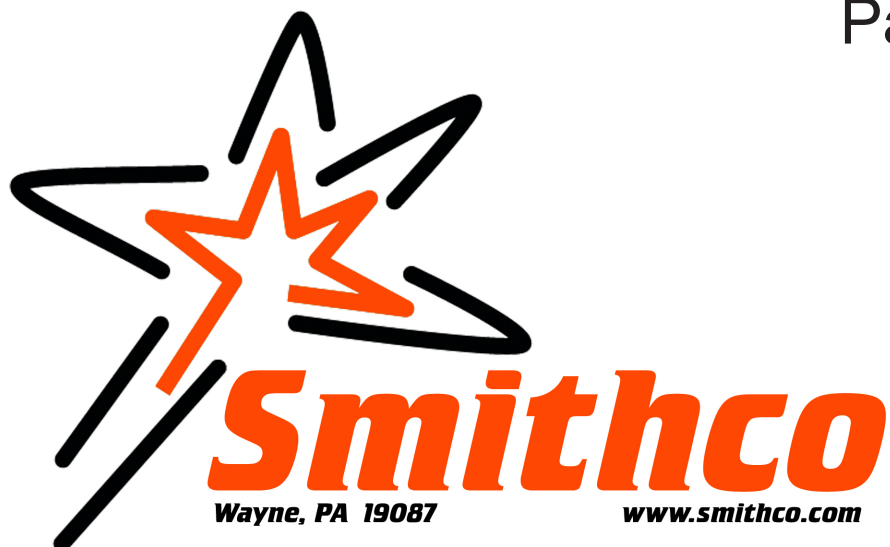


Parts & Service



# **Sand Star CVT Mechanical**

**41-000-A**

**SN 41001**

***Product Support:***

***Hwy 55 & Poplar Ave; Cameron WI 54822***

***1-800-891-9435 [productsupport@smithco.com](mailto:productsupport@smithco.com)***


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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:**

**Engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.**  
For more information visit  
[www.P65Warning.ca.gov](http://www.P65Warning.ca.gov)

**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.*


All **Smithco** machines have a Serial Number and Model Number. Both numbers are needed when ordering parts. Serial number tag is located on left rear ROPs mount post. Refer to engine manual for placement of engine serial number.

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

**SMITHCO CUSTOMER SERVICE 1-800-891-9435**

## SAFE PRACTICES

1. It is your responsibility to read this manual and all publications associated with this machine (engine, 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, 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. Beware of overhead obstructions and underground obstacles. Stay alert for hidden hazards.
6. Never operate equipment that is not in perfect working order or without decals, guards, shields, or other protective devices in place.
7. Never disconnect or bypass any switch.
8. Carbon monoxide in the exhaust fumes can be fatal when inhaled, never operate a machine without proper ventilation.
9. Fuel is highly flammable, handle with care.
10. Allow engine to cool before fueling.
11. Keep engine clean. Allow the engine to cool before storing and always remove the ignition key.
12. After engine has started, machine must not move. If movement is evident, the neutral mechanism is not adjusted correctly. Shut engine off and readjust so the machine does not move when in neutral position.
13. Never use your hands to search for oil leaks. Hydraulic fluid under pressure can penetrate the skin and cause serious injury.
14. This machine demands your attention. To prevent loss of control or tipping of the vehicle:
  - A. Use extra caution in backing up the vehicle. Ensure area is clear.
  - B. Do not stop or start suddenly on any slope.
  - C. Reduce speed on slopes and in sharp turns. Use caution when changing directions on slopes.
  - D. Stay alert for holes in the terrain and other hidden hazards.
15. Before leaving operator's position for any reason:
  - A. Disengage all drives.
  - B. Lower all attachments to the ground.
  - C. Shut engine off and remove the ignition key.
16. Keep hands, feet and clothing away from moving parts. Wait for all movement to stop before you clean, adjust or service the machine.
17. Keep the area of operation clear of all bystanders.
18. Never carry passengers.
19. Stop engine before making repairs/adjustments or checking/adding oil to the crankcase.
20. Use parts and materials supplied by **Smithco** only. Do not modify any function or part.

***These machines are intended for professional maintenance on golf courses, sports turf, and any other area maintained turf and related trails, paths and lots. No guaranty as to the suitability for any task is expressed or implied.***



## MECHANICAL SAND STAR SPECIFICATIONS

### WEIGHTS AND DIMENSIONS

Length	68" (1.73 m)
Width	61" (1.55 m)
Height	50" (1.3 m)
Wheel Base	51" (1.3 m)
Ground Clearance	5.5" - 7" (13 -18 cm)
Weight	841 lbs. (381 kg)

### SOUND LEVEL (EAR PROTECTION REQUIRED)

At Ear Level	85 dB
--------------	-------

### ENGINE

Make	Briggs and Stratton
Model#	19L237
Type / Spec#	0042-F1
Horsepower	10 hp (7.46 kW)
Fuel	Minimum of 87 octane
Alternator	10 Amp

### WHEELS & TIRE

Front: 20 X 10 - 10 Turf Tires 5 psi (.34 bar) Smithco # 52-120  
 Rear: 25 X 10 - 12 Turf Tires 5 psi (.34 bar) Smithco # 45-617

### SPEED

Forward Speed	0 to 12 m.p.h. (0-19 kph)
Reverse Speed	0 to 5 m.p.h. (0-8 kph)

### BATTERY

	Lawn & Garden Type SP 35
BCI Group	Size 35
Cold Cranking Amps	300
Ground Terminal Polarity	Negative (-)
Maximum Length	7.5" (19 cm)
Maximum Width	5" (12,7 cm)
Maximum Height	7.5" (19 cm)

### FLUID CAPACITY

Crankcase Oil	See Engine Manual
Fuel	3.8 quarts (3.6 liters)

## ACCESSORIES

13-644 Aluminum Plow  
 41-023 Sand Cultivator - Vertical Blades  
 41-022 Sand Cultivator-Spring Tines  
 13-298 Fan Rake  
 42-130 84" Mild Steel Tournament Rake  
 42-132 72" Mild Steel Tournament Rake  
 42-391 72" ProBrush Tournament Rake  
 42-392 84" ProBrush Tournament Rake  
 13-758 Rake with Finishing Blades  
 13-438 Rake with Finishing Blades  
 13-319 Fan Rake Kit for 13-438 Rake  
 26-007 Professional Infield Finisher  
 26-008 Flex Action Field Finisher  
 43-002 Flex Action Field Finisher with Brush



# MAINTENANCE

## ⚠ CAUTION

Before servicing or making adjustments to machine, stop engine and remove key from ignition.

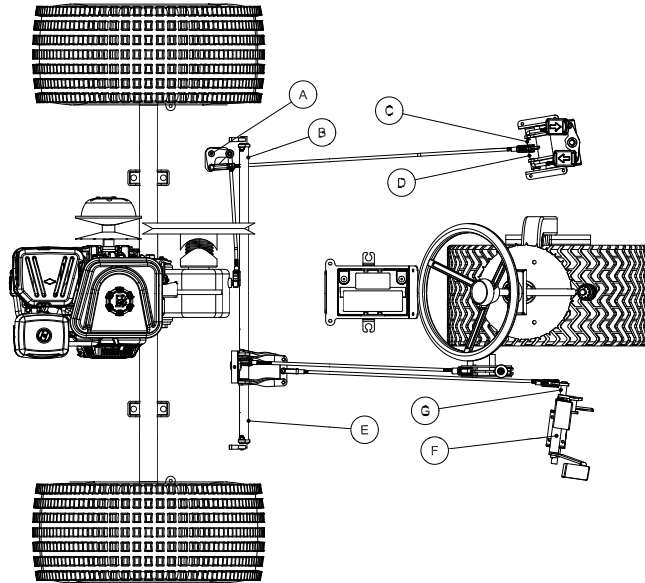
## ⚠ IMPORTANT

Use all procedures and parts prescribed by the manufacturer's. Read the engine manual.

### LUBRICATION

Use No. 2 General purpose Lithium Base Grease and lubricate every 100 hours. The Sand Star has seven grease fittings.

- A. Shift Relay
- B. LH Brake Relay
- C. Forward Pedal
- D. Reverse Pedal
- E. RH Brake Relay
- F. Gas Pedal
- G. Brake Pedal



### TOWING

When it is necessary to move the Sand Star without engine running, make sure park brake is released and pedals are in neutral position. If the machine must be moved a considerable distance, transport it on a truck or trailer.

### TIRE PRESSURE

Caution must be used when inflating a low tire to recommended pressure. Over inflating can cause tires to explode. Tires should be 5 psi (0.34 bar). Improper inflation will reduce tire life considerably.

### DAILY CHECKLIST

1. Check engine oil level in vehicle. Add as needed. DO NOT OVERFILL.
2. Check trap rake for loose or missing nuts, bolts, screws, etc., and tighten or replace as needed..
3. Check tire pressure. 5 psi (.34 bar)
6. Check electrical system for loose connections or frayed wiring, including battery cables. Replace any faulty equipment or tighten if loose.
7. Fill fuel tank. Allow engine to cool before fueling.

**ENGINE**

Change and add oil according to temperature chart below. Do not overfill. Use a high quality detergent oil classified "For Service SF, SG, SH, SJ or higher" SAE 30 oil. Use no special additives with recommended oils. Do not mix oil with gasoline.

**SAE VISCOSITY GRADES****Starting Temperature Range Anticipated Before Next Oil Change**

Outdoor temperatures determine the correct oil viscosity for the engine. Use the chart to select the best oil for outdoor temperature range expected. Engines on most outdoor power equipment operate well with 5W-30 synthetic oil. For equipment operated in hot temperatures 15W-30 synthetic oil gives the best protection.

**⚠ CAUTION**

**Before servicing or making adjustments to the machine, stop engine, set park break, block wheels and remove key from ignition.**

**⚠ IMPORTANT**

**Follow all procedures and ONLY use parts prescribed by the manufacturer. Read the engine manual before maintenance.**

The suggested maintenance checklist is not offered as a replacement for the manufacturer's engine manual but as a supplement. You must adhere to the guidelines established by the manufacturer for warranty coverage. In adverse conditions such as dirt, mud or extreme temperatures, maintenance should be more frequent.

**SERVICE INTERVALS**

After First 5 hours:

Check engine oil.

After First 8 hours or daily

Check engine oil.

Clean area around muffler and controls.

Clean air intake grille.

After 25 hours:

Clean air filter.

Clean pre-cleaner.

After 50 hours:

Check wheel lug nuts torque to 64-74 ft/lb (87-100Nm).

Inspect tires - Check air pressure 5 psi (.34 bar)

Change engine oil.

Service exhaust system.

# MAINTENANCE

## WHEEL MOUNTING PROCEDURE

1. Turn machine off and remove key.
2. Block one of the other wheels.
3. Loosen nuts slightly on wheel to be removed.
4. Jack up machine being careful not to damage underside of machine.
5. Remove nuts. Remove wheel.
5. Place new wheel on hub lining up bolt holes.
6. Torque nuts to 64-74 ft/lb (87-100 Nm) using a cross pattern. Re-torque after first 8 hours and every 250 hours thereafter.
7. Lower machine to ground and remove blocks and jack.

## BATTERY

Batteries normally produce explosive gases which can cause personal injury. Do not allow flames, sparks or any ignited object to come near the battery. When charging or working near battery, always shield your eyes and always provide proper ventilation.

Battery cable should be disconnected before using "Fast Charge".

Charge battery at 15 amps for 10 minutes or 7 amps for 30 minutes. Do not exceed the recommended charging rate. If electrolyte starts boiling over, decrease charging.

Always remove grounded (-) battery clamp first and replace it last. Avoid hazards by:

1. Filling batteries in well-ventilated areas.
2. Wear eye protection and rubber gloves.
3. Avoid breathing fumes when electrolyte is added.
4. Avoid spilling or dripping electrolyte.

### ⚠ WARNING

**Battery Electrolyte is an acidic solution and should be handled with care. If electrolyte is splashed on any part of your body, flush all contact areas immediately with liberal amounts of water. Get medical attention immediately.**

## JUMP STARTING

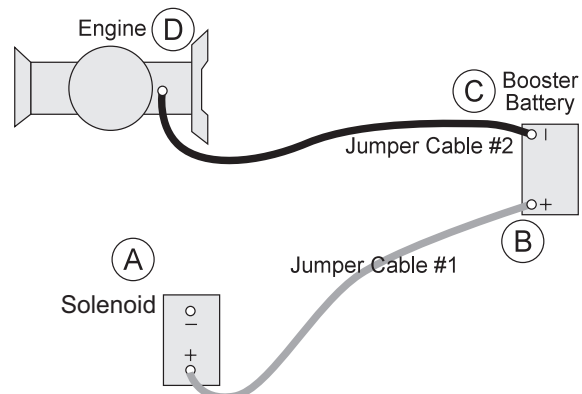
### ⚠ WARNING

**Use of booster battery and jumper cables. Particular care should be used when connecting a booster battery. Use proper polarity in order to prevent sparks.**

To jump start (negative grounded battery):

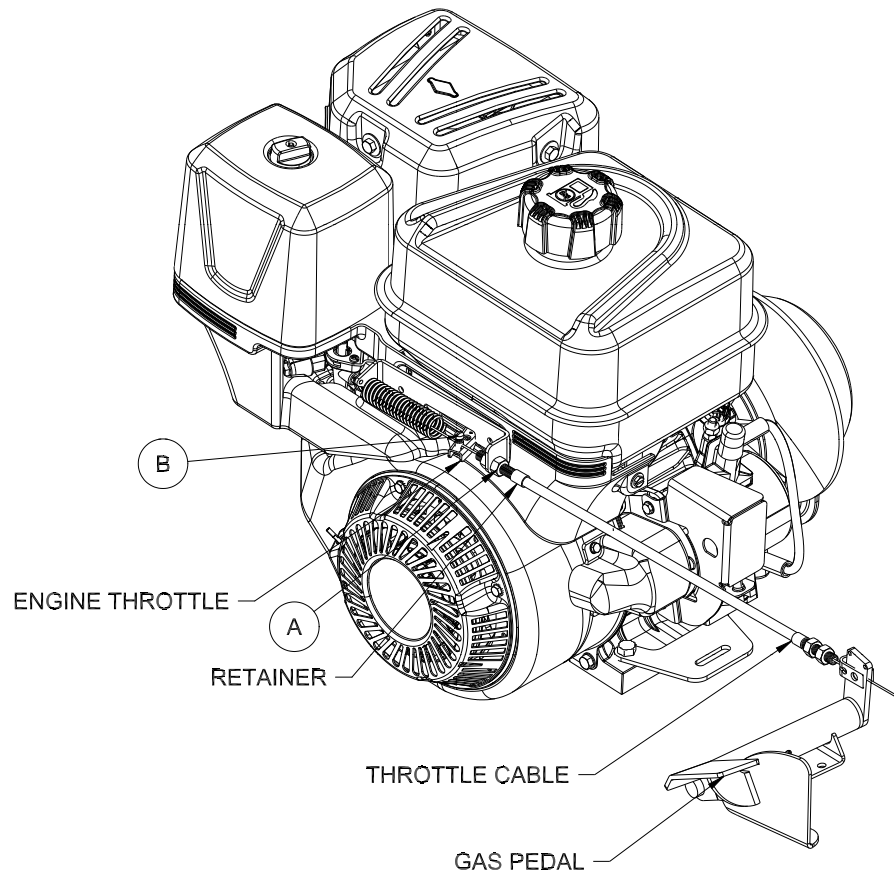
1. Shield eyes.
2. Connect ends of one cable to positive (+) terminals of bottom post on solenoid first (A), then positive post of booster battery. (B).
3. Connect one end of other cable to negative (-) terminal of booster battery (C).
4. Connect other end of cable (D) to engine block on unit being started.

To prevent damage to other electrical components on unit being started, make certain that engine is at idle speed before disconnecting jumper cables.

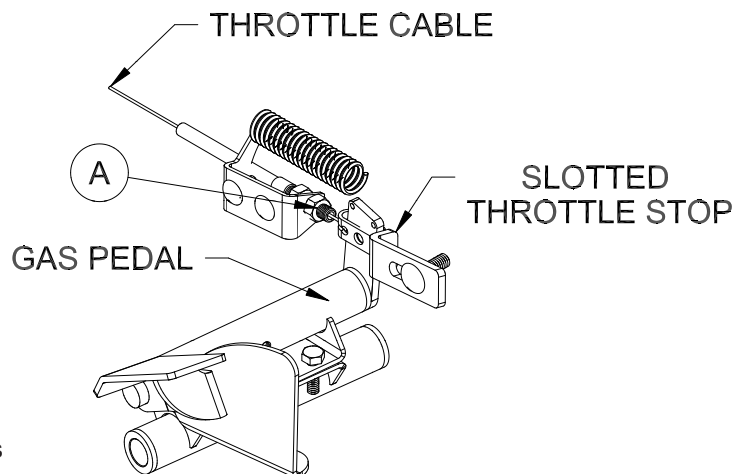




## TO ADJUST GAS PEDAL THROTTLE CABLE



1. Jack up unit so that all drive wheel are off the ground. (Use jack stands)
2. Start the engine, make certain that the gas pedal is in the idle position( $1200 \pm 100$ RPM).
3. Engine speed must increase as soon as the foot pedal begins to move in either direction. At the full forward position, the engine RPM must be  $3300\text{RPM} \pm 100$ .
4. When throttle is running wide open. The throttle stop must contact the gas pedal.
5. Minor adjustment can be made by backing out (unscrewing) Retainer (Ref A) until you reach full engine RPM with the gas pedal fully depressed in the forward position. Be sure to recheck after the nuts are fully tightened.

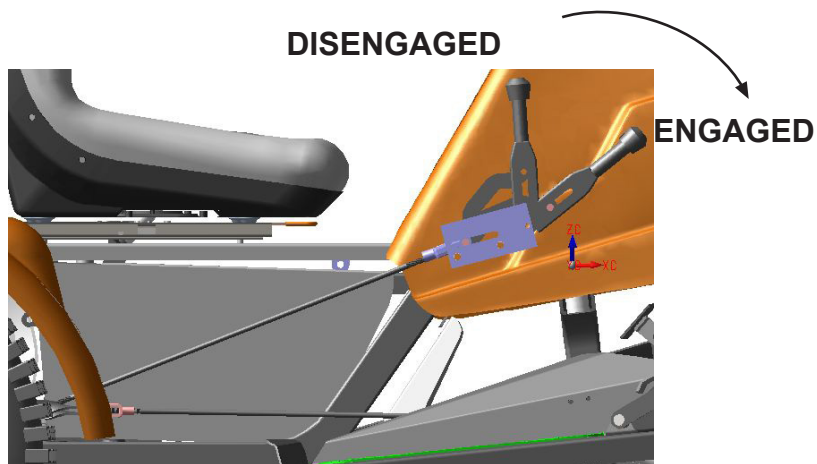


6. Major adjustment needs to be made by pulling the slack out of the cable. Loosen the screw in the wire block(Ref B) on the engine that is clamped onto the end of the cable and sliding it up to the cable block that is through the throttle plate. Do not let the throttle plate move to increase idle speed. Tighten the screw.
7. Test run to determine that there is no binding and that engine idle speed is 1200 RPM and that it is 3300RPM at full forward position of the foot pedal.

## ADJUSTMENTS

### PARK BRAKE

The park brake is located on the right hand side of the machine and operates both rear wheels. Push forward to engage and Pull lever back to disengage. To adjust park brake, turn the knob on the end of the handle.



## STORAGE

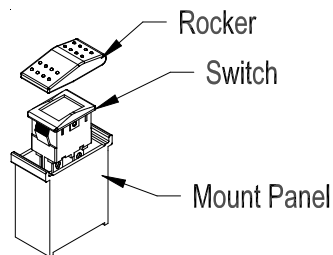
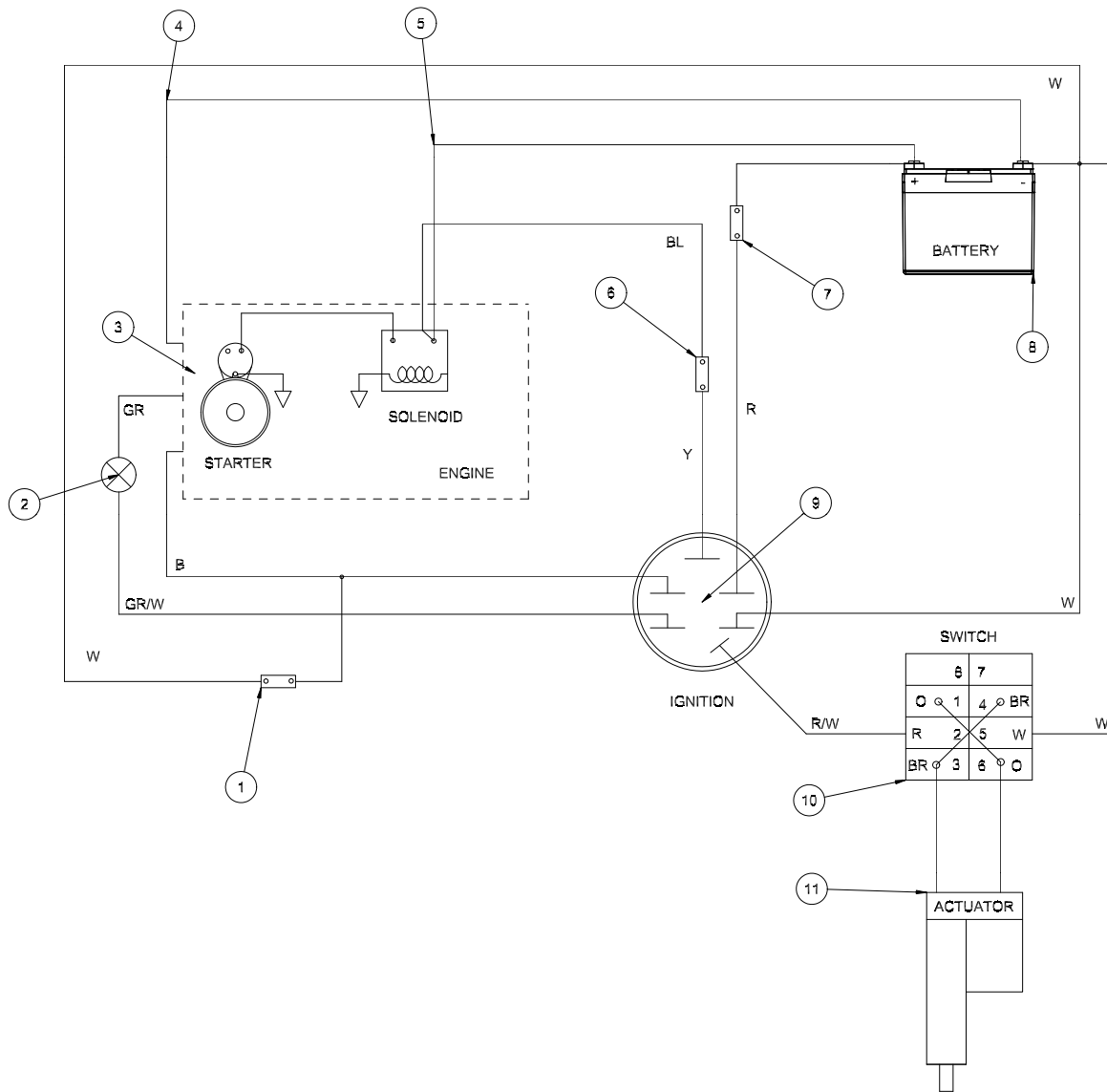
When storing, remove the key from the key switch to avoid unauthorized persons from operating machine.

1. Before storing clean machine thoroughly.
2. Check bolts and nuts, tighten as necessary.
3. Make all repairs that are needed and remove any debris.
4. Remove the battery, adjust the electrolyte level and recharge it. Store the battery in a dry, dark place.
5. Store in a clean and dry area, but NOT near a stove, furnace or water heater which uses a pilot light or any device that can create a spark.
6. If machine is stored for more then 30 days, the fuel system should either be completely drained or treated with a fuel stabilizer. This will aid in the prevention of gum and tarnish build up inside e the system along with internal essential carburetor parts.



