



OPERATOR'S MANUAL

WALK BEHIND SWEEPER WSP36 Series



Serial Number: _____

Model Number: _____

Manual Number: 51-4008

Release Date: August 2018

Serial Number: 0807001 and up
Rev. 4



WARNING

CANCER AND REPRODUCTIVE HARM

Breathing engine exhaust exposes you to chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

- Always start and operate the engine in a well ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

Operating, servicing and maintaining this product can expose you to chemicals including, but not limited to, engine exhaust, carbon monoxide, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service in a well-ventilated area and wear gloves or wash your hands frequently.

For more information go to www.P65Warnings.ca.gov

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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 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 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.

NOTE: A list of all Paladin Patents can be found at <http://www.paladinattachments.com/patents.asp>.

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 IS USED WHERE SERIOUS INJURY OR DEATH WILL RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.



WARNING

THIS SIGNAL WORD IS USED WHERE SERIOUS INJURY OR DEATH COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.



CAUTION

THIS SIGNAL WORD IS USED WHERE MINOR INJURY COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.

NOTICE

NOTICE INDICATES A PROPERTY DAMAGE MESSAGE.

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.

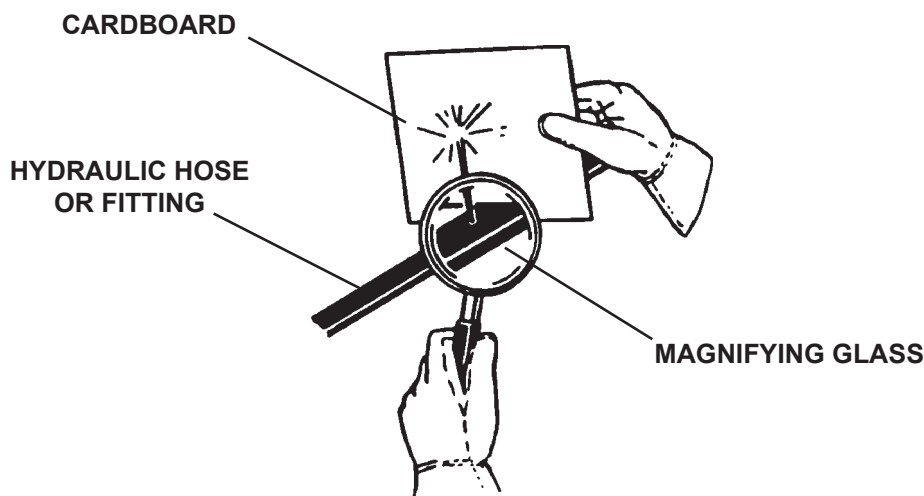
WARNING!



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 Protection 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.

DANGER FALL HAZARD! DO NOT OPERATE NEAR UNGUARDED EDGES.



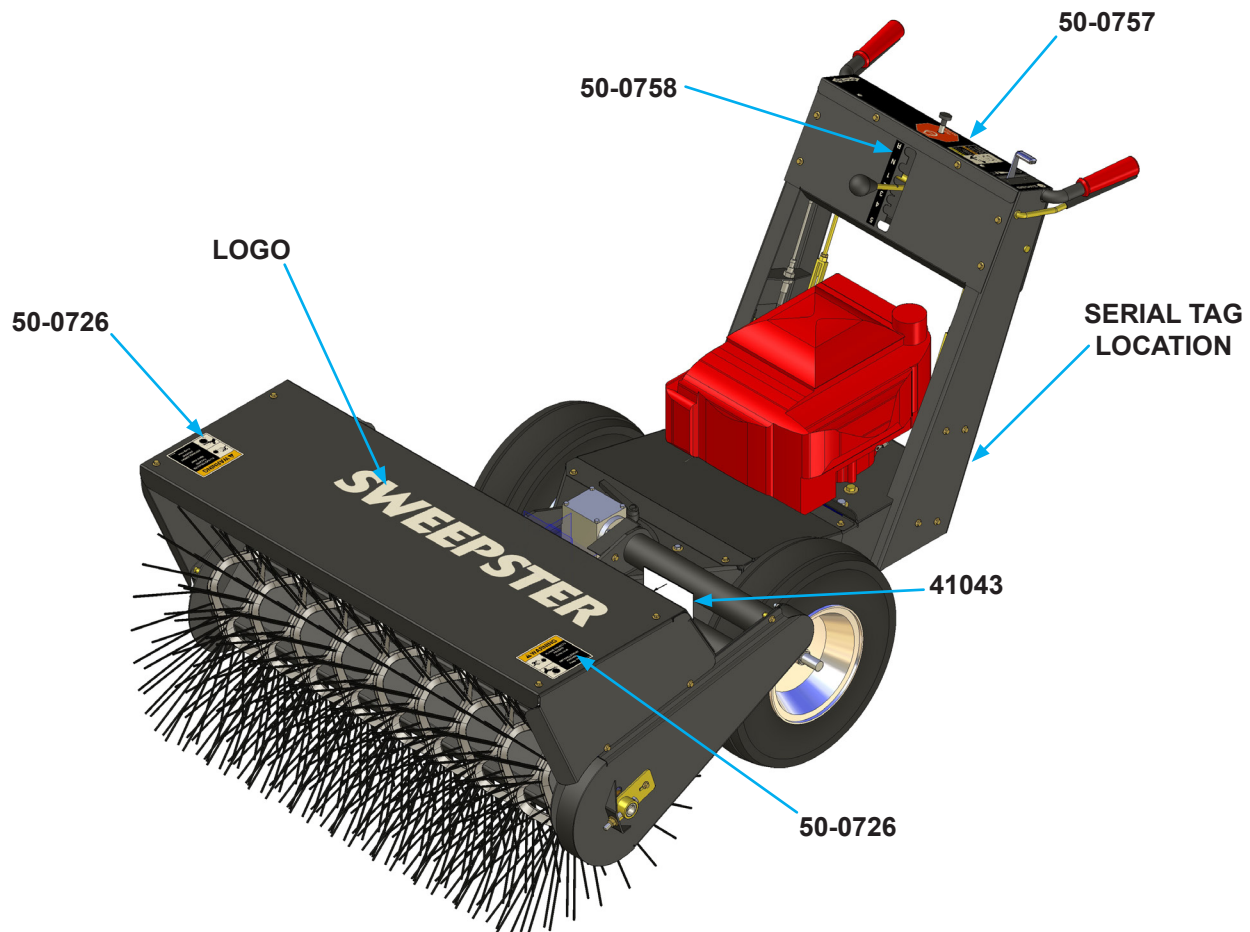
This sweeper is NOT intended for roof top use.

