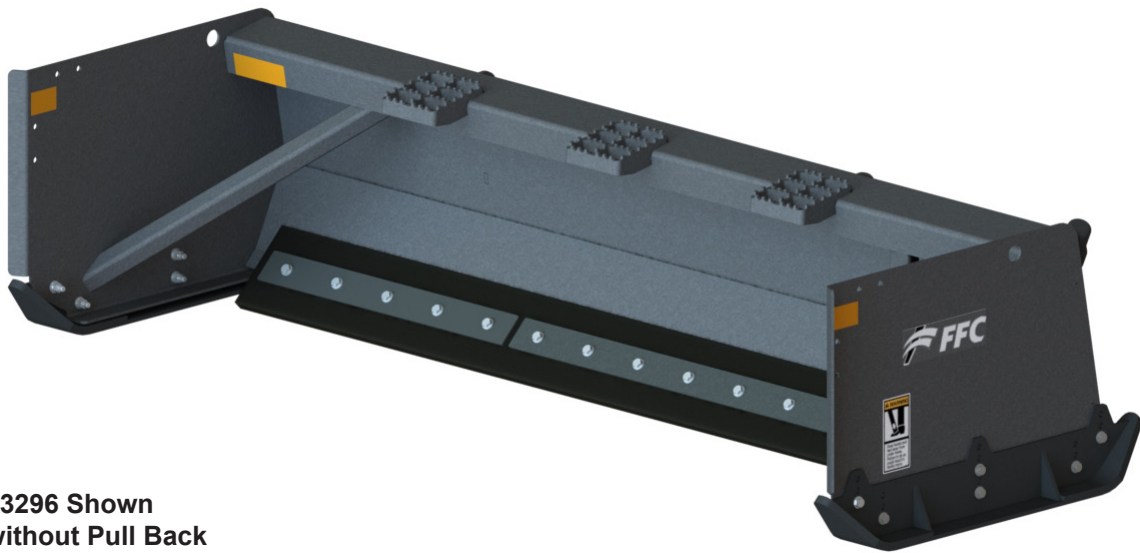




OPERATOR'S AND PARTS MANUAL

SNOW PUSH



**23296 Shown
without Pull Back**

SERIAL NUMBER: _____

MODEL NUMBER: _____

Manual Number: 51-4649

**Part Number: 23272, 23284, 23296,
23220, 23396, 23320,
23344, 23368, 22812,
22814, 22816, 22820
& Optional Kits**

Date: October 2013

Rev. 1

NOTES


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PREFACE

GENERAL INFORMATION

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.

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 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 manufacturer to obtain further assistance. Keep this manual available for reference. Provide this manual to any new owners and/or operator’s

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 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 impossible 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 POWER UNIT'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 and 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



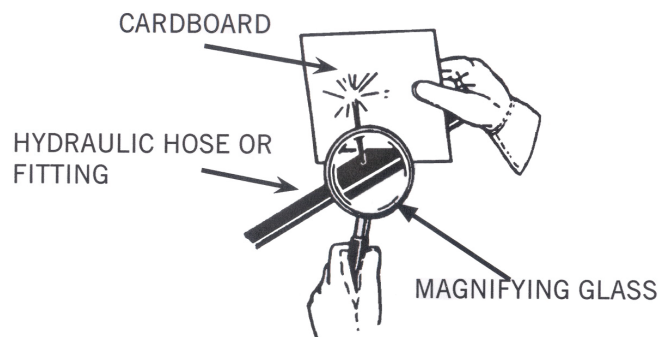
Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or onto 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 movers 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 immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a sound 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 tool 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.

WARNING! 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 operators 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.

GENERAL 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.

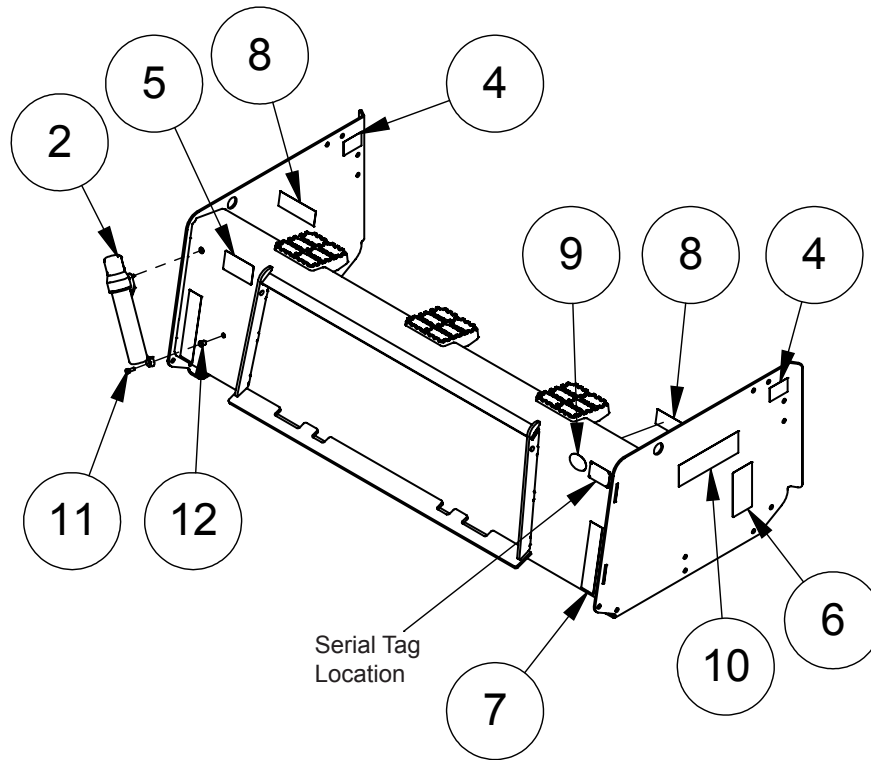
When sanding or grinding paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes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

DECALS & PLACEMENT

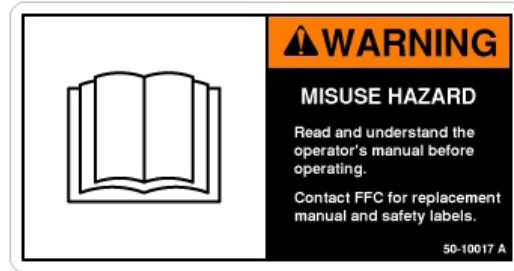


Item	Part	Qty	Description
2.	07-8273	1	Manual Holder, Small
4.	50-0916	4	Decal, Reflective Tape, Amber, 2 x 3
5.	50-10017	1	Decal, Warning, Avoid Serious Injury
6.	4468	2	Decal, Warning, Foot Crush
7.	RDL3131	2	Tape, Red Reflective, 2 x 6
8.	RDL3132	2	Tape, Amber Reflective, 2 x 6
9.	RDL3137	1	Decal, Made in the USA
10.	RDL3258	2	Decal, Logo, FFC, Large
11.	RHW1105	2	Screw, HHC, Gr5, 5/16-18 x 1
12.	RHW8642	2	Nut, Rivet, 5/16-18, .15-.312 Grip

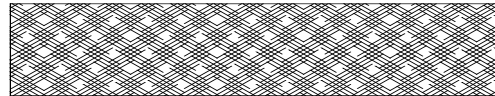
DECALS



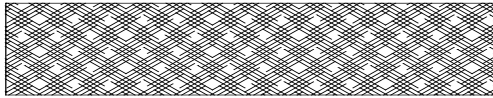
4468



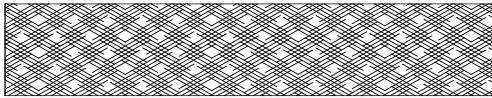
50-10017



RDL3132



RDL3131



50-0916



RDL3137

INSTRUCTIONS

- Keep all safety signs clean and legible.
- Replace all missing, illegible, or damaged safety signs.
- Replacement parts for parts with safety signs attached must also have safety signs attached.
- Safety signs are available, free of charge, from your dealer or from FFC.

