

OPERATOR'S MANUAL

Model 53H

Tow-Behind Hydraulic Power 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 53H 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:	
Date Purchased:	Serial #:



Figure 1.

A Federal Motor Vehicle Safety Standard (FMVSS) tag is mounted on the forward right side of the trailer frame. See Figure 2.



Figure 2

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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.

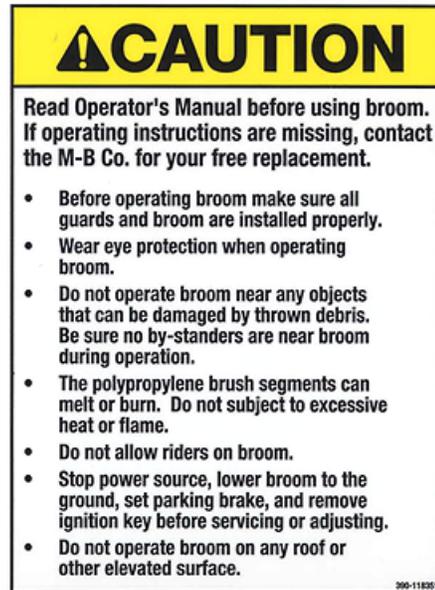
SAFETY DECALS

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.



OPERATION GUIDELINES

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

- 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 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.
- 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 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.

SAFETY

- 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.
- 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.
- Adjust level and pattern before operating.
- 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 manufacturer's recommendations for towing weight restrictions and procedures.

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.
- Stop and inspect equipment if you strike an object. Repair, if necessary, before restarting.
- 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 tractor and set parking brake before performing any adjustments on the machinery.
- 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.
- For engine equipped models, follow specific engine manufacturers recommended service intervals for dirty/dusty environments.

CONTROLS AND FEATURES

See Figure 1.

1. Hitch Coupler (Ball or Pintle type)
2. Tow Safety Chains
3. Operator Controls *
4. Storage Support Jack (or optional 3rd Wheel)
5. Main Hydraulic Connection Hoses
6. Electrical (Lights) Connector (Optional)
7. Broom Head Assembly
8. Lifting Lug (2)
9. Hydraulic Control Valve (Optional)
10. Strobe Beacon (Optional)
11. Sight Indicators (Optional)
(Custom style shown)

* Refer to the OPERATION section for more information.



Figure 1

See Figure 2.

1. Safety Support Chains
2. Lift Cylinder
3. Swing Cylinder

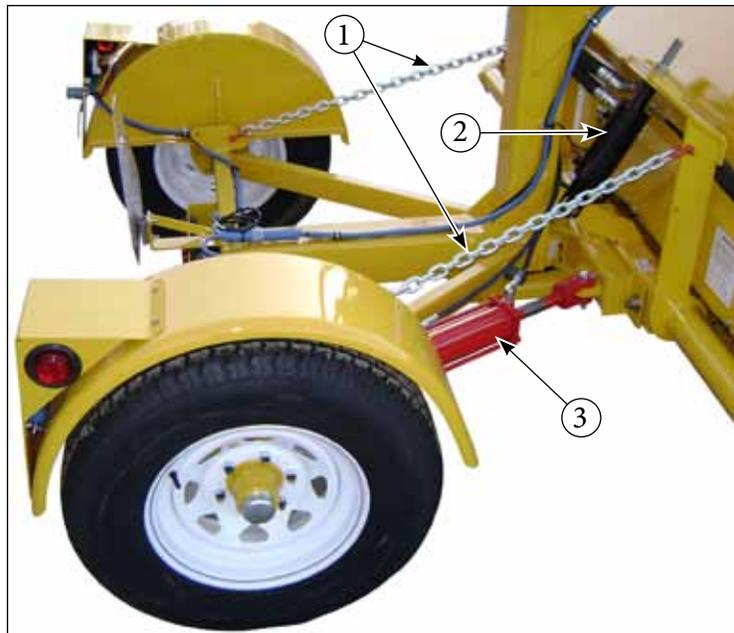


Figure 2

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OPERATION

CONTROLS

See Figure 1 when equipped with the electrical control box option.
See Figure 2 when equipped with hydraulic control levers.

1. STROBE ON/OFF
Used to control the strobe beacon and rear flashers.
2. BROOM ◀ ▶ (Left/Right)
Momentary switch, with Neutral center position, incrementally angles the broom head left (◀) or right (▶).
3. BROOM ▲▼ (Raise/Lower)
Momentary switch, with Neutral center position, incrementally moves the broom head up (▲) or down (▼). Hold switch in the ▼ position for a minimum of 3 seconds to lock in place, ensuring broom is held fully lowered.

4. Broom Rotation ON/OFF
Used to control (On/Off) broom rotation.
5. Broom Swing (LEFT/RIGHT)
Momentary valve, with Neutral center position, incrementally angles the broom head left or right.
6. Broom UP/DOWN
Momentary valve, with Neutral center position, incrementally raises/lowers broom head. Hold lever in the DOWN position for a minimum of 3 seconds to lock in place, ensuring broom is held fully lowered. Once broom is raised (UP) fully, close supply valve to lock broom in raised position.
7. Broom UP/DOWN Lock Valve
Close valve (handle perpendicular to hydraulic line) once broom is raised (UP) fully to lock broom in position for transport.



Figure 1.



Figure 1.

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 and that there is proper brush pattern. Refer to the **SETUP AND ADJUSTMENT** section.
4. Inspect the bristle length to determine if replacement segments are needed.

OPERATION

1. Ensure that the broom head safety support chains are removed.
2. Lower the broom to the sweeping position.
3. Check the broom for level and adjust if required according to the Leveling procedure within the **SETUP AND ADJUSTMENTS** section.
4. Check the pattern and adjust if required according to the Pattern Adjustment procedure within the **SETUP AND ADJUSTMENTS** section.
5. Turn on the beacon light (**STROBE ON/OFF**) before towing.

IMPORTANT! When starting or stopping broom rotation, always set prime mover control to **SLOW**.

Maximum sweeping speed of 20 mph.

- Sweep at a speed that is appropriate for the conditions and location.
- For heavy material such as gravel or stones, drive more slowly with a higher broom speed. For lighter material, drive faster with a lower broom 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.

TRAVEL PROCEDURE

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

1. Stop broom rotation, either by stopping hydraulic flow from tow vehicle or with the broom's rotation control, if so equipped.
2. Set broom to straight ahead position, either manually or using broom swing control, if so equipped.
3. Use the lift control to raise the broom to the fully UP position.
4. Install the safety support chains and lower the broom so that the weight of the broom head is resting on the chains. Refer to **CONTROLS AND FEATURES** for location of chains.
5. Close broom lock valve (handle perpendicular to hydraulic line) to lock hydraulic fluid, if so equipped.
6. Ensure that the broom is securely attached to the tow vehicle before moving.

IMPORTANT! Maximum tow speed with trailer brakes is 60 mph.

For two wheel-design without brakes, recommended maximum tow speed is 35 mph.

For 3rd wheel-design without brakes, recommended maximum tow speed is 15 mph.

SETUP AND ADJUSTMENTS

SETUP

Proper setup and leveling of your power broom will increase the life of the brush and produces more efficient movement of material. Visually inspect the adjustments on 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.

HITCH HEIGHT ADJUSTMENT

See Figure 1.

