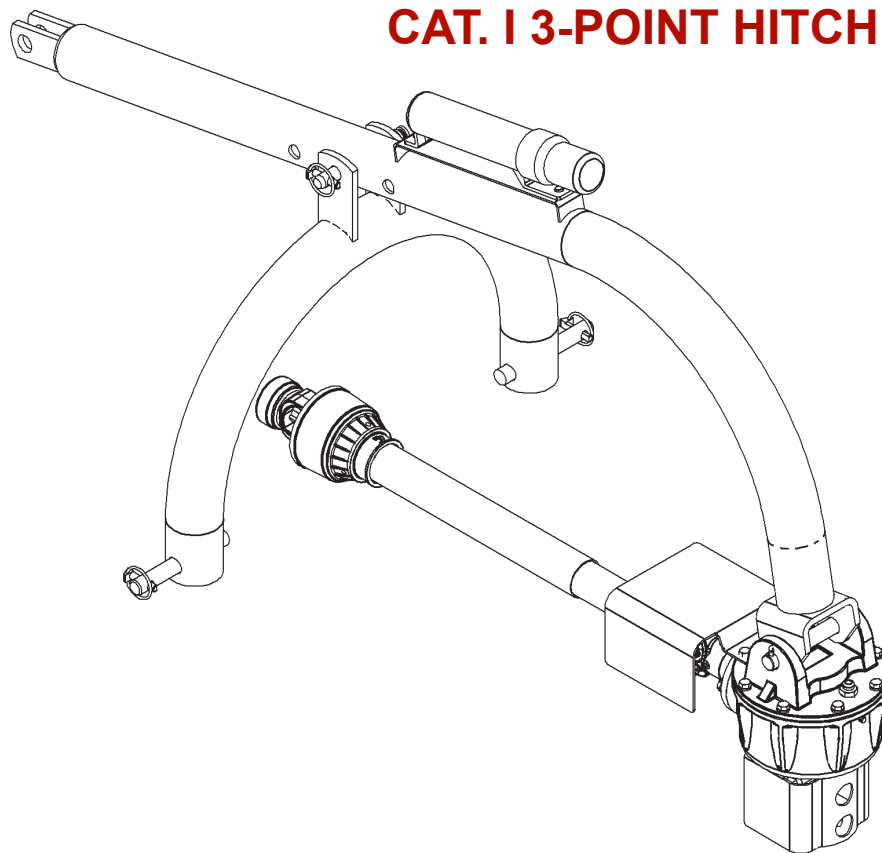




# OPERATOR'S MANUAL

## POST HOLE DIGGER PHD20 Series

**FOR  
CAT. I 3-POINT HITCH TRACTORS**



SERIAL NUMBER: \_\_\_\_\_

Manual Number: KDK06-0197

MODEL NUMBER: \_\_\_\_\_

Rev. 2



# TABLE OF CONTENTS

<b>PREFACE</b> .....	5
<b>SAFETY PRECAUTIONS</b>	
Safety Statements .....	6
General Safety Precautions.....	6-8
Equipment Safety Precautions .....	9-10
<b>DECALS</b> .....	11-12
<b>INSTALLATION</b>	
Initial Set-Up .....	13-15
Installation .....	16
Detaching.....	16
<b>OPERATION</b>	
Intended Use .....	17
Operation .....	17
Operating Tips	
Storage .....	18
Lift Points.....	18
Tie Down Points.....	19
Transporting.....	19
<b>MAINTENANCE</b>	
General information .....	20
PTO Drive Assembly.....	21-23
<b>TROUBLESHOOTING</b> .....	24
<b>SPECIFICATIONS</b>	
Bolt Torque Specifications .....	25
<b>PARTS / WARRANTY</b> .....	27

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# PREFACE

## GENERAL COMMENTS

Congratulations on the purchase of your new product! This product was carefully designed and manufactured to give you many years of dependable service. Only minor maintenance (such as cleaning and lubricating) is required to keep it in top working condition. Be sure to observe all maintenance procedures and safety precautions in this manual and on any safety decals located on the product and on any equipment on which the attachment is mounted.

This manual has been designed to help you do a better, safer job. Read this manual carefully and become familiar with its contents.

**WARNING!**  **Never let anyone operate this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual. Always choose hard, level ground to park the vehicle on and set the brake so the unit cannot roll.**

Unless noted otherwise, right and left sides are determined from the operator's control position when facing the attachment.

**NOTE:** The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the attachment as may be necessary without notification.

## BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure the equipment is operated only by trained individuals that have read and understand this manual. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer to obtain further assistance. Keep this manual available for reference. Provide the manual to any new owners and/or operators.

## SAFETY ALERT SYMBOL



This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

## SERVICE

Use only manufacturer replacement parts. Substitute parts may not meet the required standards.

Record the model and serial number of your unit on the cover of this manual. The parts department needs this information to insure that you receive the correct parts.

## SOUND AND VIBRATION

Sound pressure levels and vibration data for this attachment are influenced by many different parameters: some items are listed below (not inclusive):

- prime mover type, age, condition, with or without cab enclosure and configuration
- operator training, behavior, stress level
- job site organization, working material condition, environment

Based on the uncertainty of the prime mover, operator, and job site, it is not possible to get precise machine and operator sound pressure levels or vibration levels for this attachment.

**NOTE:** A list of all Paladin Patents can be found at <http://www.paladinattachments.com/patents.asp>.

## SAFETY STATEMENTS



THIS SYMBOL BY ITSELF OR WITH A WARNING WORD THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.



### **DANGER**

THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.



### **WARNING**

THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.



### **CAUTION**

THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE INJURY.

### **NOTICE**

NOTICE IS USED TO ADDRESS PRACTICES NOT RELATED TO PHYSICAL INJURY.

## GENERAL SAFETY PRECAUTIONS

### **WARNING!**



#### **READ MANUAL PRIOR TO INSTALLATION**

Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual, as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance. **FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVER'S MANUAL(S).**



#### **READ AND UNDERSTAND ALL SAFETY STATEMENTS**

Read all safety decals and safety statements in all manuals prior to operating or working on this equipment. Know and obey all OSHA regulations, local laws, and other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing, or operating this equipment.



#### **KNOW YOUR EQUIPMENT**

Know your equipment's capabilities, dimensions, and operations before operating. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order with all safety devices intact. Check all hardware to ensure it is tight. Make certain that all locking pins, latches, and connection devices are properly installed and secured. Remove and replace any damaged, fatigued, or excessively worn parts. Make certain all safety decals are in place and are legible. Keep decals clean, and replace them if they become worn or hard to read.

