CNH INDUSTRIAL

OPERATOR'S MANUAL / PARTS MANUAL
PICK-UP SWEEPER
215 SERIES

MANUFACTURED BY:

PALADIN ATTACHMENTS
2800 N. Zeeb Rd., Dexter, MI. 48130
www.paladinattachments.com
800-456-7100

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MODEL NUMBER:_____

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PREFACE

GENERAL COMMENTS

Congratulations on the purchase of your new product! This product was carefully designed and manufactured to give you many 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 maintenance procedures and safety precautions in this manual and on any safety decals located on the product and on any equipment on which the attachment is mounted.

This manual has been designed to help you do a better, safer job. Read this manual carefully and become familiar with its contents.

WARNING! Never let anyone operate this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual.
Always choose hard, level ground to park the vehicle on and set the brake so the unit cannot roll.

Unless noted otherwise, right and left sides are determined from the operator's control position when facing forward.

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 attachment as may be necessary without notification.

BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure the equipment is operated only by trained individuals that have read and understand this manual. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer to obtain further assistance. Keep this manual available for reference. Provide the manual to any new owners and/or operators.

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

Use only manufacturer replacement parts. Substitute parts may not meet the required standards.

Record the model and serial number of your unit on the cover of this manual. The parts department needs this information to insure that you receive the correct parts.

SOUND AND VIBRATION

Sound pressure levels and vibration data for this attachment are influenced by many different parameters: some items are listed below (not inclusive):

- prime mover type, age, condition, with or without cab enclosure and configuration
- operator training, behavior, stress level
- job site organization, working material condition, environment

Based on the uncertainty of the prime mover, operator, and job site, it is not possible to get precise machine and operator sound pressure levels or vibration levels for this attachment.

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SAFETY STATEMENTS

THIS SYMBOL BY ITSELF OR WITH A WARNING WORD THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

DANGER — **THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.**

WARNING — **THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.**

CAUTION — **THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE INJURY.**

NOTICE — **NOTICE IS USED TO ADDRESS PRACTICES NOT RELATED TO PHYSICAL INJURY.**

GENERAL SAFETY PRECAUTIONS

WARNING! READ MANUAL PRIOR TO INSTALLATION

Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual, as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance. **FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVER'S MANUAL(S).**

READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to operating or working on this equipment. Know and obey all OSHA regulations, local laws, and other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing, or operating this equipment.

KNOW YOUR EQUIPMENT

Know your equipment's capabilities, dimensions, and operations before operating. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order with all safety devices intact. Check all hardware to ensure it is tight. Make certain that all locking pins, latches, and connection devices are properly installed and secured. Remove and replace any damaged, fatigued, or excessively worn parts. Make certain all safety decals are in place and are legible. Keep decals clean, and replace them if they become worn or hard to read.

GENERAL SAFETY PRECAUTIONS

WARNING! PROTECT AGAINST FLYING DEBRIS

Always wear proper safety glasses, goggles, or a face shield when driving pins in or out, or when any operation causes dust, flying debris, or any other hazardous material.

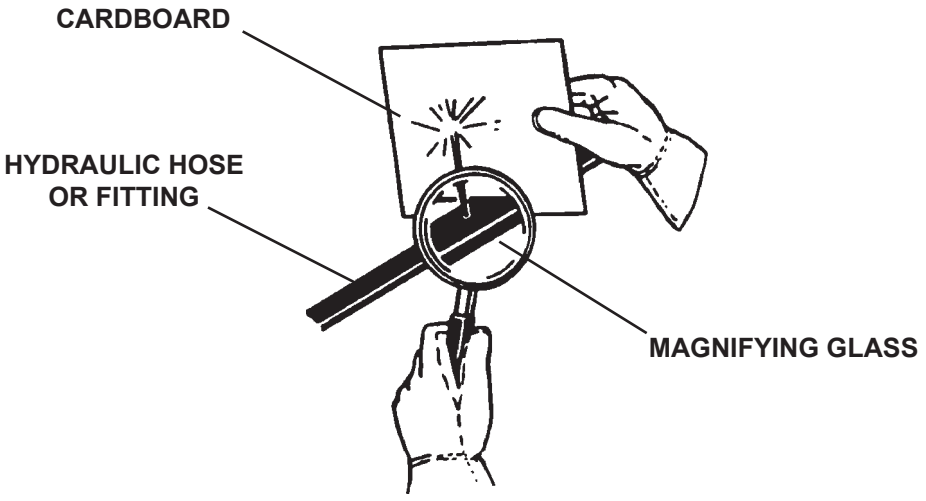
WARNING! LOWER OR SUPPORT RAISED EQUIPMENT

Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or on blocks. Lower booms and attachments to the ground before leaving the cab or operator's station.

WARNING! USE CARE WITH HYDRAULIC FLUID PRESSURE

Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Before connecting or disconnecting hydraulic hoses, read your prime mover's operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

- 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.
- Wear safety glasses, protective clothing, and use a piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS! SEE ILLUSTRATION.**



GENERAL SAFETY PRECAUTIONS

WARNING!

DO NOT MODIFY MACHINE OR ATTACHMENTS

Modifications may weaken the integrity of the attachment and may impair the function, safety, life, and performance of the attachment. When making repairs, use only the manufacturer's genuine parts, following authorized instructions. Other parts may be substandard in fit and quality. Never modify any ROPS (Roll Over Protective Structure) or FOPS (Falling Object Protective Structure) equipment or device. Any modifications must be authorized in writing by the manufacturer.

WARNING!

SAFELY MAINTAIN AND REPAIR EQUIPMENT

- Do not wear loose clothing or any accessories that can catch in moving parts. If you have long hair, cover or secure it so that it does not become entangled in the equipment.
- Work on a level surface in a well-lit area.
- Use properly grounded electrical outlets and tools.
- Use the correct tools for the job at hand. Make sure they are in good condition for the task required.
- Wear the protective equipment specified by the tool manufacturer.

SAFELY OPERATE EQUIPMENT

Do not operate equipment until you are completely trained by a qualified operator in how to use the controls, know its capabilities, dimensions, and all safety requirements. See your machine's manual for these instructions.

- Keep all step plates, grab bars, pedals, and controls free of dirt, grease, debris, and oil.
- Never allow anyone to be around the equipment when it is operating.
- Do not allow riders on the attachment or the prime mover.
- Do not operate the equipment from anywhere other than the correct operator's position.
- Never leave equipment unattended with the engine running, or with this attachment in a raised position.
- Do not alter or remove any safety feature from the prime mover or this attachment.
- Know your work site safety rules as well as traffic rules and flow. When in doubt on any safety issue, contact your supervisor or safety coordinator for an explanation.

WARNING!

CALIFORNIA PROPOSITION 65 WARNING.

This product may contain a chemical known to the state of California to cause cancer, or birth defects or other reproductive harm. www.P65Warnings.ca.gov

EQUIPMENT SAFETY PRECAUTIONS

WARNING!

KNOW WHERE UTILITIES ARE

Observe overhead electrical and other utility lines. Be sure equipment will clear them. When digging, call your local utilities for location of buried utility lines, gas, water, and sewer, as well as any other hazard you may encounter.

WARNING!

EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.

It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of any attachment that may cause high levels of dust.

WARNING!

REMOVE PAINT BEFORE WELDING OR HEATING

Hazardous fumes/dust can be generated when paint is heated by welding, soldering or using a torch. Do all work outside or in a well ventilated area and dispose of paint and solvent properly. Remove paint before welding or heating.

When sanding or grinding paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

WARNING!

END OF LIFE DISPOSAL

At the completion of the useful life of the unit, drain all fluids and dismantle by separating the different materials (rubber, steel, plastic, etc.). Follow all federal, state and local regulations for recycling and disposal of the fluid and components.

OPERATING THE ATTACHMENT

- Do not exceed the lifting capacity of your prime mover.
- Operate only from the operator's station.
- When operating on slopes, drive up and down, not across. Avoid steep hillside operation, which could cause the prime mover to overturn.
- Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle.
- An operator must not use drugs or alcohol, which can change his or her alertness or coordination. An operator taking prescription or over-the-counter drugs should seek medical advice on whether or not he or she can safely operate equipment.
- Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the engine and remove the key.
- Remove any large objects from the work area that could harm operator or others if thrown by sweeper.
- When traveling on rough terrain, reduce speed to avoid "bouncing" the sweeper. Loss of steering can result.

EQUIPMENT SAFETY PRECAUTIONS

TRANSPORTING THE ATTACHMENT

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on slopes.
- When transporting on a trailer: Secure attachment at recommended tie down locations using tie down accessories that are capable of maintaining attachment stability.
- When driving on public roads use safety lights, reflectors, Slow Moving Vehicle signs etc., to prevent accidents. Check local government regulations that may affect you.
- Do not drive close to ditches, excavations, etc., cave in could result.
- Do not smoke when refueling the prime mover. Allow room in the fuel tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.

MAINTAINING THE ATTACHMENT

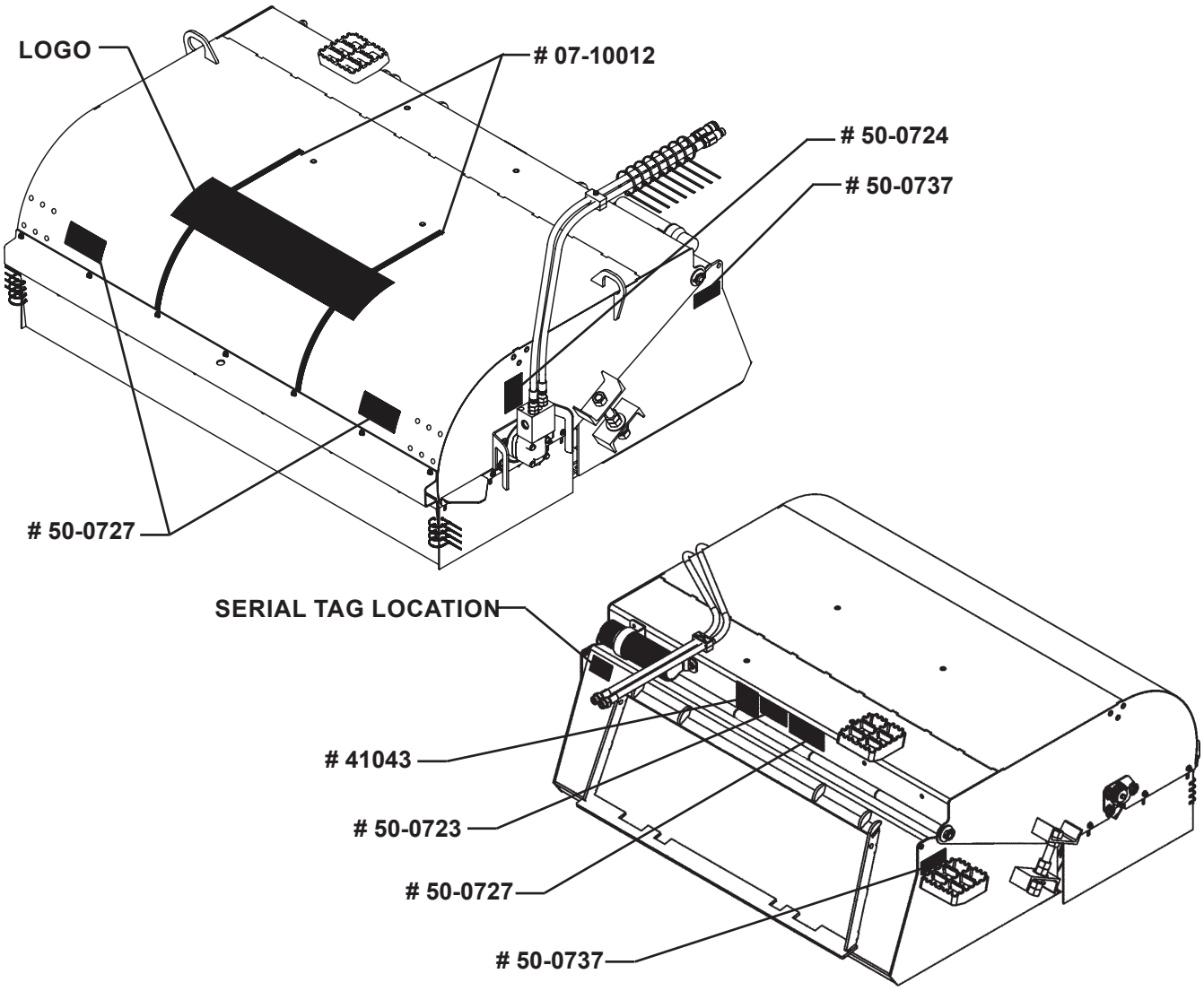
- Before performing maintenance, lower the attachment to the ground, apply the brakes, turn off the engine and remove the key.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator service manuals before any repair is made. After completing maintenance or repair, check for correct functioning of the attachment. If not functioning properly, always tag “DO NOT OPERATE” until all problems are corrected.
- Worn, damaged, or illegible safety decals must be replaced. New safety decals can be ordered from Paladin.
- Never make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.

