Parts & Service

Smithco

Wayne, PA 19087 www.smithco.com

Spray Star 5200
Model 32-500

SN: 520G001

July 2020

Product Support: ***Hwy SS & Poplar Ave; Cameron WI 54822***
1-800-891-9435 productsupport@smithco.com

CONTENTS

INTRODUCTION

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

Read this manual and all other manuals pertaining to the Spray Star 5200 carefully as they contain safety, operating, assembly and maintenance instructions. Failure to do so could result in personal injury or equipment damage.

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

WARNING:

Engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.
For more information visit
www.P65Warnings.ca.gov

WARNING

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

All ***Smithco*** machines have a Serial Number and Model Number. Serial tag is located on right main frame below hydrostatic pump. Both numbers are needed when ordering parts. Refer to engine manual for placement of engine serial number.

For product and accessory information, help finding a dealer, or to register your procuct please contact us at www.Smithco.com.

Information needed when ordering replacement parts:

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

For easy access record your Serial and Model numbers here.

SMITHCO
WAYNE, PENNSYLVANIA 19087 USA
610-688-4009 Fax 610-688-6069

SERIAL NO.	kW/hp	DATE OF MFG.

MODEL NO.	lb/kg Empty	lb/kg Full

SMITHCO CUSTOMER SERVICE 1-800-891-9435

SAFE PRACTICES

1. It is your responsibility to read this manual and all publications associated with this machine.
2. Never allow anyone to operate or service the machine or its optional equipment 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. Disengage all drives and set park brake before starting the engine.
12. Never use your hands to search for oil leaks. Hydraulic fluid under pressure can penetrate the skin and cause serious injury.
13. 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.
14. Before leaving operator's position:
    A. Disengage all drives.
    B. Shut engine off and remove the ignition key.
    C. If engine has to run to perform any maintenance keep hands, feet, clothing and all other parts of body away from moving parts.
15. Keep hands, feet and clothing away from moving parts. Wait for all movement to stop before you clean, adjust or service the machine.
16. Keep the area of operation clear of all bystanders.
17. Stop engine before making repairs/adjustments or checking/adding oil to the crankcase.
18. Use parts and materials supplied by ***Smithco*** only. Do not modify any function or part.
19. Use caution when booms are down as they extend out beyond the center line of the machine.
20. The tank is a confined space, take precaution.

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

SPECIFICATIONS SPRAY STAR 5200

WEIGHTS AND DIMENSIONS

Length	174" (4.42m)
Width	89" (2.26m)
Width w/ Booms Open	20' - 260" (6.6m) 24' - 308" (7.8m)
Height w/ ROPS	84" (2.1m)
Height w/ Booms Up	20' - 106" (2.7m) 24' - 118" (3.0m)
Wheel Base	88" (1.24m)
Weight Empty	4155 lbs (1884 kg)
Weight Full	8491 lbs (3851 kg)

SOUND LEVEL (DBA)

At ear level	86 dBA
At 30 ft. (9.14 m)	76 dBA

ENGINE

Make	Kubota
Model#	WG3800
Code / Spec#	G-E3-KEA-3
Rated Horsepower	87 hp (65kW) @2600RPM
Fuel (EMISSIONS)	Unleaded 87 Octane Gasoline Minimum
Cooling System	Liquid Cooled
Lubrication System	Full Pressure
Alternator	60 Amp

WHEELS & TIRE

Front: Two 27 x 10.50 x 15 Turf; 30 psi (2.0 bar)

Rear: Two 33 x 16.00 x LL500 Multi-Trac; 30 psi (2.0 bar)

SPEED

Infinitely Variable	0-10 m.p.h. (0-18 kph)

BATTERY

Automotive type 24F - 12 volt

BCI Group	Size 24
Cold Cranking Amps	900 minimum
Ground Terminal Polarity	Negative (-)
Maximum Length	10.25" (26 cm)
Maximum Width	6.88" (17 cm)
Maximum Height	10" (25 cm)

FLUID CAPACITY

Crankcase Oil	See Engine Manual
Fuel	20 gallon (75.7 liters)
Hydraulic Fluid	10 gallon (37.8 liters)
Grade of Hydraulic Fluid	SAE 10W-40 API Service SL or higher Motor Oil

OPTIONAL EQUIPMENT

32-509	Manual Hose Reel	5220	TeeJet Radion 8140 w/ 20' HD Boom
32-510	Electric Hose Reel	5224	TeeJet Radion 8140 w/ 24' HD Boom
32-508	Foam Marker	5285	Star Command II w/ 20' HD Boom
15-618	Water Meter Kit(liters)	5286	Star Command II w/ 24' HD Boom
14-515	Water Meter Kit (gallons)	5287	Star Command I w/ 20' HD Boom
32-511	50Gal (189l) Tank Rinse System	5288	Star Command I w/ 24' HD Boom
32-512	Chemical Clean-load Safe Fill	32-505	20' HD Super Boom
32-514	Sonar Boom	32-565	24' HD Super Boom

MAINTENANCE

⚠ CAUTION

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

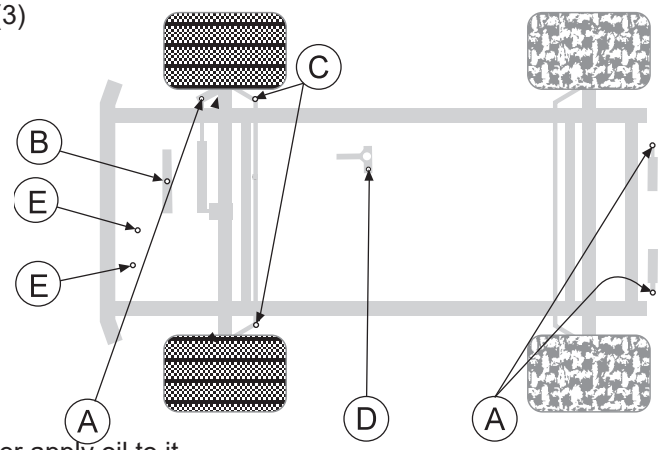
Use all procedures and parts prescribed by the manufacturer's. Read the engine manual before operation.

⚠ IMPORTANT

LUBRICATION

Use No. 2 General purpose lithium base grease and lubricate every 100 hours. The Spray Star 5200 has 9 grease fittings.

A. One on each rod end of hydraulic cylinder.(3)
B. One on the linkage relay. (1)
C. One on each end of tie rod. (2)
D. One on the idler arm.(1)
E. One on each of the pedal relays.(2)



ELECTRICAL CONNECTIONS

Use dielectric grease on all electrical connections.

AIR CLEANER ON ENGINE

Since the air cleaner on this engine is a dry type, never apply oil to it.

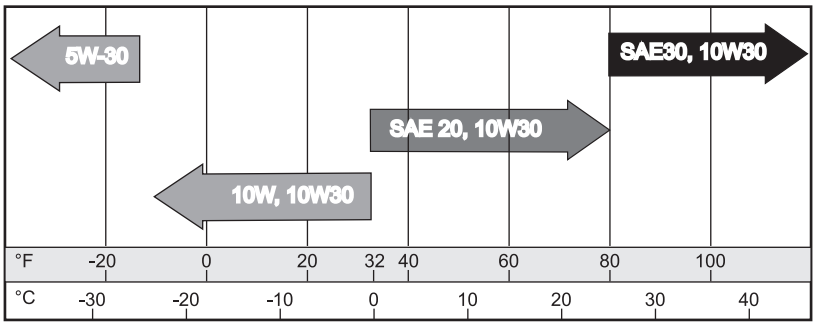
1. Open evacuator valve (see engine manual) once a week to remove large particles of dust and dirt.
2. Wipe the inside of the air cleaner with a cloth if it gets wet or dirty.
3. Avoid touching the element except when cleaning.
4. When dust adheres to the element, gently tap element on flat surface.
5. When carbon or oil adheres to the element clean according to engine manual.
6. Replace the element every year or every 6 months.
7. IMPORTANT - Make sure wing bolt for the element is tight enough. If it is loose, dust and dirt may be sucked in, wearing down the cylinder liner and piston ring, resulting in poor power output.

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

⚠ IMPORTANT

ENGINE OIL

Change and add oil according to chart below based on air temperature at the time of operation. Do not overfill. Use a high quality detergent oil classified "For Service use API classification SL or higher" oil. Use no special additives with recommended oils. Do not mix oil with gasoline.



Starting Temperature Range Anticipated Before Next Oil Change

HYDRAULIC OIL

1. Use SAE 10W-40 API Service SJ or higher motor oil.
2. For proper warranty, change oil the first 50 hours and then every 200 hours or annually, which ever is first.
3. Oil level should be 2-2½" (5-6.4cm) from top of the tank when fluid is cold. Do not overfill.
4. After changing oil, run the machine for a few minutes. Check oil level and for leaks.
5. Always use extreme 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 the natural color of the fluid has become 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 immediately after fluid is cool and find the cause. Take fluid level readings when the 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 SJ or higher when cold (below 32°F (0°C) ambient temperature. Use either motor oil or hydraulic oil, but do not mix.
10. Oil being added to the system must be the same as what is already in the tank. Mark the tank fill area as to which type you put in.

TIRE PRESSURE

Caution must be used when inflating a low tire to recommended pressure. Over inflating can cause tires to explode. Front tires and rear tires should be 30 psi (2.0bar). Improper inflation will reduce tire life considerably.

MAINTENANCE

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:

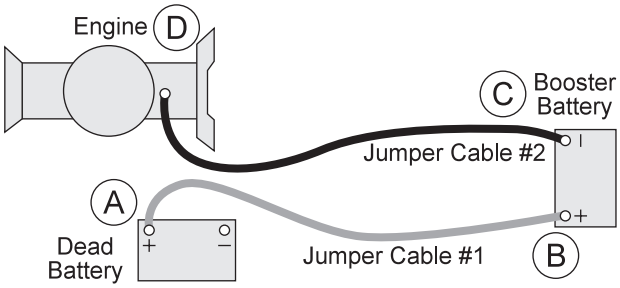
1. Filling batteries in well-ventilated areas.
2. Wear eye protection and rubber gloves.
3. Avoid breathing fumes when electrolyte is added.
4. Avoid spilling or dripping electrolyte.

⚠ 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.**

⚠ 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):

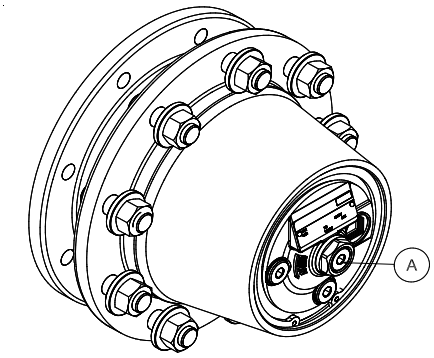
1. Shield eyes.
2. Connect ends of one cable to positive (+) terminals of each battery, first (A) then (B).
3. Connect one end of other cable to negative (-) terminal of "good" battery (C).
4. Connect other end of cable (D) to engine block on unit being started (NOT to negative (-) terminal of battery)



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

BRAKE RELEASE

Run machine at half-throttle minimum, prior to operating traction pedal. This will ensure proper brake release.



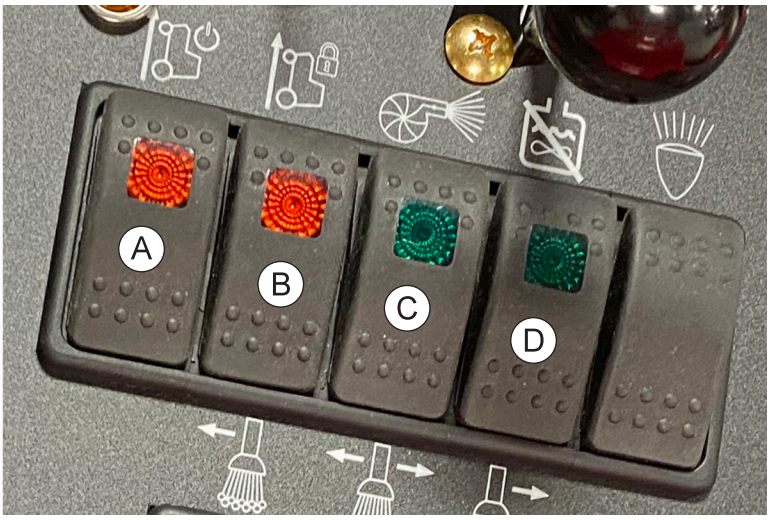
TOWING

Rear wheel brakes must be disengaged for towing. To disengage the brake, loosen the allen screw (A) in center of hub approximately 5 rotations. This will release the brake shaft. Must be done to both rear wheels. **Road speeds must not exceed 20 MPH.** When done towing, tighten the hex bolt on both wheels. Test machine before putting in operation.

⚠ WARNING **Machine is in free wheel mode when towing.**
Machine has no rear wheel braking capabilities when being towed.

GROUND SPEED CONTROL

The ground speed is regulated by the forward foot pedal and the toggle switches (A & B) on the center console.



TO ENGAGE:

1. Push top of rocker switch(A) down. This turns speed control 'On' (amber light).
2. Obtain desired speed with forward foot pedal.
3. Push top of rocker switch(B) down. This locks the speed control 'On' (amber light).
4. Push bottom of either rocker switch down to unlock speed control.

SPRAY PUMP WITH BELT

To turn the spray pump on press the spray pump rocker switch (C). The spray pump belt should have approximately 1/2" (13mm) of deflection in the center of the top strand.

TANK AGITATION

To turn on tank agitation press the top of agitation rocker switch (D). Green light will come on. When agitation is done push the bottom of the rocker switch to turn off. Green light will go out.

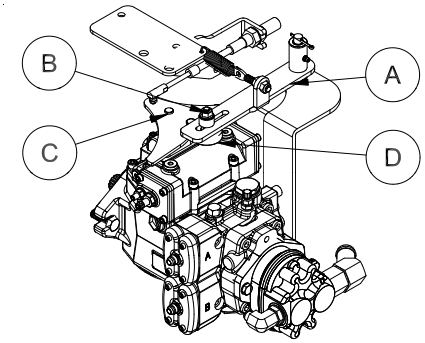
SAFETY INTERLOCK SWITCH

To adjust the interlock switch on the back hydrostatic pump loosen the set screw on the front half of the switch, with the ignition switch OFF. With a continuity tester connected across the switch, it should light with the shift arm centered. Move the shift arm to the right or left and the light should go off. By turning the back half of the switch clockwise it will reduce the amount of travel on the shift arm that is required for the light to remain on. The light must be on ONLY with the shift arm centered.

WHEEL CREEP

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

1. Lift up and support machine so rear wheels are off the ground and can turn freely.
2. In the engine compartment, the hydrostatic pump is on the right side. The shift arm (C) is on top of the pump The idler arm (A) has a bearing (D) that rides in the vee of the shift arm. Loosen bolt (B).
3. With engine running, move bearing (D) so it centers on the shift arm (C) and 'wheel creep' stops.
4. Tighten all fasteners and test by using foot pedal linkage to see that 'creep' is removed.
5. Turn engine off and lower machine.
6. Test machine before putting into operation.



SERVICE CHART

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

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

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

Duplicate this page for routine use

Maintenance Check Item	For the week of:						
	Mon	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check the Safety Seat Switch							
Check Steering Operation							
Check the fuel level							
Check the engine oil level.							
Check the condition of the air filter							
Clean the engine cooling fins.							
Check for unusual engine noises							
Check the hydraulic oil level							
Check hydraulic hoses and fittings for damage							
Check for fluid leaks.							
Check the tire pressure (20-30 psi)							
Check the Instrumentation							
Inspect electrical system for frayed wires							
Check neutral start							
Change oil filter.							
Change oil.							
Lubricate Machine and Booms							
Ensure all warning decals are intact.							

Areas of Concern		
Inspection Performed by:		
Item	Date	Information

Item	Maintenance Procedure
After the first 8 operating hours	Torque the wheel lug nuts. (64-74 ft/lb (87-100 Nm)) Change the engine oil filter.
Before each use daily	Check the engine oil level. Clean area around muffler and controls. Check the hydraulic fluid level. Check the tire pressure. Check condition of hydraulic hoses and fittings. Check for oil or water leaks. Proper function of glow lamp timer.
After the first 50 hours	Change Hydraulic Oil Filter. Change Engine oil and filter.
Every 100 hours	Clean or change air filter.[1&2] Clean fuel filter element.[1] Lubricate machine. Check the battery fluid level and cable connections.. Check fan belt tension and damage.
Every 200 hours	Check radiator hoses and clamp bands. Change engine oil.[1] Check idle speed. Replace oil filter cartridge.[1] Change hydraulic oil filter.[1] Check air intake line.[1] Torque the wheel lug nuts. (64-74 ft/lb (87-100 Nm))
Every 500 hours or yearly	Clean Water Jacket and radiator interior. Replace fan belt.
Every 800 hours	Check valve clearance.
Every 1500 hours	Check injection nozzle pressure.
Every 3000 hours	Check turbo charger. Check injection pump. Check injection timing.
Every 2 years	Change radiator coolant (L.L.C.) Replace radiator hoses and clamp bands. Replace fuel hoses and clamps. Replace intake air lines.

[1] In dusty conditions or when airborne debris is present, clean more often.

[2] Replace after every 6 times of cleaning

STORAGE

⚠ IMPORTANT **To prevent damage from freezing, pour window washer fluid into spray systems tank and operate pump to circulate mix through gun and hose back to tank. Open boom control to circulate through rest of spray system.**

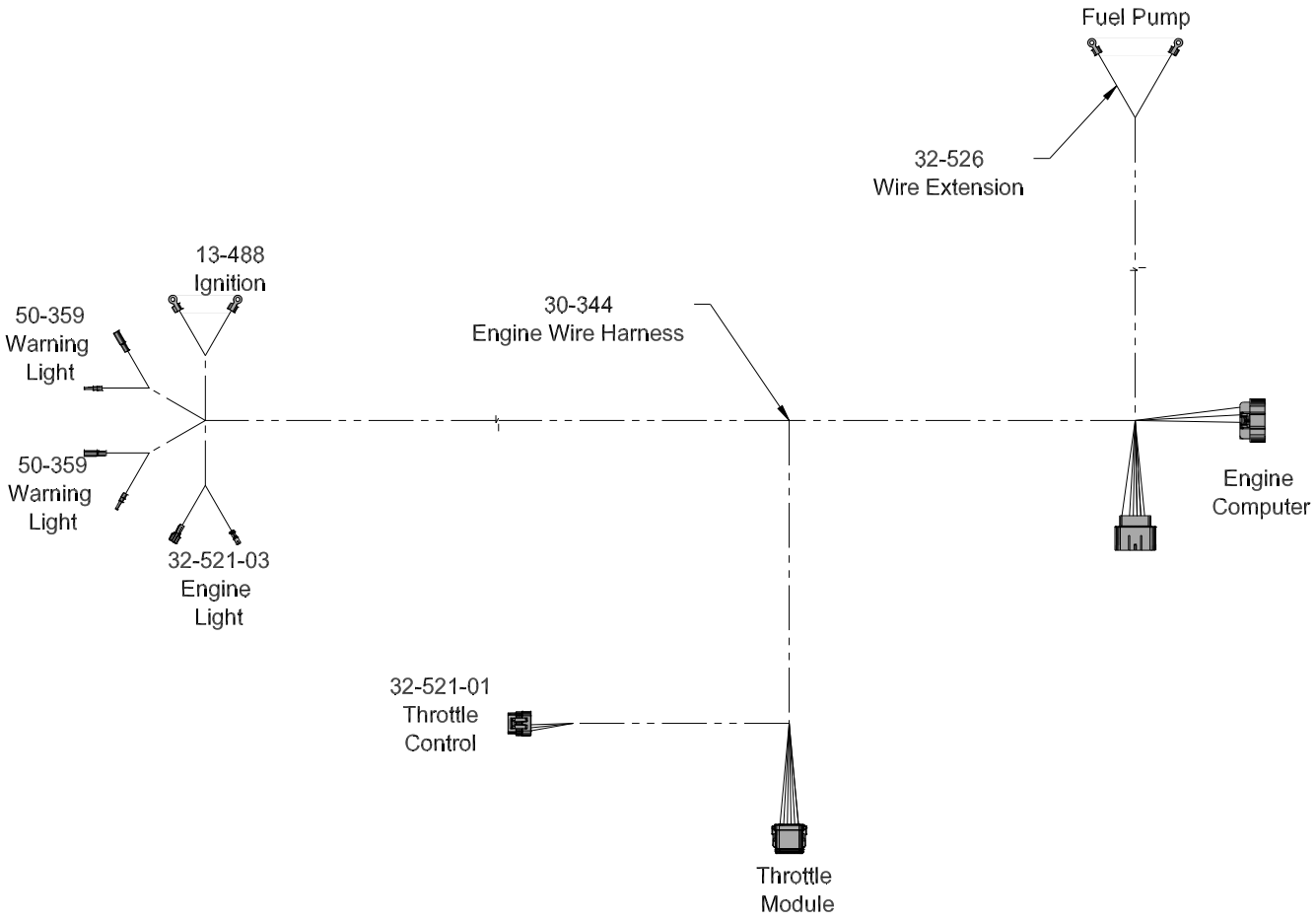
1. Clean the exterior surfaces of the engine.
2. Change the oil and filter while the engine is still warm from operation.
3. Drain coolant from the radiator. Open cock at the bottom of the radiator, and remove the pressure cap to drain water completely. Leave the cock open. Hang a not written "No Water" on the pressure cap. Since water freezes when temperature drops below 0°C (32° F) it is important that no water is left in the machine.
4. Remove battery from the engine, adjust the electrolyte level, and recharge it. Store battery in a dry dark place.
5. Store machine in a clean, dry place.

EXTENDED STORAGE

1. Check for any damaged parts or missing decals. Replace as needed.
2. Drain crankcase completely and refill with recommended engine oil or equivalent.
3. Lubricate all grease points.
4. Check coolant protection and level.
5. Clean exterior surface of engine.
6. Seal all openings in engine and accessories with non-hygroscopic material. Mask off all areas to be used for electrical contact.
7. Tape all openings and make sure all surfaces are dry. Then spray all taped openings, all engine accessories including ignition wiring, and all exterior surfaces of engine with Insulation Compound.
8. Disconnect, remove and clean battery. Check electrolyte level. Charge the battery and store in a cool dry place (NOT directly on cement).
9. Put blocks or stands under the machine to take weight off tires.

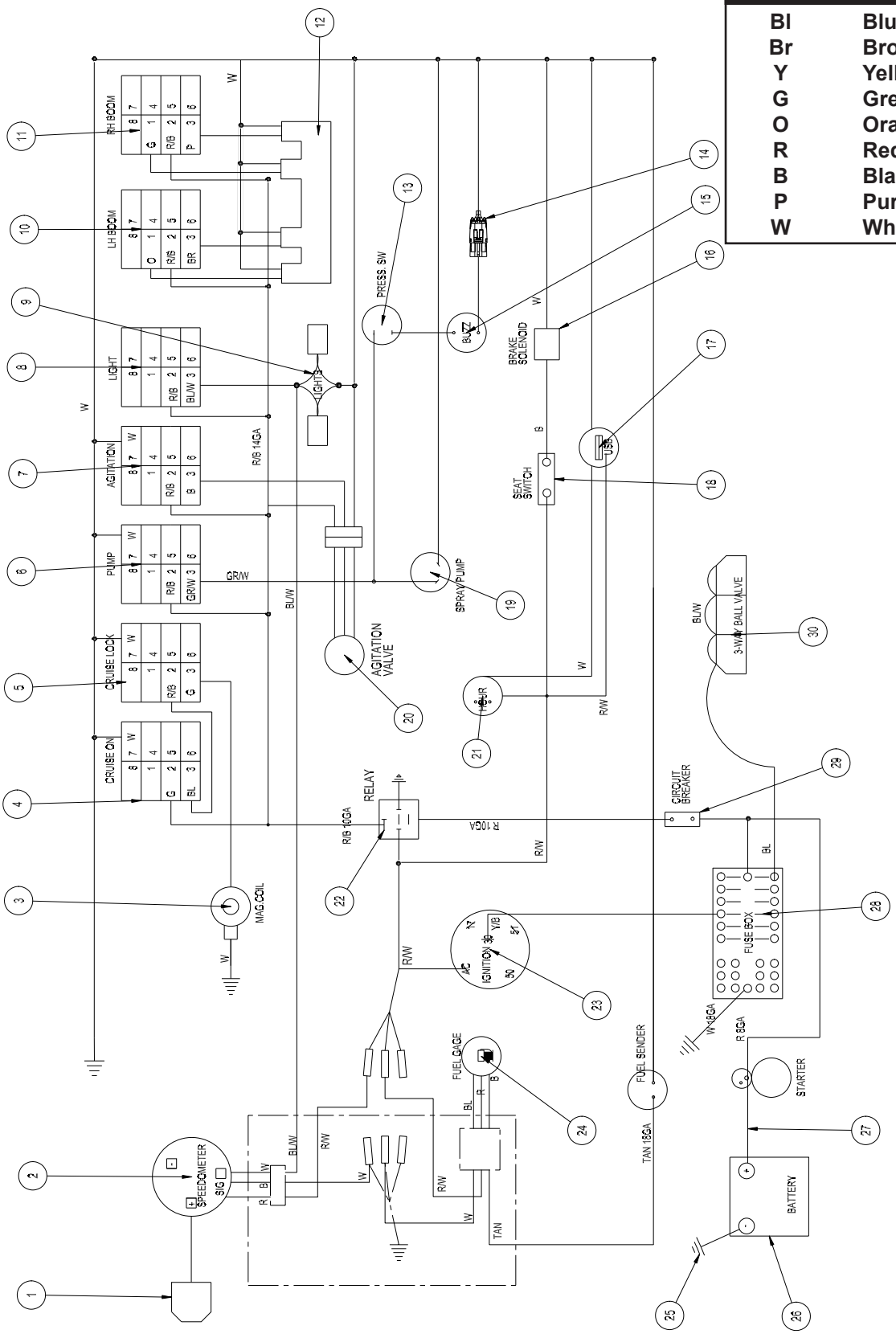
AFTER STORAGE

1. Check for any damaged parts or missing decals. Replace as needed.
2. Lubricate all grease points.
3. Clean exterior surface of engine.
4. Remove all tape and obstructions from exterior engine surfaces.
5. Charge and replace battery.
6. Check tire pressure.
7. Remove blocks or supports from under the machine.
8. Check engine oil level and coolant level and lubricate all grease points.
9. Fill fuel tank.
10. Check belt tension.
11. Run engine approximately 5 minutes before putting the engine under load.


Fuel Pump
32-526
Wire Extension
13-488
Ignition
50-359
Warning
Light
30-344
Engine Wire Harness
50-359
Warning
Light
32-521-03
Engine
Light
Engine
Computer
32-521-01
Throttle
Control
Throttle
Module

WIRING DIAGRAM

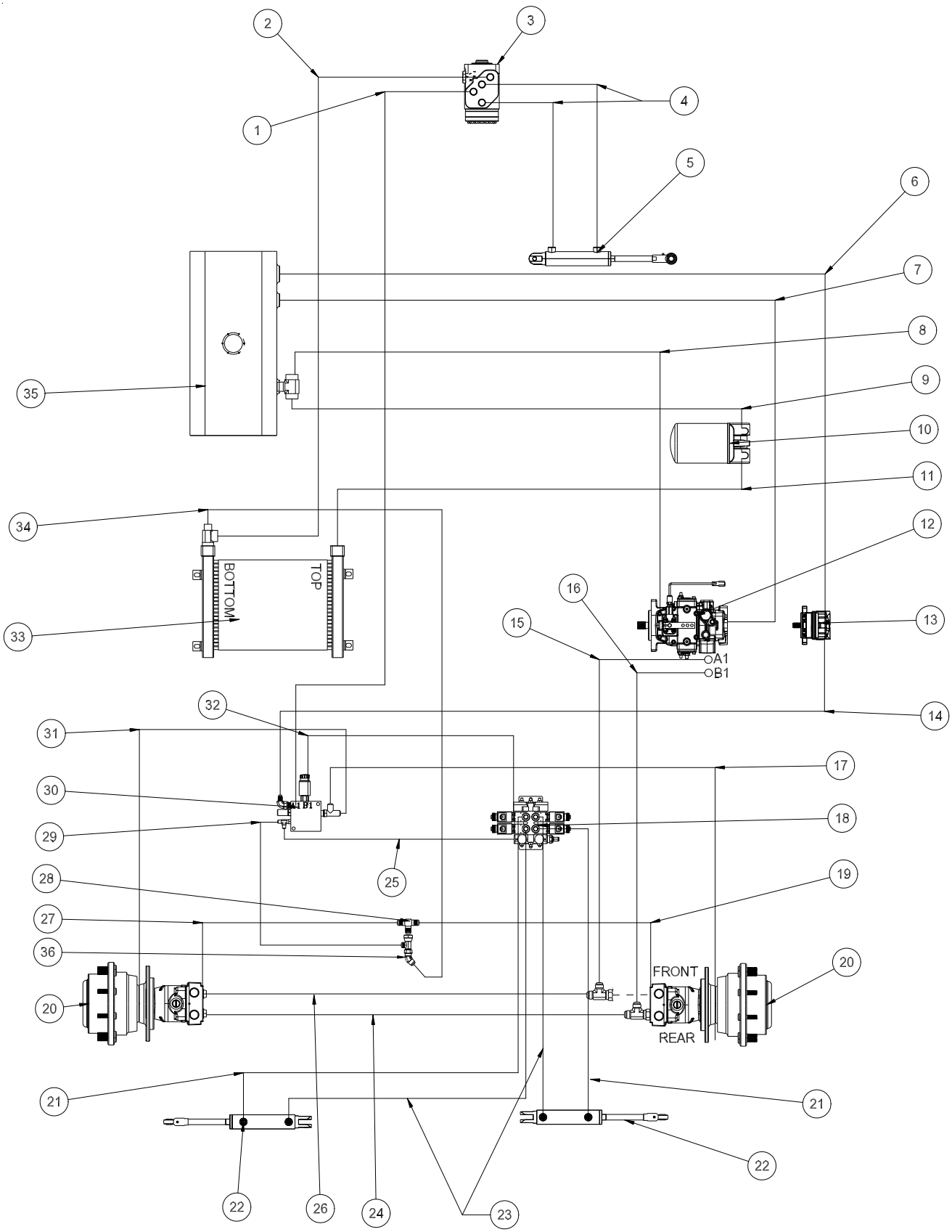
Color Code Chart	
Bl	Blue
Br	Brown
Y	Yellow
G	Green
O	Orange
R	Red
B	Black
P	Purple
W	White



REF#	PART#	DESCRIPTION	QUANTITY
1	20-730-01	GPS Antenna (part of speedometer)	1
2	30-356	GPS Speedometer	1
	8945	Closed End Connector	1
3	33-084	Magnetic Coil	1
4	**CRUISE ON**		
	15-726	Lighted Switch	1
	15-731	Rocker, Amber	1
5	**CRUISE LOCK**		
	15-726	Lighted Switch	1
	15-731	Rocker, Amber	1
6	**SPRAY PUMP**		
	15-726	Lighted Switch	1
	15-732	Rocker, Green	1
7	**AGITATION VALVE**		
	15-726	Lighted Switch	1
	15-732	Rocker, Green	1
8	**LIGHTS**		
	15-727	Rocker, No Light	1
	15-782	Non-Lighted Switch	1
9	32-637	LED Light Assembly	1
	32-704	Headlight Wire Harness	1
10	**LH BOOM**		
	15-727	Rocker, No Light	1
	15-728	Centering Switch, Momentary, On-Off-On	1
11	**RH BOOM**		
	15-727	Rocker, No Light	1
	15-728	Centering Switch, Momentary, On-Off-On	1
12	32-677	Boom Control Valve	2
13	33-480	Pressure Switch	1
14	9016	Weather Pack	1
	9017	Weather Pack Terminal	2
	9018	Seal	2
15	77-207	Buzzer	1
16	32-612	Brake Manifold Valve	1
17	32-576	USB Power Charger	1
18	14-292	Seat Switch	1
19	32-584	Spray Pump	1
20	14-673	Agitation Shut Off Valve	1
21	12-804	Hour Meter	1
22	30-042-06	Relay	1
23	17-068	Ignition Switch	1
24	32-649	LED Fuel Gage w/ Terminals	1
	8945	Closed End Connector	1
25	48-268	Ground Battery Cable	1
26	33-216	Battery	1
27	78-325	Positive Battery Cable	1
28	32-573	Fuse Block	1
29	77-261	Circuit Breaker, 40AMP	1
	8977	Circuit Breaker Boot	1
30	18-372	3-Way Manifold Ball Valve	1
	32-703	Main Wire Harness	1
	30-344	Engine Wire Harness	1
	32-526	Engine WIre Extension 48"	1
	32-704	Headlight Wire Harness	1

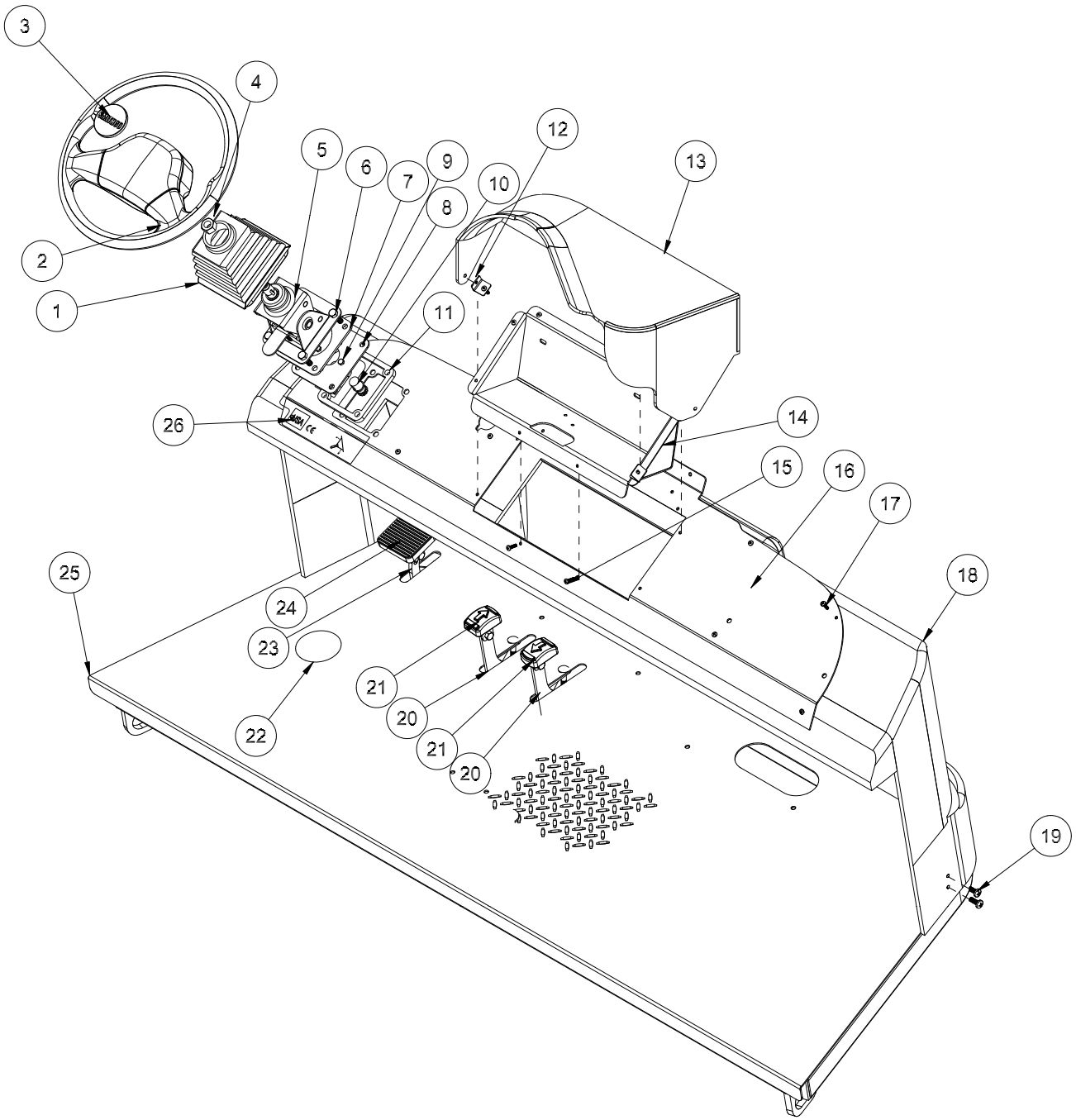
HYDRAULIC DIAGRAM

Use dielectric grease on all electrical connections.



REF#	PART#	DESCRIPTION	QUANTITY
1	32-553	Hydraulic Hose, 194.5"	1
2	32-559	Hydraulic Hose, 125.5"	1
3	15-301	Orbital	1
	15-301-01	Seal Kit	1
4	32-554	Hydraulic Hose, 69.5"	2
5	15-839	Steering Cylinder	1
	15-839-01	Seal Kit	1
6	8833-48	1" Suction Hose x 48"	1
	18-116	Hose Clamp	2
7	32-547	Hydraulic Hose, 45"	1
8	32-558	Hydraulic Hose, 66"	1
9	8833-20	1" Suction Hose, x 20"	1
	18-116	Hose Clamp	2
10	72-146	Oil Filter	1
	60-334	Replacement Filter Element	1
11	8833-40	1" Suction Hose x 40"	1
	18-116	Hose Clamp	2
12	32-609	Hydrostatic pump, 4500 PSI	1
13	76-197	Gear Pump	1
	76-197-08	Seal Kit	1
14	32-552	Hydraulic Hose, 112"	1
15	32-699	Hydraulic Hose, 69.5"	1
16	32-698	Hydraulic Hose, 67"	1
17	32-549	Hydraulic Hose, 42"	1
18	32-677	Boom Control Valve	1
19	32-555	Hydraulic Hose, 11.5"	1
20	32-610	Drive Assembly	2
21	32-693	Hydraulic Hose, 54"	2
22	13-406	Boom Cylinder	2
	14-267	Seal Kit	1 Per
23	32-692	Hydraulic Hose, 48"	2
24	32-700	Hydraulic Hose, 46.5"	1
25	32-550	Hydraulic Hose, 15"	1
26	32-701	Hydraulic Hose, 47"	1
27	32-556	Hydraulic Hose, 38.5"	1
28	18-170	Tee	1
	18-337	Run Tee	1
29	32-557	Hydraulic Hose, 33.5"	1
30	32-612	Auxiliary Pump Manifold	1
31	32-548	Hydraulic Hose, 30.75"	1
32	32-551	Hydraulic Hose, 13.5"	1
33	30-105	Oil to Air Heat Exchanger	1
34	32-694	Hydraulic Hose, 121"	1
35	30-025	Oil Tank, 10 Gallon	1
36	34-044	45° Elbow	1

NOSE CONE DRAWING

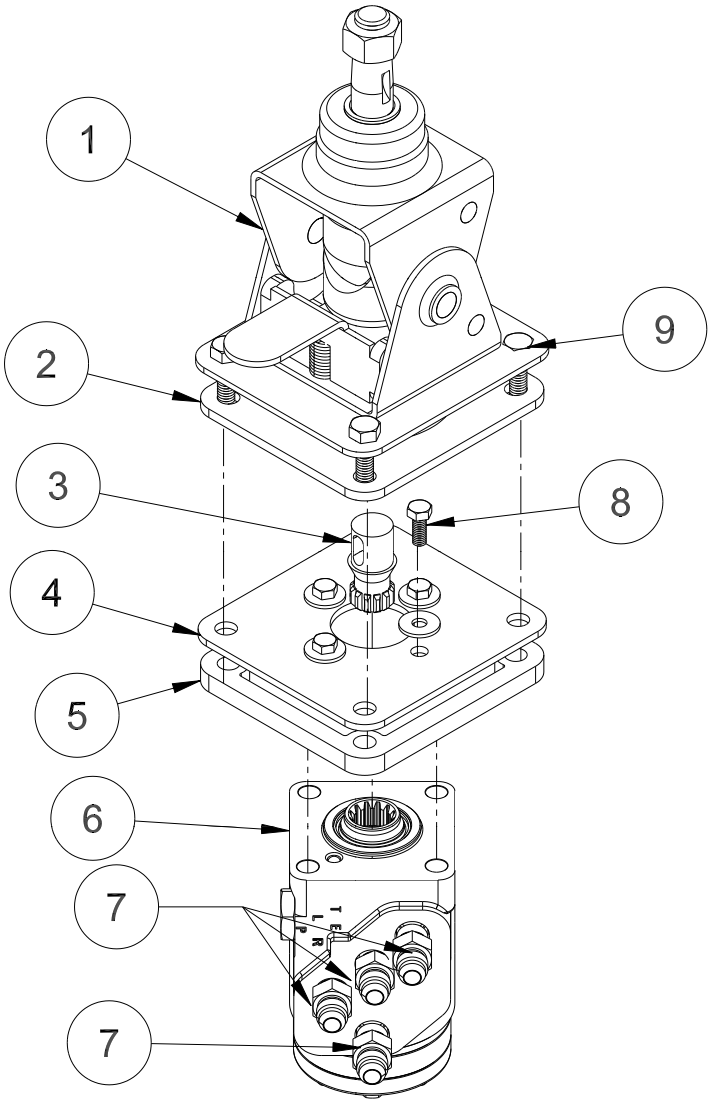


NOSE CONE PARTS LIST

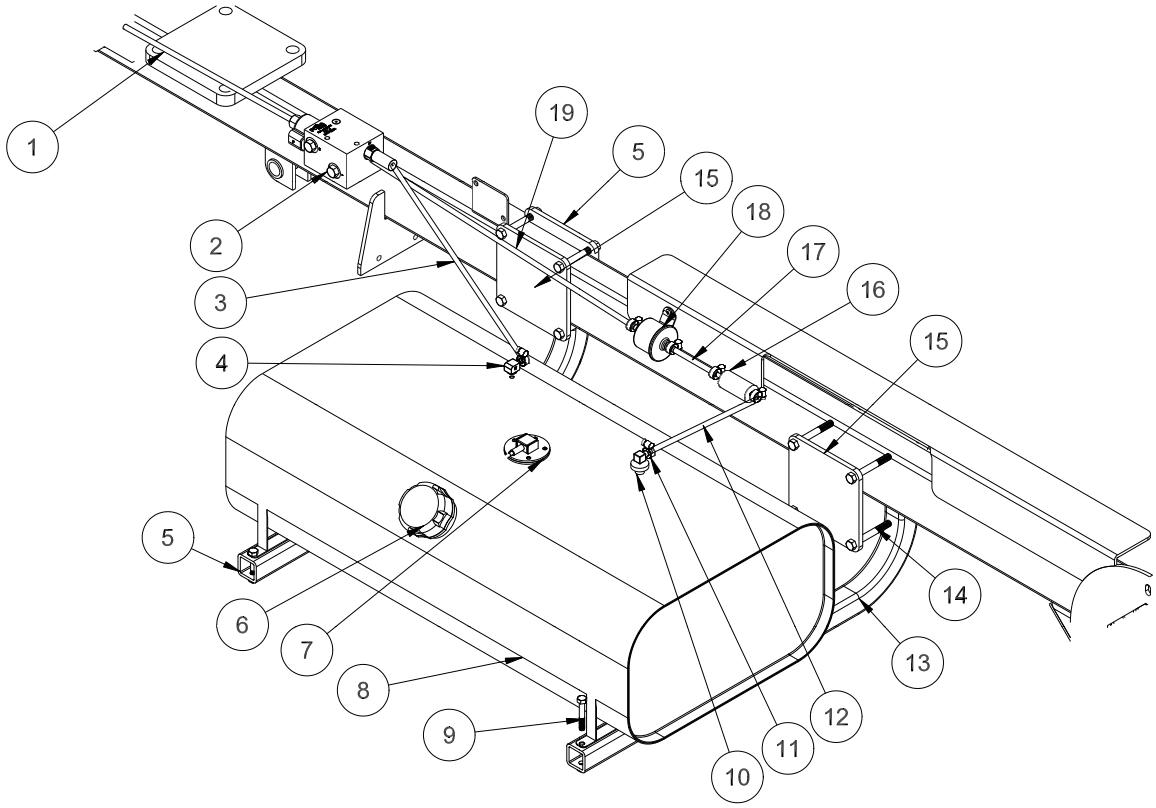
REF#	PART#	DESCRIPTION	QUANTITY
1*	76-364	Square Boot	1
2	10-751	Steering Wheel	1
3*	HNJ-58-18	Jam Nut, $^{5}/_{8}$ - 18	1
4	27-077	Decal, Smithco Round	1
5	76-362	Mini Tilt Steering(includes * items)	1
6	HB-516-18-125	Hex Bolt, $^{5}/_{16}$ - 18 x $1^{1}/_{4}$	4
	HNFL-516-18	Flange Whiz-loc Nut, $^{5}/_{16}$ -18	4
7	15-844	Tilt Steering Spacer	1
8	31-056	Tilt Steering Plate	1
9	HBM-6-1-16	Metric Hex Bolt, M6-1-16	4
	HWLM-6	Metric Lock Washer, M6	4
10	48-187	Stub Shaft	1
11	31-057	Steering Spacer	1
12†	32-685	Hood Clip	2
13†	32-681	Spray System Console Cover (fiberglass)	1
14	32-672	Dash Panel Box	1
15	HSM-10-32-100	Machine Screw, #10 -32 x 1	8
	HNFL-10-32	Flange Whiz-loc Nut, #10 -32	8
16	32-621	Dash Panel	1
17	HSM-10-32-100	Machine Screw, #10 -32 x 1	10
	HNFL-10-32	Flange Whiz-loc Nut, #10 -32	10
18	32-587	Nosecone (Fiberglass)	1
19	HSTP-516-18-150	Phillips Machine Screw, $^{5}/_{16}$ -18 x $1^{1}/_{2}$	8
	HNFL-516-18	Flange Whiz-loc Nut, $^{5}/_{16}$ -18	8
20	31-050	Pedal Assembly	2
21	45-022	Molded Pedal Pad	2
22	32-580	$3^{3}/_{8}$" Hole Plug	1
23	32-540	Brake Pedal	1
24	16-062	Pedal Plate	1
	15-015	Pedal Pad	1
25	32-530	Main Frame	1
26	32-619	Decal, Dash Panel	1

