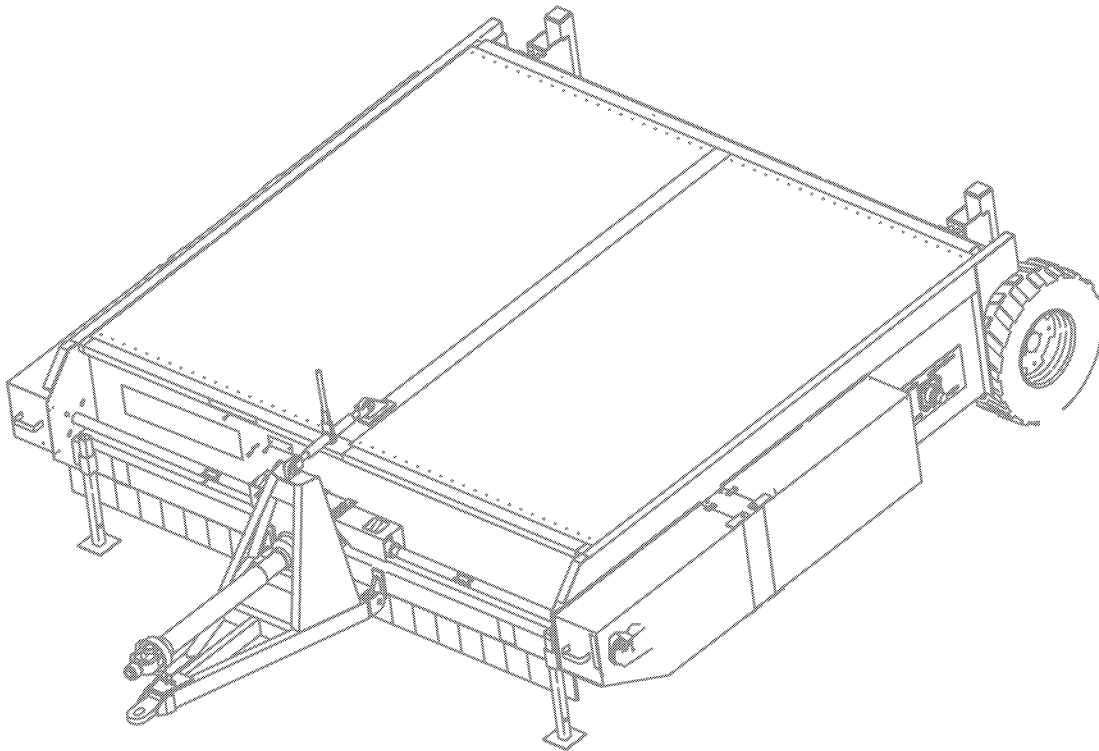




BEET DEFOLIATOR

430
622
624



500-3-1155

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

TABLE OF CONTENTS

INTRODUCTION	ii
GENERAL INFORMATION	1
SAFETY RULES	2-5
SAFETY DECALS	7-9
OPERATOR SIGN-OFF RECORD	9
OPERATION	10
FIELD OPERATION	20
ADDITIONAL EQUIPMENT	26
DEFOLIATOR STORAGE	28
SERVICE & MAINTENANCE	29
TROUBLE SHOOTING	42
INDEX TO PARTS LISTS	43
INDEX	63
BOLT TORQUE CHART	64
BOLT SIZE CHART & ABBREVIATIONS	65
REPLACEMENT PARTS WARRANTY	66
PRODUCT WARRANTY	INSIDE BACK COVER

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 raise unit and install transport locks before transporting. Leak down or failure of mechanical or hydraulic system can cause equipment to drop.
- Always attach safety chain to tractor drawbar when transporting unit.
- 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.
- Keep bystanders away from equipment.
- Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death. Follow Operator's Manual instructions for working underneath and blocking requirements or have work done by a qualified dealer.
- Do not operate or transport equipment while under the influence of alcohol or drugs.
- Operate only in daylight or good artificial light.

SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Avoid contact with electrical wires.

Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.

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

Never allow riders on power unit or attachment.

Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS systems in “locked up” position at all times.

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

Operate tractor PTO at the RPM speed stated in “Specifications” section.

Do not operate PTO during transport.

Look down and to the rear and make sure area is clear before operating in reverse.

Do not operate or transport on steep slopes.

Do not stop, start, or change directions suddenly on slopes.

Use extreme care and reduce ground speed on slopes and rough terrain.

Watch for hidden hazards on the terrain during operation.

Stop power unit and equipment immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.

Never work on scalper attachment in the raised position. Lower scalpels 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.

Electrocution can occur without direct contact.

Check clearances before raising implement.

Do not leave the operator's seat if any part of the tractor or implement contacts electric lines.

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

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

MAINTENANCE

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

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

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

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

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

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

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



SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



- Make certain all movement of equipment components has stopped before approaching for service.
- 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.
- Make sure attachment is properly secured, adjusted, and in good operating condition.
- Never perform service or maintenance with engine running.
- Make sure hydraulic hoses and cylinders are fully purged of air before 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.
- 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.

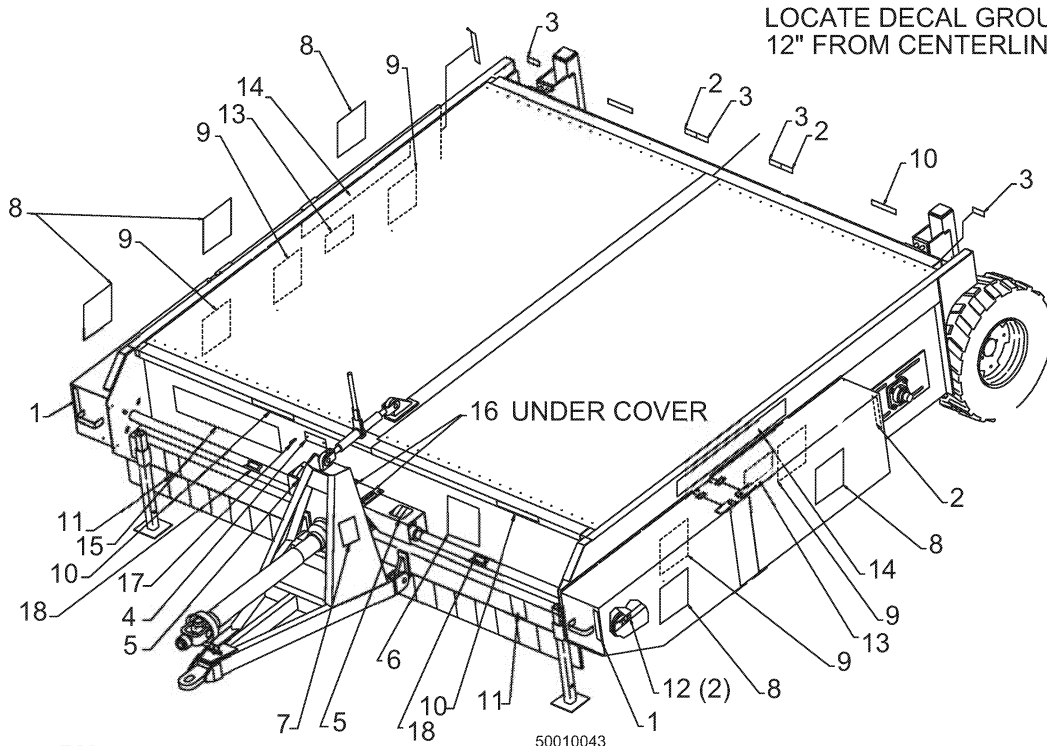
STORAGE

- 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!



6 - 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!



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.

! DANGER

GUARD MISSING. DO NOT OPERATE.

! DANGER

GUARD MISSING. DO NOT OPERATE.

! DANGER

! 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.

10 – PN 500-3-0981

! DANGER



GUARD MISSING. DO NOT OPERATE.

! DANGER



GUARD MISSING. DO NOT OPERATE.

! DANGER

18 – 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

11 – PN 500-3-0982

9– 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!



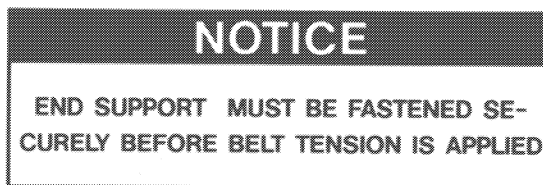
13 – 500-3-0723
INSTRUCTIONAL
DECAL

14 – TOPMASTER DECAL

15 – ALLOWAY DECAL

4 – SERIAL NUMBER PLATE

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



12 – PN 500-3-1149

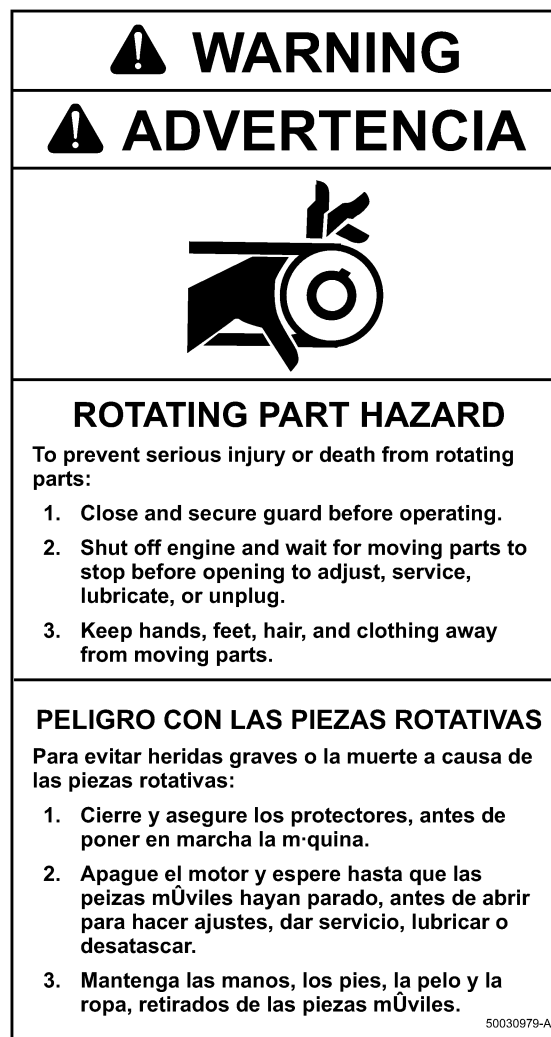
16 – PN 506-3-0194 (18869)



7 – PN 500-3-0978



8 – PN 500-3-0979



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 flail 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.

Operation Continued

PRINCIPAL COMPONENTS

The Alloway Beet Defoliator consists of three rotating drums that have steel or rubber flails. The flails remove the foliage from the plant. Rotational power to the drums is provided from the tractor PTO through a series of belts on each side of the machine.

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

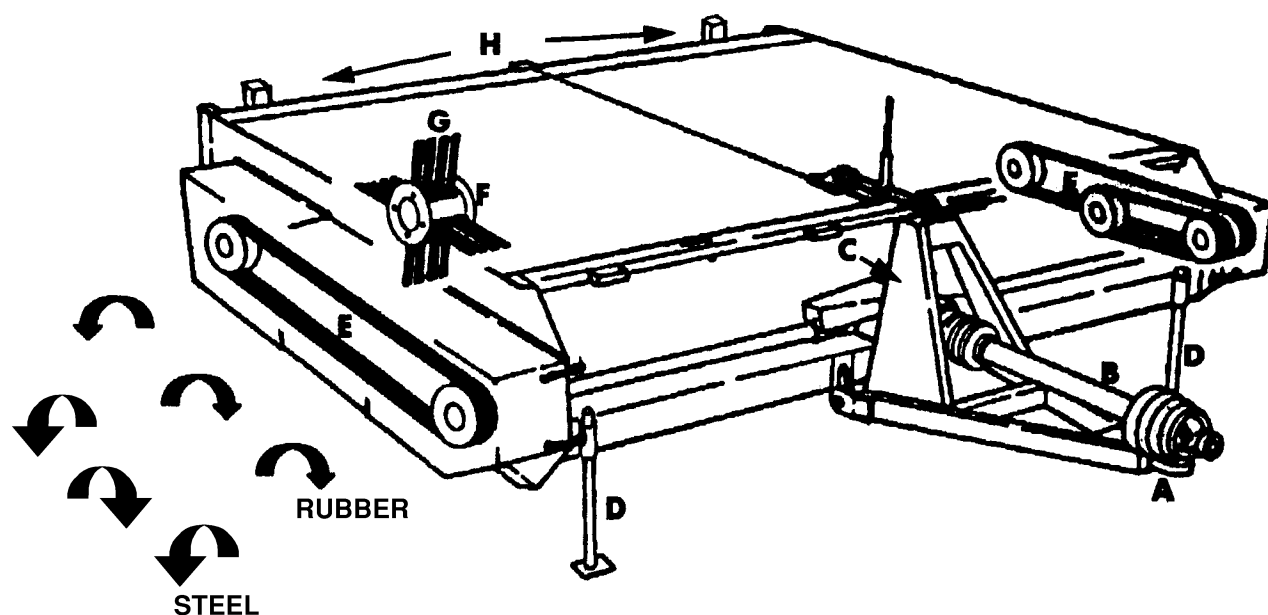


Figure 1 Beet Defoliator Principal Components

- 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 5 acres

1. Check all nuts, bolts, and other fasteners. Tighten to specifications given in the Bolt Torque Chart, page 64.
2. Check and re-torque all flail mounting bracket fasteners.
3. Tighten wheel bolts to specifications given in the Bolt Torque Chart, page 64.
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.
9. Check the tension of the drive belts. See Belt Tension, page 37.
10. After operating for 10 hours
11. Repeat steps 1 through 6.
12. Check tension of drive belts. See Belt Tension, page 37. Adjust as required.

After operating for 15, and 20 hours

13. Check tension of drive belts. See Belt Tension, page 37. 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 30 and page 31.
- ___ Use only a tractor of adequate power and weight to pull the unit.
- ___ Check that the unit is properly attached to the tractor.
- ___ Check oil level in gearbox. Add oil as required.
- ___ Check that the PTO driveline turns freely and that the driveline can telescope easily.

- ___ Check tire pressure. Bring to specified level.
- ___ Check flails. Inspect for damage or breakage. Make sure they swing freely on the mount. Repair or replace as required.
- ___ Check the condition of all drive belts. Align as required. Replace those that are frayed or broken. See Belt Replacement, page 39.
- ___ Check the condition of the optional scalpels. Adjust or repair as required. See page 40.
- ___ 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).

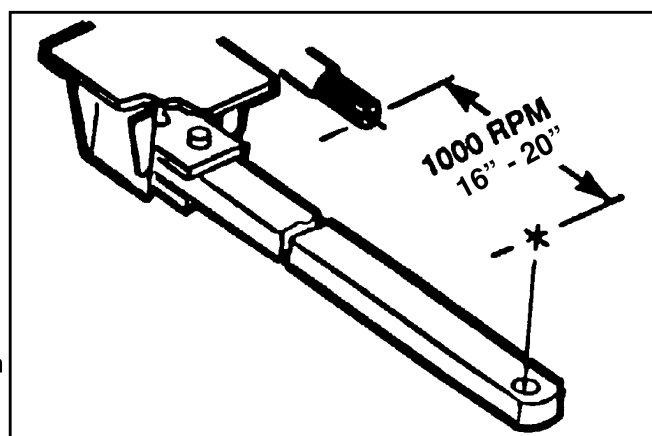


Figure 2 Drawbar Dimension

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.**

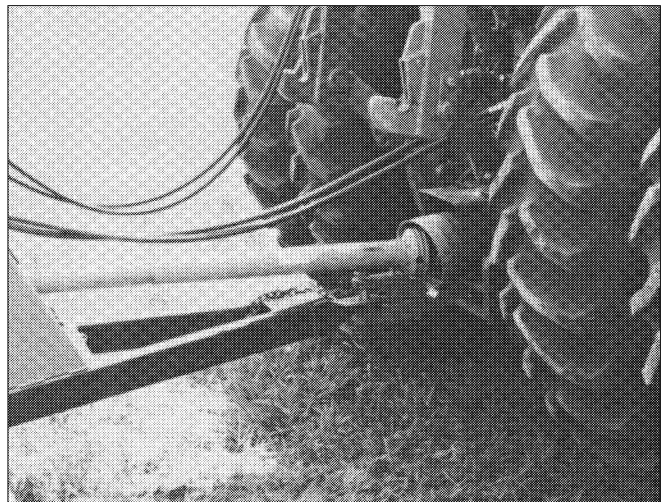


Figure 3 Driveline and hydraulics attached

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.

