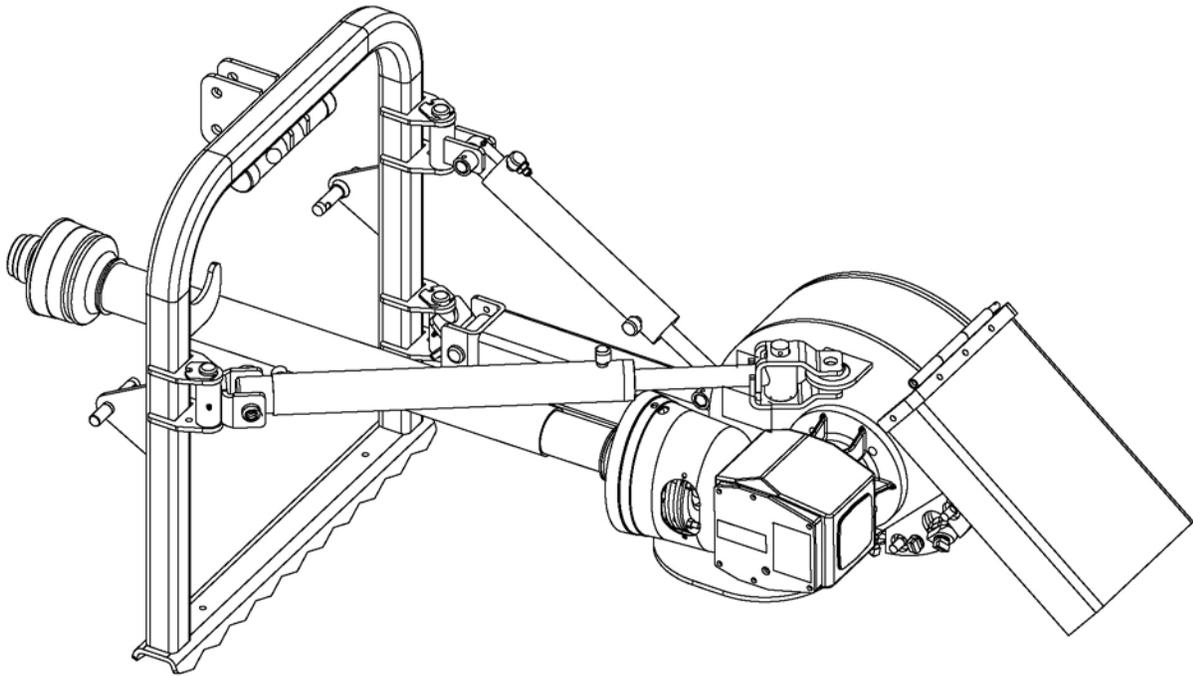


STUMP GRINDER

TSG50



MAN0495
(Rev. 1/6/2017)

WOODS®

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 Check Lists 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 Check List 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 locate your nearest dealer, check the Dealer Locator at 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.

ALITEC™

CENTRAL FABRICATORS®

GANNON®

WAIN-ROY®

WOODS®

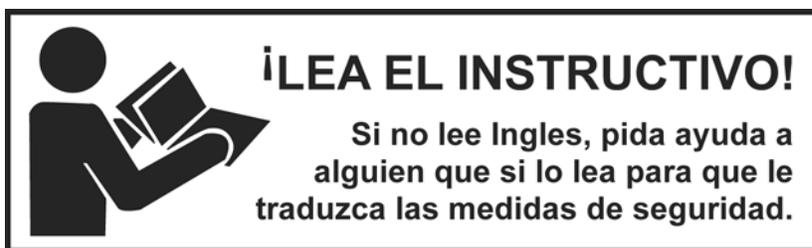
WOODS®

2 Introduction

Gen'l (Rev. 2/25/2016)

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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.

TSG50 SPECIFICATIONS

3-Point hitch	Category 1 or Category 2
Weight	540 lbs
Cutting wheel diameter	20 inches
Speed of wheel	1037 rpm
Cutting speed	5428 ft/min
Required horsepower	15 to 50 HP
Cutting teeth	24 carbide steel teeth
Maximum stump height	16 inches
Maximum cutting depth	16 inches
Horizontal cut	32 inches
Hub torque	
15 HP	76 lbs-ft
50 HP	253 lbs-ft
Force @ tooth tip	
15 HP	91 lbs
50 HP	304 lbs

GENERAL INFORMATION

 **WARNING**

■ **Some illustrations in this manual show the equipment with safety shields removed to provide a better view. This equipment should never be operated with any necessary safety shielding removed.**

The purpose of this manual is to assist you in operating and maintaining your stump grinder. 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 from the operator's position in the tractor seat.



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, 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.**

PREPARATION

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

- 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 sure attachment is properly secured, adjusted, and in good operating condition.
- 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.
- 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.

OPERATION

- Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.
- Consult local utilities before working. Know location of all underground cables, pipelines, overhead wires, and other hazards in working area and avoid contact.
- Do not put stump grinder into service unless all shields and guards are in place and in good condition. Replace if damaged.
- Keep bystanders away from equipment.
- Do not operate or transport equipment while under the influence of alcohol or drugs.
- Operate only in daylight or good artificial light.
- Avoid contact with electrical wires.
- Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.
- Always comply with all state and local lighting and marking requirements.
- Never allow riders on power unit or attachment.
- Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.

(Safety Rules continued on next page)

SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



(Safety Rules continued from previous page)

- 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.
- Shift tractor transmission into park or neutral and set brakes before engaging PTO and grinding.
- Do not operate PTO during transport.
- 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.
- Do not operate auxiliary hydraulics during transport.
- Look down and to the rear and make sure area is clear before operating in reverse.
- Use extreme care when working close to fences, ditches, other obstructions, or on hillsides.
- 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.

MAINTENANCE

- Service and maintenance work not covered in OWNER SERVICE must be done by a qualified dealership. Special skills, tools, and safety procedures may be required. Failure to follow these instructions can result in serious injury or death.
- Before performing any service or maintenance, lower equipment to ground or block securely, turn off engine, remove key, and disconnect driveline from tractor PTO.
- Do not modify or alter or permit anyone else to modify or alter the equipment or any of its components in any way.

- 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.
- Make sure attachment is properly secured, adjusted, and in good operating condition.
- Never perform service or maintenance with engine running.
- Keep all persons away from operator control area while performing adjustments, service, or maintenance.
- 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 shields and guards are properly installed and in good condition. Replace if damaged.
- When lubricating telescoping PTO drives, keep fingers out of shield access slots to prevent injury.

STORAGE

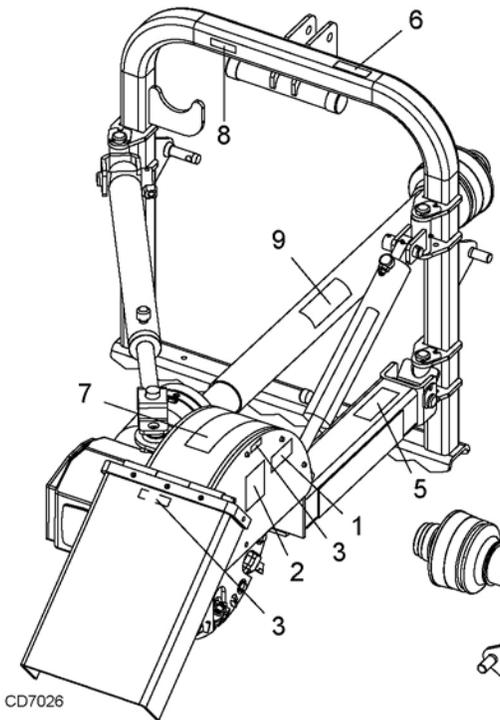
- Do not climb or lean on equipment stored on stand.
- Keep children and bystanders away from storage area.





SAFETY & INSTRUCTIONAL DECALS

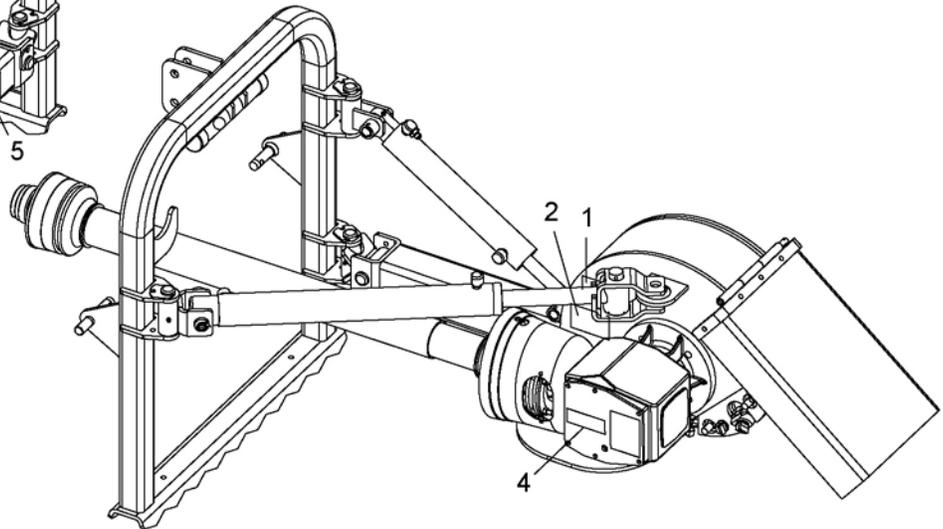
ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
Replace Immediately If Damaged!



CD7026

⚠ DANGER	KEEP AWAY!
<p>FLYING DEBRIS FROM CUTTING WHEEL</p> <p>Thrown objects can cause serious injury or death.</p>	
<p>1018364</p>	

1 - PN 1018364



2 - PN 1018365

	⚠ DANGER
	<p style="text-align: center;">KEEP AWAY!</p> <ul style="list-style-type: none"> ■ Operate from tractor seat only. ■ Keep others away from stump grinder while in operation. <p>Contact will cause serious injury or death.</p>
<p>1018365</p>	

3 - PN 18869

⚠ DANGER
<p>SHIELD MISSING</p> <p>DO NOT OPERATE - PUT SHIELD ON</p>
<p>18869-B</p>

4 - PN 1004114

⚠ DANGER
<p>If shaft connection is visible, shield is missing. Replace shield before operating equipment.</p>
<p>1004114</p>

BE CAREFUL!

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



SAFETY & INSTRUCTIONAL DECALS

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



7 - PN 1004620

5 - PN 19924

 <p style="font-size: small;">19924-B</p>	<p>⚠ WARNING</p> <p>HIGH-PRESSURE HYDRAULIC OIL LEAKS CAN PENETRATE SKIN RESULTING IN SERIOUS INJURY, GANGRENE OR DEATH.</p> <ul style="list-style-type: none"> ■ Check for leaks with cardboard; never use hand. ■ Before loosening fittings: lower load, release pressure, and be sure oil is cool. ■ Consult physician immediately if skin penetration occurs.
--	--

⚠ WARNING



- CRUSHING AND PINCHING HAZARD**
- Handle machine parts carefully. Body parts could be crushed or pinched between tractor and implement.
 - Operate tractor controls from tractor seat only.
 - Do not stand between tractor and implement when tractor is in gear.
 - Make sure parking brake is engaged before going between tractor and implement.
 - Stand clear of machine while in operation or when it is being raised or lowered.

<p>⚠ WARNING</p> <p>DO NOT EXCEED PTO SPEED OF 540 RPM</p> <p>PTO speeds higher than 540 RPM can cause equipment failure and personal injury.</p> <p style="font-size: x-small;">18866-D</p>
--

6 - PN 18866

8 - SERIAL NUMBER PLATE

<p>Model#</p> <p>Serial#</p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px auto; text-align: center; font-size: x-small;">(BAR CODE)</div>
<p>WOODS <small>Woods Equipment Company Oregon, Illinois 61061 USA</small></p>

<p>⚠ DANGER</p>

<p>ROTATING DRIVELINE CONTACT CAN CAUSE DEATH</p> <p>KEEP AWAY!</p> <p>DO NOT OPERATE WITHOUT -</p> <ul style="list-style-type: none"> ■ All driveline guards, tractor and equipment shields in place ■ Drivelines securely attached at both ends ■ Driveline guards that turn freely on driveline <p style="font-size: x-small; text-align: right;">18864-C</p>

9 - PN 18864

⚠ WARNING

- TO AVOID SERIOUS INJURY OR DEATH:**
- Read Operator's Manual before operating, servicing, or repairing equipment. Follow all safety rules and instructions. (Manuals are available from dealer or call 1-800-319-6637.)
 - Lower equipment to ground, stop engine, remove key, and set brake before dismounting tractor.
 - Never allow children or untrained persons to operate equipment.
 - Never allow riders.
 - Keep bystanders away from equipment during operation.
 - Keep all shields in place and in good condition.

⚠ WARNING



- FALLING OFF CAN RESULT IN BEING RUN OVER.**
- Tractor must be equipped with ROPS (or ROPS CAB) and seat belt. Keep foldable ROPS systems in "locked up" position at all times.
 - Buckle Up! Keep seat belt securely fastened.

FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.

1004620

OPERATION

The operator is responsible for the safe operation of this stump grinder. The operator must be properly trained. Operators should be familiar with the tractor, stump grinder, and all safety practices before starting operation. Read the safety rules and safety decals on page 5 through page 8.

WARNING

- Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.
- Keep bystanders at least 100 feet away from equipment.

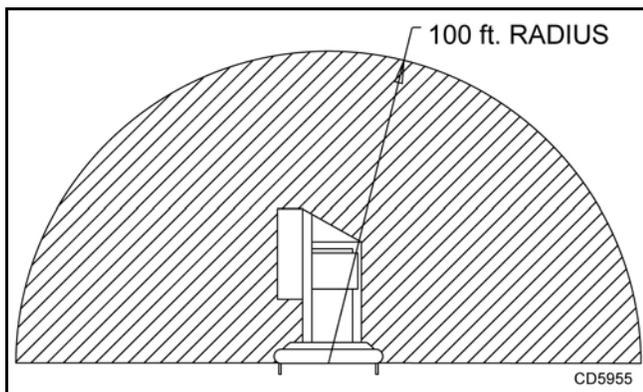


Figure 1. 100 ft. Hazard Zone

WARNING

- Do not put stump grinder into service unless all shields and guards are in place and in good condition. Replace if damaged.
- 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.

WARNING

- Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.
- 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.
- Never allow children or untrained persons to operate equipment.
- Make sure attachment is properly secured, adjusted, and in good operating condition.

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.

STUMP GRINDER PREPARATION

NOTE: For operation of this stump grinder, references to right, left, forward, and rearward directions are determined from the operator's position in the tractor seat.

NOTICE

- Gearbox does not contain oil. Fill before operating.

Fill gearbox with .33 gallons (2.64 pints) of SAE 80W or 90W gear lube. Check gearbox daily for evidence of leakage, and contact your dealer if leakage occurs.

ATTACH STUMP GRINDER TO TRACTOR

NOTICE

- Lift cylinder must be completely raised to avoid driveline damage before raising 3-point lower lift arms.

1. Attach tractor 3-point lower lift arm to stump grinder hitch pins and secure.
2. Attach tractor top link to stump grinder clevis and secure with tractor top link pin.

3. Connect driveline to tractor PTO shaft.
4. Slide lock collar back (Figure 2) or push lock pin in to make connection.

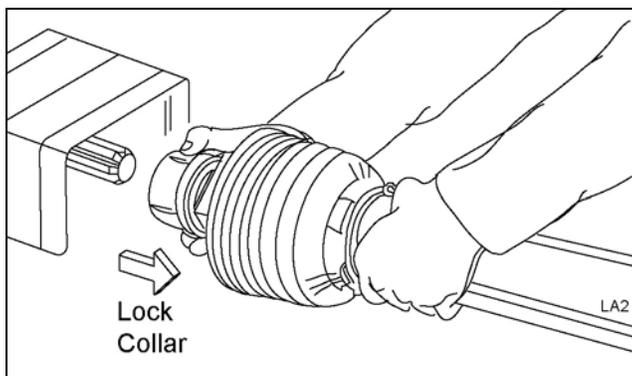


Figure 2. Lock Collar Connection

5. Make sure connection is secure. Lock collar or lock pin should snap back into original position.
6. Adjust the tractor 3-point arm anti-sway devices to prevent stump grinder from swaying side-to-side during transport.
7. Adjust tractor drawbar so that it will not interfere with stump grinder or driveline.
8. Attach quick couplers to tractor hydraulic source.

