



# HARLEY

## MODEL W3 POWER BOX RAKE®

### OPERATOR'S & PARTS MANUAL



**PALADIN.**  
LIGHT CONSTRUCTION GROUP

 **BRADCO**

 **FFC**

 **HARLEY**

 **McMILLEN**

 **SWEEPSTER**

*The Power of Combined Excellence*



Serial Number \_\_\_\_\_

Manual Number: 51-4143  
Release Date: May 2009  
Serial Number 0921200 and UP

## NOTES

# PREFACE

This manual describes the installation, operation, and maintenance of the Harley Power Box Rake®. Read and understand the manual in its entirety before performing installation, operation or maintenance in order to ensure the equipment's optimum level of performance. Read and follow all safety and precautionary notes included in this text.

Throughout this manual, references are made to front, back, right and left directions. These are determined by standing at the operator's controls of the power unit.

REMINDER: Fill in the warranty card and mail within 10 days of your purchase date. While filling in the card with the correct information, put the date purchased and the serial number on the front cover of this manual. Should you need to call your dealer or Harley Attachments, this information will help them to more quickly provide accurate service for you.

Any questions related to this should be directed to Harley Attachments customer service at **800-456-7100**.

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## OWNER ASSISTANCE

Harley Attachments, LLC and your authorized Harley dealer want you to be completely satisfied with your investment. To resolve any problems that may occur, please contact the Service Manager of your local Harley dealer. If your problem has not been handled to your satisfaction, contact:

Customer Service (8:00am – 5:00pm EST)

Harley Attachments, LLC

2800 N. Zeeb Road

Dexter, MI 48130-9499

734-996-9116

800-456-7100

Parts Fax: 734-996-9014

Please be prepared to provide the following information:

- Your name, address, and telephone number
- Machine model and SERIAL NUMBER
- Dealership name and address
- Machine purchase date
- Nature of problem

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Local Dealer Information:

Contact: \_\_\_\_\_

Address: \_\_\_\_\_

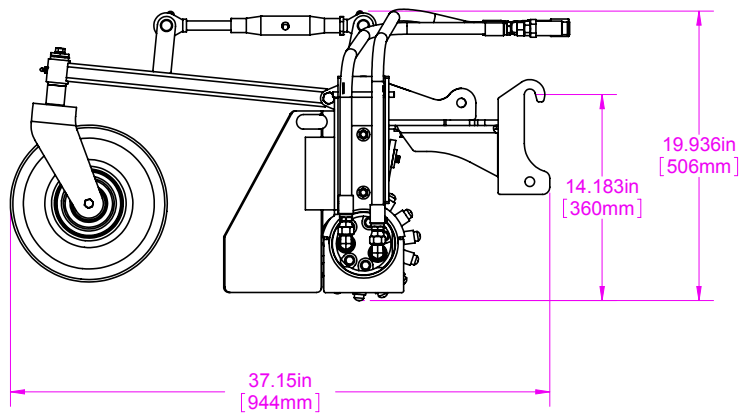
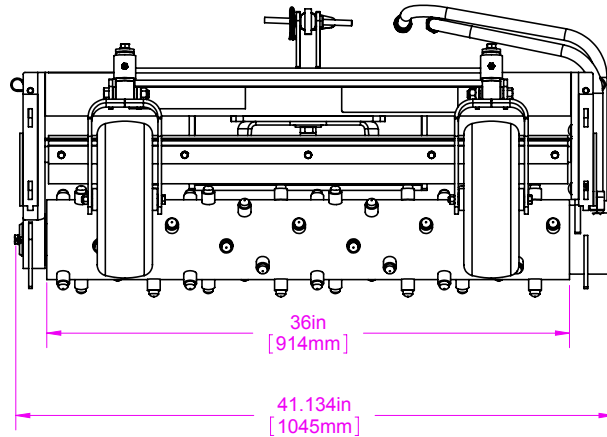
Phone #1: \_\_\_\_\_

Phone #2: \_\_\_\_\_

Email: \_\_\_\_\_

# SPECIFICATIONS

Raking Width .....	36"
Roller Type .....	Tooth Roller Standard 7" Diameter
Roller Angle .....	20 Degrees Both Directions
Gap (Tube to Barrier) .....	1-1/8" - 1-3/4" Adjustable
Power Unit Hydraulic Requirement .....	6 GP @ 2400 psi (min.)
Tires .....	10 x 4.1
Tire Pressure .....	40 psi
Weight .....	210 lbs



# BOLT TORQUE CHART

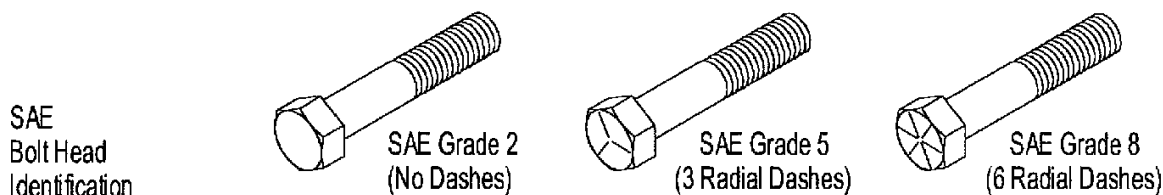
After every ten (10) hours of operation, check all hardware and tighten where required.

## SAE Series Torque Chart

DO NOT use these values if a different torque value or tightening procedure is listed for a specific application. Torque values listed are for general use only.

Fasteners should be replaced with the same grade.

Make sure fastener threads are clean and you properly start thread engagement. This will prevent them from failing when tightening.

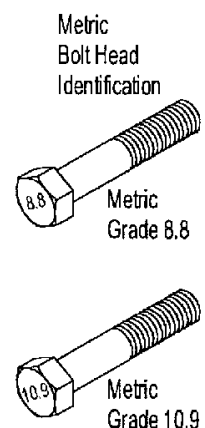


Bolt Diameter "A"	Wrench Size	MARKING ON HEAD					
		SAE 2		SAE 5		SAE 8	
		Lbs.-Ft	(N-m)	Lbs.-Ft	(N-m)	Lbs.-Ft	(N-m)
1/4	7/16	6	(8)	11	(15)	14	(19)
5/16	1/2	13	(18)	21	(28)	25	(34)
3/8	9/16	23	(31)	38	(52)	55	(75)
7/16	5/8	37	(50)	55	(75)	80	(110)
1/2	3/4	57	(77)	85	(115)	120	(165)
9/16	13/16	82	(111)	125	(170)	180	(245)
5/8	15/16	111	(150)	175	(240)	230	(310)
3/4	1 1/8	200	(270)	300	(410)	440	(600)
7/8	15/16	280	(380)	450	(610)	720	(975)
1"	1 1/2	350	(475)	680	(925)	1035	(1400)
1 1/8	1 11/16	450	(610)	885	(1200)	<p>Bolt Diameter</p>	
1 1/4	1 7/8	600	(815)	1255	(1700)		
1 3/8	2 1/16	675	(915)	1620	(2200)		
1 1/2	2 1/4	920	(1250)	2200	(2900)		

## Metric Series Torque Chart

Use only metric tools on metric hardware. Other tools may not fit properly. They may slip and cause injury.