## GENERAL SAFETY PRECAUTIONS

### WARNING!



### PROTECT AGAINST FLYING DEBRIS

Always wear proper safety glasses, goggles, or a face shield when driving pins in or out, or when any operation causes dust, flying debris, or any other hazardous material.

### WARNING!



### LOWER OR SUPPORT RAISED EQUIPMENT

Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or on blocks. Lower booms and attachments to the ground before leaving the cab or operator's station.

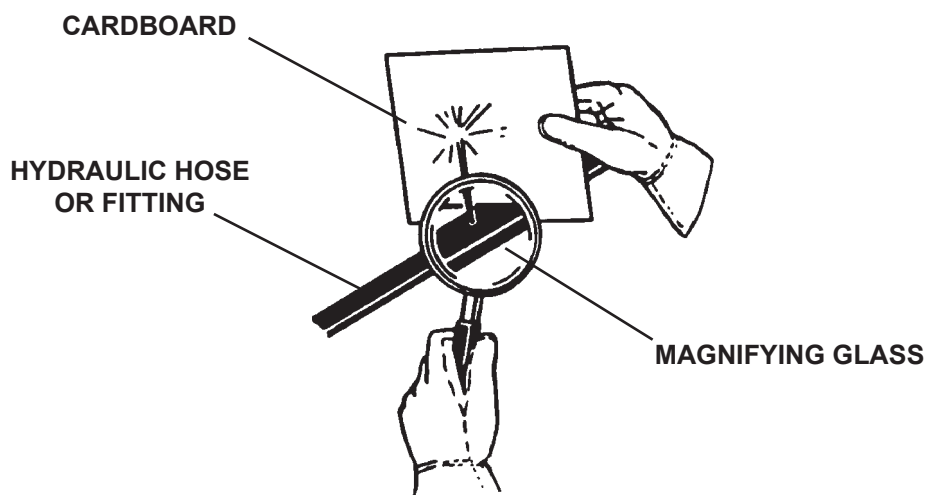
### WARNING!



### USE CARE WITH HYDRAULIC FLUID PRESSURE

Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Before connecting or disconnecting hydraulic hoses, read your prime mover's operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

- Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.
- If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS!** **SEE ILLUSTRATION.**



## GENERAL SAFETY PRECAUTIONS

### WARNING!



#### DO NOT MODIFY MACHINE OR ATTACHMENTS

Modifications may weaken the integrity of the attachment and may impair the function, safety, life, and performance of the attachment. When making repairs, use only the manufacturer's genuine parts, following authorized instructions. Other parts may be substandard in fit and quality. Never modify any ROPS (Roll Over Protective Structure) or FOPS (Falling Object Protective Structure) equipment or device. Any modifications must be authorized in writing by the manufacturer.

### WARNING!



#### SAFELY MAINTAIN AND REPAIR EQUIPMENT

- Do not wear loose clothing or any accessories that can catch in moving parts. If you have long hair, cover or secure it so that it does not become entangled in the equipment.
- Work on a level surface in a well-lit area.
- Use properly grounded electrical outlets and tools.
- Use the correct tools for the job at hand. Make sure they are in good condition for the task required.
- Wear the protective equipment specified by the tool manufacturer.



#### SAFELY OPERATE EQUIPMENT

Do not operate equipment until you are completely trained by a qualified operator in how to use the controls, know its capabilities, dimensions, and all safety requirements. See your machine's manual for these instructions.

- Keep all step plates, grab bars, pedals, and controls free of dirt, grease, debris, and oil.
- Never allow anyone to be around the equipment when it is operating.
- Do not allow riders on the attachment or the prime mover.
- Do not operate the equipment from anywhere other than the correct operator's position.
- Never leave equipment unattended with the engine running, or with this attachment in a raised position.
- Do not alter or remove any safety feature from the prime mover or this attachment.
- Know your work site safety rules as well as traffic rules and flow. When in doubt on any safety issue, contact your supervisor or safety coordinator for an explanation.

### WARNING!



#### CALIFORNIA PROPOSITION 65 WARNING

This product may contain a chemical known to the state of California to cause cancer, or birth defects or other reproductive harm. [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)



## EQUIPMENT SAFETY PRECAUTIONS

### WARNING!



#### KNOW WHERE UTILITIES ARE

Observe overhead electrical and other utility lines. Be sure equipment will clear them. When digging, call your local utilities for location of buried utility lines, gas, water, and sewer, as well as any other hazard you may encounter.

### WARNING!



#### EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.

It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of any attachment that may cause high levels of dust.

### WARNING!



#### REMOVE PAINT BEFORE WELDING OR HEATING

Hazardous fumes/dust can be generated when paint is heated by welding, soldering or using a torch. Do all work outside or in a well ventilated area and dispose of paint and solvent properly. Remove paint before welding or heating.

When sanding or grinding paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

### WARNING!



#### END OF LIFE DISPOSAL

At the completion of the useful life of the unit, drain all fluids and dismantle by separating the different materials (rubber, steel, plastic, etc.). Follow all federal, state and local regulations for recycling and disposal of the fluid and components.



#### OPERATING THE ATTACHMENT

- PTO Operated Attachment: Rotating driveline contact can cause death. Do not operate without all driveline, tractor and equipment shields in place.
- Check driveline shields turn freely on driveline before operating.
- Do not exceed specified RPM of your tractor or equipment.
- All bystanders should be kept a minimum of 10 feet (3 meters) away from the working area of the earth auger.
- Operate only from the operator's station.
- Check for underground utility lines. **CALL BEFORE YOU DIG.**
- Avoid steep hillside operation which could cause the prime mover to overturn. Consult your prime move operator's and safety manuals for maximum incline allowable.
- Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle.
- An operator must not use drugs or alcohol, which can change his or her alertness or coordination. An operator taking prescription or over-the-counter drugs should seek medical advice on whether or not he or she can safely operate equipment.
- Before exiting the prime mover, always make sure all rotation has stopped, attachment is lowered to the ground, PTO is disengaged, parking brake is engaged, engine is turned off and the keys are removed.

# EQUIPMENT SAFETY PRECAUTIONS



## TRANSPORTING THE ATTACHMENT

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on slopes.
- When transporting on a trailer: Secure attachment using tie down accessories that are capable of maintaining attachment stability.
- Use extra care when loading or unloading the attachment onto a truck or trailer.
- When driving on public roads use safety lights, reflectors, Slow Moving Vehicle signs etc., to prevent accidents. Check local government regulations that may affect you.
- Do not drive close to ditches, excavations, etc., cave in could result.
- Do not smoke when refueling the prime mover. Allow room in the fuel tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.