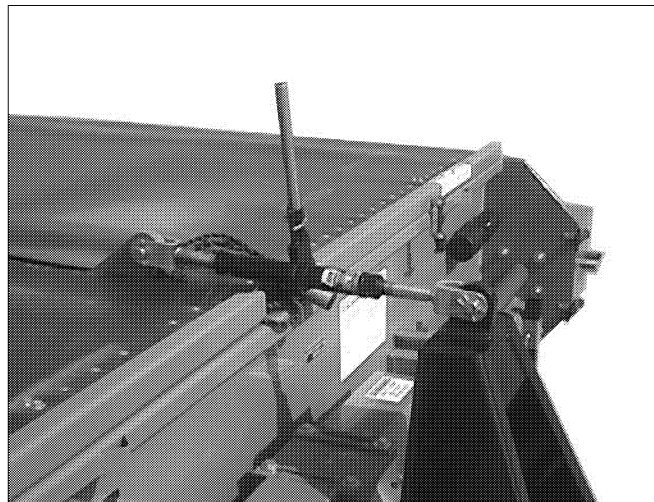


Figure 4 Hitch Ratchet

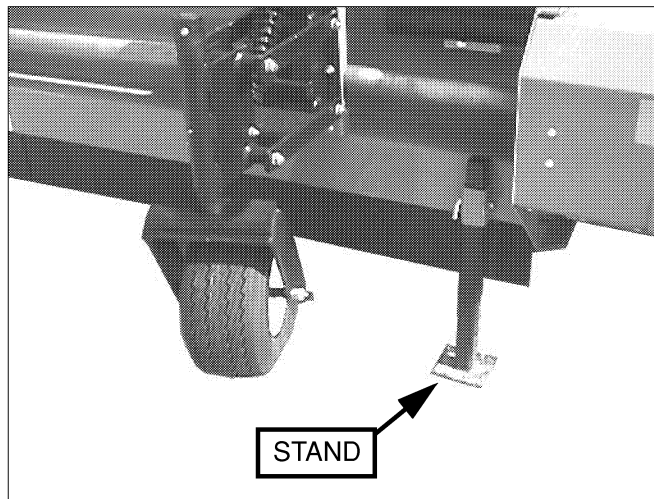


Figure 5 Stand

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 6) 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.

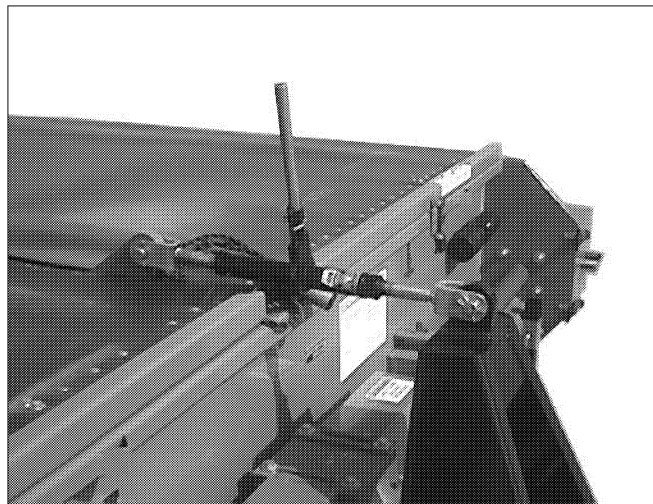


Figure 6 Hitch Ratchet

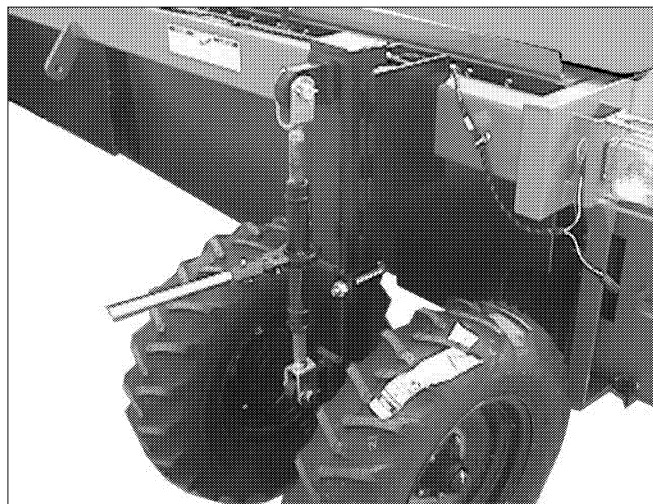


Figure 7 Rear Wheels

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.

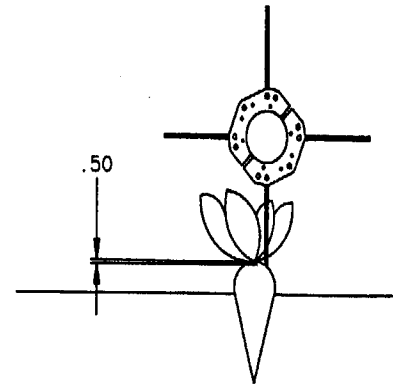


Figure 8 Flail Height

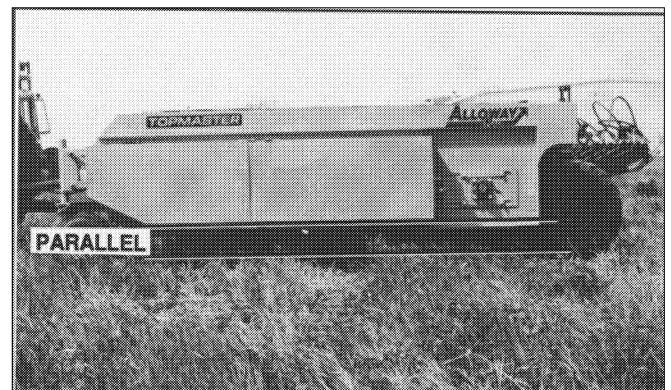


Figure 9 Machine Height

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.

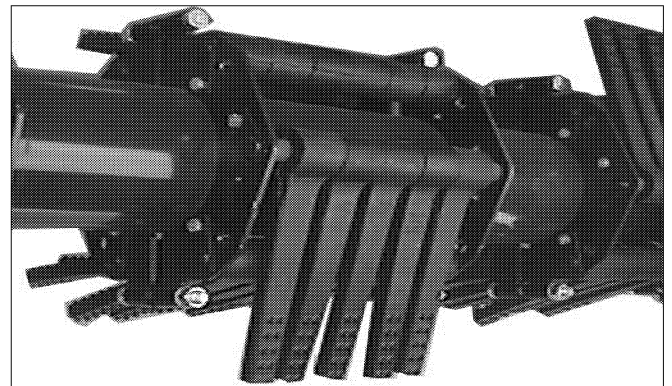


Figure 10 Flail Assembly

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 and can knock the beet out of the ground.

Follow this procedure to re-position the wheel assembly:

1. Jack up the machine.
2. Loose the top mounting bolts (Figure 11).
3. Slide assembly to desired position.
4. Re-tighten the bolts and remove jacks.

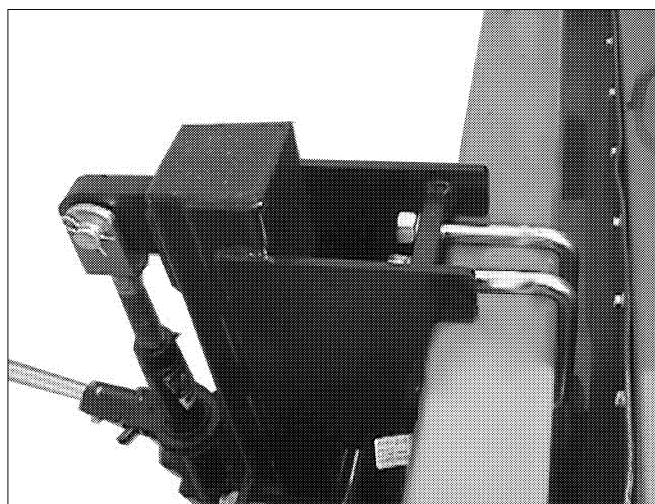


Figure 11 Wheel Mounting Bolts

Stabilizer Wheel Position

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

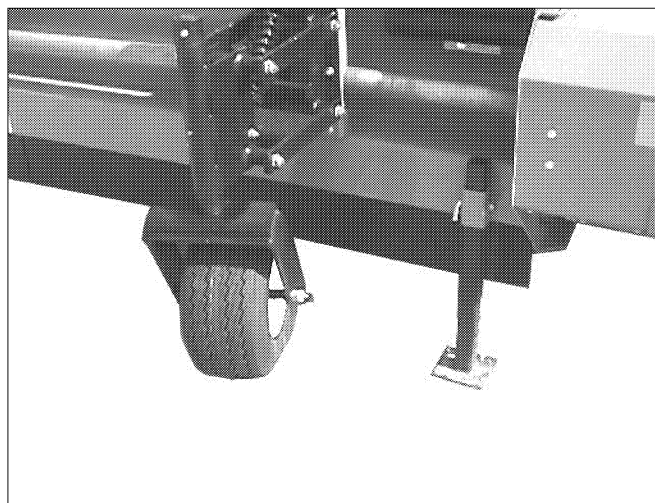


Figure 12 Stabilizer Wheel

Scalper Settings (optional)

Three types of scalpers are available:

- knife (Figure 14)
- circular (parallel arms)
(not shown; refer to page 56)
- circular (arms)
(not shown, refer to page 57)

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.

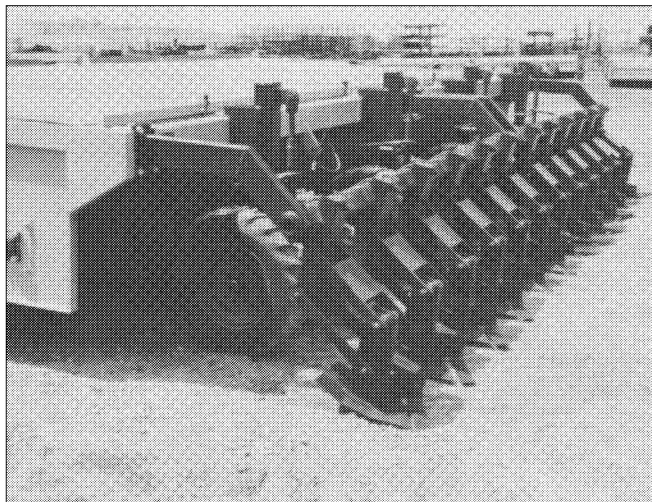


Figure 14 Knife Scalper

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

- 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.
- 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.
- 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.
- Inspect and clear area of stones, branches, or other hard objects that might be thrown, causing injury or damage.
- 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.

WARNING

- 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.
- Keep bystanders away from equipment.
- Operate tractor PTO at the RPM speed stated in “Specifications” section.
- Never allow riders on power unit or attachment.
- 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.

CAUTION

- 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.
- Always comply with all state and local lighting and marking requirements.

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:

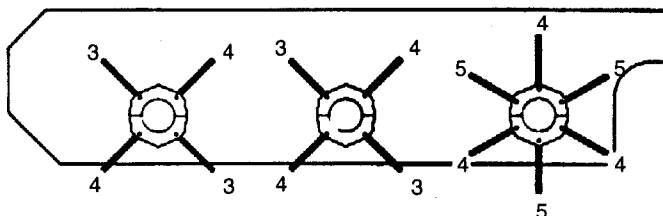
1. Increase speed if the beet tops are completely cleaned of foliage.
2. Increase speed if beets are being pulled out of the ground (or raise the flails).
3. Decrease speed if foliage is left on the crown or on the sides (or lower flails).

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 flails to hit the ground where they might pick up sticks, stones and other debris that can be thrown out and cause injury. This will also cause rapid wear or breakage.

30" ROWS



22"-26" ROWS

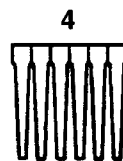
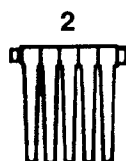
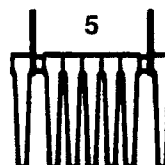
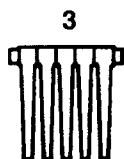
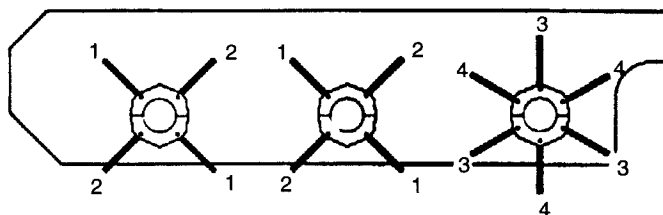


Figure 15 Flail Patterns

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.

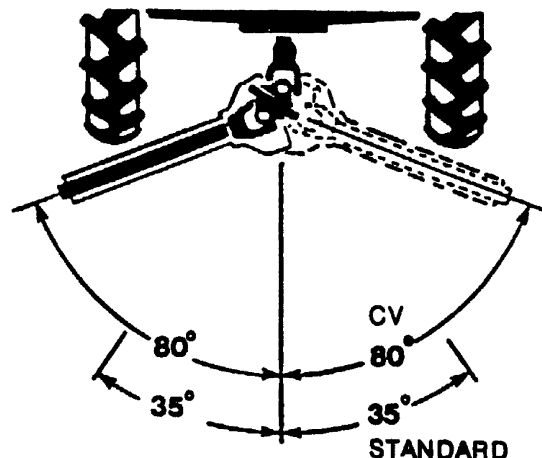


Figure 16 Driveline Angles

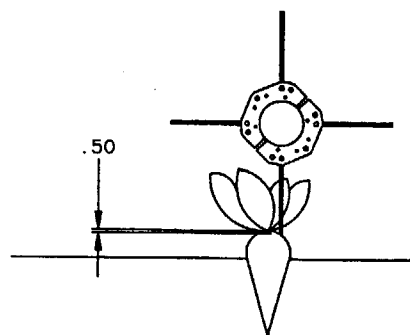


Figure 17 Flail Height

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 drive line, 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 18.

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

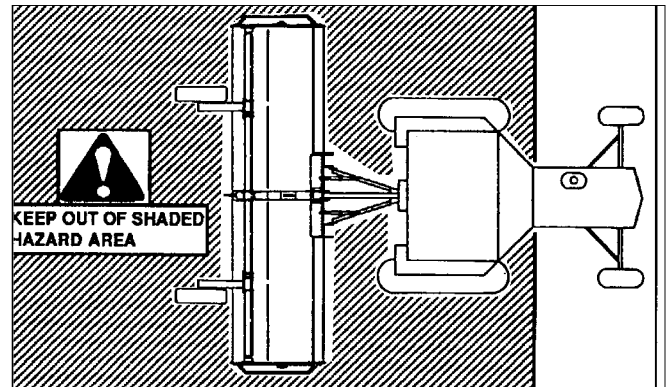


Figure 18 Hazard Area

ADDITIONAL EQUIPMENT (optional)

Rear Steer

1. Mount rear steer components to back of defoliator body. Refer to Rear Steer Components, page 51, 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.

