

SMITHCO

Wayne, Pennsylvania 19087

**PARTS & SERVICE
MANUAL**

SUPER STAR 2 WHEEL DRIVE

Model 42-001-C Bunker Rake

SUPER STAR 3 WHEEL DRIVE

Model 42-000-C Bunker Rake

Starting Serial #12588 (2WD)

October, 2001

Starting Serial #4602 (3WD)

SMITHCO PRODUCT SUPPORT

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Reference

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

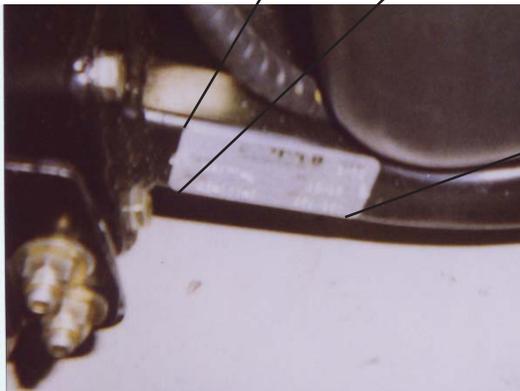
Read this manual and all other manuals pertaining to the Super Star carefully as they have safety, operating, assembly and maintenance instructions. Failure to do so could result in personal injury or equipment damage.

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.

All **SMITHCO** machines have a Serial Number and Model Number. Both numbers are needed when ordering parts. The serial number plate on the Super Star is located on the rear axle. Refer to engine manual for placement of engine serial number.

For easy access record your Serial and Model numbers here.

SMITHCO		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"/>



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

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. Keep engine clean. Allow the engine to cool before storing and always remove the ignition key.
11. 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 and baseball fields. Other use is forbidden.



WEIGHTS AND DIMENSIONS

Length	64" (163 cm)
Width	57" (145 cm)
Height	47" (119 cm)
Wheel Base	41" (104 cm)
Weight	950 lbs. (451 kg)

SOUND LEVEL

At Ear Level	85 dB
At 3ft (.914 m)	83 dB
At 30 ft (9.14 m)	73 dB

ENGINE

	2 WHEEL DRIVE	3 WHEEL DRIVE
Make	Briggs and Stratton Vanguard	Briggs and Stratton Vanguard
Model#	303447	350447
Type / Spec#	1131E1	1109E1
Horsepower	16 hp (11.9 kW)	18 hp (13.4 kW)
Fuel	Unleaded 87 Octane Gasoline Minimum	
Cooling System	Air Cooled	
Lubrication System	Full Pressure	
Alternator	16 amp	

WHEELS & TIRE

Three: 22 X 11 - 10.0 Knobby Tires 5 psi (.35 bar)
 Front tire fluid filled to 80 lbs. total 45.5 pints of windshield washer fluid or equivalent.

Speed

Forward Speed	0 to 11 m.p.h. (0-18 kph)
Reverse Speed	0 to 5 m.p.h. (0-8 kph)

BATTERY

	Automotive Type 45-12 Volt
BCI Group	Size 45
Cold Cranking Amps	480
Ground Terminal Polarity	Negative (-)
Maximum Length	9" (23 cm)
Maximum Width	5.38" (14 cm)
Maximum Height	9" (23 cm)

FLUID CAPACITY

Crankcase Oil	See Engine Manual
Fuel	20 quarts (18.93 liters)
Hydraulic Fluid	20 quarts (18.93 liters)
Grade of Hydraulic Fluid	SAE 10W-40 API Service SJ or higher Motor Oil

OPTIONAL EQUIPMENT

42-200	Super Star Baseball Field Groomer (comes with 26-008, 42-178 and 42-011)	
42-302	On/Off valve Kit (Dealer Installed)	13-298 Fan Rake Attachment
42-011	Front Mounted Manual Plow	34-191 Box Grader
42-230/42-231	Hydraulic Front Mounted Plow	34-190 Spiker
42-136	Front Mounted 60" Manual Plow	26-007 Professional Infield Finisher
43-002	Flex Action Field Finisher with Brush	26-008 Flex Action Field Finisher
42-178	Infield Scarifier (w/ Straight Blades & Castor Wheels)	42-185 Drag Mat Kit
42-179	Infield Scarifier (w/ Chisel Blades & Castor Wheels)	42-188 Drag Mat Carrier (only)
42-008	Sand Cultivator	42-223 Edger Kit
42-010	Construction Leveling Blade	42-315 Light Kit
13-438	Rake Assembly with Finishing Blades	42-750 Razor Edger Kit
13-684	Brush Kit (for 13-438 and 13-606)	42-569 RBS Mount Kit for Super Star
13-606	Rake Assembly with Lexan Blades	42-550 Greens Star Roller, Brush, Spiker System with Main Frame
42-128	Stainless Steel Tournament Rake 72"	
42-026	Stainless Steel Tournament Rake 84"	42-210 Grader Blade Kit
43-043	Brush Kit for 26-008	

MAINTENANCE



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

NOTE: 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 Super Star has two grease fittings. One is located on the shift idler arm and one on the rod end of the attachment lift cylinder.

AIR CLEANER ON ENGINE

1. Unhook clips on both sides of cover and remove cover.
2. Carefully slide pre-cleaner of cartridge. To service pre-cleaner, wash in liquid detergent and water. Squeeze dry in clean cloth. Saturate in engine oil. Squeeze in clean absorbent cloth to remove excess oil. Replace if very dirty or damaged.
3. Remove knob and plate. Carefully remove cartridge to prevent debris from entering carburetor. To service cartridge, clean by tapping gently on flat surface. Do not oil cartridge. Replace if very dirty or damaged.

NOTE: Do not use petroleum solvents, e.g., kerosene, which will cause cartridge to deteriorate. Do not use pressurized air to clean cartridge. Pressurized air can damage cartridge.

4. Reinstall cartridge, plate and knob.
5. Reassemble pre-cleaner on cartridge.
6. Replace cover and reattach clips to body.

REMOTE AIR CLEANER

1. Unclip the two clips, remove the cover and pull out the element.
2. To service, clean by tapping gently on flat surface. Do not oil. Replace if very dirty or damaged.
3. Clean out the inside of the body and cover.
4. Place the element into the body and put the cover back on.

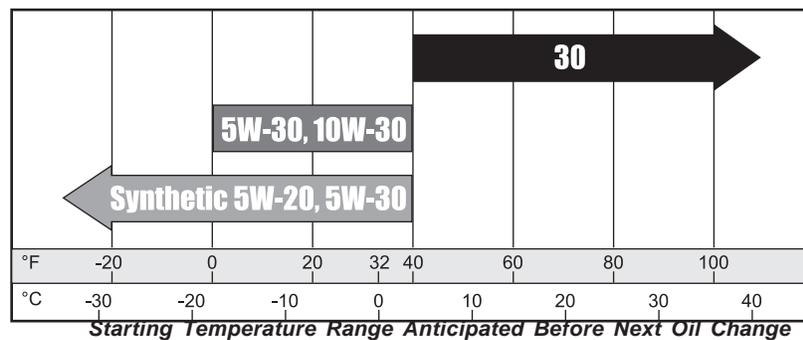
TIRE PRESSURE

Caution must be used when inflating a low tire to recommended pressure. Over inflating can cause tires to explode. Tires should be 5 psi (0.35 bar). Improper inflation will reduce tire life considerably.

ENGINE

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

SAE VISCOSITY GRADES



Air cooled engine run hotter than automotive engines. Use of multi-viscosity oils (10W-30, etc.) above 40° F (4° C) will result in high oil consumption and possible engine damage. Check oil level more frequently if using these types of oils.

SAE 30 oil, if used below 40° F (4° C), will result in hard starting and possible engine bore damage due to inadequate lubrication.

HYDRAULIC OIL

1. Use SAE 10W-40 API Service SJ or higher motor oil.
2. For proper warranty, change oil every 500 hours or annually, which ever is first and change filter after the first 20 hours, then at 100 hours, then every 250 hours thereafter.
3. The oil level should be 2" to 2½" from top of tank when fluid is cold. Do not overfill.
4. After changing oil and/or filter, run the machine for a few minutes. Check oil level and for leaks.
5. Always use caution when filling hydraulic oil tank or checking level to keep system free of contaminants. Check and service more frequently when operating in extremely cold, hot or dusty conditions.
6. If natural color of fluid is black or smells burnt, it is possible that an overheating problem exists.
7. If fluid becomes milky, water contamination may be a problem.
8. If either of the above conditions happen, change oil and filter immediately after fluid is cool and find cause. Take fluid level readings when system is cold.
9. In extreme temperatures you can use straight weight oil. We recommend SAE 30W API Service SJ or higher when hot (above 90°F (33°C)) and SAE 10W API Service SJ or higher when cold (below 32°F (0°C) ambient temperature. Use either motor oil or hydraulic oil, but do not mix.
10. Oil being added to the system must be the same as what is already in the tank. Mark tank fill area as to which type you put in.

TOWING

When it is necessary to move the Super Star without engine running, bypass valve built into hydrostatic pump must be "open" by turning it counterclockwise. The valve is located on the right side of the pump. An "open" valve allows fluid to pass through the wheels freely. When normal, driven, operation is desired, valve should be "closed" by turning it clockwise. Failure to "close" the valve with engine running means no power to wheels.

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 10 hours and every 200 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



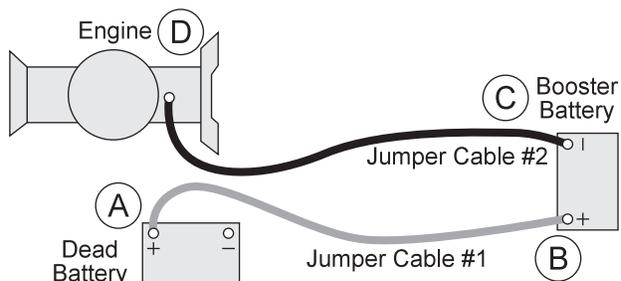
WARNING

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 each battery, first (A) then (B).
3. Connect one end of other cable to negative (-) terminal of "good" battery (C).
4. Connect other end of cable (D) to engine block on unit being started (NOT to negative (-) terminal of battery)

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





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



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

	Daily	As Required	100 Hours	200 Hours	250 Hours	300 Hours	400 Hours	Every 500 Hours/Yearly
⌘ Engine Oil	C	R	R	R	R	R	R	R
⌘ Engine Oil Filter			R	R		R	R	R
Engine for Leaks and Loose Parts	C		C	C		C	C	C
‡ Air Cleaner (Paper Element)		R	C	C		C	C	R
‡ Pre-Cleaner (Every 25 hours)		R	C	C		C	C	R
Spark Plugs							C	R
Valve Clearance								C
Idle Speed		C						C
Air Cooling System	C		C	C		C	C	C
Hoses	C				C			C
* Tire Pressure	C		C	C		C	C	C
Visual Inspection of Tires	C		C	C		C	C	C
Fuel Level	C	C						
Fuel Filter		R						R
Hydraulic Oil	C		C	C		C	C	R
† Hydraulic Oil Filter					R			R
Hydraulic System for Leaks and Loose Parts	C		C	C		C	C	C
Battery Electrolyte Level			C	C		C	C	C
Clean Battery Terminals					C			C
§ Torque Lug Nuts				C			C	C
Belt Tension and Visual Inspection			C	C		C	C	C
Lubricate			C	C		C	C	C

C=Check or Clean at specified intervals

R=Replace at specified intervals

* Tire pressure: 5 psi (0.35 bar)

† Replace hydraulic filters after the first 20, 100, and every 250 there after.

§ Torque tire nuts after the first 10 hours and every 200 hours there after (64 to 74 ft/lb (87-100 Nm))

⌘ Change Oil and Filter after first 8 hours.

⌘ Change oil every 25 hours when operating under heavy load or in high ambient temperatures.

‡ Clean more often under dusty conditions or when airborne debris is present, replace air cleaner parts, if very dirty.

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.



END USER'S SERVICE CHART

Service

	Daily	As Required	25 Hours	50 Hours	100 Hours	200 Hours	250 Hours	Every 500 Hours/Yearly
⌘ Engine Oil (Change every 50 hours)								
⌘ Engine Oil Filter								
Engine for Leaks and Loose Parts								
‡ Air Cleaner (Paper Element)								
‡ Pre-Cleaner (Every 25 hours)								
Spark Plugs								
Valve Clearance								
Idle Speed								
Belt Tension and Visual Inspection								
Air Cooling System								
Hoses								
*Tire Pressure								
Visual Inspection of Tires								
Fuel Level								
Fuel Filter								
†Hydraulic Oil								
Hydraulic System for Leaks and Loose Parts								
Battery Electrolyte Level								
Clean Battery Terminals								
§Torque Lug Nuts								
Lubricate								

C=Check or Clean at specified intervals

R=Replace at specified intervals

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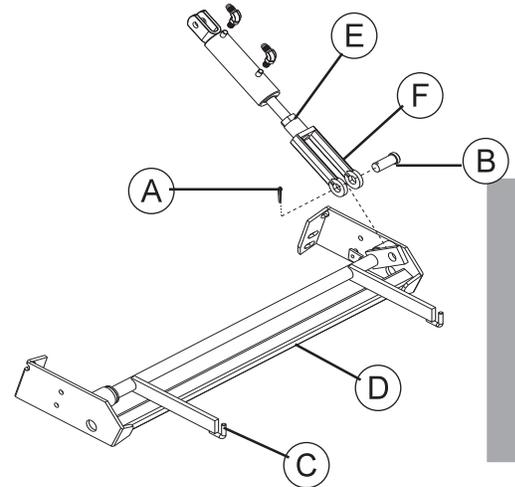


RAKE LIFT CYLINDER

Completely lower Rake Lift. Remove cotter pin (A) and clevis pin (B). Place attachment lift arms (C) at $\frac{1}{16}$ " above cross member (D) on Rake Lift. Loosen jam nut (E). Twist cylinder extension (F) so clevis pin end of cylinder extension lines up with holes in attachment lift arm. Replace clevis and cotter pins. Tighten jam nut. Raise and lower Rake Lift to check for proper clearance.

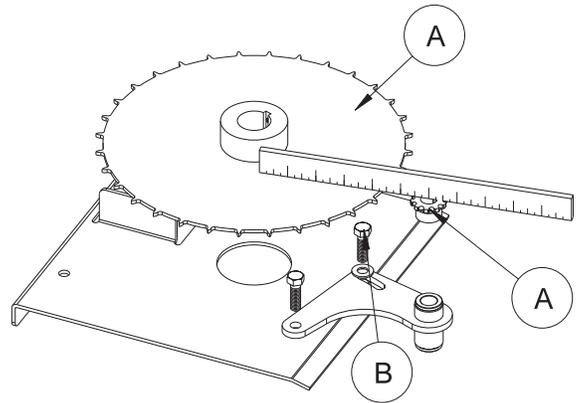


When the rear rake attachment is lowered while the machine is in forward motion, the forward speed of the machine will slow drastically. Operator should be prepared for a rapid change in speed.



STEERING CHAIN ADJUSTMENT

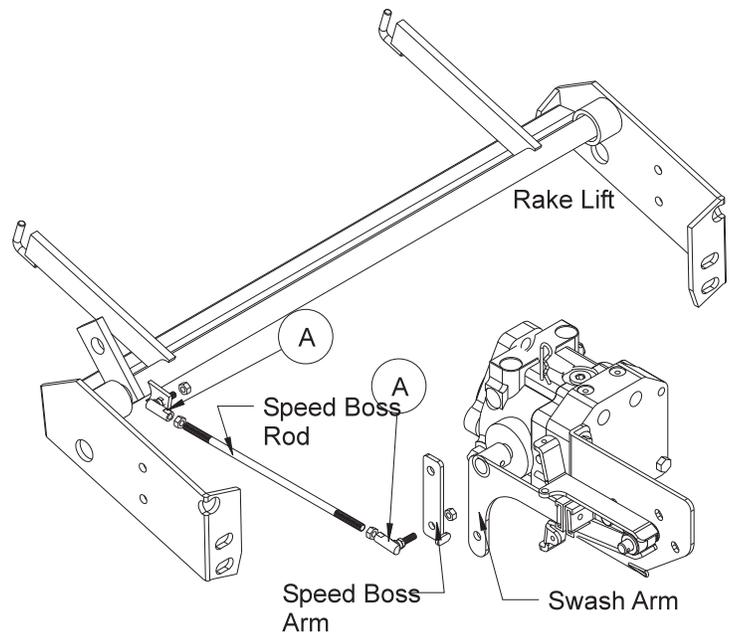
Steering Sprockets (A) should be level with each other. Check with straight edge. Make any adjustments. Adjust the chain tensioner bolt (B) so that the chain is snug. Tighten all nuts and bolts in place.



SPEED BOSS

Speed Boss allows the machine to operate at a proper speed while raking sand traps on golf courses. This speed boss has been factory set at an average speed of 3-4 m.p.h. (5-6.5 kph). The Speed Boss will only limit the speed while the rake is lowered into the operating position. The speed setting may be adjusted by turning the Ball Joint (A) counterclockwise to make the machine operate slower or turn clockwise to go faster. Tighten jam nut. Check to make sure nothing is binding and test drive to check desired speed.

For RBS System, Spiker and Grader Box remove the speed boss arm and the speed boss rod from machine so it does not interfere with other operations.

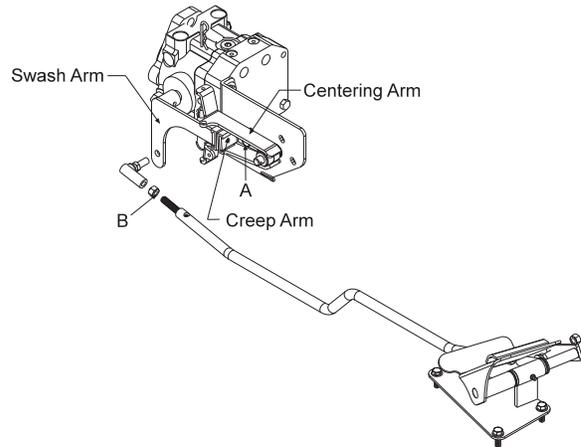


ADJUSTMENTS (CONTINUED)

WHEEL 'CREEP' ADJUSTMENT

'Creep' is when engine is running and hydrostatic transmission is in neutral, but due to inadequate alignment, wheels still move. Do the following procedures to stop this motion.

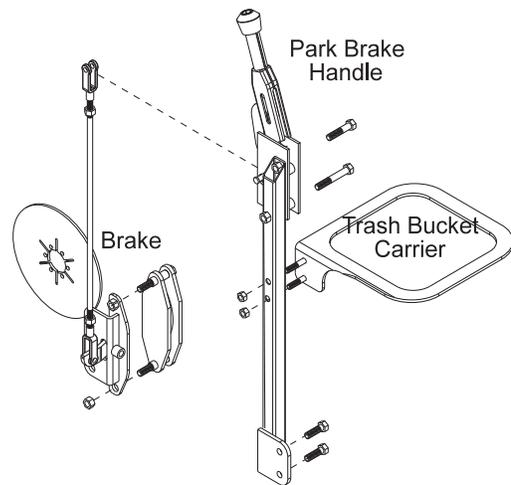
1. Lift up and support machine so all wheels are off the ground and can turn freely.
2. On the side of the pump there is a creep arm inside a centering arm. Loosen bolt (A).
3. With engine running adjust the creep arm up or down in slot so centering arm centers on the swash arm.
4. Tighten all fasteners and test by using foot pedal linkage to see that the "creep" is removed.
5. Turn engine off and lower machine.



PARK BRAKE

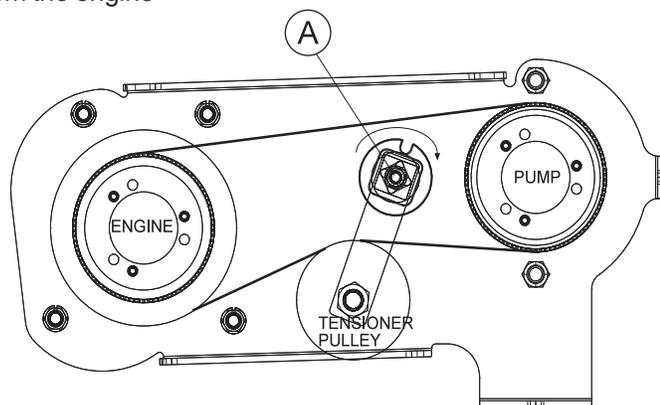
The park brake is located on the right hand side of the machine and operates a brake on the right rear wheel. Push lever forward to engage and pull back to disengage.

To adjust turn the knob on the end of the handle. For further adjustment you may turn the yokes (A) clockwise to tighten and counter clockwise to loosen.



ADJUSTMENT OF BELT TENSIONER

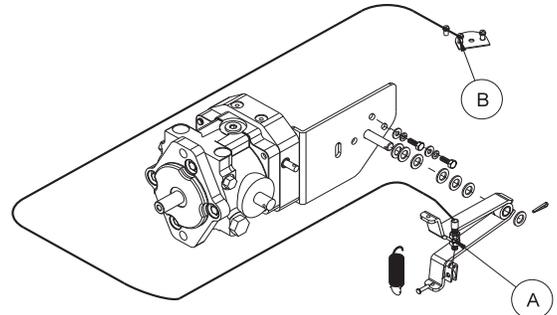
The belt tensioner controls the tension on the belt from the engine to the pump. The proper tension of the idler should be 12 to 15 as per gauge on the side of the tensioner. Over tightening the belt will shorten the life of the belt and the machine may not perform to the best of its ability. To adjust belt tensioner, loosen the bolt holding the tensioner (A). Bring idler pulley tight to the belt and turn tensioner into belt to 12 to 15. Tighten bolt on tensioner.



ADJUSTMENTS (CONTINUED)

TO ADJUST FOOT 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 hand throttle is in the idle position (1200 engine 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 3600 RPM \pm 100.
4. Minor adjustment can be made by backing out (unscrewing) (Ref A) until you reach full engine RPM with the foot pedal fully depressed in the forward position. Be sure to recheck after the nuts are fully tightened.
5. Major adjustment needs to be made at (Ref B) by pulling the slack out of the cable. Loosen the screw in the wire block 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.
6. Test run to determine that there is no binding and that engine idle speed is 1200 RPM and that it is 3600 RPM at full forward position of the foot pedal.



Service

STORAGE

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

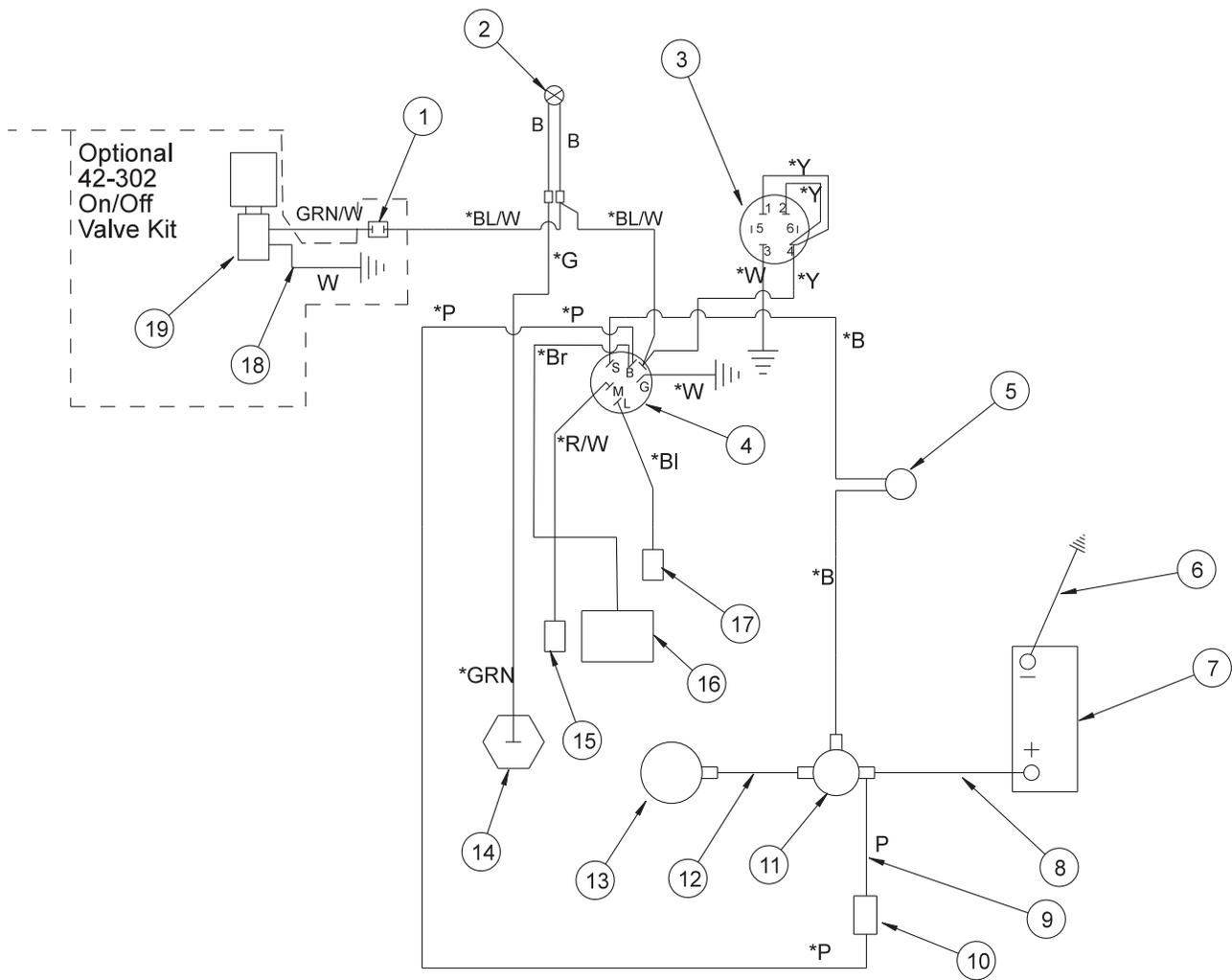
1. Before storing clean machine thoroughly.
2. Check bolts and nuts, tighten as necessary.
3. Make all repairs that are needed and remove any debris.
4. Remove the battery, adjust the electrolyte level and recharge it. Store the battery in a dry, dark place.
5. Store in a clean and dry area, but NOT near a stove, furnace or water heater which uses a pilot light or any device that can create a spark.
6. Engines stored over 30 days need to be protected or drained of fuel to prevent gum from forming in a fuel system or on essential carburetor parts. Check the engine manual and follow the instructions for the storage of the engine.

WIRING DRAWING

Color Code Chart

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

Diagrams

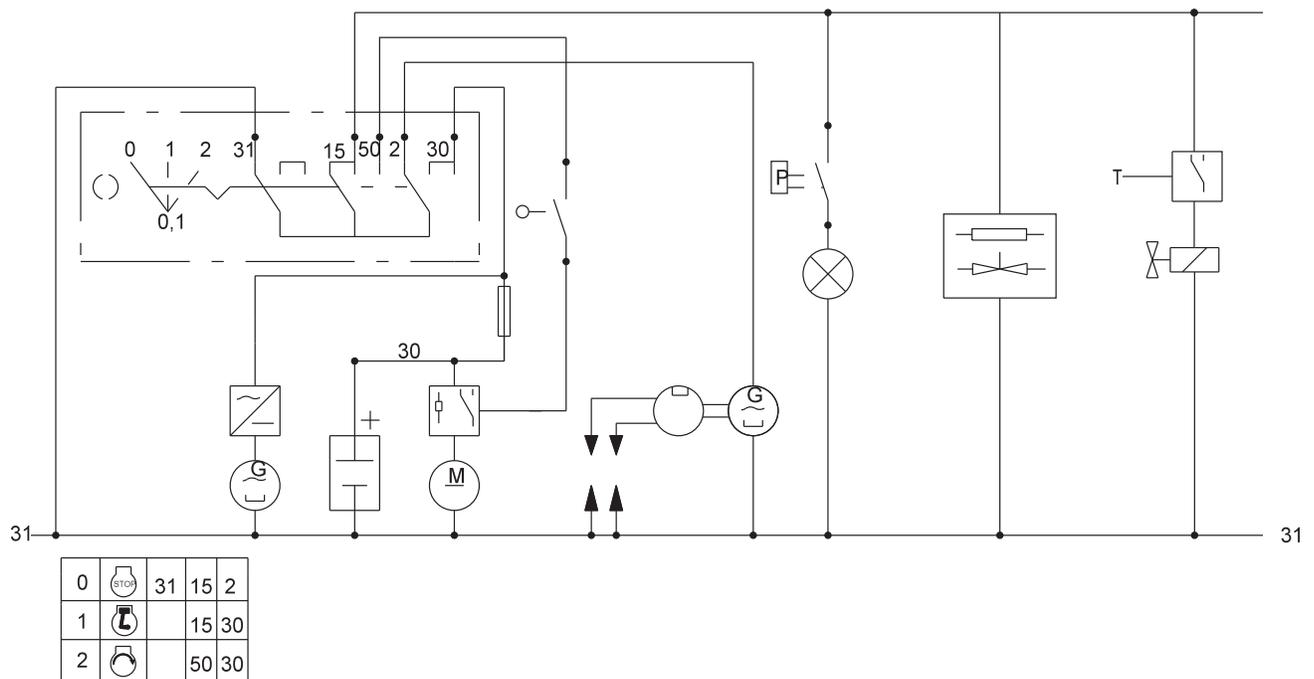


WIRING PARTSLIST

REF #	PART #	DESCRIPTION	QUANTITY
1	12-003	Toggle Switch (part of 42-302 Kit)	1
	15-472	Switch Boot	1
2	50-359	Oil Pressure Warning Light	1
3	42-064	Hour/ Volt Meter Combo	1
4	13-488	Ignition Switch (B & S# 496603)	1
	76-310	Key Set (comes with 13-488)	1
5	14-272	Seat Switch	1
6	76-327	Ground Battery Cable	1
7		Battery (not included)	
8	75-518	Battery Cable	1
9	42-252	Wire, Circuit Breaker to Solenoid	1
10	8975	30 Amp Circuit Breaker	1
	8977	Circuit Breaker Boot	1
11	13-492	Solenoid (B & S# 807829)	1
12	22-017	Cable Black	1
13		Starter (on engine)	1
14	13-491	Oil Sender (on engine B & S# 491657)	1
15		Stop Switch Terminal (on engine)	1
16		Rectifier (on engine)	1
17		After Fire Solenoid (on engine)	1
18	76-260	Ground Wire (part of 42-302 Kit)	1
19	42-118	Electric On/Off Valve (part of 42-302 Kit)	1
	42-251	Wire Harness (includes all wire colors with *)	1

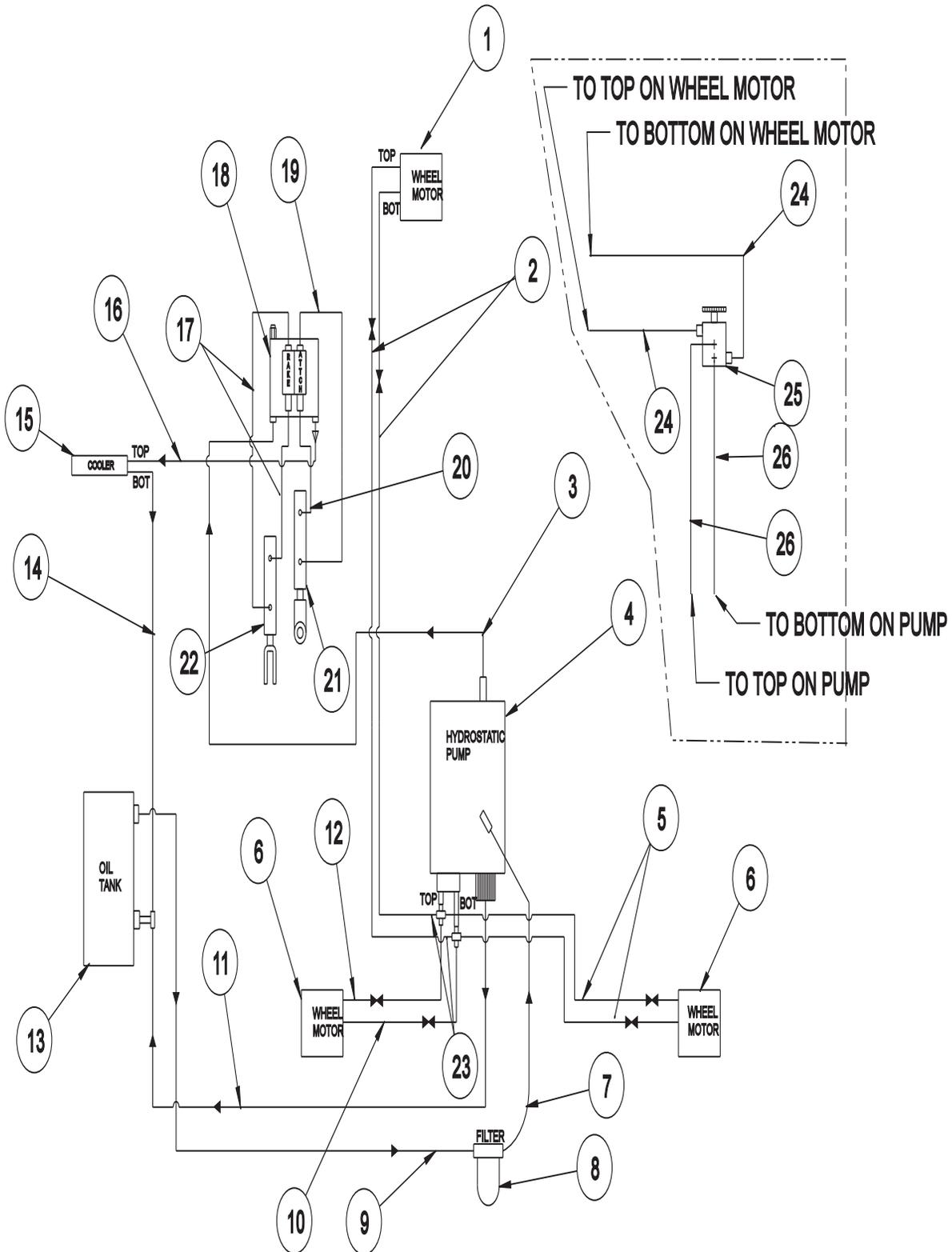
Diagrams

WIRING SCHEMATIC



42-057-K ON/OFF VALVE KIT
REPLACES REF # 2

Diagrams



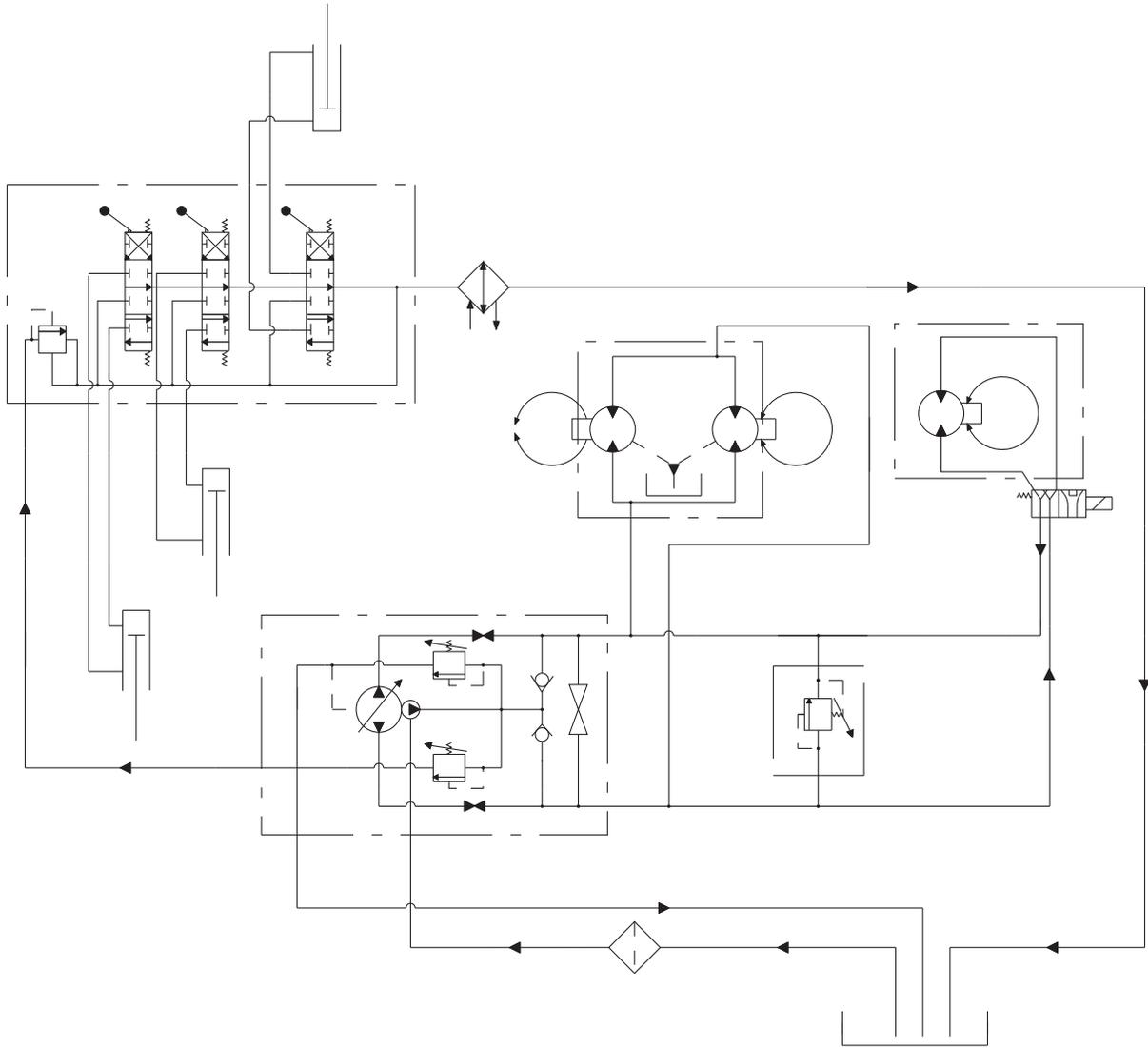
HYDRAULIC PARTSLIST

REF #	PART #	DESCRIPTION	QUANTITY
1	42-039	Front Wheel Motor (3 wheel drive only)	1
2	42-262	Hydraulic Hose (3 wheel drive only)	2
3	10-135	Hydraulic Cylinder	1
	18-154	Rod End	1
	HNJ-58-18	Jam Nut $\frac{5}{8}$ - 18	1
4	42-047	Hydraulic Hose	2
5	42-220	2 - Bank Hydraulic Valve	1
	42-271	Valve Handle	2
6	42-048	Hydraulic Hose	2
7	13-357	Hydraulic Cylinder	1
	42-040	Yoke End	1
	HNJ-34-16	Jam Nut $\frac{3}{4}$ - 16	1
8	42-044	Hydraulic Hose	1
9	18-342	Cross	2
10	42-261	Hydraulic Tube	2
11	42-002	Rear Wheel Motor	2
12	42-259	Hydraulic Hose 10 $\frac{3}{4}$ "	1
13	42-260	Hydraulic Hose	2
14	42-192	Relief Valve	2
15	34-109	Variable Pump	1
16	42-258	Hydraulic Hose 9"	1
17	8832-9.5	Suction Hose	1
	18-222	Hose Clamp	2
18	42-257	Hydraulic Hose	1
19	23-006	Oil Filter	1
	23-031	Replacement Filter Only	
20	8832-22	Suction Hose	1
	18-222	Hose Clamp	2
21	42-005	Oil Tank	1
	13-586	Filler Breather	1
22	42-256	Hydraulic Hose	1
23	42-265	Aluminum Oil Cooler	1
24	42-045	Hydraulic Hose	1
33	42-304	Hydraulic Tube	2
42-302 ELECTRIC ON/OFF VALVE KIT			
25	42-263	Hydraulic Hose	2
26	76-260	Ground Wire	1
27	42-264	Hydraulic Hose	2
28	42-118	Electric On/Off Valve	1
29	18-185	Elbow 90°	1
30	18-341	Elbow 45°	3
HYDRAULIC PLOW			
31	13-292	Hydraulic Cylinder	1
32	34-131	Hydraulic Hose	2
5	42-227	3-Bank Valve	
HYDRAULIC PRESSURES			
Pump Displacement	.913 in ³ /rev	Charge Pump Displacement	.33 in ³ /rev
Pump Input Speed (up to)	3600 rpm	Max. Inlet Vacuum	5 in. Hg
Max. Operating Pressure	3500 psi, 2500 peak psi	Max. Case Pressure	25 psi
Implement Setting	700-1000 psi	Relief Valve Pressure (set at)	2500 psi
42-220 Hydraulic Valve (2 bank)	900 psi		

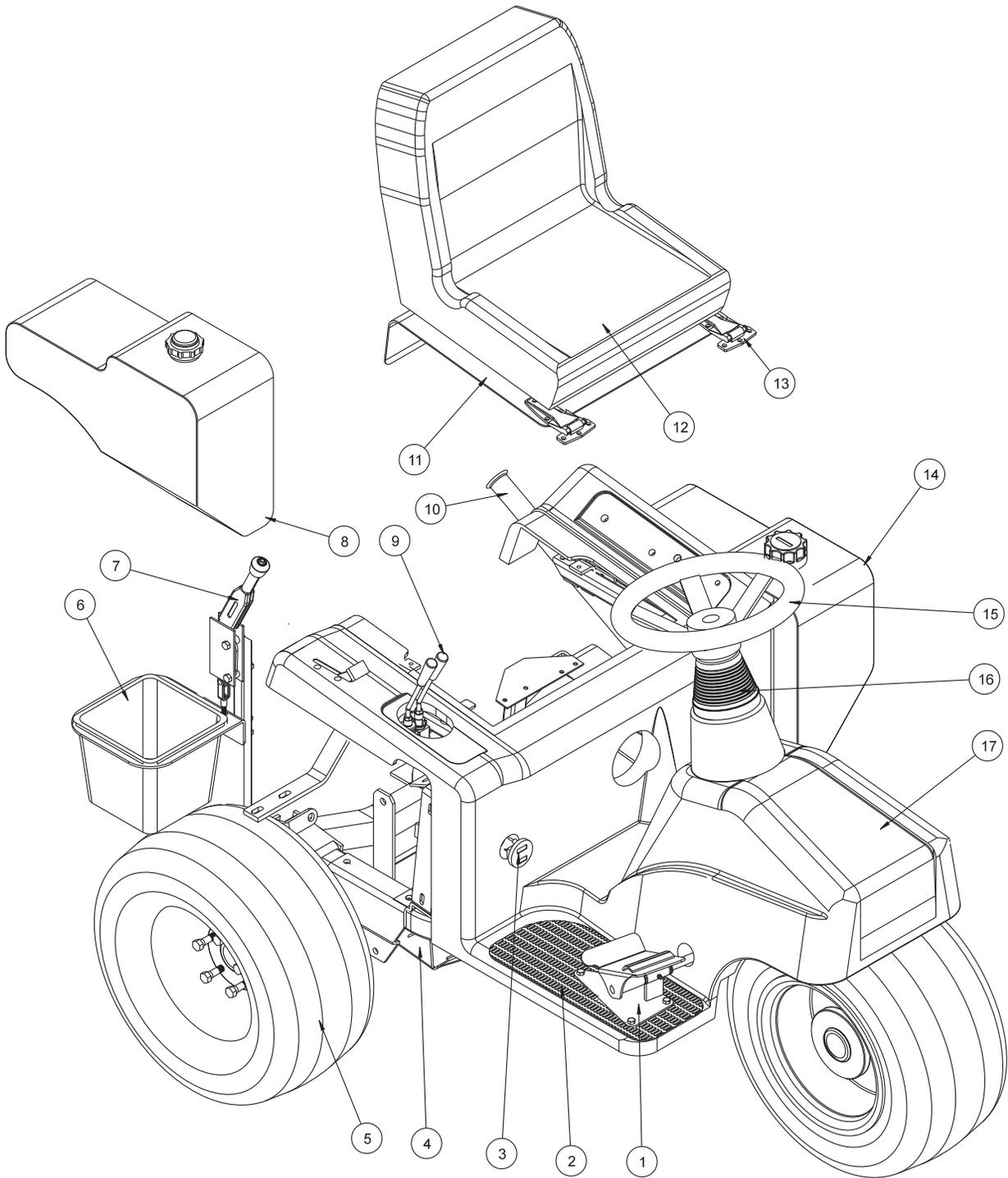
Diagrams

HYDRAULIC SCHEMATIC

Diagrams



MAINFRAME COMMON DRAWING



Parts

MAIN PARTS COMMON LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	42-309	Foot Pedal	1
2	42-089	Right Floor Mat	1
	42-088	Left Floor Mat	1
3	42-064	Volt/Hour Meter	1
4	42-310	Main Frame	1
5*	42-161	Knobby Tire and Wheel	3
	42-161-01	Tire 22 x 11 - 10 Knobby Type	3
	42-161-02	Wheel	3
6	13-192	Trash Bucket	1
7	60-106	Park Brake Lever	1
8	42-006	Gas Tank	1
	42-014	Cap	1
9	42-271	Valve Handle	2
10	42-030	Rake Holder	1
11	42-062	Seat Panel	1
12	14-269	Adjustable Low Back Seat	1
	42-098	Plastic Spacers	4
13	27-055	Hinge	2
14	42-005	Oil Tank	1
	13-586	Filler Breather	1
15	15-030	Steering Wheel	1
16	76-294	90° Black Boot	1
	76-293	Tilt Steering Mechanism	1
17	42-201	Fiber Glass Body	1

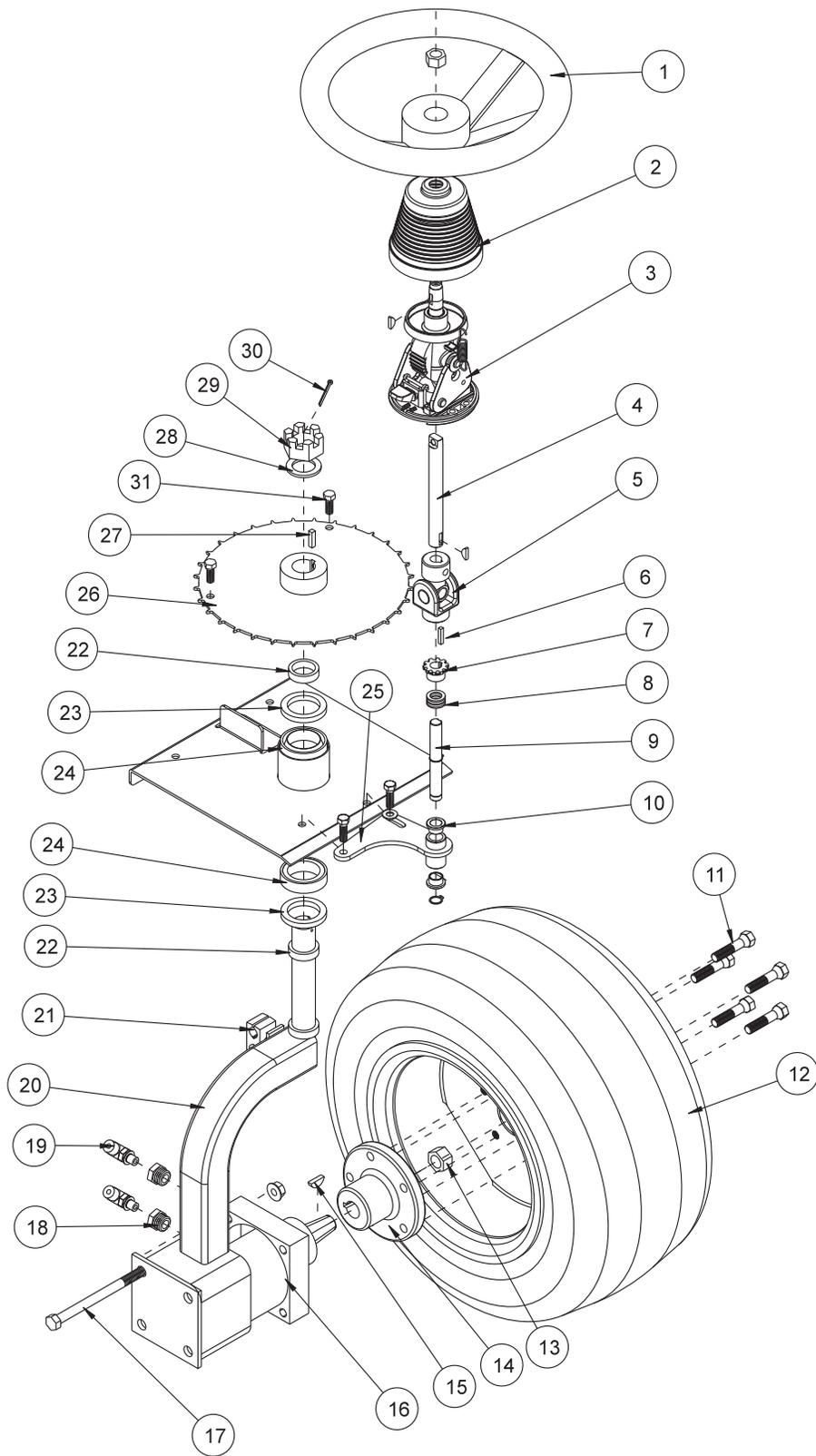
*

Front tire and wheel are fluid filled to 80 lbs. total.

