METALCRAFT OF MAYVILLE

SCAG POWER EQUIPMENT

OPERATOR'S MANUAL

Power Box Rake

Model: PBR-BRM-TLR-48

Congratulations on owning a Metalcraft of Mayville attachment! This manual contains the operating instructions and safety information for your Metalcraft of Mayville power box rake. Reading this manual can provide you with assistance in maintenance and adjustment procedures to keep your attachment performing to maximum efficiency. The specific models that this book covers are listed on the inside cover. Before operating your attachment, please read all the information enclosed.

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WARNING

FAILURE TO FOLLOW SAFE OPERATING PRACTICES MAY RESULT IN SERIOUS INJURY OR DEATH.

- Read this manual completely as well as other manuals that came with your power unit.
- Under no circumstances should the power unit be operated on slopes greater than what it is rated for.
- Keep all shields in place.
- Before performing any maintenance or service on the attachment, stop the power unit, apply the parking brake, and remove the ignition key.
- Keep hands, feet and clothing away from moving components.
- Keep others off the power unit (only one person at a time)
- Do not place any part of the body on, in, or under the attachment, especially while operating.

REMEMBER - YOUR EQUIPMENT IS ONLY AS SAFE AS THE OPERATOR!

HAZARD CONTROL AND ACCIDENT PREVENTION ARE DEPENDENT UPON THE AWARENESS, CONCERN, PRUDENCE, AND PROPER TRAINING OF THE PERSONNEL INVOLVED IN THE OPERATION, TRANSPORT, MAINTENANCE, AND STORAGE OF THE EQUIPMENT.

This manual covers the operating instructions and illustrated parts list for:		
PBR-BRM-TLR-48	**with a serial number of**	**015C00001 to 015C99999**
Always use the entire serial number listed on the serial number tag when referring to this product.		

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GENERAL INFORMATION

1.1 INTRODUCTION

Your attachment was built to the highest standards in the industry. However, the prolonged life and maximum efficiency of your attachment depends on you following the operating, maintenance and adjustment instructions in this manual.

If additional information or service is needed, contact your Authorized Dealer.

We encourage you to contact your dealer for repairs. All Authorized Dealers are informed of the latest methods to service this equipment and provide prompt and efficient service in the field or at their service shop. They carry a full line of Metalcraft of Mayville service parts.

- IMPORTANT -

The replacement of any part on this product by other than the manufacturer's authorized replacement part may adversely affect the performance, durability or safety of this product.

Use of other than original Metalcraft of Mayville replacement parts will void the warranty.

When ordering parts, always give the model and serial number of your attachment. The power box rake serial number tag is located on the top horizontal tube of the main frame as shown in Figure 1-1.

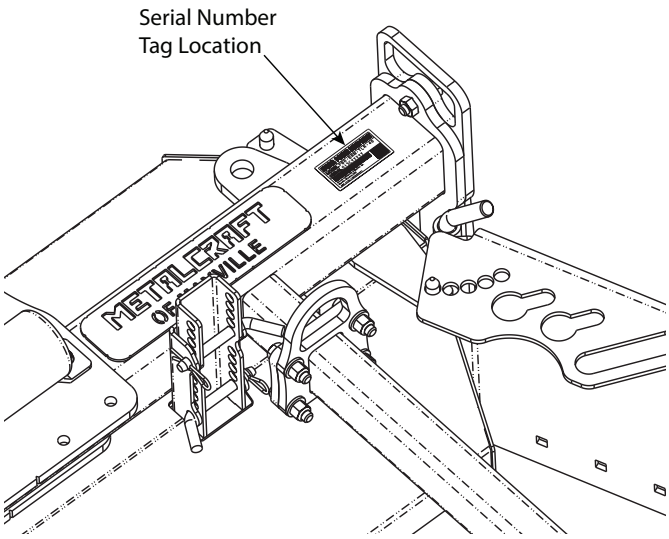


Figure 1-1. Power Box Rake Serial Number Tag Location

⚠ WARNING

For pictorial clarity, some illustrations and figures in this manual may show shields, guards or plates open or removed. Under no circumstances should your attachment be operated without these devices in place.

All information is based upon product information available at the time of approval for printing. Metalcraft of Mayville reserves the right to make changes at any time without notice and without incurring any obligation.

1.2 DIRECTION REFERENCE

The “Right” and “Left”, “Front” and “Rear” of the attachment and power unit are referenced from the operator’s right and left when in the normal operating position of the power unit and facing the forward travel direction.

1.3 SERVICING THE POWER BOX RAKE

The detailed servicing and repair of the attachment is not covered in this manual; only routine maintenance and general service instructions are provided. For service of the attachment during the limited warranty period, it is important to contact your Authorized Dealer or find a local authorized servicing agent of the component manufacturer. Any unauthorized work done on the attachment during the warranty period may void your warranty.

1.4 SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Pinch Point Hazard		Thrown Object Hazard
	Rotating Parts Hazard		Moving Parts Hazard
	Use Proper Tools		CE Mark
	Read Operator's Manual		Wear Proper Personal Protective Equipment

SAFETY INFORMATION

2.1 INTRODUCTION

Your attachment and power unit are only as safe as the operator. Carelessness or operator error may result in serious bodily injury or death. Hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of the personnel involved in the operation, transport, maintenance and storage of the equipment. Make sure every operator is properly trained and thoroughly familiar with all of the controls before operating the power unit and this attachment. The owner/user can prevent and is responsible for accidents or injuries occurring to themselves, other people or property.

READ THIS OPERATOR'S MANUAL BEFORE ATTEMPTING TO USE YOUR ATTACHMENT.

A replacement manual is available from your Authorized Service Dealer or by contacting Scag Power Equipment, Service Department at P.O. Box 152, Mayville, WI 53050 or contact us via the Internet at www.scag.com. The manual for this attachment can be downloaded by using the model and serial number, or use the contact form to make your request. Please indicate the complete model and serial number of your Metalcraft of Mayville product when requesting replacement manuals.

2.2 SIGNAL WORDS

This symbol means **"Attention! Become Alert! Your Safety is Involved!"** The symbol is used with the following signal words to attract your attention to safety messages found on the decals on the attachment and throughout this manual. The message that follows the symbol contains important information about safety. To avoid injury and possible death, carefully read the message! Be sure to fully understand the causes of possible injury or death.

SIGNAL WORD:

It is a distinctive word found on the safety decals on the attachment and throughout this manual that alerts the viewer to the existence and relative degree of the hazard.

⚠ DANGER

The signal word "DANGER" denotes that an extremely hazardous situation exists on or near the equipment that could result in high probability of death or irreparable injury if proper precautions are not taken.

⚠ WARNING

The signal word "WARNING" denotes that a hazard exists on or near the equipment that can result in injury or death if proper precautions are not taken.

⚠ CAUTION

The signal word "CAUTION" is a reminder of safety practices on or near the equipment that could result in personal injury if proper precautions are not taken.

Your safety and the safety of others depends significantly upon your knowledge and understanding of all correct operating practices and procedures of the power unit and this attachment.

2.3 BEFORE OPERATION CONSIDERATIONS

1. NEVER allow children to operate this attachment. Do not allow adults to operate this attachment without proper instructions.
2. DO NOT operate when children and/or others are present. Keep children out of the operating area and in the watchful care of a responsible adult other than the operator. Be alert and turn the power unit off if a child enters the area.
3. DO NOT allow children to ride or play on the power unit or this attachment, they are not toys.
4. DO NOT carry passengers on the power unit or on this attachment.
5. NEVER put any part of the body into, onto, or beneath the attachment, or between the attachment and the power unit.

6. DO NOT operate the machine under the influence of alcohol or drugs.
7. ALWAYS wear adequate protective clothing. Loose clothing, jewelry or long hair could get tangled in moving parts.
8. Wearing safety glasses, hearing protection, gloves, safety shoes and a helmet is advisable and is required by some local ordinances and insurance regulations.
9. Read and understand all safety decals on the power unit and on this attachment.
10. Verify the attachment is properly installed to the power unit, and that all hardware is fully tightened and locked in place.
11. Keep the power unit and attachment in good operating condition. Keep all shields, safety devices, and decals in place. If a shield, safety device or decal is defective or damaged, repair or replace it before operating the machine.
12. If the operator(s) or mechanic(s) cannot read English, it is the owner's responsibility to explain this material to them.
13. Lifting the attachment can be dangerous. Proper machine compatibility is important. Check the power unit's operator's manual for proper specifications and ballasting.

2.4 OPERATION CONSIDERATIONS

⚠ DANGER

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.

1. KNOW the function of all controls and how to stop quickly.
2. NEVER use the power box rake to lift or move a load.
3. NEVER attempt to move objects by pushing them with any part of the power box rake, as this may damage the attachment.
4. NEVER start or operate the power unit or attachment from any place other than from the designated operator's position.

⚠ WARNING

DO NOT permit untrained personnel to operate the machine.

Reduce speed and use extreme caution when operating on slopes and slick or wet surfaces. Allow extra distance to stop.

Under no circumstances should the power unit be operated on slopes greater than what it is rated for. See the power unit's operator's manual for slope requirements.

5. To prevent tipping or loss of control, operate the machine smoothly. No sudden starts or stops. No sudden or sharp turns. Use care when backing up.
6. Reduce speed and exercise extreme caution on slopes and in sharp turns to prevent tipping or loss of control. Avoid changing directions on slopes.
7. Cautiously enter a new area and be alert for hidden hazards. Before operating, check the area carefully for overhead obstructions (i.e. power lines, branches, doorways, etc.), and ground obstacles (holes, rocks, roots, etc.). Remove obstacles and large debris whenever possible.
8. Cut and remove tall grass and brush, as this could get entangled around the rotor.
9. Maintain a safe distance from the edge of ramps, platforms, ditches, and other drop-offs. The machine could suddenly roll over if a wheel or skid goes over the edge or if the edge caves in.
10. Work only in daylight or good artificial light.
11. Do not operate in severe weather.
12. Take all possible precautions when leaving the machine unattended, such as lowering the attachment, setting the parking brake, stopping the engine, and removing the key.
13. The machine and attachment should be stopped and inspected for damage after striking a foreign object, and damage should be repaired before restarting and operating the equipment.
14. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
15. When operating or transporting, run the attachment on gauge wheels to minimize bouncing.

2.5 MAINTENANCE CONSIDERATIONS & STORAGE

⚠ WARNING

Before making any adjustments to the attachment, turn off the power unit engine and remove the ignition key.

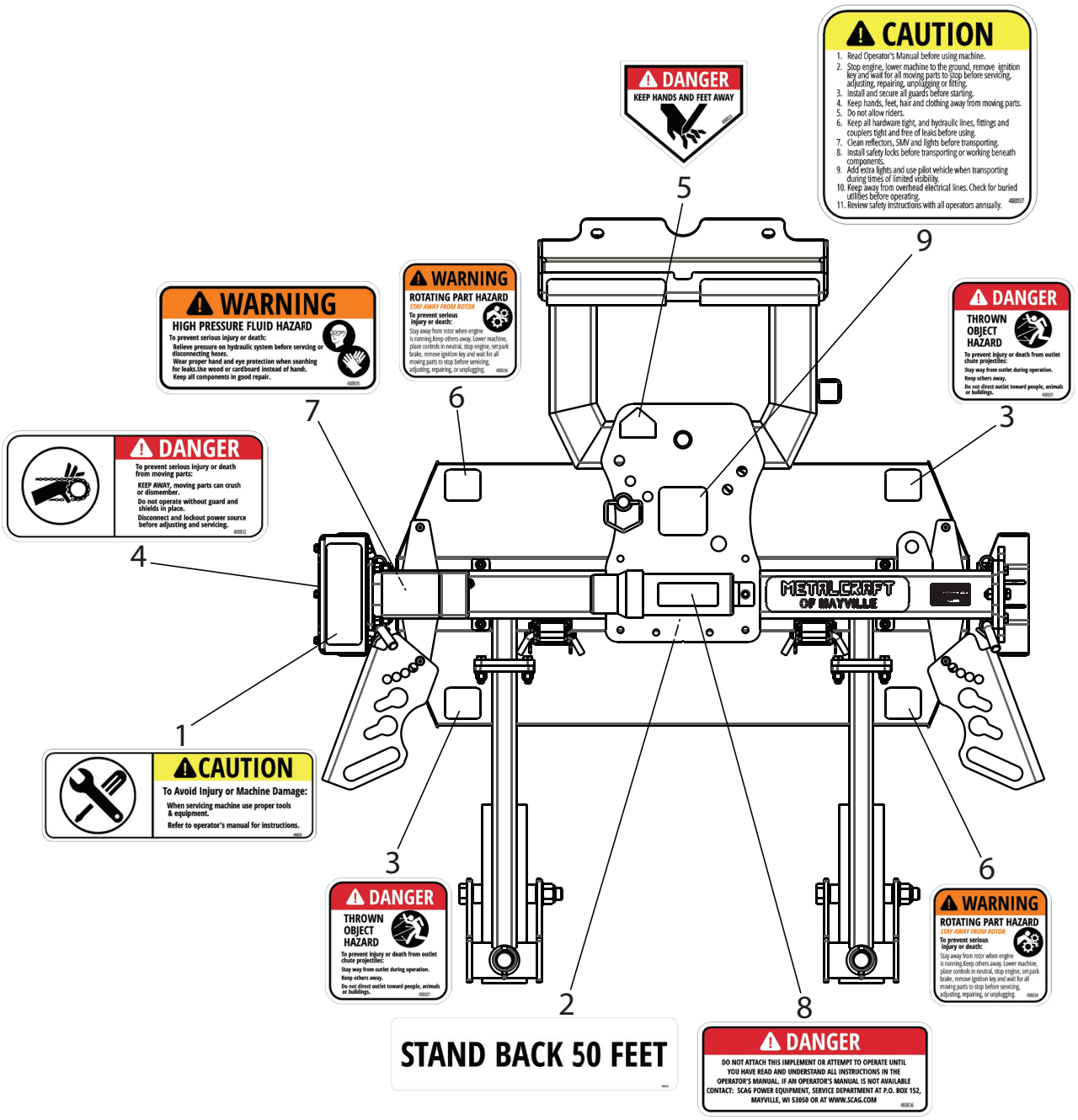
Avoid placing hands or fingers between the attachment and power unit, or near moving parts, as this could cause pinching.

