



OPERATOR'S MANUAL

BOX SCRAPER 248 Series



SERIAL NUMBER: _____

MODEL NUMBER: _____

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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 forward.

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.

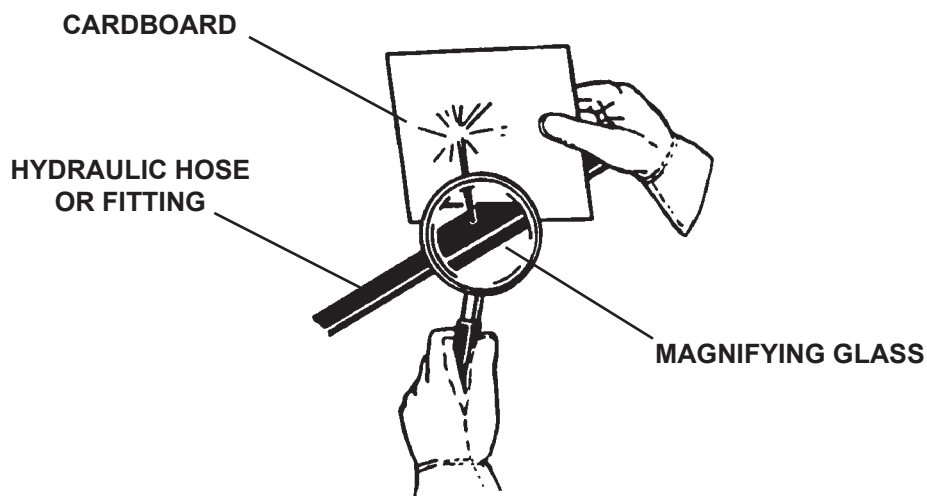
WARNING!



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

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

- Do not exceed the capacity of your prime mover when pushing or pulling loads.
- Operate only from the operator's station.
- When operating on slopes, drive up and down, not across. Avoid steep hillside operation, which could cause the prime mover to overturn.
- Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle.
- Use the blade only for its designed purpose. Do not use it to pull objects, as a battering ram, or attach ropes or chains to the unit.
- 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, lower the attachment to the ground, apply the brakes, turn off the engine and remove the key.

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 at recommended tie down locations using tie down accessories that are capable of maintaining attachment stability.
- Use extra care when loading or unloading 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

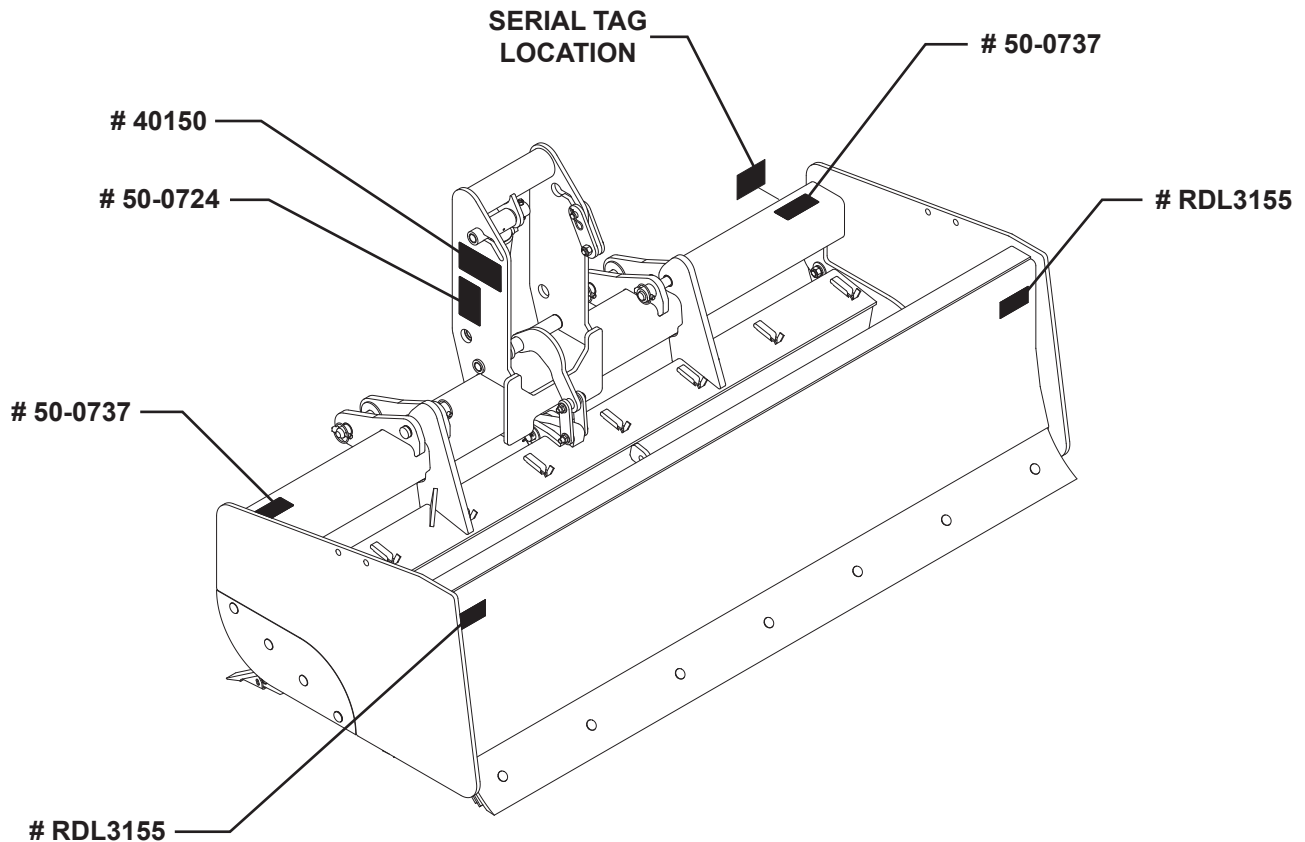
- Before performing maintenance lower the attachment to the ground, apply the brakes, turn off the engine and remove the key.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator service manuals before any repair is made. After completing 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 make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.
- Stop the prime mover engine and cycle control levers to release hydraulic pressure before servicing or adjusting attachment hydraulic systems.