Optional Tires

42-158	Tires and Wheel	
42-158-01	Tire 23 x 10.5 x 12; 4 ply multitrack	
42-158-02	Wheel	
8839	Windshield Washer Fluid or Equivalent	45.5 pints

3 WHEEL DRIVE FRONT FORK DRAWING



Parts

3 WHEEL DRIVE FRONT FORK PARTSLIST

REF#	PART#	DESCRIPTION	QUANTITY
1	15-030	Steering Wheel 13"	1
	15-031	Center Cap (comes with 15-030)	1
	27-077	Decal, Smithco Round	1
	HN-58-11	Nut ⁵ / ₈ - 11	1
	HWK-316-075	Woodruff Key ³ / ₁₆ X ³ / ₄	1
2	76-294	Tilt Steering Boot	1
3	76-293	Tilt Steering Mechanism	1
	76-293-01	Release Lever (part of 76-293)	1
4	42-055	Top Steering Shaft	1
	HWK-316-075	Woodruff Key ³ / ₁₆ X ³ / ₄	1
5	60-300	U-Joint	1
6	HKSQ-316-100	Machine Key ³ / ₁₆ X ³ / ₁₆ X 1	2
7	60-298	Sprocket	1
8	HMB-58-14	Machine Bushing ⁵ / ₈ X 14 GA	3
9	42-034	Bottom Steering Shaft	1
	HRR-58	Snap Ring ⁵ / ₈	2
10	76-128	Flange Bushing (part of 42-266)	2
11	60-268	Lug Bolts ¹ / ₂ - 20 x ¹ / ₅	5
12*	42-161	Knobby Tire and Wheel	1
	42-161-01	Tire 22 x 11 - 10 Knobby Type	1
	42-161-02	Wheel	1
	8839	Windshield Washer Fluid or Equivalent	43.5 pints
13	42-002-12	Nut ³ / ₄ - 16 (part of 42-039)	1
14	42-007	Hub	1
15	HWK-14-100	Woodruff Key ¹ / ₄ - 1 (part of 42-039)	1
16	42-039	Wheel Motor	1
17	HB-12-13-650	Bolt ¹ / ₂ - 13 x 6 ¹ / ₂	4
	HNTL-12-13	Lock Nut ¹ / ₂ - 13	4
18	18-172	Reducer	2
19	18-171	Seal Lock Elbow	2
20	42-022	Front Fork	1
21	13-652	Hose Clamp	1
22	20-141	Spacer	2
23	20-142	Oil Seal	2
24	20-143	Bearing	2
25	42-266	Chain Tensioner	1
	HB-38-16-125	Bolt ³ / ₈ - 16 x 1 ¹ / ₄	2
	HW-38	Washer ³ / ₈	1
	HNFL-38-16	Flange Whiz Lock Nut ³ / ₈ - 16	2
	42-295	Steering Sprocket	1
26	8834-37.5	#35 Roller Chain	1
	18-114	Master Link	1
27	HKSQ-14-100	Square Key ¹ / ₄ X ¹ / ₄ X 1	1
28	HMB-114-10	Machine Bushing 1 ¹ / ₄ X 10GA	1
29	HNA-114-12	Axle Nut 1 ¹ / ₄ - 12	1
30	HP-18-200	Cotter Pin ¹ / ₈ X 2	1
31	HB-38-16-100	Bolt ³ / ₈ - 16 x 1	2
	HNFL-38-16	Flange Whiz Lock Nut ³ / ₈ - 16	2

* Front tire and wheel fluid filled to 80 lbs. total

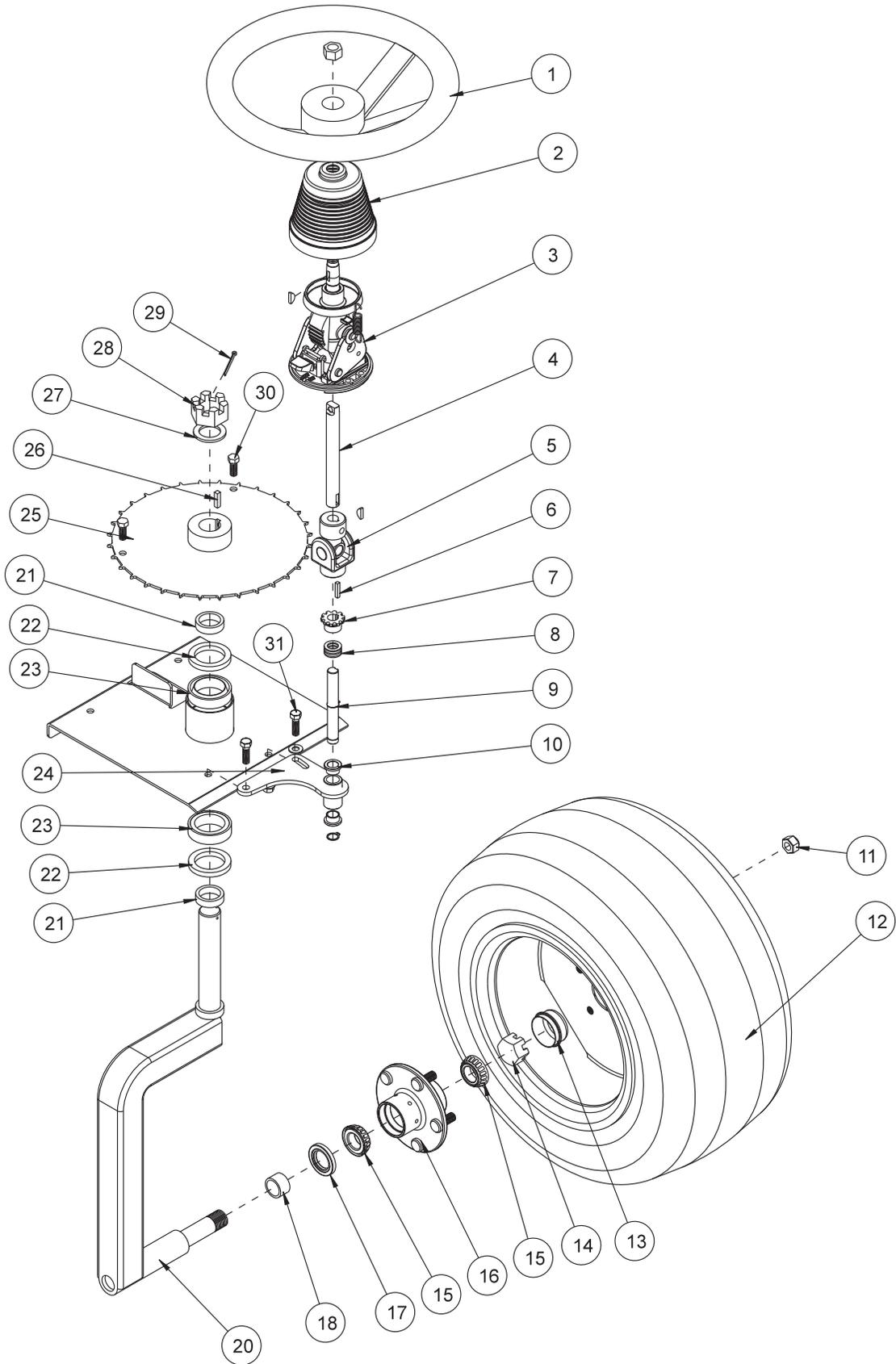
Optional Tires

42-158	Tire and Wheel
42-158-01	Tire 23 x 10.5 x 12; 4 ply multitrack
42-158-02	Wheel
8839	Windshield Washer Fluid or Equivalent

43.5 pints



2 WHEEL DRIVE FRONT FORK DRAWING



Parts

2 WHEEL DRIVE FRONT FORK PARTS LIST

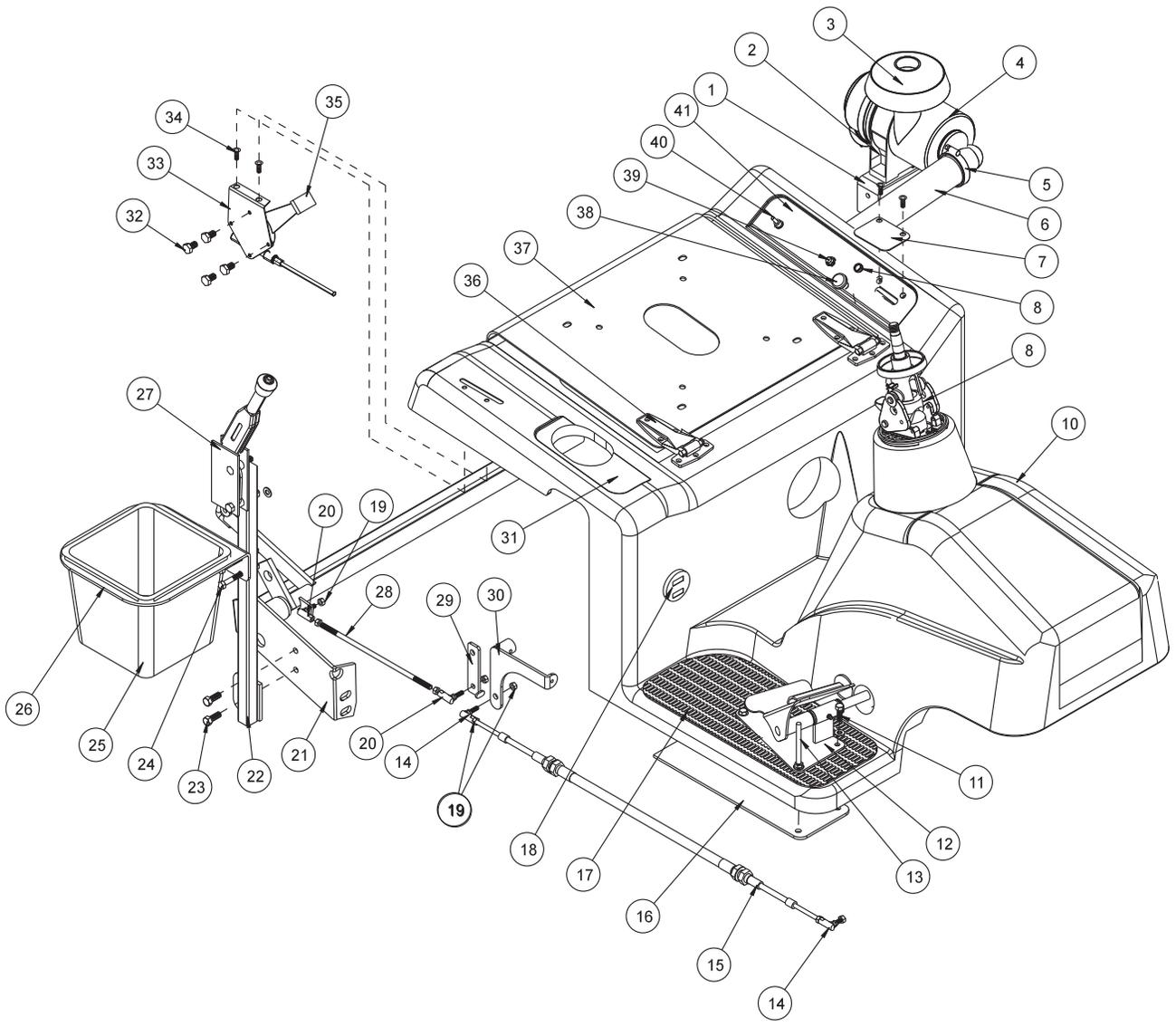
REF#	PART#	DESCRIPTION	QUANTITY
1	15-030	Steering Wheel 13"	1
	15-031	Center Cap (comes with 15-030)	1
	27-077	Decal, Smithco Round	1
	HN-58-11	Nut $\frac{5}{8}$ - 11	1
	HWK-316-075	Woodruff Key $\frac{3}{16}$ x $\frac{3}{4}$	1
2	76-294	Tilt Steering Boot	1
3	76-293	Tilt Steering Mechanism	1
	76-293-01	Release Lever (part of 76-293)	1
4	42-055	Top Steering Shaft	1
	HWK-316-075	Woodruff Key $\frac{3}{16}$ x $\frac{3}{4}$	1
5	60-300	U-Joint	1
6	HKSQ-316-100	Machine Key $\frac{3}{16}$ x $\frac{3}{16}$ x 1	2
7	60-298	Sprocket	1
8	HMB-58-14	Machine Bushing $\frac{5}{8}$ x 14 GA	3
9	42-034	Bottom Steering Shaft	1
	HRR-58	Snap Ring $\frac{5}{8}$	2
10	76-128	Flange Bushing (part of 42-266)	2
11	HNL-12-20	Lug Nut $\frac{1}{2}$ - 20	5
12*	42-161	Knobby Tire and Wheel	1
	42-161-01	Tire 22 x 11 - 10 Knobby Type	1
	42-161-02	Wheel	1
	8839	Windshield Washer Fluid or Equivalent	43.5 pints
13	80-167	Dust Cap	1
14	HNAR-100-14	Slotted Jam Nut 1 - 14	1
	HP-18-150	Cotter Pin $\frac{1}{8}$ x $1\frac{1}{2}$	1
15	11-043	Bearing	2
16	80-019	Hub (includes bearings, seal, dust cap, lug nuts, and studs)	1
	27-022-02	Stud $\frac{1}{2}$ - 20	5
17	11-041	Seal	1
18	11-042	Spacer	1
20	13-448	Front Fork	1
21	20-141	Spacer	2
22	20-142	Oil Seal	2
23	20-143	Bearing	2
24	42-266	Chain Tensioner	1
25	42-295	Steering Sprocket	1
	8834-37.5	Roller Chain	1
	18-114	Master Link	1
	26	HKSQ-14-100	Square Key $\frac{1}{4}$ x $\frac{1}{4}$ x 1
27	HMB-114-10	Machine Bushing $1\frac{1}{4}$ x 10GA	1
28	HNA-114-12	Axle Nut $1\frac{1}{4}$ - 12	1
29	HP-18-200	Cotter Pin $\frac{1}{8}$ x 2	1
30	HB-38-16-100	Bolt $\frac{3}{8}$ - 16 x 1	2
	HNFL-38-16	Flange Whiz Lock Nut $\frac{3}{8}$ - 16	2
31	HB-38-16-125	Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$	2
	HW-38	Washer $\frac{3}{8}$	1
	HNFL-38-16	Flange Whiz Lock Nut $\frac{3}{8}$ - 16	2
*	Front tire and wheel fluid filled to 80 lbs. total		
	Optional Tires		
	42-158	Tire and Wheel	
	42-158-01	Tire 23 x 10.5 x 12; 4 ply multitrack	
	42-158-02	Wheel	
	8839	Windshield Washer Fluid or Equivalent	43.5 pints

LINKAGE PARTSLIST

REF#	PART#	DESCRIPTION	QUANTITY
1	42-068	Air Cleaner Bracket	1
	HB-516-18-100	Bolt $\frac{5}{16}$ - 18 x 1	2
	HNFL-516-18	Flange Whiz Lock Nut $\frac{5}{16}$ - 18	2
2	42-076-01	Band	1
3	42-076-02	Hat	1
4	42-076	Air Cleaner	1
	42-076-03	Replacement Filter	
	13-603	Air Cleaner Base (comes with engine)	1
5	18-123	Hose Clamp	2
6	8959-26	Flex Hose x 26"	1
	42-268	Reducer (engine front)	1
7	42-324	Decal Cover PLate	1
	HSTP-14 -20-075	Phillips Truss Head Screw $\frac{1}{4}$ - 20 x $\frac{3}{4}$	2
	HNFL-14-20	Flange Whiz Lock Nut $\frac{1}{4}$ - 20	2
8	50-359	Warning Light	1
9	76-293	Tilt Steering	1
	76-294	Boot Black	1
10	42-201	Fiberglass Body	1
	8803-34	Black Trim	1
	42-066	Cover Plate	1
	HSDPS-14-075	Stainless Steel Pan Head Drill Screw $\frac{1}{4}$ x $\frac{3}{4}$	3
11	HB-516-18-150	Bolt $\frac{5}{16}$ - 18 x $1\frac{1}{2}$	2
	HW-516	Washer $\frac{5}{16}$	2
	HNFL-516-18	Flange Whiz Lock Nut $\frac{5}{16}$ - 18	2
12	42-309	Foot Pedal	1
	HG-14-28-180	Grease Fitting $\frac{1}{4}$ - 28 x 180° (comes with 42-309)	1
13	42-313	Pedal Stop	1
	HNFL-516-18	Flange Whiz Lock Nut $\frac{5}{16}$ - 18	2
14	18-115	Ball Joint $\frac{1}{4}$ - 28	2
15	27-132	Cable	1
16	42-072	Floorboard Support	2
17	42-089	Right Floor Mat	1
	42-088	Left Floor Mat	1
18	42-064	Volt/Hour Meter	1
19	HN-14-28	Nut $\frac{1}{4}$ -28	4
	HWL-14	Lockwasher $\frac{1}{4}$	2
20	21-462	Ball Joint $\frac{5}{16}$ - 24	2
21	42-024	Rake Lift	1
22	42-153	Park Brake Bracket	1
23	HB-38-16-100	Bolt $\frac{3}{8}$ - 16 x 1	2
	HNFL-38-16	Flange Whiz Lock Nut $\frac{3}{8}$ - 16	2
24	HB-516-18-175	Bolt $\frac{5}{16}$ - 18 x $1\frac{3}{4}$	2
	HNFL-516-18	Flange Whiz Lock Nut $\frac{5}{16}$ - 18	2
25	13-192	Trash Bucket	1

(Continued on next page)

LINKAGE DRAWING

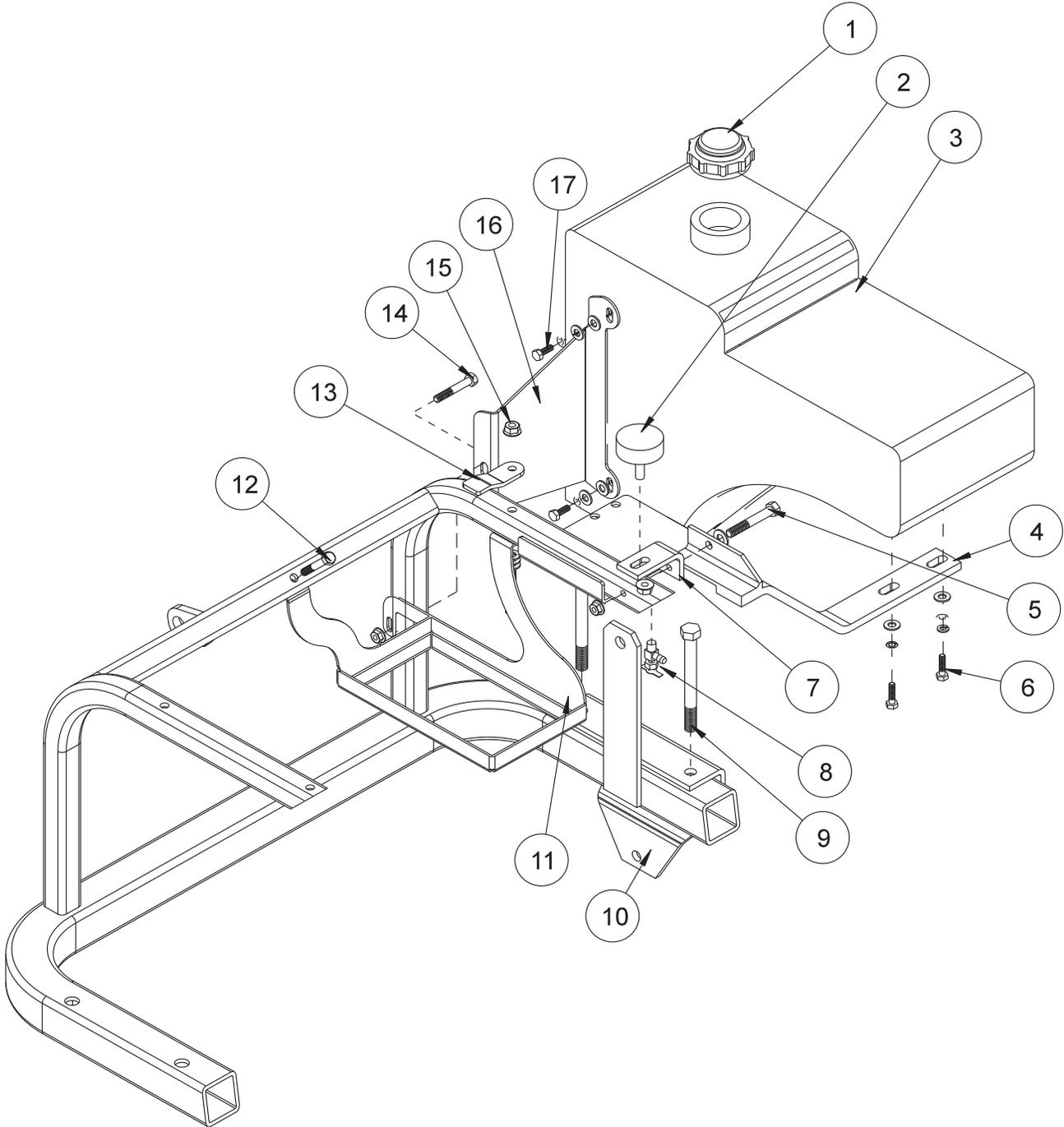


Parts

LINKAGE PARTSLIST

REF#	PART#	DESCRIPTION	QUANTITY
26	42-156	Trash Carrier Bracket	1
27	60-106	Park Brake Handle	1
28	42-267	Speed Boss Rod	1
29	42-249	Speed Boss Arm	1
30	42-308	Swash Arm	1
31	42-075	Decal, Lift Controls	1
32	HSM-10-32-063	Machine Screw 10 - 32 x ⁵ / ₈	4
	HWL-10	Lockwasher 10	4
	HN-10-32	Nut 10 - 32	4
33	42-314	Throttle Bracket	1
34	HSTP-14 -20-075	Phillips Truss Head Screw ¹ / ₄ - 20 x ³ / ₄	2
	HNFL-14-20	Flange Whiz Lock Nut ¹ / ₄ - 20	2
35	42-321	Throttle Cable	1
36	27-055	Hinge	2
	HSMFCS-10-32-088	Machine Screw #10 - 32 x ⁷ / ₈	12
	HW-10	Washer #10	12
	HWL-10	Lock Washer #10	12
	HN-10-32	Nut #10 - 32	12
37	42-062	Seat Panel	1
38	11-086	Choke	1
39	13-488	Key Switch (B&S 496603)	1
	76-310	Key Set	1
40	42-116	Rubber Plug (used when 42-302 not installed)	1
	12-003	2W/3W Toggle Switch (part of 42-302 Kit)	1
	15-472	Switch Boot (part of 42-302 Kit)	1
41	42-284	Decal, Control Panel	1

GAS TANK DRAWING

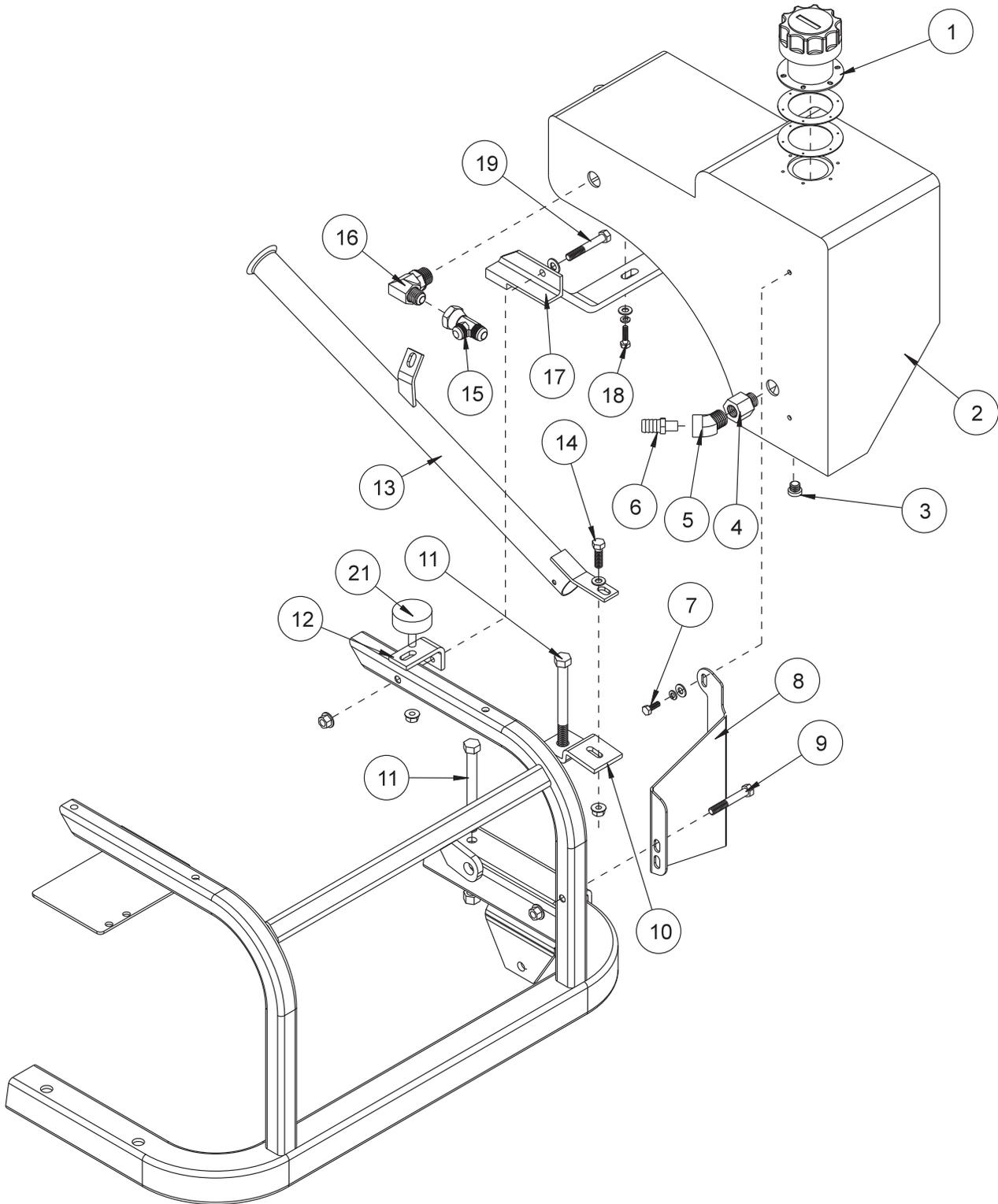


Parts

GAS TANK PARTSLIST

REF#	PART#	DESCRIPTION	QUANTITY
1	42-014	Cap	1
2	50-081	Rubber Bumper	1
	HNFL-38-16	Flange Whiz Lock Nut $\frac{3}{8}$ - 16	1
3	42-006	Gas Tank	1
4	42-018	Right Tank Support	1
5	HB-38-16-250	Bolt $\frac{3}{8}$ - 16 x 2 $\frac{1}{2}$	1
	HW-38	Washer $\frac{3}{8}$	2
	HNFL-38-16	Flange Whiz Lock Nut $\frac{3}{8}$ - 16	1
6	HB-14-20-100	Bolt $\frac{1}{4}$ - 20 x 1	2
	HW-14	Washer $\frac{1}{4}$	2
	HW-516	Washer $\frac{5}{16}$	2
	HWL-14	Lock Washer $\frac{1}{4}$	2
7	42-099	Glass Support	1
8	15-039	Fuel Shut Off (comes with 42-006)	1
	8800-36	Fuel Hose	1
	18-186	Hose Clamp	2
9	HB-12-13-500	Bolt $\frac{1}{2}$ - 13 x 5	2
	HNFL-12-13	Flange Whiz Lock Nut $\frac{1}{2}$ - 13	2
10	42-015	Attachment Mount	1
11	42-273	Battery Box	1
12	HB-516-18-200	Bolt $\frac{5}{16}$ - 18 x 1	1
	HNFL-516-18	Flange Whiz Lock Nut $\frac{5}{16}$ - 18	1
13	42-248	Battery Hold-down	1
	15-020	Grip	1
14	HB-516-18-225	Bolt $\frac{5}{16}$ - 18 x 2 $\frac{1}{4}$	1
	HNFL-516-18	Flange Whiz Lock Nut $\frac{5}{16}$ - 18	1
15	HB-516-18-225	Bolt $\frac{5}{16}$ - 18 x 2 $\frac{1}{4}$	1
	HW-516	Washer $\frac{5}{16}$	3
	HNFL-516-18	Flange Whiz Lock Nut $\frac{5}{16}$ - 18	1
16	43-026	Gas Tank Bracket	1
17	HB-14-20-075	Bolt $\frac{1}{4}$ - 20 x $\frac{3}{4}$	2
	HW-14	Washer $\frac{1}{4}$	2
	HWL-14	Lock Washer $\frac{1}{4}$	2

OIL TANK DRAWING



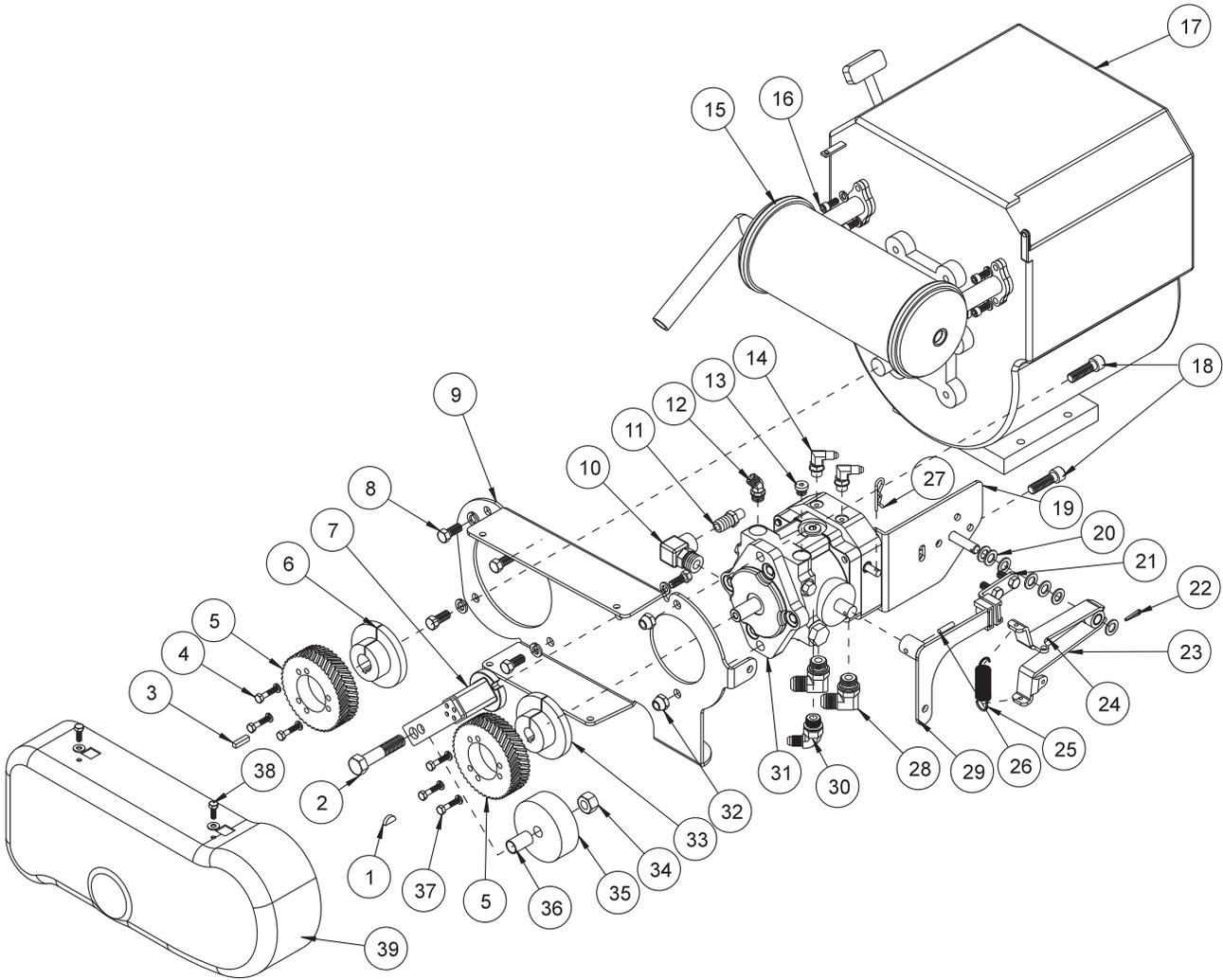
Parts

OIL TANK PARTS LIST

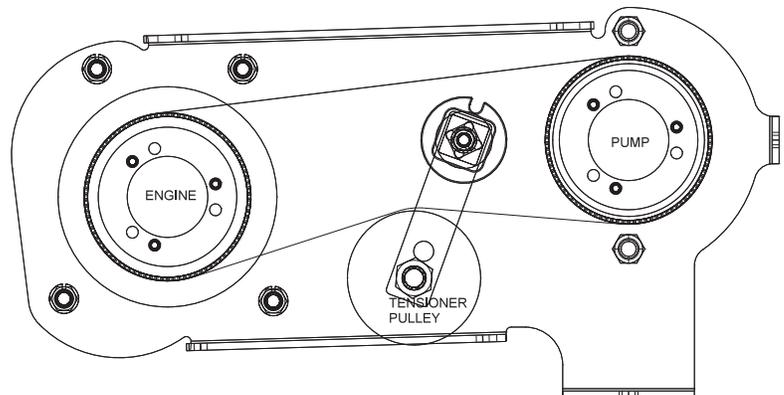
REF#	PART#	DESCRIPTION	QUANTITY
1	13-586	Filler Breather	1
	13-586-01	Cap Gasket	1
	13-586-02	Bottom Gasket	2
	HSM-8-1.25-050	Machine Screw #8 - 1.25 x 1/2	6
	HWS-8	Star Washer #8	6
2	42-005	Oil Tank	1
3	23-126	#6 Plug	1
4	18-240	Adapter	1
5	18-072	45° Elbow	1
6	18-133	Barb Fitting	1
7	HB-14-20-075	Bolt 1/4 - 20 x 3/4	2
	HW-14	Washer 1/4	2
	HWL-14	Lock Washer 1/4	2
8	43-028	Oil Tank Bracket	1
9	HB-516-18-225	Bolt 5/16 - 18 x 2 1/4	1
	HNFL-516-18	Flange Whiz Lock Nut 5/16 - 18	1
10	42-035	Tank Support	1
11	HB-12-13-500	Bolt 1/2 - 13 x 5	2
	HNTL-12-13	Top Lock Nut 1/2 - 13	2
12	42-099	Glass Support	1
13	42-030	Rake Holder	1
14	HB-38-16-150	Bolt 3/8 - 16 x 1 1/2	1
	HW-38	Washer 3/8	1
	HNFL-38-16	Flange Whiz Lock Nut 3/8 - 16	1
15	18-337	Tee	1
16	23-189	90° Elbow	1
17	42-017	Left Tank Bracket	1
18	HB-14-20-100	Bolt 1/4 - 20 x 1	2
	HW-516	Washer 5/16	2
	HW-14	Washer 1/4	2
	HWL-14	Lock Washer 1/4	2
19	HB-38-16-250	Bolt 3/8 - 16 x 2 1/2	1
	HW-38	Washer 3/8	1
	HNFL-38-16	Flange Whiz Lock Nut 3/8 - 16	1
20	42-015	Attachment Mount	2
21	50-081	Rubber Bumper	1
	HNFL-38-16	Flange Whiz Lock Nut 3/8 - 16	1

PUMP AND ENGINE DRAWING

Parts



BELT ROUTING



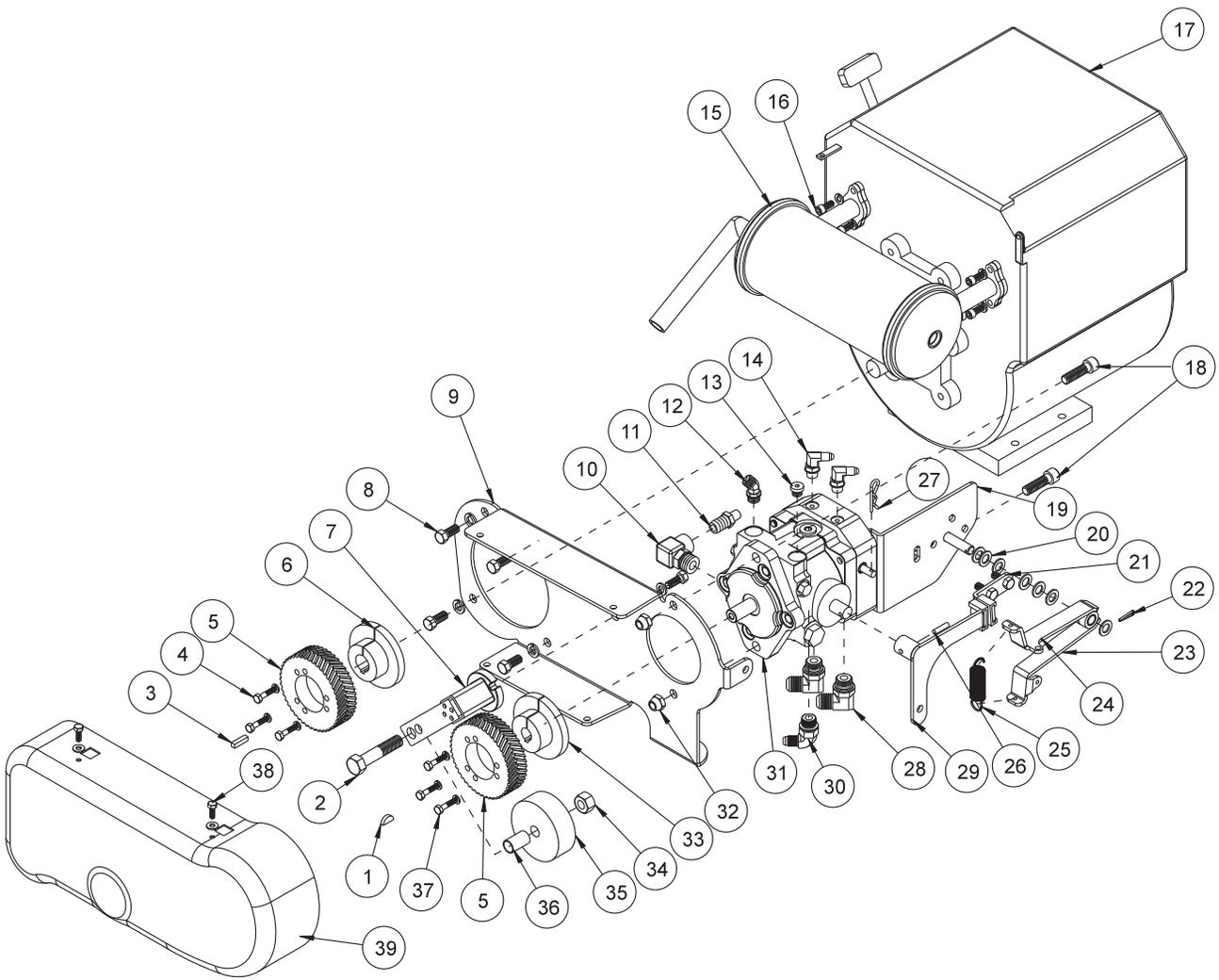
PUMP AND ENGINE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	HWK-316-075	Woodruff Key	1
2	HB-58-11-300	Bolt $\frac{5}{8}$ - 11 x 3	1
3	HKSQ-14-100	Machine Key $\frac{1}{4}$ x $\frac{1}{4}$ x 1	1
4	HB-14-20-125	Bolt $\frac{1}{4}$ - 20 x $1\frac{1}{4}$ (comes with 42-245)	3
	HW-14	Lockwasher (comes with 42-245)	3
5	42-244	Pulley	2
	42-243	Belt	1
6	42-245	Hub 1"	1
7	42-300	Tensioner	1
	HB-38-16-100	Bolt $\frac{3}{8}$ - 16 x 1 (comes with 42-300)	1
	HWL-38	Lockwasher $\frac{3}{8}$ (comes with 42-300)	1
8	HB-716-14-100	Bolt $\frac{7}{16}$ - 14 x 1	4
	HWL-716	Lockwasher $\frac{7}{16}$	4
9	42-272	Pump Mount	1
10	23-130	Elbow 90°	1
11	18-133	Barb Fitting	1
12	18-188	Elbow 45°	1
13	23-126	Plug	1
14	18-232	Elbow 90°	2
15	27-123	Muffler	1
16	HSSHSM-8-1.25-20	Metric Cap Screw M8 - 1.25 x 20	4
	HWLM-8	Lockwasher M8	4
17	43-024	Engine B&S 18 HP (3 wheel drive)	1
	15-165	Engine B&S 16 HP (2 wheel drive)	1
	15-165-01	Air Filter Element with Pre-Cleaner	1
	13-531	Engine Oil Filter	1
	13-491	Oil Switch	1
	13-492	Solenoid	1
18	HSSHHS-12-13-175	Socket Screw $\frac{1}{2}$ - 13 x $1\frac{3}{4}$	2
19	42-279	Filter Mount	1
	HW-38	Washer $\frac{3}{8}$	2
20	HMB-12-14	Machine Bushing $\frac{1}{2}$ x 14 GA	7
21	42-247	Creep Arm	1
	8946-1.5	Wear Strip (part of 42-247)	1
	HRS-316-050	Rivet (part of 42-247)	1
	HB-38-16-100	Bolt $\frac{3}{8}$ - 16 x 1	2
	HNFL-38-16	Flange Whiz Lock Nut $\frac{3}{8}$ - 16	2
22	HP-18-100	Cotter Pin $\frac{1}{8}$ x 1	1
23	42-312	Bottom Centering Arm	1
	18-234	Bushing (part of 42-312)	1
24	42-311	Top Centering Arm	1
	18-234	Bushing (part of 42-311)	1

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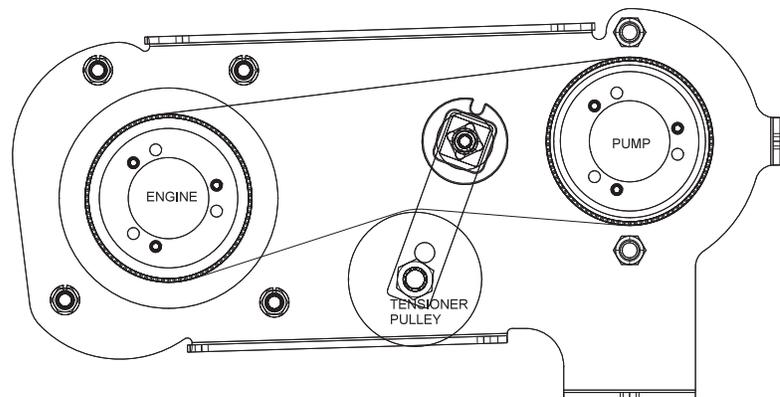


