



OPERATOR'S & PARTS MANUAL

FORKED SCRAP GRAPPLE



PALADIN
LIGHT CONSTRUCTION GROUP

BRADCO

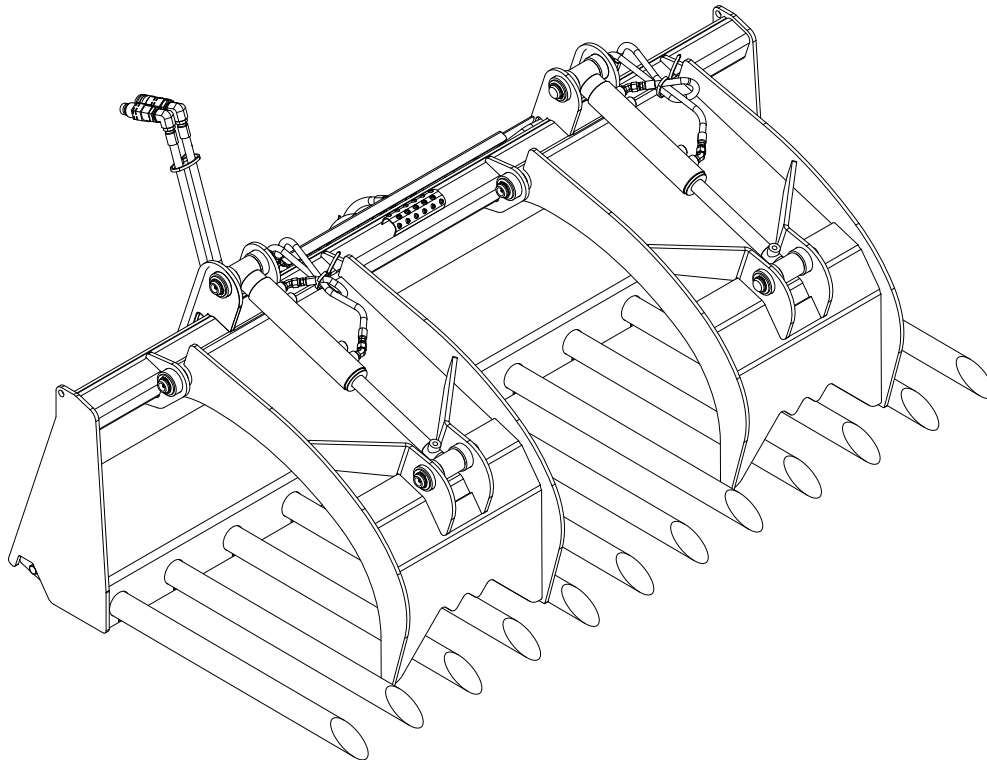
FFC

HARLEY

MCMILLEN

SWEEPSTER

The Power of Combined Excellence



SERIAL NUMBER: _____

MODEL NUMBER: _____

Manual Number: 51-10019

Models covered:

**10067, 10073, 10079, 10085;
10167, 10173, 10179 & 10185.**

Rev. 2

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INTRODUCTION

Congratulations on your purchase of your new FFC product! This product has been designed and built solely for use in material handling. You or any other person who will be assembling, operating, maintaining, or working with this product are required to read and completely understand the information and instructions contained in this manual. If anyone does not fully understand every part of this manual, please obtain further assistance by contacting the dealer from which this product was purchased or by contacting FFC at the telephone number or address listed on the cover of this manual. Keep this manual available for reference whenever this product is being handled or used. Provide this manual to any new owners and/or operators.

This manual covers models: **10067, 10073, 10079, 10085; 10167, 10173, 10179 and 10185**. The difference between the models is the width and design of the product, details of which are covered on the parts list and specifications page(s).

GENERAL INFORMATION

The purpose of this manual is to assist in assembling, mounting, operating, and maintaining your attachment. Read this manual carefully to obtain valuable information and instructions that will help you achieve years of safe and dependable service.

The illustrations and data used in this manual were current at the time of printing, but due to possible engineering and/or production changes, this product may vary slightly in detail. FFC reserves the right to redesign and/or change components as may be necessary without notification to anyone.

Throughout this manual, references may be made to:

Prime Mover	The engine-driven machine to which this product must be attached.
Right, Left, Front, Rear	Directions that are determined in relation to the operator of the equipment when seated in the normal operation position.
IMPORTANT	Precautions that must be followed to prevent substandard performance.

SERIAL NUMBER LOCATION

Always refer to the model and serial number when ordering parts or requesting information from your dealer. See Safety Signs section for the location of the serial number plate for this product.

Reference Information	
Model Number	Loader Make
Serial Number	Loader Model
Date Purchased	Loader Serial Number

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 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



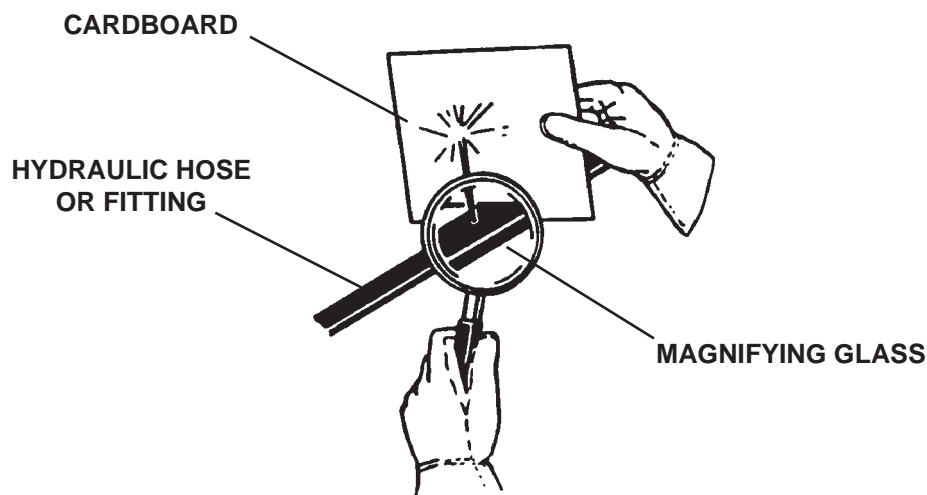
Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground 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.