Be aware of hand and finger placement when assembling and making adjustments to parts to avoid pinching between moving parts.

Verify all fasteners are properly tightened and all pins are properly locked in place before using the attachment. Failure to do so may result in injury or death.

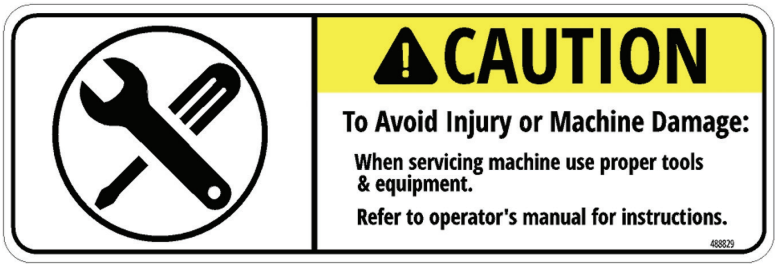
1. NEVER make adjustments to the attachment with the power unit engine running.
2. NEVER straighten, weld, or in any way modify any part of the power box rake or rotor accessories.
3. NEVER allow untrained personnel to service the machine or the attachment.
4. Lower attachment, set parking brake, stop engine and remove key to prevent accidental starting of the engine when servicing, adjusting, or cleaning the attachment.
5. Keep all nuts, bolts and screws tight to ensure the machine is in safe working condition. Check attachment hardware frequently.
6. To reduce fire hazard and facilitate detection of any damages, keep the attachment clean and free of excessive grease, oil, dirt, and other debris.
7. Keep all parts in good working condition. Replace all worn or damaged decals.
8. Store the attachment in a clean, dry environment that is protected from weather.

2.6 SAFETY AND INSTRUCTIONAL DECAL LOCATIONS



Item No.	Part No.	Decal Information
1	488829	Avoid Injury or Machine Damage
2	488830	Stand Back 50 Feet
3	488831	Thrown Object Danger Warning
4	488832	Moving Parts Danger Warning
5	488833	Pinch Point Danger Warning
6	488834	Rotating Parts Hazard
7	488835	High Pressure Fluid Hazard
8	488836	Understand Operator's Manual Before Operation
9	488837	Operation Caution

2.7 SAFETY AND INSTRUCTIONAL DECALS



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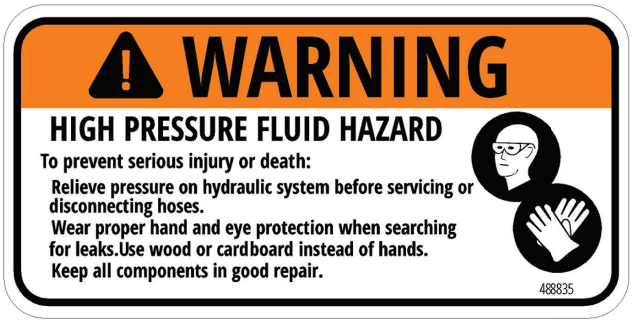

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SPECIFICATIONS

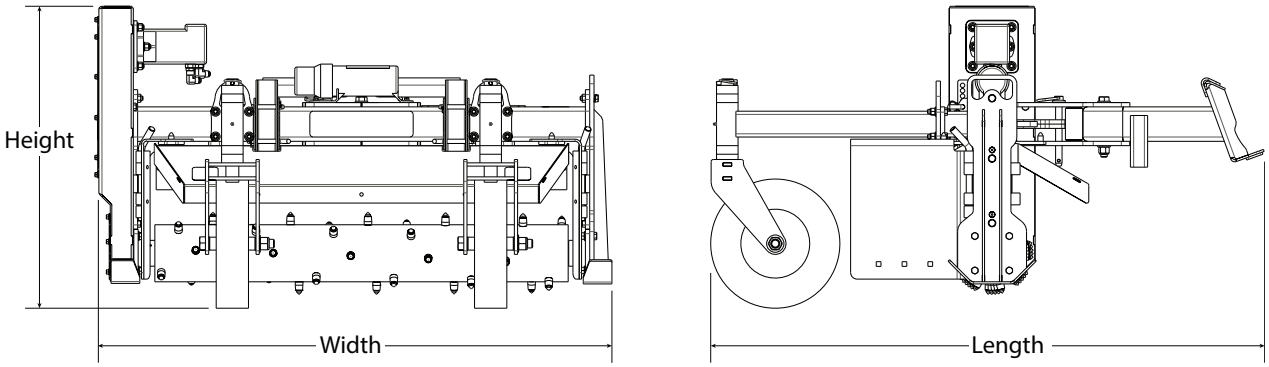


Figure 3-1. Power Box Rake Dimensions

3.1 GENERAL

Weight 856lb (388kg)
Drive ..... Hydraulic
Chain ..... #80 Roller Chain
Mount ..... Universal Mini Quick Attach
Flow Rate ..... 8GPM - 22GPM (30LPM - 83LPM)
Pressure ..... 1,800psi - 3,000psi (12,410kPa - 20,680kPa)

3.2 DIMENSIONS

Overall Length ..... 60" - 70" (1524mm-1778mm)
Overall Width ..... 60" (1524mm)
Overall Height ..... 35" (889mm)
Cut Width ..... 48" (1219mm)

3.3 ANGLED WORKING WIDTH

0 Degrees ..... 48" (1219mm)
10 Degrees ..... 48" (1219mm)
20 Degrees ..... 45" (1143mm)

3.4 STANDARD ROTOR

Length ..... 48" (1219mm)
Diameter ..... 6" (153mm)
Tooth Material ..... Abrasive Resistant Carbide
Number of Teeth 42

3.5 BROOM ROTOR

Length ..... 48" (1219mm)
Diameter ..... 18" (457mm)
Brush Material ..... Polymer Plastic, Wire
Number of Polymer Wafers 13
Number of Wire Wafers 12

3.6 TILLER ROTOR

Length ..... 48" (1219mm)
Diameter ..... 16" (406mm)
Tine Material ..... Hardened Boron Steel
Number of Tines 24

3.7 BOLT TORQUE SPECIFICATIONS

Unless specified otherwise, the following table should be used to determine bolt torque specifications. Items with * are in in-lb. All other items are in ft-lb. "Lubricated" includes lubricants, plating, and hardened washers.

SIZE	SAE GRADE 2		SAE GRADE 5		SAE GRADE 8		L9
	ASSEMBLY TORQUE DRY	LUBRICATED	ASSEMBLY TORQUE DRY	LUBRICATED	ASSEMBLY TORQUE DRY	LUBRICATED	ASSEMBLY TORQUE LUBRICATED
1/4-20	66*	49*	8	75*	12	9	11
1/4-28	76*	56*	10	86*	14	10	13
5/16-18	11	8	17	13	20	18	21
5/16-24	12	9	19	14	25	20	23
3/8-16	20	15	30	23	45	30	33
3/8-24	23	17	35	25	50	35	38
7/16-14	30	24	50	35	70	55	60
7/16-20	35	25	55	40	80	60	65
1/2-13	50	35	75	55	110	80	95
1/2-20	55	40	90	65	120	90	105
9/16-12	65	50	110	80	150	110	140
9/16-18	75	55	120	90	170	130	150
5/8-11	90	70	150	110	220	170	185
5/8-18	100	80	180	130	240	180	205
3/4-10	160	120	260	200	380	280	290
3/4-16	180	140	300	220	420	320	355
7/8-9	190	140	400	300	600	460	505
7/8-14	210	155	440	320	660	500	585
1-8	220	160	580	440	900	680	775
1-14	240	170	640	480	1000	740	900
1 1/8-7	300	220	800	600	1280	960	1150
1 1/8-12	340	260	880	660	1440	1080	1325
1 1/4-7	420	320	1120	840	1820	1360	1600
1 1/4-12	460	360	1240	920	2000	1500	1750
1 3/8-6	560	420	1460	1100	2380	1780	—
1 3/8-12	640	460	1680	1260	2720	2040	—
1 1/2-6	740	560	1940	1460	3160	2360	3250
1 1/2-12	840	620	2200	1640	3560	2660	3650

Figure 3-2. Bolt Torque Specifications

OPERATING INSTRUCTIONS

⚠ DANGER

Ensure raised equipment is supported. Never work under raised booms without supporting them. Never place any part of the body underneath equipment or between movable parts.

⚠ CAUTION

Do not attempt to operate this attachment unless you have read this manual. Learn the location and purpose of all the attachment's and power unit's controls and instruments before you operate this attachment.

- IMPORTANT -

If you are not familiar with the operation of the attachment or power unit, the steering and ground speed operations should be learned and practiced in an open area, away from buildings, fences, or obstructions.

Learn the operation on flat ground before operating on slopes.

Start practicing with a slow engine speed and slow forward travel.

Learn to feather the steering controls to obtain a smooth operating action.

Practice operating the attachment and power unit until you are comfortable with the controls before proceeding to operate the power box rake.

4.1 INITIAL SETUP OF THE ATTACHMENT

The power box rake comes 90% assembled, and the bearings are greased. The following procedures must be completed prior to operation.

UNPACKING THE ATTACHMENT

Use caution when first unpacking the attachment as the straps may be under great tension. Safety glasses and gloves should be worn while removing straps.

1. Place the shipping pallet on a hard, flat surface.
2. Remove all straps and plastic wrap.
3. Remove the power box rake, gauge wheel assemblies, and hardware packet from the shipping pallet.
   A. Use a jack stand to prevent the rake from tipping.
   B. Set the attachment on a flat surface.

GAUGE WHEEL INSTALLATION

Refer to Figure 4-1 for installing the gauge wheels.

1. Raise and support the power box rake.
2. Use the supplied hardware to attach the gauge wheel assemblies to the frame.
3. Remove the gauge wheel from the arm.
   A. Remove the lynch pin and spacers.
   B. Remove the gauge wheel and set it aside.

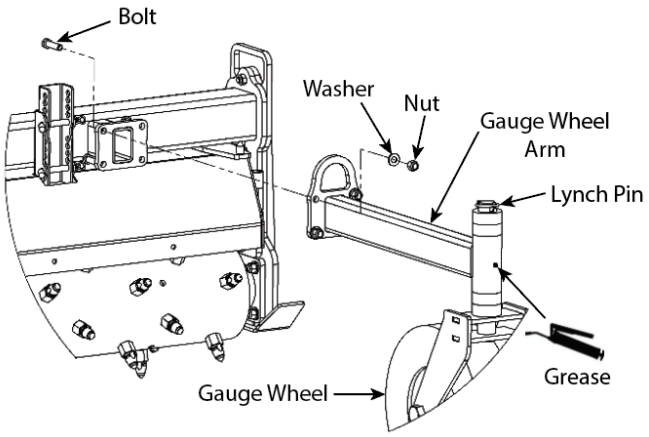


Figure 4-1. Gauge Wheel Installation

4. Attach the gauge wheel arm with 4 bolts, 4 washers and 4 lock nuts. Tighten to recommended torque (Refer to the torque spec in Section 3.7).
5. Reinstall the gauge wheel, spacers, and lynch pin.
6. Grease the gauge wheel pivot.
7. Repeat steps 1-6 for the other gauge wheel assembly.
8. Ensure spacer adjustment is the same for both assemblies.

CHAIN CASE LUBRICANT

⚠ CAUTION

THE CHAIN CASE IS SHIPPED DRY. Failure to add lubricant to the chain case could damage or shorten the life of the drive. The chain is pre-lubricated.

Refer to Figure 4-2 for adding lubricant to the chain case.

1. Remove the upper access cover on the chain case. The lower access cover is sealed with a gasket to prevent leakage, and does not need to be removed.
2. Add 12 oz. of lubricant. It is recommended to use 00 gear grease.
   A. This should fill the bottom of the chain case with approximately 1" of lubricant.
   B. Do not overfill or leakage may occur near the rotor shaft.
3. Reinstall the upper access cover.
4. Install the fasteners, and tighten to recommended torque (Refer to the torque spec in Section 3.7).

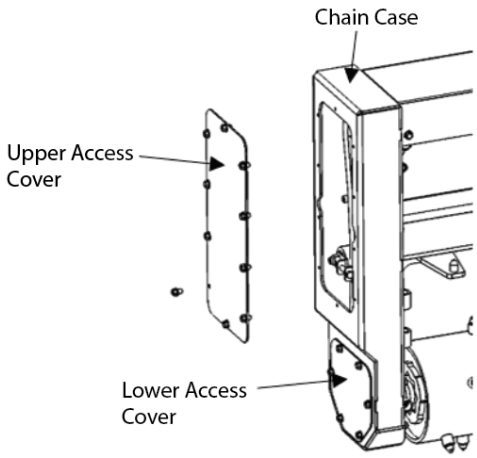


Figure 4-2. Chain Case

HYDRAULIC HOSE INSTALLATION

The power box rake is shipped with hydraulic hoses and couplers installed. There are different styles of flat face couplers. Metalcraft of Mayville offers the most common style. If the supplied couplers do not fit, see your Authorized Service Dealer for the correct couplers or contact Scag Power Equipment, Service Department at P.O. Box 152, Mayville, WI 53050 or www.scag.com. Refer to Figure 4-3 for hydraulic hose installation.

