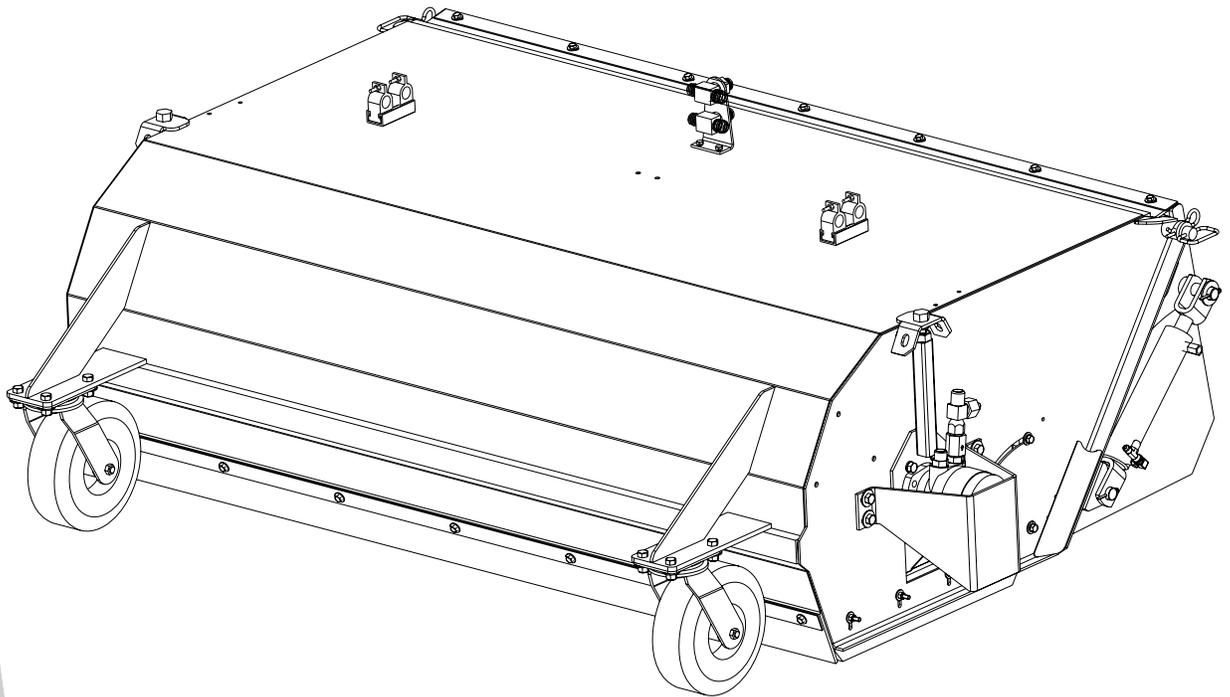


# OPERATOR'S MANUAL

## Model LLB

### Hydraulic Pickup Broom



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# INTRODUCTION

## OPERATOR'S MANUAL

You must read, understand and comply with all the safety and operating instructions in this manual before attempting to set-up and operate the Model LB Broom.

Failure to comply with the safety and operating instructions can result in loss of machine control, serious personal injury to you and/or bystanders, and risk of equipment and property damage.

## IDENTIFICATION NUMBERS

When contacting your authorized dealer for information, replacement parts or service, you **MUST** have the model and serial number of your unit.

Record the serial number in the space provided. The serial number plate/decals can be found in the location shown in Figure 1.

Model Name/Number:	LLB	
Date Purchased:	Serial #:	

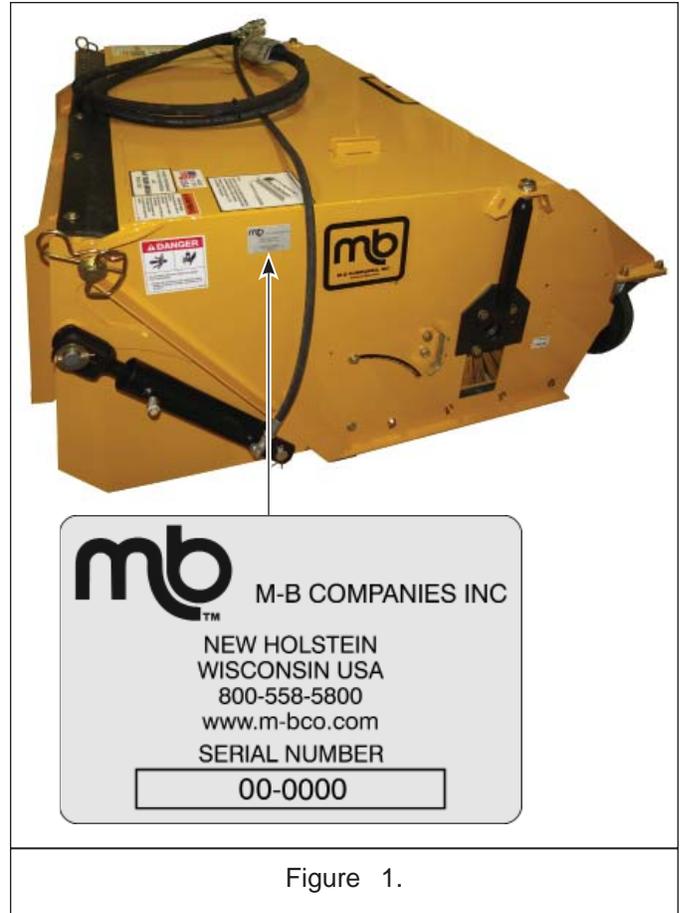


Figure 1.

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# SAFETY

## SAFETY ALERTS

Signal words and alert symbols notify of important safety precautions.

### DANGER!



Indicates a hazardous situation which, if not avoided, will result in serious injury or death.

### WARNING!



Indicates a hazardous situation which, if not avoided, could result in serious injury or death.

### CAUTION!



Indicates a hazardous situation or unsafe practice which, if not avoided, could result in minor or moderate injury or property damage.

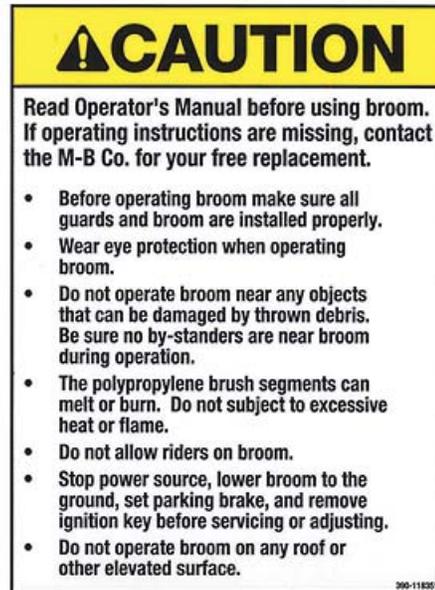
## SAFETY DECALS

Although reading this manual and the safety instructions it contains will provide you with the necessary basic knowledge to operate this equipment safely and effectively, we have placed several safety labels on the unit to remind you of this important information while you are operating your unit.

All DANGER, WARNING, CAUTION, and instructional messages on your unit should be carefully read and obeyed. Bodily injury can result when these instructions are not followed. The information is for your safety and it is important.

These labels will act as a constant visual reminder to you, and others who may use the equipment, to follow the safety instructions necessary for safe, effective operation.

If any of these labels are lost or damaged, replace them at once. See your local dealer for replacements.



## PRE-START GUIDELINES

- Install any covers or guards which may have been removed for shipping purposes.
- Before starting equipment, walk around equipment, making a visual inspection that all safety devices are properly installed and secured.
- Check that all hardware, fasteners, hydraulic fittings, etc. are in good condition and properly fastened. Replace any fatigued or damaged items with proper replacements.
- Personnel who are not required to be in the work area should be kept away. Never start the equipment unless you are absolutely certain that everyone in the area is clear of the machine and aware it is being started.
- Follow the manufacturer's recommended start-up procedure.

## OPERATION GUIDELINES

Read, understand and follow all instructions in the manual and on the unit before starting.

- To avoid serious injury or death, do not modify equipment. Any modifications made to equipment can be dangerous and can void equipment warranty.
- Never defeat a safety device to make a task easier.
- Always wear proper apparel when operating equipment; safety glasses, face shield or goggles, ear protection, and dust mask. Tie hair back. Never wear loose clothing or jewelry that could get caught in moving parts.
- Never operate equipment with covers or guards removed. Rotating parts can cause severe injury. Keep hands, feet, hair, jewelry and clothing away from all moving parts.
- Only allow responsible adults who are familiar with the instructions, to operate the unit (local regulations can restrict operator age).
- Clear the area of objects such as rocks, toys, wire, etc., which could be picked up and thrown.
- Be aware of surroundings. Be sure the area is clear of other people, bystanders or pets. Stop unit if anyone enters the area.
- Always look down and behind before and while traveling in reverse.
- Be aware of discharge direction and do not point discharge at anyone. Do not point the discharge at glass enclosures, automobiles, or windows.

# SAFETY

- Always stand clear of the discharge area when operating this unit.
- Disengage all clutches and PTO's before starting engine.
- Never leave a running machine unattended. Always disengage the attachment and drive/traction controls, lower the attachment, set the park brake, stop the engine and remove the ignition key before leaving the machine.
- Operate only in daylight or good artificial light.
- Never carry passengers.
- Do not operate the unit while under the influence of drugs, alcohol or other medication.
- Watch for traffic when operating near or crossing roadways.
- Use extra care when loading or unloading the unit into a trailer or truck.
- Keep in mind the operator is responsible for accidents occurring to other people or property.
- Data indicates that operators, age 60 years and above, are involved in a large percentage of power equipment-related injuries. These operators should evaluate their ability to operate the unit safely enough to protect themselves and others from injury.
- All operators should seek and obtain professional and practical instruction.
- Protect eyes, face and head from objects that may be thrown from unit. Wear appropriate hearing protection.
- Always wear substantial footwear and appropriate clothing. Wear footwear that improves traction on slippery slopes. DO NOT wear long scarves or loose clothing that could become entangled in moving parts.
- Abnormal vibrations are a warning of trouble. Striking a foreign object can damage unit. Stop unit and engine. Wait for all moving parts to stop. Inspect unit and make any necessary repairs before restart.
- Never place your hands or any part of your body or clothing inside or near any moving part while unit is running.
- Stop engine before: refueling, cleaning, making adjustments or removing the attachment assembly.
- Follow the drive unit manufacturer's recommendations for wheel weights or counter weights.
- Make any adjustments before operating unit.
- Do not touch parts which may be hot from operation. Allow such parts to cool before attempting to service the unit.
- Before using, always visually check that hardware is present, intact and secure. Replace worn or damaged parts.
- Never operate the machine with damaged guards, or without safety protective devices in place.
- Follow the drive unit manufacturer's recommendations for towing weight restrictions and procedures.
- Original purchaser of this unit was instructed by the seller on safe and proper operation. If unit is to be used by someone other than original purchaser; loaned, rented or sold, ALWAYS provide this manual and any needed safety training before operation.
- The Operator must understand the functions and parameters of all controls and how to operate, as well as how to STOP in an Emergency.

NOTE: All reference to left, right, front, or rear are given from the operator position and facing forward.

## MAINTENANCE GUIDELINES

- Maintain or replace safety and instruction decals/labels as necessary.
- Never run a unit in an enclosed area.
- Keep nuts and bolts tight and keep equipment in good condition
- Never tamper with safety devices. Check their proper operation regularly and make necessary repairs if they are not functioning properly.
- Keep unit free of debris and build-up. Clean up any oil spillage.
- For engine equipped models, never make adjustments or repairs with the engine running unless specified otherwise in the engine manufacturer's manual.
- Components are subject to wear, damage, and deterioration. Frequently check components and replace with the manufacturer's recommended parts, when necessary.
- Check control operation frequently. Adjust and service as necessary.
- Use only factory authorized parts when making repairs.
- Always comply with factory specifications on all settings and adjustments.
- Only authorized service locations should be utilized for major service and repair requirements.
- Never attempt to make your own repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment damage and voiding the manufacturer's warranty.
- Stop engine on drive unit and set parking brake before performing any adjustments on the machinery.
- Do not disassemble a pressurized system unless properly trained and equipped with adequate tooling.
- Escaping hydraulic fluid under pressure can have sufficient force to penetrate the skin, causing serious injury. Before operation, be sure that all hydraulic connections are tight and hoses are not damaged. Relieve pressure in system before making adjustments.
- NEVER search for hydraulic leaks with only your hands. Use cardboard or a piece of wood.
- Oils and fluids can be very hot under pressure. Use caution and allow the system to cool before beginning maintenance work.
- Never operate or pressurize one of these systems with worn or damaged components. Replace hoses, fittings, valves or other components which appear defective.
- Never adjust pressurized systems beyond recommended levels to achieve higher operating pressures.
- For engine equipped models, follow specific engine manufacturer's recommended service intervals for dirty/dusty environments.