When not equipped with the 3rd (front) wheel option, use coupler mounting hardware to raise or lower hitch until bottom of support tube is 40-1/2" from ground.

LEVELING

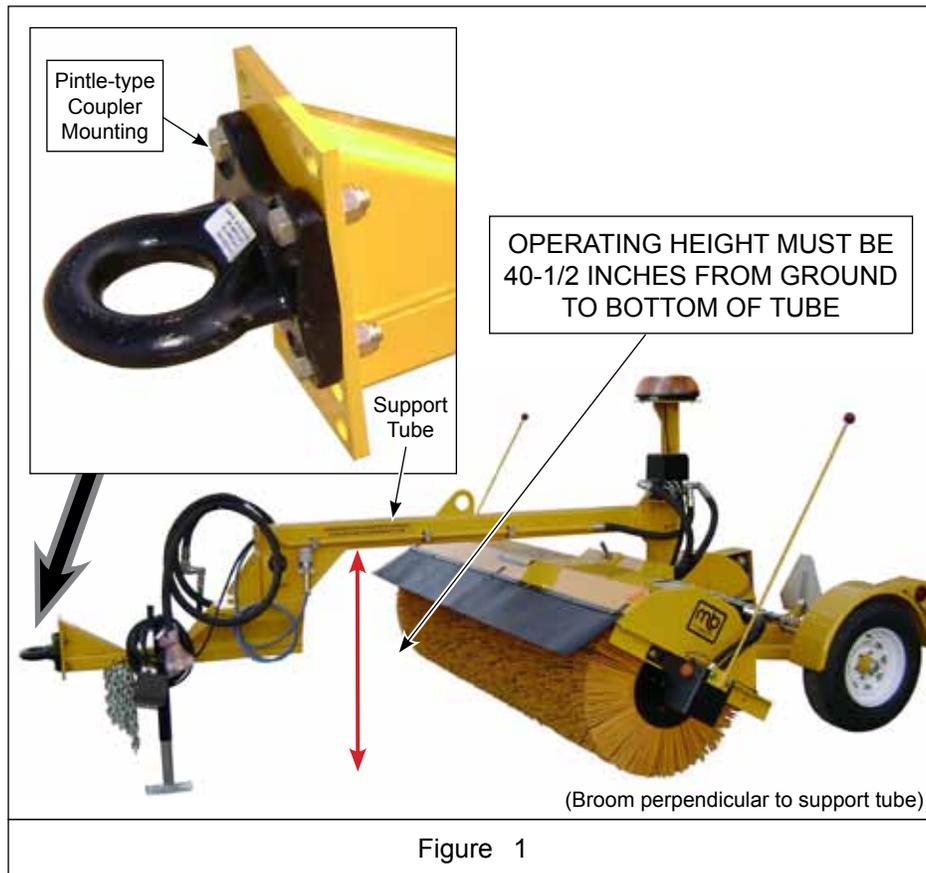
See Figures 1 and 2.

1. With the broom mounted (hitched) to the prime mover, park the unit on a flat level surface; preferably concrete or asphalt.
2. Swing the broom so that it is centered perpendicular (square) to support tube. Take measurements from common reference points between brush frame and main frame to verify.
3. Tighten the lift cylinder pattern adjustment nuts all the way down.

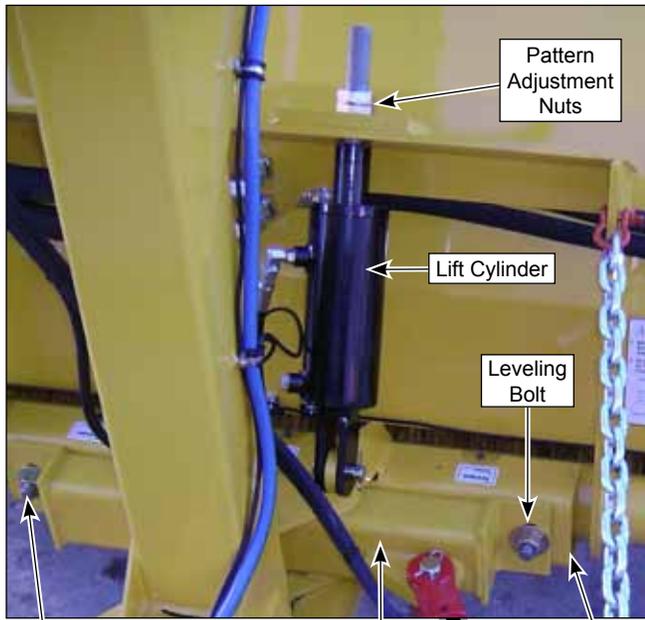
4. Adjust the broom head so it is level side-to-side by adjusting the position of the brush frame to the swing frame. Adjustment is made with the (2) 3/4-10 x 2" carriage bolts, flat washers and lock nuts. Place a level on the broom hood to verify it is level.
5. Swing broom fully side-to-side twice and return to centered position. Recheck broom head for level. If still level, continue to Pattern Adjustment. If not, perform the leveling process again.

PATTERN ADJUSTMENT

1. After the broom has been leveled, the last adjustment is to set the brush pattern (swept area).
2. With the unit on a flat level surface, adjust the nuts on the end of the lift cylinder so that the broom contact patch is approximately 3" wide from front to rear. Loosening the nuts will lower the broom, creating more contact. See Figure 2.
3. Once this adjustment is set, it can be confirmed by running the unit for about 30 seconds in the down position while stationary. Stop the broom and move the unit away. The 'cleaned' (contact patch) should be 2"-4" wide for the entire length of the broom. See Figure 3.



SETUP AND ADJUSTMENTS



Leveling Bolt Swing Frame Brush Frame



Figure 2

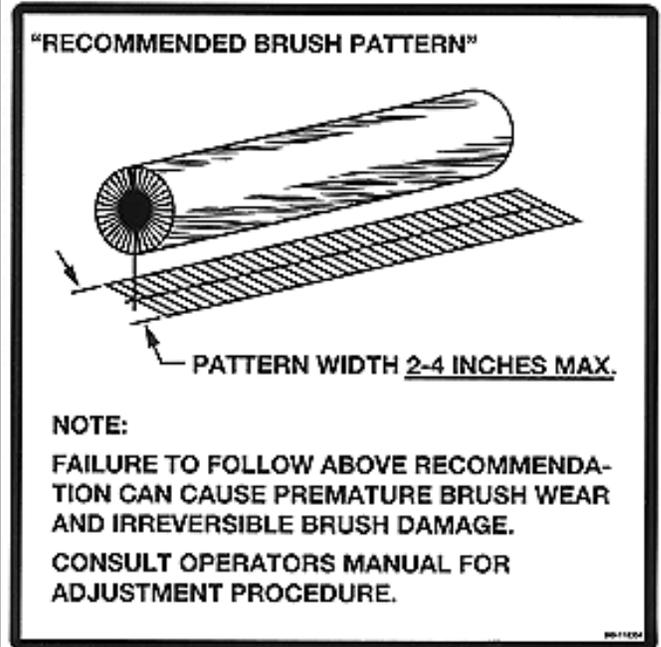


Figure 3

The level of the broom may create too heavy a brush pattern on either the left or right side (See Figure 4). In order to balance the pattern, the (Left-Right) leveling bolts attaching the swing frame to the brush frame must be loosened and the brush frame position adjusted to compensate for the lean. See Figure 2.