† *Part of Spray System*

ORBITAL DRAWING

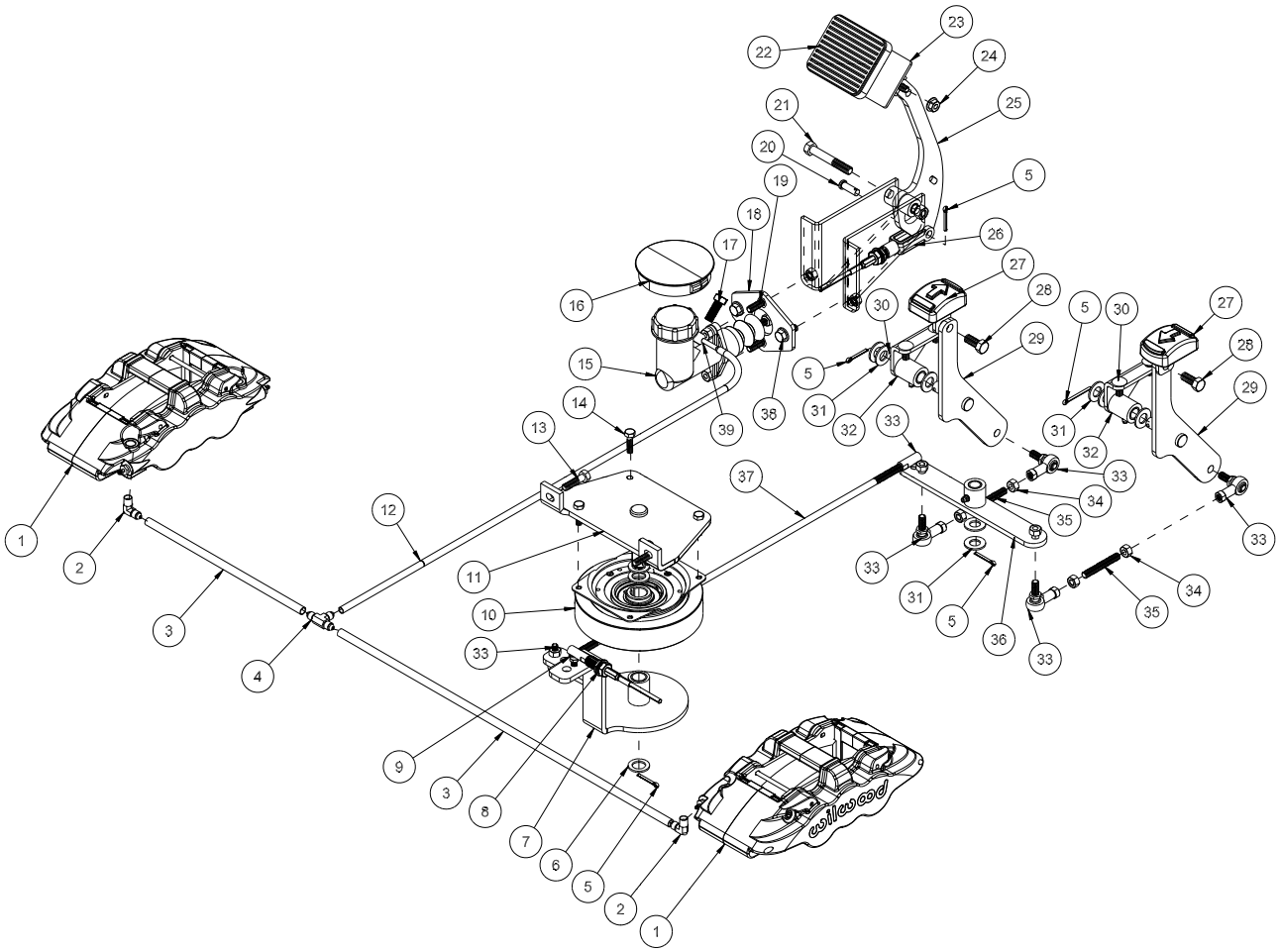


REF#	PART#	DESCRIPTION	QUANTITY
1	76-362	Mini Tilt Steering	1
2	15-844	Tilt Steering Spacer	1
3	48-187	Stub Shaft	1
4	31-056	Tilt Steering Plate	1
5	31-057	Steering Spacer	1
6	15-301	Orbital	1
7	18-169	Straight Thread Connector	4
8	HBM-6-1-16	Metric Hex Bolt, M6-1-16	4
	HWLM-6	Metric Lock Washer, M6	4
9	HB-516-18-125	Hex Bolt, $^{5}/_{16}$ - 18 x $1^{1}/_{4}$	4
	HNFL-516-18	Flange Whiz-loc Nut, $^{5}/_{16}$ - 18	4



REF#	PART#	DESCRIPTION	QUANTITY
1	8940-64	5/16" Fuel Hose x 64" (manifold to engine)	1
2		Fuel Manifold Regulator (part of engine)	1
3	8940-14	5/16" Fuel Hose x 14" (return)	1
4	18-498	Barb Fitting	1
5	32-642	Front Tank Mount	1
6	20-694	Fuel Cap	1
7	32-647	Level Sensor Assembly	1
8	32-531	20 gal. Fuel Tank	1
	25-307	Decal, Refuel with Gasoline	1
9	HB-516-18-200	Hex Bolt, 5/16 -18 x 2	4
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 - 18	4
10	32-648	Top Draw w/ Grommet	1
11	18-186	Hose Clamp	10
12	8940-7	5/16" Fuel Hose x 7" (fuel filter to top draw)	1
13	32-643	Rear Tank Mount	1
14	HB-38-16-350	Hex Bolt, 3/8 - 16 x 3 1/2	8
	HNFL-38-16	Flange Whiz-loc Nut, 3/8	8
15	32-641	Tank Mount Plate	2
16		Fuel Filter (part of engine)	1
17	8940-4	5/16" Fuel Hose x 4" (fuel filter to fuel pump)	1
18		Fuel Pump (part of engine)	1
	HWS-4	Star Washer, #4	1
	HWS-5	Star Washer, #5	1
	HNM-4-1.5	Metric Nut, #4-1.5	1
	HNM-5-1.5	Metric Nut, #5-1.5	1
19	8940-8	5/16" Fuel Hose x 8" (fuel pump to manifold)	1

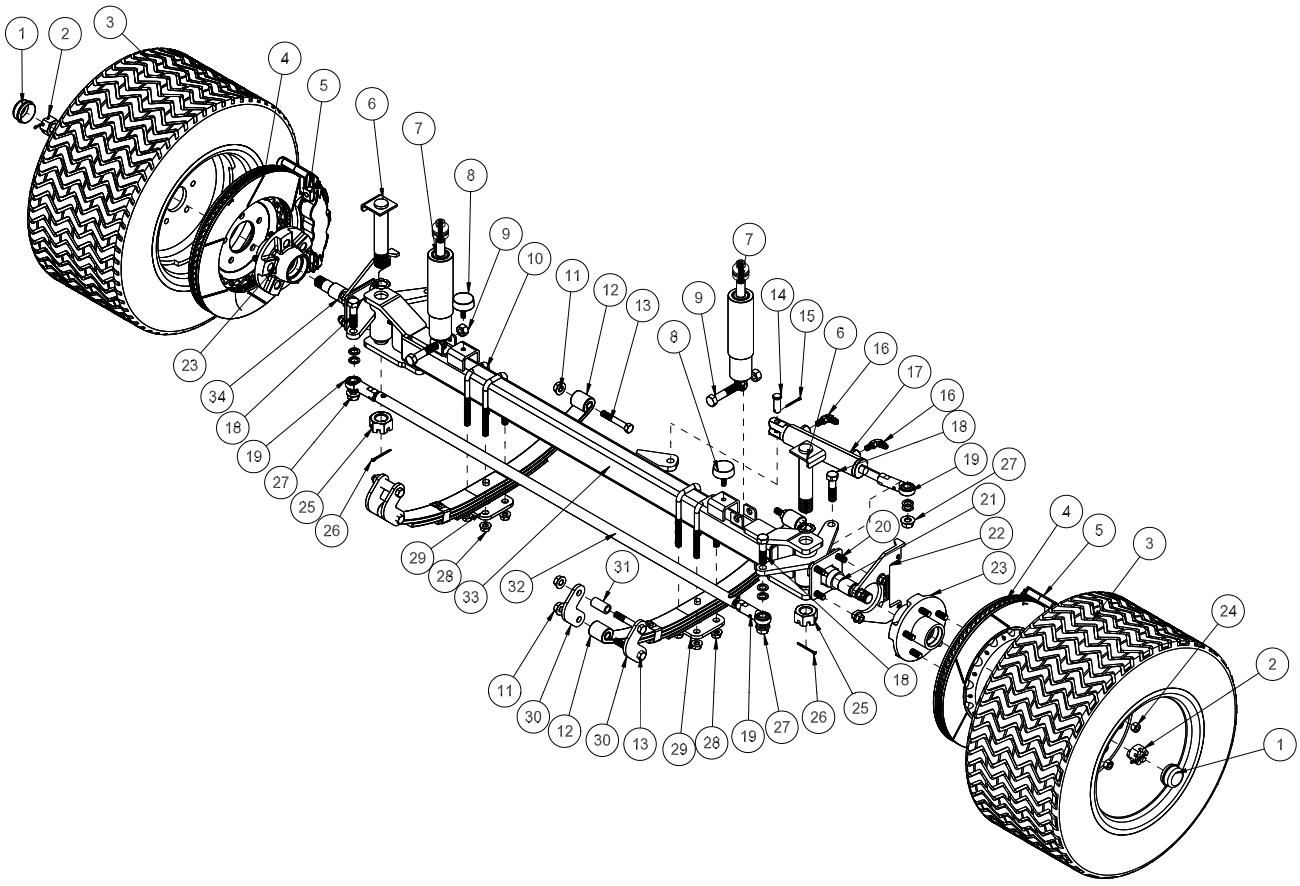
FOOT PEDAL LINKAGE DRAWING



FOOT PEDAL LINKAGE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	32-571	RH & LH Brake Set	1
2	18-487	Elbow	2
3	32-545	Brake Hose, 34"	2
4	18-486	Tee	1
5	HP-18-100	Cotter Pin, 1/8 x 1	5
6	HMB-58-14	Machine Bushing, 5/8 x 14GA	3
7	32-676	Pedal Relay	1
8	30-152	Push-Pull Cable	1
9	18-115	Ball Joint, 1/4 -28	2
	HN-14-28	Hex Nut, 1/4 - 28	2
10	33-084	Magnetic Coil	1
11	32-622	Relay Plate	1
12	32-546	Brake Hose, 52"	1
13	HB-516-18-100	Hex Bolt, 5/16 - 18 x 1	2
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 - 18	2
14	HB-14-20-075	Hex Bolt, 1/4 -20 x 3/4	4
	HNFL-14-20	Flange Whiz-loc Nut, 1/4 -20	4
15	32-579	Master Cylinder	1
16	32-580	3 3/8" Hole Plug	1
17	32-083	3/8" Banjo Bolt	1
18	32-080	Brake Cylinder Adapter	1
19	HB-516-18-075	Hex Bolt, 5/16 - 18 x 3/4	2
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 - 18	2
20	HCP-516-100	Clevis Pin, 5/16 x 1	1
21	HB-38-16-250	Hex Bolt, 3/8 -16 x 2 1/2	1
	HNTL-38-16	Nylon Lock Nut, 3/8 - 16	1
22	15-015	Pedal Pad	1
23	16-062	Pedal Pad Plate	1
24	HB-516-18-100	Hex Bolt, 5/16 - 18 x 1	1
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 - 18	1
25	32-540	Brake Pedal	1
26	11-100	Linkage Yoke	1
	HN-516-24	Hex Nut, 5/16 - 24	1
27	45-022	Molded Foot Pedal	2
28	HB-38-16-100	Hex Bolt, 3/8 - 16 x 1	2
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	2
29	31-050	Forward/Reverse Pedal	2
30	HSTP-516-18-075	Truss Head Screw, 5/16 - 18 x 3/4	4
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 - 18	4
31	HMB-12-14	Machine Bushing, 1/2 x 14GA	8
32	76-296	Pedal Mount	2
33	18-441	Ball Joint	6
34	HN-516-24	Hex Nut, 5/16 - 24	8
35	34-021	Foot Pedal Rod	2
36	10-178	Relay	1
37	45-584	F/R Linkage Rod	1
38	HB-516-18-075	Hex Bolt, 5/16 - 18 x 3/4	2
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 - 18	2
39	32-082	3/8" Banjo Adapter	1

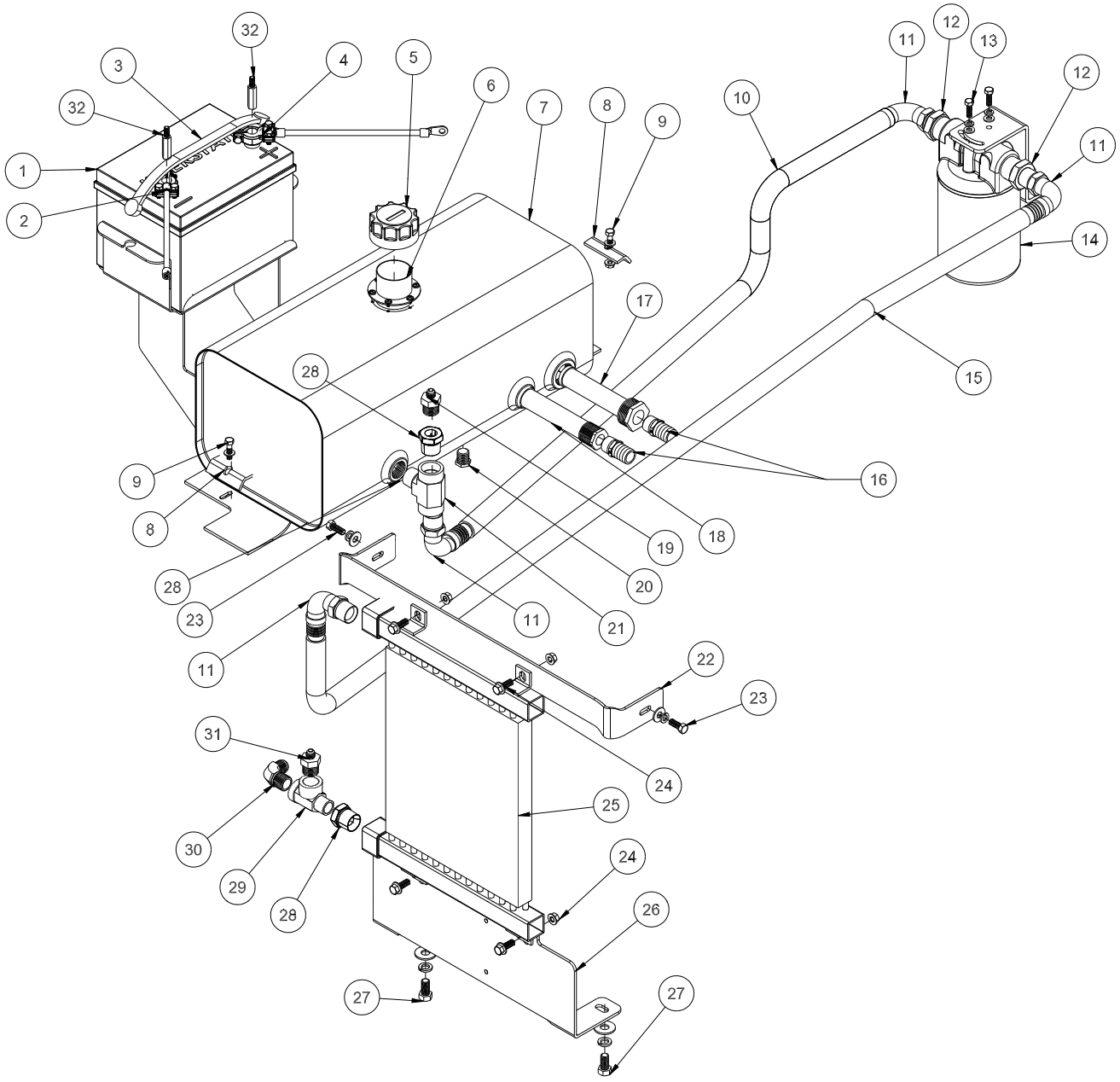
FRONT AXLE DRAWING



FRONT AXLE PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1*	33-073-02	Dust Cap	2
2*	HNAR-100-14	Slotted Jam Nut, 1 - 14	2
	HP-18-150	Cotter Pin, 1/8 - 1 1/2	2
3	72-204	Tire and Wheel	2
	72-204-01	Tire	2
	72-204-02	Wheel	2
4	32-571	RH & LH Brake Set	1
5		Brake Caliper	
6	32-617	King Pin	2
	HMB-114-10	Machine Bushing, 1 1/4 x 10GA	2
7	20-617	Shock Absorber	2
8	50-081	Rubber Insulator	2
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 -16	2
9	HB-58-11-300	Hex Bolt, 5/8 - 11 x 3	2
	HNTL-58-11	Nylon Lock Nut, 5/8 -11	2
10	30-249	U-Hex Bolt	4
11	HNTL-916-18	Nylon Lock Nut, 9/16 -18	6
12	32-572	Leaf Spring	2
13	HB-916-18-325	Hex Bolt, 9/16 - 18 x 3 1/4	6
14	HCP-58-175	Clevis Pin, 5/8 x 1 3/4	1
15	HP-18-100	Cotter Pin, 1/8 x 1	1
16	18-168	3/8 Straight Thread Elbow	2
17	15-839	Steering Hydraulic Cylinder	1
	15-839-01	Seal Kit	1
18	HB-58-11-250	Hex Bolt, 5/8 - 11 x 2 1/2	3
19	18-154	Rod End	3
	HNJ-58-18	Jam Nut, 5/8 - 18	3
	HG-14-28-90	Grease Fitting, 1/4 - 28 x 90°	3
20	HB-12-13-125	Hex Bolt, 1/2 - 13 x 1 1/4	8
	HNFL-12-13	Flange Whiz-loc Nut, 1/2-13	8
21	32-620	Right Spindle	1
	32-661	Plastic Bushing	2
22		Cast Brake Mount	2
23*	33-073	Hub Assembly (includes * items)	2
*	11-042	Bearing, Inner/Outer	2
*	11-041	Seal	2
24*	HNTL-12-20	Lock Nut, 1/2 - 20	10
25	HNA 114-12	Axle Nut, 1 1/4 - 12	2
26	HP-18-200	Cotter Pin, 1/8 - 2	2
27	HNTL-58-11	Nylon Lock Nut, 5/8 -11	3
	HMB-58-14	Machine Bushing, 5/8 x 14GA	6
28	HNFL-12-13	Flange Whiz-loc Nut, 1/2 - 13	8
29	20-538	Spring Mount	2
30	30-253	Spring Shackle	4
31	30-251	Bushing (pressed in main frame)	2
32	32-608	Tie Rod	1
33	32-615	Front Axle	1
34	32-636	Left Spindle	1
	32-661	Plastic Bushing	2

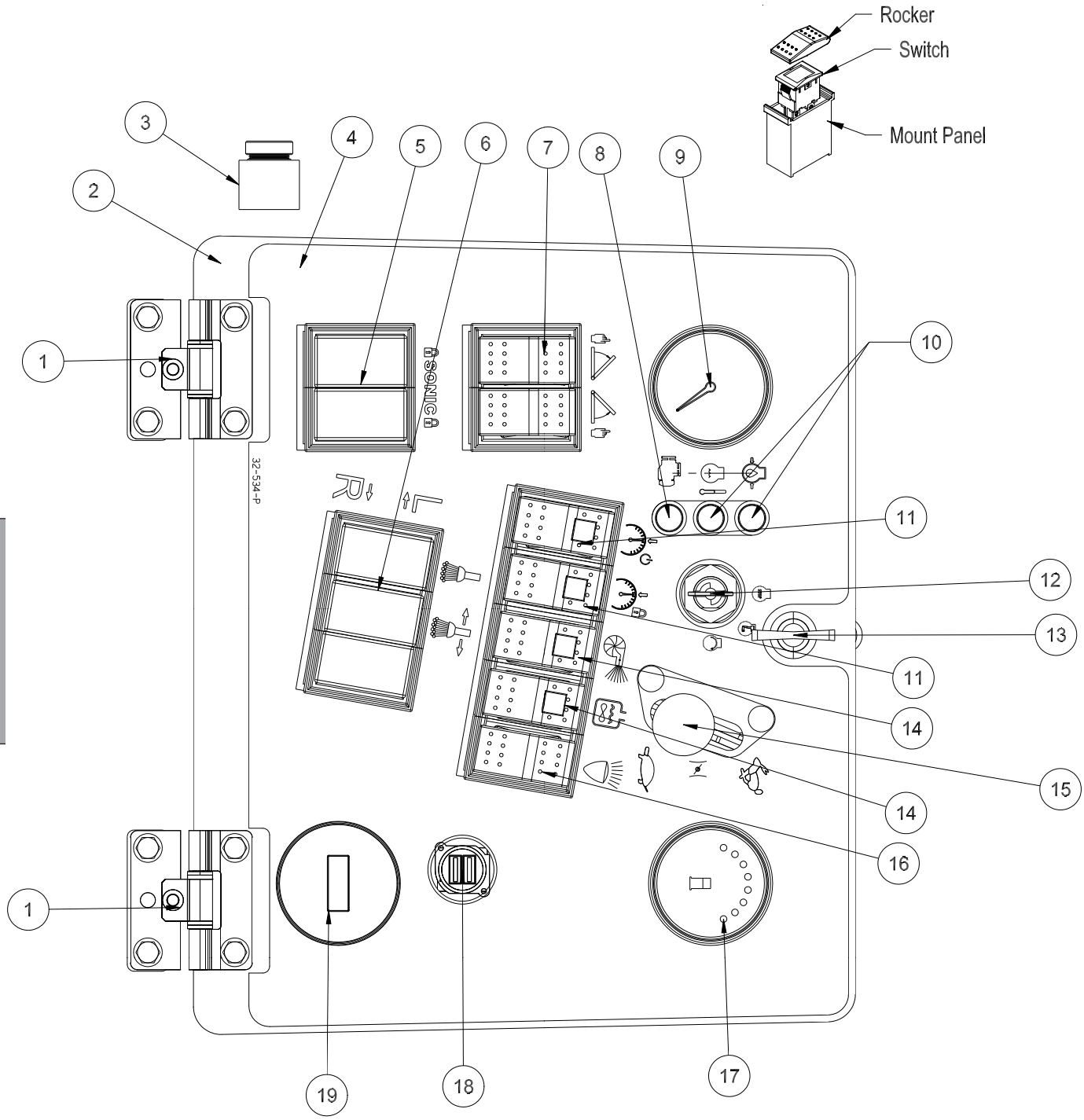
OIL TANK AND COOLER DRAWING



OIL TANK AND COOLER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	33-216	Battery	1
2	48-268	Black Battery Cable (Negative)	1
3	8-603	Battery Strap	1
4	78-325	Red Battery Cable (Positive)	1
5	13-747	Filler Breather	1
	13-586-02	Bottom Gasket	1
6	13-586-03	Fuel Tank Neck	1
	HSM-10-32-063	Machine Screw, #10-32 x 5/8	6
	HWL-10	Lock Washer, #10	6
	13-586-01	Cap Gasket	1
7	30-025	Oil Tank	1
8	75-792	Tank Hold-down	2
9	HB-516-18-125	Hex Bolt, 5/16 - 18 x 1 1/4	2
	HW-516	Flat Washer, 5/16	2
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 - 18	2
10	8833-20	1" Suction Hose x 20"	1
	18-222	Hose Clamp	2
11	18-397	90° Hose Barb	4
12	18-396	Reducer, 1 1/4 -1	2
13	HB-516-18-100	Hex Bolt, 5/16 - 18 x 1	2
	HW-516	Flat Washer, 5/16	2
	HWL-516	Lock Washer, 5/16	2
14	72-146	Oil Filter	1
	60-334	Replacement Filter	1
15	8833-40	1" Suction Hose x 20"	1
	18-222	Hose Clamp	2
16	18-250	Barb Fitting	2
17	60-213	Strainer	1
18	18-433	Strainer	1
19	18-243	Male Connector	1
20	18-069	Plug	1
21	18-473	Branch Tee	1
22	32-569	Top Cooler Mount	1
23	HB-38-16-100	Hex Bolt, 3/8 - 16 x 1	2
	HWL-38	Lock Washer, 3/8	2
	HW-38	Flat Washer, 3/8	2
24	HBFL-38-16-100	Flange Whiz-loc Bolt, 3/8 - 16 x 1	4
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	4
25	30-105	Oil to Air Heat Exchanger	1
26	32-568	Bottom Cooler Mount	1
27	HB-12-13-100	Hex Bolt, 1/2 - 13 x 1	2
	HWL-12	Lock Washer, 1/2	2
	HW-12	Flat Washer, 1/2	2
28	18-107	Reducer, 1 x 3/4	2
29	18-093	3/4" Straight Tee	1
30	23-071	Male Elbow	1
31	23-183	Straight Connector	1
32	32-702	Brass Nut	2
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	2

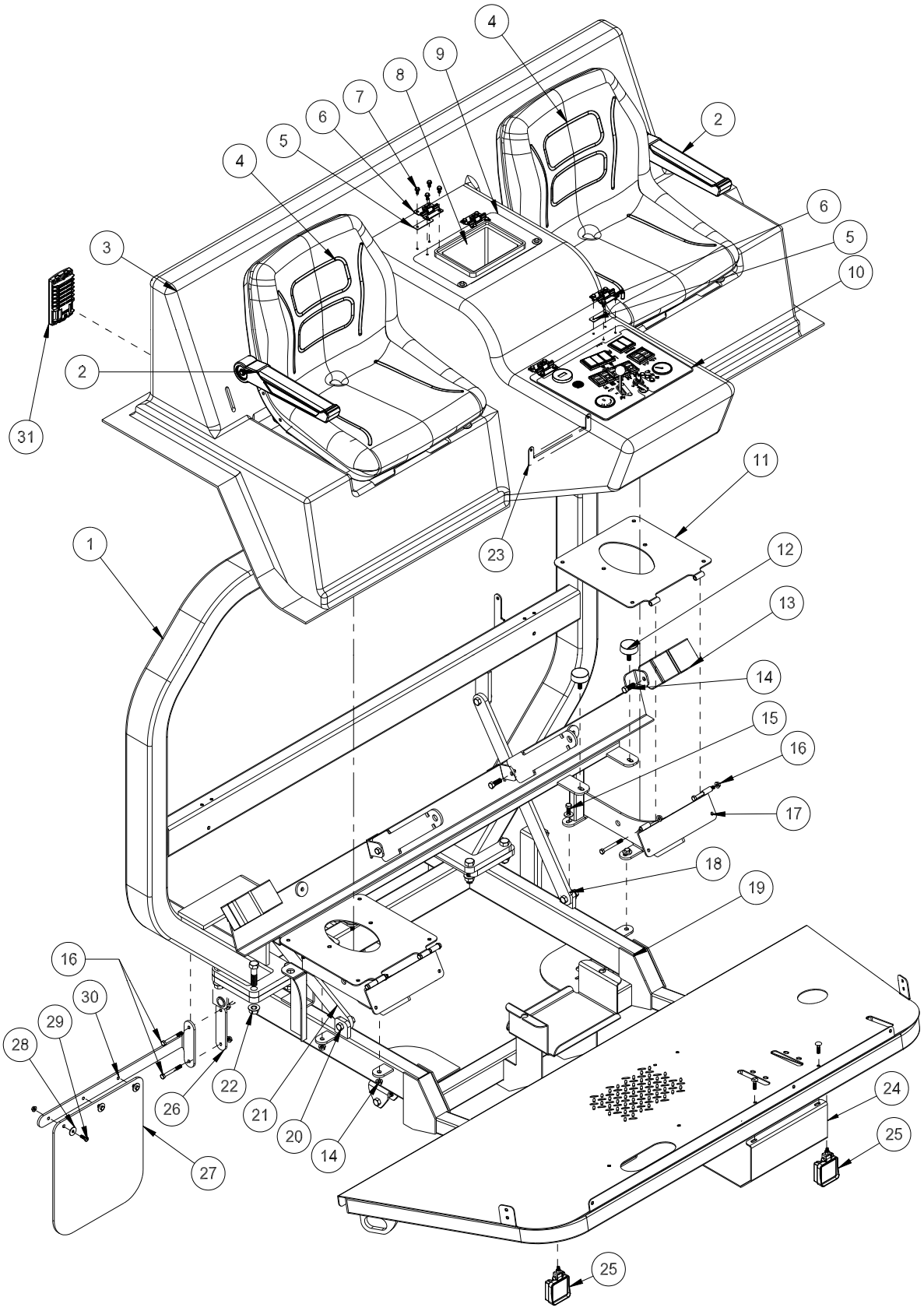
CONTROL PANEL DRAWING



CONTROL PANEL PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	32-695	Adjustable Hinge	2
	32-688	Hinge Spacer	2
	42-176	Low Head Cap Screw, 1/4 -20 x 3/4	8
	HNFL-14-20	Flange Whiz-loc Nut, 1/4 -20	8
2	32-594	Control Panel	1
3	77-207	Buzzer	1
4	32-534	Decal, Control Panel	1
5	15-725	Mount Panel End	2
	15-730	Panel Plug	2
6	15-725	Mount Panel End	2
	15-729	Mount Panel Middle	1
	15-730	Panel Plug	3
7	15-725	Mount Panel End	2
	15-727	Rocker, No Light	2
	15-728	Centering Switch, Momentary On-Off-On	2
8	32-521-03	Engine Indicator Light - Amber	1
9	30-356	GPS Speedometer	1
10	50-359	Indicator Light	2
11	15-731	Rocker, Amber	2
	15-726	Lighted Switch	2
	15-725	Mount Panel End	1
	15-729	Mount Panel Middle	1
12	17-068	Ignition	1
13	32-696	Cam Latch with Wing Handle	1
14	15-732	Rocker, Green	2
	15-726	Lighted Switch	2
	15-729	Mount Panel Middle	2
15	32-521-01	Electronic Throttle	1
	HSM-8-32-075	Machine Screw, #8 - 32 x 3/4	2
	HNFL-8-32	Flange Whiz-loc Nut, #8-32	2
16	15-727	Rocker, No Light	1
	15-782	Non-Lighted Switch	1
	15-725	Mount Panel End	1
17	32-649	LED Fuel Gauge	1
18	32-576	Dual USB Charger	1
19	12-804	Hour Meter	1

SEAT PANEL DRAWING

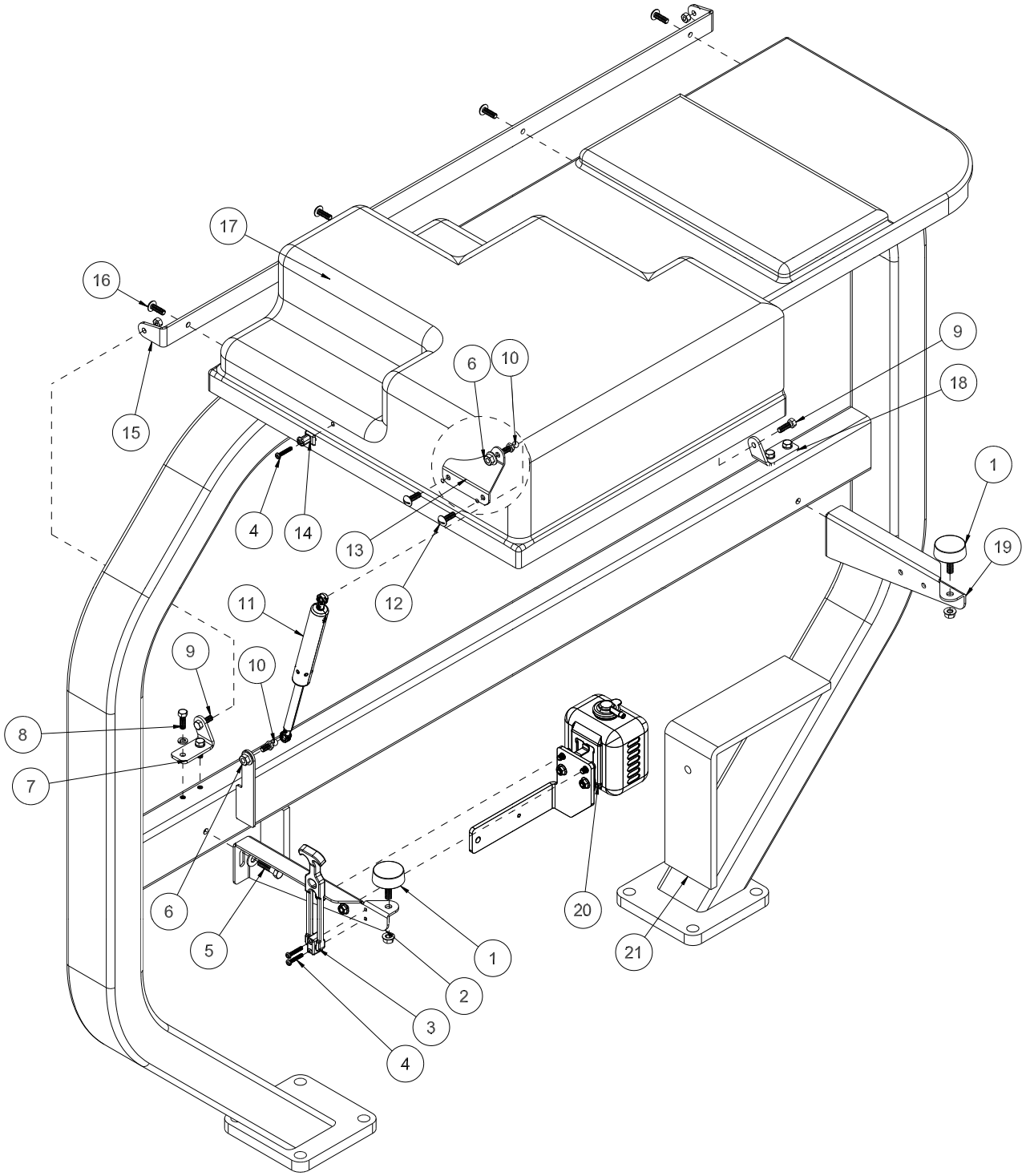


Parts

SEAT PANEL PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	32-535	Roll Bar	1
2	10-706	Arm Rest Kit	1
3	32-588	Seat Body - Fiberglass	1
4	14-294	Seat Kit (includes * items)	2
	*14-800	Seat Rail Set	2
	*HSP-1260-340-250	Seat Spacer	8
	*14-292	Seat Switch	1
5	32-688	Hinge Spacer	4
6	32-695	Adjustable Hinge	4
7	42-176	Low Head Cap Screw, 1/4 -20 x 3/4	16
	HNFL-14-20	Flange Whiz-loc Nut, 1/4 -20	16
8	32-697	Plastic Bucket	1
9	32-686	Bucket Holder	1
	42-116	Rubber Insert	2
10	32-594	Control Panel	1
11	31-052	Seat Panel	2
12	50-081	Rubber insulator	4
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 - 18	4
13	76-198-03	Seat Belt	2
14	HB-716-14-125	Hex Bolt, 7/16 - 14 x 1 1/4	4
	HW-716	Flat Washer, 7/16	4
	HNTL-716-14	Lock Nut, 7/16 - 14	4
15	HB-38-16-100	Hex Bolt, 3/8 - 16 x 1	4
	HW-38	Flat Washer, 3/8	4
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	4
16	HB-516-18-300	Hex Bolt, 5/16 -18 x 3	8
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	8
17	32-623	Seat Frame	1
18	32-567	Long Roll Bar Brace	1
19	32-530	Main Frame	1
20	HB-12-13-175	Hex Bolt, 1/2 -13 x 1 3/4	4
	HNFL-12-13	Flange Whiz-loc Nut, 1/2 -13	4
21	32-599	Short Roll Bar Brace	1
22	HB-58-11-250	Hex Bolt, 5/8 -11 x 2 1/2	8
	HNTL-58-11	Lock Nut, 5/8 - 11	8
23	32-687	Hose Holder	1
	HB-14-20-075	Hex Bolt, 1/4 - 20 x 3/4	2
	HNFL-14-20	Flange Whiz-loc Nut, 1/4 - 20	2
24	32-635	Pedal Guard	1
25	32-637	LED Light Assembly	2
	32-704	Headlight Wire Harness	1
26	32-596	Flap Strap	2
27	20-657	Mud Flap	2
28	HWF-14-150	Fender Washer, 1/4 x 1 1/2	6
29	HB-14-20-075	Hex Bolt, 1/4 - 20 x 3/4	6
	HNFL-14-20	Flange Whiz-loc Nut, 1/4 - 20	6
30	32-597	Front Mud Flap Bracket	2
31	32-573	Fuse Block	1

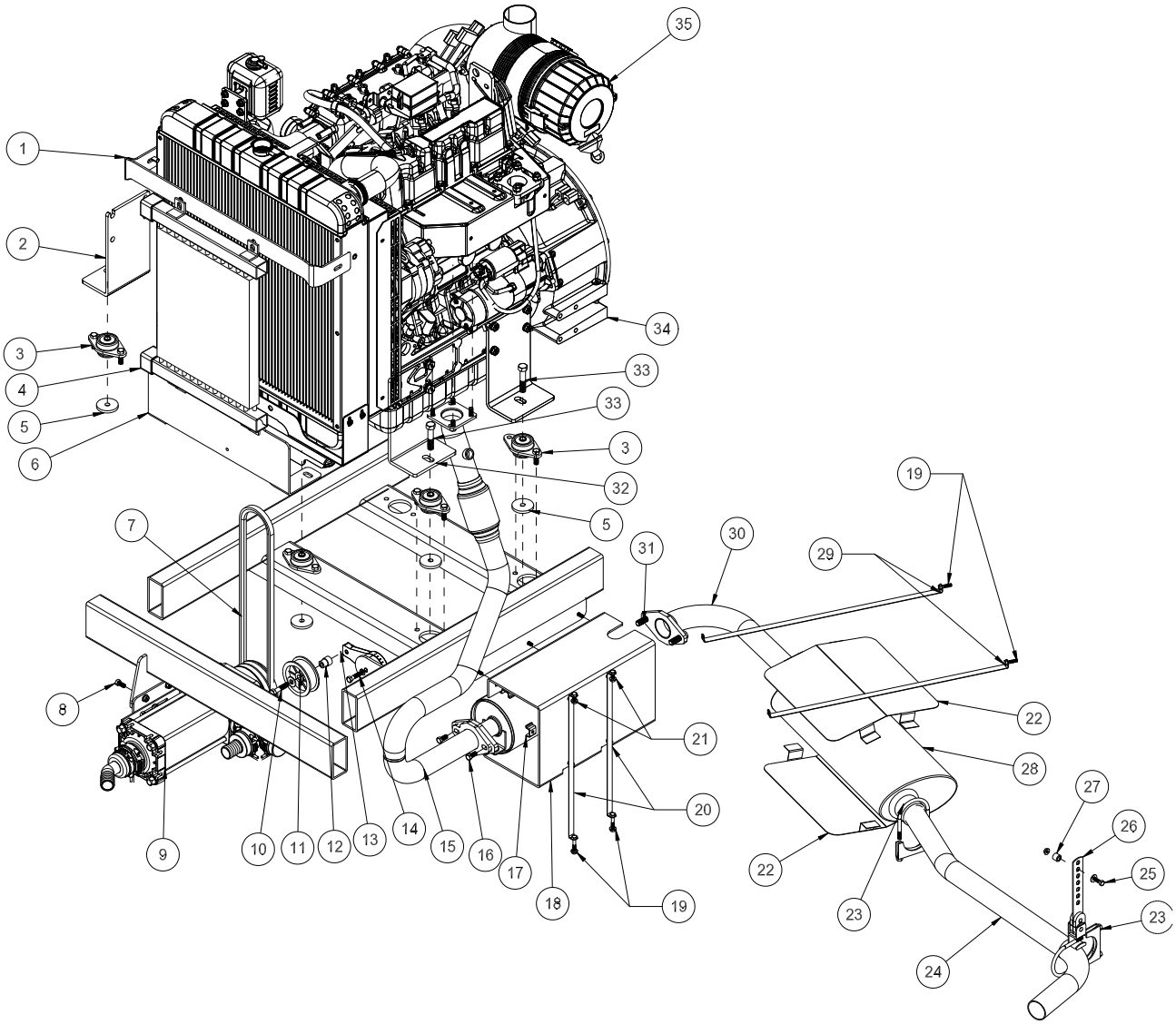
ENGINE HOOD DRAWING



ENGINE HOOD PARTS LIST

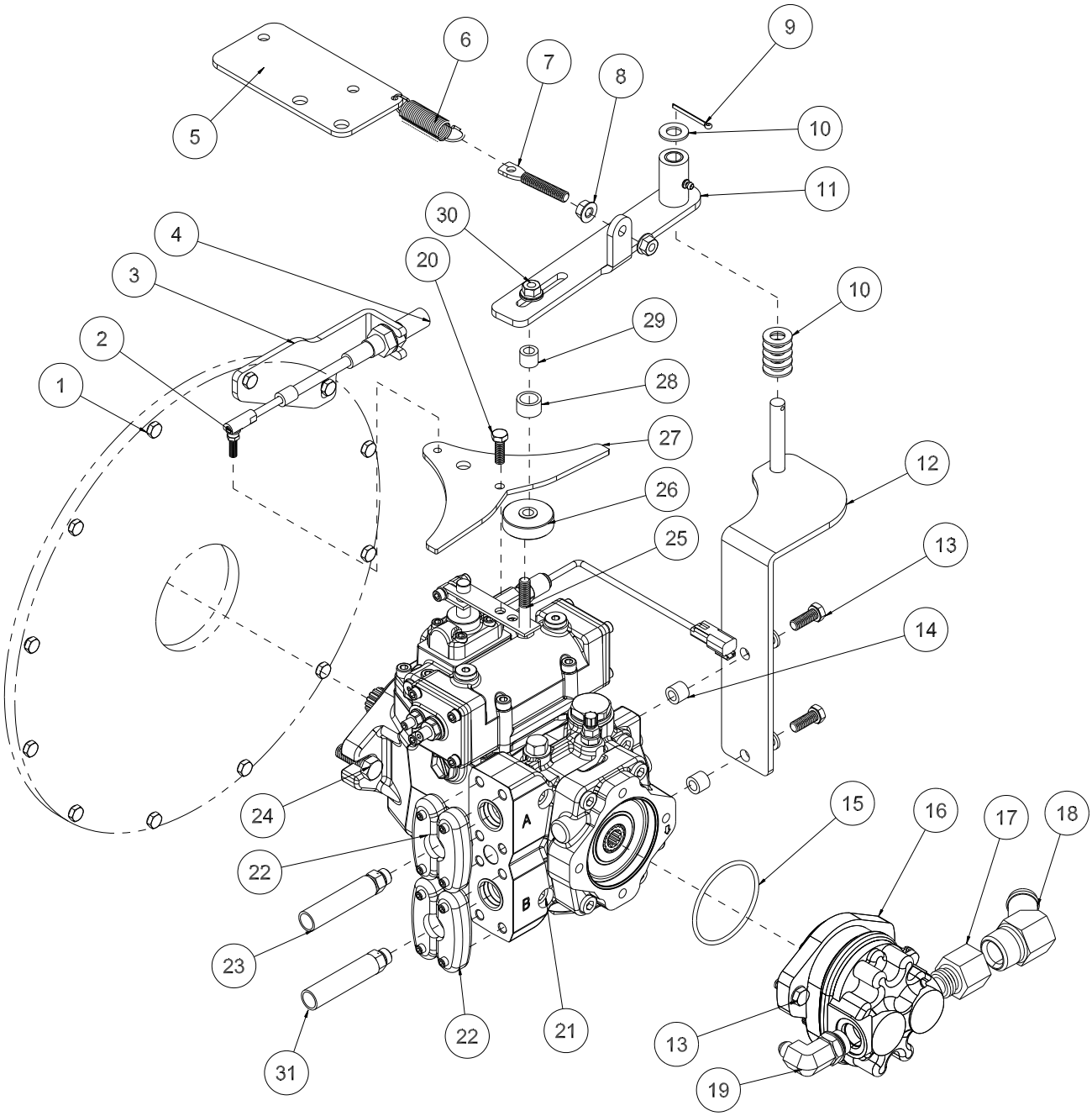
REF#	PART#	DESCRIPTION	QUANTITY
1	50-081	Rubber Bumper	2
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	2
2	32-664	LH Hood Rest	1
3*	15-437-02	Rubber Latch	1
4	HSM-10-32-112	Machine Screw, 10-32 x 1 1/8	3
	HNFL-10-32	Flange Whiz-loc Nut, 10-32	3
5	HB-38-16-150	Hex Bolt, 3/8 - 16 x 1 1/2	2
	HW-38	Flat Washer, 3/8	2
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	2
6	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	2
7	32-618	LH Hood Hinge Mount	1
8	HB-516-18-100	Hex Bolt, 5/16 -18- 1	4
	HWL-516	Lock Washer, 5/16	4
9	HB-516-18-100	Hex Bolt, 5/16 - 18 x 1	2
	HNTL-516-18	Top Lock Nut, 5/16 -18	2
10	26-034	Ball Stud	2
11	13-569	Gas Shock	1
12	HSTP-516-18-075	Truss Head Screw, 5/16 - 18 x 3/4	2
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	2
13	32-607	Gas Shock Mount	1
14*	15-437-01	Rubber Keeper	1
15	32-598	Hood Hinge	1
16	HSTP-516-18-100	Truss Head Screw, 5/16 - 18 x 1	4
	HNFL-15-18	Flange Whiz-loc Nut, 5/16 -18	4
17	32-589	Engine Hood (fiberglass)	1
18	32-592	RH Hood Hinge Mount	1
19	32-662	RH Hood Rest	1
20		Overflow Jug (part of engine)	1
21	32-535	Roll Bar	1
*	15-437	Latch and Keeper Complete	1