PLACEMENT OR REPLACEMENT OF SAFETY SIGNS

1. Clean the area of application with non-flammable solvent, and then wash the same area with soap and water.
2. Allow the surface to fully dry.
3. Remove the backing from the safety sign, exposing the adhesive surface.
4. Apply the safety sign to the position shown in the diagram above and smooth out any bubbles.

INSTALLATION & SET-UP

SNOW PUSH MOUNTING

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).**

1. Place this product on a firm, level surface that is large enough to safely accommodate this product, your prime mover and all workers involved in the mounting process.
2. Refer to the operator's manual(s) for your prime mover, loader, and quick-attach and follow the mounting instructions.
3. Carefully raise the loader and cycle the tilt cylinders to check clearances and to verify that all mounting procedures have been successfully completed.

SNOW PUSH SETUP



SAFETY FIRST!! READ AND UNDERSTAND ALL SAFETY STATEMENTS BEFORE BEGINNING ANY SNOW PUSH SETUP

PULL BACK INSTALLATION (if not assembled prior to delivery.)

1. Park your prime mover on a level surface with your Snow Push properly attached.
2. Place your prime mover's transmission in "Park" and engage the parking brake.
3. Lower your Snow Push down on to the level surface in the normal operating position.
4. Shut off your prime mover's engine, remove the starter key, wait for all moving parts to come to a stop, and relieve all pressure in the hydraulic lines.
5. Place the pull back weldment in position and secure each end plate of the pull back weldment to the corresponding end plate of your Snow Push with hardware shown in parts list. Tighten the nuts to 150 ft. lbs (203 N-m).

INSTALLATION & SET-UP

PULL BACK RUBBER EDGE KIT INSTALLATION

1. Repeat steps 1 through 4 from the PULL BACK INSTALLATION instructions.
2. Lay the rubber edge on top of the pull back weldment.
3. Lay the rubber edge strap on top of the rubber edge and loosely secure both to the pull back weldment with hardware shown in parts list.
4. Adjust the rubber edge so that a maximum of 1.5 inches (3.8 cm) of the rubber edge is exposed in front of the steel plate on the pull back weldment and tighten the nuts to 75 ft.lbs (102 N-m).

BUCKET-LIP MOUNT INSTRUCTIONS (233 Series Only)

1. Place this product on a firm, level surface that is large enough to safely accommodate this product, your prime mover and all workers involved in the mounting process.

NOTICE! *Lifting this product before step 7 (below)
CAN result in damage to this product and
WILL void all FFC warranties.*

2. Carefully raise the loader arms and slowly drive forward inserting the edge of your bucket between the rectangular tubings on the Snow Push mounting.
3. Slowly roll the bucket downward (dumping) until the bucket edge is touching the lower tubes and the top of the bucket floor is touching the upper tubes, keeping the bucket edge as close to the back of the Snow Push as possible. This will make the distance between the chain links on the Snow Push and the chain loops on your bucket as close as possible.
4. Shut off your prime mover, remove the starter key, wait for all moving parts to come to a complete stop and relieve all pressure in the hydraulic lines.
5. Each of the center most chains should then be inserted through the chain loops on your bucket and then re-attached to itself keeping the chain as tight as possible.
6. If the bucket is wider than 80 inches (203 cm) connect the outer two chains as well.
7. Re-start your prime mover. Carefully raise the loader and cycle the rollback cylinders to verify that all mounting procedures have been successfully completed.

BUCKET-LIP MOUNT INSTRUCTIONS (228 Series Only)

1. Place this product on a firm, level surface that is large enough to safely accommodate this product, your prime mover and all workers involved in the mounting process.
2. Carefully raise the loader arms and slowly drive forward inserting the edge of your bucket between the cutout slots in the Snow Push mounting ears.
3. Slowly roll the bucket downward (dumping) until the bucket edge is touching the bottom edges of the cutouts and the top of the bucket floor is touching the upper tubes, keeping the bucket edge as close to the back of the Snow Push as possible. This will make the distance between the chain links on the Snow Push and the grab hooks on your bucket as close as possible.

INSTALLATION & SET-UP

(Optional) INSTALLING THE BINDER KIT (228 Series Only)

4. Shut off your prime mover, remove the starter key, wait for all moving parts to come to a complete stop and relieve all pressure in the hydraulic lines.
5. Grab hooks are to be welded to the side or back corners of the prime mover's bucket. The location should be chosen so the chains will be parallel to the ground when attached. This allows for easy centering of the Snow Push on the bucket.
6. Attach one end of .38 inch (.96 cm) transport chain sections to the right and left end of the Snow Push using .44 inch (1.12 cm) shackles. Drop the opposite ends into the grab hooks on the bucket leaving enough slack to attach ratchet binders and allow for centering of the Snow Push. Tighten ratchet binders.
7. Re-start your prime mover. Carefully raise the loader and cycle the rollback cylinders to verify that all mounting procedures have been successfully completed. If the Snow Push is off center repeat Step #4 and adjust slack in chains to center the Snow Push. Make sure to re-tighten ratchet binders and verify mounting procedures again.

OPERATION

Intended Use

This snow push is designed to push loose material only. With the optional pull back attachment, loose material may also be pulled while backing with your prime mover. Use in any other way is considered contrary to the intended use. Compliance with and strict adherence to operation, service and repair conditions as specified by the manufacturer, are also essential elements of the intended use.



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.

NOTICE! ***Moving hardened or compacted materials
CAN result in damage to this product and
WILL void all FFC warranties.***

General Storage:

Storage:

- 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.
- 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.

Removal from Storage:

- Remove cover.
- Wash unit and replace any damage and/or missing parts.

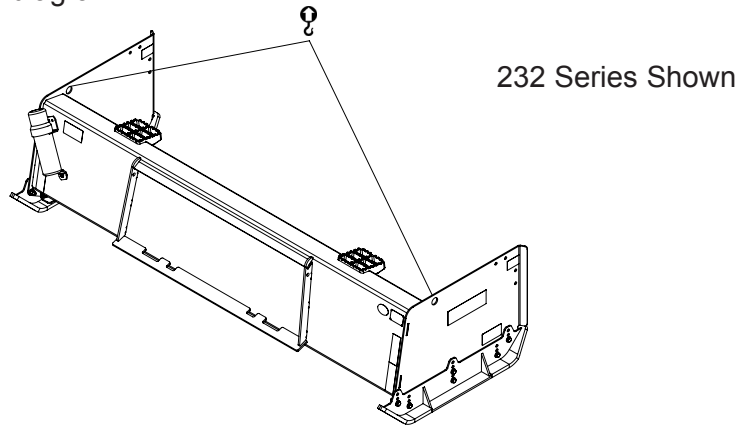
NOTICE! ***Prolonged pressure on the rubber edge will deform the rubber edge and decrease the effectiveness of the scraping action.***

When removing this product from your prime mover, place your Snow Push so that there is no pressure on the rubber edge. Prolonged pressure on the rubber edge will deform the rubber edge and decrease the effectiveness of the scraping action.


