



OPERATOR'S AND PARTS MANUAL

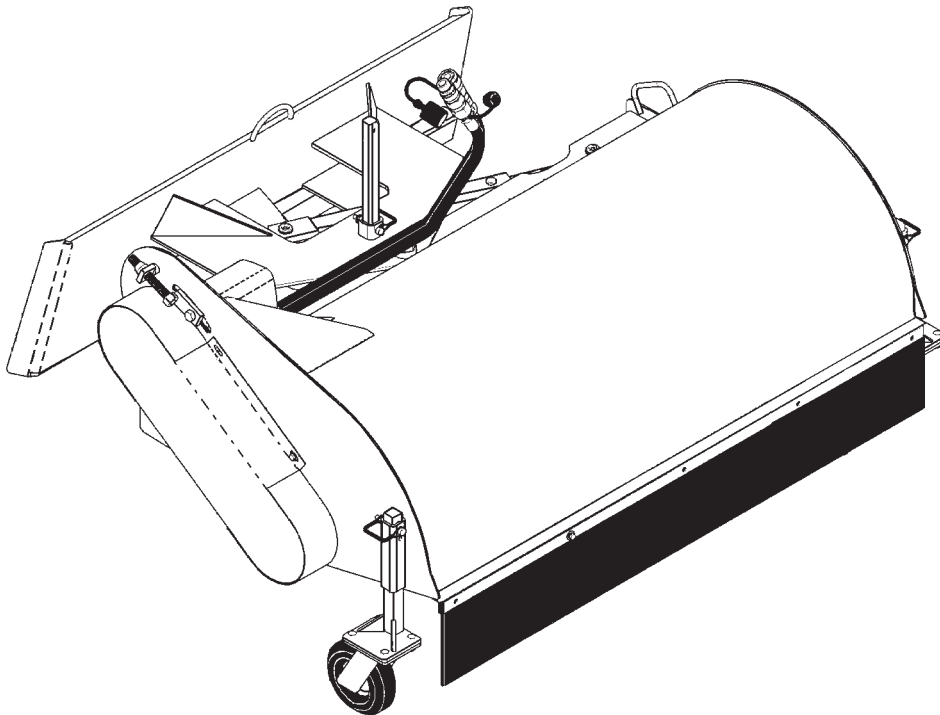
AB42 & AB48 OPEN SWEEPER



PALADIN
LIGHT CONSTRUCTION GROUP



The Power of Combined Excellence



SERIAL NUMBER: _____

MODEL NUMBER: _____

Manual Number: OM646
Part Number: 75546
Rev. 4

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TO THE OWNER

GENERAL COMMENTS

Congratulations on the purchase of your new BRADCO product! This product was carefully designed and manufactured to give you years of dependable service. Only minor maintenance (such as cleaning and lubricating) is required to keep it in top working condition. Be sure to observe all safety precautions and maintenance procedures, as 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 this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual. (See Sections B and G respectively.)**

Unless noted otherwise, right and left sides are determined from the position of the operator when behind the product 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 product, 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 model and serial number of your unit in the space provided on this page. This information may be obtained from the identification plate located on the product.

MODEL _____
SERIAL NUMBER _____
DATE PURCHASED _____

The parts department needs this information to insure that you receive the correct parts for your specific model.

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SAFETY PRECAUTIONS

TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR OTHERS. 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 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 an imminently 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, **may result in minor or moderate injury. It may also be used to alert against unsafe practices.**

SAFETY PRECAUTIONS

ROTARY BROOM

GENERAL INFORMATION

This section is composed of various warnings and safety tips. **Read and learn all the information in this section before you attempt to use your broom.** Also read your vehicle owner's manual before using your equipment. This knowledge will help you operate your unit safely. **Do not take this information lightly, it is presented for your benefit and for the benefit of others working around you.**

The "Safety Alert Symbol", as previously described, will be used throughout this manual. It will appear with the word **DANGER, WARNING, or CAUTION** above it, and a safety message pertaining to the specific topic being covered. Take the time to read these messages as you come across them.

TO THE OPERATOR

The primary responsibility for safety with the equipment falls to the operator. Make sure that the equipment is operated only by responsible individuals with the proper instruction. It is the skill, care, common sense, and good judgment of the operator that will determine how efficiently and safely the job is performed. Know your equipment before you start. Know its capabilities and how to operate all the controls. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order.

BEFORE YOU START

1. **Read the entire loader and Rotary Broom operator's manuals** before ever attempting to use the loader. This knowledge is necessary for safe operation.
2. **Follow all safety decals.** Keep them clean and replace them if they become worn, damaged, or illegible.
3. **Do not paint over,** remove, or deface any safety signs or warning decals on your equipment.
4. **Know your equipment inside and out.** Know how to operate all controls and know emergency shut down procedures.
5. **Keep all stepping surfaces, pedals, and controls free from dirt, grease, and oil.** Keep equipment clean to help avoid injury from a fall when getting on or off equipment.
6. **Use handholds and step plates when getting on/off .** Failure to do so could cause a fall.
7. **Be alert to others in the work area.** Be sure others know when and where you will be working. Make sure no one is in front of equipment.
8. **Never take passengers on your equipment.** There is no safe place for a passenger.

SAFETY PRECAUTIONS

ROTARY BROOM

9. **Never try to board equipment while it is moving.**
10. **Turn off engine before performing maintenance.** If lift arms must be left raised for maintenance or any other reason, use a positive lift arm lock to secure the arms in place. Serious damage or personal injury could result from lift arms accidentally lowering.
11. **Reduce speed when driving over rough terrain,** on a slope, or turning to avoid overturning the loader.
12. **Test all controls before you begin.**
13. **Do not smoke when refueling.** Allow room in the gas tank for expansion. Wipe up any spilt fuel. Secure cap tightly when done.

WORKING WITH THE ROTARY BROOM

1. **Never operate the unit without first reading and understanding the operator's manuals.**
2. **Operate the broom only in daylight or sufficient artificial light.**
3. **Do not carry load with arms in the raised position.** Always carry loads close to the ground. Do not step off platform with load raised.
4. **Know where all utility lines are.** Observe overhead electrical and phone lines. Be sure equipment will safely clear them.
5. **Never operate equipment while under the influence** of alcohol, or prescription drugs which could inhibit physical and/or mental capacity.
6. **Slow down before turning.** Sharp turns on any terrain may cause loss of control.
7. **Always lower the loader arms to the ground,** shut off the engine, and remove the key before getting off the unit.
8. **Check your work area for objects that could harm** the operator or others if thrown by the broom. Remove these items before sweeping.

TRANSPORTING THE ROTARY BROOM

1. **Follow all federal, state and local regulations when transporting the unit on public roads.**
2. **Use extra care when loading or unloading the machine onto a trailer or truck.**

MAINTENANCE

1. **Never work on equipment while it is running.**
2. **Never make hydraulic repairs while the system is under pressure.** Injury or death could result.

SAFETY PRECAUTIONS

ROTARY BROOM

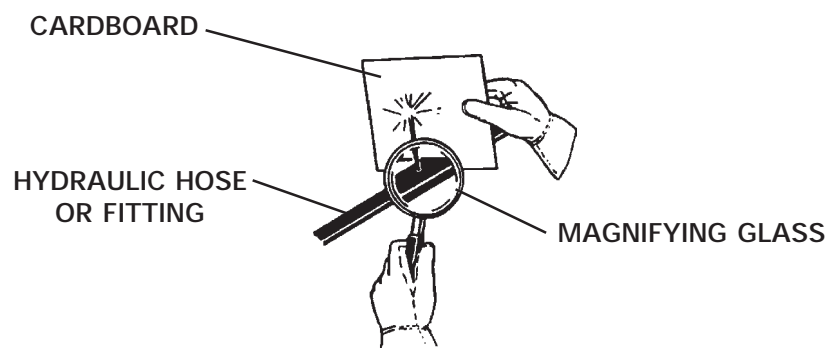
3. **Observe proper maintenance schedules** and repairs to keep the unit in safe working order.
4. **Always wear safety goggles or glasses when working on equipment.**
5. **Use a drift and hammer when pressing out pins** to prevent the pin from shattering.
6. **Use only manufacturer recommended replacement parts.** Other parts may be substandard in fit and quality.
7. **Replace all safety shields and guards when finished performing maintenance.** Do not operate the broom with protective equipment removed.

WARNING! Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands to search for suspected leaks.





Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.

If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.



INTERNATIONAL SYMBOLS

As a guide to the operation of your equipment, various international symbols have been utilized on the instruments and controls. The symbols are shown below with an indication of their meaning.