PUMP AND ENGINE DRAWING



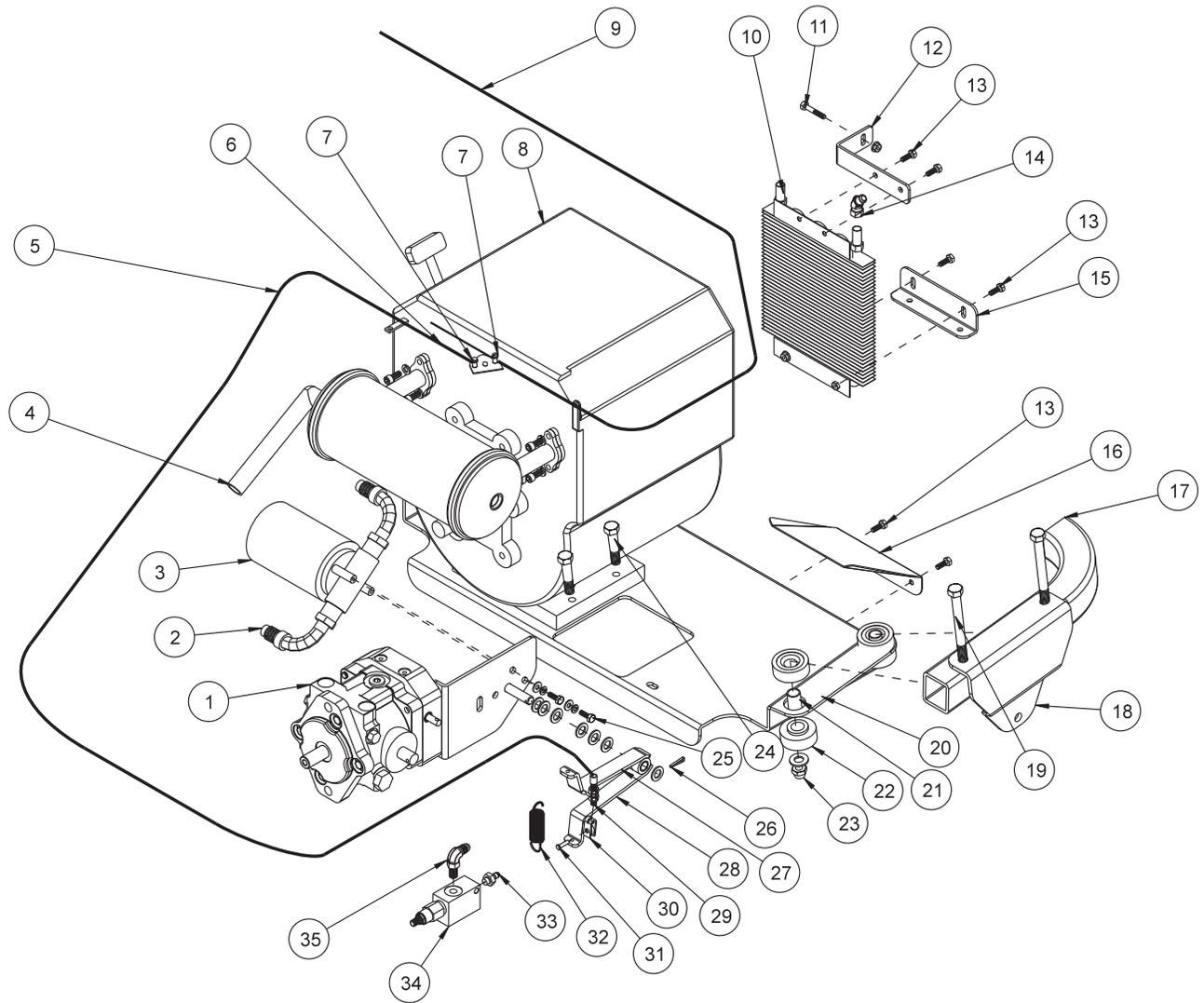
Parts

BELT ROUTING



PUMP AND ENGINE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
25	11-050	Extension Spring	1
26	HRP-14-100	Roll Pin 1/4 x 1	1
27	HHP-18	Bridge Pin 1/8	1
28	18-174	Elbow 90°	2
29	42-308	Swash Arm	1
	8946-1	Wear Strip (part of 42-308)	1
	HRS-316-050	Rivet (part of 42-308)	1
30	18-185	Elbow	1
31	34-109	Variable Pump	1
32	HNTL-12-13	Lock Nut 1/2 - 13	2
33	42-246	Hub 3/4	1
34	HNCL-58-11	Center Lock Nut 5/8 - 11	1
35	42-291	Tensioner Pulley	1
36	11-122	Spacer	1
37	HB-14-20-125	Bolt 1/4 -20 x 1 1/4 (comes with 42-246)	3
	HWL-14	Lockwasher 1/4 (comes with 42-246)	3
38	HB-14-20-075	Bolt 1/4 - 20 x 3/4	4
	HW-14	Washer 1/4	4
	HWL-14	Lockwasher 1/4	4
	78-274	Cage Nuts	4
39	42-326	Belt Guard	1
40	42-306	Heat Shield	1
	18-222	Hose Clamp	2

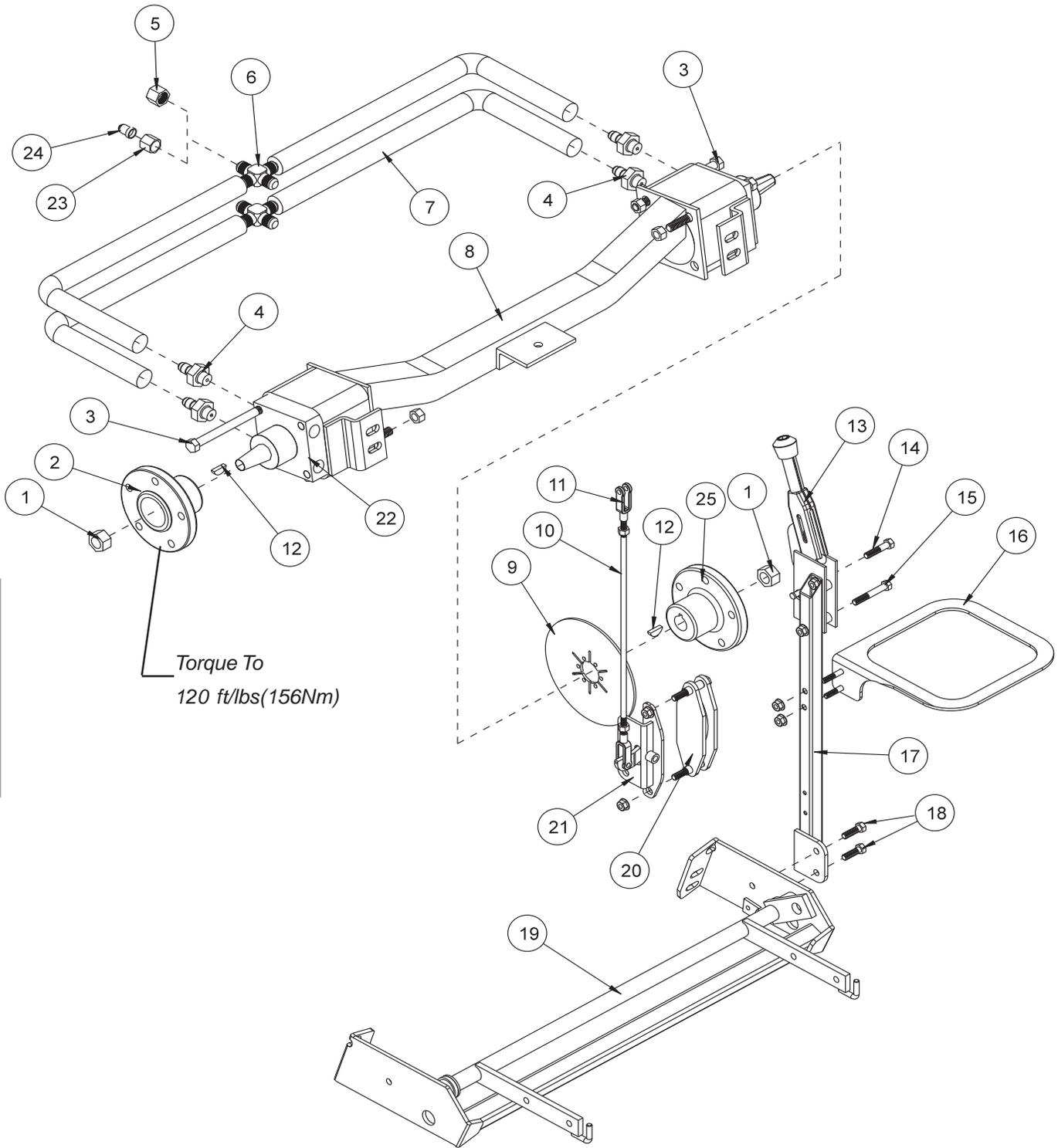


Parts

ENGINE PARTS LIST

REF #	PART #	DESCRIPTION	QUANTITY
1	34-109	Variable Pump	1
2	34-123	Elbow	2
3	23-006	Oil Filter	1
	23-031	Replacement Filter	
4	27-123	Muffler	1
5	17-152	Conduit	1
6	17-151	Cable	1
7	21-161	Wire Block	4
8	43-024	Engine B&S 18 hp (3 wheel drive)	1
	15-165	Engine B&S 16 HP (2 wheel drive)	1
9	42-321	Throttle (hand)	1
10	42-265	Aluminum Oil Cooler	1
11	HB-14-20-150	Bolt $\frac{1}{4}$ - 20 x $\frac{1}{2}$	1
	HNFL-14-20	Flange Whiz Lock Nut $\frac{1}{4}$ -20	1
12	42-276	Top Cooler Bracket	1
13	HB-14-20-075	Bolt $\frac{1}{4}$ - 20 x $\frac{3}{4}$	6
	HNFL-14-20	Flange Whiz Lock Nut $\frac{1}{4}$ - 20	6
14	18-214	Elbow 45°	1
15	42-275	Bottom Cooler Bracket	1
16	42-270	Oil Drain Pan	1
17		Main Frame	
18	42-015	Attachment Mount	2
19	HB-12-13-500	Bolt $\frac{1}{2}$ -13 x 5	4
20	42-269	Engine Plate	1
21	60-168	Spacer	4
22	60-107	Rubber Bushing	8
23	HNTL-12-13	Lock Nut $\frac{1}{2}$ - 13	4
	HW-12	Washer $\frac{1}{2}$	4
24	HB-516-18-225	Bolt $\frac{5}{16}$ - 18 x $2\frac{1}{4}$	4
	HNFL-516-18	Flange Whiz Lock Nut $\frac{5}{16}$ - 18	4
25	HB-14-20-075	Bolt $\frac{1}{4}$ - 20 x $\frac{3}{4}$	2
	HWL-14	Lockwasher $\frac{1}{4}$	2
	HW-14	Washer $\frac{1}{4}$	2
26	HP-18-100	Cotter Pin $\frac{1}{8}$ x 1	1
	HMB-12-14	Machine Bushing $\frac{1}{2}$ x 14 GA	7
27	42-311	Top Centering Arm	1
	18-234	Bushing (part of 42-311)	1
28	42-312	Bottom Centering Arm	1
	18-234	Bushing (part of 42-312)	1
29	17-155	Retainer	1
	HN-516-24	Nut $\frac{5}{16}$ - 24	2
30	17-153	Clevis	1
31	HCP-25-075	Clevis Pin $\frac{1}{4}$ x $\frac{3}{4}$	1
	HP-332-075	Cotter Pin $\frac{3}{32}$ x $\frac{3}{4}$	1
32	11-050	Extension Spring	1
33	18-169	Adapter	1
34	42-192	Relief Valve	1
35	18-168	Elbow	1
36	42-207	Cable Bracket	1
37	HB-516-18-100	Bolt $\frac{5}{16}$ - 18 x 1	2
	HW-516	Washer $\frac{5}{16}$	2
	HNTL-516-18	Lock Nut $\frac{5}{16}$ - 18	2

REAR AXLE DRAWING

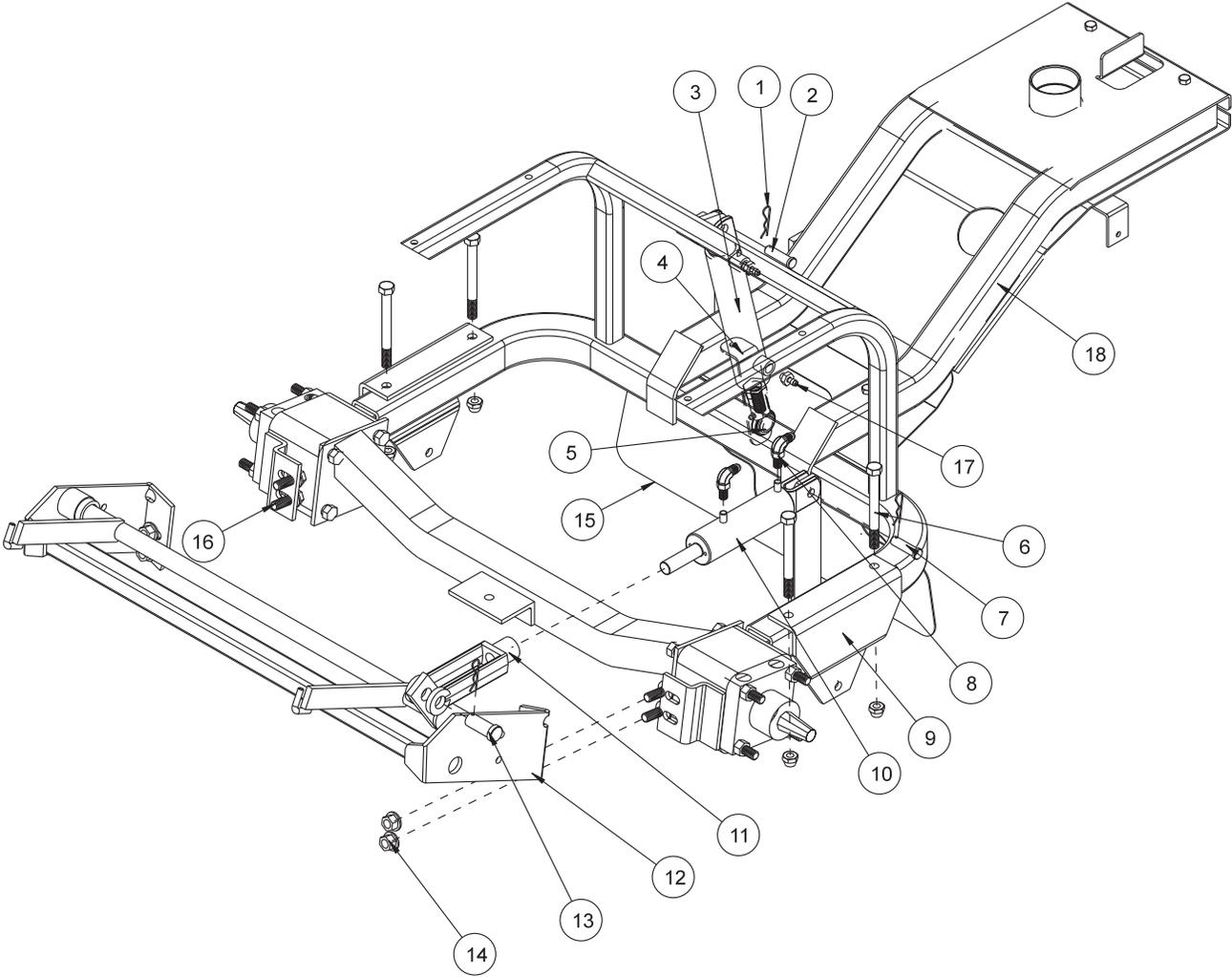


Parts

REAR AXLE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	42-002-12	Nut $\frac{3}{4}$ - 16 (part of 42-002)	2
2	42-007	Hub	1
3	HB-12-13-650	Bolt $\frac{1}{2}$ - 13 x 6 $\frac{1}{2}$	8
	HNTL-12-13	Top Lock Nut $\frac{1}{2}$ - 13	8
4	18-343	Adapters	4
5	18-344	Caps (2WD ONLY)	2
6	18-342	Cross	2
7	42-261	$\frac{1}{2}$ " Hydraulic Tube x 27 $\frac{1}{2}$ "	2
8	42-250	Main Frame	1
9	50-041	Brake Disk	1
	42-176	Low Head Cap Screw $\frac{1}{4}$ - 20 x $\frac{3}{4}$	6
10	42-155	Brake Rod	1
	HN-516-24	Nut $\frac{5}{16}$ - 24	2
11	11-100	Linkage Yoke	2
12	HWK-14-100	Woodruff Key 1/4 x 1 (part of 42-002)	2
13	60-106	Brake Lever	1
14	HB-38-16-175	Bolt $\frac{3}{8}$ - 16 x 1 $\frac{3}{4}$	1
	HNFL-38-16	Flange Whiz Lock Nut $\frac{3}{8}$ - 16	1
15	HB-38-16-250	Bolt $\frac{3}{8}$ - 16 x 2 $\frac{1}{2}$	1
	HNFL-38-16	Flange Whiz Lock Nut $\frac{3}{8}$ - 16	1
16	42-156	Trash Carrier Bracket	1
	13-192	Trash Bucket	1
	HB-516-18-175	Bolt $\frac{5}{16}$ - 18 x 1 $\frac{3}{4}$	2
	HNFL-516-18	Flange Whiz Lock Nut $\frac{5}{16}$ - 18	2
17	42-153	Park Brake Bracket	1
18	HB-38-16-100	Bolt $\frac{3}{8}$ - 16 x 1	2
	HNFL-38-16	Flange Whiz Lock Nut $\frac{3}{8}$ - 16	2
19	42-024	Rake Lift	1
20	50-042	Brake Caliper	1
21	42-151	Brake Bracket	1
22	42-002	Wheel Motor	2
23	23-120	$\frac{1}{2}$ " Tube Nut (3WD only)	2
24	34-128	Reducer (3WD only)	2
25	42-157	Right-hand Hub	1
26	42-304	$\frac{1}{2}$ " Hydraulic Tube x 27"	2
27	42-305	Shim	2

RAKELIFT DRAWING

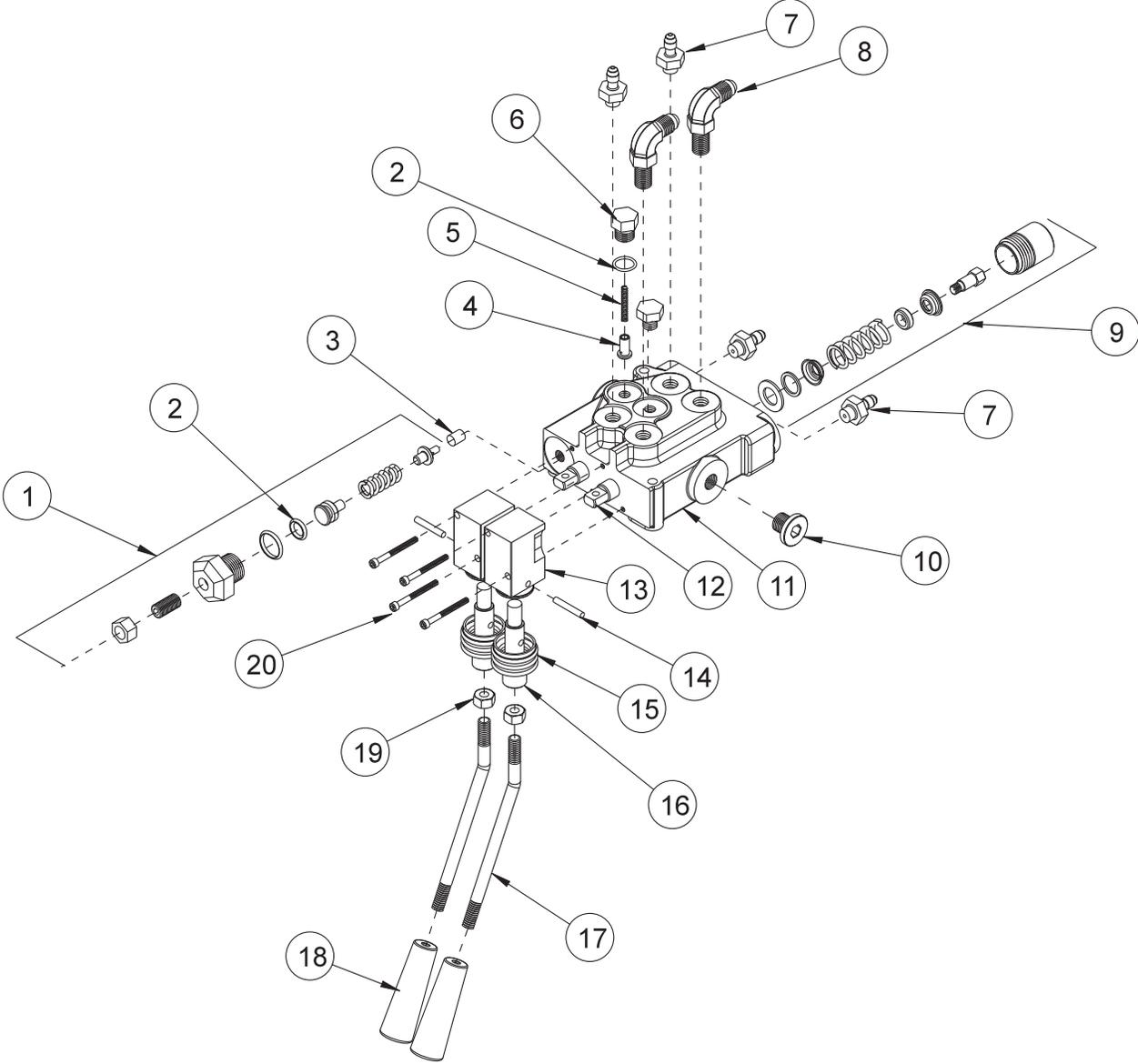


Parts

RAKE LIFT PARTSLIST

REF#	PART#	DESCRIPTION	QUANTITY
1	HHP-18	Bridge Pin $\frac{1}{8}$	3
2	HCP-58-175	Clevis Pin $\frac{5}{8}$ - $1\frac{3}{4}$	1
3	10-135	Hydraulic Cylinder	1
	HNJ-58-18	Jam Nut $\frac{5}{8}$ - 18	1
4	42-217	Cylinder Mount	1
5	18-154	Rod End	1
	HG-14-28-180	Grease Fitting $\frac{1}{4}$ - 28 x 180°	1
6	HB-12-13-500	Bolt $\frac{1}{2}$ - 13 x 5	4
	HNTL-12-13	Top Lock Nut $\frac{1}{2}$ - 13	4
7	HCP-12-150	Clevis Pin $\frac{1}{2}$ - $1\frac{1}{2}$	1
8	18-168	90° Elbow	2
9	42-015	Attachment Mount	2
10	13-357	Hydraulic Cylinder	1
	HNJ-34-16	Jam Nut $\frac{3}{4}$ - 16	1
11	42-040	Yoke	1
12	42-024	Rake Lift	1
13	HCP-34-175	Clevis Pin $\frac{3}{4}$ x $1\frac{3}{4}$	1
14	HNFL-12-13	Flange Whiz Lock Nut $\frac{1}{2}$ - 13	4
	HW-12	Washer $\frac{1}{2}$	4
15	42-590	Mud Guard	1
16	HB-12-13-150	Bolt $\frac{1}{2}$ - 13 x $1\frac{1}{2}$	4
17	18-169	Adapter	2
18	42-250	Main Frame	1

42-220 2-BANK HYDRAULIC VALVE DRAWING

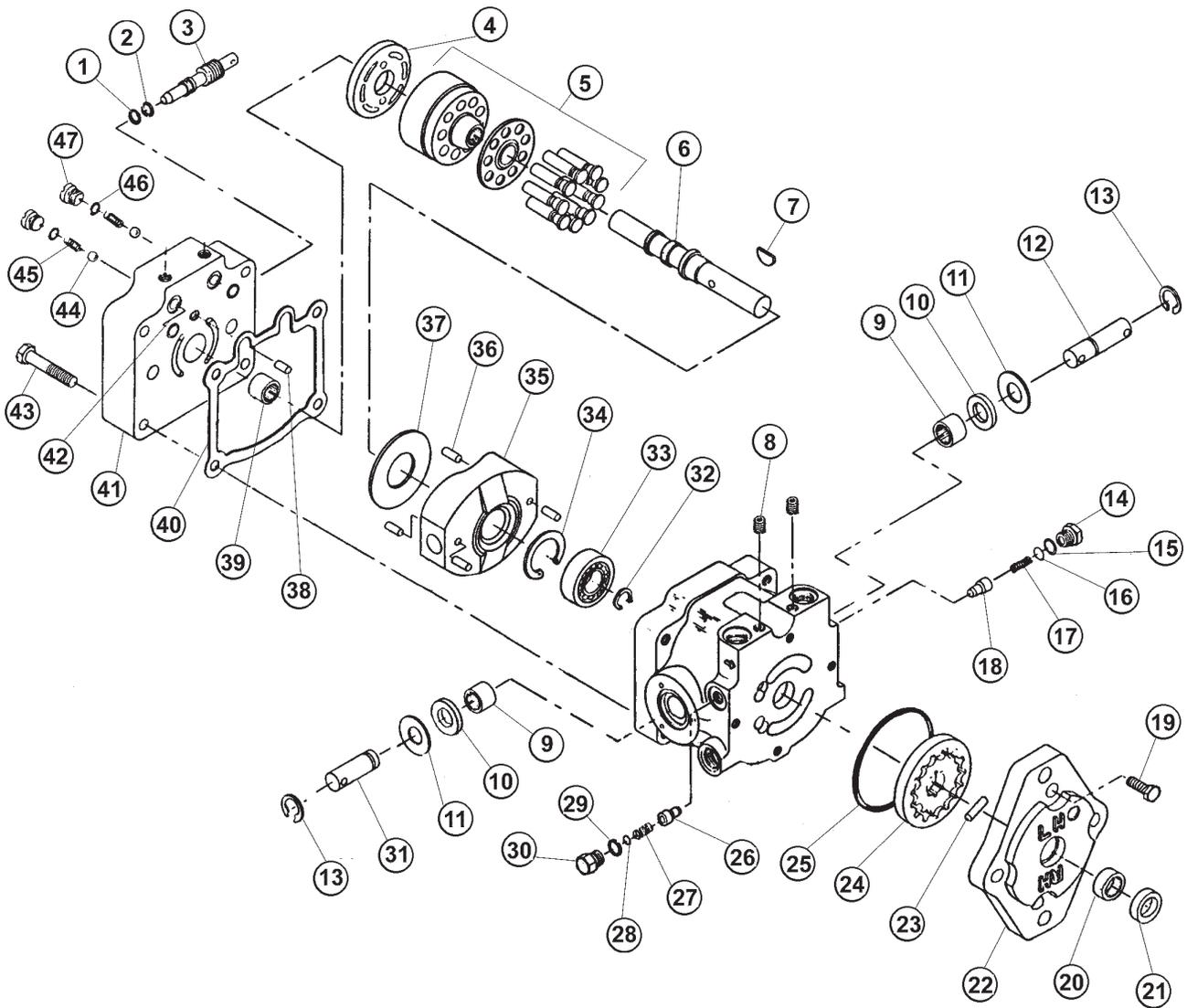


Parts

42-220 2-BANK HYDRAULIC VALVE PARTSLIST

REF #	PART #	DESCRIPTION	QUANTITY
1*	14-106	Relief Assembly Kit	1
2*	14-062	Seal Kit	1
3*	13-261-03	N.R. Plug	2
4*	13-261-07	Plunger	2
5*	13-261-06	Spring	2
6*	13-261-05	Plug	2
7	18-169	Adapter, 3/8 SAE	4
8	18-168	90° Elbow, 3/8 Straight Thread	2
9*	14-203	Spring Centered Kit	1 per bank
10*	13-261-02	Plug	1
11*	42-220-01	2-Bank Housing	1
12*	42-220-02	Spool	1 per bank
13†	42-220-04	Actuator Housing	2
14†	42-220-05	Dowel Pin	2
15†	42-220-07	Actuator Boot	2
16†	42-220-03	Actuator Link	2
17	42-271	Valve Handle (includes Ref # 18 and 19)	2
18	42-220-08	Tapered Knob	2
19	42-220-10	Jam Nut with Collar 5/16 - 18	2
20*	42-220-06	Socket Head Cap Screw, 10 - 32 x 1 1/2	4
*	42-220	2-Bank Hydraulic Valve (includes all * items)	
†	42-220-09	Actuator Housing Assembly	1 Per Bank

34-109 VARIABLE PUMP DRAWING



Parts

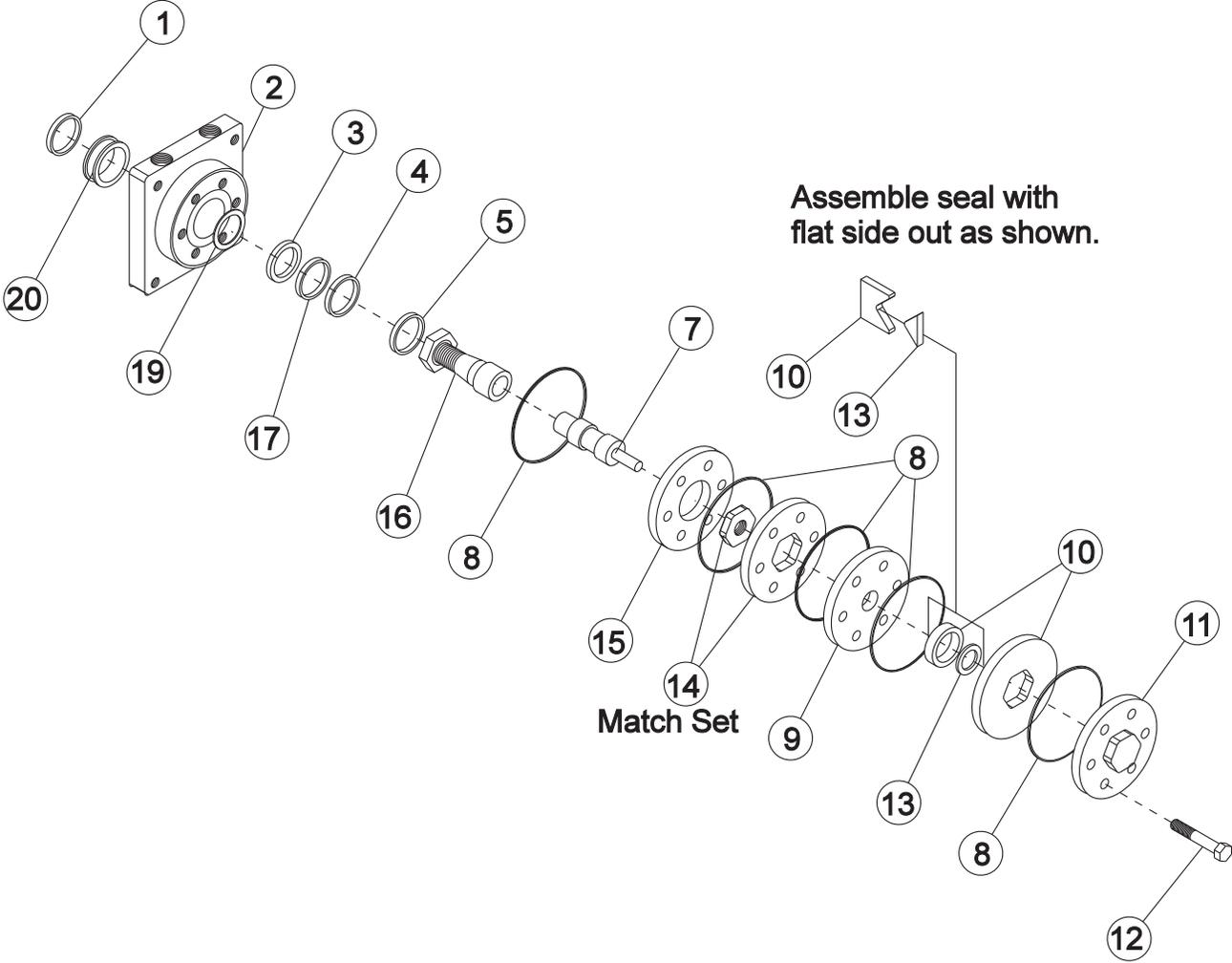
34-109 VARIABLE PUMP PARTS LIST

REF #	PART #	DESCRIPTION	QUANTITY
1	14-222	O-Ring	1
2	14-130	Ring	1
3	13-110-01	By-Pass Valve	1
4	34-109-01	Valve Plate	1
5†		Cylinder Block	1
6	14-084	Pump Shaft with Bearing	1
7	14-131	Woodruff Key	1
8	13-110-05	Pipe Plug	2
9	14-069	Needle Bearing	2
10*	14-014	Lip Seal	2
11	14-113	Washer	2
12	14-220	Truncated Shaft (long 2 holes)	1
13	14-105	Retaining Ring	2
14	13-110-10	Plug	1
15*		O-Ring	1
16	34-109-02	Shim Pack Kit	1
17	14-263	Release Valve Spring	1
18	13-110-11	Release Valve Cone	1
19§	13-110-14	Hex Head Screw	4
20§	14-129	Needle Bearing	1
21*§	14-054	Lip Seal	1
22§	13-110-13	Charge Pump Housing	1
23§	14-135	Straight Pin	1
24§	14-136	Gerotor Assembly	1
25*§		O-Ring	1
26	14-235	Release Valve Cone	1
27	14-234	Check Release Valve Spring	1
28	34-109-03	Shim Pack Kit	1
29*		O-Ring	1
30	13-110-10	Plug	1
31	14-212	Truncated Shaft (short 1 hole)	1
32	14-133	Retaining Ring	1
33	42-003-10	Ball Bearing	1
34	14-132	Retaining Ring	1
35	14-221	Variable Swash Plate	1
36	14-216	Spring Pin	3
37	14-114	Thrust Plate	1
38	14-215	Pin	1
39		Roller Bearing (comes with 14-084 Ref# 6)	1
40*	14-107	Gasket	1
41†		Pump End Cap	1
42*		O-Ring	2
43	13-110-04	Hex Head Screw	4
44▣	13-110-09	Ball	2
45▣	13-110-08	Check Valve Spring	2
46*▣		O-Ring	2
47▣	13-110-07	Check Valve Plug	2

- * 14-098 Seal Kit 1
- † Parts are not available. Replace with new unit.
- § 13-110-15 Charge Pump 1
- ▣ 13-110-16 Check Valve Kit 2



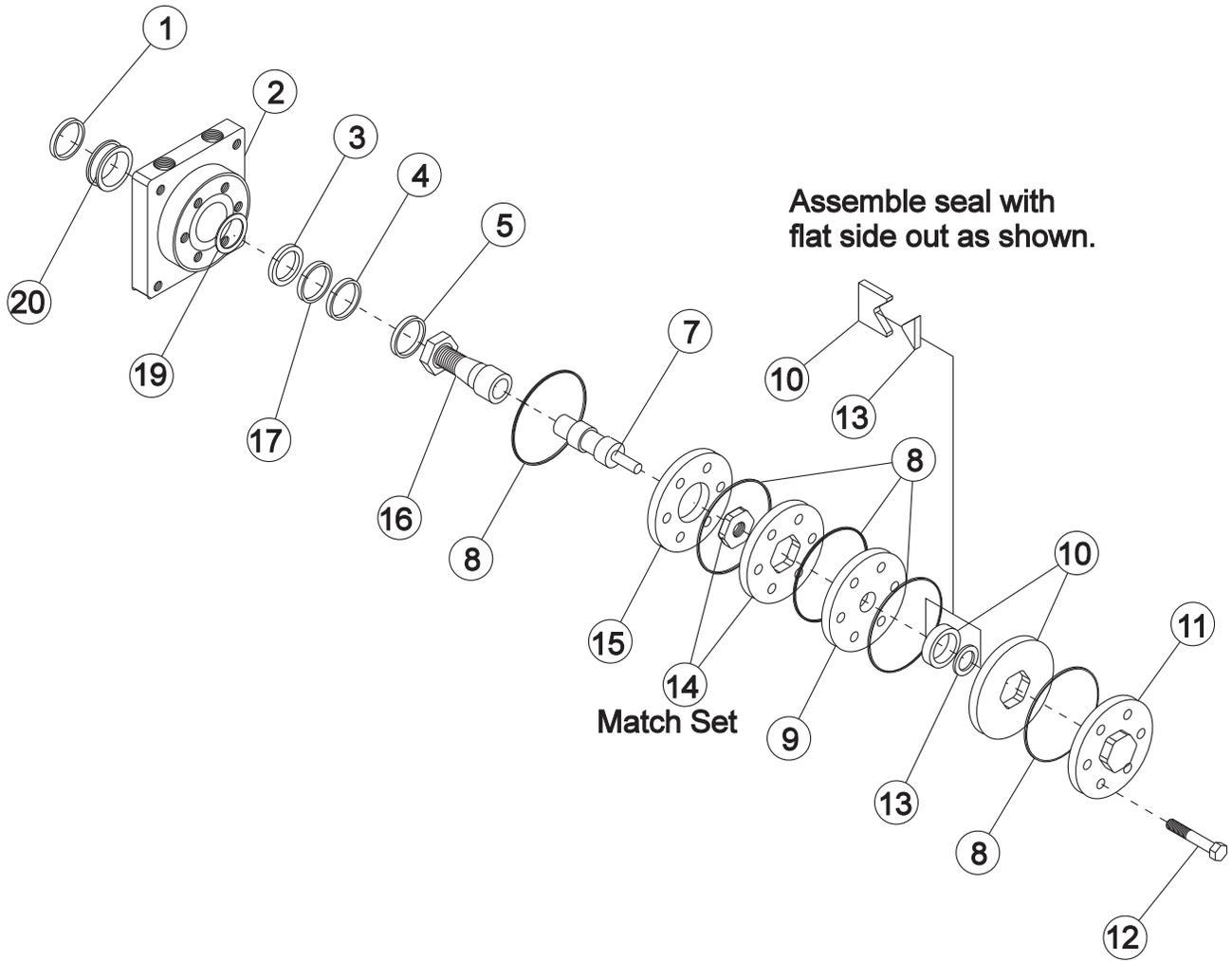
42-039 FRONT WHEEL MOTOR (4.0 C.I.) DRAWING



42-039 FRONT WHEEL MOTOR (4.0 C.I.) PARTSLIST

REF #	PART #	DESCRIPTION	QUANTITY
1*		Water & Dirt Seal	1
2	42-002-01	Service Housing Assembly	1
4	42-002-02	Thrust Bearing	1
5	42-002-03	Inner Bearing	1
7	42-039-01	Drive Link	1
8*		Ring Seal	5
9	42-002-05	Manifold	1
10	42-002-06	Commutator Assembly (matched set)	1
11	42-002-07	End Cap	1
12	42-039-02	Bolt	5
13*		Commutator Seal (matches with #10)	1
14	42-039-03	Rotor Set (matched set)	1
15	42-002-10	Wear Plate	1
16	42-002-11	Coupling Shaft	1
	HWK-14-100	Woodruff Key 1/4 x 1	1
	42-002-12	Nut 3/4 - 16	1
17	42-002-13	Thrust Washer	1
19*		Backup Ring	1
20	42-002-14	Outer Bearing	1
*	42-002-15	Seal Kit	1

42-002 REAR WHEEL MOTOR (8.0 C.I.) DRAWING

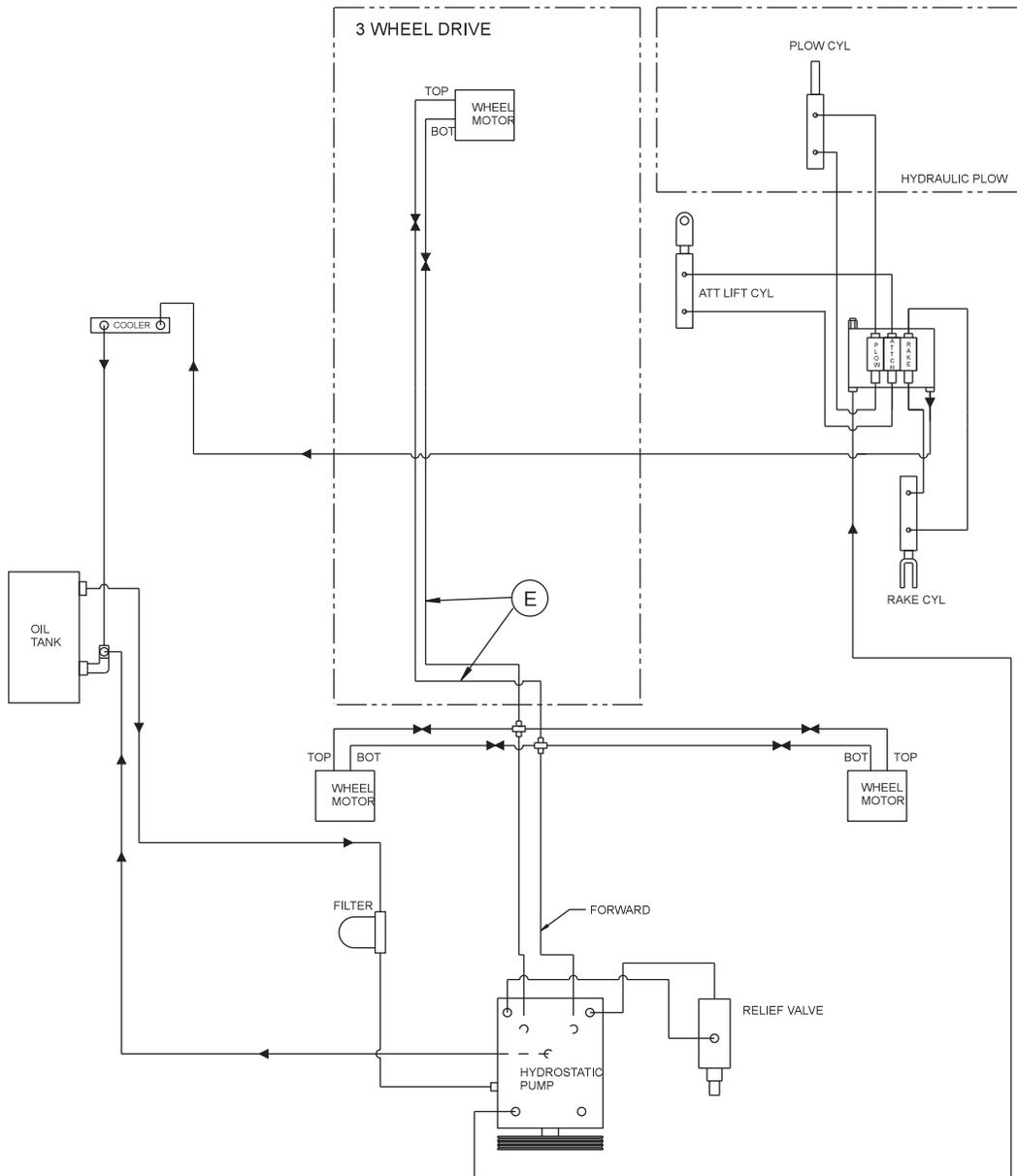
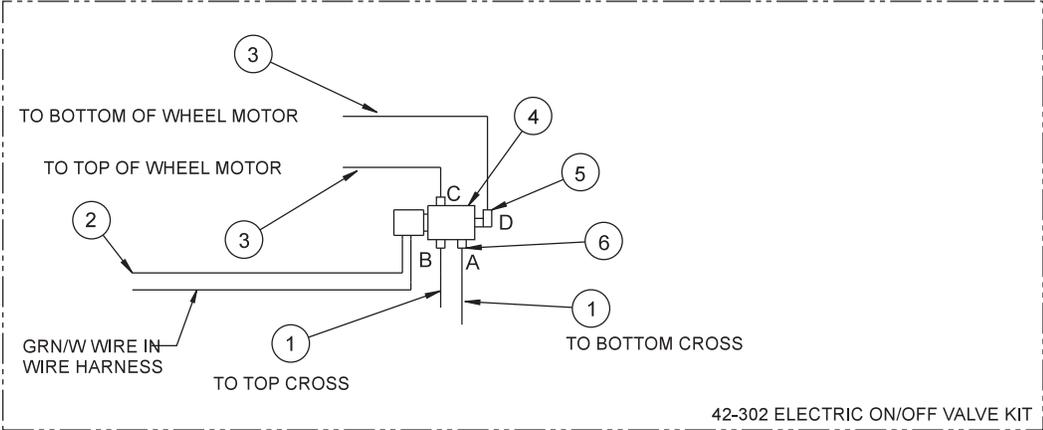


Parts

42-002 REAR WHEEL MOTOR (8.0 C.I.) PARTSLIST

REF #	PART #	DESCRIPTION	QUANTITY
1*		Water & Dirt Seal	1
2	42-002-01	Service Housing Assembly	1
4	42-002-02	Thrust Bearing	1
5	42-002-03	Inner Bearing	1
7	42-002-04	Drive Link	1
8*		Ring Seal	5
9	42-002-05	Manifold	1
10	42-002-06	Commutator Assembly (matched set)	1
11	42-002-07	End Cap	1
12	42-002-08	Bolt	5
13*		Commutator Seal (matches with #10)	1
14	42-002-09	Rotor Set (matched set)	1
15	42-002-10	Wear Plate	1
16	42-002-11	Coupling Shaft	1
	HWK-14-100	Woodruff Key 1/4 x 1	1
	42-002-12	Nut 3/4 - 16	1
17	42-002-13	Thrust Washer	1
19*		Backup Ring	1
20	42-002-14	Outer Bearing	1
*	42-002-15	Seal Kit	1

42-302 ELECTRIC ON - OFF VALVE DRAWING



Accessories

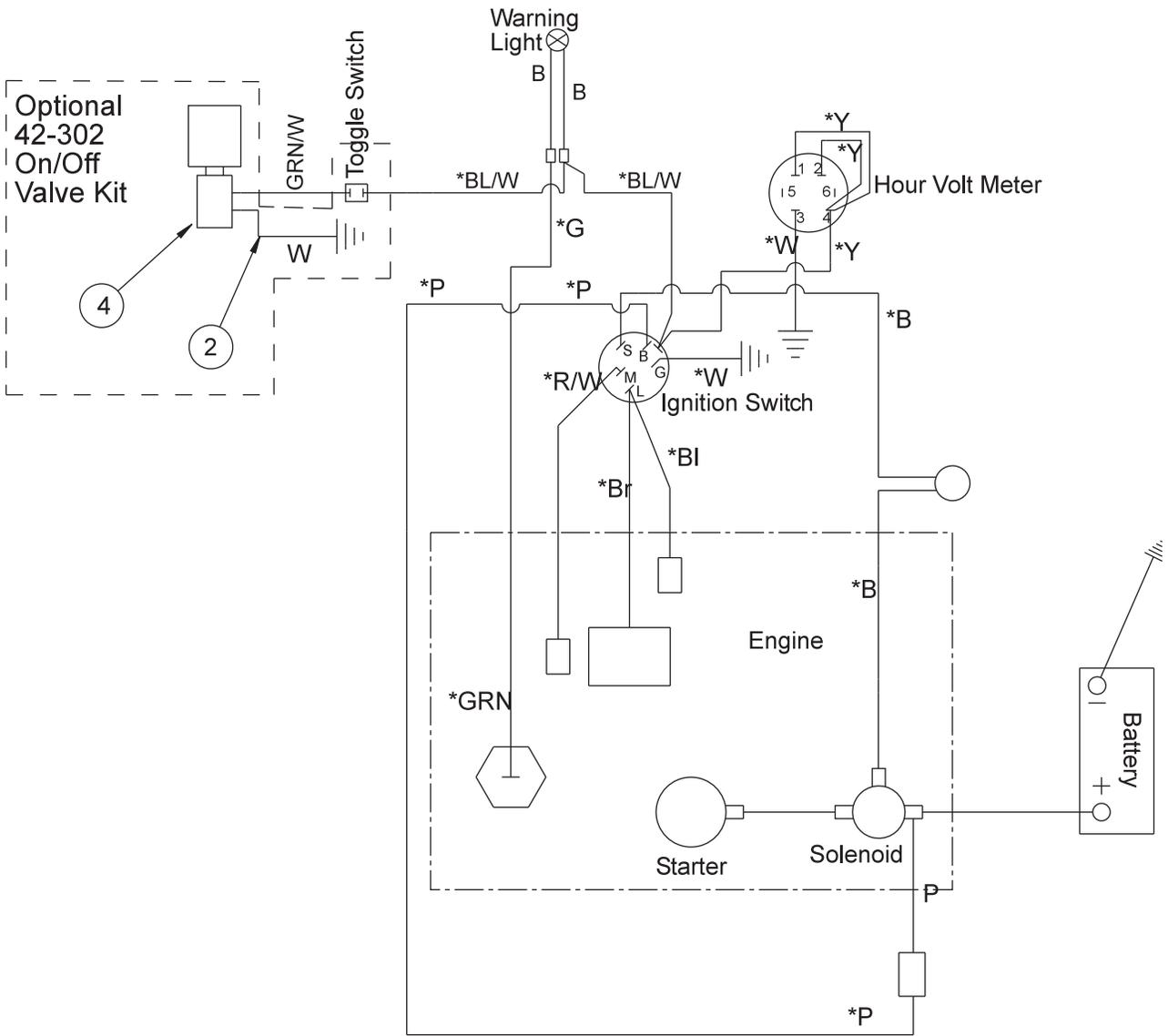
42-302 ELECTRIC ON - OFF VALVE PARTS LIST

REF #	PART #	DESCRIPTION	QUANTITY
1	42-263	Hydraulic Hose	2
2	76-260	Wire, Ground	1
3	42-264	Hydraulic Hose	2
4	42-118	Electric On/Off Valve	1
	HB-14-20-200	Bolt 1/4 - 20 x 2	2
	HNFL-14-20	Flange Whiz Lock Nut 1/4 - 20	2
5	18-185	Elbow 90°	1
6	18-341	Elbow 45°	3

INSTALLATION INSTRUCTIONS

1. Shut off machine and let engine cool. Remove key, disconnect negative (-) battery cable and pull spark plug wires..
2. Assemble the fittings into the electric on/off valve. With valve lying on bench with solenoid to the left, install the three 45° elbows (Ref 6) in the two ports closest to you and one port furthest from you. Install the one 90° elbow (Ref 5) in the right hand port.
3. Install two 42-264 hydraulic hoses (Ref 3) on C and D. Tighten.
4. Install two 42-263 hydraulic hoses (Ref 1) on A and B. Be sure straight end of hose is on the valve with the fitting going backward. Tighten.
5. Remove mud guard and place a drain pan under the cross fittings that the hoses from the front wheel motor go to.
6. Disconnect the two hoses going to the front wheel motor at the cross, then at the front wheel motor and remove.
7. Remove the cover plate from the fiber glass.
8. Feed two 42-264 hydraulic hoses (Ref 3) up through bearing plate, through the 3" hole, and out to the front fork. Connect to the front wheel motor with the hose from D to the bottom of the wheel motor and C to the top.
9. Bolt valve to bearing plate with solenoid to your left side. Use the 1/4 -20 x 2 bolt and flange whiz lock nut. Be sure to fasten the ground wire on one of the mounting bolts and the other end on one terminal of the solenoid valve.
10. Connect the two 42-263 hydraulic hoses (Ref 1) from the valve to the cross with the hose from A to the bottom cross and B to the top cross.
11. Install toggle switch on control panel. Uncoil green and white stripe wire from frame and hook on end to the toggle switch and the other end to the terminal on electric on/off valve. Install the loose end of the blue/white wire to the toggle switch.
12. Route hose and secure with 22-069 nylon ties. Reinstall mud guard.
13. Reconnect the negative (-) ground battery cable to battery and spark plug wires.
14. Make sure that everything is clear of the machine. Start the machine, test on/off valve for proper operation.
15. Check for hydraulic leaks.
16. Shut off machine, double check all fastener and fittings, be sure they are tight.
17. Reinstall cover plate.
18. Check hydraulic fluid, level should be 2 to 2 1/2 inches below the top of the tank when cold. Add if necessary.