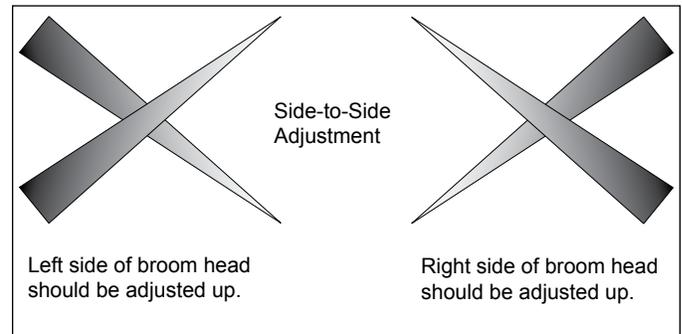


Figure 4

Once the broom has been properly adjusted, a short operation period is recommended for break-in; approximately 15 minutes. After this break-in period, repeat the leveling procedure to ensure that it is correct.

MAINTENANCE

MAINTENANCE SCHEDULE

- Check adjustments – every 10 hours
- Grease bearings – after initial 10 hours, then every 200 - 300 hours thereafter.
- Grease pivot points – every 50 hours

NOTE: Grease points are noted with an applicable decal.



LUBRICATION

- Grease bearings and pivot points per the MAINTENANCE SCHEDULE using Chevron Ultra Duty II, Grade 2; or equivalent high-temp grease.
- There are minimum of (6) grease points on the unit; (3) at the brush frame horizontal (lift) tubes, (1) at the swing pivot pin and (2) on the brush end support bearings.

FILLER REPLACEMENT

Core Removal (External Mount Motor)

1. Lower broom with lift cylinder until brush contacts the ground.
2. Remove (2) 1/2-13 x 1-1/2" capscrows, flat washers, lock nuts and motor guard from brush frame. Retain guard and mounting hardware. See Figure 1.
3. Remove (2) 1/2-13 x 1-1/2" capscrows, flat washers, lock nuts and motor mount plate from brush frame. Slide motor out of mating splined hub. Let motor hang on hoses. Retain mounting hardware. See Figure 1.
4. Remove (2) 1/2-13 x 2" bolts, flat washers and lock nuts attaching support bearing to bottom of brush frame at each end of broom. See Figure 2.
5. Slide brush assembly out the front of broom.

Core Removal (Hidden Mount Motor)

1. Lower broom with lift cylinder until brush contacts the ground.
2. Remove (3) 1/2-13 x 1-1/2" horizontal capscrows, (2) 1/2-13 x 1-3/4" vertical capscrows, flat washers and lock nuts attaching each motor mount plate to brush frame. Retain mounting hardware. See Figure 3.
3. Raise broom with lift cylinder until brush frame is clear of motor mount plates.

NOTE: Core support bearings are mounted on inside of motor mount plates.

4. Slide each motor, with attached mount plate, out of mating splined hub. (Figure 4) If necessary, rotate motor and mount plate assembly to clear brush frame. (Figure 3) Let motor and plate assemblies hang on hoses.
5. Slide brush assembly out the front of broom.

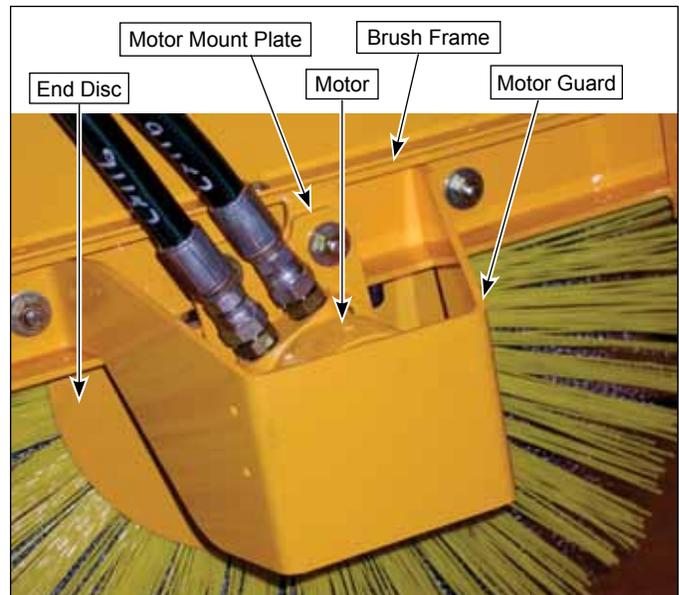


Figure 1

Brush Removal (External Mount Motor)

See Figure 2.

1. Remove support bearing from hub on one end of core.
2. Remove (3) 1/2-13 x 1" capscrows, lock washers and splined hub from one end of core. Retain hub and mounting hardware.
3. Remove (4) 5/16-18 x 3/4" capscrows, lock washers and end disc (wafer retainer plate) from one end of core. Retain end disc and mounting hardware.
4. Slide spent brush wafers and spacers off core and discard.

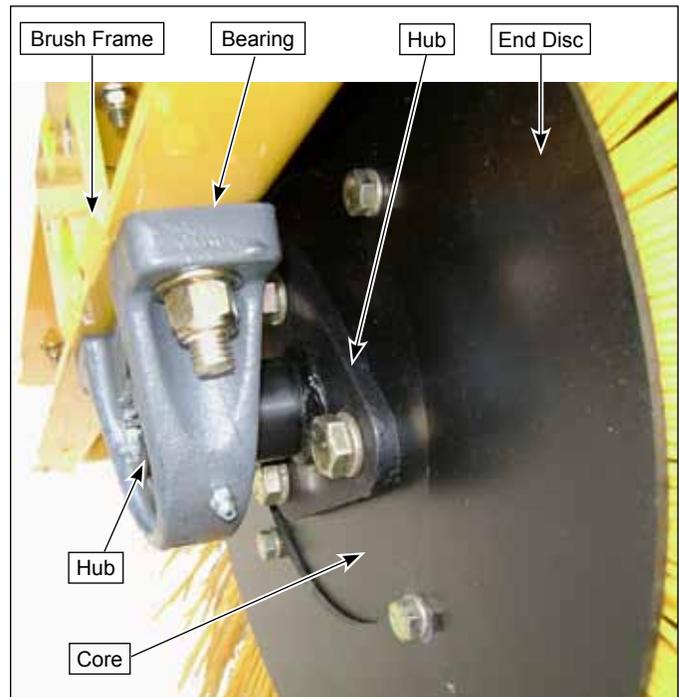


Figure 2

MAINTENANCE

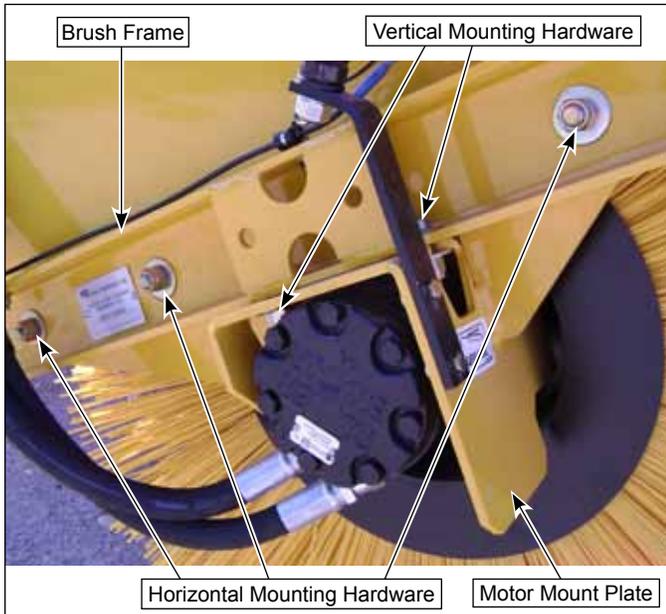


Figure 3

Brush Removal (Hidden Mount Motor)

See Figure 4.

