

*Parts Manual*



**SUPER STAR “E” 48V  
AC  
8510  
SN: EM954**

Revised January, 2022

*Product Support: 1020 Hawaii Rd; Humboldt, KS 66748  
1-888-422-5173 [wj@smithco.com](mailto:wj@smithco.com)*

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## INTRODUCTION

Thank you for purchasing a **SMITHCO** product.

Read this manual and all other manuals pertaining to the Bunker Rake carefully as they contain safety, operating, assembly and maintenance instructions. Failure to do so could result in personal injury or equipment damage.

Keep manuals in a safe place after operator and maintenance personnel have read them. Right and left sides are from the operator's seat, facing forward.

**WARNING: Failure to follow cautious operating practices can result in serious injury to the operator or other persons. The owner must understand these instructions and must allow only trained persons who understand these instructions to operate this vehicle.**

This Operation and Service Manual has been designed to enable you to maintain and service this vehicle.

Proper service, repair and maintenance are important for safe, reliable operation. If part replacement is necessary, please NOTE the use of all non-SMITHCO parts will void your warranty.

This Manual contains various **NOTES, CAUTIONS, and WARNINGS** that must be carefully observed in order to reduce the risk of personal injury during operation or repair

All **SMITHCO** machines have a Serial Number and Model Number. Both numbers are needed when ordering parts. The serial number plate on the Sand Star E 48V is located on the left, rear main frame.

For product and accessory information, help finding a dealer or to register your product please contact us at [www.smithco.com](http://www.smithco.com)

Information needed when ordering replacement parts:

1. Model Number of machine
2. Serial Number of machine
3. Name and Part Number of part
4. Quantity of parts

For easy access record your Serial and Model numbers here.

<b>SMITHCO</b>		DATE OF MFG.	
WAYNE, PENNSYLVANIA 19087 USA 610-688-4009 Fax 610-688-6069		<input type="text"/>	
SERIAL NO.	<input type="text"/>	kW/hp	<input type="text"/>
MODEL NO.	<input type="text"/>	kg/lb	<input type="text"/>

**SMITHCO Customer Service 1-888-422-5173**

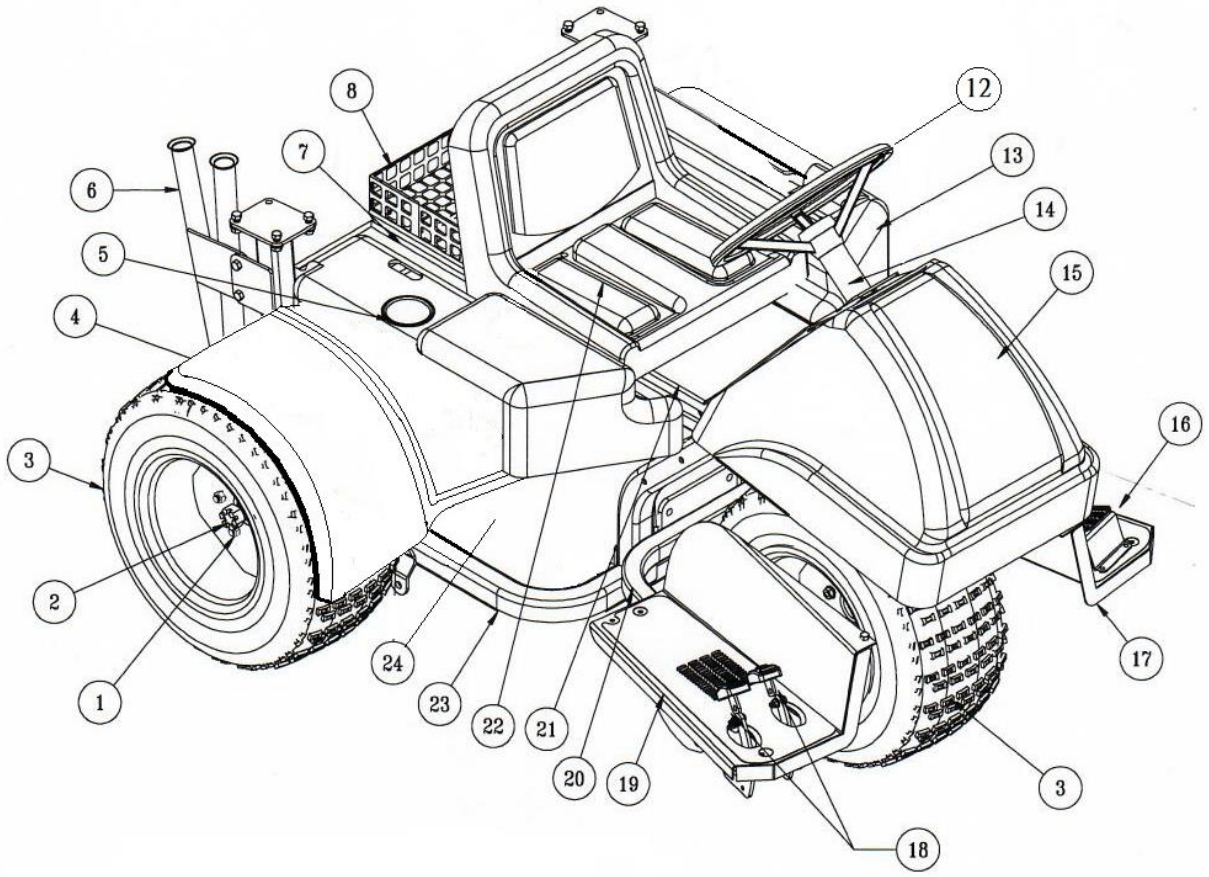
## **SAFE PRACTICES**

1. It is your responsibility to read this manual and all publications associated with this machine (accessories and attachments).
2. Never allow anyone to operate or service the machine or its attachments without proper training and instructions. Never allow minors to operate any equipment.
3. Learn the proper use of the machine, as well as the location and purpose of all the controls and gauges before you operate the equipment. Working with unfamiliar equipment can lead to accidents.
4. Wear all the necessary protective clothing and personal safety devices to protect your head, eyes, ears, hands and feet. Operate the machine only in daylight or in good artificial light.
5. Inspect the area where the equipment will be used. Pick up all debris you can find before operating. Beware of overhead obstructions and underground obstacles. Stay alert for hidden hazards.
6. Never operate equipment that is not in perfect working order or that does not have decals, guards, shields, or other protective devices in place.
7. Never disconnect or bypass any switch.
8. This machine demands your attention. To prevent loss of control or tipping of the vehicle:
  - A. Use extra caution in backing up the vehicle. Make sure area is clear.
  - B. Do not stop or start suddenly on any slope.
  - C. Reduce speed on slopes and during sharp turns. Use caution when changing directions on slopes.
  - D. Stay alert for holes in the terrain and other hidden hazards.
9. Before leaving operator's position for any reason:
  - A. Disengage all drives.
  - B. Lower all attachments to the ground.
  - C. Set park brake.
  - D. Shut off unit and remove the ignition key.
10. Keep hands, feet and clothing away from moving parts. Wait for all movement to stop before you clean, adjust or service the machine.
11. Never carry passengers.
12. Shut unit off before making repairs/adjustments or checking/adding oil to the rear axle.
13. Use parts and materials supplied by SMITHCO only. Do not modify any function or part.
14. When running the machine downhill with your foot on the accelerator pedal, the machine will reach a maximum of 10 mph (16 kph). However, if you remove your foot from the accelerator pedal when going downhill, the machine will only travel at a maximum of 5 mph (8kph). This is called "Plug Braking."

These machines are intended for professional maintenance on golf courses and baseball fields. Other use is forbidden.



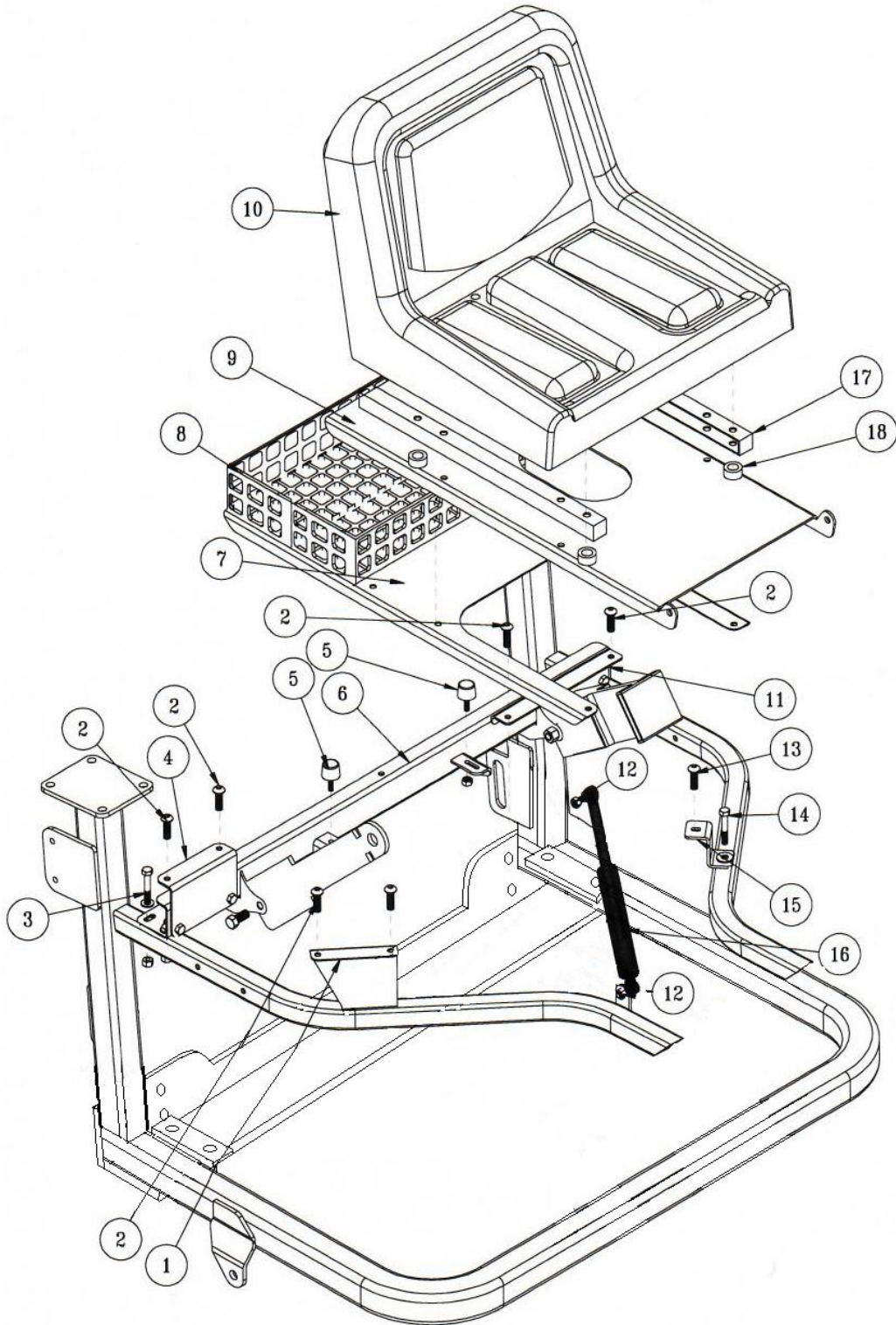
# 8510 BODY ASSEMBLY DRAWING



## 8510 BODY PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	1187	Lug Nut	10
2	851-018	Axle Assembly	1
3	932-090	Knobby Wheel & Tire	3
	932-090-1	Knobby Tire Only	3
	932-090-2	Wheel for Knobby Tire	3
4	851-053	Right Hand Fender	1
5	943-116	Plastic Cup	1
6	851-072	Rake Holder Tube	1
	400-002	5/16" – 18 x 1" HHCS	2
	400-201	1/4" Flat Washer	2
	400-281	5/16" Flanged Lock Nut	2
7	851-024	Basket Mount	1
8	851-071	Basket	1
	400-091	1/4" – Truss Head Bolt x 1"	4
	400-342	1/4" – 20 Flanged Lock Nut	4
12	720-057	15" Steering Wheel	1
	720-058	Center Cap for Steering Wheel	1
	40-482	Decal – "SMITHCO" for Steering Wheel Cap	1
	750-315	1/4" x 2 1/2" Spring Pin	1
13	851-054	Left Hand Fender	1
14	851-042	Steering Post	1
15	851-052	Nose Cone	1
	851-067	Plastic Plug for Nose Cone	1
	8803	Black Trim	45"
16	851-020	Foot Rest	1
	851-045	Foot Rest Grip	1
17	851-017	Left Hand Floorboard	1
	851-044	Left Hand Floormat	1
18	851-035	Molded Foot Pedal	2
19	851-016	Right Hand Floorboard	1
	851-043	Right Hand Floormat	1
20	851-009	Floorboard Frame	1
21	851-014	Seat Panel	1
22	832-123-2	Low-Back "SMITHCO" Seat Assembly	1
	832-123-1	Slide Rails for Seat	1
23	851-008	Main Frame	1
24	851-107	Battery Plate	1

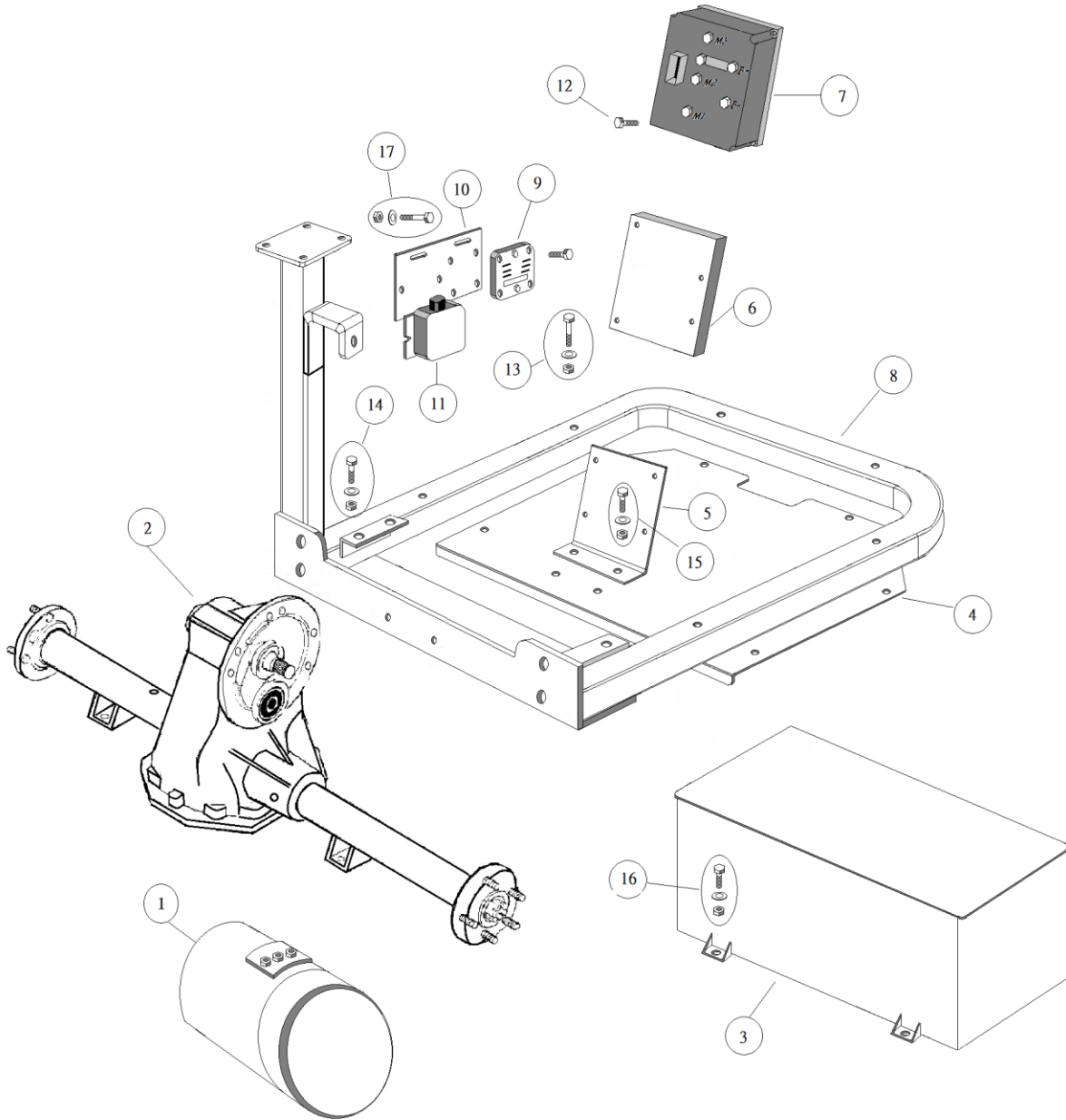
# 8510 SEAT PANEL DRAWING



## SEAT PANEL PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	851-023	Right Hand Fender Support	1
2	400-091	1/4" – Truss Head Bolt x 1"	6
	400-133-1	1/4" U-Type Clip Nut	7
3	400-356	1/4" x 1 3/4" Bolt	4
	400-201	1/4" Flat Washer	4
	400-342	1/4" – 20 Flanged Lock Nut	4
4	851-022	Right Hand Rear Fender Bracket	1
5	851-051	Rubber Bumper	2
	400-342	1/4" – 20 Flanged Lock Nut	2
6	851-013	Seat Belt Brace	1
7	851-024	Basket Mount	1
8	851-071	Basket	1
	400-091	1/4 - Truss Head Bolt x 1"	4
	400-342	1/4" – 20 Flanged Lock Nut	4
9	851-014	Seat Panel	1
10	832-123-2	Low-Back "SMITHCO" Seat Assembly	1
	932-119-1	Safety Seat Switch	1
11	851-030	Left Hand Rear Fender Mount	1
12	41-129	Ball Stud	2
	400-281	5/16" Flanged Lock Nut	2
13	400-091	1/4" - Truss Head Bolt x 1"	1
14	400-006	5/16 – 18 x 2" HHCS	3
	400-201	1/4" Flat Washer	3
	400-281	5/16" Flanged Lock Nut	3
15	851-026	Left Hand Front Fender Mount	3
16	851-061	Shock	1
17	832-123-1	Slide Rails for Seat	1
18	832-124	Nylon Washer for Seat	4

# 8510 REAR FRAME DRAWING

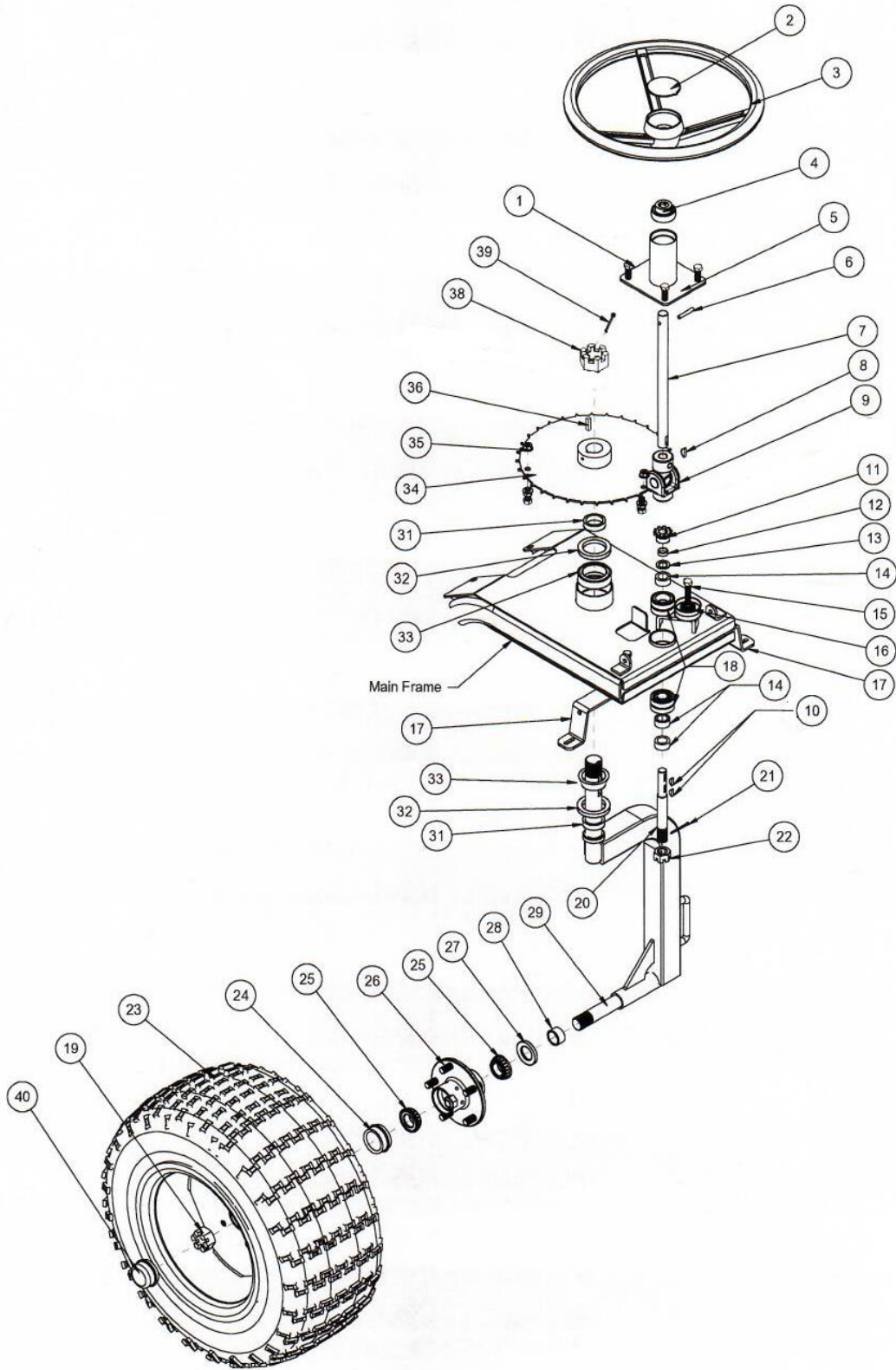


## 8510 REAR FRAME PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	851-003	Motor	1
	400-096	6MM x 1.0 x 25 Bolt	6
	400-208	¼" Lock Washer	6
2	851-018	Axle Assembly	1
3	851-105	Lithium Battery Pack	1
4	851-010	Battery Plate	1
5	851-027	Controller Mount	1
6	851-028	Aluminum Controller Plate	1
7	851-004	Controller	1
	400-351	¼" – 20 x ¾" Flange Bolt	3
8	851-008	Main Frame	1
9	851-056	6 Way Fuse Block	1
	400-228	3/16" x 1" FH Stove Bolt	4
	400-219	#8 Flat Washer	4
	400-242	#10 Lock Washer	4
	400-234	10-24 ZP Hex Machine Nut	4
10	851-057	Converter / Fuse Plate	1
11	851-108	48V to 12V Converter	1
	400-039	8/32" x ¾" Machine Screw Rnd Slit Znc	2
	400-219	#8 Flat Washer	4
	400-242	#10 Lock Washer	2
	400-113	8/32" Nut Machine Screw Hex	2
12	400-356	¼" x 1 ¾" Bolt	2
13	400-019	3/8" – 16 x 3" HHCS	6
	400-202	5/16" Flat Washer	6
	400-350	3/8" Flange Nut	6
14	400-354	7/16" – 20 x 1 ¼" Hex Cap Screw	4
	400-119	7/16" – 20 Nylon Lock Nut	4
	400-310	7/16" Flat Washer	4
15	400-090	3/8" – 16 x 1 ¼" HHCS	2
	400-202	5/16" Flat Washer	2
	400-350	3/8" Flange Nut	2
16	400-002	5/16" – 18 x 1" HHCS	4
	400-201	¼" Flat Washer	4
	400-281	5/16" Flanged Lock Nut	4
17	400-008	5/16" – 18 x 2 ½" HHCS	1
	400-006	5/16" – 18 x 2" HHCS	1
	400-201	¼" Flat Washer	6
	400-281	5/16" Flanged Lock Nut	2



# 8510 FRONT FORK DRAWING



## 8510 FRONT FORK PARTS LIST

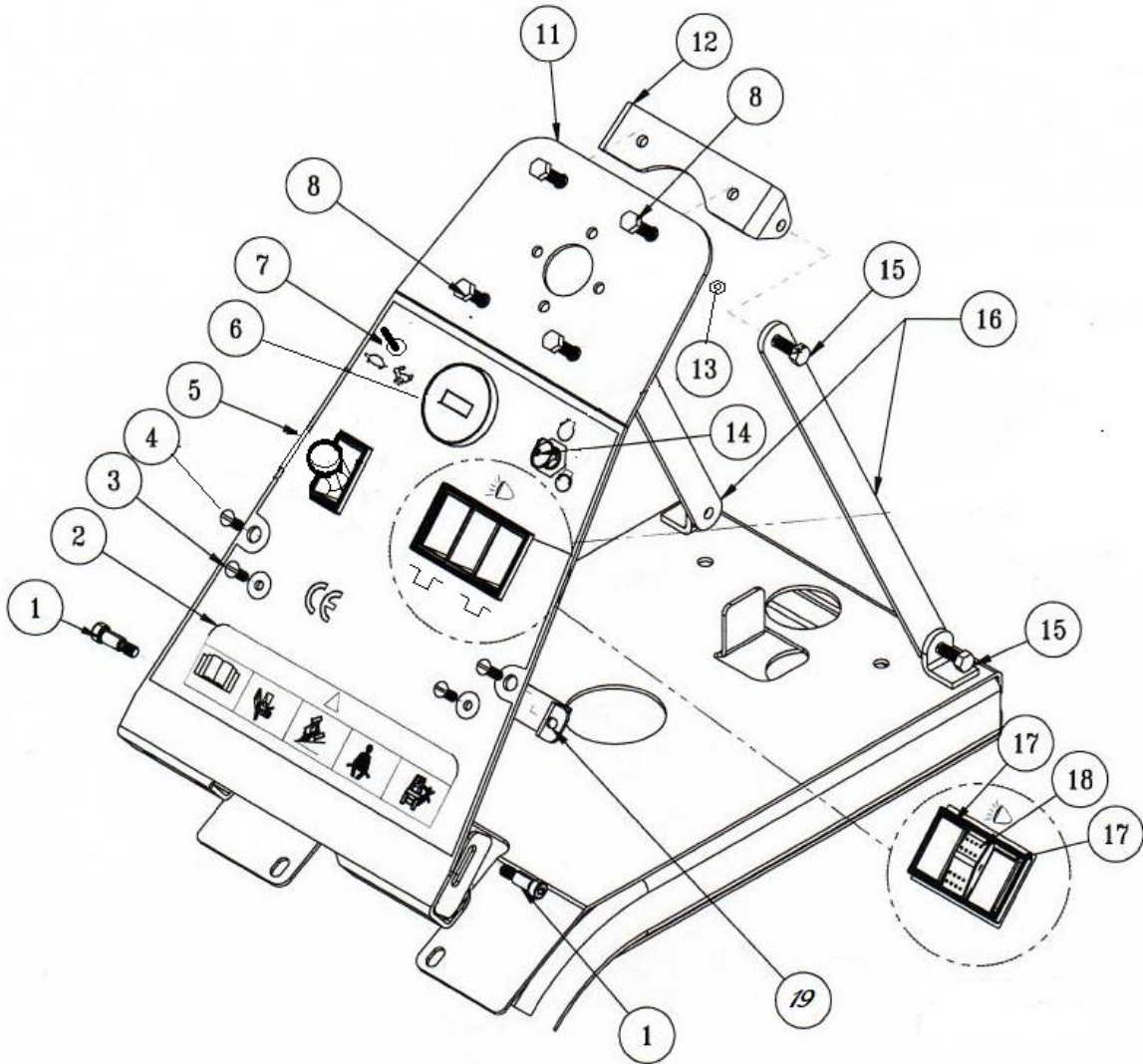
REF#	PART#	DESCRIPTION	QTY.
1	400-002	5/16 – 18 X 1” HHCS	4
	400-201	¼” Flat Washer	4
	400-281	5/16” Flanged Lock Nut	4
2	720-058	Center Cap	1
	40-482	Decal – “SMITHCO” for Steering Wheel	1
3	720-057	15” Steering Wheel	1
	750-315	¼” x 2 ½” Spring Pin	1
4	851-046	Steering Post Bearing	1
5	851-042	Steering Post	1
6	750-315	¼” x 2 ½” Spring Pin	1
7	851-047	Top Steering Shaft	1
8	740-023	Woodruff Key, 3/16” x ¾”	1
9	932-035	U-Joint	1
10	41-229	Woodruff Key 3/16” x 5/8”	2
11	932-030	Steering Sprocket	1
12	851-033	5/8” Spacer for Steering Shaft	1
13	40-166	Machine Bushing 5/8” x 14 GA	1
14	851-032	¾” Spacer for Steering Shaft	3
15	400-016	3/8” – 16 x 1 ¾” HHCS	1
	400-203	3/8” Flat Washer	3
	400-116	3/8” – 16 Lock Nut	1
16	40-022	Idler Pulley	1
17	851-025	Front Support	2
	400-202	5/16” Flat Washer	2
	400-116	3/8” – 16 Lock Nut	2
18	41-218	Bearing	2
	41-222	Grease Seal	2
19	709-126	Spindle Nut	1
	720-043	Cotter Pin 1/8” x 1 ½”	1
20	851-032	¾” Spacer for Steering Shaft	1
21	40-168	Cotter Pin 1/8” x 1”	1
22	2014	Spindle Nut	1
23	932-090	Knobby Wheel & Tire	1
	932-090-1	Knobby Tire Only	1
	932-090-2	Wheel for Knobby Tire	1
24	2013	Spindle Washer	3
25	2028	Tapered Bearing	2
26	44-923	Front Hub	1
	44-923-1	½” Stud with Lug	5
27	709-171	Seal	1
28	44-924	Front Axle Spacer	1
29	932-021	Front Fork	1
31	932-024	Spacer	2
32	932-022	Seal	2
33	932-023	Bearing	2



**8510 FRONT FORK PARTS LIST (Continued)**

<b>REF#</b>	<b>PART#</b>	<b>DESCRIPTION</b>	<b>QTY.</b>
34	932-031	Steering Sprocket	1
35	400-090	3/8" – 16 x 1 1/4" HHCS	2
	400-350	3/8" Flange Nut	2
36	1517	1/4" Key for Drive Shaft	1
38	932-042	Thick Slotted Hex Nut 1 1/4"	1
39	709-143-1	1/8" x 2 1/2" Cotter Pin	1
40	851-034	Grease Buddy Dust Cap	1
NS	851-029	Chain #35 x 102 Pitch with Connecting Link	1

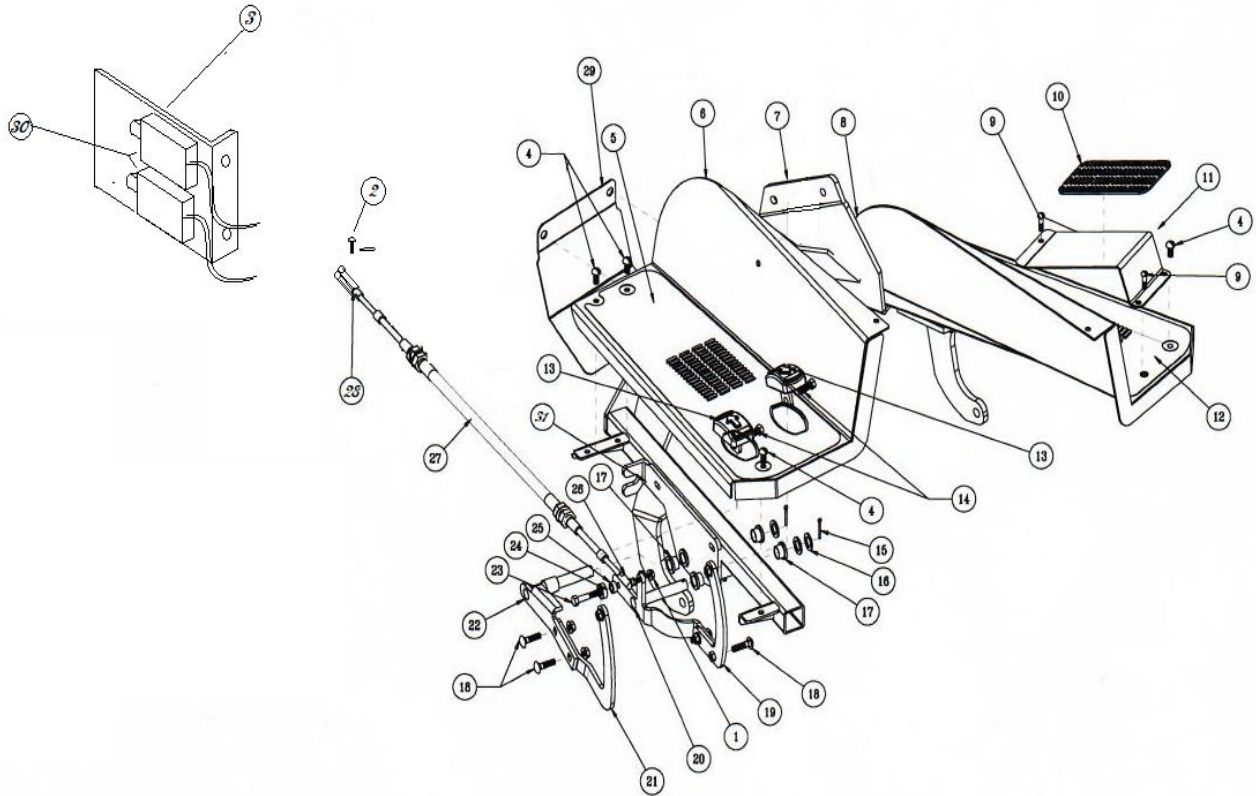
# DASHBOARD DRAWING



## DASHBOARD PARTS LIST

REF#	PART#	DESCRIPTION	QTY
1	400-353	3/8" X 3/8" Shoulder Bolt	2
	400-263	5/16" Sq Nut Course – Plain	2
2	851-064	Decal, Dashboard	1
3	400-321	1/4" x 3/4" x 20 Phillips Truss Head	2
	400-342	1/4" – 20 Flanged Lock Nut	2
4	400-091	1/4" - Truss Head Bolt x 1"	2
5	851-073	Brake Switch	1
6	851-006	BDI Display	1
7	2070	Ignition Switch	1
	709-255-1	Boot for Toggle Switch	1
8	400-002	5/16" – 18 x 1" HHCS	4
	400-201	1/4" Flat Washer	4
	400-281	5/16" Flanged Lock Nut	4
11	851-015	Dashboard	1
12	851-041	Top Mount Bracket	1
13	400-281	5/16" Flanged Lock Nut	4
14	832-514	Key Switch	1
	832-514-1	Replacement Key	1
15	400-002	5/16" – 18 x 1" HHCS	4
	400-201	1/4" Flat Washer	4
16	851-040	Dash Brace	2
17	730-220	Actuator Switch	2
	851-062	Mount Panel End	2
18	44-943	On – Off Switch	1
	851-063	Mount Panel Middle	1
19	851-021	Wire Retainer	1

## FOOT PEDAL LINKAGE DRAWING



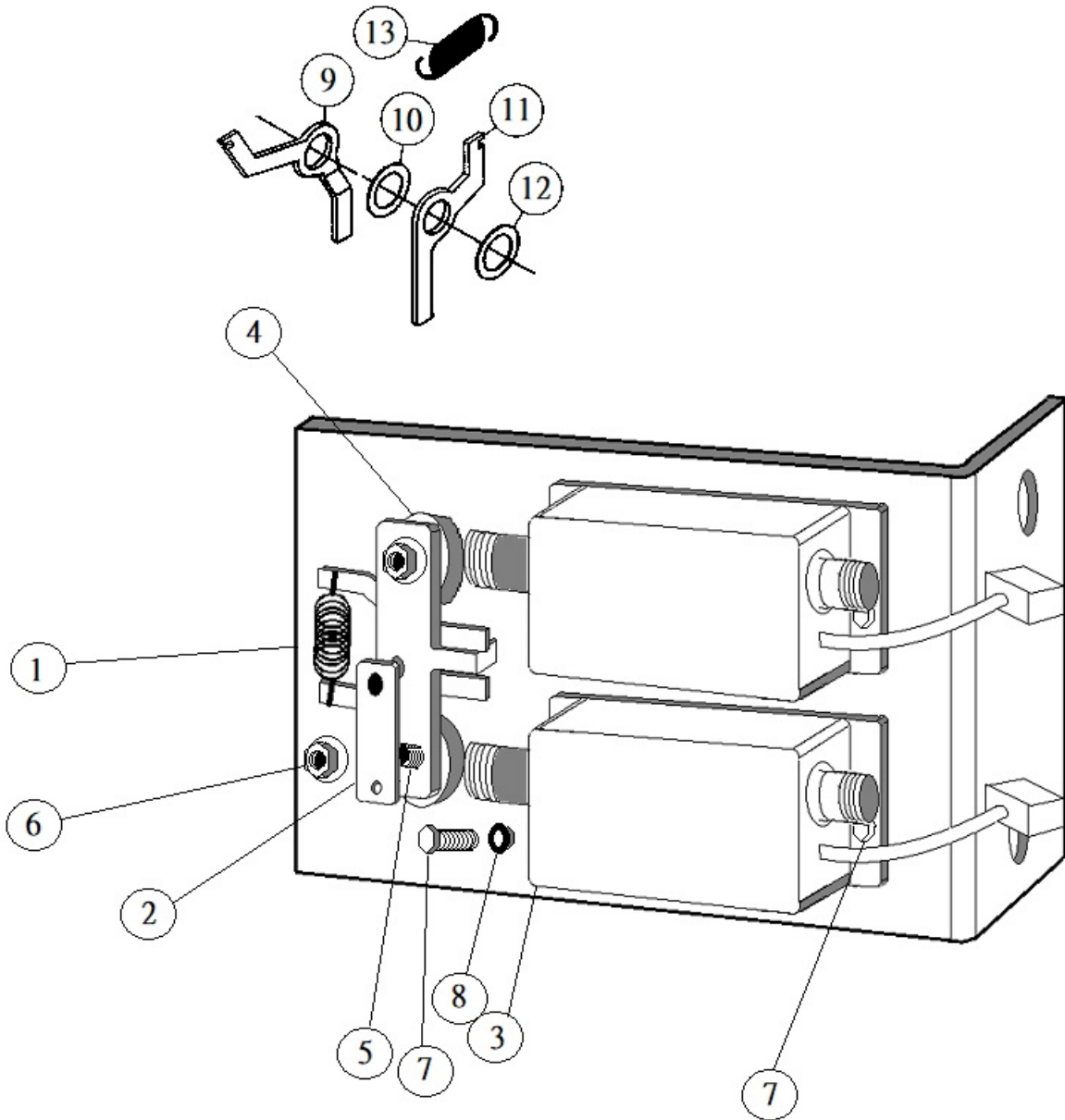
## FOOT PEDAL LINKAGE PARTS LIST

REF#	PART#	DESCRIPTION	QTY
1	400-355	1/4" x 28 Flange Nut	1
2	720-078-1	5/16" x 1" Clevis Pin	1
	720-079	Cotter Pin 3/32" x 3/4"	1
3	851-048	Accelerator Plate	1
4	400-321	1/4" x 3/4" x 20 Philips Truss Head	8
	400-342	1/4" - 20 Flanged Lock Nut	8
5	851-043	Right Hand Floormat	1
6	851-016	Right Hand Floorboard	1

