

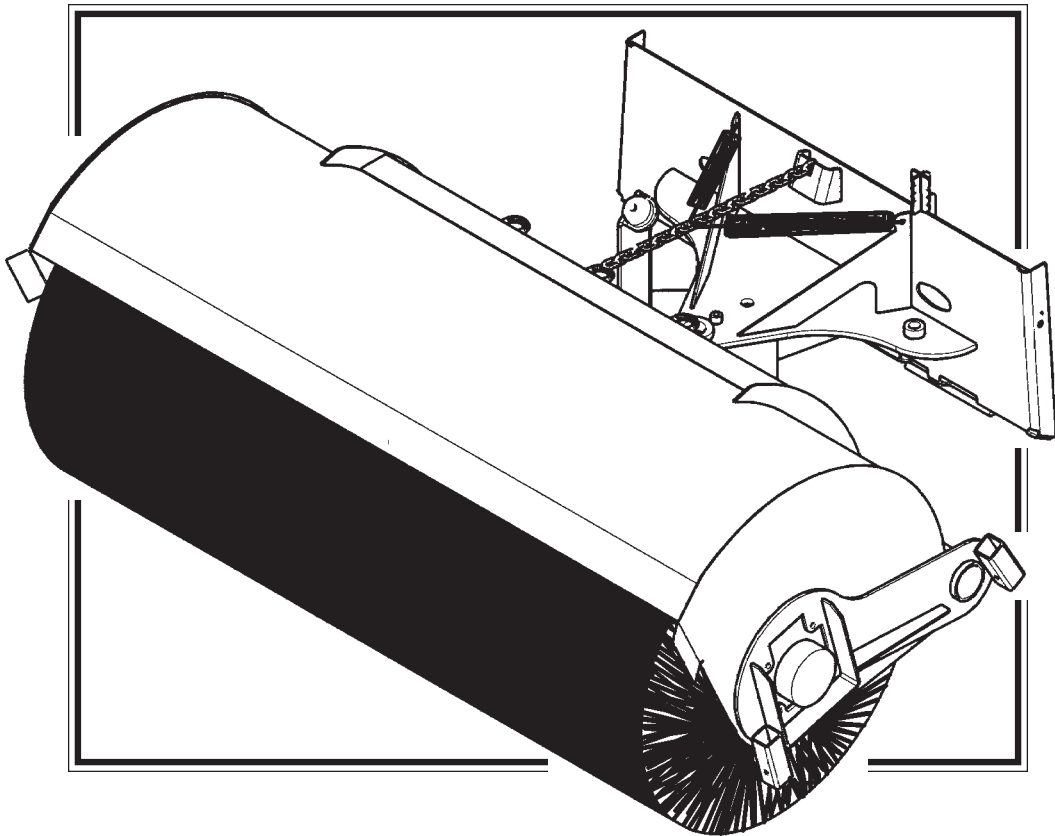
BRADCO®

AB72/AB84/AB96

OPEN FACE ANGLE BROOM

OM612
REV. 4

8591
1-5-05-4



OPERATOR'S & PARTS MANUAL

75512

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TO THE OWNER

GENERAL COMMENTS

Congratulations on the purchase of your new Bradco Sweeper. Your sweeper was carefully designed and manufactured to give you many years of dependable service. Your sweeper will require some minor cleaning 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:**

SAFETY PRECAUTIONS

BRADCO BROOMS

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 machine application and operation, it is the responsibility of the operator to conform to good safety practices in the implementation of this machine.

This section is composed of various warnings and safety tips which must be followed. Also read the owner's manual which came with the skid-steer loader which 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.

SAFETY PRECAUTIONS

BRADCO BROOMS

TO THE OPERATOR

The primary responsibility for safety with the equipment falls to the operator. 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 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 shutdown 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 it's moving.

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

SAFETY PRECAUTIONS

BRADCO BROOMS

Always use the seat belt and safety ROPS that are on the equipment.

Never allow riders or passengers on the equipment unless the equipment is designed for passengers.

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 to the loader. This reduces the amount of contamination in hydraulic components. Cover and protect the ends when the broom is disconnected and not being used.

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

PRE-OPERATION

GENERAL INFORMATION

The purpose of this manual is to assist in setting up, operating and maintaining your **BRADCO** Open Face Broom. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance.

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

Remember to read the "Safety Precautions" and "Operating Instructions" sections of this manual BEFORE you attempt to operate the attachment.

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 broom 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.

SKID-STEER OR OTHER HOST MACHINE

The skid-steer must have front auxiliary hydraulics and a 12 Volt DC electrical power source available for broom operation. The **BRADCO** Tree Spades are NOT designed for use on high flow skid-steers.

OPTIONS

DESCRIPTION	AB72	AB84	AB96
Wafer Assemblies			
Combo Wafer Kit	31093	89967	31096
Poly Wafer Kit	31091	89965	31094
Wire Wafer Kit	31092	89966	31095
Mud Deflector Assembly	15091	15092	15093
Hydraulic Angle Kit			89970
Water Kit			11232
Electrical Control Box Assemblies			
Angle Broom with Manual Angle and Water Kit Only			15757
Angle Broom with Hydraulic Angle Only			15756
Angle Broom with Hydraulic Angle and Water Kit			15758

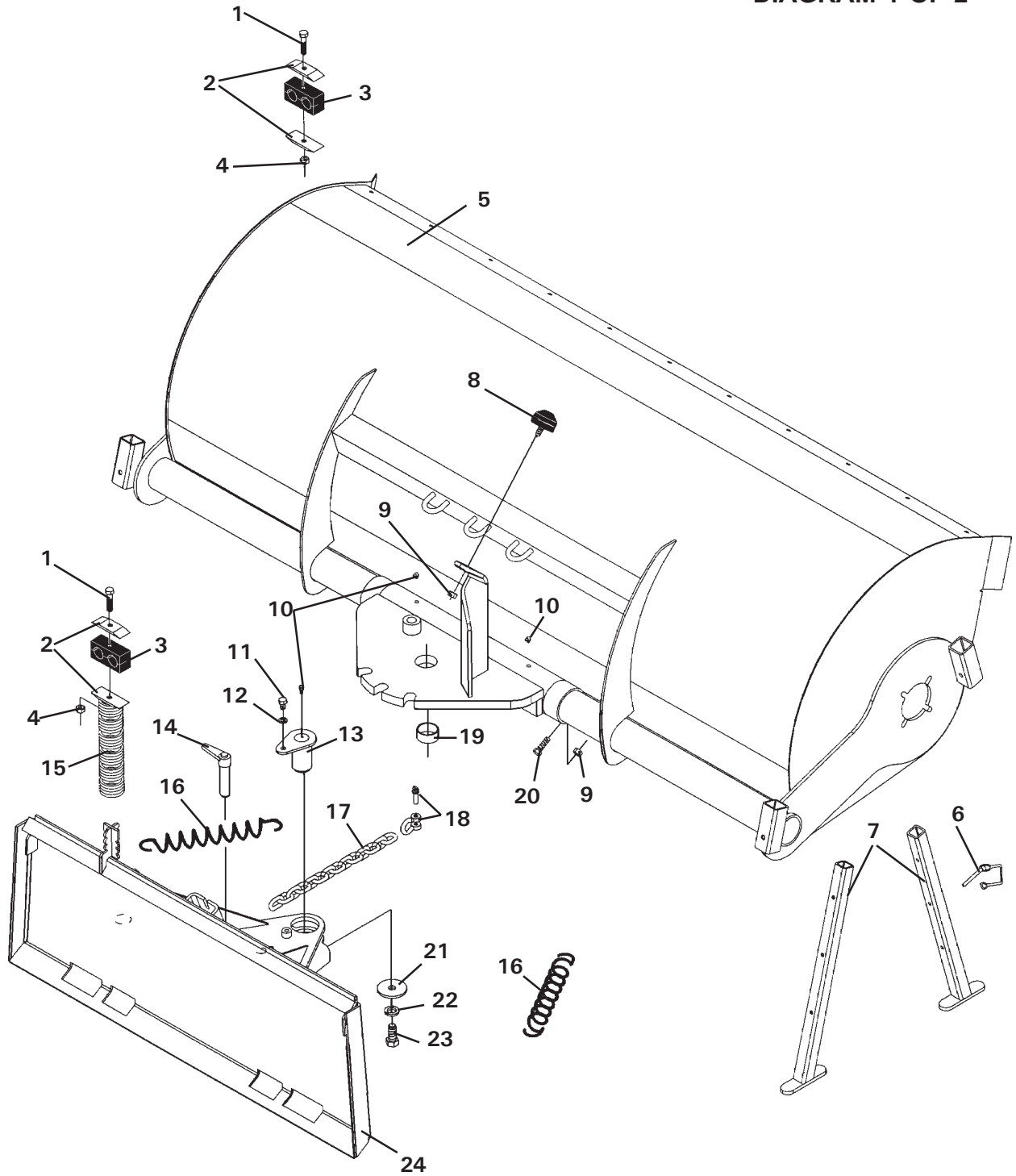
OPEN ANGLE BROOM ASSEMBLY

72" BROOM ASSEMBLY #31041

84" BROOM ASSEMBLY #89761

96" BROOM ASSEMBLY #14389

DIAGRAM 1 OF 2



OPEN ANGLE BROOM ASSEMBLY

72" BROOM ASSEMBLY #31041

84" BROOM ASSEMBLY #89761

96" BROOM ASSEMBLY #14389

LIST 1 OF 2

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	1096	.50" UNC X 3.00" Hex Capscrew
2	4	22315	Hose Clamp Plate
3	2	22316	Hose Clamp Cushion
4	2	1790	.50" UNC Serrated Lock Nut
5	1	89980	72" Cannister
	1	89773	84" Cannister
	1	14394	96" Cannister
6	4	10006	Safety Snap Pin
7	4	89811	Support Stand
8	1	6886	Rubber Bumper
9	3	1841	.50" UNC Deformed Lock Nut
10	3	6616	Grease Zerk
11	1	1088	.50" UNC X 1.00" Hex Capscrew
12	1	1505	.50" Lock Washer
13	1	89819	Pivot Pin
14	1	78407	Quick Release Pin
15	1	22288	Hose Spring
16	2	89962	Spring
17	1	89963	Chain
18	1	89968	Shackle
19	1	89807	Bushing
20	2	1091	.50" UNC X 1.75" Hex Capscrew
21	1	31090	Washer Plate
22	1	1507	.75" Lock Washer
23	1	1137	.75" UNC X 1.50" Hex Capscrew
24	1	89789	Hitch Frame

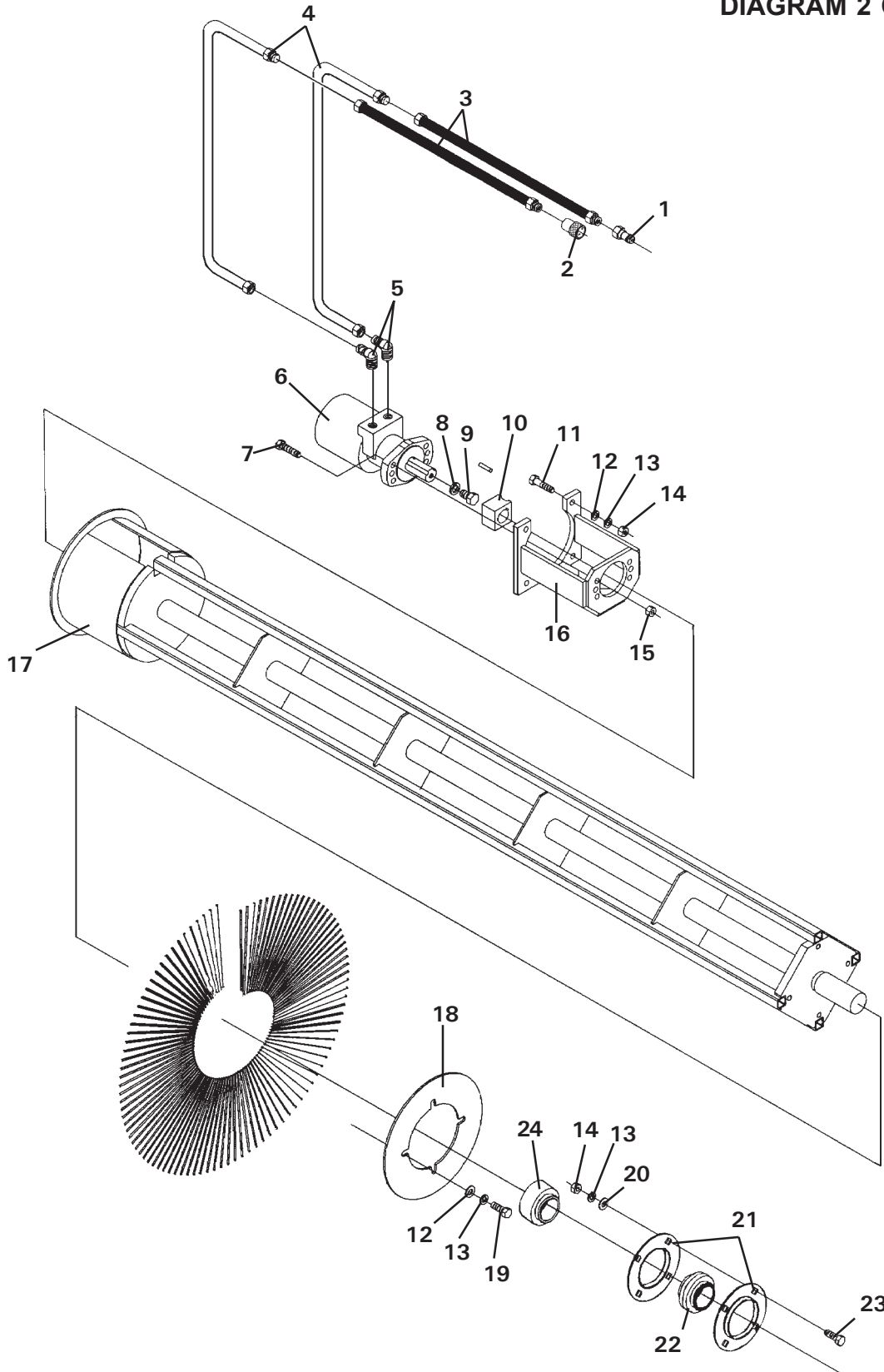
OPEN ANGLE BROOM ASSEMBLY

72" BROOM ASSEMBLY #31041

84" BROOM ASSEMBLY #89761

96" BROOM ASSEMBLY #14389

DIAGRAM 2 OF 2



OPEN ANGLE BROOM ASSEMBLY

72" BROOM ASSEMBLY #31041

84" BROOM ASSEMBLY #89761

96" BROOM ASSEMBLY #14389

LIST 2 OF 2

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	22519	Male Coupler
2	1	22518	Female Coupler
3	2	37865	Hose .62" X 118" 10FFS X 12MBo
4	2	32299	Hydraulic Tube
5	2	30233	90° Elbow 10MBo - 8MFS
6	1	89969	Hydraulic Motor
7	4	1090	.50" UNC X 1.50" Hex Capscrew
8	-	1506	.62" Lock Washer
9	-	1362	.62" UNF X 1.00" Hex Capscrew
10	1	89805	Motor Drive Block
11	4	1091	.50" UNC X 1.75" Hex Capscrew
12	8	1516	.50" Flat Washer
13	12	1505	.50" Lock Washer
14	8	1228	.50" UNC Hex Nut
15	4	1841	.50" UNC Deformed Lock Nut
16	1	89795	Motor Housing
17	1	89979	72" Core
	1	89762	84" Core
	1	14390	96" Core
18	1	89806	Wafer End Retainer
19	4	1089	.50" UNC X 1.25" Hex Capscrew
20	4	1646	.50" Hard Flat Washer
21	1	89131	Flangette Set
22	1	89128	Ball Bearing
23	4	1872	.50" UNC X 1.50" Carriage Bolt
24	1	16840	Broom Core Spacer

MOUNTING & INSTALLATION

BRADCO ANGLE BROOMS

ATTACHING THE UNIT

The BRADCO® angle brooms come in three different lengths. The lift capacity of the skid-steer or prime mover must be at least 1300 lbs. (590 kg).