# WIRING DRAWING

Diagrams

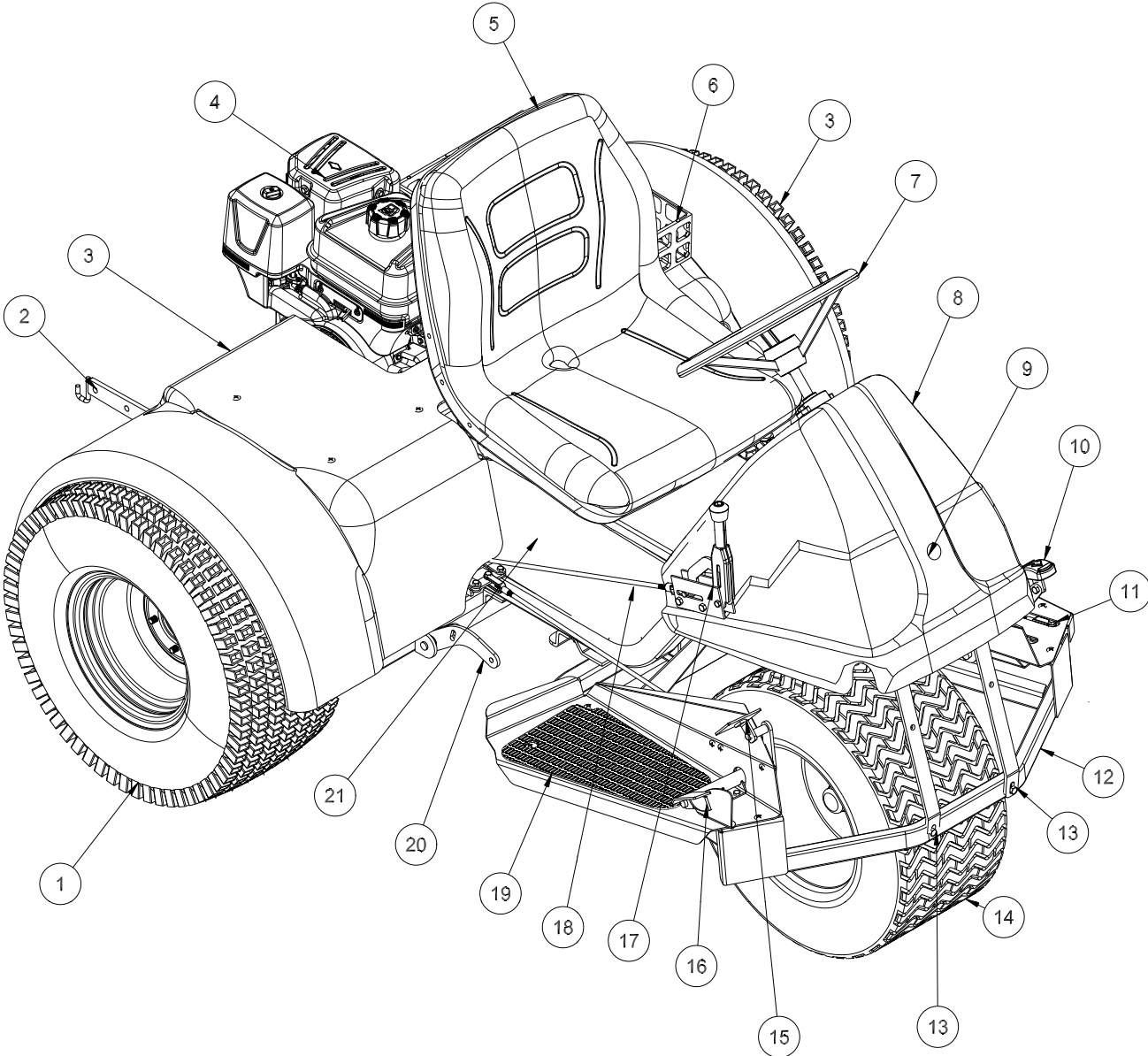


Color Code Chart	
Bl	Blue
Br	Brown
Y	Yellow
Grn	Green
O	Orange
R	Red
B	Black
P	Purple
W	White

## WIRING PARTS LIST

REF #	PART #	DESCRIPTION	QUANTITY
1	14-272	Seat Switch	1
2	50-359	Warning Indicator Lights	1
3	41-082	10hp Briggs & Stratton	1
4	48-147	Negative Black Battery Cable	1
5	50-323	Positive Red Battery Cable	1
	45-416	Red Battery Boot	1
6		Neutral Switch on Transaxle	1
7	8975	Circuit Breaker, 30AMP	1
	8977	Breaker Boot	1
8		Battery (not included)	1
9	13-488	Ignition Switch	1
10	15-727	Switch Actuator, no light	1
	15-728	Centering Switch, On-Off-On	1
11	45-631	Actuator	1
	41-085	Wire Harness	1

# MAIN FRAME DRAWING

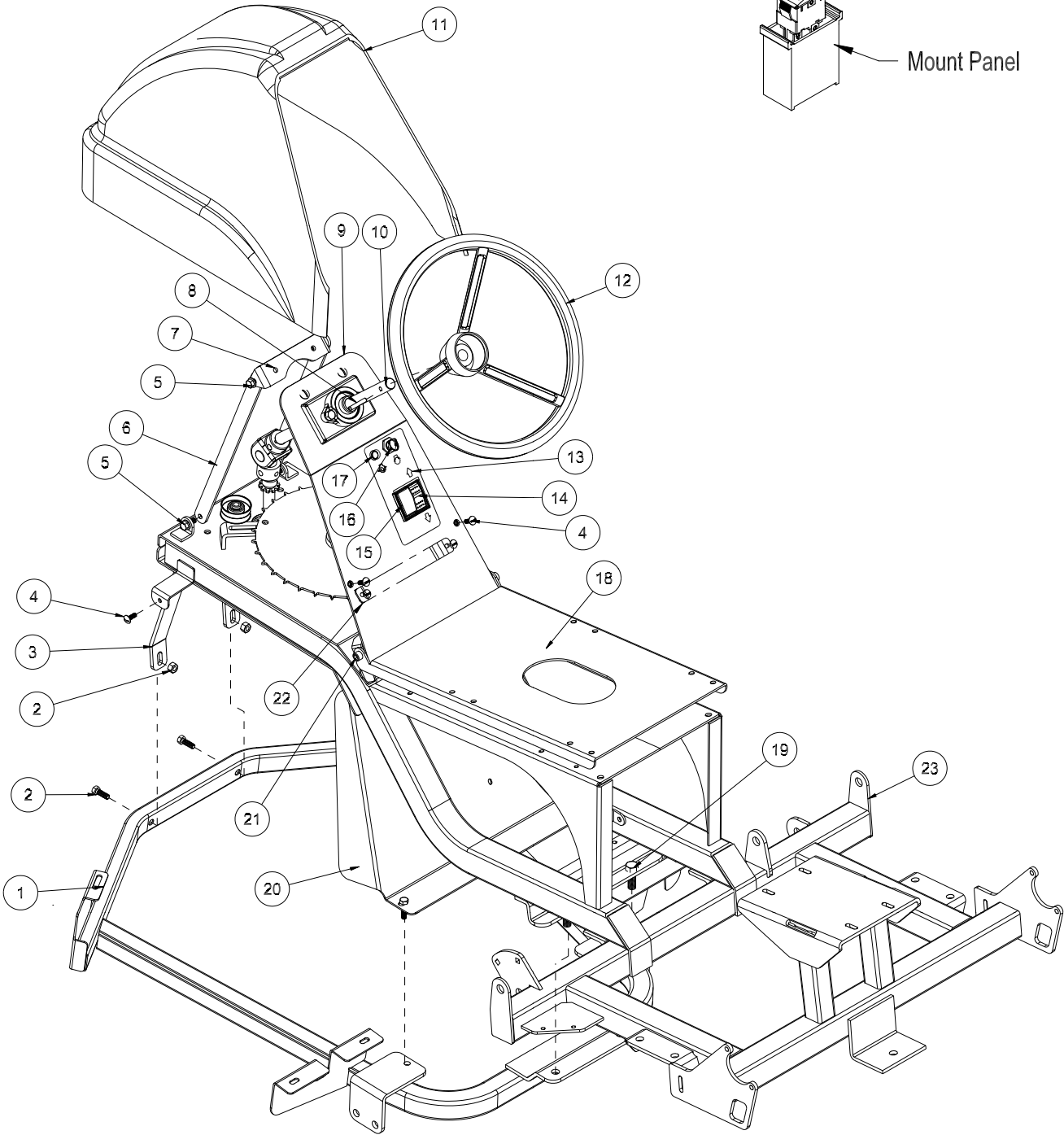
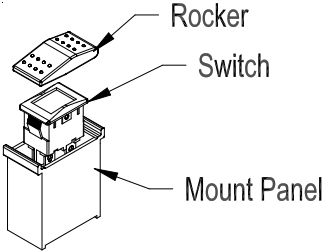


Parts

## MAIN PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	45-617	Tire & Wheel	2
	45-617-01	Tire, 25 - 10.00 x 12	2
	45-617-02	Wheel	2
2	41-071	Rear Lift	1
3	41-081	RH Rear Fender (fiberglass)	1
	41-094	LH Rear Fender (fiberglass)	1
4	41-082	Engine, Briggs & Stratton 10HP	1
5	14-293	Low Back Seat Assembly	1
6	8-532	Crate	1
7	20-057	Steering Wheel	1
	20-129	Center Cap	1
8	45-026	Nose Cone (fiberglass)	1
9	18-436	Lock Hole Plug	1
10	41-029	Forward Pedal	1
	45-022	Molded Foot Pedal	1
11	41-034	LH Floorboard	1
	41-090	LH Floor Mat	1
12	41-050	Bumper	1
13	13-208	Bumper Brace	2
14	52-120	Tire and Wheel	1
	52-120-01	Tire, 20 -10.00 x 10	1
	16-857-02	Wheel	1
15	41-053	Brake Pedal	1
	41-077	Brake Pedal Pad	1
	15-015	Pedal Pad	1
16	41-049	Gas Pedal	1
17	60-106	Park Brake Lever	1
18	41-069	Foot Brake Link	1
19	41-035	RH Floorboard	1
	41-089	RH Floor Mat	1
20	41-065	Center Lift	1
	41-062	Lift Lock	1
21	41-032	RH Side Panel	1
	41-033	LH Side Panel	1

# DASH PANEL DRAWING



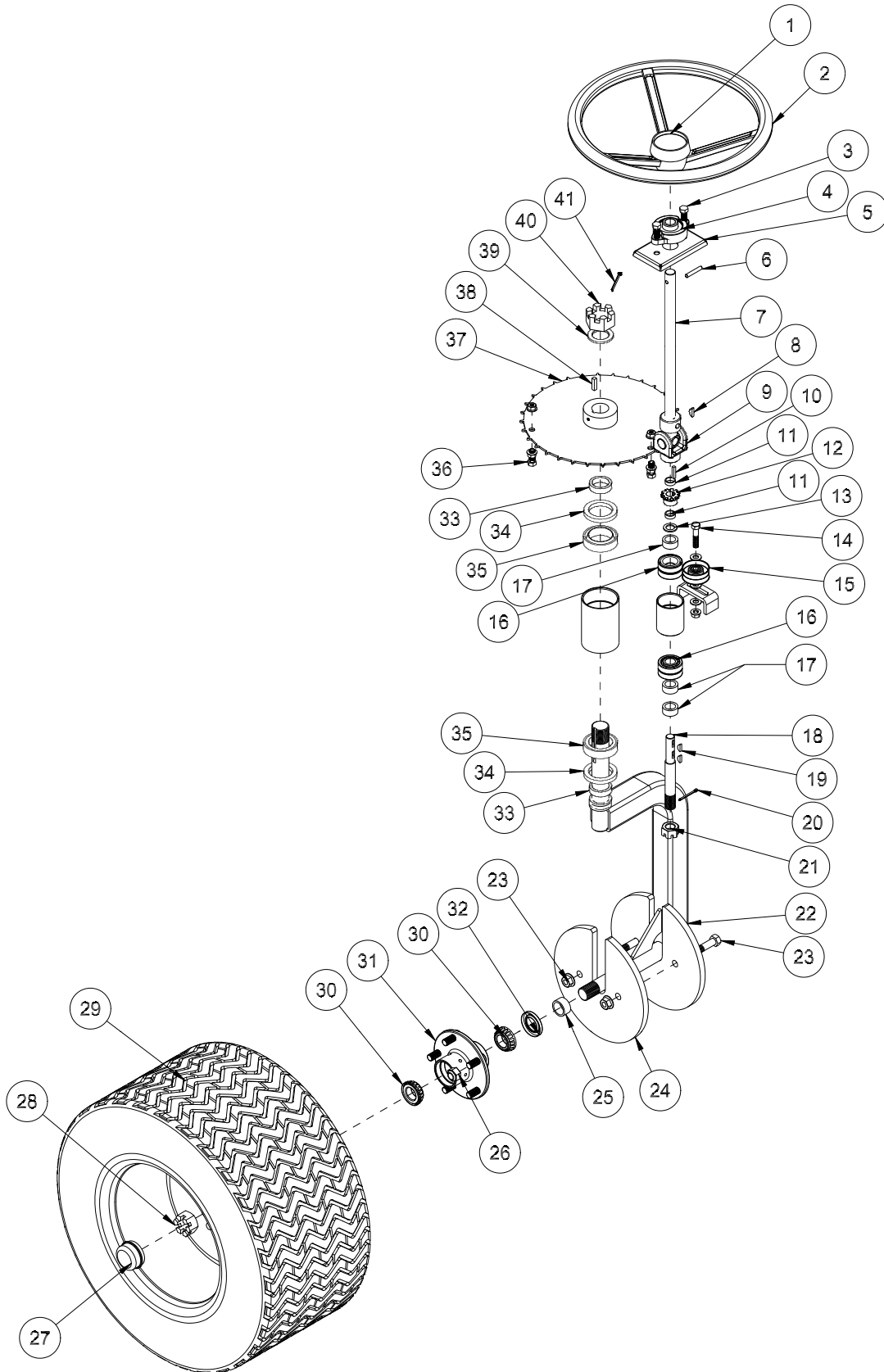
Parts



## DASH PANEL PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	41-050	Bumper	1
2	HB-38-16-200	Hex Bolt, $\frac{3}{8}$ -16 x 2	2
	HW-38	Flat Washer, $\frac{3}{8}$	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ -16	2
3	13-208	Bumper Brace	2
	HB-38-16-300	Hex Bolt, $\frac{3}{8}$ -16 x 3	2
	HW-38	Flat Washer, $\frac{3}{8}$	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ -16	2
4	HSTP-14-20-075	Truss Head Screw, $\frac{1}{4}$ -20 x $\frac{3}{4}$	8
	HNFL-14-20	Flange Whiz-loc Nut, $\frac{1}{4}$ -20	8
5	HBFL-516-18-075	Flange Whiz-loc Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$	4
	HNFL-516-18	Flange Whiz-loc Nut, $\frac{5}{16}$ -18	4
6	45-124	Dash Brace	2
7	45-078	Top Mount Bracket	1
8	HRP-14-150	Roll Pin, $\frac{1}{4}$ x $1\frac{1}{2}$	1
9	41-063	Dash Panel	1
10	41-075	Steering Shaft	1
11	45-026	Nose Cone - Fiberglass	1
12	20-057	Steering Wheel	1
	20-129	Center Cap	1
13	41-086	Decal, Switch Panel	1
14	15-727	Rocker, No light	1
	15-728	Centering Switch, On-Off-On	1
	15-725	Mount Panel End	1
15	15-730	Mount Panel Plug	1
	15-725	Mount Panel End	1
16	13-488	Ignition Switch	1
17	50-359	Warning Light	1
18	41-064	Seat Panel	1
19	HB-716-14-100	Hex Bolt, $\frac{7}{16}$ - 14 x 1	2
	HNTL-716-14	Lock Nut, $\frac{7}{16}$ - 14	2
20	41-036	Mud Guard	1
	HBFL-38-16-075	Flange Whiz-loc Bolt, $\frac{3}{8}$ -16 x $\frac{3}{4}$	2
	HNFL-38-16	Flange Whiz-loc Nut, $\frac{3}{8}$ -16	2
21	HBSH-38-38	Shoulder Bolt, $\frac{3}{8}$ -UNC x $\frac{3}{8}$	2
	HNSQ-516-18	Square Nut, $\frac{5}{16}$ -18	2
22	45-049	Wire Retainer	1
23	41-025	Mainframe	1

# FRONT FORK DRAWING

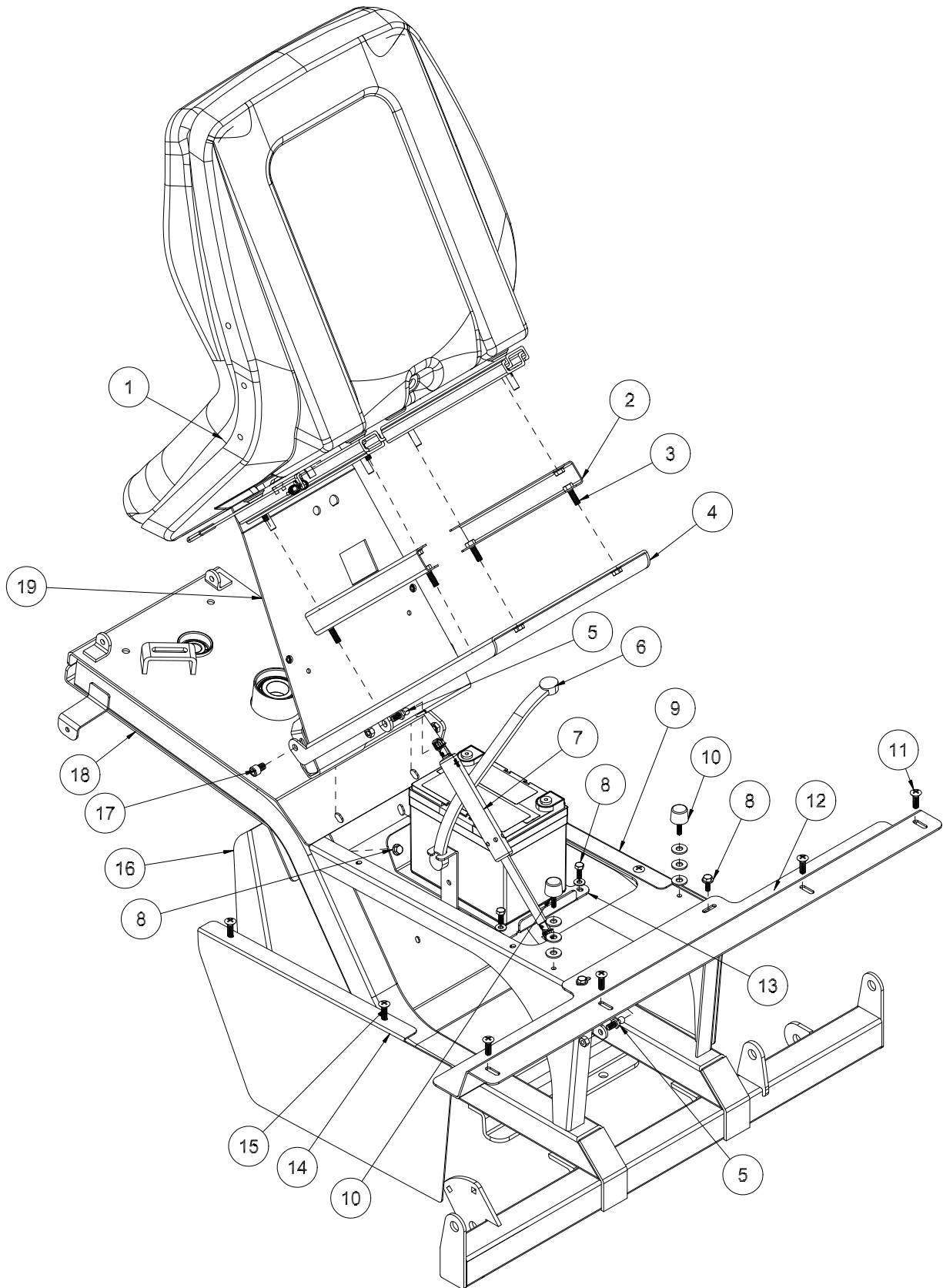


Parts

# FRONT FORK PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	20-129	Center Cap	1
2	20-057	Steering Wheel	1
3	HBFL-38-16-075	Flange Whiz-loc Bolt, $\frac{3}{8}$ -16 x $\frac{3}{4}$	2
	HNFL-38-16	Flange Whiz-loc Nut, $\frac{3}{8}$ - 16	2
4	40-009	Flange Block Bearing	1
5	41-078	Bearing Spacer Plate	1
6	HRP-14-150	Roll Pin, $\frac{1}{4}$ x $1\frac{1}{2}$	1
7	41-075	Steering Shaft	1
8	HWK-316-075	Woodruff Key, $\frac{3}{16}$ x $\frac{3}{4}$	1
9	60-300	U-joint	1
10	HKSQ-316-100	Square Key, $\frac{3}{16}$ x 1	1
11	60-325	Spacer	2
12	60-298	Sprocket	1
13	HMB-58-14	Machine Bushing, $\frac{5}{8}$ x 14GA	1
14	HB-38-16-175	Hex Bolt, $\frac{3}{8}$ -16 x $1\frac{3}{4}$	1
	HW-38	Flat Washer, $\frac{3}{8}$	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ -16	1
15	26-060	Idler Pulley	1
16	11-038	Bearing w/ Race	2
	11-039	Oil Seal	2
17	11-040	Spacer, $\frac{1}{2}$ "	3
18	13-005	Bottom Steering Shaft	1
19	HWK-316-063	Woodruff Key, $\frac{3}{16}$ x $\frac{5}{8}$	2
20	HP-18-150	Cotter Pin, $\frac{1}{8}$ x $1\frac{1}{2}$	1
21	HNA-34-16	Axle Nut, $\frac{3}{4}$ -16	1
22	41-072	Front Fork	1
23	HB-12-13-250	Hex Bolt, $\frac{1}{2}$ -13 x $2\frac{1}{2}$	2
	HNTL-12-13	Lock Nut, $\frac{1}{2}$ - 13	2
24	42-826	Weight, Front Fork	1
25	11-042	Spacer, $\frac{5}{8}$ "	1
26*	HNL-12-20	Lug Nut, $\frac{1}{2}$ -20	5
27*	80-167	Dust Cap	1
28	HNAR-100-14	Slotted Jam Nut, 1 x 14	1
	HP-18-150	Cotter Pin, $\frac{1}{8}$ x $1\frac{1}{2}$	1
29	52-120	Tire and Wheel	1
	52-120-01	Tire, 20 -10.00 x 10	1
	16-857-02	Wheel	1
30*	11-043	Bearing w/ races	2
	11-043-01	Bearing	2
	11-043-02	Race	2
31*	80-019	Hub, Complete (includes* items)	1
	27-022-02	Stud, $\frac{1}{2}$ - 20 $1\frac{7}{16}$	5
32*	11-041	Oil Seal, 1"	1
33	20-141	Spacer	2
34	20-142	Oil Seal, $1\frac{5}{8}$ "	2
35	20-143	Bearing w/ Race	2
36	HB-38-16-175	Hex Bolt, $\frac{3}{8}$ -16 x $1\frac{3}{4}$	2
	HNFL-38-16	Flange Whiz-loc Nut, $\frac{3}{8}$ -16	4
37	41-055	Steering Sprocket	1
	8834-38	Roller Chain, #35	1
	18-114	Connector Link, #35	1
38	HKSQ-14-100	Square Key, $\frac{1}{4}$ x 1	1
39	HMB-114-10	Machine Bushing, $1\frac{1}{4}$ x 10GA	1
40	HNA-114-12	Axle Nut, $1\frac{1}{4}$ -12	1
41	HP-18-200	Cotter pin, $\frac{1}{8}$ x 2	1