ENGINE & EXHAUST DRAWING



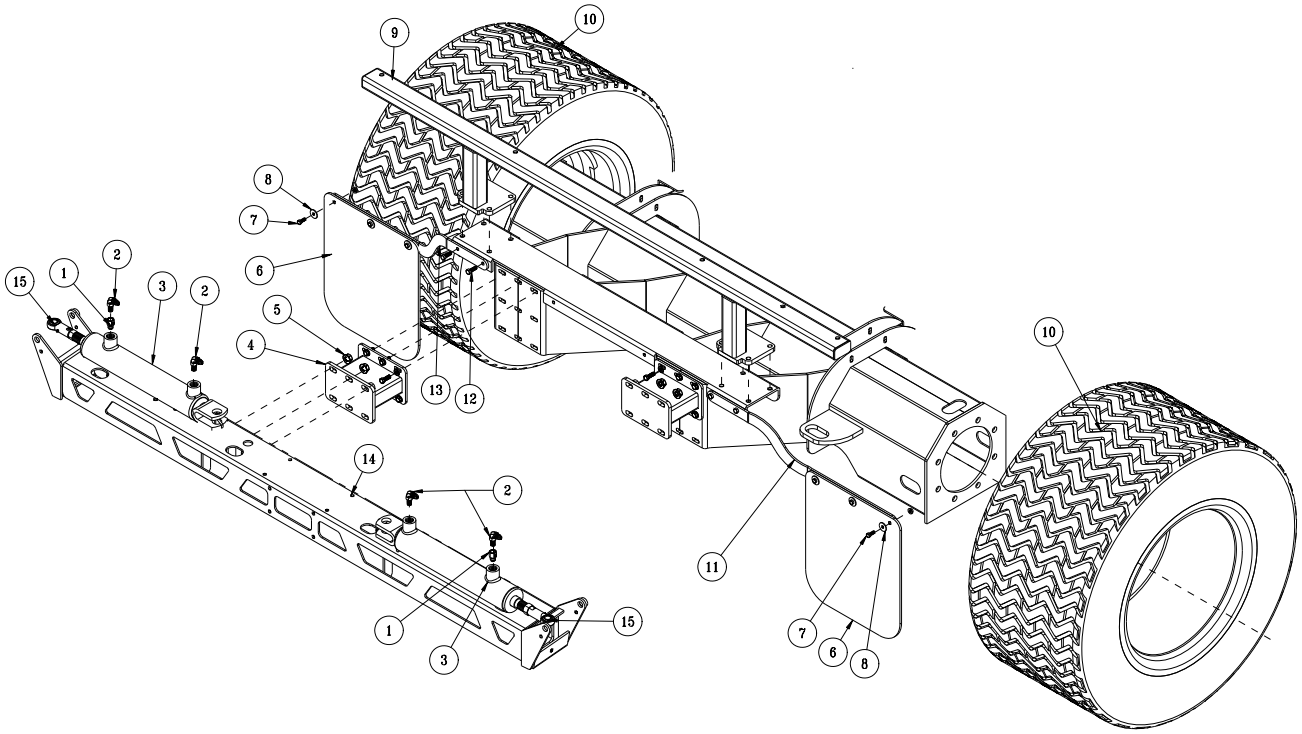
REF#	PART#	DESCRIPTION	QUANTITY
1	32-569	Top Cooler Mount	1
2	32-658	Front Engine Mount Leg	1
3	30-042-14	Engine Isolator	4
	HB-38-16-100	Hex Bolt, 3/8 - 16 x 1	8
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	8
4	30-105	Oil to Air Heat Exchanger	1
5	30-064	Motor Washer	4
6	32-568	Bottom Cooler Mount	1
7	32-575	Belt	1
8	HB-516-18-100	Hex Bolt, 5/16 - 18 x 1	2
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 - 18	2
9	32-584	Spray Pump	1
10	HB-38-16-175	Hex Bolt, 3/8 - 16 x 1 3/4	1
	HW-516	Flat Washer, 5/16	1
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	1
11	32-671	Pulley	1
12	32-675	Bushing	1
13	42-327	Belt Tensioner	1
14	HB-38-16-100	Hex Bolt, 3/8 - 16 x 1	1
	HWL-38	Lock Washer, 3/8	1
15	32-585	Stainless Steel Exhaust Manifold	1
16	HB-38-16-150	Hex Bolt, 3/8 - 16 x 1 1/2	2
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	2
17		Catalytic Converter	1
18	32-626	Catalytic Converter Shield	1
19	HB-14-20-150	Hex Bolt, 1/4 - 20 x 1 1/2	4
	HNFL-14-20	Flange Whiz-loc Nut, 1/4 - 20	4
20	32-673	Exhaust Pipe Strap	2
21	HB-14-20-075	Hex Bolt, 1/4 - 20 x - 3/4	2
	HNTL-14-20	Top Lock Nut, 1/4 - 20	2
22	32-667	Heat Shield	2
23	32-679	Muffler Clamp	3
24	32-674	Aluminized Tailpipe	1
25	HB-14-20-125	Hex Bolt, 1/4 -20 x 1 1/4	1
	HW-14	Flat Washer, 1/4	1
	HNFL-14-20	Flange Whiz-loc Nut, 1/4 - 20	1
26	33-159	Exhaust Hanger	1
27	45-154	Spacer	1
28	32-678	Muffler	1
29	32-668	Heat Shield Strap	2
30	32-532	Inlet Pipe	1
31	HB-12-13-150	Hex Bolt, 1/2 -13-1 1/2	2
	HNFL-12-13	Flange Whiz-loc Nut, 1/2 - 13	2
32	32-659	Rear Engine Mount Leg	1
33	HB-716-14-300	Hex Bolt, 7/16 - 14 x 3	4
	HNTL-716-14	Nylon Lock Nut, 7/16 - 14	4
34	32-651	Kubota WG3800 Gas Engine	1
35	32-651-01	Air Cleaner Assembly	1
	32-651-02	Outer Air Filter	1
	32-651-03	Inner Safety Filter	1

HYDROSTATIC & GEAR PUMP DRAWING



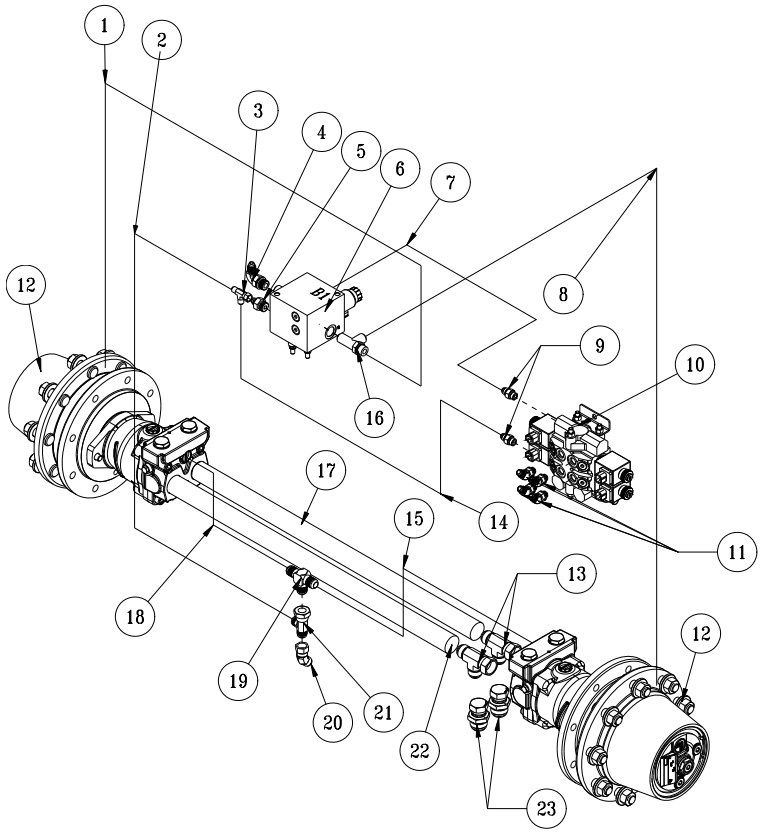
REF#	PART#	DESCRIPTION	QUANTITY
1		Kubota WG3800 Engine Plate	1
2	18-115	Ball Joint, 1/4 NF	1
	HN-14-28	Hex Nut, 1/4 -28	2
3	32-590	Cable Mount	1
4	30-152	Cable	
5	32-541	Air Cleaner Bracket	1
6	11-050	Extension Spring	1
7	42-537	Spade Bolt	1
8	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	2
9	HP-18-100	Cotter Pin, 1/8 x 1	1
10	HMB-12-14	Machine Bushing, 1/2 x 14GA	6
11	32-614	Idler Arm	1
12	32-570	Centering Plate	1
13	HB-38-16-075	Hex Bolt, 3/8 -16 x 3/4	4
	HW-38	Flat Washer, 3/8	2
	HWL-38	Lock Washer, 3/8	4
14	45-154	Valve Spacer	2
15	23-145	Oring	1
16	76-197	Gear Pump	1
	76-197-08	Seal Kit	1
17	23-136	Adapter 1/2 x 3/4	1
18	23-190	45° Elbow	1
19	18-458	90° Elbow	1
20	HB-516-18-100	Hex Bolt, 5/16 - 18 x 1	1
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	1
21	32-609	Hydrostatic Pump, 4500 psi	1
22	32-603	Flange Kit	2
23	32-699	Hydraulic Hose, 69.5" (A Port))	1
24	HBM-12-1.25-30	Metric Hex Bolt, M12-1.25 x 30	2
	HWLM-12	Metric Lock Washer, M12	2
25	HB-38-16-200	Hex Bolt, 3/8 - 16 x 2	1
	HW-38	Flat Washer, 3/8	1
26	14-266	Ball Bearing	1
27	32-680	Shift Arm	1
28	48-049	Shift Arm Spacer	1
29	18-270	Oilite Bushing	1
30	HNTL-38-16	Lock Nut, 3/8 - 16	1
31	32-698	Hydraulic Hose, 67" (B Port)	1

REAR AXLE DRAWING



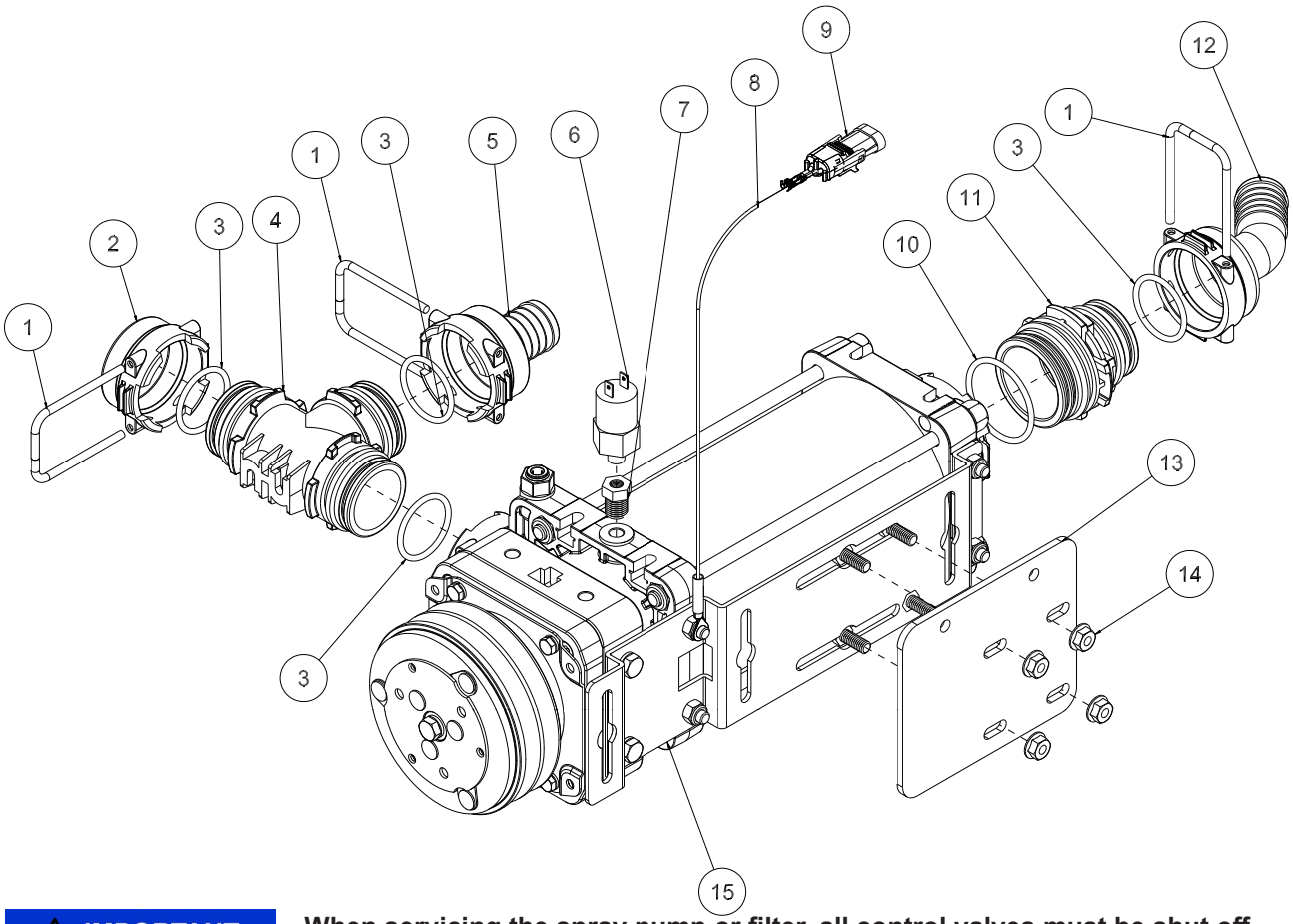
REF#	PART#	DESCRIPTION	QUANTITY
1	18-392	Orifice	2
2	18-168	3/8 Str. Thd Elbow	4
3	13-406	Hydraulic Cylinder	2
	14-267	Seal Kit	2
4*	17-614	Boom Spacer	2
5*	HB-516-18-100	Hex Bolt, 5/16 - 18 x 1	24
	HW-516	Flat Washer, 5/16	24
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	24
6	20-657	Mud Flap	2
7	HB-14-20-075	Hex Bolt, 1/4 - 20 x 3/4	6
	HNFL-14-20	Flange Whiz-loc Nut, 1/4 - 20	6
8	HWF-14-150	Fender Washer, 1/4 x 1 1/2	6
9	32-630	Rear Spray Tank Support	1
10	32-581	Tire and Wheel	2
	32-581-01	Tire, 33/16	2
	32-581-02	Wheel , 19.5 x 14, 9-bolt	2
11	32-625	RH Rear Mud Flap Bracket	1
12	HB-516-18-100	Hex Bolt, 5/16 - 18 x 1	4
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 - 18	4
13	32-634	LH Rear Mud Flap Bracket	1
14*	32-563	Center Boom	1
15	18-154	Rod End	2
	HNJ-58-18	Jam Nut, 5/8 -18	2
	HG-14-28-180	Grease Zerk	2

* Part of Boom



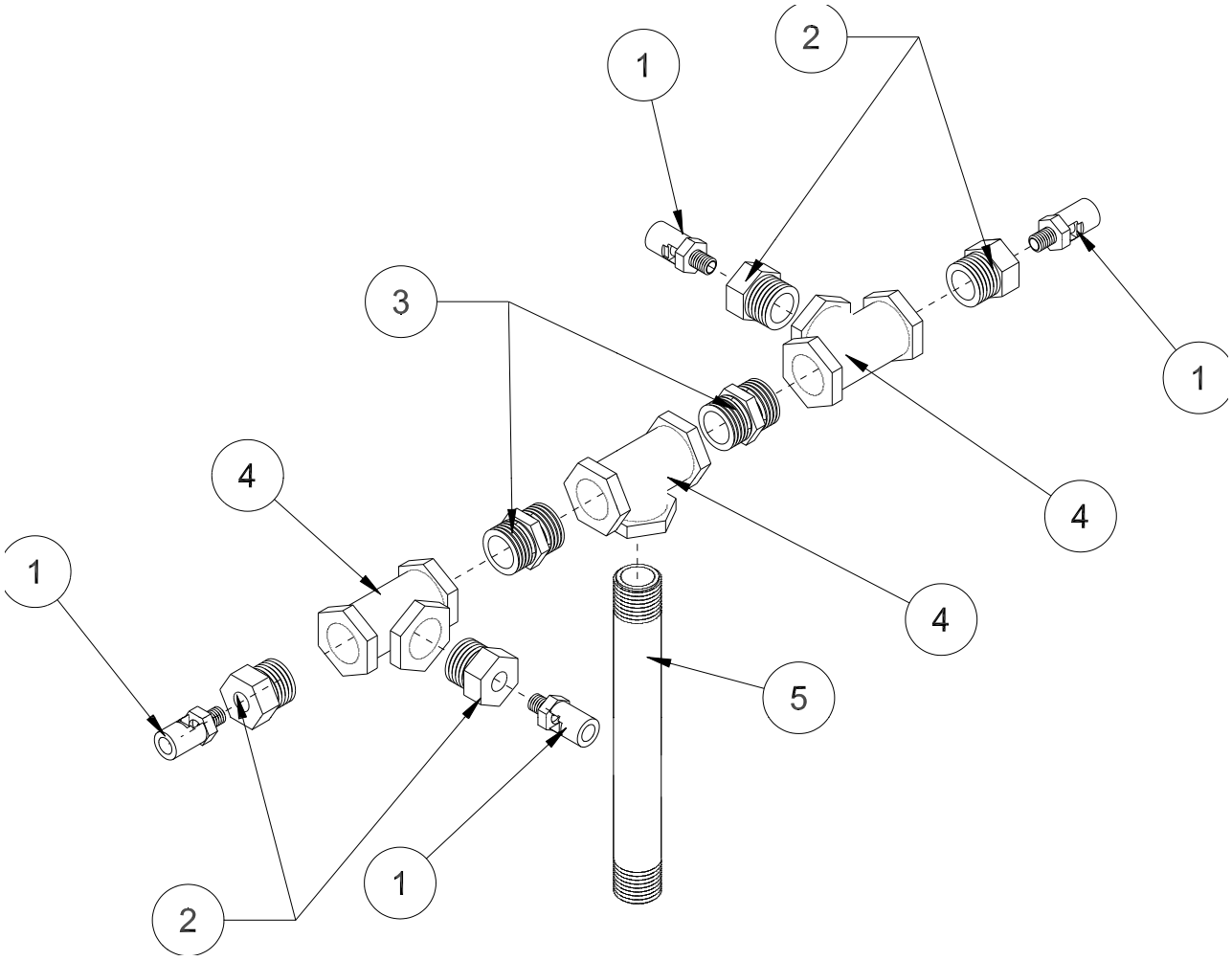
REF#	PART#	DESCRIPTION	QUANTITY
1	32-548	LH Brake Release Hose, 30.75"	1
2	32-557	Return Hose, 33.5"	1
3	18-190	Tee	1
4	18-241	Straight Thread Connector	1
5	18-185	90° Elbow	1
6	32-612	Auxiliary Manifold	1
7	32-551	Supply Hose,13.5"	1
8	32-549	RH Brake Release Hose, 42"	1
9	18-169	3/8 Adapter	2
10	32-677	Boom Control Valve	1
11	18-188	45° Elbow	4
12	32-610	Drive Assembly	2
13	18-502	Swivel Nut Run Tee	2
14	32-550	Return Hose, 15"	1
15	18-210	Tee	1
16	32-555	RH Drain Hose,11.5"	1
17	32-701	Hydraulic Hose, 47"	1
18	32-556	LH Drain Hose, 38.5"	1
19	18-170	Tee	1
20	34-044	45° Elbow	1
21	18-337	Run Tee	1
22	32-700	Hydraulic Hose, 46.5"	1
23	18-503	Male Connector	2

SPRAY PUMP DRAWING



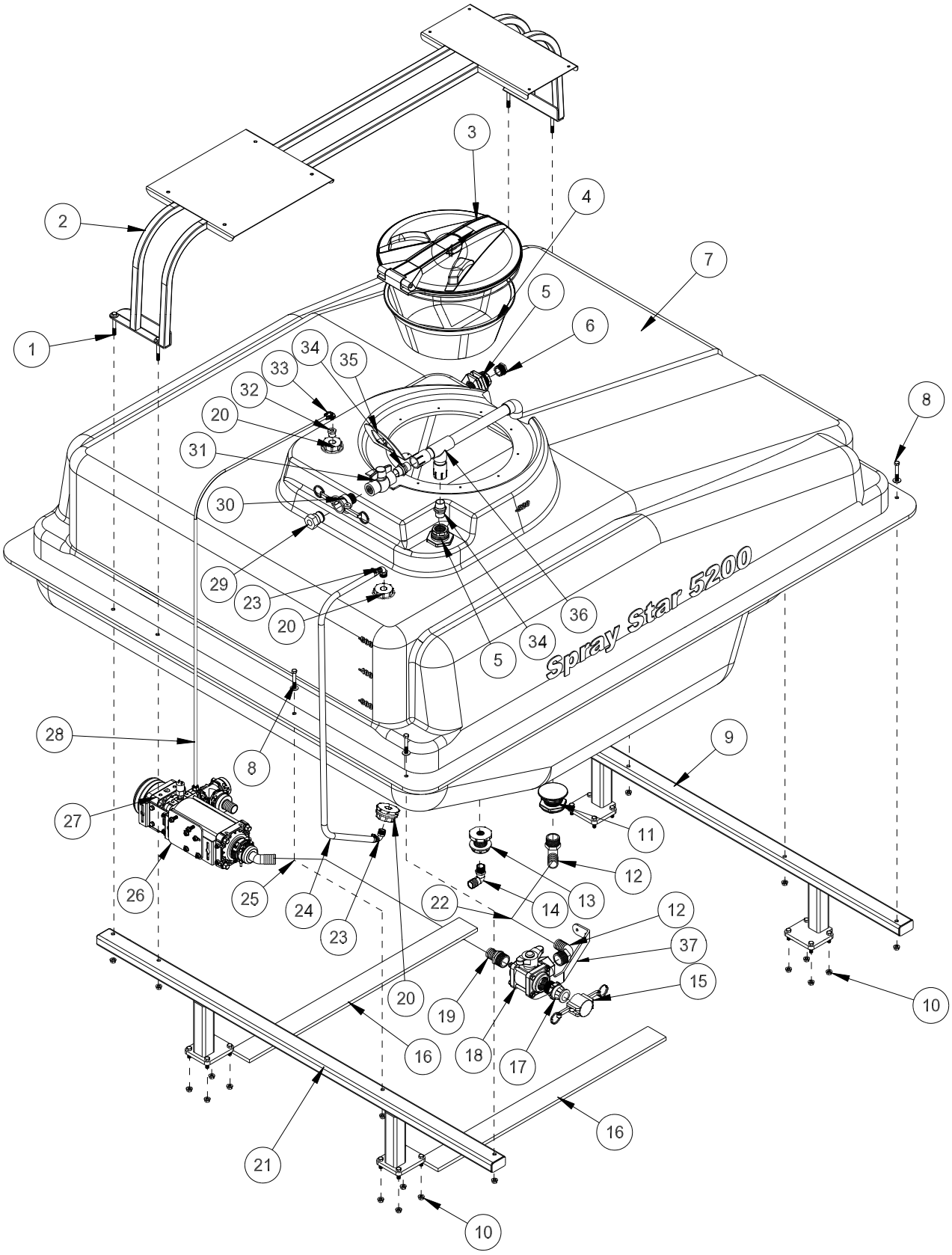
⚠ IMPORTANT **When servicing the spray pump or filter, all control valves must be shut off if there is liquid in the tank.**

REF#	PART#	DESCRIPTION	QUANTITY
1	18-494	Fork	3
2	18-481	Cap	1
3	18-492	Oring	4
4	18-480	Male Tee	1
5	18-482	Female Barb	1
6	33-480	Pressure Switch	1
7	18-042	Reducer Bushing, 1/4 -1/8	1
8	8845-10	White Wire, 14GA	1
	8857	5/16" Ring Terminal	1
	8963	1/4" Heat Shrink	1
9	9016	Weather Pack	1
	9017	Male Terminal	2
	9018	Seal	2
10	18-491	Oring	1
11	18-490	Reducer	1
12	18-493	45° Elbow	1
13	32-653	Pump Mount Bracket	1
14	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	4
	HBCL-516-18-075	Carriage Bolt, 5/16 - 18 x 3/4	4
15	32-584	Spray Pump	1
NS	32-575	Belt	1



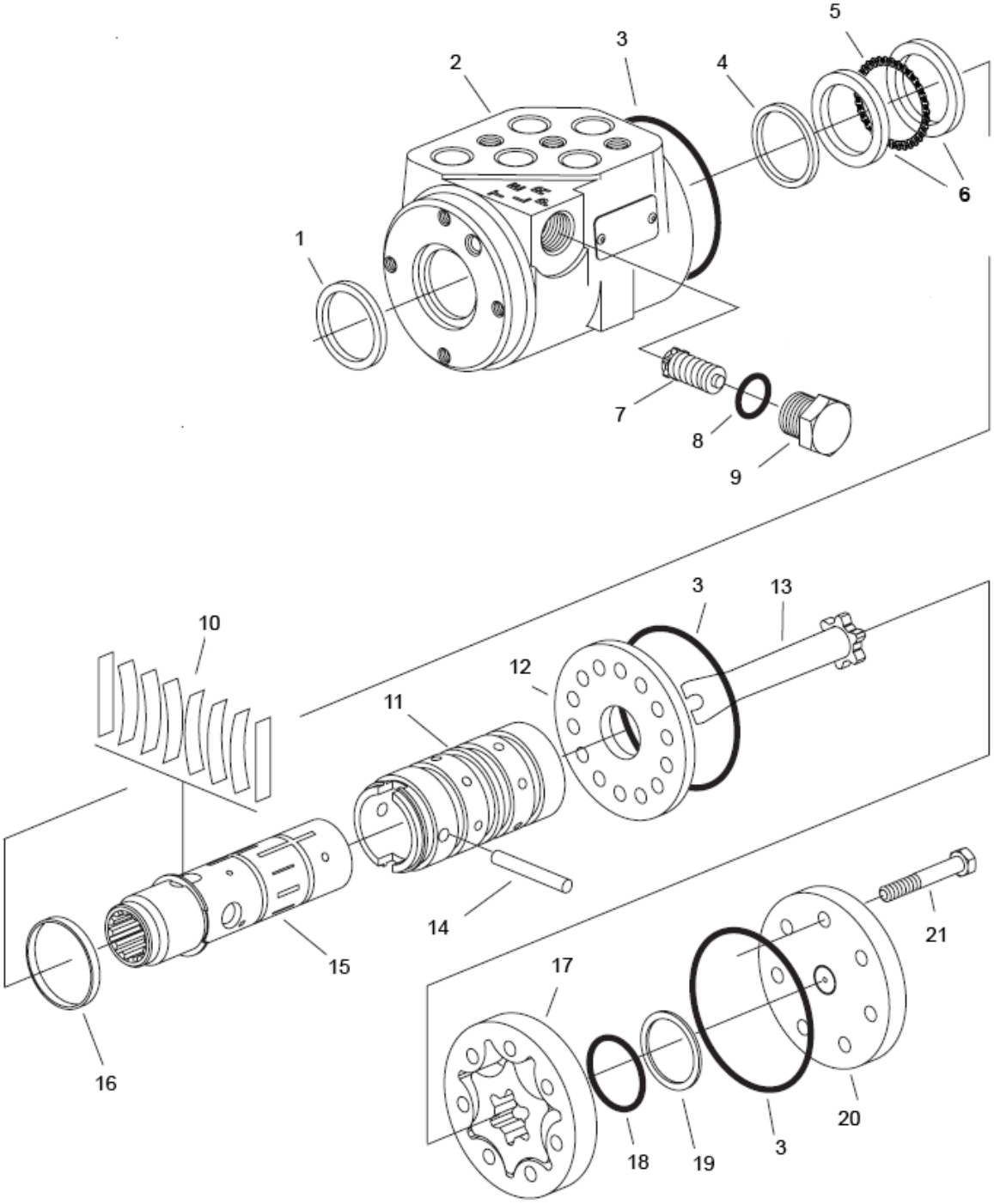
REF#	PART#	DESCRIPTION	QUANTITY
1	18-510	Mini Eductor	4
2	16-288	Reducer, 3/4 x 1/4	4
3	16-158	Close Nipple, 3/4 x 3/4	2
4	16-157	Female Pipe Thread Tee, 3/4 x 3/4 x 3/4	3
5	18-507	Nylon Nipple, 3/4 NPT x 8	1

SPRAY TANK DRAWING



REF#	PART#	DESCRIPTION	QUANTITY
1	HB-38-16-300	Hex Bolt, 3/8 -16 x 3	4
	HW-38	Flat Washer, 3/8	4
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	4
2	32-533	Accessory Mount	1
3	16-953	Hinged Lid	1
	HRS-316-1125	Rivet, 3/16 x 1 1/8	10
	HW-316	Flat Washer, 3/16	10
	20-663	EPDM Tank Gasket	1
4	16-169	16" Strainer Basket	1
5	16-945	1" Double Threaded Fitting	2
6	16-162	1" Hex Plug	1
7	32-586	500 Gallon Tank - Fiberglass	1
	32-629	Decal, Spray Star 5200	2
	32-631	Decal, Site Gage	1
8	HB-38-16-250	Hex Bolt, 3/8 -16 x 2 1/2	6
	HW-38	Flat Washer, 3/8	6
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	6
9	32-630	Rear Spray Tank Support	1
10	HB-38-16-150	Hex Bolt, 3/8 - 16 x 1 1/2	16
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	16
11	16-194	Anti-Vortex Fitting	1
12	16-156	Elbow, 1 1/4 MPT x 1 1/4 HB	2
13	16-150	3/4" Double Threaded Fitting	1
14	16-155	Elbow, 3/4 MPT x 1HB	1
15	16-935	Quick Coupler Cap	1
16	32-628	Tank Carrier Lining	2
17	16-180	Male Quick Coupler, 1 1/4	1
18	18-372	3-Way Valve	1
	18-372-01	T-handle	1
19	16-161	1 1/4 HB Fitting	1
20	33-495	Bulkhead Fitting	3
21	32-591	Front Spray Tank Support	1
22	8897-45	1 1/4" Discharge Hose x 45"	1
	18-116	Hose Clamp	2
23	16-937	Elbow, 1/2 MPT x 1/2 HB	2
24	8902-37	Clear Flo Tubing 37"	1
	18-224	Hose Clamp	2
25	8897-6	1 1/4" Discharge Hose x 45"	1
	18-116	Hose Clamp	2
26	32-653	Pump Plate	1
	HB-516-18-100	Hex Bolt, 5/16 -18 x 1	2
	HNFL-516-18	Flange Whiz-loc Nut, 5/16 -18	2
27	32-584	Spray Pump	1
28	9046-61	5/16" Tubing x 61"	1
29	16-961	1" Adapter	1
30	16-962	1" Coupler	1
31	18-448	1" PVC Ball Valve	1
32	33-496	Reducer Bushing	1
33	18-496	Poly Male Elbow	1
34	16-851	1" Close Nipple	2
35	10-639	Tank Lid Stop	1
36	14-365	Air Gap Filler	1
37	32-624	Valve Mount Arm	1

15-301 ORBITAL DRAWING



REF #	PART #	DESCRIPTION	QUANTITY
1**		Dust Seal	1
2		Housing	1
3**		O-Ring Seal	3
4**		Quad Seal	1
5	10-576-03	Thrust Bearing	1
6	10-576-02	Bearing Race	2
7		Manual Steering Relief Valve	1
8**		O-ring	1
9		Plug	1
10‡		Standard Torque Centering Springs	1
11		Sleeve	1
12	15-301-06	Wear Plate	1
13	10-576-01	Drive	1
14	15-301-08	Drive Pin	1
15		Spool	1
16‡		Spring Retaining Ring	1
17	10-576-05	Gerotor	1
18**		O-Ring	1
19**		Seal Ring	1
20	15-301-03	End Cap	1
21	10-576-06	Cap Screw	7
**	15-301-01	Seal Kit	1
‡	15-301-15	Centering Spring Kit	1

15-301 Orbital Specifications

Inlet Relief Valve Setting 1020 psi (70 bar)

Nominal Flow 3 gpm (11 lpm)

Displacement 4.50 cu. in/ R (73.8 cu cm/R)

Check Valve for Manual Steering Yes

Inlet Pressure Rating 2030 psi (140 bar)

Return Pressure Rating 145 psi (10 bar) Maximum

Fluid SAE 10W-40 API Service SJ or higher Motor Oil

Ports $^{9}/_{16}$ - 18 SAE O-Ring 4 Ports

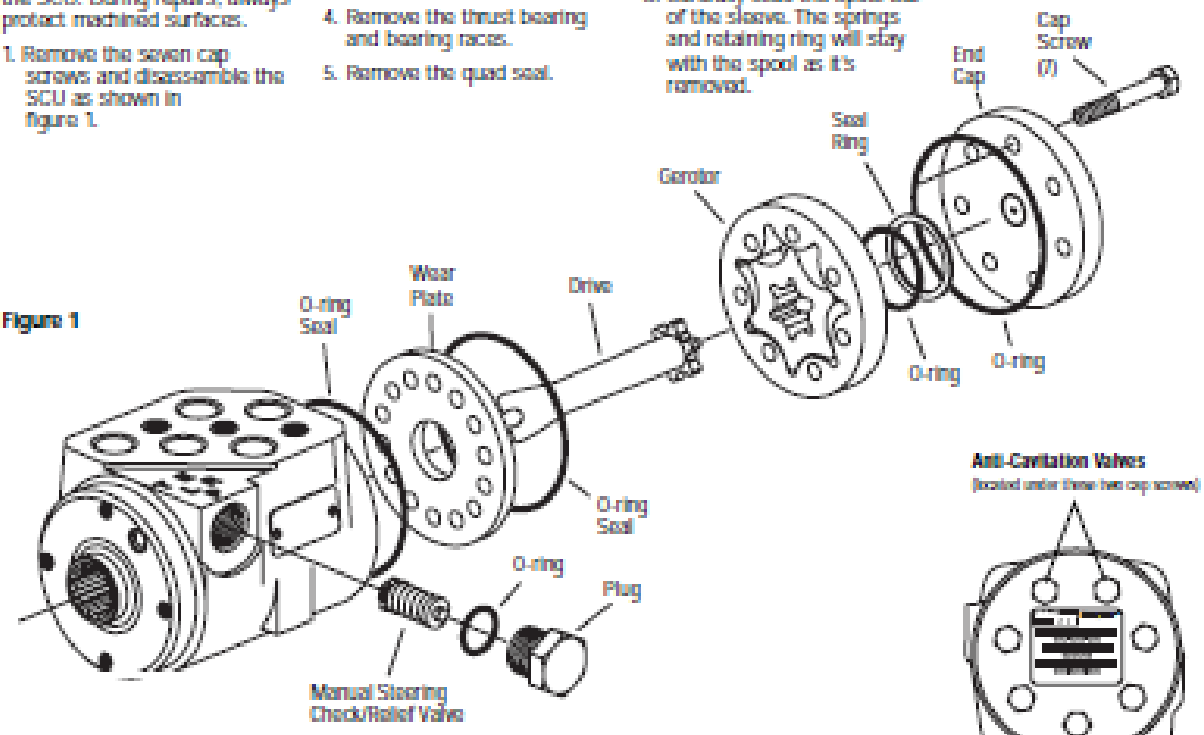
15-301 REPAIR DISASSEMBLY INSTRUCTIONS

Disassembly

Cleanliness is extremely important when repairing hydraulic Steering Control Units (SCU). Work in a clean area. Before disconnecting the hydraulic lines, clean the port area of the SCU. Before disassembly, drain the oil, then plug the ports and thoroughly clean the exterior of the SCU. During repairs, always protect machined surfaces.

1. Remove the seven cap screws and disassemble the SCU as shown in figure 1.
2. Remove the plug and manual steering check as shown in figure 1. **Note:** The manual steering check may be a check ball or a check/relief valve.
3. Slide the spool and sleeve from the housing, see figure 2.
4. Remove the thrust bearing and bearing races.
5. Remove the quad seal.
6. Using a small blade screwdriver, carefully pry the dust seal from the housing. **Important:** Do not damage the dust seal seat.
7. Remove the pin that holds the spool and sleeve together, see figure 3.
8. Carefully slide the spool out of the sleeve. The springs and retaining ring will stay with the spool as it's removed.
9. Remove the retaining ring and springs. **Caution:** The centering springs are under tension; remove the retaining ring carefully.

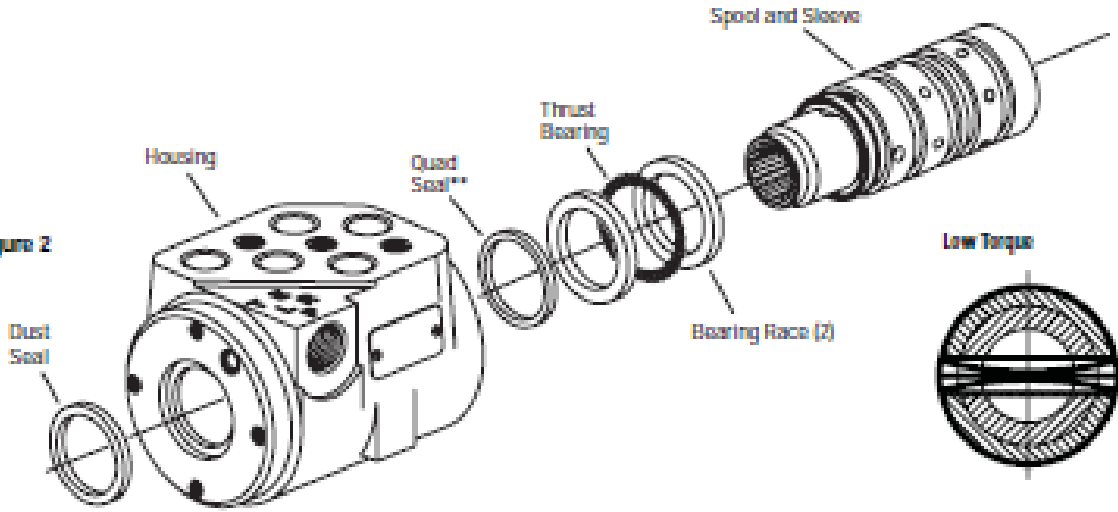
Figure 1



Anti-Cavitation Valves
(located under three hex cap screws)

Port Face

Figure 2



Low Torque

Parts

Reassembly

Check all mating surfaces. Replace any parts with scratches or burrs that could cause leakage. Wash all metal parts in clean solvent. Blow them dry with pressurized air. Do not wipe parts dry with paper towels or cloth as lint in a hydraulic system will cause damage.

Note: Always use new seals when reassembling hydraulic steering control units. Refer to page 5 for seal kit part numbers.

Important: During reassembly lubricate the new seals with a petroleum jelly such as Vaseline®. Also lubricate machined surfaces and bearings with clean hydraulic fluid.

10. Install the quad seal (see page 12 for 2-piece seal installations):
    - Put one of the bearing races and sleeve into the housing.
    - Together, the housing and bearing race create a groove into which the quad seal will be installed.
    - Hold the bearing race tightly against the input end of the housing by pushing on the gerotor end of the sleeve.
    - Fit the quad seal into its seat through the input end of the housing. Be sure the seal is not twisted.
    - Remove the sleeve and bearing race.
11. Lubricate and install the dust seal (see Figure 4 for correct seal orientation).

Figure 4

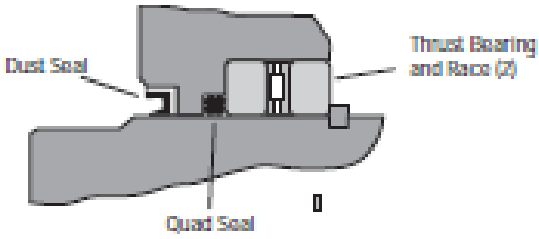
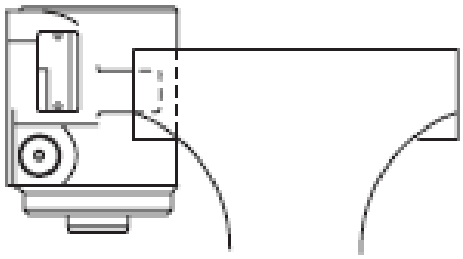


Figure 5



12. Install the centering springs in the spool. It is best to install the two flat pieces first. Next, install the curved pieces, three at a time.
13. Fit the retaining ring over the centering springs.
14. Apply a light coating of clean hydraulic fluid to the spool and slide it into the sleeve. Be sure the centering springs fit into the notches in the sleeve.
15. Install the drive, be sure the slot in the drive engages the pin.
16. Install the pin (see Figure 3).
17. Apply a light coating of petroleum jelly to the inner edge of the dust and quad seals.
18. Put the thrust bearing and races into the housing. The thrust bearing goes between the two races (see Figure 2).
19. Apply a light coating of clean hydraulic fluid to the spool and sleeve assembly and slide it into the housing.
    Important: Do not damage the dust or quad seals..
20. Clamp the housing in a vise as shown in Figure 5. Use just enough clamping force to hold the housing securely.
21. Lubricate and install a new o-ring seal in the groove in the housing.
22. Install the wear plate and align the holes in the wear plate with threaded holes in the housing.
    Note: The holes in the wear plate are symmetrical.
23. Lubricate and install a new o-ring seal in the groove in the wear plate.
24. Install the gerotor and align the screw holes.
25. Lubricate and install a new o-ring seal in the groove in the gerotor ring.
26. Lubricate and install a new o-ring and seal ring in the groove in the gerotor star.
27. Install end cap and seven cap screws. Tighten cap screws, in a crisscross pattern, to 16 -18 Nm [140 -160 lb-in].
28. Remove the SCU from the vise.
29. Install the relief valve/check or check ball and plug. Use a new o-ring and tighten the plug to 17 Nm [150 lb-in].