## FOOT PEDAL LINKAGE PARTS LIST (Continued)

REF#	PART#	DESCRIPTION	QTY
7	851-008	Main Frame	1
	400-019	3/8" – 16 x 3" HHCS	2
	400-020	3/8 – 16 x 3 1/2" HHCS	2
	400-202	5/16" Flat Washer	8
	400-203	3/8" Flat Washer	8
	400-103	3/8" – 16 Hex Nut	4
	400-209	3/8" Lock Washer	4
	400-099	1/2" x 1 3/4" Bolt	2
	400-344	1/2" – 13 Serrated Hex Flange Nut	2
	400-310	7/16" Flat Washer	2
8	851-017	Left Hand Floorboard	1
9	400-091	1/4" Truss Head Bolt x 1"	2
	400-342	1/4" – 20 Flanged Lock Nut	2
10	851-045	Foot Rest Grip	1
11	851-020	Foot Rest	1
12	851-044	Left Hand Floormat	1
13	851-035	Molded Foot Pedal	2
14	400-002	5/16" – 18 x 1" HHCS	2
	400-201	1/4" Flat Washer	2
	400-281	5/16" Flanged Lock Nut	2
15	40-168	Cotter Pin 1/8 x 1"	2
16	40-166	Machine Bushing 5/8" x 14 GA	3
17	851-038	Flange Bushing	4
18	400-012	5/16" – 18 x 1" Carriage Bolt	4
	400-281	5/16" Flanged Lock Nut	4
19	851-036	Forward Pedal Arm	1
20	851-011	Forward Pedal	1
21	851-037	Reverse Pedal Arm	1
22	851-012	Reverse Pedal	1
23	400-090	3/8" – 16 x 1 1/4" HHCS	1
	400-350	3/8" Flange Nut	1
24	851-049-2	Bearing	1
25	851-049-7	Spacer 1/8"	1
26	851-039	Ball Joint 1/4" NF	1
27	44-001-1	Stainless Steel Control Cable	1
28	11-102	1/4" Fine Thread Yoke with 5/16" Pin	1
29	851-050	Mud Guard	1
30	750-607	Accelerator	2
	400-043	1/4" – 20 x 3/4" HHCS	4
	400-342	1/4" – 20 Flanged Lock Nut	4
31	851-019	Pedal Mount	1
	400-007	5/16" – 18 x 2 1/4" HHCS	2
	400-201	1/4" Flat Washer	2
	400-281	5/16" Flanged Lock Nut	2

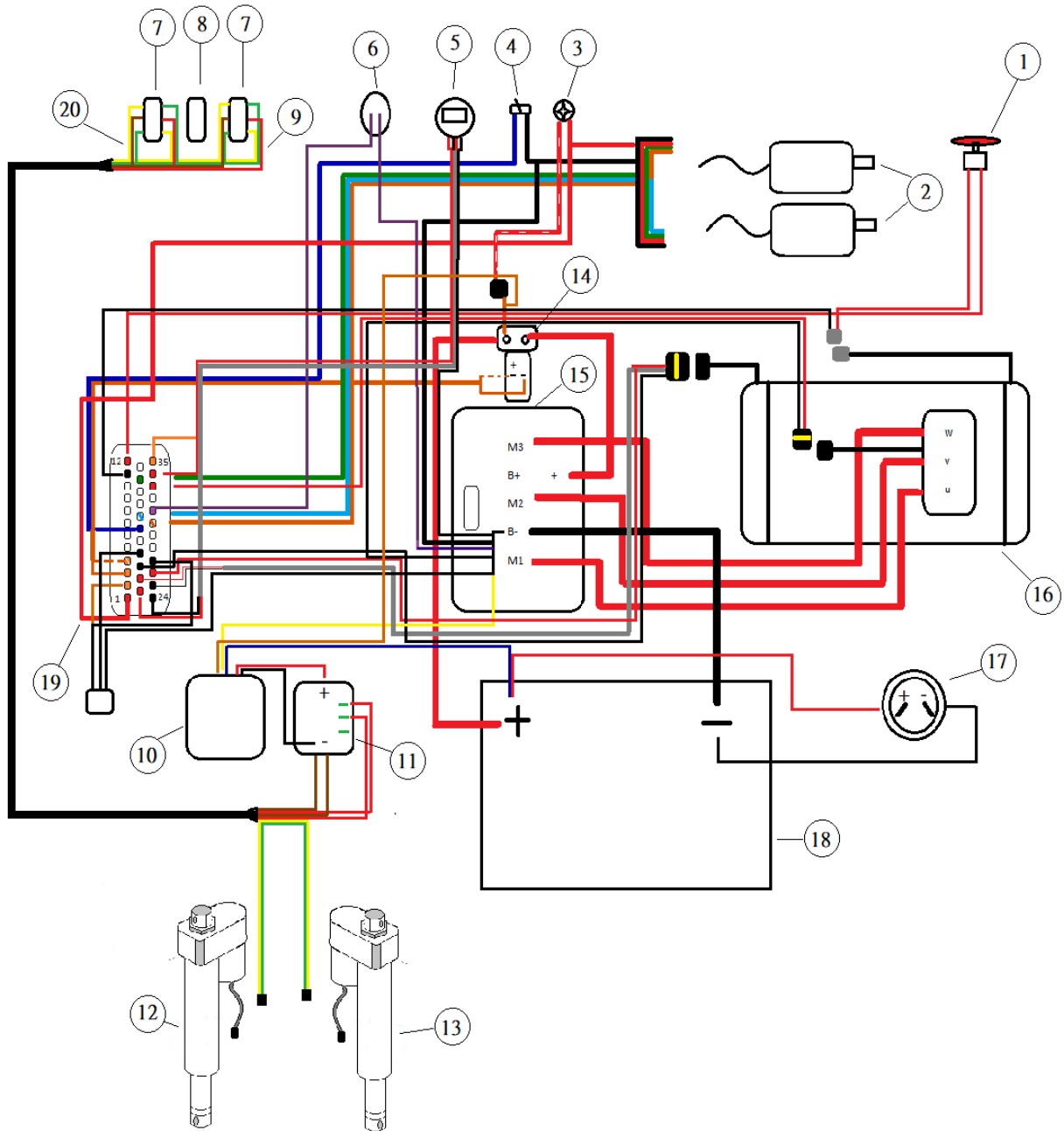
# ACCELERATOR DRAWING



## ACCELERATOR PARTS LIST

REF#	PART#	DESCRIPTION	QTY
1	851-048	Accelerator Plate	1
	10-007	Oilite Bushing (1/2" ID x 11/16" OD x 1")	1
	400-003	5/16" – 18 x 1 1/4" HHCS	1
	400-281	5/16" Flanged Lock Nut	1
2	851-049-1	Shift Mechanism Lever	1
3	750-607	Accelerator	2
4	851-049-2	Bearing	2
	851-049-7	Spacer 1/8"	2
5	400-014	3/8" – 16 x 1" HHCS	2
6	400-350	3/8" Flange Nut	2
7	400-043	1/4 - 20 x 3/4" HHCS	4
8	400-342	1/4" – 20 Flanged Lock Nut	4
9	851-049-4	Bent Accelerator Bracket	1
10	750-228-32	Nylon Washer	1
11	851-049-5	Accelerator Bracket	1
12	750-228-33	Flange	2
	851-049-3	Spacer	1
	851-049-6	1/2" Set Collar	1
	40-154	Machine Bushing 3/4 x 14 GA	2
13	750-229	Silver Spring	1

# MAIN WIRING DRAWING

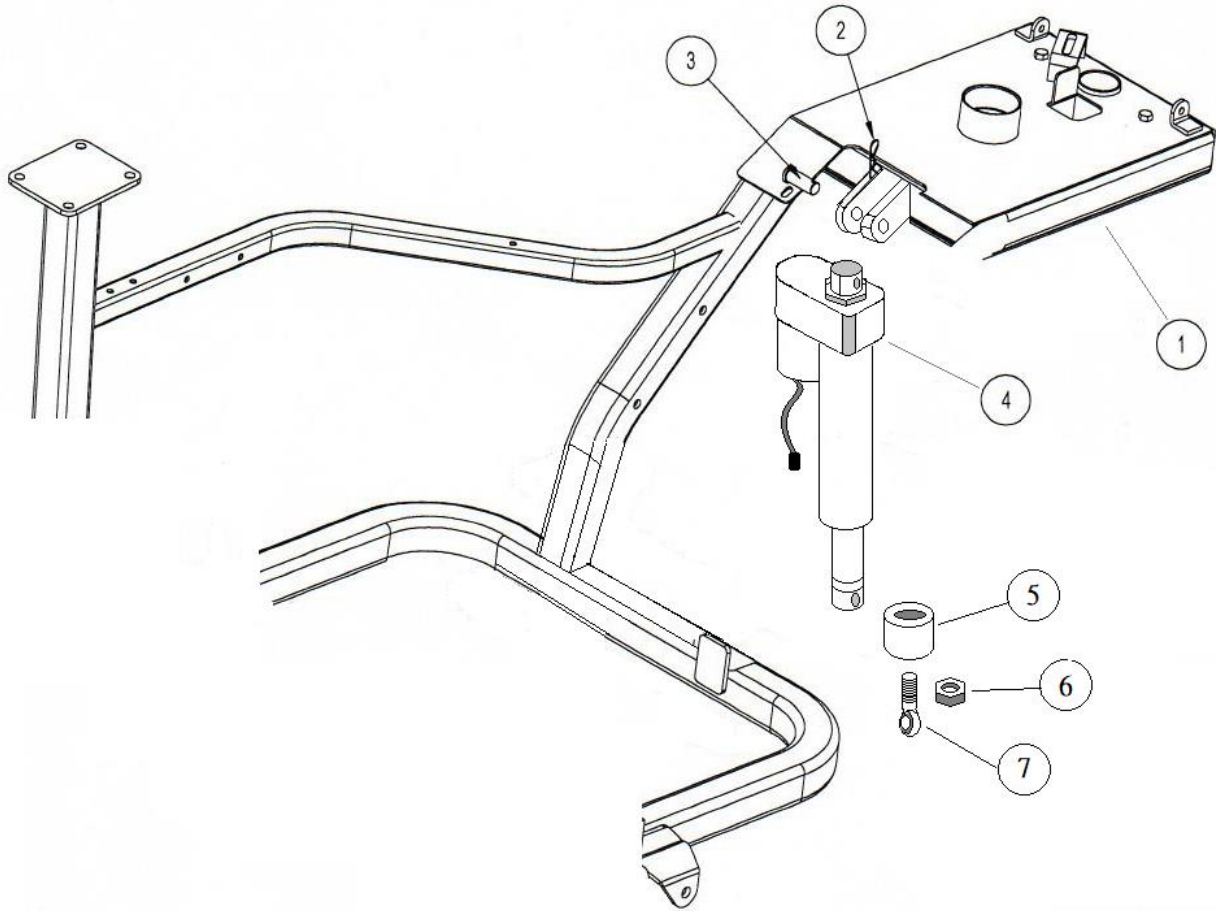




## WIRING PARTS LIST

REF#	PART#	DESCRIPTION	QTY
1	851-073	Brake Switch	1
2	750-607	Accelerator	2
3	832-514	Key Switch	1
4	2070	Ignition Switch	1
	709-255-1	Boot	1
5	851-006	BDI Display	1
6	932-119-1	Safety Seat Switch	1
7	730-220	Actuator Switch	2
8	44-943	On-Off Switch	1
9	851-058	Actuator Wire Harness for Front	1
10	851-108	48V to 12V Converter	1
11	851-056	6 Way Fuse Block	1
12	851-059	Actuator	1
13	925-110	1000# / 6" 12V Actuator	1
14	851-005	Solenoid	1
15	851-004	Controller	1
16	851-003	Motor	1
17	851-109	Yamaha 2 Pin Nubson Receptacle	1
	732-017-1	Beauty Ring	1
18	851-105	Lithium Battery Pack	1
19	851-007	Wiring Harness Kit	1
	851-007-1	Wiring Harness	1
	851-007-2	Cable Kit for Harness	1
20	851-058-1	Actuator Wire Harness for Rear	1

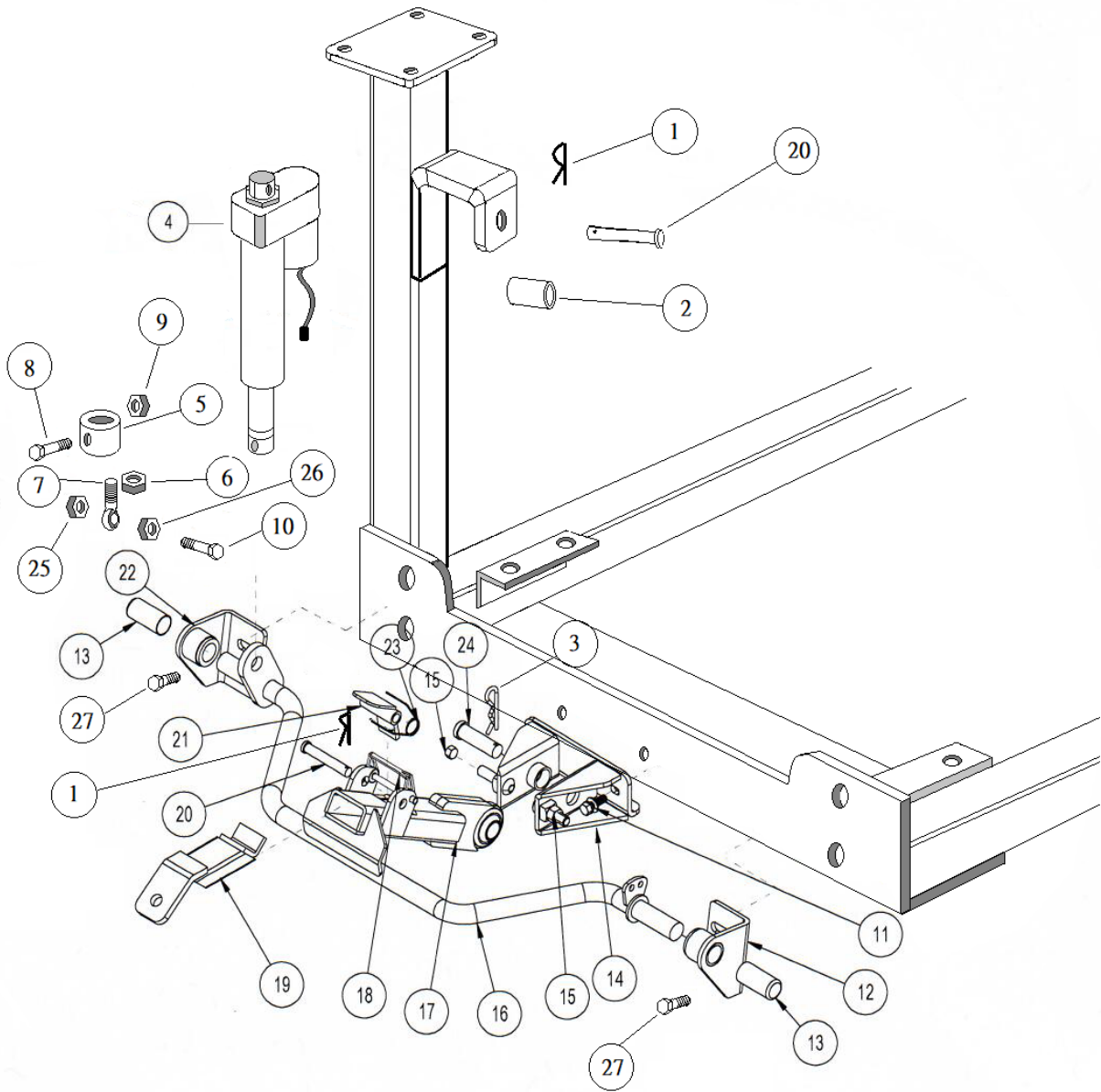
## CENTER LIFT DRAWING



## CENTER LIFT PARTS LIST

REF#	PART#	DESCRIPTION	QTY
1	851-008	Main Frame	1
2	400-307	Hitch Pin #16	1
3	40-396	Clevis Pin 1/2" x 2"	1
4	925-110	1000# - 6" 12V Actuator	1
5	851-099	Actuator Adapter	1
6	932-122	5/8" Jam Nut Fine Thread	1
7	851-103	5/8" Male Ball Joint	1

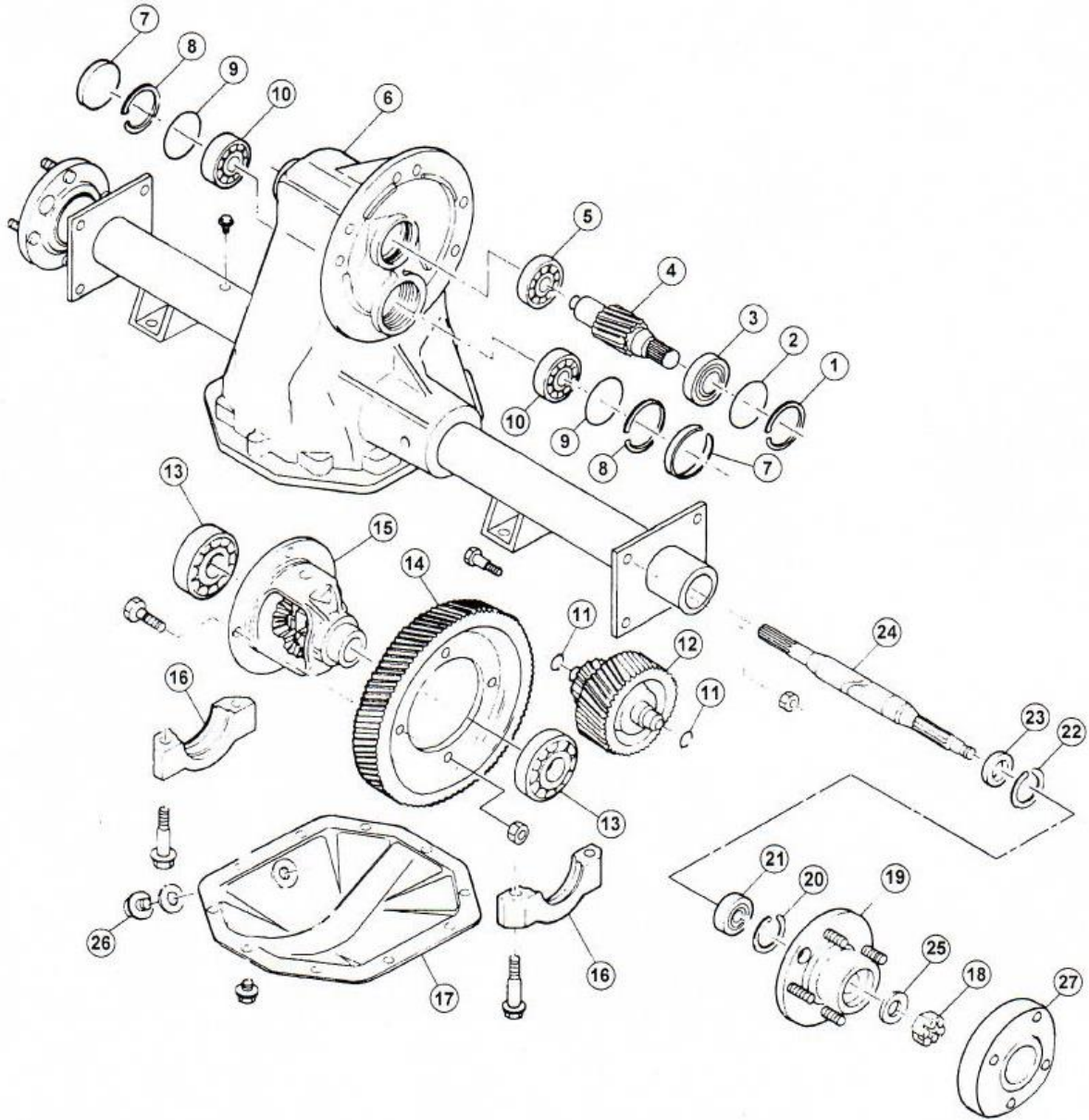
# REAR RAKE LIFT DRAWING



## REAR RAKE LIFT PARTS LIST

REF#	PART#	DESCRIPTION	QTY
1	400-307	Hitch Pin #16	2
2	851-110	Actuator Spacer	1
3	2050	Snap Pin	1
4	851-059	Actuator	1
5	851-099	Actuator Adapter	1
6	932-122	5/8" Jam Nut Fine Thread	1
7	851-103	5/8" Male Ball Joint	1
8	400-028	1/2" – 13 x 1" HHCS	1
9	400-112	1/2" – 13 Lock Nut 2-Way	1
10	400-319	5/8" – 11 x 2 1/2" Bolt	1
11	400-016	3/8" – 16 x 1 1/34" HHCS	2
	400-202	5/16" Flat Washer	2
	400-209	3/8" Lock Washer	2
12	943-191	Right Pivot Bracket	1
	720-064	Bronze Bushing	1
	709-382	1/4" Grease Zerk	1
13	720-011	Vinyl Grip	2
14	943-194	Frame Mount	1
NS	943-194-1	Frame Mount Spacer	1
15	400-099	1/2" x 1 3/4"	2
	400-105	1/2" – 13 Hex Nut	2
16	851-060	Lift Bar	1
17	851-076	Lift Arm Hitch Assembly	1
18	943-190	Wire Lock Pin	1
19	943-182	Towing Hitch	1
20	943-178	Clevis Pin 1/2" – 3 1/2"	2
21	943-179	Lock	1
22	943-193	Left Pivot Bracket	1
	720-064	Bronze Bushing	1
	709-382	1/4" Grease Zerk	1
23	943-180	Torsion Spring	1
24	943-181	Clevis Pin 7/8" x 3 1/2"	1
25	400-331	5/8" – Course Thread Stover Nut	1
26	400-106	5/8" – 11 Hex Nut	1
27	400-345	1/2" – 13 x 1 1/4" Hex Head Bolt	4

# REAR AXLE ASSEMBLY



## 8510 REAR AXLE PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	730-089	Snap Ring	1
2	730-087	O-Ring	1
3	730-088	Bearing Ball	1
4*		Input Shaft	1
5	730-086	Bearing Ball	1
6	730-075	Carrier Sub – Assembly	1
7	730-090	Plug, Cup	2
8	730-089	Snap Ring	2
9	730-087	O-Ring	2
10	730-084	Bearing – Ball	2
11	730-083	O-Ring	2
12*		Intermediate Shaft & Gear Assembly	1
13	730-082	Bearing – Ball	2
14*		Gear Output	1
15	730-078	Differential Case Assembly	1
16	730-076	Bearing Cap	2
17	730-093-1	Cover & Plug Assembly	1
18	730-141	Nut Axle Shaft	2
19	932-124	5 Bolt Hub Kit	2
20	730-102	Snap Ring	2
21	730-101	Bearing	4
22	730-102	Snap Ring	2
23	730-103	Oil Seal	2
24	730-096	Axle Shaft	2
25	730-142	Axle Washer	2
26	730-093	Plug – Fill	1
27	851-077	Wheel Spacer	2

\*Note: Order as part# 732-006 Gear Kit.

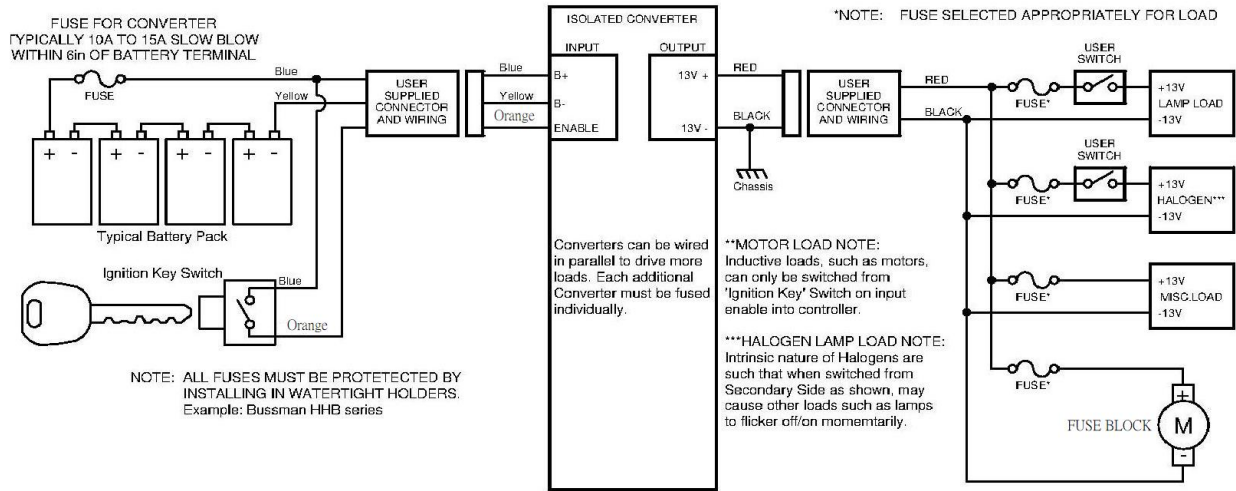
Note: Part# 851-018 is the complete axle.

Note to Ref #19: For the Hub only order a 932-124-1.

# CONVERTER WIRING

## ISOLATED CONVERTER SERIES

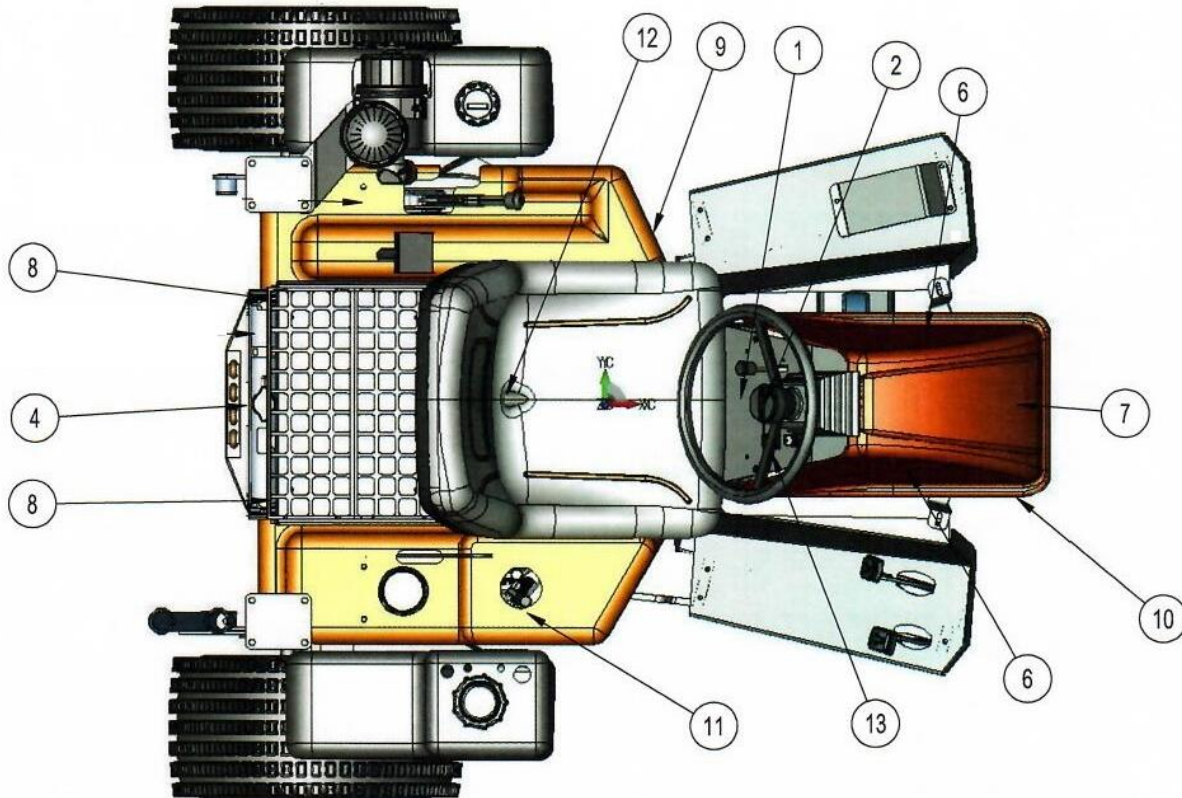
TYPICAL WIRING CONNECTION DIAGRAM



## DECAL LIST

This is a list of decals located on the Sand Star "E". Part number, description and location will help in reordering decals.

REF#	PART#	DESCRIPTION	QTY.
1	851-064	Decal, Dash Board	1
2	40-482	Decal, Smithco for Steering Wheel Cap	1
4	40-490-05	Decal, Warning – Hot	1
6	851-068	Decal, Sand Star	2
7	40-503	Decal, Star	1
8	40-490-04	Decal, Pinch Point	2
10	851-069	Decal, "E"	2
NS	40-502	Decal, 888-422-5173 (Located under seat)	1
NS	943-130	Decal, Manual / Battery (Located under seat)	1

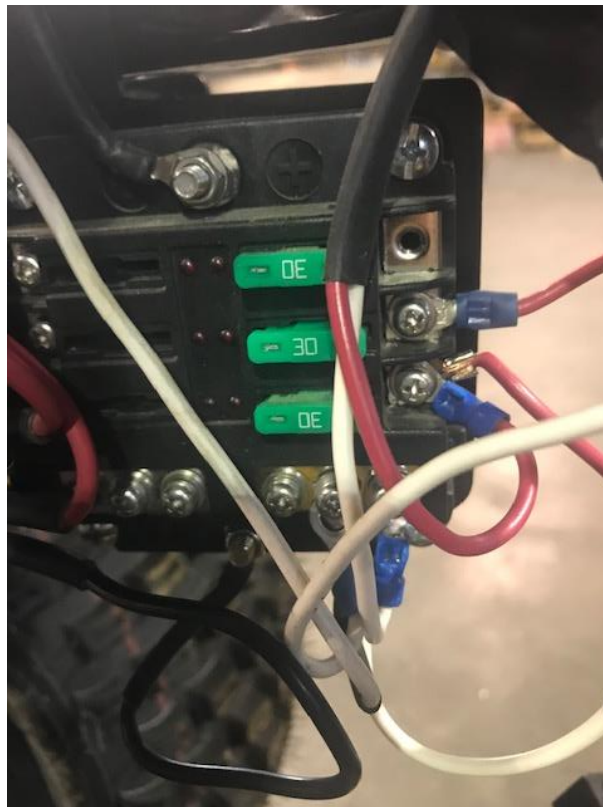




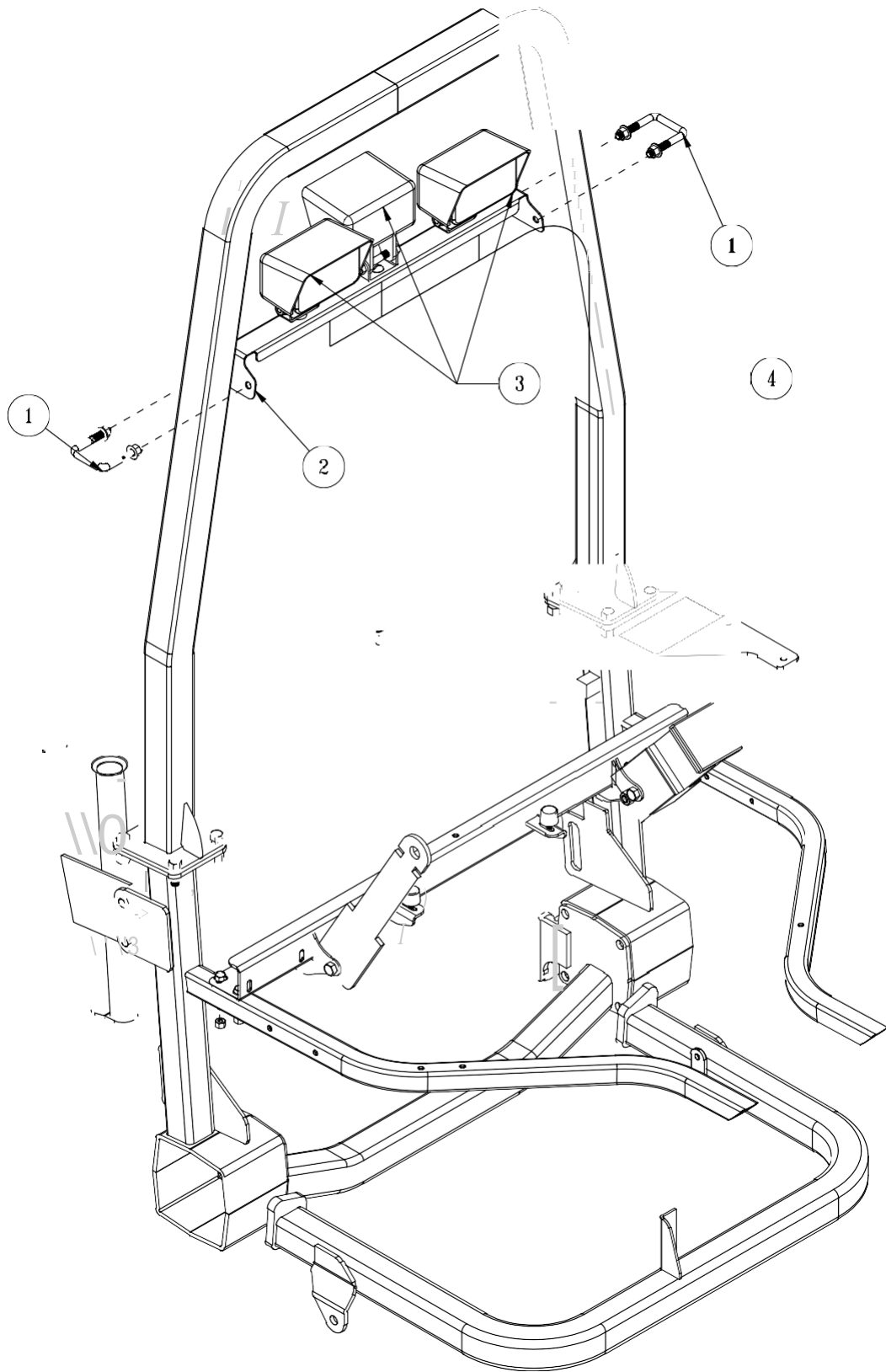
## 851-100 LIGHT KIT PARTS LIST

PART#	DESCRIPTION	QTY.
851-100-1	Front Light Mount	1
851-100-2	Rear Light Mount	1
851-100-3	Front Light	1
851-100-4	Rear Light Assembly	1
851-100-5	Wiring Harness	1





**45-016 LIGHT KIT DRAWING**



## **45-016 LIGHT KIT PARTS LIST**

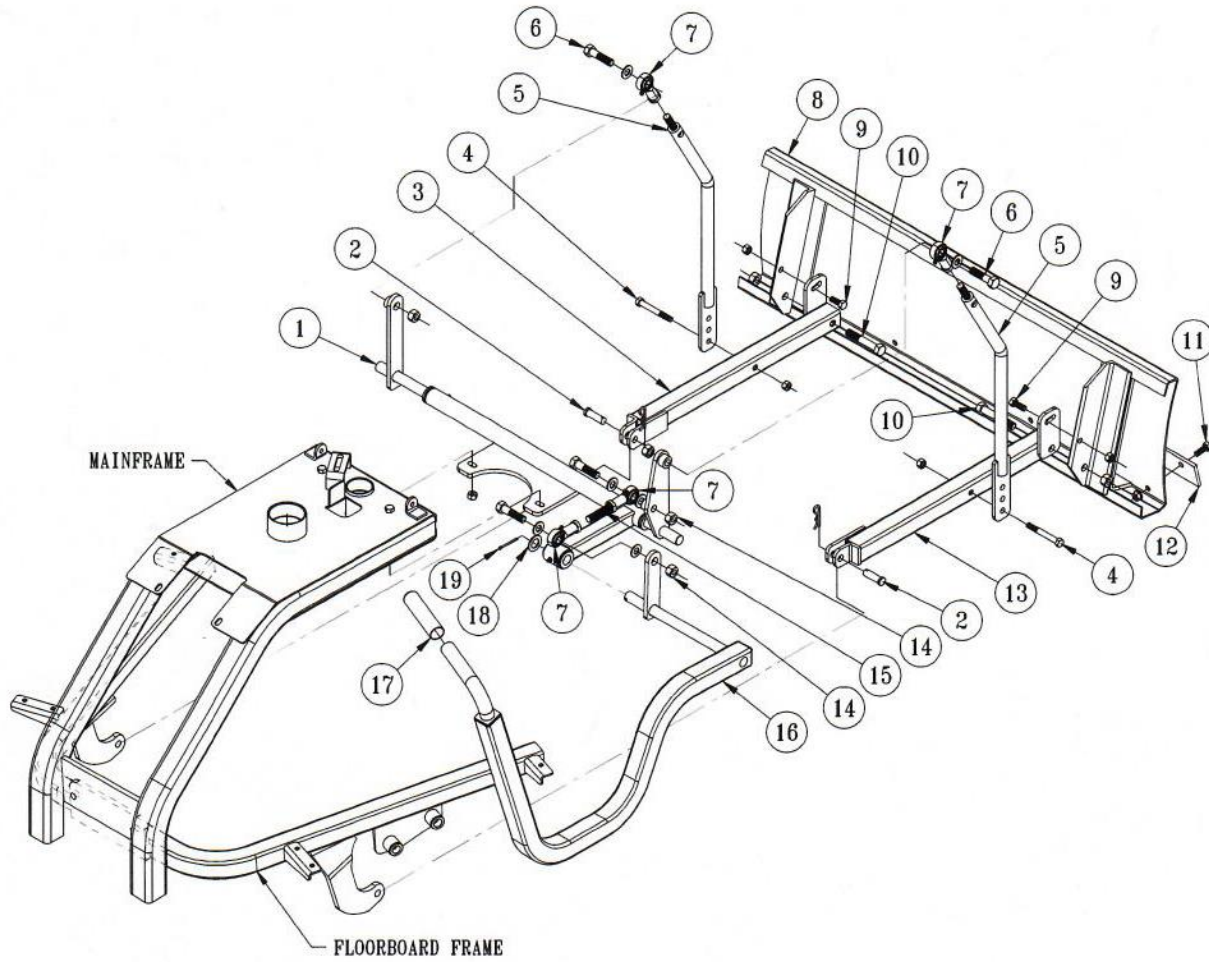
<b>REF#</b>	<b>PART#</b>	<b>DESCRIPTION</b>	<b>QTY.</b>
1	17-537	Square U-Hex Bolt	2
2	45-081	Light Bar	1
3	34-201	Light	3
4	45-004	Roll Bar Kit	1
5	43-505	Light Wire Harness	1

## **INSTALLATION INSTRUCTIONS**

45-004-K ROPs Kit is required for Light Kit on all Sand Star Machines.