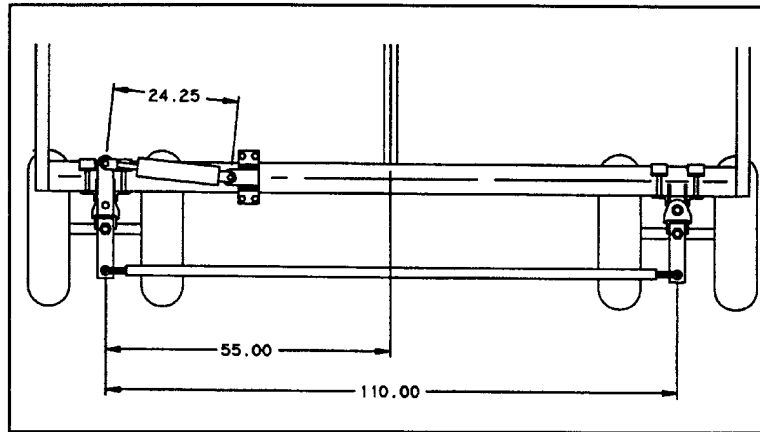


Figure 19 Rear Steer (6 Row 22)

Stabilizer Struts

1. Mount stabilizer struts to the front of defoliator. Refer to Stabilizer Wheel Components, page 55 for assembly.
2. Adjust up and down so the parallel linkage is low in the front in operating position. See Figure 21. 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.

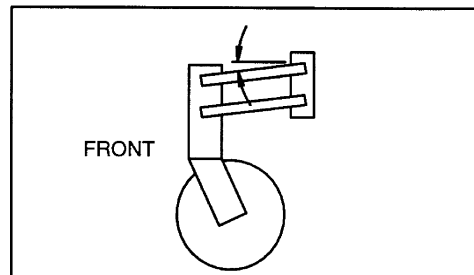


Figure 21 Stabilizer Strut

Additional Equipment Continued

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. See Figure 22. 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.

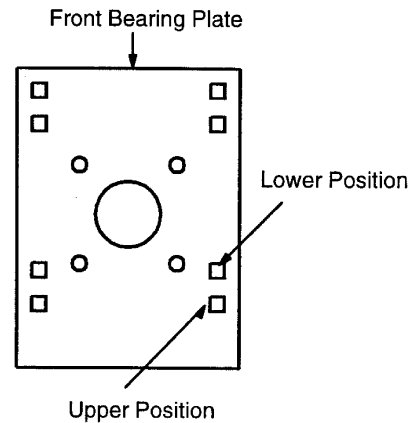


Figure 22 Steel Flail Adjustment

Idler Pulley

When using the idler pulley, flail tubes must be adjusted to the defoliator frame. This ensures that the belt is running or tracking straight with the pulley and will not walk off the pulleys and create premature wear or failure. Follow instructions on decal (Figure 23). Check belt tension (see page 37).

Mount the idler pulley using the 1/2" jam nuts between the body and the idler mount weldment. Use the jam nuts to align the pulley to the belt.

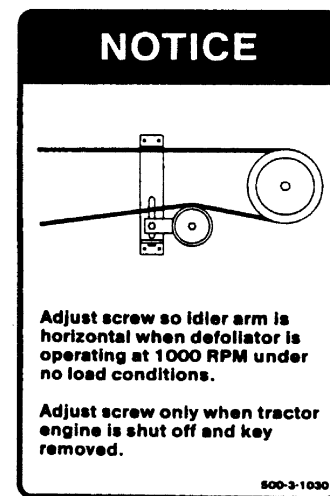


Figure 23 Idler Pulley Notice

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 (see Figure 24). 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.

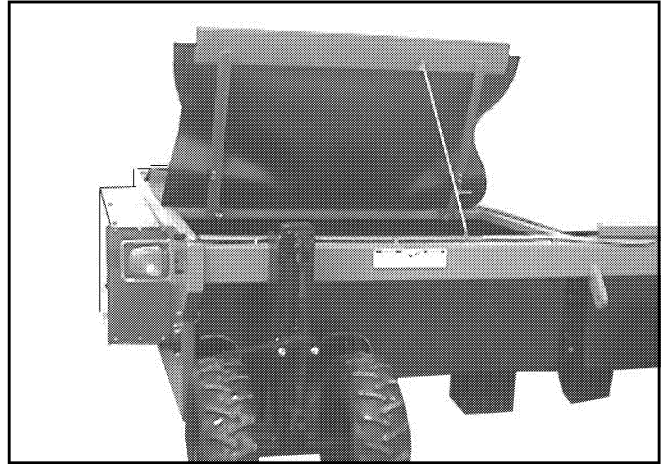


Figure 24 Open Covers

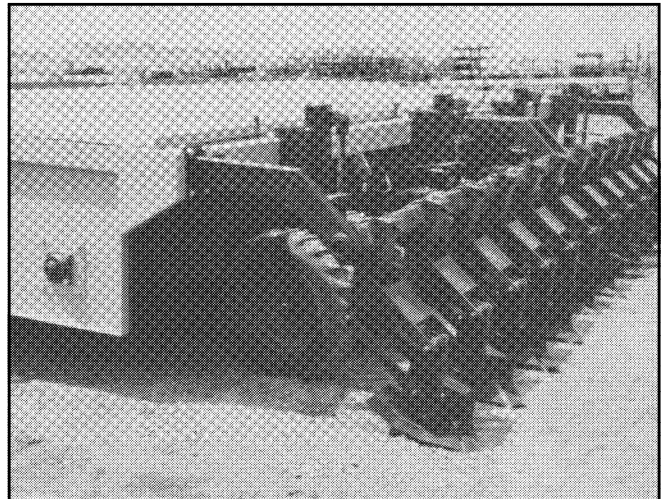


Figure 25 Scalper Storage

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 (Figure 25).
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.
- Make certain all movement of implement 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 32 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 28 for details.

Daily or 10 Hours

1. Lubricate PTO driveline, position A, Figure 26 and Figure 28
2. Use dipstick to check gearbox oil level.

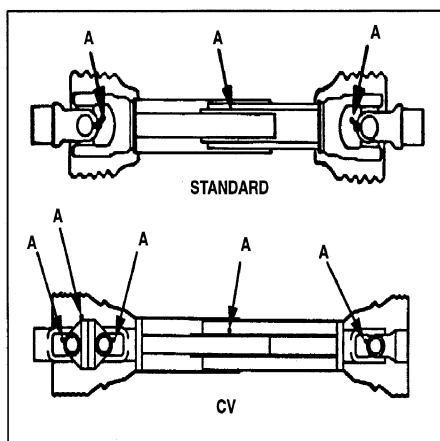


Figure 26 Driveline

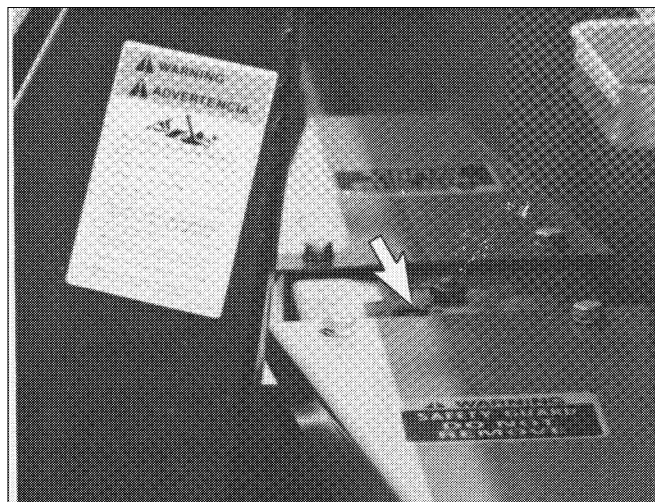


Figure 27 Dipstick

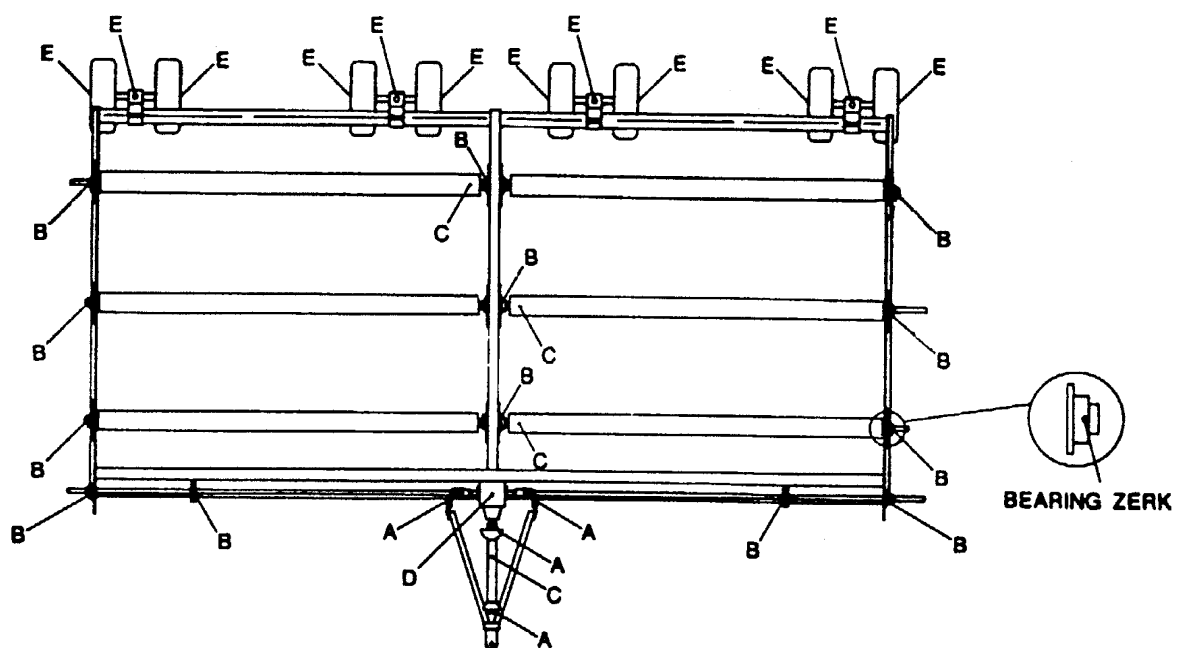


Figure 28 Lubrication Diagram

20 Hours

See Figure 28 for positions identification.

1. Lubricate bearing zerk with one shot of grease at each B position (13 positions). See Figure 29.
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.

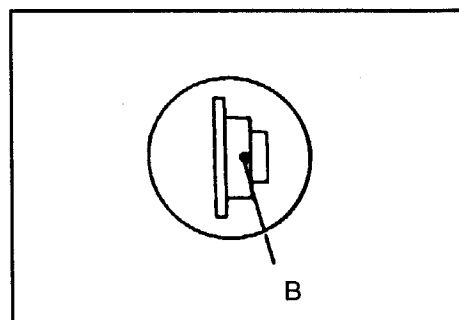


Figure 29 Position B

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).

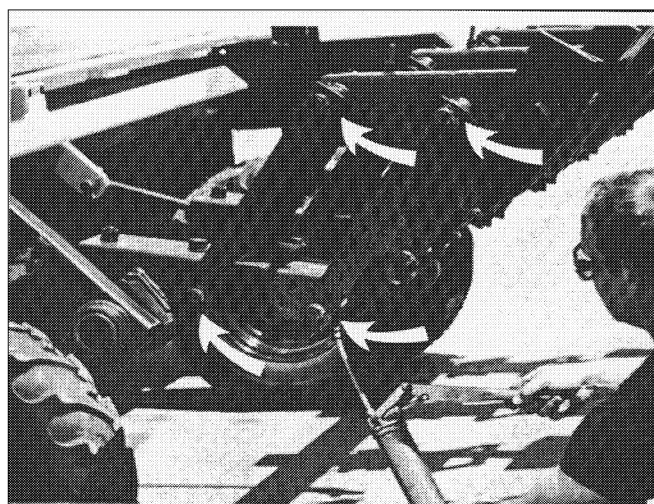


Figure 30 Scalper pivot bearings

Service & Maintenance *Continued*

Lubrication Service Record

✓ = CHECK

C = CHANGE

NOTE: See page 30 through page 31 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																
25 Hours																
L PTO Driveline telescope section																
L Rotor end bearings																
L Wheel mounting tube bearings																
40 Hours																
L Rotor inner bearings (2)																
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.

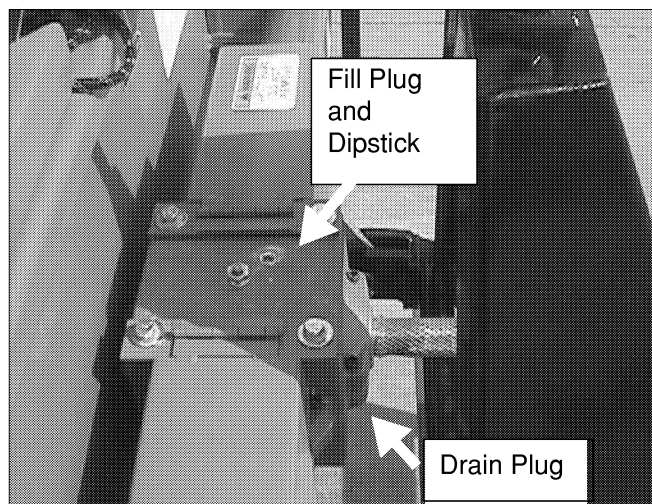


Figure 31 Gearbox, fill and drain plugs

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

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.

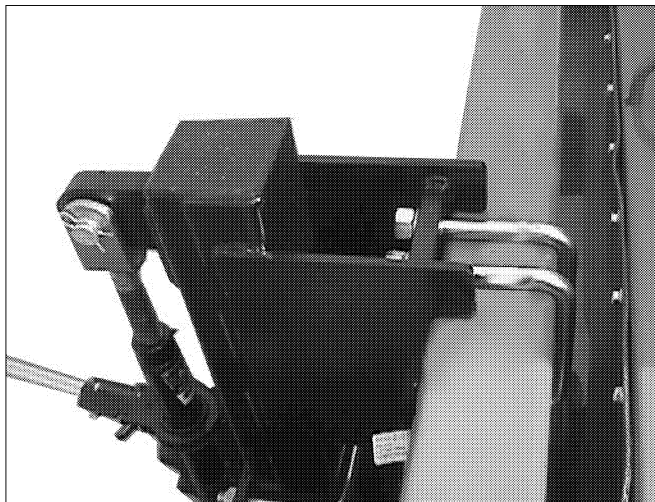


Figure 32 Wheel Mounting Bolts

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.