The angle broom comes with a universal adapter plate capable of attaching the broom to most common skid loaders.

1. Remove the bucket from the skid-steer and attach the angle broom to the prime mover's quick attach, and lock in place.
2. Connect the hydraulic hoses to the auxiliary hydraulic couplers on the prime mover.
3. Remove the snap pins on the support stands, flip the stands over, and reinstall in the same location.
4. Make adjustments to the broom. See the Adjustments Section F.

If the angle broom does not fit the loader arms, contact your skid-steer dealer for optional adapter plates to convert the machine to a more common adapter plate configuration. Refer to the skid-steer loader operator's manual for proper mounting and safe operation of attachments.

DANGER: Never operate an implement which is not securely attached to the skid-steer loader.



The skid-steer loader is required to have auxiliary hydraulics that are capable of 14-20 gpm. The hydraulic pressure must be capable of 2000-2800 psi. Verify that the skid-steer is capable of hydraulic motor operation at these levels.

ADJUSTMENTS

BRADCO ANGLE BROOMS

GENERAL INFORMATION

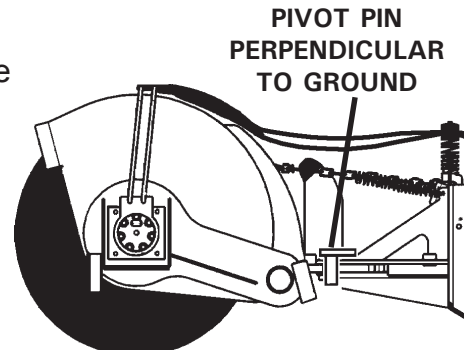
A properly adjusted broom will offer the best sweeping performance.

- 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. Proper adjustment of the **TENSION SPRINGS** will allow the brush to "float" over obstacles, without changing the position of the loader arms.
- D. Proper adjustment of the **TRANSPORT CHAIN** will allow the tension springs to carry the weight of the broom during sweeping, and eliminate some of the bouncing motion of the broom. The transport chain when properly adjusted during transporting will lengthen the life of the tension springs.
- E. **ANGLING** the sweeper to the left or right will assist in directing the debris and also in windrowing the debris.
- F. **SIDE-SHIFTING** the broom is used to keep the sweep pattern in line with the prime mover wheels when angled and in the event that the prime mover is wider than the boom, the boom can be side-shifted to sweep along a curb or wall.

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 loader arms need to be adjusted so the pivot pin, connecting the hitch frame and the broom, 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.



The tension springs may need to be readjusted after leveling is completed.

ADJUSTING THE SWEEPER BRUSH

A properly adjusted brush offers the best sweeping performance.

To adjust the brush pattern:

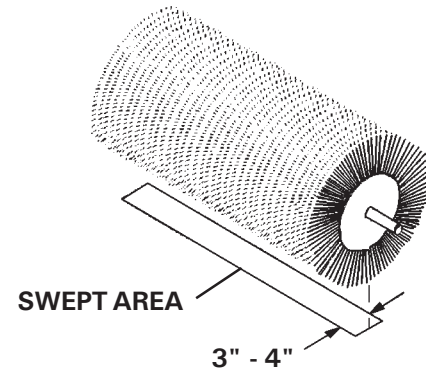
1. Move the sweeper to a dusty, flat surface.
2. Set the prime mover brake; leave the engine running.
3. Start the sweeper at a slow speed; then lower it so the bristle tips touch the ground.

ADJUSTMENTS

BRADCO ANGLE BROOMS

ADJUSTING THE SWEEPER BRUSH (Continued)

4. Run the sweeper in a stationary position for 10 seconds.
5. Raise the sweeper, and back away.
6. Switch off the prime mover 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 to be adjusted as necessary according to the instructions in "Adjusting Tension Springs" & "Adjusting Transport Chain".

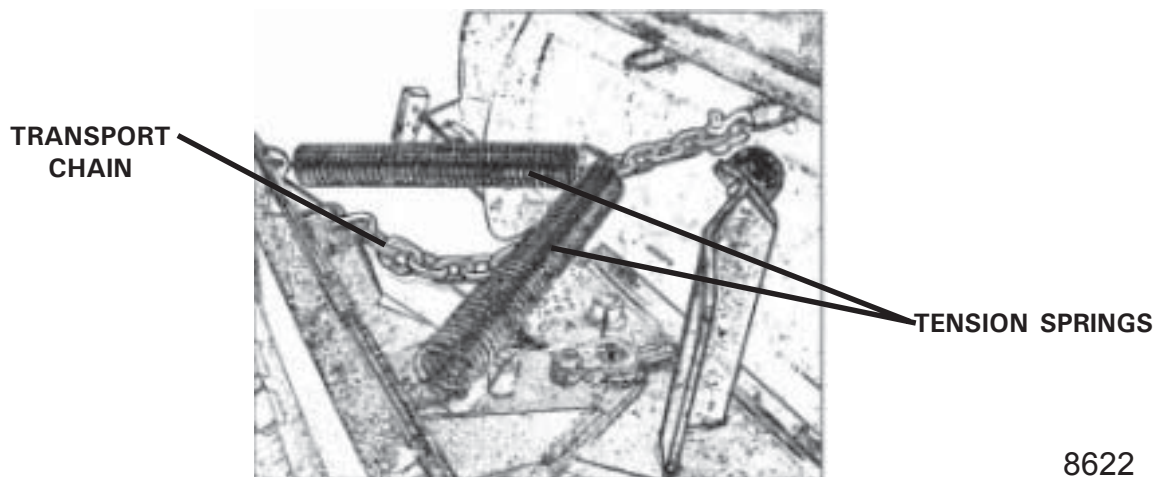


ADJUSTING THE TENSION SPRINGS

The BRADCO® angle brooms are equipped with two tension springs that when adjusted correctly will allow the broom to float over obstacles without changing the position of the loader arms.

NOTE: Applying a small amount of down-force with the prime mover loader arms will assist in disconnecting the transport chain and tension springs to readjust. Do not allow the broom to stay in this position for long periods of time, or the bristles may become deformed.

1. Adjust the transport chain for sweeping. See Adjusting Transport Chain.
2. Applying down-force with the prime mover until the broom rotates back. There will be slack in the transport chain.
3. Pull the springs tight and connect into the transport chain with all the slack between the springs and hitch frame.



ADJUSTMENTS

BRADCO ANGLE BROOMS

ADJUSTING THE TENSION SPRINGS (Continued)

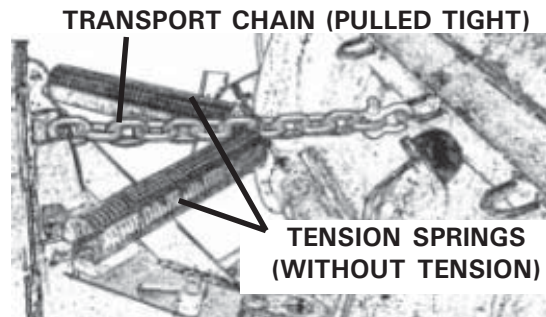
4. Lift the broom off of the ground, and check the slack in the transport chain. If the springs have expanded to the point that the chain is pulled tight, lower the broom and apply down-force until the springs can be moved up one link on the transport chain.
5. Repeat step #4 until the tension springs carry the weight of the broom instead of the transport chain. This will allow the broom to float over obstacles while sweeping and reduce shock to the prime mover.

ADJUSTING TRANSPORT CHAIN

The BRADCO® angle brooms are equipped with a transport chain to carry the broom during transport between work sites, taking the weight off of the tension springs and eliminating the bouncing motion of the broom.

For Transporting:

1. Apply a small amount of down-force with the prime mover loader arms until the broom rotates back against the rubber bumper.
2. Tighten the transport chain in the chain holder on the hitch frame.



NOTE: Adjusting the chain to take the weight off of the tension springs during transporting will eliminate unnecessary wear of the springs and also a lot of the shock to the prime mover.

For Sweeping:

1. Apply a small amount of down-force with the prime mover loader arms until the transport chain can be disconnected from the chain holder in the hitch frame.
2. Adjust the chain and tension springs, as described in “Adjusting the Tension Springs”.

MANUAL ANGLE ADJUSTMENT

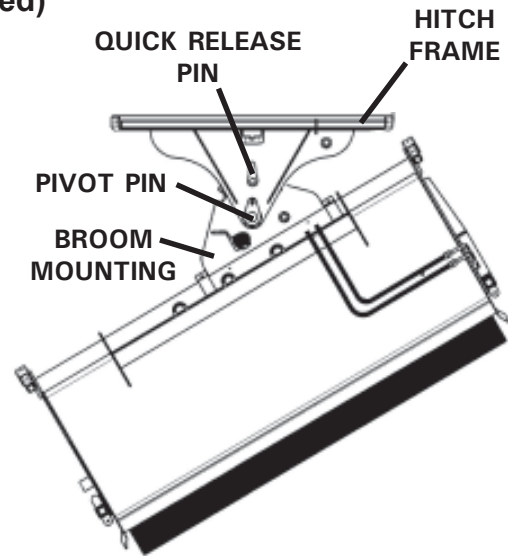
The BRADCO® angle broom has three angle positions which can be set by the operator; straight forward and 30° to the left or right, for windrowing the debris. (Due to the location of the pivot point, the broom will also need to be shifted either left or right if you wish to maintain the sweep pattern and keep it in line with the prime mover wheels.)

ADJUSTMENTS

BRADCO ANGLE BROOMS

MANUAL ANGLE ADJUSTMENT (Continued)

1. Stop the prime mover, and turn off the engine.
2. Lift the broom until the bristles are off of the ground. Shut off the engine.
3. Remove the quick release pin from the hitch assembly, and manually angle the broom in the desired direction until the holes are aligned in the hitch frame and broom mounting. Install quick release pin.
4. Level the broom, See "Leveling the Sweeper".



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

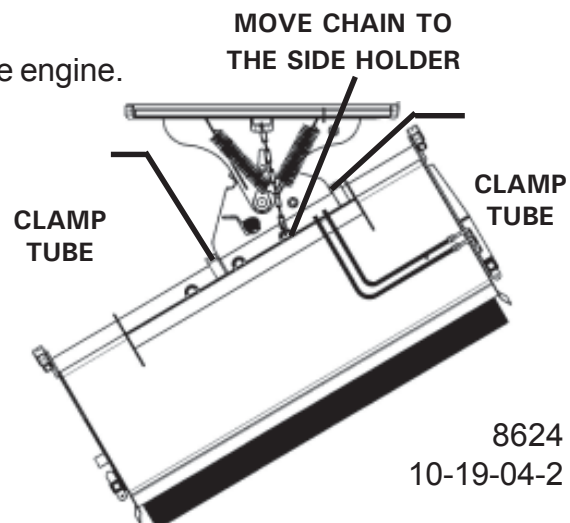
HYDRAULIC ANGLE KIT ADJUSTMENT

The BRADCO® angle broom has an optional hydraulic angle kit available. See Section "I" for the "Hydraulic Angle Kit" parts, installation, adjustment and operation.

SIDE-SHIFT ADJUSTMENT

The BRADCO® angle broom can be side-shifted either left or right, up to 10" off center. This will maintain the sweep pattern and keep it in line with the prime mover wheels when the broom is angled, and also in the event that the prime mover is wider than the broom it can be side-shifted to assist in sweeping along a curb or wall.

1. Stop the prime mover and turn off the engine.
2. Disconnect the transport chain at the shackle end and move it to the chain holder in the direction you are planning to side-shift.



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ADJUSTMENTS

BRADCO ANGLE BROOMS

SIDE-SHIFT ADJUSTMENT (Continued)

NOTE: Applying a small amount of down-force with the prime mover loader arms will assist in disconnecting the transport chain and tension springs to readjust. Do not allow the broom to stay in this position for long periods of time or the bristles may become deformed.

3. Loosen the bolts on the clamp tubes.
4. Lift the broom off the ground. (The added tension from moving the chain will assist in side shifting the broom.)
5. Set the broom down, and lift back up until broom is at the desired location.

NOTE: It may be necessary to move the prime mover to the side with the broom on the ground, therefore sliding the broom to the desired location if lifting does not achieve the desired effect.

6. Level the broom. See “Leveling the Sweeper”.

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

OPERATING INSTRUCTIONS

OPERATING THE BROOM

The **BRADCO**® Angle Brooms use the prime mover hydraulic flow to operate. To start the brush, turn on the skid-steer'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 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 skid-steer'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 along with the terms *skid-steer* and *prime mover*.

IMPORTANT: The tension springs allow the broom to follow ground contours and "*float*" over obstacles. Therefore, **DO NOT** run the sweeper with the skid-steer in the "FLOAT" position. Using "FLOAT" allows the sweeper to drop too low and lift too high resulting in poor sweeping and damage to the unit.

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 prime mover.

OPERATING INSTRUCTIONS

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.

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 prime mover 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.**

OPERATING INSTRUCTIONS

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

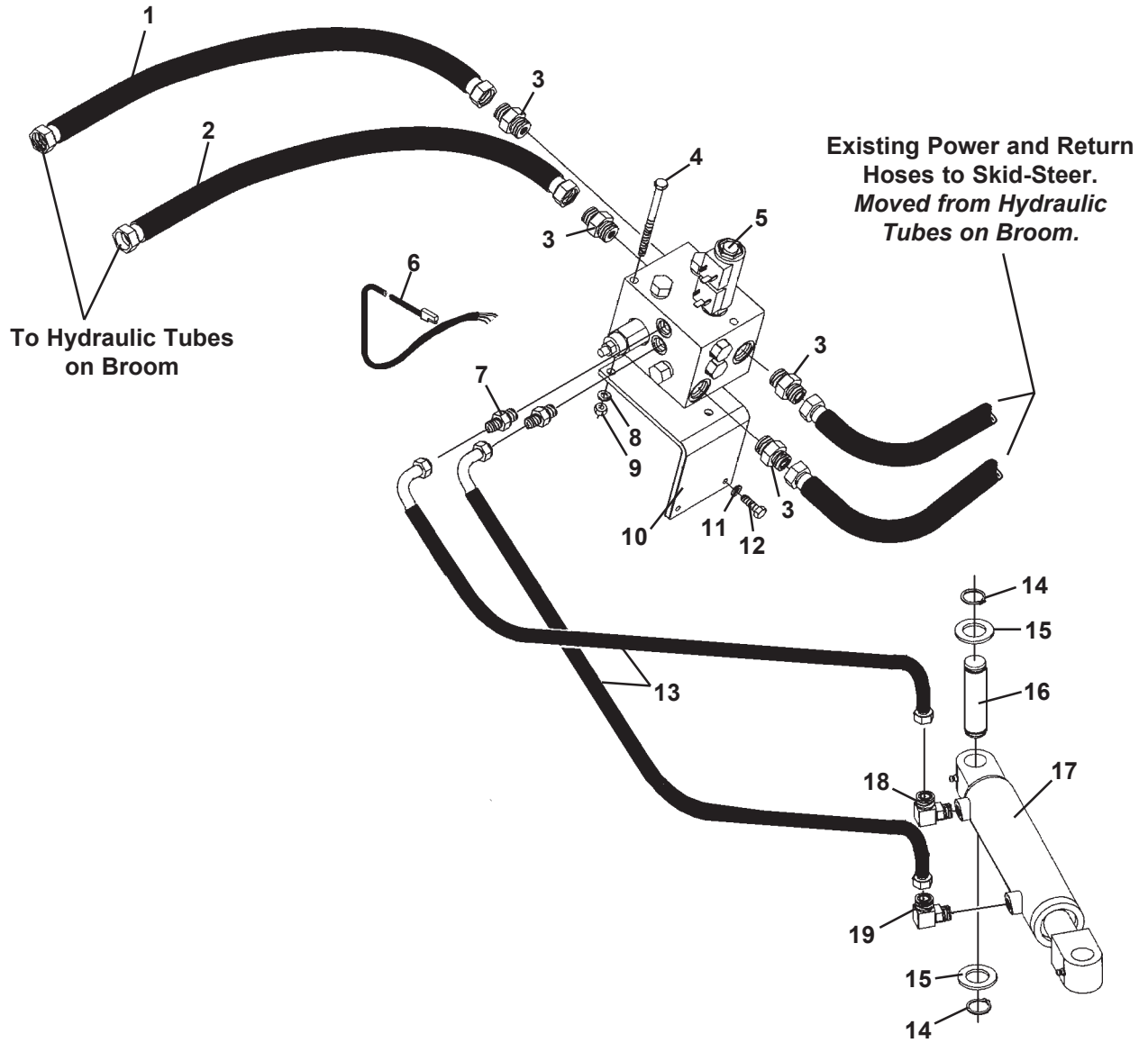
A low brush speed and low ground speed works best for thatching. To prevent the brush from pulling itself into the ground, adjust the brush so the bristle tips barely touch the grass.