# SEAT PANEL DRAWING

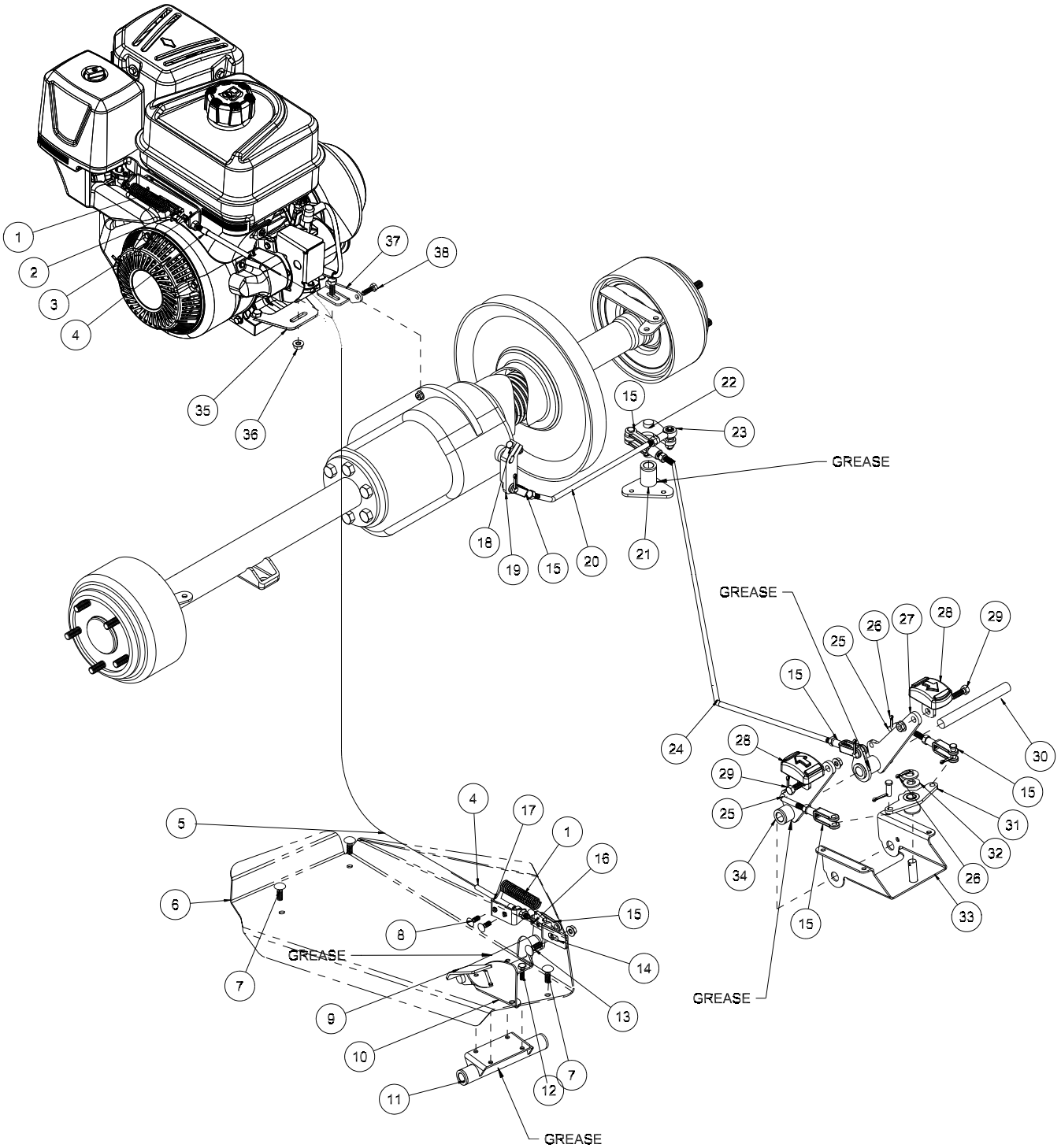


Parts

## SEAT PANEL PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	14-293	Low Back Seat Assembly	1
	HNFL-516-18	Flange Whiz-loc Nut, $\frac{5}{16}$ -18	4
	14-292	Seat Switch(included with seat)	1
2	41-041	Seat Riser	2
3	HB-516-18-075	Hex Bolt, $\frac{5}{16}$ -18 x $\frac{3}{4}$	4
	HNFL-516-18	Flange Whiz-loc Nut, $\frac{5}{16}$ -18	4
4	41-064	Seat Panel	1
5	26-034	Ball Stud	2
	HNFL-516-18	Flange Whiz-loc Nut, $\frac{5}{16}$ -18	2
6	8-603	Battery Strap	1
7	13-569	Gas Spring	1
8	HB-14-20-075	Hex Bolt, $\frac{1}{4}$ - 20 x $\frac{3}{4}$	6
	HW-14	Flat Washer, $\frac{1}{4}$	6
	HNFL-14-20	Flange Whiz-loc Nut, $\frac{1}{4}$ - 20	6
9	41-032	RH Side Panel	1
10	15-013	Rubber Bumper	2
	HNTL-14-20	Lock Nut, $\frac{1}{4}$ - 20	2
11	HSTP-516-18-100	Truss Head Screw, $\frac{5}{16}$ - 18 x 1	4
	HNFL-516-18	Flange Whiz-loc Nut, $\frac{5}{16}$ - 18	4
12	41-046	Front Fender Mount	1
13	41-048	Battery Tray	1
14	41-033	LH Side Panel	1
15	HSTP-14-20-075	Truss Head Screw, $\frac{1}{4}$ -20 x $\frac{3}{4}$	4
	HNFL-14-20	Flange Whiz-loc Nut, $\frac{1}{4}$ -20	4
16	41-036	Mud Guard	1
17	HBSH-38-38	Shoulder Bolt, $\frac{3}{8}$ - UNC x $\frac{3}{8}$	2
	HNSQ-516-18	Square Nut, $\frac{5}{16}$ -18	2
18	41-025	Main Frame	1
19	41-063	Dash Panel	1

# FOOT PEDAL LINKAGE DRAWING



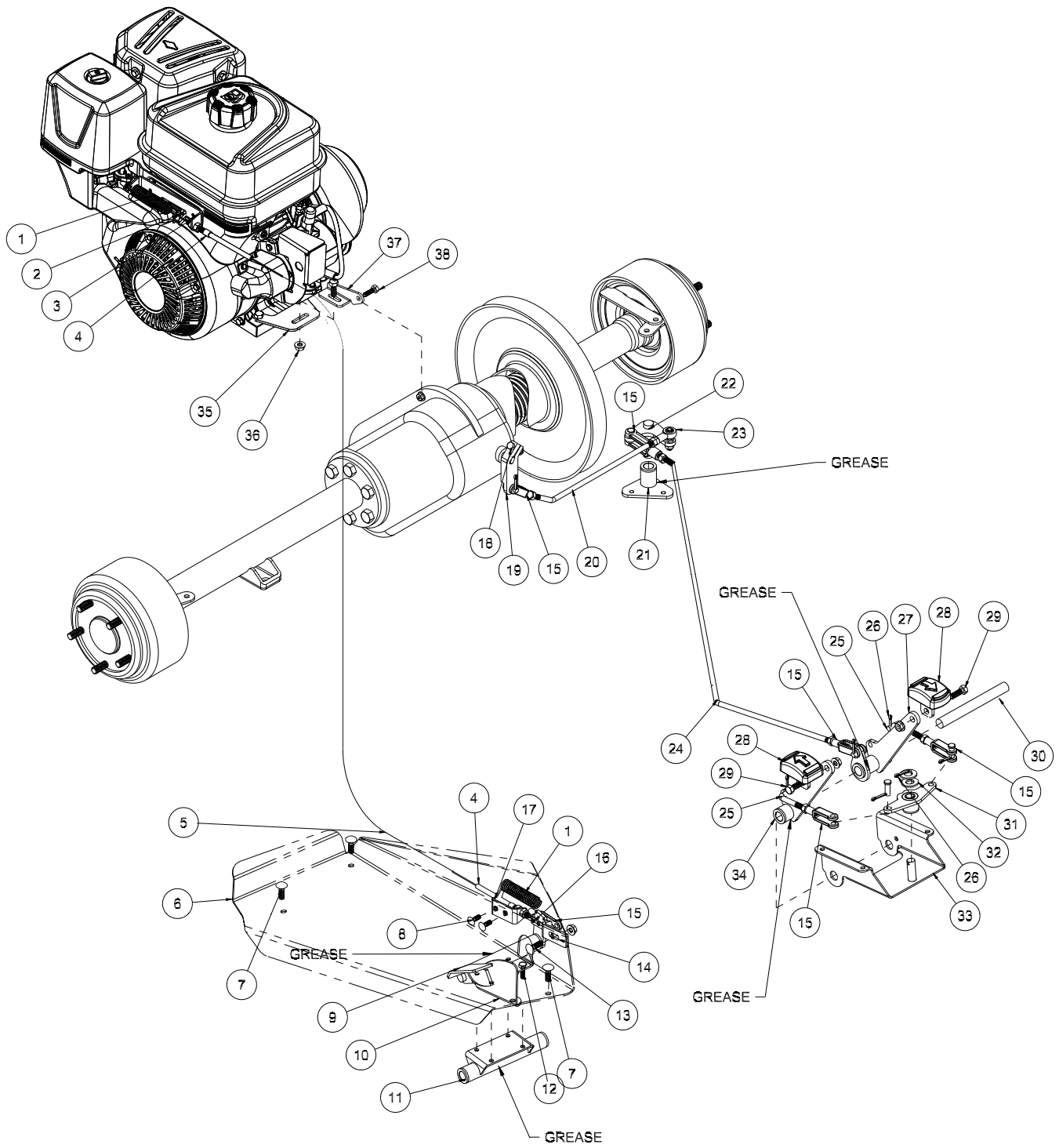
Parts

## FOOT PEDAL LINKAGE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	16-046	Extension Spring	2
2	21-161	Wire Block	1
3	41-045	Throttle Cable Mount	1
4	17-155	Retainer	1
5	17-151	Cable	1
	17-152	Conduit	1
6	41-035	RH Floorboard	1
7	HSTP-516-18-100	Truss Head Screw, $\frac{5}{16}$ -18 x 1	6
	HW-316	Flat Washer, $\frac{5}{16}$	6
	HNTL-516-18	Lock Nut, $\frac{5}{16}$ -18	6
8	HSTP-14-20-075	Truss Head Screw, $\frac{1}{4}$ -20 x $\frac{3}{4}$	2
	HNFL-14-20	Flange Whiz-loc Nut, $\frac{1}{4}$ -20	2
9	41-049	Gas Pedal	1
	76-128	Flange Bushing	2
10	41-079	Throttle Foot Rest	1
11	41-054	Brake Pedal Mount	1
	76-128	Flange Bushing	2
12	HB-14-20-100	Hex Bolt, $\frac{1}{4}$ -20 x 1	4
	HNTL-14-20	Lock Nut, $\frac{1}{4}$ -20	4
13	HSTP-516-18-075	Truss Head Screw, $\frac{5}{16}$ -18 x $\frac{3}{4}$	1
	HNFL-516-18	Flange Whiz-loc Nut, $\frac{5}{16}$ -18	1
14	41-044	Throttle Stop	1
15	11-100	Linkage yoke	6
	HN-516-24	Hex Nut, $\frac{5}{16}$ - 24	6
	HCP-316-100	Clevis Pin, $\frac{3}{16}$ x 1	6
	HP-18-075	Cotter Pin, $\frac{1}{8}$ x $\frac{3}{4}$	6
16	17-153	Clevis	1
	HCP-516-100	Clevis Pin, $\frac{5}{16}$ x 1	1
	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	1
17	41-037	Throttle Cable Bracket	1
18	HB-14-20-100	Hex Bolt, $\frac{1}{4}$ - 20 x 1	1
	HNTL-14-20	Lock Nut, $\frac{1}{4}$ - 20	1
19	52-106	Shaft Input Adapter	1
20	41-067	Short Shift Link	1
21	41-051	Shift Relay	1
	76-128	Flange Bushing	2
	HB-14-20-100	Hex Bolt, $\frac{1}{4}$ - 20 x 1	2
	HNTL-14-20	Lock Nut, $\frac{1}{4}$ - 20	2

# FOOT PEDAL LINKAGE DRAWING

Parts

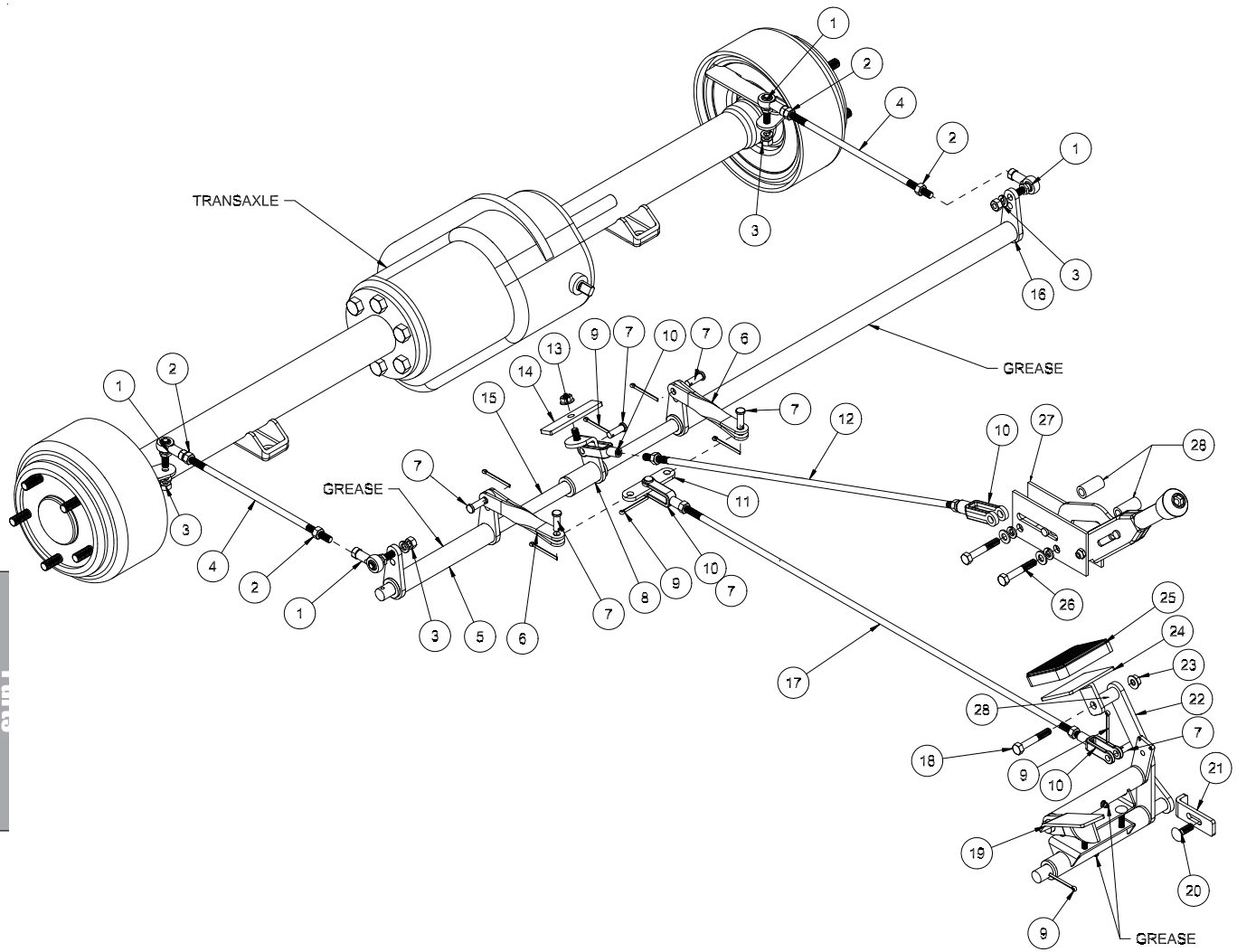




## FOOT PEDAL LINKAGE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
22	41-052	Shift Relay Link	1
23	18-441	Ball Joint	1
	HWL-516	Lock Washer, $\frac{5}{16}$	1
	HN-516-24	Hex Nut, $\frac{5}{16}$ -24	2
24	41-068	Long Shift Link	1
25	41-076	Pedal Link	2
26	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	3
27	41-029	Forward Pedal	1
	76-128	Flange Bushing	2
28	45-022	Molded Foot Pedal	2
29	HBFL-38-16-075	Flange Whiz-Loc Bolt, $\frac{3}{8}$ -16 x $\frac{3}{4}$	2
	HNFL-38-16	Flange Whiz-loc Nut, $\frac{3}{8}$ -16	2
30	41-026	Pedal Pivot Shaft	1
31	41-028	Pedal Relay	1
	18-043	Flange Bushing	1
32	HMB-12-14	Machine Bushing, $\frac{1}{2}$ x 14GA	2
33	41-031	Pedal Relay Mount	1
	HSTP-14-20-100	Truss Head Screw, $\frac{1}{4}$ - 20 x 1	4
	HNFL-14-20	Flange Whiz-loc Nut, $\frac{1}{4}$ - 20	4
34	41-030	Reverse Pedal	1
	76-128	Flange Bushing	1
35	41-039	Engine Brace	1
36	HB-516-18-125	Hex Bolt, $\frac{5}{16}$ -18 x $1\frac{1}{4}$	2
	HNFL-516-18	Flange Whiz-loc Nut, $\frac{5}{16}$ -18	2
37	41-038	Transmission Brace	1
38	HB-14-20-100	Hex Bolt, $\frac{1}{4}$ - 20 x 1	1
	HNFL-14-20	Flange Whiz-loc Nut, $\frac{1}{4}$ -20	1

# BRAKE LINKAGE DRAWING



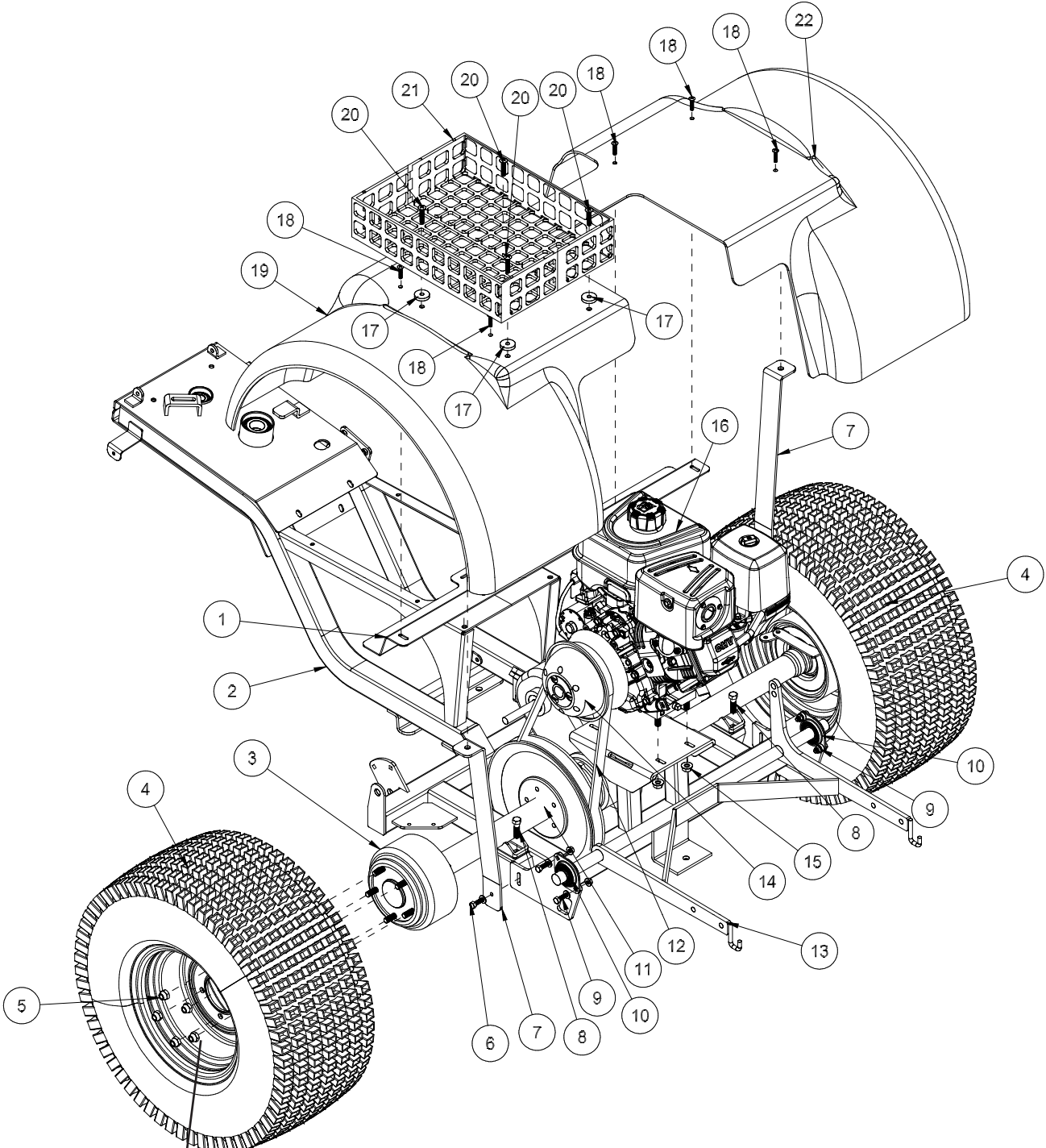
TRUCK

## BRAKE LINKAGE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	18-441	Ball Joint	4
2	HN-516-24	Hex Nut, $\frac{5}{16}$ -24	4
3	HWL-516	Lock Washer, $\frac{5}{16}$	4
4	41-088	Brake Rod	2
5	41-057	Right Hand Brake Relay	1
	76-128	Flange Bushing	2
6	41-061	Brake Link	4
7	HCP-316-100	Clevis Pin, $\frac{3}{16}$ x 1	8
8	41-056	Park Brake Lever	1
	76-128	Flange Bushing	2
9	HP-18-075	Cotter Pin, $\frac{1}{8}$ x $\frac{3}{4}$	8
10	11-100	Linkage Yoke	4
	HN-516-24	Hex Nut, $\frac{5}{16}$ -24	4
11	45-075	Equalizer Link	1
12	41-069	Foot Brake Link	1
13	HB-516-18-100	Hex Bolt. $\frac{5}{16}$ -18 x 1	1
	HNTL-516-18	Lock Nut, $\frac{5}{16}$ -18	1
14	41-047	Equalizer Link	1
15	41-059	Relay Shaft	1
16	41-058	LH Brake Relay	1
	76-128	Flange Bushing	2
17	41-070	Foot Brake Link	1
18	HB-38-16-200	Hex Bolt, $\frac{3}{8}$ -16 x 2	1
19	41-049	Gas Pedal	1
	76-128	Flange Bushing	2
20	HSTP-516-18-075	Truss Head Screw, $\frac{5}{16}$ -18 x $\frac{3}{4}$	1
	HNFL-516-18	Flange Whiz-loc Nut, $\frac{5}{16}$ -18	1
21	41-044	Throttle Stop	1
22	41-053	Brake Pedal	1
23	HNFL-38-16	Flange Whiz-loc Nut, $\frac{3}{8}$ -16	1
24	41-077	Brake Pedal Pad	1
25	15-015	Pedal Pad	1
26	HB-14-20-275	Hex Bolt, $\frac{1}{4}$ -20 x $2\frac{3}{4}$	2
	HWL-14-20	Lock Washer, $\frac{1}{4}$ -20	4
	HNTL-14-20	Lock Nut, $\frac{1}{4}$ -20	2
27	60-106	Brake Lever	1
28	41-060	Spacer	3

# REAR AXLE & ENGINE DRAWING

Parts

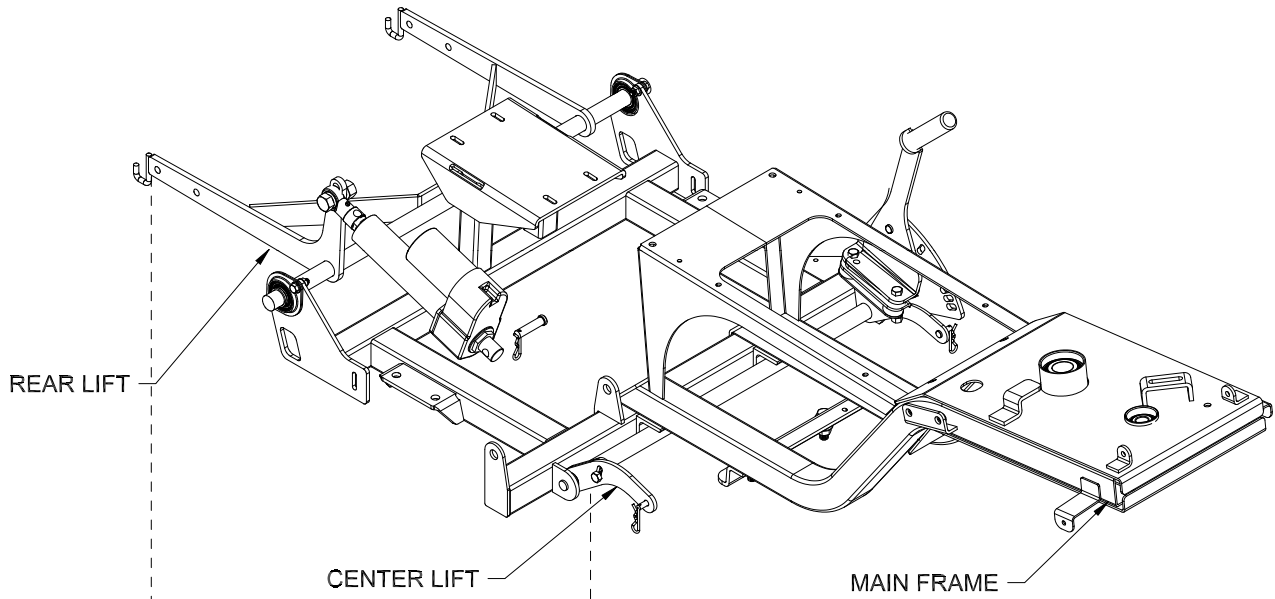


Torque To  
120 ft/lbs(156Nm)

