

# FLAIL SHREDDER

Center Drive

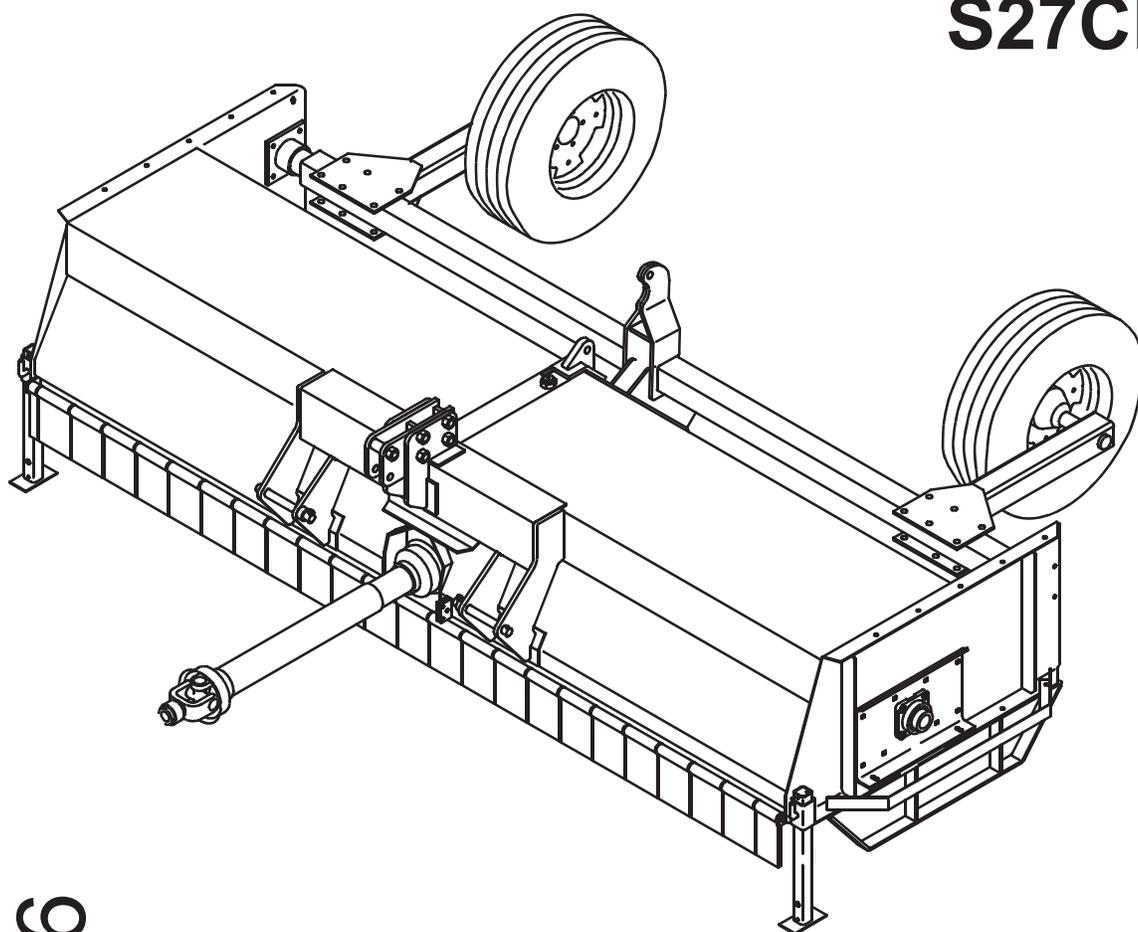
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MAN0506

(Rev 08/14/2023)

**WOODS**<sup>®</sup>

OPERATOR'S MANUAL

## TO THE DEALER:

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

**The dealer must complete the online Product Registration form at the Woods Dealer Website** which certifies that all Dealer Checklist items have been completed. Dealers can register all Woods product at dealer.WoodsEquipment.com under Product Registration.

**Failure to register the product does not diminish customer's warranty rights.**

## TO THE OWNER:

Read this manual before operating your Woods 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 adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your dealer. To obtain complete warranty details, visit [WoodsEquipment.com/warranty](http://WoodsEquipment.com/warranty). You may also request a hard copy by calling 1-800-319-6637 or mail your request to: Woods Equipment Company, Attn: Warranty Dept. 2606 South Illinois Route 2, Oregon, IL 61061. To locate your nearest dealer, check the Dealer Locator at [www.WoodsEquipment.com](http://www.WoodsEquipment.com), or in the United States and Canada call 1-800-319-6637.

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

Use only genuine Woods 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 **NOTICE** 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 is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



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



Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



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

**IMPORTANT  
or NOTICE**

Is used to address practices not related to physical injury.

**NOTE**

Indicates helpful information.

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# SPECIFICATIONS

Maximum Outside Body Width:

15'	.....	189 in. (4.9 m)
20'	.....	253 in. (6.4 m)
22'	.....	277 in. (7.0 m)
25'	.....	309 in. (7.8 m)
27'	.....	334 in. (8.4 m)

Cutting Height: ..... 3 - 18 in. (7.62 cm to 45.7 cm)

Width of Cut:

15'	.....	183 in. (4.6 m)
20'	.....	247 in. (6.2 m)
22'	.....	271 in. (6.8 m)
25'	.....	303 in. (7.6 m)
27'	.....	327 in. (8.3 m)

Knives:

	Cups	“L”	“L” Cut-Off
Number on 15'	84	164	4
Number on 20'	116	228	4
Number on 22'	128	252	4
Number on 25'	144	284	4
Number on 27'	156	308	4

Recommended Tire Size: ..... 9.5L - 15,6 ply rated

Tire Inflation Pressure: ..... 25 psi

Rotor: Speed ..... 1350 RPM dynamically balanced

Drive: PTO ..... 1000 RPM

Weight of Shredder (approximate):

15' w/ 2 casters*	.....	3600 lbs (1633 kg)
20' w/ 4 casters*	.....	4800 lbs (2177 kg)
22' w/ 4 casters*	.....	5100 lbs (2313 kg)
25' w/ 4 casters*	.....	5600 lbs (2540 kg)
27' w/ 4 casters*	.....	5900 lbs (2676 kg)

\* each caster assembly weighs approximately 214 lbs

**¡LEA EL INSTRUCTIVO!**  
 Si no lee Ingles, pida ayuda a alguien que si lo lee para que le traduzca las medidas de seguridad.

**This Operator's Manual should be regarded as part of the machine. Suppliers of both new and second-hand machines must make sure that this manual is provided with the machine.**

# IMPORTANT!

## BALANCE STATEMENT

Both of the Woods Center Drive Shredder flail tubes are balanced as rotor assemblies to meet or exceed factory standards before installation. After installation, the shredders are statistically inspected to check balance. These factory efforts allow the shredder to operate smoothly and be free of excessive vibration when delivered to the customer.

### WARNING

■ **The operator must be familiar with all safety rules and safety decals before installing and running the shredder. All personnel must be familiar with and stay out of the hazard area whenever the shredder is running. (See Figure 18, page 21).**

Smooth, acceptable vibration levels can be easily estimated in the field. After machine shutdown and coast down has been completed, place a quarter on a clean top panel of the shredder. At full rotor rpm (while maintaining all safety rules regarding safe distances from rotating equipment) observe the quarter. If the quarter stays still and does not bounce around, the operator can estimate that the shredder is free from excessive vibration. If the quarter jumps around during full rotor rpm, the shredder may be operating with excessive vibration where troubleshooting and maintenance are required (refer to the Troubleshooting section).

The Woods Center Drive Flail Shredder has been designed for maximum durability when shredding any type of crop. While operating in the field, many factors can affect and degrade shredder rotor balance and cause increased vibration levels.

- Operating too low to the ground or in frequent contact with the ground can cause the flail knives to wear unevenly. This can reduce their chopping effect and also increase vibration levels.
- Hitting large rocks or other foreign objects can damage knives and other rotor parts, causing excessive vibration.
- Over time, certain types of soil and crops can also lead to uneven knife wear and increased vibration levels.
- Once field operation has been started, it is the operator's responsibility to check and maintain shredder rotor balance.
- If knife replacement is required due to wear or damage, refer to REPLACING FLAILS, page 28.
- Throughout the life of the flail shredder, removing the flail tubes for replacement or re-balance may be necessary.
- If flail tube replacement is required due to wear or damage, refer to SERVICING ROTORS (FLAIL TUBES), page 29.
- Any re-balance should be done with all knives installed.
- Factory balanced repair rotors are available through your local Woods dealer.
- Consult with your local balance shop experts or contact Woods Technical Service for re-balance or replacement options.

Continued operation with excessive vibration can cause damage to and shorten component life, void product warranty, and affect personal safety. Checking and maintaining shredder rotor balance is the owner/operator's responsibility.

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## GENERAL INFORMATION

The purpose of this manual is to assist you in operating and maintaining your flail shredder. 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 directions. 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 and safety decals are available from your dealer. To locate your nearest dealer, check the Dealer Locator at [www.WoodsEquipment.com](http://www.WoodsEquipment.com), 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.
- 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**

- Use a suitable lifting device of sufficient capacity. Use adequate personnel to handle heavy components.
- 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 getting caught 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.
- When attaching a pull-type unit to the tractor drawbar, always use a high-strength drawbar pin. The drawbar pin must have a device that will lock it into position. Secure safety chain to attachment and tractor.
- 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 system in "locked up" position at all times.

# SAFETY RULES



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



- Connect PTO driveline directly to power unit PTO shaft. Never use adapter sleeves or adapter shafts. Adapters can cause driveline failures due to incorrect spline or incorrect operating length and can result in personal injury or death.
- Inspect rubber flaps and swing rod before each use. Replace if damaged or missing. Flaps must pivot and hang freely so there are no gaps. Do not put equipment into service until repaired.
- Remove accumulated debris from this equipment, 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.
- Inspect and clear area of stones, branches, or other hard objects that might be thrown, causing injury or damage.

## TRANSPORTATION

- 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 system 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, front tractor wheels could raise up resulting in loss of steering. The weight may be attained with 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.

## OPERATION

- Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.
- Keep bystanders away from equipment.
- Do not operate or transport equipment while under the influence of alcohol or drugs.
- Operate only in daylight or good artificial light.
- 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 system 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.
- 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.
- Leak down or failure of mechanical or hydraulic system can cause equipment to drop.

# SAFETY RULES



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



## MAINTENANCE

- Before dismounting power unit or performing any service or maintenance, follow these steps: disengage power to equipment, 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.
- Before performing any service or maintenance, lower equipment to ground or block securely, turn off engine, remove key, and disconnect driveline from tractor PTO.
- Before working underneath, read manual instructions, securely block up, and check stability. Secure blocking prevents equipment from dropping due to hydraulic leak down, hydraulic system failure, or mechanical component failure.
- Work not covered in **SERVICE & MAINTENANCE** 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.
- Use a suitable lifting device of sufficient capacity. Use adequate personnel to handle heavy components.
- Always wear relatively tight and belted clothing to avoid getting caught 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.
- 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.
- Make certain all movement of equipment components has stopped before approaching for service.
- 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.
- Do not handle knives with bare hands. Careless or improper handling may result in serious injury.
- Your dealer can supply genuine replacement knives. Substitute knives may not meet original equipment specifications and may be dangerous.
- 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 engine is stopped, power unit is properly secured, equipment and all components are lowered to the ground, and system pressure is released by operating all valve control levers.
- Leak down or failure of mechanical or hydraulic system can cause equipment to drop.

## STORAGE

- Block equipment securely for storage.
- Keep children, bystanders and animals away from the equipment and the storage area.
- Follow manual instructions for storage.

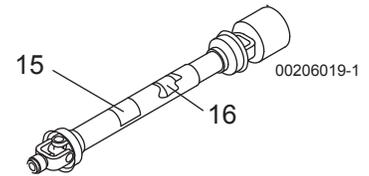
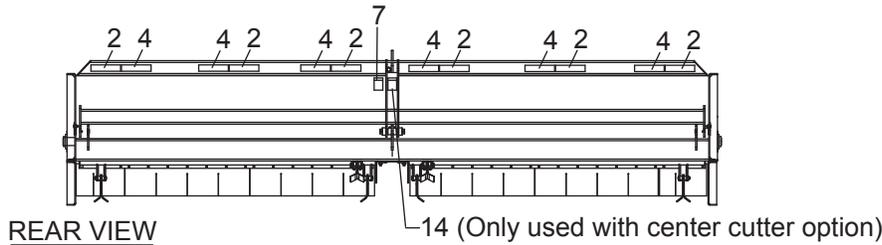
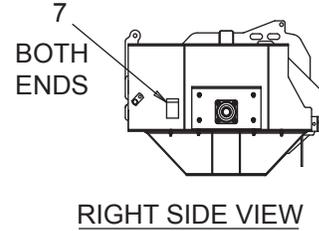
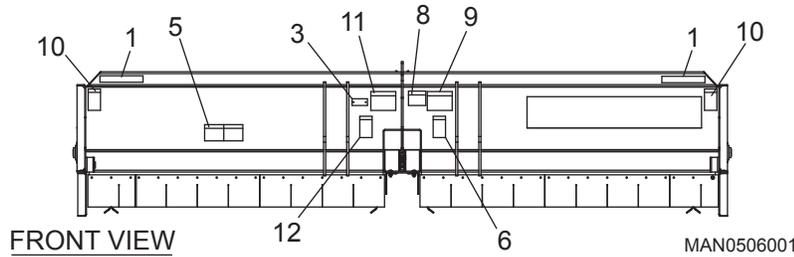
# SAFETY & INSTRUCTIONAL DECALS



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



**Replace Immediately If Damaged!**



- 1 - YELLOW REFLECTOR  
PN 20034004
- 2 - RED REFLECTOR  
PN 57123
- 4 - RED-ORANGE FLUORESCENT MATERIAL  
PN 20034034

### 3 - SERIAL NUMBER PLATE



### 5 - PN 50030977

CAUTION	PRECAUCION
<ol style="list-style-type: none"> <li>1. Read Operator's Manual before starting.</li> <li>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.</li> <li>3. Keep all guards and access doors closed and secured before operating.</li> <li>4. Keep hands, feet, hair, and clothing away from moving parts.</li> <li>5. Do not allow riders.</li> <li>6. Do not enter rotor area when engine is running.</li> <li>7. Never exceed 20 MPH when transporting.</li> <li>8. Use hazard flashers when transporting.</li> <li>9. Use drawbar pin with retainer and attach safety chain.</li> <li>10. Wear appropriate hearing protection for prolonged exposure to excessive noise.</li> <li>11. Review safety information periodically prior to use.</li> </ol>	<ol style="list-style-type: none"> <li>1. Lea el Manual del Operario antes de empezar.</li> <li>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 pizas móviles hayan parado antes de dar servicio, hacer ajustes, reparaciones, o de desatascar.</li> <li>3. Mantenga cerrados y asegurados todos los protectores y las compuertas antes de poner a funcionar la máquina.</li> <li>4. Mantenga retirados de las piezas móviles, las manos, los pies, el pelo, y la ropa.</li> <li>5. No permita que nadie vaya con usted en la máquina.</li> <li>6. No entre en el área del rotor mientras el motor está en marcha.</li> <li>7. Nunca exceda 32 km/h (20 MPH) al transportar.</li> <li>8. Use luces intermitentes de aviso cuando viaja con la máquina.</li> <li>9. Use el pasador de la barra de tiro con fiador y enganche la cadena de seguridad.</li> <li>10. Use un protector apropiado para los oídos cuando esté expuesto a ruido excesivo por un tiempo prolongado.</li> <li>11. Repase la información de seguridad periódicamente antes del uso.</li> </ol>

50030977-B

# SAFETY & INSTRUCTIONAL DECALS



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



**Replace Immediately If Damaged!**

6 - PN 50030978

**⚠ DANGER**  
**⚠ PELIGRO**

**ROTATING DRIVELINE HAZARD**

To prevent serious injury or death from rotating driveline:

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

**PELIGRO CON EL MOVIMIENTO ROTATIVO DEL EJE MOTRIZ**

Para evitar heridas graves o la muerte a causa de la rotación del eje motriz:

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

50030978-A

7 - PN 50030982

**⚠ 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

8 - PN 50530138

**NOTICE:**  
**THREE POINT MOUNTED UNITS**  
**LOAD SENSING ADJUSTMENT**

Many tractors are equipped with a load sensing feature on the 3 point hitch which can be adjusted to allow the 3 point shredder to "float" in the operating position. Adjust this feature on your tractor (if so equipped) such that the rear tires on shredder carry only minimal weight. This load sensing adjustment is critical if your fields are uneven or if drainage ditches are to be crossed with shredder operating.

10 - PN 50530314

**⚠ WARNING**

**⚠ ADVERTENCIA**

**THROWN OBJECT HAZARD**

To prevent serious injury or death:

1. Stay away from the front of machine when operating.
2. Keep others away.
3. Keep deflectors in good condition when operating.

**PELIGRO DE OBJETOS ARROJADOS POR LA MAQUINA**

Para evitar heridas graves o la muerte:

1. Manténgase retirado del frente de la máquina cuando esta está en marcha.
2. No permita que otra gente se acerque.
3. Mantenga los deflectores en buenas condiciones cuando utilice la máquina.

505-3-0314

9 - PN 50530225

**NOTICE**  
**INSTALLING FLAIL SHREDDER P.T.O. – 3 POINT UNITS**

After connecting the shredder to the tractor, the P.T.O. needs to be checked for proper length. This can be done by raising and lowering the machine. Never allow the P.T.O. shaft to telescope completely together or damage may occur. To shorten the P.T.O. shaft, cut off male spline and shielding equal amounts. **NOTE:** Cut off male end only, never cut female end. Cut only enough splined shaft and shielding off to prevent bottoming out. Never cut more than 6 inches maximum off male end. Cutting of male half 1 inch shortens both minimum and maximum lengths by 1 inch.

# SAFETY & INSTRUCTIONAL DECALS



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



**Replace Immediately If Damaged!**

11 - PN 50530707

**NOTICE**

CLUTCH RUN-IN

NECESSARY FOR NEW CLUTCHES AND ANY CLUTCH NOT OPERATED FOR 30 DAYS.

1. LOOSEN 6 SOCKET HEAD CAP SCREWS WITH 1/4" ALLEN WRENCH. BE CAREFUL TO TURN EACH SCREW 1/2 TURN AT A TIME UNTIL ALL SCREWS ARE LOOSE.
2. CONNECT DRIVELINE TO TRACTOR PTO.
3. START TRACTOR AND ENGAGE PTO FOR A FEW MINUTES OR UNTIL THE CLUTCH VISIBLY SMOKES. THEN DISENGAGE PTO AND STOP TRACTOR.
4. DISCONNECT PTO DRIVELINE.
5. TIGHTEN 6 CAP SCREWS 1/2 TURN AT A TIME UNTIL ALL SCREWS ARE TIGHT. NEXT, LOOSEN ALL SCREWS 1/2 TURN EACH FOR PROPER ADJUSTMENT OF PLATES.
6. GREASE OVERRUNNING CLUTCH ASSEMBLY.
7. CLUTCH IS NOW READY FOR USE!

12 - PN 50530728

**ATTENTION !!**

**Slip clutch maintenance is a must to protect the driveline and other major components of your machine.**

It is important that the clutches slip when an obstacle or load heavier than the clutch setting is encountered. Before using your **New** shredder for the first time and before each shredding season, the clutch must be slipped to insure that the clutch has not become frozen. Read your instruction in your parts manual for the proper method to follow to slip your clutches.

**NOTE: failure to follow the instructions listed in your manual may result in immediate breakage of some of your drive components on your shredder.**

505-3-0728

14 - PN 50530315

**⚠ WARNING**

**⚠ ADVERTENCIA**

**HIGH-PRESSURE FLUID HAZARD**

To prevent serious injury or death:

1. Relieve pressure on system before repairing, adjusting, or disconnecting.
2. Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
3. Keep all components in good repair.

**PELIGRO DE FLUIDO BAJO ALTA PRESION**

Para evitar heridas graves o la muerte:

1. Alivie la presión del sistema antes de hacer reparaciones, ajustes o desconexiones.
2. Use protección apropiada en las manos y en los ojos, cuando revise para ver si hay fugas. Utilice una tabla o un cartón en vez de las manos.
3. Mantenga todos los componentes en buen estado.

50530315-A

15 - PN 18864

**⚠ DANGER**

**ROTATING DRIVELINE CONTACT CAN CAUSE DEATH**

**KEEP AWAY!**

**DO NOT OPERATE WITHOUT -**

- All driveline guards, tractor and equipment shields in place.
- Drivelines securely attached at both ends.
- Driveline guards that turn freely on driveline.
- Read the operator's manual.
- Do not use PTO adapters.

18864

16 - PN 33347

**⚠ DANGER**

**GUARD MISSING. DO NOT OPERATE.**

**⚠ DANGER**

**GUARD MISSING. DO NOT OPERATE.**

33347

**⚠ DANGER**

**BE CAREFUL!**

Keep safety decals clean and visible.

Use a clean, damp cloth to clean safety decals.

Avoid spraying too close to decals when using a pressure washer; high-pressure water can enter through very small scratches or under edges of decals causing them to peel or come off.

Replacement safety decals can be ordered free from your Woods dealer. To locate your nearest dealer, check the Dealer Locator at [www.WoodsEquipment.com](http://www.WoodsEquipment.com), or in the United States and Canada call 1-800-319-6637.



# OPERATION

The Woods Flail Shredder is designed to pick up and shred crop and plant residue left in the field. Rotational power to the flails is provided by the tractor PTO.

Be familiar with the flail shredder before starting.

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

## WARNING

- **Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals and safety decals are available from your dealer. To locate your nearest dealer, check the Dealer Locator at [www.WoodsEquipment.com](http://www.WoodsEquipment.com), 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.**
- **Never allow riders on power unit or attachment.**
- **Before dismounting power unit or performing any service or maintenance, follow these steps: disengage power to equipment, 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.**
- **Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.**
- **Keep bystanders away from equipment.**
- **Operate tractor PTO at the rpm speed stated in “Specifications” section.**

## CAUTION

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

- **Always wear relatively tight and belted clothing to avoid getting caught 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.**

## PRINCIPAL COMPONENTS

The Woods Flail Shredder consists of a large rotating tube with swinging steel flails attached. The flails pick up or strike crop residue or trash and shred it. Rotational power to the drum is provided by the tractor PTO through a gearbox in the center of the machine.

For removing the center strip of crop residue, an optional hydraulically driven blade can be installed under the cover in the center of the machine.

The flail shredder is designed to be used as a pull-type, semi-mounted, or 3-point mounted machine.

## BREAK-IN OF THE FLAIL SHREDDER

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

### **NOTICE**

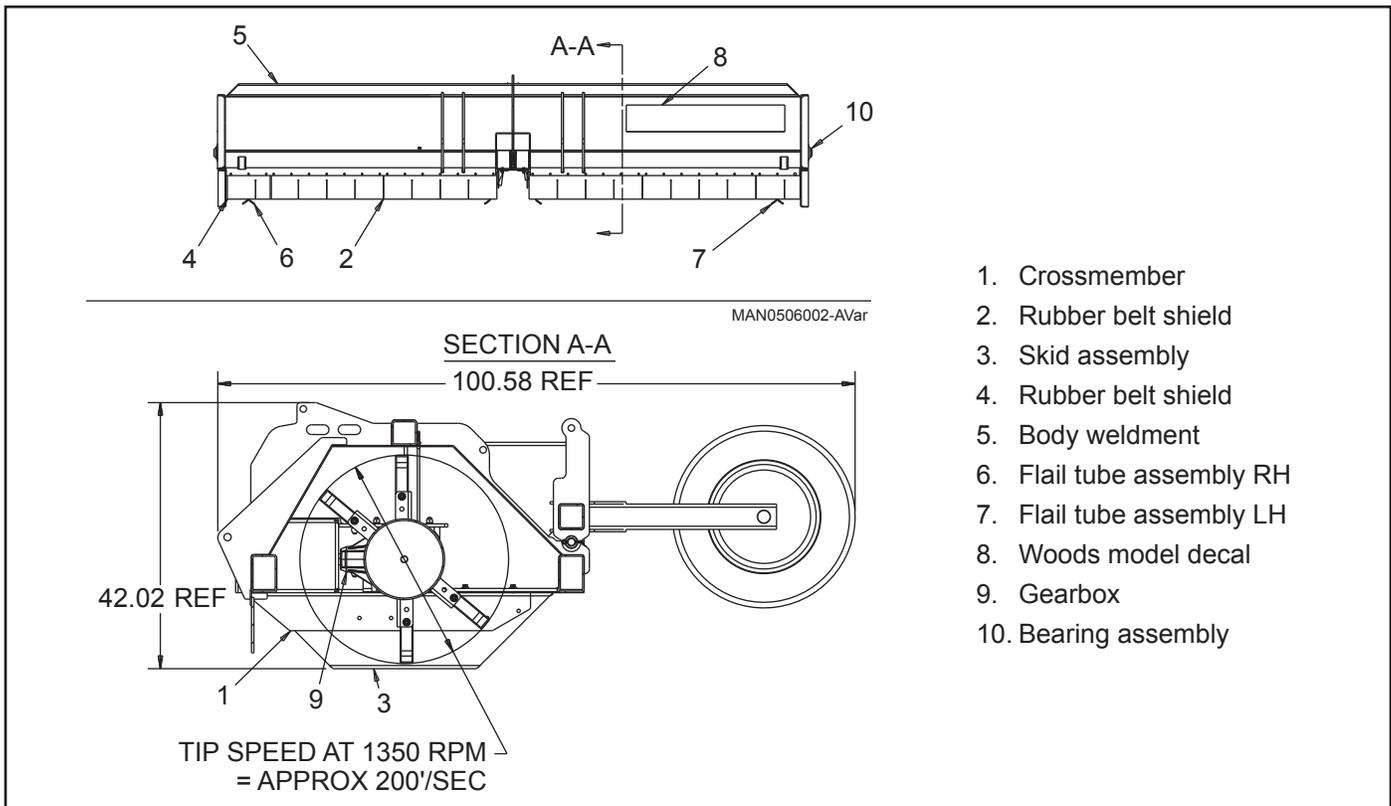
- **Before operating the unit in the field, run the PTO clutch. See Weasler Modular Friction Clutch (24K), page 31.**

### **After operating for 1/2 hour**

1. Check all nuts, bolts, and other fasteners. Tighten to specifications given in the Bolt Torque Chart, page 64.
2. Tighten wheel bolts to specifications given in the Bolt Torque Chart, page 64.
3. Check that the flails are in good condition and swing freely.
4. Check oil level in the gearbox. Add oil if needed.
5. Check that the PTO driveline shield turns freely.
6. Lubricate all grease points.

### **After operating for 5 to 10 hours**

1. Repeat Steps 1 through 5 above.
2. Follow regular service schedule as outlined in Service & Maintenance, page 23.



1. Crossmember
2. Rubber belt shield
3. Skid assembly
4. Rubber belt shield
5. Body weldment
6. Flail tube assembly RH
7. Flail tube assembly LH
8. Woods model decal
9. Gearbox
10. Bearing assembly

**Figure 1.** Flail Shredder Principal Components

## PRE-OPERATION CHECKLIST

(OWNER'S RESPONSIBILITY)

### **NOTICE**

- This Pre-Operation Checklist is provided for the operator. It is important to follow for both personal safety and maintenance of the flail shredder.