When operating sweeper, adhere to all government rules, local laws and other professional guidelines for your sweeping application.

DECALS

GENERAL INFORMATION

The diagram on this page shows the location of the decals used on your product. 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 this product. 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

5

4

3

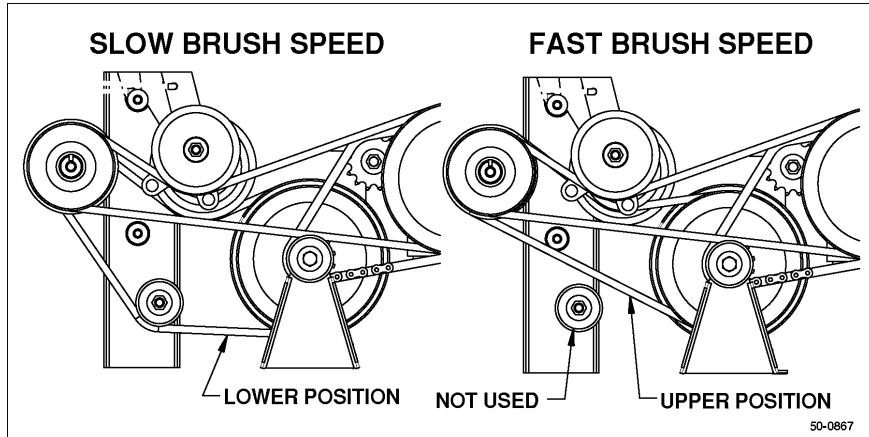
2

1

N

R

PART #50-0758
SHIFT PATTERN
DECAL



PART #50-0867
BELT SPEED
POSITION DECAL



PART #50-0726
WARNING! FLYING OBJECT/
ENTANGLEMENT DECAL



PART #41043
WARNING! HAZARDOUS DUST DECAL



PART #50-0757
HANDLE DECAL

NOTE: CONTACT YOUR LOCAL DEALER FOR MODEL NUMBER (IF SO EQUIPPED) AND LOGO DECALS.

OPERATION

INTENDED USE: This sweeper is designed for light duty cleanup, snow removal and lawn de-thatching. 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.

CAUTION! **A SWEEPER IS A DEMANDING MACHINE.** Only fully trained operators or trainee operators under supervision of a fully trained person should use this machine.



BEFORE OPERATING SWEEPER:

- Learn sweeper controls in an off-road location.
 - Be sure that you are in a safe area, away from traffic or other hazards.
 - Check all hardware making sure it is tight.
 - Replace any damaged or fatigued hardware with properly rated fasteners.
 - Check tire pressure before sweeping.
 - 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:

DANGER! This sweeper is **NOT** intended for roof top use.



When operating sweeper, adhere to all government rules, local laws and other professional guidelines for your sweeping application.

Minimize flying debris - use the slowest rotating speed that will do the job.

Keep hands, feet, hair and other loose clothing away from all moving parts.

Before leaving the operator's position for any reason, **STOP ENGINE.**

NOTICE! **AVOID TRANSMISSION DAMAGE.** Do not shift while in motion.

WARNING! Leave the brush hood (shield) and all other shields and safety equipment in place when operating the sweeper.



When sweeping on rough terrain, reduce speed to avoid "bouncing" the sweeper. Loss of control can result.

Never sweep toward people, buildings, vehicles or other objects that can be damaged by flying debris.


Only operate the controls while the engine is running.

While you 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.

OPERATION

BEFORE EACH USE

- Perform daily maintenance as indicated in Maintenance Schedule.
- Run the sweeper at a low idle. Check for proper brush rotation and drive engagement.

WARNING  **AVOID SERIOUS INJURY.** Check for large objects that could harm the operator or others if thrown by the sweeper. Remove these items before operating.