	Engine speed		Alternator charge
	Hours recorded		Power take-off (on)
	Engine water temperature		Power take-off (off)
	Lights		"Tortoise," slow or minimum setting
	Horn		"Hare," fast or maximum setting
	Engine oil pressure		Caution
	Hazard warning		Control lever operating direction
	Axle connect		Rock shaft (raised)
	Axle disconnect		Rock shaft (lowered)
	Continuously variable		Remote cylinder (extended)
	Increase		Remote cylinder (retracted)
	Decrease		Remote cylinder (FLOAT)
	Diesel fuel		Differential lock
	Creeper range		Read operators manual
	High range		Neutral
	Low range		Forward
			Reverse

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PREOPERATION

ROTARY BROOM

GENERAL INFORMATION

The BRADCO Brooms were designed to be easy to use and maintain. They are operated by the loader's auxiliary hydraulics, and mount to the toolbar / quick attach mechanism for easy mounting.

Unless noted otherwise, right and left are determined from the position of the operator facing forward.

Remember to read the "Safety Precautions" and "Operating Instructions" sections of this manual BEFORE you attempt to install or use the rotary broom.

NOTE: The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the brooms as may be necessary without notification.

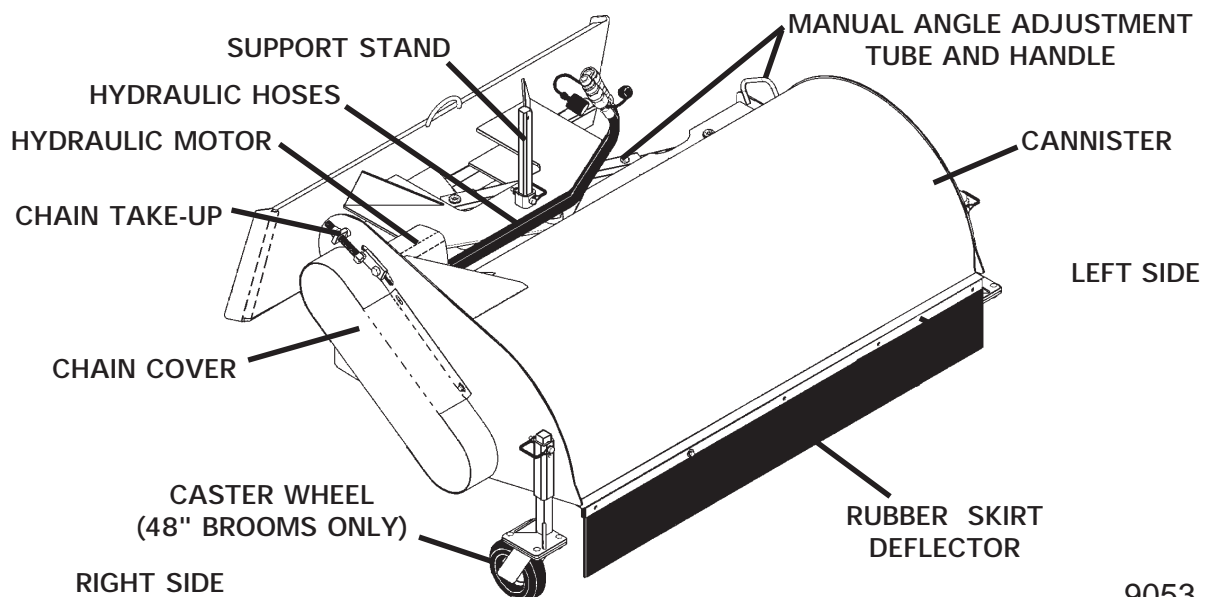
BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure that the equipment is operated only by trained individuals that have read and understand this manual. Don't hurry the learning process or take the unit for granted. Practice the operation of your new equipment, and become familiar with the controls and the way it handles on your machine.

If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer.

NOMENCLATURE

Throughout this manual, reference is made to various broom components. Study the following diagram to acquaint yourself with the various names of these components. This knowledge will be helpful when reading through this manual or when ordering service parts.



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MOUNTING & INSTALLATION

ROTARY BROOM

GENERAL INFORMATION

The following instructions will help you to mount your rotary broom onto your loader. The broom uses the quick-attach system for ease of installation. Therefore, if you know how to attach the loader bucket, attaching the rotary broom should prove no problem.

Remember to read all safety warnings, decals and operating instructions before operating the loader or attachment.

MOUNTING INSTRUCTIONS

1. Remove the steel shipping banding from around the broom and skid.
2. Remove any attachments from the front of the loader.
3. Following all standard safety practices and the instructions for attaching an attachment in your loader operator's manual, install the rotary broom onto your loader.

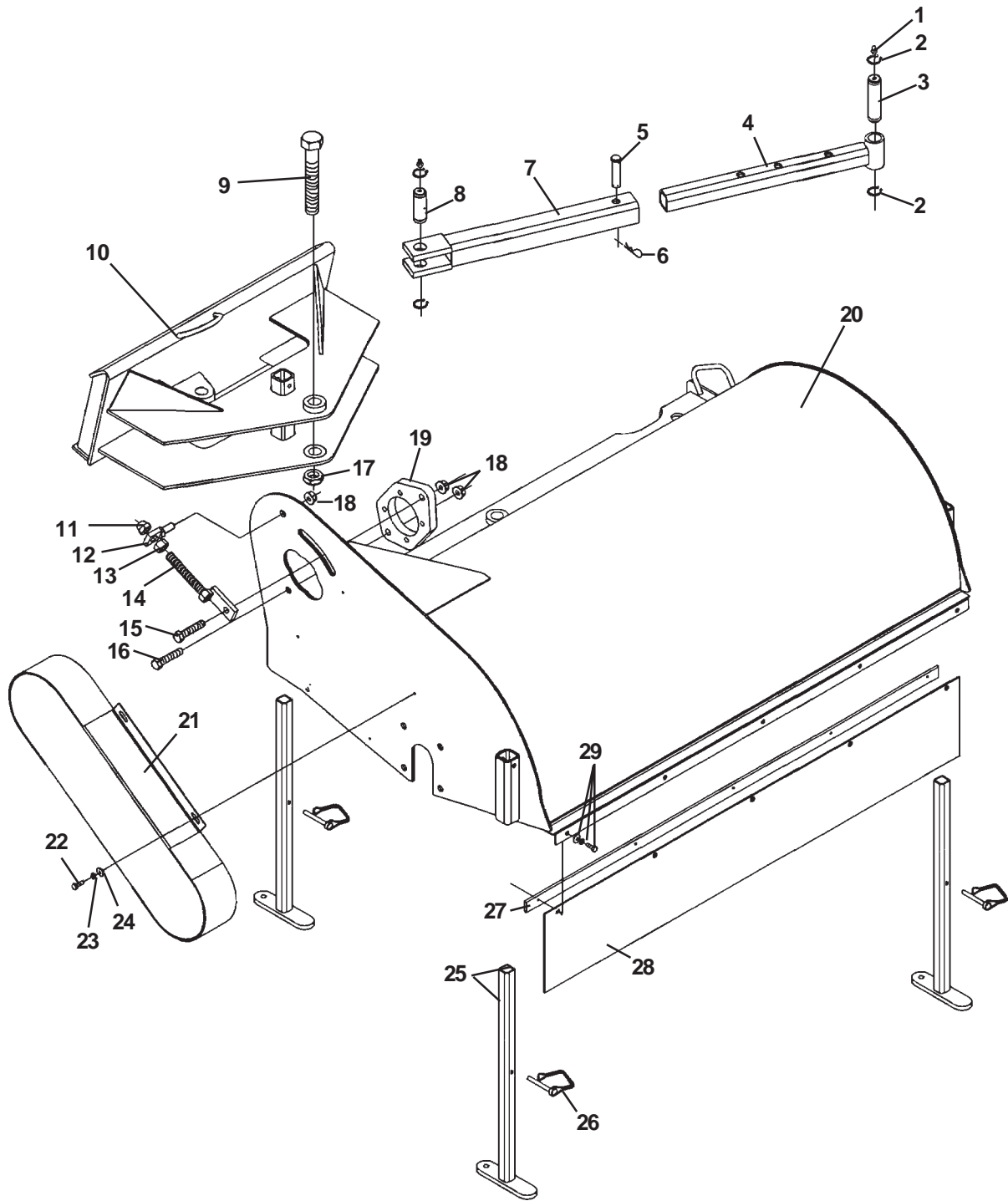
NOTE: It is important to make sure the locking mechanism on your quick attach is engaged, therefore locking the attachment onto the loader.

