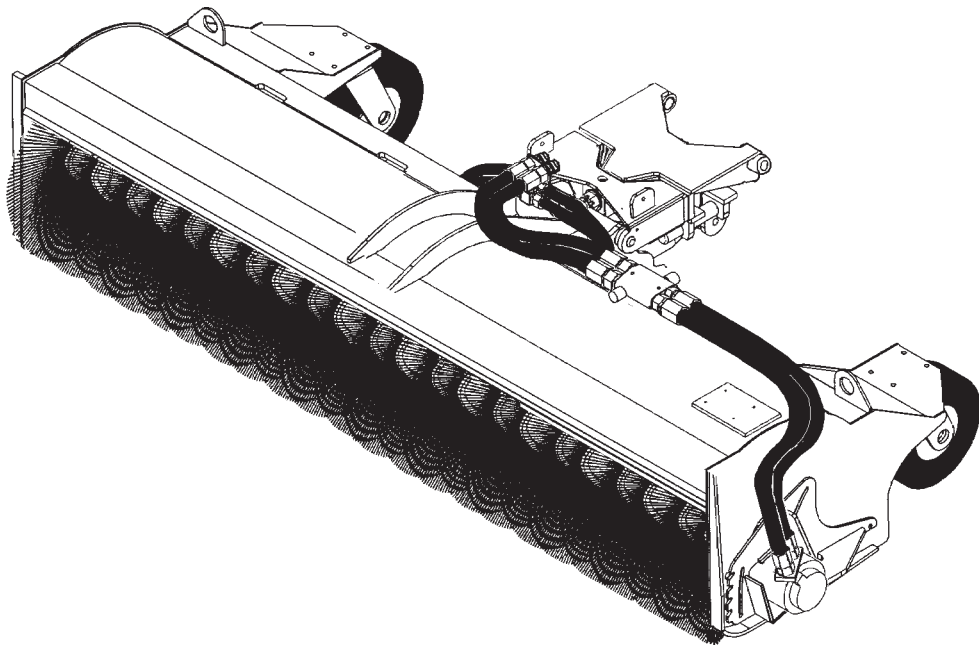


OM659

THE MAJOR®

TRUCK MOUNTED SWEEPERS



OPERATOR'S & PARTS MANUAL OPEN FACE BROOMS

The MAJOR®
503 Gay Street · P.O. Box 266
Delhi, Iowa 52223 USA

Phone: 563.922.2981 · Fax 563.922.2700

PART #75559

M-722
12-16-04-2

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GENERAL COMMENTS

Congratulations on the purchase of your new MAJOR Sweeper. Your sweeper was carefully designed and manufactured to give you many years of dependable service. Your sweeper will require some minor cleaning and maintenance to keep it in top working condition. Be sure to observe all safety precautions described in this manual.

ABOUT THIS MANUAL

This manual has been designed to help you do a better, safer job. Read this manual carefully, and become familiar with its contents. Remember, never let anyone operate the sweeper without reading the "Safety Precautions" and "Operating Instructions" sections of this manual.

Unless noted otherwise, "right-hand" and "left-hand" sides are determined from the position of the operator sitting in the operator's seat facing forward.

SAFETY ALERT SYMBOL



This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

SERVICE

When servicing your sweeper, remember to use only manufacturer replacement parts. Substitute parts may not meet the standards required for safe, dependable operation.

To facilitate parts ordering, record the serial number and model number of your sweeper in the space provided on this page.

MODEL: _____ **SERIAL NUMBER:** _____

GENERAL INFORMATION

The purpose of this manual is to provide safe operating and maintenance procedures for the intended use of the broom. It is important that all information in this manual is READ and UNDERSTOOD before operating the broom.

Since the manufacturer has no direct control over truck application and operation, it is the responsibility of the operator to conform to good safety practices in the implementation of this unit.

This section is composed of various warnings and safety tips which must be followed. Also read the owner's manual which came with the truck that the broom is attached to.

The safety alert symbol is used throughout this manual to bring attention to items which must be followed for your safety and the safety of those around you. Failure to follow these instructions can result in injury or death.



**THIS SYMBOL MEANS:
ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!**

SIGNAL WORDS: Note the use of the signal words DANGER, WARNING, and CAUTION with the safety messages. The appropriate signal word for each has been selected using the following guidelines:

DANGER: Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components which, for functional purposes, cannot be guarded.

WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also indicate unsafe practices which could result in serious damage to the machinery.

Notes are also found in this manual.

NOTE: Provides information which may be of special interest.

TO THE OPERATOR

The primary responsibility for safety with the equipment falls to the operator. It is the skill, care, common sense and good judgement of the operator that will determine how efficiently and safely the job is performed. Know the equipment before you start. Know the capabilities, dimensions, and how to operate all the controls. Visually inspect the equipment before you start and never operate equipment that is not in proper working order with all safety devices in place and operating.

BEFORE YOU START

Wear the right clothing and gear for the job. Protective equipment such as hard hat, steel-toed shoes, leather gloves, respirator or safety glasses may be in order. They can protect you from needless injury. Be sure to meet the requirements for the specific job site. Do not wear loose clothing or things such as rings and watches around the equipment. They could get caught in moving parts and lead to serious injury or death.

Know your equipment. Know how to operate all controls and know emergency shut down procedures. Make sure all safety devices are in place.

Inspect the equipment. Check for missing shields, loose bolts, twisted or damaged hydraulic hoses. Be sure all operational decals are in place and legible. Never operate a damaged or unsafe machine. Remember, you are responsible for your safety and the safety of those around you.

Keep all step plates, grab bars, pedals and controls free of dirt, grease, oil and water. Keep clear of tools, rags and extra parts. Keep equipment clean to help avoid injury from a fall when getting on or off equipment.

OPERATING PRECAUTIONS

Know your work area before you begin. Observe any potential hazard areas such as soft ground, drop-offs, rocks and other obstacles.

Know where all utility lines are. Observe overhead electrical and phone lines. Be sure equipment will safely clear them.

Be alert to others in the work area. Be sure others know when and where you will be working. Make sure no one is underneath or behind equipment.

Never try to board equipment while its moving.

Do not stand in front of the equipment when it is operating.

Always use the seat belt any other safety devices that are on the equipment.

Test all controls before starting operation. This includes safety equipment and devices.

Be aware of what is going on around you. Watch for others who may not be watching out for themselves.

MAINTENANCE PRECAUTIONS

Replace all safety shields and guards when finished performing maintenance. Do not operate the broom with protective equipment removed.

Never perform maintenance or adjustments while the broom is operating. Turn off the engine when performing maintenance to prevent accidental movement.

Make sure all operating and residual pressures are relieved before working on a hydraulic system. Shut engine off and operate all the controls to relieve any pressure.

Use only manufacturer recommended replacement parts. Other parts may be substandard in fit and quality.

Do not set relief valve pressures higher than recommended by the manufacturer. Relief valves should be checked and adjusted only by a trained service technician. Do not remove or block a relief valve.