DURING USE

Directing Debris

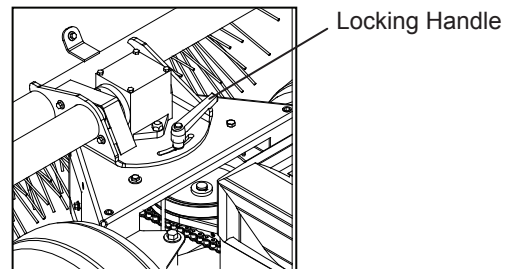
- Avoid excessive downward pressure on the brush sections to prevent excessive wear. A two to four inch wide pattern is sufficient for most applications.
- Direct debris by angling the brush head in that direction.
- Observe wind direction. Sweeping with the wind makes sweeping more effective and helps keep debris off the operator.

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

Brush Head Angling

1. Lift and rotate the locking handle counter-clockwise to loosen. (FIGURE 1)
2. Position the brush head at the desired angle.
3. Lift and rotate the locking handle clockwise to tighten.

FIGURE 1



Sweeping

1. Swing the brush head assembly the direction that you want to direct debris. (See Brush Head Angling)
2. Start the engine at idle and select forward drive speed. (1st-4th gear, 5th gear is for transport only.)
3. Engage the brush drive. (Left control lever)
4. Increase prime mover engine rpm to sweeping speed.
5. Engage the traction drive. (Right control lever)

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

OPERATING TIPS

NOTICE! **AVOID SWEEPER DAMAGE.** Do not ram into piles

NOTICE! If casters are installed they should be removed for operation in snow that is two inches or more in depth.

OPERATION

BRUSH, ENGINE & TRAVEL SPEEDS

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

LARGE AREAS

When sweeping a large area, such as a parking lot, make a path down the middle and sweep to both sides. This reduces the amount of debris that the sweeper must sweep to one side.

SNOW

Fast brush speeds and slow travel speeds are needed to sweep effectively. Start at 3/4 throttle and the lowest gear of the prime mover. For wet and/or deep snow, increase to almost full throttle. This helps keep snow from packing up inside the brush hood.

In deep snow you may need to make multiple passes to get down to a clean surface.

To keep snow from blowing back onto a swept area, always sweep so the wind is at your back.

DIRT & GRAVEL

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

Low brush speeds and moderate travel 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

Travel slowly - 1-2 mph.

Sweep a path less than the full width of the sweeper.

TRAVELING AROUND THE WORK SITE

1. Start engine at idle.
2. Select a gear with the appropriate travel speed for the conditions.
3. Push down on handles to raise the brushes off the ground and engage the traction drive control lever (right side).
4. To stop, release the traction drive control lever.

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

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.*

IMPORTANT: Before adjusting or servicing, push down emergency shut off switch and remove spark plug wire from spark plug.

- 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.
- Lubricate grease fittings.
- Disconnect battery cables.
- Store unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

Additional Precautions for Long Term Storage:

- Touch up all unpainted surfaces with paint to avoid rust.
- Check antifreeze properties and drain fluids as appropriate.
- Disconnect battery cables and store battery in a dry protected place.


REMOVAL FROM STORAGE:

- Remove cover.
- Wash unit and replace any damage and/or missing parts.
- Lubricate grease fittings.
- 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. When lifting decals are not present, verify that lifting accessories are securely attached and unit is stable before lifting.

- 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.

OPERATION

TIE DOWN POINTS

Tiedown points are identified by tiedown 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. When tiedown decals are not present, verify that tiedown accessories are securely attached and unit is stable before transporting.

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

WARNING!  **Verify that all tiedown 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.**