Bolt Diameter "A"	Wrench Size	MARKING ON HEAD			
		8.8		10.9	
		N-m	(Lbs.-Ft)	N-m	(Lbs.-Ft)
5 mm	8 mm	6	(4.5)	9	(6.5)
6 mm	10 mm	10	(7.5)	15	(11)
8 mm	13 mm	25	(18)	35	(26)
10 mm	16 mm	50	(37)	75	(55)
12 mm	18 mm	85	(63)	130	(97)
14 mm	21 mm	110	(80)	150	(110)
16 mm	24 mm	215	(159)	315	(232)
20 mm	30 mm	435	(321)	620	(457)
24 mm	36 mm	750	(553)	1070	(789)
30 mm	46 mm	1495	(1103)	2130	(1571)



## SAFETY STATEMENTS



This statement is used where serious injury or death will result if the instructions are not followed properly.



This statement is used where serious injury or death could result if the instructions are not followed properly.



This statement is used where minor injury could result if the instructions are not followed properly.



This statement is used where equipment or property damage could result if the instructions are not followed properly.



This symbol by itself or used with a safety signal 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.

## GENERAL SAFETY PRECAUTIONS



### **READ MANUAL PRIOR TO INSTALL**

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 MOVERS MANUAL.**



### **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 assure 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 and hard to read.

**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**

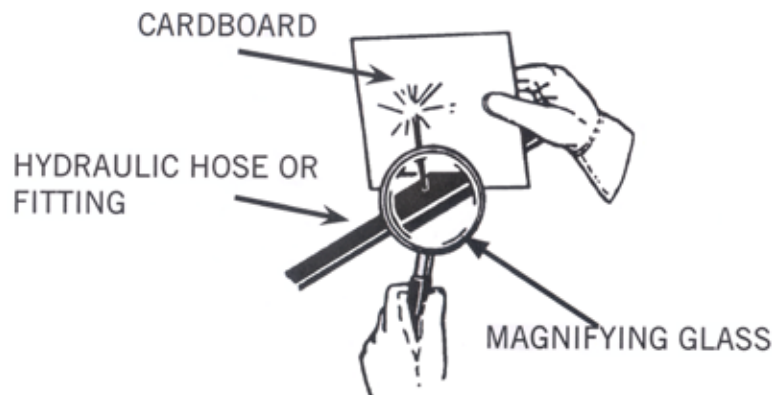
Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or onto 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 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 movers 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 immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a sound piece of card board or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS! SEE ILLUSTRATION BELOW.**



**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 Protection System) equipment or device. Any modifications must be authorized in writing by the manufacturer.



 **WARNING**

**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 prime movers 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 or being serviced.
- Do not allow riders on the attachment or the prime mover.
- Do not operate the equipment from anywhere other than the correct operators 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**

**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 tool 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.

**EQUIPMENT SAFETY PRECAUTIONS**

**NOTICE**

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator. In addition, to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of equipment. The designed and tested safety of this equipment depends on it being operated within the limitations as explained in this manual.

**NOTICE**

**The Harley W-3 Power Box Rake was designed for use with the Harley HPU13 power unit.**

**⚠ WARNING****INITIAL SET-UP AND SYSTEMS CHECK**

- Always check with your power unit manual or dealer for counter weight ballast that may be required for machine stability.
- Air in hydraulic systems can cause erratic operation and allows loads or equipment components to drop unexpectedly.
- Before operating equipment purge any air in the system by engaging all hydraulic functions.
- Check that all control lever positions function as instructed in the Operator's Manual. Do not operate until control lever and equipment movements are correct.
- Make sure all hydraulic hoses, fittings, and valves are in good condition and not leaking before starting power unit. Check and route hoses carefully to prevent damage.
- Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts.
- Operate moveable components through full operational range to check clearances. Replace damaged hoses immediately.
- Ensure implement is properly attached, adjusted, and in good condition. Power Unit coupler lock-pins must be fully extended and properly engaged into attachment retaining holes.

**⚠ WARNING****SAFELY OPERATE EQUIPMENT**

Improper operation can cause the machine to tip or roll over and cause injury or death.

- Turn on level ground.
- Go up and down slopes, not across them.
- Keep the heavy end of the machine uphill.  
Only engage power when equipment is at ground level. Always disengage power when equipment is raised off the ground.
- Do not disconnect hydraulic lines until all system pressure is relieved.
- Never go underneath equipment lowered to the ground or raised.
- Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.
- Never direct discharge toward people, animals, or property.
- Do not operate equipment while under the influence of alcohol or drugs.
- Operate only in the daylight or good artificial.
- Always comply with all state and local lighting and marking requirements.
- Ensure equipment is properly attached, adjusted, and in good operating condition. Power Unit coupler lock-pins must be fully extended and properly engaged into attachment retaining holes.

**⚠ WARNING****WATCH FOR OPERATING HAZARDS**

- Look down and to the rear and make sure area is clear before operating in reverse.

- Watch for hidden hazards on the terrain during operation.
- Use extreme care when working close to fences, ditches, other obstructions, or on hillsides.
- Reduce ground speed on slopes and rough terrain.
- Do not operate on steep slopes.
- Do not stop, start, or change directions suddenly on slopes.
- Stop Power Unit and implement immediately upon striking an obstruction. Turn off the engine. Inspect and repair any damage before resuming operation.



#### **MAINTENANCE SAFETY**

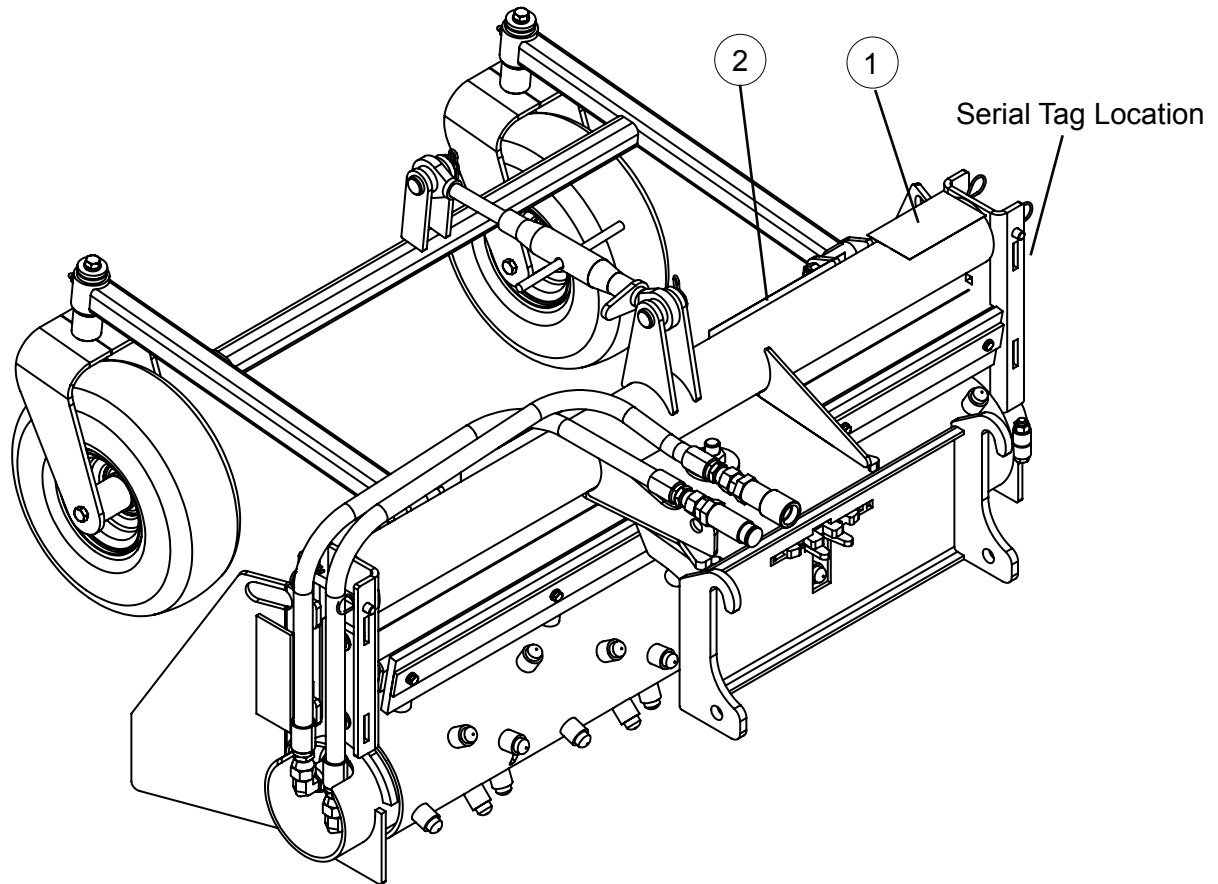
- Your dealer can supply original equipment hydraulic accessories and repair parts. Substitute parts may not meet original equipment specifications and may be dangerous.
- Avoid electrical system hazards. Never work on the electrical system unless you are qualified and thoroughly familiar with system details and the special handling requirements.
- Never perform service or maintenance with engine running.
- Tighten all bolts, nuts, and screws, and check that all cotter pins are installed securely to ensure equipment is in a safe condition before operating.



