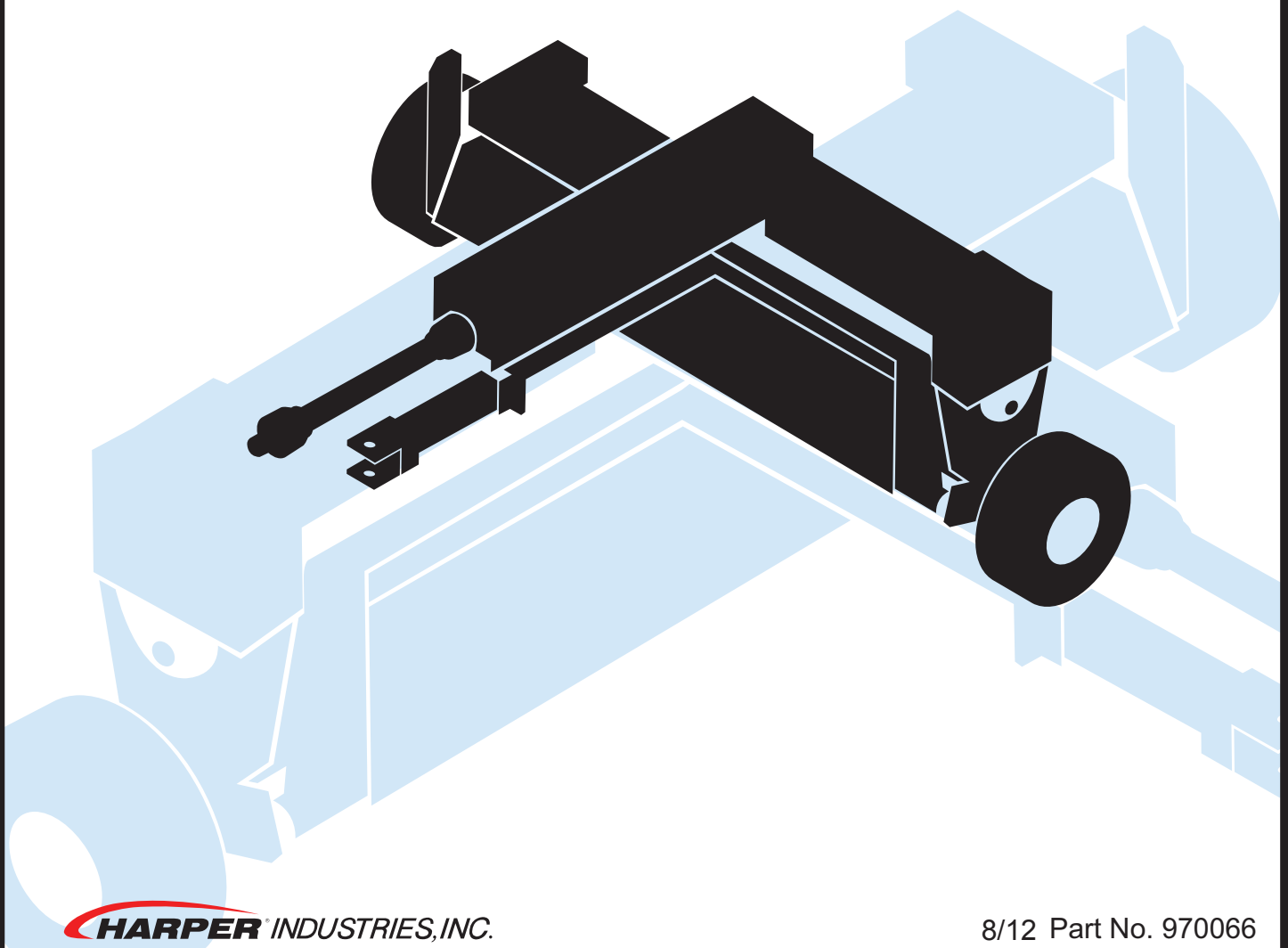




Vertical Mower

VC-60

Operator's Manual



Thank you for purchasing a Harper Industries, Inc. Verti-Cutter.

TO THE OWNER OR OPERATOR:

As with all Harper products, the Harper Verti-Cutter has been developed through tough design and testing procedures to provide a quality machine. This manual gives assembly, operating, and service information for the VC-60.

Please read and understand all instructional material included with the Verti-Cutter or its components before assembling and operating the equipment.

A vertical mower such as the Verti-Cutter can present hazards to an operator who follows unsafe procedures in either the operation or maintenance of the unit. Therefore, SAFETY WARNINGS are presented at certain locations in the text.

THIS SYMBOL:



MEANING: Failure to understand and obey this warning may result in injury to you or others.

Whenever this symbol is used, please pay very close attention to the information presented, and make sure you fully understand. If you do not, contact your Goossen dealer or Harper Industries for clarification.



ALL SHIELDS AND GUARDS MUST BE IN PLACE FOR PROPER AND SAFE OPERATION OF THIS EQUIPMENT. WHERE THEY ARE SHOWN REMOVED IN THIS MANUAL, IT IS FOR PURPOSES OF ILLUSTRATION AND INSTRUCTION ONLY. DO NOT OPERATE THIS EQUIPMENT UNLESS ALL SHIELDS AND GUARDS ARE IN PLACE.

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The Harper name and registered trademarks of Harper Industries, Inc.

All other brand and product names are trademarks or registered trademarks of their respective companies.

LIMITED WARRANTY

The Harper Verti-Cutter is warranted against defects in workmanship and materials for a period of **TWELVE MONTHS** from the date of retail purchase to the original purchaser.

Harper Industries will repair or replace, at our option, any part that our examination shows to be defective. Warranty is limited to parts, labor and ground freight delivery of replacement parts. The user will pay freight charges for parts submitted under this warranty.

No product or part may be returned for warranty consideration without prior approval from Harper Industries. This warranty does not apply to parts subjected to misuse, abuse, alteration, improper or inadequate maintenance, or normal wear (including belts, chains and knives).

Harper Industries, its agents or representatives, make or imply no other warranties. Contact Harper Industries with any questions regarding this warranty.

