



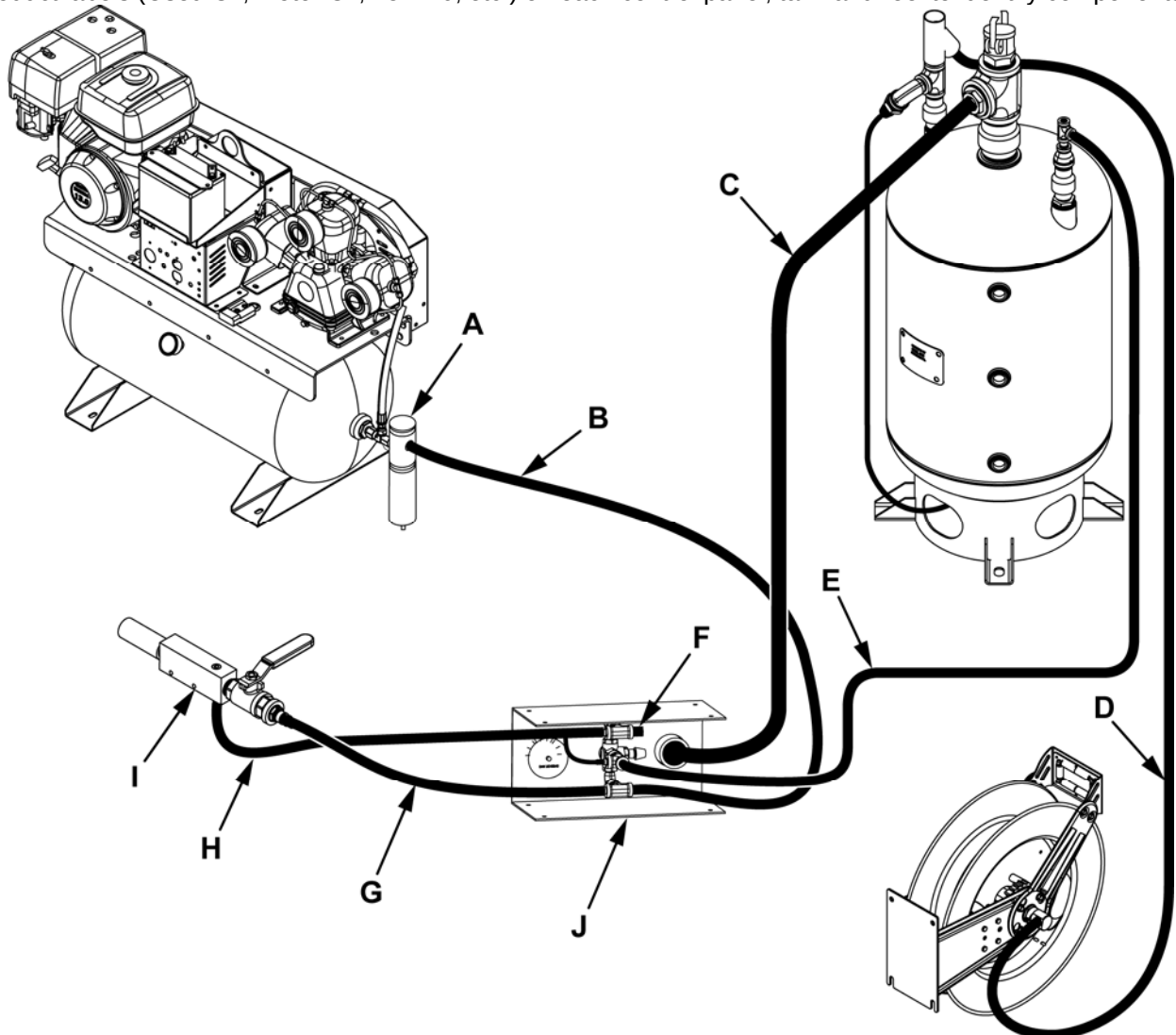
LubeBuilder™

Assembly, Operation And Parts Manual

Revision September 2011

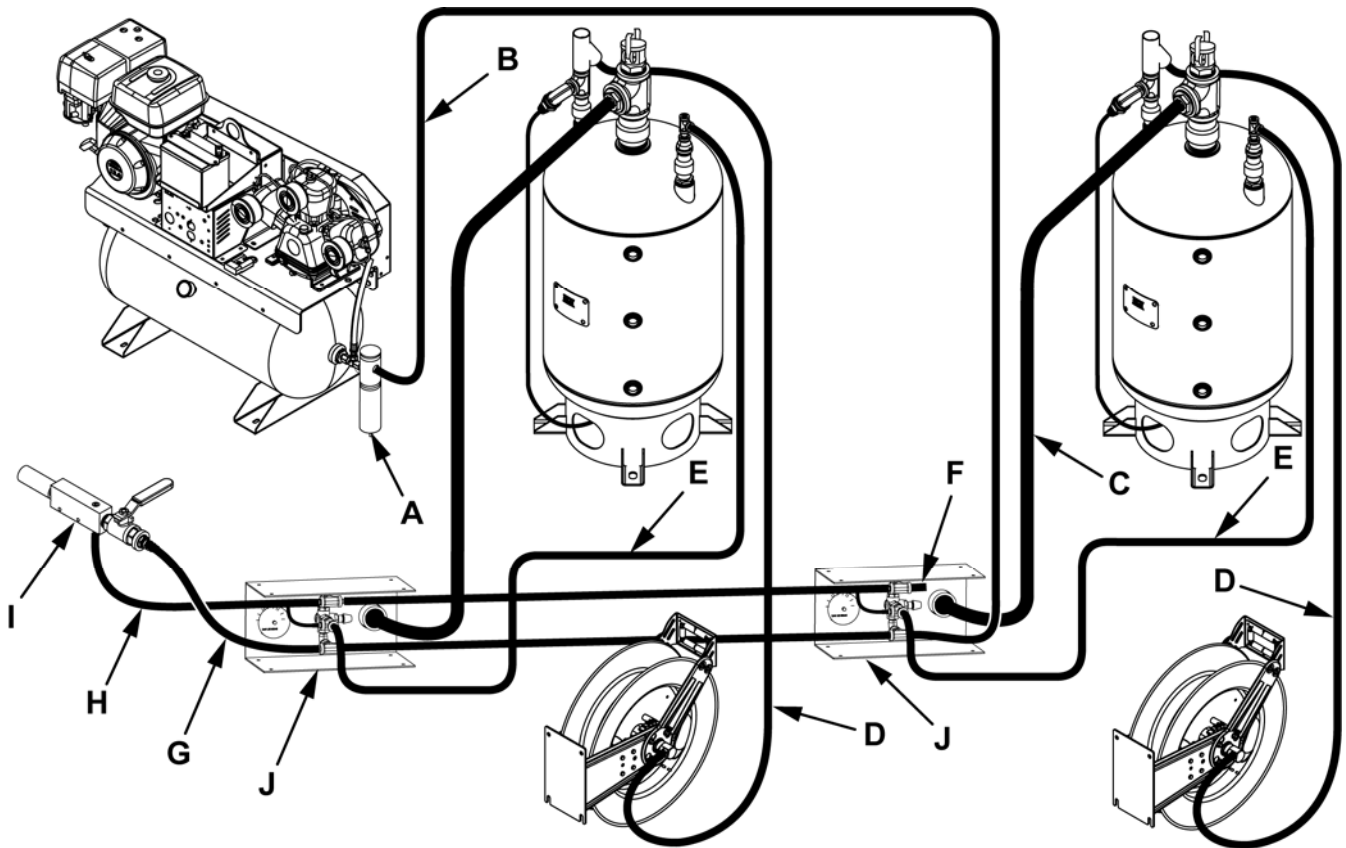
1 ASSEMBLY

1. Air supply for LubeBuilder System must be regulated to 60-65 psi and be free of moisture. If your air supply is not equipped with a regulator/water trap, install AC-754-001 air regulator/water trap (A) or equivalent to air compressor.
2. Install 3/8 in. fitting in vacuum generator (I).
3. Connect HE-006-001 hose (B) or equivalent to air regulator (A) and to pressure fitting on control panel (J).
4. Connect HE-006-001 hose (G) to fitting on vacuum generator (I) and to pressure fitting on control panel (J).
5. Connect HE-006-001 hose (H) to output port on vacuum generator (I) and to vacuum fitting on control panel (J).
6. For multiple LubeBuilder control panels, use HE-006-001 hoses to connect control panels until all control panels are plumbed in parallel. The last control panel in the series will need 1/4" plugs (F) to cap fittings.
7. Connect HE-006-001 vacuum/pressure hose (E) to port on control panel (G) and to port on tank.
8. Connect HE-012-014 or HE-016-015 hose (D) to reel and to port on tank.