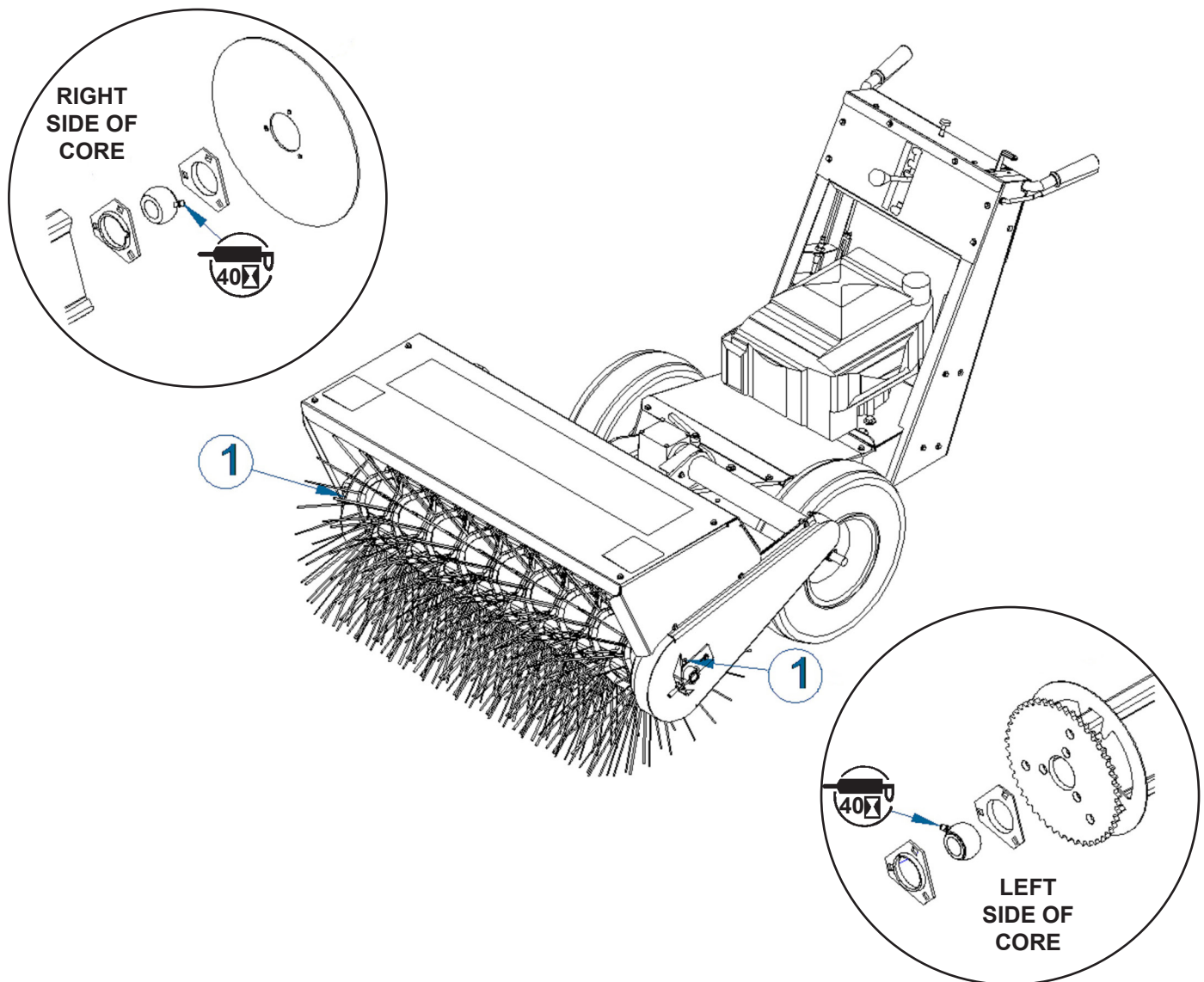
TRANSPORTING

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 product.

LUBRICATION

The following diagram is provided to help you locate all points on your sweeper that require lubricating. Be sure to follow the lubrication intervals as noted. Always replace any missing grease fittings as soon as possible.

1. Core bearing (2 fittings) (Brush may need to be rotated to align grease fitting with access hole.)



NOTICE! NO LUBRICATION IS REQUIRED FOR GEARBOX (05-1439) AND TRANSAXLE (05-1423). THESE ARE PRE-LUBRICATED FROM THE FACTORY. DAMAGE WILL OCCUR AND WILL VOID THE WARRANTY.

MAINTENANCE AND SERVICE

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.

MAINTENANCE SCHEDULE

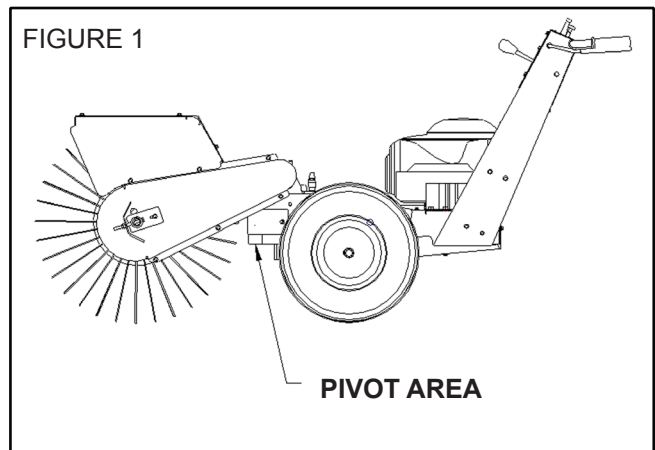
<u>PROCEDURES</u>	<u>DAILY (EVERY 8 HOURS)</u>	<u>WEEKLY (EVERY 40 HOURS)</u>	<u>AFTER EACH USE</u>
Hardware - Inspect & Tighten (See Bolt Torque Specifications)	✓		
Engine & Air Filter - Check & clean if necessary	✓		
Hydraulic System - Check for leaks and tighten as necessary. Check for damage and replace as needed.	✓		
Grease Fittings - Lubricate all grease fittings with multi-purpose grease. See Lubrication Diagram for locations.		✓	
Oil, Engine - Check Level	✓		
Brush Drive Chain - Adjust & Lubricate with chain lubricant		✓	
V-Belt Inspection	✓		
Wash Unit - Remove grease and debris			✓
Check Battery Connections (Electrolyte Level if not Maintenance Free)		✓	

Worn Section Standard				Reference Information	
Section OD, New	Ring ID	Section OD, Worn	Exposed Bristle, Worn	Bristle Length	Exposed Bristle, New
24	6.38	17	3.8	8.50	7.5
26	8.00	18	4.0	9.00	8.0
32	10.00	22	5.0	11.00	10.0
36	10.00	24	6.0	13.00	12.0
36	10.63	25	6.0	12.69	11.4
46	19.38	34	6.0	13.31	12.1

MAINTENANCE AND SERVICE

BRUSH CORE REMOVAL

1. Stop engine, push emergency switch and remove spark plug wire.
2. Support body in pivot area with a 10 inch minimum support (FIGURE 1).
3. Remove M6 bolts securing core adjustment weldments to the brush frame.
4. Remove left and right core adjustment screws.
5. Remove left and right core adjustment weldments.
6. Push core shaft to right until flush with bearing on sprocket of core.
7. Remove chain guard.
8. Remove chain.
9. Remove core.