#### **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.

# SAFETY DECAL AND SERIAL TAG PLACEMENT

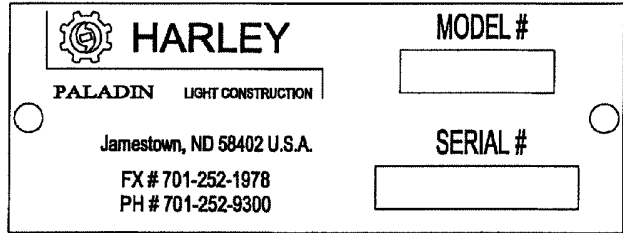


**Figure 2.** Safety Decals

# SAFETY DECALS



#1 - PN: P979104



SERIAL # TAG



#2 - PN: P970251

## OPERATIONAL PROCEDURE

### NOTICE

The W3 Power Box Rake® is designed for removing rock and small debris, and for thatching. This manual contains information for the W-3 model. Refer to the information in this manual for specifications, parts, assemblies, and adjustments.

### ATTACHING POWER RAKE TO POWER UNIT

Pull attachment lock handles on power unit and rotate 90° to maintain extended position. Carefully drive the power unit forward, engaging the attachment carrier rod with the hooks on the rake pivot mount. With the attachment engaged, rotate the attachment lock handles 90° and check that pins are fully engaged.

Connect hydraulic hoses to Power Unit auxiliary quick couplers.

### POWER RAKE FUNCTION

The power rake hydraulic motor drives the roller, which digs into the ground, cultivating and pulling up rocks, roots, and debris.

The clean soil goes between the roller and barrier, while the rocks, roots, and debris work to the side in a windrow.

With the endplates mounted in the working position and the rake straight (endplates parallel with Power Unit tires), material can be moved along, filling in the low spots. Also, rocks, roots, and debris can be collected and moved to another location for hauling away.

# OPERATIONAL PROCEDURE

## STARTING

Check roller depth and adjust accordingly

Start prime mover engine.

Engage hydraulic control lever for auxiliary implements.

Increase engine rpm to give desired rpm at the roller. Normal operating speed is approximately 3/4 to 7/8 throttle. If operating in heavy rock, reduce the speed slightly.

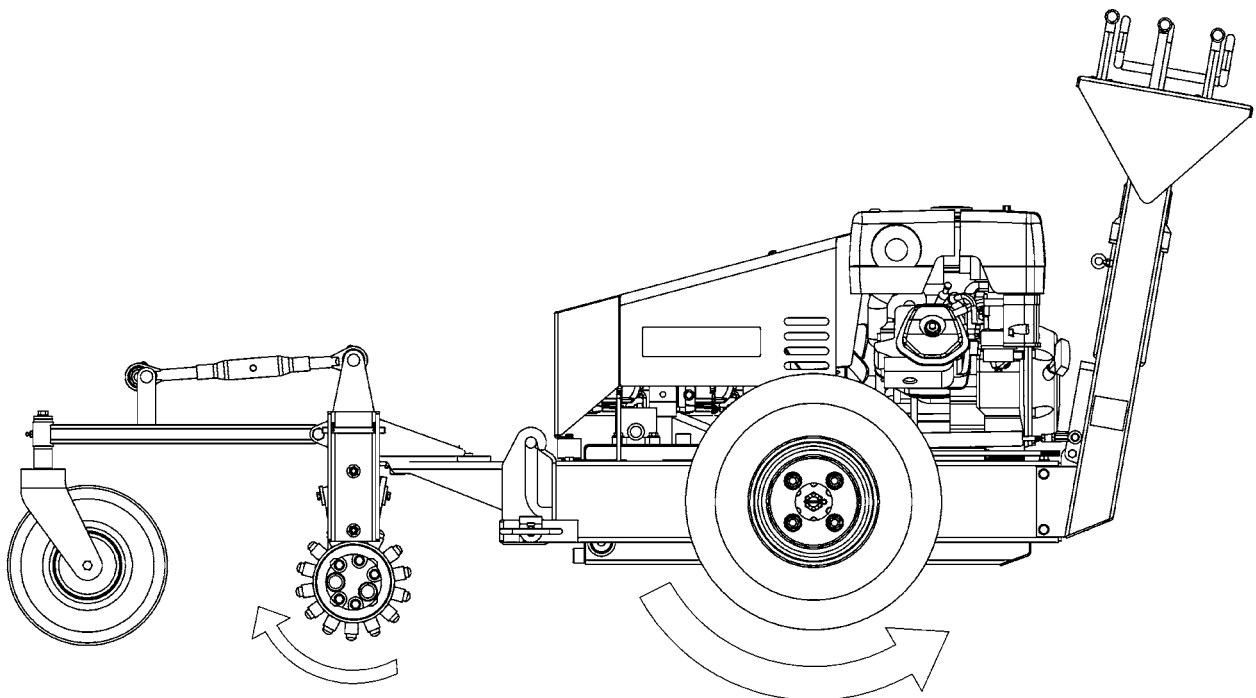
Move the power unit forward or backward as desired. For the roller to operate effectively, it must rotate in the opposite direction of the prime mover wheels, see **Figure 3 below**. Roller rotation direction is controlled by power unit auxiliary hydraulic control lever.

## Ground Speed

Ground speed should be between 2 and 4 mph under normal conditions. In heavy rock, reduce the ground speed to 1 to 2 mph.

## Hydraulic Drive Motor

The hydraulic drive motor runs off the auxiliary circuit of the power unit. The power rake should be run at 30% power for one hour for proper motor break-in.



**Figure 3.** Directional Control

# OPERATIONAL PROCEDURE

## Power Roller

Under normal operating conditions the roller should be set with the teeth fully engaging the ground.

To allow the roller to penetrate deeper into the ground, turn the adjustment link clockwise to raise the gauge wheels. To achieve the opposite, lower the gauge wheels.

Be sure to check the air pressure in each tire regularly so that an even, consistent grade will be maintained.

The normal gap between the roller and barrier for average conditions is about 1-1/4 inches. This gap can be adjusted either wider or narrower by loosening the 1/4" bolts that secure the barrier and sliding it up or down. A wider opening will allow more dirt and rock to pass through. For finer raking, reduce the gap. Be careful not to let roller hit barrier. The gap should be the same all the way across. Barrier adjustment is shown in **Figure 4. (page 18)**.