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

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

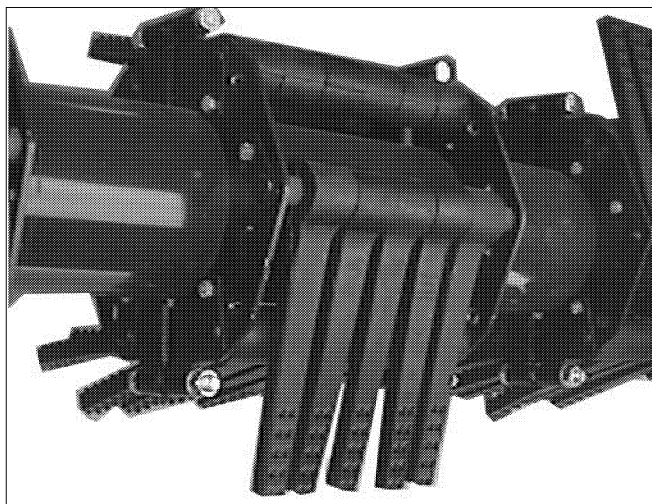


Figure 33 Rubber Flails

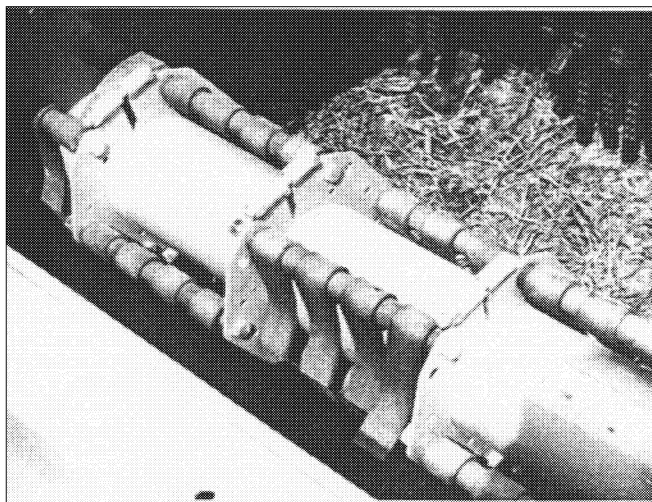


Figure 34 Steel Flails

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 pin. Tighten bolt to specified torque.
9. Repeat with other flails as required.
10. Close and secure canvas covers.
11. Attach driveline to tractor.



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

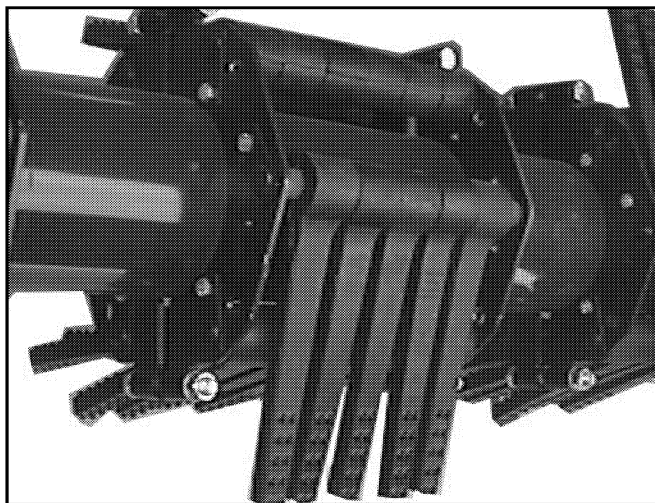


Figure 35 Flail Assembly

Belt Tension

The drive belts transmit power to turn the drums and flails. Maintain proper belt tension to ensure 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, check and adjust tension every 4 to 5 hours for 2 to 3 days until belts have "run in."

Check Belt Tension

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. Place the weight (supplied with the machine) in the center of the top belt span.
6. Use weight and deflection drawing as a guide to proper belt deflection.
 - a. The front drum's belt tension should be set approximately 1/4" deflection at 40 pounds.
 - b. The second drum's belt tension should be set approximately 1" deflection at 40 pounds.
 - c. The third drum's belt tension should be set approximately 1-5/8" deflection at 40 pounds.
7. Adjust
 - a. 6-Row and smaller units (no center hanger bearing): Adjust both ends of flail tube equally so that flail tube is parallel to cross drive shaft and defoliator frame. Measure from tabs welded to frame. See Figure 37.
 - b. 9-Row and larger units (with center hanger bearing): If using the optional idler pulley, adjust both ends of the flail tube equally so that the flail tube is parallel to the defoliator frame. (All 3 reference tabs measure equally.) If not using idler pulley, adjust pulley end of flail tube without moving the center hanger bearing or tail shaft bearing. Do not exceed 0.75 degrees or 1.5" out of parallel as coupler damage will occur.

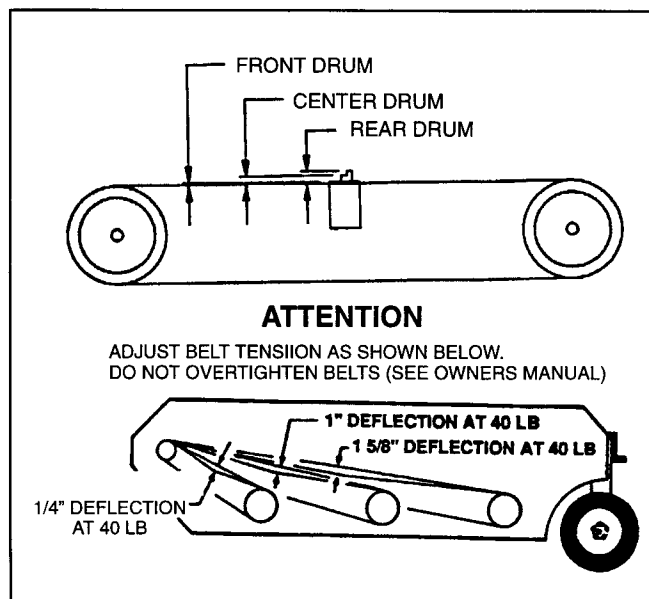


Figure 36 Belt Deflection and Weights

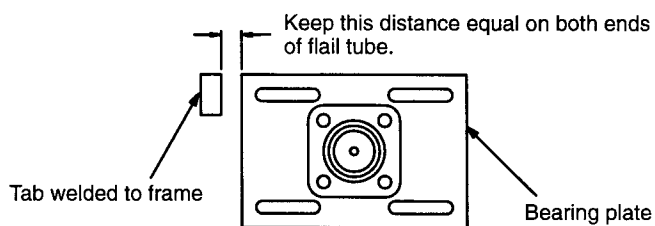


Figure 37 Reference Tabs

- c. When you approach this 1.5" limit, you must move center and tail shaft bearings to get flail tubes straight and parallel. See Figure 39. Never adjust the tail shaft end of the flail tube without moving the center bearing also.

Belt Tension *(Continued)*

8. Loosen bolts on bearing shaft bearing mounts.
9. Turn adjustment screws to adjust belt tension.
10. Tighten mounting bolts to their specified torque level.
11. Check belt deflection. Re-adjust if necessary.
12. Place a straight edge along the faces of the pulleys of belt adjusted.
13. Align the pulley if there is more than 1/16" space between the pulley and the straight edge.
14. Remove tools and weights from the machine and working area.

IMPORTANT

■ It may be necessary to adjust both ends of the belt tension idler pulley. See

15. Close and secure access doors.

16. Attach driveline to tractor.

NOTE: If defoliator is equipped with optional belt tension idler pulley, see page ---

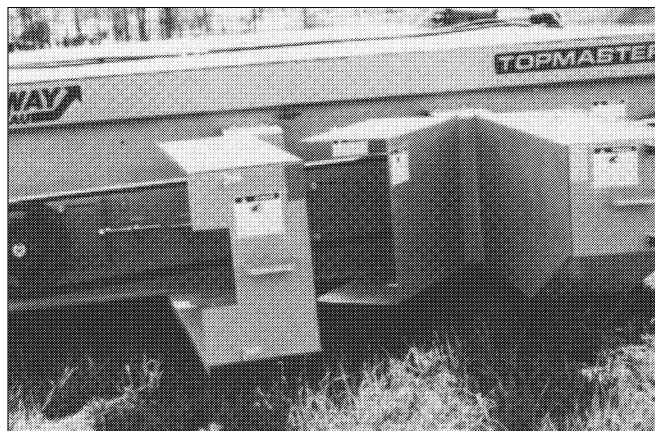


Figure 38 Belts
(top photo - right side; bottom photo - left side)

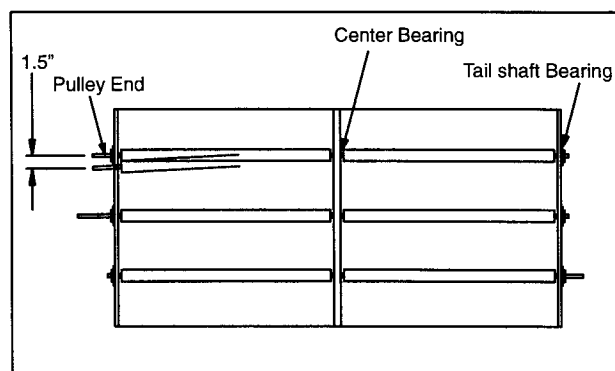


Figure 39 Flail Tubes

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 pulley shaft bearing mounts.
6. Slide the mounts over to loosen belts.
7. Remove belt.
8. Install new belt. Do not force belt over pulley and damage the cords.

IMPORTANT

■ **Use only genuine Alloway replacement parts**

9. Slide the pulley over to tension the new belt
10. Check the belt tension. See page 37 .
11. Check that all pulleys are aligned.
12. Check the tension of the new belt every 4 to 5 hours the first 2 or 3 days of operation. Adjust as required.
13. Close and secure access doors.
14. Attach driveline to the tractor.

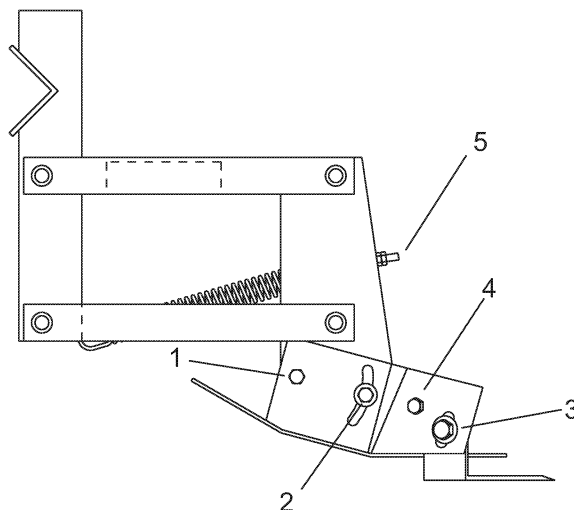
Scalpers

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.

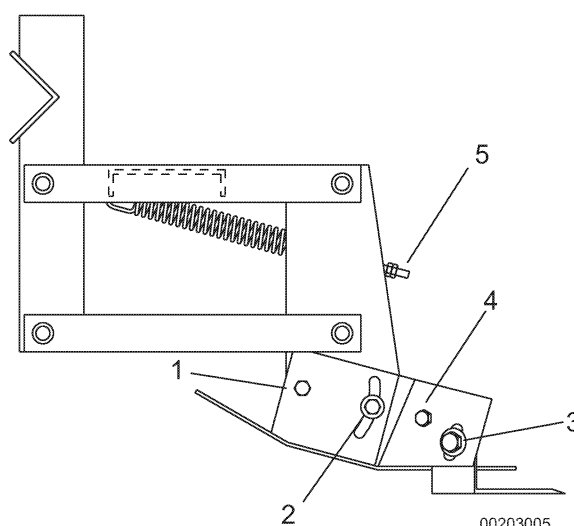
Knife Scalper

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 40.
 - 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 40.
 - 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)

00203005

Figure 40 Scalper Setting

Bearing Lock Collars

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

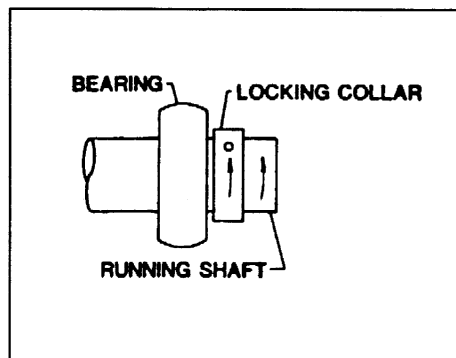


Figure 42 Locking Collar

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.

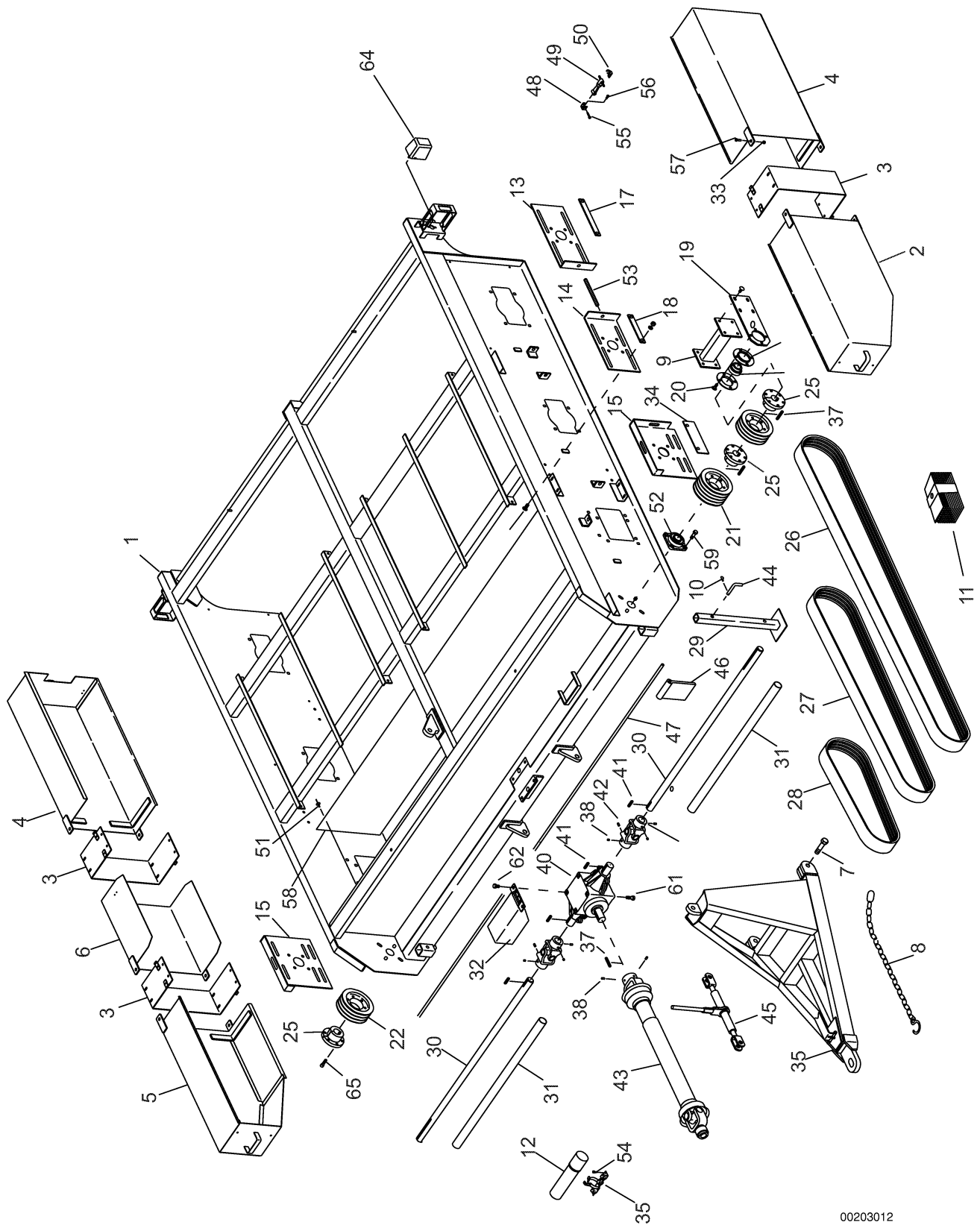
PROBLEM	CAUSE	SOLUTION
Drums won't turn	Tractor PTO defective	Repair tractor PTO
	Broken cross shaft or drive coupler on central hanger bearing	Replace (9 or 12 row units only)
Rapid belt wear	Machine plugged	Unplug machine
	Pulleys out of alignment	Align pulleys
	Loose belts, or Belts overtightened	Adjust belt tension
	Overloaded	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 scalper
	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