# INSTALLATION

## GENERAL

Depending upon the type of loader/tractor, the broom may or may not be equipped with support chains. The chains connect the broom housing (frame) to the loader/tractor lift arms and set the broom ground clearance with the lift arms fully down. As the lift arms are raised and the hopper (bucket) tilted downward, the chains limit the broom housing movement, causing the broom to open for debris dumping. See Figure 1.



Figure 1

If the loader/tractor lift arms are not equipped with chain mounting points, the broom is usually equipped with hydraulic cylinders in place of chains. With the lift arms raised, the cylinders are extended to raise the broom housing, opening the broom for debris dumping. The cylinders retract by gravity to close the broom. See Figure 2.

## INSTALLATION

The broom may be shipped partially disassembled to conserve shipping space and to package securely to reduce the possibility of damage in transit.

1. Remove all components from the shipping crate and place in a secure location.

**NOTE:** Refer to the Assembly Drawing, included after the Parts List section of this manual, to identify applicable parts.



Figure 2

2. The broom is equipped with the mounting system designated for your loader or tractor. The broom's mount will attach in a manner similar to your loader/tractor's bucket or other attachment.

**IMPORTANT!** It is important to make sure the locking mechanism on your quick attach is engaged properly, locking the broom securely onto the loader/tractor.

There must be a minimum of a 1" gap between the ground and the hopper cutting edge. Refer to the **SETUP AND ADJUSTMENTS** instruction.

3. If equipped with support chains, connect chains from broom to mounting points on loader/tractor lift arms. (Figure 1) Adjust chains to equal lengths so the broom sits level on its casters with the necessary 1" gap at the cutting edge.

**IMPORTANT!** Do not allow the hopper or its cutting edge to contact the ground during operation or premature wear will result.

**NOTE:** Ensure hydraulic hose connectors are clean and free of debris before making connections.

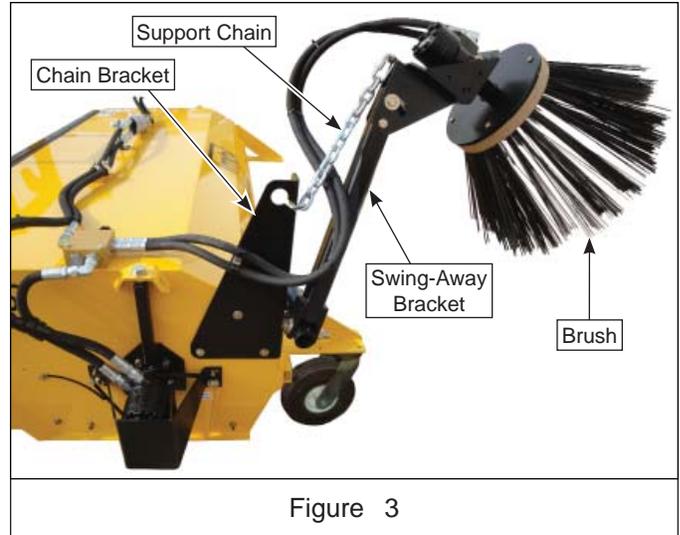
4. With the loader/tractor's auxiliary hydraulic system turned off, connect the broom's two hydraulic hoses to the proper couplers on the loader/tractor.

The optional curb/gutter broom is mounted on swing-away bracket assembly. The brush uses flat, wire bristles. Its hydraulic drive motor is adjustable with a flow control to provide variable speed, independent of the main brush. If provided with two curb/gutter brooms, both are plumbed in series to the single flow control.

# INSTALLATION

5. If so equipped, detach the support chain from bracket and lower curb/gutter broom. Remove chain from swing-away bracket. See Figure 3.

When the loader/tractor auxiliary hydraulics are activated, the main brush must rotate over the top, discharging debris back into the hopper (bucket). If the broom rotates in the opposite direction, switch the hose connections at the loader/tractor.



# OPERATION

## PRE-START CHECKS

**IMPORTANT!** You must read, understand and comply with all the safety and operating instructions in this manual before attempting to set-up and operate your power broom.

Failure to comply with the safety and operating instructions can result in loss of machine control, serious personal injury to you and/or bystanders, and risk of equipment and property damage.

1. Visually inspect equipment and hardware to ensure that all parts are secure and all hardware is tightened and secure.
2. Check for oil leaks and loose hose connections.
3. Inspect the broom adjustments to ensure that the broom is level, there is proper brush pattern, and the internal deflector position is properly set. Refer to the **SETUP AND ADJUSTMENT** section of this manual for complete information.
4. Inspect the bristle length to determine if replacement segments are needed.

## OPERATION

**CAUTION!** **DO NOT scrape with the hopper (bucket) while sweeping. It is for debris collection only and will wear prematurely if used for scraping. Never operate broom with hopper less than 1" from the ground.**

**IMPORTANT!** DO NOT operate the broom in the raised position for extended periods of time. While lifting the broom is acceptable to either clear an object or when reversing the loader/tractor, it is recommended that you stop broom rotation if raising the broom for transporting.

- Sweep at a speed that is appropriate for the conditions and location.

**NOTE:** The front caster wheels support the broom while following ground contours.

- For heavy material such as gravel or stones, drive more slowly with a higher broom rotation speed. For lighter material, drive faster with a lower broom rotation speed.
- It may be necessary to increase broom contact pattern under some conditions. If the surface being swept is uneven and causes the broom to leave upswept patches, increase the pattern size to compensate.
- If the material being swept is dried-on or difficult to remove, such as mud or ice, it may be necessary to drive extremely slow to allow the broom to "scrub" the surface.
- Decrease the loader/tractor's engine speed (rpm) before stopping the hydraulic flow to the broom.
- Using the loader/tractor controls, raise the broom above the dump site or container and depending upon broom configuration, tilt hopper downward or extend its actuation cylinders to open broom and dump debris.

Depending upon the type of loader/tractor, the broom may or may not be equipped with support chains. The chains connect the broom housing (frame) to the loader/tractor lift arms and set the broom ground clearance with the lift arms fully down. As the lift arms are raised and the hopper (bucket) tilted downward, the chains limit the broom housing movement, causing the broom to open for debris dumping. See Figure 1.



Figure 1

If the loader/tractor lift arms are not equipped with chain mounting points, the broom is usually equipped with hydraulic cylinders in place of chains. With the lift arms raised, the cylinders are extended to raise the broom housing, opening the broom for debris dumping. The cylinders retract by gravity to close the broom. See Figure 2.



Figure 2

# OPERATION

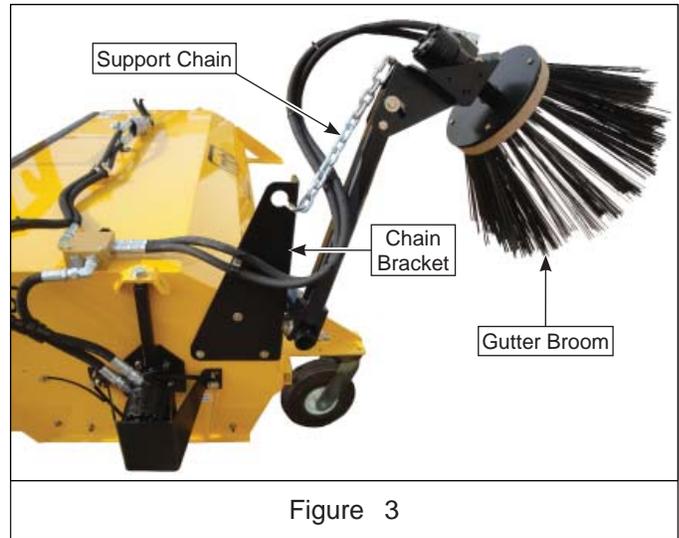
## TRAVEL PROCEDURE

Follow these instructions for extended travel (i.e. to and from the sweeping site):

1. Set loader/tractor's broom rotation control to the OFF position.
2. If so equipped, lift the curb/gutter broom, attach support chain and lock chain into bracket to hold broom in place. See Figure 3.

**DANGER!** Avoid electrical shock. Stay clear of overhead wires and power lines.

3. Use the loader/tractor's lift control to raise the broom a safe distance from the ground while still allowing an unobstructed view.



# SETUP AND ADJUSTMENTS

## SETUP

Depending upon the type of loader/tractor, the broom may or may not be equipped with support chains. The chains connect the broom housing (frame) to the loader/tractor lift arms and set the broom ground clearance with the lift arms fully down. As the lift arms are raised and the hopper (bucket) tilted downward, the chains limit the broom housing movement, causing the broom to open for debris dumping. See Figure 1.

If the loader/tractor lift arms are not equipped with chain mounting points, the broom is usually equipped with hydraulic cylinders in place of chains. With the lift arms raised, the cylinders are extended to raise the broom housing, opening the broom for debris dumping. The cylinders retract by gravity to close the broom. See Figure 2.

Proper setup and adjustment of the broom will increase the life of the brush and produces more efficient movement of material. Visually inspect the broom before each operating session and measure the adjustments once every 10 hours.

The following procedures must be followed in the prescribed sequence in order to be effective.

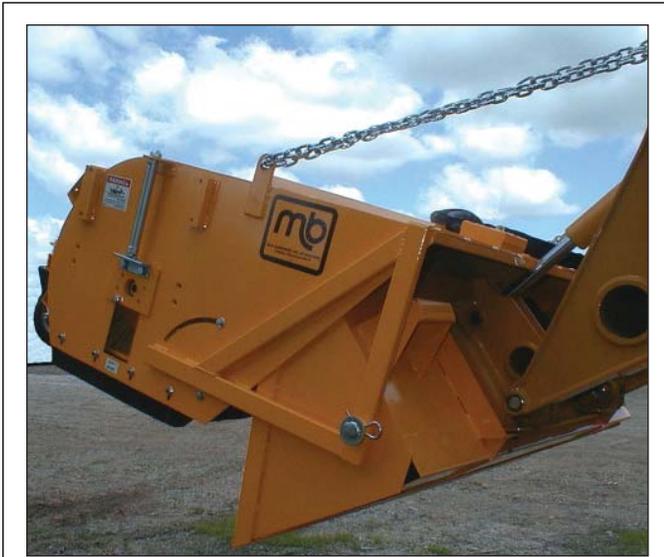


Figure 1



## LEVELING

See Figures 1 through 3.

1. After the broom is mounted to the prime mover (skid-steer or loader), park the unit on a flat level surface; preferably concrete or asphalt.
2. Lower the lift arms all the way down.
3. Tilt the quick-attach or bucket cylinders as necessary so the casters contact the ground. If there is a way to set this location on the prime mover hydraulics, do so at this time.

**NOTE:** There must be a minimum of a 1" gap between the ground and the hopper cutting edge. See Figure 3.

4. Adjust the height of the broom housing wear shoes until the broom is level side-to-side. Loosen the (4) 5/16"-18 lock nuts on each wear shoe to adjust it in the vertical slots in the broom housing. See Figure 2.

**IMPORTANT!** Do not allow the hopper or its cutting edge to contact the ground during operation or premature wear will result.

5. If equipped with support chains, adjust chains to equal lengths so the broom sits level on its casters and wear shoes with the necessary 1" gap at the hopper cutting edge.
6. Check and adjust the brush pattern.