1. Mount lights to light bar. Outside two facing forwards and center light facing to the rear.
2. Using the square u-Hex Bolts, mount light bar assembly to the roll bar.
3. Tighten u-Hex Bolts down and make sure light bar and lights are secure.
4. Tighten all hardware.
5. Center toggle switch is wired for lights via the main machine wire harness. The plug for the light wire harness is zip tied to the left rear post (Ref 5). Hook light wire harness from lights to the plug on the left rear post.
6. Use the tie straps provided to secure the light wire harness to the roll bar and the light bar.
7. Test lights.

# 45-009 ALUMINUM SAND PLOW DRAWING



## 45-009 ALUMINUM SAND PLOW PARTS LIST

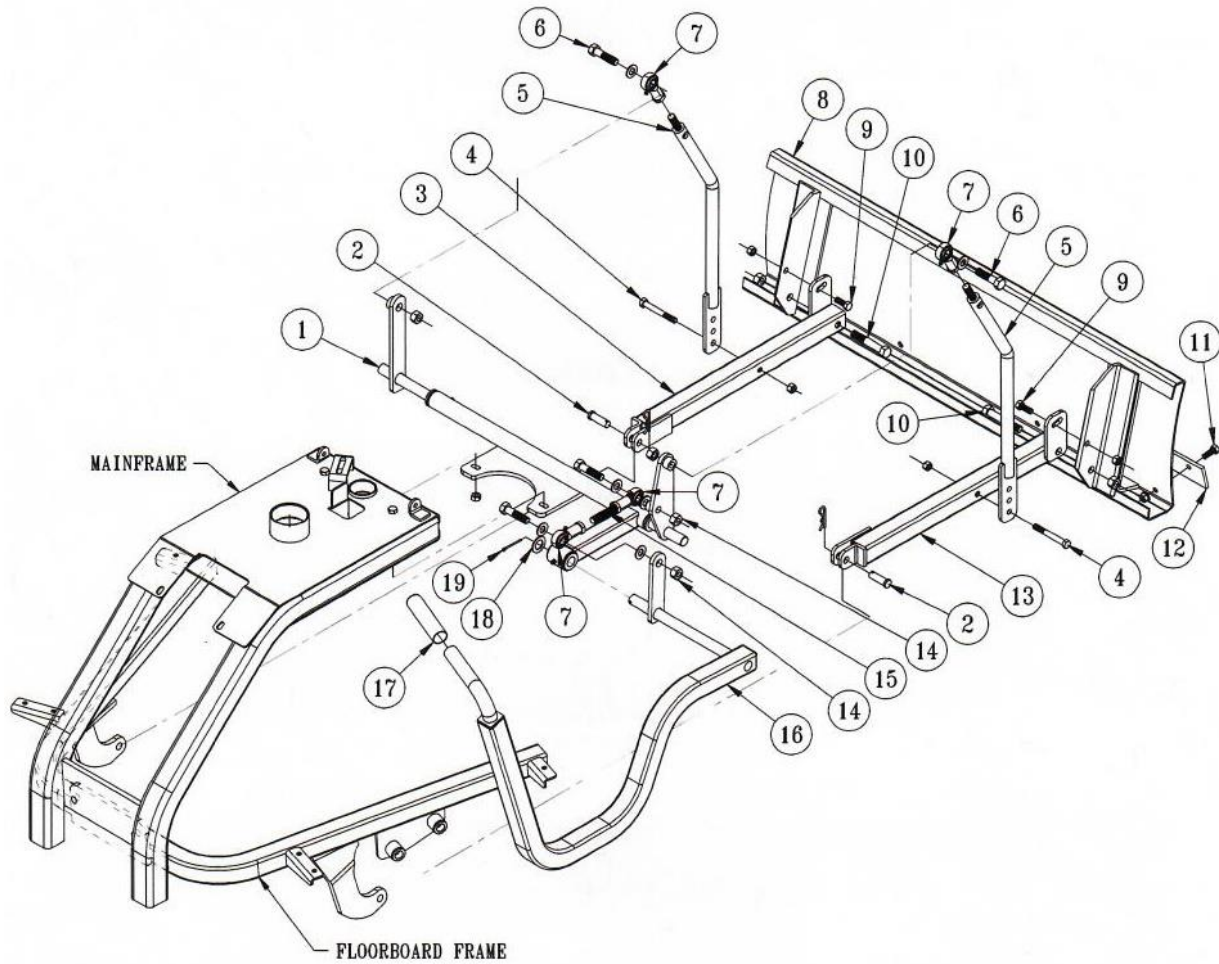
REF#	PART#	DESCRIPTION	QTY.
1	45-106	Lift Assembly	1
	18-221	Flange Bushing	2
2	HCP-12-150	Clevis Pin, 1/2" x 1 1/2"	2
	HHP-18	Bridge Pin, 1/8"	2
3	45-101	Left Pusher Bar	1
4	HB-38-16-250	Hex Bolt, 3/8" – 16 x 2 1/2"	2
	HW-38	Flat Washer, 3/8"	4
	HNTL-38-16	Nylon Lock Nut, 3/8" – 16	2
5	27-073	Lift Rod	2
6	HB-12-13-200	Hex Bolt, 1/2" – 13 x 2"	2
	HMB-12-14	Machine Bushing, 1/2" x 14GA	8
	HNTL-12-13	Nylon Lock Nut, 1/2" – 13	2
7	80-006	Rod End	4
	HNJ-12-20	Jam Nut, 1/2" – 20	4
8	45-092	Aluminum Sand Plow Blade	1
9	NB-38-16-125	Hex Bolt, 3/8" – 16 x 1 1/4"	2
	HW-38	Flat Washer, 3/8"	2
	HWL-38	Lock Washer, 3/8"	2
	HN-38-16	Hex Nut, 3/8" – 16	2
10	HB-12-13-300	Hex Bolt, 1/2" – 13 x 3"	2
	HNTL-12-13	Nylon Lock Nut, 1/2" – 13	2
11	HB-38-16-100	Hex Bolt, 3/8" – 16 x 1"	4
	HNFL-38-16	Flange Whiz-Loc Nut, 3/8" – 16	4
12	13-167	Wear Blade	1
13	45-100	Right Pusher Bar	1
14	HB-12-13-200	Hex Bolt, 1/2" – 13 x 2"	2
	HMB-12-14	Machine Bushing, 1/2" x 14GA	2
	HNTL-12-13	Nylon Lock Nut, 1/2" – 13	2
15	45-131	Plow Link	1
16	45-097	Plow Handle	1
17	15-019	Grip	1
18	HMB-34-14	Machine Bushing, 3/4" – 14GA	1
19	HP-18-150	Cotter Pin, 1/8" x 1 1/2"	1

## SAND PLOW INSTALLATION

1. Assemble (Ref #3 and 13) Pusher Bars to (Ref #8) Plow using (Ref #9 and 10) hardware. There are 2 holes to Hex Bolt (Ref #9) hardware in. Using hole closest to the blade will result in a shallow cut, whereas using the hole furthest from the blade will result in a deeper cut. The slot on the pusher bar is for amore tuned adjustment.
2. Assemble the (Ref #1) Lift Assembly to the Main Frame using the two studs that are under the frame and below the front of the console.
3. Attach the (Ref #6) Lift Handle to the lift assembly using (Ref #18 & 19) Cotter Pin and Machine Bushing. Using (Ref #15 & 7) Rod and Yoke attach the handle to the lift assembly.
4. Put (Ref #7) Rod Ends onto (Ref #10) Lift Rods with Jam Nut first. Adjust to equal lengths. Hex Bolt Lift Rods to Lift Arms with Ball Joints to the outside. Hex Bolt from outside with the 1/2" Machine Bushing between Rod End and Lift Arm and the 1/2 -13 nut on the inside. Use (Ref #6) Hardware.
5. Slide Plow under machine and connect to machine. Use (Ref #2) Clevis Pin and Bridge Pin.
6. Lift up the plow using the bottom hole in the Lift Rod as a starting point. Secure to the Pusher Bars. Use (Ref #4) hardware. For maximum blade clearance use the second hole from the front of the pusher bar. The three holes in the lift rods are for adjusting the hand lever. The top hole moves the lever forward. Each hole down moves the lever to the rear of the machine.
7. For fine tuning of blade height off ground twist (Ref #7) rod end on (Ref #15) rod. Twisting the rod end out will increase down pressure. Twisting the rod end onto the rod will decrease down pressure.



**45-019 ALUMINUM 60" SAND PLOW DRAWING**



## 45-019 ALUMINUM 60" SAND PLOW PARTS LIST

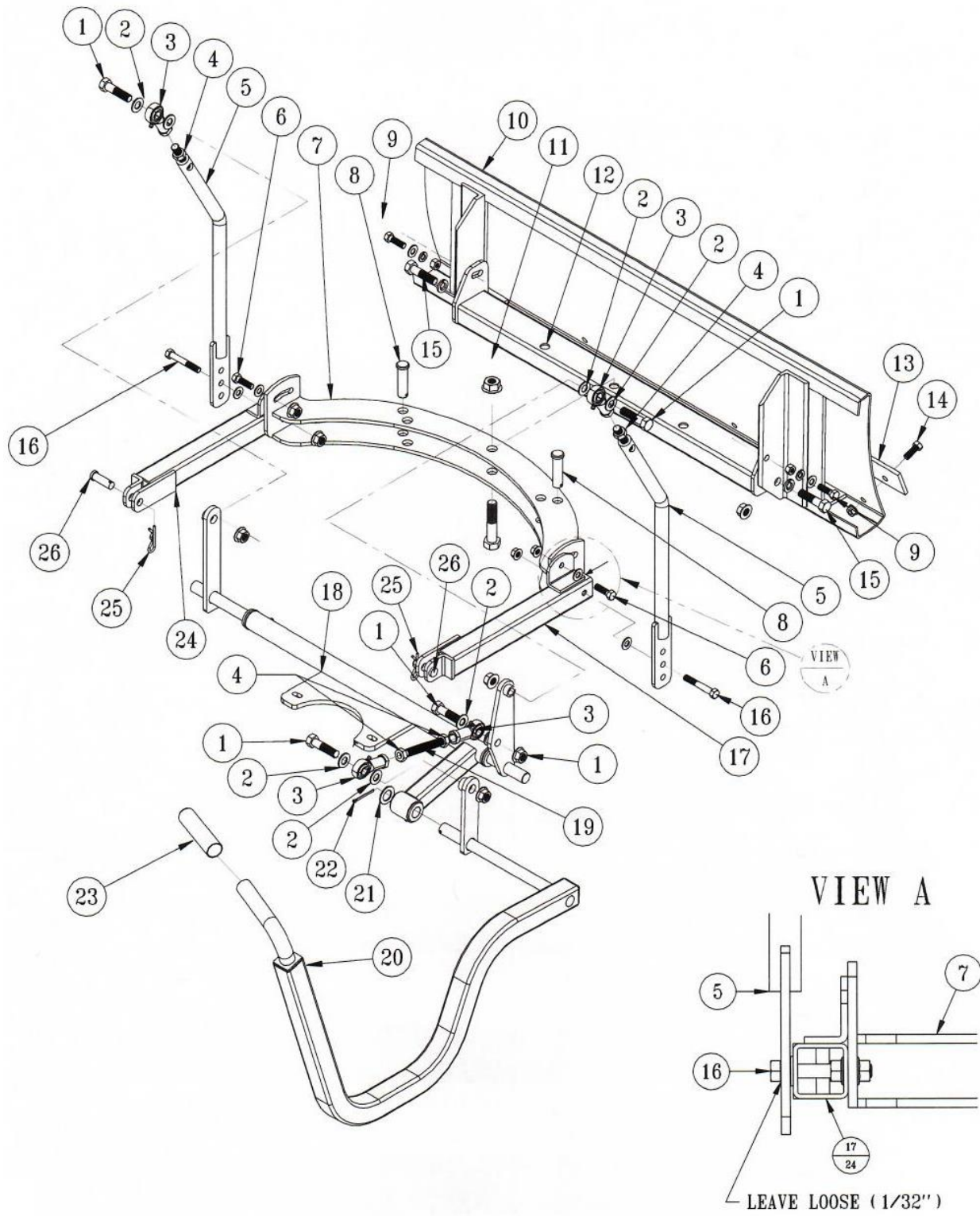
REF#	PART#	DESCRIPTION	QTY.
1	45-106	Lift Assembly	1
2	HCP-12-150	Clevis Pin, 1/2" x 1 1/2"	2
	HHP-18	Bridge Pin, 1/8"	2
3	45-101	Left Pusher Bar	1
4	HB-38-16-250	Hex Bolt, 3/8" – 16 x 2 1/2"	2
	HW-38	Flat Washer, 3/8"	4
	HNTL-38-16	Nylon Lock Nut, 3/8" – 16	2
5	27-073	Lift Rod	2
6	HB-12-13-200	Hex Bolt, 1/2" – 13 x 2"	2
	HMB-12-14	Machine Bushing, 1/2" x 14GA	8
	HNTL-12-13	Nylon Lock Nut, 1/2" – 13	2
7	80-006	Rod End	4
	HNJ-12-20	Jam Nut, 1/2" – 20	4
8	45-159	Aluminum Sand Plow Blade	1
9	NB-38-16-125	Hex Bolt, 3/8" – 16 x 1 1/4"	2
	HW-38	Flat Washer, 3/8"	2
	HWL-38	Lock Washer, 3/8"	2
	HN-38-16	Hex Nut, 3/8" – 16	2
10	HB-12-13-300	Hex Bolt, 1/2" – 13 x 3"	2
	HNTL-12-13	Nylon Lock Nut, 1/2" – 13	2
11	HB-38-16-100	Hex Bolt, 3/8" – 16 x 1"	4
	HNFL-38-16	Flange Whiz-Loc Nut, 3/8" – 16	4
12	35-012	Wear Blade	1
13	45-100	Right Pusher Bar	1
14	HB-12-13-200	Hex Bolt, 1/2" – 13 x 2"	2
	HMB-12-14	Machine Bushing, 1/2" x 14GA	2
	HNTL-12-13	Nylon Lock Nut, 1/2" – 13	2
15	42-348	Plow Link	1
16	45-097	Plow Handle	1
17	45-019	Grip	1
18	HMB-34-14	Machine Bushing, 3/4" – 14GA	1
19	HP-18-150	Cotter Pin, 1/8" x 1 1/2"	1

## SAND PLOW INSTALLATION

1. Assemble (Ref #3 and 13) Pusher Bars to (Ref #8) Plow using (Ref #9 and 10) hardware. There are 2 holes to Hex Bolt (Ref #9) hardware in. Using hole closest to the blade will result in a shallow cut, whereas using the hole furthest from the blade will result in a deeper cut. The slot on the pusher bar is for amore tuned adjustment.
2. Assemble the (Ref #1) Lift Assembly to the Main Frame using the two studs that are under the frame and below the front of the console.
3. Attach the (Ref #6) Lift Handle to the lift assembly using (Ref #18 & 19) Cotter Pin and Machine Bushing. Using (Ref #15 & 7) Rod and Yoke attach the handle to the lift assembly.
4. Put (Ref #7) Rod Ends onto (Ref #10) Lift Rods with Jam Nut first. Adjust to equal lengths. Hex Bolt Lift Rods to Lift Arms with Ball Joints to the outside. Hex Bolt from outside with the 1/2" Machine Bushing between Rod End and Lift Arm and the 1/2 -13 nut on the inside. Use (Ref #6) Hardware.
5. Slide Plow under machine and connect to machine. Use (Ref #2) Clevis Pin and Bridge Pin.
6. Lift up the plow using the bottom hole in the Lift Rod as a starting point. Secure to the Pusher Bars. Use (Ref #4) hardware. For maximum blade clearance use the second hole from the front of the pusher bar. The three holes in the lift rods are for adjusting the hand lever. The top hole moves the lever forward. Each hole down moves the lever to the rear of the machine.
7. For fine tuning of blade height off ground twist (Ref #7) rod end on (Ref #15) rod. Twisting the rod end out will increase down pressure. Twisting the rod end onto the rod will decrease down pressure.



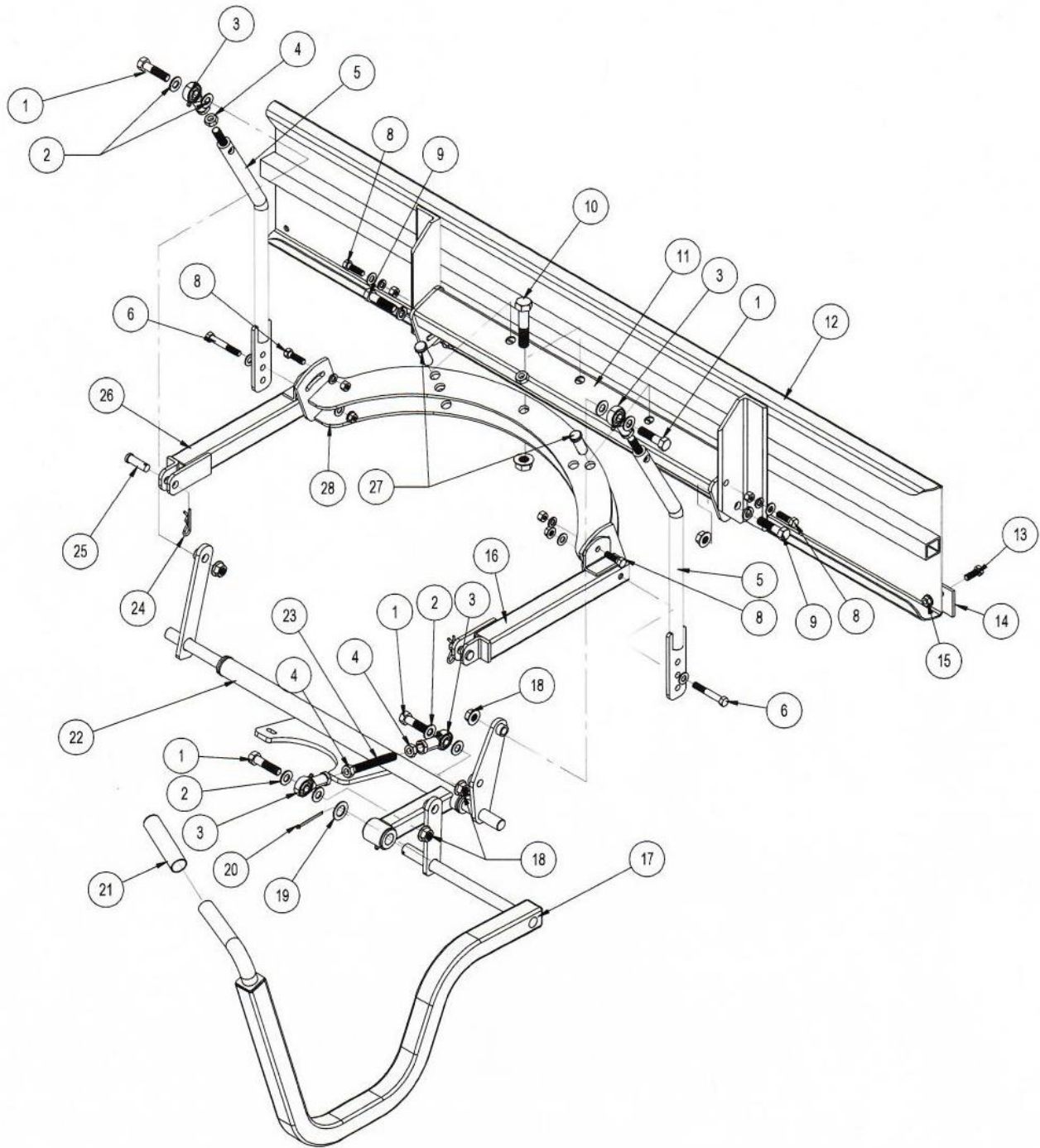
# 45-179 40" ANGLE PLOW



## 45-179 40" ANGLE PLOW PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	HB-12-13-200	Hex Bolt, 1/2" – 13 x 2"	4
	HNTL-12-13	Nylon Lock Nut, 1/2" – 13	4
2	HMB-12-14	Machine Bushing, 1/2" x 14GA	8
3	80-006	Rod End	4
4	HNJ-12-20	Jam Nut, 1/2" – 20	4
5	27-073	Lift Rod	2
6	HB-38-16-125	Hex Bolt, 5/8" – 16 x 1 1/4"	2
	HNFL-38-16	Flange Whiz-Loc Nut, 5/8" – 16	2
7	45-181	Plow Mount	1
8	HCP-58-250	Clevis Pin, 5/8" x 2 1/2"	2
	HHP-18	Bridge Pin, 1/8"	2
9	HB-38-16-125	Hex Bolt, 3/8" – 16 x 1 1/4"	2
	HW-38	Washer, 3/8"	2
	HWL-38	Lock Washer, 3/8"	2
	HN-38-16	Nut, 3/8" – 16	2
10	27-017	Aluminum Sand Plow Blade	1
11	HB-58-11-300	Hex Bolt, 5/8" – 11 x 3"	1
	HNTL-58-11	Nylon Lock Nut, 5/8" – 11	1
12	42-495	Pivot Frame	1
13	13-167	Wear Blade	1
14	HB-38-16-100	Hex Bolt, 3/8" – 16 x 1"	4
	HNFL-38-16	Flange Whiz-Loc Nut, 3/8" – 16	4
15	HB-12-13-200	Hex Bolt, 1/2" – 13 x 2"	2
	HWL-12	Lock Washer, 1/2"	2
16	HB-38-16-250	Hex Bolt, 3/8" – 16 x 2 1/2"	2
	HW-38	Flat Washer, 3/8"	2
	HNTL-38-16	Nylon Lock Nut, 3/8" – 16	4
17	45-231	Right Pusher Bar	1
18	45-106	Lift Assembly	1
19	42-348	Rod	1
20	45-097	Lift Handle	1
	18-221	Flange Bushing	2
21	HMB-34-14	Machine Bushing, 3/4" – 14GA	1
22	HP-18-150	Cotter Pin, 1/8" x 1 1/2"	1
23	15-019	Grip	1
24	45-232	Left Pusher Bar	1
25	HHP-18	Bridge Pin, 1/8"	2
26	HCP-12-150	Clevis Pin, 1/2" x 1 1/2"	2

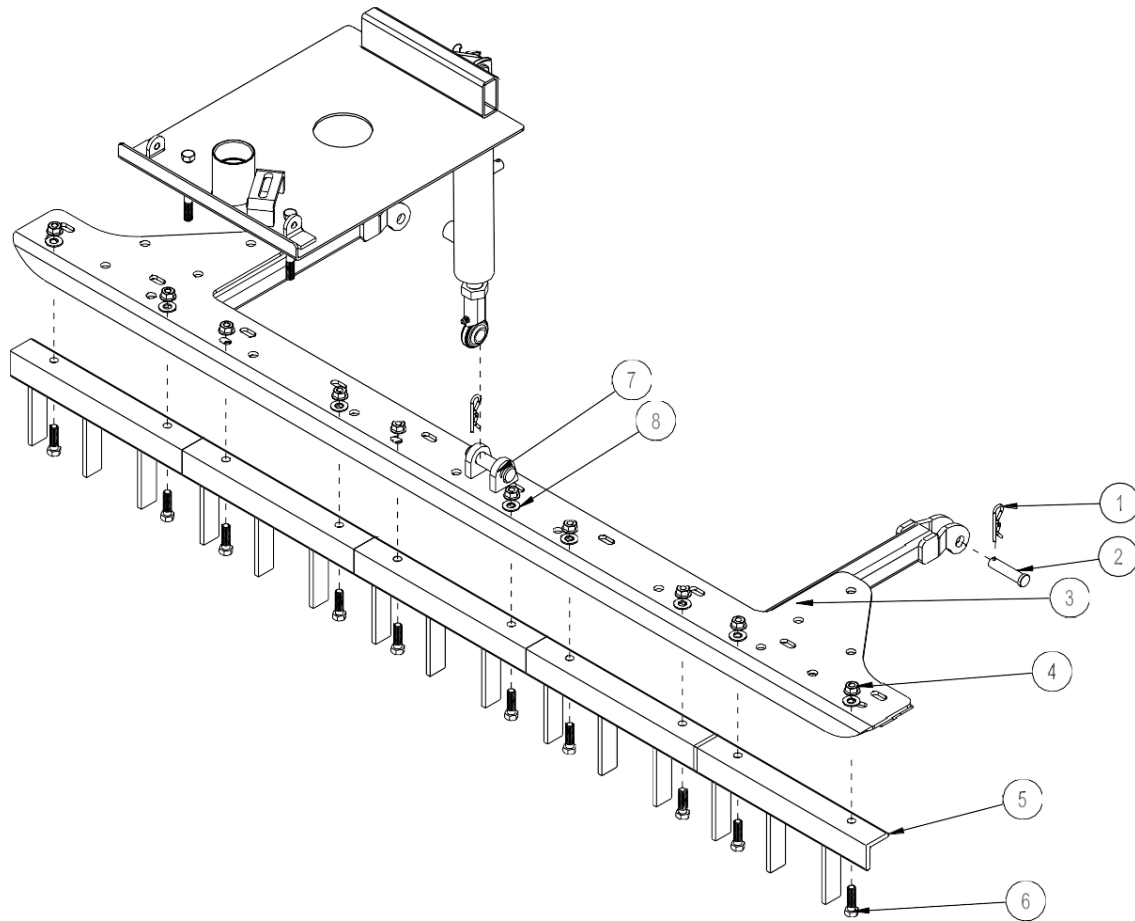
# 45-180 60" ANGLE PLOW



## 45-180 60" ANGLE PLOW PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	HB-12-13-200	Hex Bolt, 1/2" – 13 x 2"	4
2	HMB-12-14	Machine Bushing, 1/2" x 14GA	8
3	80-006	Rod End	4
4	HNJ-12-20	Jam Nut, 1/2" – 20	4
5	27-073	Lift Rod	2
6	HB-38-16-250	Hex Bolt, 3/8" – 16 x 2 1/2"	2
	HW-38	Flat Washer, 3/8"	4
	HNTL-38-16	Nylon Lock Nut, 3/8" – 16	2
7	HB-38-16-250	Hex Bolt, 3/8" – 16 x 2 1/2"	2
	HNTL-38-16	Nylon Lock Nut, 3/8" – 16	2
8	HB-38-16-125	Hex Bolt, 3/8" – 16 x 1 1/4"	4
	HW-38	Flat Washer, 3/8"	4
	HWL-38	Lock Washer, 3/8"	4
	HN-38-16	Hex Nut, 3/8" – 16	4
9	HB-12-13-200	Hex Bolt, 1/2" – 13 x 2"	2
	HNTL-12-13	Nylon Lock Nut, 1/2" – 13	2
10	HB-58-11-300	Hex Bolt, 5/8" – 11 x 3"	1
	HNTL-58-11	Nylon Lock Nut, 5/8" – 11	1
11	42-495	Pivot Frame	1
12	45-159	Aluminum 60" Sand Plow Blade	1
13	HB-38-16-100	Hex Bolt, 3/8" – 16 x 1"	4
14	35-012	Wear Blade	1
15	HNFL-38-16	Flange Whiz-Loc Nut, 3/8" – 16	4
16	45-182	Right Pusher Bar	1
17	45-097	Lift Handle	1
	18-221	Flange Bushing	2
18	HNTL-12-13	Nylon Lock Nut, 1/2" – 13	4
19	HMB-34-14	Machine Bushing, 3/4" – 14GA	1
20	HP-18-150	Cotter Pin, 1/8" x 1 1/2"	1
21	15-019	Grip	1
22	45-106	Lift Assembly	1
23	42-348	Rod	1
24	HHP-18	Bridge Pin, 1/8"	2
25	HCP-12-150	Clevis Pin, 1/2" x 1 1/2"	2
26	45-183	Left Pusher Bar	1
27	HCP-58-250	Clevis Pin, 5/8" x 2 1/2"	2
	HHP-18	Bridge Pin, 1/8"	2
28	45-181	Plow Mount	1

## 85-006 SAND CULTIVATOR DRAWING



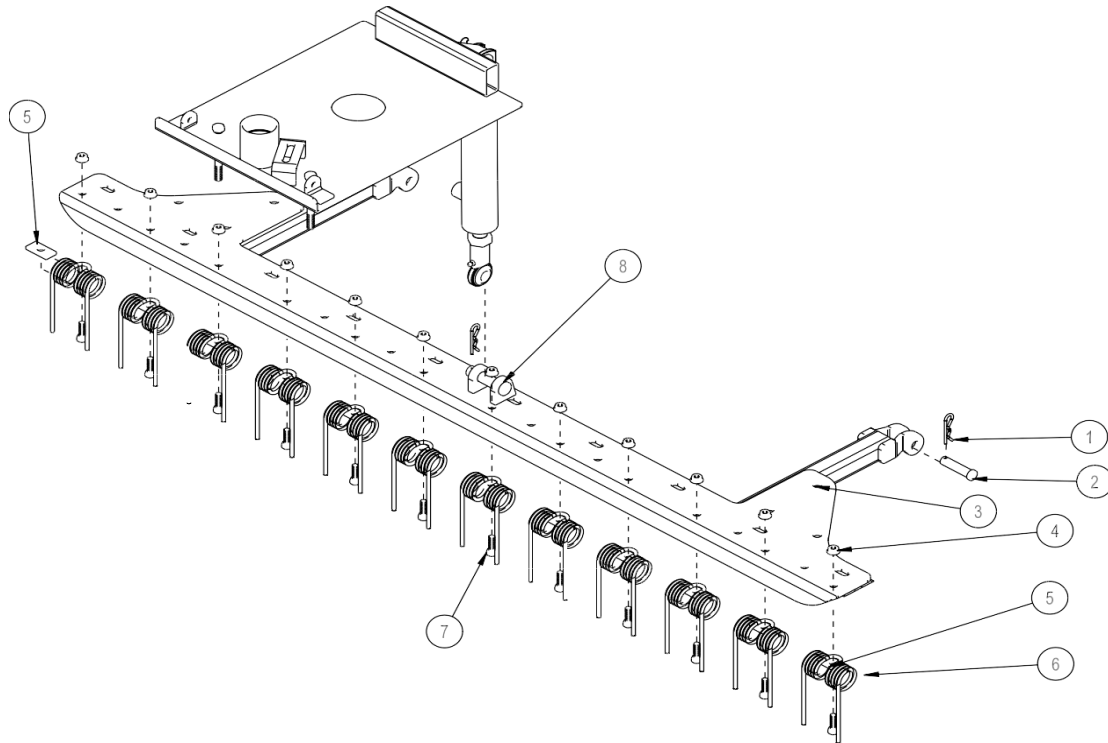
## 85-006 SAND CULTIVATOR PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	HHP-18	Bridge Pin, 1/8"	3
2	HCP-12-200	Clevis Pin, 1/2 x 2	2
3	85-200	Center Lift Bar	1
4	HNTL-38-16	Lock Nut 3/8 -16	10
5	42-038	Tine Segment	5
6	HB-38-16-100	Bolt, 3/8 – 16 x 1	10
7	HCP-58-250	Clevis Pin 5/8 x 2 1/2	1
8	HW-38	Washer 3/8	10

## INSTALLATION INSTRUCTIONS

1. Tine segments (Ref 5) should be bolted to the center lift bar (Ref 3). Use the 3/8 – 16 x 1 bolt (Ref 6), washers (Ref 8) and lock nuts (Ref 4).
2. Attach the center lift bar to main frame using (Ref 1 and 2) clevis pin and bridge pin.
3. Lift center lift bar up or extend cylinder so rod end lines up with the holes on the center of the attachment lift. Use clevis pin and bridge pin (Ref 7 and 1) to fasten cylinder to sand cultivator.
4. Turn machine on and test for proper operation.