BEET DEFOLIATOR

430, 622, 624

Frame Components	44
Frame Components Parts List	45, 46
Cover Components	46
Flail Tube Components	47
Flail Components	48
Rear Strut Components	49
Hydraulic Strut Plumbing Components	50
Rear Steer Components	51
Knife Scalper Components	52
Knife Scalper Components Parts List	53
Hydraulic Scalper Components	54
Stabilizer Wheel Components	55
Parallel Arm Rotary Scalper	56
Long Arm Rotary Scalper	57
Hydraulic Scalper Plumbing	58
Gear Box (Superior)	59
PTO Shaft (Weasler)	60
PTO Shaft - CV (Weasler)	61

FRAME COMPONENTS



00203012

FRAME COMPONENTS PARTS LIST

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-2-0348	1	Frame Weld, 120" Wide, 430	34	500-3-0750	2	Plate Front
1	500-2-0349	1	Frame Weld, 132" Wide, 622, 430 Wide, 524-526	35	500-2-0036	1	Hitch
1	500-2-0350	1	Frame Weld, 144" Wide, 624	31	500-3-1656	2	Shield Tube, (622), (430 Wide) 47.50" Long
2	500-2-0422	1	Front Shield, LH	31	500-3-1664	2	Shield Tube, (624) 53.50" Long
3	500-2-0424	3	Center Shield, Short	32	500-2-0537	2	Shield, Gearbox
4	500-2-0421	2	Rear Shield	33	500-3-0607	10	Bushing, Hinge
5	500-2-0423	1	Front Shield, RH	34	500-3-0750	2	Plate Front
6	500-2-0499	1	Center Shield	35	500-2-0036	1	Hitch
7	900-01339	4	5/8 NC x 1-1/4 Hex Bolt	36	100-3-3958	1	Clamp
8	905-07112	1	Tow Chain	37	100-3-0331	6	Key, 1/2 x 1/2 x 3
9	500-2-0541	1	Mount Weldment	38	900-16255	5	3/8 NC x 3/4 Socket Set Screw
10	900-25004	2	1/8 Hair Pin Cotter, #11	39	903-05038	2	U-Joint, 1-3/4" x 2"
11	500-2-0493	1	Weight Weldment	39	903-17710	2	Yoke, 2"
12	100-3-3957	1	Tube, Manual Storage	39	903-17525	2	Repair Kit
13	500-3-0742	2	Bearing Bracket, Rear	40	903-15399	1	Gearbox (See page 59)
14	500-3-0741	2	Bearing Bracket, Center	41	100-3-3333	4	Key, 3/8 x 3/8 x 2
15	500-2-0368	1	Bearing Bracket, Front Left	42	900-16410	5	3/8 NC x 1 Socket Set Screw
16	500-2-0369	1	Bearing Bracket, Front Right	43	903-17398	1	PTO Shaft (STD) 1-3/8" (See page 60)
17	500-3-0441	4	Plate Long	43	903-17621	1	PTO Shaft, C.V. 1-3/8" (See page 61)
18	500-3-0439	6	Plate Short	43	903-7754	1	PTO Shaft, C.V. 1-3/4" (See page 61)
19	500-3-1663	1	Bearing Plate	44	505-3-0279	2	Pin, Park Stand
20	900-01750	8	1/2 NC x 1-1/4 Carriage Bolt	45	200-2-0705	1	Ratchet Jack
21	903-08365	1	Pulley, 4C8.5 (Rubber)	46	505-3-0739		Flap, 6"
21	903-08366	1	Pulley, 4C13 (Steel)	46	505-3-0741		Flap, 2-1/2"
22	903-08362	2	Pulley, 3C8.5	47	500-3-1138	1	Rod, Flaps (430 Narrow) 122-1/2" OAL
23	901-01079	1	Insert Bearing, 2"	47	500-3-1136	1	Rod, Flaps (622) 134-1/2" OAL
24	901-01314	2	4 Hole Flangette-100mm	47	500-3-1139	1	Rod, Flaps (624) 146-1/2" OAL
25	500-3-1060	3	Pulley Hub 2", Type E, w/Bolts	48	500-3-0407	9	Bracket, Rubber Latch
26	903-01406	1	Belt, 3C240	49	905-04019	9	Rubber Latch
27	903-01414	1	Belt, 3C162	50	905-04025	9	Hood Bracket
28	903-01413	1	Belt, 4C90	51	900-21489	NA	Pop Rivet
29	500-2-0531	2	Parking Stand (Square Tube)	52	901-01008	2	Bearing, 2"
30	500-3-1667	2	Cross Shaft, (430) 58" Long	52	901-01079	2	Insert, Bearing, 2"
30	500-3-1666	2	Cross Shaft, (622), (430 Wide) 64" Long	53	500-3-0513	6	Redi-Rod, 3/4" NC x 9" Long
30	500-3-1665	2	Cross Shaft, (624) 70" Long	54	900-17110	2	1/4 x 1/2 (MAX) Hex Wash Set Screw
31	500-3-1668	2	Shield Tube, (430) 41.50" Long	55	900-01013	9	1/4 NC x 1-1/2 Hex Bolt
31	500-3-1656	2	Shield Tube, (622), (430 Wide) 47.50" Long				
31	500-3-1664	2	Shield Tube, (624) 53.50" Long				
32	500-2-0537	2	Shield, Gearbox				
33	500-3-0607	10	Bushing, Hinge				

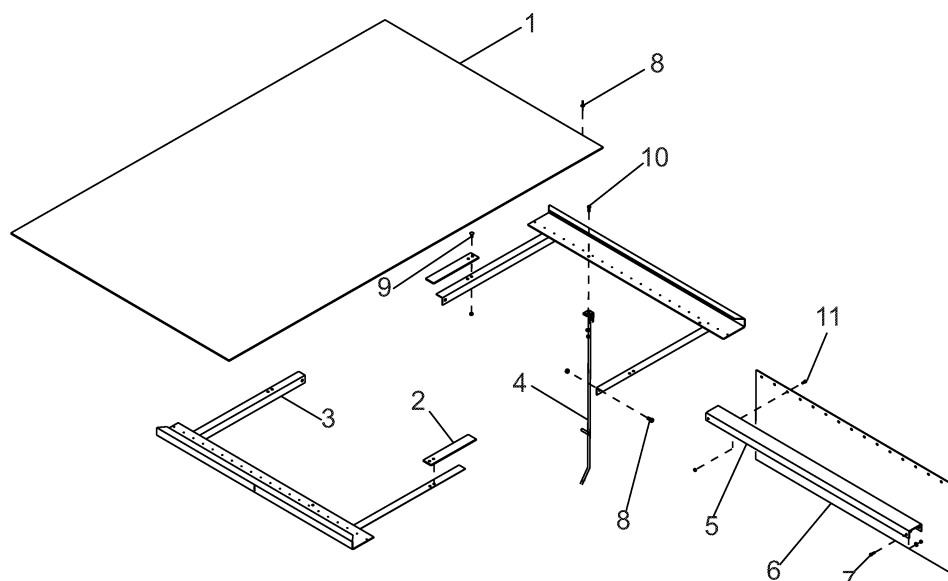
Continued on next page

FRAME COMPONENTS PARTS LIST CONTINUED

Continued from previous page

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
56	900-03419	9	5/16 NC x 3/4 Whiz Lok Hex Bolt	59	900-01345	32	5/8 NC x 2 Hex Bolt
57	900-01111	22	3/8 NC x 1-1/4 Hex Bolt	60	900-01784	24	5/8 NC x 1-1/2 Carriage Bolt
58	500-3-0760	1	Plastic Liner, 430 (Rubber Machines Only)	61	900-01227	4	1/2 NC x 1-3/4 Hex Bolt
58	500-3-0761	1	Plastic Liner, 622 (Rubber Machines Only)	62	900-01221	4	1/2 NC x 1 Hex Bolt
58	500-3-0762	1	Plastic Liner, 624 (Rubber Machines Only)	63	900-01527	2	1 NC x 4 Hex Bolt
				64	904-01132	2	Light Assembly
				64	901-01133	2	Light Bulb #3157
				NS	500-2-0731	1	Light Kit, Complete

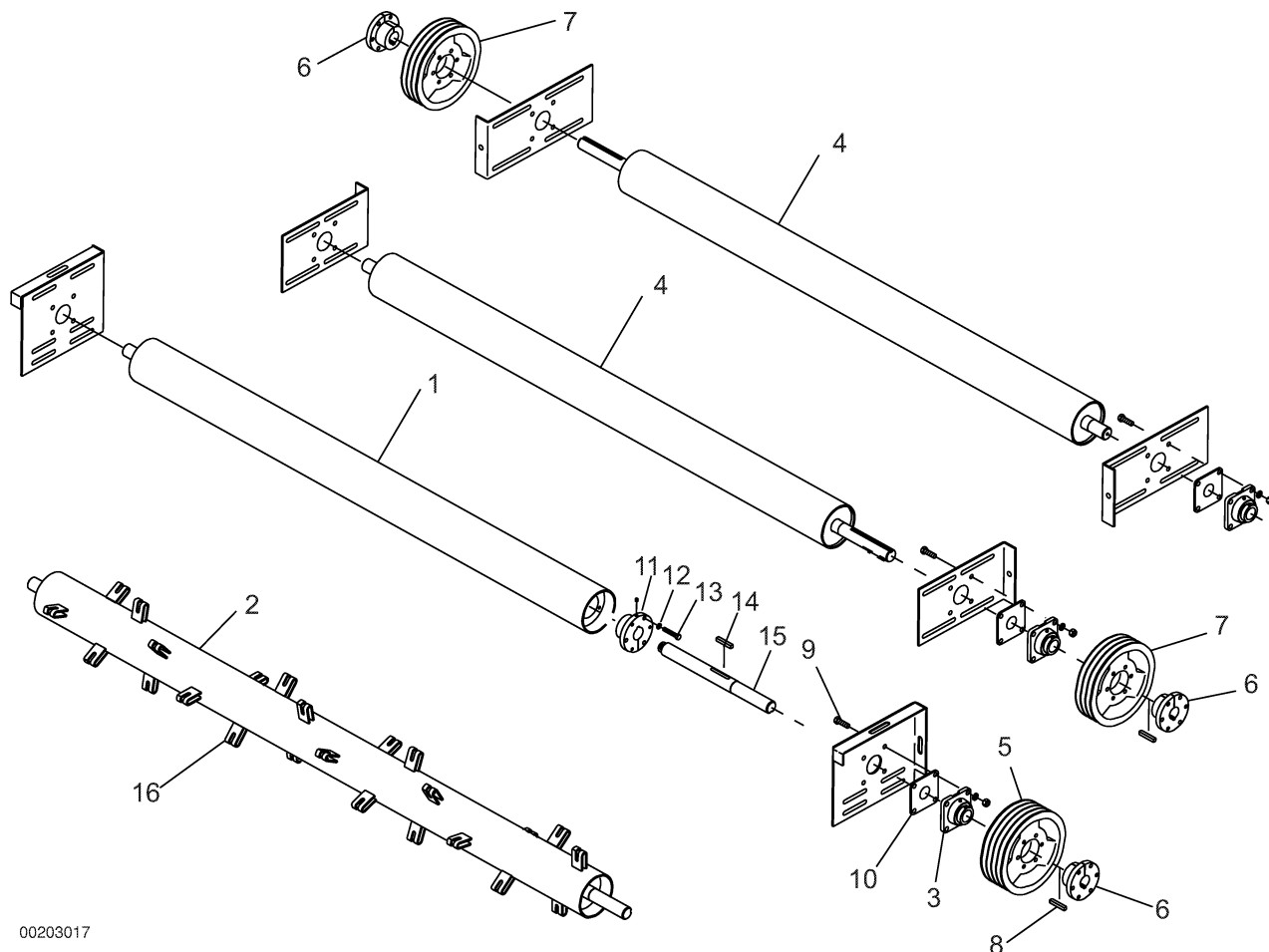
COVER COMPONENTS



00203033

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-3-0746	2	Cover, 430	5	500-3-0962	2	Cross Channel, 624
1	500-3-0747	2	Cover, 622 and 430 Wide	6	500-3-0734	2	Rear Flap, 430
1	500-3-0748	2	Cover, 624	6	500-3-0969	2	Rear Flap, 622 and 430 Wide
2	500-3-1233	4	Pinch Protector	6	500-3-0736	2	Rear Flap, 624
3	500-2-0715	4	Pivot Bracket Weldment, 430	7	900-01139	4	3/8 NC X 5-1/2 Hex Bolt
3	500-2-0575		Pivot Bracket Weldment, 622 and 430 Wide	8	900-01221	8	1/2 NC x 1 Hex Bolt
3	500-2-0714	4	Pivot Bracket Weldment, 624	9	900-01695	4	3/8 x 1 Carriage Bolt
4	500-2-0586	4	Prop Rod Weld Top Cover	10	900-01109	4	3/8 x 1 Hex Bolt
5	500-3-0960	2	Cross Channel, 430	11	900-03419	A/R	5/16 NC X 3/4 Whiz Lock Hex Bolt
5	500-3-1207	2	Cross Channel, 622 and 430 Wide				

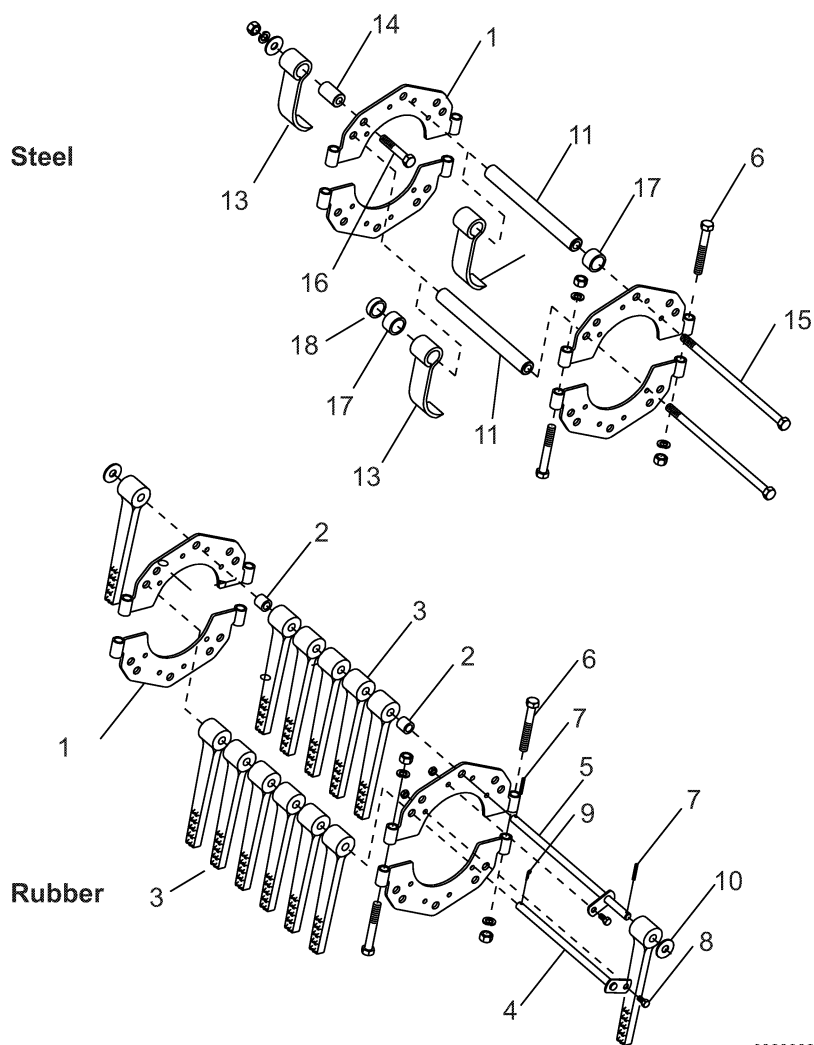
FLAIL TUBE COMPONENTS



00203017

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-2-0378	1	Tube Weldment, Front Balanced, 430	5	903-08366	1	Pulley, 4C13 (Rubber)
1	500-2-0308	1	Tube Weldment, Front Balanced, 622 and 430 Wide	5	903-08372	1	Pulley, 4C10 (Steel Cup)
1	500-2-0380	1	Tube Weldment, Front Balanced, 624	5	903-08365	1	Pulley, 4C8.5 (Steel L Knife)
2	500-2-0734	1	Tube Weldment, 430 "L"	6	500-3-1062	3	Pulley Hub 1-15/16" Type E, W/Bolts
2	500-2-0629	1	Tube Weldment, 622 "L"	7	903-08363	2	Pulley, 3C13
2	500-2-0735	1	Tube Weldment, 624 "L"	8	100-3-3331	3	Key, 1/2 x 1/2 x 3
3	901-01282	6	Bearing Assembly, W/Seal	9	900-01345	24	5/8 NC x 2 Hex Bolt
4	500-2-0379	2	Tube Weldment, Center and Rear, 430	10	500-3-0990	6	Plastic Bearing Shield
4	500-2-0214	2	Tube Weldment, Center and Rear, 622 and 430 Wide	11	500-3-1063	2	Hub, 2" Type E
4	500-2-0381	2	Tube Weldment, Center and Rear, 624	12	900-11013	6	1/2 Lock Washer
				13	900-02526	18	1/2 x 2-3/4 F.T. Tap Bolt
				14	100-3-3331	2	Key, 1/2 x 1/2 x 3
				15	500-3-0865	1	Shaft Drive
				16	500-3-1173	A/R	Rigid Knife Bracket