RECORDS

Date of Purchase _____ / _____ / _____

Dealer's Name _____

Dealer's Phone _____

Serial Number Machine _____



VERTI-CUTTER

Table of Contents

Operator's Section

To the Owner or Operator

Warranty Statement

Table of Contents..... 1

Specifications..... 2

Control Identification..... 3

VC-60

PTO Shaft..... 3

Skid Plates..... 3

Hitch..... 3

Blade Depth Adjustment..... 3

Hydraulic Cylinder..... 3

Hydraulic Hoses..... 3

Ram Stop..... 3

Gas Shock..... 3

Gearbox..... 3

Blades..... 3

Chain Tension Adjustment..... 3

Safety Guidelines

Guards & Shields..... 4

Safety Decals..... 4

Equipment & Controls..... 4

Before Operation..... 4

Safety Guidelines..... 4

Operation..... 5

Transport..... 5

Hook Up & Operation

Hook Up..... 6

Starting Operation..... 6

Stopping Operation..... 6

Tips for Successful Operation..... 6

Adjustments

Blade Depth..... 7

Level Hook Up..... 7

Chain Tension..... 7

Service & Maintenance..... 8

Modular clutch Maintenance..... 8

Troubleshooting..... 9

Parts Section

VC-60

Frame Assy..... 1.1

Wheel & Hub Assy..... 1.2

Shaft Assy..... 1.3

Blades..... 1.4

Hydraulic Assy..... 1.5

Shield Assy..... 1.6

PTO Shaft..... 1.7

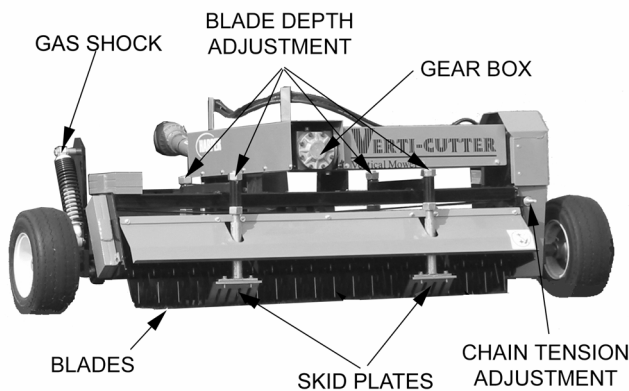
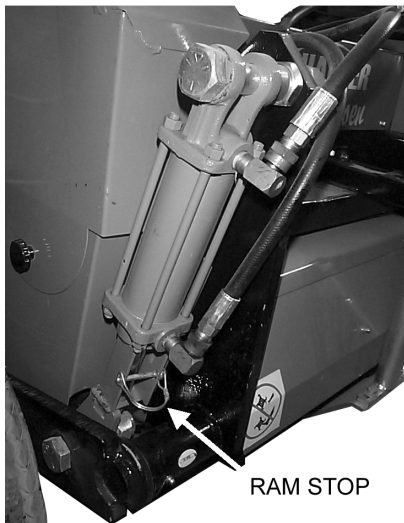
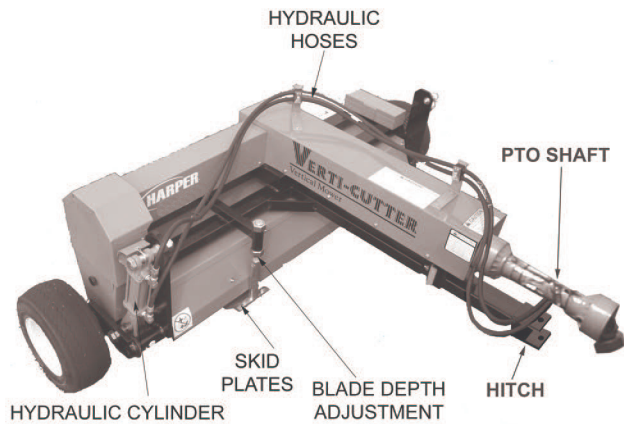
Decal Kit, Complete..... 1.8

Specifications

Model	VC-60
Swath	60"
Blades	31 - 10 gauge / 11 point / 12" diameter blades
Blade Spacing	1.5" standard, 2" or 2.5" spacing is optional
Blade Shaft Rotation	VC-60 – forward rotation
Blade Depth	0" to 1"
Blade Depth Adjustment	Large jacking bolts on no maintenance skids
Draw Bar	Two position adjustable tow bar
Hitch	Adjustable quick pin tag along
Drive	540 RPM PTO to gear box, sprockets with #50 Double chain to blade shaft with shear bolt
Required Horsepower	25 to 45 hp
Transport System	Single hydraulic lift cylinder with E-Z ram lock, quick disconnect from tractor auxiliary valve
Tires	2 – foam-filled 16 x 6.50 x 8
Frame	All-welded steel construction
Weight	800 lbs
Dimensions	Length - 62" Height - 38" Width - 89"

Harper Industries, Inc. is continually striving to improve the design and performance of its products. We reserve the right to make changes in specifications and design without thereby incurring any obligation relative to previously manufactured products.

Control Identification



VC - 60

PTO SHAFT – transfers power from the tractor to the Verti-Cutter.

SKID PLATES – control depth of blades and prevents the blades from gauging.

HITCH – connects to tractor draw bar with standard 3/4" hitch pin.

BLADE DEPTH ADJUSTMENT – adjusts the height of the skids which controls the depth of the blades.

HYDRAULIC CYLINDER – lifts the blades for transport.

HYDRAULIC HOSES – provide power to raise and lower the blades. They are connected to the tractor hydraulic remotes.

RAM STOP – secures cylinder ram in extended position for transport. ALWAYS USE RAM STOP WHEN TOWING VERTICUTTER.

GAS SHOCK – puts pressure on the axle which reduces the drag of the skids.

GEARBOX – transfers power from PTO shaft to chain drive with a 90° turn.

BLADES – rotate forward to de-thatch and aerate turf.

CHAIN TENSION ADJUSTMENT – adjusts the tension on the chain.

Safety Guidelines



SAFETY WARNING!



Use genuine factory parts or parts with equivalent characteristics, including type, strength and material. Failure to do so may result in product malfunction and possible injury to the operator and/or others.

- Replace locknuts and locking screws if you can tighten them without feeling considerable resistance for several turns before they are completely tight. Replace them with factory authorized parts or their equivalent.
- If hardware is not secure, or if some of the hardware is over-tightened, equipment failure may result, posing possible safety hazards.
- To prevent possible eye injury, always wear SAFETY GLASSES while operating and servicing the equipment.

Guards & Shields

- Keep the equipment and attachments in good operating condition, and keep all safety devices in place. Replace all worn, damaged, unusable, missing or lost safety shields and guards before operating the equipment.

Safety Decals

- If safety related or instructional decals become illegible or are removed, replace them immediately.
- If you replace parts that have such decals attached to them, make sure the decals are replaced with current versions, and that the decals are on the replacement parts before the machine is operated again.

- New decals may be obtained from your local Harper Dealer.

Equipment & Controls

- Altering this equipment in any manner which adversely affects its operation, performance, durability, or use will void the warranty and may cause hazardous conditions.
- Know the location and function of all controls and how to stop this equipment quickly in an emergency. Read and understand the owner's manual before you operate the equipment.
- Keep all nuts, bolts and screws tight to help ensure safe operation of this equipment.

Before Operation

- Before operating this equipment, read and understand the Owner's Manual.
- Do not allow children to operate this machine.
- Never operate this machine in the vicinity of bystanders.
- Before servicing or inspecting the machine, make certain that the power source is shut down, make certain all moving parts have stopped and disconnect the spark plug or PTO shaft.
- Never allow hands, clothing or any part of the body near the blades or moving parts.
- Avoid wearing loose-fitting clothing.

Safety Guidelines

- Wear approved eye and ear protection while operating the machine.

- The machine should be operated on level surfaces only.
- Before starting the machine, visually inspect all nuts, bolts and other fasteners to see that they are properly secured. Nuts, bolts and other fasteners should be checked every 8 to 10 hours of operation for proper alignment and tightness.

Operation

- Make certain the blades are clear of debris before starting the machine.
- If a foreign object should strike the blades of the machine and cause an unusual noise or vibration, shut the engine or PTO off immediately and allow it to come to a complete stop. Disconnect the spark plug wire from the spark plug, or PTO from the power unit, and then do the following:
 1. Inspect for damage.
 2. Repair or replace any damaged parts.
 3. Check for and tighten any loose bolts, nuts, fasteners or parts.
- Keep debris or foreign material from building up in the mower, as this may inhibit proper operation or cause poor performance.
- Keep all safety shields and guards in place and in good working condition.
- Keep your face and all body parts away from moving parts.
- Stay away from the discharge area when machine is in operation.
- If the vertical mower should become clogged, shut off the engine or PTO and allow it to come to a complete

stop. Disconnect the spark plug wire from the spark plug or PTO shaft before clearing debris.

- Do not allow hands, clothing or any part of the body to enter near any moving parts.
- Replace damaged or missing safety decals.
- Keep hands, feet and clothing away from PTO driven parts.
- Keep all guards and shields in place during operation. Disengage PTO and shut off the engine before removing guards or shields.
- Never attempt to adjust, clean or lubricate the machine while PTO is connected to tractor.
- Operator should never wear loose clothing when working around PTO.
- Before starting tractor, make sure that the transmission and PTO are disengaged.
- Make sure the tractor's engine is at idle speed before engaging the PTO.

Transport

- Always use the ram stop when towing the Verti-Cutter.
- **SPEEDS SHOULD NOT EXCEED 10 MPH FOR MORE THAN 2 MINUTES WHEN TOWING VERTI-CUTTER.**
- The Verti-Cutter should be transported on a trailer when moving distances greater than 2 miles.

Hook Up & Operation



SAFETY WARNING!

- **Wear approved eye and ear protection while operating the Verti-Cutter.**
- **Keep all guards in place during operation. Never operate the vertical mower with safety shields removed.**
- **Before operating the machine, check to ensure that the chain is tight to prevent the chain from slipping off the sprockets.**
- **Keep clothing and all body parts away from rotating parts.**
- **Never operate the vertical mower beyond the suggested 540 PTO speed.**

IMPORTANT: To avoid damage to the machine, lawn or pavement, always raise blades into transport position when moving from one location to another.

