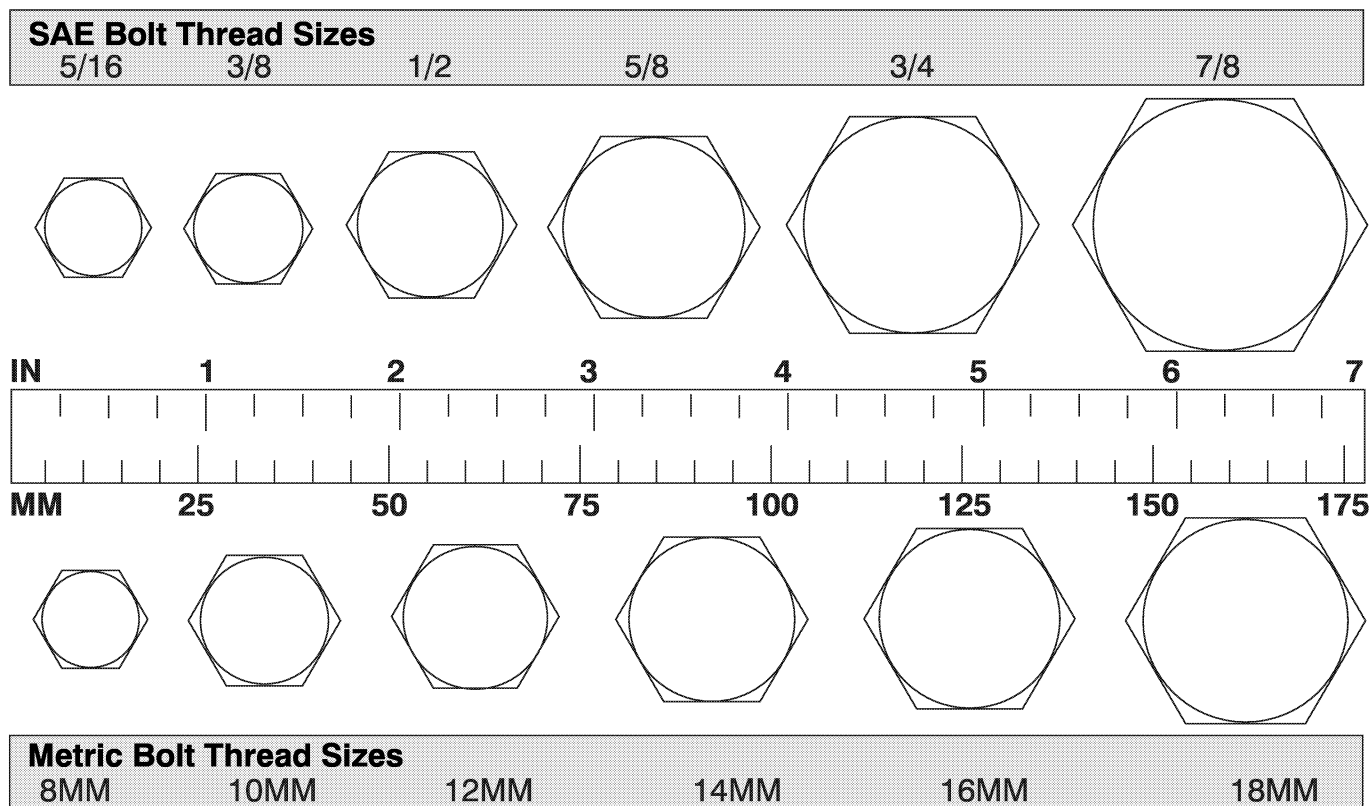
Typical Washer Installations



8/9/00

BOLT SIZE CHART

NOTE: Chart shows bolt thread sizes and corresponding head (wrench) sizes for standard SAE and metric bolts.



ABBREVIATIONS

AG.....Agriculture
 ATFAutomatic Transmission Fluid
 BSPPBritish Standard Pipe Parallel
 BSPTMBritish Standard Pipe Tapered Male
 CV.....Constant Velocity
 CCW.....Counter-Clockwise
 CW.....Clockwise
 F.....Female
 GA.....Gauge
 GR (5, etc.).....Grade (5, etc.)
 HHCS.....Hex Head Cap Screw
 HT.....Heat Treated
 JIC.....Joint Industry Council 37° Degree Flare
 LH.....Left Hand
 LT.....Left
 m.....Meter
 mm.....Millimeter
 M.....Male
 MPa.....Mega Pascal
 N.....Newton

NC.....National Coarse
 NF.....National Fine
 NPSM.....National Pipe Straight Mechanical
 NPT.....National Pipe Tapered
 NPT SWF.....National Pipe Tapered Swivel Female
 ORBM.....O-Ring Boss - Male
 P.....Pitch
 PBY.....Power Beyond
 psi.....Pounds per Square Inch
 PTO.....Power Take Off
 QD.....Quick Disconnect
 RH.....Right Hand
 ROPS.....Roll Over Protective Structure
 RPM.....Revolutions Per Minute
 RT.....Right
 SAE.....Society of Automotive Engineers
 UNC.....Unified Coarse
 UNF.....Unified Fine
 UNS.....Unified Special

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Trouble Shooting

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. ALLOWAYS' 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.

THERE ARE NO WARRANTIES, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY. ALLOWAY MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALLOWAY SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY AND/OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

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 14th 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 ninety (90) days 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.

ALLOWAYS' 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.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY. ALLOWAY MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALLOWAY SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY AND/OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

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.

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

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



PART NO.

500-3-1351

Alloway
4230 14 Ave. NW
Fargo, North Dakota 58102
701-356-4983

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