## MAINTAINING THE ATTACHMENT

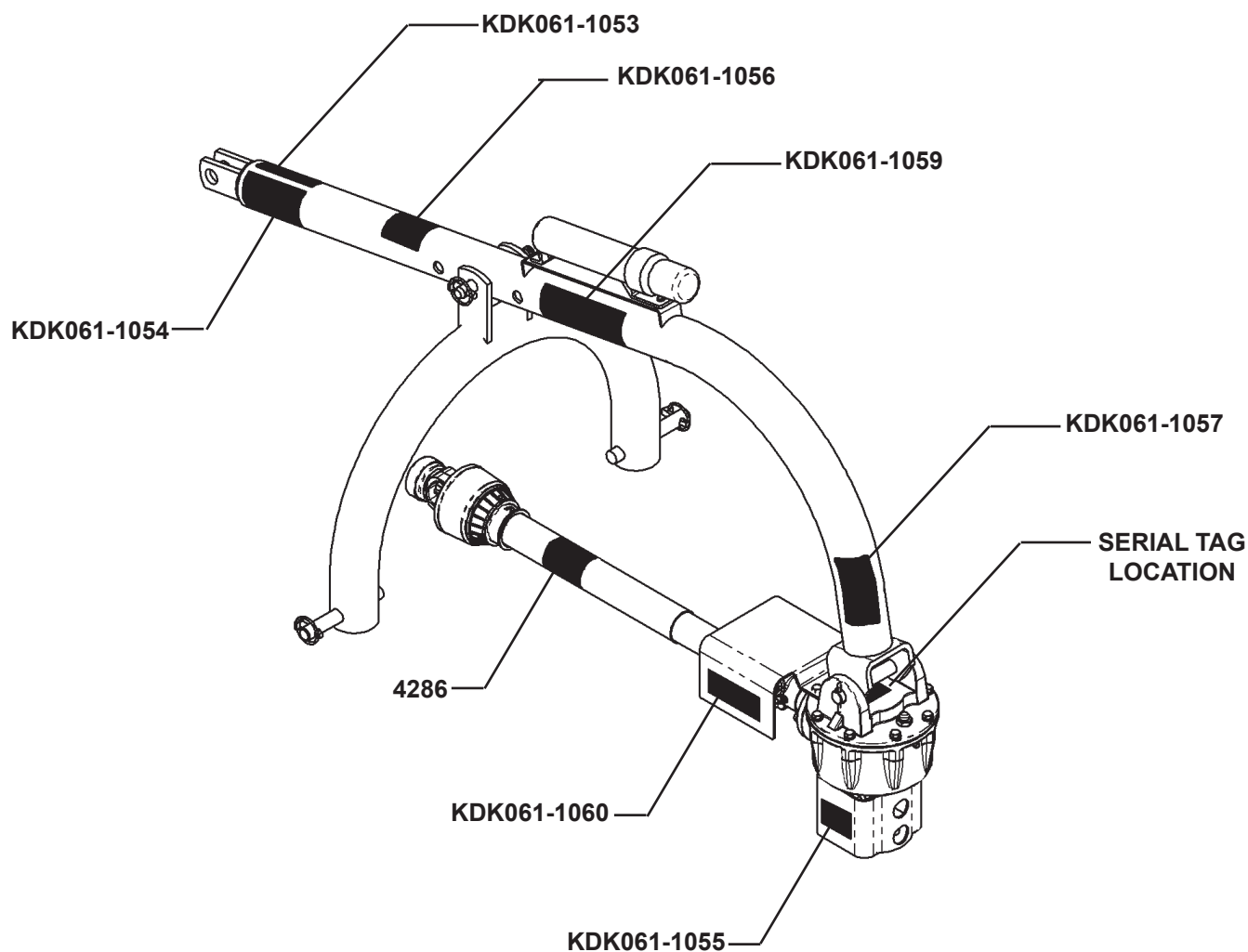
- Before exiting the prime mover to perform maintenance, always make sure all rotation has stopped, attachment is lowered to the ground, PTO is disengaged, parking brake is engaged, engine is turned off and the keys are removed.
- Disengage PTO from tractor before performing any adjustments or repairs.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator manual's before any repair is made. After completing maintenance or repair, check for correct functioning of the attachment. If not functioning properly, always tag "DO NOT OPERATE" until all problems are corrected.
- Worn, damaged, or illegible safety decals must be replaced. New safety decals can be ordered from Paladin.
- Never work under a raised attachment unless PTO has been disengaged from tractor and it is securely blocked.

# DECALS

## DECAL PLACEMENT

### GENERAL INFORMATION

The diagram on this page shows the location of the decals used on your attachment. The decals are identified by their part numbers, with reductions of the actual decals located on the following page. Use this information to order replacements for lost or damaged decals. Be sure to read all decals before operating the attachment. They contain information you need to know for both safety and product longevity.



**IMPORTANT:** Keep all safety decals clean and legible. Replace all missing, illegible, or damaged safety decals. When replacing parts with safety decals attached, the safety decals must also be replaced. Safety decals are available, free of charge, from your local dealer or Paladin.

**REPLACING SAFETY DECALS:** Clean the area of application with nonflammable solvent, then wash the same area with soap and water. Allow the surface to fully dry. Remove the backing from the safety decal, exposing the adhesive surface. Apply the safety decal to the position shown in the diagram above and smooth out any bubbles.

## DECALS



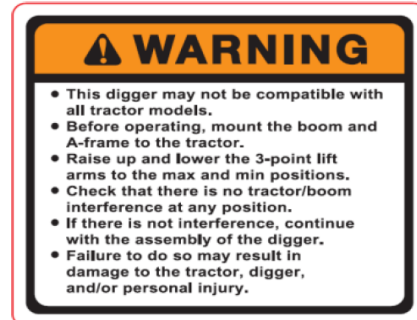
PART #KDK061-1054  
DANGER! DO NOT OPERATE



PART #KDK061-1060  
DANGER! GUARD MISSING



PART #KDK061-1055  
DANGER! GUARD MISSING



PART #KDK061-1056  
WARNING! TRACTOR COMPATIBILITY



PART #KDK061-1057  
DANGER! ROTATING PARTS



PART #KDK061-1053  
DANGER! CALL BEFORE YOU DIG



PART #KDK061-1059  
DANGER! READ MANUAL



PART #4286  
LOCATED ON PTO  
(INCLUDED WITH PTO)



PART #4285  
LOCATED ON INSIDE OF  
PTO SHAFT  
(INCLUDED WITH PTO)

NOTE: CONTACT YOUR LOCAL DEALER FOR  
MODEL NUMBER AND LOGO DECALS

# INSTALLATION

## GENERAL INFORMATION

The Post Hole Digger is designed for attaching to a tractor and comes with Cat. I 3-point mounting only.