42-302 ELECTRIC ON - OFF VALVE WIRING



Accessories

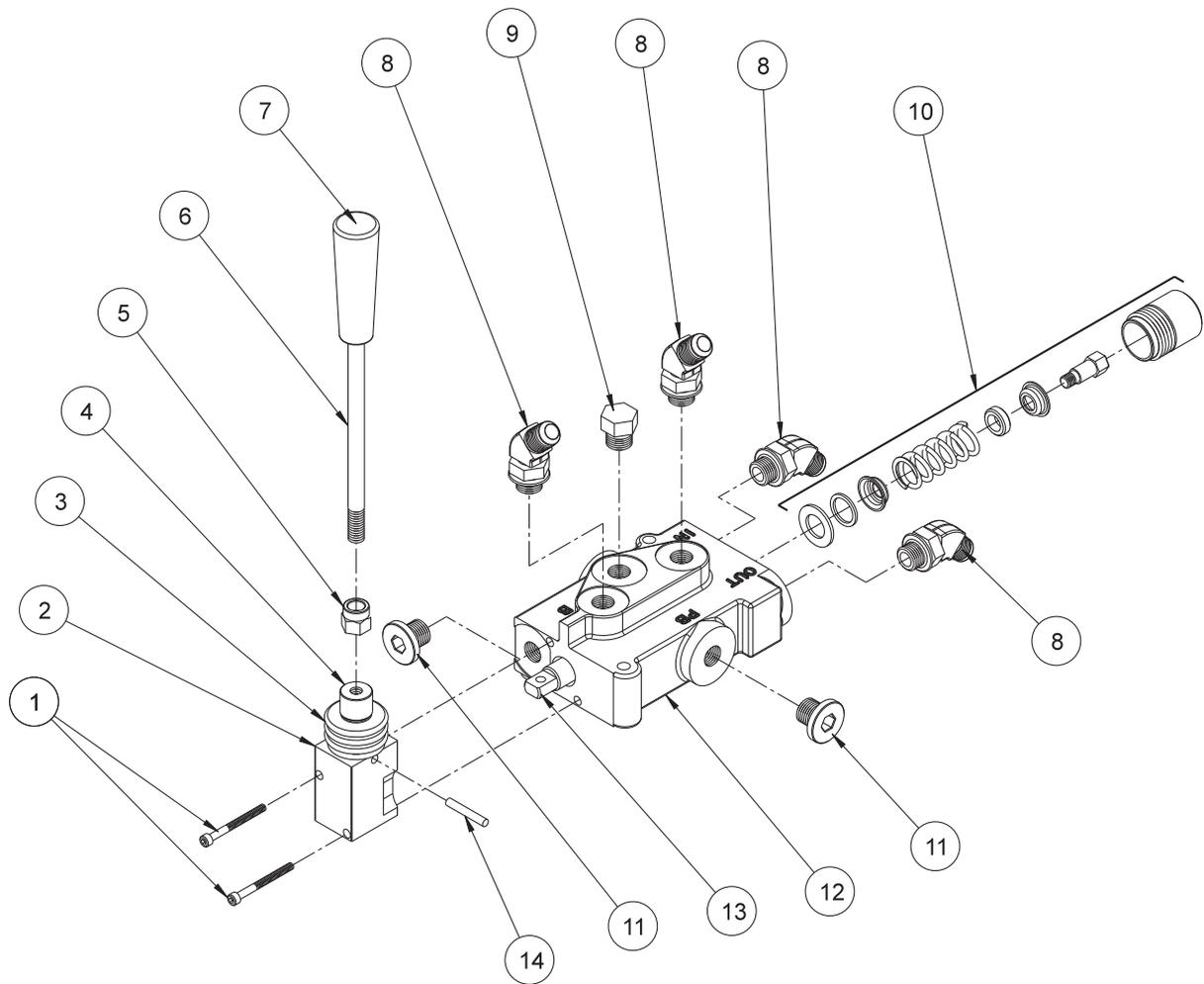
42-302 ELECTRIC ON - OFF VALVE PARTS LIST

REF #	PART #	DESCRIPTION	QUANTITY
1	42-263	Hydraulic Hose	2
2	76-260	Wire, Ground	1
3	42-264	Hydraulic Hose	2
4	42-118	Electric On/Off Valve	1
	HB-14-20-200	Bolt 1/4 - 20 x 2	2
	HNFL-14-20	Flange Whiz Lock Nut 1/4 - 20	2
5	18-185	Elbow 90°	1
6	18-341	Elbow 45°	3

INSTALLATION INSTRUCTIONS

1. Shut off machine and let engine cool. Remove key, disconnect negative (-) battery cable and pull spark plug wires..
2. Assemble the fittings into the electric on/off valve. With valve lying on bench with solenoid to the left, install the three 45° elbows (Ref 6) in the two ports closest to you and one port furthest from you. Install the one 90° elbow (Ref 5) in the right hand port.
3. Install two 42-264 hydraulic hoses (Ref 3) on C and D. Tighten.
4. Install two 42-263 hydraulic hoses (Ref 1) on A and B. Be sure straight end of hose is on the valve with the fitting going backward. Tighten.
5. Remove mud guard and place a drain pan under the cross fittings that the hoses from the front wheel motor go to.
6. Disconnect the two hoses going to the front wheel motor at the cross, then at the front wheel motor and remove.
7. Remove the cover plate from the fiber glass.
8. Feed two 42-264 hydraulic hoses (Ref 3) up through bearing plate, through the 3" hole, and out to the front fork. Connect to the front wheel motor with the hose from D to the bottom of the wheel motor and C to the top.
9. Bolt valve to bearing plate with solenoid to your left side. Use the 1/4-20 x 2 bolt and flange whiz lock nut. Be sure to fasten the ground wire on one of the mounting bolts and the other end on one terminal of the solenoid valve.
10. Connect the two 42-263 hydraulic hoses (Ref 1) from the valve to the cross with the hose from A to the bottom cross and B to the top cross.
11. Install toggle switch on control panel. Uncoil green and white stripe wire from frame and hook on end to the toggle switch and the other end to the terminal on electric on/off valve. Install the loose end of the blue/white wire to the toggle switch.
12. Route hose and secure with 22-069 nylon ties. Reinstall mud guard.
13. Reconnect the negative (-) ground battery cable to battery and spark plug wires.
14. Make sure that everything is clear of the machine. Start the machine, test on/off valve for proper operation.
15. Check for hydraulic leaks.
16. Shut off machine, double check all fastener and fittings, be sure they are tight.
17. Reinstall cover plate.
18. Check hydraulic fluid, level should be 2 to 2 1/2 inches below the top of the tank when cold. Add if necessary.

43-046 SINGLE BANK HYDRAULIC VALVE DRAWING

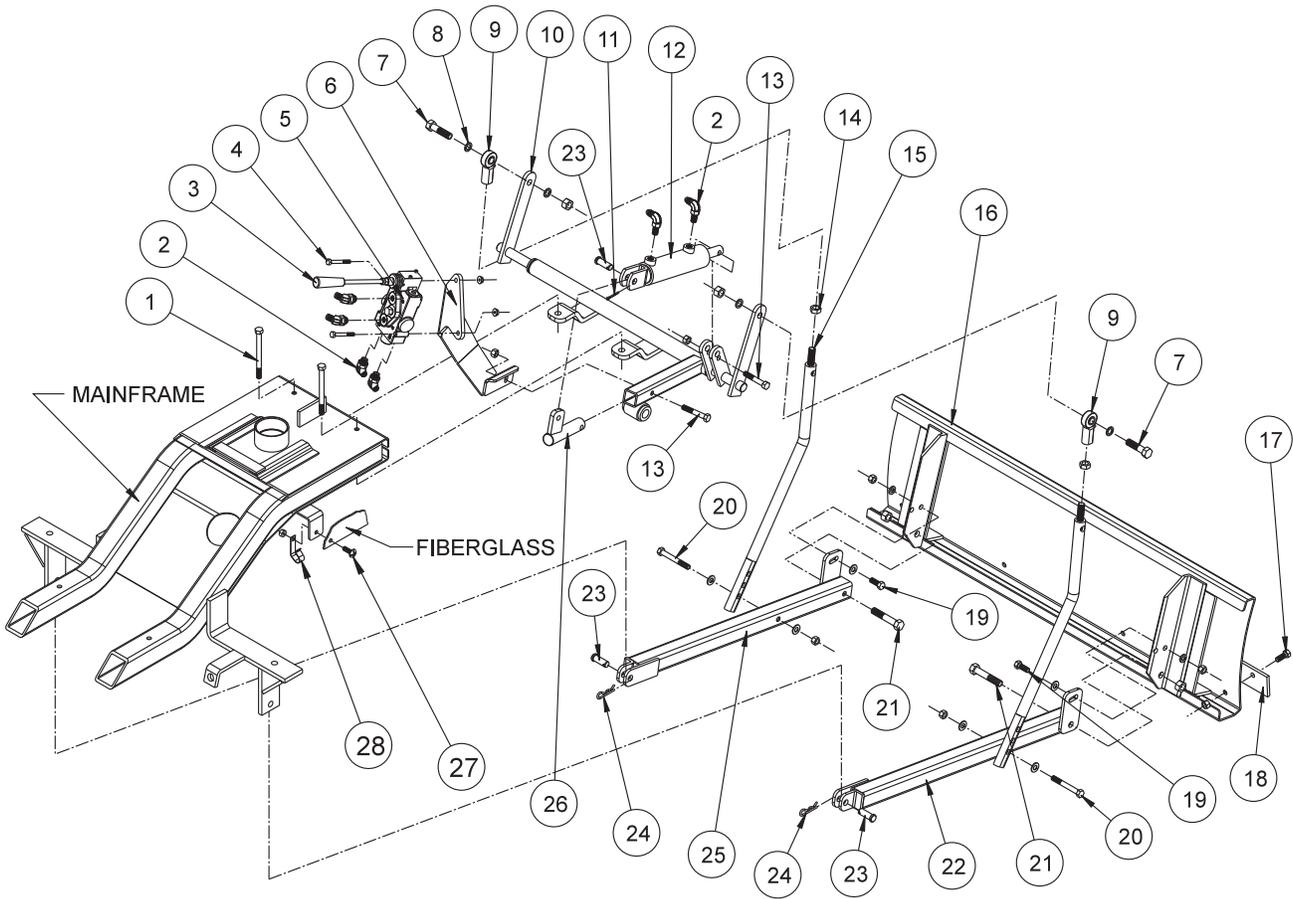


Accessories

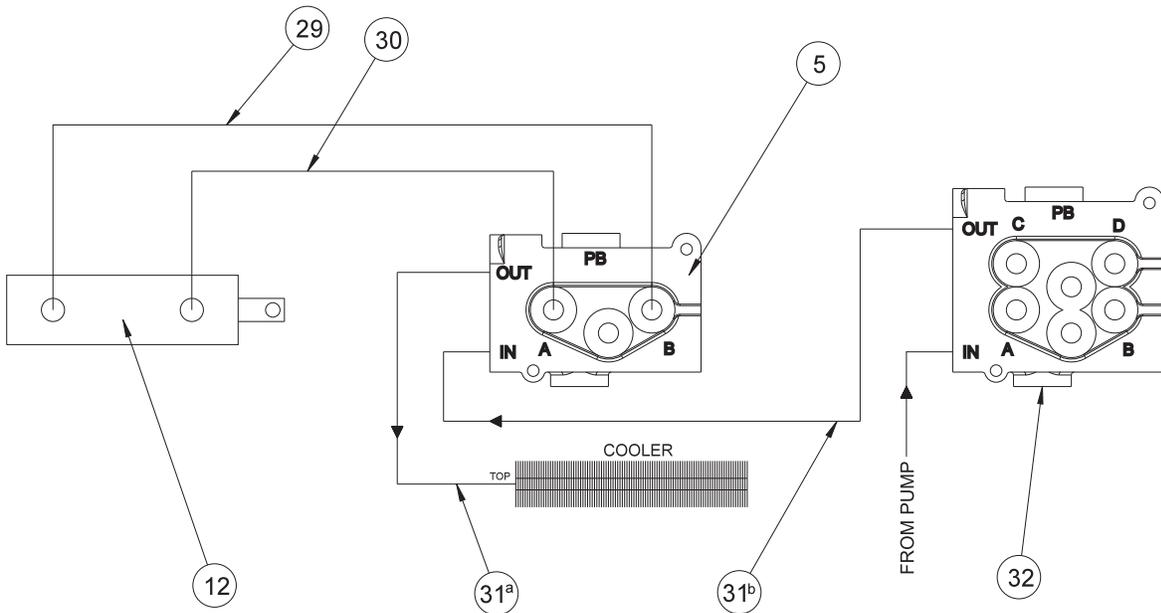
43-046 SINGLE BANK HYDRAULIC VALVE PARTSLIST

REF #	PART #	DESCRIPTION	QUANTITY
1*	42-220-06	Socket Head Cap Screw	2
2*†	42-220-04	Actuator Housing	1
3*†	42-220-07	Actuator Boot	1
4*†	42-220-03	Actuator Link	1
5*	42-220-10	Jam Nut with Collar, $\frac{5}{16}$ - 18	1
6*	42-225	Straight Handle Kit (includes Ref#'s 5 & 7)	1
7*	42-220-08	Tapered Knob	3
8	18-188	45° Elbow	4
9*	13-261-05	Plug	3
10*	14-203	Spring Centered Kit	1
11*	13-261-02	Plug	2
12*	43-046-01	Single Bank Housing	1
13*	42-220-02	Spool	1
14*†	42-220-05	Dowel Pin, $\frac{3}{16}$ x 1	1
*†	43-046	Single Bank Hydraulic Valve (includes all * items)	
†	42-220-09	Actuator Housing Assembly	1 per Bank

43-003 HYDRAULIC SAND FLOW DRAWING



HYDRAULIC VALVE PLUMBING DRAWING



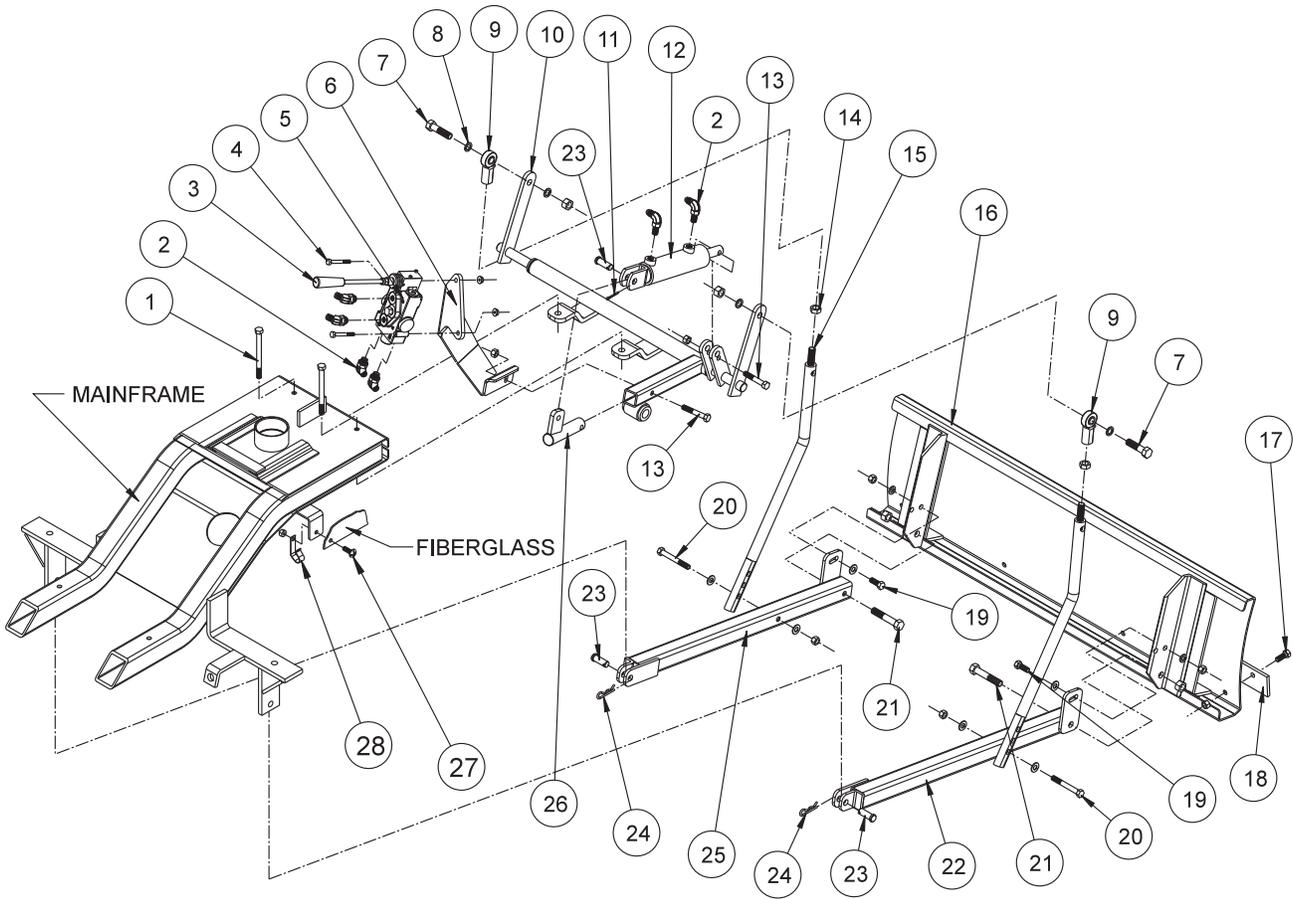
Accessories

43-003 HYDRAULIC SAND PLOW PARTS LIST

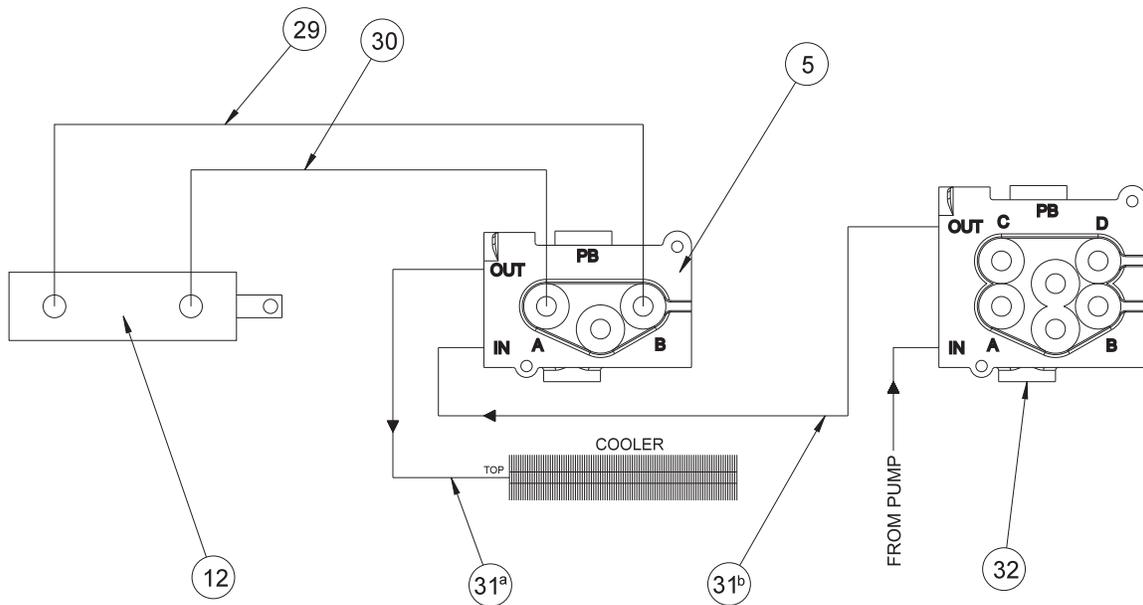
REF#	PART#	DESCRIPTION	QUANTITY
1	HB-38-16-350	Bolt, $\frac{3}{8}$ - 16 x $3\frac{1}{2}$ (Part of machine)	2
	HW-38	Washer, $\frac{3}{8}$	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	2
2	18-188	45° Elbow	6
3	42-225	Straight Handle Kit	1
4	HB-14-20-200	Bolt, $\frac{1}{4}$ - 20x 2	2
	HNFL-14-20	Flange Whiz-Lock Nut, $\frac{1}{4}$ - 20	2
5	43-046	Single Bank Hydraulic Valve	1
6	43-050	Valve Mount	1
7	HB-12-13-175	Bolt, $\frac{1}{2}$ - 13 x $1\frac{3}{4}$	2
	HNTL-12-13	Lock Nut, $\frac{1}{2}$ - 13	2
8	HMB-12-14	Machine Bushing, $\frac{1}{2}$ x 14GA	4
9	80-006	Rod End	2
10	42-092	Lift Assembly	1
11	HP-18-100	Cotter Pin, $\frac{1}{8}$ x 1	1
12	13-292	Hydraulic Cylinder	1
13	HB-38-16-200	Bolt, $\frac{3}{8}$ - 16 x 2	2
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	2
14	HNJ-12-20	Jam Nut, $\frac{1}{2}$ - 20	2
15	27-073	Lift Rod	2
16	27-017	Aluminum Sand Plow Blade	1
17	HB-38-16-100	Bolt, $\frac{3}{8}$ - 16 x 1	4
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	4
18	13-167	Wear Blade	1
19	HB-38-16-100	Bolt, $\frac{3}{8}$ - 16 x 1	2
	HW-38	Washer, $\frac{3}{8}$	2
	HWL-38	Lockwasher, $\frac{3}{8}$	2
	HN-38-16	Nut, $\frac{3}{8}$ - 16	2
20	HB-38-16-300	Bolt, $\frac{3}{8}$ - 16 x 3	2
	HW-38	Washer, $\frac{3}{8}$	4
	HNTL-38-16	Lock Nut, $\frac{3}{8}$ - 16	2
21	HB-12-13-300	Bolt, $\frac{1}{2}$ - 13 x 3	2
	HNTL-12-13	Lock Nut, $\frac{1}{2}$ - 13	2
22	27-050	Right Pusher Bar	1
23	HCP-12-150	Clevis Pin, $\frac{1}{2}$ x $1\frac{1}{2}$	3
24	HHP-18	Bridge Pin, $\frac{1}{8}$	2
25	27-049	Left Pusher Bar	1
26	42-096	Cylinder Lift	1
27	HSTP-516-18-100	Machine Screw, $\frac{5}{16}$ - 18 x 1 (on machine)	1
28	HLC-A-58	Loom Clamp	1
29	43-049	Hose, 18"	1
30	43-048	Hose, 20"	1
31 ^{a&b}	43-047	Hose, 57 $\frac{1}{2}$ "	2
32	42-220	2-Bank Valve (on machine)	



43-003 HYDRAULIC SAND PLOW DRAWING



HYDRAULIC VALVE PLUMBING DRAWING



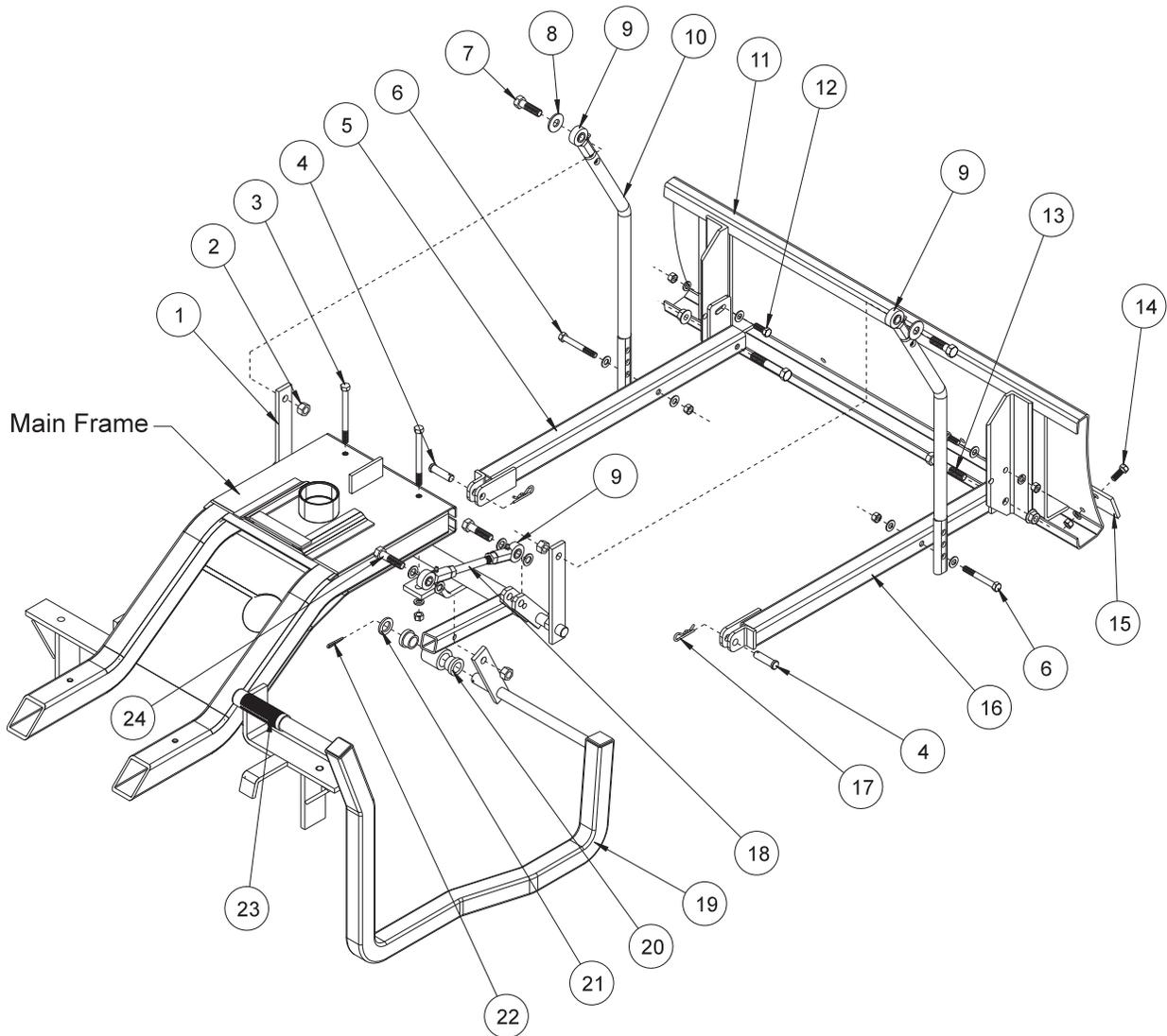
Accessories

43-003 HYDRAULIC SAND PLOW INSTRUCTIONS

1. Assemble Pusher Bars (Ref # 22 and 25) to Plow Blade (Ref # 16) using one $\frac{3}{8}$ -16 x 1 Bolt (Ref # 19) and one $\frac{3}{8}$ -16 x 3 Bolt (Ref #21) per Pusher Bar. There are 2 holes to bolt (Ref # 19) 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 a more fine tuned adjustment.
2. Assemble the Lift Assembly (Ref # 10) to the Main Frame using the two studs that are under the frame and below the front of the console.
3. Place Cylinder Lift (Ref # 26) into the tube on Lift Assembly (Ref # 10) with the tab pointing up hold with a $\frac{3}{8}$ -16 x 2 Bolt (Ref # 13), assemble the Valve Mount (Ref # 6) onto this bolt on the outside of the tube and secure both with one $\frac{3}{8}$ -16 Nut. Using a $\frac{3}{8}$ -16 x 2 Bolt mount the Hydraulic Cylinder (Ref # 12) to the Lift Assembly and secure with one $\frac{3}{8}$ -16 Nut. Connect the other end of the Hydraulic Cylinder to the Cylinder Lift using $\frac{1}{2}$ x $1\frac{1}{2}$ Clevis Pin (Ref # 23) and $\frac{1}{8}$ x 1 Cotter Pin (Ref #11).
4. Thread one $\frac{1}{2}$ - 20 Jam Nut (Ref # 14) onto each Lift Rod (Ref # 15) followed by the Rod Ends (Ref # 9). Adjust to equal lengths. Bolt Lift Rods to Lift Arms on Lift Assembly (Ref # 10) with Rod Ends to the outside. Bolt from outside with the $\frac{1}{2}$ " Machine Bushing (Ref # 8) between Rod End and Lift Arm and secure with $\frac{1}{2}$ -13 Lock Nut.
5. Slide the Plow/Pusher Bar Assembly under machine and connect to machine. Secure using $\frac{1}{2}$ x $1\frac{1}{2}$ Clevis Pins (Ref # 23) and $\frac{1}{8}$ " Bridge Pins (Ref # 24).
6. To connect Lift Rods (Ref # 15) to Pusher Bars start by lifting up the Plow Blade. Using one $\frac{3}{8}$ -16 x 3 Bolt (Ref # 20) and two $\frac{3}{8}$ " Washers assembly the Lift Rods to the Right (Ref #22) and Left (Ref # 25) Pusher Bars using the bottom hole in the Lift Rods as illustrated. Secure each with one $\frac{3}{8}$ -16 Lock Nut.
7. To fine tune the height of the blade off ground; turn the Rod Ends (Ref # 9) on the Lift Rods (Ref # 15). Turning the Rod Ends counter-clockwise will increase down pressure. Turning them clockwise will decrease down pressure.
8. Thread four of the 45° Elbow fittings (Ref # 2) into the Single Bank Valve (Ref # 5), one each in the **A** port, **B** port, **IN** port and **OUT** port. Thread the remaining two 45° Elbow fittings into the ports on the Hydraulic Cylinder (Ref # 12). Make sure the fittings on the Hydraulic Cylinder are pointing towards the machine.
9. Connect the 57 $\frac{1}{2}$ " Hoses (Ref # 31) to the fittings on the Single Bank Hydraulic Valve (Ref #5). One to the **IN** port and one to the **OUT** port. Next connect the 18" Hose (Ref # 27) to the fitting in the **B** port and connect the 20" Hose (Ref # 28) to the fitting in the **A** port.
10. Mount the Single Bank Hydraulic Valve (Ref # 5) to the Valve Mount (Ref # 6) as illustrated using the two $\frac{1}{4}$ - 20 x 2 Bolts (Ref # 4). Secure with the two $\frac{1}{4}$ - 20 Flange Whiz-Lock Nuts. Connect the Straight Handle Kit (Ref # 3) to the Valve. Reference *Single Bank Hydraulic Valve Drawing* on page 6 for a detailed view of the Valve.
11. Route the 18" Hose (Ref # 29) from the **B** port on the Single Bank Hydraulic Valve (Ref # 5) to the rear port on the Hydraulic Cylinder. Route the 20" Hose (Ref # 30) from the **A** port on the Single Bank Hydraulic Valve to the front port on the Cylinder.
12. Disconnect the negative (-) ground battery cable from the battery. Place a drain pan under the valve on the machine. **ENGINE MUST BE COOL BEFORE DISCONNECTING THE HOSES.**
13. Disconnect the hose from the **OUT** port on the 2 Bank Valve (Ref # 32) and the **top** port on the Oil Cooler. Discard this hose, it will not be used. Connect the 57 $\frac{1}{2}$ " Hose (Ref # 31^a) from the **OUT** port on the Single Bank Valve to the top port on the Oil Cooler. Connect the other 57 $\frac{1}{2}$ " Hose (Ref # 31^b) from the **IN** port of the Single Bank Valve to the **OUT** port of the 2 Bank Valve. Tie up Hoses using $\frac{5}{8}$ Loom Clamp (Ref # 28). Route 57 $\frac{1}{2}$ " Hoses under the body and along the frame avoiding any pinch points. Fasten to the frame using the 14 $\frac{1}{2}$ " Nylon Ties.
14. Reconnect the negative (-) ground battery cable to battery.
15. Make sure that everything is clear of the machine. Start the machine, work the valve so that the plow will both raise and lower. Also, do this with both the attachment lift and the rake lift. Work the lift a number of times until all air works out of the plow circuit and the cylinder works smoothly. At this time look for hydraulic leaks. If there are leaks, turn engine off and repair, start up and check again.
16. Check the hydraulic oil level. The level should be 2" to 2 $\frac{1}{2}$ " below the top of the tank. If more is needed, use SAE 10W-40 API service SG motor oil.

42-011-AB ALUMINUM SAND PLOW DRAWING

42-011-SB STEEL SAND PLOW DRAWING



Accessories

42-011 SAND PLOW PARTS LIST

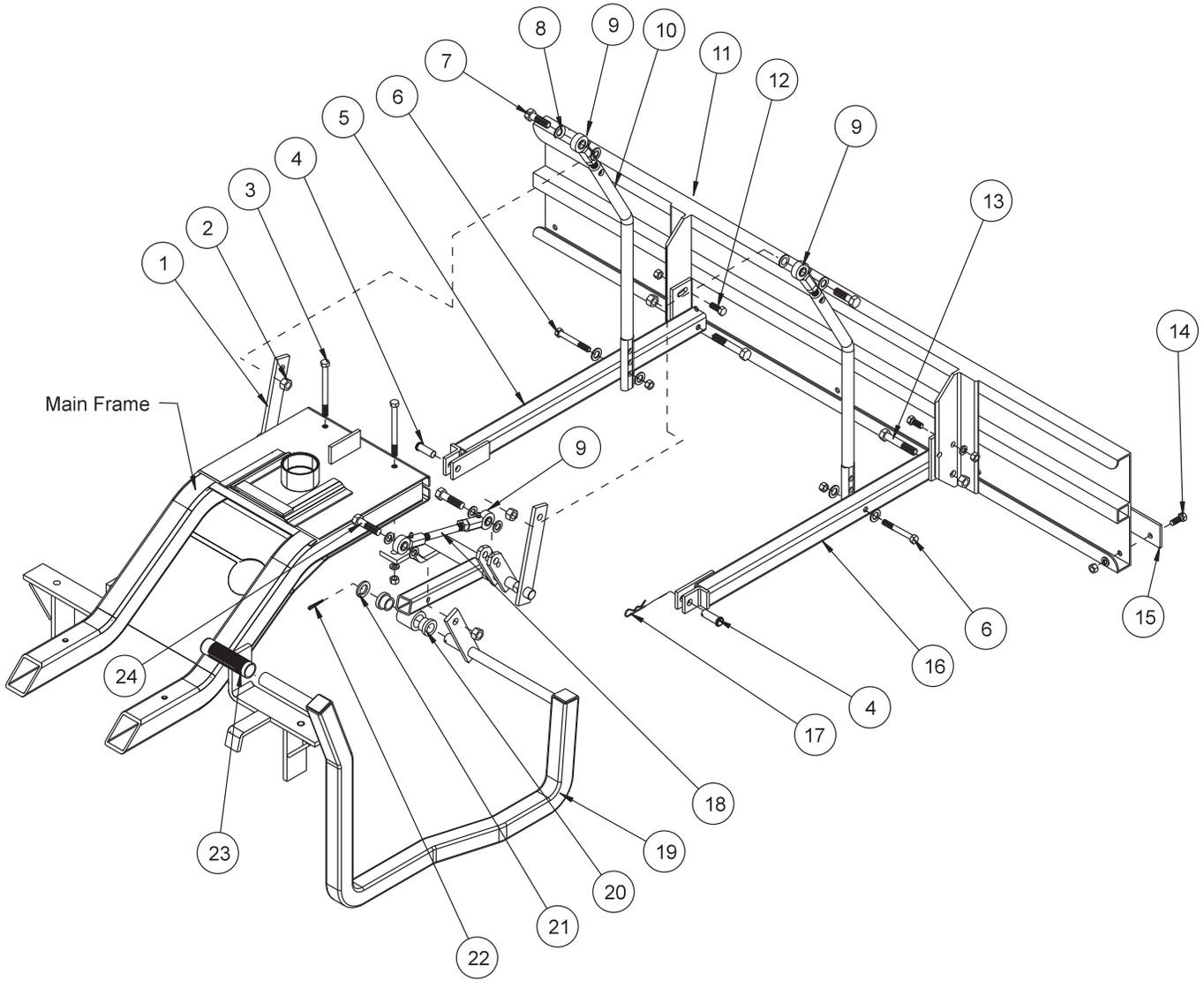
REF#	PART#	DESCRIPTION	QUANTITY
1	42-092	Lift Assembly (includes Ref# 20)	1
2	HNTL-12-13	Lock Nut 1/2 - 13	2
3	HB-38-16-350	Bolt 3/8 - 16 x 31/2 (part of main frame)	2
	HWL-38	Lock Washer 3/8	2
	HN-38-16	Nut 3/8 - 16	2
4	HCP-12-150	Clevis Pin 1/2 x 1 1/2	2
5	27-049	Left Pusher Bar	1
6	HB-38-16-300	Bolt 3/8 - 16 x 3	2
	HW-38	Washer 3/8	4
	HNTL-38-16	Lock Nut 3/8 - 16	2
7	HB-12-13-175	Bolt 1/2 - 13 x 1 3/4	2
8	HMB-12-14	Machine Bushing 1/2 x 14GA	8
9	80-006	Rod End	4
	HNJ-12-20	Jam Nut 1/2 - 20	4
10	27-073	Lift Rod	2
11	27-017	Aluminum Sand Plow Blade	1
	13-352	Steel Sand Plow Blade	1
12	HB-38-16-100	Bolt 3/8 - 16 x 1	2
	HW-38	Washer 3/8	2
	HWL-38	Lock Washer 3/8	2
	HN-38-16	Nut 3/8 - 16	2
13	HB-12-13-300	Bolt 1/2 - 13 x 3	2
	HNTL-12-13	Lock Nut 1/2 - 13	2
14	HB-38-16-100	Bolt 3/8 - 16 x 1	4
	HWL-38	Lock Washer 3/8	4
	HN-38-16	Nut 3/8 - 16	4
15	13-167	Wear Blade	1
16	27-050	Right Pusher Bar	1
17	HHP-18	Bridge Pin 1/8	2
18	42-094	Rod	1
19	42-093	Lift Handle	1
20	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	HB-12-13-200	Bolt 1/2 - 13 x 2	2

INSTALLATION INSTRUCTIONS

- Assemble the pusher bars (Ref 5 and 16) to the plow (Ref 11) using hardware (Ref 12 & 13). There are 2 holes to bolt the 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 fine tuned adjustment.
- Assemble the lift assembly (Ref 1) to the main frame using the two studs that are under the frame and below the front of the console.
- Attach the lift handle (Ref 19) to the lift assembly using cotter pin and machine bushing (Ref 21 & 22). Using rod and yoke (Ref 18 & 9) attach the handle to the lift assembly.
- Put rod ends (Ref 9) onto lift rods (Ref 10) with jam nut first. Adjust to equal lengths. Bolt lift rods to lift arms with ball joints to the outside. Bolt from outside with the 1/2" machine bushing between rod end and lift arm and the 1/2 -13 nylon lock nut on the inside. Use (Ref 7) hardware.
- Slide Plow under machine and connect to machine. Use clevis pin and bridge pin (Ref 4 & 17).
- Lift up the plow. Using the top hole in the lift rod as a starting point hook on the pusher bars. Use (Ref 6) hardware. The three holes in the lift rods are for adjusting the hand lever. The top hole moves the lever forward and holds the blade with the most clearance. Each hole down moves the lever to the rear of the machine and decreases blade clearance by approximately one inch.
- For fine tuning of blade height off ground twist rod end (Ref 9) on rod (Ref 18). Twisting the rod end out will increase down pressure. Twisting the rod end onto the rod will decrease down pressure.