1. Read the power unit's operator's manual for proper coupling selection.
2. Supplied hoses are connected as shown in Figure 4-3. This is the typical method. Other connection options are dependent upon specific applications and travel direction.
   A. Connect the pressure hose to motor port 1.
   B. Connect the return hose to motor port 2.
   C. Connect the case drain hose to case drain port 3, if applicable.

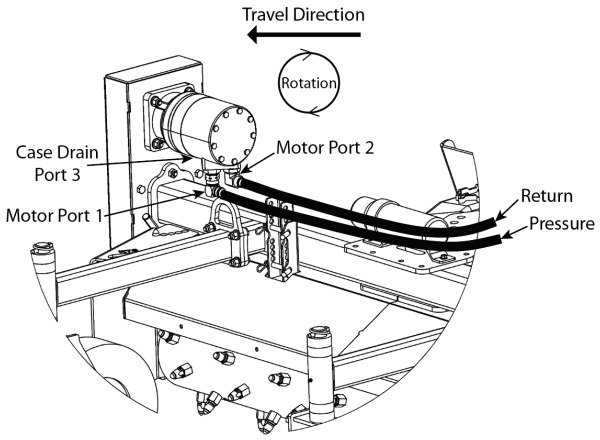


Figure 4-3. Hydraulic Hose Connections

4.2 COMPONENT IDENTIFICATION

Before operating the attachment, familiarize yourself with all components and controls. Knowing the location, function and operation of these is important for safe and efficient operation of the attachment.

1. **Quick Attach Mount (Figure 4-4).** The universal mini quick attach coupler on the rear of the attachment is used to mount the attachment to the power unit. See Section 4.3 for mounting and dismounting instructions.
2. **Rotor (Figure 4-4).** The rotor processes the material. The rotor can be easily changed between the standard, tiller and broom rotors, depending on the application.
3. **Gauge Wheels (Figure 4-4).** The wheel spacers are used to adjust the gauge wheels up or down to keep the attachment level, depending on the application.
4. **Material Bar (Figure 4-4).** The material bar helps to contain the material being processed by the rotor. This may be adjusted to allow more or less material to pass over the rotor, depending on the application.
5. **Pivot Pin (Figure 4-4).** The pivot pin allows for the rotor to be adjusted left or right by 10 or 20 degrees.
6. **Grease Zerks (Figure 4-4).** Each grease zerk must have grease added for smooth operation and improved service life.

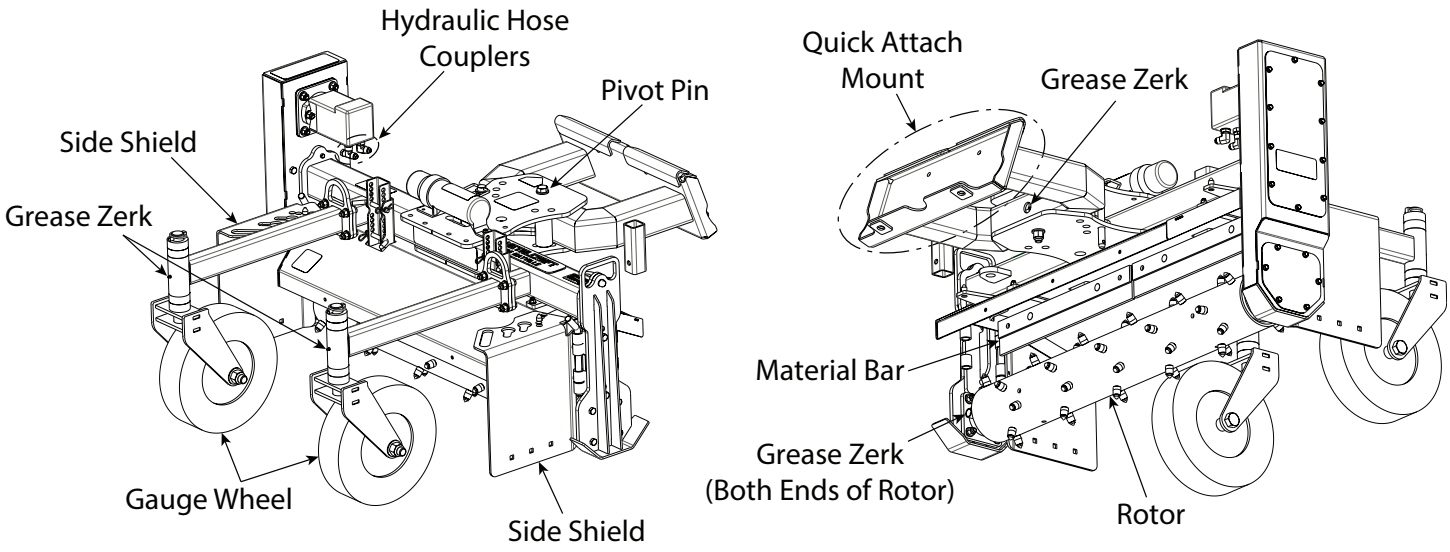


Figure 4-4. Component Identification

7. **Hydraulic Hose Couplers (Figure 4-4).** When attached to the power unit, the hydraulic hose attachment couplers provide hydraulic fluid to the power box rake for operation. See the power unit's operator's manual for location and installation instructions.
8. **Side Shields (Figure 4-4).** The side shields are used to contain material being processed by the rotor. They can be attached on the front or back sides of the attachment at various angles. The shields have slots for the hydraulic hoses to hook into when not attached to the power unit, to help prevent dirt and debris from entering the hydraulic lines.

4.3 MOUNTING AND DISMOUNTING THE ATTACHMENT

⚠ WARNING

Turn off the power unit engine when leaving the operator's position to mount, dismount, or make adjustments to the attachment.

Do not allow anyone to stand between the attachment and power unit when attaching the equipment.

Verify coupler pins fully extend through the slots on the attachment, and that all mechanisms are in the locked position prior to using. Failure to do so may cause the attachment to detach while operating, and could result in injury or death.

Read the power unit's operator's manual for more details on mounting and dismounting attachments.

MOUNTING THE ATTACHMENT

⚠ WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid injected into the skin must be surgically removed within a few hours by a doctor or gangrene may result.

Keep your body and hands away from pin hole leaks that eject high-pressure hydraulic fluid.

Use paper to find hydraulic leaks; NEVER use your hands.

Ensure that all hydraulic fluid hoses and lines are in good condition and all connections and fittings are tight before applying pressure to the hydraulic system.

-IMPORTANT-

Before Installing The Attachment, Position Machine On Level Surface, Clean Mounting Plates Of Any Dirt Or Debris And Check Quick Attach Pins For Free Movement. If The Pins Do Not Rotate Freely, Grease Them.

1. Tilt the quick attach coupler on the power unit forward slightly.
2. Align the power unit and power box rake quick attach couplers.
3. Hook the top edge of the power unit quick attach coupler under the top edge of the power box rake quick attach coupler.
4. Slowly and gently tilt the power unit quick attach coupler backward, until the power box rake is lifted and slides into place.
5. Turn off the power unit engine and remove the key.
6. Slide the coupler pins through the power unit and power box rake coupler pin holes to lock the attachment into place.
7. Engage the pin locking mechanism.
8. Verify the pins are secure. Check for other loose hardware and tighten as needed.
9. Connect the hydraulic quick connect couplers to the power unit. Ensure hoses are routed properly to prevent pinching, which may cause damage.

DISMOUNTING THE ATTACHMENT

⚠ CAUTION

Hydraulic couplers, lines, valves, and fluid may be hot. If you contact hot components, you may be burned.

Wear gloves when disconnecting couplers. Allow machine to cool before touching hydraulic components. Do not touch fluid spills.

1. While on a level surface, lower the attachment to the ground.
2. Turn off the power unit engine and remove the key.
3. Disconnect hydraulic quick couplers from the power unit.
4. Unlock and remove the coupler pins.
5. Turn on the power unit.
6. Slowly and gently tilt the quick attach coupler on the power unit forward to unhook the attachment and place it on the ground.
7. Drive the power unit away from the attachment.

4.4 START UP PROCEDURE

⚠ CAUTION

Operate the attachment at a ground speed and engine RPM appropriate for the application, site conditions, and operator's experience level.

Excessive speeds are dangerous and may cause operator injuries, damage to property, damage to equipment, or unnecessary strain on the power unit.

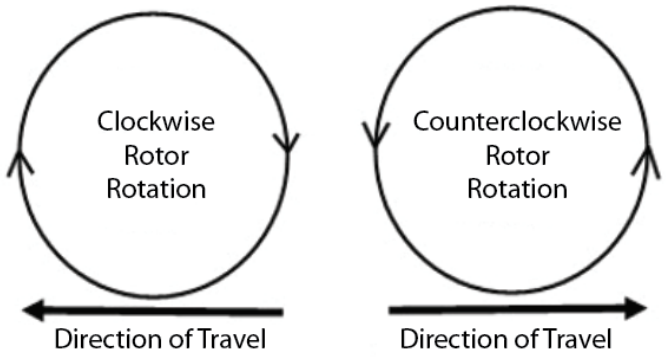


Figure 4-5. Rotor Rotation Direction

1. Start the power unit engine.
2. Raise the power box rake until the rotor is raised off of the ground.
3. Set the power unit to standard flow. DO NOT set to high flow.
4. Slowly engage the hydraulics.
   A. Ensure the rotor is spinning smoothly and rotating in the correct direction, as shown in Figure 4-5.
   B. After the hydraulics are engaged, slowly increase the engine speed until the desired speed is achieved. Normal operating speed is approximately 270 RPM.

4.5 OPERATING SPEED CONSIDERATIONS

1. Travel at slower ground speeds until comfortable with operation.
2. Never travel faster than you can react to changing terrain.
3. Under normal conditions, ground speed should be between 3 mph and 5 mph.
4. In heavy rock, reduce the ground speed to between 1 mph and 3 mph.
5. Reduce speed when turning.

4.6 OPERATING THE POWER BOX RAKE

⚠ WARNING

Before operating the attachment, observe the area for persons and obstructions. Clear the area of bystanders, obstacles, and debris before operation. Possible injury or property damage could occur.

Never raise the attachment more than a few inches off the ground when traveling to or from operating areas. Power unit and attachment compatibility and stability are important. Refer to the power unit's operator's manual for proper specifications.

1. Position the equipment at the start of the pass.
2. When operating or transporting, run the attachment on gauge wheels to minimize bouncing.
   A. Lift the attachment fully off the ground.
   B. Angle the power box rake forward, so the gauge wheels are lower than the rotor.
   C. Lower the attachment until only the gauge wheels are in contact with the ground.
3. Slowly lower the power box rake until the rotor is at the desired depth.
   A. Use float mode if the power unit is equipped with this feature.
   B. Adjust the working depth by tilting the power box rake forward or backward.
4. Travel at a slow and steady pace.
5. Slowly raise the attachment at the end of the pass.
6. Any unwanted debris will be left at the end of the pass to be removed later.

4.7 OPERATION ON SLOPES

⚠ WARNING

Reduce speed and use extreme caution when turning or when operating on slopes and slick or wet surfaces. Allow extra distance to stop.

Under no circumstances should the power unit be operated on slopes greater than what it is rated for. See the power unit's operator's manual for slope requirements.

1. To prevent tipping or loss of control while operating on grades, ramps, or inclines:
   A. Do not start or stop suddenly.
   B. Travel at a reduced speed.
   C. Avoid unnecessary turns.
   D. Travel straight up and down the incline when possible.
2. Raise the attachment only as high as necessary to clear the ground or other obstructions.

4.8 AFTER OPERATION

1. Wash the attachment as needed. Do not use high pressure spray or direct the spray onto the decals.
2. Keep the attachment clean and free of excessive debris to reduce fire hazard, facilitate detection of any damages, and ensure full life use.
3. Keep all nuts, bolts and screws tight, to ensure the machine is in safe working condition.
4. Replace any latches or hardware that is damaged or missing.
5. Verify all parts are in good working condition. Replace all worn or damaged decals.
6. Store the attachment in a clean, dry environment that is protected from weather.
7. Clean and cover the hose quick couplers to protect them from dirt and debris.

TROUBLESHOOTING

CONDITION	CAUSE	CURE
ROTOR DOES NOT TURN	Broken chain or master link	Repair or replace chain or master link
	Sheared key on upper or lower chain case sprocket	Replace key
	Rotor obstruction	Remove obstruction
	Power unit auxiliary valve not engaged	Engage auxiliary valve
	Relief valve setting adjusted too low	Refer to power unit operator's manual
	Inadequate hydraulic flow	Check hydraulic flow to attachment
	Couplers not properly connected to power unit	Connect couplers
	Loose or damaged fittings or hose	Tighten or replace fittings or hose
	Hydraulic motor damaged	Contact the Scag Power Equipment Service Department or an authorized dealer for assistance
EXCESSIVE VIBRATION	Chain tension not adjusted properly	Adjust chain tensioner
	Debris entangled around rotor	Remove debris
	Rotor or drive line components bent or damaged	Contact the Scag Power Equipment Service Department or an authorized dealer for assistance
LEAKING FLUID OR LUBRICANT	Chain case overfilled	Drain excess lubricant
	Couplers not properly connected	Connect couplers
	Loose or damaged fittings or hose	Tighten or replace fittings or hose
	Hydraulic motor damaged or seal blown	Contact the Scag Power Equipment Service Department or an authorized dealer for assistance
NOISY CHAIN CASE	Chain tension not adjusted properly or damaged	Adjust chain tensioner
	Damaged or worn chain or sprockets	Replace damaged or worn parts
GAUGE WHEELS DO NOT SPIN	Axle bolt too tight	Loosen axle bolt

ADJUSTMENTS

6.1 ROTOR REMOVAL AND INSTALLATION

⚠ DANGER

Never work under the attachment unless it is securely supported or blocked to prevent sudden or inadvertent falling, which could result in serious injury or death.