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.

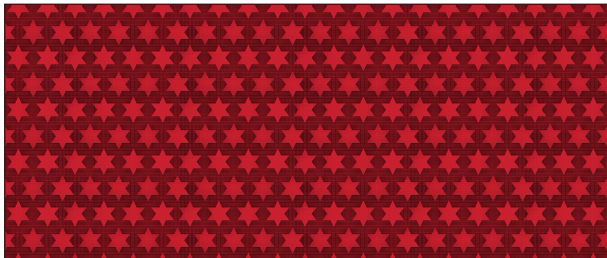
DECALS



40150 WARNING! READ MANUAL



50-0737 WARNING! PINCH POINT HAZARD



RDL3155 RED REFLECTIVE TAPE



50-0724 WARNING! HIGH PRESSURE FLUID

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

INSTALLATION

GENERAL INFORMATION

The following instructions will help you to mount your Box Scraper onto your prime mover. The Box Scraper uses the Cat. II 3-point hitch system for ease of installation.

Remember to read all safety warnings, decals and operating instructions before operating the attachment. If there is any portion of this manual that you do not understand, contact your dealer.

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.

NOTICE! Lubricate all grease fittings before connecting this product to your prime mover's hydraulic system. Refer to Lubrication page and follow the instructions.

1. Remove any attachment from the 3-point hitch of the prime mover.
2. Following all standard safety practices and the instructions for installing an attachment in your prime mover operator's manual, install the attachment onto your prime mover.

WARNING!



To avoid serious personal injury, make sure the attachment is securely latched to the attachment mechanism of your unit. Failure to do so could result in separation of the attachment from the prime mover.

3. Carefully raise the 3-point hitch to check clearances between the scraper, tractor tires and drawbar. (Reposition or remove drawbar if interference occurs.)
4. Ensure sway links/chains have been installed to prevent excessive side movement of the attachment.
5. Lower the unit to the ground and relieve pressure to the auxiliary hydraulic lines.
6. Following the safety shut down procedure for your prime mover, shut down and exit the prime mover.
7. After making sure that the hydraulic couplers are free from any foreign material or contaminants, connect the couplers to the auxiliary hydraulic system of your prime mover.

NOTE: Your Box Scraper requires hydraulic couplers to be installed. The supplied power & return hoses are #6 JIC.

NOTICE: Do not lock the auxiliary hydraulics of your prime mover in the "ON" position, Machine damage could occur.

INSTALLATION

8. Following the standard start up procedure for your prime mover, start the prime mover and run all cylinders on the attachment to purge any air from the system. Check for proper hydraulic connection, hose routing and hose length.
9. Attachment installation is complete.

DETACHING

1. Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the engine, and remove the key.
2. Follow prime mover operator's manual to relieve pressure in the hydraulic lines.
3. Disconnect power and return hoses from the auxiliary hydraulics.
4. Follow your prime mover operator's manual for detaching (removing) an attachment.
5. Connect hydraulic couplers together or install caps to prevent contaminants from entering the hydraulic system. Store hoses off of the ground to help prevent damage.

OPERATION

INTENDED USE

This Scraper is designed solely for excavating, grading, back filling and scarifying. Use in any other way is considered contrary to the intended use. Compliance with and strict adherence to operation, service and repair conditions as specified by the manufacturer, are also essential elements of the intended use.

GENERAL INFORMATION

Before beginning any work call 811 and have the entire work area inspected for underground utility lines. The operator should also visually check the area for stumps, concrete foundations, large rocks, posts, or any other solid object that would not easily move when struck by any part of this product. Remember that your Box Scraper is not a bulldozer and is not designed to remove pavement, uproot trees, etc.

When **excavating, grading or back filling**, the performance of this product can be fine tuned by adjusting the length of the top link of your prime mover's 3-point hitch to increase or decrease digging capabilities. Changes can also be made by varying your prime mover's speed and by changing control settings for your prime mover's 3-point hitch. When attempting to grade very hard ground it may require "ripping" or "scarifying" to loosen the soil so the scraper can achieve the desired effects.

When **scarifying**, the best method for achieving your desired digging depth is to perform several test passes. This is the best way to select the correct scarifier depth, speed, and the 3-point hitch control settings due to many differences in operators and ground conditions.

EXCAVATING, GRADING, AND BACKFILLING

Excavate by lowering the scraper to the ground and driving forward. The blades should begin the leveling process while the excess material accumulates in the box. The material can be transferred to a nearby location and then slowly raise the box scraper to deposit the material.

Grading is achieved by adjusting the box scraper to shave off the high spots and deposit material in the low spots.