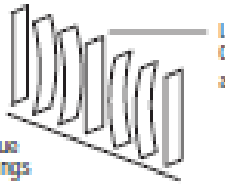
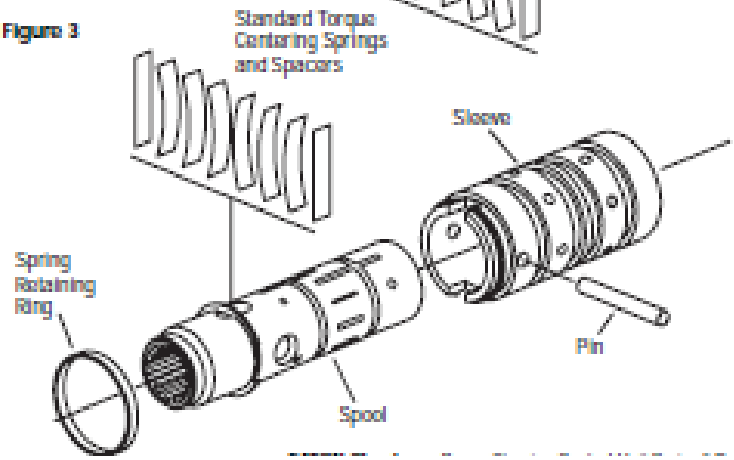


Figure 3



Parts

15-301 2-PIECE SHAFT SEAL INSTRUCTIONS

2-Piece Shaft Seal Installation

For installation of
O-Ring 4999650-001 and
Seal 4998312-001

1. Place housing on a flat work area as shown in figure 13.
2. Lubricate seal and o-ring with hydraulic oil before installation.
3. Align sleeve with housing bore (figure 13).
4. Insert sleeve into housing bore (figure 14).
5. Place o-ring on plunger (figure 15).
6. Align seal with plunger cross section "L" shape of seal should be upside down (figure 16).
7. Push seal onto plunger. Lip of seal should be between o-ring and plunger. No gap should exist between o-ring and seal (figure 17).
8. Align plunger into sleeve until it bottoms out, rotate 1/4 turn (figure 19).
9. While holding sleeve in housing, withdraw plunger.
10. Withdraw sleeve.
11. Inspect seal installation. Seal and o-ring must both be within shaft seal counter bore of housing.

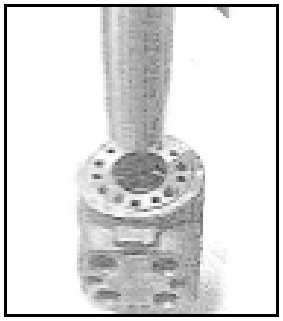
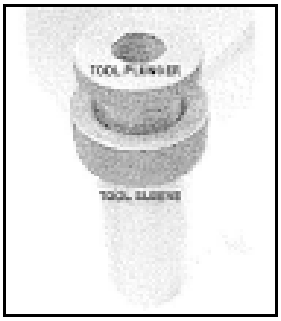


Figure 13



Tool No. 600801-001

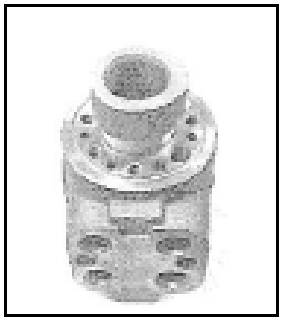


Figure 14

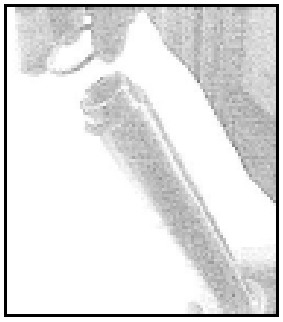


Figure 15

Figure 16

Figure 17

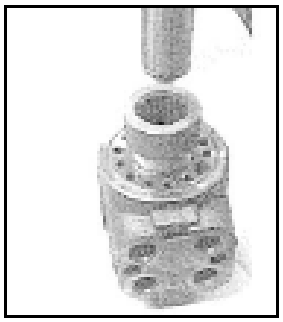


Figure 18

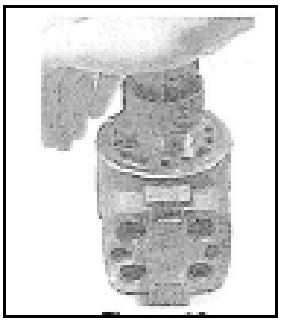


Figure 19

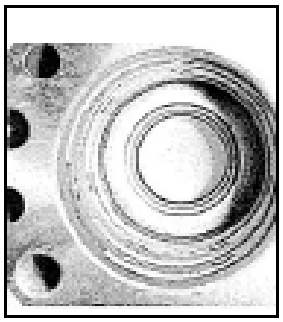
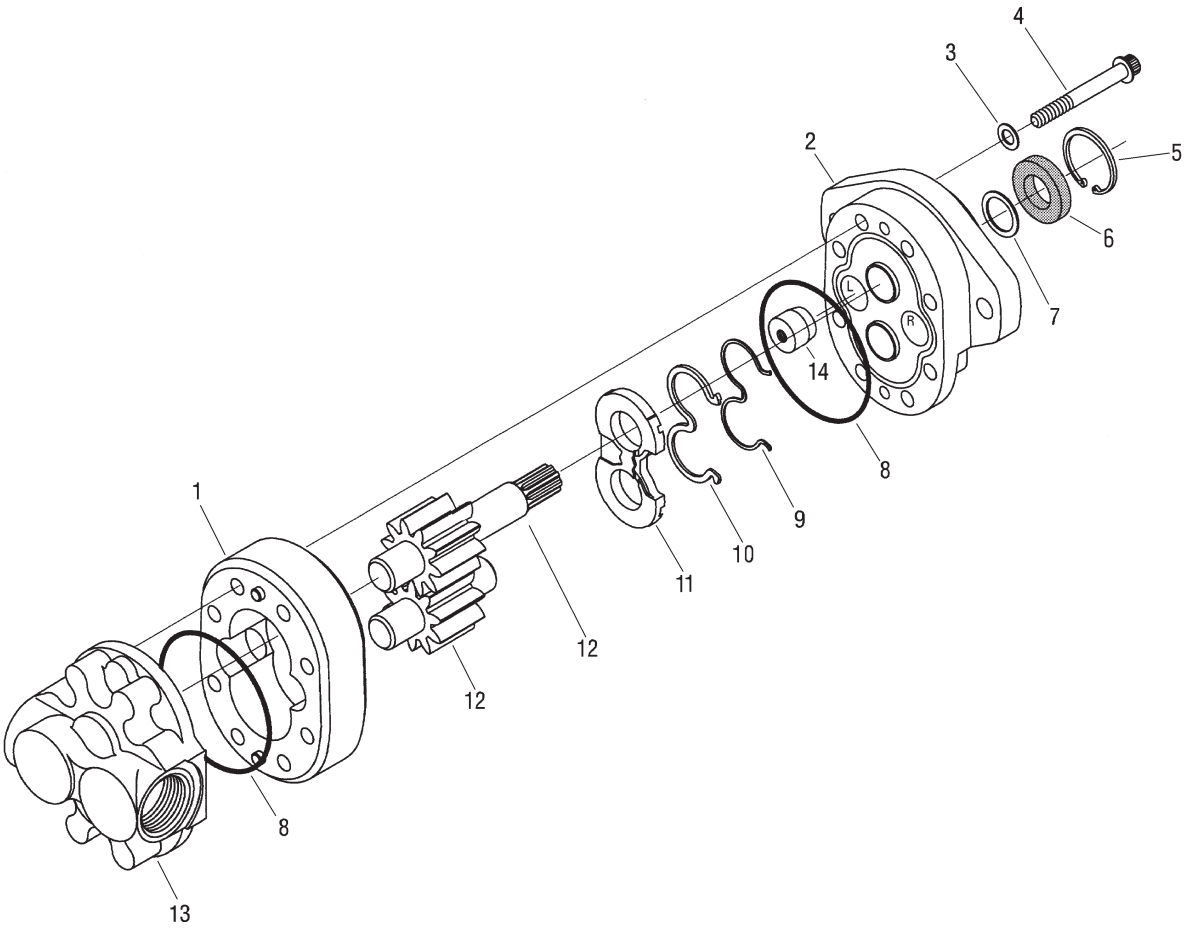


Figure 20

Parts



REF#	PART#	DESCRIPTION	QUANTITY
1		Body	1
2	76-197-01	Front Plate	1
3*		Washer	4
4	76-197-06	Cap Screw	8
5	76-197-07	Retaining Ring	1
6*		Shaft Seal	1
7	33-061-15	Washer	1
8*		O-Ring	2
9*		Backup Gasket	1
10*		Seal	1
11*		Wear Plate	1
12	76-197-04	Shaft (comes with Idler Gear)	1
13	76-197-02	Back Plate	1
14*		Plug	1
*	76-197-08	Seal Kit	

Repair Information - Model 26000

Work in a clean area; cleanliness is extremely important when repairing hydraulic pumps. Before disconnecting the lines, clean port area of pump. Disconnect hydraulic lines, removing pump assembly from vehicle and plugging ports. Thoroughly clean the outside of pump. After cleaning, remove port plugs and drain oil.

Disassembly

1 Remove *key* from drive shaft if keyed drive gear assembly is used.

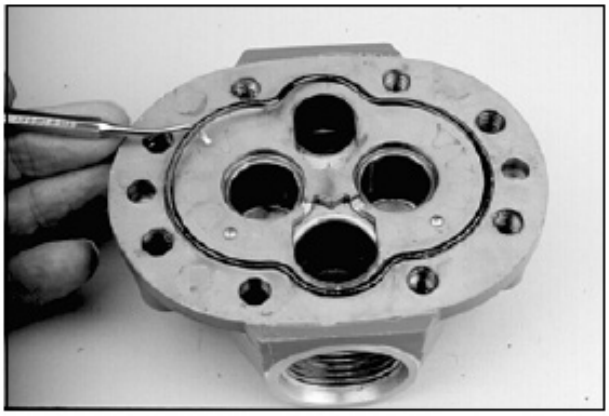
2 Put a *location mark* across front plate, body and backplate to assure proper reassembly.

3 Clamp pump in vise, shaft end up.

4 Remove *cap screws* (eight each) and washer (four each).

5 Remove pump from vise, hold pump in hands and tap shaft with plastic hammer or rawhide mallet to separate front plate from backplate. Body will remain with either front plate or backplate.

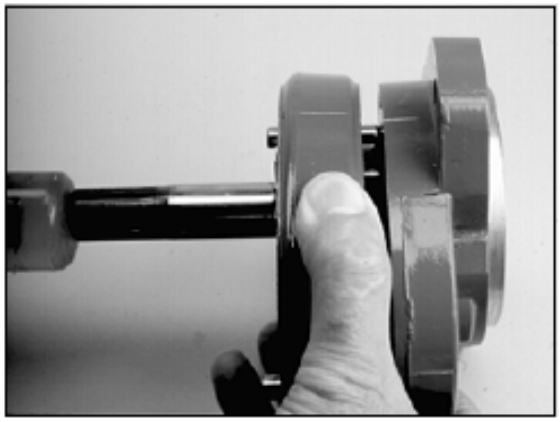
6 Remove *o-ring* seal from backplate.



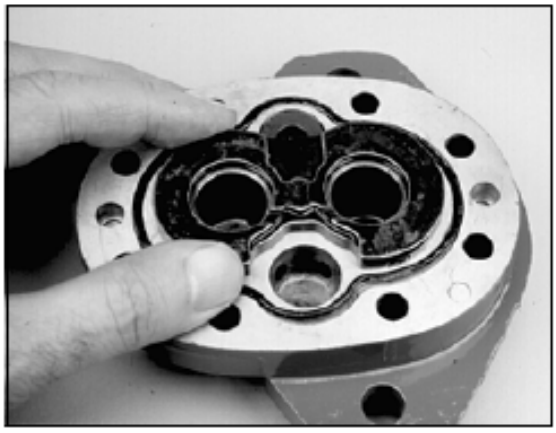
7. Remove backplate.

8 Remove *idler gear assembly* from body.

9 To separate *body* from the plate it remained with, place *drive gear assembly* in gear pocket and tap protruding end with plastic hammer or rawhide mallet. Remove drive gear assembly.



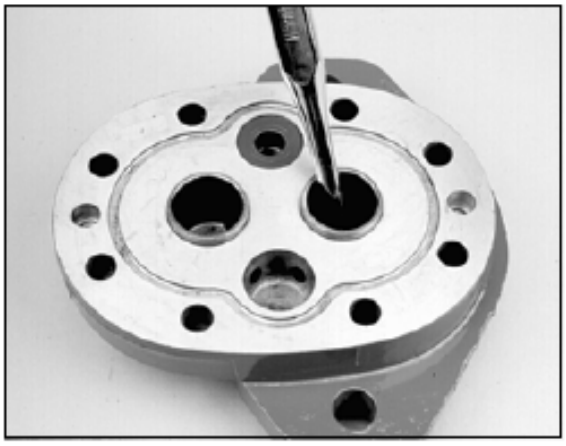
10 Remove wear plate and o-ring seal, noting position of open side of wear plate.



11 Remove *back-up gasket and seal* from wear plate by extracting with a o-ring tool.

12 Remove snap ring (if applicable) from the front of the front plate shaft seal area.

13 Remove *shaft seal* and *washer* from front plate with a blunt punch from the back side.



14 Removing the *plug* in front plate is not necessary, unless you intend to change rotation. See Reversibility - Changing Input Rotation of Pump.

Inspect Parts for Wear

General

1 Clean and dry all parts.

2 Remove all nicks and burrs from all parts with emery cloth.

Gear Assembly Inspection

1 Check spline drive shaft for twisted or broken teeth or check keyed drive shaft for broken or chipped keyway.

2 Inspect both the drive gear and idler gear shafts at bushing points and seal area for rough surfaces and excessive wear.

3 Replace gear assembly if shaft measures less than 19 mm [.748 in] in bushing area. (One gear assembly may be replaced separately; shafts and gears are available as assemblies only.)

4 Inspect gear for scoring and excessive wear.

5 Replace gear assembly if gear width is below the following dimensions. Refer to chart on this page.

6 Assure that snap rings are in grooves on either side of drive and idler gears.

7 If edge of gear teeth are sharp, break edge with emery cloth.

Front plate and Backplate Inspection

1 Oil groove in bushings in front plate should be in line with dowel pin holes and 180° apart. The oil grooves in the backplate bushings should be at approximately 37° to the pressure side.

2 Replace the backplate or front plate if I.D. of bushings exceed 19,2 mm [.755 in] (Bushings are not available as separate items).

3 Bushings in front plate should be at 3,20 mm [.126 in] above surface of front plate.

4 Check for scoring on face of backplate. Replace if wear exceeds ,038 mm [.0015 in.].

Body Inspection

1 Check body inside gear pockets for excessive scoring or wear.

2 Replace body if I.D. of gear pockets exceeds 43,7 mm [1.719 in].

Model Number	26001	26002	26003	26004	26005	26006	26007	26008	26009	26010	26011	26012	26013
Pump Disp. cm^3/r [in^3/r]	6,6 [.40]	8,2 [.50]	9,5 [.58]	10,8 [.66]	13,8 [.84]	16,7 [1.02]	19,7 [1.20]	22,5 [1.37]	24,3 [1.48]	25,2 [1.54]	27,7 [1.69]	29,0 [1.77]	30,6 [1.87]
Gear Width mm [in]	7,85 [.309]	9,75 [.384]	11,20 [.441]	12,95 [.510]	16,15 [.636]	19,35 [.762]	22,56 [.888]	25,76 [1.014]	28,12 [1.107]	28,96 [1.140]	32,16 [1.266]	33,78 [1.330]	35,36 [1.392]

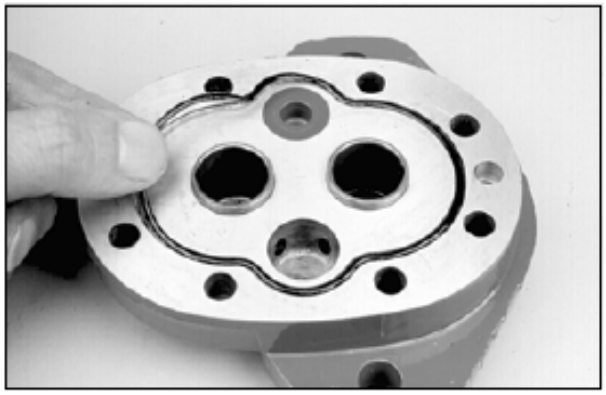
General Information

It is important that the relationship of the backplate, body, wear plate and front plate is correct. You will note two half moon cavities in the body. Note: The smaller half moon port cavity must be on the pressure side of the pump. The side of wear plate with midsection cut out must be on suction side of pump. Suction side of backplate is always side with larger port boss.

Reassembly

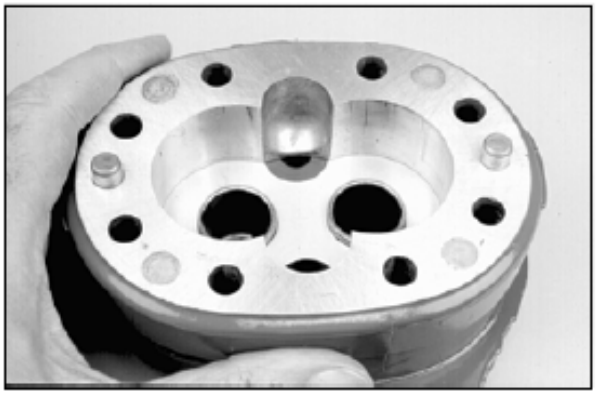
1 During the reassembly replace the *wear plate, seal, back-up gasket, shaft seal and o-rings* as new parts.

2 Install *o-ring* in groove of front plate.



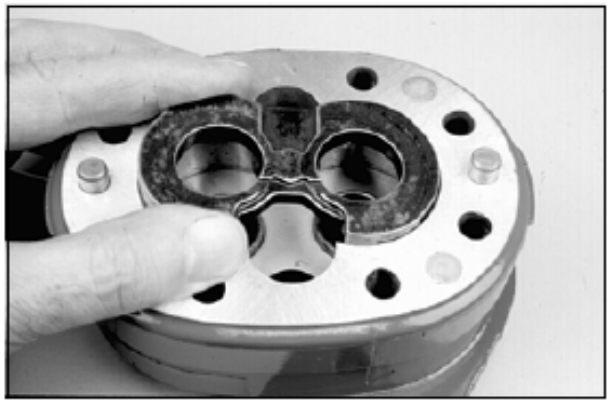
3 Apply a thin coat of petroleum jelly or hydraulic oil to both milled gear pockets of body. Slip body onto front plate with half moon port cavities in body facing away from front plate.

Note: The small half moon port cavity must be on the pressure side (the plugged side of the front plate) of pump.

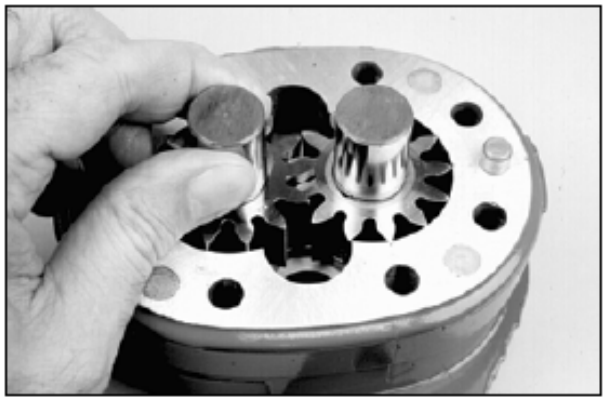


4 Install new *seal* and new *backup gasket* into wear plate. Note in the middle of the backup gasket a flat section or support. This area must face away from the wear plate inside the seal.

5 Place new *wear plate, seal,* and *backup gasket* into gear pocket with seal and backup gasket next to front plate. The side of the wear plate with the mid section cut-away must be on the suction side of pump.

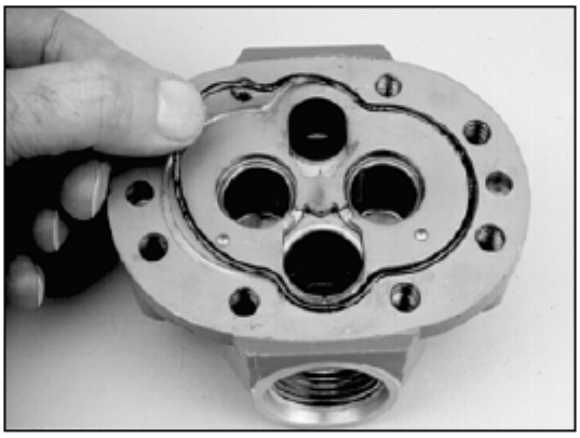


6 Dip *gear assemblies* into oil and slip into front plate bushings and gears into pockets of body.



76-197 REPAIR REASSEMBLY INSTRUCTIONS

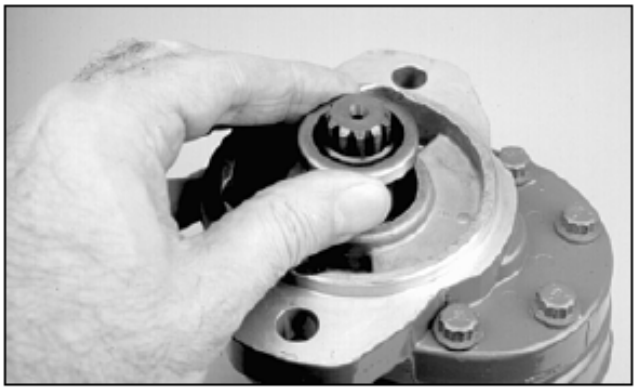
7 Install new *o-ring* in groove of backplate.



8 Make sure port orientation is correct and then slide *backplate* over gear shafts until dowel pins are engaged.

9 Secure with *cap screws* and new *washers*. Tighten cap screws evenly in a crisscross pattern 34 to 38 N•m [25 to 28 lbf•ft] torque.

10 Place washer over drive shaft into housing. Liberally oil shaft seal and install over drive shaft, carefully so that rubber sealing lips are not cut.



11 Place 1-5/16 in. O.D. sleeve over shaft and press in shaft seal until flush with front surface of front plate.

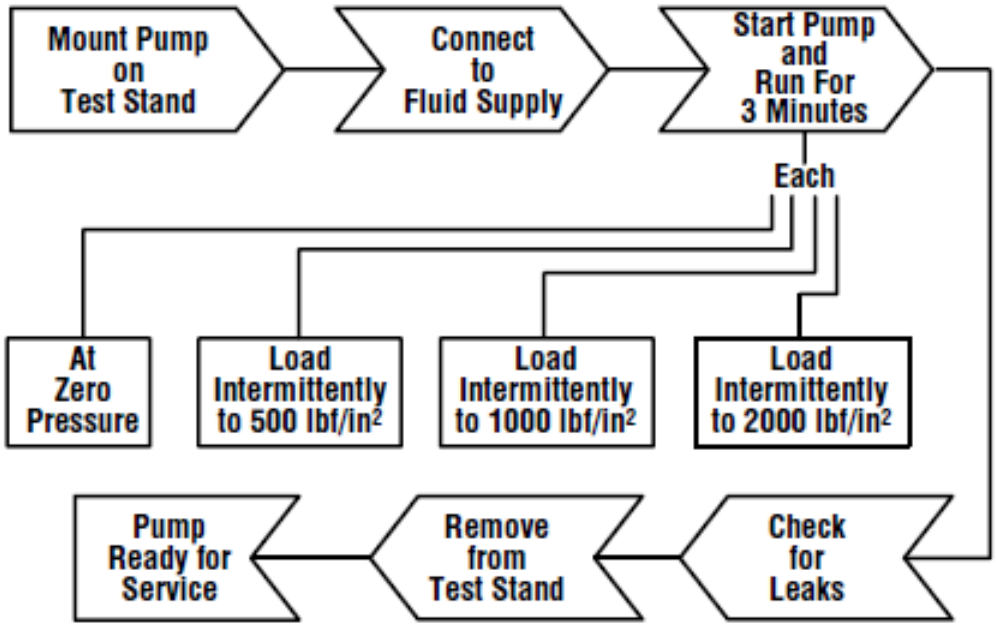
13 Install key on keyed shaft.

Note: Refer to Start-up Procedure and Trouble Shooting Procedure.

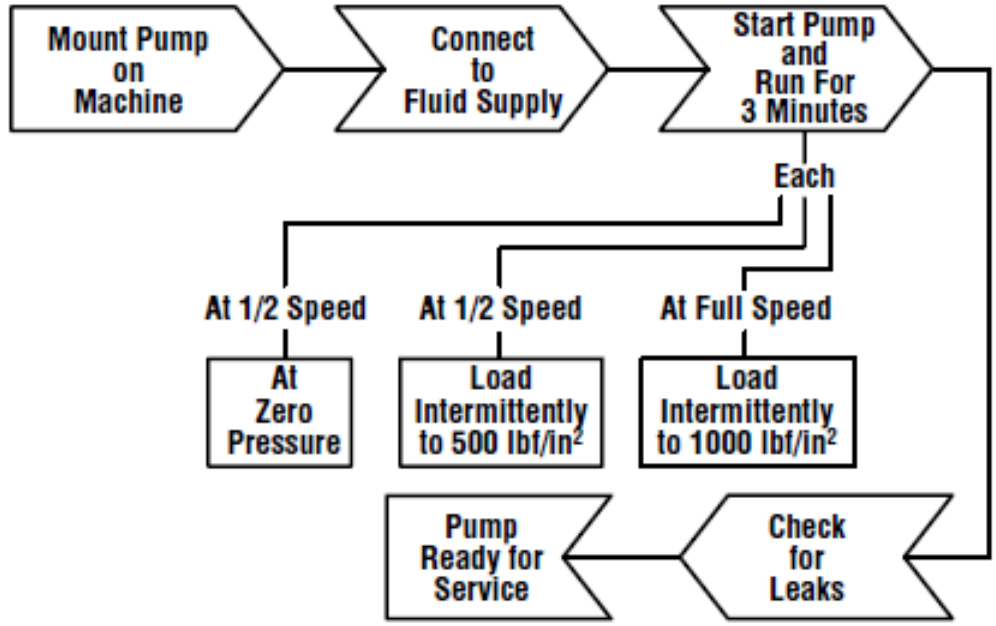
76-197 REPAIR TROUBLESHOOTING

Problem	Possible Cause	Correction
Cavitation	a. Oil too heavy. b. Oil filter plugged. c. Suction line plugged or too small.	a. Change to proper viscosity b. Clean filter. c. Clean line and check size of line.
Oil heating	a. Oil supply low. b. Contaminated oil. c. Setting of relief valve too high or too low. d. Oil in system too light.	a. Fill reservoir. b. Drain reservoir and refill with clean oil. c. Set to correct pressure. d. Drain reservoir and refill with proper viscosity oil.
Shaft seal leakage	a. Worn shaft seal. b. Worn shaft in seal area. c. Debris in shaft seal suction side drain holes.	a. Replace shaft seal. b. Replace drive assembly. c. Disassemble pump and inspect.
Foaming oil	a. Low oil level b. Air leaking into suction line c. Wrong kind of oil.	a. Fill reservoir. b. Tighten fittings. c. Drain and fill reservoir with non-foaming oil.

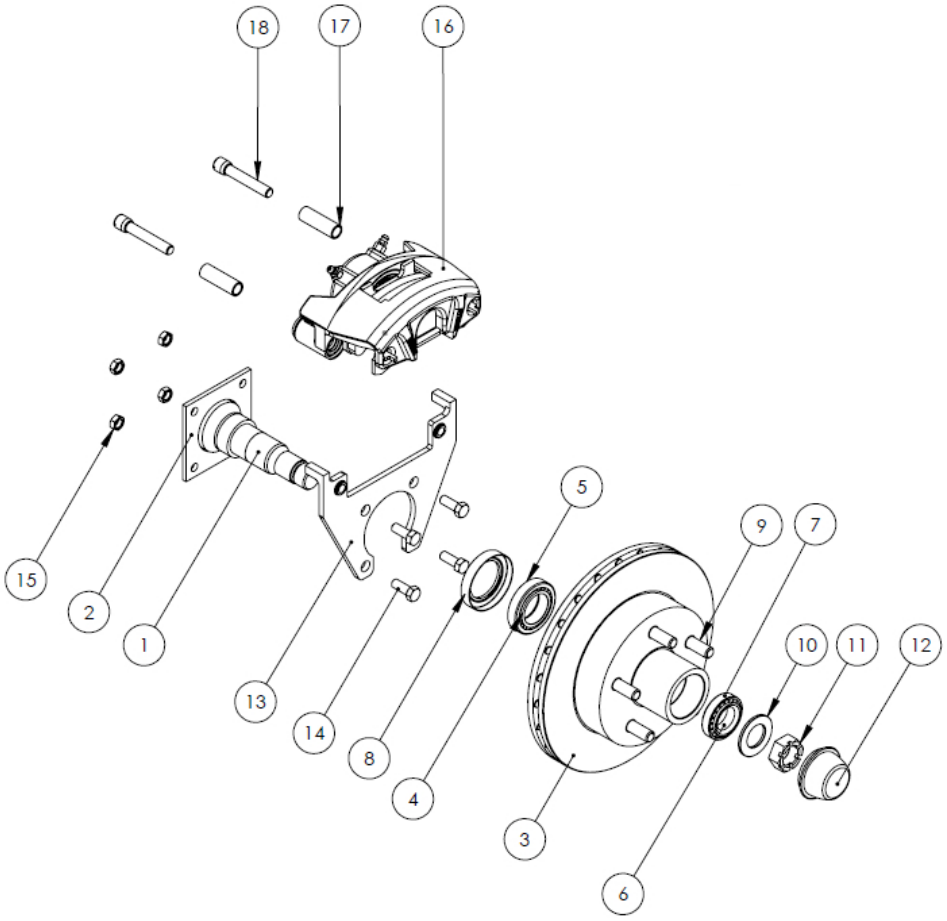
When test stand is *available*.



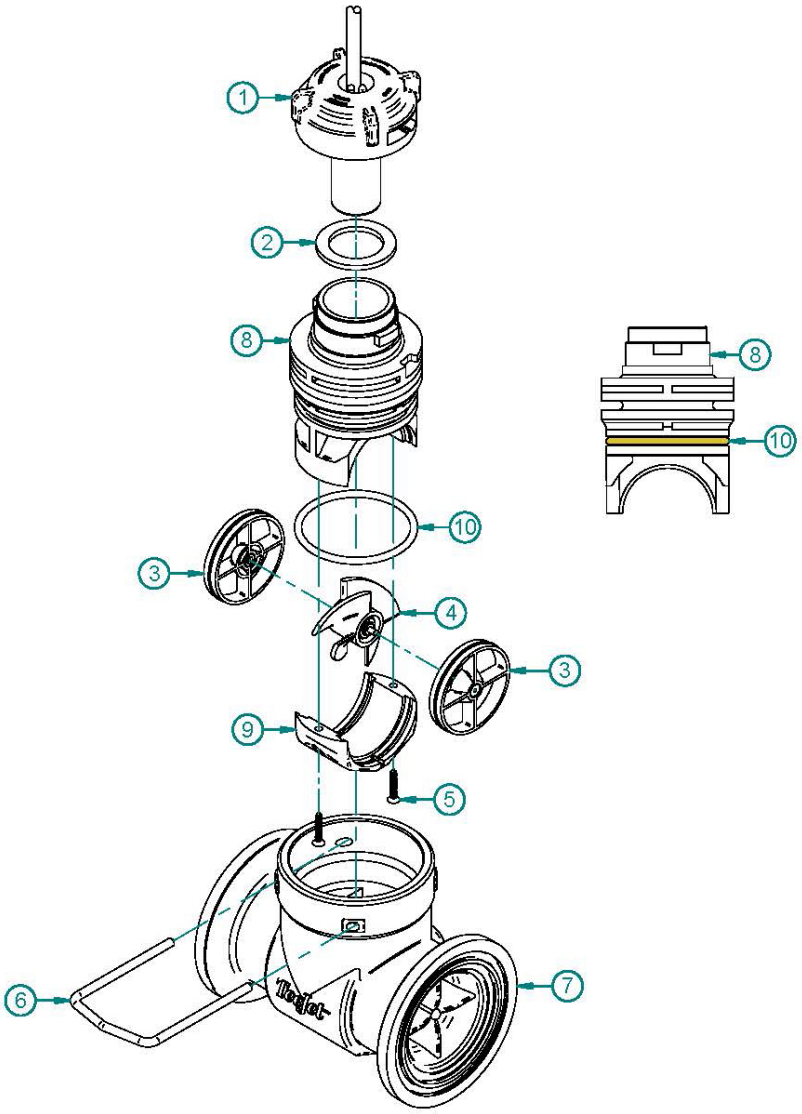
When test stand is *not available*.



32-571 FRONT BRAKE



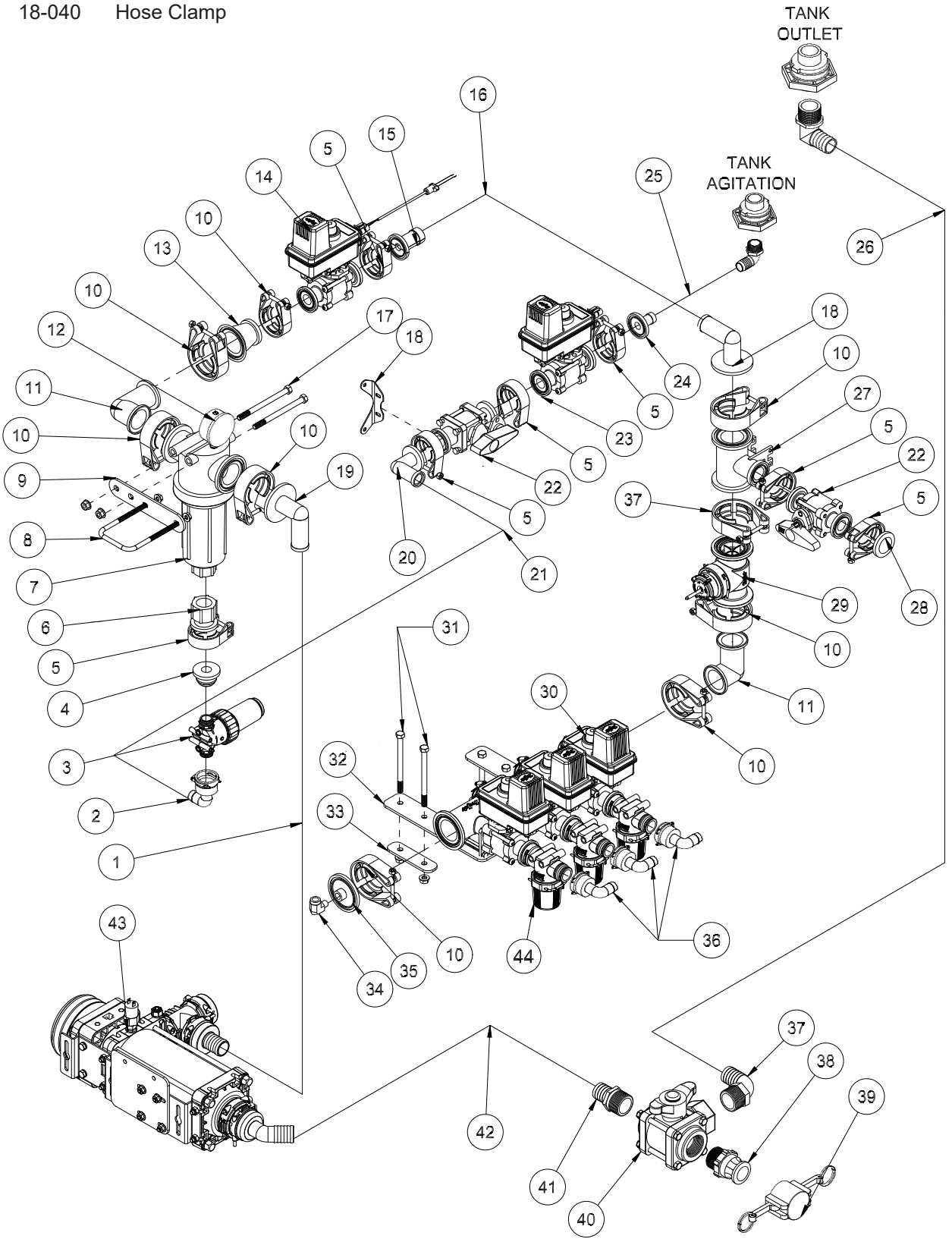
REF#	PART#	DESCRIPTION	QUANTITY
1		Standard #84 Spindle	1
2		Standard #84 Brake Flange	1
3		Hub Rotor	1
4		Inner Bearing Cone	1
5		Inner Bearing Cup	1
6		Outer Bearing Cone	1
7	27-023-30	Outer Bearing Cup	1
8		Seal	1
9	27-022-02	Lug Studs, 1/2 - 20	5
10		Spindle Washer	1
11		Dust Cap	1
13		Caliper Mounting Bracket	1
14	HB-38-16-100	Hex Bolt, 3/8 - 16 x 1	4
15	HN-38-16	Hex Nut, 3/8 - 16	4
16		Caliper Loaded	1
17		SS Bolt Sleeve	2
18		SS Guide Bolt M11 x 1.5	2



REF#	PART#	DESCRIPTION	QUANTITY
1	20-684-01	Sensor, PCB Assembly	1
2		Washer, Seal	1
3*		Guide Vane Bearing	2
4*		Turbine Assembly	1
5*		Flat HEad Screw, #6 - ⅝	2
6		Pin, Retaining	1
7	20-684-04	Body	1
8*		Insert, Body	1
9*		Endcap	1
10*	20-684-02	Oring	1
*	20-684-03	802 Flowmeter Repair Kit (includes all * items)	

5220&5224 PLUMBING DRAWING (RADION 8140)

15-817	#50 Fitting O-ring	15-818	#75 Fitting O-ring
20' Boom		**24' Boom**	
9032-128	3/4" Black Hose x 128" (left boom)	9032-148	3/4" Black Hose x 148" (left boom)
9032-96	3/4" Black Hose x 96" (center boom)	9032-96	3/4" Black Hose x 96" (center boom)
9032-124	3/4" Black Hose x 124" (right boom)	9032-144	3/4" Black Hose x 144" (right boom)
18-040	Hose Clamp		



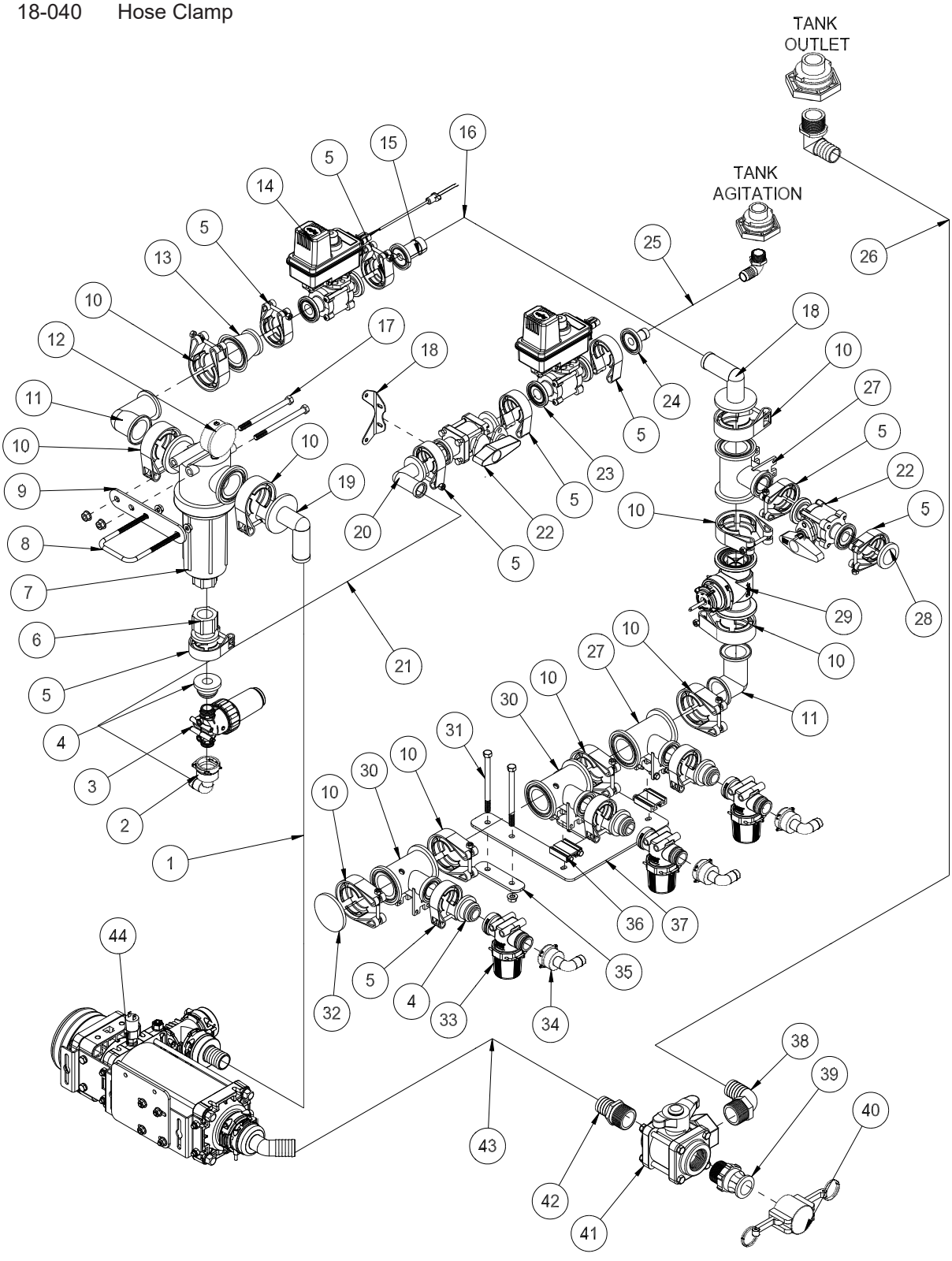
5220 & 5224 PLUMBING PARTS LIST (RADION® 8140)

REF#	PART#	DESCRIPTION	QUANTITY
1	8897-47	1 1/4" Discharge Hose 47"	1
	18-116	Hose Clamp	2
2	14-671	1" Hose Barb Outlet	1
	15-553-01	Clip	1
	15-553-02	O-ring	1
3	14-801	Agitator Line Strainer, 50 Mesh	1
	14-802	Replacement 50 Mesh Screen	
4	15-825	#50 Male Quick Coupler	1
5	15-740	#50 Series Clamp	8
6	15-735	#50 x 1 Female Pipe thread Fitting	1
7	15-737	Flanged Strainer	1
	16-968-03	Screen (50 mesh)	1
8	32-627	Square U-bolt, 5/16-18	1
	HNFL-516-18	Flange Whiz-loc Nut, 5/16-18	2
9	32-682	Strainer Mount	1
10	15-741	#75 Series Clamp	8
11	15-734	#75 Elbow Coupling	2
12	16-281	Liquid Filled Gauge	1
13	15-748	Reducer Coupling	1
14	20-785	Regulator Valve	1
15	15-870	#50 1 1/4 Hose Barb	1
16	8897-10	1 1/4" Discharge Hose 10"	1
	18-116	Hose Clamp	2
17	HB-38-16-550	Hex Bolt, 3/8 - 16 x 5 1/2	2
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	2
18	20-689	Valve Bracket	1
19	15-739	#75 x 90° x 1 1/4 Hose Barb	2
20	15-746	#50 - 90° Hose Barb	1
21	8896-10	1" Discharge Hose 10"	1
	18-222	Hose Clamp	2
22	15-738	Flanged Ball Valve	2
23	14-673	Agitation Shut-Off Valve	1
24	15-808	#50 Straight Hose Barb	1
25	8896-48	1" Discharge Hose 48"	1
	18-222	Hose Clamp	2
26	8897-45	1 1/4" Discharge Hose x 45"	1
	18-116	Hose Clamp	2
27	15-775	Reducer Tee	1
28	15-778	Blank Gauge Port Flange	1
29	20-684	#802 Flow Meter	1
30	15-743	Manifold Valve	1
31	HB-38-16-500	Hex Bolt, 3/8 - 16 x 5	4
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	4
32	32-683	Manifold Mount	1
33	32-684	Manifold Mount Strap	2
34	18-007	Street Elbow	1
35	15-882	#75 Gauge Port	1
36	15-553	3/4" - 90° Hose Barb	3
	15-553-01	Clip	3
	15-553-02	O-ring	3
37	16-156	Elbow, 1 1/4 MP x 1 1/4 HB	1
38	16-180	Male Quick Coupler, 1 1/4	1
39	16-935	Quick Coupler Cap	1
40	18-372	3-Way Valve	1
	18-372-01	Handle	1
41	16-161	Fitting	4
42	8897-6	1 1/4" Discharge Hose 6"	1
42	18-116	Hose Clamp	2
43	32-584	Spray Pump	1
44	14-607	Strainer, QC 100 Mesh	3

STAR COMMAND PLUMBING DRAWING

DynaJet ®Plumbing Drawing (for Aeros ® 9040 or radion® 8140)