9. Connect HE-020-010 hose (C) to tank and to barrel straw fitting on control panel (J).
10. Place product labels (Used Oil, Motor Oil, 15w-40, etc.) on each control panel, tank and reel to identify components.



LubeBuilder System For One Product

- A – AC-754-001 Air Regulator / Water Trap
- B – HE-006-001 Hose
- C – HE-020-010 Hose or 200 PSI Minimum Oil Resistant Hose With A 4:1 Safety Factor
- D – HE-016-015 or 100R1 Hose With Crimp Fittings
- D – HE-012-014 Hose or 100R1 Hose With Crimp Fittings
- E – HE-006-001 Hose
- F – HE-006-001 or HE-000-000 Cap
- G – HE-006-001 Hose
- H – HE-006-001 Hose
- I – MA-020-001, MA-025-001 or MA030-001 Vacuum Generator (Part Number Dependant On Configuration)
- J – MA-ELC-003 Control Panel



LubeBuilder System For Two Products

2 OPERATION

2.1 PREPARE SYSTEM FOR USE

This section covers the procedures you will normally use in operating the Sage Oil Vac family of equipment.



WARNING

Risk of fire or explosion.

Do not smoke or use an open flame within 50 feet of the unit.

Verify that correct grounding procedures have been followed prior to operation.

If fluid is spilled, stop operation and notify safety personnel.



WARNING

Burn hazard.

Hoses and fittings may be extremely hot during operation.