### DANGER!

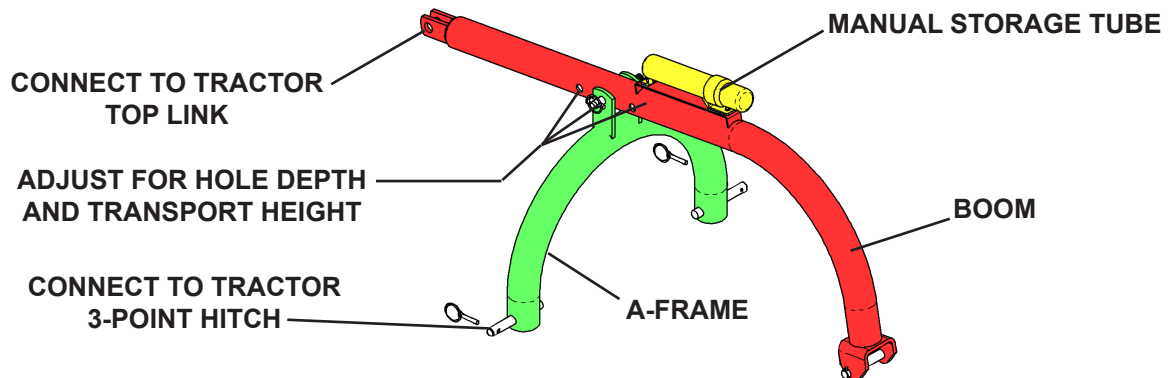


**A crushing hazard exists when installing onto a tractor. Place the tractor in park, set parking brake, shut off engine and remove key before allowing anyone, including the operator, in the area between the tractor and the attachment during installation or detaching the attachment from the tractor. Do not operate the 3-point lift controls while anyone is directly behind the tractor or near the attachment.**

## INITIAL SET-UP

1. Place this product on a firm, level surface that is large enough to safely accommodate this product, your prime mover and all workers involved in the mounting process.
2. Unpack the Post Hole Digger from the packing crate and inventory all parts. Refer to the Parts Diagrams located on the website listed in the back of this manual for parts identification.
3. With the gearbox sitting on a level surface, fill with 90 wt. gear oil up to the side level check (approximately 1.2 qts). To prevent gearbox damage, do not overfill.
4. Connect manual storage tube to boom using .31" hardware provided. See Figure #1
5. Remove tractor top link and install boom to top link location using the existing hitch pin and retaining pin. See Figure #1

**FIGURE#1**



6. Attach the A-frame to the 3-point hitch lower arms using the klik pins provided. See Figure #1
7. Lift the boom and rotate the A-frame up until the ears on the A-frame line up with the center hole on the boom. Install pivot pin and hitch pin provided. See Figure #1

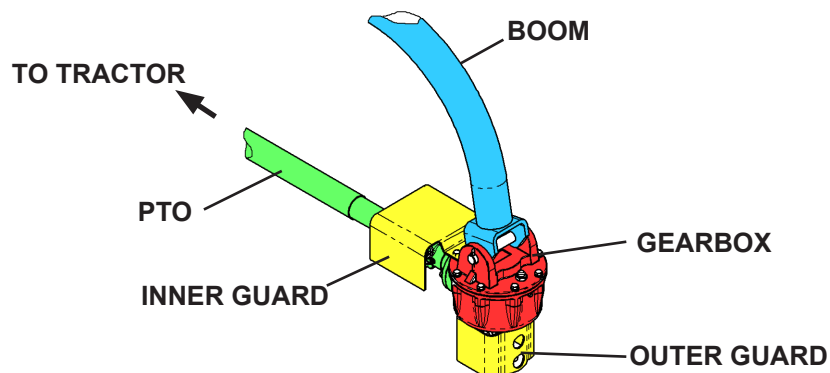
**NOTE: Depending on your tractor configuration this connection can be moved to one of the other hole locations to adjust for desired hole depth and transport height.**

8. Connect sway links to limit side movement of the boom and A-frame.
9. Attach the inner and outer gearbox guards to the gearbox input and output shaft using the hardware provided. See Figure #2

## INSTALLATION

10. Remove the pivot pin from the end of the boom and position the gearbox mounting ears on each side of the boom with the input shaft towards the tractor. Reinsert the pivot pin and secure in place with cotter pin (Bend legs of the cotter pin to secure pivot pin in place.) See Figure #2

FIGURE #2



11. Apply a liberal amount of all purpose grease to the tractor PTO shaft and gearbox input shaft. Slide PTO driveline onto input shaft on the gearbox. Install shear bolt provided and tighten set screw to secure driveline to gearbox.
12. Attach auger to output shaft of the gearbox using hardware provided with auger.

**WARNING!** Do not install auger using a bolt that is longer than what was originally supplied with the auger. A protruding bolt is more likely to grab loose clothing and cause serious injury or death.

13. Slowly engage tractor 3-point lift to raise Post Hole Digger until the input shaft of the gearbox and the tractor PTO shaft are aligned. Double check that PTO is disengaged, set parking brake, shut engine off and remove the key before exiting the prime mover.
14. Support Post Hole Digger with support jacks or blocks to keep it from drifting down.
15. Pull inner and outer driveline apart and apply a multi-purpose lubricant to the inside of the outer profile and reassemble.

**DANGER!** Do not operate with a broken or bent driveline. Do not operate without all driveline, tractor and equipment guards in place. The driveline securely attached at both ends and driveline shields that turn freely on the driveline.

**DANGER!** Do not exceed 540 RPM PTO speed. Do not use a PTO adapter to attach your Post Hole Digger to a non-matching tractor PTO. Serious personal injury and/or equipment failure can result. Consult an authorized dealer for assistance if the Post Hole Digger PTO does not match the tractor PTO.

**NOTICE:** The PTO length may need to be customized for your application. (The tractor PTO shaft and gearbox input shaft must be aligned and level with each other when checking driveline length.) Overlap should never be less than 1/3 the free length with both the inner and outer telescoping tubes being of equal length. Also a driveline that is too long can bottom out causing severe damage to the tractor or gearbox. **DO NOT FORCE THE PTO TO FIT.**

# INSTALLATION

**NOTICE:** To avoid premature driveline breakdown, do not exceed an angle of 25° up or down during operation.

16. Attach the PTO driveline to the tractor by sliding the front section of the PTO into the back section and attach to the PTO shaft at the rear of the tractor. (Pull back on the driveline yoke collar and align the splines of the yoke with the PTO shaft. Push yoke onto the PTO shaft releasing the locking collar.)