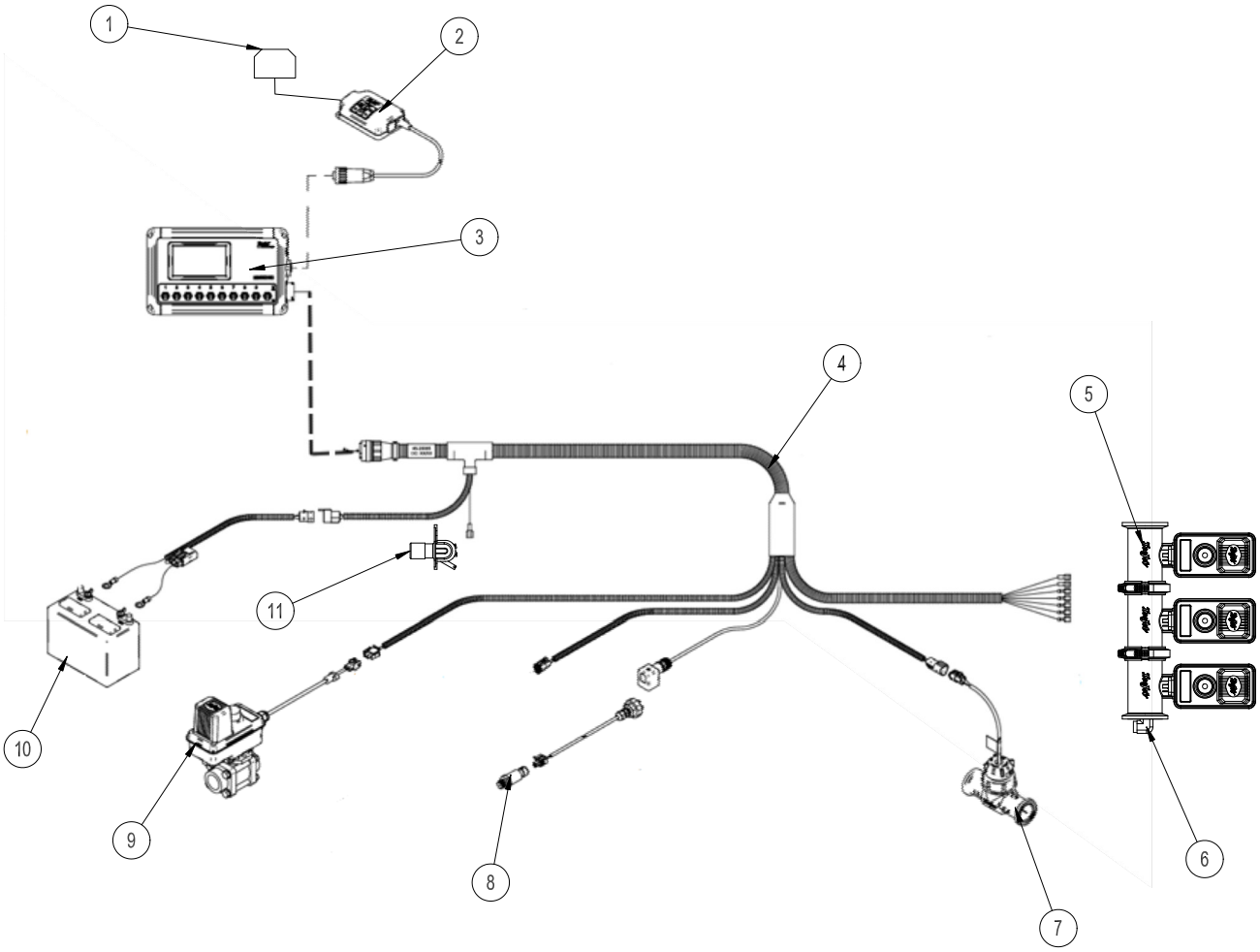
15-817	#50 Fitting O-ring	15-818	#75 Fitting O-ring
20' Boom		**24' Boom**	
9032-128	3/4" Black Hose x 128" (left boom)	9032-148	3/4" Black Hose x 148" (left boom)
9032-96	3/4" Black Hose x 96" (center boom)	9032-96	3/4" Black Hose x 96" (center boom)
9032-124	3/4" Black Hose x 124" (right boom)	9032-144	3/4" Black Hose x 144" (right boom)
18-040	Hose Clamp		



STAR COMMAND PLUMBING PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	8897-47	1 1/4" Discharge Hose 47"	1
	18-116	Hose Clamp	2
2	14-671	1" Hose Barb Outlet	1
	15-553-01	Clip	1
	15-553-02	O-ring	1
3	14-801	Agitator Line Strainer, 50 Mesh	1
	14-802	Replacement 50 Mesh Screen	
4	15-825	#50 Male Quick Coupler	1
5	15-740	#50 Series Clamp	11
6	15-735	#50 x 1 Female Pipe thread Fitting	1
7	14-628	Flanged Strainer with Screen (80 mesh)	1
8	32-627	Square U-bolt, 5/16-18	1
	HNFL-516-18	Flange Whiz-loc Nut, 5/16-18	2
9	32-682	Strainer Mount	1
10	15-741	#75 Series Clamp	10
11	15-734	#75 Elbow Coupling	2
12	14-686	Liquid Filled Gauge. 160PSI	1
13	15-748	Reducer Coupling	1
14	20-785	Regulator Valve	1
15	15-870	#50 1 1/4 Hose Barb	1
16	8897-10	1 1/4" Discharge Hose 10"	1
	18-116	Hose Clamp	2
17	HB-38-16-550	Hex Bolt, 3/8 - 16 x 5 1/2	2
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	2
18	20-689	Valve Bracket	1
19	15-739	#75 x 90° x 1 1/4 Hose Barb	2
20	15-746	#50 - 90° Hose Barb	1
21	8896-10	1" Discharge Hose 10"	1
	18-222	Hose Clamp	2
22	15-738	Flanged Ball Valve	2
23	14-673	Agitation Shut Off Valve	1
24	15-808	#50 Straight Hose Barb	1
25	8896-48	1" Discharge Hose 48"	1
	18-222	Hose Clamp	2
26	8897-45	1 1/4" Discharge Hose x 45"	1
	18-116	Hose Clamp	2
27	15-775	Reducer Tee	2
28	15-778	Blank Gauge Port Flange	1
29	20-684	#802 Flow Meter	1
30	30-164	Tapped Reducer Tee	2
31	HB-38-16-500	Hex Bolt, 3/8 - 16 x 5	4
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 - 16	4
32	15-742	#75 Inlet Cover	1
33	14-607	Strainer, 100 Mesh	3
	14-609	Replacement Screen, 100 Mesh	
34	15-553	3/4" - 90° Hose Barb	3
	15-553-01	Clip	3
	15-553-02	O-ring	3
35	32-684	Manifold Mount Strap	2
36	15-743-03	Mounting Rail	2
	15-743-06	Screw	8
37	32-683	Manifold Mount	1
38	16-156	Elbow, 1 1/4 MP x 1 1/4 HB	1
39	16-180	Male Quick Coupler, 1 1/4	1
40	16-935	Quick Coupler Cap	1
41	18-372	3-Way Valve	1
	18-372-01	Handle	1
42	16-161	Fitting	4
43	8897-6	1 1/4" Discharge Hose 6"	1
	18-116	Hose Clamp	2
44	32-584	Spray Pump	1

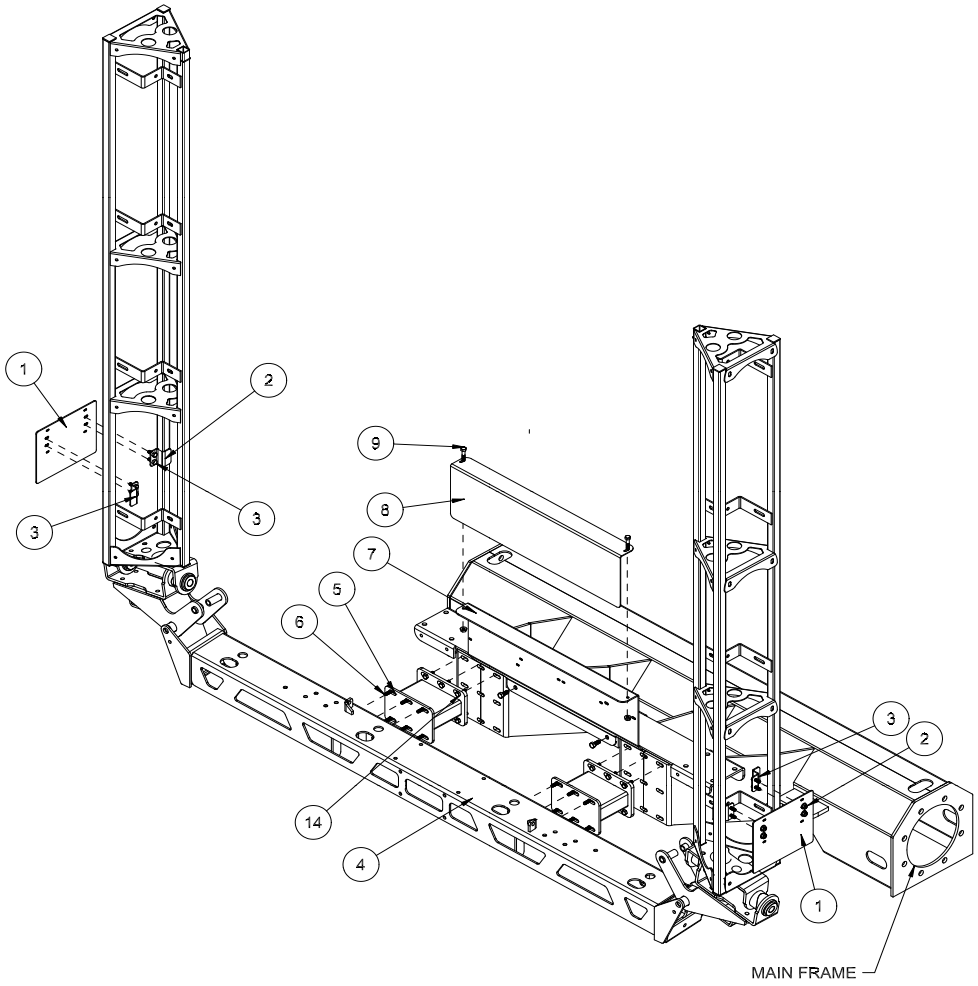
5220/5224 WIRING [RADION 8140]



IMPORTANT If using Simulated Speed with a Radion 8140, one needs to change back to Ground Speed for proper rate control when spraying.

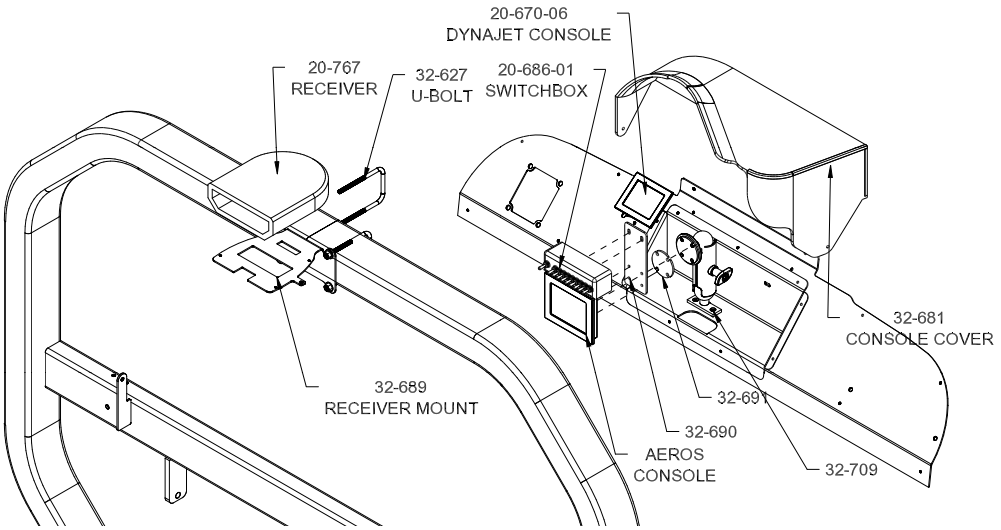
REF#	PART#	DESCRIPTION	QUANTITY
1*		Antenna	1
2*	20-687-02	GPS Speed Sensor	1
3*	20-697-01	Radion 8140 Console	1
4*	20-697-02	Wire Harness	1
5	15-743	Manifold Valve	1
6	18-007	Elbow	1
7	20-684	Flow Meter	1
8*	20-670-04	Pressure Sensor	1
9	20-785	Regulator Valve	1
10	33-216	Battery	1
11	33-509	Master Boom Control	1
*	20-697	TeeJet® Radion Kit (includes * items)	1

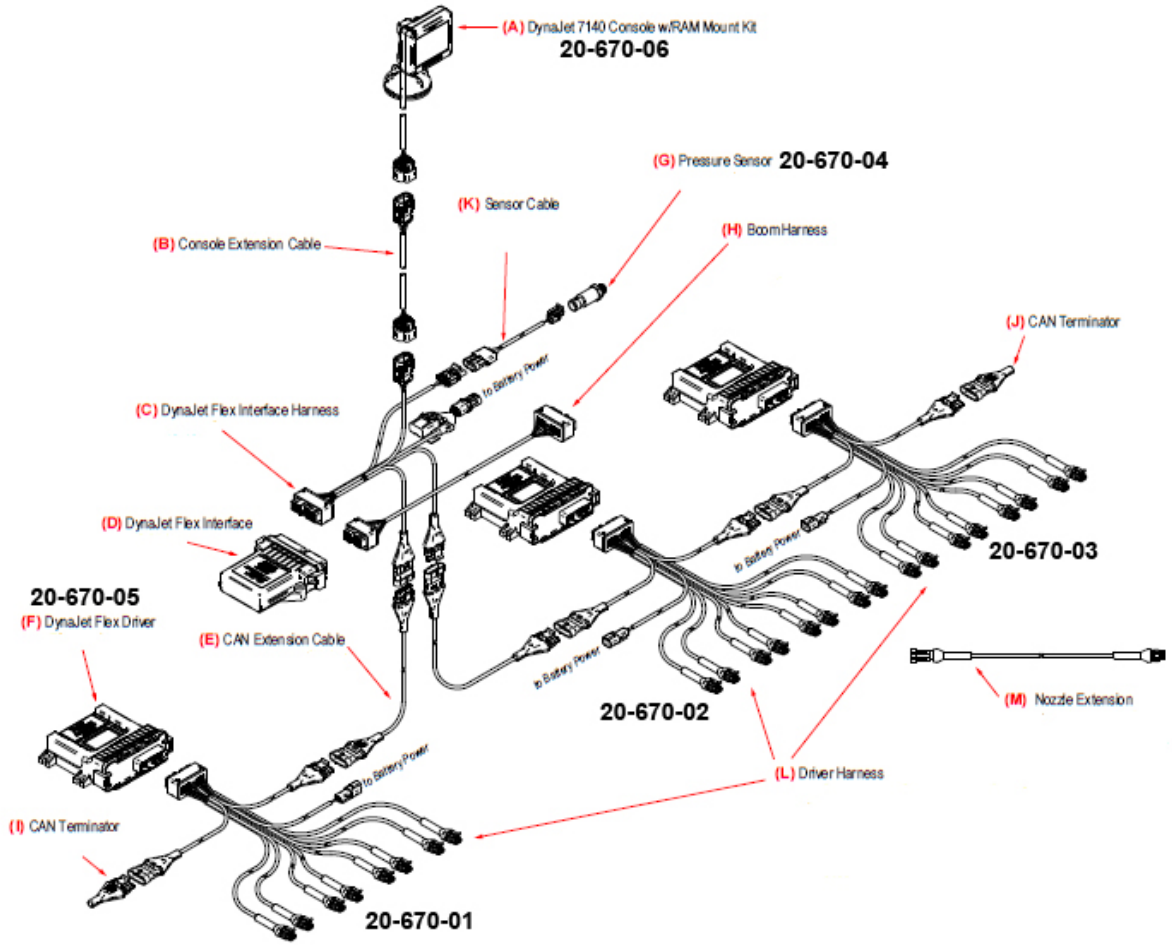
Use Dielectric Grease On All Electrical Connections



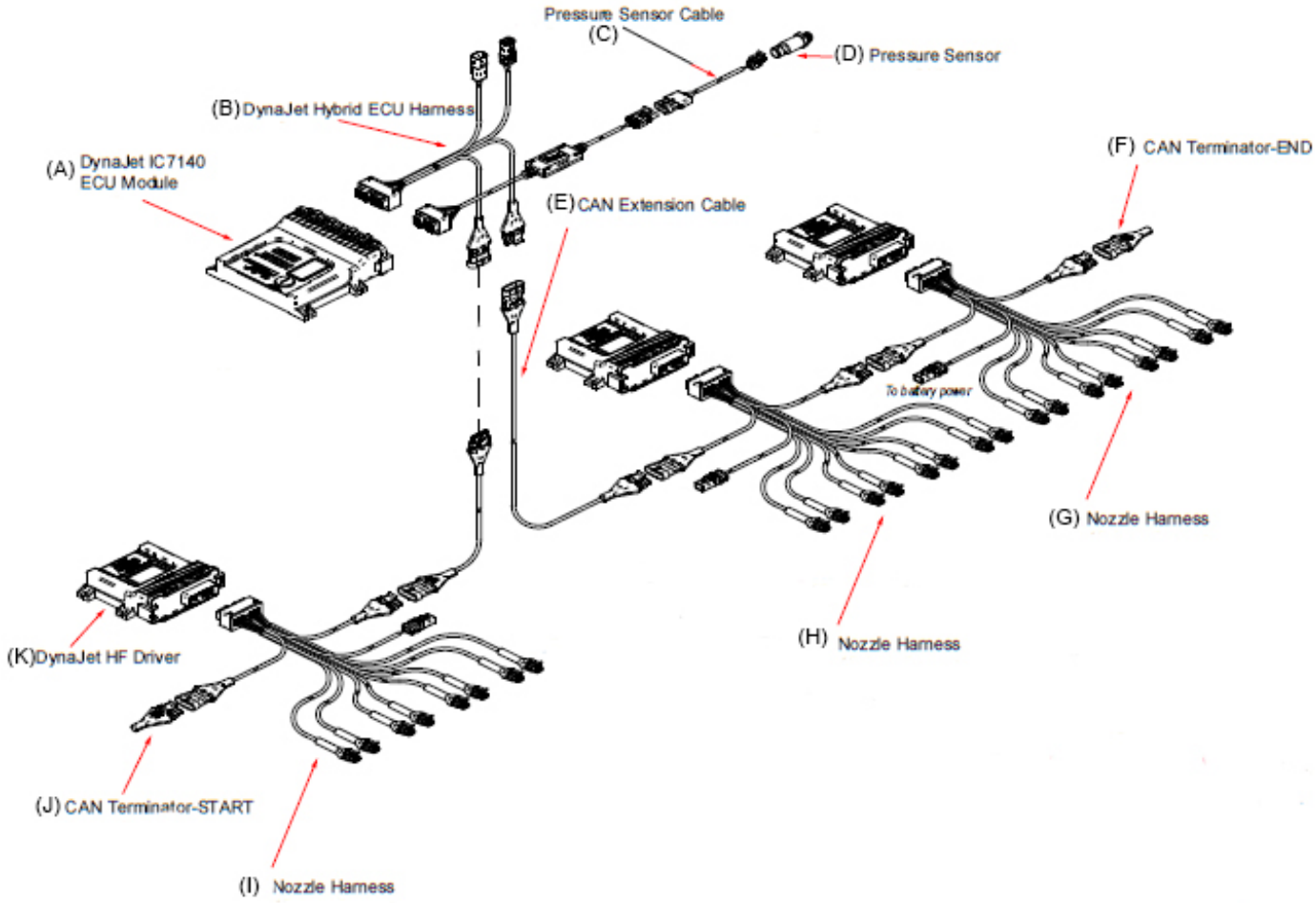
REF#	PART#	DESCRIPTION	QUANTITY
1	20-665	Drive Module Bracket	2
2	20-664	Z Bracket	4
3	HSTP-14-20-075	Machine Screw, 1/4 - 20 x 3/4	10
	HNFL-14-20	Flange Whiz-loc Nut, 1/4 - 2	10
4		Center Boom Mount	1
5	17-614	Boom Spacer	2
6	HB-516-18-100	Hex Bolt, 5/16 -18 x 1	12
	HNTL-516-18	Nylon Lock Nut, 5/16 -18	12
7	32-542	Module Mount	1
12	32-543	Module Cover	1
13	HB-14-20-075	Hex Bolt, 1/4 -20 x 1 3/4	2
	HW-14	Flat Washer, 1/4 -20	2
	HNFL-14-20	Flange Whiz-loc Nut, 1/4 -20	2
14	HB-38-16-125	Hex Bolt, 3/8 - 16 x 1¼	12
	HNTL-38-16	Nylon Lock Nut, 3/8 - 16	12
	HW-38	Flat Washer, 3/8	12
	HW-516	Flat Washer, 5/16	12

5287/5288 DYNAJET WIRING STAR COMMAND I

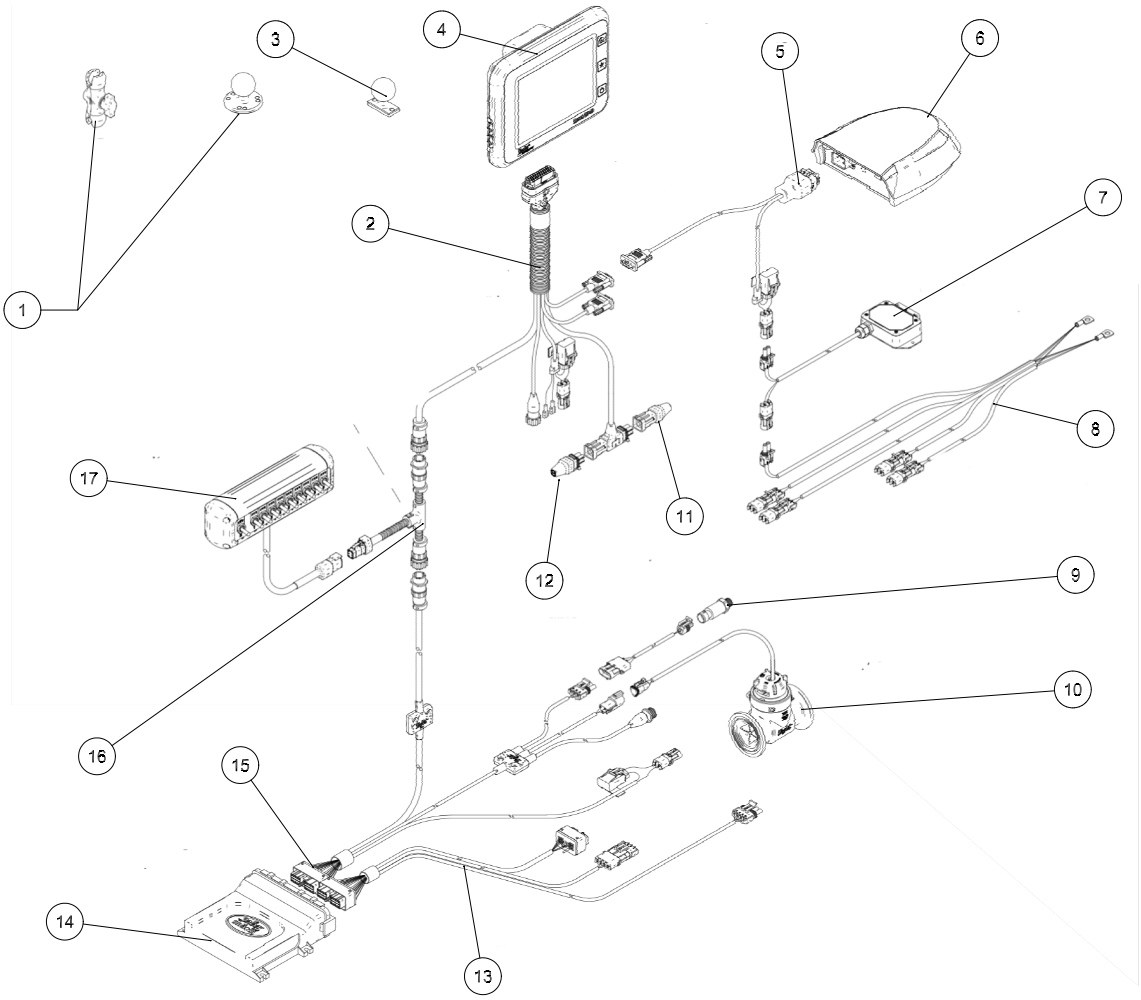




5285/5286 DYNAJET WIRING STAR COMMAND II

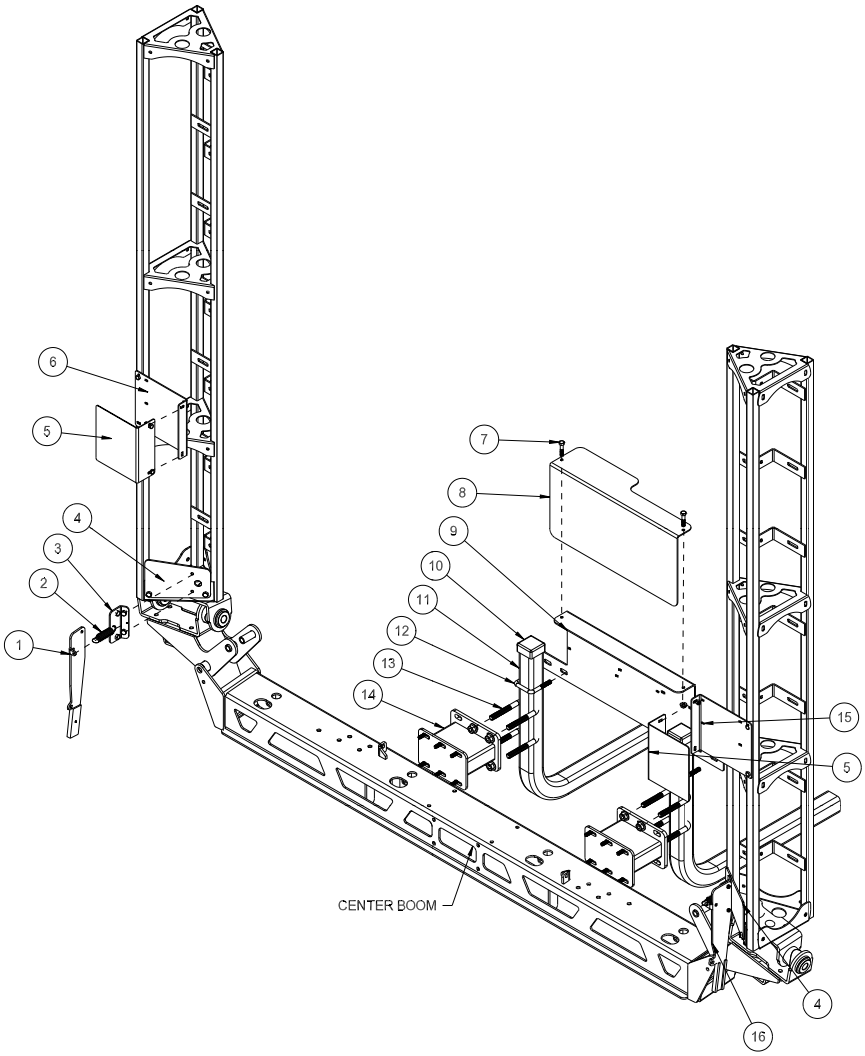


REF#	PART#	DESCRIPTION	QUANTITY
A		DynaJet IUC7140 Module	1
B		Harness, IC7140 to IC35	1
C		Cable, Pressure Sensor	1
D	20-670-04	Pressure Sensor	1
E		CAN Extension Cable	1
F	20-670-08	CAN Terminator End	1
G		RIght Harness, DJ Driver	1
H		Center Harness, DJ Driver	1
I		Left Harness, DJ Driver	1
J		CAN Terminator Start	1
K	20-670-05	DynaJet Driver	3

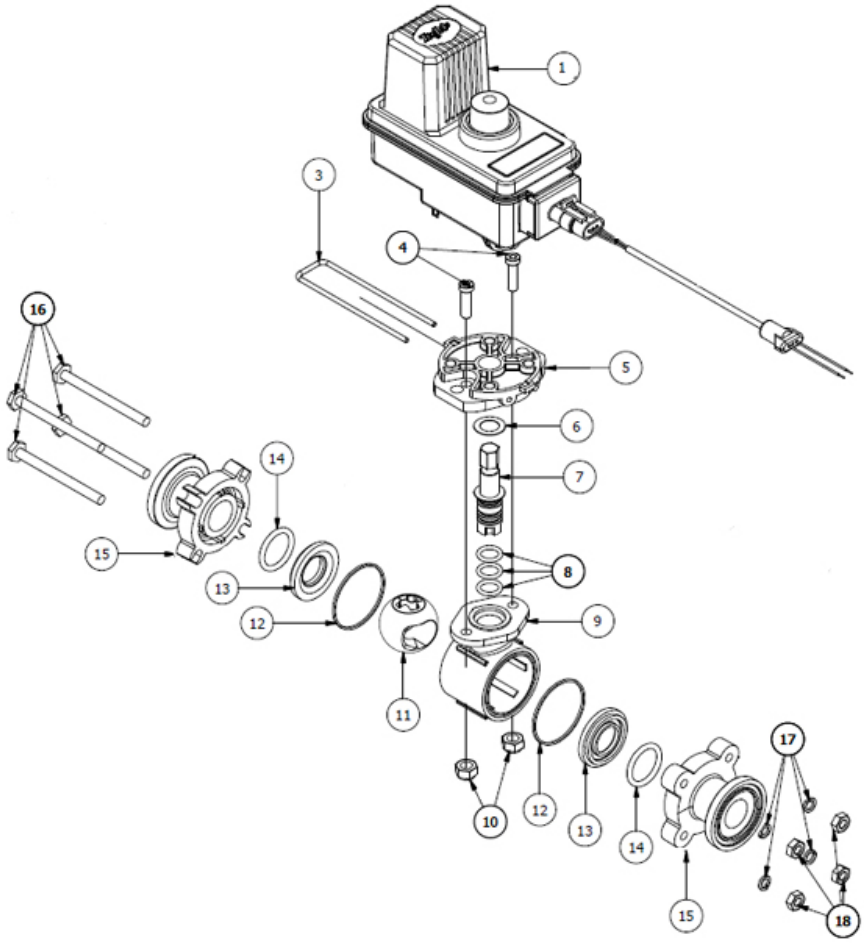


REF#	PART#	DESCRIPTION	QUANTITY
1	20-540	Ram Mount	1
2		Aeros Harness w/ ISO CAN	1
3		RAM Base	1
4		Aeros Console	1
5	20-736-01	Antenna Cable	1
6	20-767	RX720 Receiver	1
7		Switch box	1
8		Power Cable	1
9	20-670-04	Pressure Sensor	1
10	20-684	Flow Meter	1
11		Terminator	1
12		Terminator	1
13		DynaJet Interface Boom Harness	1
14		IC18 Sprayer Module	1
15		IC18 Harness	1
16		TeeJet In-Cab Cable	1
17	20-686-01	Switch Box	1
NS	17-647	E-chemsaver Extensin Cable for 15' Boom	

STAR COMMAND II MODULE MOUNTS



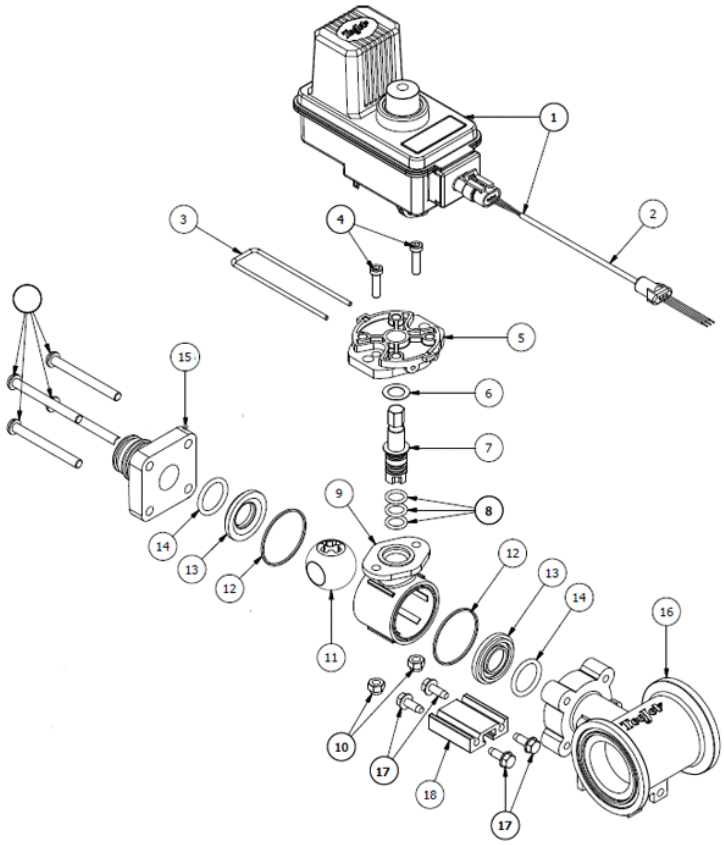
REF#	PART#	DESCRIPTION	QUANTITY
1	17-562	LH Break-Away Arm	1
2	11-050	Spring	2
3	17-560	Hinge Mount	2
4	17-559	Break-Away Mount	2
5	20-796	Bracket Cover	2
6	20-795	LH Driver Module Bracket	1
7	HB-516-18-150	Hex Bolt, $^{5}/_{16}$-18 x $1^{1}/_{2}$	2
	HNFL-516-18	Flange Whiz-loc Nut, $^{5}/_{16}$-18	2
8	20-794	Module Cover Bracket	1
9	10-625	Module Mount Bracket	1
10	16-557	Square Cap	2
11	17-615	Boom Carrier	2
12	17-537	Square U-bolt	1
13	20-555	U-Bolt	4
	HNFL-12-13	Flange Whiz-loc Nut, $^{1}/_{2}$- 13	8
14	17-614	Boom Spacer	2
15	20-793	RH Driver Module Bracket	1
16	17-561	RH Break-Away Arm	1



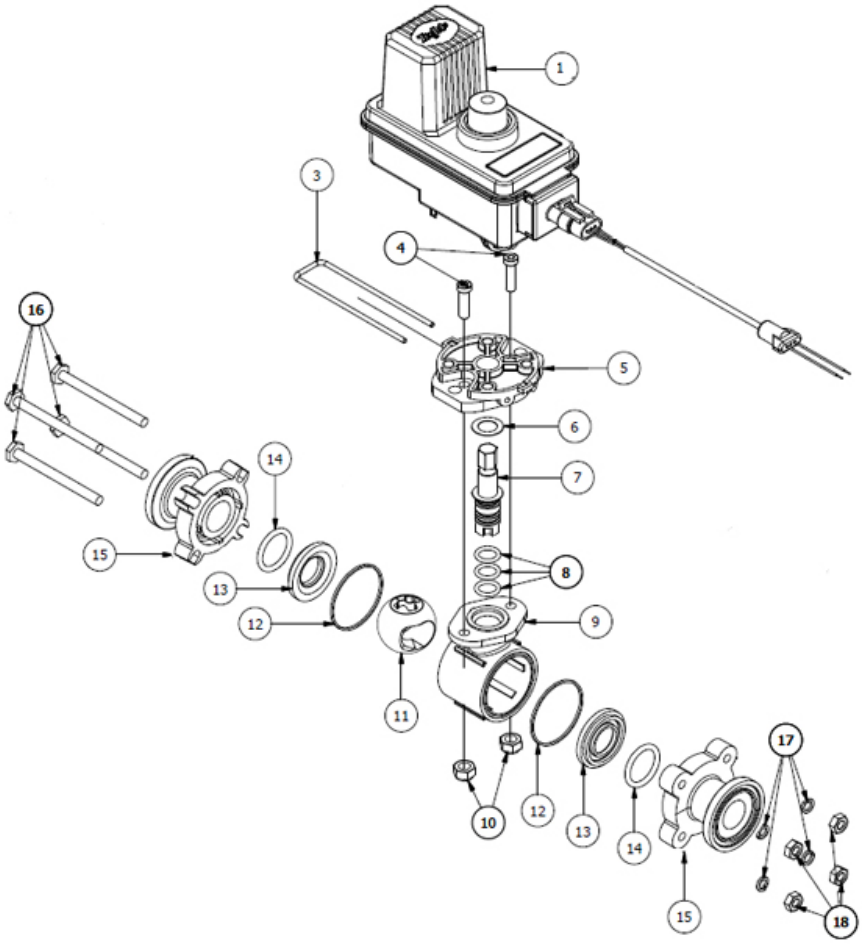
REF#	PART#	DESCRIPTION	QUANTITY
1	20-785-01	6RPM Motor	1
3	15-552-24	Retaining Clip	1
4		Socket Head Cap Screw, Stainless Steel	2
5	15-552-26	Motor Adapter, Polypropylene	1
6	15-517-11	Thrust Washer, Teflon	1
7	15-552-27	Stem, Stainless Steel	1
8*	15-552-05	O-ring, Viton	3
9	15-517-16	Body, Nylon	1
10		Lock Nut, Stainless Steel	2
11		Ball, Polypropylene	1
12	15-552-13	Gasket, Viton	2
13	15-517-19	Seal, Teflon	2
14	15-517-20	O-ring, Viton	2
15	15-743-01	End Cap	1
16		SS Hex Bolt, 1/4 - 20 x 3	4
17		SS Lock Washer, 1/4	4
18		SS Nut, 1/4 - 20	4

20-785	Complete Regulator Valve
15-817	#50 Fitting O-ring
15-818	#75 Fitting O-ring

15-743 MANIFOLD BALL VALVE

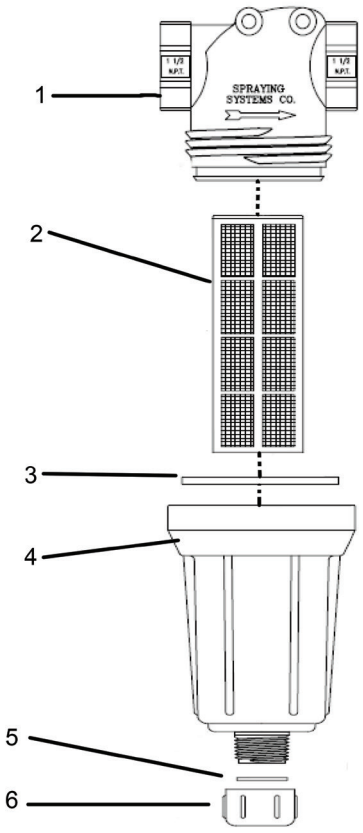


REF#	PART#	DESCRIPTION	QUANTITY
1	15-552-23	Motor	
2	15-878	Metri-Pack Cable (comes with motor)	1
3	15-552-24	Retaining Clip	1
4	15-552-25	Socket Head Cap Screw, Stainless Steel	2
5	15-552-26	Motor Adapter, Polypropylene	1
6*	15-517-11	Thrust Washer, Teflon	1
7	15-552-27	Stem, Stainless Steel	1
8*	15-552-05	O-ring, Viton	3
9	15-517-16	Body, Nylon	1
10		Lock Nut, Stainless Steel	2
11	15-743-04	Ball, Polypropylene	1
12*	15-552-13	Gasket, Viton	2
13*	15-517-19	Seal, Teflon	2
14*	15-517-20	O-ring, Viton	2
15	15-743-01	End Cap	1
16	15-743-02	#75 Tee Body	1
17	15-743-06	Screw, SS	4
18	15-743-03	Mounting Rail Aluminum	1
*	15-552-10	Spare Parts Kit (includes all * items)	
	15-743-05	Single Valve (shown)	
	15-817	#50 Fitting O-ring	
	15-818	#75 Fitting O-ring	



REF#	PART#	DESCRIPTION	QUANTITY
1		Motor	1
3	15-552-24	Retaining Clip	1
4		Socket Head Cap Screw, Stainless Steel	2
5	15-552-26	Motor Adapter, Polypropylene	1
6	15-517-11	Thrust Washer, Teflon	1
7	15-552-27	Stem, Stainless Steel	1
8*	15-552-05	O-ring, Viton	3
9	15-517-16	Body, Nylon	1
10		Lock Nut, Stainless Steel	2
11	15-743-04	Ball, Polypropylene	1
12	15-552-13	Gasket, Viton	2
13	15-517-19	Seal, Teflon	2
14	15-517-20	O-ring, Viton	2
15		End Cap	1
16		SS Hex Bolt, 1/4 - 20 x 3	4
17		SS Lock Washer, 1/4	4
18		SS Nut, 1/4 - 20	4

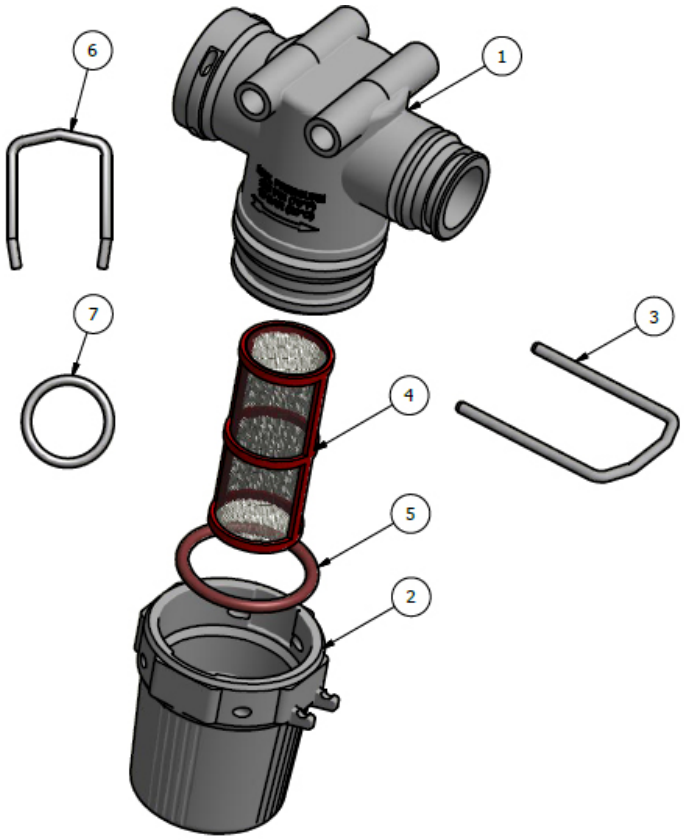
15-737/14-628 FLANGED STRAINER



REF#	PART#	DESCRIPTION	QUANTITY
1	15-737-01	Strainer Head 75 Series	1
2*	16-968-03	50 Mesh Screen	1
**	16-968-05	80 Mesh S	1
3	14-521-02	EPDM Gasket	1
4	14-521-03	Bowl 1" NPT	1
5	14-521-04	EPDM Rubber gasket	1
6	14-521-05	Cap	1

*	15-737	Flanged Strainer Assembly with 50 Mesh Screen
**	14-628	Flanged Strainer Assembly with 80 Mesh Screen

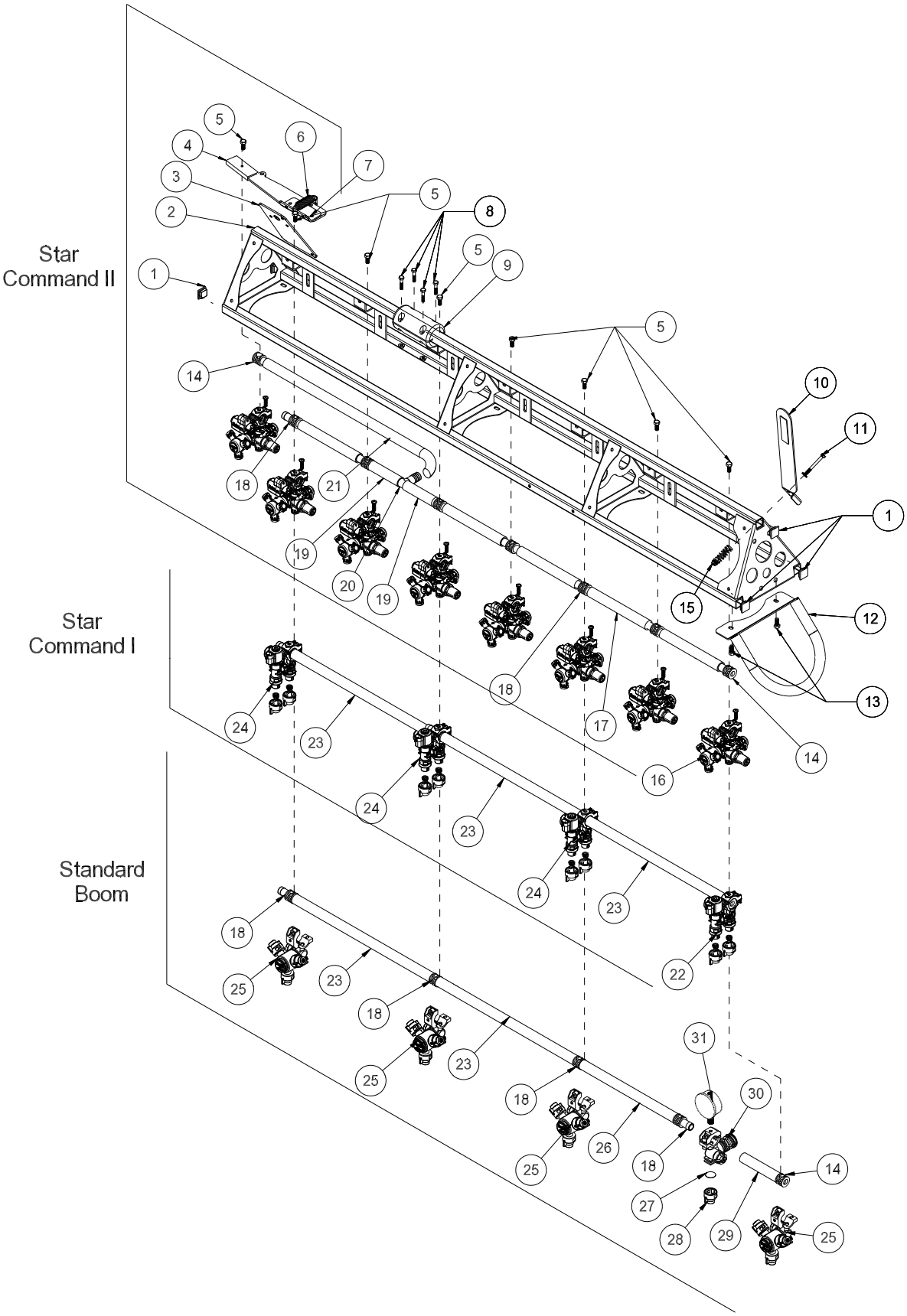
14-801/14-607 STRAINER ASSEMBLY



REF#	PART#	DESCRIPTION	QUANTITY
1		QC Strainer Head	1
2	14-801-01	Bowl	1
3		Strainer QC Retaining Clip	1
4*	14-802	50 Mesh Screen	1
**	14-609	100 Mesh Screen	1
5	14-801-02	Viton Oring	1
6	15-553-01	Retaining Clip	1
7	15-553-02	Viton Oring	1