## 85-008 SAND CULTIVATOR WITH SPRING TINES DRAWING



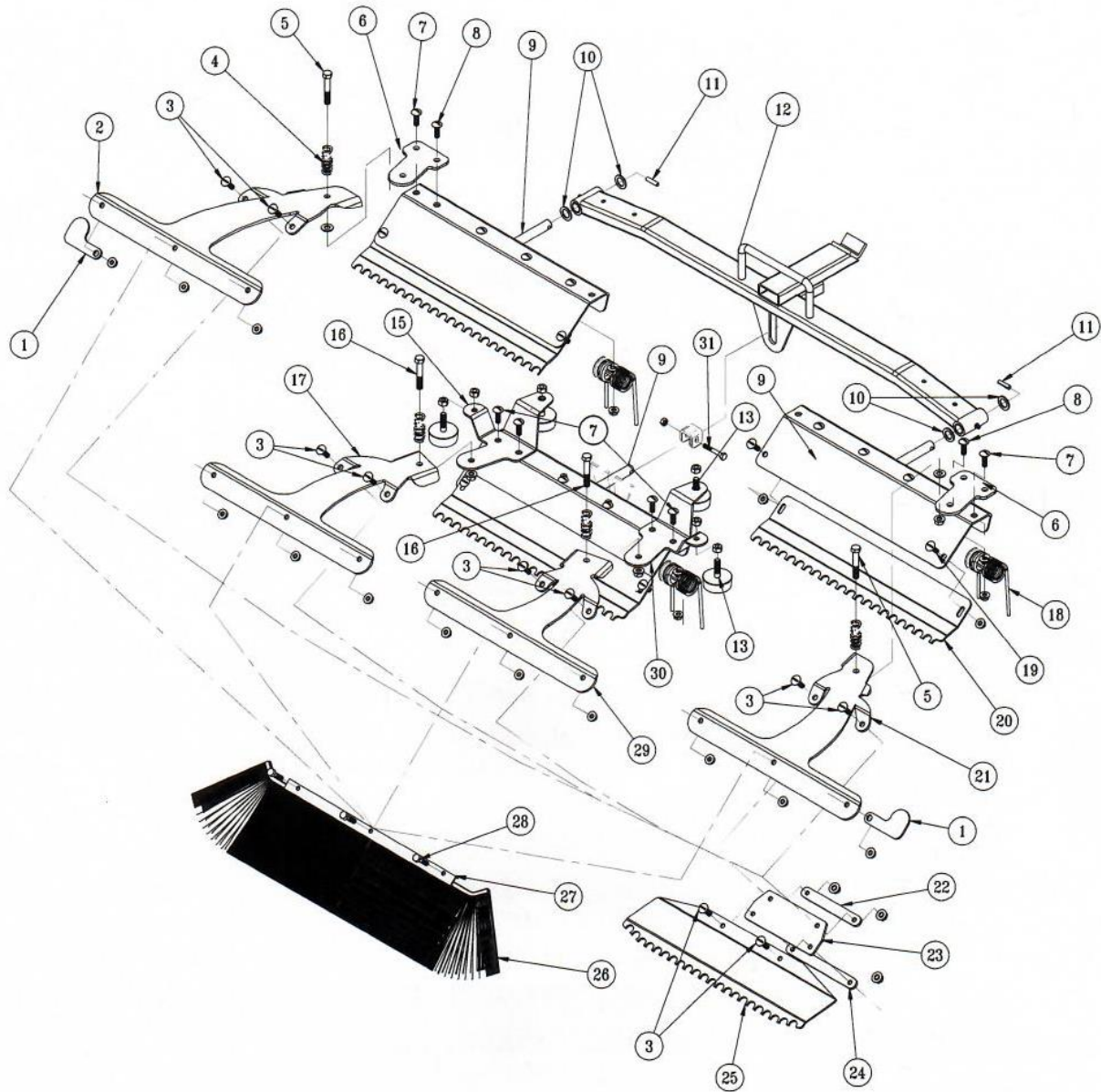
## 85-008 SAND CULTIVATOR WITH SPRING TINES PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	HHP-18	Bridge Pin, 1/8"	3
2	HCP-12-200	Clevis Pin, 1/2 x 2	2
3	85-201	Center Lift Bar	1
4	HNTL-516-18	Lock Nut 5/16 – 18	12
5	42-177	Spring Holder	12
6	42-122	Rake Spring	12
7	HB-516-18-125	Hex Bolt 5/16 – 18 x 1 1/4	12
8	HCP-58-250	Clevis Pin, 5/8 x 2 1/2	1

## INSTALLATION INSTRUCTIONS

1. Springs (Ref 6) should be bolted to the center lift bar (Ref 3) with the spring holder (Ref 5) between center lift bar and the spring. Bolt in place with 5/16 – 18 x 1 1/4 bolt (Ref 7) and lock nut (Ref 4).
2. Attach the center lift bar to main frame using (Ref 1 and 2) clevis pin and bridge pin.
3. Lift center lift bar up or extend cylinder so rod end lines up with the holes on the center of the attachment lift. Use clevis pin and bridge pin (Ref 8 and 1) to fasten cylinder to sand cultivator.
4. Turn machine on and test for proper operation.

**42-391Q 72" (183CM) PROBRUSH TOURNAMENT RAKE DRAWING**



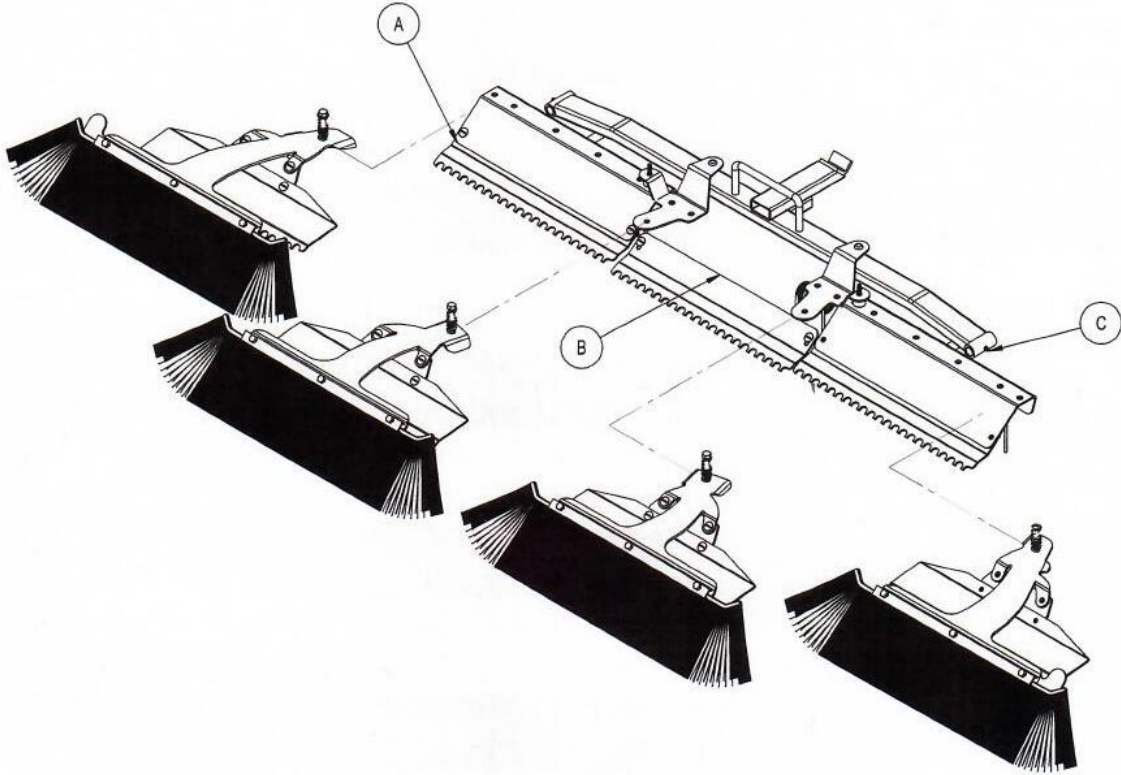


**42-391Q 72" (183CM) PROBRUSH TOURNAMENT RAKE PARTS LIST**

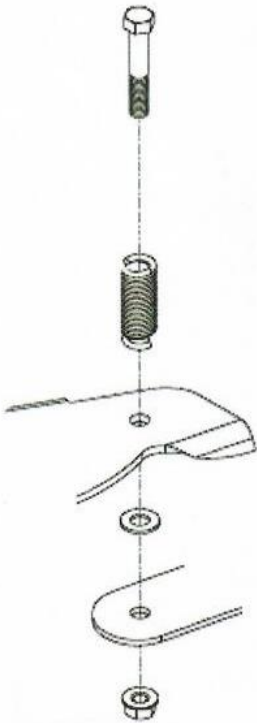
<b>REF#</b>	<b>PART#</b>	<b>DESCRIPTION</b>	<b>QTY.</b>
1	42-489	Tip Guard	2
2	42-397	Outside Brush Arm, LH	1
3	HSTP-516-18-100	Phillip Truss Head Screw, 5/16" – 18 x 1"	16
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	16
4	11-055	Compression Spring	4
5	HB-38-16-275	Hex Bolt, 3/8" – 16 x 2 3/4"	2
	HW-38	Flat Washer, 3/8"	2
	HNTL-38-16	Nylon Lock Nut, 3/8" – 16	2
6	42-396	Outside Brush Arm Mount	2
7	HSTP-516-18-100	Phillip Truss Head Screw, 5/16" – 18 x 1"	4
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	4
8	HSTP-516-18-125	Phillips Truss Head Screw, 5/16" – 18 x 1 1/4"	12
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	12
9	42-140	Outside Rake	3
10	HMB-58-14	Machine Bushing, 5/8" – 14GA	4
11	HRP-14-100	Roll Pin, 1/4" x 1"	2
12	43-154	Draw Bar	1
13	50-081	Rubber Bumper	4
	HNFL-38-16	Flange Whiz-Loc Nut, 3/8" – 16	6
15	42-399	Brush Arm Mount, LH	1
16	HB-38-16-250	Hex Bolt, 3/8" – 16 x 2 1/2"	2
	HNTL-38-16	Nylon Lock Nut, 3/8" – 16	2
17	42-454	Inside Brush Arm, LH	1
18	42-122	Rake Spring	12
	42-177	Spring Holder	12
19	HSTP-516-18-075	Phillip Truss Head Screw, 5/16" – 18 x 3/4"	6
	HFNL-516-18	Flange Whiz-Loc Nut 5/16" – 18	6
20	42-171	Groomer Blades	3
21	42-393	Outside Brush Arm, RH	1
22	42-105	Top Strap	4
23	42-107	Matting	4
24	42-106	Bottom Strap	4
25	42-170	Finishing Blades	4
26	42-466	Brush, 21"	4
27	42-465	Brush Clamp	4
28	HB-516-18-125	Hex Bolt, 5/16" – 18 x 1 1/4"	12
29	42-453	Inside Brush Arm, RH	1
30	42-398	Brush Arm Mount, RH	1
31	HB-14-20-175	Hex Bolt, 1/4" – 20 x 1 3/4"	1
	HNTL-14-20	Nylon Lock Nut, 1/4" – 20	1



**42-391Q 72" (183CM) PROBRUSH TOURNAMENT RAKE DRAWING**



**Fig. 1**



**Fig. 2**



**Fig. 3**

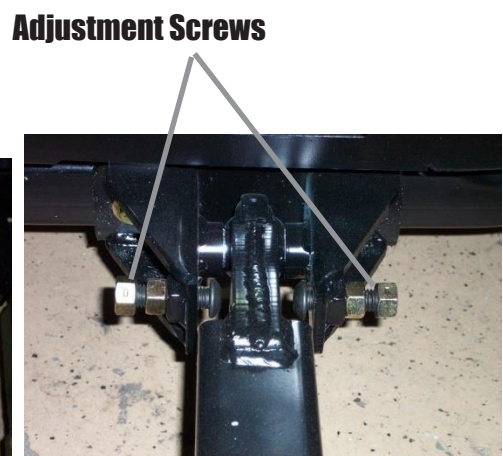
# PROBRUSH TOURNAMENT RAKE ASSEMBLY INSTRUCTIONS

Your **ProBrush TOURNAMENT RAKE** comes mostly assembled.

1. Before assembly please note the two Brush/Finish Blade Assemblies (Refs A & C in Fig.1) that are mounted on the outside (RH & LH) have flat washers that are between the Brush Arms (Refs 2 & 21) and the Brush Arm Mount (Ref 6).
2. Also please note the placement of the Brush/Finish Blade Assemblies as illustrated in Fig 1. They must be mounted as illustrated to work as intended.
3. Begin assembling your **ProBrush TOURNAMENT RAKE** by inserting the Outside and Center Groomer Blade Assemblies (Refs A, B & C in Fig.1) in their locations as illustrated. Secure the Outside Assemblies with the  $\frac{1}{4}$ " Pin (Ref 11) and the Center Assembly with the  $\frac{1}{4}$ " x  $1\frac{3}{4}$ " Bolt and Lock Nut (Ref 13).
4. Mount the Brush/Finish Blade Assemblies to the Brush Arm Mounts (Refs 6, 30 & 15) as illustrated using the  $\frac{3}{8}$ " x  $2\frac{1}{2}$ " Bolts and Lock Nuts. Assemble with the Springs (Ref 4) as shown in Fig. 2. Please note that the  $\frac{3}{8}$ " Flat Washers are used only on the Outside Assemblies. Secure when assembled.
5. Mount your **ProBrush TOURNAMENT RAKE** to the trap rake quick hitch. Position the Rake so it is centered and equal distance away from the right and left hand tires (2-3 inches). Fig. 4. Once positioned, set the Adjustment Screws on the Hitch so they touch the trap rake hitch. Fig. 5.
6. Run machine and test for operation of the Rake by raising and lowering the assembly and with rake down turn sharp corners in both directions to ensure rake is not contacting the tires. Test Rake in sand to ensure tire tracks are covered when turning sharp corners. If the tire tracks are not covered by the Rake, turn the Adjustment Screws on the Rake Hitch so the rake comes closer to the tires when turning. For reference see Fig. 4 and 5 below.

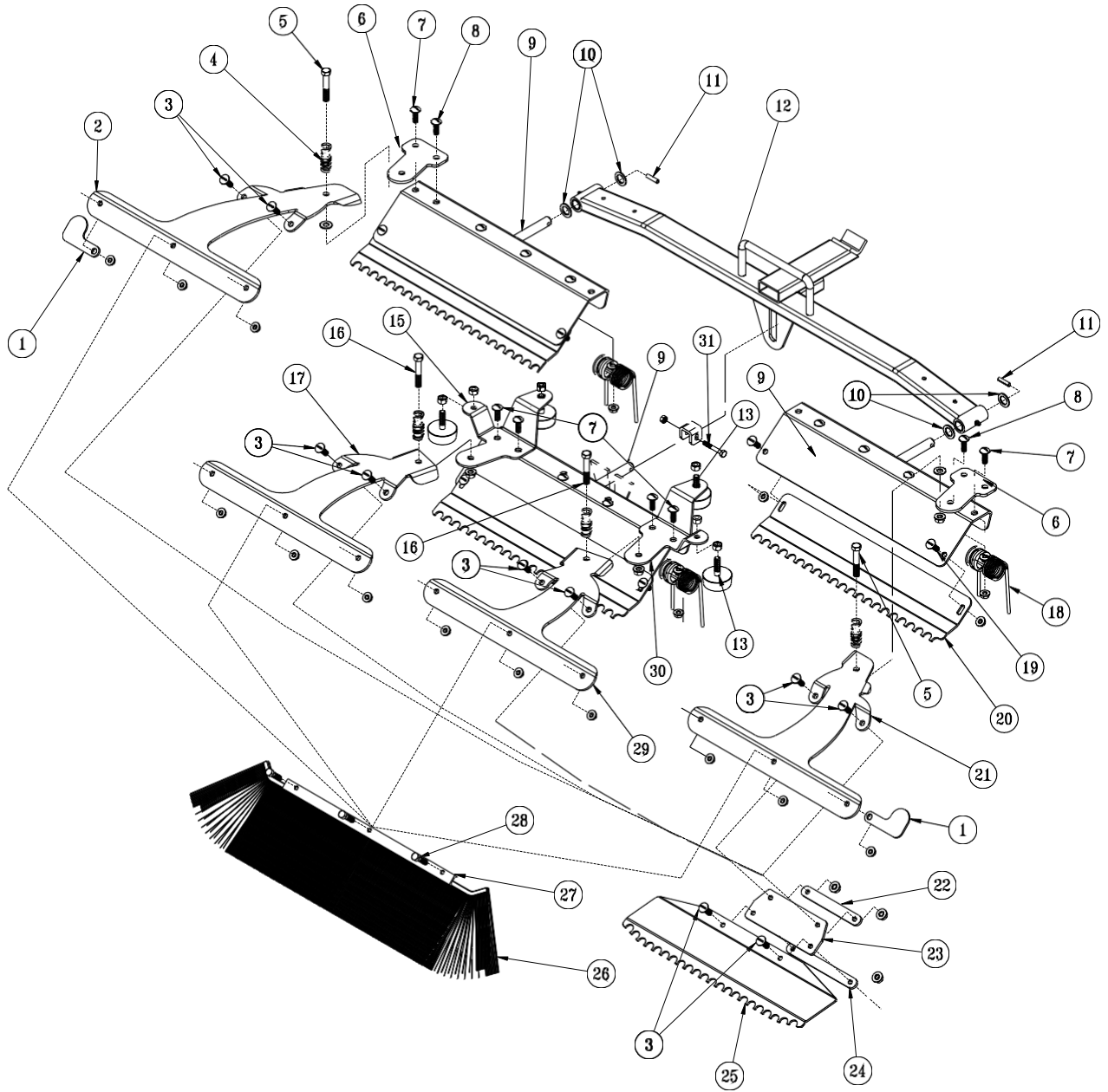
## NOTE:

The Outside Brush/Finish Blade Assemblies may be rotated 180° for transport and for working in narrow areas, as illustrated in Fig.3 on the facing page.



**Fig. 5**

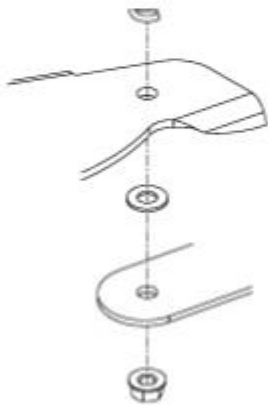
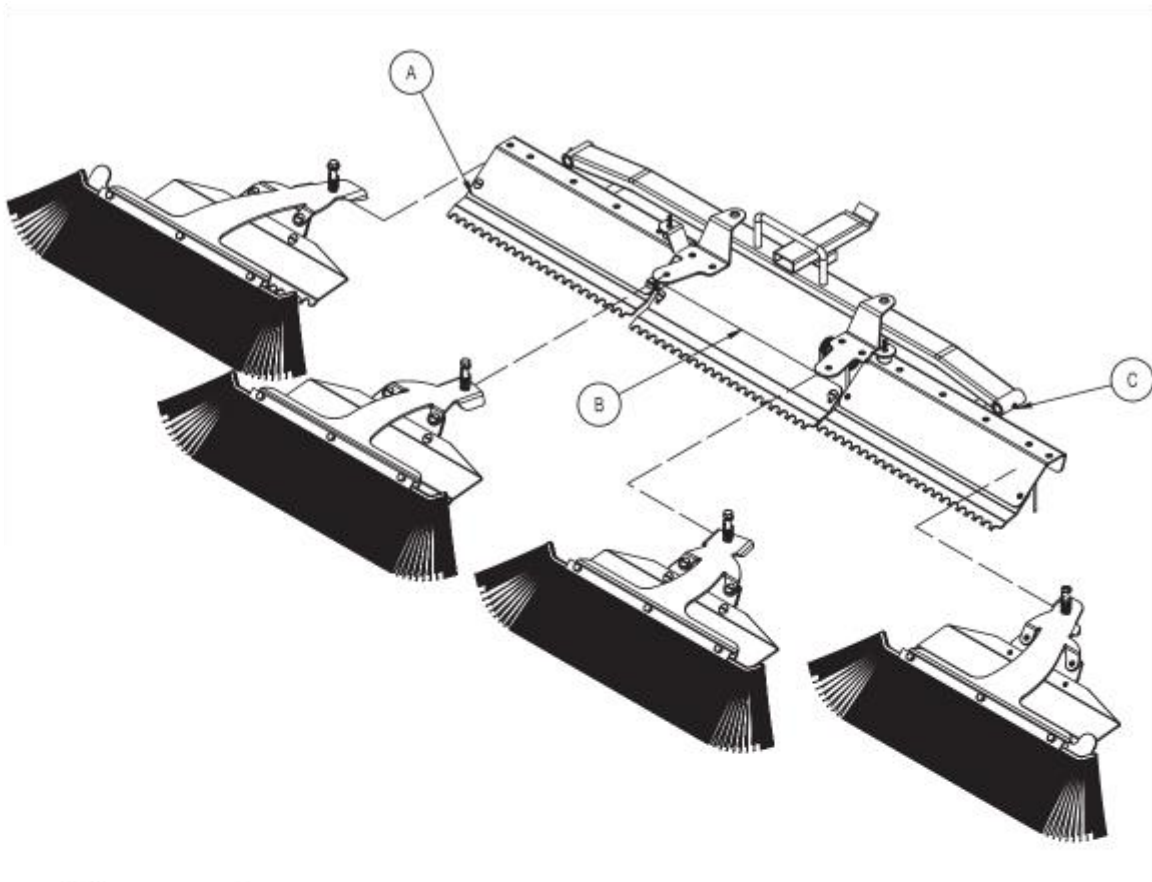
**42-392Q 84" (213CM) PROBRUSH TOURNAMENT RAKE DRAWING**



**42-392Q 84" (213CM) PROBRUSH TOURNAMENT RAKE PARTS LIST**

<b>REF#</b>	<b>PART#</b>	<b>DESCRIPTION</b>	<b>QTY.</b>
1	42-489	Tip Guard	2
2	42-397	Outside Brush Arm, LH	1
3	HSTP-516-18-100	Phillip Truss Head Screw, 5/16" – 18 x 1"	16
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	16
4	11-055	Compression Spring	4
5	HB-38-16-250	Hex Bolt, 3/8" – 16 x 2 1/2"	2
	HW-38	Flat Washer, 3/8"	2
	HNTL-38-16	Nylon Lock Nut, 3/8" – 16	2
6	42-396	Outside Brush Arm Mount	2
7	HSTP-516-18-100	Phillip Truss Head Screw, 5/16" – 18 x 1"	4
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	4
8	HSTP-516-18-125	Phillips Truss Head Screw, 5/16" – 18 x 1 1/4"	12
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	12
9	42-102	84" Outside Rake	3
10	HMB-58-14	Machine Bushing, 5/8" x 14GA	4
11	HRP-14-100	Roll Pin, 1/4" x 1"	2
12	43-144	84" Draw Bar	1
13	50-081	Rubber Bumper	4
	HNFL-38-16	Flange Whiz-Loc Nut, 3/8" – 16	6
15	42-399	Brush Arm Mount, LH	1
16	HB-38-16-250	Hex Bolt, 3/8" – 16 x 2 1/2"	2
	HNTL-38-16	Nylon Lock Nut, 3/8" – 16	2
17	42-454	Inside Brush Arm, LH	1
18	42-122	Rake Spring	12
	42-177	Spring Holder	12
19	HSTP-516-18-075	Phillip Truss Head Screw, 5/16" – 18 x 3/4"	6
	HFNL-516-18	Flange Whiz-Loc Nut 5/16" – 18	6
20	42-129	Groomer Blades	3
21	42-393	Outside Brush Arm, RH	1
22	42-105	Top Strap	4
23	42-107	Matting	4
24	42-106	Bottom Strap	4
25	42-135	Finishing Blades	4
26	42-466	Brush, 21"	4
27	42-465	Brush Clamp	4
28	HB-516-18-125	Hex Bolt, 5/16" – 18 x 1 1/4"	12
	HNFL-516-18	Flange Whiz-Loc Nut 5/16" – 18	12
29	42-453	Inside Brush Arm, RH	1
30	42-398	Brush Arm Mount, RH	1
31	HB-14-20-175	Hex Bolt, 1/4" – 20 x 1 3/4"	1
	HNTL-14-20	Nylon Lock Nut, 1/4" – 20	1

**42-392Q 84" (213CM) PROBRUSH TOURNAMENT RAKE DRAWING**





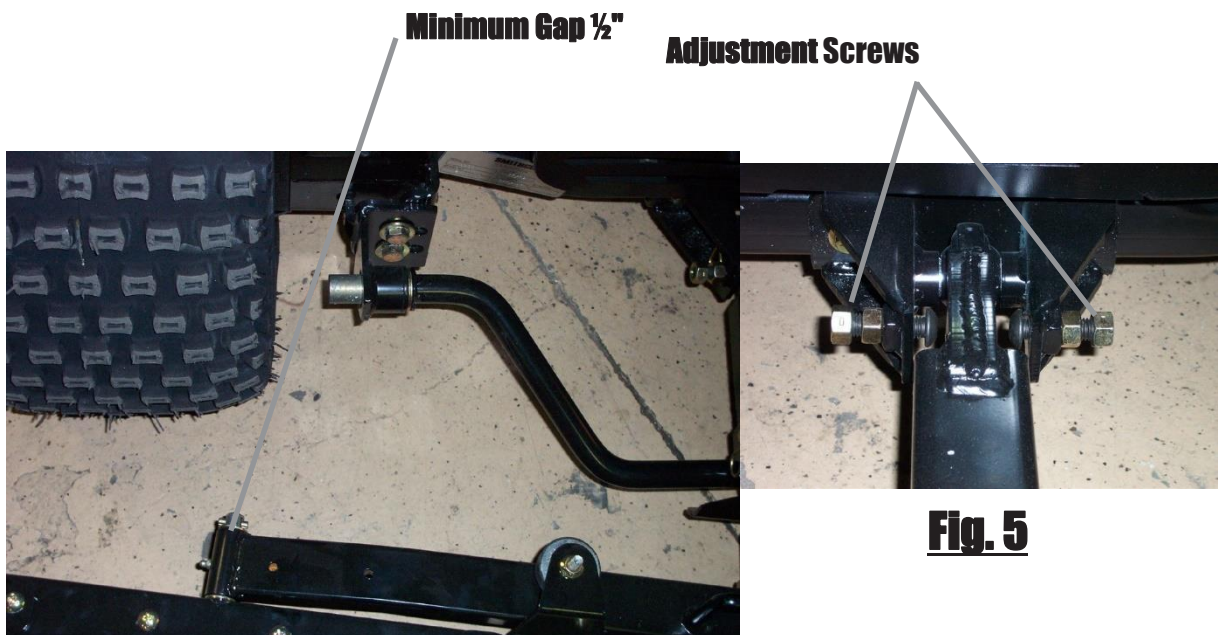
# PROBRUSH TOURNAMENT RAKE ASSEMBLY INSTRUCTIONS

Your **ProBrush TOURNAMENT RAKE** comes mostly assembled.

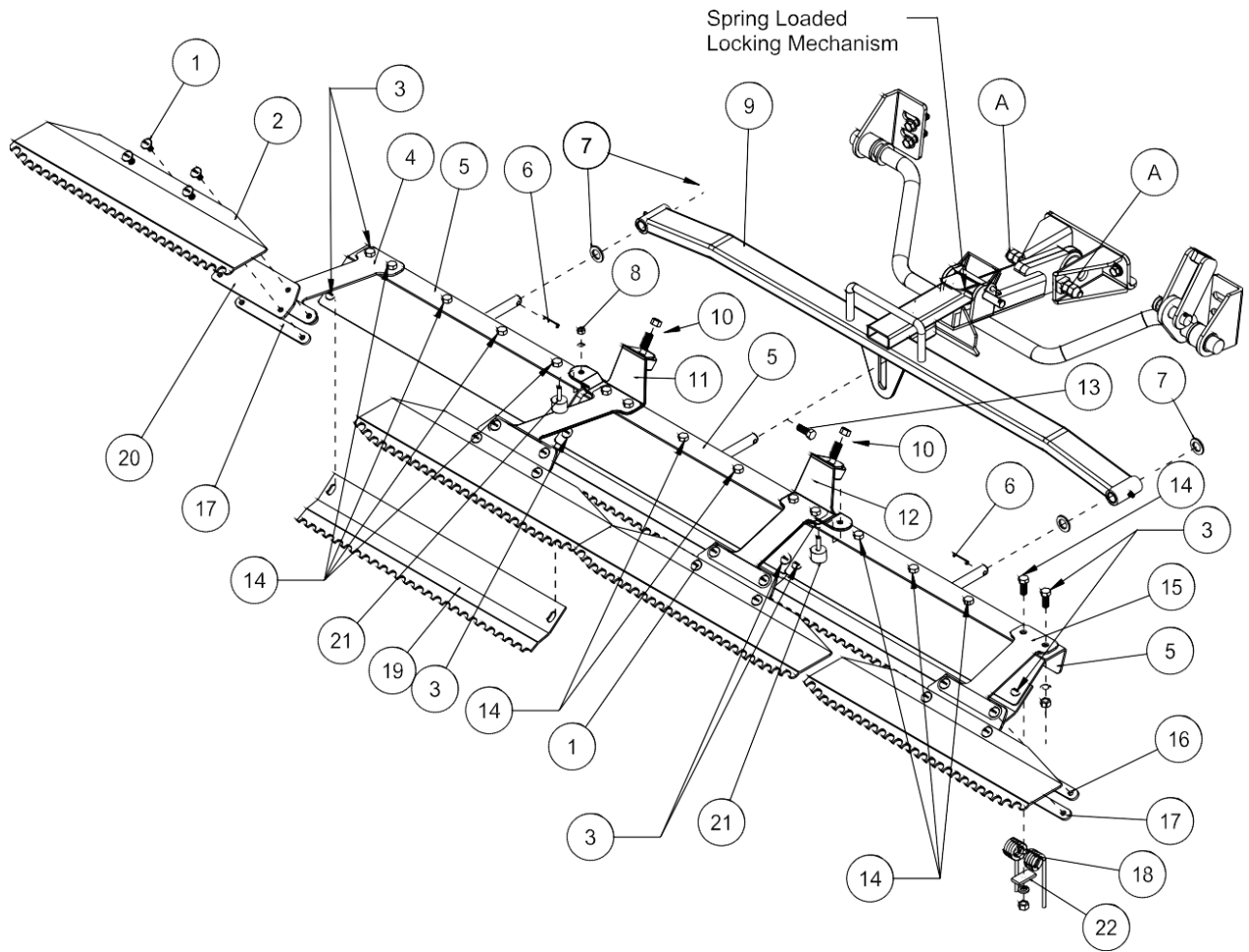
1. Before assembly please note the two Brush/Finish Blade Assemblies (Refs A & C in Fig.1) that are mounted on the outside (RH & LH) have flat washers that are between the Brush Arms (Refs 2 & 21) and the Brush Arm Mount (Ref 6).
2. Also please note the placement of the Brush/Finish Blade Assemblies as illustrated in Fig 1. They must be mounted as illustrated to work as intended.
3. Begin assembling your **ProBrush TOURNAMENT RAKE** by inserting the Outside and Center Groomer Blade Assemblies (Refs A, B & C in Fig.1) in their locations as illustrated. Secure the Outside Assemblies with the  $\frac{1}{4}$ " Pin (Ref 11) and the Center Assembly with the  $\frac{1}{4}$ " x  $1\frac{3}{4}$ " Bolt and Lock Nut (Ref 13).
4. Mount the Brush/Finish Blade Assemblies to the Brush Arm Mounts (Refs 6, 30 & 15) as illustrated using the  $\frac{3}{8}$ " x  $2\frac{1}{2}$ " Bolts and Lock Nuts. Assemble with the Springs (Ref 4) as shown in Fig. 2. Please note that the  $\frac{3}{8}$ " Flat Washers are used only on the Outside Assemblies. Secure when assembled.
5. Mount your **ProBrush TOURNAMENT RAKE** to the trap rake quick hitch. Position the Rake so it is centered and equal distance away from the right and left hand tires (2-3 inches). Fig. 4. Once positioned, set the Adjustment Screws on the Hitch so they touch the trap rake hitch. Fig. 5.
6. Run machine and test for operation of the Rake by raising and lowering the assembly and with rake down turn sharp corners in both directions to ensure rake is not contacting the tires. Test Rake in sand to ensure tire tracks are covered when turning sharp corners. If the tire tracks are not covered by the Rake, turn the Adjustment Screws on the Rake Hitch so the rake comes closer to the tires when turning. For reference see Fig. 4 and 5 below.

## NOTE:

The Outside Brush/Finish Blade Assemblies may be rotated 180° for transport and for working in narrow areas, as illustrated in Fig.3 on the facing page.



**42-130Q 84" (213CM) MILD STEEL TOURNAMENT RAKE DRAWING**

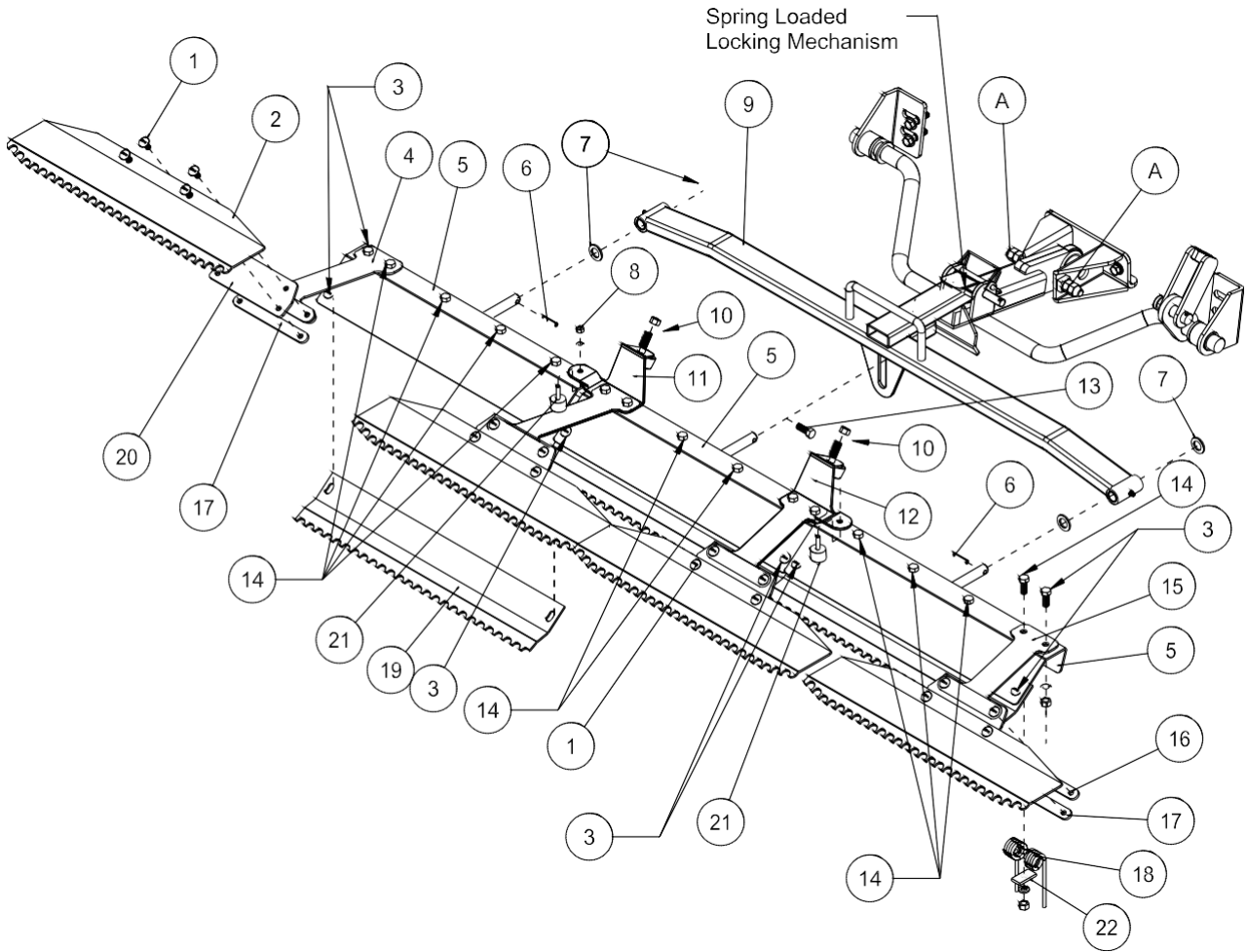


**42-130Q 84" (213CM) MILD STEEL TOURNAMENT RAKE PARTS LIST**

<b>REF#</b>	<b>PART#</b>	<b>DESCRIPTION</b>	<b>QTY.</b>
1	HSTP-516-18-100	Phillips Machine Screw, 5/16" – 18 x 1"	16
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	16
2	42-135	Finishing Blades	4
3	HSTP-516-18-075	Phillips Machine Screw, 5/16" – 18 x 3/4"	8
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	8
4	42-111	Left Outside Mount	1
5	42-102	Outside Rake	3
6	HRP-14-100	Roll Pin, 1/4" x 1"	2
7	HMB-58-14	Machine Bushing, 5/8" x 14GA	4
8	HCN-14-20	Cap Nut, 1/4" – 20	2
	HWL-14	Lock Washer, 1/4"	2
9	43-144	Draw Bar	1
10	50-081	Rubber Bumper	2
11	42-110	Left Inside Mount	1
12	42-108	Inside Trowel Mount	1
13	HB-14-20-175	Hex Bolt, 1/4" – 20 x 1 3/4"	1
	HNFL-14-20	Nylon Lock Nut, 1/4" – 20	1
14	HSTP-516-18-125	Phillips Machine Screw, 5/16" – 18 x 1 1/4"	12
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	12
15	42-109	Outside Towel Mount	1
16	42-105	Top Strap	4
17	42-106	Bottom Strap	4
18	42-122	Rake Spring	12
19	42-129	Groomer Blades	3
20	42-107	Matting	4
21	15-013	Rubber Bumper	2
22	42-177	Spring Holder	12



**42-130Q 84" (213CM) MILD STEEL TOURNAMENT RAKE DRAWING**

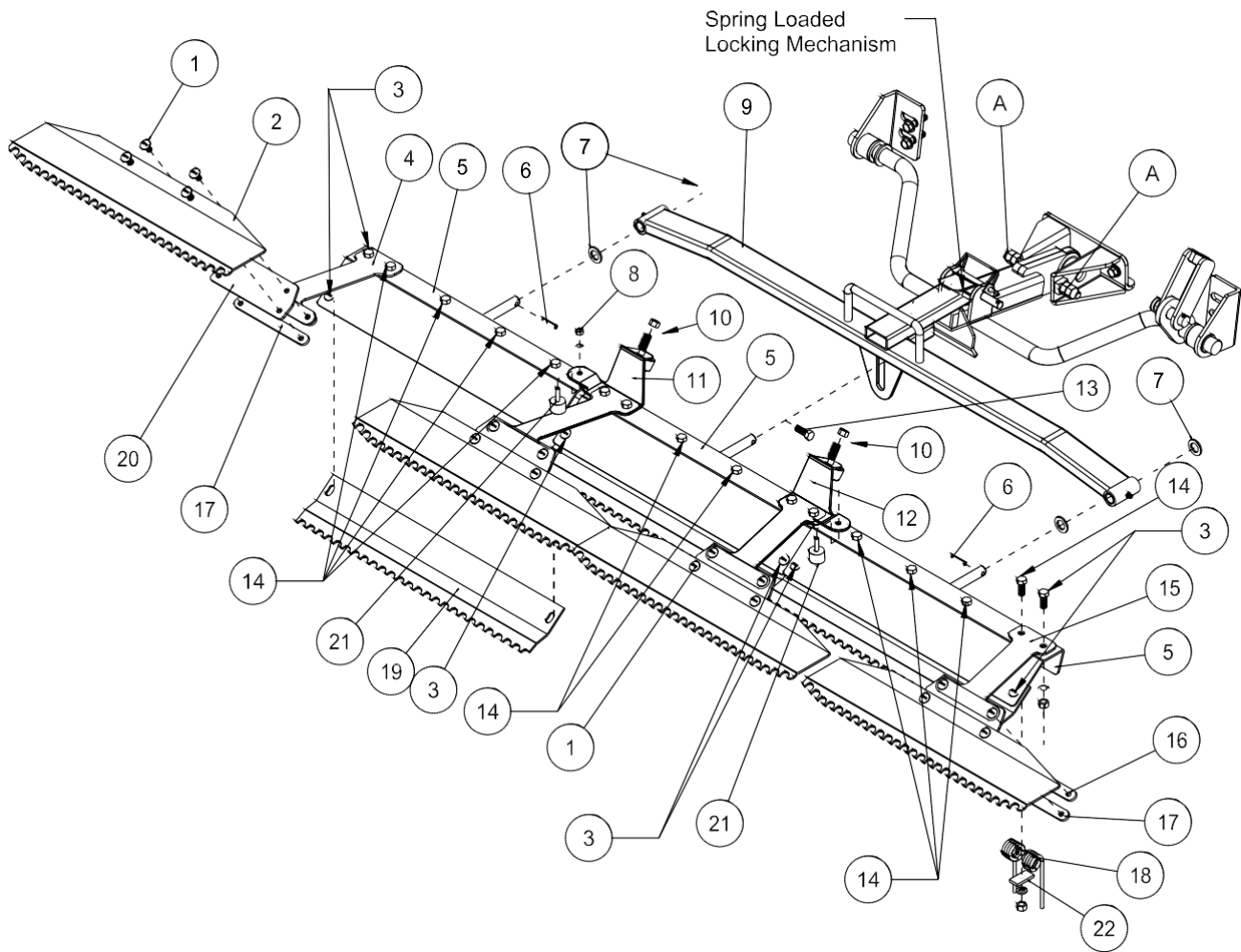


## RAKE ASSEMBLY INSTRUCTIONS

1. Hex Bolt rake spring (Ref 18) to rake frames (Ref 5) using hardware (Ref 14). Leave the two outside holes on right, left, and center rake open.
2. Attach rubber bumper (Ref 21) using cap nut and washer (Ref# 8). Attach rubber grommets (Ref 10) to inside mounts (Ref 11 & 12)
3. Attach the left outside mount (Ref 4), the left inside mount (Ref 11), the outside trowel mount (Ref 15), and the inside trowel mount (Ref 12) to the outside and center rakes (Ref 5) as shown. Use the  $\frac{3}{4}$ " truss head screws (Ref 3) on the outside hole of each rake. Use the spring holder (Ref 22) and the  $1\frac{1}{4}$ " truss head screws (Ref 14) to attach rake springs (Ref 18) to the rakes under the left outside and inside mounts and the outside and inside trowel mounts.
4. Slide a machine bushing onto outside rake frames then slide the outside rake frames (Ref 5) into the tubing on the end of the drawbar. Hold in place with another machine bushing and a roll pin (Ref 6).
5. Attach center rake (Ref 5) to draw bar (Ref 9) as shown, using  $1\frac{1}{2}$  bolts and lock nuts (Ref 13) with the shaft of the center rake in the slot on the bottom of the drawbar.
6. Attach the matting (Ref 20) and the top strap (Ref 16) to the inside and outside mounts using the truss head screw  $5/16$ " – 18 x 1 (Ref 1). Attach four finishing blades (Ref 2) to the matting on the inside and outside mounts with the truss head screw  $5/16$ " – 18 x 1 (Ref 1) going through the finishing blade, matting and bottom strap (Ref 17).
7. Place the three groomer blades (Ref 19) under the three rake assemblies as shown, using (Ref 3).
8. Attach the rake lift to the trap rake quick hitch, by sliding the hitch into the spring loaded locking mechanism.
9. With the rake on the ground pull the rake to the right side until it is 2-3 inches from the tire.
10. Using the adjustment bolts (Ref A) on the side of hitch, adjust the hex bolts until it hits the trap rake hitch. Lock jam nut so adjustment will not change.
11. Repeat steps for the left side.
12. Turn machine on and test for operation of rake assembly by raising and lowering the rake assembly. Also with rake down, turn sharp corners to check that rake does not touch wheels.