1. Remove (3) 5/16-18 x 3/4" capscrews, lock washers and end disc (wafer retainer plate) from extension on one end of core. Retain end disc and mounting hardware.
2. Slide spent brush wafers and spacers off core and discard.

Brush Installation

NOTE: Wafers and spacers install in the same manner over the core extensions (Figure 4) used with the hidden mount motor option.

1. Stand core in upright position and begin filling by sliding a poly 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 5.

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

NOTE: Brush surface contact during initial operation will set all wafer drive pins up against the core stop flanges. See Figure 6.

- 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 poly brush wafer.
- NOTE: Always start and finish with a poly 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 or core extension with original hardware. See Figures 2 or 4.
- NOTE: Steps 5 and 6 apply to the External Mount Motor configuration only.
5. Install splined hub on core with original hardware. See Figure 2.
 6. Install support bearing on hub. See Figure 2.

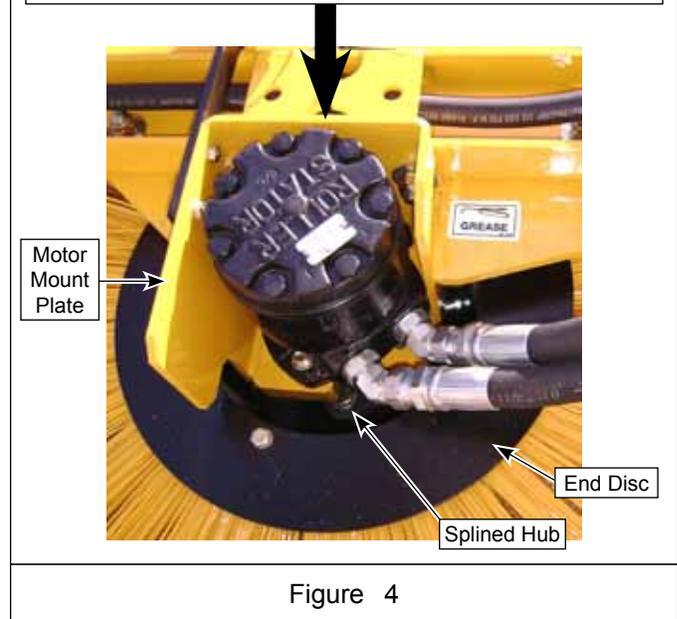
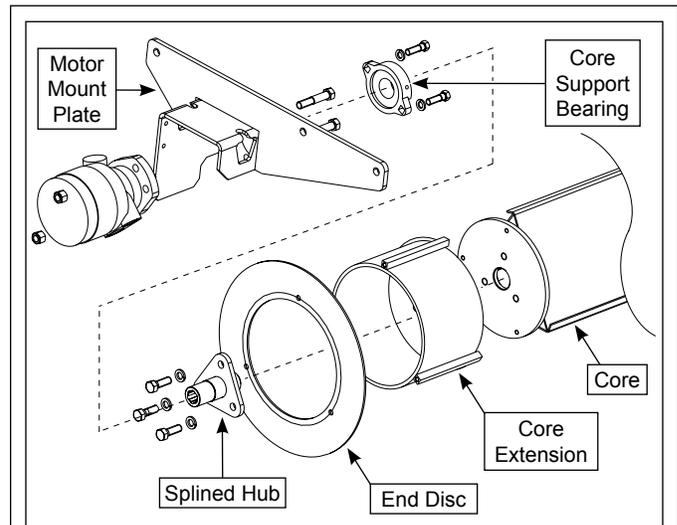


Figure 4

MAINTENANCE



Figure 5

Core Installation (External Mount Motor)

1. Position refilled core in front of the broom head. Lift the broom head high enough to place the filled core (brush assembly) back into its original position. Once in place, lower broom head down onto the core support bearings. See Figure 2.
2. Attach core support bearings, at each end of broom, to bottom of brush frame with original hardware. See Figure 2.

NOTE: Apply grease to hub splines before installing hydraulic motors.

3. Slide motor shaft into mating splined hub.
4. Install motor mount plate on brush frame using original hardware. See Figure 1.
5. Install motor guard on brush frame with original hardware. See Figure 1.
6. Before placing machine back into service, adjust and test for proper amount of brush pattern. Excessive and/or misaligned pattern can cause brush failure or premature wear. Refer to the Pattern Adjustment procedure within the **Setup and Adjustments** section.

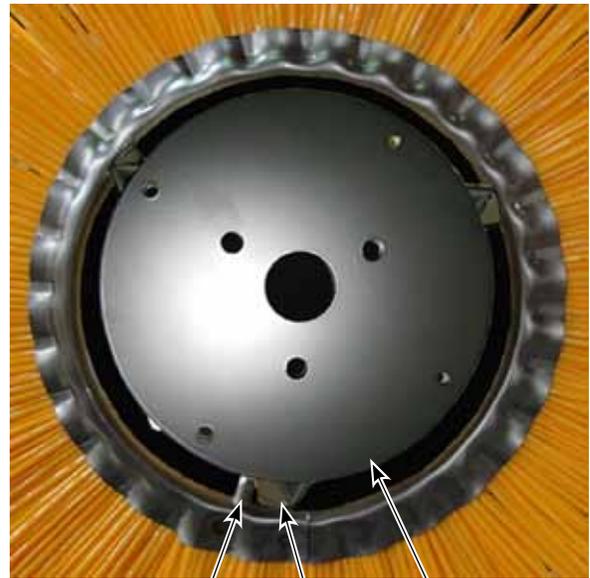


Figure 6

Core Installation (Hidden Mount Motor)

1. Position refilled core in front of the broom head. Lift the broom head high enough to place the filled core (brush assembly) back into its original position.

NOTE: Apply grease to hub splines before installing hydraulic motors.

- Core support bearings are mounted on inside of motor mount plates.
2. Slide each motor, with attached mount plate, into mating splined hub on core. See Figure 4.
 3. Lower broom head until brush frame contacts motor mount plates. If necessary, rotate motor and mount plate assemblies to align with brush frame. See Figure 3.
 4. Install (3) 1/2-13 x 1-1/2" horizontal capscrews, (2) 1/2-13 x 1-3/4" vertical capscrews, flat washers and lock nuts to attach each motor mount plate to brush frame. See Figure 3.
 5. Before placing machine back into service, adjust and test for proper amount of brush pattern. Excessive and/or misaligned pattern can cause brush failure or premature wear. Refer to the Pattern Adjustment procedure within the **Setup and Adjustments** section.

