FFC
BY PALADIN

OPERATOR'S MANUAL

BOX SCRAPER
138 Series

SERIAL NUMBER: _____

MODEL NUMBER: _____

Manual Number: MR15554
Part Number: 13884 & 13888
Date: August 2018
Rev. 4

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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.

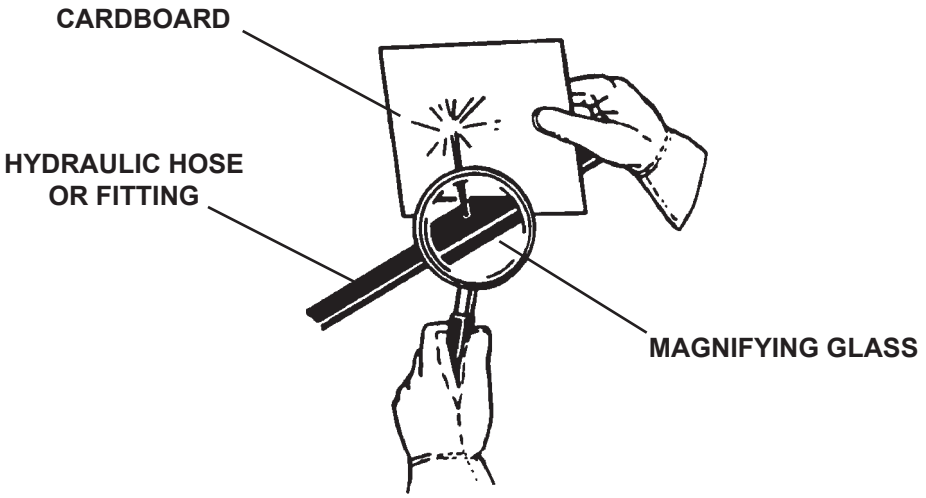
WARNING! **LOWER OR SUPPORT RAISED EQUIPMENT**

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

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

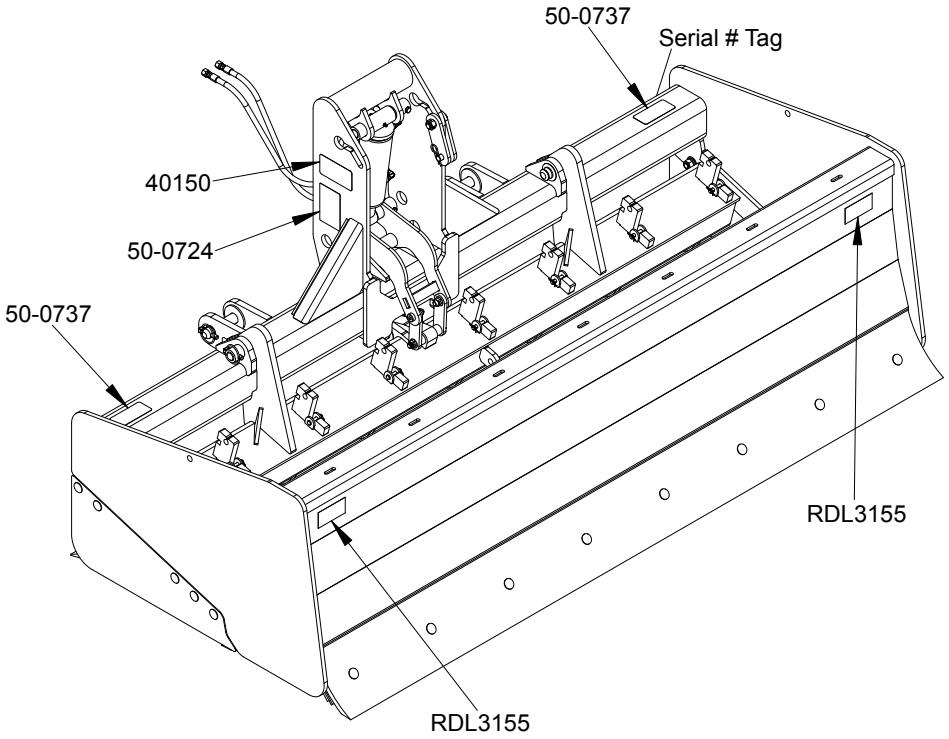
At the completion of the useful life of the unit, drain all fluids and dismantle by separating the different materials (rubber, steel, plastic, etc.). Follow all federal, state and local regulations for recycling and disposal of the fluid and components.

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.

