SMITHCO

Wayne, Pennsylvania 19087

PARTS & SERVICE MANUAL

SUPER RAKE 2 WHEEL DRIVE

Model 13-551-C Bunker Rake

SUPER RAKE 3 WHEEL DRIVE

Model 13-550-C Bunker Rake

Starting Serial #1080 (2WD) **January, 1999**
Starting Serial #6201 (3WD)

SMITHCO PRODUCT SUPPORT
1-800-891-9435
Hwy SS and Poplar Avenue, Cameron WI 54822

E-mail: productsupport@smithco.com

CONTENTS

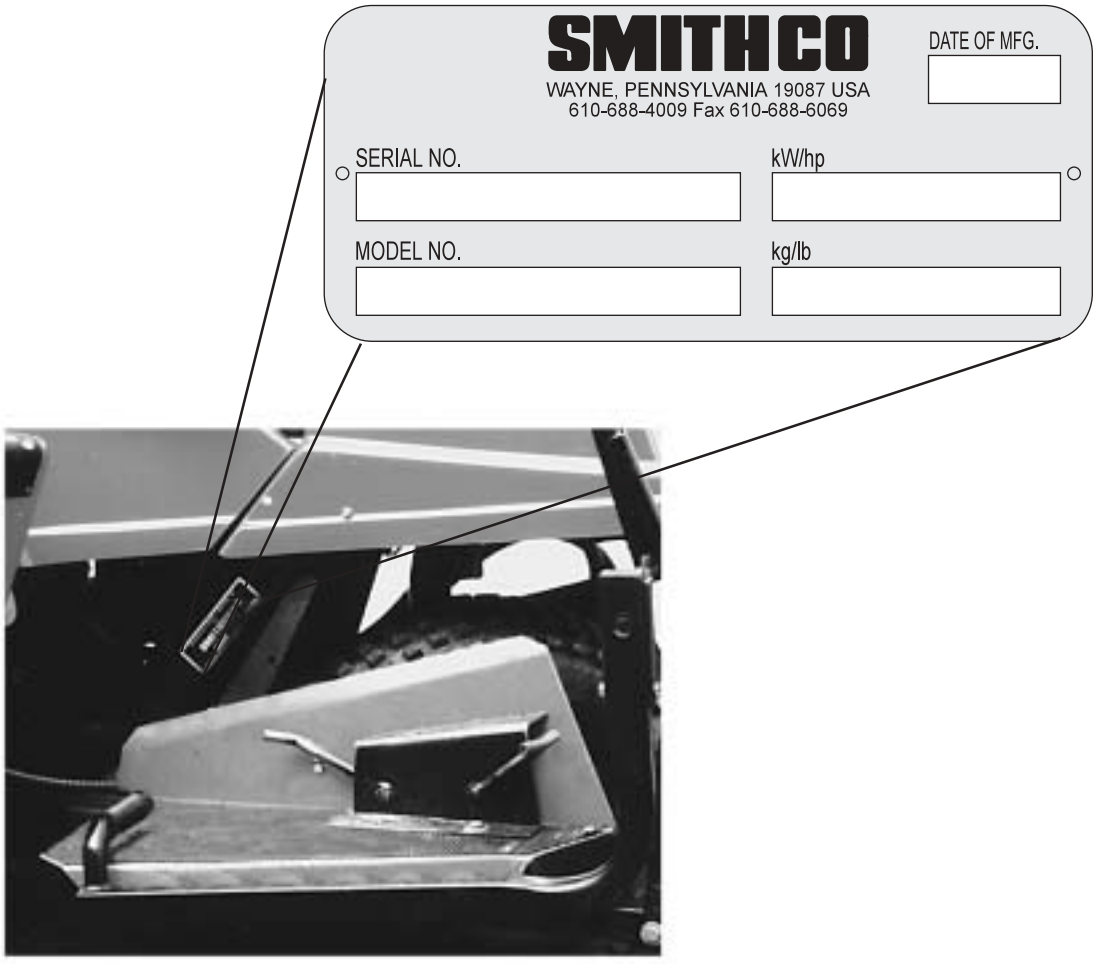
Thank you for purchasing a **SMITHCO** product.

Read this manual and all other manuals pertaining to the Super Rake 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 Rake is located on the right side main frame. Refer to engine manual for placement of engine serial number.

For easy access record your Serial and Model numbers here.



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

SYMBOLS

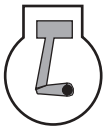

Read Operator's Manual


Electrical Power


No Electrical Power

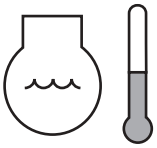
Engine - Stop

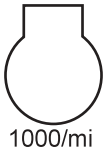

Engine - Start


Engine - Run

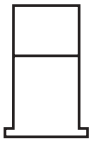

Engine Oil

Temperature Light


Water Temperature



RPM


Gasoline

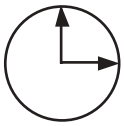
Diesel

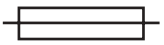

Glow Plug - On


Glow Plug - Off

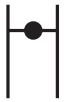

Glow Plug


Hour Meter


Hour Meter


Fuse

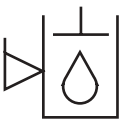

Hand Throttle


Choke - Closed

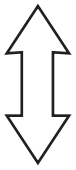

Choke - Open

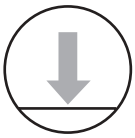
Park Brake

Park Brake Release


Hydraulic Oil Level

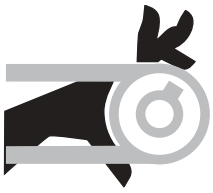
SYMBOLS

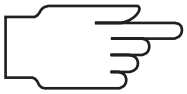

Up/Down Arrow


Down/Lower


Up/Raise

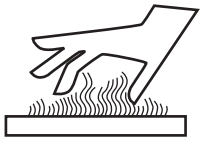

No Smoking

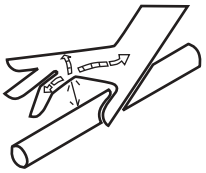

Moving Parts

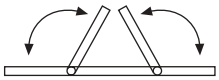

Manual Operation

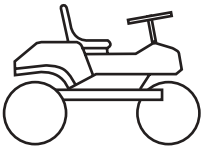

Pinch Point

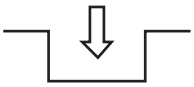

Step


Hot Surface

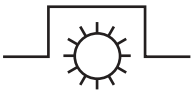

Hydraulic Fluid Penetration

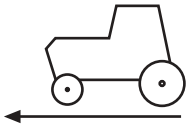

Lift Arm


Tractor


Engage


Disengage


PTO


Ground Speed


Fast


Slow

H
High

L
Low

F
Forward

R
Reverse

N
Neutral


Warning
Danger
Caution

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 devises to protect your head, eyes, ears, hands and feet. Operate the machine only in daylight or in good artificial light.
5. Inspect the area where the equipment will be used. Pick up all debris you can find before operating. Beware of overhead obstructions and underground obstacles. Stay alert for hidden hazards.
6. Never operate equipment that is not in perfect working order or 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. Set park brake.
    D. 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.

SAFETY PRECAUTIONS

Banding is under tension.

Connecting battery cables to the wrong post could result in personal injury and/or damage to electrical system. Make sure battery and cables do not interfere or rub on any moving part. Connect red positive (+) cable (A) to battery first. When disconnecting remove black negative (-) cable (B) first.

Gasoline is flammable. Caution must be used when storing or handling it. Do not fill fuel tank while engine is running or in an enclosed area. Fumes are explosive and dangerous to inhale. DO NOT SMOKE while filling fuel tank. DO NOT OVERFILL.

Disengage front wheel drive for transport and plow operation only. Three to two wheel drive can be shifted on the fly. Two wheel drive increases ground speed.

Quick removal of foot from forward or reverse pedal will result in an abrupt stop of machine.

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

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

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

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.

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.

SPECIFICATIONS

WEIGHTS AND DIMENSIONS	
Length with Rake	85" (216cm)
Length with out Rake	68" (173cm)
Width with Rake	73.5" (187cm)
Width with out Rake	58" (147cm)
Height	44" (112cm)
Wheel Base	47" (119cm)
Ground Clearance	7" (18cm)
Turning Radius	10" (25cm) Inside Back Tires
Crated Weight	990 lbs (449kg)
SOUND LEVEL (DBA) AT 3200 RPM	
At ear level	84 dba
At 3 ft (0.914 m)	89 dba
At 30 ft (9.14 m)	74 dba
ENGINE	
Make	Briggs and Stratton Vanguard
Model#	303447
Type / Spec#	1018A2
Code	95110111
Horsepower	16 Hp (12 Kw)
Torque	24.3 ft/lb at 2400 RPM
Fuel Pump	Vacuum Operated
Fuel	Unleaded 85 Octane Gasoline Minimum
Air Cleaner	Dual Element on Engine Remote Replaceable Element Mounted on Fender
Cooling System	Air Cooled
Displacement	29.3 CID (480cc)
Bore & Stroke	2.68" x 2.60" (68mm x 66mm)
Governor	Mechanical
Lubrication System	Pressure type
Valve Clearance	Cold, Intake and Exhaust Lash 0.004" - 0.006" (0.10mm - 0.15mm)
Ignition Type	Magnetron®
Idle Speed	1200 RPM
Maximum Speed	3600 RPM
WHEELS & TIRE	(3) 21 x 11.00 x 8 NHS 5 psi (0.35bar)
PARK BRAKE	Hand Operated Lever
FRAME CONSTRUCTION	Welded Structural Steel Tubing
HYDRAULIC SYSTEM	
Pump	Sunstrand Hydrostatic Pump
Filter	10 Micron
Grade of Fluid	SAE 10W-40 API Service SG Motor Oil
DRIVE	Hydrostatic Pump to Wheel Motors Two or Three Wheel Drive (Switchable)
HYDRAULIC DRIVE WHEEL MOTOR	
Front	Parker (4.9 cu/in (80cc) Fixed Displacement)(Three wheel drive ONLY)
Rear	Parker (7.8 cu/in (128cc) Fixed Displacement)

SPECIFICATIONS **(CONTINUED)**

SPEED	
Forward Speed	0 to 10 mph (0-16 kph)
Reverse Speed	0 to 4 mph (0-6 kph)
DRIVE CONTROL	Foot control, 2 pedals, Forward and Reverse, Also controls engine speed
STEERING	Front Wheel, 15" (38cm) - Steering Wheel, 7:1 reduction ratio
ELECTRICAL SYSTEM	12 volt, 16 Amp alternator, Negative ground, Electric start
BATTERY (Not Included)	Automotive type 45-12 volt
BCI Group	Size 45
Cold Cranking Amps	480
Ground Terminal Polarity	Negative (-)
Maximum Length	9" (23cm)
Maximum Width	5.38" (14cm)
Maximum Height	9" (23cm)
SEAT	Adjustable position deluxe seat with back support
FLUID CAPACITY	
Crankcase Oil	Approximately 1.5 quart (1.4 liters) without filter Approximately 1.75 quart (1.7 liters) with filter
Fuel	15.6 quart (14.8 liters)
Hydraulic Fluid	12.9 quart (12.2 liters)

OPTIONAL EQUIPMENT

13-505 Attachment Lift (13-551 Only)
13-395 Front Mount Fan Rake
13-413 Front Mounted Sand Plow
13-355 3-Bank Valve (used with 13-412)
13-644 Sand Plow
13-107* Infield Scarifier
13-116* Weed Cultivator
13-199* Edger Kit
13-577* Scarifier, Vertical Blades
13-111 Drag Mat Kit
13-438 Rake Assembly
13-606 Rake Assembly with Lexan Blades
13-319 Fan Rake Kit
13-298 Fan Rake Attachment

26-007 Professional Infield Finisher
26-008 Flex Action Field Finisher
34-191 Box Grader
34-190 Spiker
42-502 Green Star Spiker Reel Set (3)
42-503 RBS Mount for Smithco Super Rake
42-512 Green Star Roller Set (3)
42-513 Green Star Brush Set (3)
42-520 Green Star RBS Main Frame
42-530 22-11.00 x 8 Turf Track R/S Tire
42-531 22-11.00 x 8 Custom Smooth Tread Tire
42-550 Green Star Total RBS System

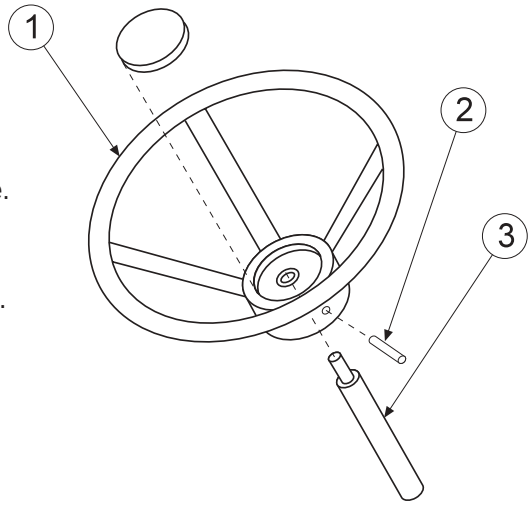
* Must have 13-505 Lift Assembly installed before installation (13-551 Only).

SETUP

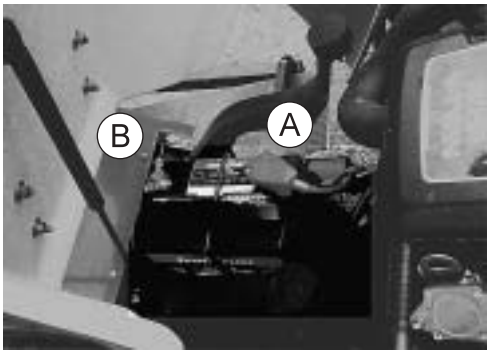
The Super Rake arrives from **SMITHCO** with some assembly required before service.

1. Remove top and sides from shipping crate. Remove metal banding from machine. Remove seat, steering wheel and anything els in create.

WARNING **Banding is under tension.**



2. Set park brake. Park brake is located on left side of console. Push brake lever forward and park brake is engaged.
3. Rear wheel mounting. Block front tire. Jack up rear of machine being careful not to damage underside of machine. Place wheel on hub lining up bolt holes. Use ten lug bolts provided. Then torque to 64 - 74 ft/lb (87-100Nm) using a cross pattern. Retorque after first 10 hours and every 200 hours thereafter. Lower machine to ground and remove blocks and jack.
4. Install steering wheel (Ref#1) on machine. Place steering wheel on shaft (Ref#3). Line up holes and insert 1/4 x 2" Roll Pin (Ref#2) into wheel and shaft. Tighten set screw.
5. Check tire pressure. Rear tire pressure should be 5 psi (0.35bar). Front tire is fluid filled only on 2WD.
6. Battery not furnished. Install an automotive type 45 -12 volt; 300 cold cranking amps (minimum) battery in battery box located under the seat. Battery should be in battery box with posts to right with positive to rear. This is a negative grounding system. Attach battery hold-downs. Then attach red positive (+) cable (A) to positive terminal. Slide rubber boot over positive terminal to prevent shorts. Attach black negative (-) cable (B) to negative terminal.



WARNING **Connecting battery cables to the wrong post could result in personal injury and/or damage to electrical system. Make sure battery and cables do not interfere or rub on any moving part. Connect red positive (+) cable (A) to battery first. When disconnecting remove black negative (-) cable (B) first.**

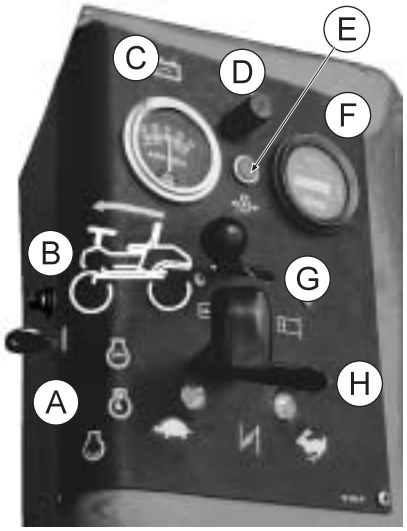
7. Check engine oil and add as necessary. Dip stick is located on back left side of engine. Oil fill is located on left valve cover, see engine manual for recommended motor oil. **DO NOT OVERFILL**.
8. Fill fuel tank, located on left rear of machine, with Unleaded 87 Octane gasoline (minimum).

DANGER **Gasoline is flammable. Caution must be used when storing or handling it. Do not fill fuel tank while engine is running or in an enclosed area. Fumes are explosive and dangerous to inhale. DO NOT SMOKE while filling fuel tank. DO NOT OVERFILL.**

9. Check hydraulic oil level in right side tank. The level should be 2" to 2 1/2" from top of fill neck when fluid is cold. If level is low, add SAE 10W-40 API Service SG motor oil.
10. Machine should be greased before starting. Refer to *Lubrication* under *Maintenance* for locations.
11. Read operating instructions before starting machine.

INSTUMENT PANEL

Located on right fender.



A. **Ignition Switch**: Located on front of the right fender.

B. **Two Or Three Wheel Drive**: Front wheel drive valve is located on front right fender. Push to engage front wheel drive and pull to disengage front wheel drive.

CAUTION

Disengage front wheel drive for transport and plow operation only. Three to two wheel drive can be shifted on the fly. Two wheel drive increases ground speed.

C. **Ammeter**: The ammeter indicates the rate of charging or discharging of batttery.

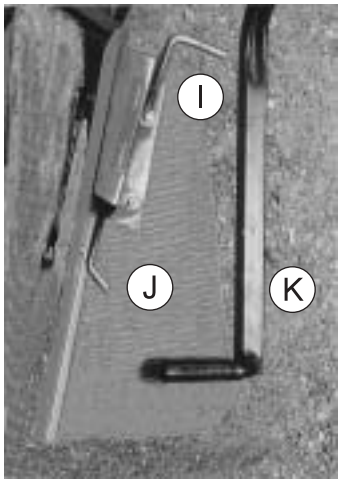
D. **Fuse Holder and Fuse**: Located in center on right side of instrument panel. A 30 Amp fuse is used.

E. **Oil Light**: The oil light should come on when ignition is on, without engine running. The oil light will light when the oil pressure is low. If oil light should come on, shut off engine immediately and find cause.

F. **Hour Meter**: The hour meter indicates hours of machine operation. The hour meter operates when ignition switch is on.

G. **Choke**: Choke is located in center of instrument panel. Pull choke to rear to close choke plate when starting a cold engine. A warm engine may not require "choking" to start.

H. **Hand Throttle**: Hand throttle is located on left side of instument panel. Use it to regulate engine speed.

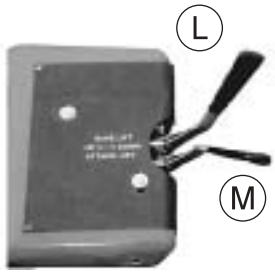


RIGHT FLOORBOARD

Two Pedal Foot Control: Foot Pedal controls forward and reverse motion and also acts as a brake. Pushing down on front pedal (I) will give you a forward motion and pushing down on rear pedal (J) will give you a reverse motion. When pedal is released the hydrostatic transmission centers and stops the vehicle with a braking action. Ground speed is proportional to how far the foot pedal is depressed. (K) is the Hand Lift for the Sand Plow.

CAUTION

Quick removal of foot from forward or reverse pedal will result in an abrupt stop of machine.



VALVE PANEL

The Lift Levers are located on left fender. To raise pull back and to lower push forward. Release the lever when attachment is in proper position and lever will return too neutral. The Rake Lift lever (L) is on the outside of the machine. The Lift Assembly lever (M) is on the inside closest to the seat unless equipped with a hydraulic plow then the plow lever is closest to the seat.

STEERING

Acquaint yourself with steering before operating machine. The automotive type steering wheel is connected to the front wheel assembly by a chain driven sprocket. This allows for quick turns and short turning radius.

SEAT ADJUSTMENT

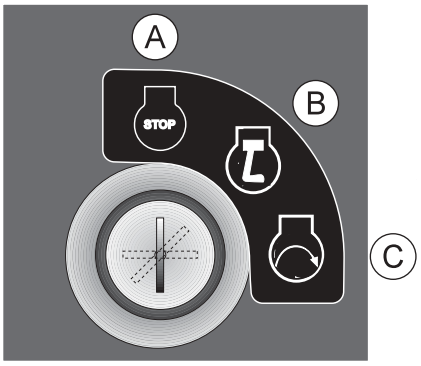
Seat Adjustment Lever is located under front of seat on left side. It allows seat adjustment forward or backward for operator's comfort. There are four different bolt patterns so that you can manually adjust seat to fit operator's comfort.

PARK BRAKE

Park brake is located on left side of steering console. Push lever forward to set brake and pull lever rearward to release brake. Park brake must be applied to start trap rake.

OPERATION

STARTING ENGINE



Before operating this machine, become familiar with all controls and functions of these units. Also complete all maintenance requirements and read all safety warnings. By knowing the machine thoroughly, how it operates and by doing the prescribed maintenance steps, you can expect relatively trouble-free operation for years to come.

1. Make sure the fuel flow valve, located on the fuel tank, is “ON.”
2. Set park brake. Start safety switch is on the park brake.
3. The ignition switch is located on right fender. Insert key (A) and turn clockwise until engine starts (C). Release key and it will return to run position (B). Use choke and hand throttle as necessary.
4. Allow engine to idle and warm up a few minutes before selecting a direction of travel.

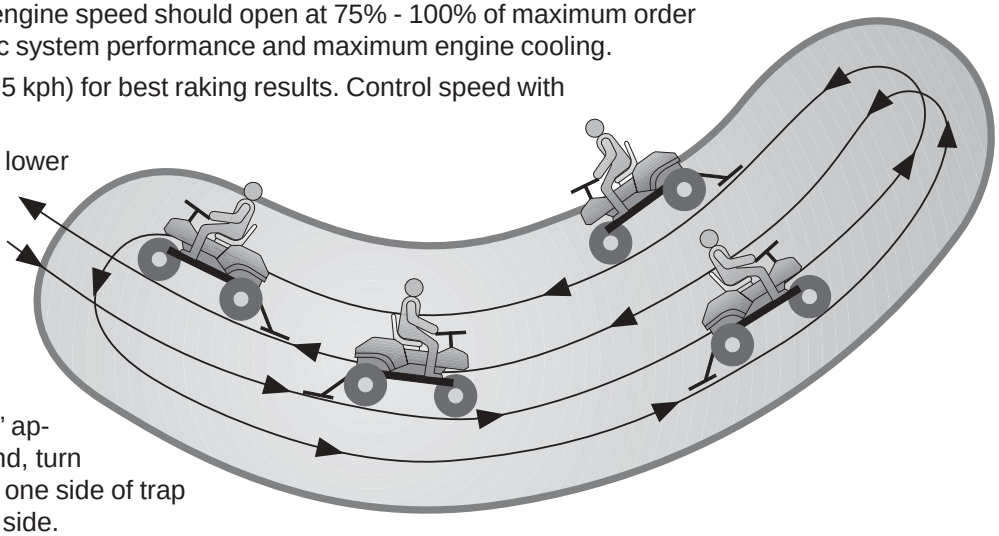
HOW TO RAKE A SAND TRAP

View bunker to determine the most efficient pattern to follow so that rake pattern and configuration of bunker will flow in same general direction and look attractive.

Enter bunker at its lowest point. Perhaps drain area or another point where “lip” of the trap is minimal.

Hydraulic drive tractors engine speed should open at 75% - 100% of maximum order to insure proper hydraulic system performance and maximum engine cooling.

Operate at 2-4 mph (3-6.5 kph) for best raking results. Control speed with hydraulic pedal.



Once fully inside bunker, lower rear rake and proceed forward as described above.

First pass should be directly down center of trap. This helps avoid extremely sharp turns that will spoil sands’ appearance. Once at far end, turn machine and drive down one side of trap and come back up other side.

Grass or other material may build up on rake tines as machine passes “enter/exit” point. Lift rake briefly while still moving forward.

Do not rake closer than 6" (15cm) to edge of trap.

Do not rake slopes in trap. The weight of machine will pull sand down.

Use cultivator or other center mounted accessories only as necessary for compacted sand. Frequent use will leave sand too soft and objectionable to some golfers.

Use front mounted plow to push sand to desired locations within trap.

After exiting trap, secure machines in accordance with practices described in this manual. Rake trap edges, slopes and “enter /exit” area with a hand rake.

After returning to maintenance area, thoroughly clean machine, check fluids, and lubricate as advised in this manual.

CAUTION **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 before operation.**

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

DAILY CHECKLIST

1. Check park brake adjustment. Adjust as required.
2. Check engine oil level. Add as needed. DO NOT OVERFILL.
3. Rear tire pressure should be 5 psi (0.35bar) maximum. Front tire is fluid filled only on the 2WD.
4. Inspect electrical system for loose connections or frayed wiring, including battery cables. Replace any faulty equipment or tighten if loose.
5. Check hardware for loose or missing nuts, bolts, screws, etc., and tighten or replace as needed.
6. Inspect hydraulic lines for damage or leaks. Never use hands to inspect leaks.
7. Check hydraulic oil level in right side tank. The level should be 2" to $2^1/_2$" from top of fill neck when fluid is cold. If level is low, add SAE 10W-40 API Service SG motor oil.
8. Change hydraulic oil filter after first 20 hours then at 100 hours, then every 250 hours thereafter.
9. Inspect steering, throttle and shift linkages for good hookups and clear travel.
10. Check anti-vibration mounts on engine frame.
11. Check controls for smooth, proper working operation. Lubricate as needed.

LUBRICATION

Use No. 2 General purpose Lithium Base Grease and lubricate every 100 hours. The Super Rake has one grease fitting located in bearing on steering shaft.

AIR CLEANER ON ENGINE

1. Unhook clips on both sides of cover and remove cover.
2. Carefully slide pre-cleaner off cartridge.

   To service pre-cleaner, wash in liquid detergent and water. Squeeze dry in a clean cloth. Saturate in engine oil. Squeeze in clean, absorbent cloth to remove all 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, eg., 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.

AIR CLEANER ON FENDER

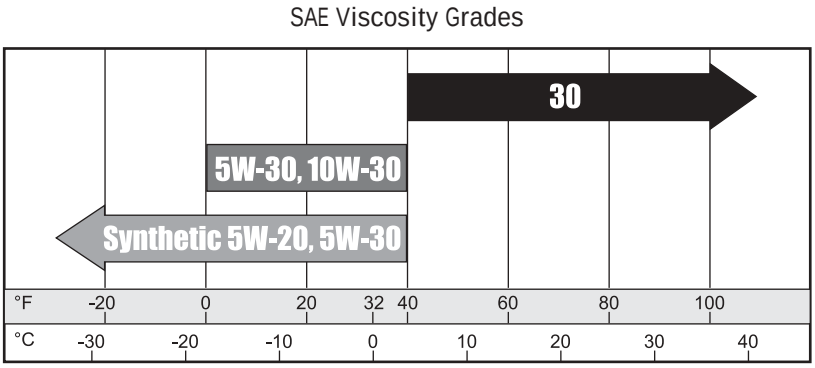
1. Remove end cap and filter element, clean by tapping gently on flat surface. Do not oil cartridge. Replace if very dirty or damaged.
2. Remove air clearner cap and clean. Cap can be washed in solvent, make sure its dry before reinstalling.

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 (0.35bar). Improper inflation will reduce tire life considerably.

ENGINE OIL

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



Starting Temperature Range Anticipated Before Next Oil Change

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 SG/SH/CD/EC-11 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 2 1/2" from top of fill neck 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 now 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 SG when hot (above 90°F (33°C)) and SAE 10W API Service SG 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 Rake without engine running, by-pass valve built into hydrostatic pump must be "open" by truning it counter-clockwise. The valve is located on bottom left of 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.

WHEEL MOUNTING PROCEDURE

1. Set park brake. 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 (87-100Nm) using a cross pattern. Retorque 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.

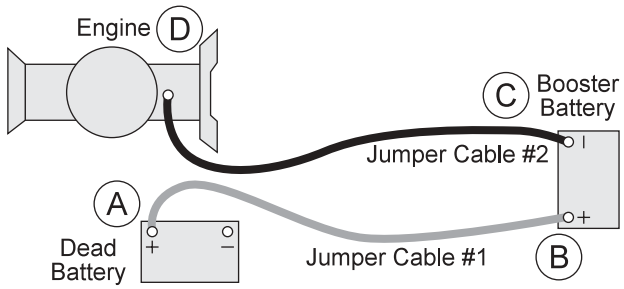
WARNING **Battery Electrolyte is an acidic solution and should be handled with care. If electrolyte is splashed on any part of your body, flush all contact areas immediately with liberal amounts of water. Get medical attention immediately.**

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.

SERVICE CHART

CAUTION

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

NOTE:

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 (Change every 50 hours)	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, Engine and Fender Mounted		R	C	C		C	C	R
‡ Air Cleaner Pre-Cleaner		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
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 (87-100Nm))
¤ 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.

	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)+A18+A18								
‡Pre-Cleaner (Every 25 hours)								
Spark Plugs								
Valve Clearance								
Idle Speed								
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
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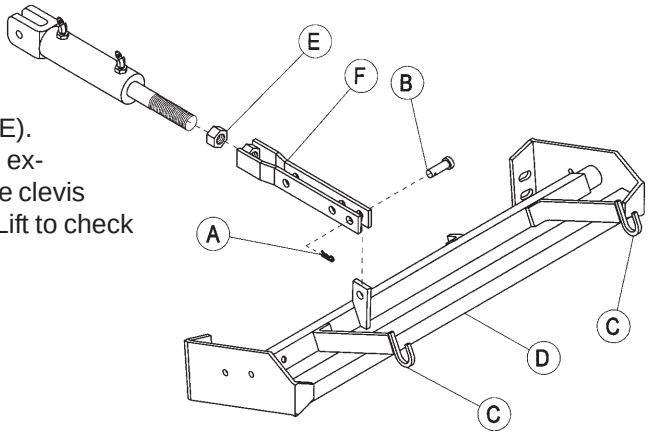
¤ Change Oil and Filter after first 8 hours.
£ Change oil every 25 hours when operating under heavy load or in high ambient temperatures.
‡ Clean more often under dusty conditions or when airborne debris is present , replace air cleaner parts, if very dirty.

ADJUSTMENTS

RAKE LIFT CYLINDER

Completely lower Rake Lift. Remove cotter pin (A) and clevis pin (B). Place attachment lift arms (C) at $^{1}/_{16}$" 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.

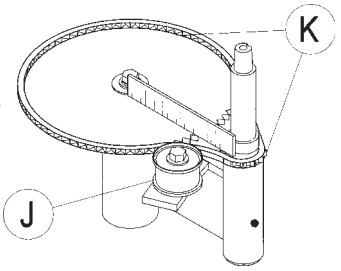


PARK BRAKE

By turning knob on end of lever you can tighten or loosen brake a small amount. Make all adjustments on knob. Adjusting yokes will result incable kinking.

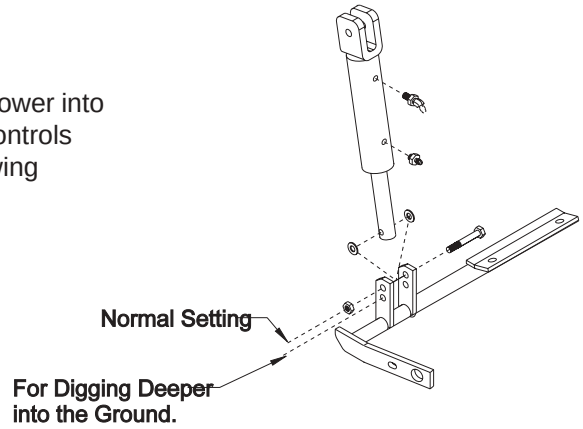
STEERING CHAIN

Steering sprockets (K) should be level with each other, check with straight edge. Make any adjustments. Slide idler pulley (J) so that it is snug onto the chain. Tighten all nuts and bolts in place.



LIFT ASSEMBLY

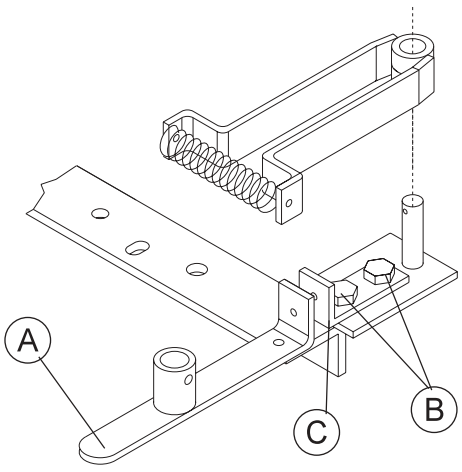
When it is necessary to have attachment lift dig deeper or lower into ground, relocate cylinder rod of hydraulic cylinder which controls the lift distances, into lower set of holes in attachment lift swing arm. This new position forces attachment farther down.



WHEEL 'CREEP' ADJUSTMENT

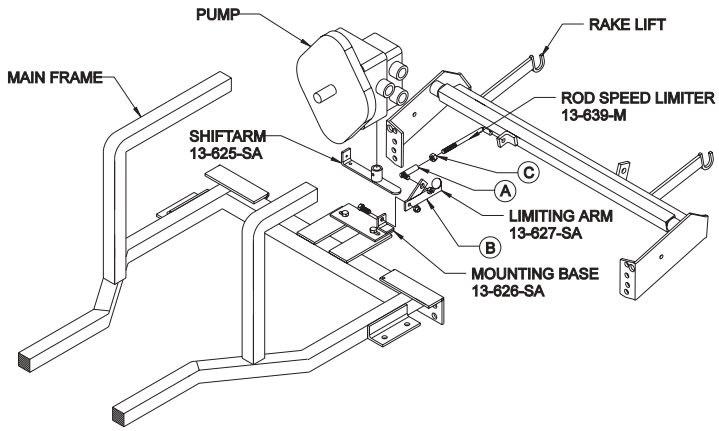
'Creep' is when engine is running and hydrostatic transmission is in neutral, but due to inadequate alignment wheels still move. Do the following procedures to stop this motion.

1. Lift up and support machine so all wheels are off the ground and can turn freely.
2. At rear of machine, on the bottom of the hydrostatic transmission is the shift arm (A). Loosen bolts (B).
3. With engine running move stop (C) so it moves shift arm (A) to center and wheel creep stops.
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.



SPEED BOSS

Speed Boss allows the machine to operate at a proper speed while raking bunkers on golf courses. This speed has been factory set at an average speed of 3-4 MPH(5-6.5 kph). The Speed Boss will only limit the speed while the rake is in lowerered into the operating position. The speed setting may be adjusted by removing the ball joint(A) from the limiting arm(B). Then loosen jam nut(C). Turn ball joint clockwise to make the machine operate faster or turn counter clockwise to go slower. Tighten jam nut. Connect ball joint to limiting arm. Check to make sure nothing is binding and test drive to check desired speed.



CAUTION

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

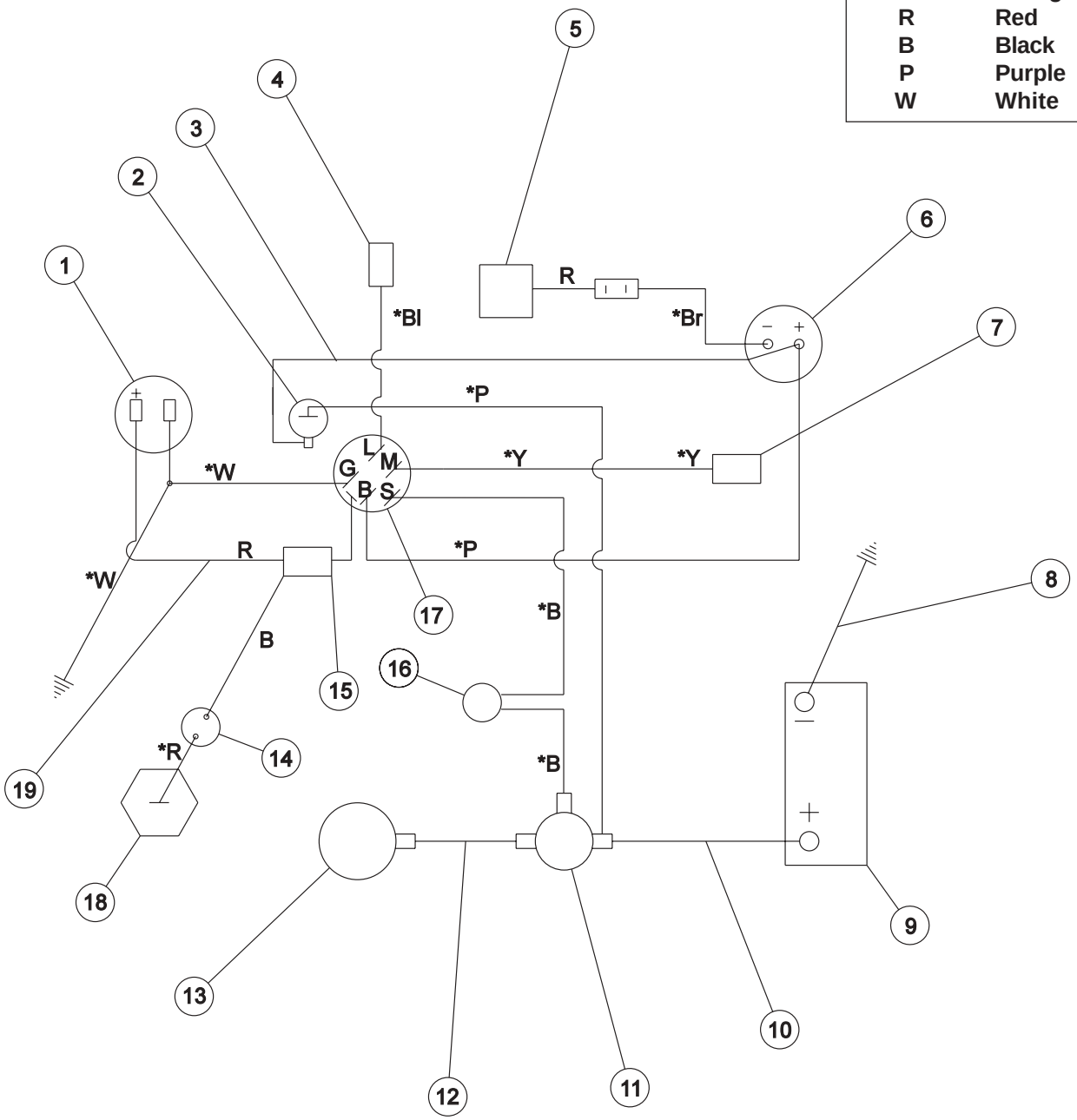
STORAGE

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.

1. For engine protection, we recommend use of Briggs and Stratton Gasoline Additive, Part Number 5041, or a comparable gasoline additive. Mix Additive with fuel in fuel tank or storage container. Run engine for a short time to circulate additive through carburetor. Engine and fuel can be store up to 24 months. Your Service Dealer has single-use pouches of Gasoline Additive available.
2. If engine is still warm, drain oil from crankcase. Refill with fresh oil of recommended grade.
3. Remove spark plugs and pour about 1 oz (3ml) of engine oil into cylinders. Replace spark plugs and crank slowly to distribute oil.
4. Clean dirt and chaff from cylinders, cylinder head fins, blower housing, rotating screen and muffler area.
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.