Contact with these parts may cause serious burns.



WARNING

Risk of hearing loss.

This machine produces extremely loud noise.

Hearing protection is required while operating this machine.

2.1.1 VISUAL EQUIPMENT INSPECTION

The steps described below to prepare the Sage Oil Vac system for use. Failure to follow these steps may prevent operation of the system or create a safety hazard.

Note: Inspection items are dependant on equipment model.

- Inspect all hoses, nozzles, fittings, tanks and related parts for damage, cracking and signs of leakage and missing parts.
- Place all valves in the closed position.
- Check all fluid tank level gauges for the presence of fluids. If used fluid tank is above 90% level, proceed to used product disposal location after completing visual equipment inspection.
- Verify that vacuum/pressure gauges read zero.
- Verify that cam-lock caps are secure.

2.2 FILL NEW PRODUCT TANK

The new product tank can be filled by pouring fluid directly into the fluid intake nozzle or by siphoning from a drum or barrel with vacuum. The following steps describe the vacuum method.

2.2.1 SIPHON NEW PRODUCT FROM DRUM OR BARREL

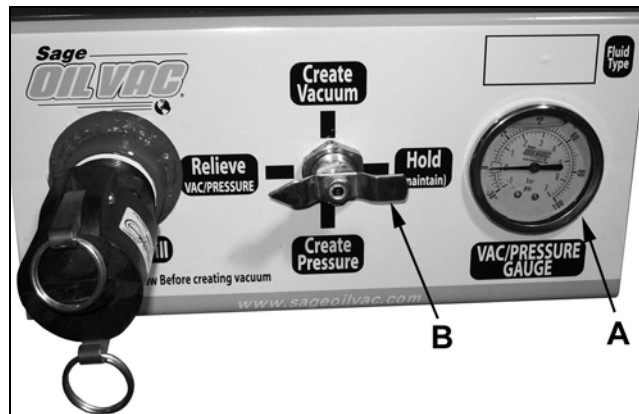
⚠ WARNING

Pressure hazard.