DECALS

DECALS PLACEMENT

GENERAL INFORMATION

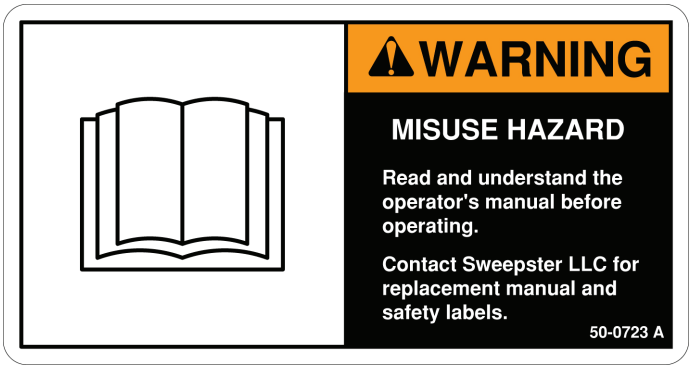
The diagrams on this page show the location of the decals used on your attachment. The decals are identified by their part numbers, with reductions of the actual decals located on the following page. Use this information to order replacements for lost or damaged decals. Be sure to read all decals before operating the attachment. They contain information you need to know for both safety and product longevity.



IMPORTANT: Keep all safety decals clean and legible. Replace all missing, illegible, or damaged safety decals. When replacing parts with safety decals attached, the safety decals must also be replaced. Safety decals are available, free of charge, from your local dealer or Paladin.

REPLACING SAFETY DECALS: 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 decal, exposing the adhesive surface. Apply the safety decal to the position shown in the diagram above and smooth out any bubbles.

DECALS



 # 50-0723 WARNING! MISUSE HAZARD

 # 50-0724 WARNING! HIGH PRESSURE FLUID

 # 50-0727 WARNING! FLYING OBJECTS

 # 50-0737 WARNING! PINCH POINT HAZARD

 # 41043 WARNING! HAZARDOUS DUST

#07-10012 BRUSH MARKERS FOR COLD PLANER SPECIAL ONLY

NOTE: CONTACT YOUR LOCAL DEALER FOR MODEL NUMBER AND LOGO DECALS

INSTALLATION

GENERAL INFORMATION

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

Remember to read all safety warnings, decals and operating instructions before operating the attachment. If there is any portion of this manual that you do not understand, contact your dealer.

INSTALLATION

1. Remove any attachment from the front of the loader.
2. Following all standard safety practices and the instructions for installing an attachment in your prime mover operator's manual, install the attachment onto your loader.

WARNING! To avoid serious personal injury, make sure the attachment is securely latched to the attachment mechanism of your unit. Failure to do so could result in separation of the attachment from the prime mover.

3. Lower the unit to the ground and relieve pressure to the auxiliary hydraulic lines.
4. Following the safety shut down procedure for your prime mover, shut down and exit the prime mover.
5. After making sure that the hydraulic couplers are free from any foreign material or contaminants, connect the couplers to the auxiliary hydraulic system of your prime mover.
6. Following the standard start up procedure for your prime mover, start the loader. Using the tilt control roll out the bucket cylinder on the prime mover and check for proper hydraulic connection, hose routing and hose length.
7. Attachment installation is complete.

DETACHING

1. Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the prime mover's engine, and remove the key.
2. Follow prime mover operator's manual to relieve pressure in the hydraulic lines.
3. Disconnect power and return hoses from the auxiliary hydraulics.
4. Follow your prime mover operator's manual for detaching (removing) an attachment.
5. Connect hydraulic couplers together or install caps to prevent contaminants from entering the hydraulic system. Store hoses off of the ground to help prevent damage.

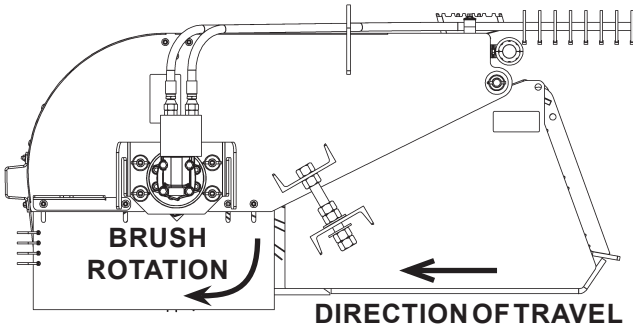
OPERATION
CONTROLS

STARTING AND STOPPING THE SWEEPER

The Pick-Up Sweepers use the prime mover hydraulic flow to operate. To start the brush, turn on the prime mover auxiliary hydraulics. To stop the brush, turn off the auxiliary hydraulic flow. To avoid motor damage, do not stop the sweeper at high engine speed. Decrease engine RPM before turning off the hydraulic flow.

TRAVEL DIRECTION

Travel should be in the forward direction and brush rotation always away from the operator. The sweeper can reverse the brush rotation for end of pass pile clean up or stuck on material.



BRUSH SPEED

To increase brush speed, increase prime mover RPM. Use the LOWEST speed needed to complete the job at hand. In general, half throttle provides the necessary engine speed.

END OF PASS - PILE CLEAN UP

During normal sweeping operation, a small pile of material is pushed along in front of the sweeper. End of pass clean up is one of the two reasons the brush rotation can be reversed. Using reverse mode for normal sweeping will NOT clean as well and will result in premature wear.

To clean up this pile at the end of the sweeping pass, throttle down the prime mover, drop the bucket cutting edge to the ground, and change the hydraulic flow (reversing brush rotation) and inch forward. This will wisp the small pile of debris into the bucket (similar to that of a broom and dust pan).

NOTE: Do not forget to lift the bucket approximately 1” and change broom rotation to the forward direction after pile clean up.

DUMPING

Empty the bucket by raising the sweeper above the container, then dump using the prime mover tilt controls.

WARNING! EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.

It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of any attachment that may cause high levels of dust.

OPERATION

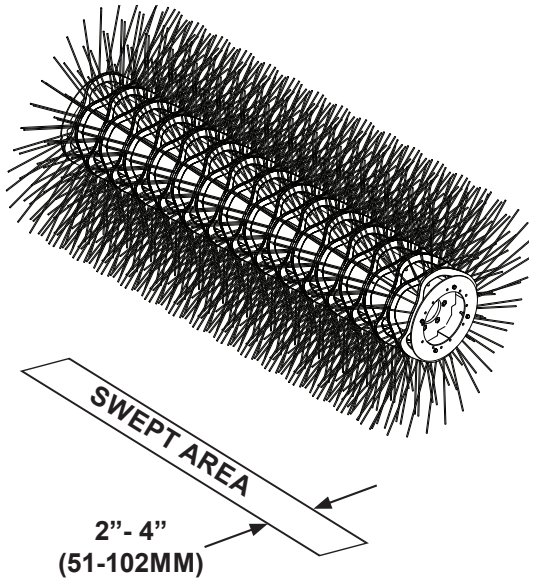
INTENDED USE: This sweeper is designed solely for use in construction cleanup, road maintenance and similar operations. Use in any other way is considered contrary to intended use. Compliance with and strict adherence to operation, service and repair conditions, as specified by the manufacturer, are essential elements of intended use.

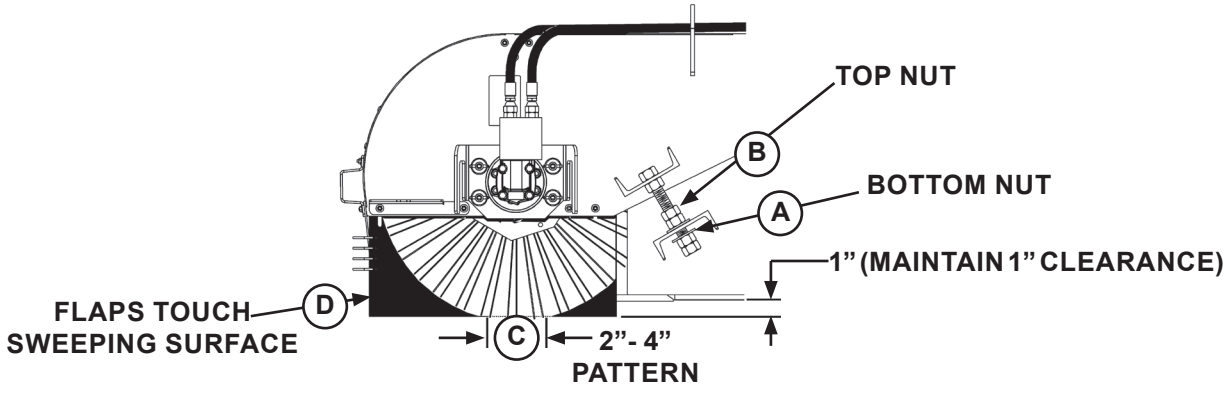
ADJUSTING THE SWEEPER BRUSH PATTERN

A properly adjusted brush offers the best sweeping performance. For special applications or as the brushes wear it may be necessary to adjust the brush pattern.

To check the brush pattern:

1. Move the sweeper to a dusty, flat surface.
2. Set the prime movers parking brake and leave the engine running.
3. Start the sweeper at a slow speed and lower it so the boom arms bottom out. Run the sweeper in a stationary position for 10-15 seconds.
4. Raise the sweeper and back away. Lower the sweeper to the ground, apply the brakes, turn off the prime mover's engine and remove the key. The brush pattern left in the dust should be 2" - 4" wide, running the full length of the brush.
5. Adjust the brush pattern as necessary.
   a. Loosen the bottom 1" nut.
   b. Adjust the top 1" nut to set the pattern. Tighten (clockwise) to increase pattern. Loosen (Counter clockwise) to decrease pattern.
   c. When the pattern is set, tighten the bottom 1" nut.
   d. Adjust the flaps so they just touch the ground.
6. Repeat steps 1-5 until the brush pattern is 2"- 4" wide.





NOTICE! To extend brush life make sure bolts on both sides are adjusted evenly.