If the brush does pull into the grass and stalls while sweeping use the prime mover 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.

OPTIONAL HYDRAULIC ANGLE KIT

"ON THE GO" HYDRAULIC ANGLE KIT #17403



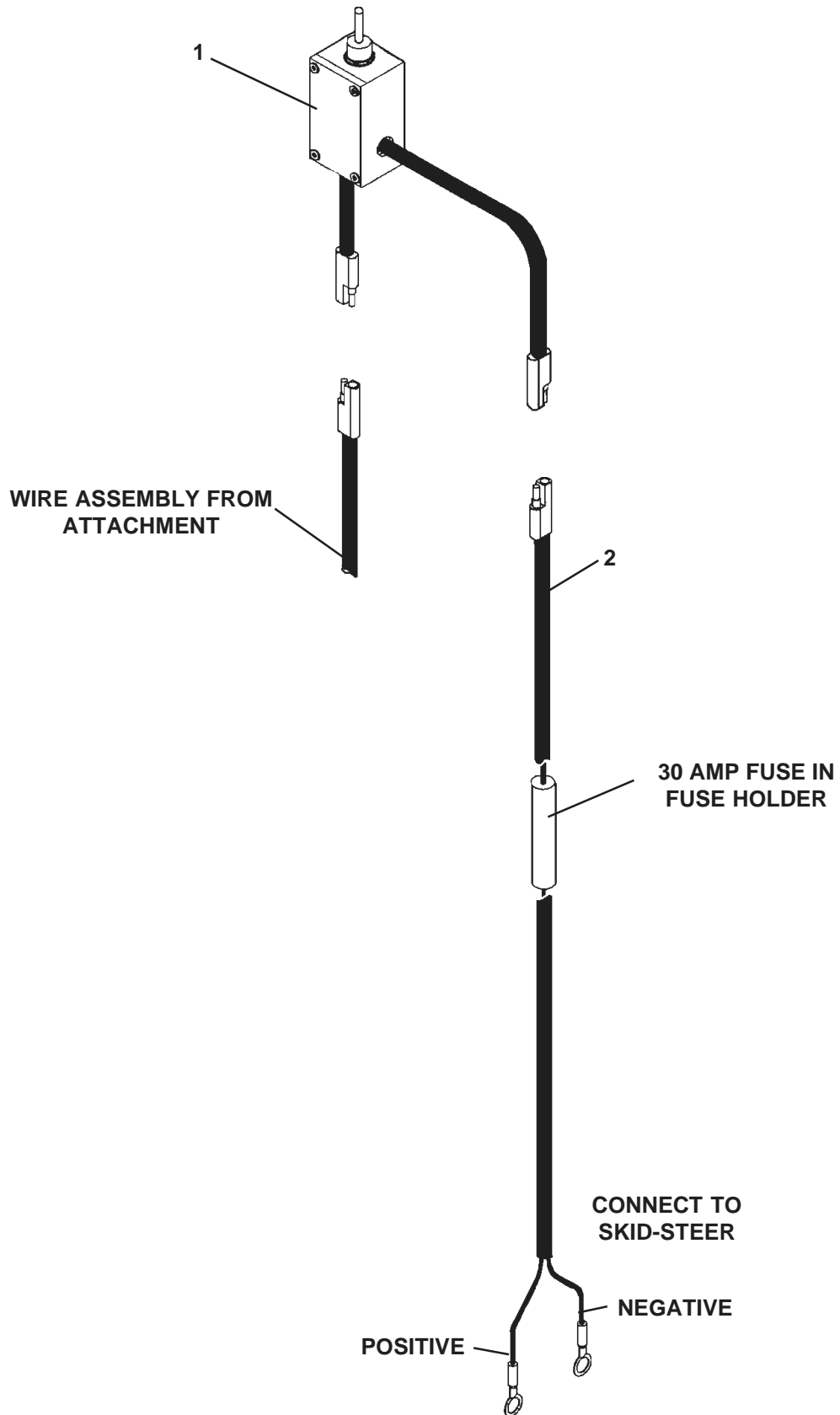
OPTIONAL HYDRAULIC ANGLE KIT

"ON THE GO" HYDRAULIC ANGLE KIT #17403

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	37879	Hose .62" X 42" 10FFSX - 10FFSX
2	1	37901	Hose .62" X 40" 10FFSX - 10FFSX
3	4	30308	Straight Connector 10MBo-10MFF
4	2	1036	.31" UNC X 5.00" Hex Capscrew
5	1	14898	Control Valve
6	1	89289	Wire Mold Plug Assembly
7	2	30208	Straight Connector 6MBo-6MFS
8	2	1502	.31" Lock Washer
9	2	1225	.31" UNC Hex Nut
10	1	17404	Mounting Plate
11	2	1501	.25" Lock Washer
12	2	1003	.25" UNC X 1.00" Hex Capscrew
13	2	38229	Hose .38" X 48" 6FFS - 6FFS
14	2	6612	Snap Ring
15	2	57462	Thrust Washer
16	1	89978	Cylinder Pin
17	1	89964	Cylinder Assembly
18	1	30209	90° Elbow 6MBo - 6MFS with .027 Orifice
19	1	30204	90° Elbow 6MBo - 6MFS

OPTIONAL ELECTRICAL CONTROL BOX

ELECTRICAL CONTROL BOX ASSEMBLY #15754



OPTIONAL ELECTRICAL CONTROL BOX

ELECTRICAL CONTROL BOX ASSEMBLY #15754

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	17692	Control Box Assembly (Includes one single pole, double throw, normally open, momentary closed, spring return toggle switch.)
2	1	17173	Wire Assembly (To Skid-Steer Power Supply)

DANGER! ELECTROCUTION HAZARD

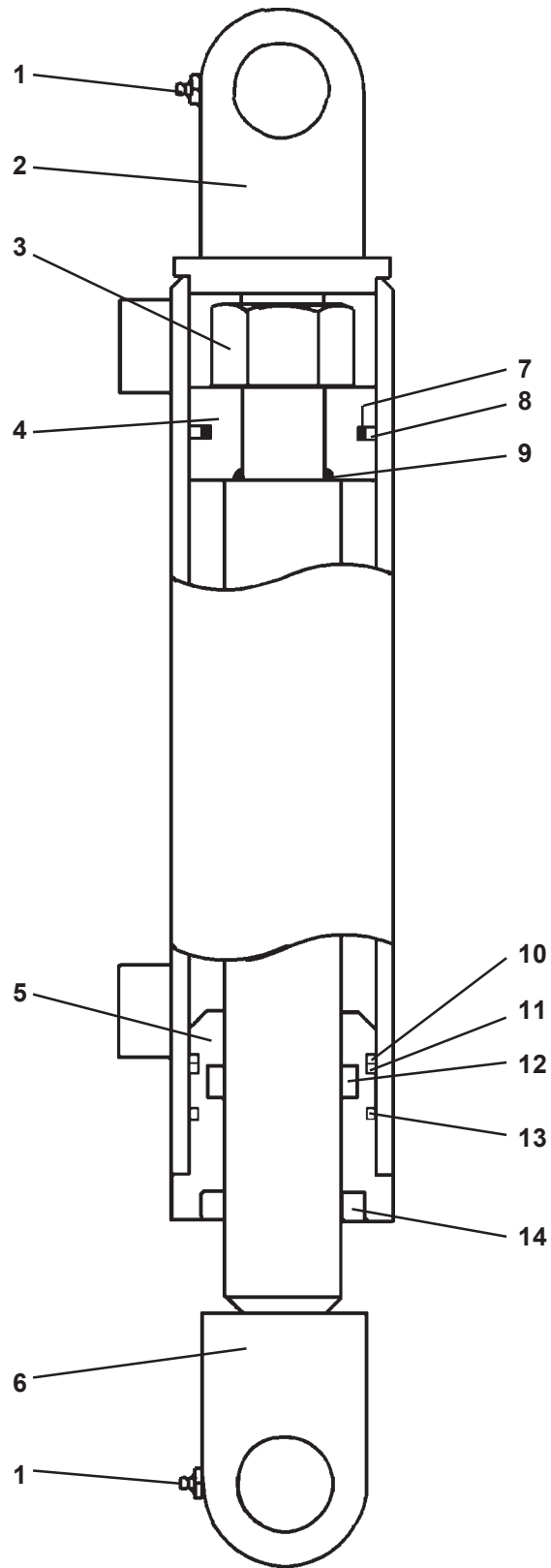


Provide electrical power to the control box by following your skid-steer manufacturer's recommended procedures.

The electrical circuit must be fused to prevent machine damage and serious personal injury or death.

CYLINDER ASSEMBLY

ASSEMBLY #89964



CYLINDER ASSEMBLY

ASSEMBLY #89964

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	6616	Grease Fitting
2	1	89976	Cylinder Tube
3	1	1482	Hex Nut
4	1	6992	Piston
5	1	57330	Cylinder Gland
6	1	89975	Cylinder Rod
7	1	4637*	O-Ring
8	1	4636*	Piston Ring
9	1	4635*	O-Ring
10	1	4633*	O-Ring
11	1	4634*	Back-Up Washer
12	1	45219*	Poly Pak Seal
13	1	7164*	Gland Retaining Ring
14	1	4974*	Rod Wiper

NOTE: Seal Kit #45136 includes all parts marked with an asterisk (*). Parts are not sold separately.

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MOUNTING INSTALLATION & OPERATION

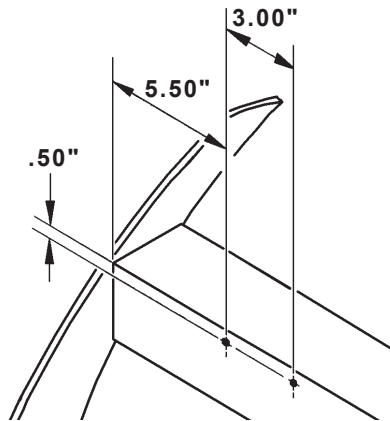
OPTIONAL "ON THE GO" HYDRAULIC ANGLE ASSEMBLY #17403

The following instructions will assist in the installation of the optional "On The Go" Hydraulic Angle Kit.

FIELD INSTALLATION

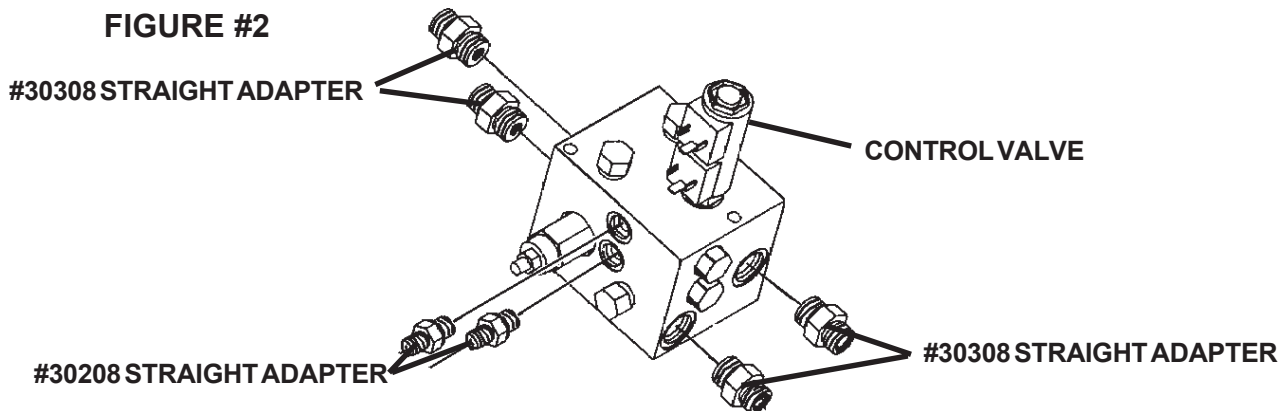
1. Although the BRADCO angle brooms currently have the holes drilled into the cannister for mounting the valves, there are some early production units that do not. You will need to drill two .203" (13/64") holes and tap both to .25-20 UNC. On the angle reinforcement, measure in 5.50" (5-1/2") from the left and down .50" (1/2") for the first hole, and then using the valve mounting bracket as a template drill the second hole. Tap. See Figure #1

FIGURE #1



2. Install two #30308 straight adapters to the front ports of the control valve. Install the remaining two #30308 straight adapters to the back ports of the control valve. Install the two #30208 straight adapters to the left side ports of the control valve. See Figure #2