Hook Up

1. Mount Verti-Cutter to hitch of tractor and connect PTO shaft to tractor output shaft.
2. Connect hydraulic hoses to auxiliary connections on tractor.
3. With the tractor and unit on level ground, adjust so that the skid plates are parallel to the ground. This allows the Verti-Cutter to glide smoothly over turf. The hitch can also be adjusted to adjust for different tractor hitch heights.

Starting Operation

1. Engage PTO lever on the tractor AT IDLE SPEED of the tractor.
2. Lower machine with lever on tractor that controls auxiliary hydraulics and place in "float" position.
3. Increase tractor engine speed to rated operating RPM and begin operation of the vertical mower.

Stopping Operation

1. Move throttle on tractor to the slow position and disengage the PTO lever on the tractor.
2. Shut off the tractor engine and allow the machine to come to a complete stop.
3. If it is necessary to inspect or service the Verti-Cutter, always disengage the PTO and shut off the tractor before doing so.

NOTE: On initial operation of the machine, the chain may stretch and need re-adjusted after the first hour of use. When re-adjusting chain tension, use a straight-edge across the faces of the sprockets to make sure they are properly aligned and the chain will run true.

Tips for Successful Operation

- Rake across slopes, never up and down.
- Use caution when changing direction on slopes.
- Avoid raking very steep slopes or areas where safety might be in doubt.
- Do not rake water-soaked lawns. This will pull turf off the surface.
- Mow tall grass before raking.

Adjustments

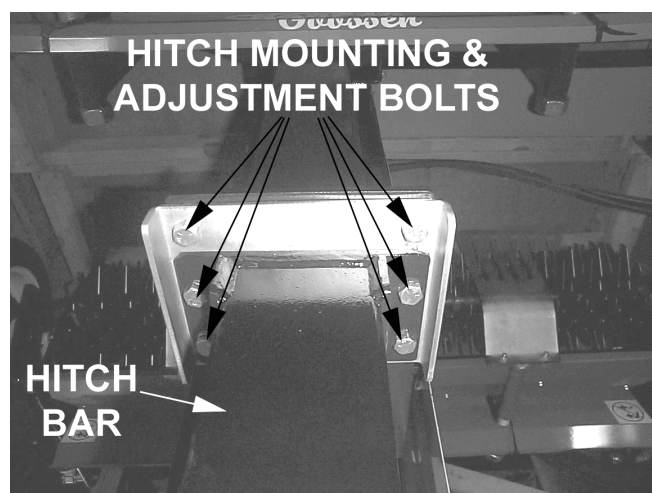
Blade Depth



The skid plate height determines the cutting depth of the blades.

- Tighten or loosen the nuts on the skid plate height adjustment to raise or lower the blades.
- Make sure both skid plates are adjusted equally and parallel to the ground to get an even cut and ensure the unit glides smoothly.

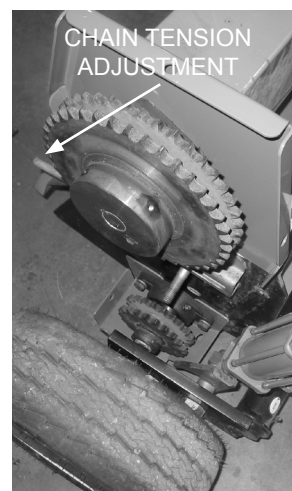
Level Hook Up



Level hook up between the Verti-Cutter and the tractor will prevent the skid plates from digging into the ground.

- The hitch bar is adjusted up or down depending on which holes it is bolted into.
- The hitch can be mounted in the top two holes to raise the hitch position or the bottom two holes to lower the hitch position.
- The position of the hitch depends upon the height of the tractor hitch.

Chain Tension



Check the condition of drive chain before each use or after every 25 hours of operation.

- Adjust chain by moving tensioner adjustment nut to achieve proper tension.

NOTE: Do not over-tighten chain. Excessive tension can cause premature bearing and chain failure.

NOTE: Use a straightedge to check alignment across the faces of sprockets after adjusting chain tension to ensure that the chain will run true.

Service & Maintenance



SAFETY WARNING!

- Before servicing or inspecting the Verti-Cutter, make sure the power source is shut off and all parts have stopped moving.
- Disconnect the PTO shaft from the tractor.
- Always wear safety glasses and protective gloves when servicing the vertical mower.

Break-in Service

After the first hour of use:

- Check chain. Tighten if needed.
- Tighten set screws on bearings.
- Check nuts, bolts and fasteners to see that they are secure.

Lubrication

Grease every 10 hours:

- 2 bearings on axle

Grease every 40 hours:

- 2 bearings on blade shaft
- 2 U-joints on PTO shaft

NOTE: Follow the recommended greasing requirements to ensure long life for bearings and joints.

Modular Clutch Maintenance

If the clutch has not been operated for (1) season we recommend the following"

You will need: 1/2" box wrench or socket.

1. Make sure the tractor is off and the PTO is disengaged.
2. Disconnect the driveline from the tractor.
3. Locate the bolts on the O.D. of the clutch pak. Loosen the bolts until all are finger tight, then tighten each one half a turn.
4. Attach the implement to the tractor at the hitch pin, and the driveline to the tractor PTO.
5. Turn the tractor on. Engage the PTO clutch and run for a few seconds, or until the clutch visibly smokes.
6. Disengage the tractor PTO and shut off the tractor. Keep clear of the machine until all parts stop moving.
7. Disconnect the driveline from the tractor.
8. Tighten the bolts on the O.D. of the clutch pak until the compression plate is in full contact with the housing.
9. If the clutch contains an integral overrunning clutch, make sure the clutch spins freely in one direction.

Standard Torque Chart

Size	In.-lb.	Ft.-lb.	N-m
No. 10-24	25-35	5-7	2.8-4.0
1/4 in.	60-80	18-20	7-9
5/16 in.	120-140	28-30	14-16
3/8 in.	340-360	64-74	24-27
1/2 in.		126-150	90-100

NOTE: When tightening two or more screws or bolts on the same part, **DO NOT** tighten screws completely right away, or one at a time. To avoid distortion, first tighten all screws in sequence to onethird of torque value, then tighten to twothirds of torque value, then tighten to full value.