Relieve pressure before filling product tanks.

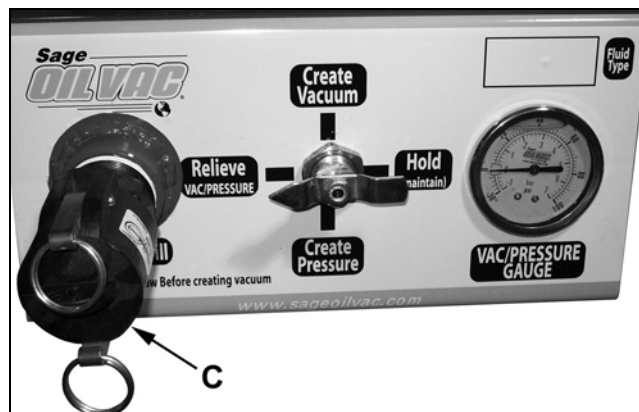
Failure to do so could cause serious injury.

1. Verify vacuum/pressure gauge (A) reads zero, indicating no pressure or vacuum in tank. If there is pressure in tank to be filled, rotate valve (B) to Relieve. After pressure is relieved, rotate valve (B) to Create Vacuum.



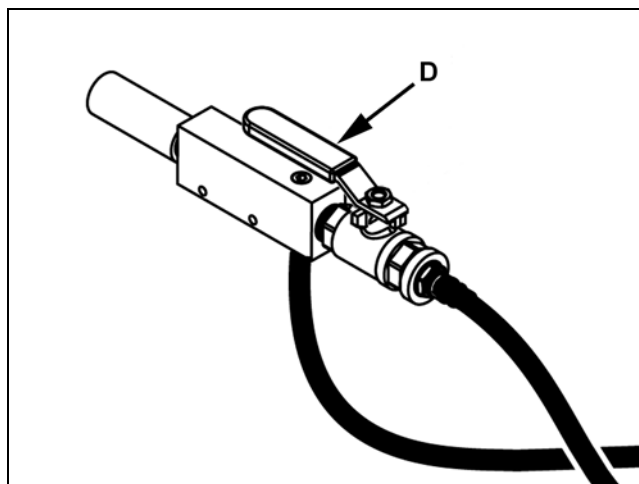
Control Panel

2. Remove cap (C) and connect barrel straw to coupler on control panel. Verify barrel straw shut-off valve is in closed position.



Control Panel

3. Move vacuum generator valve (D) to the open position as shown.

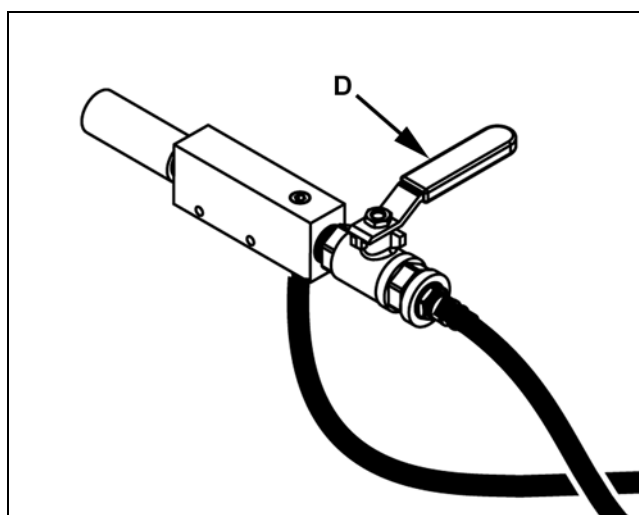


Vacuum Generator Valve Open

4. With air compressor at rated pressure, observe the vacuum/pressure gauge (A) on control panel until approximately –20 inches (Hg-Mercury) of vacuum is reached.