**NOTE:** Push and pull the driveline back and forth until locked in place.

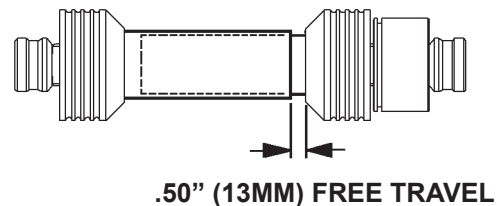
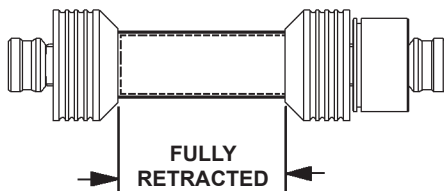
**WARNING!** The locking collar must slide freely and the locking balls seated in the groove on the tractor PTO shaft before operating. A driveline not attached correctly could come loose from the tractor resulting in personal injury and damage to the attachment.



17. Connect PTO safety chains to gearbox safety shield and tractor to prevent shields from turning.

## POWER (PTO) SHAFT ADJUSTMENT

Confirm the minimum and maximum working lengths of the driveshaft. The telescoping tubes must overlap by at least 1/3 of their length while in use. The (PTO) drive assembly may need to be shortened to fit up to your tractor correctly and to prevent the drive assembly from “bottoming out” and causing extensive damage to the tractor PTO drive assembly.



The shaft assembly is shortest when the shaft is straight inline with the attachment. There should be a minimum of .50" (13mm) of free travel before the shaft is fully retracted. To check:

- a. Position the attachment with the shaft parallel to the ground and straight inline with the attachment gearbox and tractor PTO shaft.
- b. Check to see if there is a minimum of .50" free travel.

If there is not at least .50" (13mm) of free travel DO NOT OPERATE ATTACHMENT.

**NOTICE:** IF THE DRIVE SHAFT “BOTTOMS OUT” BEFORE IT IS STRAIGHT INLINE WITH THE ATTACHMENT, STOP AND CALL YOUR NEAREST DEALER OR THE ATTACHMENT MANUFACTURER BEFORE OPERATING.

**CAUTION** FAILURE TO HAVE THE REQUIRED DISTANCE OF CLEARANCE WILL DAMAGE THE POWER TAKE OFF (PTO) OF YOUR TRACTOR.





# INSTALLATION

## INSTALLATION

### DANGER!



A crushing hazard exists when installing onto a tractor. Place the tractor in park, set parking brake, shut off engine and remove key before allowing anyone, including the operator, in the area between the tractor and the attachment during installation or detaching the attachment from the tractor. Do not operate the 3-point lift controls while anyone is directly behind the tractor or near the attachment.

1. Place this product on a firm, level surface that is large enough to safely accommodate this product, your prime mover and all workers involved in the mounting process.
2. Back the tractor to the Post Hole Digger aligning the 3-point lower arms up with the A-frame.
3. Verify that the PTO is disengaged, set parking brake, shut engine off, remove the key and exit the prime mover.
4. With the sway links adjusted to prevent excessive side movement, lift A-frame and attach to the 3-point hitch lower arms using the klik pins provided.
5. Remove tractor top link and install boom to top link location using the existing pin.
6. Remove the retaining ring from the input shaft on the gearbox and install the shear pin end of the PTO driveline (if it is not already installed). Install **Grade 2** shear bolt and nut and reinstall the retaining ring back onto the gearbox shaft to secure driveline.

**NOTE: Failure to install the retaining ring can result in damage to the post hole digger and driveline.**

7. Install the driveline to the tractor by sliding the front section of the PTO into the back section and attach to the PTO shaft at the rear of the tractor. (Pull back on the driveline yoke collar and align the splines of the yoke with the PTO shaft. Push yoke onto the PTO shaft releasing the locking collar.)

**NOTE: Push and pull the driveline back and forth until locked in place.**

### WARNING!



The locking collar must slide freely and the locking balls seated in the groove on the tractor PTO shaft before operating. A driveline not attached correctly could come loose from the tractor resulting in personal injury and damage to the attachment.

**Use only Grade 2 shear bolt**

8. Connect PTO safety chains to gearbox safety shield and tractor to prevent shields from turning.

## DETACHING

1. Lower the auger tip to the ground and verify that the PTO is disengaged, set parking brake, shut engine off, remove the key and exit the prime mover.
2. Pull back on driveline locking collar and hold while pulling yoke from the tractor PTO shaft. (Store yoke end of the driveline off the ground and out of the dirt.)
3. Unhook boom from top link hitch (retain pin for re-use).
4. Remove klik pins securing A-frame to lower 3-point hitch arms and carefully remove A-frame from lower hitch arms being prepared for the weight of the Post Hole Digger. Lower A-frame and boom to the ground or onto supporting blocks. Reinstall klik pins into A-frame for storage.



# OPERATION

## INTENDED USE:

This unit is designed for drilling vertical holes into the earth. Use in any other way is considered contrary to the intended use.

We recommend getting to know your post hole digger in a safe and cleared area. Become familiar with engine speeds, auger speeds and different ground conditions. Increase engine speed to increase auger speed and decrease engine speed to decrease auger speed. Increase engine speed when digging in soft or sandy soil and decrease engine speed when digging in hard, rocky or frozen ground.

Carry the auger close to the ground when traveling between digging positions.

**DANGER! Call 811 before digging to locate all underground utility lines.**



After all Set-Up and Installation instructions have been completed, all safety information and the operator's manuals have been read and understood, you are now ready to operate your Post Hole Digger.

**NOTE: Positioning the tractor on the upside of a hill when digging will greatly increase its balance and down force.**

1. With the tractor and auger in the desired digging position, lock the tractor brakes to prevent rolling during operation which may result in damage to the auger. Lower the auger point slowly to the ground.

**WARNING! Do not use body weight or any other body part to force the auger into the ground or to position the auger when it is moving.**



**Do not operate without all shields in place.**

**Do not operate with anyone near or in contact with the attachment, PTO driveline or auger.**

**Do not replace shear bolt or auger retaining bolt with anything that does not meet manufacturer's specifications.**

2. Engage PTO and start digging at a slow speed while lowering the auger slowly into the ground.
3. Depending on the desired hole depth we recommend digging approximately 24" and raise the auger slightly to remove soil, lower auger and continue to dig another 24" and raise the auger to within one foot of being out of the hole. Once the auger has reached the desired depth, rotate momentarily at a high speed to clean out the hole. Reduce speed and lift auger slowly to within one foot of being out of the hole. Stop rotation and continue to raise auger.