42-136 60" SAND PLOW DRAWING



Accessories

42-136 60" SAND PLOW PART LIST

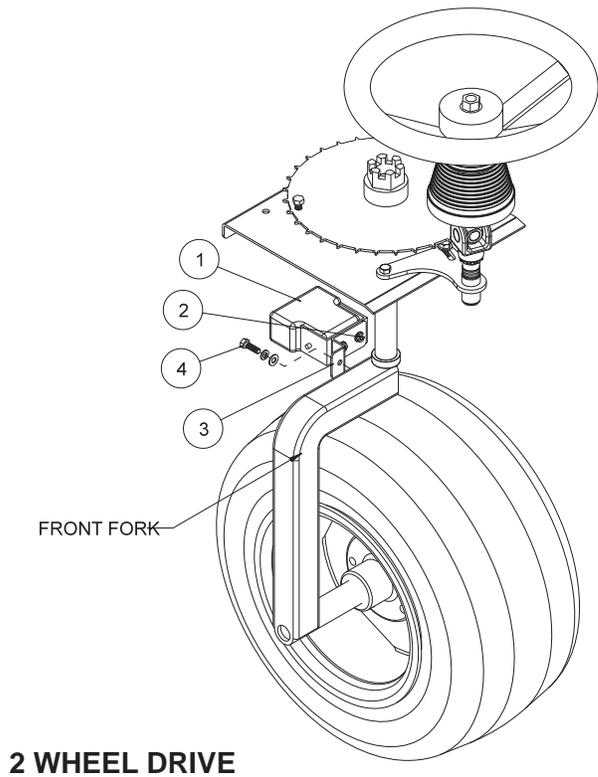
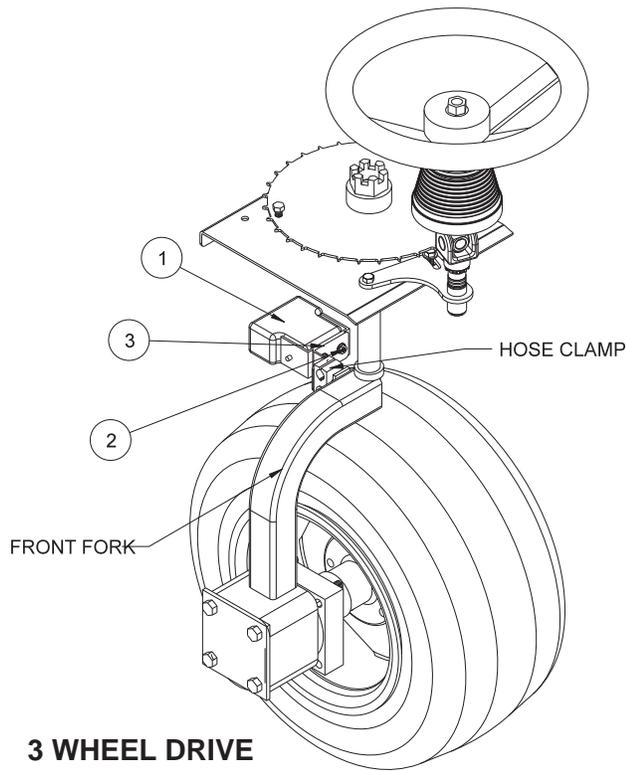
REF#	PART#	DESCRIPTION	QUANTITY
1	42-092	Lift Assembly (includes Ref# 20)	1
2	HNTL-12-13	Lock Nut $\frac{1}{2}$ - 13	4
3	HB-38-16-350	Bolt $\frac{3}{8}$ - 16 x $3\frac{1}{2}$ (part of main frame)	2
	HWL-38	Lock Washer $\frac{3}{8}$	2
	HN-38-16	Nut $\frac{3}{8}$ - 16	2
4	HCP-12-150	Clevis Pin $\frac{1}{2}$ x $1\frac{1}{2}$	2
5	27-049	Left Pusher Bar	1
6	HB-38-16-300	Bolt $\frac{3}{8}$ - 16 x 3	2
	HW-38	Washer $\frac{3}{8}$	4
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	2
7	HB-12-13-175	Bolt $\frac{1}{2}$ - 13 x $1\frac{3}{4}$	2
8	HMB-12-14	Machine Bushing $\frac{1}{2}$ x 14GA	8
9	80-006	Rod End	4
	HNJ-12-20	Jam Nut $\frac{1}{2}$ - 20	4
10	27-073	Lift Rod	2
11	35-011	Aluminum Plow Blade 60"	1
12	HB-38-16-100	Bolt $\frac{3}{8}$ - 16 x 1	2
	HW-38	Washer $\frac{3}{8}$	2
	HWL-38	Lock Washer $\frac{3}{8}$	2
	HN-38-16	Nut $\frac{3}{8}$ - 16	2
13	HB-12-13-300	Bolt $\frac{1}{2}$ - 13 x 3	2
	HNTL-12-13	Lock Nut $\frac{1}{2}$ - 13	2
14	HB-38-16-100	Bolt $\frac{3}{8}$ - 16 x 1	5
	HWL-38	Lock Washer $\frac{3}{8}$	5
	HN-38-16	Nut $\frac{3}{8}$ - 16	5
15	35-012	Wear Blade	1
16	27-050	Right Pusher Bar	1
17	HHP-18	Bridge Pin $\frac{1}{8}$	2
18	42-094	Rod	1
19	42-093	Lift Handle	1
20	18-221	Flange Bushing	2
21	HMB-34-14	Machine Bushing $\frac{3}{4}$ - 14GA	1
22	HP-18-150	Cotter Pin $\frac{1}{8}$ x $1\frac{1}{2}$	1
23	15-019	Grip	1
24	HB-12-13-200	Bolt $\frac{1}{2}$ - 13 x 2	2

INSTALLATION INSTRUCTIONS

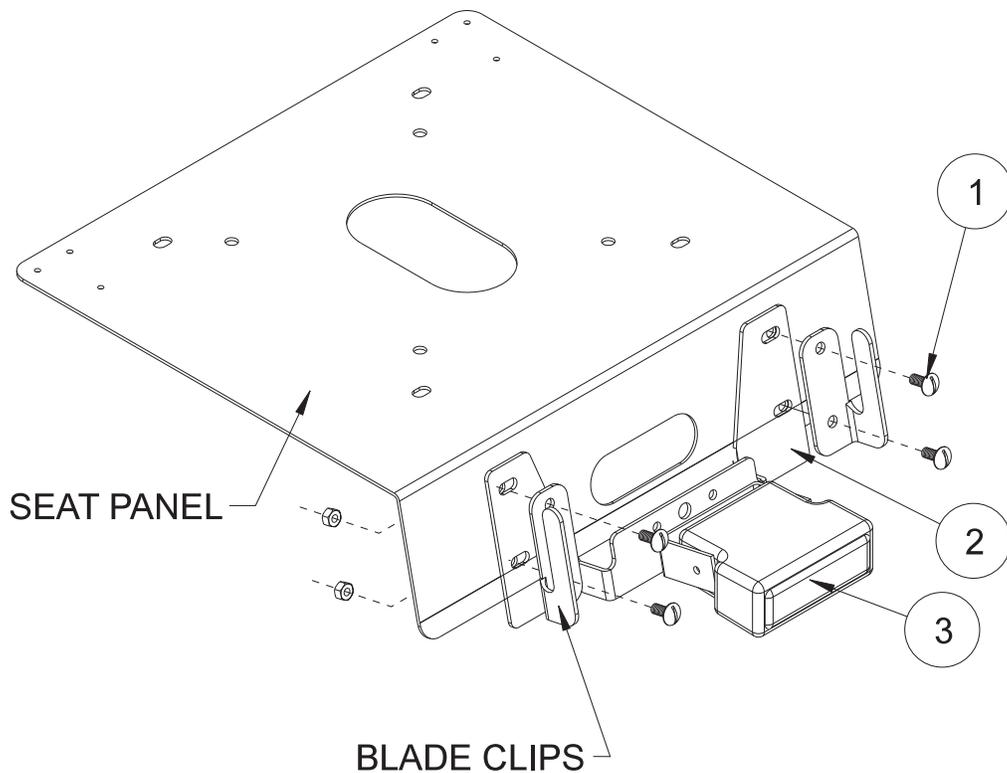
- Assemble pusher bars (Ref 5 and 16) to plow (Ref 11) using hardware (Ref 12 & 13). There are 2 holes to bolt the hardware in. Using hole closest to the blade will result in a shallow cut, whereas using the hole furthest from the blade will result in a deeper cut. The slot on the pusher bar is for fine tuned adjustment.
- Assemble the lift assembly (Ref 1) to the main frame using the two studs that are under the frame and below the front of the console.
- Attach the lift handle (Ref 19) to the lift assembly using cotter pin and machine bushing (Ref 21 & 22). Using rod and yoke (Ref 18 & 9) attach the handle to the lift assembly.
- Put rod ends (Ref 9) onto lift rods (Ref 10) with jam nut first. Adjust to equal lengths. Bolt lift rods to lift arms with ball joints to the outside. Bolt from outside with the $\frac{1}{2}$ " machine bushing between rod end and lift arm and the $\frac{1}{2}$ -13 nylon lock nut on the inside. Use (Ref 7) hardware.
- Slide plow under machine and connect to machine. Use clevis pin and bridge pin (Ref 4 & 17).
- Lift up the plow. Using the top hole in the lift rod as a starting point hook on the pusher bars. Use (Ref 6) hardware. The three holes in the lift rods are for adjusting the hand lever. The top hole moves the lever forward and holds the blade with the most clearance. Each hole down moves the lever to the rear of the machine and decreases blade clearance by approximately one inch.
- For fine tuning of blade height off ground twist rod end (Ref 9) on rod (Ref 18). Twisting the rod end out will increase down pressure. Twisting the rod end onto the rod will decrease down pressure.



42-315 LIGHT KIT - FRONT LIGHT MOUNT DRAWING



REAR LIGHT MOUNT DRAWING



Accessories

42-315 LIGHT KIT PART LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	42-317	Front Light	1
2	HSTP-14-20-075	Phillips Machine Screw $\frac{1}{4}$ - 20 x $\frac{3}{4}$	2
	HNFL-14-20	Flange Whiz Lock Nut $\frac{1}{4}$ - 20	2
3	42-323	Front Light Mount	1
4	HB-516-18-100	Bolt $\frac{5}{16}$ - 18 x 1 (2 WD Only)	1
	HW-516	Washer $\frac{5}{16}$ (2 WD Only)	1
	HWL-516	Lockwasher $\frac{5}{16}$ (2 WD Only)	1

FRONT LIGHT INSTALLATION

SUPER STAR 3 WHEEL DRIVE FRONT LIGHT INSTALLATION

1. Remove bolt and strong back from hose clamp on front of front fork. Place front light mount (Ref 3) on hose clamp and replace bolt and strong back.
2. Bolt front light (Ref 1) to front light mount, using the $\frac{1}{4}$ - 20 machine screws and whiz lock nuts. Be sure wires are macup.

SUPER STAR 2 WHEEL DRIVE FRONT LIGHT INSTALLATION

1. You will have to drill and tap a $\frac{5}{16}$ - 18 hole in the front fork approximately 1" from the end, and centered, where the steering shaft is welded.
2. Bolt front light mount (Ref 3) to the front fork using the $\frac{5}{16}$ - 18 bolt, lockwasher and washer (Ref 4).
3. Bolt front light (Ref 1) to front light mount, using the $\frac{1}{4}$ - 20 machine screws and whiz lock nuts. Be sure wires are up.

REAR LIGHT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	HST-516-18-075	Truss Head Screw $\frac{5}{16}$ - 18 x $\frac{3}{4}$	4
	HNFL-516-18	Flange Whiz Lock Nut $\frac{5}{16}$ - 18	4
2	42-322	Rear Light Mount	1
3	42-316	Rear Light	1
	HSTP-14-20-075	Phillips Machine Screw $\frac{1}{4}$ - 20 x $\frac{3}{4}$	2
	HNFL-14-20	Flange Whiz Lock Nut $\frac{1}{4}$ - 20	2

REAR LIGHT INSTALLATION

NOTE: NOTE: If your machine has a 42-210 Grader Blade, you will have to remove the blade clips from the back of the seat panel to install rear light.

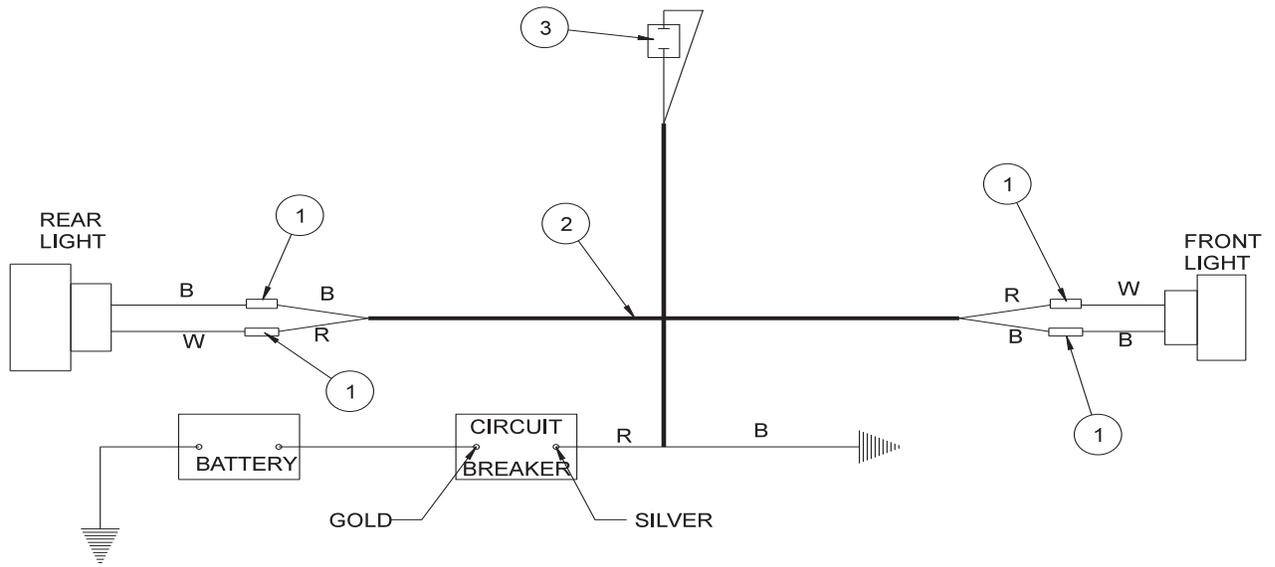
1. Install rear light mount (Ref 2) on back of seat panel. If you have the blade clips, put the rear light mount between the blade clips and the seat panel. Then use the $\frac{5}{16}$ - 18 truss head screws and whiz lock nuts (Ref 1) to hold in place.
2. Install light (Ref 3) with wires up on the rear light mount using two $\frac{1}{4}$ - 20 machine screws and whiz lock nuts.



Do not touch lights. Very Hot.



42-315 LIGHT KIT WIRING DRAWING



42-315 LIGHT KIT WIRING PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	8875	Bullet Terminal	4
	8963	Heat Shrink 1/4"	4
2	42-319	Wire Harness	1
	HLC-58	Loom Clamp 5/8"	2
3	12-003	Toggle Switch	1
	15-472	Switch Boot	1

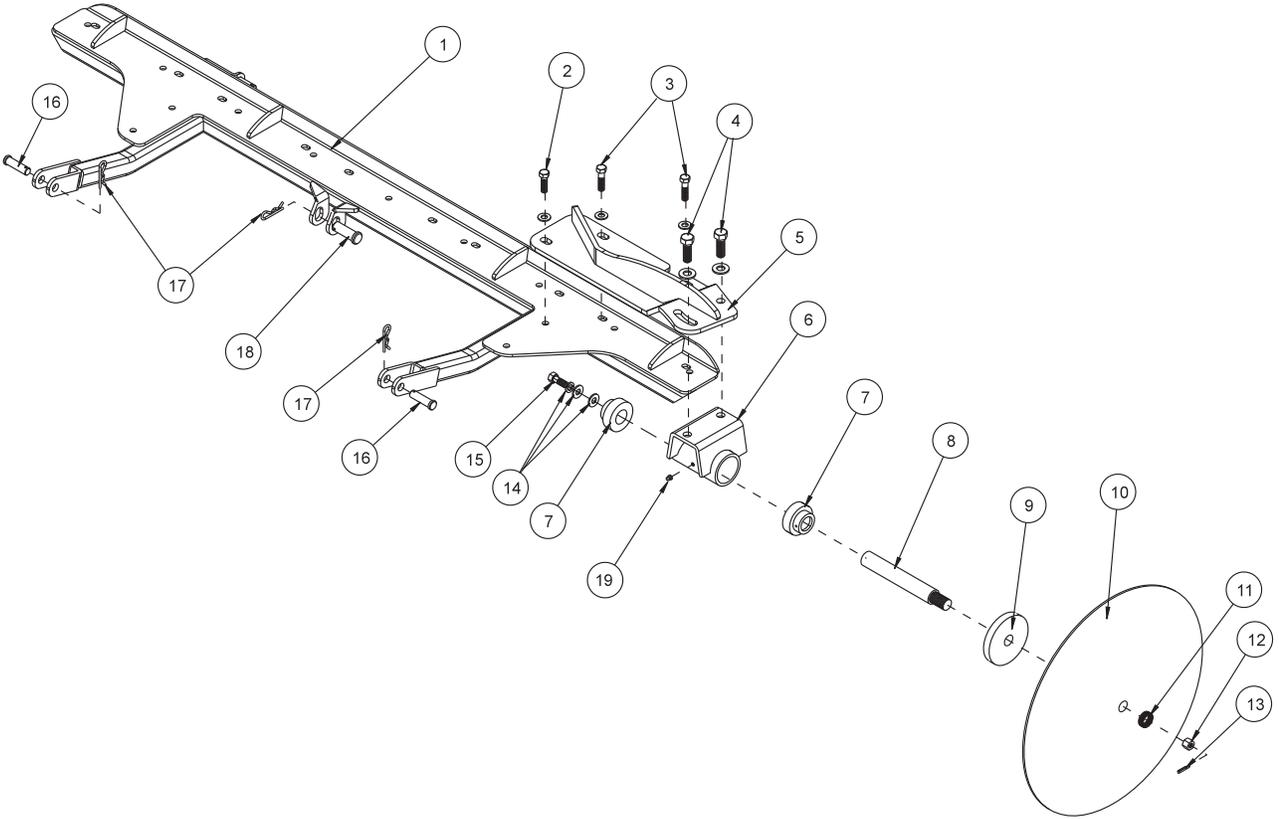
WIRING INSTALLATION

1. Remove nut from left hand seat studs and place two loom clamps (HLC-58) onto seat stud. Hold in place with the nut.
2. Drill a 1/2" hole in fiberglass control panel 1" from 2WD/3WD toggle switch. (NOTE: Use 2WD/3WD hole if not being used).
3. Hook red wire from the wire harness to toggle switch. Place toggle switch (Ref 3) into hole. Install switch boot.
4. Run wire harness (Ref 2) to the front light. Snip the factory installed ends on headlight wires and install the heat shrink and the bullet terminal (Ref 1) provided. Plug in wire harness to front head light. Do the same to the rear light.
5. Run the red wire to the silver post of the circuit breaker and the black to the ground battery wire on the engine.
6. Hook wire harness up in the loom clamps installed earlier.
7. Rotate front wheel to stop. Check for wire routing and interference. Place warning decal on lights.
8. Test headlights before putting machine into service.



Do not touch lights. Very Hot.

42-223 ADJUSTABLE DISC EDGER DRAWING



Accessories

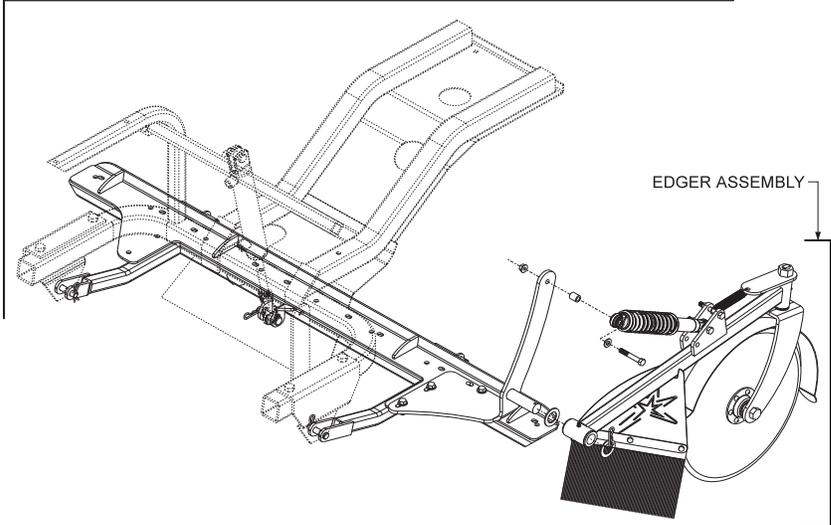
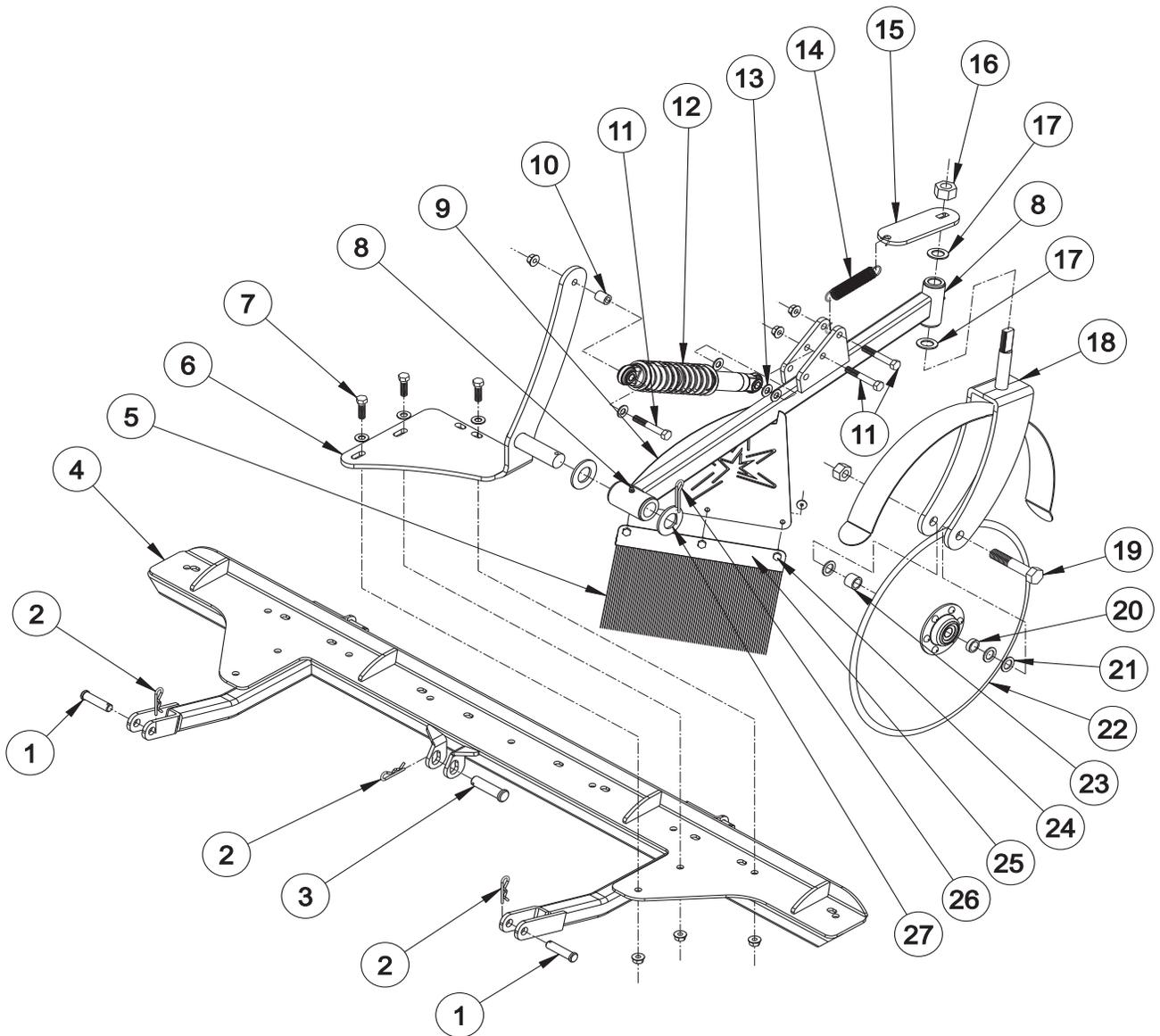
42-223 ADJUSTABLE DISC EDGER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	42-203	Attachment Lift Assembly	1
2	HB-38-16-125	Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$	1
	HW-38	Washer $\frac{3}{8}$	1
	HNTL-38-16	Lock Nut $\frac{3}{8}$ -16	1
3	HB-38-16-150	Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{2}$	2
	HW-38	Washer $\frac{3}{8}$	2
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	2
4	HB-12-13-150	Bolt $\frac{1}{2}$ - 13 x $1\frac{1}{2}$	2
	HW-12	Washer $\frac{1}{2}$	2
	HNTL-12-13	Lock Nut $\frac{1}{2}$ - 13	2
5	42-224	Edger Mount	1
6	13-203	Spindle	1
7	21-169	Bearing and Collar	2
8	13-206	Spindle Shaft	1
9	13-205	$\frac{1}{2}$ Disc Flange	1
10	13-204	Disc	1
11	HMB-34-10	Machine Bushing $\frac{3}{4}$ x 10GA	4
12	HNA-34-16	Axle Nut $\frac{3}{4}$ - 16	1
13	HP-18-150	Cotter Pin $\frac{1}{8}$ x $1\frac{1}{2}$	1
14	HWL-38	Washer $\frac{3}{8}$	1
	HW-516	Washer $\frac{5}{16}$	1
	HW-716	Washer $\frac{7}{16}$	1
15	HB-38-16-100	Bolt $\frac{3}{8}$ -16 x 1	1
16	HCP-12-200	Clevis Pin $\frac{1}{2}$ x 2	2
17	HHP-18	Bridge Pin $\frac{1}{8}$	3
18	HCP-58-250	Clevis Pin $\frac{5}{8}$ x $2\frac{1}{2}$	1
19	HG-14-28-180	Grease Fitting $\frac{1}{4}$ - 28 x 180	1

INSTALLATION INSTRUCTIONS

- For initial assembly, bolt spindle assembly (Ref 6) to the edger mount (Ref 5). Use the $\frac{1}{2}$ - 13 bolts, washers and lock nuts (Ref 4) to hold in place.
- Make sure the $\frac{1}{2}$ " disc flange (Ref 9) is on the spindle shaft (Ref 8) up to the shoulder. Then place the disc (Ref 10) onto the shaft, curved towards the spindle housing, followed by four machine bushings (Ref 11), and the axle nut (Ref 12).
- Tighten axle nut and slide in the cotter pin (Ref 13).
- The edger mount mounts onto the attachment lift assembly (Ref 1). Use the $\frac{3}{8}$ bolts, washers and lock nuts (Ref 2 and 3) with the $1\frac{1}{4}$ " bolt going into the last hole on the mount plate.
- The Edger mounts under the center of the trap rake.
- Place the handle and linkage onto the empty linkage port of the two bank valve on the machine.
- Start the engine and lower the cylinder for the attachment lift FULLY. Stop engine.
- Slide Edger under the trap rake from the right side.
- Position the lift arms on the attachment lift assembly to the lift brackets on the machine. Hold in place with $\frac{1}{2}$ x 2 clevis pin and bridge pins (Ref 16 and 17).
- Attach the cylinder to the center tab on the attachment lift assembly using the $\frac{5}{8}$ x $2\frac{1}{2}$ clevis pin and bridge pin (Ref 17 and 18).
- Start engine and test lift and Edger to make sure all works well.

42-750 CART PATH AND SIDEWALK EDGER DRAWING



Accessories

42-750 CART PATH AND SIDEWALK EDGER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	HCP-12-200	Clevis Pin, 1/2 x 2	2
2	HHP-18	Bridge Pin, 1/8	4
3	HCP-58-250	Clevis Pin, 5/8 x 2 1/2	1
4	42-203	Attachment Lift Assembly	1
5	42-758	Brush	1
6	42-754	Edger Mount	1
7	HB-38-16-125	Bolt, 3/8 - 16 x 1 1/4	3
	HNFL-38-16	Flange Whiz-Lock Nut, 3/8-16	3
	HW-38	Flat Washer, 3/8	3
8	HG-14-28-180	Grease Fitting, 1/4 - 28 x 180°(Part of 42-755)	1
9	42-755	Edger Arm	1
10	10-134	Spacer	1
11	HB-38-16-250	Bolt, 3/8 - 16 x 2 1/2	3
	HNFL-38-16	Flange Whiz-Lock Nut, 3/8-16	3
	HW-38	Flat Washer, 3/8	1
12	60-123	Shock Absorber	1
13	HW-38	Flat Washer, 3/8	4
14	48-109	Spring	1
15	42-757	Spring Mount	1
16	HNTL-34-16	Lock Nut, 3/4 - 16	1
17	HMB-34-10	Machine Bushing, 3/4 x 10GA	2
18	42-756	Edger Fork	1
19	HB-58-11-325	Bolt, 5/8 - 11 x 3 1/4	1
	HNCL-58-11	Center Lock Nut, 5/8-11	1
20	76-298	Spacer	2
21	42-752	Edger Blade	1
22	42-759	Brush Holder	1
23	HB-14-20-075	Bolt, 1/4 - 20 x 3/4	3
	HNFL-14-20	Flange Whiz-Lock Nut, 1/4 - 20	3
24	HMB-100-14	Machine Bushing, 1 x 14GA	2

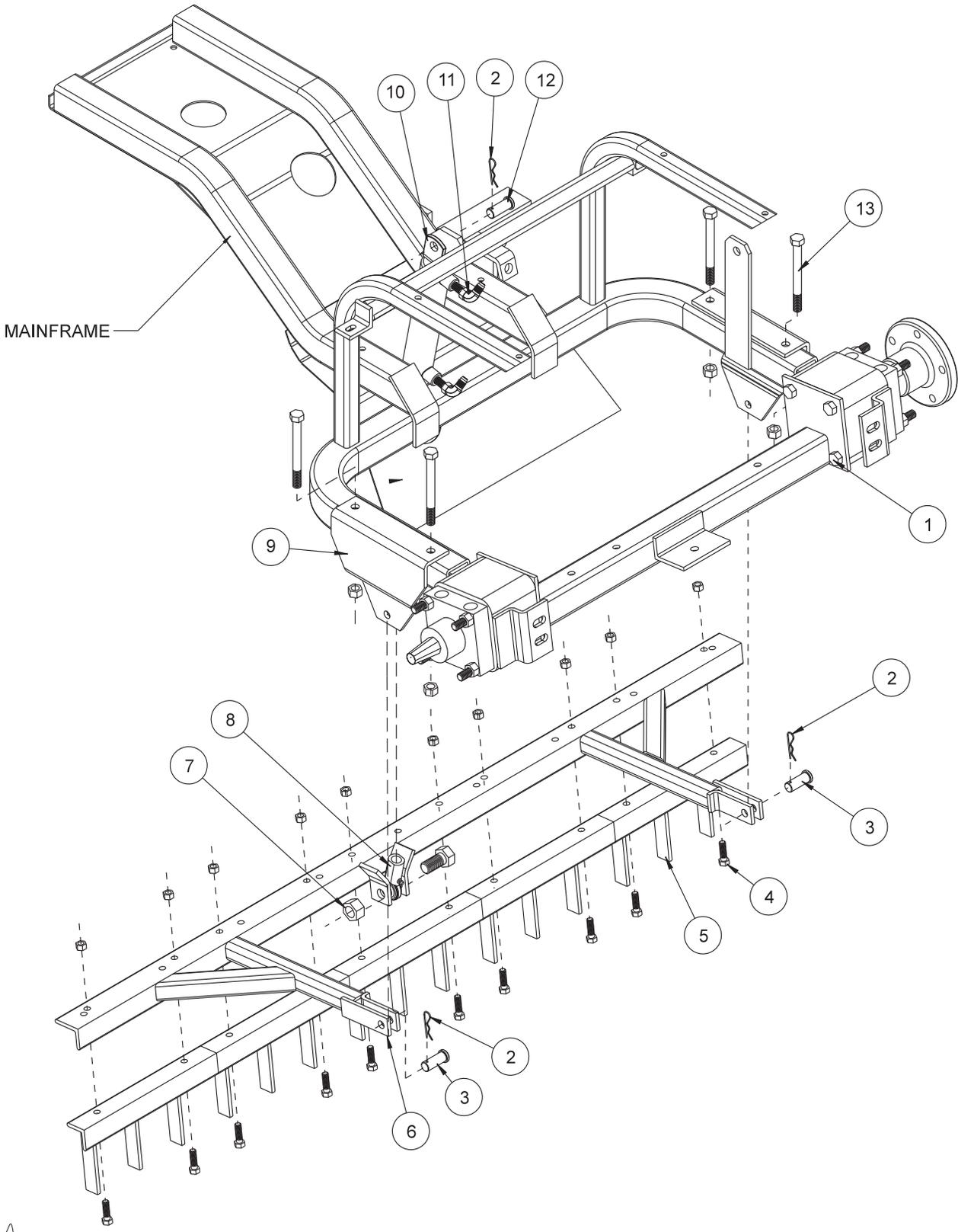
INSTALLATION INSTRUCTIONS

For your convenience and ease of installation, a major set of components are pre-assembled at the factory. This is the "Edger Assembly" and includes Reference #'s 11 thru 23.

1. Slide attachment lift assembly (Ref 4) under machine and attach using (2) 1/2 x 2" clevis pins and 1/8" bridge pins (Ref 1 and 2). Connect the free end of the hydraulic cylinder to the attachment lift assembly (Ref 4) as illustrated using the 5/8 x 2 1/2 clevis pin and 1/8" bridge pin (Ref 3 and 2).
2. Attach the edger mount (Ref 6) to the attachment lift assembly (Ref 4) using (3) 3/8 - 16 x 1 1/4 bolts, 3/8 flat washers & 3/8 -16 whiz-lock nuts (Ref 7).
3. Now slide (1) 1" machine bushing (Ref 24) on the edger mount's (Ref 6) pin. Next install the "Edger Assembly" (see sidebar) onto the pin. Place the second 1" machine bushing (Ref 24) on the pin. Secure with a 1/8" ridge pin (Ref 2).
4. Slide (1) 3/8" flat washer onto (1) 3/8 - 16 x 2 1/2 bolt & insert this in the free end of the shock absorber (Ref 12). Next, slide the spacer (Ref 10) onto the bolt and use (1) 3/8 -16 whiz-lock nut to secure the shock absorber (Ref 12) to the edger mount (Ref 6) as illustrated.
5. Grease all grease fittings (Ref 8) and check all fasteners for proper installation.



42-008 SAND CULTIVATOR DRAWING



Accessories

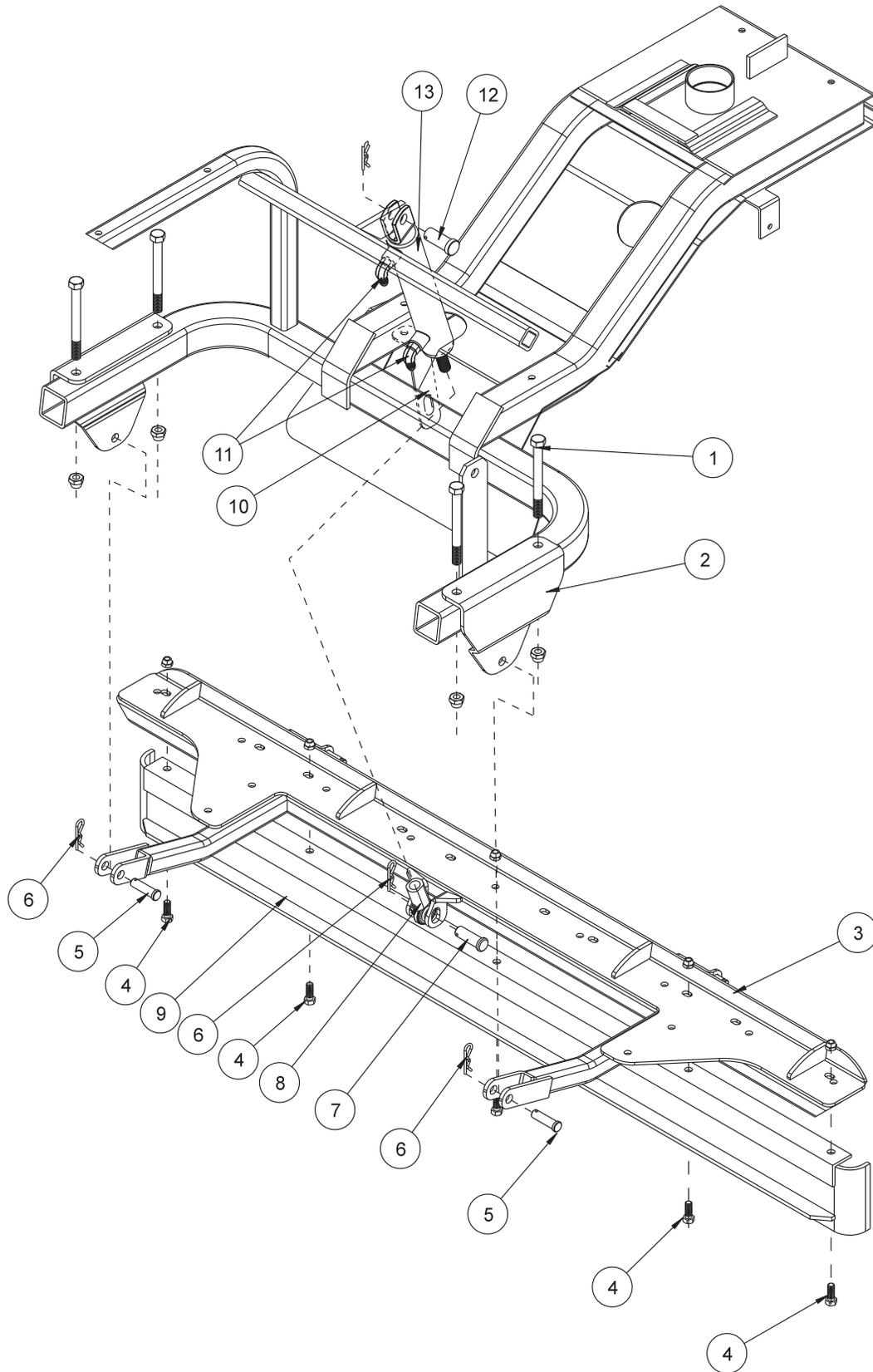
42-008 SAND CULTIVATOR PARTSLIST

REF#	PART#	DESCRIPTION	QTY
1	HCP-58-175	Clevis Pin $\frac{5}{8}$ - $1\frac{3}{4}$	1
2	10-135	Hydraulic Cylinder	1
3	18-168	90° Elbow	2
4	42-217	Cylinder Mount	1
5	HB-12-13-500	Bolt $\frac{1}{2}$ - 13 x 5	4
	HNTL-12-13	Lock Nut $\frac{1}{2}$ - 13	4
6	42-015	Attachment Mount	2
*7	HHP-18	Bridge Pin $\frac{1}{8}$	3
*9	HB-38-16-125	Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$	10
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	10
*10	42-038	Tine Segment	5
*11	HCP-12-200	Clevis Pin $\frac{1}{2}$ x 2	2
*12	42-203	Attachment Lift	1
*13	HCP-58-250	Clevis Pin $\frac{5}{8}$ x $2\frac{1}{2}$	1
14	18-154	Rod End	1
*	42-008	Sand Cultivator (all other parts reference only)	

INSTALLATION INSTRUCTIONS

1. Install valve handle with linkage (13-672) onto valve.
2. Remove the cylinder mount (Ref 4) from the machine.
3. Tine Segments (Ref 10) should be bolted to the attachment lift (Ref 12). Attach the attachment lift to (Ref 12) attachment mount using (Ref 11 & 7) clevis pin and bridge pin.
4. Lift attachment lift up or extend cylinder so rod end (Ref 14) lines up with the holes on the center of the attachment lift. Use clevis pin and bridge pin (Ref 7 and 13) to fasten cylinder to sand cultivator.
6. Turn machine on and test for proper operation.

42-010 CONSTRUCTION LEVELING BLADE DRAWING



Accessories

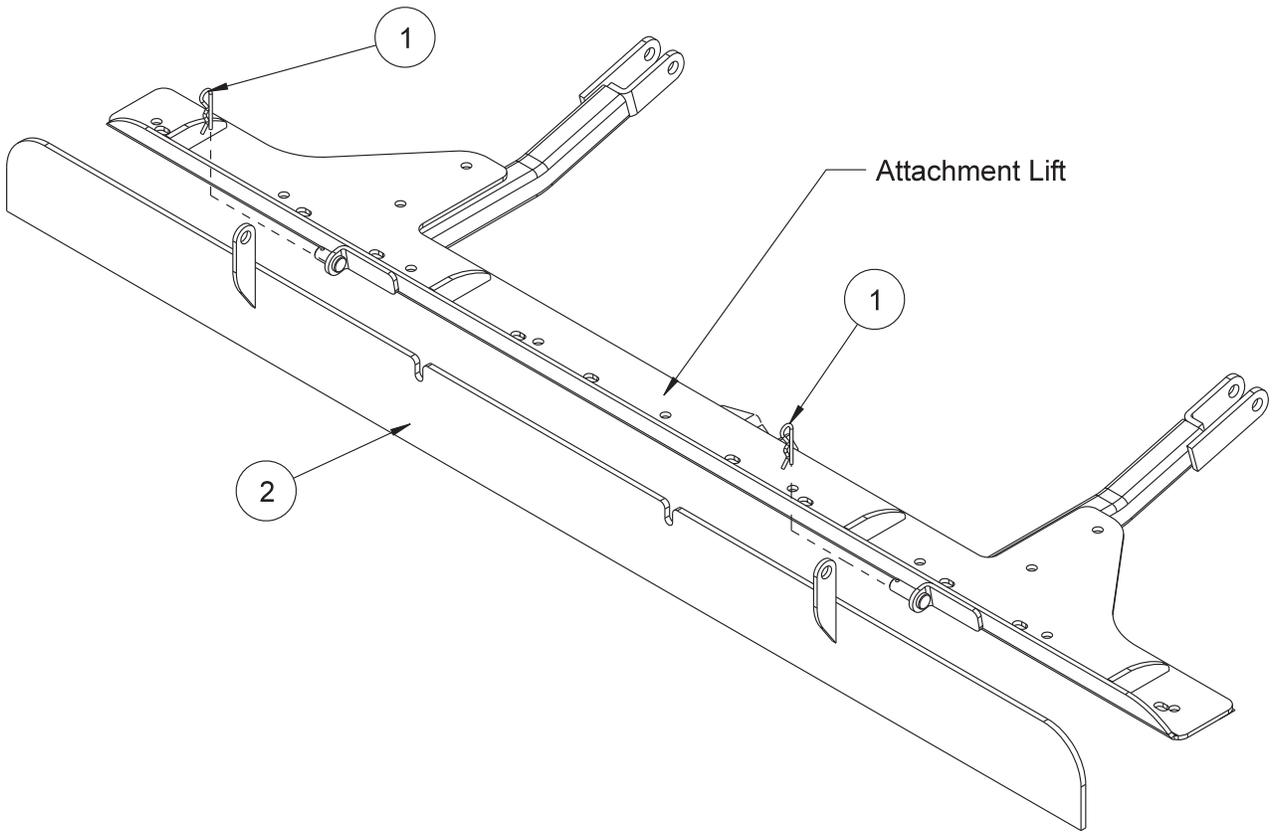
42-010 CONSTRUCTION LEVELING BLADE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	HB-12-13-500	Bolt $\frac{1}{2}$ - 13 x 5	4
	HNTL-12-13	Lock Nut $\frac{1}{2}$ - 13	4
2	42-015	Attachment Mount	2
*3	42-203	Attachment Lift	1
*4	HB-38-16-100	Bolt $\frac{3}{8}$ - 16 x 1	5
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	5
*5	HCP-12-200	Clevis Pin $\frac{1}{2}$ x 2	2
*6	HHP-18	Bridge Pin $\frac{1}{8}$	3
*7	HCP-58-250	Clevis Pin $\frac{5}{8}$ x $2\frac{1}{2}$	1
8	18-154	Rod End	1
*9	42-097	Leveling Blade	1
10	42-217	Cylinder Mount	1
11	18-168	90° Elbow	2
12	HCP-34-175	Clevis Pin $\frac{3}{4}$ - $1\frac{3}{4}$	1
13	10-135	Hydraulic Cylinder	1
*	42-010	Construction Leveling Blade (all other parts are reference only)	

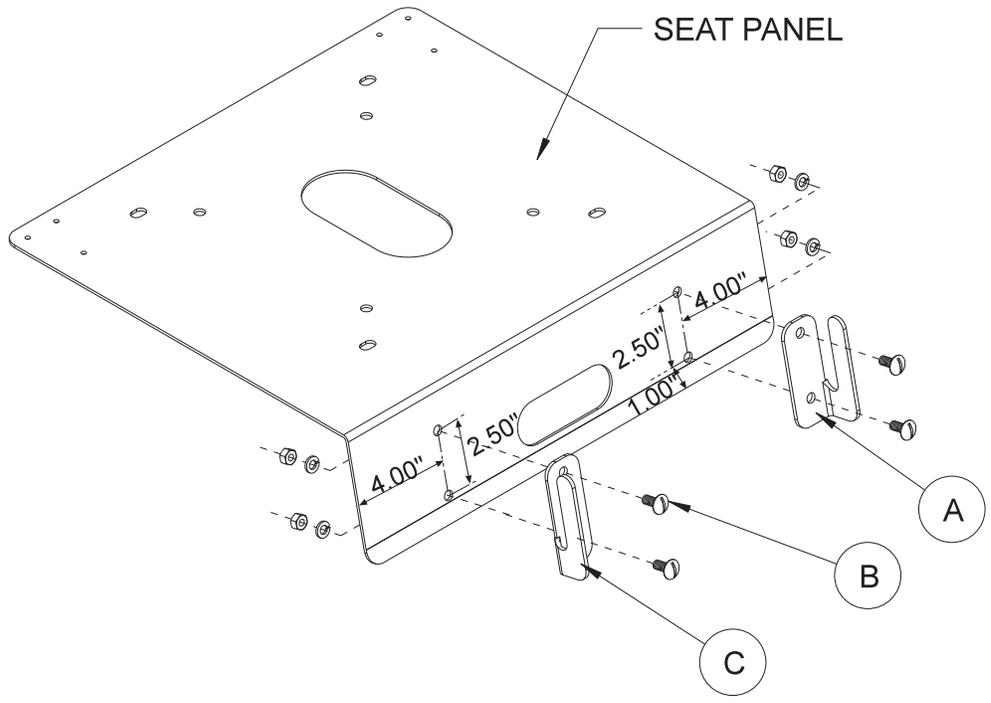
INSTALLATION INSTRUCTIONS

1. Remove the cylinder mount (Ref 10) from the machine.
2. Bolt leveling blade (Ref 9) to attachment lift (Ref 3) using five $\frac{3}{8}$ - 16 x 1 bolts and five $\frac{3}{8}$ - 16 lock nuts as shown on drawing.
3. Attach the attachment lift to attachment mount (Ref 3) using clevis pin and bridge pin (Ref 5 and 6).
4. Lift attachment lift up or extend cylinder so rod end (Ref 8) lines up with the holes on the center of the attachment lift. Use $\frac{5}{8}$ x $2\frac{1}{2}$ clevis pin and bridge pin (Ref 6 & 7) to fasten cylinder to cultivator.
5. Turn machine on and test for proper operation.