Troubleshooting

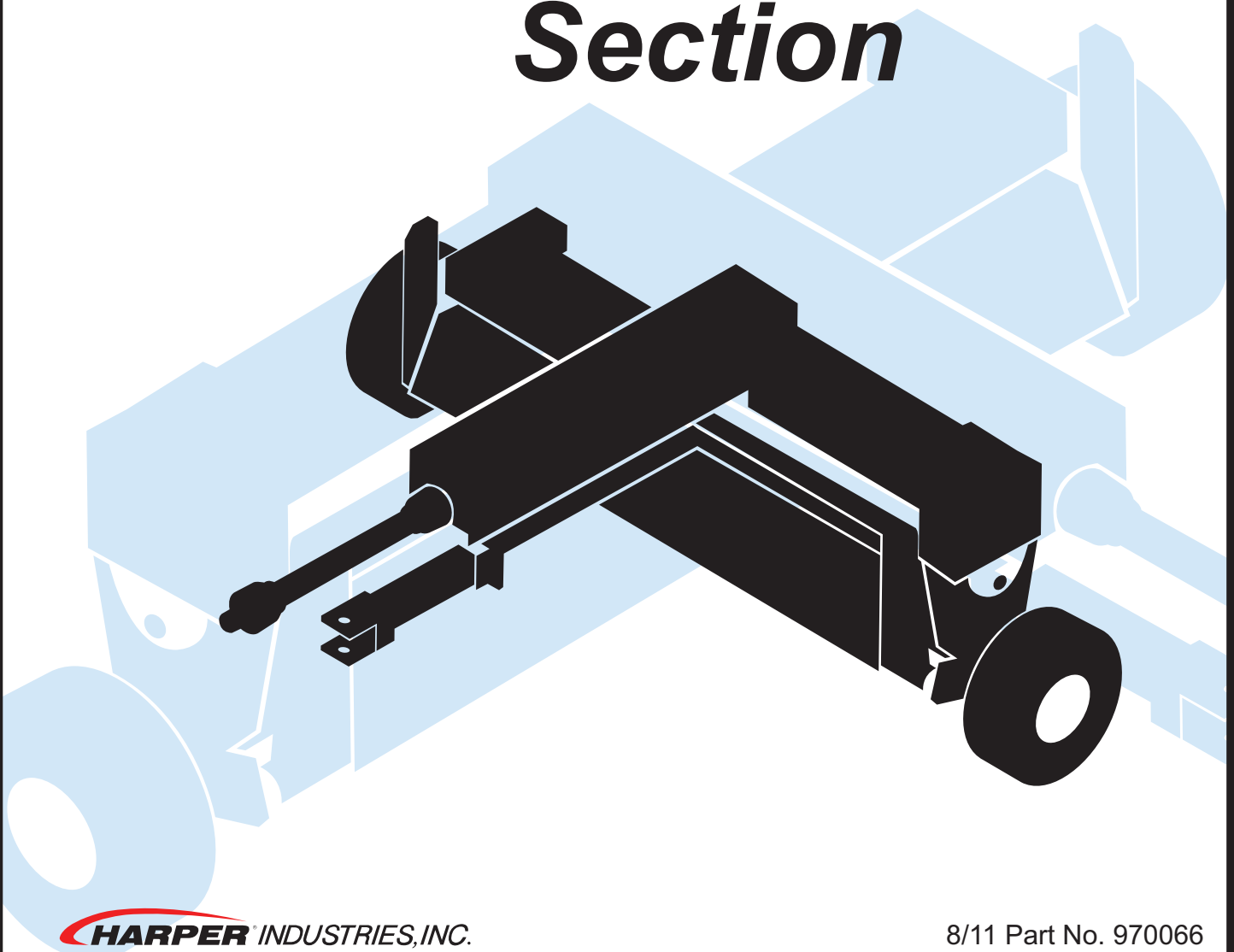
Problelem	What to Check
Chain comes off	<ul style="list-style-type: none">• Tension adjustment.• Load may be excessive• Bearings may have seized
Chains wears rapidly, jump, catches or twists.	<ul style="list-style-type: none">• Sprockets may not be properly aligned• Check sprockets w/ straightedge across faces of sprockets.
Skid plates dig into the ground	<ul style="list-style-type: none">• Verti-Cutter may not be hooked up level w/ tractor• Skid plates may not be adjusted level w/ ground.

