BRADCO
BY PALADIN

OPERATOR'S MANUAL

VIBRATORY ROLLER
48", 66", 73" & 84"

FOR
SKID STEER LOADERS

SERIAL NUMBER: _____

MODEL NUMBER: _____

Manual Number: OM695
Part Number: 75595
Rev. 9

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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

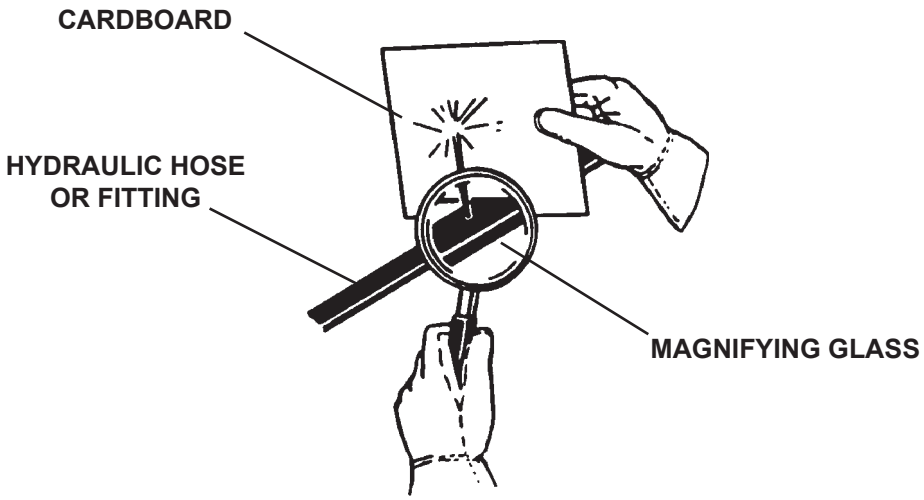
Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground 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 VIBRATORY ROLLER

- Block off work area from bystanders, livestock, etc.
- Operate only from the operator's station.
- Do not lift loads in excess of the capacity of the prime mover.
- 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.
- 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, turn off the engine, remove the key and apply the brakes.

EQUIPEMENT SAFETY PRECAUTIONS

TRANSPORTING THE VIBRATORY ROLLER

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on slopes.
- 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 gas tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.

MAINTAINING THE VIBRATORY ROLLER

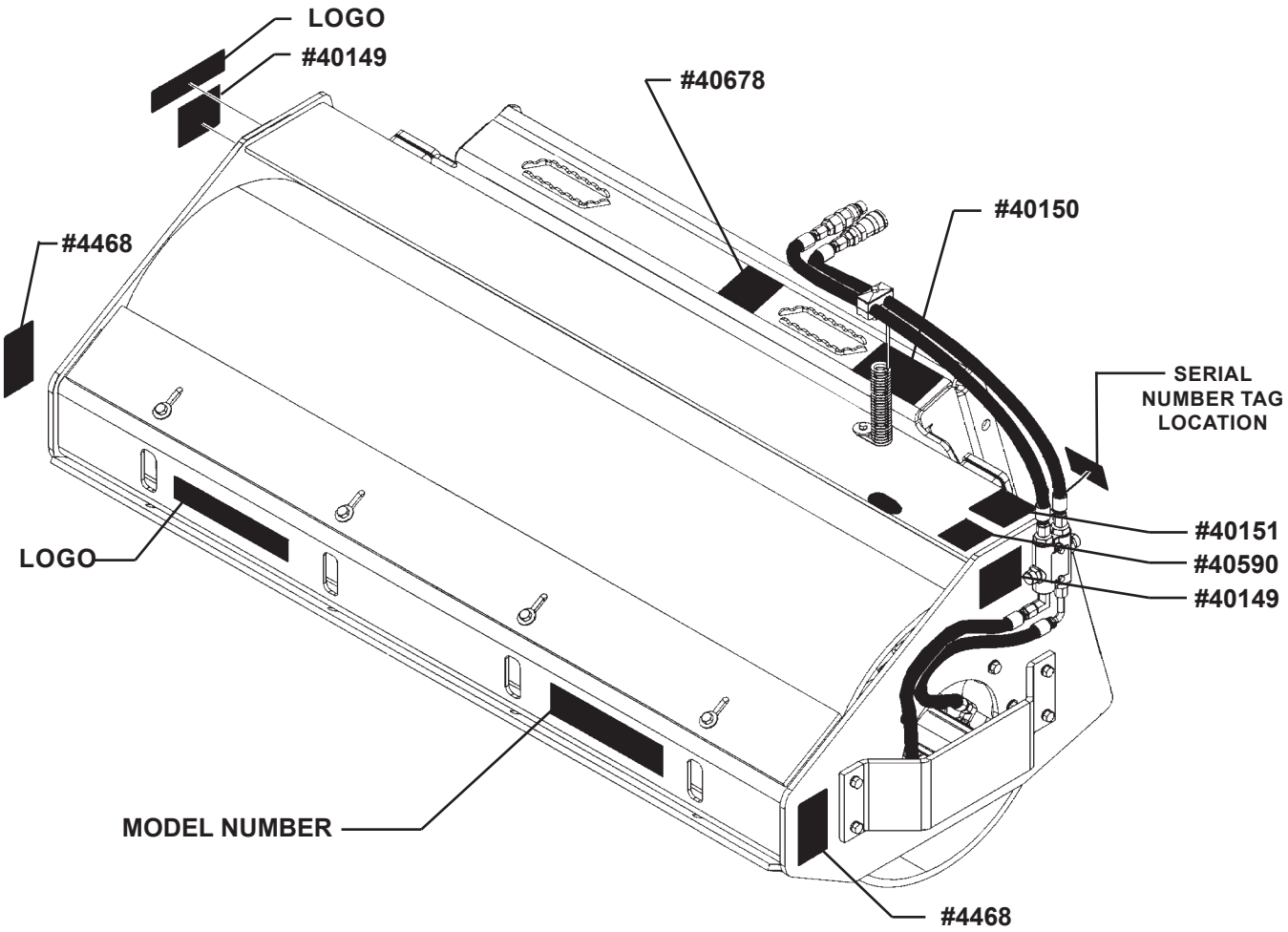
- Before performing maintenance, lower the attachment to the ground, turn off the engine, remove the key and apply the brakes.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator service manual's before any repair is made. After completing 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 BRADCO.
- Never make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.