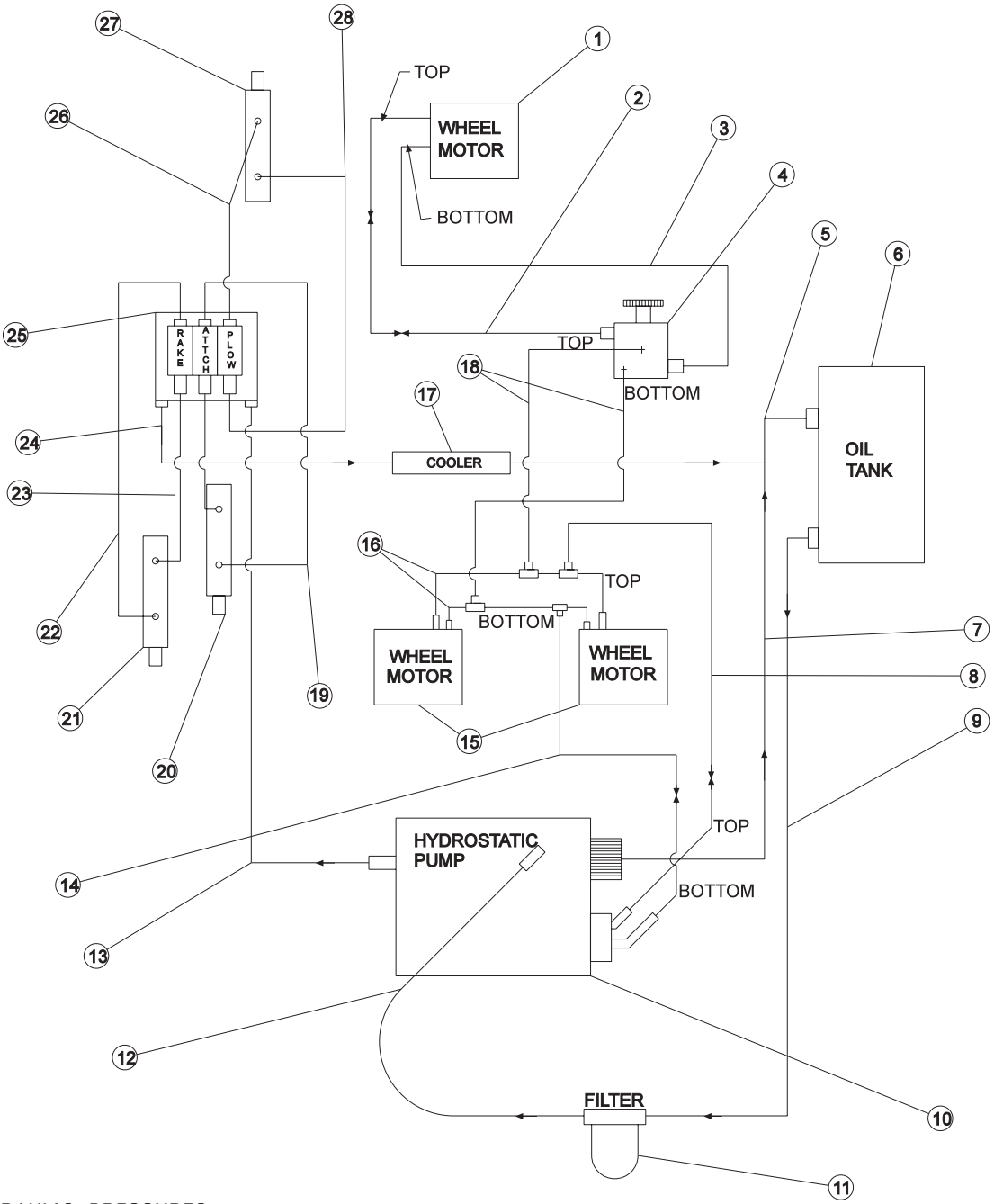
WIRING DIAGRAM

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



REF#	PART#	DESCRIPTION	QUANTITY
1	12-017	Hour Meter	1
2	50-360	Fuse Holder	1
	22-071	Fuse 30 AMP	1
3	13-050	Purple Wire (fuse to ammeter)	1
4		After Fire Solenoid (on engine)	1
5		Rectifier (on engine)	1
6	22-003	Ammeter	1
7		Stop Switch Terminal (on engine)	1
8	22-054	Battery Cable, Black	1
9		Battery, automotive type 45-12V; 300 cold cranking AMPS minimum (5 3/8" wide x 9" high x 9" long)	1
10	22-055	Battery Cable, Red	1
	12-031	Battery Boot	1
11	13-492	Solenoid (B & S# 807829)	1
12	13-215	Starter Cable	1
13		Starter (on engine)	1
14	50-359	Oil Pressure Light	1
15	8862	Coupler	1
16	22-002	Interlock Switch	1
17	13-488	Ignition Switch (B & S# 496603)	1
18	13-491	Oil Sender (on engine) (B & S# 491657)	1
19	13-641	Red Wire (ignition to hour meter)	1
	22-017	Ground Cable from Engine to Solenoid Mount	1
*	13-497	Wire Harness	

HYDRAULIC DIAGRAM

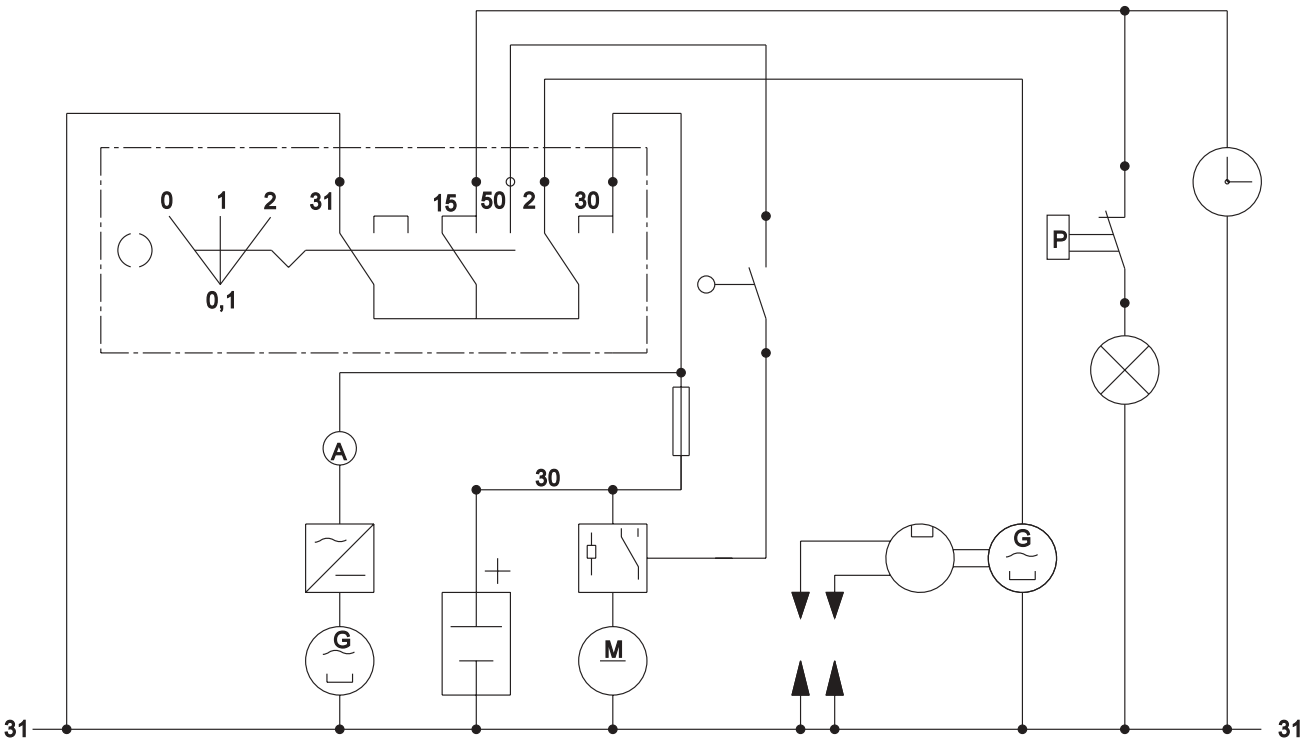


HYDRAULIC PRESSURES

Pump Displacement	.913 in.^{3}/ rev
Pump Input Speed (up to)	3600 RPM
Max. Operating Pressure	3500 PSI, 4500 Peek PSI
Charge Pump Displacement	.33 in.^{3}/ rev
Max. Inlet Vacuum	5 in. Hg
Max. Case Pressure	25 PSI
Implement Setting	700 - 1000 PSI
Relief Valve Pressure (set at)	3600 PSI
13-261 Hydraulic Valve (2 bank)	700 PSI
13-355 Hydraulic Valve (3 bank)	700 PSI

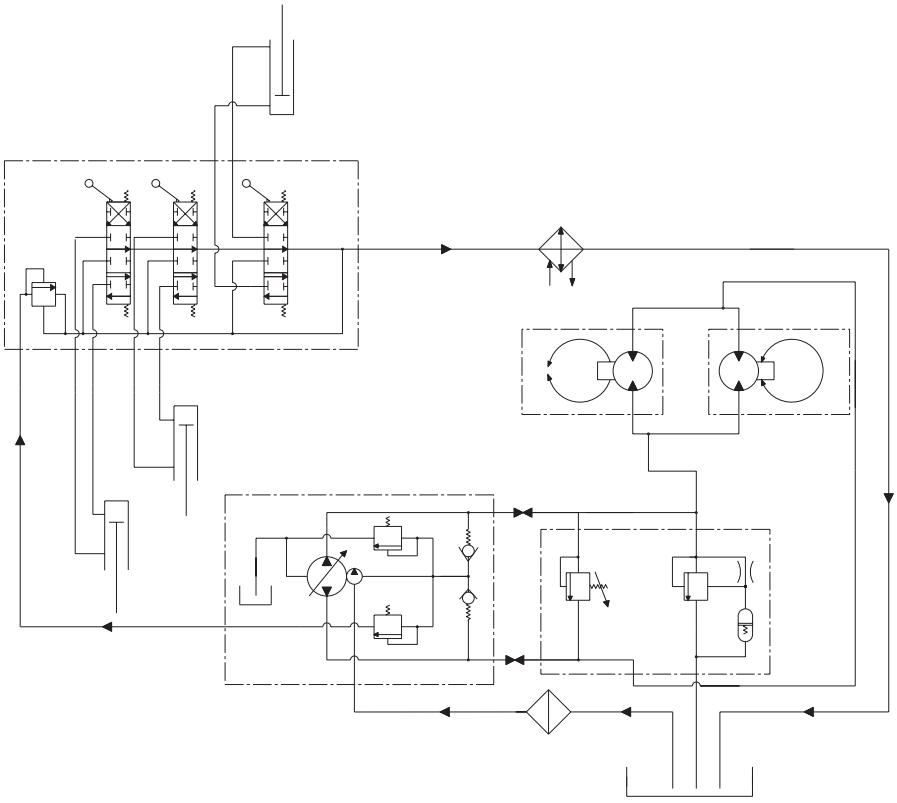
REF#	PART#	DESCRIPTION	QUANTITY
1	13-032	Wheel Motor	1
2	13-424	Hydraulic Hose (63 1/4 long)	1
	8840-62	Flex Guard Loom	1
3	13-425	Hydraulic Hose (70 1/4 long)	1
	8840-69	Flex Guard Loom	
4	13-409	On - Off Valve	1
	18-174	Elbow 1/2 ST Thread	2
	18-228	Hollow Hex Plug	2
	18-266	Elbow 45°	2
5	13-587	Hydraulic Hose (16 long)	1
6	13-584	Oil Tank	1
	13-586	Filler Breather	1
7	8810-11	Hose 5/8	1
	18-077	Hose Clamp	2
8	13-616	Hydraulic Hose (29 long)	1
9	8810-36	Hose 5/8	1
	18-077	Hose Clamp	2
10	13-110	Hydrostatic Pump	1
11	23-006	Oil Filter	1
	23-031	Replacement Filter Only	
12	8917-11	Suction Hose 5/8	1
	18-077	Hose Clamp	2
13	18-184	Hydraulic Hose (29 long)	1
14	13-617	Hydrauic Hose (25 long)	1
15	13-615	Wheel Motor	2
16	13-612	Hydraulic Tube	2
17	23-172	Oil Cooler	1
18	13-633	Hydraulic Hose (19 1/2 long)	2
	18-264	Cap (2WD only)	2
19	18-164	Hydraulic Hose (16 long)	2
20	13-292	Hydraulic Cylinder	1
21	13-357	Hydraulic Cylinder	1
22	13-552	Hydaraulic Hose (21 1/4ong)	1
23	13-549	Hydraulic Hose (24 1/8 long)	1
24	76-105	Hydraulic Hose (17 1/2long)	1
25	13-261	Hydraulic Valve (2 bank)	1
	13-262	Valve Handle Set (2 bank)	1
	13-355	Hydraulic Valve (3 bank)	
	13-484	Valve Handle Kit (3 bank)	
26	60-368	Hydraulic Hose (59 1/4long)	1
27	13-406	Hydraulic Cylinder	1
28	13-444	Hydraulic Hose (50 long)	1

WIRING SCHEMATIC 2 WHEEL DRIVE

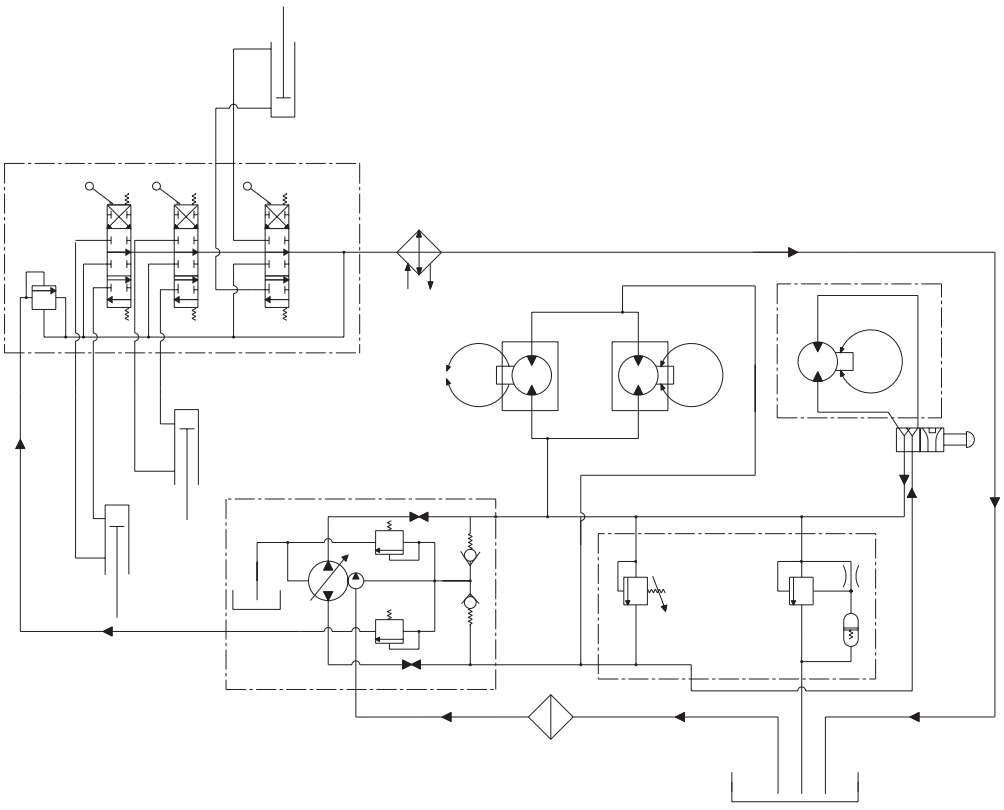


0		31	15	2
1			15	30
2			50	30

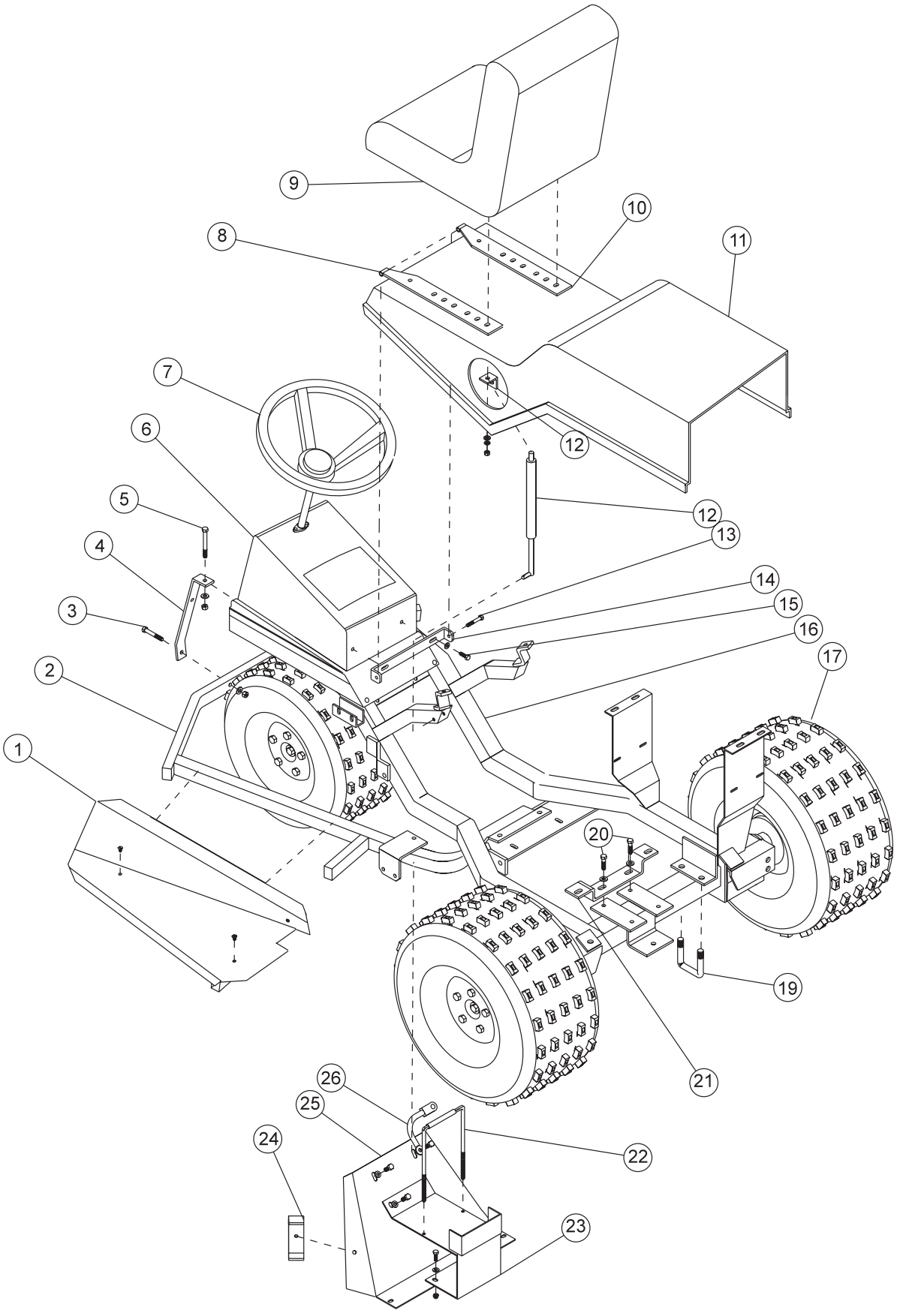
HYDRAULIC SCHEMATIC 2 WHEEL DRIVE



HYDRAULCI SCHEMATIC 3 WHEEL DRIVE

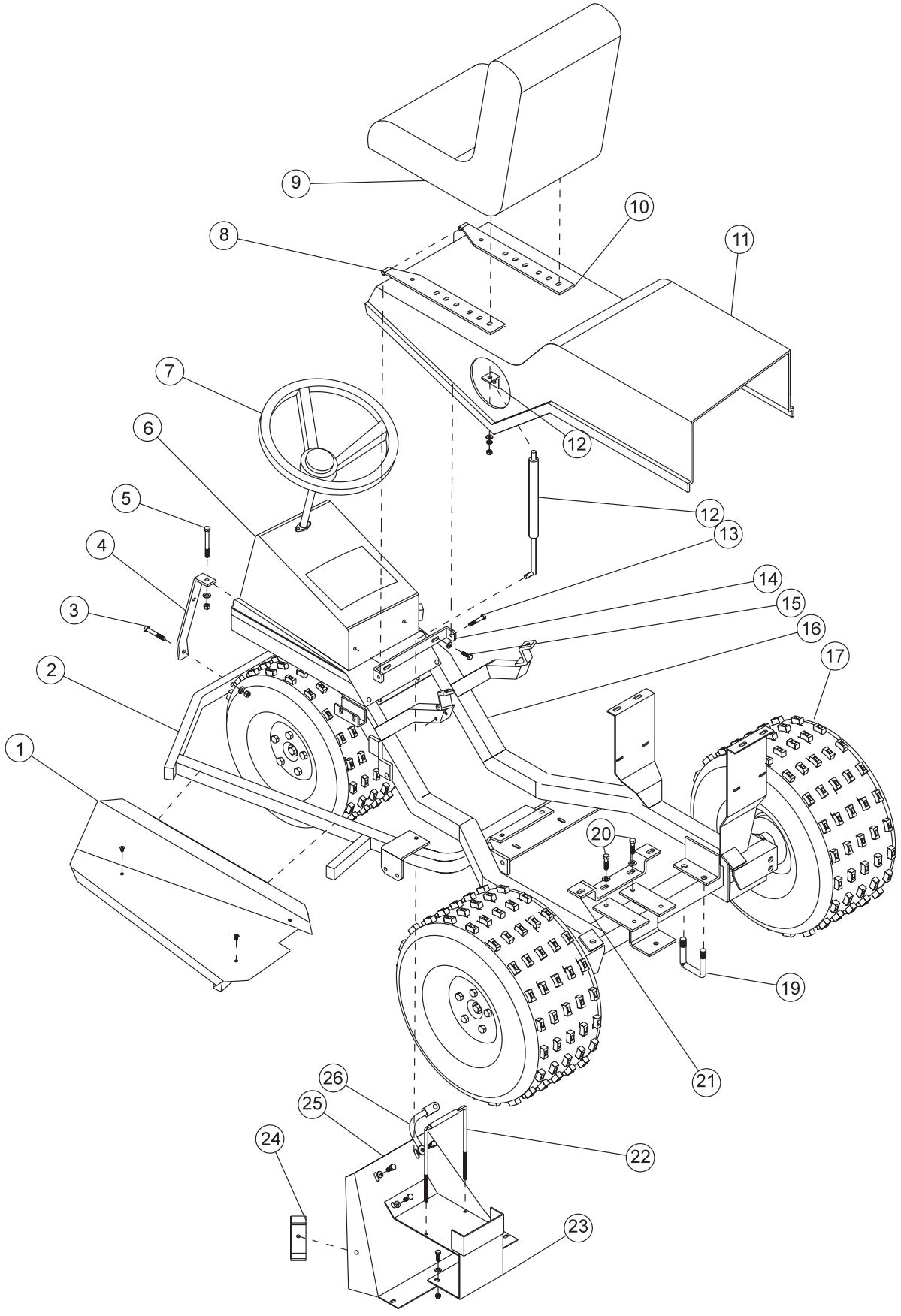


MAIN FRAME DRAWING



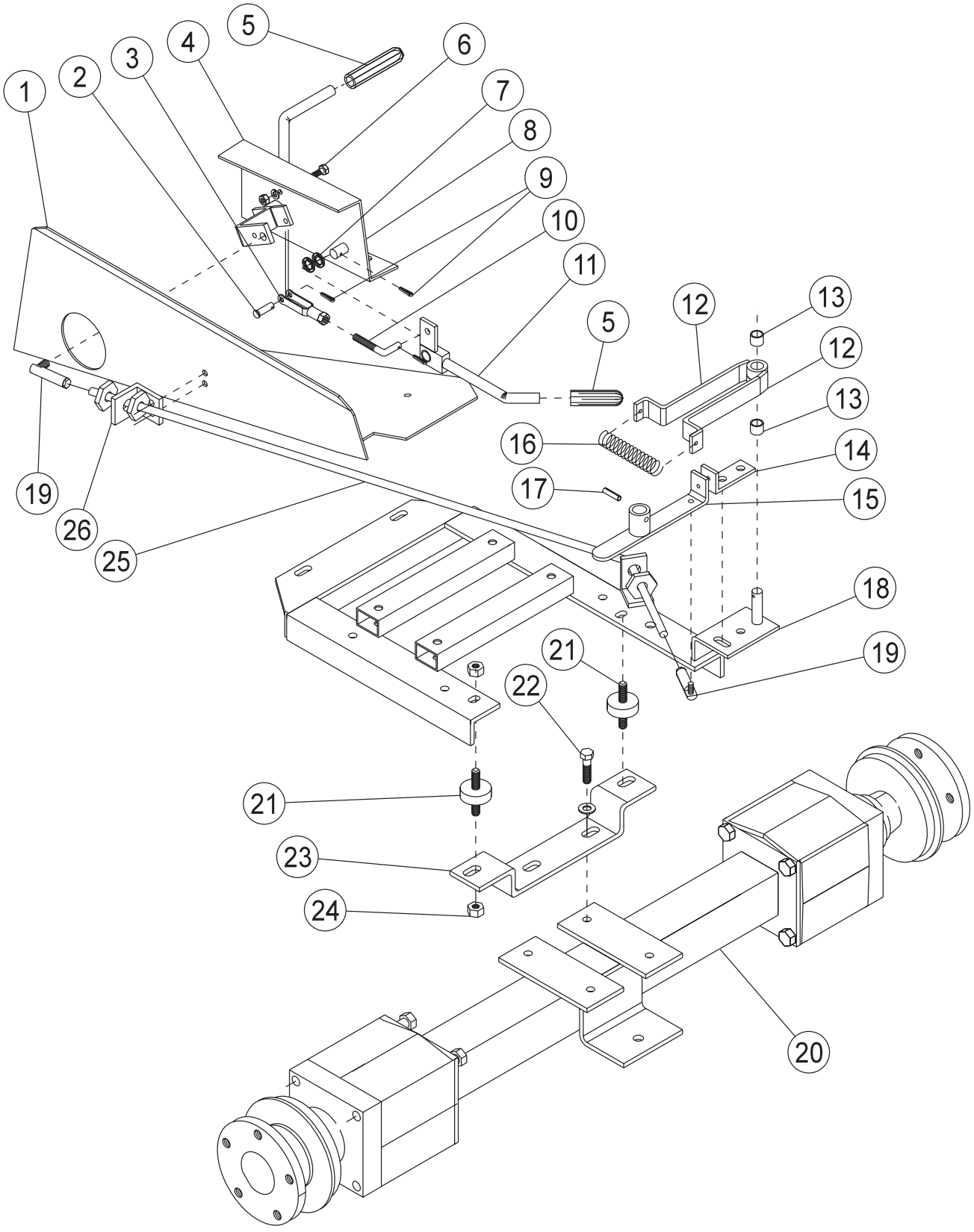
REF#	PART#	DESCRIPTION	QUANTITY
1	13-419	Left Floor Board	1
	13-422	Left Rubber Mat	1
	HSD-14-100	Drill Screw 14 x 1	3
2	13-418	Front Bumper	1
3	HB-38-16-250	Bolt 3/8 - 16 x 2 1/2	2
	HW-38	Washer 3/8	2
	HNTL-38-16	Lock Nut 3/8 - 16	2
4	13-208	Bumper Brace	2
5	HB-38-16-350	Bolt 3/8 - 16 x 3 1/2	2
	HW-38	Washer 3/8	2
	HNCL-38-16	Center Locknut 3/8 - 16	2
6	13-035	Console	1
	HSD-14-100	DrilL Screw 1/4 x 1	4
7	20-057	Steering Wheel	1
	20-129	Center Cap	1
8	13-010	Left Seat Bracket	1
	HB-516-18-125	Bolt 5/16 - 18 x 1 1/4	1
	HW-516	Washer 5/16	1
	HWL-516	Lockwasher 5/16	1
	HN-516-18	Nut 5/16 - 18	1
9	13-547	Adjustable Seat	1
	HW-516	Washer 5/16	4
	HWL-516	Lockwasher 5/16	4
	HN-516-18	Nut 5/16 - 18	4
10	13-009	Right Seat Bracket	1
	HB-516-18-125	Bolt 5/16 - 18 x 1 1/4	1
	HW-516	Washer 5/16	1
	HWL-516	Lockwasher 5/16	1
	HN-516-18	Nut 5/16 - 18	1
11	13-596	Rear Hood, Orange	1
	78-024	Draw Latch	2
	HRS-316-050	Pop Rivet 3/16 x 1/2	6
12	13-570	Bracket	1
13	13-569	Gas Spring 60#	1
	26-034	Ball Stud	2
	HWL-516	Lockwasher 5/16	2
	HN-516-18	Nut 5/16 - 18	2
14	HB-516-18-200	Bolt 5/16 - 18 x 2	2
	HNTL-516-18	Lock Nut 5/16 x 18	2
15	13-016	Seat Hinge	1
16	HB-516-18-100	Bolt 5/16 - 18 x 1	2
	HN-516-18	Nut 5/16 - 18	2
	HW-516	Washer 5/16	4
	HWL-516	Lockwasher 5/16	2
17	13-631	Main Frame	1
18	13-610	Tire and Wheel	2
	11-005-01	Tire 21 x 11.00 x 8 Compass	2
	13-610-02	Wheel	2
	60-268	Lug Bolt 1/2 - 20 x 1 5/16	10
19	13-118	U-Bolt	2
	13-623	Axle	1
	HWL-12	Lockwasher 1/2	4
	HN-12-20	Nut 1/2 - 20	4

MAIN FRAME DRAWING



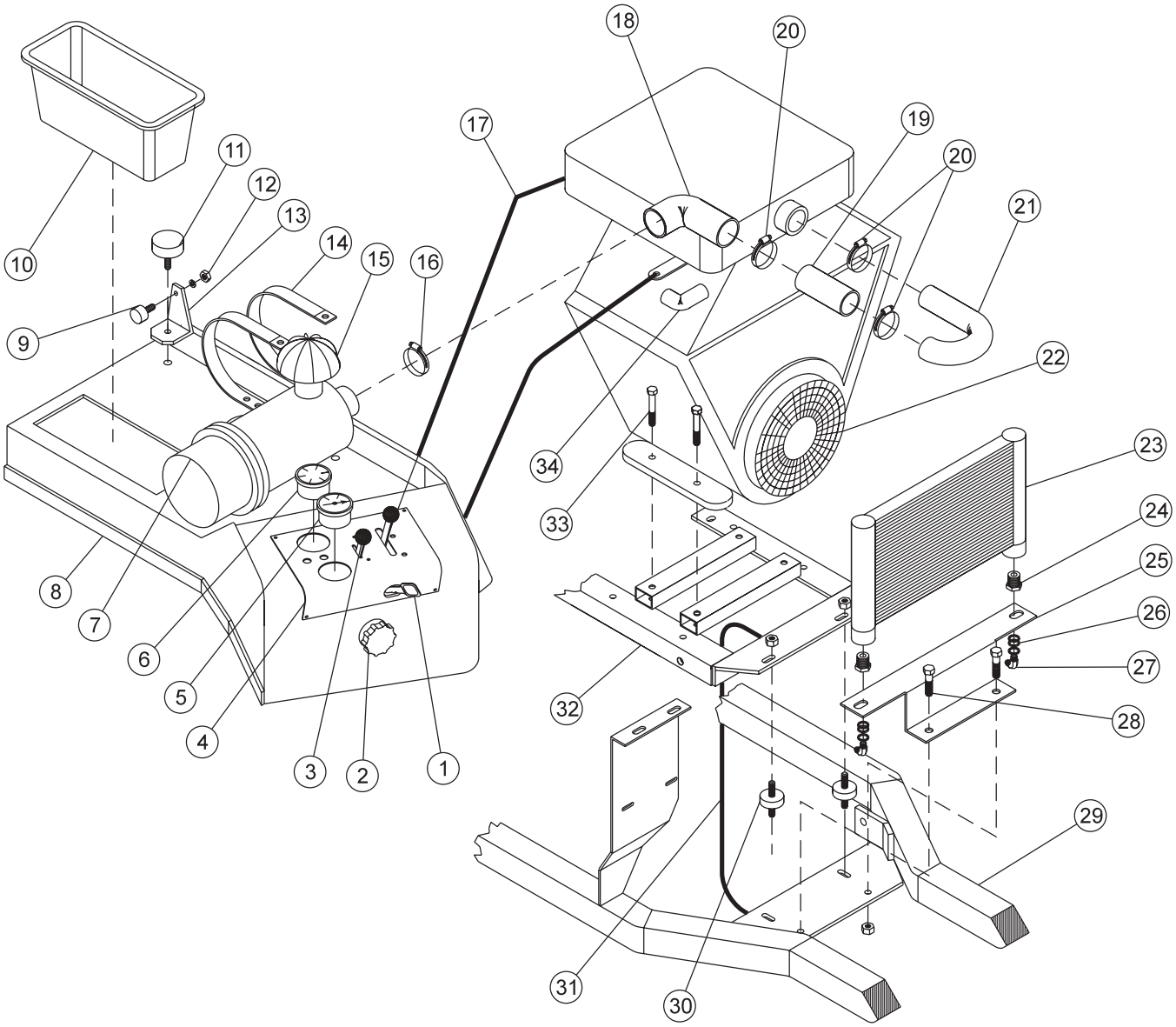
REF#	PART#	DESCRIPTION	QUANTITY
20	HB-38-16-125	Bolt 3/8 - 16 x 1 1/4	2
	HW-38	Washer 3/8	2
	HNTL-38-16	Lock Nut 3/8 - 16	2
21	13-637	Engine Mount	1
22	13-214	Battery Hold Down	1
	8900-6	Flex Guard Loom 1/4	1
	HWL-14	Lockwasher 1/4	2
	HNW-14-20	Wing Nut 1/4 - 20	2
23	13-213	Battery Box	1
	HB-516-18-100	Bolt 5/16 - 18 x 1	4
	HW-516	Washer 5/16	6
	HNTL-516-18	Lock Nut 5/16 - 18	4
24	13-099	Hose Clamp	1
	HB-38-16-175	Bolt 3/8 - 16 x 1 3/4	1
	HNTL-38-16	Lock Nut 3/8 - 16	1
25	13-218	Mud Guard	1
	HB-38-16-125	Bolt 3/8 - 16 x 1 1/4	3
	HW-38	Washer 3/8	4
	HNTL-38-16	Lock Nut 3/8 - 16	3
26	22-054	Battery Cable	1
	HB-38-16-125	Bolt 3/8 - 16 x 1 1/4	1
	HW-38	Washer 3/8	1
	HWL-38	Lock Washer 3/8	1
	HN-38-16	Nut 3/8 - 16	1

ACCELERATOR LINKAGE DRAWING



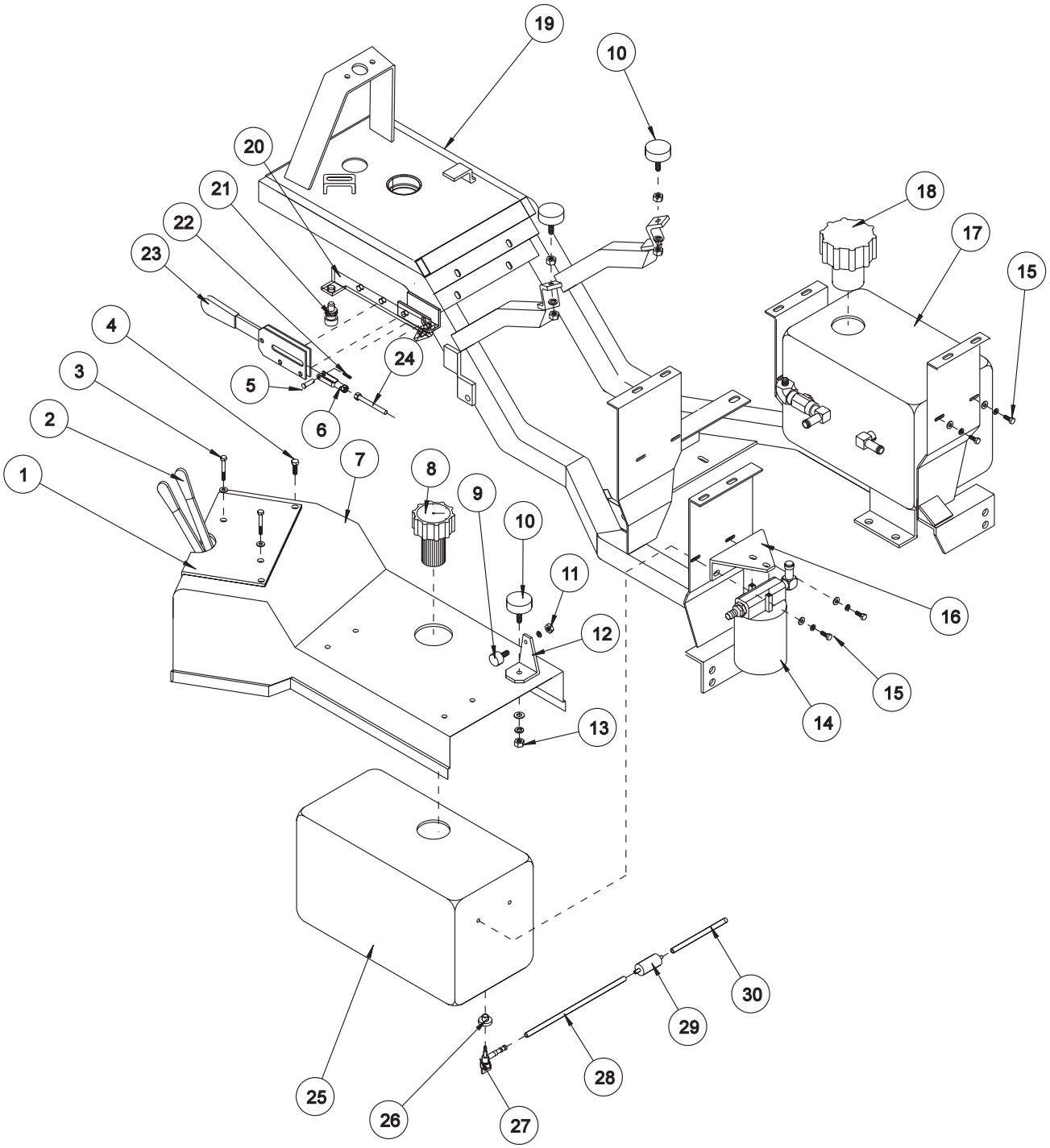
REF#	PART#	DESCRIPTION	QUANTITY
1	13-420	Right Floor Board	1
	13-421	Right Rubber Mat	1
2	HCP-516-100	Clevis Pin 5/16 x 1	1
3	11-100	Linkage Yoke 5/16 - 24	1
4	13-526	Foot Pedal Assembly (Includes Ref# 2, 3, 5, 7 through11)	1
5	13-499	Grip	2
6	HB-14-20-100	Bolt 1/4 - 20 x 1	1
	HWL-14	Lockwasher 1/4	1
	HN-14-20	Nut 1/4 - 20	2
7	HMB-12-14	Machine Bushing 1/2 x 14GA	2
8	13-510	Foot Pedal Bracket	1
	13-515	Forward/Reverse Decal	1
9	HP-18-100	Cotter Pin 1/8 x 1	1
10	13-512	Linkage Rod	1
	HP-18-100	Cotter Pin 1/8 x 1	1
	HN-516-24	Nut 5/16 - 24	1
11	13-511	Reverse Pedal with Bushing	1
	18-234	Bushing	1
	HP-18-100	Cotter Pin 1/8 x 1	1
12	34-038	Centering Arm with Bushing	2
13	18-234	Bushing	2
14	13-624	Stop with Plastic Wear Strip	1
	HB-38-16-100	Bolt 3/8 - 16 x 1	2
	HW-38	Washer 3/8	1
	HNTL-38-16	Lock Nut 3/8 - 16	2
	HRS-316-050	Pop Rivet 3/16 x 1/2	1
	8946-1.5	Plastic Wear Strip	1
15	13-625	Shift Arm with Plastic Wear Strip	1
	8946-1.5	Plastic Wear Strip	1
	HRS-316-050	Pop Rivet 3/16 x 1/2	1
16	11-050	Extension Spring	1
17	HRP-14-100	Roll Pin 1/4 x 1	1
18	13-628	Engine Frame	1
19	18-115	Ball Joint 1/4 - 28	2
	HWL-14	Lockwasher 1/4	2
	HN-14-28	Nut 1/4 - 28	4
20	13-623	Axle	1
21	11-021	Rubber Engine Mount	2
	HWL-38	Lockwasher 3/8	4
22	HB-38-16-125	Bolt 3/8 - 16 x 1 1/4	2
	HW-38	Washer 3/8	2
	HNTL-38-16	Lock Nut 3/8 - 16	2
23	13-637	Engine Mount	1
24	HN-38-24	Nut 3/8 - 24	4
25	13-632	Push-Pull Cable with Nuts	1
	HNJ-58-18	Jam Nut 5/8 - 18	4
26	13-635	Cable Bracket	1
	HB-14-20-075	Bolt 1/4 - 20 x 3/4	2
	HNTL-14-20	Lock Nut 1/4 - 20	2