BRUSH CORE INSTALLATION

1. Place core in brush frame.
2. Install chain.
3. Push core shaft to right until flush with bearing on sprocket.
4. Install chain guard.
5. Push core shaft to left.
6. Install core adjustment weldments and adjustment bolts, then M6 bolts.
7. While rotating brush, adjust final drive chain tension.
8. Be sure both left and right adjustments are equal.
9. Tighten all hardware.
10. Remove support from body.
11. Re-connect spark plug wire, run and test.

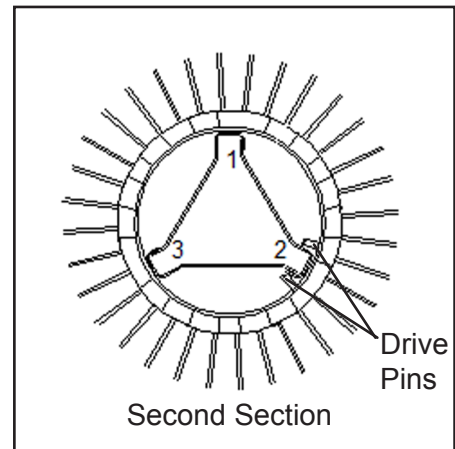
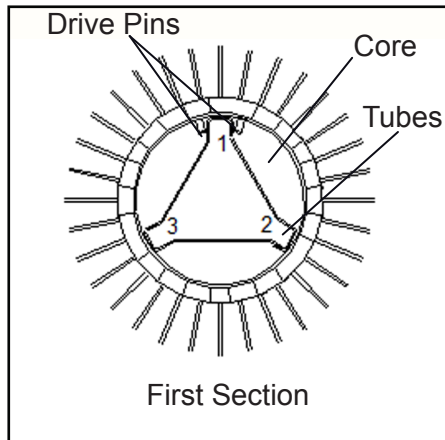
REPLACING BRUSH SECTIONS

1. Remove core from brush head assembly following brush core removal instructions.
2. Remove retaining plate from the core assembly.
3. Remove old sections.

MAINTENANCE AND SERVICE

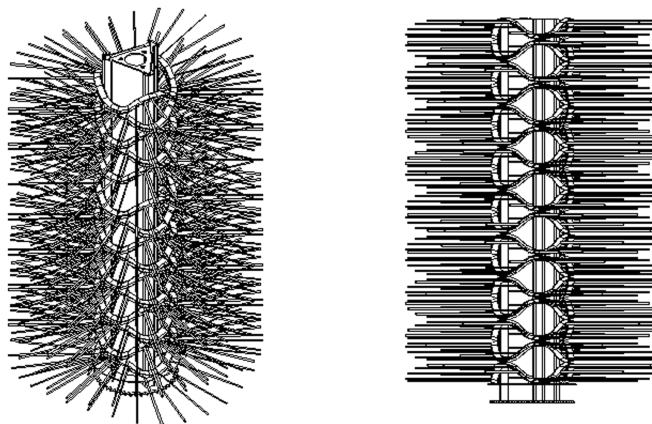
4. Install new sections by doing the following:
 - a. Number the tubes on the core as 1,2 and 3 (FIGURE 1).
 - b. Slide the first section onto the core with the drive pins on either side of tube 1. Make sure that the drive pins angle up (FIGURE 1).

FIGURE 1



- 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 (FIGURE 2).
 - d. Put the third section on with the drive pins around tube 3. Be sure the drive pins angle up.
 - e. Slide sections on until the core is full, making sure to alternate the tubes used and the direction of the drive pins.

FIGURE 2



5. Re-attach the section retainer plate with previously removed hardware.
6. Follow brush core installation instructions

MAINTENANCE AND SERVICE

BRUSH SPEED CHANGE

1. Stop engine, push emergency switch and remove spark plug wire.
2. Remove top cover.
3. Move brush drive V-belt to upper (faster rpm) or lower (slower rpm) set of grooves on engine, idler and jack shaft pulleys.
4. Re-install cover.
5. Connect spark plug wire.