OPERATION

BEFORE OPERATING SWEEPER:

- Learn sweeper and prime mover controls in an off-road location.
- Be sure that you are in a safe area, away from traffic or other hazards.
- Perform all daily maintenance listed in the Maintenance section of this manual.
- Check tire pressures and ratings before sweeping. Be sure they match the prime mover load rating. Weigh sweeper end of prime mover to insure proper tire rating.
- Remove from the sweeping area all property that could be damaged by flying debris.
- Be sure all persons not operating the sweeper are clear of the sweeper discharge area.
- Always wear proper apparel such as a long sleeved shirt buttoned at the cuffs; safety glasses, goggles or a face shield; ear protection; and a dust mask.

WHILE OPERATING SWEEPER:

- When operating sweeper, adhere to all government rules, local laws and other professional guidelines for your sweeping application.
- Before leaving the operator's area for any reason, lower the sweeper to the ground. Stop the engine, set the brakes and remove the key.
- Use the slowest rotating speed that will do the job to minimize flying debris.
- Keep hands, feet, hair and other loose clothing away from all moving parts.
- Leave all shields and safety equipment in place when operating the sweeper.
- Be aware of the extra weight and width a sweeper adds. Reduce travel speed accordingly. Keep in mind the center of gravity changes when an attachment is installed.
- When sweeping on rough terrain, reduce speed to avoid "bouncing" the sweeper. Loss of steering can result.
- Never sweep toward people, buildings, vehicles or other objects that can be damaged by flying debris.
- Only operate the sweeper from the operator's station of the prime mover. Seat belt fastened and protective glasses worn. Only operate the controls while the engine is running.
- Operate the sweeper slowly in an open area, check for proper operation of all controls and all protective devices. Note any repairs needed during operation of the sweeper. Report any needed repairs.
- Carry sweeper low to ground so operator has good visibility and stability. Avoid sudden movements from one side to the other side when you carry a sweeper.
- Avoid excessive downward pressure on brush sections to prevent excessive wear. A 2" to 4" (5-10 cm) wide pattern is sufficient for most applications. Ensure that motor and bearing plates are equally adjusted to prevent uneven wear pattern.
- Observe wind direction. Sweeping with the wind makes sweeping more effective and helps keep debris off the operator.

OPERATION

NOTICE! AVOID SWEEPER DAMAGE. Reduce travel speed to avoid hitting immovable objects.

OPERATING TIPS

NOTICE! Avoid sweeper damage. Do not ram into piles. Use a dozer blade for this type of job.

STUCK ON MATERIAL

When encountering stuck on material that cannot be removed by the rotating brush alone, the operator may simply back over the material and lower the bucket cutting edge to the ground and scrape the material loose. The brush direction may then be reversed to assist in collecting this material. **NOTE: Do not forget to lift the bucket approximately 1" and change brush rotation to the forward direction after removal of stuck on material.**

BRUSH, ENGINE & TRAVEL SPEEDS

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

DIRT & GRAVEL

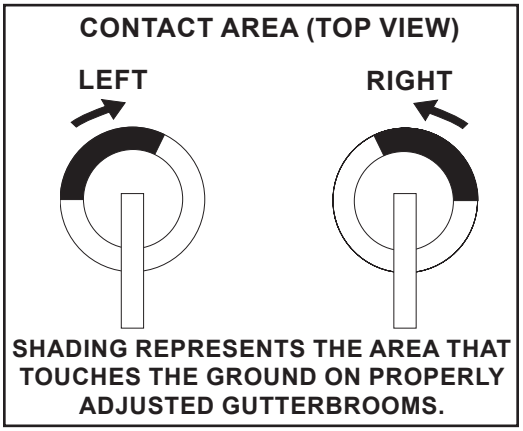
To keep dust at a minimum, plan your sweeping for days when it is overcast and humid or after it has rained. Also, sweep so the wind blows at your back or in the direction the brush head is angled.

Low brush speeds and moderate ground speeds work best for cleaning debris from hard surfaces. Brush speeds that are too fast tend to raise dust because of the aggressive sweeper action. To sweep gravel, use just enough brush speed to "roll" the gravel, not throw it.

HEAVY DEBRIS

For 2" (51mm) or more of heavy debris, a maximum brush speed in the low range and ground speeds of less than 5 mph (8 kph) are recommended.

OPTIONAL GUTTERBROOM OPERATION



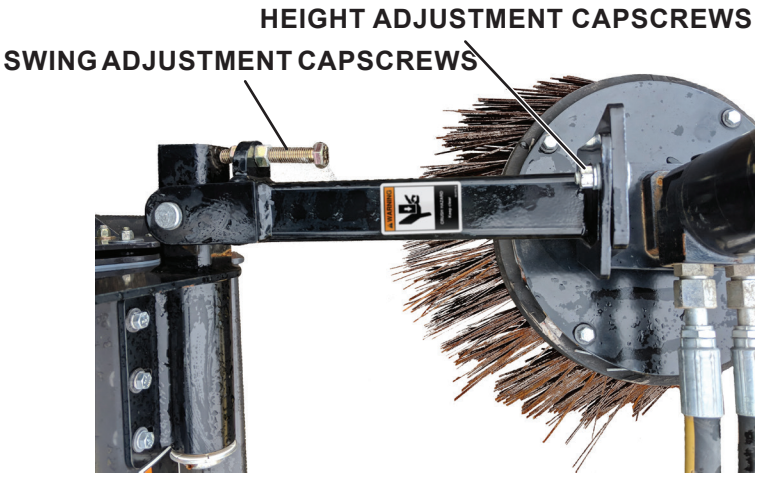
The gutterbrooms are designed for sweeping forward only. When sweeping next to curbs or walls with a gutterbroom, only the bristle tips should touch the vertical surface. When the gutterbroom height is properly adjusted, bristles contact the ground as shown.

To adjust the gutterbroom height:

1. Lower the gutterbroom to the ground.
2. Loosen the hardware holding the gutterbroom motor mounting plate.
3. Turn the motor mounting plate to the left or right.
4. Adjust the tension chain so it holds the gutterbroom in place.
5. Tighten the hardware holding the motor mounting plate.

A properly adjusted gutterbroom extends the main brush's sweeping path, leaving no streaks between the two paths. For this to happen the inside edge of the gutterbroom brush pattern must line up with the outside edge of the sweeper brush pattern.

OPERATION



To adjust gutterbroom swing:

1. Loosen the nut.
2. Adjust the capscrew (turn it in for more swing or out for less swing).
3. Tighten the nut.

When not using the gutterbroom for a short period of time, adjust the tension chain until the gutterbroom is raised 1” - 2” off the ground. When not using the gutterbroom for extended periods of time, unhook the hydraulic hoses from the gutterbroom motor, remove the gutterbroom assembly and connect the hydraulic hoses to run only the main sweeper.

OPTIONAL DUST SUPPRESSION

The dust suppression systems are available for a 12 Volt or 24 Volt system and both contain a 25 gallon water tank and enough nozzles and hose to use with or without the optional gutterbrooms.

STORAGE

NOTICE! ***Do not store the sweeper with weight on the brush. Weight will deform the bristles, destroying the sweeping effectiveness. To avoid this problem, place the sweeper on blocks or use storage stands.***

Do not store polypropylene brushes in direct sunlight. The material can deteriorate and crumble before the bristles are worn out.

Keep polypropylene brush material away from intense heat or flame.

- Clean the unit thoroughly, removing all snow, dirt and grease.
- Inspect for visible signs of wear, breakage or damage. Order any parts required and make the necessary repairs to avoid delays upon removal from storage.
- Tighten loose nuts, capscrews and hydraulic connections.
- Seal hydraulic system from contaminants and secure all hydraulic hoses off the ground to help prevent damage.
- Store unit in a dry and protected place. Leaving the unit outside will materially shorten its life.
- Do not store unit with weight on brushes. Place the unit on blocks or use storage stands.

OPERATION

Additional Precautions for Long Term Storage:

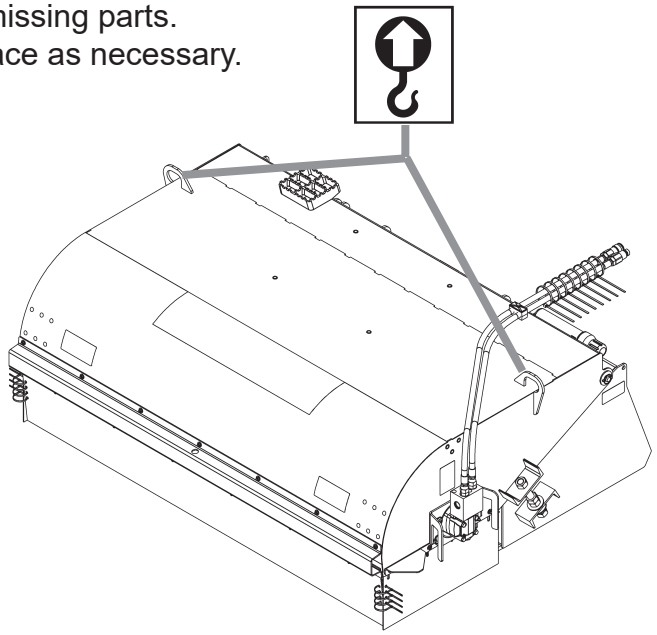
- Touch up all unpainted surfaces with paint to avoid rust.

REMOVAL FROM STORAGE:

- Wash unit and replace any damage and/or missing parts.
- Check hydraulic hoses for damage and replace as necessary.

LIFT POINTS

Lifting points are identified by lifting decals where required. Lifting at other points is unsafe and can damage attachment. Do not attach lifting accessories around cylinders or in any way that may damage hoses or hydraulic components. See Diagram.



- Attach lifting accessories to unit at recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.

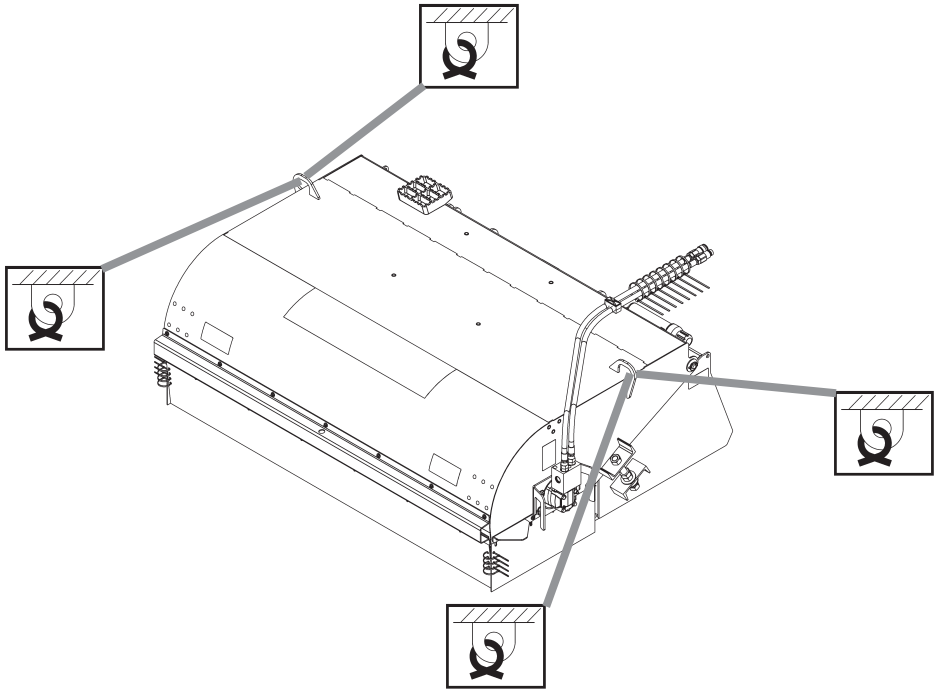
WARNING! Use lifting accessories (chains, slings, ropes, shackles and etc.) that are capable of supporting the size and weight of your attachment. Secure all lifting accessories in such a way to prevent unintended disengagement. Failure to do so could result in the attachment falling and causing serious personal injury or death.