Set-Up and Fine Tuning

1. Park your prime mover and scraper on a level surface.
2. Fully extend the hydraulic cylinder to raise the ripper shanks, lower the attachment to the ground, apply the brakes and turn off the engine and remove the key.
3. Follow your prime mover operator's manual to relieve pressure in the hydraulic lines.
4. Verify that the cutting edges are parallel with the ground. If they are not parallel, follow the instructions in your prime mover operator's manuals for adjusting the 3-point hitch arms until the cutting edges are parallel with the ground.
5. Verify the side plates are also parallel to the ground. If they are not parallel, follow the instructions in your prime mover operator's manuals for adjusting the 3-point top link until the side plates are parallel. You are now ready to begin.

OPERATION

Operation

1. Raise or lower the scraper to determine how much material you would like to move (Excavating or Grading).

NOTICE: This unit is designed to be pulled. If you are pushing, be careful not to over-bind the lift and tie arms on the scraper. Damage to the prime mover's top link and lower lift arms could occur.

2. Lower the cutting edges to the ground and start moving forward. Your speed will be determined by the condition of the soil. Do not exceed 5 MPH.
3. Lift the box scraper off the ground when turning.
4. Pass diagonally through sharp dips and avoid sharp drops to prevent "hanging up" the tractor and scraper.
5. Watch for hidden hazards on the terrain during operation.

NOTICE: Striking objects that are not easily movable (i.e. stumps, concrete foundations, etc.) at an excessive ground speed can result in damage to this product and will void all Paladin warranties.

SCARIFYING

When grading very hard ground it may require ripping to loosen the soil so the Box Scraper can achieve the desired effects. Lowering the shanks completely on extremely hard surfaces may actually stop the prime mover. In that application we recommend making multiple shallow ripping passes to get the same outcome and reduce the possibility of actually stopping the tractor by being too aggressive. The Box Scraper performs best in dry to slightly damp soil.

NOTICE! Operating this product without the scarifier locked in the down position can result in damage to this product and will void all Paladin warranties.

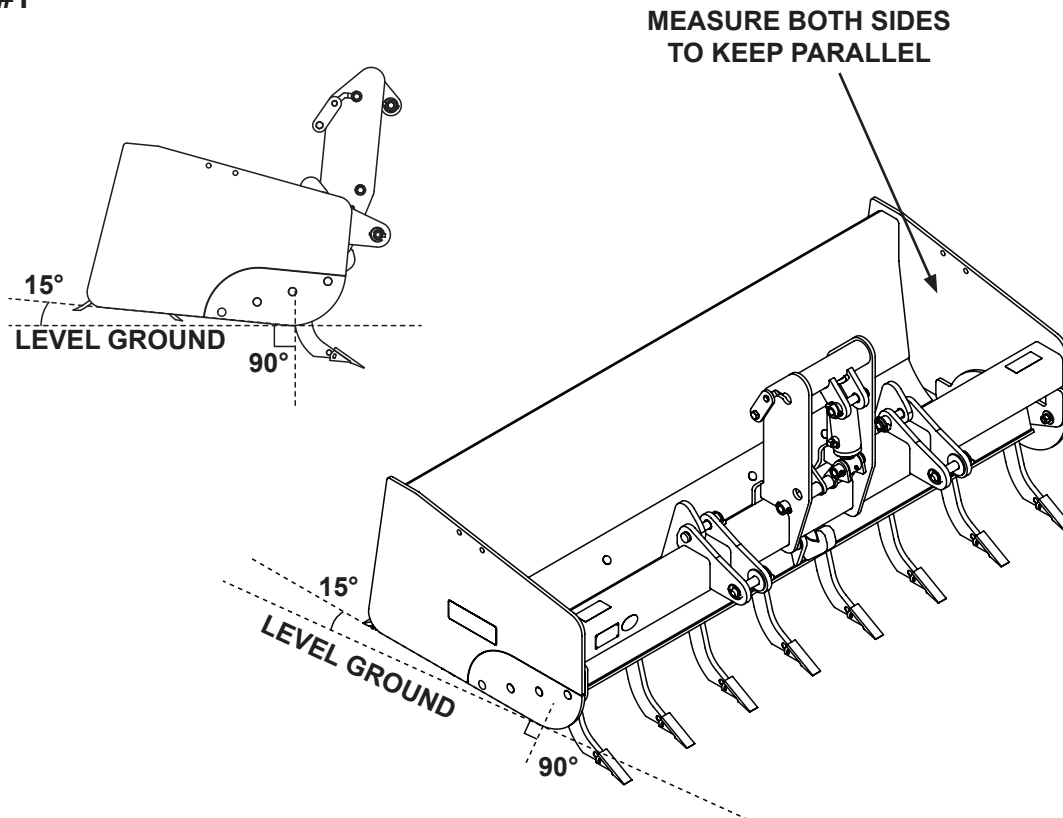
When scarifying, the best method for achieving your desired digging depth is to perform several test passes. This is the best way to select the correct scarifier depth, speed, and the 3-point hitch control settings due to many differences in operators and ground conditions.