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.

EQUIPMENT SAFETY PRECAUTIONS



OPERATING THE FORKED SCRAP GRAPPLE

- 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, turn off the primer mover's engine, remove the key and apply the brakes.
- Never heap or load heavy material where the combined weight of the forked scrap grapple and material could exceed the rated lifting capacity of the loader.
- Be sure the load does not stick out too far in front of the rake. A light load sticking out too far can have the same tipping effect as a heavy load carried in close.
- When using the grapple, lift the load slightly and make sure that the load is secure. If the load appears to be unstable, lower the load, open the grapple and reposition the load to attain full stability.



TRANSPORTING THE FORKED SCRAP GRAPPLE

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on slopes.
- 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 gas tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.



MAINTAINING THE FORKED SCRAP GRAPPLE

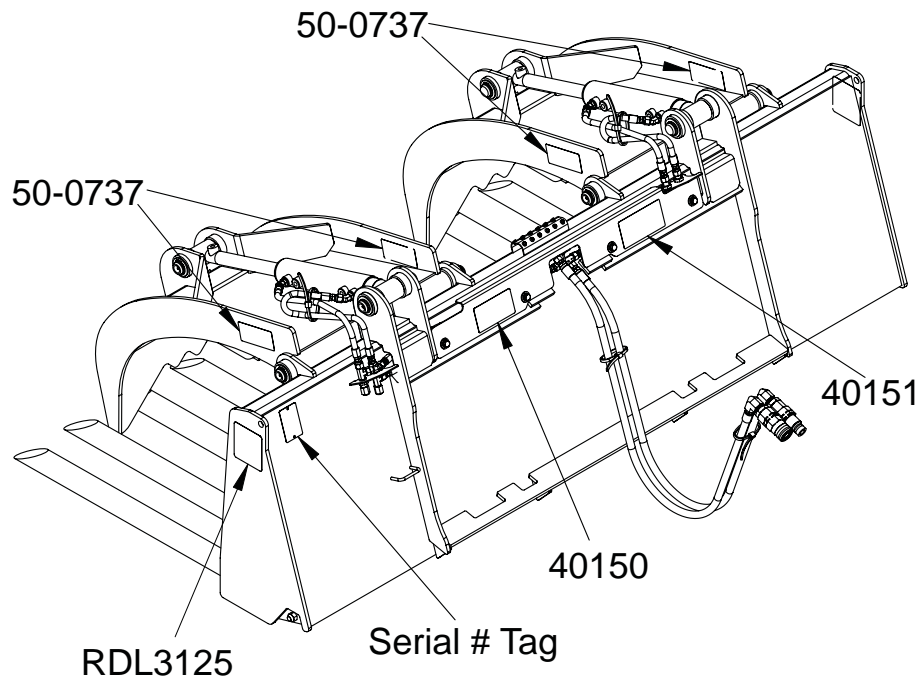
- Before performing maintenance, lower the attachment to the ground, turn off the engine, remove the key and apply the brakes.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator service manual's before any repair is made. After completing 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 FFC.
- Never make hydraulic repair while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.

DECALS

DECAL PLACEMENT

GENERAL INFORMATION

The diagram on this page shows the location of the decals used on the FFC Forked Scrap Grapples. 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.



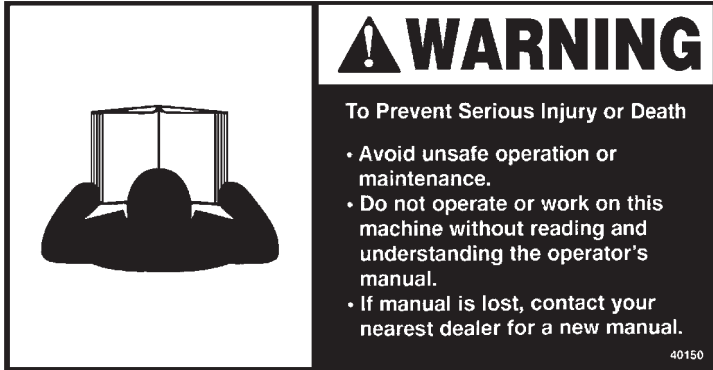
INSTRUCTIONS

- 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.

DECALS



PART #40150
WARNING! READ OPERATOR'S MANUAL



PART #40150
WARNING! HIGH PRESSURE FLUID



PART #50-0737
WARNING! PINCH POINT HAZARD



PART #RDL3125
WARNING! CRUSH HAZARD

PRIME MOVER SPECIFICATIONS

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

DESCRIPTION	SPECIFICATIONS
Weight of Prime Mover without Forked Scrap Grapple	20,000 lbs. maximum
Lift Capacity of Prime Mover's Loader	10,000 lbs. maximum
Operating Capacity of Prime Mover's Loader	5,000 lbs. maximum
Hydraulic Pressure Output	4,000 psi maximum
Rear Ballast	As required to maintain full prime mover stability. (Note the shipping weight of your model, then see the operator's manual(s) for your prime mover and loader for ballasting needs.)

ATTACHMENT SPECIFICATIONS

Model Number	Overall Width	Overall Height w/ Closed Grapples	Overall Depth w/ Univ Mounts	Weight
STANDARD				
10067	66"	17.3"	40.5"	1266#
10073	73"	17.3"	40.5"	1301#
10079	78"	17.3"	40.5"	1329#
10085	84"	17.3"	40.5"	1364#
FULL FEATURED				
10167	66"	17.3"	40.5"	1303#
10173	73"	17.3"	40.5"	1414#
10179	78"	17.3"	40.5"	1442#
10185	84"	17.3"	40.5"	1477#

All replacement hydraulic hoses and fittings must have a minimum rated working pressure of 4,000 psi.

BOLT TORQUE




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	<div style="text-align: center;"> <p>GRADE 2</p>  <p>GRADE 5</p>  <p>GRADE 8</p>  </div>
5/16	7.94	14	19	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

OPERATION

OPERATING TIPS

Before each Use

Perform daily maintenance as indicated in the Maintenance Schedule.

Activate the attachment cylinder(s) with the prime mover at a slow idle. Check for hydraulic leaks or other problems and make corrections, if necessary, before using. See "Fittings/Hoses Inspection Guidelines" (pg. 16).