TIE DOWN POINTS

Tie down points are identified by tie down decals where required. Securing to trailer at other points is unsafe and can damage attachment. Do not attach tie down accessories around cylinders or in any way that may damage hoses or hydraulic components. See Diagram.

- Attach tie down accessories to unit as recommended.
- Check unit stability before transporting.

OPERATION



WARNING! Verify that all tie down accessories (chains, slings, ropes, shackles and etc.) are capable of maintaining attachment stability during transporting and are attached in such a way to prevent unintended disengagement or shifting of the unit. Failure to do so could result in serious personal injury or death.

TRANSPORTING

Follow all local government regulations that may apply along with recommended tie down points and any equipment safety precautions at the front of this handbook when transporting your attachment.

MAINTENANCE

GENERAL INFORMATION

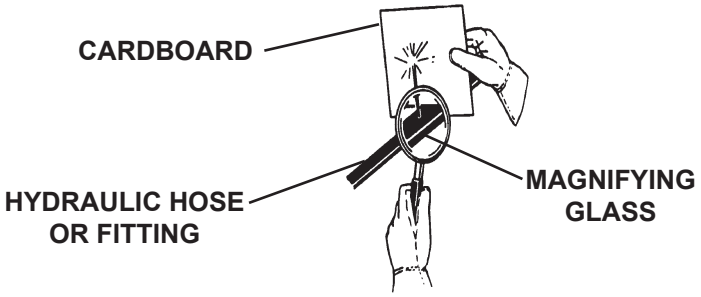
Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to an absolute minimum. However, it is very important that these maintenance functions be performed as described below.

Procedure	Daily (every 8 hours)	See Prime Mover Manual
Replace any missing bolts or nuts with approved replacement parts.	✔	
Check brush pattern. See Operating Section.	✔	
Check hydraulic system for leaks and tighten as necessary. Check for damage and replace as needed.	✔	
Check prime mover hydraulic system to ensure an adequate level and cleanliness of hydraulic oil.	✔	✔
Check for missing or illegible Safety / Warning Decals and replace as necessary	✔	
Check for any loose hardware and tighten as required. See Bolt Torque Specifications	✔	
Visually inspect the machine for worn parts or cracked welds, and repair as necessary.	✔	

WARNING! **Escaping fluid under pressure can penetrate the skin causing serious 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.

Stop the engine and relieve pressure before connecting or disconnecting lines. Tighten all connections before starting engine or pressurizing lines.



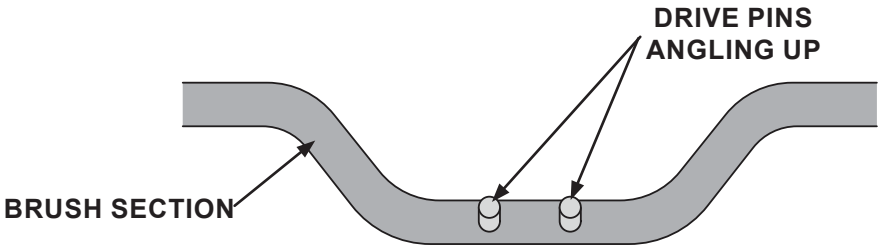
MAINTENANCE

REPLACING BRUSH SECTIONS

1. Remove four klik pins securing motor to sweeper. Remove motor bucket mount with motor. Retain hardware for reinstallation.
2. Remove bearing assembly: Remove three klik pins, center capscrew and idler shaft. Retain hardware for reinstallation.
3. Lift sweeper body leaving core on ground.
4. Remove the core retainer plate. Retain hardware for reinstallation.
5. Remove old sections.
6. Stand the core on end and install new sections:

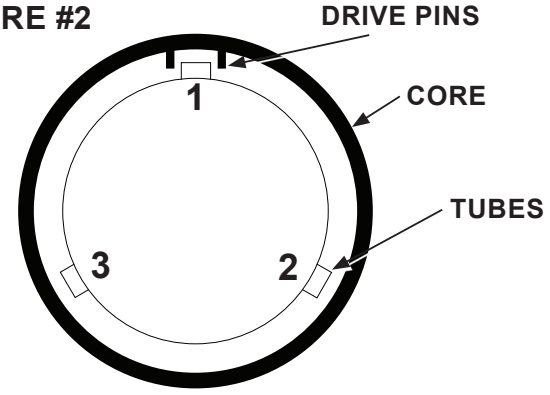
Note: Drive pin direction can be difficult to determine. Inspect your sections to determine up and down directions. See Figure #1

FIGURE #1



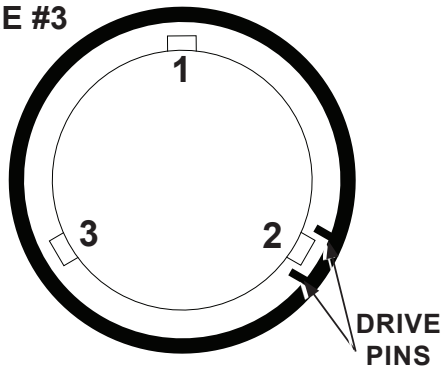
a. Number the tubes on the core as 1, 2 and 3. See Figure #2
b. Slide the first section onto the core with the drive pins on either side of tube 1. Make sure that the drive pins angle up. See Figure #2
c. Place the second section on the core with the drive pins on either side of tube 2. Be sure the drive pins angle down. See Figure #3
d. Put the third section on with the drive pins around tube 3. Be sure the drive pins angle up.

FIGURE #2



FIRST SECTION

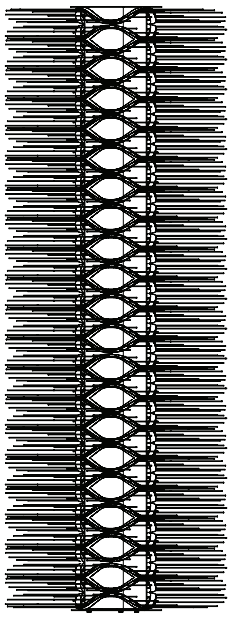
FIGURE #3



SECOND SECTION

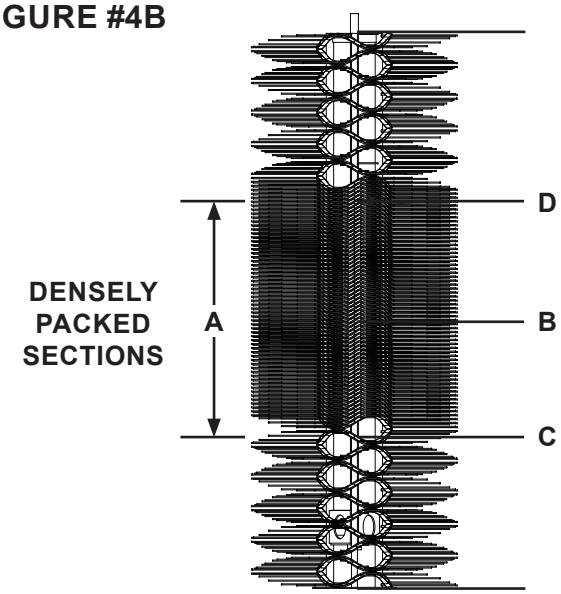
e. **Standard 215:** Continue to slide sections on until the core is full. Make sure to alternate the tubes and the direction of the drive pins. See Figure #4A
Cold Planer Special: Determine width of Planer (A) and center of core (B). Measure and mark one-half of planer width down (C) and up (D) from core center (B). Slide sections onto the core alternating tubes and pin directions until you have reached the first mark (C). Slide sections onto the core with drive pins in the same direction until you reach the second mark (D). Revert back to alternating tubes and pin directions until the core is full. See Figure #4B

FIGURE #4A



STANDARD 215 CORE

FIGURE #4B



COLD PLANER SPECIAL

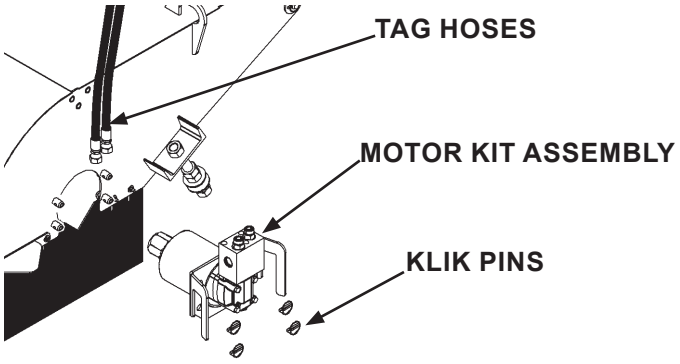
NOTE: This will give you a densely packed section in the middle of your brush head the same width as your planer. The brush marker decals on the brush hood should be placed to identify this area for the operator during operation.

7. Re-attach the core retainer plate.
8. Lay core on ground. Lower body over core.
9. Re-attach the bearing assembly with previously removed hardware in Step #2.
10. Re-attach motor bucket mount with hardware removed in Step #1.

REPLACING HYDRAULIC MOTOR

The hydraulic motor comes as a complete kit.

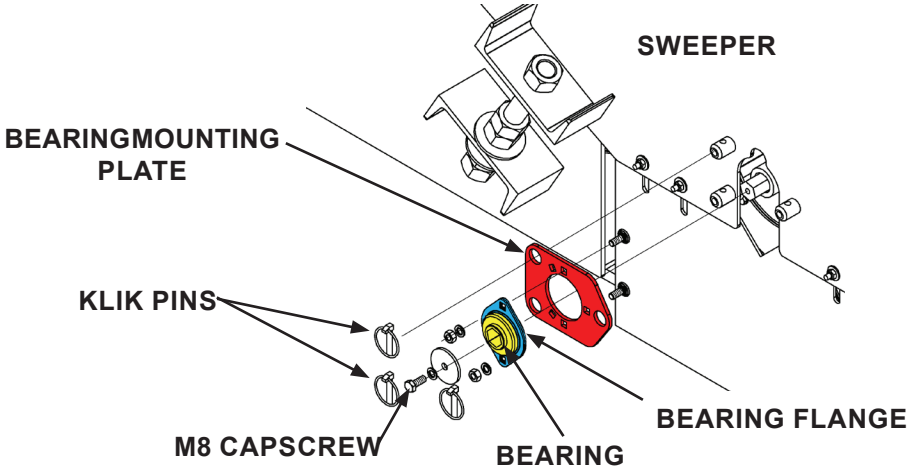
1. Tag and disconnect hydraulic hoses from the hydraulic motor.
2. Remove klik pins securing the motor assembly to the sweeper.
3. Slide the motor assembly out of the sweeper while leaving the hex receiver plate attached to the core.
4. Inspect the hex receiver plate for damage and replace if required.
5. Your new replacement motor assembly will come complete with bucket mount and hex hub. Install the new motor assembly into the sweeper and secure in place using the existing klik pins.
6. Install hydraulic hoses onto the new motor.



MAINTENANCE

REPLACING BEARING

1. Remove the center M8 capscrew and the klik pins securing the bearing mounting plate to the bearing assembly and side of sweeper.
2. Remove the bearing flange from the mounting plate.
3. Press out existing bearing and replace with new.
4. Reinstall the bearing flange to the mounting plate using existing hardware.
5. Reinstall by reversing steps #1 and #2.