RIGHT FENDER AND ENGINE DRAWING



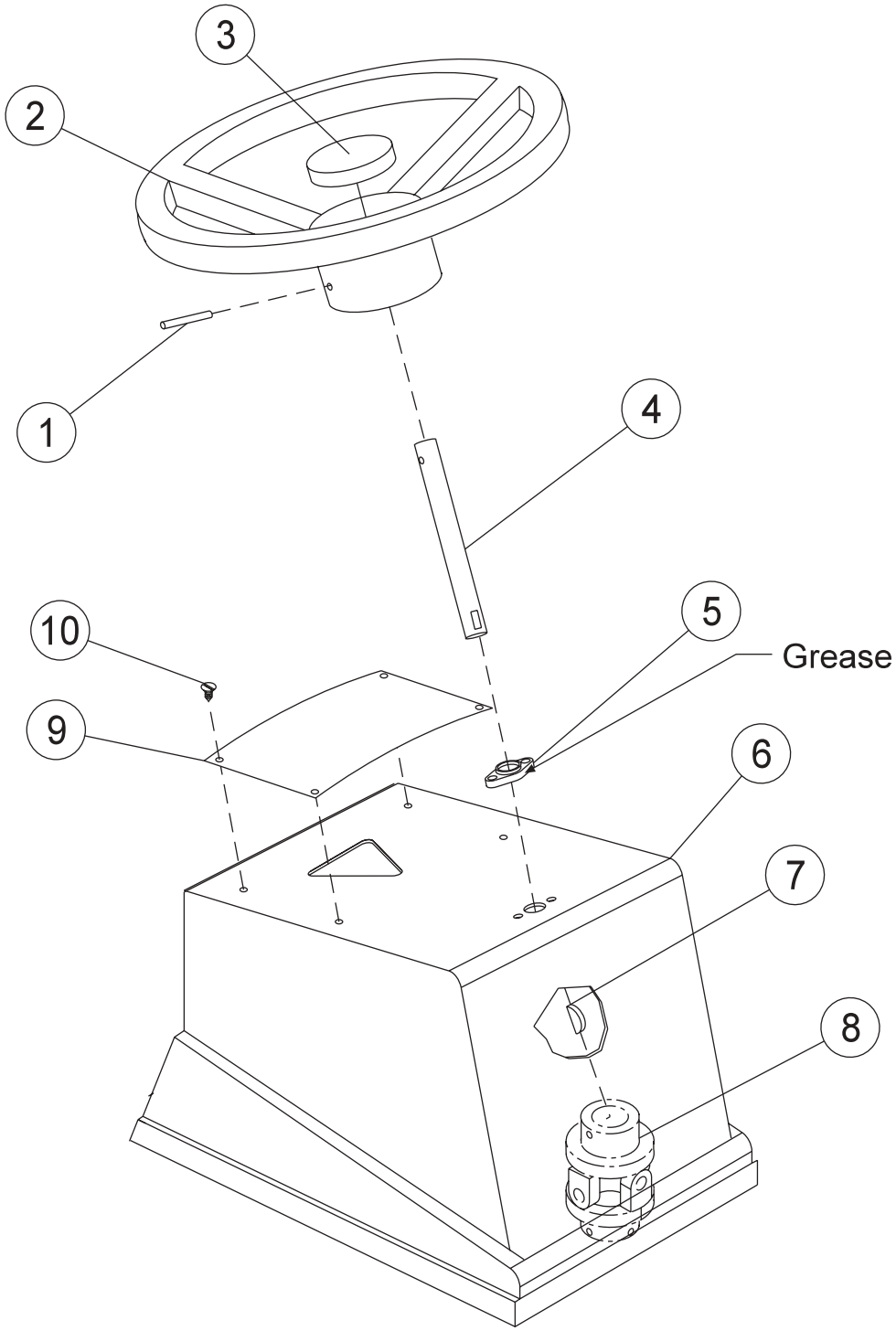
REF#	PART#	DESCRIPTION	QUANTITY
1	13-488	Ignition Key with Switch	1
2	13-409	On-Off Valve 3WD to 2WD	1
3	13-539	Choke Control with Cable	1
4	13-566	Instrument Panel	1
	13-640	Instrument Panel Decal	1
	HSA-8-075	Tapping Screw #8 x 3/4	4
5	22-003	Ammeter	1
6	12-017	Hour Meter	1
7	11-130	Air Cleaner with Element	1
	11-131	Filter Element (Replacement)	1
8	13-593	Right Fender, Orange	1
9	15-013	Rubber Bumper	1
10	13-583	Trash Bucket	1
11	50-081	Rubber Insulator	1
12	HW-14	Lockwasher 1/4	1
	HN-14-20	Nut 1/4 - 20	1
13	13-416	Right Hood Support	1
14	11-132	Mounting Band	2
	HB-14-20-075	Bolt 1/4 - 20 x 3/4	4
	HWL-14	Lockwasher 1/4	4
	HN-14-20	Nut 1/4 - 20	4
15	11-133	Air Inlet Cap	1
16	18-123	Hose Clamp #32 1 9/16 - 2 1/2	1
17	34-160	Throttle Control with Cable	1
	34-162	Throttle Bracket	1
	HSM-10-32-063	Machine Screw #10 - 32 x 5/8	4
	HWL-10	Lockwasher #10	4
	HN-10-32	Nut #10 - 32	4
	HST-14-20-075	Truss Machine Screw 1/4 - 20 x 3/4	2
	HWL-14	Lockwasher 1/4	2
	HN-14-20	Nut 1/4 - 20	2
	34-163	Cable Bracket	1
	HN-38-24	Nut 3/8 - 24	2
	21-161	Wire Block	2
18	27-113	Rubber Elbow	1
19	27-115	Tube	1
20	18-116	Hose Clamp #24 1 1/16 - 2	3
21	13-609	Rubber Hose	1
22	15-165	Engine Briggs and Straton 16HP	1
	15-165-01	Air Filter Element with Pre-Cleaner	1
	13-531	Engine Oil Filter	1
	13-518	Carburetor to Air Cleaner Gasket	1
	13-491	Oil Switch	1
23	23-172	Oil Cooler	1
24	18-015	Pipe Thread Reducer 1/2 x 1/4	2
25	13-004	Cooler Bracket	1
26	HMB-916-14	Machine Bushing 9/16 x 14GA	6
27	23-140	Elbow	2
28	HB-716-14-175	Bolt 7/16 - 14 x 1 3/4	2
	HNCL-716-14	Center Lock Nut 7/16 - 14	2
29		Main Frame	1
30	11-021	Rubber Engine Mount	4
	HW-38	Washer 3/8	4
	HWL-38	Lockwasher 3/8	8
	HN-38-24	Nut 3/8 - 24	8
31	22-017	Ground Cable	1
32	13-628	Engine Frame	1
33	HB-38-16-250	Bolt 3/8 - 16 x 2 1/2	4
	HNTL-38-16	Lock Nut 3/8 - 16	4
34	13-524	Blo Plug	1

LEFT FENDER AND TANK DRAWING



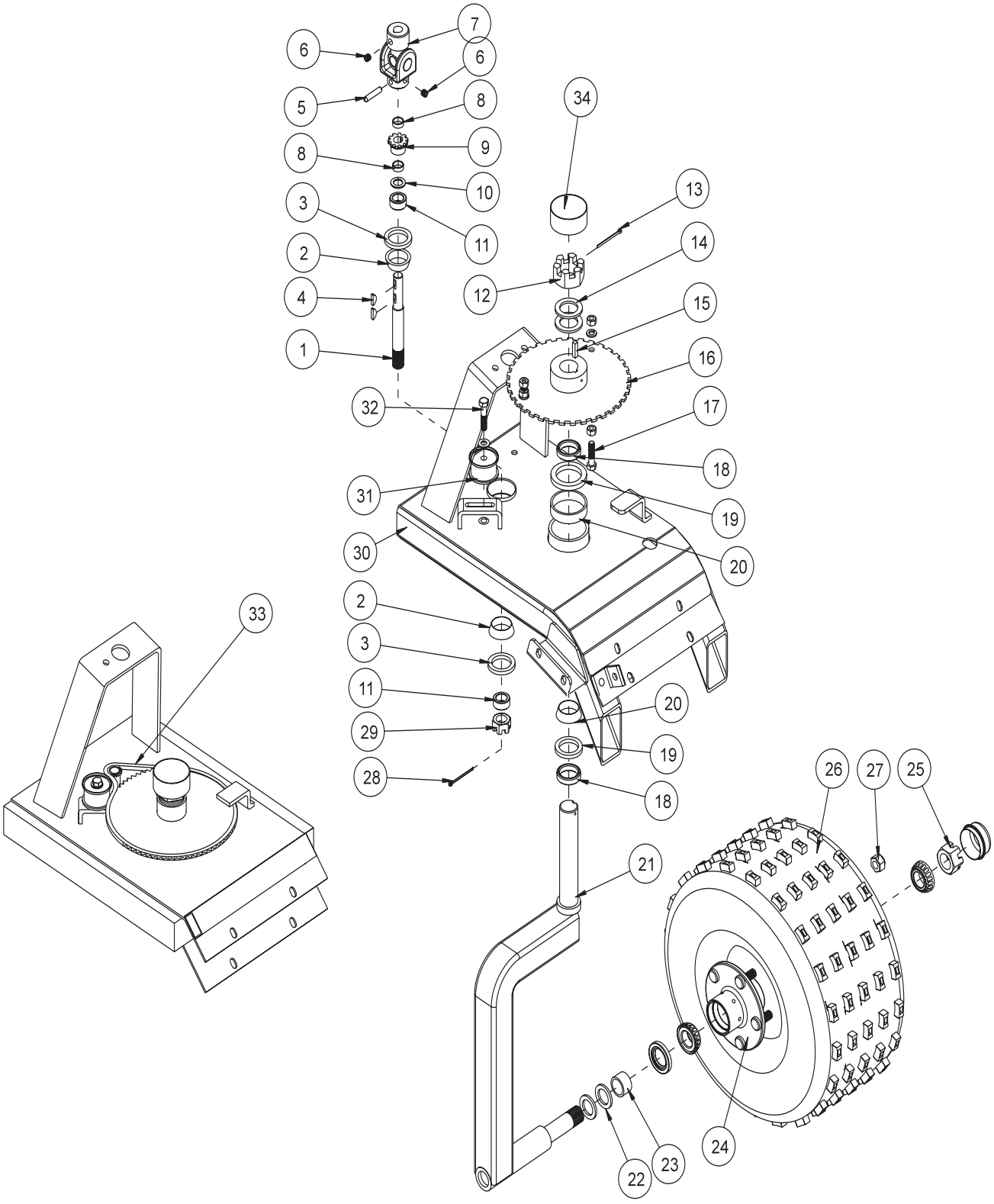
REF#	PART#	DESCRIPTION	QUANTITY
1	13-565	Valve Cover	1
	13-554	Valve Cover Decal	1
2	13-261	Hydraulic Valve with Handle	1
	13-262	Valve Handle Set	1
	14-062	Seal Kit	1
	14-203	Spring Centering Assembly Kit (One per Bank)	1
	14-106	Relief Assembly Kit	1
3	HB-14-20-200	Bolt 1/4 - 20 x 2	2
	HW-14	Washer 1/4	2
	HWL-14	Lockwasher 1/4	2
	HN-14-20	Nut 1/4 - 20	2
4	HSA-8-075	Tapping Screw #8 x 3/4	4
5	HCP-516-125	Clevis Pin 5/16 x 1 1/4	1
6	11-100	Linkage Yoke 5/16 - 24	1
	HN-516-24	Nut 5/16 - 24	2
7	13-594	Left Fender, Orange	1
8	13-588	Gas Gauge and Cap	1
9	15-013	Rubber Bumper	1
10	50-081	Rubber Insulator	3
11	HW-14	Lockwasher 1/4	1
	HN-14-20	Nut 1/4 - 20	1
12	13-415	Left Hood Support	1
13	HW-38	Washer 3/8	1
	HWL-38	Lockwasher 3/8	3
	HN-38-16	Nut 3/8 - 16	5
14	23-006	Hydraulic Oil Filter	1
	23-031	Hydraulic Filter Element	1
15	HB-14-20-075	Bolt 1/4 - 20 x 3/4	4
	HWL-14	Lockwasher 1/4	4
	HW-14	Washer 1/4	4
16	13-217	Oil Filter Bracket	1
17	13-584	Oil Tank	1
18	13-586	Filler Breather	1
19	13-631	Main Frame	1
20	13-654	Park Brake Bracket	1
21	22-002	Interlock Switch	1
22	HP-18-100	Cotter Pin 1/8 x 1	1
23	60-106	Brake Lever	1
	HB-38-16-175	Bolt 3/8 - 16 x 1 3/4	2
	HW-38	Washer 3/8	2
	HWL-38	Lockwasher 3/8	2
	HN-38-16	Nut 3/8 - 16	2
24	50-264	Brake Cable with Nuts	1
	HNJ-916-12	Jam Nut 9/16 - 12	4
	60-536	Bellows (One Each End of Brake Cable)	2
25	13-585	Gas Tank with Cap	1
26	26-054	Bushing Insert	1
27	26-055	Shut Off Valve	1
28	8800-12	Fuel Hose 1/4 x 11 1/2	1
	18-186	Hose Clamp	2
29	50-403	Fuel Filter	1
30	8800-7	Fuel Hose 1/4 x 6 1/2	1
	18-186	Hose Clamp	2

CONSOLE DRAWING



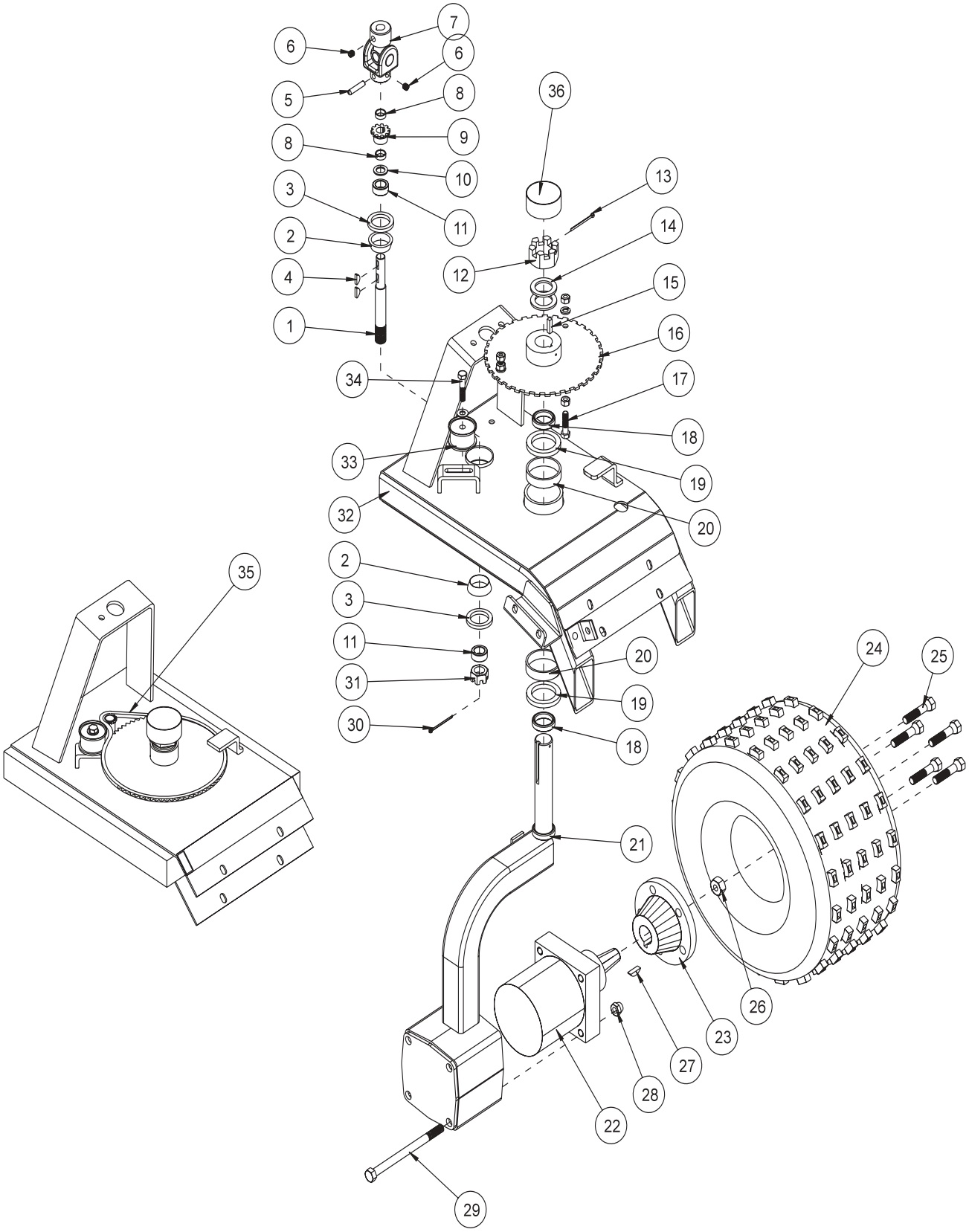
REF#	PART#	DESCRIPTION	QUANTITY
1	HRP-14-200	Roll Pin	1
2	20-057	Steering Wheel	1
	HSSHS-516-18-050	Set Screw $^{5}/_{16}$ - 18 x $^{1}/_{2}$	1
3	20-129	Center Cap	1
4	13-034	Top Steering Shaft	1
5	40-009	Flange Bearing	1
	HB-516-18-175	Bolt $^{5}/_{16}$ - 18 x $1^{3}/_{4}$	2
	HNTL-516-18	Lock Nut $^{5}/_{16}$ x 18	2
6	13-035	Console	1
7	HWK-316-075	Woodruff Key $^{3}/_{16}$ x $^{3}/_{4}$	1
8	60-300	U-Joint	1
	HRP-532-150	Roll Pin $^{5}/_{32}$ x $1^{1}/_{2}$	1
9	13-564	Console Cover	1
	25-285	Super Rake Warning Decal	1
10	HSA-8-075	Tapping Screw #8 x $^{3}/_{4}$	4

TWO WHEEL DRIVE FRONT FORK DRAWING



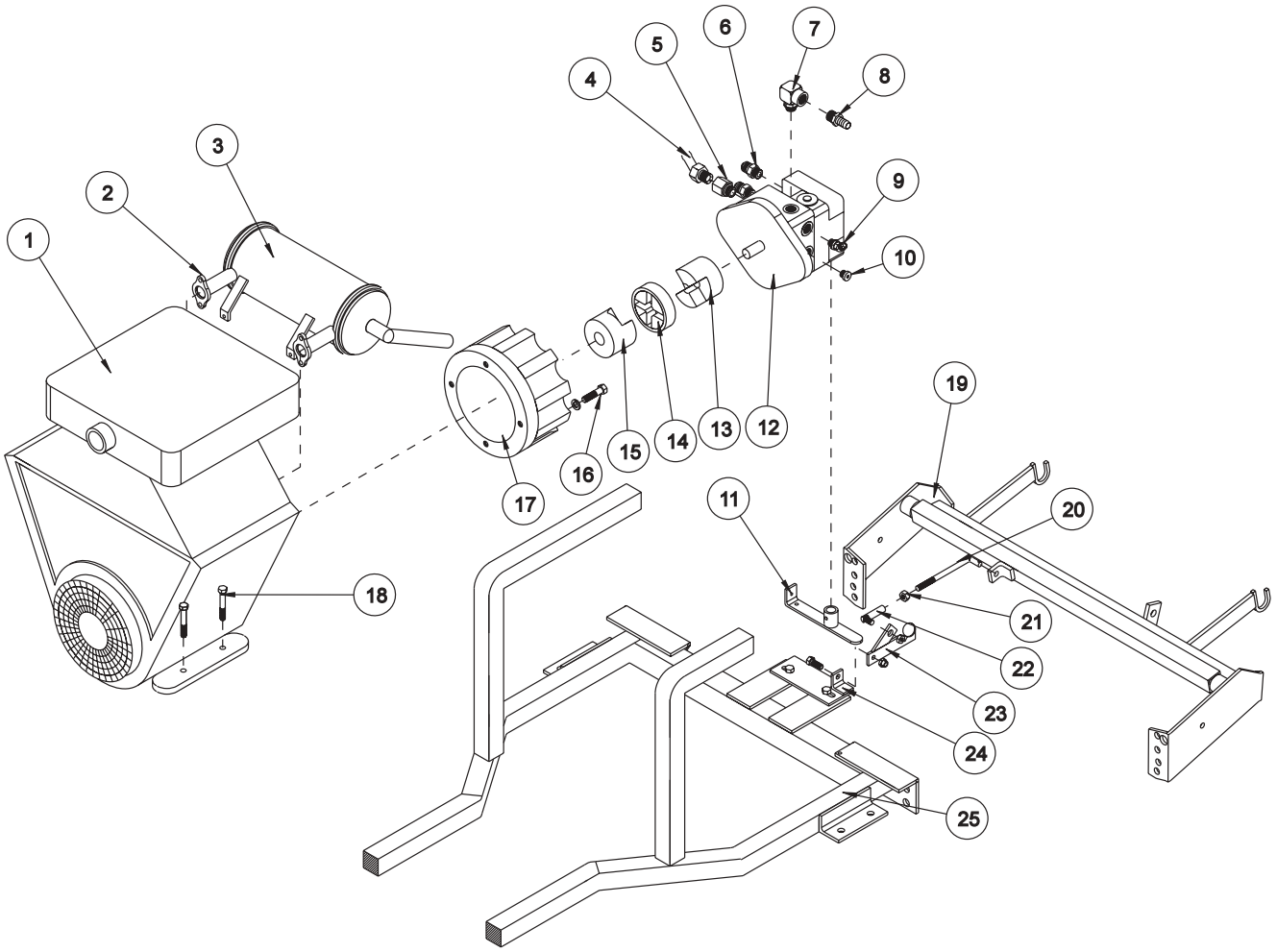
REF#	PART#	DESCRIPTION	QUANTITY
1	13-005	Bottom Steeing Shaft	1
2	11-038	Bearing	2
3	11-039	Oil Seal	2
4	HWK-316-063	Woodruff Key 3/16 x 5/8	2
5	HRP-532-150	Roll Pin 5/32 x 1 1/2	1
6	HSSHS-38-16-038	Set Screw 3/8 - 16 x 3/8	2
7	60-300	U-Joint	1
8	60-325	Spacer	2
9	60-298	Sprocket (3510 x 5/8)	1
10	HMB-58-14	Machine Bushing 5/8 x 14GA	1
11	11-040	Spacer	3
12	HNAJ-114-12	Slotted Jam Nut 1 1/4 - 12	1
13	HP-18-200	Cotter Pin 1/8 x 2	1
14	HBM-114-10	Machine Bushing	2
15	HKSQ-14-100	Machine Key 1/4 x 1/4 x 1	1
16	13-039	Steering Sprocket	1
17	HB-38-16-150	Bolt 3/8 - 16 x 1 1/2	2
	HWL-38	Lockwasher 3/8	2
	HN-38-16	Nut 3/8 - 16	4
18	20-141	Spacer	2
19	20-142	Oil Seal	2
20	20-143	Bearing	2
21	13-448	Front Fork	1
22	HMB-100-10	Machine Bushing 1 x 10GA	2
23	11-042	Spacer	1
24	80-019	Hub (Includes Bearings, Seal, Dust Cap and Lug Nuts)	1
	11-043	Bearing	2
	11-041	Seal	1
	80-167	Dust Cap	1
25	HNAR-100-14	Slotted Jam Nut 1 - 14	1
	HP-18-150	Cotter Pin 1/8 x 1 1/2	1
26	11-005	Tire and Wheel	1
	11-005-01	Tire 21 x 11.00 x 8 Compass	1
	11-005-02	Wheel	1
27	HNL-12-20	Lug Nut 1/2 - 20	5
28	HP-18-150	Cotter Pin 1/8 x 1 1/2	1
29	HNAT-34-16	Slotted Nut	1
30		Part of Main Frame	
31	40-022	Idler Pulley(serial number 1019-1083)	1
	26-060	Idler Pulley(serial number 1084 and up)	1
32	HB-38-16-175	Bolt 3/8 - 16 x 1 3/4	1
	HW-38	Washer 3/8	As Required
	HWL-38	Lockwasher 3/8	1
	HN-38-16	Nut 3/8 - 16	1
33	13-040	Roller Chain #35	1
	18-114	Connecting Link #35	1
	18-143	Offset Link #35	As Required

THREE WHEEL DRIVE FRONT FORK DRAWING



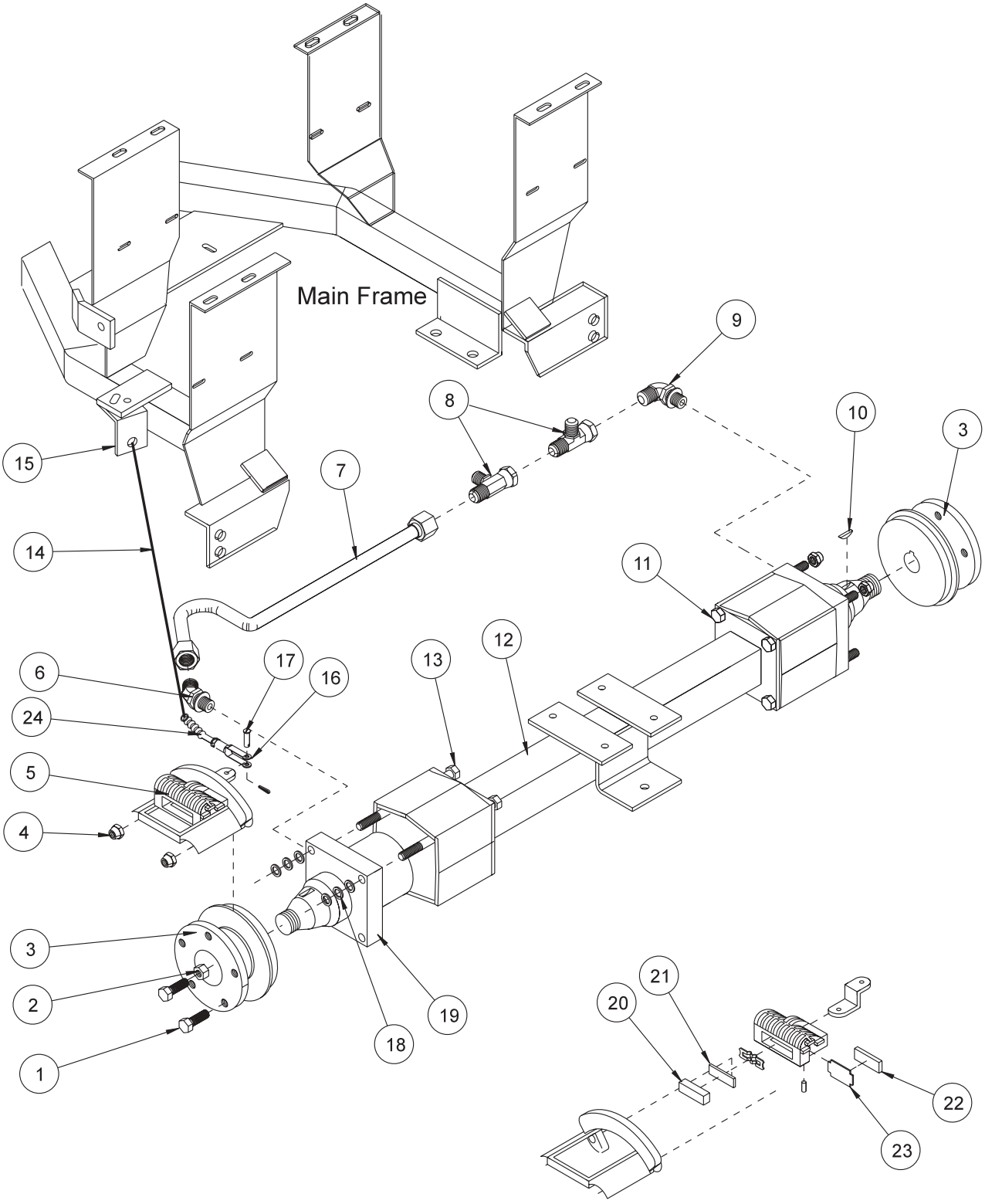
REF#	PART#	DESCRIPTION	QUANTITY
1	13-005	Bottom Steeing Shaft	1
2	11-038	Bearing	2
3	11-039	Oil Seal	2
4	HWK-316-063	Woodruff Key 3/16 x 5/8	2
5	HRP-532-150	Roll Pin 5/32 x 1 1/2	1
6	HSSHS-38-16-038	Set Screw 3/8 - 16 x 3/8	2
7	60-300	U-Joint	1
8	60-325	Spacer	2
9	60-298	Sprocket (3510 x 5/8)	1
10	HMB-58-14	Machine Bushing 5/8 x 14GA	1
11	11-040	Spacer	3
12	HNAJ-114-12	Slotted Jam Nut 1 1/4 - 12	1
13	HP-18-200	Cotter Pin 1/8 x 2	1
14	HBM-114-10	Machine Bushing	2
15	HKSQ-14-100	Machine Key 1/4 x 1/4 x 1	1
16	13-039	Steering Sprocket	1
17	HB-38-16-150	Bolt 3/8 - 16 x 1 1/2	2
	HWL-38	Lockwasher 3/8 - 16	2
	HN-38-16	Nut 3/8 - 16	4
18	20-141	Spacer	2
19	20-142	Oil Seal	2
20	20-143	Bearing	2
21	13-130	Front Fork	1
	13-652	Hose Clamp	1
22	13-032	Wheel Motor	1
	18-172	Reducer	2
	18-171	Seal Lock	2
23	13-033	Hub	1
24	11-005	Tire and Wheel	1
	11-005-01	Tire 21 x 11.00 x 8 Compass	1
	11-005-02	Wheel	1
25	60-268	Lug Bolt 1/2 - 20 x 1 5/16	5
26	14-265	Nut 1 - 20	1
27	HWK-516-100	Woodruff Key 5/16 x 1	1
28	HNTL-12-13	Lock Nut 1/2 - 13	4
29	HB-12-13-700	Bolt 1/2 - 13 x 7	4
30	HP-18-150	Cotter Pin 1/8 x 1 1/2	1
31	HNAT-34-16	Slotted Nut 3/4 - 16	1
32		Part of Main Frame	
33	40-022	Idler Pulley(serial number 6038-6220)	1
	26-060	Idler Pulley(serial number 6221 and Up)	1
34	HB-38-16-175	Bolt 3/8 - 16 x 1 3/4	1
	HW-38	Washer 3/8	As Required
	HWL-38	Lockwasher 3/8	1
	HN-38-16	Nut 3/8 - 16	1
35	13-040	Roller Chain #35	1
	18-114	Connecting Link #35	1
	18-143	Offset Link #35	As Required

ENGINE AND PUMP DRAWING



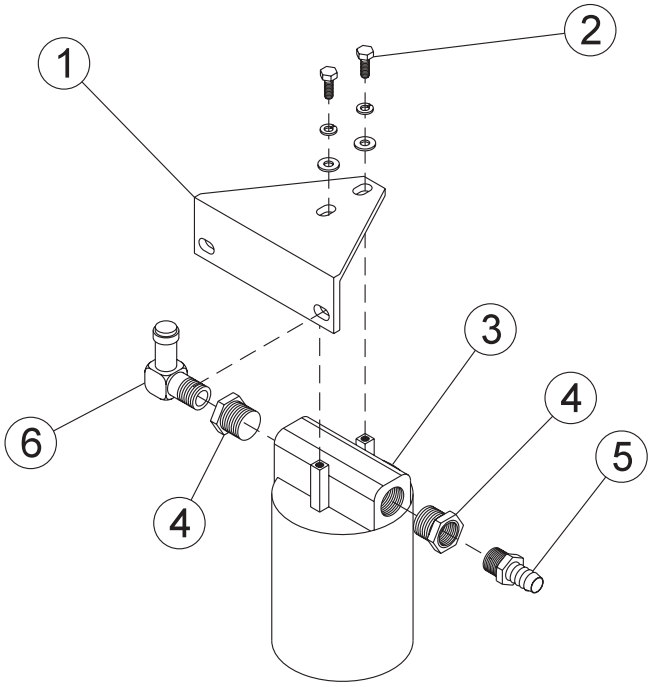
REF#	PART#	DESCRIPTION	QUANTITY
1	15-165	Engine Briggs and Straton 16HP	1
2	13-532	Exhaust Port to Muffler Gasket	2
3	27-123	Muffler	1
4	23-076	O-Ring Adapter	1
5	23-143	Connector	1
6	18-267	Staright Thread Connector	2
7	23-130	Elbow	1
8	23-139	Barb Fitting	1
9	18-188	Elbow 45°	1
10	23-126	O-ring Plug	1
11	13-625	Shift Arm	1
12	13-110	Variable Pump (Right Rotation)	1
	HSSH-12-13-175	Socket Screw 1/2 - 13 x 1 3/4	2
	HWL-12	Lockwasher 1/2	2
13*	13-655	Steel Coupler Half #4 3/4" Bore	1
	HSSHS-516-18-075	Socket Head Set Screw 5/16 - 18 x 3/4	1
	HSSHS-38-16-050	Socket Head Set Screw 3/8 - 16 x 1/2	1
	HWK-316-063	Woodruff Key 3/16 x 5/8	1
14*	13-666	Steel Coupler Insert #4	1
15*	13-667	Steel Coupler Half #4 1" Bore	1
	HSSHS-516-18-075	Socket Head Set Screw 5/16 - 18 x 3/4	1
	HSSHS-38-16-050	Socket Head Set Screw 3/8 - 16 x 1/2	1
	HKSQ-14-100	Machine Key 1/4 x 1/4 x 1	1
16	HB-716-14-175	Bolt 7/16 - 14 x 1 3/4	4
	HWL-716	Lockwasher 7/16	4
17	60-212	Adapter Pump Mount	1
18	HB-38-16-250	Bolt 3/8 - 16 x 2 1/2	4
	HNTL-38-16	Lock Nut 3/8 - 16	4
19	13-175	Rake Lift Assembly	1
20	13-639	Rod Speed Limiter	1
21	21-173	Ball Joint 3/8 - 24	1
22	HN-38-24	Nut 3/8 - 24	2
23	13-627	Limiting Arm	1
24	13-626	Mounting Base	1
25	13-631	Main Frame	1
*	16-664	Coupler Kit	1

REAR AXLE DRAWING

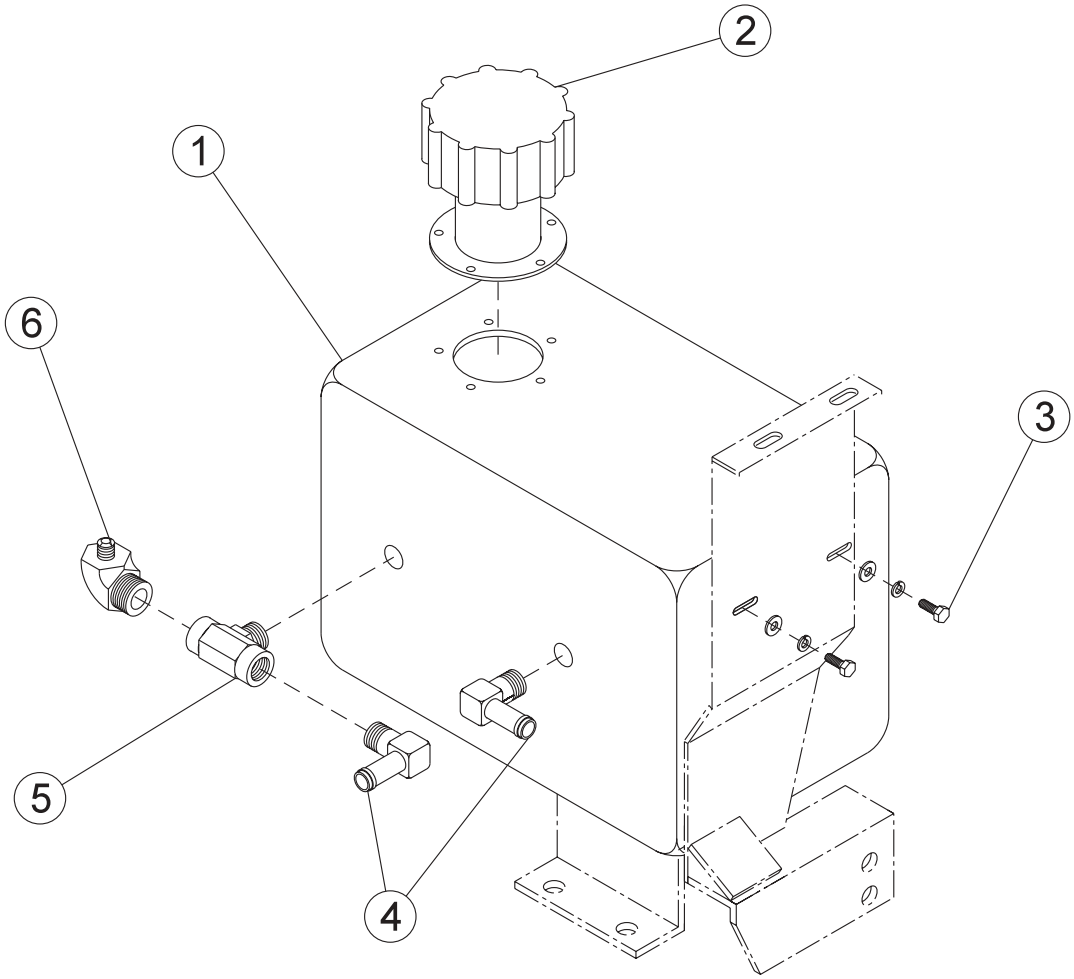


REF#	PART#	DESCRIPTION	QUANTITY
1	60-268	Lug Bolt 1/2 - 20 x 1 5/16	10
2	14-265	Nut 1 - 20	2
3	34-100	Hub and Disc	2
4	HNTL-12-13	Lock Nut 1/2 - 13	8
5	34-101	Complete Brake	1
6	18-265	45° Elbow	2
7	13-612	Hydraulic Tube Assembly	2
8	34-058	Swivel Tee	4
9	34-122	Elbow	2
10	HWK-516-100	Woodruff Key 5/16 x 1	2
11	HB-12-13-700	Bolt 1/2 - 13 x 7	6
12	13-623	Axle	1
13	HB-12-13-750	Bolt 1/2 - 13 x 7 1/2	2
14	50-264	Brake Cable with Nuts	1
15	13-655	Cable Bracket	1
	HB-38-16-300	Bolt 3/8 - 16 x 3	2
	HW-38	Washer 3/8	2
	HNTL-38-16	Lock Nut 3/8 - 16	2
16	11-100	Linkage Yoke	1
	HN-516-24	Nut 5/16 - 24	1
17	HCP-516-100	Clevis Pin 5/16 x 1	1
	HP-18-100	Cotter Pin 1/8 x 1	1
18	HMB-12-14	Machine Bushing 1/2 x 14GA	6
19	13-615	Wheel Motor	2
20*		Cam Side Pad	1
21*		Cam Side Pad Support	1
22*		Carrier Side Pad	1
23*		Carrier Side Pad Support	1
24	19-205	Compression Spring	1
	HN-516-24	Nut 5/16 - 24	1
*	34-101-01	Pad Kit with 2 Pads	1
	34-101-02	Pad Kit with 2 Pads and Steel Backing Hydraulic Oil Filter	