During Use

WARNING! Avoid serious injury.



- THE GRAPPLE MOVES QUICKLY! Do not allow anyone near the grapples.
- Never get between the grapple and the rake.
- Do not lift any load that is taller than the height of the fully opened grapple.
- Do not roll back this product so far that the load falls off toward or on the operator.

Positioning the Load

Approach the load so that the weight will be centered on the floor of the attachment. If the load has a heavy side, then that side should be closest to the rear of the rake rather than near the rake edge.

If the grapple is ever used as a rake to drag materials into a position for being picked up, **the grapple must be completely open**. Applying a raking-type force to the partially open grapple will greatly magnify the fluid pressure in the hydraulic hoses, fittings, and cylinders and may cause those components to fail.

**NOTICE - Using the partially open grapple as a rake
CAN result in damage to this product and
WILL void all FFC warranties!**

Make certain that the rake is completely under the load and make certain that the rake floor is level.

Close the grapple to the fullest extent possible.

Lift the load slightly and make sure that the load is secure. If the load appears to be unstable, lower the load, reposition the load to achieve full stability, and repeat above steps until full stability is achieved.

Transporting the Load

WARNING! Avoid serious injury.



- Raise the load to the **minimum** height required for the terrain that must be crossed with the load.
- Operate the prime mover so that the load always remains level.
- Accelerate, turn, and brake gradually.
- Avoid any obstacles, bumps, or holes in your intended path.
- Frequently check the load to make sure that the load has not become unstable

OPERATION

FORKED SCRAP GRAPPLE INSTALLATION

Attachment to Prime Mover

WARNING! Improper attachment of the Forked Scrap Grapple could result in injury or death. Do not operate this product until you have positive indication that the attachment is securely mounted.



1. Position the attachment on a level surface.
2. Enter the prime mover.
3. Fasten the safety restraints.
4. Start the engine.
5. Disengage the parking brake.
6. Follow the attaching procedure in the prime mover owners manual. Align the attachment mechanism with the mounting on the grapple rake, attach to the prime mover.
7. Engage the parking brake and shut down the prime mover. Be sure to relieve pressure to the auxiliary hydraulic lines.
8. Unfasten safety restraints and exit the prime mover.
9. Ensure that the hydraulic quick couplers are clean. Connect hydraulic lines for the attachment to the prime mover. Twist the collar of the quick couplers one quarter of a turn in order to secure hydraulic connections. Purchase proper couplers and hoses, as needed, and attach to the prime mover per the manufacturer's instructions.
10. Carefully raise the loader and cycle the rollback/dump cylinders to check clearances, that limiting stops make proper contact and verify that all mounting procedures have been successfully completed. Contact FFC for instructions if the limiting stops do not contact properly.
11. Cycle the hydraulic cylinder(s) on this product several times from fully retracted to fully extended until all air has been completely removed from the cylinder(s).

NOTICE - When shipped, the hydraulic cylinder(s) on this product contained air or an air-fluid mixture. Also, there are orifices beneath the port(s) in the hydraulic cylinder barrel(s) that will restrict the exit of that air. Failure to remove all the air from the hydraulic cylinder(s) can cause uneven, jerky cylinder movement when the hydraulic controls are being operated and unwanted cylinder movement when those controls are not being operated.

12. While the loader arms are lowered, visually inspect the attachment mechanism to ensure that it is securely mounted.

OPERATION

REMOVING THE FORKED SCRAP GRAPPLE

WARNING! Serious injury or death may result from disengaging the attachment when the attachment is in an unstable position or carrying a load. Place the attachment in a stable position before disengaging.



CAUTION - Hoses for the attachment must be removed before the quick attach is disengaged. Pulling the attachment with the hoses could result in damage to the prime mover or the attachment.



1. Lower the attachment to the ground.
2. Engage the parking brake and shut down the prime mover. Be sure to relieve pressure to the auxiliary hydraulic lines.
3. Unfasten safety restraints and exit prime mover.
4. Disconnect the attachment hydraulic lines from the prime mover. Connect quick couplers together to keep clean.
5. Disengage attachment locking mechanism (mechanical type).
6. Enter prime mover, fasten safety restraints and start the prime mover.
7. Disengage attachment locking mechanism (hydraulic type).
8. Disengage the parking brake, and back away from the attachment.

OPERATION

STORAGE

1. Clean the unit thoroughly, removing all mud, dirt, and grease.
2. Inspect for visible signs of wear, breakage, or damage. Order any parts required, and make the necessary repairs to avoid delays when starting next season.
3. Tighten loose nuts, capscrews, and hydraulic connections.
4. Cap hydraulic couplers to protect against contaminants.
5. Touch up all unpainted surfaces with paint, to prevent rust.
6. Coat the exposed portions of the cylinder rod with grease.
7. Store the unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

MAINTENANCE

MAINTENANCE SCHEDULE

Procedure	Before each use	After each use	100 Hours	500 Hours	See Prime Mover Manual
Fittings/hoses, hydraulic - Check for leaks/tighten - Check for damage	✓				
Fittings, zerk - Grease (See Lubrication Points)	✓				
Oil, hydraulic (Prime Mover) - Check level	✓	See Below for Requirements.			
Hardware - Check for tightness	✓				

Oil Cleanliness Requirements

IMPORTANT - All hydraulic fluid shall be filtered before use in any FFC product to obtain the ISO cleanliness standard of 20/18/15. Unless explicitly specified otherwise.

Fittings/Hoses Inspection Guidelines

Stop the prime mover engine and release hydraulic pressure before servicing or adjusting hydraulic system.

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.

Do not bend high pressure lines. Do not strike high pressure lines. Do not install bent lines, bent tubes, or kinked hoses. Do not install damaged lines, damaged tubes, or damaged hoses.

Repair loose lines, loose tubes, and loose hoses. Repair damaged lines, damaged tubes, and damaged hoses. Leaks can cause fires. See your FFC dealer for repair or replacement parts.

Check lines, tubes, and hoses carefully. Do not use your hand to check for leaks. Use a board or cardboard to check for leaks. Tighten all connections to the recommended torque.

