

Parts & Service



Spray Star 1000
10-100-C
SN: 100444

June 2010

Product Support:

Hwy 55 & Poplar Ave; Cameron WI 54822

1-800-891-9435 productsupport@smithco.com

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

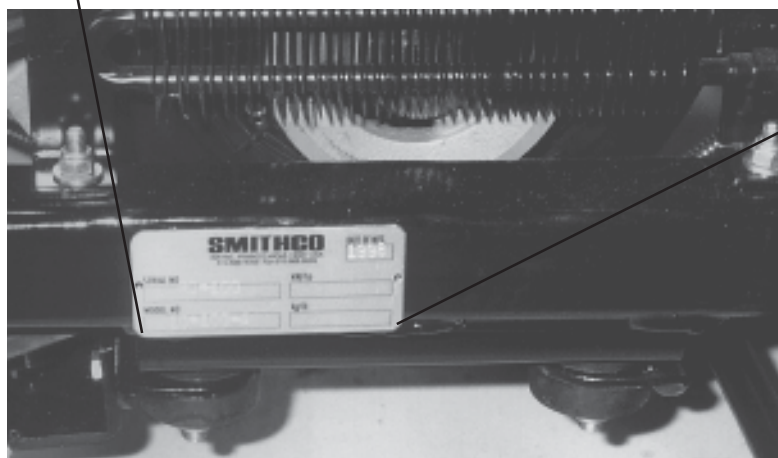
Read this manual and all other manuals pertaining to the Spray Star 1000 carefully as they have safety, operating, assembly and maintenance instructions. Failure to do so could result in personal injury or equipment damage.

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

All **Smithco** machines have a Serial Number and Model Number. Both numbers are needed when ordering parts. The serial number plate on the Spray Star 1000 is located on the left side, in front of the front tire. Refer to engine manual for placement of engine serial number.

For easy access record your Serial and Model numbers here.

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



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

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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 devices to protect your head, eyes, ears, hands and feet. Operate the machine only in daylight or in good artificial light.
5. Inspect the area where the equipment will be used. Pick up all debris you can find before operating. Beware of overhead obstructions and underground obstacles. Stay alert for hidden hazards.
6. Never operate equipment that is not in perfect working order or 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. Set park brake.
 - C. Shut engine off and remove the ignition key.
 - D. 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. Never carry passengers.
18. Stop engine before making repairs/adjustments or checking/adding oil to the crankcase.
19. Use parts and materials supplied by **Smithco** only. Do not modify any function or part.
20. Use caution when booms are down as they extend out beyond the center line of the machine.
21. 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.

WEIGHTS AND DIMENSIONS

| | |
|----------------------|-------------------|
| Length | 112" (285 cm) |
| Width | 70" (178 cm) |
| Width With Boom Open | 180" (457 m) |
| Height | 48" (122 cm) |
| Wheel Base | 53" (135 cm) |
| Weight Empty | 1283 lbs (582 kg) |
| Weight Full | 2200 lbs (998 kg) |

SOUND LEVEL (DBA)

| | |
|-------------------|--------|
| At ear level | 88 dba |
| At 3 ft (0.914 m) | 84 dba |
| At 30 ft (9.14 m) | 72 dba |

ENGINE

| | |
|--------------------|-------------------------------------|
| Make | Kohler |
| Model# | Command CH25S |
| Type / Spec# | PA 68673 |
| Horsepower | 25HP (19 kw) |
| Fuel | Unleaded 87 Octane Gasoline Minimum |
| Cooling System | Air Cooled |
| Lubrication System | Full Pressure |
| Alternator | 25 Amp |

WHEELS & TIRE

Front: Two 20 x 10.00 x 10 NHS Multi-Rib; 20psi (1.4 bar)
Rear: Two 24 x 12.00 x 12 NHS Multi-Trac; 20 psi (1.4 bar)

PARK BRAKE

Hand Operated Lever, Discs on Rear Axle

SPEED

| | |
|---------------|----------------------|
| Forward Speed | 0-8 mph (0-12.8 kph) |
| Reverse Speed | 0-3 mph (0-4.8 kph) |

BATTERY

| | |
|--------------------------|-----------------------------|
| | Automotive type 24F-12 Volt |
| BCI Group | Size 24 |
| Cold Cranking Amps | 575 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 | 7 gallon (26.5 liters) |
| Hydraulic Fluid | 5 gallon (19 liters) |
| Grade of Hydraulic Fluid | SAE 10W-40 API Service SJ or higher Motor Oil |

OPTIONAL EQUIPMENT

| | |
|--|---|
| 10-417 Chemical Cleanload Safe Fill System | 1002 203 Spray System |
| 10-419 Fresh Water Tank | 1008 440 Spray System |
| 15-550 15' Smithco Super Boom | 1010 3-Way Manual System |
| 10-160 15' Stainless Steel Boom - manual | 10-378 Foam Marker |
| 17-525 18.5' Smithco Super Boom | 17-550 15' Smithco Super Boom |
| 15-835 Tank Rinsing System | 10-422 Hose Reel Mount kit f/ 17-550/17-525Booms |
| 10-365 Water Meter Kit (gallons) | 33-541 Triple Nozzle Kit f/ 15ft/5m 9 nozzle Boom |
| 10-370 Water Meter Kit (liters) | 33-540 Triple Nozzle Kit f/ 18'/5.5m Booms |
| 15-622 Weather Canopy | 10-377 Hose Reel Mounting Kit f/ 10-160 Boom |
| 16-129 Manual Rewind Hose Reel, 200-foot/61-meter capacity | |
| 16-906 Electric Rewind Hose Reel, 200-foot/61-meter capacity | |

MAINTENANCE



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.

LUBRICATION

Use No. 2 General purpose lithium base grease and lubricate every 100 hours. The Spray Star 1000 has 9 grease fittings.

- A. One on the rod end of hydraulic cylinder.
- B. One on each the right and left spindles.
- C. One on the center front pivot.
- D. One on the pump pivot.
- E. One on the brake relay.
- F. One on the pedal relay.
- G. One on the reverse pedal.
- H. One on the forward pedal.

Every 500 hours of operation, separate the hydrostatic pump and the engine, clean the splined areas and lightly grease the male portion of the pump spline. Use either Dow Corning® G-N Metal Assembly Paste or #77 Assembly Paste (Kohler# 25 357 12-s).

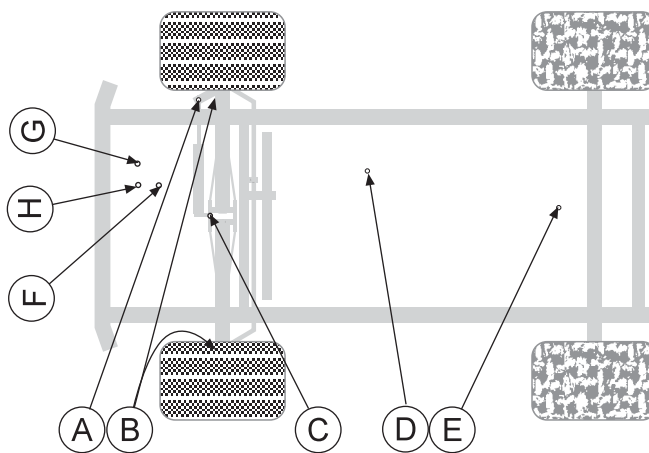
As you mount the pump back onto the engine, be certain the mating surfaces are clean and free of any foreign material and that the pump is correctly aligned.

ELECTRICAL CONNECTIONS

Use dielectric grease on all electrical connections.

FLOW METER MAINTENANCE AND ADJUSTMENT (440 SYSTEM ONLY)

1. Remove Flowmeter from Sprayer, brush away any debris and flush with clean water to remove any foreign material.
2. Remove the retaining rings carefully. Remove the bearing hub, turbine hub, and turbine from inside flowmeter.
3. Clean the turbine and hubs of metal filings and any other foreign material. Use pressurized air to blow metal filings and debris out of both hub and turbine. Check blades for wear. Holding turbine and bearing in your hand, spin turbine. It should spin freely with very little drag.
4. If bearing hub stud is adjusted or replaced, verify the turbine fit before reassembling. Put turbine hub and retaining ring in place. Put bearing hub with turbine against turbine hub inside the flowmeter housing. Put the retaining ring into the groove, to lock bearing hub in place. Spin turbine by blowing on it. Tighten bearing hub stud until turbine stalls. Loosen the stud 1/3 turn. The turbine should spin freely.
5. Use a low pressure (5PSU) jet of air through flowmeter in the direction of flow and again in opposite direction to verify that the turbine spins freely. If there is drag, loosen the stud on the bearing hub 1/16 turn until the turbine spins freely.
6. If turbine spins freely and the cables have been checked, but the flowmeter is not totalizing properly, verify that the sensor assembly is threaded all the way into the flowmeter body and the orientation groove on top of the sensor is parallel with the flowmeter body. If flowmeter still does not totalize, replace sensor assembly.

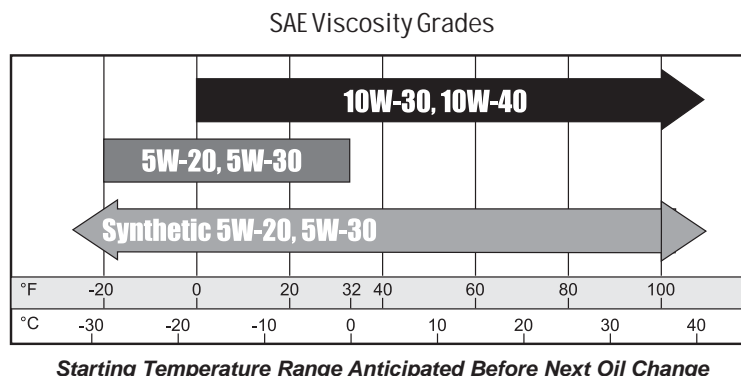


AIR CLEANER

1. Loosen cover retaining knob and remove cover.
2. Remove pre-cleaner from paper element.
3. Check paper element. Replace element as necessary.
4. Wash pre-cleaner in warm water with detergent. Rinse pre-cleaner thoroughly until all traces of detergent are eliminated. Squeeze out excess water (do not wring). Allow pre-cleaner to air dry.
5. Saturate pre-cleaner with new engine oil. Squeeze out all excess oil.
6. Reinstall pre-cleaner over paper element.
7. Reinstall air cleaner cover. Secure cover with cover retaining knob.

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 SJ or higher" oil. Use no special additives with recommended oils. Do not mix oil with gasoline.



HYDRAULIC OIL

1. Use SAE 10W-40 API Service SJ or higher motor oil.
2. For proper warranty, change oil every 500 hours or annually, which ever is first.
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. All tires should be 20 psi (1.4bar). Improper inflation will reduce tire life considerably.

MAINTENANCE

WHEEL MOUNTING PROCEDURE

1. Set park brake. Turn machine off and remove key.
2. Block wheel on opposite corner.
3. Loosen nuts slightly on wheel to be removed.
4. Jack up machine being careful not to damage underside of machine.
5. Place wheel on hub lining up bolt holes.
6. Torque to 64-74 ft/lb (87-100Nm) using a cross pattern. Retorque after first 10 hours and every 200 hours thereafter.
7. Lower machine to ground and remove blocks and jack.

BATTERY

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

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

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

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

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



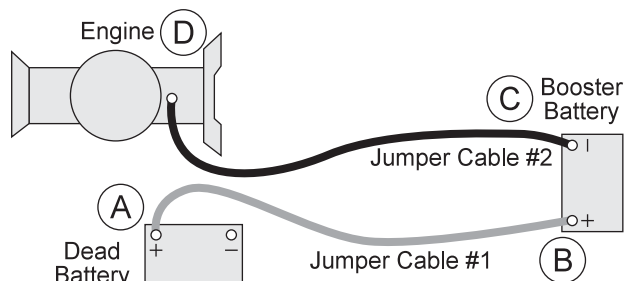
Battery Electrolyte is an acidic solution and should be handled with care. If electrolyte is splashed on any part of your body, flush all contact areas immediately with liberal amounts of water. Get medical attention immediately.



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

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.

PARK BRAKE

Turn knob clockwise on end of park brake to tighten. Turn it counter clockwise to loosen. If finer adjustment is needed turn clevis on brake cable to adjust length of cable.



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



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

| Maintenance Service Interval | Maintenance Procedure |
|------------------------------------|---|
| After the first 5 operating hours | Torque the wheel lug nuts. (64-74 ft/lb (87-100 Nm)) Change the engine oil and filter. |
| After the first 20 operating hours | Replace hydraulic filter |
| Before each use daily | Check the engine oil. Check the hydraulic fluid level. Check the tire pressure. Check fuel level Check condition of hydraulic hoses and fittings. Inspect and clean the machine. Flush spray system tank. Inspect cooling system. |
| Every 100 hours | Change the engine oil and filter. Check hydraulic filter Check engine for leaks or loose parts. Check spark plugs Check air cleaner. Check tire pressure (20 psi (1.4 bar)). Check the battery fluid level and cable connections. Torque the wheel lug nuts. (64-74 ft/lb (87-100 Nm)) Grease Machine. Check belt tension (where needed) |
| Every 200 Hours | Change oil filter Torque the wheel lug nuts. (64-74 ft/lb (87-100 Nm)) |
| Every 250 hours | Check Idle Speed Change hydraulic filter Clean battery terminals |
| Every 400 hours | Check spark plugs |
| Every 500 hours or yearly | Lubricate machine Visual inspection of machine and hydraulic hoses Change oil. Torque lug nuts. Check battery terminals and electrolyte level. Change all filters. |

END USER'S SERVICE CHART

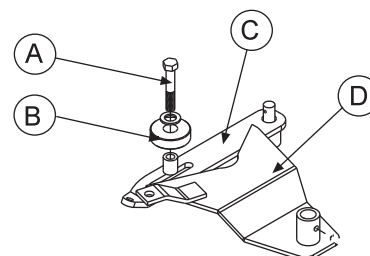
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WHEEL CREEP

"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 transmission is on the left side. The swash plate (D) is under the transmission and comes out forward. The idler arm (B) has a bearing that runs in the notch of the swash plate. Loosen bolt (A).
3. With engine running, move bearing (B) so it centers on the swash plate (D) 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.



SPRAY PUMP

Located to the rear and right of the engine. Should have approximately $\frac{1}{2}$ " (13mm) of deflection in the center of the top strand. Loosen and tighten the $\frac{5}{16}$ -18 x $1\frac{1}{4}$ set screw located on the foot of the pump mount.

SPEED CALIBRATION NUMBERS

The speed calibration numbers for Spray Star 1008 with GPS is 785. Metric is 205.

MASTER BOOM SWITCH (FOOT SWITCH FOR SPRAY STAR 1008)

The master boom switch, located on the left floorboard is used to override the master switch on the computer console of the spray systems. By pushing down it will turn on/off the booms. *For the 440 System* the Master Switch on the computer **must be off** for the master boom control switch to work.

TO ENGAGE:

1. Flip rocker switch 'On' (green light).
2. Obtain desired speed with foot pedal.
3. Step on foot switch to lock speed.
4. Push foot switch again to disengage.

SPRAY BOSS CONTROL HANDLE

This lever located on the left side of the seat engages and disengages the speed boss. Forward is engage and all the way back is disengage. When the lever is engaged it sets a stop for the accelerator. The accelerator pedal must be used to maintain this speed. To adjust speed use the knob on the end of the lever, counter clockwise increases speed and clockwise decreases speed. Disengage the lever and you will have full accelerator pedal range.

STORAGE

If the engine will be out of service for two or more months, use the following storage procedure.

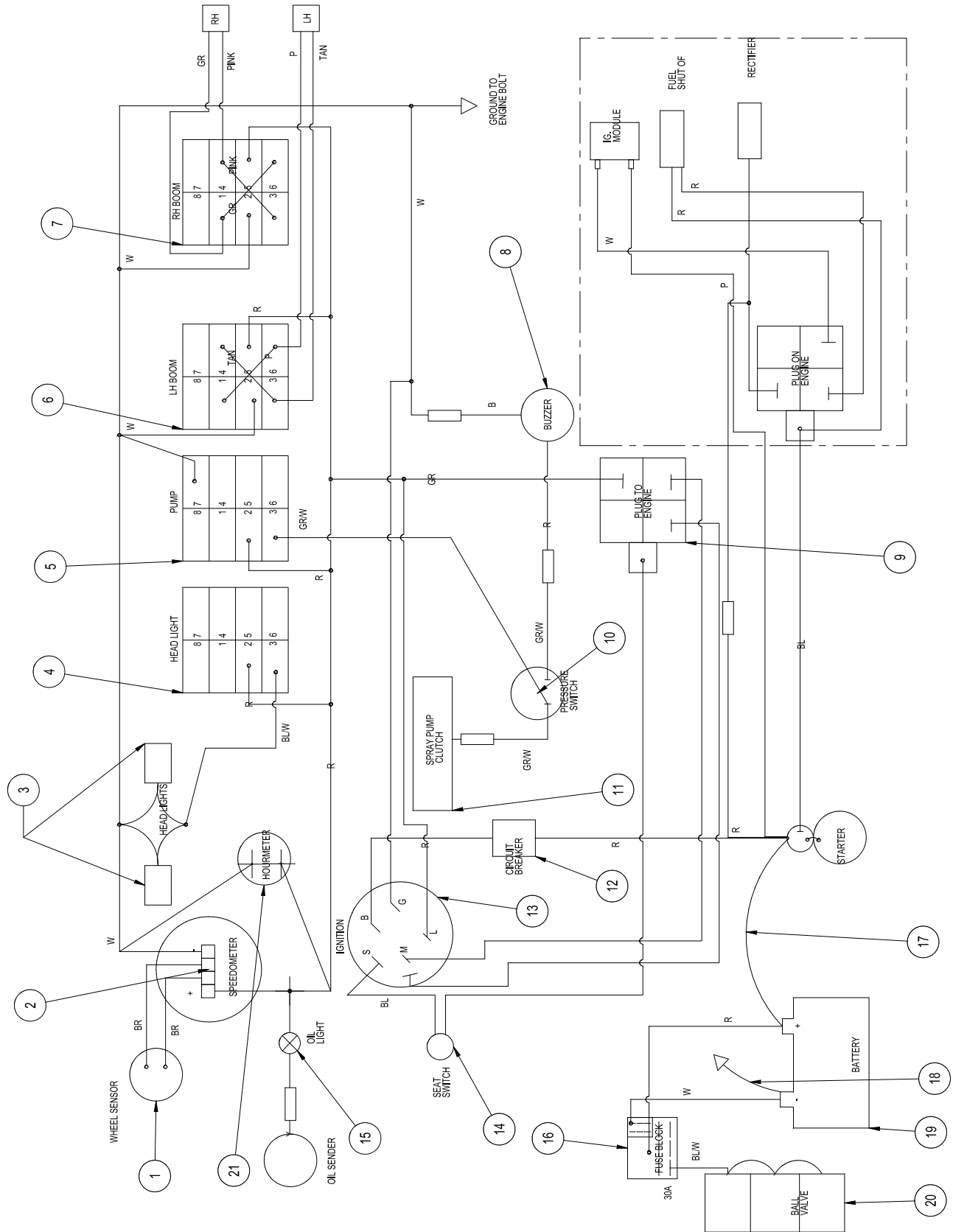
1. Clean the exterior surfaces of the engine.
2. Change the oil and filter while the engine is still warm from operation.
3. The fuel system must be completely emptied, or the gasoline must be treated with a stabilizer to prevent deterioration.

If you choose to use a stabilizer, follow manufacturers recommendations, and add the correct amount for the capacity of fuel system. Fill fuel tank with clean, fresh gasoline. Run engine for 2-3 minutes to get stabilized fuel into carburetor. Close fuel shut-off valve when unit is being stored or transported.

To empty the system, drain fuel tank and carburetor, or run engine until tank and system are empty.

4. Remove the spark plugs. Add one tablespoon of engine oil into each spark plug hole. Install plugs, but do not connect the plug leads. Crank the engine two or three revolutions.
5. Store machine in a clean, dry place.

WIRING DIAGRAM



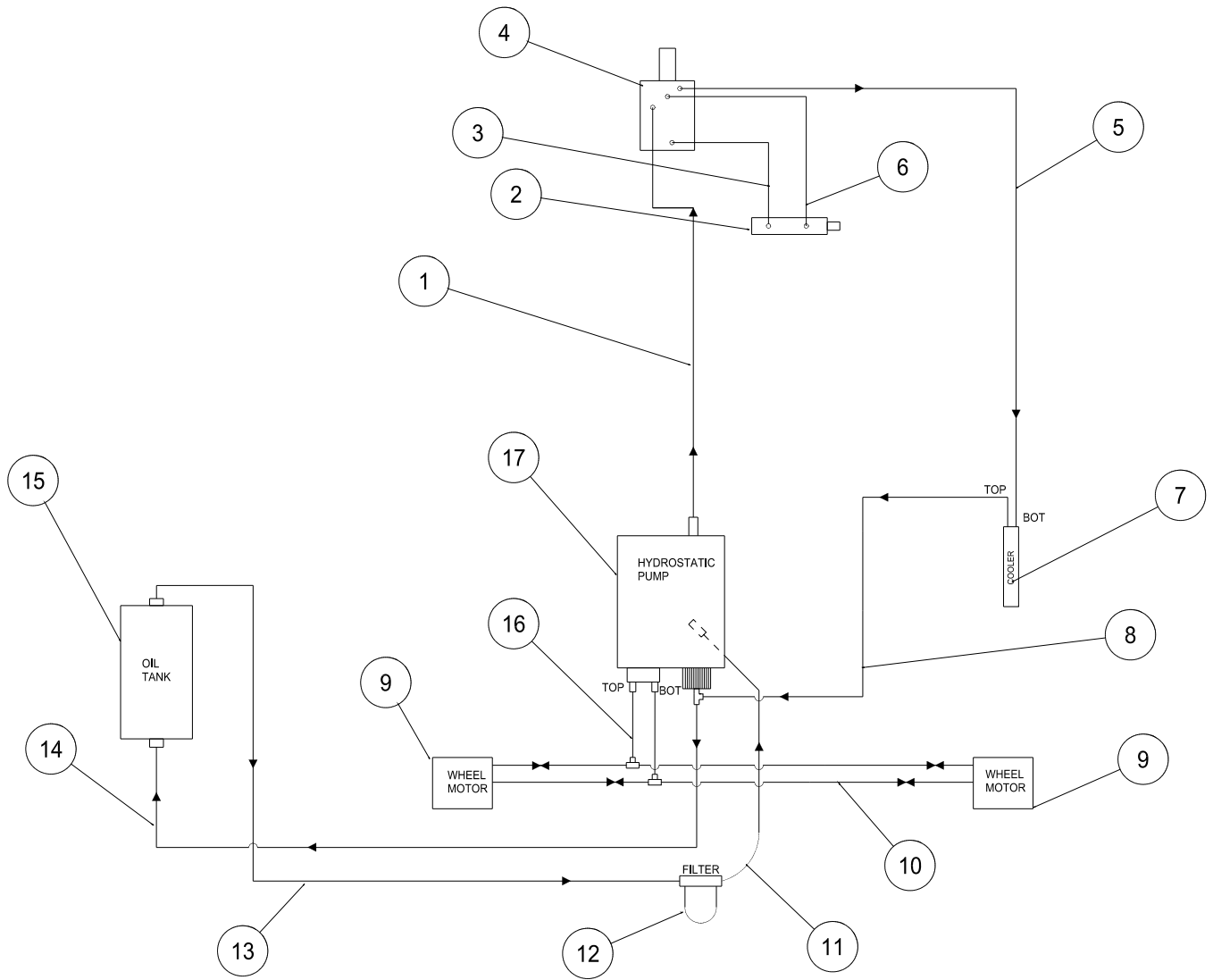
WIRING PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-------------|------------------------------------|----------|
| 1 | 16-883 | Wheel Sensor | 1 |
| 2 | 10-202 | Speedometer | 1 |
| | 8854 | Fork Terminal | 2 |
| | 8963 | Heat Shrink | 2 |
| 3 | 17-524 | Lights | 2 |
| | 10-421 | Pig tail | 2 |
| 4 | Head Lights | | |
| | 15-725 | Mount Panel End | 1 |
| | 15-727 | Switch Actuator | 1 |
| | 15-782 | Rocker Switch, Unlit | 1 |
| 5 | Pump | | |
| | 15-729 | Mount Panel Middle | 1 |
| | 15-726 | Switch Body, Light | 1 |
| | 15-731 | Actuator, Amber | 1 |
| 6 | Left Boom | | |
| | 15-729 | Mount Panel Middle | 1 |
| | 15-727 | Switch Actuator | 1 |
| | 15-728 | Switch Body, On-Off-On | 1 |
| 7 | Right Boom | | |
| | 15-725 | Mount Panel End | 1 |
| | 15-727 | Switch Actuator | 1 |
| | 15-728 | Switch Body, On-Off-On | 1 |
| 8 | 77-207 | Buzzer | 1 |
| | 8875 | Male Bullet | 2 |
| | 8963 | Heat Shrink | 2 |
| 9 | | Plug to Engine | 1 |
| 10 | 33-480 | Pressure Switch | 1 |
| 11 | 16-998 | Hypro Pump With Electric Clutch | 1 |
| 12 | 77-261 | Circuit Breaker | 1 |
| | 8977 | Circuit Breaker Boot | 1 |
| 13 | 13-488 | Ignition Switch (Kohler 25 099 04) | 1 |
| 14 | 14-292 | Seat Switch | 1 |
| 15 | 50-359 | Oil Warning Light | 1 |
| | 8853 | Slide On Connector | 2 |
| | 8963 | Heat Shrink | 2 |
| 16 | 33-271 | Fuse Block | 1 |
| 17 | 22-055 | Red Battery Cable | 1 |
| 18 | 48-147 | Ground Battery Cable | 1 |
| 19 | 33-216 | Battery | 1 |
| 20 | 15-743 | Ball Valve | 1 |
| 21 | 12-017 | Hour Meter | 1 |
| | 10-371 | Wire Harness | 1 |

Use dielectric grease on all electrical connections.

To reset circuit breaker on ball valve, you must disconnect power to computer.

HYDRAULIC DIAGRAM



HYDRAULIC DIAGRAM PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|--------------------|----------|
| 1 | 10-276 | Hydraulic Hose | 2 |
| 2 | 10-135 | Hydraulic Cylinder | 1 |
| 3 | 10-277 | Hydraulic Hose | 1 |
| 4 | 15-301 | Orbitrol Motor | 1 |
| 5 | 10-279 | Hydraulic Hose | 1 |
| 6 | 10-278 | Hydraulic Hose | 1 |
| 7 | 42-265 | Oil Cooler | 1 |
| 8 | 10-373 | Hydraulic Hose | 1 |
| 9 | 10-116 | Wheel Motor | 2 |
| 10 | 10-273 | Hydraulic Hose | 4 |
| 11 | 10-376 | Hydraulic Hose | 1 |
| 12 | 15-626 | Oil Filter | 1 |
| | 15-626-01 | Replacement Filter | |
| 13 | 10-375 | Hydraulic Hose | 1 |
| 14 | 10-374 | Hydraulic Hose | 1 |
| 15 | 60-473 | Oil Tank | 1 |
| 16 | 10-274 | Hydraulic Hose | 2 |
| 17 | 10-117 | Hydrostatic Pump | 1 |

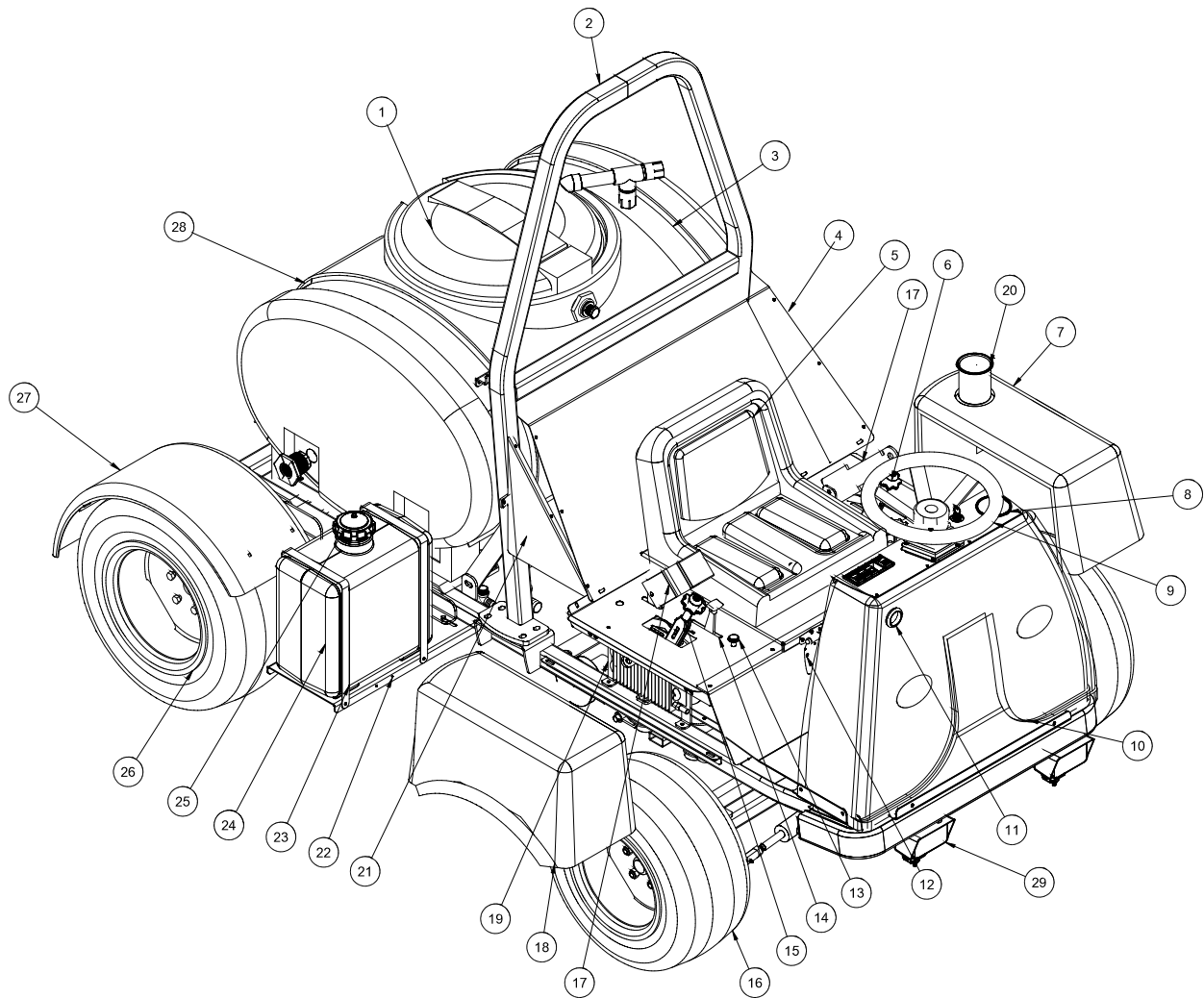
FITTING TORQUE CHARTS

| SAE Straight Thread O-ring Plugs (Steel) | | | | | |
|---|--------------------|--|----------|---|----------|
| Fitting Size | SAE Port Thread | Hollow Hex Head Plug (HP50N) Assembly Torque | | Hex Head Plug (P50N) Assembly Torque | |
| | | in. lbs. | ft. lbs. | in. lbs. | ft. lbs. |
| 2 | 5/16 - 24 | 35 ± 5 | 3 ± .5 | 90 ± 5 | 7.5 ± .5 |
| 3 | 3/8 - 24 | 60 ± 5 | 5 ± .5 | 170 ± 10 | 14 ± 1 |
| 4 | 7/16 - 20 | 135 ± 10 | 11 ± 1 | 220 ± 15 | 18 ± 1 |
| 5 | 1/2 - 20 | 180 ± 10 | 15 ± 1 | 260 ± 15 | 22 ± 1 |
| 6 | 9/16 - 18 | 220 ± 10 | 18 ± 1 | 320 ± 20 | 27 ± 2 |
| 8 | 3/4 - 16 | 550 ± 20 | 46 ± 2 | 570 ± 25 | 48 ± 2 |
| 10 | 7/8 - 14 | 900 ± 50 | 75 ± 5 | 1060 ± 50 | 90 ± 5 |
| 12 | 1 1/16 - 12 | 1020 ± 50 | 85 ± 5 | 1300 ± 50 | 110 ± 5 |
| 14 | 1 3/16 - 12 | 1550 ± 75 | 130 ± 6 | 1750 ± 75 | 145 ± 6 |
| 16 | 1 5/16 - 12 | 1600 ± 75 | 135 ± 6 | 1920 ± 75 | 160 ± 6 |
| 20 | 1 5/8 - 12 | 2700 ± 150 | 225 ± 12 | 2700 ± 150 | 225 ± 12 |
| 24 | 1 7/8 - 12 | 3000 ± 150 | 250 ± 12 | 3000 ± 150 | 250 ± 12 |
| 32 | 2 1/2 - 12 | 3900 ± 200 | 325 ± 15 | 3900 ± 200 | 325 ± 15 |

| Seal-Lok Straight and Adjustable Fitting (Steel) | | | |
|---|----------------------------|---------------------|------------|
| Fitting Size | SAE Port Thread Size | Assembly Torque (2) | |
| | | in. lbs. | ft. lbs. |
| 4 | 7/16 - 20 | 190 ± 10(1) | 16 ± 1.0 |
| 6 | 9/16 - 18 | 420 ± 15 | 35 ± 1.0 |
| 8 | 3/4 - 16 | 720 ± 25 | 60 ± 2.0 |
| 10 | 7/8 - 14 | 1260 ± 50 | 105 ± 5.0 |
| 12 | 1 1/16 - 12 | 1680 ± 75 | 140 ± 6.0 |
| 16 | 1 5/16 - 12 | 2520 ± 100 | 210 ± 8.0 |
| 20 | 1 5/8 - 12 | 3100 ± 150 | 260 ± 12.0 |
| 24 | 1 7/8 - 12 | 3800 ± 150 | 315 ± 12.0 |

Over tightened fittings will result in crushing the cone which will create a leak.
Charts Developed by Parker Hennipin