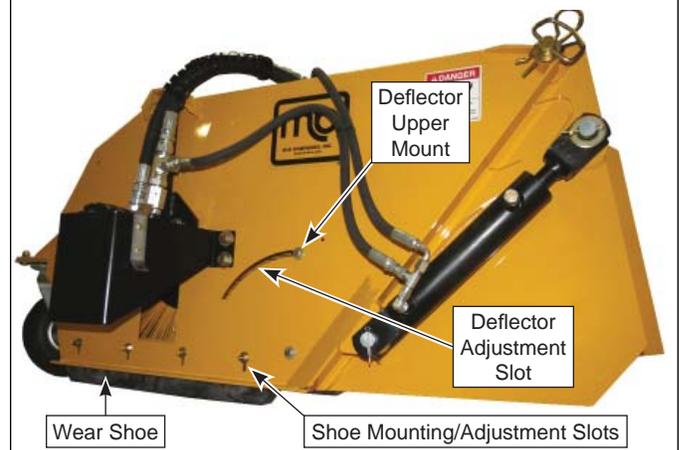


Figure 2

# SETUP AND ADJUSTMENTS

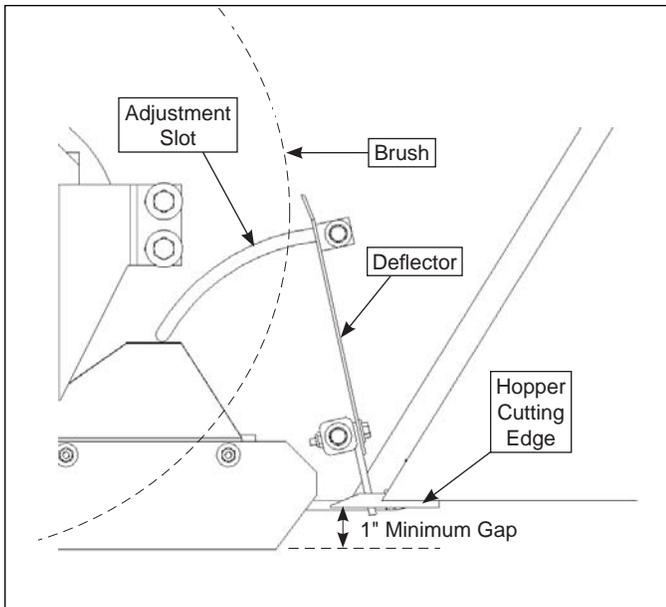


Figure 3

## PATTERN ADJUSTMENT

1. After the broom has been leveled front to back, set the brush pattern (swept area).
2. With the unit on a flat level surface, run the unit for about 30 seconds in the down position while stationary. Stop the broom and back the unit away. The 'cleaned' (contact patch) should be 2"-4" wide, front to rear, for the entire length of the broom. See Figure 4.
3. If the brush contact patch is not approximately 3" wide, or varies in width from end to end, brush height adjustment is necessary.

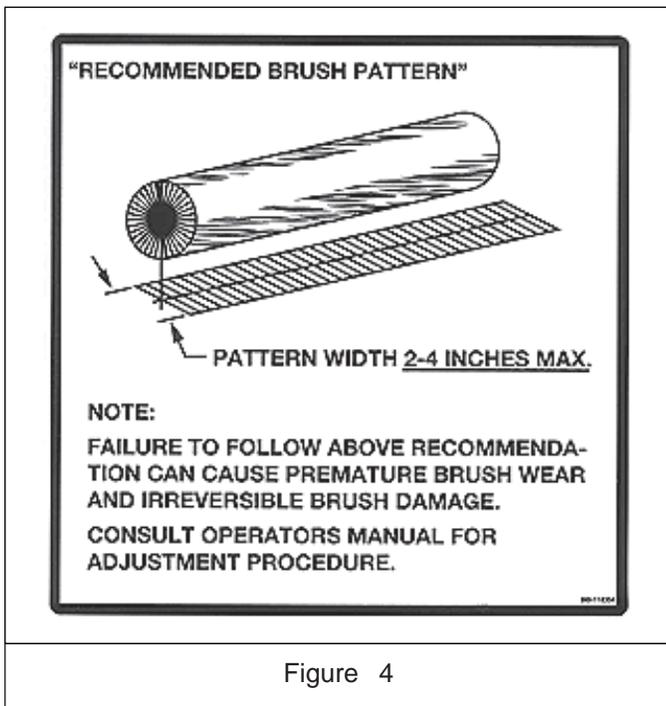


Figure 4

NOTE: The brush may create too heavy a pattern on either the left or right side if the support chains are not the same length.

4. If so equipped, verify chain lengths are equal. If necessary, adjust chain lengths.

NOTE: Splined hubs are mounted to each end of the brush core and are supported in bearings mounted indirectly to the brush height adjustment brackets. The brush drive motor(s), mounted directly to the outside of the brush height adjustment brackets, mate with the splined hubs.

5. Raise the broom slightly to create a small gap between the brush and ground.

NOTE: Only one side may require height adjustment to level the brush.

6. Loosen the adjustment jam nut(s) away from the broom housing. See Figure 5.

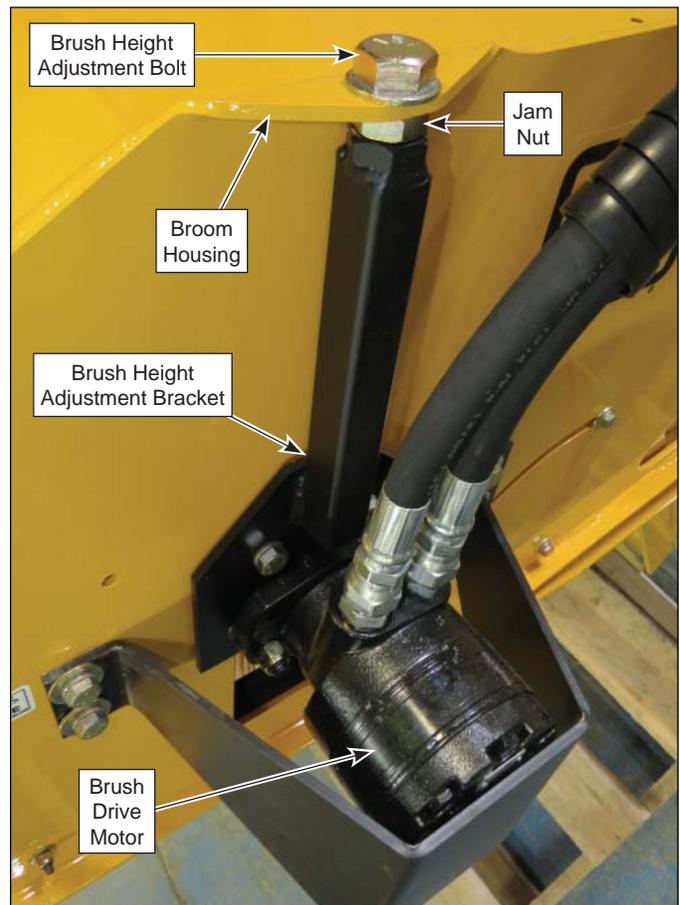


Figure 5

7. Adjust the brush height until the gap between the brush and the ground is equal for the entire length of the brush.

Turn the height adjustment bolt(s) counterclockwise (CCW) to push the brush height adjustment brackets down, lowering the brush. Turn the height adjustment bolt(s) clockwise (CW) to pull the brush height adjustment brackets up, raising the brush.

8. Tighten the adjustment jam nut(s) against from the broom housing.
9. If necessary, adjust the internal deflector position.

# SETUP AND ADJUSTMENTS

## DEFLECTOR ADJUSTMENT

The deflector is mounted inside the broom housing, to the rear of the brush. It deflects debris from the brush into the hopper. The position of the deflector must be kept near the brush and must be adjusted as the brush wears. The broom must be leveled and the brush pattern (swept area) set before adjusting the deflector position. See Figure 6.

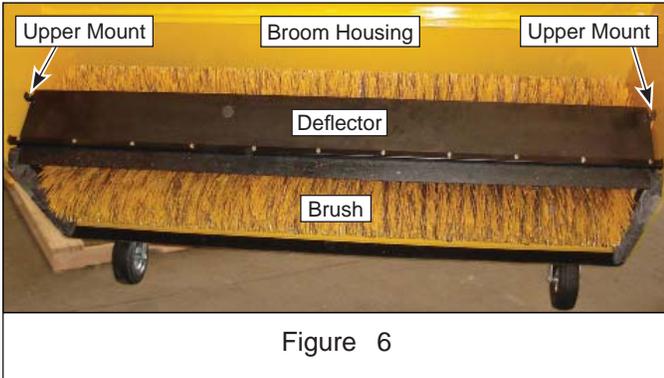


Figure 6

1. Loosen the deflector upper mounting bolt on each side of the broom housing. See Figures 2 and 3.

NOTE: The deflector upper mounting bolts ride in curved slots in the sides of the broom housing.

2. Tip the deflector toward the brush until very close, keeping deflector from contacting bristles. The deflector position can be seen through the curved slots in the sides of the broom housing.
3. Tighten the deflector mounting bolt on each side of the broom housing.

Once the broom has been properly adjusted, a short operation period is recommended for break-in; approximately 15 minutes. After this break-in period, verify that the broom is level and the pattern adjustment is correct.

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# MAINTENANCE

## MAINTENANCE SCHEDULE

- Check adjustments – every 10 hours.
- Grease bearings – after initial 10 hours, then every 100 - 200 hours thereafter.
- Grease pivot points – every 50 hours.

NOTE: Grease points are noted with an applicable decal.



- Replace brush filler – as needed.

## LUBRICATION

- Grease bearings and pivot points per the MAINTENANCE SCHEDULE using Chevron Ultra Duty II, Grade 2; or equivalent high-temp grease.
- Grease points on the unit include (2) on the brush end support bearings and (4) on caster wheel pivot mounts and axle shafts.
- Use an ISO 32 or greater hydraulic fluid, dependant upon operating temperatures, for M-B supplied independent hydraulic systems. If the oil is supplied by the prime mover, use the prime mover manufacturer's recommended fluid.

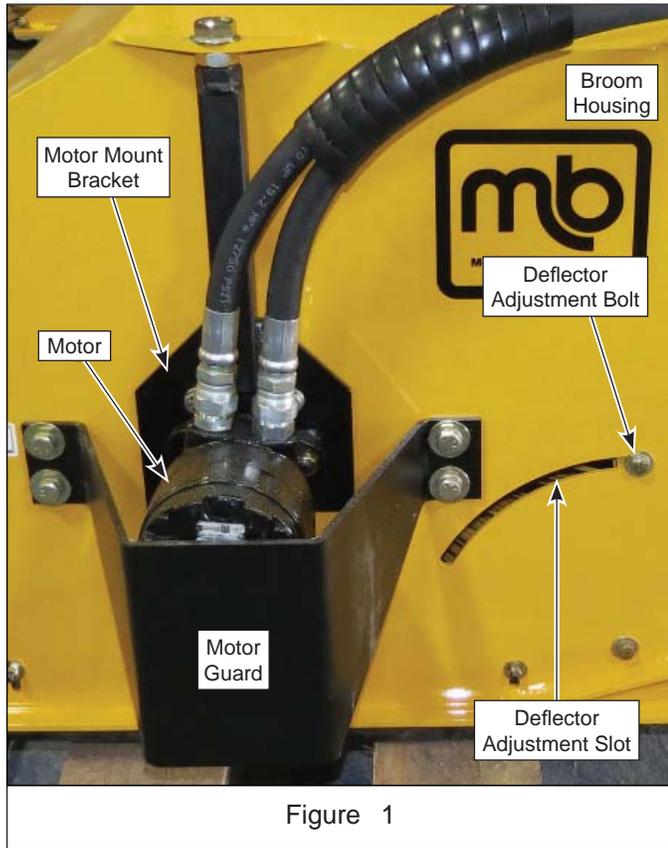


Figure 1

## FILLER REPLACEMENT

### Brush Removal

1. Lower broom until brush contacts the ground.

NOTE: Steps 2 and 3 apply to end with brush drive motor, whether broom is single or dual motor drive.

2. Remove (4) 1/2-13 x 1-1/4" hex head capscrews, flat washers and motor guard from broom housing. Retain guard and mounting hardware. See Figure 1.
3. Remove (2) 1/2"-13 lock nuts and motor from mount bracket. Slide motor out of mating splined hub. Let motor hang on hoses. Retain mounting hardware. See Figure 2.