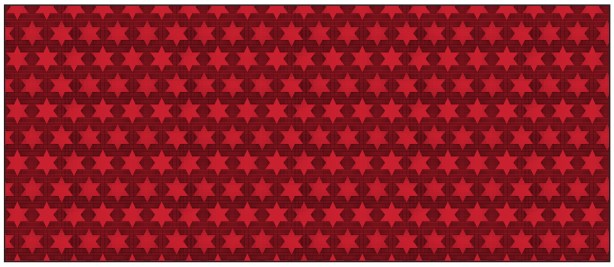
REPLACING SAFETY DECALS: Clean the area of application with nonflammable solvent, then wash the same area with soap and water. Allow the surface to fully dry. Remove the backing from the safety decal, exposing the adhesive surface. Apply the safety decal to the position shown in the diagram above and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

DECALS

PART # 40150
WARNING! READ MANUAL

PART # 50-0724
WARNING! HIGH PRESSURE FLUID

PART # 50-0737
WARNING! PINCH POINT HAZARD



PART # RDL3155
RED REFLECTIVE TAPE

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

INSTALLATION

GENERAL INFORMATION

The Box Scraper is designed for attaching to a tractor and comes with Cat. II 3-point mounting only.

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. Refer to the operator's manual(s) for your prime mover, 3-point hitch, and quick hitch and follow the mounting instructions contained therein.
3. Carefully raise the 3-point hitch to check clearances and to verify that all mounting procedures have been successfully completed.

4. **IMPORTANT Lubricate all grease fittings before connecting this product to your prime mover's hydraulic system. Refer to BOX SCRAPER MAINTENANCE and follow the instructions**

HYDRAULIC CONNECTION

1. Remove all the protective plastic caps from the hose ends.
2. Make the connection to your prime mover using the appropriate method below for your prime mover:

- If your prime mover has male or female threads for connecting the hydraulic hoses to the auxiliary hydraulic lines, make certain that the threads, as well as the inside of the fittings and hoses, are clean, then secure the hoses to the fittings using the torque specified in your prime mover's operator's manual.
- If your prime mover has quick-couplers for connecting the hydraulic hoses to the auxiliary hydraulic lines, you may need to purchase the proper quick-coupler fittings that you must install on the free ends of the two hoses. In most cases, the owner's manual for your prime mover will describe the exact type of fitting that is needed for your hydraulic coupling system, but in no case should any fitting have an allowable operating pressure of less than 4,000 psi. Once all the quick-coupler fittings are properly installed, then the hoses can be coupled to the prime mover's hydraulic valve body or auxiliary hydraulic lines as per the instructions found in your prime mover's operator's manual.

3. Carefully raise the 3-point hitch to check hose clearances and to check for any interference. Operate the hydraulic cylinder(s) on this product to make the same checks.
4. Cycle the hydraulic cylinder(s) on this product several times from fully retracted to fully extended until all air has been completely removed from the cylinder(s).

WARNING! Do not lock the auxiliary hydraulics of your prime mover in the "ON" position.Failure to obey this warning could result in death or serious injury.

NOTICE! ***When shipped, the hydraulic cylinder(s) on this product contained air or an air-fluid mixture. There are orifices beneath the port(s) in the hydraulic cylinder barrel(s) that will restrict the exit of that air. Failure to remove all the air from the hydraulic cylinder(s) can cause uneven, jerky cylinder movement when the hydraulic controls are being operated and unwanted cylinder movement when the controls are not being operated.***

INSTALLATION

EXCAVATING, GRADING, AND BACKFILLING

1. Park your prime mover on a level surface with this product properly attached.
2. Place your prime mover's transmission in "Park" and engage the parking brake.
3. Lower this product onto the level surface.
4. Make sure that the hydraulic cylinder is fully extended so that the ripper shanks are in the fully raised position.
5. Shut off your prime mover's engine, remove the starter key, wait for all moving parts to come to a stop, and relieve all pressure in the hydraulic lines.
6. Check to see that the cutting edges of this product are parallel to the level surface. If they are not parallel, make the edges and the level surface parallel by following the instructions for adjustment of the 3-point hitch as found in the operator's manual(s) for your prime mover and 3-point hitch.
7. Check to see that the bases of the main frame end plates are parallel to the level surface. If they are not parallel, make the bases and the level surface parallel by adjusting the 3-point hitch's top link as described in the operator's manual(s) for the prime mover and 3-point hitch.

SCARIFYING

1. Perform steps 1 through 6 above.
2. Check to see that the bases of the main frame end plates are leaning forward approximately 15 degrees relative to the level surface. If this is not the case, adjust the 3-point hitch's top link as described in the operator's manual(s) for your prime mover and 3-point hitch. Leaning this product forward 15 degrees will lift the cutting edges up a few inches off the level surface and will result in the straight upper portion of the ripper shanks being perpendicular (90 degrees) to the ground surface during operation.
3. Verify that the ripper shanks are set in the proper slot for performing the desired work. When the front edges of the main frame end plates are flush with the ground level, then:
   - positioning the ripper shanks in the lower slot will produce a 3-3/4" deep cut and
   - positioning the ripper shanks in the upper slot will produce a 6-1/4" deep cut.