IMPORTANT: Make sure all foreign matter is cleaned from hydraulic connectors before making connections.

4. With the auxiliary hydraulic system turned off, route the hydraulic hoses through the hose guide on the broom mounting frame, and connect them to their proper auxiliary couplers on the loader.
5. Remove the safety snap pins from the support stands, raise the stand, and reinstall the snap pins.
6. Make the desired adjustments to the broom.
7. Complete the predelivery checklist located in the back of this manual (Section R). Broom installation is now complete.

MOUNTING KIT INSTALLATION

42" SWEEPER ASSEMBLY



MOUNTING KIT INSTALLATION

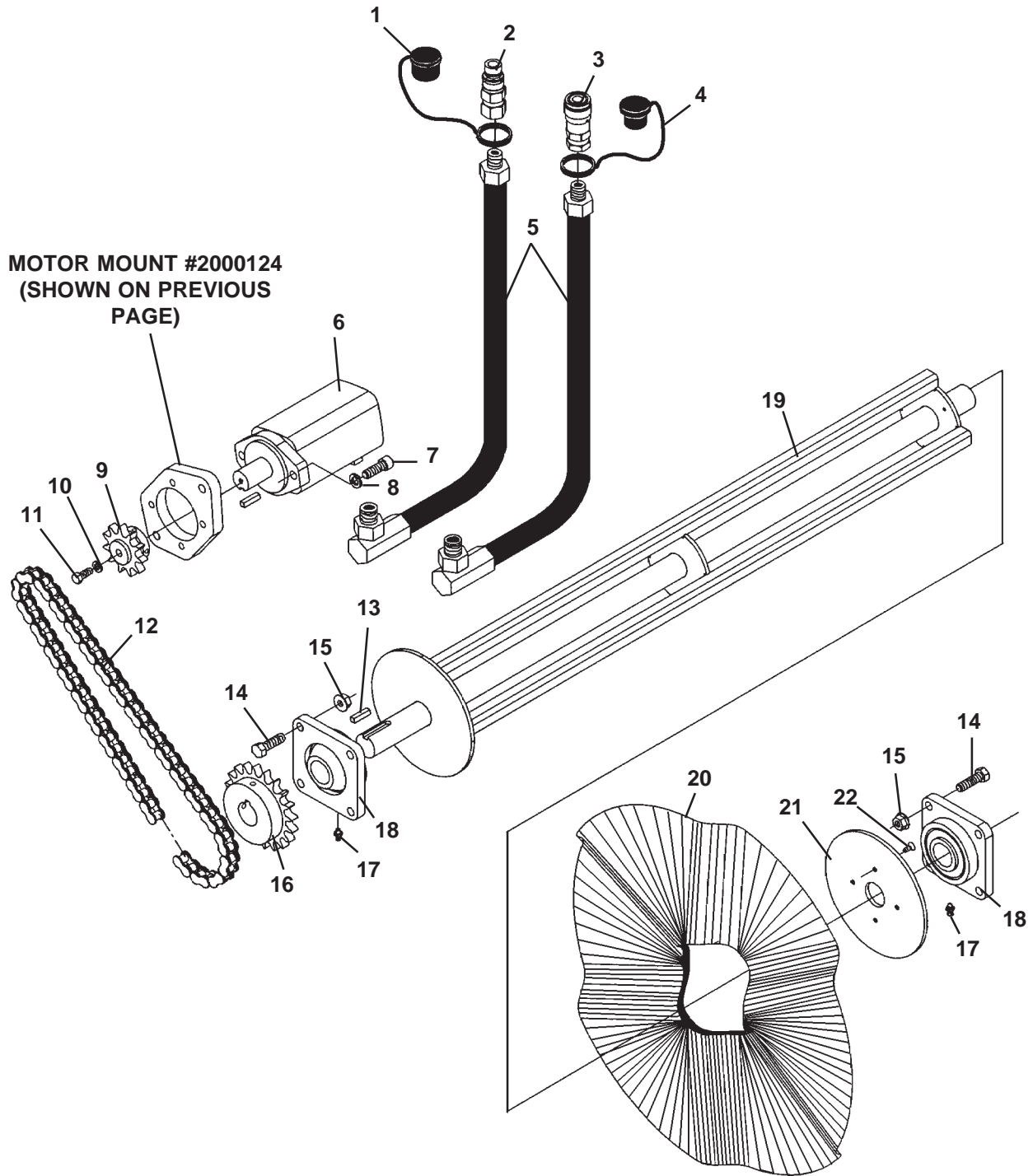
42" SWEEPER ASSEMBLY

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	6616	Grease Fitting
2	4	6612	Snap Ring
3	1	17887	Pivot Pin
4	1	2004122	Inside Adjustment Tube
5	1	17828	Pin
6	1	1735	Hair Pin
7	1	2004132	Outside Adjustment Tube
8	1	17310	Pivot Pin
9	1	1198	1.00" UNC X 6.50" Hex Capscrew
10	1	**	Mounting Frame
11	1	10003	.62" UNF Deformed Lock Nut
12	1	2000610	Take-Up Mount
13	1	1480	.62" UNF Hex Nut
14	1	2000625	Chain Take Up
15	1	1093	.50" UNC X 2.25" Hex Capscrew GR 5
16	1	1091	.50" UNC X 1.75" Hex Capscrew GR 5
17	1	2001560	1.00" UNC Nylon Nut
18	3	1790	.50" UNC Serrated Flange Lock Nut
19	1	2000124	Motor Mounting Plate
20	1	17796	42" Cannister
21	1	17883	Chain Cover
22	4	1021	.31" UNC X .75" Hex Capscrew
23	4	1502	.31" Lock Washer
24	4	1513	.31" Flat Washer
25	3	17779	Leg
	3	19093	1.00" x 1.00" Plastic Plug
26	3	10006	Safety Snap Pin
27	1	2002858	42" Rubber Skirt Support
28	1	2001867	42" Rubber Skirt
29	5	1002	.25" UNC X .75" Hex Capscrew
	5	1501	.25" Lock Washer
	5	1512	.25" Flat Washer

**** Mounting Frames are specific to your loader application. Contact Factory or your local BRADCO dealer to order this item.**