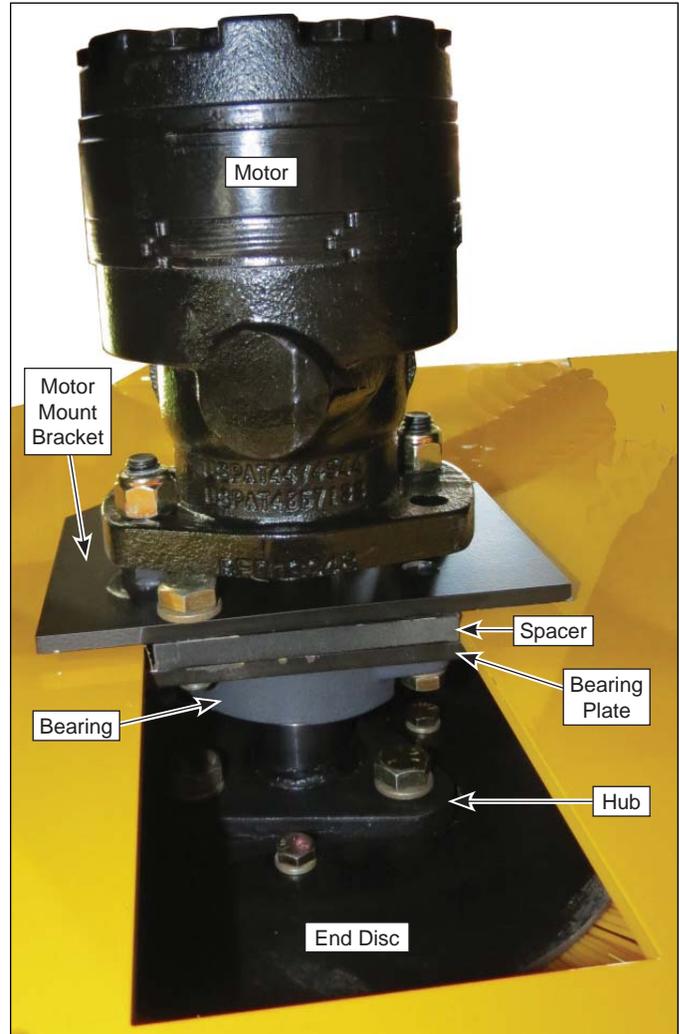


Figure 2 (Bottom View)

4. On both sides of broom, remove (3) 1/2-13 x 1" hex head capscrews and lock washers attaching outer mount bracket to inner bearing plate. Spacer will fall free when capscrews are removed. See Figure 3.
5. Lift broom to slide brush out the bottom.

# MAINTENANCE



Figure 3

## Bristle Removal

1. On one end of core, loosen bearing setscrew(s) and slide support bearing with plate off hub.
2. Remove (3) 1/2-13 x 1" capscrews, lock washers and splined hub from end of core. Retain hub and mounting hardware. See Figures 2 and 3.
3. Remove (3) 5/16-18 x 3/4" capscrews, lock washers and end disc (wafer retainer plate) from end of core. Retain end disc and mounting hardware. See Figures 2 and 3.
4. Slide spent brush wafers and spacers off core and discard.

## Bristle Installation

**IMPORTANT!** Proper wafer and spacer position must be followed to ensure proper balance on the core.

1. Stand core in upright position and begin filling by sliding a brush wafer and then a spacer down the full length of the core.
  - a. Note the location of the drive pin on the inside ring of each brush wafer. Position each wafer so its drive pin is positioned between the stop flanges. Rotate each subsequent wafer before installing so the position of its pin is staggered on the core by one stop flange. See Figure 4.

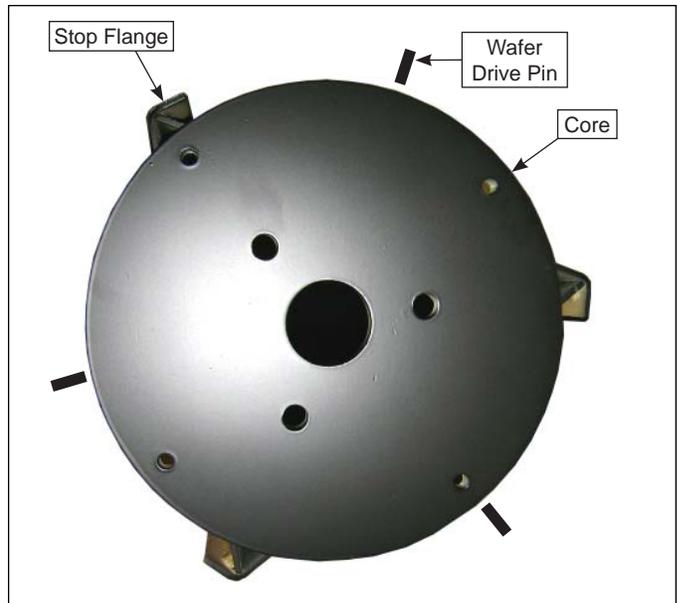


Figure 4

**NOTE:** Brush surface contact during initial operation will set all wafer drive pins up against the core stop flanges. See Figure 5.

- b. The circular spacers have unconnected, overlapped ends. Position the overlap of the first spacer between the stop flanges, rotated one flange ahead of the drive pin location of the immediately preceding brush wafer. All subsequent spacers must follow the same staggered placement pattern.
3. Continue stacking the core in a wafer-spacer, wafer-spacer configuration until it is full, ending with a brush wafer.

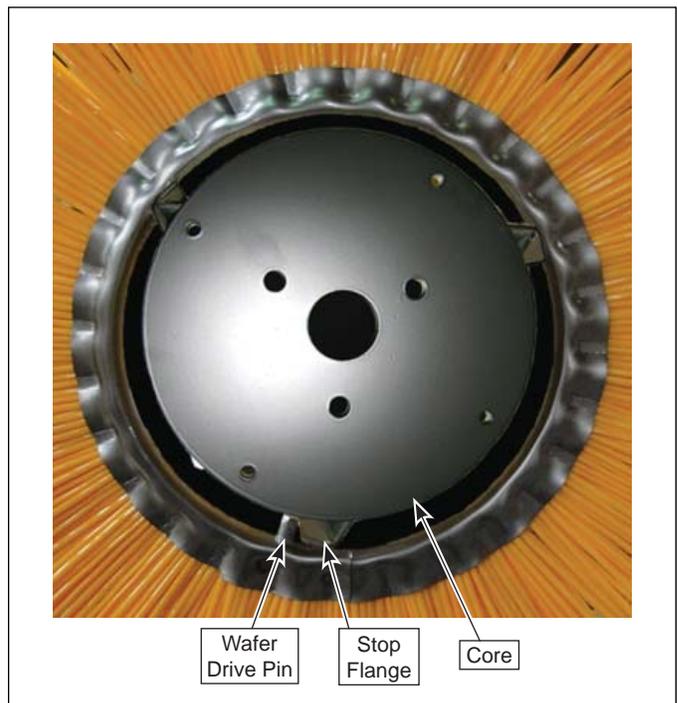


Figure 5

# MAINTENANCE

**NOTE:** Always start and finish with a brush wafer. The last wafer should actually extend beyond the end of the core (Minimum 1/2") so the end disc compresses the spacers onto the core when tightened.

4. Install end disc on core with original hardware. See Figures 2 and 3.
5. Install splined hub on core with original hardware. See Figures 2 and 3.
6. Install support bearing with plate onto hub. Do not tighten bearing setscrew(s) at this time.

## Brush Installation

1. Loosen the deflector upper mounting bolt on each side of the broom housing. See Figure 1.

**NOTE:** The deflector upper mounting bolts ride in curved slots in the sides of the broom housing.

2. Tip the deflector away from the brush position to create clearance. The deflector position can be seen through the curved slots in the sides of the broom housing.
3. Lift broom and position refilled brush below housing. Lower broom down over brush while guiding bearing plates into housing.
4. Align mounting holes in inner bearing plate with holes in outer mount bracket.
5. Insert spacer between inner plate and outer bracket so that all holes align. Install original (3) 1/2-13 x 1" hex head capscrews and lock washers to secure outer bracket and spacer to inner plate. See Figure 2.
6. Tighten setscrew(s) to lock support bearing onto hub.

**NOTE:** Steps 7 and 8 apply to end with brush drive motor, whether broom is single or dual motor drive.

Apply grease to hub splines before installing hydraulic motor(s).

7. Slide motor shaft into mating splined hub and secure motor to outer plate with (2) 1/2"-13 lock nuts. See Figure 2.
8. Install motor guard on broom housing with (4) 1/2-13 x 1-1/4" hex head capscrews and flat washers. See Figure 1.
9. Tip the deflector toward the brush until very close, keeping deflector from contacting bristles. The deflector position can be seen through the curved slots in the sides of the broom housing. See Figure 1.
10. Tighten the deflector mounting bolt on each side of the broom housing.
11. Perform the leveling and the pattern adjustment procedures before placing machine back into service. Refer to the **SETUP AND ADJUSTMENTS** section of the manual.

Once the broom has been properly adjusted, a short operation period is recommended for break-in; approximately 15 minutes. After this break-in period, verify that the broom is level and the pattern adjustment is correct.

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# STORAGE

## STORAGE

- Always store the broom in a supported position on blocks with the brush off the ground. If the bristles are stored in a deformed position for extended periods of time the broom will become severely out of balance.
- Store the broom in a location out of the sun and weather to prevent premature failure of plastic bristles. Bristles can become brittle when subjected to sunlight or repeated temperature changes.
- Connect couplers together to prevent contamination from entering hydraulic system.
- Disconnect all electrical connections between the broom and loader/tractor for extended storage to prevent battery drain.
- Properly clean the unit before storage and remove dirt, debris, salt, etc. to extend paint life.
- If the unit is power-washed, all lubrication points should be greased before storage.

# TROUBLESHOOTING

Trouble	Possible Cause	Remedy
Broom does not rotate.	<ol style="list-style-type: none"> <li>1. No/Low hydraulic pressure/flow.</li> <li>2. Hoses disconnected.</li> <li>3. Hoses bent or kinked.</li> <li>4. Air in hydraulic system.</li> <li>5. Worn or damaged broom motor(s).</li> <li>6. Brush support bearings worn or damaged.</li> <li>7. Brush contact area too large.</li> <li>8. Pressure relieving too low.</li> <li>9. Excessive system backpressure.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check loader/tractor operation. Check loader/tractor hydraulic oil level.</li> <li>2. Connect hoses and fittings.</li> <li>3. Remove sharp bends and kinks.</li> <li>4. Raise broom and operate auxiliary controls until air is bled from system.</li> <li>5. Repair or replace broom motor(s).</li> <li>6. Replace brush support bearings.</li> <li>7. Adjust brush pattern/contact area.</li> <li>8. Adjust relief valve.</li> <li>9. Check loader/tractor Operator's manual.</li> </ol>
Broom rotates in wrong direction.	<ol style="list-style-type: none"> <li>1. Hoses installed incorrectly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Switch hydraulic hose connections</li> </ol>
Bristles wearing unevenly.	<ol style="list-style-type: none"> <li>1. Broom not level side to side.</li> <li>2. Pattern adjustment not set.</li> <li>3. Tires on loader/tractor at different pressures or of different sizes.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check loader/tractor lift arms for level.</li> <li>2. Adjust brush height adjustment brackets.</li> <li>3. Check tire pressure, sizes and rating. Adjust and/or correct as necessary.</li> </ol>
Brushes wear very quickly.	<ol style="list-style-type: none"> <li>1. Brush pattern too wide.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust brush pattern to be 2-4" wide. Refer to the <b>Setup and Adjustments</b> section of this manual.</li> </ol>
Broom bounces during sweeping.	<ol style="list-style-type: none"> <li>1. Travel speed too fast and/or brush speed too slow.</li> <li>2. Bristles deformed by improper storage.</li> <li>3. Bent brush core.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust to find correct ground and brush speed for surface.</li> <li>2. Replace brush wafers.</li> <li>3. Replace core.</li> </ol>
Broom sweeping poorly.	<ol style="list-style-type: none"> <li>1. Material is 'caked-on' or frozen.</li> <li>2. Uneven sweeping surface.</li> <li>3. Material is too heavy.</li> <li>4. Broom rotating too slowly.</li> <li>5. Prime mover moving too fast.</li> </ol>	<ol style="list-style-type: none"> <li>1. Slow down and 'scrub' surface.</li> <li>2. Increase brush pattern.</li> <li>3. Slow down loader/tractor speed.</li> <li>4. Increase loader/tractor engine speed (rpm).</li> <li>5. Slow down loader/tractor speed.</li> </ol>
Hopper (bucket) does not open.	<ol style="list-style-type: none"> <li>1. Chains not equal in length or disconnected.</li> <li>2. No/Low hydraulic pressure/flow.</li> <li>3. Hoses disconnected.</li> <li>4. Hoses bent or kinked.</li> <li>5. Air in hydraulic system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect chains and adjust lengths to be equal.</li> <li>2. Check loader/tractor operation. Check loader/tractor hydraulic oil level.</li> <li>3. Connect hoses and fittings.</li> <li>4. Remove sharp bends and kinks.</li> <li>5. Raise broom and operate auxiliary controls until air is bled from system.</li> </ol>