Replace the parts if any of the following conditions are present:

- The end fittings are damaged or leaking.
- The outer covering is chafed or cut.
- The reinforcing wire layer is exposed.
- The outer cover is ballooning locally.
- The hose is kinked or crushed.
- The hoses have been pulled or stretched.

Make sure that all clamps, guards, and shields are installed correctly.

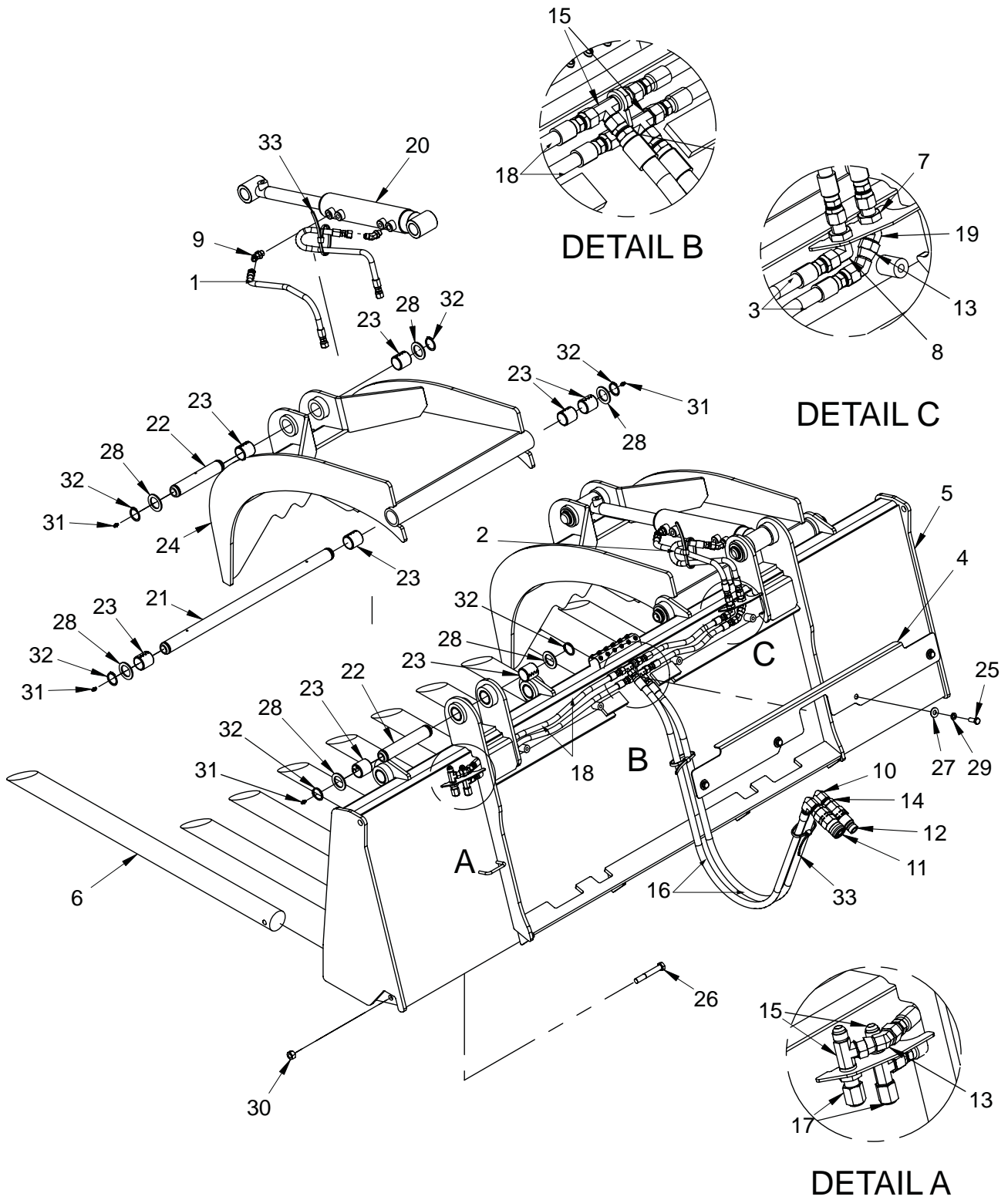
MAINTENANCE

MAINTENANCE RECORD

Use this log to record maintenance performed on the attachment.