The roller on the power rake is **bi-rotational**. You can operate the roller in both directions clockwise and counter-clockwise. The roller operates most efficiently when it rotates in the opposite direction of the prime mover wheels.

## Operating Depth

When power raking, the depth will determine how much dirt is carried ahead of the roller. The ideal depth will vary with conditions and can be anywhere from skimming the surface to about 2 inches deep. See instructions in **Power Roller** above to set roller depth.

When making the first windrow, the level of dirt may be halfway up on the barrier. When moving the windrow two or three times, the level of the dirt may be to the top of the barrier. However, try to prevent material from flowing over the top.

The power rake allows fast raking of large areas of ground by being able to move windrows several times. Of course, the volume or density of the material being raked will dictate how many times a windrow can be moved.

## Endplates

The function of the endplates is to contain the material in front of the roller while the clean material passes between the roller and barrier.

With the endplates mounted in the working position and the roller straight (parallel with prime mover), material can be moved along, filling in the low spots.

The offset endplates are used to keep the endplate in a straight forward position while the rake is in its angled position, right or left.



# OPERATIONAL PROCEDURE

Make sure the disconnected power rake is stored on a hard, level surface. Use the endplates mounted on attachment side of rake to ensure stability.

## Operator Production

Successful operation of the power rake will come with operator experience.

An operator that masters the technique of adjusting the angle of attack of the roller against the soil will also find ideal settings under various conditions to give the desired results.

### NOTICE

**Do not drop power rake to the ground with the roller turning. Sudden high speed jolts multiply stress to the drive line and can cause extreme damage.**

## Application Techniques

The power rake is capable of many applications. The following are some of the common applications:

### Pulverizing Topsoil

For breaking up compacted soil or conditioning hardened baseball diamonds, raise the gauge wheels so only the toothed roller is in contact with the ground. Maintain sufficient RPM to avoid stalling the toothed roller in its progress. The rake can be straight or angled, but the endplates should not be mounted in order to allow material to move out of the way and not slow the process.

### Debris Removal

Once the surface has been loosened, the process of removing debris can begin. Lower the gauge wheels to control the depth of the toothed roller. The roller can be angled at this time for windrowing debris or the roller can be set straight with both endplates installed to collect debris. Power unit travel speed should be increased for this process.

### Finish Grading

The gauge wheels are lowered until the teeth of the toothed roller are barely touching the soil. Power unit speed can be increased for this operation, the idea being to collect material from the high spots and leave it in the low areas.

### Spreading Fill and Topsoil

Position rake so it is running on the gauge wheels, since depth of cut is not the objective. Endplates can be installed and the windrow angle set as needed to control the material movement.

### Changing Grade

Grade modification can be accomplished during finish grading by angling the rake to collect and windrow the maximum amount of material toward targeted areas.

### Thatching Existing Grass Areas

Adjust the gauge wheels so the teeth of the roller are just grazing the surface. Travel speed should be slow and careful.

# OPERATIONAL PROCEDURE

## Shutting Down

Turn off engine, set brake.

## Removing Power Rake From Prime Mover

Turn off engine and set brake

Install endplates on attachment side of power rake.

Cycle the auxiliary hydraulic lever to relieve any pressure.

Disconnect hydraulic hoses from quick couplers. Couple hoses together for storage.

Pull each attachment lock pin out and rotate 90°

Start engine, release brake and back out of attachment until it is disengaged from the power rake. The attachment should rest in a stable position for storage.

## STORAGE

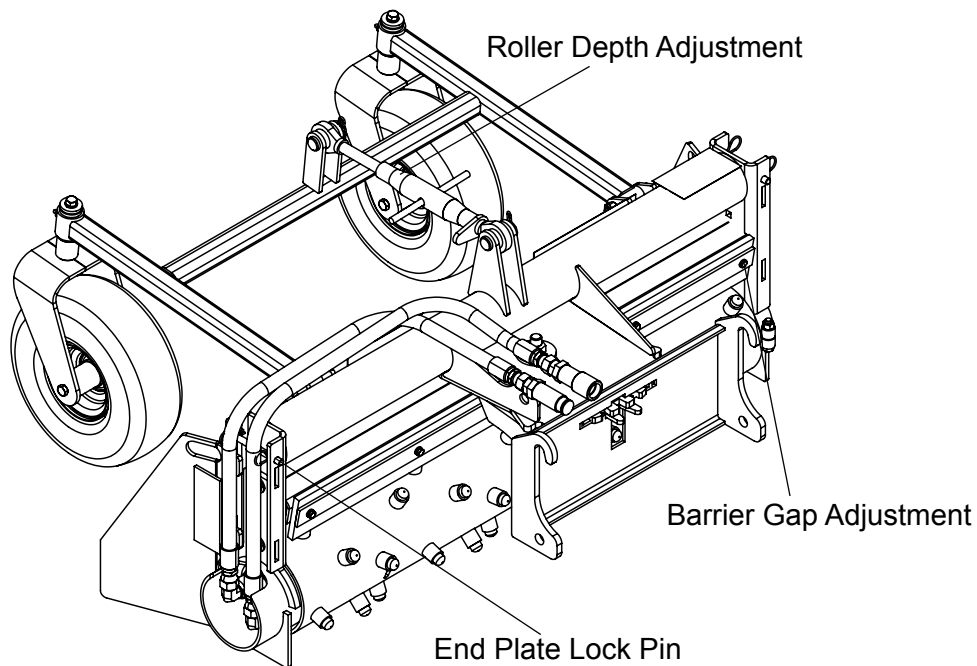
Make sure the disconnected power rake is stored on a hard, level surface. Endplates mounted on attachment side of rake increase stability.