HYDRAULIC OIL FILTER DRAWING



HYDRAULIC OIL TANK DRAWING



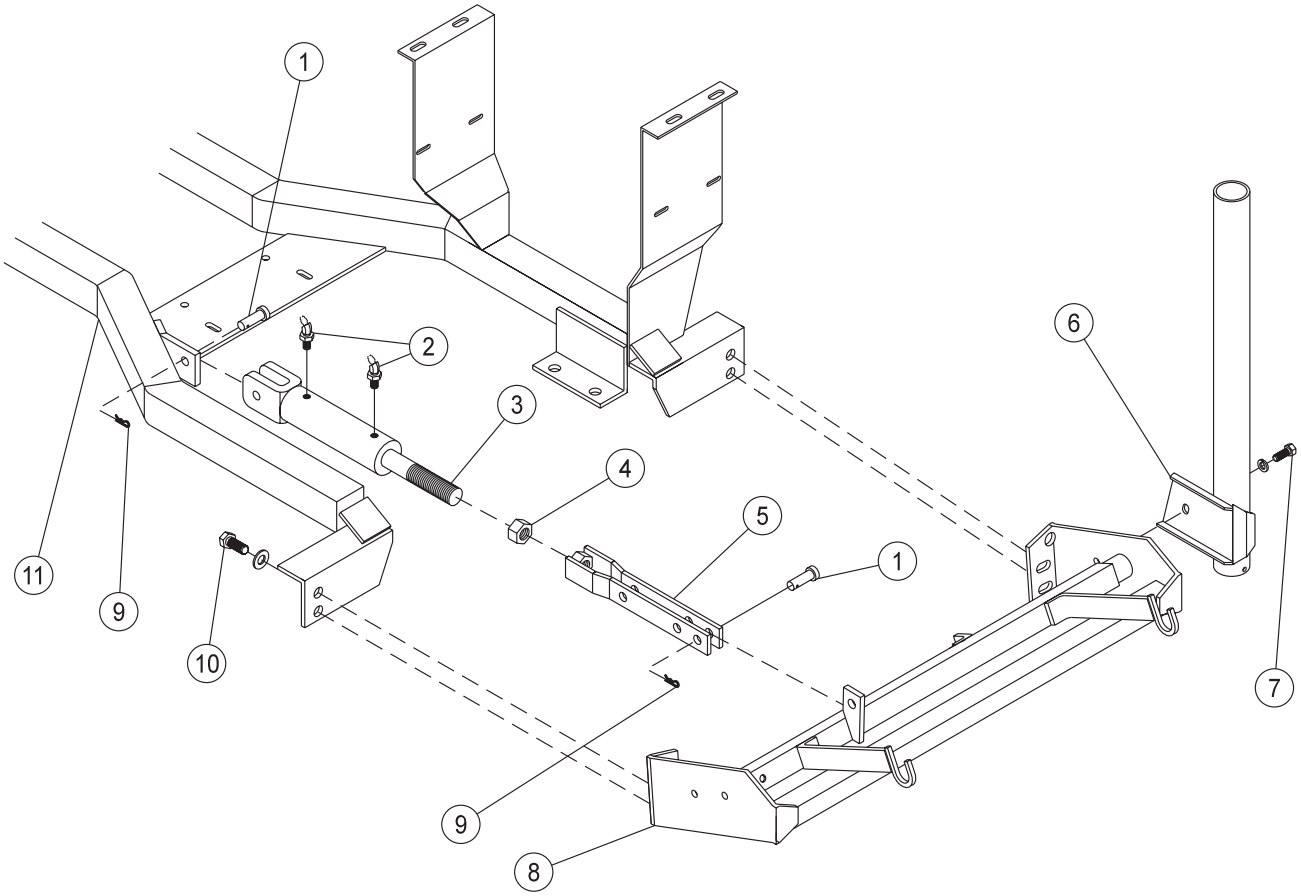
HYDRAULIC OIL FILTER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-217	Oil Filter Bracket	1
2	HB-14-20-075	Bolt 1/4 - 20 x 3/4	2
	HWL-14	Lock washer 1/4	2
	HW-14	Washer 1/4	2
3	23-006	Hydraulic Oil Filter	1
	23-031	Hydraulic Oil Filter Element	1
4	18-008	Reducer Bushing	2
5	23-139	Barb Fitting	1
6	23-142	Elbow	1

HYDRAULIC OIL TANK PARTS LIST

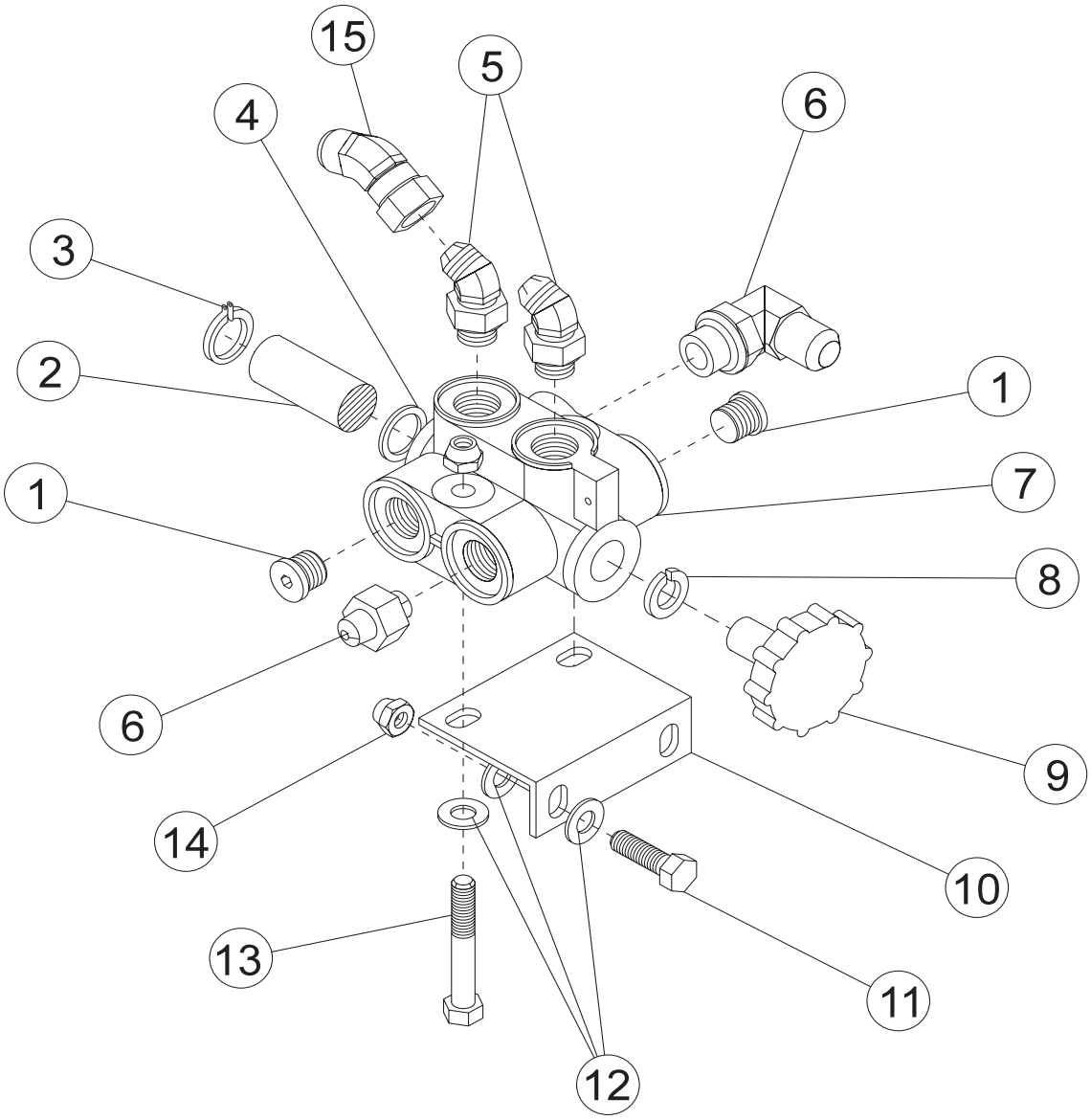
REF#	PART#	DESCRIPTION	QUANTITY
1	13-584	Oil Tank	1
	18-118	Pipe Plug 1/8	1
2	13-586	Filler Breather	1
	HSM-8-32-038	Machine Screw #8 - 32 x 3/8	6
	HWS-8	Star Washer #8	6
3	HB-14-20-075	Bolt 1/4 - 20 x 3/4	4
	HWL-14	Lockwasher 1/4	4
	HW-14	Washer 1/4	4
4	23-142	Connector	2
5	17-018	Male Brance Tee	1
6	17-019	Male Elbow	1

REAR RAKE LIFT DRAWING



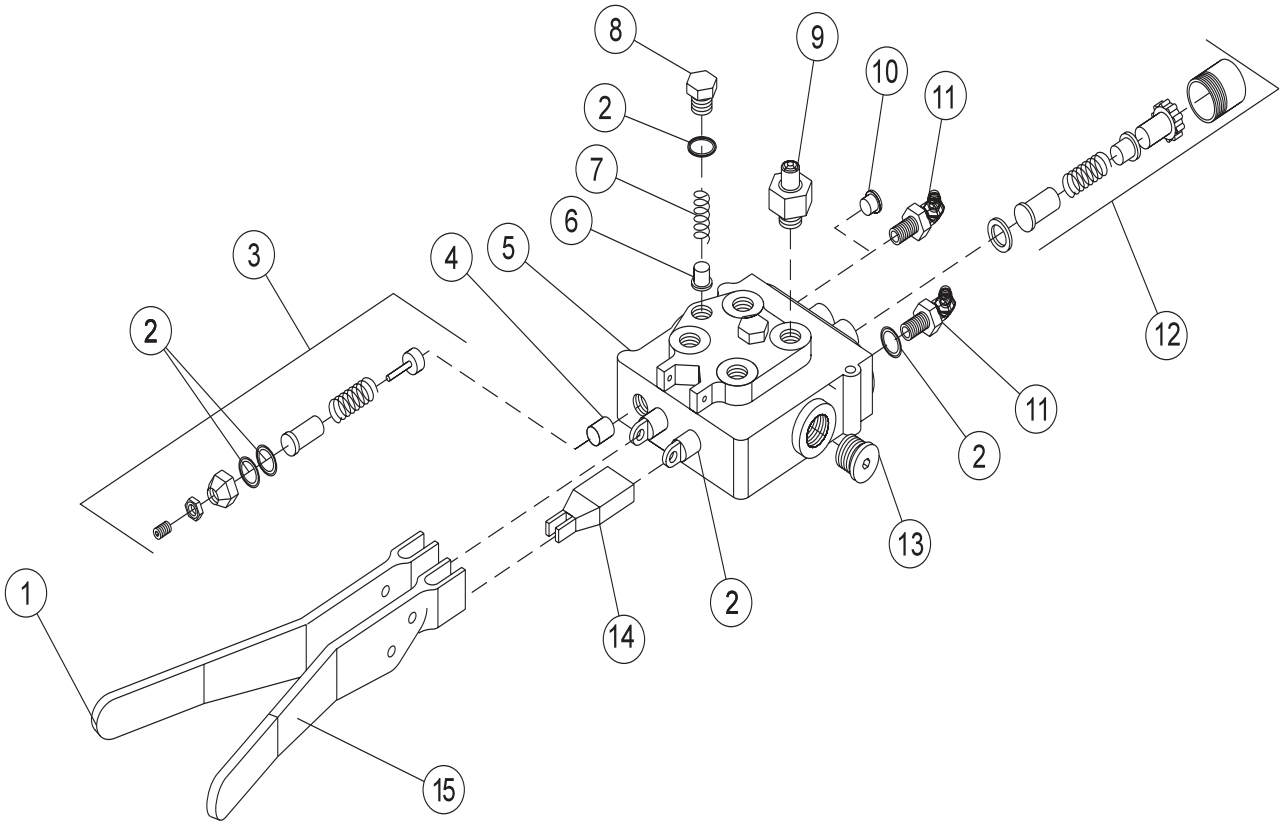
REF#	PART#	DESCRIPTION	QUANTITY
1	HCP-12-150	Clevis Pin 1/2 x 1 1/2	2
2	18-208	Elbow	2
3	13-357	Cylinder	1
	14-253	Seal Kit	1
4	HNJ-34-16	Jam Nut 3/4 - 16	1
5	13-366	Cylinder Extension	1
6	13-194	Rake Holder	1
7	HB-38-16-100	Bolt 3/8 - 16 x 1	1
	HW-38	Washer 3/8	1
	HNTL-38-16	Lock Nut 3/8 - 16	1
8	13-175	Rake Lift Assembly	1
9	HP-18-100	Cotter Pin 1/8 x 1	2
10	HB-12-13-150	Bolt 1/2 - 13 x 1 1/2	4
	HW-12	Washer 1/2	4
	HNTL-12-13	Lock Nut 1/2 - 13	4
11		Main Frame	

ON-OFF VALVE DRAWING



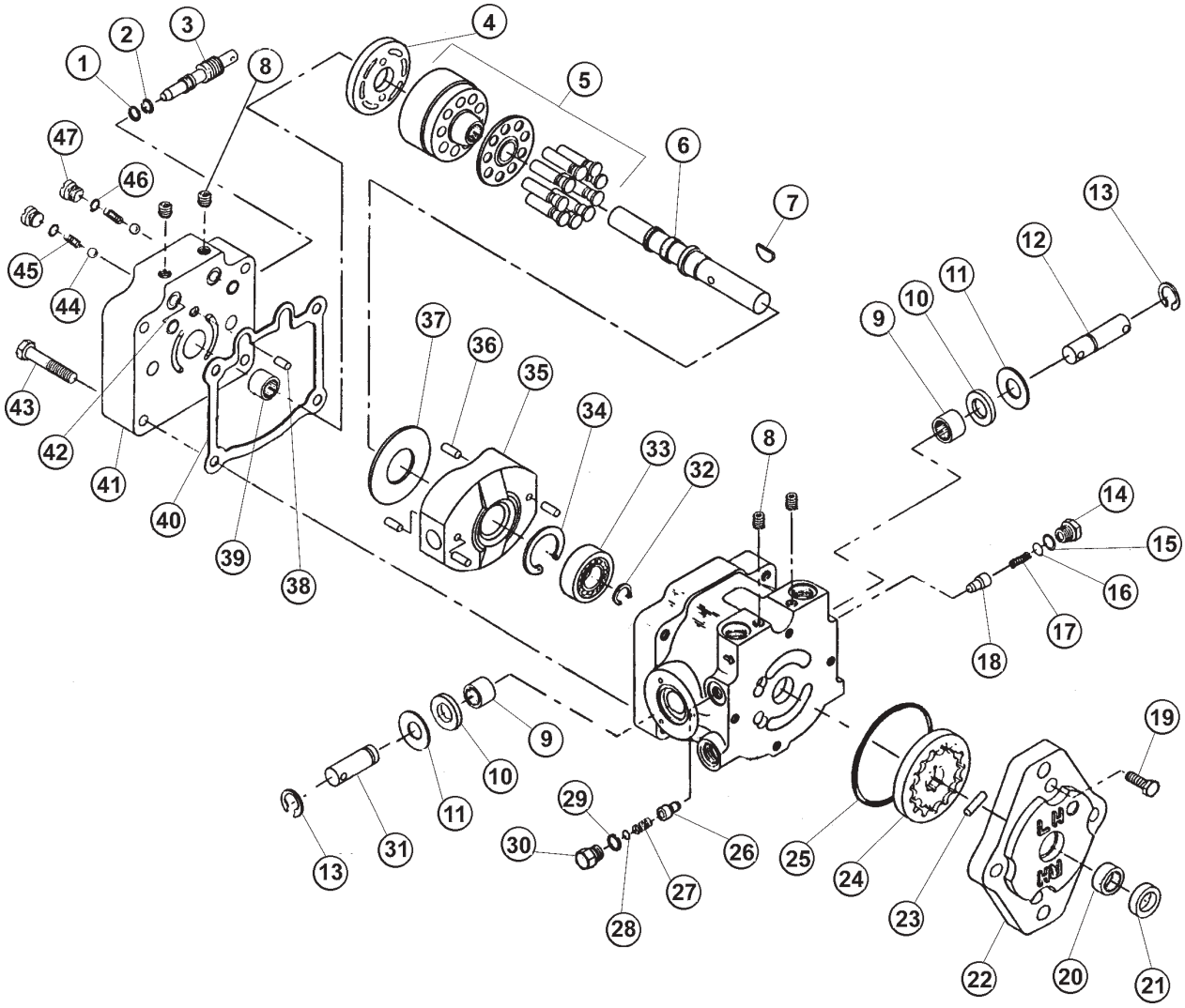
REF#	PART#	DESCRIPTION	QUANTITY
1	18-228	Hollow Hex Plug	2
2*	14-243	Spool	1
3*	14-242	Snap Ring	2
4*	14-244	Quad Seal	2
5	18-175	Elbow 1/2 - 45°	2
6	18-161	Elbow Standard Thread 5/8 x 1/2	2
7*		Valve Body	1
8*	14-245	Lockwasher	1
9*	14-246	Knob	1
10	13-427	Valve Bracket	1
11	HB-38-16-125	Bolt 3/8 - 16 x 1 1/4	2
12	HW-38	Washer 3/8	6
13	HB-38-16-250	Bolt 3/8 - 16 x 2 1/2	2
14	HNTL-38-16	Lock Nut 3/8 - 16	4
15	34-044	45° Elbow	1
*	13-409	On-Off Valve	

HYDRAULIC VALVE DRAWING



REF#	PART#	DESCRIPTION	QUANTITY
1	13-672	Left Handle w/ Linkage	1
2	14-062	Seal Kit	1
3	14-106	Relief Assembly Kit	1
4	13-261-03	N.R. Plug	1
5	13-261-01	Housing	1
6	13-261-07	Plunger	2
7	13-261-06	Spring	2
8	13-261-05	Plug	2
9*	18-166	Adapter	4
10	13-261-04	Plug Cap (For Shipping Only)	6
11*	18-168	Elbow	2
12	14-203	Spring Centered Kit	One Per Bank
13	13-261-02	Plug	1
14	14-204	Linkage Kit (Includes Hitch Pin, Clevis Pin And Link)	2
15	13-673	Right Handle w/ Linkage	1
*	13-261	Hydraulic Valve (comes with all except * ones)	2-Bank

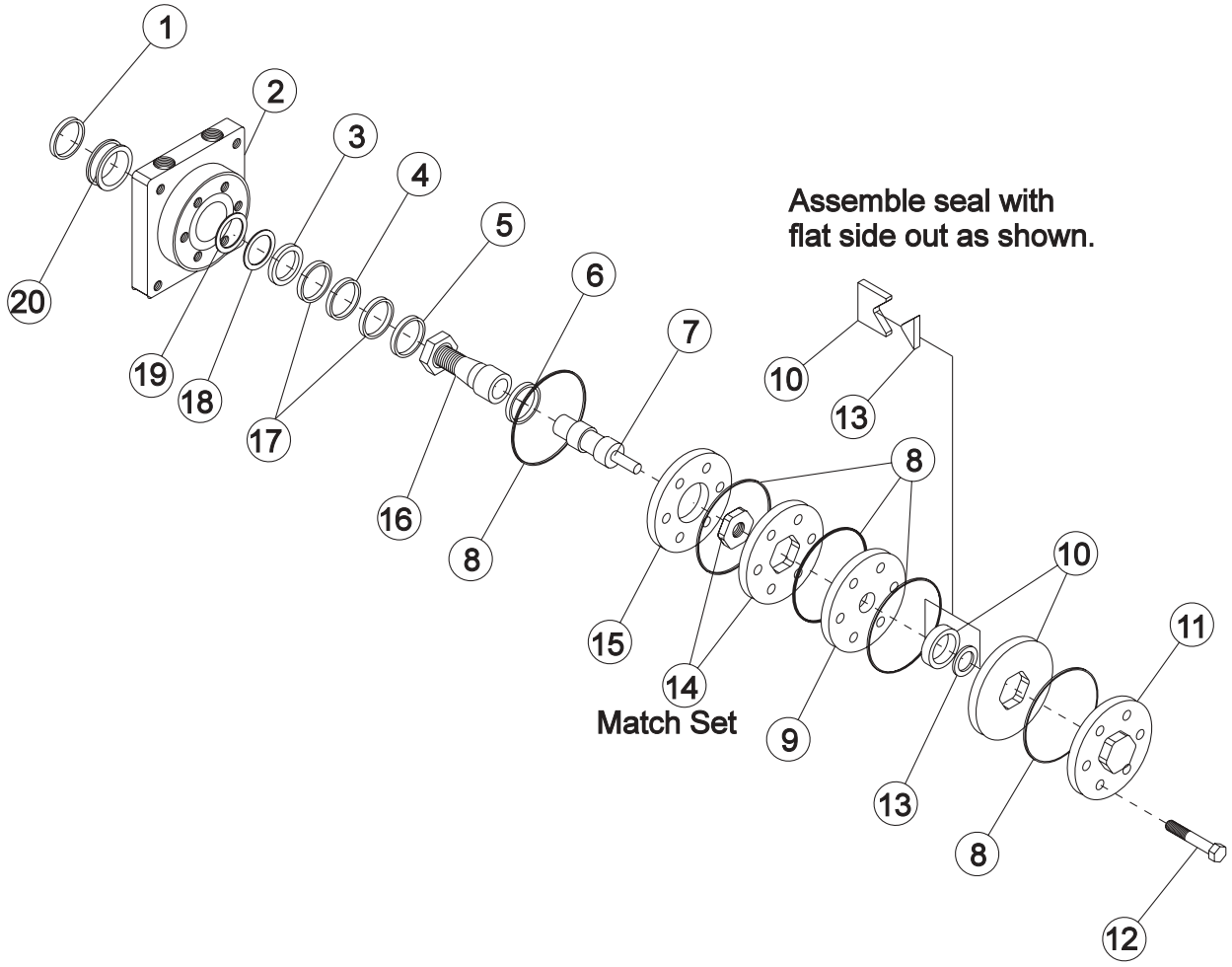
13-110 VARIABLE PUMP DRAWING



REF#	PART#	DESCRIPTION	QUANTITY
1	14-222	O-Ring	1
2	14-130	Ring	1
3	13-110-01	By-Pass Valve	1
4	14-115	Valve Plate	1
5†		Cylinder Block	1
6	14-084	Pump Shaft	1
7	14-131	Woodruff Key	1
8	13-110-05	Pipe Plug	4
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‡	14-219	Shim Pack Kit	1
17‡	14-263	Release Valve Spring	1
18‡	13-110-11	Relaese 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	Geroter Assembly	1
25*§		O-Ring	1
26£	14-235	Release Valve Cone	1
27£	14-234	Check Release Valve Spring	1
28£	14-219	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	14-128	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	14-217	Roller Bearing	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
†	Parts are not available. Replace with new unit.	
§	13-110-15	Charge Pump
¤	13-110-16	Check Valve Kit
£	14-214	Relief Valve Kit
‡	13-110-17	Relief Valve Kit

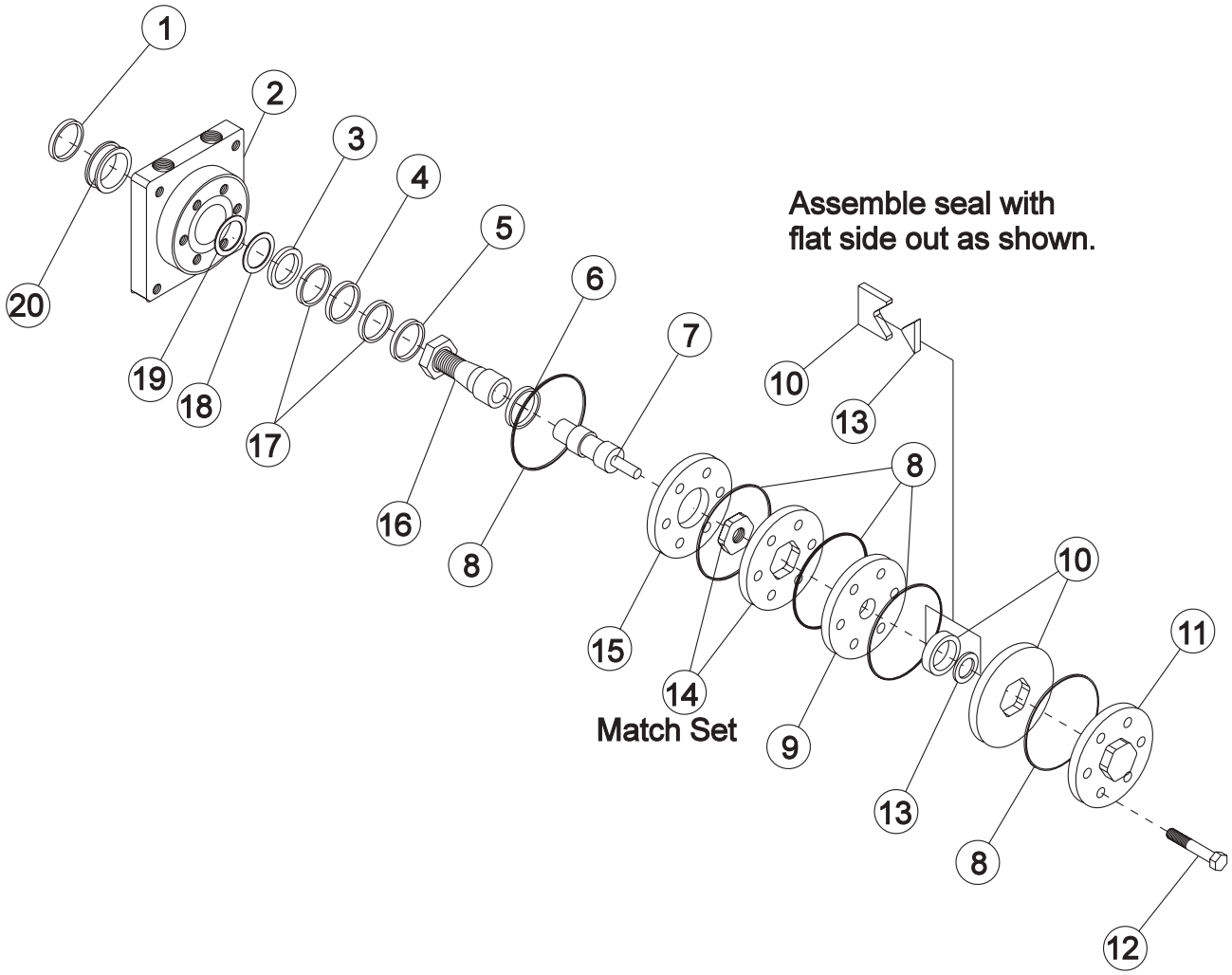
13-032 FRONT WHEEL MOTOR (4.9 C.I.) DRAWING



13-032 FRONT WHEEL MOTOR (4.9 C.I.) PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1*		Water & Dirt Seal	1
2		Service Housing Assembly	1
3*		Inner Seal	1
4	13-032-27	Thrust Bearing	1
5	13-032-28	Inner Bearing	1
6	13-032-29	Thrust Bearing	1
7	13-032-30	Drive Link	1
8*		Ring Seal	5
9	13-032-31	Manifold	1
10	13-032-32	Commulator Assembly(matched set)	1
11	13-032-33	End Cover	1
12	14-134	Bolt	7
13*		Commulator Seal(matches with #10)	1
14	13-032-34	Rotor Set (matched set)	1
15	13-032-35	Plate Wear	1
16	13-032-36	Coupling Shaft	1
	HWK-516-100	Woodruff Key $^{5}/_{16}$ x 1	1
	14-265	Nut 1 - 20	1
17	13-032-37	Thrust Washer	2
18*		Backup Washer	1
19*		Backup Washer	1
20	13-032-38	Outer Bearing	1
*	14-080	Seal Kit	1

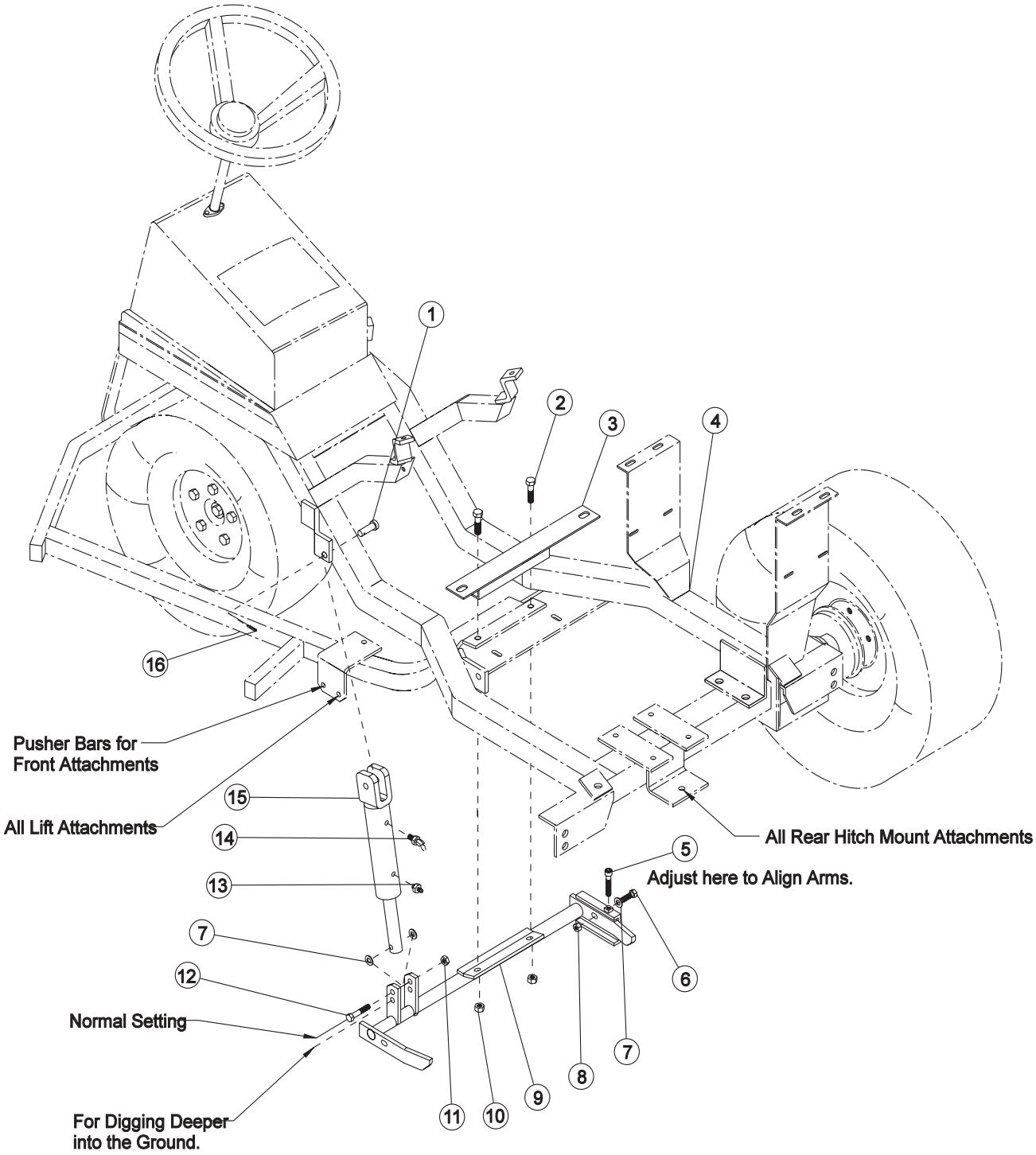
13-615 REAR WHEEL MOTOR (7.5 C.I.) DRAWING



13-615 REAR WHEEL MOTOR (7.5 C.I.) PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1*		Water & Dirt Seal	1
2	13-615-05	Service Housing Assembly	1
3*		Inner Seal	1
4	13-032-27	Thrust Bearing	1
5	13-032-28	Inner Bearing	1
6	13-032-29	Thrust Bearing	1
7	13-615-03	Drive Link	1
8*		Ring Seal	5
9	13-032-31	Manifold	1
10	13-032-32	Commulator Assembly(matched set)	1
11	13-032-33	End Cover	1
12	13-615-01	Bolt	7
13*		Commulator Seal(matches with #10)	1
14	13-615-02	Rotor Set (matched set)	1
15	13-032-35	Plate Wear	1
16	13-615-04	Coupling Shaft	1
	HWK-516-100	Woodruff Key $^{5}/_{16}$ x 1	1
	14-265	Nut 1 - 20	1
17	13-032-37	Thrust Washer	2
18*		Backup Washer	1
19*		Backup Washer	1
20	13-032-38	Outer Bearing	1
*	14-080	Seal Kit	1
	Ref# 2	Includes #4, #5, #17(2 req'd) and #20	

13-505 LIFT ASSEMBLY DRAWING



13-505 LIFT ASSEMBLY PARTS LIST

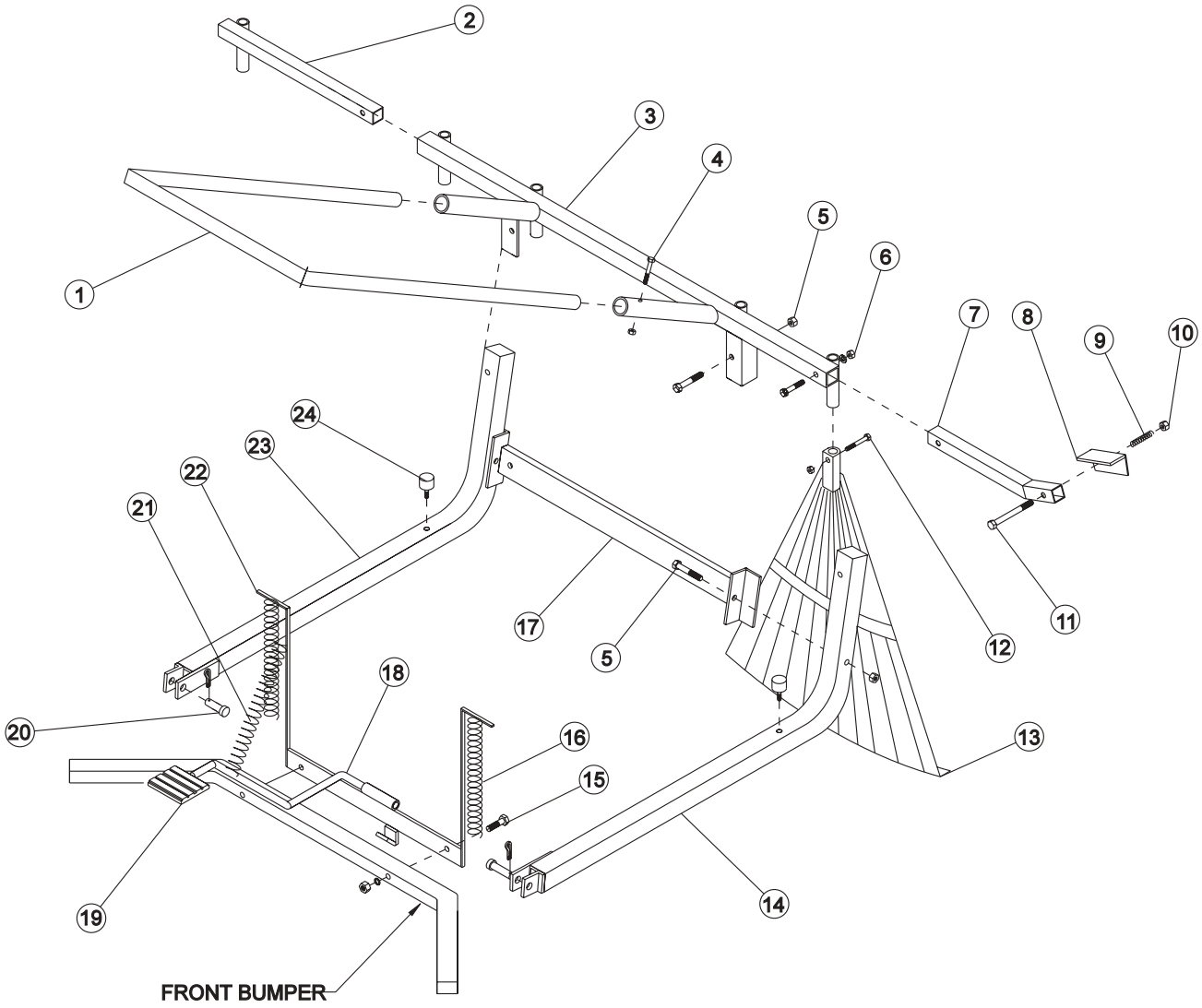
REF#	PART#	DESCRIPTION	QUANTITY
1	HCP-12-150	Clevis Pin 1/2 x 1 1/2	1
2	HB-716-14-150	Bolt 7/16 -14 x 1 1/2	2
3	13-004	Cooler Bracket	1
4		Main Frame (Part of Trap Rake)	
5	HSSQ-38-16-200	Square Head Set Screw 3/8 - 16 x 2	1
	HN-38-16	Nut 3/8 - 16	1
6	HB-38-16-125	Bolt 3/8 -16 x 1 1/4	1
7	HW-38	Washer 3/8	3
8	HNTL-38-16	Lock Nut 3/8 -16	1
9	13-146	Attachment Lift	1
10	HNTL-716-14	Lock Nut 7/16 -14	2
11	HNTL-38-16	Lock Nut 3/8	1
12	HB-38-16-200	Bolt 3/8 -16 x 2	1-16
13	18-166	Adapter	3
14	18-292	Elbow w/ Orfice	1
15	13-292	Hydraulic Cylinder	1
16	HP-18-100	Cotter Pin 1/8 x 1	1
	18-164	Hydraulic Hose	2
	14-253	Seal Kit for 13-292	

LIFT ASSEMBLY INSTALLATION

13-505 Lift Assembly comes standard on 13-550 Super Rake optional on 13-551 Super 2.

1. Raise and block machine so you can get under it safely.
2. Replace (Ref# 2)Bolts located toward rear of machine with two new 7/16 - 14 x 1 1/2 bolts. Place (Ref# 9)Attachment Lift under frame with cylinder tabs on left side of machine and the arms pointing to rear. Use two 7/16 - 14 lock nuts to hold in place.
3. Lower machine to ground.
4. Connect (Ref# 15)Cylinder to (Ref# 4)Frame using (Ref# 1)Clevis Pin and (Ref# 16)Cotter Pin with cylinder ports pointing up.
5. Bolt rod end of cylinder in top hole of (Ref# 9)Attachment Lift using (Ref# 12)Bolt , two (Ref# 7)Washers (one on each side of cylinder rod) and (Ref# 11)Locknut . Bolt head should be to the outside.
6. Before making the attachment adjustment, be sure tire pressure in all tires is the same. On a level surface, lower attachment to ground until one side touches. On the right side of the attachment lift there is an adjustment (Ref# 5 and 6)to level the arms.
7. If adjustable side is high, adjust (Ref# 5)Square Head Set Screw to lower attachment so that it is level with the ground. If adjustable side is low, adjust the Square Head Set Screw to raise attachment level to the ground. Tighten Lock Nut.
8. Put (Ref# 6)Bolts with one 3/8 washer through arm and bracket. The bolt head should be to the outside of machine, with lock nut on inside.
9. Put (Ref# 14)Elbow with orfice into port on clevis end of cylinder (pointing to rod end) and tighten. Put one (Ref# 13)Adapter in other port and tighten.
10. Remove two plugs from valve and replace with two adapters. Tighten both adapters.
11. To connect hoses, first connect tube end of hose to adapter on rod end of cylinder. Leave it loose. Route hose to bottom port of valve. Tighten both ends of hose. Then connect other hose (hose end) to elbow in cylinder and tube end to top port of valve. Tighten both ends of the hose.
12. Assemble valve handle to valve.
13. Sit on seat and start machine. Work the valve so lift will raise and lower. Do this until air works out and cylinder operates smoothly. At same time check for hydraulic leaks. Shut engine off.
14. Check hydraulic oil tank level. The level should be about 2" to 2 1/2" from top of fill neck when fluid is cold. Use SAE 10W-40 API Service SG motor oil.