Date	Maintenance Procedure Performed	Performed by	Comments

PARTS ILLUSTRATION



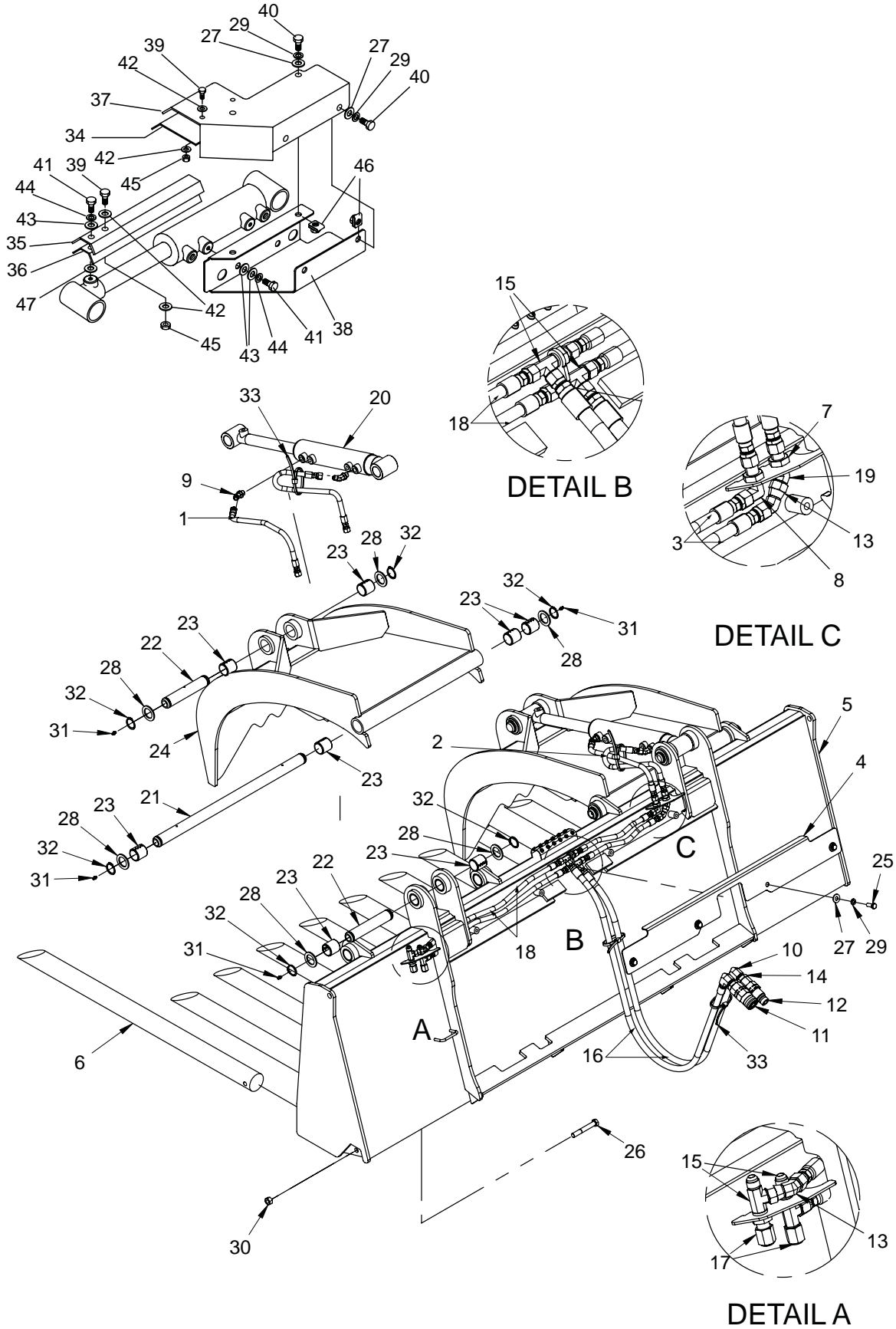
FORKED SCRAP GRAPPLE (Standard Models) PARTS LIST

ITEM	QTY	10067 66"	10073 73"	10079 78"	10085 84"	DESCRIPTION
1	2				38195	Hydraulic Hose .25" x 19" 6FJ-6FJ HS
2	2				38107	Hydraulic Hose .25" x 17" 6FJ-6FJ HS
3	2				37104	Hydraulic Hose .25" x 13" 6FJ-6FJ HS
4	1				13-50012	Hose Guard (varies by model)
5	1	13-51267	13-51272	13-51276	13-51280	Frame Weldment
6	vary	(10)	(11)	(12)	(13)13-51284	Rod 2.25" x 38.75 with Features
7	6				3217	#6 Bulkhead Jam Nut .56"-18
8	1				3282	90° Elbow Bulkhead 6MJ-6MJ
9	4				39313	45° Elbow 6MB-6MJ
*10	2				30442	90° Elbow 8MB-8FB
*11	1				22518	QD Female 12FB FF .5" Body
*12	1				19632	QD Male 12FB FF .5" Body Cup
13	2				3469	45° Elbow 6MJ-6FJ
*14	2				30377	Adapter 12MB-8FB
15	4				30379	Run Tee Bulkhead 6MJ
*16	2				38604	Hydraulic Hose .38" x 60" 6FJ-8MB HS
17	2				3285	Cap 6FJ
18	2				37282	Hose .25" x 24" 6FJ-6FJ
19	1				30417	45° Elbow 6MJ-6MJ
20	2				LAF4796	Cylinder 2" x 1.25" x 8"
21	2				LAF9387	Grapple Pivot Pin 1.25" x 24.06" Greasable
22	4				LAF9388	Cylinder Pin 1.25" x 6.81" Greasable
23	16				LAF9544	Split Bushing 1.5" OD x 1.25" ID x 1.5"
24	2				LAF9546	Grapple Weldment
25	4				1043	Hex Cap Screw .38"-16 x 1" Grade 5
26	vary	(10)	(11)	(12)	(13) 1098	Hex Cap Screw .5"-13 x 3.5" Grade 5
27	4				1514	Flat Washer .38" Grade 5 USS
28	12				RHW5972	Machinery Bushing 1.88" OD x 1.25" ID x .135"
29	4				1503	Lock Washer .38" Grade 5
30	vary	(10)	(11)	(12)	(13) 1841	Lock Nut Torque .5" Grade 8
31	8				6616	Grease Zerk .25"-28 TPI Self-Tapping
32	12				RHW8167	Retaining Ring 1.25" External
33	4				7104	Tie Strap .3" x 15.25" Plastic HD

NOTE: All parts are the same as 10085 except for those parts numbered under other sizes.

*ITEM may vary per Skid Steer -- Contact FFC for correct item.