DECALS

DECAL PLACEMENT

GENERAL INFORMATION

The diagram on this page shows the location of the decals used on the Vibratory Roller. 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 longevity.



IMPORTANT: Keep all safety signs clean and legible. Replace all missing, illegible, or damaged safety signs. When replacing parts with safety signs attached, the safety signs must also be replaced.

REPLACING SAFETY SIGNS: 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 sign, exposing the adhesive surface. Apply the safety sign to the position shown in the diagram above and smooth out any bubbles.

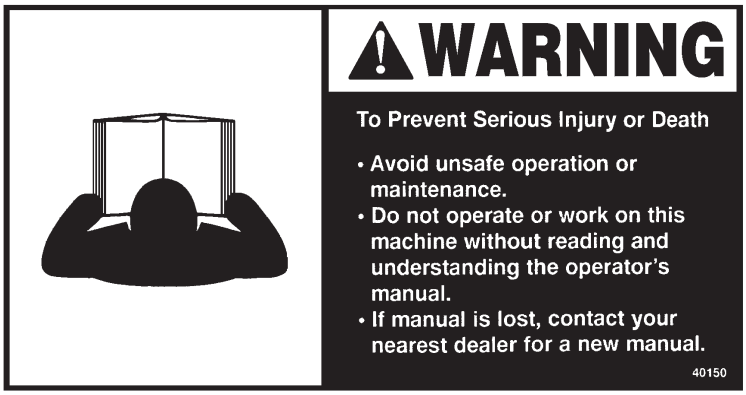
DECALS

WARNING! FOOT CRUSH
PART #4468

WARNING! HIGH PRESSURE FLUID
PART #40151

DANGER! PINCH POINT
PART #40149

CAUTION! HIGH FLOW SYSTEMS
PART #40590



WARNING! READ MANUAL
PART #40150

WARNING! BEFORE LEAVING SEAT
PART #40678

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

INSTALLATION

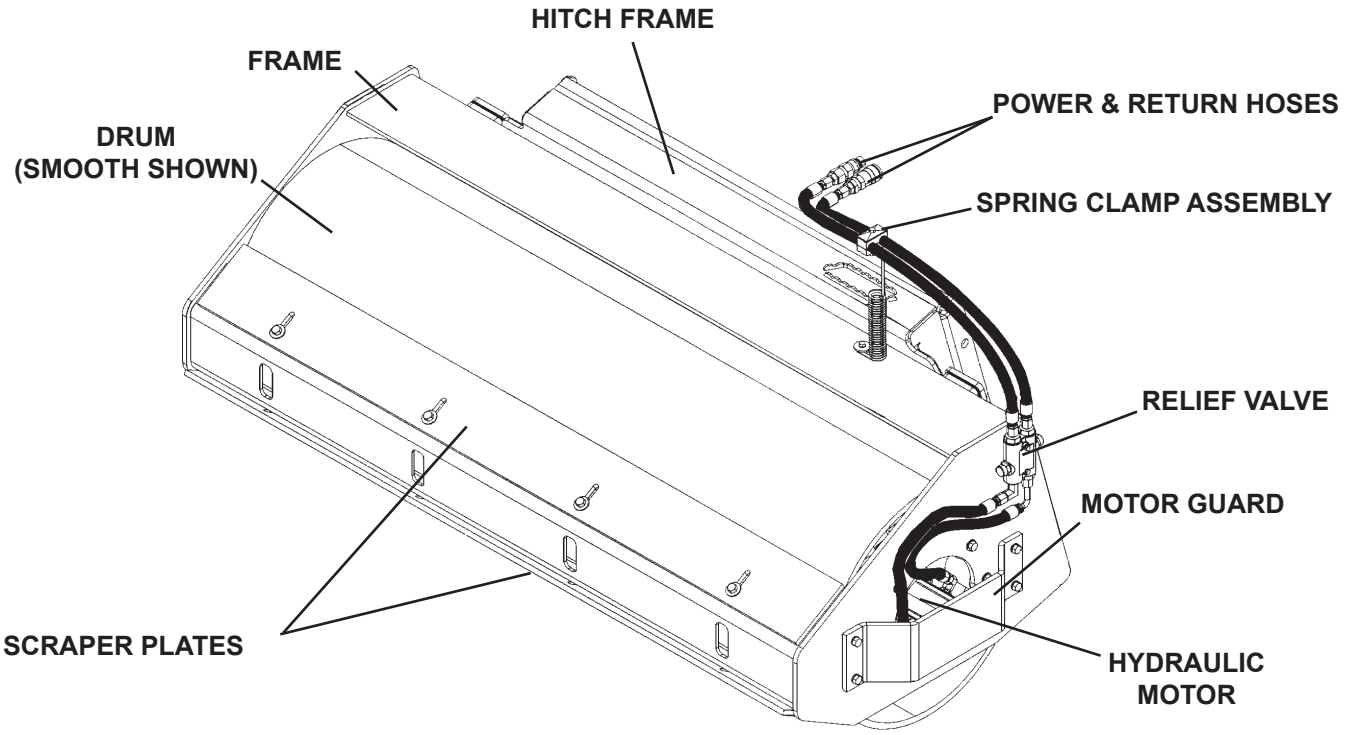
GENERAL INFORMATION

The Vibratory Rollers were designed to be easy to use and maintain. They are operated by the loaders auxiliary hydraulics. The Vibratory Rollers mount to the toolbar / quick attach mechanism for easy mounting.

NOTICE: DO NOT operate the Vibratory Rollers on a Hi-Flow hydraulic system (25 GPM Maximum). Damage to the hydraulic motor will occur.

