



OPERATOR'S & PARTS MANUAL



The Power of Combined Excellence

MODEL T6 POWER BOX RAKE®



SERIAL NUMBER: _____

PURCHASE DATE: _____

MANUAL P/N: P970612
REV 1

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 sitting in the operator's seat of the tractor.

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

Local Dealer Information:

Contact: _____
Address: _____
Phone #1: _____
Phone #2: _____
Email: _____

SPECIFICATIONS

Raking Width	72"
Roller Type	Tooth Roller Standard 9" Diameter
Roller Angle	15 Degrees Both Directions
Gap (Tube to Barrier)	5/16" - 3" Adjustable
Tires	16.5 x 6.5-8
Tire Pressure	60 psi
Weight	840 lbs
Oil Capacity of Chain Case	Approximately 1.5 Pints
Tractor Three-Point Attachment.....	Cat. 1
3-Point Lift Requirement at 24" 903 lbs	
PTO Drive.....	540 RPM
Tractor Hydraulic System	3-Pt Hitch and One Remote Valve
Tractor PTO HP	28 - 40 HP

(*Tractor must meet ASAE lift capacity requirement.)

BOLT TORQUE CHART

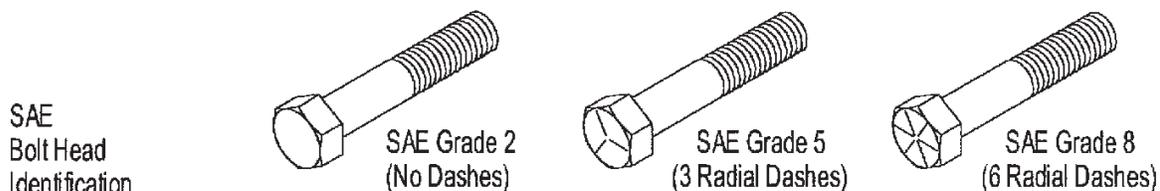
After every ten (10) hours of operation, check all hardware and tighten where required.

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.

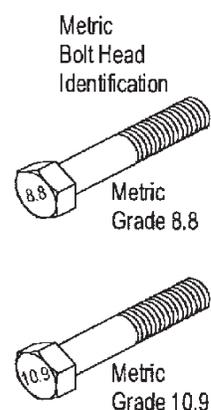


Bolt Diameter "A"	Wrench Size	MARKING ON HEAD					
		SAE 2		SAE 5		SAE 8	
		Lbs.-Ft	(N-m)	Lbs.-Ft	(N-m)	Lbs.-Ft	(N-m)
1/4	7/16	6	(8)	11	(15)	14	(19)
5/16	1/2	13	(18)	21	(28)	25	(34)
3/8	9/16	23	(31)	38	(52)	55	(75)
7/16	5/8	37	(50)	55	(75)	80	(110)
1/2	3/4	57	(77)	85	(115)	120	(165)
9/16	13/16	82	(111)	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)		
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

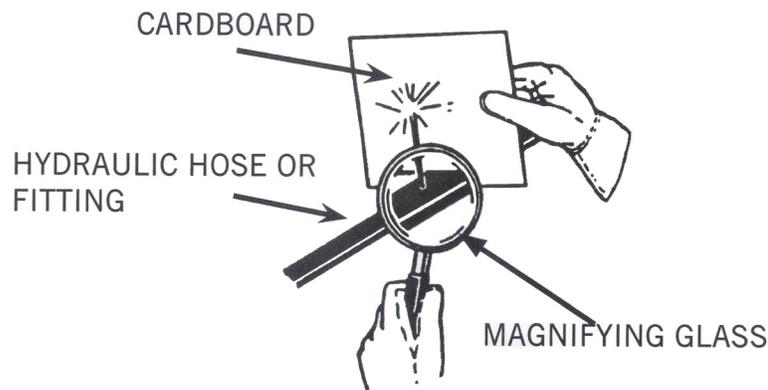
Do not work under raised 3 point lift arms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower lift arms to ground level or onto blocks. Lower lift arms 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.

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

- Always check with your prime mover 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.
- Tractor must be equipped with ROPS and seat belt/operator restraint.
- Keep seat belt/operator restraint securely fastened/engaged. Falling off tractor can result in death from being run over or crushed. Keep ROPS systems in place at all times.



SAFELY OPERATE EQUIPMENT

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

- Keep tractor lift arms and attachment as low as possible.
- 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 lighting.
- Always comply with all state and local lighting and marking requirements.
- Ensure equipment is properly attached, adjusted and in good operating condition.
- Before starting tractor, check all equipment driveline guards for damage and make sure they rotate freely on all drivelines. Replace any damaged guards. If guards do not rotate freely on drivelines, repair and replace bearings before operating.
- Make sure driveline is correct length to prevent bottoming out or pulling apart during the full lift range of the hitch.
- Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO splined groove.
- A minimum 20% of tractor and equipment weight must be on tractor front wheels with attachments in “transport” position. Without this weight, tractor could tip over causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires, or front tractor weights. When attaining wheels, you must not exceed the Roll Over Protection Structure (ROPS) weight certification. Weigh the tractor and equipment. Do not estimate.

- Ensure shields and guards are properly installed and in good condition. Replace if damaged.

 **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 tractor and implement immediately upon striking an obstruction. Dismount tractor using proper procedure. Inspect and repair any damage before resuming operation.

 **WARNING**

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.
- Disconnect battery before working on electrical system. Remove “ground” cable first. When reconnecting battery, connect “ground” cable last.
- 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.

 **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.

SAFETY DECAL AND SERIAL TAG PLACEMENT

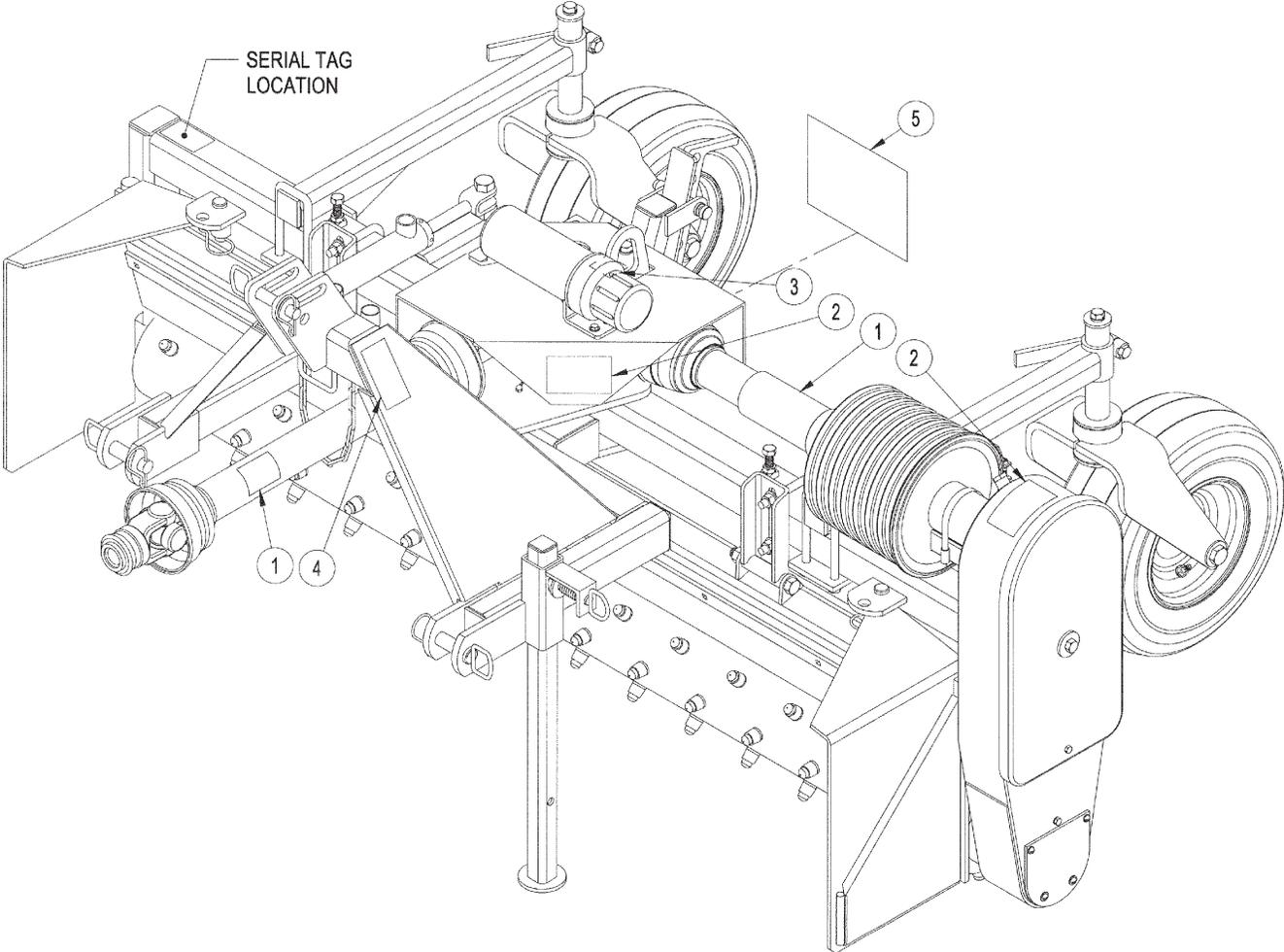


Figure 1. Safety Decals

SAFETY DECALS

DANGER

ROTATING DRIVELINE
CONTACT CAN CAUSE DEATH
KEEP AWAY!

DO NOT OPERATE WITHOUT –

- ALL DRIVELINE GUARDS, TRACTOR AND EQUIPMENT SHIELDS IN PLACE
- DRIVELINES SECURELY ATTACHED AT BOTH ENDS
- DRIVELINE GUARDS THAT TURN FREELY ON DRIVELINE

#1 - PN: P970400

DANGER

ROTATING PART HAZARD

- KEEP HANDS, HAIR AND CLOTHING AWAY FROM MOVING PARTS.
- CLOSE AND SECURE ALL SHIELDS BEFORE OPERATING.