**Block equipment securely for storage.**



**Keep children and bystanders away from storage area.**



**Figure 4.** Adjustments

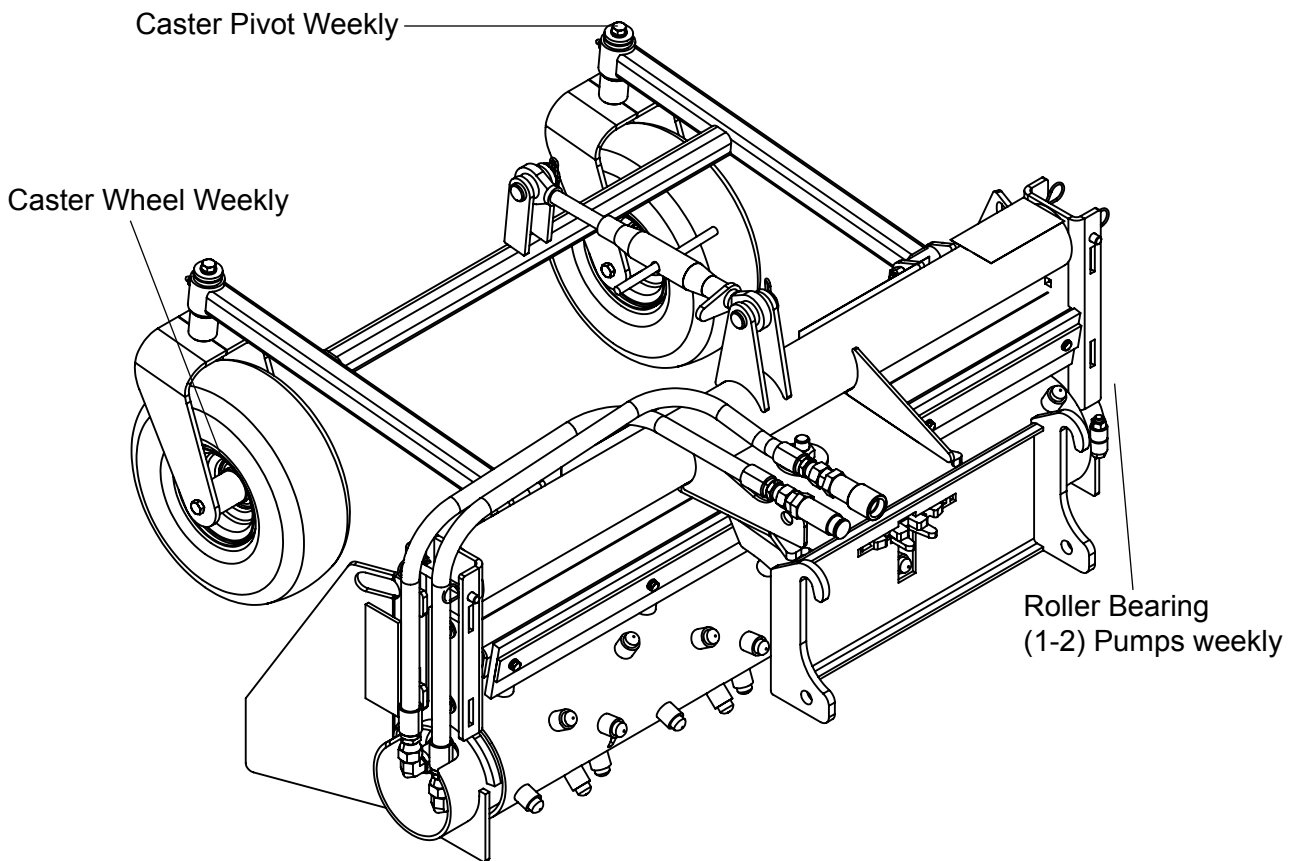
## MAINTENANCE

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

Regular preventive maintenance and immediate repair of broken or worn parts will ensure maximum efficiency and long life.

Because of the nature of the jobs the power rake does, such as site preparation and rock raking, the power rake is constantly vibrating and shaking. Parts may loosen up as it is used. One of the most important functions an operator can perform is observing and inspecting the equipment for loose or worn parts to prevent further damage or excessive downtime.

PROCEDURE	INTERVAL
Inspect power unit hydraulic system to be sure the level of hydraulic oil is adequate.	daily
Repair hydraulic oil leaks.	daily
Lubricate all grease fittings.	weekly
Check tire pressure.	weekly 40 psi cold
Inspect and clean safety decals. Replace if damaged. (See <b>safety decals</b> section for location.)	monthly



**Figure 5.** Lubrication Maintenance

# MAINTENANCE

## QUALIFIED TECHNICIAN MAINTENANCE

### HYDRAULIC MOTOR

#### Removal

1. Remove (2) 3/8-16 top lock nuts & washers from motor plate. Then remove motor assembly by pulling it out of the roller.
2. Remove 3/4" hex nut.
3. Remove hub driver.
4. Remove (4) 3/8" bolts and lock washers from mount weldment. You can now remove the hydraulic motor.

#### Reassembly

Reverse the removal procedure.

### BEARINGS

Highest quality bearings are used on the power rake. Only triple-seal bearings are used on the roller which operates down in the dirt. Lubrication of the bearing will vary considerably with conditions. As a rule, bearings should be under-lubricated rather than over-lubricated. Over lubrication can cause seals to blow out.

#### NOTICE

**Replacement bearings should be only high quality original equipment bearings for longer life.**

Install new complete bearing housing if needed or just replace the bearing insert. The shafts should be straight, free of burrs, and up to size. If shaft is worn, replace or have the shaft built up to standard prior to completing assembly.

#### Protective Collars

The special protective collars protect bearings from vine and wire wrap, and dirt buildup next to the bearing seal. The bearing protector is sandwiched onto the shaft which rotates within a close clearance from the outer race of the bearing. Grease coming from the bearing oozes into the protecting collar, keeping dust and particles from entering the seal area, increasing the bearing life.

#### Right Roller Bearing

1. Remove the hex bolt and bearing cap from outside of bearing.
2. Loosen bolt on the bearing tube that holds cartridge bearing in place.
3. Pry bearing tube apart to free bearing assembly.

#### NOTICE

**Have roller blocked up or supported.**

To replace, reverse the procedure. Be sure all parts and wear surfaces are thoroughly clean and in good condition.

# MAINTENANCE

## ROLLER REPLACEMENT

### NOTICE

**It will be necessary to have a lifting device or additional help while removing and replacing the roller. The roller weighs approximately 50 lbs.**

1. Remove the two bolts that hold the motor assembly to the frame. Remove this assembly from roller.
2. Loosen the bolt on the bearing tube of the non-drive end.
3. Slide roller and bearing out of frame.
4. Remove hex bolt, bearing cap, bearing, and protective collar from roller.
5. On roller to be installed, place protective collar against end plate on roller.
6. Place bearing and bearing cap on roller. Clamp in place with hex bolt and lock washer into end of roller shaft.
7. Slide roller and bearing into bearing tube on non-drive end of frame. Do not tighten bearing tube at this time.
8. Reinstall motor assembly
9. Check that roller is centered in the frame on both ends (adjust, if required).
10. Tighten 3/8" bolt in bearing tube on non-drive end of frame.
11. Run power rake and watch for any interference between roller frame.

**Have the roller blocked up or supported.**

## TROUBLE SHOOTING

Problem	Possible Cause	Solution
Roller will not turn.	<p>Hydraulic valve on power unit not engaged.</p> <p>Relief valve setting on prime mover not properly adjusted.</p> <p>Worn, damaged, insufficient, or inadequate pump.</p> <p>Insufficient oil in system.</p> <p>Hose ends not completely engaged.</p> <p>Obstruction in hydraulic lines.</p> <p>Obstruction between roller and barrier.</p>	<p>See power unit Operator's Manual for auxiliary hydraulic operation procedure.</p> <p>Check relief pressure setting set at 2450 psi.</p> <p>Repair or replace hydraulic pump.</p> <p>Service the power unit hydraulic reservoir.</p> <p>Check hose coupling and engage properly.</p> <p>Replace obstructed or damaged line.</p> <p>Reverse roller to clear obstruction.</p>
Oil leaks.	<p>Worn or damaged seal.</p> <p>Loose or damaged hoses.</p> <p>Loose or damaged connections.</p>	<p>Replace leaking seal.</p> <p>Replace damaged hoses and secure loose hoses.</p> <p>Replace damaged hose connections and tighten loose fittings.</p>

# ASSEMBLY/PARTS IDENTIFICATION

## SET-UP INSTRUCTIONS

The W-3 power rake is shipped assembled.

It is advisable to have a mechanical lifting device to facilitate uncrating.

## UNPACKING CRATE

Be careful of nails in boards when uncrating.

Select a suitable working area.

1. Remove top, sides, and ends of crate.
2. Remove rake assembly from crate.
3. Remove loose nails from boards and dispose of crate according to local codes.