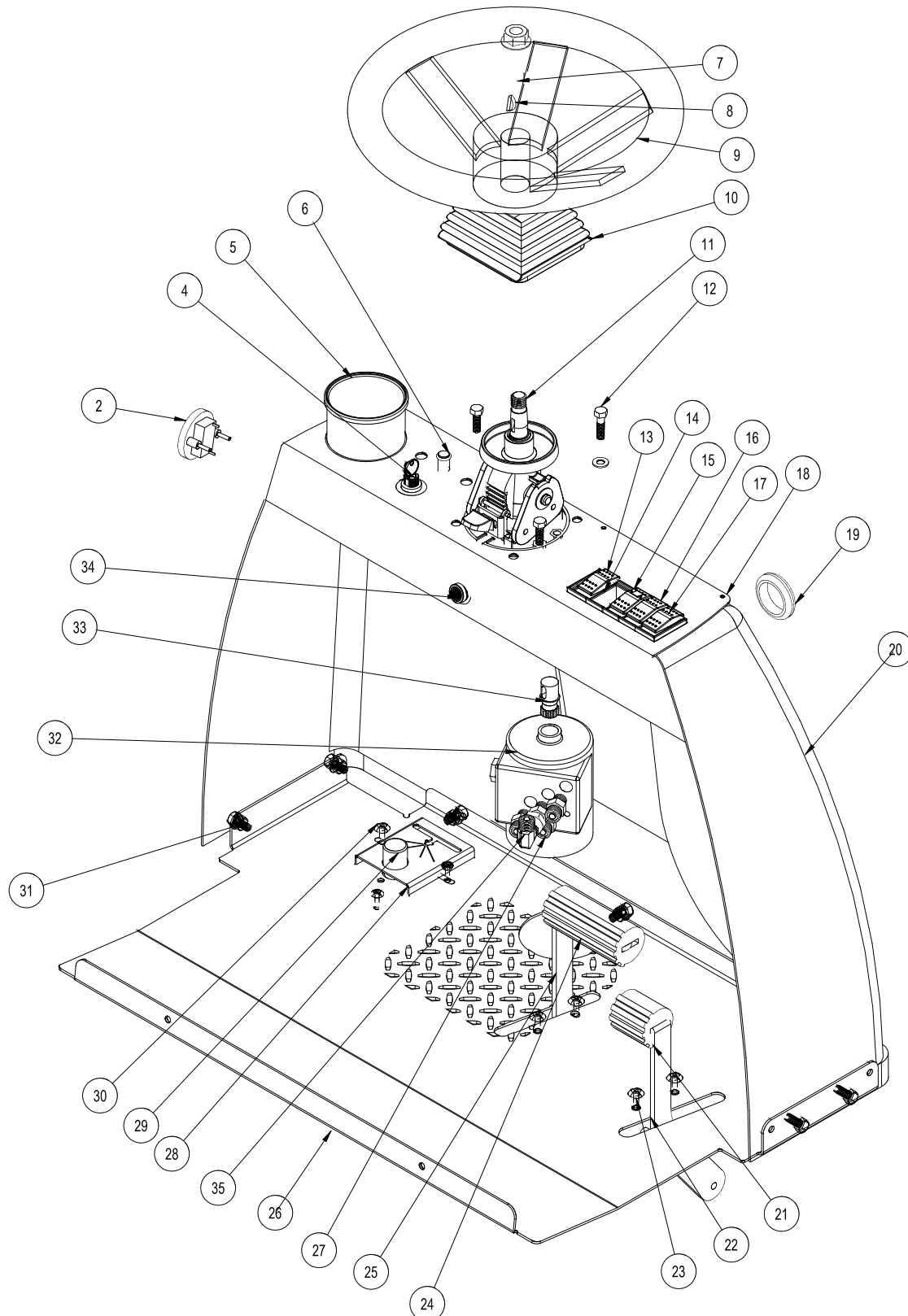
BODY & FRAME DRAWING



BODY & FRAME PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------------|--|----------|
| 1 | 10-111 | 110 Gallon Poly Tank | 1 |
| | 14-532 | Lid | 1 |
| 2 | 10-404 | Roll Bar | 1 |
| 3 | 10-410 | Left Tank Strap | 1 |
| 4 | 10-382 | Back Panel | 1 |
| | 9023 | Heat Reflective Matting (18 x 25.5) | 1 |
| 5 | 14-519 | Seat | 1 |
| | 14-292 | Seat Switch | 1 |
| | HB-516-18-125 | Bolt ⁵ / ₁₆ - 18 x 1 ¹ / ₄ | 4 |
| | HW-516 | Washer ⁵ / ₁₆ | 4 |
| | HWL-516 | Lock Washer ⁵ / ₁₆ | 4 |
| | HN-516-18 | Nut ⁵ / ₁₆ - 18 | 4 |
| 6 | 10-228 | Spray Boss Handle | 1 |
| 7 | 10-392 | Left Front Fender | 1 |
| 8 | 10-202 | Speedometer | 1 |
| 9 | 13-718 | Steering Wheel | 1 |
| 10 | 15-763 | Nose Cone | 1 |
| 11 | 50-400 | Rubber Grommet | 1 |
| 12 | 27-055 | Seat Hinge | 2 |
| 13 | 80-020 | Choke | 1 |
| 14 | 34-160 | Throttle Control with Cable | 1 |
| 15 | 60-106 | Park Brake Handle | 1 |
| 16 | 16-857 | Tire and Wheel | 2 |
| | 16-857-01 | Tire 20 x 10 - 10NHS 4 Ply | 2 |
| | 16-857-02 | Wheel | 2 |
| 17 | 76-198-03 | Seat Belt | 1 |
| 18 | 10-391 | Right Front Fender | 1 |
| 19 | 34-105 | Oil Cooler | 1 |
| | 10-395 | Cooler Mount | 1 |
| | 18-352 | Female Swivel Fitting | 2 |
| 20 | 15-781 | Drink Cup Holder | 1 |
| 21 | 10-383 | Right Side Panel | 1 |
| | 10-384 | Left Side Panel | 1 |
| 22 | 10-400 | Gas Tank Bracket | 1 |
| 23 | 73-051 | Gas Tank Strap | 2 |
| 24 | 73-049 | Fuel Tank | 1 |
| 25 | 73-050 | Fuel Cap | 1 |
| 26 | 10-114 | Tire and Wheel | 2 |
| | 10-114-01 | Tire 24-12-12NHS | 2 |
| | 10-114-02 | Wheel | 2 |
| 27 | 10-168 | Rear Fender | 2 |
| | HBCL-516-18-100 | Low Carriage Bolt ⁵ / ₁₆ - 18 x 1 | 8 |
| | HNFL-516-18 | Flange-Loc Nut ⁵ / ₁₆ - 18 | 8 |
| 28 | 22-528 | Right Tank Strap | 1 |
| 29 | 34-201 | Lights | 2 |

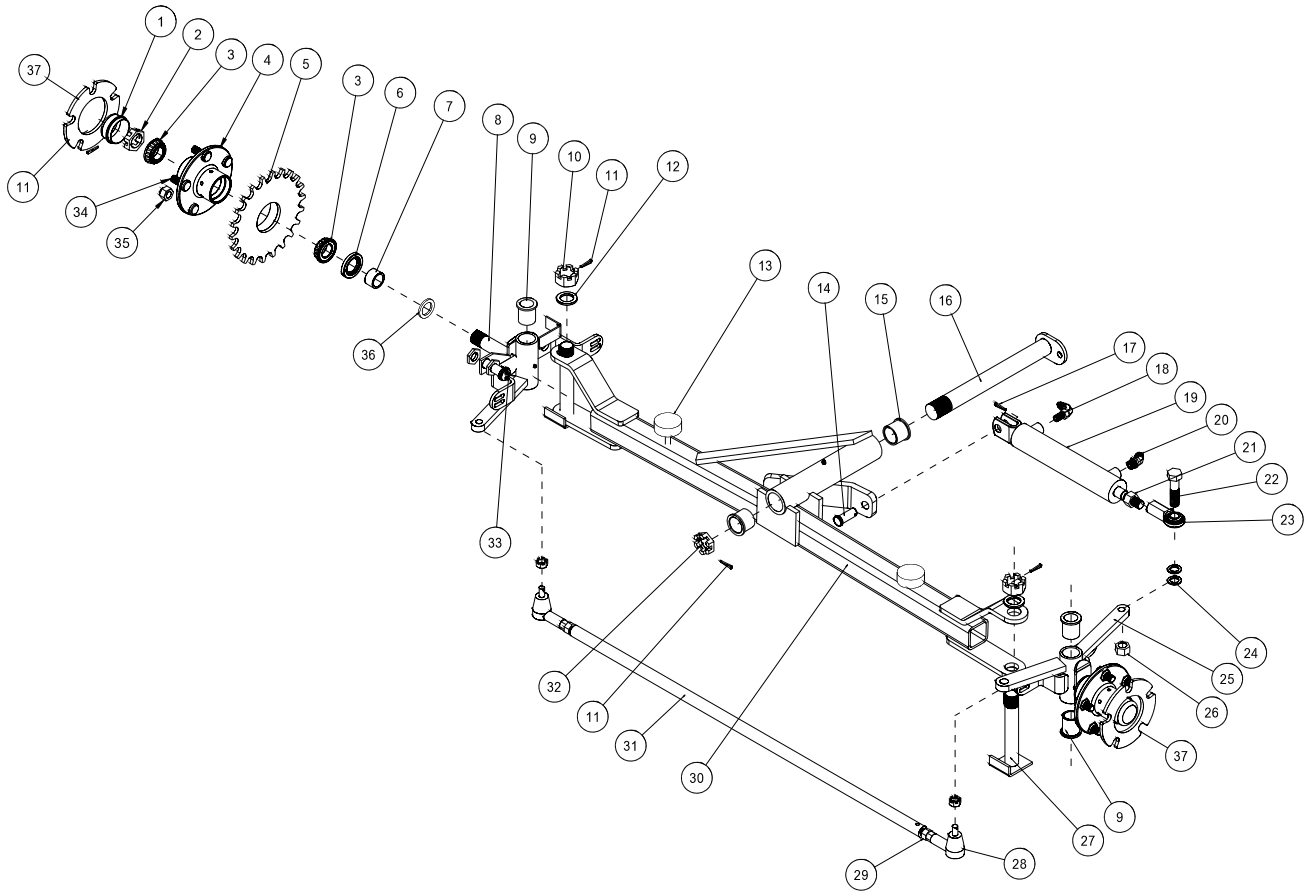
NOSE CONE DRAWING



NOSE CONE PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------------|--|----------|
| 2 | 12-017 | Hour meter | 1 |
| 4 | 13-488 | Key Switch | 1 |
| 5 | 10-202 | Speedometer | 1 |
| 6 | 50-359 | Oil Warning Indicator Light | 1 |
| 7 | HNJ-58-18 | Jam Nut $\frac{5}{8}$ - 18 | 1 |
| 8 | HWK-316-075 | Woodruff Key $\frac{3}{16}$ - $\frac{3}{4}$ | 1 |
| 9 | 13-718 | Steering Wheel | 1 |
| | 13-726 | Steering Wheel Cap | 1 |
| 10 | 76-364 | Black Boot | 1 |
| 11 | 76-362 | Mini Tilt Steering Mechanism | 1 |
| 12 | HB-516-18-100 | Bolt $\frac{5}{16}$ - 18 x 1 | 4 |
| | HW-516 | Washer $\frac{5}{16}$ - 18 | 8 |
| | HNFL-516-18 | Flange-Loc Nut $\frac{5}{16}$ | 4 |
| 13 | 15-725 | Mount Panel End | 1 |
| | 15-727 | Switch Actuator | 1 |
| | 15-782 | Rocker Switch, Unlit | 1 |
| 14 | 15-729 | Mount Panel Middle | 1 |
| | 15-730 | Mount Panel Plug | 1 |
| 15 | 15-729 | Mount Panel Middle | 1 |
| | 15-726 | Switch Body, Light | 1 |
| | 15-731 | Actuator, Amber | 1 |
| 16 | 15-729 | Mount Panel Middle | 1 |
| | 15-727 | Switch Actuator | 1 |
| | 15-728 | Switch Body, On-Off-On | 1 |
| 17 | 15-725 | Mount Panel End | 1 |
| | 15-727 | Switch Actuator | 1 |
| | 15-728 | Switch Body, On-Off-On | 1 |
| 18 | 15-754 | Dash Panel | 1 |
| | 15-672 | Decal, Dashboard | 1 |
| | HSM-10-32-100 | Machine Screw #10 -32 x 1 | 4 |
| | HW-14 | Washer 1/4 | 4 |
| | HNFL-10-32 | Flange loc Nut #10 -32 | 4 |
| 19 | 50-400 | Rubber Grommet | 1 |
| 20 | 15-763 | Console | 1 |
| 21 | 48-132 | Short Pedal Pad | 1 |
| 22 | 10-164 | Reverse Pedal | 1 |
| 23 | HSTP-516-18-100 | Machine Screw $\frac{5}{16}$ - 18 x 1 | 4 |
| | HNFL-516-18 | Flange-Loc Nut $\frac{5}{16}$ - 18 | 4 |
| 24 | 48-066 | Pedal Pad | 1 |
| 25 | 10-163 | Forward Foot Pedal | 1 |
| 26 | 10-403 | Main Frame | 1 |
| 27 | 18-306 | $\frac{11}{16}$ X $\frac{9}{16}$ Straight Thread Connector | 4 |
| 28 | 15-758 | Spray Switch Plate (440 System (1008)) | 1 |
| 29 | 33-509 | Master Boom Switch (440 System (1008)) | 1 |
| 30 | HBM-6-1-16 | Metric Bolt #6 - 1 x 16 | 2 |
| 31 | HSTP-516-18-100 | Machine Screw $\frac{5}{16}$ - 18 x 1 | 7 |
| | HNFL-516-18 | Flange Loc Nut $\frac{5}{16}$ - 18 | 7 |
| 32 | 15-301 | Orbitrol | 1 |
| 33 | 48-187 | Stub Shaft | 1 |
| 34 | 77-207 | Buzzer | 1 |
| 35 | 18-309 | Swivel Nut Elbow | 1 |

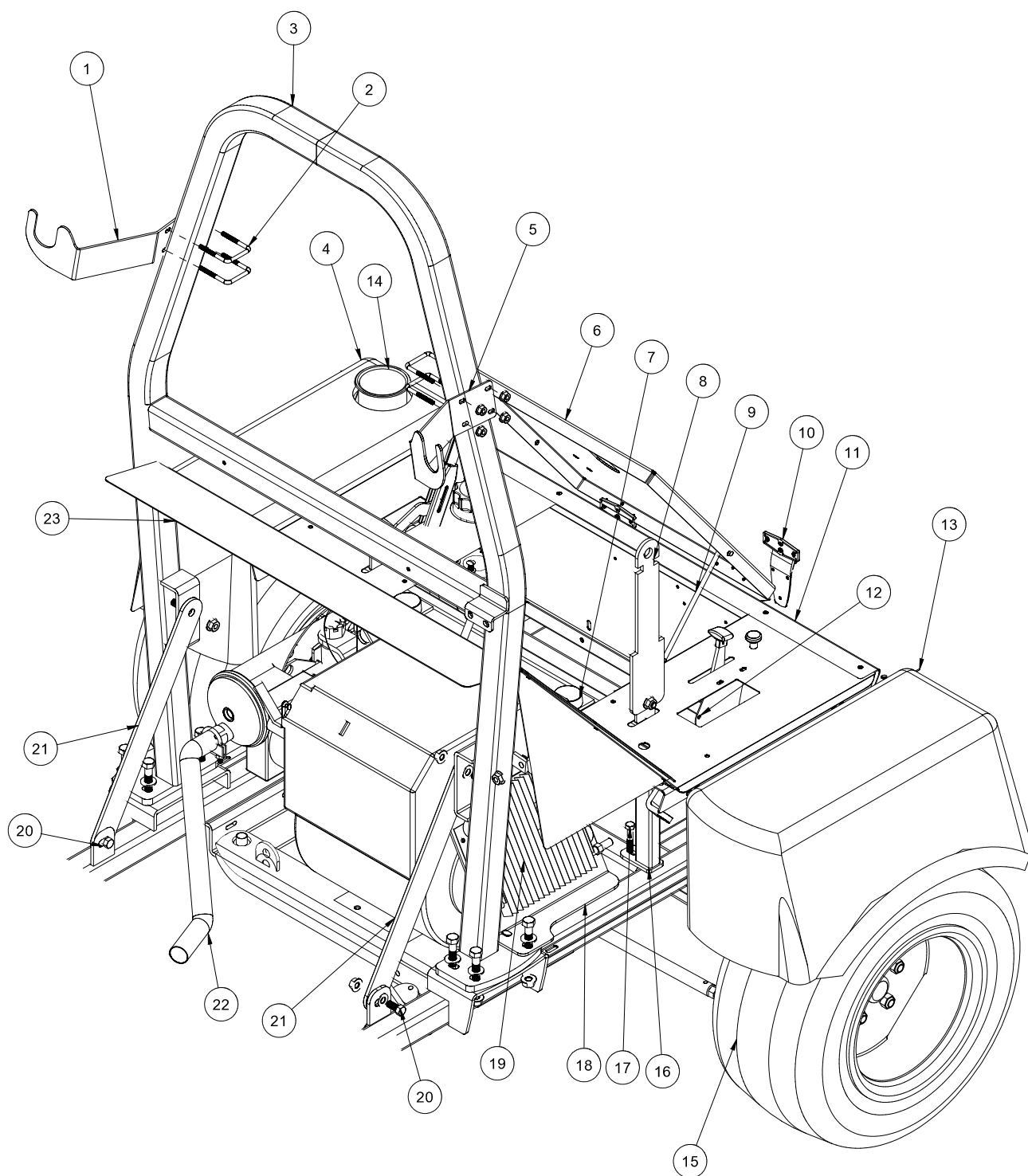
FRONT AXLE DRAWING



FRONT AXLE PARTSLIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|------------------|--|----------|
| 1* | 80-167 | Dust Cap | 2 |
| 2 | HNAR-100-14 | Slotted Jam Nut 1 - 14 | 2 |
| 3* | 11-043 | Bearing | 4 |
| 4* | 80-019 | Hub (includes * items Ref# 1,3,6,34 & 35) | 2 |
| 5 | 10-265 | Hub with Sprocket | 1 |
| | HSSHS-516-18-038 | Socket Head Set Screw $\frac{5}{16}$ -18 x $\frac{3}{8}$ | 1 |
| 6* | 11-041 | Oil Seal | 2 |
| 7 | 11-042 | Spacer | 2 |
| 8 | 10-294 | Left Spindle | 1 |
| | HG-14-28-180 | Grease Fitting $\frac{1}{4}$ - 28 x 180° | 1 |
| 9 | 18-035 | Bushing (part of 10-294 -and 10-295; 2 per) | 4 |
| 10 | HNA-100-14 | Slotted Nut 1 - 14 | 2 |
| 11 | HP-18-150 | Cotter Pin $\frac{1}{8}$ - $1\frac{1}{2}$ | 4 |
| 12 | HMB-100-14 | Machine Bushing 1 x 14GA | 2 |
| 13 | 50-081 | Rubber Insulator | 2 |
| 14 | HCP-58-175 | Clevis Pin $\frac{5}{8}$ - $1\frac{3}{4}$ | 1 |
| 15 | 18-153 | Bushing (part of 10-131) | 2 |
| 16 | 10-138 | Axle Pin | 1 |
| 17 | HP-18-100 | Cotter Pin $\frac{1}{8}$ x 1 | 1 |
| 18 | 18-307 | $1\frac{1}{16}$ x $\frac{9}{16}$ 45° Straight Thread Elbow | 1 |
| 19 | 10-135 | Hydraulic Cylinder | 1 |
| | 14-267 | Seal Kit | 1 |
| 20 | 18-171 | $1\frac{1}{16}$ x $\frac{9}{16}$ 90° Straight Thread Elbow | 1 |
| 21 | HNJ-58-18 | Jam Nut $\frac{5}{8}$ - 18 | 1 |
| 22 | HB-58-11-250 | Bolt $\frac{5}{8}$ - 11 x $2\frac{1}{2}$ | 1 |
| 23 | 18-154 | Rod End | 1 |
| 24 | HMB-58-14 | Machine Bushing $\frac{5}{8}$ x 14GA | 2 |
| 25 | 10-295 | Right Spindle | 1 |
| | HG-14-28-180 | Grease Fitting $\frac{1}{4}$ - 28 x 180° | 1 |
| 26 | HNTL-58-11 | Lock Nut $\frac{5}{8}$ - 11 | 1 |
| 27 | 16-076 | King Pin | 2 |
| 28 | 16-565 | Rod End | 2 |
| 29 | HNM-12-1.25 | Metric Nut M12 - 1.25 | 2 |
| 30 | 10-131 | Front Axle | 1 |
| | HG-14-28-180 | Grease Fitting $\frac{1}{4}$ - 28 x 180° | 1 |
| 31 | 10-139 | Tie Rod | 1 |
| 32 | HNAT-114-12 | Thick Slotted Nut $1\frac{1}{4}$ -12 | 1 |
| 33 | 16-883 | Magnetic Sensor | 1 |
| | HNJ-34-16 | Jam Nut $\frac{3}{4}$ - 16 | 1 |
| 34* | 27-022-02 | Stud $\frac{1}{2}$ - 20 | 10 |
| 35* | HNL-12-20 | Lug Nut $\frac{1}{2}$ - 20 | 10 |
| 36 | HMB-100-10 | Machine Bushing 1 x 10GA | 2 |
| 37 | 10-327 | Shim | 2 |

SEAT CONSOLE AND ROPS DRAWING

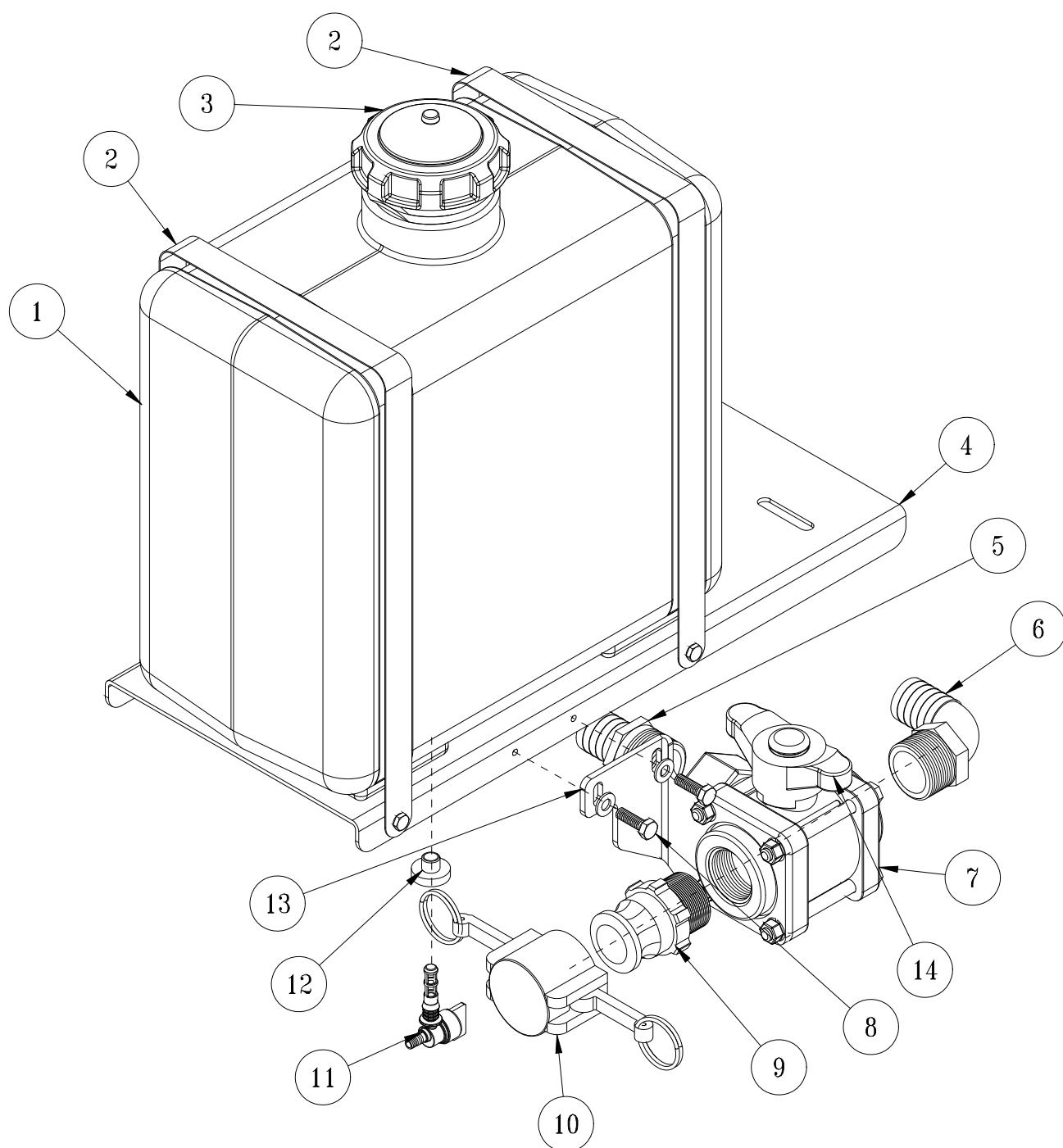


Parts

SEAT CONSOLE AND ROPS PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|------------------|--|----------|
| 1 | 15-710 | Left Boom Holder | 1 |
| 2 | 10-194 | U-Bolt | 4 |
| | HNFL-14-20 | Flange-Loc Nut $\frac{1}{4}$ - 20 | 8 |
| 3 | 10-404 | Roll Bar | 1 |
| 4 | 10-392 | Left Front Fender | 1 |
| 5 | 15-709 | Right Boom Holder | 1 |
| 6 | 10-388 | Seat Panel | 1 |
| 7 | 50-081 | Rubber Bumper | 2 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 2 |
| 8 | 76-198-03 | Seat Belt | 1 |
| 9 | 15-786 | Hood Rod | 1 |
| | HW-38 | Washer $\frac{3}{8}$ | 4 |
| | HP-18-075 | Cotter Pin $\frac{1}{8}$ x $\frac{3}{4}$ | 2 |
| 10 | 27-055 | Hinge | 2 |
| | HSMFCS-10-32-063 | Flat Head Machine Screw #10 - 32 x $\frac{5}{8}$ | 12 |
| | HNFL-10-32 | Flange-Loc Nut #10 - 32 | 12 |
| 11 | 10-385 | Front Panel | 1 |
| 12 | 42-766 | Throttle Bracket | 1 |
| 13 | 10-391 | Right Front Fender | 1 |
| 14 | 15-781 | Cup Holder | 1 |
| 15 | 16-857 | Front Tire and Wheel | 2 |
| 16 | 10-338 | Seat Panel | 1 |
| 17 | HB-38-16-300 | Bolt $\frac{3}{8}$ - 16 x 3 | 2 |
| | HNFL-38-16 | Flange-Loc Nut $\frac{3}{8}$ - 16 | 2 |
| 18 | 10-395 | Cooler Mount | 1 |
| 19 | 34-105 | Oil Cooler | 1 |
| | 18-352 | Female Swivel Fitting | 2 |
| 20 | HB-12-13-150 | Bolt $\frac{1}{2}$ - 1 3 x $1\frac{1}{2}$ | 4 |
| | HNTL-12-13 | Loc Nut $\frac{1}{2}$ - 13 | 4 |
| 21 | 10-398 | Roll Bar Brace | 2 |
| 22 | 10-380 | Tailpipe | 1 |
| 23 | 10-382 | Back Panel | 1 |
| | 9023 | Heat Reflective Matting (18 x 25.5) | 1 |

FUEL TANK DRAWING

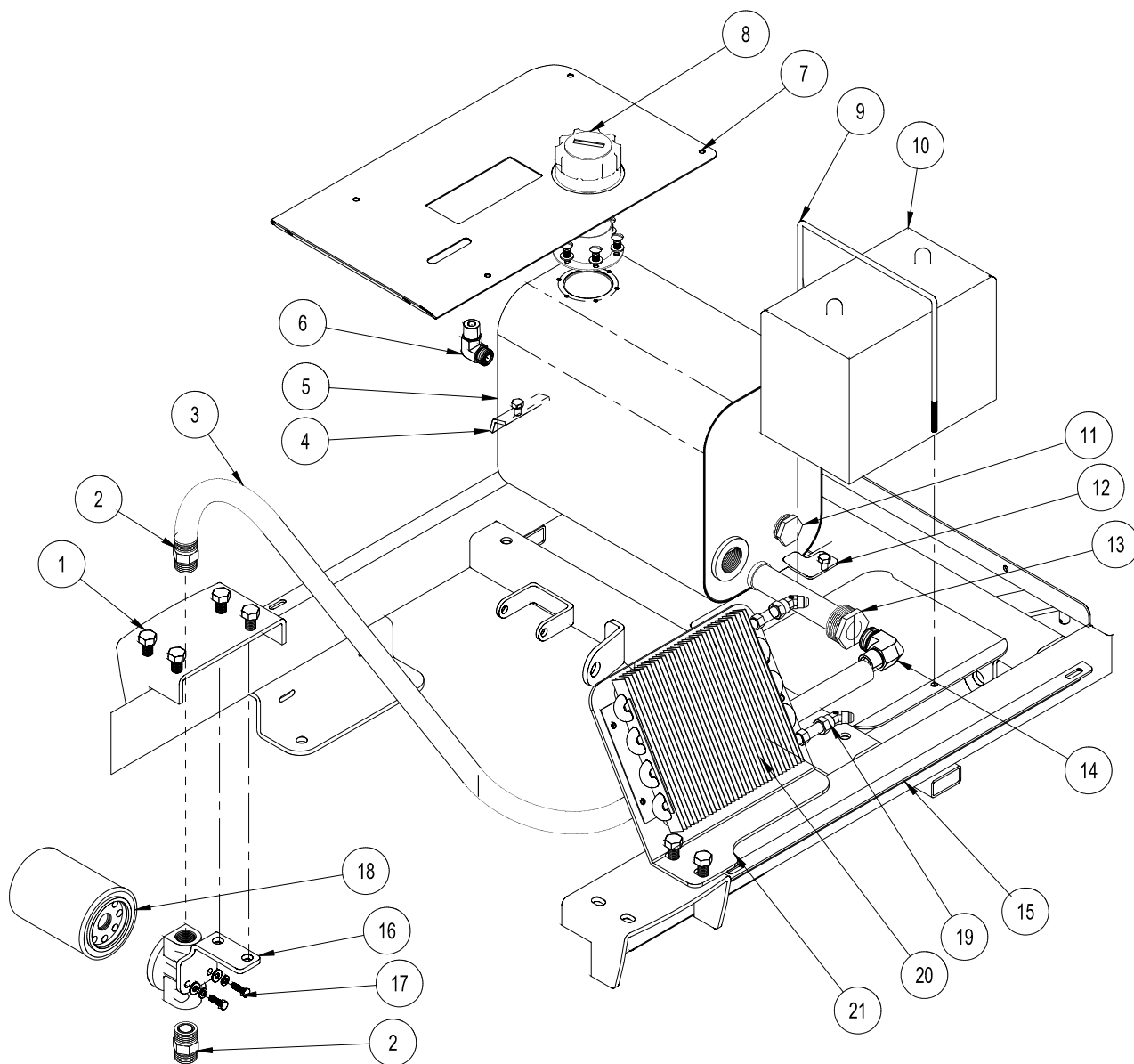


FUEL TANK PARTSLIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|--|----------|
| 1 | 73-049 | Fuel Tank | 1 |
| 2 | 73-051 | Tank Strap | 2 |
| | HB-14-20-100 | Bolt $\frac{1}{4}$ - 20 x 1 | 2 |
| | HB-14-20-075 | Bolt $\frac{1}{4}$ - 20 x $\frac{3}{4}$ | 2 |
| | HNTL-14-20 | Lock Nut $\frac{1}{4}$ - 20 | 4 |
| 3 | 73-050 | Fuel Cap | 1 |
| 4 | 10-400 | Gas Tank Bracket | 1 |
| 5 | 16-161 | Fitting $1\frac{1}{4}$ MPT x $1\frac{1}{4}$ HB | 1 |
| 6 | 16-156 | Elbow $1\frac{1}{4}$ MPT x $1\frac{1}{4}$ HB | 1 |
| 7 | 18-372 | 3-Way Ball Valve | 1 |
| 8 | HB-516-18-100 | Bolt $\frac{5}{16}$ - 18 x 1 | 2 |
| | HW-516 | Washer $\frac{5}{16}$ | 2 |
| | HNTL -516-18 | Lock Nut $\frac{5}{16}$ - 18 | 2 |
| 9 | 16-180 | Quick Coupler, $1\frac{1}{4}$ Male | 1 |
| 10 | 16-935 | Quick Coupler Cap | 1 |
| 11 | 26-055 | Shut -Off Valve | 1 |
| 12 | 26-054 | Bushing Insert | 1 |
| 13 | 10-396 | Valve Mount | 1 |
| 14 | 18-372-01 | T-Handle | 1 |