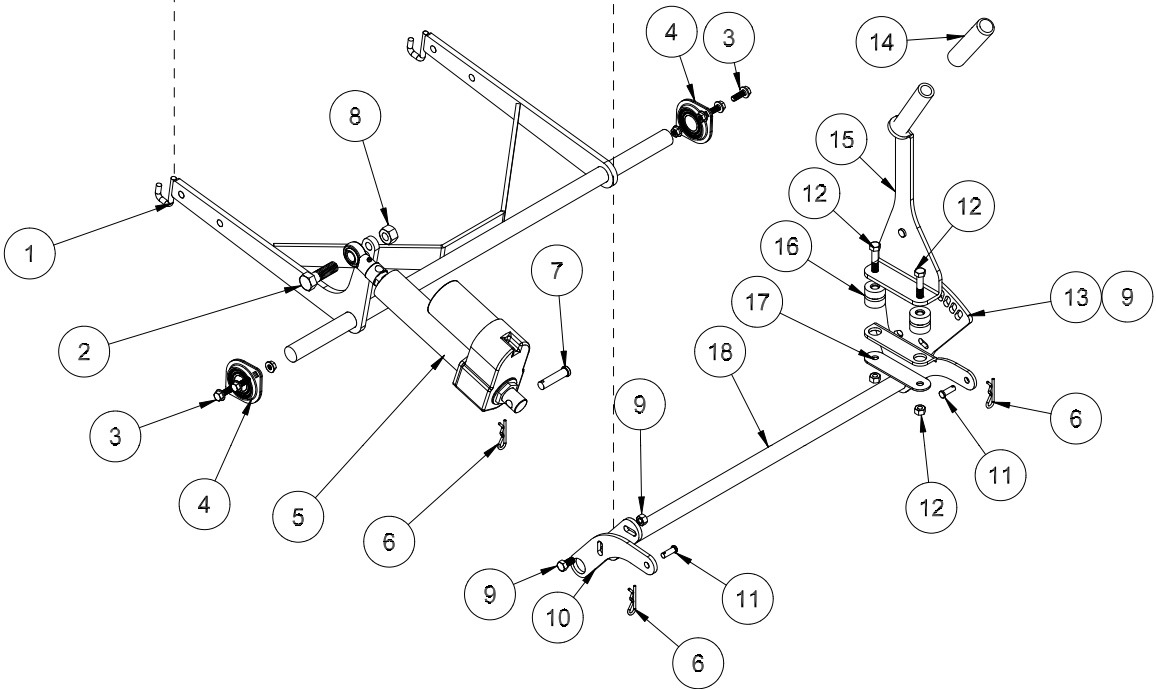
## REAR AXLE & ENGINE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	41-046	Front Fender Mount	1
2	41-025	Main Frame	1
3	41-080	Transaxle	1
4	45-617	Tire & Wheel	2
	45-617-01	Tire, 25 - 10.00 x 12	2
	45-617-02	Wheel	2
5	HNL-12-20	Lug Nut, 1/2 - 20	10
6	HB-516-18-100	Hex Bolt, 5/16 -18 x 1	2
	HW-516	Flat Washer, 5/16	2
	HNTL-516-18	Lock Nut, 5/16 - 18	2
7	41-042	Fender Brace	2
8	HB-716-14-100	Hex Bolt, 7/16 - 14 x 1	4
	HW-716	Flat Washer, 7/16	4
	HNTL-716-14	Lock Nut, 7/16 - 14	4
9	HBCL-516-18-075	Carriage Bolts, 5/16 -18 x 3/4	4
	HNFL-516-18	Flange Whiz-loc Nuts, 5/16 -18	4
10	13-391	Flange Bearing	2
11	41-083	Driven Converter	1
12	41-084	Drive Belt	1
13	41-071	Rear Lift	1
14	52-044	Drive Converter	1
15	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	4
	HB-516-18-125	Hex Bolt, 5/16 -18 x 1 1/4	4
16	41-082	Engine, Briggs & Stratton, 10HP	1
17	HSP-1260-340-250	Spacer	4
18	HSTP-516-18-100	Truss Head Screw, 5/16 -18 x 1	6
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	6
19	41-081	RH Rear fender (fiberglass)	1
20	HSTP-516-18-150	Truss Head Screw, 5/16 -18 x 1 1/2	4
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	4
21	8-532	Crate	1
22	41-094	LH Rear fender (fiberglass)	1

# REAR & CENTER LIFT DRAWING



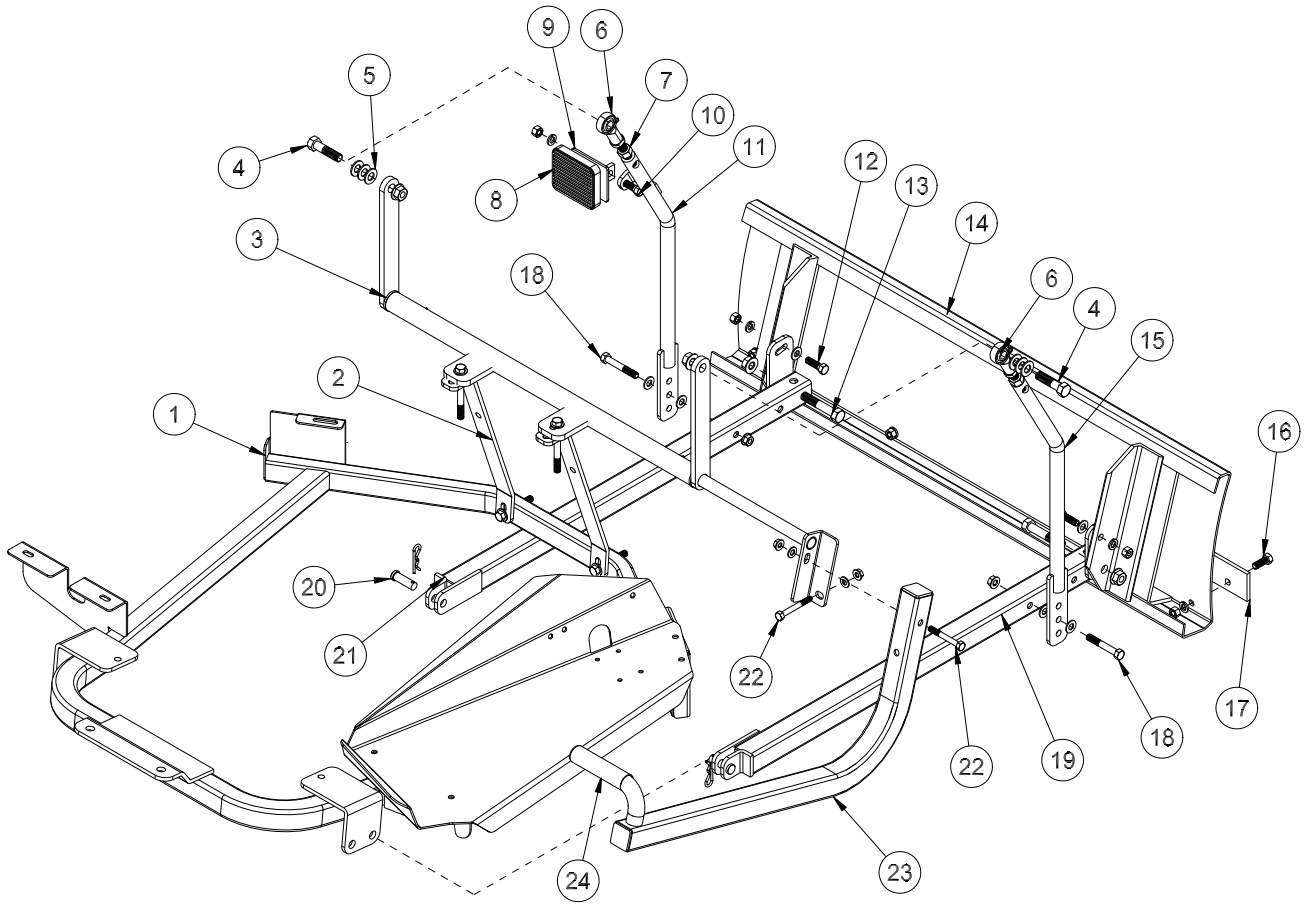
Parts



## REAR & CENTER LIFT PARTS LIST

REF #	PART #	DESCRIPTION	QUANTITY
1	41-071	Rear Lift	1
2	HB-716-14-100	Hex Bolt, $\frac{7}{16}$ - 14 x 1	1
	HW-716	Flat Washer, $\frac{7}{16}$	1
3	HBCL-516-18-075	Carriage Bolts, $\frac{5}{16}$ -18 x $\frac{3}{4}$	4
	HNFL-516-18	Flange Whiz-loc Nuts, $\frac{5}{16}$ -18	4
4	13-391	Flange Bearing	2
5	45-631	4" Electric/Hydraulic Actuator	1
6	HHP-18	Bridge Pin, $\frac{1}{8}$ x 1	3
7	HCP--12-200	Clevis Pin, $\frac{1}{2}$ x 2	1
8	HNTL-716-14	Lock Nut, $\frac{7}{16}$ -14	1
9	HBCL-516-18-100	Carriage Bolt, $\frac{5}{16}$ -18 x 1	3
	HNFL-516-18	Flange Whiz-loc Nut, $\frac{5}{16}$ -18	3
10	41-043	Mount Brace	1
11	HCP-516-100	Clevis Pin, $\frac{5}{16}$ x 1	2
12	HB-38-16-225	Hex Bolt, $\frac{3}{8}$ -16 x $2\frac{1}{4}$	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ -16	2
13	41-062	Lift Lock	
14	15-019	Round Grip	1
15	41-066	Center Lift Handle	1
16	52-124	Rubber Insulator	2
17	41-027	Bushing Plate	1
18	41-065	Center Lift	1
	76-128	Flange Bushing	2

# 13-644 ALUMINUM PLOW



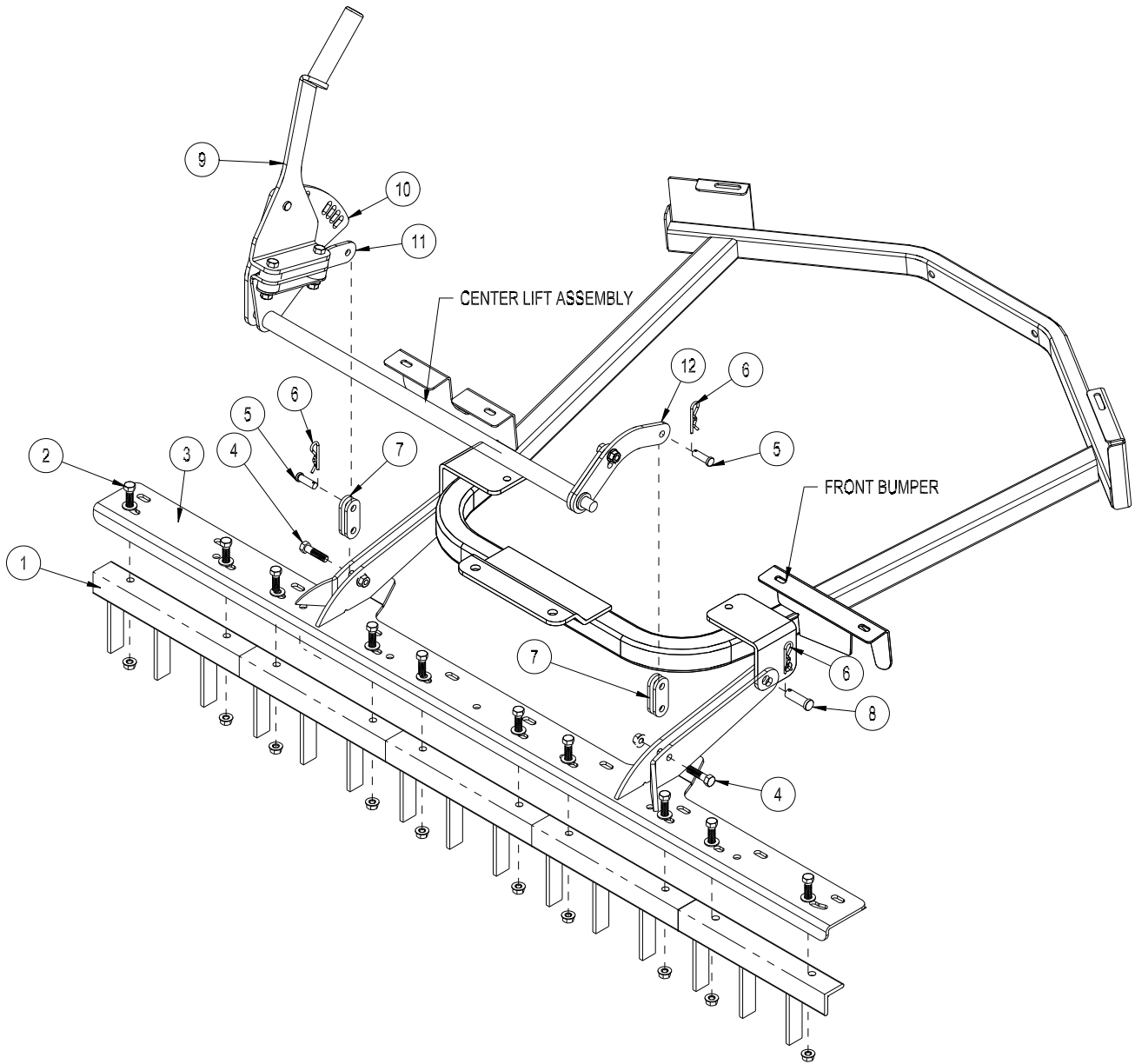
Accessories



# 13-644 SAND PLOW

REF#	PART#	DESCRIPTION	QUANTITY
1		Front Bumper	1
2	13-208	Bumper Brace	2
3	13-642	Lift Handle	1
4	HB-12-13-200	Hex Bolt, 1/2 - 13 x 2	2
	HNCL-12-13	Center Lock Nut, 1/2 - 13	2
5	HMB-12-14	Machine Bushing, 1/2 x 14GA	6
6	80-006	Rod End	2
7	HNJ-12-20	Jam Nut, 1/2 - 20	2
8	15-015	Pedal Pad	1
9	16-062	Pedal Pad Plate	1
10	HB-38-16-125	Hex Bolt, 3/8 - 16 x 1 1/4	1
	HWL-38	Lock Washer, 3/8	1
	HN-38-16	Hex Nut, 3/8 - 16	1
11	13-643	Left Lift Rod	1
12	HB-38-16-125	Hex Bolt, 3/8 - 16 x 1 1/4	2
	HW-38	Flat Washer, 3/8	2
	HNTL-38-16	Lock Nut, 3/8 - 16	2
13	HB-12-13-275	Hex Bolt, 1/2 - 13 x 2 3/4	2
	HNCL-12-13	Center Lock Nut, 1/2 - 13	2
14	27-017	Aluminum Sand Plow Blade(13-644-AB)	1
15	27-073	Right Lift Rod	1
16	HB-38-16 -100	Hex Bolt, 3/8 - 16 x 1	4
	HWL-38	Lock Washer, 3/8	4
	HN-38-16	Hex Nut, 3/8 - 16	4
17	13-167	Wear Blade	1
18	HB-38-16-250	Hex Bolt, 3/8 - 16 x 2 1/2	2
	HW-38	Flat Washer, 3/8	4
	HNTL-38-16	Lock Nut, 3/8 - 16	2
19	13-169	Right Pusher Bar	1
20	HCP-12-150	Clevis Pin	2
	HHP-18	Bridge Pin, 1/8	2
21	13-168	Left Pusher Bar	1
22	HB-516-18-225	Hex Bolt, 5/16 - 18 x 2 1/4	2
	HW-516	Flat Washer, 5/16	2
	HNTL-516-18	Lock Nut, 5/16 - 18	2
23	13-645	Handle	1
24	15-019	Hand Grip	1

# 41-023 SAND CULTIVATOR DRAWING



Reference

## 41-023 SAND CULTIVATOR PARTS LIST

REF#	PART#	DESCRIPTION	QTY
1	42-038	Tine Segment	5
2	HB-38-16-100	Hex Bolt, $\frac{3}{8}$ - 16 x 1	10
	HW-38	Flat Washer, $\frac{3}{8}$	10
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	10
3	41-073	Center Lift Bar	1
4	HB-38-16-150	Hex Bolt, $\frac{3}{8}$ -16 x 1 $\frac{1}{2}$	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	2
5	HCP-38-113	Clevis Pin, $\frac{3}{8}$ X 1 $\frac{1}{8}$	2
6	HHP-18	Bridge Pin, $\frac{1}{8}$	4
7	41-040	Lift Link	4
8	HCP-12-150	Clevis Pin, $\frac{1}{2}$ x 1 $\frac{1}{2}$	2
9*	41-066	Center Lift Handle	1
10*	41-062	Lift Lock	1
11*	41-065	Center Lift	1
12*	41-043	Lift Mount Brace	1

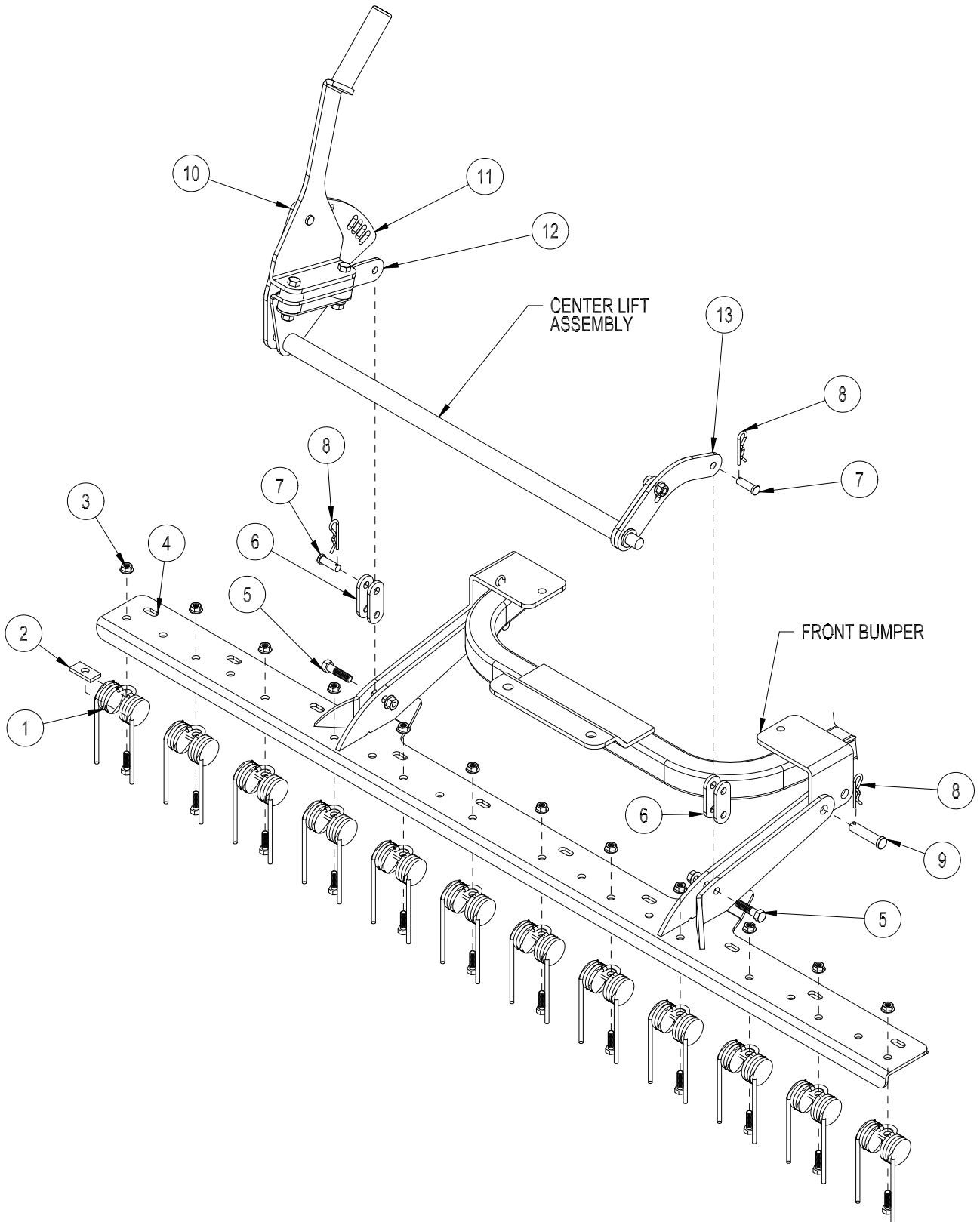
\* Part of machine

## INSTALLATION INSTRUCTIONS

1. Tine segments (Ref 1) should be bolted to the center lift bar (Ref 3). Use the  $\frac{3}{8}$ - 16 x 1 bolts, washers and lock nuts (Ref 2).
2. Attach lift links (Ref 7) to center lift bar (Ref 3) using  $\frac{3}{8}$  x 1 $\frac{1}{2}$  bolt and lock nut (Ref 4) provided.
3. Attach the assembled center lift bar to the front bumper using the clevis pin and bridge pin (Ref 8 & 6).
4. Using Center lift handle (Ref 9), lower center lift assembly to bottom slot on lift lock (Ref 10). Attach Lift Links (Ref 7) to the center lift (Ref 11) and the lift mount brace (Ref 12). secure with clevis and bridge pin (Ref 5 & 6)
5. This is a manual lift attachment. There is a pin that is welded to the lift handle (Ref 9). Flex handle inwards to remove pin from lift lock slot and lower center lift to next slot on lift lock (Ref 9). Continue lowering lift handle until you reach desired cultivating depth or the last slot on lift lock.
6. Test for proper operation.

**NOTE:** For a complete break down of the center lift assembly parts refer to the Rear and Center Lift drawing in the parts manual.

# 41-022 SAND CULTIVATOR DRAWING



Reference

## 41-022 SAND CULTIVATOR PARTS LIST

REF#	PART#	DESCRIPTION	QTY
1	42-122	Rake Spring	12
2	42-177	Spring Holder	12
3	HB-38-16-100	Hex Bolt, $\frac{3}{8}$ - 16 x 1	12
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	12
4	41-074	Center Lift Bar	1
5	HB-38-16-150	Hex Bolt, $\frac{3}{8}$ - 16 x 1 $\frac{1}{2}$	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	2
6	41-040	Lift Link	4
7	HCP-38-113	Clevis Pin, $\frac{3}{8}$ X 1 $\frac{1}{8}$	4
8	HHP-18	Bridge Pin, $\frac{1}{8}$	6
9	HCP-12-150	Clevis Pin, $\frac{1}{2}$ x 1 $\frac{1}{2}$	2
10*	41-066	Center Lift Handle	1
11*	41-062	Lift Lock	1
12*	41-065	Center Lift	1
13*	41-043	Lift Mount Brace	1

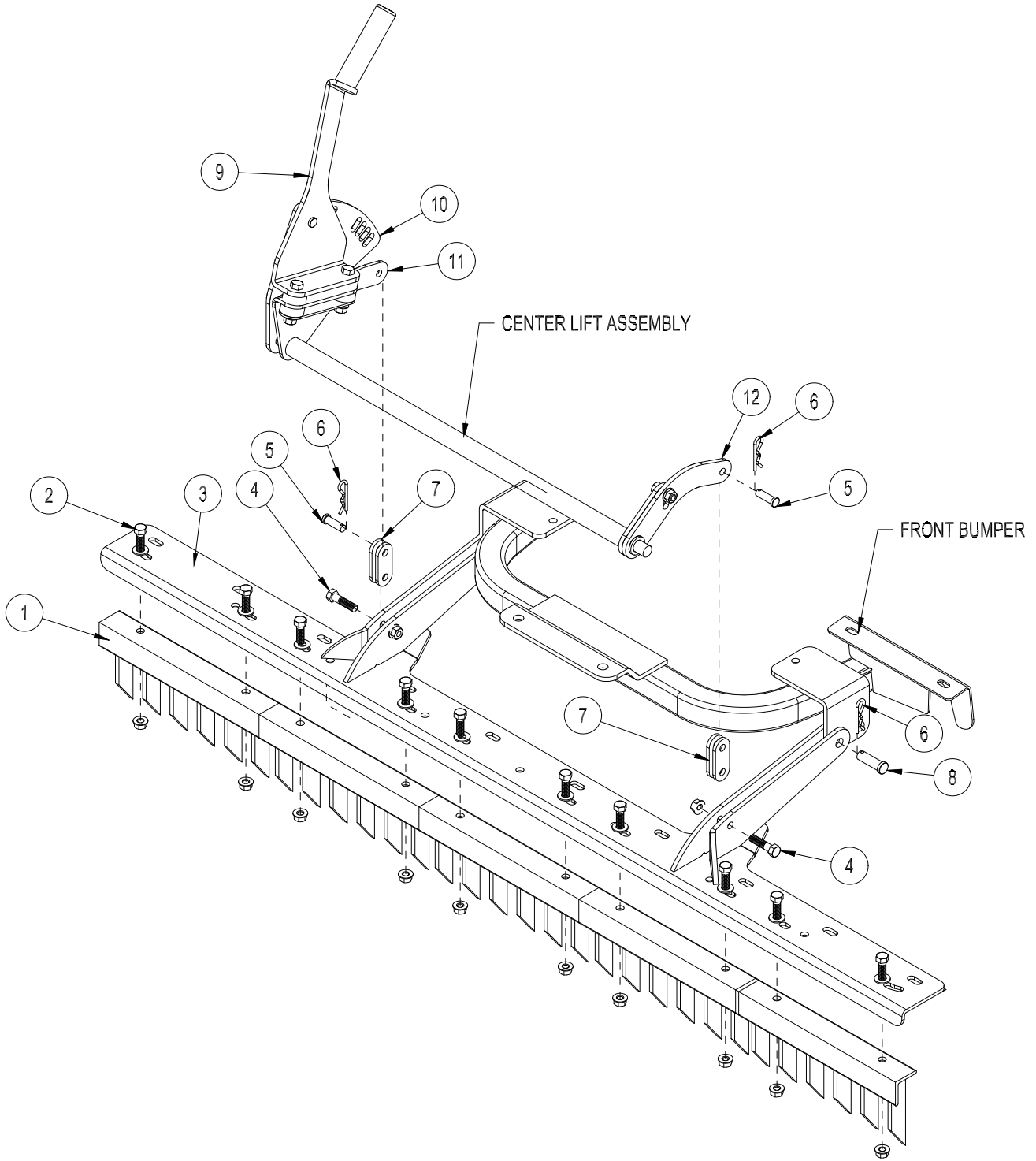
\* Part of machine

## INSTALLATION INSTRUCTIONS

1. Spring tines (Ref 1) should be bolted to the center lift bar (Ref 3). Slide the spring holder (Ref 2) into the spring and bolt to center lift bar using the  $\frac{3}{8}$  - 16 x 1 bolts and lock nuts (Ref 3).
2. Attach lift links (Ref 76 to center lift bar (Ref 4) using  $\frac{3}{8}$  x 1 $\frac{1}{2}$  bolt and lock nut (Ref 5) provided.
3. Attach the assembled center lift bar to the front bumper using the clevis pin and bridge pin (Ref 8 & 9).
4. Using Center lift handle (Ref 10), lower center lift assembly to bottom slot on lift lock (Ref 11). Attach Lift Links (Ref 6) to the center lift (Ref 12) and the lift mount brace (Ref 13). secure with clevis and bridge pin (Ref 7 & 8)
5. This is a manual lift attachment. There is a pin that is welded to the lift handle (Ref 10). Flex handle inwards to remove pin from lift lock slot and lower center lift to next slot on lift lock (Ref 11). Continue lowering lift handle until you reach desired cultivating depth or the last slot on lift lock.
6. Test for proper operation.