Set-Up and Fine Tuning

1. Park your prime mover and scraper on a level surface.
2. Fully extend the hydraulic cylinder to raise the ripper shanks, lower the attachment to the ground, apply the brakes and turn off the engine and remove the key.
3. Follow your prime mover operator's manual to relieve pressure in the hydraulic lines.
4. Verify that the cutting edges are parallel with the ground. If they are not parallel, follow the instructions in your prime mover operator's manuals for adjusting the 3-point hitch arms until the cutting edges are parallel with the ground.
5. Verify the side plates are leaning forward approximately 15° relative to the ground. Follow the instructions in your prime mover operator's manuals for adjusting the 3-point top link until a 15° angle has been achieved. Leaning the scraper forward 15° will lift the cutting edges up a few inches off the ground and result in the straight upper portion of the ripper shanks being perpendicular (90°) to the ground during operation. See Figure #1

OPERATION

FIGURE #1



6. Adjust the ripper shanks up or down for your desired cutting depth. See Ripper Shank Adjustment and Replacement in the Maintenance section.

NOTE: Positioning the ripper shanks in the lower slot will produce a 3.75" deep cut and the upper slot will produce a 6.25" deep cut.

Operation

1. Restart your prime mover and raise the 3-point hitch. Completely retract the hydraulic cylinder to extend the ripper shanks to their lowest and locked position.

NOTICE: Failure to lower the ripper shanks until the locking mechanism engages will result in excessive hydraulic cylinder strain and could cause permanent cylinder damage.

IMPORTANT: The deeper you set the shanks, the slower you will need to travel and the more stress you put on the Box Scraper and prime mover. It is better to take less material and make more trips than to try to do it all in one pass.

2. Lower the shanks into the ground and start moving forward. Your speed will be determined by the condition of the soil and the depth of the cut. You may need to use less or more angle depending on the job. Do not exceed 5 MPH.

OPERATION

3. Lift the box scraper off the ground when turning.
4. Pass diagonally through sharp dips and avoid sharp drops to prevent “hanging up” the tractor and scraper.
5. Watch for hidden hazards on the terrain during operation.

NOTICE! Backing up with any portion of the ripper shanks below the ground surface can result in damage to this product and will void all Paladin warranties.

NOTICE: Striking objects that are not easily movable (i.e. stumps, concrete foundations, etc.) at an excessive ground speed can result in damage to this product and will void all Paladin warranties.

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, capscrews and hydraulic connections.
- Coat exposed portions of the cylinder rods with grease.
- Lubricate grease fittings.
- Seal hydraulic system from contaminants and secure all hydraulic hoses off the ground to help prevent damage.
- Replace decals that are damaged or in unreadable condition.
- 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 prevent rust.

REMOVAL FROM STORAGE

- Wash unit and replace any damaged and/or missing parts.
- Lubricate grease fittings.
- Check hydraulic hoses for damage and replace as necessary.

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 handbook when transporting your attachment.

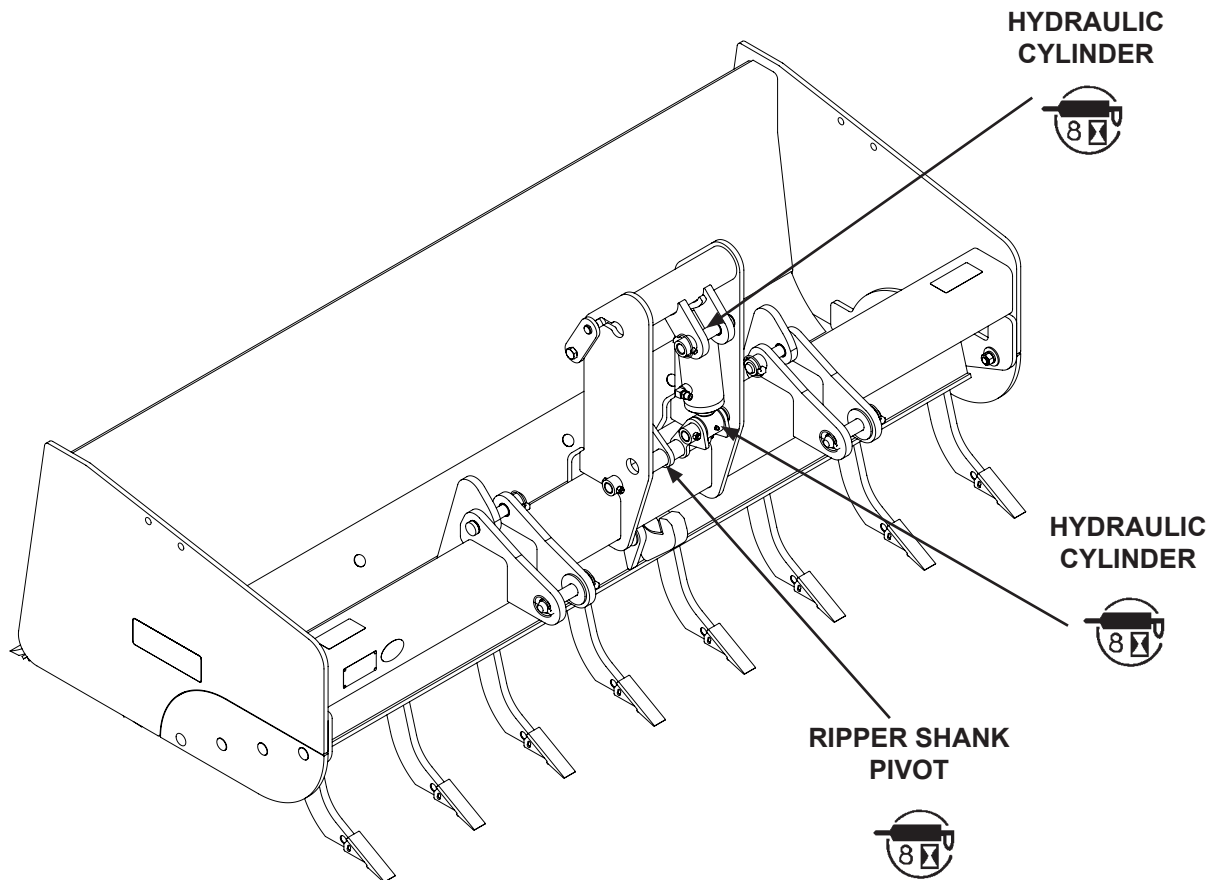
LUBRICATION

LUBRICATION

All parts provided with grease fittings should be lubricated as indicated. If any grease fittings are missing, replace them immediately. Clean all fittings thoroughly before using grease gun.