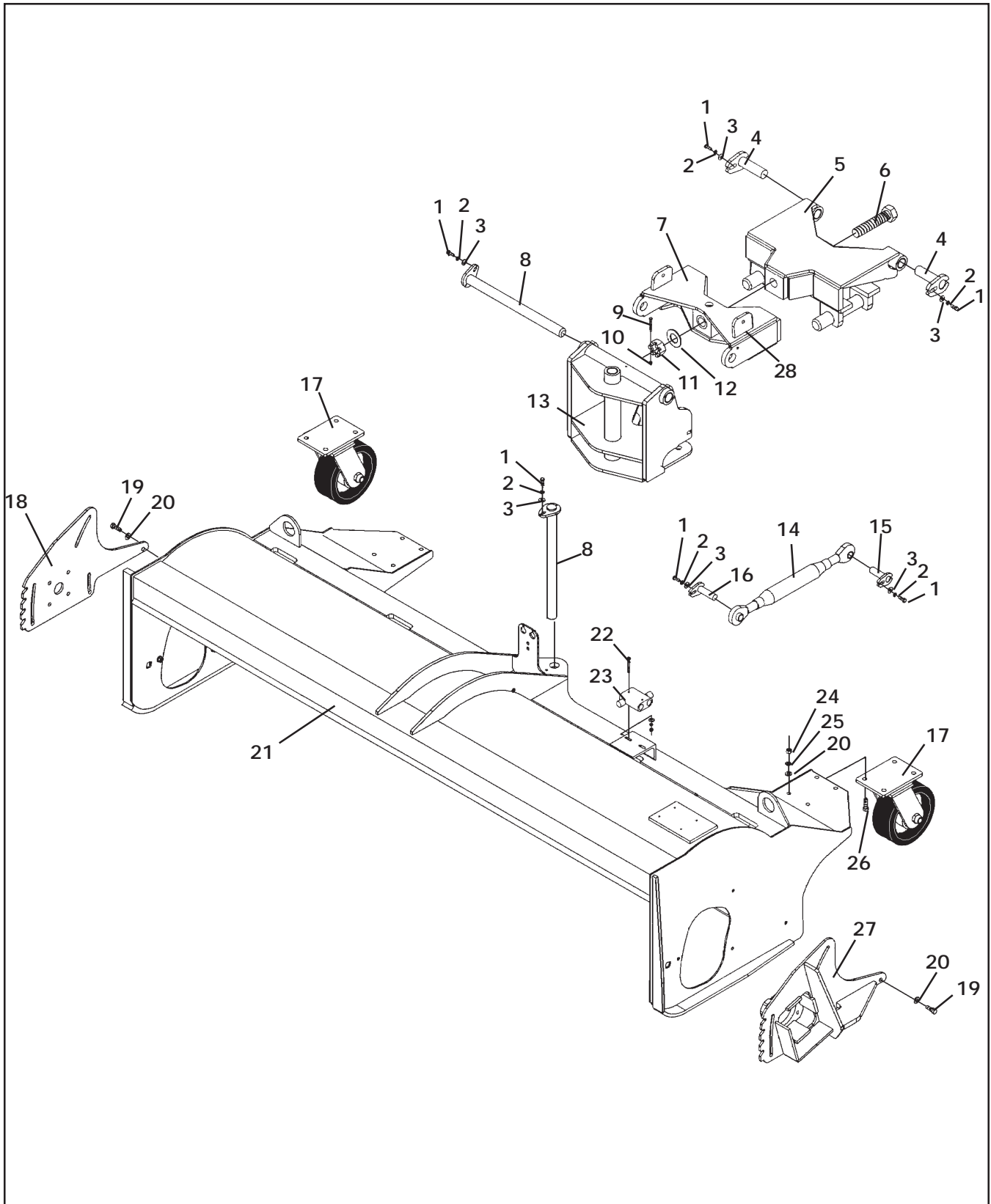
Observe proper maintenance schedules. Proper maintenance can help prevent a hazardous condition.

Always wear safety goggles or glasses when working on equipment.

Never use your hands to search for hydraulic fluid leaks. Use cardboard or paper to indicate the presence of a leak. High pressure hydraulic fluid leaks can be invisible and may cause an infection or toxic reaction if skin is penetrated. Seek medical attention immediately if hydraulic fluid is injected into skin.

Always clean the ends of the hydraulic lines before attaching them. This reduces the amount of contamination in hydraulic components. Cover and protect the ends when the broom is disconnected and not being used.

TRUCK MOUNTED OPEN SWEEPER ASSEMBLY

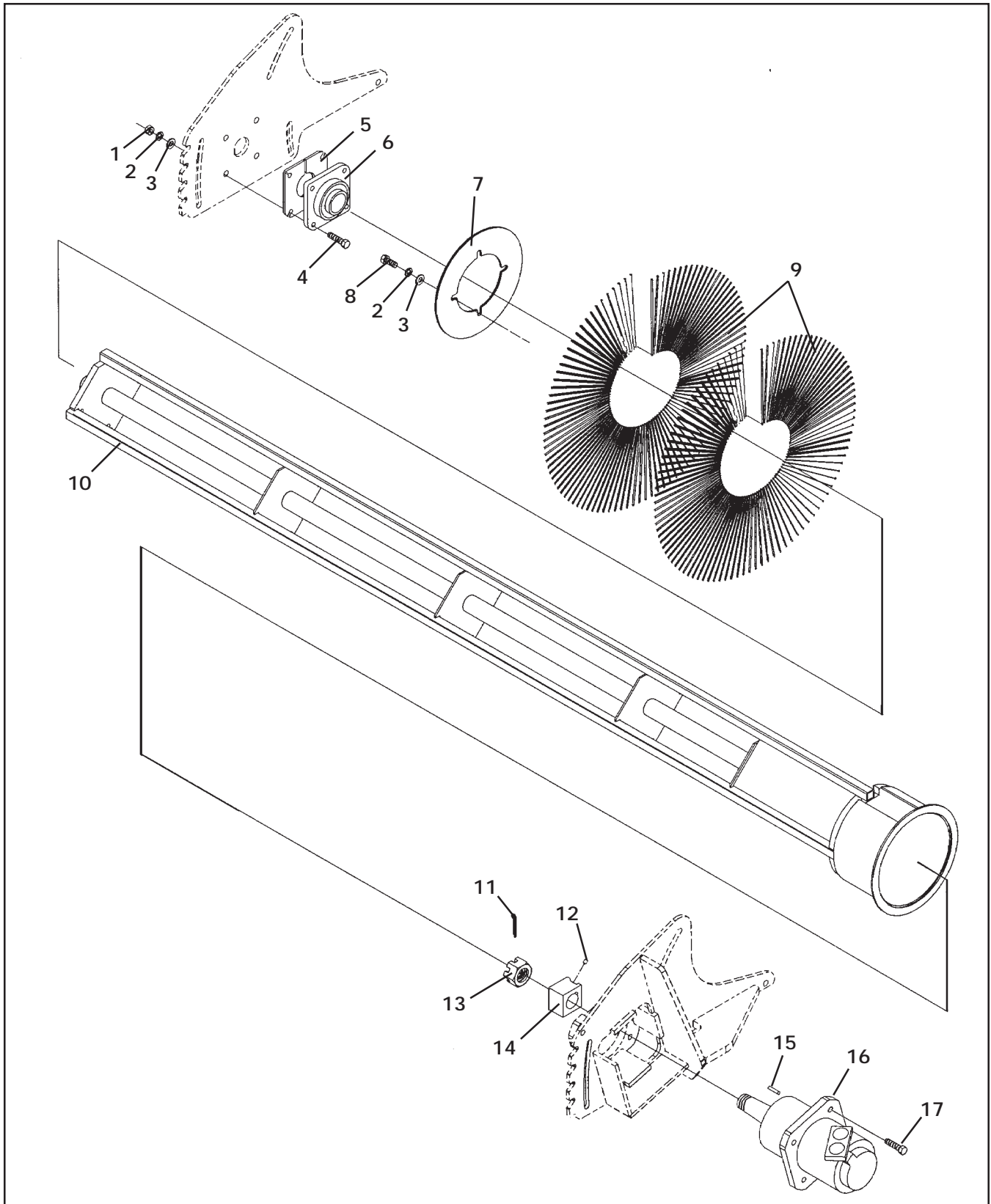


TRUCK MOUNTED OPEN SWEEPER ASSEMBLY

NO	REQ'D	PART NO.	DESCRIPTION
1	6	1043	.38" UNC X 1.00" Hex Capscrew
2	6	1503	.38" Lock Washer
3	6	1514	.38" Flat Washer
4	2	31459	Pivot Pin (1.50" X 5.13")
5	1	31445	Hinge Weldment (8' & 9' Sweepers)
	1	19927	Hinge Weldment (10' Sweepers)
	2	6616	Grease Fitting
6	1	10013	1.50" UNF x 7.00" Hex Drilled Capscrew-Grade 8
7	1	31443	Universal Broom Weldment
	-	14099	Replacement Pivot Sleeve
	1	9371	Grease Fitting
8	2	31444	Pivot Pin (1.50" X 20.38")
9	1	1009	.25" UNC X 2.50" Hex Capscrew
10	1	1224	.25" UNC Hex Nut
11	1	10019	1.50" UNF Castle Nut
12	1	1522	1.50" Flat Washer
13	1	31430	Pivot Frame
	2	6616	Grease Fitting
14	1	32023	Turnbuckle
15	1	32005	Pin (1.00" X 3.63")
16	1	14071	Pin (1.00" X 3.31")
17	2	12230	Wheel Assembly (8' & 9' Sweepers)
	2	19520	Wheel Assembly (10' Sweepers)
18	1	32633	Bearing Mount
19	8	1090	.50" UNC X 1.50" Hex Capscrew
20	16	1646	.50" Hard Flat Washer
21	1	33381	8' Cannister Weldment
	1	31407	9' Cannister Weldment
	1	19507	10' Cannister Weldment
22	2	1028	.31" UNC X 2.50" Hex Capscrew
	2	1502	.31" Lock Washer
	2	1513	.31" Flat Washer
	2	1225	.31" UNC Hex Nut
23	1	11755	Relief Valve
24	8	1228	.50" UNC Hex Nut
25	8	1505	.50" Lock Washer
26	8	1091	.50" UNC X 1.75" Hex Capscrew
27	1	33176	Motor Mounting
	1	10042	Replacement Safety Snap (Not Shown)
	1	31034	Replacement Jack Stand (Not Shown)
28	2	89968	.38" Straight Shackle

** Due to the various mounting combinations available the mounts are not shown. Contact Factory for mounting bracket information.