# OPERATION

**NOTE: Periodically adjust the machine's position to keep the auger and hole vertical.**

4. Disengage the PTO before moving the tractor to the next location.

## OPERATING TIPS:

- Stop rotation before raising auger completely out of the hole. This will keep the auger from wobbling due to an unbalanced dirt load.
- If auger stalls while digging, raise until auger is free and rotation starts. Continue normal digging.
- If auger starts to "screw" itself into the soil, stop rotation immediately and raise until auger is free. Continue normal digging.
- If auger does not penetrate an obstruction, raise auger completely out of hole and remove obstruction or dig a new hole close by. It is best to use other rock excavation methods when digging through hard rock.
- Reversing auger rotation when lifting out of the hole will dump soil back in.

## STORAGE

- Clean the unit thoroughly, removing all mud, dirt and grease.
- Inspect for visible signs of wear, breakage or damage. Order any parts required and make the necessary repairs to avoid delays upon removal from storage.
- Tighten loose nuts and capscrews.
- Store unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

### Additional Precautions for Long Term Storage:

- Touch up all unpainted surfaces with paint to avoid rust.

## REMOVAL FROM STORAGE:

- Remove cover.
- Wash unit and replace any damage and/or missing parts.

## LIFT POINTS

Lifting points are identified by lifting decals where required. Lifting at other points is unsafe and can damage attachment. Do not attach lifting accessories around cylinders or in any way that may damage hoses or hydraulic components.

- Attach lifting accessories to unit at recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.

**WARNING! USE LIFTING ACCESSORIES (CHAINS, SLINGS, ROPES, SHACKLES AND ETC.) THAT ARE CAPABLE OF SUPPORTING THE SIZE AND WEIGHT OF YOUR ATTACHMENT. Secure all lifting accessories in such a way to prevent unintended disengagement. Failure to do so could result in the attachment falling and causing serious personal injury or death.**




# OPERATION

## TIE DOWN POINTS

Tie down points are identified by tie down decals where required. Securing to trailer at other points is unsafe and can damage attachment. Do not attach tie down accessories around cylinders or in any way that may damage hoses or hydraulic components.

- Attach tie down accessories to unit as recommended.
- Check unit stability before transporting.

**WARNING!**  **VERIFY THAT ALL TIE DOWN ACCESSORIES (CHAINS, SLINGS, ROPES, SHACKLES AND ETC.) ARE CAPABLE OF MAINTAINING ATTACHMENT STABILITY DURING TRANSPORTING and are attached in such a way to prevent unintended disengagement or shifting of the unit. Failure to do so could result in serious personal injury or death.**

## TRANSPORTING

Follow all local government regulations that may apply along with recommended tie down points and any equipment safety precautions at the front of this manual when transporting your attachment.

Make sure the post hole digger is in the raised position and does not contact the ground before transporting between work sites. We recommend securing the auger with ropes, chains or slings to prevent swinging and machine damage when transporting longer distances.

# MAINTENANCE

## GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to an absolute minimum. However, it is very important that these maintenance functions be performed as described below.

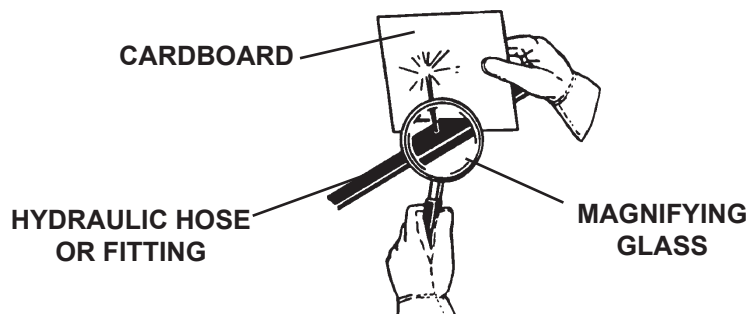
Procedure	Daily (Every 8 Hours)	Weekly (Every 40 Hours)	Every 3 Months
Check all hardware and tighten if necessary. (See Bolt Torque Specifications)	✓		
Check for missing or illegible Safety / Warning Decals. Replace as needed.	✓		
Check auger for loose or worn teeth, flighting or hardware.	✓		
Replace any missing or damaged bolts or nuts with approved replacement parts.	✓		
Check driveline shear bolts, Replace with a Grade 2 bolt if worn, damaged, bent or sheared.	✓		
Lubricate all grease fittings and universal joints on drivelines.		✓	
Check oil in gearbox.		✓	
Grease sliding driveshaft with an all purpose grease.			✓

**WARNING!** Escaping hydraulic / diesel fluid under pressure can penetrate the skin causing serious injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands to search for suspected leaks.



Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities. If injured by injected fluid, see a doctor at once.

Stop the engine and relieve pressure before connecting or disconnecting lines. Tighten all connections before starting engine or pressurizing lines.



# MAINTENANCE

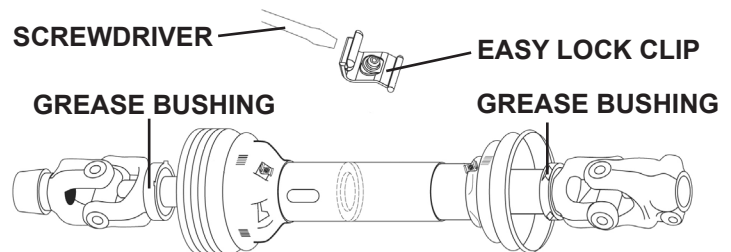
## PTO DRIVE ASSEMBLY

The following instructions will assist in replacing the safety shields on your PTO drive assembly. Keep all PTO guards and shields in place at all times.

**IMPORTANT:** Cutter maintenance does not require you to go between the tractor and the cutter with the driveline installed. Before replacing, servicing or removing the cutter from the tractor, shut off the tractor, set the parking brake and remove the keys.

When replacing damaged or missing PTO shields, disconnect the rotary cutter from the tractor and remove the driveline from the cutter.

1. To remove damaged guards, use a screwdriver to release the “easy lock” clip on the driveline. Turn the bushing to disengage and remove the guard.



**IMPORTANT:** Check that the “**Guard Missing**” decal on the steel tube under the inner guard and “**Rotating Driveline**” decal on the outer guard are both firmly affixed and legible. If not, replace them before re-connecting the driveline to the cutter.

2. Clean and grease the bushing groove before installing the bushing. Grease any remaining bushings in the guard.
3. Slide the new guard half over the driveline and insert bushing tabs into the openings in the guard.