NOMENCLATURE

Throughout this manual, reference is made to various Vibratory Roller components. Study the following diagram to acquaint yourself with the various names of these components. This knowledge will be helpful when reading through this manual or when ordering service parts. There is a complete parts breakdown for each roller at the back of this manual.



ATTACHING

Install the Vibratory Roller by following your power unit operator's manual for proper installion of an attachment. Connect the power and return hoses to the auxiliary hydraulic couplers on the loader. **IMPORTANT: All hose routings should be check for kinks or pinching. Reroute if necessary.**

WARNING! To Avoid Serious Personal Injury, make sure the Vibratory Roller is securely latched to the attachment mechanism of your unit. Failure to do so could result in separation of the attachment from the unit.

INSTALLATION

DETACHING

On firm, level ground. Lower the lift arms against the frame and place the roller on the ground.

Move the control levers back and forth to relieve pressure in the line. Disconnect couplers.

NOTE: Connect couplers together or install dust caps and plugs to prevent contaminants from entering the hydraulic system.

Follow your power unit operator's manual for detaching (removing) an attachment.

CAUTION! Block vibratory roller drum to prevent rolling when not attached to loader.

NOTE: Frequent lubrication of grease fittings with a multi-purpose grease will greatly increase the life of the product.

IMPORTANT: DISENGAGE THE AUXILIARY HYDRAULICS, STOP THE ENGINE, ENGAGE PARKING BRAKE AND REMOVE KEY BEFORE LEAVING THE OPERATOR'S STATION.

OPERATION

GENERAL INFORMATION

The Vibratory Roller is a hydraulically powered attachment designed to compact soil, stone or fill material. Performance of the roller varies greatly depending on the operator and how the attachment is used.

WARNING! Read and understand the Safety Precautions section of this manual before beginning operation.

Operate the attachment only from the operator's station. Any other method could result in serious personal injury or death.

Do not allow bystanders in the area when operating.

Go up and down slopes, not across them. Keep the heavy end of the machine uphill.

Follow mandatory safety shutdown procedures before cleaning, adjusting, lubricating or servicing this attachment.

OPERATING PROCEDURE

1. Position the Vibratory Roller in the desired starting location and lower the attachment to the ground.

2. Lower the loader arms and roll the toolbar out until the top of the roller frame is parallel to the ground and the front tires of the loader are approximately 1-3 inches off the ground.

3. Engage the auxiliary hydraulics on the loader and slowly drive forward.

4. Once you have reached the end of the pass, reverse the skid steer and drive slowly backwards to further pack the soil and cover any tire tracks.

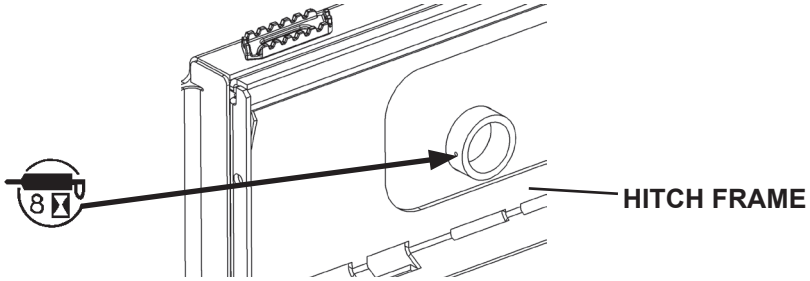
IMPORTANT: The drive circuit is bi-directional but, for the best results it is recommended that you reverse the auxiliary hydraulic flow when you reverse direction.

NOTICE: DO NOT operate the Vibratory Roller on Hi-Flow hydraulic systems (25 GPM maximum). Damage to the hydraulic motor will occur.

LUBRICATION

LUBRICATION

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



CHECKING OIL IN ROLLER SHAFT

Check oil in roller shaft every 100 hours. To Check Oil: Remove 90° elbow with fittings in the cover plate. Oil level is sufficient if oil is up to the fill hole. If the unit is level and the oil is not visible, add as required.

NOTE: The Vibratory Roller is a sealed unit. If oil is low, service is required.

CHANGING OIL IN DRIVE CIRCUIT

WARNING! Follow all mandatory safety shutdown procedures outlined in the loader operator's manual before adjusting, cleaning, lubricating or servicing this attachment.

The gear oil in the drive circuit must be changed after every 500 hours of operation with an 80-90 weight gear lube.

TO CHANGE GEAR LUBE:

1. Raise the left side (motor side) of the vibratory roller using a hoist and place a 6" x 6" block under the drum and lower the roller onto the block.
2. On the right side of the vibratory roller, place a container (to catch the oil) under the cover plate and remove the cover plate leaving all fittings in place.
3. Once the oil has been completely drained from the roller shaft, remove the block from the left side of the vibratory roller and place under the right side of the roller.
4. Clean the existing silicone from the cover plate and reseal and replace using new adhesive sealant (100% Silicone Rubber). Check for leaks.
5. Remove the breather plug from the cover plate and fill the roller shaft with the amount of 80-90 weight gear lube recommended for your attachment. (See Oil Requirements below.) Replace breather plug with breather pointing up.

OIL REQUIREMENTS (APPROXIMATE)

48" Vibratory Roller	=	1.38 Quarts
66" Vibratory Roller	=	2.00 Quarts
73" Vibratory Roller	=	2.13 Quarts
84" Vibratory Roller	=	2.50 Quarts

MAINTENANCE AND SERVICE

GENERAL INFORMATION

Regular maintenance and service is the key to long equipment life and safe operation. Maintenance requirements have been kept to a minimum. However it is important that these maintenance procedures be performed as described in this section.

WARNING! Read the Safety Precautions section of this manual before performing any maintenance procedure.

Follow all mandatory safety shutdown procedures outlined in the loader operator's manual before adjusting, cleaning, lubricating or servicing this attachment.