13-395 FRONT MOUNT FAN RAKE DRAWING



13-395 FRONT MOUNT FAN RAKE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-403	Handle	1
2	13-477	Left Extension	1
3	13-396	Fan Rake Holder	1
4	HB-14-20-175	Bolt 1/4 - 20- 1 3/4	2
	HNCL-14-20	Center Lock Nut 1/4 - 20	2
5	HB-38-16-225	Bolt 3/8 - 16 x 2 1/4	4
	HNCL-38-16	Center Lock Nut 3/8 -16	4
6	HB-516-18-175	Bolt 5/16 - 18 x 1 3/4	2
	HWL-516	Lockwasher 5/16	2
	HN-516-18	Nut 5/16 - 18	2
7	13-478	Right Extension	1
8	13-402	Edge Rake Holder	1
9	11-055	Compression Spring	1
10	HNTL-38-16	Lock Nut 3/8 - 16	1
11	HB-38-16-375	Bolt 3/8 - 16 x 3 3/4	1
12	HB-14-20-200	Bolt 1/4 - 20 x 2	6
	HNCL-14-20	Center Lock Nut 1/4 - 20	6
13	13-310	Rake	6
14	13-472	Right Pusher Bar	1
15	HB-38-16-250	Bolt 3/8 - 16 x 2 1/2 (part of Trap Rake)	2
	HW-38	Washer 3/8 (part of Trap Rake)	2
	HNTL-38-16	Lock Nut 3/8 -16	2
16	21-445	Spring	2
17	13-474	Cross Brace	1
18	13-238	Release Lever	1
19	15-015	Pedal Pad	1
20	HCP-12-150	Clevis Pin 1/2 x 1 1/2	2
	HHP-18	Bridge Pin 1/8	2
21	11-050	Spring	1
22	13-172	Plow Lift Holder	1
	20-019	Bushing	2
	HG-14-28-180	Grease Fitting 1/4 - 28 x 180°	1
23	13-473	Left Pusher Bar	1
24	15-013	Rubber Bumper	2

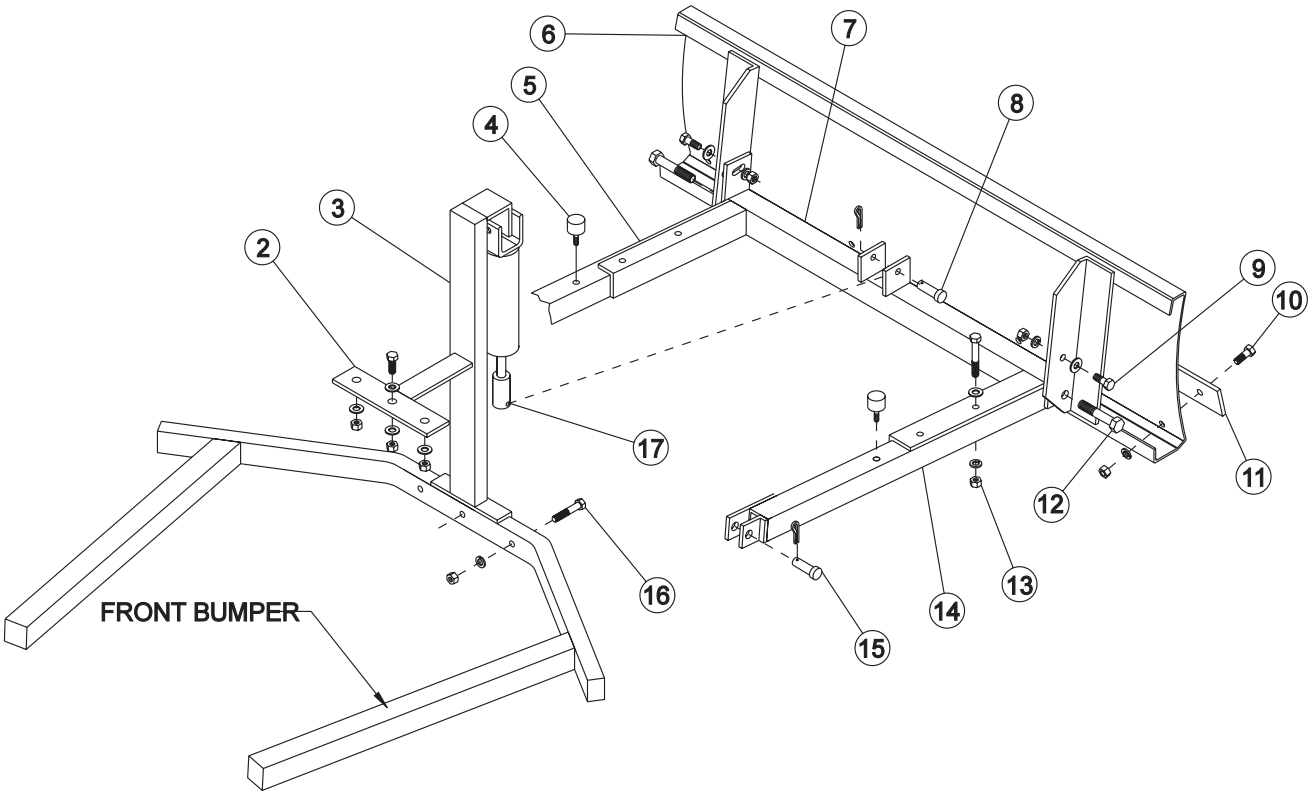
RAKE INSTALLATION

This Fan Rake Kit fits on the front bumper of the Super Rake. Any Current pusher bars must be removed from the machine. If the Sand Plow is being replaced, the pedal release lever and plow lift holder can remain on the bumper. Simply disconnect the lower end of the (Ref# 16)Springs from the plow cross bar and leave the holder on the bumper. If the Super Rake has no attachments on the front end, bolt (Ref# 22)Plow Lift holder to the bumper using the same fasteners that hold the bumper to the underside of the console(nose cone).

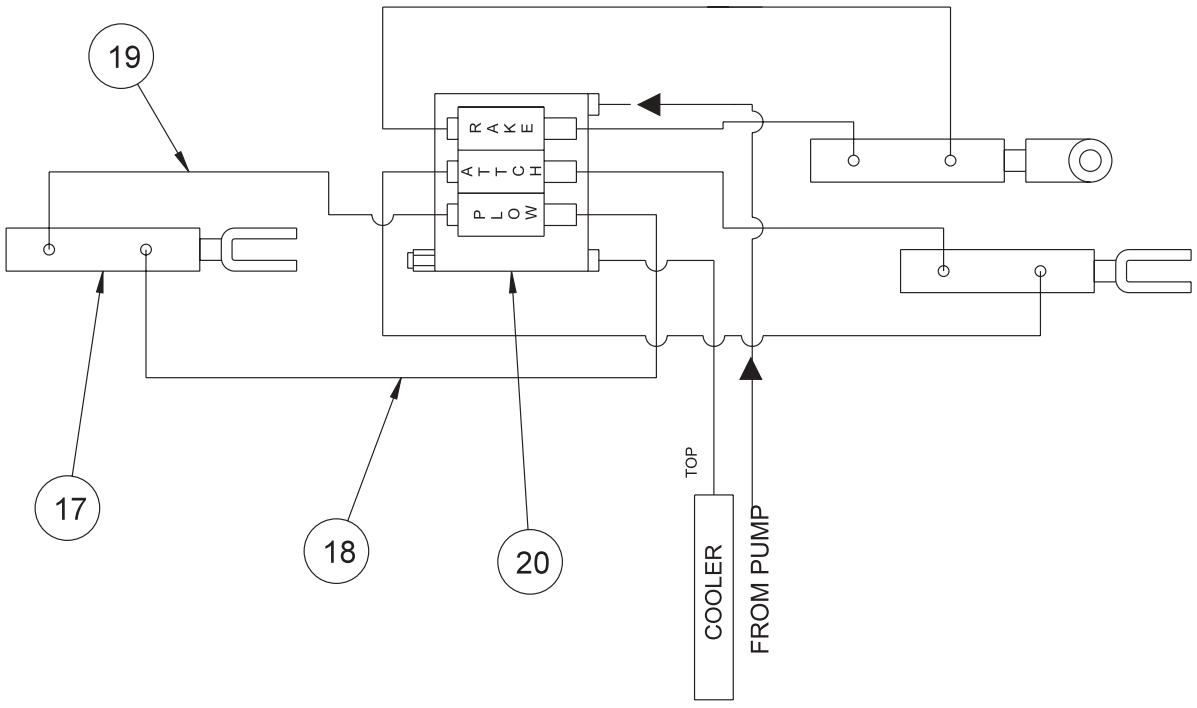
1. Install (Ref# 23 & 14)Right and Left Pusher Bars to frame tabs using (Ref# 20)Clevis Pins and Bridge Pins.
2. Put (Ref# 17)Cross Bar in place and loosely hold it together with (Ref# 5)Bolts and Nuts.
3. Attach (Ref# 16)Springs to the holes in the Cross Brace.
4. If the fan rake bars are not pre-assembled, place the center (Ref# 3)Fan Rake Holder over the ends of Pusher Bars. Tighten the cross brace and the fan rake holder to the pusher bars with (Ref# 5)Bolts and Nuts.
5. Insert (Ref# 2 & 7)Extensions in the ends of the center holder. Secure them with (Ref# 6)Fasteners.
   (The straight (Ref# 2)Extension goes in the left end, the bent (Ref# 7)Extension goes in the right end).
6. Fasten (Ref# 8)Edge Rake Holder to the extension with (Ref# 11)Bolt, (Ref# 9) Spring and (Ref# 10)Lock Nut.
7. Fit the six (Ref# 13)Rakes over the holder tubes and secure them with (Ref# 12)Bolts and Nuts.
8. Insert (Ref# 1)Handle into the tube sockets of the center holder, lining up the desired holes and tightening with (Ref# 4)Bolts and Nuts.

Test the installation by lifting the rake unit until it engages the hook of (Ref# 18)Pedal Release Lever. Press down on the Pedal release lever. Pressing down on the pedal lever should allow the Rakes to drop and be guided by (Ref# 1)Handle for depth of raking. Lifting on the handle should raise the rakes to engage the hook again until the rakes are needed again.

13-413 HYDRAULIC SAND PLOW WITH LIFT DRAWING



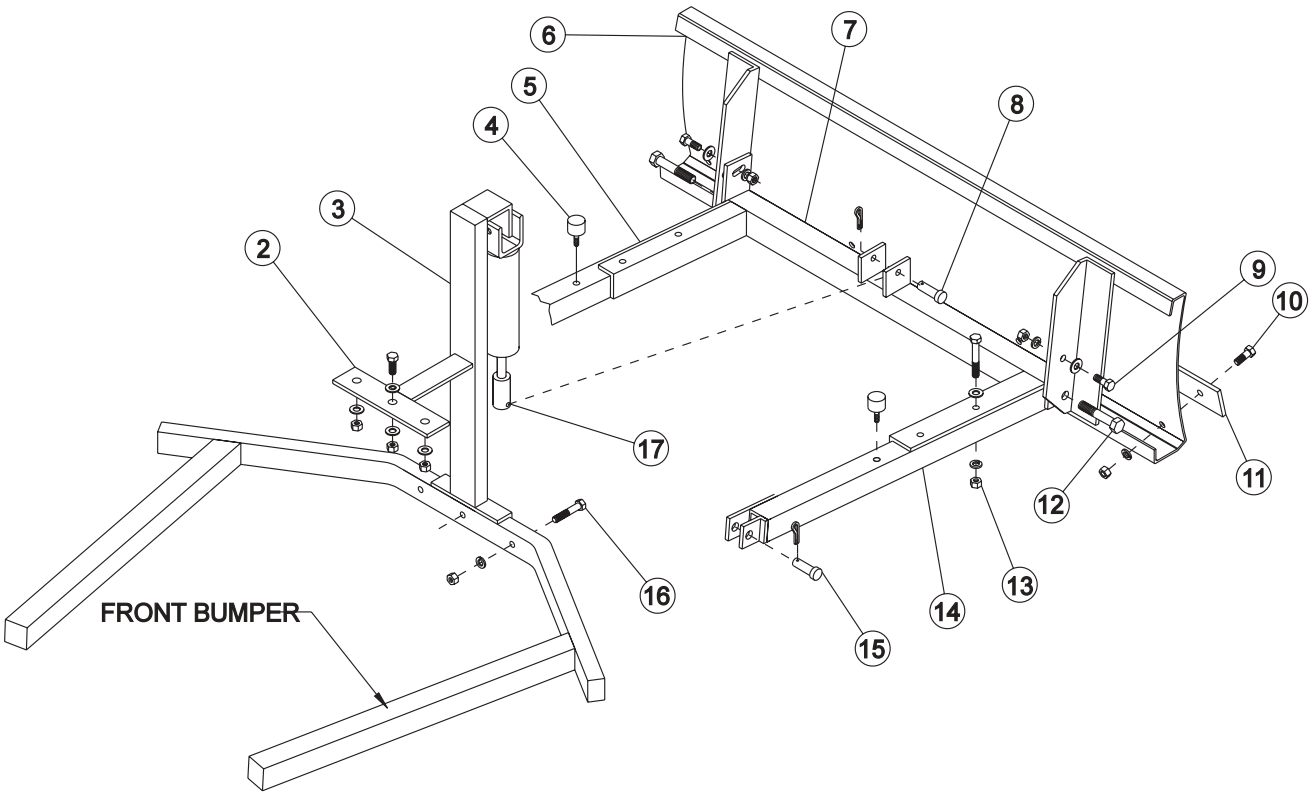
HYDRAULIC VALVE PLUMBING



13-413 HYDRAULIC SAND PLOW WITH LIFT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
2	13-325	Brace	1
	HB-38-16-100	Bolt 3/8 - 16 x 1	1
	HW-38	Washer 3/8	4
	HNCL-38-16	Center Lock Nut 3/8 -16	3
3	13-407	Cylinder Bracket	1
4	15-013	Rubber Bumper	2
5	13-168	Left Pusher Bar	1
6	13-352	Hydraulic Sand Plow	1
7	13-322	Lift Bar	1
8	HCP-12-200	Clevis Pin 1/2 x 2	1
	HHP-18	Bridge Pin 1/8	1
9	HB-38-16-125	Bolt 3/8 -16 x 1 1/4	2
	HW-38	Washer 3/8	2
	HWL-38	Lockwasher 3/8	2
	HN-38-16	Nut 3/8 -16	2
10	HB-38-16-100	Bolt 3/8 -16 x 1	4
	HWL-38	Lockwasher 3/8	4
	HN-38-16	Nut 3/8 -16	4
11	13-167	Wear Blade	1
12	HB-12-13-300	Bolt 1/2-13 x 3	2
	HWL-12	Lockwasher 1/2	2
	HN-12-13	Nut 1/2 - 13	2
13	HB-38-16-225	Bolt 3/8 -16 x 2 1/4	4
	HW-38	Washer 3/8	4
	HNCL-38-16	Center Lock Nut 3/8 - 16	4
14	13-169	Right Pusher Bar	1
15	HCP-12-150	Clevis Pin 1/2 x 1 1/2	2
	HHP-18	Bridge Pin 1/8	2
16	HB-38-16-250	Bolt 3/8 -16 x 2 1/2 (part of Trap Rake)	2
	HWL-38	Lockwasher 3/8 (part of Trap Rake)	2
	HN-38-16	Nut 3/8 -16 (part of Trap Rake)	2
17	13-406	Hydraulic Cylinder	1
	14-267	Seal Kit	1
	23-141	Union Adapter	1
	HNJ-58-18	Jam Nut 5/8 - 18	1
	23-018	O-ring Elbow	1
	13-324	Ram Extension	1
	HCP-58-175	Clevis Pin 5/8 x 1 1/4	1
	HHP-18	Bridge Pin 1/8	1
18	13-444	Hydraulic Hose 55"	1
19	60-368	Hydraulic Hose 64"	1
20	13-355	3 Bank Hydraulic Valve	1

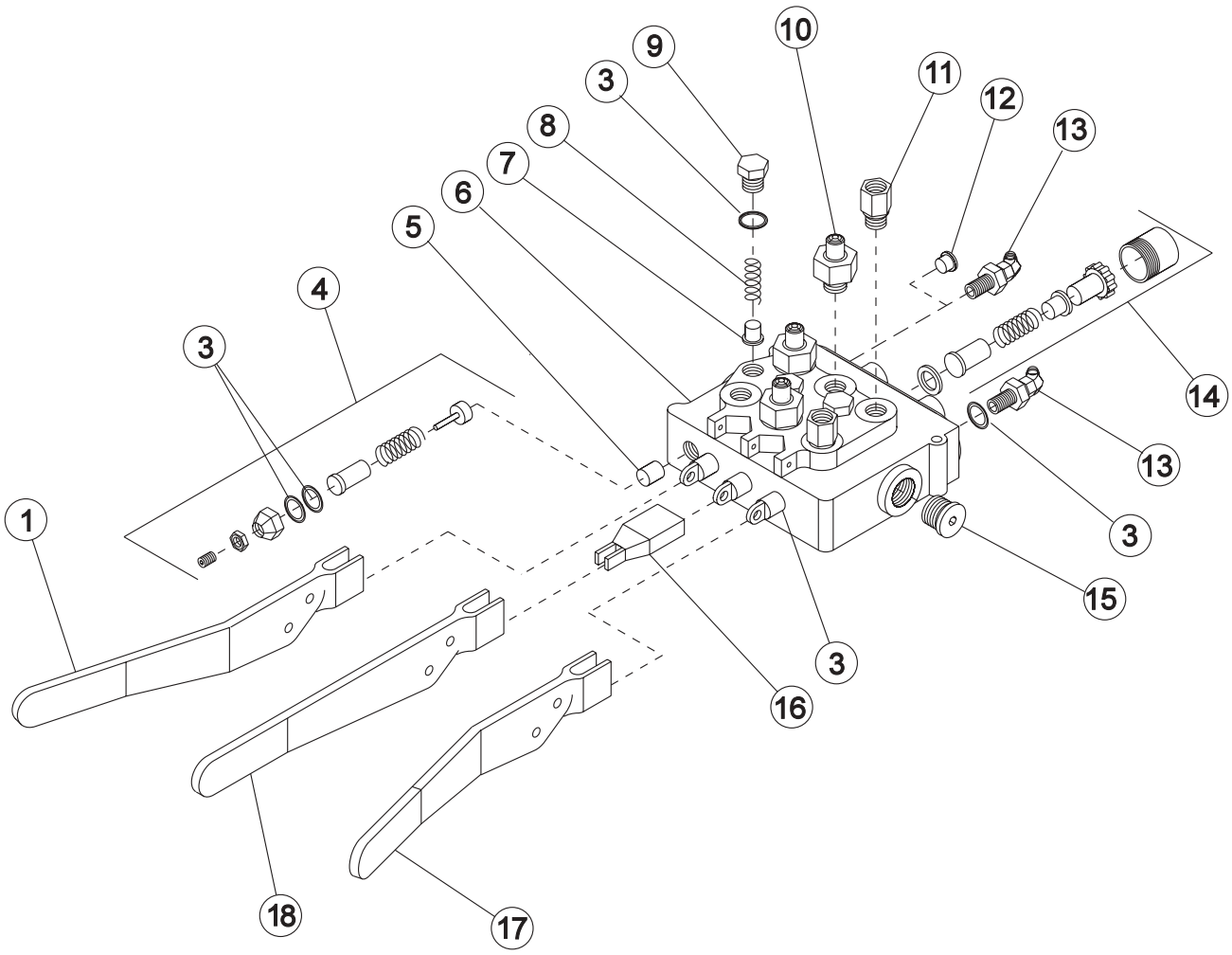
13-413 HYDRAULIC SAND PLOW WITH LIFT DRAWING



13-413 HYDRAULIC SAND PLOW WITH LIFT INSTRUCTIONS

1. Loosely bolt (Ref# 2)Brace, to (Ref# 3)Cylinder Bracket with the brace on top. The bolt and washer are on top; the washer and nut are on the bottom.
2. Remove two bolts that go through the bumper and bumper brace. Use these to bolt the cylinder bracket to the bumper.
3. Place the cylinder bracket to the bumper so that the brace will fit over the ends of the bolt (ones holding the top ends of the bumper brace). Fasten it to the bolts with a washer and a center lock nut on each side. Bolt the bottom of the Cylinder Bracket to the bumper with the bolts from above. Tighten all fasteners.
4. Fasten (Ref# 5 & 14) Pusher Bars to the (Ref# 6)Sand Plow, as shown. Leave loose.
5. Fasten (Ref# 7)Lift Bar to the Pusher Bars as shown. Leave loose.
6. Put the Plow in front of the Trap Rake and slide it back so that the Pusher Bars can be connected to the tabs on the frame with (Ref# 15)Clevis Pin and Bridge Pin.
7. Tighten the bolts and nuts holding the left bar to the pusher bars.
8. Set the plow at the desired angle and tighten the bolts and nuts holding it to the pusher bars.
9. Attach the hydraulic cylinder to the cylinder bracket with the $^{5}/_{8}$ x $1^{3}/_{4}$ clevis pin and one $^{1}/_{8}$ bridge pin. The ports on the cylinder must point to the left side of the machine.
10. Thread the jam nut and the ram extension onto the cylinder rod end and leave them loose to find the required length.
11. Either extend the rod or raise the plow up and fasten them together with the $^{1}/_{2}$ x 2 clevis pin and $^{1}/_{8}$ bridge pin.
12. Put the handles on the 3-bank valve with the straight one in the middle and the bent ones pointing to the outsides.
13. Mark the hoses on the 2-bank valve that is on the machine so that they can be put in the same position on the 3-bank valve.
14. Disconnect the negative (-) ground battery cable from the battery. Place a drain pan under the valve in the machine. Be sure engine is cool before disconnecting the hoses. Remove the 2-bank valve.
15. Remove the fittings from the 2-bank valve and put them into the 3-bank valve (with the inside bank for the sand plow). Put the two new (23-018)O-ring Elbows, into the ports for the diesel trap rake or the two (23-011)Adapters for the gas trap rake.
16. Put the 3-bank valve into the machine and reconnect the hoses. The outside bank is the rake lift; middle bank is the attachment lift; the inside bank is for the sand plow.
17. Drill a $^{3}/_{8}$ diameter hole in the left floorboard, 12 inches forward from the rear edge and $3^{1}/_{2}$ inches down from the edge.
18. Put the o-ring elbow into the top port of the cylinder and the union adapter into the bottom port. Both fittings should point down and towards the rear of the machine. Do not tighten fittings at this time.
19. Connect the two hoses to the cylinder using the ridge end first. Connect (13-444)hose (55" long) to the bottom of the cylinder and the bottom of the valve. Connect (60-368)hose (64" long) to the top of the cylinder to the top of the valve. Route the hose along the left side floorboard and up to the valve being careful to leave clearance by moving parts. Tighten all fittings.
20. Secure the two hoses to the inside of the left floorboard using (60-501)hose strap. Place the $^{5}/_{16}$ - 18 x $1^{1}/_{2}$ truss machine screw through the hole you drilled with one hose on each side of the screw. Place the hose strap over the screw and hoses, tighten $^{5}/_{16}$ - 18 center locknut. Use one nylon tie about half way to the cylinder and the other about half way to the valve.
21. Reconnect the negative (-) ground battery cable to battery.
22. 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.
23. Double check all fasteners and fittings, be sure they are tight.
24. Check the hydraulic oil level. The level should be 2" to $2^{1}/_{2}$" from the top of the fill neck. If more is needed, use SAE 10W-40 API service SG motor oil.

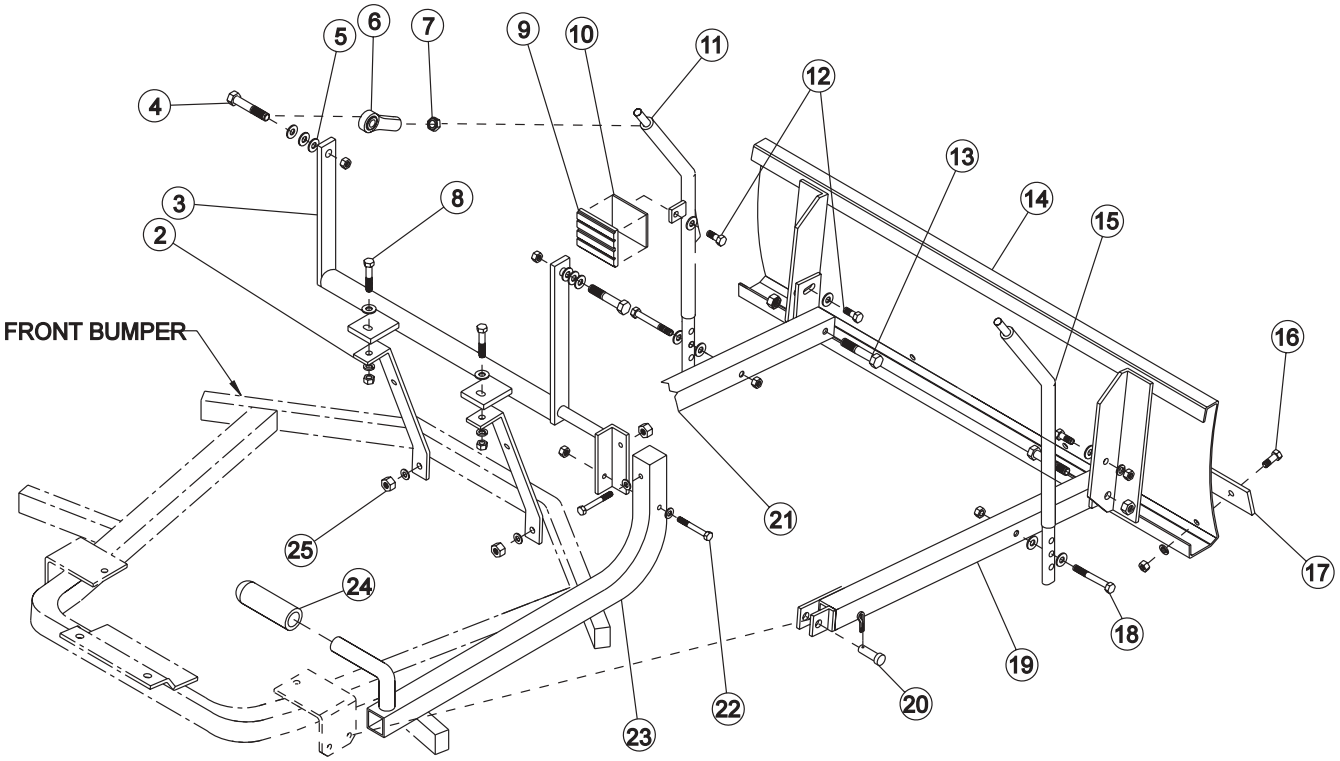
13-355 HYDRAULIC 3-BANK VALVE DRAWING



13-355 HYDRAULIC 3-BANK VALVE PARTS LIST

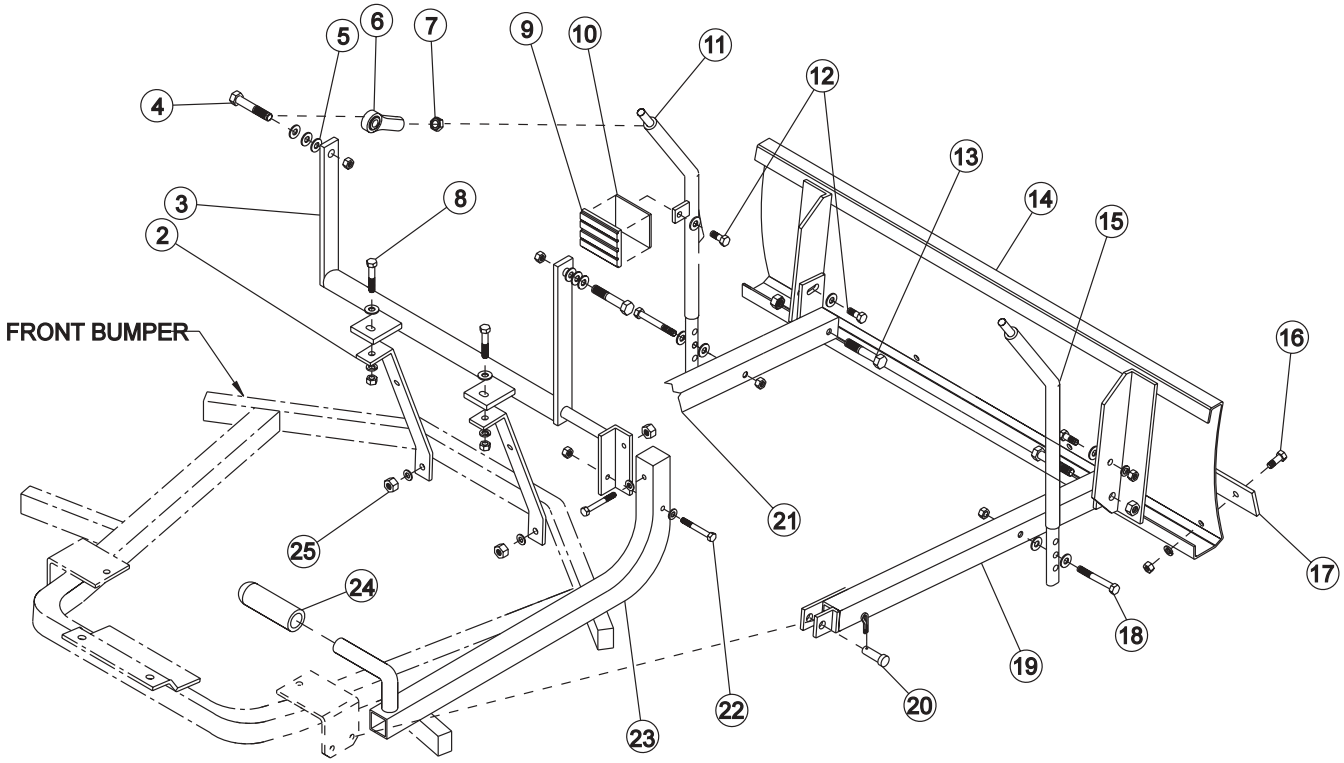
REF#	PART#	DESCRIPTION	QUANTITY
1*	13-672	Left Handle w/ Linkage	1
3	14-205	Seal Kit	1
4	14-106	Relief Assembly Kit	1
5	13-261-03	H.R. Plug	1
6	13-355-01	Housing	1
7	13-261-07	Plunger	3
8	13-261-06	Spring	3
9	13-261-05	Plug	3
10*	18-166	Adapter	4
11*	23-011	Adapter	2
12	13-261-04	Plug Cap	8(shipping only)
13*	18-168	Elbow	2
14	14-203	Spring Centered Kit	1 per Bank
15	13-261-02	Plug	1
16	76-025	Linkage Kit (includes Hitch Pin, Clevis Pin and Link)	3
17	13-673	Right Handle w/ Linkage	1
18	16-671	Handle w/ Linkage	1
	13-355	Hydraulic Valve 3-Bank(includes all except *)	1

13-644 SAND PLOW DRAWING



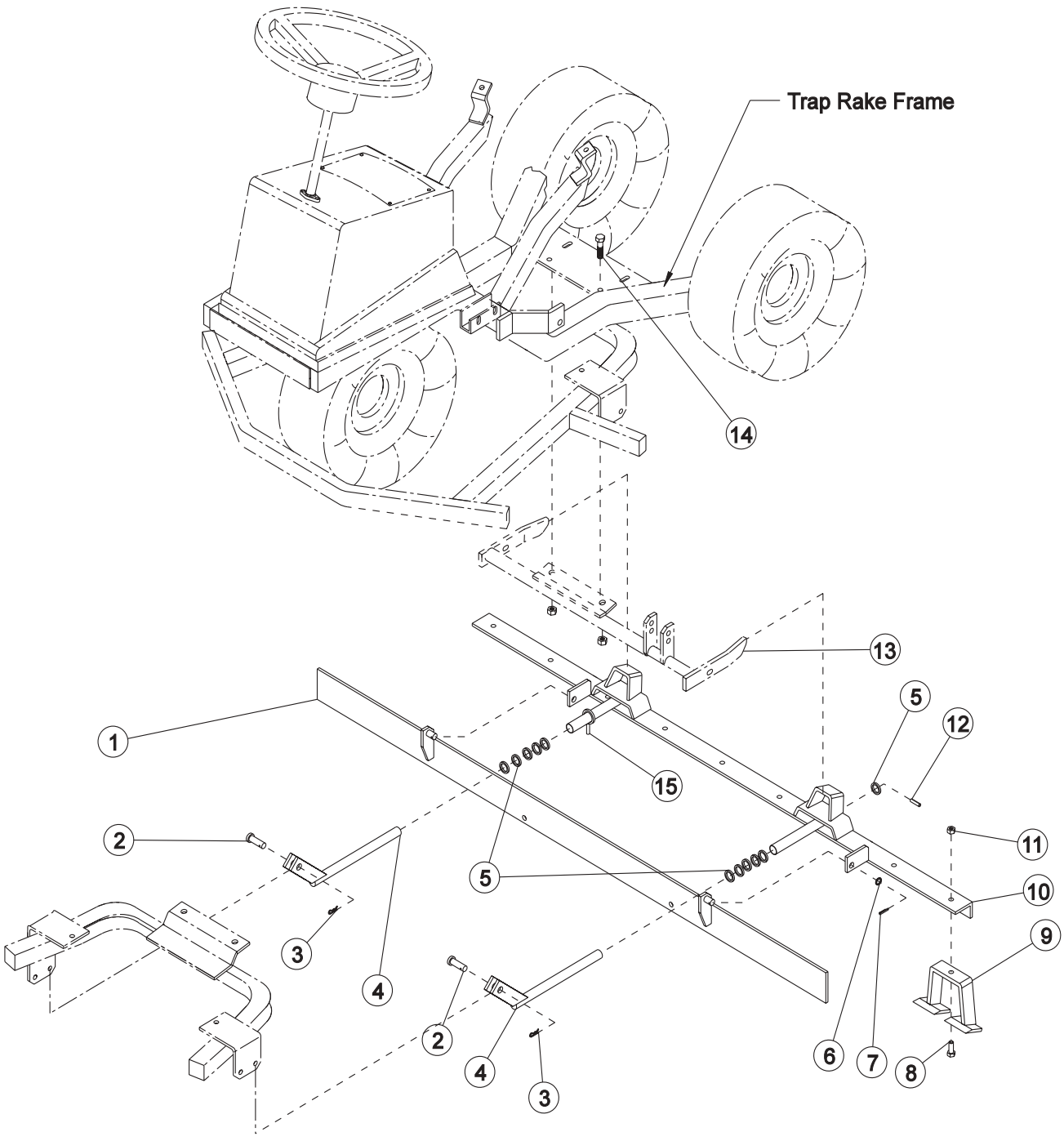
REF#	PART#	DESCRIPTION	QUANTITY
2	13-208	Bumper Brace	2
3	13-642	Lift Handle	1
4	HB-12-13-200	Bolt 1/2 - 13 x 2	2
	HNCL-12-13	Center Lock Nut 1/2 - 13	2
5	HMB-12-14	Machine Bushing 1/2 x 14GA	6
6	80-006	Rod End	2
7	HNJ-12-20	Jam Nut 1/2 - 20	2
8	HB-38-16-350	Bolt 3/8 - 16 x 3 1/2	2
	HW-38	Washer 3/8	2
	HNTL-38-16	Top Lock Nut 3/8 - 16	2
9	15-015	Pedal Pad	1
10	16-062	Pedal Pad Plate	1
11	13-643	Left Lift Rod	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-12-13-275	Bolt 1/2 - 13 x 2 3/4	2
	HNCL-12-13	Center Lock Nut 1/2 -13	2
14	27-017	Sand Plow Blade	1
15	27-073	Right Lift Rod	1
16	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
17	13-167	Wear Blade	1
18	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
19	13-169	Right Pusher Bar	1
20	HCP-12-150	Clevis Pin	2
	HHP-18	Bridge Pin 1/8	2
21	13-168	Left Pusher Bar	1
22	HB-516-18-225	Bolt 5/16 - 18 x 2 1/4	2
	HW-516	Washer 5/16	2
	HNTL-516-18	Lock Nut 5/16 -18	2
23	13-645	Handle	1
24	15-019	Hand Grip	1
25	HB-38-16-250	Bolt 3/8- 16 x 2 1/2	2
	HW-38	Washer 3/8	2
	HNTL-38-16	Top Lock Nut 3/8 -16	2

13-644 SAND PLOW DRAWING



1. Disconnect the negative (-) ground battery cable from the battery.
2. Remove the four tapping screws holding the console cover to the console and remove the cover.
3. Remove the nuts from (Ref# 8)Bolts. To hold the bolts you will have to go through the opening in the console. Remove (Ref# 25 and 2)Hardware and Bumper Brace.
4. Place the tabs on (Ref# 3)Lift Handle over the (Ref# 8)Bolts and the angle on the Lift Handle to the right side of the machine. Next put Bumper Brace over the bolts with a washer and a center lock nut. Leave hardware loose at this time. Put (Ref# 25)Hardware back through the bumper and bumper brace. Tighten all four bolts at this time.
5. Replace the Console Cover.
6. Bolt (Ref# 23)Handle to (Ref# 3)Lift Handle using (Ref# 22)Bolts, Washers and Lock Nuts.
7. Put (Ref# 24)Hand Grip onto the handle.
8. Assemble (Ref# 19 & 21)Pusher Bars to (Ref# 13)Plow using (Ref# 14 & 15)Hardware. There are two holes to bolt (Ref# 15)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.
9. Put (Ref# 9 & 10)Pedal Pad and Pedal Pad Plate into (Ref# 11)Left Lift Rod using (Ref# 15)Hardware.
10. Put (Ref# 6)Rod Ends onto (Ref# 11 & 12)Lift Rods with (Ref# 7)Jam Nuts first. Adjust to equal lengths. Bolt Lift Rods (the one with the pedal to the left side of the machine) to lift arms with the ball joints to the outside. Bolt from the outside with (Ref# 4)Hardware with 3 $^{1}/_{2}$" machine bushing between each rod end and lift arm.
11. Check to make sure level to hard surface after final assembly.
12. Slide plow under machine and connect to machine as shown. Use (Ref# 20)Clevis Pin and Cotter Pin.
13. Connect (Ref# 11 & 12)Lift Rods to (Ref# 19 & 21)Pusher Bars using (Ref# 18)Hardware as shown. The three holes in the lift rods are for adjusting the position of 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.
14. Reconnect the negative (-) ground battery cable to the battery.

13-107 INFIELD SCARIFIER DRAWING



13-107 INFIELD SCARIFIER PARTS LIST

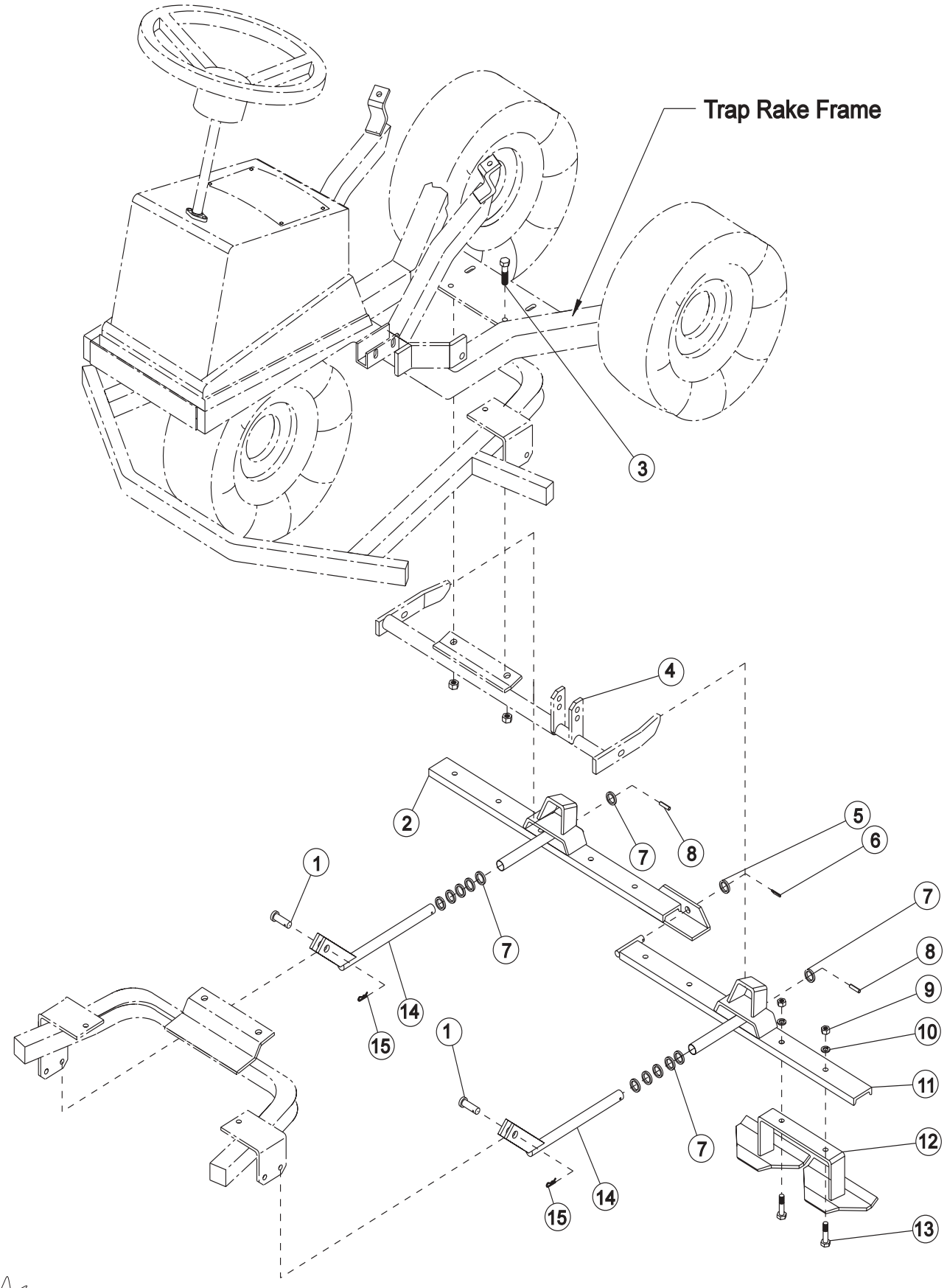
REF#	PART#	DESCRIPTION	QUANTITY
1	13-117	Grader Blade	1
2	HCP-12-150	Clevis Pin 1/2 x 1 1/2	2
3	HHP-18	Bridge Pin 1/8	3
4	13-115	Hitch (Pistols)	2
5	HMB-34-10	Machine Bushing 3/4 x 10GA	12
6	HMB-12-14	Machine Bushing 1/2 x 14GA	4
7	HP-18-100	Cotter Pin 1/8 x 1	1
8	HB-38-16-100	Bolt 3/8 - 16 x 1	9
9	13-114	Digger Blade	9
10	13-113	Frame	1
11	HNCL-38-16	Center Lock Nut 3/8 - 16	9
12	HRP-14-100	Roll Pin 1/4 x 1	2
13	Attachment Lift (part of Lift Assembly)		
14	HB-716-14-150	Bolt 7/16 - 14 x 1 1/2	2
	HNTL-716-14	Lock Nut 7/16 -14	2
15	19-217	Transportation Hook	1

INFIELD SCARIFIER INSTALLATION

Optional Lift Assembly 13-505 must be installed before installing this unit on Super 2.