OIL TANK-OIL FILTER-OIL COOLER DRAWING

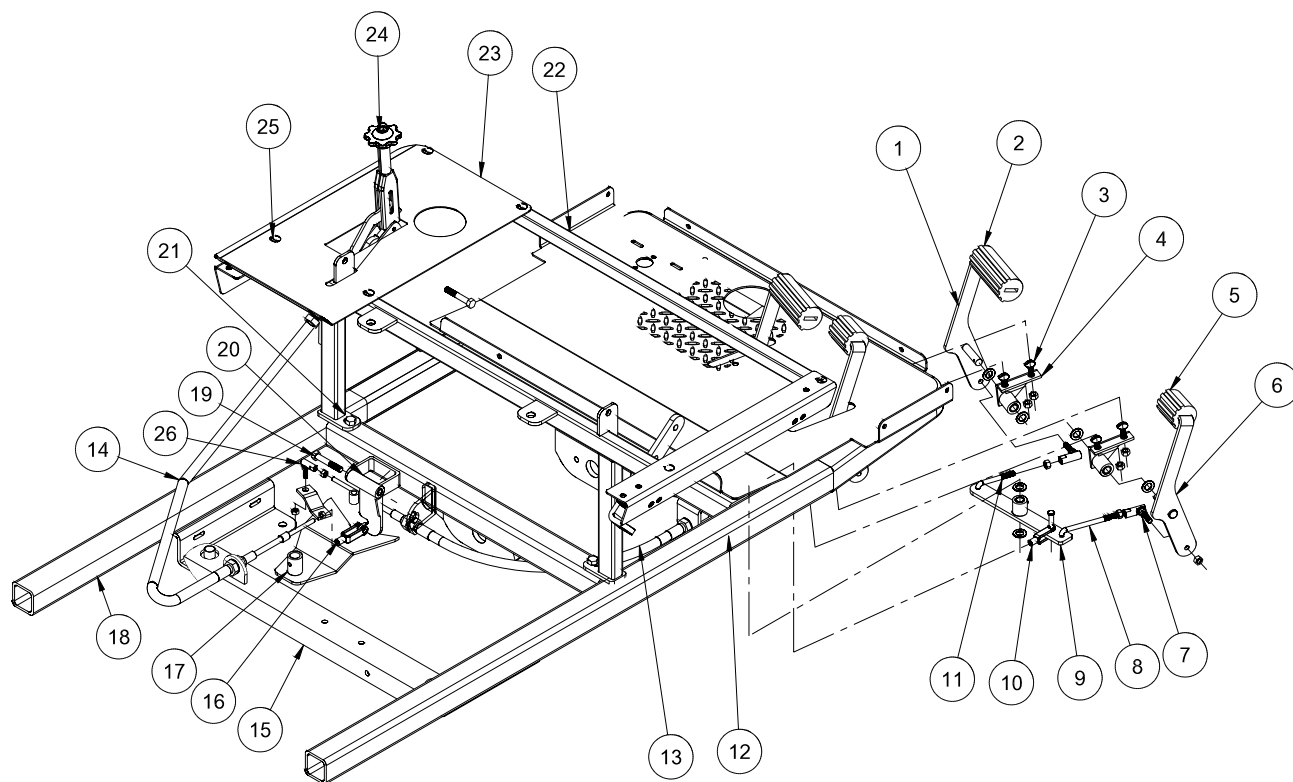
Parts



OIL TANK-OIL FILTER-OIL COOLER PARTS LIST

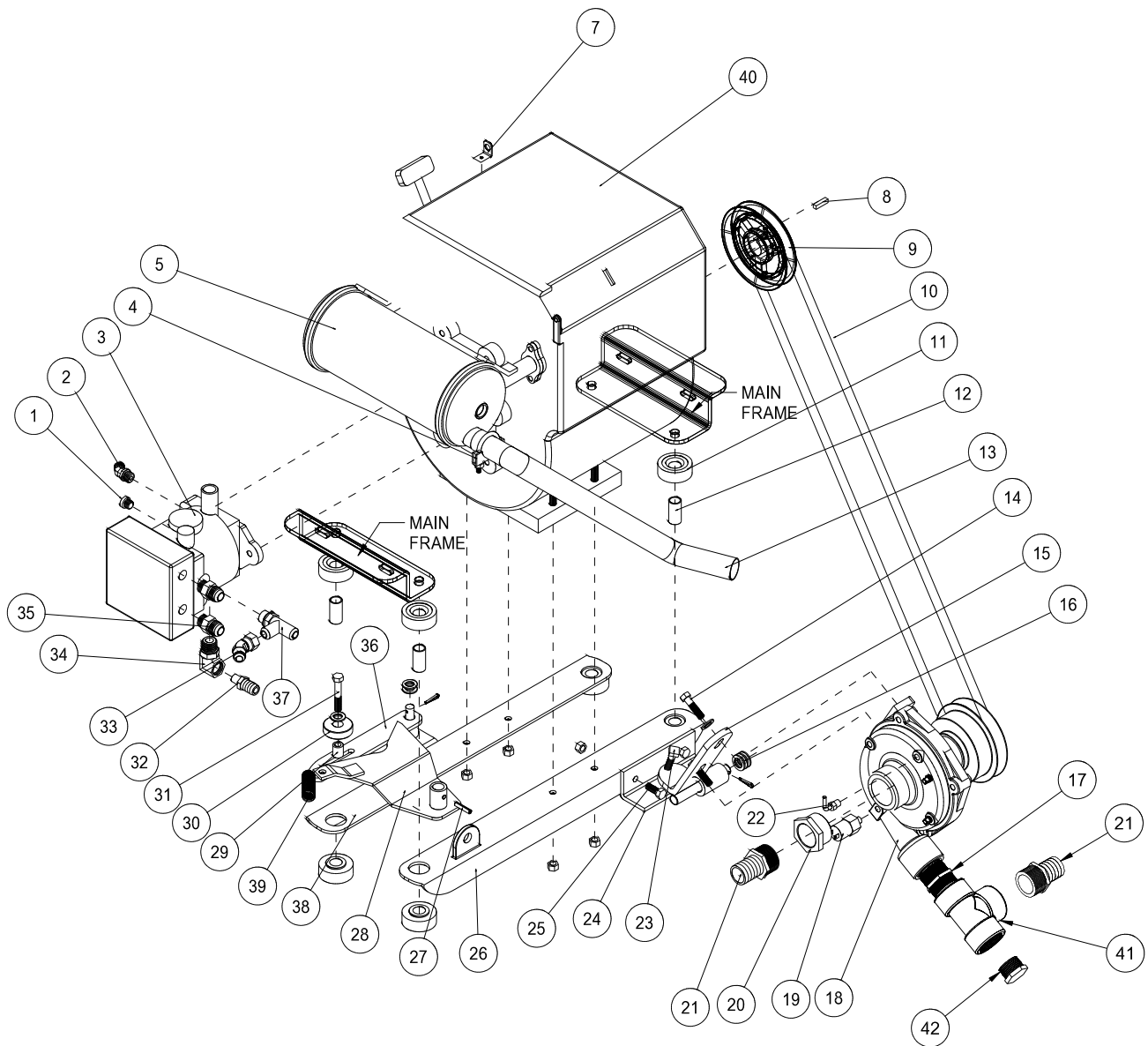
| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|---|----------|
| 1 | HB--12-13-175 | Bolt $\frac{1}{2}$ - 13 x $\frac{3}{4}$ | 8 |
| | HW-12 | Washer $\frac{1}{2}$ | 8 |
| | HNTL-12-13 | Lock Nut $\frac{1}{4}$ - 13 | 8 |
| 2 | 18-311 | Straight Thread Connector | 2 |
| 3 | 10-375 | Hydraulic Hose | 1 |
| 4 | 76-792 | Tank Hold-down | 1 |
| | HB-516-18-150 | Bolt $\frac{5}{16}$ - 18 x 1- $\frac{1}{2}$ | 1 |
| | HW-516 | Washer $\frac{5}{16}$ | 1 |
| | HNTL-516-18 | Lock Nut $\frac{5}{16}$ - 18 | 1 |
| 5 | 60-473 | Hydraulic Oil Tank | 1 |
| | 18-118 | $\frac{1}{8}$ " Pipe Plug | 1 |
| 6 | 18-413 | 90° Male Elbow | 1 |
| 7 | 10-387 | Left Side Panel | 1 |
| 8 | 13-747 | Filler Breather | 1 |
| | 13-586-03 | Neck | 1 |
| | 13-586-01 | Gasket | 1 |
| | HSM-10-32-063 | Machine Screw 10- 32 x $\frac{5}{8}$ | 6 |
| | HWL-10 | Lock washer #10 | 6 |
| 9 | 10-393 | Battery Hold Down | 1 |
| 10 | 33-216 | Battery | 1 |
| 11 | 18-069 | $\frac{1}{2}$ " Pipe Plug | 1 |
| 12 | 10-394 | Tank Hold-down | 1 |
| 13 | 60-213 | Strainer | 1 |
| 14 | 18-412 | 90° Male Elbow | 1 |
| 15 | 10-403 | Main Frame | 1 |
| 16 | 10-402 | Oil Filter Bracket | 1 |
| 17 | HB-14-20-075 | Bolt $\frac{1}{4}$ - 20 x $\frac{3}{4}$ | 2 |
| | HW-14 | Washer $\frac{1}{4}$ | 2 |
| | HWL-14 | Lockwasher $\frac{1}{4}$ | 2 |
| 18 | 15-626 | Oil Filter | 1 |
| | 15-626-01 | Replacement Filter | |
| 19 | 18-352 | 37° Female Swivel | 2 |
| 20 | 42-265 | Oil Cooler | 1 |
| 21 | 10-395 | Cooler Mount | 1 |

FOOT PEDAL LINKAGE DRAWING



FOOT PEDAL LINKAGE PARTS LIST

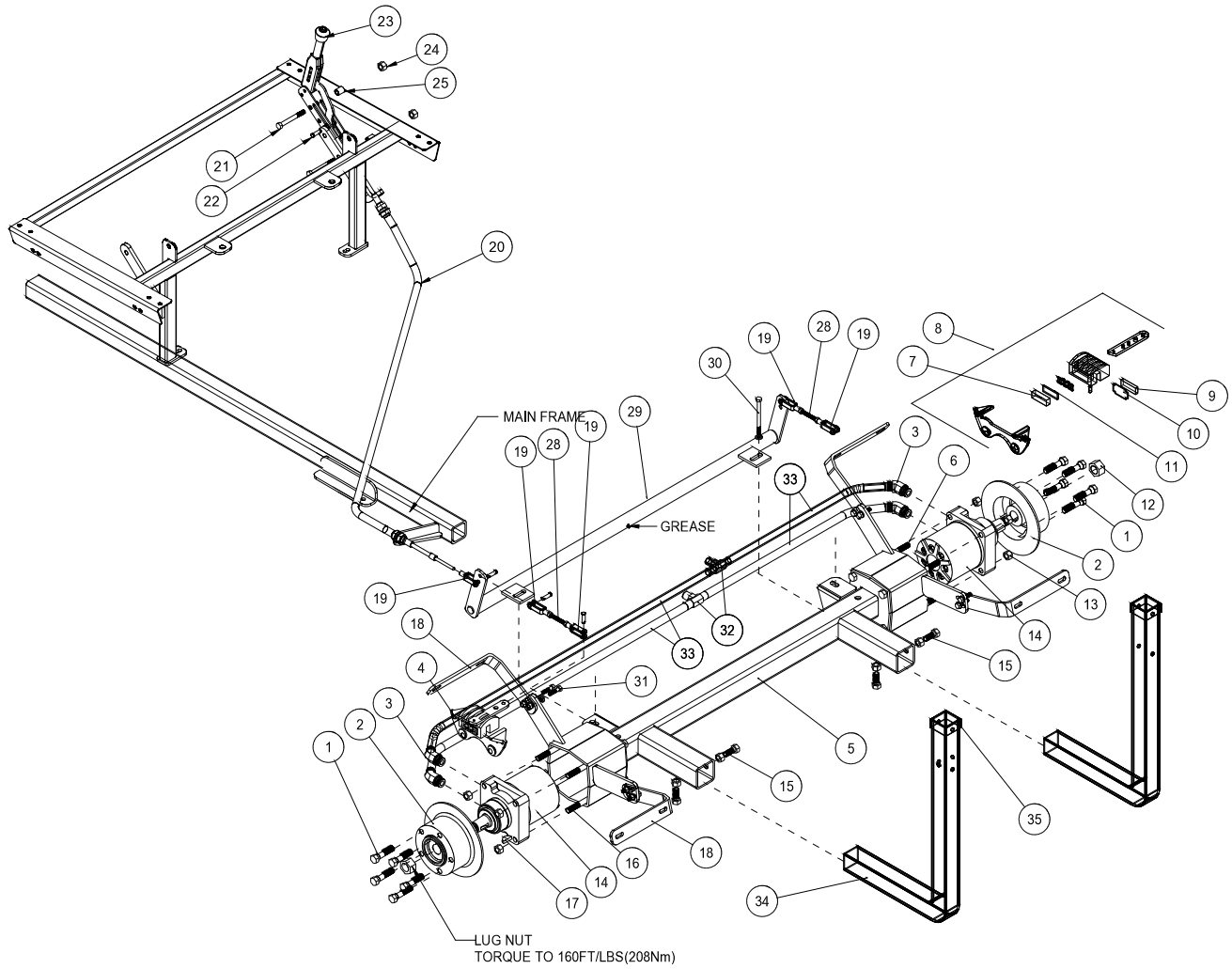
| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------------|--|----------|
| 1 | 10-163 | Forward Foot Pedal | 1 |
| | HMB-12-14 | Machine Bushing $\frac{1}{2}$ x 14GA | 2 |
| 2 | 48-066 | Pedal Pad | 1 |
| 3 | HSTP-516-18-100 | Truss Head Screw $\frac{5}{16}$ - 18 x 1 | 4 |
| | HNTL-516-18 | Lock Nut $\frac{5}{16}$ - 18 | 4 |
| 4 | 76-296 | Pedal Mount | 2 |
| | 18-234 | Bushing (part of 76-296) | 4 |
| | HG-14-28-180 | Grease Fitting $\frac{1}{4}$ - 28 x 180° (part of 76-296) | 2 |
| 5 | 48-132 | Short Pedal Pad | 1 |
| 6 | 10-164 | Reverse Foot Pedal | 1 |
| | HMB-12-14 | Machine Bushing $\frac{1}{2}$ x 14GA | 2 |
| 7 | 21-462 | Ball Joint | 2 |
| | HN-516-24 | Nut $\frac{5}{16}$ - 24 | 2 |
| 8 | 10-420 | Reverse Linkage | 1 |
| | HN-516-24 | Nut $\frac{5}{16}$ - 24 | 1 |
| 9 | 10-178 | Relay | 1 |
| | 18-234 | Bushing (part of 10-178) | 2 |
| | HG-14-28-180 | Grease Fitting $\frac{1}{4}$ - 28 x 180° (part of 10-178) | 1 |
| | HMB-12-14 | Machine Bushing $\frac{1}{2}$ x 14GA | 2 |
| | HP-18-100 | Cotter Pin $\frac{1}{8}$ x 1 | 1 |
| 10 | 11-103 | Linkage yoke $\frac{1}{4}$ NF | 2 |
| | HCP-14-075 | Clevis Pin $\frac{1}{4}$ x $\frac{3}{4}$ | 2 |
| | HP-332-075 | Cotter Pin $\frac{3}{32}$ x $\frac{3}{4}$ | 2 |
| 11 | 10-148 | Forward Linkage | 1 |
| | HN-516-24 | Nut $\frac{5}{16}$ - 24 | 1 |
| 12 | HB-516-18-400 | Bolt $\frac{5}{16}$ - 18 x 4 | 2 |
| | HNTL-516-18 | Lock Nut $\frac{5}{16}$ - 18 | 2 |
| 13 | 42-063 | Cable with nuts | 1 |
| 14 | 10-190 | Cable, Spray Boss Control | 1 |
| 15 | 10-166 | Rear Engine Mount | 1 |
| 16 | 11-100 | Yoke $\frac{5}{16}$ | 2 |
| | HN-516-24 | Nut $\frac{5}{16}$ - 24 | 2 |
| | HCP-516-100 | Clevis Pin $\frac{5}{16}$ x 1 | 2 |
| | HP-18-100 | Cotter Pin $\frac{1}{8}$ x 1 | 2 |
| 17 | 10-151 | Swash Plate | 1 |
| 18 | 10-403 | Main Frame | 1 |
| 19 | HB-38-16-350 | Bolt $\frac{3}{8}$ - 16 x $3\frac{1}{2}$ | 1 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 1 |
| 20 | 10-189 | Speed Boss | 1 |
| | 18-289 | Bushing (part of 10-189) | 2 |
| 21 | HB-38-16-300 | Bolt $\frac{3}{8}$ - 16 x 3 | 2 |
| | HNFL-38-16 | Flange-Loc Nut $\frac{3}{8}$ - 16 | 2 |
| 22 | 10-401 | Seat Frame | 1 |
| 23 | 10-386 | Right Side Panel | 1 |
| 24 | 10-228 | Spray Boss Control | 1 |
| | 10-134 | Spacer | 2 |
| 25 | HSTP-14-20-075 | Phillips Truss Head Machine Screw $\frac{1}{4}$ - 20 x $\frac{3}{4}$ | 2 |
| | HNFL-14-20 | Flange-Loc Nut $\frac{1}{4}$ - 20 | 2 |
| 26 | 18-115 | Ball Joint, $\frac{1}{4}$ NF | 1 |
| | HWL-14 | Lockwasher $\frac{1}{4}$ | 1 |
| | HN-14-28 | Nut $\frac{1}{4}$ - 28 | 2 |



ENGINE, PUMPS AND EXHAUST PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|----------------|---|----------|
| 1 | 23-126 | O-Ring Plug | 1 |
| 2 | 18-307 | 45° Straight Thread Elbow $1^{1/16} \times 9^{9/16}$ | 1 |
| 3 | 10-117 | Hydrostatic Pump | 1 |
| | HSSH-12-13-175 | Socket Screw $1/2 - 13 \times 1^{3/4}$ | 2 |
| 4 | 18-220 | Muffler Clamp $1^{1/4}$ | 1 |
| 5 | 10-118-01 | Muffler (Kohler 24 786 11) | 1 |
| 7 | 34-163 | Cable Bracket | 1 |
| 8 | HKSQ-14-100 | Machine Key $1/4 \times 1/4 \times 1$ | 1 |
| 9 | 10-212 | Pulley BK57 | 1 |
| 10 | 10-179 | Belt | 1 |
| 11 | 60-107 | Rubber Bushing | 8 |
| 12 | 60-168 | Spacer | 4 |
| 13 | 10-380 | Tailpipe | 1 |
| 14 | HB-38-16-175 | Bolt $3/8 - 16 \times 1^{3/4}$ | 2 |
| | HW-38 | Washer $3/8$ | 2 |
| | HNTL-38-16 | Lock Nut $3/8 - 16$ | 2 |
| 15 | 10-338 | Pump Mount | 1 |
| 16 | HMB-58-14 | Machine Bushing $5/8 \times 14GA$ | 3 |
| | HHP-18-100 | Bridge Pin $1/8 \times 1$ | 1 |
| 17 | 16-880 | Poly Close Nipple | 1 |
| 18 | 16-998 | Hypro® Pump | 1 |
| 19 | 33-480 | Pressure Switch | 1 |
| 20 | 16-825 | Stainless Steel Reducer Bushing $1^{1/2} \times 1^{1/4}$ | 1 |
| 21 | 16-161 | Fitting $1^{1/4} MPT \times 1^{1/4} HB$ | 2 |
| 22 | 33-494 | Male Elbow | 1 |
| 23 | HSSQ-38-16-150 | Adjustment Screw $3/8 - 16 \times 1^{1/2}$ | 1 |
| | HN-38-16 | Nut $3/8 - 16$ | 1 |
| 24 | 10-133 | Pivot | 1 |
| | HG-14-28-180 | Grease Fitting $1/4 - 28 \times 180^\circ$ (part of 10-133) | 1 |
| | 18-268 | Bushing (part of 10-133) | 2 |
| 25 | HB-38-16-100 | Bolt $3/8 - 16 \times 1$ | 2 |
| | HNTL-38-16 | Lock Nut $3/8 - 16$ | 2 |
| 26 | 10-166 | Rear Engine Mount | 1 |
| 27 | HRP-14-100 | Roll Pin $1/4 \times 1$ | 1 |
| 28 | 10-151 | Swash Plate | 1 |
| 29 | 10-134 | Spacer | 1 |
| 30 | 14-266 | Ball Bearing $1^{3/4} OD \times 5/8 ID$ | 1 |
| | 18-270 | Oilite Bushing $5/8 OD \times 3/8 ID$ | 1 |
| 31 | HB-38-16-225 | Bolt $3/8 - 16 \times 2^{1/4}$ | 1 |
| | HNTL-38-16 | Lock Nut $3/8 - 16$ | 1 |
| 34 | 18-313 | 90° Straight Thread Elbow $1^{3/16} \times 3/4$ | 1 |
| 35 | 18-303 | Straight Thread Connector $1 \times 3/4$ | 2 |
| 36 | 10-136 | Idler Arm | 1 |
| | 18-234 | Oilite Bushing (part of 10-136) | 2 |
| | HG-14-28-180 | Grease Fitting $1/4 - 28 \times 180^\circ$ (part of 10-136) | 1 |
| | HMB-12-14 | Machine Bushing $1/2 - 14GA$ | 2 |
| | HP-18-100 | Cotter Pin $1/8 \times 1$ | 1 |
| 37 | 18-304 | Union Tee $1^{3/16} \times 3/4 \times 1^{3/16}$ | 1 |
| 38 | 10-177 | Front Engine Mount | 1 |
| 39 | 21-212 | Spring | 1 |
| 40 | 10-118 | Engine Kohler 25 hp | 1 |
| | 76-324-03 | Crankshaft Splined Insert (part of engine) | 1 |
| 41 | 18-390 | $1^{1/4}$ Pipe Tee | 1 |
| 42 | 10-389 | $1^{1/4}$ Plug | 1 |

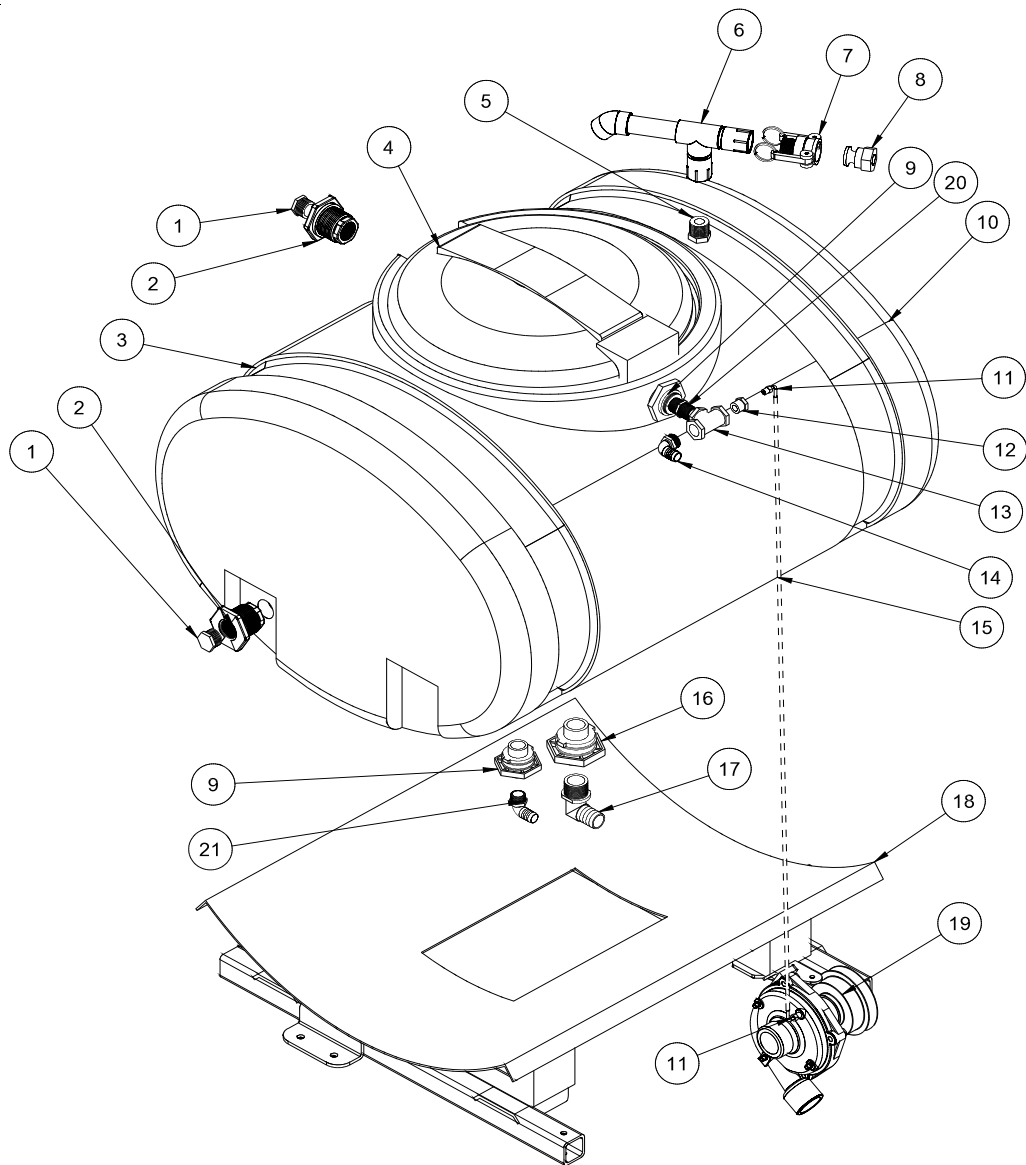
PARK BRAKE AND REAR AXLE DRAWING



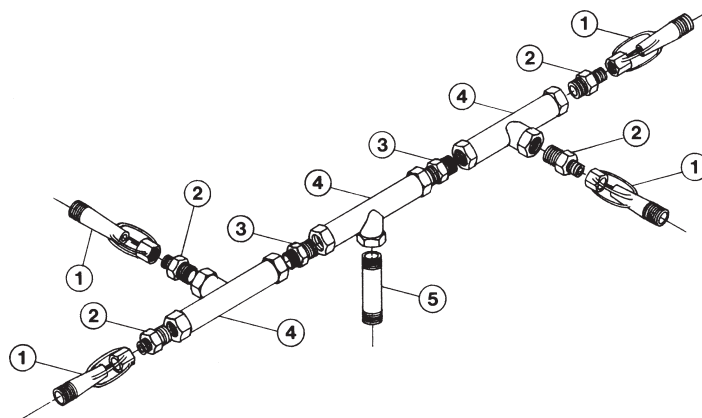
PARK BRAKE AND REAR AXLE PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|---|----------------------|
| 1 | 60-268 | Lug Bolt $\frac{1}{2}$ - 20 x $1\frac{5}{16}$ | 10 |
| 2 | 76-239 | 8" Brake Disk (5 hole) | 2 |
| 3 | 18-301 | 45° Straight Thread Elbow 1" x $\frac{7}{8}$ | 4 |
| 4 | 76-240 | Left Caliper (CCW) | 1 |
| 5 | 10-124 | Rear Axle | 1 |
| 6 | HB-12-13-800 | Bolt $\frac{1}{2}$ - 13 x 8 | 4 |
| 7* | | Cam Side Pad | 1 |
| 8 | 76-241 | Right Caliper (CW) | 1 |
| 9* | | Carrier Side Pad | 1 |
| 10* | | Carrier Side Pad Support | 1 |
| 11* | | Cam Side Pad Support | 1 |
| 12 | 14-265 | Nut 1 - 20 (included with Ref# 14) | 2 |
| 13 | HNFL-12-13 | Flange Loc Nut $\frac{1}{2}$ - 13 | 8 |
| 14 | 10-116 | Wheel Motor (includes Ref# 12 & 17) | 2 |
| 15 | HB-12-13-125 | Bolt $\frac{1}{2}$ - 13 x $1\frac{1}{4}$ | 4 |
| | HN-12-13 | Nut $\frac{1}{2}$ - 13 | 4 |
| 16 | HB-12-13-750 | Bolt $\frac{1}{2}$ - 13 x $7\frac{1}{2}$ | 4 |
| 17 | HWK-516-100 | Woodruff Key $\frac{5}{16}$ x 1 (included with Ref# 14) | 2 |
| 18 | 10-154 | Fender Brackets | 4 |
| 19 | 11-100 | Linkage Yokes $\frac{5}{16}$ | 6 |
| | HN-516-24 | Nut $\frac{5}{16}$ - 24 | 12 |
| | HCP-516-100 | Clevis Pin $\frac{5}{16}$ x 1 | 5 |
| | HP-18-100 | Cotter Pin $\frac{1}{8}$ x 1 | 5 |
| 20 | 76-225 | Brake Cable w/ Nuts | 1 |
| 21 | HB-516-18-200 | Bolt $\frac{5}{16}$ - 18 x 2 | 2 |
| 22 | HCP-516-138 | Clevis Pin $\frac{5}{16}$ x $1\frac{3}{8}$ | 1 |
| | HP-18-100 | Cotter Pin $\frac{1}{8}$ x 1 | 1 |
| 23 | 60-106 | Park Brake Handle | 1 |
| 24 | HNFL-516-18 | Flange-Loc Nut $\frac{5}{16}$ - 16 | 2 |
| 25 | 10-134 | Spacer | 2 |
| 28 | 10-126 | Brake Rod $\frac{5}{16}$ - 24 | 2 |
| 29 | 10-125 | Brake Relay | 1 |
| | HG-14-28-180 | Grease Fitting $\frac{1}{4}$ - 28 x 180° | 1 |
| 30 | HB-12-13-150 | Bolt $\frac{1}{2}$ - 13 x $1\frac{1}{2}$ | 2 |
| | HW-12 | Washer $\frac{1}{2}$ | 4 |
| | HNTL-12-13 | Lock Nut $\frac{1}{2}$ - 13 | 2 |
| 31 | HB-516-18-125 | Bolt $\frac{5}{16}$ - 18 x $1\frac{1}{4}$ | 8 |
| | HW-516 | Washer $\frac{5}{16}$ | 16 |
| | HNTL-516-18 | Lock Nut $\frac{5}{16}$ - 18 | 8 |
| 32 | 18-302 | Union Tee 1" | 2 |
| 33 | 10-273 | Hydraulic Hose | 4 |
| 34 | 10-205 | Boom Carrier | 2 |
| 35 | 16-557 | Square Cap | 2 |
| * | 34-101-02 | Pad Kit with 2 Pads and Steel Backing Plates | 2 Kits Req'd/Axle |

TANK DRAWING



TURBO-QUAD AGITATOR DRAWING



TANK PARTS LIST

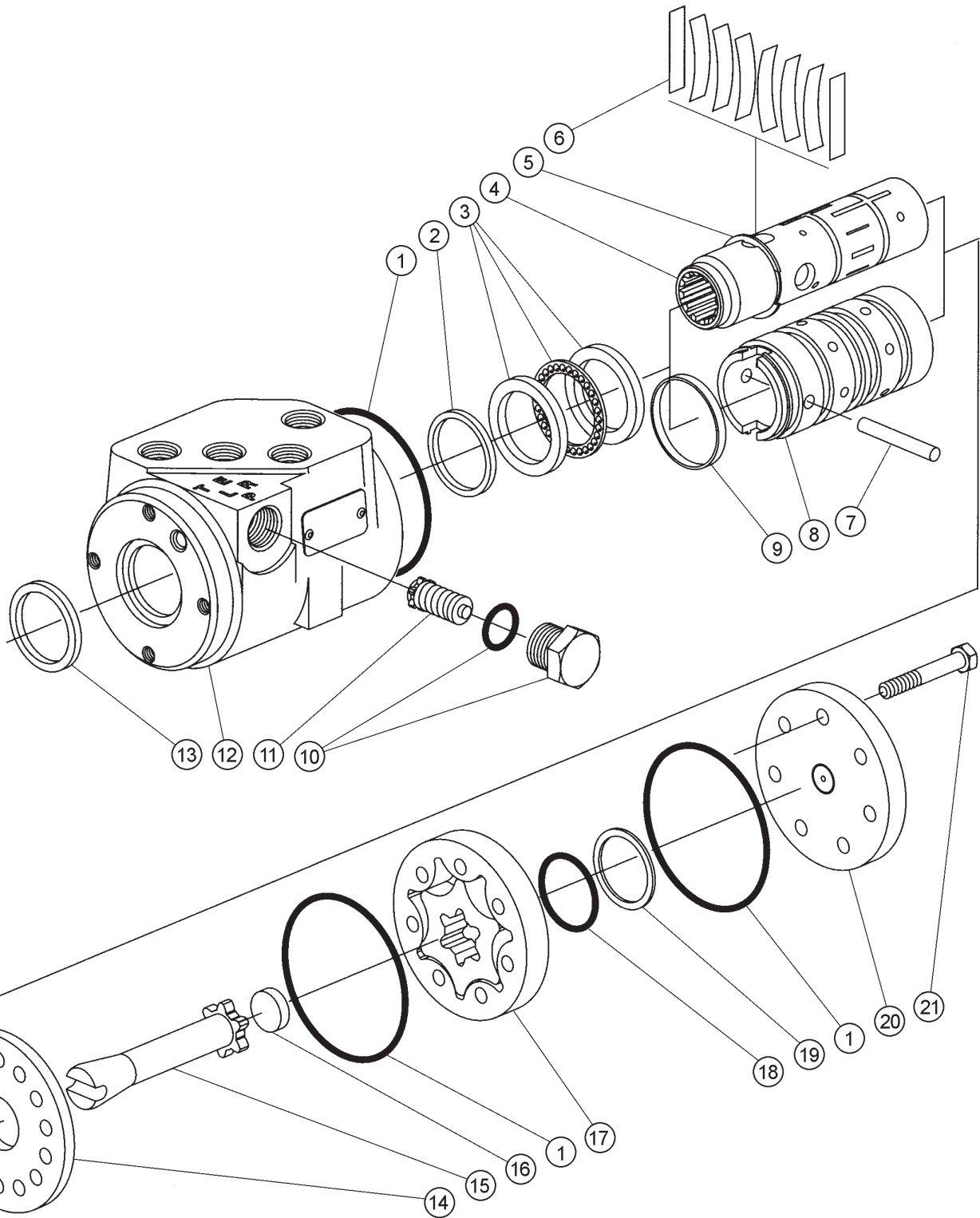
| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------------|--|----------|
| 1 | 16-162 | 1" Plug | 2 |
| 2 | 16-945 | Double Head Fitting | 2 |
| 3 | 22-528 | Right Tank Strap | 1 |
| | HB-38-16-400 | Bolt $\frac{3}{8}$ - 16 x 4 | 1 |
| | HB-38-16-100 | Bolt $\frac{3}{8}$ - 16 x 1 | 1 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 2 |
| 4* | 14-532 | 16" Hinged Lid/Well with Gasket | 1 |
| | 14-532-01 | Gasket for 16-953 | 1 |
| | 16-169 | Strainer Basket 16" | 1 |
| 5 | 10-410 | Left Tank Strap | 1 |
| | HB-38-16-400 | Bolt $\frac{3}{8}$ - 16 x 4 | 1 |
| | HB-38-16-100 | Bolt $\frac{3}{8}$ - 16 x 1 | 1 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 2 |
| 6 | 10-254 | Air Gap Filler | 1 |
| 7 | 16-962 | Aluminum Coupler 1" Male Thread | 1 |
| 8 | 16-961 | Aluminum Adapter 1" Female Thread | 1 |
| 9* | 16-150 | Double Threaded Fitting $\frac{3}{4}$ | 2 |
| 10* | 10-111 | 110 Gallon Poly Tank | 1 |
| 11 | 33-494 | Male Elbow | 2 |
| 12 | 10-390 | Reducer | 1 |
| 13 | 16-157 | Female Pipe Thread Tee $\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{3}{4}$ | 1 |
| 14 | 16-153 | Elbow $\frac{3}{4}$ MPT x $\frac{3}{4}$ HB | 1 |
| 15 | 8954-30 | Clear Hose $\frac{3}{16}$ ID | 1 |
| | 18-116 | Hose Clamp | 2 |
| 16* | 16-194 | Anti-Vortex Fitting 1 $\frac{1}{4}$ | 1 |
| 17 | 16-156 | Elbow 1 $\frac{1}{4}$ MPT x 1 $\frac{1}{4}$ HB | 1 |
| 18 | 10-112 | Tank Carrier | 1 |
| 19 | 16-998 | Hypro Pump | 1 |
| 20 | 16-158 | Close Nipple | 1 |
| 21 | 16-155 | Elbow, $\frac{3}{4}$ MPT x 1 HB | 1 |

* Comes with 110 Gallon Poly Tank (only one 16-150 Double Threaded Fitting in bottom of tank)

TURBO-QUAD AGITATOR PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------|---|----------|
| 1 | 16-036 | Agitator Jet (Includes one each $\frac{1}{8}$ ", $\frac{5}{53}$ ", and $\frac{3}{16}$ " orifices) | 4 |
| 2 | 16-173 | Reducer $\frac{3}{4}$ x $\frac{1}{2}$ | 4 |
| 3 | 16-158 | Close Nipple $\frac{3}{4}$ x $\frac{3}{4}$ | 2 |
| 4 | 16-157 | Female Pipe Thread Tee $\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{3}{4}$ | 3 |
| 5 | 16-172 | Nylon Nipple $\frac{3}{4}$ NPT x 3 $\frac{1}{2}$ | 1 |

15-301 ORBITROL DRAWING



Parts

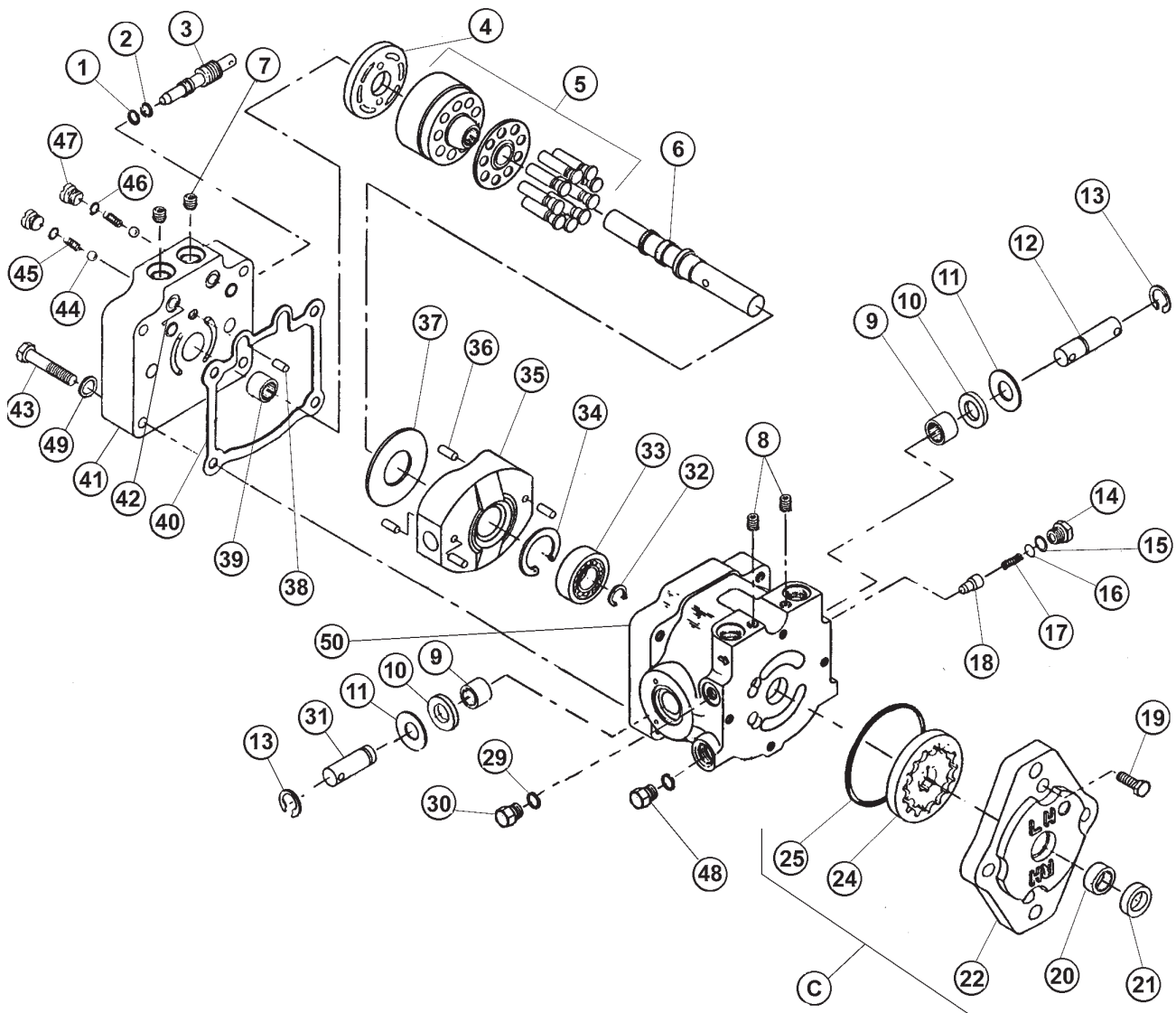
15-301 ORBITROL PARTS LIST

| REF # | PART # | DESCRIPTION | QUANTITY |
|-------|-----------|--|----------|
| 1* | | O-Ring Seal | 3 |
| 2* | | Quad Seal | 1 |
| 3 | 15-301-14 | Bearing Kit | 1 |
| | | Bearing Race | 2 |
| | | Bearing | 1 |
| 4 | | Spool | 1 |
| 5 | 15-301-13 | External Retaining Ring | 1 |
| 6 | 15-301-15 | Spring Centering Kit (Includes Ref# 9) | 1 |
| | | Spring Spacer | 2 |
| | | Centering Spring | 6 |
| | | Spring Retaining Ring | 1 |
| 7 | 15-301-08 | Pin | 1 |
| 8 | | Sleeve | 1 |
| 9 | | Retainer | 1 |
| 10 | 15-301-11 | Plug and O-ring | 1 |
| * | | O-Ring Seal | 1 |
| | | Plug | 1 |
| 11 | 15-301-12 | Relief Valve/Check (1015 psi (70 bar)) | 1 |
| 12 | | Housing | 1 |
| 13* | | Dust Seal | 1 |
| 14 | 15-301-06 | Wear Plate | 1 |
| 15 | 15-301-07 | Drive | 1 |
| 16 | 15-301-05 | Spacer | 1 |
| 17 | 15-301-04 | Gerotor | 1 |
| 18* | | O-Ring | 1 |
| 19* | | Seal | 1 |
| 20 | 15-301-03 | End Cap | 1 |
| 21 | 15-301-02 | Cap Screw | 7 |
| * | 15-301-01 | Seal Kit | |