- \_\_\_\_\_ Check all lubrication points and grease as instructed in Lubrication Service Record, page 26.
- \_\_\_\_\_ Use only a tractor of adequate power and weight to pull the unit. (See chart below.)
- \_\_\_\_\_ Check that the unit is properly attached to the tractor. On pull-type unit, be sure there is a mechanical retainer through the drawbar pin and the safety chain is installed. On 3-point hitch units, be sure retainers are used on the mounting pins.
- \_\_\_\_\_ 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. Inflate to specified level.
- \_\_\_\_\_ Check flails. Inspect for damage or breakage. Make sure they swing freely on their mount. Repair or replace as required.
- \_\_\_\_\_ Check condition of cutter blade (if so equipped).

\_\_\_\_\_ Inspect all hydraulic lines, hoses, couplers, and fittings. Tighten, repair, or replace any leaking or damaged components.

\_\_\_\_\_ Install and secure all guards, doors, and covers.

\_\_\_\_\_ Check PTO clutch operation (see . Weasler Modular Friction Clutch (24K), page 31).

## CHOOSING THE CORRECT TRACTOR

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

### **1. Horsepower**

Use Table 1 on page 15 for selecting the tractor horsepower class appropriate for your unit's width.

Increase the horsepower level by 25 percent when operating in hilly, soft, or wet conditions.

### **2. Tractor Weight**

By following recommendations for tractor horsepower, the tractor will have sufficient weight to provide stability for unit during field operation or when transporting.

When using a 3-point mounted shredder, we recommend that each tractor be equipped with a full complement of suitcase weights on the tractor front (see Figure 2 for example). This will provide the required front weight for turning and extra traction if equipped with front wheel assist.

**Table 1.** Tractor Horsepower (6-8) vs. Unit Width

Width	Minimum Horsepower
15	90
20	120
22	132
25	150
27	162



**Figure 2.** Tractor Front Weight

### 3. 3-Point Hitch

The 3-point hitch models require that the tractor be equipped with a Category II or Category III 3-point hitch. If the hitch can be converted from one to the other, use a Category III to provide a wider stance and more stability.

Use the upper top link hole for Category III and the lower hole for Category II as shown in Figure 3.

For easier attachment, use a quick hitch. If not using a quick hitch, use optional hitch extension.

### 4. Hydraulic Requirements when Using Center Cutter Options

The tractor hydraulic system must be capable of 8 gpm (30 lpm) at 1500 psi (10,335 kPa). Either closed-centered or open-centered systems can be used.

### 5. Load Sensing Hydraulics (3-Point Models Only)

Many newer tractors are equipped with “load sensing” hydraulics. The operator is responsible for setting the tractor hydraulic system to provide “float” on the 3-point hitch. Refer to the tractor manual for specific instructions.

The “float” feature will allow the unit to follow the ground contours during operation. This applies to 3-point mounted machines only.

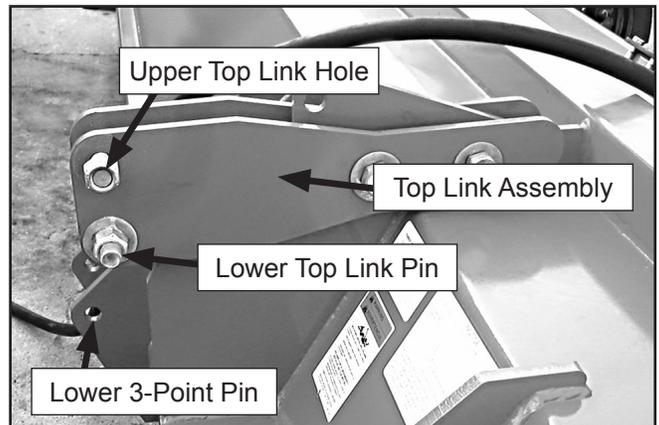
### 6. Drawbar (Pull-Type Models Only)

The tractor drawbar must be set to provide 16" (406 mm) on 1-3/8 - 21 or 20" (508 mm) 1-3/4 - 20 between the end of the PTO shaft and the center of the drawbar pin for all 1000 rpm PTO. See Figure 4. This dimension will provide the required clearance for the CV (Constant Velocity) joint on the front of the driveline.

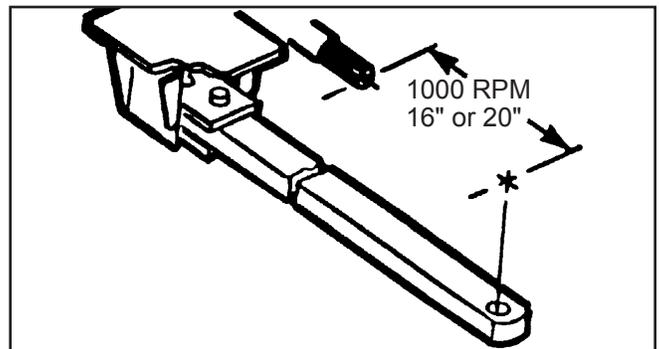
## NOTICE

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

**NOTE:** On pull-type models, do not cut driveline.



**Figure 3.** 3-Point Hitch Attachment



**Figure 4.** Drawbar Dimension

### PTO Driveline Length

#### (3-Point & 2-Point Models Only)

The unit is equipped with a PTO driveline long enough to fit any tractor and 3-point linkage system.

The operator is responsible for measuring the dimensions of the driveline through its working range. These dimensions will indicate if the driveline requires shorting to operate on the particular tractor/unit attachment system. The operator must check dimensions before using the unit for the first time and each time a different tractor is used with the unit.

Use the following procedure when determining driveline dimension:

## ⚠ WARNING

- **Keep bystanders away from equipment.**
1. Clear the area of all bystanders.
  2. Attach the 3-point hitch to the unit but not the PTO driveline.
  3. Raise the unit until the tractor PTO and gearbox shafts are the same height.
  4. Measure the dimension between the shaft grooves on the tractor and implement ends. If this dimension is less than 34.81 inches, the shaft will require shortening.
  5. Move the unit to its highest and lowest working position and measure this dimension again. [The unit's shaft can telescope (see Figure 6) before it has been shortened.]
  6. If required, shorten the shaft to prevent bottoming out during use. **NOTE:** An extra inch of compression space in the shaft can eliminate bottoming out during use. Measure to make sure.
  7. Use an abrasive wheel power saw to cut the male end of the shaft. Cut the same amount from both the splined shaft and the safety shield. See Figure 5. Use a file to remove any burrs from the cut end.

## NOTICE

- **Cut only the male end. Never cut the female end.**
8. Never cut more than 9 inches from the male end. Cutting 1 inch from the male end shortens both the minimum and maximum lengths by 1 inch.

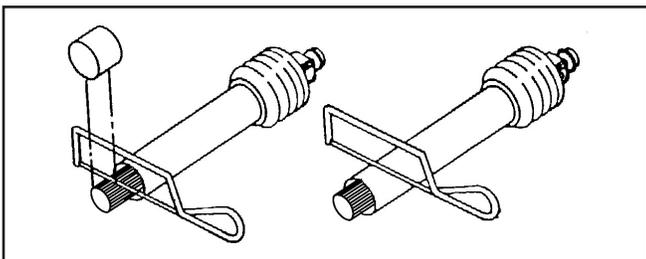


Figure 5. Cutting the Driveline Shaft

## ATTACHING SHREDDER TO TRACTOR

### ⚠ WARNING

- **Keep bystanders away from equipment.**
- **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.**

### ⚠ CAUTION

- **Do not allow anyone to stand between tractor and unit when backing up to the unit.**
1. Place unit on a level, dry area free of debris and other foreign object.
  2. Clear the area of bystanders, especially children.
  3. Provide enough clearance to back the tractor safely into the unit.

### With Quick Hitch Attachment:

4. Set the height of the 3-point hitch so that quick hitch claws are lower than the mounting pins.
5. Make sure 3-point hitch is set in the non-sway position. See tractor manual for details.
6. Align the claws under the lower and upper mast mounting pins while backing up.

**NOTE:** For a Category II hitch, use the bottom upper mast hole. For a Category III hitch, use the top upper mast hole.

7. When the claws are under the pins, slowly raise the 3-point hitch. Make sure each mounting pin seats in its respective claw.
8. Release the claw retainer locks to secure the mounting pins in the claws.
9. Check the top link frame. It should be free to slide in its mounting slots. This movement allows the unit to follow the ground contour when cresting a hill or going through a depression.

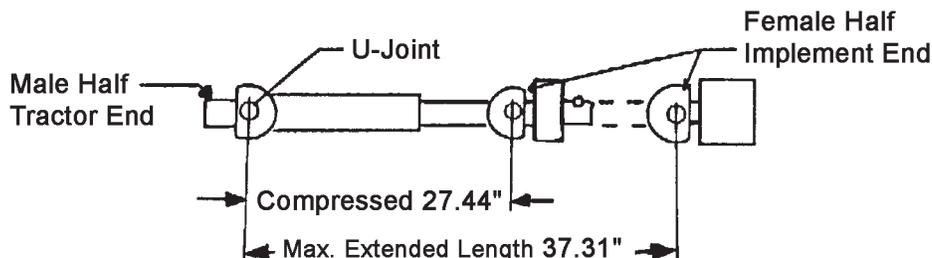


Figure 6. Driveline Dimension

### Without Quick Hitch Attachment:

1. Back tractor lower 3-point arms between lower mast plates and align with lower 3-point hole.
2. Place 1-3/4 OD spacer through 3-point arm pivot (both sides).
3. Push tractor's 3-point arm to the inside and slide a 1-7/16 OD spacer between to take up the empty space. Secure with lower 3-point hitch pin assembly, 1-3/4 OD spacer, and 7/16 x 2 klik pin.
4. Repeat steps 5 and 6 for other side.
5. Lower the tractor's top link arm and secure in top hole of upper mast assembly using spacer, hex bolt, and lock nut. (See illustration and parts list, page 46 - 47.)

### Pull-Type Model:

1. Use the ratchet (see Figure 7) on top of the hitch to set the hitch height.
2. Check and set the drawbar dimension.
3. Back the tractor up to the hitch.
4. Use a hardened drawbar pin that provides for a mechanical retainer, such as a Klik pin.
5. Attach safety chain from hammer strap around the drawbar or cage to prevent unexpected separation. Provide sufficient slack for turning.
6. Use the ratchet to transfer the unit's weight to the drawbar.
7. Make sure the drawbar is pinned in its center position.

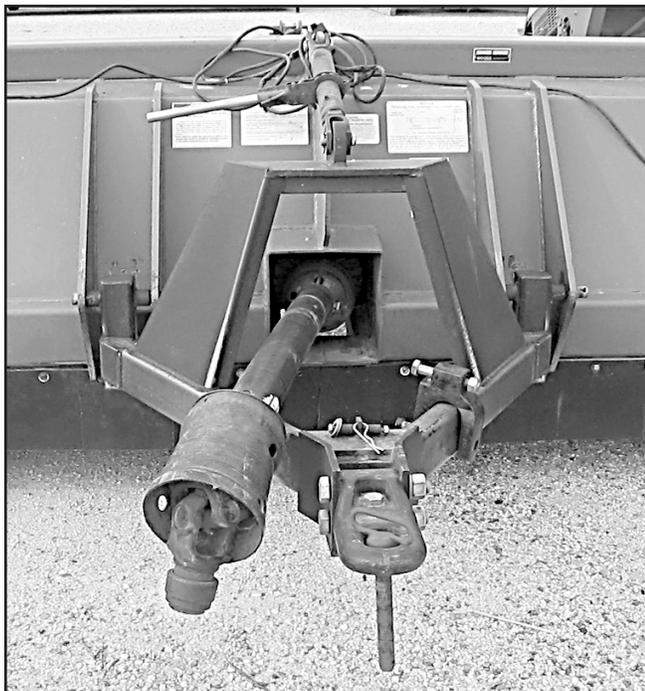


Figure 7. Attaching to Pull-Type Model

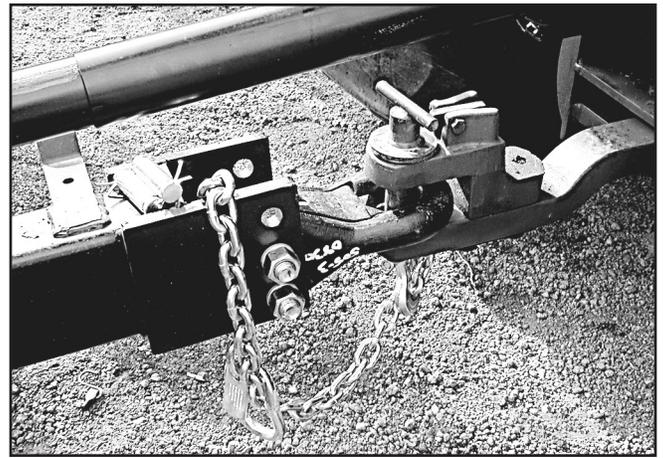


Figure 8. Drawbar & Safety Chain

### Attach PTO Driveline

1. Make sure the driveline telescopes easily and shields rotate freely.

### NOTICE

- The drawbar may need repositioning to provide clearance for the driveline.
2. 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. Make sure the yoke is locked into position. See Figure 9.

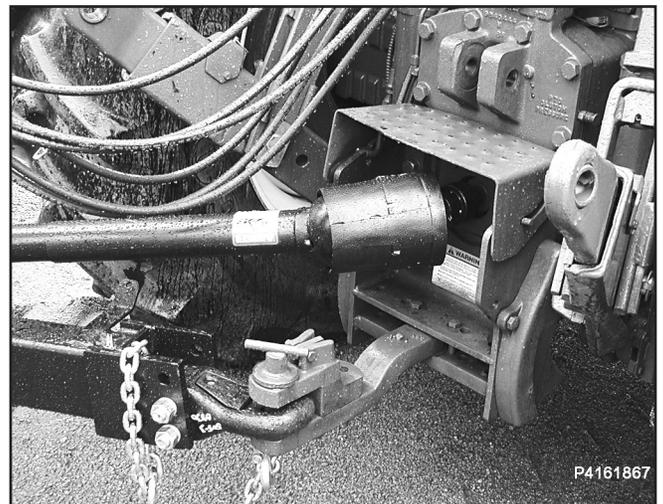


Figure 9. Locking Collar

### Attach Hydraulics (Center Cutter Option)

1. Use a clean cloth to clean hose ends and area around the couplers on the tractor.
2. Insert the hose male ends into the tractor couplers. Make sure hoses lock in place.
3. Route hoses along or over the hitch and secure in position with clips, tape, or plastic ties. Provide enough slack for turning and lifting.

## Raise Stands

1. Use hitch ratchets or 3-point hitch to raise the front of the machine.
2. Unpin front frame stands. Raise and pin in their upper position. See Figure 10.

## REMOVING SHREDDER FROM TRACTOR

Reverse the above procedure (Steps 1-17) when removing unit from the tractor.



Figure 10. Parking Stand

## FIELD OPERATION

The Woods Flail Shredder 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 CHECKLIST, page 14, and Attaching Shredder to Tractor, page 16.

### **⚠ WARNING**

- **Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals and safety decals are available from your dealer. To locate your nearest dealer, check the Dealer Locator at [www.WoodsEquipment.com](http://www.WoodsEquipment.com), 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.**
- **Before dismounting power unit or performing any service or maintenance, follow these steps: disengage power to equipment, 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.**
- **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.**
- **Keep bystanders away from equipment.**
- **Operate tractor PTO at the rpm speed stated in "Specifications" section.**

### **⚠ CAUTION**

- **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.**
- **Always comply with all state and local lighting and marking requirements.**
- **Always wear relatively tight and belted clothing to avoid getting caught 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.**

## PREPARING FOR OPERATION

1. Pull into the field and position the unit in a level area.
2. Lower into operating position.
3. **3-Point hitch models:** Set the 3-point so the quick hitch is vertical and the floating upper mast is forward.

## Flail Height

Set the unit to give a flail height of at least 3 to 6 inches (75 to 150 mm) above the ground. This will minimize the amount of stones and dirt picked up by the flails under all operating conditions. (See Balance Statement, page 5.)

**NOTE:** To avoid unnecessary wear on knives and related parts, never set the unit lower than the recommended setting. (See Balance Statement, page 5.)



**Figure 11.** 3-Point Hitch Models

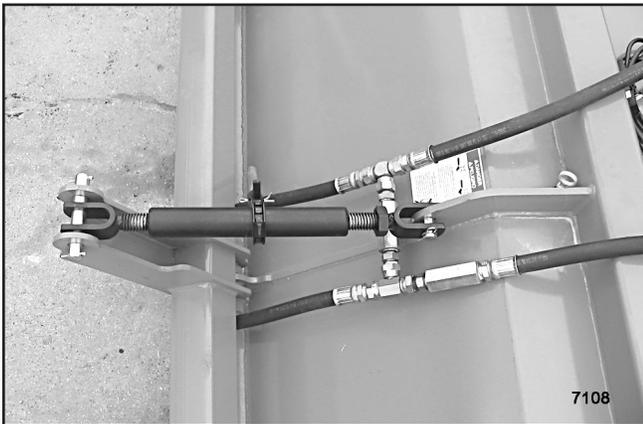
## **SET OPERATING HEIGHT**

### **3-Point Hitch Models**

Use the ratchet on the rockshaft mount to set the unit height.

### **Pull-Type Models**

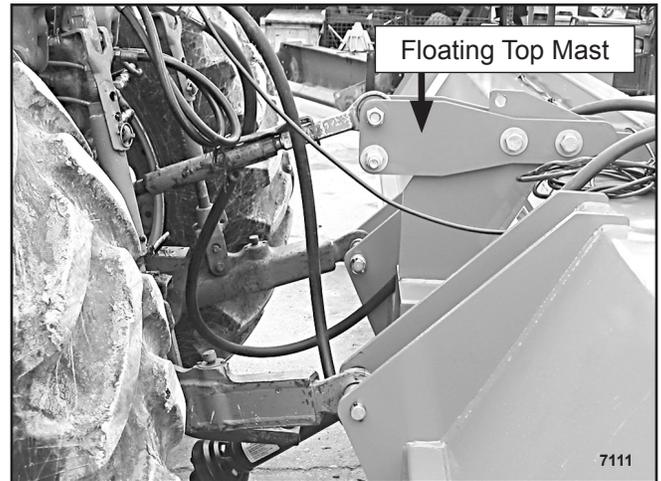
Use the ratchets or cylinders on the hitch and rockshaft mount to set the unit height.



**Figure 12.** Pull-Type Models (Ratchet)

### **3-Point & 2-Point Hitch Models**

1. Set lower 3-point arms in the free-float position.
2. Set the hitch in the non-swing position.
3. Set the hydraulic system to allow the 3-point to float. Refer to tractor manual for instructions.
4. 3-Point models only: Be sure the floating mast is free to slide in its mounting frame to allow the machine to follow ground contours. Refer to Figure 13.



**Figure 13.** Free-Float Position

## **FLAIL KNIVES**

The shredder is factory equipped with “L” or cup type flails. The two types are interchangeable.

### **“L” Flails**

“L” flails (Figure 15) work best when trash or crop residue is standing.

### **Cup Flails**

Cup flails (Figure 16) can pick up material from the ground and work best in matted trash conditions.

The standard cup flail is 8-1/2 inches (216 mm) long and is used for most applications. Optional 6-3/16 inch and 7-1/2 inch (157 mm and 191 mm) flails are available to match the tip position to ground contour.

Attach optional cup flails as follows, making sure that knives at 180° match (see Figure 14) (see Balance Statement, page 5):

1. Leave standard flails located between the rows.
2. Remove others and install shorter flails to follow ground contour. Be sure to mount the same size flails on opposite sides of the tube. Measure the row spacing and flail position carefully to minimize ground contact. See page 34 and page 35.

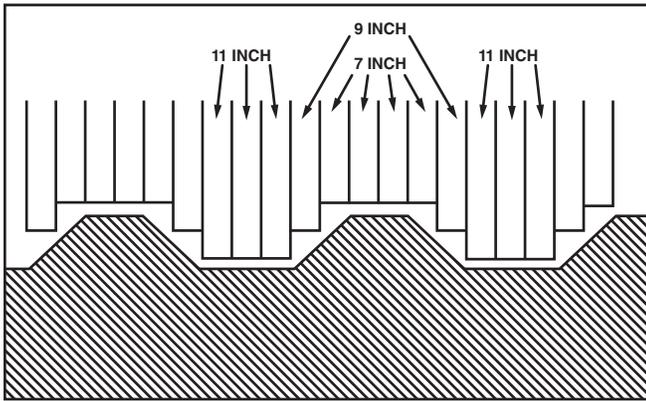


Figure 14. Optional Flail Contour



Figure 15. "L" Flails

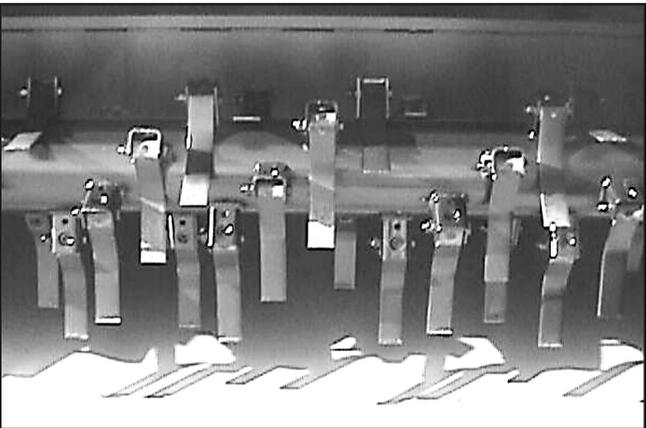


Figure 16. Cup Flails

### Setting Flail Height

1. Be sure wheels are set to follow in the center of furrow row. Set flails 3 to 6 inches (75 to 150 mm) above the ground. (See Balance Statement, page 5.)
2. Align the unit with the working area on or between rows on flat farming.
3. **3-Point Models:** Set the 3-point hitch so the wheels carry only a small portion of the unit's weight and act more as stabilizing wheels. See tractor manual for setting hitch.

### Setting Outer Trailing Wheels (Casters & Struts)

Normally, wheels are set to track in the row centers, between the raised seed beds. Tire position will determine flail height, but depth of furrow is also a factor in setting flail height. In some conditions the furrow between the seed beds is deeper on the ends, where irrigation waters enter the field. As furrows change depth, flail height will change.

To compensate for the depth change, move the trailing wheels against the side of the outer seed bed (see Figure 17). The wheels will then tend to climb up the side of the seed bed and prevent the flails from hitting the top of the bed.

Set the flail height after the wheels have been moved against the seed bed.

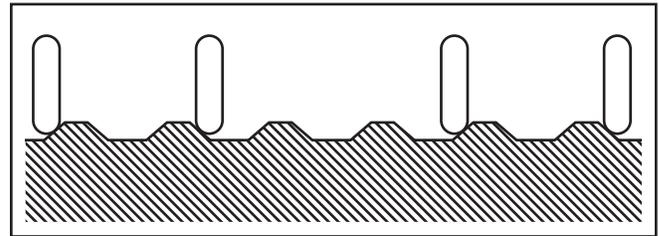


Figure 17. Wheel Position

### STARTING THE TRACTOR

1. Run tractor engine at low idle.
2. Slowly engage PTO control to start the shredder.
3. Slowly bring tractor engine to rated PTO speed. Never exceed rated speed.

### STOPPING THE TRACTOR

#### **! WARNING**

- Before dismantling power unit or performing any service or maintenance, follow these steps: disengage power to equipment, 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.
1. Slowly decrease engine speed to low idle.
  2. Disengage center cutter's hydraulic system (if so equipped). Never approach unit until the blade has stopped turning.
  3. Slowly disengage PTO clutch. The overrunning clutch will allow the shredder to freewheel down.
  4. Restart the unit only after the drums quit turning. The PTO will not need to be disengaged to lift the unit on the ends or while turning.

## HAZARD AREA

### WARNING

- **Make certain all movement of equipment 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.

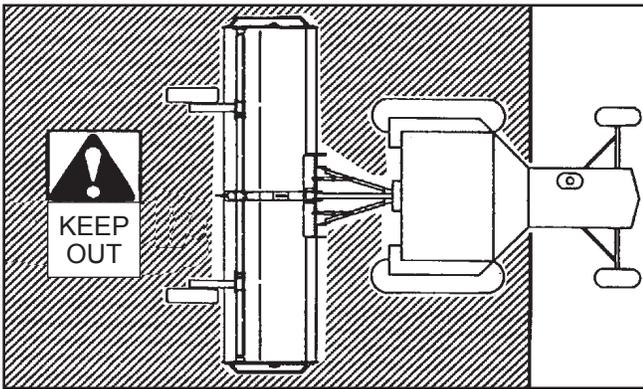


Figure 18. Hazard Area

## GROUND SPEED

Travel speed can vary between 3 and 8 mph (5 and 13 kmph) depending on the bulk of residue and terrain conditions. The operator is responsible for noting the condition of the work, setting the speed to obtain a quality shredding job, and maintaining control of the unit.

Speed may be increased if shredding quality is good.

Decrease speed if trash is left standing or if some is not picked up.

## TURNING

### 3-Point Mounted Units:

Always raise the unit slightly to lift rear wheels off the ground before turning. This will eliminate side loads on the wheel assembly, unless unit is equipped with caster wheels.

### Pull-Type Units:

The front universal is equipped with a CV (Constant Velocity) joint to allow for turning. Although the CV joint allows for sharper turns than a regular driveline, it does have some limitations. Refer to Figure 19.

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.

## NOTICE

- **Disengage PTO when making sharp turns.**

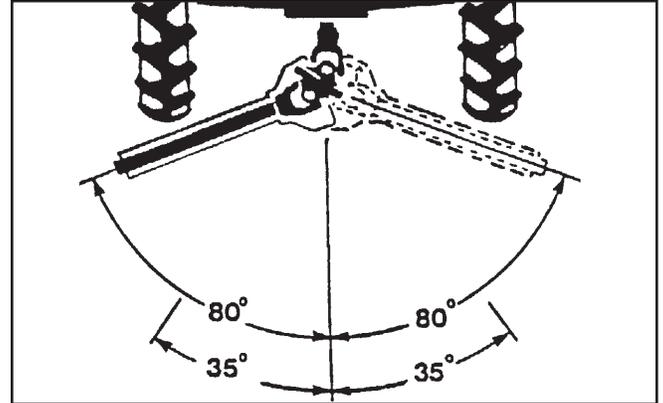


Figure 19. CV Joint Angles

## CLEANING

### After Each Use

- **Remove large debris such as clumps of dirt, grass, crop residue, etc. from machine.**
- **Inspect machine and replace worn or damaged parts.**
- **Replace any safety decals that are missing or not readable.**

### Periodically or Before Extended Storage

- **Clean large debris such as clumps of dirt, grass, crop residue, etc. from machine.**
  - **Remove the remainder using a low-pressure water spray.**
1. Be careful when spraying near scratched or torn safety decals or near edges of decals as water spray can peel decal off surface.
  2. Be careful when spraying near chipped or scratched paint as water spray can lift paint.
  3. If a pressure washer is used, follow the advice of the pressure washer manufacturer.
- **Inspect machine and replace worn or damaged parts.**
  - **Sand down scratches and the edges of areas of missing paint and coat with Woods spray paint of matching color (purchase from your Woods dealer).**
  - **Replace any safety decals that are missing or not readable (supplied free by your Woods dealer). See Safety Decals section for location drawing.**

## STORAGE

### **⚠ WARNING**

- **Block equipment securely for storage.**
- **Keep children and bystanders away from storage area.**

At the end of the season, the shredder should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent unnecessary down time at the beginning of the next season.