1. Slide the Transportation Hook over the right tube of the (Ref# 2) Frame. Insert (Ref# 12) Bridge Pin in hook for use when required later.
2. Using nine (Ref# 10) Bolts and (Ref# 7) Nuts attach (Ref# 8) Digger Blades to (Ref# 2) Frame.
3. Insert (Ref# 13) Hitch (pistols) into tubes of Frame with up to five (Ref# 5) Machine Bushings in front and one bushing in the rear of tube. Secure pistols with (Ref# 6) Roll Pins. Check spacing before driving in roll pin all the way. For more tire clearance, machine bushings may be moved from front to rear.
4. Attach (Ref# 1)Grader Blade to (Ref# 2) Frame as shown using (Ref# 9) Machine Busing and (Ref# 11) Cotter Pin.
5. Lift (Ref# 1 and 2) Grader Blade/Frame Unit and hook pockets over the arms of (Ref# 4) Attachment Lift.
6. Attach pistols to the tabs of the trap rake frame undercarriage in the rear holes using (Ref# 14) Clevis Pins, (Ref# 12) Machine Bushings and (Ref# 14) Bridge Pins.
7. Turn machine on and test for proper operation.

13-116 WEED CULTIVATOR DRAWING



13-116 WEED CULTIVATOR PARTS LIST

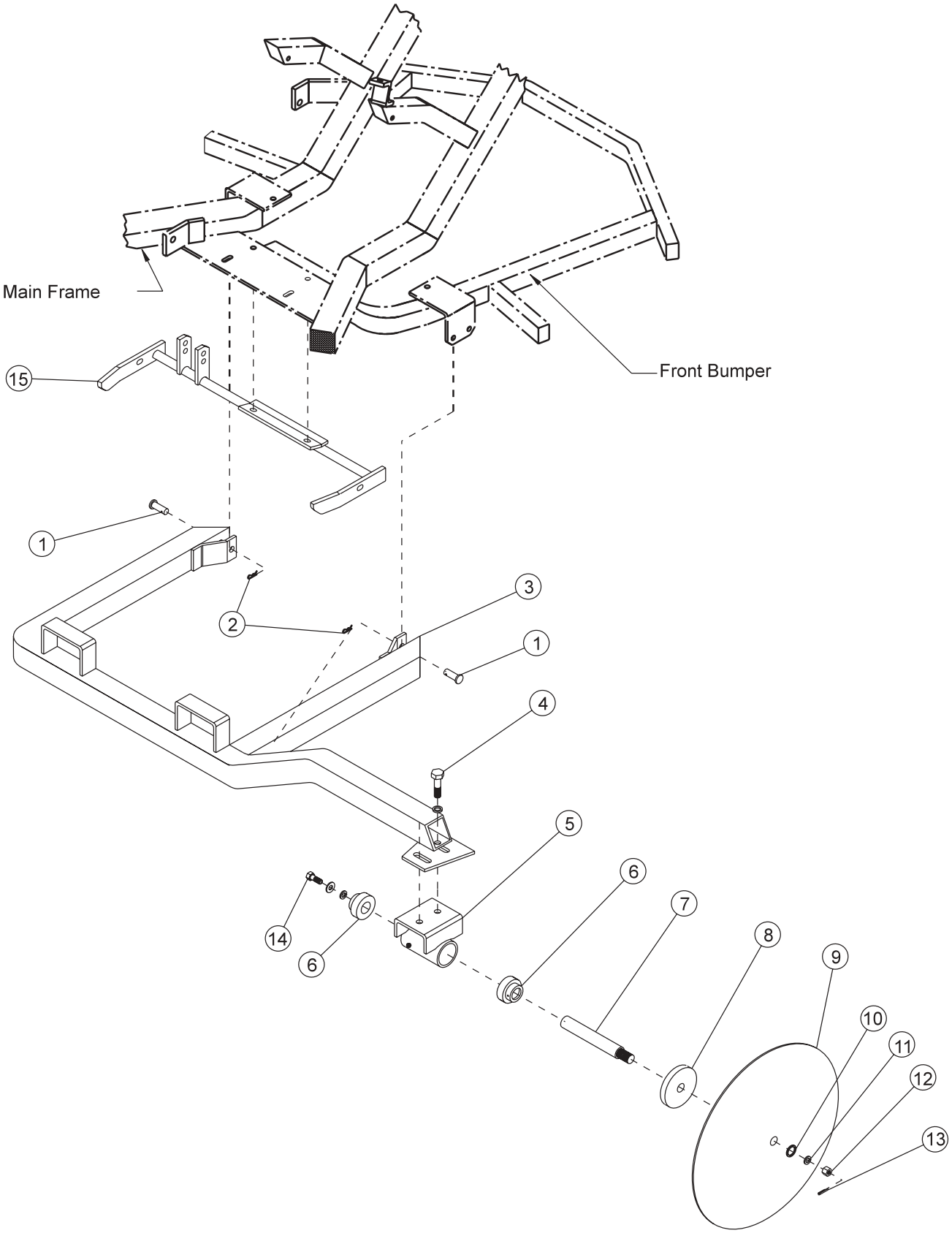
REF#	PART#	DESCRIPTION	QUANTITY
1	HB-716-14-150	Bolt 7/16 - 14 x 1 1/2 (Part of Trap Rake)	2
2		Main Frame (Part of Trap Rake)	1
3	HNTL-716-14	Lock Nut 7/16 - 14 (Part of Trap Rake)	2
4		Attachment Lift (part of Lift Assembly)	1
	HSSQ-38-16-200	Square Head Set Screw 3/8 -16 x 2	1
	HN-38-16	Nut 3/8 - 16	1
	HB-38-16-125	Bolt 3/8 - 16 x 1 1/4	1
	HW-38	Washer 3/8	1
	HNTL-38-16	Lock Nut 3/8 - 16	1
5	HMB-12-14	Machine Bushing 1/2 x 14GA	1
6	HP-18-100	Cotter Pin 1/8 x 1	1
7	HMB-34-10	Machine Bushing 3/4 x 10GA	12
8	HRP-14-100	Roll Pin 1/4 x 1	2
9	HN-38-16	Nut 3/8 - 16	8
10	HWL-38	Lockwasher 3/8	8
11	13-120	Left Frame Cultivator	1
12	13-096	Blade	4
13	HB-38-16-125	Bolt 3/8 - 16 x 1 1/4	8
14	13-115	Hitch (Pistols)	2
15	HHP-18	Bridge Pin 1/8	2
16	HCP-12-150	Clevis Pin 1/2 x 1 1/2	2
17	13-121	Right Frame Cultivator	1

INSTALLATION WEED CULTIVATOR

Optional Lift Assembly 13-505 must be installed before installing this unit on Super 2

1. Attach (Ref# 11 and 17) Cultivator Frames together at center pin using (Ref# 5) Machine Bushings and (Ref# 6) Cotter Pin.
2. Bolt four (Ref# 12) Blade Assemblies to Frames using eight (Ref# 13) Bolts, (Ref# 10) Lockwashers and (Ref# 9) Nuts. The blade points should angle down and forward.
3. Insert (Ref# 14) Hitch, (pistols) into tubes of Frames ((Ref# 11 and 17) with up to five (Ref# 7) Bushings in front and one Bushing in the rear of tube. Secure pistols with (Ref# 8) Roll Pins. Check spacing before driving roll pin in all the way. For more tire clearance, the machine bushing may be moved from front to rear.
4. Slide pockets of Cultivator Frames over arms of (Ref# 4) Attachment Lift.
5. Hook pistols up to tabs under trap rake frame by using rear holes with (Ref# 16) Clevis Pins and (Ref# 15) Bridge Pin.
6. Start engine to test operation of Cultivator. Raise and lower attachment checking for leaks and to see whether they are fairly level.

13-199 EDGER KIT DRAWING



13-199 EDGER KIT PARTS LIST

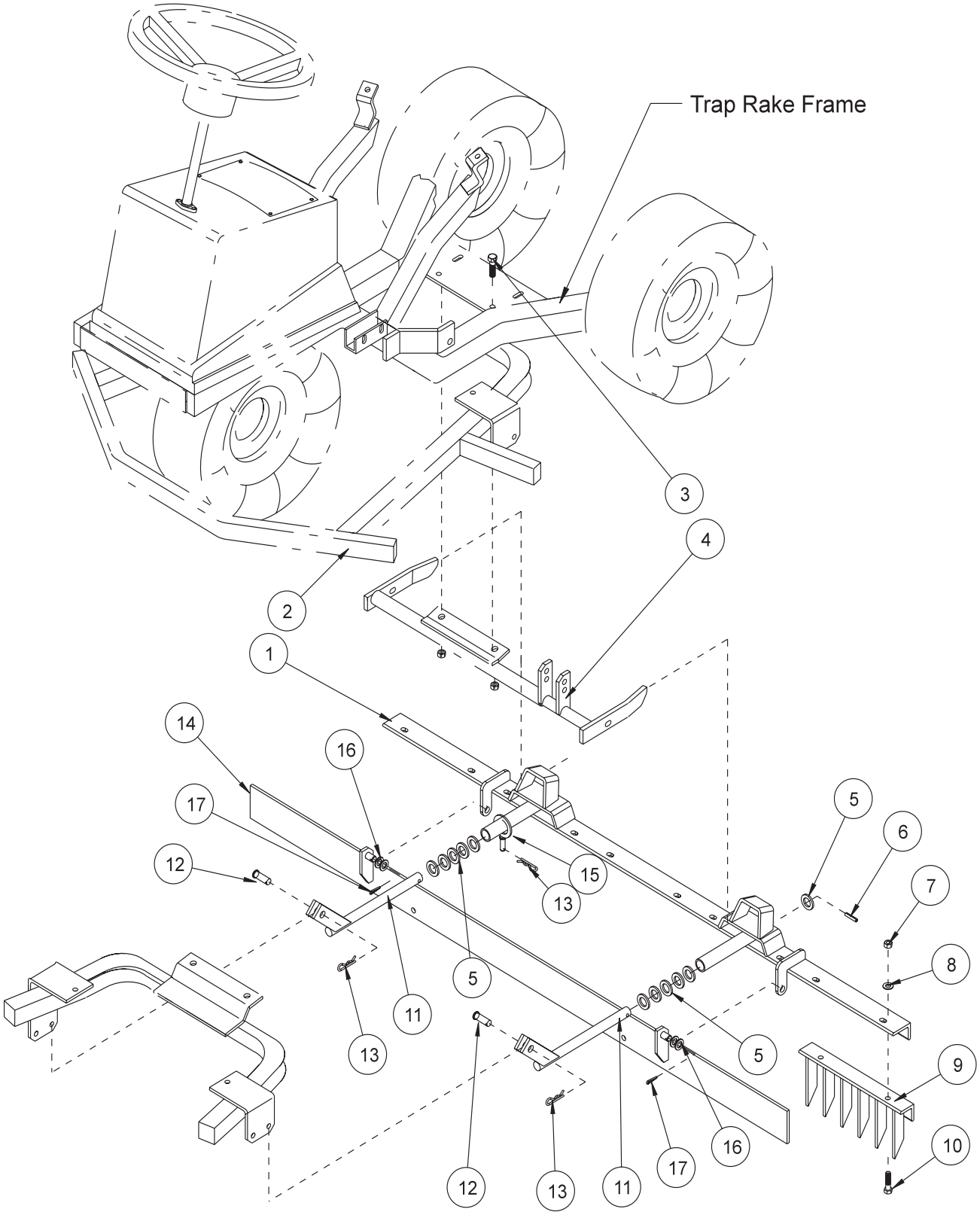
REF#	PART#	DESCRIPTION	QUANTITY
1	HCP-12-150	Clevis Pin, 1/2 x 1 1/2	2
2	HHP-18	Bridge Pin, 1/8	2
3	13-200	Edger Frame	1
4	HB-12-13-150	Bolt 1/2 - 13 x 1 1/2	2
	HW-12	Washer 1/2	2
	HWL-12	Lockwasher 1/2	2
	HN-12-13	Nut 1/2 - 13	2
5	13-203	Spindle Tube	1
	HG-14-28-180	Grease Fitting 1/4 - 28 x 180°	1
6	21-169	Bearing & Collar	2
7	13-206	Spindle Shaft	1
8	13-205	1/2 Disc Flange	1
9	13-204	Disc	1
10	HMB-34-14	Machine Bushing 3/4 x 14GA	2
11	HWL-34	Lockwasher 3/4	1
12	HNA-34-16	Axle nut 3/4 - 16	1
13	HP-18-150	Cotter Pin 1/8 x 1 1/2	1
14	HB-38-16-100	Bolt 3/8 - 16 x 1	1
	HWL-38	Lockwasher 3/8	1
	HW-516	Washer 5/16	1
	HW-716	Washer 7/16	1
15		Attachment Lift (Part of Lift Assembly)	
16		Main Frame (Part of Trap Rake)	

EDGER KIT INSTALLATION

Optional Lift Assembly 13-505 must be installed before installing this unit on Super 2

1. For initial assembly, bolt (Ref# 5) Spindle Tube to (Ref# 3) Edger Frame at a 60° to 70° angle. Use (Ref# 4) bolts, washers and nuts.
2. Next, make sure (Ref# 8) 1/2" thick by 3 1/2" round spacer is on spindle shaft up to shoulder. Then place (Ref# 9) Disc onto the shaft followed by two (Ref# 10) 3/4 machine bushings, one 3/4 lockwasher and one (Ref# 12) 3/4 - 16 axle nut. Tighten nut and use (Ref# 13) 1/8 x 1 1/2 cotter pin to lock it.
3. The edger unit mounts under the center of trap rake, fastening to Attachment Lift Assembly, 13-146.
4. Start engine and lower attachment lift FULLY. Stop engine.
5. Slide Edger Unit under trap rake from right side.
6. Position lift brackets (pockets) of edger on lift bars, both sides at once or one side at a time if only one person is working on this.
7. Start engine again and raise lift bars until horizontal with ground. Stop engine.
8. Slide edger frame arms forward until holes of arms match rear holes of attachment bracket on main frame of trap rake. Secure them with two each; 1/2 x 1 1/2 clevis pins and 1/8 bridge pins.
9. Start engine and test lift and edger to make sure that all works well.
10. To remove edger, lower lift until horizontal, undo the clevis and bridge pins, and slide edger off lift arms. Use CAUTION when releasing unit so it will not come down to fast on anyone's toes, fingers or legs.

13-577 SCARIFIER VERTICAL BLADES DRAWING



13-577 SCARIFIER VERTICAL BLADES PARTS LIST

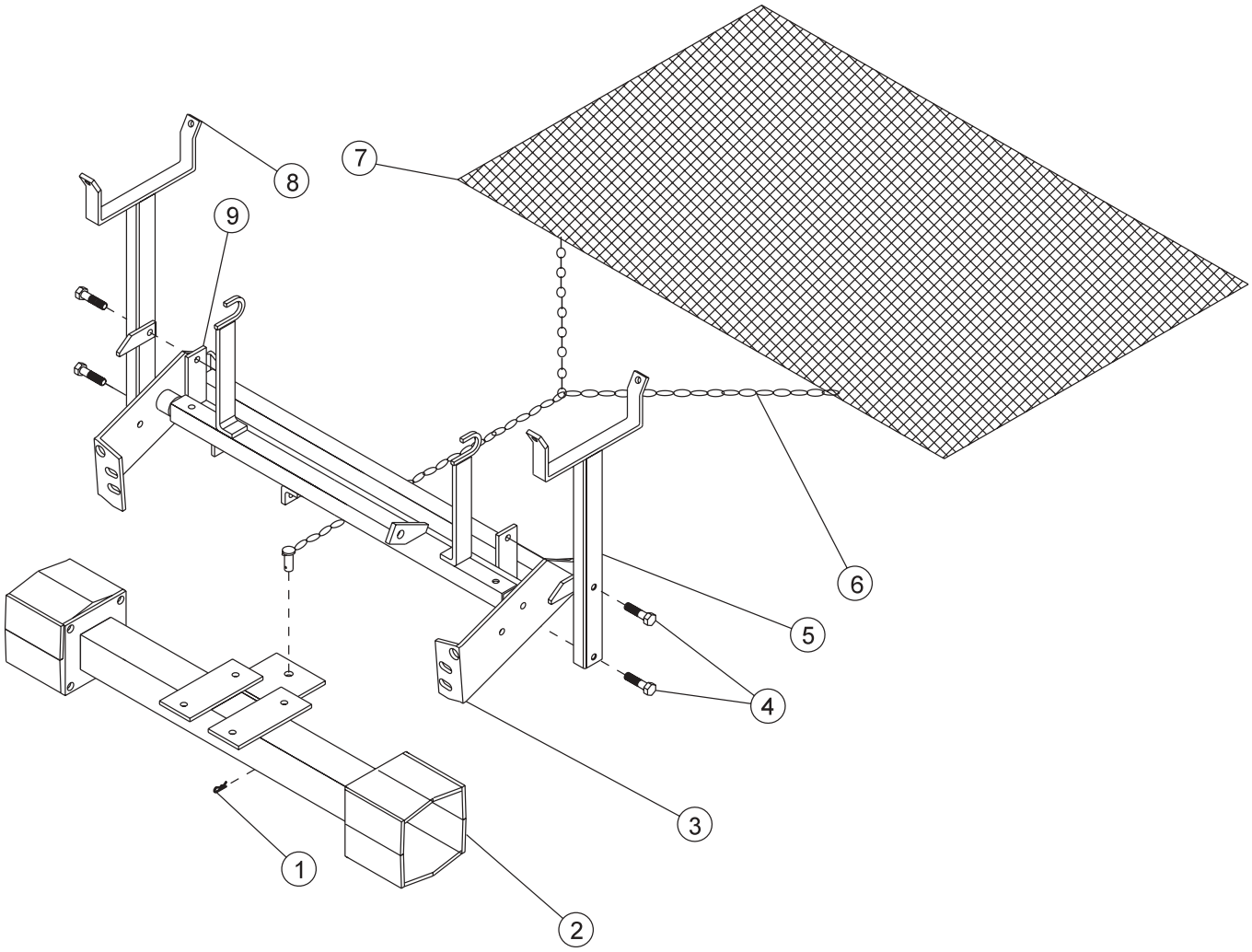
REF#	PART#	DESCRIPTION	QUANTITY
1	13-578	Frame	1
2		Main Frame (Part of Trap Rake)	
3	HB-716-14-150	Bolt 7/16 -14 x 1 1/2	2
	HNTL-716-14	Lock Nut 7/16 -14	2
4		Attachment Lift (part of Lift Assembly)	1
5	HMB-34-10	Machine Bushing 3/4 x 10GA	12
6	HRP-14-100	Roll Pin 1/4 x 1	2
7	HN-38-16	Nut 3/8 - 16	10
8	HWL-38	Lockwasher 3/8	10
9	26-042	Tine Segment	5
10	HB-38-16-100	Bolt 3/8 - 16 x 1	10
11	13-115	Hitch (Pistols)	2
12	HCP-12-150	Clevis Pin 1/2 x 1 1/2	2
13	HHP-18	Bridge Pin 1/8	5
14	13-117	Grader Blade	1
15	19-217	Hook	1

INSTALLATION INSTRUCTIONS

Optional Lift Assembly 13-505 must be installed before installing this unit on Super 2

1. Bolt five tine segments (Ref 9) to frame (Ref 1) using ten bolts, lockwashers and nuts (Ref 7, 8 and 10) as shown on drawing.
2. Put hook (Ref 15) over right hand tube on frame (Ref 1). Hook is to used to hold grader blade up when not in use.
3. Insert hitch (pistols) (Ref 11) into tubes of main frame with up to five machine bushings (Ref# 5) in front and one bushing in rear of the tube. Secure pistols with roll pins (Ref# 6). Check the spacing before driving roll pin in all the way. For more tire clearance, machine bushings may be moved from front to rear.
4. Put the grader blade (Ref 14) on as shown using two bridge pins (Ref 13).
5. Lift up frame (Ref 1) and hook pockets over the arms of attachment lift (Ref 4).
6. Attach pistols to the tabs of the trap rake frame undercarriage in the rear holes using clevis pins (Ref 12) and bridge pins (Ref 13).
7. Turn machine on and test for proper operation.

13-111 DRAG MAT KIT DRAWING



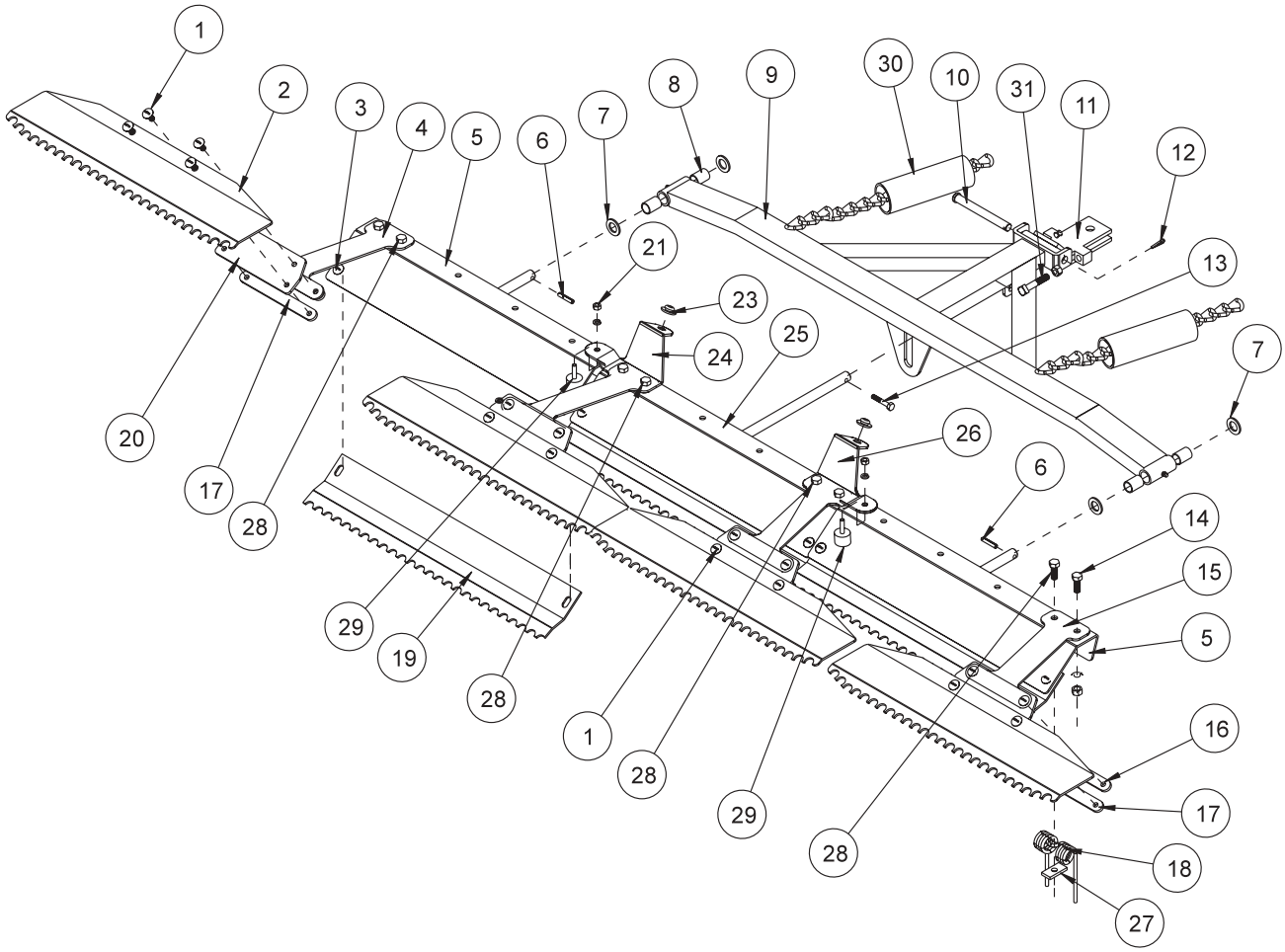
13-111 DRAG MAT KIT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	HHP-18	Bridge Pin 1/8	1
2		Hitch (Part of Trap Rake)	1
3		Rake Lift (Part of Trap Rake)	1
4	HB-38-16-225	Bolt 3/8 - 16 x 2 1/4	4
	HWL-38	Lockwasher 3/8	4
	HN-38-16	Nut 3/8 - 16	4
5	13-195	Left Mat Carrier Post	1
6	19-605	Drag Mat Chain	1
7	19-601	Drag Mat	1
8	13-156	Right Mat Carrier Post	1
9	13-157	Carrier Lock Strap	2
	13-112	Carrier Kit, posts with hardware	1

DRAG MAT KIT INSTALLATION

1. Looking from the rear of the trap rake, mount the (Ref# 8) Mat Carrier Post outside the right rear corner of the rake lift with the (Ref# 9) Lock Strap on the inside of the rake lift side plate. Bolt into place with two (Ref# 4) bolts, nuts and lockwashers.
2. Mount the (Ref# 5) Left Mat Carrier outside the left corner similar to the right side with the (Ref# 9) Lock Strap to the inside.
3. To carry the Mat, roll it up and place it in the brackets of the Carrier Posts.
4. To use the mat, unroll it flat and hook it up to the trap rake hitch with the clevis pin and bridge pin.

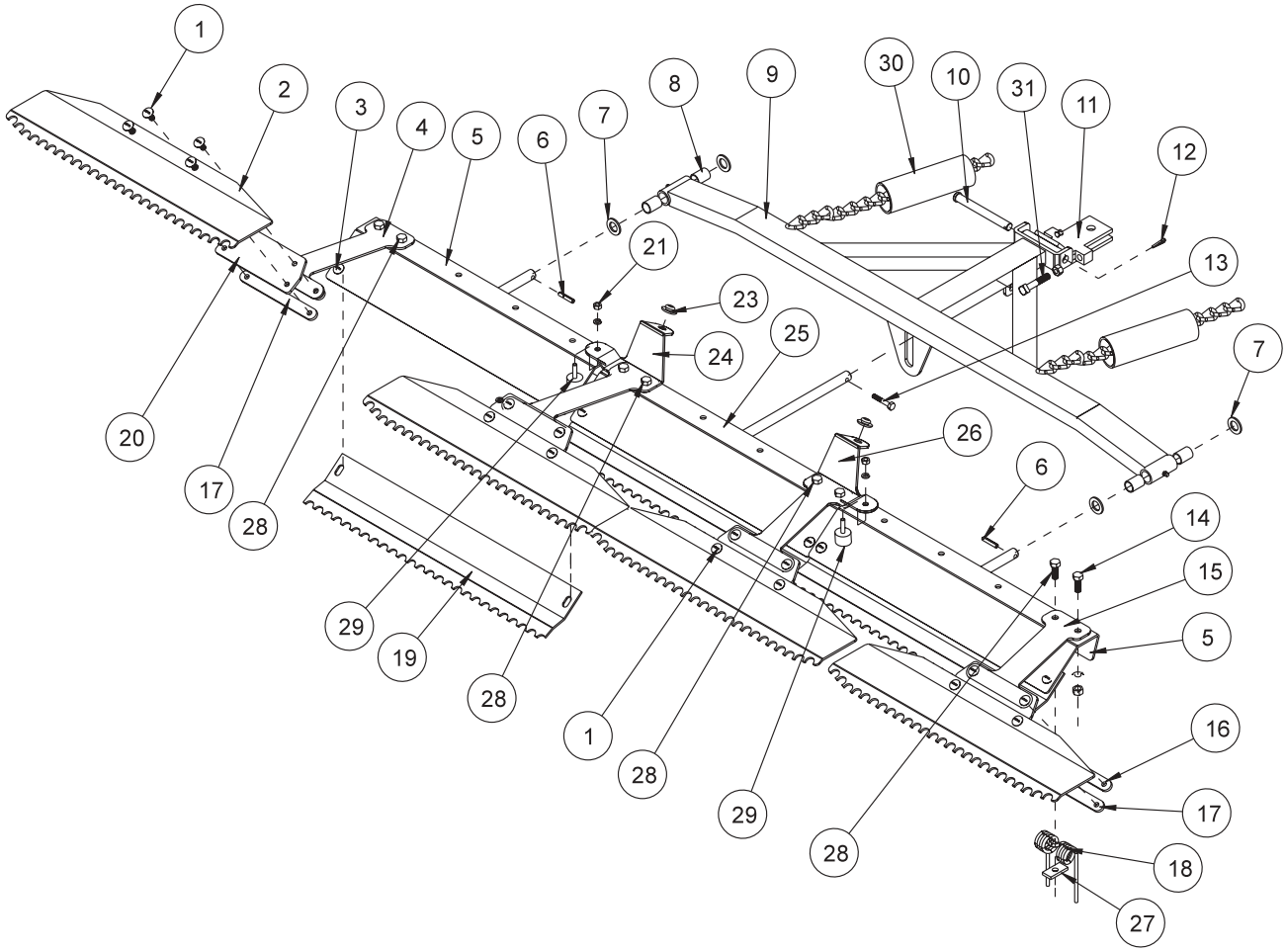
42-026 84"(213CM) STAINLESS STEEL TOURNAMANT RAKE DRAWING



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

REF#	PART#	DESCRIPTION	QUANTITY
1	HSTS-516-18-100	Stainless Truss Head Screw 5/16 - 18 x 1	16
	HWL-516	Lockwasher 5/16	16
	HN-516-18	Nut 5/16 - 18	16
2	42-104	Finishing Blades	4
3	HSTS-516-18-075	Stainless Truss Head Screw 5/16 - 18 x 3/4	6
	HW-516	Washer 5/16	6
	HWL-516	Lockwasher 5/16	6
	HN-516-18	Nut 5/16 - 18	6
4	42-111	Left Outside Mount	1
5	42-102	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 drawbar)	4
9	42-100	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	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	Lockwasher 3/8	4
	HN-38-16	Nut 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 1/4 - 20	2
	HWL-14	Lockwasher 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	HSTS-38-16-125	Stainless Steel Truss Head Screw 3/8 - 16 x 1 1/4	12
	HWL-38	Lockwasher 3/8	12
	HN-38-16	Nut 3/8 - 16	12
29	15-013	Rubber Bumper	2
30	8892-6	Hose Wrap 1/4"	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

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



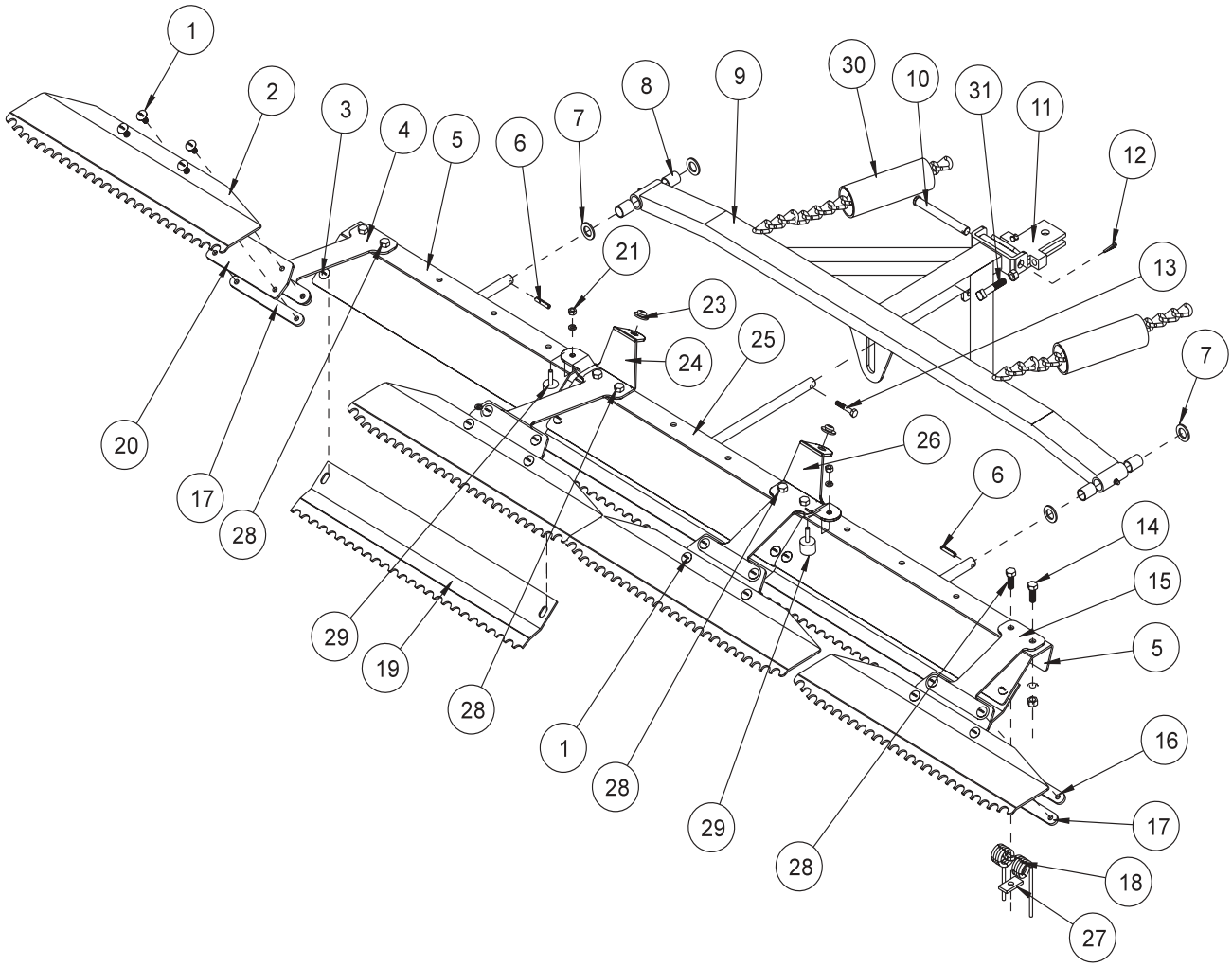
RAKE ASSEMBLY INSTRUCTIONS

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 $1^{1}/_{4}$" 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 $^{1}/_{4}$ - 20 - $1^{3}/_{4}$ 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 $^{5}/_{16}$ - 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.

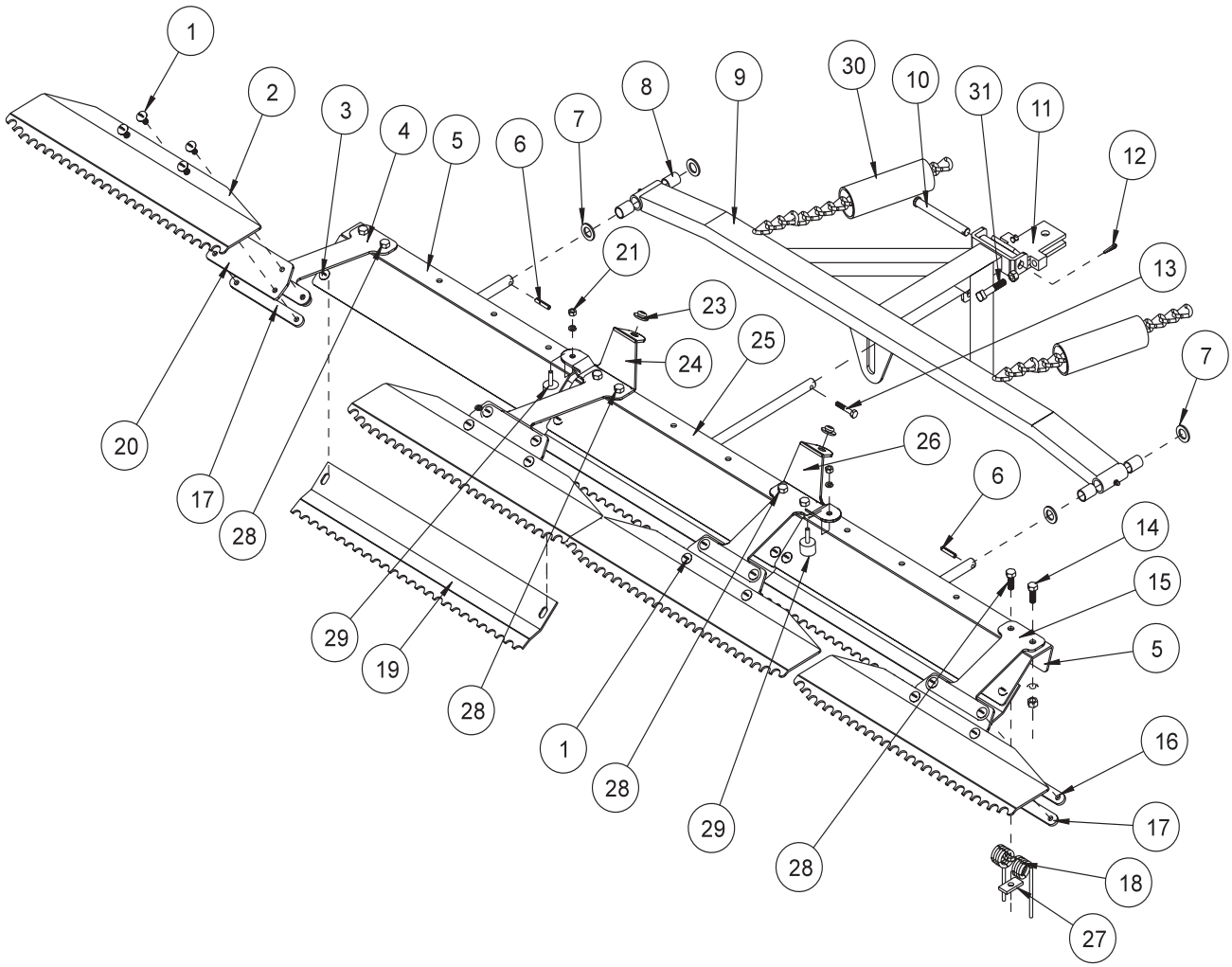
42-130 84"(213CM) MILD STEEL TOURNAMENT RAKE DRAWING



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

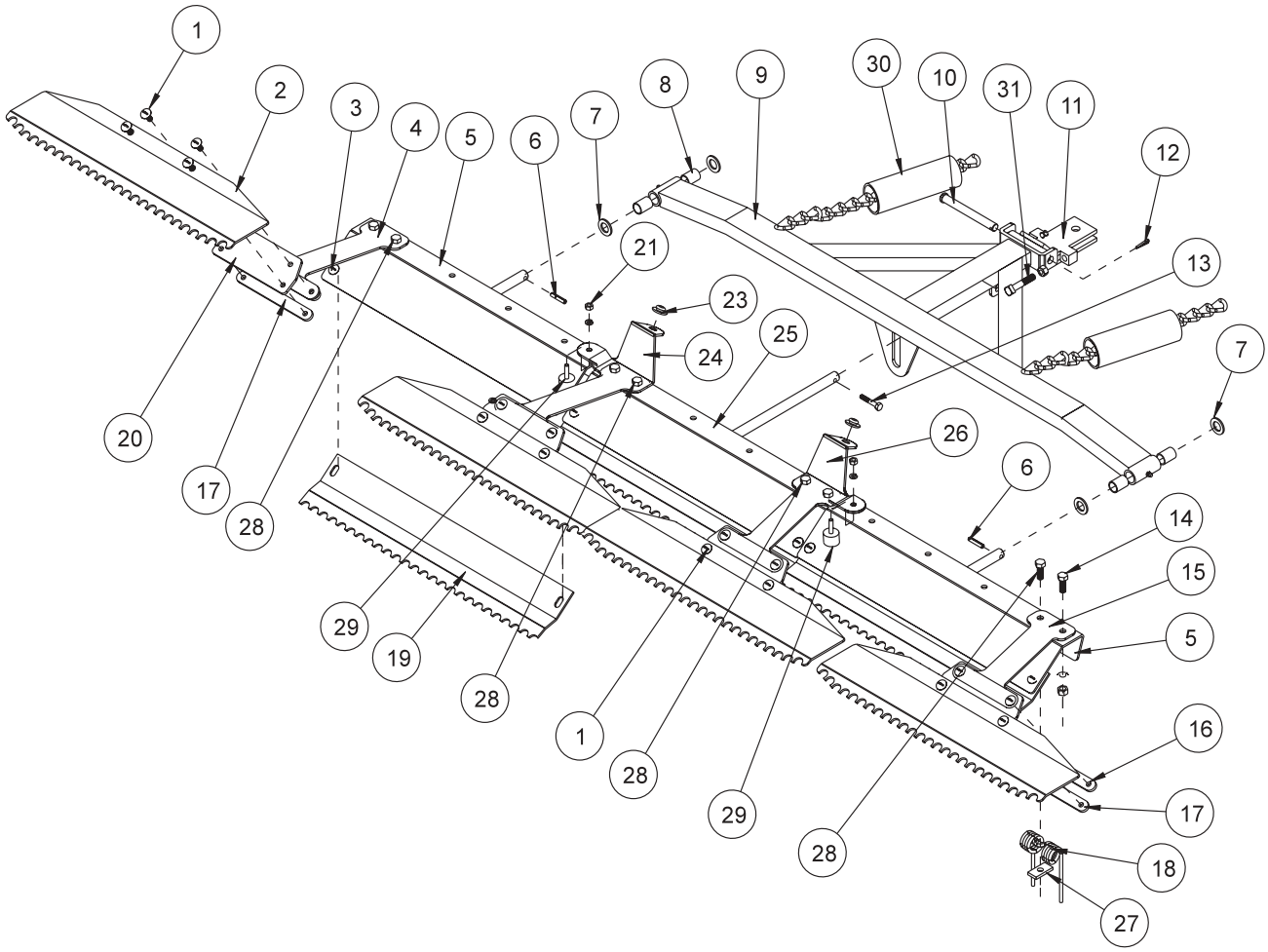
REF#	PART#	DESCRIPTION	QUANTITY
1	HST-516-18-100	Truss Head Screw 5/16 - 18 x 1	16
	HWL-516	Lock Washer 5/16	16
	HN-516-18	Nut 5/16 - 18	16
2	42-135	Finishing Blades	4
3	HST-516-18-075	Truss Head Screw 5/16 - 18 x 3/4	6
	HW-516	Washer 5/16	6
	HWL-516	Lock Washer 5/16	6
	HN-516-18	Nut 5/16 - 18	6
4	42-111	Left Outside Mount	1
5	42-133	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 drawbar)	4
9	42-100	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-14-20-150	Bolt 1/4 - 20 x 1 1/2	1
	HNTL-14-20	Lock Nut 1/4 - 20	1
14	HST-38-16-100	Truss Head Screw 3/8 - 16 x 1	16
	HWL-38	Lock Washer 3/8	16
	HN-38-16	Nut 3/8 - 16	16
15	42-109	Right Outside Mount	1
16	42-105	Top Strap	4
17	42-106	Bottom Strap	4
18	42-112	Rake Spring	12
19	42-129	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
22	15-013	Rubber Bumper	2
23	42-116	Rubber insert	2
24	42-110	Left Inside Mount	1
25	42-131	Center Rake	1
26	42-108	Right Inside Mount	1
27	42-177	Spring Holder	12
28	HSTS-38-16-125	Stainless Steel Truss Head Screw 3/8 - 16 x 1 1/4	4
	HWL-38	Lock Washer 3/8	4
	HN-38-16	Nut 3/8 - 16	4
29	15-013	Rubber Bumper	2
30	8892-6	Hose Wrap 1/4"	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

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



1. Attach drawbar(Ref# 9) to hitch(Ref# 11) using clevis pin(Ref# 10) and cotter pin (Ref# 12).
2. Bolt rake spring(Ref# 18) to rake frames(Ref# 5 & 25) using hardware(Ref# 14). Leave the two outside holes on right and left rake open.
3. Slide a machine bushing onto outside rake frames then slide the outside rake frames(Ref# 5 & 25) into the tubing on the end of the drawbar. Hold in place with another machine bushing and a roll pin (Ref# 6).
4. Attach rubber bumper(Ref# 22) and rubber inserts(Ref# 23)to the inside mounts.
5. Attach the inside mounts to the rake frames using hardware(Ref# 14). One bolt in each mounts will also hold the rake spring in place.
6. Attach the matting(Ref# 20) and the top strap(Ref# 16) to the inside and outside mounts using Stainless Truss Head Screw $^{5}/_{16}$ - 18 x $^{3}/_{4}$(Ref# 3).
6. Attach four finishing blades(Ref# 2) to the tabs of the inside and outside mounts with the Stainless Truss Head Screw $^{5}/_{16}$ - 18 x 1 (Ref# 1) going through the finishing blade, matting, and bottom strap(Ref# 17).
6. Attach the rake lift to the trap rake hitch.
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# 31)on the right side of hitch, adjust the screw until it hits the trap rake hitch, located on rear axle. Lock jam nut so adjustment will not change.
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.
13. Place the three groomer blades(Ref# 19) under the three rake assemblies.
14. 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’.
15. 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.