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STORAGE

STORAGE

- Always store the broom so that it is not in contact with the ground. Support the broom from the safety support chains or storage stands, if so equipped. If the broom is stored in contact with the ground for an extend period of time with the bristles deformed, 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.
- Disconnect all electrical connections between the broom and prime mover (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.

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TROUBLESHOOTING

Trouble	Possible Cause	Remedy
Broom does not rotate.	<ol style="list-style-type: none"> 1. No hydraulic pressure/flow. 2. Hoses disconnected. 3. Hoses bent or kinked. 4. Pressure relieving too low. 5. Electric/manual valve not functioning or not On. 	<ol style="list-style-type: none"> 1. Check prime mover hydraulic supply operation. 2. Connect hoses and fittings. 3. Remove sharp bends and kinks. Replace if damaged. 4. Adjust relief valve. 5. Check electrical connections.
Broom rotates in wrong direction.	<ol style="list-style-type: none"> 1. Hoses installed incorrectly. 	<ol style="list-style-type: none"> 1. Switch hydraulic hose connections
Bristles wearing unevenly.	<ol style="list-style-type: none"> 1. Broom head not level. 2. Pattern adjustment incorrect. 3. Tires of different sizes or pressures low. 	<ol style="list-style-type: none"> 1. Adjust using leveling bolts. Refer to the Setup and Adjustments section of this manual. 2. Adjust on head anchor/lift cylinder. Refer to the Setup and Adjustments section of this manual. 3. Check tire sizes, rating and pressure. Adjust and/or correct as necessary.
Broom bounces during sweeping.	<ol style="list-style-type: none"> 1. Travel speed too fast and/or brush speed too slow. 2. Brush overloaded. 	<ol style="list-style-type: none"> 1. Adjust to find correct ground and brush speed for surface. 2. Reduce load on brush.
Broom sweeping poorly.	<ol style="list-style-type: none"> 1. Pattern adjustment incorrectly set. 2. Towing too fast. 3. Uneven sweeping surface. 4. Material is too heavy. 5. Material is 'caked-on' or frozen. 6. Broom rotating too slowly. 7. Bristles worn excessively. 	<ol style="list-style-type: none"> 1. Adjust on head anchor/lift cylinder. Refer to the Setup and Adjustments section of this manual. 2. Slow down towing vehicle speed. 3. Increase pattern to compensate. 4. Slow down towing vehicle speed. 5. Slow down and 'scrub' surface. 6. Increase prime mover hydraulic power supply and/or broom speed. 7. Replace brush wafers.
Broom does not lift or angle.	<ol style="list-style-type: none"> 1. No/Low hydraulic pressure/flow. 2. Electric/manual valve not functioning. 	<ol style="list-style-type: none"> 1. Check prime mover hydraulic system oil level and circuit operation. 2. Check electrical operation and connections. Check solenoids, if so equipped.
Remote Operator Control Box (option) not functioning.	<ol style="list-style-type: none"> 1. Control Box not connected. 2. Prime mover not running. 3. Blown or faulty fuse. 	<ol style="list-style-type: none"> 1. Check connection/plug. 2. Start prime mover following manufacturer's start-up guidelines. 3. Inspect and/or replace fuse.

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SPECIFICATIONS

Model:	53H		
Brush Diameter:	32" OD x 10" ID		
Brush Length:	7' (84")	8' (96")	9' (108")
Main Frame:	Two or three wheel (optional) design 15" automotive-type wheels Adjustable hitch height of 16" to 30" from ground		
Brush Drive:	Dual 18.3 c.i.d. Hydraulic Motors (20 to 44 GPM flow required) (Low Flow Hydraulic Motors (16 to 28 GPM) available.) External (guarded) or Hidden motor mounting available		
Brush Speed:	275 RPM Maximum		
Brush Angle:	Maximum 30° swing left/right of center with provisions to hold broom in the 0° position.		
Brush Filament:	Poly (polypropylene), Wire (Steel), Alternating Poly and Wire, or Combo (Poly/Wire) Mix		
Lift Method:	Manual or Hydraulic (8" ground clearance for transport)		
Swing Method:	Hydraulic		
Broom Hood:	Covers 155° of brush circumference		
Mounting Hitch:	3" Pintle Eye		
Options:	Dirt Deflector (Hood)		
	Remote Electric Controls for Hydraulic Swing and Lift.		
	Sprinkler System (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).		
	2" or 2-5/16" Ball Hitch		
	3rd Wheel (front)		
	Adjustable Length Tow Pole		
	180° Broom Hood		
	Strobe Light		
	Stop/Turn/Tail Lights		
	Fenders		
	Spare Tire		
	Sight Indicators (Flags)		
	Parking Brakes		

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SERVICE PARTS

Part Number	Description
907-46662	Refill Kit, 32" x 7', Wafer, Poly
907-92097	Refill Kit, 32" x 7', Wafer, Alternating Poly/Wire
907-46664	Refill Kit, 32" x 7', Wafer, Wire
907-46663	Refill Kit, 32" x 7', Wafer, Poly/Wire Combo
907-46665	Refill Kit, 32" x 8', Wafer, Poly
907-92098	Refill Kit, 32" x 8', Wafer, Alternating Poly/Wire
907-46667	Refill Kit, 32" x 8', Wafer, Wire
907-46666	Refill Kit, 32" x 8', Wafer, Poly/Wire Combo
907-76909	Refill Kit, 32" x 9', Wafer, Poly
907-92099	Refill Kit, 32" x 9', Wafer, Alternating Poly/Wire
907-90593	Refill Kit, 32" x 9', Wafer, Wire
907-76910	Refill Kit, 32" x 9', Wafer, Poly/Wire Combo
600-68509	Bearing, Pillow Block, Core
410-93199	Hub, Splined, Core
400-64724	End Disc, Core
401-132066	Guard, Brush Motor
410-132554	Pin, Pivot, Brush Swing
203-72275	Cylinder, Broom Lift
203-92006	Seal Kit, Lift Cylinder
203-92034	Cylinder, Broom Swing
203-92094	Seal Kit, Swing Cylinder

Part Number	Description
201-75209	Hydraulic Motor, Standard Flow
201-75649	Hydraulic Motor, Low Flow
201-92028	Shaft, Hydraulic Motor (Std. and Low Flow)
201-92039	Seal Kit (Standard and Low Flow)
202-92297	Valve Block (30 GPM), Hydraulic
202-126892	• Valve, Lift
202-126893	• Valve, Float
202-126891	• Valve, Swing
202-126888	• Valve, Priority
202-126890	• Valve, Motor
202-92205	• Valve, Relief
202-92179	Valve, Check
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
email: 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

53H Decals

8

WARNING

FLYING OBJECTS HAZARD
Keep Clear

ENTANGLEMENT HAZARD
Keep Clear

390-118222

9

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.

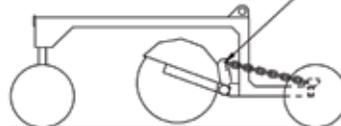
390-118221

10

WARNING

- BRUSH FRAME SUPPORT CHAINS MUST BE CONNECTED WHILE SWEEPER IS BEING TRANSPORTED.
- PUT LIFT CYLINDER CONTROL IN THE DOWN POSITION ONCE CHAINS ARE CONNECTED.