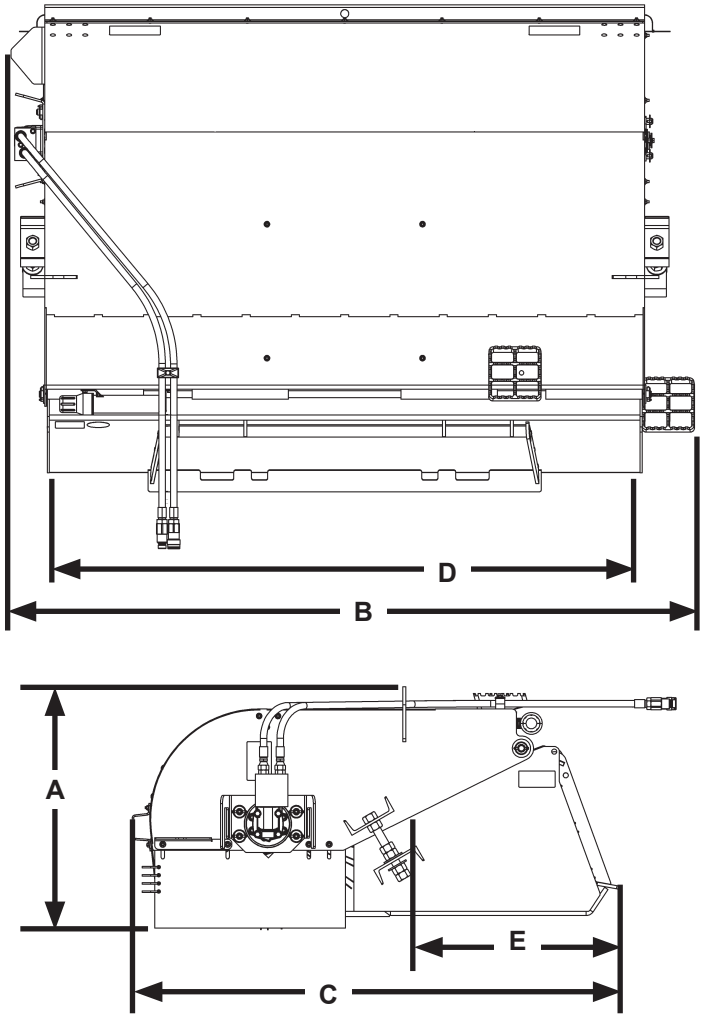
TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
MOTOR FOR BROOM WILL NOT OPERATE	Auxiliary hydraulics control on prime mover is activated in the wrong position.	Verify controls. See prime mover owners manual.
	Hoses improperly connected to prime mover.	Connect hoses correctly to prime mover.
	Hoses on prime mover are obstructed.	Clear obstruction on prime mover.
	Hoses on broom are obstructed.	Clear obstruction on broom.
	The motor has failed.	Replace the motor.
SLUGGISH BROOM OPERATION	Insufficient oil flow from the prime mover.	Increase engine RPM.
	One or more seals have failed in the motor.	Replace the seals or motor.
	Hydraulic filter on prime mover is dirty.	Replace filter.
THE MOTOR RUNS BUT THE BROOM DOES NOT RUN	Motor shaft has a sheared key.	Replace key.
OIL LEAKS FROM THE MOTOR	One or more seals have failed in the motor.	Replace the seals or motor.
	Seals on the fittings are damaged.	Replace seals or fittings.
	Fittings are loose or damaged.	Tighten or replace fittings.
	Hydraulic hoses are loose or damaged.	Tighten or replace hoses.
BRUSH ROTATES IN WRONG DIRECTIONS	Hoses installed incorrectly.	Switch hose connections.
BRUSH SLOWS OR STOPS WHEN SWEEPING	Brush pattern too wide.	Adjust brush pattern.
	Travel speed too fast.	Reduce travel speed.
	Trying to sweep too much material at once.	Reduce amount of material being swept, make more passes.
	Hydraulic motor is failing.	Replace motor.
BRUSH WEARS VERY QUICKLY	Brush pattern is too wide.	Adjust brush pattern.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
EXCESSIVEHYDRAULIC OIL TEMPERATURE	Low hydraulic oil level on the prime mover.	Add hydraulic fluid.
	Hydraulic hoses are obstructed.	Clear obstructions in hoses.
	Hydraulic oil and/or filter on prime mover is dirty.	Replace hydraulic oil and/or filter on prime mover.
	Quick couplers are not properly seated.	Reconnect quick couplers properly.
	Brush pattern too wide.	Adjust brush pattern.
	Travel speed too fast.	Reduce travel speed.
	Trying to sweep too much material at once.	Reduce the amount of material being swept. Make more passes.
	Hydraulic motor failure.	Replace motor.
HYDRAULIC QUICK COUPLER LEAKS	Quick coupler is not installed completely or damaged.	Connect properly or replace.

SPECIFICATIONS



DESCRIPTION	60”	72”	84”
A. Overall Height	29.70” (75.4cm)	29.70” (75.4cm)	29.70” (75.4cm)
B. Overall Width	72.30” (183.6cm)	84.30” (214.1cm)	96.30” (244.6cm)
C. Overall Length	61.00” (154.9cm)	61.00” (154.9cm)	61.00” (154.9cm)
D. Sweeping Width	60.00” (152.4cm)	72.00” (182.9cm)	84.00” (213.4cm)
G. Center of Gravity	20.30” (51.6cm)	20.30” (51.6cm)	20.30” (51.6cm)
Weight (lbs)	943# (429kg)	1068# (484kg)	1190# (540kg)
Hydraulic Flow - 18.7 CID Motor			10-18 GPM (38-68 lpm)
Hydraulic Flow - 24.7 CID Motor			15-25 GPM (57-95 lpm)
Maximum Pressure			3500 PSI (241 bar)

SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

BOLT TORQUE SPECIFICATIONS

GENERAL TORQUE SPECIFICATION TABLES

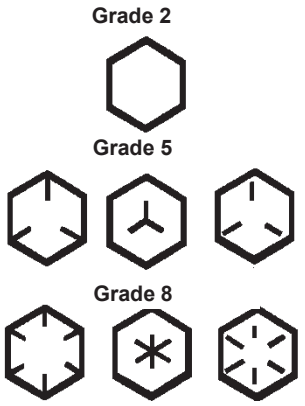
Use the following charts when determining bolt torque specifications, when special torques are not given. Always use grade 5 or better when replacing bolts.

SAE BOLT TORQUE SPECIFICATIONS

Note: The following torque values are for use with extreme pressure lubricants, plating or hard washer applications. Increase torque 15% when using hardware that is unplated and either dry or lubricated with engine oil.

Bolt Size		SAE GRADE 5 TORQUE				SAE GRADE 8 TORQUE			
		Ft-lbs		Newton-Meter		Ft-lbs		Newton-Meter	
Inches	mm	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF
1/4	6,35	8	9	11	12	10	13	14	18
5/16	7,94	14	17	19	23	20	25	27	34
3/8	9,53	30	36	41	49	38	46	52	62
7/16	11,11	46	54	62	73	60	71	81	96
1/2	12,70	68	82	92	111	94	112	127	152
9/16	14,29	94	112	127	152	136	163	184	221
5/8	15,88	128	153	174	207	187	224	254	304
3/4	19,05	230	275	312	373	323	395	438	536
7/8	22,23	340	408	461	553	510	612	691	830
1	25,40	493	592	668	803	765	918	1037	1245
1-1/8	25,58	680	748	922	1014	1088	1224	1475	1660
1-1/4	31,75	952	1054	1291	1429	1547	1700	2097	2305
1-3/8	34,93	1241	1428	1683	1936	2023	2312	2743	3135
1-1/2	38,10	1649	1870	2236	2535	2686	3026	3642	4103

Bolt head identification marks as per grade.
NOTE: Manufacturing Marks Will Vary



METRIC BOLT TORQUE SPECIFICATIONS

NOTE: The following torque values are for use with metric hardware that is unplated and either dry or lubricated with engine oil. Reduce torque 15% when using hardware that has extreme pressure lubricants, plating or hard washer applications.

Bolt head identification marks as per grade.

Bolt Size	Grade No.	Pitch (mm)	Ft-lbs	Newton-Meter	Pitch (mm)	Ft-lbs	Newton-Meter
M6	5.6	1,0	3.6-5.8	4,9-7,9	-	-	-
	8.8		5.8-.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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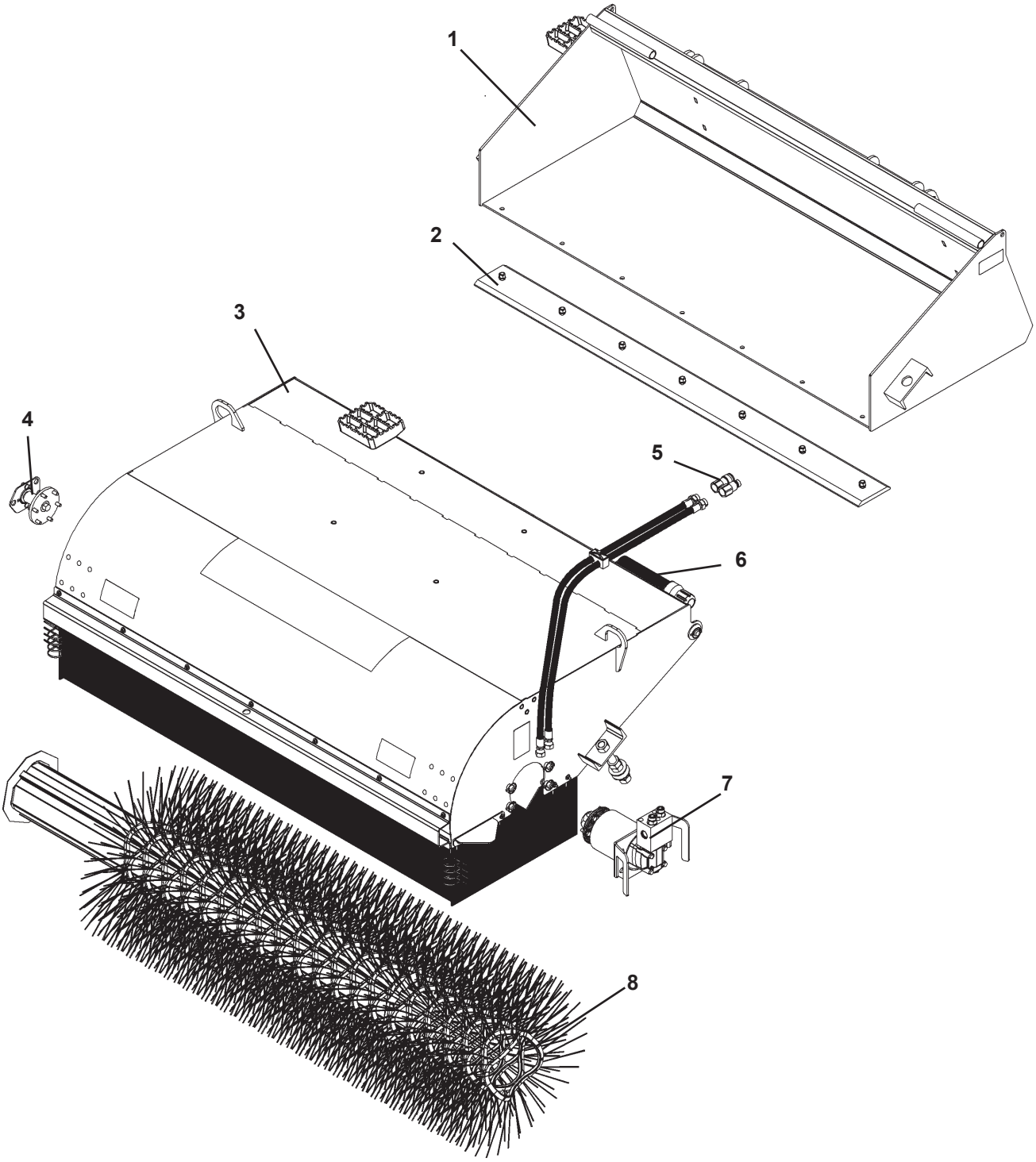
LIMITED WARRANTY

In order to provide you with the most UP-TO-DATE Warranty information, Paladin Warranty Statement and Warranty Procedures along with Warranty Registration and Claim Forms have been moved to our website at ***www.paladinattachments.com***.