TRANS AXLE DRIVE BELT REPLACEMENT

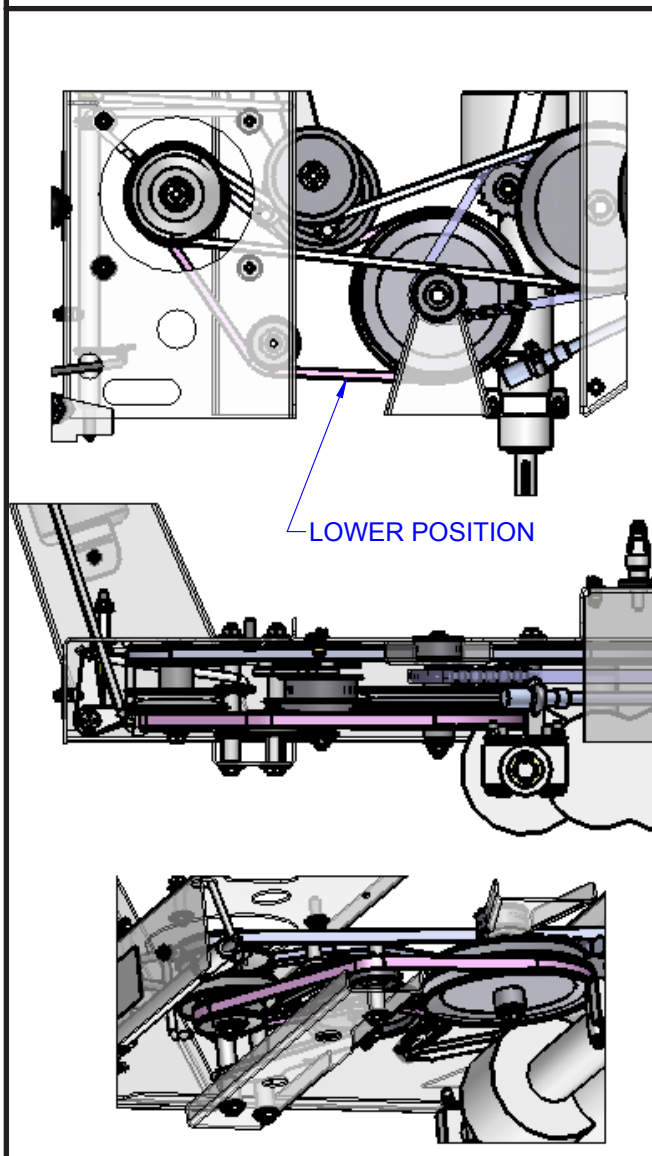
1. Stop engine, push emergency switch and remove spark plug wire.
2. Remove both top and bottom covers.
3. Remove front body cover.
4. Slide brush drive belt off engine pulley.
5. Remove and replace V-belt.
6. Re-install covers.
7. Adjust trans axle drive lever for proper engagement.

BRUSH DRIVE BELT REPLACEMENT

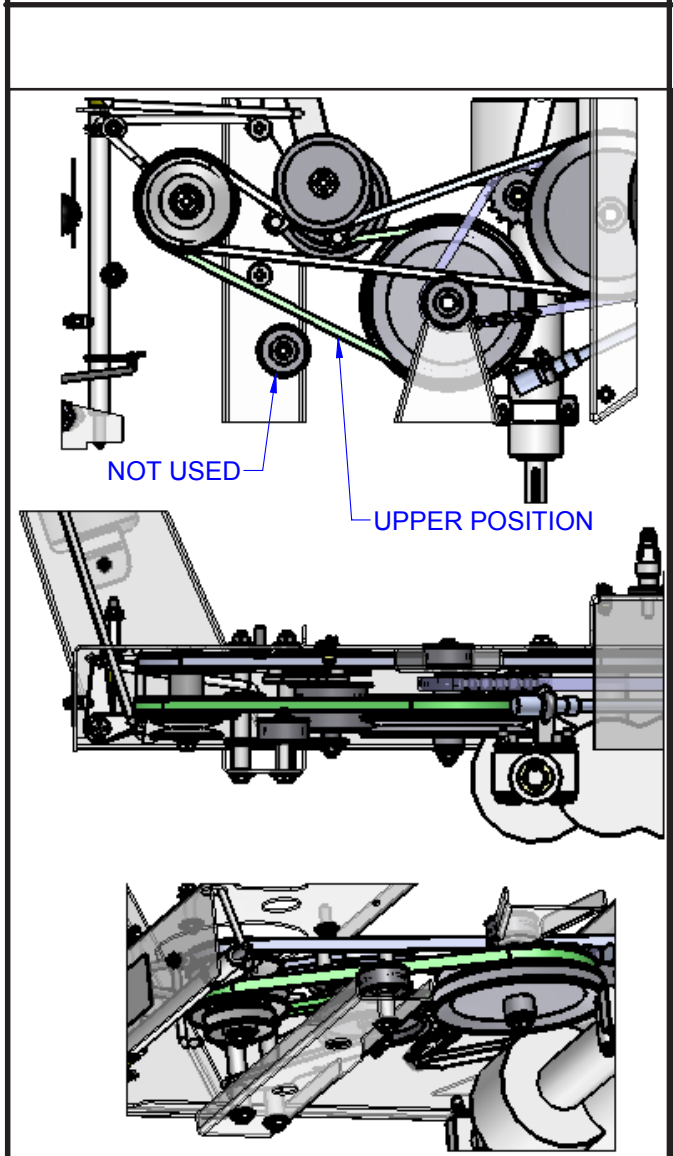
1. Stop engine, push emergency switch, remove spark plug wire.
2. Remove both top and bottom covers.
3. Release tension on chain idler.
4. Remove hardware for brush drive pulley.
5. Slide brush drive pulley towards engine and remove V-belt.
6. Install new V-belt onto brush drive pulley.
7. Slide brush drive pulley back into position.
8. Verify chain is in correct position on brush drive sprocket. If necessary remove front body cover to assist in chain repositioning.
9. Replace hardware for brush drive pulley.
10. Re-tension chain.
11. Make sure brush drive pulley spins freely after tightening.
12. Place V-belt on low or high speed pulley grooves of brush drive pulley, idler and engine pulley.
13. Re-install both covers.
14. Verify that all hardware is tight and replace spark plug wire.
15. Adjust brush drive lever for proper engagement.