# ASSEMBLY - RAKE

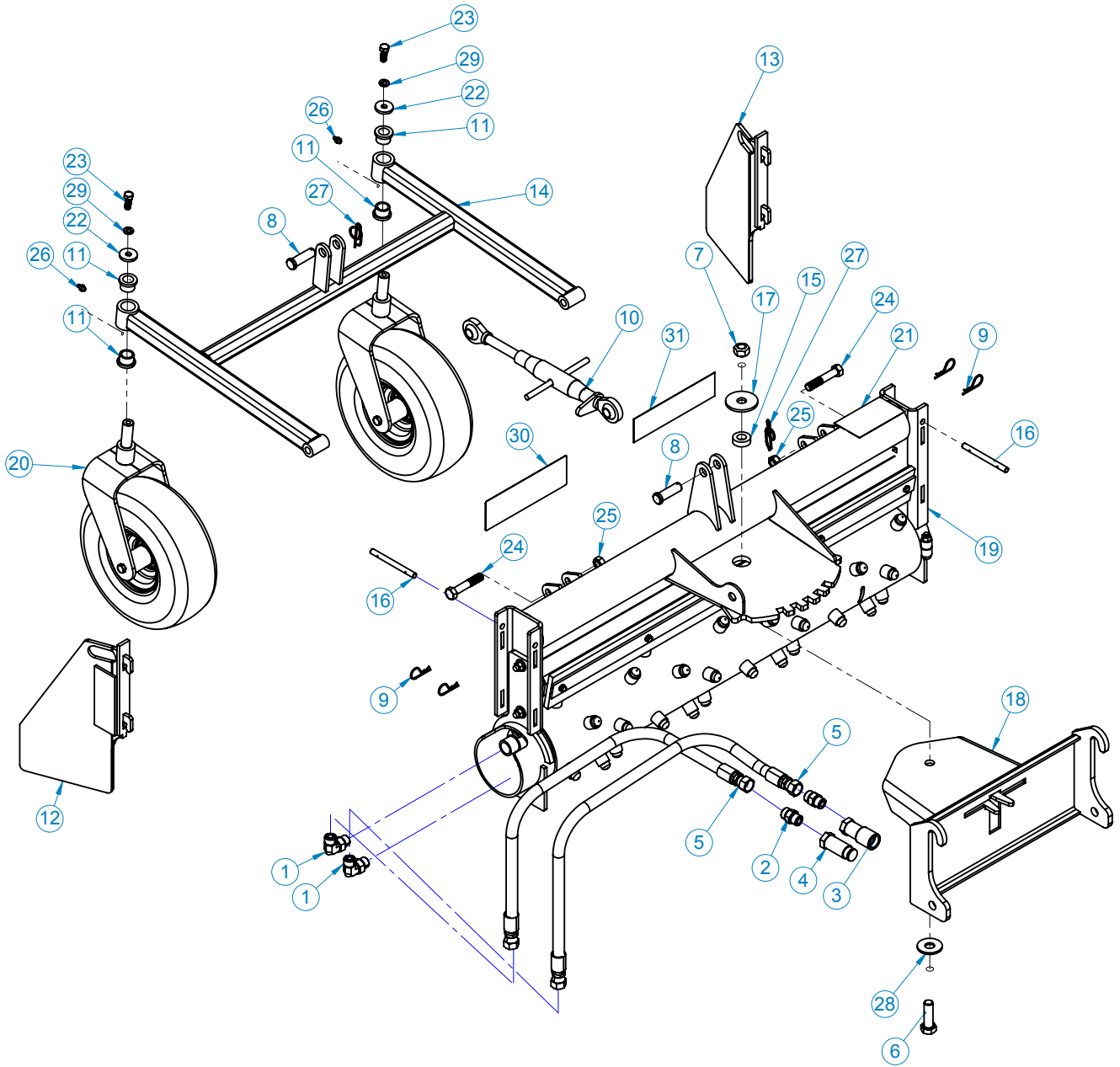


Figure 6. Rake Assembly



## ASSEMBLY - RAKE PARTS LIST

<u>ITEM</u>	<u>PART</u>	<u>QTY</u>	<u>DESCRIPTION</u>
1.	03-3318	2	Fitting, Elbow, HP, 90°, 3/4MOR, 1/2MFS
2.	03-3514	2	Fitting, 8MF, 8MB
3.	03-3861	1	Quick Disconnect, Flat Face, Female, 8FB
4.	03-3862	1	Quick Disconnect, Flat Face, Male, 8FB
5.	03-5569	2	Hose, .50 x 36, 8FF, 8FF
6.	07-0066	1	Screw, HHC, Gr8, 5/8-11 x 2
7.	07-0181	1	Nut, Hex, Lock, Gr8, 5/8-11
8.	07-0201	2	Pin, Clevis, 5/8 x 2
9.	07-0210	4	Clip, Hairpin, 14ga x 1 3/4
10.	07-2484	1	Toplink, CAT 0, 10 3/4C x 16 3/8E
11.	08-0210	4	Bearing, Sleeve, Flanged, 3/4 x 1, 1 1/4 Flange
12.	13-60085	1	Weld, Bent Gate Left
13.	13-60087	1	Weld, Bent Gate Right
14.	13-60089	1	Weld, Cross Bar
15.	13-60096	1	Tube, Pivot Bushing
16.	13-60101	2	Rod, Gate Pin
17.	13-60102	1	Plate, Pivot Washer
18.	13-60204	1	Weld, Pivot
19.	28-8046	1	Assembly, Roller Frame
20.	28-8050	2	Assembly, Tire
21.	50-0813	1	Label, Operator Warning
22.	M5225	2	Washer, 3/16 x 13/32 x 1-1/4
23.	P100604	2	Bolt, Hex, 3/8-16 x 1
24.	P100811	2	Bolt, Hex, 1/2-13 x 2-3/4
25.	P155850	2	Nut, Lock, Top, 1/2-13
26.	P620200	2	Fitting, Grease, Straight, 1/4-28
27.	P622610	2	Cotter, Ring, Rue, 3/4
28.	RHW5662	1	Washer, Flat, 5/8
29.	P851106	2	Washer, Lock, 3/8
30.	P970251	1	Decal: Danger Roller
31.	P975801	1	Decal Harley 2 x 8