PARTS ILLUSTRATION



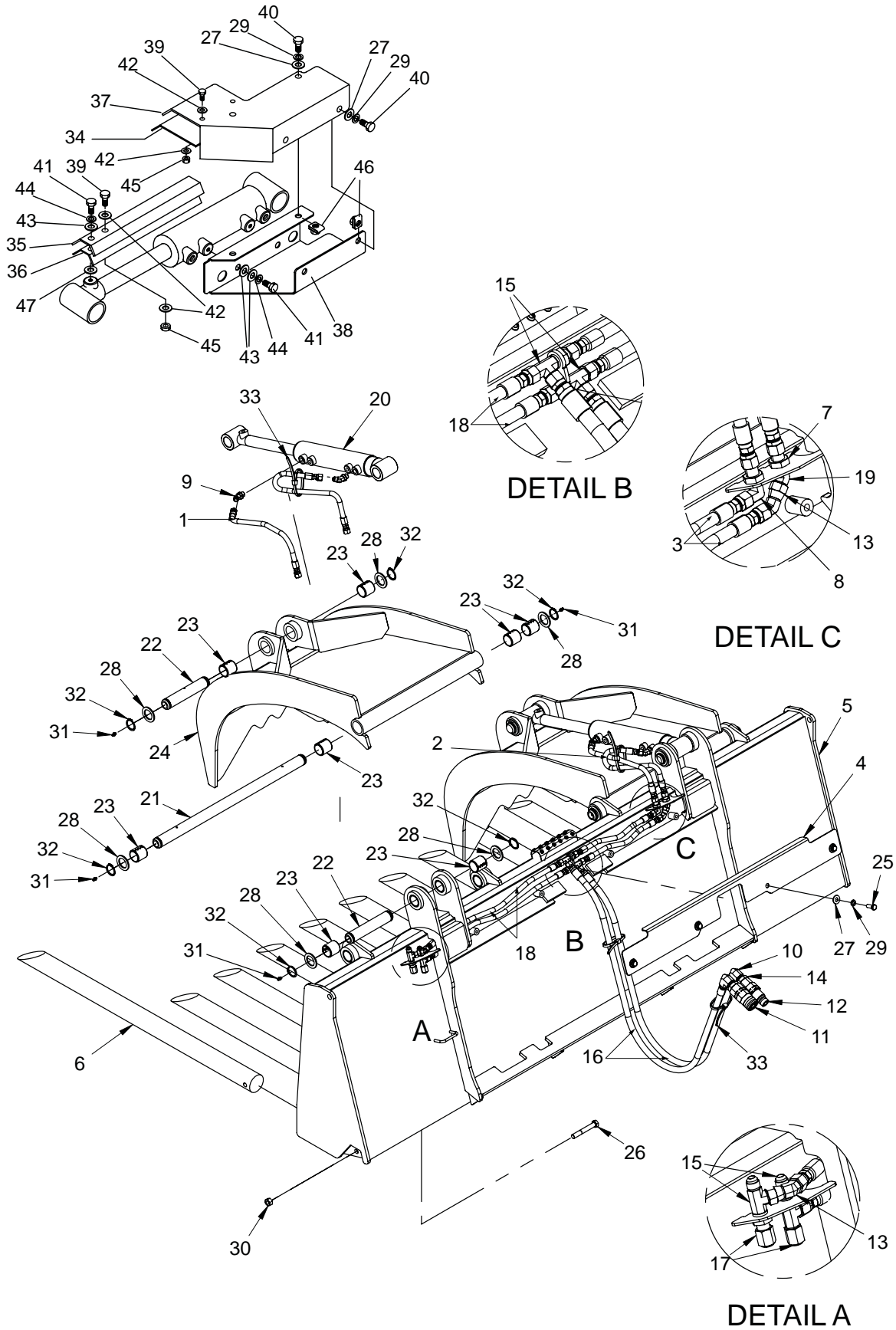
FORKED SCRAP GRAPPLE (Full Featured Models) PARTS LIST

ITEM	QTY	10167 66"	10173 73"	10179 78"	10185 84"	DESCRIPTION
1	2				38195	Hydraulic Hose .25" x 19" 6FJ-6FJ HS
2	2				38107	Hydraulic Hose .25" x 17" 6FJ-6FJ HS
3	2				37104	Hydraulic Hose .25" x 13" 6FJ-6FJ HS
4	1				13-50012	Hose Guard (varies by model)
5	1	13-51267	13-51272	13-51276	13-51280	Frame Weldment
6	vary	(10)	(11)	(12)	(13)13-51284	Rod 2.25" x 38.75 with Features
7	6				3217	#6 Bulkhead Jam Nut .56"-18
8	1				3282	90° Elbow Bulkhead 6MJ-6MJ
9	4				39313	45° Elbow 6MB-6MJ
*10	2				30442	90° Elbow 8MB-8FB
*11	1				22518	QD Female 12FB FF .5" Body
*12	1				19632	QD Male 12FB FF .5" Body Cup
13	2				3469	45° Elbow 6MJ-6FJ
*14	2				30377	Adapter 12MB-8FB
15	4				30379	Run Tee Bulkhead 6MJ
*16	2				38604	Hydraulic Hose .38" x 60" 6FJ-8MB HS
17	2				3285	Cap 6FJ
18	2				37282	Hose .25" x 24" 6FJ-6FJ
19	1				30417	45° Elbow 6MJ-6MJ
20	2				LAF4661	Cylinder 2" x 1.25" x 8" (Cushioned Bottom)
21	2				LAF9543	Grapple Pivot Pin 1.25" x 24.06" Greasable (Heat Treated)
22	4				LAF9542	Cylinder Pin 1.25" x 6.81" Greasable (Heat Treated)
23	16				LAF9544	Split Bushing 1.5" OD x 1.25" ID x 1.5"
24	2				LAF9546	Grapple Weldment
25	4				1043	Hex Cap Screw .38"-16 x 1" Grade 5
26	vary	(10)	(11)	(12)	(13) 1098	Hex Cap Screw .5"-13 x 3.5" Grade 5

NOTE: All parts are the same as 10185 except for those parts numbered under other sizes.

*ITEM may vary per Skid Steer -- Contact FFC for correct item.