OPERATION

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:

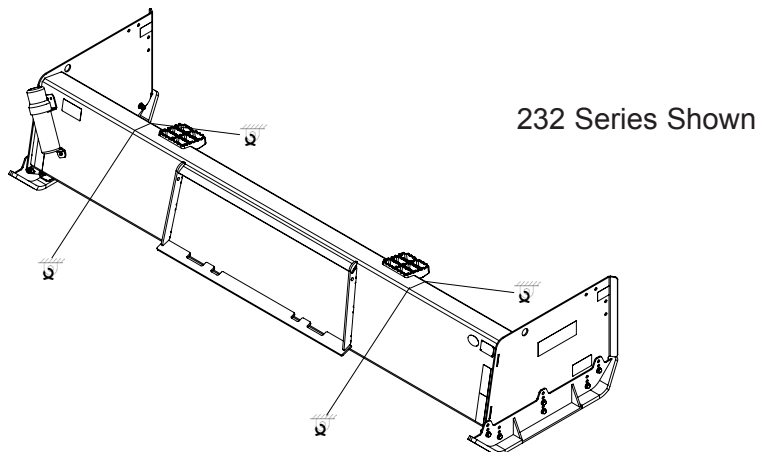


- Attach lifting accessories to unit at recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.


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.

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.**

MAINTENANCE

Procedure	Before Each Use
Check and Tighten all hardware and fasteners	✓
Check all safety decals that they are clean and legible	✓
Replace any damaged and excessively worn parts	✓

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.

MAINTENANCE

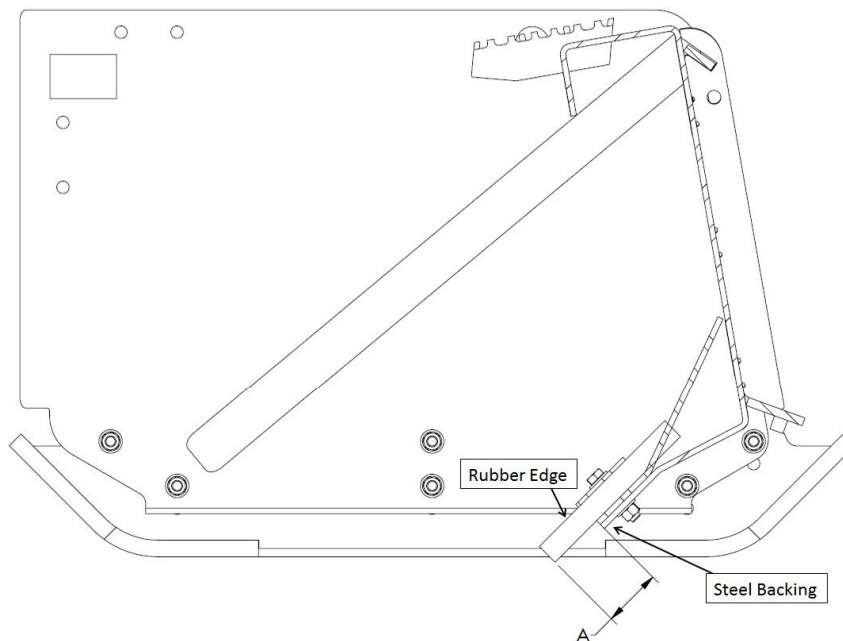
WARNING! DO NOT MODIFY MACHINE OR ATTACHMENTS



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.

ADJUSTING OR REPLACING THE RUBBER EDGE

1. Park your prime mover on a level surface with this product properly attached.
2. Place your prime mover's transmission in "Park" and engage the parking brake.
3. Lower your Snow Push down on to the level surface.
 - a) Place a solid object of 1 inch (2.5 cm) thickness or more under the skid shoes to raise the snow push adequately off the ground.
4. Shut off your prime mover's engine, remove the starter key, wait for all moving parts to come to a stop.
5. Loosen the nuts that secure the rubber edge and:
 - a) If adjusting the 1 inch (2.5 cm) rubber edge, move the rubber edge so that a maximum of 2.5 inches (6.4 cm) of the rubber edge is exposed beyond the steel backing. If adjusting the 1.5 inch (3.8 cm) rubber edge, move the rubber edge so that a maximum of 3.5 inches (8.9 cm) of the rubber edge is exposed beyond the steel backing as shown in the figure below (Dimension A).
 - b) If replacing the rubber edge, remove the rubber edge strap and the old rubber edge.
 - i. Dispose of the old rubber edge in an environmentally suitable manner.
 - ii. Lay the new rubber edge on top of the weldment.
 - iii. Lay the rubber edge strap on top of the new rubber edge and loosely secure both to the steel plate using hardware shown in parts list.
6. Retighten the nuts to 75 ft. lbs. (102 N-m) on the 232 and 233 series and 150 ft lbs. (203 N-m) on the 228 series.



SPECIFICATIONS

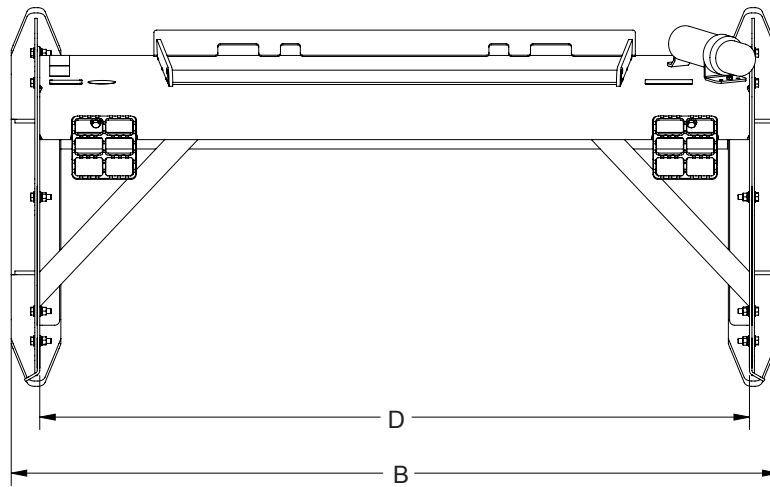
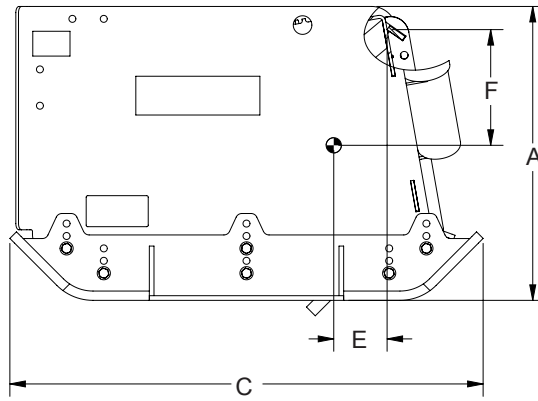
NOTICE!