HARPER® VERTI-CUTTER

Vertical Mower

VC-60

Parts Section



VC -60

PARTS

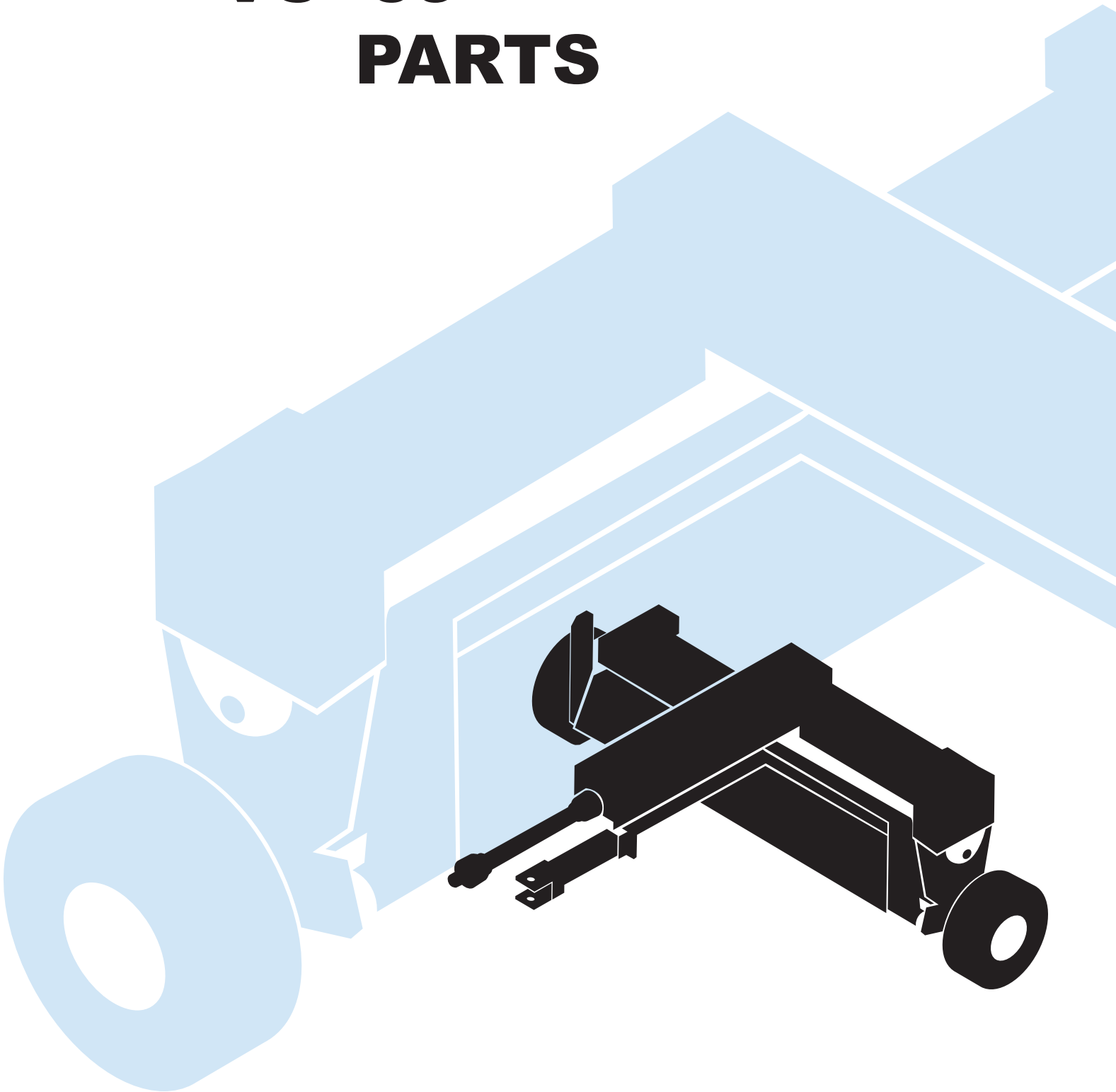


Table of Contents

Parts Section
VC-60

Frame Assy..... 1.1

Wheel & Hub Assy..... 1.2

Shaft Assy..... 1.3

Blades..... 1.4

Hydraulic Assy..... 1.5

Shield Assy..... 1.6

PTO Shaft..... 1.7

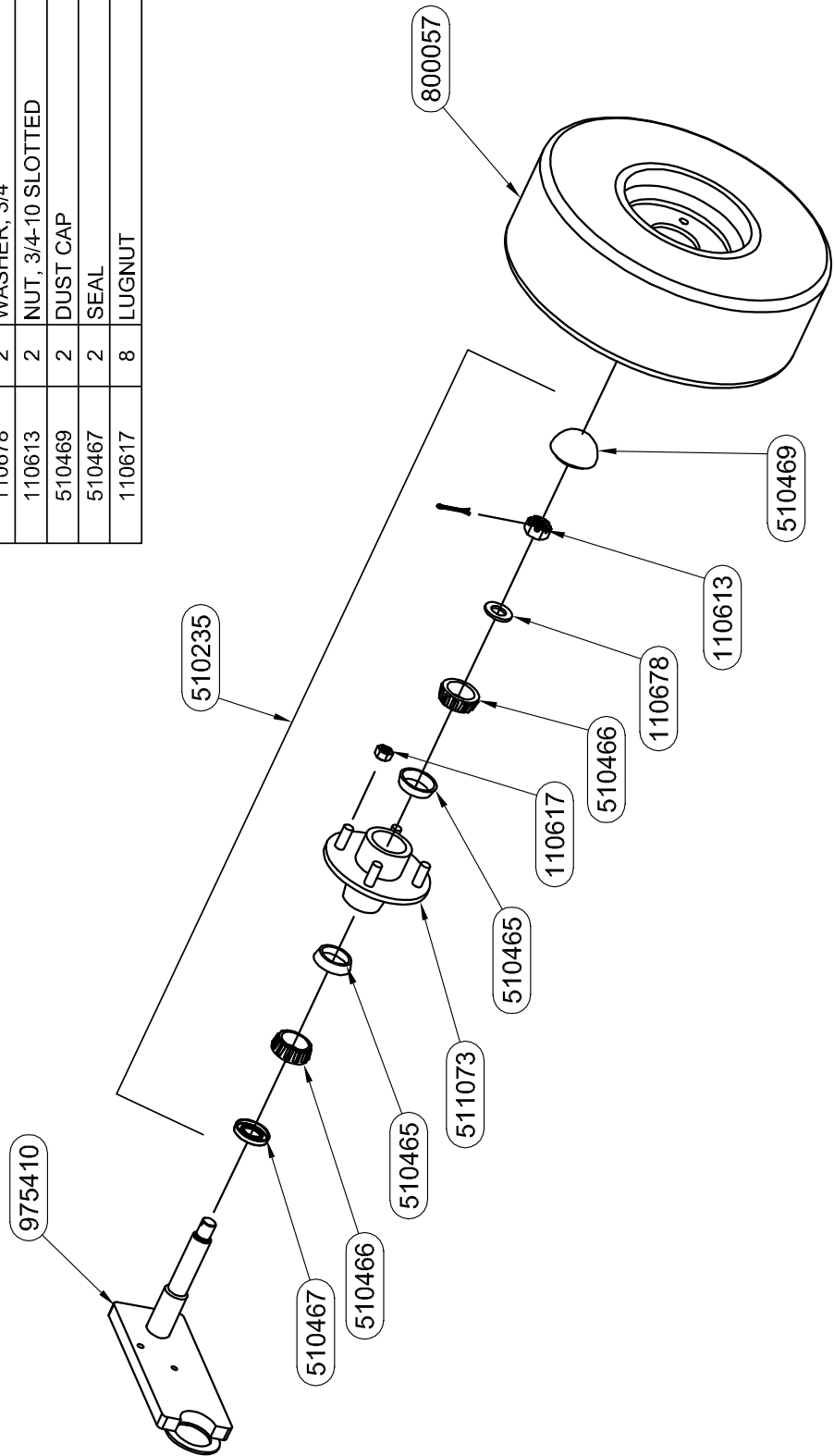
Decal Kit, Complete..... 1.8

Parts List		
PART #	QTY	DESCRIPTION
110003	1	BOLT, 1/2-13 X 4.0
110319	10	NUT, 5/16-18 U-TYPE, .75L
110333	8	NUT, 1-1/4-7
110403	1	BOLT, 1/2-13 X 2.5
110420	10	BOLT, 3/8-16 X 1.0
110435	10	BOLT, 3/8-16 X 1.5
110535	4	BOLT, 7/16-14 X 1.5
110539	2	BOLT, 7/16-14 X 1.25
110610	12	NUT, 1/2-13
110612	6	NUT, 3/8-16 GR 2
110616	16	NUT, 5/16", J-TYPE, CAGE, .5C
110641	6	NUT, 7/16-14
110658	4	WASHER, 1/2" FLAT STANDARD
110666	11	WASHER, 1/2" LOCK
110671	6	WASHER, 7/16" LOCK
110672	20	WASHER, 3/8" LOCK
110676	16	WASHER, 3/8" FLAT STANDARD
110826	8	NUT, 3/8-16 GR 5
510174	3	GREASE ZERK, 1/4-28 ST
970409	1	CHAIN ADJUSTER PLATE
970426	1	UPPER SHOCK SPACER
970436	1	LOWER SHOCK MNTG BRKT
970439	1	ADJUSTER PLATE
970491	2	PLATE - SKID, 2 In., VC60
972013	1	SHOCK, GAS W/ HELPER SPRING
975403	4	SKID POST WELDMENT
975407	1	HITCH BAR WELDMENT
975408	1	TOP COUNTERWEIGHT WELDMENT
975409	1	SIDE COUNTERWEIGHT WELDMENT
975410	1	FRAME WELDMENT

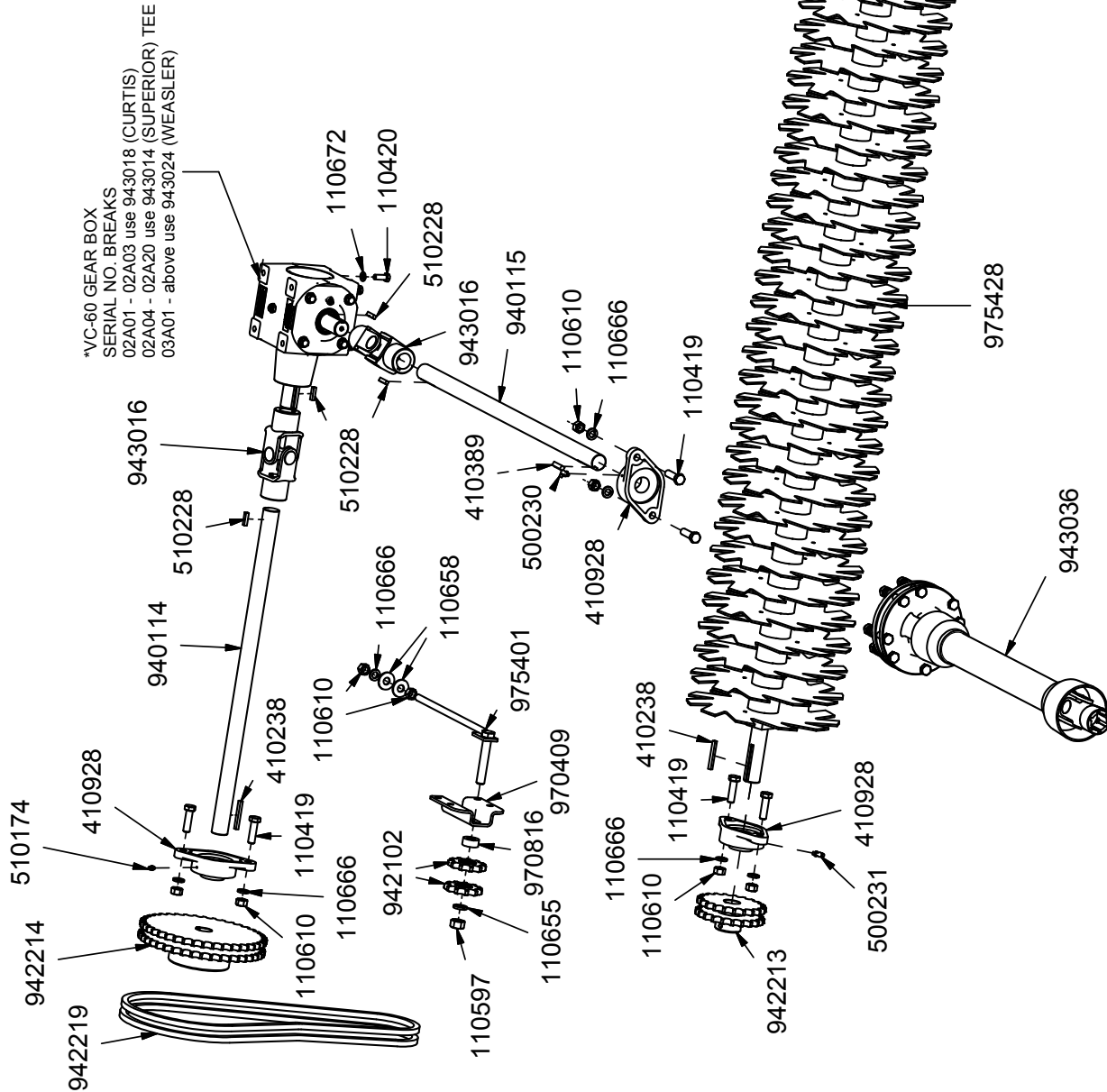


WHEEL & HUB ASSY.