Procedure	Daily	Every 100 Hours	Every 500 Hours
Lubricate all grease fittings (one fitting on back of the hitch frame).	✔		
Check all bolts and nuts for tightness. See Bolt Torque Specifications. Replace if required with approved replacement parts.	✔		
Check hydraulic system for hydraulic oil leaks, pinching or deterioration. Replace as required.	✔		
Visually inspect the machine for worn parts or cracked welds, and repair as required.	✔		
Check for missing, damaged or illegible Safety / Warning Decals and replace as required.	✔		
Check oil in roller shaft. Add as required.		✔	
Change oil in the drive circuit.			✔

WARNING! Escaping hydraulic fluid under pressure can have sufficient force to penetrate the skin causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood rather than your 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. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.

MAINTENANCE AND SERVICE

DRUM REMOVAL

NOTE: Removal of the isolator bolts will allow the vibratory roller frame to fall. Make sure the frame is completely supported before removing.

WARNING! NEVER place hands or fingers between the frame and drum assemblies during installation or removal. Severe personal injury could occur.

WARNING! Follow all mandatory safety shutdown procedures outlined in the loader operator's manual before adjusting, cleaning, lubricating or servicing this attachment.

1. Using a loader or hoist, position the unit with the drum on the ground and the frame completely supported on blocks. Remove the motor guard and the motor bolts. Place a container (to catch the oil from the roller shaft) under the motor and remove the motor from the drum assembly. See Figure #1

FIGURE #1

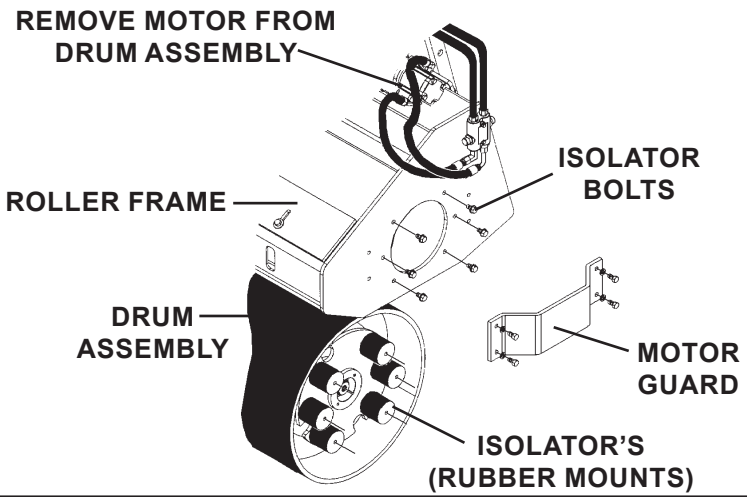
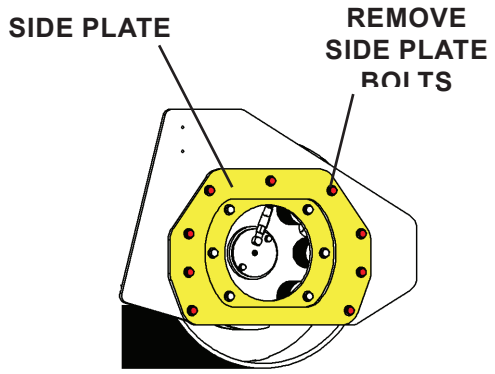


FIGURE #2



2. **SN# 543314 and DOWN (Without removable side plate):** Remove the twelve (isolator) bolts securing the roller frame to the drum and isolators. See Figure #1

   SN# 543315 and UP (With removable side plate): Remove the six isolator bolts securing the left side of the roller frame to the drum and isolators and remove the bolts securing the side plate to the roller frame on the right side of the vibratory roller. See Figure #1 and #2

3. Using the loader or hoist, lift the frame assembly off of the drum assembly and set aside.

4. Use a hoist to finish draining the oil from the roller shaft. Drum removal is complete

DRUM INSTALLATION

1. Lift the roller frame over the top of the drum assembly and into position. (Take extra care on units with the removable side plate to position the frame between the roller drum and the side plate.) Reinstall the isolator bolts and hard flat washers (using loctite 271 or equivalent) and the side plate bolts (if so equipped) securing the frame to the drum.

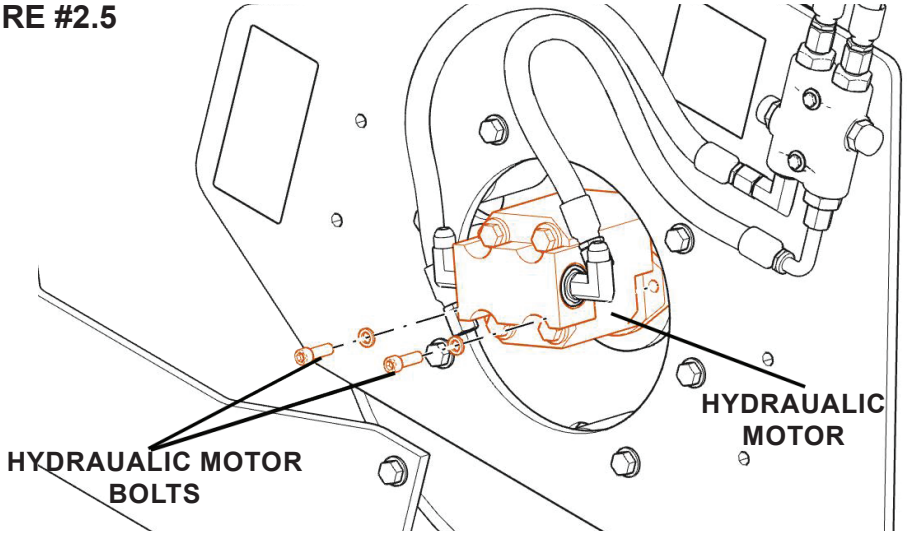
WARNING! NEVER place hands or fingers between the frame and drum assemblies during installation or removal. Severe personal injury could occur.