FAILURE TO DO SO COULD RESULT IN
SERIOUS INJURY OR DEATH

#2 - PN: P970300

DANGER

ROTATING PART HAZARD

- KEEP HANDS, HAIR AND CLOTHING AWAY FROM MOVING PARTS.
- CLOSE AND SECURE ALL SHIELDS BEFORE OPERATING.

FAILURE TO DO SO COULD RESULT IN
SERIOUS INJURY OR DEATH

#3 - PN: P970301

WARNING

BEFORE ATTACHING, CHECK TRACTOR'S 3PT LIFT CAPACITY TO ENSURE ITS ABILITY TO SAFELY HANDLE THE WEIGHT.

MAX PTO SPEED IS 540 RPM'S

DO NOT OPERATE WITHOUT GUARDS/SHIELDS IN PLACE AND IN GOOD WORKING ORDER.

STOP ALL MOVING PARTS INCLUDING TRACTOR ENGINE BEFORE CLEANING, UNPLUGGING, ADJUSTING, AND/OR PERFORMING MAINTENANCE.

KEEP BYSTANDERS 10 FEET FROM POWER RAKE WHEN IN OPERATION. P970100

#4 - PN: P970100

DANGER

- Stay at least 10 feet (3m) away from operating equipment.
- Flying objects and rotating parts can cause injury or death.
- Stop engine before cleaning or servicing.
- Keep all guards in place.

#5 - PN: P970250

OPERATIONAL PROCEDURE

NOTICE

The T6 Power Box Rake® is designed for removing rock and small debris, and for thatching. This manual contains information for the T6 models. Refer to the information in this manual for specifications, parts, assemblies, and adjustments.

ATTACHING POWER RAKE TO TRACTOR

Move tractor into position in front of the power rake. Move back slowly and carefully, not allowing anyone to be between the tractor and the rake. Turn off tractor engine. Attach the two lower arms of the 3-point hitch with the two hitch-pin assemblies.

Attach the tractor center link to the upper hitch point of the power rake. Use either the “lock-out” setting or the “float” feature depending on your application.

Attach the front PTO from the power rake to the tractor. Slide the front section of the PTO into the back section and attach to the PTO shaft at the rear of the tractor.

Reattach driveline storage chain in its original position so that it will contact PTO driveline.



- **If the PTO is too long, severe PTO and gearbox damage is possible when hooking up the PTO from the power rake to the tractor. The front PTO is long enough to fit a variety of tractors. It is possible that the front PTO will need to be cut. There will be NO benefit by cutting only one telescoping section. Both sections of the PTO must be cut. DO NOT FORCE THE PTO TO FIT.**
- **WARRANTY IS VOID IF THE PTO IS TOO LONG, resulting in gearbox, PTO, yoke, or cross bearing damage.**

The PTO, when attached to the tractor and gearbox, must not extend so there is less than five inches of overlap within the PTO.

Attach the two hydraulic lines on the rake to the two female hydraulic couplers on the tractor. The hydraulic hose ends on the power rake are ISO male couplers, which are compatible with newer tractors.

Raise jackstand and secure in operating position.



Always clean connector ends prior to attaching. Dirt could contaminate hydraulic fluid and damage the hydraulic system.

OPERATIONAL PROCEDURE

POWER RAKE FUNCTION

The tractor PTO 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 tractor tires), material can be moved along, filling in the low spots.

Maximum safe PTO operating speed is 540 rpm.

Before using your new Harley Power Box Rake, the slip clutch assembly must be in RUN-IN. See CLUTCH in the maintenance section, page 20, for the RUN-IN procedure. After you have completed the RUN-IN of the clutch, return to the operating instructions and proceed with start-up. Failure to run the clutch in could result in pre-mature drive line failure and warranty will be voided.

Start tractor engine.

Lower power rake slowly to the ground.

Engage tractor PTO.

Increase engine rpm to give desired rpm at the roller. Normal operating speed must not exceed 540 rpm. If operating in heavy rock, reduce the speed slightly.

Move the tractor forward. Select a slow tractor speed and increase slightly until operation is satisfactory.

Ground Speed

Ground speed should be between 3 and 5 mph under normal conditions. In heavy rock, reduce the ground speed to 1 to 3 mph.

Power Rake Angle Adjustment

The power rake may be angled up to 15 degrees left or right for placing material in a windrow.

With the power rake angle cylinder connected to a tractor hydraulic control valve, move tractor control valve to select the desired angle. Return the tractor control to neutral to maintain the selected angle.

Power Roller

The roller should be level with the ground. To level rake from side to side, adjust one of the tractor 3-point lower lift arms.

The power rake should be level front to back. Level the rake using the tractor 3-point top link, the 3-point lift arms, or the gauge wheels.

OPERATIONAL PROCEDURE

To allow the roller to penetrate deeper into the ground, loosen the handle and 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.

Barrier

The normal gap between the roller and barrier for average conditions is about 1-1/4". This gap can be adjusted by rotating the barrier and pinning in desired position. A wider opening will allow more dirt and rock to pass through, allowing wet soil to dry for final raking. 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 2 (page 17)**.

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 3 inches deep. See instructions in "Power Roller" on page 13 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.

Soil can be removed from the windrow of rocks by moving it back and forth a few times onto the clean area. If dirt clods are a problem, running the tractor tire over the windrow and then moving it a final time will help to break up and cut down on dirt clods.

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 operating position and the rake straight (endplates parallel with tractor tires), material can be moved along, filling in the low spots.

By decreasing the gap between the roller and barrier, more material can be pulled along. Barrier adjustment is shown in **Figure 2 (page 17)**.

When not using the endplates for operation, they can be placed in "storage" position, see **Figure 2 (page 17)**.

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.

OPERATIONAL PROCEDURE

Operator Production

Successful operation of the power rake will come with operator experience. The rake's performance also depends on the type and size of the tractor it's mounted on.

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 driveline and can cause extreme damage.

APPLICATION TECHNIQUES

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

See **Figure 2 (page 17)** for adjustment locations.

Pulverizing Topsoil

For breaking up compacted soil or conditioning hardened baseball diamonds, the 3-point top link is set in the "lock-out" positions so that down pressure can be exerted on the tooth roller. The top link is shortened to take the guide wheels off the ground so only the toothed roller is in contact with the ground. The rake can be straight or angled, with the barrier opened up to allow material to flow over the roller.

Debris Removal

Once the surface has been loosened, the process of removing debris can begin. The 3-point hitch top link is mounted in the "float" position holes. This allows the rake to begin the early stages of the final grading process. The 3-point hitch is lowered until the guide wheels control the depth of the toothed roller. The rake can be angled at this time for windrowing debris or the rake can be set straight with both endplates installed to collect debris. Tractor travel speed should be increased for this process.

Finish Grading

For this operation, set the tractor top link in the "float" position and mount both endplates in the "forward" position. The rake is tilted forward until the teeth of the toothed roller are barely touching the soil. Tractor 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

Start with tractor top link in "fixed" position and rake tilted on 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.

OPERATIONAL PROCEDURE

Thatching Existing Grass Areas

This procedure is done with the 3-point top link in the “lock-out” position so accurate depth control can be maintained. The top link should be lengthened to support the rake on the gauge wheels and toothed roller raised so teeth are just grazing the surface. Select and maintain a slow travel speed.

Shutting Down

Stop equipment.

Lower the lift arms and power rake to the ground.

Purge any air in the system. Hydraulic system leakdown, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly.

Shut off engine, set brake, remove key, and remove seat belt before leaving the tractor operator’s seat.



Do not disconnect hydraulic lines until all system pressure is relieved. Lower unit to ground, stop engine, and operate all hydraulic control levers.

REMOVING POWER RAKE FROM TRACTOR

Install endplates on attachment side of power rake as shown in **Figure 2 (page 17)**.

Lower jackstand to “storage” position.

On a hard level surface, lower attachment to the ground.

Shut off engine, set brake, remove keys, and remove seat belt before leaving the tractor operator’s seat.

Disconnect driveline from tractor PTO shaft and support with storage chain.

Disconnect 3-point upper and lower links from power rake.

Disconnect hydraulic hoses from quick couplers. Install dust plugs for storage.

Move to tractor seat and start engine. Release brake and drive tractor forward until it is disengaged from the attachment. 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.



WARNING

Block equipment securely for storage.



CAUTION

Keep children and bystanders away from storage area.