PARTS ILLUSTRATION

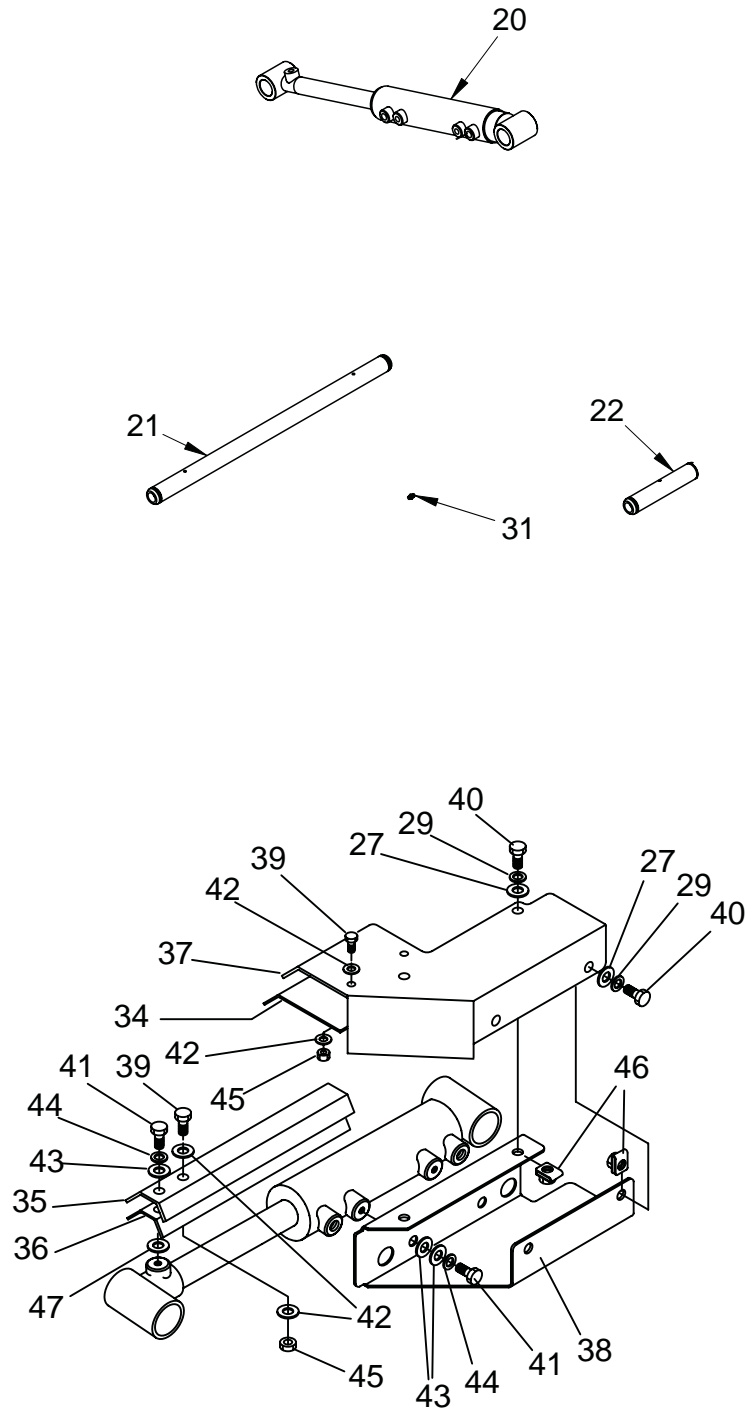


FORKED SCRAP GRAPPLE (Full Featured Models) PARTS LIST

ITEM	QTY	10167 66"	10173 73"	10179 78"	10185 84"	DESCRIPTION
27	12				1514	Flat Washer .38" Grade 5 USS
28	12				RHW5972	Machinery Bushing 1.88" OD x 1.25" ID x .135"
29	12				1503	Lock Washer .38" Grade 5
30	vary	(10)	(11)	(12)	(13) 1841	Lock Nut Torque .5" Grade 8
31	8				6616	Grease Zerk .25"-28 TPI Self-Tapping
32	12				RHW8167	Retaining Ring 1.25" External
33	4				7104	Tie Strap .3" x 15.25" Plastic HD
34	2				LAF9533	Cylinder Cover Top Liner
35	2				LAF9532	Cylinder Guard
36	2				LAF9531	Cylinder Guard Liner
37	2				LAF9530	Cylinder Guard Top
38	2				LAF9529	Cylinder Guard Bottom
39	6				1002	Hex Cap Screw .25"-20 x .75" Grade 5
40	8				1044	Hex Cap Screw .38"-16 x 1.25" Grade 5
41	6				1088	Hex Cap Screw .5"-13 x 1" Grade 5
42	12				1512	Flat Washer .25" Grade 5 USS
43	10				1516	Flat Washer .5" Grade 5 USS
44	6				1505	Lock Washer .5" Grade 5
45	6				1629	Lock Nut Nylon .25" Grade 5
46	8				RHW7210	U-Style Clip Nut .38"-16
47	4				1527	Flat Washer .5" Grade 5 SAE

NOTE: All parts are the same as 10185 except for those parts numbered under other sizes.
*ITEM may vary per Skid Steer -- Contact FFC for correct item.

OPTIONAL KITS PARTS ILLUSTRATION



OPTIONAL KITS PARTS LISTS

ITEM	QTY	10067 73"	10073 78"	10079 82"	10085 87"	DESCRIPTION
					LAF5001	OPTIONAL CUSHION CYLINDER KIT
20	2				LAF4661	Cylinder 2" x 1.25" x 8" (Cushioned Bottom)

					LAF5000	OPTIONAL HARDENED PINS KIT
21	2				LAF9543	Grapple Pivot Pin 1.25" x 24.06" Greasable (Heat Treated)
22	4				LAF9542	Cylinder Pin 1.25" x 6.81" Greasable (Heat Treated)
31	8				6616	Grease Zerk .25"-28 TPI Self-Tapping

					10050	OPTIONAL GRAPPLE HOSE/ CYLINDER GUARD KIT
27	8				1514	Flat Washer .38" Grade 5 USS
29	8				1503	Lock Washer .38" Grade 5
34	2				LAF9533	Cylinder Cover Top Liner
35	2				LAF9532	Cylinder Guard
36	2				LAF9531	Cylinder Guard Liner
37	2				LAF9530	Cylinder Guard Top
38	2				LAF9529	Cylinder Guard Bottom
39	6				1002	Hex Cap Screw .25"-20 x .75" Grade 5
40	8				1044	Hex Cap Screw .38"-16 x 1.25" Grade 5
41	6				1088	Hex Cap Screw .5"-13 x 1" Grade 5
42	12				1512	Flat Washer .25" Grade 5 USS
43	10				1516	Flat Washer .5" Grade 5 USS
44	6				1505	Lock Washer .5" Grade 5
45	6				1629	Lock Nut Nylon .25" Grade 5
46	8				RHW7210	U-Style Clip Nut .38"-16
47	4				1527	Flat Washer .5" Grade 5 SAE