**Exceeding any of the maximum recommended prime mover specifications
CAN result in damage to this product and
WILL void all FFC warranties.**

	232 Series	233 Series	228 Series
Weight of Prime Mover without Snow Push	11,500 lbs. (4990 kg) maximum	20,000 lbs. (9072 kg) maximum	32,000 lbs. (14,515 kg) maximum
Lift Capacity of Power Unit's Loader	9,500 lbs. (4309 kg) maximum	11,000 lbs. (4990 kg) maximum	11,000 lbs. (4990 kg) maximum
Minimum Loader Bucket Capacity	N/A	N/A	2.5cu yd (1.9 cu m)
Rear Ballast	As required to maintain full prime mover stability. (Note the Weight in the specifications, then see the operator's manual(s) for your prime mover, loader, and quick-attach for ballasting needs.)		

	23272	23284	23296	23220
A. Overall Height with Skid Shoe at Top Position	22.69 inches (57.6 cm)			
A. Overall Height with Skid Shoe at Bottom Position	24.69 inches (57.6 cm)			
B. Overall Width	77.25 inches (196.2 cm)	89.25 inches (226.7 cm)	101.25 inches (257.2 cm)	125.25 inches (318.1 cm)
C. Overall Length	38.14 inches (96.9 cm)			
D. Cutting Width	71.5 inches (181.6 cm)	83.5 inches (212.1 cm)	95.5 inches (242.6 cm)	119.5 inches (303.5 cm)
E. Center of Gravity-Horizontal	5.7 inches (14.5 cm)	5.3 inches (13.5 cm)	5.0 inches (12.7 cm)	4.5 inches (11.4 cm)
F. Center of Gravity-Vertical	12.4 inches (31.5 cm)	12.4 inches (31.5 cm)	12.3 inches (31.3 cm)	12.2 inches (31 cm)
Weight	525 lbs (238 kg)	570 lbs (258 kg)	615 lbs (279 kg)	705 lbs (320 kg)
Pullback without Rubber Edge	150 lbs (68 kg)	175 lbs (79 kg)	200 lbs (91 kg)	250 lbs (113 kg)
Pullback with Rubber Edge	185 lbs (84 kg)	215 lbs (98 kg)	245 lbs (111 kg)	305 lbs (138 kg)

SPECIFICATIONS



	23396	23320	23344	23368	22812	22814	22816	22820
A. Overall Height with Skid Shoe at Top Position	40.3 inches (102.4 cm)				46.8 inches (118.9 cm)			
A. Overall Height with Skid Shoe at Bottom Position	42.3 inches (107.4 cm)				48.8 inches (124 cm)			
B. Overall Width	101.5 inches (257.8 cm)	125.5 inches (318.8 cm)	149.5 inches (379.7 cm)	173.5 inches (440.7 cm)	149.7 inches (380.2 cm)	173.7 inches (441.2 cm)	197.7 inches (502.2 cm)	245.7 inches (624.1 cm)
C. Overall Length	41.5 inches (105.4 cm)				71.6 inches (181.9 cm)			
D. Cutting Width	95.5 inches (242.6 cm)	119.5 inches (303.5 cm)	143.5 inches (364.5 cm)	167.5 inches (425.5 cm)	142.5 inches (362 cm)	166.5 inches (422.9 cm)	190.5 inches (483.9 cm)	238.5 inches (605.8 cm)
E. Center of Gravity-Horizontal	10.3 inches (26.2 cm)	9.9 inches (25.2 cm)	9.5 inches (24.1 cm)	9.2 inches (23.4 cm)	30.5 inches (77.5 cm)	30.5 inches (77.5 cm)	30.5 inches (77.5 cm)	30.5 inches (77.5 cm)
F. Center of Gravity-Vertical	6.1 inches (15.5 cm)	6.1 inches (15.5 cm)	5.9 inches (15 cm)	5.9 inches (15 cm)	20.2 inches (51.3 cm)	20.2 inches (51.3 cm)	20.2 inches (51.3 cm)	20.2 inches (51.3 cm)
Weight	1100 lbs (499 kg)	1230 lbs (558 kg)	1375 lbs (624 kg)	1505 lbs (683 kg)	2485 lbs (1127 kg)	2660 lbs (1207 kg)	2835 lbs (1286 kg)	3185 lbs (1445 kg)
Pullback without Rubber Edge	200 lbs (91 kg)	250 lbs (113 kg)	290 lbs (132 kg)	335 lbs (152 kg)	N/A	N/A	N/A	N/A
Pullback with Rubber Edge	245 lbs (111 kg)	305 lbs (138 kg)	350 lbs (159 kg)	410 lbs (186 kg)	N/A	N/A	N/A	N/A




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	<p>GRADE 2</p>  <p>GRADE 5</p>  <p>GRADE 8</p> 
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	

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

WARRANTY

Limited Warranty

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

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

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

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

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

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

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

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

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

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

LIMITATIONS AND EXCLUSIONS.

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

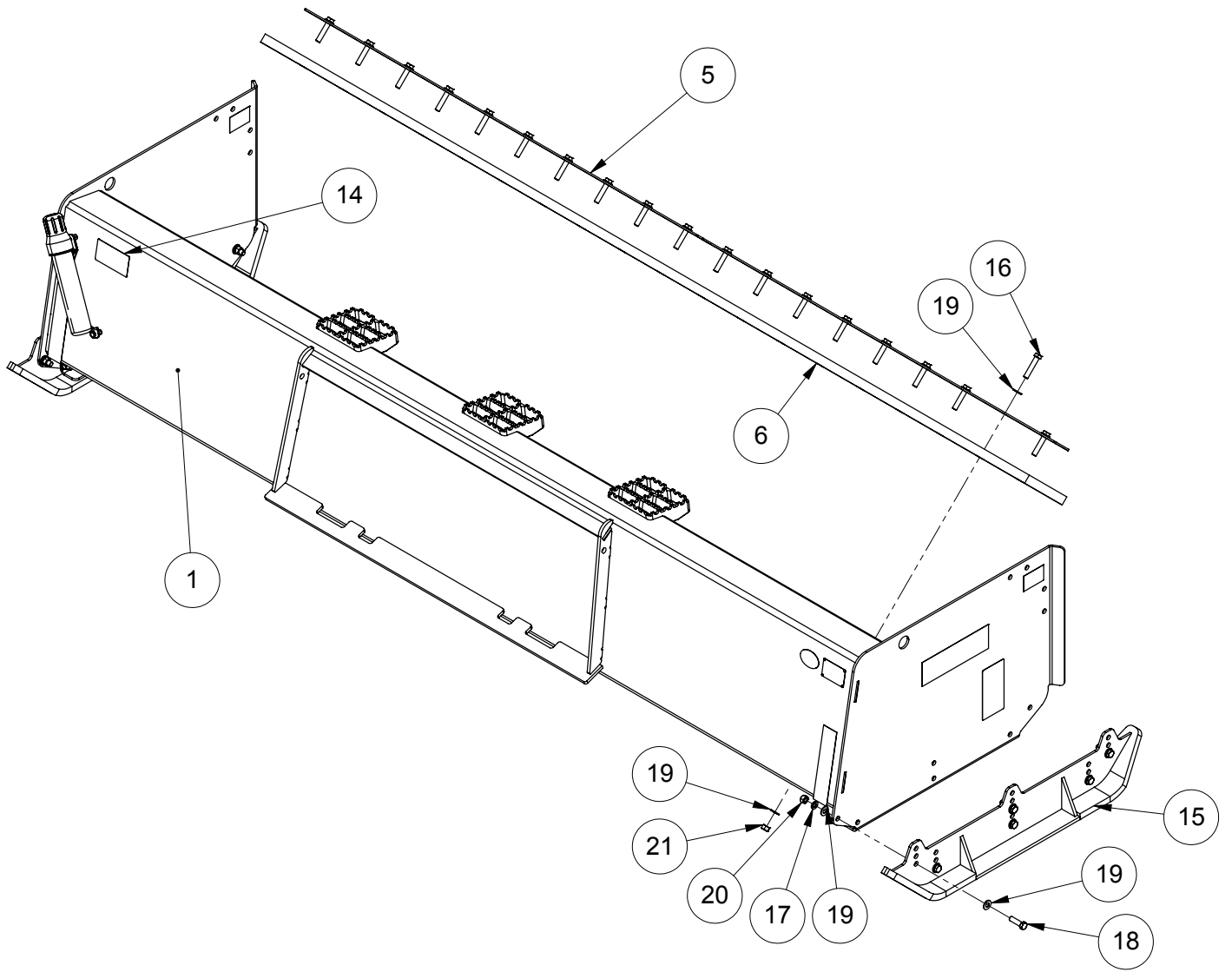
IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES.