   See RIPPER SHANK ADJUSTMENT AND REPLACEMENT in the Service section of this manual for instructions on how to reposition the ripper shanks.

NOTICE! Operating this product with the ripper shanks only partially extended into the ground CAN result in damage to this product and <u>WILL</u> void all FFC warranties.

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

OPERATION

Before beginning any work, have a qualified individual or firm inspect the entire work area for underground utility lines. The operator should carefully inspect the entire 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 upper arm of your prime mover's 3-point hitch to increase or decrease digging capabilities. Changes can also be make by varying your prime mover's speed and by changing control settings for your prime mover's 3-point hitch.

When scarifying, the best method for achieving a desired digging depth is to perform several test passes. With there being so may variable in operators and ground conditions, this is the best way to select the correct ripper shank depth slot, the correct speed, and the correct 3-point hitch control settings.

1. Raise or lower the Box Scraper and shanks to determine how much or how little material you would like to move.
2. The deeper you set the shanks, the slower you will need to go with your tractor and the more stress you put on the box scraper, as well as the tractor. It is better to take less material and make more trips than to try to do it all in one pass.
3. This unit can be used to push, but is made to be pulled. If you are pushing, be careful not to over bind the lift and tie arms on the Box Scraper. Damage can occur to the top link on the tractor, as well as the lift arms.
4. Lower the blade to the ground and start moving forward. Your speed will be determined by the condition of the soil. You may need to use less or more angle depending on the job.
5. The speed of the tractor should not exceed 5 mph.
6. When turning lift unit from the ground.
7. Pass diagonally through sharp dips and avoid sharp drops to prevent “hanging up” the tractor and blade.
8. Watch for hidden hazards on the terrain during operation.

OPERATION

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.

WARNING! Failure to obey the following procedures could result in death or serious injury.

- Make sure that a qualified individual or firm that specializes in locating underground utilities has inspected the work area. Do not operate this product where contact with a utility line of any kind is possible.
- Operate at a very slow ground speed where objects that are not easily moveable (i.e. stumps, concrete foundations, etc.) may be present.

NOTICE! ***Striking objects that are not easily moveable (i.e. stumps, concrete foundations, etc.) at an excessive ground speed CAN result in damage to this product and <u>WILL</u> void all FFC warranties.***

NOTICE! ***Backing up with any portion of the ripper shanks below the ground surface CAN result in damage to this product and <u>WILL</u> void all FFC 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.
- 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.
- Lubricate grease fittings.
- Check hydraulic hoses for damage and replace as necessary.

OPERATION

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.

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.

MAINTENANCE

GENERAL INFORMATION

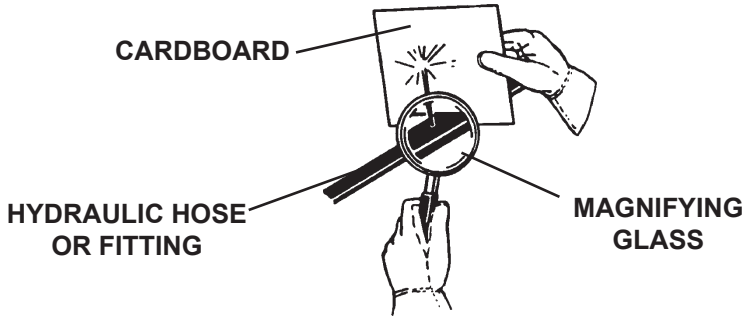
Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to an absolute minimum. However, it is very important that these maintenance functions be performed as described below.

Procedure	Before Each Use	After Each Use	After Every 10 Hours of Use
Hardware - Check for tightness (see Bolt Torque Specifications)	✔		
Hydraulic System - Check for leaks and tighten as necessary. Check for damage and replace as needed.	✔		
Check for missing or illegible Safety / Warning Decals.	✔		
Replace any missing or damaged bolts or nuts with approved replacement parts	✔		
Lubricate all grease fittings.			✔
Clean Unit- Remove all mud and dirt		✔	

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

1. Park your prime mover on a level surface with this product properly attached.
2. Place your prime mover's transmission in "Park" and engage the parking brake.
3. Lower this product onto the ground with the ripper shanks fully raised.
4. Shut off your prime mover's engine, remove the starter key, wait for all moving parts to come to a stop.
5. 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 cotter pin 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 cotter pin.
6. While still standing behind the rear cutting edge, reach forward across the scarifier tube and remove the rue ring cotter pin, the clevis pin, and the shank block that secures the ripper shank.
7. 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.