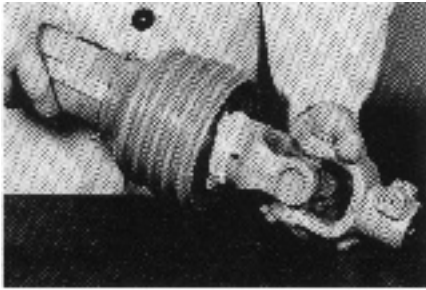
4. Turn the bushing until it engages into the guard.
5. Push the “easy lock” clip into position. The bushing and guard are now secure.



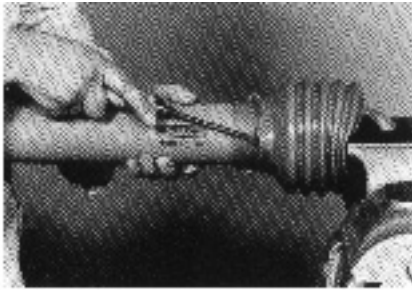
# MAINTENANCE

## SAFETY SHIELD

### DISASSEMBLY

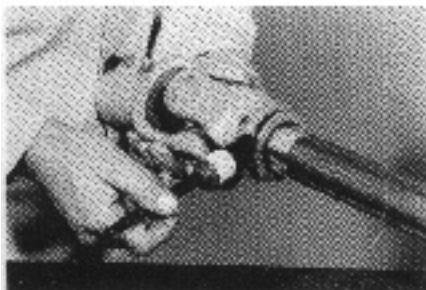


Use special tool SW21 to release bearing locking tabs and remove the shield from PTO drive shaft half.



Or, clamp the PTO yoke in the vise as shown to create pressure on the locking tabs and use a flat bladed screw driver to release one tab at a time to remove shield.

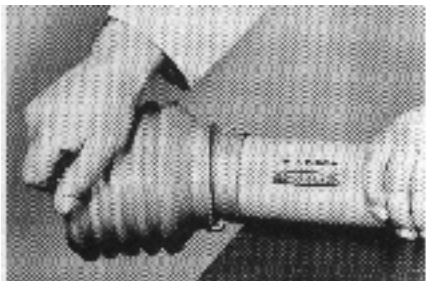
### ASSEMBLY



Grease the shield bearing groove on the yoke and the telescoping tube before assembly.



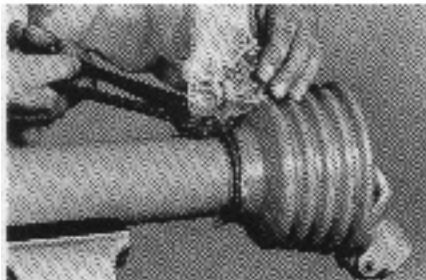
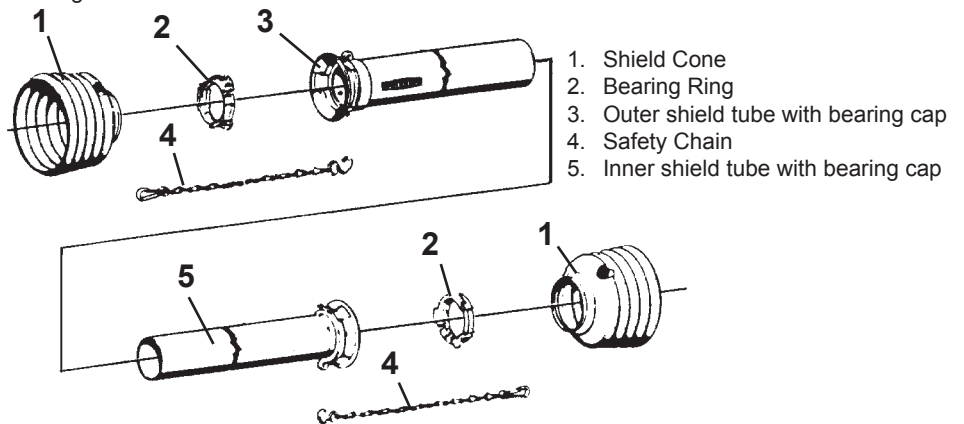
Place bearing ring in groove with the locking tabs nearest the telescoping tube side.



To remove the old shield cone, cut the cone near the bearing cap being careful not to damage the cap. Heat the new shield cone by placing the contact portion in water heated to approximately 180° F. until it is very flexible. Then, pull it over the tube and on to the bearing cap. As it cools, the cone will return to its natural size and become secure for normal function.



To mount the shield on to the half shaft, place it over the telescoping member, align the locking tabs on the bearing in the appropriate channels of the bearing cap and push the shield into place or apply light blows until all three locking tabs are visible in the openings.



# MAINTENANCE

## U-JOINT

### DISASSEMBLY



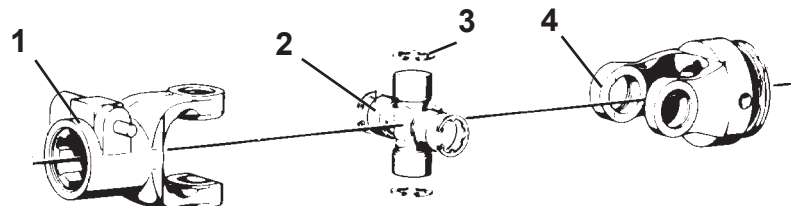
Remove retaining rings (3).



Place joint in the vise as illustrated (do not clamp tight) and with light hammer blows, drive up the bearing bushing.

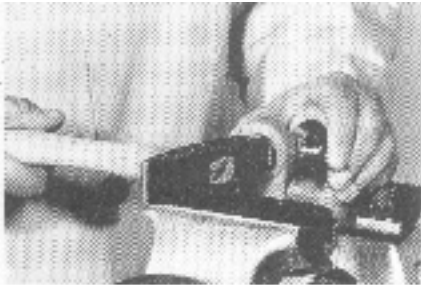


Use special tool SW23 or SW27 to clamp the bearing bushing in the vise. Using either light hammer blows or by twisting the yoke, remove the bearing bushing.



1. Quick-disconnect yoke coupling
2. Cross and bearing kit coupling
3. Retaining ring
4. Inboard yoke

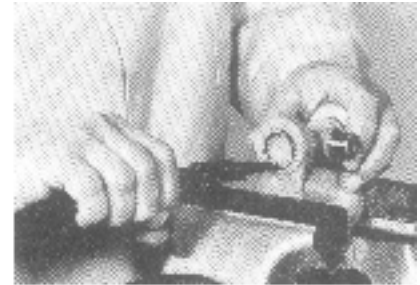
### ASSEMBLY



Clamp the yoke in the vise as illustrated. Remove the bearing bushing from the cross kit and place the cross into one of the yokes. Begin mounting the bearings by extending the cross journal out through the bearing bore. Place a bearing on it and holding the cross with one hand to position the bearing, tap with light hammer blows until you notice resistance. Do the same for the opposite bearing.