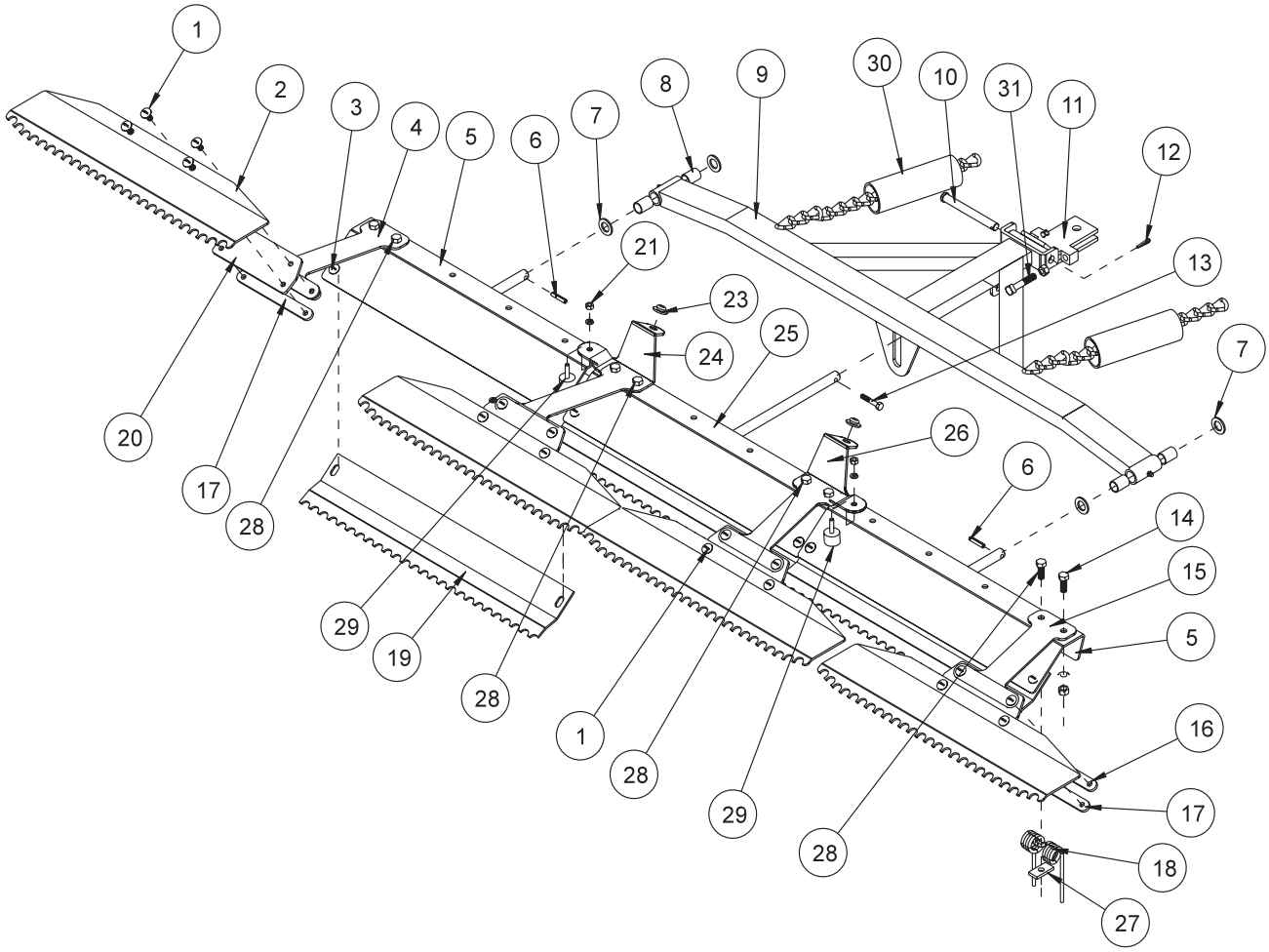
42-128 72"(183CM) STAINLESS STEEL TOURNAMENT RAKE DRAWING



42-128 72"(183CM) 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-516-18-075	Stainless Steel Truss Head Screw 5/16 - 18 x 3/4	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	HSTS-38-16-125	Stainless Steel 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

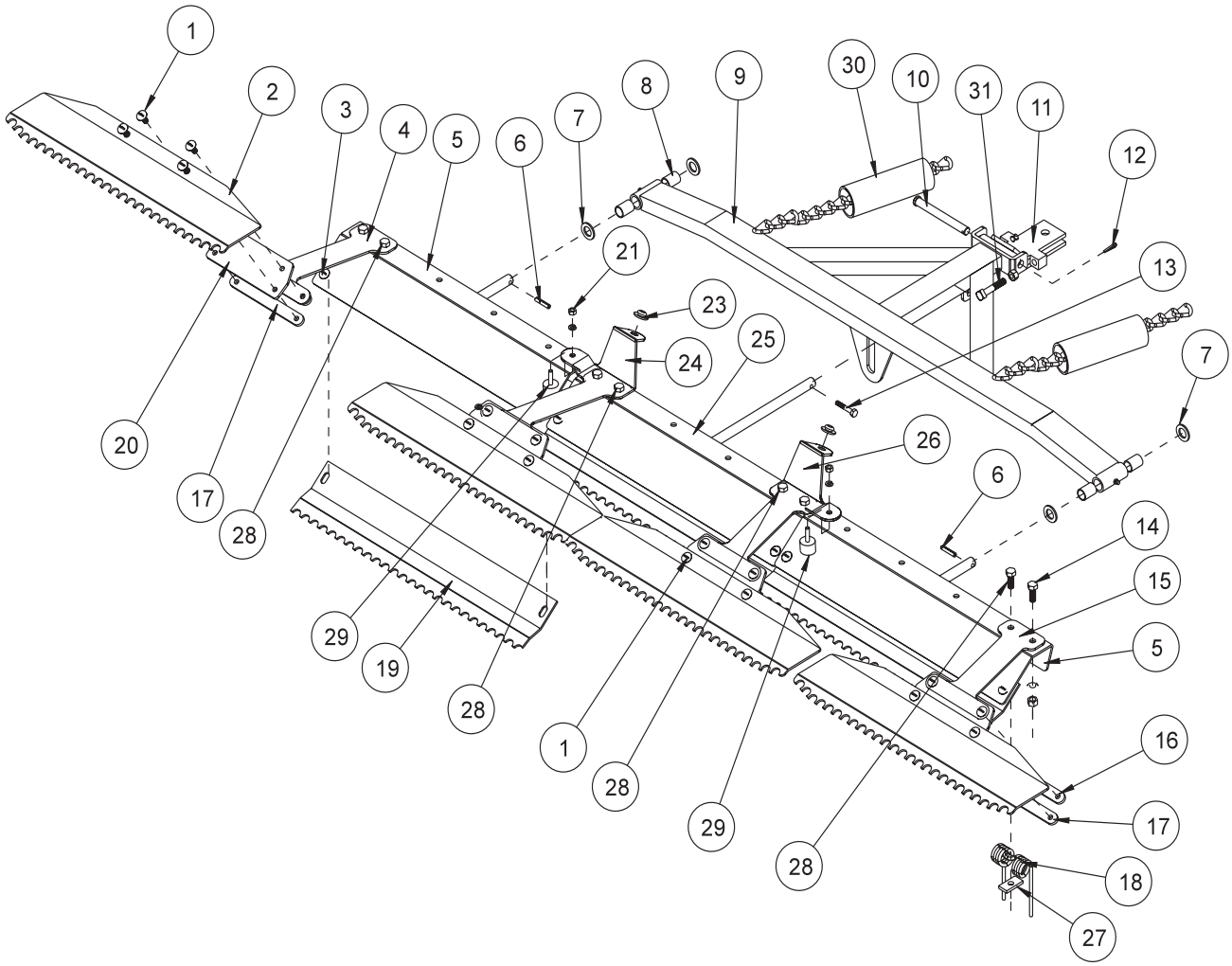
42-128 72"(183CM) STAINLESS STEEL TOURNAMENT RAKE DRAWING



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 $1^{1}/_{4}$" 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 $^{1}/_{4}$ - 20 - $1^{3}/_{4}$ 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 $^{5}/_{16}$ - 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.

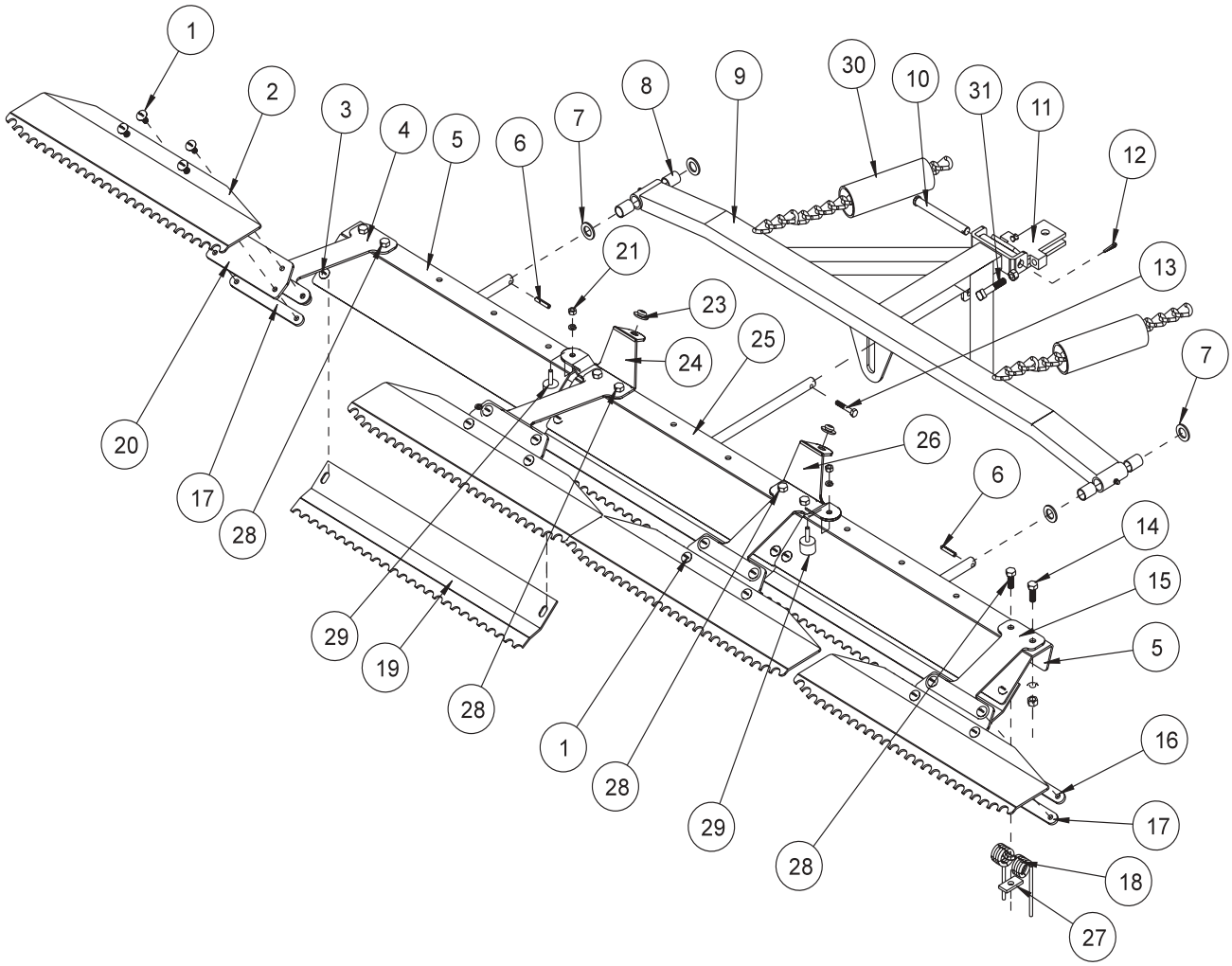
42-132 72"(183CM) MILD STEEL TOURNAMENT RAKE DRAWING



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

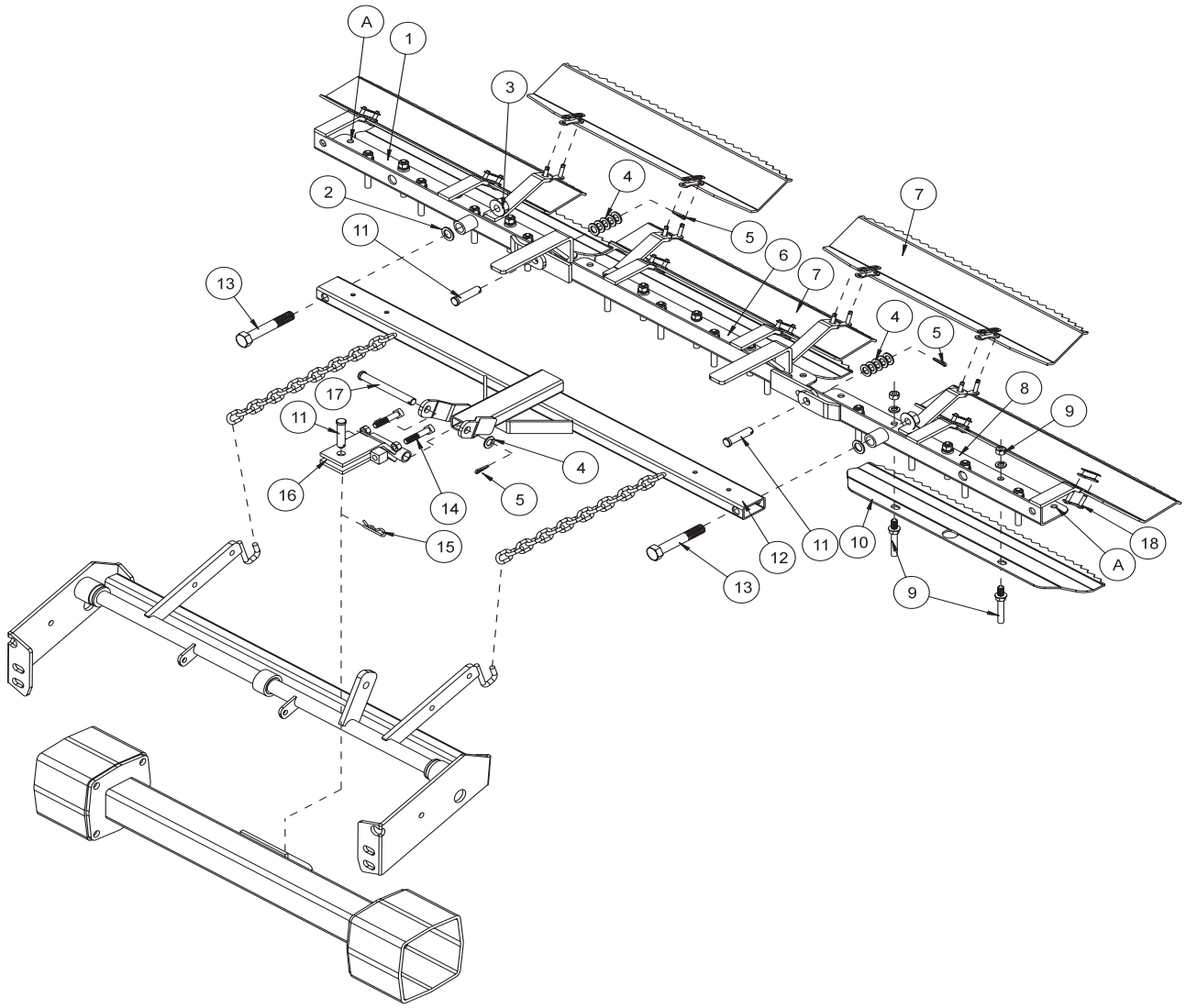
REF#	PART#	DESCRIPTION	QUANTITY
1	HST-516-18-100	Truss Head Screw 5/16 - 18 x 1	16
	HWL-516	Lock Washer 5/16	16
	HN-516-18	Nut 5/16 - 18	16
2	42-170	Finishing Blades	4
3	HST-516-18-075	Truss Head Screw 5/16 - 18 x 3/4	6
	HW-516	Washer 5/16	6
	HWL-516	Lock Washer 5/16	6
	HN-516-18	Nut 5/16 - 18	6
4	42-111	Left Outside Mount	1
5	42-172	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 drawbar)	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-14-20-150	Bolt 1/4 - 20 x 1 1/2	1
	HNTL-14-20	Lock Nut 1/4 - 20	1
14	HST-38-16-100	Truss Head Screw 3/8 - 16 x 1	16
	HWL-38	Lock Washer 3/8	16
	HN-38-16	Nut 3/8 - 16	16
15	42-109	Right Outside Mount	1
16	42-105	Top Strap	4
17	42-106	Bottom Strap	4
18	42-112	Rake Spring	12
19	42-170	Finishing Blades	4
20	42-107	Matting	4
21	HNC-14-20	Cap Nut 1/4 - 20	2
	HWL-14	Lock Washer 1/4	2
	15-013	Rubber Bumper	2
23	42-116	Rubber insert	2
24	42-110	Left Inside Mount	1
25	42-173	Center Rake	1
26	42-108	Right Inside Mount	1
27	42-177	Spring Holder	12
28	HSTS-38-16-125	Stainless Steel Truss Head Screw 3/8 - 16 x 1 1/4	4
	HWL-38	Lock Washer 3/8	4
	HN-38-16	Nut 3/8 - 16	4
29	15-013	Rubber Bumper	2
30	42-171	Groomer Blades	3
31	8892-6	Hose Wrap	2
32	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

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



1. Attach drawbar(Ref# 9) to hitch(Ref# 11) using clevis pin(Ref# 10) and cotter pin (Ref# 12).
2. Bolt rake spring(Ref# 18) to rake frames(Ref# 5 & 25) using hardware(Ref# 14). Leave the two outside holes on right and left rake open.
3. Slide a machine bushing onto outside rake frames then slide the outside rake frames(Ref# 5 & 25) into the tubing on the end of the drawbar. Hold in place with another machine bushing and a roll pin (Ref# 6).
4. Attach rubber bumper(Ref# 21) and rubber inserts(Ref# 23)to the inside mounts.
5. Attach the inside mounts to the rake frames using hardware(Ref# 14). One bolt in each mounts will also hold the rake spring in place.
6. Attach the matting(Ref# 20) and the top strap(Ref# 16) to the inside and outside mounts using Stainless Truss Head Screw $^{5}/_{16}$ - 18 x $^{3}/_{4}$(Ref# 3).
6. Attach four finishing blades(Ref# 2) to the tabs of the inside and outside mounts with the Stainless Truss Head Screw $^{5}/_{16}$ - 18 x 1 (Ref# 1) going through the finishing blade, matting, and bottom strap(Ref# 17).
6. Attach the rake lift to the trap rake hitch.
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# 32) on the right side of hitch, adjust the screw until it hits the trap rake hitch, located on rear axle. Lock jam nut so adjustment will not change.
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.
13. Place the three groomer blades(Ref# 30) under the three rake assemblies.
14. 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’.
15. 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.

13-438 RAKE ASSEMBLY WITH FINISHING BLADES DRAWING



13-438 RAKE ASSEMBLY WITH FINISHING BLADES PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-441	Right Rake	1
2	HMB-58-14	Machine Bushing $^5/_8$ x 14GA	2
3	HNCL-58-11	Lock Nut $^5/_8$ - 11	2
4	HMB-12-14	Machine Bushing $^1/_2$ x 14GA	11
5	HP-18-100	Cotter Pin $^1/_8$ x 1	3
6	13-440	Center Rake	1
7	13-443	Finishing Blade	5
8	13-439	Left Rake	1
9*	19-106	Rake teeth	25
10	13-442	Groomer Blade	3
11	HCP-12-150	Clevis Pin $^1/_2$ - $1^1/_2$	3
12	13-365	Drawbar	1
13	HB-58-11-400	Bolt $^5/_8$ - 11 x 4	2
14	HSSQS-38-16-200	Stainless Steel Square Head Set Screw $^3/_8$ -16 x 2	2
	HNS-38-16	Stainless Steel Nut $^3/_8$- 16	2
15	HHP-18	Bridge Pin $^1/_8$	1
16	13-647	Hitch (includes Ref 14)	1
17	HCP-12-450	Clevis Pin $^1/_2$ - $4^1/_2$	1
18	13-417	Connector Link	10
*	13-445	Rake Teeth Kit (25 Studs and Hardware)	1

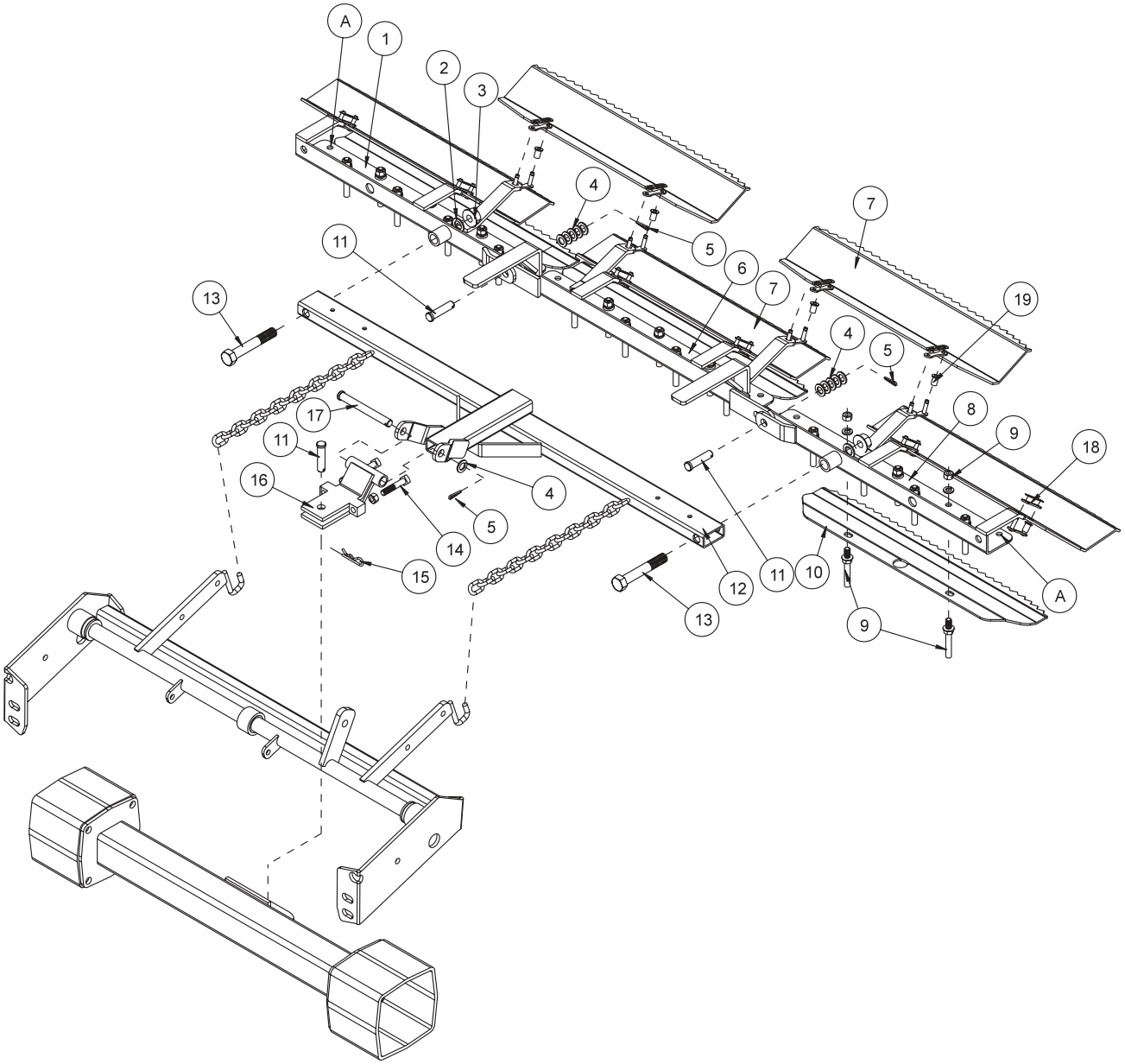
RAKE ASSEMBLY INSTRUCTIONS

1. Attach drawbar (Ref 12) to hitch (Ref 16) using clevis pin, machine bushing and cotter pin (Ref 17, 4 and 5).
2. Bolt rake teeth (Ref 9) to frames, keeping all the same length. Leave the two outside holes on right and left rake open (Ref A).
3. Lay out rake frames (Ref 1,6 and 8). Connect them using clevis pin, machine bushing and cotter pin (Ref 11, 4 and 5).
4. Attach drawbar to left and right frames using bolt, machine bushing, and nut (Ref 13, 2 and 3).
5. Attach five finishing blades (Ref 7) to the tabs of the rake frames using master link (Ref 18). Blades may be mounted with saw tooth up or down, depending on the desired finish of the sand trap.
6. Attach the rake hitch (Ref 16) to trap rake hitch on the rear axle using a clevis pin and bridge pin (Ref 11 and 15).
7. The end links of chain on the drawbar are to be hooked to the hooks of the trap rake lift.
8. With the rake on the ground pull the rake to the right side until it is 2-3 inches from the tire.
9. Using the adjustment screw (Ref 14) on the right, adjust the screw until it hits the trap rake hitch, located on rear axle. Lock jam nut so adjustment will not change.
10. Repeat steps 8 and 9 on left side.
11. Turn machine on and test for operation of rake assembly by raising and lowering the rake assembly. Also with rake down, turn sharp corners to check that rake does not touch wheels.
12. **NOTE:** Test rake in sand to assure tire tracks are covered by the rake when turning sharp corners in either direction. If there are tire tracks, readjust using the adjusting screws on the hitch, so the rake comes closer to the tire.

GROOMER BLADES - GOLF COURSE USE ONLY.

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

13-606 RAKE ASSEMBLY WITH LEXAN BLADES DRAWING



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 $^{5}/_{8}$ x 14GA	2
3	HNCL-58-11	Lock Nut $^{5}/_{8}$ - 11	2
4	HMB-12-14	Machine Bushing $^{1}/_{2}$ x 14GA	11
5	HP-18-100	Cotter Pin $^{1}/_{8}$ x 1	3
6	13-440	Center Rake	1
7	13-605	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 $^{1}/_{2}$ - $1^{1}/_{2}$	3
12	13-365	Drawbar	1
13	HB-58-11-400	Bolt $^{5}/_{8}$ - 11 x 4	2
14	HSSQS-38-16-200	Stainless Steel Square Head Set Screw $^{3}/_{8}$ -16 x 2	2
	HNS-38-16	Stainless Steel Nut $^{3}/_{8}$- 16	2
15	HHP-18	Bridge Pin $^{1}/_{8}$	1
16	13-647	Hitch (includes Ref 14)	1
17	HCP-12-450	Clevis Pin $^{1}/_{2}$ - $4^{1}/_{2}$	1
18	13-417	Connector Link	10
19	18-272	Nylon Bushing	10
*	13-445	Rake Teeth Kit (25 Studs and Hardware)	1

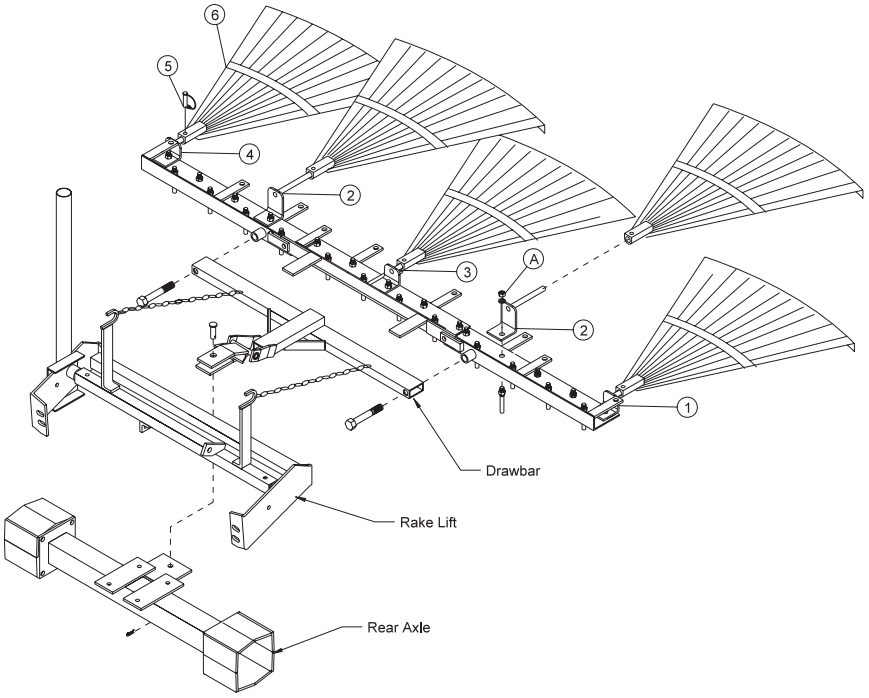
INSTALLATION INSTRUCTIONS

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.

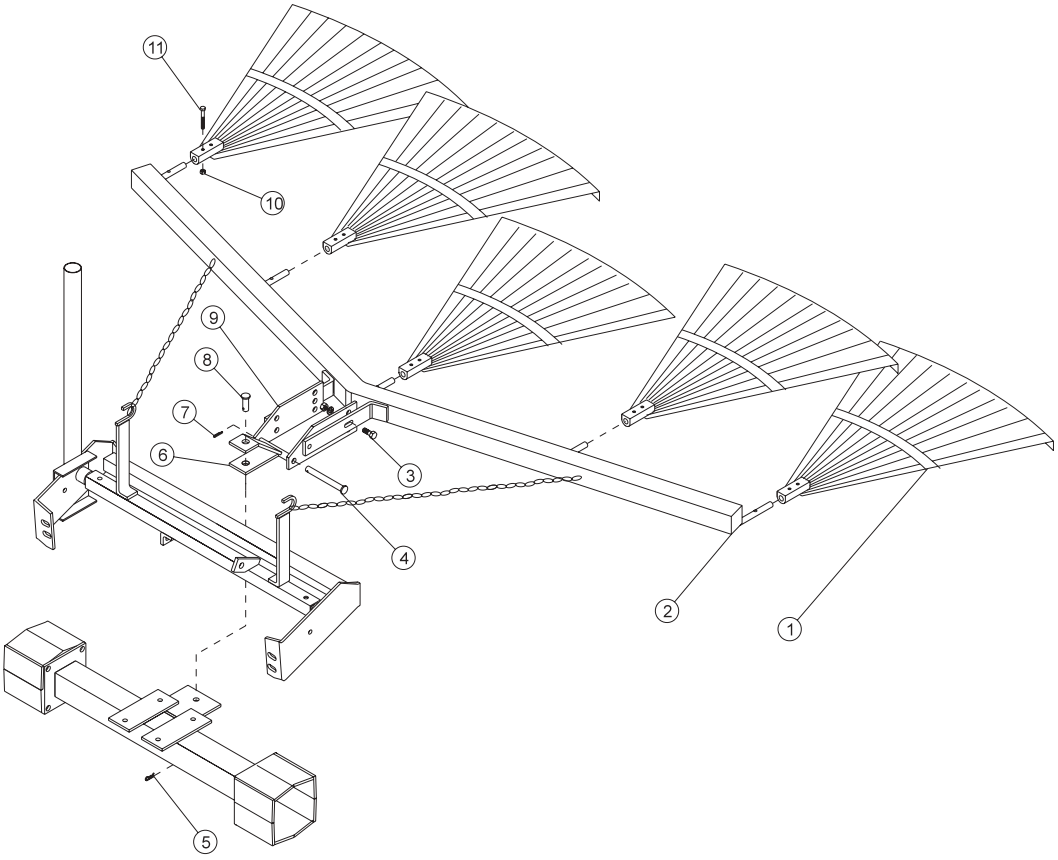
GROOMER BLADES - GOLF COURSE USE ONLY.

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.

13-319 FAN RAKE KIT DRAWING



13-298 FAN RAKE ATTACHMENT DRAWING



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.
2. Remove Groomer Blades from rake frame that are held on with (Ref# A)rake teeth studs. Replace rake teeth studs.
3. Place (Ref# 1)Left Holder, angle side up, to the outer rake teeth hole and install rake tooth stud.
4. Remove the 8th rake tooth stud from the end of right and left rake frame and place (Ref# 2)Long Holders on top, reinstall rake teeth studs.
5. Remove rake tooth in direct center of rake and install the (Ref# 3)Center Holder. Reinstall rake teeth studs.
6. Place (Ref# 4)Right Holder, angle side up, to the outer rake teeth hole and install rake tooth stud.
7. Slide (Ref# 6)Fan Rake onto holders and pin with (Ref# 5)Lock Pin.

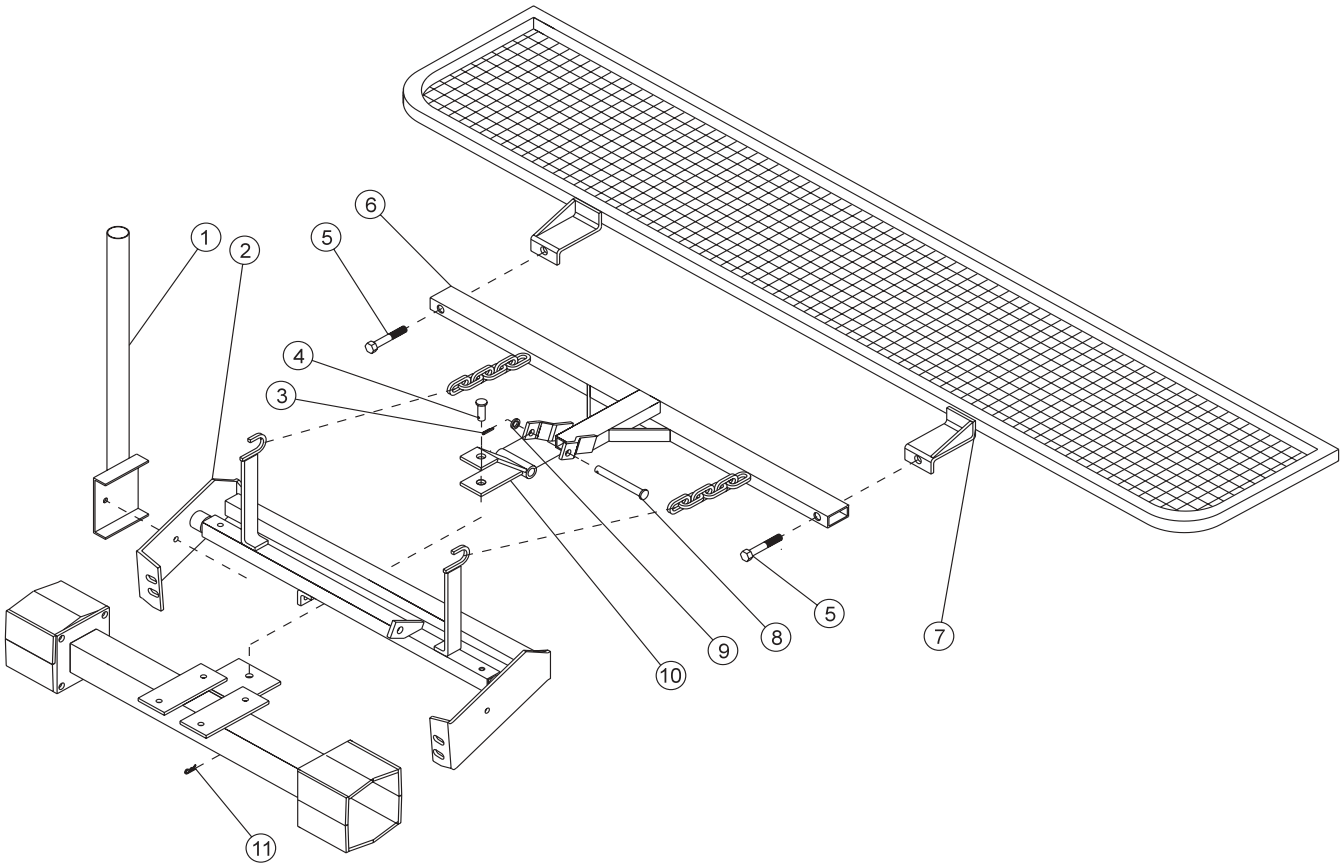
13-298 FAN RAKE ATTACHMENT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-310	Rake	5
2	13-306	Frame	1
3	HB-38-16-100	Bolt 3/8 - 16 x 1	4
	HN-38-16	Nut 3/8 - 16	4
	HWL-38	Lockwasher 3/8	4
4	HCP-12-450	Clevis Pin 1/2 x 4 1/2	1
5	HHP-18	Bridge Pin 1/8	1
6	19-107	Drawbar	1
7	HP-18-100	Cotter Pin 1/8 x 1	1
8	HCP-12-150	Clevis Pin 1/2 x 1 1/2	1
9	13-307	Hitch	2
10	HNCL-14-20	Center Lock Nut 1/4 - 20	5
11	HB-14-20-200	Bolt 1/4 - 20 x 2	5

FAN RAKE ATTACHMENT 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 (Ref# 9) Hitch to (Ref# 2)Frame using (Ref# 3)Hardware. Assemble (Ref# 6)Drawbar to the hitch using (Ref# 4)Clevis Pin and (Ref# 7)Cotter Pin, as shown. The Different Holes in the hitch are for adjusting the angle of the rakes.
3. Assemble the five (Ref# 1) Rakes to the (Ref# 2) Frame using 1/4 - 20 x 2 bolt and center lock nuts (Ref# 10 and 11). Slide the fan rake assembly under the rear of the trap rake to the hitch. Attach the (Ref# 6) Drawbar to the hitch using the (Ref# 8) Clevis Pin and the (Ref# 5) Bridge Pin.
4. Hook the chains from the Frame to the hooks on the Rake Lift.