MOUNTING KIT INSTALLATION

42" SWEEPER ASSEMBLY



MOUNTING KIT INSTALLATION

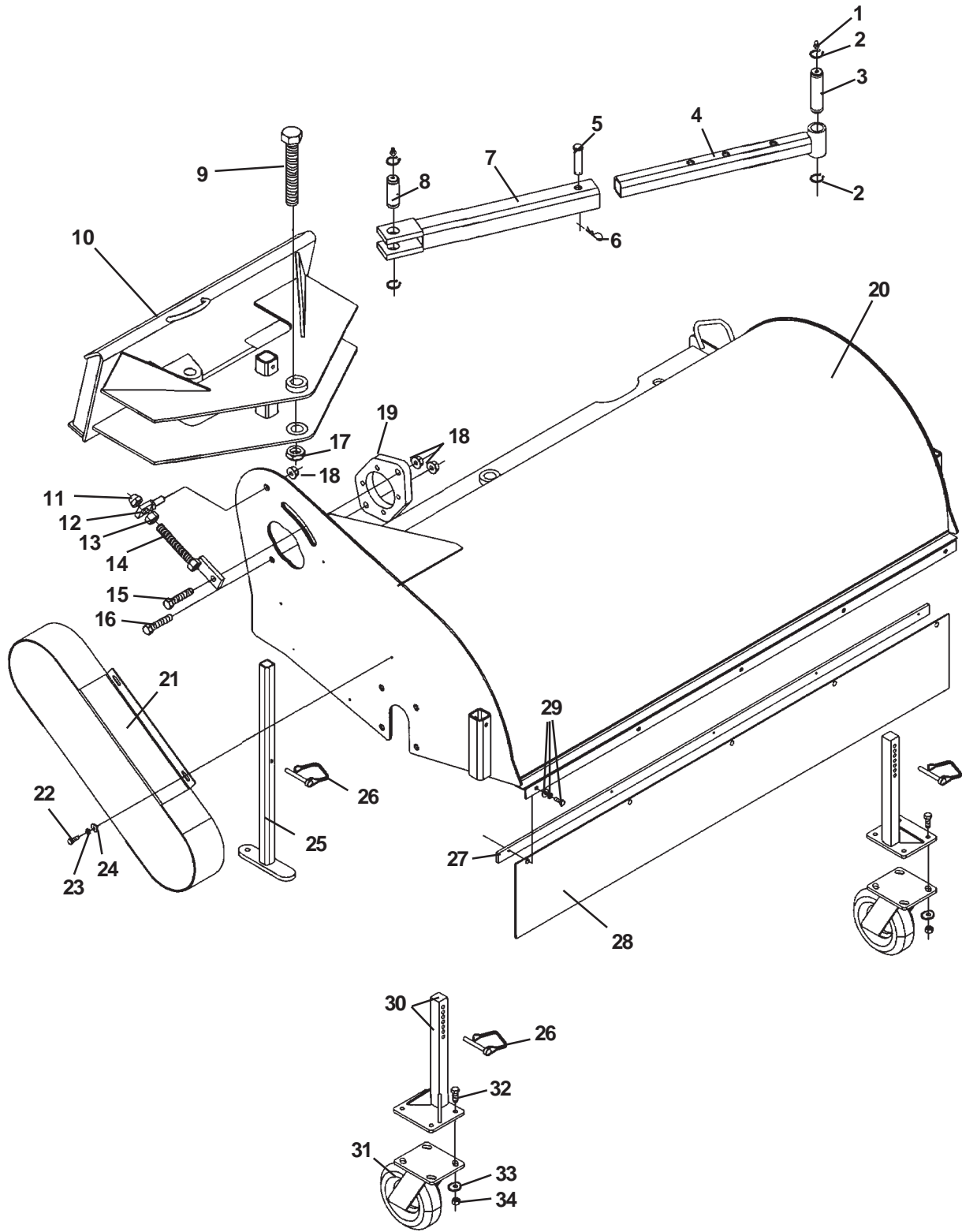
42" SWEEPER ASSEMBLY

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	**	Dust Cap
2	1	**	Coupler
3	1	**	Coupler
4	1	**	Dust Plug
5	2	38063	Hose Assembly .50" x 65" 10MBo 90° x 8MBo
6	1	2000065	Hydraulic Motor
	-	5661	Replacement Key
7	2	22336	.50" X 1.50" Socket Head Capscrew - Grade 8
8	2	1505	.50" Lock Washer
9	1	2000073	Chain Sprocket
10	1	1503	.38" Lock Washer
11	1	1043	.38" UNC X 1.00" Hex Capscrew
12	1	2002837	Chain - 60 Pitch
		22510	Master Link
13	1	32903	Key
14	8	1091	.50" UNC X 1.75" Hex Capscrew
15	8	1790	.50" UNC Serrated Flange Lock Nut
16	1	2000080	Chain Sprocket
17	-	9371	Replacement Grease Fitting
18	2	2000085	Flange Bearing
19	1	2002863	42" Core
20	12	12058	Poly Wafer
	11	12234	Wire Wafer
21	1	2002840	Cover
22	4	1700	.25" UNC X .75" Flat Head Screw

**** Hydraulic couplers and covers are specific to your loader application.
Contact Factory or your local BRADCO dealer to order these items.**

MOUNTING KIT INSTALLATION

48" SWEEPER ASSEMBLY



MOUNTING KIT INSTALLATION

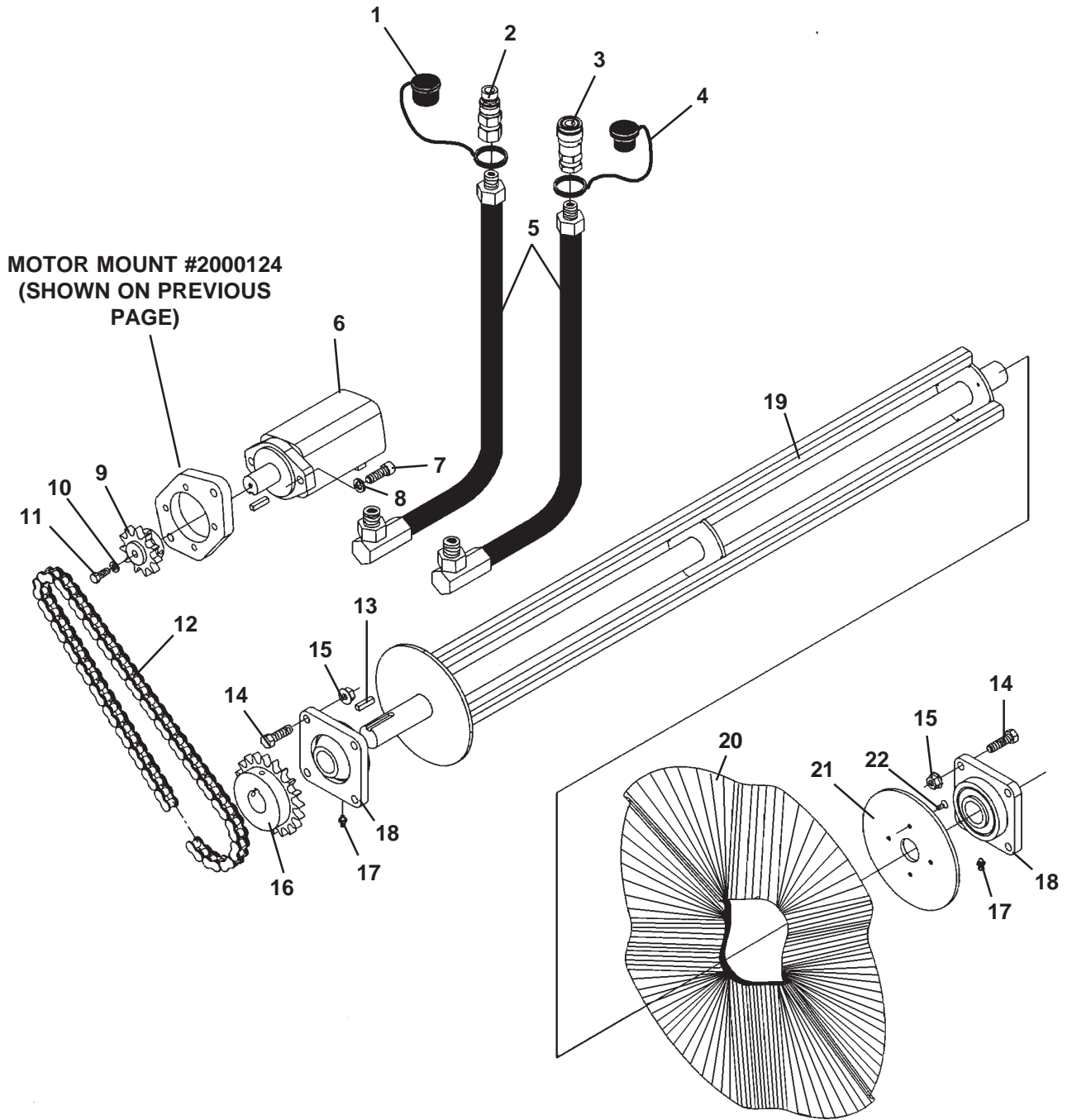
48" SWEEPER ASSEMBLY

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	6616	Grease Fitting
2	4	6612	Snap Ring
3	1	17887	Pivot Pin
4	1	2004122	Inside Adjustment Tube
5	1	17828	Pin
6	1	1735	Hair Pin
7	1	2004132	Outside Adjustment Tube
8	1	17310	Pivot Pin
9	1	1198	1.00" UNC X 6.50" Hex Capscrew
10	1	**	Mounting Frame
11	1	10003	.62" UNF Deformed Lock Nut
12	1	2000610	Take-Up Mount
13	1	1480	.62" UNF Hex Nut
14	1	2000625	Chain Take Up
15	1	1093	.50" UNC X 2.25" Hex Capscrew GR 5
16	1	1091	.50" UNC X 1.75" Hex Capscrew GR 5
17	1	2001560	1.00" UNC Nylon Nut
18	3	1790	.50" UNC Serrated Flange Lock Nut
19	1	2000124	Motor Mounting Plate
20	1	2004546	48" Cannister
21	1	17883	Chain Cover
22	4	1021	.31" UNC X .75" Hex Capscrew
23	4	1502	.31" Lock Washer
24	4	1513	.31" Flat Washer
25	3	17779	Leg
	3	19093	1.00" x 1.00" Plastic Plug
26	3	10006	Safety Snap Pin
27	1	2002855	48" Rubber Skirt Support
28	1	2001869	48" Rubber Skirt
29	5	1002	.25" UNC X .75" Hex Capscrew
	5	1501	.25" Lock Washer
	5	1512	.25" Flat Washer
30	2	18461	Caster Stand
31	2	2004426	Caster Wheel
32	8	1044	.38" UNC X 1.25" Hex Capscrew
33	8	1525	.38" Flat Washer
34	8	1837	.38" UNC Deformed Lock Nut