42-210 GRADER BLADE DRAWING



BLADE CLIP DRAWING



Accessories

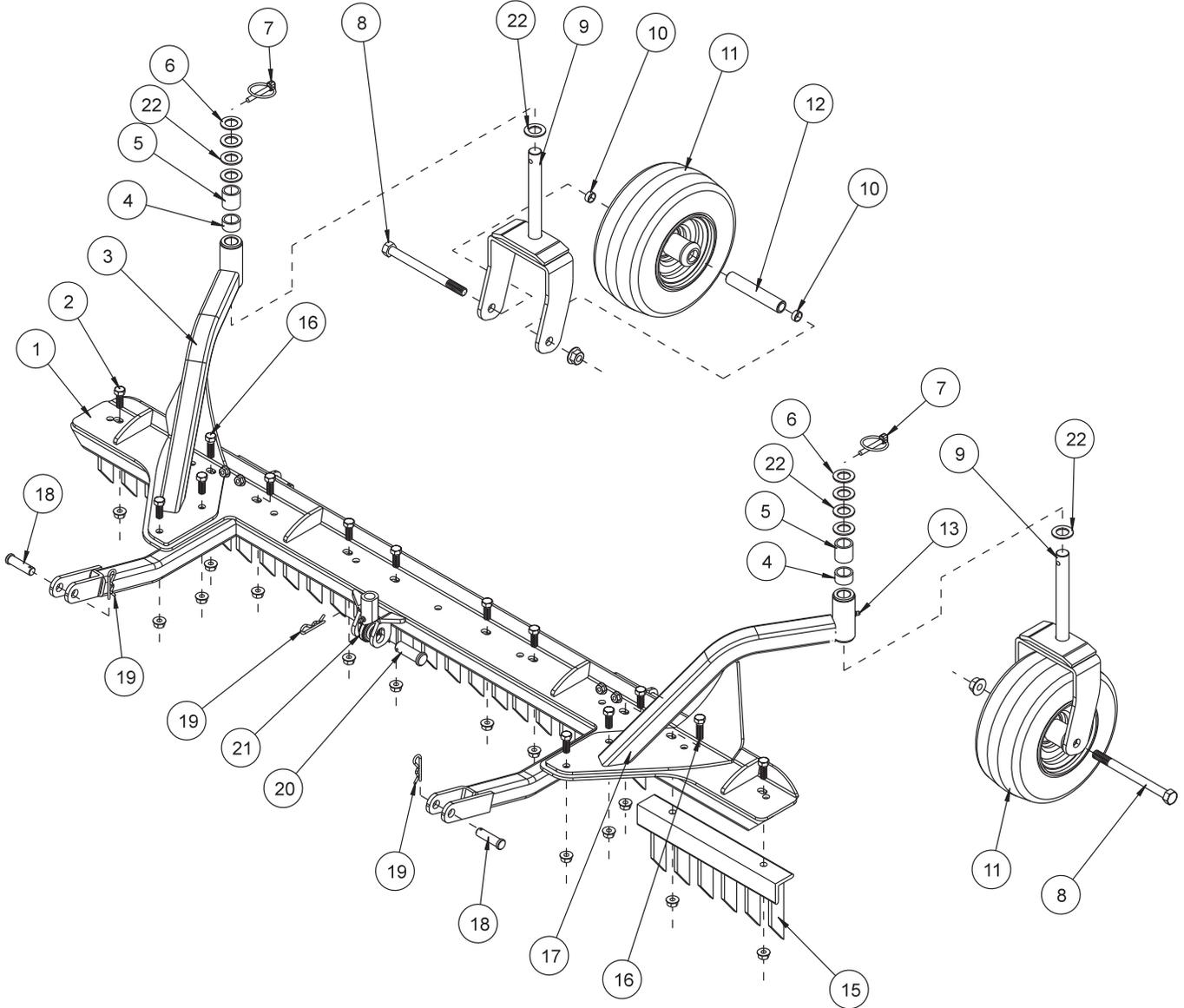
42-210 GRADER BLADE PARTS LIST

REF#	PART#	DESCRIPTION	QTY
1	HHP-18	Bridge Pin $\frac{1}{8}$	2
2	42-207	Grader Blade	1
A	42-211	Right Blade Clip	1
B	HST-516-18-075	Truss Head Screw $\frac{5}{16}$ - 18 x $\frac{3}{4}$	4
	HWL-516	Lock Washer $\frac{5}{16}$	4
	HN-516-18	Nut $\frac{5}{16}$ - 18	4
C	42-216	Left Blade Clip	1

INSTALLATION INSTRUCTIONS

1. Install Grader Blade to Attachment Lift by sliding tabs onto clevis pins and secure with bridge pins.
2. Install right and left blade clips (Ref A and C) on seat panel. If holes need to be drilled, drill (4) $\frac{11}{32}$ holes 4" in from the ends and 1" and $3\frac{1}{2}$ " up from the bottom. Blade clips are for grader blade (Ref 8) storage when not in use. Place notches on the top of the grader blade into slots on blade clips.
3. Turn machine on and test for proper operation.

42-178 INFIELD SCARIFIER WITH VERTICAL BLADES DRAWING

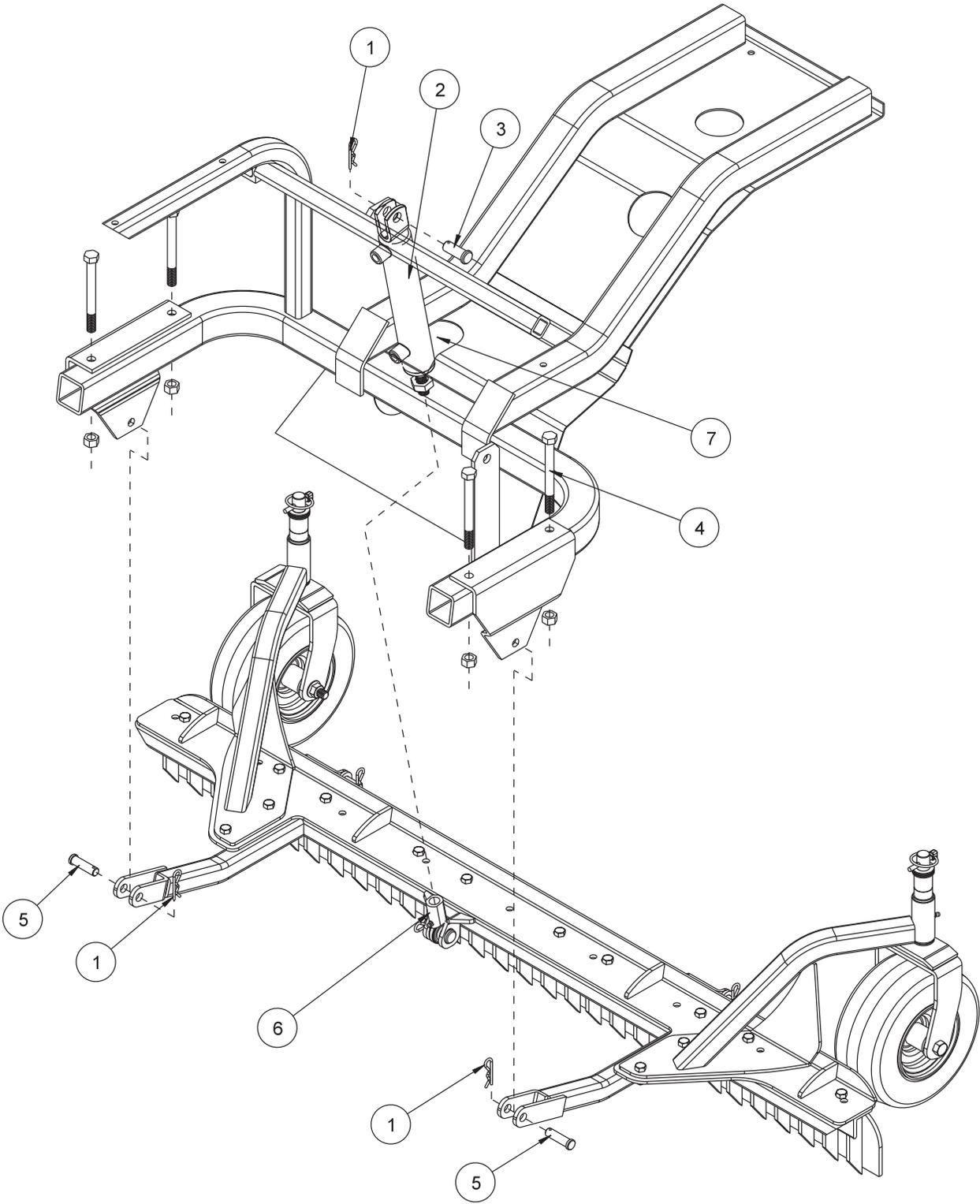


Accessories

42-178 INFIELD SCARIFIER WITH VERTICAL BLADES PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	42-203	Attachment Lift Assembly	1
2	HB-38-16-100	Bolt $\frac{3}{8}$ - 16 x 1	12
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	12
3	42-205	Left Castor Wheel Bracket	1
	10-025	Bushing (part of 42-205)	2
4	42-215	Short Spacer	2
5	42-214	Long Spacer	2
6	HMB-34-14	Machine Bushing $\frac{3}{4}$ x 14GA	2
7	42-539	Lynch Pin $\frac{5}{16}$	2
8	HB-12-13-600	Bolt $\frac{1}{2}$ -13 x 6	2
	HNTL-12-13	Lock Nut $\frac{1}{2}$ - 13	2
9	42-204	Castor Fork	2
10	42-212	Castor Wheel Spacer	4
11	42-202	Tire and Wheel	2
	42-202-01	Tire 9 x 3.5 x 4 Ply	2
	42-202-02	Wheel	2
12	42-213	Axle Bearing	2
13	HG-14-28-180	Grease Fitting $\frac{1}{4}$ - 28 x 180° (part of 42-205 and 42-206)	2
15	26-042	Tine Segment	5
16	HB-38-16-125	Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$	2
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	2
17	42-206	Right Castor Wheel Bracket	1
	10-025	Bushing (part of 42-205)	2
18	HCP-12-200	Clevis Pin $\frac{1}{2}$ x 2	2
19	HHP-18	Bridge Pin $\frac{1}{8}$	3
20	HCP-58-250	Clevis Pin $\frac{5}{8}$ x $2\frac{1}{2}$	1
21	18-154	Rod End (part of machine)	1
22	HMB-34-10	Machine Bushing $\frac{3}{4}$ x 10GA	8

42-178 SCARIFIER MOUNTING DRAWING



Accessories

42-178 SCARIFIER MOUNTING PARTS LIST

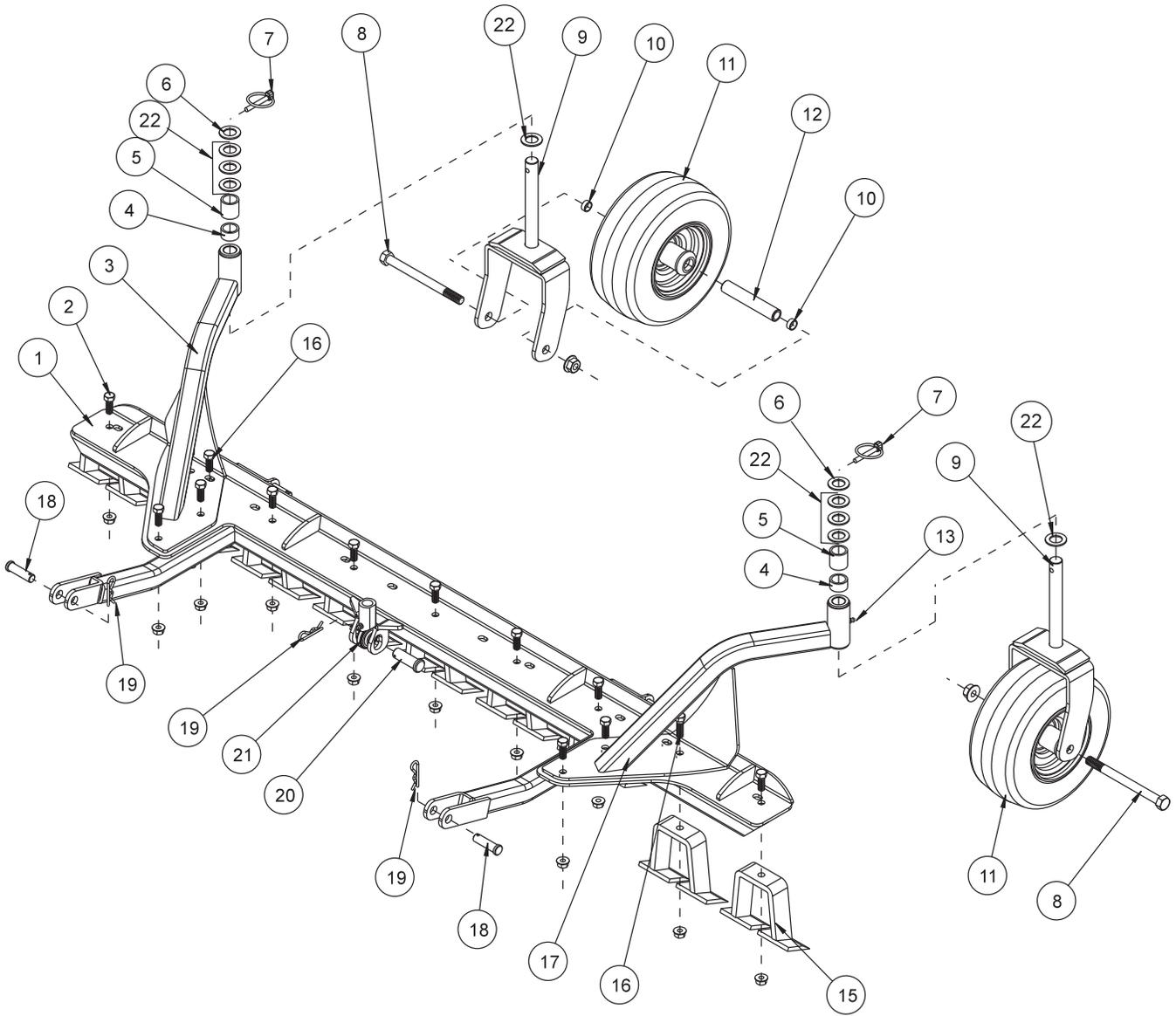
REF#	PART#	DESCRIPTION	QUANTITY
1	HHP-18	Bridge Pin $\frac{1}{8}$	3
2	10-135	Hydraulic Cylinder (part of machine)	1
3	HCP-58-175	Clevis Pin $\frac{5}{8} \times 1\frac{3}{4}$	1
4	HB-12-13-500	Bolt $\frac{1}{2}$ - 13 x 5	4
	HNTL-12-13	Lock Nut $\frac{1}{2}$ - 13	4
5	HCP-12-200	Clevis Pin $\frac{1}{2}$ - 2	2
6	18-154	Rod End (part of machine)	1
7	42-217	Cylinder Mount (part of machine)	1

INSTALLATION INSTRUCTIONS

1. Assemble the Scarifier as shown on previous page.
2. Remove the rod end (Ref 6) on the hydraulic cylinder (Ref 2) from the cylinder mount (Ref 7). Remove the cylinder mount (Ref 7) from the machine.
- *3. Place the handle and linkage onto the empty linkage port of the two bank valve on the machine.
4. Slide the Scarifier under the machine lining up the hydraulic cylinder and the center of the attachment lift assembly.
5. Extend hydraulic cylinder all the way down by pushing the lever forward.
6. Mount the rod end of the cylinder onto the attachment lift assembly and secure with a clevis pin and bridge pin.
7. Attach the arms on the attachment lift to the attachment mount on the machine and secure with clevis pin and bridge pin.
8. Turn machine on and test for proper operation.
9. Adjust castor wheels by placing the short or long spacer on the castor wheel fork before placing the castor wheel assembly into the castor wheel brackets. Be sure both castor wheels are adjusted to the same height.

* For machines prior to serial numbers 4500 (3WD) and 12500 (2WD).

42-179 INFIELD SCARIFIER WITH CHISEL BLADES DRAWING

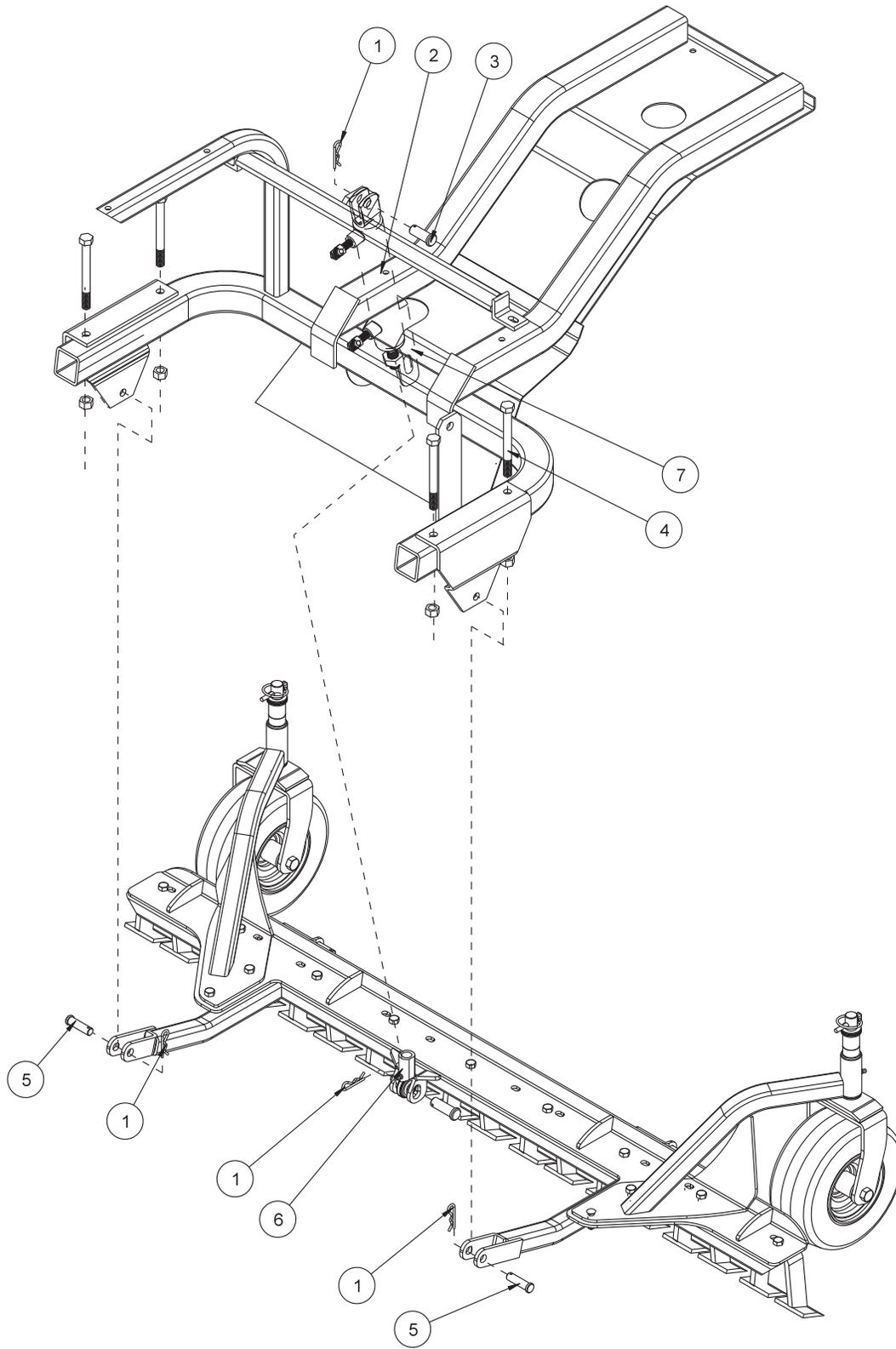


Accessories

42-179 INFIELD SCARIFIER WITH CHISEL BLADES PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	42-203	Attachment Lift Assembly	1
2	HB-38-16-125	Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$	11
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	11
3	42-205	Left Castor Wheel Bracket	1
	10-025	Bushing (part of 42-205)	2
4	42-215	Short Spacer	2
5	42-214	Long Spacer	2
6	HMB-34-14	Machine Bushing $\frac{3}{4}$ x 14GA	2
7	42-539	Lynch Pin $\frac{5}{16}$	2
8	HB-12-13-600	Bolt $\frac{1}{2}$ -13 x 6	2
	HNTL-12-13	Lock Nut $\frac{1}{2}$ - 13	2
9	42-204	Castor Fork	2
10	42-212	Castor Wheel Spacer	4
11	42-202	Tire and Wheel	2
	42-202-01	Tire 9 x 3.5 x 4 Ply	2
	42-202-02	Wheel	2
12	42-213	Axle Bearing	2
13	HG-14-28-180	Grease Fitting $\frac{1}{4}$ - 28 x 180° (part of 42-205 and 42-206)	2
15	13-114	Digger Blade	9
16	HB-38-16-150	Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{2}$	2
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	2
17	42-206	Right Castor Wheel Bracket	1
	10-025	Bushing (part of 42-205)	2
18	HCP-12-200	Clevis Pin $\frac{1}{2}$ x 2	2
19	HHP-18	Bridge Pin $\frac{1}{8}$	3
20	HCP-58-250	Clevis Pin $\frac{5}{8}$ x $2\frac{1}{2}$	1
21	18-154	Rod End (part of machine)	1
22	HMB-34-10	Machine Bushing $\frac{3}{4}$ x 10GA	8

42-179 SCARIFIER MOUNTING DRAWING



Accessories

42-179 SCARIFIER MOUNTING PARTS LIST

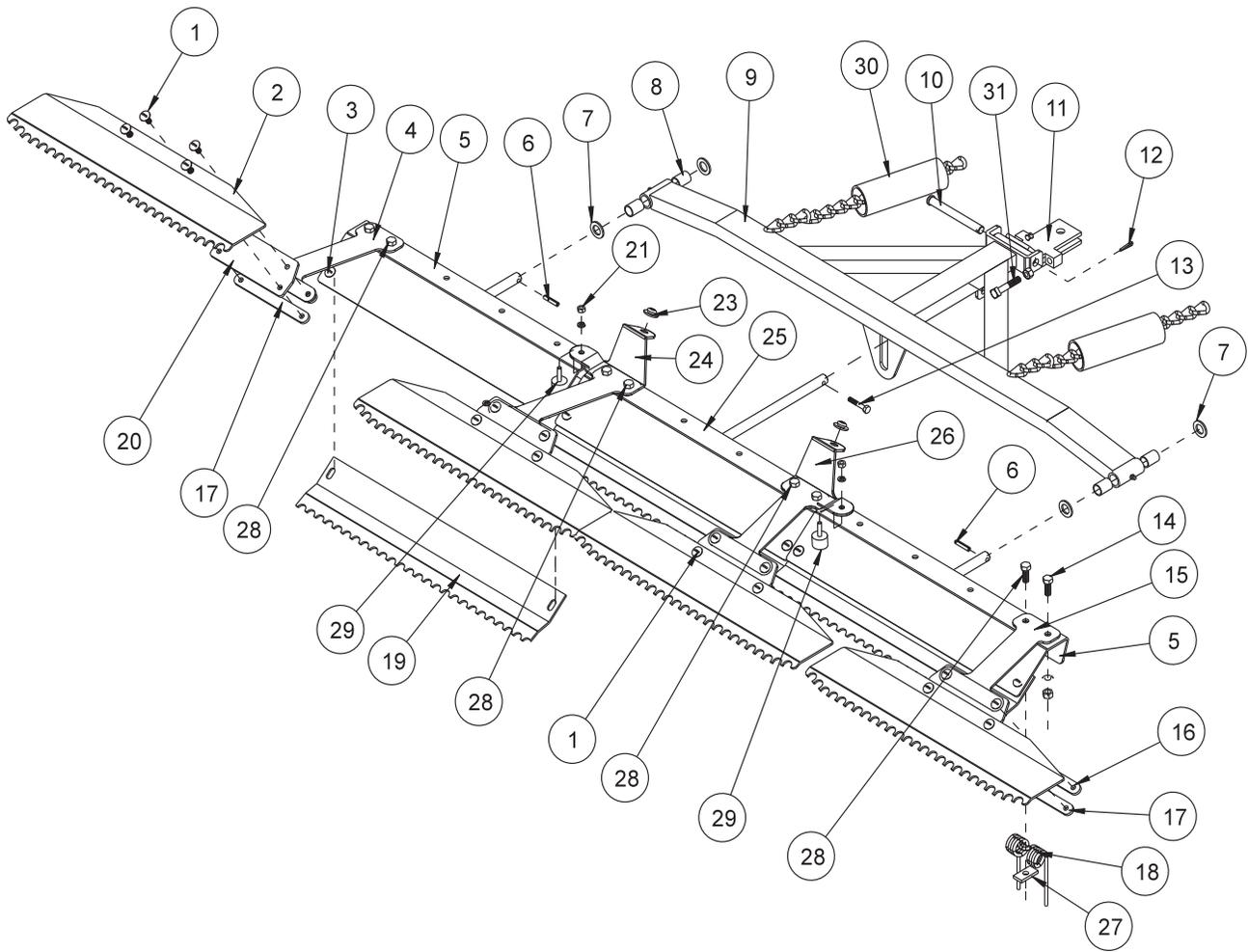
REF#	PART#	DESCRIPTION	QUANTITY
1	HHP-18	Bridge Pin $\frac{1}{8}$	3
2	10-135	Hydraulic Cylinder (part of machine)	1
3	HCP-58-175	Clevis Pin $\frac{5}{8} \times 1\frac{3}{4}$	1
4	HB-12-13-500	Bolt $\frac{1}{2}$ - 13 x 5	4
	HNTL-12-13	Lock Nut $\frac{1}{2}$ - 13	4
5	HCP-12-200	Clevis Pin $\frac{1}{2}$ - 2	2
6	18-154	Rod End (part of machine)	1
7	42-217	Cylinder Mount (part of machine)	1

INSTALLATION INSTRUCTIONS

1. Assemble the Scarifier as shown on previous page.
2. Remove the rod end (Ref 6) on the hydraulic cylinder (Ref 2) from the cylinder mount (Ref 7). Remove the cylinder mount (Ref 7) from the machine.
- *3. Place the handle and linkage onto the empty linkage port of the two bank valve on the machine.
4. Slide the Scarifier under the machine lining up the hydraulic cylinder and the center of the attachment lift assembly.
5. Extend hydraulic cylinder all the way down by pushing the lever forward.
6. Mount the rod end of the cylinder onto the attachment lift assembly and secure with a clevis pin and bridge pin.
7. Attach the arms on the attachment lift to the attachment mount on the machine and secure with clevis pin and bridge pin.
8. Turn machine on and test for proper operation.
9. Adjust castor wheels by placing the short or long spacer on the castor wheel fork before placing the castor wheel assembly into the castor wheel brackets. Be sure both castor wheels are adjusted to the same height.

* For machines prior to serial numbers 4500 (3WD) and 12500 (2WD).

42-026 84"(213CM) STAINLESS STEEL TOURNAMENT RAKE DRAWING

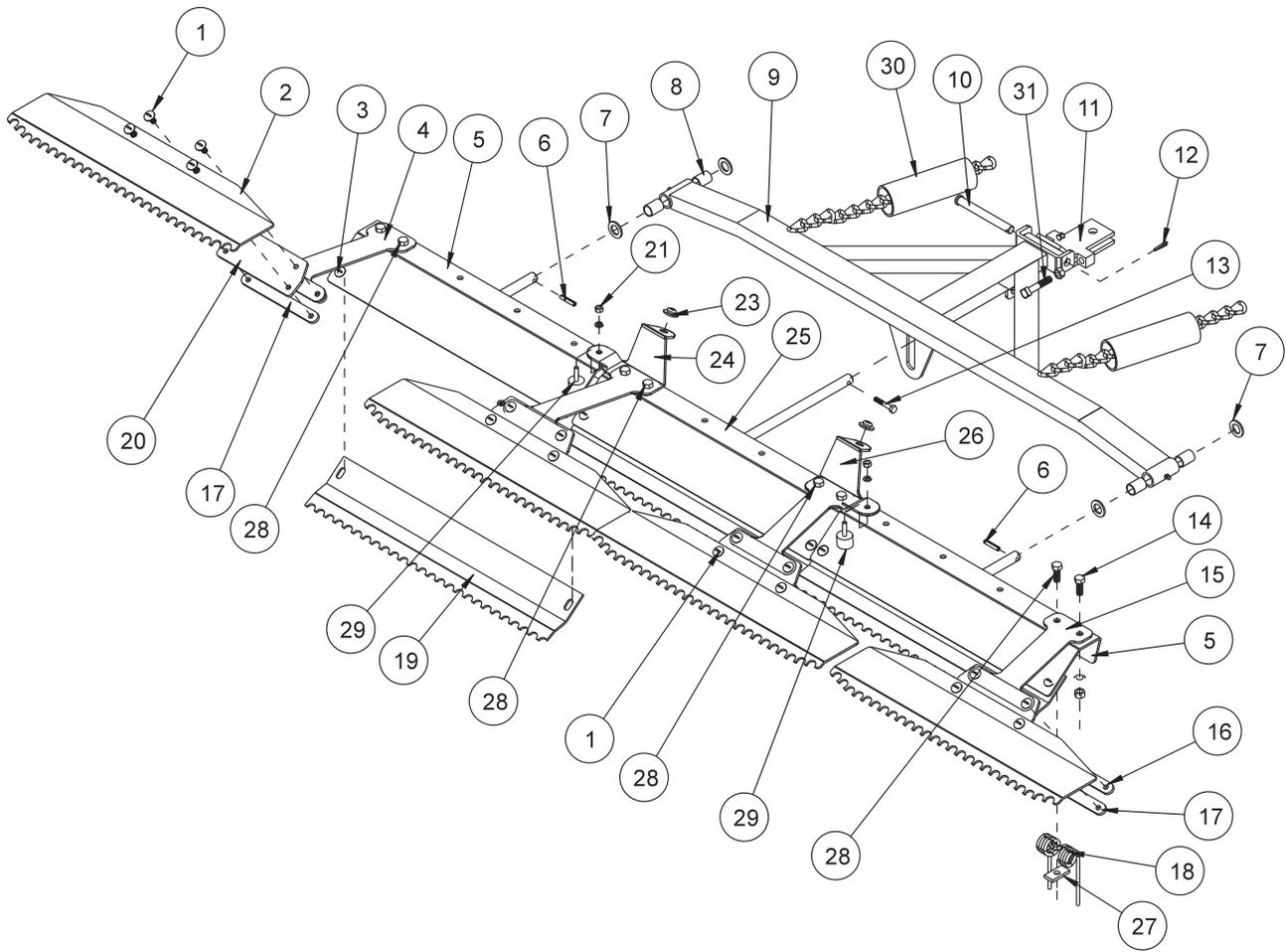


Accessories

42-026 84" (213CM) STAINLESS STEEL TOURNAMENT RAKE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	HSTS-516-18-100	Stainless Truss Head Screw $\frac{5}{16}$ - 18 x 1	16
	HWL-516	Lockwasher $\frac{5}{16}$	16
	HN-516-18	Nut $\frac{5}{16}$ - 18	16
2	42-104	Finishing Blades	4
3	HSTS-516-18-100	Stainless Truss Head Screw $\frac{5}{16}$ - 18 x 1	6
	HW-516	Washer $\frac{5}{16}$	6
	HWL-516	Lockwasher $\frac{5}{16}$	6
	HN-516-18	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 drawbar)	4
9	42-100	Draw Bar	1
	25-338	Decal, Speed Boss	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	Bolt $\frac{1}{4}$ - 20 x $1\frac{3}{4}$	1
	HNTL-14-20	Lock Nut $\frac{1}{4}$ - 20	1
14	HSTS-38-16-100	Stainless Steel Truss Head Screw $\frac{3}{8}$ - 16 x 1	4
	HWL-38	Lockwasher $\frac{3}{8}$	4
	HN-38-16	Nut $\frac{3}{8}$ - 16	4
15	42-109	Right Outside Mount	1
16	42-105	Top Strap	4
17	42-106	Bottom Strap	4
18	42-122	Rake Spring	12
19	42-103	Groomer Blades	3
20	42-107	Matting	4
21	HNC-14-20	Cap Nut $\frac{1}{4}$ - 20	2
	HWL-14	Lockwasher $\frac{1}{4}$	2
23	42-116	Rubber insert	2
24	42-110	Left Inside Mount	1
25	42-101	Center Rake	1
26	42-108	Right Inside Mount	1
27	42-177	Spring Holder	12
28	HSTPS-38-16-125	Stainless Steel Phillips Truss Head Screw $\frac{3}{8}$ - 16 x $1\frac{1}{4}$	12
	HWL-38	Lockwasher $\frac{3}{8}$	12
	HN-38-16	Nut $\frac{3}{8}$ - 16	12
29	15-013	Rubber Bumper	2
30	8892-6	Hose Wrap $\frac{1}{4}$ "	2
31	HSSQ-38-16-200	Square Head Set Screw $\frac{3}{8}$ - 16 x 2 (comes with 13-647)	2
	HN-38-16	Nut $\frac{3}{8}$ - 16 (comes with 13-647)	2

42-026 84"(213CM) STAINLESS STEEL TOURNAMENT RAKE DRAWING

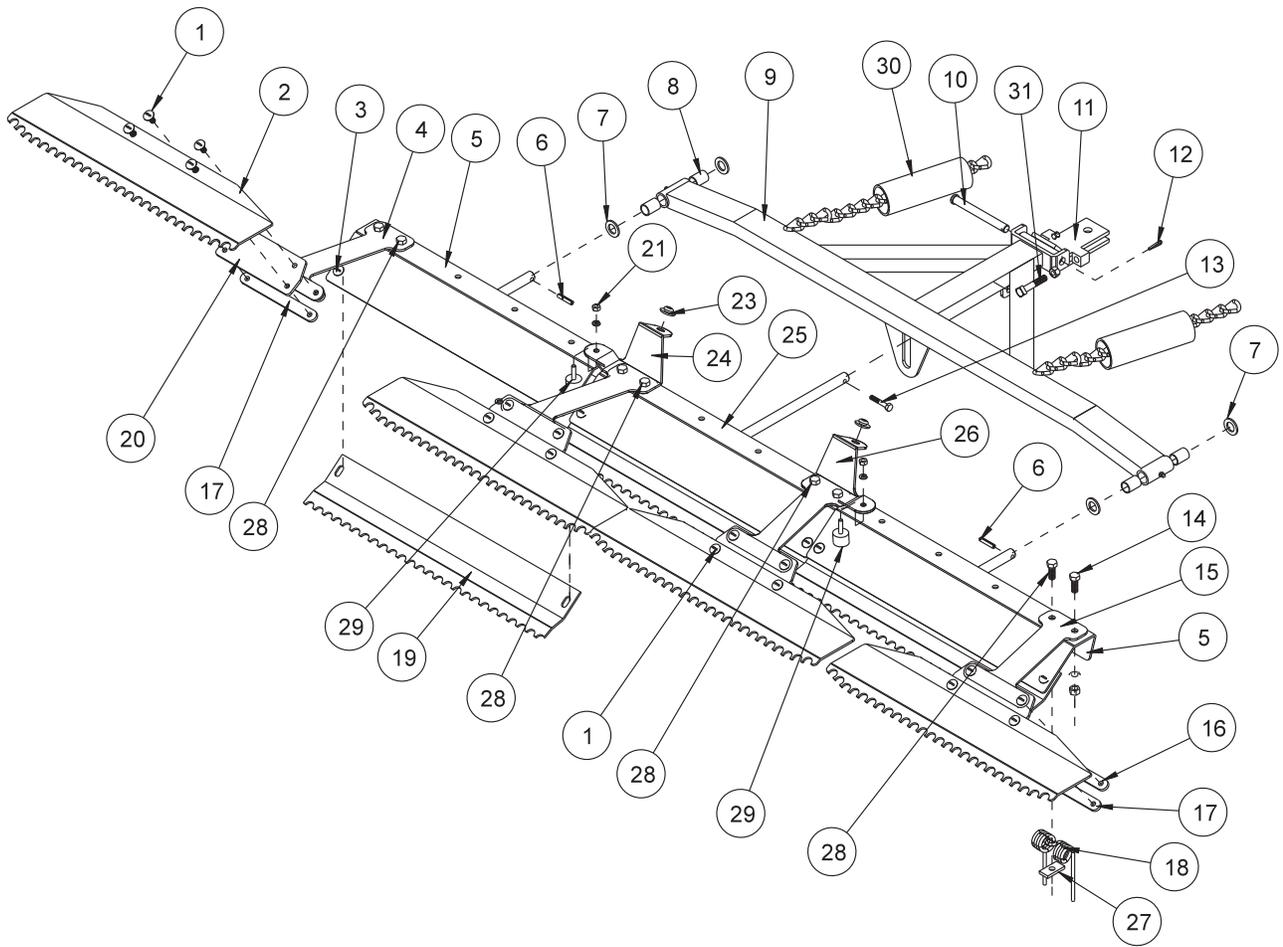


Accessories

INSTALLATION INSTRUCTIONS

1. Attach drawbar (Ref 9) to hitch (Ref 11) using clevis pin (Ref 10) and cotter pin (Ref 12).
 2. 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 and 26).
 3. 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 and 25) as shown. Use the 1" stainless steel truss head screws (Ref 14) on the outside hole of each rake.
 4. Use the spring holder (Ref 27) and the 1 $\frac{1}{4}$ " stainless steel truss head screws (Ref 28) to attach rake springs (Ref 18) to the rakes.
 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 the $\frac{1}{4}$ - 20 - 1 $\frac{3}{4}$ 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 stainless steel truss head screw $\frac{5}{16}$ - 18 x 1 (Ref 1). Attach four finishing blades (Ref 2) to the matting on the inside and outside mounts with the stainless steel truss head screw $\frac{5}{16}$ - 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).
 9. Attach the rake hitch (Ref 11) 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 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.

42-128 72" (183 CM) STAINLESS STEEL TOURNAMENT RAKE DRAWING



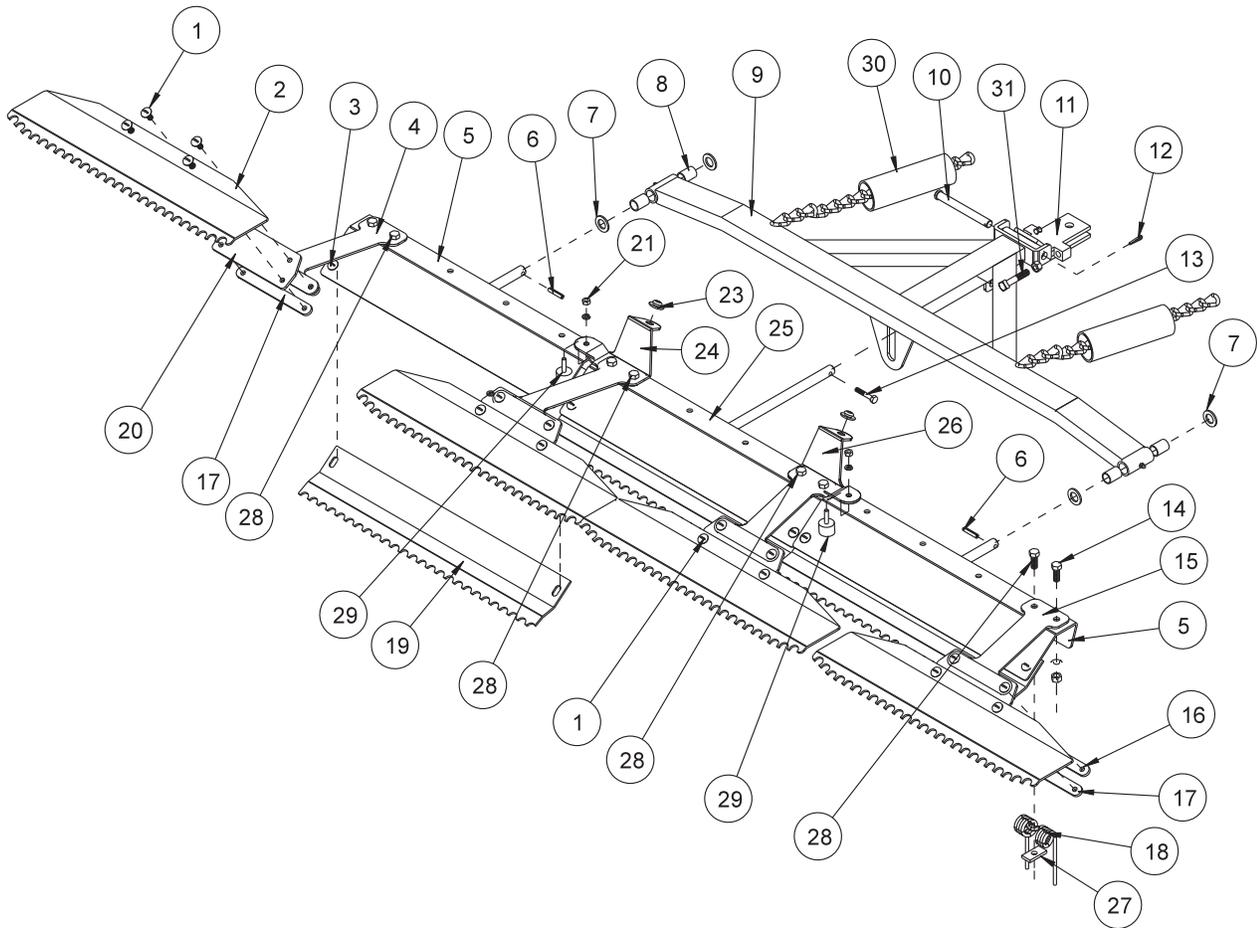
Accessories

42-128 72" (183 CM) STAINLESS STEEL TOURNAMENT RAKE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	HSTS-516-18-100	Stainless Steel Truss Head Screw $5/16$ - 18 x 1	16
	HWL-516	Lock Washer $5/16$	16
	HN-516-18	Nut $5/16$ - 18	16
2	42-137	Finishing Blades	4
3	HSTS-516-18-100	Stainless Steel Truss Head Screw $5/16$ - 18 x 1	6
	HW-516	Washer $5/16$	6
	HWL-516	Lock Washer $5/16$	6
	HN-516-18	Nut $5/16$ - 18	6
4	42-111	Left Outside Mount	1
5	42-140	Outside Rake	2
6	HRP-14-100	Roll Pin $1/4$ x 1	2
7	HMB-58-14	Machine Bushing $5/8$ 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 $1/2$ x $4 1/2$	1
11	13-647	Hitch	1
	HCP-12-150	Clevis Pin $1/2$ x $1 1/2$	1
	HHP-18	Bridge Pin $1/8$	1
12	HP-18-100	Cotter Pin $1/8$ x 1	1
13	HB-14-20-175	Bolt $1/4$ - 20 x $1 3/4$	1
	HNTL-14-20	Lock Nut $1/4$ - 20	1
14	HSTS-38-16-100	Stainless Steel Truss Head Screw $3/8$ - 16 x 1	4
	HWL-38	Lock Washer $3/8$	4
	HN-38-16	Nut $3/8$ - 16	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	42-138	Groomer Blades	3
20	42-107	Matting	4
21	HNC-14-20	Cap Nut $1/4$ - 20	2
	HWL-14	Lock Washer $1/4$	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	HSTPS-38-16-125	Stainless Steel Phillips Truss Head Screw $3/8$ - 16 x $1 1/4$	12
	HWL-38	Lock Washer $3/8$	12
	HN-38-16	Nut $3/8$ - 16	12
29	15-013	Rubber Bumper	2
30	8892-6	Hose Wrap	2
31	HSSQ-38-16-200	Square Head Set Screw $3/8$ - 16 x 2 (comes with 13-647)	2
	HN-38-16	Nut $3/8$ - 16 (comes with 13-647)	2



42-128 72" (183 CM) STAINLESS STEEL TOURNAMENT RAKE DRAWING

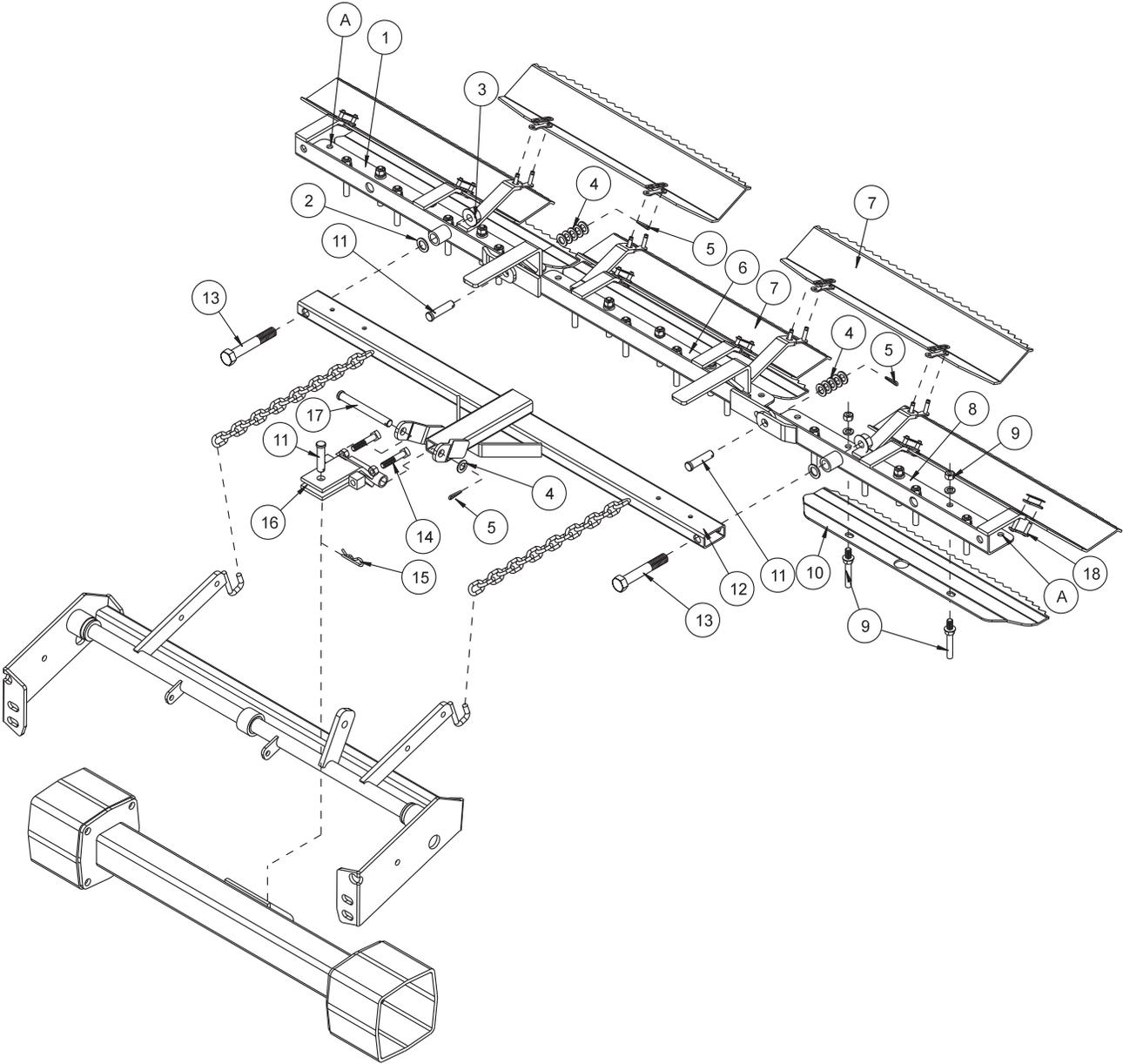


Accessories

INSTALLATION INSTRUCTIONS

1. Attach drawbar (Ref 9) to hitch (Ref 11) using clevis pin (Ref 10) and cotter pin (Ref 12).
 2. 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 and 26).
 3. 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 and 25) as shown. Use the 1" stainless steel truss head screws (Ref 14) on the outside hole of each rake.
 4. Use the spring holder (Ref 27) and the 1¹/₄" stainless steel truss head screws (Ref 28) to attach rake springs (Ref 18) to the rakes.
 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 the 1¹/₄ - 20 - 1³/₄ 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 stainless steel 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 stainless steel 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).
 9. Attach the rake hitch (Ref 11) 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 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.