(For ripper shank adjustment or replacement, skip to step 11. To replace the shank point, continue with step 8.)

8. **WARNING! Failure to obey the following procedures could result in death or serious injury.**

- Read and understand the operator's manuals that came with your cutting torch and compressed gases before starting any work. Never operate a cutting torch near any flammable objects or fluids.

9. Cut open the existing shank point using a cutting torch. Make sure that the shank is not being damaged while the shank point is being cut. Remove and properly dispose of the existing shank point.
10. Slide a new point onto the ripper shank. Make sure that the cutting face of the shank point is on top of the hooked end of the ripper shank when the ripper shank is held in the normal scarifying position.
11. Crimp the shank point onto the ripper shank by pressing the sides of the shank point into the depressions on each side face of the ripper shank tip. Make sure that the deforming force is applied directly over the ripper shank depressions and that sufficient deformation occurs for the shank point to be securely attached to the ripper shank.
12. Reinsert the ripper shank into the scarifier tube and seat the ripper shank in the desired slot.
13. Replace the shank block and then the clevis pin. Secure the clevis pin with the rue ring cotter pin.

MAINTENANCE

REPLACEMENT OF CUTTING EDGES

1. Park your prime mover on a level surface with this product properly attached.
2. Place your prime mover's transmission in "Park" and engage the parking brake.
3. With the ripper shanks fully lowered and locked into position, lower end plates of the main frame of this product onto pre-placed blocking as specified below:

WARNING! Failure to obey the following procedures could result in death or serious injury.

- Do not use blocking made of concrete blocks, logs, buckets, barrels or any other material that could suddenly collapse or ship 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.

4. Shut off your prime mover's engine, remove the starter key, wait for all moving parts to come to a stop, and relieve all pressure in the hydraulic lines.
5. 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, 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 5 until a completely stable condition exists.
6. TWO WORKERS ARE REQUIRED to remove a cutting edge. From the rear of this product, reach under the rear cutting edge, loosen and remove the center five nuts, then remove the corresponding bolts.
7. Loosen the remaining two nuts. While the first worker holds up one end of the cutting edge, the second 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 surface below. Repeat this process for the remaining bolt.
8. The cutting edge can then be turned end for end and be reinstalled or, if both edges are worn out, the old cutting edge should be properly discarded. Whether reversing the cutting edge or installing a new one, replacement of all bolts is recommended. Replacement of all locknuts and any damaged or worn bolts is required.
9. Reverse the removal process in Step 7 and loosely secure the cutting edge with two bolts: one in each end hole. Install the other five 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.
10. If necessary, repeat steps 6 through 9 for the second cutting edge.

SPECIFICATIONS

IMPORTANT Exceeding any of the maximum recommended prime mover specifications **CAN** result in damage to this product and **WILL** void all FFC warranties.

DESCRIPTION	SPECIFICATIONS
Weight of Prime Mover without Box Scraper	20,000 lbs. maximum
Category of Prime Mover's 3-Point Hitch	Category II only
Hydraulic Pressure Output	4,000 psi maximum
Rear Ballast	As required to maintain full prime mover stability. (Note the Shipping Weight on the specifications page, then see the operator's manual(s) for your prime mover, 3-point hitch, and quick hitch for ballasting needs.)

BOX SCRAPER SPECIFICATIONS

Model Number	Overall Width	Overall Height*	Overall Depth	Cutting Width	Excavation Capacity	Shipping Weight
13884	85"	39.63"	45.50"	84"	38.4 cu. ft.	1565 lbs.
13888	89"	39.63"	45.50"	88"		
All replacement hydraulics must have a minimum rated working pressure of 4,000 psi.						

BOLT TORQUE SPECIFICATION

GENERAL TORQUE SPECIFICATION TABLES

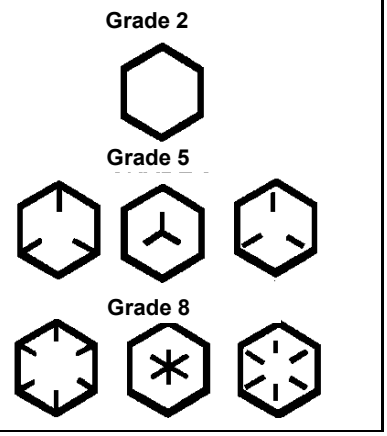
Use the following charts when determining bolt torque specifications, when special torques are not given. Always use grade 5 or better when replacing bolts.

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			
		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

Bolt head identification marks as per grade.
NOTE: Manufacturing Marks Will Vary



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***. 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***.