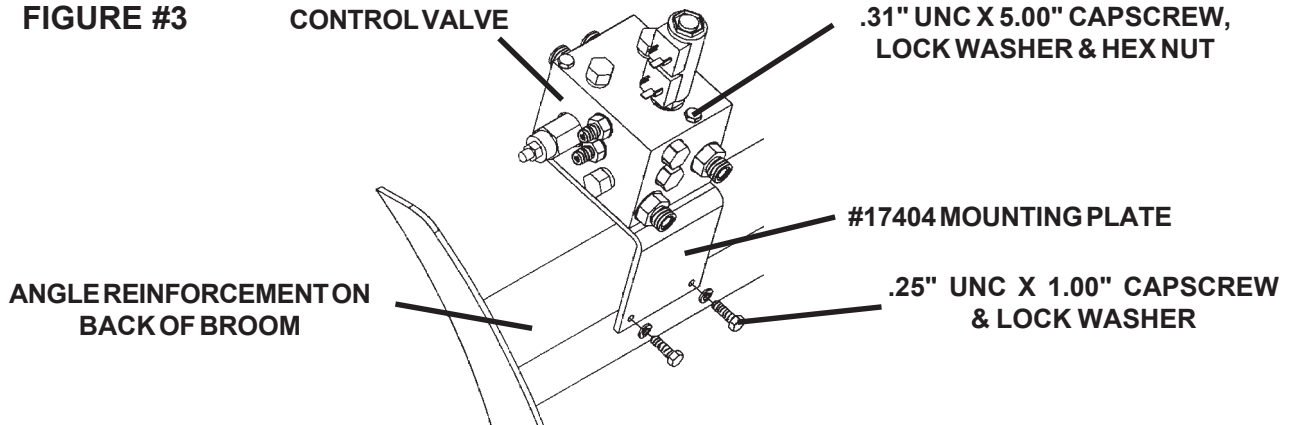
FIGURE #2



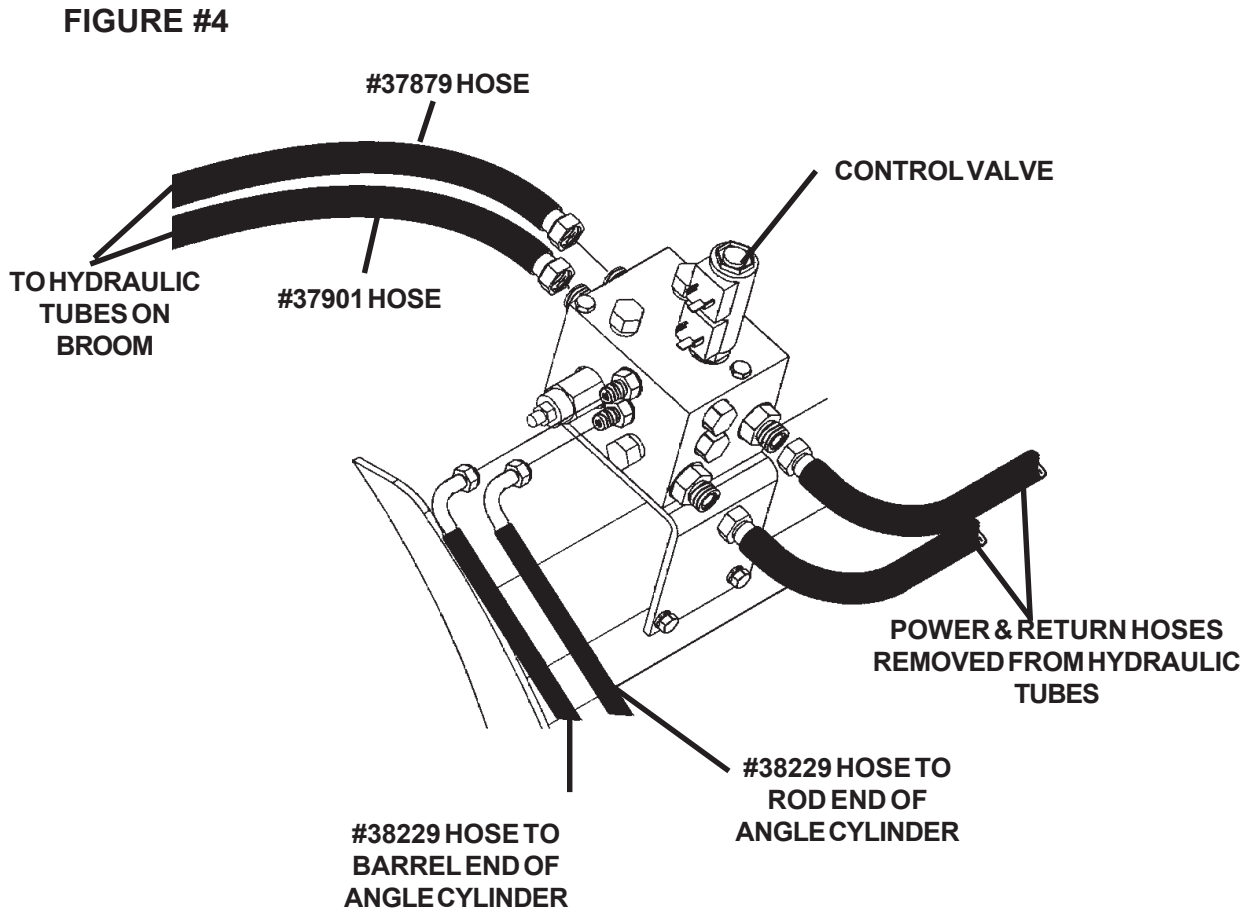
3. Bolt the control valve to the mounting plate using the two .31" x 5.00" capscrews, lock washers and hex nuts provided. Bolt the mounting plate to the broom cannister using two .25" UNC X 1.00" capscrews and lock washers provided. See Figure #3

MOUNTING INSTALLATION & OPERATION

OPTIONAL "ON THE GO" HYDRAULIC ANGLE ASSEMBLY #17403



4. Remove the power and return hoses from the tubes on the broom, and install on the straight adapters located on the front of the control valve. Install hose #37879 to the front hydraulic tube and to the right (inside) straight adapter on the front of the control valve and then hose #37901 to the back hydraulic tube and to the left straight adapter on the front of the control valve. See Figure #4

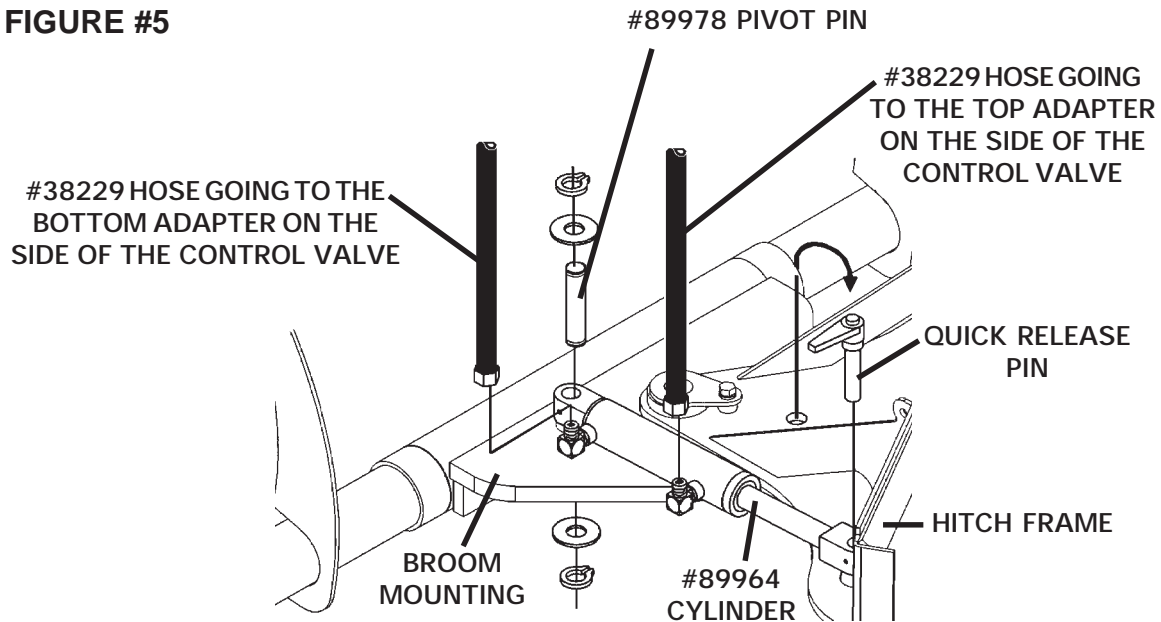


MOUNTING INSTALLATION & OPERATION

OPTIONAL "ON THE GO" HYDRAULIC ANGLE ASSEMBLY #17403

5. Install the tube end of the #89964 cylinder to the broom mounting using the #89978 pivot pin, thrust washers and snap rings provided. See Figure #5
6. Connect the rod end of the cylinder to the hitch frame with the existing quick release pin. See Figure #5

FIGURE #5



7. Install one #38229 hose to the outside top adapter on the control valve and to the rod end of the cylinder. See Figure # 5
8. Install the remaining #38229 hose to the bottom adapter on the control valve and then to the tube end of the cylinder. See Figure #5
9. If the wires on the control valve have not already been connected to the wires on the mold plug (#89289) do so now.
10. Plug the wire assembly into the BRADCO electrical control box (#15754), or directly to your prime mover's electrical outlet.
11. Connect the power & return hoses to the prime mover. Check all hydraulic fittings and hoses for leaks, and ensure they are properly connected and routed to avoid pinching or chafing.

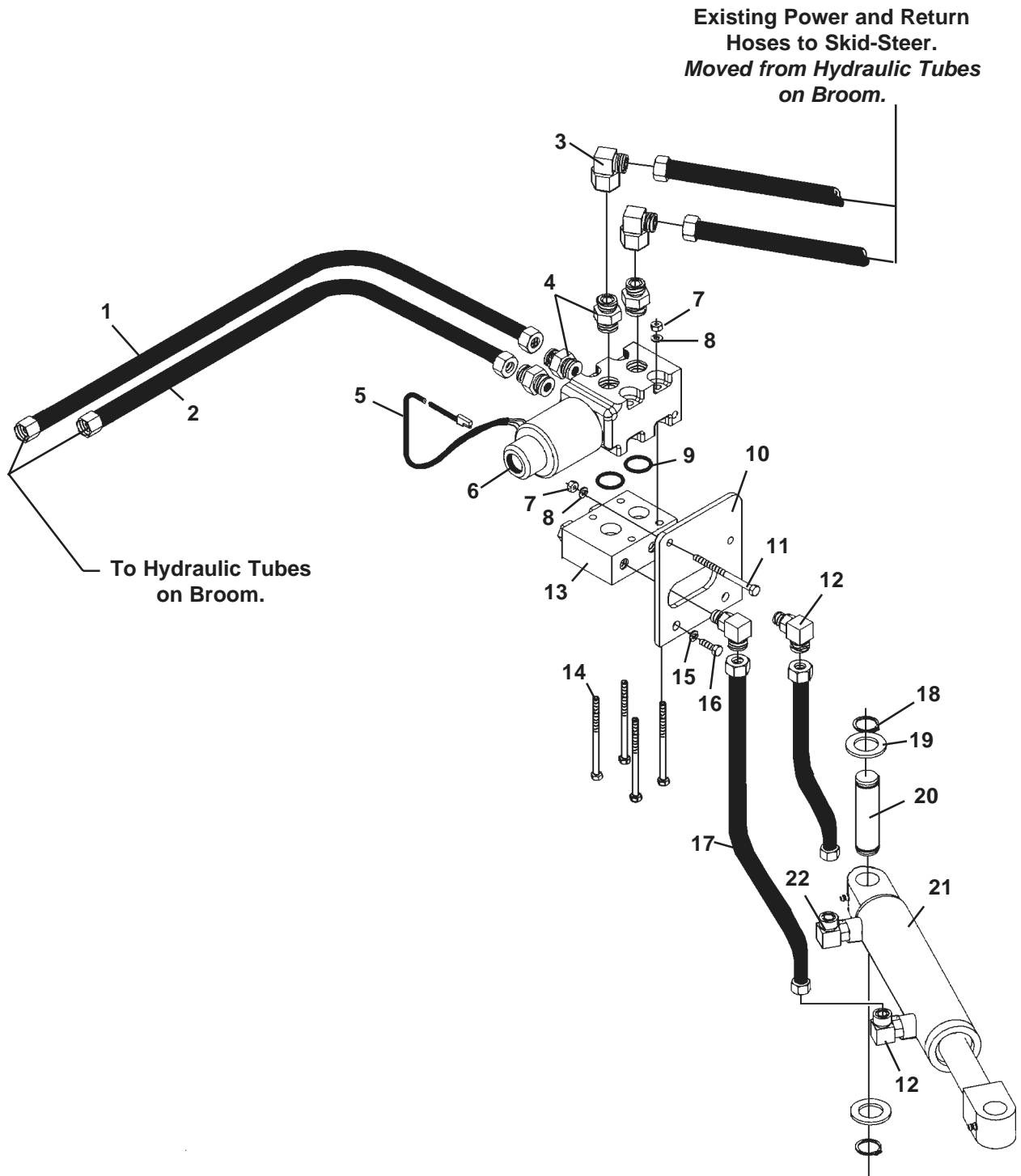
IMPORTANT:

Avoid hydraulic system damage. Make sure hose ends and fittings are clean before installation.

Avoid hose damage. Make sure that the hoses do not get pinched or twisted. Do not allow hoses to drag on the ground.

OPTIONAL HYDRAULIC ANGLE KIT

DIVERTER VALVE ANGLE KIT #89970



OPTIONAL HYDRAULIC ANGLE KIT

DIVERTER VALVE ANGLE KIT #89970

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	37879	Hose Assembly .62" X 42" 10FFSX-10FFSX
2	1	37901	Hose Assembly .62" X 40" 10FFSX-10FFSX
3	2	30311	90° Elbow 10MFS-10FFS
4	4	30308	Straight Connector 10MBo-10MFF
5	1	89289	Wire Mold Plug Assembly
6	1	17006	Diverter Valve
7	6	1225	.31" UNC Hex Nut
8	6	1502	.31" Lock Washer
9	2	4865	O'Ring
10	1	17162	Mounting Plate
11	2	1032	.31" UNC X 3.50" Hex Capscrew
12	3	30204	90° Elbow 6MBo-6MFS
13	1	17026	Check Valve
14	4	1034	.31" UNC X 4.00" Hex Capscrew
15	2	1501	.25" Lock Washer
16	2	1003	.25" UNC X 1.00" Hex Capscrew
17	2	38008	Hose Assembly .38" X 32" 6FFS-6FFS
18	2	6612	Snap Ring
19	2	57462	Thrust Washer
20	1	89978	Pivot Pin
21	1	89964	Cylinder Assemble
22	1	30209	90° Elbow 6Mbo-6MFS with .027 Orifice

MOUNTING INSTALLATION & OPERATION

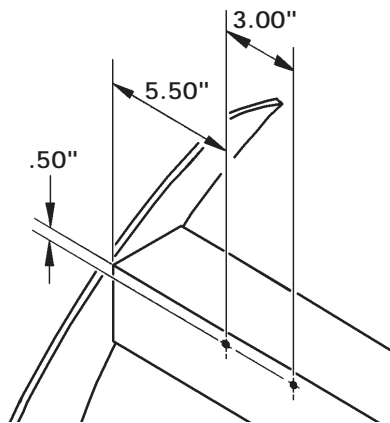
OPTIONAL HYDRAULIC ANGLE KIT ASSEMBLY

The following instructions will assist in the installation of the optional Hydraulic Angle Kit.

FIELD INSTALLATION

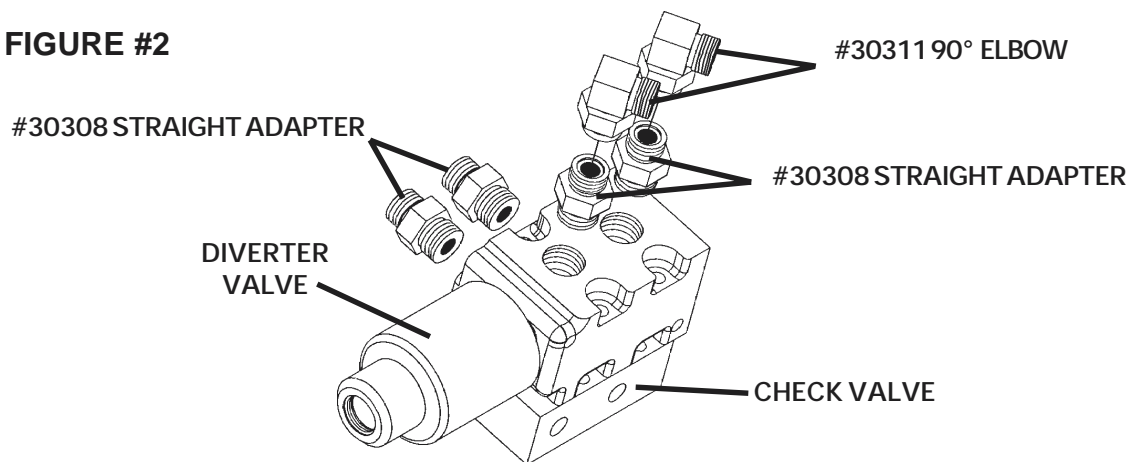
1. Although the BRADCO angle brooms currently have the holes drilled into the cannister for mounting the valves, there are some early production units that do not. You will need to drill two .203" (13/64") holes and tap both to .25-20 UNC. On the angle reinforcement, measure in 5.50" (5-1/2") from the left and down .50" (1/2") for the first hole, and then using the valve mounting bracket as a template drill the second hole. Tap. See Figure #1

FIGURE #1



2. Install two #30308 straight adapters to the top ports of the diverter valve followed by the two #30311 elbows. Install the remaining two #30308 straight adapters to the front ports of the diverter valve. See Figure #2