**** Mounting Frames are specific to your loader application. Contact Factory or your local BRADCO dealer to order this item.**

MOUNTING KIT INSTALLATION

48" SWEEPER ASSEMBLY



MOUNTING KIT INSTALLATION

48" SWEEPER ASSEMBLY

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	**	Dust Cap
2	1	**	Coupler
3	1	**	Coupler
4	1	**	Dust Plug
5	2	38063	Hose Assembly .50" x 65" 10MBo 90° x 8MBo
6	1	2000065	Hydraulic Motor
	-	5661	Replacement Key
7	2	22336	.50" X 1.50" Socket Head Capscrew - Grade 8
8	2	1505	.50" Lock Washer
9	1	2000073	Chain Sprocket
10	1	1503	.38" Lock Washer
11	1	1043	.38" UNC X 1.00" Hex Capscrew
12	1	2002837	Chain - 60 Pitch
		22510	Master Link
13	1	32903	Key
14	8	1091	.50" UNC X 1.75" Hex Capscrew
15	8	1790	.50" UNC Serrated Flange Lock Nut
16	1	2000080	Chain Sprocket
17	-	9371	Replacement Grease Fitting
18	2	2000085	Flange Bearing
19	1	2004556	48" Core
20	13	12058	Poly Wafer
	12	12234	Wire Wafer
21	1	2002840	Cover
22	4	1700	.25" UNC X .75" Flat Head Screw

**** Hydraulic couplers and covers are specific to your loader application. Contact Factory or your local BRADCO dealer to order these items.**

ADJUSTMENTS

ROTARY BROOM

GENERAL INFORMATION

A properly adjusted broom will offer the best sweeping performance.

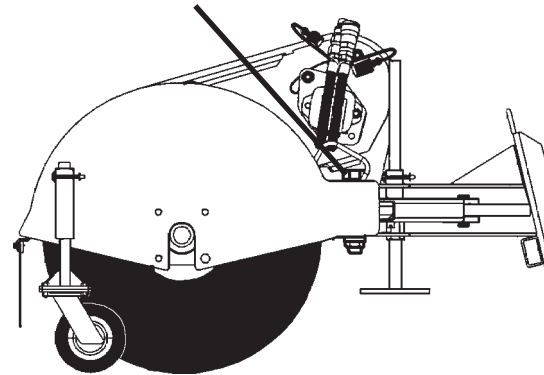
- A. Keeping the broom **LEVEL** is recommended at all times, but is critical when sweeping at an angle to avoid uneven wear of the wafers.
- B. Adjusting the **BRUSH PATTERN** so only 3" -4" of brush touches the ground offers the best sweeping performance without premature wearing of the wafers.
- C.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

LEVELING THE BROOM

Keeping the broom 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 loader arms need to be adjusted so the pivot pin connecting the mounting frame to the broom cannister, is perpendicular to the ground. If this cannot be obtained by simply lifting the loader arms then they will need to be rolled out or in.

PIVOT PIN PERPENDICULAR TO GROUND

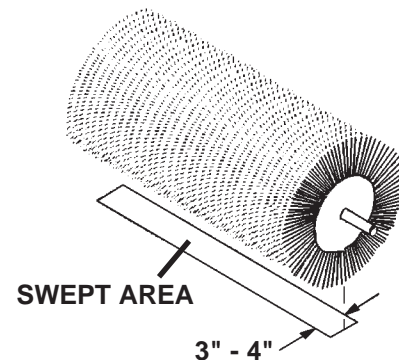


ADJUSTING THE SWEEPER BRUSH

A properly adjusted brush offers the best performance.

To adjust the brush pattern:

1. Move the broom to a dusty, flat surface.
2. Set the loader brake: leave the engine running.
3. Start the broom at a slow speed: then lower it so the bristle tips touch the ground.
4. Run the broom in a stationary position for 10 seconds.
5. Raise the broom and back away.
6. Shut off the loader 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 to be adjusted as necessary.



MANUAL ANGLE ADJUSTMENT

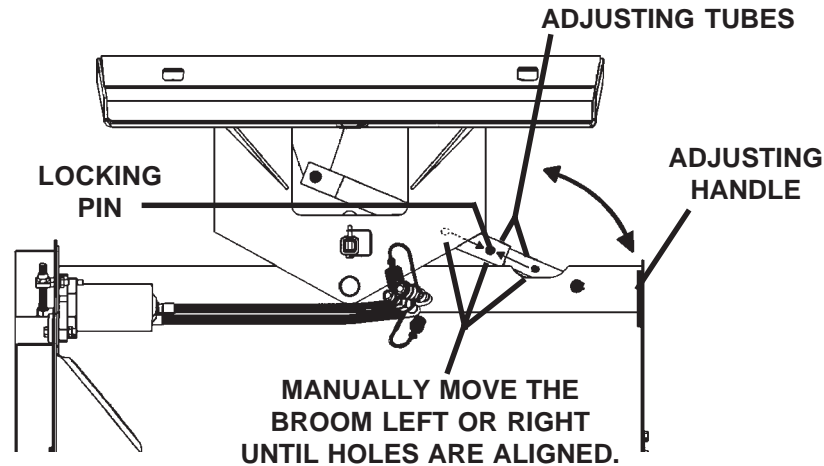
The BRADCO rotary broom has three angle positions which can be set by the operator; straight forward, 30° to the left, or 30° to the right, for windrowing the debris.

ADJUSTMENTS

ROTARY BROOM

To angle the broom:

1. Lift the broom until the bristles are off the ground. Stop the engine and remove the key.
3. Remove the locking pin from the adjusting tubes, and grabbing the handle manually angle the broom in the desired direction until the holes are aligned in the adjusting tubes. Install the locking pin.
4. Level the broom. See "Leveling the Broom".



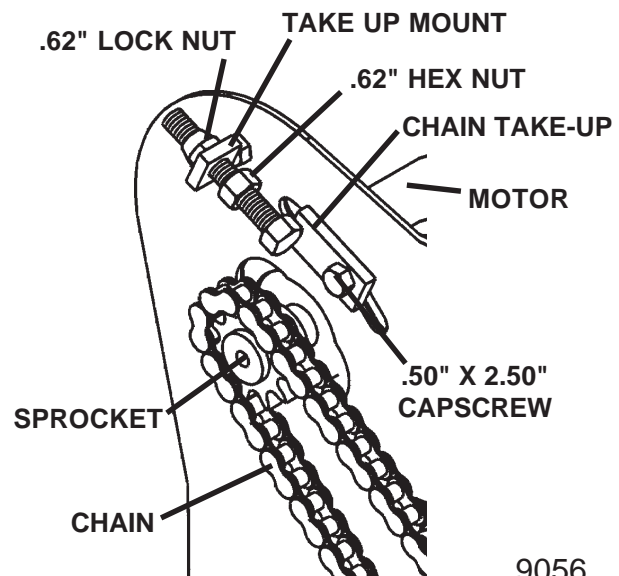
NOTE: When sweeping at an angle it is critical that the broom be level to prevent premature and uneven wear of the wafers.

CHAIN ADJUSTMENT

When sweeping with the BRADCO Rotary Brooms, the chain tension should be adjusted so that there is approximately 1/2" to 3/4" of play in the chain. Overtightening the chain will cause premature chain wear. Too loose of a chain will cause premature wearing of the sprocket and bearing, or the chain will fall off the sprocket.

To Tighten Chain:

1. Remove the chain cover & monitor chain tension while tightening.
2. Loosen the two .50" x 2.50" bolts holding the motor mount to the broom.
3. Loosen the .62" hex nut off the take up mount by turning it further onto the chain take up.
4. Tighten the .62" lock nut onto the chain take up, therefore pulling the chain take up closer to the take up mount and moving the motor towards the back of the broom.
5. When the correct tension has been accomplished, tighten the .62" hex nut back up against the take up mount.



OPERATING INSTRUCTIONS

OPERATING THE BROOM

The **BRADCO**® Rotary Brooms use the loader hydraulic flow to operate. To start the brush, turn on the loader's 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 make sure 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 loader's 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 loader.
3. Engage the brush (with engine at low speed) and slowly lower it to the ground.
4. Increase engine rpms to required sweeping speed. Use the **LOWEST** speed that will complete the job.
5. 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.