# ASSEMBLY - ROLLER FRAME

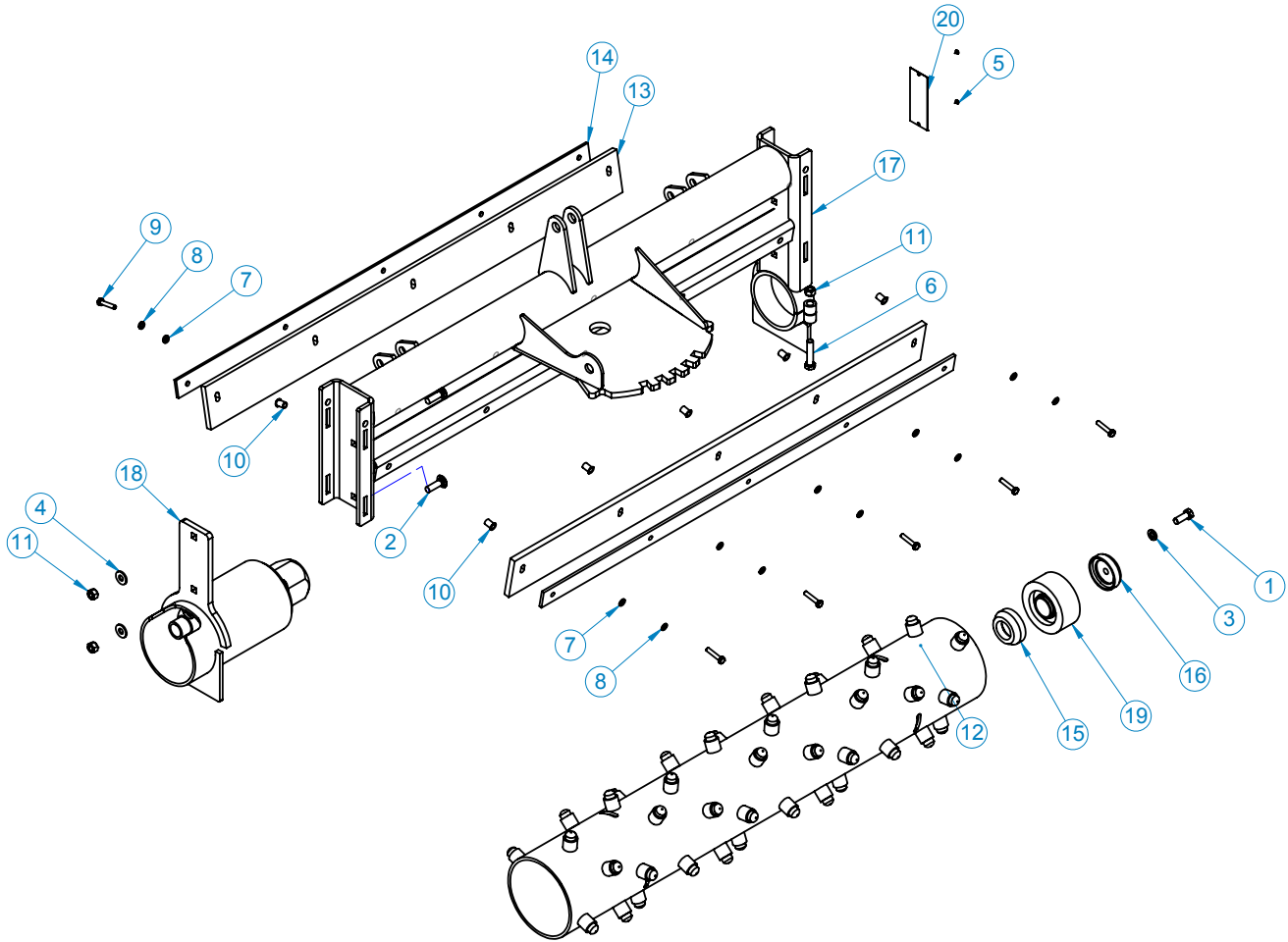
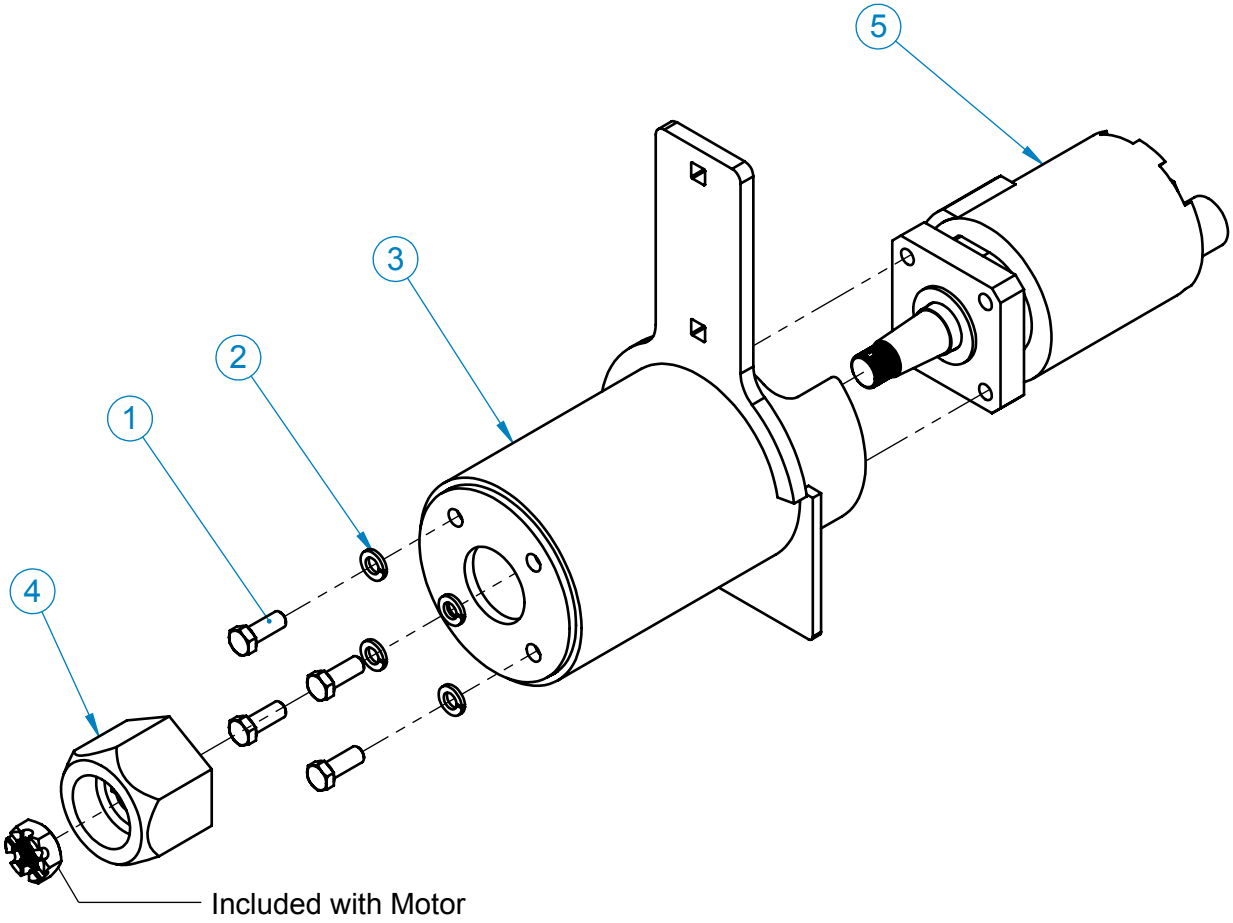


Figure 7. Roller Frame Assembly

## ASSEMBLY - ROLLER FRAME PARTS LIST

<u>ITEM</u>	<u>PART</u>	<u>QTY</u>	<u>DESCRIPTION</u>
1.	07-1443	1	Screw, HHC, Gr8, 3/8-24 x 1
2.	07-1717	2	Bolt, Carriage, Gr5, 3/8-16 x 1 1/4
3.	07-1718	1	Washer, Lock, Split, Medium, 3/8
4.	07-3275	2	Washer, Flat, Gr8, 5/16
5.	07-3624	2	Tack, Metal, 31 Series
6.	07-3656	1	Screw, HHC, Gr8, 3/8-16 x 1 3/4
7.	07-3278	10	Washer, Lock, CL8.8, M6
8.	07-3730	10	Washer, Lock, Split, Medium, M6
9.	07-3731	10	Screw, HHC, CL10.9, M6-1 x 30MM
10.	07-3922	10	Nut, Insert, M6 x 1, .165-.251 Grip Length
11.	07-5370	3	Nut, Hex, Lock, 3/8-16, Gr8
12.	13-60053	1	Weld, Roller
13.	13-60056	2	Barrier
14.	13-60057	2	Plate, Barrier Strap
15.	13-60070	1	Rod, Bearing Collar
16.	13-60071	1	Rod, Bearing Cap
17.	13-60206	1	Weld, Frame
18.	28-8048	1	Assembly, Motor, Mount
19.	28-8049	1	Assembly, Bearing, 1 1/4
20.	P985000	1	Serial Number Tag