TRUCK MOUNTED OPEN SWEEPER ASSEMBLY

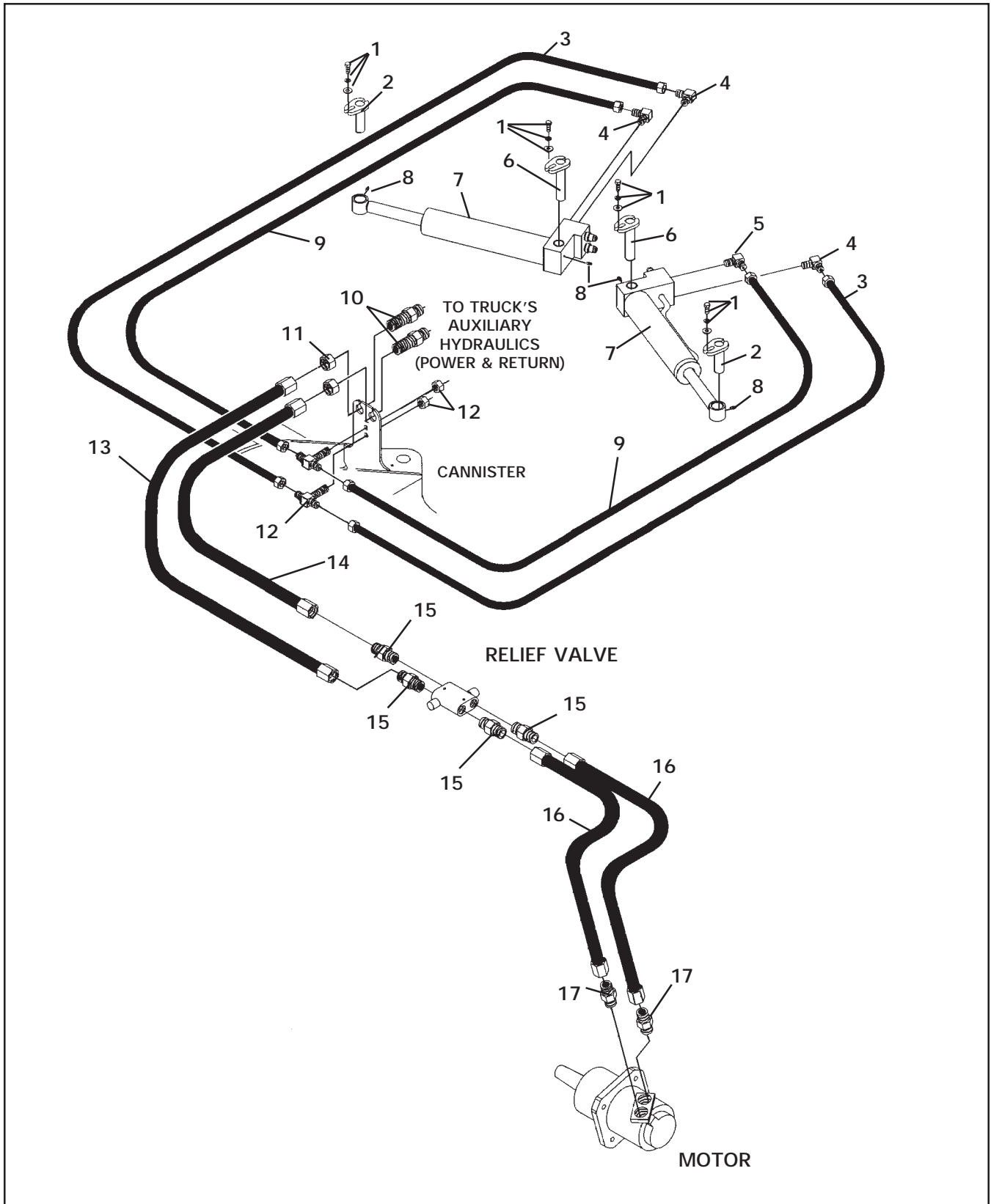


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TRUCK MOUNTED OPEN SWEEPER ASSEMBLY

NO	REQ'D	PART NO.	DESCRIPTION
1	4	1228	.50" UNC Hex Nut
2	8	1505	.50" Lock Washer
3	8	1646	.50" Hard Flat Washer
4	4	1092	.50" UNC X 2.00 Hex Capscrew
5	1	11620	Bearing Shim
6	1	32641	Bearing
7	1	89806	Retainer Plate
8	4	1089	.50" UNC X 1.25" Hex Capscrew
9	1	11736	8' Sweeper Wafer Set
	1	11738	9' Sweeper Wafer Set
	1	12625	10' Sweeper Wafer Set
10	1	33331	8' Core
	1	32009	9' Core
	1	19506	10' Core
11	-	1614	Replacement Cotter Pin
12	-	1999	Replacement Set Screw
13	-	45841	Replacement Motor Castle Nut
14	1	11224	2.50" Drive Block
15	-	45840	Replacement Key
16	1	12190	Hydraulic Motor
17	4	1341	.50" UNF X 1.75" Hex Capscrew

TRUCK MOUNTED OPEN SWEEPER ASSEMBLY (HYDRAULICS)



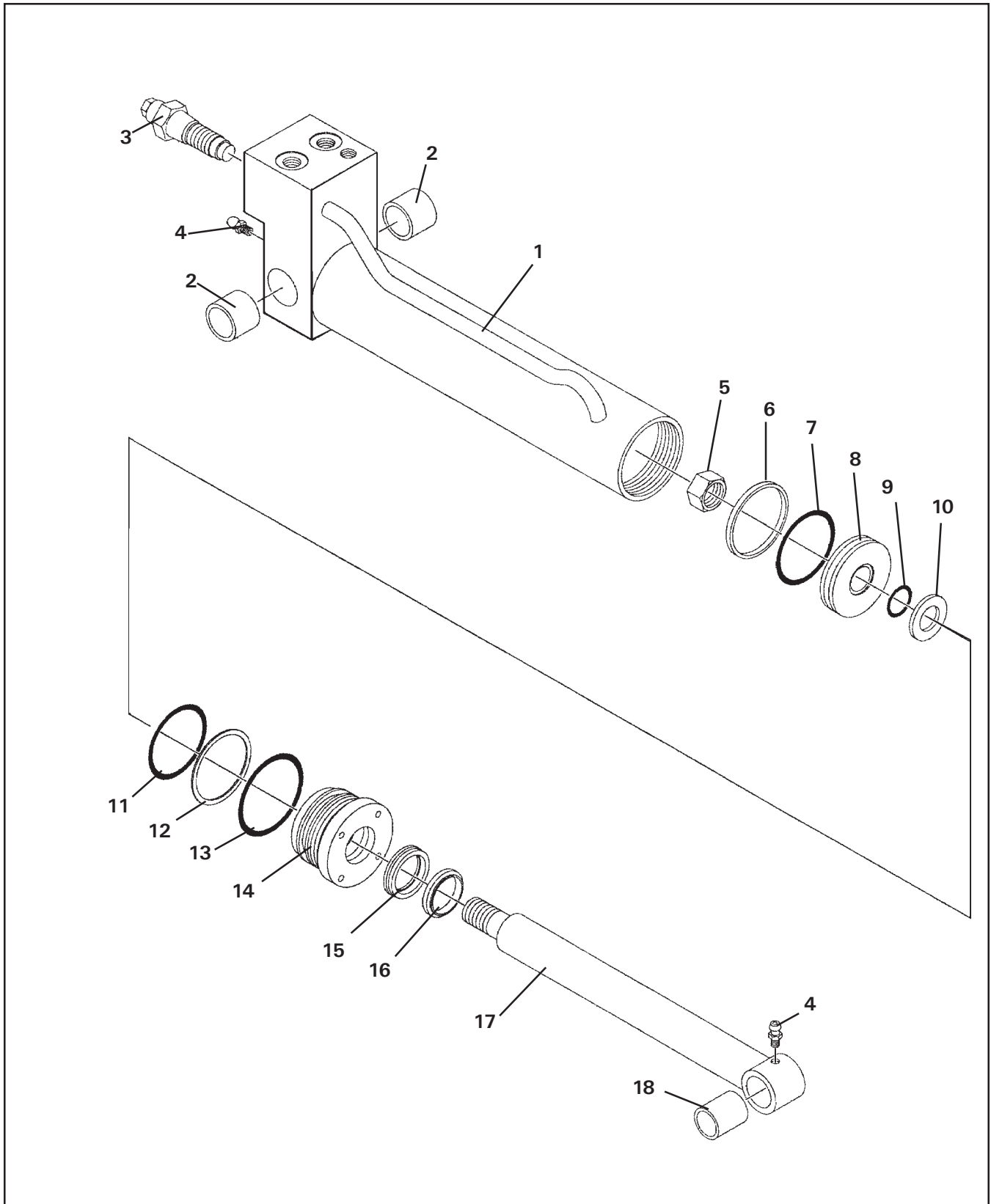
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M-720
10-27-03