**NOTE:** For a complete break down of the center lift assembly parts refer to the Rear and Center Lift drawing in the parts manual.

# 41-023 INFIELD SCARIFIER DRAWING



Reference

## 41-023 INFIELD SCARIFIER PARTS LIST

REF#	PART#	DESCRIPTION	QTY
1	26-042	Tine Segment	5
2	HB-38-16-100	Hex Bolt, $\frac{3}{8}$ - 16 x 1	10
	HW-38	Flat Washer, $\frac{3}{8}$	10
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	10
3	41-073	Center Lift Bar	1
4	HB-38-16-150	Hex Bolt, $\frac{3}{8}$ -16 x 1 $\frac{1}{2}$	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	2
5	HCP-38-113	Clevis Pin, $\frac{3}{8}$ X 1 $\frac{1}{8}$	2
6	HHP-18	Bridge Pin, $\frac{1}{8}$	4
7	41-040	Lift Link	4
8	HCP-12-150	Clevis Pin, $\frac{1}{2}$ x 1 $\frac{1}{2}$	2
9*	41-066	Center Lift Handle	1
10*	41-062	Lift Lock	1
11*	41-065	Center Lift	1
12*	41-043	Lift Mount Brace	1

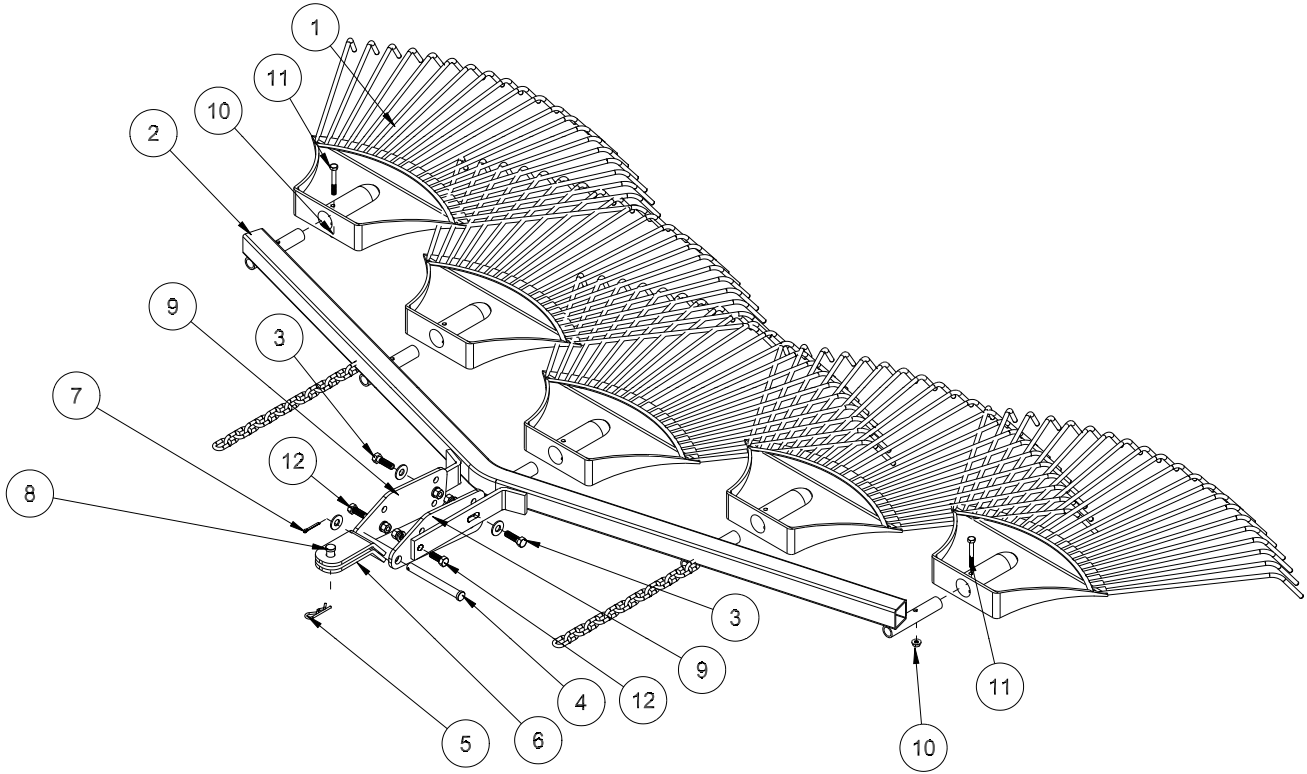
\* Part of machine

## INSTALLATION INSTRUCTIONS

1. Tine segments (Ref 1) should be bolted to the center lift bar (Ref 3). Use the  $\frac{3}{8}$ - 16 x 1 bolts, washers and lock nuts (Ref 2).
2. Attach lift links (Ref 7) to center lift bar (Ref 3) using  $\frac{3}{8}$  x 1 $\frac{1}{2}$  bolt and lock nut (Ref 4) provided.
3. Attach the assembled center lift bar to the front bumper using the clevis pin and bridge pin (Ref 8 & 6).
4. Using Center lift handle (Ref 9), lower center lift assembly to bottom slot on lift lock (Ref 10). Attach Lift Links (Ref 7) to the center lift (Ref 11) and the lift mount brace (Ref 12). secure with clevis and bridge pin (Ref 5 & 6)
5. This is a manual lift attachment. There is a pin that is welded to the lift handle (Ref 9). Flex handle inwards to remove pin from lift lock slot and lower center lift to next slot on lift lock (Ref 9). Continue lowering lift handle until you reach desired cultivating depth or the last slot on lift lock.
6. Test for proper operation.

**NOTE:** For a complete break down of the center lift assembly parts refer to the Rear and Center Lift drawing in the parts manual.

# 13-298 FAN RAKE ATTACHMENT DRAWING



Reference



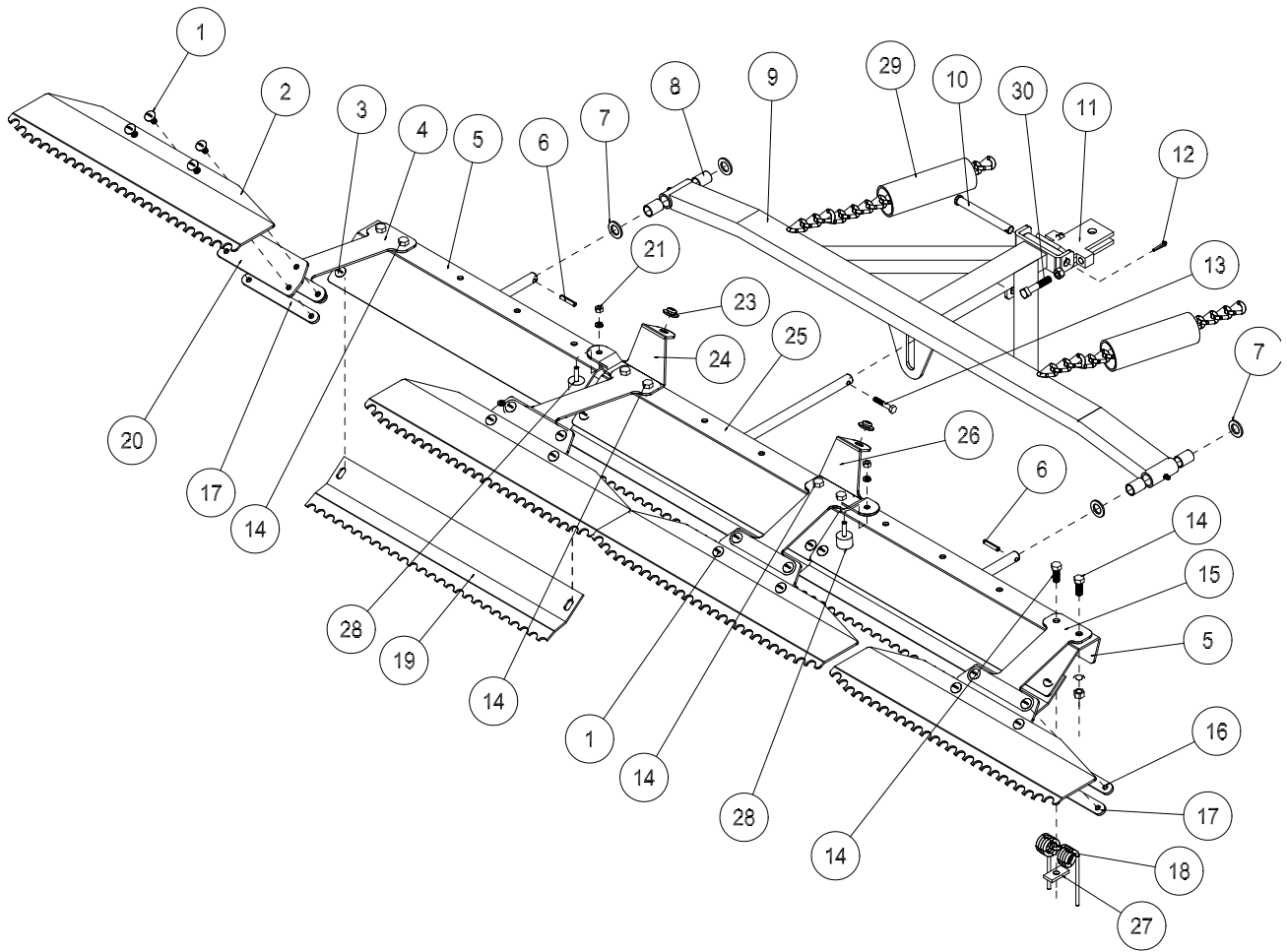
## 13-298 FAN RAKE ATTACHMENT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-310	Rake	5
2	13-306	Frame	1
3	HB-38-16-100	Hex Bolt, $\frac{3}{8}$ - 16 x 1	2
	HN-38-16	Hex Nut, $\frac{3}{8}$ - 16	2
	HWL-38	Lock Washer, $\frac{3}{8}$	2
4	HCP-12-450	Clevis Pin, $\frac{1}{2}$ x $4\frac{1}{2}$	1
5	HHP-18	Bridge Pin, $\frac{1}{8}$	1
6	19-107	Drawbar	1
7	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	1
	HMB-12-14	Machine Bushing, $\frac{1}{2}$ x 14GA	1
8	HCP-12-150	Clevis Pin, $\frac{1}{2}$ x $1\frac{1}{2}$	1
9	13-307	Hitch	2
10	HNTL-14-20	Nylon Lock Nut, $\frac{1}{4}$ - 20	5
11	HB-14-20-200	Hex Bolt, $\frac{1}{4}$ - 20 x 2	5
12	HB-38-16-125	Hex Bolt, $\frac{3}{8}$ - 16 x $1\frac{1}{4}$	2
	HN-38-16	Hex Nut, $\frac{3}{8}$ - 16	2
	HWL-38	Lock Washer, $\frac{3}{8}$	2
	HW-38	Flat Washer, $\frac{3}{8}$	2

## INSTALLATION INSTRUCTIONS

1. Remove the complete rake assembly from the trap rake. Replace the clevis pin and bridge pin in the hitch for future use with the rake.
2. Assemble hitch (Ref 9) to frame (Ref 2) using hardware (Ref 3 and 12). Assemble drawbar (Ref 6) to the hitch using clevis pin (Ref 4), machine bushing and cotter pin (Ref 7), as shown. The different holes in the hitch are for adjusting the angle of the rakes.
3. Assemble the five rakes (Ref 1) to the frame (Ref 2) using  $\frac{1}{4}$  - 20 x 2 bolt and center lock nuts (Ref 10 and 11). Slide the fan rake assembly under the rear of the trap rake to the hitch. Attach the drawbar (Ref 6) to the hitch using the clevis pin (Ref 8) and the bridge pin (Ref 5).
4. Hook the chains from the frame to the hooks on the rake lift.

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

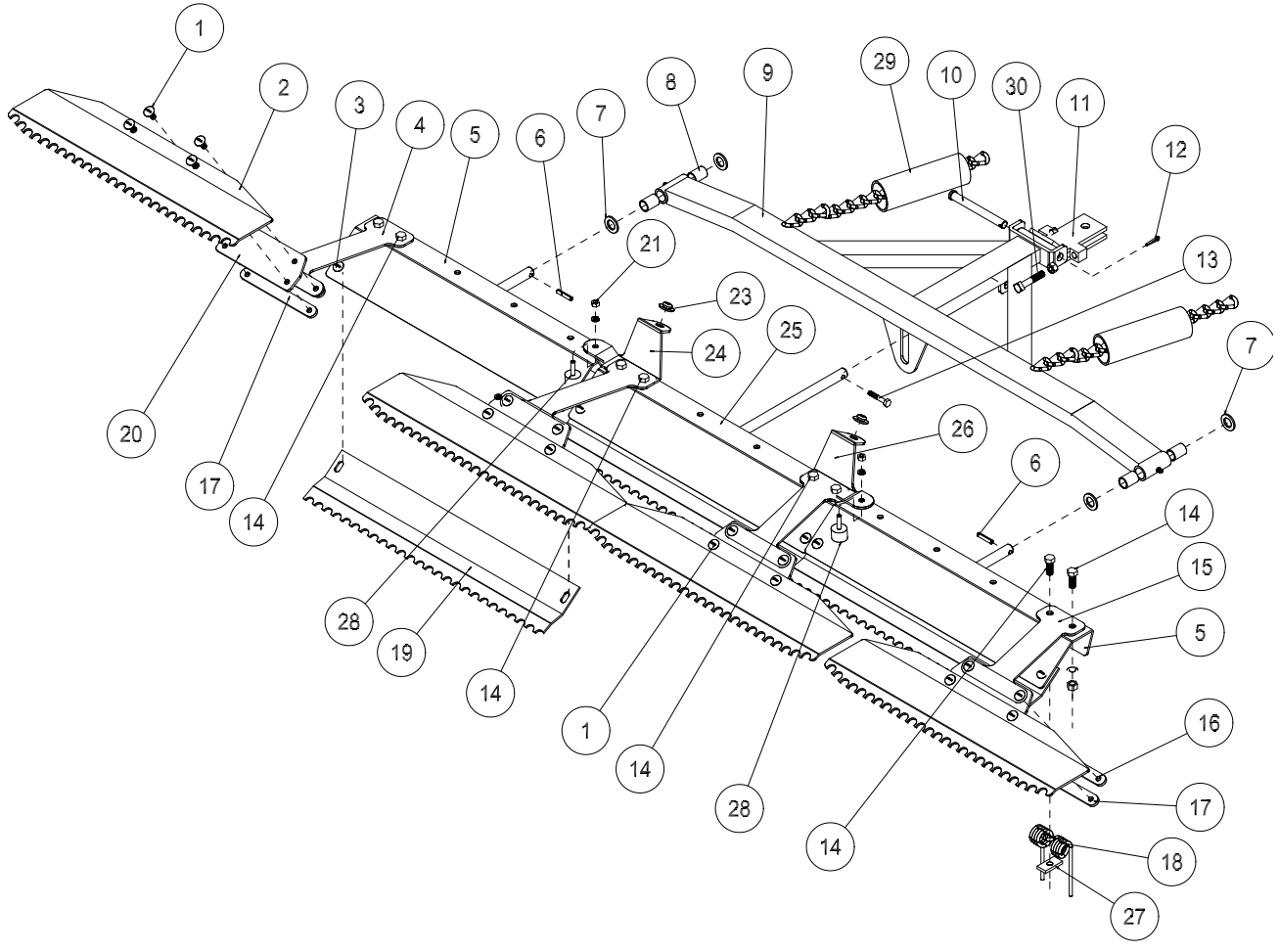


Reference

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

REF#	PART#	DESCRIPTION	QUANTITY
1	HSTP-516-18-100	Phillips Machine Screw, $\frac{5}{16}$ - 18 x 1	16
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	16
2	42-135	Finishing Blades	4
3	HSTP-516-18-075	Phillips Machine Screw, $\frac{5}{16}$ - 18 x $\frac{3}{4}$	6
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	6
4	42-111	Left Outside Mount	1
5	42-102	Outside Rake	2
6	HRP-14-100	Roll Pin, $\frac{1}{4}$ x 1	2
7	HMB-58-14	Machine Bushing, $\frac{5}{8}$ x 14GA	4
8	20-018	Oilite Bushing (comes with 42-100)	4
9	42-100	Draw Bar	1
10	HCP-12-450	Clevis Pin, $\frac{1}{2}$ x 4 $\frac{1}{2}$	1
11	13-647	Hitch	1
	HSSQ-38-16-200	Square Head Set Screw, $\frac{3}{8}$ - 16 x 2 (adjustment screw)	2
	HN-38-16	Hex Nut, $\frac{3}{8}$ - 16	2
	HCP-12-150	Clevis Pin, $\frac{1}{2}$ x 1 $\frac{1}{2}$	1
	HHP-18	Bridge Pin, $\frac{1}{8}$	1
12	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	1
13	HB-14-20-175	Hex Bolt, $\frac{1}{4}$ - 20 x 1 $\frac{3}{4}$	1
	HNTL-14-20	Lock Nut, $\frac{1}{4}$ - 20	1
14	HSTP-38-16-125	Phillips Machine Screw, $\frac{5}{16}$ - 18 x 1 $\frac{1}{4}$	16
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	16
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	HNC-14-20	Cap Nut, $\frac{1}{4}$ - 20	2
	HWL-14	Lock Washer, $\frac{1}{4}$	2
23	42-116	Rubber Insert	2
24	42-110	Left Inside Mount	1
25	42-101	Center Rake	1
26	42-108	Inside Trowel Mount	1
27	42-177	Spring Holder	12
28	15-013	Rubber Bumper	2
29	8892-6	Hose Wrap	2
30	HSSQ-38-16-200	Square Head Set Screw, $\frac{3}{8}$ - 16 x 2 (comes with 13-647)	2
	HN-38-16	Hex Nut, $\frac{3}{8}$ - 16 (comes with 13-647)	2

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

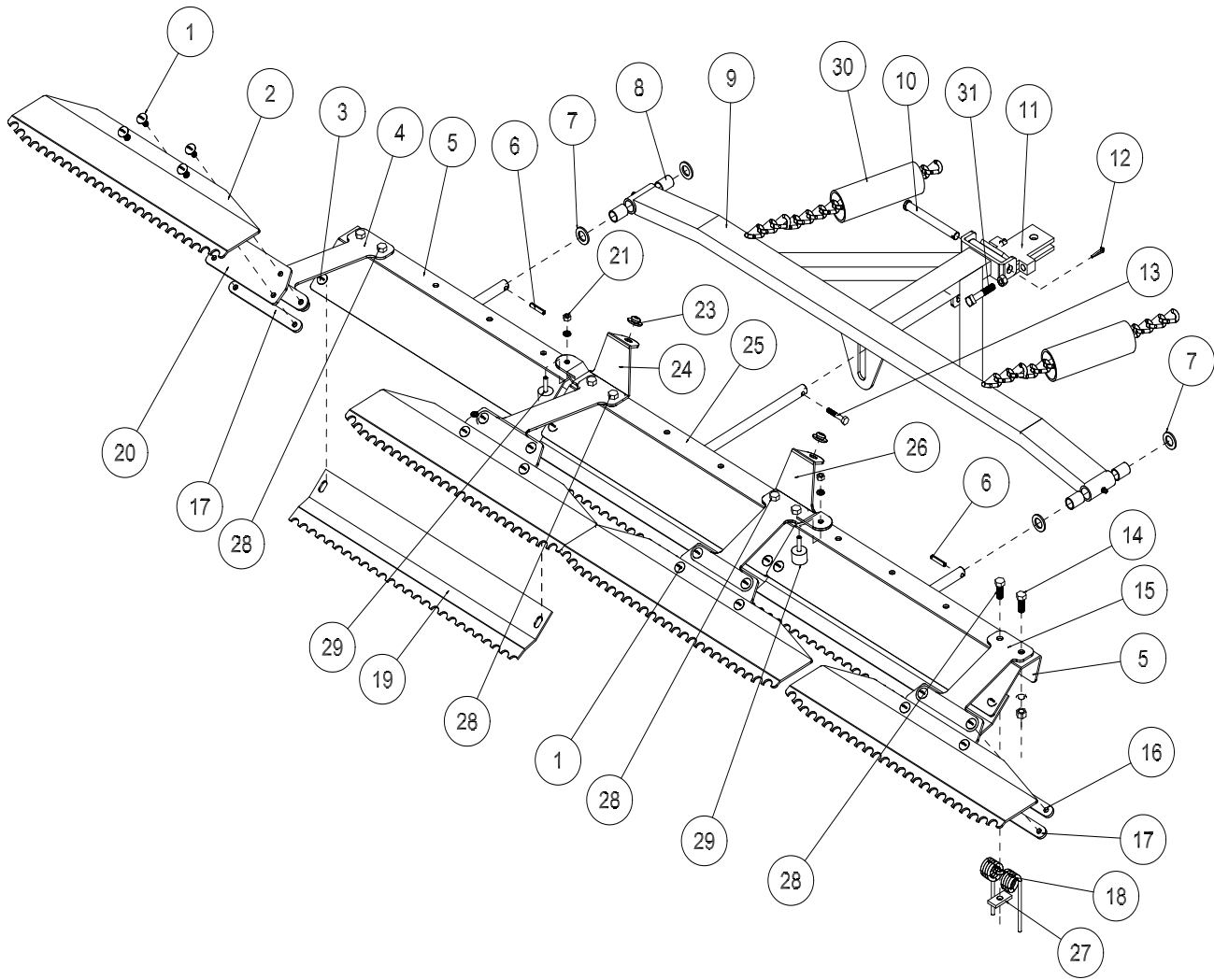


Reference

## RAKE ASSEMBLY INSTRUCTIONS

1. Attach drawbar (Ref 9) to hitch (Ref 11) using clevis pin (Ref 10) and cotter pin (Ref 12).
  2. Bolt rake spring (Ref 18) to rake frames (Ref 5 & 25) using hardware (Ref 14). Leave the two outside holes on right, left, and center rake open.
  3. Attach rubber bumper (Ref 28) using cap nut and washer (Ref 21). Attach the rubber inserts (Ref 23) to the inside mounts (Ref 24 & 26).
  4. Attach the left outside mount (Ref 4), the left inside mount (Ref 24), the outside trowel mount (Ref 15), and the inside trowel mount (Ref 26) to the outside and center rakes (Ref 5 & 25) as shown. Use the 1<sup>1/4</sup>" truss head screws (Ref 14) on the outside hole of each rake. Use the spring holder (Ref 27) and the 1<sup>1/4</sup>" 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.
  5. 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).
  6. Attach center rake (Ref 25) to draw bar (Ref 9) as shown, using 1<sup>3/4</sup> bolts and lock nuts (Ref 13) with the shaft of the center rake between the tabs on the bottom of the drawbar.
  7. 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).
  8. Place the three groomer blades (Ref 19) under the three rake assemblies as shown, using (Ref 3) hardware.
  9. Attach the rake lift to the trap rake hitch.
  10. The end links of chain on the drawbar are to be hooked to the hooks of the trap rake lift.
  11. With the rake on the ground pull the rake to the right side until it is 2-3 inches from the tire.
  12. Using the adjustment screw (Ref 30) on the right side of hitch, adjust the screw until it hits the trap rake hitch, located on rear axle. Lock jam nut so adjustment will not change.
  13. Repeat steps 8 and 9 on left side.
  14. 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 come closer to the tire.