⚠ WARNING

Before making any adjustments to the attachment, turn off the power unit engine and remove the ignition key.

Avoid placing hands or fingers between the attachment and power unit, or near moving parts, as this could cause pinching.

Be aware of hand and finger placement when assembling and making adjustments to parts to avoid pinching between moving parts.

Verify all fasteners are properly tightened and all pins are properly locked in place before using the attachment. Failure to do so may result in injury or death.

⚠ CAUTION

The rotor is heavy and may require additional support.

The rotor can quickly be changed between the standard, tiller, and broom rotors. The rotor may also be rotated end to end, so that both sides of the teeth and blades may be used and wear evenly.

ROTOR REMOVAL

Rotor removal is easier if done on a hard, flat surface. A small cart or dolly may be used to support the rotor. Removing the rotor may require two people. Refer to Figures 6-1 through 6-3 for rotor removal.

1. Raise and support the power box rake several inches off the ground or cart.
2. Remove the 3 bolts and washers from the idler bearing end of the power box rake. The bearing housing assembly will be supported by the alignment pins.

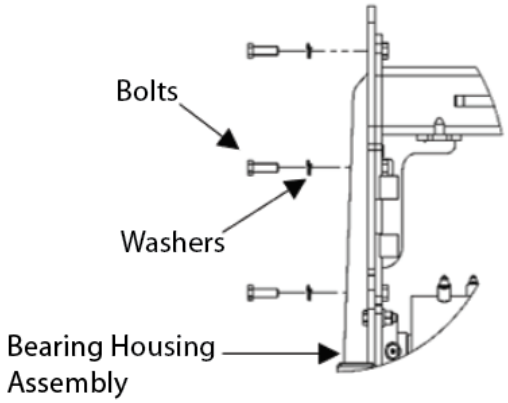


Figure 6-1. Bearing Housing Assembly Hardware

3. Slide the bearing housing assembly off of the alignment pins by rotating the top outward.
4. Carefully lower the bearing housing assembly and rotor.
5. Slide the bearing housing assembly off of the rotor and set it aside.

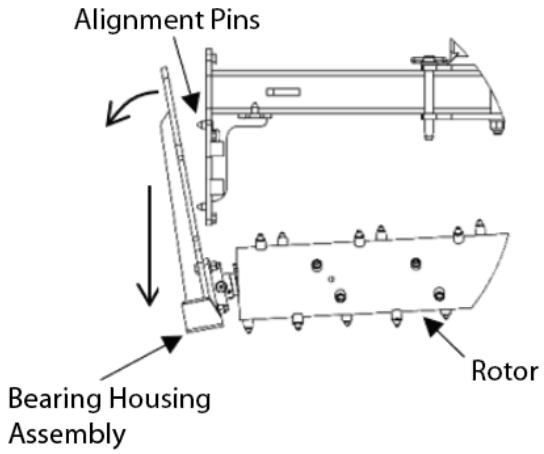


Figure 6-2. Bearing Housing Assembly Removal

6. Slide the rotor off of the chain case stub shaft.
7. Complete the following steps while the rotor is disassembled:
   A. Inspect for loose, missing, or damaged hardware.

B. Inspect for cracks in the bearing housings and the bearing seal condition.
C. Clean the drive and idler stub shafts.
D. Inspect for damage and general condition.

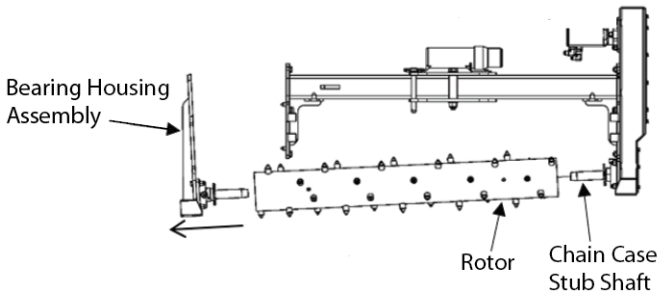


Figure 6-3. Rotor Removal

ROTOR INSTALLATION

⚠ CAUTION

Apply anti-seize to both the idler and drive stub shafts, and ensure stub shaft and rotor bore cleanliness prior to installing the rotor. Failure to do so will make future rotor removal much more difficult.

Refer to Figure 6-1, and Figures 6-4 through 6-6 for rotor installation.

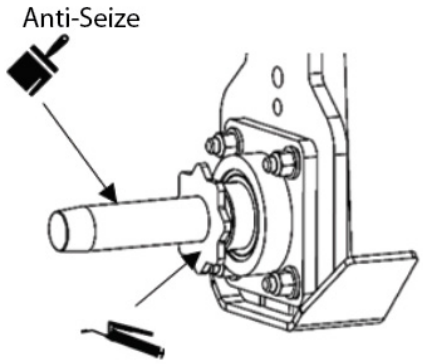


Figure 6-4. Stub Shaft Prep

1. Apply anti-seize to the stub shafts, on both the drive and idler sides.
2. Apply grease to the star drive surfaces on the stub shafts, on both the drive and idler sides.
3. Slide the rotor onto the stub shaft. Ensure the star drive is properly engaged.

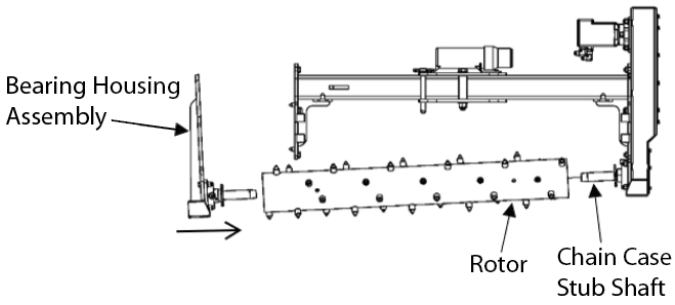


Figure 6-5. Rotor Assembly

4. Slide the bearing housing assembly onto the rotor.
5. Raise the bearing housing assembly and the rotor until the alignment pins are engaged.
6. Install the 3 bolts and washers to the bearing housing assembly. Torque to 110 ft-lb.

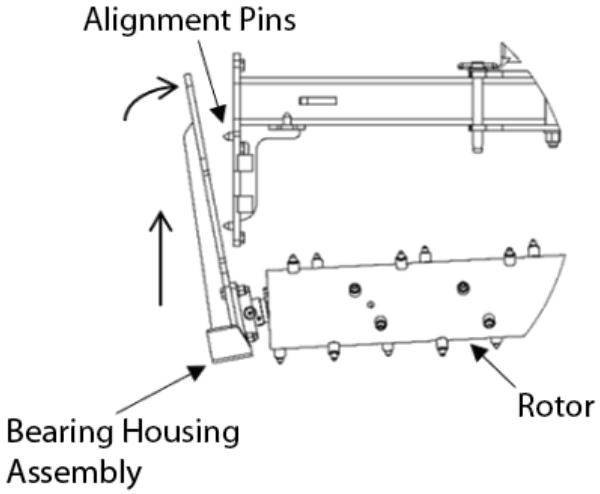


Figure 6-6. Bearing Housing Assembly Installation

6.2 ANGLE ADJUSTMENT

The power box rake can be adjusted left or right by 10 or 20 degrees. Refer to Figure 6-7 for angle adjustment.

1. Raise the power box rake slightly off the ground.
2. Turn off the power unit engine and remove the ignition key.
3. Remove the lynch and pivot pins.
4. Manually position the power box rake to the desired angle.
5. Reinstall the pivot and lynch pins.
6. Adjust or remove the side shields as needed.

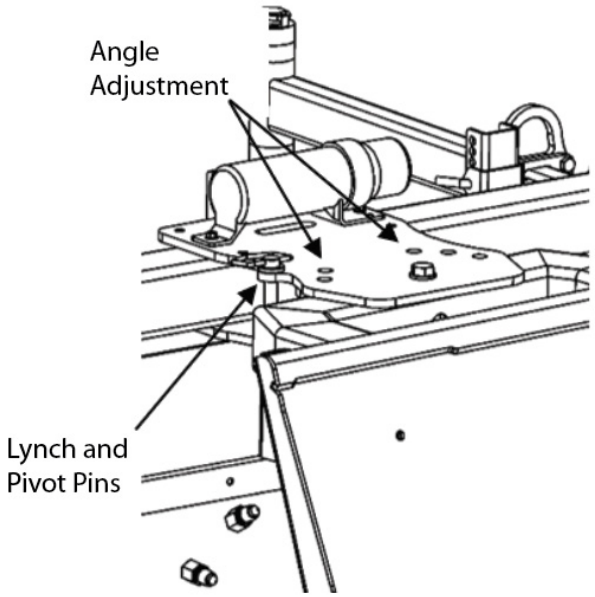


Figure 6-7. Angle Adjustment

6.3 MATERIAL BAR ADJUSTMENT

⚠ CAUTION

Ensure the material bar is not in contact with the rotor teeth, as this may cause damage to the attachment or material bar.

The material bar can be adjusted for a wide range of applications. Adjusting the material bar controls the size of material passing over the rotor. Raising the material bar to its highest position allows the maximum amount of material to pass over the rotor. Adjust the bar to this position when taking the initial pass to prevent clogging. Lowering the material bar to just above the rotor teeth will achieve maximum processing to break down heavy sod and dirt clumps when landscaping. Adjust the bar to this position to achieve the smoothest finish. Refer to Figure 6-8 for material bar adjustment.

1. Remove pins.
2. Adjust material bar up or down to achieve the desired results.
3. Reinstall pins.
4. Ensure material bar does not make contact with rotor.

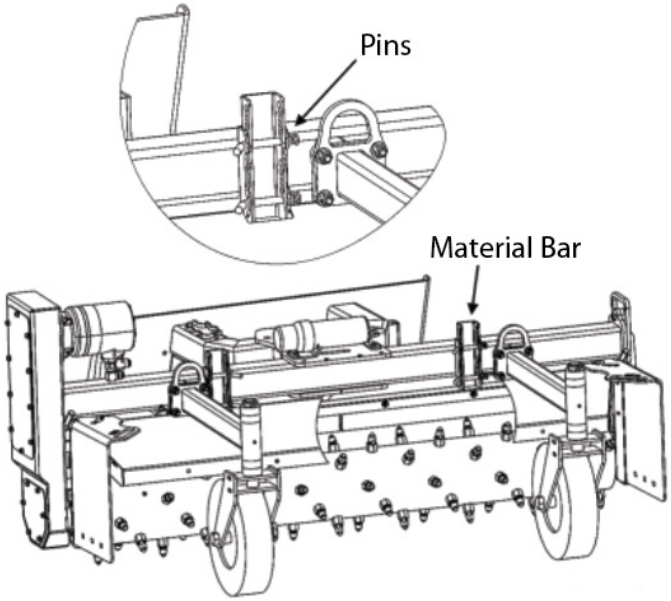


Figure 6-8. Material Bar Adjustment

6.4 SIDE SHIELDS ADJUSTMENT

The power box rake can be operated with or without the side shields in place. The side shields can be mounted on the front or back of the power box rake, depending on the direction of travel. With the side shields mounted and with the attachment straight, the side shields allow material to stay in front of the rotor, which aids in filling low spots. When windrowing with the power box rake at an angle, remove the side shield on the trailing side of the attachment. The side shield can be installed on the back opposite side of the attachment for convenience. Refer to Figure 6-9 for side shield adjustment.

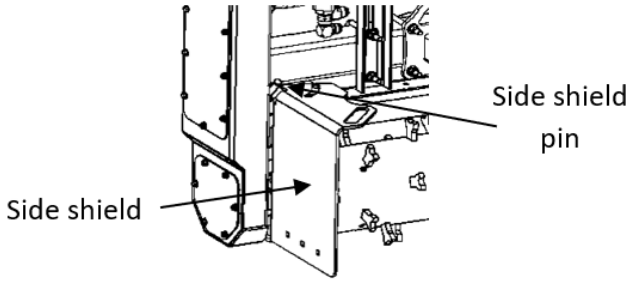


Figure 6-9. Side Shield Adjustment

1. Remove the side shield pin.
2. Adjust the side shield to the desired angle.
3. Reinstall the side shield pin.

6.5 GAUGE WHEEL ADJUSTMENT

⚠ DANGER

Never work under attachment unless it is securely supported or blocked to prevent sudden or inadvertent falling, which could result in serious injury or death.

⚠ CAUTION

Gauge wheel assemblies are heavy. Adjustment may require additional personnel. Minor injury or damage to equipment could result if instructions are not followed properly.

The gauge wheels need to be adjusted so that the power box rake is level during operation. Refer to Figure 6-10 for gauge wheel adjustment.

1. Raise the power box rake or tilt it back so the gauge wheels are lifted and the shaft of the gauge wheel assembly can be removed. Verify the power box rake is supported before making adjustments.
2. Ensure the gauge wheel assembly is well supported.
3. Remove the lynch pin and upper spacers.
4. Slide the gauge wheel shaft out of the gauge wheel arm.
5. Add or remove lower spacers as needed.
6. Slide the gauge wheel shaft into the gauge wheel arm.
7. Replace the upper spacers and lynch pin.
8. Lower the power box rake.