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# SPECIFICATIONS

Model:	LLB			
Brush Diameter:	25"			
Brush Length:	7' (84")	8' (96")	9' (108")	10' (120")
Brush Drive:	<p>Standard is Single 18.3 c.i.d. Hydraulic Motor (for prime mover with 12 to 20 GPM)                      Low Flow Hydraulic Motor available (for prime mover with 8 to 11 GPM)</p> <p>(Note: Hoses are provided from broom motors to bulkhead fittings. Customer to provide hoses and couplers to connect prime mover hydraulics to bulkhead. Optional hose kit available. Does not include hydraulic valve(s) on prime mover. Brush on/off with prime mover valve unless supplied with optional Independent Hydraulic System (IHS).</p>			
Brush Speed:	200 RPM Maximum			
Brush Filament:	Poly (polypropylene), Wire (Steel), Alternating Poly and Wire, or Combo (Poly/Wire) Mix			
Lift Method:	Provided by prime mover.			
Hopper Dump:	Hydraulic			
Casters:	360° rotation of 17" pneumatic tires			
Broom Hood:	Covers 140° of brush circumference			
Options:	<p>Independent Hydraulic System (IHS):                      Required when the prime mover is not equipped with auxiliary hydraulics, or when the auxiliary hydraulics cannot supply 8 GPM at 2000 psi. Includes pump, relief valve, reservoir and hoses to broom.                      Pump may be rear-mounted on 540 rpm PTO.                      Tank may be mounted in rear on tractor 3-point hitch system, or in front on broom mounting frame.</p> <p>Mounting Frame with Pin-on Ears                      Quick Attach Frame with choice of ACS Pro or Caterpillar, JRB, FFC or Volvo Coupler                      No Mount                      Custom Mount Design by M-B (Applies to mounts not previously designed by MB.)</p> <p>Sprinkler System (45 or 150 Gallon):                      Provides dust control while sweeping. Includes tank, mounting, hoses, electric pump (12 or 24V), and broom hood-mounted spray bar with nozzles (unless specified otherwise). Customer provides tank mounting location.</p> <p>Single or Dual Gutter Broom                      Mounted on swing-away bracket assembly. Driven by independent hydraulic motor with adjustable flow control for variable speed, independent of main broom.</p> <p>Hose Kit and Couplers</p> <p>Sight Indicators</p>			

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# SERVICE PARTS

Part Number	Description
907-46662	Refill Kit, 32" x 7', Wafer, Poly
907-46663	Refill Kit, 32" x 7', Wafer, Alternating Poly/Wire
907-46664	Refill Kit, 32" x 7', Wafer, Wire
907-92097	Refill Kit, 32" x 7', Wafer, Poly/Wire Combo
907-46665	Refill Kit, 32" x 8', Wafer, Poly
907-46666	Refill Kit, 32" x 8', Wafer, Alternating Poly/Wire
907-46667	Refill Kit, 32" x 8', Wafer, Wire
907-92098	Refill Kit, 32" x 8', Wafer, Poly/Wire Combo
907-76909	Refill Kit, 32" x 9', Wafer, Poly
907-76910	Refill Kit, 32" x 9', Wafer, Alternating Poly/Wire
907-90593	Refill Kit, 32" x 9', Wafer, Wire
907-92099	Refill Kit, 32" x 9', Wafer, Poly/Wire Combo
402-93740	Guard, R.H.Brush Motor
402-93739	Guard, L.H.Brush Motor
201-75209	Hydraulic Motor, Brush Rotation (Std. Flow)
201-75649	Hydraulic Motor, Brush Rotation (Low Flow)
201-92028	Shaft, Brush Motor (Std. and Low Flow)
201-92039	Seal Kit, Brush Motor (Std. and Low Flow)
600-90327	Bearing, Core Hub Support
410-93199	Hub, Splined, Core Support
400-64724	Disc, Wafer Retainer

Part Number	Description
402-93051	Pin, Hitch, Bucket
380-83957	Pin, Hitch Pin Cotter
203-92093	Cylinder,Bucket Dump
203-92099	Seal Kit, Dump Cylinder
410-92416	Fork Weldment, Caster Wheel
100-92025	Caster Wheel
390-92000	Flag, 6' Safety
401-169648	Bracket, Mounting, Safety Flag
101-92023	Brush, Curb Broom
201-65652	Hydraulic Motor, Curb Broom
109-131128	Paint, Spray, MB Yellow
249-92003	Paint, Spray, Black
249-92005	Primer, Spray

Please have your serial number (S/N) ready when contacting M-B Co. or an Authorized Dealer for replacement parts or service information.

M-B Co.  
1615 Wisconsin Ave.  
P.O. Box 200  
New Holstein, WI 53061-0200

website: [www.m-bco.com](http://www.m-bco.com)  
email: [sales@m-bco.com](mailto:sales@m-bco.com)  
Phone: 800-558-5800 or 920-898-4203  
FAX:

Main 920-898-4588  
Attachments 920-898-1085  
Brush Dept. 920-898-1082

# LB Decals

4

**⚠ CAUTION**

Read Operator's Manual before using broom. If operating instructions are missing, contact the M-B Co. for your free replacement.

- Before operating broom make sure all guards and broom are installed properly.
- Wear eye protection when operating broom.
- Do not operate broom near any objects that can be damaged by thrown debris. Be sure no by-standers are near broom during operation.
- The polypropylene brush segments can melt or burn. Do not subject to excessive heat or flame.
- Do not allow riders on broom.
- Stop power source, lower broom to the ground, set parking brake, and remove ignition key before servicing or adjusting.
- Do not operate broom on any roof or other elevated surface.

300-118251

8

**⚠ WARNING**



**HIGH PRESSURE FLUID HAZARD**

Use cardboard or wood (not your hand) to search for leaks.  
Keep away from hydraulic system until pressure is relieved.  
If high pressure fluid penetrates the skin, see a doctor immediately.

300-169221

1

**⚠ DANGER**

To prevent serious injury or death:

- Do not allow any riders

300-118251

10



7



**GREASE**

300-118259

2

**⚠ DANGER**



To prevent serious injury or death from pinching:

- Keep all persons and objects clear while any part of this machine is in motion.

300-118253

3

**⚠ WARNING**

**MOVING PART HAZARD**

To prevent serious injury or death from moving parts:

- Close and secure guards and shields before starting.
- Keep hands, feet, hair and clothing away from moving parts.
- Disconnect and lockout power source before adjusting or servicing.
- Do not stand or climb on machine when operating.

300-118251

# LLB Decals

3

**WARNING**

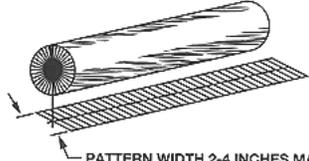
**MOVING PART HAZARD**

To prevent serious injury or death from moving parts:

- Close and secure guards and shields before starting.
- Keep hands, feet, hair and clothing away from moving parts.
- Disconnect and lockout power source before adjusting or servicing.
- Do not stand or climb on machine when operating.

5

**"RECOMMENDED BRUSH PATTERN"**



PATTERN WIDTH 2-4 INCHES MAX.

NOTE:  
FAILURE TO FOLLOW ABOVE RECOMMENDATION CAN CAUSE PREMATURE BRUSH WEAR AND IRREVERSIBLE BRUSH DAMAGE. CONSULT OPERATORS MANUAL FOR ADJUSTMENT PROCEDURE.

6

FOR BEST PERFORMANCE OF THIS POWER BROOM, USE **M-B TOUGH BRUSH** REFILLS ONLY.



2

**DANGER**



To prevent serious injury or death from pinching:

- Keep all persons and objects clear while any part of this machine is in motion.

9

7



**GREASE**

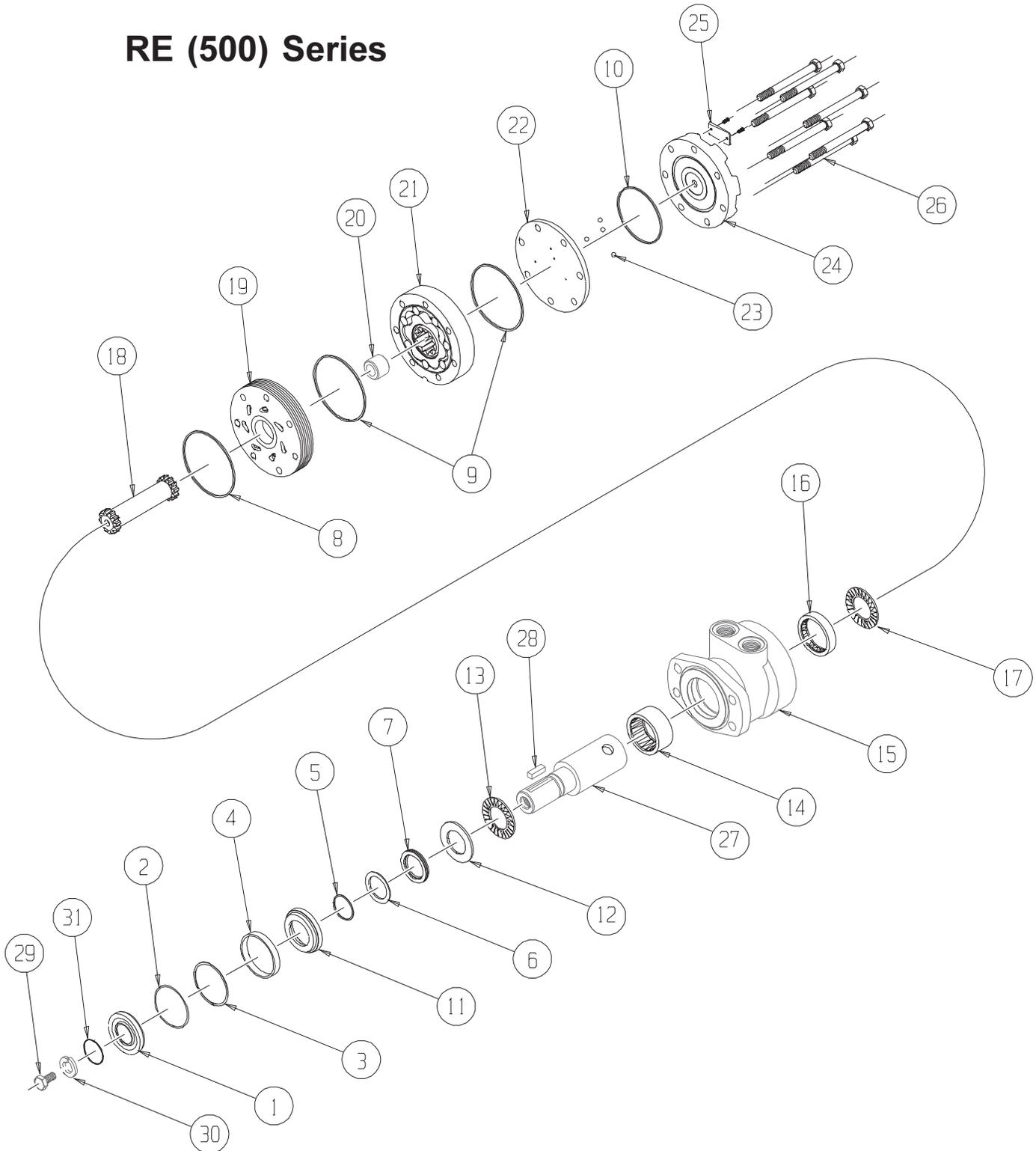
390-118356

## LLB Decals

Item	Description	Part Number	
	Decal Sheet	390-117958	(Includes items 1 - 8)
1	• Decal, DANGER, No Riders	390-118349	
2	• Decal, DANGER, Pinch Point	390-118353	
3	• Decal, WARNING, Moving Part/Guards	390-118352	
4	• Decal, CAUTION, Read Operator's Manual	390-118351	(M-B Co.)
5	• Decal, Brush Pattern	390-118354	
6	• Decal, M-B Brush Refills	390-118355	
7	• Decal, Grease	390-118356	
9	Decal, WARNING, High Pressure Fluid	390-169221	
9	Decal, MB Logo, Black, Medium	390-117897	
10	Decal, MB Logo, Black, Large	390-117898	