15-301 ORBITOR SPECIFICATIONS

| | |
|--|--|
| Maximum System Pressure | 1015 psi (70 bar) |
| Maximum Back Pressure | 150 psi (10 bar) |
| Maximum System Operating Temperature. | 200°F (93°C) |
| Maximum Flow | 4 gpm (15 lpm) |
| Maximum Temperature Differential between Steering Unit and System. | 50°F (28°C) |
| Input Torque Powered | 15-25 lb/in @ 100 psi tank pressure (2-3 Nm @ 7 bar) |
| Input Torque Maximum Non-powered | 60 lb/ft (81 Nm) |
| Rotation Limits | None |
| Fluid | SAE 10W-40 API Service SJ or higher Motor Oil |
| Check Valve for Manual Steering | Yes |
| Relief Valve Setting | 1015 psi (70 bar) |
| Ports | 9/16 - 18 SAE O-Ring 4 Ports |
| Displacement | 61 cu. in/ R (100 cu cm/R) |

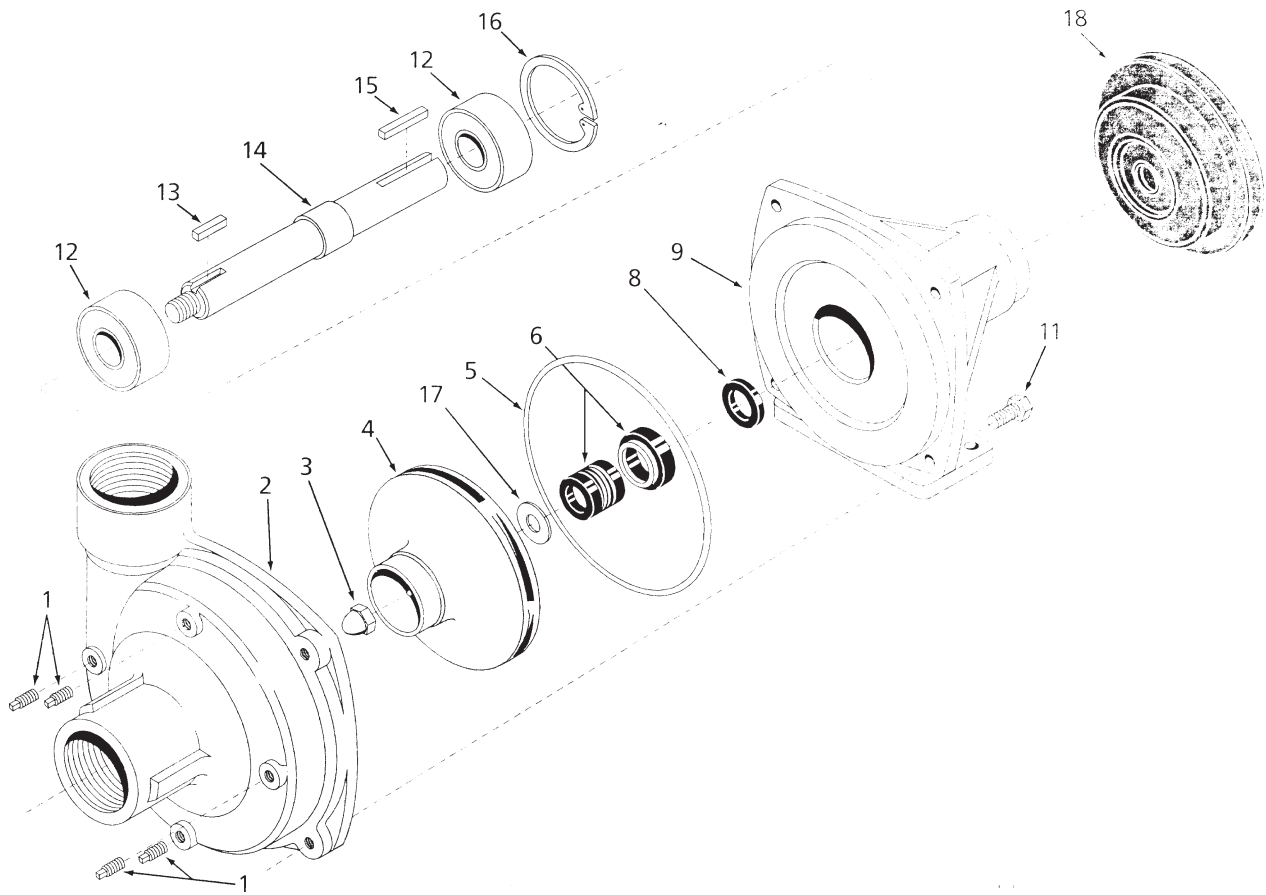
10-117 HYDRAULIC PUMP DRAWING



10-117 HYDRAULIC PUMP PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|-------------------------------------|----------|
| 1* | 42-003-01 | O-Ring | 1 |
| 2 | 14-130 | Ring | 1 |
| 3 | 13-110-01 | By-Pass Valve | 1 |
| 4 | 14-115 | Valve Plate | 1 |
| 5 | 42-003-16 | Cylinder Block Kit | 1 |
| 6 | 42-003-02 | Pump Shaft | 1 |
| 7 | 42-003-03 | Plug | 2 |
| 8 | 13-110-05 | Pipe Plug | 2 |
| 9 | 14-069 | Needle Bearing | 2 |
| 10* | 42-003-04 | Lip Seal | 2 |
| 11 | 42-003-05 | Washer | 2 |
| 12 | 14-220 | Truncated Shaft (long 2 holes) | 1 |
| 13 | 14-105 | Retaining Ring | 2 |
| 14 | 13-110-10 | Plug | 1 |
| 15* | | O-Ring | 1 |
| 16 | 10-117-02 | Shim Pack Kit | 1 |
| 17 | 14-234 | Release Valve Spring | 1 |
| 18 | 14-235 | Release Valve Cone | 1 |
| 19C | 13-110-14 | Hex Head Screw | 4 |
| 20C | 42-003-07 | Needle Bearing | 1 |
| 21*C | 14-054 | Lip Seal | 1 |
| 22C | 13-110-13 | Charge Pump Housing | 1 |
| 24C | 42-003-08 | Geroter | 1 |
| 25*C | | O-Ring | 1 |
| 29* | | O-Ring | 1 |
| 30 | 13-110-10 | Plug | 1 |
| 31 | 14-212 | Truncated Shaft (short 1 hole) | 1 |
| 32 | 42-003-09 | Retaining Ring | 1 |
| 33 | 42-003-10 | Ball Bearing | 1 |
| 34 | 14-132 | Retaining Ring | 1 |
| 35 | 14-221 | Variable Swash Plate | 1 |
| 36 | 14-216 | Spring Pin | 4 |
| 37 | 14-114 | Thrust Plate | 1 |
| 38 | 14-215 | Pin | 1 |
| 39 | 14-217 | Roller Bearing | 1 |
| 40* | 14-107 | Gasket | 1 |
| 41 | 10-117-01 | Pump End Cap | 1 |
| 42* | | O-Ring | 2 |
| 43 | 42-003-11 | Hex Head Screw | 4 |
| 44 | 10-117-04 | Valve | 2 |
| 45 | 10-117-05 | Relief Valve Spring | 2 |
| 46* | | O-Ring | 2 |
| 47 | 10-117-03 | Relief Valve Plug | 2 |
| 48 | 42-003-12 | Plug | 2 |
| 49 | 42-003-13 | Washer | 1 |
| 50 | 42-003-17 | Housing Assembly (includes #9 & 10) | 1 |
| | | | |
| * | 14-098 | Seal Kit | 1 |
| C | 42-003-14 | Charge Pump | 1 |

16-998 HYPRO PUMP DRAWING



Parts

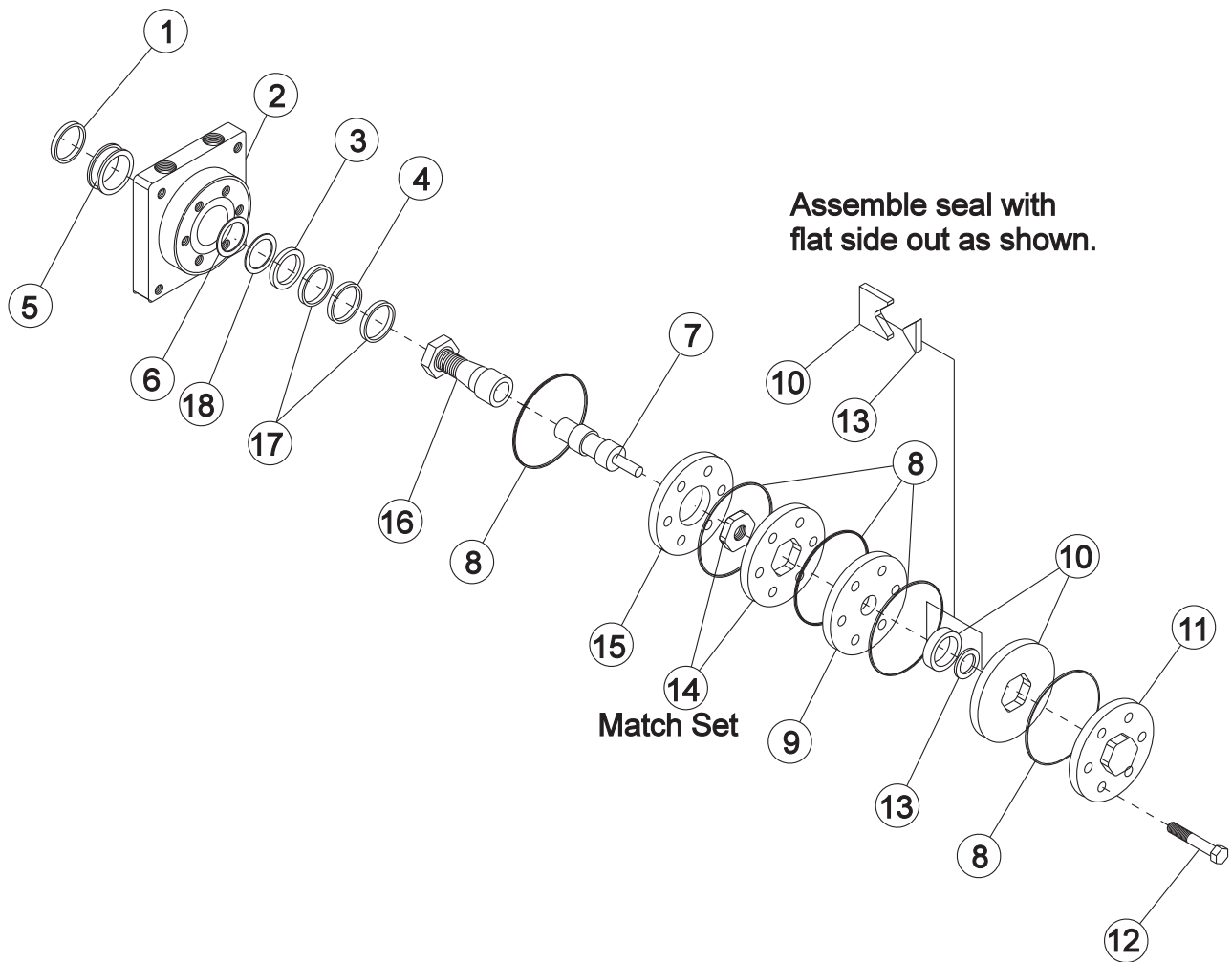
16-998 HYPRO® PUMP PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|-----------------------------------|----------|
| 1 | 16-998-01 | Drain Plug | 4 |
| 2 | 16-998-02 | Pump Casing | 1 |
| 3 | 16-998-03 | Impeller Nut | 1 |
| 4 | 16-966-16 | Impeller | 1 |
| 5* | 16-497 | O-Ring | 1 |
| 6* | 16-998-05 | Mechanical Seal (Silicon Carbide) | 1 |
| 8* | 16-966-06 | Slinger Ring | 1 |
| 9 | 16-998-06 | Mounting Flange | 1 |
| 11 | 16-998-07 | Bolt | 4 |
| 12 | 16-966-10 | Ball Bearing | 2 |
| 13 | 16-998-08 | Key | 1 |
| 14 | 16-998-09 | Pump Shaft | 1 |
| 15 | 16-822-20 | Key | 1 |
| 16 | 16-966-13 | Bearing Retainer | 1 |
| 17* | 16-998-10 | Gasket | 1 |
| 18 | 16-994-01 | Clutch | 1 |
| * | 16-967 | Silicone - Carbon Seal Kit | |

NOTE:

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

10-116 WHEEL MOTOR (14.0 CI) DRAWING



10-116 WHEEL MOTOR (14.0 CI) PARTSLIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-------------|--|----------|
| 1* | | Water & Dirt Seal | 1 |
| 2 | 10-116-01 | Service Housing Assembly (Includes Ref 4, 5, 17 (2req'd) and 20) | 1 |
| 3* | | Inner Seal | 1 |
| 4 | 10-116-02 | Thrust Bearing | 1 |
| 5 | 13-032-38 | Outer Bearing | 1 |
| 6* | | Backup Washer | 1 |
| 7 | 10-116-05 | Drive Link | 1 |
| 8* | | Ring Seal | 5 |
| 9 | 42-002-05 | Manifold | 1 |
| 10 | 10-116-06 | Commutator Assembly (matched set) | 1 |
| 11 | 10-116-07 | End Cover | 1 |
| 12 | 10-116-08 | Bolt | 7 |
| 13* | | Commutator Seal (matches with Ref 10) | 1 |
| 14 | 10-116-09 | Rotor Set (matched set) | 1 |
| 15 | 42-002-10 | Plate Wear | 1 |
| 16 | 10-116-10 | Coupling Shaft | 1 |
| | HWK-516-100 | Woodruff Key $\frac{5}{16}$ x 1 | 1 |
| | 14-265 | Nut 1 - 20 | 1 |
| 17 | 10-116-11 | Thrust Washer | 2 |
| 18* | | Backup Washer | 1 |
| | | | |
| * | 10-116-13 | Seal Kit | 1 |

1010 PLUMBING DRAWING (3-WAY MANUAL)

15-818 O-ring for 75 Series Clamp



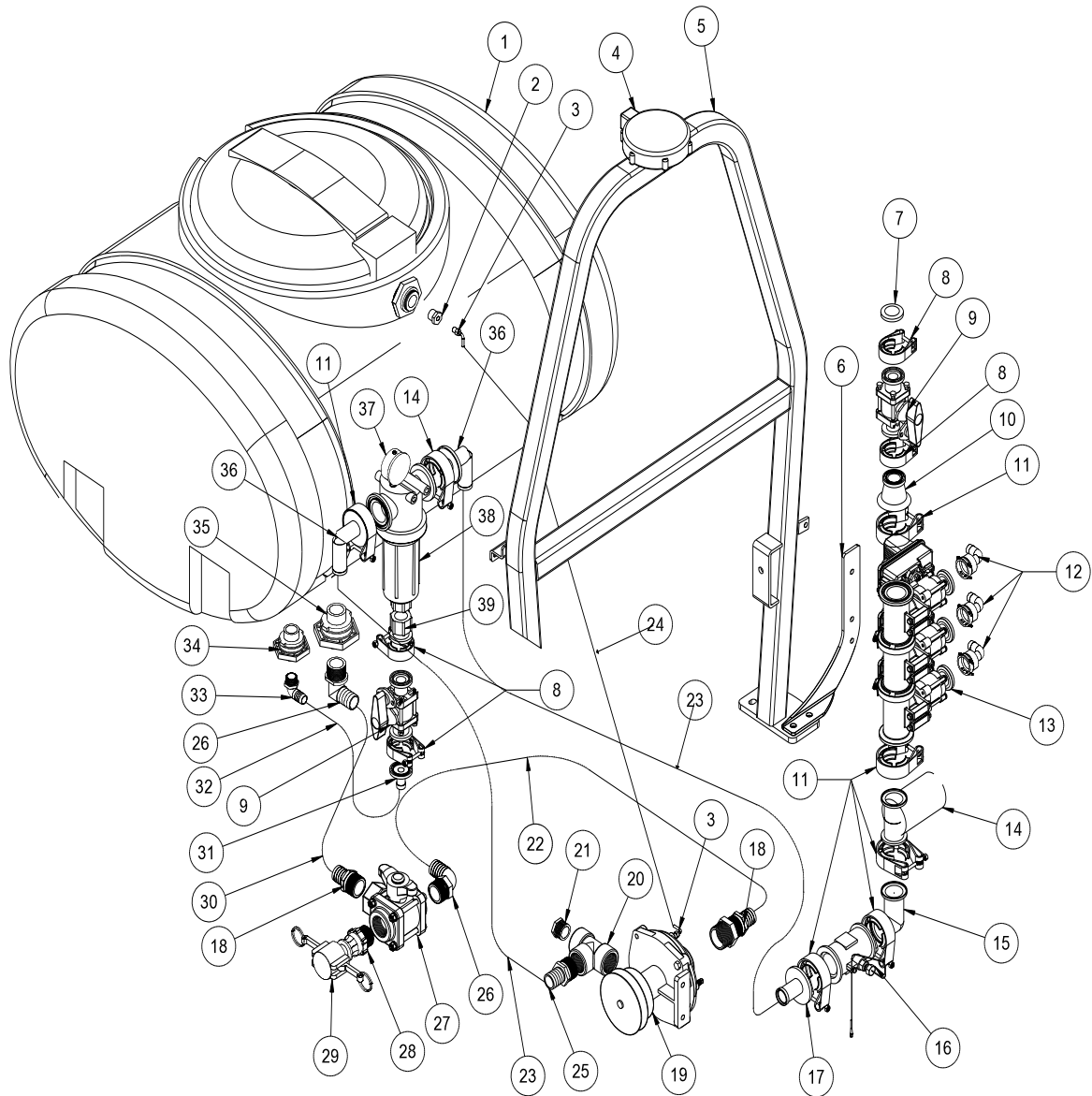
1010 PLUMBING PARTS LIST (3-WAY MANUAL)

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------------|---|----------|
| 1 | 10-399 | Ball Valve Mount | 2 |
| | HB-14-20-100 | Bolt 1/4 - 20 x 1 | 4 |
| | HNTL-14-20 | Lock Nut 1/4 - 20 | 4 |
| 2 | 10-268 | Valve 3-Way | 1 |
| 3 | 16-281 | Liquid Filled Gauge | 1 |
| 4 | 10-268-13 | 90° Elbow (comes with 10-268) | 3 |
| 5 | 8896-4 | Discharge Hose 1" | 1 |
| | 18-222 | Hose Clamp | 2 |
| 6 | 8896-48 | Discharge Hose 1" | 1 |
| | 18-222 | Hose Clamp | 2 |
| 7 | 16-164 | Elbow 1 MPT x 1 HB | 1 |
| 8† | 10-111 | 110 Gallon Poly Tank (includes † items) | 1 |
| | 14-532 | 16" Hinged Lid/Well with Gasket | 1 |
| | 16-953-01 | Gasket | 1 |
| | 16-169 | Strainer Basket 16" | 1 |
| 9 | 16-166 | Hex Plug. 3/4 | 1 |
| 10 | 16-157 | Tee, 3/4 x 3/4 3/4 | 1 |
| 11 | 16-158 | Close Nipple 3/4 x 3/4 | 1 |
| 12 | 10-390 | Reducer | 1 |
| 13 | 33-494 | Male Elbow | 2 |
| 14† | 16-150 | Double Thread Fitting | 1 |
| 15 | 16-155 | Elbow 3/4" MPT x 1" HB | 1 |
| 16 | 8954-30 | 3/16 Clear hose | 1 |
| | 18-116 | Hose Clamp, HS-24 | 2 |
| 17† | 16-194 | Anti-Vortex Fitting 1 1/4 | 1 |
| 18 | 16-156 | Elbow 1 1/4 MPT x 1 1/4 HB | 2 |
| 19 | 8897-38 | Discharge Hose 1 1/4" | 1 |
| | 18-040 | Hose Clamp | 2 |
| 20 | 8889-26 | Suction Hose 1 1/4 x 26" | 1 |
| | 18-116 | Hose Clamp | 2 |
| 21 | 16-161 | Fitting 1 1/4 NPT x 1 1/4 HB | 2 |
| 22 | 16-998 | Hypro® Pump | 1 |
| 23 | 18-390 | Pipe Tee 1 1/4 | 1 |
| 24 | 16-161 | Fitting 1 1/4 NPT x 1 1/4 HB | 1 |
| 25 | 10-389 | Plug 1 1/4 | 1 |
| 26 | 8897-50 | Discharge Hose 1 1/4" | 1 |
| | 18-116 | Hose Clamp, HS-24 | 2 |
| 27 | 16-935 | Quick Coupler 1 1/4 Cap | 1 |
| 28 | 16-180 | Quick Coupler 1 1/4 Male | 1 |
| 29 | 18-372 | 3-Way Ball Valve | 1 |
| | 18-372-01 | T-Handle | 1 |
| 30 | 16-825 | Reducer | 1 |
| 31 | 8896-55 | Discharge Hose 1" | 1 |
| | 18-040 | Hose Clamp | 2 |
| 32 | 15-808 | Hose Barb Flange | 1 |
| 33 | 15-740 | 50 Series Clamp | 5 |
| 34 | 15-738 | Flanged Ball Valve | 2 |
| 35 | 15-735 | 50 Series 1 FPT | 1 |
| 36 | 15-737 | Flanged Strainer | 1 |
| 37 | 15-739 | 75 Series 90° x 1 1/2 Hose Barb | 1 |
| 38 | 15-780 | 1/4" Poly Plug | 1 |
| 39 | 15-748 | Reducer Coupling | 1 |
| 40 | 15-741 | 75 Series Clamp | 2 |
| 41 | 15-736 | 50 Series Elbow Coupling | 1 |
| 42 | 15-808 | Hose Barb Flange | 1 |
| 43 | 8897-40 | Discharge Hose 1 1/4" | 1 |
| | 18-040 | Hose Clamp | 2 |
| 44 | 10-269 | Plastic Tee | 1 |
| 45 | 8896-12 | Discharge Hose 1" x 12" | 1 |
| | 18-222 | Hose Clamp | 2 |

1008 PLUMBING DRAWING (RAVEN 440)

15-817 O-ring for 50 Series Clamp

15-818 O-ring for 75 Series Clamp



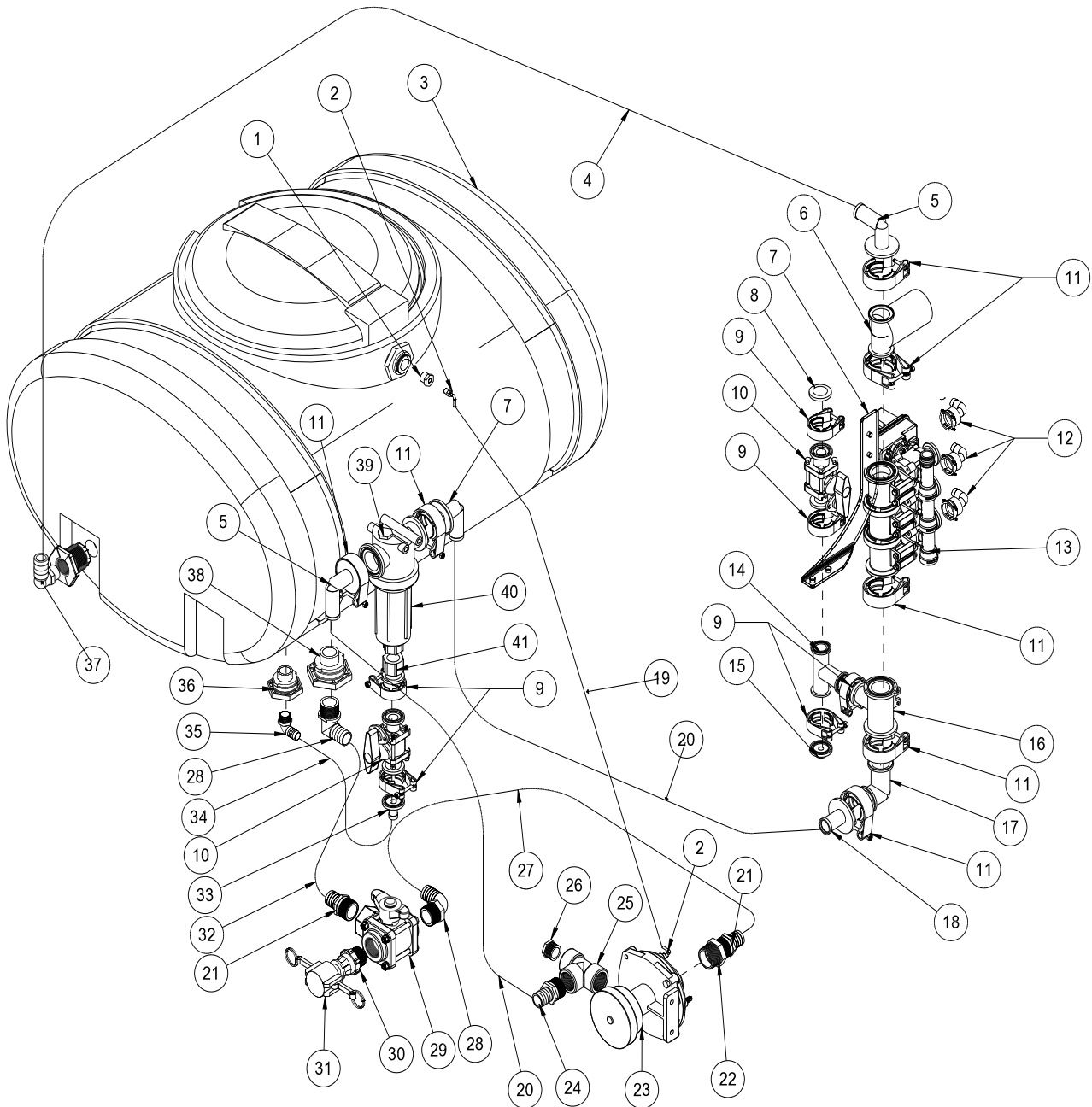
1008 PLUMBING PARTS LIST (RAVEN 440)

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|---|----------|
| 1† | 10-111 | 110 Gallon Poly Tank (includes † items) | 1 |
| | 14-532 | 16" Hinged Lid/Well with Gasket | 1 |
| | 16-953-01 | Gasket | 1 |
| | 16-169 | Strainer Basket 16" | 1 |
| 2 | 10-390 | Reducer | 1 |
| 3 | 33-494 | Male Elbow | 2 |
| 4 | 10-408 | Phoenix 10 GPS | 1 |
| 5 | 10-404 | ROPS | 1 |
| 6 | 10-397 | Valve Mount | 1 |
| 7 | 15-778 | Blank Gauge Port Flange | 1 |
| 8 | 15-740 | 50 Series Clamp | 4 |
| 9 | 15-738 | Flanged Ball Valve | 2 |
| 10 | 15-748 | Reducer Coupling | 1 |
| 11 | 15-741 | 75 Series Clamp | 7 |
| 12 | 15-553 | 3/4 -90° Hose Barb | 3 |
| | 15-553-01 | Clip | 3 |
| | 15-553-02 | O-Ring | 3 |
| | 8887-80 | Orange PVC Hose 3/4" | 1 |
| | 8887-100 | Orange PVC Hose 3/4" | 2 |
| | 18-040 | Hose Clamp, HS-12 | 3 |
| 13 | 15-743 | Manifold Valve | 1 |
| 14 | 16-524 | Motorized Control Valve | 1 |
| 15 | 15-734 | 75 Series Elbow Coupling | 1 |
| 16 | 18-373 | Flow Meter | 1 |
| | 18-373-01 | Sensor | 1 |
| 17 | 15-744 | Series 75 1 1/4 Hose Barb | 1 |
| 18 | 16-161 | Fitting 1 1/4 MPT x 1 1/4 HB | 2 |
| 19 | 16-988 | Hypro® Pump | 1 |
| 20 | 18-390 | Pipe Tee 1 1/4 | 1 |
| 21 | 10-389 | Plug 1 1/4 | 1 |
| 22 | 8897-52 | Discharge Hose 1 1/4" | 1 |
| | 18-040 | Hose Clamp, HS-12 | 2 |
| 23 | 8897-50 | Discharge Hose 1 1/4" | 2 |
| | 18-116 | Hose Clamp, HS-24 | 4 |
| 24 | 8954-30 | 3/16 Clear hose | 1 |
| | 18-116 | Hose Clamp, HS-24 | 2 |
| 25 | 16-161 | Fitting 1 1/4 MPT x 1 1/4 HB | 1 |
| 26 | 16-156 | Elbow 1 1/4 MPT x 1 1/4 HB | 2 |
| 27 | 18-372 | 3-Way Valve | 1 |
| | 18-372-01 | T-handle | 1 |
| 28 | 16-180 | Quick Coupler 1 1/4 Male | 1 |
| 29 | 16-935 | Quick Coupler 1 1/4 Cap | 1 |
| 30 | 8897-38 | Discharge Hose 1 1/4" | 1 |
| | 18-040 | Hose Clamp, HS-12 | 2 |
| 31 | 15-808 | Hose Barb Straight | 1 |
| 32 | 8896-40 | Discharge Hose 1" | 1 |
| | 18-222 | Hose Clamp, 13/16 to 1 1/2 | 2 |
| 33 | 16-155 | Elbow 3/4" MPT x 1" HB | 1 |
| 34† | 16-150 | Double Thread Fitting 3/4" (part of tank) | 1 |
| 35† | 16-194 | Anti Vortex Fitting (part of tank) | 1 |
| 36 | 15-739 | 75 Series 90° x 1 1/2 Hose Barb | 2 |
| 37 | 16-281 | Liquid Filled Gauge | 1 |
| 38 | 15-737 | Flanged Strainer | 1 |
| 39 | 15-735 | 50 Series 1" FPT | 1 |

1002 PLUMBING DRAWING (RAVEN 203)

15-817 O-ring for 50 Series Clamp

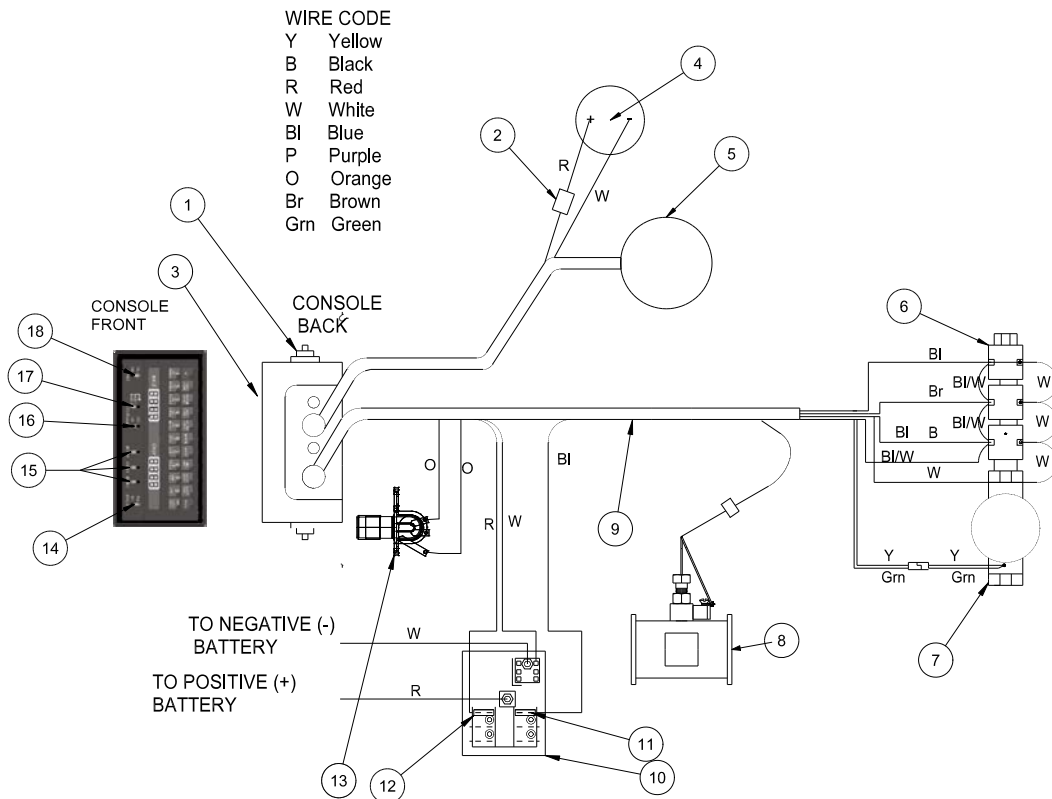
15-818 O-ring for 75 Series Clamp



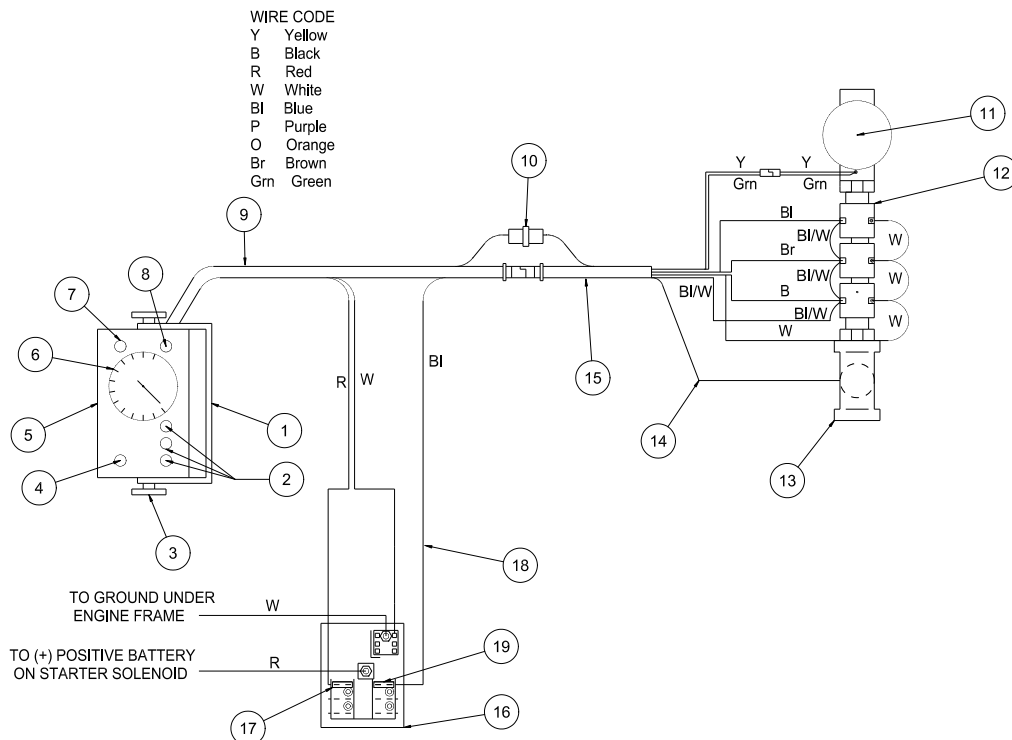
1002 PLUMBING PARTS LIST (RAVEN 203)