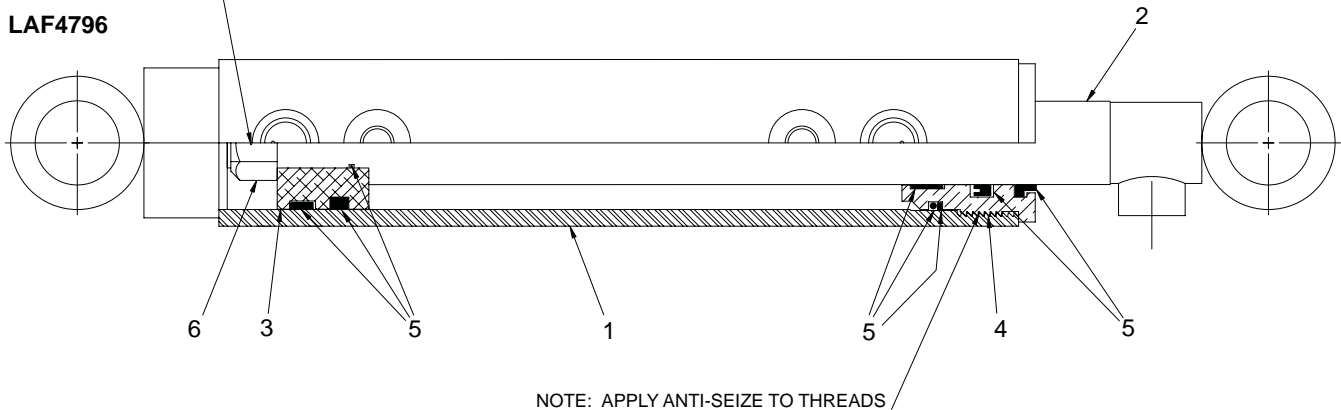
NOTE: All parts are the same as 10085 except for those parts numbered under other sizes.

HYDRAULIC CYLINDERS

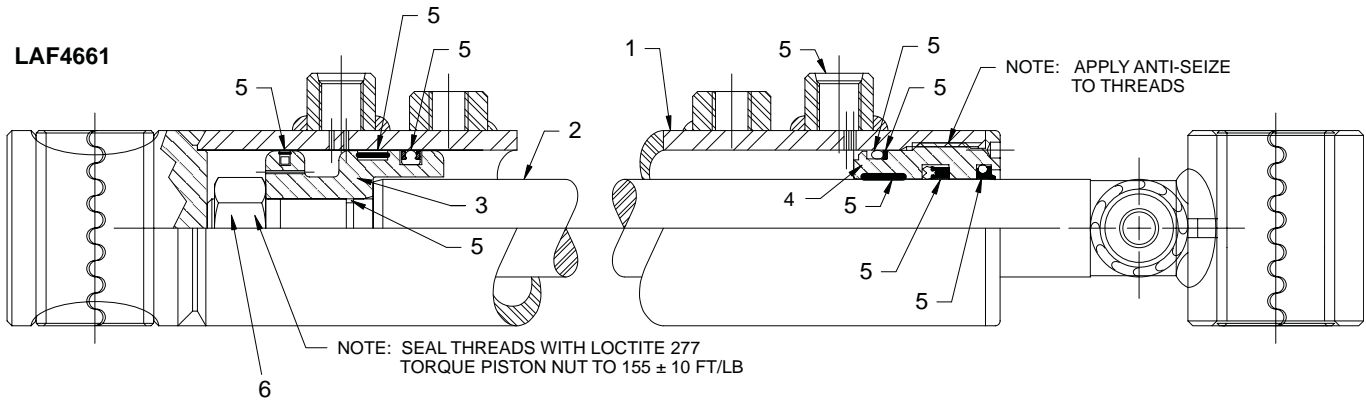
ILLUSTRATIONS AND PARTS LIST

NOTE: SEAL THREADS WITH LOCTITE 277
TORQUE PISTON NUT TO 320 ±15 FT/LB

LAF4796



LAF4661



ITEM	QTY.	LAF4796	LAF4661	DESCRIPTION
1	1	LAF4801	LAF4662	Barrel 2" ID x 8" Stroke with Parallel Cross Tube End
2	1	LAF4800	LAF4663	Shaft 1-1/4" Dia. with Cross Tube End
3	1	LAF4618	LAF4664	Piston 2" OD
4	1	LAF4619	LAF4619	Head 2" OD, Nominal
5	1	LAF4617	LAF4617	Seal Kit (Includes all Seals, O-Rings, etc.)
6	1	LAF4802	LAF4129	Piston Nut

OPTIONAL FLOW CONTROL KIT

IMPORTANT

Any Wheel Loader with a single cylinder dump circuit must install a Flow Control Kit. This device is necessary to prevent the loader from dumping the attachment too fast and slamming against the stops. Failure to install Flow Control Device on Wheel Loaders with a single dump circuit:

CAN result in damage to the prime mover and
WILL void all FFC warranties.

Installation instructions listed below are only for models listed. Please contact your Loader's dealer for a Flow Control Device and installation instructions.

MODELS:

CASE 021D, 221D and 321D

NEW HOLLAND LW50.B, LW60.B, LW70.B and LW80.B

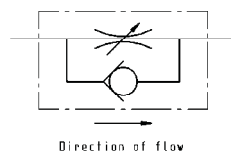
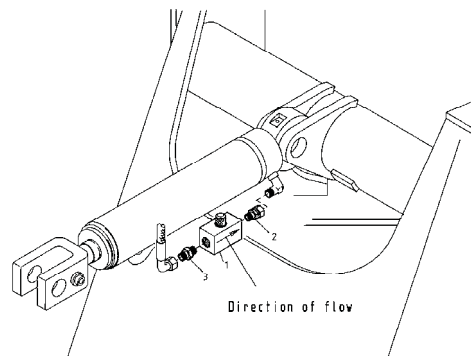
Action Required

Install the Flow Restrictor Valve as shown below. The amount of flow restriction this valve provides is adjustable. Turning the knurled knob on the valve clockwise increases the flow restriction which reduces the speed of the bucket cylinder retraction. Turning the knurled knob counter-clockwise decreases the flow restriction which increases the speed of the bucket cylinder retraction. The bucket cylinder extension speed is not affected by this adjustment. After installation, adjust the valve so the attachment will not dump too fast and slam against the stops.

Parts Information

The Adjustable Flow Restrictor Valve Kit (FFC) part number is 03-10009 (Case part #424240A1). This valve is made up of the following parts:

Item	Qty.	Part No.	Designation
1	1	424239A1	Valve, Adjustable Flow Restrictor
2	1	421409A1	Union
3	1	420798A1	Union



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.