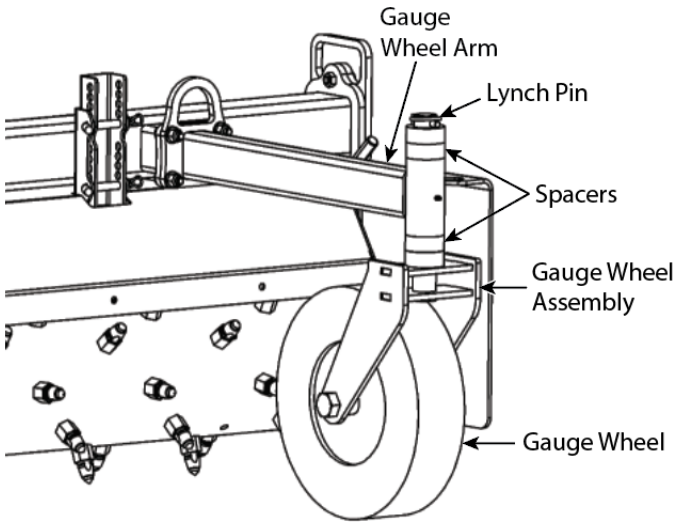


Figure 6-10. Gauge Wheel Adjustment

MAINTENANCE

- IMPORTANT -

Follow all maintenance safety instructions and statements. Review the safety instructions with all users prior to any maintenance or operation of the attachment.

7.1 BREAK IN PERIOD

After running the attachment for 5 hours:

1. Check all hardware. Tighten if needed, and replace if missing or damaged. Hardware could set into the paint, causing loosening of bolts. Factory installed Thread locker is used in assembly to prevent bolts from loosening.
2. Check the chain for proper tension. See Section 7.5 for details.

7.2 MAINTENANCE CHART - RECOMMENDED SERVICE INTERVALS

FREQUENCY				PROCEDURE
BEFORE & AFTER EACH USE	WEEKLY	MONTHLY	ANNUALLY	
X				Check all hardware for tightness. Tighten if needed. Replace if missing or if damaged.
X				Inspect the rotor and teeth, tines, and/or bristles for excessive wear or damage. Check that the rotor turns freely.
X				Check cleanliness of attachment. Wash as needed to remove any debris build up.
X				Inspect all guards, shields, and other safety equipment for damage and wear, and verify they are properly installed and secured.
X				Check hydraulic hoses, fittings, cylinder and couplers for leaks, major wear, or other damage. Replace as required.
X	X			Grease mount pivot and gauge wheel pivots. See Section 7.6 for details.
X	X			Check attachment for major wear, scratches, cracks, or other damage. Replace components as required.
	X			Remove the rotor, clean the rotor and stub shafts, reapply grease or anti-seize, and reinstall the rotor.
X		X		Inspect all decals for wear. Replace if missing or if text or graphic is illegible.
		X		Check the chain for proper tension. See Section 7.5 for details.
		X		Check chain case lubricant and chain case overall condition.
		X		Inspect hydraulic motor for leaks, cracks, or other damage.
		X		Grease bearings. See Section 7.6 for details.
		X		Inspect rubber skirt of material bar for wear.
			X	Change chain case lubricant. See Section 7.4 for details.
			X	Detailed inspection of power box rake. Replace/repair as required. See Section 7.8 for details.

Perform these maintenance procedures more frequently under extreme working conditions.
For procedures with multiple frequencies, complete the maintenance based on whichever occurs first.

7.3 MAINTENANCE CONSIDERATIONS & STORAGE

⚠ DANGER

Never work underneath the attachment, unless it is securely supported or blocked to prevent sudden or inadvertent falling, which could result in serious injury or death.

⚠ WARNING

Always wear proper personal protective equipment while performing maintenance.

If the attachment is assembled to the power unit, ensure that the engine is off, the parking brake is engaged, and the ignition key is removed before starting any maintenance, cleaning, or inspection.

Avoid placing hands or fingers between the attachment and power unit, or near moving parts, as this could cause pinching.

Be aware of hand and finger placement when assembling parts and completing maintenance to avoid pinching between moving parts.

Verify all fasteners are properly tightened and all pins are properly locked in place before using the attachment. Failure to do so may result in injury or death.

Never straighten, weld, or in any other way alter any part of the attachment. Any alterations may result in injury or death, and will void the warranty.

To ensure years of operation, regular preventive maintenance and repair of worn or broken parts is essential. Parts may loosen due to the severe environment this equipment operates in. Operators must observe and inspect equipment for loose, worn, or damaged parts to prevent further damage. Do not continue to operate equipment if these conditions are observed.

1. NEVER allow untrained personnel to service the attachment. Personnel should have sufficient knowledge and training prior to performing any maintenance procedures.
2. It is recommended to wear safety glasses, gloves, and safety shoes when servicing, adjusting, or cleaning the attachment.
3. ALWAYS work in a well ventilated area. Never operate the engine of the power unit in a closed building. The exhaust fumes may cause asphyxiation.
4. Lower the attachment, set parking brake, stop engine and remove ignition key to prevent accidental starting of the engine when servicing, adjusting, or cleaning the attachment.
5. Be certain that all moving parts on the equipment have come to a complete stop before attempting to perform maintenance.
6. Ensure the attachment is properly supported before servicing, adjusting, or cleaning the attachment. Always use a safety support, and always block the wheels. NEVER use a jack to support the attachment.
7. Keep all nuts, bolts and screws tight to ensure the machine is in safe working condition. Check attachment hardware frequently.
8. To reduce fire hazard and facilitate detection of any damages, keep the attachment clean and free of excessive grease, oil, dirt, and other debris.
9. Keep all parts in good working condition. Replace all worn, damaged or missing decals, pins, latches and hardware.
10. Always use proper tools or equipment for the job, and ensure all tools, parts, and service equipment are removed after servicing is complete.
11. Before putting the attachment into long term storage, clean the attachment well, and touch up any small chips or scratches with paint to prevent the attachment from rusting. Cover hose coupler connections.
12. Store the attachment in a clean, dry environment that is protected from weather.

7.4 CHAIN CASE LUBRICANT

⚠ CAUTION

Do not over fill the chain case, as this will cause leakage past the bearing.

Refer to Figure 7-1 for chain case lubricant maintenance.

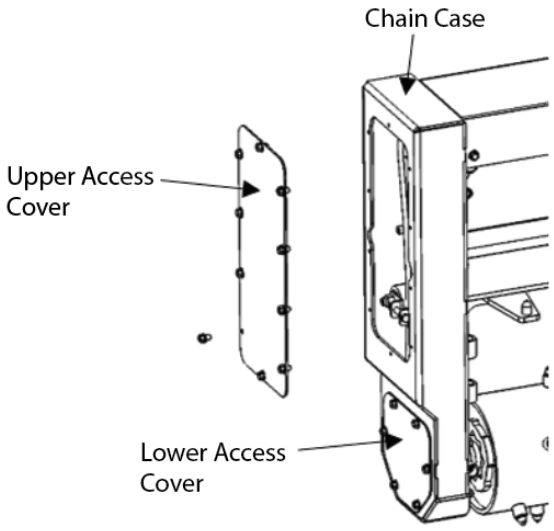


Figure 7-1. Chain Case Lubricant

CHAIN CASE LUBRICANT LEVEL

1. Ensure the power box rake is level.
2. Remove the upper access cover on the chain case. Take caution not to damage the gasket. The lower access cover does not need to be removed.
3. Use a clean measure stick to check the lubricant level. There should be approximately 1” (or half of the lowest chain link) of lubricant on the bottom of the case.
4. Add lubricant as required. It is recommended to use 00 gear grease.
5. Reinstall the access cover.
   A. Inspect the gasket and replace if needed.
   B. Install fasteners.
   C. Tighten to recommended torque per the torque spec in Section 3.7.

CHAIN CASE LUBRICANT CHANGE

1. Ensure the power box rake is level.
2. Place a suitable container under the chain case.
3. Remove the upper and lower access covers. Take caution not to damage gaskets.
4. Wipe out any residual lubricant and clean inside of the chain case.
5. Reinstall the lower access cover.
   A. Inspect the gasket and replace if needed.
   B. Install fasteners.
   C. Tighten to recommended torque per the torque spec in Section 3.7.
6. Add approximately 12 oz. of lubricant. It is recommended to use 00 gear grease.
7. You may use a clean measure stick to check the lubricant level. There should be approximately 1” (or half of the lowest chain link) of lubricant on the bottom of the case.
8. Reinstall the upper access cover.
   A. Inspect the gasket and replace if needed.
   B. Install fasteners.
   C. Tighten to recommended torque per the torque spec in Section 3.7.

7.5 CHAIN TENSIONER

⚠ CAUTION

Do not over tighten the chain tensioner, as this may damage or cause excessive wear to the chain, sprockets, and tensioner rollers.

Refer to Figures 7-1 through 7-3 for chain case tensioner maintenance.

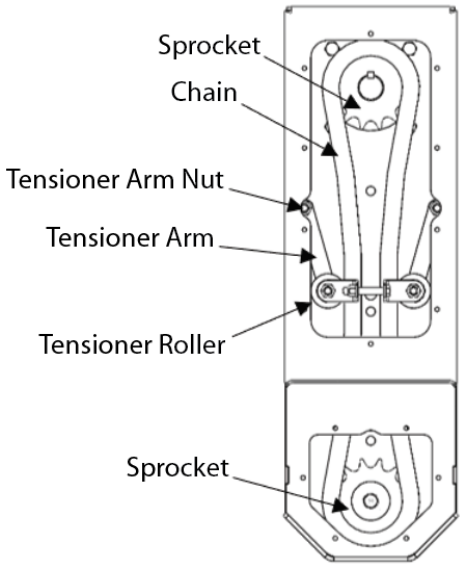


Figure 7-2. Chain Case

1. Raise and support the power box rake so that the rotor is not in contact with anything.
2. Remove the upper access cover to perform inspection.
   A. Inspect for loose, missing, or damaged hardware.
   B. Inspect for cracks.
   C. Inspect for worn tensioner rollers. Check that the tensioner rollers rotate freely.
   D. Inspect chain and sprockets for excessive wear.
3. Tighten the tensioner arm nuts until snug, then back off ½ - ¾ of a turn. The tensioner arms should swing freely.
4. Adjust the tensioning nut and bolt. There should be approximately a 3/8" gap under the bolt head when the tensioner brackets are squeezed together.

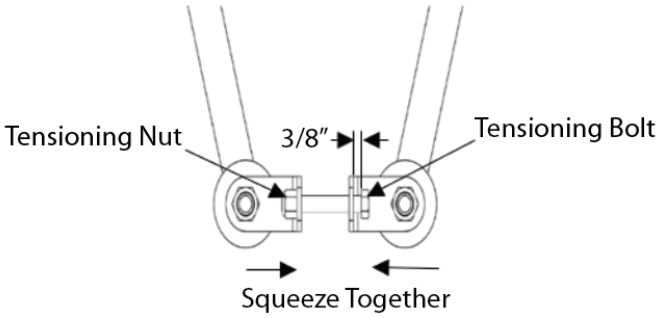


Figure 7-3. Chain Tensioner

5. Spin the rotor by hand, and observe that the chain has slack. Connect the hydraulic hoses to allow fluid to circulate so that the rotor can spin.
6. Reinstall the upper access cover.
   A. Inspect the gasket and replace if needed.
   B. Install fasteners.
   C. Tighten to recommended torque per the torque spec in Section 3.7.

7.6 BEARINGS AND PIVOT POINTS

Refer to Figure 7-4 for bearing and pivot point maintenance.

INSPECTION

1. Inspect for loose, missing, or damaged hardware.
2. Inspect for cracks in bearing housings.
3. Inspect gauge wheel spacers for wear.
4. Inspect for damage and general condition.

⚠ CAUTION

Do not over grease the bearings, as this could cause damage to the seals.

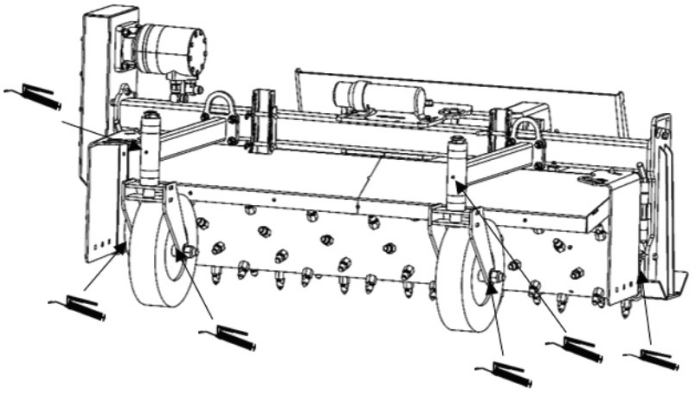


Figure 7-4. Lubrication Points

LUBRICATION

Use multi-purpose EP grease in the following areas.

1. Bearings
   A. Do not over grease. Use only 2-3 pumps of grease. If resistance is felt STOP IMMEDIATELY.
   B. Excess pressure could dislodge seals.
2. Gauge wheels
   A. Grease axles.
   B. Grease spindle pivot.

7.7 MATERIAL BAR

Refer to Figure 7-5 for material bar maintenance.