TRACTOR STABILITY

⚠ WARNING

■ **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.**

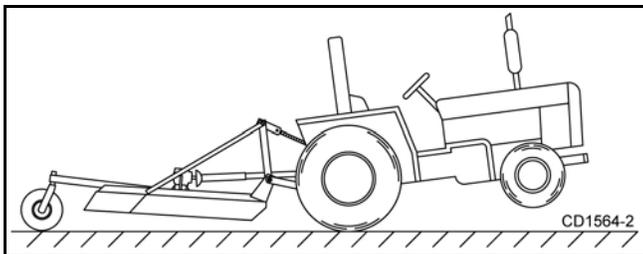


Figure 3. Tractor Stability

OPERATING TECHNIQUE

NOTICE

■ **DO NOT ENGAGE PTO WITH STUMP GRINDER MAIN FRAME OFF THE GROUND. Always lower tractor 3-point arms until main frame crossbrace is**

on the ground and the cutting head is in the raised position. Adjust 3-point anti-sway links to prevent stump grinder from moving during operation.

NOTICE

■ **Make sure lift cylinder is completely retracted before backing up to a stump. If cylinder is extended, debris guard may get pushed into the cutting wheel and be destroyed.**

1. Power for operating the stump grinder is supplied by the tractor PTO. Know how to stop the tractor and stump grinder quickly in an emergency.
2. Position stump grinder above stump to be removed with the main frame crossbrace on the ground and the cutting wheel in the raised position.
3. Engage PTO at low engine rpm to minimize stress on the drive system and gearbox. With PTO engaged, increase PTO speed to 540 rpm and maintain throughout grinding operation.
4. Activate lift cylinder to lower the cutting wheel onto the stump to desired depth.

NOTE: The amount of material removed may vary depending on tractor size and hardness of wood.

5. Start cutting wheel on left edge of stump and slowly activate swing cylinder to begin grinding. Cutting wheel can pivot 44-degrees from side to side.
6. With pass across stump completed, lower cutting wheel on the right edge of the stump and slowly activate the swing cylinder to the left. The cutting wheel has cutting teeth on both sides to perform the cut.

NOTE: If stump is too large to remove in one pass, reposition tractor and start operating procedures over.

NOTICE

■ **Lift cylinder must be completely retracted to avoid driveline damage before raising 3-point lift arms.**

■ **Always raise cutting head to avoid pushing the debris guard into the cutting wheel during repositioning.**

When finished grinding stump, disengage PTO, raise lift cylinder, and raise stump grinder main frame off the ground with the 3-point lower lift arms.

STUMP GRINDER STORAGE

1. Lower stump grinder with 3-point lower lift arms until main frame crossbrace is on the ground. Activate lift cylinder and lower cutting head to the ground.
2. Disconnect driveline from tractor and place in storage bracket.

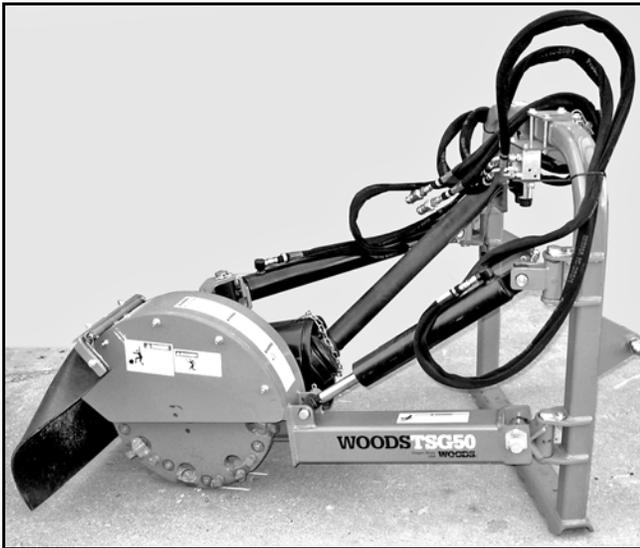


Figure 4. Stump Grinder in Storage Position

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.

PRE-OPERATION CHECK LIST

(OWNER'S RESPONSIBILITY)

- ___ Review and follow all safety rules and safety decal instructions on page 5 through page 8.
- ___ Check that all safety decals are installed and in good condition. Replace if damaged.
- ___ Check to make sure all shields and guards are properly installed and in good condition.
- ___ Check all lubrication points and grease as instructed in Lubrication Information, page 12. NOTE: For operation of this stump grinder, references to right, left, forward, and rearward directions are determined from the operator's position in the tractor seat.
- ___ Check that all hardware is properly installed and secured.
- ___ Check that equipment is properly and securely attached to tractor.
- ___ Inspect area and remove stones, branches or other hard objects that might be thrown, causing injury or damage.
- ___ Make sure driveline spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove and in gearbox spline groove.
- ___ Check condition of stump grinder teeth before operation. Check for dull or chipped teeth. Make sure jam nuts are torqued to 170 lbs-ft.



OWNER SERVICE

The information in this section is written for operators who possess basic mechanical skills. If you need help, your dealer has trained service technicians available. For your protection, read and follow the safety information in this manual.

! WARNING

■ Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.

■ Make sure 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.

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

■ Before performing any service or maintenance, lower equipment to ground or block securely, turn off engine, remove key, and disconnect driveline from tractor PTO.

■ Never perform service or maintenance with engine running.

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

! CAUTION

■ If you do not understand any part of this manual and need assistance, see your dealer.

LUBRICATION INFORMATION

1. Do not let excess grease collect on or around parts, particularly when operating in sandy areas.
2. Use a lithium grease of #2 consistency with a MOLY (molybdenum disulfide) additive for all locations unless otherwise noted.

NOTE: Be sure to clean fittings thoroughly before attaching grease gun. One good pump of most

guns is sufficient when the lubrication schedule is followed.

3. Grease stump grinder pivot points every 8 hours.

Gearbox Lubrication

For gearbox, use a high quality gear oil with a viscosity index of 80W or 90W and an API service rating of GL-4 or GL-5.

Fill gearbox with .33 gallons (2.64 pints) of SAE 80W or 90W gear lube. Check gearbox daily for evidence of leakage, and contact your dealer if leakage occurs.

Driveline Lubrication

1. Lubricate the driveline slip joint every eight operating hours. Failure to maintain proper lubrication could result in damage to the U-joints, gearbox, and driveline. See Figure 5.
2. Lower stump grinder to ground, disconnect driveline from tractor PTO shaft, and slide halves apart but do not disconnect from each other.
3. Apply a bead of grease completely around male half where it meets female half. Slide drive halves over each other several times to distribute grease.

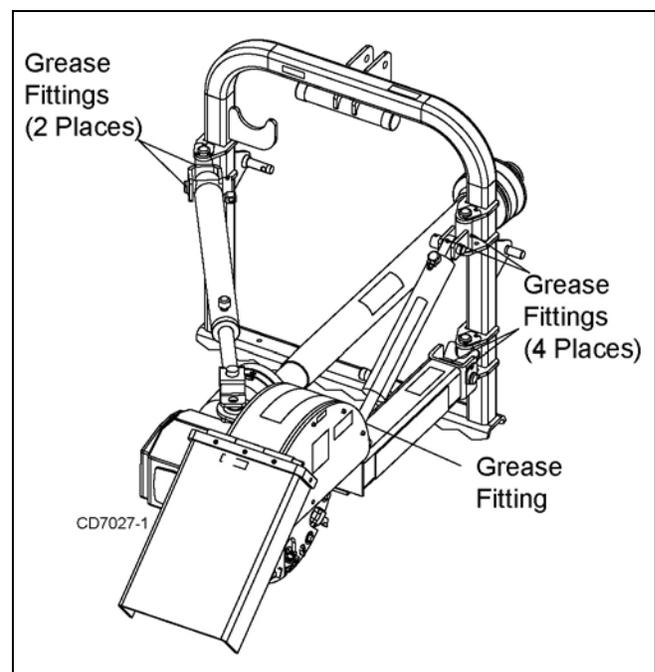


Figure 5. Lubrication Points

STUMP GRINDER TOOTH REPLACEMENT

NOTE: Replace teeth whenever they become damaged, broken, or excessively worn. Excessively worn cutting edges greatly decrease cutting efficiency.

NOTICE

■ **Never operate the stump grinder with missing teeth.**

1. Use a 15/16 socket wrench and remove the 5/8" jam nuts as shown in Figure 6.
2. Remove hex nut from tooth and remove tooth.
3. When installing new teeth, torque the 5/8" jam nuts to 170 lbs-ft (230 N-m).



Figure 6. Tooth Installed

SLIP CLUTCH ADJUSTMENT

The slip clutch is designed to slip so that the gearbox and driveline are protected if the cutter strikes an obstruction.

A new slip clutch or one that has been in storage over the winter may seize. Before operating the grinder, make sure it will slip by performing the following operation:

1. Turn off tractor engine and remove key.
2. Loosen eight 10 mm cap screws (6) to remove all tension from pressure plate (5). Springs should rotate freely.
3. Place a mark on edge of lining rings (3).
4. Hold flanged hub (4) solid and rotate driveline to make sure clutch slips. Check marks on edge of lining rings to see if they have moved.
5. If clutch does not slip freely, disassemble and clean surface of flanged hub (4), flange yoke (1), and pressure plate (5).
6. Reassemble clutch.
7. Tighten springs (7) until they are compressed to the 1.26 inches shown in Figure 7.
8. If a clutch continues to slip when the springs are compressed to the 1.26 inch dimension, check lining rings (3) for excessive wear. Rings are 1/8" when new. Replace rings after 1/32" wear to ensure proper operation.

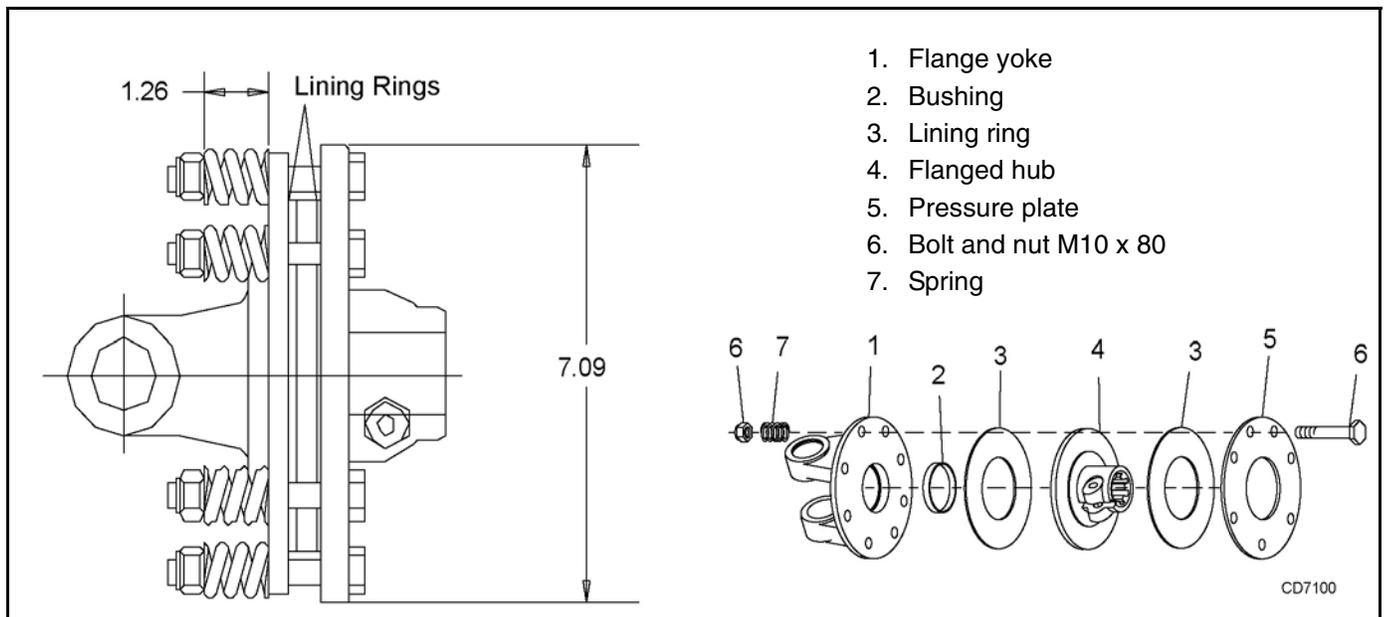


Figure 7. Slip Clutch Assembly

DEALER SERVICE

The information in this section is written for dealer service personnel. The repair described here requires special skills and tools. If your shop is not properly equipped or your mechanics are not properly trained in this type of repair, you may be time and money ahead to replace complete assemblies.

⚠ WARNING

■ Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.

■ Make sure 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 perform service or maintenance with engine running.

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

■ 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.

GEARBOX MAINTENANCE

NOTE: Read this entire section before starting any repair. Many steps are dependent on each other.

NOTE: Repair to this gearbox is limited to replacing bearings, seals, and gaskets. Replacing gears, shafts, and a housing is not cost effective. Purchasing a complete gearbox is more economical.

Inspect gearbox for leakage and bad bearings. Leakage is a very serious problem and must be corrected immediately.

Bearing failure is indicated by excessive noise and side-to-side or end-play in gear shafts.

Cutting Wheel Removal

1. Position stump grinder on a hard level surface with main frame crossbrace firmly on the ground.
2. Remove hardware and side shield from the right side of the cutter frame.
3. Remove cotter pin and slotted hex nut from end of horizontal gearbox shaft and remove wheel and hub (Figure 10).

NOTE: You will need to use a heavy-duty puller to remove cutting wheel and hub from gearbox shaft.

Cutting Wheel Installation

Slide cutting wheel onto gearbox shaft. Install washer and nut. Torque nut to 200 ft-lbs. Replace cotter pin. Replace side shield.

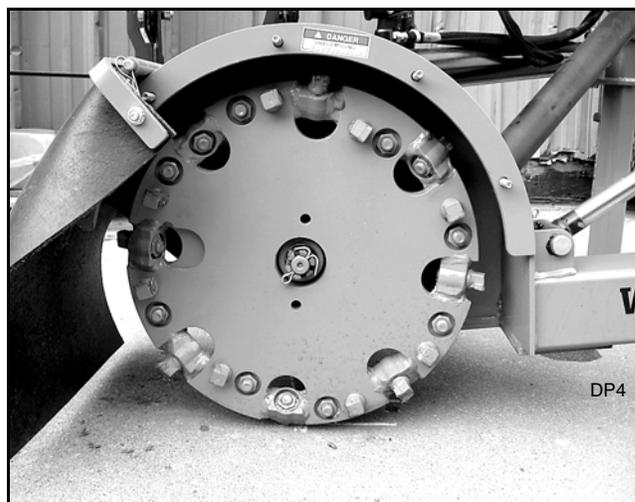


Figure 10. Cutting Wheel and Hardware

Gearbox Removal

1. Disconnect and remove the driveline from the tractor.
2. Disconnect and remove the driveline from the gearbox.
3. Remove the four bolts that attach gearbox to stump grinder and remove gearbox.

Seal Replacement

Recommended sealant for gearbox repair is Permatex® Aviation 3D Form-A-Gasket or equivalent.

Leakage can occur at the vertical or horizontal gaskets and shaft seals.

Leakage at the horizontal gasket or seal can be repaired without removing the gearbox from the cutter.

Seal Installation

NOTE: Proper seal installation is important. An improperly installed seal will leak.

1. Clean area in housing where seal outer diameter (OD) seats. Apply a thin coat of Permatex.
2. Inspect area of shaft where seal seats. Remove any burrs or nicks with an emery cloth.
3. Lubricate gear shaft and seal lips.
4. Place seal squarely on housing, spring-loaded lip toward housing. Select a piece of pipe or tubing with an OD that will sit on the outside edge of the seal but will clear the housing. Tubing with an OD that is too small will bow seal cage and ruin seal.
5. Carefully press seal into housing, avoiding distortion to the metal seal cage.