ATTACH TRANSPORT CHAINS BEFORE TOWING UNIT



390-121518

CAUTION

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

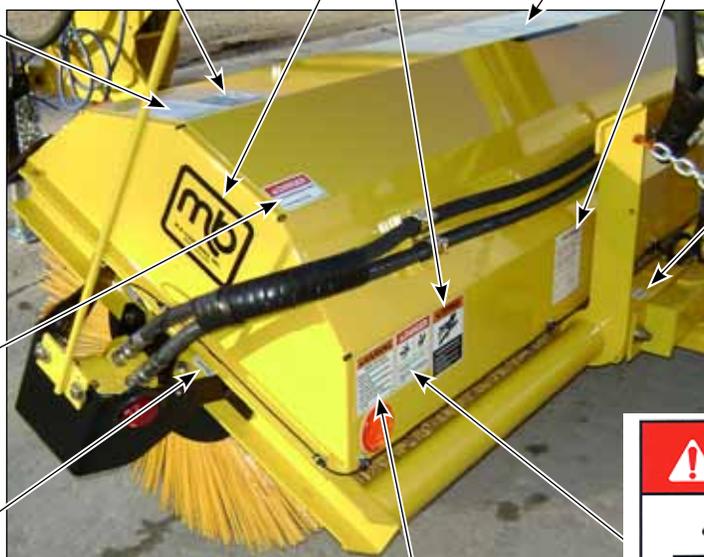
- Before operating broom make sure all guards and broom are installed properly.
- Wear eye protection when operating broom.
- Do not operate broom near any objects that can be damaged by thrown debris. Be sure no by-standers are near broom during operation.
- The polypropylene brush segments can melt 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.

390-118251

4

12

7



GREASE

390-118256

1

DANGER

To prevent serious injury or death:

- Do not allow any riders

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.

390-118253

7

GREASE

390-118256

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.

390-118223



53H Decals

10

⚠ WARNING

- BRUSH FRAME SUPPORT CHAINS MUST BE CONNECTED WHILE SWEEPER IS BEING TRANSPORTED.
- PUT LIFT CYLINDER CONTROL IN THE DOWN POSITION ONCE CHAINS ARE CONNECTED.

ATTACH TRANSPORT CHAINS BEFORE TOWING UNIT

390-121518

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.

12



11

7

GREASE

390-118356

7

GREASE

390-118356

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.

390-118356

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.

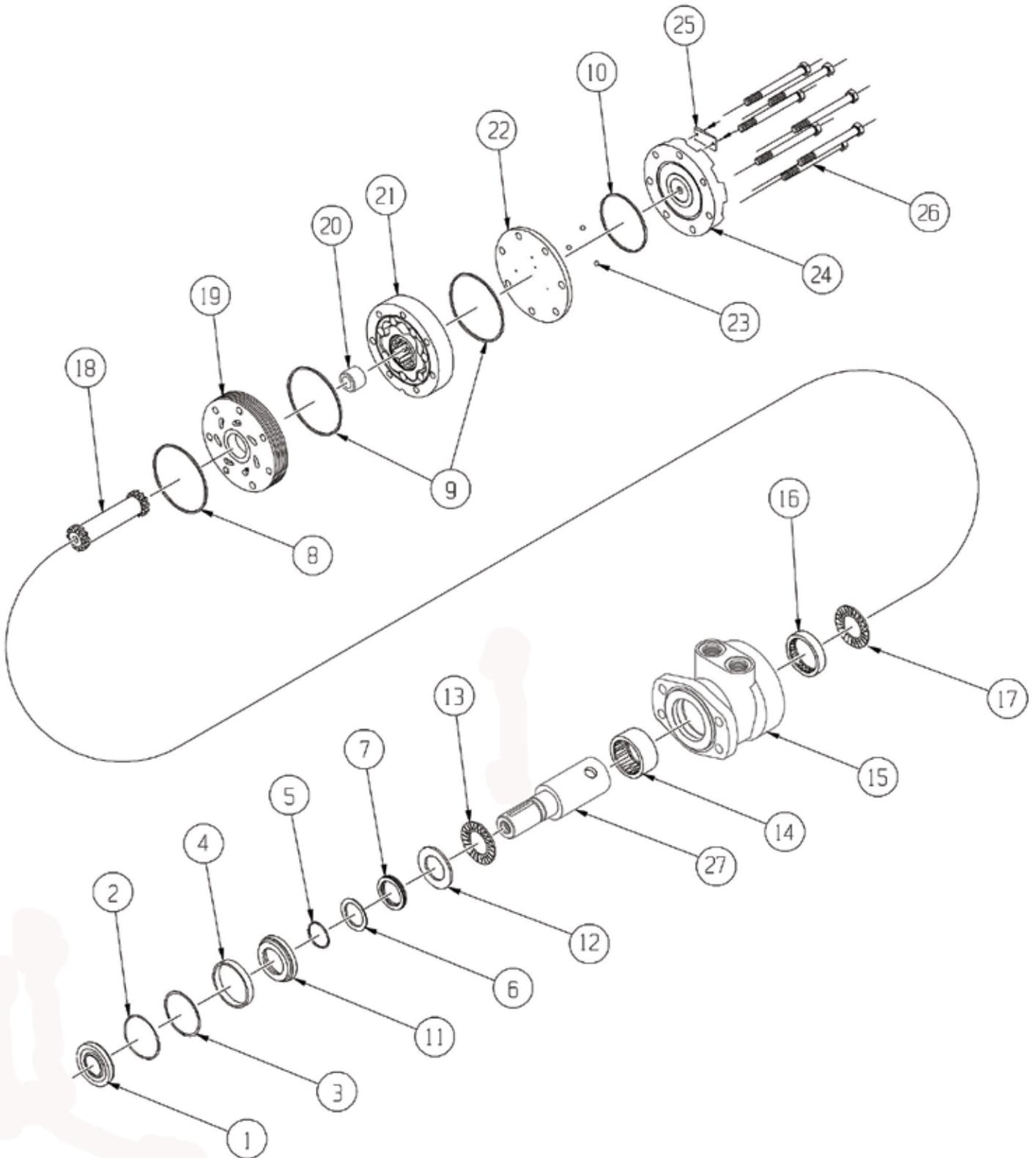
390-118356



53H Decals

Item	Description	Part Number	
	Decal Sheet	390-117958	(Includes items 1 - 7)
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	
5	• Decal, Brush Pattern	390-118354	
6	• Decal, M-B Brush Refills	390-118355	
7	• Decal, Grease	390-118356	
8	Decal, WARNING, Flying Debris	390-169222	
9	Decal, WARNING, High Pressure Fluid	390-169221	
10	Decal, WARNING, Support Chains	390-121518	
11	Decal, MB Logo, Black, Medium	390-117897	
12	Decal, MB Logo, Black, Large	390-117898	
	Decal, Operating Height	390-92143	(See in SETUP AND ADJUSTMENTS section.)

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



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	



Standard Displacement (201-75209) & Low Displacement (201-75649) SERVICE INSTRUCTIONS FOR THE RE [500 & 501] SERIES MOTORS

For Use With Seal Kits: 500444001 & 500444002

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), the bearing spacer (32), and the front housing bearing (14). 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 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).

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.

J) Place housing (15) in vice with the seven bolt assembly holes facing up. If model uses an excluder seal (33), place in the recess of housing. Place metal shim (5) in the smallest diameter recess in the housing (15) on top of excluder seal if used. 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.