2. Reinstall the hydraulic motor.

3. Apply Loctite 271, or equivalent, to bolt threads and allow for the Loctite to cure.

4. Torque the hydraulic motor bolts into place (min. 50 ft. lbs – max. 56 ft. lbs). For specifications, see “Bolt Torque Specifications.” See Figure 2.5.

FIGURE #2.5



5. Reinstall a new motor gasket and motor guard using the existing hardware (using loctite 271 or equivalent on motor mounting hardware).

6. Fill the roller shaft with 80-90 weight gear lube by following the procedure see “Lubrication.”

MAINTENANCE AND SERVICE

REPLACING VIBRATION ISOLATORS (RUBBER MOUNTS)

NOTE: Removal of the isolator bolts will allow the vibratory roller frame to fall. Make sure the frame is completely supported before removing.

WARNING! Follow all mandatory safety shutdown procedures outlined in the loader operator's manual before adjusting, cleaning, lubricating or servicing this attachment.

1. Remove the drum by following the procedure listed for **DRUM REMOVAL**. (Remove side plate from drum if so equipped.)

2. Remove the .50" UNC deformed lock nuts securing the isolators to the left and right hubs and install new isolators. Torque nuts to 55 ft. lbs.

NOTICE: Do NOT remove the hubs from the roller shaft. Removing the hubs without first supporting the roller shaft will cause damage to the roller shaft seals.

3. Install the drum by following the procedure listed for **DRUM INSTALLATION.**

WARNING! NEVER place hands or fingers between the frame and drum assemblies during installation or removal. Severe personal injury could occur.

REPLACING LEFT BEARINGS AND/OR HUBS

WARNING! Follow all mandatory safety shutdown procedures outlined in the loader operator's manual before adjusting, cleaning, lubricating or servicing this attachment.

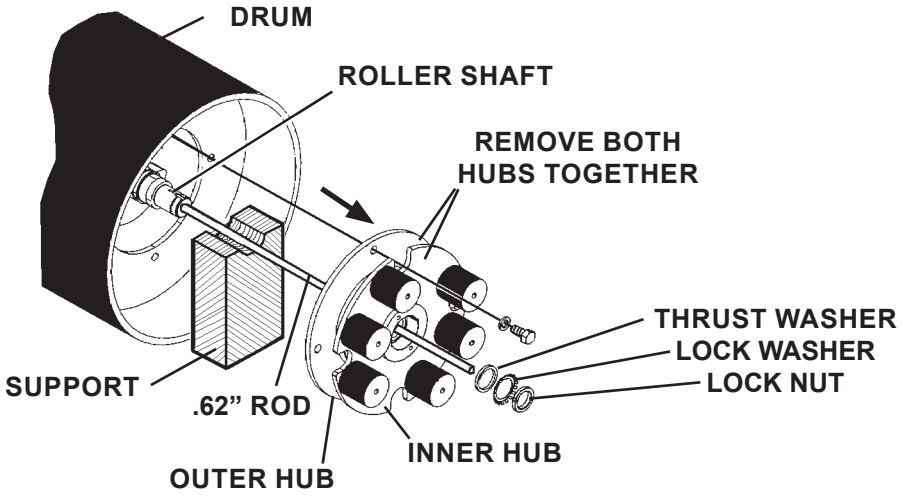
1. Remove the drum by following the procedure listed for **DRUM REMOVAL**.

2. Remove the thrust washer, lock washer and lock nut from the end of the roller shaft by first bending back the engaged tab on the lock washer. See Figure #3

3. Insert a clean .62" rod into the motor end of the roller shaft and support the shaft in its current position. See Figure #3

MAINTENANCE AND SERVICE

FIGURE #3



NOTICE: Removing the hubs without first supporting the roller shaft will cause damage to the roller shaft seals.

4. Remove the outer bearing hub mounting bolts and slide both bearing hubs out and over the end of the rod while keeping the roller shaft firmly supported. See Figure #3

NOTICE: Do not let the roller shaft drop and come into contact with the drum or hub. Seal damage could occur.

NOTICE: Shaft and bearing hubs are heavy. Be careful not to drop one on the other as denting may occur.

5. Pull the inner bearing hub out of the outer bearing hub. Remove the oil seal and snap ring from the end of the left inner hub. Tilt the housing to allow each bearing cone to fall out. See Figure #4

6. The bearing cup will need to be removed and replaced using an industrial press. Install new bearing cones. One cone from the inside (towards the outer hub) and the spacer and second cone other side of the inner hub. See Figure #4