**NOTE: Test rake in sand to assure tire tracks are covered by the rake when turning sharp corners in either direction. If there are tire tracks, readjust using the adjusting screws on the hitch, so the rake comes closer to the tire.**

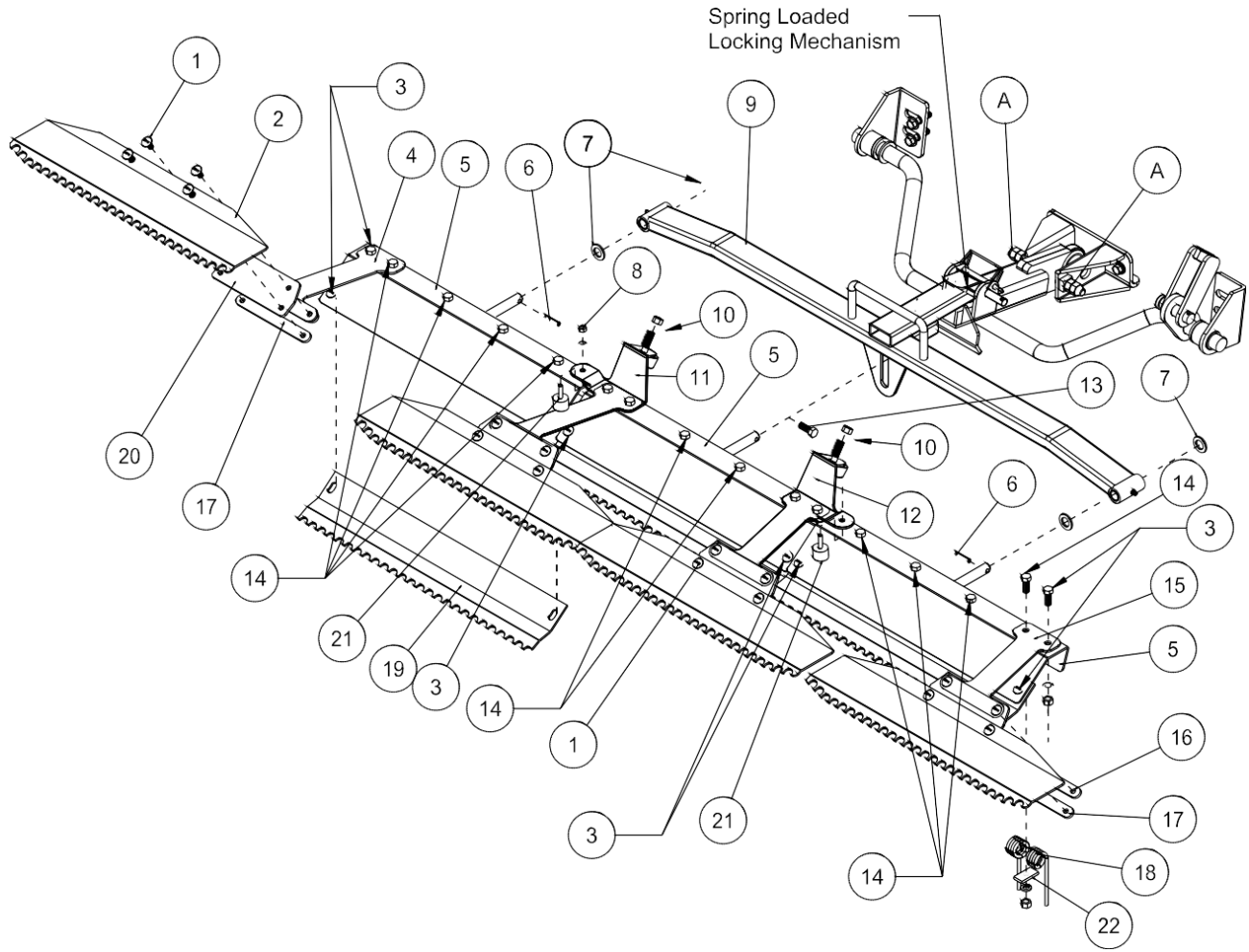
**42-132Q 72" (183CM) MILD STEEL TROUNAMENT RAKE DRAWING**



**42-132Q 72" (183CM) MILD STEEL TROUNAMENT RAKE PARTS LIST**

REF#	PART#	DESCRIPTION	QTY.
1	HSTP-516-18-100	Phillips Machine Screw, 5/16" – 18 x 1"	16
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	16
2	42-170	Finishing Blades	4
3	HSTP-516-18-075	Phillips Machine Screw, 5/16" – 18 x 3/4"	10
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	10
4	42-111	Left Outside Mount	1
5	42-140	Outside Rake	3
6	HRP-14-100	Roll Pin, 1/4" x 1"	2
7	HMB-58-14	Machine Bushing, 5/8" x 14GA	4
8	HNC-14-20	Cap Nut, 1/4" – 20	2
	HWL-14	Lock Washer, 1/4"	2
9	43-154	Draw Bar	1
10	50-081	Rubber Bumper	2
	HNFL-38-16	Flange Whiz-Loc Nut, 3/8" – 18	2
11	42-110	Left Inside Mount	1
12	42-108	Inside Trowel Mount	1
13	HB-14-20-175	Hex Bolt, 1/4" – 20 x 1 3/4"	1
	HNTL-14-20	Nylon Lock Nut, 1/4" – 20	1
14	HSTP-516-18-125	Phillips Machine Screw, 5/16" – 18 x 1 1/4"	12
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	12
15	42-109	Outside Trowel Mount	1
16	42-105	Top Strap	4
17	42-106	Bottom Strap	4
18	42-122	Rake Spring	12
19	42-171	Groomer Blades	3
20	42-107	Matting	4
21	15-013	Rubber Bumper	2
22	42-177	Spring Holder	12

**42-132Q 72" (183CM) MILD STEEL TROUNAMENT RAKE DRAWING**

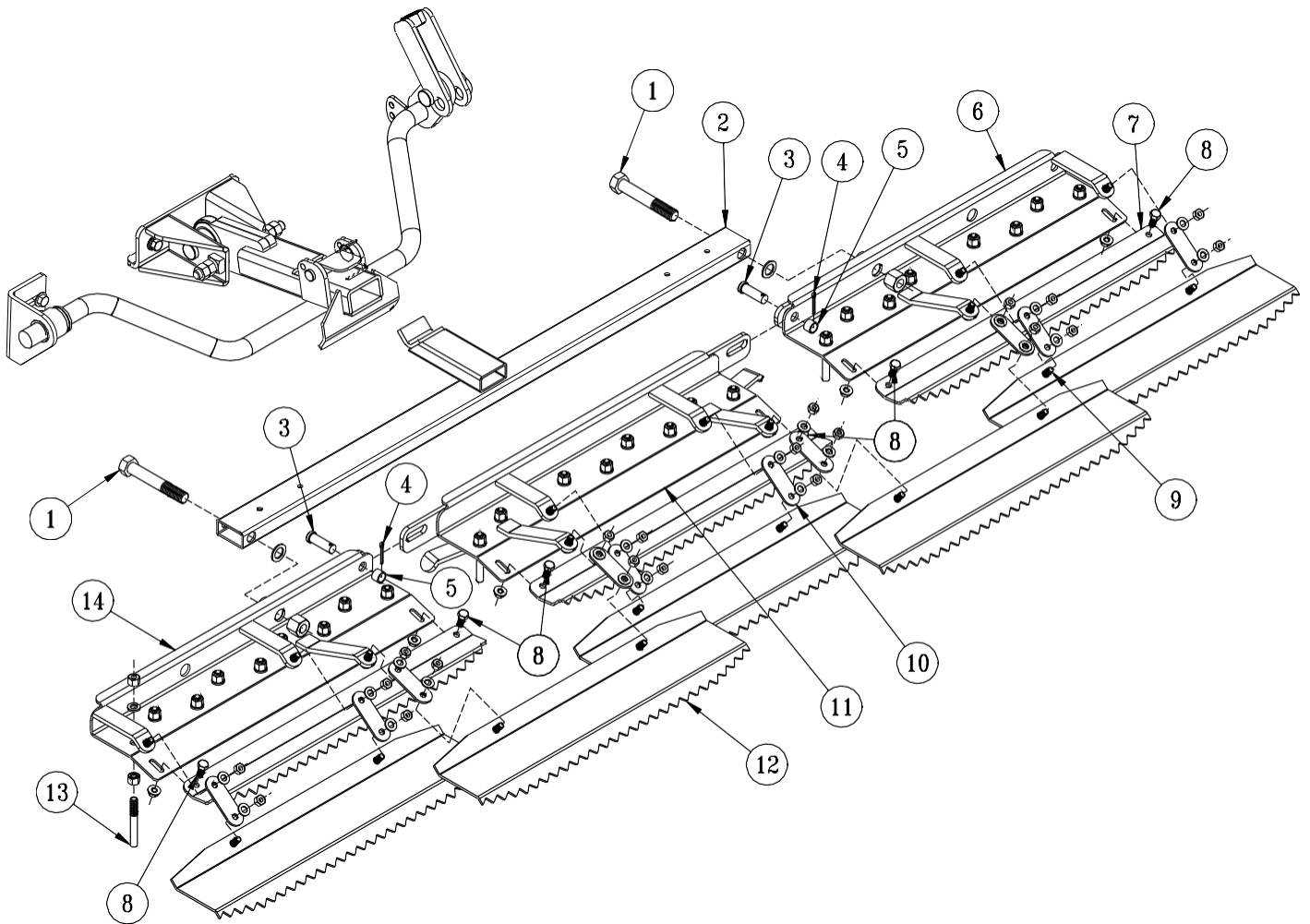


## RAKE ASSEMBLY INSTRUCTIONS

1. Hex Bolt rake spring (Ref 18) to rake frames (Ref 5) using hardware (Ref 14). Leave the two outside holes on right, left, and center rake open.
2. Attach rubber bumper (Ref 21) using cap nut and washer (Ref# 8). Attach rubber grommets (Ref 10) to inside mounts (Ref 11 & 12)
3. Attach the left outside mount (Ref 4), the left inside mount (Ref 11), the outside trowel mount (Ref 15), and the inside trowel mount (Ref 12) to the outside and center rakes (Ref 5) as shown. Use the 3/4" truss head screws (Ref 3) on the outside hole of each rake. Use the spring holder (Ref 22) and the 1 1/4" truss head screws (Ref 14) to attach rake springs (Ref 18) to the rakes under the left outside and inside mounts and the outside and inside trowel mounts.
4. Slide a machine bushing onto outside rake frames then slide the outside rake frames (Ref 5) into the tubing on the end of the drawbar. Hold in place with another machine bushing and a roll pin (Ref 6).
5. Attach center rake (Ref 5) to draw bar (Ref 9) as shown, using 1 3/4" bolts and lock nuts (Ref 13) with the shaft of the center rake in the slot on the bottom of the drawbar.
6. Attach the matting (Ref 20) and the top strap (Ref 16) to the inside and outside mounts using the truss head screw 5/16" – 18 x 1 (Ref 1). Attach four finishing blades (Ref 2) to the matting on the inside and outside mounts with the truss head screw 5/16" – 18 x 1 (Ref 1) going through the finishing blade, matting and bottom strap (Ref 17).
7. Place the three groomer blades (Ref 19) under the three rake assemblies as shown, using (Ref 3).
8. Attach the rake lift to the trap rake quick hitch, by sliding the hitch into the spring loaded locking mechanism.
9. With the rake on the ground pull the rake to the right side until it is 2-3 inches from the tire.
10. Using the adjustment bolts (Ref A) on the side of hitch, adjust the bolts until it hits the trap rake hitch. Lock jam nut so adjustment will not change.
11. Repeat steps for the left side.
12. Turn machine on and test for operation of rake assembly by raising and lowering the rake assembly. Also with rake down, turn sharp corners to check that rake does not touch wheels.

**NOTE: Test rake in sand to assure tire tracks are covered by the rake when turning sharp corners in either direction. If there are tire tracks, readjust using the adjusting screws on the hitch, so the rake comes closer to the tire.**

# 13-758 MAX FLEX SAND RAKE DRAWING



## 13-758 MAX FLEX SAND RAKE PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	HB-58-11-400	Hex Bolt, 5/8" – 11 x 4"	2
	HMB-58-14	Machine Bushing, 5/8" x 14GA	2
	HNCL-58-11	Nylon Lock Nut, 5/8" – 11	2
2	43-145	Draw Bar	1
3	HCP-12-150	Clevis Pin, 1/2" x 1 1/2"	2
4	HP-18-100	Cotter Pin, 1/8" x 1"	2
5	76-275	Spacer	2
6	13-762	Right Rake	1
7	13-759	Grooming Blade	3
8	HB-516-18-075	Hex Bolt, 5/16" – 18 x 3/4"	6
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	6
9	HBFL-516-18-100	Flange Lock Hex Bolt, 5/16" – 18 x 1"	20
	HNTL-516-18	Nylon Lock Nut, 5/16" -18	20
	HW-516	Flat Washer, 5/16"	20
10	13-757	Rake Connect Strap	10
11	13-761	QH Center Rake	1
12	13-443	Finishing Blade	5
14	13-763	Left Rake	1
13*	13-745	Rake Teeth Kit (27 Studs & Hardware)	1

## INSTALLATION INSTRUCTIONS

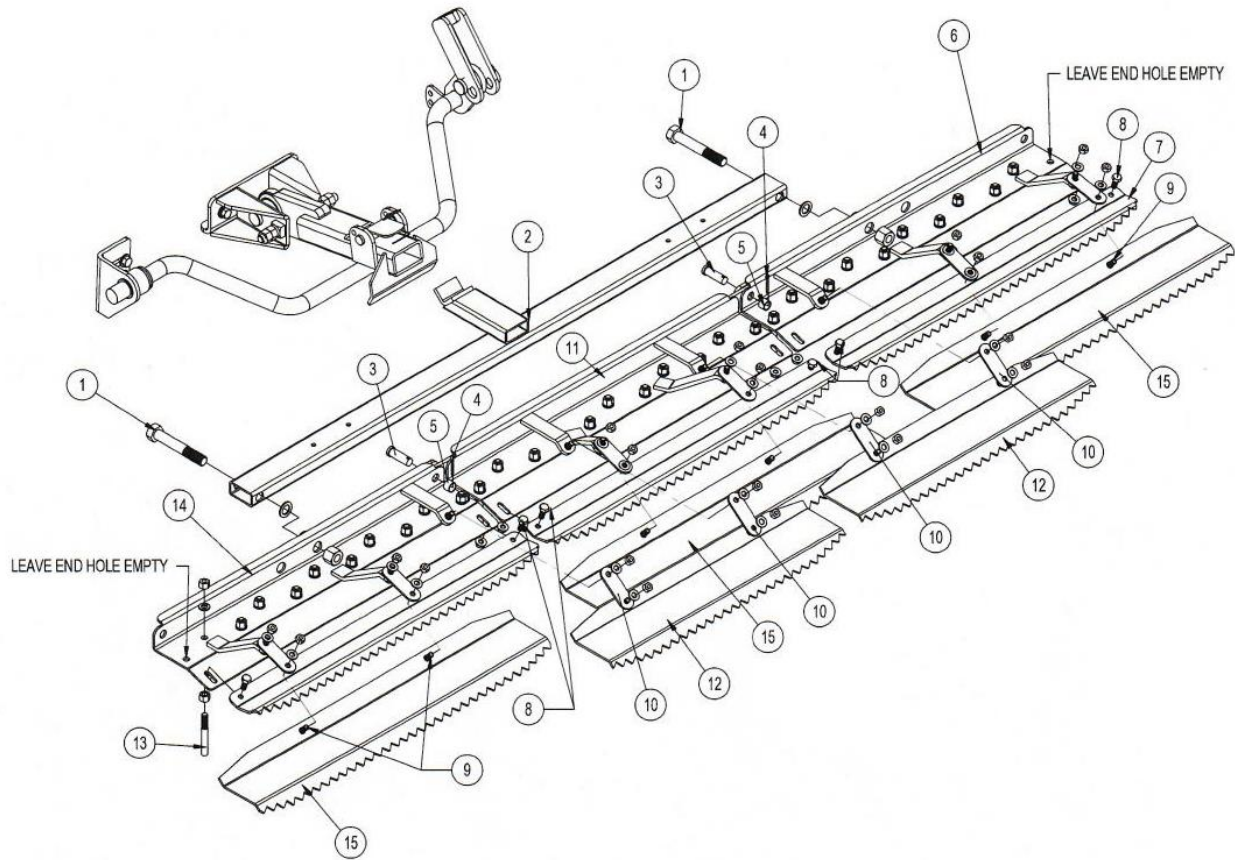
1. Bolt rake teeth (Ref 13) to frames, keeping all the same length.
2. Lay out rake frames (Refs 6, 11 & 14). Connect them using Clevis Pin (Ref 3), Spacer (Ref 5) and Cotter Pin (Ref 4).
3. Attach Left Frame (Ref 14) and Right Frame (Ref 6) to Drawbar (Ref 2) using 5/8 Bolt, Machine Bushing, and Center Lock Nut (Ref 1).
4. Attach the three Groomer Blades (Ref 7), one to each of the Rake Frames (Refs 6, 11 & 14) using two Hex Bolts and Flange Whiz-Loc Nuts (Ref 8). Slide Groomer Blades to end of slot and tighten hardware.
5. Attach the five Finishing Blades (Ref 12) to the tabs of the rake frames using two Rake Connect Strap (Ref 10) per Finishing Blade. Secure using Flange Lock Hex Bolt, Flat Washer and Nylon Lock Nut (Ref 9).

**NOTE: Attach Straps using hardware as illustrated, placing Flat Washer on Strap then secure with Nylon Lock Nut. Attaching with the Flange Hex Bolt in contact with the Strap will cause the Strap to bind and misalign Finishing Blade.**

6. Attach the rake to the trap rake quick hitch by sliding the draw bar hitch into the spring loaded locking mechanism.
7. With the rake on the ground pull the rake to the right side until it is 2-3 inches from the tire.
8. Repeat steps on left side.
9. Turn machine on and test for operation of rake assembly by raising and lowering the rake assembly. Also with rake down, turn sharp corners to check that rake does not touch wheels.
10. **NOTE:** Test rake in sand to assure tire tracks are covered by the rake when turning sharp corners in either direction. If there are tire tracks, readjust using the adjusting screws on the hitch, so the rake comes closer to the tire.



# 45-503 84" RAKE ASSEMBLY DRAWING



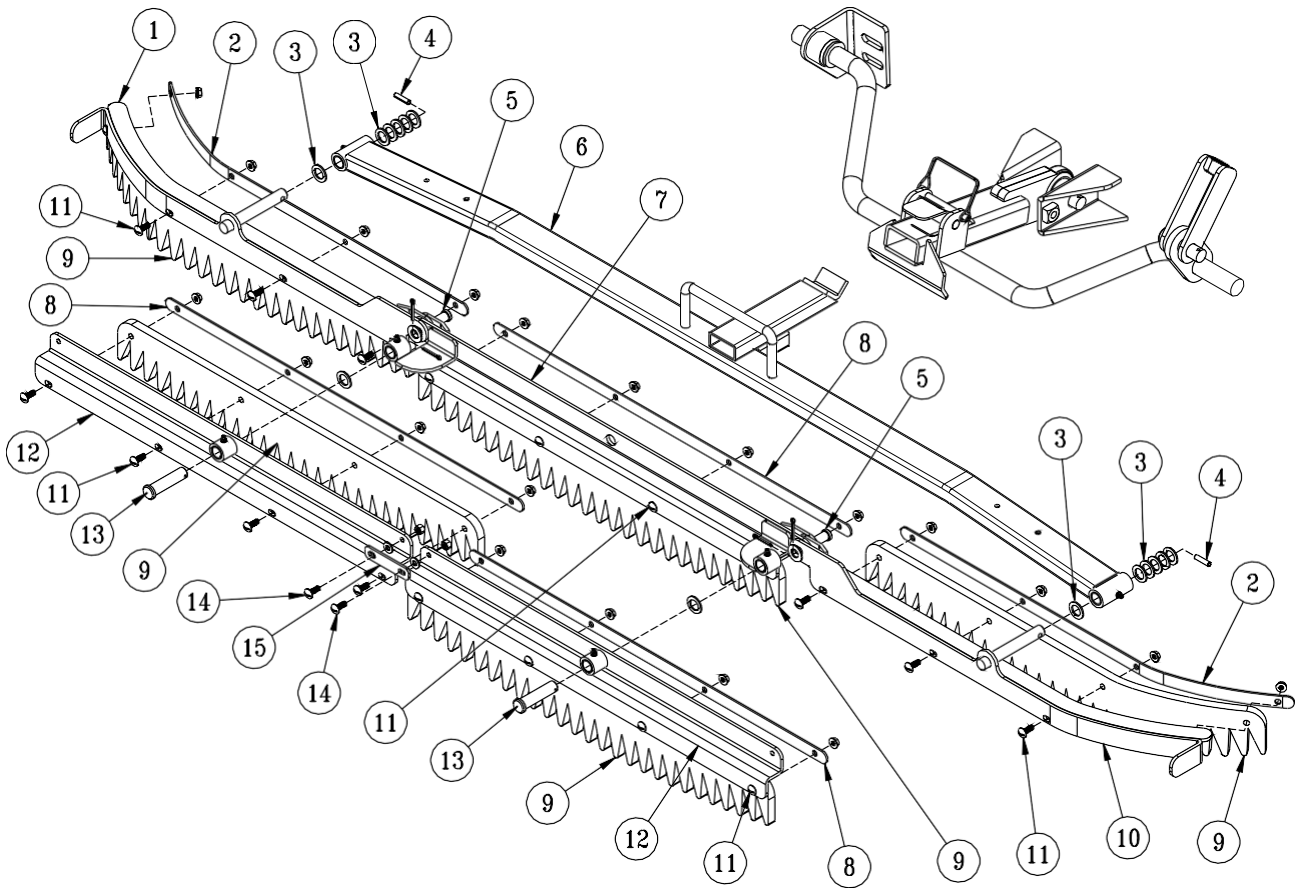
## 45-503 84" RAKE ASSEMBLY PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	HB-58-11-400	Hex Bolt, 5/8" – 11 x 4	2
	HMB-58-14	Machine Bushing, 5/8" x 14GA	2
	HNCL-58-11	Nylon Lock Nut, 5/8" – 11	2
2	45-588	Draw Bar	1
3*	HCP-12-150	Clevis Pin, 1/2" – 1 1/2"	2
4*	HP-18-100	Cotter Pin, 1/8" x 1"	2
5	76-275	Spacer	2
6	45-590	Right Rake Frame	1
7	45-586	Grooming Blade	3
8*	HB-516-18-075	Hex Bolt, 5/16" – 18 x 3/4"	6
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16" – 18	6
9*	HBFL-516-18-075	Flange Whiz-Loc Bolt, 5/16" – 18 x 3/4"	20
	HNTL-516-18	Nylon Lock Nut, 5/16" – 18	20
	HW-516	Flat Washer, 5/16"	20
10	13-757	Rake Connect Strap	10
11	45-589	Center Rake Frame	1
12	13-443	Finishing Blade	2
13	19-106	Rake Teeth	31
	HN-38-16	Hex Nut, 3/8" – 16	62
	HWL-38	Lock Washer, 3/8"	31
14	45-591	Left Rake Frame	1
15	45-587	Finishing Blades	3
*	13-764	Hardware Kit	1

## INSTALLATION INSTRUCTIONS

1. Bolt rake teeth (Ref 13) to frames, keeping all the same length.
  2. Lay out rake frames (Refs 6, 11 & 14). Connect them using Clevis Pin (Ref 3), Spacer (Ref 5) and Cotter Pin (Ref 4).
  3. Attach Left Frame (Ref 14) and Right Frame (Ref 6) to Drawbar (Ref 2) using 5/8 Bolt, Machine Bushing, and Center Lock Nut (Ref 1).
  4. Attach the three Groomer Blades (Ref 7), one to each of the Rake Frames (Refs 6, 11 & 14) using two Hex Bolts and Flange Whiz-Loc Nuts (Ref 8). Slide Groomer Blades to end of slot and tighten hardware.
  5. Attach three large finishing blades (Ref 15) and then the two smaller finishing blades (Ref 12) to the tabs of the rake frames using two rake connect straps (Ref 10) per finishing blade. Secure, using flange lock Hex Bolt, Flat Washer and Nylon Lock Nut (Ref 9)
- NOTE: Attach Straps using hardware as illustrated, placing Flat Washer on Strap then secure with Nylon Lock Nut. Attaching with the Flange Hex Bolt in contact with the Strap will cause the Strap to bind and misalign Finishing Blade.**
6. Attach the rake to the trap rake quick hitch by sliding the draw bar hitch into the spring loaded locking mechanism.
  7. With the rake on the ground pull the rake to the right side until it is 2-3 inches from the tire.
  8. Repeat steps on left side.
  9. Turn machine on and test for operation of rake assembly by raising and lowering the rake assembly. Also with rake down, turn sharp corners to check that rake does not touch wheels.
  10. **NOTE:** Test rake in sand to assure tire tracks are covered by the rake when turning sharp corners in either direction. If there are tire tracks, readjust using the adjusting screws on the hitch, so the rake comes closer to the tire.

# 45-511 RUBBER FLEX RAKE ASSEMBLY DRAWING



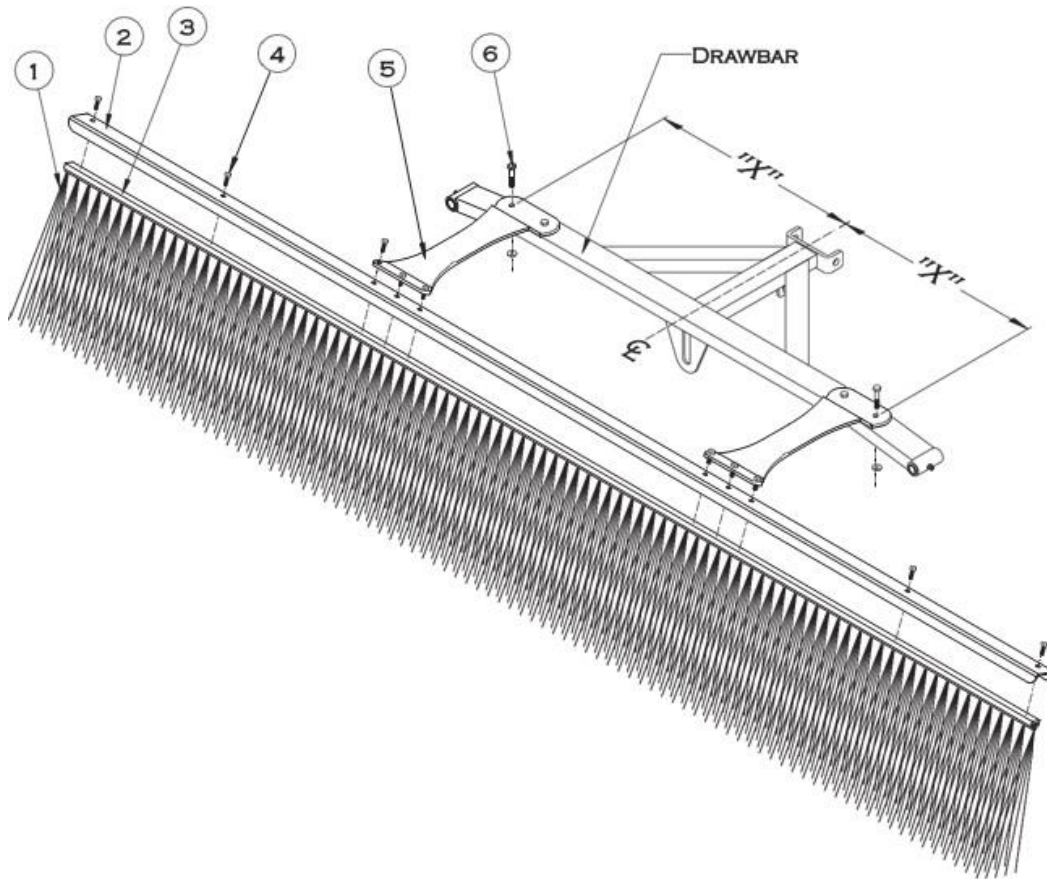
## 45-511 RUBBER FLEX RAKE ASSEMBLY PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	45-653	LH Wing	1
2	45-657	Curved Cover Strap	2
3	HMB-58-14	Machine Bushing, 5/8 x 14GA	12
4	HRP-14-100	Roll Pin, 1/4 x 1	2
5	HCP-12-150	Clevis Pin, 1/2 - 1 1/2	2
	HMB-12-14	Machine Bushing, 1/2 x 14GA	2
	HP-18-100	Cotter Pin, 1/8 x 1	2
6	45-649	Draw Bar	1
7	45-654	Center Rake	1
8	45-658	Flat Cover Strap	1
9	45-651	Rubber Rake Blade	5
10	45-652	RH Wing	1
11	HSTP-14-20-100	Phillips Machine Screw, 1/4 - 20 x 1	20
	HNFL-14-20	Flange Whiz-Loc Nut, 1/4 - 20	20
12	45-655	Rear Rake Mount	2
13	HCP-58-250	Clevis Pin, 5/8 x 2 1/2	2
	HMB-58-14	Machine Bushing, 5/8 x 14GA	2
	HP-18-100	Cotter Pin, 1/8 x 1	2
14	HSTP-14-20-075	Phillips Machine Screw, 1/4 - 20 x 3/4	2
	HNTL-14-20	Nylon Lock Nut, 1/4 - 20	2
	HW-14	Flat Washer, 1/4	2
15	45-656	Rake Strap	1

## INSTALLATION INSTRUCTIONS

1. Hex Bolt rubber rake blades (Ref 9) onto all five rake sections using 1/4 x 1 machine Hex Bolts, and Flange Whiz-Loc Nuts (Ref 11). Add cover straps (Ref 8) and then tighten hardware.
2. Lay out right, left and center rake sections and connect them using 1/2 x 1 1/2 clevis pins, machine bushings and cotter pins (Ref 5).
3. Attach the three assembled sections onto the draw bar (Ref 6) and secure with machine bushings and roll pins (Ref 3 and 4).
4. Connect the two rear rake mounts (Ref 12) together with the rake strap (Ref 8) using two 1/4 x 3/4 machine Hex bolts with Nylon Lock Nuts (Ref 14). **Only tighten enough so they move freely.**
5. Connect the two assembled rear rake mounts onto the other rake sections using two 5/8 x 2 1/2 clevis pins, machine bushings and cotter pins (Ref 13).
6. Attach the rake to the bunker rake quick hitch by sliding the draw bar into the spring loaded locking mechanism.
7. With the rake on the ground, pull the rake to the sides and adjust hitch stops so the rake stops about 2" from the tires.
8. Start machine and test for operation of rake assembly by raising and lowering the rake assembly. Check for loose hardware.