**HYDRAULIC MOTOR**  
**Standard Displacement (201-75209)**  
**Low Displacement (201-75649)**

**RE (500) Series**



**HYDRAULIC MOTOR**  
**Standard Displacement (201-75209)**  
**Low Displacement (201-75649)**

Item	Description	Part Number	Qty	
	Kit, Seal	201-92039	1	(Includes items 1 - 12)
1	• Seal, Dust			
2	• Seal, Housing			
3	• Shim, Metal Backup			
4	• Seal, High Pressure			
5	• Shim, Metal Backup			
6	• Seal, Polyamide			
7	• Seal, Shaft			
8	• Seal, Rear Housing			
9	• Seals, Body (2)			
10	• Seal, End Cover			
11	• Seal Carrier			
12	• Washer, Thrust			
13	Bearing, Front Thrust	201-169461	1	
14	Bearing, Housing Front			(Available in Item 15, Housing Kit, P/N 201-92022)
15	Kit, Housing	201-92022	1	(Includes Items 14 & 16)
16	Bearing, Housing Rear			(Available in Item 15, Housing Kit, P/N 201-92022)
17	Bearing, Rear Thrust	201-92027	1	
18	Kit, Drive Link (Includes Item 20)	201-92029	1	(Standard Displacement Motor P/N 201-75209)
		201-169461	1	(Low Displacement Motor P/N 201-75649)
19	Plate, Manifold	201-92031	1	
20	Spacer, Drive Link			(Available in Item 18, Drive Link Kit, P/N 201-92029)
21	Rotor, Roller Stator	201-92032	1	(Standard Displacement Motor P/N 201-75209)
		201-169459	1	(Low Displacement Motor P/N 201-75649)
22	Plate, Balance (Includes Item 23)	201-92034	1	
23	Balls, 3/16" Steel	201-92033	3	
24	End Cover	201-92035	1	
26	Kit, Bolt	201-92036	1	(Standard Displacement Motor P/N 201-75209)
		201-169460	1	(Low Displacement Motor P/N 201-75649)
27	Shaft, Splined	201-92028	1	

**SERVICE INSTRUCTIONS FOR THE RE [500 & 501] SERIES MOTORS**

For Use With Seal Kits: 500444001, 500444002, 500444112

dimensions: mm [in]

**NOTE: IN DECEMBER 2006, THE 500 SERIES INCORPORATED A DESIGN CHANGE. THIS SET OF INSTRUCTIONS WILL AID IN THE DISASSEMBLY AND ASSEMBLY FOR BOTH DESIGNS. MID 2010 A DESIGN CHANGE WAS IMPLEMENTED ON WHEEL MOUNTS TO REMOVE THE EXTERNAL DUST SEAL AND REPLACE IT WITH AN INTERNAL EXCLUDER SEAL. PLEASE REFER TO THE EXPLODED VIEW DRAWING ON PAGE 3 TO DETERMINE WHICH DESIGN IS BEING REPAIRED AND THEN FOLLOW THE APPROPRIATE INSTRUCTIONS FOR THAT DESIGN.**

**Motor Section Disassembly (Same Instructions For Both Designs)**

- A)** Remove all shaft related components from shaft (27) (i.e. keys, wire rings, nuts). To aid in reassembly of the motor, make a "V" shaped set of lines from the endcover (24) to the housing using either paint or a marker. With shaft facing down, secure motor in vise by clamping on to housing (15).
- B)** Loosen and remove seven bolts (26) holding motor assembly together. Remove endcover (24) and endcover seal (10). Discard seal. Remove balance plate (22) taking care not to drop the three steel balls (23) located in the three holes in the balance plate (22). Remove rotor assembly (21), manifold (19), drive link spacer (20) (NOTE: Some motors do not use spacer), drive link (18) and thrust bearing (17). Remove body seals (9) from rotor assembly (21) and housing seal (8) from housing (15) and discard seals. (NOTE: Compare old housing seal (8) to the two housing seals included in kit to determine which one to use.) Gently tap shaft (27) upward from housing (15) and remove through rear of housing and lay aside.

**Housing/Shaft Disassembly And Assembly (Design That Utilizes A Seal Carrier (11))**

- C)** Remove housing (15) from vise and turn over. Pry dust seal (1) from housing. Push the seal carrier (11), thrust washer (12) and thrust bearing (13) down until they make contact with the roller bearing (14) located in the housing bore.
- D)** Remove wire ring (2), steel backup shim (3) and high pressure seal (4) from inner bore groove with a small screwdriver. Lift seal carrier (11), thrust washer (12) and thrust bearing (13) from the housing bore. Using a small screwdriver, carefully pry shaft seal (7), backup seal (6), and metal backup shim (5) from seal carrier (11) and discard. Lay seal carrier (11), thrust washer (12) and thrust bearing (13) aside. (NOTE: If a new thrust washer (12) and seal carrier (11) is included in kit, old items may be discarded).

At this point, all parts should be cleaned in an oil-base solvent and dried using compressed air (For safety, observe all OSHA safety guidelines). All new seals should be lightly coated in clean oil prior to installation.

- E)** Place shaft (27) on a clean flat surface with output end facing up. Place thrust bearing (13) (NOTE: If thrust bearing has integral washer, make sure washer surface faces down.) Then thrust washer (12) on shaft (See Technical Bulletin PI444004 to determine correct thrust washer to use). Lightly coat seal area of shaft with clean oil and place plastic installation sleeve with shaft seal (7) down onto shaft covering all splines, keyways and wire ring grooves. Slide shaft seal (7) down onto shaft (27) making sure that lip on seal faces down (See Figure 1 for correct seal orientation) until it contacts thrust washer (12). Remove plastic installation sleeve. Carefully install the backup seal (6) onto the shaft (27) with the flat side up and the seal lip facing the shaft seal (7). Place the metal backup shim (5) onto the shaft and against the backup seal (6). Place the seal carrier (11) onto the shaft (large end down) and carefully press the seal carrier (11) down onto the seal assembly using an arbor press and sleeve to compress the seal into the carrier.
- F)** With pilot side facing up, place housing (15) on spacers to raise housing approximately 6 [.25] above work surface (NOTE: Spacers should allow shaft to contact work surface). Place shaft/seal carrier assembly into housing (15). Install high pressure seal (4) into groove in housing. Install metal backup shim (3) against high pressure seal (4) in groove in housing bore by squeezing the shim (3) between thumb and forefinger to bow shim. While maintaining bow in shim, start the shim into the groove and use a small screwdriver to push the shim into groove. Install wire ring (2) into the groove making sure that the ends are butted.
- G)** While holding shaft into housing, place housing/shaft assembly in vise with shaft end down. Making sure that end of drive link (18) with crowned splines goes into shaft end, install drive link (18) into shaft and tap lightly to seat the seal carrier against the wire ring (2). Place thrust bearing (17) over drive link (18). If seal carrier (11) is properly seated against wire ring (2), thrust bearing (17) will be flush with rear surface of housing.

**Housing/Shaft Disassembly And Assembly (Design That Does NOT Utilize A Seal Carrier (11))**

- H)** Position the housing (15) in vise and use a slide and hammer type bearing puller to remove the rear housing bearing (16). Then remove the bearing spacer (32). To remove the front housing bearing (14), flip the housing over and place a screwdriver or small chisel in between a roller in the bearing and rest it on the bottom of the bearing cage. Strike the chisel or screwdriver with a hammer just until the cage stretches or chips enough to allow the rollers to fall out. Clear away all rollers, then replace the housing in vise upside down and use the slide and hammer to remove bearing making sure that no finger of the puller is pulling on the weak point caused when removing the roller bearings. Remove the thrust washer (12) and thrust bearing (13) and set aside. Using a small screwdriver carefully pry the shaft seal (7), backup seal (6), and metal shim (5) from housing bore if present and discard. Also remove excluder seal (33) if the motor design uses this seal and discard. (See Figure 4 for additional information.)
- I)** Remove the housing from vise and turn over and pry the dust seal (1) from housing and discard (external dust seal is not used on

models that use an internal excluder seal.

## HYDRAULIC MOTOR - Std (201-75209) and Low (201-75649) Displacement

- J)** At this point, all parts should be cleaned in an oil-base solvent and dried using compressed air (For safety, observe all OSHA safety guidelines). All new seals should be lightly coated in clean oil prior to installation. Place housing (15) in vice with the seven bolt assembly holes facing up. If model uses an excluder seal (33), place it in the recess of housing, if not, place the metal shim (5) in recess. Install the backup seal (6) into the housing (15) with the flat side down and the seal lip facing up. Insert shaft seal (7) down into housing (15) making sure that lip on seal faces up (See Figure 2 for correct seal orientation). Install thrust washer (12) into housing and using an arbor press, seat the shaft seal (7) into housing (15), then place the thrust bearing (13) into housing.
- K)** Place front housing bearing (14) onto housing and press bearing into housing to a depth of 60,1 [2.37] from the rear surface of the housing (15) to the top of the bearing. Insert the bearing spacer (32) into the housing. Place the rear housing bearing (16) onto the rear housing bore and press to a depth of 3,6 [14] from the rear surface of the housing (15) to the top of the bearing (16). Place the shaft (27) down into housing (15) and place thrust bearing (17) on top of shaft (27). If shaft seals are properly seated against the housing (15), thrust bearing (17) will be flush with rear surface of housing.
- Motor Section Assembly (Same Instructions For Both Designs)**
- L)** Install housing seal (8) into groove in housing (15). Place manifold (19) onto housing, (15) side with only seven holes facing housing (15). Place body seals (9) in grooves in both sides of rotor (21). Place rotor (21) onto manifold (19) with side of rotor with chamfer in splines facing manifold (19).
- M)** Install balance plate (22) onto rotor (21) making sure holes for steel balls (23) faces up. Install three steel balls (23) in holes in balance plate (22). Install endcover seal (10) into groove in endcover (24) and place endcover onto balance plate (22). Install seven assembly bolts (26) and pre-torque to 13,6 Nm [10 ft. lbs.] Using the bolt torque sequence shown in Figure 3, final torque all bolts to 67,8 Nm [50 ft. lbs.]
- N)** Remove motor from vise and place on work surface with shaft (27) facing up. Making sure that lip on seal (1) faces up, place dust seal (1) over shaft (27). Using a sleeve and a hammer, carefully drive dust seal (1) into place.