Lubricate daily or every 8 hours of operation, whichever comes first, with SAE Multi-Purpose Lubricant or an equivalent SAE Multi-Purpose type grease.



IMPORTANT: Avoid excessive greasing. Dirt collects on exposed grease and greatly increases wear. After greasing, wipe off excessive grease from fittings.

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.

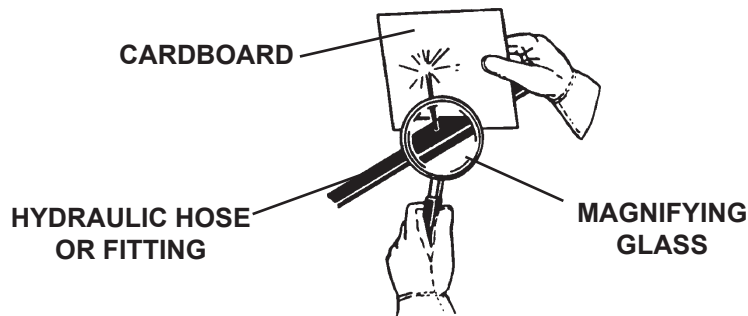
Procedure	Every 8 Hours (Daily)
Check prime mover hydraulic system to ensure an adequate level and cleanliness of hydraulic oil.	✓
Check for missing or loose hardware. Replace or tighten as necessary. See Bolt Torque Specifications	✓
Check hydraulic system for leaks and tighten as necessary. Check for damage and replace as needed.	✓
Check for missing or damaged safety decals and replace as necessary.	✓
Inspect attachment for any worn parts or cracked welds. Repair as required.	✓
Lubricate grease fittings.	✓
Lubricate & retract cylinder rods.	✓

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

RIPPER SHANK ADJUSTMENT, RE-POINTING, AND REPLACEMENT

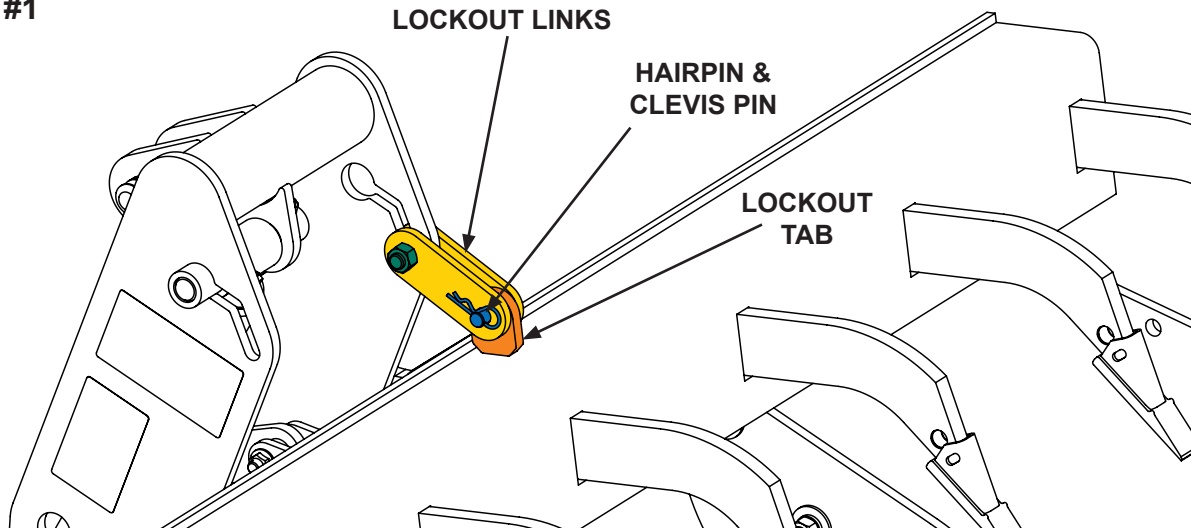
DANGER!



CRUSHING HAZARD! To prevent serious injury or death, 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. Do not operate the 3-point lift controls while anyone is directly behind the tractor or near the attachment.

1. Park your prime mover and scraper on a level surface.
2. Fully extend the hydraulic cylinder to raise the ripper shanks, lower the attachment to the ground, apply the brakes and turn off the engine and remove the key.
3. Follow your prime mover operator's manual to relieve pressure in the hydraulic lines.
4. Lock the scarifier tube in the fully raised position. While standing behind the center of the rear cutting edge, slide the lockout links to the top of the slot in the mast of the main frame. Remove the hairpin and the clevis pin from the lockout links. Place one lockout link on each side of the tab on the scarifier tube and secure the lockout links to the tab with the clevis pin and the hairpin. See Figure #1

FIGURE #1



5. From the front of the box scraper, remove the retaining clip that secures the ripper shank.
6. Moving to the back of the scraper, reach forward across the scarifier tube and with one hand, grasp the portion of the ripper shank that extends to the front side of the scarifier tube and lift up while pushing down with the other hand on the opposite end of the ripper shank. When clear of the ripper shank slot, slide the ripper shank to the other slot or completely out to the rear of the scarifier tube, whichever is the desired option.
7. Reinsert the ripper shank into the scarifier tube and seat the ripper shank in the desired slot.
8. Secure the ripper shank in place with the retaining clip provided.