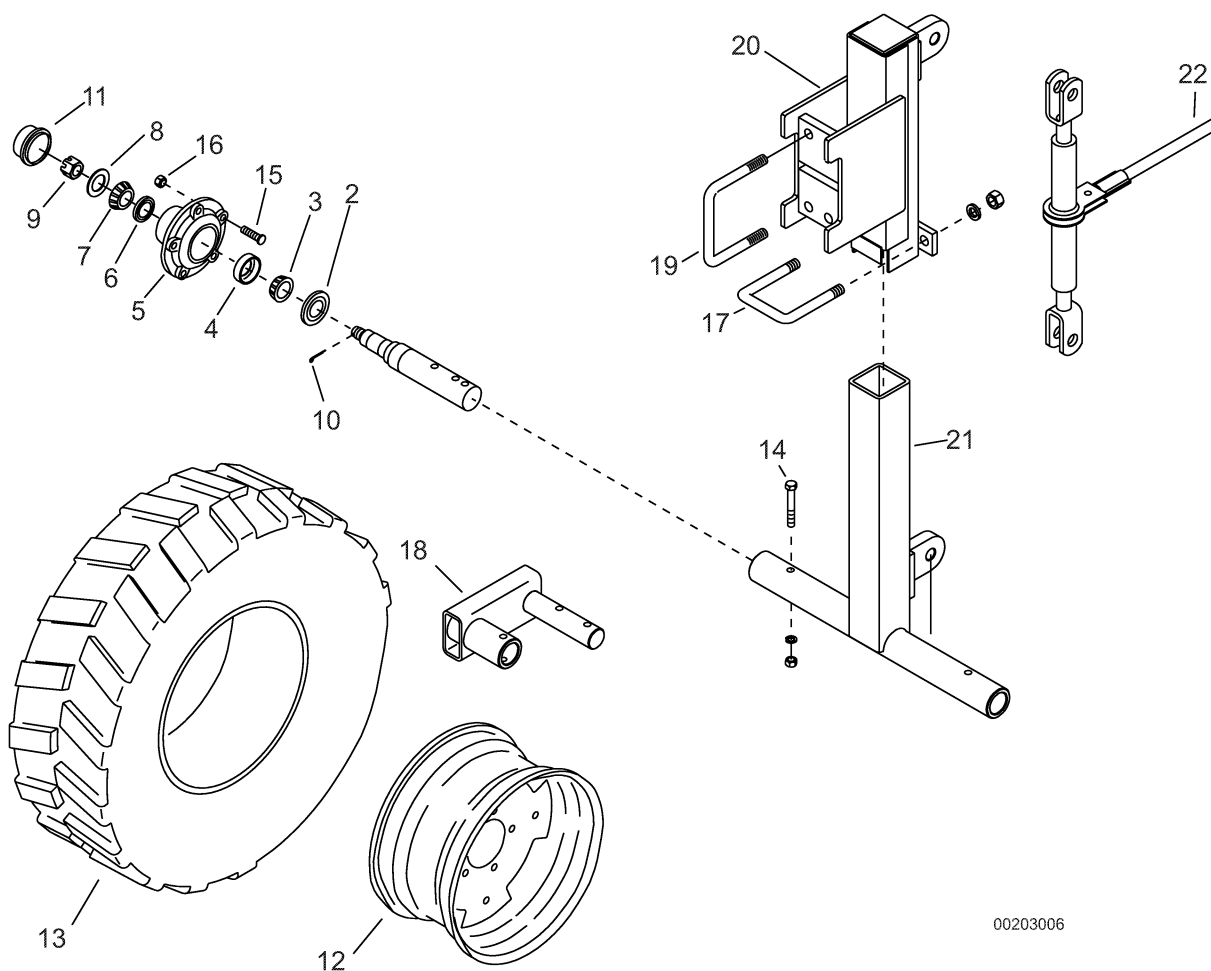
FLAIL COMPONENTS



00203020

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-2-0067	A/R	Flail Mounting Bracket	11	500-3-1065	A/R	Bushing, Long
2	500-3-0151	A/R	1" Spacer	13	505-3-0004	A/R	Steel Flail
3	500-3-0316	A/R	Rubber Flail	13	505-3-0972	A/R	Steel Flail (2001 and later production)
4	500-2-0068	A/R	Rubber Flail Pin	14	505-3-0405	A/R	Bushing, Wear
5	500-2-0069	A/R	Rubber Flail Pin Extension	15	900-03036	A/R	5/8 NC X 14 Hex Bolt
6	900-01363	A/R	5/8 NC x 4-1/2 Hex Bolt	16	900-01357	A/R	5/8 NC x 3-1/2 Hex Bolt
7	900-29153	A/R	Roll Pin, 7/32 x 1-1/2	17	500-3-1066	A/R	1" Spacer
8	900-01105	A/R	3/8 NC x 3/4 Hex Bolt	18	500-3-1067	A/R	1/2" Spacer
9	900-23041	A/R	3/16 x 1 Cotter Pin	19	505-3-0001	A/R	Steel "L" Knife
10	900-11131	A/R	Washer, Nylon 5/8 ID	20	900-01790	A/R	5/8 NC x 3 Carriage Bolt

REAR STRUT COMPONENTS



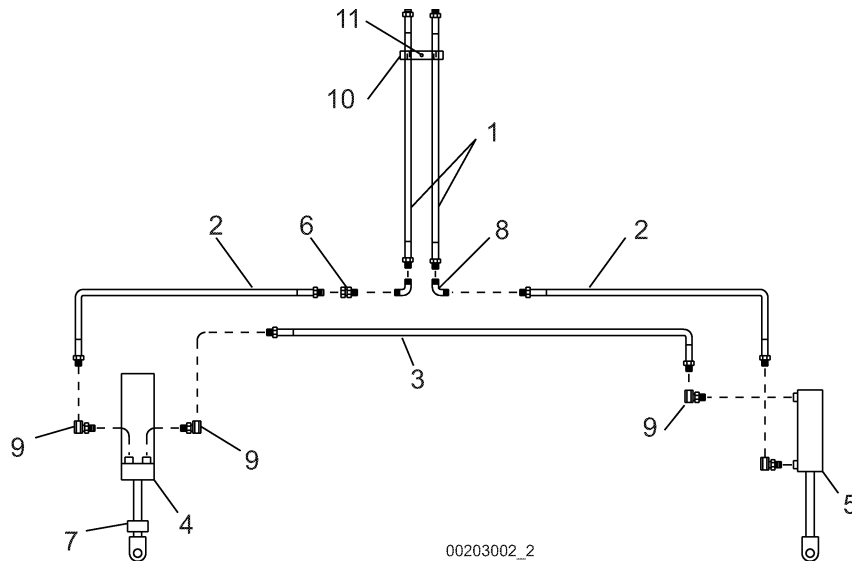
00203006

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
23	900-12043	1	3/16 x 1-1/2 Cotter Pin
23	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)

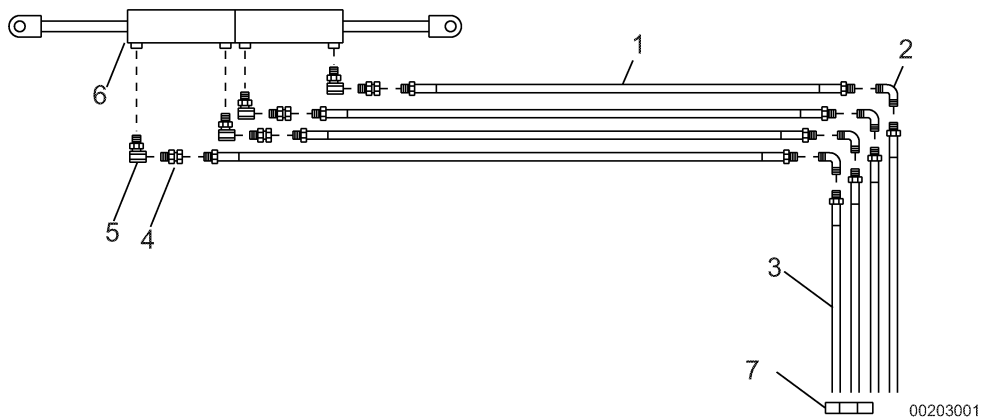
NS = Not Shown

HYDRAULIC STRUT PLUMBING COMPONENTS



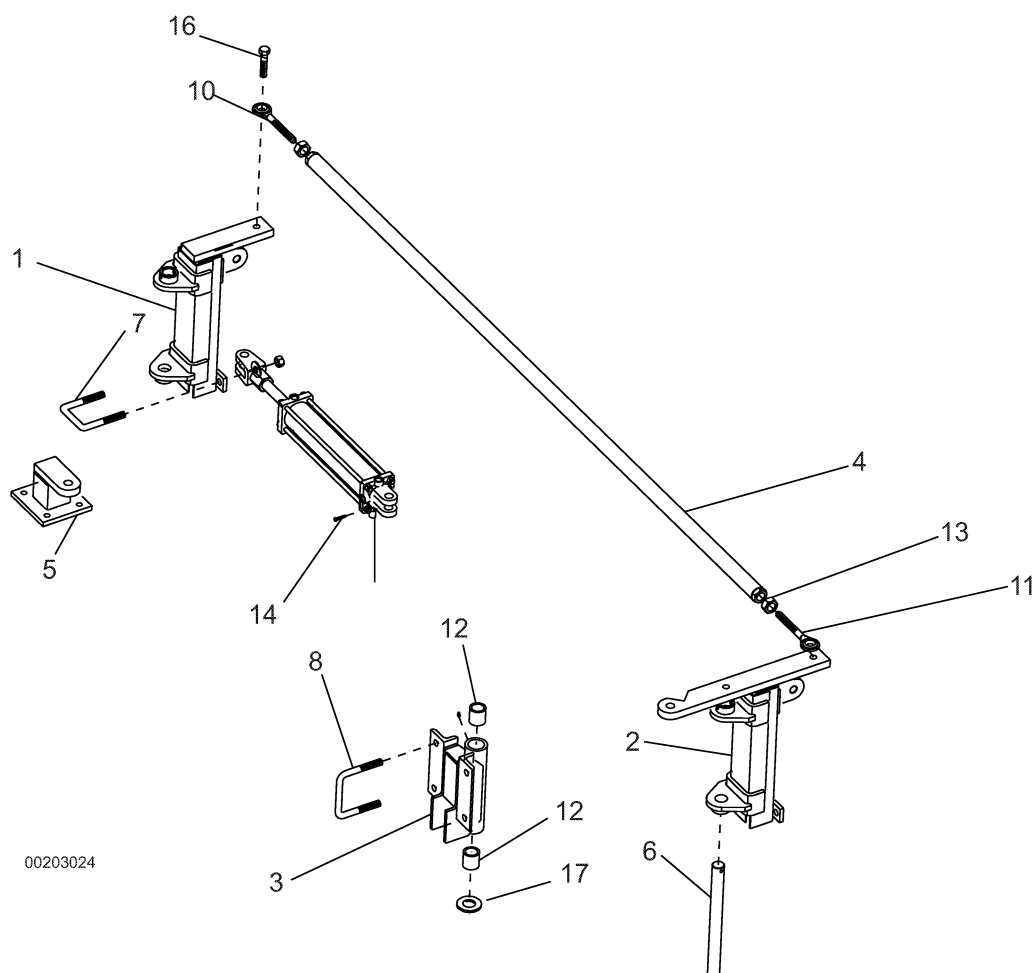
REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	210-2-0179	2	3/8 Hose, 1/2 MP x 1/2 MP x 220	5	905-21290	1	Hydraulic Cylinder, 3.50 x 8R
2	210-2-0174	2	3/8 Hose, 1/2 MP x 1/2 MP x 73	5	905-21372	1	Seal Kit, 3.25 x 8R
3	210-2-0185	1	3/8 Hose, 1/2 MP x 1/2 MP x 160	6	905-01531	1	1/2 Swivel Restrictor, 1/16
4	500-2-0721	1	Hydraulic Cylinder 3-3/4 x 8R W/ Stop Nut	7	905-21407	1	Mechanical Depth Stop Nut
4	905-21398	1	Hydraulic Cylinder	8	905-01004	2	Elbow, 1/2 NPT x 90 Deg.
4	905-21405	1	Seal Kit, 3-3/4 x 8R	9	905-01528	4	Elbow, 3/4 MORB x 1/2 FPT x 90 Deg.
				10	210-3-0199	4	Hose Holder
				11	900-16964	4	1/4 x 1-1/2 Tek Screw