To ensure a long, trouble-free life, prepare the unit for storage by carrying out the following procedure:

1. Clear the area of bystanders, especially children.
2. Thoroughly wash the unit, using a pressure washer to remove all dirt, mud, debris, and residue. See Cleaning instructions on page 21.
3. Inspect the flails and rotors for damage or entangled material. Remove entangled material. Repair or replace damaged parts.
4. Inspect all hydraulic hoses, lines, couplers, and fittings. Tighten all loose fittings. Replace any hose that is cut, nicked, abraded, or separating from the crimped end of a fitting.
5. Change gearbox oil.
6. Lubricate all grease fittings. Make sure all grease cavities have been filled with grease to remove any water residue from pressure washing.
7. Touch up all paint nicks and scratches to prevent rust.
8. Move to storage area. Select a dry area free of debris. Store in an area away from human activity.
9. Unhook from tractor (see Removing Shredder from Tractor, page 18).
10. Place safety stands or large blocks under the frame to take the load off the tires. **NOTE:** Do not deflate tires.
11. If the unit cannot be placed indoors, cover with a waterproof tarpaulin and tie securely. Store away from human activity.
12. Do not allow children to play on or around the stored unit.

## OPTIONAL EQUIPMENT

### Rubber Flaps

All units are equipped with front shield flaps (Figure 20) along the front of the frame. The shield flaps stop or deflect trash, stones, or other debris picked up by the flails.

Be sure the shield flaps are in good condition for operation. Replace if damaged, torn, or missing.

### Additional Rear Wheels

Additional rear wheels (Figure 21) should be installed on machines 18 feet or wider. They provide extra flotation and stability for wide units and are available from your dealer or the factory.



Figure 20. Optional Rear Wheels

### Bed Cones

#### 3-Point Units Only

For some operations you may want to pack hills. Mount bed cones (Figure 21) directly over the row in place of rear wheels.

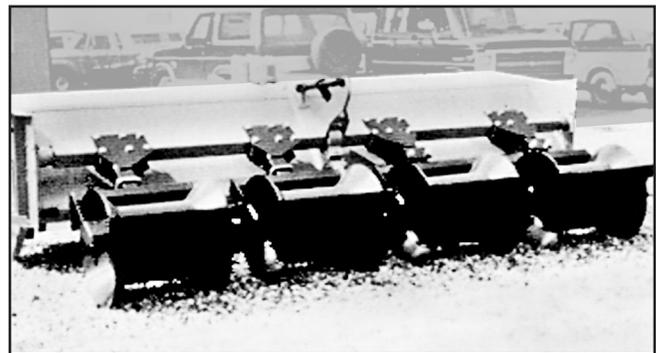


Figure 21. Optional Bed Cones

# SERVICE & MAINTENANCE

## WARNING

- Before dismounting power unit or performing any service or maintenance, follow these steps: disengage power to equipment, 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.
- Before working underneath, read manual instructions, securely block up, and check stability. Secure blocking prevents equipment from dropping due to hydraulic leak down, hydraulic system failure, or mechanical component failure.
- 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.
- Make sure shields and guards are properly installed and in good condition. Replace if damaged.

## CAUTION

- Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.
- Make certain all movement of equipment components has stopped before approaching for service.

## LUBRICANTS

### 1. Grease

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

### 2. Gearbox Oil

Use an SAE 85W90 gear oil for all operating conditions. Capacity: 3-1/2 U.S. quarts (110 oz.).

## 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 26 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

**NOTE:** Recommendations are based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication or oil changes. Refer to Figure 23.

### Daily or every 8 hours of operation

**PTO Driveline.** Lubricate daily or every 8 hours of operation (every 4 hours if U-joints run at angles). See Figure 22 for lubrication points.

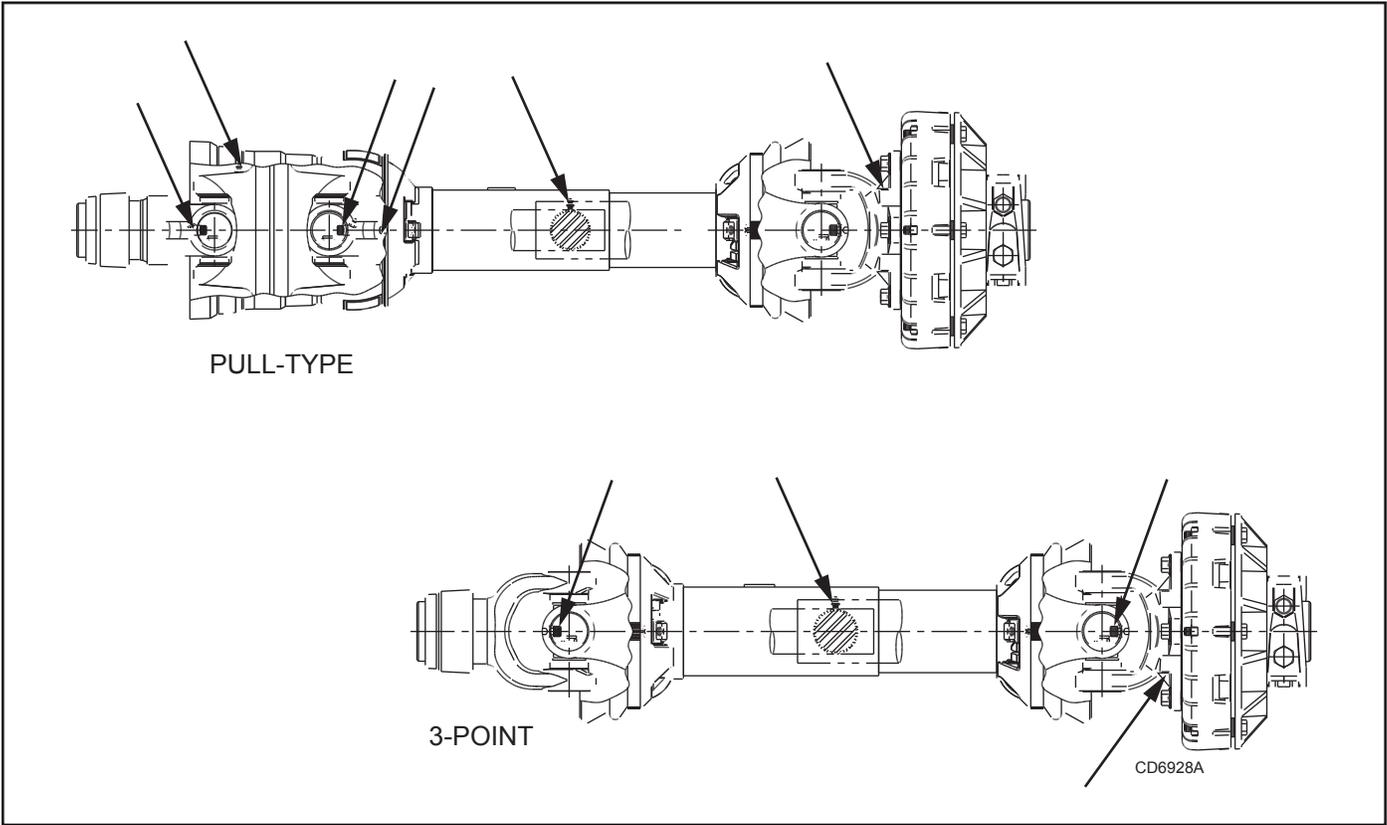


Figure 22. PTO Driveline Lubrication Points

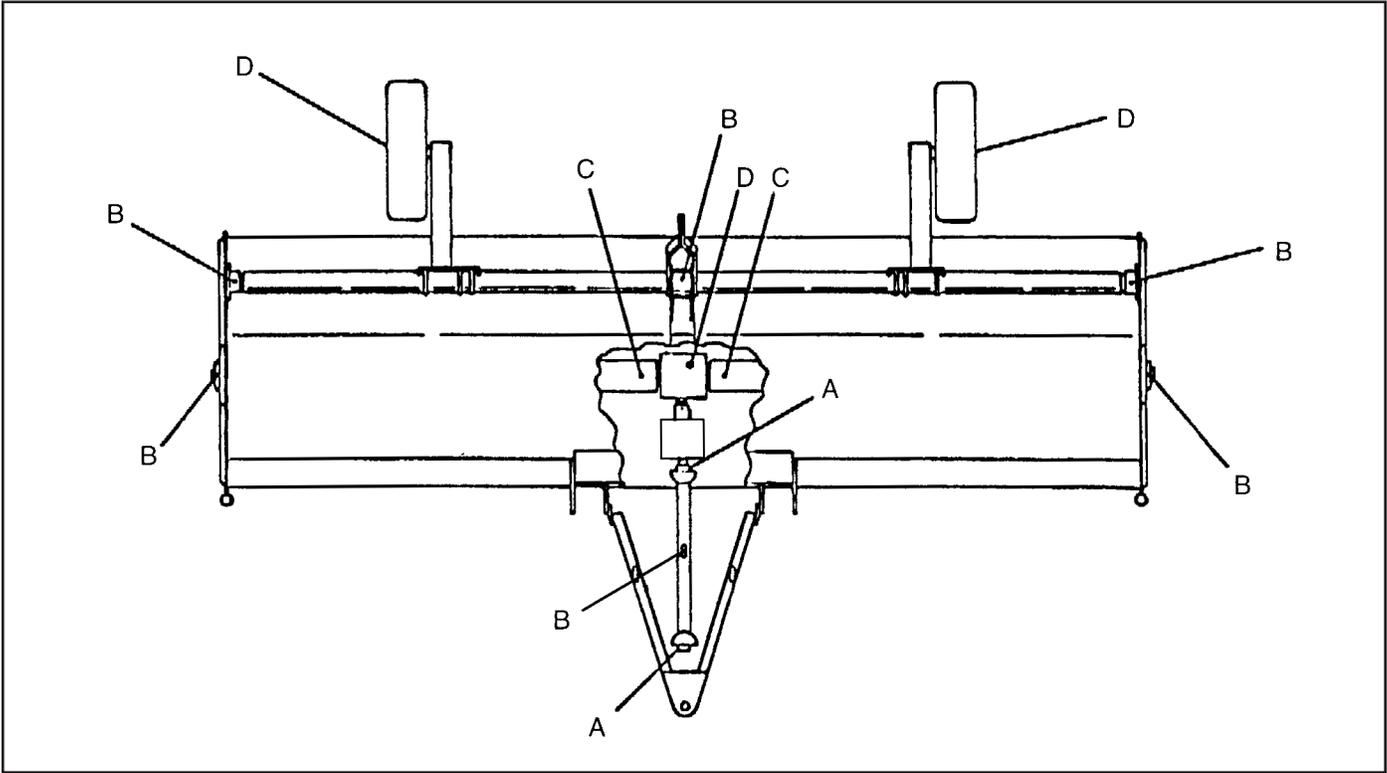


Figure 23. Lubrication Points

## Daily or every 8 hours of operation

1. Lubricate PTO U-joints and over-running clutch.
2. Check gearbox daily or every 8 hours of operation. See Figure 24 for gearbox oil fill location.



Figure 24. Gearbox Oil Fill Location

## Every 25 hours of operation

1. Lubricate PTO driveline telescoping section (one location, Position B, Figure 23).
2. Lubricate rotor end bearings. See Figure 25.
3. Lubricate wheel rockshaft bearings (3 to 5 locations). See Figure 26.

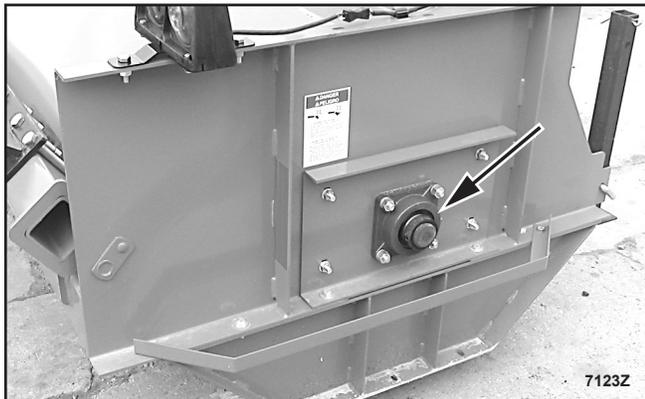


Figure 25. Rotor End Bearing Lubrication Point

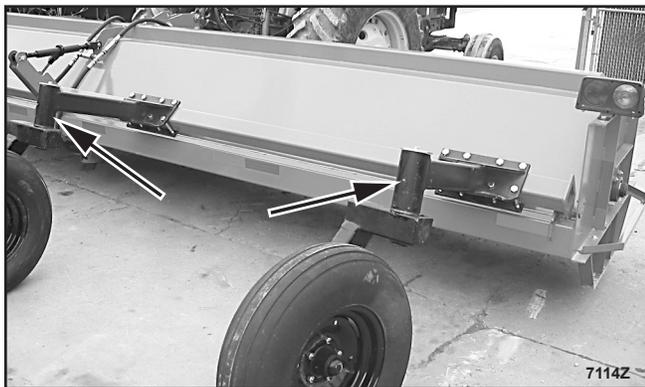


Figure 26. Wheel Rockshaft Bearing Lubrication Points

## Every 40 hours of operation

1. Lubricate rotor drive couplers next to the couplers on underside of unit and inside of flail tube (use hole in flail tube to access grease fitting, 2 locations).
2. Grease the drive hubs with 10 to 20 pumps. You may use extra grease only on drive hubs.

## Annually

1. Change gearbox oil. Refill with SAE 85W90 gear oil. Capacity: 3-1/2 U.S. quarts (110 oz.). See Figure 27.

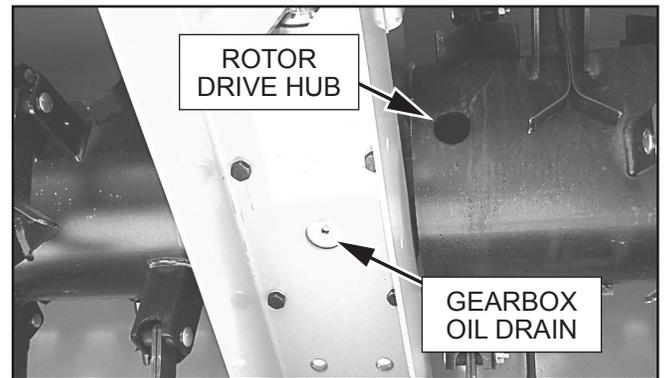


Figure 27. Gearbox Oil Drain Location

2. Repack wheel bearings. See Figure 28.

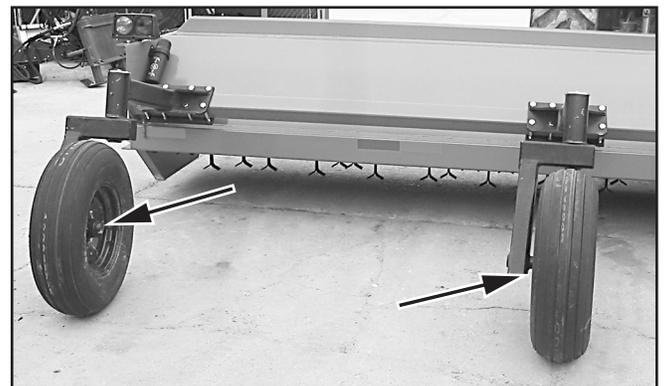


Figure 28. Wheel Bearings

3. Lubricate ratchets as necessary (2 locations each ratchet). See Figure 29.

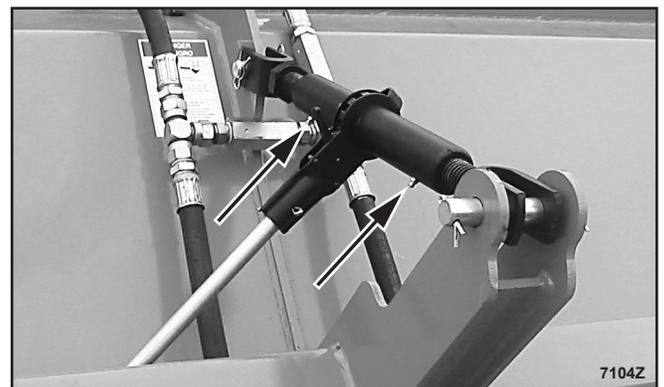


Figure 29. Ratchet Lubrication Points

## LUBRICATION SERVICE RECORD

**NOTE:** See page 23 through page 25 for details. Copy this page to continue service record.

<b>HOURS OF SERVICE</b>																				
<b>SERVICED BY</b>																				
<b>10 Hours or daily</b>																				
L PTO Driveline (8)																				
L PTO Driveline telescope section																				
L U-Joint (1)																				
L Overrunning clutch (1)																				
✓ Gearbox oil level																				
<b>25 Hours</b>																				
L Rotor end bearings																				
L Wheel mounting tube bearings																				
<b>40 Hours</b>																				
L Rotor inner bearings (2)																				
<b>Annually</b>																				
C Gearbox oil																				
R Wheel bearings																				
L Ratchets																				

### GEARBOX OIL LEAKAGE

#### **NOTICE**

- Major oil leakage from the gearbox shaft seal area is not acceptable and could cause the gearbox to fail due to lack of lubrication and cooling. It is the operator's responsibility to check the gearbox oil level per the Lubrication Service Table.

Before checking gearbox oil level, shut down the shredder for a couple of hours to allow the oil to drain back into the reservoir for the most accurate reading. Proper oil level should be between the full and add lines on dipstick. When oil is needed, add through the dipstick tube.

#### **NOTICE**

- DO NOT OVERFILL.** Lab tests have proven that overfilling the gearbox can dramatically increase the gearbox operating temperature. In extreme cases this can overheat the oil, reducing its lubricating and cooling properties, and eventually cause shaft seals to deteriorate and fail. Overheated oil has an obvious burnt smell; drain it and refill with new oil. Overfilling gearbox oil can void the warranty.

The gearbox should not require frequent servicing of oil. It is not designed to consume or lose large amounts of oil. If oil needs to be added frequently, troubleshooting the cause is required (see section below).

## Gearbox Leakage & Troubleshooting

Some gearbox oil leakage may be acceptable if:

1. Oil covers less than a 3-inch diameter circle around the shaft seal area (see Figure 30).
2. Oil covers less than a 4-inch diameter circle around the dipstick tube (see Figure 30).

If oil leakage covers an area larger than that described in 1 and 2, do the following:

1. Properly check oil level. If low, properly service.
2. Clean oily area of gearbox. Use a degreaser to remove all oil from outside surface of gearbox.
3. Closely monitor gearbox for 10 hours of operation. Check and service oil every 30 minutes or as needed to ensure operation does not occur with oil below the add mark.
4. If after 10 hours of operation, oil covers less than the area described in 1 & 2 above, seepage is considered to be acceptable.
5. If after 10 hours of operation, oil covers more than the area described in 1 & 2 above, this seepage is considered to be unacceptable leakage.
6. Gearboxes with unacceptable leakage should be rebuilt, replacing old seals and worn parts with new seals and parts. Gearbox rebuild and seal replacement parts are available through your local Woods dealer. Consult with Woods Technical Service for further details, rebuild recommendations, or warranty questions.

## CHANGING GEARBOX OIL

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

1. Clear area of bystanders, especially children.
2. Shut off tractor, place all controls in neutral, set parking brake, remove key, and wait for all moving parts to stop.
3. Raise the unit to provide access to underside. Place safety stands or large blocks under frame.
4. Disconnect PTO driveline and hydraulic lines.
5. Place a pan under drain plug. Remove drain plug and dipstick plug (see Figure 31).
6. Allow gearbox to drain for 10 minutes.

**NOTE:** To remove the most contaminants, drain oil when gearbox is hot.

**NOTE:** To separate gearbox halves for servicing, seal guards must be removed first otherwise damage to gearbox housings will occur. Seal guards can be removed by gently prying out of housing with a flat blade screwdriver using the cutout area machined in the housing to get behind the guards. Use care not to bend guards during removal so they can be reused for reassembly. Replace guards if they are damaged.

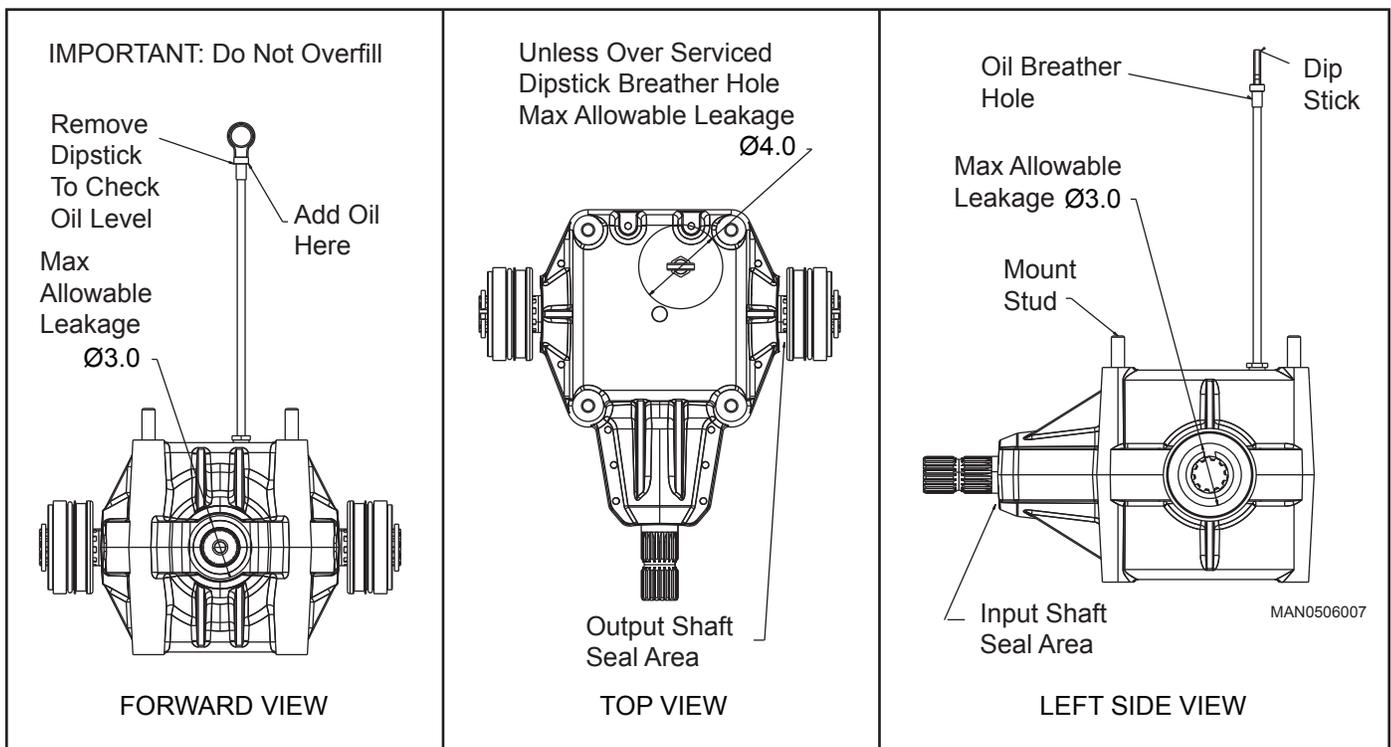


Figure 30. Acceptable Oil Leakage



**Figure 31.** Drain Plug (Underside of Unit)

7. Re-install and tighten drain plug.
8. Dispose of used oil in an approved container.
9. Add SAE 85W90 gear oil through the dipstick cover. Use the dipstick to check the oil level (Figure 32) and add oil accordingly.
10. Re-install and tighten fill plug.
11. Reconnect PTO driveline and hydraulic lines.
12. Remove blocks or safety stands.



**Figure 32.** Dipstick Location

## **RATCHET HEIGHT ADJUSTMENT**

Mechanical ratchets provide height setting for the unit. To set ratchets, follow this procedure:

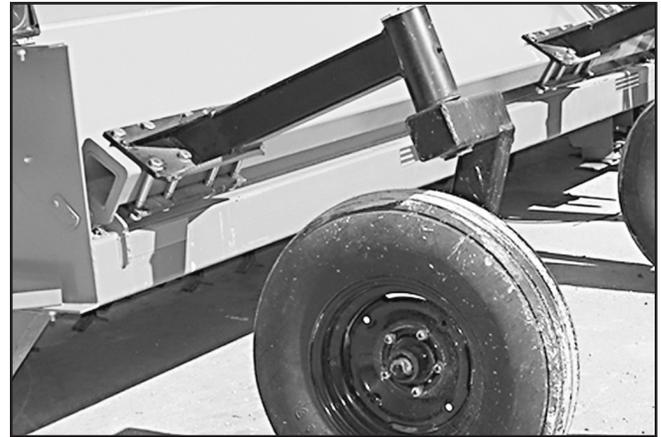
1. Clear the area of bystanders, especially children.
2. Turn the turnbuckle to achieve the desired ratchet length (see Figure 32). Repeat Step 2 with other ratchets.

## **WHEEL SPACING**

The rear wheels can be adjusted for alignment with crop rows.

1. Clear the area of bystanders, especially children.

2. Shut off tractor, place all controls in neutral, set parking brake, remove key, and wait for all moving parts to stop.
3. Use a jack with sufficient capacity to lift the frame.
4. To determine wheel spacing, measure from the center line of the unit. Mark positions on the frame.
5. Lift frame until wheels have cleared the ground.
6. Place safety stands or large blocks under the frame.
7. Loosen mounting bolts on one wheel assembly.
8. Slide assembly along the frame tube to new position (see Figure 33).
9. Tighten mounting bolts to specified torque level.



**Figure 33.** Positioning Wheel Assembly

10. Remove safety stands or blocks.
11. Lower and remove jack.
12. Repeat with other wheel assembly.

## **REPLACING FLAIL KNIVES**

### **! WARNING**

- **Do not handle blades with bare hands. Careless or improper handling may result in serious injury.**
- **Read Balance Statement, page 5, before replacing any knives.**

The flail knives in pairs swing on a hardened bushing, designed to reduce wear, and are sandwiched between two steel spacers. The hardened bushing is bolted to the clip with a 1/2" NC carriage bolt and a flange lock nut.

1. Clear the area of any bystanders.
2. Shut off tractor, place all controls in neutral, set parking brake, remove key, and wait for all moving parts to stop.
3. Disconnect driveline and hydraulic lines from the tractor.

4. Place jackstands with a load rating of 2000 lbs or more under the tubular beams on the shredder body. A minimum of four jackstands must be placed under the shredder before working underneath the unit.
5. Loosen and remove the worn flail and its opposite on the other side of the rotor. Discard worn flails and their mounting hardware.
6. Replace with new flails and mounting hardware (see Figure 34).