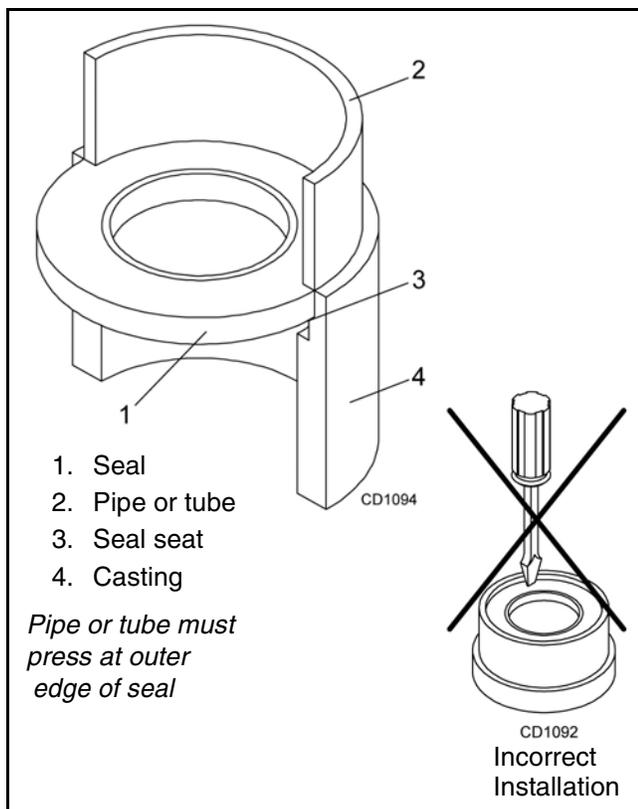


Figure 11. Seal Installation

Output Shaft Seal Repair

Refer to Figure 12.

1. Remove vent plug (27) and siphon gear lube from housing through this opening.
2. Remove output shaft seal (21). Replace with new seal (see **Seal Installation, page 15**).

Output seal should be recessed in housing. Input seal should be pressed flush with outside of housing.

NOTE: Distortion to seal cage or damage to seal lip will cause seal to leak.

3. Remove and replace any seal damaged in installation.
4. Fill gearbox with .33 gallon (2.64 pints) of SAE 80W or 90W gear lube.

Input Shaft Seal Repair

Refer to Figure 12.

1. Remove vent plug (27) and siphon gear lube from housing through this opening.
2. If the leak occurred at either end of input shaft, remove oil cap (23) and/or oil seal (22). Replace with new one (refer to **Seal Installation, page 15**).
3. Fill gearbox with .33 gallon (2.64 pints) of SAE 80W or 90W gear lube.

GEARBOX REPAIR

NOTE: Repair to this gearbox is limited to replacing bearings, seals, and gaskets. Replacing gears, shafts, and a housing is not cost effective. Purchasing a complete gearbox is more economical.

Gearbox Removal

Follow instructions page 14 to remove cutting wheel and gearbox.

Gearbox Disassembly

Refer to Figure 12.

1. Remove 3/8" plug from side of gearbox and pour out gear oil.
2. Remove oil cap (23) (to be replaced).
3. Remove snap ring (12) and shim (15) from input shaft (3).
4. Support gearbox in hand press and push on input shaft (3) to remove bearing (9) and spacer (14).
5. Remove top cover (25) from housing. Remove gear (1) from inside housing.
6. Remove oil seal (22) from front of housing (to be replaced).
7. Remove snap ring (12) and shim (15) from front of housing (2).
8. Remove input bearing (8) by using a punch and hammer from outside of housing.
9. Support housing in vise in a horizontal position.
10. Remove the snap ring (10), washer (19), and seal (21).
11. Remove cotter pin (11), castle nut (16), and washer (20) from the top of output shaft (4).

12. Remove output shaft (4) by using a punch and hammer and tap on top to drive down.
13. Remove gear (5) and shim (15) from inside housing.
14. Remove bearing (7) by using a punch and hammer from the top, outside the housing.
15. Support housing upside down (top cover surface) and remove bearing (6) by using a punch and hammer from the bottom side of the housing.
16. Inspect gears for broken teeth and wear. Some wear is normal and will show on loaded side. Forged gear surfaces are rough when new. Check that wear pattern is smooth.
17. Inspect output and input shafts for grooves, nicks, or bumps in the areas where the seals seat. Resurface any damage with emery cloth.
18. Inspect housing and caps for cracks or other damage.

Gearbox Assembly

Refer to Figure 12.

1. Clean housing, paying specific attention to areas where gaskets will be installed.
2. Wash housing and all components thoroughly. Select a clean area for gearbox assembly. Replace all seals, bearings, and gaskets. All parts must be clean and lightly oiled before reassembling.
3. Insert output bearings (6 & 7) in the housing, using a round tube of the correct diameter and a hand press.
4. Slide output shaft (4) through both bearings (6 & 7) until it rests against bearing (6).
5. Slide shim (15) over output shaft (4).
6. Press gear (5) onto output shaft (4) and secure with washer (20), castle nut (16), and cotter pin (11).
7. Apply grease to lower seal lips (21) and press seal (21) over output shaft (4), using a tube of the correct diameter. Be sure not to damage the seal lip.

Press in housing so that seal is recessed. Insert protective washer (19) by hand. Install snap ring (10) and position it together with dual lip seal (21)

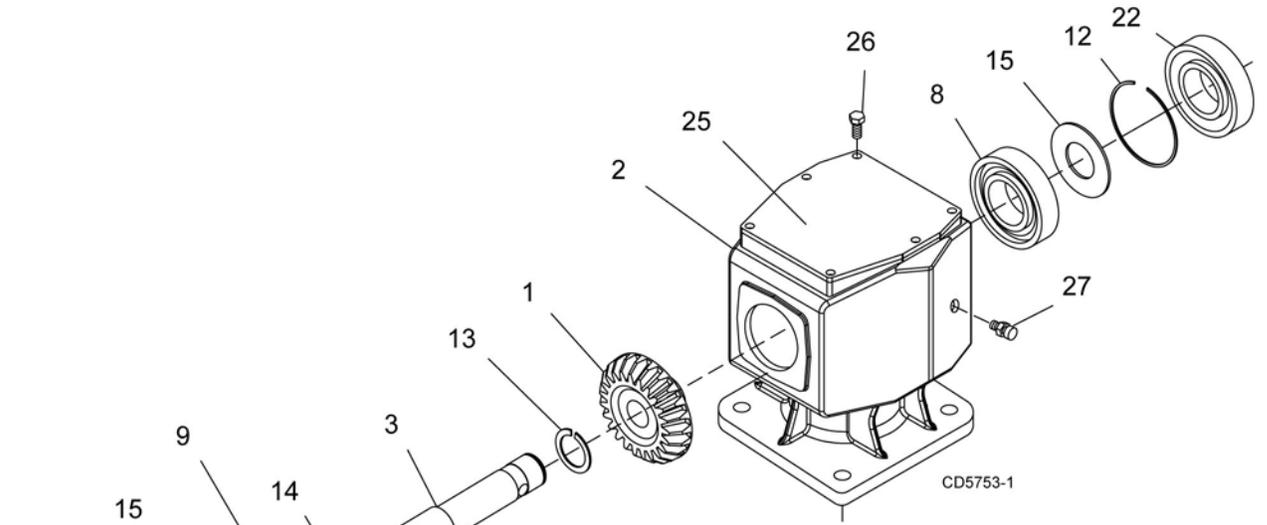
by pressing it into position. Verify that snap ring is seated correctly.

8. Press bearing (8) into the housing, using a round tube of the correct diameter and a hand press. Secure with shim (15) and snap ring (12).
9. Secure snap ring (13) on input shaft (3) if not already secure.
10. Place gear (1) through top of housing and align gear (1) and gear (5) so that gear teeth are a match.
11. While holding gear (1) in place, slide input shaft (3) through gear (1) and bearing (8). Align splines on shaft (3) and gear (1).
12. Slide spacer (14) over input shaft (3) and press bearing onto input shaft (3), using a round tube of the correct diameter and a hand press.
13. Slide shim (15) over input shaft (3) and secure with snap ring (12).
14. Check input shaft end float by moving the input shaft (3) by hand. If end float is higher than 0.012", insert shim between input shaft (3) and rear bearing (8). Repeat until end float is less than 0.012". Check rotational torque by hand. The torque should be less than 2.2 lbs-inch.
15. Check that the gear backlash is between 0.006" and 0.016". You should not have to adjust the backlash.
16. Press in input oil seal (22), using tube of correct diameter. Be careful not to damage seal lip.
17. Press oil cap (23) on to cover the rear of housing, using a tube of the correct diameter.
18. Check gearbox housing for leaks by plugging all holes except one. Apply 4 psi compressed air and immerse the gearbox in water to verify that there are no leaks.
19. Remove gearbox from water and dry off with compressed air. Fill with .33 gallon (2.64 pints) of SAE 80W or 90W gear lube. Tighten all plugs.

Gearbox Installation

Gearbox is heavy; do not attempt to move without mechanical assistance.

Attach gearbox to stump grinder with bolts and nuts previously removed. Torque bolts to 170 lbs-ft.



- | | |
|-----------------------------------|----------------------------------|
| 1. Crown gear | 20. Flat washer |
| 2. Gearbox housing | 21. Metric seal 40 x 80 x 12 |
| 3. Input shaft (horizontal shaft) | 22. Oil seal |
| 4. Output shaft (vertical shaft) | 23. Oil cup |
| 5. Gear pinion | 25. Top cover |
| 6. Bearing, output | 26. Cap screw 8 mm x 16 (8.8) |
| 7. Bearing, output | 27. Vent plug |
| 8. Bearing, input | 28. Cotter pin or 6" Wire, 9 ga. |
| 9. Ball bearing | |
| 10. Internal retainer ring | |
| 11. Cotter pin | |
| 12. Snap ring | |
| 13. Snap ring | |
| 14. Spacer 35.3 x 48.25 | |
| 15. Shim kit | |
| 16. Castle nut | |
| 17. Castle nut metric M24 x 2 | |
| 18. Washer | |
| 19. Protective washer | |

Figure 12. Gearbox Assembly

CYLINDER SERVICE

The cylinders are designed to be reliable and easy to service. If a cylinder should malfunction during the warranty period, return the complete cylinder assembly, without disassembling, to your authorized service department or contact your authorized service department for instructions. Unauthorized disassembly of a cylinder in the warranty period will VOID WARRANTY.

NOTE: Repair to cylinders is limited to replacing seals, wear rings, and O-rings. Replacing rod, barrel, or pistons is not cost effective. Purchasing a complete cylinder is more economical.

The lift cylinder on the stump grinder was assembled with either a spanner nut assembly or threaded rod guide assembly. See Figure 13 and Figure 14 to determine the style of cylinder on your loader. Spanner nut cylinders can also be identified by the letter "J" included in the stamping located at the base end port. Follow repair procedures for each style of cylinder.

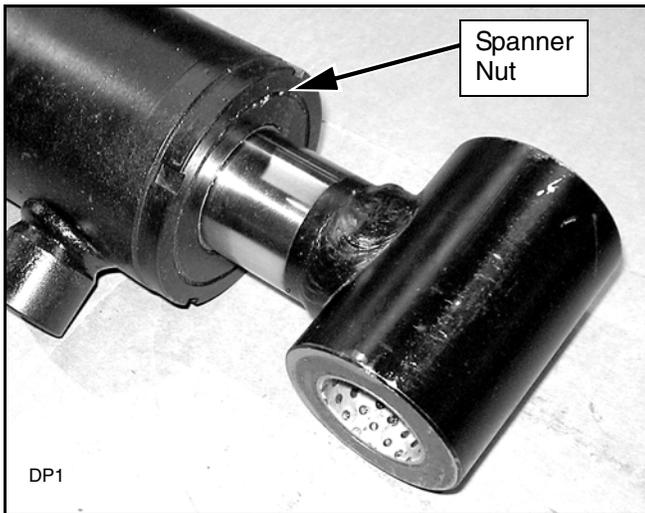


Figure 13. Spanner Nut Cylinder

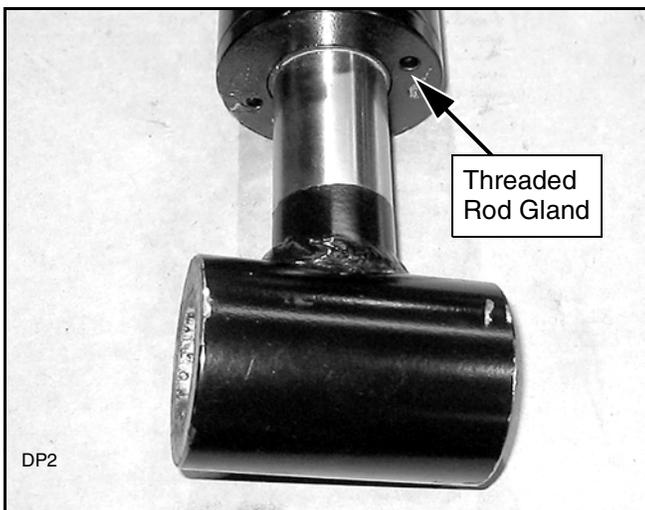


Figure 14. Threaded Rod Gland Cylinder

LIFT CYLINDER REPAIR

Spanner Nut Cylinders

Disassemble

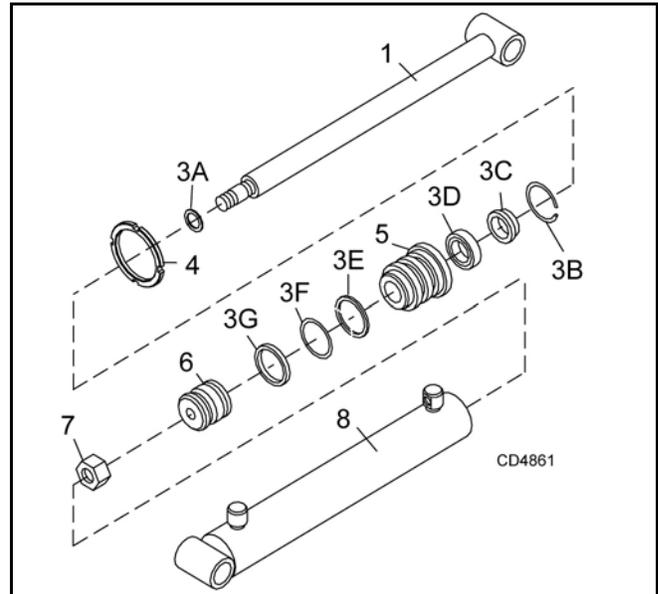


Figure 15. Spanner Nut Cylinder Assembly

On spanner nut style cylinders, unscrew spanner nut (4) using a spanner wrench, or carefully use a punch and hammer. (Spanner wrench 1021841 is available from Woods to help with these procedures.)

Tap rod guide (5) into barrel (8) about 1/2". Remove round retaining ring (3B). Pull on rod (1) to remove parts from barrel.

Clamp cross pin end of rod assembly (1) in a vise with protective jaws. Remove lock nut (7) from rod assembly. Remove piston (6), stop tube (2), and rod guide (5) from rod.

Remove and discard all seals, wear rings and O-rings. Clean all components in solvent and blow dry with low pressure air.

Inspect inside diameter of barrel (8). Replace cylinder if damaged.

Assemble

Lubricate O-rings and seals with clean hydraulic fluid. Install back-up washer (3E) on rod guide (5), then install O-ring (3F) in exterior O-ring groove of rod guide. Install rod seal (3D) into inner groove of rod guide with open portion of V-groove toward piston.

Place rod wiper (3C) in outer rod guide groove. Slide rod guide assembly (5) onto rod (1). Place crown piston seal (3G) in piston groove.

Lightly coat rod threads with hydraulic oil and slide O-ring (3A) over threads and into groove. Install stop tube and piston (6) onto rod (1) as shown in Figure 16.