TRUCK MOUNTED OPEN SWEEPER ASSEMBLY (HYDRAULICS)

NO	REQ'D	PART NO.	DESCRIPTION
1	4	1043	.38" UNC X 1.00" Hex Capscrew
	4	1503	.38" Lock Washer
	4	1514	.38" Flat Washer
2	2	14071	Cylinder Pin (1.00" x 3.31")
3	2	37917	Hose Assembly .25" x 41" 6FJX-6FJX
4	3	3434	90° Elbow 6MBo-6MJ
5	1	14067	90° Elbow 6MBo-6MJ with .027" Orifice
6	2	14070	Cylinder Pin (1.00" x 4.72")
7	2	89117	Cylinder Assembly
8	4	6616	Grease Fitting
9	2	37916	Hose Assembly .25" x 40" 6FJX-6FJX
10	2	30249	Straight Bulkhead Connector 12MJ-12MJ
11	2	30250	#12 Bulkhead Nut
12	2	3498	Bulkhead Tee 6MJ-6MJ-6MJ (Includes Nut)
13	1	37374	Hose Assembly .75" x 42" 12FJX-12FJX
14	1	37501	Hose Assembly .75" x 34" 12FJX-12FJX
15	4	3419	Straight Connector 12MBo-12MJ
16	2	37913	Hose Assembly .75" x 49" 12FJX-12FJX
17	2	3409	Straight Connector 12MBo-12MJ

CYLINDER ASSEMBLY #89117



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CYLINDER ASSEMBLY #89117

NO	REQ'D	PART NO.	DESCRIPTION
1	1	89118	Cylinder Tube with Valve
2	2	88919	Bronze Bushing
3	2	89120	Valve Cartridge - Over Center
4	2	6616	Grease Fitting
5	1	1483	Hex Nut
6	1	4644*	Piston Ring
7	1	4645*	Seal Ring
8	1	50252	Piston
9	1	4641*	Seal Ring
10	1	5421	Washer
11	1	4509*	Seal Ring
12	1	4510*	Back-Up Washer
13	1	45250*	Seal Ring
14	1	77458	Cylinder Gland
15	1	45219*	Polypak Seal
16	1	45389*	Rod Wiper
17	1	88915	Piston Rod
18	1	88918	Bronze Bushing
	1	45617	Cylinder Seal Kit, Includes all parts marked with an asterisk (*). Parts are not sold separately.

GENERAL INFORMATION AND CONTROLS

The MAJOR'S Open Face Broom is built to fit various truck mounting systems. Due to the many different types of mounting brackets available, refer to your units operator's manual for attaching and detaching the sweeper.

NOTE: You will need to purchase quick couplers to match your trucks auxiliary hydraulics and four hoses with a minimum rating of 3000 PSI. Two .75" hoses with a 12FJX end and two .25" hoses with a 6FJX end to connect the broom to your operating vehicle.

When picking up the sweeper with your machine, **DO NOT RAISE THE UNIT MORE THAN IS ABSOLUTELY NECESSARY TO LOCK THE BROOM TO YOUR MACHINE. THERE IS A POSSIBILITY THAT THE BROOM COULD FALL AND CAUSE INJURY IF NOT PROPERLY LOCKED TO THE MACHINE.**

Once the Open Face Broom is properly locked, lower the unit to the ground and stop the engine. Connect your hydraulic hoses to the bulkhead fittings on the Open Broom and operate the auxiliary hydraulic system to relieve the pressure in the lines and then connect the hydraulic hoses from the broom to the truck.

Ensure the broom is operating properly and note the direction of rotation when you operate the auxiliary controls.

NOTE: Check the truck owner's manual for correct operation of the auxiliary hydraulic system.

NOTE: If your controls are not functioning correctly reverse the two .75" hoses going to your truck.

DANGER: Never operate an attachment which is not securely attached to the machine.



Your operating vehicle is required to have auxiliary hydraulics that are capable of 30 - 40 GPM and hydraulic pressure of 2250 PSI. Verify that your unit is capable of hydraulic motor operation at these levels.

ADJUSTMENTS

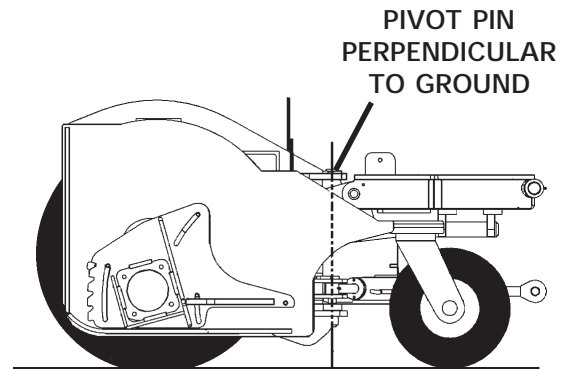
A properly adjusted broom will offer the best sweeping performance.

- A. Keeping the broom **LEVEL** is recommended at all times but is critical when sweeping at an angle to avoid uneven wear of the wafers.
- B. Adjusting the **BRUSH PATTERN** so only 3" - 4" of brush touches the ground offers the best sweeping performance without premature wearing of the wafers.
- C. **ANGLING** the sweeper to the left or right will assist in directing the debris and also in windrowing the debris.

LEVELING THE SWEEPER

Keeping the sweeper level is recommended at all times but is critical when sweeping at an angle to avoid uneven and premature wear of the wafers.

After properly adjusting the broom for the best sweeping performance, the operating machine's arms need to be adjusted so the pin connecting the pivot frame to the cannister is perpendicular to the ground. This can be obtained by setting the caster wheels on the ground and rolling the broom in or out using the turnbuckle until the unit is level and parallel with the ground.

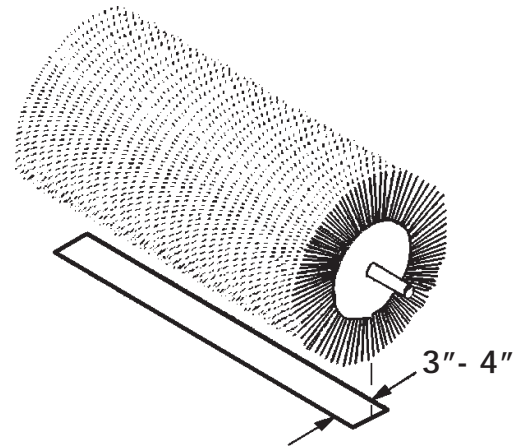


ADJUSTING THE SWEEPER BRUSH (WAFERS)

A properly adjusted brush offers the best sweeping performance.

TO ADJUST BRUSH PATTERN:

1. Move the sweeper to a dusty, flat surface.
2. Set the parking brake; leave the engine running.
3. Start the sweeper at a slow speed; then lower until the bristle tips touch the ground.
4. Run the sweeper in a stationary position for 10 seconds.
5. Raise the sweeper and back away.
6. Shut off the engine and remove the key.
7. Check the brush pattern left in the dust. The swept area should be 3" - 4" wide, running the full length of the brush.
8. If the brush pattern is not 3" - 4" wide the brush height needs adjusted as necessary.