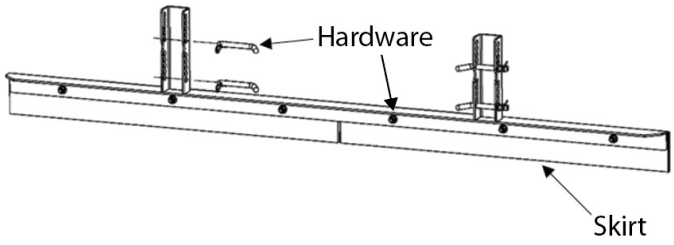


Figure 7-5. Material Bar

1. Inspect for loose, damaged, or missing hardware. Tighten or replace as needed.
2. Inspect rubber skirt for wear. Replace if needed.

7.8 ADDITIONAL POWER BOX RAKE INSPECTION

⚠ WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid injected into the skin must be surgically removed within a few hours by a doctor or gangrene may result.

Keep your body and hands away from pin hole leaks that eject high-pressure hydraulic fluid.

Use paper to find hydraulic leaks; NEVER use your hands.

Ensure that all hydraulic fluid hoses and lines are in good condition and all connections and fittings are tight before applying pressure to the hydraulic system.

1. Check the attachment for wear, scratches, cracks, or other damage. If minor scratches are present, they may be painted to prevent rust. If major damage or wear is present, the parts must be replaced.
2. The attachment should be fully inspected at least every 12 months or when permanent deformation or damage is suspected. Inspection shall be completed by qualified personnel only. The attachment must be inspected for the following:
    - A. Check the attachment and rotors for any damage, such as bent, dented, or cracked components. Check for cracks in all welds.
    - B. Check all hydraulic components for damage, such as leaks or major wear. DO NOT USE HAND to check for suspected leaks.
    - C. Check for proper function of rotating components, such as rotors, chain, sprockets, and bearings.
    - D. Check that all pins, bushings, and locking hardware are not worn or missing. Grease all grease points.
    - E. Check that the decals are present and legible.
3. If any of the criteria are not met, the attachment or components must be replaced or repaired. Inspection shall be completed by qualified personnel only. See your local authorized dealer for service.

ILLUSTRATED PARTS LIST

8.1 METALCRAFT OF MAYVILLE APPROVED ACCESSORIES

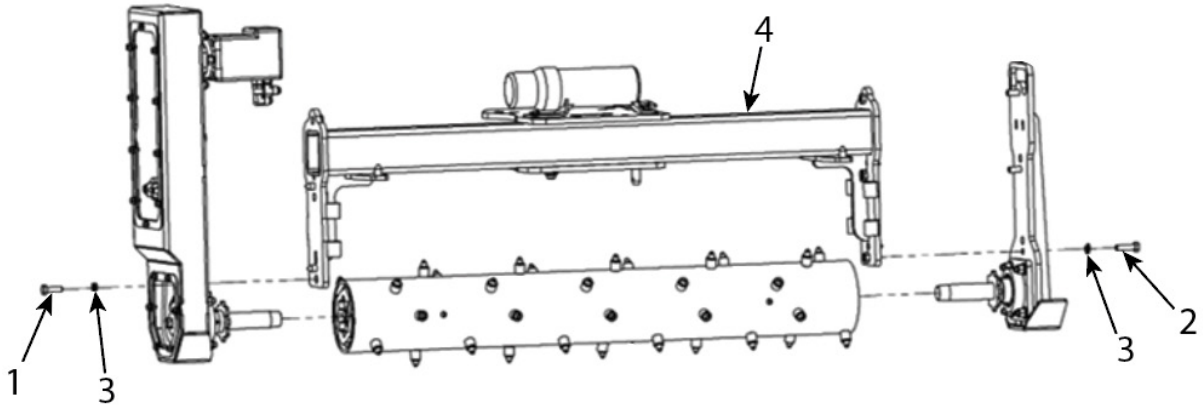
Accessories manufactured by companies other than Metalcraft of Mayville are not approved for use on this attachment.

Accessories	P/N
Replacement Standard Rotor	488912
Replacement Tiller Rotor	488913
Replacement Broom Rotor	488914

8.2 METALCRAFT OF MAYVILLE SERVICE/REPLACEMENT PARTS

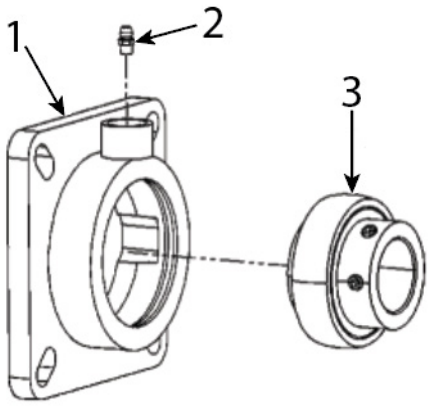
Components manufactured by companies other than Metalcraft of Mayville are not approved for use on this attachment. Use of other than original Metalcraft of Mayville replacement parts will void the warranty. Any unauthorized work done on the attachment during the warranty period may void your warranty.

FRAME AND ROTOR ASSEMBLY



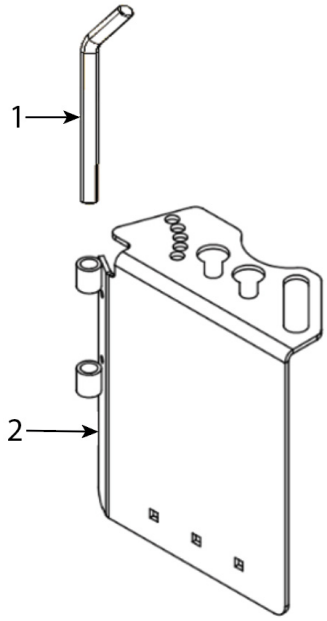
Ref. No.	Part No.	Description
1	488863	Bolt, 1/2”-13 x 1-1/2” HHCS Gr8
2	488864	Bolt, 1/2"-13 x 1-3/4" HHCS Gr8
3	04030-06	Washer, 1/2” Split Lock Med
4	463828	Frame, 4’

BEARING, 1 1/2" 4 BOLT



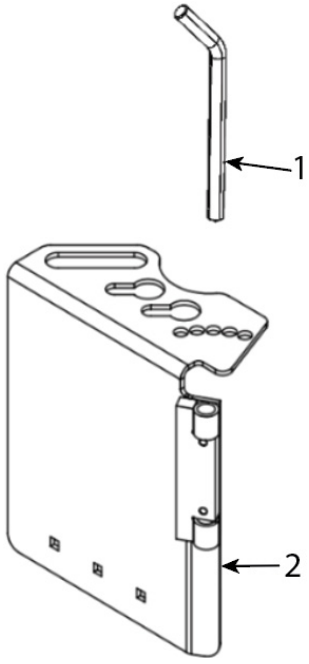
Ref. No.	Part No.	Description
1	453833	Bearing Housing, 1-1/2” 4 BLT
2	48114-04	Grease Fitting, 1/4"-28 Straight
3	488811	Bearing Insert, 1-1/2" Set Screw

SIDE SHIELD RIGHT



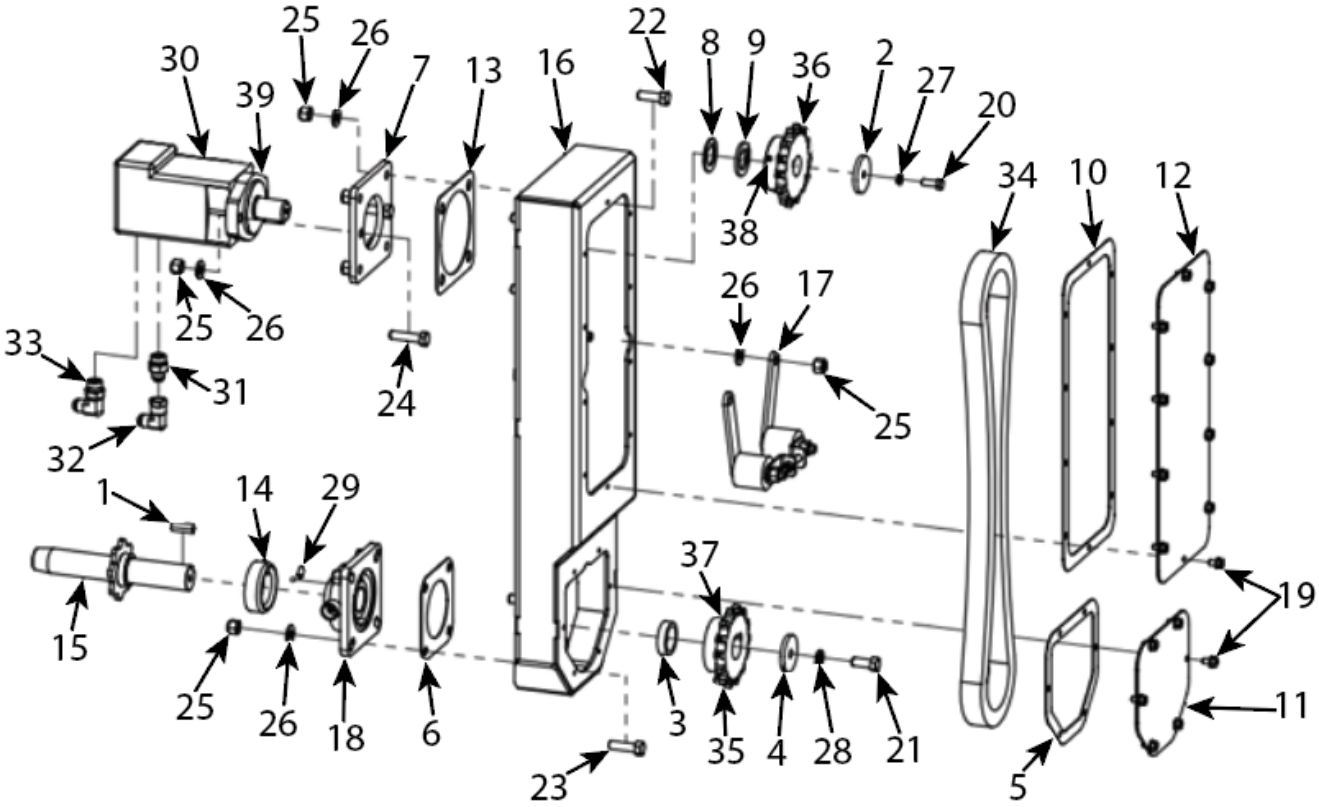
Ref. No.	Part No.	Description
1	44287	Pin, Side Shield
2	4201619	Side Shield, Right Assy 5 Position

SIDE SHIELD LEFT



Ref. No.	Part No.	Description
1	44287	Pin, Side Shield
2	4201620	Side Shield, Left Assy 5 Position

CHAIN CASE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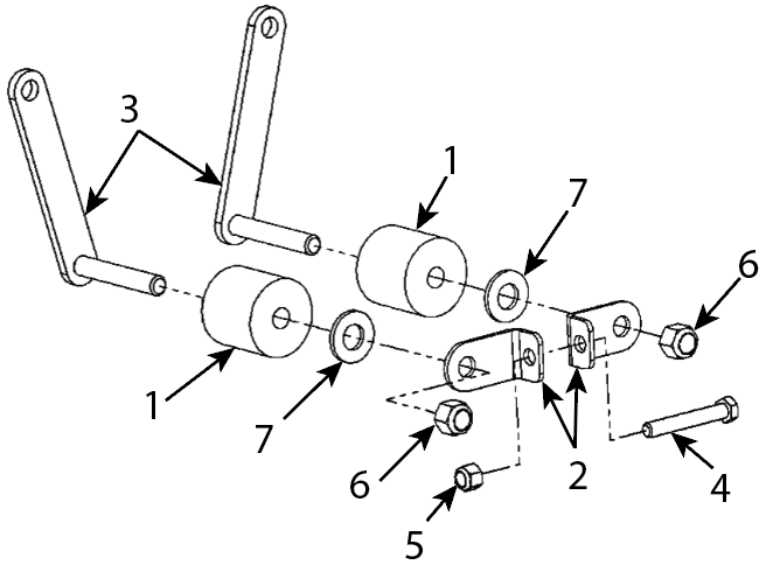
CHAIN CASE