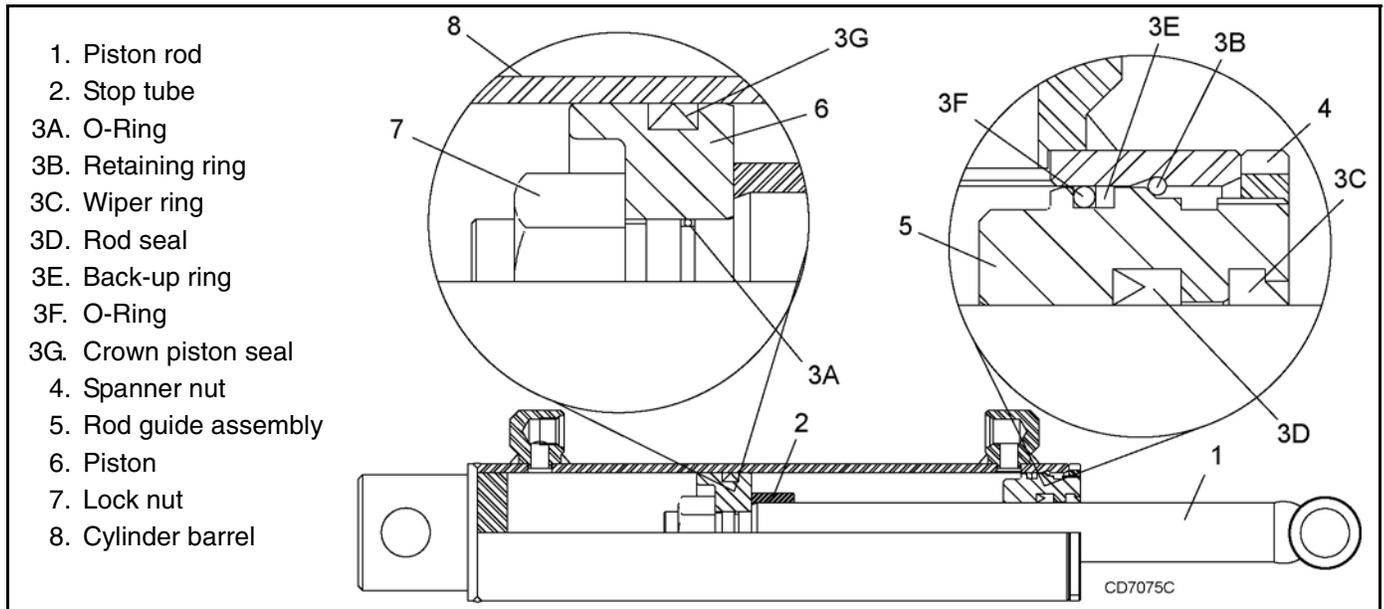


Figure 16. Spanner Nut Cylinder Assembly

Completely clean threads of hydraulic oil, apply Loctite® Primer 7649 and Loctite® 242 to the rod threads, and install lock nut (7). Torque to 175 lbs-ft.

Compress crown piston seal and carefully insert piston and rod assembly into barrel. Use care to prevent damage while installing.

Carefully push or tap rod guide (5) into barrel (8) just past groove inside barrel. Insert retaining ring (3B) into groove and pull rod (1) to seat rod guide (5) against ring. Apply Loctite 242 to rod guide threads. Screw spanner nut (4) into rod guide (5) using a spanner wrench, or carefully use a punch and hammer.

Threaded Rod Guide Cylinders

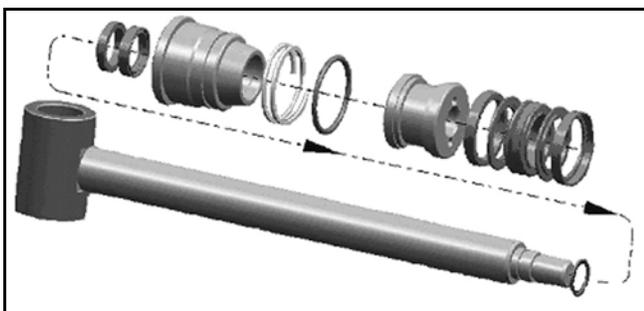


Figure 17. Seal Kit

Disassemble

On threaded guide type cylinders, unscrew guide (5) using a spanner wrench, or carefully use a punch and hammer. (Spanner wrench 1021841 is available from Woods to help with these procedures.) Pull on rod (1) to remove parts from barrel.

Clamp cross pin end of rod assembly (1) in a vise with protective jaws. Unscrew piston (6) from end of rod

assembly using a spanner wrench, or carefully use a punch and hammer. Remove rod guide (5) from rod.

Remove and discard all seals, wear rings and O-rings. Clean all components in solvent and blow dry with low pressure air.

Inspect inside diameter of barrel. Replace cylinder if damaged.

Assemble

For these assembly instructions the front surface of the threaded rod guide with two holes will be referred to as the "rod guide face".

Lubricate O-rings and seals with clean hydraulic fluid. Install back-up washer (3D) on rod guide (5), and then install O-ring (3E) in exterior O-ring groove of rod guide. See Figure 17 or Figure 18. Make sure that the back-up ring is located closest to the rod guide face. Place rod wiper (3B) in outer rod guide groove. Install rod seal (3C) into the second groove from the rod guide face with the open portion of V-groove toward piston.

With all of the rod guide seals installed, slide the rod guide assembly (5) onto rod (1).

Place O-ring (3F) into narrow deep groove in piston (6). Install piston seal (3G) around O-ring (3F) in piston groove. Install guide ring (3H) into wide groove of piston (6).

Install crown piston seal (3J) onto piston (6). Install offset rings (3H) on both sides of the crown piston seal (3J) in the large groove on the piston (6). The profile of the offset ring (3H) should mate with the lip on the crown piston seal (3J). Place the "L" shaped guide ring (3G) on the outside of each offset ring (3H).

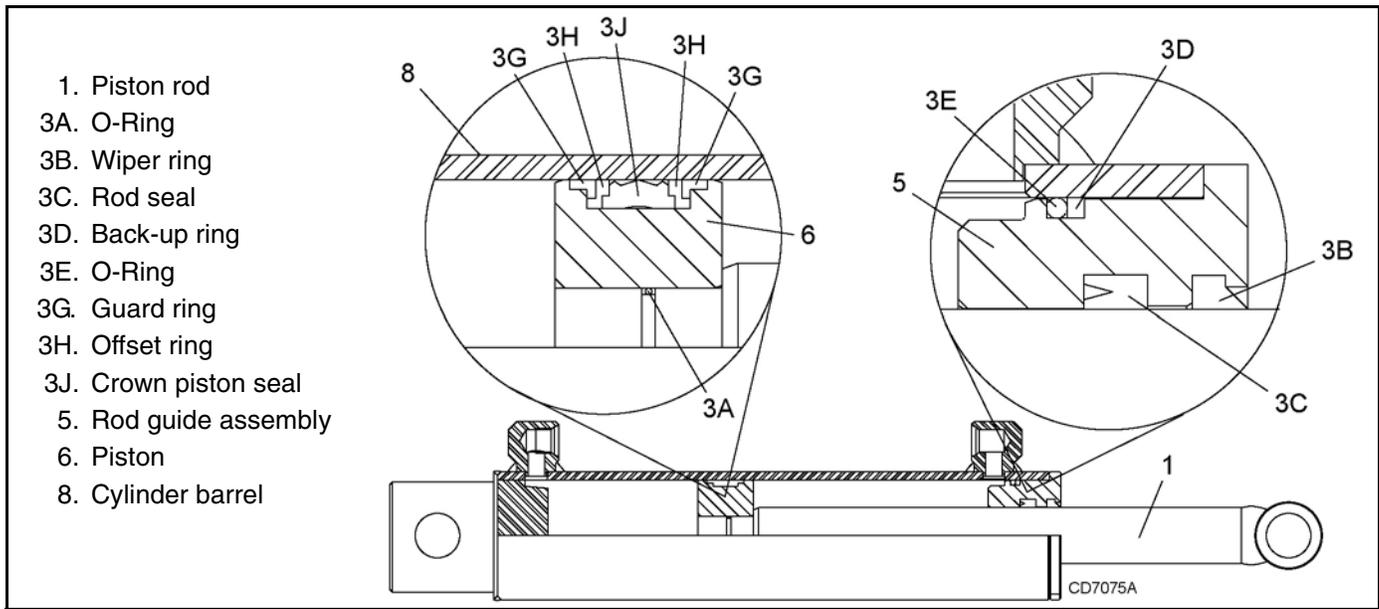


Figure 18. 1021509 Hydraulic Cylinder

Lightly coat rod threads with hydraulic oil and slide O-ring (3A) over threads and into groove. Completely clean threads of hydraulic oil, apply Loctite Primer 7649 and Loctite 242 to the rod threads, and thread piston (6) onto rod (1) with the two holes in the piston orientated away from the rod. Torque the piston (6) to 100 lbs-ft.

Compress wear rings and piston seals and carefully insert piston and rod assembly into barrel. Use care to prevent damage while installing. Carefully screw rod guide (5) into barrel (8) using a spanner wrench, or carefully use a punch and hammer.

SWING CYLINDER REPAIR

Repair to cylinders is limited to replacing seals, wear rings, and O-rings. Replacing rod, barrel, or pistons is not cost effective. Purchasing a complete cylinder is more economical.

Disassembly

Remove retaining ring (G) from barrel (2). Slide rod assembly (3) out of barrel. Inspect inside of cylinder barrel and rod surface for any scratches or scouring. Small scratches can be removed with fine crocus cloth. If scratches cannot be repaired, replace entire cylinder.

Clamp tube end of rod assembly in vise. Use a small torch to heat nut (4) and break down the thread-locking compound. Remove nut. Remove piston (5) and rod guide (1) from rod assembly. Clean threads on rod assembly and nut. Discard all seals.

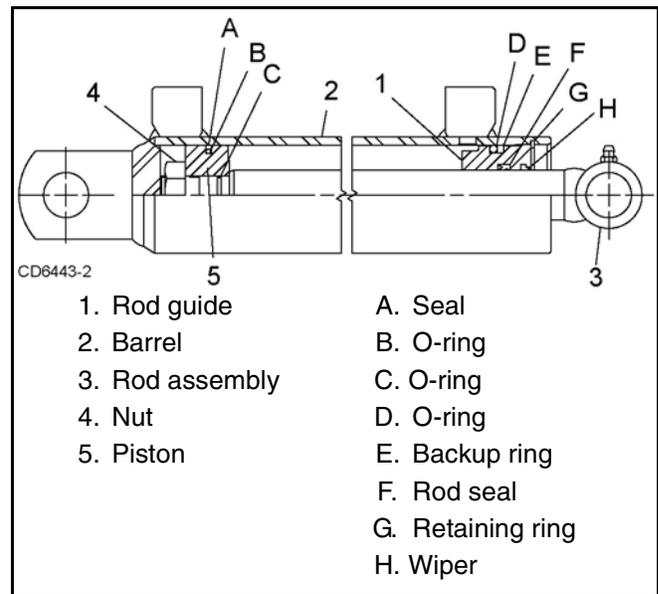


Figure 19. Swing Cylinder Components

Assembly

Lubricate new seals with clean oil. Install O-ring (D) and back up ring (E) in the outer groove of guide (1). Note the position of the backup ring. Install rod seal (F) in inner groove of rod guide. Note that the lips of the seal should be toward the piston side of the guide. Install wiper (H) with lip pointed outward from guide. Slide rod guide onto rod assembly.

Install O-ring (B) and seal (A) on piston (5). Apply oil to threads on rod assembly. Slide O-ring (C) over threads. Install piston. Apply permanent type thread-locking compound to rod threads and install nut. Torque nut to 125-135 lbs-ft.

Lubricate seals, slide rod assembly into tube and install snap ring (G) to complete assembly.

UNIVERSAL JOINT REPAIR

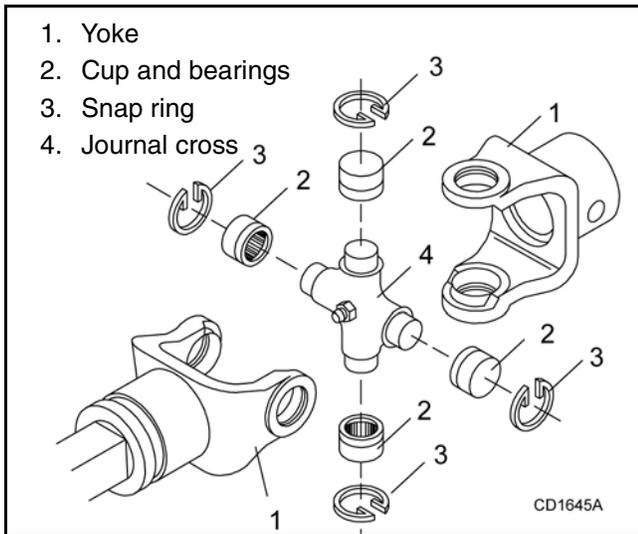


Figure 20. U-Joint Exploded View

U-Joint Disassembly

1. Remove external snap rings from yokes in four locations as shown in Figure 21.

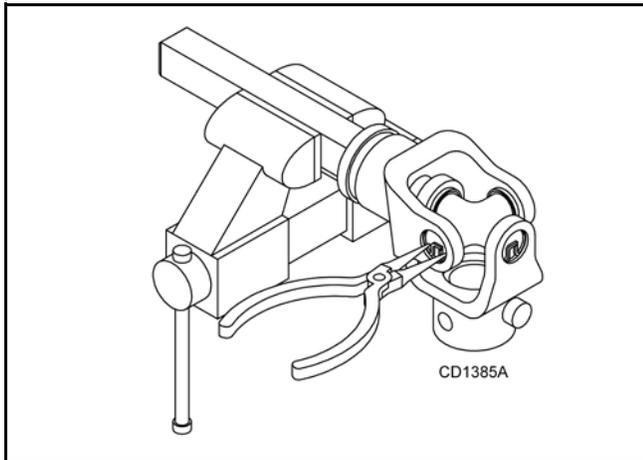


Figure 21.

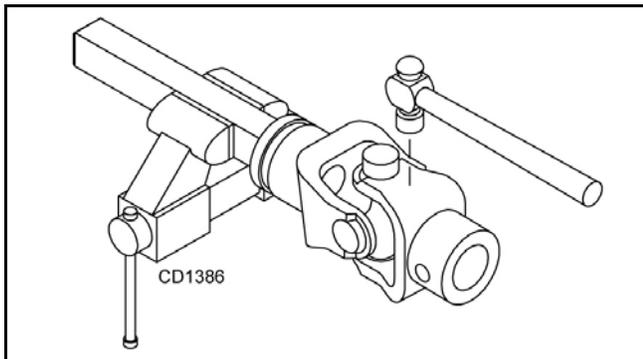


Figure 22.

2. With snap rings removed, support drive in vise, hold yoke in hand, and tap on yoke to drive cup out of yoke. See Figure 22.
3. Clamp cup in vise as shown in Figure 23 and tap on yoke to completely remove cup from yoke. Repeat Step 2 and Step 3 for opposite cup.

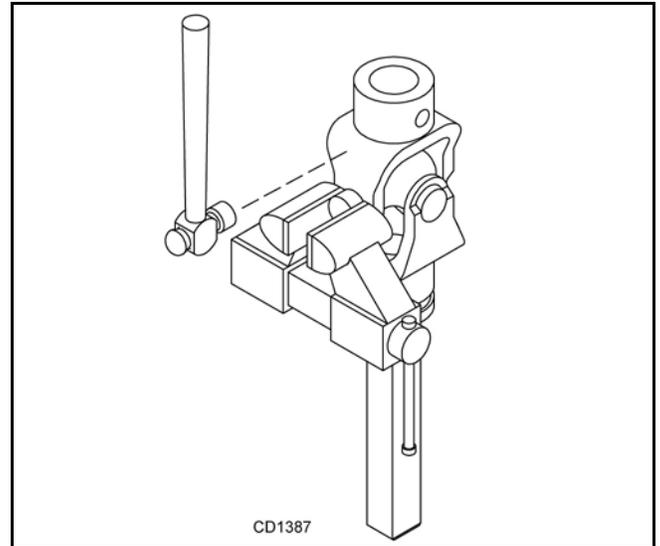


Figure 23.