OPERATIONAL PROCEDURE

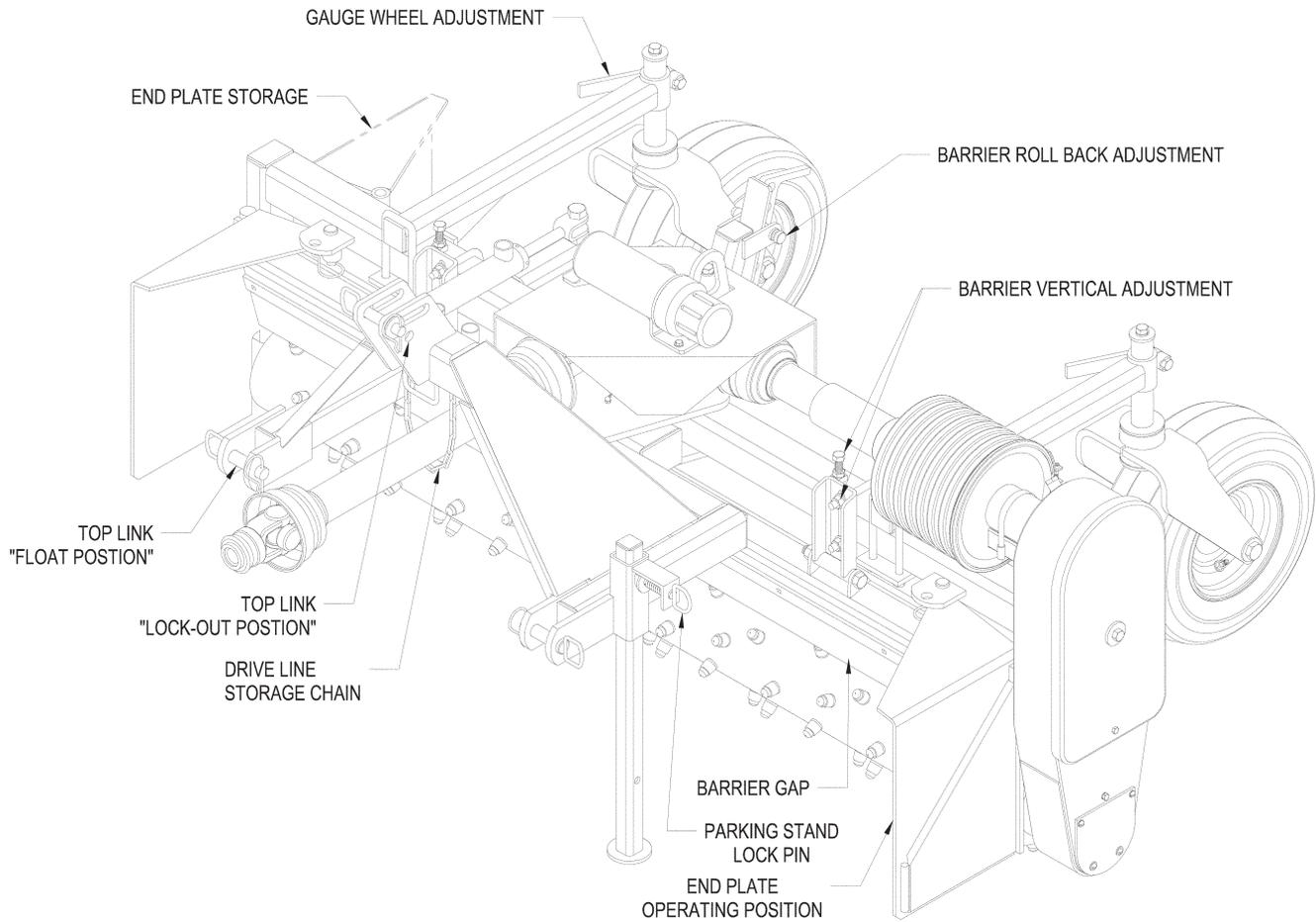


Figure 2. Operation

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	LUBE
Inspect prime movers hydraulic system to be sure the level of hydraulic oil is adequate.	daily	
Repair hydraulic oil leaks.	daily	
Lubricate all grease fittings.	weekly	#2 lithium w/moly
Lubricate drive line u-joints.	monthly	#2 lithium w/moly
Check tire pressure.	weekly 60 psi cold	
Inspect and clean safety decals. Replace if damaged. (See safety decals section for location.)	monthly	
Inspect drive chain.	monthly	
Check oil level in chain case.	monthly	#00 fluid gear grease
Change lubrication in chain case.	quarterly	#00 fluid gear grease
Check gearbox oil level.	quarterly	80-90 wt. gear lube

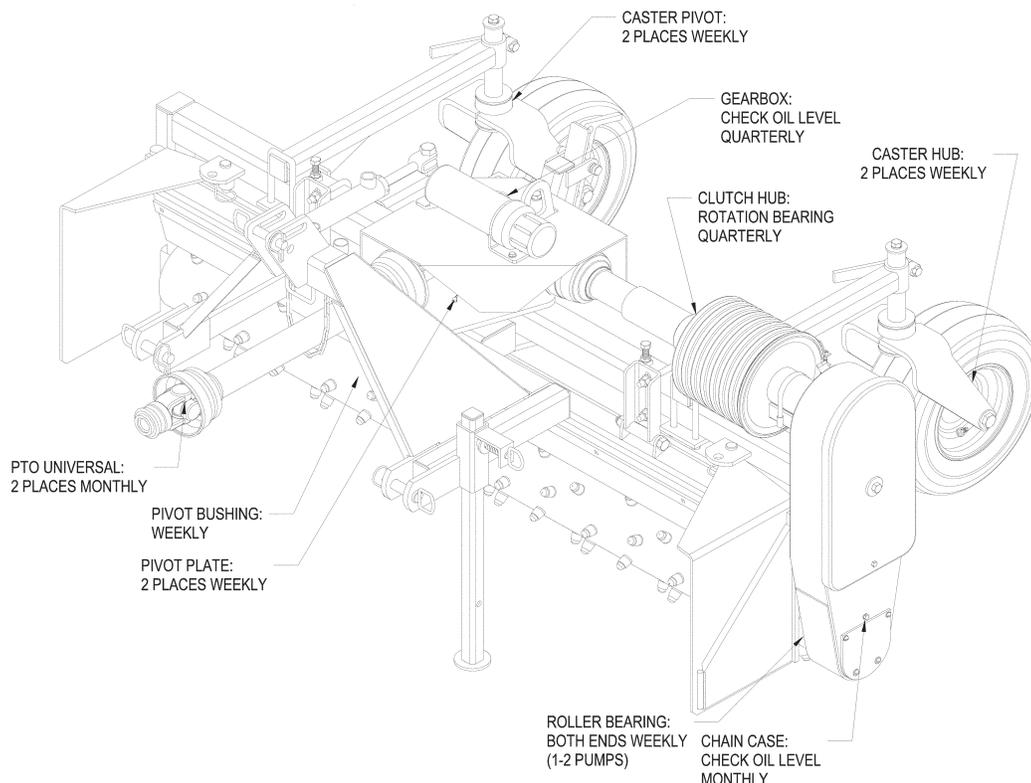


Figure 3. Lubrication Maintenance

MAINTENANCE

CHAIN MAINTENANCE

The drive chain should be inspected monthly. New chain has a tendency to stretch, so it is necessary to check the chain tension to prevent flopping around, thus causing potential problems. Chain tension is preset with the extension spring. If the chain becomes excessively loose, it may be necessary to remove one link (two pitches). If unable to reassemble, add an offset link to lengthen the chain.

NOTICE

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

When being stored for a long period or at end of season, change the oil, adding #00 fluid gear grease, and rotate the roller several times allowing the chain to be coated with lubricant, enhancing chain life. Rotate the roller periodically to maintain lubrication.

PTO DRIVE LINES

Periodically check the yokes on both ends of the front and side PTO's. Make sure the set screws/jam nuts are tight and the yoke is not moving on the shaft. PTO shafts and U-joints should be sparingly lubricated weekly.

SPROCKETS

Sprockets should be checked to be sure slotted hex nut or hex bolt is tight, the cotter pin is in place, and the sprocket cannot move on shaft.

QUALIFIED TECHNICIAN MAINTENANCE

GEARBOX

The gearbox is almost maintenance-free, but should be checked quarterly to be sure that the oil level is maintained at half full. EP 80-90 wt. gear lube is recommended for use in the gearbox. Oil should be changed after the first 100 hours or 30 days of operating. Then, normal change should be adequate. In the case of seasonal usage, it is best to change the oil at the end of the season to remove moisture and corrosive contaminants.

It should be noted that the gearbox only exceeds its thermal capacity when the oil temperature exceeds 200°F.

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 bearings 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.

MAINTENANCE

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.

CLUTCH

Run-In

If the rake has not been used or has not been operated for one year, the following run-in procedure is recommended.

The Weasler Torqmaster clutch is a pre-set, nonadjustable friction disc clutch. Follow the directions below for run-in and clutch maintenance. See **Figure 7 (page 36) for Parts Identification**.

TOOLS REQUIRED:

(1) 1/2" box end wrench or socket and torque wrench.

1. Make sure tractor is off and the PTO disengaged.
2. Disconnect the drive line from the tractor.
3. Remove the clutch shield clamp and slide the shield over to expose the clutch.
4. Locate the six (6) bolts (Item 8) on the OD of the clutch pack. Loosen the bolts until they rotate freely, finger tighten each bolt, and then tighten each bolt one-half turn.
5. Replace shield back over the clutch and clamp in place.
6. Attach the driveline to the tractor and start the tractor. Engage the tractor PTO and run for a few seconds or until the friction clutch visible smokes.
7. Disengage the tractor PTO and shut the tractor off observing the above-mentioned precautions.
8. Disconnect the driveline from the tractor.
9. Tighten the six (6) bolts (Item 8) on the OD of the clutch pack until the compression plate (Item 4) is in contact with the housing. Then tighten each bolt to 30 ft. lbs.
10. Locate the four (4) bolts (Item 7) that attach the yoke and hub to the clutch pack and check that each bolt is tightened to 30 ft. lbs.
11. Replace the clutch shield and clamp in place.

FRICION DISC REPLACEMENT

1. Make sure tractor is off and the PTO is disengaged.
2. Disconnect the drive line from the tractor.
3. Remove the clutch shield clamp and slide the shield over to expose the clutch.
4. Remove the 3/8" jam nuts and set screws, securing clutch/PTO to the drive shaft and slide clutch off the drive shaft.
5. Remove the six (6) bolts (Item 8) on the OD of the clutch pack. Remove Items 3 through 6. Replace friction discs and reassemble.
6. Position clutch on drive shaft and secure in place with 3/8" set screws and jam nuts.
7. Follow procedure for clutch run-in before using rake.

MAINTENANCE

TOP BEARING HOUSING SERVICE

If it is necessary to service the bearing housing because of bearing or shaft failure, please follow these instructions. See **Figure 10 (page 42)**.



We suggest the bearings also be replaced when the shaft is replaced.

Removal

1. Remove chain from top sprocket, cotter pin, slotted nut, and washer.
2. Remove the clutch shield and side PTO.
3. Remove the four bolts holding the bearing housing to the chain case.
4. Press on end of shaft with dimple hole, forcing the shaft to come out. It will now be necessary to reach with a large punch and push each bearing out.

Reassembly

1. Press bearing in bearing holder with collar of bearing to the center of the holder. Be careful to press only on the outer bearing race until the bearing hits the shoulder and stops. See **Figure 10 (page 42)**.
2. Insert the shaft in the bearing with the spline end at the flange end of the holder.
3. Slide the sleeve over the shaft and into the bearing holder.
4. Press bearing into the bearing holder with the collar part of the bearing facing toward the center of the holder. Be careful to press on both the outer and inner bearing race rests on the sleeve. See **Figure 10 (page 42)**.
5. Replace O-ring and O-ring space. Check O-ring for cuts or nicks.
6. Apply a liberal amount of silicone sealer to the inside of the flange. Attach the bearing holder to the chain case with four bolts and lock washers.
7. Slide the top sprocket, hub first on the shaft. Use machine bushings on the inside or outside of the sprocket for proper alignment.