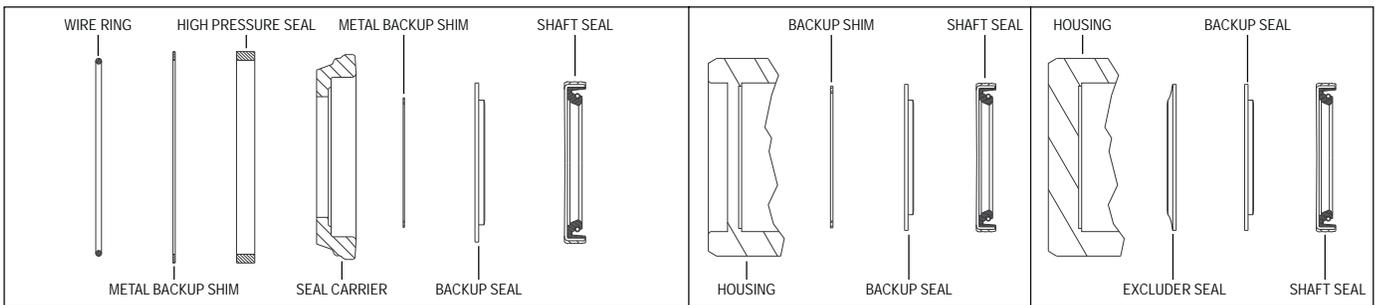


FIGURE 1

FIGURE 2

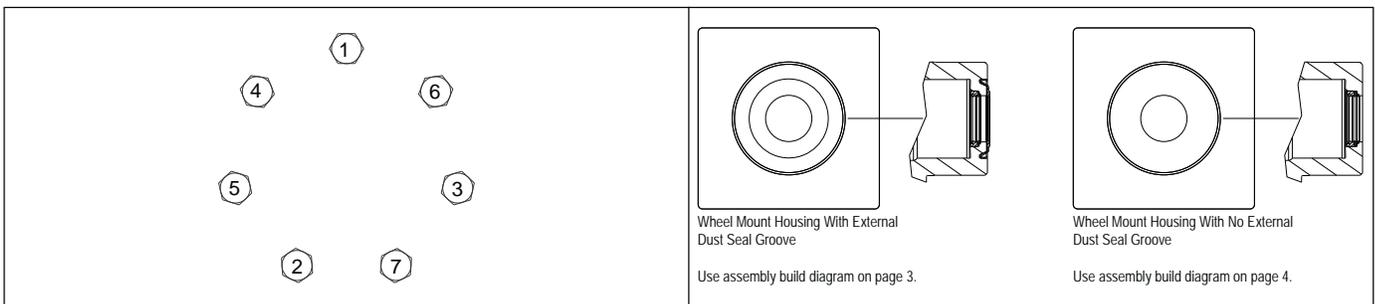


FIGURE 3

FIGURE 4

### EXPLODED VIEW PARTS DESCRIPTION

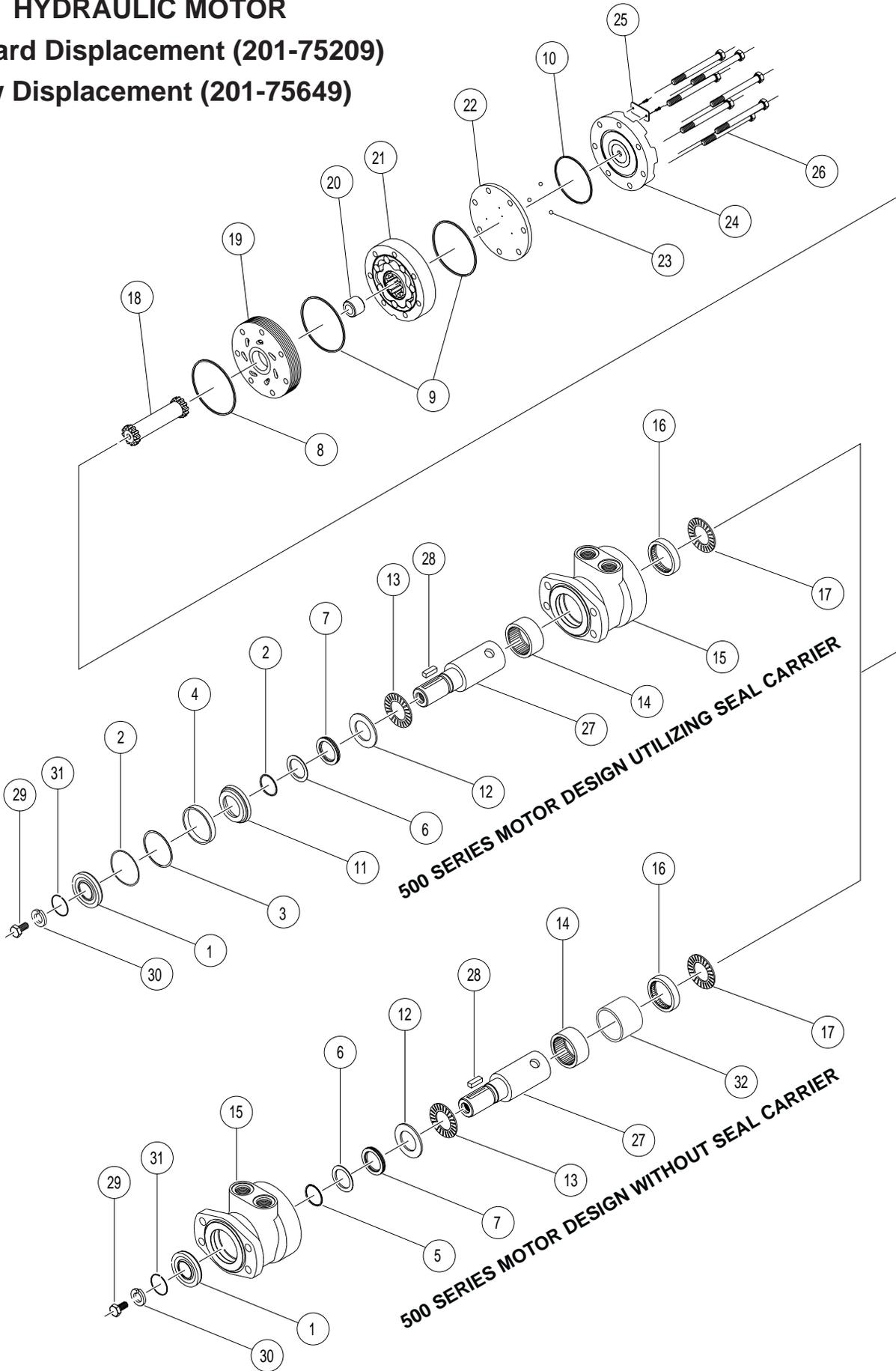
- |                         |                             |                           |   |
|-------------------------|-----------------------------|---------------------------|---|
| 1. 1 Dust Seal          | 12. 2 Thrust Washer         | 23. Steel Balls (3)       | 1 Included in seal kit(s):<br>500444001, 500444002, 500444112 |
| 2. 1 Split Wire Ring    | 13. Front Thrust Bearing    | 24. Endcover              | 2 Included in seal kit(s):<br>500444001                       |
| 3. 1 Metal Backup Shim  | 14. 3 Front Housing Bearing | 25. I.D. Tag Assembly     | 3 Included in seal kit(s):<br>500444112                       |
| 4. 1 High Pressure Seal | 15. Housing                 | 26. Assembly Bolts (7)    | 4 Included in seal kit(s):<br>500444002, 500444112            |
| 5. 1 Metal Backup Shim  | 16. 3 Rear Housing Bearing  | 27. Shaft                 |   |
| 6. 1 Backup Seal (2)    | 17. Rear Thrust Bearing     | 28. Shaft Key             |   |
| 7. 1 Shaft Seal (2)     | 18. Drive Link              | 29. Shaft Bolt            |   |
| 8. 1 Housing Seal       | 19. Manifold                | 30. Lock Washer           |   |
| 9. 1 Body Seals (2)     | 20. Drive Link Spacer       | 31. Wire Ring             |   |
| 10. 1 Endcover Seal     | 21. Rotor Assembly          | 32. Bearing Spacer        |   |
| 11. 2 Seal Carrier      | 22. Balance Plate           | 33. 4 Excluder Shaft Seal |   |

**Note:** The motor design that utilizes a seal carrier will use the larger O.D. backup seal and shaft seal.

# HYDRAULIC MOTOR

Standard Displacement (201-75209)

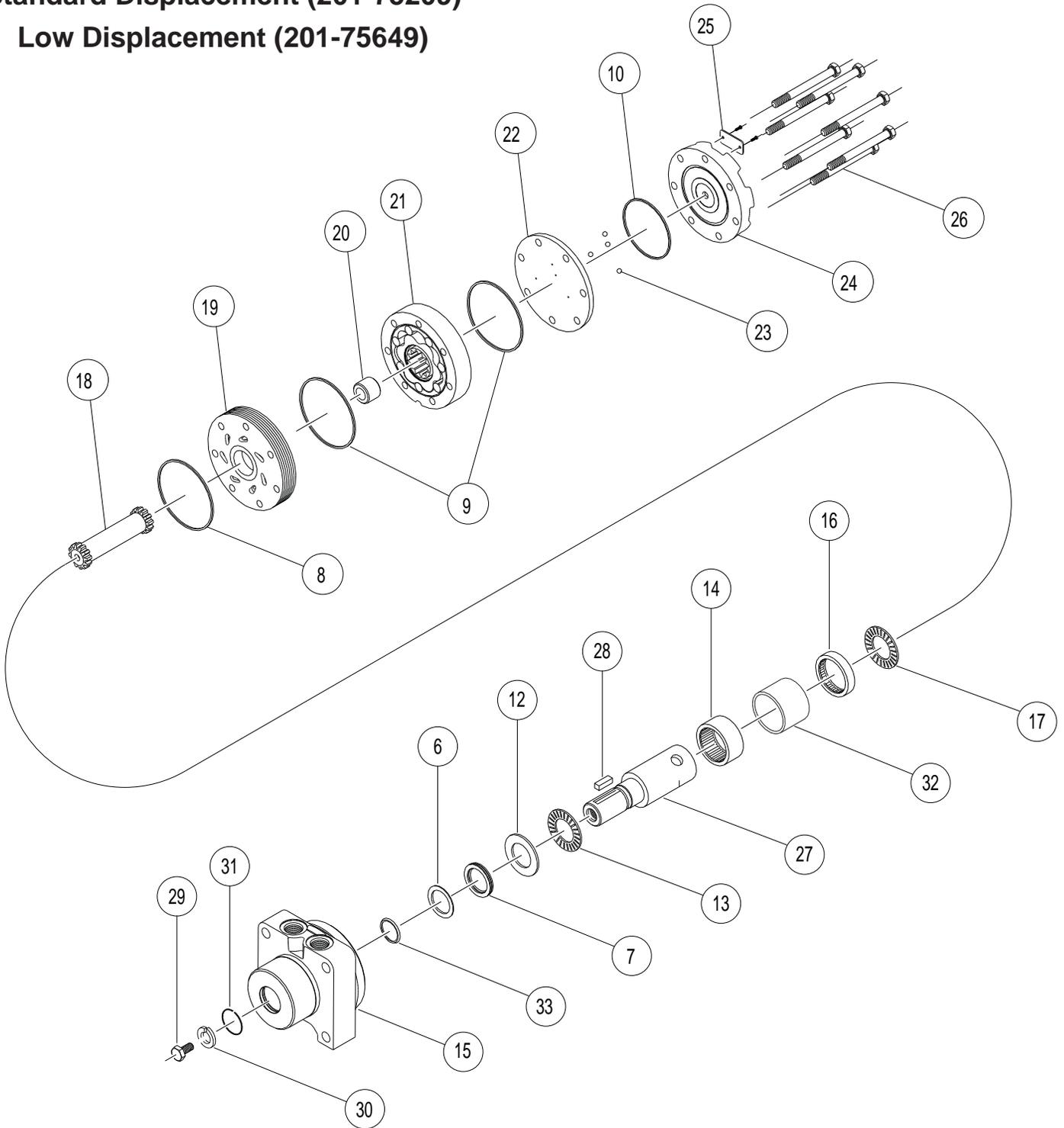
Low Displacement (201-75649)



# HYDRAULIC MOTOR

Standard Displacement (201-75209)

Low Displacement (201-75649)



**500 SERIES MOTOR DESIGN WITH EXCLUDER SEAL  
(REFER TO FIGURE 4)**

# HYDRAULIC MOTOR

## 201-65652

PI255001 Rev. 4.09



whitedriveproducts

### SERVICE INSTRUCTIONS FOR THE WR [255 & 256] SERIES MOTORS

For Use With Seal Kit: 255222001

dimensions: mm [in]

**IMPORTANT NOTE:** The WR(255/256) Series Motors depend on the correct orientation of parts as well as correct internal timing for proper motor operation. Before disassembling the motor, it is highly recommended that paint or a marker be used to make a “V” shaped set of lines from the endcover to the housing. This will aid in reassembling the motor components properly. It is also important that the steps involving internal parts timing be followed carefully to insure proper motor operation.