SWEEPER ASSEMBLY

Assemblies 21560 & 21572 & 21584



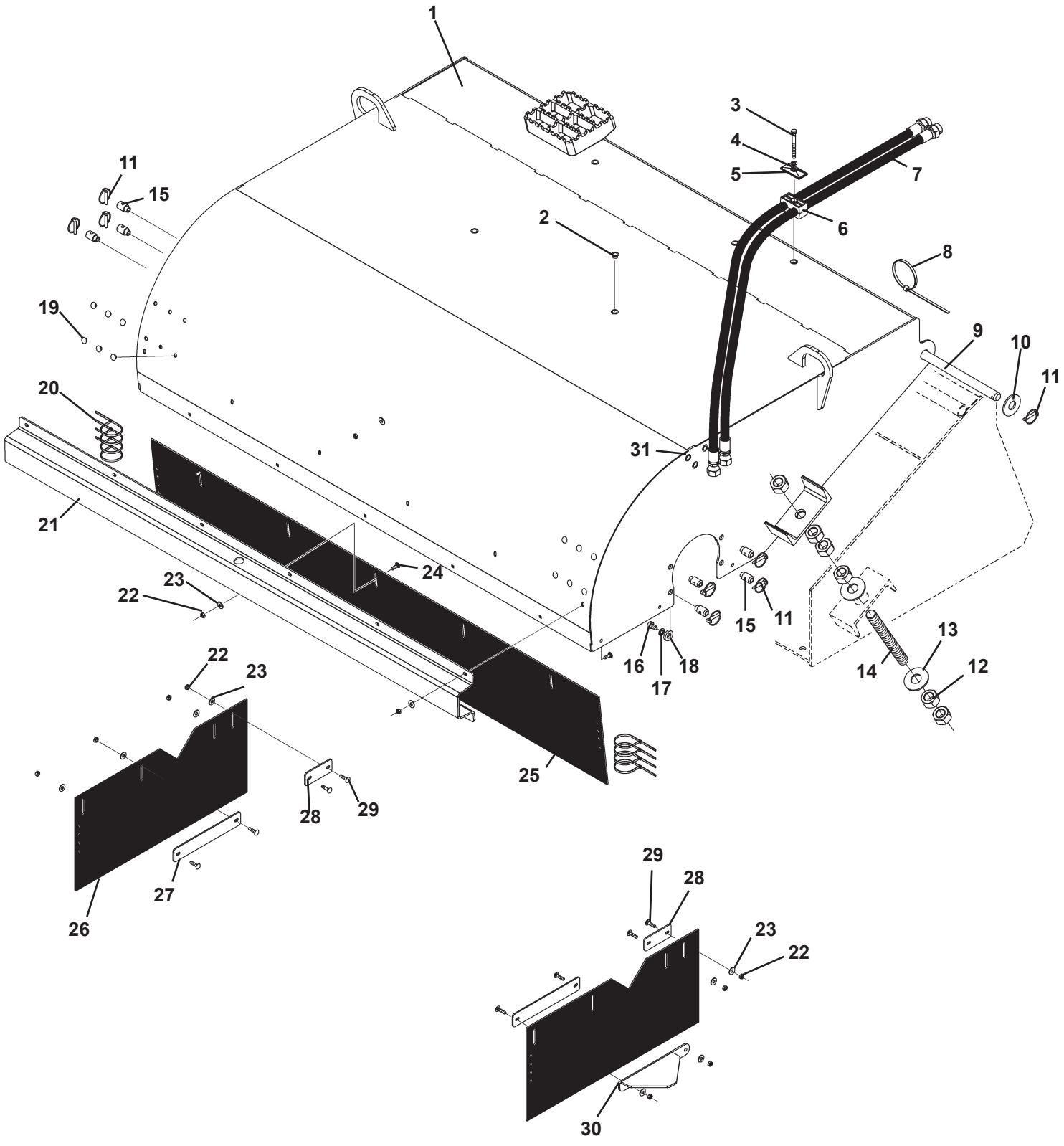
SWEEPER ASSEMBLY

Assemblies 21560 & 21572 & 21584

ITEM	REQ'D	PART NO.	DESCRIPTION
1	1	13-17037-5	Bucket - 5'
	1	13-17037-6	Bucket - 6'
	1	13-17037-7	Bucket - 7'
2	1	13-17037-5	Bucket - 5'
	1	13-17037-6	Bucket - 6'
	1	13-17037-7	Bucket - 7'
3	1	28-11070-60	Body Assembly - 5'
	1	28-11070-72	Body Assembly - 6'
	1	28-11070-84	Body Assembly - 7'
4	1	28-10333	Bearing Assembly
5	1	28-9570	Quick Disconnect Kit - 28-9570
6	1	07-8273	Manual Storage Tube
	2	07-1714	.31" UNC X 1.00" Hex Capscrew - GR8
	2	RHW8642	.31" UNC Rivet Nut
7	1	28-11071-1	Motor Assembly
	1	28-11071-2	Motor Assembly
8	1	28-10999-60	Core Assembly
	1	28-10999-72	Core Assembly
	1	28-10999-84	Core Assembly

BODY ASSEMBLY

Assembly 28-11070



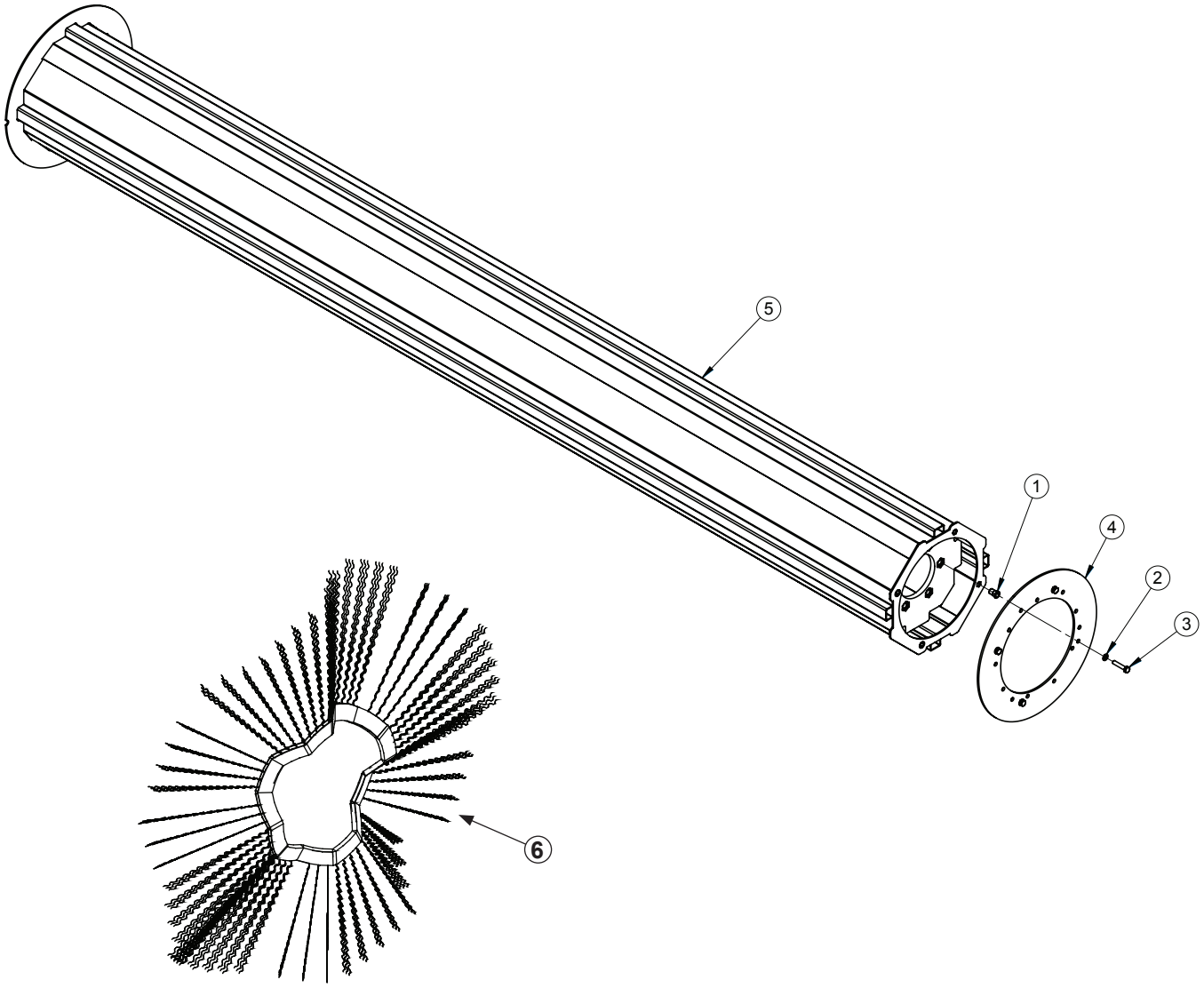
BODY ASSEMBLY

Assembly 28-11070

ITEM	REQ'D	PART NO.	DESCRIPTION
1	1	13-20138-60	Body - 5'
		13-20138-72	Body - 6'
		13-20138-84	Body - 7'
2	2	RHW8645	.31" Rivet Nut
3	1	07-3651	.31" UNC X 3.00" Hex Capscrew - GR8
4	1	07-3273	.31" Lock Washer
5	1	RHW8614	Cover Plate
6	1	RHW8616	Hose Cradle
7	2	03-5653	Hose .50" X 120" 10FFS-12MBo
8	8	07-1817	Plastic Tie
9	1	13-17038-5	Rod .88" X 63.50"
		13-17038-6	Rod .88" X 75.50"
		13-17038-7	Rod .88" X 87.50"
10	2	07-5451	.88" Flat Washer - GR8
11	9	RHW8068	Lynch Pin - .25"
12	12	07-4035	1.00" UNC Hex Nut - GR8
13	4	07-0159	1.00" Flat Washer
14	2	13-16240	1" UNC Threaded Rod
15	7	13-14083	Motor Mounting Stud
16	7	07-8384	M10-1.5 X 16mm Hex Capscrew - CL10.9
17	7	07-3747	M10 Lock Washer
18	7	P852608	.50" Hard Washer
19	12	LAF9853	.38" Plug - Plastic
20	8	07-0678	Plastic Tie
21	1	13-20145-60	Front Bumper Plate
		13-20145-72	Front Bumper Plate
		13-20145-84	Front Bumper Plate
22	-	07-5824	.25" UNC Top Lock Hex Nut - GR C
23	-	07-4032	.25" Flat Washer - GR8
24	-	07-3690	.25" UNC X .75" Carriage Bolt
25		13-17042-5	Front Flap - 5'
		13-17042-6	Front Flap - 6'
		13-17042-7	Front Flap - 7'
26	2	13-17059	Side Flap
27	2	LAF8331	Side Flap Retainer -Long
28	2	LAF8330	Side Flap Retainer - Short
29	8	07-3691	.25" UNC X 1.00" Carriage Bolt
30	1	13-20146	Side Bumper
31	9	RHW8642	.31" UNC Rivet Nut