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

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

February 10, 2010

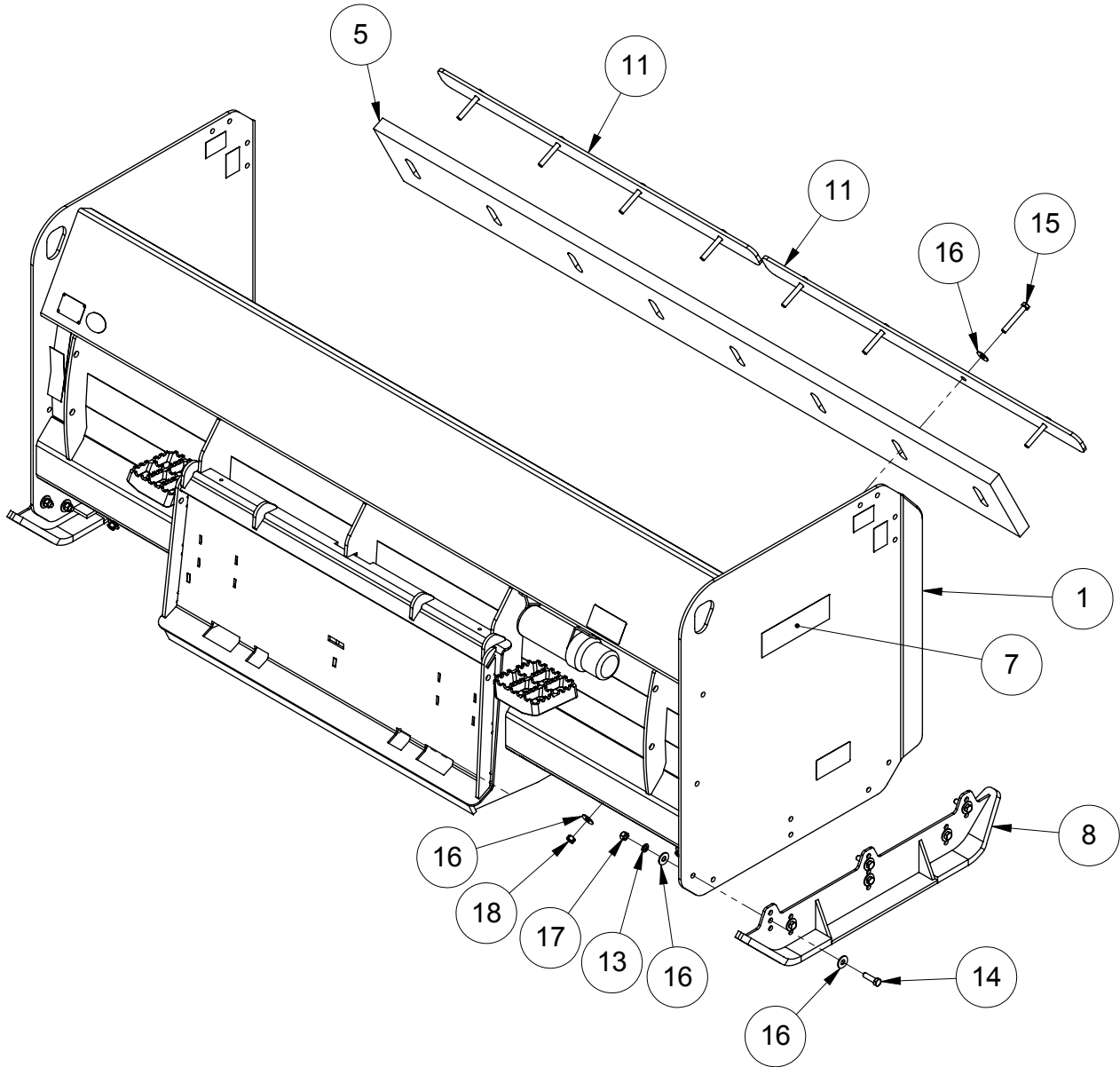
232 SERIES SNOW PUSH



232 SERIES SNOW PUSH

Item	Part	Qty	Description
1.	13-18113-72	1	Weld, Low Profile, 72 inch
	13-18113-84	1	Weld, Low Profile, 84 inch
	13-18113-96	1	Weld, Low Profile, 96 inch
	13-18113-120	1	Weld, Low Profile, 120 inch
5.	13-52537	1	Edge Strap (72 inch)
	13-52546	1	Edge Strap (84 inch)
	13-51941	1	Edge Strap (96 inch)
	13-52476	1	Edge Strap (96 inch)
	13-51941	1	Edge Strap (120 inch)
	13-52545	1	Edge Strap (120 inch)
6.	13-52539	1	Rubber Edge, 1 x 8 (72 inch)
	13-52538	1	Rubber Edge, 1 x 8 (84 inch)
	13-52467	1	Rubber Edge, 1 x 8 (96 inch)
	13-52468	1	Rubber Edge, 1 x 8 (120 inch)
14.	28-10830	1	Assembly, Labels
15.	LAF3605	2	Weld, Skid Shoe
16.	P100810	11	Screw, HHC, Gr5, .5 x 2.5 (72 inch)
	P100810	13	Screw, HHC, Gr5, .5 x 2.5 (84 inch)
	P100810	15	Screw, HHC, Gr5, .5 x 2.5 (96 inch)
	P100810	19	Screw, HHC, Gr5, .5 x 2.5 (120 inch)
17.	P851108	12	Washer, Lock, Gr5, .5
18.	RHW1406	12	Screw, HHC, Gr5, 1/2-13 x 1 3/4
19.	RHW5432	46	Washer, Flat, Gr5, .5 (72 inch)
	RHW5432	50	Washer, Flat, Gr5, .5 (84 inch)
	RHW5432	54	Washer, Flat, Gr5, .5 (96 inch)
	RHW5432	62	Washer, Flat, Gr5, .5 (120 inch)
20.	RHW7401	12	Nut, Hex, Gr5, .5
21.	RHW7403	11	Nut, Lock, Gr5, (72 inch)
	RHW7403	13	Nut, Lock, Gr5, (84 inch)
	RHW7403	15	Nut, Lock, Gr5, (96 inch)
	RHW7403	19	Nut, Lock, Gr5, (120 inch)