*	14-801	Agitation Strainer Assembly with 50 Mesh Screen
**	14-607	QC Strainer Assembly with 100 Mesh Screen

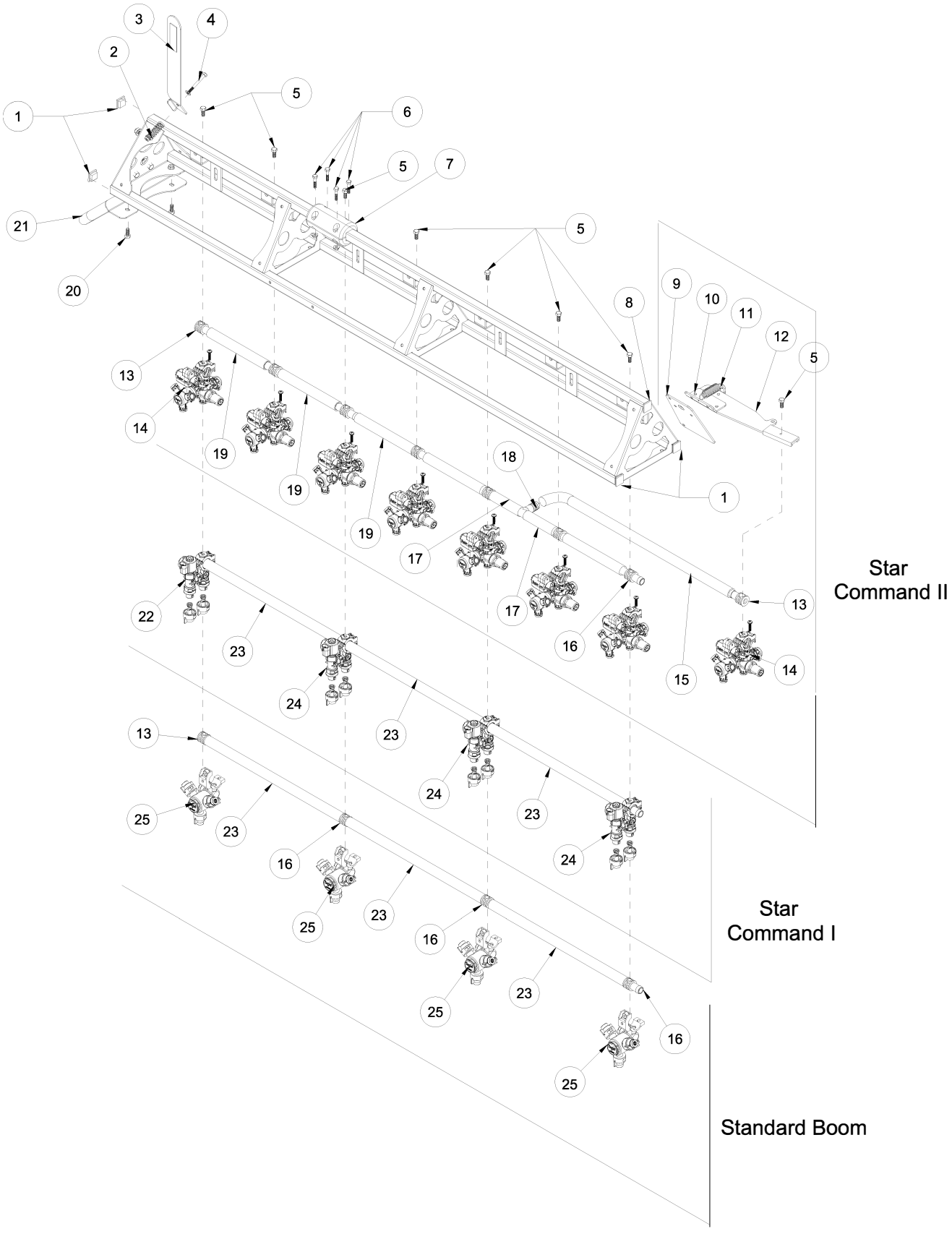
32-505 20' RIGHT BOOM DRAWING



32-505 20' RIGHT BOOM PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	30-258	1" 10-14GA Ribbed Plug	5
2	17-653	Boom Arm, RH	1
3	17-559	Break-Away Mount	1
4	17-561	RH Break-Away Arm	1
5	HB-516-18-075	Bolt, 5/16 - 18 x 3/4	4 or 8
	HNTL-516-18	Lock Nut, 5/16 - 18	4 or 8
6	11-050	Spring	1
7	17-560	HInge Mount	1
8	HB-14-20-125	Bolt 1/4 - 20 x 1 1/4	4
	HNTL-14-20	lock Nut 1/4 - 20	4
9	17-573	Guide Boom Set	1
10	32-632	RH Sight Gage	1
	74-156	Decal, Reflective	1
11	HB-14-20-250	Bolt, 1/4 - 20 x 2 1/2	1
	HW-14	Flat Washer, 1/4	2
	HNTL-14-20	Lock Nut, 1/4 - 20	1
12	17-541	Boom End Guard	1
13	HBFL-516-18-075	Flange Bolt, 5/16 - 18 x 3/4	2
	HNFL-516-18	Flange Lock Nut, 5/16 - 18	2
14	18-417	Single Barb - Star Command II	2
	18-417	Single Barb - Standard Boom	1
15	11-055	Spring	1
16	20-807	Nozzle Body	8
17	9032-8.5	3/4" Black Hose x8.5"	5
	18-040	Hose Clamp	10
	9024	Clamp Cover	10
18	18-416	Double Barb - Star Command II	5
	18-416	Double Barb - Standard Boom	4
19	9032-4	3/4" Black Hose x4"	2
	18-040	Hose Clamp	4
	9024	Clamp Cover	4
20	18-415	3/4" Hose Barb Tee	1
21	9032-28	3/4" Black Hose x 28"	1
	18-040	Hose Clamp	2
	9024	Clamp Cover	2
22	20-675	Single Hose Barb Nozzle- Right Orientation	1
23	9032-19	3/4" Black Hose x19"	2 or 3
	18-040	Hose Clamp	4 or 6
	9024	Clamp Cover	4 or 6
24	20-673	Double Hose Barb Nozzle	3
25	33-506	Body	4
	HB-516-18-075	Hex Bolt, 5/16 - 18 x 3/4	4
	HNTL-516-18	Lock Nut, 5/16 - 18	4
26	9032-13	3/4" Black Hose x 13"	1
	18-040	Hose Clamp	2
	9024	Clamp Cover	2
27	16-800	Seal	1
28	16-921	Cap	1
29	9032-5	3/4" Black Hose x 5"	1
	18-040	Hose Clamp	2
	9024	Clamp Cover	2
30	17-602	Body	1
31	16-281	Pressure Gauge	1

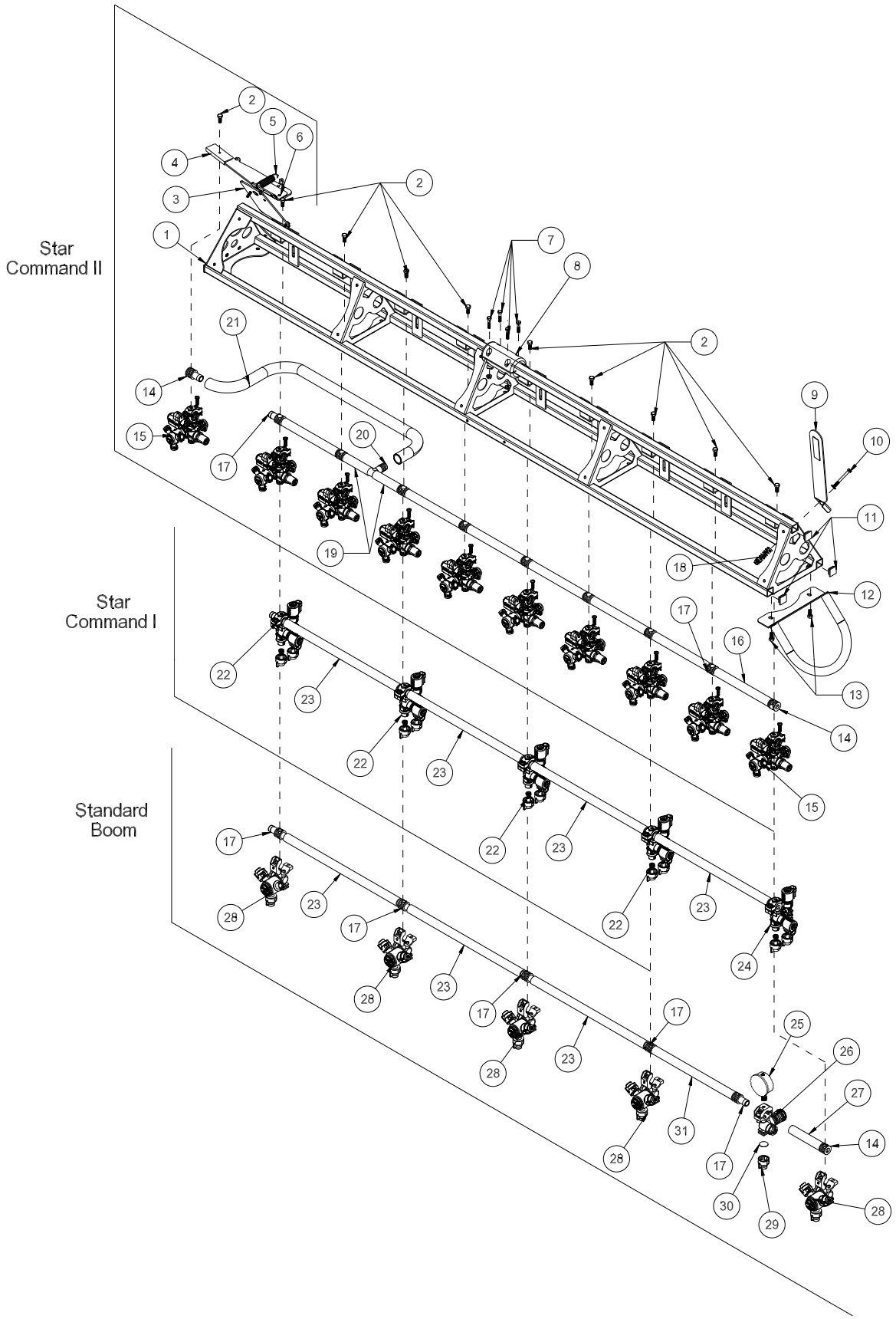
32-505 20' LEFT BOOM DRAWING



32-505 20' LEFT BOOM PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	30-258	1" 10-14ga Ribbed Plug	5
2	11-055	Spring	1
3	32-633	LH Site Gage	1
	74-156	Decal, Reflective	1
4	HB-14-20-250	Bolt, 1/4 - 20 x 2 1/2	1
	HW-14	Flat Washer, 1/4	2
	HNTL-14-20	Lock Nut, 1/4 - 20	1
5	HB-516-18-075	Bolt, 5/16 - 18 x 3/4	4 or 8
	HNTL-516-18	Lock Nut, 5/16 - 18	4 or 8
6	HB-14-20-125	Bolt 1/4 - 20 x 1 1/4	4
	HNTL-14-20	Lock Nut 1/4 - 20	4
7	17-573	Guide Boom Set	1
8	17-652	Boom Arm, LH	1
9	17-559	Break-Away mount	1
10	17-560	Hinge Mount	1
11	11-050	Spring	1
12	17-562	LH Break-Away Arm	1
13	18-417	Single Barb - Star Command II	2
	18-417	Singel Barb - Standard Boom	1
14	20-807	Nozzle Body	8
15	9032-28	3/4" Black Hose x 28"	1
	18-040	Hose Clamp	2
	9024	Clamp Cover	2
16	18-416	Double Barb - Star Command II	6
	18-416	Double Barb - Standard Boom	3
17	9032-4	3/4" Black Hose x 4"	2
	18-040	Hose Clamp	4
	9024	Clamp Cover	4
18	18-415	3/4" Hose Barb Tee	1
19	9032-8.5	3/4" Black Hose x 8.5"	5
	18-040	Hose Clamp	10
	9024	Clamp Cover	10
20	HBFL-516-18-075	Flange Bolt, 5/16 - 18 x 3/4	2
	HNFL-516-18	Flange Lock Nut, 5/16 - 18	2
21	17-541	Boom End Guard	1
22	20-674	Single Hose Barb Nozzle - Left Orientation	1
23	9032-19	3/4" Black Hose x 19"	3
	18-040	Hose Clamp	6
	9024	Clamp Cover	6
24	20-673	Double Hose Barb Nozzle	3
25	33-506	Standard Nozzle Body	4

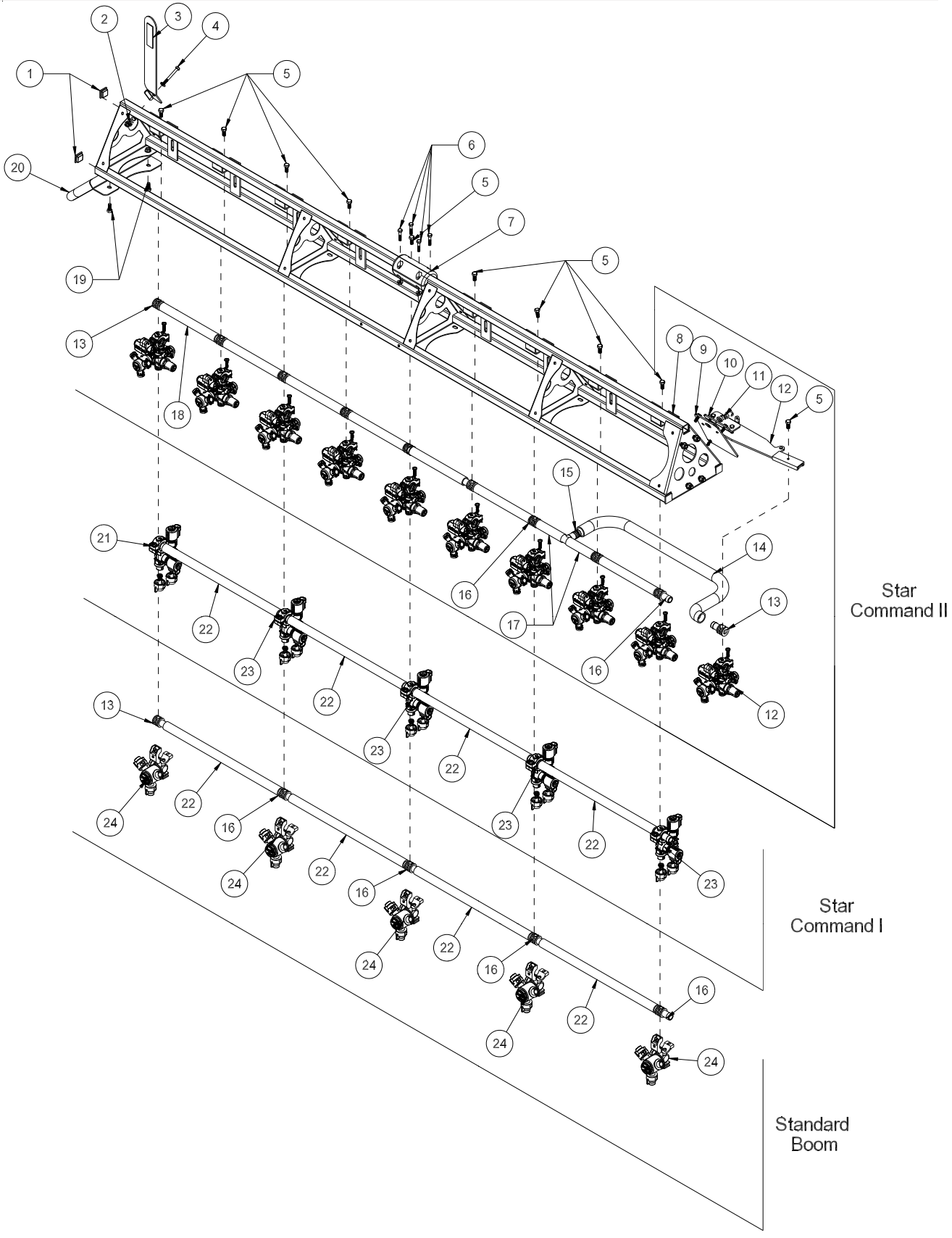
32-565 24' RIGHT BOOM DRAWING



32-565 24' RIGHT BOOM PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	32-561	Boom Arm, RH	1
2	HB-516-18-075	Bolt, 5/16 - 18 x 3/4	5 or 10
	HNTL-516-18	Lock Nut, 5/16 - 18	5 or 10
3	17-559	Break-Away Mount	1
4	17-561	RH Break-Away Arm	1
5	11-050	Spring	1
6	17-560	Hinge Mount	1
7	HB-14-20-125	Bolt 1/4 - 20 x 1 1/4	4
	HNTL-14-20	lock Nut 1/4 - 20	4
8	17-573	Guide Boom Set	1
9	32-632	RH Sight Gage	1
	74-156	Decal, Reflective	1
10	HB-14-20-250	Bolt, 1/4 - 20 x 2 1/2	1
	HW-14	Flat Washer, 1/4	2
	HNTL-14-20	Lock Nut, 1/4 - 20	1
11	30-258	1" 10-14GA Ribbed Plug	5
12	17-541	Boom End Guard	1
13	HBFL-516-18-075	Flange Bolt, 5/16 - 18 x 3/4	2
	HNFL-516-18	Flange Lock Nut, 5/16 - 18	2
14	18-417	Single Barb - Standard Boom	1
	18-417	Single Barb - Star Command II	2
15	20-807	Star Command II Nozzle Body	10
16	9032-8.5	3/4" Black Hose x8.5"	7
	18-040	Hose Clamp	14
	9024	Clamp Cover	14
17	18-416	Double Barb - Standard Boom	45
	18-416	Double Barb - Star Command II	8
18	11-055	Spring	1
19	9032-4	3/4" Black Hose x 4"	2
	18-040	Hose Clamp	4
	9024	Clamp Cover	4
20	18-415	3/4" Hose Barb Tee	1
21	9032-28	3/4" Black Hose x 28"	1
	18-040	Hose Clamp	2
	9024	Clamp Cover	2
22	20-673	Double Hose Barb Nozzle	4
23	9032-19	3/4" Black Hose x19"	4
	18-040	Hose Clamp	8
	9024	Clamp Cover	8
24	20-675	Single Hose Barb Nozzle- Right Orientation	1
25	16-281	Pressure Gauge	1
26	17-602	Body	1
27	9032-5	3/4" Black Hose x 5"	1
	18-040	Hose Clamp	2
	9024	Clamp Cover	2
28	33-506	Standard Nozzle Body	5
	HB-516-18-075	Hex Bolt, 5/16 - 18 x 3/4	5
	HNTL-516-18	Lock Nut, 5/16 - 18	5
29	16-921	Cap	1 per
30	16-800	Seal	1 per
31	9032-13	3/4" Black Hose x 13"	1
	18-040	Hose Clamp	2
	9024	Clamp Cover	2

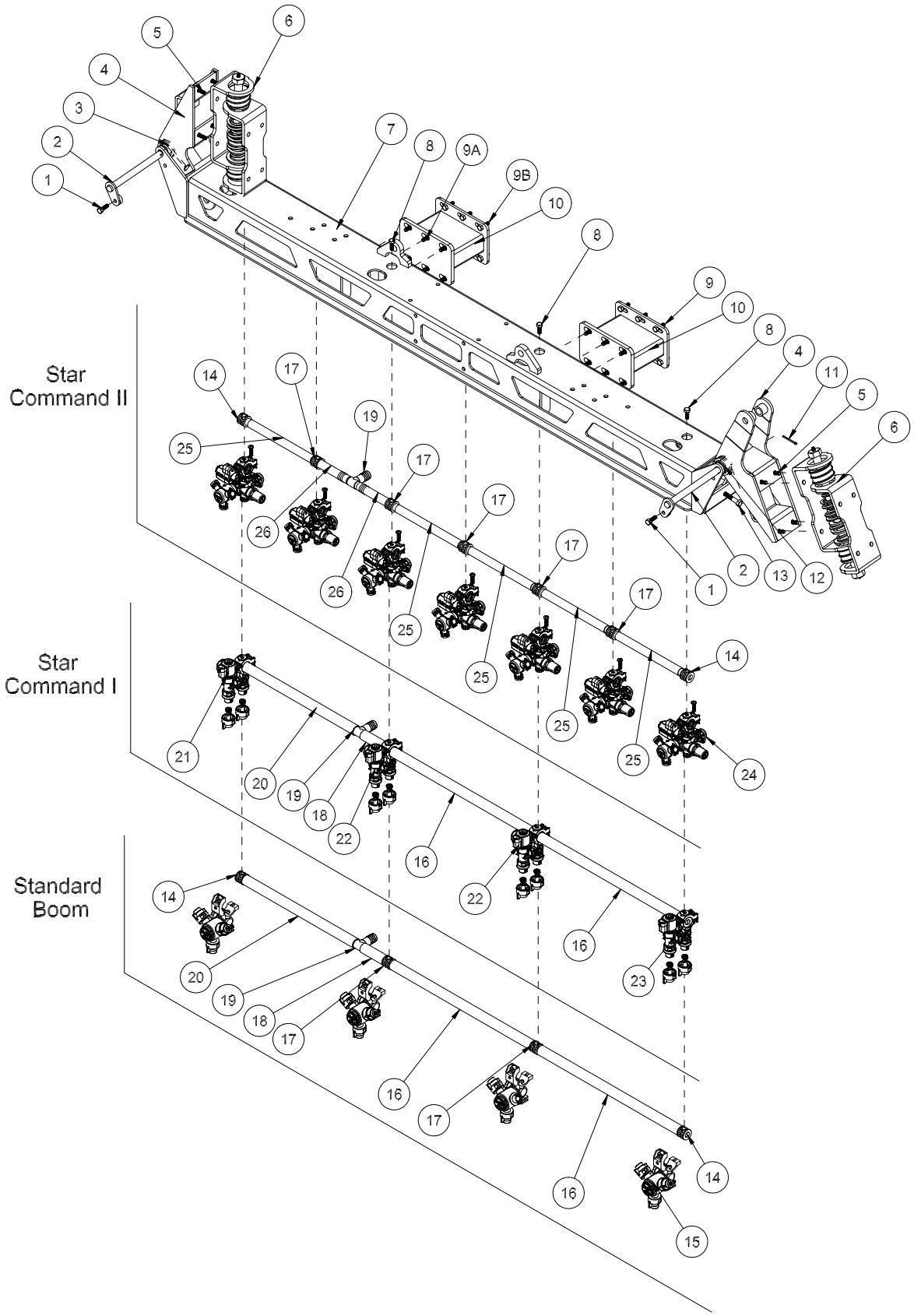
32-565 24' LEFT BOOM DRAWING



32-565 24' LEFT BOOM PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	30-258	1" 10-14ga Ribbed Plug	5
2	11-055	Spring	1
3	32-633	LH Site Gage	1
	74-156	Decal, Reflective	1
4	HB-14-20-250	Bolt, 1/4 - 20 x 2 1/2	1
	HW-14	Flat Washer, 1/4	2
	HNTL-14-20	Lock Nut, 1/4 - 20	1
5	HB-516-18-075	Bolt, 5/16 - 18 x 3/4	5 or 10
	HNTL-516-18	Lock Nut, 5/16 - 18	5 or 10
6	HB-14-20-125	Bolt 1/4 - 20 x 1 1/4	4
	HNTL-14-20	Lock Nut 1/4 - 20	4
7	17-573	Guide Boom Set	1
8	32-562	Boom Arm, LH	1
9	17-559	Break-Away Mount	1
10	17-560	Hinge Mount	1
11	11-050	Spring	1
12	17-562	LH Break-Away Arm	1
13	18-417	Single Barb - Standard Boom	1
	18-417	Single Barb - Star Command II	2
14	9032-28	3/4" Black Hose x 28"	1
	18-040	Hose Clamp	2
	9024	Clamp Cover	2
15	18-415	3/4" Hose Barb Tee	1
16	18-416	Double Barb - Standard Boom	4
	18-416	Double Barb - Star Command II	8
17	9032-4	3/4" Black Hose x 4"	2
	18-040	Hose Clamp	4
	9024	Clamp Cover	4
18	9032-8.5	3/4" Black Hose x8.5"	7
	18-040	Hose Clamp	14
	9024	Clamp Cover	14
19	HBFL-516-18-075	Flange Bolt, 5/16 - 18 x 3/4	2
	HNFL-516-18	Flange Lock Nut, 5/16 - 18	2
20	17-541	Boom End Guard	1
21	20-674	Single Hose Barb Nozzle - Left Orientation	1
22	9032-19	3/4" Black Hose x 19"	4
	18-040	Hose Clamp	8
	9024	Clamp Cover	8
23	20-673	Double Hose Barb Nozzle	4
24	33-506	Standard Nozzle Body	5

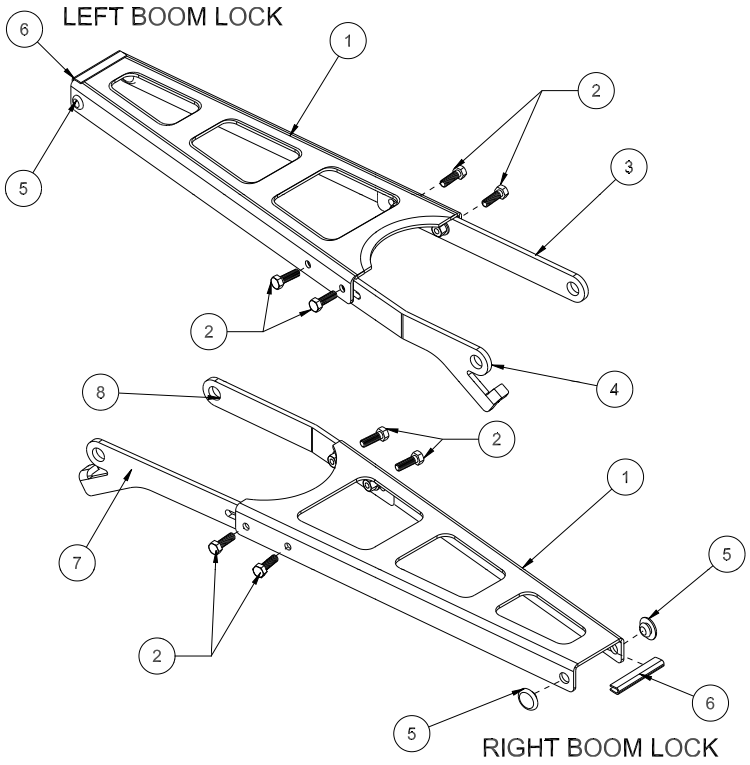
CENTER BOOM DRAWING (COMMON FOR BOTH 20' AND 24' BOOM)



CENTER BOOM PARTS LIST (COMMON FOR BOTH 20' AND 24' BOOM)

REF#	PART#	DESCRIPTION	QUANTITY
1	HB-516-18-100	Bolt, 5/16 - 18 x 1	2
	HNFL-516-18	Flange Lock Nut, 5/16 - 18	2
2	17-596	Hinge pin w/ Spacer	2
3	17-598	LH Torsion Spring	1
4	32-544	Arm Pivot Hinge	2
5	HB-38-16-100	Bolt, 3/8 - 16 x 1	8
	HNFL-38-16	Flange Lock Nut, 3/8 - 16	8
6	17-632	Hinge Assembly	2
7	32-563	Boom Center	1
	25-334	Decal, Serial Tag	1
8	HB-516-18-075	Bolt, 5/16 - 18 x 3/4	4 or 8
	HNTL-516-18	Lock Nut, 5/16 - 18	4 or 8
9A	HB-516-18-100	Bolt, 5/16 - 18 x 1	12
	HNFL-516-18	Flange Lock Nut, 5/16 - 18	12
9B	HB-38-16-125	Bolt, 3/8 - 16 x 1 1/4	12
	HNFL-38-16	Flange Lock Nut, 3/8 -16	12
	HW-38	Flat Washer, ⅜	12
	HW-516	Flat Washer, 5/16	12
10	17-614	Boom Spacer	2
11	HP-18-100	Cotter Pin, 1/8 x 1	2
12	17-597	RH Torsion Spring	1
13	HB-38-16-175	Bolt, 3/8 - 16 x 1 3/4	2
	HNFL-38-16	Flange Lock Nut, 3/8 -16	4
14	18-417	Single Barb	2
15	33-506	Body	4
16	9032-19	3/4" Black Hose x 19"	2
	18-040	Hose Clamp	4
	9024	Clamp Cover	4
17	18-416	Double Barb - Standard Boom	2
	18-416	Double Barb - Star Command II	5
18	9032-2.5	3/4" Black Hose x 2.5"	1
	18-040	Hose Clamp	2
	9024	Clamp Cover	2
19	18-415	3/4 Tee Hose Barb	1
20	9032-15.5	3/4" Black Hose x15.5"	1
	18-040	Hose Clamp	2
	9024	Clamp Cover	2
21	20-674	Single Hose Barb Nozzle - Left Orientation	1
22	20-673	Double Hose Barb Nozzle	2
23	20-675	Single Hose Barb Nozzle - Right Orientation	1
24	20-807	Nozzle Body	7
25	9032-8.5	3/4" Black Hose x 8.5"	5
	18-040	Hose Clamp	10
	9024	Clamp Cover	10
26	9032-4	3/4" Black Hose x 4"	2
	18-040	Hose Clamp	4
	9024	Clamp Cover	4

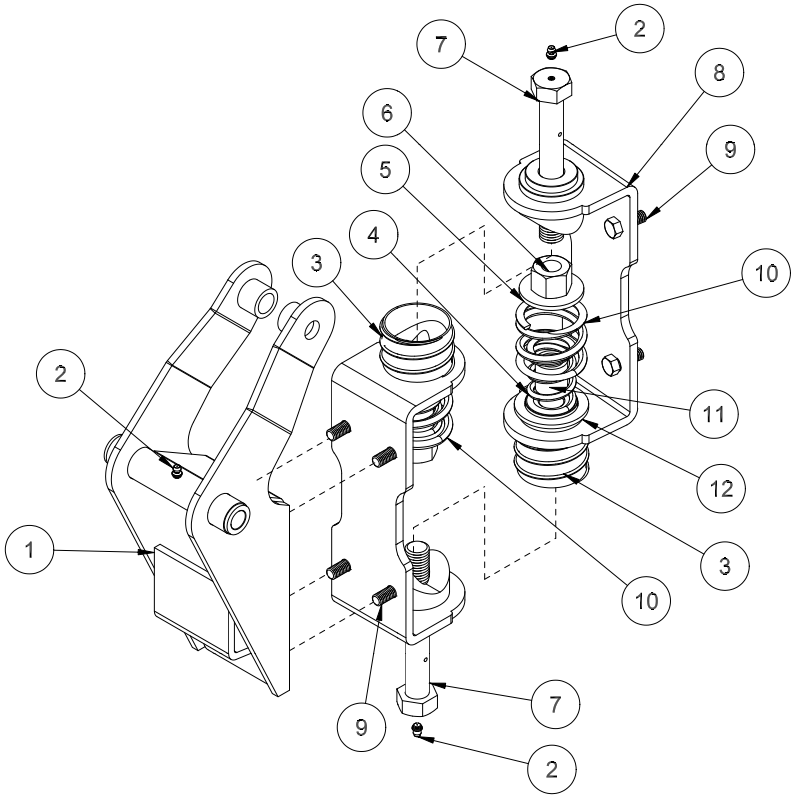
BOOM LOCK ASSEMBLY



REF#	PART#	DESCRIPTION	QUANTITY
1	32-564	Boom Lock	2
2	HB-516-18-100	Bolt, $^{5}/_{16}$ -18 x 1	8
	HW-516	Flat Washer,$^{5}/_{16}$	8
	HNFL-516-18	Flange Lock Nut, $^{5}/_{16}$- 18	8
3	17-592	Lock Hinge, LH	1
4	17-593	Limit Hinge, LH	1
5	42-116	Rubber Insert	4
6	8803-2.75	Trim, black w/ lace	2
7	17-589	Limit Hinge, RH	1
8	17-588	Lock Hinge, RH	1

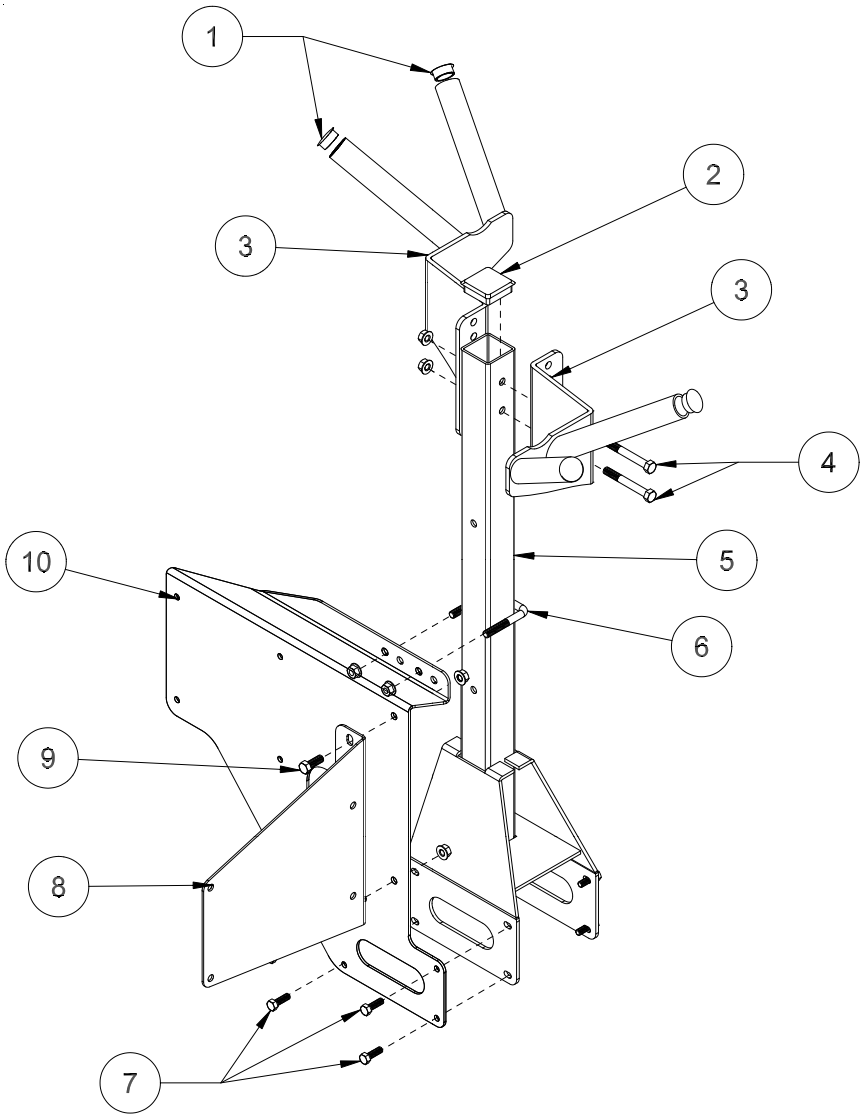
2 HINGE ASSEMBLIES PER BOOM

17-632-K Boom Hinge Complete



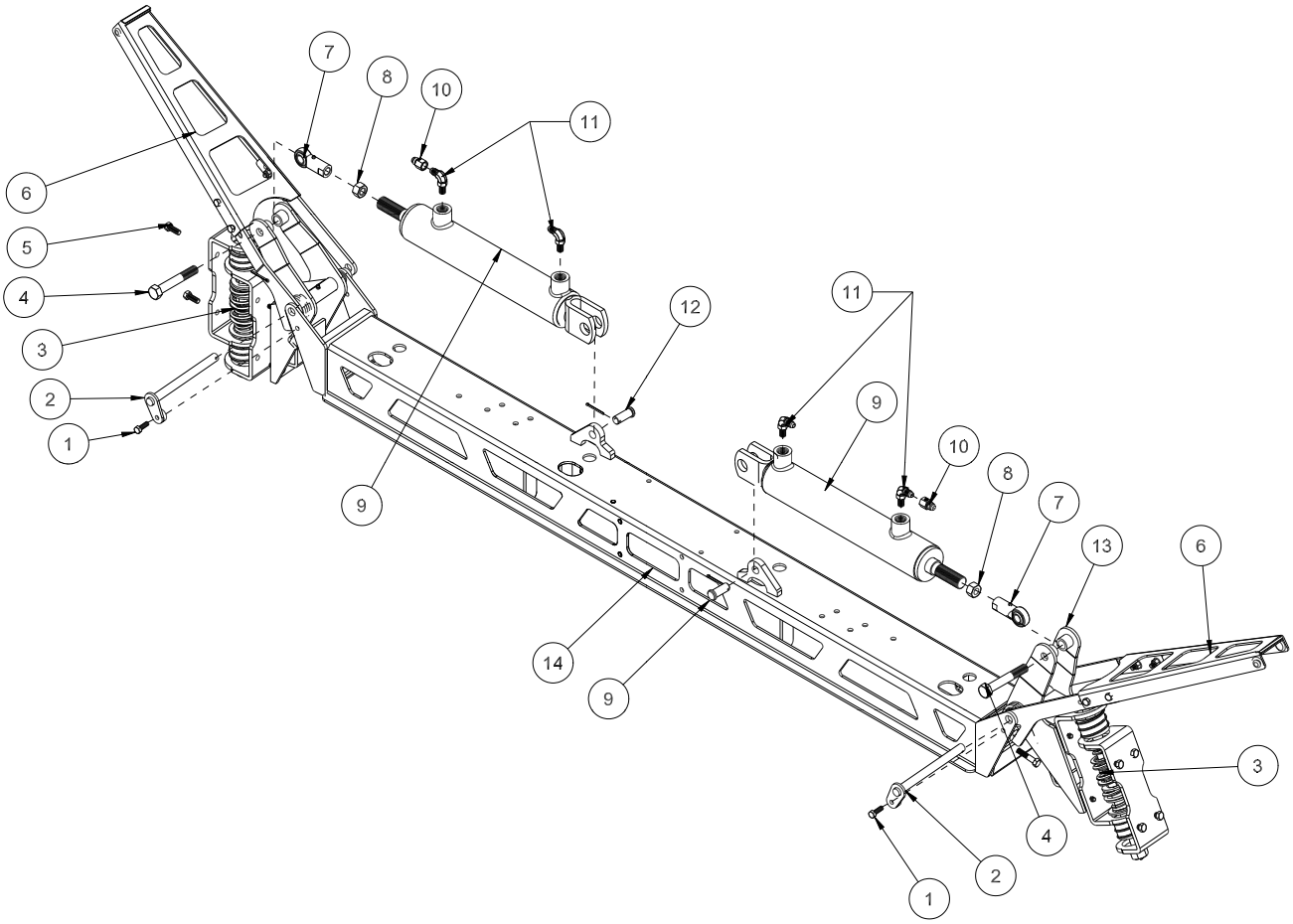
REF#	PART#	DESCRIPTION	QUANTITY
1	32-544	Arm Pivot Hinge	1
2	9026-2	Poly Rubber Duct Hose 2"	2
3	17-527	Boom Hinge	1
4	17-539	Compression Spring	2
5	17-540	Tapped Bolt	2
6	HW-34	Flat Washer, 3/4	2
7	HNCL-34-10	Center Lock Nut 3/4 - 10	2
8	HG-14-28-180	Grease Zerk, 1/4 - 28 x 180°	3
9	17-591	Compression Spring	2
10	17-599	Spring Shim	2
11	17-594	Spring Sleeve	2
12	HB-38-16-100	Bolt, 3/8 -16 x 1(order separately)	4
	HNFL-38-16	Flange Lock Nut, 3/8 -16 (order separately)	4

BOOM NEST ASSEMBLED



REF#	PART#	DESCRIPTION	QUANTITY
1	17-619	Push in Plug	4
2	18-297	Cap Plug	1
3	32-566	Boom Cradle	2
4	HB-38-16-300	Bolt, $^{3}/_{8}$ - 16 x 3	2
	HNFL-38-16	Flange Lock Nut, $^{3}/_{8}$ - 16	2
5	17-578	V-Boom Nest Post	1
6	17-537	Square U-bolt	1
7	HB-516-18-100	Bolt, $^{5}/_{16}$ - 18 x 1	8
	HW-516	Flat Washer, $^{5}/_{16}$	8
	HNFL-516-18	Flange Lock Nut, $^{5}/_{16}$ - 18	8
8	17-636	Fresh Water Tank Mount	1
9	HB-38-16-100	Bolt, $^{3}/_{8}$ - 16 x 1	2
	HW-38	Flat Washer, $^{3}/_{8}$	2
	HNFL-38-16	Flange Lock Nut, $^{3}/_{8}$ - 16	2
10	17-660	Clean Load Mount	1