PART #	QTY	NAME
510235	1	WHEEL HUB COMPLETE
975410	1	FRAME WELDMENT
800057	2	FILLED TIRE
511073	2	HUB W/RACES
510465	4	RACE
510466	4	BEARING
110678	2	WASHER, 3/4
110613	2	NUT, 3/4-10 SLOTTED
510469	2	DUST CAP
510467	2	SEAL
110617	8	LUGNUT

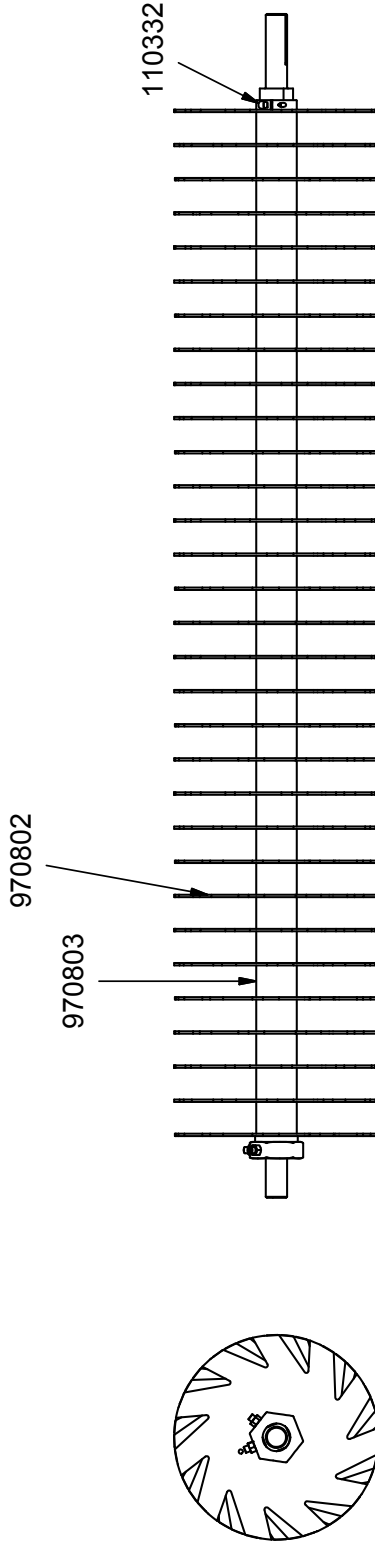
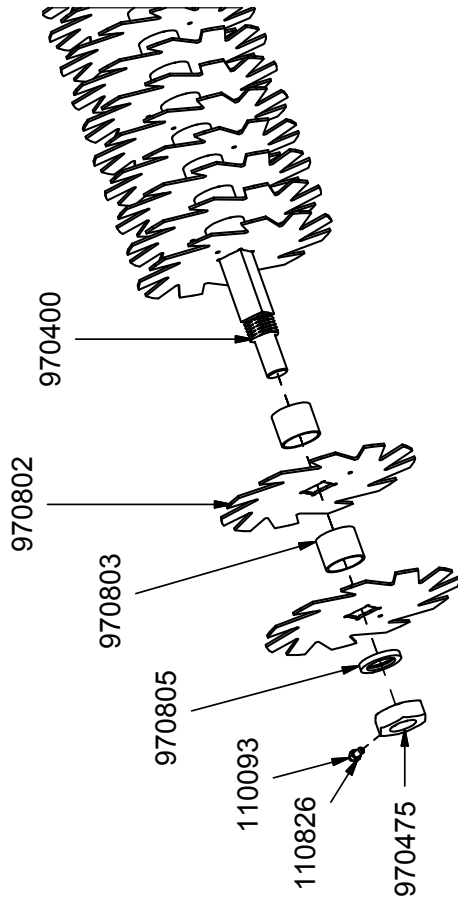


SHAFT ASSY.



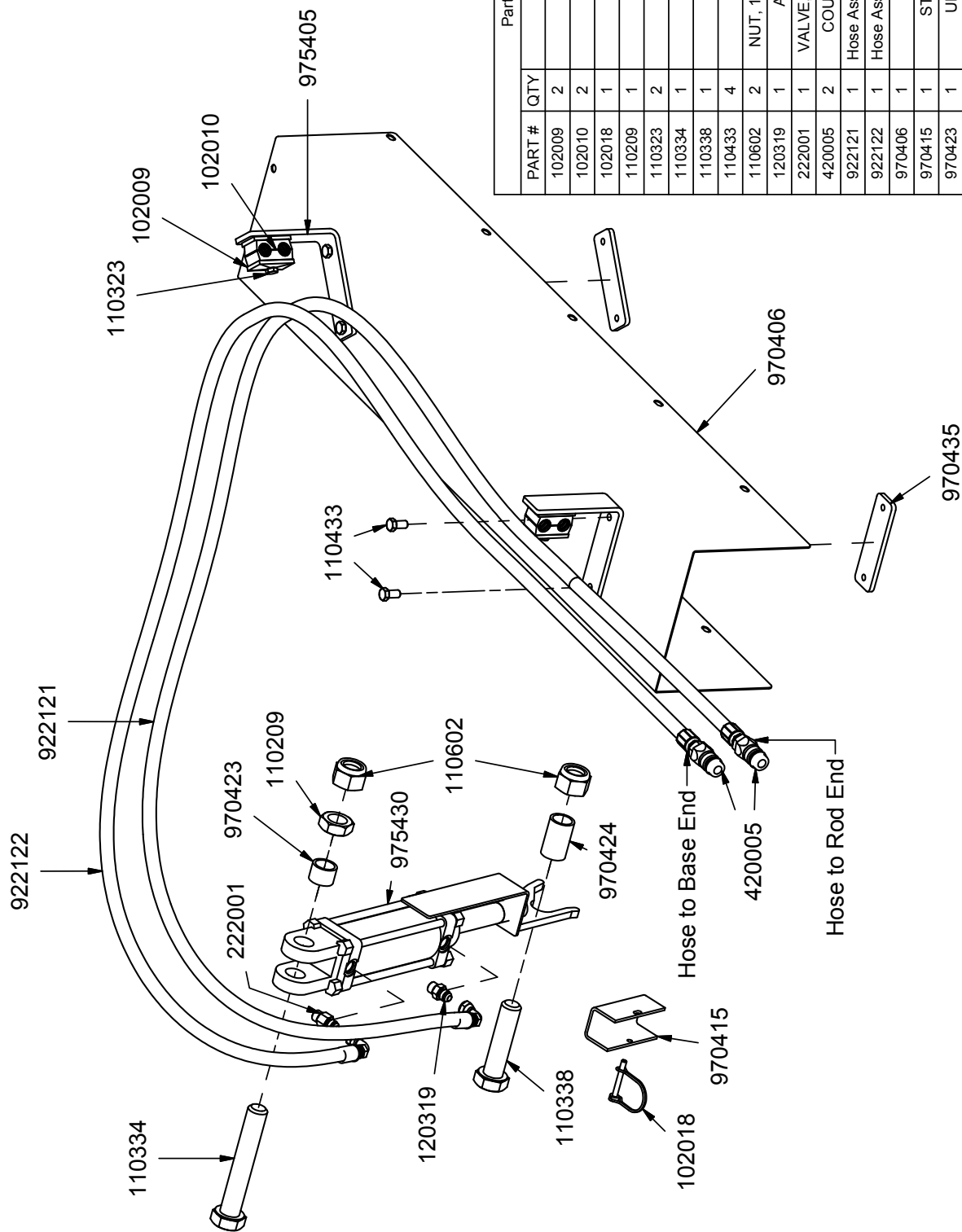
Parts List		
PART #	QTY	DESCRIPTION
110419	8	BOLT, 1/2-13 X 1.75
110420	10	BOLT, 3/8-16 X 1.0
110597	1	NUT, 5/8-11 HEX
110610	12	NUT, 1/2-13
110655	1	WASHER, 5/8" LOCK
110658	4	WASHER, 1/2" FLAT STANDARD
110666	11	WASHER, 1/2" LOCK
110672	20	WASHER, 3/8" LOCK
410238	2	KEY, 1/4 X 1/4 X 2.25 in
410389	1	KEY, 5/16 X 5/16 X 1.25 in
410928	4	BEARING, SLAT DRIVE 1.25 SHAFT
500230	1	GREASE ZERK, 1/4-28 90deg
500231	2	GREASE ZERK, 1/4-28 45deg
510174	3	GREASE ZERK, 1/4-28 ST
510228	5	KEY, 1/4 X 1/4 X 1.0 in
940114	1	SHAFT - SIDE DRIVE
940115	1	SHAFT - FRONT DRIVE, VC60 - 28"
942102	2	SPROCKET - IDLER, 6011
942213	1	SPROCKET - 60-2-21
942214	1	SPROCKET - 60-2-40
942219	1	Chain, #50 Double
943016	2	U-Joint Assy, 1 1/4 to 1 1/4, 12h
943024	1	GEAR BOX (WEASLER)
943036	1	PTO Shaft, Verti-cutter
970409	1	CHAIN ADJUSTER PLATE
970816	1	IDLER SPROCKET SPACER
975401	1	CHAIN ADJUST ROD WELDMENT
975428	1	Rotor Assembly, 2", 10ga