4. Place universal cross in vise as shown in Figure 24 and tap on yoke to remove cup. Repeat Step 3 for final removal. Drive remaining cup out with a drift and hammer.

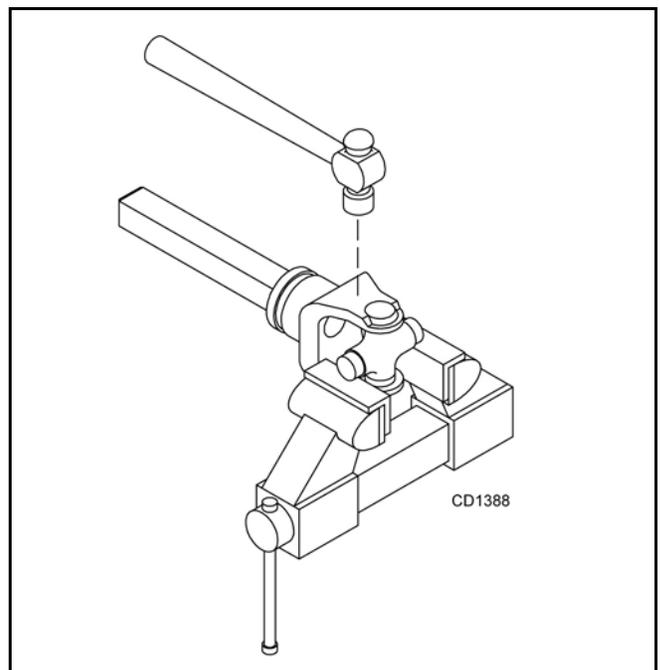


Figure 24.

U-Joint Assembly

1. Place seals securely on bearing cups. Insert cup into yoke from outside and press in with hand pressure as far as possible. Insert journal cross into bearing cup with grease fitting away from shaft. Be careful not to disturb needle bearings. Insert another bearing cup directly across from first cup and press in as far as possible with hand pressure.

Trap cups in vise and apply pressure. Be sure journal cross is started into bearings and continue pressure with vise, squeezing in as far as possible. Tapping the yoke will help.

2. Seat cups by placing a drift or socket (slightly smaller than the cup) on cup and rap with a hammer. See Figure 25. Install snap ring and repeat on opposite cup.
3. Repeat Step 1 and Step 2 to install remaining cups in remaining yoke.
4. Move both yokes in all directions to check for free movement. If movement is restricted, rap sharply on yokes with a hammer to relieve any tension.

Repeat until both yokes move in all directions without restriction.

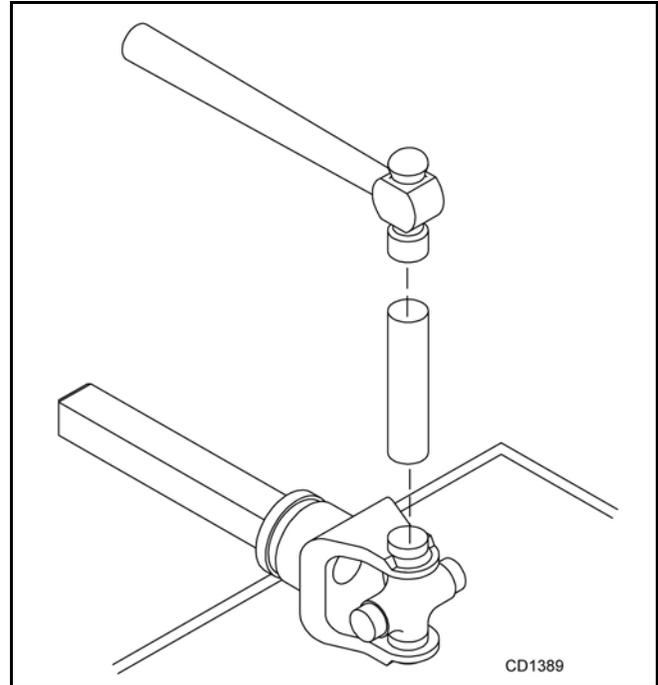


Figure 25.



ASSEMBLY INSTRUCTIONS

DEALER SET-UP INSTRUCTIONS

Assembly of this stump grinder is the responsibility of the Woods dealer. It should be delivered to the owner completely assembled, lubricated, and adjusted for normal grinding conditions.

Assembly will be easier if parts are aligned and loosely assembled before tightening hardware. Recommended torque values for hardware are located in the Bolt Torque Chart, page 37.

Complete check lists on page 28 when you have completed the assembly.

DRIVELINE INSTALLATION

A new slip clutch, or one that has been in storage over the winter, may seize.

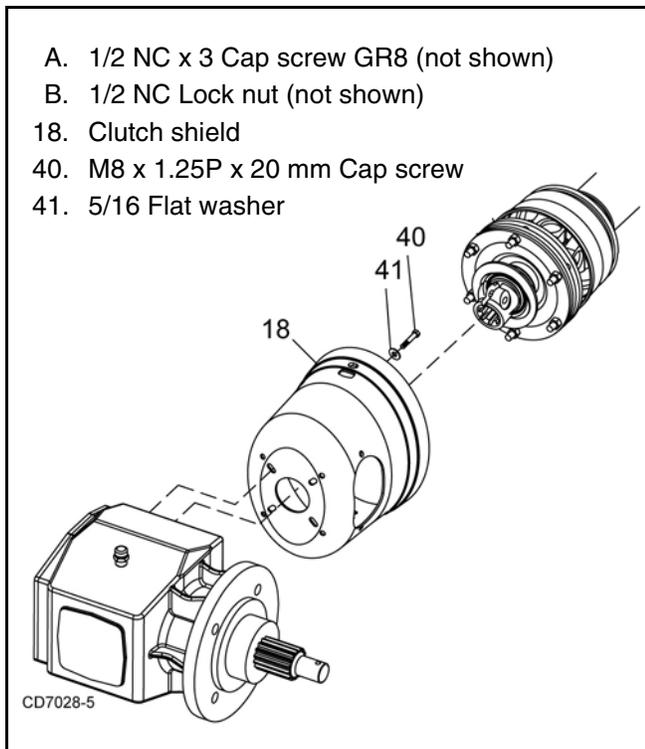


Figure 26. Slip Clutch Driveline Installation

1. Position clutch shield (18) against gearbox. Secure using cap screws (40) and flat washers (41). Torque hardware to 15 lbs-ft.
2. Slide driveline onto gearbox input shaft and secure with bolt (A) and nut (B) supplied with drive.
3. Lubricate rear driveline half and install front driveline half.
4. Attach tether chain.
5. Before operating slip clutch, make sure it will slip. Refer to Slip Clutch Adjustment, page 13.

OPTIONAL EQUIPMENT

Category 2 Hitch Pin Installation

The stump grinder comes equipped with category 1 hitch pins. Optional category 2 pins are available.

1. Remove Cat 1 hitch pins from stump grinder.
2. Attach Cat 2 hitch pins to the stump grinder frame using nuts and washers supplied with each pin.
3. Place hitch pins on the outside of frame; they should point outward.
4. Torque pins to 474 lbs-ft.

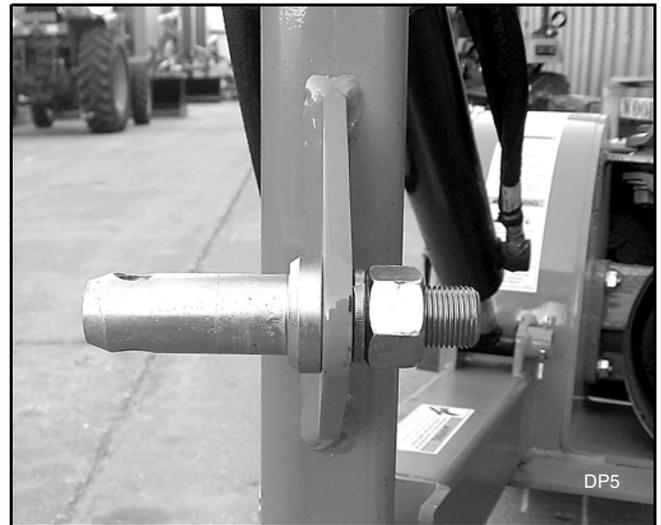


Figure 27. Cat 2 Hitch Pin Installed - Left Side Shown

Hose Kit Installation

Refer to Figure 28.

These instructions are for operating the Stump Grinder using the tractor dual hydraulic remote couplers.

1. Attach adapter (1) to base end of each cylinder.
2. Attach restrictor adapter (2) to the rod end of each cylinder.
3. Connect male quick couplers to end of supply hoses.

NOTE: The male hydraulic quick couplers and adapters for connection to tractor are NOT INCLUDED with this hose kit but are available as service parts.

4. Connect opposite end of supply hoses to the cylinders.
5. Keep hoses away for driveline and close to stump grinder frame. Secure hoses using tie straps provided.

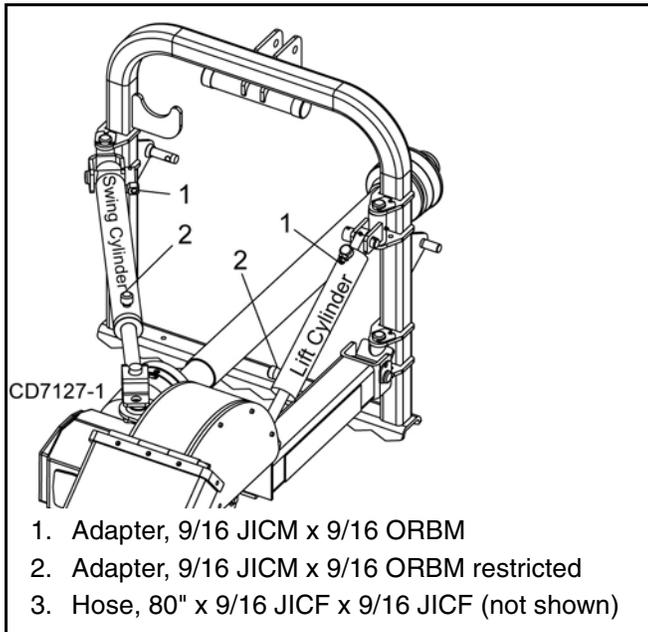


Figure 28. Hose and Fitting Installation

Manual Selector Valve Kit Installation

These instructions are for operating the Stump Grinder using manual select control valve and a single set of tractor hydraulic remote couplers.

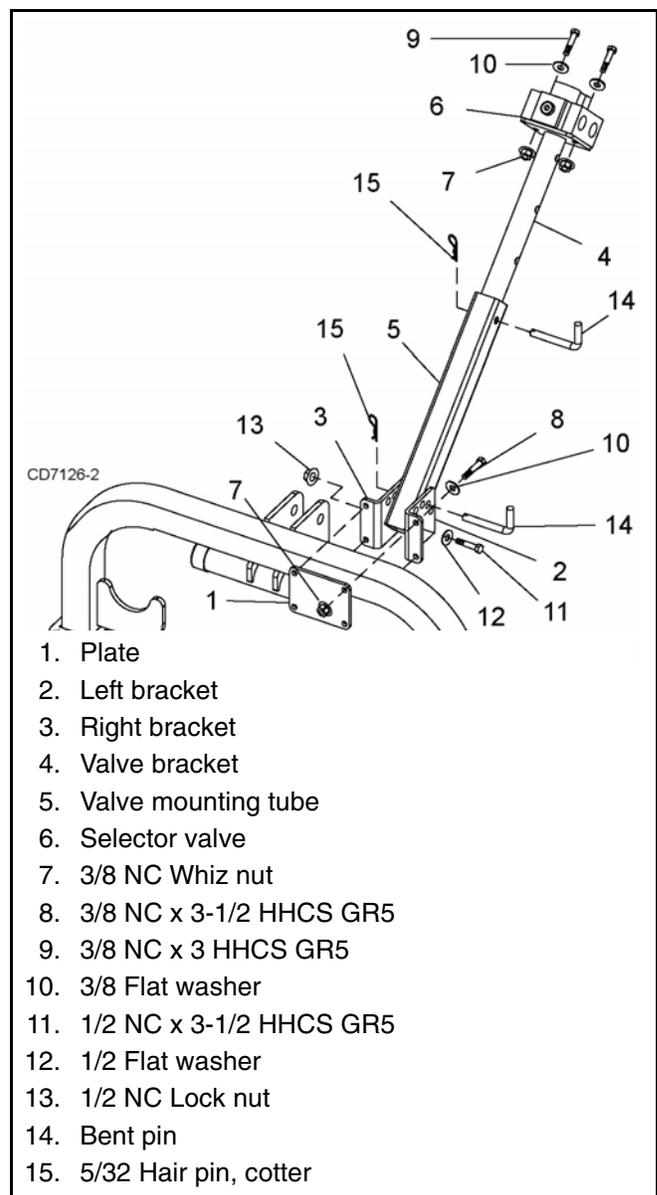
Valve Bracket Installation (Figure 29)

1. Attach right bracket (3), left bracket (2), and plate (1) to the top of stump grinder frame using four cap screws (8), washers (10), and whiz nuts (7).
2. Place mounting tube (5) between brackets (2 & 3) and secure using one cap screw (11), washer (12)

and lock nut (13). Do not over tighten hardware. Tube must be able to pivot between brackets.

3. Insert pin (14) in desired hole and secure with safety pin (15).
4. Attach selector valve (6) to valve bracket (4) using two cap screws (9), washers (10), and whiz nuts (7).
5. Attach valve handle to selector valve using hardware provided.
6. Insert valve bracket (4) in mounting tube (5). Adjust bracket to desired position and secure using pin (14) and safety pin (15). Valve handle should be positioned towards the tractor seat.

NOTE: Adjust valve bracket and mounting tube so selector valve can be reached from the tractor seat.



1. Plate
2. Left bracket
3. Right bracket
4. Valve bracket
5. Valve mounting tube
6. Selector valve
7. 3/8 NC Whiz nut
8. 3/8 NC x 3-1/2 HHCS GR5
9. 3/8 NC x 3 HHCS GR5
10. 3/8 Flat washer
11. 1/2 NC x 3-1/2 HHCS GR5
12. 1/2 Flat washer
13. 1/2 NC Lock nut
14. Bent pin
15. 5/32 Hair pin, cotter

Figure 29. Selector Valve Bracket Installation

Hoses and Fittings Installation

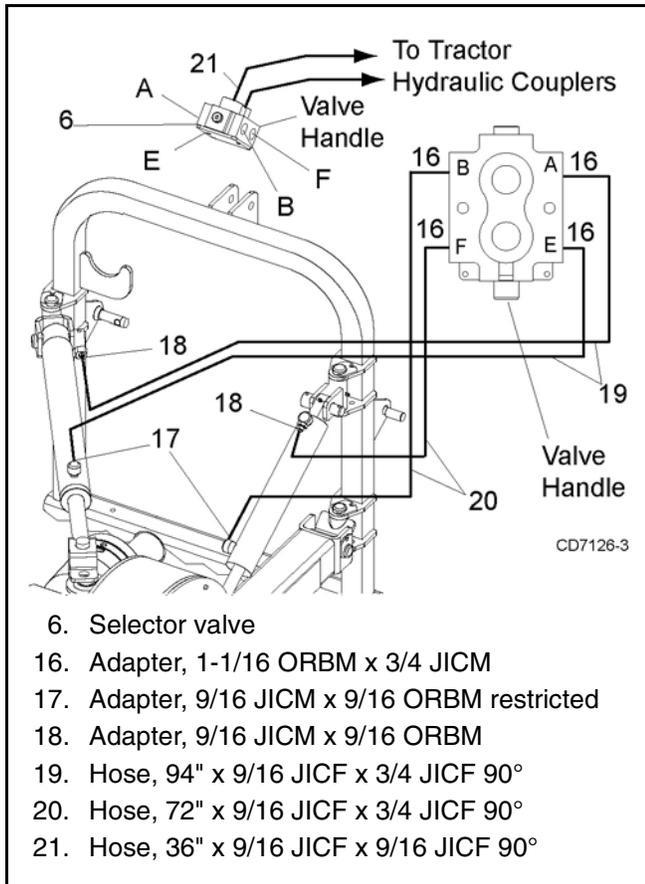


Figure 30. Hydraulic Hose and Fitting Installation

1. Attach adapter (18) to base end of each cylinder.
2. Attach restrictor adapter (17) to the rod end of each cylinder.
3. Install adapters (16) to each port (six) of the selector valve (6).
4. Attach straight hose (19) to the base end of swing cylinder. Attach 90° end of hose to port (A) on the selector valve.
5. Attach second hose (19) to the rod end of swing cylinder. Attach 90° end of hose to port (E) on the selector valve.
6. Attach straight end of hose (20) to the base end of lift cylinder. Attach 90° end of hose to port (F) on the selector valve.
7. Attach second hose (20) to the rod end of lift cylinder. Attach 90° end of hose to port (B) on the selector valve.
8. Attach 90° ends of supply hose (21) to the top ports on the selector valve.