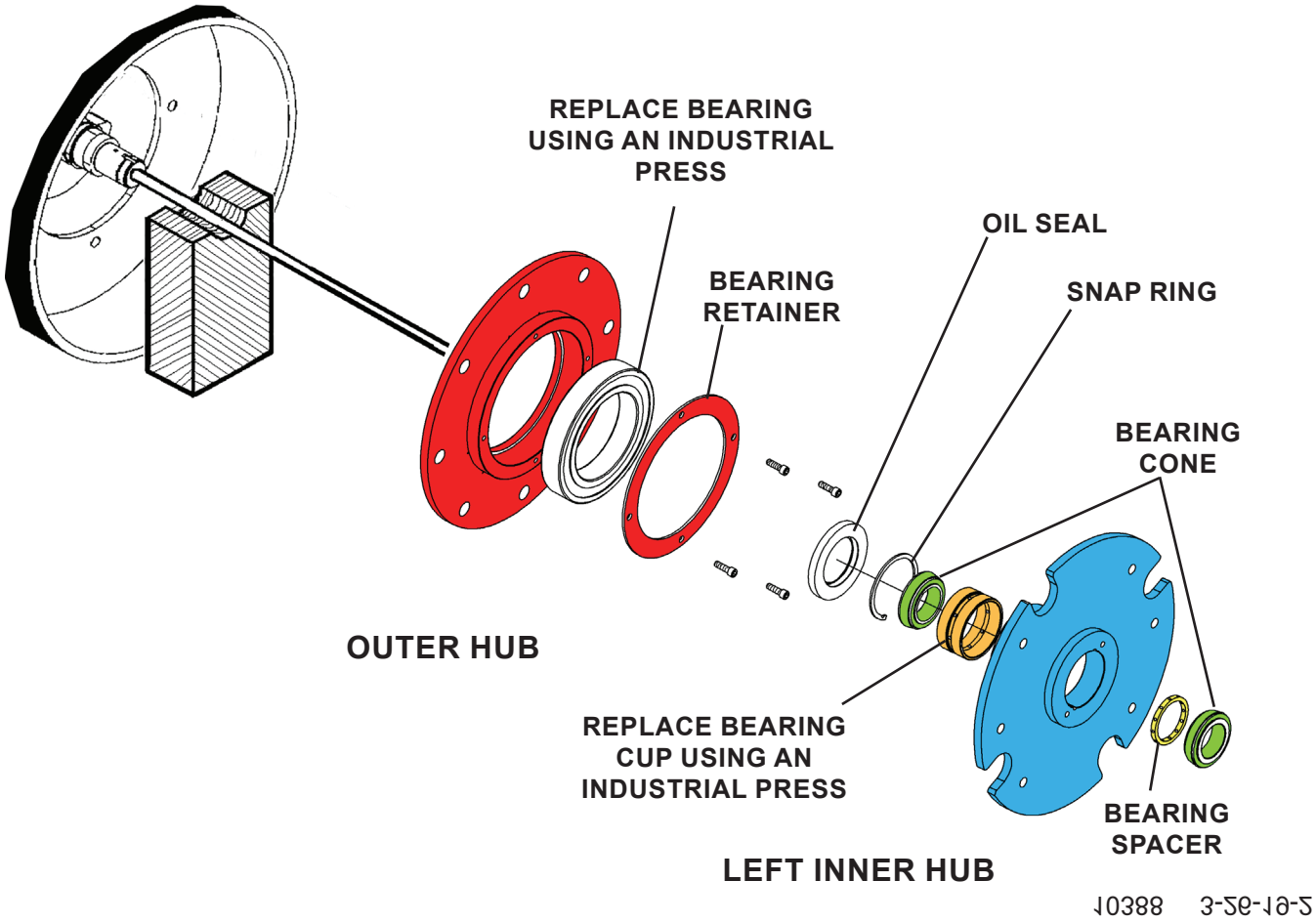
NOTE: The left inner hub bearing #123981 has been updated (SN# 536117 and UP) and is interchangeable with existing bearings. The new bearing components are part of a set that includes two bearing cones and a spacer used to preset the bearing. These internal components are not interchangeable with other bearings.

7. Reinstall the snap ring and press on the new oil seal. See Figure #4

8. Remove the bearing retainer from the outer hub and using an industrial press, remove and replace the outer bearing. See Figure #4

MAINTENANCE AND SERVICE

FIGURE #4



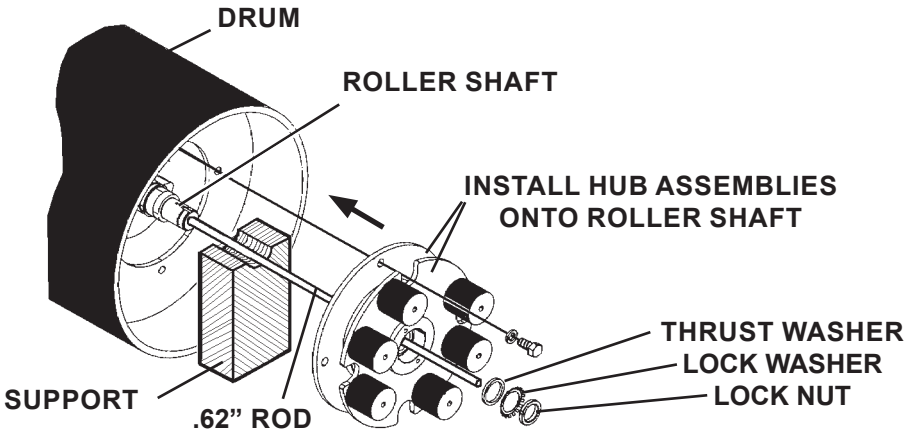
9. Reinstall the bearing retainer using the existing hardware. See Figure #4

10. Apply a small amount of oil or grease to the outer bearing hub and using an industrial press assemble the outer bearing hub to the inner bearing hub.

11. While maintaining support of the roller shaft, slide the hub assemblies over the .62” rod and install securely to the drum using the existing .75” UNC X 1.50” capscrews.

12. Reinstall the thrust washer, lock washer and lock nut onto the end of the roller shaft. Torque the nut to 200-250 ft. lbs.. Be sure to fully engage the tab on the lock washer into the slot on the shaft nut. See Figure #5

FIGURE #5



IMPORTANT: A BEARING SOCKET #124786 FOR USE WITH AN IMPACT WRENCH IS AVAILABLE THROUGH PALADIN PARTS DEPARTMENT FOR INSTALLING AND TORQUING THE BEARING LOCK NUT #22359.

13. Install the drum by following the procedure listed for **DRUM INSTALLATION.**

WARNING! NEVER place hands or fingers between the frame and drum assemblies during installation or removal. Severe personal injury could occur.

REPLACING RIGHT BEARINGS AND/OR HUBS

WARNING! Follow all mandatory safety shutdown procedures outlined in the loader operator's manual before adjusting, cleaning, lubricating or servicing this attachment.

1. Remove the drum and side plate (if so equipped) by following the procedure listed for **DRUM REMOVAL**.
2. Remove the cover plate or reservoir (84" roller only) with fittings. See Figure #6
3. Insert a clean .75" rod into the end of the roller shaft and support the shaft in its current position. See Figure #6

NOTICE: Removing the hubs without first supporting the roller shaft will cause damage to the roller shaft seals.