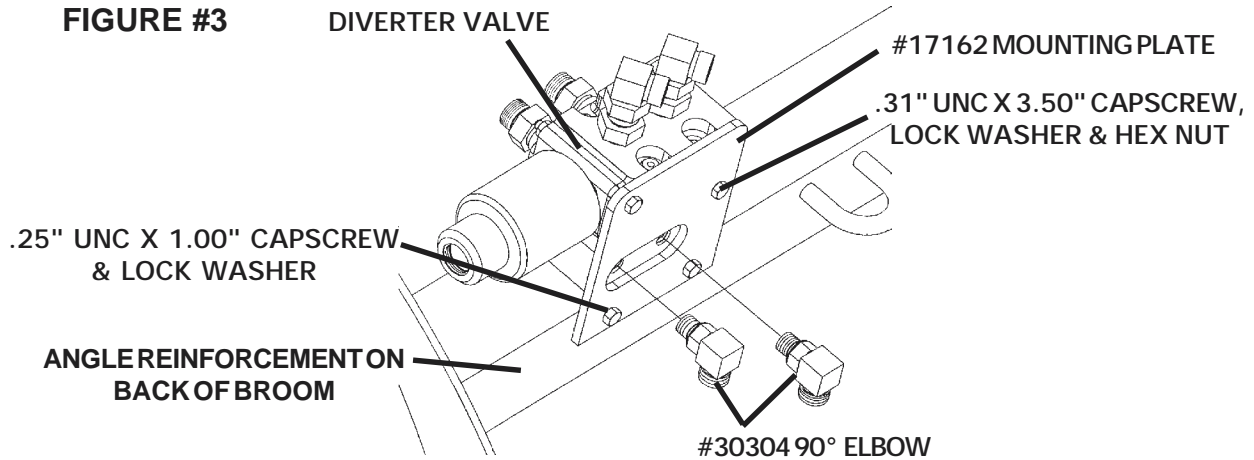
FIGURE #2



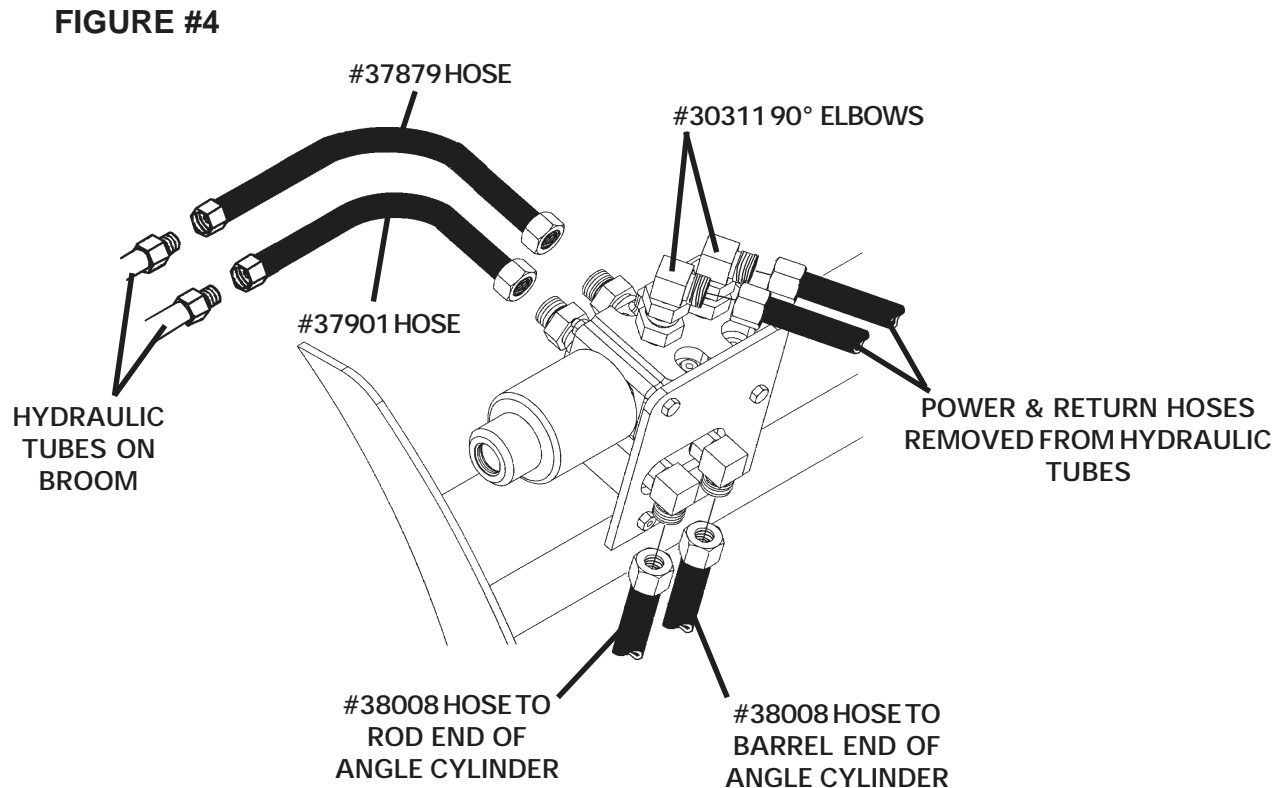
3. Bolt the diverter valve (with check valve) to the mounting plate using the two .31" x 3.50" capscrews provided. Bolt the mounting plate to the broom cannister using two .25" UNC X 1.00" capscrews and lock washers provided. See Figure #3

MOUNTING INSTALLATION & OPERATION

OPTIONAL HYDRAULIC ANGLE KIT ASSEMBLY



4. Install two of the #30204 elbows to the back of the check valve / diverter valve. See Figure #3
5. Remove the power and return hoses from the tubes on the broom, and install on the 90° elbows located on the top of the diverter valve. Install hose #37879 to the front hydraulic tube and to the right straight adapter on the front of the diverter valve and then hose #37901 to the back hydraulic tube and to the left straight adapter on the front of the diverter valve. See Figure #4

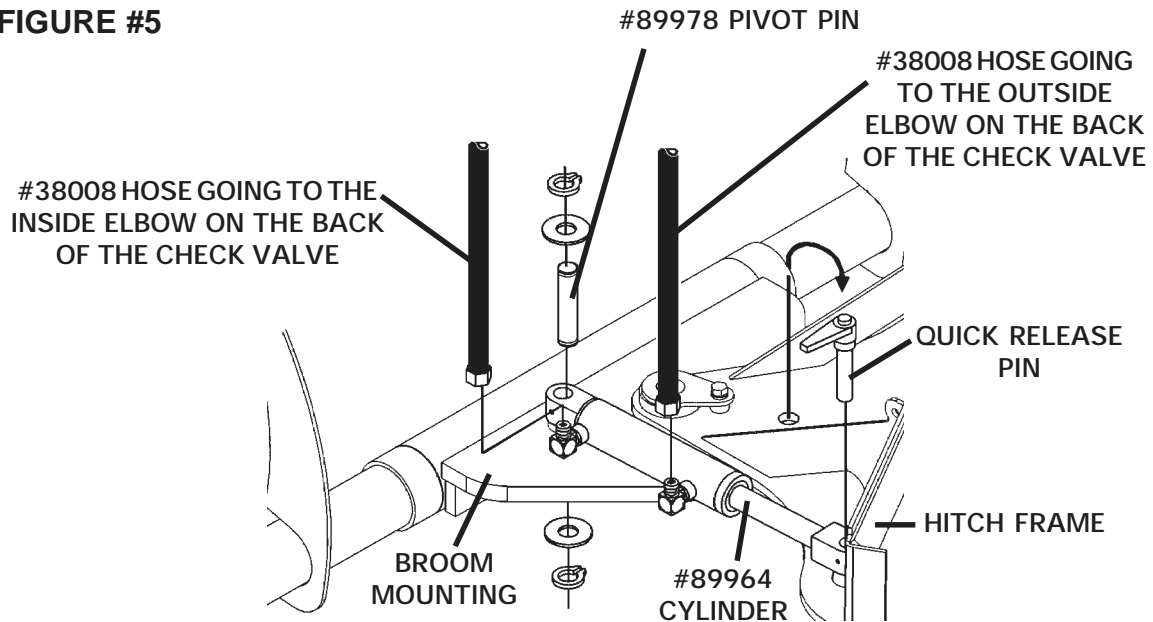


MOUNTING INSTALLATION & OPERATION

OPTIONAL HYDRAULIC ANGLE KIT ASSEMBLY

6. Install the tube end of the #89964 cylinder to the broom mounting using the #89978 pivot pin, thrust washers and snap rings provided. See Figure #5
7. Connect the rod end of the cylinder to the hitch frame with the existing quick release pin. See Figure #5

FIGURE #5



8. Install one #38008 hose to the outside (left) elbow on the check valve and to the rod end of the cylinder. See Figure #5
9. Install the remaining #38008 hose to the inside (right) elbow on the check valve/diverter valve and then to the tube end of the cylinder. See Figure #5
10. If the wires on the diverter valve have not already been connected to the wires on the mold plug (#89289) do so now.
11. Plug the wire assembly into the BRADCO electrical control box (optional), or directly to your prime mover's electrical outlet.
12. Connect the power & return hoses to the prime mover. Check all hydraulic fittings and hoses for leaks, and ensure they are properly connected and routed to avoid pinching or chafing.

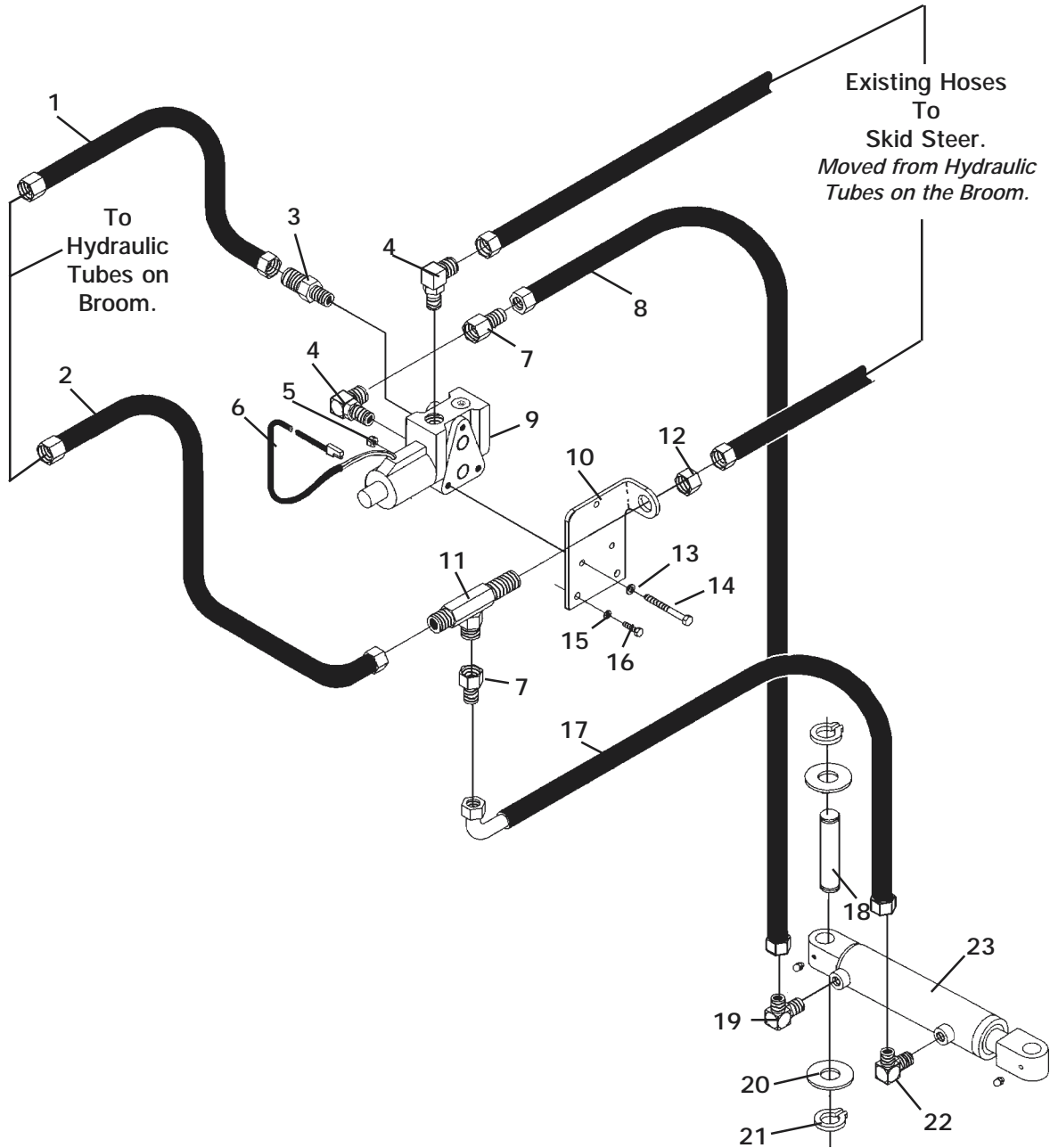
IMPORTANT:

Avoid hydraulic system damage. Make sure hose ends and fittings are clean before installation.

Avoid hose damage. Make sure that the hoses do not get pinched or twisted. Do not allow hoses to drag on the ground.