26-007 PROFESSIONAL INFIELD FINISHER DRAWING



26-007 PROFESSIONAL INFIELD FINISHER PARTS LIST

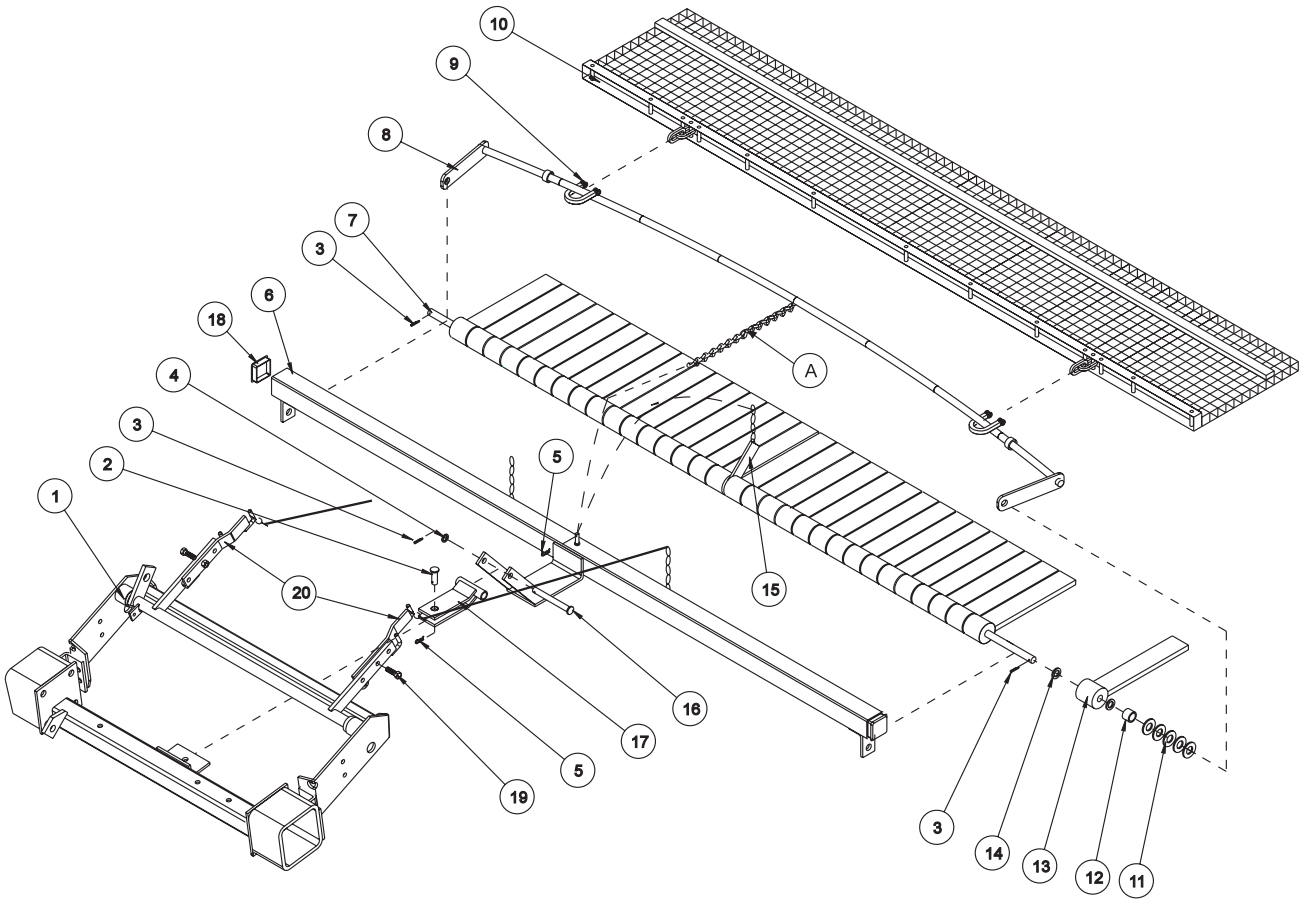
REF#	PART#	DESCRIPTION	QUANTITY
1		Rake Holder (Part of Trap Rake)	1
2		Rake Lift (Part of Trap Rake)	1
3	HP-18-100	Cotter Pin 1/8 x 1	1
4	HCP-12-150	Clevis Pin 1/2 x 1 1/2	1
5	HB-58-11-300	Bolt 5/8 - 11 x 3	2
	HNCL-58-11	Center Lock Nut 5/8 - 11	2
6	13-365	Drawbar	1
7	26-045	Leveling Screen	1
8	HCP-12-450	Clevis Pin 1/2 x 4 1/2	1
9	HMB-12-14	Machine Bushing 1/2 x 14GA	1
10	19-107	Hitch	1
11	HHP-18	Bridge Pin 1/8	1

PROFESSIONAL INFIELD FINISHER INSTALLATION

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

1. Attach (Ref# 7) Leveling Screen to (Ref# 6) Drawbar using two (Ref# 5)Bolts and Center Lock Nuts.
2. Attach (Ref# 10) Hitch to (Ref# 6) Drawbar using (Ref# 8) 1/2 x 4 1/2 Clevis Pin, (Ref# 9) 1/2 x 14GA Machine Bushing and a (Ref# 3) 1/8 x 1 Cotter Pin.
3. Mount Professional Field Finisher to the hitch on the trap rake with a (Ref# 4) 1/2 x 1 1/2 Clevis Pin and (Ref# 11) 1/8" Bridge Pin.
4. Hook chains from Finisher to Rake Lift Arms.
5. **NOTE:** When assembled properly, rake will angle down from front to back. If front of finisher is not higher than the back, damage will result to infield.

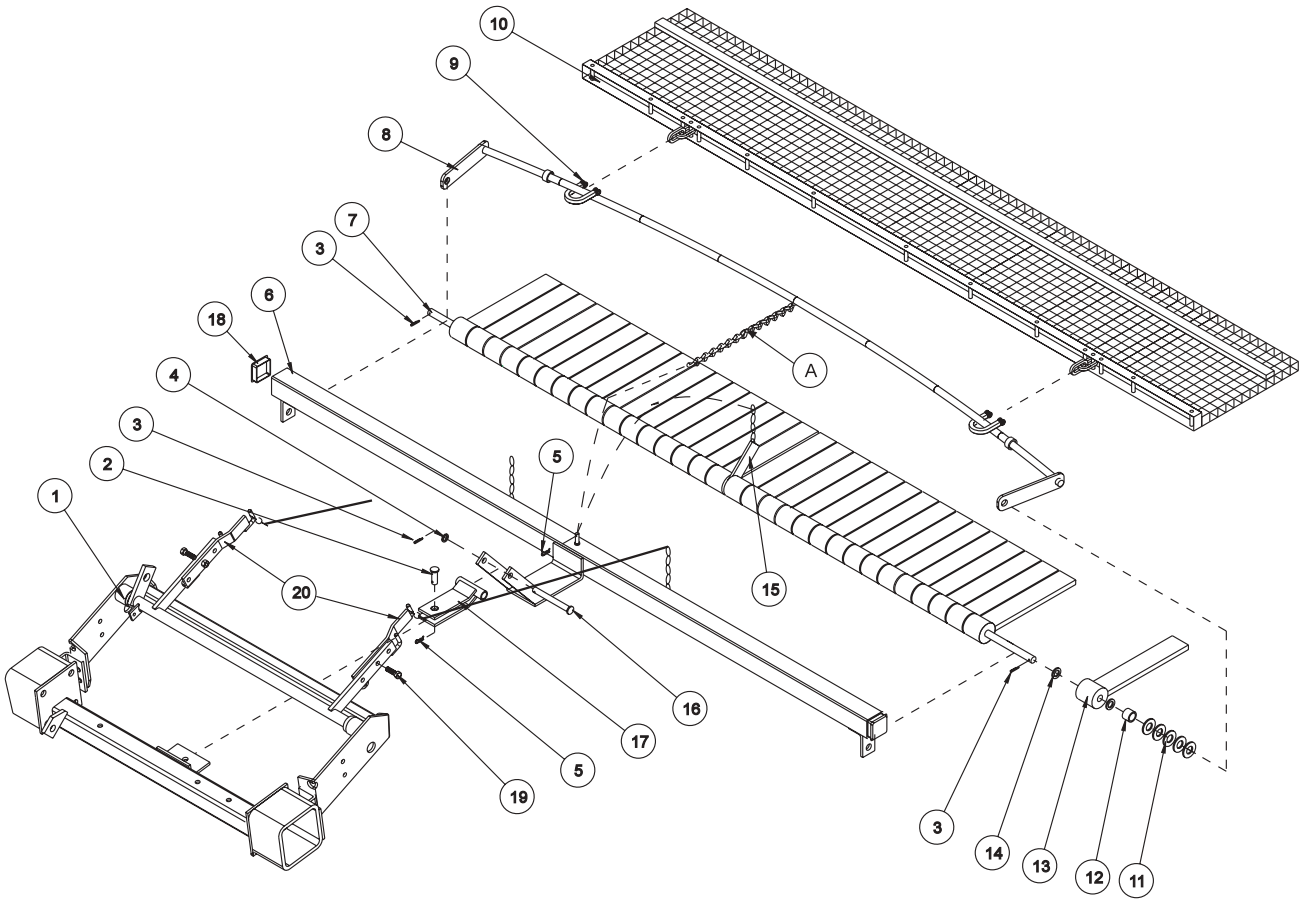
26-008 FLEX ACTION FIELD FINISHER DRAWING



26-008 FLEX ACTION FIELD FINISHER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1		Rake Lift	1
2	HCP-12-150	Clevis Pin $^{1}/_{2}$ x $1^{1}/_{2}$	1
3	HP-18-100	Cotter Pin $^{1}/_{8}$ x 1	3
4	HMB-12-14	Machine Bushing $^{1}/_{2}$ - 14GA	1
5	HHP-18	Bridge Pin $^{1}/_{8}$	2
6	26-046	Frame	1
7	26-049	Mounting Bar	1
8	26-047	Leveler Bar	1
9	21-060	$^{3}/_{8}$ Chain Clevis	2
10	26-115	Mesh Finisher	1
11	HMB-58-14	Machine Bushing $^{5}/_{8}$ x 14GA	10
12	11-040	Spacer $^{3}/_{4}$"	2
13	26-041	Rasp Flail	32
14	HW-58	Washer $^{5}/_{8}$	32
15	26-048	Flail Bar Strap	1
16	HCP-12-450	Clevis $^{1}/_{2}$ x $4^{1}/_{2}$	1
17	19-107	Hitch	1
18	18-297	Cap Plug	2
19	HB-38-16-125	Bolt $^{3}/_{8}$ - 16 x $1^{1}/_{4}$	4
	HN-38-16	Nut $^{3}/_{8}$ - 16	4
20	26-116	Right Extension Arm	1
	26-117	Left Extension Arm	1

26-008 FLEX ACTION FIELD FINISHER DRAWING



1. Install (Ref# 15)Flail Bar Strap to center of (Ref# 7)Mounting Bar 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 (Ref# 13)Rasp Flail with knobby side down adjacent to sides of (Ref# 15)Flail Bar Strap. Now install a (Ref# 14)Flat Washer 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 (Ref# 12)Spacer to each end of Mounting Bar adjacent to Washer.
4. Install (Ref# 8)Leveler Bar 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 (Ref# 6)Frame 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 (Ref# 3)Cotter Pin.
6. Install (Ref# 15)Flail Bar Strap to center tab on frame with $^{3}/_{8}$ -16 x 1 bolt and $^{3}/_{8}$ -16 center lock nut. Loose fit is required. No not over tighten
7. Flip assembly over so knobby sides of Flails are now facing down. Install (Ref# 17)Hitch to frame with (Ref# 16)Clevis Pin and (Ref# 3)Cotter Pin. 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) $1^{1}/_{4}$ bolts(Ref# 19). **Supreme & Super Rake** - use the two outside holes on the extension arms and (4) $1^{1}/_{4}$ bolts. Hook Lift Chains to Extension Arms(Ref# 20).

OPERATING INSTRUCTIONS

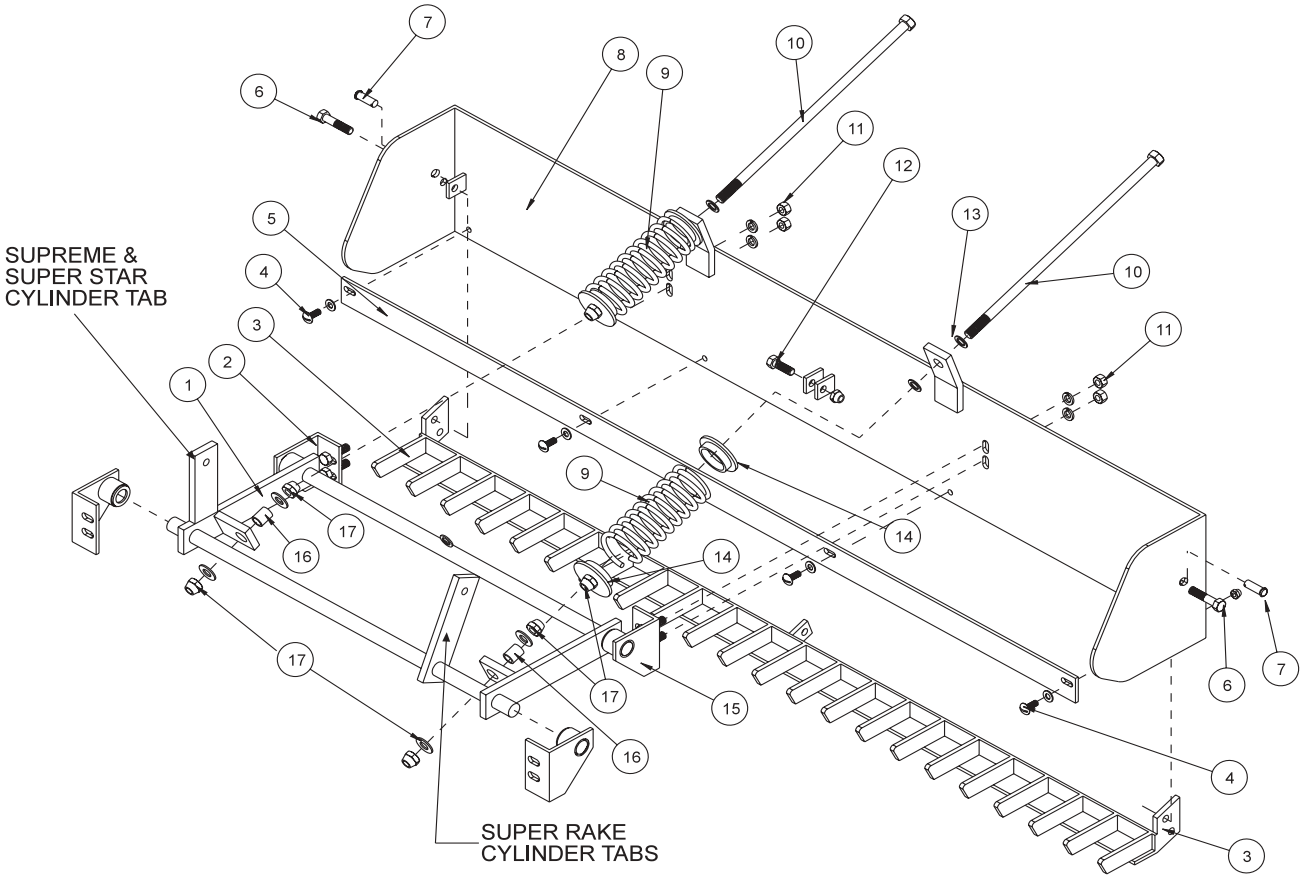
Running Attachment with all Flails down, flat on the surface, will provide a leveling function. Running attachment partially raised and Flails at a 20° - 40° angle in relation to the level surface, will provide a finishing function. The flails increase down pressure for desired finish. Drive in wide 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 thorough the chain hooks on Mesh Finisher. The clevis pin that comes with the chain clevis should go through the chain clevis, first link on chain hook (on the Mesh Finisher) and then through other side of the chain clevis. Insert the cotter pin.
4. Center Mesh Finisher with Flex Action Field Finisher.
5. Raise lift on your machine to insure proper ground clearance before driving your machine.
6. (Ref# A) Chain length is to control amount of mesh trailing behind flails for wet or dry conditions. For Wet Conditions: Shorten (Ref# A)Chains. For Dry Conditions: May use maximum amount of (Ref# A)Chain to make desired finish.

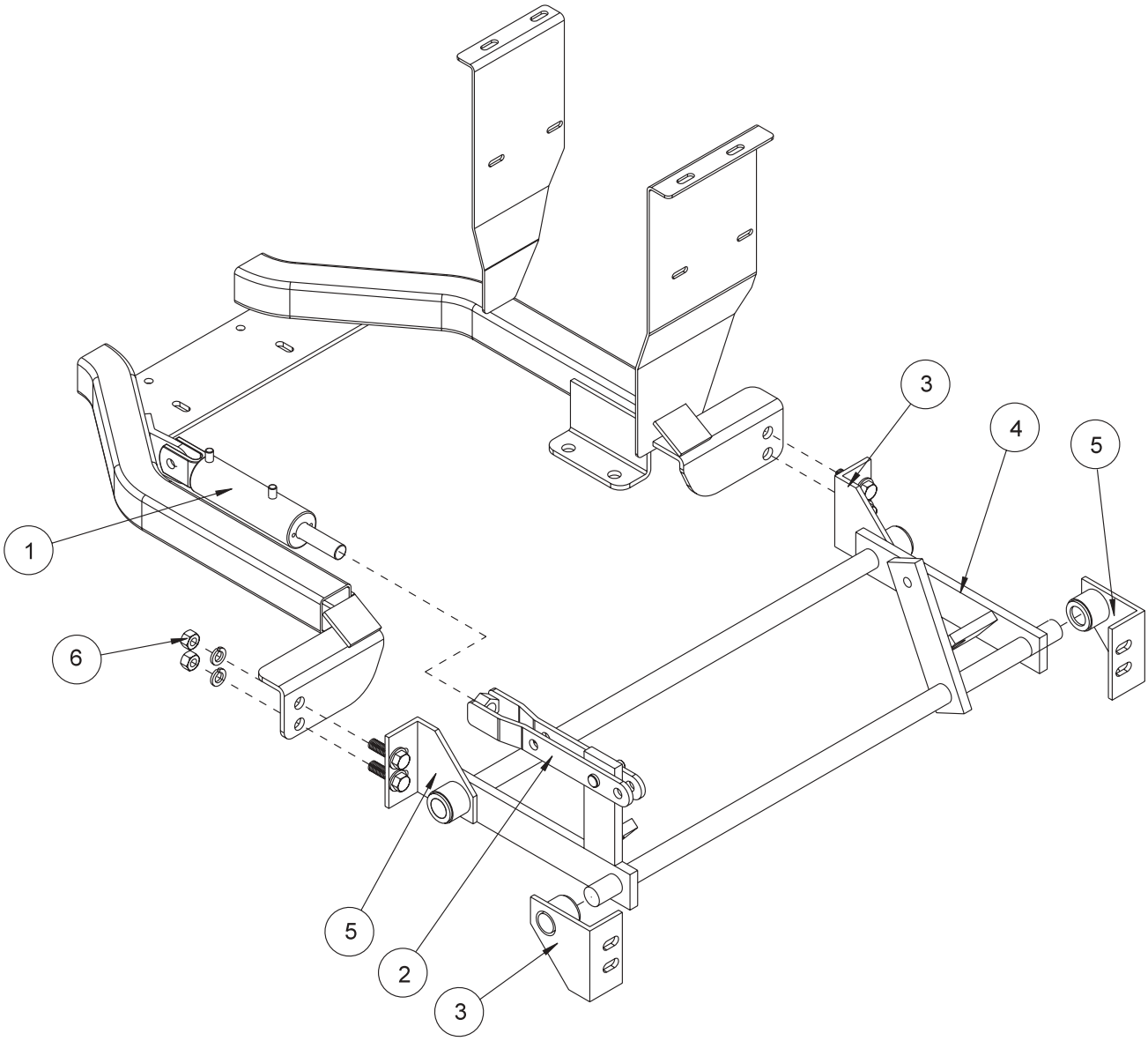
34-191 BOX GRADER DRAWING



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 3/8 - 16 x 1	4
	HW-38	Washer 3/8	4
	HNCL-38-16	Center Lock Nut 3/8 - 16	4
5	34-218	Cutter Blade	1
6	HB-12-13-250	Bolt 1/2 -13 x 2 1/2	2
	HNCL-12-13	Center Lock Nut 1/2 - 13	2
7	HCP-12-150	Clevis Pin 1/2 x 1 1/2	2
	HHP-18	Bridge Pin 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 1/2 - 13 x 1 1/4	4
	HW-12	Washer 1/2	4
	HWL-12	Lockwasher 1/2	4
	HN-12-13	Nut 1/2 -13	4
12	HB-12-13-150	Bolt 1/2 - 13 x 1 1/2	1
	HNCL-12-13	Center Lock Nut 1/2 - 13	1
13	HMB-58-14	Machine Bushing 5/8 - 14GA	4
14	13-277	Spring Pad	4
15	34-219	Left Pivot Bracket	2
	33-086	Bushing	2
16	34-215	Threaded Spacer	2
17	HNCL-58-11	Center Lock Nut 5/8 - 11	4

SUPER RAKE LIFT ASSEMBLY



BOX GRADER PARTS LIFT

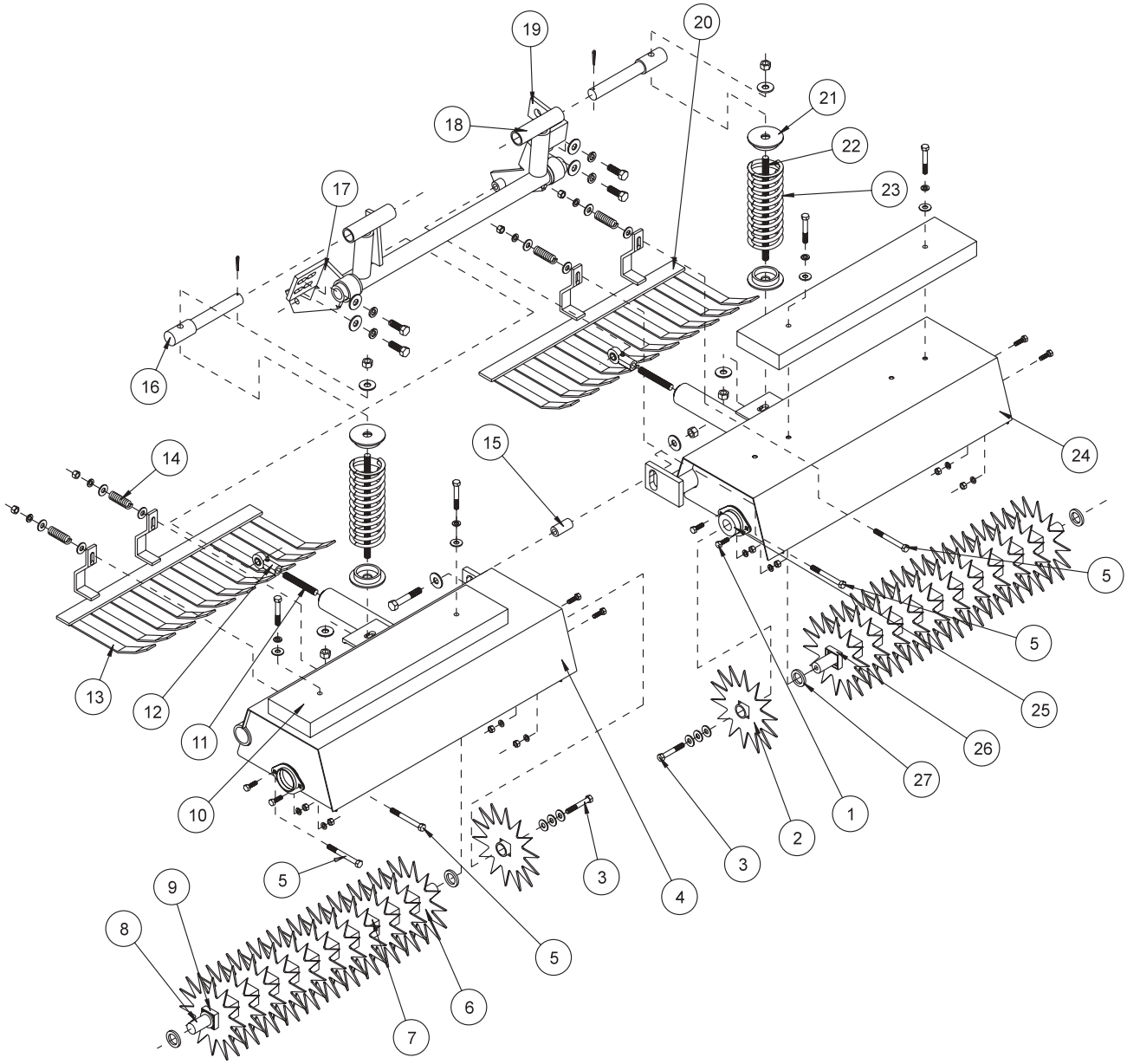
REF#	PART#	DESCRIPTION	QUANTITY
1	13-357	Hydraulic Cylinder (comes with machine)	1
	HNJ-34-16	Jam Nut 3/4 - 16	1
2	13-366	Cylinder Extension (comes with machine)	1
3	34-219	Right Pivot Assembly	2
	18-218	Bushing	2
4	34-221	Lift Assembly	1
5	34-220	Right Pivot Bracket	2
	18-218	Bushing	2
6	HB-12-13-150	Bolt 1/2 - 13 x 1 1/2 (comes with machine)	4
	HW-12	Washer 1/2	4
	HWL-12	Lockwasher 1/2	4
	HN-12-13	Nut 1/2 - 13	4

MOUNTING INSTRUCTIONS FOR SUPER RAKE

1. To mount Box Grader to Super Rake you must remove the rake lift.
2. On all Super Rakes unhook the speed boss arm before removing the rake lift. Completely remove the rod speed limiter and ball joint from machine. The speed boss does not need to function when using the Box Grader.
3. Position the Box Grader unit at the rear of the trap rake, using the bolts (Ref 6) that held the rake lift on, bolt pivot brackets (Ref 3 & 5) to the frame. **Please note** the way the pivot brackets mount to the machine. Trim cuts point up and tabs bend out.
4. Loosen jam nut on cylinder and turn the cylinder extension (Ref 2) within a 1/4" of the end of the cylinder shaft.
5. Attach the cylinder extension to the Box Grader using the second hole from the end.
6. 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.
7. Springs should be adjusted to a length of 7". Adjust tension to your preference. Tighten to increase trip pressure.
8. To lower break up bar, remove the two clevis pins from the sides of the Box Grader. The break up bar will tilt forward.

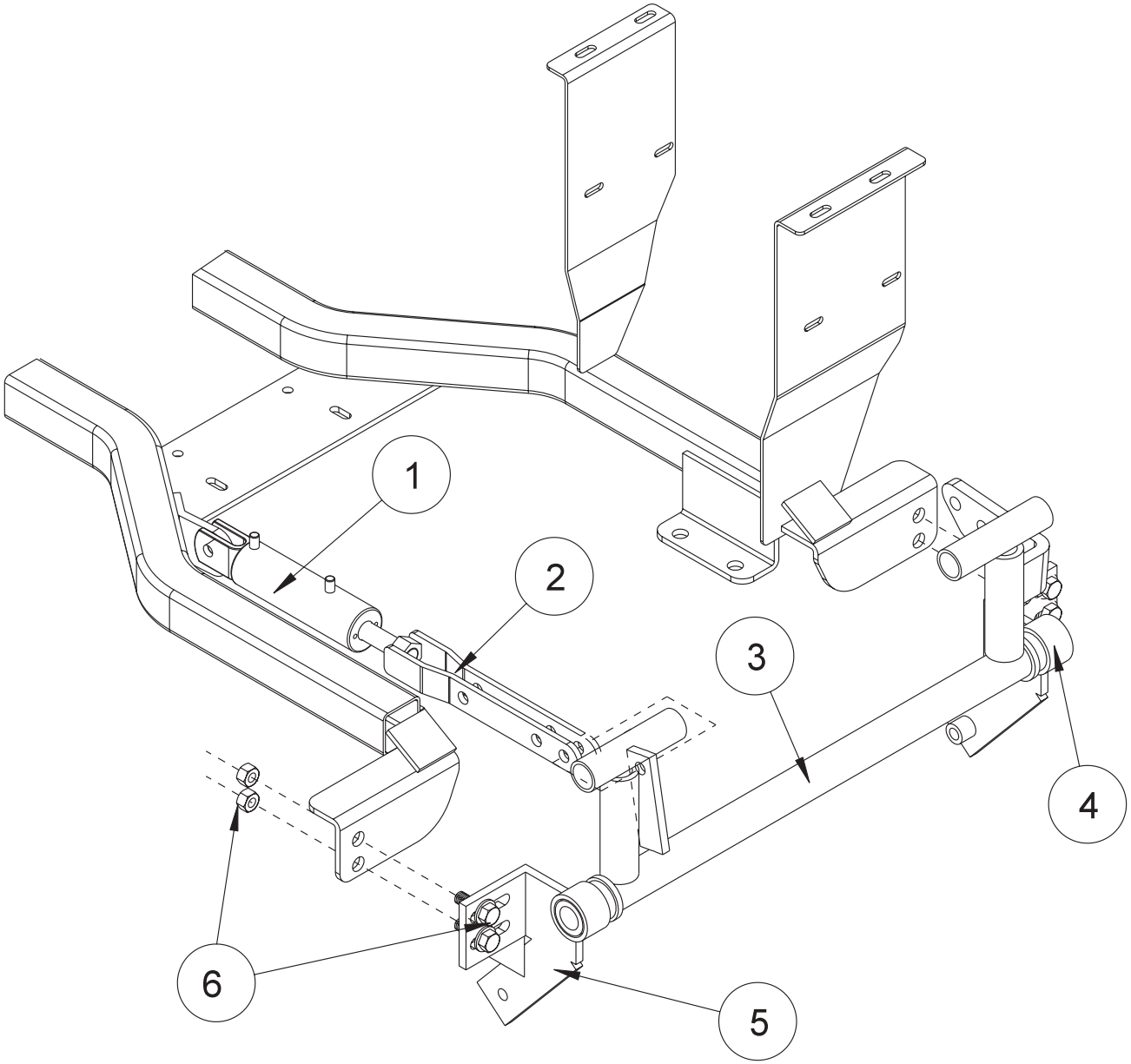
NOTE: **The speed boss is not used with Box Grader. Leave unhooked.**

34-190 SPIKER DRAWING



REF#	PART#	DESCRIPTION	QUANTITY
1	13-391	Bearing (2 each half)	4
	HB-516-18-100	Bolt 5/16 - 18 x 1	8
	HWL-516	Lock Washer 5/16	8
	HN-516-18	Nut 5/16 - 18	8
2	13-661	Inside Spiker Blade	2
3	HB-38-16-250	Bolt 3/8 - 16 x 2 1/2	2
	HW-38	Washer 3/8	2
4	13-371	Left Spiker Box	1
5	HB-38-16-350	Bolt 3/8 - 16 x 3 1/2	4
	HW-38	Washer 3/8	8
	HWL-38	Lock Washer 3/8	4
	HN-38-16	Nut 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 1/2"	2
10	13-384	Weight	2
	HB-38-16-250	Bolt 3/8 - 16 x 2 1/2	4
	HWL-38	Lock Washer 3/8	4
	HW-38	Washer 3/8	4
11	13-372	Threaded Rod 1/2 - 20 x 4	2
12	80-006	Rod End with Grease Fitting	2
	HB-12-13-275	Bolt 1/2 - 13 x 2 3/4	2
	HN-12-13	Nut 1/2 - 13	2
	HWL-12	Lock Washer 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 1/2 - 13 x 3	1
	HW-12	Washer 1/2	2
	HN-12-13	Nut 1/2 - 13	1
16	13-377	Spring Pivot Pin	2
	HP-18-100	Cotter Pin 1/8 x 2	2
17	13-659	Left Pivot	1
	HB-12-13-150	Bolt 1/2 - 13 x 1 1/2	2
	HW-12	Washer 1/2	2
	HWL-12	Lock Washer 1/2	2
	HN-12-13	Nut 1/2 - 13	2
18	13-382	Cylinder Lift Frame	1
19	13-658	Right Pivot	1
	HB-12-13-150	Bolt 1/2 - 13 x 1 1/2	2
	HW-12	Washer 1/2	2
	HWL-12	Lock Washer 1/2	2
	HN-12-13	Nut 1/2 - 13	2
20	13-386	Right Tines	1
21	13-277	Spring Pad	4
22	13-375	Spring Adjsutmant Rod	2
	HN-12-13	Nut 1/2 - 13	4
	HW-12	Washer 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 RAKE LIFT ASSEMBLY



SPIKER LIFT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	13-357	Hydraulic Cylinder	1
	HNJ-34-16	Jam Nut 3/4 - 16	1
2	13-366	Cylinder Extension	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 1/2 - 13 x 1 1/2	4
	HW-12	Washer 1/2	4
	HWL-12	Lockwasher 1/2	4
	HN-12-13	Nut 1/2 - 13	4

MOUNTING INSTRUCTIONS FOR SUPER RAKE

1. To mount Spiker onto the Super Rake you must remove the rake lift.
2. You have to unhook the speed boss arm before removing the rake lift. Completely remove the rod speed limiter and ball joint from machine. The speed boss does not need to function when using the Spiker.
3. Set the spiker behind the machine. Bolt the Spiker to the main frame using the outside holes on the pivot brackets (Ref 4 & 5). Use the 1/2 - 13 x 1 1/2 bolts, washers, lockwashers and nuts (Ref 6).
4. Thread the cylinder extension (Ref 2) so it is just on the cylinder (Ref 1). Tighten down with jam nut.
5. Using the first hole from the end of the cylinder extension, hook the cylinder extension (Ref 2) to the cylinder tab on the cylinder lift frame (Ref 3).
6. Compression springs should be tightened to 6 1/2 " for best result.
7. Test spiker for ground penetration. If there is too much ground penetration loosen the springs. If you need more ground penetration, tighten springs.

NOTE: **The speed boss is not used with spiker. Leave unhooked.**

EC Declaration of Conformity

according to Directive 89/392/EEC

We **SMITHCO**

(Name of supplier)

34 West Ave/Wayne, PA 19087

(Full address of the manufacturer - authorized representative established in the Community must also give the business name and address of the manufacturer)

declare under our sole responsibility, that the product

Gas Super Rake 13-550/13-551

(Make, Model)

to which this declaration relates corresponds to the relevant basic safety and health requirements of the Directive 89/392/EEC,

(if applicable)

and to the requirements of the other Directives:

EN292-01
EN292-2
EN294
EN349
92/59
89/392

(Title and/or number and date of issue of the other Directives)

(if applicable)

For the relevant implementation of the safety and health requirements mentioned in the Directives, the following standard(s) and/or technical specification(s) has (have) been respected:

ISO 37-1983
PREN836
ISO 1219-1976
SAE-HS-2800
SAE-J1362

(Title and/or number and date of issue of standard(s) and/or technical specification(s))

Cameron, Wisconsin USA

(Place and date of issue)

(Name, function and signature of the authorized person)

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

13-437	Front Wheel Drive	Lower Right Fender
13-515	Forward/Reverse	Foot Pedal
13-554	Valve Panel	Left Fender
13-640	Instrument Panel	Right Fender
15-598	"2"	Right anD Left Outside Fender(13-551 only)
16-088	Moving Parts Hot	Inside Rear Cowling
17-065	Super Rake (Slant)	Right and Left Outside Fender
25-004	Serial #	Right Main Frame
25-277	Alternator Battery	Above Battery On Nose Cone
25-279	Stay Clear	Rear Cowling
25-285	Safety Warning	Console
25-286	Pinch Points	Front Right and Left Fender - Rear Hydraulic Pump
25-298	Warning Hot	Rear Cowling
25-307	Refuel Gas	Left Fender Right Side Gas Cap
25-308	Caution Engine Idle	Engine
25-322	Made In U.S.A.	Above Left Corner of 25-285
25-329	Smithco Black $^{7}/_{8}$"	Right and Left Nose Cone
25-333	Briggs And Stratton	Visible From Operators Position
25-337	Speed Boss	Hang Tag
25-354	Tire Pressure 5 psi	All Three Wheels
27-077	Smithco Round	Steering Wheel
27-086	CE	Left Side of Rear Cowling Below Seat (overseas machines only)
27-087	Park Brake	Left Side Console
27-093	Hydraulic Fluid Level	Right Fender Behind Garbage Box
27-096	Plow Lift	Optional
25-342	ByPass Valve	Hang Tag

QUICK REFERENCE REPLACEMENT PARTS

REPLACEMENT FILTERS

23-031	Hydraulic Oil Filter	
15-165-01	Air Filter Element with Pre-Cleaner	Briggs and Stratton# 5050
11-131	Air Filter Element Fender Mounted	
50-403	Fuel Filter	
13-531	Engine Oil Filter	Briggs and Stratton# 492932

SEAL KITS

13-110	Variable Pump
14-098	Seal Kit
13-032 and 13-615	Wheel Motors
14-080	Seal Kit
13-261	Hydraulic 2 Bank Valve
14-062	Seal Kit
14-106	Relief Assembly Kit
14-203	Spring Centering Assembly Kit (1 per bank)
13-355	Hydraulic 3 Bank Valve
14-205	Seal Kit
14-106	Relief Assembly Kit
14-203	Spring Centered Assembly Kit (1 per bank)
*13-292	Hydraulic Cylinder (Attachment Lift Cylinder)
*13-357	Hydraulic Cylinder for Rake Lift
*13-406	Hydraulic Cylinder for Sand Plow Lift

FLUIDS

Engine Oil	Refer to Engine Manual
Hydraulic Fluid	SAE 10W-40 API Service SG Motor Oil

OTHER PARTS

	Spark Plugs	RC12YC (Gap 0.030 inch (0.76mm))
*14-253	Seal Kit for cylinders with part number stamped on cylinder and a retaining ring on rod end.	
*14-267	Seal Kit for cylinders with part number stamped on cylinder and a spanner nut on the rod end.	

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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