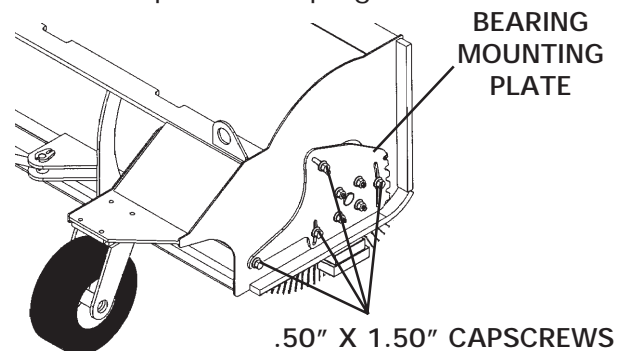


ADJUSTING BRUSH HEIGHT:

It is important that the rotating brushes are kept correctly adjusted. Failure to do so will result in premature wear of the brushes and poor sweeping.

To Adjust Rotating Brushes:

1. Raise the broom until the bottom is about 2" above the ground and level.
2. Loosen the four .50" X 1.50" capscrews on each side of the broom, holding the bearing mounting plate and the motor mounting plate to the broom cannister.



3. Allow the side plates to rotate downward to lower the brush.
4. Tighten all bolts when the brushes measure approximately five inches from the bottom of the cannister.

ANGLING THE SWEEPER

Angling the broom to the left or right will assist in directing debris and also in windrowing the debris.

The direction of angle (right or left) depends upon the auxiliary hydraulic system of your truck.

OPERATING THE BROOM

The **MAJOR** Open Brooms use your unit's hydraulic flow to operate. To start the brush, turn on the auxiliary hydraulics; to stop it, turn off the hydraulic flow.

With this broom you sweep "Over" the brush while moving in a forward direction.

NOTE: Broom rotation should always be away from the operator.

CAUTION! Only fully trained operators or trainee operators under the close supervision of a fully trained person should use this machine.



Check all hydraulic fittings for leaks and that they are properly connected and routed. Check hardware for tightness.

Be sure all persons not operating the sweeper are clear of the sweeper discharge area.

To increase or decrease brush speed, change the rpm. Use the **LOWEST** speed that will complete the job. In general, half throttle provides plenty of engine speed.

WARNING! Avoid serious injury. Check for objects that could harm the operator or others if thrown by the sweeper. Remove these items before sweeping.



Observe wind direction. Sweeping with the wind makes sweeping more effective and helps keep debris off the operator.

Direct the debris by angling the brush head in that direction.

NOTE: The terms *swing* and *angle* are used interchangeably.

IMPORTANT: Wire wafers will damage decorative or delicate surfaces such as: tile, brick, fresh or sealed concrete, etc.

TO SWEEP

1. Set the brush head assembly in the direction you want to direct the debris.
2. Start the truck and engage the brush (with engine at low speed) and slowly lower it to the ground.

3. Increase engine rpms to required sweeping speed. Use the **LOWEST** speed that will complete the job.
4. Travel forward at 5 mph or less.

At the end of a run: slow engine and travel speeds, disengage the brush, and raise the brush head off of the ground and make the turn.

Vary brush, engine and travel speeds to match sweeping conditions.

LARGE AREAS

When sweeping large areas, such as parking lots, make a path down the middle and then sweep to both sides. This will reduce the amount of debris that the brush must sweep in each consecutive pass and allow the sweeper to run in a continuous pattern.

HEAVY DEBRIS

Travel slowly, less than 5 mph and sweep a path less than the width of the sweeper. Increase engine speed slowly if debris becomes too heavy.

NOTE: A maximum brush speed in the low range and travel speed less than 5 mph is recommended when sweeping heavy debris.

NOTE: For excessive amounts of accumulated debris it may be more effective to use a dozer blade followed by the sweeper.

SNOW

To sweep snow effectively, a high brush speed and slow ground speed is required. It is recommended to start at 3/4 throttle with the machine traveling slowly. It may be necessary to increase the throttle speed for wet or deep snow applications. This will also help to avoid snow buildup inside the broom hood.

NOTE: In deep snow you may need to make more than one pass to obtain a clean surface.

OPERATING TIP: To keep snow from blowing back onto your swept area it is recommended you sweep with the wind to your back.

CAUTION! Avoid equipment damage. Do not ram into piles of debris. Use a dozer blade for this type of job with the sweeper for the final clean-up.



DIRT & GRAVEL

A low brush speed and moderate ground speed works best for cleaning debris from hard surfaces. When sweeping gravel use just enough brush speed to "roll" the gravel, not throw it. Brush speeds that are too fast tend to raise dust.

OPERATING TIP: To keep dust to a minimum it is recommended to plan your sweeping for days when it is overcast and humid or after it has rained. It is also recommended to sweep so the wind is at your back or in the direction the brush head is angled.

THATCH

A low brush speed and low ground speed works best for thatching. To prevent the brush from pulling itself into the ground, adjust the brush so the bristle tips barely touch the grass.

If the brush does pull into the grass and stalls while sweeping use the machine to lift the brush. Do not increase throttle speed to override a stall out.

OPERATING TIP: Use a combination of brush speed and ground speed to roll thatch up into a neat windrow. To deter thatch from blowing back into the operator's face or into a swept area it is recommended to sweep so the wind is at your back or in the direction the brush head is angled.

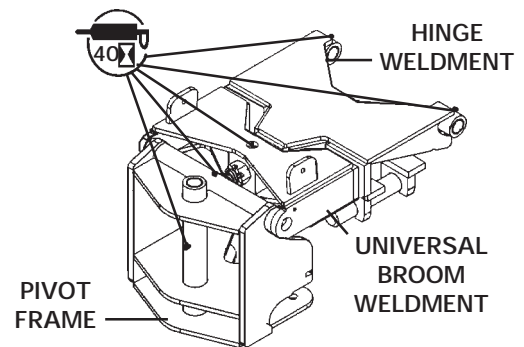
GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been kept to an absolute minimum. However, it is very important that these maintenance functions be performed as described in this section.

LUBRICATION

Lubrication is an important part of the maintenance. It is recommended that all grease fittings be lubricated after every 40 hours of use. There are (12) grease fittings to be lubricated in the following locations.

- Pivot tubes on the pivot frame (2).
- Pivot point on top of the universal broom weldment (1).
- Pivot tubes on the hinge weldment (2).
- Rod and tube ends on the Angle Cylinders (4).
- Bearing on the core located on the right side of the bucket (1).
- Wheel assembly swivel points (2).



REPLACING HYDRAULIC MOTOR

1. Lower the sweeper to the ground and set on supports placed under the frame to protect the wafers.

WARNING! Avoid serious injury. Stop brush rotation, lower the sweeper to the ground, set the parking brake, stop the engine and remove the key before leaving the operator's seat.



2. Tag and disconnect the hydraulic hoses and fittings from the motor.
3. Remove the motor from the mounting plate by removing the (4) .50" x 1.75" fine threaded capscrews and slide the motor out of the motor mounting plate.
4. Remove the drive block from the motor by first removing the cotter pin and castle nut and then loosening the set screw and sliding it off the tapered shaft. Install the drive block onto the new motor.
5. Install the new motor to the motor mounting plate using the existing capscrews removed in step #3.
6. Reinstall the hoses and fittings into the new motor.
7. Run the sweeper to check for hydraulic leaks and to verify that the hose connection is correct.

REPLACING THE OFFSIDE BEARING

1. Lower the sweeper to the ground and set on supports placed under the frame to prevent the wafers from carrying the entire load.

WARNING! Avoid serious injury. Stop brush rotation, lower the sweeper to the ground, set the parking brake, stop the engine and remove the key before leaving the operator's seat.



2. Remove the bearing mount from the right side of the cannister by removing the (4) .50" x 1.50" capscrews. **NOTE: The end of the broom core will fall (until the wafers are able to support it) when the bearing mount is removed.**
3. Remove the bearing from the bearing plate by removing the (4) .50" x 2.00" capscrews.
4. Install the new bearing to the bearing mount using the existing hardware and bearing shims. **NOTE: To maintain the correct end float on the brush it is important to replace any bearing shims that you found between the bearing and the mounting plate.**
5. Lift the broom core until it is positioned into the bearing and secure the bearing mount onto the cannister using the existing hardware.
6. Adjust the brushes as necessary.

REPLACING BRUSHES (WAFERS)

As the brushes become worn they need to be replaced. It is recommended that all brushes are replaced at the same time.