NOTICE

At least one machine bushing MUST be placed between the sprocket and the bearing to prevent damage to the bearing.

8. Replace washers, slotted hex nut, and cotter pin. Replace chain, PTO, and clutch guard.

BEARING & ROLLER REPLACEMENT

Left Roller Bearing

1. Remove drive chain. Then remove lower sprocket by removing cotter pin, slotted hex nut, and washer.
2. Remove the two bolts holding the chain case to the frame.

NOTICE

Have roller blocked up or supported and slide chain case and bearing off roller shaft.

NOTICE

The top drive shaft will come off with the chain case.

3. Loosen bolt on the bearing tube that holds cartridge bearing in place. Remove bearing and O-ring.

MAINTENANCE

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

When replacing bearing, first put O-ring on bearing. Apply a coat of grease on O-ring. Slide bearing in and apply moderate pressure on bearing so O-ring will seat and spread slightly, thus keeping the oil in chain case from escaping through the bearing.

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. Pry bearing tube apart to free bearing assembly.

NOTICE

Have roller blocked up or supported. Pry bearing off of shaft and out of bearing holder.

NOTICE

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

Roller Replacement

It will be necessary to have a lifting device or additional help while removing and replacing the roller. The roller weighs approximately 150 lbs.

1. Remove upper and lower chain case covers.
2. Remove sprocket tension spring and drive chain.
3. Remove lower sprocket by removing cotter pin, slotted nut, and washers.
4. Remove the sleeve behind the sprocket you just removed.

NOTICE

Have the roller blocked up or supported.

5. Remove the two bolts holding chain case to frame and slide chain case off of roller shaft. The roller bearing will stay in the chain case.

NOTICE

If chain case bearing is also being replaced, see “Left Roller Bearing” on page 21.

6. Loosen the bolt on the bearing tube of the non-drive end, sliding roller and bearing out of frame.
7. Remove hex bolt, bearing cap, bearing, and protective collar from roller.
8. On roller to be installed, place machine bushing and protective collar against end plate of roller.
9. Place bearing and bearing cap on roller.
10. Clamp in place with hex bolt and lock washer into end of roller shaft.
11. Slide roller and bearing into bearing tube on non-drive end of frame. Do not tighten bearing tube at this time.
12. Place machine bushing, protective collar, and O-ring from splined end of removed roller to replacement roller. Check O-ring for cuts or nicks.
13. Apply sealant to bearing area of shaft.

MAINTENANCE

14. Slide chain case back onto roller and bolt to frame.
15. Replace sleeve, sprocket, and washer on drive shaft.
16. Clamp solid with the 1" slotted nut.
17. Check that roller clears frame on both ends. Adjust, if required.
18. Tighten 3/8" bolt in bearing tube on non-drive end of frame.
19. Reinstall chain and tension spring.
20. Replace lower cover, be careful not to pinch the O-ring.
21. Fill the chain case with 1.5 pints of #00 gear grease.
22. Replace upper cover.
23. Run power rake and watch for interference between roller and frame.

TROUBLE SHOOTING

Problem	Possible Cause	Solution
Roller will not turn.	Tractor PTO not engaged. Clutch friction discs worn. Obstruction between roller and barrier. Chain broken. Gearbox damaged.	Check control lever. Check and replace. Check and clear obstruction. Replace chain. Check that output shaft rotates.
Hydraulic cylinder inoperative.	Hydraulic couplers not completely engaged. Insufficient oil in tractor hydraulic system. Air in hydraulic system. Broken hose. Worn, insufficient, or inadequate hydraulic pump.	Check connections. Check fluid level per tractor manual. Cycle lever back and forth several times to purge air. Check for leaks. Check flow and pressure output of tractor hydraulics.
Oil leaks.	Worn or damaged seal. Loose or damaged hoses or connections. Worn or damaged housing.	Inspect and replace. Check for leaks and repair or replace. Inspect and replace if required.

ASSEMBLY/PARTS IDENTIFICATION

SET-UP INSTRUCTIONS

The power rake is shipped partially assembled. Assembly will be easier if components are aligned and loosely assembled before tightening hardware. Recommended torque values for hardware are located on page 4.

Select a suitable working area. Refer to illustrations, accompanying text, parts lists, and exploded view drawings.

For reference, front, back, left, and right directions are determined by sitting in the tractor's operator's seat.

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

UNPACKING CRATE

Be careful of nails in boards when uncrating.

1. Remove top, sides, and ends of crate.
2. Remove gauge wheel assemblies.
3. Remove right and left endplates.
4. Remove rake assembly from crate.
5. Remove loose nails from boards and dispose of crate according to local codes.

STANDARD MODEL ASSEMBLY PROCEDURE (See Figure 4)

Tools Required

3/4" combination wrench

1. Stand rake frame upright and position one endplate on each side of frame to stabilize the rake.
2. Attach the two gauge wheel assemblies to main frame using two 1/2" U-bolts and locking nuts.
3. Extend jack stand to help stabilize rake.

NOTICE

Do NOT add front PTO half to Power Box Rake® yet. Follow instructions and important notice concerning the front PTO in the Attaching and Detaching Power Box Rake® section.

4. Mount the left and right end plates to the frame.
5. Check the gear lube level in the chain case. Add #00 fluid gear grease, if required.
6. See Clutch "Run-In" under maintenance on page 20.

ASSEMBLY - CRATE

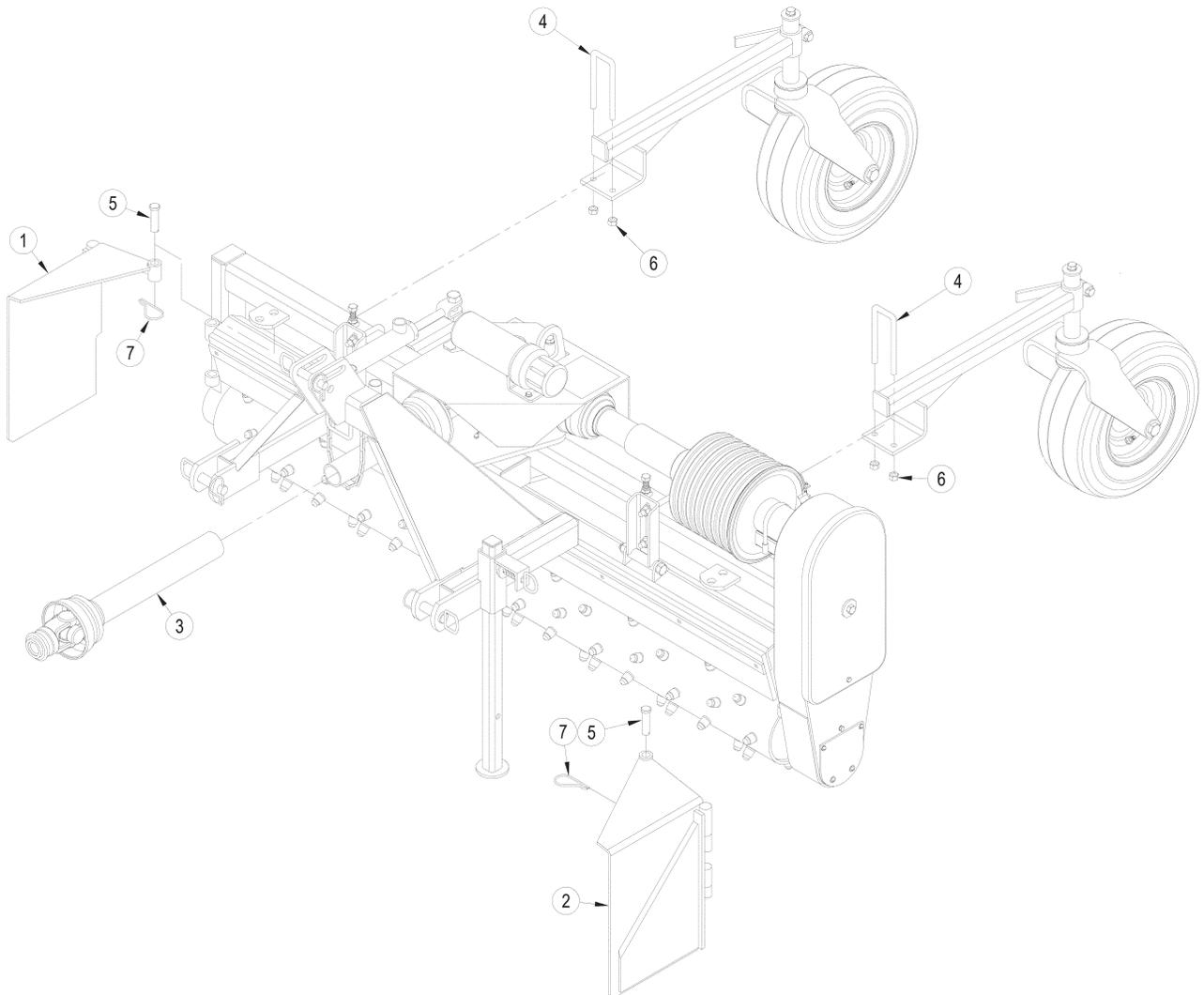


Figure 4. Crate Assembly

ASSEMBLY - CRATE PARTS LIST

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	M6624PG	Right End Plate
2	1	M6625PG	Left End Plate
3	1	P400100-1	Front PTO – Front Half
-	1	P400100-2	Front PTO - Rear Half
4	2	P128324	1/2" X 2-1/2" X 6" U-bolt
5	2	P120600	Gate Pin
6	4	P155850	1/2" Top Lock Nut
7	2	P622600	Hair Pin Clip