## 13-740 SAND RAKE BRUSH KIT DRAWING & PARTS LIST

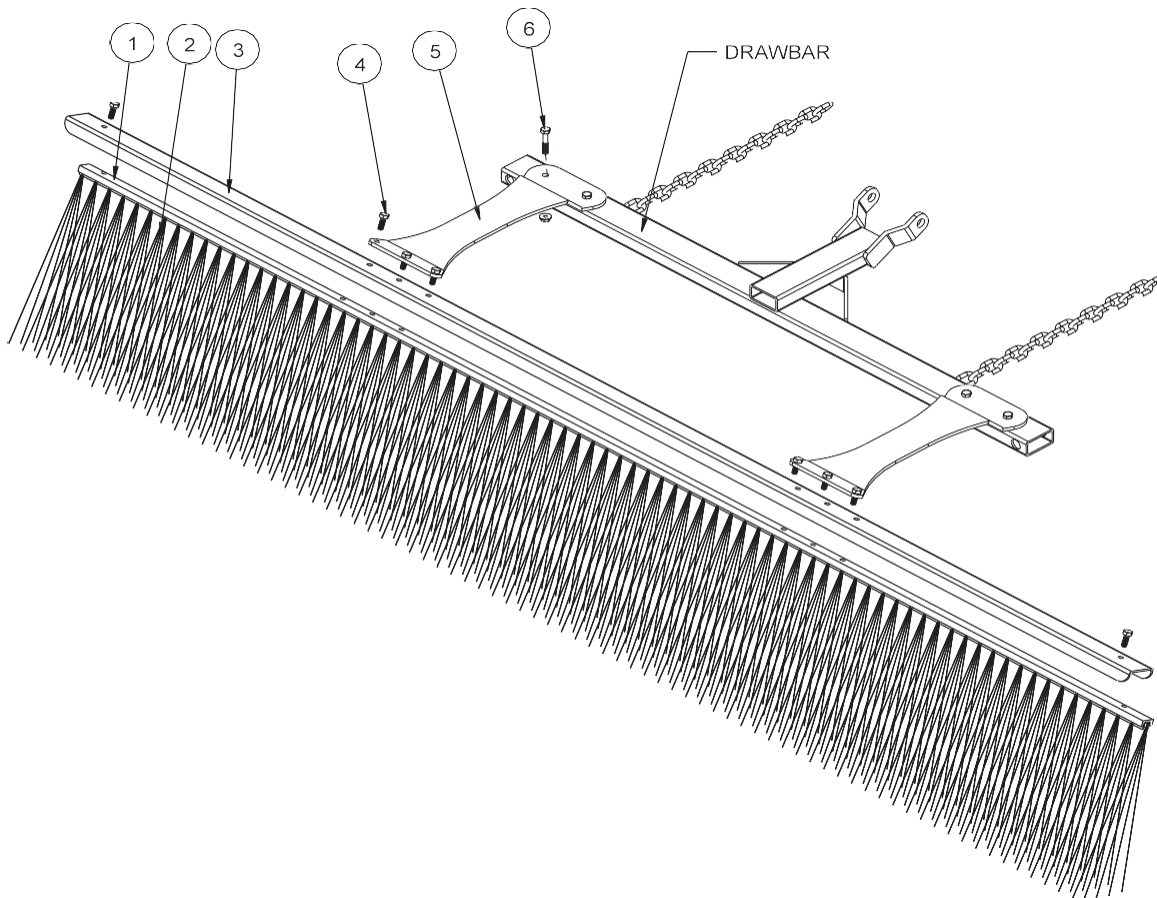


REF#	PART#	DESCRIPTION	QTY.
1	13-738	Brush, 89 x 11	1
2	13-737	Brush Channel	1
3	13-739	Brush Track	1
4	HB-14-20-075	Hex Bolt, ¼ - 20 x ¾	10
	HNFL-14-20	Flange Whiz-Lock Nut, ¼ - 20	10
5	13-681	Mounting Brackets	2
6	HB-14-20-150	Hex Bolt, ¼ - 20 x 1 ½	4
	HNFL-14-20	Flange Whiz-Lock Nuts, ¼ - 20	4

## INSTALLATION INSTRUCTIONS

1. Place the Brush (Ref 1) into the Brush Track (Ref 3). Place the Brush Channel (Ref 2) between the brush track and the mounting brackets. Now Hex Bolt the Mounting Brackets (Ref 5) to the brush track using the ¾" Hex Bolts and flange whiz-Nylon Lock Nuts (Ref 4).
2. To mount the Brush Assembly (Ref 1-5) to the Rake Draw bar, first align the Mounting Brackets so the Brush Assembly is centered ("X" measurements are equal) on the Rake Draw bar. Mark the locations for the four holes that will need to be drilled. Note: To fit the curve of the Rake Draw bar, a small amount of twist will need to be put in the Mounting Brackets. This can be done by clamping the Mounting Brackets to the Draw bar.
3. Mount the Brush Assembly to the Draw bar using the four 1 ½" Hex Bolts and flange whiz-Nylon Lock Nuts (Ref 6).

## 13-684 SAND RAKE BRUSH KIT DRAWING & PARTS LIST



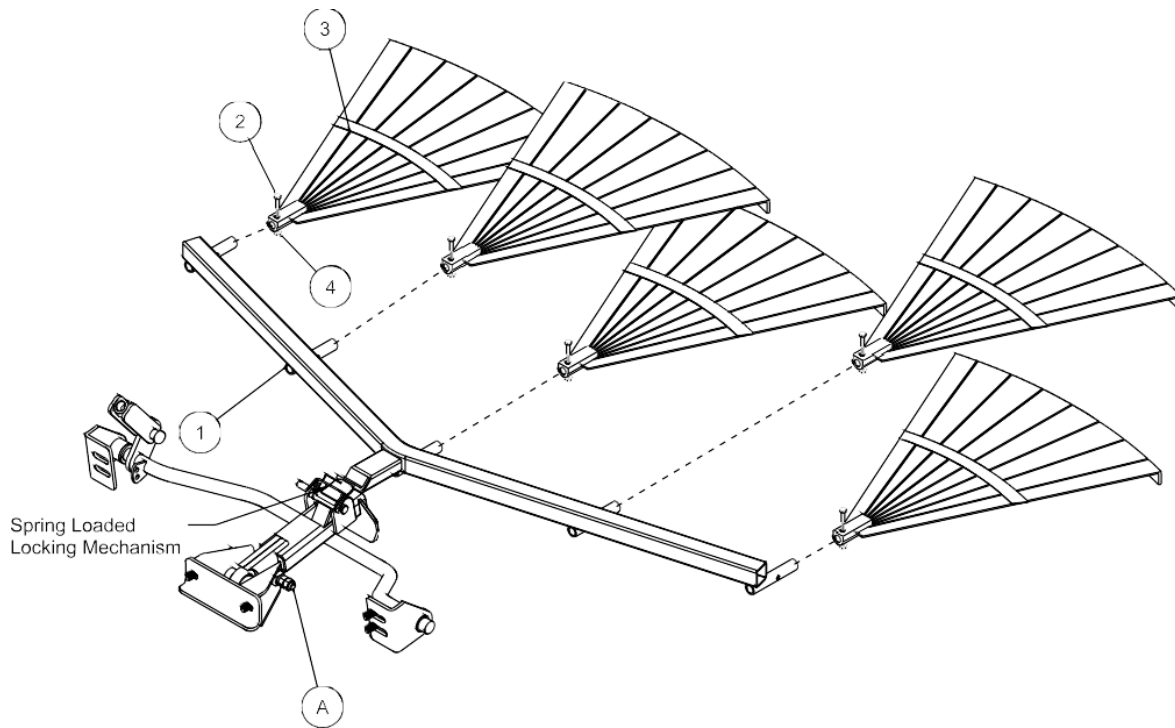
REF#	PART#	DESCRIPTION	QTY.
1	13-683	Brush Track	1
2	13-682	Brush 77 x 11	1
3	13-688	Brush Channel	1
4	HB-14-20-075	Hex Bolt, ¼ - 20 x ¾	8
	HNFL-14-20	Flange Whiz-Lock Nut, ¼ - 20	8
5	13-681	Mounting Brackets	2
6	HB-14-20-150	Hex Bolt, ¼ - 20 x 1 ½	4
	HNFL-14-20	Flange Whiz-Lock, ¼ - 20	4

### INSTALLATION INSTRUCTIONS

1. Place the brush (Ref 2) into the brush track (Ref 1). Place the brush channel (Ref 3) between the brush track and the mounting brackets. Now Hex Bolt the mounting brackets (Ref 5) to the brush track using the ¾" Hex Bolts and flange whiz-Nylon Lock Nuts (Ref 3).
2. Mount the brush assembly to the draw bar using four ¾" Hex Bolts and flange whiz-Nylon Lock Nuts (Ref 5).



## 13-298Q FAN RAKE ATTACHMENT DRAWING & PARTS LIST

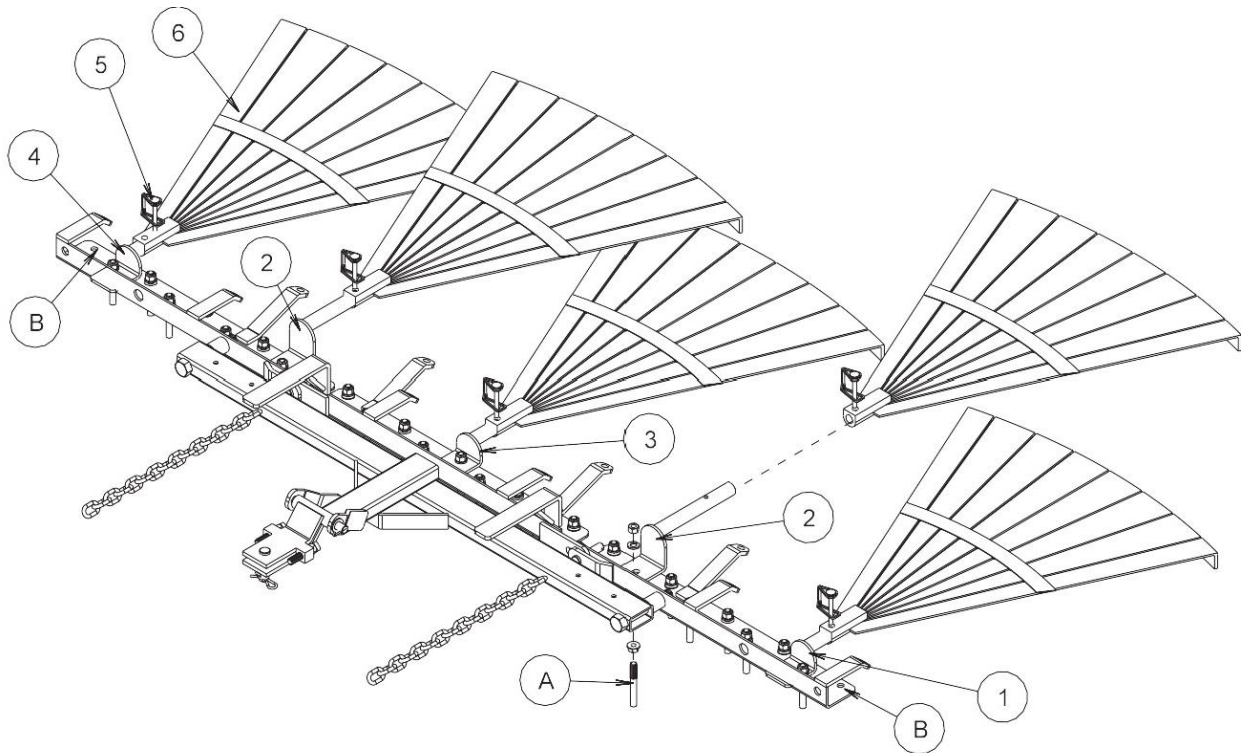


REF#	PART#	DESCRIPTION	QTY.
1	45-153	Frame	1
2	HB-14-20-200	Hex Bolt, ¼ - 20 x 2	5
3	13-310	Rake	5
4	HNCL-14-20	Center Nylon Lock Nut, ¼ - 20	5

## INSTALLATION INSTRUCTIONS

1. Assemble the five rakes (Ref 3) to the frame using the Hex Bolt and center Nylon Lock Nuts (Ref 2 and 4). Slide the fan rake assembly under the rear of the trap rake to the hitch.
2. Attach the rake lift to the trap rake quick hitch, by sliding the hitch into the spring loaded locking mechanism.
3. With the rake on the ground pull the rake to the right side until it is 2-3 inches from the tire.
4. Repeat steps on the left side.
5. Turn machine on and test for operation of rake assembly by raising and lowering the rake assembly. Also with rake down, turn sharp corners to check that rake does not touch wheels.

## 13-319-K FAN RAKE KIT DRAWING & PARTS LIST



REF#	PART#	DESCRIPTION	QTY.
1	13-326	Left Holder	1
2	13-329	Long Holder	2
3	13-327	Center Holder	1
4	13-328	Right Holder	1
5	29-541	Lock Pin	5
6	13-310	Rake	5

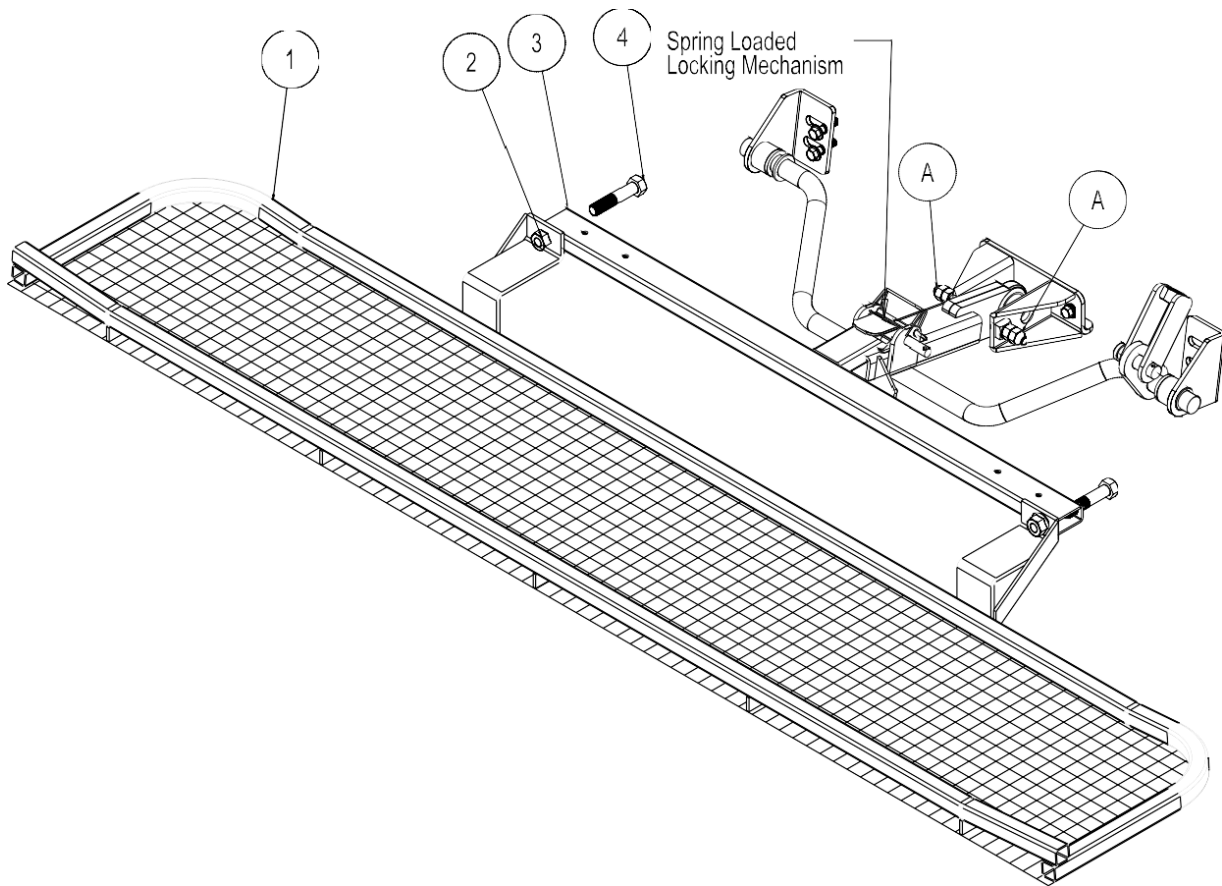
B No Studs in first slot – Leave empty.

### INSTALLATION INSTRUCTIONS

1. Remove connector links that hold rake blades to rake frame if desired.
2. Remove groomer blades from rake frame that are held on with rake teeth studs (Ref A). Replace rake teeth studs, if desired.
3. Place left holder (Ref 1), angle side up, to the second rake tooth hole from the end and install rake tooth stud. The first rake tooth hole from each end (Ref B) have no rake teeth in them.
4. Remove the 8<sup>th</sup> rake tooth stud from the end of right and left rake frame and place long holders (Ref 2) on top, reinstall rake teeth studs.
5. Remove rake tooth in direct center of rake and install the center holder (Ref 3). Reinstall rake teeth studs.
6. Place right holder (Ref 4), angle side up, to the second rake tooth hole from the end and install rake tooth stud. The first rake tooth hole from each end (Ref B) have no rake teeth in them.
7. Slide fan rake (Ref 6) onto holders and pin with lock pin (Ref 5).



## 26-007Q PROFESSIONAL INFIELD FINISHER DRAWING & PARTS LIST



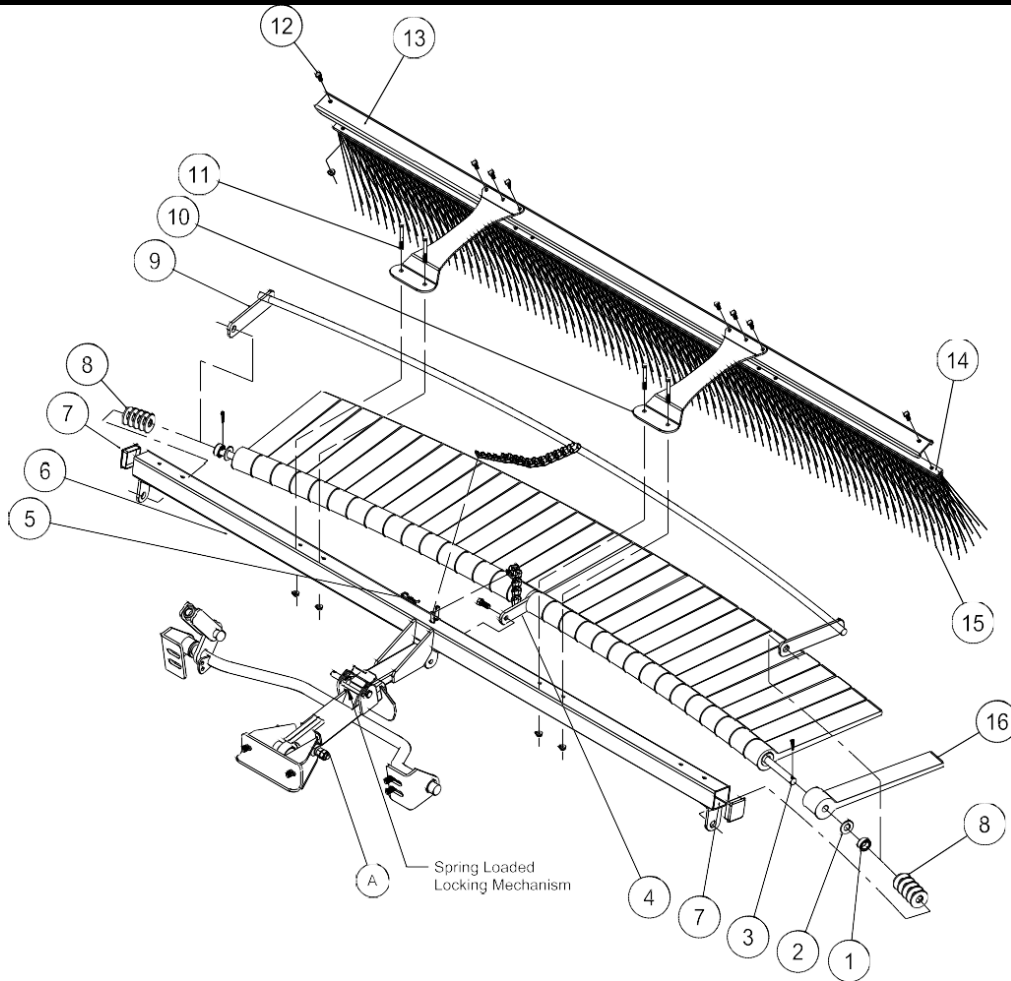
REF#	PART#	DESCRIPTION	QTY.
1	26-045	Leveling Screen	1
2	HNCL-58-11	Center Nylon Lock Nut, 5/8 – 11	2
3	43-145	Draw Bar	1
4	HB-58-11-300	Hex Bolt, 5/8 – 11 x 3	2

## INSTALLATION INSTRUCTIONS

The Professional Field Finisher is used for smoothing and leveling fields to professional standards.

1. Attach leveling screen (Ref 1) to draw bar (Ref 3) using two Hex Bolts (Ref 4) and center Nylon Lock Nuts (Ref 2).
2. Mount Professional Field Finisher to the hitch on the trap rake by sliding the draw bar into the quick hitch locking mechanism.
3. When Professional Field Finisher is attached, adjust Hex Bolts on hitch (Ref A) to hold Finisher in desire position.
4. **NOTE:** When assembled properly, rake will angle down from front to back. If front of finisher is not higher than the back, damage will result to infield.
5. When removing the attachment from machine. Push down on quick hitch locking mechanism and pull accessory out.

## 43-002Q FLEX ACTION FIELD FINISHER WITH BRUSH



REF#	PART#	DESCRIPTION	QTY.
1	11-040	Spacer, 3/4"	2
2	HW-58	Washer, 5/8	32
3	26-049	Mounting Bar	1
	HP-18-100	Cotter Pin, 1/8 x 1	2
4	26-048	Flail Bar Strap	1
	HB-38-16-100	Hex Bolt, 3/8 – 16 x 1	1
	HNCL-38-16	Center Nylon Lock Nut 3/8 – 16	1
5	HHP-18	Bridge Pin, 1/8	2
6	43-146	Frame	1
7	18-297	Cap Plug	2
8	HMB-58-14	Machine Bushing 5/8 x 14GA	10
9	26-047	Leveler Bar	1
10	13-681	Mount Bracket	2
11	HB-14-20-250	Hex Bolt, 1/4 - 20 x 2 1/2	4
	HNFL-14-20	Flange Whiz-Nylon Lock Nut, 1/4 - 20	4
12	HB-14-20-075	Hex Bolt, 1/4 - 20 x 3/4	8
	HNFL-14-20	Flange Whiz-Nylon Lock Nut, 1/4 - 20	8
13	13-688	Brush Channel	1
14	13-683	Brush Track	1
15	13-682	Brush, 77 x 11	1
16	26-041	Rasp Flail	32

## **43-002Q FLEX ACTION FIELD FINISHER WITH BRUSH INSTRUCTIONS**

### **ASSEMBLY INSTRUCTIONS**

1. Install flail bar strap (Ref 4) to center of mounting bar (Ref 3) with chain on top of flail bar strap and mounting bar bent away from you. Apply a light coat of lubricant to overall length of mounting bar.
2. Install one rasp flail (Ref 17) with knobby side down adjacent to sides of flail bar strap. Now install a flat washer (Ref 2) so it sits adjacent with the outside of the rasp flail. Continue to install flails with knobby sides down with washers between until you have 16 flails and washers on the left hand side of bar strap and 17 flails and washers on the right hand side. Force all flails tightly toward bar strap.
3. After all 33 flails have been installed, place one spacer (Ref 1) to each end of mounting bar adjacent to washer.
4. Install leveler bar (Ref 10) to mounting bar, with curved leveler bar resting on top on the smooth sides of flails. **If all flails and washers do not fit snugly at this time, remove leveler bar and install enough machine bushings next to spacer to ensure a snug fit.** Then reinstall leveler bar.
5. Lay the frame (Ref 7) on the floor or bench with welded tabs facing up. Install ends of assembled mounting bar, with knobby sides of flails up into welded tabs on each end of frame and secure with 1/8 x 1 cotter pin.
6. Install flail bar strap (Ref 4) to center tab on frame with 3/8-16 x 1 1/2 Hex Bolt and 3/8 – 16 center Nylon Lock Nut. Loose fit is required. Do not over tighten.
7. Flip assembly over so knobby sides of flails are now facing down. Connect Finisher to the Quick Hitch frame, locking securely in the locking mechanism, as illustrated.
8. Install bar strap chain over welded pin on frame. Install leveler bar chain on to pin and secure in place with bridge pin. Use last bridge pin and clevis pin to hitch field finisher to your machine.

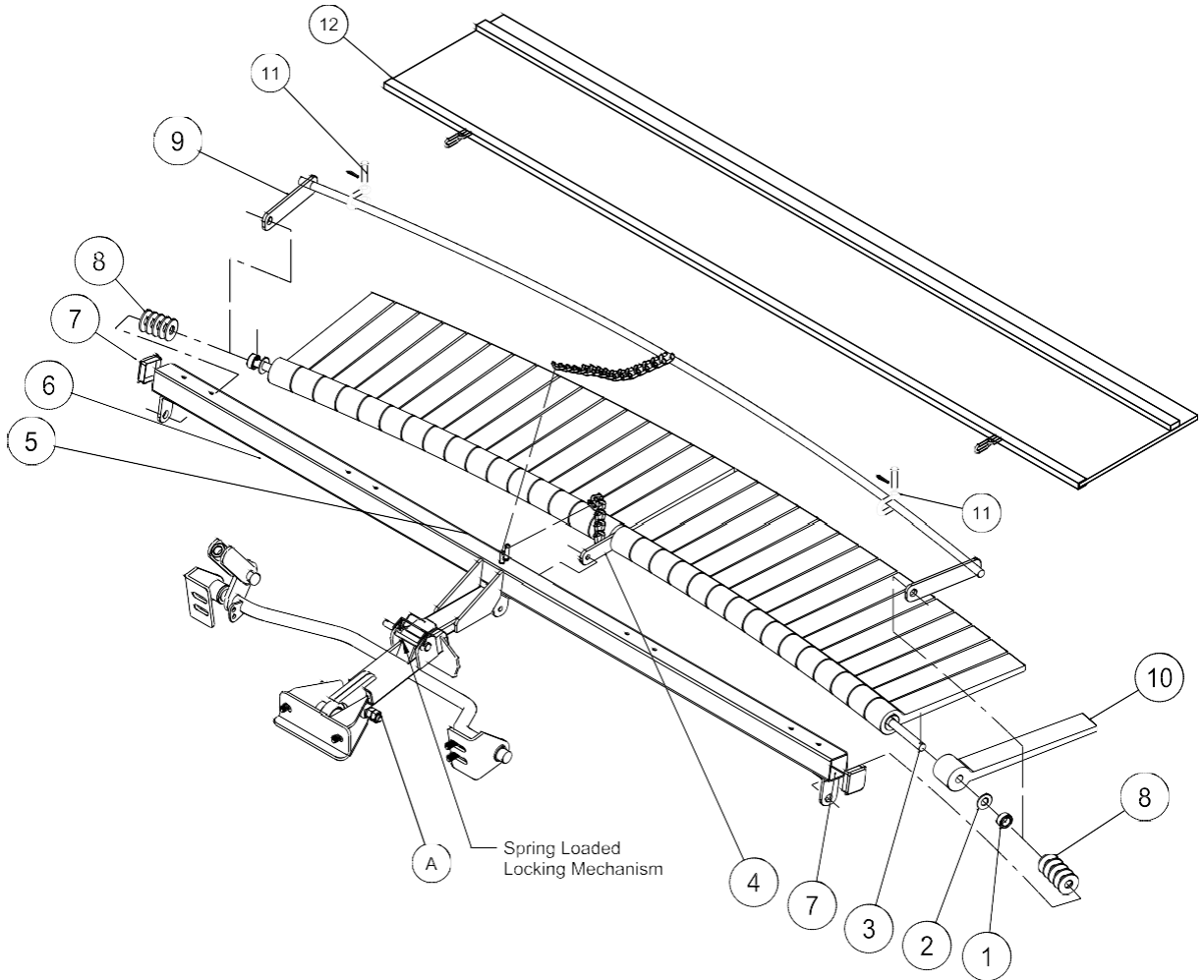
### **OPERATING INSTRUCTIONS**

Running attachment with all flails down, flat on the surface, will provide leveling function. Running attachment partially raised and flails at a 20°- 40° angle in relation to the level surface, will provide a finishing function. The flails increase down pressure for desired finish. Drive in wide circular patterns and increase or decrease ground speed to achieve desired finish.

### **BRUSH ASSEMBLY**

1. Place the brush (Ref 16) into the brush track (Ref 15). Place the brush channel (Ref 14) between the brush track and the mounting brackets. Now Hex Bolt the mounting brackets (Ref 11) to the brush track using the 1/4 - 20 x 3/4 Hex Bolts and 1/4 - 20 Flange Whiz-Lock Nuts (Ref 13).
2. Mount the brush assembly to the frame using the (4) 1/4 - 20 x 2 1/2 Hex Bolts and 1/4 - 20 Flange Whiz-Lock Nuts (Ref 12).

# 26-008Q FLEX ACTION FIELD FINISHER DRAWING



## 26-008Q FLEX ACTION FIELD FINISHER PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	11-040	Spacer, 3/4"	2
2	HW-58	Washer, 5/8	32
3	26-049	Mounting Bar	1
4	26-048	Flail Bar Strap	1
	HB-38-16-100	Hex Bolt, 3/8 – 16 x 1	1
	HNCL-38-16	Center Nylon Lock Nut, 3/8 – 16	1
5	HHP-18	Bridge Pin, 1/8	2
6	43-146	Frame	1
7	18-297	Cap Plug	2
8	HMB-58-14	Machine Bushing, 5/8 x 14GA	10
9	26-047	Leveler Bar	1
10	26-041	Rasp Flail	32
11	21-260	Clevis	2
12	26-115	Mesh Finisher	1

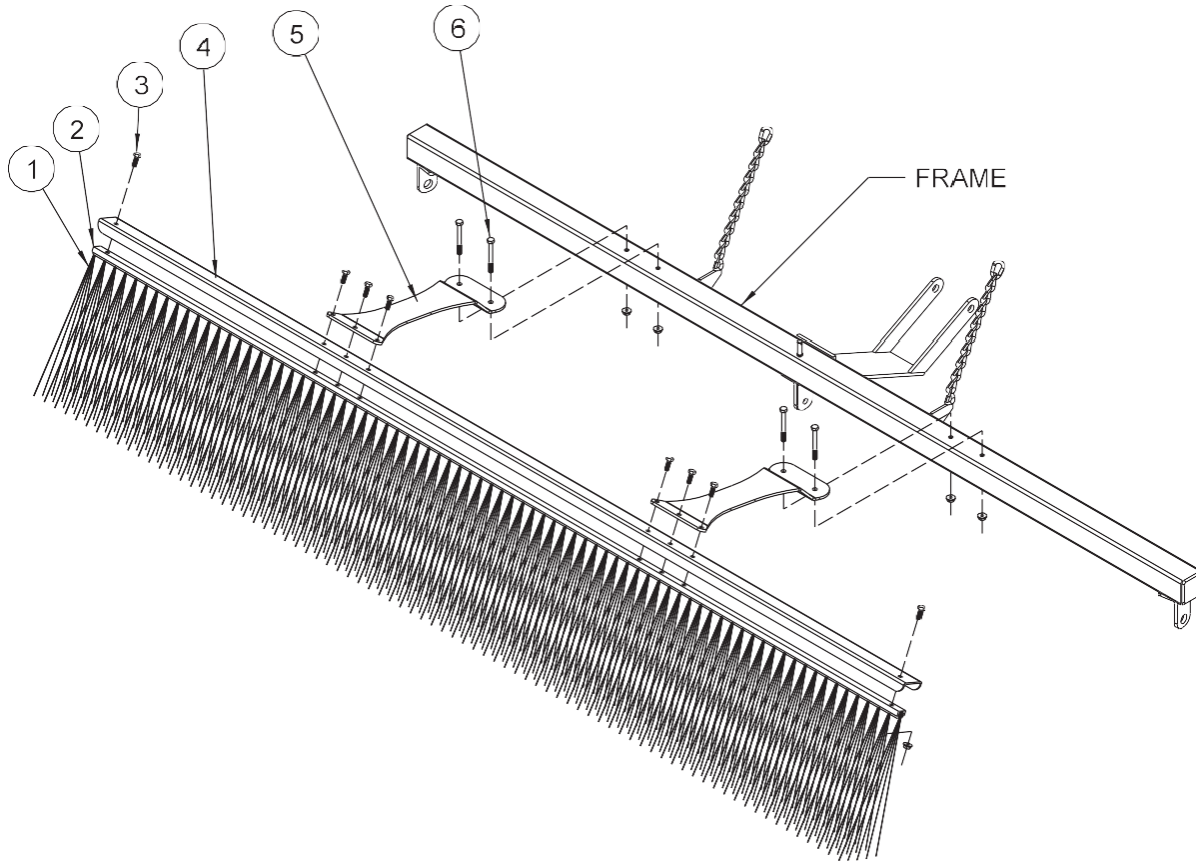
## INSTALLATION INSTRUCTIONS

1. Install flail bar strap (Ref 4) to center of mounting bar (Ref 3) with chain on top of flail bar strap and mounting bar bent away from you. Apply a light coat of lubricant to overall length of mounting bar.
2. Install one rasp flail (Ref 16) with knobby side down adjacent to sides of flail bar strap. Now install a flat washer (Ref 2) so it sits adjacent with the outside of the rasp flail. Continue to install flails with knobby sides down with washers between until you have 16 flails and washers on each side of bar strap. Force all flails tightly toward bar strap.
3. After all 32 flails have been installed, place one spacer (Ref 1) to each end of mounting bar adjacent to washer.
4. Install leveler bar (Ref 9) to mounting bar, with curved leveler bar resting on top on the smooth sides of flails. If all flails and washers do not fit snugly at this time, remove leveler bar and install enough machine bushings to ensure a snug fit. Then reinstall leveler bar.
5. Lay the frame (Ref 6) on the floor or bench with welded tabs facing up. Install ends of assembled mounting bar, with knobby sides of flails up, into welded tabs on each end of frame and secure with 1/8 x 1 cotter pin.
6. Install flail bar strap (Ref 4) to center tab on frame with 3/8 – 16 x 1 Hex Bolt and 3/8 – 16 center Nylon Lock Nut. Loose fit is required. Do not over tighten.
7. Flip assembly over so knobby sides of flails are now facing down. Install hitch to frame with clevis pin (Ref 3) and cotter pin (Ref 24). The hitch should be attached to the frame as shown.
8. Install bar strap chain over welded pin on frame. Install leveler bar chain on to pin and secure in place with bridge pin. Use last bridge pin and clevis pin to hitch field finisher to your machine.

## OPERATING INSTRUCTIONS

Running attachment with all flails down, flat on the surface, will provide a leveling function. Running attachment partially raised and flails at 20° - 40° angle in relation to the level surface, will provide a finishing function. The flails increase down pressure for desired finish. Drive in wide circular patterns and increase or decrease ground speed to achieve desired finish.

## 43-043 FINISHING BRUSH KIT

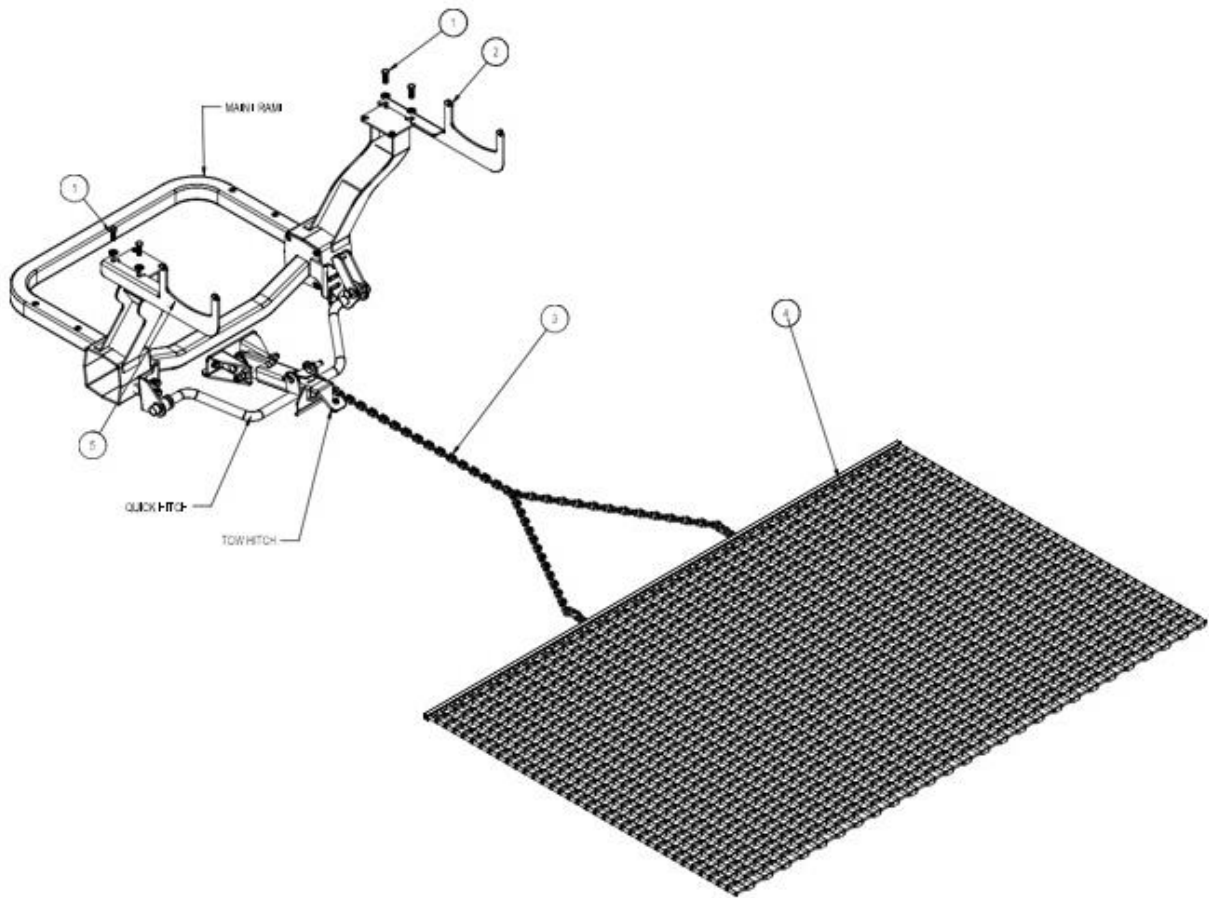


REF#	PART#	DESCRIPTION	QTY.
1	13-682	Brush, 77 x 11	1
2	13-683	Brush Track	1
3	HB-14-20-075	Hex Bolt, ¼ - 20 x ¾	8
	HNFL-14-20	Flange Whiz-Lock Nut, ¼ - 20	8
4	13-688	Brush Channel	1
5	13-681	Mount Bracket	2
6	HB-14-20-250	Hex Bolt, ¼ - 20 x 2 ½	4
	HNFL-14-20	Flange Whiz-Lock Nut, ¼ - 20	4

## INSTALLATION INSTRUCTIONS

1. Remove the mesh finisher from your unit, it will not be used with the brush.
2. Place the brush (Ref 1) into the brush track (Ref 2). Place the brush channel (Ref 4) between the brush track and the mounting bracket (Ref 5). Now Hex Bolt the mounting brackets (Ref 5) to the brush track using the ¼ - 20 x ¾" Hex Bolts and ¼ - 20 Flange Whiz-Nylon Lock Nuts (Ref 3).
3. Mount the brush assembly to the frame using the four ¼ - 20 x 2 ½" Hex Bolts and ¼ - 20 Flange Whiz-Nylon Lock Nuts (Ref 5).