REAR STEER PLUMBING COMPONENTS



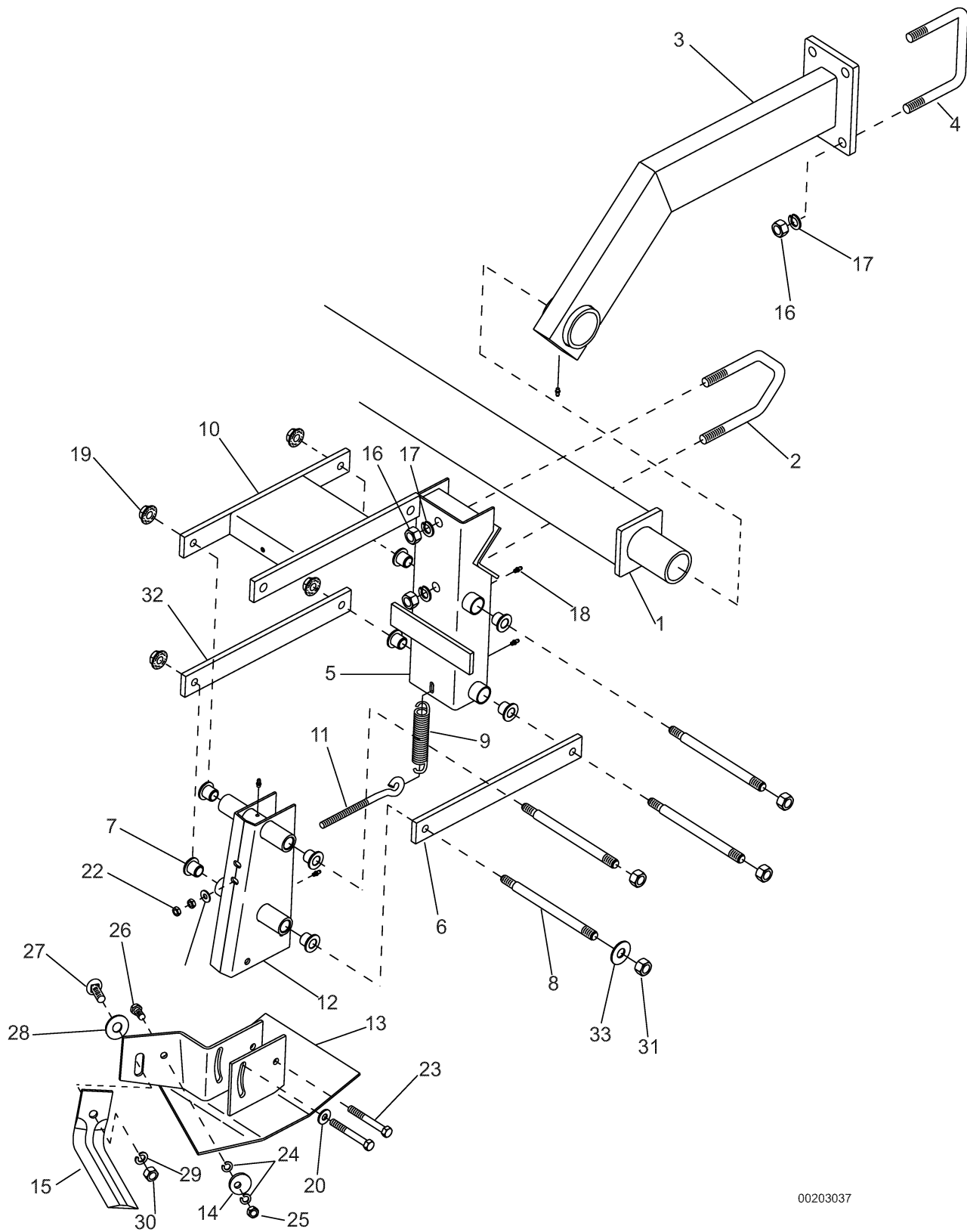
REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	210-2-0393	4	3/8 Hose, 1/2 MP x 43"	5	905-01528	4	Elbow, 3/4 MORB x 1/2 FPT x 90 Deg.
2	905-01004	4	Elbow, 1/2 NPT x 90 Deg.	6	905-21369	1	Rear Steer Cylinder
3	210-2-0201	4	3/8 Hose, 1/2 MP x 1/2 MP x 235"	7	210-3-0199	3	Hose Holder
4	905-01531	4	1/2 Swivel Restrictor, 1/16	NS	900-16964	2	1/4 x 1-1/4 Hex Screw

REAR STEER COMPONENTS



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-2-0625	1	Tube Weldment (RH)	10	903-05030	1	Pivot Link, 3/4" Uni-Ball, LH Thread
2	500-2-0624	1	Tube Weldment (LH)	11	903-05031	1	Pivot Link, 3/4" Uni-Ball, RH Thread
3	500-2-0623	2	Pivot Tube Assy.	12	901-01146	4	Bronze Bushing
4	500-2-0412	1	Adjustment Tube, 102" Long Tube	13	900-06288	1	1-1/8 NC Jam Nut (RH)
5	500-2-0621	1	Cylinder Mount Weldment	13	900-06310	1	1-1/8 NC Jam Nut (LH)
6	500-3-1328	2	Pin, Pivot	14	900-16964	3	1/4 x 1-1/4 Tek Screw
7	200-3-0017	2	U-Bolt, 5/8 NC x 4 x 7-1/2	15	900-23084	2	3/8 x 3-1/2, Cotter Pin
8	200-3-0024	8	U-Bolt, 3/4 NC x 6 x 5-1/2	16	900-01415	2	3/4 NC x 3-1/2 Hex Bolt
9	210-3-0199	3	Hose Holder	17	500-3-0538	2	Spacer Bushing

KNIFE SCALPER COMPONENTS

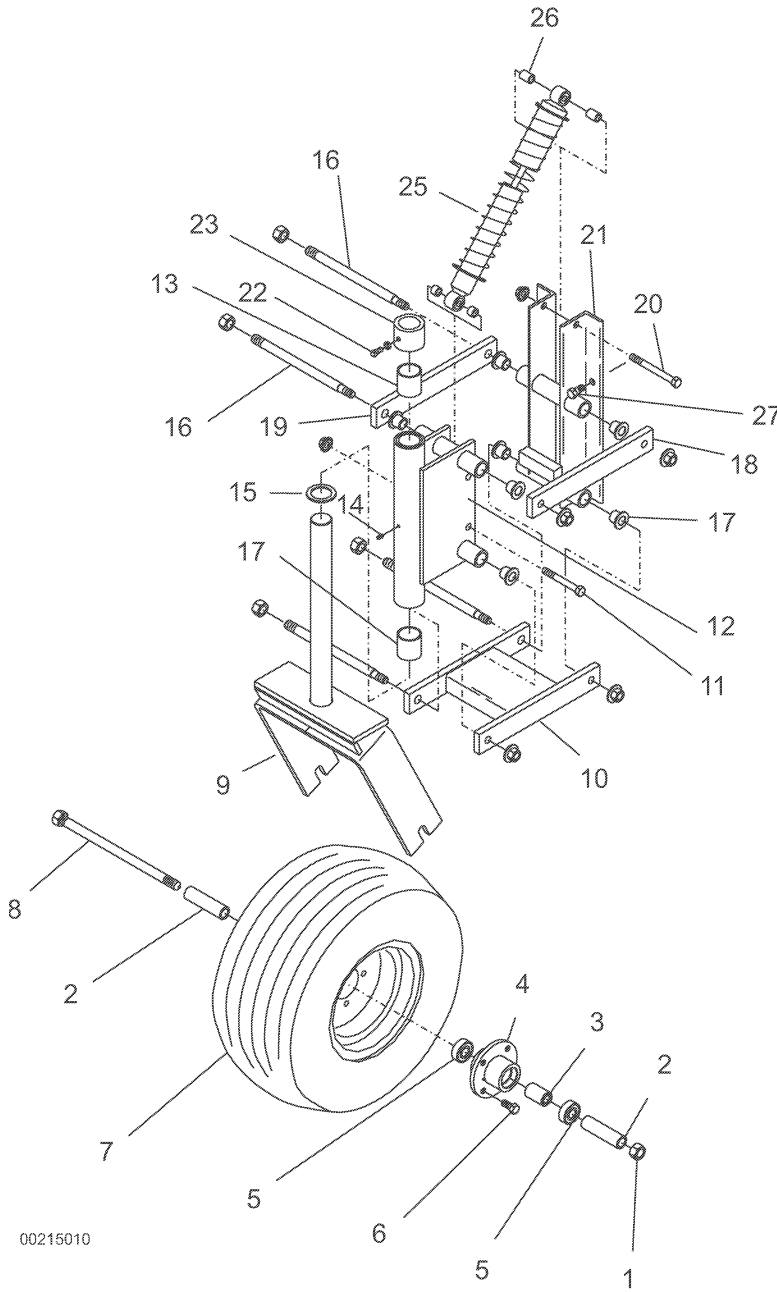


00203037

KNIFE SCALPER COMPONENTS PARTS LIST

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	500-2-0407	1	Toolbar Weldment, 108" long Tube, 430	13	500-20336	1	Shoe Weldment, Right
1	500-2-0408	1, 2	Toolbar Weldment, 120" long Tube, 622	14	500-3-0201	1	Eccentric Spacer
1	500-2-0409	1	Toolbar Weldment, 132" long Tube, 624	15	500-3-0910	1	Knife Scalper
1	500-2-0489	1	Toolbar Weldment, 74" long Tube, 422	16	900-06015	2	3/4 NC Hex Nut
1	500-2-0448	1	Toolbar Weldment, 96" long Tube, 522	17	900-11017	2	3/4" Lock Washer
2	500-3-0635	1	A-Bolt, 3/4 x 4 x 4	18	905-1 5024	6	1/4 UNF Straight Zerk
3	500-2-0566	2	Mounting Arm Scalper	19	900-06145	4	5/8 NC Whiz Nut
4	200-3-0024	4	U-Bolt, 3/4 NC x 6 x 5-1/2 Long	20	900-11035	2	1/2 Flat Washer
5	500-2-0330	1	Mount Weldment with Bushings and Zerk	21	900-11033	1	3/8 Flat Washer
6	500-3-0992	1	Pivot Arm, 3/4" Holes	22	900-06005	2	3/8 Hex Nut
7	200-3-0877	8	Flanged Bushing	23	900-01245	2	1/2 NC x 4 Hex Bolt
8	200-3-2631	4	Pin	24	900-11013	4	1/2 Lock Washer
9	400-3-0263	1	Spring	25	900-06009	3	1/2 NC Hex Nut
10	500-2-0518	1	H-Weldment	26	900-01223	1	1/2 NC x 1-1/4 Hex Nut
11	500-3-0675	1	Eye Bolt, 3/8 NC x 8 long	27	900-01784	1	5/8 x 1-1/2 Carriage Bolt
12	500-2-0338	1	Upright Weldment with Bushings and Zerk	28	900-11038	1	3/4 Flat Washer
13	500-2-0335	1	Shoe Weldment, Left (shown)	29	900-11015	1	5/8 Lock Washer
				30	900-06013	1	5/8 NC Hex Nut
				31	900-06510	4	3/4 NC Lock Nut
				32	500-3-0991	1	Pivot Arm, 5/8" Holes
				33	905-09066	A/R	Washer, SAE 3/4"

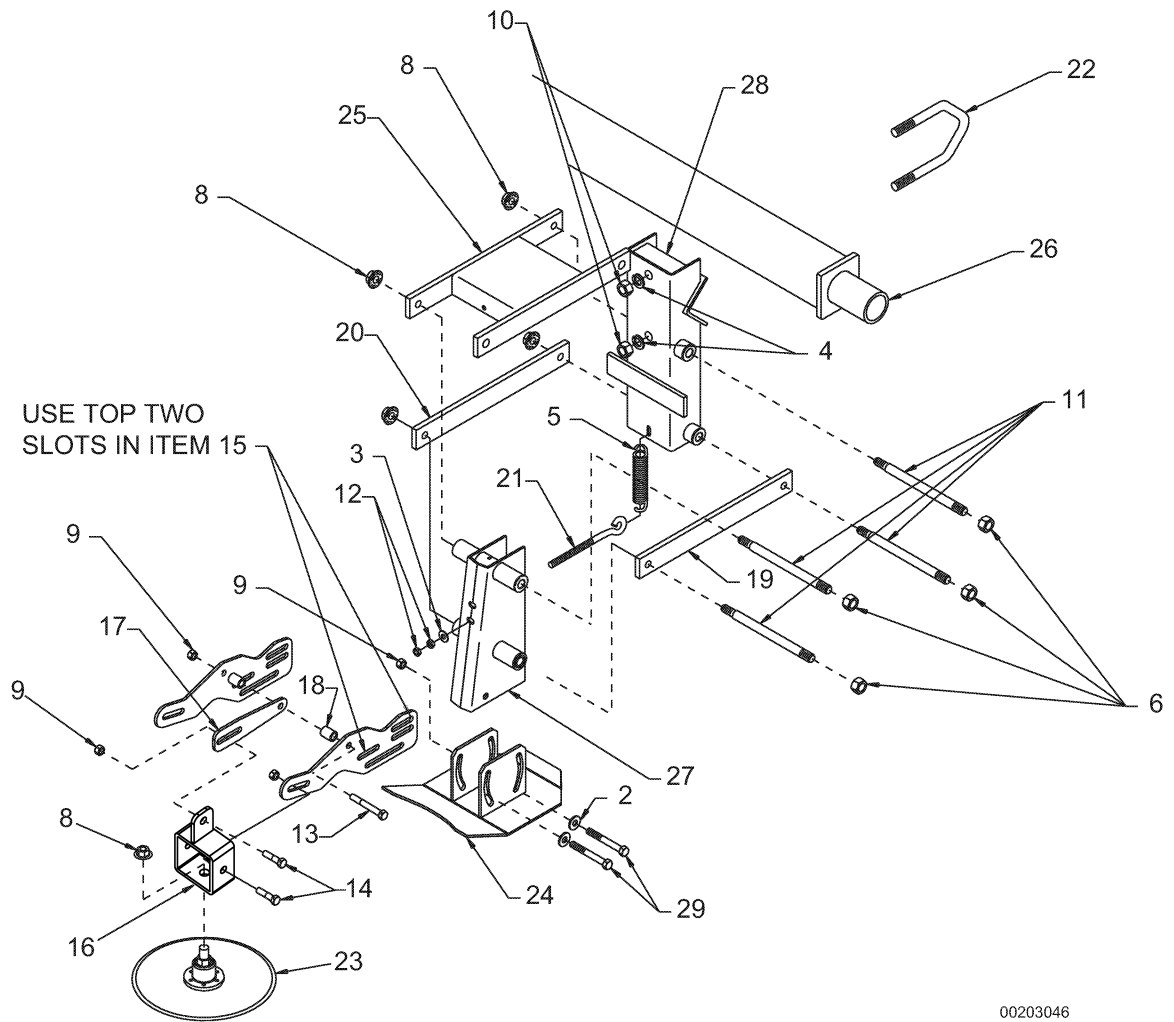
STABILIZER WHEEL COMPONENTS



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	905-1 5024	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
NS	500-2-0552	1	Strut Mount