Replacing only a section of brushes is acceptable for special sweeping applications, where only part of the brush is being used consistently and the remainder of the brushes are in "new" condition. **NOTE: Always install a poly section on each end of the core, 1 first and 1 last. If installing a combination wafer kit alternate between wire and poly brushes.**

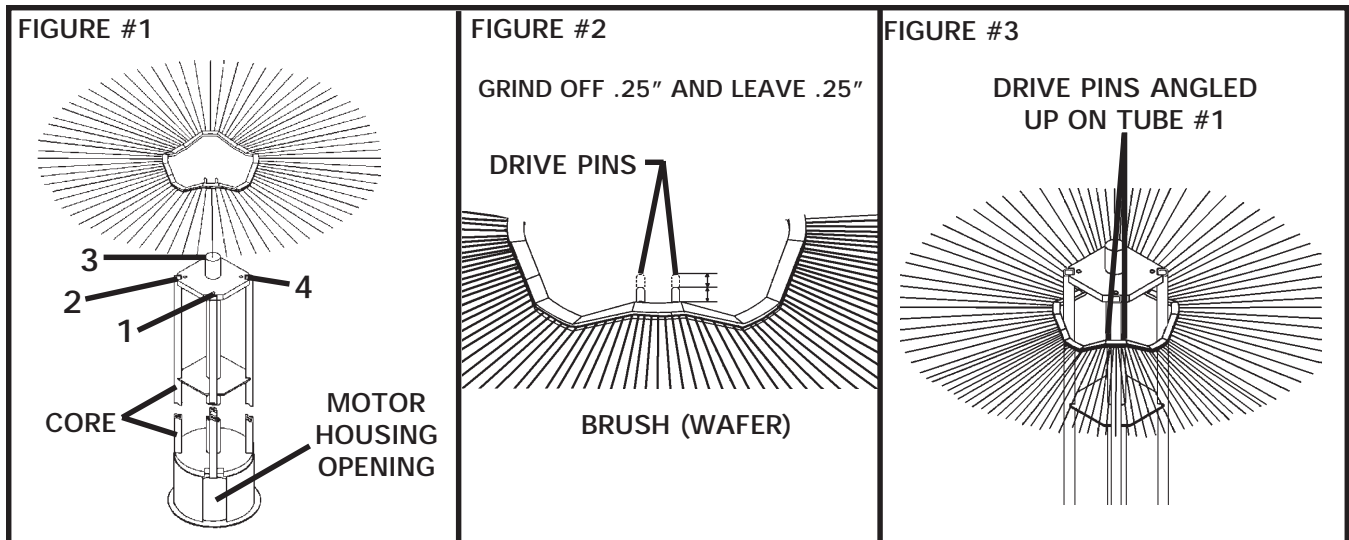
1. Drive the sweeper to a location where an overhead hoist is available. Lower the sweeper to rest on the ground. Place supports under the frame of the broom.

WARNING! Avoid serious injury. Lower and stop the sweeper, set the brake, shut off the engine and remove the key before leaving the operator's seat.

2. Remove the eight .50" X 1.50" capscrews securing the motor mount and bearing mount to the broom.
3. Remove the motor mount with the motor attached from the cannister and place in a position that the hydraulic hoses are not stressed. **NOTE: The end of the broom core will fall (until the wafers are able to support it) when the motor mount is removed.**
4. Remove the bearing mount from the cannister. **NOTE: The broom core will fall (until the wafers are able to support it) when the bearing mount is removed.**
5. Remove the brush wafer and core assembly from the cannister.
6. Remove the wafer end retainer.
7. For quick and easy removal of the worn brushes: Using an overhead hoist attach to the motor end of the core and lift. The brushes (wafers) will fall off the core.
8. Set the core on end, with the motor end on the ground.

9. For installation of the new brushes, number the tubes on the core as 1, 2, 3 and 4 with #1 being the tube located at the motor housing opening. (See Figure #1) Due to the housing on the motor end of the core the first four wafers will be install on tube #1.

NOTE: For clearance it is necessary to grind off 1/4" from the drive pins on the first two wafers leaving 1/4". See Figure #2



10. Slide the first brush section (wafer) onto the core with a drive pin on each side of tube #1. Be sure the drive pins angle UP. See Figure #3
11. Place the second brush section onto the core with a drive pin on each side of tube #1. Be sure the drive pins are angled down.
12. Place the third brush section onto the core with a drive pin on each side of tube #1. Be sure the drive pins are angled up.
13. Place the fourth brush section onto the core with a drive pin on each side of tube #1. Be sure the drive pins are angled down.
14. Place the fifth brush section onto the core with a drive pin on each side of tube #2. Be sure the drive pins are angled up.
15. Continue sliding brush sections (wafers) on until the core is full, making sure to alternate tubes (#1, #2, #3, and #4) AND the direction of the drive pins (up then down).

NOTE: If the last section will take more space than remains but more than 1/2" of the core needs to be filled, nest the last section on the previous section by placing both drive pins on the same tube.

16. When the core is full reinstall the wafer end retainer and, using the overhead hoist, gently lay the brush back onto the ground.
17. Position the core into the broom cannister and support it in place..
18. Slide the motor mount into the core of the brush and bolt into place.

REMOVING THE BROOM

1. Move the broom to a flat, level surface or storage area.
2. Position blocks to set the sides of the cannister on that will keep the wafers off of the ground.
3. Disconnect the power and return lines from the machine and either install dust caps or connect the couplers together to prevent contaminants from entering the hydraulic system.
4. Unlock the broom from your machine and following the instructions in your operator's manual for removing an attachment, remove the sweeper from the machine.

IMPORTANT:

Do not store the sweeper with weight on the brushes. This will deform the bristles, destroying their effectiveness. To avoid this problem, always support the unit on blocks.

Do not store the polypropylene brushes in direct sunlight. They will deteriorate and crumble.

Keep polypropylene brush material away from intense heat or flame. It will melt.

STORING THE BROOM

1. Store the broom in a dry place.
2. Apply a coat of grease to all exposed cylinder rods to prevent rusting.
3. If the broom is being stored outside, cover with a suitable weather cover. This will keep moisture, dirt and other airborne debris from getting into the system.
4. Repair or replace any worn, damaged or missing parts.
5. Replace any damaged, missing or illegible decals.

TROUBLESHOOTING

THE MAJOR®

<u>PROBLEM</u>	<u>POSSIBLE CAUSE</u>	<u>POSSIBLE REMEDY</u>
Brush rotates wrong direction.	Hoses installed incorrectly.	Switch hoses at quick couplers.
Broom fails to operate.	Low oil supply	Add oil.
	Improper hose hookup.	Check hydraulic diagram; reinstall properly.
	Motor damaged.	Check pressure, flow & back pressure. Check flow on return side for bypassing, more than 2 GPM, replace motor.
	Broken hydraulic lines.	Check for leaks and replace damaged line.
	Pinched hose.	Reroute hose.
	Motor drive block loose.	Retighten block to shaft.
	Motor shaft key broken.	Replace
Brush slows or stops when sweeping.	Brush pattern too wide.	Check brush pattern and adjust to 3-4". (See Operation Section of this manual.)
	Travel speed too fast.	Travel no more than 5 MPH when sweeping.
	Trying to sweep too much material at once.	Make several passes.
	Motor failing.	Replace motor.
Broom operates too slow.	Cold oil.	Warm oil with engine at idle speed.
	Engine speed too slow.	Advance throttle. (Use the lowest speed that will complete the job.)
	Oil too heavy.	Use recommended oil
	Motor damaged.	Check pressure, flow & back pressure.
Brush wears into cone shape.	Sweeper is not level.	Level sweeper.
	Tires on machine at different pressure or are different size.	Check tire size and ratings. Make corrections as necessary.

<u>PROBLEM</u>	<u>POSSIBLE CAUSE</u>	<u>POSSIBLE REMEDY</u>
Brush head assembly "bounces" during sweeping.	Sweeper stored with weight on the brush causing deformation of bristles.	Replace wafers.
	Travel speed too fast and/or brush speed too slow.	Find correct combination of ground and brush speeds.
	Core is bent.	Replace.
Brush wears too quickly or bristles falling out.	Brush pattern too wide.	Check brush pattern and adjust to 3-4". (See Adjustments Section of this
	Wafer damaged.	Replace.
	Sweeping large debris causing extensive wear of wafers.	Replace worn wafers.
Hydraulic angle not working.	Improper hose hookup.	Check hydraulic diagram: reinstall properly.
	Cylinder rod bent.	Replace cylinder rod.
Hydraulic oil over-heating.	To much down force.	Check brush pattern and adjust to 3-4". (See Adjustments Section of this manual.)
	Quick coupler or hose restriction.	Inspect couplers and hoses for dirt, rust, and other contaminants and repair or replace as needed.
	Relief valve set too low.	See machine operator's manual and/or dealer for proper relief valve service and adjustment.
External leakage.	Loose fitting.	Tighten all fittings.
	O'ring damaged on fittings.	Replace o'ring.
	Broken hydraulic line.	Check for leaks and replace damaged line.
	Motor housing damaged.	Replace.