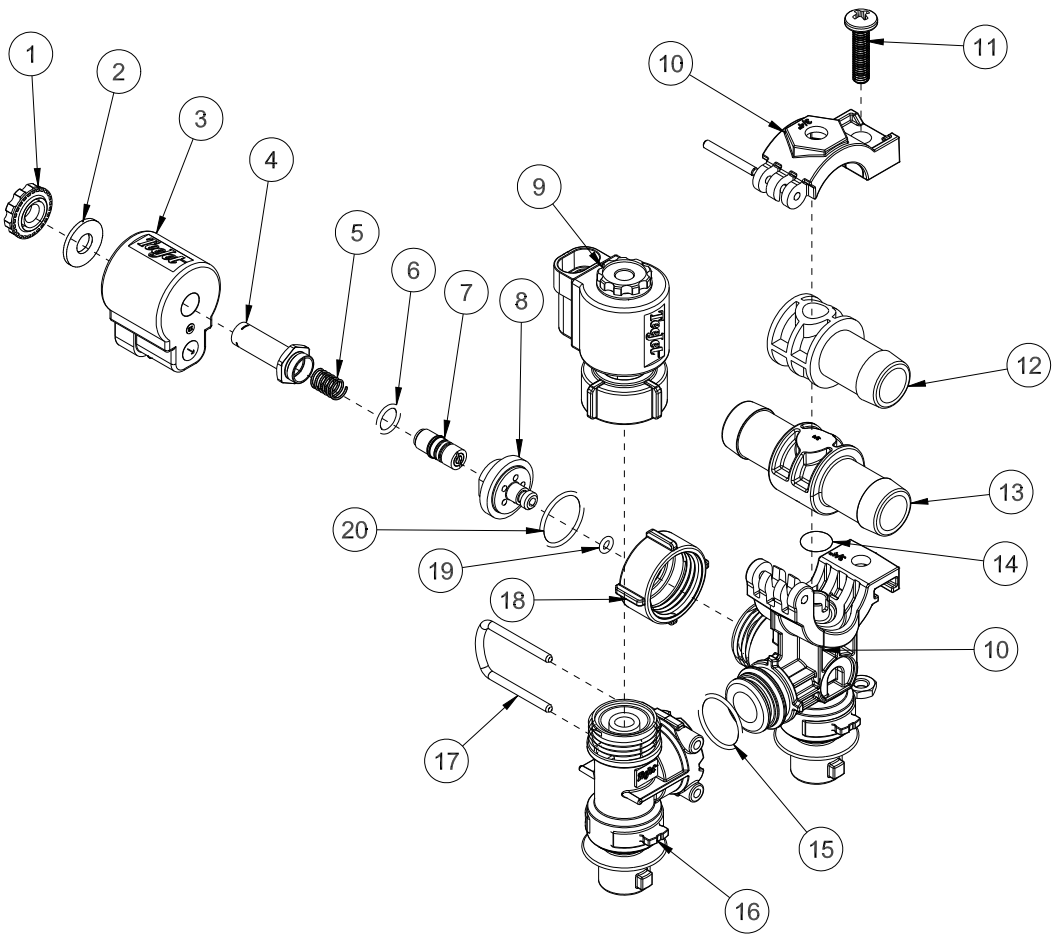
BOOM LOCK AND CYLINDER ASSEMBLY



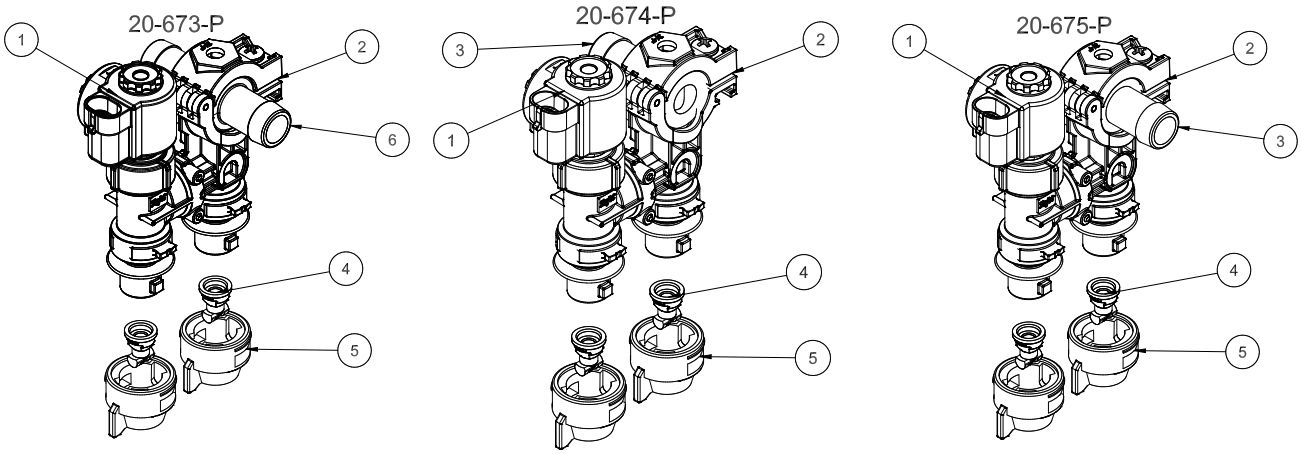
REF#	PART#	DESCRIPTION	QUANTITY
1	HB-516-18-100	Bolt, $^{5}/_{16}$ - 18 x 1	2
	HNFL-516-18	Flange Lock Nut, $^{5}/_{16}$ - 18	2
2	17-596	Hinge Pin w/Spacer	2
	HP-18-100	Cotter Pin, $^{1}/_{8}$ x 1	2
3	17-632	Boom Hinge Complete	2
4	HB-58-11-400	Bolt, $^{5}/_{8}$ - 11 x 4	2
	HNCL-58-11	Center Lock Nut, $^{5}/_{8}$ - 11	2
5	HB-38-16-100	Bolt, $^{3}/_{8}$ - 16 x 1	8
	HNFL-38-16	Flange Lock Nut, $^{3}/_{8}$ - 16	8
6	17-587	Boom Lock	2
7*	18-154	Rod End	2
	HG-14-28-180	Grease Zerk, $^{1}/_{4}$ - 28 x 180°	2
8*	HNJ-58-18	Jam Nut, $^{5}/_{8}$ - 18	2
9*	13-406	Cylinder	2
10*	18-392	Orifice Adapter	2
11*	18-168	Fitting	4
12	HCP-58-150	Clevis Pin, $^{5}/_{8}$ x 1-1/2	2
	HP-18-100	Cotter Pin, $^{1}/_{8}$ x 1	2
13	32-544	Arm Pivot Hinge	2
14	32-563	Boom Center	1

* Part of Spray Star Truck

STAR COMMAND I NOZZLE DRAWING



REF#	PART#	DESCRIPTION	QUANTITY
1		Nylon Black Nut	1
2		303 Stainless Steel Washer	1
3	20-673-09	12V Coil Assembly	1
4		Tube Sub Assembly	1
5*		302 Stainless Steel Spring	1
6*		Viton Oring	1
7*		Plunger	1
8		303 Stainless Steel Cap	1
9	20-673-02	E-Chemsaver Solenoid	1
10	20-673-04	3/4" Mount Assembly	1
11		Pan Head Screw	1
12	18-417	Single Barb (part of 20-674-P and 20-675-P)	1
13	18-416	Double Barb (part of 20-673-P)	1
14	16-920-03	Oring	1
15	20-673-11	Oring	1
16	20-673-05	End Body Sub-assembly	1
17	20-673-08	Retaining Clip	1
18		Locking Ring	1
19*	20-673-07	Viton Oring	1
20*	20-673-06	Viton Gasket	1
*	20-673-01	Spare Parts Kit	



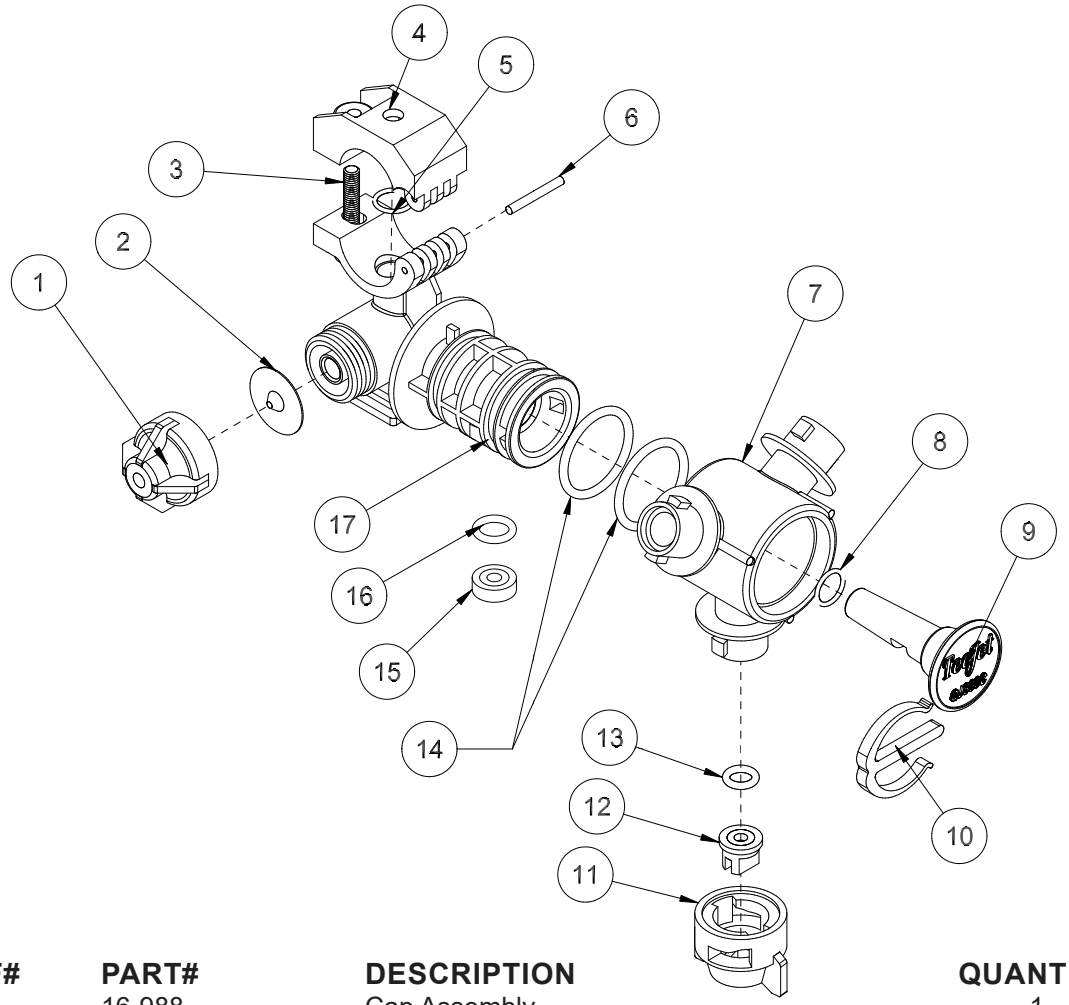
REF#	PART#	DESCRIPTION	QUANTITY
1*	20-673-02	E-Chemsaver®	1
2*	20-673-04	3/4" Bottom Mount Nozzle Body	1
3†	18-417	Single Barb	1
4	20-676	Turbo TeeJet Tip	2
5	20-677	QT White Cap and Washer	2
6‡	18-416	Double Hose Barb	1

Quantity is per nozzle body. For 20' booms multiply quantity by 12.
Quantity is per nozzle body. For 24' booms multiply quantity by 14.

20-673	Double Hose Barb Nozzle (includes * and ‡ item)	8 or 10
20-674	Single Hose Barb Left Orientation (includes * and † item)	2
20-675	Single Hose Barb - Right Orientation(includes * and † item)	2

Nozzles are located 20" (51 cm) apart on the right, left, and center tubes. Nozzles are 20" high off ground.

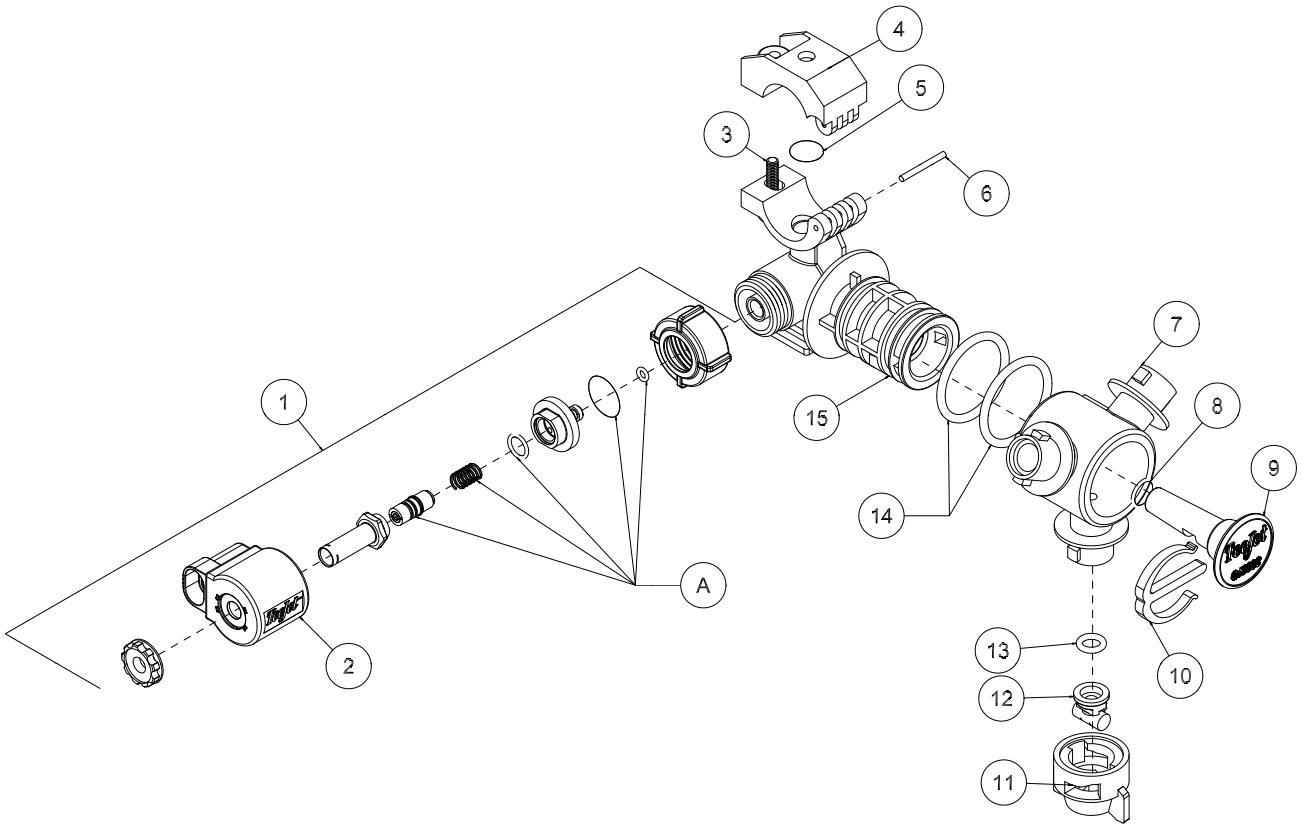
33-506 STANDARD NOZZLE ASSEMBLY DRAWING



REF#	PART#	DESCRIPTION	QUANTITY
1*	16-988	Cap Assembly	1
2*	16-920-06	Diaphragm, EPDM	1
3*		Stainless Steel Screw	1
4*		Upper Clamp	1
5*	16-920-03	O-ring	1
6*		Pivot Pin, Stainless Steel	1
7*		Turret, 3-Outlet, Nylon	1
8*		O-ring, EPDM	1
9*		Plug	1
10*		E-clip	1
11	33-538	Cap - White	1
12	33-554	Nozzle Tip - White (XR11008-VS)	1
13	16-800	Viton Gasket	1
14*		O-ring, Teflon	2
15*		O-ring, Viton	1
16*		Seal, Viton Teflon Filled	1
17*	33-506	Body Assembly (includes all * items)	1

Quantity is per nozzle body. For 20' booms multiply quantity by 12.
Quantity is per nozzle body. For 24' booms multiply quantity by 14.
Nozzles are located 20" (51 cm) apart on the right, left, and center tubes.
Nozzles are 20" high off ground.

20-807 STAR COMMAND II NOZZLE DRAWING

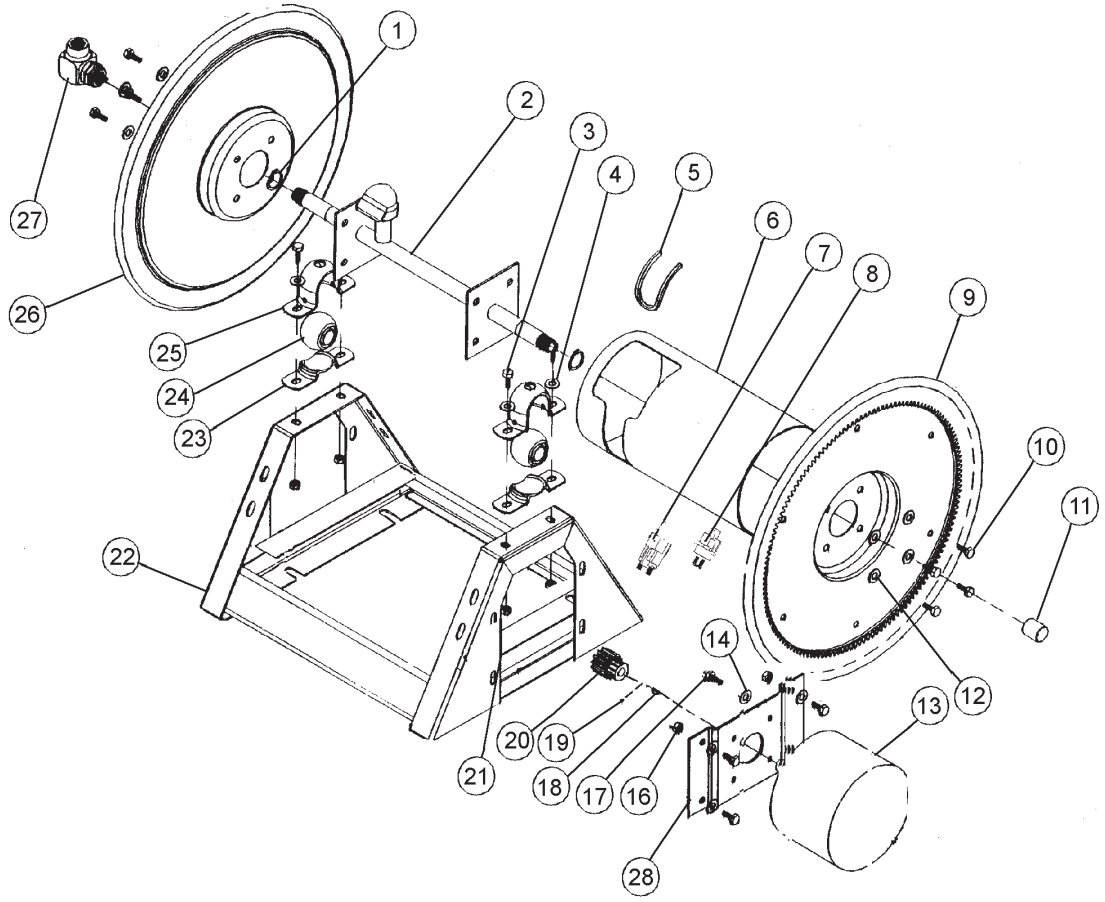


REF#	PART#	DESCRIPTION	QUANTITY
1	20-807-01	e-Chemsaver	1
2	20-673-09	12V Coil	1
3		Stainless Steel Screw	1
4		Upper Clamp	1
5	16-920-03	O-ring	1
6		Pivot Pin, Stainless Steel	1
7		Turret, 3-Outlet, Nylon	1
8		O-ring, EPDM	1
9		Plug	1
10		E-clip	1
11	20-838	Cap - Gray	1
12	20-837	Turbo Twinjet Nozzle Tip, Cap & Gasket - Gray	1
13	16-800	Viton Gasket	1
14		O-ring, Teflon	2
15	33-506	Body Assembly	1
A	20-807-02	Spare Parts Kit	

Quantity is per nozzle body. For 20' booms multiply quantity by 23.
Quantity is per nozzle body. For 24' booms multiply quantity by 27.

Nozzles are located 10" (25 cm) apart on the right, left, and center tubes.
Nozzles are 20" high off ground.

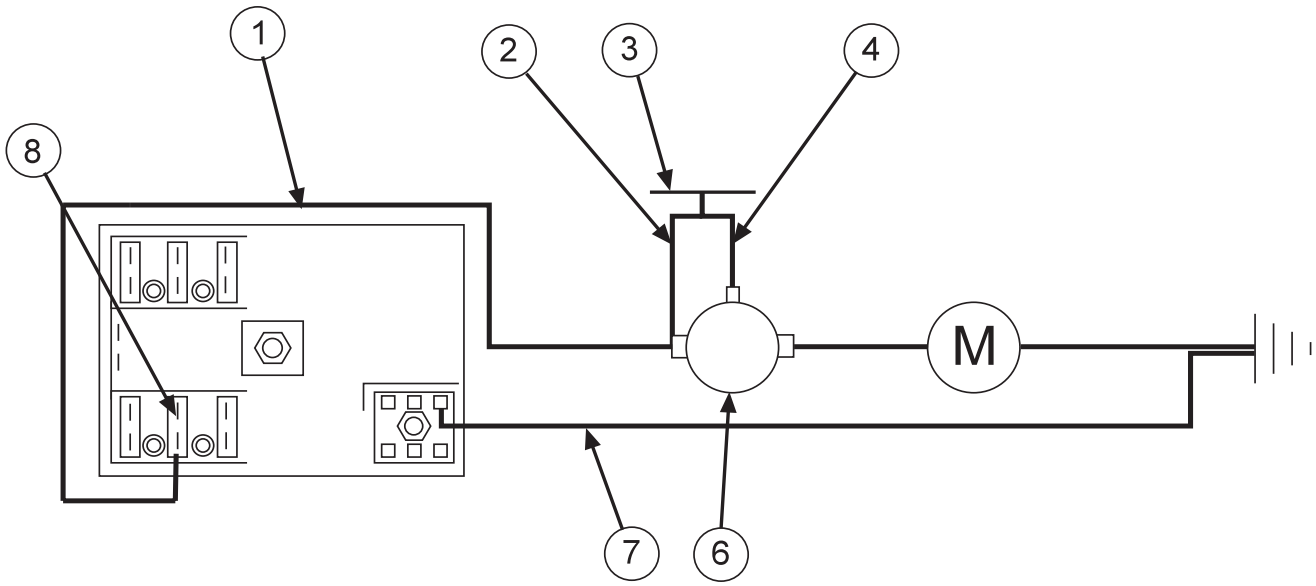
32-510 ELECTRIC HOSE REEL DRAWING



32-510 ELECTRIC HOSE REEL PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	16-906-25	Retaining Ring	2
2	16-906-22	Axle Assembly	1
3	HB-38-16-100	Hex Bolt, 3/8 - 16 x 1	4
4	HW-38	Flat Washer, 3/8	4
5	16-906-27	Trim, Drum Edge	1
6	16-906-21	Drum Center	1
7	13-750	Solenoid	1
	HB-14-20-075	Hex Bolt, 1/4 - 20 x 3/4	2
	HWL-14	Lock Washer, 1/4	2
	HN-14-20	Hex Nut, 1/4 - 20	2
8	33-251	Switch	1
9	16-906-19	Disc and Gear Assembly	1
10	HB-516-18-075	Hex Bolt, 5/16 - 18 x 3/4	8
11	16-906-26	Pipe Cap, 3/4	1
12	HWL-516	Lock Washer, 5/16	8
13		Motor 12VDC	1
14	HW-516	Flat Washer, 5/16	4
16	HNTL-516-18	Nylon Lock Nut, 5/16 - 18	4
17	HB-516-18-100	Hex Bolt, 5/16 -18 x 1	4
18	16-906-17	Key	1
19		Set Screw	2
20	16-906-29	Pinion	1
21	HNTL-38-16	Nylon Lock Nut, 3/8 - 16	4
22	16-906-18	Frame Assembly	1
23	16-906-08	Mounting Pillow Block (Bottom)	2
24	16-906-24	Bearing	2
25	16-906-07	Mounting Pillow Block (Top)	2
26	16-906-20	Disc, 17 1/2"	1
27	16-906-23	Swivel Assembly 3/4	1
	16-906-30	Seal Kit (For 16-906-23)	1
28	16-906-28	Bracket 12VDC	1
	16-982	Electric Hose Reel (only)	1

ELECTRIC HOSE REEL WIRING DIAGRAM



REF#	PART#	DESCRIPTION	QUANTITY
	8843-132	Flexguard $^{3}/_{8}$ ID	1
1	8919-144	10GA Red Wire 144"	1
	8912	Ring Terminal	1
2	16-979	Wire, Switch to Solenoid Hot Terminal	1
3	33-251	Push Button Switch	1
4	16-978	Wire, Switch to Solenoid Start Terminal	1
6	13-750	Solenoid	1
	SOLENOID TERMINALS		
	HN -516-24	Hex Nut , $^{5}/_{16}$ - 24	2
	HN -10-32	Hex Nut, 10 - 32	1
7	8931-144	10GA White Wire 144"	1
	8912	Ring Terminal	1
8	33-273	Auto Blade Type Fuse 30Amp	1

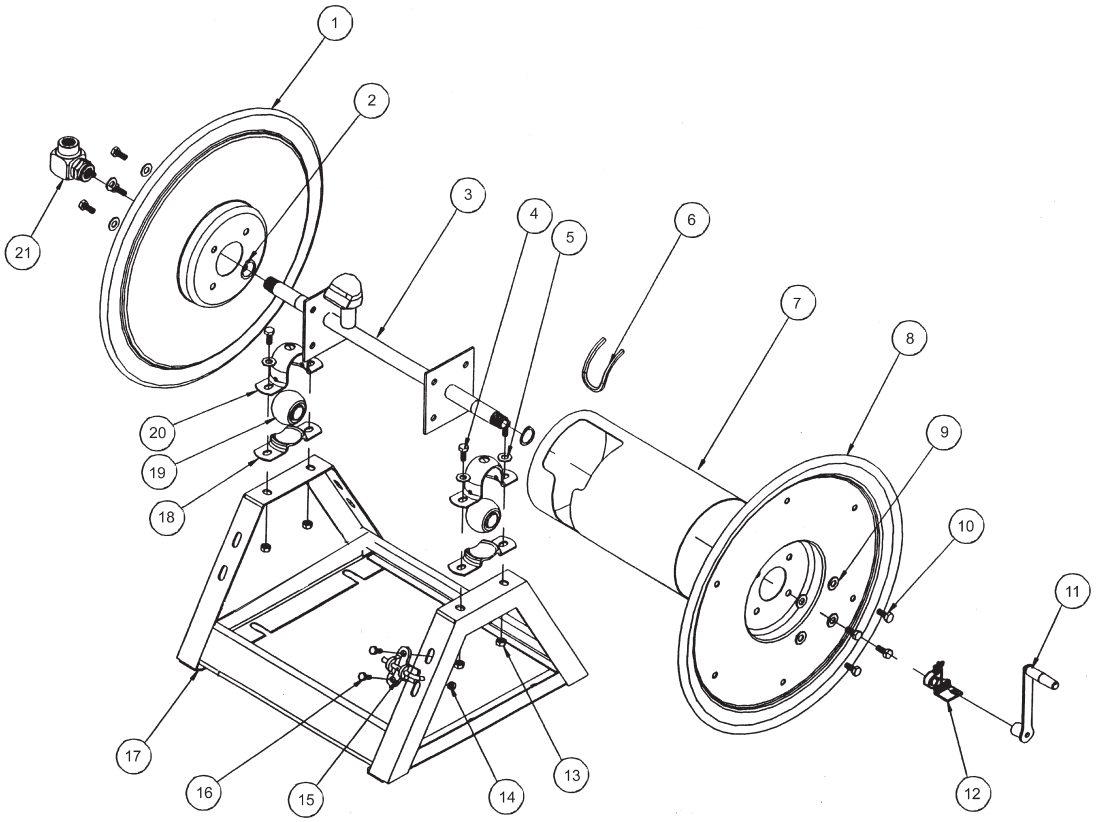
CONNECTION INSTRUCTIONS

Route wire harness along side of tank and over to fuse block taking care to stay clear of moving parts or hot engine components. Cut off excess wire and strip back $^{3}/_{8}$". Place one 8963 heat shrink ($^{1}/_{4}$ x $1^{1}/_{4}$) on each wire before crimping ring terminals to the red and white wires. Connect the two wires to the fuse block first the red to the (+) positive and the white to the (-) negative. Put the 33-273 auto blade type fuse (30 amp) into fuse block.

⚠ WARNING **Make certain you are connecting positive (+) to positive; negative (-) to negative while attaching power leads. If you do not observe polarity, damage will result to electrical components.**

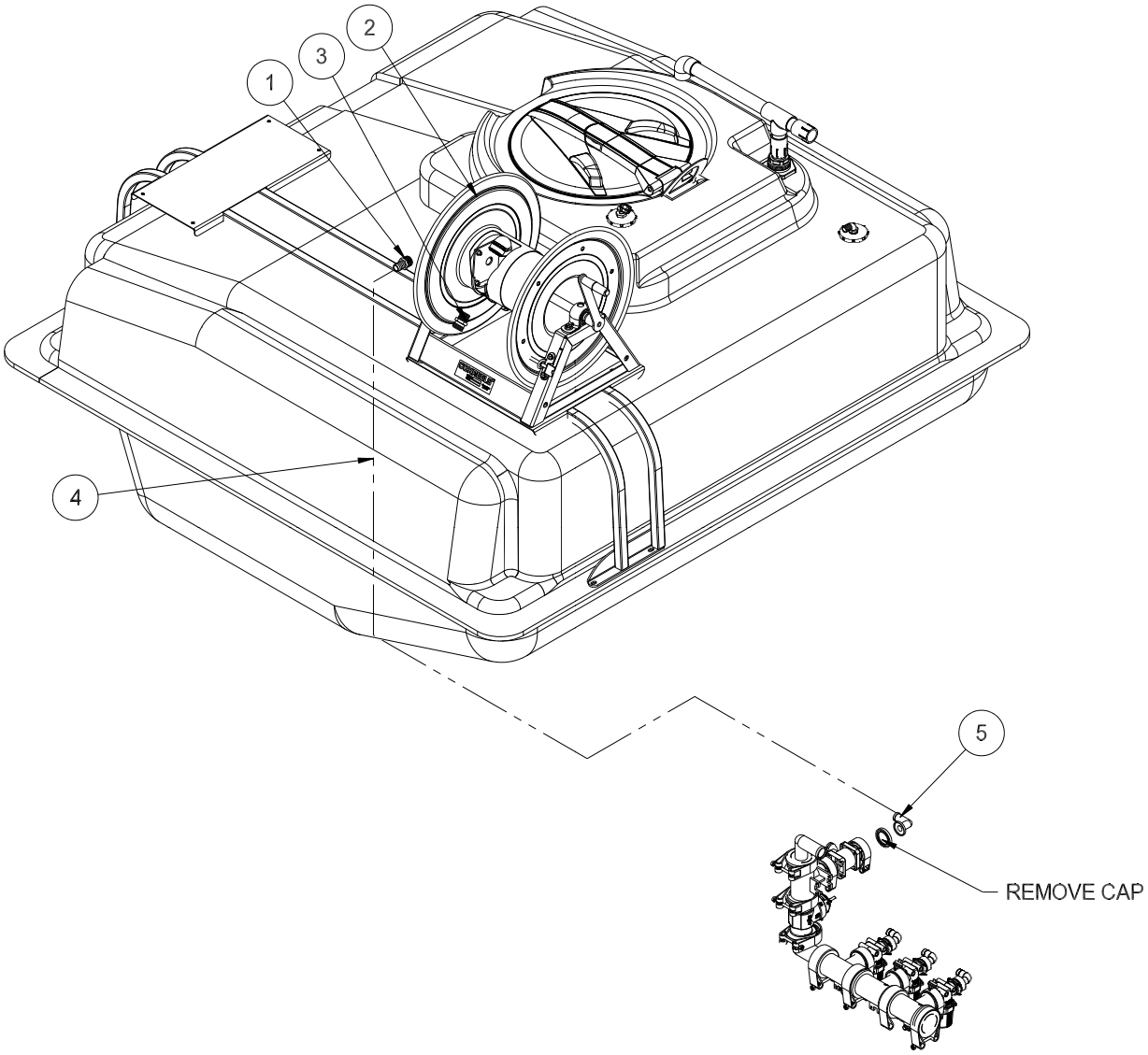
Use Dielectric Grease On All Electrical Connections

32-509 MANUAL HOSE REEL DRAWING



REF#	PART#	DESCRIPTION	QUANTITY
1	16-129-11	Disc, 17 1/2"	1
2	16-906-25	Retaining Ring	2
3	16-906-22	Axle Assembly 3/4	1
4	HB-38-16-100	Hex Bolt, 3/8 - 16 x 1	4
5	HW-38	Flat Washer, 3/8	4
6	16-906-27	Trim, Drum Edge	1
7	16-906-21	Drum Center	1
8	16-906-20	Disc 17 1/2", Crank Side	1
9	HWL-516	Lock Washer, 5/16	8
10	HB-516-18-075	Hex Bolt, 5/16 - 18 x 3/4	8
11	16-129-09	Crank Assembly, 3/4	1
12	16-129-10	Brake Assembly, 3/4	1
13	HNTL-38-16	Nylon Lock Nut, 3/8 - 16	4
14	HNTL-516-18	Nylon Lock Nut, 5/16 - 18	2
15	16-129-08	Lock Pin Assembly	1
16	HB-516-18-075	Hex Bolt, 5/16 - 18 x 3/4	2
	HW-516	Flat Washer, 5/16	2
17	16-129-07	Frame Assembly	1
18	16-906-08	Mounting Pillow Block (Bottom)	2
19	16-906-24	Bearing	2
20	16-906-07	Mounting Pillow Block (Top)	2
21	16-906-23	Swivel Assembly, 3/4	1
	16-906-30	Seal Kit (For 16-906-23)	1

HOSE REEL MOUNT DRAWING

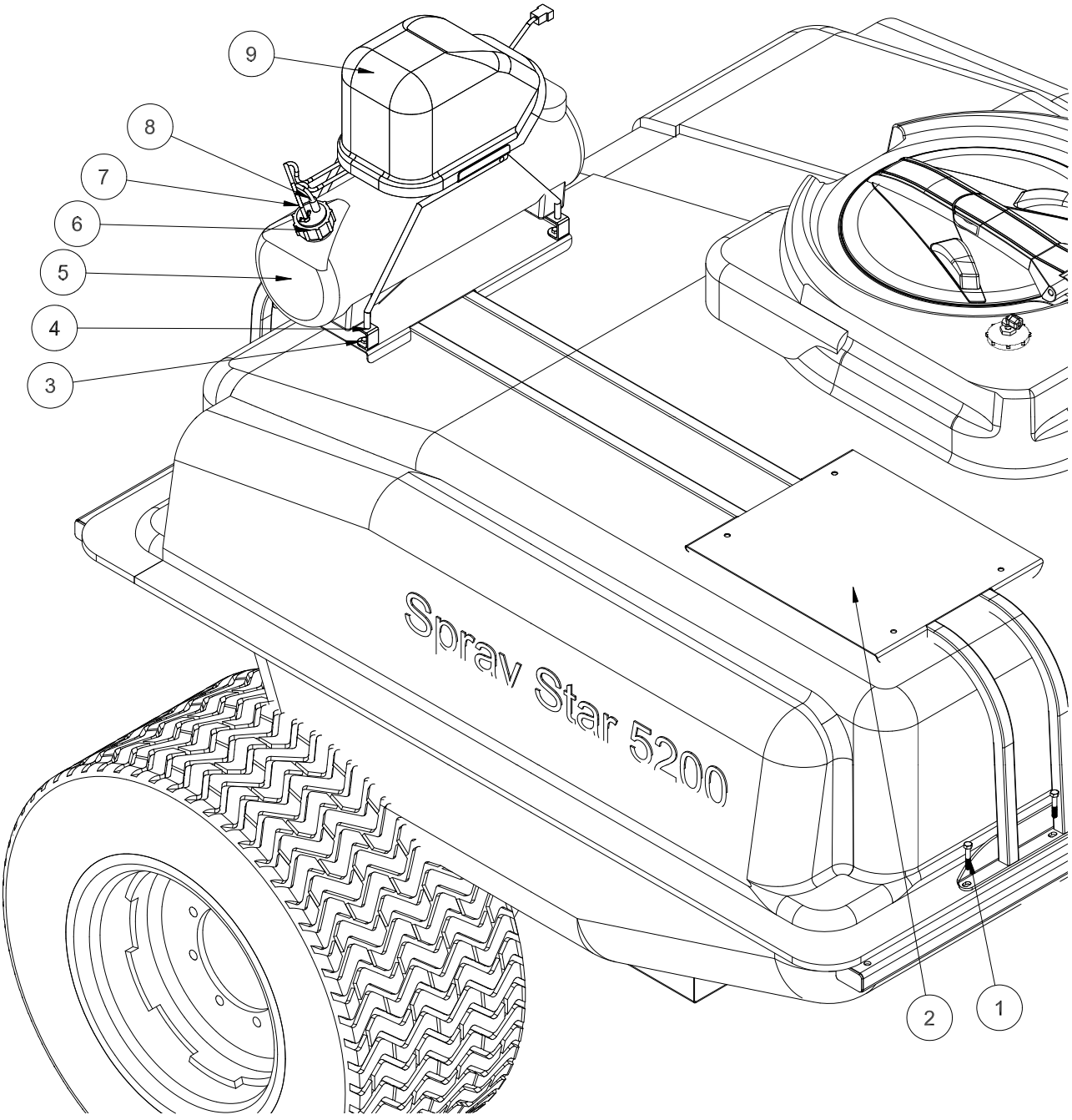


HOSE REEL MOUNT PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	18-249	Barb Fitting	1
2	16-129	Manual Crank Hose Reel	1
	16-982	Electric Hose Reel	1
	HB-516-18-150	Hex Bolt, $^{5}/_{16}$ -18 x $1^{1}/_{2}$	4
	HW-516	Flat Washer, $^{5}/_{16}$	4
	HNTL-516-18	Nylon Lock Nut, $^{5}/_{16}$ - 18	4
3	16-295	Hose Fitting, $^{3}/_{4}$	1
4	9032-125	Black Hose, $^{3}/_{4}$" x 125"	1
	18-040	Hose Clamp	2
5	15-919	Hose Barb	1

1. Wear protective clothing when draining the tank and taking apart the lines.
2. Drain tank and spray system in a safe and approved method insuring that no chemical or water remain in tank as you will be taking apart lines.
3. Remove key from ignition, set park brake and block wheels.
4. Put hose reel on hose reel bracket with fitting to the rear of machine. Use four Hex Bolts $^{5}/_{16}$ - 18 x $1^{1}/_{2}$ and four $^{5}/_{16}$ - 18 lock nuts to hold in place. Tighten Hex Bolts.
5. Put 18-249 barb fitting into hose reel side.
6. Place the 16-295 Hose Fitting into the Hose reel center.
7. Remove the blank cover from the ball valve by the manifold valve and place the 15-919 Hose Barb. Tighten clamp.
8. Route hose from the hose barb on the ball valve to the barb fitting on the side of the hose reel. Hold in place with the two 18-040 clamps.
9. Be sure all clamps and hardware are tight before using.

32-508 FOAM MARKER DRAWING



32-508 FOAM MARKER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	HB-516-18-175	Bolt, $^{5}/_{16}$-18 x $1^{3}/_{4}$ (part of machine)	4
	HNFL-516-18	Flange Lock Nut, $^{5}/_{16}$- 18 (part of machine)	4
2	32-533	Accessory Mount (part of machine)	1
3	HN-14-20-075	Hex Bolt, $^{1}/_{4}$-20 x $^{3}/_{4}$	2
	HBFL-14-20	Flange Lock Nut, $^{1}/_{4}$-20	2
4*	14-291-04	Tank Bracket	2
5*	14-291-02	Foamer Tank	1
6*	14-284-02	Cap Assembly	1
7*		Blue Tube	1
8*		Clear Tube	1
9*	14-291-03	Compressor Only	1
	14-291-01	Black Cover	1
*	14-291	Foamer (includes * parts)	1

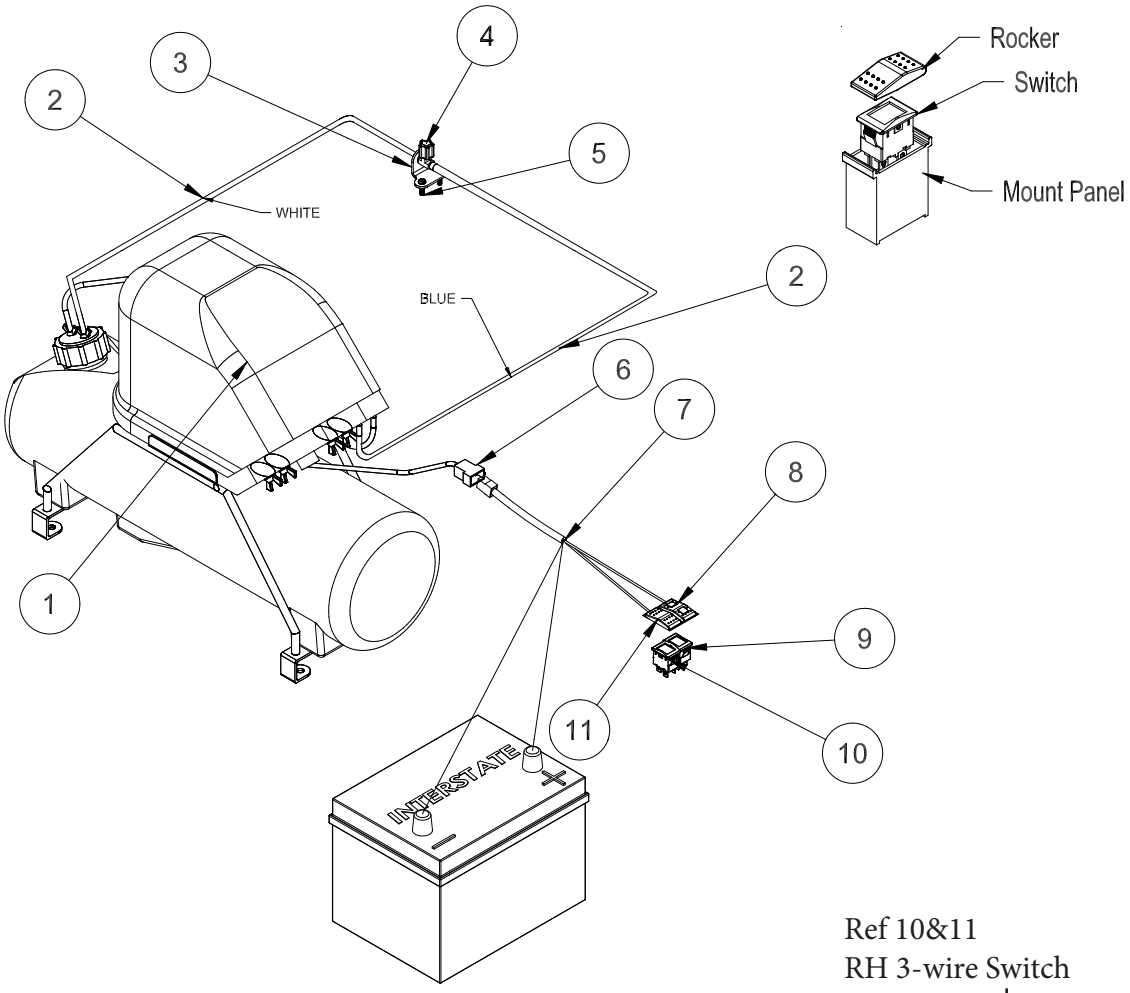
INSTALLATION INSTRUCTIONS

Safety: Before working on machine stop engine, set park brake, remove key from ignition and block wheels. Disconnect negative (-) battery terminal.

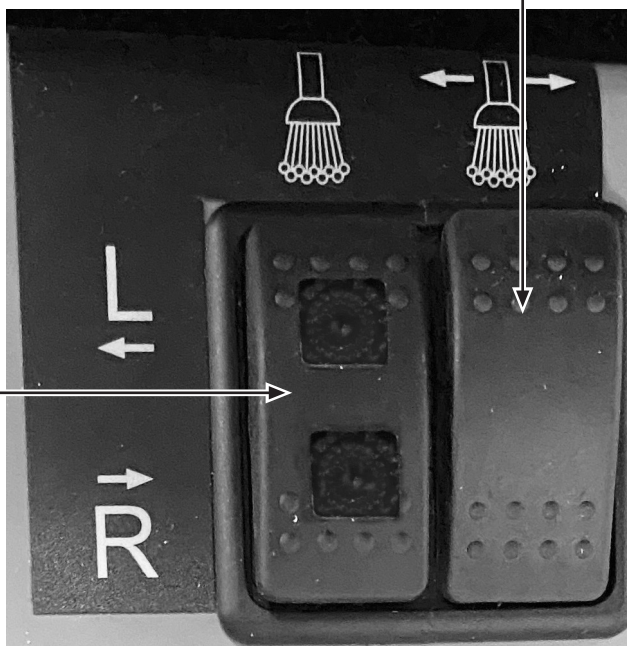
WIRING

1. Mount Foamer on tank Mount bracket (Ref 2).
2. Route the power wire to the fuse block (on the back of the seat panel) out of the way of any heat or moving parts. Use nylon ties as needed.
3. Cut the power wire with enough length to connect the fuse block. Put the fork terminal with heat shrink onto the wire ends and connect to fuse block.
4. Hook wire harness to battery. Red to positive(+), black to negative(-). Insert 15 amp fuse into slot which has red wire attached to it.