ROTOR ASSY.



Parts List		
PART #	QTY	DESCRIPTION
110093	2	SetScrew, 3/8-16 X 1.25
110332	1	COLLAR - 1-1/2" SPLIT
110826	2	NUT, 3/8-16 GR 5
970400	1	SHAFT - VERTICUTTER, VC60
970475	1	NUT - HEX, JAM, 1-3/4 - 5 UNC
970802	31	DISC - VERTI CUTTER, 10 Ga, 11 POINT
970803	30	SPACER - VERTI CUTTER, 2 IN
970805	1	WASHER - CUP, ROTOR

HYDRAULIC ASSY.

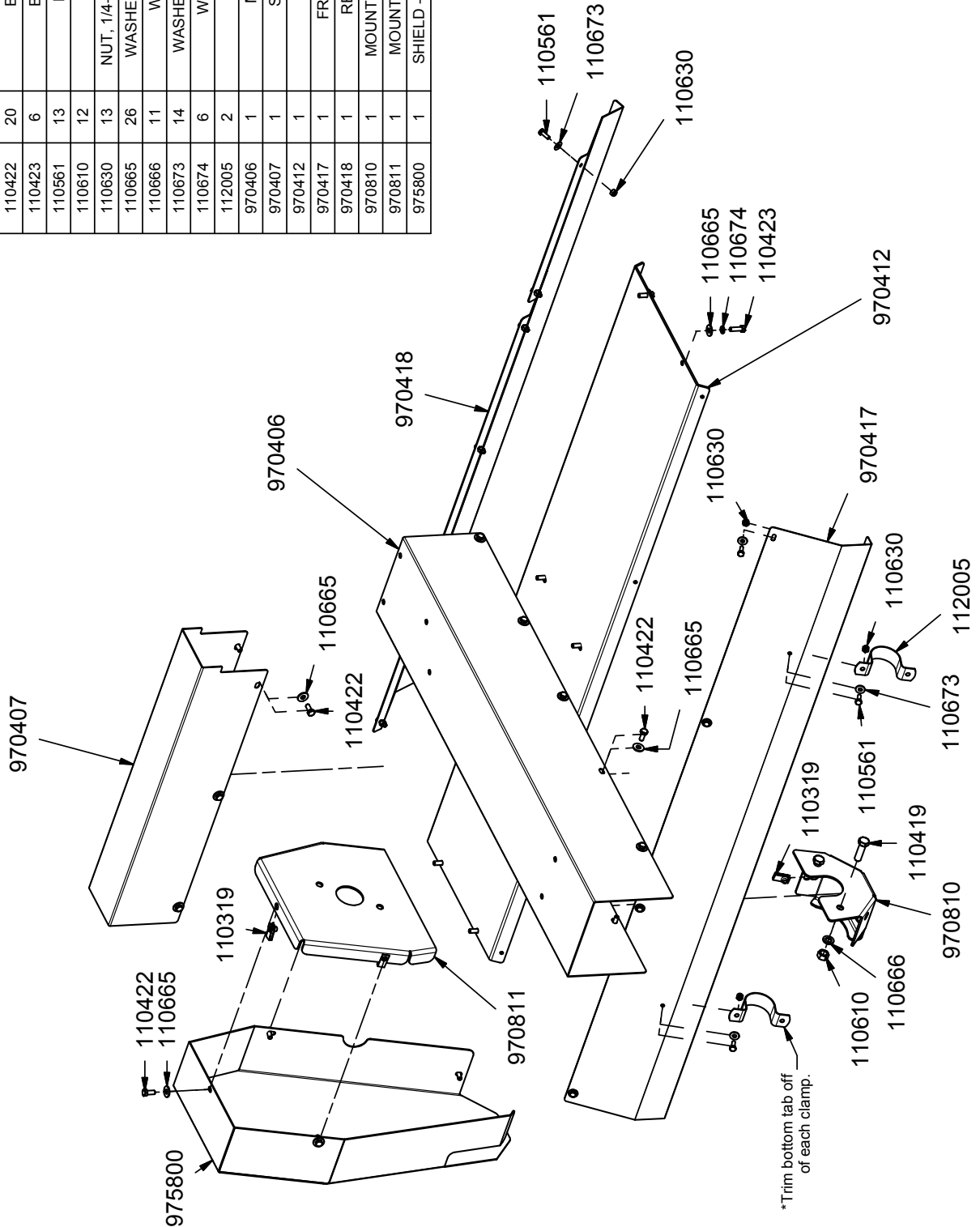


Parts List		
PART #	QTY	DESCRIPTION
102009	2	Cover Plate
102010	2	Clamp Body
102018	1	PIN, WIRE LOCK
110209	1	NUT, 1-8 JAM
110323	2	Bolt, 1/4-20 X1 3/8
110334	1	BOLT, 1-8 X 6.0
110338	1	BOLT, 1-8 X 4.0
110433	4	BOLT, 3/8-16 X .75
110602	2	NUT, 1-8 LOCK NYLON INSERT
120319	1	ADAPTER, 6MJ-6MB
222001	1	VALVE, CHECK W/ .063 ORIFICE
420005	2	COUPLER, PIONEER MALE
922121	1	Hose Assy, .375 X 125, 8mp/6fjx90m
922122	1	Hose Assy, .375 X 118, 8mp/6fjx90m
970406	1	MAIN PTO GUARD
970415	1	STOP, RAM VERTICUT
970423	1	UPPER RAM SPACER
970424	1	LOWER RAM SPACER
970435	2	BACKING PLATE
975405	2	Hose Tower Weldment
975430	1	RAM C/EVIS GUIDE WELDMENT

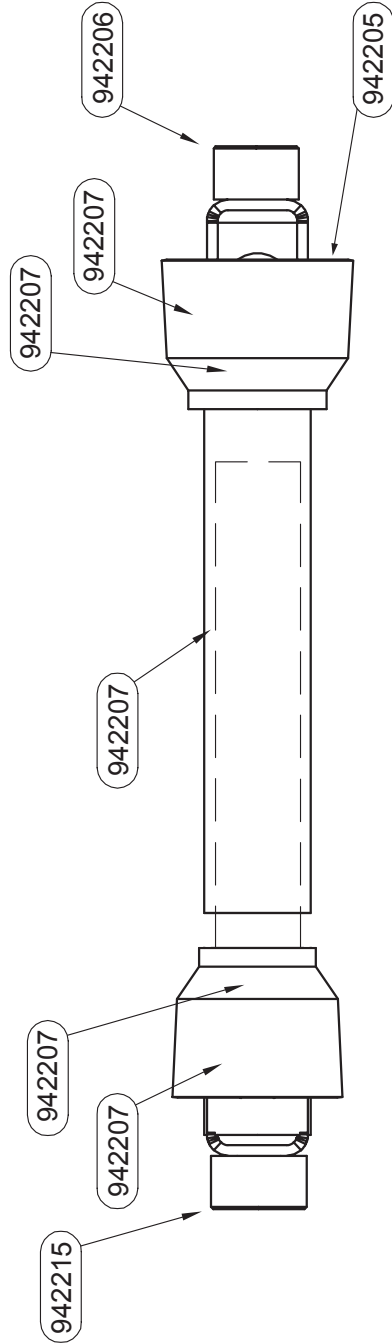
11/11

SHIELD ASSY.