# ASSEMBLY - MOTOR

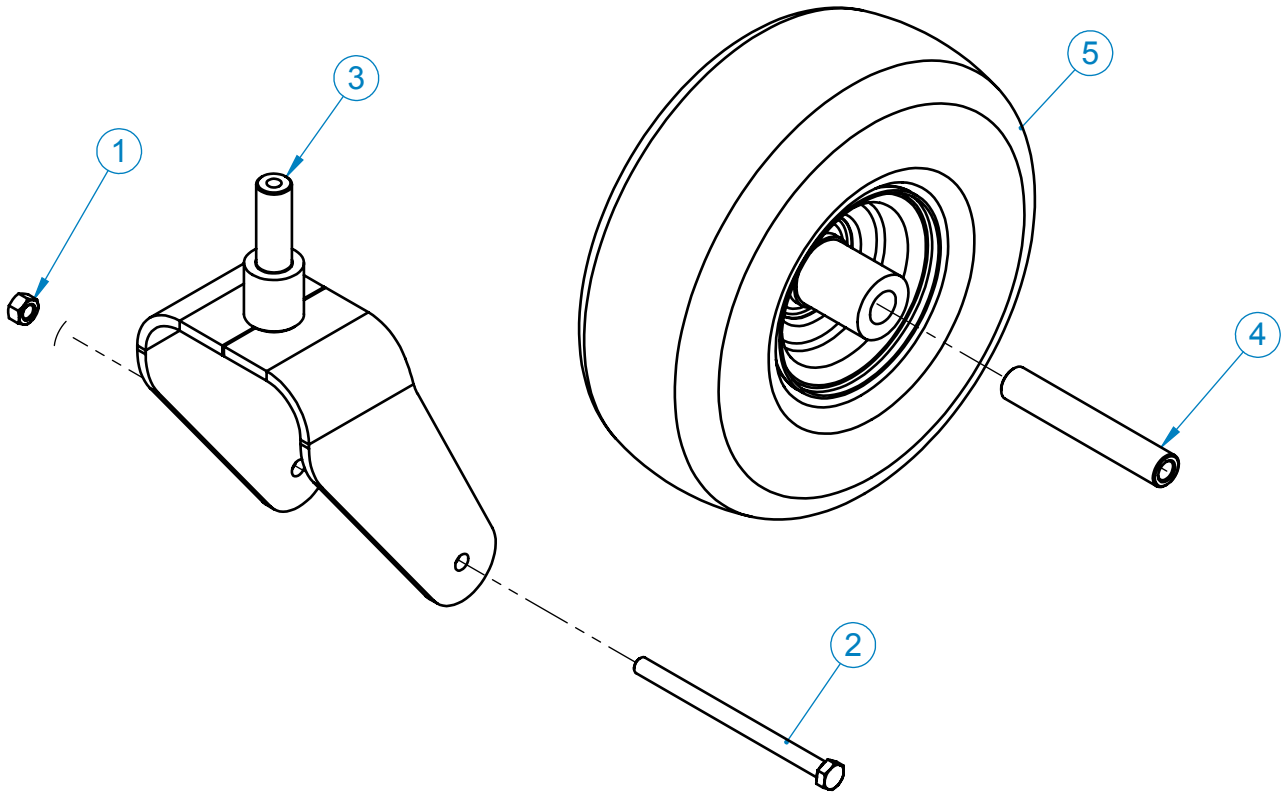


**Figure 8.** Motor Assembly

## ASSEMBLY - MOTOR PARTS LIST

<u>ITEM</u>	<u>PART</u>	<u>QTY</u>	<u>DESCRIPTION</u>
1.	07-0018	4	Screw, HHC, Gr8, 3/8-16 x 1
2.	07-1718	4	Washer, Lock, Split, Medium, 3/8
3.	13-60075	1	Motor Mount Weldment
4.	13-60076	1	Rod, Hex, Hub Driver
5.	P350850	1	Motor, 5.0 CID 4 Bolt, Parker

# ASSEMBLY - WHEEL



**Figure 9.** Wheel Assembly

## ASSEMBLY - WHEEL PARTS LIST

<u>ITEM</u>	<u>PART</u>	<u>QTY.</u>	<u>DESCRIPTION</u>
1.	07-5370	1	Nut, Hex, Lock, 3/8-16
2.	07-6926	1	Screw, HHC, Gr8, 3/8-16 x 5 1/2
3.	13-60092	1	Weld, Fork
4.	13-60099	1	Tube, Wheel Bolt Sleeve
5.	P771000	1	Wheel and Tire

# Limited Warranty

Except for the Excluded Products as described below, all new products are warranted to be free from defects in material and/or workmanship during the Warranty Period, in accordance with and subject to the terms and conditions of this Limited Warranty.

1. Excluded Products. The following products are excluded from this Limited Warranty:

(a) Any cable, part that engages with the ground (i.e. sprockets), digging chain, bearing, teeth, tamping and/or demolition head, blade cutting edge, pilot bit, auger teeth and broom brush that either constitutes or is part of a product.

(b) Any product, merchandise or component that, in the opinion of Paladin Light Construction<sup>1</sup>, has been (i) misused; (ii) modified in any unauthorized manner; (iii) altered; (iv) damaged; (v) involved in an accident; or (vi) repaired using parts not obtained through Paladin Light Construction.

2. Warranty Period. The Limited Warranty is provided only to those defects that occur during the Warranty Period, which is the period that begins on the first to occur of: (i) the date of initial purchase by an end-user, (ii) the date the product is first leased or rented, or (iii) the date that is six (6) months after the date of shipment by Paladin Light Construction as evidenced by the invoiced shipment date (the "Commencement Date") and ends on the date that is twelve (12) months after the Commencement Date.

3. Terms and Conditions of Limited Warranty. The following terms and conditions apply to the Limited Warranty hereby provided:

(a) Option to Repair or Replace. Paladin Light Construction shall have the option to repair or replace the product.

(b) Timely Repair and Notice. In order to obtain the Limited Warranty, (i) the product must be repaired within thirty (30) days from the date of failure, and (ii) a claim under the warranty must be submitted to Paladin Light Construction in writing within thirty (30) days from the date of repair.

(c) Return of Defective Part or Product. If requested by Paladin Light Construction, the alleged defective part or product shall be shipped to Paladin Light Construction at its manufacturing facility or other location specified by Paladin Light Construction, with freight PRE-PAID by the claimant, to allow Paladin Light Construction to inspect the part or product.

Claims that fail to comply with any of the above terms and conditions shall be denied.

## **LIMITATIONS AND EXCLUSIONS.**

**THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY BASED ON A COURSE OF DEALING OR USAGE OF TRADE.**

**IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES.**

**IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR ANY LOSS OR CLAIM IN AN AMOUNT IN EXCESS OF THE PURCHASE PRICE, OR, AT THE OPTION OF PALADIN LIGHT CONSTRUCTION, THE REPAIR OR REPLACEMENT, OF THE PARTICULAR PRODUCT ON WHICH ANY CLAIM OF LOSS OR DAMAGE IS BASED. THIS LIMITATION OF LIABILITY APPLIES IRRESPECTIVE OF WHETHER THE CLAIM IS BASED ON BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR OTHER CAUSE AND WHETHER THE ALLEGED DEFECT IS DISCOVERABLE OR LATENT.**

<sup>1</sup>Attachment Technologies Inc., a subsidiary of Paladin Brands Holding, Inc. (PBHI) is referred to herein as Paladin Light Construction.

February 10, 2010



# NOTES



*The Power of Combined Excellence*