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|---|----------|
| 1 | 10-390 | Reducer | 1 |
| 2 | 33-494 | Male Elbow | 2 |
| 3† | 10-111 | 110 Gallon Poly Tank | 1 |
| | 14-532 | 16" Hinged Lid/Well with Gasket | 1 |
| | 16-953-01 | Gasket | 1 |
| | 16-169 | Strainer Basket 16" | 1 |
| 4 | 8897-92 | Discharge Hose 1 1/4" | 1 |
| | 18-040 | Hose Clamp, HS-12 | 2 |
| 5 | 15-739 | 75 Series 90° x 1 1/2 Hose Barb | 3 |
| 6 | 16-524 | Motorized Control Valve | 1 |
| 7 | 10-397 | Valve Mount | 1 |
| 8 | 15-778 | Blank Gauge Port Flange | 1 |
| 9 | 15-740 | 50 Series Clamp | 6 |
| 10 | 15-738 | Flanged Ball Valve | 2 |
| 11 | 15-741 | 75 Series Clamp | 7 |
| 12 | 15-553 | 3/4 -90° Hose Barb | 3 |
| | 15-553-01 | Clip | 3 |
| | 15-553-02 | O-Ring | 3 |
| | 8887-80 | Orange PVC Hose 3/4" | 1 |
| | 8887-100 | Orange PVC Hose 3/4" | 2 |
| | 18-040 | Hose Clamp, HS-12 | 3 |
| 13 | 15-743 | Manifold Valve | 1 |
| 14 | 15-776 | 50 Series Tee | 1 |
| 15 | 15-777 | Gauge Port Flange | 1 |
| 16 | 15-775 | Reducer Tee | 1 |
| 17 | 15-734 | 75 Series Elbow Coupling | 1 |
| 18 | 15-744 | Series 75 1 1/4 Hose Barb | 1 |
| 19 | 8954-30 | 3/16 Clear hose | 1 |
| | 18-116 | Hose Clamp, HS-24 | 2 |
| 20 | 8897-50 | Discharge Hose 1 1/4" | 2 |
| | 18-116 | Hose Clamp, HS-24 | 4 |
| 21 | 16-161 | Fitting 1 1/4 MPT x 1 1/4 HB | 2 |
| 22 | 16-825 | Stainless Steel Reducer Bushing 1 1/2 x 1 1/4 | 1 |
| 23 | 16-988 | Hypro® Pump | 1 |
| 24 | 16-161 | Fitting 1 1/4 MPT x 1 1/4 HB | 1 |
| 25 | 18-390 | Pipe Tee 1 1/4 | 1 |
| 26 | 10-389 | Plug 1 1/4 | 1 |
| 27 | 8897-52 | Discharge Hose 1 1/4" | 1 |
| | 18-040 | Hose Clamp, HS-12 | 2 |
| 28 | 16-156 | Elbow 1 1/4 MPT x 1 1/4 HB | 2 |
| 29 | 18-372 | 3-Way Valve | 1 |
| | 18-372-01 | T-Handle | 1 |
| 30 | 16-180 | Quick Coupler 1 1/4 Male | 1 |
| 31 | 16-935 | Quick Coupler 1 1/4 Cap | 1 |
| 32 | 8897-38 | Discharge Hose 1 1/4" | 1 |
| | 18-040 | Hose Clamp, HS-12 | 2 |
| 33 | 15-808 | Hose Barb Straight | 1 |
| 34 | 8896-40 | Discharge Hose 1" | 1 |
| | 18-222 | Hose Clamp, 13/16 to 1 1/2 | 2 |
| 35 | 16-155 | Elbow 3/4" MPT x 1" HB | 1 |
| 36† | 16-150 | Double Thread Fitting 3/4" (part of tank) | 1 |
| 37 | 15-779 | Hose Barb | 1 |
| 38† | 16-194 | Anti Vortex Fitting (part of tank) | 1 |
| 39 | 15-780 | 1/4 Poly Plug | 1 |
| 40 | 15-737 | Flanged Strainer | 1 |
| 41 | 15-735 | 50 Series 1" FPT | 1 |

1008 CONTROL SYSTEM DRAWING (RAVEN 440)



CONTROL 1002 SYSTEM DRAWING (RAVEN 203)



1008 CONTROL SYSTEM PARTS LIST (RAVEN 440)

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|-----------------------------|----------|
| 1 | 16-558 | Mounting Knob | 2 |
| 2 | | 5 amp fuse | 1 |
| 3 | 16-525 | Console (only) | 1 |
| | 16-234 | Console Cover | 1 |
| | 10-237 | Mount Bracket | 1 |
| 4 | 10-202 | Speedometer | 1 |
| 5 | 10-408-01 | Phoenix 1 0GPS | 1 |
| 6 | 15-743 | Manifold Valve | 1 |
| 7 | 16-524 | Motorized Control Valve | 1 |
| 8 | 18-373 | Flow Meter | 1 |
| 9 | 15-369 | Console Control Cable | 1 |
| 10 | 33-271 | Fuse Block | 1 |
| 11 | 33-562 | Auto Blade Type Fuse 40 amp | 1 |
| 12 | 33-508 | Auto Blade Type Fuse 15 amp | 1 |
| 13 | 33-509 | Master Boom Floor Switch | 1 |
| 14 | 16-697 | Master Switch | 1 |
| 15 | 16-141 | Boom Switch | 3 |
| 16 | 16-873 | Adjustment Switch | 1 |
| 17 | 16-525-01 | Rate1/Rate2 Manual Switch | 1 |
| 18 | 16-140 | Power Switch | 1 |

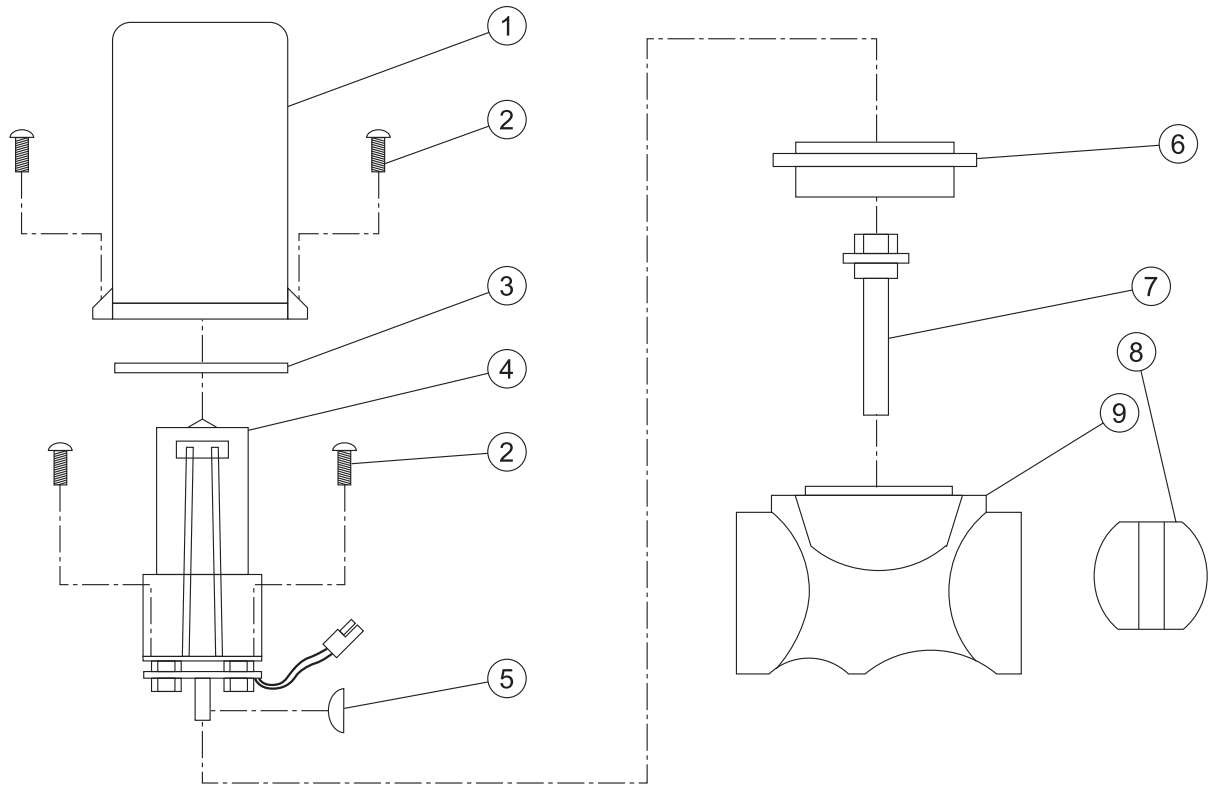
Use Dielectric Grease On All Electrical Connections

CONTROL 1002 SYSTEM PARTS LIST (RAVEN 203)

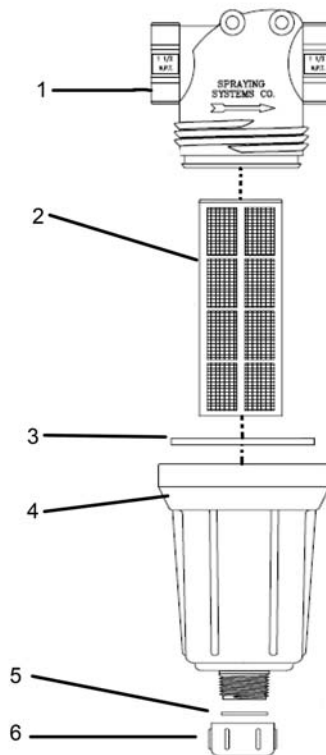
| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|---|----------|
| 1 | 16-958-01 | Mounting Bracket | 1 |
| 2 | 16-898 | Boom Switch | 3 |
| 3 | 16-900 | Mounting Knob | 2 |
| 4 | 16-899 | Master Switch | 1 |
| 5 | 18-418 | Console with Liquid Filled Pressure Gauge | 1 |
| 6 | 33-090-02 | Liquid Filled Pressure Gauge | 1 |
| | 33-090-04 | Pressure gauge Tube Fitting | 1 |
| 7 | 16-958-02 | Fuse Holder | 1 |
| | 16-525-03 | Fuse 15 AMP | 1 |
| 8 | 16-895 | Pressure Switch | 1 |
| 9 | 16-902 | Cable Assembly 6ft Enclosure Hook-Up | 1 |
| 1 | 16-958-05 | Union Fitting | 1 |
| 11 | 16-524 | Motorized Control Valve | 1 |
| 12 | 15-743 | Manifold Valve | 1 |
| 13 | 15-775 | Tee | 1 |
| 14 | 16-955 | Tubing | 1 |
| 15 | 16-902 | Cable Assembly 72" Solenoid Hook-Up | 1 |
| 16 | 33-271 | Fuse Block | 1 |
| 17 | 33-508 | Auto Blade Type Fuse 15 amp | 1 |
| 18 | 10-225 | Wire Harness (fuse block to electric valve) | 1 |
| 19 | 33-562 | Auto Blade Type Fuse 40 Amp | 1 |

Use Dielectric Grease On All Electrical Connections

16-524 MOTORIZED CONTROL VALVE DRAWING



15-737 STRAINER



16-524 / 16-995 MOTORIZED CONTROL VALVE PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|---------------------------------|----------|
| 1 | 16-870 | Valve Cover | 1 |
| 2* | 16-524-01 | #6 Self Tapping Screw 3/4" Long | 6 |
| 3 | 16-897 | Seal Tetraseal | 1 |
| 4 | 16-875 | Motor Assembly | 1 |
| 5* | 16-957 | Woodruff Key | 1 |
| 6* | 16-524-04 | Isolation Flange Assembly | 1 |
| 7* | 16-524-02 | Coupler Shaft | 1 |
| 8* | 16-956 | Butterfly | 1 |
| 9* | 16-524-03 | Valve Body Assembly | 1 |
| * | 16-524-05 | 1" Valve ISO-Body Kit | |

WHEN SERVICING VALVE:

Replace valve body with ISO-Body Kit if valve has been leaking internally.

Replace motor assembly if the motor will not run or if the printed circuit board is corroded.

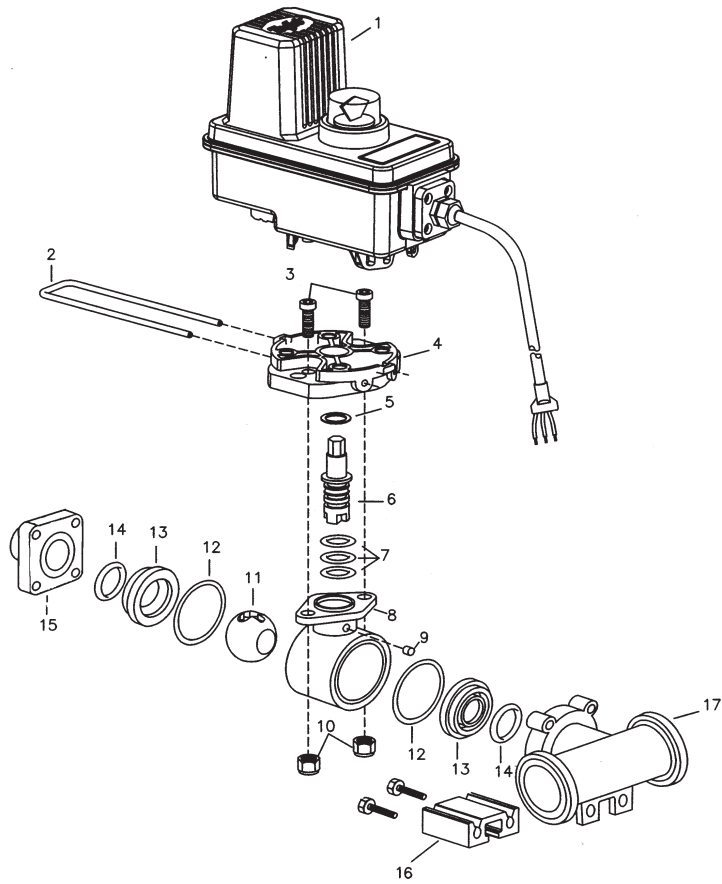
Before reassembling valve, remove the coupler shaft from the valve body. Apply Loctite to coupler shaft and woodruff key. Place the coupler shaft (Ref 7) and the woodruff key (Ref 5) onto the motor shaft. Plug motor into the valve connector coming from Sprayer Control Console. Check that the motor rotates in both directions. Motor must stop when coupler CAM releases printed circuit board switch button.

When reassembling valve, grease both sealing surfaces of coupler shaft. Insert coupler shaft into Iso-flange and be sure seal properly seats on shaft. Install on valve body and apply RTV 738 to mounting holes. Reassemble remaining items as shown in parts diagram on opposite side.

15-737 STRAINER

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|-------------------------|----------|
| 1 | 15-737-01 | Strainer Head 75 Series | 1 |
| 2 | 16-968-03 | 50 Mesh Strainer | 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 |

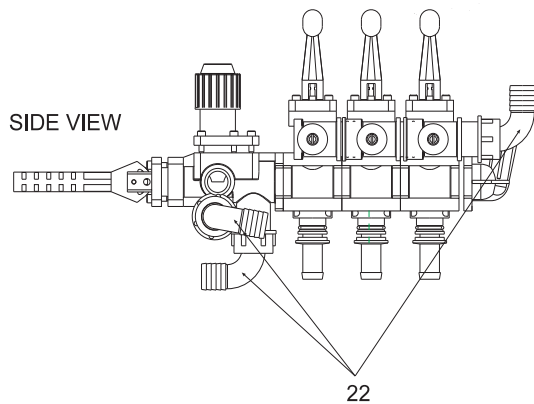
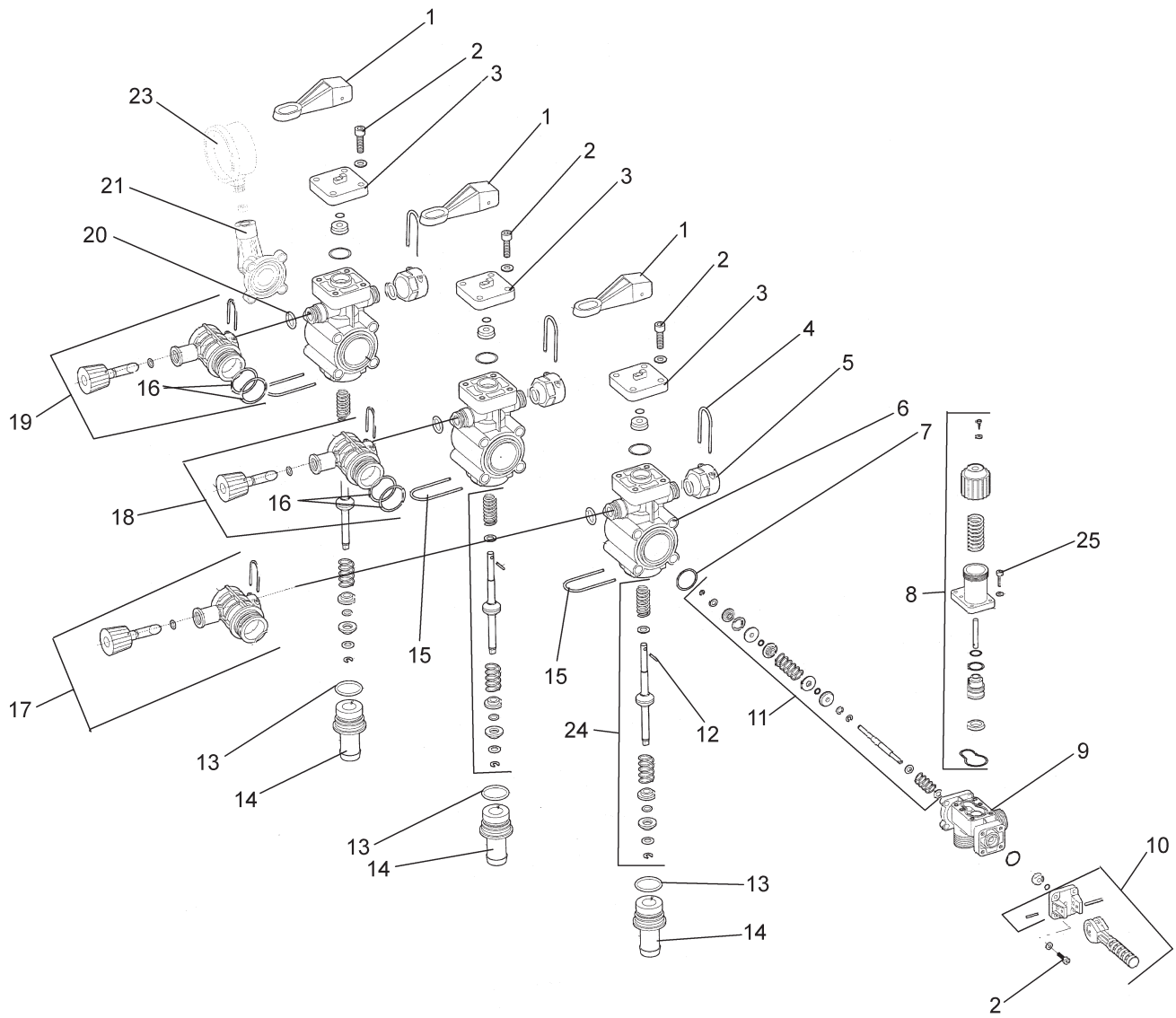
15-743 MANIFOLD VALVE DRAWING



15-743 MANIFOLD VALVE PARTSLIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|--|----------|
| 1 | 15-552-23 | Motor | |
| 2 | 15-552-24 | Retaining Clip | 1 |
| 3 | 15-552-25 | Socket Head Cap Screw, Stainless Steel | 2 |
| 4 | 15-552-26 | Motor Adapter, Polypropylene | 1 |
| 5* | 15-517-11 | Thrust Washer, Teflon | 1 |
| 6 | 15-552-27 | Stem, Stainless Steel | 1 |
| 7* | 15-552-05 | O-ring, Viton | 3 |
| 8 | 15-517-16 | Body, Nylon | 1 |
| 9* | 15-517-17 | Dust Plug, Felt | 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 | 15-743-03 | Mounting Rail aluminum | 1 |
| 17 | 15-743-02 | #75 tee Body | 1 |
| | | | |
| * | 15-552-10 | Spare Parts Kit (includes all * items) | |

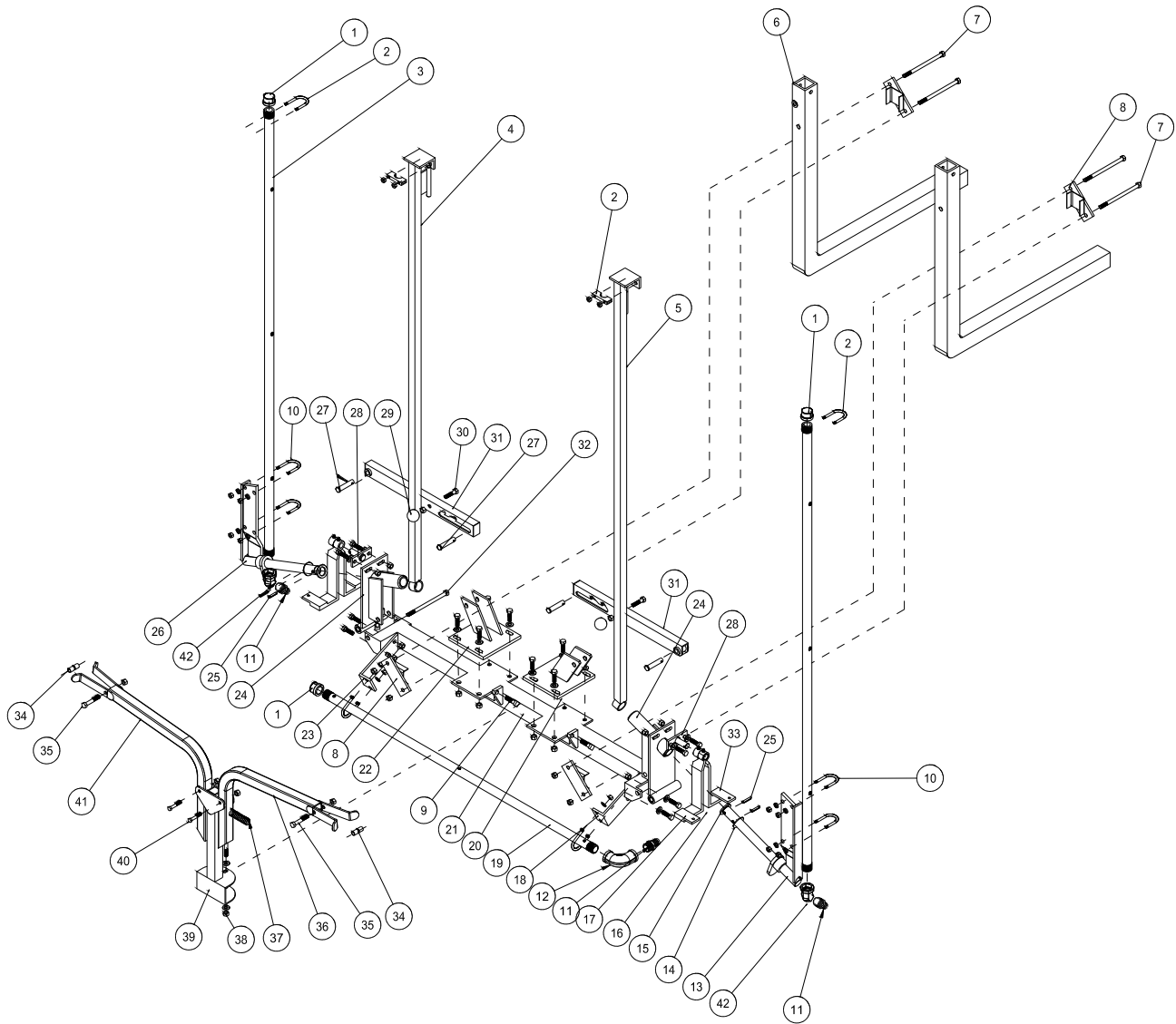
10-268 3-WAY MANUAL VALVE DRAWING



10-268 3-WAY MANUAL VALVE PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|-----------|-----------|--|------------|
| 1 | 10-268-07 | Boom Lever | 3 |
| 2 | 10-268-28 | Bolt and Washer | 18 |
| 3 | 10-268-17 | Boom Lever Plate | 3 |
| 4 | 10-268-06 | Spring Clip $\frac{5}{8}$ | 6 |
| 5 | 10-268-05 | Cap | 3 |
| | 10-268-21 | O-Ring (included with 10-268-19 Seal Kit) | 3 |
| 6 | 10-268-02 | Main Body | 3 |
| | 10-268-19 | Seal Kit | 1 per body |
| 7 | 10-268-24 | O-Ring for Main Body | 3 |
| 8 | 10-268-27 | Main Pressure Adjust | 1 |
| 9 | 10-268-29 | Pressure Adjust Body | 1 |
| 10 | 10-268-09 | Main Boom Lever | 1 |
| 11 | 10-268-30 | Master Boom Lever Guts | 1 |
| 12 | 10-268-25 | Boom Lever Pin | 3 |
| 13 | 10-268-22 | O-Ring (included with 10-268-19 Seal Kit) | 3 |
| 14 | 10-268-03 | Hose Barb $\frac{3}{4}$ | 3 |
| 15 | 10-268-04 | Spring Clip $\frac{7}{8}$ | 3 |
| 16 | 10-268-23 | O-Ring (included with 10-268-12 and 10-268-14) | 4 |
| 17 | 10-268-11 | Boom Pressure Adjust (threaded end) | 1 |
| 18 | 10-268-12 | Boom Pressure Adjust (middle) | 1 |
| 19 | 10-268-14 | Boom Pressure Adjust (capped) | 1 |
| 20 | 10-268-21 | O-Ring | 3 |
| 21 | 10-268-01 | Gage Elbow | 1 |
| 22 | 10-268-13 | Elbow 90° 1" Hose Barb with Nut | 3 |
| 23 | 16-281 | Liquid Filled Gauge (not part of 10-268) | 1 |
| 24 | 10-268-26 | Boom Lever Guts | 3 |
| 25 | 10-268-28 | Bolt & Washer | 6 |
| Not Shown | 10-268-15 | Tie Rod with Nuts and Washer | 4 |

10-160 STAINLESS STEEL 15' MANUAL BOOM DRAWING



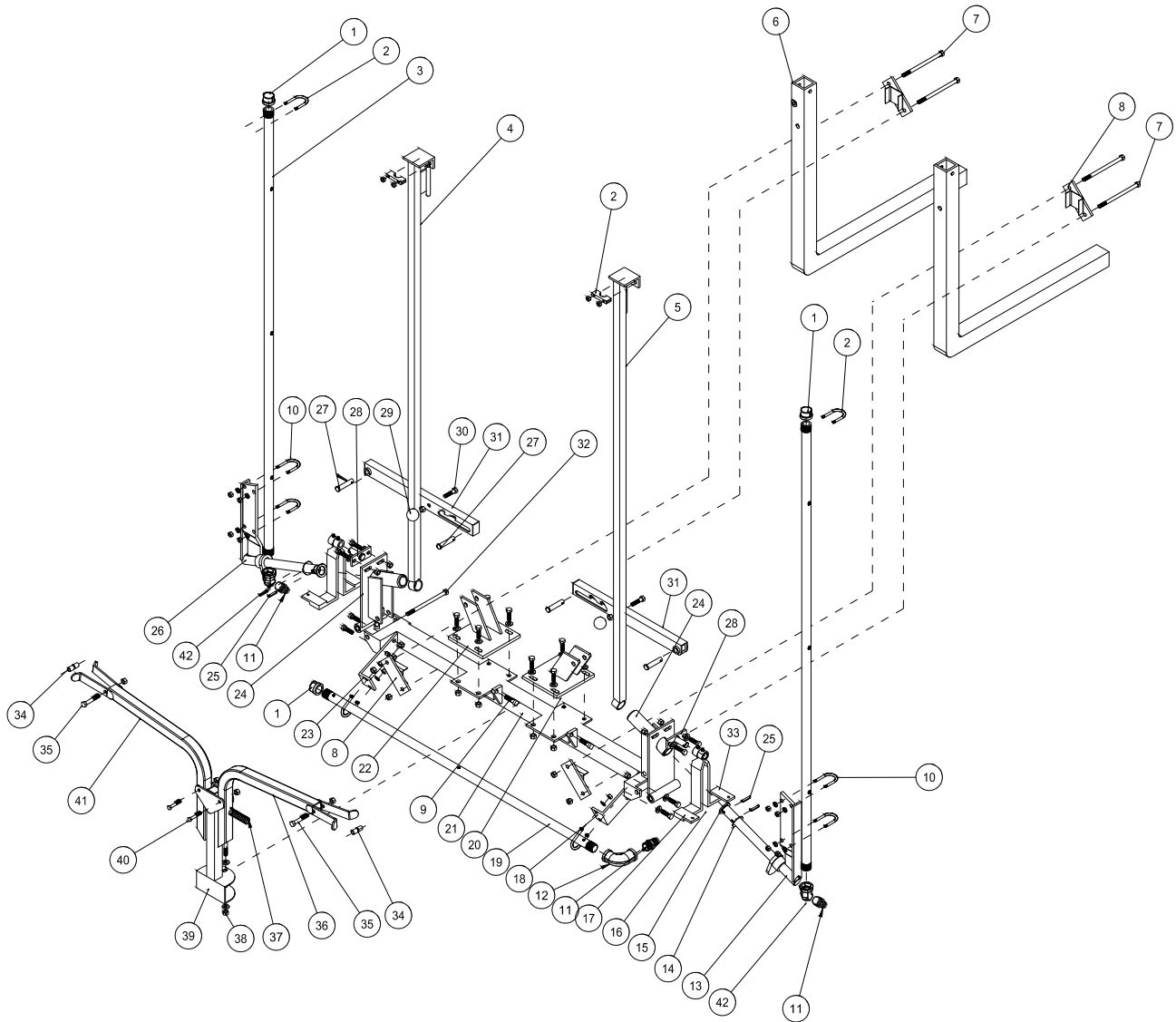
Accessories

10-160 STAINLESS STEEL 15' MANUAL BOOM PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------------|--|----------|
| 1 | 16-926 | Stainless Steel Cap $\frac{3}{4}$ | 3 |
| 2 | 13-498 | U-Bolt Kit $1\frac{1}{8}$ | 2 |
| 3 | 15-562 | Right and Left Boom Tube | 2 |
| 4 | 15-565 | Left Brush Guard | 1 |
| 5 | 15-564 | Right Brush Guard | 1 |
| 6 | | Boom Carrier (part of the truck) | |
| 7 | HBS-38-16-550 | Stainless Steel Bolt $\frac{3}{8}$ - 16 x $5\frac{1}{2}$ | 4 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 4 |
| 8 | 16-761 | Boom Brackets | 4 |
| 10 | 16-024 | U-Bolt $\frac{5}{16}$ - 24 | 6 |
| | HWS-516 | Stainless Steel Washer $\frac{5}{16}$ | 12 |
| | HNS-516-24 | Stainless Steel Nut $\frac{5}{16}$ - 24 | 12 |
| 11 | 18-249 | Barb Fitting | 3 |
| | 18-040 | Hose Clamp | 3 |
| 12 | 16-925 | Stainless Steel Pipe Elbow $\frac{3}{4}$ x 90° | 1 |
| 13 | 33-301 | Right Pivot Bracket | 1 |
| 14 | HMB-100-14 | Machine Bushing 1 x 14GA | 4 |
| 15 | HMB-100-10 | Machine Bushing 1 x 10GA | 2 |
| 16 | 15-495 | Extension Spring | 2 |
| 17 | 15-812 | Right Cam Stop (must also order 15-811) | 2 |
| | 18-268 | Oilite Bushing | 2 |
| 18 | 33-308 | Right, Center Tube Bracket | 1 |
| | HBS-38-16-125 | Stainless Steel Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$ | 2 |
| | HWS-38 | Stainless Steel Washer $\frac{3}{8}$ | 2 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 2 |
| 19 | 16-927 | Center Tube | 1 |
| 20 | 33-330 | Right Actuator Bracket | 1 |
| | HBS-38-16-125 | Stainless Steel Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$ | 4 |
| | HWS-38 | Stainless Steel Washer $\frac{3}{8}$ | 4 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 4 |
| 21 | 33-329 | Center Mount | 1 |
| A | HSSQS-38-16-150 | Stainless Steel Set Screw $\frac{3}{8}$ - 16 x $1\frac{1}{2}$ (part of 33-329) | 2 |
| | HN-38-16 | Nut $\frac{3}{8}$ - 16 (part of 33-329) | 2 |
| 22 | 33-331 | Left Actuator Bracket | 1 |
| | HB-38-16-125 | Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$ | 4 |
| | HW-38 | Washer $\frac{3}{8}$ | 4 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 4 |
| 23 | 33-309 | Left Center Tube Bracket | 1 |
| | HBS-38-16-125 | Stainless Steel Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$ | 2 |
| | HWS-38 | Stainless Steel Washer $\frac{3}{8}$ | 2 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 2 |
| 24 | 15-813 | Pivot Bracket | 2 |
| | 15-494 | Nylon Flange Bushing | 4 |
| | 18-036 | Oilite Bushing | 4 |
| B | HSSQS-38-16-150 | Stainless Steel Set Screw $\frac{3}{8}$ - 16 x $1\frac{1}{2}$ | 2 |
| | HN-38-16 | Nut $\frac{3}{8}$ - 16 | 2 |
| 25 | HRPS-14-150 | Stainless Steel Roll Pin $\frac{1}{4}$ x $1\frac{1}{2}$ | 4 |
| 26 | 33-302 | Left Pivot Bracket | 1 |
| 27 | HCPS-12-225 | Stainless Steel Clevis Pin $\frac{1}{2}$ x $2\frac{1}{4}$ | 4 |
| | HPS-18-100 | Stainless Steel Cotter Pin $\frac{1}{8}$ x 1 | 4 |
| 28 | 15-810 | Pivot | 2 |
| | HMB-58-14 | Machine Bushing $\frac{5}{8}$ x 14GA | 8 |
| | HPS-18-100 | Cotter Pin $\frac{1}{8}$ x 1 | 2 |
| | HBS-38-16-125 | Stainless Steel Bolt $\frac{3}{8}$ - 16 x $1\frac{1}{4}$ | 4 |
| | HWS-38 | Stainless Steel Washer $\frac{3}{8}$ | 4 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 4 |

(Continued on next page)

10-160 STAINLESS STEEL 15' MANUAL BOOM DRAWING (CONTINUED)



Accessories

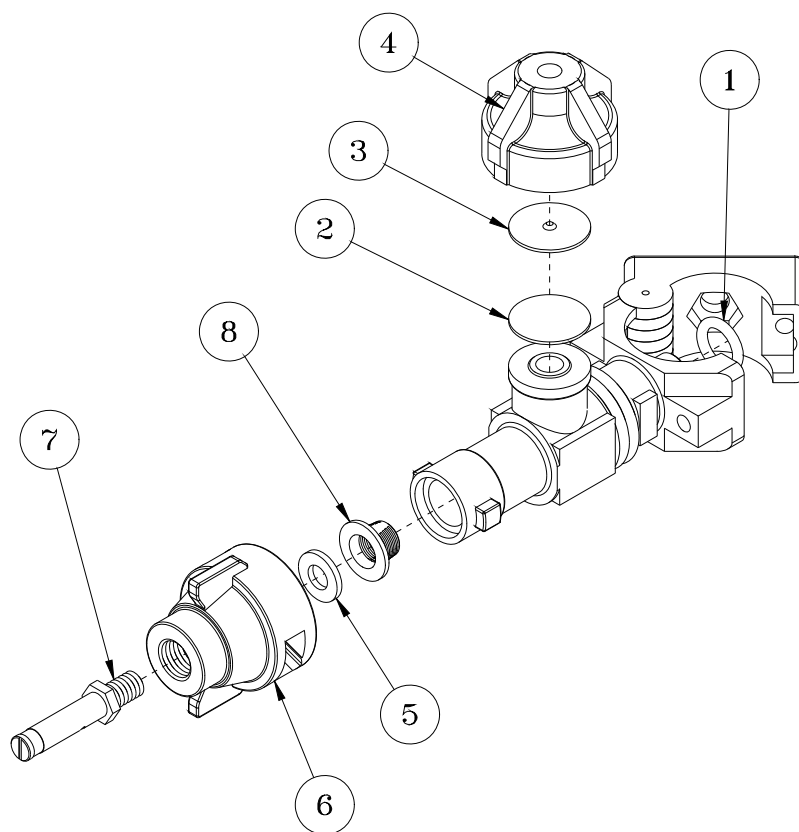
10-160 STAINLESS STEEL 15' MANUAL BOOM PARTS LIST (CONTINUED)

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|---|----------|
| 29 | 15-014 | Shift Knob | 2 |
| 30 | HB-38-16-175 | Bolt $\frac{3}{8}$ - 16 x $1\frac{3}{4}$ | 2 |
| | HN-38-16 | Nut $\frac{3}{8}$ - 16 | 2 |
| 31 | 15-561 | Boom Lift | 2 |
| 32 | HBS-12-13-550 | Stainless Steel Bolt $\frac{1}{2}$ - 13 x $5\frac{1}{2}$ | 2 |
| | HNCL-12-13 | Center Lock Nut $\frac{1}{2}$ - 13 | 2 |
| 33 | 15-811 | Left Cam Stop (must also order 15-812) | 1 |
| | 18-268 | Oilite Bushing | 2 |
| 34 | 18-289 | Bushing $\frac{3}{8}$ ID - $\frac{1}{2}$ OD x $\frac{5}{8}$ | 4 |
| 35 | HB-38-16-225 | Bolt $\frac{3}{8}$ - 16 x $2\frac{1}{4}$ | 2 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 2 |
| 36 | 10-247 | Right Boom Stabilizer | 1 |
| | 15-020 | Hand Grip | 2 |
| 37 | 21-212 | Extension Spring | 1 |
| 38 | HB-38-16-300 | Bolt $\frac{3}{8}$ - 16 x 3 | 1 |
| | HW-38 | Washer $\frac{3}{8}$ | 2 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 1 |
| 39 | 10-162 | Boom Support | 1 |
| 40 | HB-516-18-225 | Bolt $\frac{5}{16}$ - 18 x $2\frac{1}{4}$ | 2 |
| | HNTL-516-18 | Lock Nut $\frac{5}{16}$ - 18 | 2 |
| 41 | 10-246 | Left Boom Stabilizer | 1 |
| | 15-020 | Hand Grip | 2 |
| 42 | 18-411 | Stainless Steel Pipe Elbow $\frac{3}{4}$ x 45° | 2 |

For best result use Teflon® tape on all fittings.