OPERATING INSTRUCTIONS

LARGE AREAS

When sweeping large areas, 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 loader 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 loader 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.

MAINTENANCE & SERVICE

GENERAL INFORMATION

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

DAILY

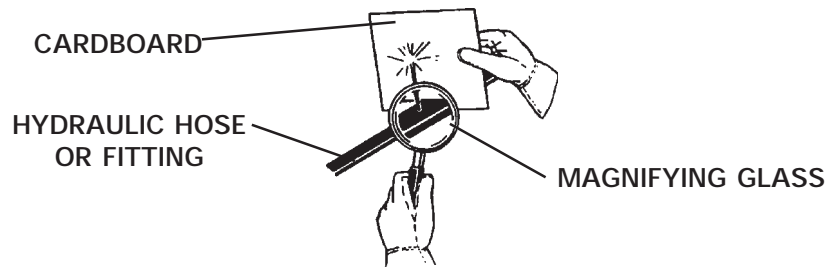
- Check all bolts and nuts for tightness.
- Replace any missing bolts or nuts with approved replacement parts.
- Check that the chain cover is securely in place.
- Check hydraulic system for hydraulic oil leaks. See procedure below.
- Visually inspect the machine for worn parts or cracked welds, and repair as necessary.

WARNING! Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands to search for suspected leaks.



Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.

If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.



IMPORTANT: When replacing parts use only factory approved replacement parts. Manufacturer will not claim responsibility for use of unapproved parts or accessories and/or other damages as a result of their use.

WEEKLY

- Lubricate all grease fittings. (One in each bearing and one in each pivot pin on adjustment tubes.)
- Check chain for tightness. Adjust as necessary. See Section F.

REPLACING THE HYDRAULIC MOTOR

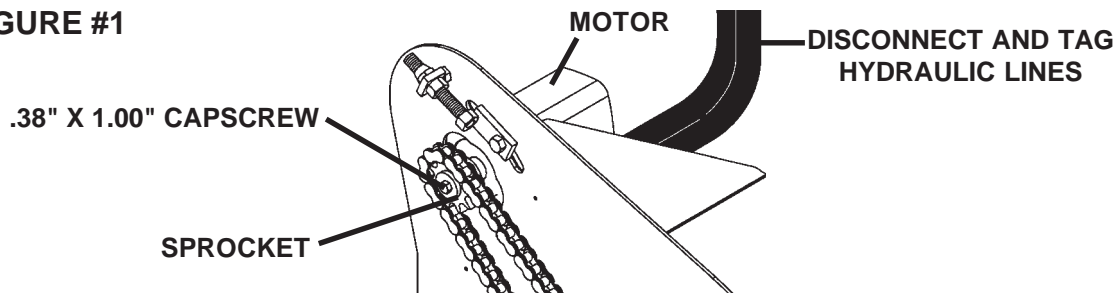
Lower the support stand(s) and set the broom on the ground. Shut off the engine and remove the key before leaving the operator's station.

WARNING! Avoid serious injury. Follow Safety Shutdown procedures before performing service.



1. Remove the chain cover and then remove the upper sprocket by removing the .38" x 1.00" capscrew and sliding the sprocket off of the motor. See Figure #1
2. Tag and disconnect the hydraulic hoses from the hydraulic motor.
3. Remove the (2) 22336 bolts securing the motor to the motor mount and remove the motor.
4. Install the new hydraulic motor using the existing capscrews and lock nuts. See Figure #1
5. Re-connect the hydraulic hoses to the new motor.
6. Reinstall the upper sprocket to the motor shaft.
7. Reinstall the chain cover.
8. Run the broom to verify that hose connection is correct.

FIGURE #1



NOTE: Field replacement of the internal motor seals voids warranty.

REPLACING LEFT BEARING

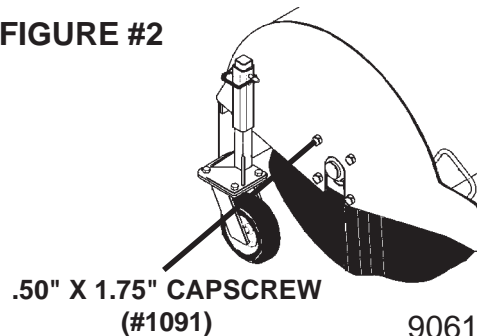
Lower the support stand(s) and set the broom on the ground. Shut off the engine and remove the key before leaving the operator's station.

WARNING! Avoid serious injury. Follow Safety Shutdown procedures before performing service.



1. Remove the (4) #1091 bolts securing the bearing to the left side of the broom and carefully let the left side of the core drop down to gain access to the bearing. See Figure #2
2. Loosen the set screws securing the bearing to the core and replace the bearing.

FIGURE #2



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MAINTENANCE & SERVICE

3. Position the core and bearing back up into the broom cannister and reinstall the #1091 bolts and #1790 lock nuts.

REPLACING THE RIGHT BEARING

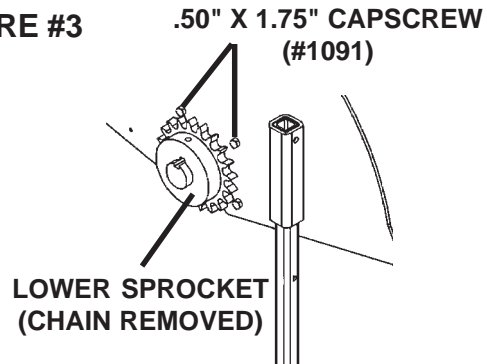
Lower the support stand(s) and set the broom on the ground. Shut off the engine and remove the key before leaving the operator's station.

WARNING! Avoid serious injury. Follow Safety Shutdown procedures before performing service.



1. Remove the chain cover. Loosen the chain with the chain tightener and remove the chain from the lower sprocket. Remove the lower sprocket.
2. Remove the (4) #1091 bolts securing the bearing to the right side of the broom and carefully let the right side of the core drop down to gain access to the bearing. See Figure #3
3. Loosen the set screws securing the bearing to the core and replace the bearing.
4. Position the core and bearing back up into the broom cannister and reinstall the #1091 bolts and #1790 lock nuts.
5. Reinstall the sprocket and chain.
6. Adjust the chain. See Chain Adjustment in Section F.

FIGURE #3



REPLACING BRUSHES

As the brushes become worn they need to be replaced. It is recommended that all the 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 brush on each end of the core, 1 first and 1 last. If installing a combination kit alternate between wire and poly brushes.

Drive the broom to a location where an overhead hoist is available. Lower the support stand(s) and set the broom on the ground. Shut off the engine and remove the key before leaving the operator's station.

WARNING! Avoid serious injury. Follow Safety Shutdown procedures before performing service.

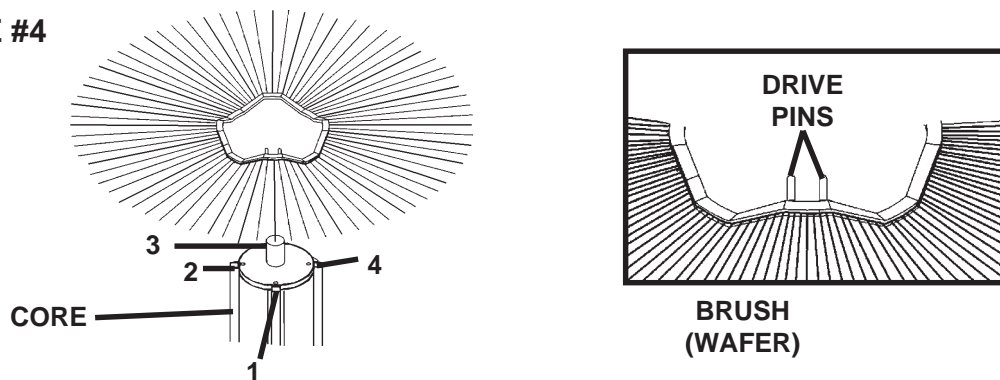


MAINTENANCE & SERVICE

REPLACING BRUSHES (Continued)

1. Remove the chain cover and loosen the chain with the chain tightener. Remove the chain from the lower sprocket.
2. Remove the (8) #1091 bolts securing the bearings and the core to the broom and carefully let the core drop down.
3. Raise the sweeper leaving the brush on the ground and back away.
4. Remove the left bearing and the cover (brush retainer) from the left end of the core.
5. For quick and easy removal of the worn brushes: Using an overhead hoist attach the right end of the core and lift. The brushes (wafers) will fall off the core.
6. Set the core on end, with the sprocket end on the ground. See Figure #4

FIGURE #4



7. For installation of the new brushes, number the tubes on the core as 1, 2, 3, and 4. Slide the first brush section (poly wafer) onto the core with a drive pin on each side of tube #1. Be sure the drive pins angle UP. See Figure #4
8. Place the second brush section (wire wafer) onto the core with a drive pin on each side of tube #3. Be sure the drive pins angle UP.
9. Place the third brush section (poly wafer) onto the core with a drive pin on each side of tube #1. Be sure the drive pins angle UP.
10. Alternate between tube #1 and #3 and also poly and wire wafers until the core is full. Make sure the drive pins angle UP.