MAINTENANCE

REPLACEMENT OF CUTTING EDGES

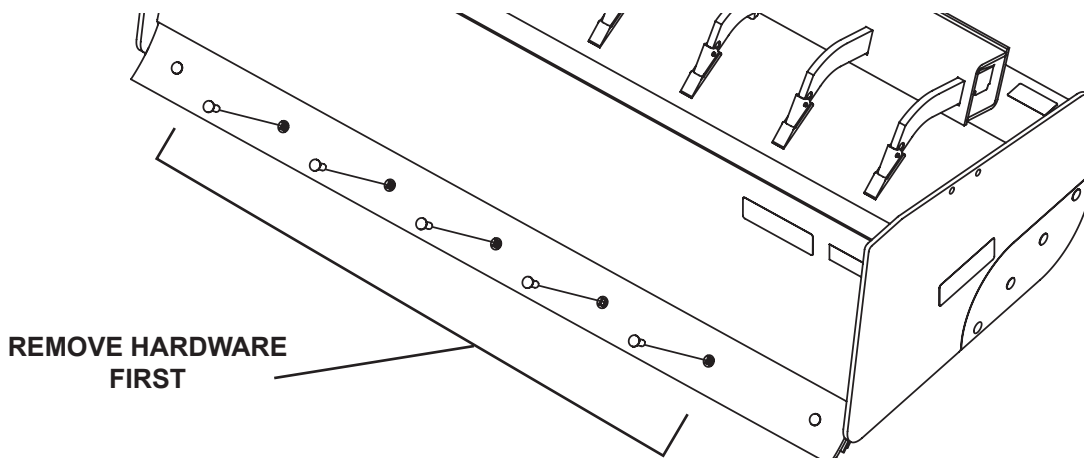
1. Park your prime mover on a level surface with this product properly attached.
2. Fully extend the hydraulic cylinder to raise the ripper shanks.
3. Lower end plates of the main frame of this product onto pre-placed blocking. Apply the brakes, turn off the engine, remove the key.
4. Lock the scarifier tube in the fully raised position by standing behind the center of the rear cutting edge and slide the lockout links to the top of the slot in the mast of the main frame. Remove the hairpin and the clevis pin from the lockout links. Place one lockout link on each side of the lockout tab on the scarifier tube and secure in place with the clevis pin and the hairpin.
5. Disconnect the top link of the 3-point hitch.
6. Continue to lower the front of the box scraper to the ground.

WARNING! Do not use blocking made of concrete blocks, logs, buckets, barrels or any other material that could suddenly collapse or shift positions. Do not use wood or steel blocking that shows any signs of material decay. Do not use blocking that is warped, twisted, or tapered. Failure to follow these instructions could result in serious personal injury or death.



7. Apply the brakes, turn off the engine, remove the key and follow your prime mover operator's manual to relieve pressure in the hydraulic lines.
8. Make sure that this product is completely stable on the blocking. If the blocking appears to be unstable or is even of questionable stability, restart your prime mover, reconnect the top link, raise this product off the blocking, and move away from the blocking. After the blocking has been repositioned in a more stable fashion, repeat steps 1 through 4 until a completely stable condition exists.
9. Disconnect the lower link arms of your prime mover's 3-point hitch.
10. **TWO WORKERS ARE REQUIRED** to remove a cutting edge. From the rear of this product with one person under both ends of the rear cutting edge, loosen and remove the center nuts leaving one nut on each outside end, then remove the corresponding bolts. See Figure #1

FIGURE #1



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11. Loosen the remaining two nuts. While one worker holds up one end of the cutting edge, the other worker must remove the nut and bolt from that end so that the first worker can lower that end of the cutting edge to the ground. Repeat this process for the remaining bolt.
12. The cutting edge can then be turned end for end and be reinstalled or, if both edges are worn, the old cutting edge should be properly discarded. Whether reversing the cutting edge or installing a new one, replacement of all locknuts and any damaged or worn bolts is required.
13. Reverse the removal process in Steps 10 & 11 and loosely secure the cutting edge with two bolts: one in each end hole. Install the center bolts, then gradually and uniformly tighten all the bolts to 100 ft. lbs. + or - 6.0 ft. lbs., drawing the cutting edge into the proper operating position.
14. If necessary, repeat steps 10 through 13 for the second cutting edge.

LEVELING AND PITCH ADJUSTMENT

1. Park your prime mover and scraper on a level surface.
2. Fully extend the hydraulic cylinder to raise the ripper shanks, lower the attachment to the ground, apply the brakes, turn off the engine and remove the key.
3. Follow your prime mover operator's manual to relieve pressure in the hydraulic lines.
4. Check that the cutting edges are parallel with the ground. If not, follow the instructions in your prime mover operator's manual and adjust tractor 3-point lower arms to level the scraper left and right.
5. **To adjust pitch for excavating or grading:** Check that the side plates are parallel with the ground. If not, adjust tractor's top link until the scraper is level front to back.
To adjust pitch for scarifying: Check that the side plates are leaning forward approximately 15° relative to the ground. If not, adjust the 3-point top link until a 15° angle has been achieved. Leaning the scraper forward 15° will lift the cutting edges up a few inches off the ground and result in the straight upper portion of the ripper shanks being perpendicular (90°) to the ground during operation.