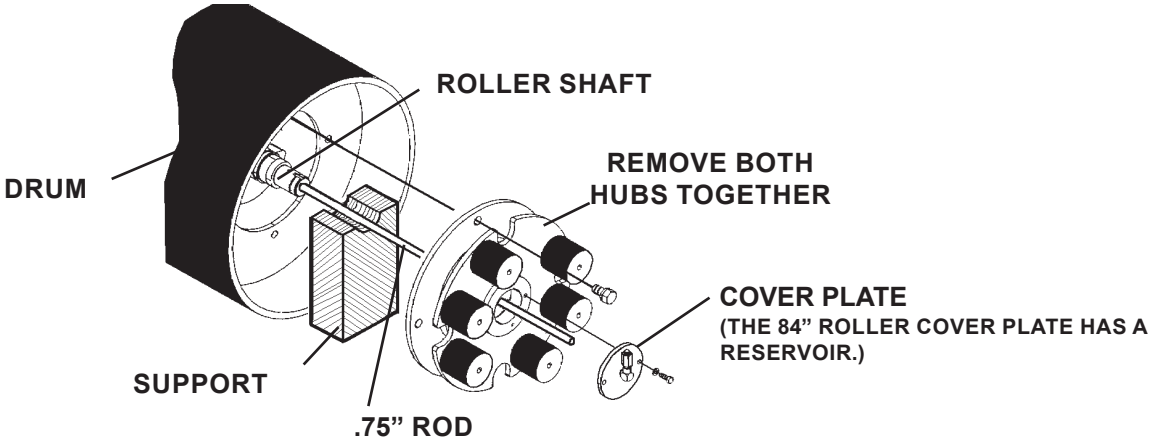
4. Remove the outer bearing hub mounting bolts and slide both bearing hubs out and over the end of the rod while keeping the roller shaft firmly supported. See Figure #6

NOTICE: Do not let the roller shaft drop and come into contact with the drum or hub. Seal damage could occur.

NOTICE: Shaft and bearing hubs are heavy. Be careful not to drop one on the other as denting may occur.

MAINTENANCE AND SERVICE

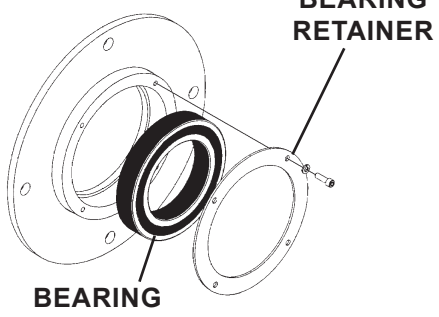
FIGURE #5



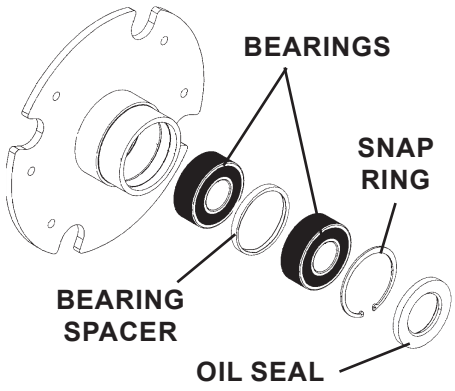
5. Remove the oil seal and snap ring from the end of the right inner hub. See Figure #7
6. Replacing Right Inner Hub Bearings:
   a. If your unit is equipped with a spherical bearing, remove bearing and replace with two #107605 bearings and one #107387 spacer using an industrial press. Install new bearings. See Figure #7
   b. If your unit is equipped with the two roller bearings and spacer, remove bearings and spacer and replace using an industrial press. Install new bearings. See Figure #7
   c. If your unit is equipped with two ball bearings (no spacer), replace the complete right side inner hub assembly #104805.
7. Reinstall the snap ring and press on the new oil seal. See Figure #7
8. Remove the bearing retainer from the outer hub and using an industrial press, remove and replace the outer bearing. See Figure #7
9. Reinstall the bearing retainer using the existing hardware. See Figure #7
10. Apply a small amount of oil or grease to the outer bearing hub and using an industrial press assemble the outer bearing hub to the inner bearing hub.
11. While maintaining support of the roller shaft, slide the hub assemblies over the .75" rod and secure to the drum using the existing outer bearing hub mounting bolts.
12. Reinstall the cover plate or reservoir (84" roller ONLY).
13. Install the drum by following the procedure listed for **DRUM INSTALLATION.**

WARNING! NEVER place hands or fingers between the frame and drum assemblies during installation or removal. Severe personal injury could occur.

FIGURE #7



OUTER HUB AND BEARING



RIGHT INNER HUB AND BEARINGS

MAINTENANCE AND SERVICE

HYDRAULIC MOTOR REPLACEMENT

WARNING! Follow all mandatory safety shutdown procedures outlined in the loader operator's manual before adjusting, cleaning, lubricating or servicing this attachment.

1. Place a block under the left side of the vibratory roller and disconnect the hydraulic couplers from the loader. Remove the motor guard and the motor bolts. Tag and disconnect the hydraulic hoses from the hydraulic motor. Note the hose routing for re-installation.

NOTE: It is recommended that the motor gasket be replaced at the same time as the hydraulic motor.

NOTE: The updated hydraulic motor has a cast housing instead of aluminum. If updating your unit you must also replace the 10MBo-8MJ elbow with a 12MBo-8MJ elbow #3316 (going to hose #38343).

2. Remove the motor and gasket from the drum assembly and replace with the new hydraulic motor and gasket. Reconnect the hydraulic hoses and fittings to the new motor.

NOTE: Field replacement of the internal motor seals voids warranty.