MAINTENANCE AND SERVICE

BELT PLACEMENT SLOW BRUSH SPEED

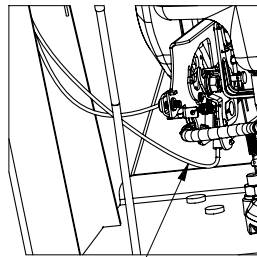
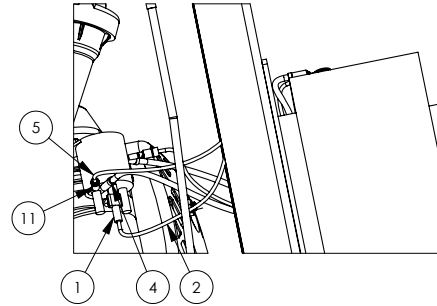
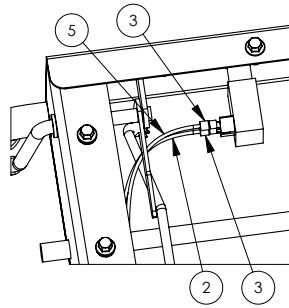


BELT PLACEMENT FAST BRUSH SPEED



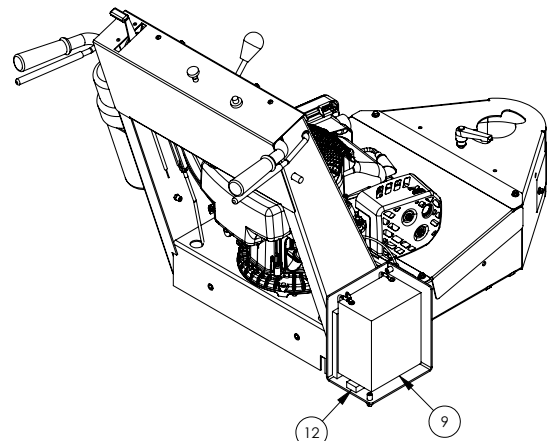
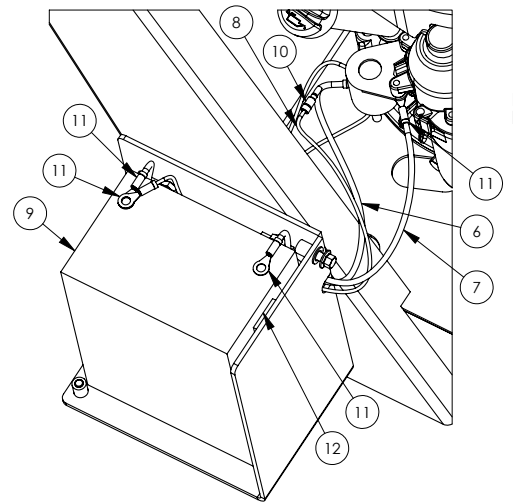
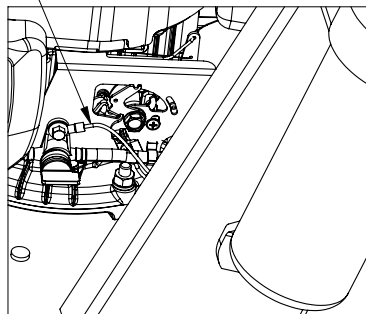
MAINTENANCE AND SERVICE