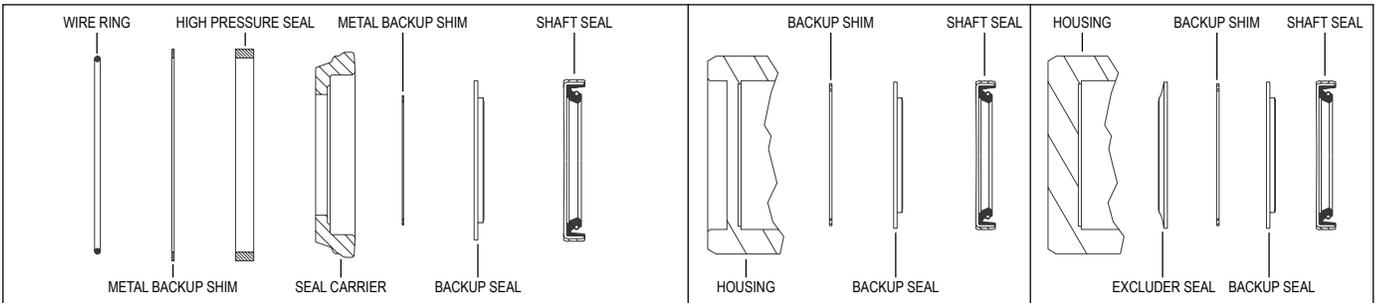


FIGURE 1

FIGURE 2

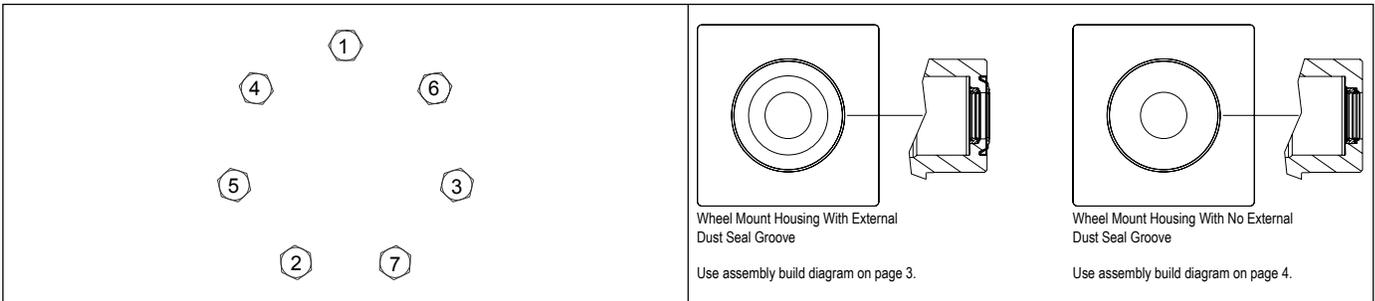


FIGURE 3

FIGURE 4

EXPLODED VIEW PARTS DESCRIPTION

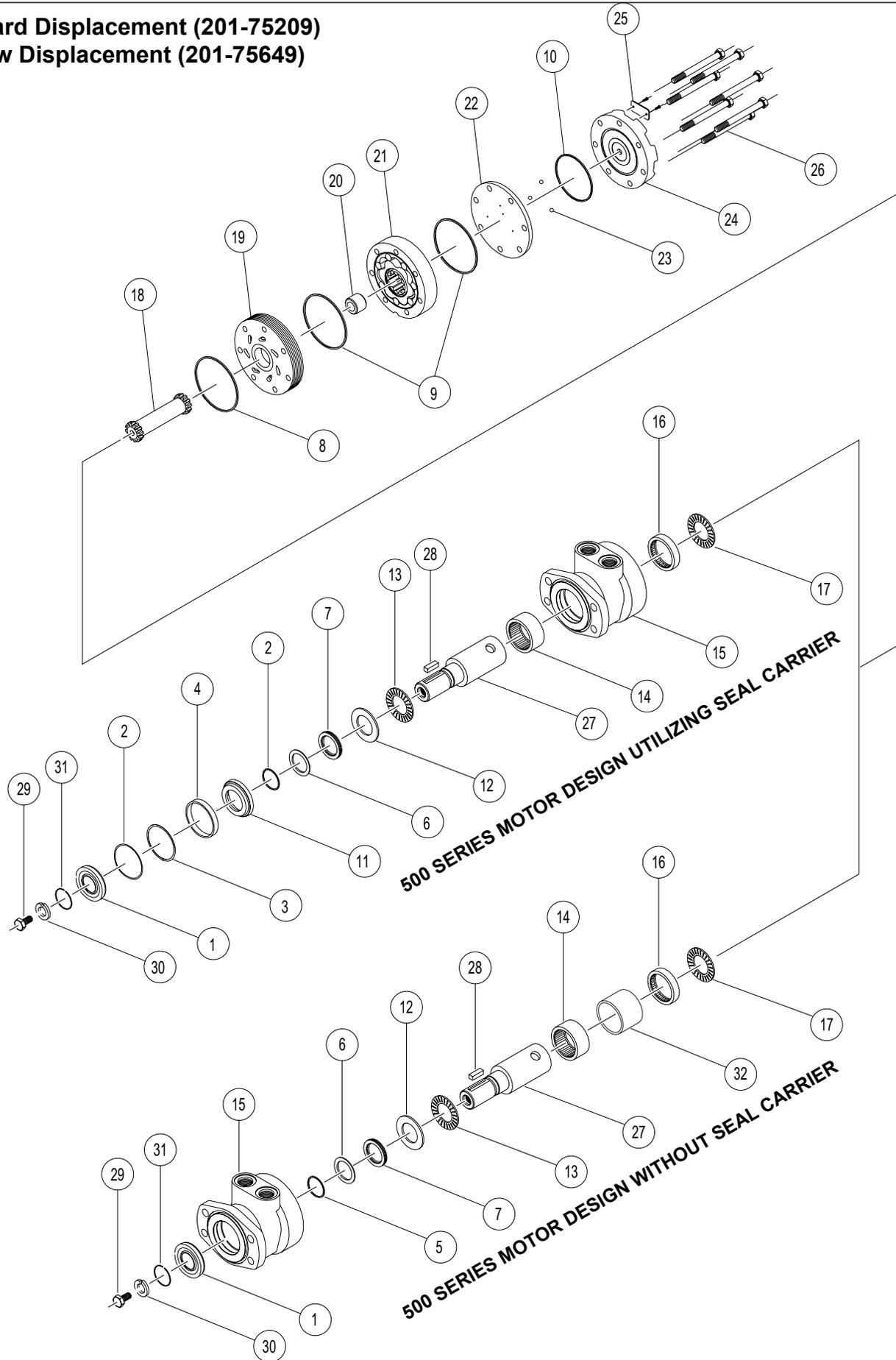
- | | | |
|--------------------------|---------------------------|-----------------------------|
| 1. *† Dust Seal | 13. Front Thrust Bearing | 25. I.D. Tag Assembly |
| 2. *† Split Wire Ring | 14. Front Housing Bearing | 26. Assembly Bolts (7) |
| 3. *† Metal Backup Shim | 15. Housing | 27. Shaft |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