3. Check for leaks. Reinstall the motor bolts and the motor guard.
4. Check oil level in roller shaft and fill as needed with 80-90 weight gear lube.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Insufficient compaction	Loader “down pressure” insufficient	Increase the “down pressure” by raising the front wheels off the ground (see Operation)
	Operating RPM too slow	Increase RPM to half throttle
Does not vibrate	Hydraulic couplers mal-functioning	Replace
	Hydraulic couplers not completely engaged	Check and tighten couplers
	Hydraulic motor damaged	Replace motor
	Relief Valve damaged	Replace Relief Valve
	Roller shaft bearings damaged	Replace
	Low oil supply	Check for oil leaks and service as required
Excessive noise and/or vibration	Isolator’s worn	Replace Isolators
	Operating RPM too slow	Increase RPM to half throttle
	Hydraulic motor damaged	Replace
Oil leaking	Oil seals damaged	Replace
	Relief Valve damaged	Replace
	Hydraulic motor damaged	Replace
	Bearings damaged	Replace (replace oil seals at the same time)
	Broken or loose hydraulic lines or fittings	Check for leaks and repair or replace
Drum will not turn	Frame installed incorrectly	Check frame for correct installation and all hardware intact.
	Bearings damaged	Replace
	Binding between frame and drum.	Remove
Vibratory roller not tilting correctly	Guide retainer on hitch too loose or too tight	Add or remove shims from hitch

BOLT TORQUE SPECIFICATIONS

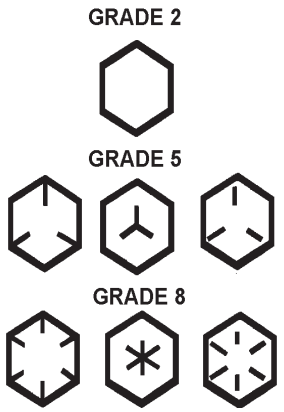
GENERAL TORQUE SPECIFICATION TABLES

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.

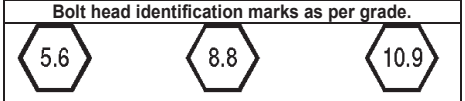
Bolt Size		SAE GRADE 5 TORQUE				SAE GRADE 8 TORQUE				Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters		
Inches	Millimeters	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	
1/4	6.35	8	9	11	12	10	13	14	18	
5/16	7.94	14	17	19	23	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	



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.

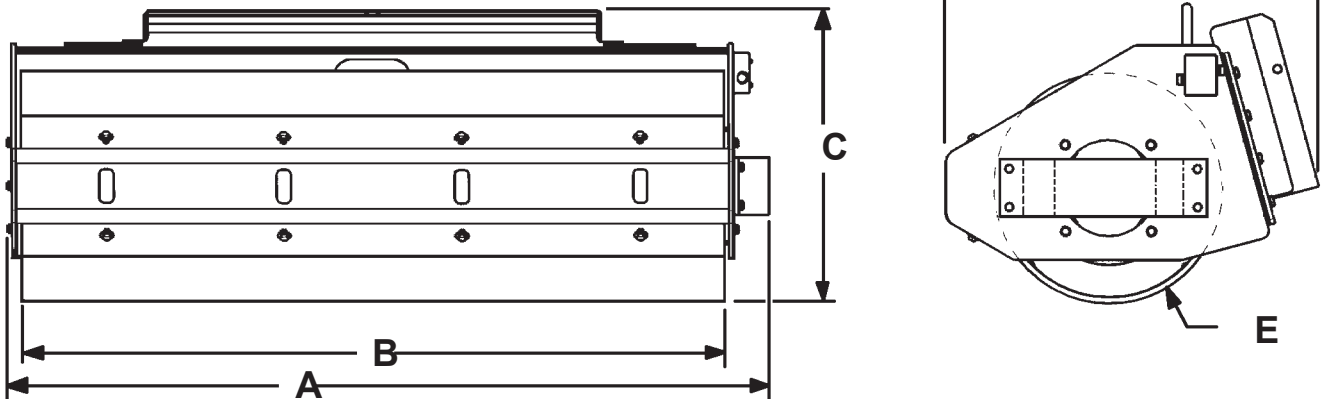
Bolt head identification marks as per grade.



Size of Bolt	Grade No.	Pitch (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
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

SPECIFICATIONS

VIBRATORY ROLLER



SPECIFICATION AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE AND WITHOUT LIABILITY THERE-

SMOOTH VIBRATORY ROLLERS

	VRS48	VRS66	VRS73	VRS84
A. Overall Width	61.00”	72.00”	79.00”	90.00”
B. Drum Width	48.00”	66.00”	73.00”	84.00”
C. Overall Height	31.00”	31.00”	31.00”	31.00”
D. Overall Length	39.00”	39.00”	39.00”	39.00”
E. Drum Diameter	24.00”	24.00”	24.00”	24.00”
Operating Weight (lbs)	1680#	2150#	2300#	2530#
Dynamic Force (lbs)	5750#	7800#	8550#	9370#
Vibrating Speed (vpm)	2600	2600	2600	2600
Vibrating Weight (lbs)	935#	1190#	1290#	1440#
Drum Oscillation/Tilt (degrees)	15°	15°	15°	15°
Maximum Flow (gpm)	25	25	25	25

PADDED VIBRATORY ROLLERS

	VRP48	VRP66	VRP73	VRP84
A. Overall Width	61.00”	72.00”	79.00”	90.00”
B. Drum Width	48.00”	66.00”	73.00”	84.00”
C. Overall Height	31.00”	31.00”	31.00”	31.00”
D. Overall Length	39.00”	39.00”	39.00”	39.00”
E. Drum Diameter (Without Pads)	20.00”	20.00”	20.00”	20.00”
Operating Weight (lbs)	1630#	2085#	2230#	2455#
Dynamic Force (lbs)	5750#	7800#	8550#	9370#
Vibrating Speed (vpm)	2600	2600	2600	2600
Vibrating Weight (lbs)	890#	1130#	1225#	1370#
Drum Oscillation/Tilt (degrees)	15°	15°	15°	15°
Maximum Flow (gpm)	25	25	25	25

NOTE: Specifications are based on 20 GPM hydraulic flow wherever applicable.
NOTE: VRS48 and VRP48 can be center mounted or offset 12.00” to the right.

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***.