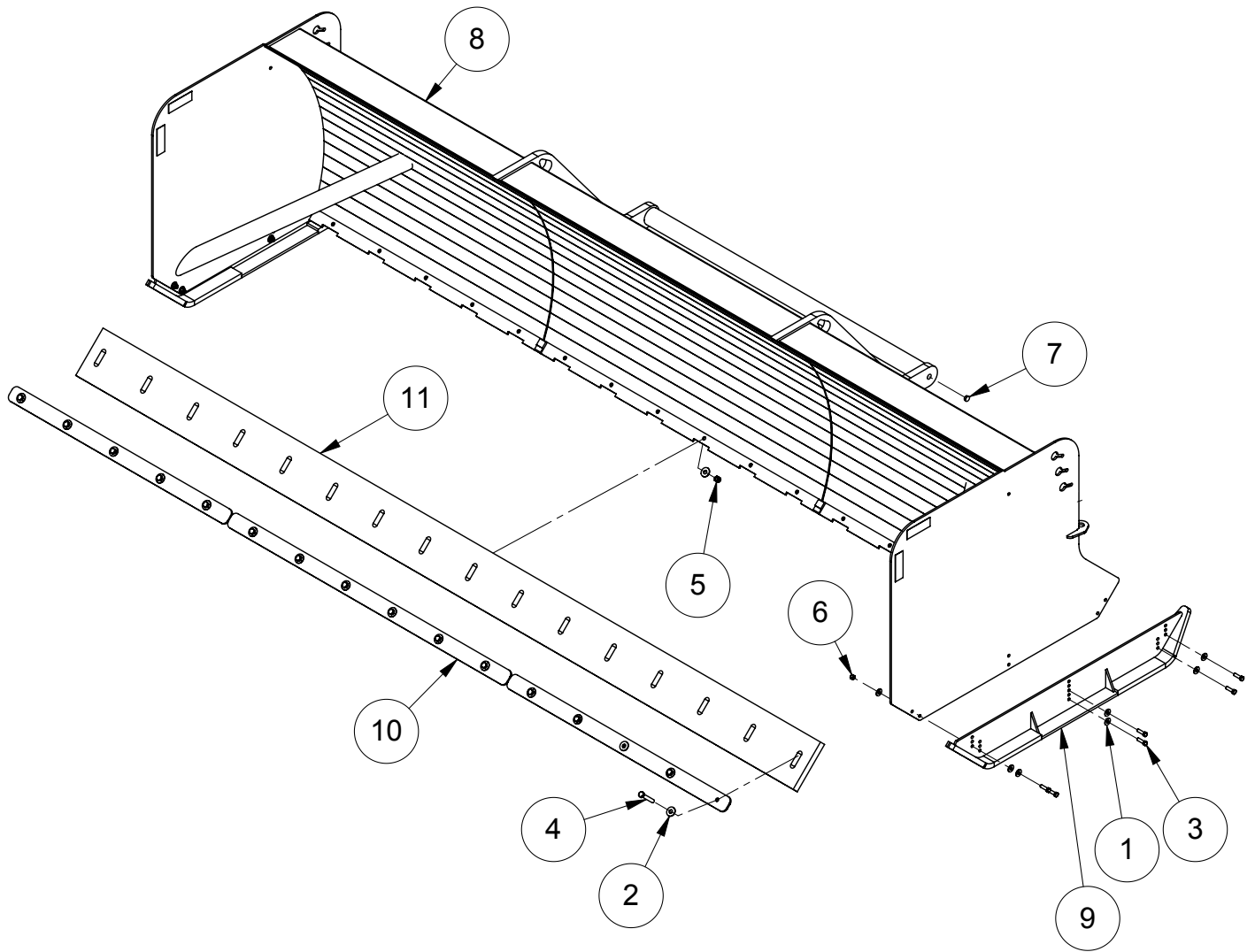
233 SERIES SNOW PUSHER



233 SERIES SNOW PUSH

Item	Part	Qty	Description
1.	13-18322-96	1	Weld, 3x3 (96 inch)
	13-18322-120	1	Weld, 3x3 (120 inch)
	13-18322-144	1	Weld, 3x3 (144 inch)
	13-18322-168	1	Weld, 3x3 (168 inch)
5.	LAF3667	1	Edge, Rubber, 1.5 x 10 x 91 (96 inch)
	LAF3668	1	Edge, Rubber, 1.5 x 10 x 115 (120 inch)
	13-52879	1	Edge, Rubber, 1.5 x 10 x 139 (144 inch)
	13-52880	1	Edge, Rubber, 1.5 x 10 x 163 (168 inch)
7.	28-10830	1	Assembly, Labels
8.	LAF3605	2	Weld, Skid Shoe
11.	LAF9408	2	Plate, Edge Strip, 4 ft (96 inch)
	LAF9408	3	Plate, Edge Strip, 4 ft (144 inch)
	LAF9408	1	Plate, Edge Strip, 4 ft (168 inch)
	LAF9409	2	Plate, Edge Strip, 5 ft (120 & 168 inch)
13.	P851108	12	Washer, Lock, 1/2
14.	RHW1406	12	Screw, HHC, 1/2-13 x 1 3/4, Gr5, Nylock
15.	RHW1413	8	Screw, HHC, 1/2-13 x 3 1/2, Gr5 (96 inch)
	RHW1413	10	Screw, HHC, 1/2-13 x 3 1/2, Gr5 (120 inch)
	RHW1413	12	Screw, HHC, 1/2-13 x 3 1/2, Gr5 (144 inch)
	RHW1413	14	Screw, HHC, 1/2-13 x 3 1/2, Gr5 (168 inch)
16.	RHW5462	40	Washer, Flat, Gr5, 1/2 (96 inch)
	RHW5462	44	Washer, Flat, Gr5, 1/2 (120 inch)
	RHW5462	48	Washer, Flat, Gr5, 1/2 (144 inch)
	RHW5462	52	Washer, Flat, Gr5, 1/2 (168 inch)
17.	RHW7401	12	Nut, Hex, Gr5, 1/2
18.	RHW7403	8	Nut, Lock, Gr5, 1/2 (96 inch)
	RHW7403	10	Nut, Lock, Gr5, 1/2 (120 inch)
	RHW7403	12	Nut, Lock, Gr5, 1/2 (144 inch)
	RHW7403	14	Nut, Lock, Gr5, 1/2 (168 inch)