## 43-008 DRAG MAT

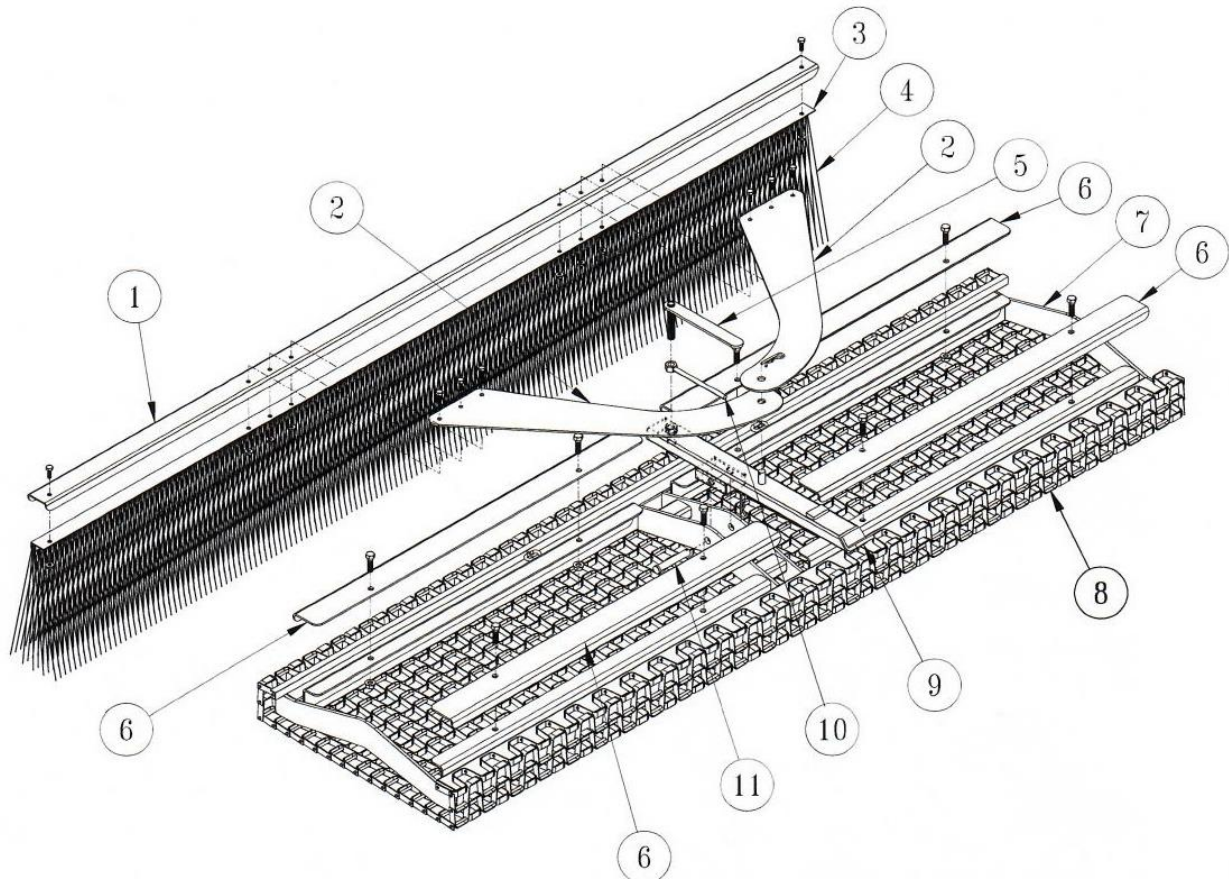


REF#	PART#	DESCRIPTION	QTY.
1	HB-716-14-125	Hex Bolt, 7/16 – 14 x 1 ¼"	4
	HW-716	Flat Washer, 7/16	4
	HNTL-716-14	Nylon Lock Nut, 7/16 – 14	4
2	13-751	Right Carrier Mount	1
3	19-605	Drag Mat Chain	1
	HHP-18	Bridge Pin, 1/8	1
4	19-601	Steel Drag Mat	1
5	13-752	Left Carrier Mount	1

## INSTALLATION INSTRUCTIONS

1. The Drag Mat Kit can be installed on all Super Star with or without the options Roll Bars.
2. Remove the two inside Hex Bolts from the roll bar mounts. Install the flat washers and secure right and left carrier mounts on opposite sides. Tighten all hardware.
3. Install the tow hitch insert into the quick hitch. This is where the tow chain on the drag mat attaches to the machine.

**45-176 72" DRAG MAT + FINISHER BRUSH DRAWING**





## 45-176 72" DRAG MAT + FINISHER BRUSH PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	13-688	Brush Channel	1
	HB-14-20-075	Hex Bolt, ¼ - 20 x ¾	2
	HNFL-14-20	Flange Whiz-Lock Nut, ¼ - 20	2
2	43-168	Brush Mount Arm	2
	HB-14-20-075	Hex Bolt, ¼ - 20 x ¾	8
	HNFL-14-20	Flange Whiz-Lock Nut, ¼ - 20	8
3	13-683	Brush Track	1
4	13-682	Brush, 77 x 11	1
5	43-164	Adjustment Handle	1
6	43-166	Mat Clamp	4
	HB-38-16-125	Hex Bolt, 3/8 – 16 x 1 ¼	8
	HNFL-38-16	Flange Whiz-Lock Nut, 3/8 -16 x 1 ¼	8
7	43-165	Frame	1
8	45-167	Steel Mat, 72 x 29	1
9	43-162	Draw Bar	1
	HHP-18	Bridge Pin, 1/8	1
10	43-163	Lock Handle	1
11	HCP-12-300	Clevis Pin, ½ x 3	1
	HHP-18	Bridge Pin, 1/8	1

## ASSEMBLY INSTRUCTIONS

Some components of your Drag Mat + Finisher Brush have been assembled at the factory for your convenience.

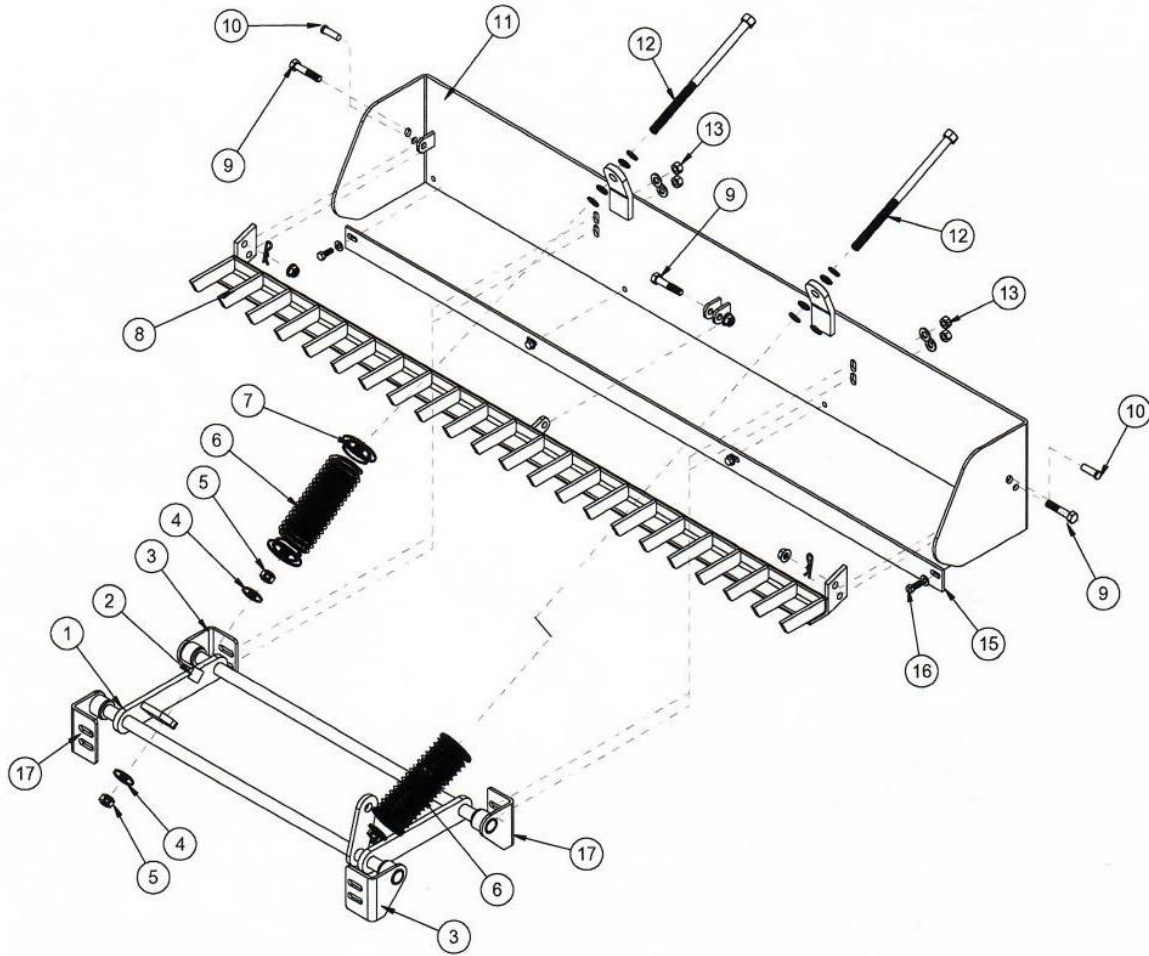
1. Start by mounting the Draw Bar (Ref 9) to the Frame (Ref 7) using the Clevis Pin and Bridge Pin (Ref 11). Position the Draw Bar, using either set of holes, as illustrated.
2. Next, mount the Brush assembly (Ref 1, 3 & 4) to the Brush Mount Arms (Ref 2), as illustrated, using the (6) ¼ - 20 x ¾ Hex Bolts and 1/4 – 20 Flange Whiz-Lock Nuts. Secure fasteners tight.
3. The holes on each of the Brush Mount Arms will line up. Mount to the pin on the Draw Bar (Ref 9) and secure using the remaining Bridge Pin.
4. Thread the Lock Handle (Ref 10) on to the Adjustment Handle (Ref 5). Thread the Adjustment Handle into the nut on top of the Draw Bar (Ref 9), continuing until the threaded rod is through the Draw Bar tube. Turn the Lock Handle clockwise to lock the Adjustment handle in place.

### ADJUSTING THE STEEL MAT FINISHER

Adjusting the leading edge (front) will affect the performance of the Finisher. Various field compositions and conditions can benefit from the fine tuning of the Finisher's leading edge angle.

1. Release the Lock Handle (Ref 10) by holding the Adjustment Handle (Ref 5) and turning the Lock Handle counter-clockwise.
2. To raise the leading edge (front) of the Finisher, turn the Adjustment Handle clockwise. When you obtain your desired position, turn the Lock Handle clockwise to lock the Adjustment handle in place.
3. To lower the leading edge (front) of the Finisher, turn the Adjustment Handle counter-clockwise. When you obtain your desired position, turn the Lock Handle clockwise to lock the Adjustment handle in place.

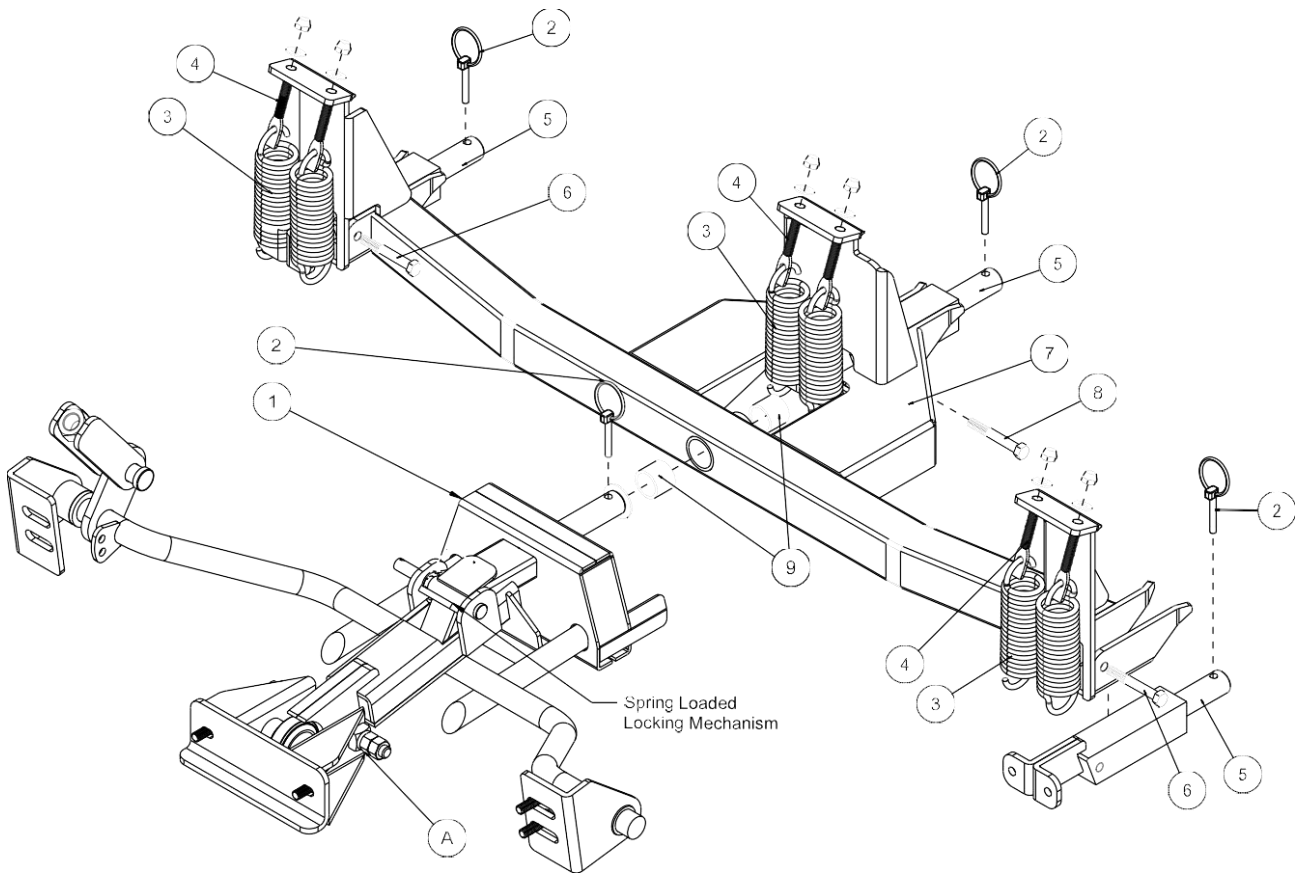
# 45-010 BOX GRADER DRAWING



## 45-010 BOX GRADER PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	45-141	Lift Assembly	1
2	34-215	Spacer	2
3	34-220	Right Pivot Bracket	2
	33-086	Bushing	2
4	HW-58	Flat Washer, 5/8	4
5	HNTL-58-18	Nylon Lock Nut, 5/8 – 18	2
	HN-58-18	Hex Nut, 5/8 – 18	4
6	13-276	Compression Spring	2
7	13-277	Spring Pad	4
8	34-217	Break Up Bar	1
9	HB-12-13-200	Hex Bolt, ½ - 13 x 2	3
	HNTL-12-13	Nylon Lock Nut, ½ - 13	3
10	HCP-12-150	Clevis Pin, ½ x 1 ½	2
	HHP-18	Bridge Pin, 1/8	2
11	34-216	Blade Assembly	1
12	34-214	Spring Rod	2
	HMB-58-14	Machine Bushing, 5/8 – 14GA	4
13	HB-12-13-125	Hex Bolt, ½ - 13 x 1 ¼	4
	HW-716	Flat Washer, 7/16	8
	HWL-12	Lock Washer, ½	4
	HN-12-13	Hex Nut, ½ - 13	4
15	34-218	Cutter Blade	1
16	HB-38-16-125	Hex Bolt, 3/8 – 16 x 1 ¼	4
	HW-38	Flat Washer, 3/8	4
	HWL-38	Lock Washer, 3/8	4
	HN-38-16	Nylon Lock Nut, 3/8 – 16	4
17	34-219	Left Pivot Bracket	2
	33-086	Bushing	2

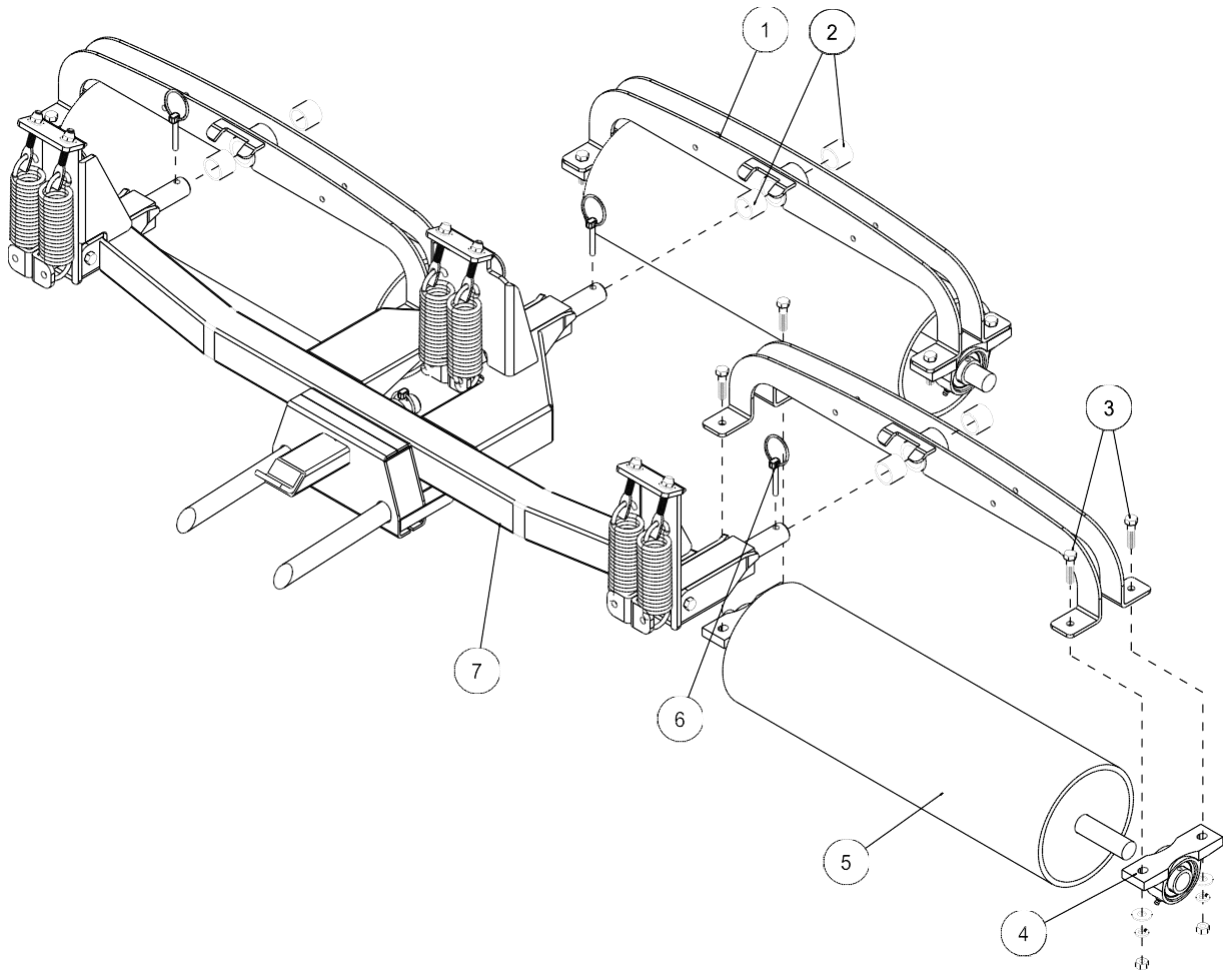
## 42-587Q GREEN STAR RBS MAIN FRAME DRAWING



## 42-587Q GREEN STAR RBS MAIN FRAME PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	43-155	Hitch	1
2	42-539	Lynch Pin, 5/16	4
3	42-536	Spring	6
4	42-537	Spade Hex Bolt	6
	HNTL-38-16	Nylon Lock Nut, 3/8 – 16	6
5	42-576	Spring Tower	3
6	HB-38-16-275	Hex Bolt, 3/8 – 16 x 2 3/4	2
	HNTL-38-16	Nylon Lock Nut, 3/8 – 16	2
7	42-577	Frame	1
8	HB-38-16-250	Hex Bolt, 3/8 – 16 x 2 1/2	1
	HNCL-38-16	Center Nylon Lock Nut, 3/8 – 16	1
9	18-295	Oilite Bushing (parts of 42-577)	2

**42-581 GREEN STAR RBS ROLLER SET (3) DRAWING**



## **42-581 GREEN STAR RBS ROLLER SET (3) PARTS LIST**

<b>REF#</b>	<b>PART#</b>	<b>DESCRIPTION</b>	<b>QTY.</b>
1	42-574	Fork	3
2	18-295	Oilite Bushing (part of 42-574)	6
3	HB-38-16-150	Hex Bolt, 3/8 – 16 x 1 ½	12
	HWL-38	Lock Washer, 3/8	12
	HW-38	Flat Washer, 3/8	12
	HN-38-16	Hex Nut, 3/8 – 16	12
4	11-094	Pillow Block	6
5	42-584	Roller	3
6	42-539	Lynch Pin, 5/16 (part of main frame)	3
7	42-586Q	Green Star RBS Main Frame	1

## **ADJUSTMENTS AND OPERATION INSTRUCTIONS**

### **ADJUSTMENT**

The springs are preset for maximum down pressure, and should not need to be adjusted. If you feel the need to adjust the springs please call for further instructions. The unit comes pre-adjusted for most models. The four adjustment holes on the hitch are for making sure all three rollers are touching the ground at the same pressure. When installing roller system start with the lower mounting holes on hitch.

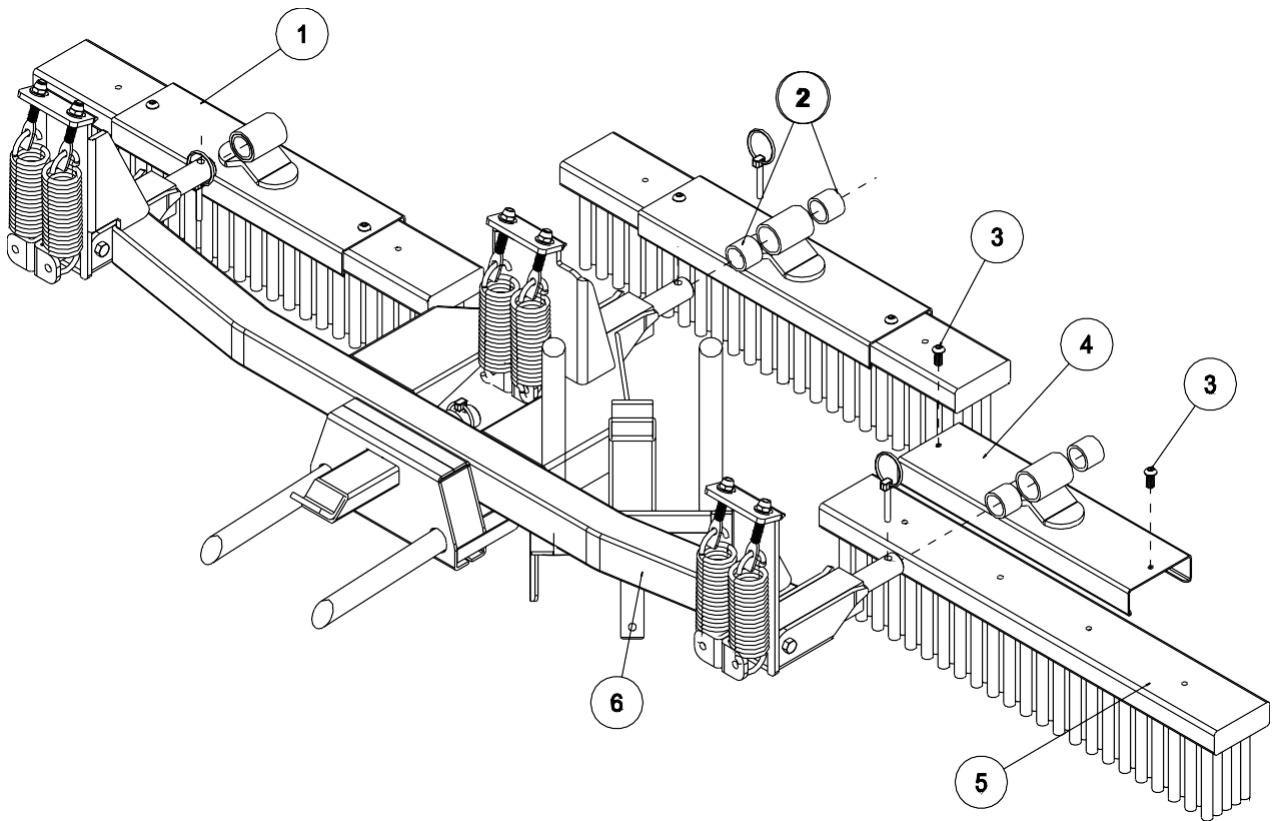
Tire pressure should be 4 psi in the front and 7 psi in the rear tire for best traction.

### **OPERATION**

Make sure the rolling system has been installed and adjusted properly for your model of bunker rake. Always transport in fully raised position. Always remove flag pole before rolling green. Do not stop on green while rolling. Do not roll up steep slopes or loss of traction may result. Do not turn while rolling.

To begin rolling, lower unit all the way down as you come across collar and continue straight across green until reaching other collar and raise as you come off of green. Overlap stripes the same as if you were mowing.

**42-585 GREEN STAR RBS BRUSH SET (3) DRAWING**



## **42-585 GREEN STAR RBS BRUSH SET (3) PARTS LIST**

<b>REF#</b>	<b>PART#</b>	<b>DESCRIPTION</b>	<b>QTY.</b>
1	42-539	Lynch Pin, 5/16 (part of main frame)	4
2	18-295	Oilite Bushing (part of 42-579)	6
3	HSPP-516-18-075	Phillip Head Screw, 5/16 – 18 x ¾	6
4	42-579	Brush Bracket	3
5	42-545	Brush Head	3
6	42-586Q	Green Star RBS Main Frame	1

## **ADJUSTMENTS AND OPERATION INSTRUCTIONS**

### **ADJUSTMENT**

The springs are preset for maximum down pressure, and should not need to be adjusted. If you feel the need to adjust the springs please call for further instructions. The unit comes pre-adjusted for most models. The four adjustment holes on the hitch are for making sure all three brushes are touching the ground at the same pressure. When installing brush system start with the lower mounting holes on hitch.

Tire pressure should be 4 psi in the front and 7 psi in the rear tire for best traction.

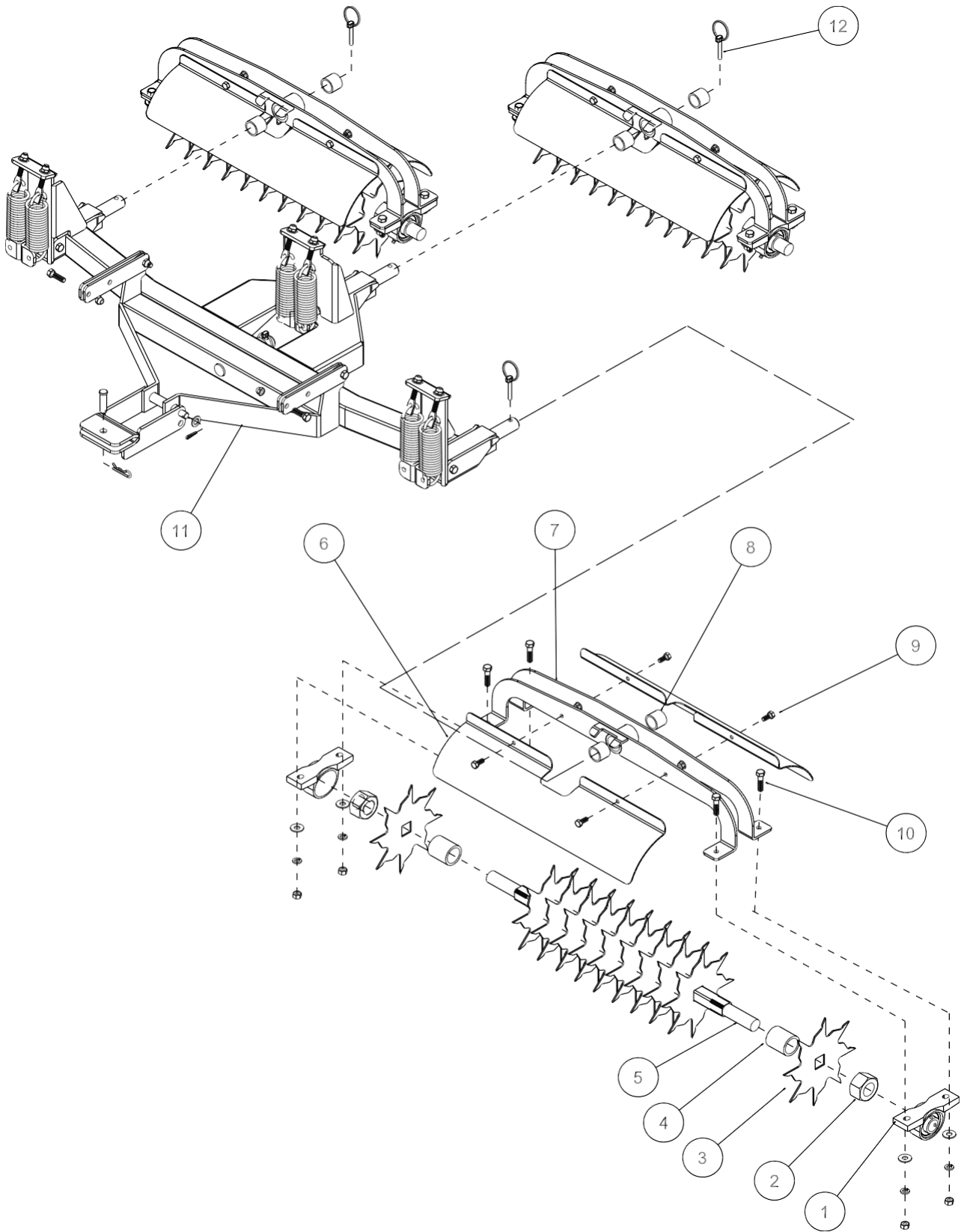
### **OPERATION**

Make sure the brush system has been installed and adjusted properly for your model of bunker rake. Always transport in fully raised position. Always remove flag pole before rolling green. Do not stop on green while brushing. Do not brush up steep slopes or loss of traction may result. Do not turn while brushing.

For drag brushes use hydraulics to control the amount of down pressure required to move your top dressing material. We recommend reversing drag brushes after each use for even wear. To begin brushing, lower unit as you come across collar and continue straight across green until reaching other collar and raise as you come off of green. Overlap stripes the same as if you were mowing.



**42-582 GREEN STAR RBS SPIKER SET (3) DRAWING**



## **42-582 GREEN STAR RBS SPIKER SET (3) PARTS LIST**

<b>REF#</b>	<b>PART#</b>	<b>DESCRIPTION</b>	<b>QTY.</b>
1	11-094	Pillow Block Bearing	6
2	HNJ-114-12	Jam Nut, 1 ¼ - 12	6
3	42-583	Spiker Blade	33
4	8965-1.875	Spiker Blade Spacer (1.875")	30
5	42-554	Spiker Shaft	3
6	42-578	Spiker Cover	6
7	42-574	Fork	3
8	18-295	Oilite Bushing (part of 42-574)	6
9	HB-516-18-075	Hex Bolt, 5/16 – 18 x 3/4	12
	HNTL-516-18	Nylon Lock Nut, 5/16 – 18	12
10	HB-38-16-150	Hex Bolt, 3/8 – 16 x 1 ½	12
	HWL-38	Lock Washer, 3/8	12
	HW-38	Washer, 3/8	12
	HN-38-16	Nut, 3/8 – 16	12
11	42-586Q	Green Star RBS Main Frame	1
12	42-539	Lynch Pin, 5/16 (part of main frame)	3

## **ADJUSTMENTS AND OPERATION INSTRUCTIONS**

### **ADJUSTMENT**

The springs are preset for maximum down pressure, and should not need to be adjusted. If you feel the need to adjust the springs please call for further instructions. The unit comes pre-adjusted for most models. The four adjustment holes on the hitch are for making sure all three spikers are touching the ground at the same pressure. When installing spiker system start with the lower mounting holes on hitch.

Tire pressure should be 4 psi in the front and 7 psi in the rear tire for best traction.

### **OPERATION**

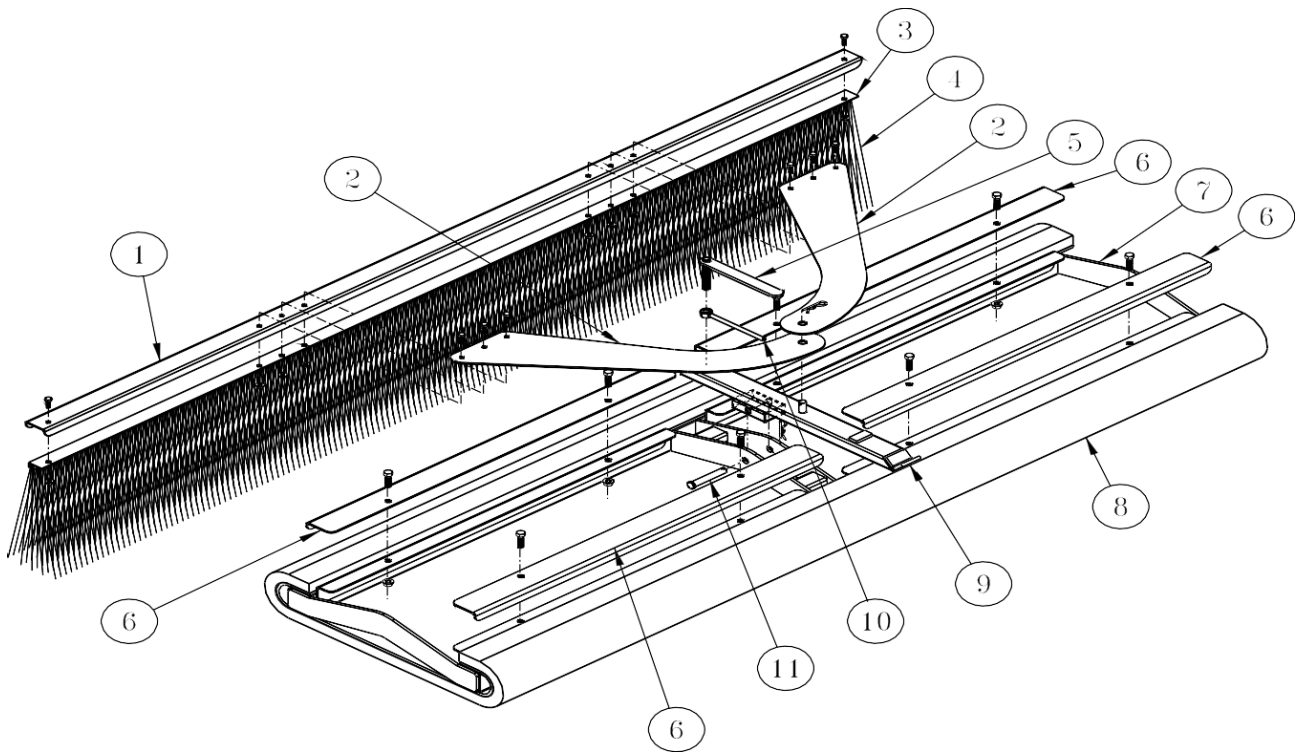
Make sure the spiker system has been installed and adjusted properly for your model of bunker rake. Always transport in fully raised position. Always remove flag pole before spiking green. Do not stop on green while spiking. Do not spike up steep slopes or loss of traction may result. Do not turn while spiking.

To being spiking, lower unit all the way down as you come across collar and continue straight across green until reaching other collar and raise as you come off of green. Overlap the stripes the same as if you were mowing.

### **INSTALLATION**

Spiker blades must be installed so that the jagged side of the tooth cuts into the turf first. This allows only a piercing of the turf, whereas if the straight edge of the spiker blades enters first it will act more as a cutting effect.