ELECTRIC START WIRING



RED WIRE FROM SWITCH
PUSH/PULL STOP

BLACK WIRE FROM SWITCH
PUSH/PULL STOP

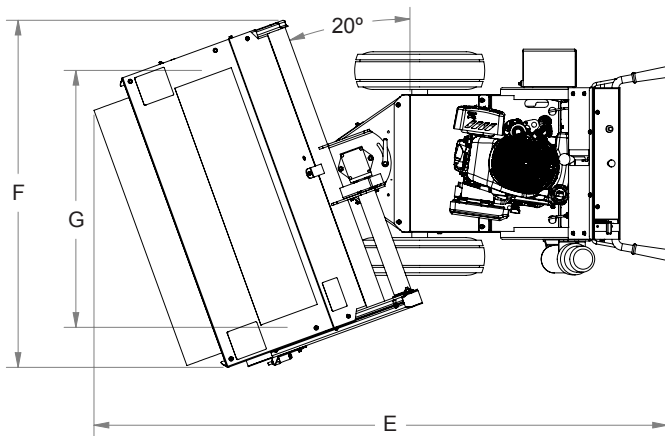
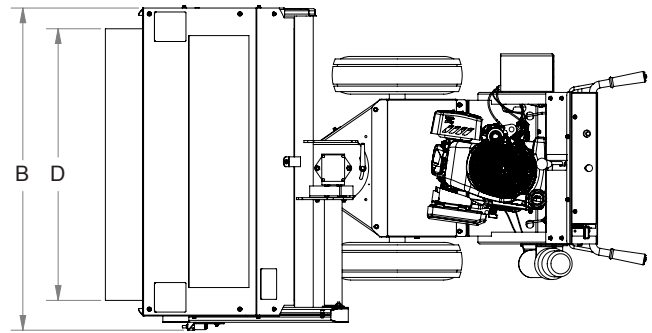
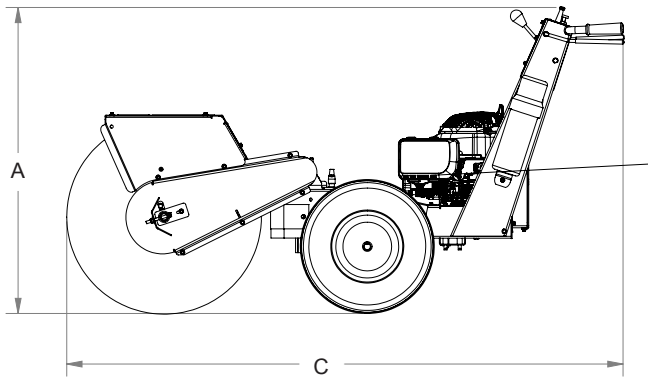


ITEM	REQ'D	PART NO.	DESCRIPTION
1	1	07-0812	Terminal Connector, Q/K, .25 Female, 16-14
2	2.5 ft	07-0832	Red Wire, 16ga
3	2	07-0916	Terminal Ring, #8, 16-14
4	1	07-0927	Terminal Ring, .25, 16-14
5	2.5 ft.	07-0961	Black Wire, 16ga
6	1.5 ft	07-1499	Red Wire, 10ga
7	1.5 ft.	07-1900	Black Wire, 10ga
8	1.5 ft.	07-5691	Brown Wire, 16ga
9	1	07-8284	Battery, 12 Volt Flooded
10	1	07-8306	Terminal, Bullet, Male, .156, 14-16
11	5	07-8307	Terminal Ring, .25, 16-14
12	3.5 ft.	09-0282	Rubber Neoprene Foam

TROUBLESHOOTING

Problem	Possible Cause	Possible Solution
Brush slows or stops when sweeping	Idler not engaging	Adjust turnbuckle
	Filter plugging	Change or clean air filter
	Travel speed too fast	Travel no more than 5 mph (8 kph) while sweeping (1-3 mph recommended)
	Trying to sweep too much material at once	Make several passes with sweeper
Brush head assembly “bounces” during sweeping	Travel speed too fast and/or brush speed too slow	Find correct combination of ground and brush speeds: do not travel at more than 5 mph (8 kph)
Brush wears into cone shape	Improper tire size or under inflation	Check tire sizes and rating: make corrections as necessary
Traction drive slips	Idler not working	Adjust turnbuckle
	Belt worn	Replace belt
Difficulty with changing gears	Out of adjustment	Adjust bulkhead nuts

SPECIFICATIONS



SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. WHENEVER APPLICABLE, SPECIFICATIONS ARE IN ACCORDANCE WITH SAE STANDARDS.

A. Overall Height	27.8 inches
B. Overall Width at 0°	41.1 inches
C. Overall Length at 0°	68.6 inches
D. Sweeping Width at 0°	36 inches
E. Overall Length at 20°	73 inches
F. Overall Width at 20°	44.1 inches
G. Sweeping Width at 20°	33 inches
Approximate Weight	295 lbs
Maximum Articulation	20°
Brush Diameter	24 inches

Specifications and Model Views without Optional Casters or Hopper

BOLT TORQUE SPECIFICATIONS

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				Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters		
Inches	Millimeters	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	


GRADE 2



GRADE 5






GRADE 8



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.		
		

Size of Bolt	Grade No.	Pitch (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
M6	5.6	1.0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-4	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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PARTS

In order to provide you with the most UP-TO-DATE part information, all parts for this attachment have been moved to our website at www.paladinattachments.com/Manuals. Please use these diagrams and parts lists to locate replacement parts.

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

To facilitate parts ordering when contacting the factory, please have the product control number (PCN or C/N) or model and serial number of your product ready to ensure that you receive the correct parts for your specific attachment.

The product control number, model and serial number for your attachment should be recorded in the space provided on the cover of this manual. This information may be obtained from the serial number identification plate located on your attachment.

NOTE: Most daily and emergency parts orders (in stock) received by 10:30 A.M. (Eastern Standard Time) will be shipped UPS Ground the same day received. UPS Next Day orders must be received by 1:30 PM (Eastern Standard Time.)

SERVICE DEPARTMENT

(734) 996-9116

(800) 456-7100

For Fax and E-mail Orders

PLC_Sales@paladinattachments.com

(734) 996-9014

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.