SOLENOID VALVE ANGLE KIT

REPLACEMENT PARTS ONLY



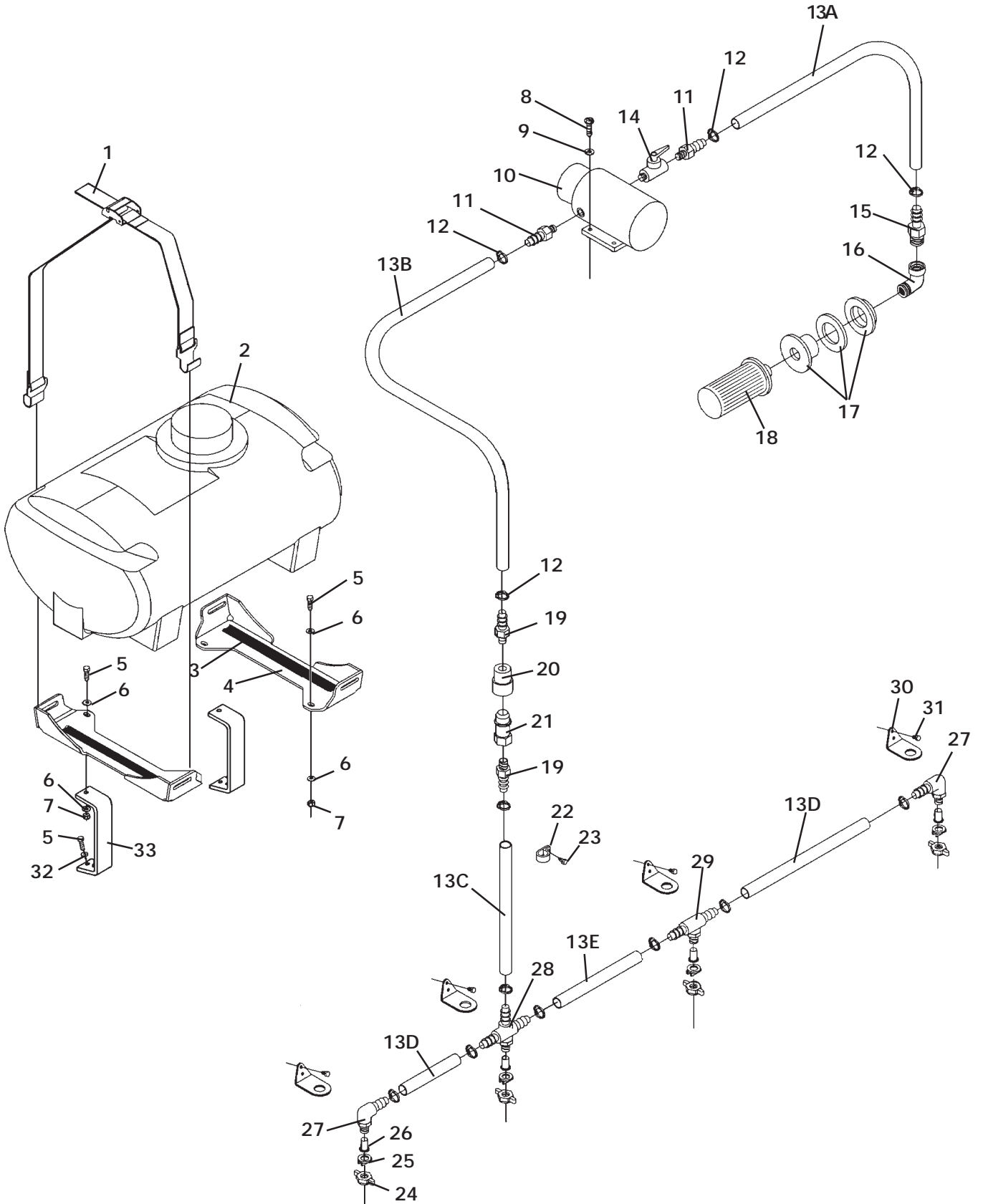
SOLENOID VALVE ANGLE KIT

REPLACEMENT PARTS ONLY

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	37901	Hose Assembly .62" X 40" 10FFS-10FFS
2	1	37879	Hose Assembly .62" X 42" 10FFS-10FFS
3	1	30240	Straight Adapter 10MFS-8MBo
4	2	30241	90° Elbow 10MFS-8MBo
5	3	1225	.31" UNC Hex Nut
6	1	89289	Wire Mold Plug Assembly
7	2	30234	Straight Reducer 10FFS-8MFS
8	1	37878	Hose Assembly .38" X 36" 8FFS-6FFS
9	1	89631	Solenoid Valve
10	1	32698	Valve Mounting Bracket
11	1	30244	Bulkhead Tee
12	1	30246	Bulkhead Tee Nut
13	3	1502	.31" Lock Washer
14	3	1030	.31" UNC X 3.00" Hex Capscrew
15	2	1501	.25" Lock Washer
16	2	1003	.25" UNC X 1.00" Hex Capscrew
17	1	37900	Hose Assembly .38" X 26" 8FFS90°-6FFS
18	1	89978	Pivot Pin
19	1	30209	90° Elbow 6MBo-6MFS with .027 Oriface
20	2	57462	Thrust Washer
21	2	6612	Snap Ring
22	1	30204	90° Elbow 6MBo-6MFS
23	1	89964	Cylinder Assembly

25 GALLON WATERKIT ASSEMBLY

ASSEMBLY #11232



25 GALLON WATERKIT ASSEMBLY

ASSEMBLY #11232

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	32219	Cambuckle Strap
2	1	32260	25 Gallon Tank
3	2	32218	Hose Sock
4	2	32217	Mounting Bracket
5	8	1043	.38" UNC X 1.00" Hex Capscrew
6	8	1525	.38" Flat Washer
7	4	1536	.38" UNC Nylock Nut
8	4	10030	#10 X 1.00" Pan Head Screw
9	4	10031	#10 Flat Washer
10	1	32259	Pump - 12 Volt
11	2	30216	Hose Barb
12	12	30227	Hose Clamp
13	1	36297	PVC Hose - .38" X 15' (Cut into 6 Hoses) A = 19" Long (Approximately) B = 30" Long (Approximately) C = 28" Long (Approximately) D = 18" Long (2 required) (Approximately) E = 24" Long (Approximately)
14	1	30231	Ball Valve
15	1	30217	Hose Barb
16	1	30218	90° Elbow
17	1	30219	Bulkhead Seal
18	1	30220	Strainer
19	2	30213	Hose Barb
20	1	30215	Female Quick Coupler
21	1	30214	Male Quick Coupler
22	1	30212	Hose Clamp
23	1	1641	#10 X .50" Self Tapping Screw
24	4	30225	Nozzlebody Wing Cap
25	4	30229	Spray Nozzle Tip
26	4	30221	Inline Nozzlebody Strainer
27	2	30222	90° Nozzlebody
28	1	30224	Cross Nozzlebody
29	1	30223	Tee Nozzlebody
30	4	32365	Nozzlebody bracket (Angle Brooms Only)
31	8	1641	#10 X .50" Screw (Angle Brooms Only)
32	4	1503	.38" Lock Washer (Angle Brooms Only)
33	2	15177	Rear Mounting Bracket (Angle Brooms Only)

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MOUNTING INSTALLATION & OPERATION

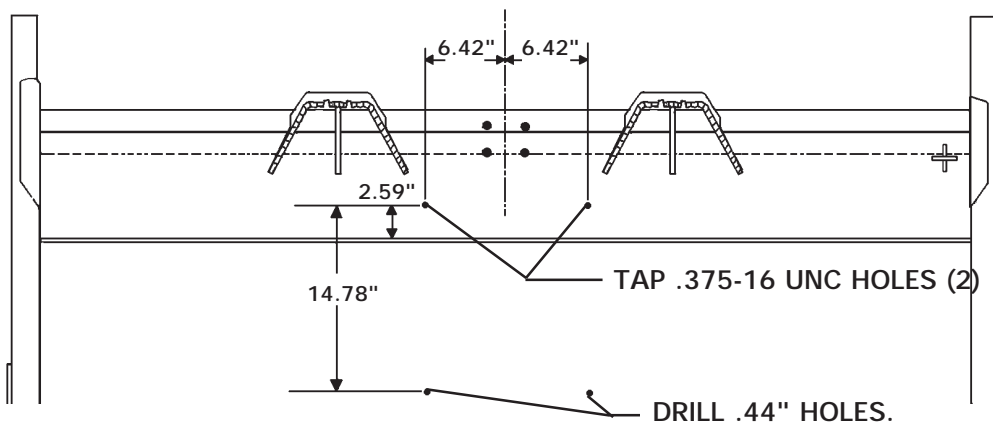
OPTIONAL 25 GALLON WATER KIT ASSEMBLY BUCKET BROOMS

The following instructions will assist in the installation of the optional 25 gallon water kit assembly.

MOUNTING INSTALLATION

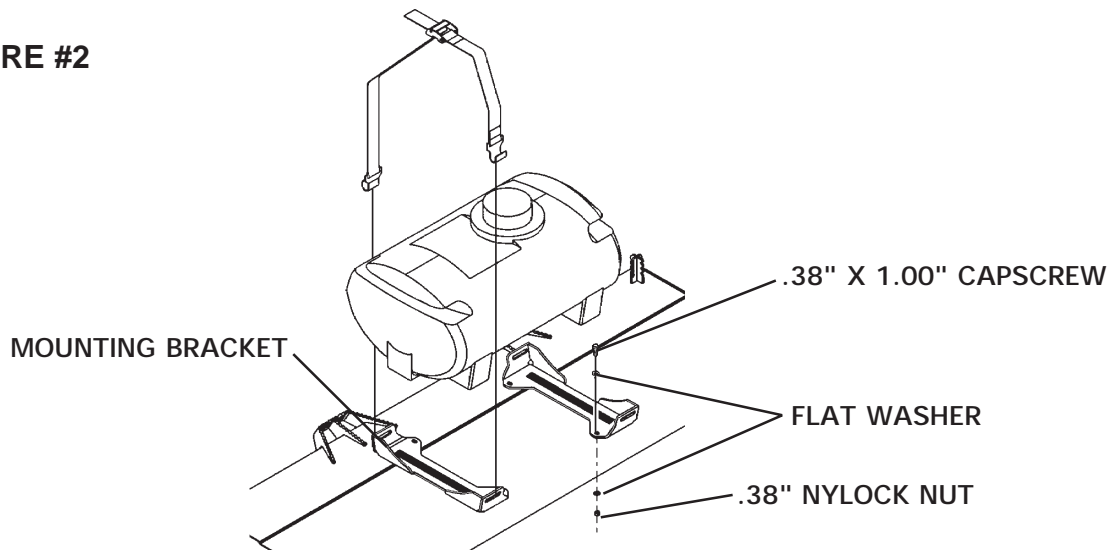
1. Even though the brooms currently have the holes drilled into the cannister for mounting the water tank brackets, there are some early production units that do not. Measuring from the center of the bucket, drill two .31" holes and tap to .375-16 UNC into the top of the cannister and then just drill two .44" holes. See Figure #1 for correct location.

FIGURE #1



2. Position the brackets onto the top of the broom and bolt down using the .38" UNC X 1.00" capscrews, flat washers, and nylock nuts provided. See Figure #2

FIGURE #2



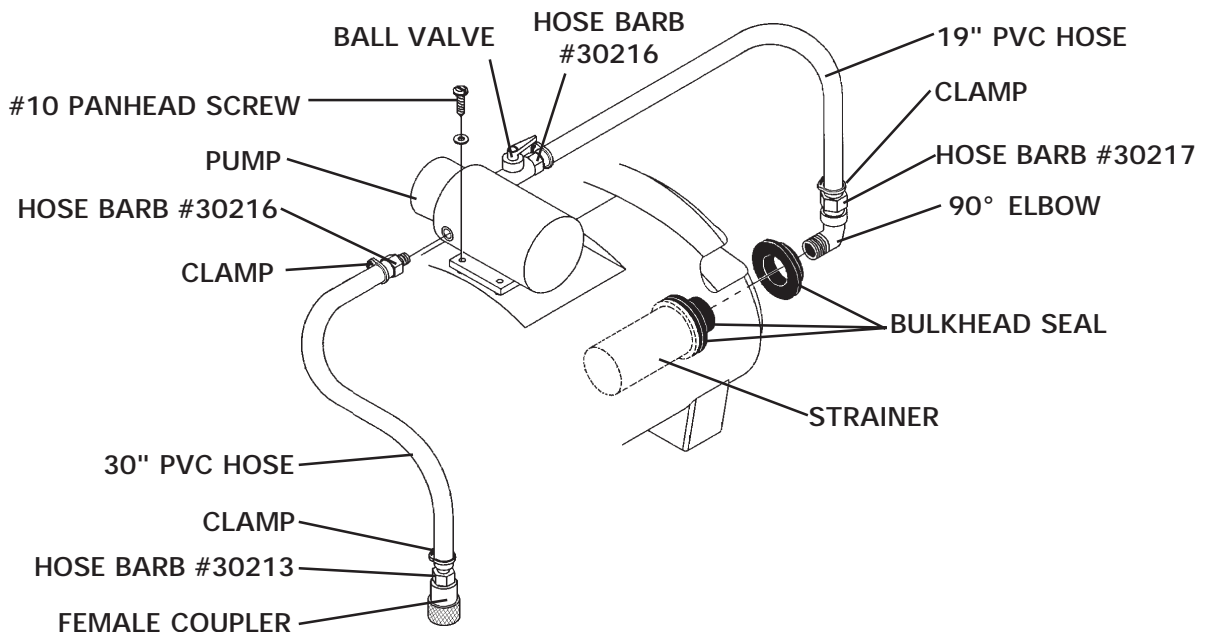
NOTE: To gain access to the underneath side of the cannister it may be necessary to either lift the broom up with the skid-steer loader (be sure to lock the arms in the raised position and turn off the engine before working on the broom), or lift the broom with an overhead hoist, allowing the bucket to open (as in the dumping position).

MOUNTING INSTALLATION & OPERATION

OPTIONAL 25 GALLON WATER KIT ASSEMBLY BUCKETBROOMS

3. Install the pump to the top of the tank (ports to the back of the sweeper), with the (4) #10 X 1.00" screws and flat washers provided. See Figure #3
4. Install the Strainer and the bulkhead seal to the inside of the tank with the male end and the seal to the inside, and the female end of the bulkhead seal on the outside of the tank. See Figure #3
5. Install the 90° elbow (#30218), followed by the hose barb with a .50" NPT end. See Figure #3
6. Install the ball valve (#30231) into the pump, followed by the hose barb with a .25" NPT end. See Figure #3
7. Cut a 19" long piece of PVC hose, and install it onto the two hose barbs with two hose clamps. See Figure #3
8. Install the remaining hose barb, with a .25" NPT end, to the other side of the pump. See Figure #3
9. Cut a 30" piece of PVC hose and install it onto the hose barb with a hose clamp, followed by one of the hose barbs with a .38" NPT end, hose clamp, and the female quick coupler. See Figure #3

FIGURE #3

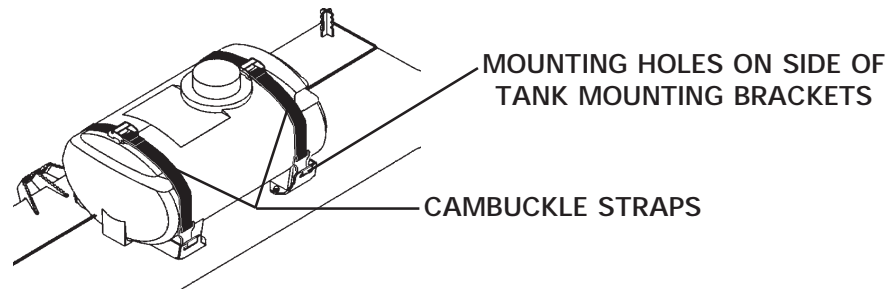


10. Strap the tank to the top of the broom, using the two cambuckle straps provided. See Figure #4

MOUNTING INSTALLATION & OPERATION

OPTIONAL 25 GALLON WATER KIT ASSEMBLY BUCKETBROOMS

FIGURE #4

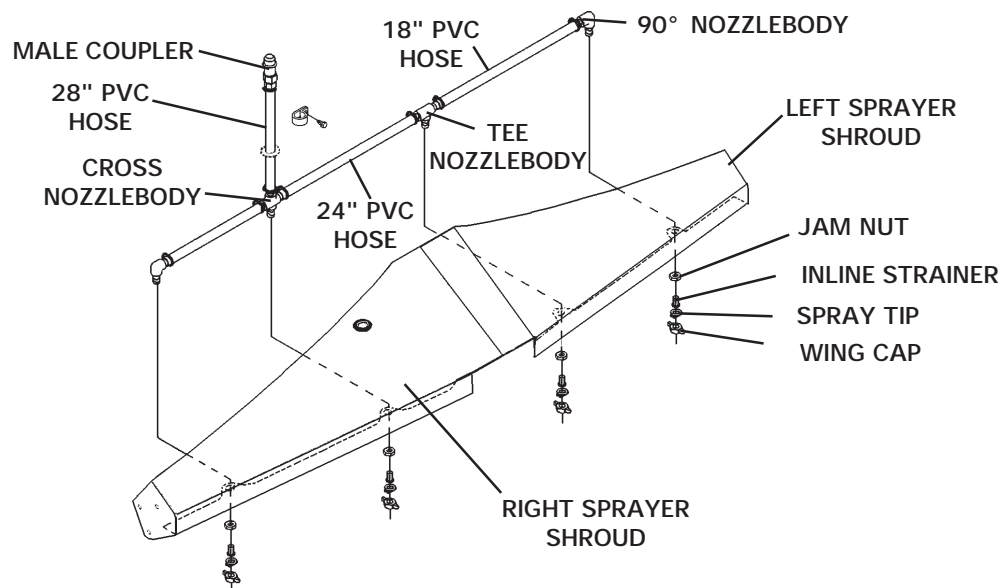


11. On the bottom side of the sprayer shrouds there are four mounting holes. Install the two 90° nozzlebodies to the outside holes (facing to the center). See Figure #5

NOTE: Nozzle bodies are installed by placing them through the mounting holes and securing in place with the jam nuts provided. See Figure #5

12. On the second hole in the right shroud install the cross nozzlebody, and in the remaining hole on the left shroud install the tee nozzlebody. See Figure #5