9. Connect male quick couplers to opposite ends of supply hoses.
10. Keep hoses away from driveline and close to stump grinder frame. Secure hoses using tie straps provided.
11. The male hydraulic quick couplers and adapters for connection to tractor are NOT INCLUDED with this hose kit but are available as service parts.

Electric Selector Valve Kit Installation

These instructions are for operating the Stump Grinder using an electronic selector control valve and a single set of tractor hydraulic remote couplers.

Selector Valve Installation

1. Place upper plate (5) and lower plate (4) between stump grinder frame and secure together using four cap screws (6), flat washers (7), and whiz nuts (8).
2. Attach selector valve (3) to the bottom side of lower plate (4) using two cap screws (9) and lock washers (10).

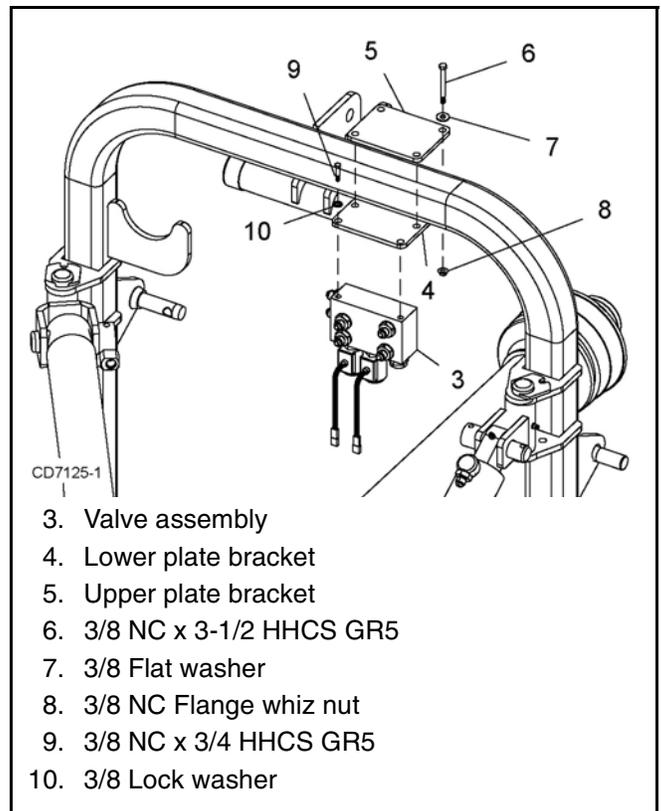
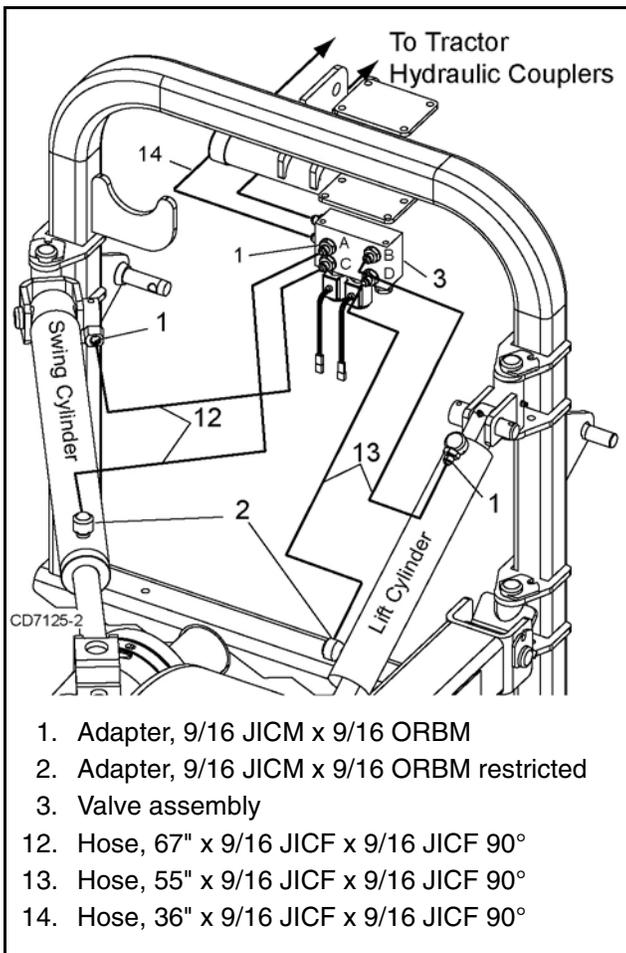


Figure 31. Selector Valve Installation

Hose and Fitting Installation



1. Adapter, 9/16 JICM x 9/16 ORBM
2. Adapter, 9/16 JICM x 9/16 ORBM restricted
3. Valve assembly
12. Hose, 67" x 9/16 JICF x 9/16 JICF 90°
13. Hose, 55" x 9/16 JICF x 9/16 JICF 90°
14. Hose, 36" x 9/16 JICF x 9/16 JICF 90°

Figure 32. Hose and Fitting Installation

1. Attach adapter (1) to base end of each cylinder.
2. Attach restrictor adapter (2) to the rod end of each cylinder.
3. Install adapters (1) to each port (six) of the selector valve (3).
4. Attach straight hose (12) to the base end of swing cylinder. Attach 90° end of hose to port (A) on the selector valve.
5. Attach second hose (12) to the rod end of swing cylinder. Attach 90° end of hose to port (C) on the selector valve.

6. Attach straight end of hose (13) to the base end of lift cylinder. Attach 90° end of hose to port (B) on the selector valve.
 7. Attach second hose (13) to the rod end of lift cylinder. Attach 90° end of hose to port (D) on the selector valve.
 8. Attach 90° ends of supply hose (14) to the side ports on the selector valve.
 9. Connect male quick couplers to opposite ends of supply hoses.
- NOTE:** The male hydraulic quick couplers and adapters for connection to tractor are NOT INCLUDED with this hose kit but are available as service parts.
10. Connect green and white wire leads from harness switch assembly to leads on valve assembly (3) shown in Figure 33.
 11. Attach harness switch assembly to a desired location on the tractor.

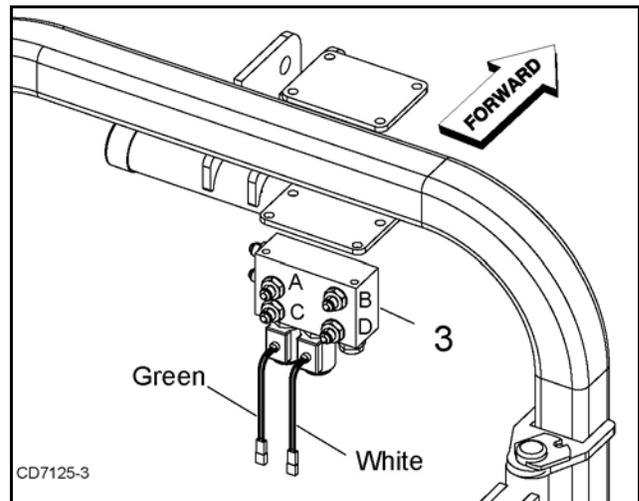


Figure 33. Harness to Valve Assembly Connection

12. Keep hoses and wires away for driveline and close to the stump grinder frame. Secure hoses and wires using tie straps provided.
13. Connect red wire on harness switch assembly to positive terminal and black wire to the negative terminal on tractor battery.



NOTES

DEALER CHECK LISTS

PRE-DELIVERY CHECK LIST

DEALER'S RESPONSIBILITY

Inspect stump grinder thoroughly after assembly to ensure it is set up properly before delivering it to the customer. The following check list is a reminder of points to inspect. Check off each item as it is found satisfactory or after corrections are made.

- ___ Check that shields and guards are properly installed and in good condition. Replace if damaged.
- ___ Check all bolts to be sure they are properly torqued.
- ___ Gearboxes are not filled at the factory. Prior to delivery, fill as specified in the Stump Grinder Preparation, page 9 and check to see that there are no leaking seals.
- ___ Check that all cotter pins and safety pins are properly installed. Replace if damaged.
- ___ Check and grease all lubrication points as identified in Lubrication Information, page 12. NOTE: For operation of this stump grinder, references to right, left, forward, and rearward directions are determined from the operator's position in the tractor seat.

DELIVERY CHECK LIST

DEALER'S RESPONSIBILITY

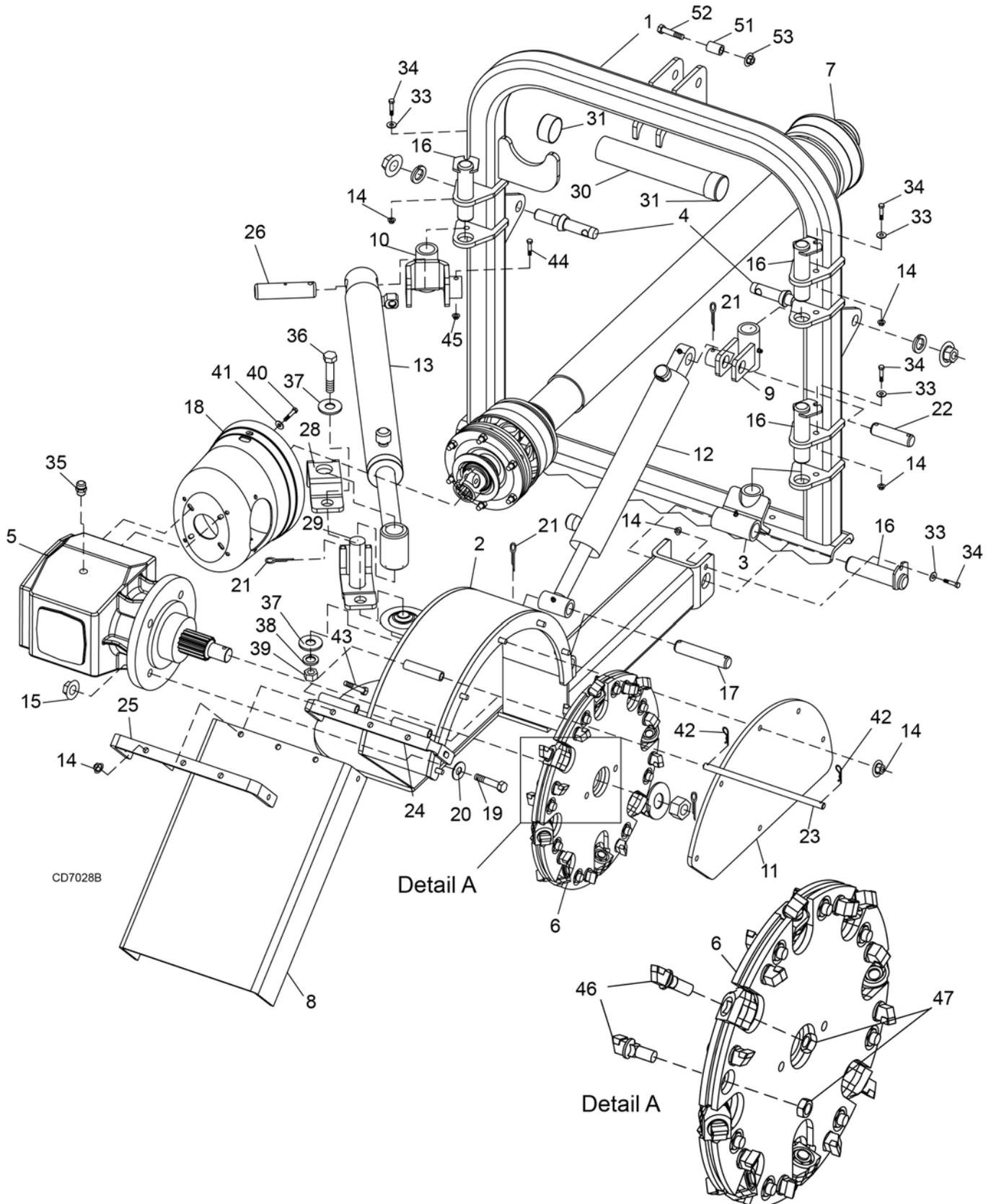
- ___ Point out the safety decals. Explain their meaning and the need to keep them in place and in good condition. Emphasize the increased safety hazards when instructions are not followed.
- ___ Present Operator's Manual and request that customer and all operators read it before operating equipment. Point out the manual safety rules, explain their meanings and emphasize the increased safety hazards that exist when safety rules are not followed.
- ___ Show customer how to make adjustments and properly attach stump grinder to tractor.
- ___ Show customer how to make sure driveline is properly installed and that spring-activated locking pin or collar slides freely and is seated in groove on tractor PTO shaft.
- ___ Instruct customer how to lubricate and explain importance of lubrication.
- ___ Point out the correct mounting and routing of hydraulic hoses. Explain that during operation, mounting, dismounting and storage, care must be taken to prevent hoses from pulling, twisting and kinking.



TSG50 Stump Grinder

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TSG50 STUMP GRINDER ASSEMBLY



CD7028B

30 Parts

(Rev. 12/19/2014)
MAN0495 (12/15/2006)