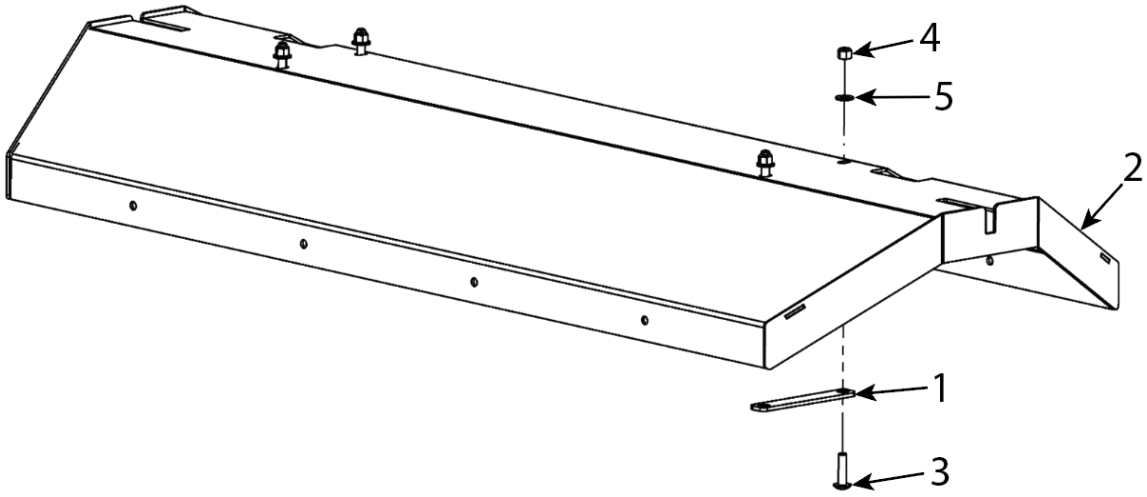
Ref. No.	Part No.	Description
1	4201622	Key, 3/8" x 1-3/8"
2	04041-28	Washer, .25" T x .406" ID x 2.25" OD
3	431395	Spacer, 1-1/2" x 1/2"
4	04041-33	Washer, .25" T x .530" ID x 2.25" OD
5	488805	Gasket, Chain Case
6	488806	Gasket, Bearing UCF 208
7	4201611	Plate, Adapter 2000 Series Motor
8	4201612	Spacer, 1-1/4" x .120"
9	4201613	Spacer, 1-1/4" x .179"
10	488807	Gasket, Chain Case Upper
11	4201618	Cover, Lower Chain Case
12	463826	Cover, Upper Chain Case
13	488809	Gasket, Chain Case
14	431398	Guard, 1-1/2" Bearing
15	453825	Shaft, Drive Coupler
16	463829	Chain Case
17	463789	Chain Tensioner Assy
18	463791	Bearing Assy, 80mm 1-1/2" 4 BLT
19	488853	Bolt, 5/16"-18 x 1/2" Anti Vibe
20	04001-229	Bolt, 3/8"-16 x 1" HHCS GR8
21	04001-234	Bolt, 1/2"-13 x 1-1/4" HHCS Gr8
22	488863	Bolt, 1/2"-13 x 1-1/2" HHCS Gr8
23	488864	Bolt, 1/2"-13 x 1-3/4" HHCS Gr8
24	04001-185	Bolt, 1/2"-13 x 2.0" HHCS Gr8
25	04021-35	Nut, 1/2"-13 Nyloc Gr8
26	04040-07	Washer, 1/2", SAE Gr8
27	04030-04	Washer, 3/8" Split Lock Med
28	04030-06	Washer, 1/2" Split Lock Med
29	488857	Set Screw, 5/16"-24 x 5/8" Knurled Cup Point
30	488818	Hyd Motor, WF104-1027
31	487432-02	Fitting, 8 JICM to 10 ORBM
32	488820	Fitting, 8 JICM to 8 JICF 90 SW
33	487432-03	Fitting, 8 JICM to 10 ORBM 90Deg
34	488826	Chain, No 80 61 Pitch + CL
35	488827	Sprocket, 80 P 14 T 1-1/2" Bore
36	488828	Sprocket, 80 P 14 T 1-1/4" Bore
37	04012-06	Set Screw, 3/8"-16 x 5/8" Cup Point
38	488856	Set Screw, 5/16"-18 x 1/2" Cup Point
39	488822	Seal Kit, 104 Complete Kit

CHAIN TENSIONSER



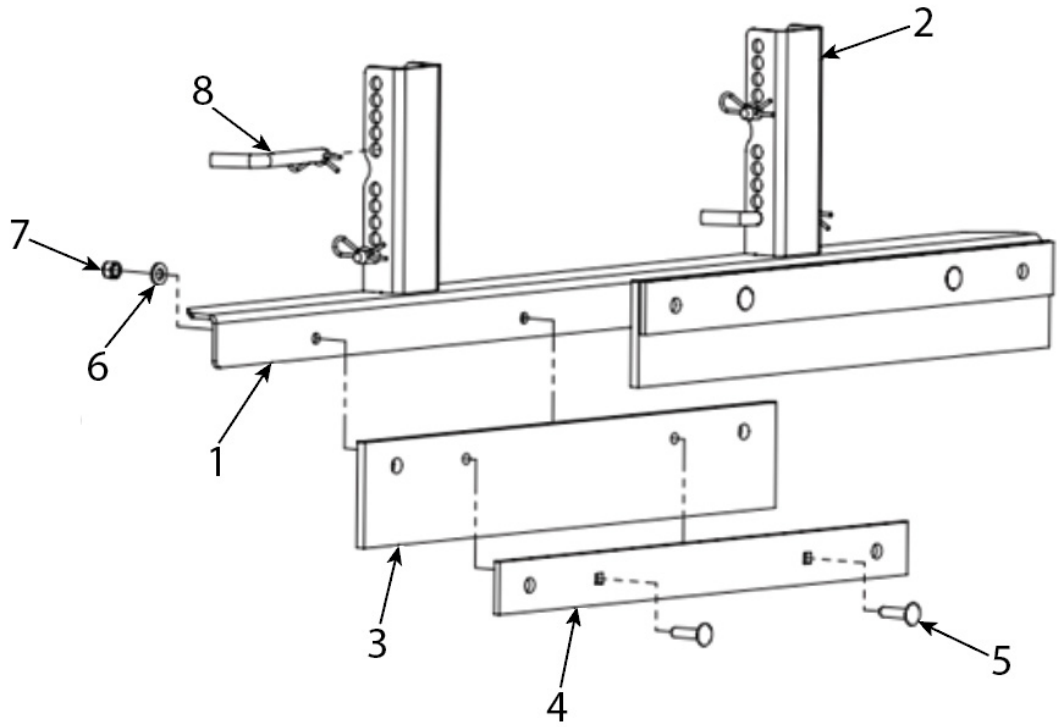
Ref. No.	Part No.	Description
1	431399	Roller, Chain Tensioner
2	4201621	Bracket, Tensioner
3	453832	Arm Wlmt, Chain Tensioner
4	04001-139	Bolt, 3/8”-16 x 2-1/2” Gr8
5	04021-09	Nut, 3/8”-16 Nyloc Gr8
6	04021-35	Nut, 1/2”-13 Nyloc Gr8
7	04040-07	Washer, 1/2” SAE Gr8

4' SHIELD



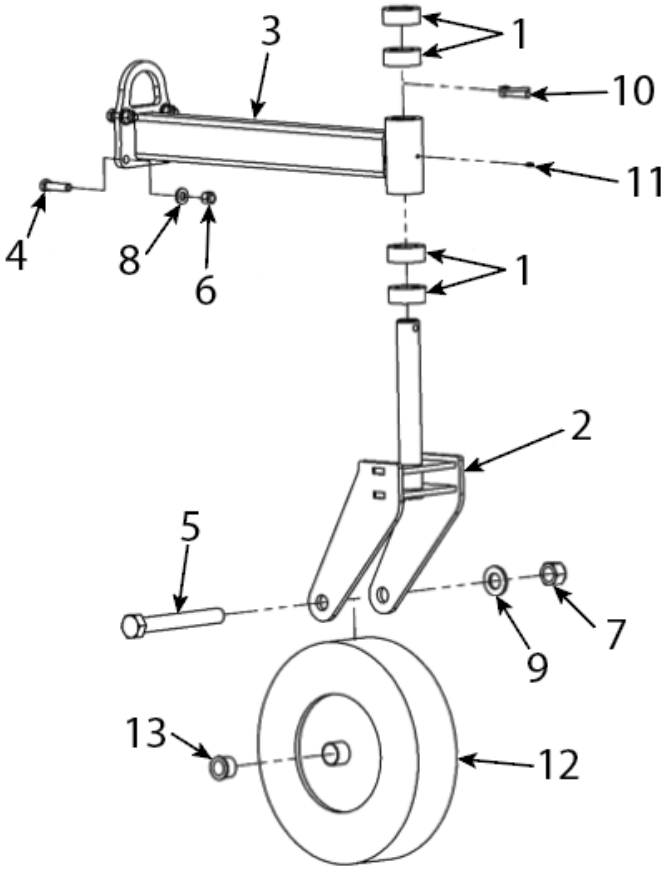
Ref. No.	Part No.	Description
1	4201616	Plate, Clamp
2	463827	Shield, 4’ Frame Mounted
3	04003-05	Bolt, 3/8”-16 x 1-1/2” Carriage
4	04021-09	Nut, 3/8”-16 Nyloc Gr8
5	04040-05	Washer, 3/8” SAE

MATERIAL BAR



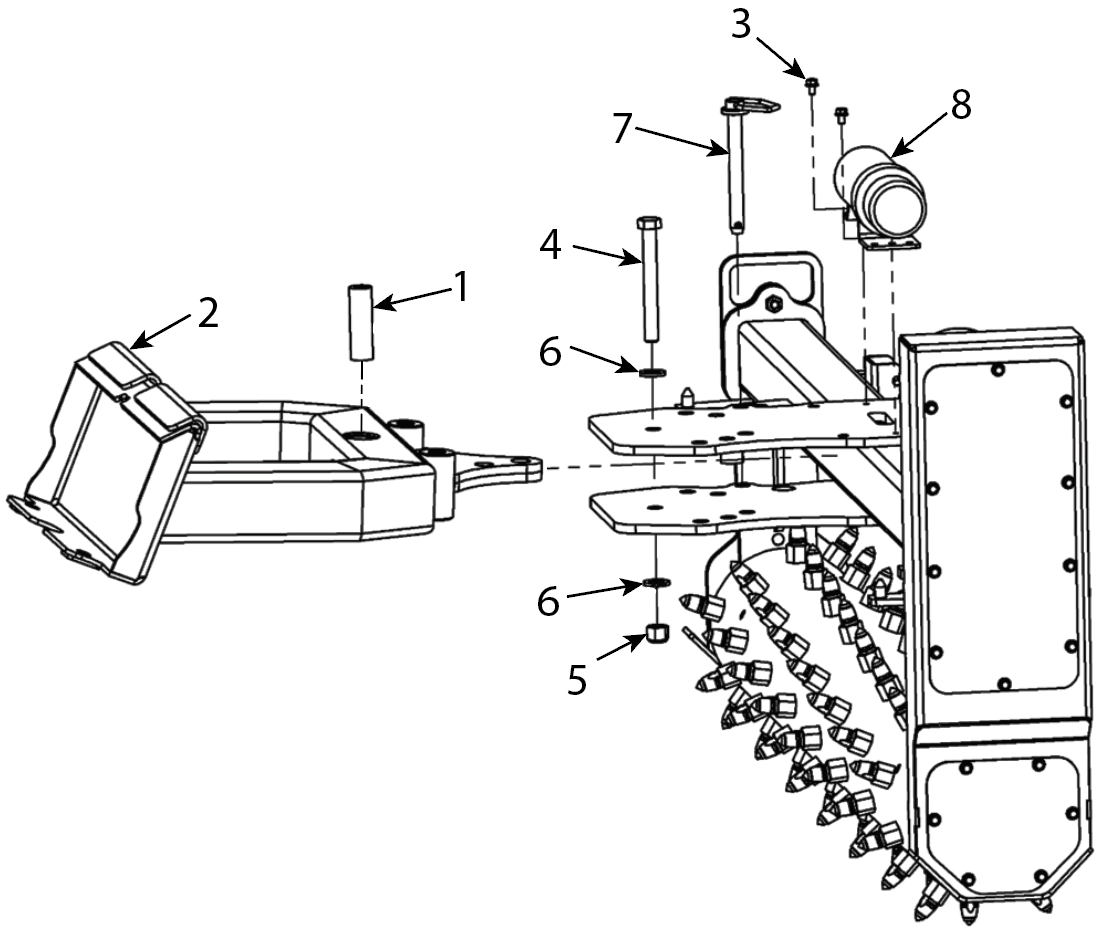
Ref. No.	Part No.	Description
1	4201615	Angle, 4’ Material Bar
2	4201614	Channel, Material Bar
3	488810	Flap, 2 Ply 4” x 24” Rubber
4	4201610	Bar, 24” Clamp
5	04003-05	Bolt, 3/8"-16 x 1-1/2" Carriage
6	04040-05	Washer, 3/8” SAE Gr8
7	04021-09	Nut, 3/8"-16 Nyloc Gr8
8	488815	Pin, Bent Hitch 1/2” x 3.0”

GAUGE WHEEL



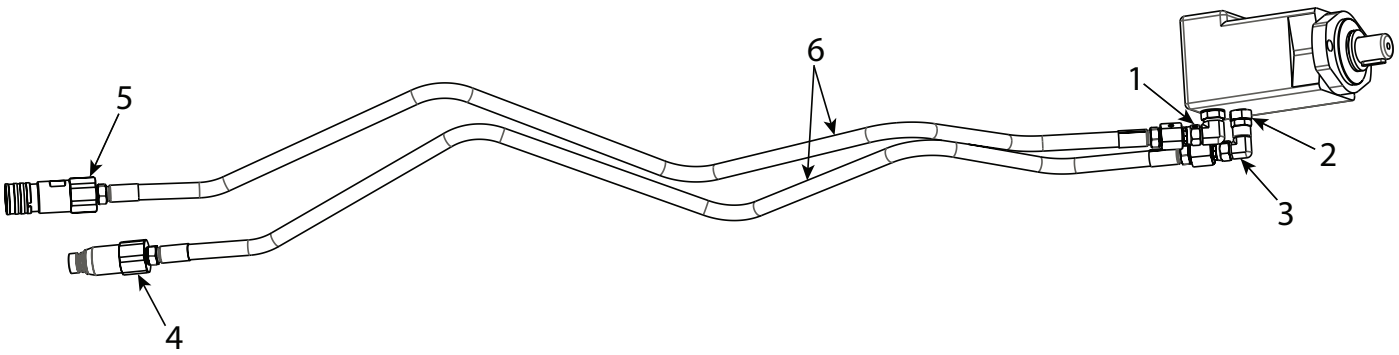
Ref. No.	Part No.	Description
1	431396	Spacer, 1-1/2” Gauge Wheel
2	453824	Yoke, Gauge Wheel Single
3	453828	Arm, Gauge Wheel Fixed
4	04001-185	Bolt, 1/2”-13 x 2.0” HHCS Gr8
5	488854	Bolt, 1”-8 x 8.0” HHCS Gr8
6	04021-35	Nut, 1/2”-13 Nyloc Gr8
7	04021-36	Nut, 1”-8 Nyloc Gr8
8	04040-07	Washer, 1/2”, SAE Gr8
9	04042-05	Washer, 1” x 2.0” SAE Gr8
10	488814	Pin, Lynch 7/16” x 1-5/8”
11	48114-04	Grease Fitting 1/4”-28 Straight
12	488817	Wheel, 4 x 8 Laminated
13	431400	Bushing, Oilite