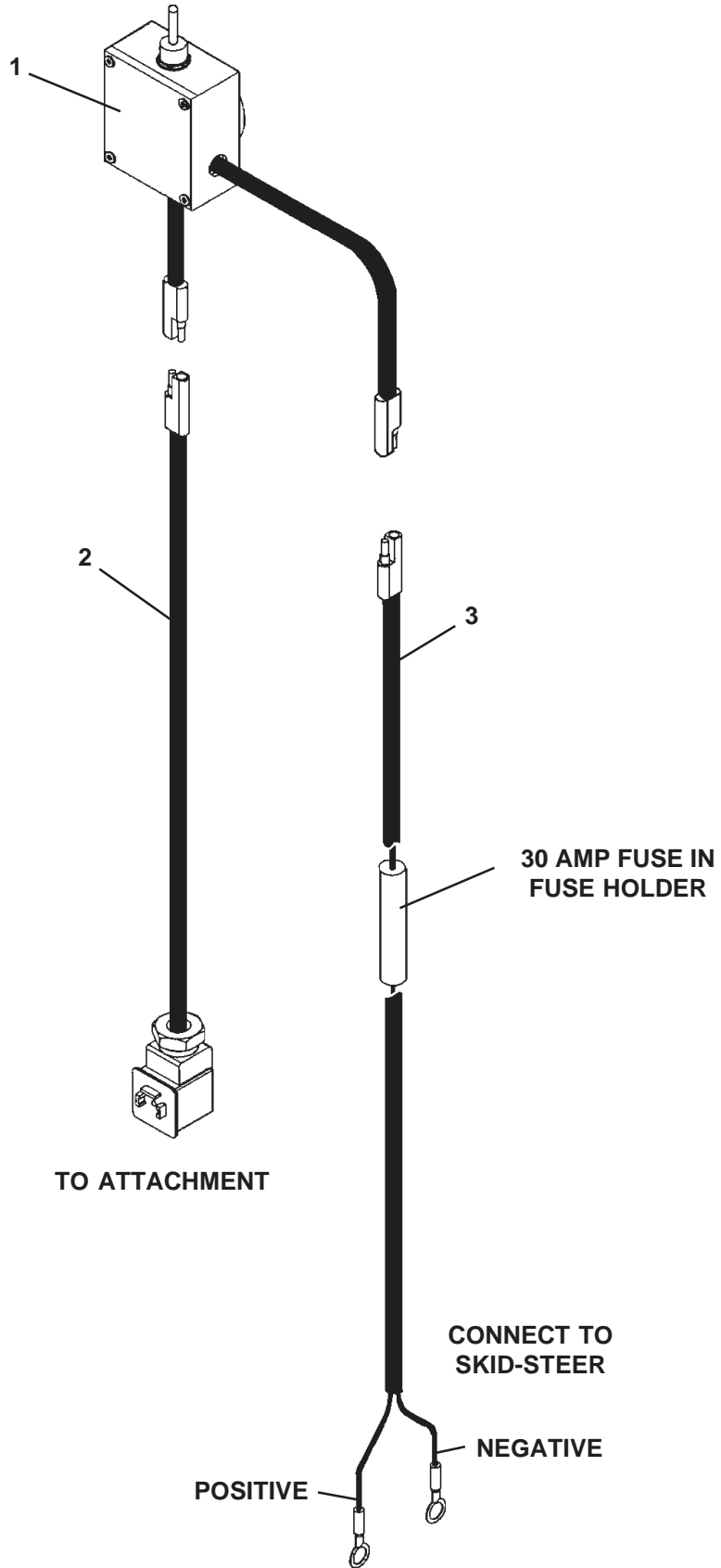
FIGURE #5



13. On the bottom side of the nozzlebodies install the inline strainers, spray nozzle tips, and wing caps. See Figure #5
14. Cut two 18" pieces of PVC hose, and install them onto the outside nozzlebodies with a 24" piece of PVC hose between the middle nozzlebodies. See Figure #5
15. Cut a 28" piece of PVC hose, and install it onto the top port of the cross nozzlebody. Route the hose through the hole in the top of the right shroud, and clamp into place using the hose clamp and self tapping screw provided. Install the remaining hose barb and male coupler.
16. Connect the couplers together to complete the circuit.

OPTIONAL ELECTRICAL CONTROL BOX

ELECTRICAL CONTROL BOX ASSEMBLY #15756



OPTIONAL ELECTRICAL CONTROL BOX

ELECTRICAL CONTROL BOX ASSEMBLY #15756

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	17709	Control Box Assembly (Includes one single pole, double throw, normally open, momentary closed, spring return toggle switch.)
2	1	17716	Wire Assembly (To Attachment)
3	1	17173	Wire Assembly (To Skid-Steer Power Supply)

DANGER! ELECTROCUTION HAZARD

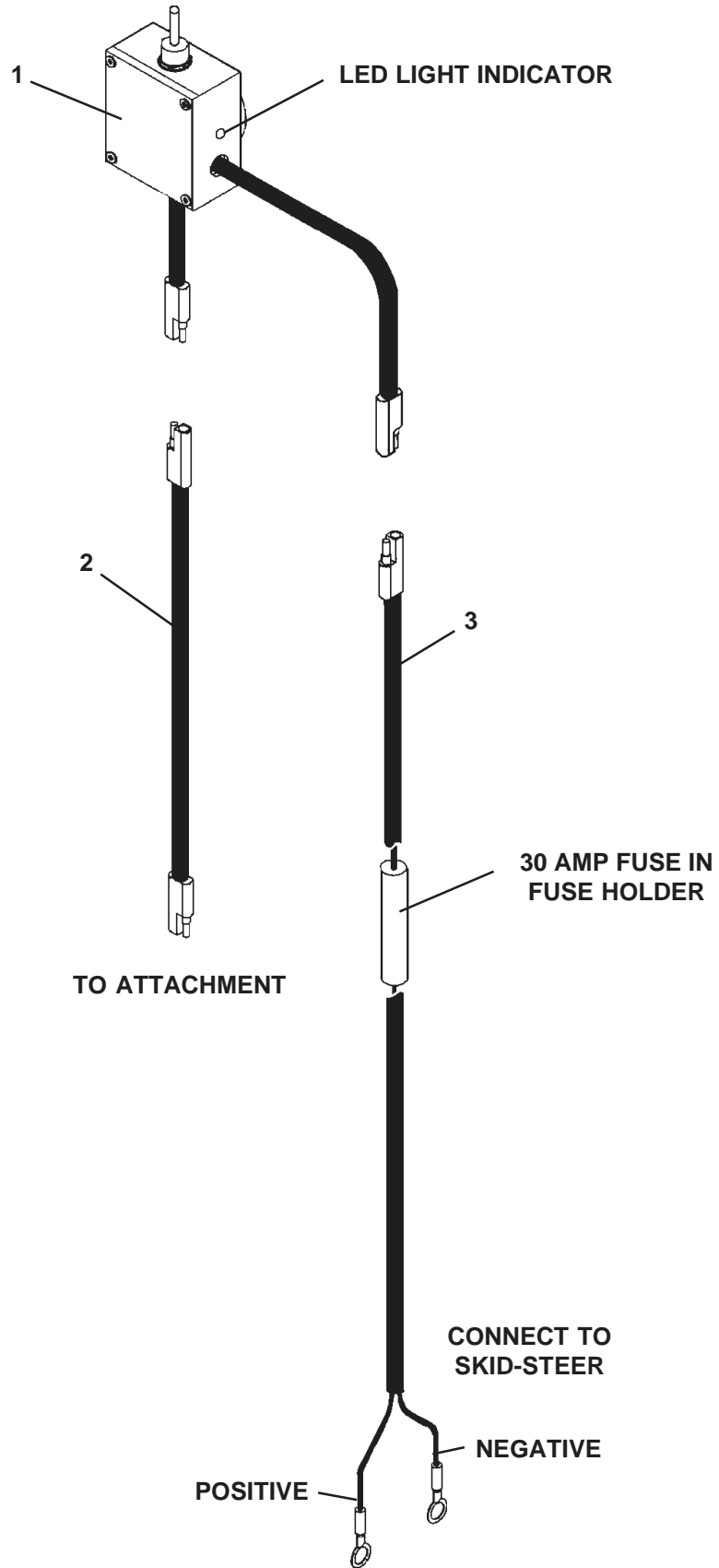


Provide electrical power to the control box by following your skid-steer manufacturer's recommended procedures.

The electrical circuit must be fused to prevent machine damage and serious personal injury or death.

OPTIONAL ELECTRICAL CONTROL BOX

ELECTRICAL CONTROL BOX ASSEMBLY #15757



OPTIONAL ELECTRICAL CONTROL BOX

ELECTRICAL CONTROL BOX ASSEMBLY #15757

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	17710	Control Box Assembly (Includes one single pole, single throw, normally open, maintained closed, toggle switch and LED to light when closed.)
2	1	17712	Wire Assembly (To Attachment)
3	1	17173	Wire Assembly (To Skid-Steer Power Supply)

DANGER! ELECTROCUTION HAZARD

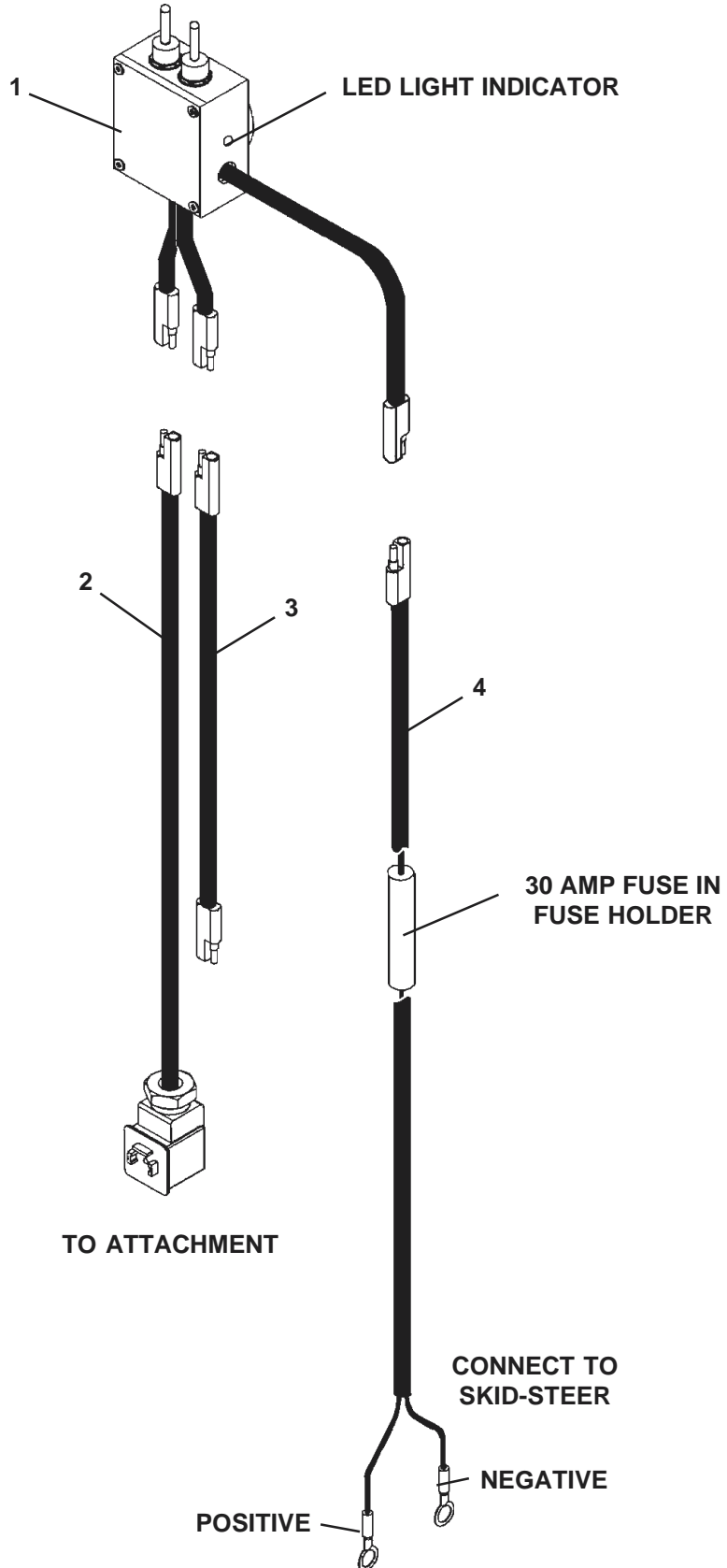


Provide electrical power to the control box by following your skid-steer manufacturer's recommended procedures.

The electrical circuit must be fused to prevent machine damage and serious personal injury or death.

OPTIONAL ELECTRICAL CONTROL BOX

ELECTRICAL CONTROL BOX ASSEMBLY #15758



OPTIONAL ELECTRICAL CONTROL BOX

ELECTRICAL CONTROL BOX ASSEMBLY #15758

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	17694	Control Box Assembly (Includes one single pole, double throw, normally open, momentary closed, spring return toggle switch and one single pole, single throw, normally open, maintained closed, toggle switch with LED to light when closed.)
2	1	17716	Wire Assembly (To Attachment)
3	1	17712	Wire Assembly (To Attachment)
4	1	17173	Wire Assembly (To Skid-Steer Power Supply)

DANGER! ELECTROCUTION HAZARD



Provide electrical power to the control box by following your skid-steer manufacturer's recommended procedures.

The electrical circuit must be fused to prevent machine damage and serious personal injury or death.

MAINTENANCE

BRADCO ANGLE BROOMS

GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced 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 maintenance. It is recommended that all grease fittings be lubricated after every 40 hours of use. There are only four (4) grease fittings to be lubricated in the following locations:

- Pivot tube on the broom mounting on the back of the cannister (2).
- Pivot pin (#89819) connecting the hitch frame and cannister (1).
- Bearing on the core located on the right side of the bucket (1).

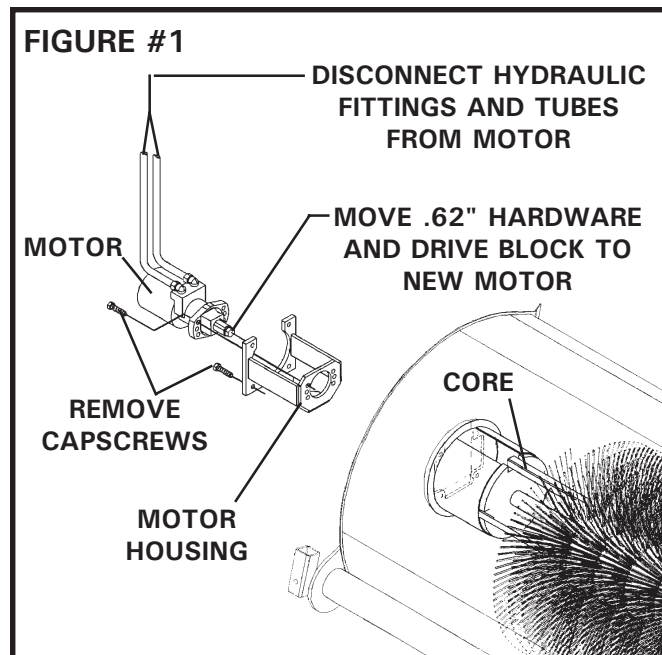
REPLACING HYDRAULIC MOTOR

1. Lower the sweeper to rest on the ground. Place supports under the frame of the broom, if not supported by the skid-steer, to keep the core unit level.

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



2. Tag and disconnect the hydraulic tubes and fittings from the hydraulic motor. See Figure #1
3. Remove the four .50" X 1.75" capscrews securing the motor housing to the broom and core. See Figure #1
4. Slide out the motor housing from the core and remove the four .50" x 1.50" cap-screws securing the motor to the housing. See Figure #1
5. Remove the hydraulic motor. See Figure #1
6. Remove the drive block and .62" hardware from the motor, and install on the replacement motor. See Figure #1
7. Bolt the new motor into the housing, using the existing hardware removed in Step #4.