Figure 34. Flail Replacement

### NOTICE

- To maintain rotor balance, always replace opposite (180°) pairs of flails and mounting hardware.
7. Tighten flail mounting flange lock nut.
  8. Replace additional worn flails following step 5 and step 6.
  9. Remove safety stands or blocks from under frame.
  10. Lower unit and remove jack.
  11. Attach driveline and hydraulic line to tractor.
  12. Refer to Balance Statement, page 5, for balance issues.

### REPLACING RUBBER SHIELD FLAPS

Rubber shield flaps on the front of the unit deflect or prevent stones or debris from being ejected when operating unit. Replace if damaged or missing to provide a safe work environment. To replace, follow this procedure:

1. Clear the area of bystanders, especially children.
2. Lower the unit to the ground, place all controls in neutral, shut off engine, set park brake, remove key, and wait for all moving parts to stop before dismantling.

**NOTE:** For 3-point hitch units, unhook to gain access to center flaps.

3. Remove 3/8" nut, washer and carriage bolt from each worn flap. (Replace any worn or damaged hardware. See page 47 for hardware sizes.)



Figure 35. Front Rubber Shield Flaps

4. Replace damaged flap with new flap and secure with correct hardware.

**NOTE:** Use only genuine Woods parts when replacing flaps.

### SERVICING ROTORS (FLAIL TUBES)

#### ⚠ WARNING

- Do not handle blades with bare hands. Careless or improper handling may result in serious injury.
- Any excessive vibration caused by worn or missing knives or damaged drive components can cause damage to the shredder and personal injury. Excessive vibration can also be transmitted through the hitch mounts and PTO to the tractor resulting in tractor damage.
- Once field operation has been started, it is the responsibility of the owner/operator to monitor and maintain acceptable rotor balance. Refer to Balance Statement, page 5, for details.

### NOTICE

- Read Balance Statement, page 5, before replacing any knives.

Refer to Replacing Flails, page 28, for knife or knife component replacement.

The Woods Center Drive Flail Shredder has been designed for durability when shredding any type of crop. Some operating conditions will shorten the life of the shredder or components. These include operating too low to the ground or in frequent contact with the ground, and contact with large rocks or other foreign objects. Over time, some types of soils and crops can cause wear or damage to rotor components and affect rotor balance, leading to increased vibration. Continued operation with excessive vibration can damage the shredder, requiring rotor service, removal, or replacement.

Factory balanced spare replacement rotors are available through your local Woods dealer. Contact Woods Technical Service for re-balance options or further details.

Follow the procedure below if rotor removal or replacement is required.

## ⚠ CAUTION

- **Use a suitable lifting device of sufficient capacity. Use adequate personnel to handle heavy components.**

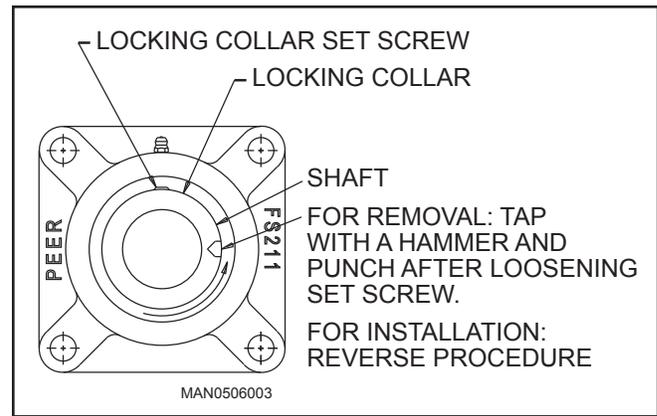
1. Clear the area of any bystanders.
2. Shut off tractor, place all controls in neutral, set parking brake, remove key, and wait for all moving parts to stop.
3. Remove PTO driveline from the shredder.
4. Fully disconnect the shredder from the tractor.
5. Remove wheel arms (casters or struts).
6. Use a hoist, crane, or frame of sufficient capacity to raise the front of the unit and allow the back of the unit to rest on a solid surface (blocks).
7. Leave lifting device attached while working on rotors to prevent tipping.

### Removing Components

Refer to Replacing Flails, page 28, for knife or knife component replacement.

Refer to Servicing Rotors, page 29, before proceeding with these steps.

1. Follow steps in the previous section to prepare and position shredder. Support each end of the rotor (flail tube) to be removed with a crane or hoist.
2. Remove bearing locking collar (see Figure 36).
3. Remove the six bolts holding the bearing plate to the body assembly.
4. Slide rotor out to disengage from the center drive coupling.
5. Thoroughly clean and inspect gearbox drive couplings for wear and replace if any wear is detected. Also inspect the rubber O-ring for wear or tears and replace if any wear or tears are detected.
6. Remove crossmember from the underside of the shredder, providing access for the removal of the gearbox.
7. Remove gearbox, if damaged. This will require removal of the second rotor (repeat steps 1-5 above).



**Figure 36.** Locking Collar

### Replacing Components

1. Place new stud bolts into gearbox using Loctite® No. 271 or equivalent.
2. Remount gearbox. The gearbox oil dipstick should protrude out the top panel of the shredder for checking and servicing. Reinstall the nuts and lock washers securing the top of the gearbox to the shredder gearbox mount plate and torque to specifications in Bolt Torque Chart, page 64.
3. Remount the crossmember securing the bottom of the gearbox and torque to specifications in Bolt Torque Chart, page 64.
4. Install drive couplings and reapply new grease around entire O-ring and gear teeth surfaces.
5. Install rotors (flail tubes) in the opposite fashion as removal. Position rotors with each end supported by a crane or hoist so that it is aligned with the gear coupling and gearbox output shaft center lines. The bearing (stub shaft) end of the rotor will protrude out of the hole in the end sheet.
6. With gentle care not to damage gear coupler teeth or O-ring, provide pressure to align gear teeth and slide the rotor back into its original position.

**NOTE:** When re-installing rotors, the gear coupling grease fitting will need to be temporarily removed to allow for air to purge from the coupler assembly during installation. After successful installation, re-install grease fitting and re-service.

7. Reinstall bearing plate assembly and bolts, and apply appropriate torque.
8. Reinstall bearing locking collar and tighten (see Figure 36).

### NOTICE

- **If removing rotor drive coupling, use Loctite No. 271 or equivalent and special high collar lock washers to keep bolts from loosening.**

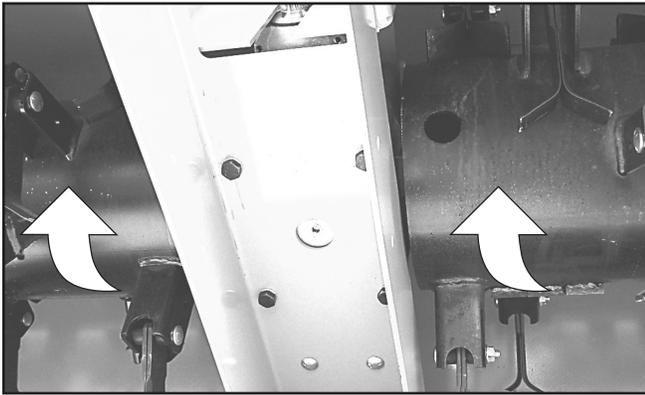


Figure 37. Rotor Direction of Rotation

## SERVICING WEASLER MODULAR FRICTION CLUTCH

### Tools Required

- 3/4" Socket wrench
- 8" Minimum C-clamps (2)
- 1/4" Hex Allen wrench
- Regular screwdriver or punch
- Duct tape or locking pliers with 3" throat minimum
- Hammer
- 1/2" sq. to 1" sq. bar x 9"
- Scale or Vernier

### Breaking In the Clutch (Run In)

**NOTE:** All new clutches must be broken in (Run in) and any clutch that has not been used for approximately 60 days.

1. Shut off tractor and disengage PTO.
2. Disconnect driveline from the tractor PTO shaft.
3. Loosen the bolts on the outside diameter of the clutch until all bolts are just loose, then tighten all bolts 1/2 turn.

4. Attach the driveline to the tractor PTO. Stand clear of the unit.
5. Start tractor. Engage PTO clutch and run for a few seconds or until clutch visibly smokes.
6. Disengage PTO. Shut off tractor. Disconnect driveline from the tractor.
7. Tighten all bolts on the outside diameter of the clutch until the compression plate is tight against the housing.
8. Grease the fitting on the yoke, using a multi-purpose high-temperature EP grease or an equivalent lithium grease.
9. For an integral overrunning clutch, make sure clutch turns freely in one direction.

### REPLACING STUB SHAFT

1. Remove rotor (see Servicing Rotors (Flail Tubes), page 29).
2. Remove three 1/2 x 2-1/2 hex bolts in taper lock hub and re-install bolts in three threaded holes (see Figure 38).
3. Tighten bolts evenly to release taper lock hub from stub shaft. **NOTE:** You may have to give a sharp blow directly to each bolt head to help the hub disengage.
4. Unscrew stub shaft from the rotor tube.
5. Install new stub shaft, reversing Steps 1-3.

### Removing the Driveline

1. Shut off tractor and disengage PTO.
2. Disconnect driveline from PTO shaft.
3. Remove the bolt (21K) or clamp (24K) that attaches the clutch to the shredder's input shaft.

**NOTE:** The shaft is heavy. Grasp the clutch firmly with both hands and slide off the input shaft.

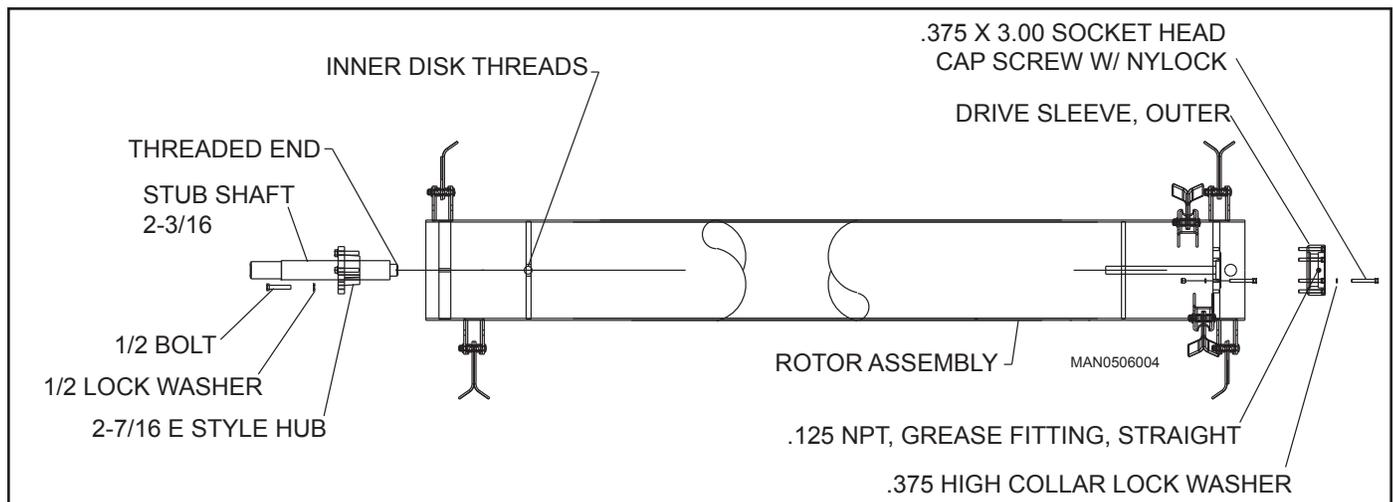


Figure 38. Stub Shaft Assembly

## Rebuilding Friction Pack

### Disassembly

1. Position clutch and universal joint assembly on a bench so that end is accessible.
2. Remove the long bolts on the outside of the housing that hold the friction pack together.
3. Remove the plate(s) and all internal components. Leave the yoke/hub intact.
4. Discard friction discs.
5. If rebuilding the overrunning clutch, refer to Rebuilding Overrunning Clutch, page 31, beginning with Step 2.

### Inspection

1. Inspect the steel and iron parts for wear, warping, or cracks, and replace if necessary.
2. Inspect the yoke/hub for looseness. If there is more than .03 end play, replace.
3. Clean any rust or dust from the plate surfaces with a wire brush or steel wool.

### Assembly

1. Place one new friction disc, then separator plate, then second friction disc into housing.
2. Add the pressure plate so that the flat surface rests on the friction disc. NOTE: The tangs on the plate must fall into the reliefs in the housing.
3. Add the disc spring so that its inside diameter contacts the fins of the pressure plate.
4. Assemble the compression plate and all the long bolts. Make sure all nuts rest in their pockets.
5. Tighten all long bolts to 30 lbs-ft.

## Rebuilding Overrunning Clutch

### Disassembly

1. Remove the four bolts that secure the friction pack. Remove the friction pack.
2. Using screwdriver and pliers, remove the retaining ring that holds the overrunning clutch together.
3. Slide the collar and washer off the clutch hub, noting the orientation of the collar for reinsertion.
4. Remove and discard the keys and leaf springs.

### Inspection

1. Inspect the steel parts for wear and replace if necessary.
2. Inspect the yoke/hub for looseness. If there is more than .03 end play, replace.
3. Using screwdriver, scrape any hardened grease from the overrunning key pockets.

### Assembly

1. Using a multi-purpose high-temperature EP grease or equivalent lithium grease, inject one grease gun pump into each key pocket. Evenly wipe two more pumps over the overrunning surface.
2. Press a new leaf spring into each pocket. The ends should touch the bottom of the pockets.



**Figure 39.** Weasler Modular Friction Clutch (24K)

3. Add new keys. With one hand, hold the two keys in the pockets.
4. Slide the collar onto the hub, orienting collar correctly.
5. Add washer.
6. Install retaining ring.
7. Make sure clutch spins freely and only in correct direction.
8. Reassemble friction pack.

## **MOUNTING CLUTCH TO SHREDDER**

1. Mount and bolt the clutch hub onto the shredder input shaft. Make sure shaft and clutch grooves line up.
2. Re-install any shielding that was moved or removed.
3. Run the clutch before using. Refer to Breaking In the Clutch (Run In), page 31.

# TROUBLESHOOTING

The Woods Flail Shredder uses swinging flails to pick up and shred crop residue left in the field. It is a simple and reliable system that requires minimal maintenance.

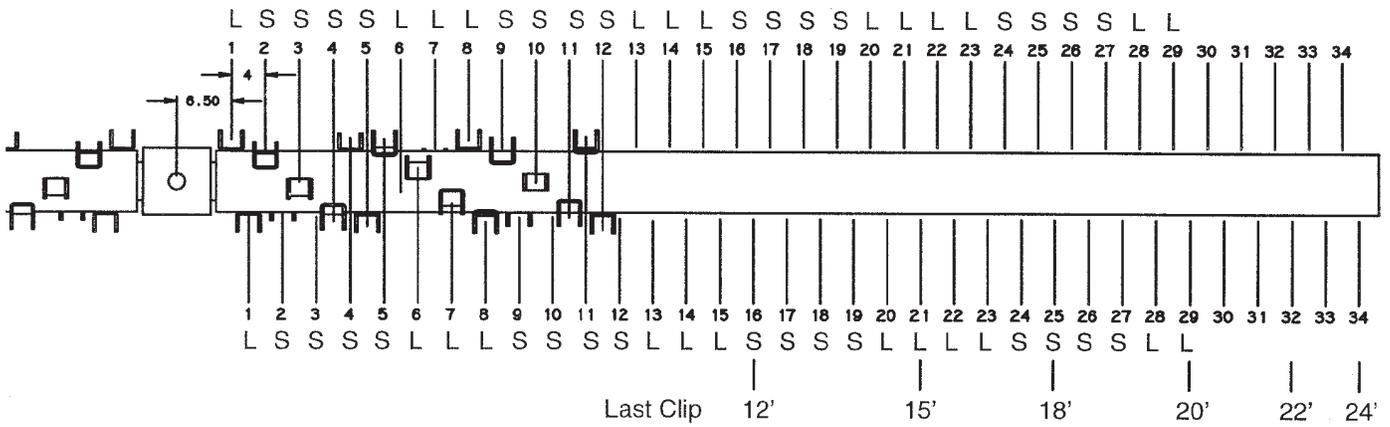
The following table lists problems, causes, and solutions that you may encounter. If you encounter a problem that is difficult to solve even after reading through this table, please call your local Woods dealer. When calling, please have this manual and your unit's serial number ready.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Shredder doesn't track	Poor wheel spacing	Set wheels in center of crop rows.
	3-Point not set	Set 3-point hitch in non-sway position.
	Shredder not level	Level shredder (see Set Operating Height, page 19).
	Irrigation furrows not even	Set wheels against seed bed (see Setting Outer Trailing Wheels (Casters & Struts), page 20).
Shredder doesn't follow ground contour	3-Point not set	Set 3 point in float position.
		See tractor manual to set Load Sensing hydraulic system.
	Shredder too high	Set shredder closer to ground.
	Irrigation furrows not even	Set wheels against seed bed.
Shredder vibrates	Driveline doesn't telescope	Remove, disassemble, and clean telescoping joint.
	Rotor out of balance	Replace damaged or broken flails and flails 180 degrees opposite.
		Check for missing balance weights or rebalance.
Debris is being thrown out from under shredder	Shredder set too low	Raise shredder.
	Knives excessively worn	Replace knives.
	Rubber shields missing	Replace flaps immediately.
Crop residue is being left	Traveling too fast	Slow travel speed.
	Shredder too high	Lower shredder.
	Improper flails	Change flails.
	Crop residue strip left in shredder <b>center</b>	Add center cutter or divider.

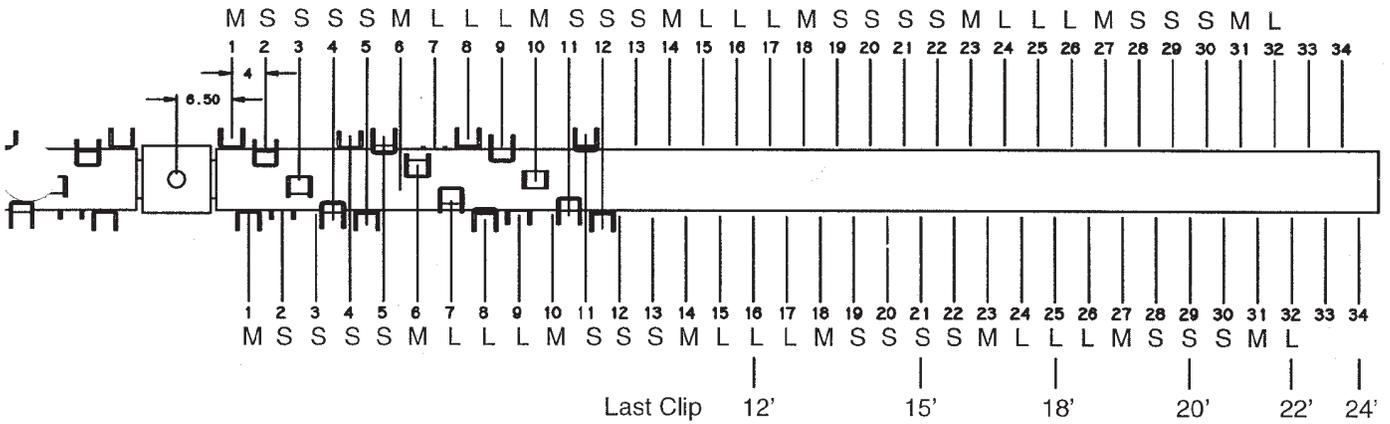
# WORKSHEET FOR CONTOUR FLAIL PATTERNS

NOTE: Use the same knives on opposite clips to keep balanced.

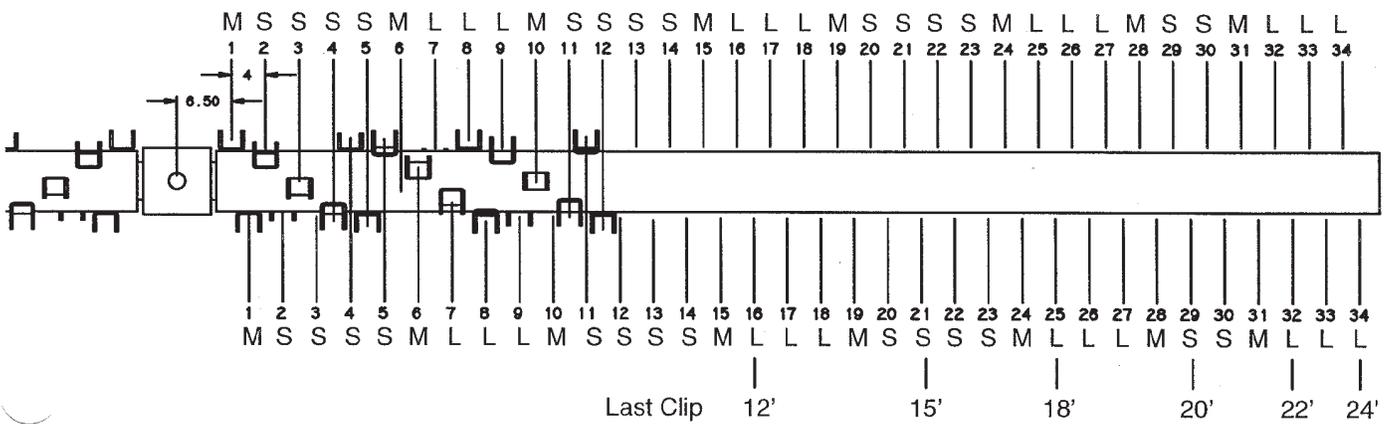
## 30" ROWS



## 34" ROWS



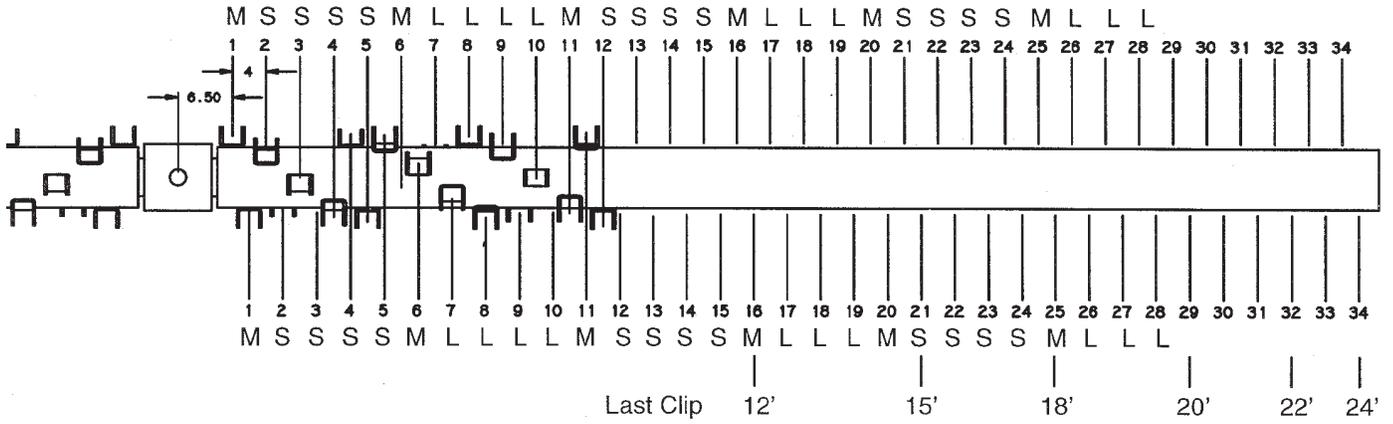
## 36" ROWS



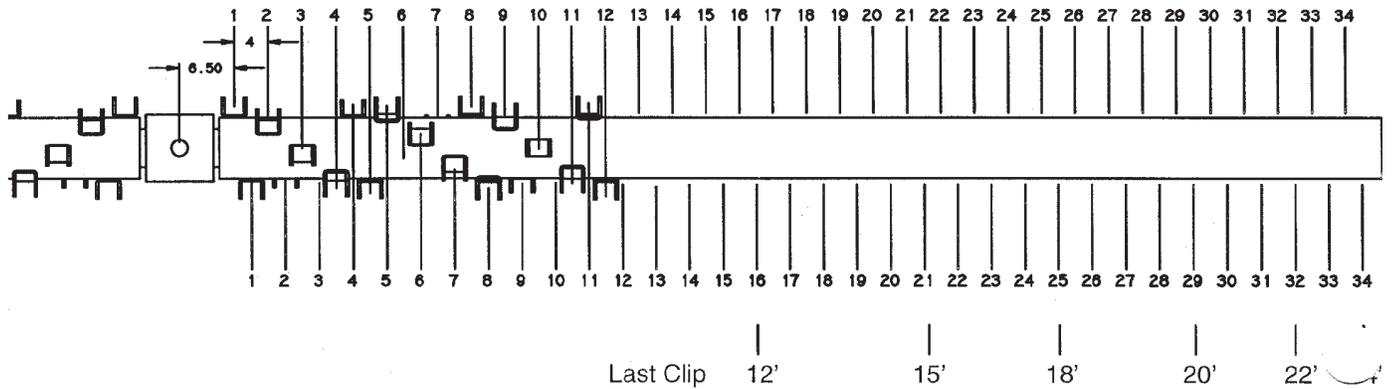
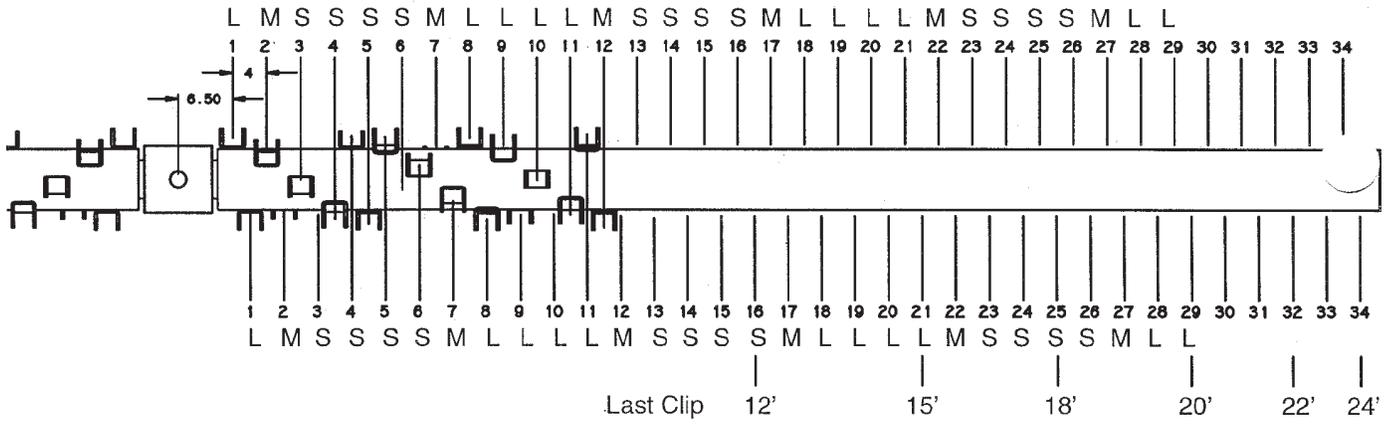
# WORKSHEET FOR CONTOUR FLAIL PATTERNS

NOTE: Use the same knives on opposite clips to keep balanced.