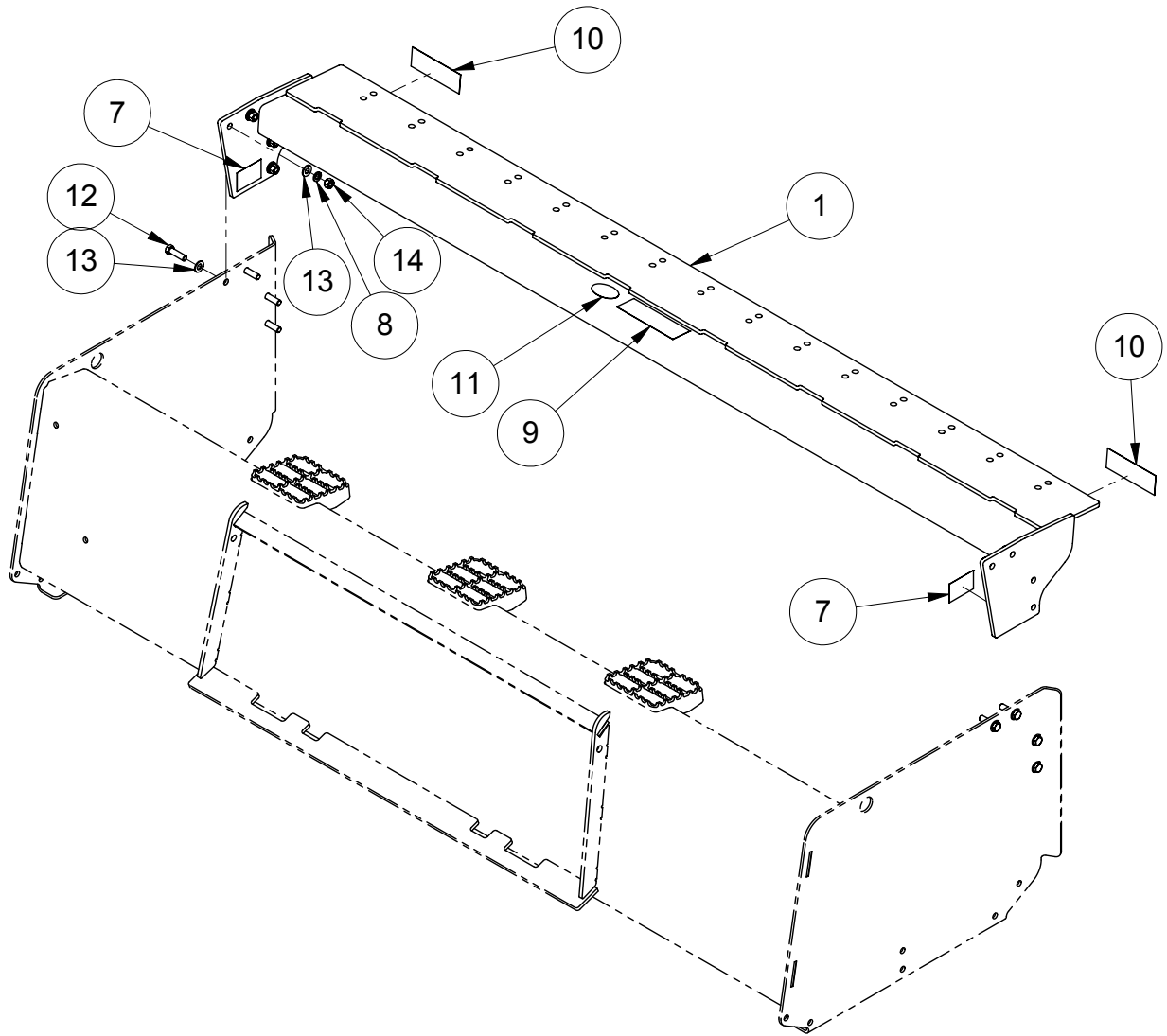
228 SERIES SNOW PUSH BUCKET LIP



228 SERIES SNOW PUSH BUCKET LIP

Item	Part	Qty	Description
1.	07-0156	24	Washer, Flat, Gr8, 1/2
2.	07-3120	24	Washer, Flat, Gr8, 5/8 (12 ft)
	07-3120	28	Washer, Flat, Gr8, 5/8 (14 ft)
	07-3120	32	Washer, Flat, Gr8, 5/8 (16 ft)
	07-3120	40	Washer, Flat, Gr8, 5/8 (20 ft)
3.	07-3671	12	Screw, HHC, Gr8, 1/2-13 x 1 3/4
4.	07-3682	12	Screw, HHC, Gr8, 5/8-11 x 4 (12 ft)
	07-3682	14	Screw, HHC, Gr8, 5/8-11 x 4 (14 ft)
	07-3682	16	Screw, HHC, Gr8, 5/8-11 x 4 (16 ft)
	07-3682	20	Screw, HHC, Gr8, 5/8-11 x 4 (20 ft)
5.	07-4031	12	Nut, Hex, Nylock, Gr8, 5/8-11 (12 ft)
	07-4031	14	Nut, Hex, Nylock, Gr8, 5/8-11 (14 ft)
	07-4031	16	Nut, Hex, Nylock, Gr8, 5/8-11 (16 ft)
	07-4031	20	Nut, Hex, Nylock, Gr8, 5/8-11 (20 ft)
6.	07-4037	12	Nut, Hex, Nylock, Gr8, 1/2-13
7.	07-4523	4	Cap, Tube, Vinyl, 1 x .51, Black
8.	13-17623-12	1	Weld, 4 x 4 , 12 ft, Bucket Lip Mount
	13-17623-14	1	Weld, 4 x 4 SP, 14 ft, Bucket Lip Mount
	13-17623-16	1	Weld, 4 x 4 SP, 16 ft, Bucket Lip Mount
	13-17623-20	1	Weld, 4 x 4 SP, 20 ft, Bucket Lip Mount
9.	13-17627	2	Weld, Skid Shoe
10.	13-17769	2	Plate, 3/8 x 3 x 68.5 (12 ft)
	13-50637	2	Plate, 3/8 x 3 x 56.5 (14 ft)
	LAF9408	1	Plate, 4 ft, Edge Strip (14 ft)
	13-50636	1	Plate, 3/8 x 3 x 72 (16 ft)
	13-50637	2	Plate, 3/8 x 3 x 56.5 (16 ft)
	13-50637	2	Plate, 3/8 x 3 x 56.5 (20 ft)
	LAF9409	2	Plate, 5 ft, Edge Strip (20 ft)
11.	13-17773	1	Edge, 1.5 x 10 x 137.5 (12 ft)
	13-17774	1	Edge, 1.5 x 10 x 161.5 (14 ft)
	13-50643	1	Edge, 1.5 x 10 x 185.5 (16 ft)
	13-51166	1	Edge, 1.5 x 10 x 233.5 (20 ft)