13-438 RAKE ASSEMBLY WITH FINISHING BLADES DRAWING



Accessories

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 $\frac{5}{8}$ x 14GA	2
3	HNCL-58-11	Lock Nut $\frac{5}{8}$ - 11	2
4	HMB-12-14	Machine Bushing $\frac{1}{2}$ x 14GA	11
5	HP-18-100	Cotter Pin $\frac{1}{8}$ x 1	3
6	13-440	Center Rake	1
7	13-443	Finishing Blade	5
8	13-439	Left Rake	1
9*	19-106	Rake teeth	25
10	13-442	Groomer Blade	3
11	HCP-12-150	Clevis Pin $\frac{1}{2}$ - $1\frac{1}{2}$	3
12	13-365	Drawbar	1
13	HB-58-11-400	Bolt $\frac{5}{8}$ - 11 x 4	2
14	HSSQS-38-16-200	SS Square Head Set Screw $\frac{3}{8}$ -16 x 2 (comes with 13-647)	2
	HN-38-16	Nut $\frac{3}{8}$ - 16 (comes with 13-647)	2
15	HHP-18	Bridge Pin $\frac{1}{8}$	1
16	13-647	Hitch (includes Ref 14)	1
17	HCP-12-450	Clevis Pin $\frac{1}{2}$ - $4\frac{1}{2}$	1
18	13-417	Connector Link	10
*	13-445	Rake Teeth Kit (25 Studs and Hardware)	1

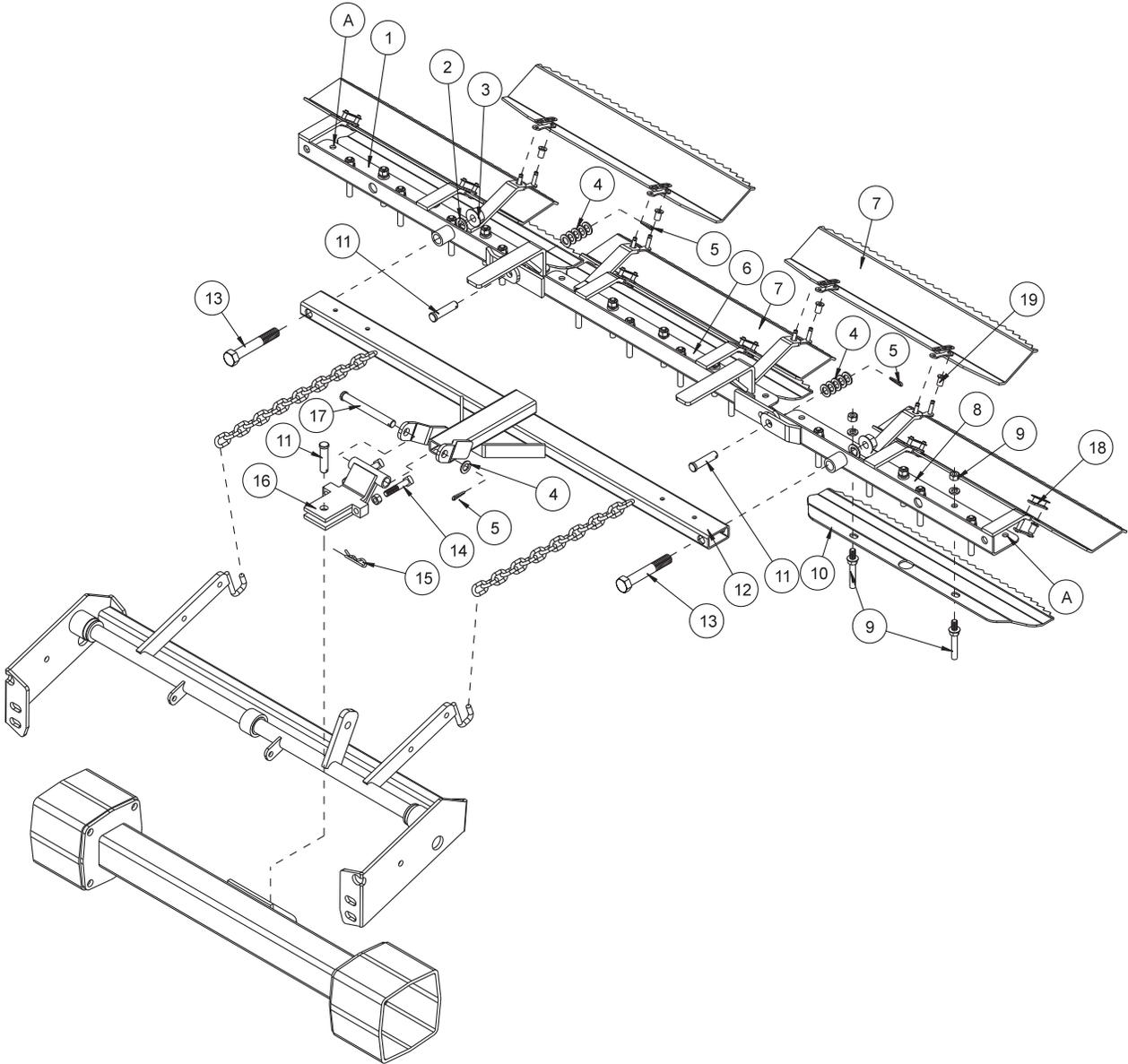
INSTALLATION INSTRUCTIONS

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 'teeth'. Blade thickness should be accounted for by shortening the 'teeth' an equal length.

13-606 RAKE ASSEMBLY WITH LEXAN BLADES DRAWING



Accessories

13-606 RAKE ASSEMBLY WITH LEXAN BLADES PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-441	Right Rake	1
2	HMB-58-14	Machine Bushing $\frac{5}{8}$ x 14GA	2
3	HNCL-58-11	Lock Nut $\frac{5}{8}$ - 11	2
4	HMB-12-14	Machine Bushing $\frac{1}{2}$ x 14GA	11
5	HP-18-100	Cotter Pin $\frac{1}{8}$ x 1	3
6	13-440	Center Rake	1
7	13-605	Lexan Blade (with weight & rivets)	5
8	13-439	Left Rake	1
9*	19-106	Rake teeth	25
10	13-442	Groomer Blade	3
11	HCP-12-150	Clevis Pin $\frac{1}{2}$ - 1 $\frac{1}{2}$	3
12	13-365	Drawbar	1
13	HB-58-11-400	Bolt $\frac{5}{8}$ - 11 x 4	2
14	HSSQS-38-16-200	SS Square Head Set Screw $\frac{3}{8}$ -16 x 2 (comes with 13-647)	2
	HN-38-16	Nut $\frac{3}{8}$ - 16 (comes with 13-647)	2
15	HHP-18	Bridge Pin $\frac{1}{8}$	1
16	13-647	Hitch (includes Ref 14)	1
17	HCP-12-450	Clevis Pin $\frac{1}{2}$ - 4 $\frac{1}{2}$	1
18	13-417	Connector Link	10
19	18-272	Nylon Bushing	10
*	13-445	Rake Teeth Kit (25 Studs and Hardware)	1

INSTALLATION INSTRUCTIONS

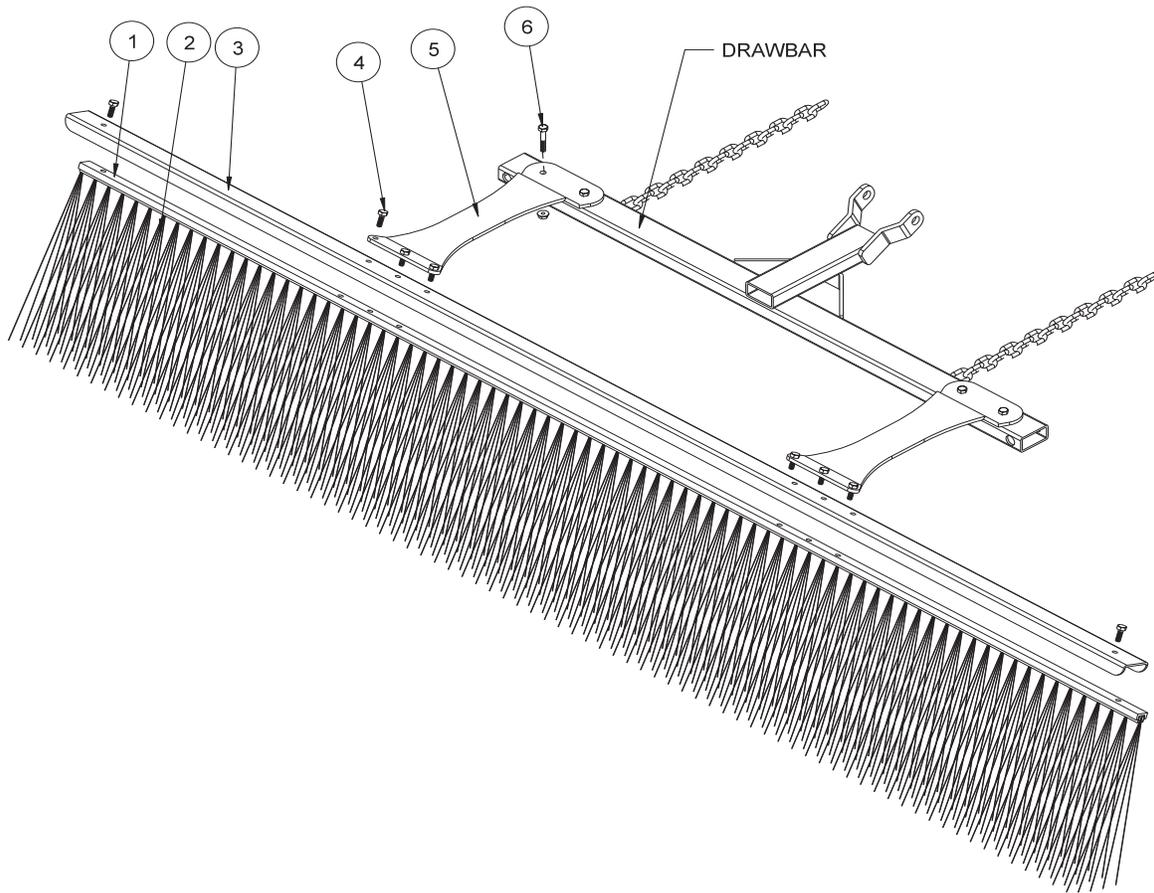
1. Attach drawbar (Ref 12) to hitch (Ref 16) using clevis pin, machine bushing and cotter pin (Ref 17, 4 and 5).
2. Bolt rake teeth (Ref 9) to frames, keeping all the same length. Leave the two outside holes on right and left rake open (Ref A).
3. Lay out rake frames (Ref 1,6 and 8). Connect them using 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 lexan blades (Ref 7) to the tabs of the rake frames using master link (Ref 18) and nylon bushings (Ref 19). 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.

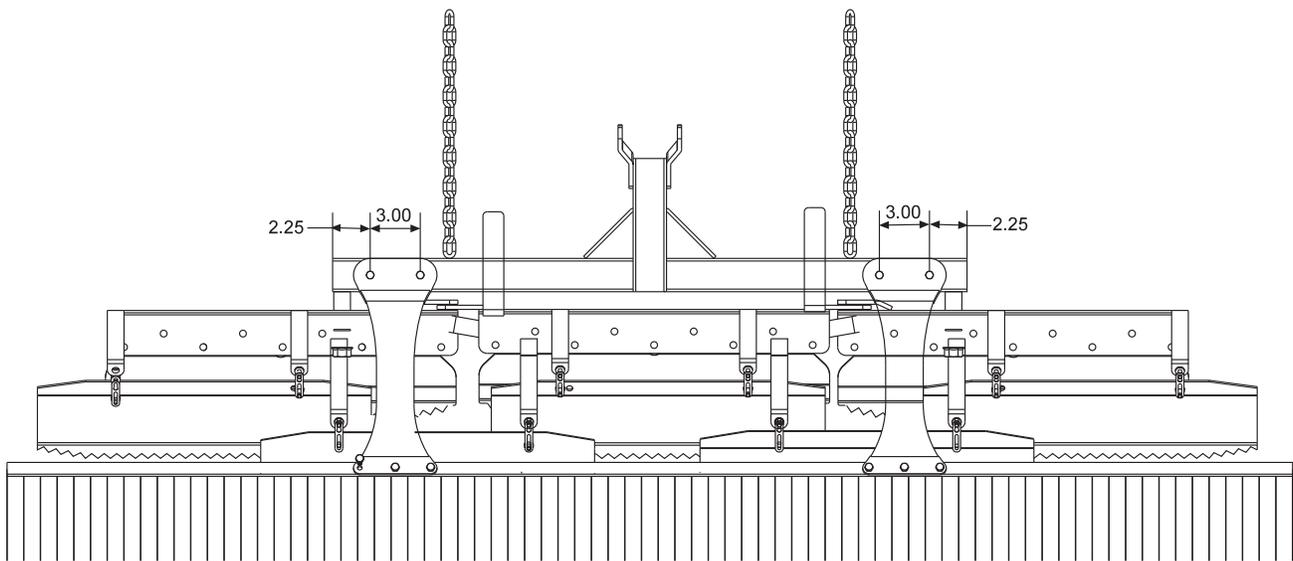
1. Place the three groomer blades (Ref 10) under the three rake assemblies (Ref 1, 6 and 8) .
2. Center blades below rear most row of rake teeth. The blade is designed to miss the outside two "teeth" and fit around the center "tooth".
3. Remove the two "teeth" that line up with slots of each groomer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



13-684 SANDRAKE BRUSH KIT DRAWING



HOLE LOCATION



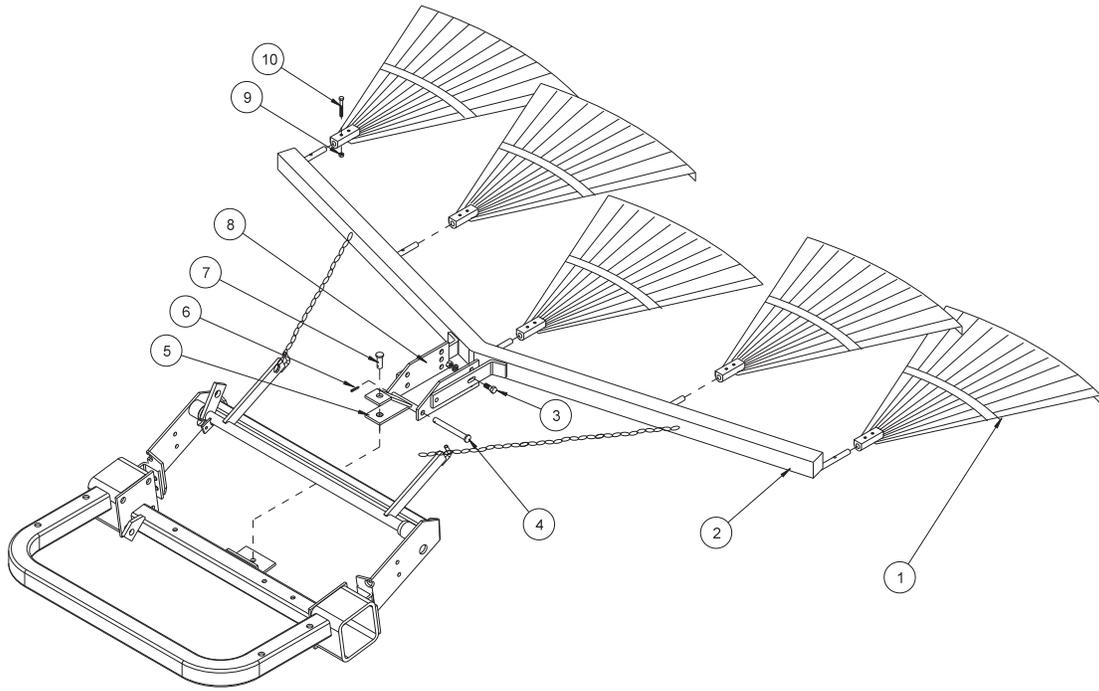
13-684 SAND RAKE BRUSH KIT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
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	Bolt $\frac{1}{4}$ - 20 x $\frac{3}{4}$	6
	HNFL-14-20	Flange Whiz-Lock Nut $\frac{1}{4}$ - 20	6
5	13-681	Mounting Brackets	2
6	HB-14-20-150	Bolt $\frac{1}{4}$ - 20 x $1\frac{1}{2}$	4
	HNFL-14-20	Flange Whiz-Lock Nuts $\frac{1}{4}$ - 20	4

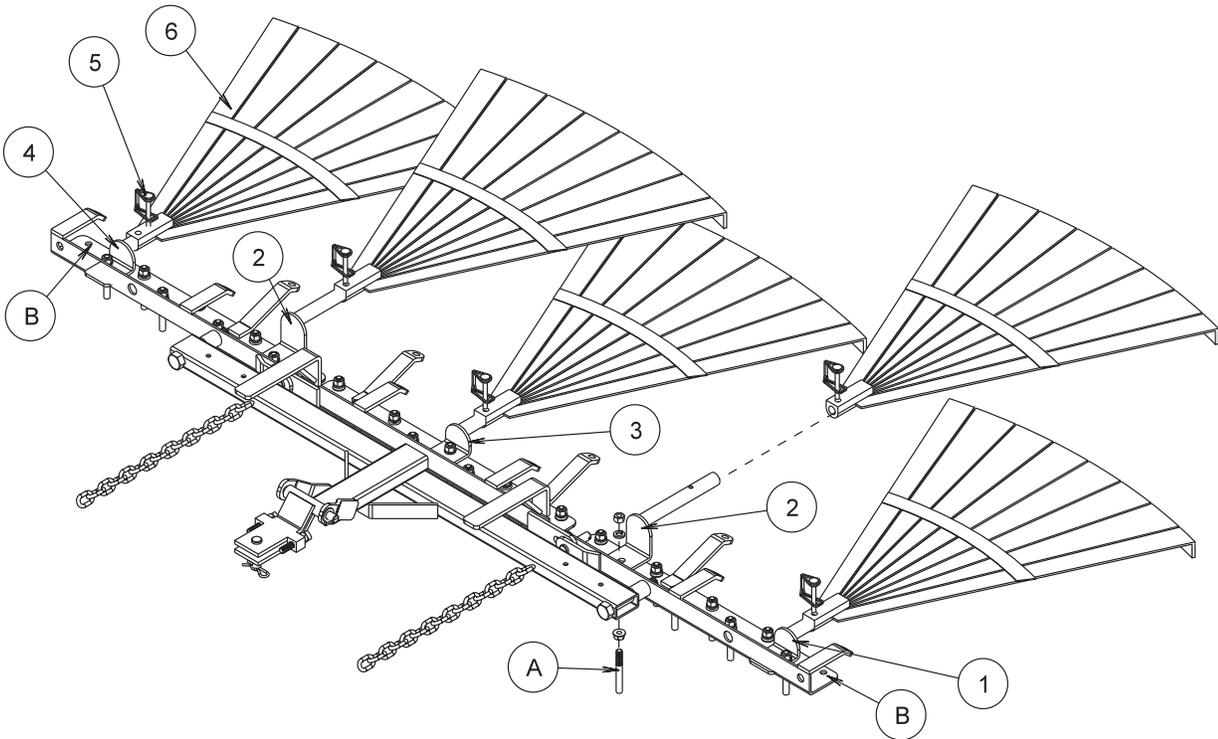
INSTALLATION INSTRUCTIONS

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 bolt the mounting brackets (Ref 5) to the brush track using the $\frac{3}{4}$ " bolts and flange whiz-lock nuts (Ref 3).
2. Two holes need to be drilled into the drawbar of the rake to install the brush. Drill two .281 holes $2\frac{1}{4}$ " in from each end and 3" apart (see drawing).
3. Mount the brush assembly to the drawbar using four $\frac{3}{4}$ " bolts and flange whiz-lock nuts (Ref 5).

13-298 FAN RAKE ATTACHMENT DRAWING



13-319 FAN RAKE KIT



Accessories

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	Bolt $\frac{3}{8}$ - 16 x 1	4
	HN-38-16	Nut $\frac{3}{8}$ - 16	4
	HWL-38	Lockwasher $\frac{3}{8}$	4
4	HCP-12-450	Clevis Pin $\frac{1}{2}$ x $4\frac{1}{2}$	1
5	19-107	Drawbar	1
6	HP-18-100	Cotter Pin $\frac{1}{8}$ x 1	1
7	HCP-12-150	Clevis Pin $\frac{1}{2}$ x $1\frac{1}{2}$	1
	HHP-18	Bridge Pin $\frac{1}{8}$	1
8	13-307	Hitch	2
9	HNCL-14-20	Center Lock Nut $\frac{1}{4}$ - 20	5
10	HB-14-20-200	Bolt $\frac{1}{4}$ - 20 x 2	5

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 8) to frame (Ref 2) using hardware (Ref 3). Assemble drawbar (Ref 5) to the hitch using clevis pin (Ref 4) and cotter pin (Ref 6), 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 using the bolt and center lock nuts (Ref 9 and 10). Slide the fan rake assembly under the rear of the trap rake to the hitch. Attach the drawbar to the hitch using the clevis pin and the bridge pin (Ref 7).
4. Hook the chains from the frame to the hooks on the rake lift.

13-319 FAN RAKE KIT PARTS LIST

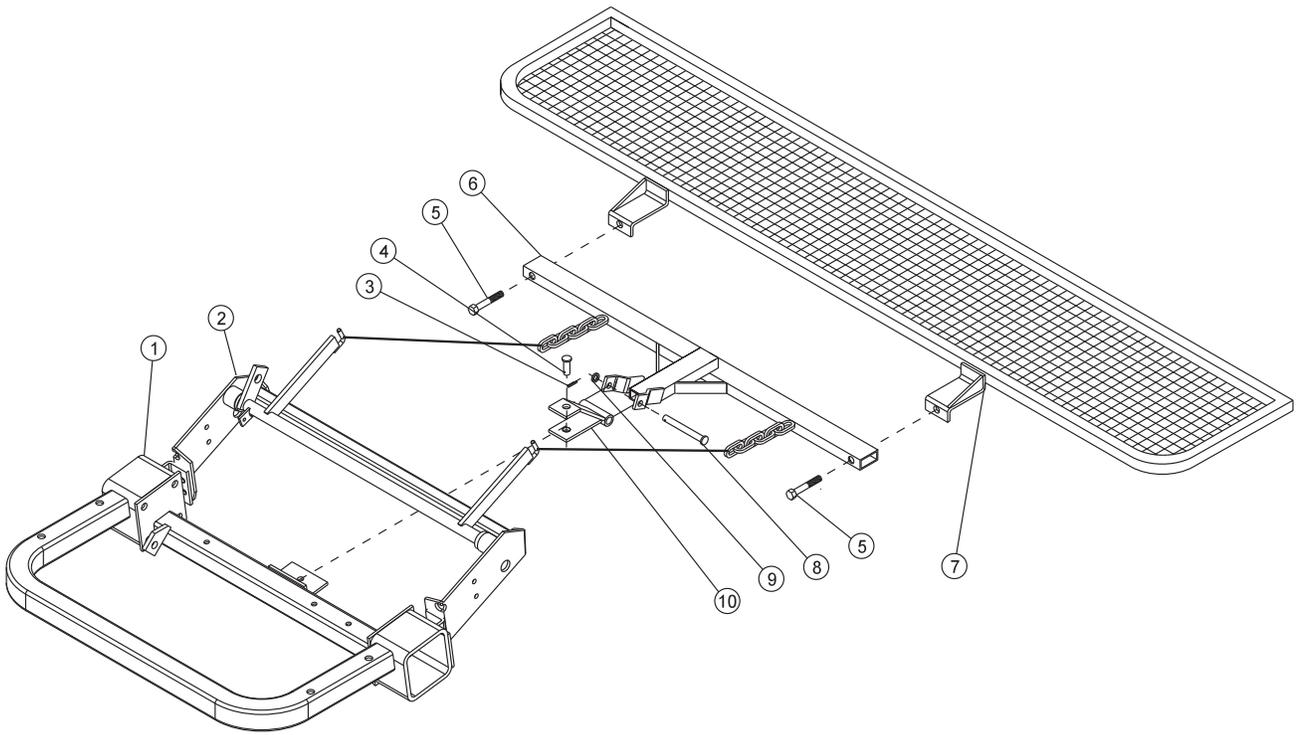
REF#	PART#	DESCRIPTION	QUANTITY
1	13-326	Left Holder	1
2	13-329	Long Holder	2
3	13-327	Center Holder	1
4	13-328	Right Holder	1
5	29-541	Lock Pin	5
6	13-310	Rake	5

FAN RAKE KIT INSTRUCTIONS

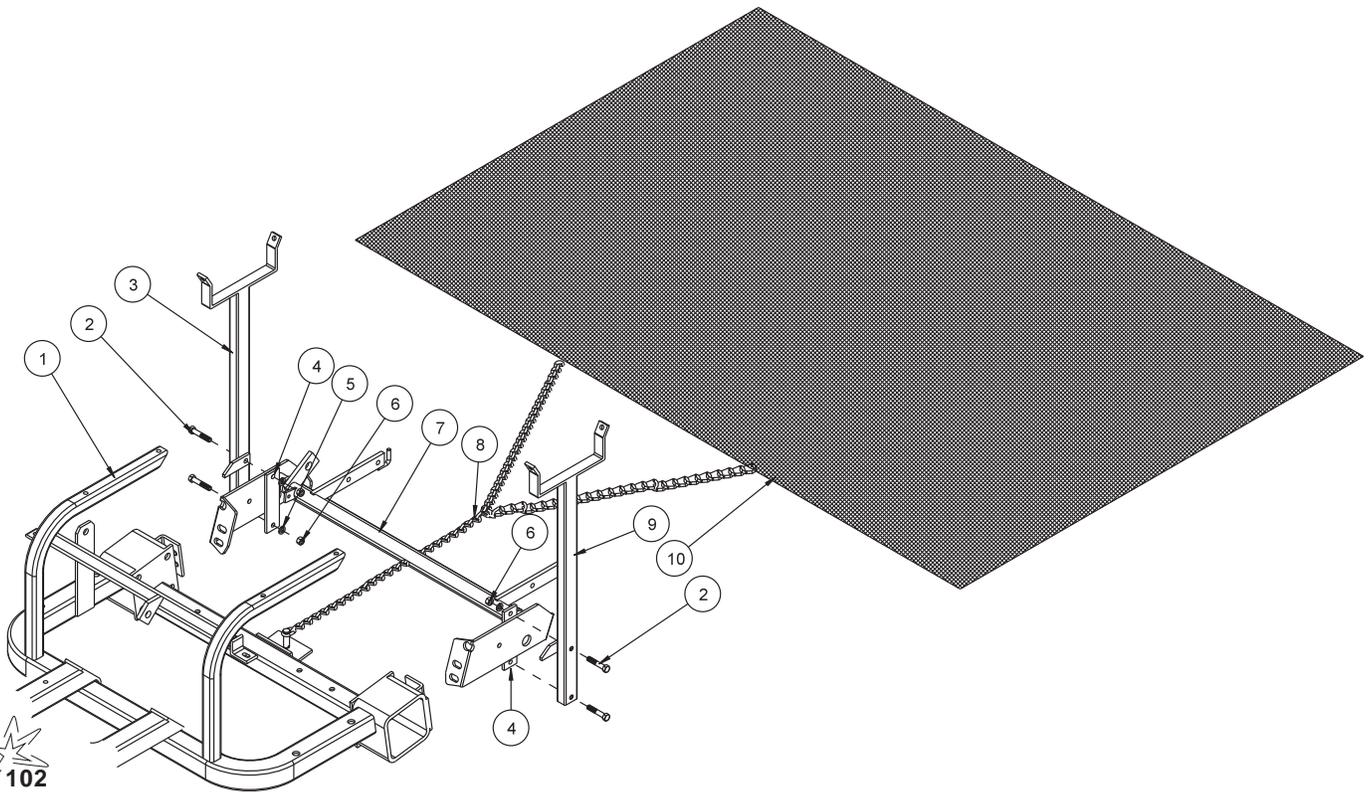
1. Remove connector links that hold rake blades to rake frame if desired.
2. Remove groomer blades from rake frame that are held on with rake teeth studs (Ref A). Replace rake teeth studs, if desired.
3. Place left holder (Ref 1), angle side up, to the second rake tooth hole from the end and install rake tooth stud. The first rake tooth hole from each end (Ref B) have no rake teeth in them.
4. Remove the 8th 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).



26-007 PROFESSIONAL INFIELD FINISHER DRAWING



42-185 DRAG MAT KIT DRAWING



Accessories

26-007 PROFESSIONAL INFIELD FINISHER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1		Rear Axle (part of main frame)	1
2	42-024	Rake Lift	1
3	HP-18-100	Cotter Pin $\frac{1}{8}$ x 1	1
4	HCP-12-150	Clevis Pin $\frac{1}{2}$ x $1\frac{1}{2}$	1
5	HB-58-11-300	Bolt $\frac{5}{8}$ - 11 x 3	2
	HNCL-58-11	Center Lock Nut $\frac{5}{8}$ - 11	2
6	13-365	Drawbar	1
7	26-045	Leveling Screen	1
8	HCP-12-450	Clevis Pin $\frac{1}{2}$ x $4\frac{1}{2}$	1
9	HMB-12-14	Machine Bushing $\frac{1}{2}$ x 14GA	1
10	19-107	Hitch	1
11	HHP-18	Bridge Pin $\frac{1}{8}$	1

INSTALLATION INSTRUCTIONS

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

1. Attach leveling screen (Ref 7) to drawbar (Ref 6) using two bolts (Ref 5) and center lock nuts.
2. Attach hitch (Ref 10) to drawbar (Ref 6) using clevis pin (Ref 8), machine bushing (Ref 9) and a cotter pin (Ref 3).
3. Mount Professional Field Finisher to the hitch on the trap rake with a clevis pin (Ref 4) and bridge pin (Ref 11).
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.

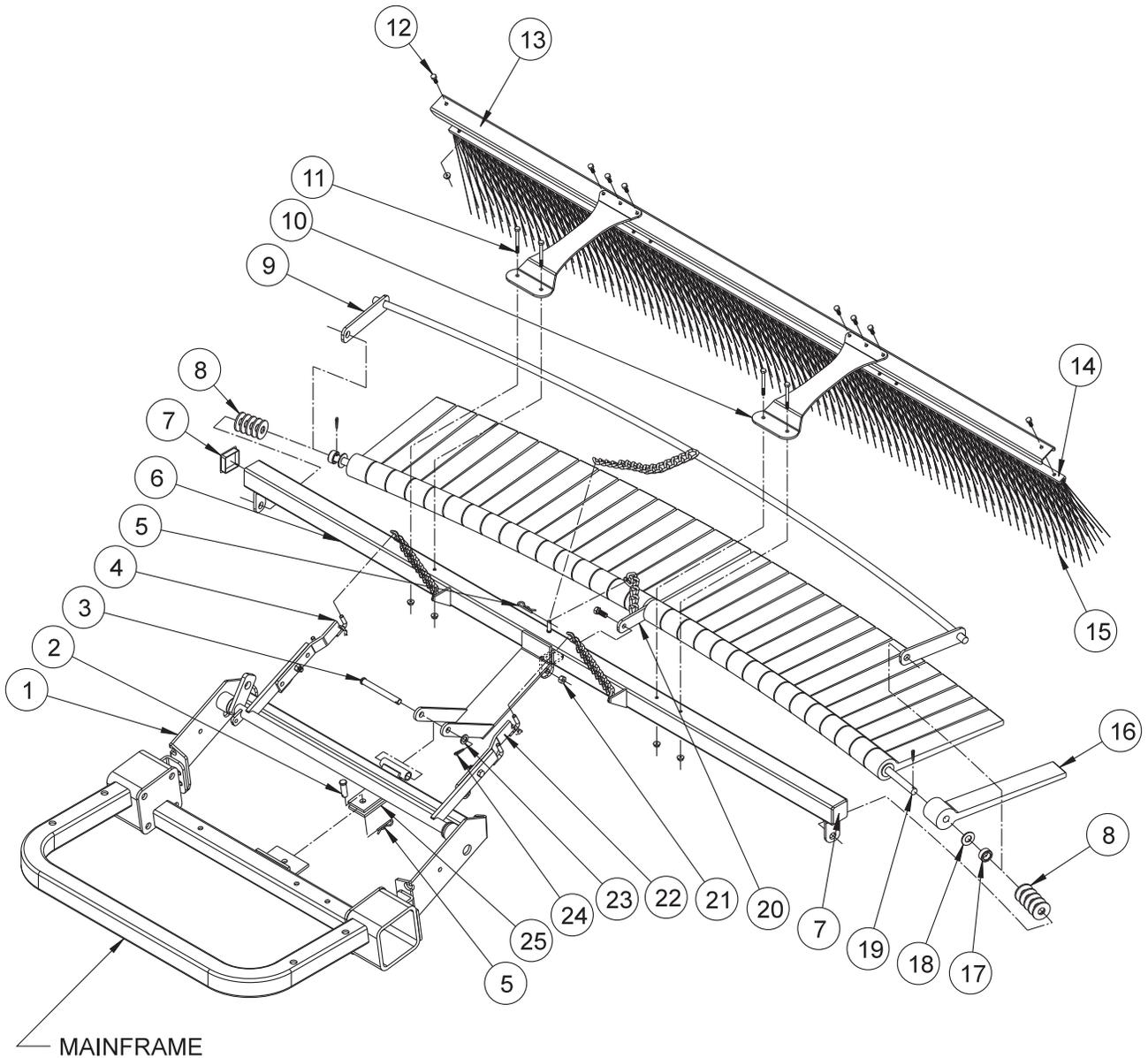
42-185 DRAG MAT KIT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1		Main Frame	1
2	HB-38-16-225	Bolt $\frac{3}{8}$ - 16 x $2\frac{1}{4}$	4
3	42-186	Right Mat Carrier	1
4	13-157	Strap	2
5	HWL-38	Lock Washer $\frac{3}{8}$	4
6	HN-38-16	Nut $\frac{3}{8}$ - 16	4
7	42-024	Rake Lift (part of machine)	1
8	19-605	Drag Mat Chain	1
	HHP-18	Bridge Pin $\frac{1}{8}$	1
9	42-187	Left Mat Carrier	1
10	19-601	Steel Mat	1

INSTALLATION INSTRUCTIONS

1. Looking from the rear of the Super Star, mount the mat carrier posts (Ref 3 & 9) outside the rear corner of the rake lift with the straps (Ref 4) on the inside of the rake lift side plate. Bolt into place with $\frac{3}{8}$ - 16 x $2\frac{1}{4}$ bolts, lockwasher and nuts.
2. To carry the Drag Mat, roll it up and place it in the brackets of the mat carriers.
3. To use the Drag Mat, unroll the mat flat and hook it up to the Super Star hitch with the clevis pin in the chain and the bridge pin provided.

43-002 FLEXACTION FIELD FINISHER WITH BRUSH DRAWING



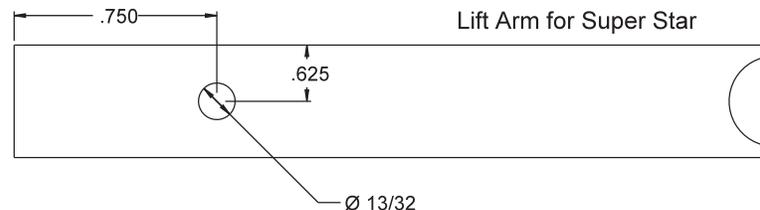
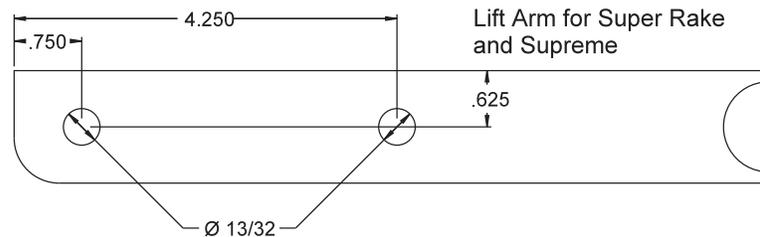
Accessories

43-002 FLEX ACTION FIELD FINISHER WITH BRUSH PARTS LIST

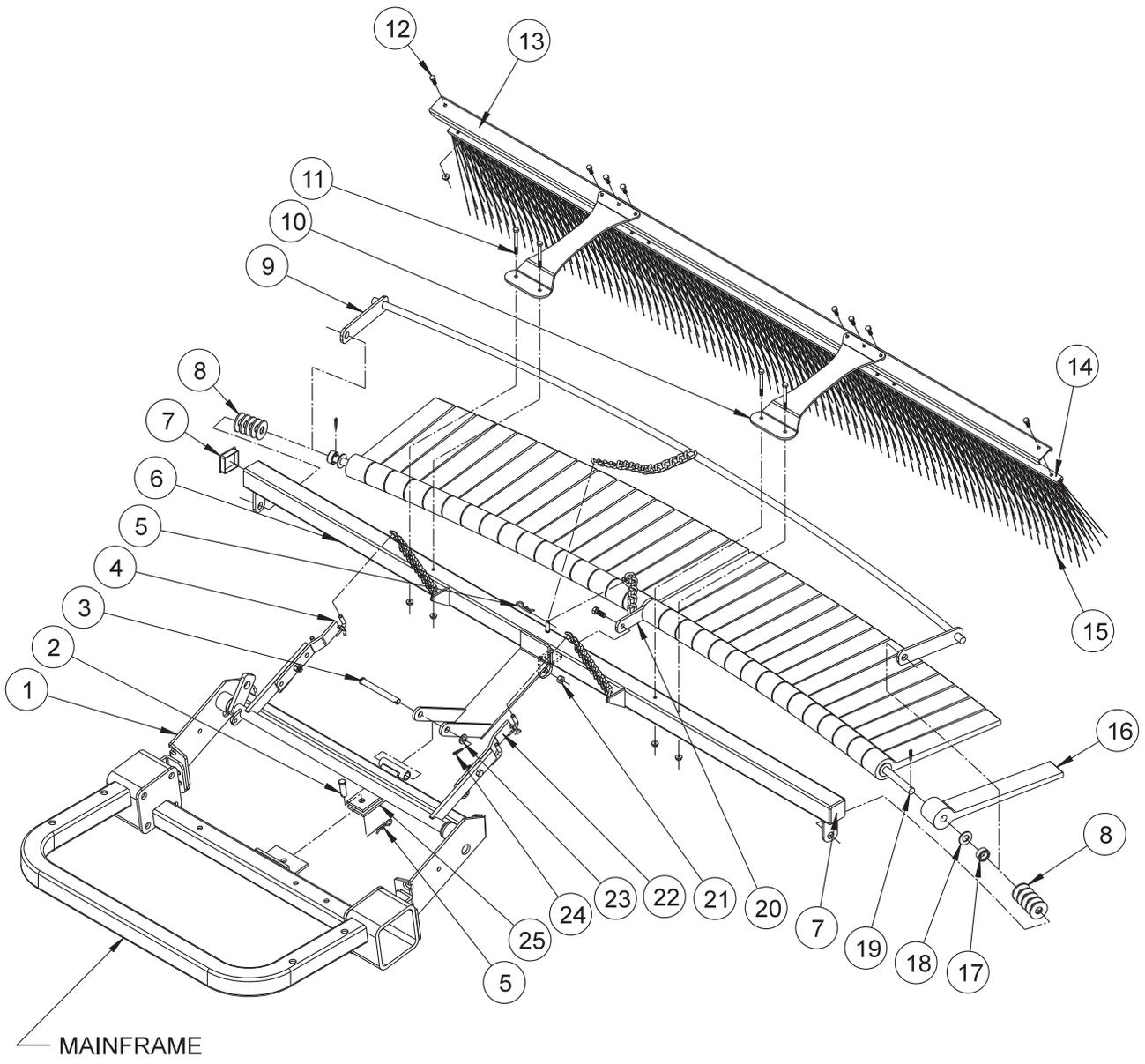
REF#	PART#	DESCRIPTION	QUANTITY
1		Rake Lift (comes with machine)	1
2	HCP-12-150	Clevis Pin $1/2$ x $1 1/2$	1
3	HCP-12-450	Clevis Pin, $1/2$ x $4 1/2$	1
4	26-116	Right Extension Arm	1
	HB-38-16-125	Bolt $3/8$ - 16 x $1 1/4$	1
	HNTL-38-16	Lock Nut $3/8$ - 16	1
5	HHP-18	Bridge Pin, $1/8$	2
6	26-046	Frame	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	43-041	Mount Bracket	2
11	HB-14-20-250	Bolt, $1/4$ -20 x $2 1/2$	4
	HNFL-14-20	Flange Whiz-Lock Nut, $1/4$ -20	4
12	HB-14-20-075	Bolt, $1/4$ -20 x $3/4$	8
	HNFL-14-20	Flange Whiz-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
17	11-040	Spacer, $3/4$ "	2
18	HW-58	Washer, $5/8$	32
19	26-049	Mounting Bar	1
	HP-18-100	Cotter Pin, $1/8$ x 1	2
20	26-048	Flail Bar Strap	1
21	HB-38-16-100	Bolt, $3/8$ - 16 x 1	1
	HNCL-38-16	Center Lock Nut, $3/8$ - 16	1
22	26-117	Left Extension Arm	1
	HB-38-16-125	Bolt $3/8$ - 16 x $1 1/4$	1
	HNTL-38-16	Lock Nut $3/8$ - 16	1
23	HMB-12-14	Machine Bushing, $1/2$ - 14GA	1
24	HP-18-100	Cotter Pin, $1/8$ x 1	1
25	19-107	Draw Bar Assembly	1

RAKE LIFT ARM HOLE PLACEMENT

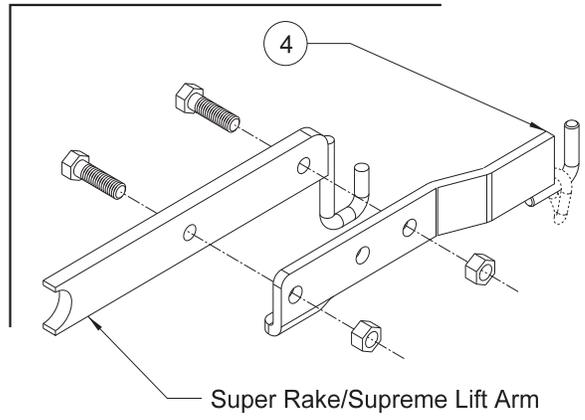
If the Lift Arms on the Rake Lift are not drilled, use the following dimensions to drill $\varnothing 13/32$ holes to mount the extension arms to.



43-002 FLEXACTION FIELD FINISHER WITH BRUSH DRAWING



Accessories



43-002 FLEXACTION 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 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. **Super Star** - use the center hole and only (1) $\frac{3}{8}$ -16 x $1\frac{1}{4}$ bolt per arm. **Supreme & Super Rake(see sidebar)** - use the two outside holes on the extension arms and (2) $\frac{3}{8}$ -16 x $1\frac{1}{4}$ bolts per arm. Hook lift chains to extension arms (Refs 4 & 22).