## 38" ROWS



## 40" ROWS



# ASSEMBLY

## DEALER SET-UP INSTRUCTIONS

### **⚠ WARNING**

- Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.
- Do not handle blades with bare hands. Careless or improper handling may result in serious injury.
- 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.**

- Check that all hardware is properly installed. Always tighten to torque chart specifications unless instructed otherwise in this manual.

### **⚠ CAUTION**

- Always wear relatively tight and belted clothing to avoid getting caught 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.
  - Use a suitable lifting device of sufficient capacity. Use adequate personnel to handle heavy components.
1. Open the crate and cartons containing the attaching components and mounting hardware.
  2. Use the packing list to check that all parts have been shipped.

### For Some Models Shipped on End

Units that stand on their aft ends during shipping have a dipstick shipping plug installed in the gearbox dipstick tube to prevent leakage during shipping.

### **NOTICE**

- For units shipped on aft end, the dipstick shipping plug must be removed before shredder operation. Replace plug with dipstick in filler tube after shredder has been removed from truck and leveled.

After the unit has been leveled for a couple of hours, check oil level and service through the dipstick/filler tube as required.

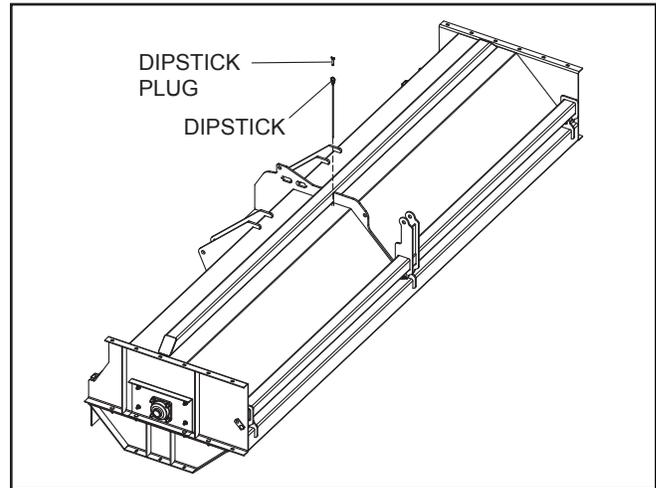


Figure 40. Dipstick Shipping Plug Removal

## WHEEL ASSEMBLY

1. Raise the rear of the unit.
2. Place safety stands or large blocks under frame.
3. Measure the wheel spacing from the center of the unit. Mark the frame (rockshaft).
4. Install the wheel assembly to the rockshaft (Figure 41). **If equipped with caster wheels, verify that there is enough clearance for casters to rotate without hitting each other.** Failure to do so will result in tire damage.
5. Tighten mounting bolts to their specified torque.

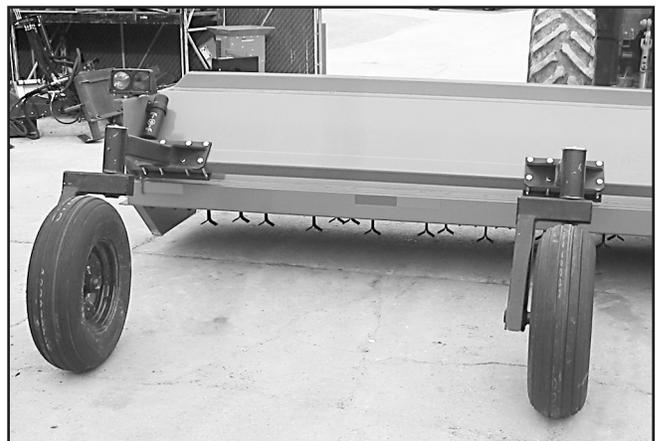


Figure 41. Wheel Assembly Installed

### **3-POINT UNITS**

6. Attach floating upper mast (1) to shredder using two hardened bushings, 1 x 5" hex bolts, lock nuts, and four 3/4 x 3" spacers. See parts list for hardware, page 46 - 47. (Keep hardware loose.)
7. Attach front top link spacer, bolts, and lock nuts to front of upper mast assembly.

#### **NOTE:**

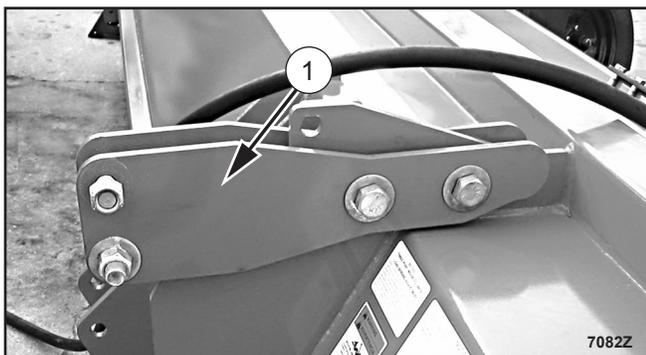
For **Quick Hitch Cat II**, use spacer in front lower hole of upper mast assembly.

For **Quick Hitch Cat III**, use spacer in front upper hole of upper mast assembly.

**Without Quick Hitch**, use spacer through top link pivot in front upper hole of upper mast assembly.

8. Assemble lower 3-point hitch pin assembly, spacers, and klik pin to lower mast (both sides).

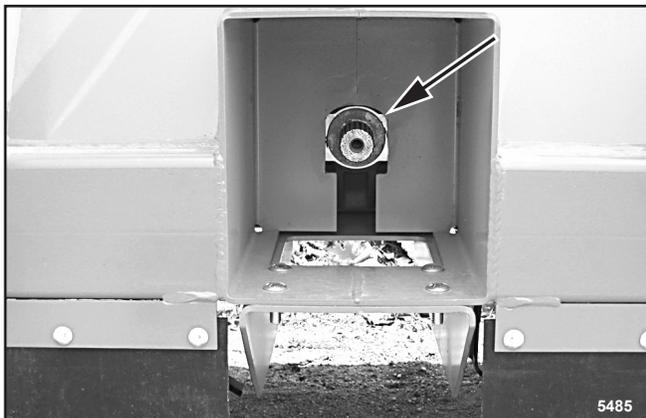
**NOTE:** For Quick Hitch Cat II & III, place 1-3/4 OD spacer on the inside and 1-7/16 OD spacer on the outside.



**Figure 42.** Floating Upper Mast Installed

### **ALL UNITS**

1. Install PTO driveline by sliding the yoke with the slip clutch over the input shaft (Figure 43).
2. Tighten interlocking clamp bolts to their specified torque.



**Figure 43.** Gearbox Input Shaft

3. Install front parking stands (Figure 44), using L-pin and hair pin cotter.



**Figure 44.** Front Stands Installed

### **PULL-TYPE HITCH INSTALLATION**

#### **(Pull-type units only)**

1. Mount hitch to 3-point lower mounts, using pins and Klik pins.
2. Install ratchet. Be sure to install retaining pins.
3. Attach clevis or pin to hitch tongue (See page 47 for parts breakdown.)
4. Attach tow chain to hitch.



**Figure 45.** Pull-Type Hitch Installed

## MANUAL STORAGE TUBE INSTALLATION

The manual storage tube may be supplied in either of the following styles.

### For One-Piece Style Manual Tube:

Mount the manual tube to the inside of the shredder side sheet, using three 3/8 x 1-1/4" hex bolts, washers, and 3/8" nuts. Mounting holes are located above the bearing plate (see Figure 46).



Figure 46. One-Piece Style Manual Tube Installed

### For Clamp-Style Manual Tube:

1. Mount the tube clamp to the inside of the shredder side sheet using two 1/4" self-tapping screws (Figure 47). Mounting holes are located above the bearing plate.

2. Place the tube in the clamp with the cap facing forward.

**NOTE:** Keep the Operator's Manual with the shredder at all times.

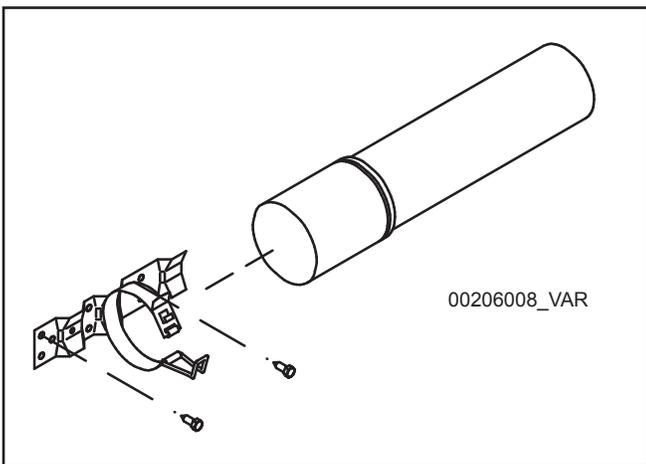


Figure 47. Clamp-Style Manual Tube Assembly

## OPTIONAL EQUIPMENT

### Rubber Belting Installation

1. Remove all components from shipping carton. Make sure that all required hardware is included.
2. Attach rubber belting and bars to front of shredder using 3/8 NC x 1-1/2 carriage bolts and 3/8 flange lock nuts.

**NOTE:** Use equal number of belting and bars on each side of shredder.

3. Tighten all hardware.

### Rubber Flap Installation

1. Remove all components from shipping carton. Make sure that all required hardware is included.
2. Attach flap brackets to the front of the shredder using 3/8 NC x 1-1/2 carriage bolts and 3/8 flange lock nuts.

**NOTE:** Use flap brackets to space flap brackets out evenly across front of shredder.

3. Attach flap bars to flat brackets using 3/8 NC x 1-1/2 carriage bolts and 3/8 flange lock nuts.
4. Assemble rod and rubber flaps through flap brackets and secure using 3/16 x 1-1/2 cotter pins.
5. Tighten all hardware.
6. For detailed installation instructions, see the parts diagram and instruction sheet the comes with the swing flap kit designed for each shredder.

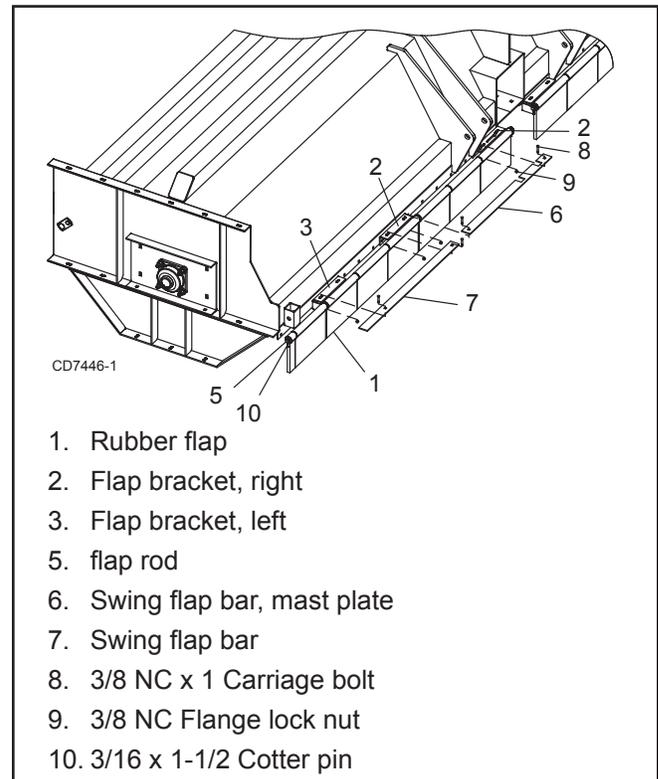
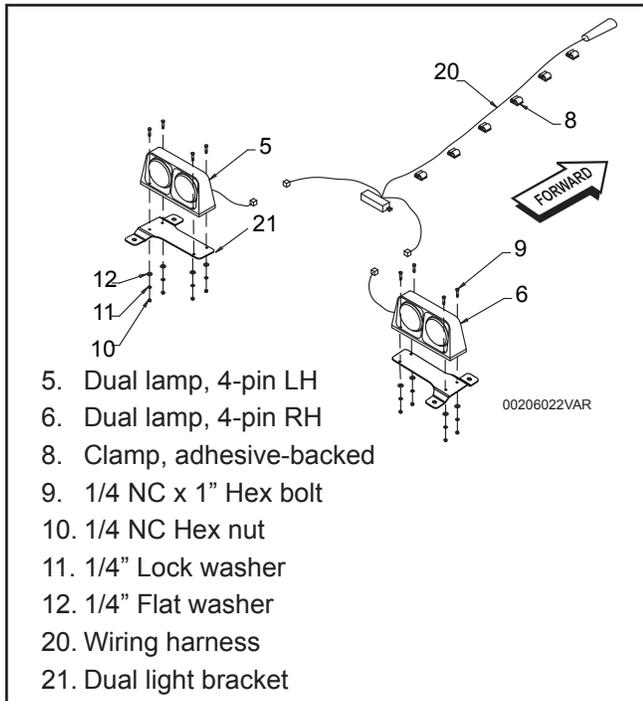


Figure 48. Rubber Flat Installation (15' Shown)

## Safety Light Kit Installation

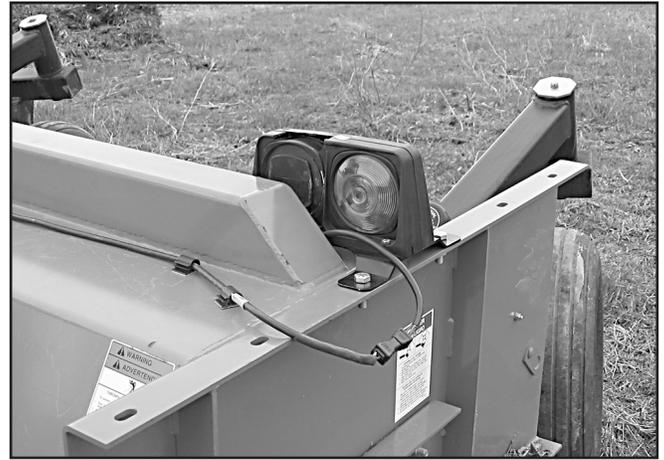
1. Remove all components from shipping carton. Make sure that all required hardware is included.
2. Attach dual safety lights (Figure 49) to their bases using 1/4 NC x 1" hex bolts, washers and nuts provided. Make sure that light lenses are in the correct position in relation to direction of equipment travel: amber lenses on the outside, red lenses on the inside facing rear of shredder.
3. Install light bracket on end of shredder using 1/2 NC x 1-1/2" hex bolts, washers and nuts (four each) in slots 3 and 4 on top of end sheet.
4. Plug ends of wiring harness into corresponding plugs of the light units (Note: left side of wishbone harness is labeled "Left").
5. Run wiring harness along top of shredder and secure with enclosed adhesive-backed clamps (5) approximately every two feet.
6. Connect 7-pin connector of wiring harness to tractor and test all light functions before actual use.



**Figure 49.** Safety Light Kit Diagram (Non-End Tow)



**Figure 50.** Safety Light Installed - Rear View

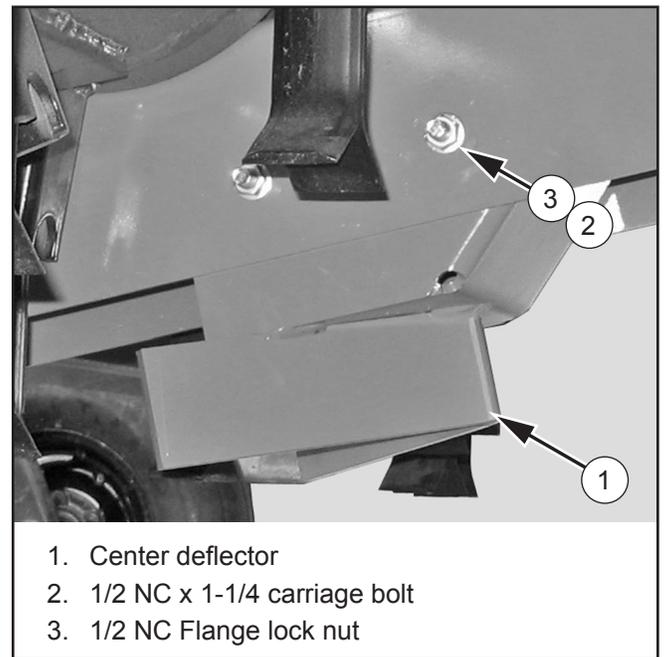


**Figure 51.** Safety Light Installed - Front View

## Install Center Deflector

Slide deflector (1) between shredder center channel with the point forward.

Secure into position using four 1/2 NC x 1-1/4 carriage bolts (2) and flange lock nuts (3).



**Figure 52.** Center Deflector Installed

## CENTER CUT KIT INSTALLATION

### Block Shredder

#### **⚠ WARNING**

- **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.**

To minimize the potential hazards of working underneath the cutter, follow these procedures.

1. Place jackstands with a load rating of 2000 lbs or more under the tubular beams on the shredder body. A minimum of four jackstands must be placed under the shredder before working underneath the unit.

Do not position jackstands under wheels, axles, or wheel supports. Components can rotate and cause shredder to fall.

2. Consider the overall stability of the blocked unit. Just placing jackstands underneath will not ensure your safety.

The working surface must be level and solid to support the weight on the jackstands. Make sure jackstands are stable, both top and bottom. Make sure shredder is approximately level.

3. With full shredder weight lowered onto jackstands, test blocking stability before working underneath.
4. If shredder is attached to tractor when blocking, set the brakes, remove key, and block shredder before working underneath.
5. Securely block rear tractor wheels, in front and behind. Tighten tractor lower 3-point arm anti-sway mechanism to prevent side-to-side movement.

### Assemble Motor and Blade

1. Install elbow (8), adapter (9), elbow (10) and hose (11) to the IN or PRESSURE side of the hydraulic motor.
2. Install adapter (23) and hose (11) to the OUT or RETURN side of the motor.
3. Place motor (4) inside motor housing (2) and secure using six 9/16 NC x 1-1/2 cap screws (7) lock nuts (6).

Make sure OUT or RETRUN side of motor is on the open side of the motor housing. Torque hardware to 171 lbs-ft.

4. Slide blade hub (1) over motor shaft, install 1/4" key and secure using one 5/16 NF x 1-1/2 cap screw (20), flat washers (33) and lock washer (34) in the bottom of the shaft. Torque to 19 lbs-ft.
5. Clamp hub to shaft using two 3/8 NC x 1-3/4 cap screws (18) and lock nuts (22).
6. Secure blade (3) to blade hub using two 3/8 NC x 1-1/4 cap screws (19) and flange lock nuts (22). Torque to 35 lbs-ft.

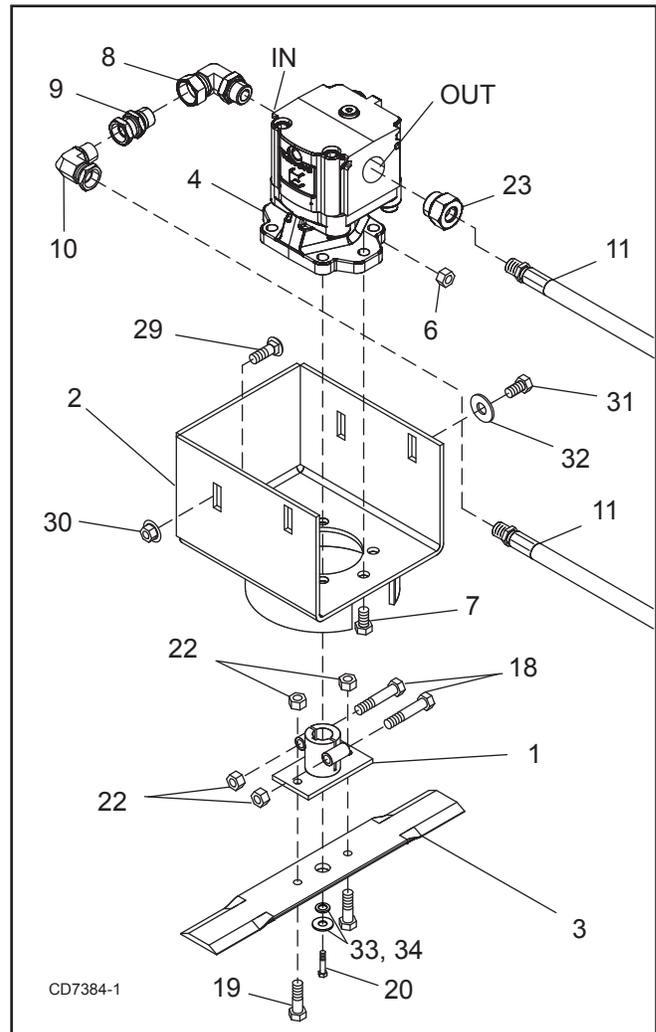


Figure 53. Motor Assembly

## Install Motor Housing

1. Slide motor assembly between shredder center channel and secure to the left side using two 1/2 NC x 1-1/4 carriage bolts (29) and flange lock nuts (30).
2. Install 1/2 NC x 1 cap screw (31) and flat washer (32) to the right rear hole of the motor housing and secure with flange lock nuts (30).
3. Install 1/2 NC x 1-1/4 carriage bolt (29) and flange lock nut (30) into the right front hole.
4. Raise motor housing to the bottom of the mounting slots and torque hardware to 85 lbs-ft.

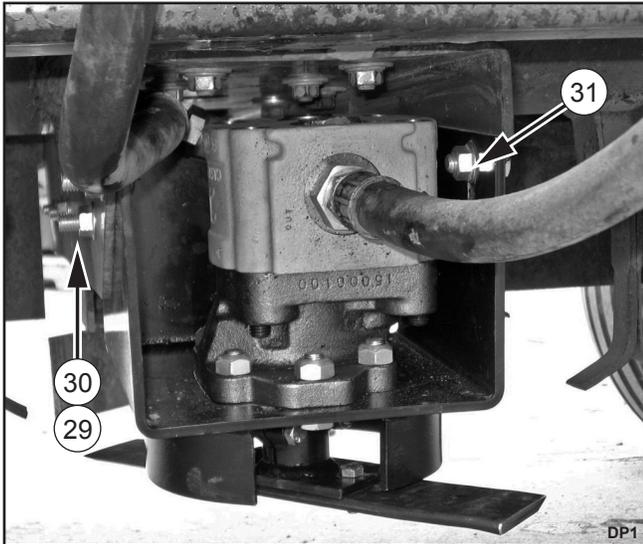


Figure 54. Motor Assembly Installed

## Assembly Hoses

1. Attach male quick coupler (17) and adapter (16) to the end of hose (15). Attach tee (12) to the opposite end of hose.
2. Attach male quick coupler (17) and adapter (16) to the end of second hose (15). Attach check valve (14), nipple (13) and tee (12) to the opposite end of hose.

**NOTE:** Make sure flow indicator arrow on the side of the check valve (14) is pointing in the correct direction. See Figure 55

3. Install check valve (14) and two nipples (13) between the two tees (12).

**NOTE:** Make sure flow indicator arrow on the side of the check valve (14) is pointing in the correct direction.

4. Place hose assembly around center plate of shredder and drape quick couplers over the front of the shredder. See Figure 55 and Figure 56.
5. Make sure hose with check valve is on the right side of the center plate.

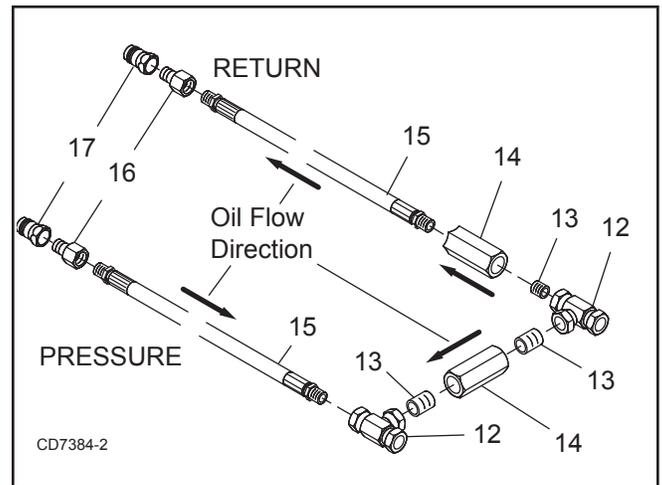


Figure 55. Hose Assembly

6. Route hose (11) from the IN side of the motor between shredder and rockshaft and attach it to tee (12) on the left side of the center plate.
7. Route hose (11) from the OUT side of the motor between shredder and rockshaft and attach it to tee (12) on the right side of the center plate.

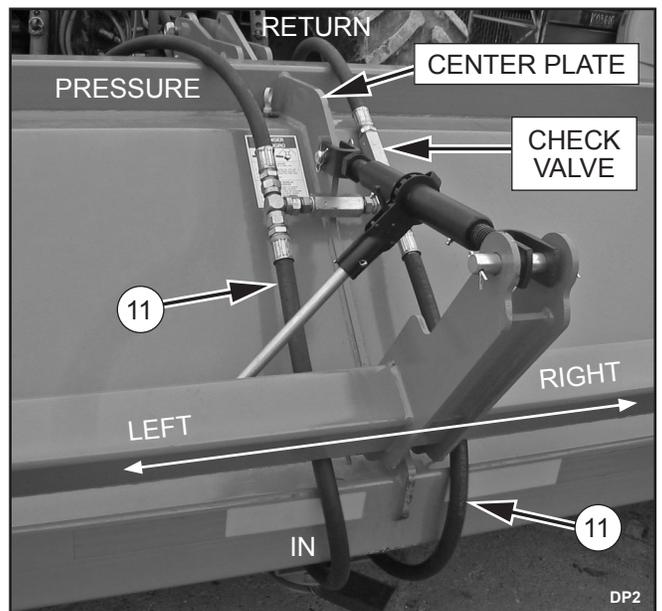


Figure 56. Hose Routing

## Install Hose Clamps

1. Place hose clamps (36) around hoses (11) and center hoses between center plate.
2. Mark clamp holes in desired location on shedder body and drill two 11/32" holes.
3. Secure hose clamps to shredder using 5/16 NF x 1-1/4 cap screws (20), flat washers (33), lock washers (34) and hex nuts (35). See Figure 57.