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

11. When the core is full reinstall the cover (wafer retainer) and, using the overhead hoist, gently lay the brush back onto the ground.
12. Install the left bearing onto the core and lock in place with the set screws. Position the core into the broom cannister and install the (8) #1091 bolts and lock nuts secure the bearings and core to the cannister.
13. Reinstall the lower sprocket.
14. Position the chain around both sprockets and adjust as necessary. See Chain Adjustment Section F.
15. Reinstall the chain cover.

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REMOVAL AND STORAGE

REMOVING THE BROOM

1. Move the broom to a flat, level surface or storage area.
2. Remove the safety snap pins from the support stands and lower the stands to support the broom and reinstall the snap pins.
3. Disconnect the hydraulic hoses from the loader auxiliary hydraulics and connect the couplers together to prevent contaminants from entering the hydraulic system.
4. Unlock the broom from the loader and following the instructions in your loader operator's manual for removing attachments, remove the broom from the loader.

IMPORTANT:

Do not store the broom with weight on the brushes. This will deform the bristles, destroying their effectiveness. To avoid this problem, always install the support stands before removing the sweeper.

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.

PREPARATION FOR STORAGE

1. Clean the unit thoroughly, removing all mud, dirt and grease.
2. Inspect for visible signs of wear breakage or damage. Make any necessary repairs to avoid delays when starting next season.
3. Tighten all loose nuts, capscrews and hydraulic connections.
4. Touch up all unpainted and exposed areas with paint to prevent rust.
5. Replace decals if damaged or in unreadable condition.
6. Store the broom in a dry place.
7. 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. Leaving the unit outside without protective cover will materially shorten its life.

REMOVING FROM STORAGE

1. Remove all protective coverings.
2. Check hydraulic hoses for deterioration and replace if necessary.

TROUBLESHOOTING

<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 or tube.	Reroute hose; replace tube.
	Right bearing wore.	Replace bearing.
	Motor shaft or core shaft key broken or worn.	Replace key.
	Drive chain broken or off sprocket.	Replace or re-adjust as necessary. (See Adjustments Section of this manual.)
Brush slows or stops when sweeping.	Brush pattern too wide.	Check brush pattern and adjust to 3-4". (See Adjustments 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.
	Drive chain too tight.	Re-adjust chain correctly. (See Adjustments Section of this manual.)

TROUBLESHOOTING

<u>PROBLEM</u>	<u>POSSIBLE CAUSE</u>	<u>POSSIBLE REMEDY</u>
Brush wears into cone shape.	Sweeper is not level.	Level sweeper before each use.
	Tires on loader at different pressure or are different size.	Check tire size and ratings. Make corrections as necessary.
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.
	To much down force.	Check brush pattern and adjust to 3-4". (See Adjust ments Section of this manual.)
	Quick coupler or hose restriction.	Inspect couplers and hoses for dirt, rust, and other contaminates and repair or replace as needed.
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 Adjust ments Section of this
	Wafer damaged.	Replace.
	Sweeping large debris causing extensive wear of wafers.	Replace worn wafers.

TROUBLESHOOTING

<u>PROBLEM</u>	<u>POSSIBLE CAUSE</u>	<u>POSSIBLE REMEDY</u>
Hydraulic oil overheating.	To much down force.	Check brush pattern and adjust to 3-4". (See Adjust ments Section of this manual.)
	Quick coupler or hose restriction.	Inspect couplers and hoses for dirt, rust, and other contaminates and repair or replace as needed.
	Loader relief valve set too low.	See loader 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 damaged.	Replace.



BOLT TORQUE

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	Inches	Millimeters	Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters	
			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

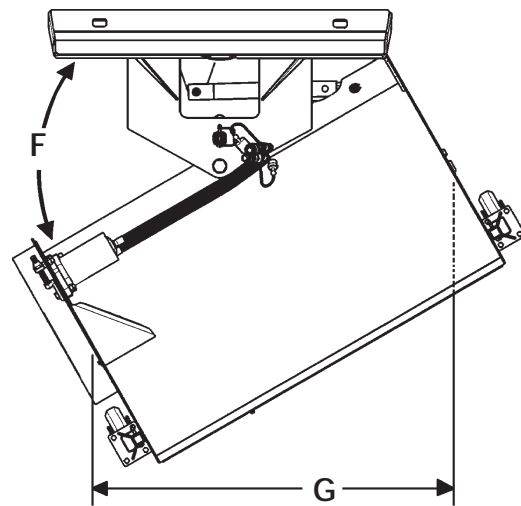
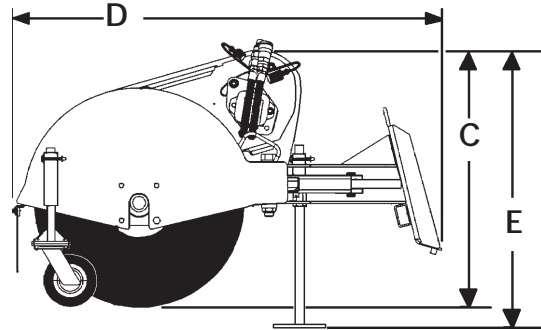
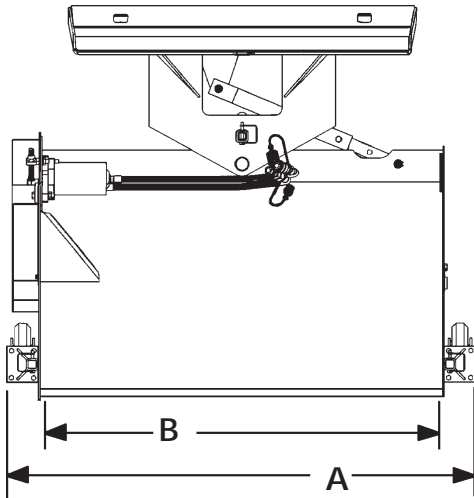
METRIC BOLT TORQUE SPECIFICATIONS

Size of Screw	Grade No.	Coarse Thread			Fine Thread		
		Ptich (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

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SPECIFICATIONS

BRADCO ROTARY BROOMS



Specifications and design are subject to change without notice and without liability therefore. Whenever applicable specifications are in accordance with SAE standards.