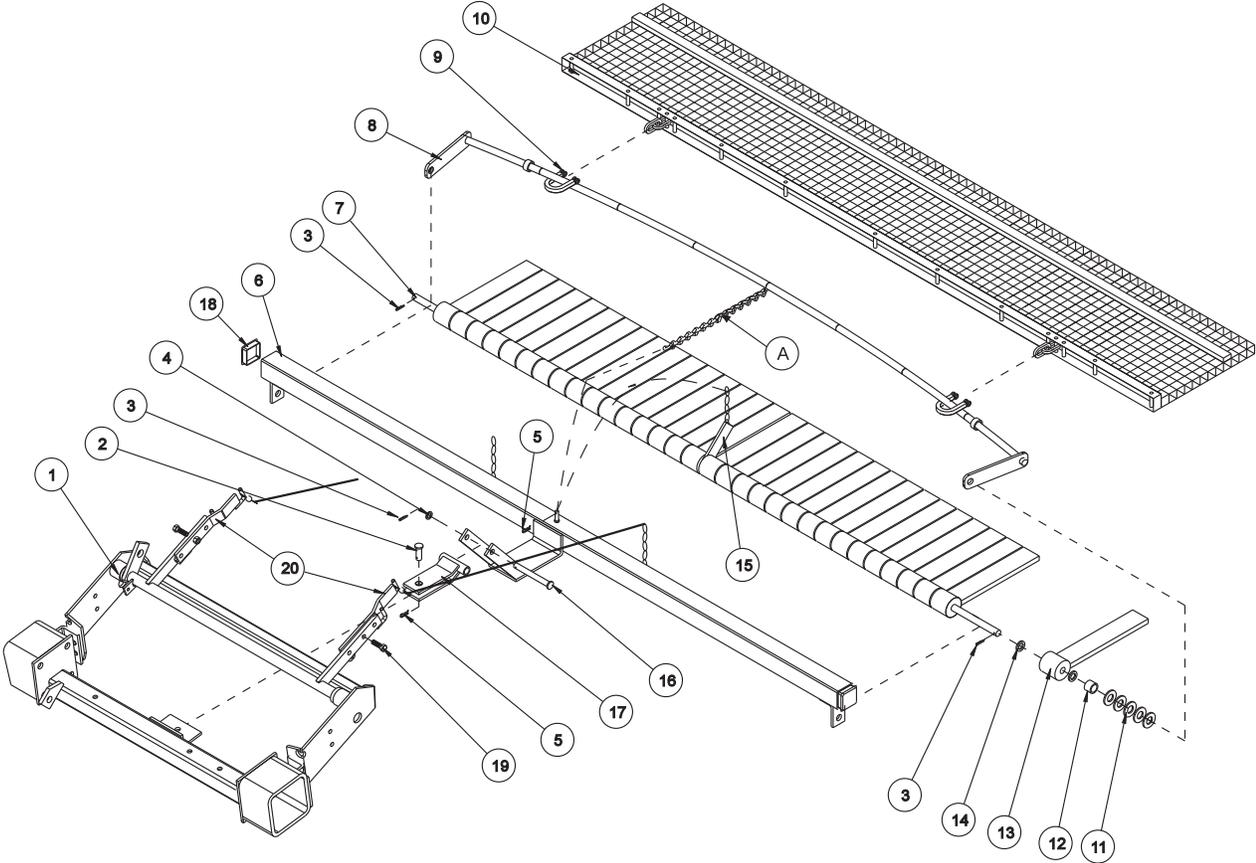
OPERATING INSTRUCTIONS

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.

BRUSH ASSEMBLY

1. Place the brush (Ref 15) into the brush track (Ref 14). Place the brush channel (Ref 13) between the brush track and the mounting brackets. Now bolt the mounting brackets (Ref 10) to the brush track using the $\frac{1}{4}$ -20 x $\frac{3}{4}$ bolts and $\frac{1}{4}$ -20 flange whiz-lock nuts (Ref 12).
2. Mount the brush assembly to the frame using the (4) $\frac{1}{4}$ -20 x $2\frac{1}{2}$ bolts and $\frac{1}{4}$ -20 flange whiz-lock nuts (Ref 11).

26-008 FLEX ACTION FIELD FINISHER DRAWING

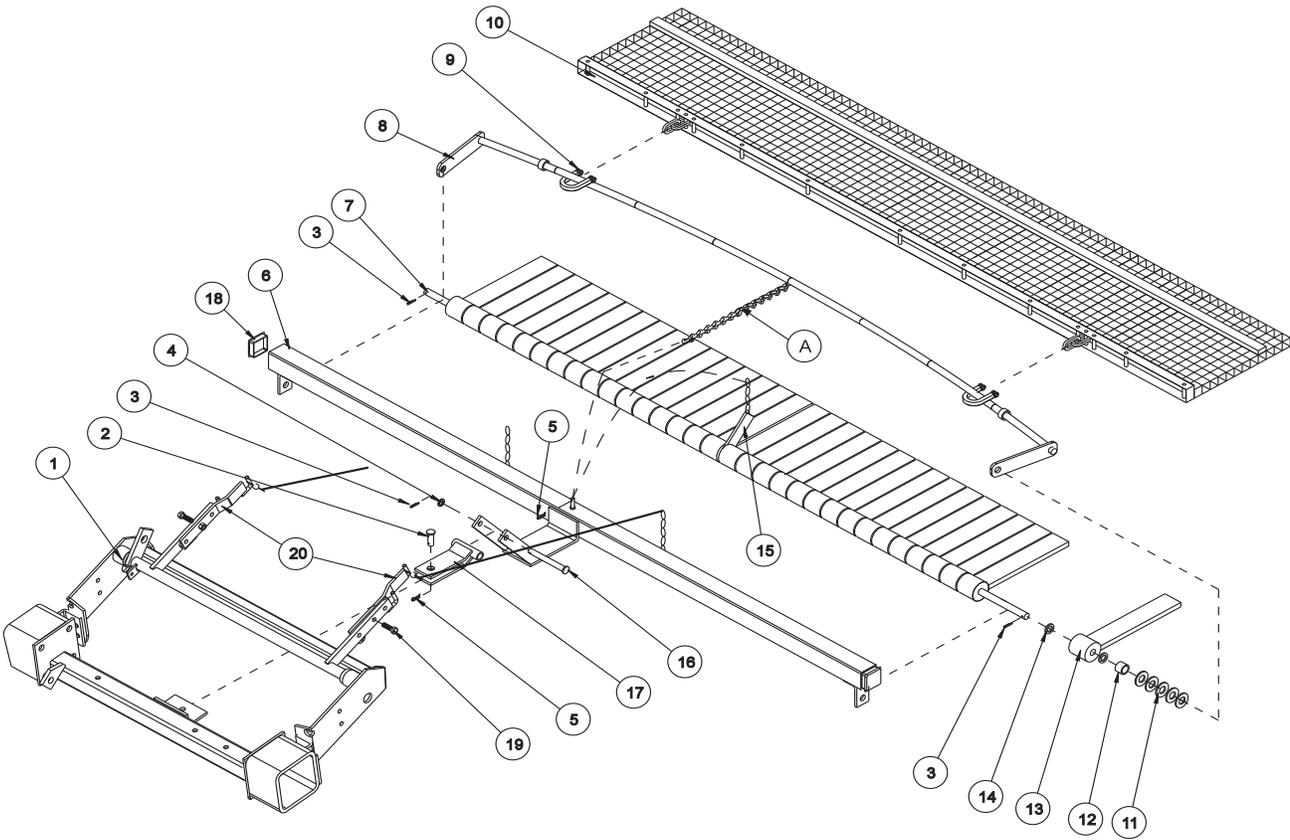


Accessories

26-008 FLEX ACTION FIELD FINISHER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	42-024	Rake Lift (comes with machine)	1
2	HCP-12-150	Clevis Pin $\frac{1}{2} \times 1\frac{1}{2}$	1
3	HP-18-100	Cotter Pin $\frac{1}{8} \times 1$	3
4	HMB-12-14	Machine Bushing $\frac{1}{2}$ - 14GA	1
5	HHP-18	Bridge Pin $\frac{1}{8}$	2
6	26-046	Frame	1
7	26-049	Mounting Bar	1
8	26-047	Leveler Bar	1
9	21-260	$\frac{3}{8}$ Chain Clevis	2
10	26-115	Mesh Finisher	1
11	HMB-58-14	Machine Bushing $\frac{5}{8} \times 14$ GA	10
12	11-040	Spacer $\frac{3}{4}$ "	2
13	26-041	Rasp Flail	32
14	HW-58	Washer $\frac{5}{8}$	32
15	26-048	Flail Bar Strap	1
	HB-38-16-100	Bolt $\frac{3}{8}$ - 16 x 1	1
	HNCL-38-16	Center Lock Nut $\frac{3}{8}$ - 16	1
16	HCP-12-450	Clevis $\frac{1}{2} \times 4\frac{1}{2}$	1
17	19-107	Hitch	1
18	18-297	Cap Plug	2
19	HB-38-16-125	Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$	4
	HNTL-38-16	Lock Nut $\frac{3}{8}$ - 16	4
20	26-116	Right Extension Arm	1
	26-117	Left Extension Arm	1

26-008 FLEX ACTION FIELD FINISHER DRAWING



Accessories

INSTALLATION INSTRUCTIONS

1. Install flail bar (Ref 15) strap to center of mounting bar (Ref 7) 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 13) with knobby side down adjacent to sides of flail bar strap (Ref 15). Now install a flat washer (Ref 14) 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 12) to each end of mounting bar adjacent to washer.
4. Install leveler bar (Ref 8) 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 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 3).
6. Install flail bar strap (Ref 15) 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 17) to frame with clevis pin (Ref 16) and cotter pin (Ref 3). 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 (Ref 20) to rake lift. **Super Star** - use the center hole and only (2) $1\frac{1}{4}$ bolts (Ref 19). **Supreme & Super Rake** - use the two outside holes on the extension arms and (4) $1\frac{1}{4}$ bolts. Hook lift chains to extension arms (Ref 20).

OPERATING INSTRUCTIONS

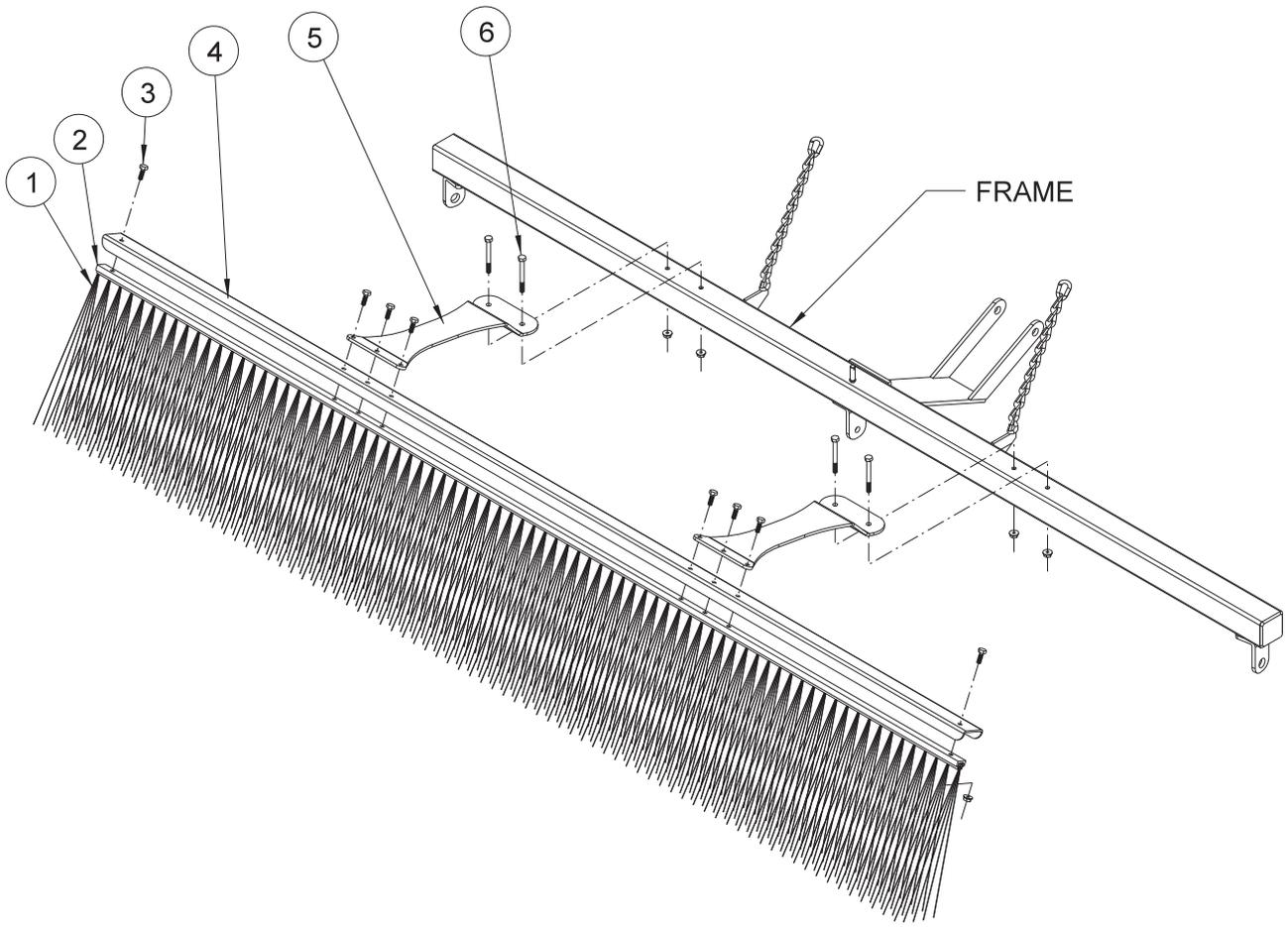
Running attachment with all flails down, flat on the surface, will provide a leveling function. Running attachment partially raised and flails at a 20° - 40° angle in relation to the level surface, will provide a finishing function. The flails increase down pressure for desired finish. Drive in wide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

MESH FINISHER

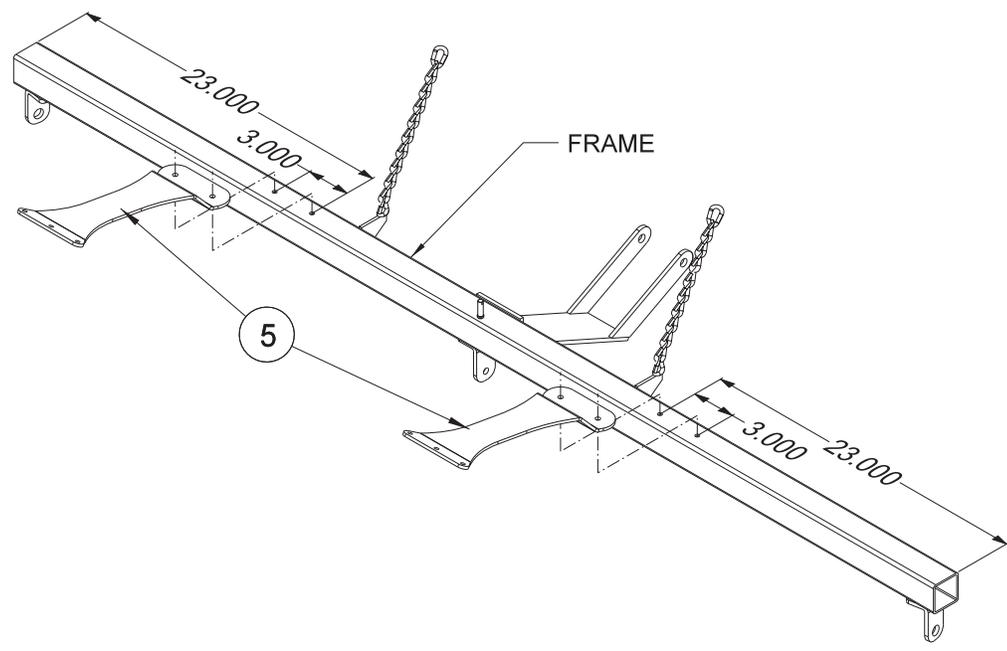
To get a smoother finish, Install a Mesh Finisher onto your Flex Action Field Finisher.

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 through 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. (Ref A) Chain 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.

43-043 FINISHING BRUSH KIT DRAWING



HOLE LOCATION



Accessories

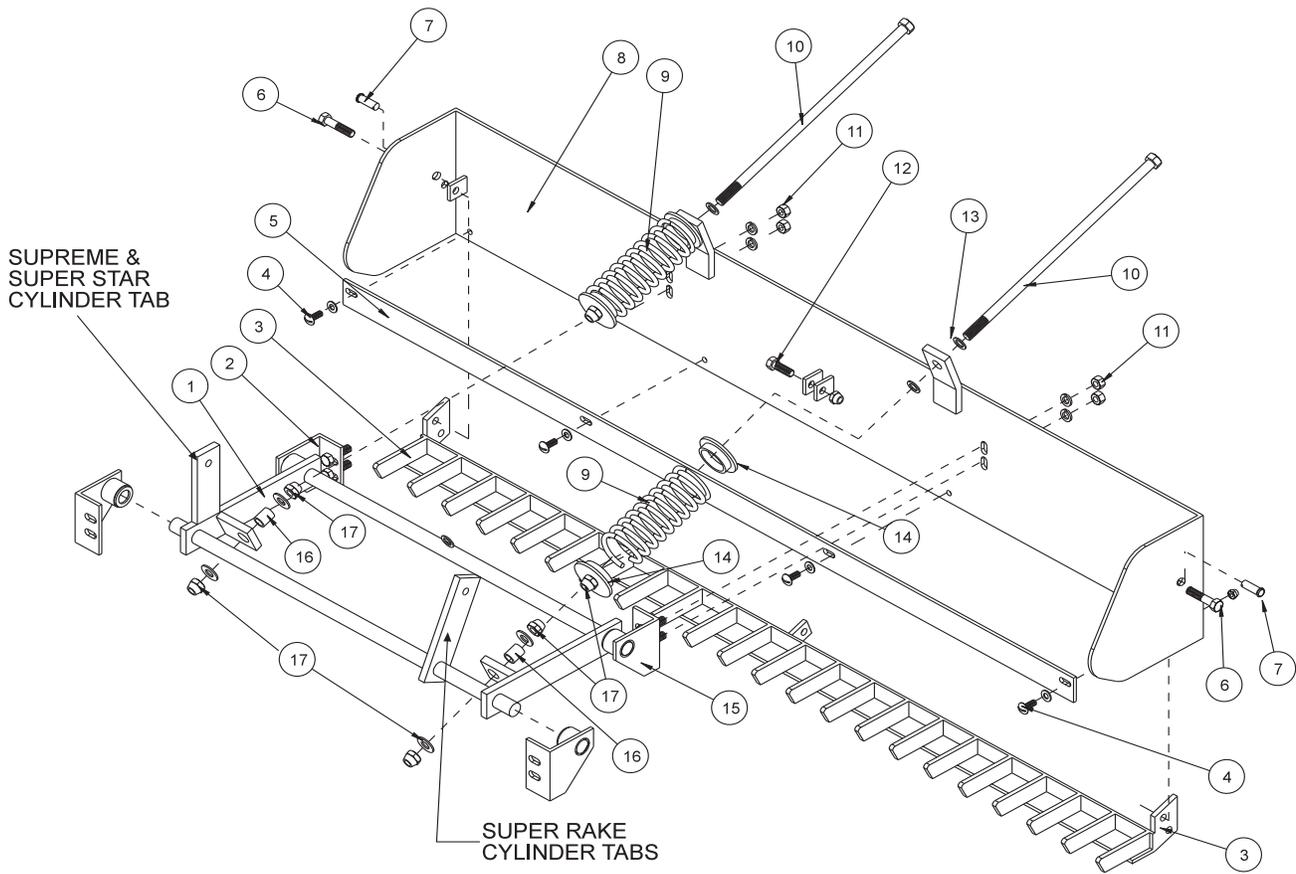
43-043 FINISHING BRUSH KIT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-682	Brush, 77 x 11	1
2	13-683	Brush Track	1
3	HB-14-20-075	Bolt, 1/4 - 20 x 3/4	8
	HNFL-14-20	Flange Whiz-Lock Nut, 1/4 - 20	8
4	13-688	Brush Channel	1
5	43-041	Mount Bracket	2
6	HB-14-20-250	Bolt, 1/4 - 20 x 2 1/2	4
	HNFL-14-20	Flange Whiz-Lock Nut, 1/4 - 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 brackets (Ref 5). Now bolt the mounting brackets (Ref 5) to the brush track using the 1/4 - 20 x 3/4" bolts and 1/4 - 20 flange whiz-lock nuts (Ref 3).
3. Four holes need to be drilled into the frame of the Flex Action Finisher to mount the brush. Drill two $\text{Ø}^{9/32}$ holes 23" in from each end and 3" apart (see Reference drawing).
4. Mount the brush assembly to the frame using the four 1/4 - 20 x 2 1/2" bolts and 1/4 - 20 flange whiz-lock nuts (Ref 5).

34-191 BOX GRADER DRAWING

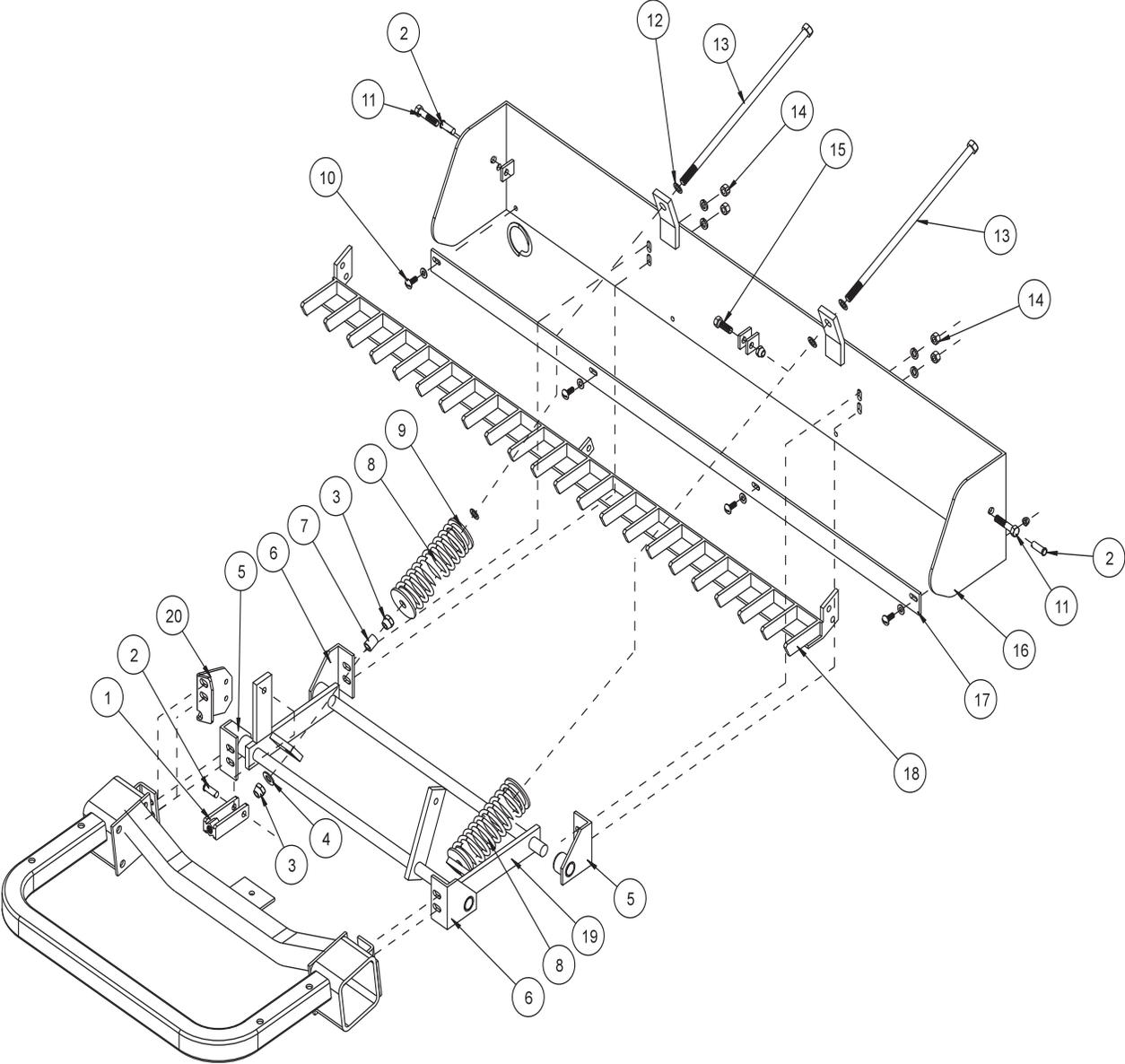


Accessories

34-191 BOX GRADER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	34-221	Lift Assembly	1
2	34-220	Right Pivot Bracket	2
	33-086	Bushing	2
3	34-217	Break Up Bar	1
4	HST-38-16-100	Truss Head Machine Screw $\frac{3}{8}$ - 16 x 1	4
	HW-38	Washer $\frac{3}{8}$	4
	HNCL-38-16	Center Lock Nut $\frac{3}{8}$ - 16	4
5	34-218	Cutter Blade	1
6	HB-12-13-250	Bolt $\frac{1}{2}$ - 13 x $2\frac{1}{2}$	2
	HNCL-12-13	Center Lock Nut $\frac{1}{2}$ - 13	2
7	HCP-12-150	Clevis Pin $\frac{1}{2}$ x $1\frac{1}{2}$	2
	HHP-18	Bridge Pin $\frac{1}{8}$	2
8	34-216	Blade Assembly	1
9	13-276	Compression Spring	2
10	34-214	Spring Rod	2
11	HB-12-13-125	Bolt $\frac{1}{2}$ - 13 x $1\frac{1}{4}$	4
	HW-12	Washer $\frac{1}{2}$	4
	HWL-12	Lockwasher $\frac{1}{2}$	4
	HN-12-13	Nut $\frac{1}{2}$ -13	4
12	HB-12-13-150	Bolt $\frac{1}{2}$ - 13 x $1\frac{1}{2}$	1
	HNCL-12-13	Center Lock Nut $\frac{1}{2}$ - 13	1
13	HMB-58-14	Machine Bushing $\frac{5}{8}$ - 14GA	4
14	13-277	Spring Pad	4
15	34-219	Left Pivot Bracket	2
	33-086	Bushing	2
16	34-215	Spacer	2
17	HNCL-58-11	Center Lock Nut $\frac{5}{8}$ - 11	6
	HW-58	Washer $\frac{5}{8}$	4

SUPER STAR BOX GRADER MOUNT DRAWING



Accessories

SUPER STAR BOX GRADER MOUNT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-357	Hydraulic Cylinder (comes with machine)	1
	HNJ-34-16	Jam Nut $\frac{3}{4}$ - 16	1
2	42-551	Lift Yoke	1
3	42-190	Park Brake Adapter Bracket	1
5	34-220	Right Pivot Bracket	2
	18-218	Bushing	2
6	34-221	Lift Assembly	1
7	34-219	Left Pivot Bracket	2
	18-218	Bushing	2
8	HB-12-13-150	Bolt $\frac{1}{2}$ - 13 x $1\frac{1}{2}$ (comes with machine)	4
	HW-12	Washer $\frac{1}{2}$	4
	HWL-12	Lockwasher $\frac{1}{2}$	4
	HN-12-13	Nut $\frac{1}{2}$ - 13	4

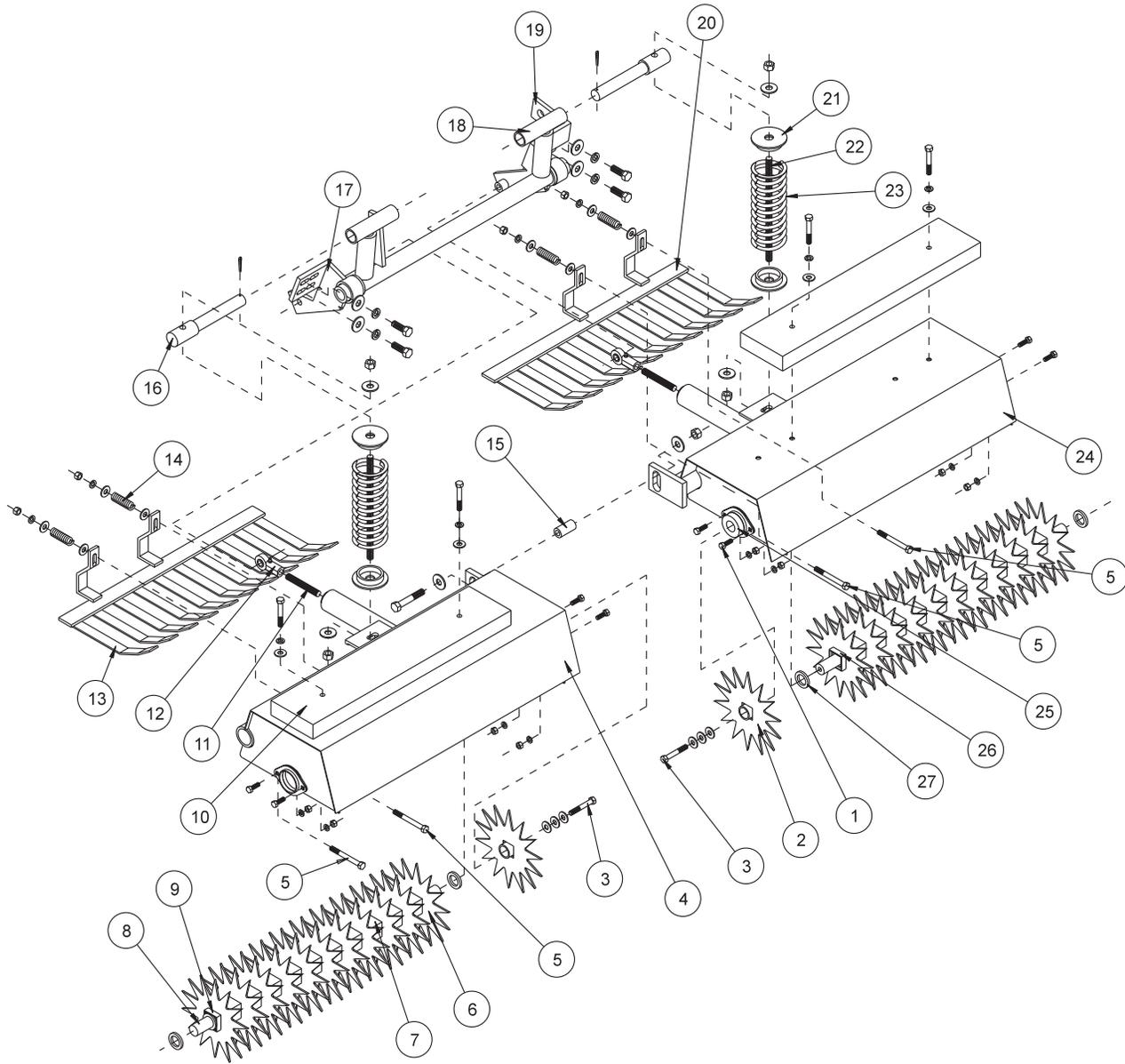
INSTALLATION INSTRUCTIONS

1. To mount Box Grader to Super Star you must remove the rake lift.
2. On all Super Stars unhook the speed boss before removing the rake lift. The speed boss does not need to function when using the Box Grader.
3. If your machine has a parking brake, remove the two bolts from the park brake bracket where it mounts to the side of the rake lift.
4. Now you may remove the rake lift from the machine.
5. Enclosed is a park brake adapter bracket (Ref 3). This needs to be installed between the pivot bracket and the main frame on the right hand side. This allows you to bolt the park brake back up.
6. Position the Box Grader unit at the rear of the trap rake, using the bolts (Ref 8) that hold the rake lift on, bolt pivot brackets (Ref 5 & 7) and park brake adapter bracket to the frame. **Please note** the way the pivot brackets mount to the machine. Trim cuts point up and tabs bend in.
7. Loosen jam nut on cylinder, remove the existing yoke from the cylinder and install the lift yoke (Ref 2) that was shipped with the Box Grade. Turn the lift yoke half way on the cylinder shaft.
8. Attach the lift yoke to the Box Grader.
9. Bolt the park brake handle assembly to the park brake adapter bracket.
10. Turn the trap rake on and test the operation of the cylinder lift several times to make sure the grader blade travels all the way up. To adjust, turn cylinder extension counterclockwise to lower and clockwise to raise.
11. Test park brake to make sure nothing came unhooked while moving.
12. Springs should be adjusted to a length of 7". Adjust tension to your preference. Tighten to increase trip pressure.
13. To lower break up bar, remove the two clevis pins from the sides of the Box Grader. The break up bar will tilt forward.

NOTE:

The speed boss is not used with Box Grader. Leave unhooked.

34-190 SPIKER DRAWING

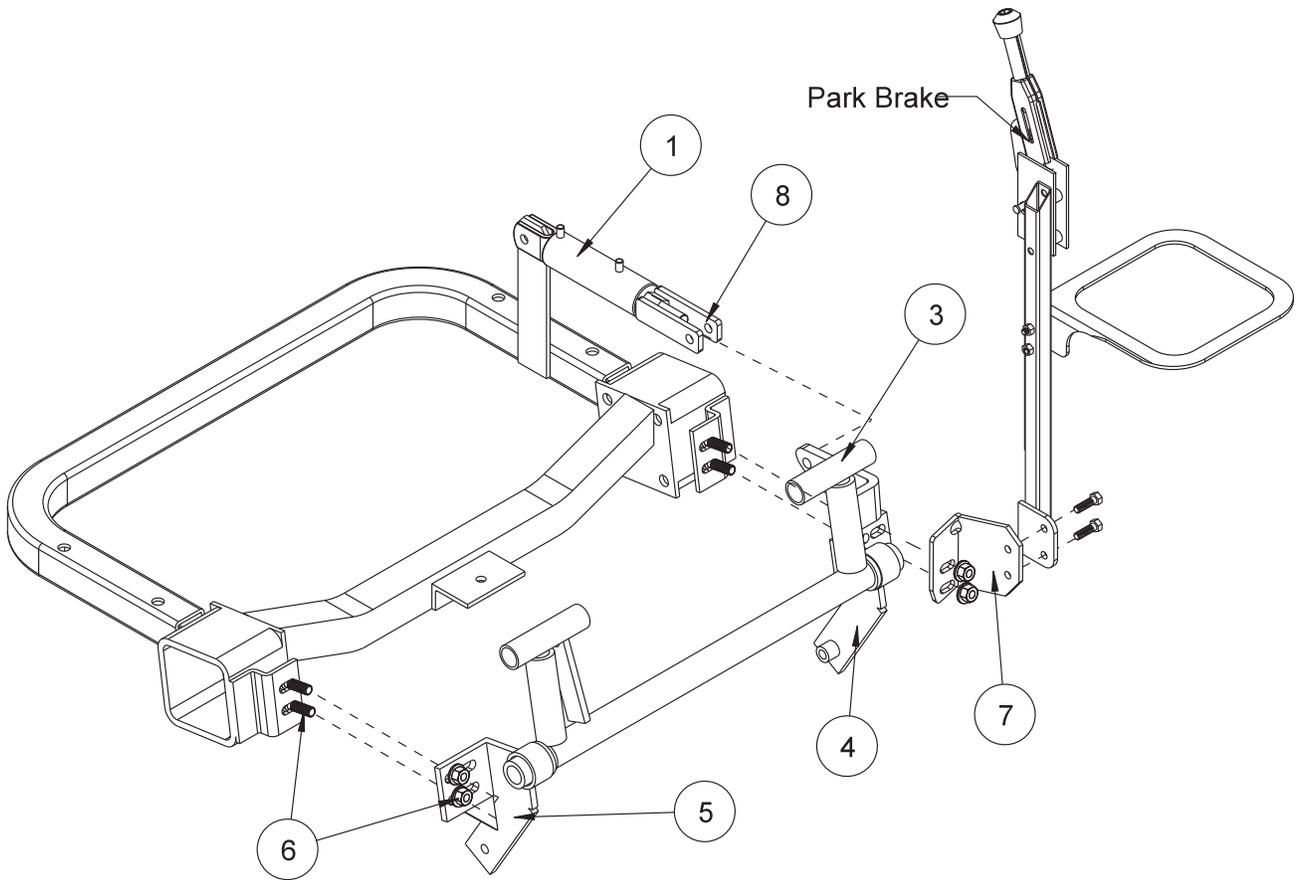


Accessories

34-190 SPIKER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-391	Bearing (2 each half)	4
	HB-516-18-100	Bolt $\frac{5}{16}$ - 18 x 1	8
	HWL-516	Lock Washer $\frac{5}{16}$	8
	HN-516-18	Nut $\frac{5}{16}$ - 18	8
2	13-661	Inside Spiker Blade	2
3	HB-38-16-250	Bolt $\frac{3}{8}$ - 16 x 2 $\frac{1}{2}$	2
	HW-38	Washer $\frac{3}{8}$	2
	HWL-38	Lock Washer $\frac{3}{8}$	2
4	13-371	Left Spiker Box	1
5	HB-38-16-350	Bolt $\frac{3}{8}$ - 16 x 3 $\frac{1}{2}$	4
	HW-38	Washer $\frac{3}{8}$	8
	HWL-38	Lock Washer $\frac{3}{8}$	4
	HN-38-16	Nut $\frac{3}{8}$ - 16	4
6	13-378	Spiker Blade	22
7	13-381	Spacer (large)	20
8	13-379	Spiker Bar	2
9	13-399	Spacer $\frac{1}{2}$ "	2
10	13-384	Weight	2
	HB-38-16-250	Bolt $\frac{3}{8}$ - 16 x 2 $\frac{1}{2}$	4
	HWL-38	Lock Washer $\frac{3}{8}$	4
	HW-38	Washer $\frac{3}{8}$	4
11	13-372	Threaded Rod $\frac{1}{2}$ - 20 x 4	2
12	80-006	Rod End with Grease Fitting	2
	HB-12-13-275	Bolt $\frac{1}{2}$ - 13 x 2 $\frac{3}{4}$	2
	HN-12-13	Nut $\frac{1}{2}$ - 13	2
	HWL-12	Lock Washer $\frac{1}{2}$	2
13	13-385	Left Tine	1
14	11-055	Die Spring	4
15	13-660	Spacer	1
	HB-12-13-300	Bolt $\frac{1}{2}$ - 13 x 3	1
	HW-12	Washer $\frac{1}{2}$	2
	HWL-12	Lock Washer $\frac{1}{2}$	1
	HN-12-13	Nut $\frac{1}{2}$ - 13	1
16	13-377	Spring Pivot Pin	2
	HP-18-100	Cotter Pin $\frac{1}{8}$ x 1	2
17	13-659	Left Pivot	1
	18-282	Bushing (comes with 13-659)	1
	HB-12-13-150	Bolt $\frac{1}{2}$ - 13 x 1 $\frac{1}{2}$	2
	HW-12	Washer $\frac{1}{2}$	2
	HWL-12	Lock Washer $\frac{1}{2}$	2
	HN-12-13	Nut $\frac{1}{2}$ - 13	2
18	13-382	Cylinder Lift Frame	1
19	13-658	Right Pivot	1
	18-282	Bushing (comes with 13-658)	1
	HB-12-13-150	Bolt $\frac{1}{2}$ - 13 x 1 $\frac{1}{2}$	2
	HW-12	Washer $\frac{1}{2}$	2
	HWL-12	Lock Washer $\frac{1}{2}$	2
	HN-12-13	Nut $\frac{1}{2}$ - 13	2
20	13-386	Right Tines	1
21	13-277	Spring Pad	4
22	13-375	Spring Adjustment Rod	2
	HN-12-13	Nut $\frac{1}{2}$ - 13	4
	HW-12	Washer $\frac{1}{2}$	4
23	13-276	Compression Spring	2
24	13-370	Right Spiker Box	1
25	13-387	Bearing Spacer (inside only)	2
26	13-380	Spacer (short)	2
27	HMB-100-10	Machine Bushing 1 x 10GA	4

SUPER STAR SPIKER MOUNT DRAWING



Accessories

SUPER STAR SPIKER MOUNT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-357	Hydraulic Cylinder	1
	HNJ-34-16	Jam Nut $\frac{3}{4}$ - 16	1
3	13-382	Cylinder Lift Frame	1
4	13-658	Right Pivot Bracket	1
5	13-659	Left Pivot Bracket	1
6	HB-12-13-150	Bolt $\frac{1}{2}$ - 13 x $1\frac{1}{2}$	4
	HW-12	Washer $\frac{1}{2}$	4
	HWL-12	Lockwasher $\frac{1}{2}$	4
	HN-12-13	Nut $\frac{1}{2}$ - 13	4
7	42-190	Park Brake Adapter Bracket	1
8	42-551	Lift Yoke	1

INSTALLATION INSTRUCTIONS

1. To mount Spiker onto the Super Star you must remove the rake lift.
2. You have to unhook the speed boss before removing the rake lift. The speed boss does not need to function when using the Spiker.
3. If your machine has a parking brake, remove the two bolts from the park brake bracket where it mounts to the side of the rake lift.
4. Now you may remove the rake lift from the machine.
5. If your machine has a parking brake, install the park brake adapter bracket (Ref 7). It bolts to the outside of the right pivot bracket (Ref 4).
6. Using the $\frac{1}{2}$ - 13 x $1\frac{1}{2}$ bolts, washer, lockwashers and nuts bolt the Spiker and the park brake adapter bracket to the main frame. Do not tighten the bolts at this time.
7. Remove the cylinder extension from the cylinder and replace with the new shorter lift yoke (Ref 8). Thread lift yoke all the way on. Tighten down with jam nut.
8. Hook the lift yoke (Ref 8) to the top hole on the cylinder tab on the cylinder lift frame (Ref 3). You may have to slide the spiker to the left or right slightly to line up cylinder.
9. Tighten all four mounting bolts at this time.
10. Bolt the park brake handle assembly to the park brake adapter bracket.
11. Compression springs should be tightened to 6" for best result.
12. Test spiker for ground penetration. If there is too much ground penetration loosen the springs. If you need more ground penetration, tighten springs.
13. Test Super Stars park brake to make sure nothing came unhooked while moving.

NOTE:

The speed boss is not used with spiker. Leave unhooked.

DECAL LIST

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

13-556	Decal, Warning	1	Left Side Below Seat
25-277	Decal, Battery	1	Bottom Seat
25-286	Decal, Pinch Point	1	Bottom Seat Panel
25-298	Decal, Warning Hot	2	Bottom Seat Panel. Oil Filter Bracket
25-333	Decal, Emissions	1	Engine
25-337	Decal, Speed Boss	1	Hang from Steering
25-344	Decal, Smithco 3" Star	1	Steering Column
25-349	Decal, Foot Pedal	1	Right Side Nose Cone
25-352	Decal, By-Pass Valve	1	Hang Tag
25-354	Decal, Tire Pressure 5psi	3	Wheels
25-361	Decal, Technical Assistance	1	Main Frame
27-077	Decal, Smithco Round	1	Steering Cap
25-357	Decal, Smithco	1	Front Nose Cone
42-075	Decal, Lift Control	1	Right Body Top
42-284	Decal, Control Panel	1	Left of Seat
42-283	Decal, Super Star V	2	Nose Cone

QUICK REFERENCE REPLACEMENT PARTS

REPLACEMENT FILTERS

23-031	Hydraulic Oil Filter	
15-165-01	Air Filter Element with Pre-Cleaner	Briggs and Stratton# 5050
42-076-03	Air Filter Element Fender Mounted	
50-403	Fuel Filter	
13-531	Engine Oil Filter	Briggs and Stratton# 492932

SEAL KITS

34-109	Variable Pump	
14-098	Seal Kit	
42-002 and 42-039	Wheel Motors	
42-002-15	Seal Kit	
42-220	2-Bank Hydraulic Valve	
14-062	Seal Kit	
14-106	Relief Assembly Kit	
14-203	Spring Centering Assembly Kit (1 per bank)	
42-227	3-Bank Hydraulic Valve	
14-205	Seal Kit	
14-106	Relief Assembly Kit	
14-203	Spring Centered Assembly Kit (1 per bank)	
10-135	Hydraulic Cylinder (Attachment Lift Cylinder)	
13-357	Hydraulic Cylinder for Rake Lift	
13-292	Hydraulic Cylinder for Sand Plow Lift	
14-267	Seal Kit	

FLUIDS

Engine Oil	Refer to Engine Manual
Hydraulic Fluid	SAE 10W-40 API Service SJ or higher Motor Oil

OTHER PARTS

Spark Plugs	RC12YC (Gap 0.030 inch (0.76mm))
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LIMITED WARRANTY

SMITHCO warrants this product to be free from defects in material and workmanship under normal use for one year from the date of purchase by the original user. (60 days if product is used for rental purposes.) All warranty claims must be handled through a SMITHCO authorized dealer or by SMITHCO, INC. All transportation charges must be paid by the purchaser.

There is no further express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to one year, (60 days if product is used for rental purposes) from the date of purchase by the original user, and to the extent permitted by law any and all implied warranties are excluded and disclaimed after the expiration of such period.

All incidental and consequential damages, including pickup and delivery of the unit, communication, mileage charges and/or rental of a replacement unit during repair, are not covered under this warranty, nor is any loss of income and/or other loss resulting from the failure of the product to function due to a warranty defect.

The following items are not covered under the SMITHCO warranty, and are warranted by their respective manufacturer.

- (a) Engine and engine parts, including starters, generators, alternators and filters.
- (b) Transaxle, differentials, gear boxes and mechanical pumps.
- (c) Hydrostatic transmissions, hydraulic pumps and motors.
- (d) Batteries.
- (e) Wheels and tires.

A copy of the warranty for the above items is furnished if necessary with each SMITHCO product.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitations of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which may vary from state to state.

Federal law now requires disclosure of the warranty which applies to this product prior to the sale to a customer. Please leave this statement attached to the product and allow the buyer to remove it after purchase.

SMITHCO

Wayne, Pennsylvania 19087