MAINTENANCE

CYLINDER SEAL REPLACEMENT

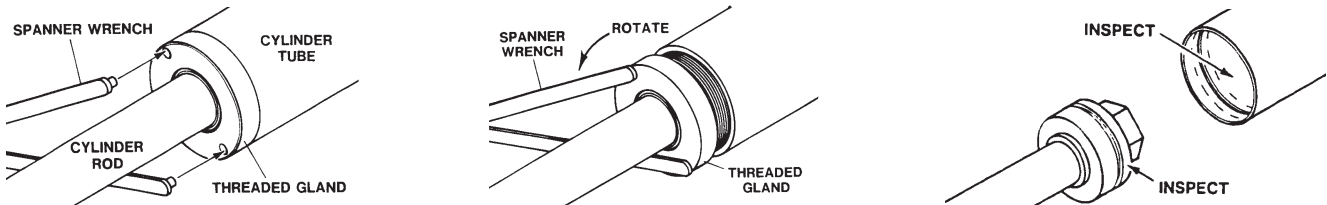
The following information is provided to assist you in the event you should need to repair or rebuild a hydraulic cylinder. When working on hydraulic cylinders, make sure that the work area and tools are clean and free of dirt to prevent contamination of the hydraulic system and damage to the hydraulic cylinders. Always protect the active part of the cylinder rod (the chrome section). Nicks or scratches on the surface of the rod could result in cylinder failure. Clean all parts thoroughly with a cleaning solvent before reassembly.

DISASSEMBLY PROCEDURE

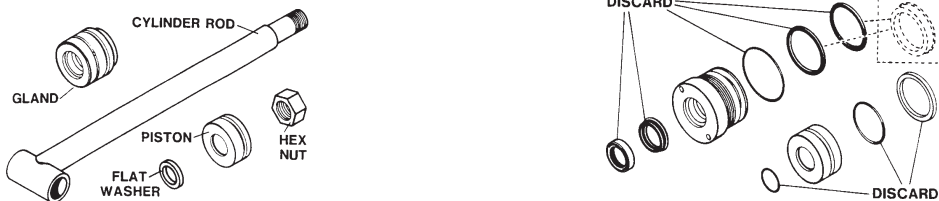
IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

THREADED TYPE GLAND

1. Rotate the gland with a spanner wrench counterclockwise until the gland is free of the cylinder tube.
2. Pull the cylinder rod from the cylinder tube and inspect the piston and the bore of the cylinder tube for deep scratches or galling. If damaged, the piston AND the cylinder tube must be replaced.



3. Remove the hex nut, piston, flat washer or spacer tube (if so equipped), and gland from the cylinder rod. If the cylinder rod is rusty, scratched, or bent, it must be replaced.
4. Remove and discard all the old seals.

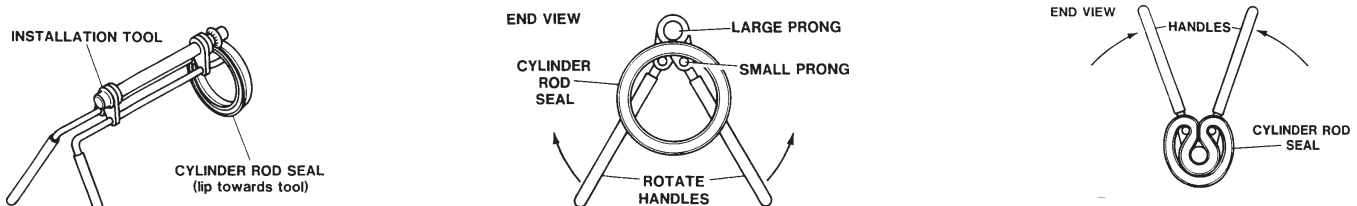


ASSEMBLY PROCEDURE

IMPORTANT: Replace all seals even if they do not appear to be damaged. Failure to replace all seals may result in premature cylinder failure. **NOTE:** Seal kits will service most cylinders of similar bore size and rod diameter.

1. Install the cylinder rod seal in the gland first. Be careful not to damage the seal in the process, as it is somewhat difficult to install.

NOTE: A special installation tool (Part #65349) is available to help with installing the seal. Simply fit the end of the tool over the seal so that the large prong of the tool is on the outside of the seal, and the two smaller prongs on the inside. The lip of the seal should be facing towards the tool. Rotate the handles on the tool around to wrap the seal around the end of the tool.



Rotate the handles on the tool around to wrap the seal around the end of the tool.

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Now insert the seal into the gland from the inner end. Position the seal in its groove, and release and remove the tool. Press the seal into its seat the rest of the way by hand.

2. Install the new piston ring, rod wiper, O-rings and backup washers, if applicable, on the piston.

Be careful not to damage the seals. Caution must be used when installing the piston ring. The ring must be stretched carefully over the piston with a smooth, round, pointed tool.

3. After installing the rod seal inside the gland, as shown in step #1, install the external seal.

NOTE: Threaded glands may have been equipped with a separate O-ring and backup washer system or a polypak (all in one) type seal. Current seal kits contain a polypak (all in one) type seal to replace the discarded seal types on ALL THREADED GLANDS.