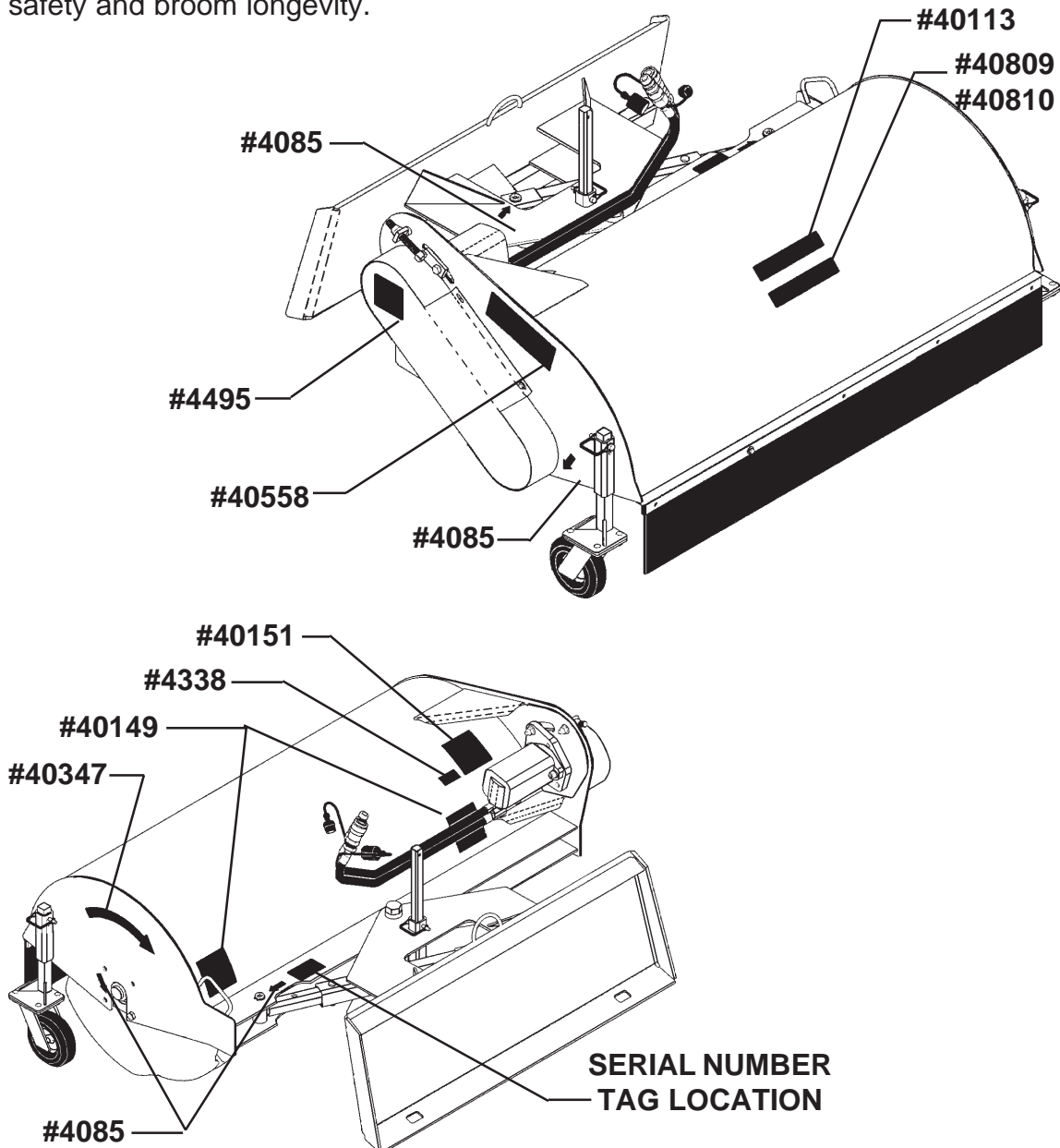
SPECIFICATIONS		
DESCRIPTION	42"	48"
A. Overall Width	51.25"	57.25"
B. Sweeping Width.....	42"	48"
C. Overall Height	29.60"	29.60"
D. Overall Length	43"	43"
E. Transport Height On Stand	32.25"	32.25"
F. Maximum Angle (Left and Right)	30°	30°
G. Sweeping Width @ 30° Angle	36.50"	42.00"
Weight	400#	530#
Brush Diameter	24"	24"
Wafers (Quantity)	23	25
Hydraulic Flow (GPM).....	7 - 10	
Hydraulic Pressure (PSI).....	2000 - 2500	

DECALS

DECAL PLACEMENT

GENERAL INFORMATION

The diagram on this page shows the location of the decals used on the BRADCO Rotary Brooms. 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.



IMPORTANT: 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.

DECALS

DECALS

BRADCO®

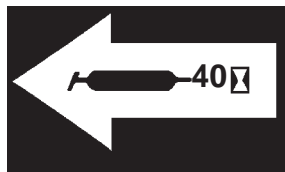
BRADCO LOGO
PART #40113



DANGER! PINCH POINTS
PART #40149



WARNING! HIGH PRESSURE FLUID
PART #40151



GREASE 40 HOURS
PART #4085



MADE IN USA
PART #4338

DECALS
DECALS

AB42

MODEL NUMBER AB42
PART #40809

AB48

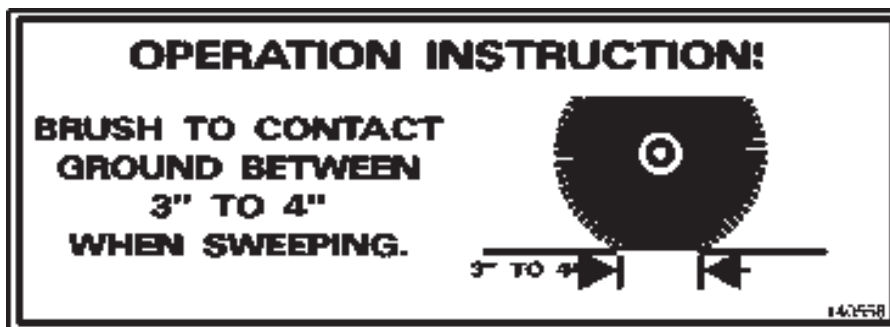
MODEL NUMBER AB48
PART #40810



WARNING! MOVING PARTS
PART #4495



DIRECTION OF ROTATION
PART #40347



OPERATION INSTRUCTIONS
PART #40558

PREDELIVERY CHECKLIST

GENERAL INFORMATION

The following is a list of areas that should be inspected by the dealer prior to delivery of the BRADCO Rotary Broom to the customer. The customer should check the list and make sure that the dealer has completed the inspection. Completion of this checklist will help insure that the customer receives the unit in complete working order, ready to install.

PREDELIVERY CHECKLIST - CHECK AND ADJUST AS NECESSARY

1. _____ Visually inspect the broom for bent, loose, cracked, damaged or missing parts. Check for any other irregularities.
2. _____ Check bolts for tightness. Retighten after the first eight working hours, and after every forty working hour intervals thereafter. See "Bolt Torque", Section O.
3. _____ Check all hydraulic connections for leaks and all hoses for proper positioning to reduce chafing and binding.
4. _____ Make sure decals are not damaged or missing and are in their correct location. See "Decals" Section Q.
5. _____ Make sure the customer has the necessary couplers to attach the unit to the loader auxiliary hydraulic couplers.
6. _____ Complete and return the manufacturer's "Warranty Validation Form" and sign your dealership predelivery checklist.

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Limited Warranty

Except for the Excluded Products as described below, all new products are warranted to be free from defects in material and/or workmanship during the Warranty Period, in accordance with and subject to the terms and conditions of this Limited Warranty.

1. Excluded Products. The following products are excluded from this Limited Warranty:

(a) Any cable, part that engages with the ground (i.e. sprockets), digging chain, bearing, teeth, tamping and/or demolition head, blade cutting edge, pilot bit, auger teeth and broom brush that either constitutes or is part of a product.

(b) Any product, merchandise or component that, in the opinion of Paladin Light Construction¹, has been (i) misused; (ii) modified in any unauthorized manner; (iii) altered; (iv) damaged; (v) involved in an accident; or (vi) repaired using parts not obtained through Paladin Light Construction.

2. Warranty Period. The Limited Warranty is provided only to those defects that occur during the Warranty Period, which is the period that begins on the first to occur of: (i) the date of initial purchase by an end-user, (ii) the date the product is first leased or rented, or (iii) the date that is six (6) months after the date of shipment by Paladin Light Construction as evidenced by the invoiced shipment date (the "Commencement Date") and ends on the date that is twelve (12) months after the Commencement Date.

3. Terms and Conditions of Limited Warranty. The following terms and conditions apply to the Limited Warranty hereby provided:

(a) Option to Repair or Replace. Paladin Light Construction shall have the option to repair or replace the product.

(b) Timely Repair and Notice. In order to obtain the Limited Warranty, (i) the product must be repaired within thirty (30) days from the date of failure, and (ii) a claim under the warranty must be submitted to Paladin Light Construction in writing within thirty (30) days from the date of repair.

(c) Return of Defective Part or Product. If requested by Paladin Light Construction, the alleged defective part or product shall be shipped to Paladin Light Construction at its manufacturing facility or other location specified by Paladin Light Construction, with freight PRE-PAID by the claimant, to allow Paladin Light Construction to inspect the part or product.

Claims that fail to comply with any of the above terms and conditions shall be denied.

LIMITATIONS AND EXCLUSIONS.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY BASED ON A COURSE OF DEALING OR USAGE OF TRADE.

IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES.

IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR ANY LOSS OR CLAIM IN AN AMOUNT IN EXCESS OF THE PURCHASE PRICE, OR, AT THE OPTION OF PALADIN LIGHT CONSTRUCTION, THE REPAIR OR REPLACEMENT, OF THE PARTICULAR PRODUCT ON WHICH ANY CLAIM OF LOSS OR DAMAGE IS BASED. THIS LIMITATION OF LIABILITY APPLIES IRRESPECTIVE OF WHETHER THE CLAIM IS BASED ON BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR OTHER CAUSE AND WHETHER THE ALLEGED DEFECT IS DISCOVERABLE OR LATENT.

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