ASSEMBLY - GENERAL & FRAME

DIAGRAM 1 OF 2

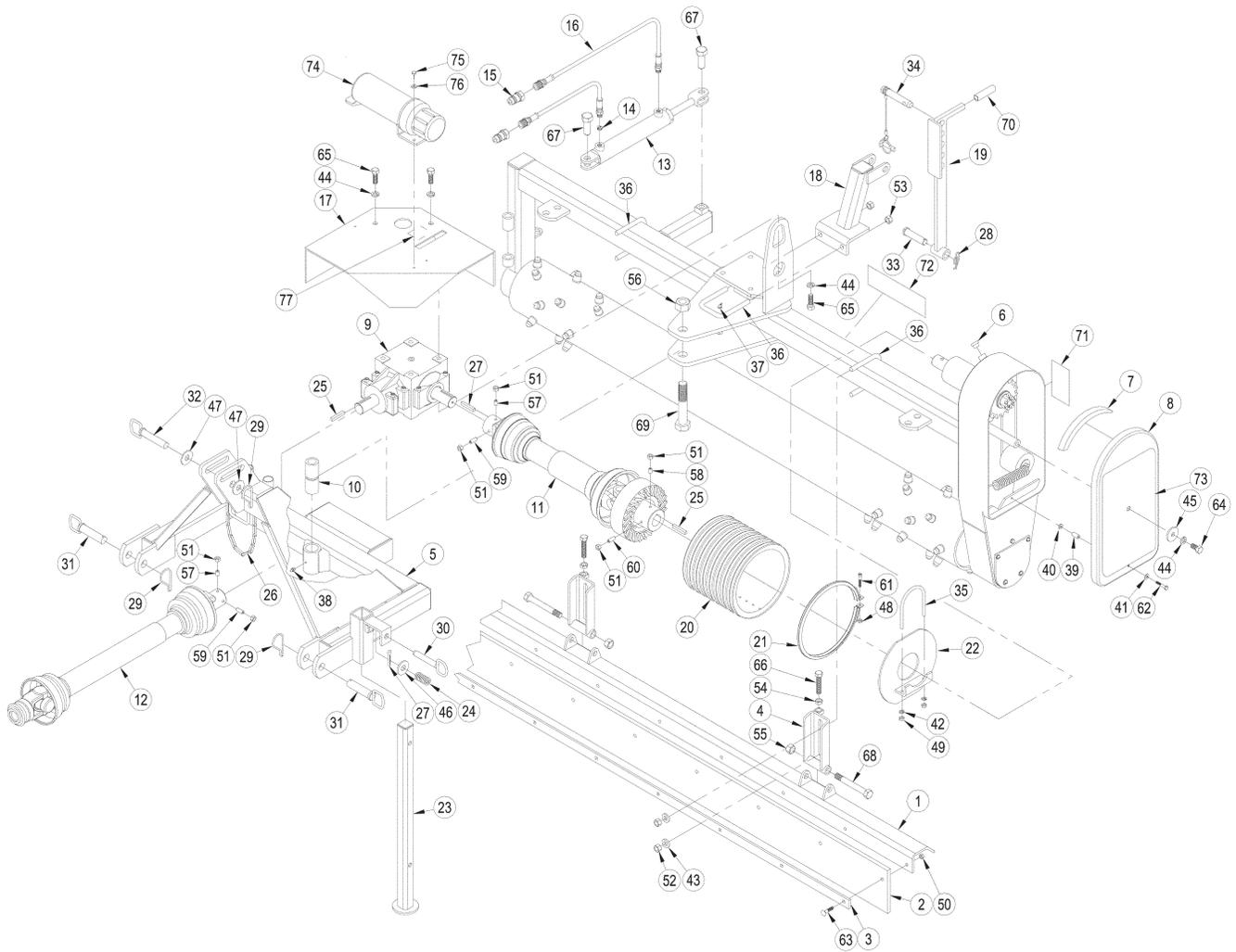


Figure 5. General & Frame Assembly

ASSEMBLY - GENERAL & FRAME PARTS LIST

LIST 1 OF 2

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	M6546PG	Barrier Mount
2	1	M6427	Barrier
3	1	M6428PG	Barrier Strap
4	2	M6551PG	Barrier Pivot Guide
5	1	M6487	Mast Frame
6	1	P278001	Vent Plug
7	1	M8626	Seal
8	1	M8624CY	Cover
9	1	P205400	Gear Box 2:1
10	1	M6637	Pivot Bushing
11	1	P400850-1	Side PTO W/Clutch
-	1	P400850-2	Side PTO W/O Clutch
12	1	P400100-1	Front PTO – Front Half
-	1	P400100-2	Front PTO - Rear Half
13	1	03-5726	Cylinder 1.5 x .75 x 8, 2.5K
14	1	P270400	Restrictor Plug
15	2	P272600	Quick Coupler
16	2	P246472	1/4" Hose 8MP-6MB (72")
17	1	M6224PG	Gear Box Shield Assembly
18	1	M6543	Top Cylinder Mount
19	1	M6555	Barrier Adjustment Bar
20	1	M6262	Clutch Shield
21	1	P128605	Band Clamp
22	1	M6258PG	Shield Mount
23	1	M6455PG	Jack Stand
24	1	P604500	Compression Spring
25	3	M5000-5	5/16" X 2" Square Key
26	1	M6266	PTO Support Chain
27	1	P116204	1/8" X 1" Cotter Pin
28	1	P622610	Rue Ring Cotter
29	3	P622600	Hair Pin Clip
30	1	M8263	Jack Pin
31	2	M8073	Lower Hitch Pin
32	1	M5003	Upper Hitch Pin
33	1	P120150	3/4" X 3" Clevis Pin
34	1	M6556	Barrier Pin Assembly
35	1	P128500	5/16" U-bolt
36	3	P128318	1/2" X 3" X 4-1/4" U-Bolt
37	2	P620000	1/4"-28 X 45° Grease Fitting
38	1	P620200	1/4"-28 Straight Grease Fitting

ASSEMBLY - GENERAL & FRAME

DIAGRAM 2 OF 2

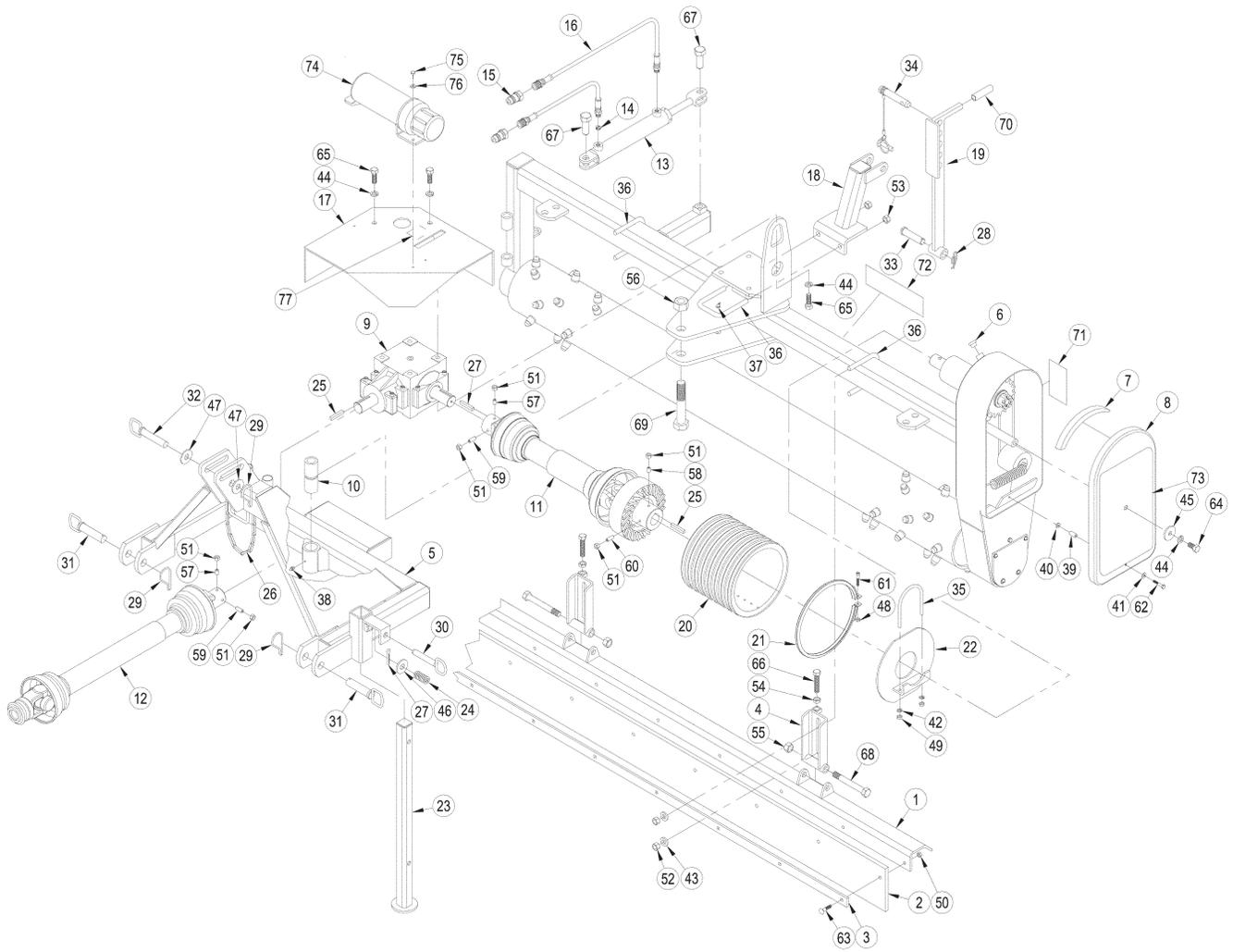


Figure 5. General & Frame Assembly

ASSEMBLY - GENERAL & FRAME PARTS LIST

LIST 2 OF 2

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
39	1	P481010	Bushing Spacer
40	1	P500302	1/4" Rubber Face Washer
41	1	P500300	1/4" O-Ring Washer
42	2	P851105	5/16" Lock Washer
43	4	P852608	1/2" Hard Washer
44	7	P851108	1/2" Lock Washer
45	1	M5009-5	3/16" X 1/2" X 1-3/4" Washer
46	1	P852001	16 MM Washer
47	2	P850812	3/4" SAE Washer
48	1	P158003	1/4" Lock Nut
49	2	P150500	5/16" Hex Nut
50	8	P155350	5/16" Top Lock Nut
51	6	P155400	3/8" Hex Jam Nut
52	4	P158005	1/2" Nylock Nut
53	2	P155850	1/2" Top Lock Nut
54	2	P157200	1/2" 13 Hex Jam Nut
55	2	P157500	5/8" Top Lock Nut
56	1	P156401	1" Lock Nut
57	2	P108610	3/8" X 5/8" Set Screw
58	1	P108612	3/8" X 3/4" Set Screw
59	2	P108616	3/8" X 1" Set Screw
60	1	P108620	3/8" X 1-1/4" Set Screw
61	1	P100406	1/4" X 1-1/2" Hex Bolt
62	1	P115406	1/4" X 1-1/2" Fillister Head Screw
63	8	P104506	5/16" X 1-1/2" Carriage Bolt
64	1	P100804	1/2" X 1" Hex Bolt
65	6	P100806	1/2" X 1-1/2" Hex Bolt
66	2	P098810	1/2" X 2-1/2" Full Thread Hex Bolt
67	2	P103208	3/4" X 2" Hex Bolt
68	2	P101020	5/8" X 5" Hex Bolt
69	1	P101622	1" X 5-1/2" Fine Thread Bolt
70	1	P955850	Square Cap 1/2" X 3"
71	1	P970003	Decal: Lubrication
72	1	P975800	Decal: Harley
73	1	P975916	Decal: T-6 Power Box Rake
74	1	P136000	Manual Tube
75	3	P100403	1/4" X 3/4" Hex Bolt
76	3	P850104	1/4" Washer
77	2	P976500	Decal Lift