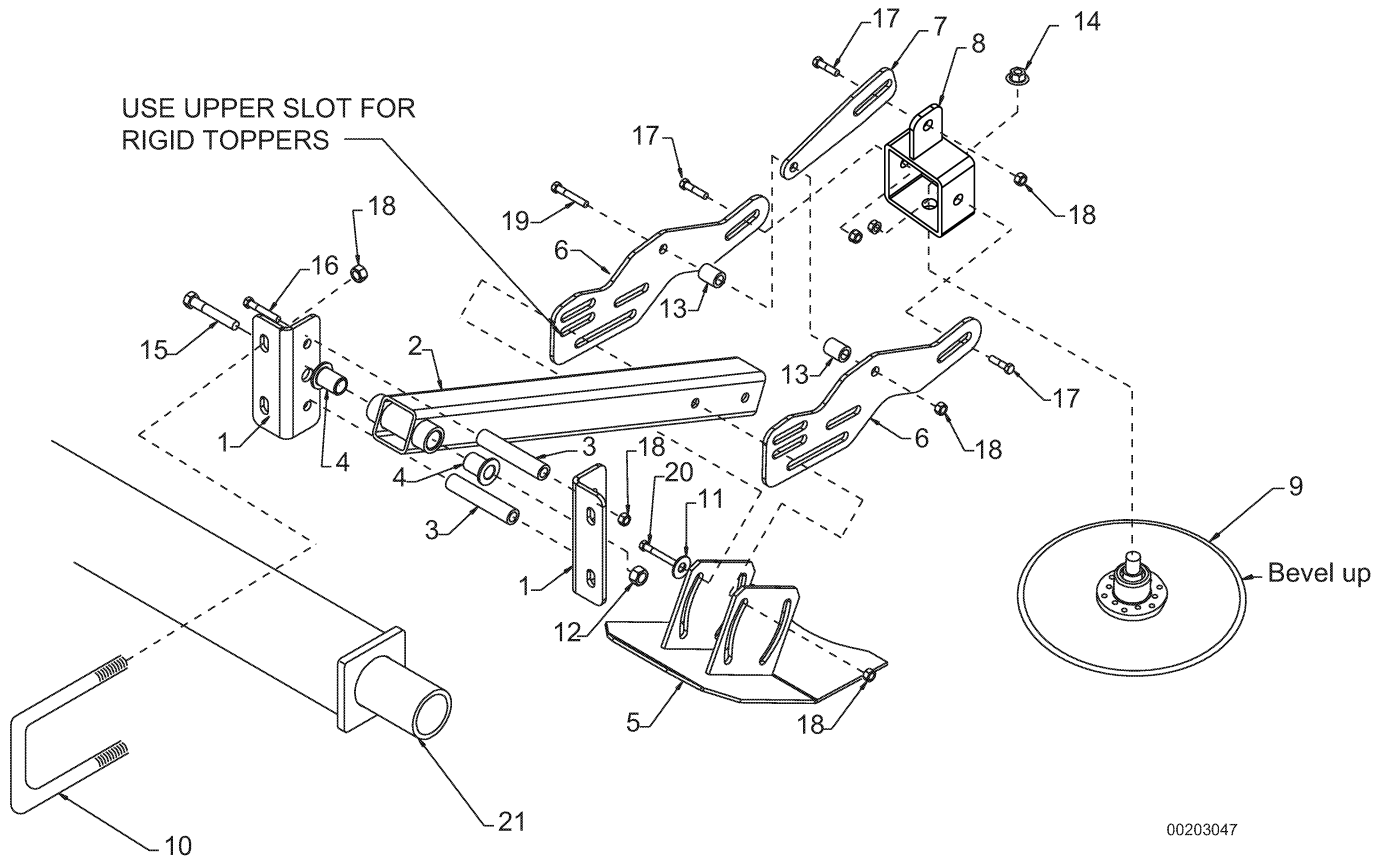
PARALLEL ARM ROTARY SCALPER



00203046

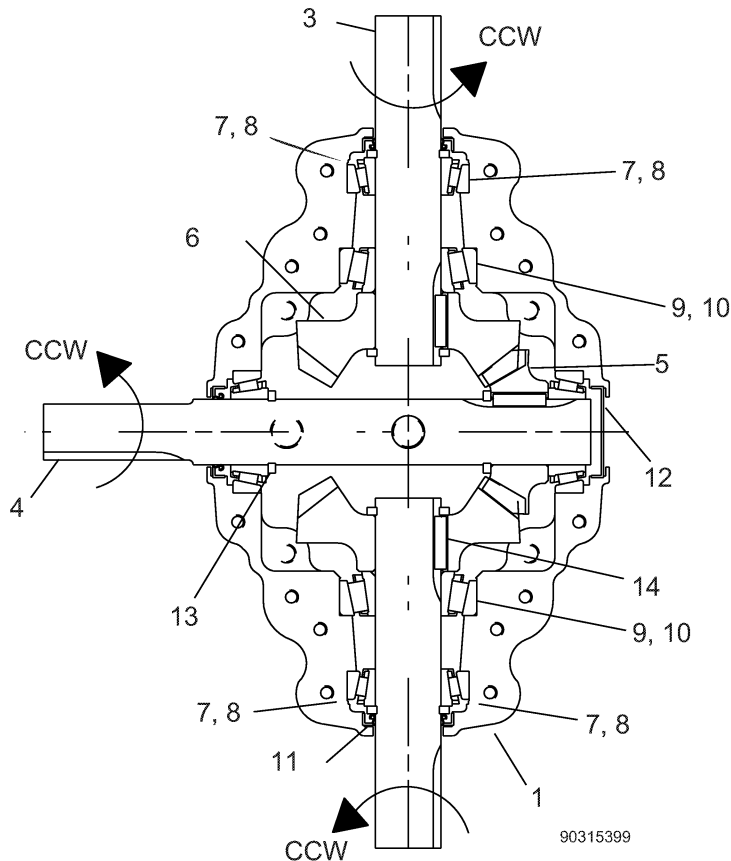
REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
2	900-11035	2	1/2 Flat Washer, ZP	20	500-3-0991	1	Bar, 5/8 Holes
3	900-11033	1	3/8 Flat Washer, ZP	21	500-3-0675	1	3/8 Eye Bolt x 8" Long
4	900-11017	2	3/4 Lock Washer	22	500-3-0635	1	A-Bolt, 3/4 x 4 x 4
5	400-3-0263		Spring, GM and Allowboom	23	500-2-0762	1	Hub Assy, Scalper
6	900-06510	4	3/4 NC Top Lock Nut, ZP		500-3-1582	1	Disc
8	900-06145	5	5/8 NC Spiralock Flange Nut		901-09219	1	Hub Assy
9	900-06143	6	1/2 NC Spiralock Flange Nut		901-09220	1	Hub Repair Kit
10	900-06015	2	3/4 NC Hex Nut ZP	24	500-2-0704	1	Scalper Shoe Weld
11	200-3-2631	4	Pin, Plated	25	500-2-0518	1	H-Weld
12	900-06005	2	3/8 NC Hex Nut, ZP	26	500-2-0408	1	Toolbar, Scalper (6-22)
13	900-01245	1	1/2 NC x 4 Hex Bolt, GR5	26	500-2-0409	1	Toolbar, Scalper (6-24)
14	900-01223	3	1/2 NC x 1-1/4 Hex Bolt	26	500-2-0448	1	Toolbar, Scalper (4-30)
15	500-3-1563	2	Plate, Bracket, Rear Top	26	500-2-0481	1	Toolbar, Scalper (4-22)
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
19	500-3-0992	1	Bar, 3/4 Holes				

LONG ARM ROTARY SCALPER



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
	901-09-1216	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	1	Tool Bar (6 - 22)

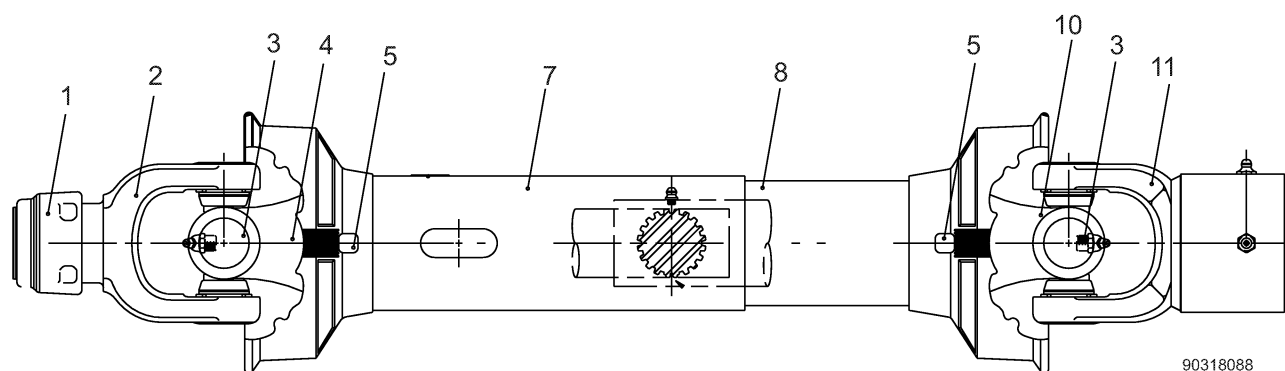
GEAR BOX (SUPERIOR)



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	903-15399	1	Gear Box, Complete, Keyed	

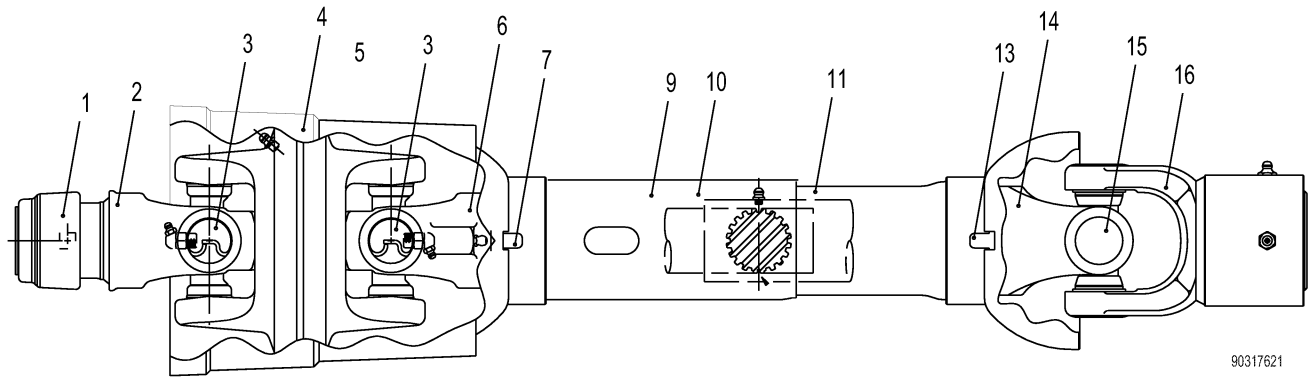
NS = Not Shown

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

NOTES

INDEX

General

Abbreviations	.65
Bolt Size Chart	.65
Bolt Torque Chart	.64
General Information	.1
Introduction	ii
Operator Sign-off Record	.9
Product Warranty	.66
Replacement Parts Warranty	.67
Table of Contents	.1

Operation

Additional Equipment	.26
Idler Pulley	.27
Rear Steer	.26
Stabilizer Struts	.26
Steel Flail Units	.7
Attaching Defoliator to Tractor	.14
Breaking in	.12
Choosing Correct Equipment	.13
Drawbar	.13
Hydraulic System	.13
PTO	.13
Field Operation	
Flail Patterns	.23
Hazard Area	.25
Operating the Defoliator	.24
Preparing for Operation	.22
Ground Speed	.22
Starting the Machine	.22
Stopping the Machine	.22
Speed vs. Weight ratio (Table 2)	.21
Transporting the Defoliator	.21
Turning	.24

Operation (continued)

Machine Settings	.16
Flail Height	.17
Flail Spacing	.17
Machine Leveling	.16
Scalper Settings (optional)	.19
Stabilizer Wheel Position	.18
Wheel Spacing	.18
Pre-Operation Check List	.12
Principal Components	.11
Removing Defoliator from Tractor	.15
Storage	.28
Trouble Shooting	.42

Parts Index	.43
-------------	-----

Safety

Hazard Area	.25
Operator Sign-off Record	.9
Pre-operation Check List	.12
Storage	.28
Transporting the Defoliator	.21

Service & Maintenance

Belt Replacement	.39
Belt Tension	.37
Changing Gearbox Oil	.33
Flail Replacement	.36
Flail Spacing	.35
Lubricants	.29
Lubrication Schedule	.30
Lubrication Service Record	.32
Scalpers	.40
Wheel Spacing	.34

Trouble Shooting	.42
------------------	-----

BOLT TORQUE CHART

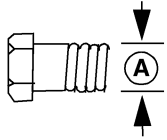
Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.

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

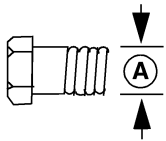


SAE Grade 5
(3 Radial Dashes)



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

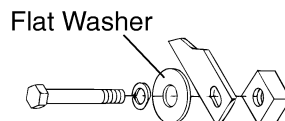
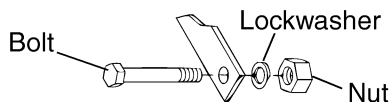
Metric Bolt Head
Identification



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

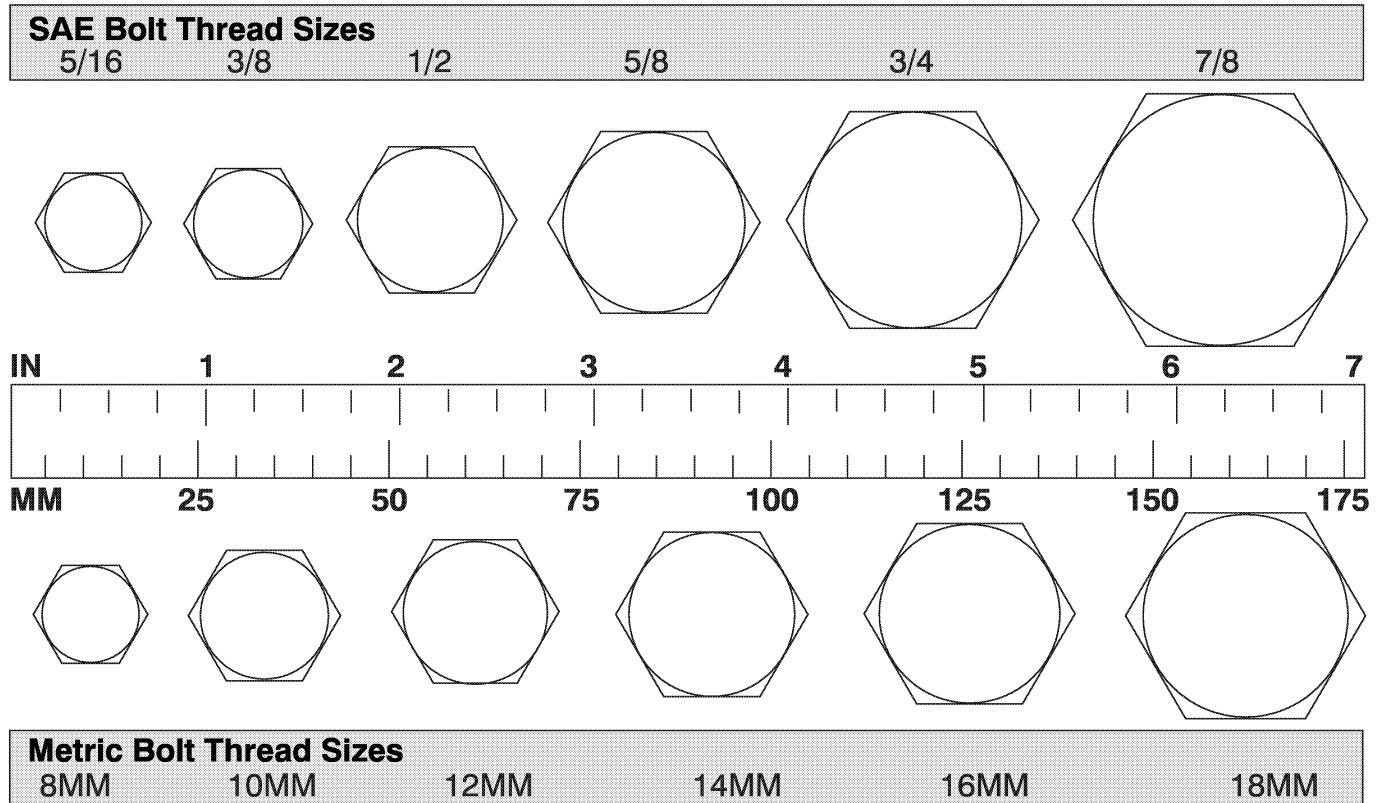
Typical Washer Installations



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
 ATF Automatic Transmission Fluid
 BSPP British Standard Pipe Parallel
 BSPTM British 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

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.

500-3-1155

**Alloway Equipment
Company**

4230 14th Ave. NW

Fargo, North Dakota 58102

701-356-4983

alloway STANDARD