- The three boom assemblies are not on the packing list but are in the carton. The long boom assemblies are the right and left booms. The labels are located on the pivot brackets (Ref 13 and 26). The small boom assembly is the center boom. You can NOT order these boom assemblies as one unit. Please refer to parts drawing for individual parts.
- Mount small boom assembly to the boom carriers on sprayer using four boom brackets (Ref 8), four bolts, $\frac{3}{8}$ - 16 x $5\frac{1}{2}$ and four lock nuts, $\frac{3}{8}$ - 16 (Ref 7). One boom bracket should go on boom assembly and one on boom carrier. Do the same for right and left side. Place boom at desired level (approximately 20" (51 cm) nozzle height) and center. Tighten bolts.
- Put the actuator brackets (Ref 20 and 22) on the center mount (Ref 21) using $\frac{3}{8}$ - 16 x $1\frac{1}{4}$ bolts, washers and lock nuts, with washers next to the slots. Snug up the bolts so that you can adjust actuator brackets with the set screws (Ref A) on the center mount after booms have been mounted.
- Take right boom and slide pivot bracket (Ref 24) in center mount (Ref 21) and hold in place with $\frac{1}{2}$ - 13 x $5\frac{1}{2}$ bolt and $\frac{1}{2}$ - 13 center lock nut (Ref 32). Do not over tighten, boom must be able to move up and down. Repeat for left boom.
- Install boom lifts (Ref 31) using clevis pin and cotter pin (Ref 27) so the bushing end hooks to the pivot bracket (Ref 24) and the slotted end hooks to the actuator bracket (Ref 20 and 22).
- Hook hoses to respective fittings using hose clamps (18-040). The hose coming from right side of sprayer goes to straight fitting on right boom. Center hose from sprayer goes to straight fitting on center boom. The left hose from sprayer goes to straight fitting on left boom. Be sure all clamps are tight.
- Use the adjustment slots on the boom lifts to completely lift and lower booms.
- Using set screws (Ref A) adjust actuator brackets so nozzles of booms are at same height with nozzles of center section. Tighten bolts holding actuator brackets to center mount and locknuts on set screws.
- Rubber boom carrier and latch are located on the horizontal boom support on top of tank.
- Put the viton gaskets (16-800), Raindrop tips (16-805) and quick TeeJet caps (16-921) on nozzle bodies (16-996) on the three boom sections.
- Make certain set screws (B) on both sides are completely screwed in and locked with the lock nut.

NOZZLE ASSEMBLY DRAWING



| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|----------------------------------|----------|
| 1* | 16-920-03 | O-Ring | 1 |
| 2* | 16-920-05 | Diaphragm Teflon (Optional) | 1 |
| 3* | 16-920-06 | Diaphragm EPDM Rubber (Standard) | 1 |
| 4* | 16-798 | Chemsaver End Cap | 1 |
| 5 | 16-800 | Gasket Viton | 1 |
| 6 | 16-921 | Cap | 1 |
| 7 | 15-588 | Turbo Turf Jet Tip #8 | 1 |
| 8 | 16-802 | Brass Strainer | 1 |
| * | 16-996 | Body | 1 |

NOTE:

When the 16-920-05 Teflon Diaphragm is used, it is placed in the assembly in front of the 16-920-06 EPDM Rubber Diaphragm. Nozzles are located 20" (51 cm) apart on the right, left, and center tubes. There are predrilled holes in all tubes. The Nozzle should be at a 45° angle to

NOTE:

For all 15' Booms: The nine 16-996 bodies are installed on the boom sections. The nine 16-800 viton gasket, 16-802 strainers, 15-588 Turbo Turf Jet Tip #8 and 16-921 cap are in the small parts bag.

TURBO TURFJET TIPS

This is a wide-angle (110°), hollow-cone, drift-reduction nozzle. Replaces conventional flooding nozzles in broadcast applications.

FEATURES:

- Color-coding makes it easy to match nozzle flow rates for easy identification.
- Color-coding is available in sizes 1/4 TTJ02-VS through 1/4 TTJ15-VS.
- Uniform spray distribution.
- A large orifice opening and passages minimize clogging.
- The Turbo TurfJet nozzle's patented design element, a secondary swirl chamber in the nozzle cap, alters the swirling action of the liquid so that the fewer driftable lines are discharged from the secondary orifice.
- Spraying Pressure 25-75 PSI (1.5-5 bar).

NOZZLE TILT

Delavan's extensive research on spray patterns has proven that a tilt of about 45° for flood Nozzles or tips will significantly improve the spray pattern uniformity.

The nozzle tilt reduces the effect of boom height variation and allows the spray nozzle to maintain a more fully developed pattern even when the nozzle outlet is below the recommended height for the best spray pattern uniformity.

RECOMMENDED OVERLAP AND NOZZLE HEIGHT

Adjust spray height in the field to overlap a minimum of 30% of each edge of pattern. Adjust nozzle height until this is achieved. If a decision to tilt the nozzle is made, do it before measuring the width of the spray on the ground and adjusting nozzle height. See example below.

DRIFTABLE FINES PRODUCED

(0.5 gpm at 40 psi)

| Nozzle (.5 gpm Output) | Percent of Spray Volume less than 200 microns |
|---------------------------|--|
| Turbo TurfJet | <1% |

XR TEEJET TIPS

This is an extended range flat spray tip. It is excellent for Contact Pesticides and Growth Regulators and good for Systemic Pesticides.

Contact Pesticides and Growth Regulators - At medium pressures (20-30 psi) provides medium size droplets for good surface coverage and less drift. At higher pressures (30-60 psi) produces smaller droplets for better coverage. Wide angle 110° tips produce slightly smaller droplets than 80° tips at equal pressures.

Systemic Pesticides - At lower pressures (15-20 psi) produces larger spray droplets and reduces drift while still providing uniform coverage along the boom.

FEATURES:

- Excellent spray distribution over a wide range of pressures (15-60 psi).
- Ideal for rigs equipped with sprayer controllers.
- Reduces drift at lower pressures, better coverage at higher pressures.
- Available in stainless steel and hardened stainless steel in 80° and 110° tip spray angles with VisiFlo color coding.

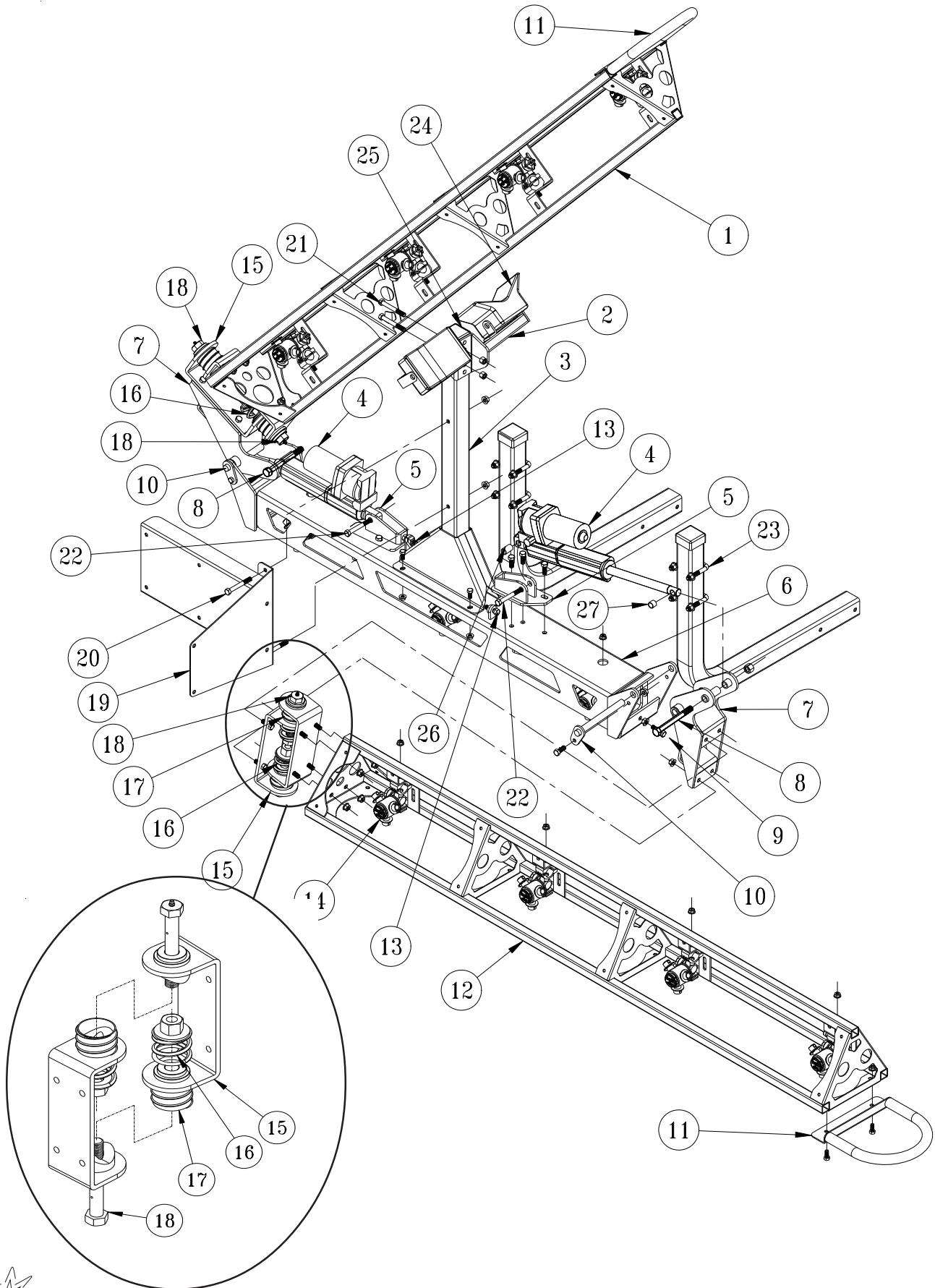
RECOMMENDED OVERLAP

Adjust nozzle spray height to overlap 30% of each edge of pattern.

NOZZLE HEIGHT

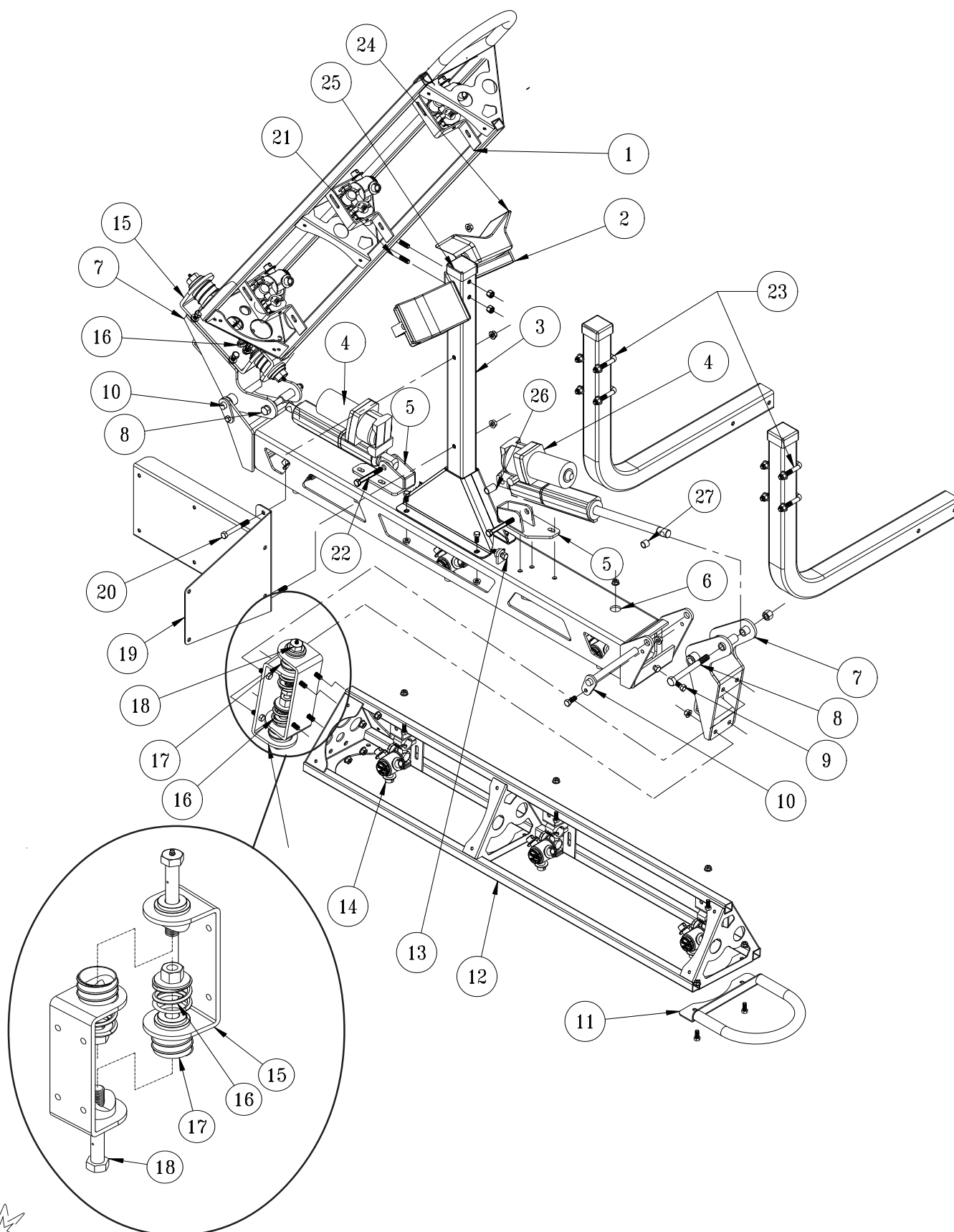
Suggested spray nozzle height with 20" spacing, tip spray angle of 80° should be 17-19", tip spray angle of 110° should be 12-14".

17-525 18.5' SMITHCO SUPER BOOM



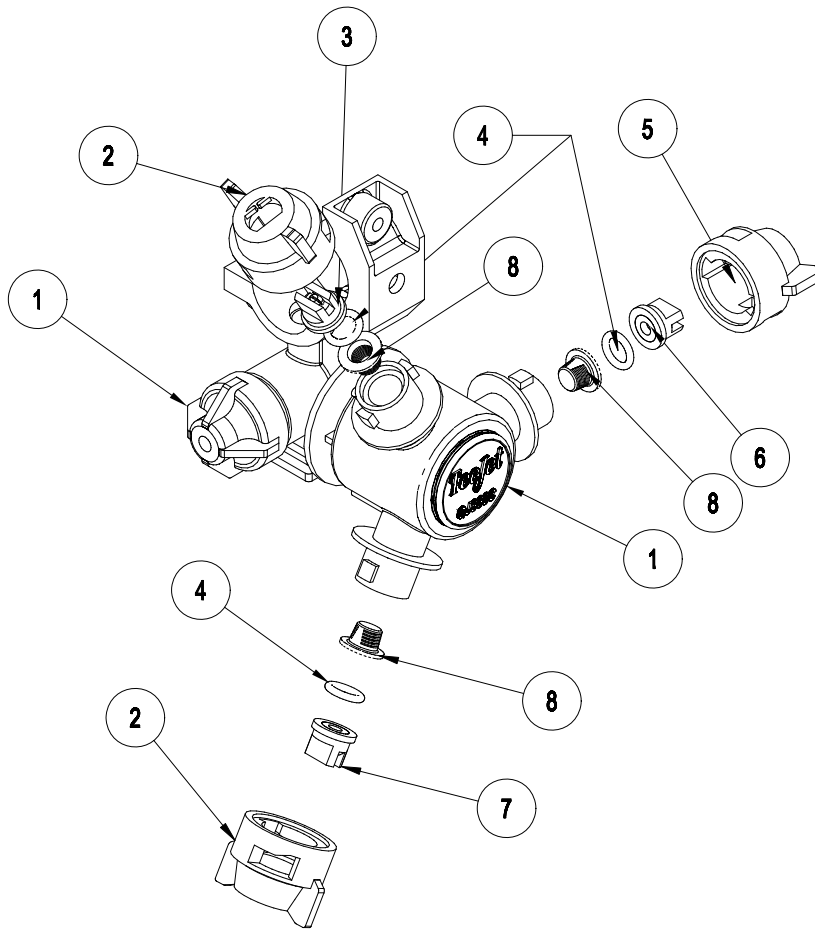
| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------------|--|----------|
| 1 | 17-531 | Left Boom Arm | 1 |
| 2 | 17-544 | Nest Plate | 1 |
| 3 | 17-533 | Boom Nest post | 1 |
| | HBFL-516-18-075 | Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 4 |
| | HNFL-516-18 | Flange Lock Nut, $\frac{5}{16}$ - 18 | 4 |
| 4 | 17-553 | 8" Elelctric Hydraulic Actuator | 2 |
| 5 | 17-545 | Ram Mount | 2 |
| | HB-38-16-100 | Bolt, $\frac{3}{8}$ - 16 x 1 | 6 |
| | HW-516 | Washer, $\frac{5}{16}$ | 6 |
| | HNFL-38-16 | Flange Lock Nut, $\frac{3}{8}$ -16 | 6 |
| 6 | 17-528 | Boom Center | 1 |
| 7 | 17-529 | Arm Pivot Hinge | 2 |
| 8 | HB-12-13-500 | Bolt, $\frac{1}{2}$ - 13 x 5 | 2 |
| | HNTL-12-13 | Lock Nut, $\frac{1}{2}$ - 13 | 2 |
| 9 | HB-38-16-250 | Bolt, $\frac{3}{8}$ - 16 x $2\frac{1}{2}$ | 2 |
| | HNTL-38-16 | Lock Nut, $\frac{3}{8}$ - 16 | 2 |
| 10 | 17-530 | Hinge Pin | 2 |
| | HB-516-18-075 | Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 2 |
| 11 | 17-541 | Boom End Guard | 2 |
| | HBFL-516-18-075 | Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 4 |
| | HNFL-516-18 | Flange Lock Nut, $\frac{5}{16}$ - 18 | 4 |
| 12 | 17-532 | Right Boom Arm | 1 |
| 13 | HSSQS-38-16-150 | Square Head Set SCrew , $\frac{3}{8}$ -16 x $1\frac{1}{2}$ | 2 |
| 14 | 33-506 | Body (see nozzle drawing) | 11 |
| | HB-516-18-075 | Bolt, $\frac{5}{16}$ -18 x $\frac{3}{4}$ | 11 |
| | HNFL-516-18 | Flange Lock Nut, $\frac{5}{16}$ -18 | 11 |
| 15 | 17-527 | Boom Hinge | 4 |
| | HB-38-16-100 | Bolt, $\frac{3}{8}$ - 16 x 1 | 16 |
| | HNFL-38-16 | Lock Nut, $\frac{3}{8}$ - 16 | 16 |
| 16 | 17-539 | Compression Spring | 4 |
| 17 | 9026-2 | Rubber Duct Hose x 2" | 4 |
| 18 | 17-540 | Tapped Bolt | 4 |
| | HW-34 | Washer, $\frac{3}{4}$ | 4 |
| | HNTL-34-10 | Lock Nut, $\frac{3}{4}$ -10 | 4 |
| | HG-14-28-180 | Grease Fitting, $\frac{1}{4}$ - 28 x 180° | 4 |
| 19 | 17-535 | Clean Load Mount | 1 |
| 20 | HB-38-16-300 | Bolt, $\frac{3}{8}$ - 16 x 3 | 2 |
| | HNTL-38-16 | Lock Nut, $\frac{3}{8}$ - 16 | 2 |
| 21 | HB-38-16-300 | Bolt, $\frac{3}{8}$ - 16 x 3 | 2 |
| | HW-38 | Washer, $\frac{3}{8}$ | 2 |
| | HNTL-38-16 | Lock Nut, $\frac{3}{8}$ - 16 | 2 |
| 22 | HCP-12-200 | Clevis Pin, $\frac{1}{2}$ - 2 | 2 |
| | HHP-18 | Bridge Pin, $\frac{1}{8}$ | 2 |
| 23 | 17-537 | Square U-bolt with Nut | 4 |
| 24 | 17-543 | Y -bow Stop | 2 |
| | HB-12-13-500 | Bolt, $\frac{1}{2}$ - 13 x 5 | 2 |
| | HNTI-12-13 | Lock Nut, $\frac{1}{2}$ - 13 | 2 |
| 25 | 16-557 | Rubber Cap | 1 |
| 26 | 18-234 | 1" Bushing (part of 17-553) | 2 |
| 27 | 18-036 | $\frac{1}{2}$ " Bushing (part of 17-553) | 2 |

17-550 15' SMITHCO SUPER BOOM



| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------------|--|----------|
| 1 | 17-551 | Left Boom Arm | 1 |
| 2 | 17-544 | Nest Plate | 1 |
| 3 | 17-533 | Boom Nest post | 1 |
| | HBFL-516-18-075 | Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 4 |
| | HNFL-516-18 | Flange Lock Nut, $\frac{5}{16}$ - 18 | 4 |
| 4 | 17-553 | 8" Electric Actuator | 2 |
| 5 | 17-545 | Actuator Mount | 2 |
| | HB-38-16-100 | Bolt, $\frac{3}{8}$ - 16 x 1 | 6 |
| | HW-516 | Washer, $\frac{5}{16}$ | 6 |
| | HNFL-38-16 | Flange Lock Nut, $\frac{3}{8}$ - 16 | 6 |
| 6 | 17-528 | Boom Center | 1 |
| 7 | 17-529 | Arm Pivot Hinge | 2 |
| 8 | HB-12-13-500 | Bolt, $\frac{1}{2}$ - 13 x 5 | 2 |
| | HNTL-12-13 | Lock Nut, $\frac{1}{2}$ - 13 | 2 |
| 9 | HB-38-16-250 | Bolt, $\frac{3}{8}$ - 16 x $2\frac{1}{2}$ | 2 |
| | HNFL-38-16 | Flange Lock Nut, $\frac{3}{8}$ - 16 | 2 |
| 10 | 17-530 | Hinge Pin | 2 |
| | HB-516-18-075 | Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 2 |
| 11 | 17-541 | Boom End Guard | 2 |
| | HBFL-516-18-075 | Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 4 |
| | HNFL-516-18 | Flange Lock Nut, $\frac{5}{16}$ - 18 | 4 |
| 12 | 17-552 | Right Boom Arm | 1 |
| 13 | HSSQS-38-16-150 | Square Head Set Screw, $\frac{3}{8}$ - 16 x $1\frac{1}{2}$ | 2 |
| 14 | 33-506 | Body (see nozzle drawing) | 9 |
| | HB-516-18-075 | Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 9 |
| | HNFL-516-18 | Flange Lock Nut, $\frac{5}{16}$ - 18 | 9 |
| 15 | 17-527 | Boom Hinge | 4 |
| | HB-38-16-100 | Bolt, $\frac{3}{8}$ - 16 x 1 | 16 |
| | HNFL-38-16 | Lock Nut, $\frac{3}{8}$ - 16 | 16 |
| 16 | 17-539 | Compression Spring | 4 |
| 17 | 9026-2 | Rubber Duct Hose x 2" | 4 |
| 18 | 17-540 | Tapped Bolt | 4 |
| | HW-34 | Washer, $\frac{3}{4}$ | 4 |
| | HNTL-34-10 | Lock Nut, $\frac{3}{4}$ - 10 | 4 |
| | HG-14-28-180 | Grease Fitting, $\frac{1}{4}$ - 28 x 180° | 4 |
| 19 | 17-535 | Clean Load Mount | 1 |
| 20 | HB-38-16-300 | Bolt, $\frac{3}{8}$ - 16 x 3 | 2 |
| | HNTL-38-16 | Lock Nut, $\frac{3}{8}$ - 16 | 2 |
| 21 | HB-38-16-300 | Bolt, $\frac{3}{8}$ - 16 x 3 | 2 |
| | HW-38 | Washer, $\frac{3}{8}$ | 2 |
| | HNTL-38-16 | Lock Nut, $\frac{3}{8}$ - 16 | 2 |
| 22 | HCP-12-200 | Clevis Pin, $\frac{1}{2}$ - 2 | 2 |
| | HHP-18 | Bridge Pin, $\frac{1}{8}$ | 2 |
| 23 | 17-537 | Square U-bolt with Nut | 4 |
| 24 | 17-543 | Y-bow Stop | 2 |
| | HB-12-13-500 | Bolt, $\frac{1}{2}$ - 13 x 5 | 2 |
| | HNTL-12-13 | Lock Nut, $\frac{1}{2}$ - 13 | 2 |
| 25 | 16-557 | Square Rubber Cap | 1 |
| 26 | 18-036 | 1" Bushing (part of 15-553) | 2 |
| 27 | 18-234 | $\frac{1}{2}$ " Bushing (part of 15-553) | 2 |

TRIPLE NOZZLE ASSEMBLY DRAWING



| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------|-----------------------------|----------|
| 1 | 33-506 | Body | 1 |
| 2 | 33-538 | Cap - Gray | 2 |
| 3 | 33-553 | Nozzle -Gray (XR11006-VS) | 1 |
| 4 | 16-800 | Viton Gasket | 3 |
| 5 | 33-537 | Cap - Red | 1 |
| 6 | 33-552 | Nozzle - Red (XR11004-VS) | 1 |
| 7 | 33-554 | Nozzle - White (XR11008-VS) | 1 |
| 8 | 16-802 | Strainer | 3 |

Quantity is per nozzle body. For 18' booms multiply quantity by 11.

Quantity is per nozzle body. For 15' booms multiply quantity by 9.

Nozzles are located 20" (51 cm) apart on the right, left, and center tubes. There are predrilled holes in all tubes. The Nozzle should be at a 45° angle to the ground for proper application.

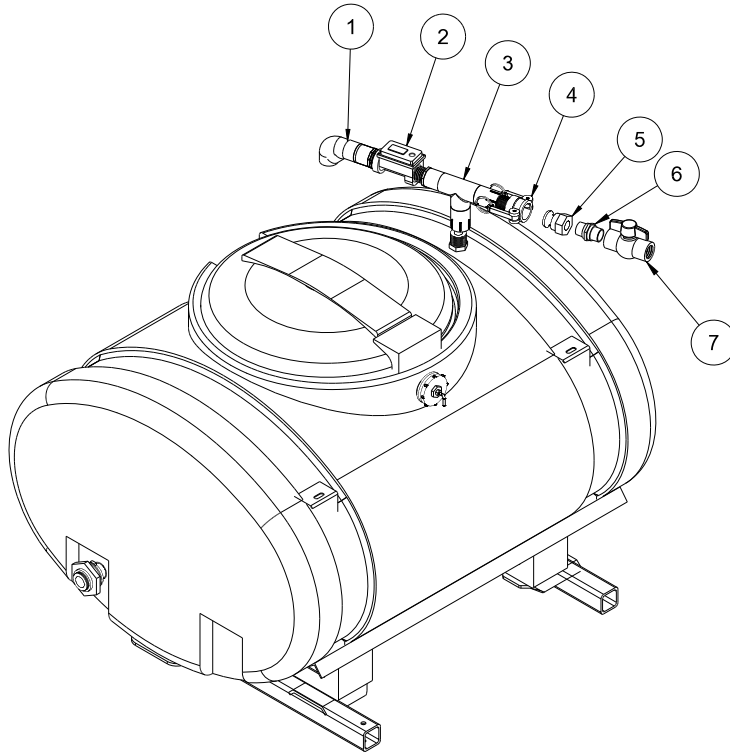
For re-ordering Nozzle Kits the following numbers apply

33-540 Triple Nozzle Kit for 18' Booms

33-541 triple Nozzle Kit for 15' Booms

10-370 WATER FILL METER KIT - LITERS

10-365 WATER FILL METER KIT - GALLONS



| REF # | PART # | DESCRIPTION | QUANTITY |
|-------|--------|------------------------------------|----------|
| 1 | 14-524 | Filler Outlet | 1 |
| 2 | 14-514 | Water Meter - Gallons | 1 |
| | 14-527 | Water meter - Liters | 1 |
| 3 | 10-364 | Filler Inlet | 1 |
| 4 | 16-962 | Quick Coupler (already on machine) | 1 |
| 5 | 16-961 | Quick Coupler (already on machine) | 1 |

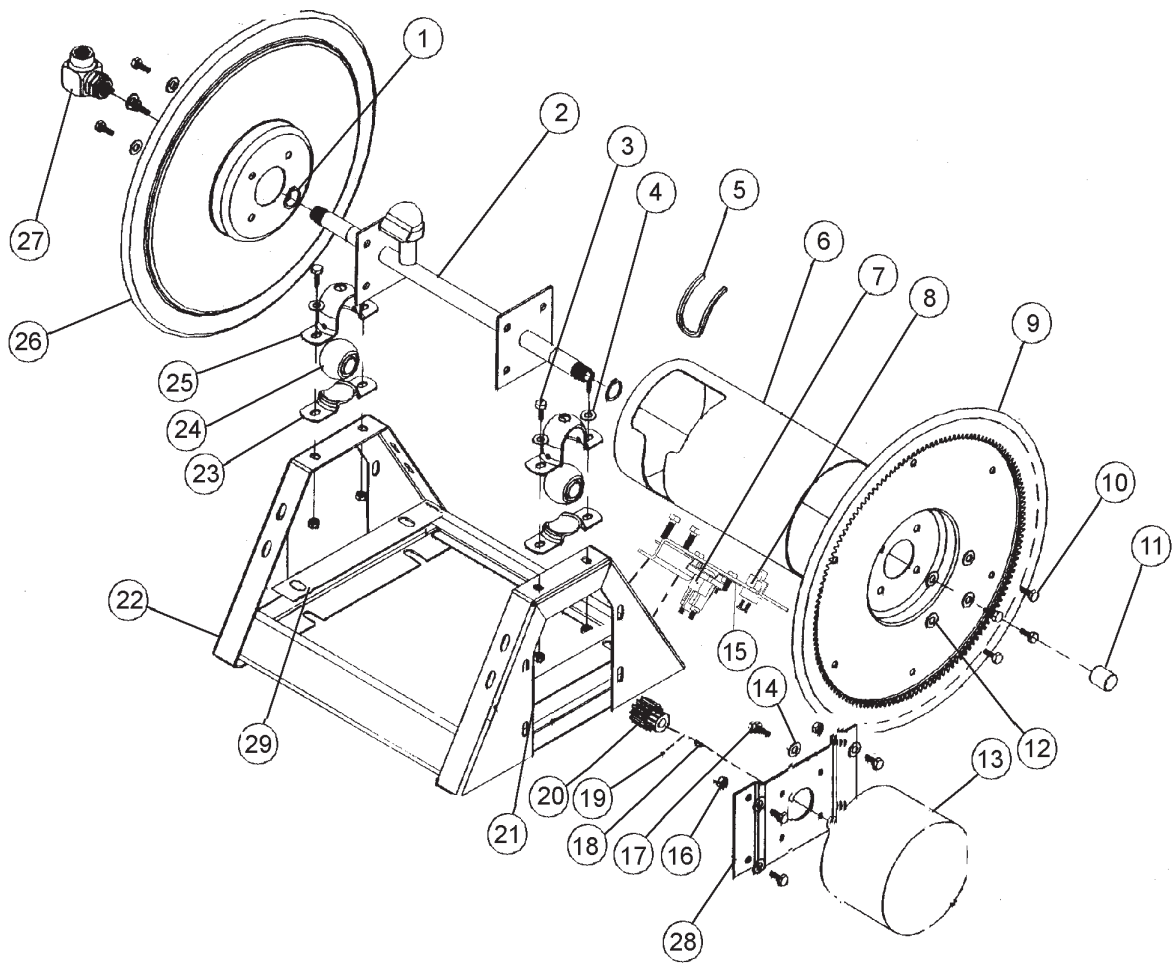
1. Thoroughly flush the service line upstream of the meter to remove dirt and debris.
2. Set meter inline.
3. Make sure the water flow follows the arrow cast on the meter body.
4. The DLJ Meter is for use **only** with **COLD WATER** up to 122°F (50°C)
5. Slowly open any upstream valves to prevent damage to the meter.