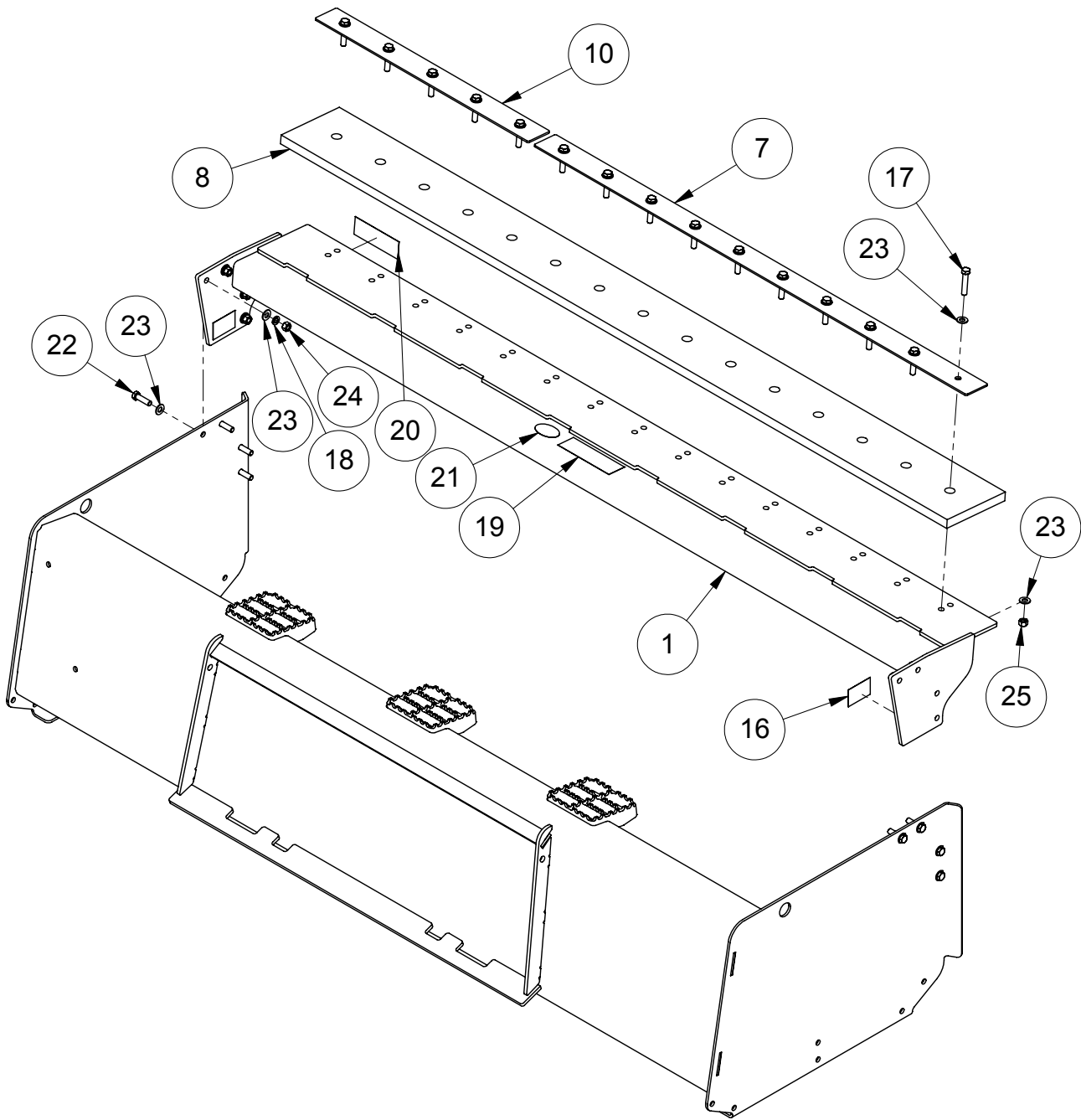
232/233 PULL BACK WITHOUT RUBBER EDGE



232/233 PULL BACK WITHOUT RUBBER EDGE

Item	Part	Qty	Description
1.	13-18060-72	1	Weld, Pullback for 72 inch
	13-18060-84	1	Weld, Pullback for 84 inch
	13-18060-96	1	Weld, Pullback for 96 inch
	13-18060-120	1	Weld, Pullback for 120 inch
	13-18060-144	1	Weld, Pullback for 144 inch
	13-18060-168	1	Weld, Pullback for 168 inch
7.	50-0916	2	Decal, Reflective Tape, Amber, 2 x 3
8.	P851108	8	Washer, Lock, Gr5, .5
9.	RDL3118	1	Label, Logo, FFC, Medium
10.	RDL3132	2	Tape, Amber, Reflective, 2 x 6
11.	RDL3137	1	Label, Made In USA
12.	RHW1406	8	Screw, HHC, Gr5, .5 x 1.75
13.	RHW5432	16	Washer, Flat, Gr5, .5
14.	RHW7401	8	Nut, Hex, Gr5, .5

232/233 PULL BACK WITH RUBBER EDGE



232/233 PULL BACK WITH RUBBER EDGE

Item	Part	Qty	Description
1.	13-18060-72	1	Weld, Pullback (72 inch)
	13-18060-84	1	Weld, Pullback (84 inch)
	13-18060-96	1	Weld, Pullback (96 inch)
	13-18060-120	1	Weld, Pullback (120 inch)
	13-18060-144	1	Weld, Pullback (144 inch)
	13-18060-168	1	Weld, Pullback (168 inch)
7.	13-51941	1	Plate, Strap, Rubber Edge (96 & 120 inch)
8.	13-52539	1	Edge, Rubber, 1 x 8 x 67.25 (72 inch)
	13-52539	2	Edge, Rubber, 1 x 8 x 67.25 (144 inch)
	13-52538	1	Edge, Rubber, 1 x 8 x 79.25 (84 inch)
	13-52538	2	Edge, Rubber, 1 x 8 x 79.25 (168 inch)
	13-52467	1	Edge, Rubber, 1 x 8 x 91.25 (96 inch)
	13-52468	1	Edge, Rubber, 1 x 8 x 115.25 (120 inch)
10.	13-52537	1	Plate, Edge Strap, 6 Feet (72 inch)
	13-52537	2	Plate, Edge Strap, 6 Feet (144 inch)
	13-52546	1	Plate, Edge Strap, 7 Feet (84 inch)
	13-52546	2	Plate, Edge Strap, 7 Feet (168 inch)
	13-52476	1	Plate, Edge Strap, 2.5 Feet (96 inch)
	13-52545	1	Plate, Edge Strap, 4.5 Feet (120 inch)
16.	50-0916	2	Decal, Reflective Tape, Amber, 2 x 3
17.	P100810	11	Bolt, Hex, Gr5, 1/2 x 2 1/2 (72 inch)
	P100810	13	Bolt, Hex, Gr5, 1/2 x 2 1/2 (84 inch)
	P100810	15	Bolt, Hex, Gr5, 1/2 x 2 1/2 (96 inch)
	P100810	19	Bolt, Hex, Gr5, 1/2 x 2 1/2 (120 inch)
	P100810	22	Bolt, Hex, Gr5, 1/2 x 2 1/2 (144 inch)
	P100810	26	Bolt, Hex, Gr5, 1/2 x 2 1/2 (168 inch)
18.	P851108	8	Washer, Lock, 1/2
19.	RDL3118	1	Decal, Logo
20.	RDL3132	2	Decal, Reflective Tape, Amber, 2 x 6
21.	RDL3137	1	Decal, Made in the USA
22.	RHW1406	8	Screw, HHC, Gr5, Nylock, 1/2-13 x 1 3/4
23.	RHW5432	38	Washer, Flat, Gr5, .5 (72 inch)
	RHW5432	42	Washer, Flat, Gr5, .5 (84 inch)
	RHW5432	46	Washer, Flat, Gr5, .5 (96 inch)
	RHW5432	54	Washer, Flat, Gr5, .5 (120 inch)
	RHW5432	60	Washer, Flat, Gr5, .5 (144 inch)
	RHW5432	68	Washer, Flat, Gr5, .5 (168 inch)
24.	RHW7401	8	Nut, Hex, Gr5, .5
25.	RHW7403	11	Nut, Lock, Gr5 (72 inch)
	RHW7403	13	Nut, Lock, Gr5 (84 inch)
	RHW7403	15	Nut, Lock, Gr5 (96 inch)
	RHW7403	19	Nut, Lock, Gr5 (120 inch)
	RHW7403	22	Nut, Lock, Gr5 (144 inch)
	RHW7403	26	Nut, Lock, Gr5 (168 inch)