ASSEMBLY - ROLLER FRAME

DIAGRAM 1 OF 2

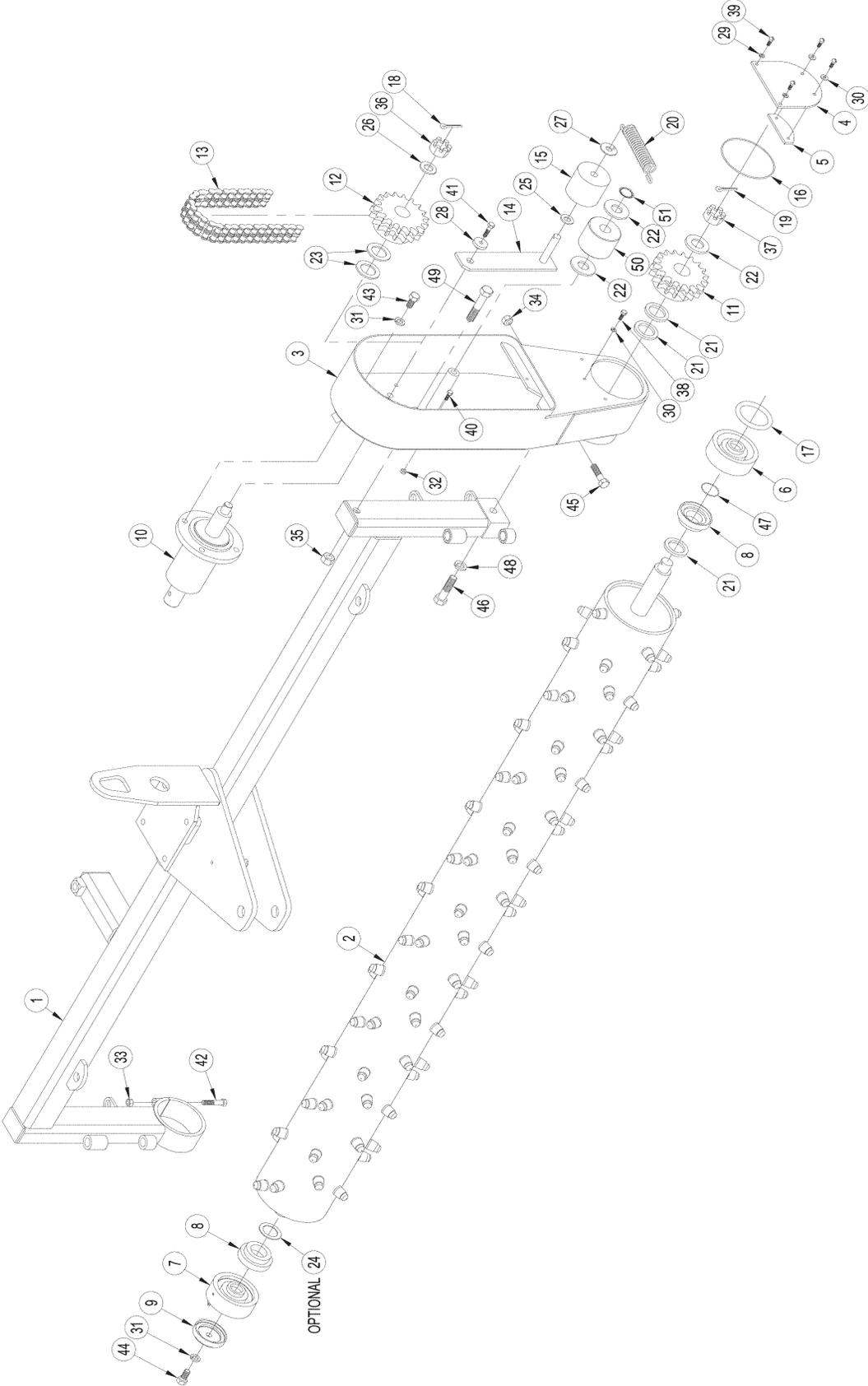


Figure 6. Roller Frame Assembly

ASSEMBLY - ROLLER FRAME PARTS LIST

LIST 1 OF 2

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	M6565	Main Frame
2	1	M6503	Carbide Tooth Roller
3	1	M6497	Chain Case
4	1	M8241PG	Lower Cover
5	1	M8272	Cover Tab
6	1	M6572	Bearing Drive Assembly
-	1	P015210	Bearing Housing
-	1	P010401	1-1/2" Bearing Insert
7	1	M6573	Bearing Assembly
-	1	P015210	Bearing Housing
-	1	P010401	1-1/2" Bearing Insert
8	2	P015308	1-1/2" Non Locking Collar
9	1	P015307	1-1/2" Bearing Cap
10	1	M8814	Bearing Housing Assembly
11	1	P661802	Sprocket 18 Tooth 1-1/2"
12	1	P661800	Sprocket 18 Tooth 1-3/8"
13	1	M6509	Chain: #60-2 77P+1CL
14	1	M6491	Chain Tension Arm
15	1	M8812	Tension Idler
16	1	P500202	3/32" X 4-3/4" O-Ring
17	1	P500203	3/8" X 2-5/8" O-Ring
18	1	P116256	5/32" X 1-1/2" Cotter Pin
19	1	P116306	3/16" X 1-1/2" Cotter Pin
20	1	P604700	Extension Spring
21	3	M6757	.218" X 1-1/2" X 2-1/8" Spacer
22	3	M5464	.172" X 1" X 2-1/4" Spacer
23	2	P855122	10 GA X 1-3/8" Machine Bushing
24	1	P855324	14 GA X 1-1/2" Machine Bushing
25	1	P850609	9/16" Flat Washer
26	1	P850612	3/4" Flat Washer
27	1	M6756	Pinned Washer
28	1	M6630	Pivot Bushing
29	2	P851104	1/4" Lock Washer
30	3	P500300	1/4" O-Ring Washer
31	5	P851108	1/2" Lock Washer
32	2	P155350	5/16" Top Lock Nut
33	1	P155450	3/8" Top Lock Nut
34	1	P155852	1/2"-20 Lock Nut
35	1	P157500	5/8" Top Lock Nut
36	1	P158000	3/4"-16 Slotted Hex Nut