**43-009 72" COCO MAT FINISHER DRAWING**



## 72" COCO MAT FINISHER PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	13-688	Brush Channel	1
	HB-14-20-075	Hex Bolt, ¼ - 20 x ¾	2
	HNFL-14-20	Flange Whiz-Lock Nut, ¼ - 20	2
2	43-168	Brush Mount Arm	2
	HB-14-20-075	Hex Bolt, ¼ - 20 x ¾	6
	HNFL-14-20	Flange Whiz-Lock Nut, ¼ - 20	6
3	13-683	Brush Track	1
4	13-682	Brush, 77 x 11	1
5	43-164	Adjustment Handle	1
6	43-166	Mat Clamp	4
	HB-38-16-125	Hex Bolt, 3/8 – 16 x 1 ¼"	8
	HNFL-38-16	Flange Whiz-Lock Nut, 3/8 -16 x 1 ¼	8
7	43-165	Frame	1
8	43-167	Coco Mat, 27 x 72	1
9	43-162	Draw Bar	1
	HHP-18	Bridge Pin, 1/8	1
10	43-163	Lock Handle	1
11	HCP-12-300	Clevis Pin, ½ x 3	1
	HHP-18	Bridge Pin, 1/8	1

Some components of your Coco Mat Finisher have been assembled at the factory for your convenience.

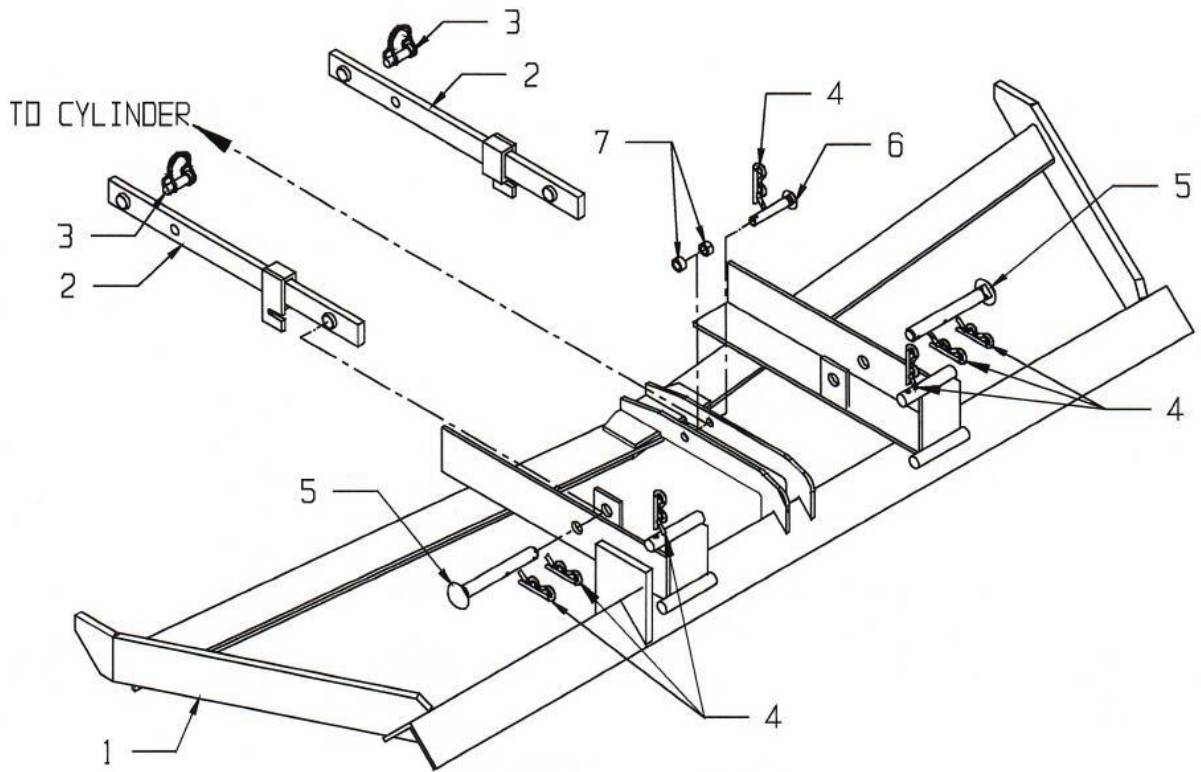
1. Start by mounting the Draw Bar (Ref 9) to the Frame (Ref 7) using the Clevis Pin and Bridge Pin (Ref 11). Position the Draw Bar, using either set of holes, as illustrated.
2. Next, mount the Brush assembly (Ref 1, 3 & 4) to the Brush Mount Arms (Ref 2), as illustrated, using the (6) ¼ - 20 x ¾ Hex Bolts and ¼ - 20 Flange Whiz-Lock Nuts. Secure to fasteners tight.
3. The holes on each of the Brush Mount Arms will line up. Mount to the pin on the Draw Bar (Ref 9) and secure using the remaining Bridge Pin.
4. Thread the Lock Handle (Ref 10) on to the Adjustment Handle (Ref 5). Thread the Adjustment Handle into the nut on top of the Draw Bar (Ref 9), continuing until the threaded rod is through the Draw Bar tube. Turn the Lock Handle clockwise to lock the Adjustment handle in place.

### Adjusting the Coco Mat Finisher

Adjusting the leading edge (front) will affect the performance of the Finisher. Various field compositions and conditions can benefit from fine tuning of the Finisher's leading edge angle.

1. Release the Lock Handle (Ref 10) by holding the Adjustment Handle (Ref 5) and turning the Lock Handle counterclockwise.
2. To raise the leading edge (front) of the Finisher, turn the Adjustment Handle clockwise. When you obtain your desired position, turn the Lock Handle clockwise to lock the Adjustment handle in place.
3. To lower the leading edge (front) of the Finisher, turn the Adjustment Handle counterclockwise. When you obtain your desired position, turn the Lock Handle clockwise to lock the Adjustment handle in place.

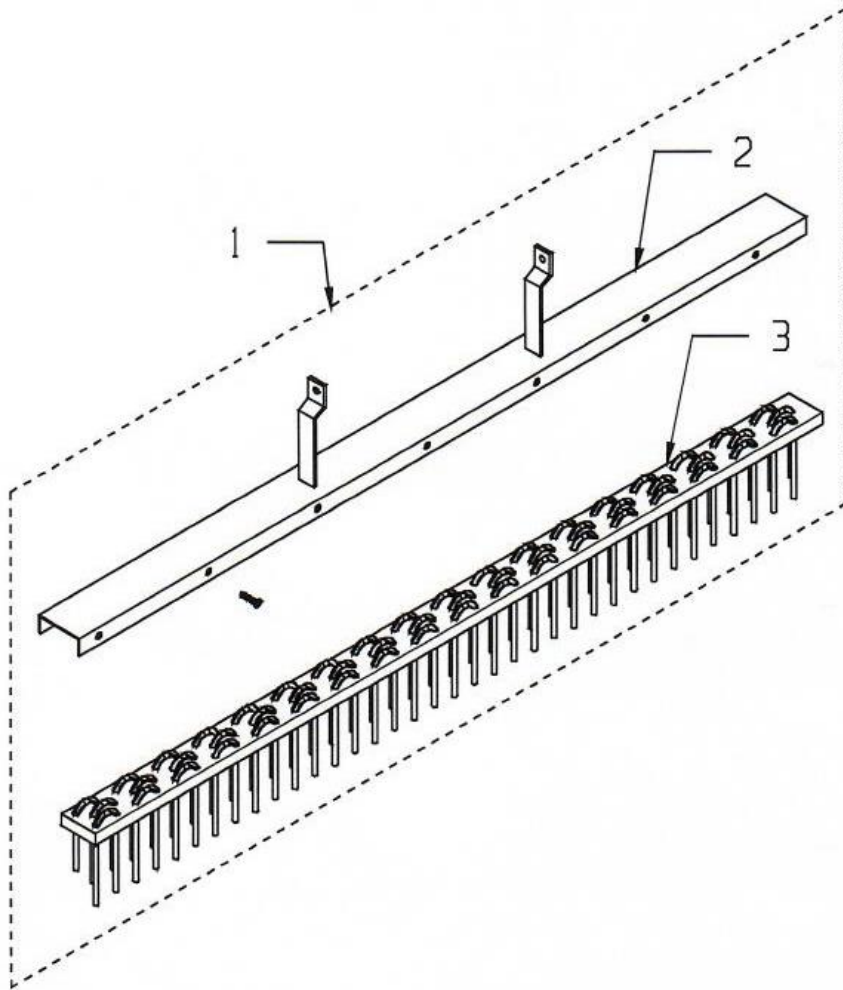
**Infield Groomer  
Model GL650**



**Base Unit, Infield Groomer**

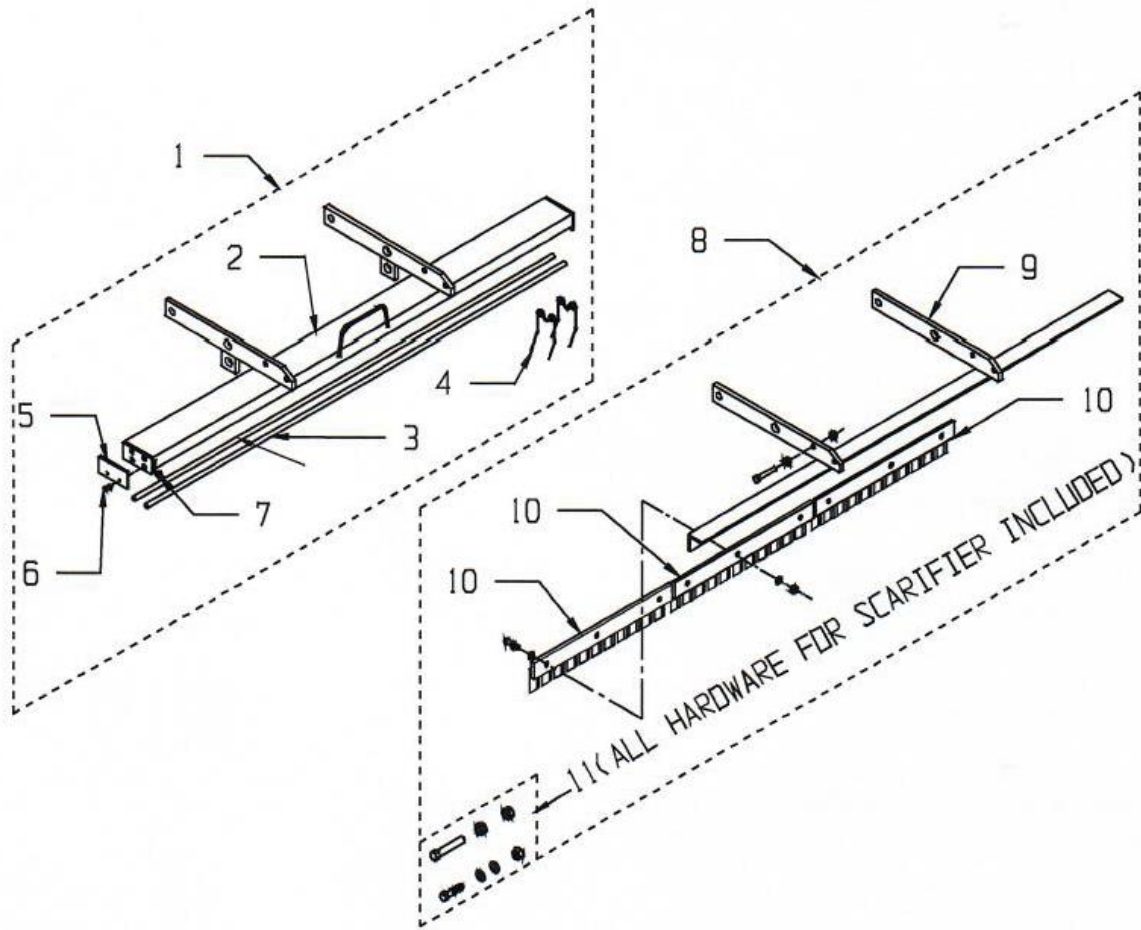
REF#	PART#	DESCRIPTION	QTY.
1	GL650-1	Groomer Frame	1
2	GL-650-3	Pull Arms, Set (includes 2 arms)	1
3	HP8-09-01	Pull Arm Locking Pins, Set (included 2 pins)	1
4	HP-8-10	Hitch Pin	7
5	HP-8-02	6" Mounting Pin Set (Included 2 pins)	1
6	HP8-03	Mounting Pin, 3 x 1/2	1
7	HP-8-382	Spacer (Set of 2)	1

**Infield Groomer  
Model GL650**



**6' Broom Assembly**

REF#	PART#	DESCRIPTION	QTY.
1	GL650-6	Broom Assembly, Complete	1
2	GL650-6-2	Broom Channel with Arms	1
3	GL650-6-1	Replacement Broom	1



**Scarifier Options**

REF#	PART#	DESCRIPTION	QTY.
1	GL650-4-10	Spring Tine Assembly, Complete	1
2	GL650-4-10-1	Spring Tine Channel with Arms	1
3	GL650-4-10-2	Rods, 1/2" x 60"	2
4	GL650-4-15	Spring Tine Replacement Set (Includes 38 pcs)	1
5	GL650-4-10-3	End Cap	1
6		HHCS, 1/4 x 3/4	2
7		Nylon Lock Nut, 1/4	2
8	GL650-4	Scarifier Assembly	1
9	GL650-4-1-1	5 Foot Scarifier Angle	1
10	GL650-4-5-3	Scarifier Replacement Set	1
11	GL650-4-9	Hardware Package	1



## 43-170 RAHN GROOMER



Picture #1

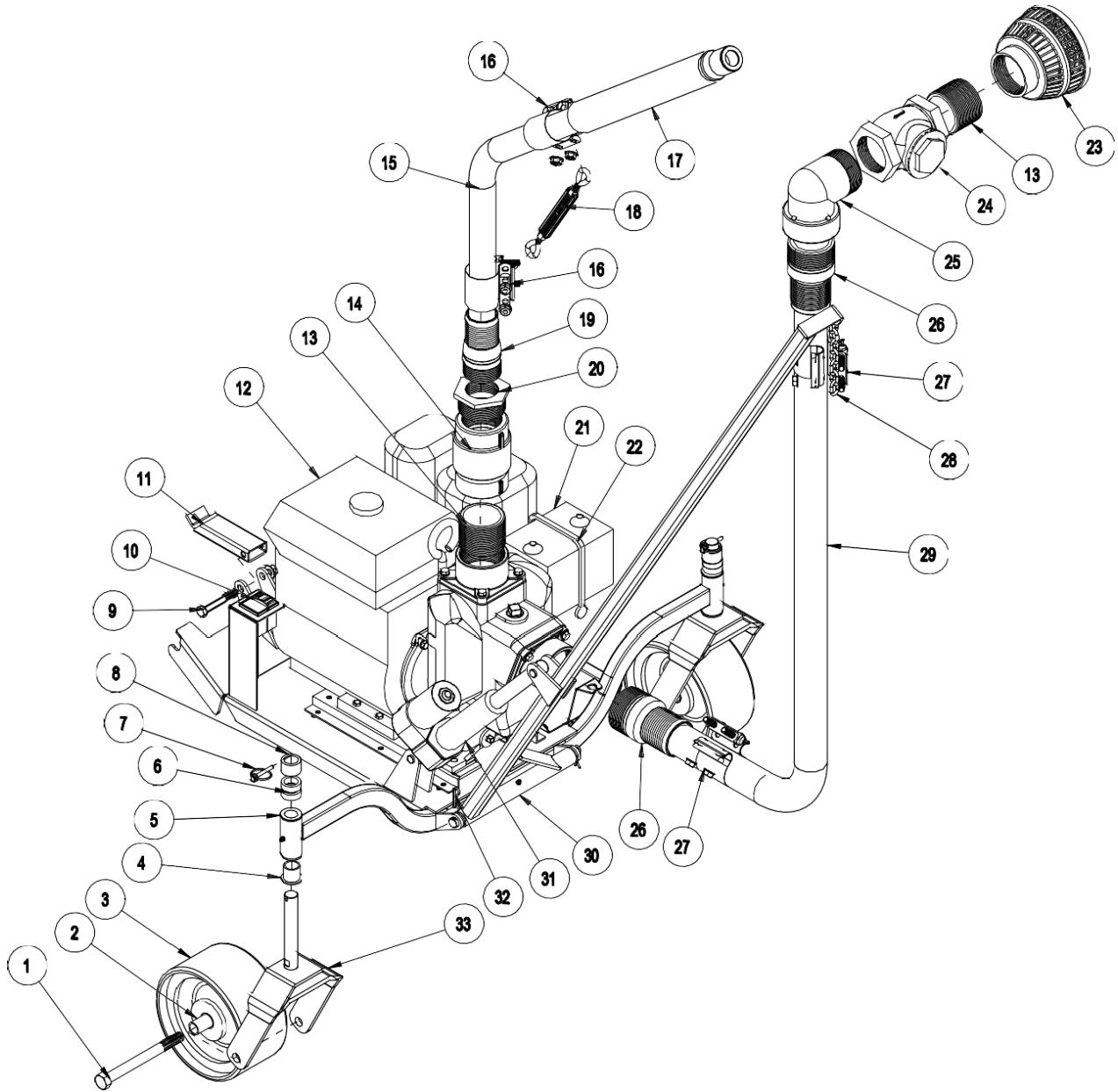


Picture #2

### SMITHCO QUICK ATTACH MOUNTING INSTRUCTIONS

1. Install Rahn Center Lift assembly into the Smithco Quick Attach mounting slot until it engages with the spring assisted stop. Make sure the  $\frac{3}{4}$ " Rods are below the Quick Attach Cross Member (Picture #1)
2. Install the Rahn Pull Arm Brackets (Left & Right) on top of the brackets used for the Quick Attach System using the hardware provided. When installing the brackets, the hex bolt holes are located toward the wheels and the ears of the bracket are to the inside.
3. Remove Clevis Pin in the Rod End of the cylinder. Install cylinder mount extender over existing ear on Cross Member. Tighten hex bolt and replace pin. (Picture #2)

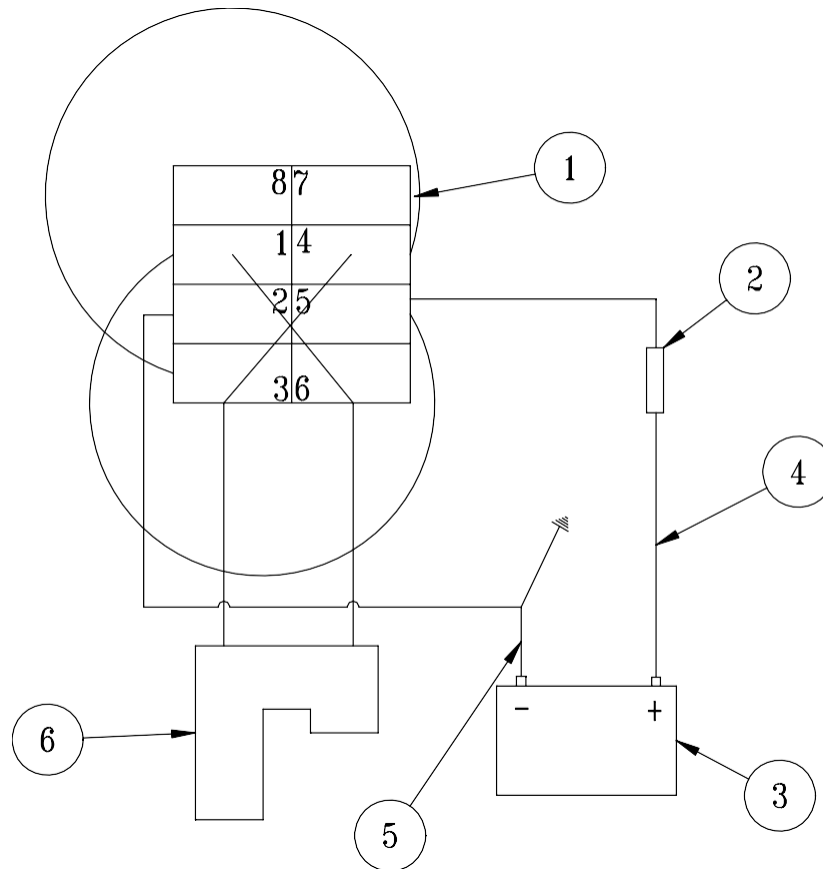
# TYPHOON DRAWING



# TYPHOON PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	HB-34-10-800	Hex Bolt, 3/4 - 10 x 8	2
	HNTL-34-10	Nylon Lock Nut, 3/4 - 10	2
2	72-135	Castor Wheel Spacer	4
3	78-012	Tire and Wheel	2
4	18-223	Flange Bushing (part of 41-520)	4
5	41-520	Frame	1
6	29-584	Adjustment Spacer, 1/2"	4
7	42-539	Lynch Pin	2
8	29-585	Adjustment Spacer, 1"	2
9	HB-12-13-350	Hex Bolt, 1/2 - 13 x 3 1/2	1
	HNTL-12-13	Nylon Lock Nut, 1/2 - 13	1
10	15-725	Mount Panel End	2
	15-727	Switch Actuator, no light	1
	15-728	Switch Body, On-Off-On	1
	15-730	Mount Panel Plug	1
11	41-522	Quick Hitch Bar	1
12	41-532	Pump with 11 HP Honda Engine	1
	41-532-01	Impeller, Wear Plate, Gasket and Seal	1
	41-532-02	Gasket	1
	41-532-03	Seal	1
13	18-376	Close Nipple, 3"	2
14	41-530	Swivel Joint, 3"	1
15	18-382	2 1/2" Suction Hose	1
16	41-527	Band Clamp, 2 1/2"	2
17	41-529	Discharge Tube	1
18	41-525	Turnbuckle	1
19	18-375	King Nipple, 2 1/2"	1
20	18-378	Bushing, 3" x 2 1/2"	1
21		U-1 300 Amp Battery (not supplied)	1
22	8-603	Battery Strap	1
23	41-531	3" Basket Strainer	1
24	18-380	Check Valve, 3"	1
25	18-379	Plastic Elbow	1
26	18-374	King Nipple, 3"	1
27	41-526	Band Clamp, 3"	2
28	8820-8	Machine Chain, 8 links	1
29	18-381	3" Suction Hose	1
30	41-521	Hose Boom	1
	HG-14-28-180	Grease Fitting, 1/4 - 28 x 180°	1
31	16-754	Actuator with 8" Stroke	1
	HCP-12-225	Clevis Pin, 1/2 x 2 1/4	2
	HP-18-100	Cotter Pin, 1/8 x 1	2
32	41-523	Pivot Rod	1
	HHP-18	Bridge Pin, 1/8	2
33	72-134	Castor Wheel	1

# TYPHOON WIRING



## WIRING PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	15-727	Switch Actuator, no light	1
	15-728	Switch Body, On-Off-On	1
2	77-261	Circuit Breaker, 40 amp	1
	8977	Circuit Breaker Boot	1
3		U-1 300 Amp Battery (not supplied)	1
4	22-056	Cable	1
	12-031	Battery Boot	1
5	22-065	Starter Cable	1
6	16-754	Actuator	1
	41-524	Wire Harness	1
	16-088	Decal, Moving Parts Hot	1
	25-286	Decal, Pinch Points	2
	25-298	Decal, Warning, Hot	1

# INSTRUCTIONS



## READ ENGINE MANUAL PRIOR TO STARTING THIS MACHINE.

Machine is shipped with **NO OIL** in engine.

Fill Engine with oil as suggested in Engine Manual.

1. You must prime pump before starting the engine. To do so, insert garden hose in Discharge Tube and fill system to full. Full is when you see water in both suction hoses.
2. Fill engine up with 4-stroke motor oil as advised in the engine manual.
3. Install a U-1 300 Amp Battery into the battery box on the right side of the engine. Connect battery cables and strap battery into place.
4. Make yourself familiar with engine controls located on the engine by reading the Engine Owner's Manual.
5. Once the pump is primed, battery installed, and the engine oil is filled you may hook the Typhoon up to the Super Star Bunker Rake.
6. The Typhoon is equipped with a quick hitch attachment. Insert quick hitch bar into hitch on Super Star and lock in place with lock pin.
7. There are ½" and 1" spacers on the castor wheels that can be arranged in any combination to achieve the desired height. Please keep both side adjusted the same.
8. Transport the Typhoon to the water hole that needs to be siphoned. Back Typhoon to edge of water.
9. Using the rocker switch on the left side of the engine, lower the boom and suction screen into the water.
10. Stand clear of the discharge tube. Make sure the discharge tube is pointing in a direction that is free of bystanders and buildings.
11. Start engine. There will be immediate water discharge from the discharge tube. There is a swivel tube that allows you to turn the discharge in any direction you desire. There is also a turnbuckle that can be lengthened to give a longer flow or shortened for a closer distance. For best performance keep hand on discharge tube to prevent it from straying.

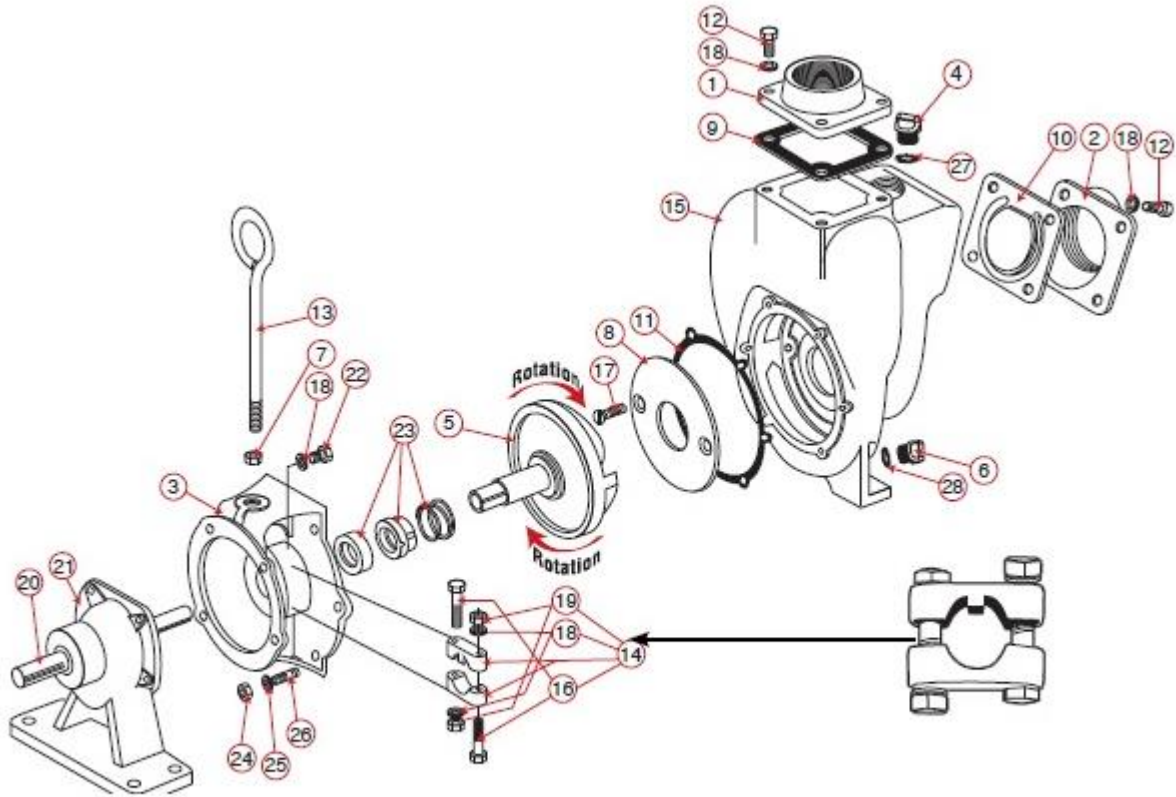
12. When water is siphoned, shut off engine, leaving water in the pump and discharge hose, so you do not run the pump dry.



**DO NOT RUN THE PUMP DRY!**

13. Using the rocker switch, raise boom out of the water hole.

# 41-532 TYPHOON PUMP DRAWING

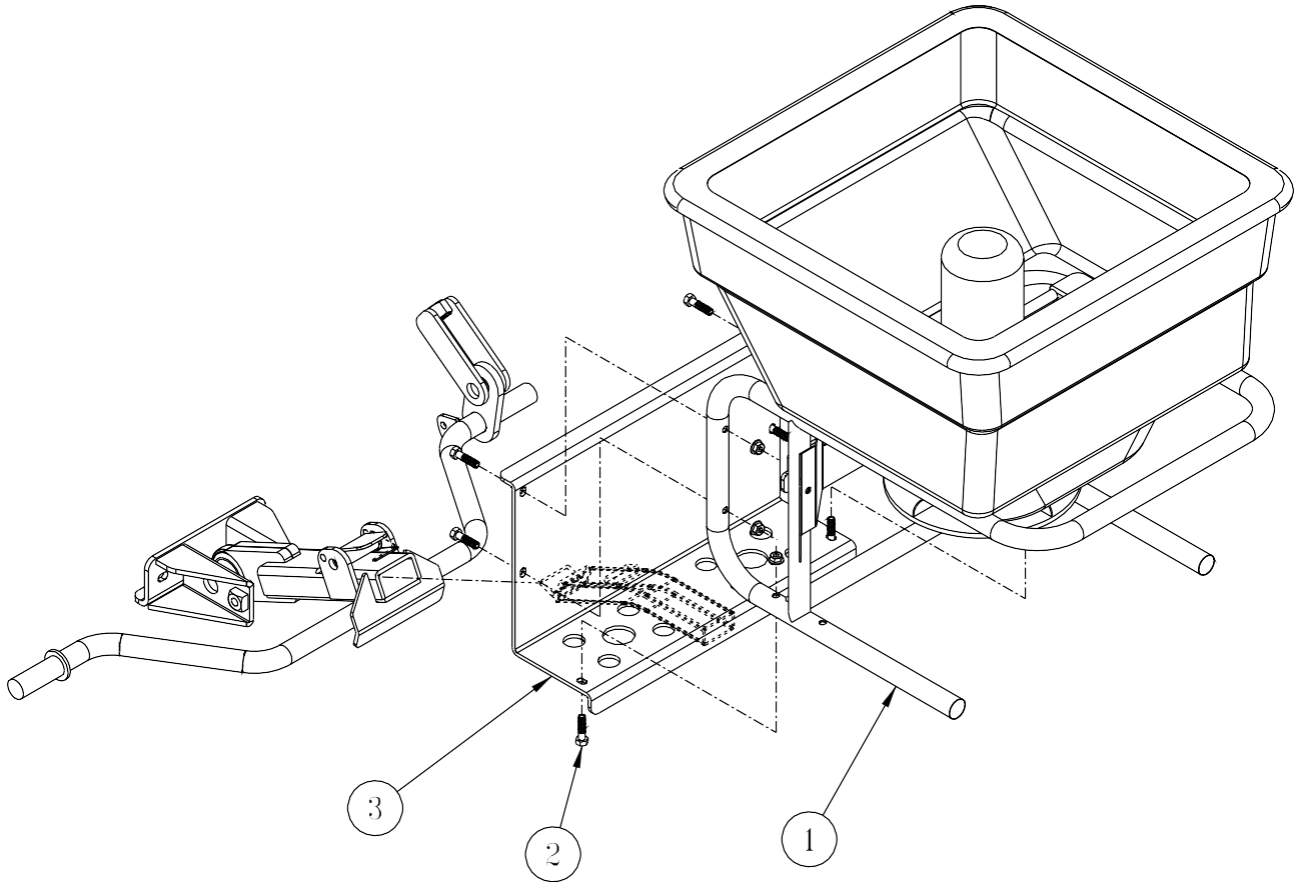


## 41-532 TYPHOON PUMP REPLACEMENT PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	41-532-07	NPT Outlet Flange	1
2	41-532-05	NPT Inlet Flange	1
3		Adapter for Gas Engine	1
4	41-532-10	Plug	1
5*		Impeller & Drive Shaft for Gas Engine	1
6	41-532-11	Plug	1
7		5/8 SS Jam Nut	1
8*		Wear Plate	1
9	41-532-06	EPDM Outlet Gasket	1
10	41-532-04	Gasket Check Valve Assembly	1
11*	41-532-02	Adapter Gasket	1
12		3/8 - 16 x 1 1/8 SS Cap Screw HXHD	8
13		Handle	1
14		Clamp Assembly	1
15	41-532-08	Pump Housing	1
16		3/8 - 24 x 2 1/4 Hex Bolt	2
17*		Wear Plate Flat Head Screw	2
18		3/8 Lock Washer	8
19		3/8 x 24 SS Hex Nut	1
20		1" Shaft	1
21		Bearing Pedestal	2
22		Hex Bolt	4
23*	41-532-03	Viton Seal Assembly	1
24		3/8 - 16 SS Hex Nut	6
25		3/8 SS Lock Washer	6
26		3/8 - 16 x 3/8 - 24 x 1 1/2 SS Stud	6
27	41-532-12	O-ring	1
28	41-532-13	O-ring	1
	41-532-01	Repair Kit (includes * items)	



## 41-502 12V BROADCAST SPREADER DRAWING



REF#	PART#	DESCRIPTION	QTY.
1	41-533	12V Earthway Spreader, Model M40	1
2	HB-516-18-125	Hex Bolt, 5/16 – 18 x 1 ¼	6
	HNFL-516-18	Flange Whiz-Lock Nut, 5/16 – 18	6
3	41-534	Spreader Mount	1

## INSTALLATION INSTRUCTIONS

The 12 Volt Broadcast Spreader is a great option for your seeding and fertilizing needs.

1. Using the six 5/16 – 18 x 1 ¼ Hex Bolts and Whiz-Lock Nuts (Ref 2) mount the Spreader (Ref 1) to the Spreader Mount (Ref 3). Tighten all hardware.
2. Connect to the Quick Hitch Receiver on your Smithco machine.
3. Connect the wires to the battery according to the directions given in the Earthway Spreader Manual.
4. Refer to the manual that came with the Earthway Spreader for operation instructions and to determine your desire spreading rate.

**For replacement parts for the Spreader, refer to the Earthway Spreader Manual.**

# The Smithco Commercial Products Two-Year Limited Warranty

Smithco, Inc. (Smithco) warrants your 2016 or newer Smithco Commercial Product (“Product”) purchased after October 1, 2016 to be free from defects in materials or workmanship for the period of time listed below. Where a warrantable condition exists, Smithco will repair the Product at no cost to you including diagnosis, labor (at the Smithco standard labor rate, subject to the Smithco flat rate schedule), and parts.

## Warranty Duration Is:

1. Two years, 1500 operational hours\* from the date of delivery to the original purchaser or five years from the date of original manufacturer of the product, whichever occurs first. (\*Products equipped with hour meter).
2. Products used in rental situations are covered for 90 days from date of delivery to original user/renter.

## Owner responsibilities:

As the Product owner, you are responsible for required maintenance and adjustments stated in your Owner’s Manual. Failure to perform required maintenance and adjustments can be grounds for disallowing a warranty claim. **You are particularly responsible to train all present and future operators of this product on the safe operation of this product at your location.**

## Instructions for Obtaining Warranty Service:

You are responsible for notifying the Authorized Smithco Products Distributor from whom you purchased the Product as soon as you believe a warrantable condition exists and not later than 30 days from discovery of the condition.

If you need help locating an Authorized Smithco Distributor, or if you have questions regarding your warranty rights or responsibilities, you may contact us at:

Smithco Product Support Department  
Highway SS @ Poplar St.  
Cameron, Wisconsin 54822  
Telephone: 715-458-4192 E-Mail: [ProductSupport@Smithco.com](mailto:ProductSupport@Smithco.com)

## Maintenance Parts:

Parts scheduled for replacement as required maintenance (“Maintenance Parts”), are warranted for the period of time up to the scheduled replacement time for that part.

## Items/Conditions Not Covered:

Not all product failures or malfunctions that occur during the warranty period are defects in materials or workmanship. The items/conditions listed below are not covered by this warranty.



Product failures which result from the use of non-Smithco replacement parts, or from installation and use of add-on, modified, or unapproved accessories are not covered.



Product failures which result from failure to perform required maintenance and/or adjustments are not covered.



Product failures that result from operating the Product in an abusive, negligent or reckless manner are not covered.



This warranty does not apply to parts subject to consumption through use, unless found to be defective. Examples of parts which are consumed, or used up during normal Product operation include, but are not limited to: blades, tines, teeth, scarifiers, rakes, plates, wear plates, castor wheels, tires, batteries, filters, belts, nozzles, etc.



This warranty does not apply to failures caused by outside influence. Items considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved coolants, lubricants, additives, or chemicals, etc.



This warranty does not apply to normal "wear and tear" items. Normal "Wear and Tear" includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows, etc.



Smithco may require the return of failed parts or components in order determine the validity of any warranty claim.



Smithco will not be obligated to replace components of other manufacturers if inspection by the original component manufacturer indicates that failure was due to normal wear and tear, expected consumption through use or improper care or service.

#### **Other Legal Disclaimers:**

The above remedy for product defects through repair or replacement by an authorized Smithco distributor or dealer is the purchaser's sole remedy for any defect. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**THERE ARE NO OTHER EXPRESS WARRANTIES OTHER THAN THOSE SET FORTH ABOVE. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE ARE LIMITED TO THE DURATION OF THE LIMITED WARRANTIES CONTAINED HEREIN.**

Some States may not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

**THE SMITHCO COMPANY IS NOT LIABLE FOR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE USE OF THE PRODUCT, INCLUDING ANY COST OR EXPENSE OF PROVIDING A SUBSTITUTE PRODUCT OR SERVICE DURING PERIODS OF MALFUNCTION OR NON-USE.**

Some states may not allow the exclusion of indirect, incidental or consequential damages, so the above exclusion may not apply to you.

**Smithco neither assumes, nor authorizes any person to assume for it, any other liability in connection with the sale or use of this product.**

**SMITHCO, INC.  
WANYE, PA 19087**