# 42-132 72"(183CM) MILD STEEL TOURNAMENT RAKE DRAWING

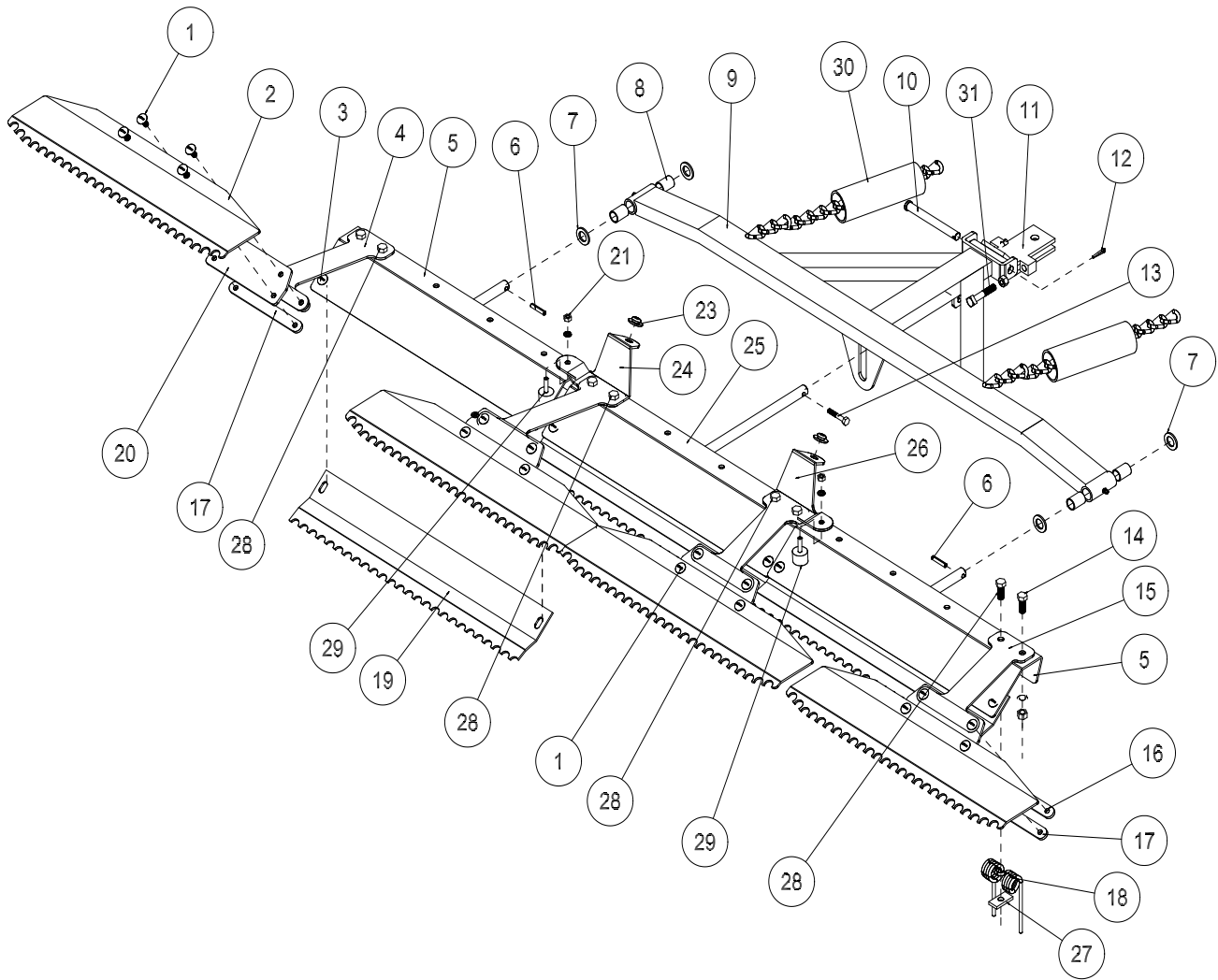


Reference

## 42-132 72"(183CM) MILD STEEL TOURNAMENT RAKE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	HSTP-516-18-100	Phillip Machine Screw, $\frac{5}{16}$ - 18 x 1	16
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	16
2	42-170	Finishing Blades	4
3	HSTP-516-18-075	Phillip Machine Screw, $\frac{5}{16}$ - 18 x $\frac{3}{4}$	6
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	6
4	42-111	Left Outside Mount	1
5	42-140	Outside Rake	2
6	HRP-14-100	Roll Pin, $\frac{1}{4}$ x 1	2
7	HMB-58-14	Machine Bushing, $\frac{5}{8}$ x 14GA	4
8	20-018	Oilite Bushing (comes with 42-141)	4
9	42-141	Draw Bar	1
10	HCP-12-450	Clevis Pin, $\frac{1}{2}$ x 4 $\frac{1}{2}$	1
11	13-647	Hitch	1
	HCP-12-150	Clevis Pin, $\frac{1}{2}$ x 1 $\frac{1}{2}$	1
	HHP-18	Bridge Pin, $\frac{1}{8}$	1
12	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	1
13	HB-14-20-175	Hex Bolt, $\frac{1}{4}$ - 20 x 1 $\frac{3}{4}$	1
	HNTL-14-20	Lock Nut, $\frac{1}{4}$ - 20	1
14	HSTP-516-18-125	Phillips Machine Screw, $\frac{5}{16}$ - 18 x 1 $\frac{1}{4}$	4
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	4
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	HNC-14-20	Cap Nut, $\frac{1}{4}$ - 20	2
	HWL-14	Lock Washer, $\frac{1}{4}$	2
23	42-116	Rubber Insert	2
24	42-110	Left Inside Mount	1
25	42-139	Center Rake	1
26	42-108	Inside Trowel Mount	1
27	42-177	Spring Holder	12
28	HSTP-516-18-125	Phillips Machine Screw, $\frac{5}{16}$ - 18 x 1 $\frac{1}{4}$	12
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	12
29	15-013	Rubber Bumper	2
30	8892-6	Hose Wrap	2
31	HSSQ-38-16-200	Square Head Set Screw, $\frac{3}{8}$ - 16 x 2 (comes with 13-647)	2
	HN-38-16	Hex Nut, $\frac{3}{8}$ - 16 (comes with 13-647)	2

# 42-132 72"(183CM) MILD STEEL TOURNAMENT RAKE DRAWING



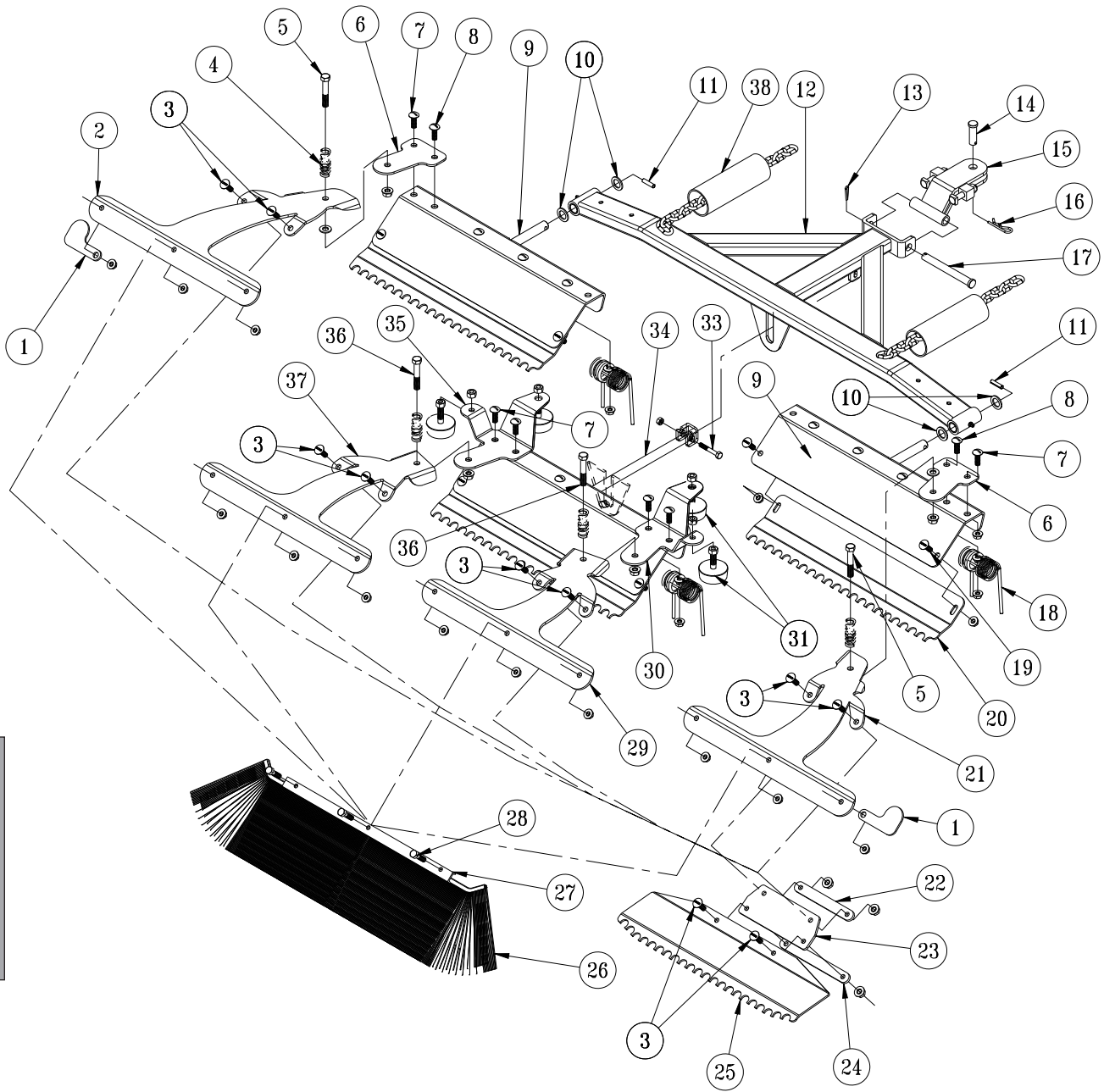
Reference



## RAKE ASSEMBLY INSTRUCTIONS

1. Attach drawbar (Ref 9) to hitch (Ref 11) using clevis pin (Ref 10) and cotter pin (Ref 12).
  2. Bolt rake spring (Ref 18) to rake frames (Ref 5 & 25) using hardware (Ref 28). Leave the two outside holes on right, left, and center rake open.
  3. Attach rubber bumper (Ref 29) using cap nut and lock washer (Ref 21). Attach the rubber inserts (Ref 23) to the inside mounts (Ref 24 & 26).
  4. Attach the left outside mount (Ref 4), the left inside mount (Ref 24), the outside trowel mount (Ref 15), and the inside trowel mount (Ref 26) to the outside and center rakes (Ref 5 & 25) as shown. Use the 1<sup>1/4</sup>" truss head screws (Ref 14) on the outside hole of each rake. Use the spring holder (Ref 27) and the 1<sup>1/4</sup>" truss head screws (Ref 28) to attach rake springs (Ref 18) to the rakes under the left outside and inside mounts and the outside and inside trowel mounts.
  5. 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).
  6. Attach center rake (Ref 25) to draw bar (Ref 9) as shown, using 1<sup>3/4</sup> bolt and lock nut (Ref 13) with the shaft of the center rake between the tabs on the bottom of the drawbar.
  7. Attach the matting (Ref 20) and the top strap (Ref 16) to the inside and outside mounts using the truss head screw <sup>5/16</sup> - 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 <sup>5/16</sup> - 18 x 1 (Ref 1) going through the finishing blade, matting, and bottom strap (Ref 17).
  8. Place the three groomer blades (Ref 19) under the three rake assemblies as shown, using (Ref 3) hardware.
  9. Attach the rake lift to the trap rake hitch.
  10. The end links of chain on the drawbar are to be hooked to the hooks of the trap rake lift.
  11. With the rake on the ground pull the rake to the right side until it is 2-3 inches from the tire.
  12. Using the adjustment screw (Ref 31) on the right side of hitch, adjust the screw until it hits the trap rake hitch, located on rear axle. Lock jam nut so adjustment will not change.
  13. Repeat steps 8 and 9 on left side.
  14. 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.

# 42-391 72"(183CM) ProBRUSH TOURNAMENT RAKE DRAWING



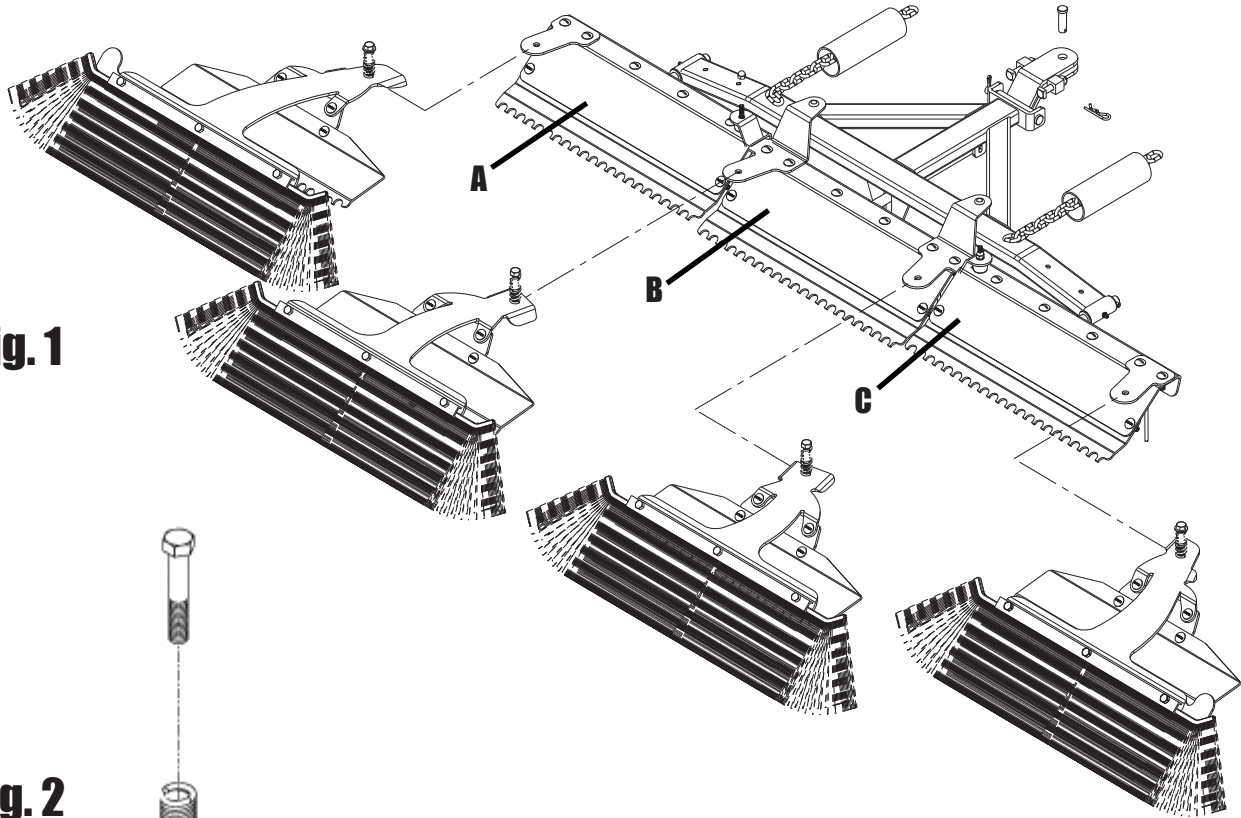
Reference

## 42-391 72"(183CM) ProBrush TOURNAMENT RAKE PARTS LIST

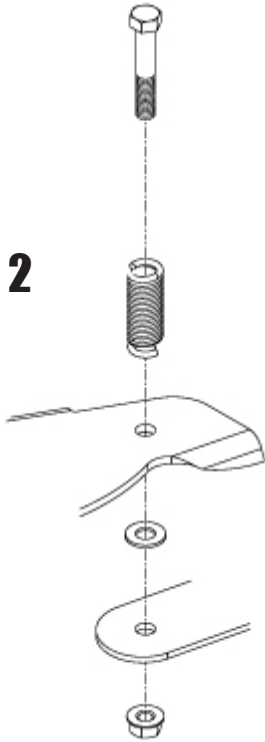
REF#	PART#	DESCRIPTION	QUANTITY
1	42-489	Tip Guard	2
2	42-397	Outside Brush Arm, LH	1
3	HSTP-516-18-100	Phillip Truss Head Screw, 5/16 - 18 x 1	16
	HNFL-516-18	Flange Whiz-Loc Nut, 5/16 - 18	16
4	11-055	Compression Spring	4
5	HB-38-16-275	Hex Bolt, 3/8 - 16 x 2 3/4	2
	HW-38	Flat Washer, 3/8	2
	HNTL-38-16	Lock Nut, 3/8 - 16	2
6	42-396	Outside Brush Arm Mount	2
7	HSTP-516-18-100	Phillips 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	2
10	HMB-58-14	Machine Bushing, 5/8 x 14GA	4
11	HRP-14-100	Roll Pin, 1/4 x 1	2
12	42-141	Draw Bar	1
	20-018	Oilite Bushing (comes with 42-141)	4
13	HP-18-100	Cotter Pin, 1/8 x 1	1
14	HCP-12-150	Clevis Pin, 1/2 x 1 1/2	1
15	13-647	Hitch	1
	HSSQ-38-16-200	Square Head Set Screw, 3/8 - 16 x 2 (comes with 13-647)	2
	HN-38-16	Hex Nut, 3/8 - 16 (comes with 13-647)	2
16	HHP-18	Bridge Pin, 1/8	1
17	HCP-12-450	Clevis Pin, 1/2 x 4 1/2	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
	HNFL-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
	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	50-081	Rubber Bumper	4
	HNFL-38-16	Flange Lock Nut, 3/8 - 16	6
33	HB-14-20-175	Hex Bolt, 1/4 - 20 x 1 3/4	1
	HNTL-14-20	Lock Nut, 1/4 - 20	1
34	42-139	Center Rake	1
35	42-399	Brush Arm Mount, LH	1
36	HB-38-16-250	Hex Bolt, 3/8 - 16 x 2 1/2	2
	HNTL-38-16	Lock Nut, 3/8 - 16	2
37	42-454	Inside Brush Arm, LH	1
38	8892-6	Hose Wrap, 6"	2

# 42-391 72"(183CM) ProBRUSH TOURNAMENT RAKE DRAWING

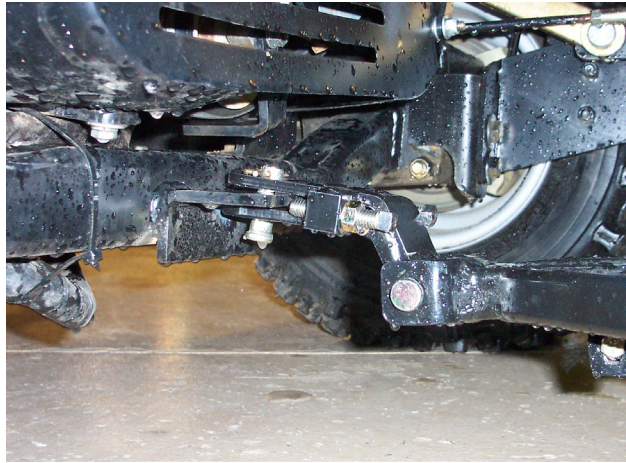
**Fig. 1**



**Fig. 2**



**Fig. 3**



**Fig. 4**



Reference

# 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 33).
4. Mount the Brush/Finish Blade Assemblies to the Brush Arm Mounts (Refs 6, 30 & 35) 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 hitch. Position the Rake so it is centered and equal distance away from the right and left hand tires (2-3 inches). Once positioned, set the Adjustment Screws on the Hitch (Ref 14) so they touch the trap rake hitch. Lock in place with Hex Nuts. **NOTE: Make sure Hitch (Ref 15) is in the position illustrated in Fig 3.**
6. Hook the the chain link to the rake lift hooks.
7. 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 (Ref 14) so the rake comes closer to the tires when turning. For reference see Fig. 5 below.

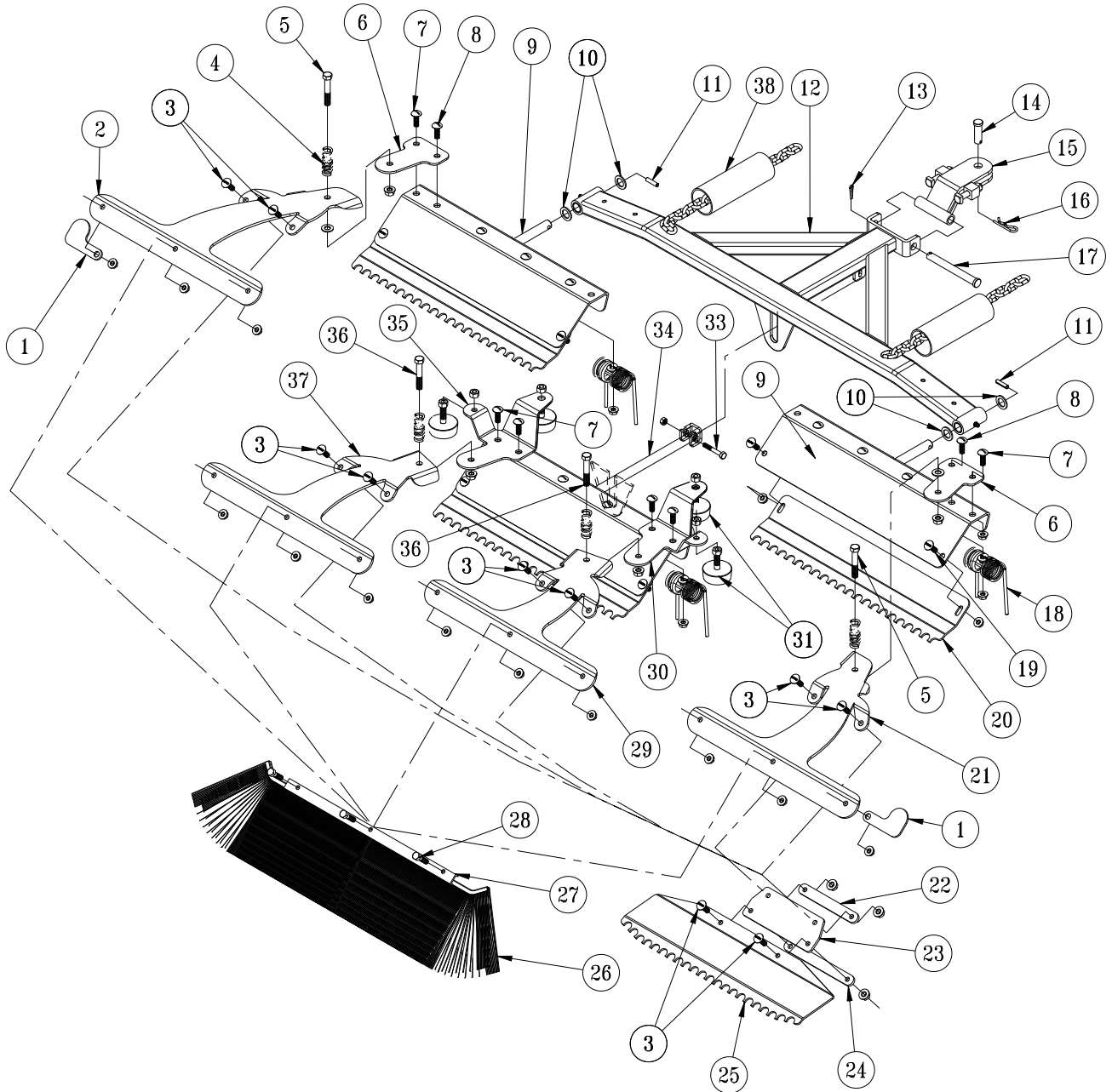
## NOTE:

The Outside Brush/Finish Blade Assemblies may be rotated 180° for transport and for working in narrow areas, as illustrated in Fig.4 on the facing page.