* Contained in Seal Kit 500444001
 † Contained in Seal Kit 500444002

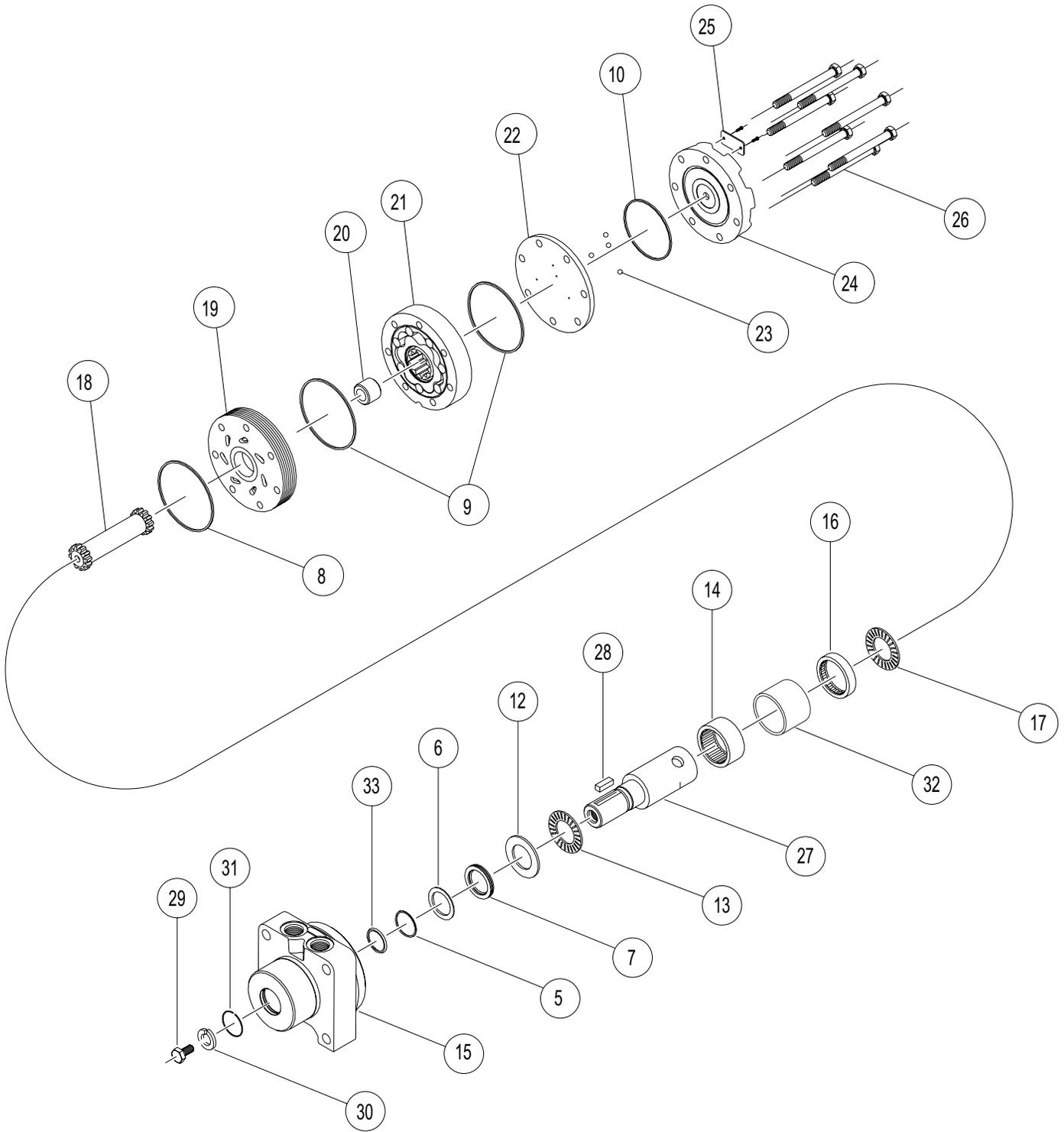
NOTE: The motor design that utilizes a seal carrier will use the larger O.D. backup seal and shaft seal.

Standard Displacement (201-75209) & Low Displacement (201-75649)

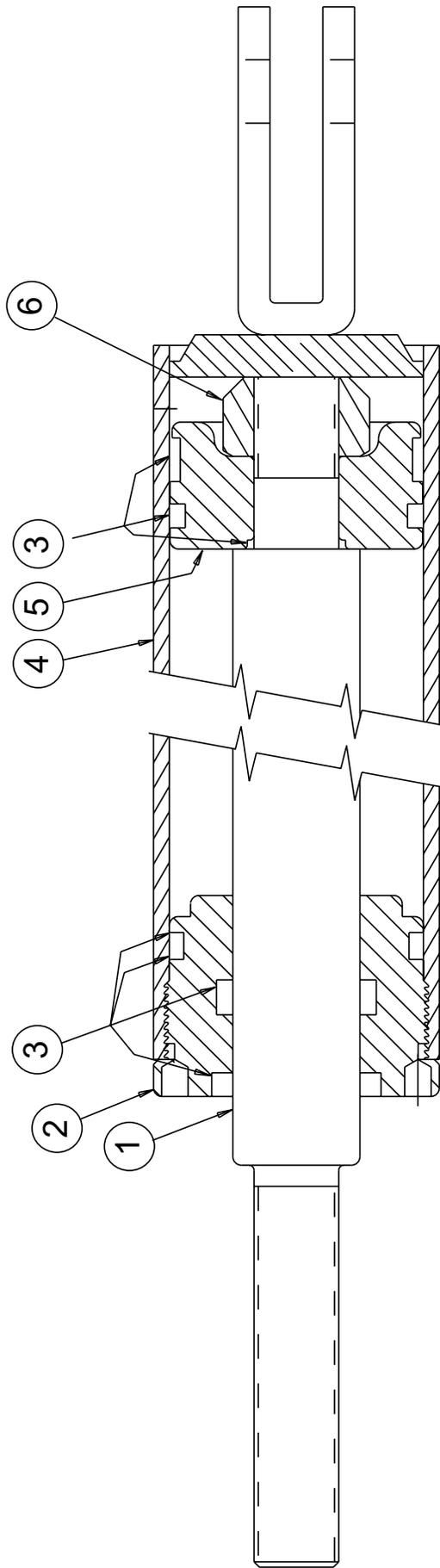
**Standard Displacement (201-75209)
& Low Displacement (201-75649)**



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



**Standard Displacement (201-75209)
& Low Displacement (201-75649)**



Item	Description	Part Number	Quantity
1	Cylinder Rod	203-92002	1
2	Head Gland	203-92003	1
3	Seal Kit	203-92006	1
4	Cylinder Barrel	203-92001	1
5	Piston	203-92005	1
6	Locknut	203-92004	1
7	Nut, Cylinder Rod (Not Shown)	371-02772	1

LIFT CYLINDER (203-72275)

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.

AIRPORT SNOW REMOVAL EQUIPMENT
1200 Park Street
Chilton, WI 53014
800-558-5800

PAVEMENT MARKING EQUIPMENT-PA
79 Montgomery Street
Montgomery, PA 17752
888-323-2900

PAVEMENT MARKING EQUIPMENT-OR
2490 Ewald Avenue SE
Salem, OR 97302
800-253-2909

ATTACHMENTS DIVISION
1615 Wisconsin Avenue
New Holstein, WI 53061
800-558-5800



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