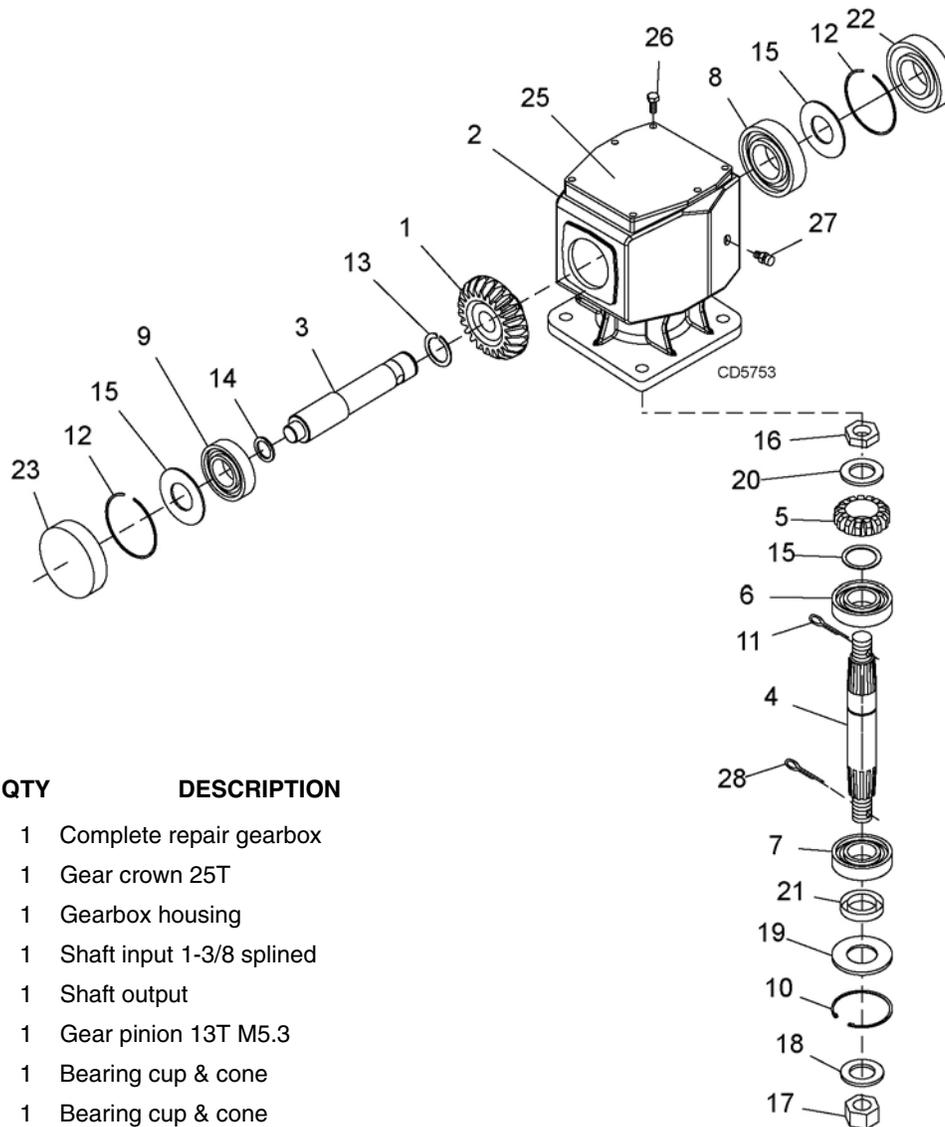
TSG50 STUMP GRINDER PARTS LIST

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1024692	1	TSG50 Frame with decals	26	1020279	4	Pin, 1.25 x 4.88
2	1024693	1	TSG50 Shroud with decals	28	1018368	2	Bent lug .38 x 2.0 x 7.38
3	1018360	1	Clevis	29	1016984	1	Link weldment
4	33661 *	2	Category 1 mounting pin	30	1004656	1	Manual tube
4	30006 *	2	Category 2 mounting pin (optional)	31	1004657	2	Caplug 2.0 x 1.0
5	1024691	1	Gearbox 1:1.92, with decals	33	565 *	3	3/8 Flat washer
6	1018302	1	TSG50 Cutting wheel	34	12169 *	3	3/8 NC x 1-1/4 HHCS GR5
7	1020901	1	Complete drive assembly	35	39325	1	Vent plug 3/8 NPT
8	1018367	1	Debris guard	36	58494	1	7/8 NC x 4 HHCS GR8
9	1018073	1	Clevis	37	4258 *	2	7/8 Flat washer
10	1018308	1	Clevis	38	30008 *	1	7/8 Lock washer
11	1024694	1	Shroud panel with decals	39	4261 *	1	7/8 NC Hex nut
12	1008201	1	Hydraulic cylinder 2.25 x 1.125 x 12.5	40	24801	1	M8 x 1.25P x 20 mm HHCS
13	1021509	1	Hydraulic cylinder 2.48 x 1.5 x 20	41	35037 *	4	5/16 Standard flat washer
14	70069 *	14	3/8 NC Flange whiz nut	42	21363 *	2	1/16 x 1 Hair pin cotter
15	19025 *	4	5/8 NC Flange lock nut	43	976 *	5	3/8 NC x 1-1/2 HHCS GR5
16	1021821	5	Pin, 1.0 x 4.0 x 5.64 headless	44	7164 *	1	5/16 NC x 2-1/4 HHCS GR5
17	8345	1	Pin, 1.0 x 4.08 headless	45	14139 *	1	5/16 Flange lock nut
18	1002048	1	Clutch shield	46	1007684	24	Bit, short - Sandvik
19	902 *	4	5/8 NC x 2 HHCS GR5	47	38042 *	24	5/8 NF Jam nut
20	57817	4	5/8 Hardened flat washer	48	1024749	1	Tooth kit, (set of 24 teeth & nuts) not shown
21	6185 *	6	1/4 x 2-1/4 Cotter pin	49	1024690		Decal, complete set (not shown)
22	1631	1	Headless pin, 1 x 2.72	50	1026022	1	4.5" Hose clamp to attach manual tube (item 30) to attach frame (item 1) (not shown)
23	1021818	1	Pin, .50 x 11.2 headless	51	1003614	1	Quick hitch bushing, upper
24	1018359	1	Guard clamp weldment	52	15007 *	1	3/4 NC x 3-1/2 HHCS GR5
25	1018358	1	Guard clamp	53	302207 *	1	3/4 NC Flange lock nut
				54	-----	2	Quikc hitch bushing, lower (not shown)

HHCS Hex Head Cap screw

* Standard hardware, obtain locally

GEARBOX ASSEMBLY



REF	PART	QTY	DESCRIPTION
A	1024691	1	Complete repair gearbox
1	57458	1	Gear crown 25T
2	N/S	1	Gearbox housing
3	1005320	1	Shaft input 1-3/8 splined
4	57489	1	Shaft output
5	57491	1	Gear pinion 13T M5.3
6	57476	1	Bearing cup & cone
7	57478	1	Bearing cup & cone
8	57462	1	Bearing cup & cone
9	20890	1	Bearing, ball
10	20897	1	Ring retainer 81mm internal
11	----- *	1	Cotter pin
12	57466	2	Snap ring
13	20895	1	Snap ring
14	57373	1	Spacer 35.3 x 48 x 2.5
15	57328	2	Gearbox shim kit
16	57468	1	Castle nut
17	20892	1	Castle nut metric M24 x 2
18	20893	1	Washer 25 x 44 x 4 mm
19	20888	1	Protective washer
20	57473	1	Flat washer 21 x 37 x 3

REF	PART	QTY	DESCRIPTION
21	20900	1	Seal, metric 40 x 80 x 12
22	57463	1	Oil seal 35 x 72 x 10
23	57374	1	Oil cap
25	57375	1	Top cover
26	----- *	6	M8 x 16 Hex head cap screw CL8.8
27	39325	1	Vent plug 3/8 NPT
28	----- *	1	Cotter pin

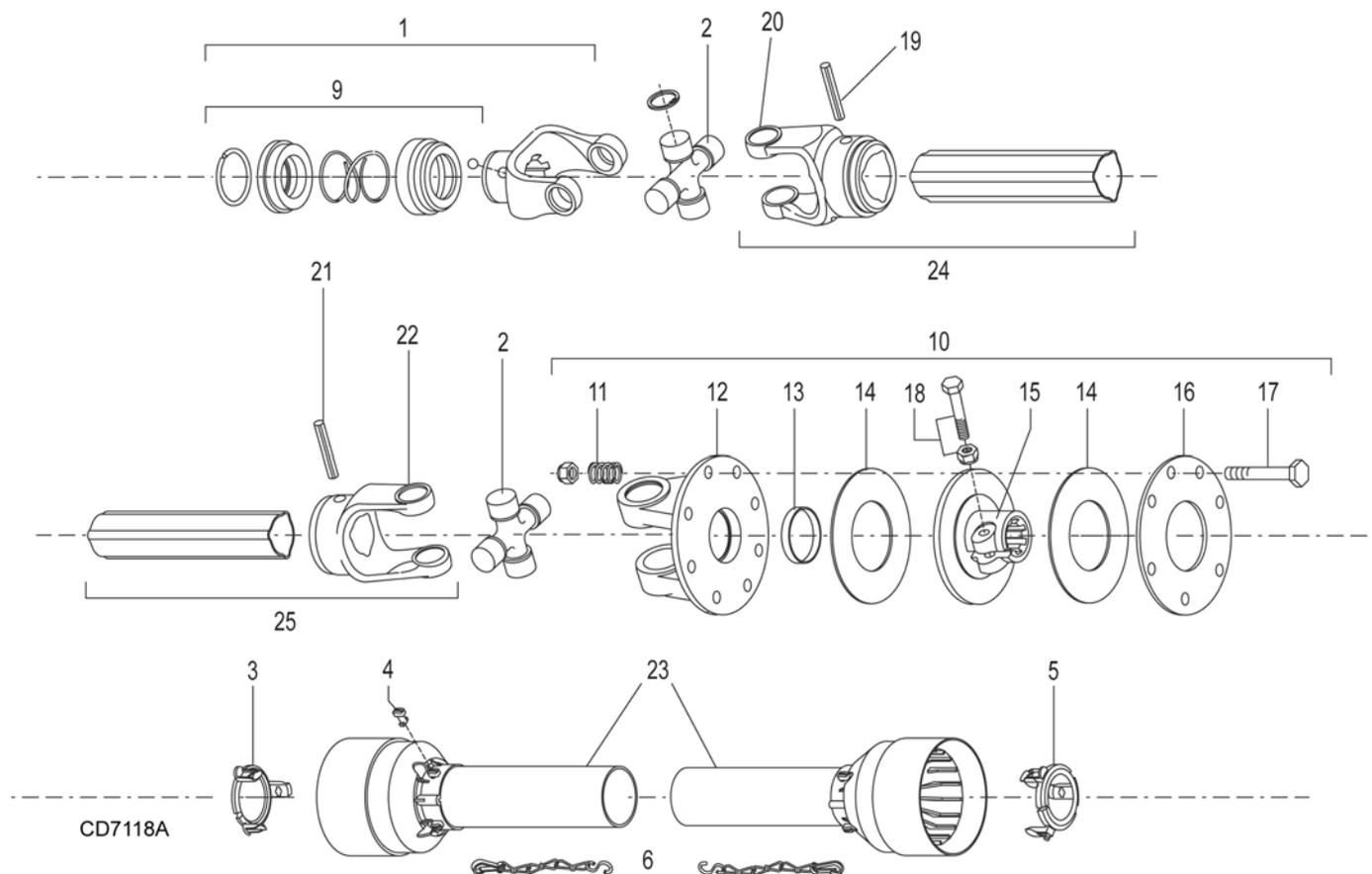
N/S Not serviced

* Standard hardware, obtain locally

32 Parts

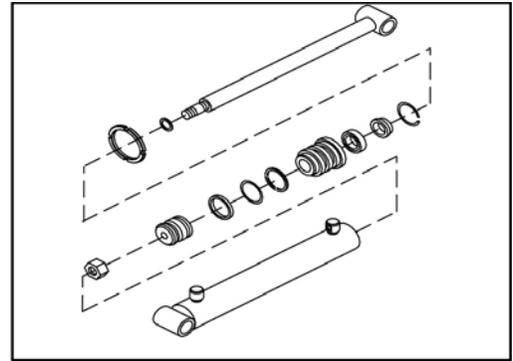
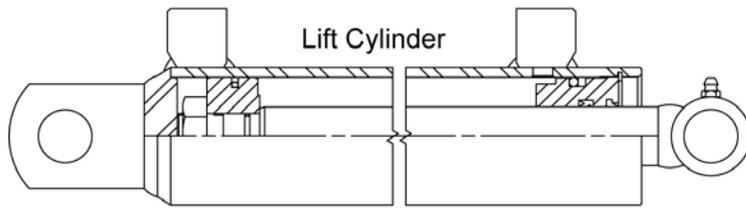
MAN0495 (12/15/2006)

DRIVELINE

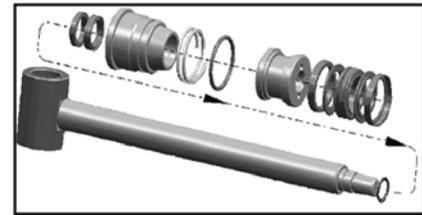
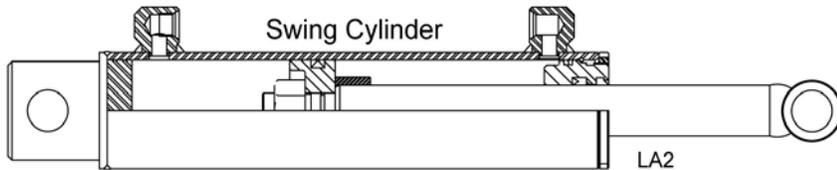


REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
A	1020901	1	Complete drive assembly	13	1001313	1	Bushing
1	1001300	1	Complete collar yoke 1-3/8 - 6	14	1001314	2	Friction disc - lining ring
2	38478	2	Cross & bearing kit	15	1001316	1	Flange hub
3	1019442	1	Outer cone fix ring	16	1001317	1	Pressure plate
4	30922	6	Shield retainer	17	1001318	8	M10 x 80 mm HHCS & nut
5	1019444	1	Inner cone fix ring	18	1001315	1	M12 x 1.25P x 60 mm HHCS & nut
6	30917	2	Shield tether chain	19	1001302	1	Flex pin
9	1001340	1	Lock collar repair kit	20	1001301	1	Outer yoke tube
10	1019449	1	Friction clutch	21	1001305	1	Flex pin
11	1001311	8	Spring	22	1001306	1	Inner tube yoke
12	1001312	1	Flange yoke	23	1021552	1	Shield, complete
				24	30926	1	Outer yoke & tube
				25	30932	1	Inner yoke & tube

CYLINDER



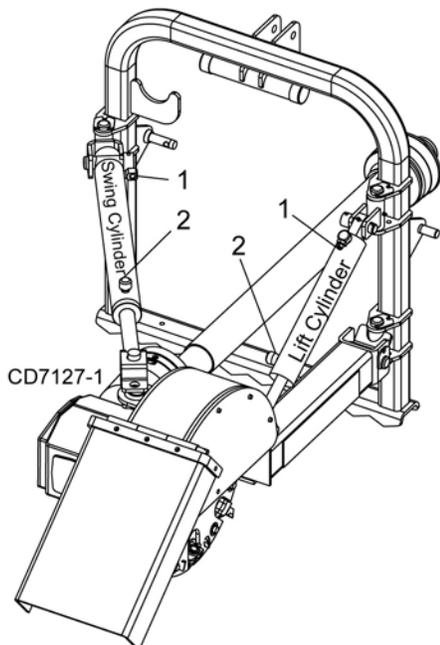
SPANNER NUT STYLE



THREADED ROD GLAND STYLE

Function	Complete Assembly	Base End Style	Retracted Length	Extended Length	Bore Dia	Rod Dia	Seal Kit
Lift	1008201	Tang	19.50	32.00	2.25	1.12	1008410
Swing	1021509		28.75	48.75	2.48	1.5	1023732 (Spanner Nut Style) 1023734 (Threaded Rod Gland Style)

1024682 HOSE KIT (OPTIONAL)



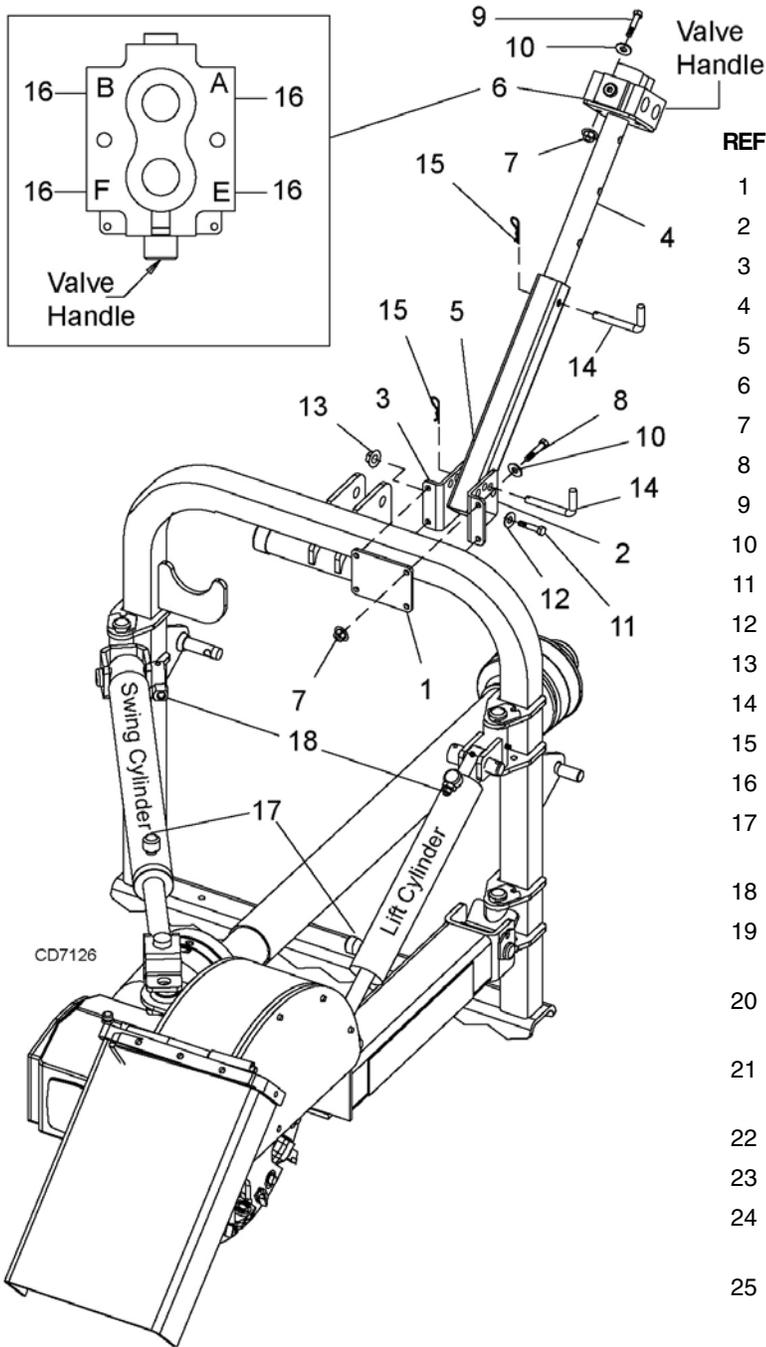
REF	PART	QTY	DESCRIPTION
1	F1044	2	Adapter, 9/16 JICM x 9/16 ORBM
2	37508	2	Adapter, 9/16 JICM x 9/16 ORBM restricted
3	H1224	4	Hose, 80" x 9/16 JICF x 9/16 JICF
4	54315 †	4	Adapter, 1/2 NPTM x 9/16 JICM (Tractor Hydraulic Couplers)
5	66511 †	4	QD, Male ISO 1/2 NPT (Tractor Hydraulic Couplers)