Parts List		
PART #	QTY	DESCRIPTION
110319	10	NUT, 5/16-18 U-TYPE .75L
110419	8	BOLT, 1/2-13 X 1.75
110422	20	BOLT, 5/16-18 X .75
110423	6	BOLT, 5/16-18 X 1.0
110561	13	BOLT, 1/4-20 X .75
110610	12	NUT, 1/2-13
110630	13	NUT, 1/4-20 LOCK (NYLON INSERT)
110665	26	WASHER, 5/16" FLAT STANDARD
110666	11	WASHER, 1/2" LOCK
110673	14	WASHER, 1/4" FLAT STANDARD
110674	6	WASHER, 5/16" LOCK
112005	2	Clamp, 2", 2 hole
970406	1	MAIN PTO GUARD
970407	1	SHIELD - SIDE PTO
970412	1	BLADE PAN
970417	1	FRONT BLADE GAURD
970418	1	REAR BLADE GAURD
970810	1	MOUNT - DRIVE SHIELD, LOWER
970811	1	MOUNT - DRIVE SHIELD, UPPER
975800	1	SHIELD - FINAL DRIVE, WELDMENT



PART #	QTY	NAME
400036	1	DECAL, SAFETY, PTO SLICER (NOT SHOWN)
400037	1	DECAL, "DANGER", PTO (NOT SHOWN)
942215	1	YOKE, IMPLEMENT END, 1.25" BORE
942207	2	REPAIR KIT, PTO 12N
942206	1	YOKE, SNAP HITCH 12N
942207	2	CROSS KIT
942207	1	YOKE, SHAFT WELD 12N
942207	1	GUARD, INNER PALSTIC 12N
942207	1	YOKE, TUBE WELD 12N
942205	1	FUNCTION CLUTCH (NOT SHOWN)



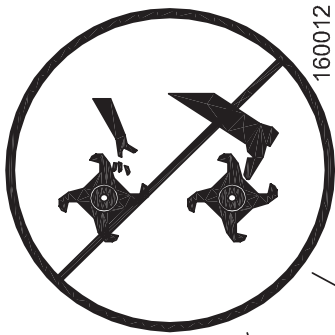
PTO SHAFT - Part No. 943036
VC-60

VC-60 DECAL KIT, COMPLETE - 905041

HARPER VERTI-CUTTER

902108 Vertical Mower 902080

- CAUTION**
- TRACTOR ENGINE MUST BE IN IDLE SPEED BEFORE ENGAGING PTO.
 - PTO SPEED NOT TO EXCEED 540 RPM.
 - BEFORE CLOSING, ADJUST ON SURVIVAL, DISengage PTO AND WAIT FOR ALL MOVEMENT TO STOP. SECURE TRANSPORT SAFETY LOCK.
 - TRACTOR HYDRAULICS CONTROL THE TRANSPORT SYSTEM.
 - NOT FOR HIGHWAY USE.



LOCATED NEAR AXLE GREASE ZERKS



LOCATED NEAR ALL BEARINGS, AND U-JOINTS.



12/02

CAUTION

Read Operator's Manual before using machine.

160010

WARNING

SHIELD HAS BEEN REMOVED! REPLACE PRIOR TO MACHINE OPERATION

400014

CAUTION

THIS EQUIPMENT DESIGNED FOR NORMAL OPERATING SPEED 540 RPM

KEEP U-JOINT ANGLE SMALL AND EQUAL. DO NOT EXCEED 15° ANGLE ON EACH U-JOINT.

902001

DANGER

ROTATING DRIVELINE

CONTACT CAN CAUSE DEATH

KEEP AWAY!

- DO NOT OPERATE WITHOUT -
- ALL DRIVELINE GUARDS, TRACTOR AND EQUIPMENT SHIELDS IN PLACE
- DRIVELINES SECURELY ATTACHED AT BOTH ENDS
- DRIVELINE GUARDS THAT TURN FREELY ON DRIVELINE

40001



902072

NOTES

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Harper, KS 67058

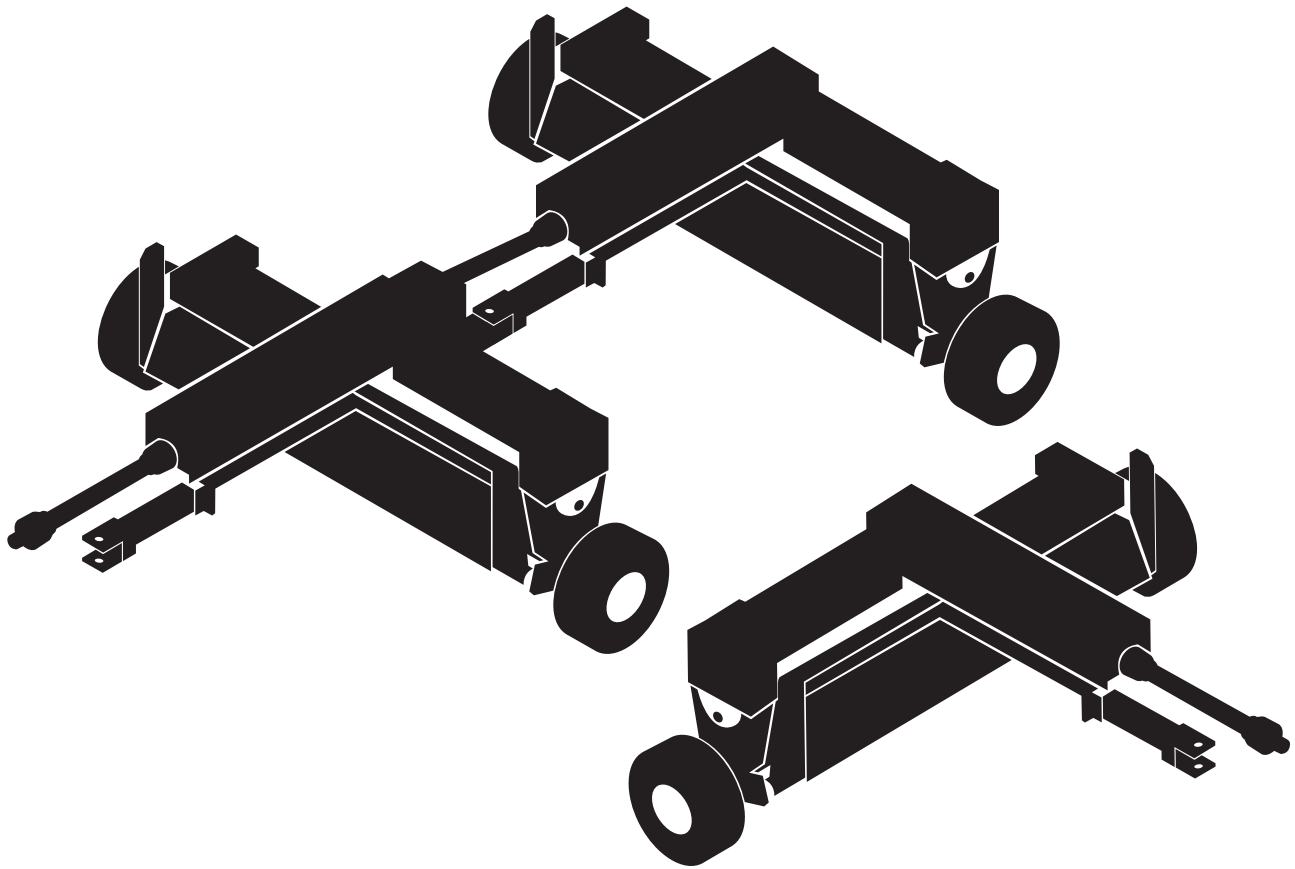
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VERTI-CUTTER





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