ASSEMBLY - ROLLER FRAME

DIAGRAM 2 OF 2

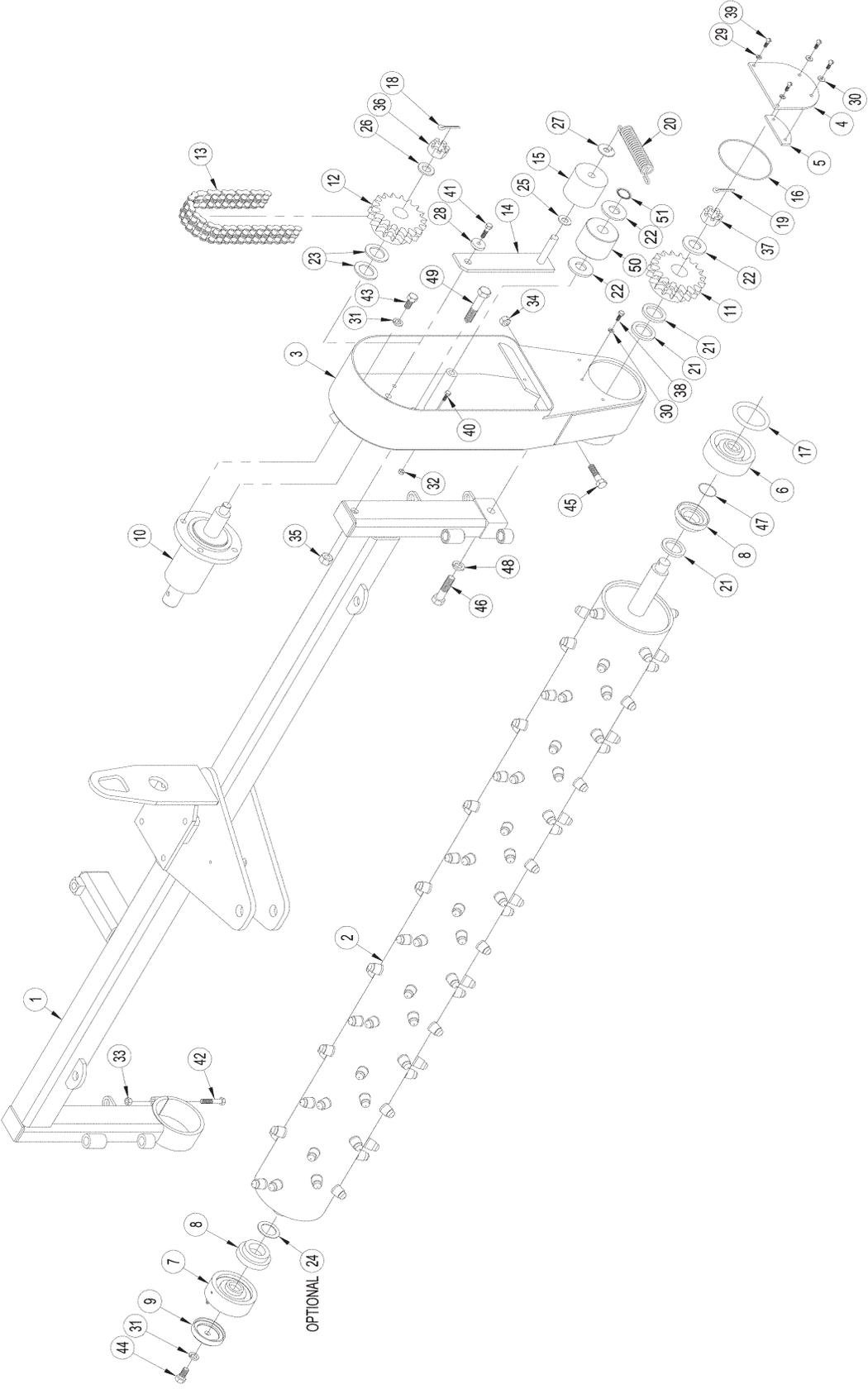


Figure 6. Roller Frame Assembly

ASSEMBLY - ROLLER FRAME PARTS LIST

LIST 2 OF 2

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
37	1	P156402	1"-14 Slotted Hex Nut
38	1	P100402	1/4" X 1/2" Hex Bolt
39	4	P110901	1/4" X 3/4" Button Head Screw
40	1	P100503	5/16" X 3/4" Hex Bolt
41	1	P100505	5/16" X 1-1/4" Hex Bolt
42	1	P100608	3/8" X 2" Hex Bolt
43	4	P100804	1/2" X 1" Hex Bolt
44	1	P102805	1/2" X 1-1/4" Fine Thread Hex Bolt
45	1	P102808	1/2" X 2" Fine Thread Hex Bolt
46	1	P101010	5/8" X 2-1/2" Hex Bolt
47	1	P500138	.062" X 1-3/8" ID O-Ring
48	1	P851110	5/8" Lock Washer
49	1	P101013	5/8" X 3-1/4" Hex Bolt
50	1	M6568	Chain Idler
51	1	P952260	1" Rotor Clip Ring

ASSEMBLY - PTO DRIVELINE

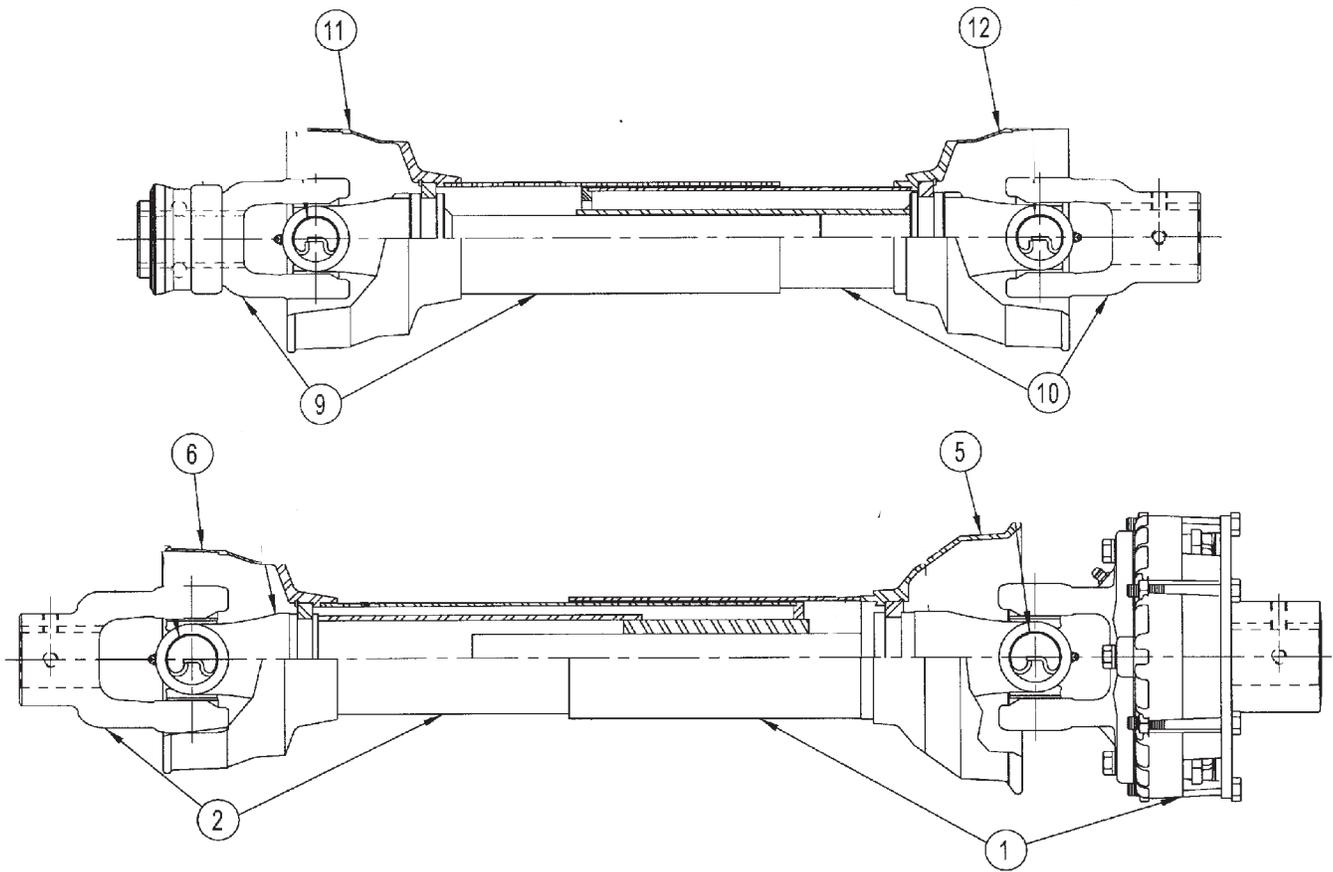


Figure 8. PTO Driveline Assembly

ASSEMBLY - PTO DRIVELINE PARTS LIST

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	P400850-1	Side Pto Clutch Half
2	1	P400850-2	Side Pto Gear Box Half
5	1	P400853	Shield Outer Side PTO
6	1	P400854	Shield Inner Side PTO
9	1	P400100-1	Front Pto Tractor Half
10	1	P400100-2	Front Pto Gear Box Half
11	1	P400101	Shield Outer Front PTO
12	1	P400102	Shield Inner Front PTO