**Fig. 5**

# 42-392 84"(213CM) ProBrush TOURNAMENT RAKE DRAWING

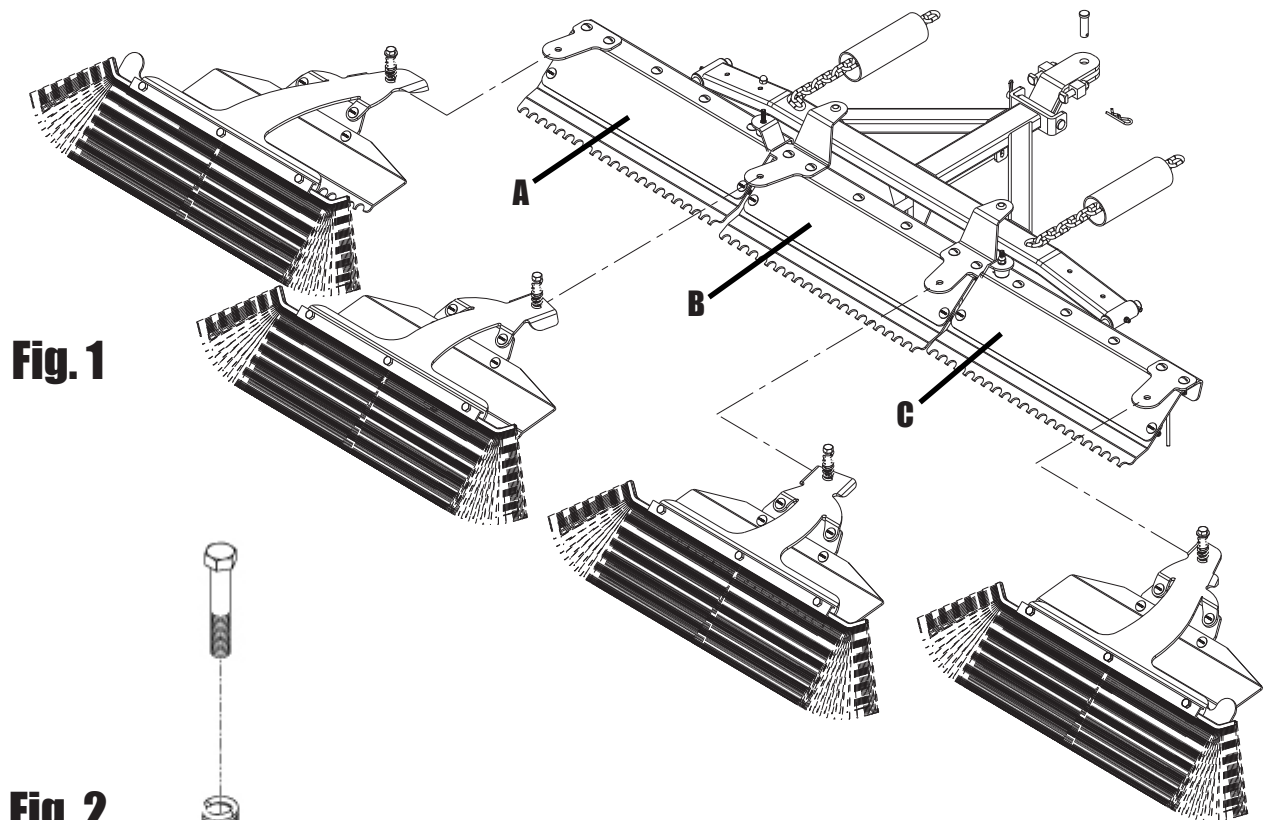


Reference

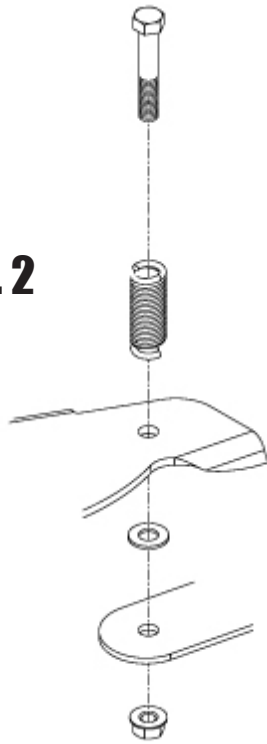
## 42-392 84"(213CM) ProBrush TOURNAMENT RAKE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	42-489	Tip Guard	2
2	42-397	Outside Brush Arm, LH	1
3	HSTP-516-18-100	Phillip Truss Head Screw, $\frac{5}{16}$ - 18 x 1	16
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	16
4	11-055	Compression Spring	4
5	HB-38-16-275	Hex Bolt, $\frac{3}{8}$ - 16 x 2 $\frac{3}{4}$	2
	HW-38	Flat Washer, $\frac{3}{8}$	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	2
6	42-396	Outside Brush Arm Mount	2
7	HSTP-516-18-100	Phillips Truss Head Screw, $\frac{5}{16}$ - 18 x 1	4
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	4
8	HSTP-516-18-125	Phillips Truss Head Screw, $\frac{5}{16}$ - 18 x 1 $\frac{1}{4}$	12
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	12
9	42-102	84" Outside Rake	2
10	HMB-58-14	Machine Bushing, $\frac{5}{8}$ x 14GA	4
11	HRP-14-100	Roll Pin, $\frac{1}{4}$ x 1	2
12	42-100	84" Draw Bar	1
	20-018	Oilite Bushing (comes with 42-141)	4
13	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	1
14	HCP-12-150	Clevis Pin, $\frac{1}{2}$ x 1 $\frac{1}{2}$	1
15	13-647	Hitch	1
	HSSQ-38-16-200	Square Head Set Screw, $\frac{3}{8}$ - 16 x 2 (comes with 13-647)	2
	HN-38-16	Hex Nut, $\frac{3}{8}$ - 16 (comes with 13-647)	2
16	HHP-18	Bridge Pin, $\frac{1}{8}$	1
17	HCP-12-450	Clevis Pin, $\frac{1}{2}$ x 4 $\frac{1}{2}$	1
18	42-122	Rake Spring	12
	42-177	Spring Holder	12
19	HSTP-516-18-075	Phillip Truss Head Screw, $\frac{5}{16}$ - 18 x $\frac{3}{4}$	6
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 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, $\frac{5}{16}$ - 18 x 1 $\frac{1}{4}$	12
	HNFL-516-18	Flange Whiz-Loc Nut, $\frac{5}{16}$ - 18	12
29	42-453	Inside Brush Arm, RH	1
30	42-398	Brush Arm Mount, RH	1
31	50-081	Rubber Bumper	4
	HNFL-38-16	Flange Lock Nut, $\frac{3}{8}$ - 16	6
33	HB-14-20-175	Hex Bolt, $\frac{1}{4}$ - 20 x 1 $\frac{3}{4}$	1
	HNTL-14-20	Lock Nut, $\frac{1}{4}$ - 20	1
34	42-101	84" Center Rake	1
35	42-399	Brush Arm Mount, LH	1
36	HB-38-16-250	Hex Bolt, $\frac{3}{8}$ - 16 x 2 $\frac{1}{2}$	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	2
37	42-454	Inside Brush Arm, LH	1
38	8892-6	Hose Wrap (one per chain)	2

# 42-392 84"(213CM) ProBrush TOURNAMENT RAKE DRAWING



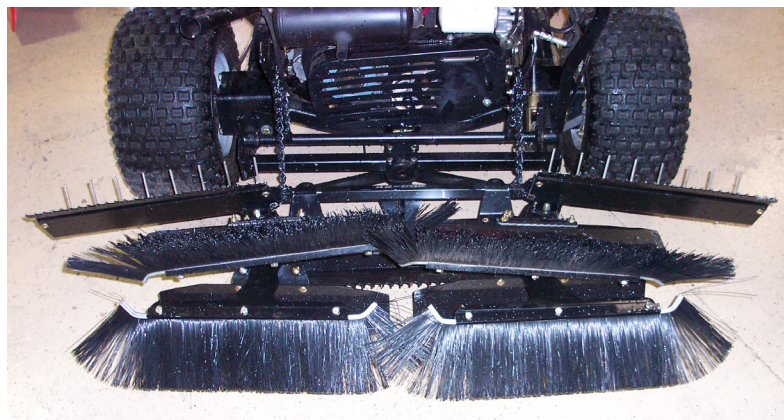
**Fig. 1**



**Fig. 2**



**Fig. 3**



**Fig. 4**

Reference



# 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 33).
4. Mount the Brush/Finish Blade Assemblies to the Brush Arm Mounts (Refs 6, 30 & 35) 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 hitch. Position the Rake so it is centered and equal distance away from the right and left hand tires (2-3 inches). Once positioned, set the Adjustment Screws on the Hitch (Ref 14) so they touch the trap rake hitch. Lock in place with Hex Nuts. **NOTE: Make sure Hitch (Ref 15) is in the position illustrated in Fig 3.**
6. Hook the the chain link to the rake lift hooks.
7. 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 (Ref 14) so the rake comes closer to the tires when turning. For reference see Fig. 5 below.

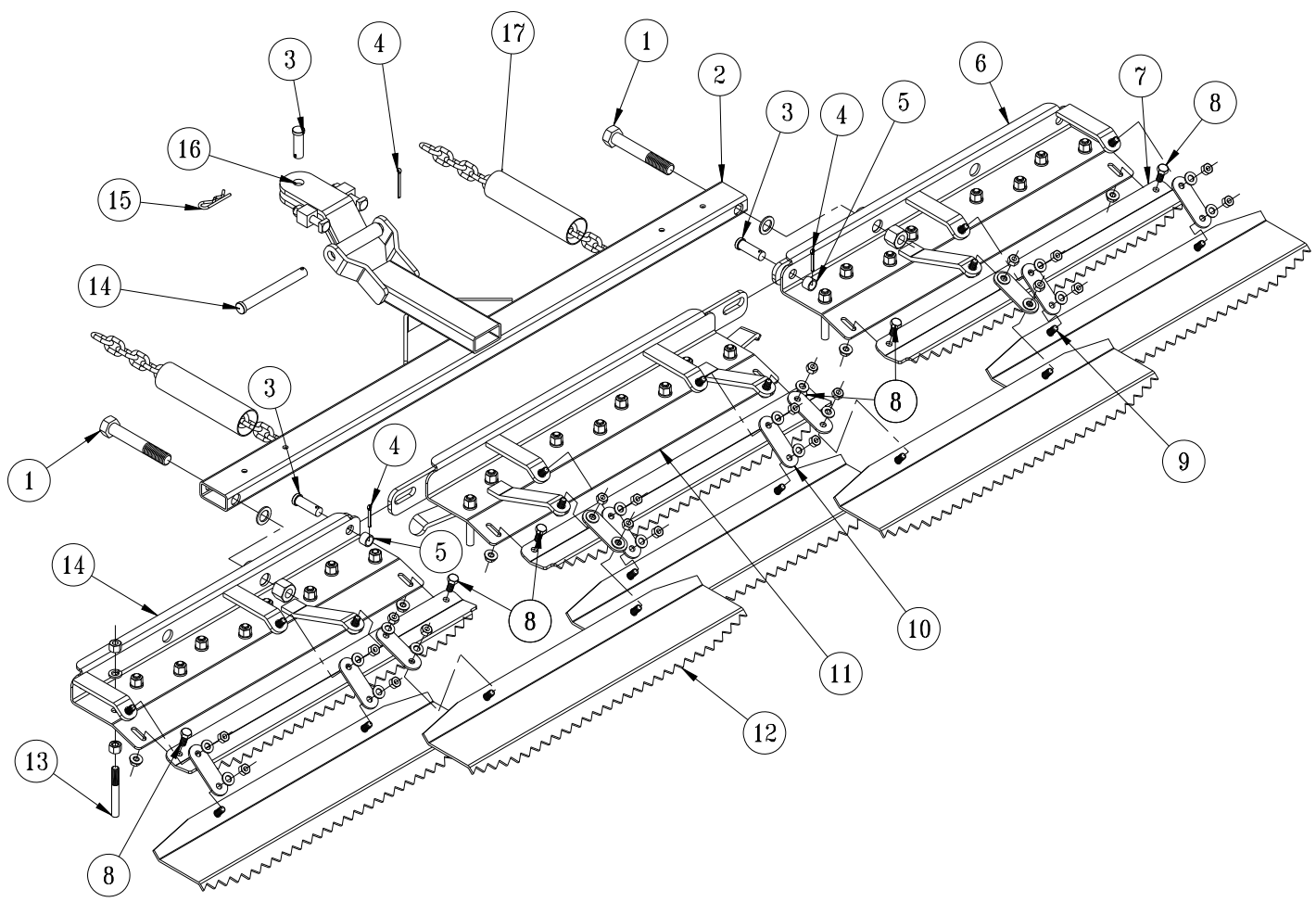
## NOTE:

The Outside Brush/Finish Blade Assemblies may be rotated 180° for transport and for working in narrow areas, as illustrated in Fig.4 on the facing page.

**Fig. 5**



# 13-758-A RAKE ASSEMBLY WITH FINISHING BLADES DRAWING



Reference

## 13-758-A RAKE ASSEMBLY WITH FINISHING BLADES PARTS LIST

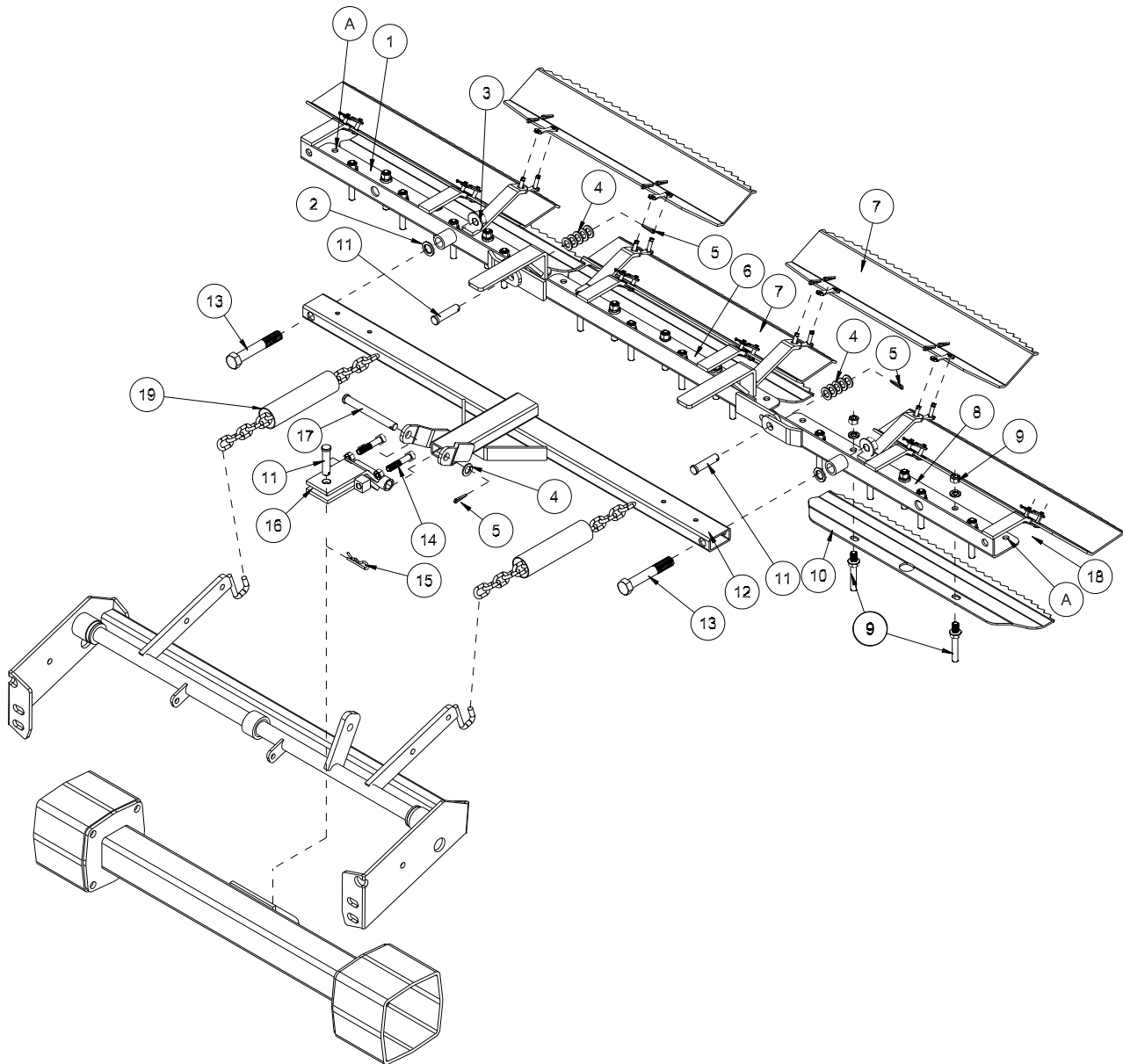
REF#	PART#	DESCRIPTION	QUANTITY
1	HB-58-11-400	Hex Bolt, $\frac{5}{8}$ - 11 x 4	2
	HMB-58-14	Machine Bushing, $\frac{5}{8}$ x 14GA	2
	HNCL-58-11	Lock Nut, $\frac{5}{8}$ - 11	2
2	13-365	Drawbar	1
3	HCP-12-150	Clevis Pin, $\frac{1}{2}$ - 1 $\frac{1}{2}$	3
4	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	3
5	76-275	Spacer	2
6	13-762	Right Rake	1
7	13-759	Grooming Blade	3
8	HB-516-18-075	Hex Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$	6
	HNFL-516-18	Flange Lock Nut, $\frac{5}{16}$ - 18	6
9	HBFL-516-18-075	Flange Lock Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$	20
	HNTL-516-18	Nylon Lock Nut, $\frac{5}{16}$ - 18	20
	HW-516	Flat Washer, $\frac{5}{16}$	20
10	13-757	Rake Connect Strap	10
11	13-761	Center Rake	1
12	13-443	Finishing Blade	5
14	13-763	Left Rake	1
13	13-090	Rake Teeth Kit (studs + hardware)	1
14	HCP-12-450	Clevis Pin, $\frac{1}{2}$ - 4 $\frac{1}{2}$	1
15	HHP-18	Bridge Pin, $\frac{1}{8}$	1
16	13-647	Hitch	1
17	8892-6	Hose Wrap, 6"	2

## INSTALLATION INSTRUCTIONS

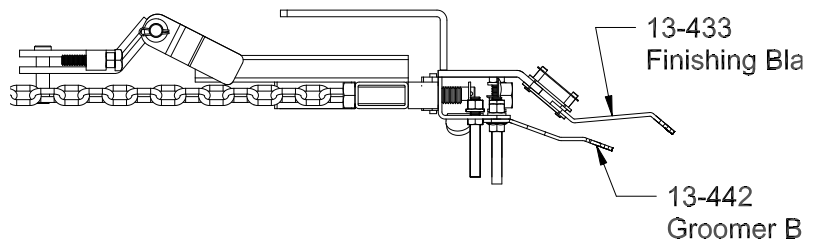
1. Bolt rake teeth (Ref 13) to frames, keeping all the same length.
2. Lay out rake frames (Refs 6, 11 & 14). Connect them using Clevis Pin (Ref 3), Spacer (Ref 5) and Cotter Pin (Ref 4).
3. Attach Left Frame (Ref 14) and Right Frame (Ref 6) to Drawbar (Ref 2) using  $\frac{5}{8}$  Bolt, Machine Bushing, 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 Lock 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 Bolt, Flat Washer and Nylon Lock Nut (Ref 9).
 

**NOTE: Attach Straps using hardware as illustrated, placing Flat Washer on Strap then secure with Lock Nut. Attaching with the Flange Bolt in contact with the Strap will cause the Strap to bind and misalign Finishing Blade.**
6. Attach the hitch (Ref 16) to the rake assembly. Attach the rake assembly to the trap rake using clevis pin and cotter pin (Ref 3 and 4).
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.

# 13-438 RAKE ASSEMBLY WITH FINISHING BLADES DRAWING



Reference



## 13-438 RAKE ASSEMBLY WITH FINISHING BLADES PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-441	Right Rake	1
2	HMB-58-14	Machine Bushing, 5/8 x 14GA	2
3	HNCL-58-11	Lock Nut, 5/8 - 11	2
4	HMB-12-14	Machine Bushing, 1/2 x 14GA	11
5	HP-18-100	Cotter Pin, 1/8 x 1	3
6	13-440	Center Rake	1
7	13-443	Finishing Blade	5
8	13-439	Left Rake	1
9	13-090	Rake Teeth Kit (Studs and Hardware)	1
	19-106	Rake Teeth	25
	HN-38-16	Hex Nut, 3/8 - 16	50
	HWL-38	Lock Washer, 3/8	25
10	13-442	Groomer Blade	3
11	HCP-12-150	Clevis Pin, 1/2 - 1 1/2	3
12	13-365	Drawbar	1
13	HB-58-11-400	Hex Bolt, 5/8 - 11 x 4	2
14	HSSQS-38-16-200	Stainless Steel Square Head Set Screw, 3/8 - 16 x 2	2
	HN-38-16	Hex Nut, 3/8 - 16	2
15	HHP-18	Bridge Pin, 1/8	1
16	13-647	Hitch (includes Ref 14)	1
17	HCP-12-450	Clevis Pin, 1/2 - 4 1/2	1
18	13-417	Connector Link	10
19	8892-6	Hose Wrap	2

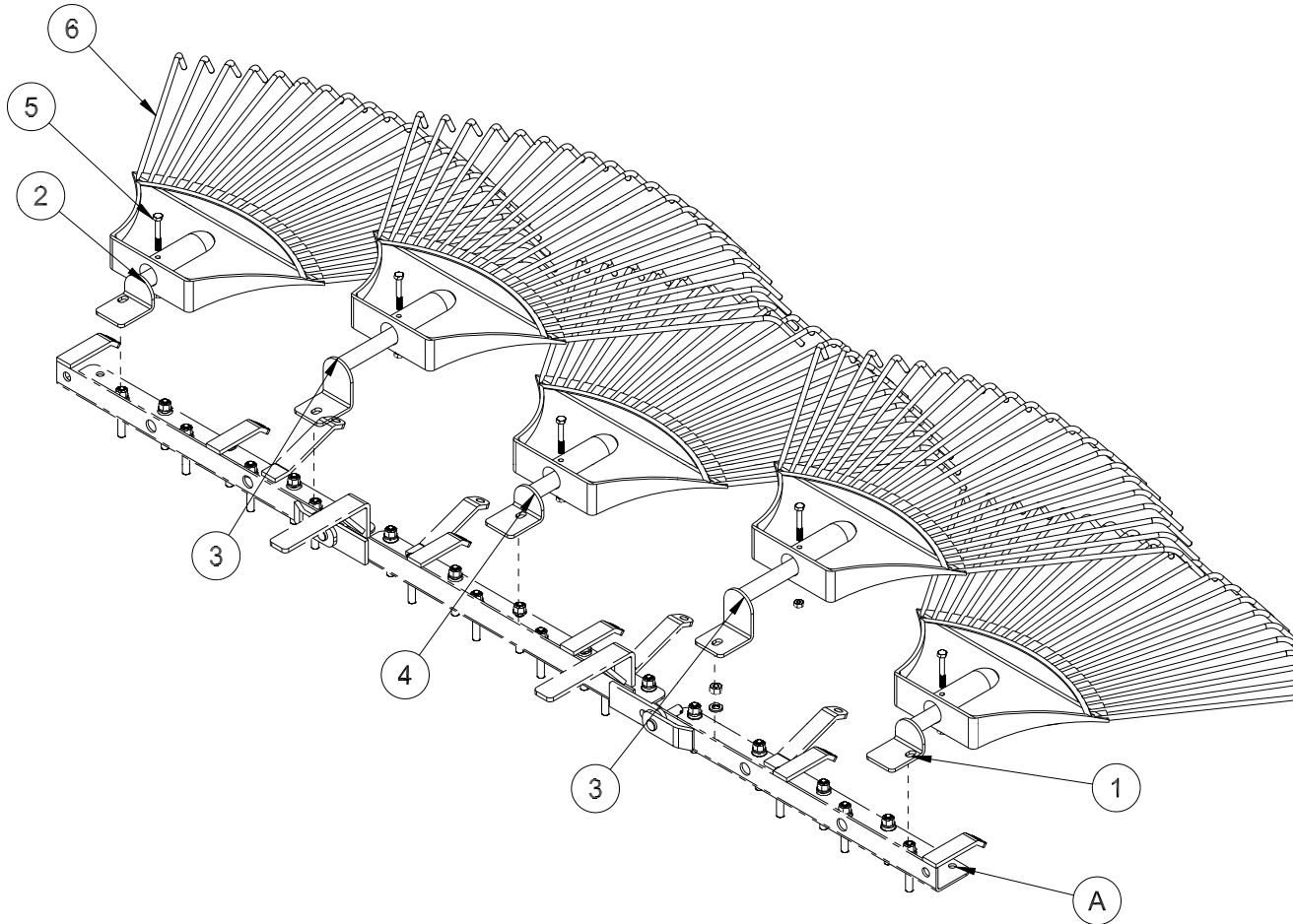
## RAKE ASSEMBLY INSTRUCTIONS

1. Attach drawbar (Ref 12) to hitch (Ref 16) using clevis pin, machine bushing and cotter pin (Ref 17, 4 and 5).
2. Bolt rake teeth (Ref 9) to frames, keeping all the same length. **Leave the two outside holes on right and left rake open (Ref A).**
3. Lay out rake frames (Ref 1,6 and 8). Connect them using clevis pin, machine bushing and cotter pin (Ref 11, 4 and 5).
4. Attach drawbar to left and right frames using bolt, machine bushing, and nut (Ref 13, 2 and 3).
5. Attach five finishing blades (Ref 7) to the tabs of the rake frames using master link (Ref 18). Blades may be mounted with saw tooth up or down, depending on the desired finish of the sand trap.
6. Attach the rake hitch (Ref 16) to trap rake hitch on the rear axle using a clevis pin and bridge pin (Ref 11 and 15).
7. The end links of chain on the drawbar are to be hooked to the hooks of the trap rake lift.
8. With the rake on the ground pull the rake to the right side until it is 2-3 inches from the tire.
9. Using the adjustment screw (Ref 14) on the right, adjust the screw until it hits the trap rake hitch, located on rear axle. Lock jam nut so adjustment will not change.
10. Repeat steps 8 and 9 on left side.
11. 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.
12. **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.