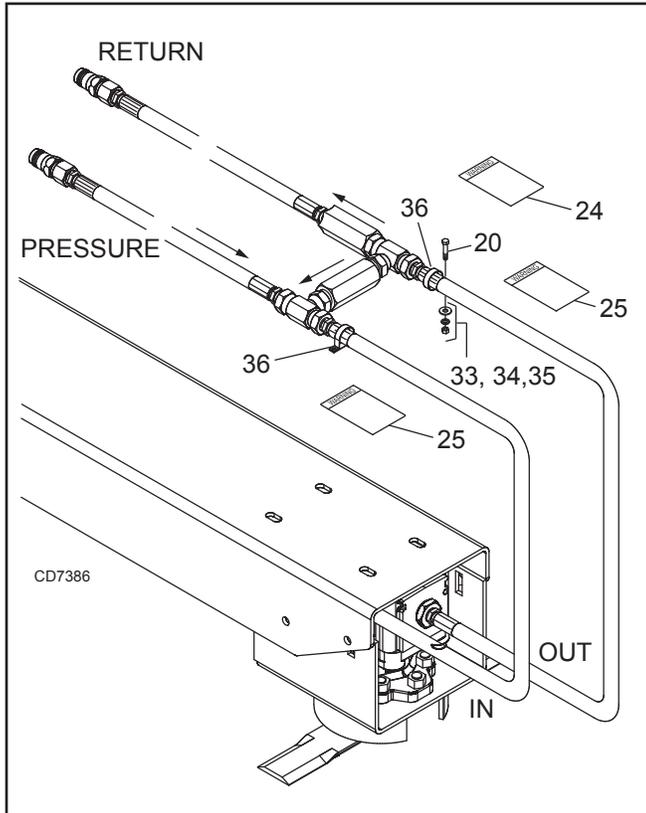


Figure 57. Hose Clamp Installation

## Connect Hoses to Tractor

### NOTICE

- Oil flow to hydraulic motor must not exceed 28 gpm.
1. Connect PRESSURE hose to a tractor rear remote quick coupler that has a lever (handle) that can be placed in the detent or locked position.
  2. RETURN hose must be connected directly to the tractor reservoir or to a specifically designated motor return or 'zero' back pressure port.

## Install Decals

Apply safety decals (24 & 25) to a clean surface on the back of the shredder where they can be seen with out obstructions. Install decals (25) on either side of the hose assembly. See Figure 57.

## Remove Deflector Kit

1022652 deflector kit must be removed from the shredder before using cutter kit. Deflector kit pushes material away from the cutter kit and preventing material from being cut.

# DEALER CHECKLISTS

## DEALER PRE-DELIVERY CHECKLIST

### (DEALER'S RESPONSIBILITY)

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

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

- \_\_\_\_\_ Check that all safety decals are installed and in good condition. Replace if damaged.
- \_\_\_\_\_ Properly attach implement to tractor and make all necessary adjustments.
- \_\_\_\_\_ Check all bolts to be sure they are properly torqued.
- \_\_\_\_\_ Check wheel bolts for proper torque.
- \_\_\_\_\_ Check that all cotter pins and safety pins are properly installed. Replace if damaged.
- \_\_\_\_\_ Check and grease all lubrication points as identified in Lubrication Schedule, page 23.

## DELIVERY CHECKLIST

### (DEALER'S RESPONSIBILITY)

- \_\_\_\_\_ Show customer how to make adjustments.
- \_\_\_\_\_ Instruct customer how to lubricate and explain the importance of lubrication.
- \_\_\_\_\_ Point out the safety decals. Explain their meaning and the need to keep them in place and in good condition. Emphasize the increased safety hazards when instructions are not followed.
- \_\_\_\_\_ Present Operator's Manual and request that customer and all operators read it before operating equipment. Point out the manual safety rules, explain their meanings and emphasize the increased safety hazards that exist when safety rules are not followed.
- \_\_\_\_\_ Explain to customer the potential crushing hazards of going underneath raised equipment. Instruct customer that service work does not require going underneath unit and never to do so.
- \_\_\_\_\_ Show customer the safe, proper procedures to be used when mounting, dismounting, and storing equipment.
- \_\_\_\_\_ For mounted units, add wheel weights, ballast in front tires, and/or front tractor weight to enhance front end stability. A minimum 20% of tractor and equipment gross weight must be on front tractor wheels. When adding weight to attain 20% of tractor and equipment weight on front tractor wheels, you must not exceed the ROPS weight certification. Weigh the tractor and equipment. Do not estimate!
- \_\_\_\_\_ Make customer aware of optional equipment available so that customer can make proper choices as required.

# NOTES



# FLAIL SHREDDER

## Center Drive

CENTER DRIVE FLAIL SHREDDER FRAME ASSEMBLY . . . . . 46 - 47

FLAIL TUBE ASSEMBLY . . . . . 48

WHEEL & CASTER ASSEMBLY (CLEVIS STYLE) . . . . . 49

WHEEL ASSEMBLY (CANTILEVER STYLE) . . . . . 50

BED CONE ASSEMBLY (OPTIONAL) . . . . . 51

WEASLER® PTO SHAFT WITH TORQMASTER CLUTCH

    24K PULL-TYPE . . . . . 51 - 52

    24K 2-POINT & 3-POINT . . . . . 53

DUAL SAFETY LIGHT KIT . . . . . 53

WEASLER 24K TORQMASTER CLUTCH . . . . . 54

WEASLER 30K AUTOMATIC CLUTCH (OPTIONAL) . . . . . 55

WEASLER PTO SHAFT WITH AUTOMATIC CLUTCH (OPTIONAL)

    30K 3-POINT . . . . . 56

    30K PULL-TYPE . . . . . 57

CENTER DRIVE GEARBOX ASSEMBLY . . . . . 58

RUBBER BELTING (OPTIONAL) . . . . . 59

RUBBER FLAPS (OPTIONAL) . . . . . 60

CENTER DEFLECTOR (OPTIONAL) . . . . . 61

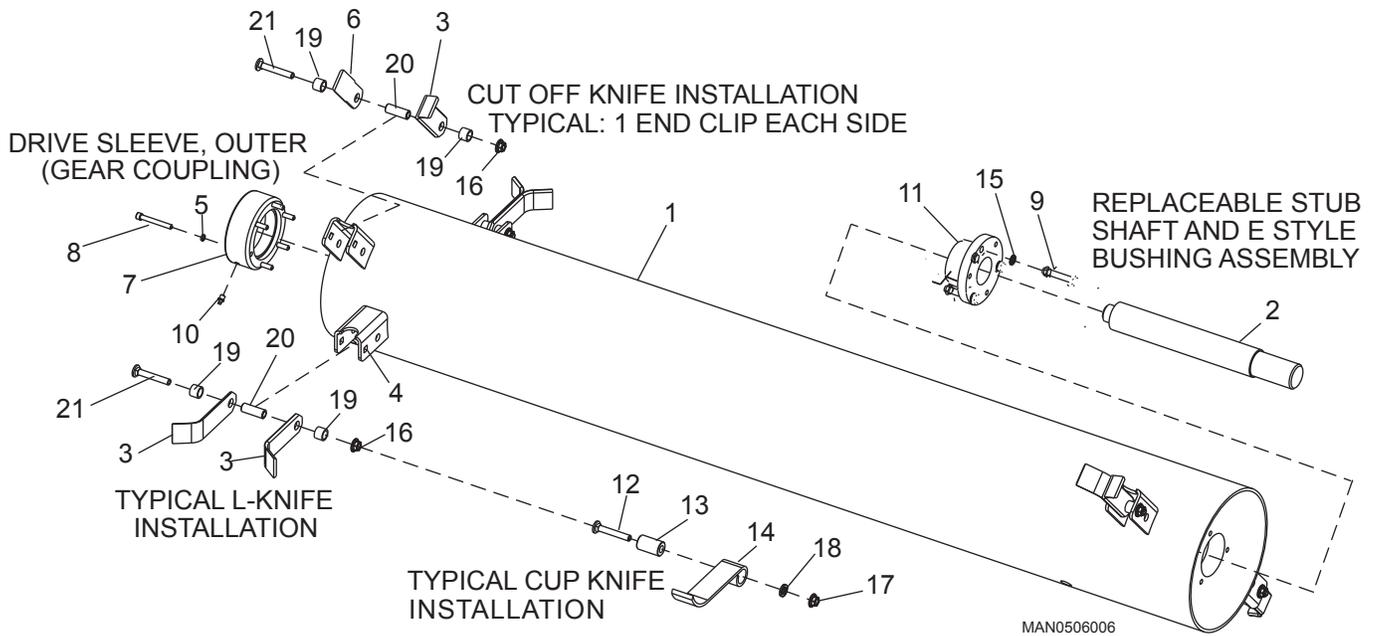
CENTER CUTTER KIT (OPTIONAL) . . . . . 62 - 63



# CENTER DRIVE FLAIL SHREDDER FRAME ASSEMBLY PARTS LIST

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	NSS	1	S15CD Body weldment	39	50530831	1	Hitch, Cat 3 complete (items 51-54)
1	NSS	1	S20CD Body weldment	41	90002734 *	4	5/8 NC x 1-3/4 Hex bolt, black
1	NSS	1	S22CD Body weldment	42	90006019	2	1" NC Nut
1	NSS	1	S25CD Body weldment	43	1013067	2	Skid weldment
1	NSS	1	S27CD Body weldment	44	1012202	AR	Rubber belt shield
2	-----	-	Flail tube asy, right & left (see page 48)	45	1016188	AR	Rubber belt shield, 15' & 27'
3	1016168	1	15' Rockshaft asy	45	1016195	AR	Rubber belt shield, 20'
3	1013097	1	20' Rockshaft asy	45	1019763	AR	Rubber belt shield, 22'
3	1016167	1	22' Rockshaft asy	47	10033957	1	Manual storage tube, clamp style -or-
3	1013057	1	25' Rockshaft asy	47	1003828	1	Manual storage tube, 1-piece style
3	1013122	1	27' Rockshaft asy	48	90011021	2	1" Lock washer
5	90507112	1	Tow chain (pull-type only)	49	50530219	1	Pin, rear hitch
6	1012170	2	Bearing, 2-3/16 flange	50	50520412	1	Pull-type hitch weldment
7	1010120	2	Bearing plate	51	50530834	1	Top plate
8	56383	2	Pin weldment	52	50530832	1	Cushion
9	50520211	2	Parking stand, square	53	50530833	1	V-Plate
10	1005338	2	Pin, bent 5/8 x 3 w/clip	54	90001411	2	3/4 NC x 3 Hex bolt GR5
14	1013049	1	Gearbox 800 Series (see page 58)	55	90001537	2	1 NC x 6-1/2 Hex bolt GR5
16	1016104	1	3-Point PTO shaft, 1-3/8" yoke with clutch (see page 51)	58	90023081 *	2	3/8 x 2 Cotter pin
16	1016105	1	3-Point PTO shaft, 1-3/4" yoke with clutch (see page 51)	59	50520433	1	Clevis hitch kit
16	1016106	1	3-Point PTO shaft, 1-3/8" yoke with clutch long (see page 51)	60	20030151	1	1" ID Mast spacer bushing
16	1016107	1	3-Point PTO shaft, 1-3/4" yoke with clutch long (see page 51)	63	50030338	2	Drive hub, splined inner
16	1016108	1	Pull-type PTO shaft, 1-3/8" yoke with clutch (see page 51)	64	90109126	2	O-Ring, flail coupler
16	1016109	1	Pull-type PTO shaft, 1-3/4" yoke with clutch (see page 51)	65	90039030	4	Snap ring, 1-3/4
17	1012175	1	Gearbox stand	66	50530313	4	Stud bolt, 5/8 NC x 2-3/4 GR5
20	90025004 *	2	1/8 Hair pin cotter	67	1016187	4	Spacer mast .75 x 3.00
21	90025012 *	2	7/16 x 2 Klik pin	68	1016186	2	Hardened bushing
22	20020705	1	Ratchet jack with pipe	69	90001531	5	Bolt, 1 x 5 HHCS GR5
24	20020553	2	Lower 3-pt hitch pin assembly	70	90006514	5	Nut, 1 NC Top lock
24a	90029204 *	1	5/16 x 1-5/8 Roll pin	71	20030960	2	Spacer, 1-3/4 OD
25	90006143	24	1/2 NC Nut, Spirallock flanged	72	20030961	2	Spacer, 1-7/16 OD
27	1019786	1	Dipstick tube/Jam nut/Dipstick	73	20030959	2	Spacer. 1-3/4 OD
29	1019755	-	Complete safety decal set	75	1013114	2	Upper mast plate
30	12735 *	24	1/2 NC x 1-3/4 HT Carriage bolt	76	20020553	2	Lower 3-pt hitch pin asy
31	90023084 *	2	3/8 x 3-1/2 Cotter pin	77	90017110	2	1/4 x 1/2 Hex wash self-tap screw
32	230 *	8	5/8 NC Nut ZP	78	10033958	1	Clamp
33	2855 *	8	5/8 NC x 2 Carriage bolt	79	57050	2	Access hole cover
34	90011015 *	8	5/8 Lock washer	80	14350 *	2	3/8 NC Flange hex lock nut
36	20973 *	AR	3/8 NC x 1-1/4 Carriage bolt GR5				
37	565 *	AR	3/8 Flat washer				
38	90006500 *	AR	3/8 NC Top lock nut				
					AR		As Required
					NSS		Not Sold Separately
					*		Standard hardware, obtain locally

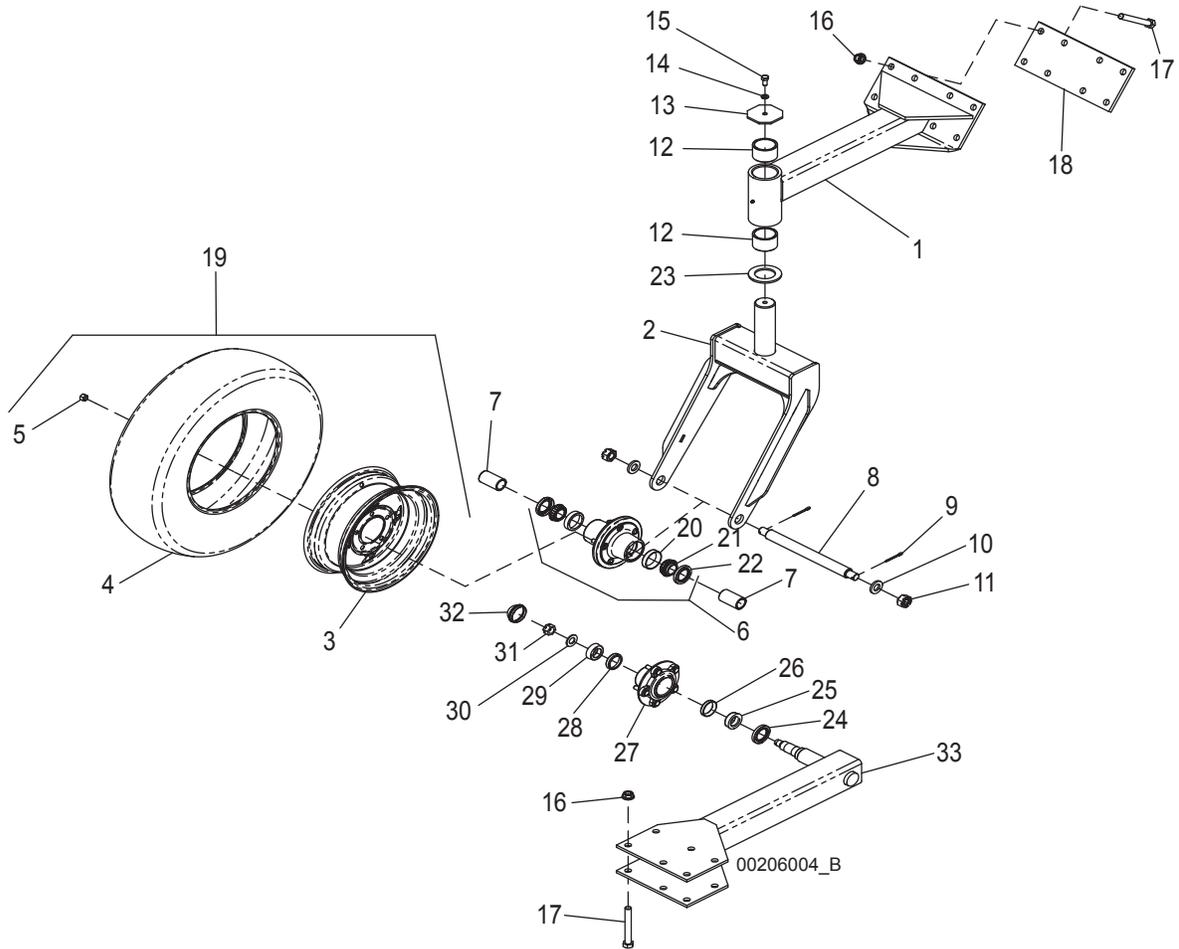
# FLAIL TUBE ASSEMBLY



REF	LEFT PART	RIGHT PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION	
1	1016199LK	1016198LK	1	15' Flail tube w/ knives	2	1012163	2	Stub shaft, 2-3/16"	
1	1016199HD	1016198HD	1	15' HD Cotton tube w/ knives	3	50531067	AR	L-Knife, long 8-1/2", (6 mm)	
1	1016199CP	1016198CP	1	15' Cup knife tube w/ knives	3	1019788	AR	L-Knife, HD cotton (Durafaced) (8 mm)	
1	1013109LK	1013108LK	1	20' Flail tube w/ knives	4	50531048	AR	Weld-on clip	
1	1013109HD	1013108HD	1	20' HD Cotton tube w/ knives	5	50030779	12	3/8 High collar lock washer	
1	1013109CP	1013108CP	1	20' Cup knife tube w/ knives	6	1010056	AR	L- Knife, cut off	
1	1016179LK	1016178LK	1	22' Flail tube w/ knives	6	1019789	AR	L- Knife, cut off	
1	1016179HD	1016178HD	1	22' HD Cotton tube w/ knives	7	50030345	2	Drive hub sleeve, outer	
1	1016179CP	1016178CP	1	22' Cup knife tube w/ knives	8	1013092	12	3/8 NC x 2-1/2 SHCS	
1	1012169LK	1012168LK	1	25' Flail tube w/ knives	9	90002526	6	1/2 NC x 2-3/4 Tap bolt, full thread	
1	1012169HD	1012168HD	1	25' HD Cotton tube w/ knives	10	90515001	*	2	1/8 NPT Straight grease fitting
1	1012169CP	1012168CP	1	25' Cup knife tube w/ knives	11	1012164	2	2-7/16 Hub, E-style	
1	1013119LK	1013118LK	1	27' Flail tube w/ knives	12	90001357	*	AR	5/8 NC x 3-1/2 Hex bolt GR5
1	1013119HD	1013118HD	1	27' HD Cotton tube w/ knives	13	50530405	AR	Hardened wear bushing	
1	1013119CP	1013118CP	1	27' Cup knife tube w/ knives	14	1022607	AR	Steel cup flail 8-1/2" (Standard)	
					14	1022606	AR	Steel cup flail 7-1/2"	
					14	1022605	AR	Steel cup flail short 6-3/16"	
					15	90011013	*	AR	1/2 Lock washer
					16	11900	*	AR	1/2 NC Flange lock nut
					17	90006508	AR	5/8 NC Top lock nut	
					18	90011015	*	AR	5/8 Lock washer
					19	1010061	AR	Spacer, steel (for 6 mm L-knife)	
					19	1012184	AR	Spacer, steel (for 8 mm L-knife)	
					20	1010062	AR	Bushing, L-knife	
					21	90001758	*	AR	1/2 NC x 3-1/4 Carriage bolt

SHCS      Socket Head Cap Screw  
 NS        Not Shown  
 AR        As Required  
 \*         Standard hardware, obtain locally

## WHEEL & CASTER ASSEMBLY (CLEVIS STYLE)



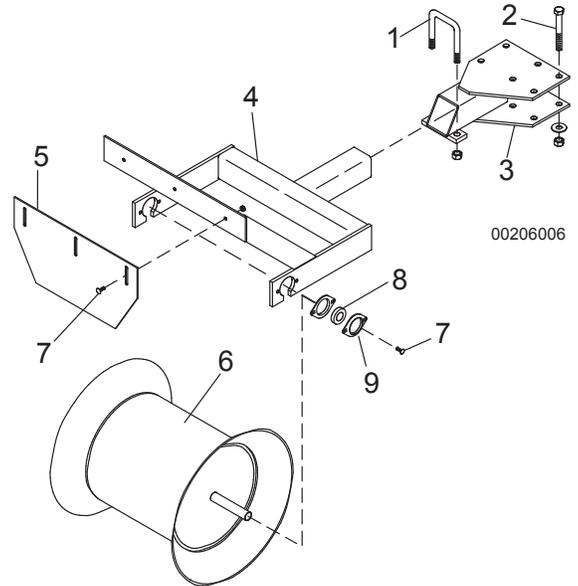
REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1010013	1	Caster arm assembly (8 holes)	19	1040995	1	11.5L x 15, Tire, rim & hrdw
2	1041897	1	Caster & hub assembly	20	7069	2	Bearing cup
2	1040973	1	Caster weldment	21	1041042	2	Bearing cone
3	1041045	1	Wheel rim (15" x 8 5 bolt)	22	1041043	2	Seal
4	1041044	1	Tire, 11L x 15	23	20031233	1	Oilite washer
5	35317	5	1/2 NF Wheel nut	24	90109002	1	Seal
6	1041000	1	Hub, 5 bolt (Inc. items 5, 20, 21 & 22)	25	90101023	1	Inner bearing cone
7	1041005	2	Spacer	26	90101022	1	Inner bearing cup
8	1041001	1	Axle	27	90509003	1	Hub, 5 bolt
9	64803 *	2	3/16 x 2 Cotter pin	28	90101016	1	Outer bearing cup
10	11920	2	Washer, 1 x 1-7/8 x 1/4	29	2303	1	Outer bearing cone
11	106861	2	1"-8 UNC Hex slotted nut	30	28539	1	7/8 SAE Flat washer
12	20031766	2	Bearing caster pivot	31	20378	1	7/8 NF Slotted hex nut
13	20031219	1	Retainer plate	32	90509009	1	Dust cap
14	855 *	1	1/2 lock washer	33	50520111	1	Strut weldment
15	25475 *	1	1/2 NC x 1 HHCS, GR5	33	50520112	1	Strut assembly with hub
16	302207	8	3/4 NC Flanged lock nut		HHCS		Hex Head Cap Screw
17	2377	8	3/4 NC x 6 HHCS, GR5		*		Standard hardware, obtain locally
18	1010014	1	Back plate				



## BED CONE ASSEMBLY (OPTIONAL) 50510065

REF	PART	QTY	DESCRIPTION
1	20031440	1	U-Bolt, 3/4 NC x 4 x 5.5 long
2	2377	6	3/4 NC x 6 Hex bolt GR5
3	50520162	1	Strut weldment
4	50520163	1	Yoke weldment
5	50530349	1	Scraper
6	50520164	1	Roller weldment
7	20973 *	7	3/8 NC x 1-1/4 Carriage bolt GR5
8	90101002	2	1-1/4 Insert bearing
9	NSS	4	2-Hole flange
A	50520179	1	Packer asy (Items 4-9)

NSS Not sold separately  
 \* Standard hardware, obtain locally

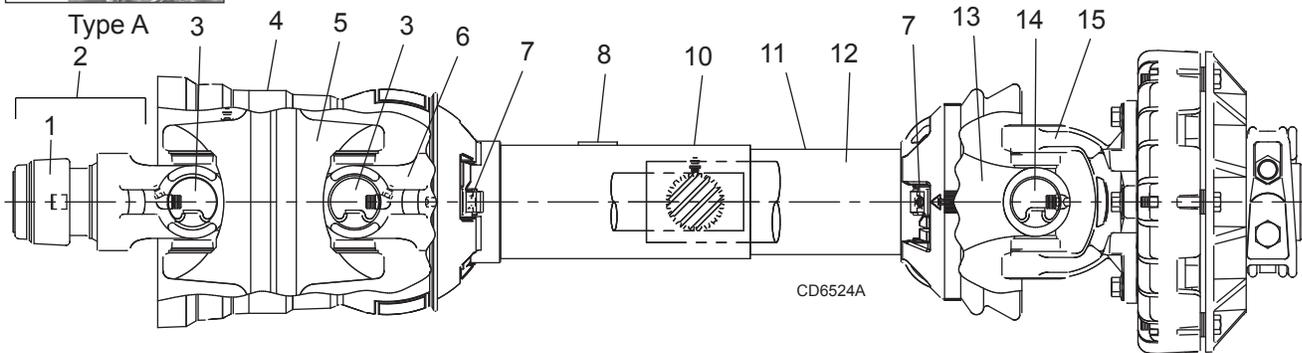


## TYPE A - WEASLER® 24K PULL-TYPE PTO SHAFT WITH TORQMASTER CLUTCH



Note 1: Two types of Weasler Drives are used.  
 See photo to determine type.

Note 2: Lube fitting in center of cross and bearing.

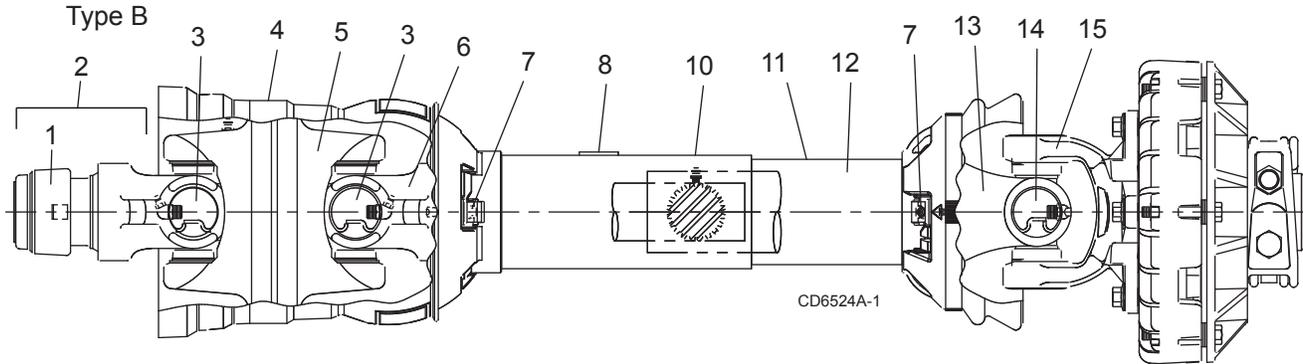


REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	19851	1	Slide lock repair kit 1.38 ID -or-	10	1010819	1	Outer guard & bearing
	19837	1	Slide lock repair kit 1.75 ID	11	1010820	1	Inner guard & bearing
2	90317733	1	Slide lock yoke asy 1.38 ID -or-	12	33347	1	Decal, Danger, Guard missing
	90318121	1	Slide lock yoke asy 1.75 ID	13	90317909	1	Yoke, tube & slip sleeve
3	58759	2	Cat 6 CV U-joint repair kit	14	58765	1	U-Joint cross & bearing kit
4	19840	1	CV Bell shield	15	1010805	1	Clutch asy, 55 clamp 24K
5	58760	1	CV Body with fitting	A	1016108	1	PTO CV 1.38-21 CD P-type 24KE
6	90318183	1	Yoke & shaft 26.8	A	1016109	1	PTO CV 1.75-20 CD P-type 24KE
7	19846	2	Shield bearing repair kit	B	1016127	1	Tractor half asy with guard 1.38
8	18864	1	Safety sign	B	1016125	1	Tractor half asy with guard 1.75
9	55648	1	Centralizer repair kit (not shown)				

# TYPE B - WEASLER® 24K PULL-TYPE PTO SHAFT WITH TORQMASTER CLUTCH

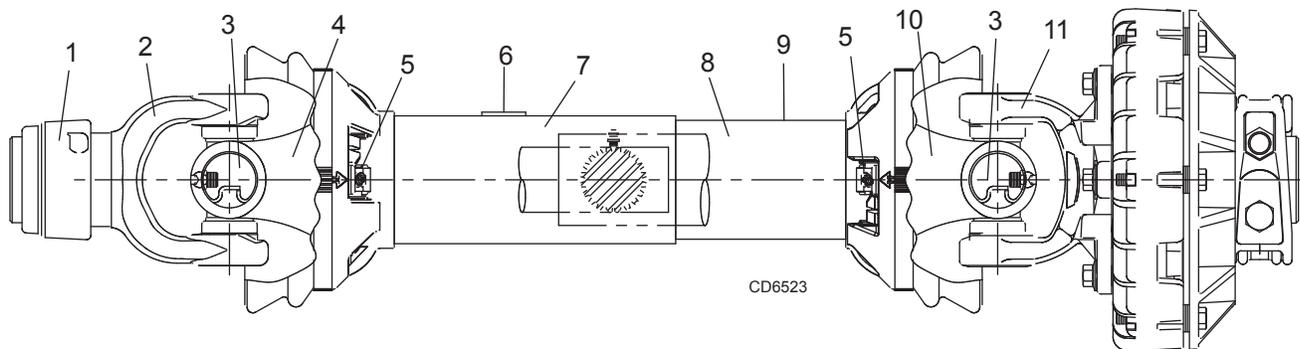


Note 1: Two types of Weasler Drives are used.  
See photo to determine type.  
Note 2: Lube fitting at end of cross and bearing.