BOLT TORQUE SPECIFICATIONS

GENERAL TORQUE SPECIFICATION TABLE

Use the following torques when special torques are not given. These values apply to fasteners as received from suppliers, dry, or when lubricated with normal engine oil. They do not apply if special graphited or moly disulphide greases or other extreme pressure lubricants are used. This applies to both UNF and UNC threads. Remember to always use grade five or better when replacing bolts.

SAE Grade No.		2				5				8*			
Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary													
		TORQUE		TORQUE		TORQUE		TORQUE		TORQUE		TORQUE	
Bolt Size		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters	
Inches	Millimeters	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	6.35	5	6	6.8	8.13	9	11	12.2	14.9	12	15	16.3	30.3
5/16	7.94	10	12	13.6	16.3	17	20.5	23.1	27.8	24	29	32.5	39.3
3/8	9.53	20	23	27.1	31.2	35	42	47.5	57.0	45	54	61.0	73.2
7/16	11.11	30	25	40.7	47.4	54	64	73.2	86.8	70	84	94.9	113.9
1/2	12.70	45	52	61.0	70.5	80	96	108.5	130.2	110	132	149.2	179.0
9/16	14.29	65	75	88.1	101.6	110	132	149.2	179.0	160	192	217.0	260.4
5/8	15.88	95	105	128.7	142.3	150	180	203.4	244.1	220	264	298.3	358.0
3/4	19.05	150	185	203.3	250.7	270	324	366.1	439.3	380	456	515.3	618.3
7/8	22.23	160	200	216.8	271.0	400	480	542.4	650.9	600	720	813.6	976.3
1	25.40	250	300	338.8	406.5	580	696	786.5	943.8	900	1080	1220.4	1464.5
1-1/8	25.58	-	-	-	-	800	880	1084.8	1193.3	1280	1440	1735.7	1952.6
1-1/4	31.75	-	-	-	-	1120	1240	1518.7	1681.4	1820	2000	2467.9	2712.0
1-3/8	34.93	-	-	-	-	1460	1680	1979.8	2278.1	2380	2720	3227.3	3688.3
1-1/2	38.10	-	-	-	-	1940	2200	2630.6	2983.2	3160	3560	4285.0	4827.4

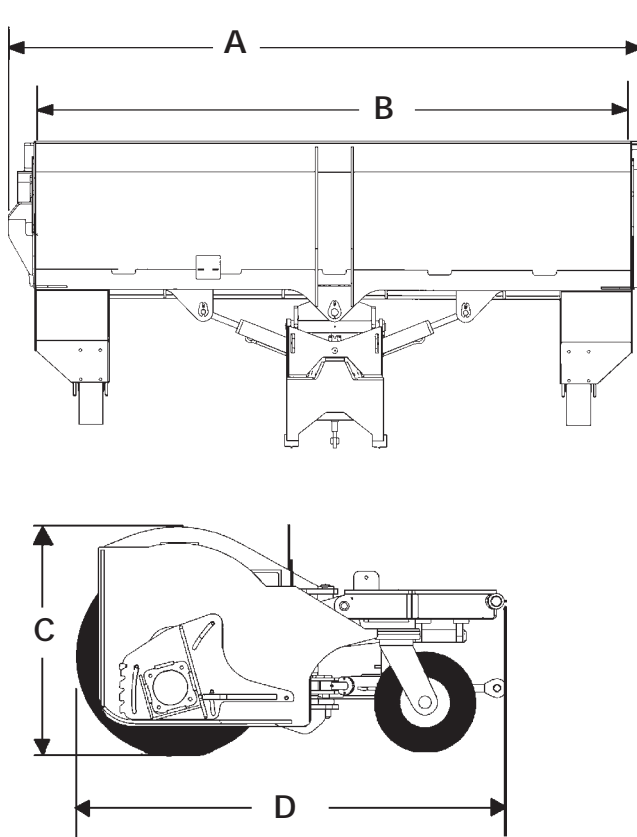
* Thick Nuts must be used with Grade 8 bolts

METRIC BOLT TORQUE SPECIFICATIONS

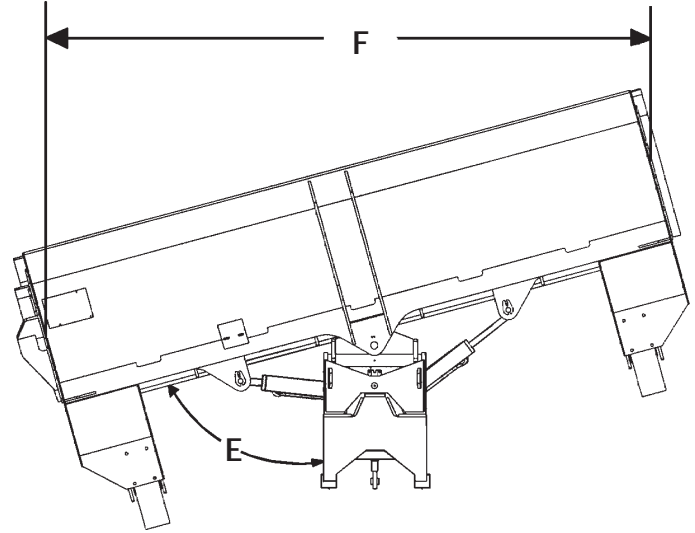
Size of Screw	Grade No.	Coarse Thread			Fine Thread		
		Pitch (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
M6	5.6	1.0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-9.4	7.9-12.7		-	-
	10.9		7.2-10	9.8-13.6		-	-
M8	5.6	1.25	7.2-14	9.8-19	1.0	12-17	16.3-23
	8.8		17-22	23-29.8		19-27	25.7-36.6
	10.9		20-26	27.1-35.2		22-31	29.8-42
M10	5.6	1.5	20-25	27.1-33.9	1.25	20-29	27.1-39.3
	8.8		34-40	46.1-54.2		35-47	47.4-63.7
	10.9		38-46	51.5-62.3		40-52	54.2-70.5
M12	5.6	1.75	28-34	37.9-46.1	1.25	31-41	42-55.6
	8.8		51-59	69.1-79.9		56-68	75.9-92.1
	10.9		57-66	77.2-89.4		62-75	84-101.6
M14	5.6	2.0	49-56	66.4-75.9	1.5	52-64	70.5-86.7
	8.8		81-93	109.8-126		90-106	122-143.6
	10.9		96-109	130.1-147.7		107-124	145-168
M16	5.6	2.0	67-77	90.8-104.3	1.5	69-83	93.5-112.5
	8.8		116-130	157.2-176.2		120-138	162.6-187
	10.9		129-145	174.8-196.5		140-158	189.7-214.1
M18	5.6	2.0	88-100	119.2-136	1.5	100-117	136-158.5
	8.8		150-168	203.3-227.6		177-199	239.8-269.6
	10.9		175-194	237.1-262.9		202-231	273.7-313
M20	5.6	2.5	108-130	146.3-176.2	1.5	132-150	178.9-203.3
	8.8		186-205	252-277.8		206-242	279.1-327.9
	10.9		213-249	288.6-337.4		246-289	333.3-391.6

SPECIFICATIONS

THE MAJOR®



SPECIFICATION AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE AND WITHOUT LIABILITY THEREFORE.