MAINTENANCE

BRADCO ANGLE BROOMS

REPLACING HYDRAULIC MOTOR (CONTINUED)

8. Reinstall the hydraulic tubes and fittings into the new motor.
9. Slide the motor housing into the core of the brush, and secure in place using the existing hardware removed in Step #3.
10. Run the sweeper to verify that hose connection is correct.

REPLACING BRUSHES

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, if not supported by the skid-steer.

WARNING! **Avoid serious injury. Lower and stop the sweeper, set the brake, stop the skid-steer engine, and remove the key before leaving the operator's seat.**



2. Tag and disconnect the hydraulic hoses from the hydraulic motor.
3. Remove the four .50" X 1.75" capscrews securing the motor housing to the broom and core.
4. Slide out the motor housing from the core of the brush. See Figure #1 in "Replacing the Hydraulic Motor".
5. Remove the lock collar from the bearing on the end of the core, and then remove the bearing and flange set.
6. Raise the sweeper, leaving the brush on the ground, and back away.
7. Remove the wafer end retainer.
8. 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 of the core.
9. Set the core on end, with the motor end on the ground.
10. 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 #2) Due to the housing on the motor end of the core the first four wafers will be install on tube #1.

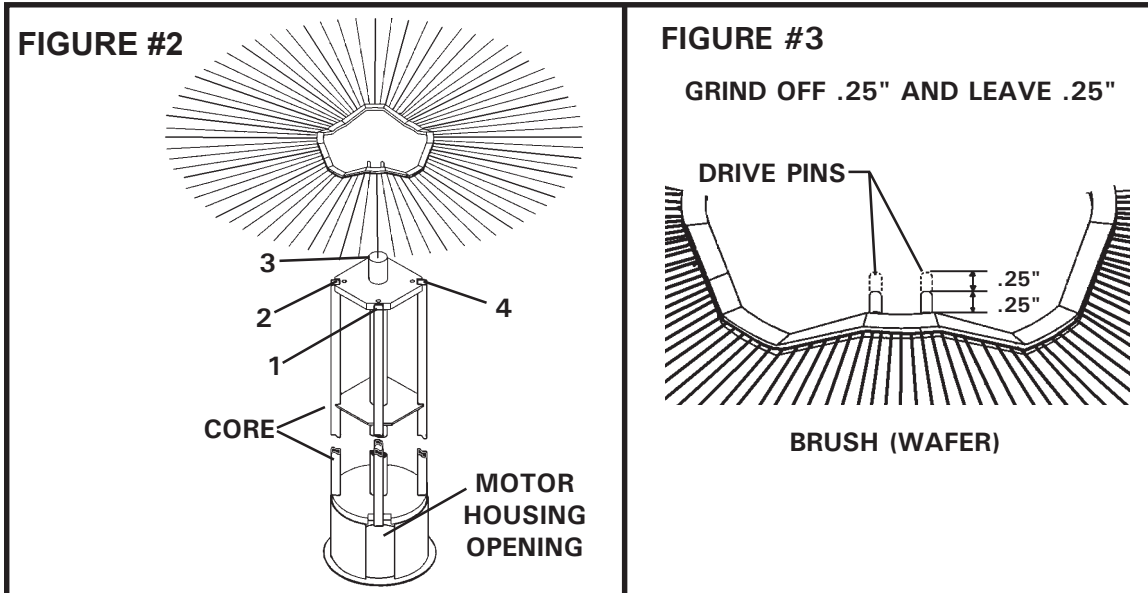
NOTE: For clearance it is necessary to grind off 1/4" from the drive pins on the first two wafers leaving 1/4". See Figure #3

11. 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 #4
12. 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.

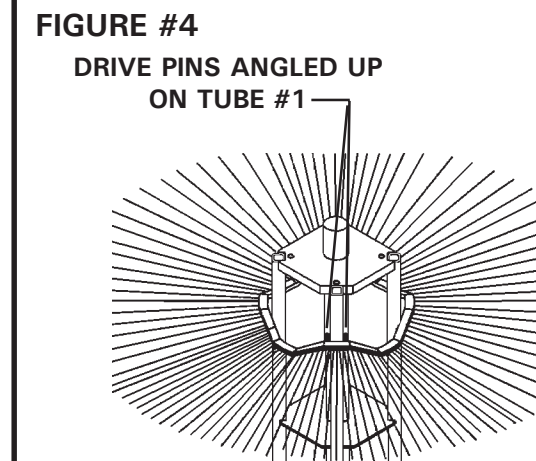
MAINTENANCE

BRADCO ANGLE BROOMS

REPLACING BRUSHES (CONTINUED)



13. 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.
14. 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.
15. 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.



16. 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.

17. When the core is full, reinstall the wafer end retainer, and using the overhead hoist, gently lay the brush back onto the ground.
18. Position the core into the broom cannister, and install the flange set and locking collar.
19. Slide the motor housing into the core of the brush, and bolt into place. Align the core.
20. Reinstall the motor and connect the hydraulic hoses.
21. Run the sweeper to verify that hose connection is correct.

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 turn the stands around to support the broom, and reinstall the snap pins.
3. Disconnect the hydraulic hoses from the skid-steer auxiliary hydraulics, and connect the couplers together to prevent contaminants from entering the hydraulic system.
4. Unlock the sweeper from the skid-steer, and following the instructions in your skid-steer operator's manual for removing attachments, remove the sweeper from the skid-steer.

IMPORTANT:

Do not store the sweeper with weight on the brush. 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.

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.

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.
	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 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.
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 before each use.
	Tires on prime mover at different pressure or are different size.	Check tire size and ratings. Make corrections, as necessary.

TROUBLESHOOTING

<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.	Electronic failure.	Check electronic switch, battery, & wire hook-up. Replace if necessary.
	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 contaminates and repair or replace as needed.
	Skid-steer relief valve set too low.	See skid-steer 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

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

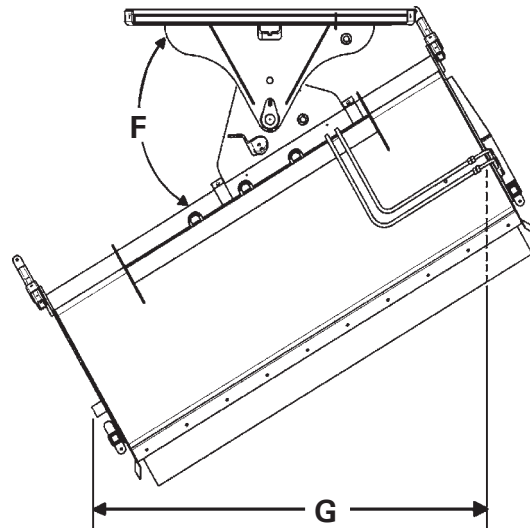
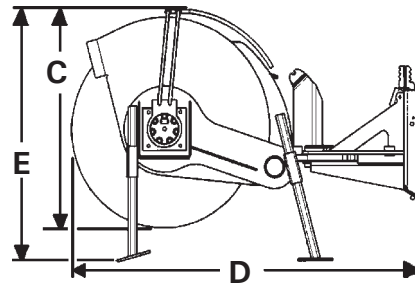
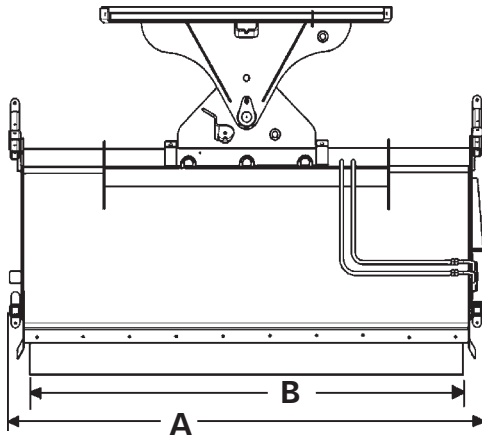
* Thick Nuts must be used with Grade 8 bolts

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

SPECIFICATIONS

BRADCO ANGLE BROOMS



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

SPECIFICATIONS

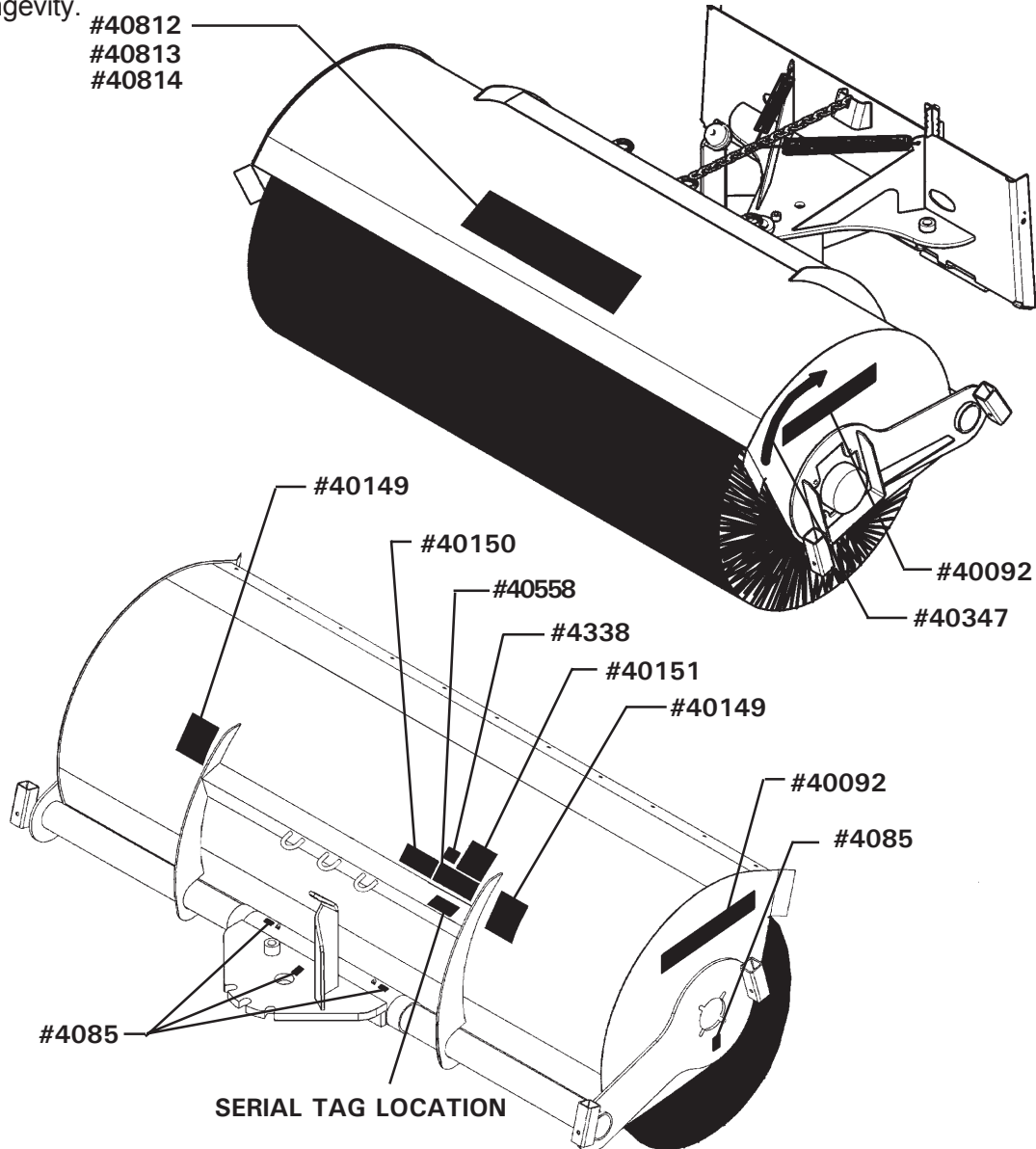
DESCRIPTION	72"	84"	96"
A. Overall Width	82"	94"	106"
B. Sweeping Width.....	76"	88"	100"
C. Overall Height	35.5"	35.5"	35.5"
D. Overall Length	59.60"	59.60"	59.60"
E. Transport Height On Stand	40.0"	40.0"	40.0"
F. Maximum Angle (Left and Right)	30°	30°	30°
G. Sweeping Width @ 30° Angle	66"	76"	86"
Weight	972#	1031#	1105#
Brush Diameter	32"	32"	32"
Wafers (Quantity)	38	45	51
Hydraulic Flow (GPM)	14 - 20		
Hydraulic Pressure (PSI)	2000 - 2800		
Rated Brush Speed (RPM)	140		

DECALS

DECAL PLACEMENT

GENERAL INFORMATION

The diagrams on this page show the location of all the decals used on the BRADCO Open Angle 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.



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.

BRADCO®

PART #40092
BRADCO LOGO (WHITE)



PART #4338
MADE IN U.S.A.

AB72

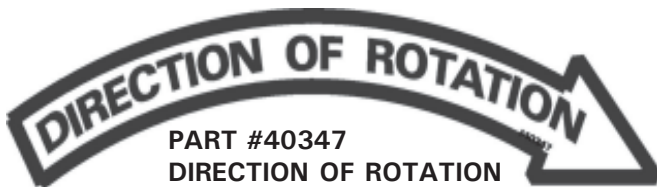
PART #40812
AB72 MODEL NUMBER (72" OPEN FACE BROOM)

AB84

PART #40813
AB84 MODEL NUMBER (84" OPEN FACE BROOM)

AB96

PART #40814
AB96 MODEL NUMBER (96" OPEN FACE BROOM)



PART #40347
DIRECTION OF ROTATION

WARNING

HIGH-PRESSURE FLUID HAZARD

To prevent serious injury or death:

- Relieve pressure on system before repairing or adjusting or disconnecting.
- Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
- Keep all components in good repair.

#40151

PART #40151
WARNING! HIGH PRESSURE FLUID

WARNING

To Prevent Serious Injury or Death

- Avoid unsafe operation or maintenance.
- Do not operate or work on this machine without reading and understanding the operator's manual.
- If manual is lost, contact your nearest dealer for a new manual.

#40150

PART #40150
WARNING! READ MANUAL



PART #4085
GREASE 40 HOURS

OPERATION INSTRUCTION!

BRUSH TO CONTACT
GROUND BETWEEN
3" TO 4"
WHEN SWEEPING.

#40558

PART #40558
OPERATION INSTRUCTIONS

DANGER

To prevent serious injury or death from pinching:

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

PART #40149
DANGER! PINCH POINT

LIMITED WARRANTY

EFFECTIVE ON PRODUCTS MANUFACTURED AFTER JANUARY 1, 2001

All new BRADCO products are warranted to be free from defects in materials or workmanship which may cause failure under normal usage and service when used for the purpose intended.

In the event of failure within twenty four (24) months from initial retail sale, lease or rental date (excluding cable, ground engaging parts such as sprockets, digging chain, bearings, teeth, tamping and demolition heads, blade cutting edges, pilot bits, auger teeth, auger heads & broom bristles), if after examination, BRADCO determines failure was due to defective material and/or workmanship, parts will be repaired or replaced. BRADCO may request defective part or parts be returned prepaid to them for inspection at their place of business at Delhi, Iowa, or to a location specified by BRADCO.

Any claims under this warranty must be made within fifteen (15) days after the Buyer learns of the facts upon which such claim is based. All claims not made in writing and received by BRADCO within the time period specified above shall be deemed waived.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED AND THERE ARE NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL BRADCO BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGE.

BRADCO'S LIABILITY FOR ANY AND ALL LOSSES AND DAMAGES TO BUYER, RESULTING FROM ANY CAUSE WHATSOEVER, INCLUDING BRADCO'S NEGLIGENCE, IRRESPECTIVE OF WHETHER SUCH DEFECTS ARE DISCOVERABLE OR LATENT, SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PARTICULAR PRODUCTS WITH RESPECT TO WHICH LOSSES OR DAMAGES ARE CLAIMED, OR, AT THE ELECTION OF BRADCO, THE REPAIR OR REPLACEMENT OF DEFECTIVE OR DAMAGED PRODUCTS.