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
A	1016108	1	PTO complete 1-3/8 21 spline -or-	9	55648	1	Centralizer repair kit (not shown)
A	1016109	1	PTO complete 1-3/4 20 spline	10	1010819	1	Outer guard & bearing
1	19851	1	Slide lock repair kit 1.38 ID -or-	11	1010820	1	Inner guard & bearing
	19837	1	Slide lock repair kit 1.75 ID	12	33347	1	Decal, Danger, Guard missing
2	1033104	1	Slide lock yoke asy 1.38 ID -or-	13	90317909	1	Yoke, tube & slip sleeve
	1033105	1	Slide lock yoke asy 1.75 ID	14	58765	1	U-Joint cross & bearing kit
3	1033107	2	Cat 6 CV U-joint repair kit	15	1010805	1	Clutch asy, 55 clamp 24K
4	19840	1	CV Bell shield	A	1016108	1	PTO CV 1.38-21 CD P-type 24KE
5	1033106	1	CV Body with fitting	A	1016109	1	PTO CV 1.75-20 CD P-type 24KE
6	1033109	1	Yoke & shaft	B	1016127	1	Tractor half asy with guard 1.38
7	19846	2	Shield bearing repair kit	B	1016125	1	Tractor half asy with guard 1.75
8	18864	1	Safety sign				

# WEASLER® 24K 2-POINT & 3-POINT PTO SHAFT WITH TORQMASTER CLUTCH

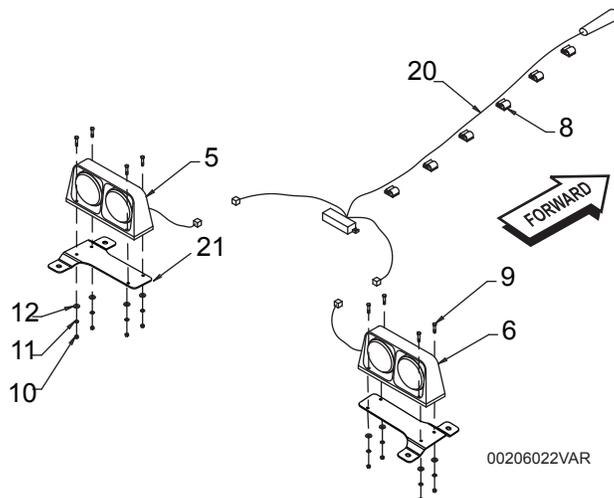


REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	19851	1	Slide lock repair kit 1.38 ID -or-	10	90317724	1	Yoke, tube & slip sleeve
1	19837	1	Slide lock repair kit 1.75 ID	11	1010805	1	Friction overrunning clutch asy. 55 clamp (24K)
2	90317208	1	Slide yoke assembly 1.38 ID -or-	A	1016104	1	PTO Shaft complete 1-3/8 -21 CD Std
2	90317418	1	Slide yoke assembly 1.75 ID	A	1016105	1	PTO Shaft complete 1-3/4 -20 CD Std
3	1016113	2	U-Joint cross & bearing kit	B	1016106	1	PTO Shaft complete 1-3/8 -21 CD long
4	90318183	1	Yoke & shaft 26.8 center-end -or-	B	1016107	1	PTO Shaft complete 1-3/4 -20 CD long
4	90318074	1	Yoke & shaft, 32.9 center-end	C	1016117	1	Tractor half asy w/guard 1-3/4 Std
5	19846	1	Shield bearing repair kit	C	1016111	1	Tractor half asy w/guard 1-3/8 Std
6	18864	1	Safety sign	D	1016122	1	Tractor half asy w/guard 1-3/8 long
7	1010803	1	Outer guard & bearing (1016117, 1016111) -or-	D	1016124	1	Tractor half asy w/guard 1-3/4 long
7	1010813	1	Outer guard & bearing (1016122, 1016124)	E	1016112	1	Implement half asy w/guard 24K
8	1010804	1	Inner guard & bearing				
9	33347	1	Safety sign, Danger, Guard missing				

## DUAL SAFETY LIGHT KIT (OPTIONAL)

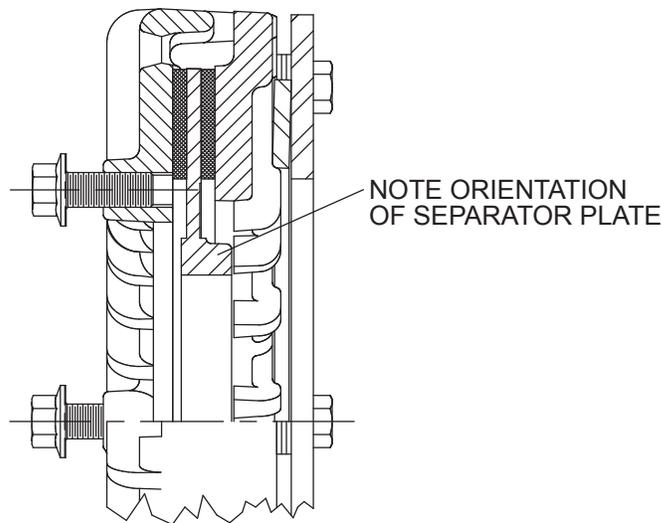
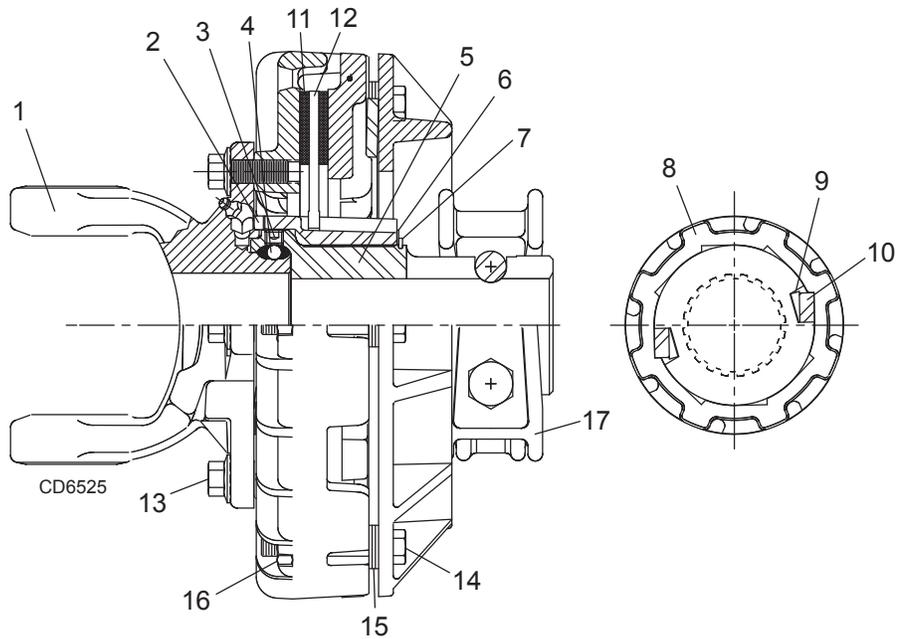
REF	PART	QTY	DESCRIPTION
5	90401149	1	Dual lamp, 4-pin LH
6	90401150	1	Dual lamp, 4-pin RH
8	90507121	12	Clamp, adhesive-backed
9	10378 *	10	1/4 NC x 1 Hex bolt GR5
10	5288 *	10	1/4 NC Hex nut
11	1985 *	10	1/4 Lock washer
12	5336 *	10	1/4 Flat washer
20	90401152	1	Wiring harness, wishbone 26'
21	50530986	2	Bracket, dual safety light

\* Standard hardware, obtain locally



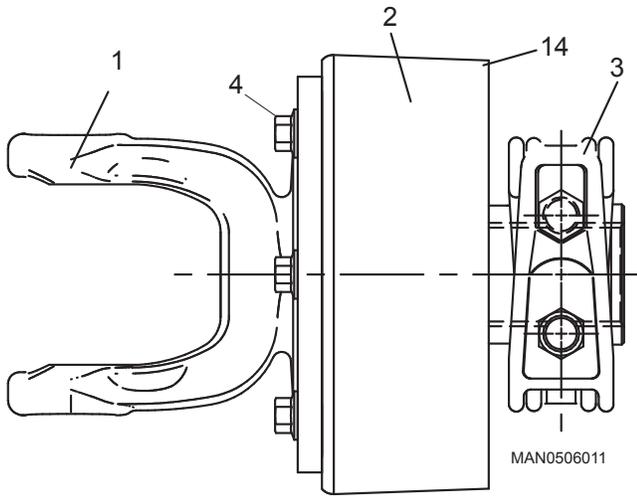
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# WEASLER® 24K TORQMASTER CLUTCH ASSEMBLY

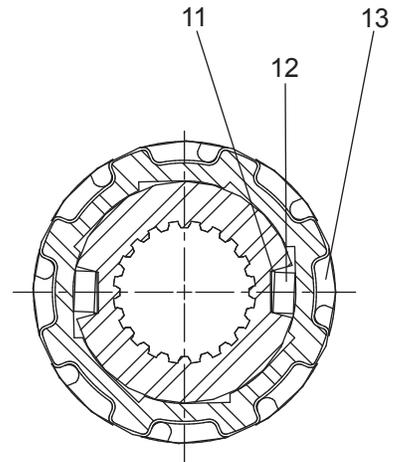
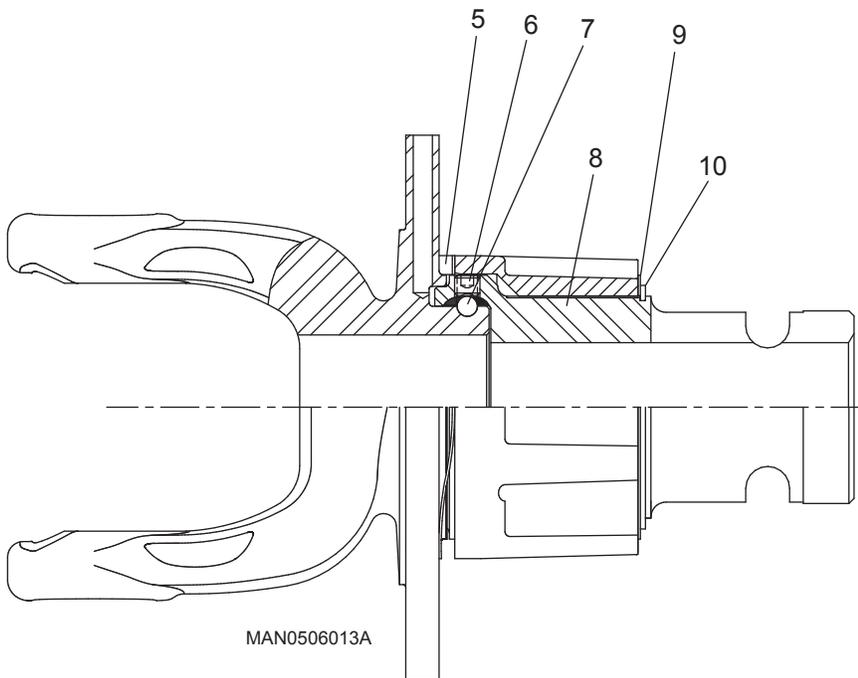


REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1010831	1	Yoke, Clamp style with overrunning clutch & hub asy (10 mm bolts) (includes Items 2-10)	11	90318175	2	Friction disk
1A	1019629	1	Overrunning clutch repair kit (includes items 2, 6, 7, 9, & 10)	12	90318174	1	Separator plate
2	90318165	1	Wave spring	13	90003055	4	M10 x 1.50 x 25 Serrated hex head cap screw
3	90318154	1	Set screw, .312-18 x .25 long	14	90003053	6	M8 x 1.25 x 60 Hex bolt, CL 10.9
4	90317541	31	Ball, 1/4" dia.	15	90011236	A/R	Washer, 8 mm x 1.6 thick
5	1019630	1	OR Inner hub assembly	16	90006548	6	Nut, M8 x 1.25 Hex ZP
6	90318167	1	Washer	17	1010833	1	Hub clamp asy 1.75
7	90318168	1	Retaining ring	A	1010832	1	Friction pack, overrunning (10 mm bolts, 24K)
8	90318169	1	Overrunning hub	B	1010805	1	Complete clutch asy, 55 clamp (10 mm bolts, 24K)
9	90318170	1	Leaf spring				
10	90318171	1	Overrunning key		NSS		Not Serviced Separately

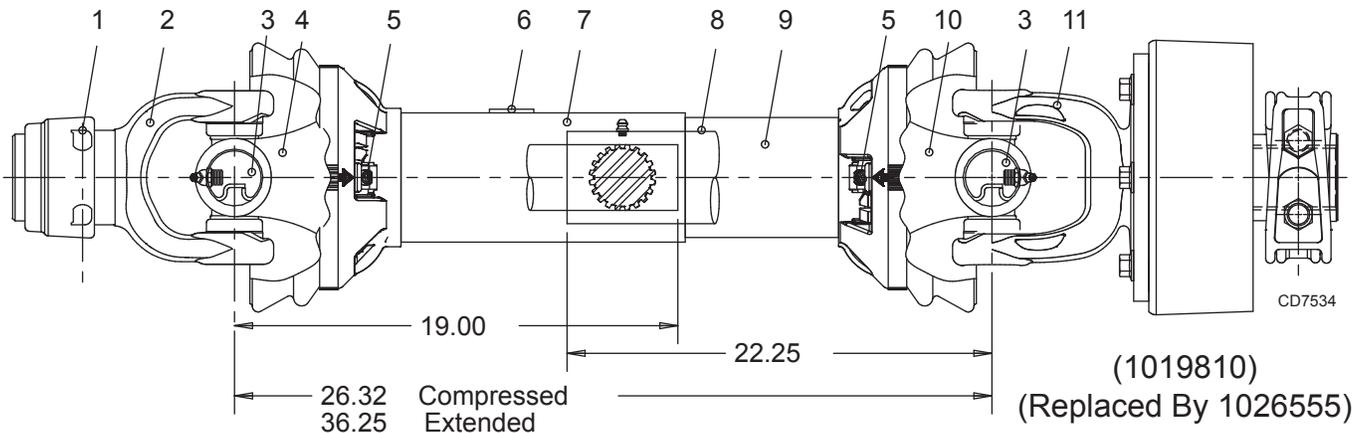
# WEASLER® 30K AUTOMATIC CLUTCH (OPTIONAL)



REF	PART	QTY	DESCRIPTION
A	1019811	-	Automatic clutch asy complete
1	1019813	1	Yoke & hub, 30K auto
2	1019814	1	Clutch pack, 30K auto
3	1010833	1	Hub clamp assembly 1-3/4
4	1025874	6	HHCS, M12-1.75P x 20 mm CL10.9 flanged head
5	90318165	1	Wave spring
6	90318154	1	Set screw, .312-18 x .25 long
7	90317541	31	Ball, 1/4" dia
8	1019630	1	Overrunning inner hub
9	90318167	1	Washer
10	90318168	1	Retaining ring
11	90318170	2	Leaf spring
12	90318171	2	Overrunning key 1/4 x 1/2 x 1-1/2
13	90318169	1	Overrunning hub
14	1042049	1	Retaining ring
15	1019629	1	Overrunning repair kit Includes items 5, 9, 10, 11 & 12) (Not shown)

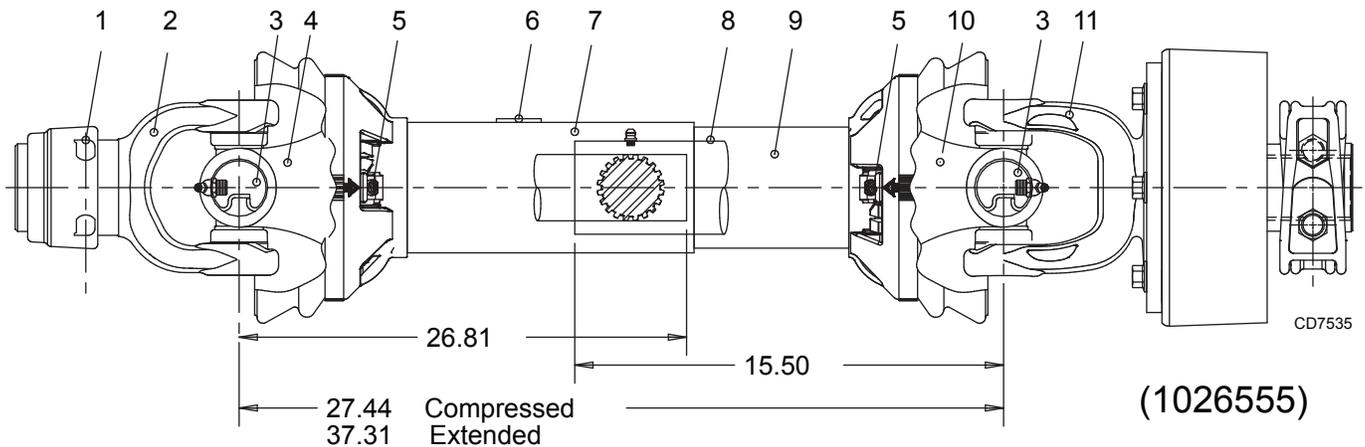


## WEASLER® 30K 3-POINT PTO SHAFT WITH AUTOMATIC CLUTCH (OPTIONAL)



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
A	1019810	-	PTO Shaft complete 1-3/4 20-spline 30K 3-point with automatic clutch	6	90317455	1	Safety sign
1	19837	1	Slide lock repair kit 1.75 ID	7	1022638	1	Outer guard & bearing
2	90317418	1	1-3/4 20-Spline yoke	8	1022639	1	Inner guard & bearing
3	58765	2	U-Joint cross & bearing kit 55E	9	33347	1	Danger decal, guard missing
4	1022637	1	Yoke & shaft, (1.69 - 20 spline)	10	1022640	1	Yoke, tube & slip sleeve
5	1009065	2	Drive shield bearing kit	11	1019811	1	Automatic clutch assembly 30K (see page 55 for breakdown)

## WEASLER® 30K 3-POINT PTO SHAFT WITH AUTOMATIC CLUTCH (OPTIONAL)



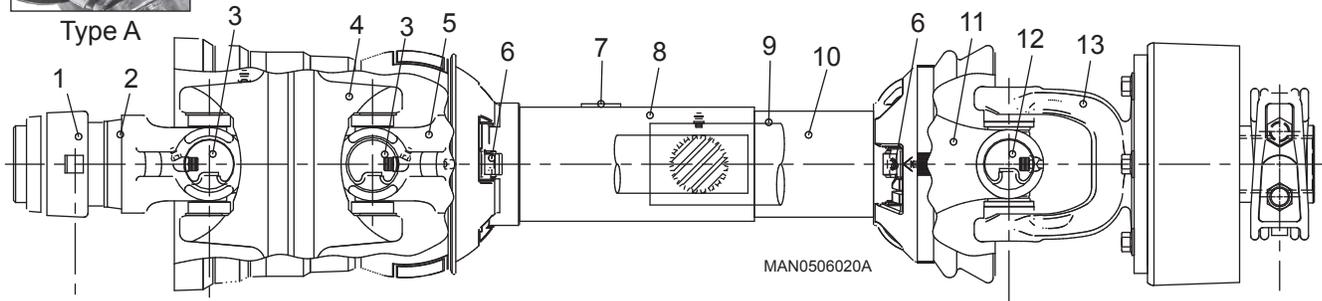
REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
A	1026555	-	PTO Shaft complete 1-3/4 20-spline 30K 3-point with automatic clutch	5	1009065	2	Drive shield bearing kit
1	19837	1	Slide lock repair kit 1.75 ID	6	90317455	1	Safety sign
2	90317418	1	1-3/4 20-Spline yoke	7	1010803	1	Outer guard & bearing
3	58765	2	U-Joint cross & bearing kit 55E	8	1010804	1	Inner guard & bearing
4	90317613	1	Yoke & shaft, 1.69 20-spline, 30.6 long -or-	9	33347	1	Danger decal, guard missing
4	90318183	1	Yoke & shaft, 1.69 20-spline, 26.8 long	10	90317724	1	Yoke, tube & slip sleeve
				11	1019811	1	Automatic clutch assembly 30K (see page 55 for breakdown)

# TYPE A - WEASLER® 30K PULL-TYPE PTO SHAFT WITH AUTOMATIC CLUTCH (OPTIONAL)



Note 1: Two types of Weasler Drives are used.  
See photo to determine type.

Note 2: Lube fitting in center of cross and bearing.



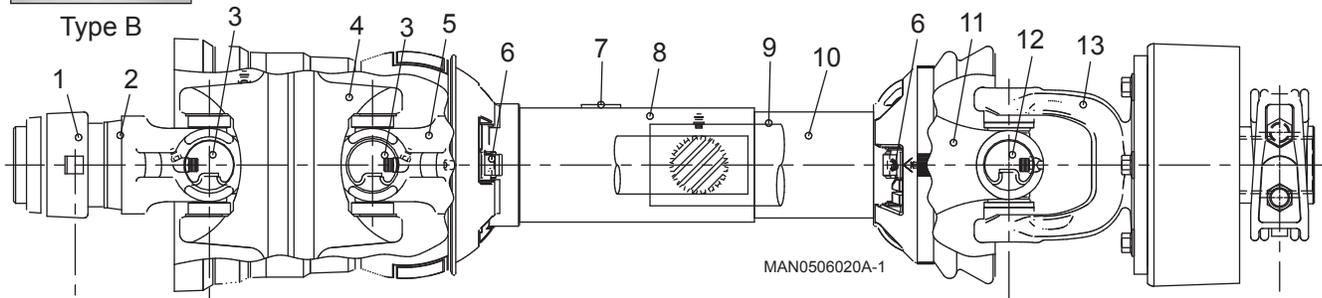
REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
A	1019820	-	PTO Shaft complete 1-3/4 20-spline 30K pull-type with automatic clutch	7	18864	1	Safety sign
1	19837	1	Slide lock repair kit 1.75 ID	8	1022642	1	Outer guard & bearing
2	90318121	1	Slide lock yoke assembly	9	1022643	1	Inner guard & bearing
3	58759	2	CV U-Joint repair kit 55E	10	33347	1	Danger decal, guard missing
4	58760	1	CV Body with fitting	11	1022644	1	Yoke, tube & slip sleeve
5	1022641	1	Yoke & shaft (1.69 - 20 spline)	12	58765	2	U-Joint cross & bearing kit 55E
6	1009065	2	Drive shield bearing kit	13	1019811	1	Automatic clutch assembly 30K (see page 55 for breakdown)

# TYPE B - WEASLER® 30K PULL-TYPE PTO SHAFT WITH AUTOMATIC CLUTCH (OPTIONAL)



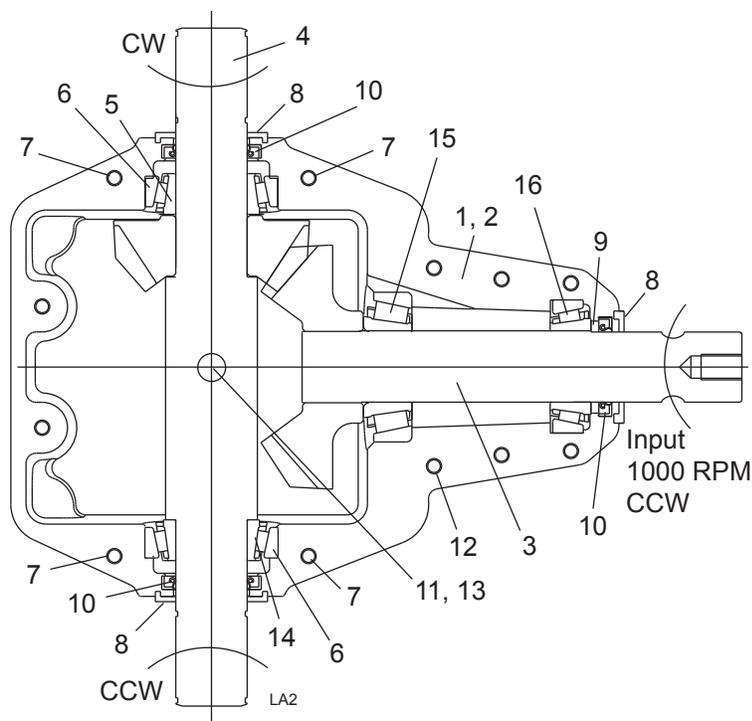
Note 1: Two types of Weasler Drives are used.  
See photo to determine type.

Note 2: Lube fitting at end of cross and bearing.