32-508 FOAM MARKER DRAWING



Ref 10&11
RH 3-wire Switch



Ref 8&9
LH 7-wire Switch

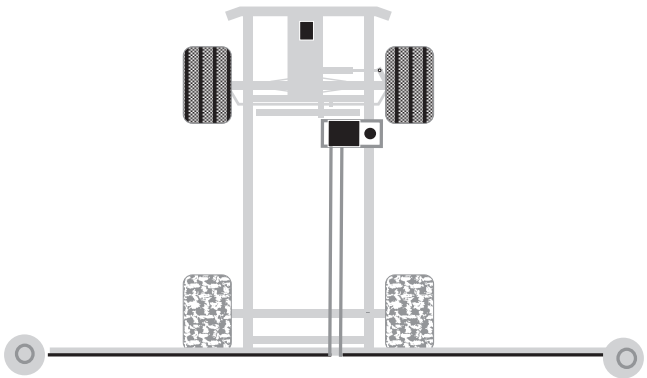
32-508 FOAM MARKER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
1	14-291-03	Compressor	1
2	15-507	Tubing -Blue and white	1
3	20-769	Mount Bracket	1
4	14-699	Male Coupler	1
	14-291-09	Blue Fly Nut	1
	14-702	Red Washer	1
5	HSM-10-32-075	Machine Screw, #10-32 x 3/4	2
	HNFL-10-32	Flange Whiz-loc Nut, #10-32	2
6	15-504-04	Foam Marker Wiring Harness	1
7	32-574	Foamer Wire Harness	1
8	15-917	Rocker, 2 Red Lenses	1
9	15-918	Switch, 2 Red LED	1
10	15-782	Switch, Unlit	1
11	15-727	Rocker, No Light	1

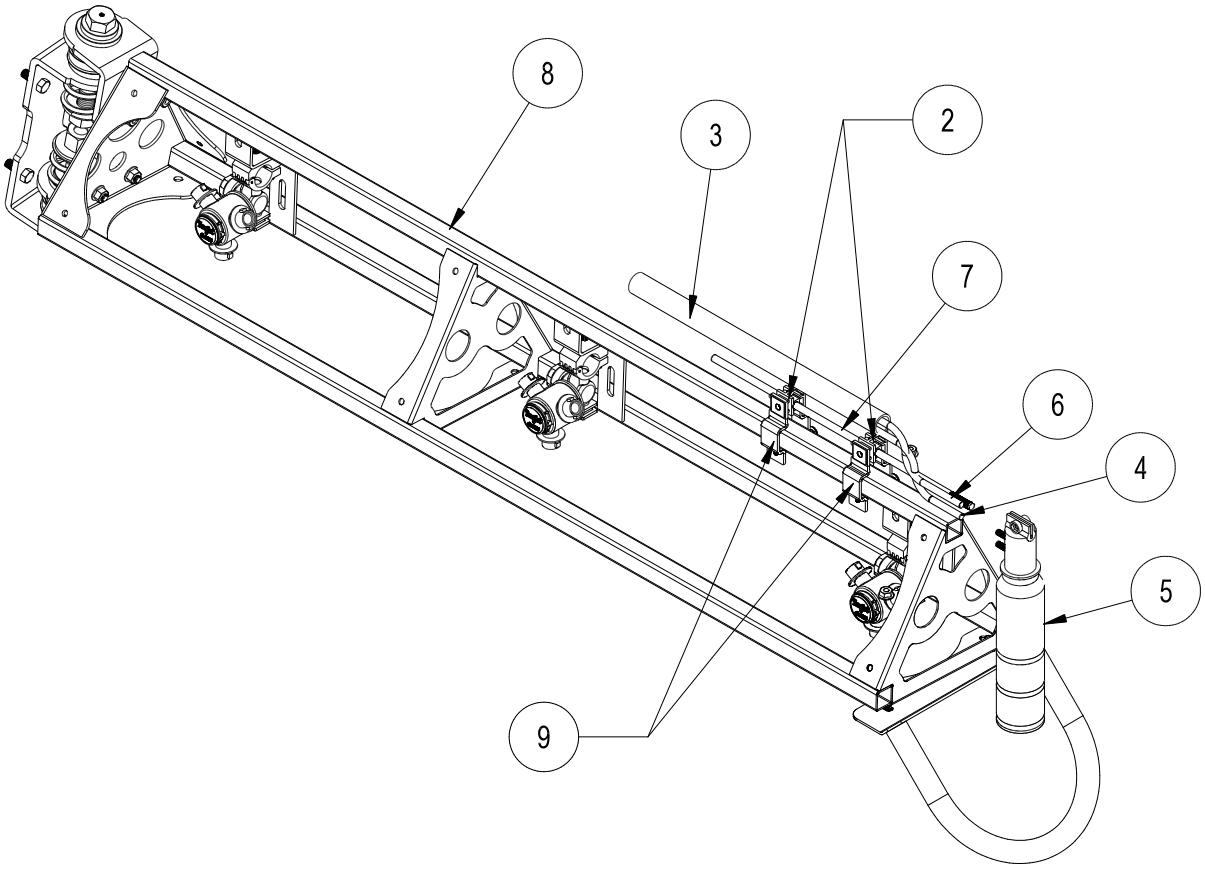
INSTALLATION

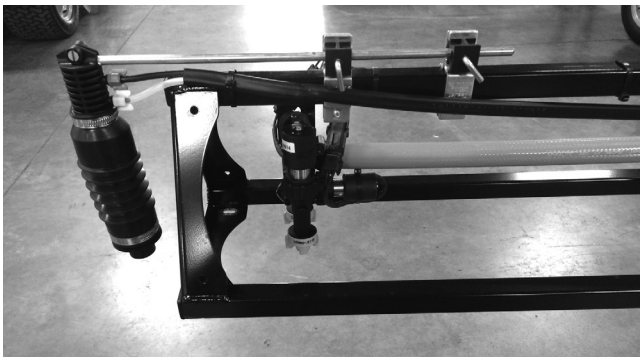
1. Connect the compressor wire harness (Ref 6) to the switches using the wire harness (Ref 7).
2. Use dielectric grease on all electrical connections. Route the wire harness to the battery and out of the way of any heat or moving parts. Use nylon ties as needed. Connect the wire harness to the battery. Red to positive(+), black to negative(-).
3. Remove plugs from console.
4. The RH Unlit Switch (Ref 10) is the 3 wire switch and has the unlit rocker. The LH Red LED Switch (Ref 9) is the 7-wire switch and has the red lens rocker.
5. Mount switches (Ref 9 & 10) to switch mount and place in center console.

HOSESBeing careful not to cut the tubing, cut the over-sleeve back approximately 2" (5 cm) to expose blue and clear tubing. Remove blue wing nut from top connector of foam nozzle and slide it on the blue tube with the threads facing toward end of tube. Slide blue tube all the way over the top of the small tube on foam nozzle. Slide wing nut back to the threads and hand tighten. Follow the same steps for the clear tube and tube nut. Route the tubing along underside of main frame using tie downs as necessary. Install opposite ends of air-liquid tubes to compressor, again cutting back the over-sleeve approximately 2" (5 cm) and inserting blue and clear tubes for the left boom section into the tubing connectors on the right side of compressor as far as possible. Follow the same steps for the right boom tubing. Notice the right boom is inserted into left side of compressor. To release tubing from compressor using the blue and white wing nuts.



FOAMER NOZZLE MOUNT & HOSE GUARD MOUNT DRAWING





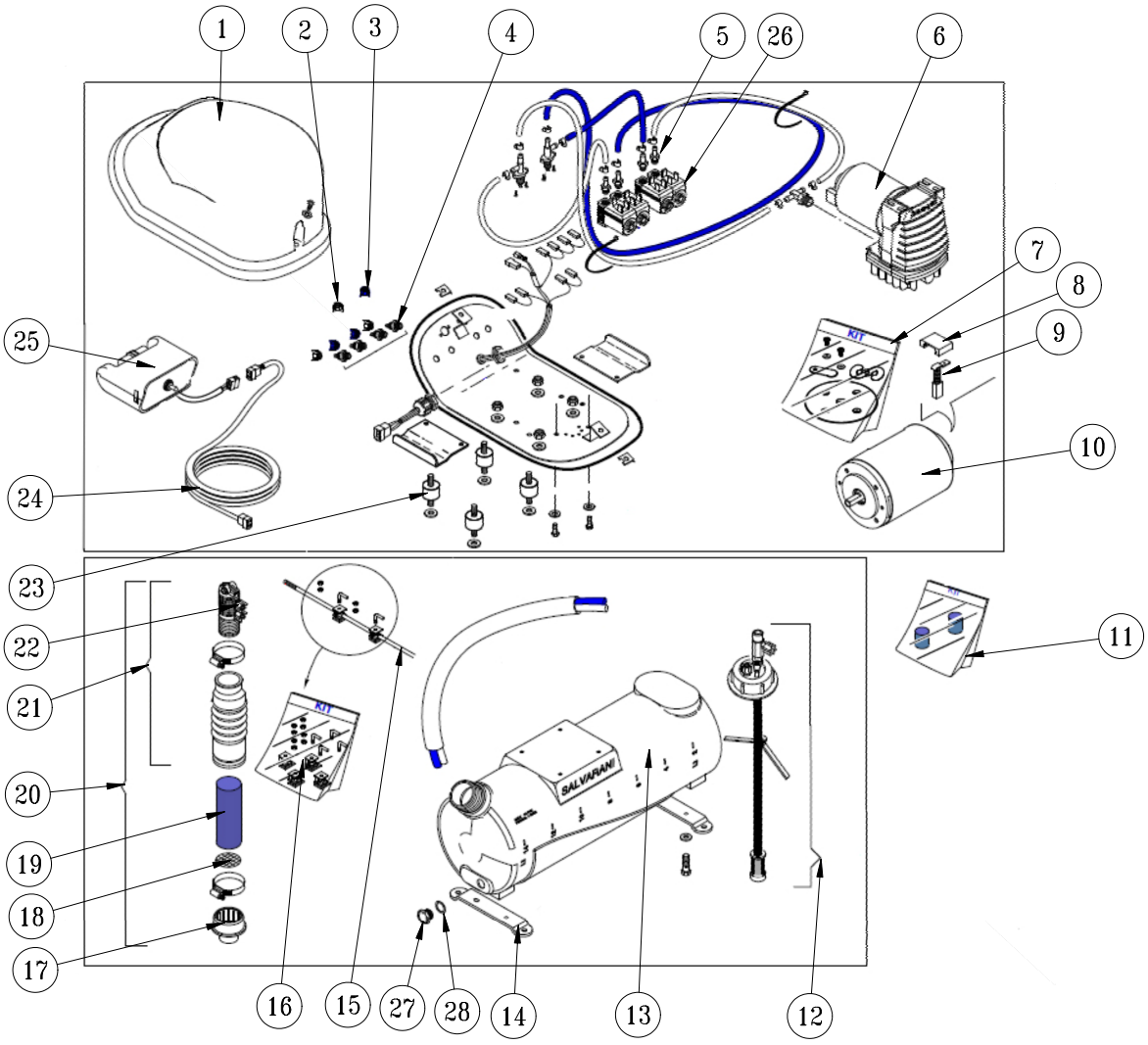
32-508 MARKER PARTS LIST

REF#	PART#	DESCRIPTION	QUANTITY
2	16-987	Foam Nozzle Mounting Kit	1 per boom
3	15-507	Foamer Tubing	2
4		Clear Tubing	
5	15-511	Foam Nozzle	2
6		Blue Tubing	
7	15-510-01	Nozzle Mounting Rod	2
8		Boom	
9	16-795	Square Clamp	4

INSTALLATION INSTRUCTIONS

1. Slide hose clamp onto drop tube of foam nozzle and attach restricter bell.
2. Place splined end of Nozzle mounting rod (Ref 7) into top of foam nozzle (Ref 5). Tighten screw.
3. Slide two foam nozzle mounts (Ref 2) onto the rod. Place square clamps (Ref 9) on foam nozzle mounts and mount the square clamps to the boom (Ref 8). Adjust foam nozzle mounts and clamps so nozzle assembly will clear end of boom. Tighten foam nozzle mounts and square clamps to prevent side to side movement. Do the same to the other side.
4. Being careful not to cut the tubing (Ref 3), cut the over sleeve back approximately 2" (5 cm) to expose blue (Ref 6) and clear tubing (Ref 4).
5. Remove blue wing nut from top connector of foam nozzle and slide it on the blue tube with the threads facing toward end of tube. Slide blue tube all the way over the top of the small tube on foam nozzle. Slide wing nut back to the threads and hand tighten. Follow the same steps for the clear tube and tube nut.
6. Route the tubing along underside of main frame using tie downs as necessary.
7. Install opposite ends of air-liquid tubes to compressor, again cutting back the over sleeve approximately 2" (5 cm) and inserting blue and clear tubes for the left boom section into the tubing connectors (Ref A) on the right side of compressor as far as possible.
8. Follow the same steps for the right boom tubing. Notice the right boom is inserted into left side of compressor. To release tubing from compressor, hold black ring around tubing, and pull tube out.
9. Hose's must be routed on bottom of the boom square tubing.
10. Mark 6 inches in from inside edge of foamer nozzle mounting bracket on square boom tubing.
11. Connect small plastic electrical plug under compressor to electrical extension cable.
12. Cut cable and strip casing, allowing enough length to connect to fuse block.
13. Strip and connect slide on connectors to each wire and use the heat shrink.
14. Connect black negative (-) wire to the ground and connect red wire to the positive (+).
15. Insert 10 amp fuse into slot which red wire was attached to.

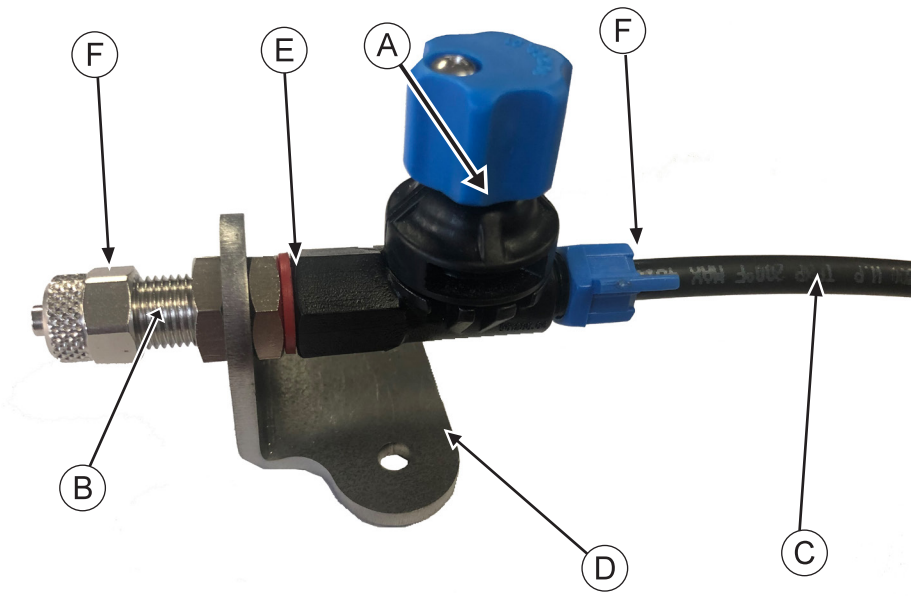
14-291 FOAMER REPLACEMENT PARTS



14-291 FOAMER REPLACEMENT PARTS

REF#	PART#	DESCRIPTION	QUANTITY
1	14-291-01	Black Cover	1
2	14-291-08	White Fly Nut	1
3	14-291-09	Blue Fly Nut	1
4	14-284-10	Tubing Connector	1
5	14-291-17	M6 Tubing Connector	1
6	14-536	Compressor Complete	1
7	14-291-11	Diaphragm Replacement Kit	1
8	15-505-08	Brush Retainer	1
9	15-505-06	Brush	1
10	15-505-07	12V Electric Motor	1
11	15-511-02	Foam Sponge	1
12	14-284-02	Cap Assembly	1
13	14-291-02	Foamer Tank	1
14	14-291-04	Tank Brackets	2
15	15-510-01	Nozzle Mounting Rod	2
16	16-987	Foam Nozzle Mounting Kit	1
17	14-284-09	Foam Nozzle Reducer	2
18	15-511-09	Stainless Steel Screen	2
19	15-511-08	Long Foam Sponge	2
20	15-511	Foam Nozzle	2
21	15-511-07	Foam Nozzle Assembly	1
22	15-511-01	Foam Nozzle Sub Assembly	1
23	14-291-15	Shock Absorber	4
24	14-284-05	Extension Wire	1
25	14-291-05	Switch Box	1
	15-506-02	Switch	1
26	14-284-11	Solenoid Valve	4
27	14-291-19	Drain Plug	1
28	14-291-18	Drain Plug Seal	1
NS	15-507	Foamer Tubing	1

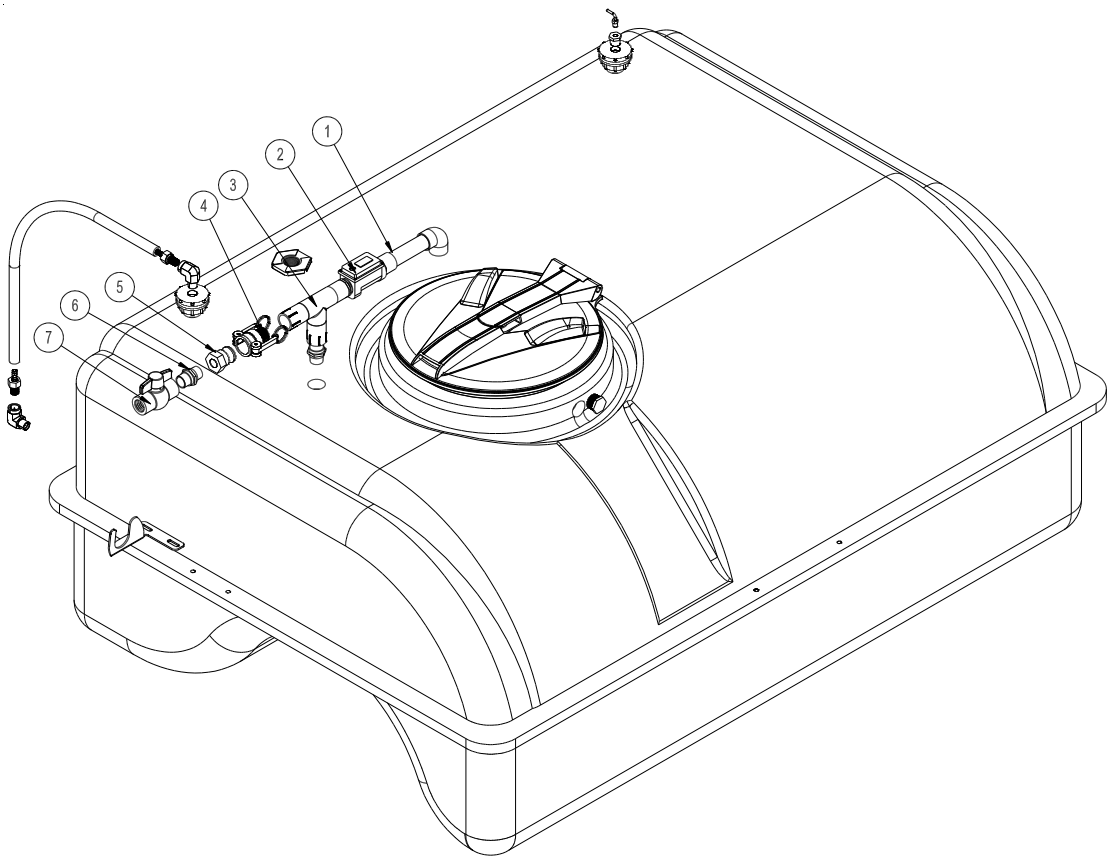
FOAMER FLOW REGULATOR VALVE



REF#	PART#	DESCRIPTION	QUANTITY
A	14-284-13	Flow Regulating Valve	1
B	14-699	Male Coupling	1
C	15-507	Tubing	1
D	20-769	Regulating Valve Bracket	1
E	14-702	Red Washer	1
F	14-291-09	Replacement Blue Wing Nut	1

14-515 WATER METER KIT (GALLONS)

15-618 WATER METER KIT (LITERS)



REF #	PART #	DESCRIPTION	QUANTITY
1	14-524	Filler Outlet	1
2	14-514	Water Meter (Gallons)	1
	14-527	Water Meter (Liters)	1
3	14-525	Filler Inlet	1
4	16-962	1" Quick Coupler (already on machine)	1
5	16-961	1" Adapter Quick Coupler (already on machine)	1
6	16-851	1" Nipple (already on machine)	1
7	18-448	1" Ball Valve (already on machine)	1

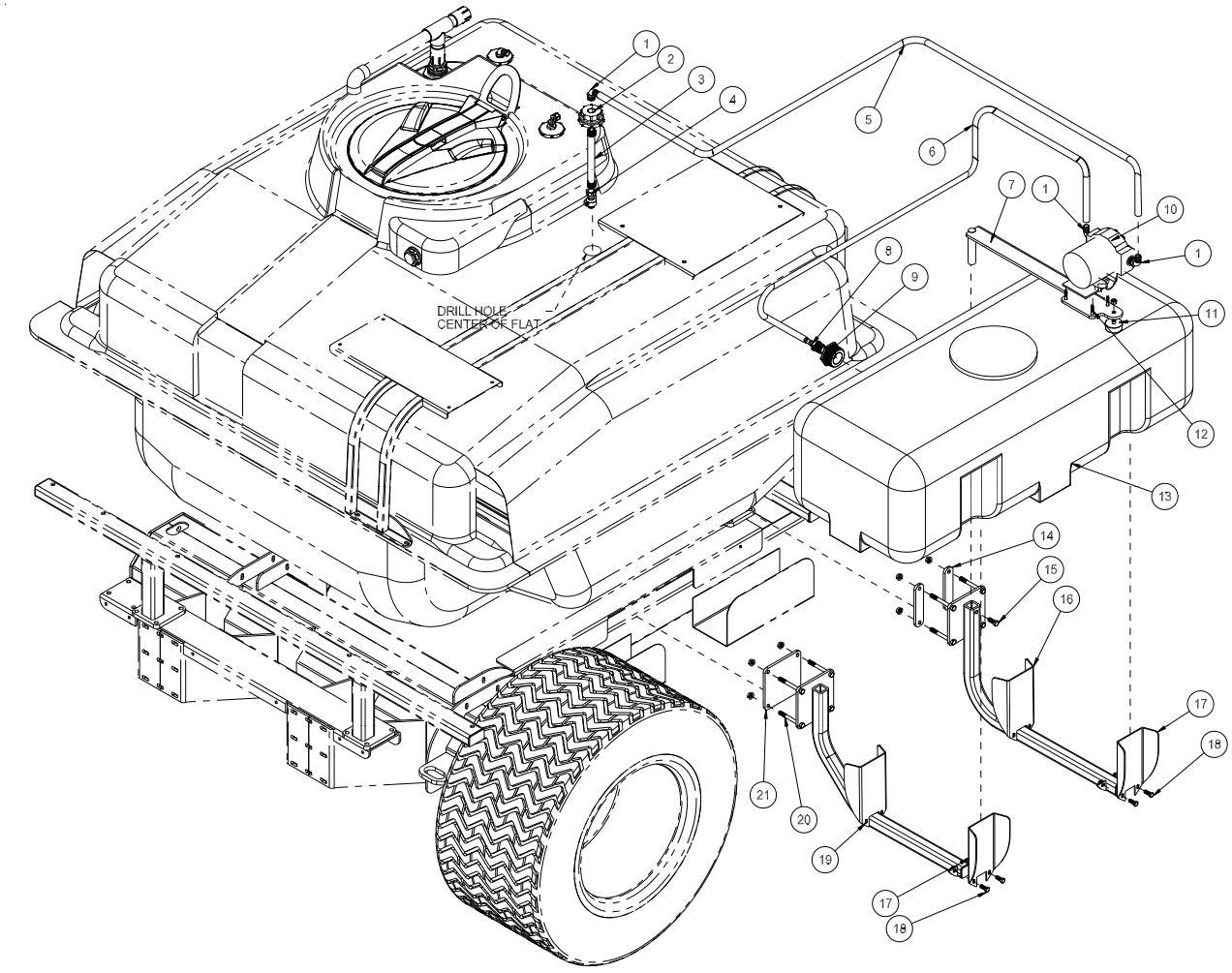
1. Thoroughly flush the service line upstream of the meter to remove dirt and debris.
2. The DLJ Meter is for use **only** with **COLD WATER** up to 122°F (50°C)
3. Slowly open any upstream valves to prevent damage to the meter.

Gallons to Cubic feet Conversion :

Multiply gallons reading by 0.1337 to get cubic feet.

There are 7.48052 gallon per cubic foot.

32-511 50 GALLON TANK RINSING SYSTEM



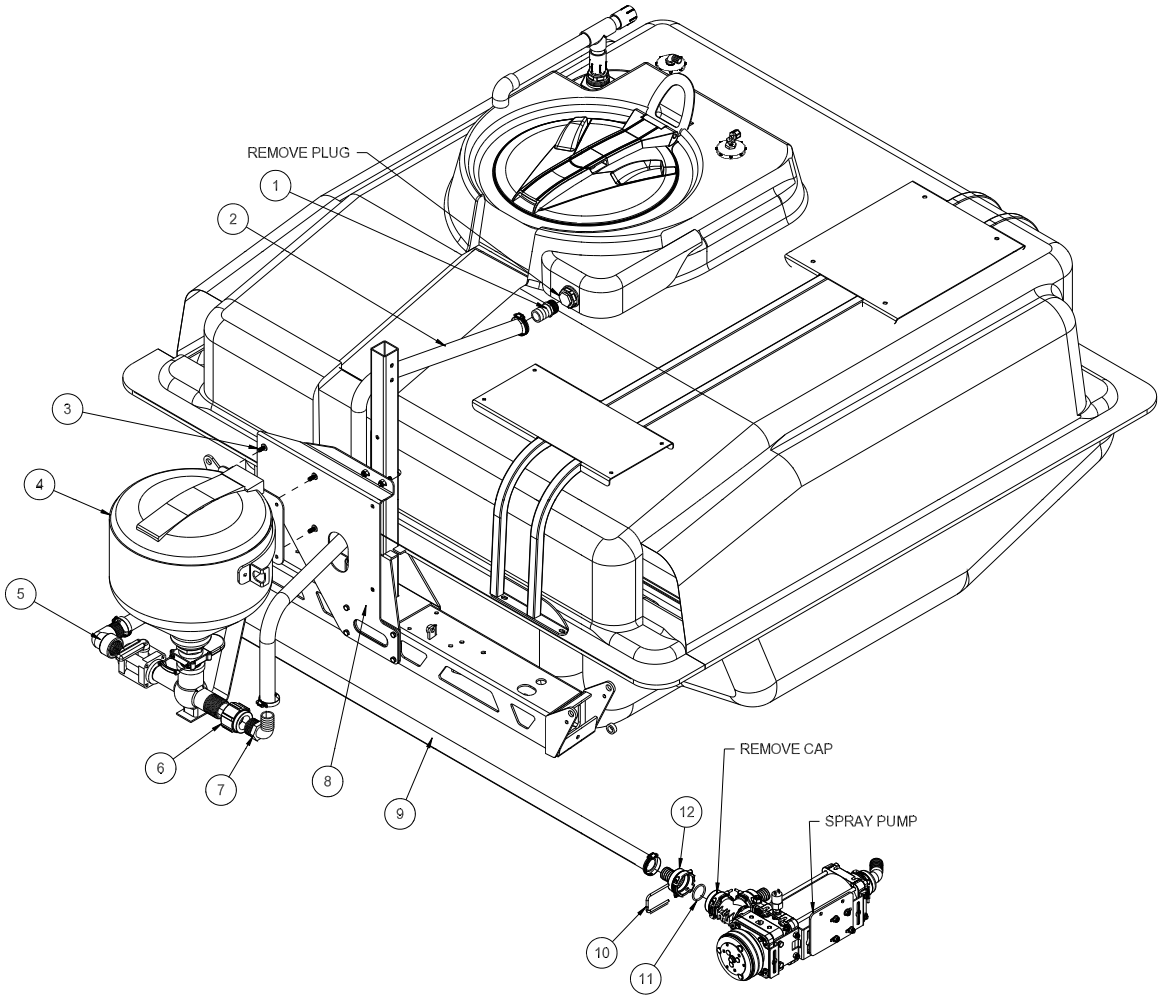
Drill 1-3/4" hole in center of flat part of tank.

32-511 50 GAL TANK RINSING SYSTEM

REF#	PART#	DESCRIPTION	QUANTITY
1	16-937	Elbow, 1/2 MPT x 1/2 HB	3
2	33-495	Bulkhead Fitting	1
3	30-247	PVC Nipple, 1/2 x 8"	1
4	30-246	Tank Rinsing Nozzle	1
5	9050-84	1/2" PVC Tube x 84"	1
	18-186	Hose Clamp	2
6	9050-36	1/2" PVC Tube x 36"	1
	18-224	Hose Clamp	4
7	32-633	Pump Mount	1
8	16-185	Elbow, 3/4 MPT x 1/2 HB	1
9	32-525	Reducer Bushing, 2" x 3/4	1
10	32-523	Diaphragm Pump	1
11	50-081	Rubber Insulator	1
	HN-38-16	Hex Nut, 3/8 - 16	1
12	HB-14-20-150	Hex Bolt, 1/4 - 20 x 1 1/2	4
	HNFL-14-20	Flange Whiz-loc Nut, 1/4- 20	4
13	32-522	50 Gallon Rinse Tank	1
14	32-670	Front Tank Mount Strap	2
15	HB-38-16-125	Hex Bolt, 3/8 - 16 x 1 1/4	1
	HNFL-38-16	Flange Whiz-loc Nut, 3/8 -16	1
16	32-665	Front Tank Mount	1
17	32-669	Support Plate	2
18	HB-516-18-100	Hex Bolt, 5/16 - 18 x 1	4
	HNFL-516-18	Flange Whiz-loc Nut, 5/16-18	4
19	32-666	Rear Tank mount	1
20	HB-38-16-350	Hex Bolt, 3/8 - 16 x 3 1/2	8
	HNFL-38-16	Flange Whiz-loc Nut, 3/8-16	8
21	32-641	Rear Tank Mount Plate	

⚠ WARNING **This tank is for fresh clear water ONLY. Do not put chemicals in this tank.**

32-512 CHEMICAL CLEAN-LOAD DRAWING



REF#	PART #	DESCRIPTION	QUANTITY
1	16-159	Hose Barb	1
2	8897-54	1 1/4" Discharge Hose x 54"	1
	18-116	Hose Clamp	2
3	HB-516-18-100	Hex Bolt, 5/16 - 18 x 1	4
	HNFL-516-18	Flange Lock Nut, 5/16 - 18	4
4	15-620	Clean-load Assembly	1
5	16-972	90° Elbow	1
6	18-391	Coupling	1
7	16-156	Elbow	1
8	17-635	Clean Load Mount (part of boom)	1
9	8897-150	1 1/4" Discharge Hose x 150"	1
	18-116	Hose Clamp	2
10	18-494	Fork	1
11	18-492	Oring	1
12	18-482	Female Barb	1

START-UP

1. All Clean-load valves must be closed prior to starting: inlet ball valve, knife valve and hopper rinse ball valve.
2. Open lid to check for foreign objects which may hinder performance or contaminate the system.
3. Close and lock lid by turning cover clockwise.
4. Divert pump flow to Clean-load inlet line. A pressure of 30 PSI minimum and 150 PSI maximum must be used. Highest pressures increase eduction rate and available wand suction.
5. Turn inlet ball valve on (yellow handle).
6. Open knife valve, located on the bottom of hopper, by pushing handle in (red handle).
7. Unlock and open lid slowly by turning cover counterclockwise.

LOADING LIQUID OR POWDERED CHEMICAL INTO HOPPER

8. Pour required amount of chemical into hopper. Avoid splashing liquids or powdered chemicals outside of hopper.
9. Rinse empty chemical containers if applicable. Place container opening over container rinse valve and press down. This will activate the rinse valve and rinse container.
10. Rinse Clean-load hopper. Close and lock lid by turning cover clockwise. Release the safety locking band on the hopper rinse ball valve and turn on for 20 seconds. Close ball valve and return locking band to locked position.
11. Open lid and inspect for chemical residue. Repeat step 10 as necessary.
12. Close knife valve by pulling red handle out towards you. Turn inlet (yellow handle) off.

LOADING LIQUID AND/OR POWDERED CHEMICAL WITH SUCTION LANCE

Note: Lance suction is dependent upon eductor pressure and flow. For best results, use highest pressure available up to 150 PSI maximum.

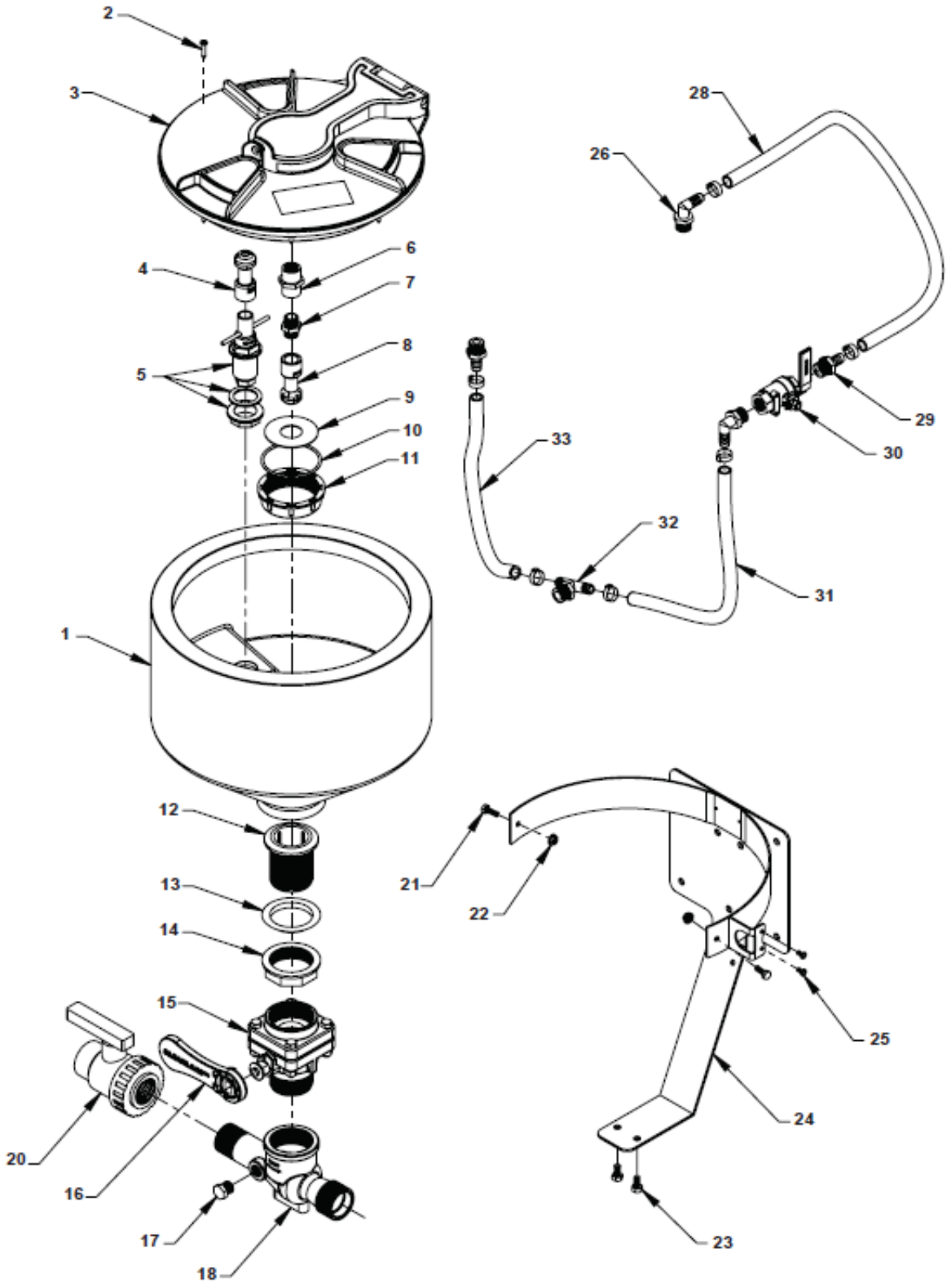
8. Insert lance body with o-ring into eductor until the o-ring is sealed.
9. Use the free end of the lance to pierce bag or container to vacuum powdered or liquid chemical.
10. Rinse lance. Place lance end into a clean container of water to rinse lance assembly.
11. Remove lance body from eductor and drain any remaining fluid into hopper.
12. Close knife valve (red handle). Turn inlet valve (yellow handle) off.

SHUTDOWN

1. Ensure that:
   - All valves are closed. Be sure to close knife valve first. (Close by pulling red handle out towards you.)
   - Chemical residue has been cleaned.
   - Hopper lid is closed and locked by turning cover clockwise.
2. Divert pump flow back to normal operation.

Symptom	Corrective Action
Low eduction rate	Check pump pressure and flow. Cleanload Eductor performance is based on flow and pressure to the system. Note requirements for high eduction rates. Increase outlet hose size back to tank.
Plugged or clogged bottle rinse nozzle	Disassemble rotary portion of nozzle from lower valve assembly and back flush until nozzle ports are clear of debris.
Plugged or clogged tank rinse nozzle	Disassemble rotary portion of nozzle from NPT hose barb and back flush until nozzle ports are clear of debris. Remove screen and flush with water to clear away foreign material.
Fitting leaks	Check for cracks in fitting. Replace fitting if necessary. Disassemble and add more joint seal in compound if leak occurs on threads.

15-620 CHEMICAL CLEAN LOAD® PARTS DRAWING



15-620 CHEMICAL CLEAN LOAD® PARTS LIST

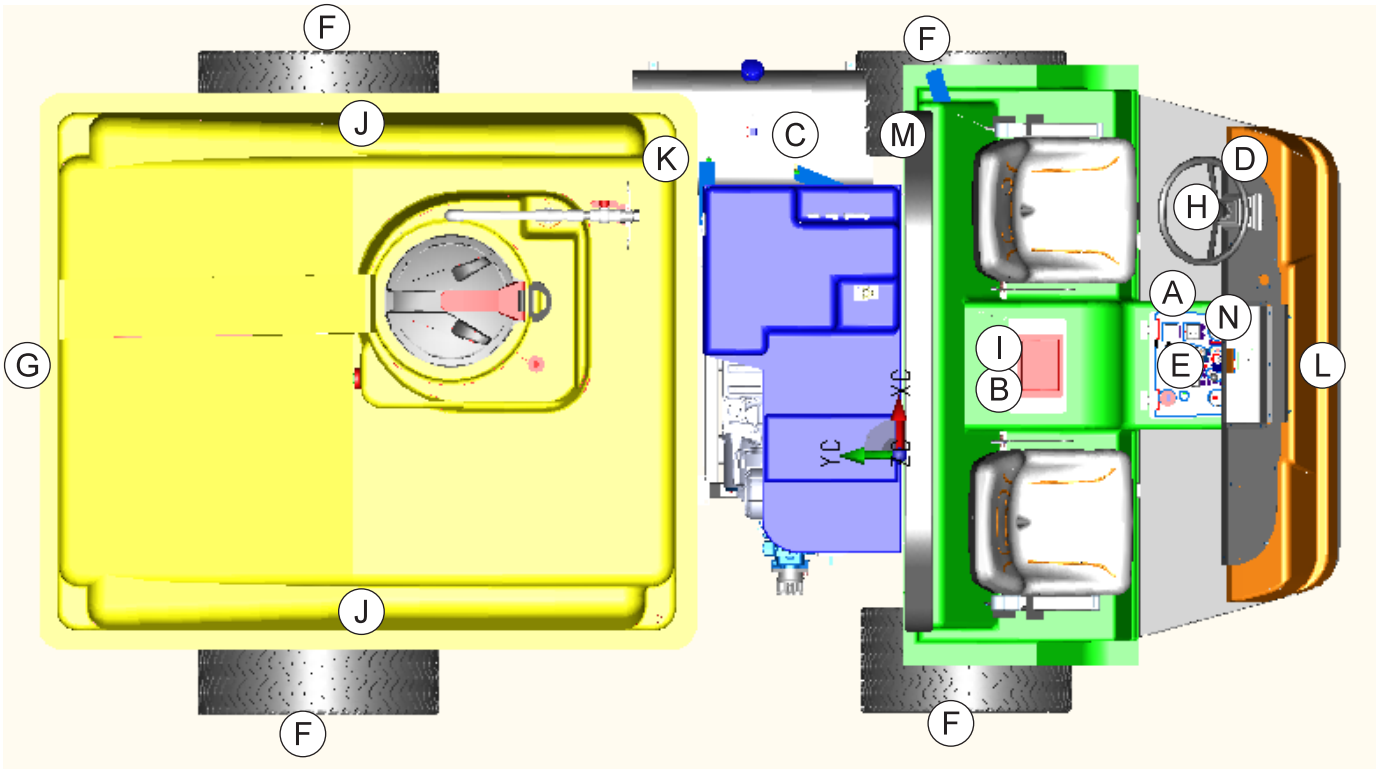
REF#	PART#	DESCRIPTION	QUANTITY
1	15-620-21	Tank	1
2		Screw, #6 x 1”	8
3	15-620-02	Tank Lid	1
4	15-620-22	ProClean Container Nozzle	1
5	15-620-23	ProClean Push Valve Assembly	1
	15-620-19	Tank Rinse	1
	15-620-20	Gasket, 1”	1
6		1/2 x 1/2 FNPT Coupler	1
7		1/2 x 1/2 Thread Nipple	1
8		ProClean Tank Wash Nozzle	1
9		Splash Retainer	1
10		O-ring Breather	1
11		Nut, Breather	1
12	15-620-18	Drain Head, 2”	1
13	15-620-17	Gasket, 2” Tapered	1
14	15-620-16	Locking Ring, 2”	1
15	15-620-12	Ball Valve	1
	15-620-15	Gasket, 2” BSP	1
16	15-620-13	Handle, Clean-load	1
17		1/2 MNPT PP Hex Plug	1
18	15-620-04	Clean-load Eductor	1
20	15-620-14	Ball Valve, 1 1/4 Single Union	1
21		Screw	2
22		Flange Nut	2
23		Hex Head Screw	2
24	15-620-01	Frame, Back Mount	1
25		Phillips Head Screw	2
26	15-620-11	Elbow 1/2”	2
28	15-620-08	Hose, Tank Rinse, 1/2” EPDM	1
29	15-620-09	HB, 1/2 MNPT x 1/2 HB	2
30	15-620-10	Valve, SS Tank Rinse	1
31	15-620-06	Hose, Valve Feeder, 1/2” EPDM	1
32	15-620-05	HB Tee, 1/2 MNPT to 1/2 HB	1
33	15-620-07	Hose, Bottle Rinse, 1/2” EPDM	1

NOTES

DECAL LIST

This is a list of decals located on the Spray Star 5200. Part number, description and location will help in reordering decals.

A	25-370	Decal, 88 dBA
B	25-277	Decal, Battery Warning
C	25-307	Decal, Fuel Only
D	32-619	Decal, Dash Panel
E	32-534	Decal, Control Panel
F	25-380	Decal, Tire Pressure 30psi
G	25-373	Decal, 7" Smithco Logo
H	27-077	Decal Smithco Round
I	27-093	Decal, Hydraulic Oil Level
J	32-629	Decal, Spray Star 5200
K	32-631	Decal, Site Gauge
L	25-374	Decal, 12" Smithco Logo
M	14-803	Decal, Clean Agitation Line Strainer
N	15-463	Decal, SprayPump



QUICK REFERENCE REPLACEMENT PARTS

REPLACEMENT FILTERS

72-146	Hydraulic Oil Filter Assembly
60-334	Replacement Oil Filter Element
17-068	Ignition Switch
32-651-02	Outer Air Filter
32-651-03	Inner Air Filter
32-521-04	Fuel Filter Assembly
32-521-05	Muffler Gasket
30-042-09	Engine oil Filter Cartridge

REPLACEMENT BELTS

32-575	Spray Pump V-Belt

SEAL KITS

13-406	Boom Cylinders
14-267	Seal Kit
15-301	Power Steering Orbital Motor
15-301-01	Seal Kit
15-839	Hydraulic Cylinder (steering)
15-839-01	Seal Kit
32-609	Hydrostatic Pump
32-609-01	Seal Kit
32-610	Rear Drive Assembly
32-610-01	Seal Kit
76-197	Gear Pump
76-197-08	Seal Kit

FLUIDS

Engine Oil	SAE 10W-40 API Service SJ or higher Motor Oil
Hydraulic Fluid	SAE 10W-40 API Service SJ or higher Motor Oil
Radiator	3.33 Gal 50/50 Antifreeze/water mixture

OTHER PARTS

15-818	#75 Fitting O-ring
15-817	#50 Fitting O-ring
16-953	Hinged Cover On Tank with Gasket
16-953-01	Gasket For Cover
16-169	Strainer Basket
20-663	Tank Lid Gasket
77-261	Circuit Breaker 40Amp

The Smithco Commercial Products Two-Year Limited Warranty

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

Warranty Duration is:

(1) Two years, 1500 operational hours* from the date of delivery to the original purchaser or Five years from the date of original manufacturer of the product, whichever occurs first. (*Products equipped with hour meter).

(2) Products used in rental situations are covered for 90 days from date of delivery to original user/renter.

Owner Responsibilities:

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

Instructions for Obtaining Warranty Service:

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

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

Smithco Product Support Department
200 West Poplar Ave.
Cameron, Wisconsin 54822
Telephone: 800-891-9435 E-Mail: ProductSupport@Smithco.com

Maintenance Parts:

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

Items/Conditions Not Covered:

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

- Product failures which result from the use of non-Smithco replacement parts, or from installation and use of add-on, modified, or unapproved accessories are not covered.
- Product failures which result from failure to perform required maintenance and/or adjustments are not covered.
- Product failures that result from operating the Product in an abusive, negligent or reckless manner are noT covered.
- This warranty does not apply to parts subject to consumption through use, unless found to be defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to: blades, tines, teeth, scarifiers, rakes, plates, wear plates, castor wheels, tires, batteries, filters, belts, nozzles, etc.

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

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

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

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

Other Legal Disclaimers:

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

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

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

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

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

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

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