4. Slide the gland onto the cylinder rod, being careful not to damage the rod wiper. Then install the spacer, or flat washer (if so equipped), small o-ring, piston, and hex nut onto the end of the cylinder rod.
5. Secure the cylinder rod (mounting end) in a vise with a support at its center. Torque the nut to the amount shown for the thread diameter of the cylinder rod (see chart).

Thread Diameter	POUNDS - FEET
7/8"	150-200
*1"	230-325
1-1/8"	350-480
1-1/4"	490-670
1-3/8"	670-900
* 1" Thread Diameter WITH 1.25" Rod Diameter	
Min. 230 ft. lbs.	Max. 250 ft. lbs.

IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

6. Apply a lubricant (such as Lubriplate #105) to the piston and teflon ring. Insert the cylinder rod assembly into the cylinder tube.

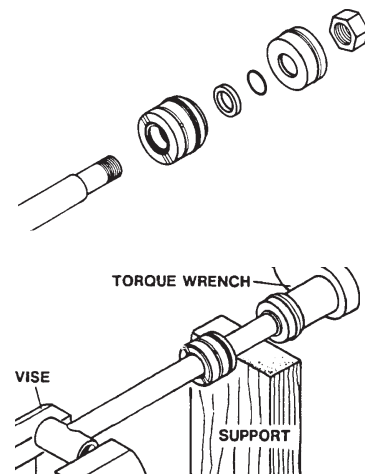
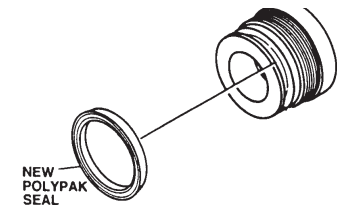
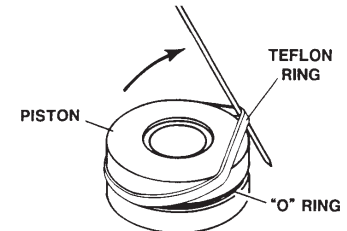
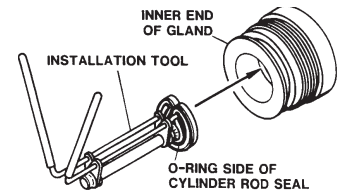
IMPORTANT: Ensure that the piston ring fits squarely into the cylinder tube and piston groove, otherwise the ring may be damaged and a leak will occur.

7. Use a spanner wrench to rotate the gland clockwise into the cylinder. Continue to rotate the gland with the spanner wrench until it is tight.

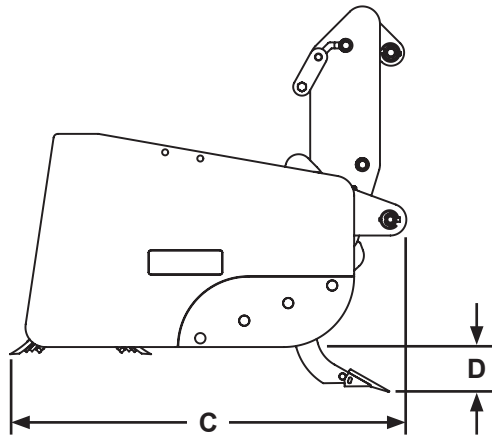
WARNING!



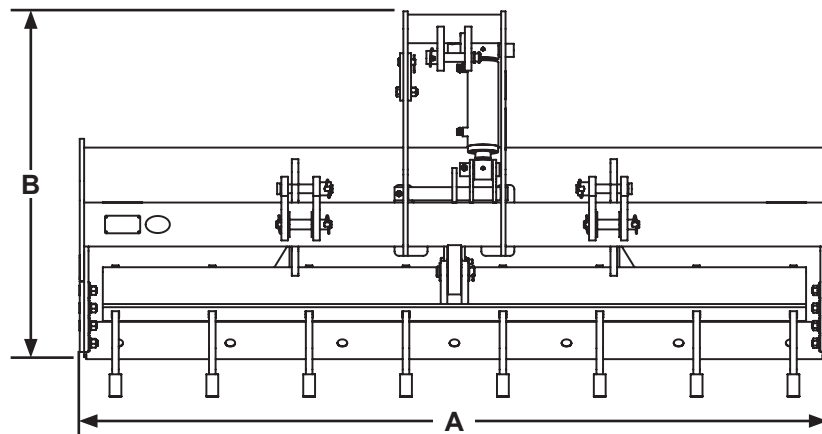
Cylinders serviced in the field are to be tested for leakage prior to the attachment being placed in work. Failure to test rebuilt cylinders could result in damage to the cylinder and/or the attachment, cause severe personal injury or even death.



SPECIFICATIONS



SPECIFICATIONS AND
DESIGN ARE SUBJECT TO
CHANGE WITHOUT NOTICE
AND WITHOUT LIABILITY
THEREFOR.



DESCRIPTION	84"	88"
A. Overall Width	85.36	89.08"
B. Overall Height	39.57"	39.57"
C. Overall Length	45.50"	45.50"
D. Maximum Scarifying Depth	6.25"	6.25"
Weight (lbs)	1440#	1490#
Maximum Hydraulic Pressure	4000 PSI	
3-Point Hitch Category	Cat. II	








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.

		SAE GRADE 5 TORQUE				SAE GRADE 8 TORQUE				Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
Bolt Size		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	<div>Grade 2</div> <div></div> <div>Grade 5</div> <div></div> <div>Grade 8</div> <div></div>
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	

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

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. 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.