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
A	1019820	-	PTO Shaft complete 1-3/4 20-spline 30K pull-type with automatic clutch	7	18864	1	Safety sign
1	19837	1	Slide lock repair kit 1.75 ID	8	1022642	1	Outer guard & bearing
2	1033105	1	Slide lock yoke assembly	9	1022643	1	Inner guard & bearing
3	1033107	2	CV U-Joint repair kit 55E	10	33347	1	Danger decal, guard missing
4	1033106	1	CV Body with fitting	11	1022644	1	Yoke, tube & slip sleeve
5	1033109	1	Yoke & shaft (1.69 - 20 spline)	12	58765	2	U-Joint cross & bearing kit 55E
6	1009065	2	Drive shield bearing kit	13	1019811	1	Automatic clutch assembly 30K (see page 55 for breakdown)

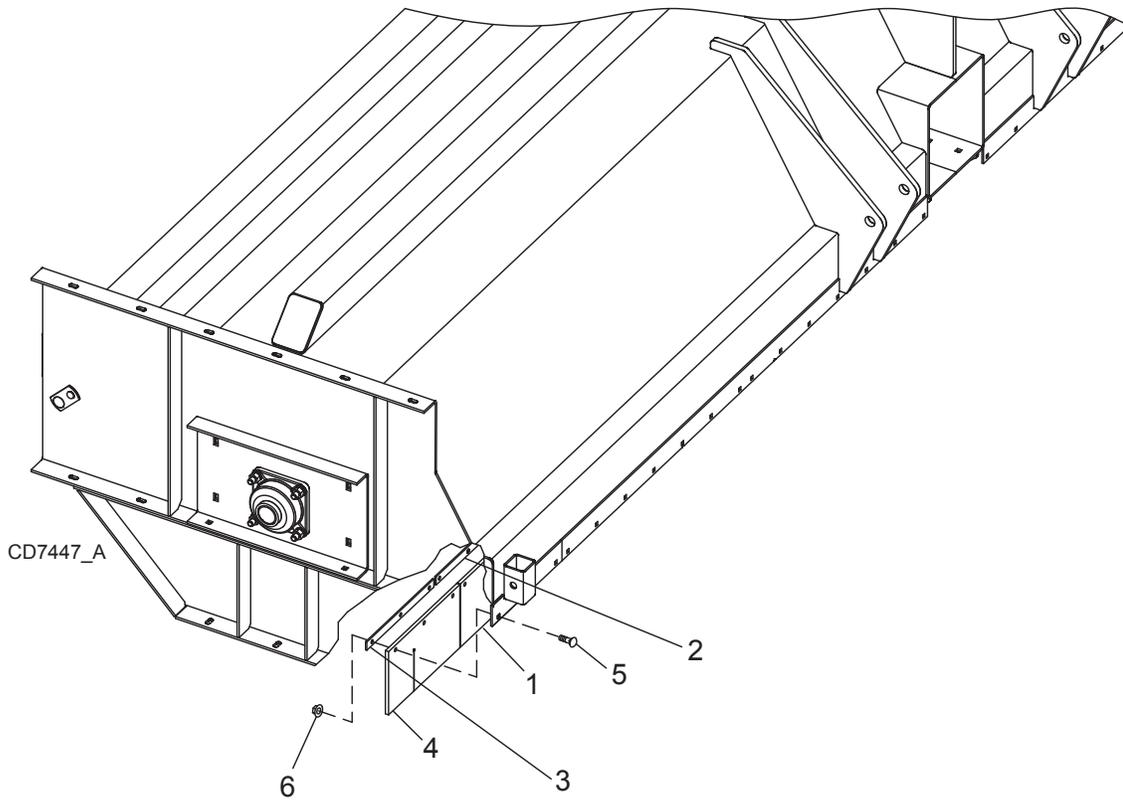
## CENTER DRIVE GEARBOX ASSEMBLY



REF	PART	QTY	DESCRIPTION
A	1013049	1	Complete gearbox, Series 800
1	1019782	1	Casting, Threaded holes
2	1019783	1	Casting, Non-threaded holes
3	1019784	1	Pinion shaft/gear asy 27T with bearing cones & bearing cups
4	90315546	1	Cross shaft/gear asy 20T
5	90101150	1	Bearing cone
6	90101152	2	Bearing cup
7	1019785	4	Bolt, 3/8-16 x 2.75 SHCS
8	1019787	3	Guard, seal
9	90039030	1	Snap ring 1.750
10	90109125	3	Seal TC-1.750-2.437-.312
11	90503078	2	Plug, 1/2-14 NPT SCHD W/3M
12	90003033	8	Bolt, 3/8-16 x 2.25 SHCS
13	90501159	1	Bushing, 1/2 NPT to 1/8 NPT
14	90101328	1	Bearing cone
15	NSS	-	Bearing cone (included in item 3)
16	NSS	-	Bearing cone (included in item 3)
	NSS		Not Serviced Separately

**NOTE:** To separate gearbox halves for servicing, seal guards (8) must be removed first otherwise damage to gearbox housings will occur. Seal guards can be removed by gently prying out of housing with a flat blade screwdriver using the cutout areas machined in the housing to get behind the guards. Use care not to bend guards during removal so they can be reused for reassembly. Replace guards if they are damaged.

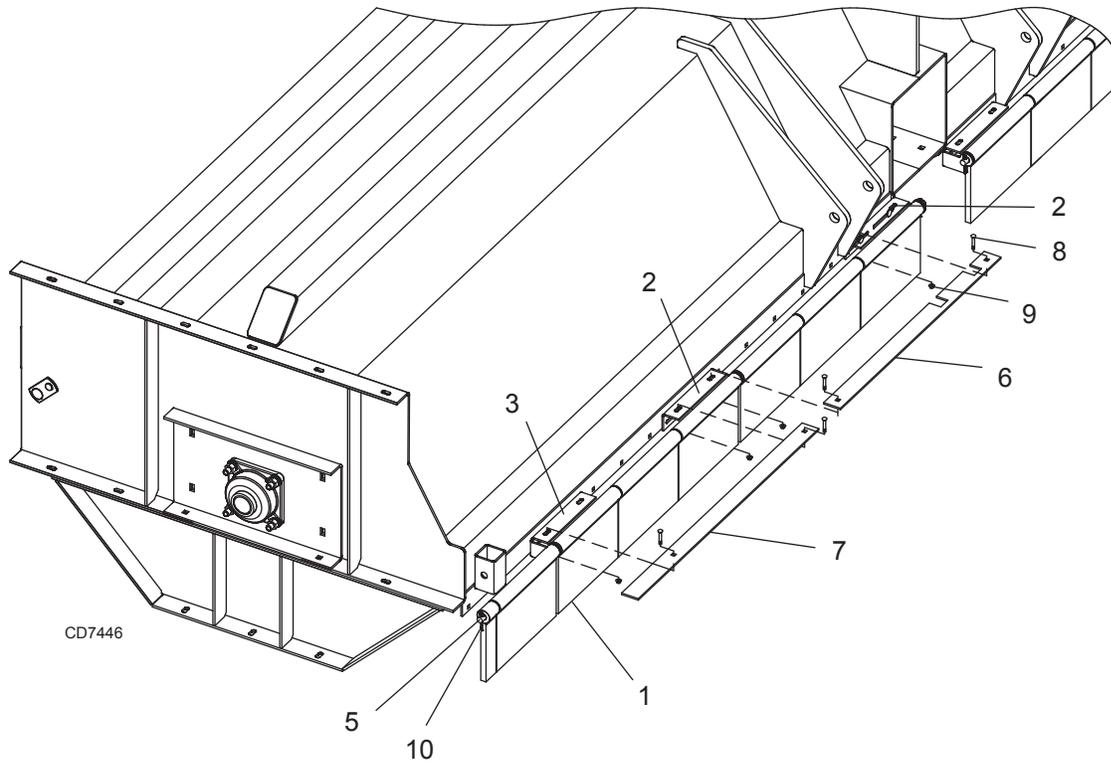
## RUBBER BELTING (OPTIONAL)



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1012202	4	Rubber belting (15 ft)	5	64824 *	34	3/8 NC x 1-1/2 Carriage bolt (15 ft)
1	1012202	6	Rubber belting (20 ft & 22 ft)	5	64824 *	46	3/8 NC x 1-1/2 Carriage bolt (20 ft)
1	1012202	8	Rubber belting (25 ft & 27 ft)	5	64824 *	50	3/8 NC x 1-1/2 Carriage bolt (22 ft)
2	1022647	4	Belt bar (15ft)	5	64824 *	62	3/8 NC x 1-1/2 Carriage bolt (25 ft)
2	1022647	6	Belt bar (20 ft & 22 ft)	5	64824 *	34	3/8 NC x 1-1/2 Carriage bolt (27 ft)
2	1022647	8	Belt bar (25 ft & 27 ft)	6	14350 *	34	3/8 NC flange lock nut (15 ft)
3	1022649	2	Belt bar (15 ft & 27 ft)	6	14350 *	46	3/8 NC flange lock nut (20 ft)
3	1022648	2	Belt bar (20 ft)	6	14350 *	50	3/8 NC flange lock nut (22 ft)
3	1022650	2	Belt bar (22 ft)	6	14350 *	26	3/8 NC flange lock nut (25 ft)
4	1016188	2	Rubber belting (15 ft & 27 ft)	6	14350 *	62	3/8 NC flange lock nut (27 ft)
4	1016195	2	Rubber belting (20 ft)				
4	1019763	2	Rubber belting (22 ft)				

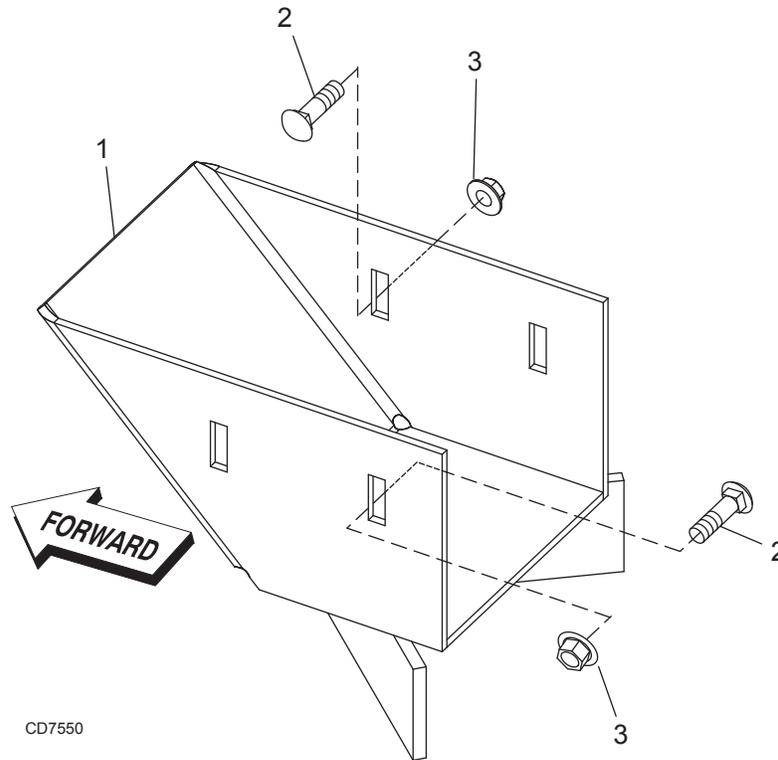
\* Standard hardware, obtain locally

## RUBBER FLAP (OPTIONAL)



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	50531089	14	Rubber flap (12" - 15 ft)	6	1026528	2	Swing flap bar, mast plate (32" all)
1	50531089	18	Rubber flap (12" - 20 ft)	7	1026529	2	Swing flap bar (32", 20 ft, 25 ft, 27 ft)
1	50531089	20	Rubber flap (12" - 22 ft)	8	15028 *	20	3/8 NC x 1 Carriage bolt (15 ft)
1	50531089	24	Rubber flap (12" - 25 ft)	8	15028 *	28	3/8 NC x 1 Carriage bolt (20 ft)
1	50531089	26	Rubber flap (12" - 27 ft)	8	15028 *	32	3/8 NC x 1 Carriage bolt (22 ft)
2	1022659	3	Flap bracket, right (15 ft)	8	15028 *	36	3/8 NC x 1 Carriage bolt (25 ft)
2	1022659	4	Flap bracket, right (20 ft)	8	15028 *	40	3/8 NC x 1 Carriage bolt (27 ft)
2	1022659	5	Flap bracket, right (22 ft & 25 ft)	9	14350 *	20	3/8 NC Flange lock nut (15 ft)
2	1022659	6	Flap bracket, right (27 ft)	9	14350 *	28	3/8 NC Flange lock nut (20 ft)
3	1022660	3	Flap bracket, left (15 ft)	9	14350 *	32	3/8 NC Flange lock nut (22 ft)
3	1022660	4	Flap bracket, left (20 ft)	9	14350 *	36	3/8 NC Flange lock nut (25 ft)
3	1022660	5	Flap bracket, left (22 ft & 25 ft)	9	14350 *	40	3/8 NC Flange lock nut (27 ft)
3	1022660	6	Flap bracket, left (27 ft)	10	1266 *	4	3/16 x 1-1/2 cotter pin
4	1022661	2	Rubber flap (2", 15 ft & 27 ft)				
4	1022662	2	Rubber flap (8.5", 20 ft & 22 ft)				
5	1022654	2	Flap rod (15 ft)				* Standard hardware, obtain locally
5	1022655	2	Flap rod (20 ft)				
5	1022656	2	Flap rod (22 ft)				
5	1022657	2	Flap rod (25 ft)				
5	1022658	2	Flap rod (27 ft)				

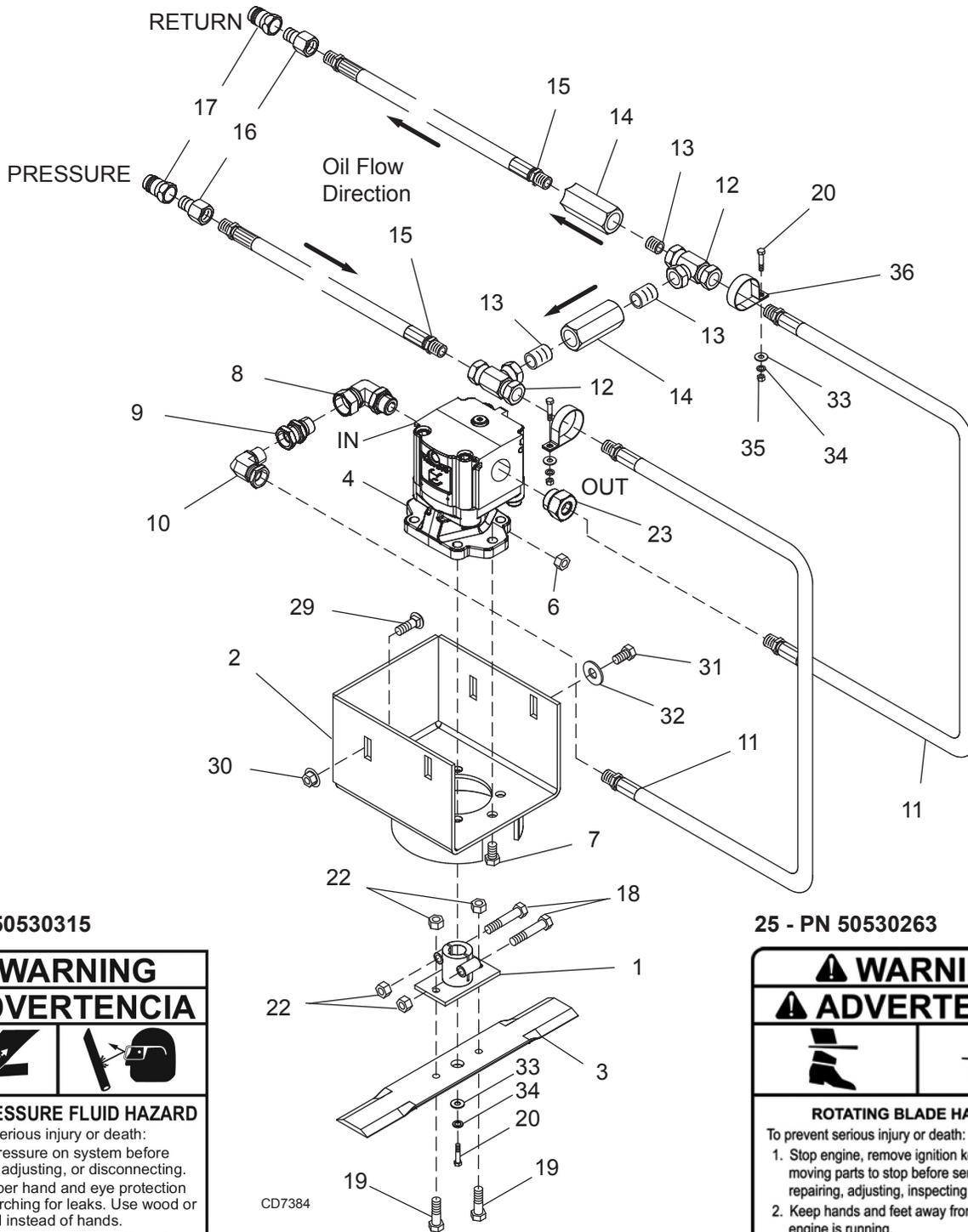
## CENTER DEFLECTOR (OPTIONAL)



REF	PART	QTY	DESCRIPTION
1	1016151	1	Center deflector
2	301109 *	4	1/2 NC x 1-1/4 Carriage bolt GR5
3	11900 *	4	1/2 NC Flange lock nut

\* Standard hardware, obtain locally

# CENTER CUTTER KIT (OPTIONAL)



24 - PN 50530315

25 - PN 50530263

<b>⚠ WARNING</b>	
<b>⚠ ADVERTENCIA</b>	
<b>HIGH-PRESSURE FLUID HAZARD</b>	
To prevent serious injury or death:	
1. Relieve pressure on system before repairing, adjusting, or disconnecting.	
2. Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.	
3. Keep all components in good repair.	
<b>PELIGRO DE FLUIDO BAJO ALTA PRESION</b>	
Para evitar heridas graves o la muerte:	
1. Alivie la presión del sistema antes de hacer reparaciones, ajustes o desconexiones.	
2. Use protección apropiada en las manos y en los ojos, cuando revise para ver si hay fugas. Utilice una tabla o un cartón en vez de las manos.	
3. Mantenga todos los componentes en buen estado.	
<small>50530315-A</small>	

<b>⚠ WARNING</b>	
<b>⚠ ADVERTENCIA</b>	
<b>ROTATING BLADE HAZARD</b>	
To prevent serious injury or death:	
1. Stop engine, remove ignition key and wait for moving parts to stop before servicing, repairing, adjusting, inspecting or unplugging.	
2. Keep hands and feet away from blades when engine is running.	
3. Keep others away.	
<b>PELIGRO DE LA CUCHILLAS GIRATORIA</b>	
Para evitar heridas graves o la muerte:	
1. Para el motor, quite la llave del encendido y espere que las piezas móviles hayan parado antes de dar servicio, hacer reparaciones, ajustes, inspecciones o desatascar.	
2. Mantenga lejos de la cuchillas, las manos y los pies cuándo el motor esté en marcha.	
3. No permita que otra gente se acerque.	
<small>50530263A</small>	

## CENTER CUTTER KIT PARTS LIST

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1024671	1	Blade hub	16	90501303	2	Adapter, 1/2 NPTM x 3/4 NPTF
2	1016161	1	Motor housing	17	90519003	2	Quick coupler, male
3	1024674	1	Blade, .31 x 2.50 x 13.31 dbl edge	18	90001115 *	2	3/8 NC x 1-3/4 HHCS GR5
4	1017719	1	Hydraulic motor	19	12169 *	2	3/8 NC x 1-1/4 HHCS GR5
4A	1034644	1	Kit, shaft & bearing (includes shaft, upper & lower bearings and key)	20	66 *	3	5/16 NF x 1-1/2 HHCS GR5
4B	1034635	1	Seal, 30 x 62 x 7	22	14350 *	4	3/8 NC Flange lock nut
4C	1034636	1	Bearing, ball	23	1023035	1	Adapter, 1-5/16 ORBM x 3/4 NPTF
4D	1034638	1	Seal, motor body	24	50530315	1	Decal, Hydraulic pressure
6	58125 *	6	9/16 NC Lock nut	25	50530263	2	Decal, Rotating blades
7	58452 *	6	9/16 NC x 1-1/2 HHCS GR8	29	301109 *	3	1/2 NC x 1-1/4 Carriage bolt
8	90503099	1	Elbow, 1-1/16 ORBM x 3/4NPTF	30	11900 *	4	1/2 NC Flange lock nut
9	27309	1	Adapter, 3/4 NPTF x 3/4 NPTM	31	25475 *	1	1/2 NC x 1 HHCS GR5
10	1023026	1	Elbow, 3/4 NPTM x 3/4 NPTF 90°	32	854 *	1	1/2 Flat washer
11	90506021	2	Hose, 40" x 3/4 NPTM x 3/4 NPTM	33	4378 *	3	5/16 Flat washer
12	90503098	2	Tee, 3/4 NPTF	34	2472 *	3	5/16 Lock washer
13	90501239	3	Nipple, 3/4 NPTM	35	5283 *	2	5/16 NF Hex nut
14	90503097	2	Check valve, 3/4 NPT	36	1004695	2	Clamp, 1.94 dia Pipe
15	90506016	2	Hose, 114" x 3/4 NPTM x 3/4 NPTM		HHCS		Hex Head Cap Screw
					*		Standard hardware, obtain locally

# BOLT TORQUE CHART

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

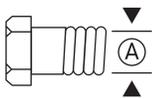
Fasteners must always be replaced with the same grade as specified in the manual parts list.

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 MAR 99 & J1701M JUL 96.

## SAE SERIES TORQUE CHART

SAE Bolt Head Identification



SAE Grade 2  
(No Dashes)



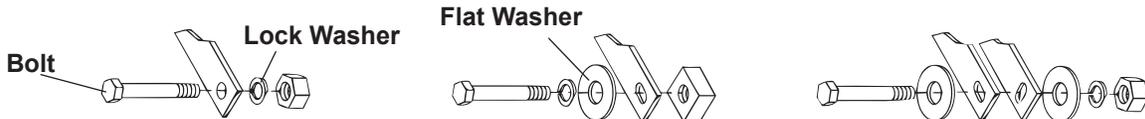
SAE Grade 5  
(3 Radial Dashes)



SAE Grade 8  
(6 Radial Dashes)

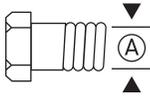
Ⓐ Diameter (Inches)	Wrench Size	Marking on Head					
		SAE 2		SAE 5		SAE 8	
		lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m
1/4"	7/16"	6	8	10	13	14	18
5/16"	1/2"	12	17	19	26	27	37
3/8"	9/16"	23	31	35	47	49	67
7/16"	5/8"	36	48	55	75	78	106
1/2"	3/4"	55	75	85	115	120	163
9/16"	13/16"	78	106	121	164	171	232
5/8"	15/16"	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

## TYPICAL WASHER INSTALLATIONS



## METRIC SERIES TORQUE CHART

Metric Bolt Head Identification



Metric  
Grade 8.8



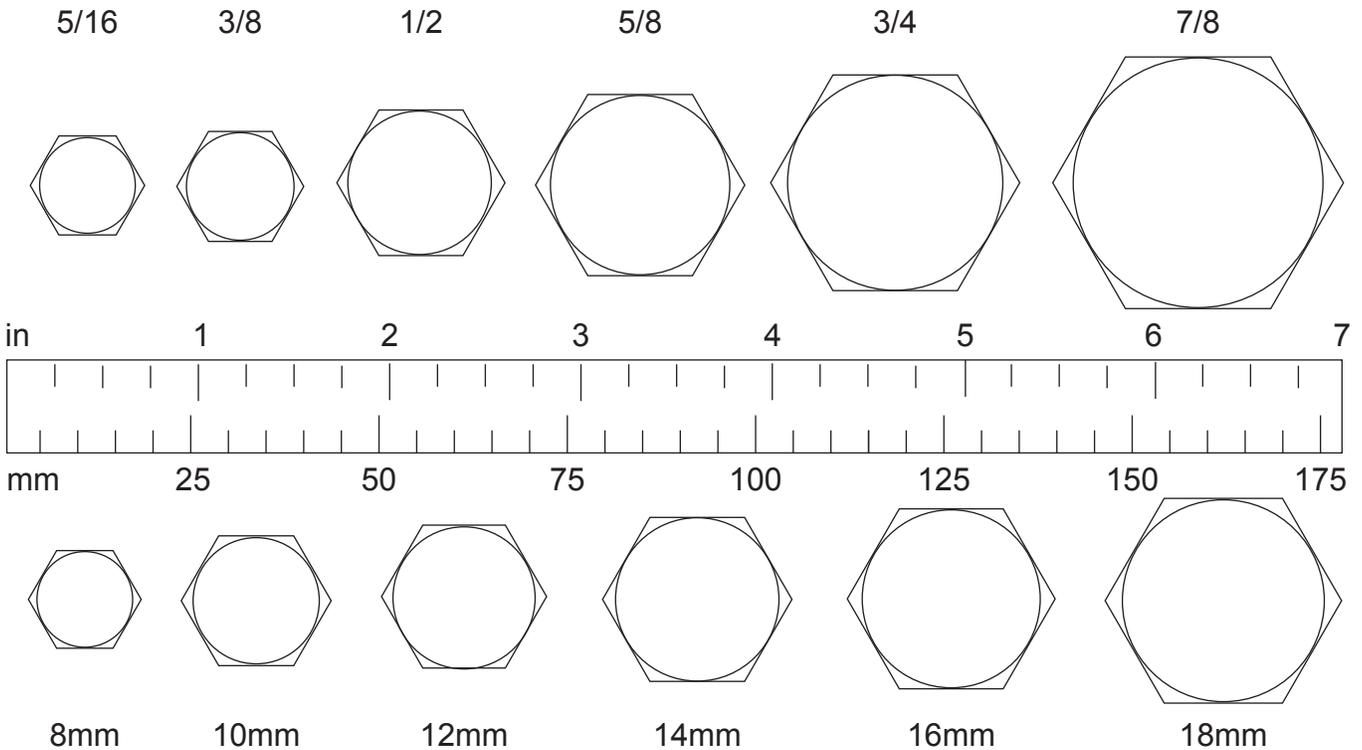
Metric  
Grade 10.9

Ⓐ Diameter & Thread Pitch (Millimeters)	Wrench Size	Coarse Thread				Fine Thread				Ⓐ Diameter & Thread Pitch (Millimeters)
		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

# BOLT SIZE CHART

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

## SAE BOLT THREAD SIZES



## METRIC BOLT THREAD SIZES

## ABBREVIATIONS

AG . . . . . Agriculture	HT . . . . . Heat-Treated	ORBM . . . . . O-Ring Boss - Male
ASABE . . . . . American Society of Agricultural & Biological Engineers (formerly ASAE)	JIC . . . . . Joint Industry Council 37° Degree Flare	P . . . . . Pitch
ASAE . . . . . American Society of Agricultural Engineers	LH . . . . . Left Hand	PBY . . . . . Power-Beyond
ATF . . . . . Automatic Transmission Fluid	LT . . . . . Left	psi . . . . . Pounds per Square Inch
BSPP . . . . . British Standard Pipe Parallel	m . . . . . Meter	PTO . . . . . Power Take Off
BSPTM . . . . . British Standard Pipe Tapered Male	mm . . . . . Millimeter	QD . . . . . Quick Disconnect
CV . . . . . Constant Velocity	M . . . . . Male	RH . . . . . Right Hand
CCW . . . . . Counter-Clockwise	MPa . . . . . Mega Pascal	ROPS . . . . . Roll-Over Protective Structure
CW . . . . . Clockwise	N . . . . . Newton	RPM . . . . . Revolutions Per Minute
F . . . . . Female	NC . . . . . National Coarse	RT . . . . . Right
FT . . . . . Full Thread	NF . . . . . National Fine	SAE . . . . . Society of Automotive Engineers
GA . . . . . Gauge	NPSM . . . . . National Pipe Straight Mechanical	UNC . . . . . Unified Coarse
GR (5, etc.) . . . . . Grade (5, etc.)	NPT . . . . . National Pipe Tapered	UNF . . . . . Unified Fine
HHCS . . . . . Hex Head Cap Screw	NPT SWF . . . . . National Pipe Tapered Swivel Female	UNS . . . . . Unified Special

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