ASSEMBLY - GAUGE WHEEL

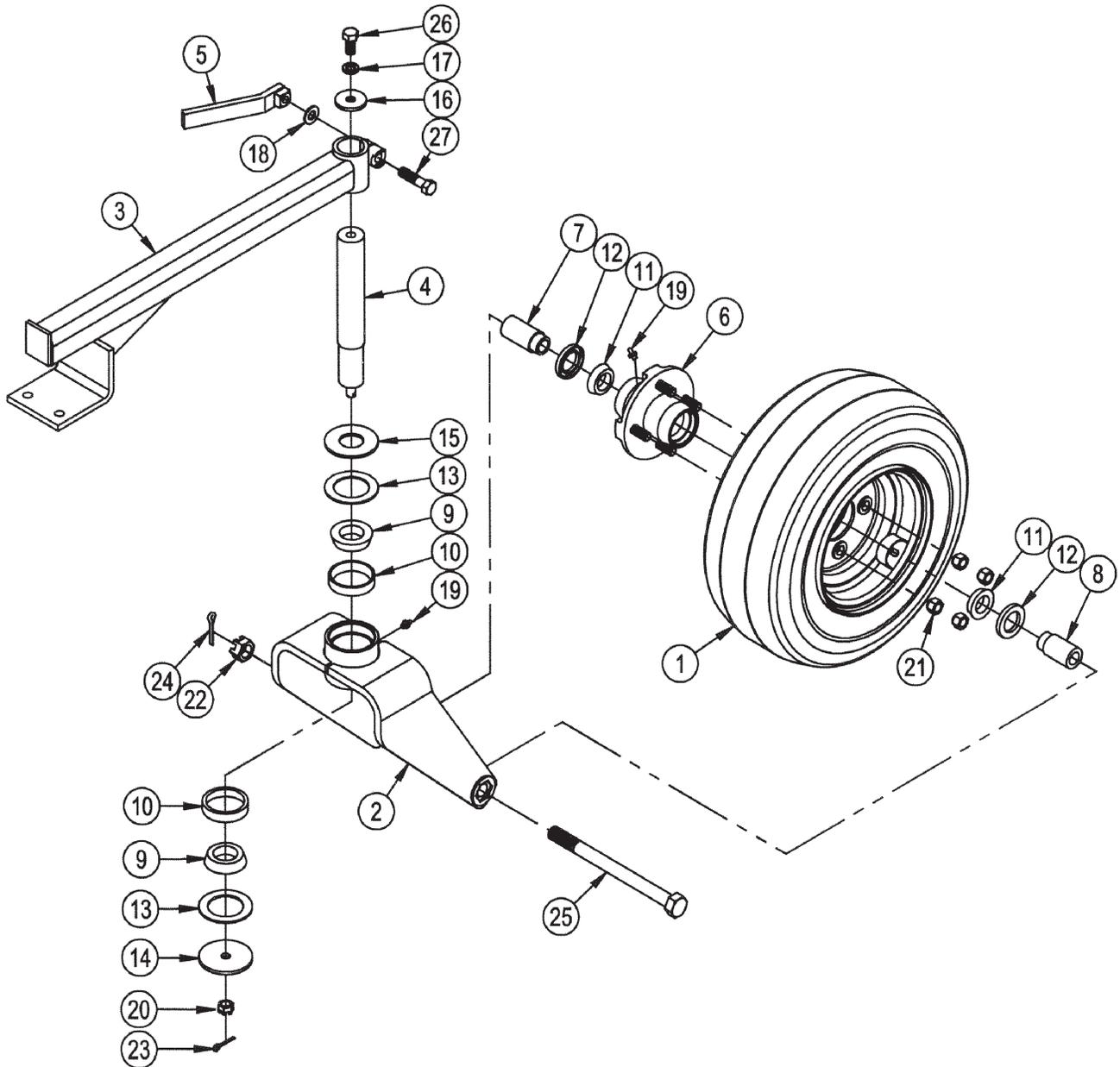


Figure 9. Gauge Wheel

ASSEMBLY - GAUGE WHEEL PARTS LIST

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	P756160	Wheel And Tire
1A	1	M16107	Wheel, Tire, & Hub
2	1	M6817PG	Caster Fork
3	1	M6521PG	Caster Support Arm
4	1	M16011	Caster Shaft
5	1	M6415PG	Handle
6	1	M16158	Wheel Hub W/Studs
6A	1	M16120	Wheel Hub Complete
7	1	M16108	Axle Spacer Long
8	1	M16109	Axle Spacer Short
9	2	P760300	Bearing Cone
10	2	P760500	Bearing Cup
11	2	P762200	1" Bearing Cone
12	2	P756163	Grease Seal
13	2	P852200	Felt Washer
14	1	M6223	Washer
15	1	P850620	1-1/4" Flat Washer
16	1	M5009-5	3/16" X 1/2" X 1-3/4" Washer
17	1	P851108	1/2" Lock Washer
18	1	P852608	1/2" Hard Washer
19	2	P620200	1/4"-28 Straight Grease Fitting
20	1	P158006	1/2"-13 Slotted Hex Nut
21	4	P756165	1/2"-20 Wheel Nut
22	1	P158000	3/4"-16 Slotted Hex Nut
23	1	P116204	1/8" X 1" Cotter Pin
24	1	P116256	5/32" X 1-1/2" Cotter Pin
25	1	M10463	3/4" X 9-1/2" Axle Bolt
26	1	P100804	1/2" X 1" Hex Bolt
27	1	P102808	1/2" X 2" Fine Thread Hex Bolt

ASSEMBLY - BEARING HOUSING

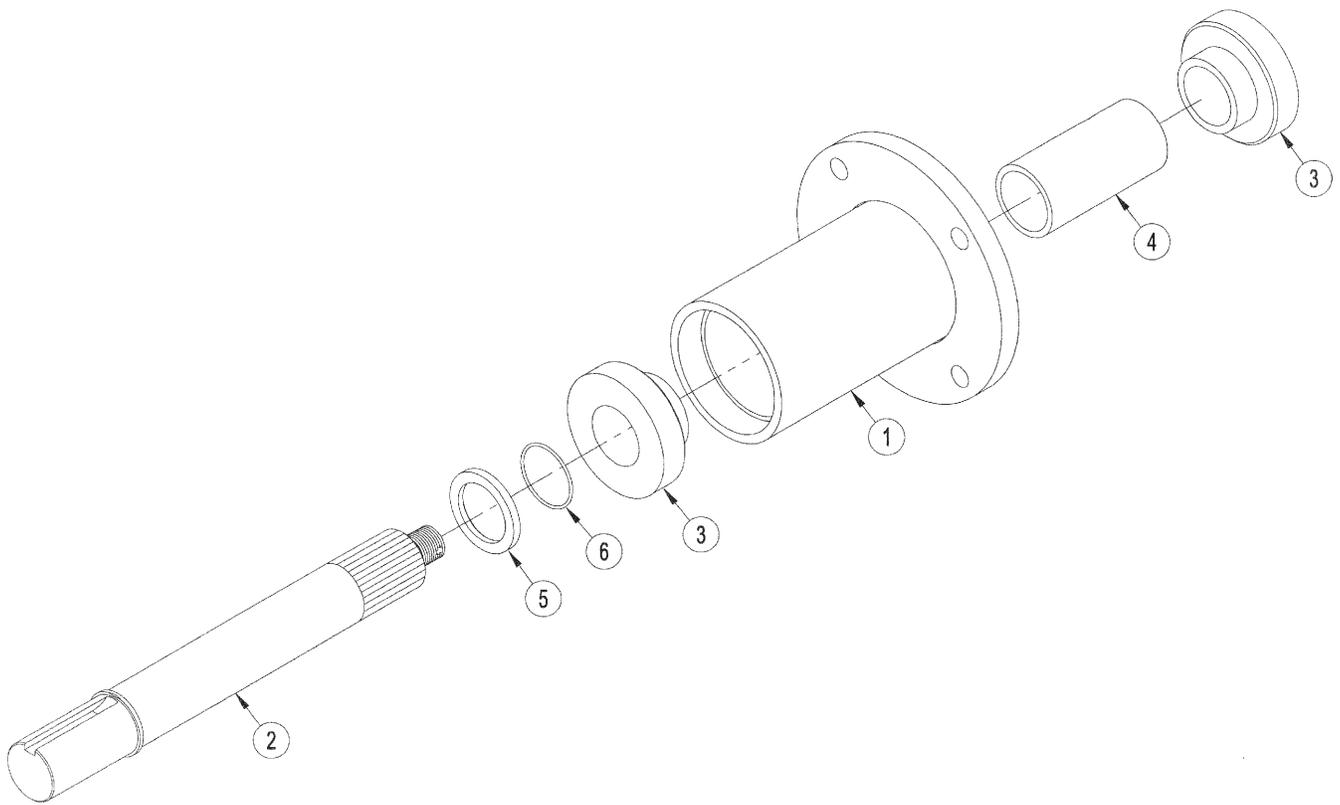


Figure 10. Bearing Housing Assembly

ASSEMBLY - BEARING HOUSING PARTS LIST

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	M8815	Bearing Housing
2	1	P635005	Drive Shaft
3	2	P009204	Ball Bearing Insert
4	1	M6301	Sleeve
5	1	M5503	1-3/8" O-Ring Spacer
6	1	P500138	O-Ring .062" X 1-3/8" ID

ASSEMBLY - GEARBOX

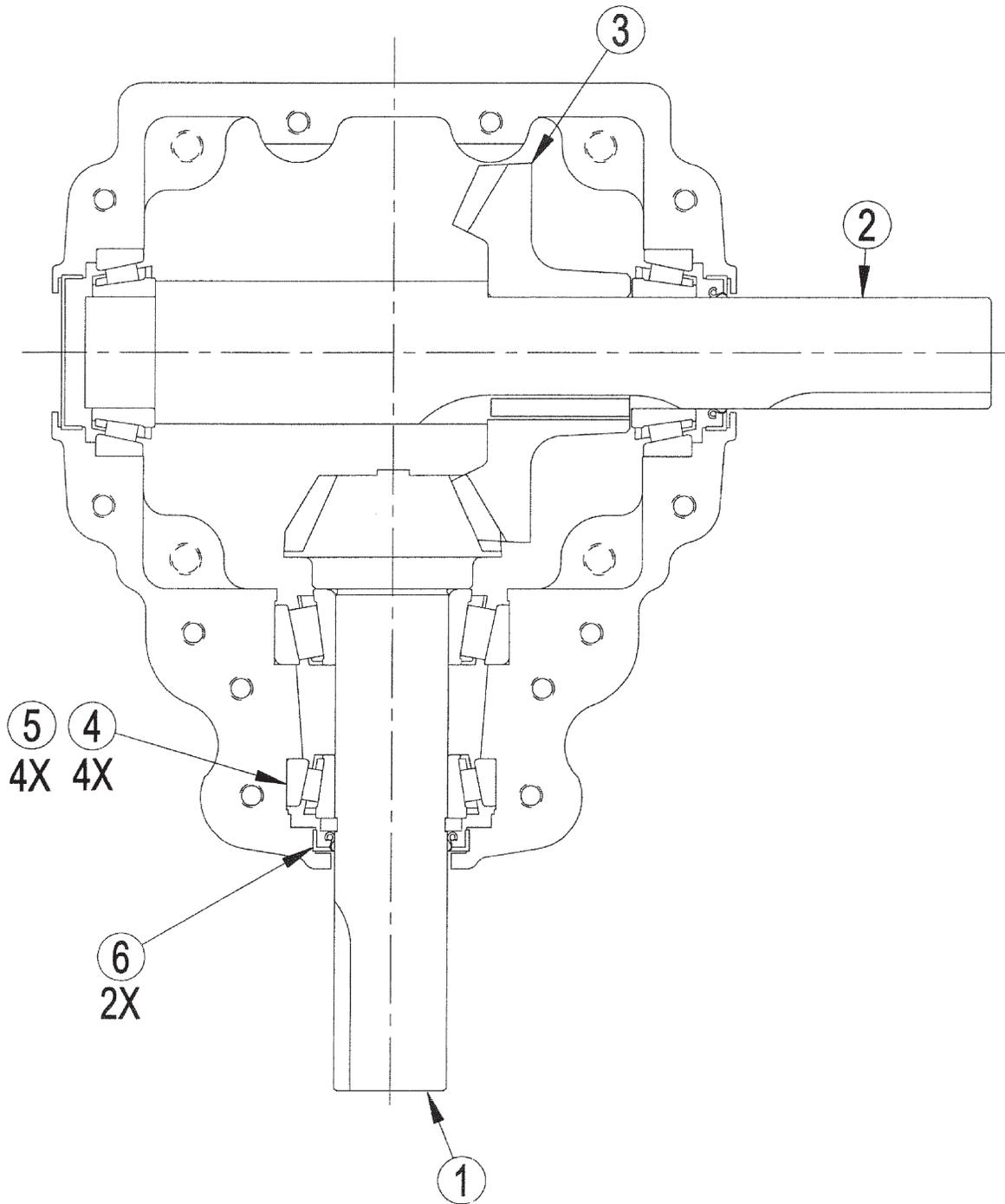


Figure 11. Gearbox Assembly

ASSEMBLY - GEARBOX PARTS LIST

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	P205408	Geared Pinion Shaft
2	1	P205413	Cross Shaft
3	1	P205401	Gear (2:1 30T)
4	1	P205403	Bearing, Cone
5	1	P205410	Bearing, Cup
6	2	P205404	1-3/8" ID Seal

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 Construction¹, 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.

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

February 10, 2010



The Power of Combined Excellence