Gallons to Cubic feet Conversion :

Multiply gallons reading by 0.1337 to get cubic feet.

There are 7.48052 gallons per cubic foot.

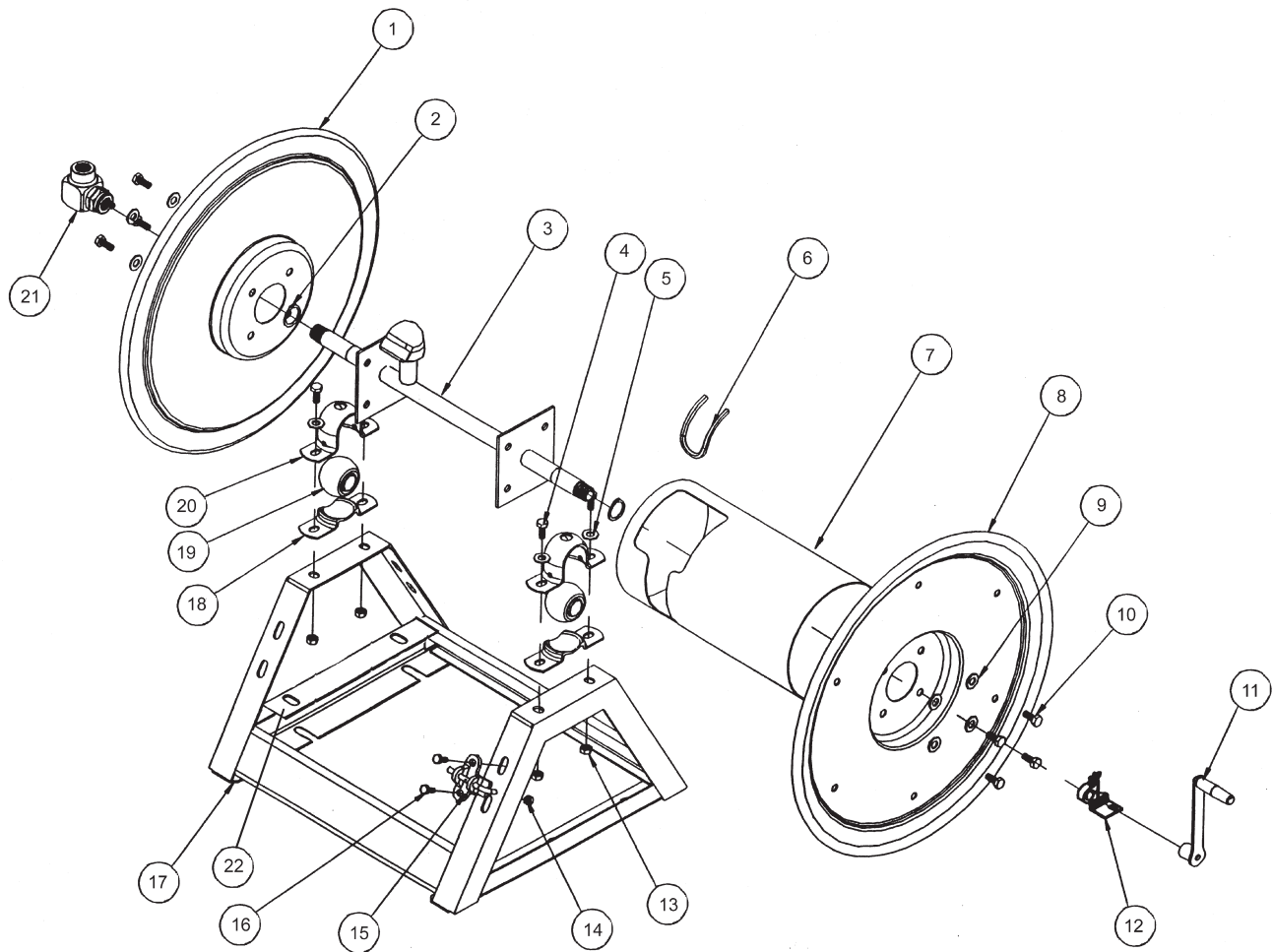
16-906 ELECTRIC HOSE REEL DRAWING



16-906 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 | Bolt $\frac{3}{8}$ - 16 x 1 | 4 |
| 4 | HW-38 | Washer $\frac{3}{8}$ | 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 | Bolt $\frac{1}{4}$ - 20 x $\frac{3}{4}$ | 2 |
| | HWL-14 | Lockwasher $\frac{1}{4}$ | 2 |
| | HN-14-20 | Nut $\frac{1}{4}$ - 20 | 2 |
| 8 | 33-251 | Switch | 1 |
| 9 | 16-906-19 | Disc and Gear Assembly | 1 |
| 10 | HB-516-18-075 | Bolt $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 8 |
| 11 | 16-906-26 | Pipe Cap $\frac{3}{4}$ | 1 |
| 12 | HWL-516 | Lockwasher $\frac{5}{16}$ | 8 |
| 13 | | Motor 12VDC | 1 |
| 14 | HW-516 | Washer $\frac{5}{16}$ | 4 |
| 15 | 33-252 | Switch and Solenoid Brkt | 1 |
| | HB-516-18-100 | Bolt $\frac{5}{16}$ - 18 x 1 | 2 |
| | HW-516 | Washer $\frac{5}{16}$ | 2 |
| | HWL-516 | Lockwasher $\frac{5}{16}$ | 2 |
| | HN-516-18 | Nut $\frac{5}{16}$ - 18 | 2 |
| 16 | HNTL-516-18 | Lock Nut $\frac{5}{16}$ - 18 | 4 |
| 17 | HB-516-18-100 | Bolt $\frac{5}{16}$ - 18 x 1 | 4 |
| 18 | 16-906-17 | Key | 1 |
| 19 | | Set Screw | 2 |
| 20 | 16-906-29 | Pinion | 1 |
| 21 | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 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 $\frac{1}{2}$ | 1 |
| 27 | 16-906-23 | Swivel Assembly $\frac{3}{4}$ | 1 |
| | 16-906-30 | Seal Kit (For 16-906-23) | 1 |
| 28 | 16-906-28 | Bracket 12VDC | 1 |
| 29 | 16-980 | Mount Bracket | 2 |
| | HB-516-18-175 | Bolt $\frac{5}{16}$ - 18 x 1 $\frac{3}{4}$ | 4 |
| | HW-516 | Washer $\frac{5}{16}$ | 4 |
| | HNTL-516-18 | Lock Nut $\frac{5}{16}$ - 18 | 4 |
| | 16-982 | Electric Hose Reel (only) | 1 |

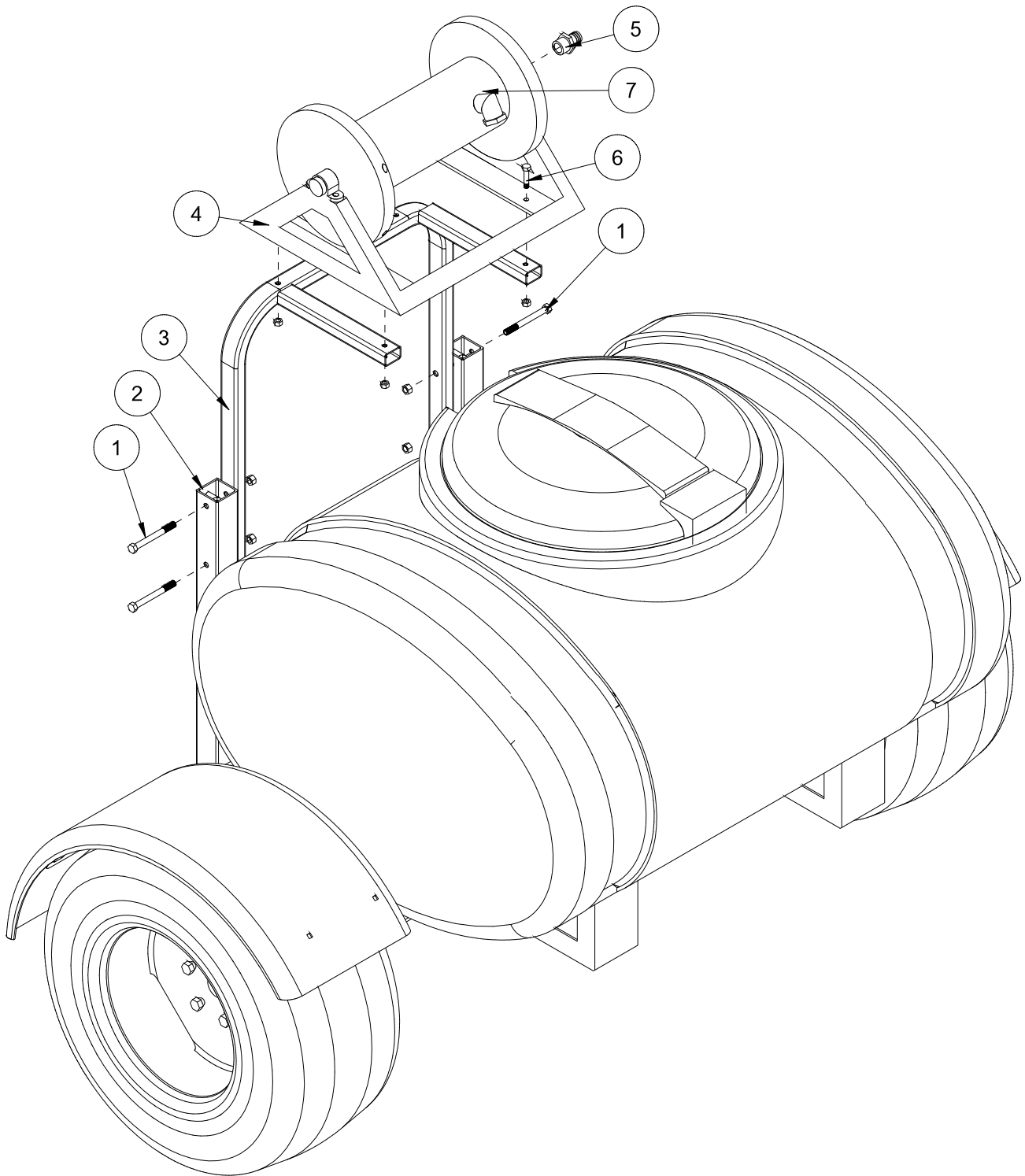
16-129 MANUAL HOSE REEL DRAWING



16-129 MANUAL HOSE REEL PARTS LIST

| 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 | Bolt ³ / ₈ - 16 x 1 | 4 |
| 5 | HW-38 | 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 | Lockwasher ⁵ / ₁₆ | 8 |
| 10 | HB-516-18-075 | 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 | Lock Nut ³ / ₈ - 16 | 4 |
| 14 | HNTL-516-18 | Lock Nut ⁵ / ₁₆ - 18 | 2 |
| 15 | 16-129-08 | Lock Pin Assembly | 1 |
| 16 | HB-516-18-075 | Bolt ⁵ / ₁₆ - 18 x ³ / ₄ | 2 |
| | HW-516 | 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 |
| 22 | 16-980 | Mount Bracket | 2 |
| | HB-516-18-175 | Bolt ⁵ / ₁₆ - 18 x 1 ³ / ₄ | 4 |
| | HW-516 | Washer ⁵ / ₁₆ | 4 |
| | HNTL-516-18 | Lock Nut ⁵ / ₁₆ - 18 | 4 |

10-377 HOSE REEL MOUNT FOR 10-160 BOOM

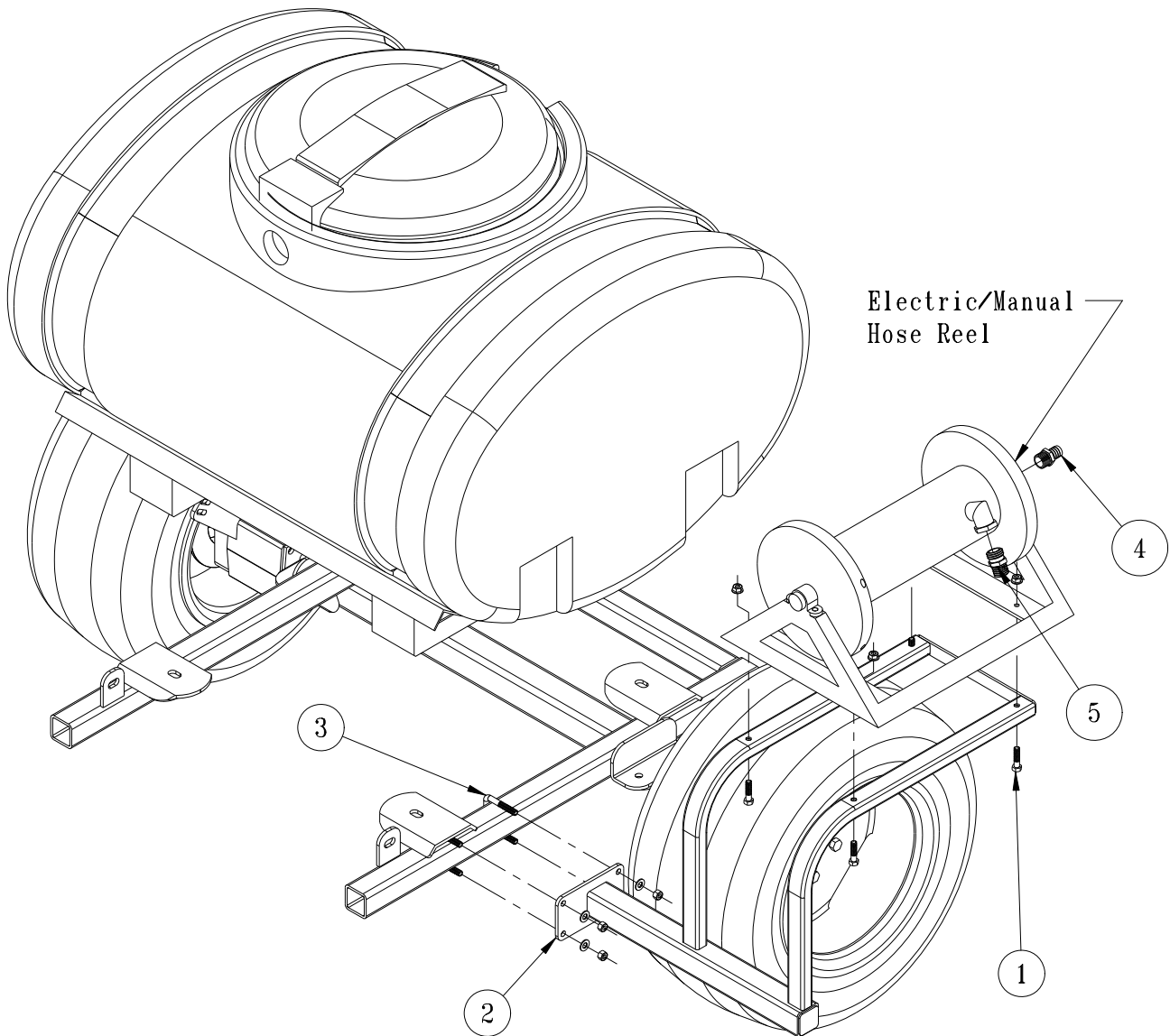


HOSE REEL MOUNT PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|---|----------|
| 1 | HB-38-16-375 | Bolt $\frac{3}{8}$ - 16 x $3\frac{3}{4}$ | 4 |
| | HNTL-38-16 | Lock Nut $\frac{3}{8}$ - 16 | 4 |
| 2 | 10-205 | Boom Carrier (part of machine) | 2 |
| 3 | 10-221 | Hose Reel Mount | 1 |
| 4 | 16-906 | Electric Hose Reel | 1 |
| | 16-129 | Manual Hose Reel | 1 |
| 5 | 18-249 | Barb Fitting $\frac{3}{4}$ MPT x $\frac{3}{4}$ HB | 1 |
| 6 | HB-516-18-150 | Bolt $\frac{5}{16}$ - 18 x $1\frac{1}{2}$ | 4 |
| | HNTL-516-18 | Lock Nut $\frac{5}{16}$ - 18 | 4 |
| 7 | 16-295 | Hose Fitting | 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. Remove square rubber covers on boom carriers. Cut a notch into the covers to clear the top bolt then put them back in.
5. Place hose reel bracket inside the boom carrier tubes with arms pointing toward front of machine.
6. Lower bracket until top hole in bracket lines up with hole in upright. Use four $\frac{3}{8}$ - 16 x $3\frac{3}{4}$ bolts and four $\frac{3}{8}$ - 16 lock nuts with nuts on inside of uprights.
7. Put hose reel on hose reel bracket with fitting on left side of machine. Use four bolts $\frac{5}{16}$ - 18 x $1\frac{1}{2}$ and four $\frac{5}{16}$ - 18 lock nuts to hold in place. Tighten bolts.
8. Put 18-249 barb fitting into hose reel.

10-422HOSE REEL MOUNT FOR 17-525/17-550 BOOMS

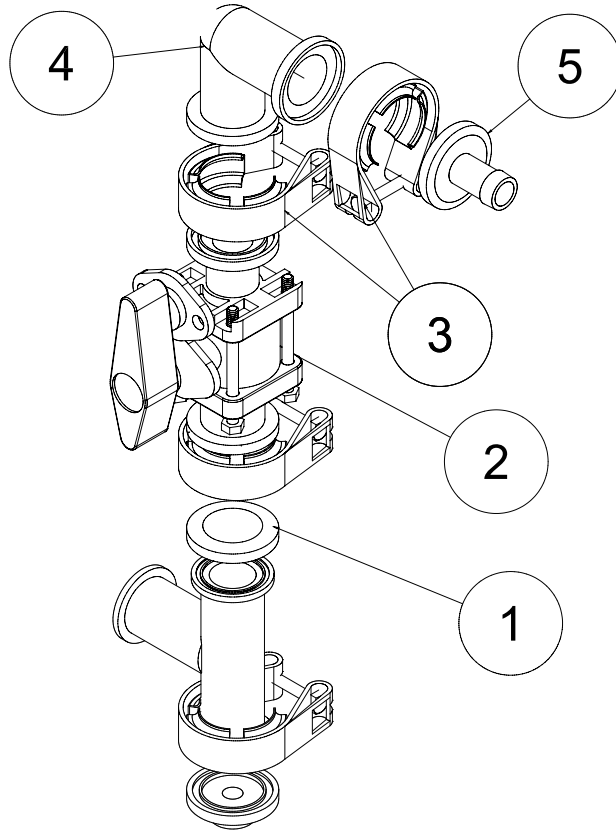


HOSE REEL MOUNT PARTS LIST

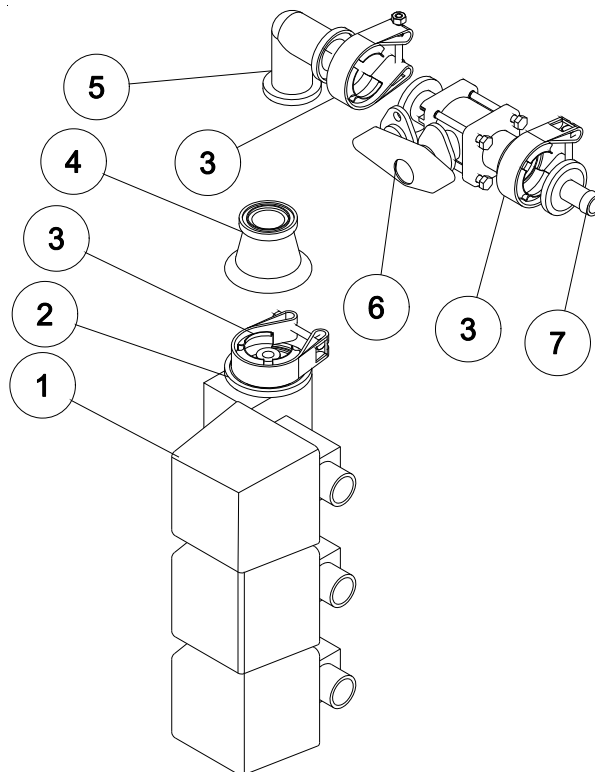
| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|---|----------|
| 1 | HB-516-18-150 | Bolt $\frac{5}{16}$ - 18 x $1\frac{1}{2}$ | 4 |
| | HNTL-516-18 | Lock Nut $\frac{5}{16}$ - 18 | 4 |
| 2 | 10-423 | Hose Reel Mount | 1 |
| 3 | 17-537 | Square U-bolt | 2 |
| 4 | 18-249 | Barb Fitting | 1 |
| 5 | 16-295 | Hose e Fitting | 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. Install hose reel mount on the left side of the machine in front of the rear wheel. Mount arms pointing to the rear of the machine.
5. Use the u-bolts to secure the mount to the machine.
6. Put hose reel on hose reel bracket with fitting to the rear of machine. Use four bolts $\frac{5}{16}$ - 18 x $1\frac{1}{2}$ and four $\frac{5}{16}$ - 18 lock nuts to hold in place. Tighten bolts.
7. Put 18-249 barb fitting into side of hose reel. Place 16-295 Fitting into center of hose reel. Run 55" hose from the 18-249- to the 15-749 hose barb.

1002 (RAVEN 203) HOSE REEL PLUMBING DRAWING



1008 (RAVEN 440) HOSE REEL PLUMBING DRAWING



1002 (RAVEN 203) HOSE REEL PLUMBING PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------|--------------------|----------|
| 1 | 15-778 | Blank Gauge Port | 1 |
| 2 | 15-738 | Flanged Ball Valve | 1 |
| 3 | 15-740 | 50 Series Clamp | 2 |
| 4 | 15-736 | #50 Elbow Coupling | 1 |
| 5 | 15-749 | Hose Barb | 1 |

INSTALLATION INSTRUCTIONS

1. Between the boom control valves and the fuel tank you will find a tee fitting with a black cap on top of it. Remove the clamp and the cap.
2. Install the 15-738 ball valve (Ref 2) onto the top of the tee using the clamp and o-ring you removed in step 1. The Handle can be positioned so it clears the other hoses by rotating it before the clamp is tightened. Tighten clamp when ball valve is in the position you wanted.
3. Install the 15-736 Elbow (Ref 4) on top of the ball valve pointing to the back of the machine and secure with 15-740 clamp (Ref 3) and O-ring. Tighten.
4. Install the 15-749 flanged hose barb (Ref 5) on to the open end of the elbow with a 15-740 clamp and O-ring. Tighten.
5. Route the orange $\frac{3}{4}$ " hose from the hose barb you just installed to the hose barb on the hose reel. Secure with an 18-040 hose clamp. Secure orange hose to machine with 22-075 nylon ties.
6. You will have a reducer coupling, clamp and cap left over that you will not need.

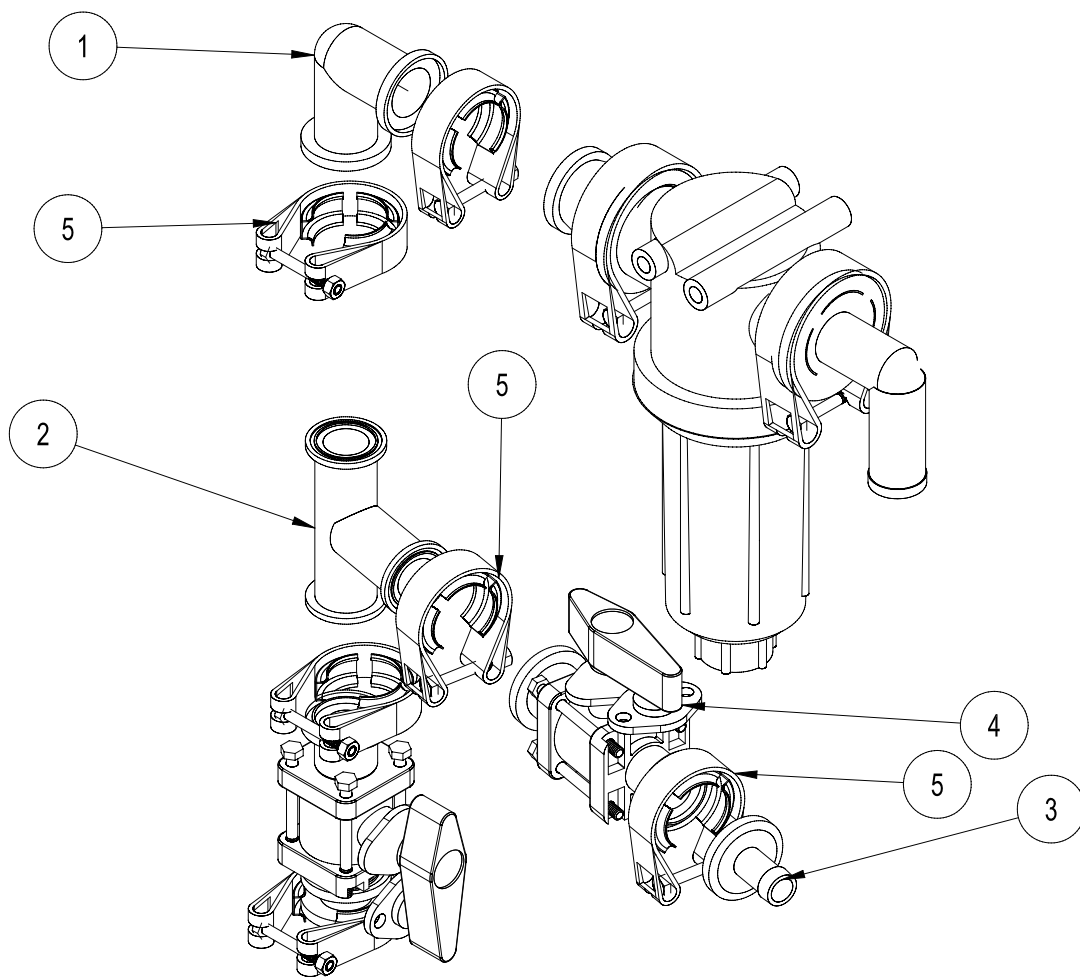
1008 (RAVEN 440) HOSE REEL PLUMBING PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------|---------------------|----------|
| 1 | 15-743 | Electric ball Valve | 1 |
| 2 | 15-742 | Inlet Cover | 1 |
| 3 | 15-740 | 50 Series Clamp | 3 |
| 4 | 15-748 | Reducer Coupling | 1 |
| 5 | 15-736 | #50 Elbow Coupling | 1 |
| 6 | 15-738 | Flanged Ball Valve | 1 |
| 7 | 15-749 | Hose Barb | 1 |

INSTALLATION INSTRUCTIONS

1. On the top of the Electric Spray Control Valve (Ref 1) you will find a cover. Remove clamp, o-ring and cover. Install a 15-748 reducer (Ref 4) in place of the cover you just removed. Reinstall clamp and o-ring and tighten. The cap will not be used again.
2. Install a 15-736 Elbow onto the top of the reducer with a 15-740 clamp (Ref 3) and O-ring. Rotate it 90° so it points to the rear of the machine, then tighten clamp.
3. Install the 15-738 ball valve (Ref 6) onto the elbow using a 15-740 clamp and O-ring. Tighten with the handle on the top or side.
4. Install the 15-749 Hose Barb (Ref 7) onto the open end of the ball valve with a 15-740 clamp and o-ring. Tighten.
5. Route the orange $\frac{3}{4}$ " hose from the hose barb to the hose barb on the hose reel and secure with a 18-040 Hose clamp.
6. Secure the orange hose to the machine with a nylon tie strap.

1010 (MANUAL) HOSE REEL PLUMBING DRAWING



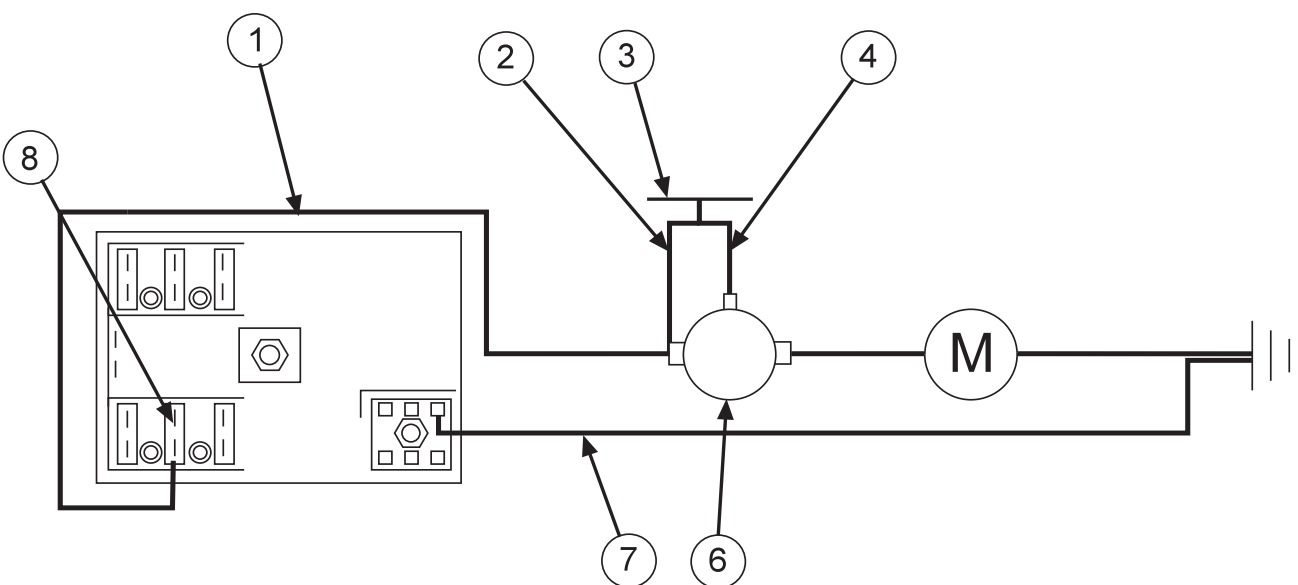
1010 (MANUAL) HOSE REEL PLUMBING PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------|-----------------|----------|
| 1 | 15-736 | Elbow | 1 |
| 2 | 15-776 | Tee | 1 |
| 3 | 15-749 | Hose Barb | 1 |
| 4 | 15-738 | Ball Valve | 1 |
| 5 | 15-740 | 50 Seires Clamp | 1 |

INSTALLATION INATRUCTIONS

1. Disconnect the ball valve from the elbow fitting on the outside of the filter assembly. Install 15-776 tee fitting (Ref 2) between the ball valve and the elbow. Use the clamp that was removed and on of the new ones provided. Only tighten clamps enough so it can be rotated.
2. Install 15-749 hose barb (Ref 3) onto the 15-738 ball valve (Ref 4) using a 50 series clamp (Ref 5) Tighten clamp. Install the ball valve and hose barb to the 15-776 tee (Ref 2) that was installed in step 1.
3. Rotate the tee fitting so the valve points toward the outside of the machine, just behind the filter assembly. Tighten all clamps.
4. Route the 3/4" orange hose from the hose barb you installed in step 2 to the hose barb on the hose reel. Secure with 18-040 Hose clamps.
5. When installing the hose reel with a manual spray system you will have a reducer coupling and an elbow coupling left over that you will not need.

ELECTRIC HOSE REEL WIRING DIAGRAM



HOSE REEL ADJUSTMENTS

OPERATIONAL CHECK:

1. Pull hose off drum at least one full revolution. A clicking noise should be heard from locking mechanism.
2. Let the hose retract.
3. Pull the hose off until the first click is heard. Drum should lock when the hose tension is removed.
4. Continue pulling the hose, no more than one revolution, until no clicking is heard. Hose should rewind when tension is removed.

HOSE REPLACEMENT PROCEDURE:

1. Facing swivel, turn the hose drum clockwise until all of the hose is removed from the drum and the drum is held by locking mechanism. Make sure spring is locked.
2. Remove hose clamps and disconnect hose from swivel. Remove old hose.
3. Insert new hose through roller guide, connect to swivel and reinstall hose clamps. Use spring guard over hose to protect the hose from being cut by the drum.
4. Remove check ball from old hose and install on replacement hose.
5. Carefully, keeping the tension on the hose, pull the hose to release the locking mechanism. Let the hose wind on the drum.

ELECTRIC HOSE REEL WIRING PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|---------------------------|------------|---|----------|
| | 8843-132 | Flexguard $\frac{3}{8}$ ID | 1 |
| 1 | 8919-144 | 10GA Red Wire 144" | 1 |
| | 8901 | Slide-On Connector | 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 | 12-015 | Solenoid | 1 |
| SOLENOID TERMINALS | | | |
| | HN -516-24 | $\frac{5}{16}$ - 24 Hex Nut | 2 |
| | HN -10-32 | 10 - 32 Hex Nut | 1 |
| 7 | 8931-144 | 10GA White Wire 144" | 1 |
| | 8901 | Slide-On Connector | 1 |
| 8 | 33-273 | Auto Blade Type Fuse 30Amp | 1 |

CONNECTION INSTRUCTIONS

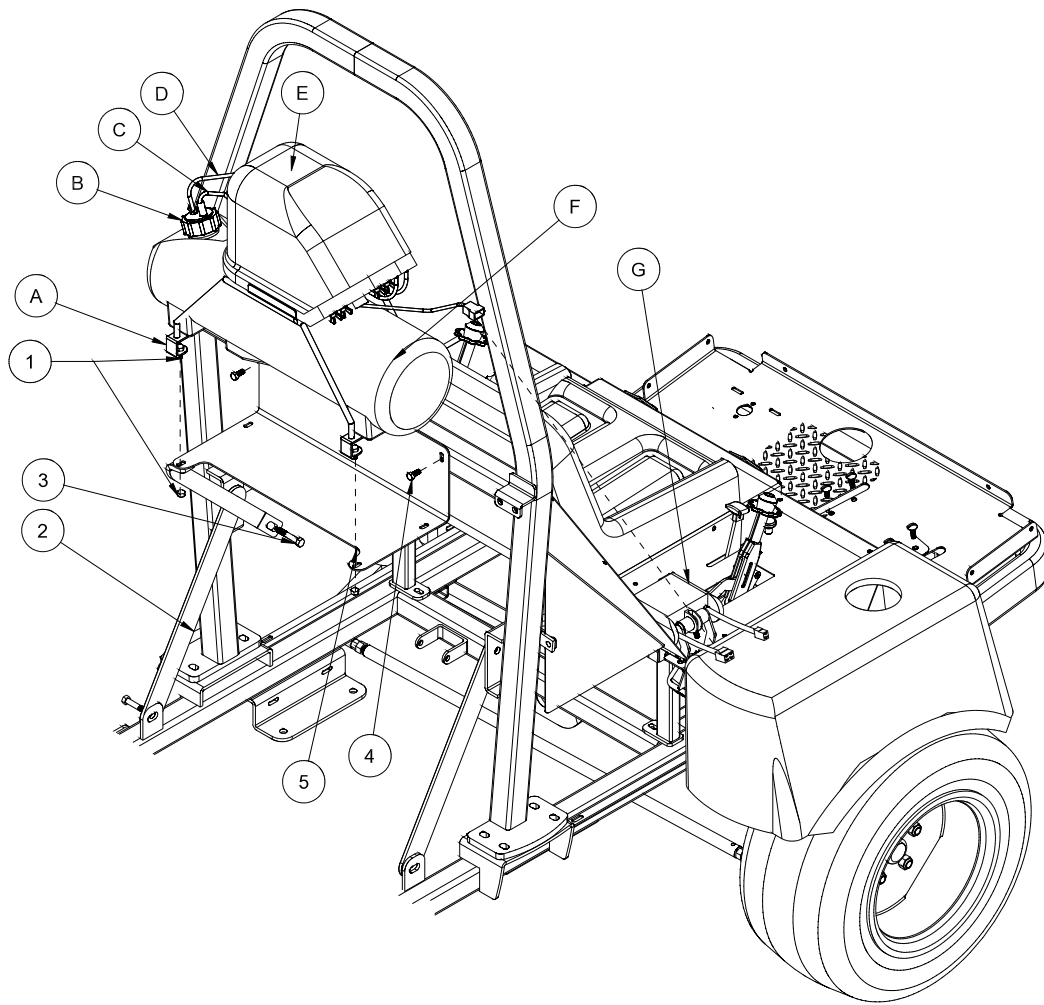
Route wire harness along side of tank and over to fuse block taking care to stay clear of moving parts or hot engine components. Cut off excess wire and strip back $\frac{3}{8}$ ". Place one 8963 heat shrink ($\frac{1}{4} \times 1\frac{1}{4}$) on each wire before crimping 8901 slide on connectors to 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.