- A) Remove all shaft related components from shaft (15) (i.e. keys, nuts). To aid in reassembly of the motor, make a “V” shaped set of lines from the endcover (11) to the housing using either paint or a marker. With shaft facing down, secure motor in vise by clamping on to the housing (5).
- B) Loosen and remove seven bolts (14) holding motor assembly together. Remove endcover (11). Remove body seal (4) and discard seal. Remove rotor set assembly (9), & wear plate (8). Remove body seals (4) from rotor assembly (9) and housing (5) and discard seals. Remove drive link pin (10) and drive link (7) from motor and lay aside.
- C) Gently tap shaft (15) upward through housing (5) and remove through rear of housing. Remove housing (5) from vise. Collect thrust bearing and thrust washer from the rear of the housing while turning the housing over. Secure the housing in the vise with the flange end facing up. Gently pry dust seal (1) from housing using a small screwdriver and a hammer. Gently remove shaft seal (2) with a small screwdriver and discard it.

At this point, all parts should be cleaned in an oil-based solvent and dried using compressed air (For safety, observe all OSHA safety guidelines). All new seals should be lightly coated in clean oil prior to installation.

- D) Place shaft (15) on a clean flat surface with output end facing up. Place thrust bearing (6) then thrust washer (3) on the shaft. Install shaft seal (2) down onto shaft (15) making sure that lip on seal faces down. (See Figure (1) for shaft component orientation).

**NOTE:** To turn the WR Series Motors to proper operation, the rotation code of the motor must be known. The rotation code of the motor is 255 (standard) 256 (reverse timed) – the first 3 digits of the model code. If the rotational code is not known, and if port ‘A’ is pressurized, motors that are to have the shafts turning clockwise (as viewed from the shaft end) should be timed using the “255” series and motors that are to have the shafts turning counterclockwise (as viewed from shaft end) should be timed using the “256” series.

- E) Turn shaft (15) over so that output end of the shaft faces down. Lower drive link (7) into shaft making sure that the timing mark end of drive link faces up and that the timing mark on the end of the drive link (7) is aligned to the left of any short, open cutter slot on shaft (15).
- F) Turn housing (5) over so that the pilot of housing faces down and secure housing (5) in vise. Without disturbing the shaft seal (2), and drive link (7), carefully lower shaft assembly into housing. Apply pressure using an arbor press or a rubber mallet to make sure that the shaft end is flush or slightly lower than the housing bolt hole surface.
- G) Place a body seal (4) in groove in the rear surface of the housing (5). Place wear plate (8) on housing. Make sure that the seven valving slots on the wear plate line up with the seven bolt holes on the housing (5).
- H) Place a body seal (4) in the groove in the face of the rotor assembly (9). With the seal groove surface on the rotor assembly facing wear plate, lower rotor assembly (9) onto drive link (7) making sure that the timing mark on drive link is aligned with a peak on the rotor (9) for 256 series, or with a valley on the rotor (9) for 255 series (See Figure (2)). After assembling the rotor assembly on the drive link rotate the rotor assembly to line up the assembly bolt holes. Insert drive link pin (10) into end of drive link (7) making sure that concave or the indented end faces up.
- I) Place remaining body seal (4) in groove in endcover (11). Place endcover (11) onto motor making sure that end of drive link pin (10) is in hole in center of end cover (11). There is no specific orientation to assemble the end cover on the motor.
- J) Install one washer (13) on each bolt (14) from the threaded end side. Insert seven assembly bolts (14) with washers (13) into bolt holes and pre-torque to 13.6 Nm [10 ft. lb.]. Using a crisscross pattern, final torque bolts to 60 Nm [44 ft. lb.].
- K) Remove motor from vise and place on work surface with shaft (15) facing up. Making sure that lip on dust seal (1) faces up, place dust seal (1) over shaft (15). Using a sleeve and hammer, carefully drive dust seal (1) into place.

# HYDRAULIC MOTOR

## 201-65652

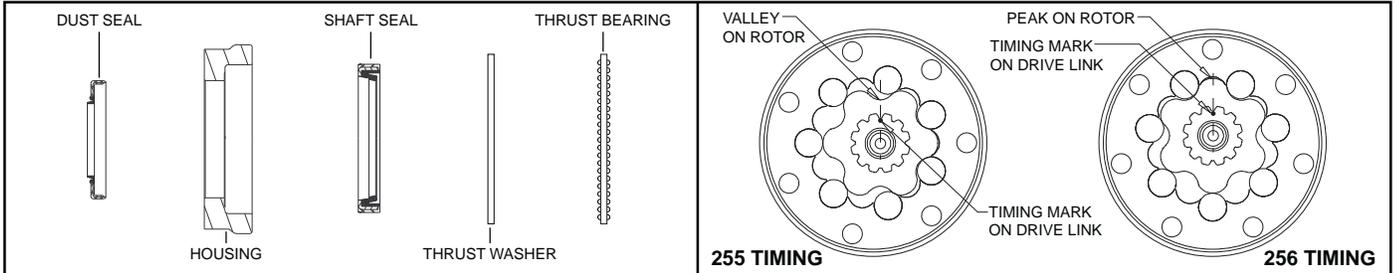
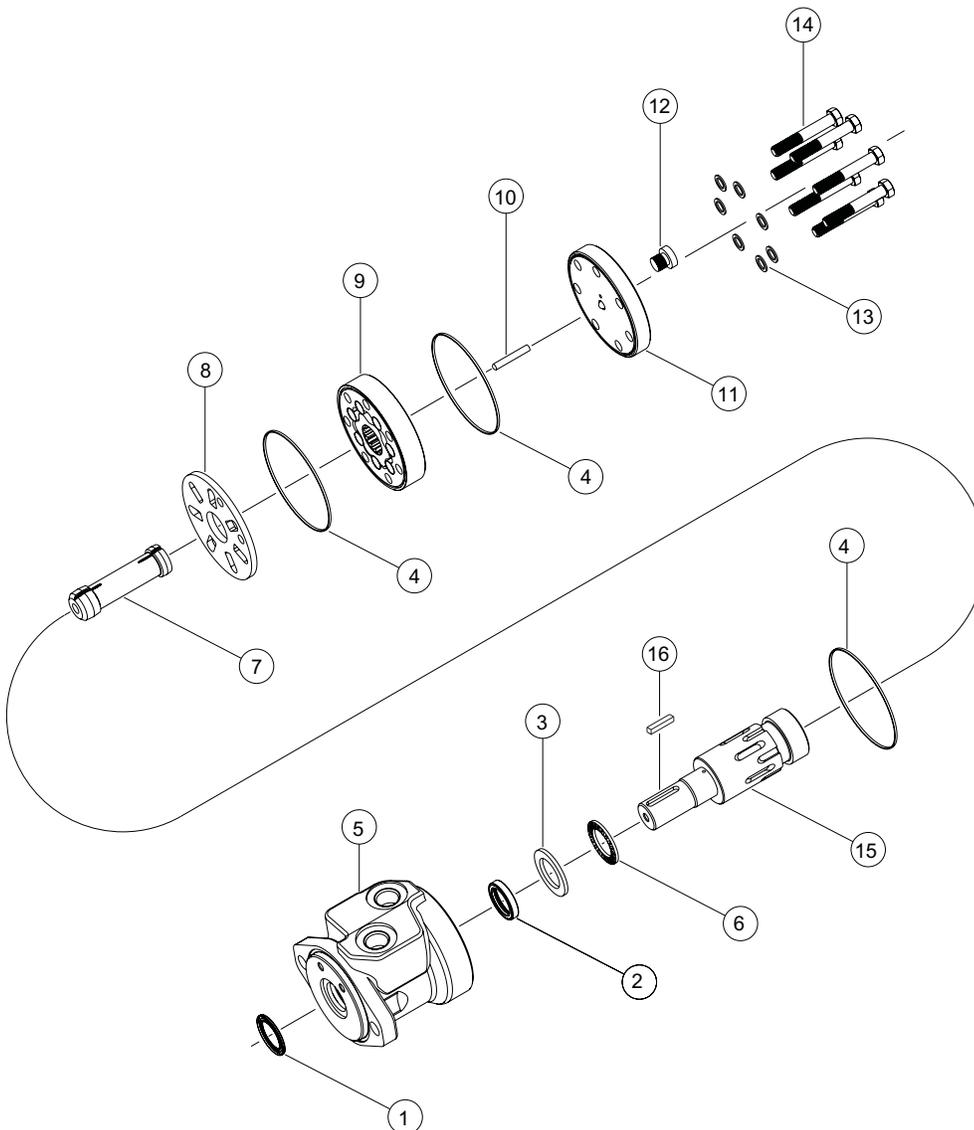


FIGURE 1

FIGURE 2



1. \* Dust Seal
2. \* Shaft Seal
3. \* Thrust Washer
4. \* Body Seals (3)
5. Housing
6. Thrust Bearing
7. Drive Link
8. Wear Plate
9. Rotor Assembly
10. Drive Link Pin
11. Endcover
12. Endcover Plug
13. Assembly Bolt Washers (7)
14. Assembly Bolts (7)
15. Shaft
16. Shaft Key

\* Contained in Seal Kit 255222001

## LIMITED WARRANTY

Limited Warranty: Subject to the limitations set forth herein, M-B Companies, Inc. ("M-B") warrants its products to be free from defects in material and workmanship for a period of twelve (12) months from the date of delivery of the product to its original owner, except that the warranty is twelve (12) months solely for the following products: Truck Mounted Pavement Marking Equipment, Airport Snow Removal Products, Attachment Products, Brushes, MSV Multi-Service Vehicles. Parts shall have a ninety (90) day warranty. This warranty is not transferable without the written consent of M-B.

Notice: M-B's obligations under this Limited Warranty are conditioned on M-B receiving, within the warranty period, written notice from Buyer specifying the nature of any alleged defect and requesting corrective action by Seller.

Remedies: M-B, at its option, will repair or replace, or provide a credit to Buyer for, defective warranted items. If requested by M-B, products or parts for which a warranty claim is made shall be returned, transportation prepaid, to M-B's factory. Buyer shall not return any product for repair, replacement or credit without M-B's advance written consent.

Other Manufacturer's Warranty: On products furnished by M-B, but manufactured by any other manufacturer, the warranty of said manufacturer, if any, will be assigned to Buyer, if the said warranty is assignable. However, M-B does not represent or guarantee that such manufacturer will comply with any of the terms of the warranty of such manufacturer.

Exclusions: Any improper use, operation beyond capacity, or substitution of parts not approved by M-B, or alteration or repair by others in such a manner as in M-B's judgment materially and/or adversely affects the product shall void this warranty. This warranty does not apply to defects caused by damage or unreasonable use while in the possession of the owner, including but not limited to: failure to provide reasonable and necessary maintenance, normal wear, routine tune ups or adjustments, improper handling or accidents, operation at speed or load conditions contrary to published specifications, improper or insufficient lubrication, or improper storage.

Seller manufactures power brooms that mount to many makes and models of equipment. Seller attempts to ensure that the mounting frames fit correctly. However, the large number of tractor models, types and options currently available, compounded by frequent manufacturer design changes, may prevent Seller from supplying a frame that fits every unit correctly. Therefore, unless Buyer supplies drawing which detail the attachment points on the specific unit to which the broom will be mounted, Seller will not be responsible for the fit of the mounting frame.

The batteries, tires, rubber material, brushes and material normally consumed in operation, and major components such as engines, air compressors, and hydraulic pumps and motors are excluded from this warranty but may be covered to the extent of any warranty received by M-B from its supplier if permitted by the terms of such warranty.

Limitations of liability: M-B shall not be liable for any incidental, consequential, punitive or special damages of any kind, including, but not limited to, consequential labor costs or transportation charges in connection with the repair or replacement of defective parts, or lost time profits or expense which may have accrued because of said defect.

M-B disclaims all other warranties, whether express or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. This warranty is exclusive remedy of buyer. This warranty cannot be extended, broadened or changed in any respect except in writing by an authorized officer of M-B.

Notwithstanding anything in this warranty is to the contrary, in no event shall M-B's total liability hereunder exceed the purchased price of the particular product.

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