Using a flat surfaced drift punch or special tool SW28 drive the bearing in until the annular groove is visible.



Replace the retaining ring, make sure it is properly seated.



When installing the second yoke and bearings, make sure the grease zerk is positioned on the proper side for easy access when lubricating. Replace the bearings as described previously using the cross journal to help guide the bearings into the bore.



Relieve the stress from the bearings and yoke by applying several sharp hammer blows to the yoke ears.



Grease the joint. Note that all four bearings are properly purged and rotate to make sure the U-joint will move freely.

# TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
UNUSUAL NOISE	Gearbox grease insufficient.	Check seals in gearbox and fill to proper level.
POOR DIGGING PERFORMANCE	Not maintaining proper PTO speed.	Check PTO speed with tachometer and operate at proper RPM.
PTO WILL NOT TELESCOPE	Improper lubrication.	Separate and fill female tube half full of grease.
	PTO twisted.	Replace twisted portion. Caution operator not to ground out machine.
	Bent PTO.	PTO too long. Size to tractor according to manual.
	Shields damaged.	Replace.
PTO TWISTED	Over torqued.	Do not allow blades to come into contact with the ground.
	Not maintaining correct PTO speed.	Maintain proper PTO speed.



# BOLT TORQUE SPECIFICATION

## GENERAL TORQUE SPECIFICATION TABLES


Use the following charts when determining bolt torque specifications, when special torques are not given. Always use grade 5 or better when replacing bolts.

## SAE BOLT TORQUE SPECIFICATIONS




**Note:** The following torque values are for use with extreme pressure lubricants, plating or hard washer applications. Increase torque 15% when using hardware that is unplated and either dry or lubricated with engine oil.

Bolt Size		SAE GRADE 5 TORQUE				SAE GRADE 8 TORQUE				Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
		Ft-lbs		Newton-Meter		Ft-lbs		Newton-Meter		
Inches	mm	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	
1/4	6,35	8	9	11	12	10	13	14	18	
5/16	7,94	14	17	19	23	20	25	27	34	
3/8	9,53	30	36	41	49	38	46	52	62	
7/16	11,11	46	54	62	73	60	71	81	96	
1/2	12,70	68	82	92	111	94	112	127	152	
9/16	14,29	94	112	127	152	136	163	184	221	
5/8	15,88	128	153	174	207	187	224	254	304	
3/4	19,05	230	275	312	373	323	395	438	536	
7/8	22,23	340	408	461	553	510	612	691	830	
1	25,40	493	592	668	803	765	918	1037	1245	
1-1/8	25,58	680	748	922	1014	1088	1224	1475	1660	
1-1/4	31,75	952	1054	1291	1429	1547	1700	2097	2305	
1-3/8	34,93	1241	1428	1683	1936	2023	2312	2743	3135	
1-1/2	38,10	1649	1870	2236	2535	2686	3026	3642	4103	




Grade 2



Grade 5






Grade 8



## METRIC BOLT TORQUE SPECIFICATIONS

**NOTE:** The following torque values are for use with metric hardware that is unplated and either dry or lubricated with engine oil. Reduce torque 15% when using hardware that has extreme pressure lubricants, plating or hard washer applications.

Bolt head identification marks as per grade.		
		

Bolt Size	Grade No.	Pitch (mm)	Ft-lbs	Newton-Meter	Pitch (mm)	Ft-lbs	Newton-Meter
M6	5.6	1,0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-4	7.9-12.7		-	-
	10.9		7.2-10	9.8-13.6		-	-
M8	5.6	1,25	7.2-14	9.8-19	1,0	12-17	16,3-23
	8.8		17-22	23-29,8		19-27	25,7-36,6
	10.9		20-26	27,1-35,2		22-31	29,8-42
M10	5.6	1,5	20-25	27,1-33,9	1,25	20-29	27,1-39,3
	8.8		34-40	46,1-54,2		35-47	47,4-63,7
	10.9		38-46	51,5-62,3		40-52	54,2-70,5
M12	5.6	1,75	28-34	37,9-46,1	1,25	31-41	42-55,6
	8.8		51-59	69,1-79,9		56-68	75,9-92,1
	10.9		57-66	77,2-89,4		62-75	84-101,6
M14	5.6	2,0	49-56	66,4-75,9	1,5	52-64	70,5-86,7
	8.8		81-93	109,8-126		90-106	122-143,6
	10.9		96-109	130,1-147,7		107-124	145-168
M16	5.6	2,0	67-77	90,8-104,3	1,5	69-83	93,5-112,5
	8.8		116-130	157,2-176,2		120-138	162,6-187
	10.9		129-145	174,8-196,5		140-158	189,7-214,1
M18	5.6	2,0	88-100	119,2-136	1,5	100-117	136-158,5
	8.8		150-168	203,3-227,6		177-199	239,8-269,6
	10.9		175-194	237,1-262,9		202-231	273,7-313
M20	5.6	2,5	108-130	146,3-176,2	1,5	132-150	178,9-203,3
	8.8		186-205	252-277,8		206-242	279,1-327,9
	10.9		213-249	288,6-337,4		246-289	333,3-391,6

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## PARTS

In order to provide you with the most UP-TO-DATE part information, all parts for this attachment have been moved to our website at [www.paladinattachments.com/Manuals](http://www.paladinattachments.com/Manuals). Please use these diagrams and parts lists to locate replacement parts.

When servicing your attachment, remember to use only original manufacturer replacement parts. Substitute parts may not meet the standards required for safe, dependable operation.

To facilitate parts ordering when contacting the factory, please have the product control number (PCN or C/N) or model and serial number of your product ready to ensure that you receive the correct parts for your specific attachment.

The product control number, model and serial number for your attachment should be recorded in the space provided on the cover of this manual. This information may be obtained from the serial number identification plate located on your attachment.

**NOTE: Most daily and emergency parts orders (in stock) received by 10:30 A.M. (Eastern Standard Time) will be shipped UPS Ground the same day received. UPS Next Day orders must be received by 1:30 PM (Eastern Standard Time.)**

### SERVICE DEPARTMENT

(734) 996-9116

(800) 456-7100

### For Fax and E-mail Orders

PLC\_Sales@paladinattachments.com

(734) 996-9014

## WARRANTY

In order to provide you with the most UP-TO-DATE Warranty information, Paladin Warranty Statement and Warranty Procedures along with Warranty Registration and Claim Forms have been moved to our website at [www.paladinattachments.com](http://www.paladinattachments.com).