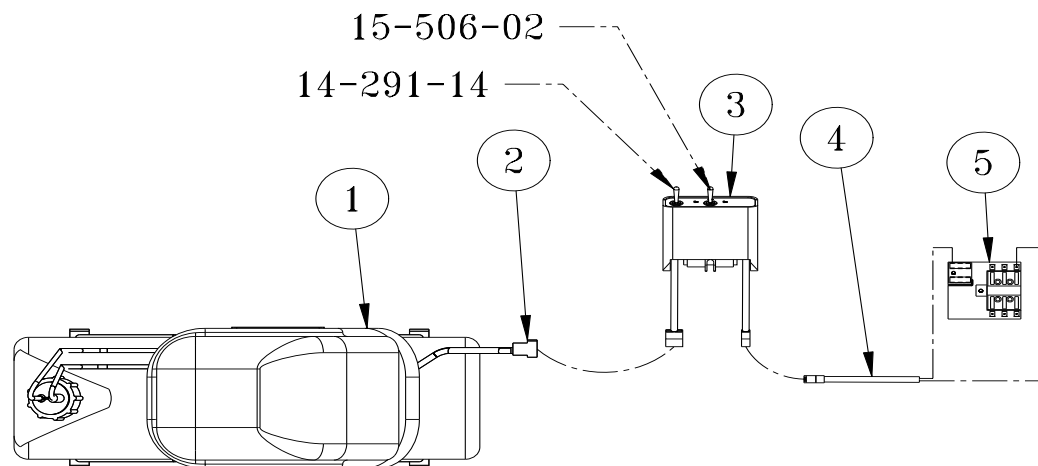
Make certain you are connecting positive (+) to positive; negative (-) to negative while attaching power leads. If you do not observe polarity, damage will result to electrical components.

Use Dielectric Grease On All Electrical Connections

10-378 FOAM MARKER FOR 1000 DRAWING



WIRING DRAWING



10-378 FOAM MARKER FOR 1000 PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------------|--|----------|
| 1 | HB-14-20-075 | Hex Bolt, $\frac{1}{4}$ -20 x $\frac{3}{4}$ | 4 |
| | HNFL-14-20 | Flange Lock Nut, $\frac{1}{4}$ -20 | 4 |
| 2 | 10-413 | Foamer Brace | 1 |
| 3 | HB-12-13-150 | Flange Bolt, $\frac{5}{16}$ -18 x $1\frac{1}{2}$ | 1 |
| 4 | HBFL-516-18-075 | Flange Bolt, $\frac{5}{16}$ -18 x $\frac{3}{4}$ | 2 |
| 5 | 10-409 | Mount Plate | 1 |
| A | 14-291-04 | Tank Bracket | 2 |
| B | 14-284-02 | Cap Assembly | 1 |
| C | | Blue Tube | 1 |
| D | | Clear Tube | 1 |
| E | 14-291-03 | Compressor Only | 1 |
| | 14-291-01 | Black Cover | 1 |
| F | 14-291-02 | Foamer Tank | 1 |
| G | 14-291-05 | Double Switch Box | 1 |
| | 33-508 | Fuse 15AMP | 1 |
| | 15-506-02 | Switch | 1 |
| A-G | 14-291 | Foamer (includes parts A-G) | 1 |

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

1. Mount the switch box on the side control panel facing towards the seat using the two wing nuts that came with the switch box.
2. Connect the compressor to the switch box.

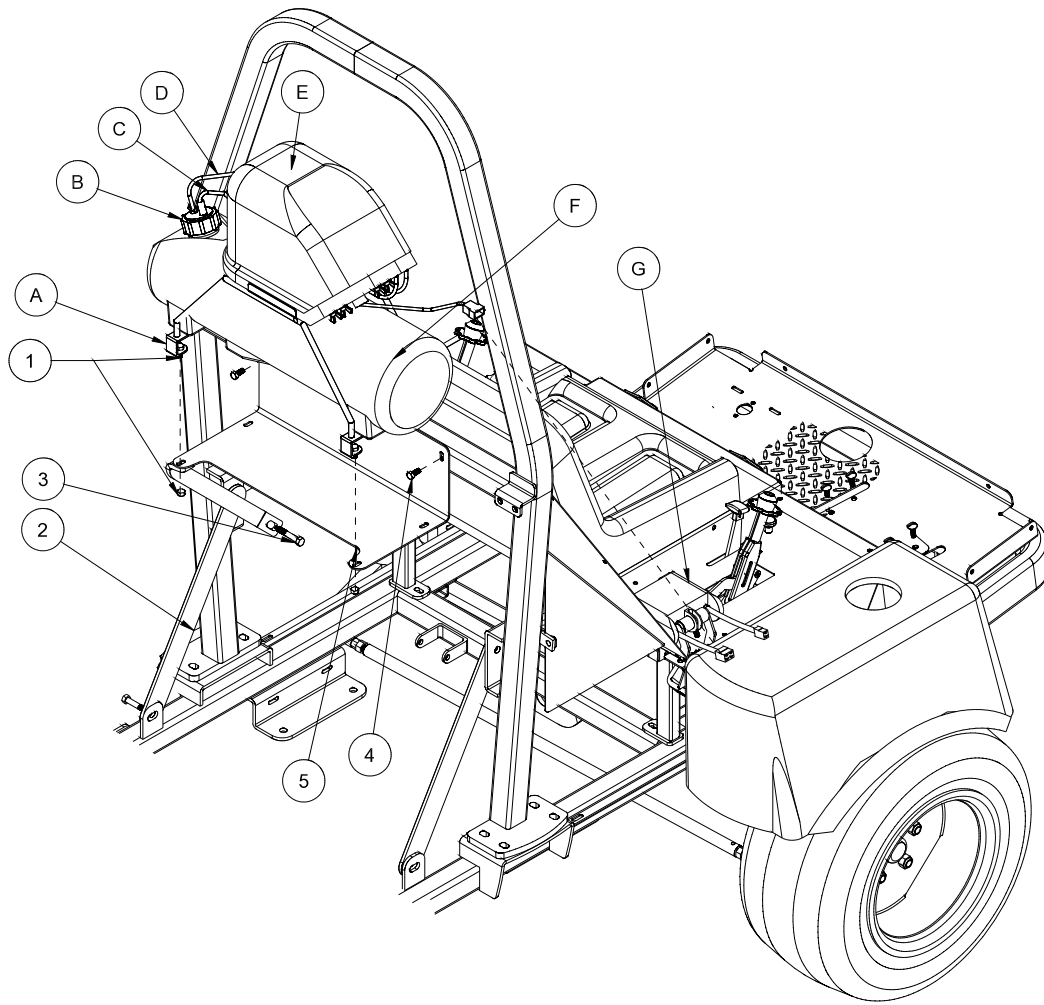
WIRING

Use dielectric grease on all electrical connections. Connect power cable (15-509) to the switch box. Turn the switch off. Route the power wire to the fuse block (on the inside of the engine cover) out of the way of any heat or moving parts. Use nylon ties as needed. Cut the power wire with enough length to connect the fuse block. Put the slide on terminal with heat shrink onto the wire ends and connect to fuse block. Red to positive(+), black to negative(-). Insert 10 amp fuse into slot which has red wire attached to it.

FOAM MARKER WIRING PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|------------------------------|----------|
| 1 | 14-291-03 | Compressor | 1 |
| 2 | 15-504-04 | Wiring Harness | 1 |
| 3 | 14-291-05 | Switch Box | 1 |
| | 33-508 | Fuse 15 amp | 1 |
| | 15-506-02 | Center Switch | 1 |
| | 14-291-04 | Switch | 1 |
| 4 | 15-509 | Power Cable | 1 |
| 5 | 33-271 | Fuse Block (part of machine) | 1 |
| | 33-508 | Fuse 15 amp | 1 |

10-378 FOAM MARKER DRAWING



10-378 FOAM MARKER PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------------|---|----------|
| 1 | HB-14-20-075 | Hex Bolt, $\frac{1}{4}$ -20 x $\frac{3}{4}$ | 4 |
| | HNFL-14-20 | Flange Lock Nut, $\frac{1}{4}$ -20 | 4 |
| 2 | 10-413 | Foamer Brace | 1 |
| 3 | HB-12-13-150 | Flange Bolt, $\frac{1}{2}$ -13 x $1\frac{1}{2}$ | 1 |
| 4 | HBFL-516-18-075 | Flange Bolt, $\frac{5}{16}$ -18 x $\frac{3}{4}$ | 2 |
| 5 | 10-409 | Mount Plate | 1 |
| A | 14-291-04 | Tank Bracket | 2 |
| B | 14-284-02 | Cap Assembly | 1 |
| C | | Blue Tube | 1 |
| D | | Clear Tube | 1 |
| E | 14-291-03 | Compressor Only | 1 |
| | 14-291-01 | Black Cover | 1 |
| F | 14-291-02 | Foamer Tank | 1 |
| G | 14-291-05 | Double Switch Box | 1 |
| | 15-506-01 | Fuse (F10A 250) | 1 |
| | 15-506-02 | Switch | 1 |
| A-G | 14-291 | Foamer (includes parts A-G) | 1 |

1. Position the mount plate on the back side of the roll bar using two $\frac{5}{16}$ flange bolts. Install the brace by removing the $\frac{1}{2}$ bolt from the left side roll bar brace. Reinstall the bolt, holding the two braces to the roll bar. Other end of foamer mount brace goes under the mount plate.
2. Place foamer unit onto mount plate, with cap facing to the left side of machine. Using $\frac{1}{4}$ bolts and flange nuts bolt foam marker to mount plate. The left rear corner mount of the foamer will bolt through the mount plate and brace. Tighten all hardware.
3. Make sure all bolts are tightened.

CONNECTING THE CAP ASSEMBLY

Connect the blue tube to the tank cap connector which is also connected to the large blue tube which hangs below the cap. This is the soap outlet tube. Connect the clear tube to the other connector on the tank cap. This is the air input tube. Tighten connectors hand tight, assembly tank cap onto tank.

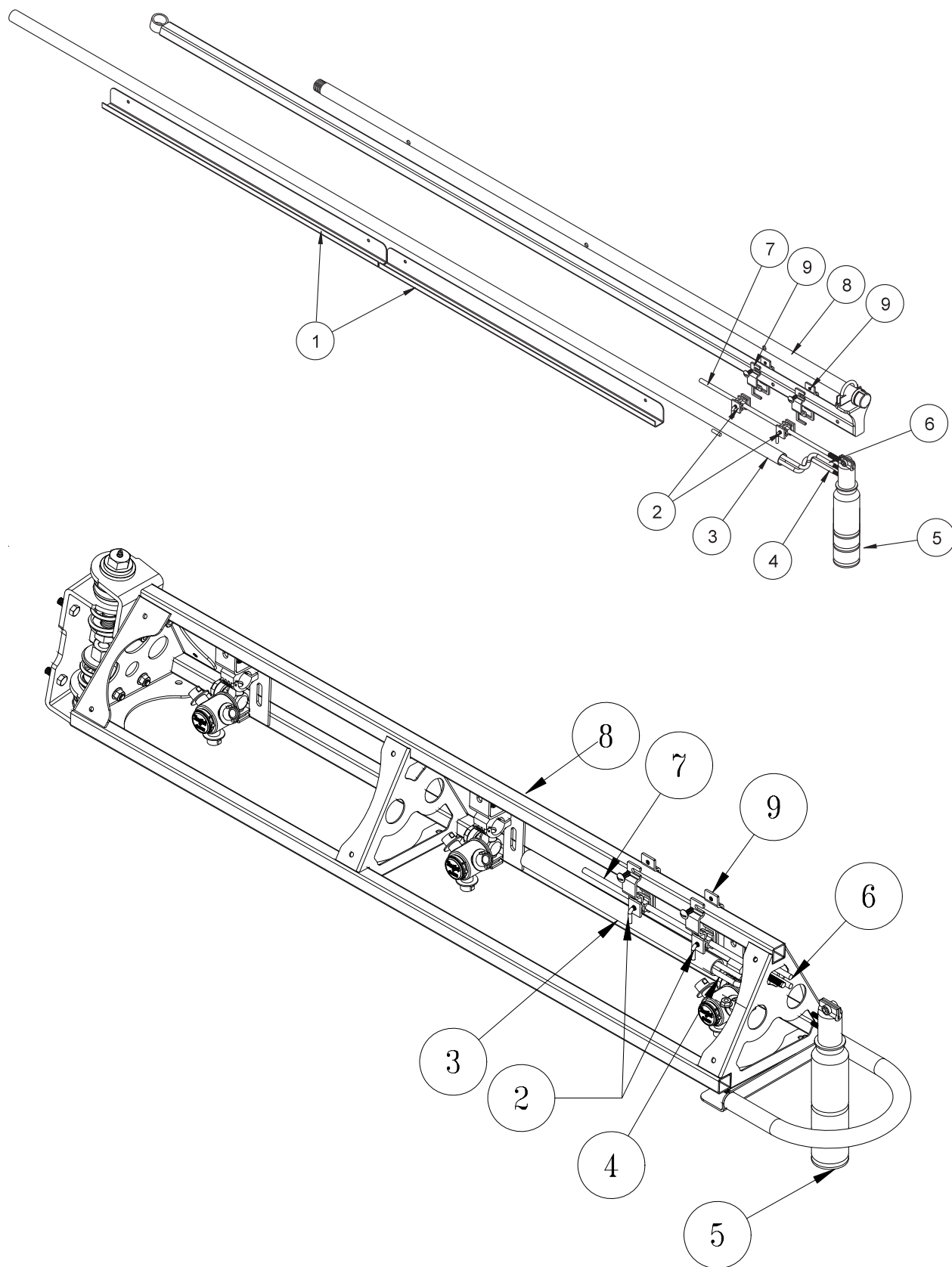
HOSES

Being careful not to cut the tubing, cut the oversleeve 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 oversleeve 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, hold black ring around tubing, and pull tube out.

FOAMER NOZZLE MOUNT & HOSE GUARD MOUNT DRAWING



10-378 FOAM MARKER PARTSLIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------------|---|------------|
| 1 | 15-537 | Foamer Hose Guard 31" | 2 |
| | 10-256 | Foamer Hose Guard 16" | 2 |
| | HSDPS-14-075 | Stainless Steel Pan Head Drill Screw $\frac{1}{4} \times \frac{3}{4}$ | 8 |
| 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 |

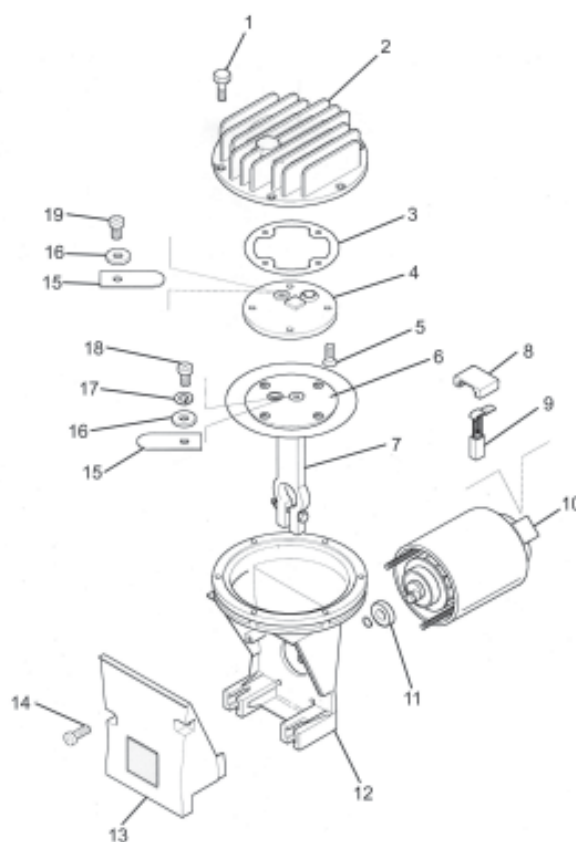
- Slide hose clamp onto drop tube of foam nozzle and attach restrictor bell.
- Place splined end of Nozzle mounting rod (Ref 7) into top of foam nozzle (Ref 5). Tighten screw.
- Slide two foam nozzle mounts (Ref 2) onto the rod. Place square clamps (Ref 9) on foam nozzle mounts and mount the square clamps 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.
- Being careful not to cut the tubing (Ref 3), cut the oversleeve back approximately 2" (5 cm) to expose blue (Ref 6) and clear tubing (Ref 4).
- 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 oversleeve 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.
- 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.
- Hose's must be routed on bottom of the boom square tubing.
- Mark 6 inches in from inside edge of foamer nozzle mounting bracket on square boom tubing.
- Place hose guard (Ref 1) flush with top of square tubing with edge on previous mark. The channel covers hoses on the bottom of the square tubing.
- Install hose guard using 2 drill screws (you may want to drill a $\frac{3}{16}$ pilot hole first).
- Place another hose guard against first and install in same manner.
- Repeat process for other boom side.
- Connect small plastic electrical plug under compressor to electrical extension cable.
- Cut cable and strip casing, allowing enough length to connect to fuse block.
- Strip and connect slide on connectors to each wire and use the heat shrink.
- Connect black negative (-) wire to the ground and connect red wire to the positive (+).
- Insert 10 amp fuse into slot which red wire was attached to.

FOAM MARKER DRAWING



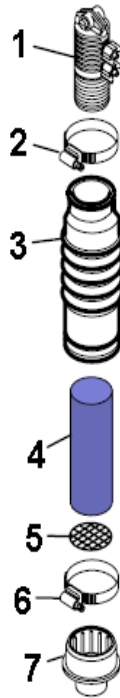
| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|--------------------------|----------|
| 1 | 15-507 | Foamer Tubing | 2 |
| 2 | 14-291-02 | Tank | 1 |
| 3 | 14-291-01 | Black Cover | 1 |
| | 14-291-03 | Compressor | 1 |
| 4 | 14-284-02 | Cap Assembly | 1 |
| 5 | 14-291-04 | Tank Bracket | 1 |
| 6 | 14-291-05 | Double Switch Box | 1 |
| 7 | 15-511 | Foam Nozzle | 1 |
| 8 | 15-510-01 | Nozzle Mounting Rod | 1 |
| 9 | 16-987 | Foam Nozzle Mounting Kit | 1 |

15-505 MOTOR SUB ASSEMBLY PARTS LIST



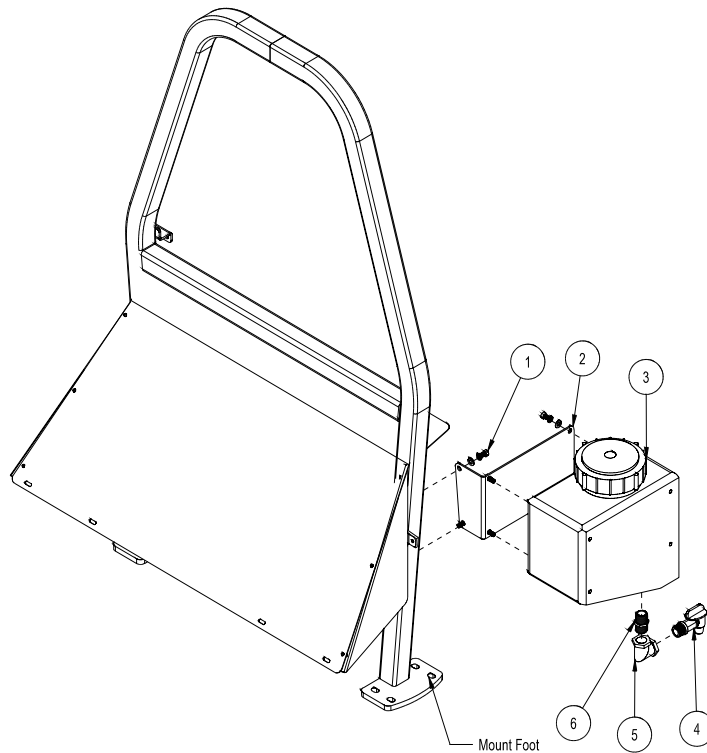
| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|-----------------------------------|----------|
| 1† | | Bolt | 6 |
| 2 | | Head | 1 |
| 3 | 15-505-01 | Exhaust Manifold Gasket | 1 |
| 4 | | Exhaust Manifold | 1 |
| 5† | | Manifold Screw | 8 |
| 6† | 15-505-03 | Diaphragm | 1 |
| 7† | | Piston | 1 |
| 8 | | Brush Retainer | 2 |
| 9 | 15-505-06 | Brush | 2 |
| 10 | 15-505-07 | 12 Volt Electric Motor | 1 |
| 11 | 15-505-05 | Stainless Steel Bearing | 1 |
| 12 | | Block | 1 |
| 13 | | Cover | 1 |
| 14 | | Cover Screw | 2 |
| 15* | | Exhaust Reed Valve | 1 |
| 16*† | | Washer | 2 |
| 17*† | | Split Lockwasher | 1 |
| 18*† | | Intake Valve Screw | 1 |
| 19* | | Exhaust Valve Screw | 1 |
| * | 15-505-02 | Intake Exhaust Valve Sub Assembly | |
| † | 15-505-04 | Intake Piston Sub Assembly | |

15-511 FOAM NOZZLE SUB ASSEMBLY DRAWING



| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|--------------------------|----------|
| 1* | 15-511-01 | Foam Nozzle Inlet Body | 1 |
| | 15-510-01 | Nozzle Mounting Rods | 2 |
| 2* | | Hose Clamp | 1 |
| 3* | | Drop Tube | 1 |
| 4 | 15-511-08 | Foam Sponge | 1 |
| 5 | 15-511-09 | Stainless Steel Screen | 1 |
| 6 | | Hose Clamp | 1 |
| 7 | 14-284-09 | Foam Nozzle Reducer | 1 |
| * | 15-511-07 | Foam Nozzle Sub Assembly | |

10-419 FRESH WATER WASH TANK DRAWING



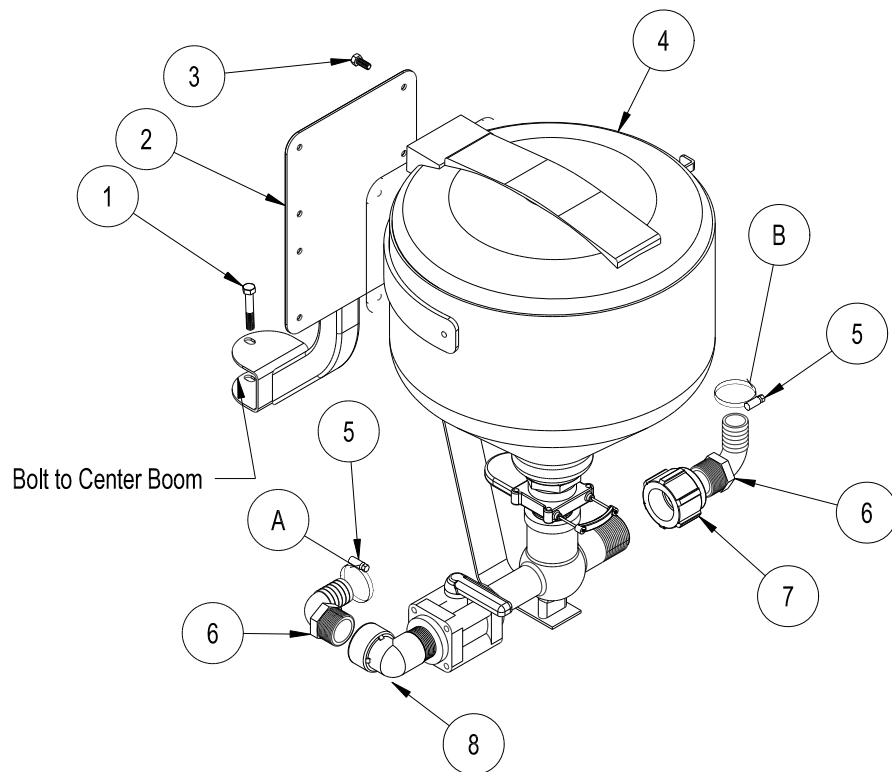
| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|--|----------|
| 1 | HB-516-18-075 | Bolt $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 6 |
| | HWL-516 | Lock Washer $\frac{5}{16}$ | 6 |
| | HW-516 | Washer $\frac{5}{16}$ | 6 |
| 2 | 15-750 | Fresh Water Tank Bracket(for auto boom) | 1 |
| 3 | 10-234 | 3 Gallon Rectangular Tank | 1 |
| 4 | 16-960 | Spigot $\frac{3}{4}$ NPT | 1 |
| 5 | 16-151 | Elbow FPT $\frac{3}{4}$ x $\frac{3}{4}$ | 1 |
| 6 | 16-158 | Close Nipple $\frac{3}{4}$ x $\frac{3}{4}$ | 1 |

1. Fresh Water Wash Tank mounts on the left side of the horizontal boom support.
2. Clamp the mount bracket to the backside of the rollbar post approximately 24" up from the mount foot. Drill 2 holes into the tubing using a $\frac{1}{4}$ " drill bit. Then use a $\frac{5}{16}$ -18 tap to thread the holes.
3. Install mount bracket to rollbar post using two $\frac{5}{16}$ -18- x $\frac{3}{4}$ bolts, lockwashers and washer.
4. Line holes on the tank with holes on the mount bracket and use the $\frac{5}{16}$ bolts to fasten tank to mount bracket.
5. Rinse tank with clear water and check for leaks around fittings.



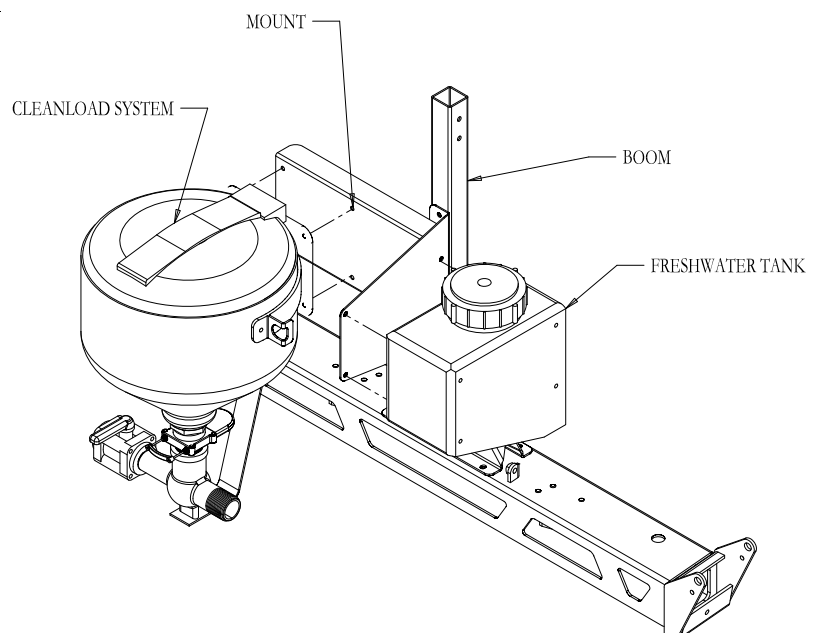
This tank is for fresh clear water ONLY. Do not put chemicals in this tank.

10-417 CHEMICAL CLEANLOAD



CLEANLOAD FRESHWATER MOUNT ON 17-550/17-525 BOOMS

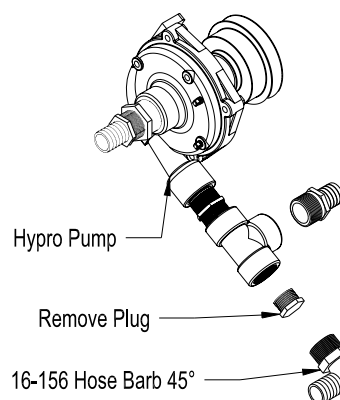
When placing a 17-525/17-550 Heavy Boom on the Sprayer you will have to relocate the Chemical Cleanload System and the Fresh Water tank. There is a mount provided for you, please see in the illustration.



10-417 CHEMICAL CLEANLOAD PART LIST

| REF# | PART # | DESCRIPTION | QUANTITY |
|------|-----------------|--|----------|
| 1 | HB-38-16-300 | Bolt $\frac{3}{8}$ -16 x 3 | 1 |
| | HNFL-38-16 | Flange Lock Nut $\frac{3}{8}$ -16 | 1 |
| 2 | 15-816 | Mount Bracket | 1 |
| 3 | HBFL-516-18-075 | Flange Bolt $\frac{5}{16}$ -18 x $\frac{3}{4}$ | 4 |
| | HNFL-516-18 | Flange Lock Nut $\frac{5}{16}$ -18 | 4 |
| 4 | 15-620 | Cleanload Eductor | 1 |
| 5 | 18-116 | Hose Clamps | 4 |
| 6 | 16-156 | 90° Hose Barb | 3 |
| 7 | 18-391 | Reducer Coupling | 1 |
| 8 | 16-972 | Elbow | 1 |
| A | 8897-80 | Hose to Tee by Valve | 1 |
| B | 8897-35 | Hose to fitting on Back of Tank | 1 |

1. Make sure all chemicals have been flushed out of spray system, as you will be disconnecting fittings from the pump. Remember to use threaded tape on all new fitting connections.
2. Remove the $1\frac{1}{4}$ " plug from the tee on the outlet side of the pump and install one Hose barb (16-156). Then tighten so it points to the left side of the machine.
3. Install mounting brackets onto left side of center boom between boom pivot and vertical boom support. Secure with $\frac{3}{8}$ x 3 bolt, flatwasher (top and bottom) and lock nut.
4. Bolt Cleanload assembly onto mounting bracket using four flange bolts $\frac{5}{16}$ -18 x $\frac{3}{4}$ and flange nuts. Install 90° hose barb (16-156) into inlet side of Cleanload (valve with yellow handle) then tighten so it points forward and down.
5. Install one reducer coupling (18-391) and one 90° Hose Barb (16-156) onto the outlet side of Cleanload. Tighten so hose barb points forward and up.
6. Remove plug from top rear center of spray tank and discard. Install one hose barb (16-161) into tank fitting and tighten.
7. Route 80" hose from the 90° hose barb on spray pump to the inlet side of the Cleanload and secure with hose clamps (18-116).
8. Route 35" hose from 90° hose barb on outlet side on Cleanload to the hose barb on the top rear of the tank.
9. Make sure all hardware, fittings, and clamps are tight. Add about 25 gallons of water to the spray tank. Start Sprayer and circulate water through system and check for leaks.
10. Be sure to read start up and shutdown instructions for Cleanload assembly before using it with chemicals. When working with chemicals always wear protective clothing, goggles and gloves.



OPERATING INSTRUCTIONS

STARTUP

1. All Cleanload 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 Cleanload 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 Cleanload 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.

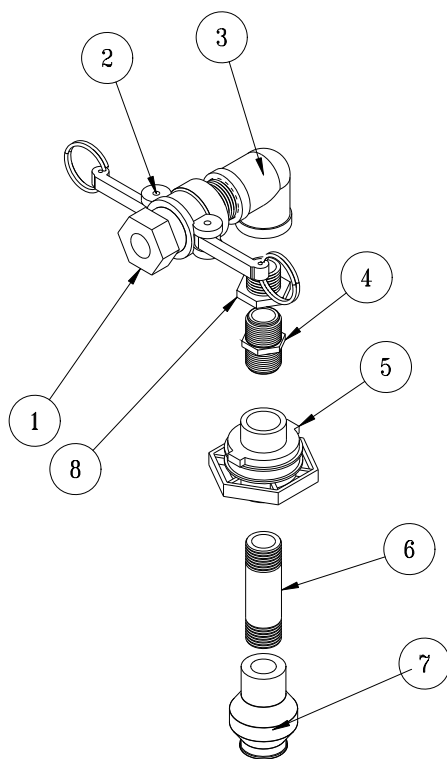
8. Insert lance body with o-ring into eductor until the o-ring is sealed.
9. Use the free end of the lance to pierce bag or container to vacuum powdered or liquid chemical.
10. Rinse lance. Place lance end into a clean container of water to rinse lance assembly.
11. Remove lance body from eductor and 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 education rate | Check pump pressure and flow. Cleanload Eductor performance is based on flow and pressure to the system. Note requirements for high education 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. | |

15-835 TANK RINSING DEVICE



| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------|-----------------------|----------|
| 1 | 16-961 | 1" Adapter | 1 |
| 2 | 16-962 | 1" Coupler | 1 |
| 3 | 16-864 | 1" FTP Elbow | 1 |
| 4 | 16-158 | Close Nipple | 1 |
| 5 | 16-150 | Double Thread Fitting | 1 |
| 6 | 16-172 | 4" Nipple | 1 |
| 7 | 15-834 | Tank Rinsing Nozzle | 1 |
| 8 | 16-163 | Reducer Bushing | 1 |

Drill 1-3/4" hole 5" from outside edge of cover.

Install Tank Rinsing kit as shown, with the Double Thread Fitting (Ref 5) going into the cover.

Basket Must be removed During Use.



This is a list of decals located on the Spray Star 1000. Part number, description and location will help in reordering a decals.

| | | |
|--------|------------------------|------------------------------|
| 10-328 | Decal, Spray Star 1000 | Right and Left Tank Sides |
| 10-414 | Decal, Control Panel | Control Panel |
| 15-672 | Decal, Dash Panel | Dash Board |
| 25-298 | Decal, Warning Hot | Hood - Back Edge, Both Sides |
| 25-308 | Decal, Engine RPM | Engine |
| 25-352 | Decal, Bypass Valve | Hang Tag |
| 25-356 | Decal, Tire Pressure | All Wheels |
| 25-373 | Decal, Smithco | Front Nose Cone |
| 25-370 | Decal, 88 dba | Console |
| 76-304 | Decal, Crush Pinch | Front Side of Tank |

QUICK REFERENCE REPLACEMENT PARTS

REPLACEMENT FILTERS

| | | |
|-----------|----------------------|--------------------|
| 15-626-01 | Hydraulic Oil Filter | |
| 78-090 | Oil Filter | Kohler # 12 050 01 |
| 76-311 | Air Filter Element | Kohler # 24 083 03 |
| 76-312 | Pre-Cleaner | Kohler # 24-083-05 |
| 13-488 | Key Switch | |
| 76-310 | Key Set | |

REPLACEMENT BELTS

| | |
|--------|------|
| 10-179 | Belt |
|--------|------|

SEAL KITS

| | |
|-----------|--------------------|
| 15-301 | Orbital |
| 15-301-01 | Repair Kit |
| 10-135 | Hydraulic Cylinder |
| 14-267 | Seal Kit |
| 10-116 | Wheel Motor |
| 10-116-13 | Seal Kit |
| 10-117 | Pump |
| 14-098 | 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 |

OTHER PARTS

| | |
|---------------|--|
| 14-532 | Hinged Cover On Tank with Gasket |
| 14-532-01 | Gasket For Cover |
| 15-818 | #75 Fitting Oring |
| 15-817 | #50 Fitting Oring |
| Spark Plugs | Champion type RC12YC (Gap 0.030 inch (.76 mm)) |
| Spline Grease | #77 Assembly Paste (Kohler # 25 357 12-s) |

The Smithco Commercial Products Two-Year Limited Warranty

Smithco, Inc. (Smithco) warrants your 2007 or newer Smithco Commercial Product ("Product") purchased after January 1, 2007, 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 three 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 W Poplar PO Box 487
Cameron, Wisconsin 54822

Telephone: 1-800-891-9435 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 workman-ship. The items/conditions listed below are not covered by this warranty:



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



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



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



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



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



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



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



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

Other Legal Disclaimers:

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