CORE ASSEMBLY

Assembly 28-10999



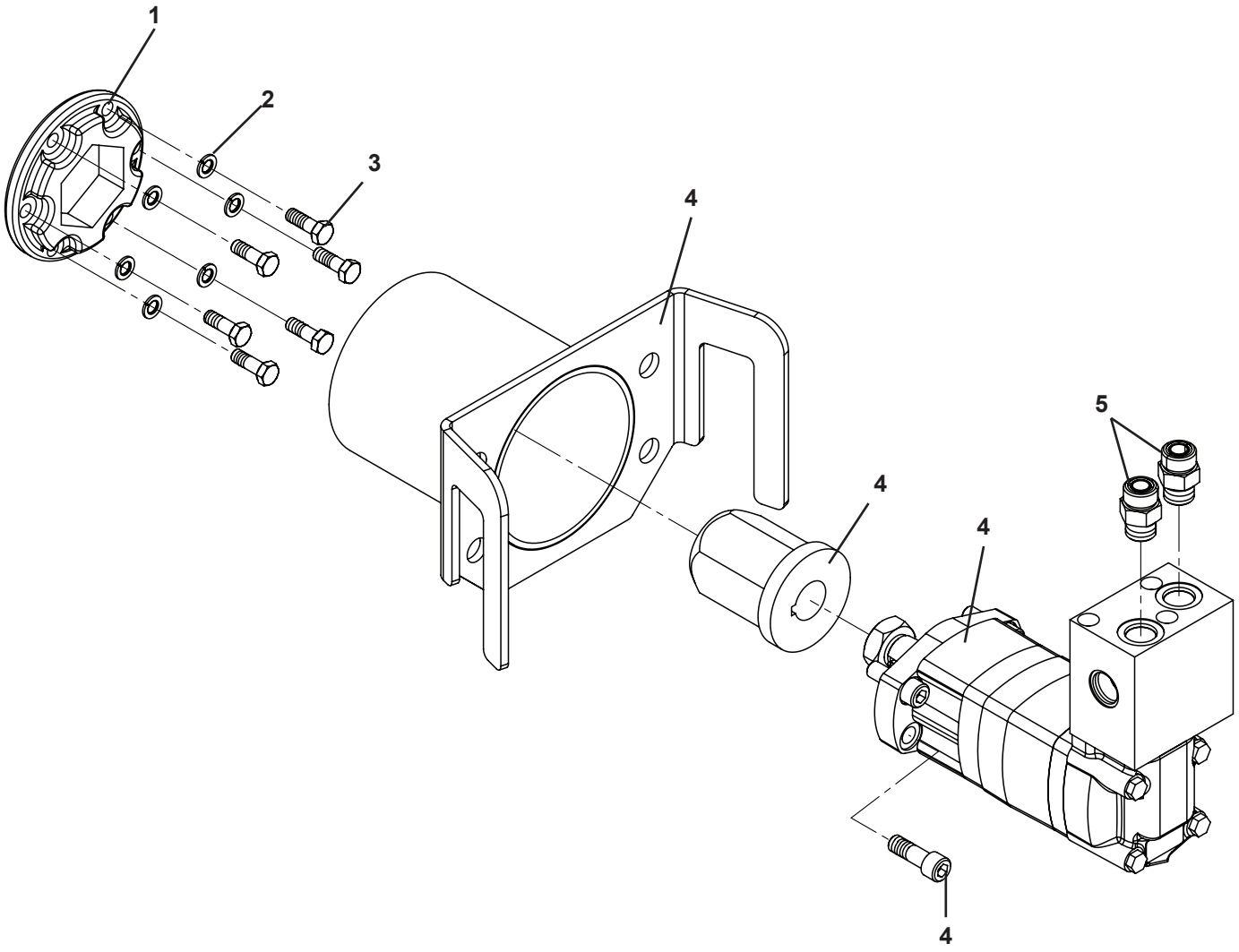
CORE ASSEMBLY

Assembly 28-10999

Item	Req'd	Part No.	Description
1	4	07-3617	M6-1.00 Insert Nut
2	4	07-3730	M6 Lock Washer
3	4	07-3731	M6-1.0 X 30MM Hec Capscrew CL10.9
4	1	13-15662	Retainer Plate
5	1	13-19461-60	Core - 5'
	1	13-19461-72	Core - 6'
	1	13-19461-84	Core - 7'
6	1	01-0873	32" Brush Kit - Poly - 5'
	1	01-9370	32" Brush Kit - Poly - 6'
	1	01-1163	32" Brush Kit - Poly - 7'
	1	01-1156	32" Brush Kit - Mixed - 5'
	1	01-9371	32" Brush Kit - Mixed - 6'
	1	01-1978	32" Brush Kit - Mixed - 7'

MOTOR ASSEMBLY

Assemblies 28-11071-1 & 28-11071-2



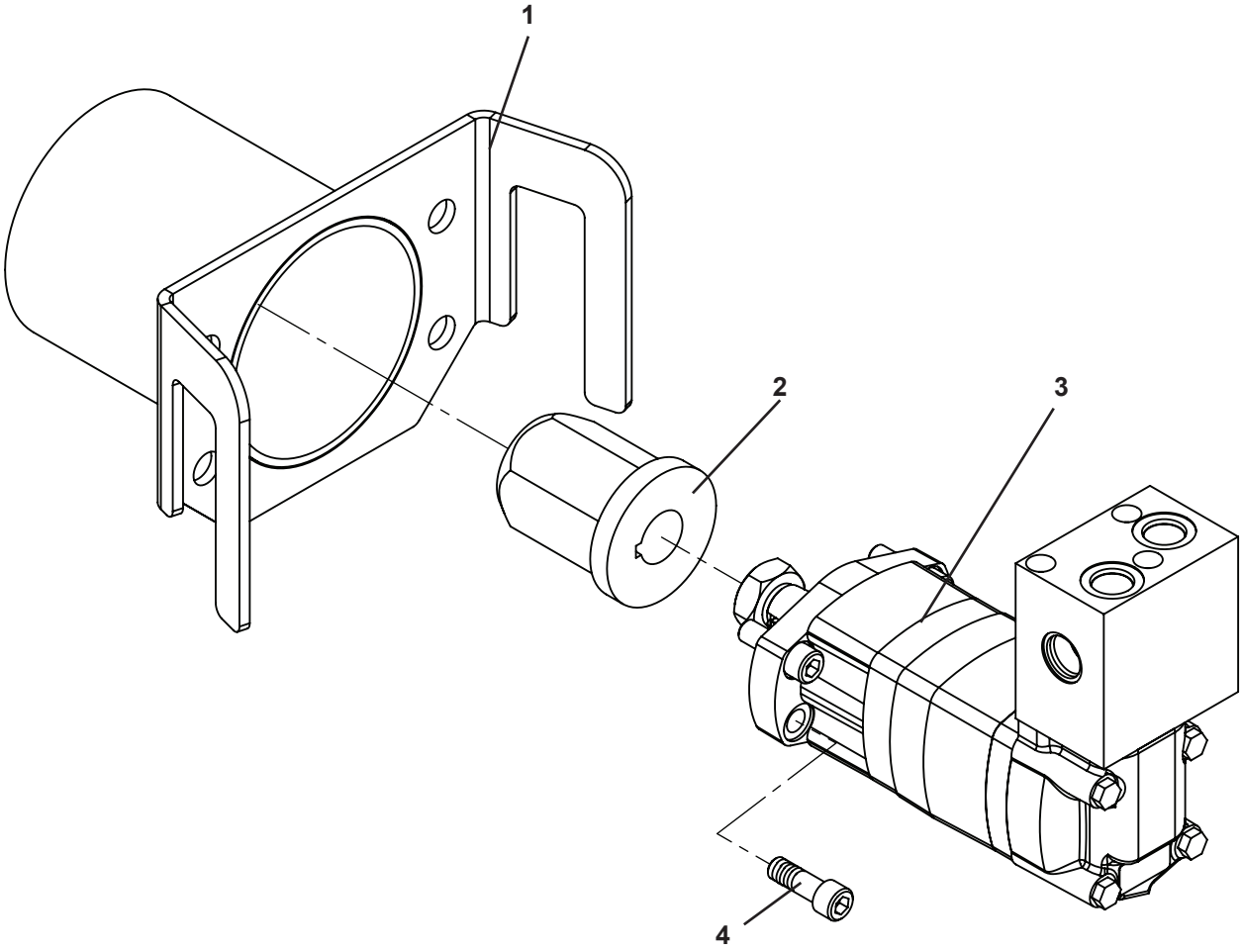
MOTOR ASSEMBLY

Assemblies 28-11071-1 & 28-11071-2

ITEM	REQ'D	PART NO.	DESCRIPTION
1	1	13-16225	Hex Receiver Plate
	1	10787	Hex Drive Kit (Includes Hex Receiver Plate and Hex Hub)
2	6	07-3747	M10 Lock Washer
3	6	07-3749	M10-1.5 X 30mm Hex Capscrew - CL10.9
4	1	28-11089-1	Motor Kit 24.1 CID
	1	28-11089-2	Motor Kit 18.7 CID
5	2	03-5901	Fitting 10MBo-10MFS