MOUNT



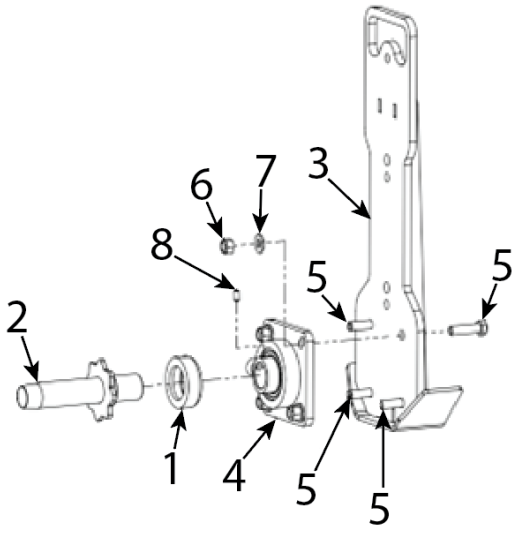
Ref. No.	Part No.	Description
1	431397	Pivot Bushing, 3/4”
2	463790	Mount Assy, Universal Mini
3	488853	Bolt, 5/16”-18 x 1/2” Anti Vibe
4	488855	Bolt, 3/4"-10 x 6-1/2" HHCS Gr8
5	04021-37	Nut, 3/4”-10 Nyloc Gr8
6	04040-21	Washer, 3/4” x 1.469” SAE Gr8
7	488813	Pin, Drawbar 3/4” x 6-1/4”
8	488816	Manual Canister

HYDRAULIC HOSES



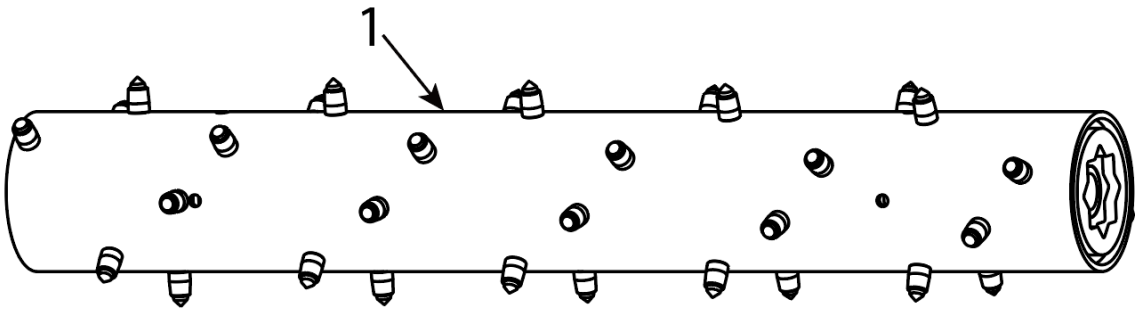
Ref. No.	Part No.	Description
1	487432-03	Fitting, 8 JICM to 10 ORBM 90 Deg
2	487432-02	Fitting, 8 JICM to 10 ORBM
3	488820	Fitting, 8 JICM to 8 JICF 90 SW
4	488823	Plug Male FF, 1/2” 1/2” NPTF F
5	488824	Coupler Female FF, 1/2” 1/2” NPTF F
6	488825	Hose, 1/2” 8JIC F - 8MP, 66"

IDLER LEG



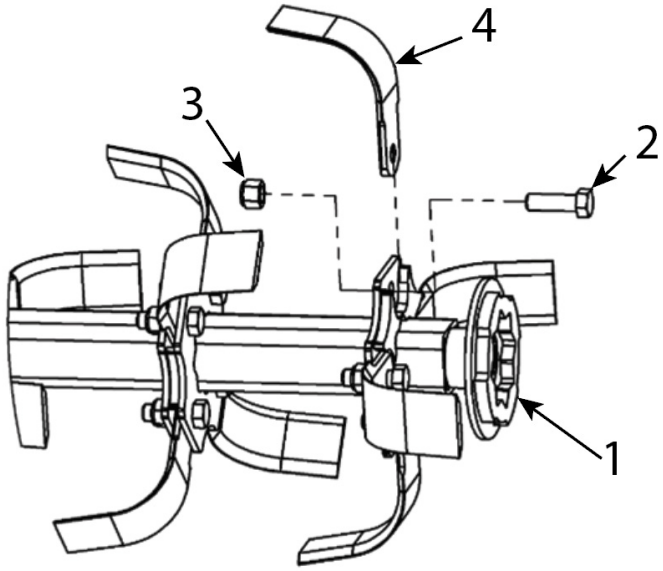
Ref. No.	Part No.	Description
1	431398	Guard, 1-1/2” Bearing
2	453826	Shaft, Coupler Idler
3	453831	Idler Leg, 1-1/2”
4	463791	Bearing Assy, 80mm 1-1/2” 4 Blt
5	04001-185	Bolt, 1/2"-13 x 2.0 HHCS Gr8
6	04021-35	Nut, 1/2"-13 Nyloc Gr8
7	04040-07	Washer, 1/2" SAE Gr8
8	488857	Set Screw, 5/16"-24 x 5/8" Knurled Cup Point

4' STANDARD ROTOR



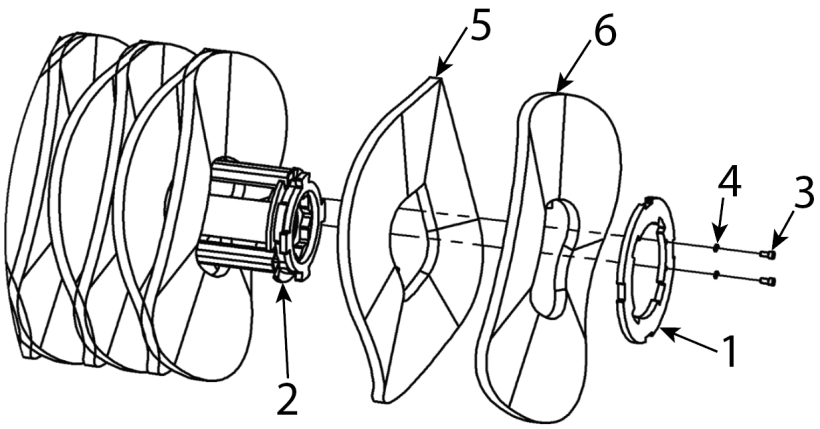
Ref. No.	Part No.	Description
1	488912	Standard Tool Rotor, 4'

4' TILLER ROTOR



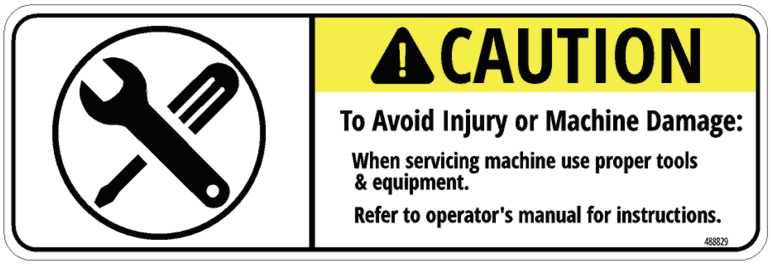
Ref. No.	Part No.	Description
1	453834	Tiller Rotor Wlmt
2	488858	Bolt, 5/8”-11 x 2” HHCS Gr8
3	04021-32	Nut, 5/8”-11 Nyloc Gr8
4	488812	Tine, Dual Edge Tiller

4' BROOM ROTOR



Ref. No.	Part No.	Description
1	4201623	Sweeper Wafer Clamp
2	453835	Wafer Carrier Wlmt
3	04015-10	Bolt, 1/4”-20 x .50” SHCS
4	488859	Washer, 1/4" Split Lock Socket
5	488840	6-3/8” – 18 Poly Wafer
6	488839	6-3/8” – 18 Wire Wafer

REPLACEMENT DECALS



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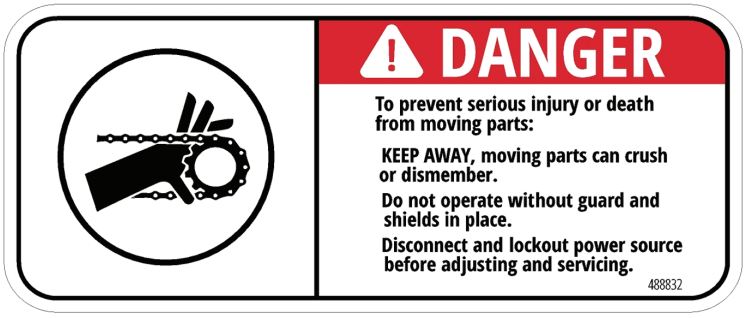

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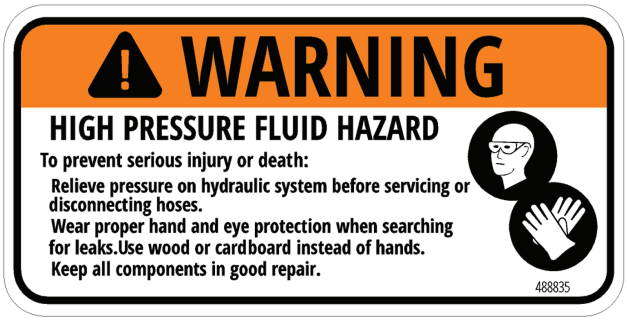
488834



488835

488837

488836

REPLACEMENT DECALS

Ref. No.	Part No.	Description
1	488829	Decal, Avoid Injury or Damage
2	488830	Decal, Stand Back 50 Feet
3	488831	Decal, Thrown Object
4	488832	Decal, Moving Parts
5	488833	Decal, Hands and Feet
6	488834	Decal, Rotating Parts
7	488835	Decal, High Pressure Fluid
8	488836	Decal, Understand Operation
9	488837	Decal, Operator's Manual

LIMITED WARRANTY - ATTACHMENTS

Any part of the attachment manufactured by Metalcraft of Mayville and found, in the reasonable judgment of Metalcraft of Mayville, to be defective in materials or workmanship, will be repaired or replaced by an Authorized Service Dealer without charge for parts and labor during the periods specified below. This warranty is limited to the original purchaser and is not transferable. Proof of purchase will be required by the dealer to substantiate any sole warranty and claims. All warranty work must be performed by an Authorized Service Dealer.

This expressed implied warranty is limited to the following specified periods from the date of the original registered retail purchase for defects in materials or workmanship:

- Wear items including but not limited to: blades, cutting edges, teeth, bushings, pins, hoses, belts, chains, ground contacting components and abrasion wear are not included in this warranty.
- Frame and structural components are warranted for one (1) year (parts and labor). Bent frames and/or couplers are not covered under this warranty. The repair or replacement of the attachment will be at the discretion of Metalcraft of Mayville. We reserve the right to request components for evaluation. This warranty does not cover any product that has been subject to misuse, abuse, neglect, negligence, an accident, or that as been operated in any way contrary to the operating instructions as specified in the Operator's Manual.

The attachment, including any defective part must be returned to an Authorized Service Dealer within the warranty period. The expense of delivering the attachment to the dealer for warranty work and the expense of returning it to the owner after repair will be paid for by the owner. Metalcraft of Mayville's responsibility is limited to making the required repairs and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale of any Metalcraft of Mayville product.

This warranty does not cover any product that has been subject to misuse, abuse, neglect, negligence, or accident, or damage or deterioration due to normal use or that has been operated in any way contrary to the operating instructions as specified in the Operator's Manual. The warranty does not apply to any damage to any attachment that is the result of improper maintenance or to any attachment or parts that have not been assembled or installed as specified in the Operator's Manual. The warranty does not cover any attachment that has been altered or modified, changing performance or durability. In addition, the warranty does not extend to repairs made necessary by normal wear, to items subject to abrasion wear, or by the use of parts or accessories which, in the reasonable judgment of Metalcraft of Mayville, are either incompatible with the attachment or adversely affect its operation, performance or durability.

Metalcraft of Mayville reserves the right to change or improve the design of any product without assuming any obligation to modify any product previously manufactured. All other implied warranties for this attachment are limited in duration to the one (1) year warranty period or ninety (90) days for attachments used for rental purposes. Accordingly, any such implied warranties including merchantability, fitness for a particular purpose, or otherwise, are disclaimed in their entirety after the expiration of the appropriate warranty period. Metalcraft of Mayville's obligation under this warranty is strictly and exclusively limited to the repair or replacement of defective parts and Metalcraft of Mayville does not assume or authorize anyone to assume for them any other obligation. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Metalcraft of Mayville assumes no responsibility for incidental, consequential or other damages including, but not limited to, expense for fuel, expense of delivering the attachment to an Authorized Service Dealer and expense of returning it to the owner, mechanic's travel time, telephone or telegram charges, rental of a like product during the time warranty repairs are being performed, travel, loss or damage to personal property, loss of revenue, loss of use, loss of time or inconvenience. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.