† Not Shown

34 Parts

(Rev. 1/6/2017)
MAN0495 (12/15/2006)

1021809 MANUAL SELECTOR VALVE KIT (OPTIONAL)



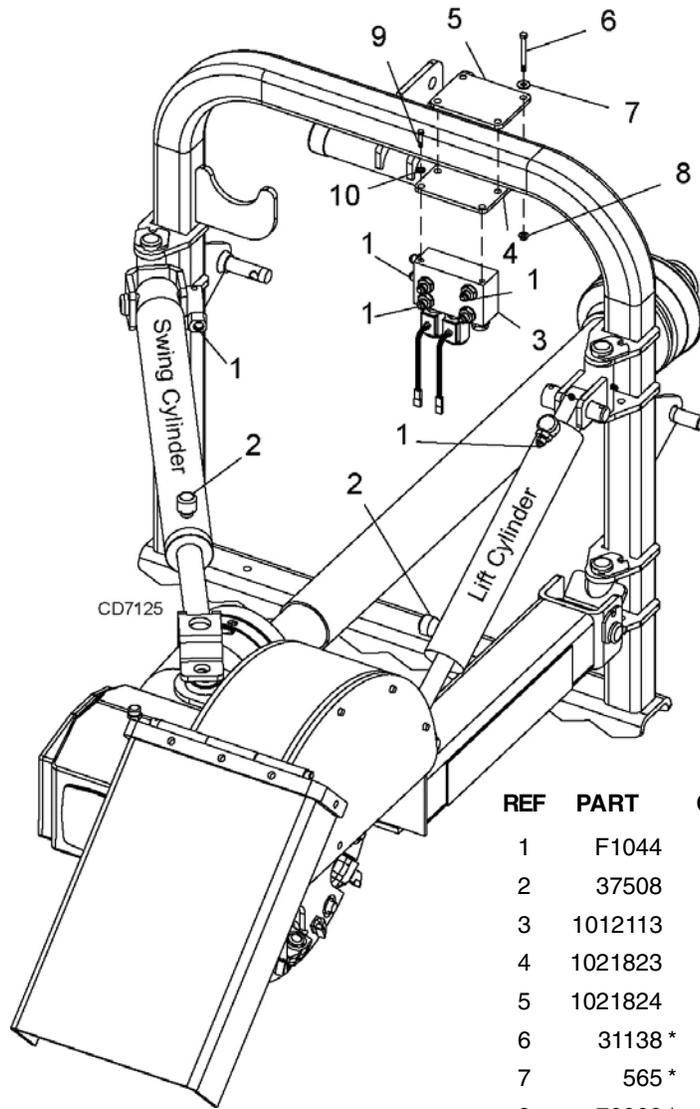
REF	PART	QTY	DESCRIPTION
1	1021824	1	Upper plate
2	1021813	1	Left valve bracket
3	1021814	1	Right valve bracket
4	1023100	1	Manual valve bracket
5	1021812	1	Valve tube
6	1004261	1	Selector valve
7	70069 *	4	3/8 NC Whiz nut
8	31138 *	4	3/8 NC x 3-1/2 HHCS GR5
9	7747 *	2	3/8 NC x 3 HHCS GR5
10	565 *	6	3/8 Flat washer
11	1637 *	1	1/2 NC x 3-1/2 HHCS GR5
12	854 *	1	1/2 Flat washer
13	11900 *	1	1/2 NC Lock nut
14	16329	2	Bent pin
15	2688 *	2	5/32 Hair pin, cotter
16	316017	6	Adapter, 3/4 JICM x 1-1/16 ORBM
17	37508	2	Adapter, 9/16 JICM x 9/16 ORBM restricted
18	F1044	2	Adapter, 9/16 JICM x 9/16 ORBM
19	1024686 †	2	Hose, 94" x 9/16 JICF x 3/4 JICF 90° (swing cylinder)
20	1024687 †	2	Hose, 72" x 9/16 JICF x 3/4 JICF 90° (lift cylinder)
21	H1183 †	2	36" x 9/16 JIFCF x 9/16 JICF 90° (tractor hydraulic couplers)
22	1004295 †		Seal kit, selector valve
23	1004296 †		Handle kit, selector valve
24	54315 †	2	Adapter, 1/2 NPTM x 9/16 JICM (Tractor Hydraulic Couplers)
25	66511 †	2	QD, Male ISO 1/2 NPT (Tractor Hydraulic Couplers)

† Not shown

HHCS Hex head cap screw

* Standard hardware, obtain locally

1021822 ELECTRIC SELECTOR VALVE KIT (OPTIONAL)



REF	PART	QTY	DESCRIPTION
1	F1044	8	Adapter, 9/16 JICM x 9/16 ORBM
2	37508	2	Adapter, 9/16 JICM x 9/16 ORBM restricted
3	1012113	1	Valve assembly, 2-stage
4	1021823	1	Lower plate
5	1021824	1	Upper plate
6	31138 *	4	3/8 NC x 3-1/2 HHCS GR5
7	565 *	4	3/8 Flat washer
8	70069 *	7	3/8 NC Flange whiz nut
9	1686 *	2	3/8 NC x 3/4 HHCS GR5
10	838 *	2	3/8 Lock washer
11	E0066 †	1	Wire harness assembly
12	H1222 †	2	Hose, 67" x 9/16 JICF x 9/16 JICF 90° (swing cylinder)
13	H1163 †	2	Hose, 55" x 9/16 JICF x 9/16 JICF 90° (lift cylinder)
14	H1183 †	2	Hose, 36" x 9/16 JICF x 9/16 JICF 90° (tractor hydraulic couplers)
15	54315 †	2	Adapter, 1/2 NPTM x 9/16 JICM (Tractor Hydraulic Couplers)
16	66511 †	2	QD, Male ISO 1/2 NPT (Tractor Hydraulic Couplers)

† Not shown

HHCS Hex head cap screw

* Standard hardware, obtain locally

BOLT TORQUE CHART

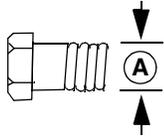
Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.

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 Grade 2
(No Dashes)

SAE Bolt Head Identification

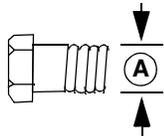


SAE Grade 5
(3 Radial Dashes)



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



METRIC SERIES TORQUE CHART



8.8
Metric
Grade 8.8

Metric Bolt Head Identification



10.9
Metric
Grade 10.9

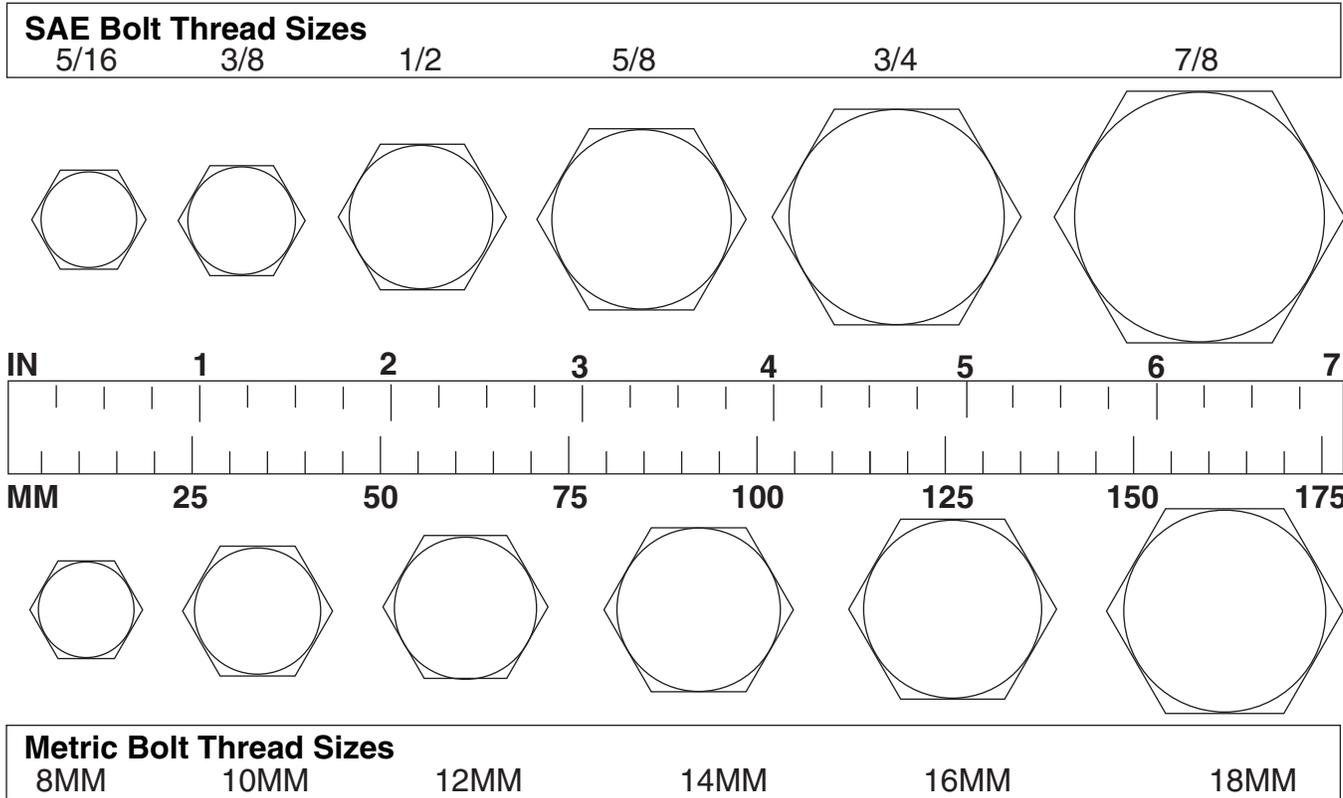
Ⓐ Diameter & Thread Pitch (Millimeters)	Wrench Size	COARSE THREAD				FINE THREAD				Ⓐ Diameter & Thread Pitch (Millimeters)
		MARKING ON HEAD								
		Metric 8.8		Metric 10.9		Metric 8.8		Metric 10.9		
		N-m	lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m	lbs-ft	
6 x 1.0	10 mm	8	6	11	8	8	6	11	8	6 x 1.0
8 x 1.25	13 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

Typical Washer Installations

8/9/00

BOLT SIZE CHART

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



ABBREVIATIONS

AG Agriculture
 ASABE American Society of Agricultural & Biological Engineers (formerly ASAE)
 ASAE..... American Society of Agricultural Engineers
 ATF.....Automatic Transmission Fluid
 BSPP..... British Standard Pipe Parallel
 BSPTM..... British Standard Pipe Tapered Male
 CV Constant Velocity
 CCW..... Counter-Clockwise
 CW Clockwise
 F Female
 FT..... Full Thread
 GA Gauge
 GR (5, etc.)..... Grade (5, etc.)
 HHCS Hex Head Cap Screw
 HT Heat-Treated
 JIC..... Joint Industry Council 37° Degree Flare
 LH..... Left Hand
 LT Left
 m Meter
 mm Millimeter
 M Male

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

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WARRANTY

(Replacement Parts For All Models Except Mow'n Machine™
Zero-Turn Mowers and Woods Boundary™ Utility Vehicles)

Woods Equipment Company ("WOODS") warrants this product to be free from defect in material and workmanship for a period of ninety (90) days from the date of delivery of the product to the original purchaser with the exception of V-belts, which will be free of defect in material and workmanship for a period of 12 months.

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

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

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

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

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

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

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

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

ALITEC™
CENTRAL FABRICATORS®
GANNON®
WAIN-ROY®
WOODS®



WOODS® | A Blount International Brand
2606 South Illinois Route 2
Post Office Box 1000
Oregon, Illinois 61061 USA
800-319-6637 tel
800-399-6637 fax
woodsequipment.com



WARRANTY

All Models Except Mow'n Machine™ Zero-Turn Mowers

Please Enter Information Below and Save for Future Reference.

Date Purchased: _____

From (Dealer): _____

Model Number: _____

Serial Number: _____

Woods Equipment Company ("WOODS") warrants this product to be free from defect in material and workmanship. Except as otherwise set forth below, the duration of this Warranty shall be for TWELVE (12) MONTHS COMMENCING ON THE DATE OF DELIVERY OF THE PRODUCT TO THE ORIGINAL PURCHASER.

All current model backhoes, loaders and mounts (except 3-pt. SAF-T-LOK® mounts) are warranted for two (2) years from the date of delivery to the original purchaser. The limited warranty covers any defects in the material and/or workmanship. Following the proper, recommended installation by an authorized Woods Dealer and normal use of a Woods mounting and backhoe or loader, if a tractor incurs damage resulting from the attachment, Woods will cover the existing tractor warranty in the event the manufacturer voids its tractor warranty because of the attachment. Warranty does not cover any misuse or abusive conditions that could cause premature wear or damage to attachment or tractor.

The warranty periods for specific parts or conditions are listed below:

Part or Condition Warranted	Model Number	Duration (from date of delivery to the original purchaser)
	All units invoiced after 4/30/2012	
Gearbox components	BB48X, BB60X, BB72X, BB84X, BB600X, BB720X, BB840X, BB6000X, BB7200X, BB8400X, DS1440, TS1680, DS8.30, DS10.40, DS8.50, DSO8.50, DS10.50, DSO10.50, DBH5.30, DBH6.30	6 years
	BW12, BW15, BW126X, BW180X, BW126XHD, BW180XHD, BW1260X, BW1800X,	
	BW240X, BW240XHD, BW1620X, BW2400X	
	RD990X, PRD6000, PRD7200, PRD8400, S15CD, S20CD, S22CD, S25CD, S27CD, S30CD, TC/R74, TC/R68, TC/R60, TBW144, TBW180, TBW204, TSG50, S12ED, S15ED, S18ED, S20ED, TPD25, TPD35, TPD65, TPD95	3 years (1 year if used in rental or commercial applications)
RDC54, RD60, RD72, TBW150C, TS/R60, TS/R52, TS/R44, RC3.5, RC4, RC5, RC6		
Blade spindles	RD990X, PRD6000, PRD7200, PRD8400, TBW144, TBW180, TBW204	3 years

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

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

WOODS makes no warranty, express or implied, with respect to engines, batteries, tires or other parts or accessories not manufactured by WOODS. Warranties for these items, if any, are provided separately by their respective manufacturers.

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

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

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

No agent, representative, dealer, distributor, serviceperson, salesperson, or employee of any company, including without limitation, WOODS, its authorized dealers, distributors, and service centers, is authorized to alter, modify, or enlarge this Warranty. Answers to any questions regarding warranty service and locations may be obtained by contacting:

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