MOTOR KIT ASSEMBLY

Assemblies 28-11089-1 & 28-11089-2



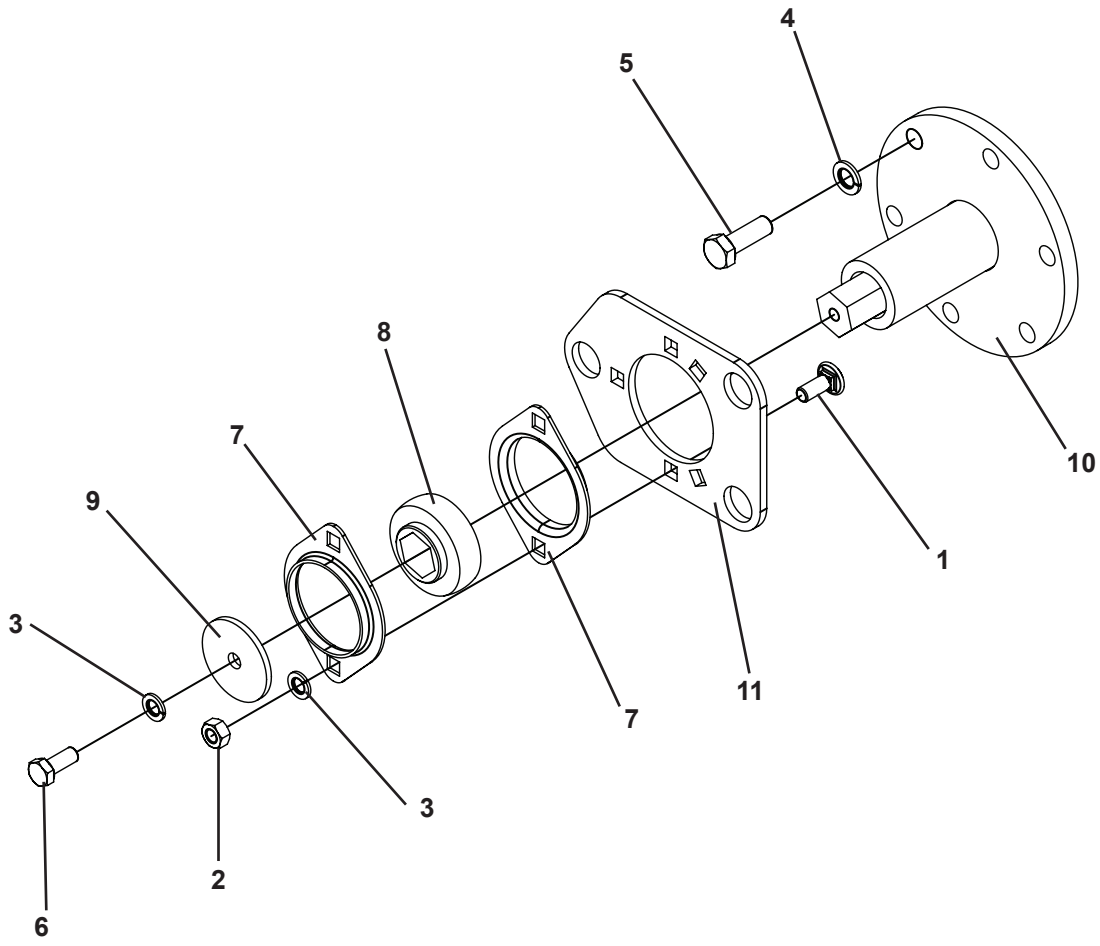
MOTOR KIT ASSEMBLY

Assemblies 28-11089-1 & 28-11089-2

ITEM	REQ'D	PART NO.	DESCRIPTION
1	1	13-20141	Motor Bucket
2	1	13-15206	Hex Hub
3	-	NSS	Hydraulic Motor 24.1 CID
	-	NSS	Hydraulic Motor 18.7 CID
4	4	RHW8236	.50" UNC X 1.50" Allen Head Capscrew

BEARING ASSEMBLY

Assembly 28-10333



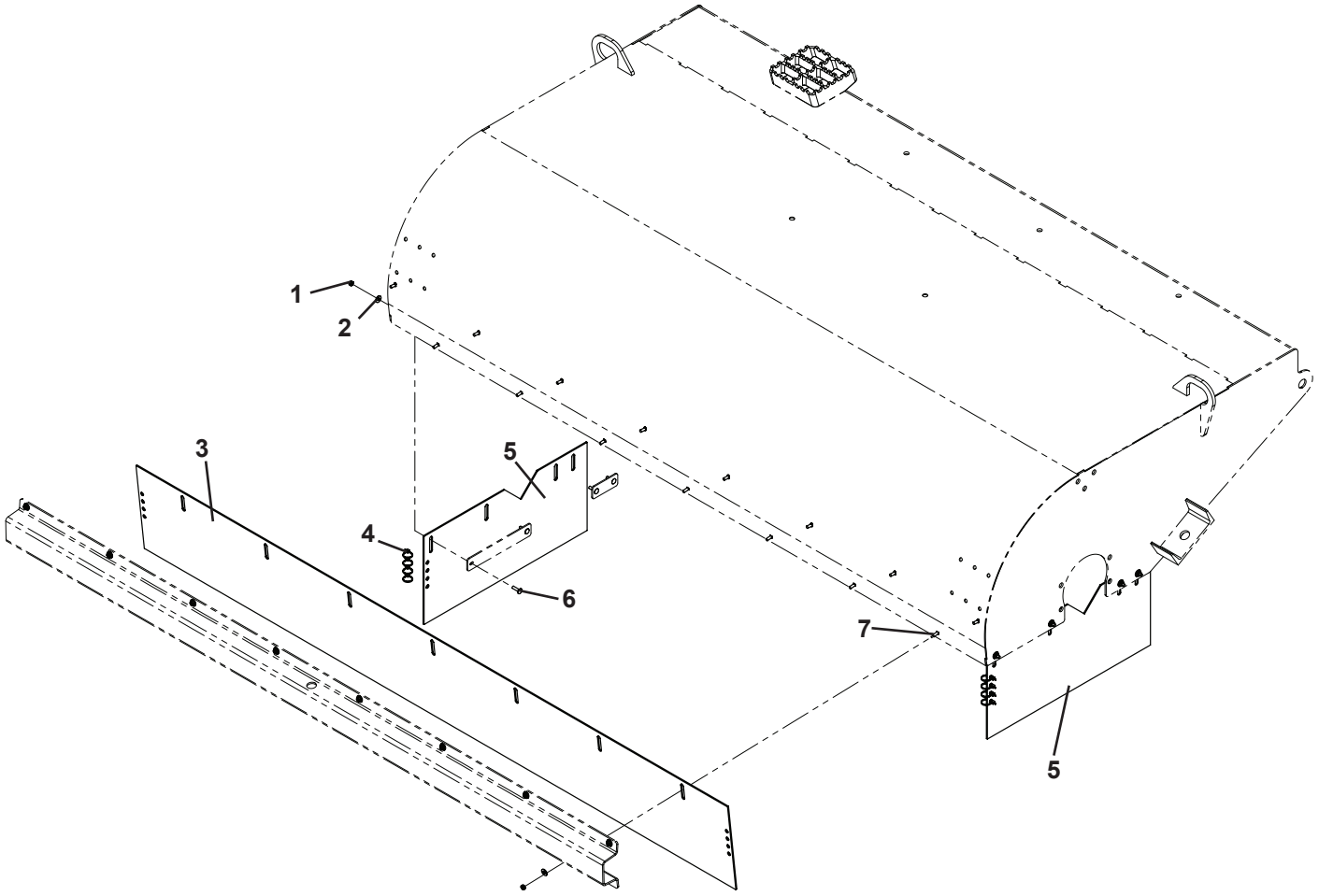
BEARING ASSEMBLY

Assembly 28-10333

ITEM	REQ'D	PART NO.	DESCRIPTION
1	2	07-2950	M8-1.25 X 20mm Carriage Bolt - CL8.8
2	2	07-3737	M8-1.25 Hex Nut - CL10
3	3	07-3738	M8 Lock Washer
4	6	07-3747	M10 Lock Washer
5	6	07-8383	M10-1.5 X 30mm Hex Capscrew - CL10.9 With Loctite
6	1	07-3777	M8-1.25 X 20mm Hex Capscrew - CL10.9
7	2	08-0005	Flange Bearing
8	1	08-0037	Bearing
9	1	13-11903	.34" Flat Washer
10	1	13-16923	Hex Shaft Idler - Bolt-On
11	1	13-17015	Bearing Mounting Plate

FLAP ASSEMBLY

Assembly 28-11088-60



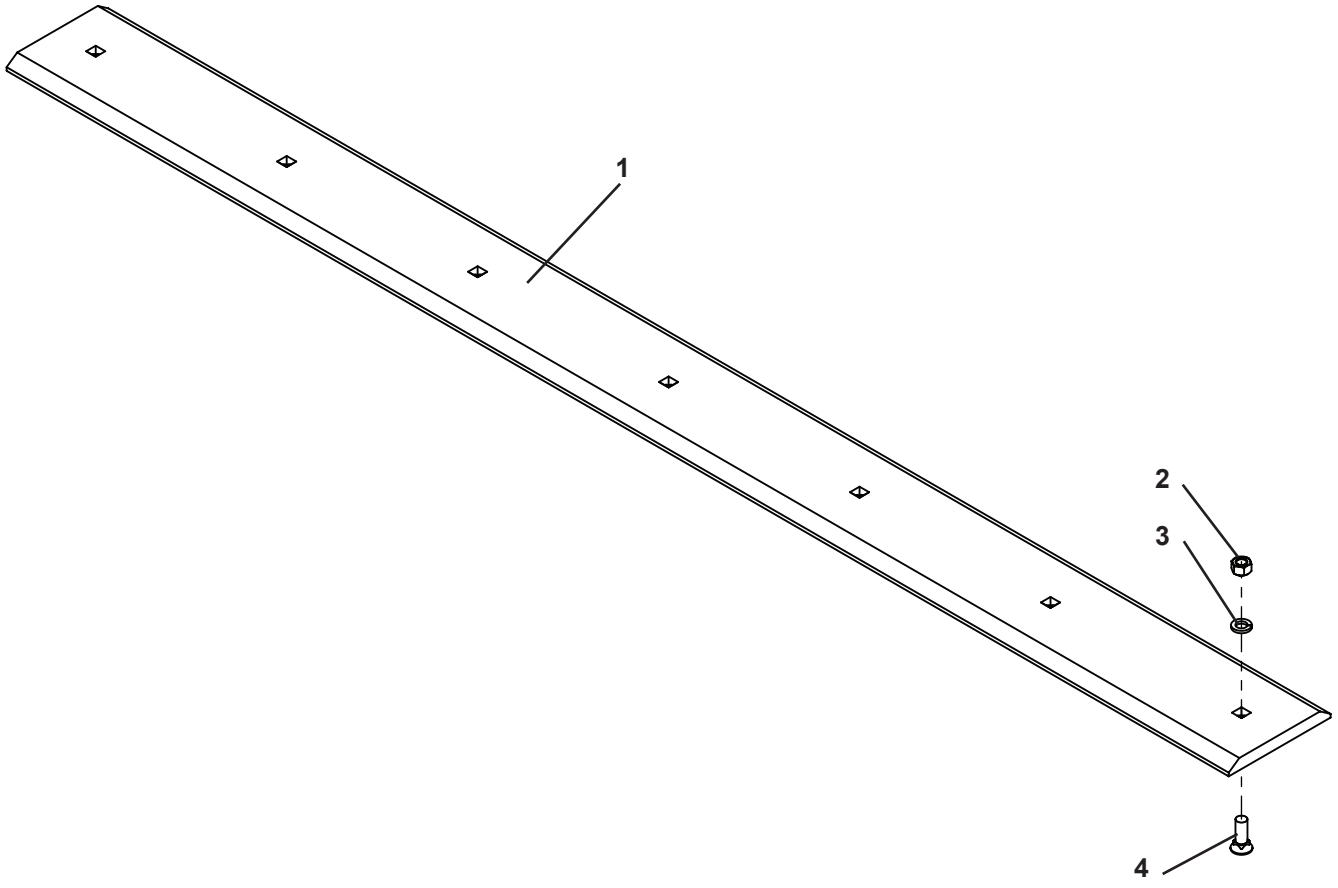
FLAP ASSEMBLY

Assembly 28-11088-60

ITEM	REQ'D	PART NO.	DESCRIPTION
1	-	07-5824	.25" UNC Top Lock Hex Nut - GR C
2	-	07-4032	.25" Flat Washer - GR8
3	1	13-17042-5	Front Flap - 5'
		13-17042-6	Front Flap - 6'
		13-17042-7	Front Flap - 7'
4	-	07-1767	Plastic Tie
5	2	13-17059	Side Flap
6	8	07-3691	.25" UNC X 1.00" Carriage Bolt
7	-	07-3690	.25" UNC X .75" Carriage Bolt

CUTTING EDGE KIT

Assembly 28-10578



CUTTING EDGE KIT

Assembly 28-10578

ITEM	REQ'D	PART NO.	DESCRIPTION
1	1	LAF8361	Cutting Edge - 5'
		LAF2803	Cutting Edge - 6'
		LAF8337	Cutting Edge - 7'
2	6	07-1764	.50" UNC Hex Nut - GR8
3	6	07-1762	.50" Lock Washer
4	6	07-4454	.50" UNC X 1.50" Plow Bolt - GR8