### GROOMER BLADES - GOLF COURSE USE ONLY.

1. Place the three groomer blades (Ref 10) under the three rake assemblies (Ref 1, 6 and 8) .
2. Center blades below rear most row of rake teeth. The blade is designed to miss the outside two "teeth" and fit around the center 'tooth'.
3. Remove the two 'teeth' that line up with slots of each groomer blade. Move blade up and into position and reattach

# 13-319-K FAN RAKE KIT FOR 13-438 RAKE



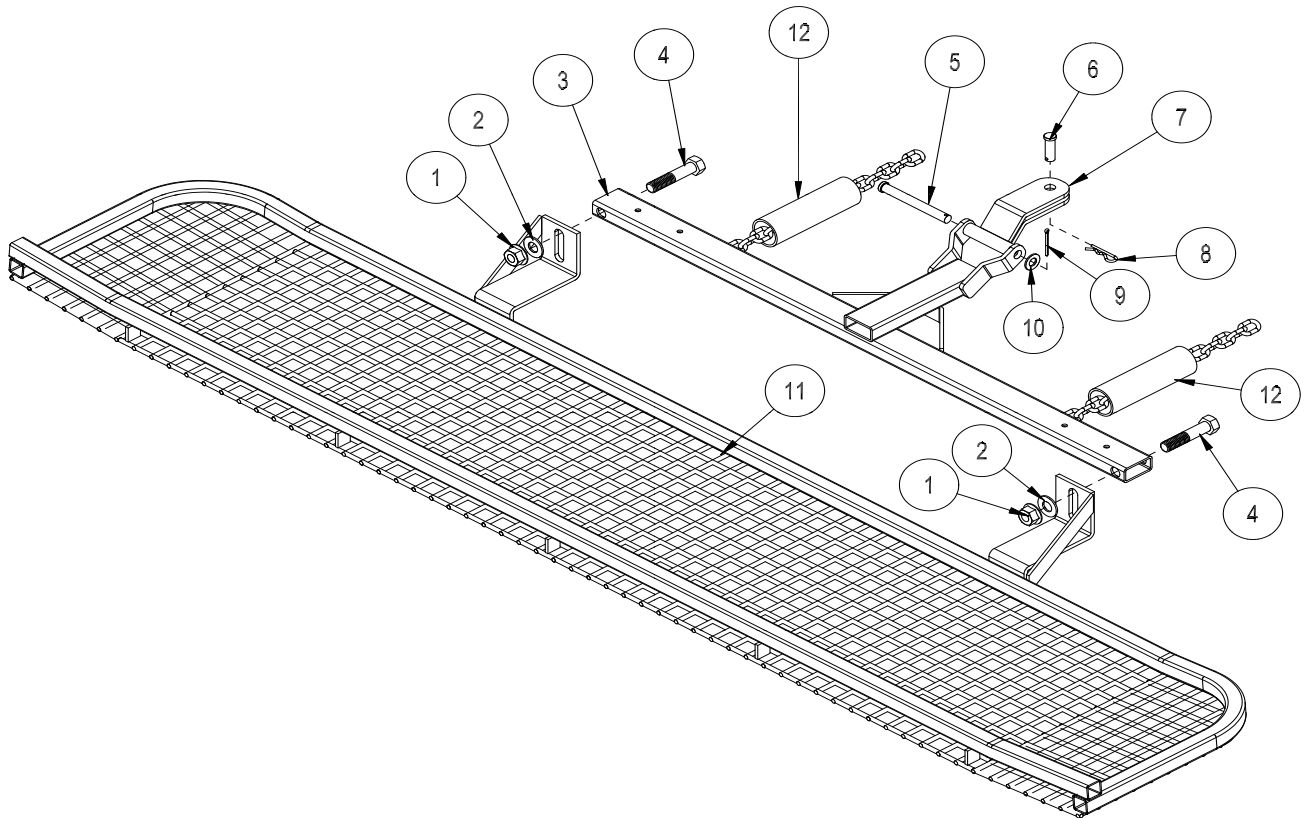
REF#	PART#	DESCRIPTION	QUANTITY
1	13-326	Left Holder	1
2	13-328	Right Holder	1
3	13-329	Long Holder	2
4	13-327	Center Holder	1
5	HB-14-20-200	Hex Bolt, 1/4 - 20 x 2	5
	HNTL-14-20	Nylon Lock Nut, 1/4 - 20	5
6	13-310	Rake	5

A No studs in first slot - Leave Empty.

## FAN RAKE KIT INSTRUCTIONS

1. Assemble the fan rakes (Ref 6) to the frame using the bolt, and lock nuts. (Ref 5). Slide the fan rake assembly under the rear of the trap rake to the hitch.
2. Attach the fan rake assemblies to the top of the frame. Use the nuts and washers that are on the studs to secure in place.
3. 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 the wheels.

## 26-007 PROFESSIONAL INFIELD FINISHER



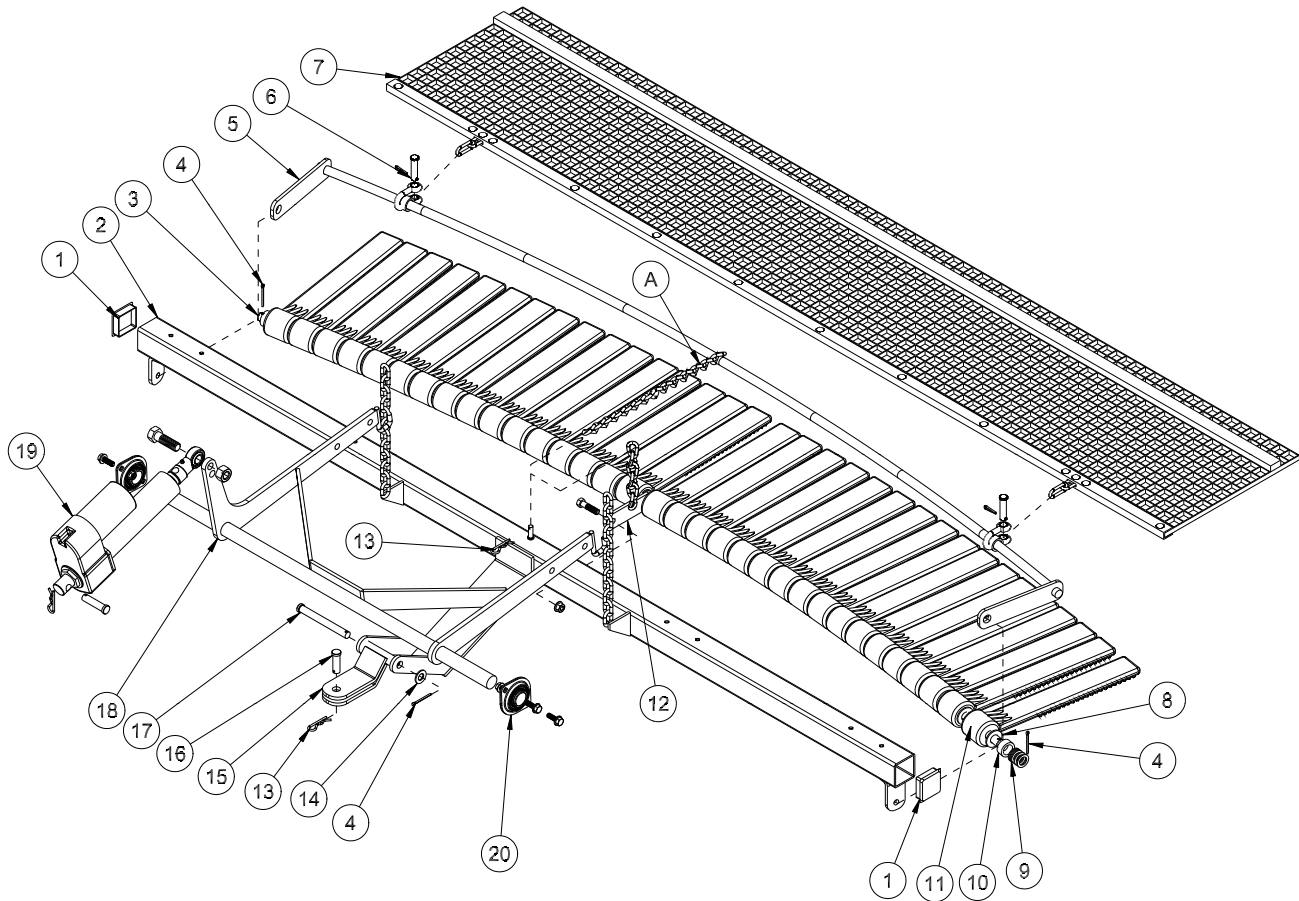
REF#	PART#	DESCRIPTION	QUANTITY
1	HNCL-58-11	Center Lock Nut, $\frac{5}{8}$ - 11	2
2	HW-58	Flat Washer, $\frac{5}{8}$	2
3	13-365	Drawbar	1
4	HB-58-11-300	Hex Bolt, $\frac{5}{8}$ - 11 x 3	2
5	HCP-12-450	Clevis Pin, $\frac{1}{2}$ x $4\frac{1}{2}$	1
6	HCP-12-150	Clevis Pin, $\frac{1}{2}$ x $1\frac{1}{2}$	1
7	19-107	Hitch	1
8	HHP-18	Bridge Pin, $\frac{1}{8}$	1
9	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	1
10	HMB-12-14	Machine Bushing, $\frac{1}{2}$ x 14GA	1
11	26-045	Leveling Screen	1
12	8892-6	Hose Wrap	2

## PROFESSIONAL INFIELD FINISHER INSTALLATION

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

1. Attach leveling screen (Ref 11) to drawbar (Ref 3) using two bolts, washers and center lock nuts (Ref 4, 2, and 1).
2. Attach hitch (Ref 7) to drawbar using clevis pin, machine bushing and a cotter pin (Ref 5, 10 and 9). **Be sure the hitch is flipped to the highest position when using this attachment.**
3. Mount professional field finisher to the hitch on the trap rake with a clevis pin and bridge pin (Ref 6 and 8).
4. Hook chains from finisher to rake lift arms.
5. **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.

# 26-008 FLEX ACTION FIELD FINISHER DRAWING



REF#	PART#	DESCRIPTION	QUANTITY
1	18-297	Cap Plug	2
2	26-046	Frame	1
3	26-049	Mounting Bar	1
4	HP-18-100	Cotter Pin, 1/8 x 1	3
5	26-047	Leveler Bar	1
6	21-260	3/8 Chain Clevis	2
7	26-115	Mesh Finisher	1
8	HW-58	Flat Washer, 5/8	33
9	HMB-58-14	Machine Bushing, 5/8 x 14GA	20
10	11-040	Spacer, 3/4"	2
11	26-041	Rasp Flail	33
12	26-048	Flail Bar Strap	1
	HB-38-16-150	Hex Bolt, 3/8 - 16 x 1 1/2	1
	HNCL-38-16	Center Lock Nut, 3/8 - 16	1
13	HHP-18	Bridge Pin, 1/8	2
14	HMB-12-14	Machine Bushing, 1/2 - 14GA	1
15	19-107	Hitch	1
16	HCP-12-150	Clevis Pin, 1/2 x 1 1/2	1
17	HCP-12-450	Clevis Pin, 1/2 x 4 1/2	1
18	41-071	Rake Lift (comes with machine)	1
19	45-631	Electric Actuator (comes with machine)	1
20	13-391	Flange Bearing (comes with machine)	2

Reference



## 26-008 FLEX ACTION FIELD FINISHER INSTRUCTIONS

1. Install flail bar strap (Ref 12) 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 11) with knobby side down adjacent to sides of flail bar strap (Ref 12). Now install a flat washer (Ref 8) 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 10) to each end of mounting bar adjacent to washer.
4. Install leveler bar (Ref 5) 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 (Ref 9) by spacer to ensure a snug fit.** Then reinstall leveler bar.
5. Lay the frame (Ref 2) on the floor or bench with weld 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 cotter pin (Ref 4).
6. Install flail bar strap (Ref 12) to center tab on frame with  $\frac{3}{8}$  -16 x 1 bolt and  $\frac{3}{8}$  -16 center 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 (Ref 15) to frame with clevis pin (Ref 17), cotter pin (Ref 4) and  $\frac{1}{2}$ " machine bushing (Ref 14). The hitch should be attached to the frame as shown.
8. Install bar strap chain (Ref 12) over welded pin on frame. Install leveler bar chain (Ref A) on to pin and secure in place with bridge pin(Ref 13). Use last and clevis pin (Ref 16) and bridge pin (Ref 13) to hitch field finisher to your machine.

### OPERATING INSTRUCTIONS

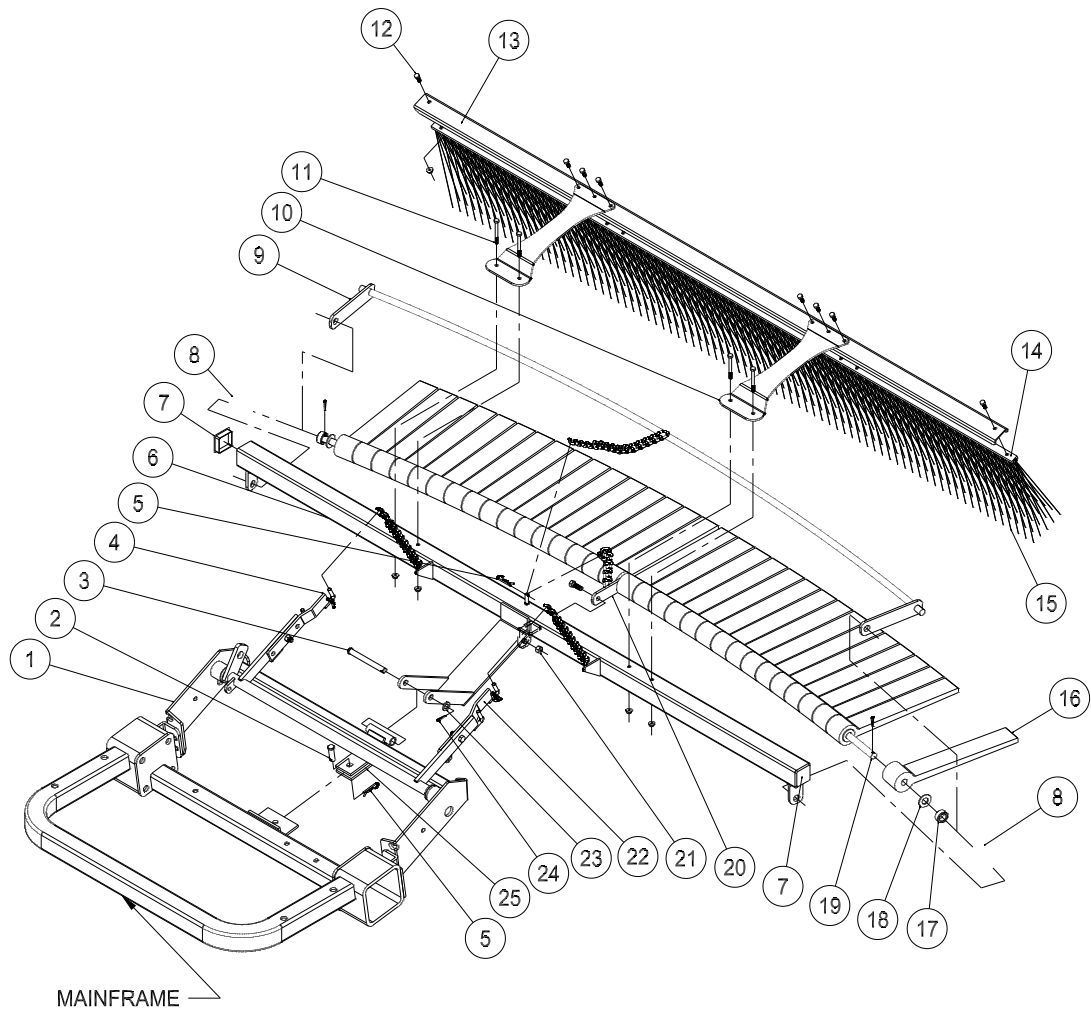
Running attachment with all flails down, flat on the surface, will provide a leveling function. Running attachment partially raised and flails at a 20° - 40° angle in relation to the level surface, will provide a finishing function. The flails increase down pressure for desired finish. Drive in wide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

### MESH FINISHER

To get a smoother finish, Install a Mesh Finisher onto your Flex Action Field Finisher.

1. If the 26-008 Flex Action Field Finisher is on your machine, lower it to the ground. You may have to pull machine ahead slightly so the field finisher is lying flat on the ground or floor.
2. Lay mesh finisher behind field finisher with weight bar facing up and chain hooks towards field finisher.
3. Take the two chain clevis' and hook onto leveler bar and then thorough the chain hooks on mesh finisher. The clevis pin that comes with the chain clevis should go through the chain clevis, first link on chain hook (on the Mesh Finisher) and then through other side of the chain clevis. Insert the cotter pin.
4. Center Mesh Finisher with Flex Action Field Finisher.
5. Raise lift on your machine to insure proper ground clearance before driving your machine.
6. Chain (Ref A) length is to control amount of mesh trailing behind flails for wet or dry conditions. For wet conditions: Shorten chains. For dry conditions: May use maximum amount of chain to make desired finish.

# 43-002 FLEX ACTION FIELD FINISHER WITH BRUSH DRAWING

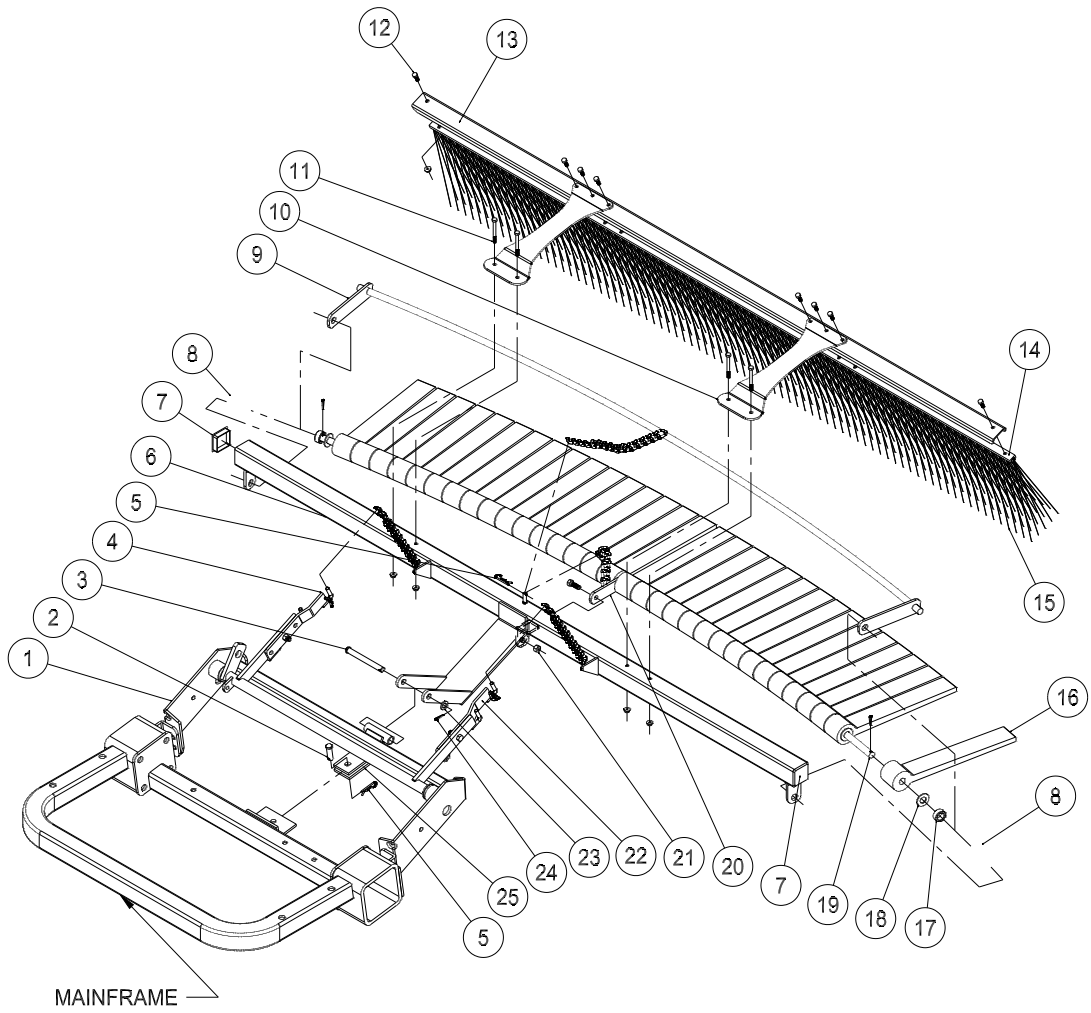


Reference

## 43-002 FLEX ACTION FIELD FINISHER WITH BRUSH PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1		Rake Lift (comes with machine)	1
2	HCP-12-150	Clevis Pin $\frac{1}{2}$ x $1\frac{1}{2}$	1
3	HCP-12-450	Clevis Pin, $\frac{1}{2}$ x $4\frac{1}{2}$	1
4	26-116	Right Extension Arm	1
	HB-38-16-125	Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$	1
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	1
5	HHP-18	Bridge Pin, $\frac{1}{8}$	2
6	26-046	Frame	1
7	18-297	Cap Plug	2
8	HMB-58-14	Machine Bushing $\frac{5}{8}$ x 14GA	20
9	26-047	Leveler Bar	1
10	13-681	Mount Bracket	2
11	HB-14-20-250	Bolt, $\frac{1}{4}$ -20 x $2\frac{1}{2}$	4
	HNFL-14-20	Flange Whiz-Lock Nut, $\frac{1}{4}$ -20	4
12	HB-14-20-075	Bolt, $\frac{1}{4}$ -20 x $\frac{3}{4}$	8
	HNFL-14-20	Flange Whiz-Lock Nut, $\frac{1}{4}$ -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	33
17	11-040	Spacer, $\frac{3}{4}$ "	2
18	HW-58	Washer, $\frac{5}{8}$	33
19	26-049	Mounting Bar	1
	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	2
20	26-048	Flail Bar Strap	1
21	HB-38-16-150	Bolt, $\frac{3}{8}$ - 16 x $1\frac{1}{2}$	1
	16-990	Spacer	1
	HNCL-38-16	Center Lock Nut, $\frac{3}{8}$ - 16	1
22	26-117	Left Extension Arm	1
	HB-38-16-125	Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$	1
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	1
23	HMB-12-14	Machine Bushing, $\frac{1}{2}$ - 14GA	1
24	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	1
25	19-107	Draw Bar Assembly	1

# 43-002 FLEX ACTION FIELD FINISHER WITH BRUSH DRAWING



Reference

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

### ASSEMBLY INSTRUCTIONS

1. Install flail bar strap (Ref 20) to center of mounting bar (Ref 19) 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 (Ref 20). Now install a flat washer (Ref 18) 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 17) 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 next to spacer 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  $\frac{1}{8}$  x 1 cotter pin.
6. Install flail bar strap (Ref 20) to center tab on frame with  $\frac{3}{8}$  -16 x 1 bolt and  $\frac{3}{8}$  -16 center 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 (Ref 25) 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.
9. Add extension arms (Refs 4 & 22) to rake lift.

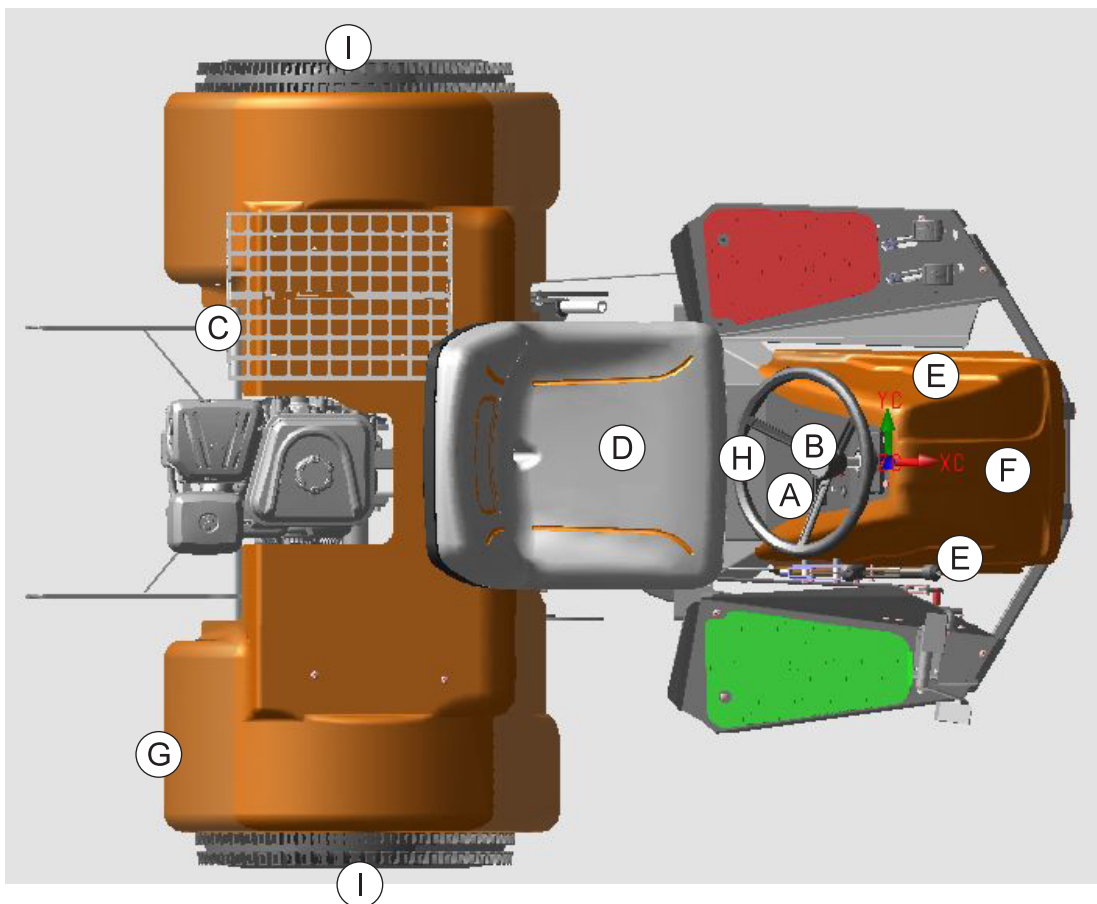
### OPERATING INSTRUCTIONS

Running attachment with all flails down, flat on the surface, will provide a 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.

# DECAL LIST

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

REF#	PART#	DESCRIPTION	QTY
A	41-086	Decal, Dash Panel	1
B	27-077	Decal, Round Smithco	1
C	16-088	Decal, Warning	1
D	25-277	Decal, Battery	1
E	41-091	Decal, Sand Star	2
F	25-373	Decal, Smithco Star, Small	1
G	25-374	Decal, Smithco Star, Large	1
H	25-370	Decal, DbA 88	1
I	25-354	Decal, Tire Pressure 5PSI	3



Reference

# 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  
200 West Poplar Ave.  
Cameron, Wisconsin 54822  
Telephone: 800-891-9435 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 to 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:**

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