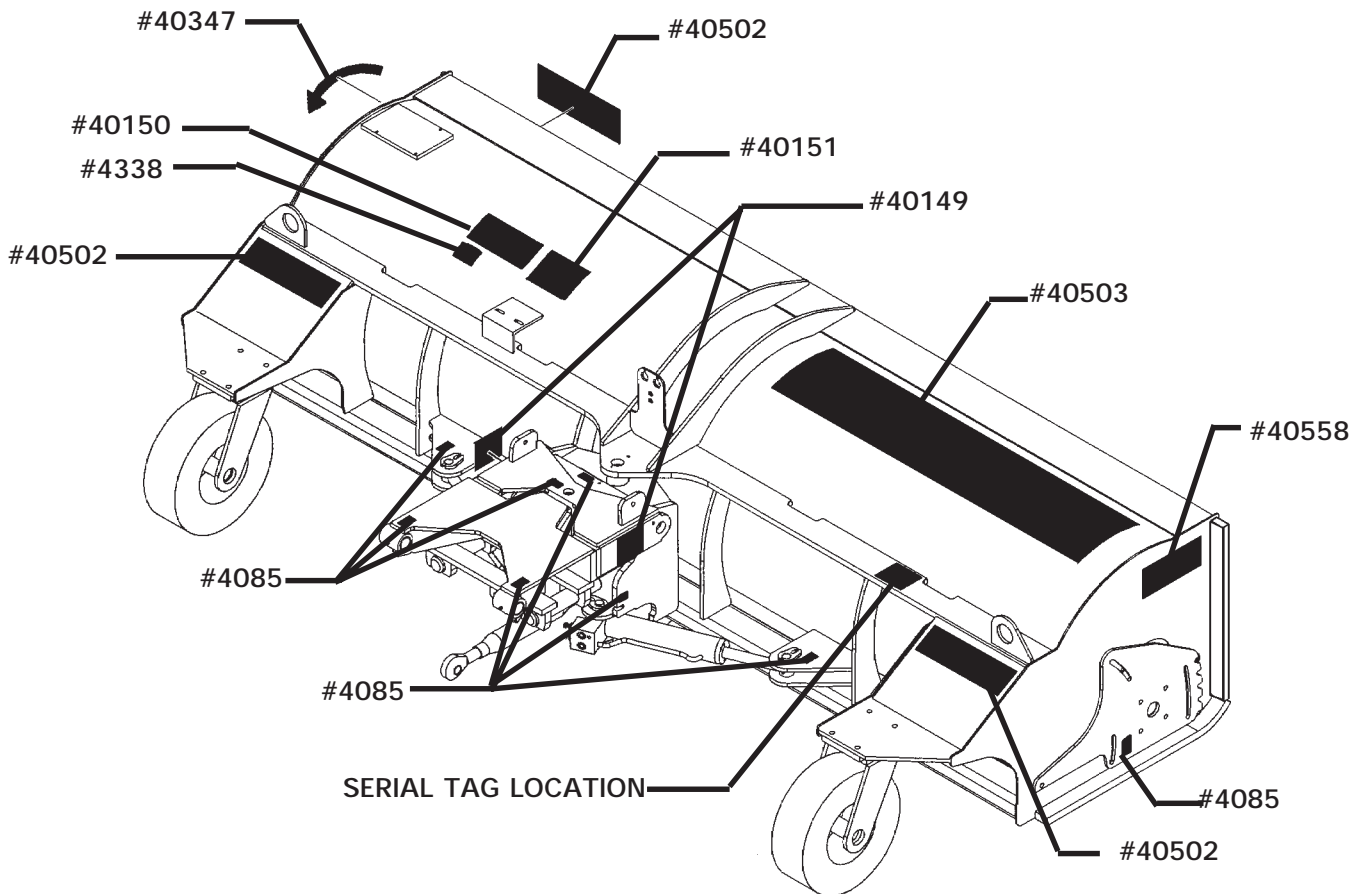


SPECIFICATIONS

DESCRIPTION	8'	9'	10'
A. Overall Width	108.5"	120.5"	132.5"
B. Sweeping Width	98"	110"	122"
C. Overall Height	36"	36"	36"
D. Overall Length (without Mount)	68.7"	68.7"	68.7"
E. Maximum Angle (Left and Right)	20°	20°	20°
F. Sweeping Width @ 20° Angle	91"	103"	115"
Weight	2100#	2300#	2500#
Brush Diameter	32"	32"	32"
Wafers (Quantity)	47	57	67
Hydraulic Flow (GPM)	30-40	30-40	30-40
Hydraulic Pressure (PSI)	2500	2500	2500
*Due to the various mounting applications available all specifications are configured without mounting bracket.			

GENERAL INFORMATION

The diagram on this page shows the location of all the decals used on **The MAJOR® Open Face Sweepers**. The decals are identified by their part numbers, with reductions of the actual decals located on the following pages. Use this information to order replacements for lost or damaged decals. Be sure to read all decals before operating the broom. They contain information you need to know for both safety and broom longevity.



Keep all safety signs clean and legible. Replace all missing, illegible, or damaged safety signs. When replacing parts with safety signs attached, the safety signs must also be replaced.

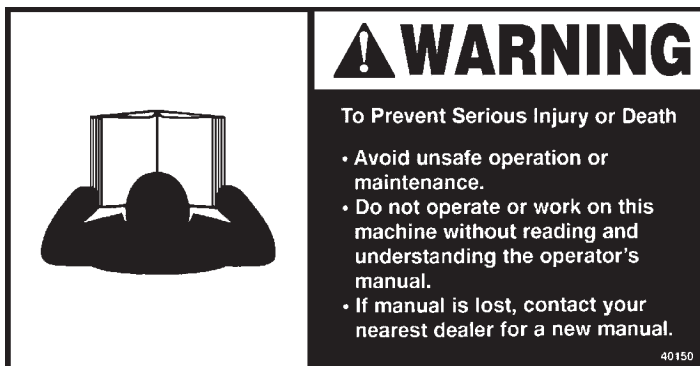
Replacing Safety Signs: Clean the area of application with nonflammable solvent, then wash the same area with soap and water. Allow the surface to fully dry. Remove the backing from the safety sign, exposing the adhesive surface. Apply the safety sign to the position shown in the diagram above and smooth out any bubbles. Remove any premask material from the front of the decal (if applicable).



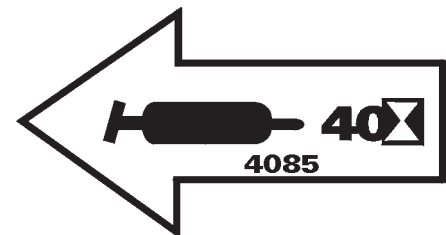
PART #40149
DANGER! PINCH POINT



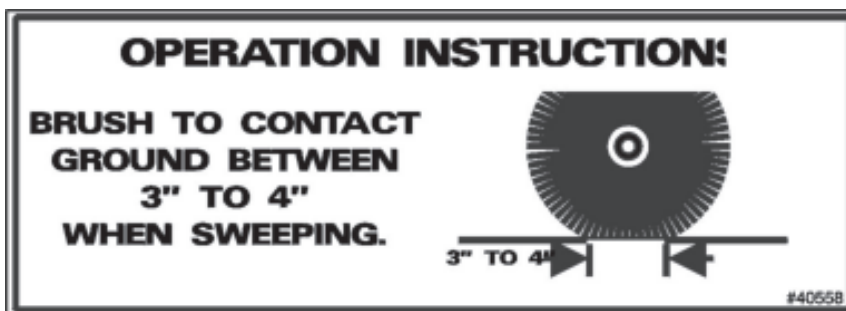
PART #40151
WARNING! HIGH PRESSURE FLUID



PART #40150
WARNING! READ MANUAL



PART #4085
GREASE 40 HOURS



PART #40558
OPERATION INSTRUCTIONS



PART #4338
MADE IN U.S.A.

MAJOR

PART #40502
MAJOR LOGO (MEDIUM)

PART #40503
MAJOR LOGO (LARGE)



PART #40347
DIRECTION OF ROTATION

THE MAJOR® Equipment Company (herein referred to as **THE MAJOR®**) warrants new products sold by it to be free from defects in material or workmanship for a period of one (1) year or twelve (12) calendar months from the date of delivery subject to the following conditions.

- THE MAJOR®'s liability under this warranty is limited to repairing or replacing THE MAJOR®'s parts which, upon inspection by a representative of The MAJOR® or a person(s) appointed by THE MAJOR®, have been found to be defective in materials or workmanship. Such parts shall be provided at no cost to the user at the business establishment of the authorized distributor of THE MAJOR® products during regular business hours. This warranty shall not apply to normal wear and tear. This warranty shall not apply to component parts or accessories of products not manufactured by THE MAJOR® and which carry the warranty of the manufacturer.
- Replacement or repair parts installed in the product covered by this warranty are warranted only for the remainder of the warranty period as if such parts were original components of said product.
- THE MAJOR® makes no other warranty, expressed or implied and makes no warranty for merchantability or fitness for any particular purpose.
- THE MAJOR®'s obligations under this warranty shall not include transportation, travel, or mileage expenses, duty taxes or any other charges, or liability for direct, indirect, incidental, or consequential damage or delay. Any improper use, including operation after discovery of defect or worn parts, operation beyond rated capacity, substitution of parts not approved by THE MAJOR®, or any alteration or repair by others in such a manner as, in THE MAJOR®'s judgment, affects the product materially and adversely, shall void this warranty.
- No employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing by an officer of THE MAJOR® at the home office.