Note: There is no risk of damage to equipment if operator allows compressor to run for extended periods building vacuum.

5. Rotate valve (B) to Hold and move vacuum generator valve (D) to closed position, to trap vacuum in fluid tank. Vacuum generator does not need to be operating to vacuum product.



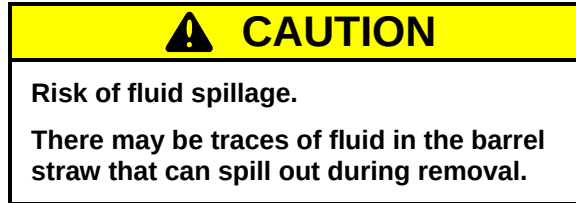
Vacuum Generator Valve Closed

6. The system is now prepared to fill new fluid tank using vacuum method.
7. Insert barrel straw into new product container.
8. Open barrel straw valve.
9. Monitor product barrel or drum level, the new product tank level gauge and vacuum level gauge.

Note: If there is insufficient vacuum to fill the tank, you will have to follow steps to create a vacuum to fill the new fluid tank to desired level.

Note: Additional vacuum may be applied while barrel straw is connected to control panel coupler. Do not fill new product tank beyond the 90% recommended capacity.

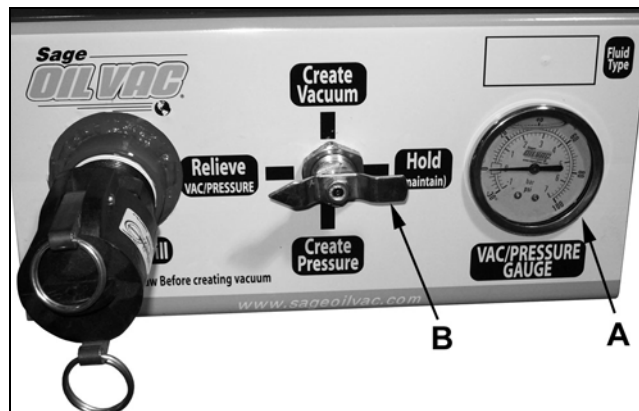
10. Close barrel straw valve when product tank is 90% full.
11. Carefully remove barrel straw from new product container. Invert and elevate barrel straw for a few seconds to clear the tool.



12. Disconnect and stow barrel straw.
13. Install and lock cap (C).
14. Repeat procedure for each new product tank to be filled.

2.2.2 FILL PRODUCT TANK AT FILL PORT

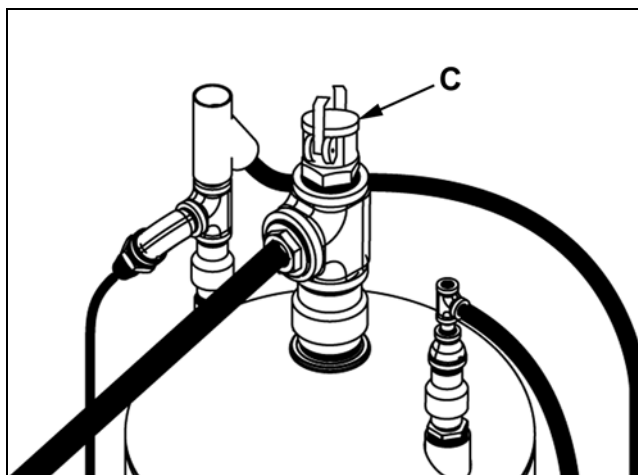
1. Turn off air compressor.
2. Verify vacuum/pressure gauge (A) reads zero, indicating no pressure or vacuum in tank. If there is pressure in tank to be filled, rotate valve (B) to Relieve. After pressure is relieved, rotate valve (B) to Hold.



Control Panel

Note: Tank has a check valve to prevent product from spraying out if cap (C) is remove while tank is pressurized. If tank is pressurized, check valve is seated, not allowing you to fill tank through fill port until pressure is relieved.

3. Remove cap (C) from fill port and fill product tank to no more than 90% of capacity.

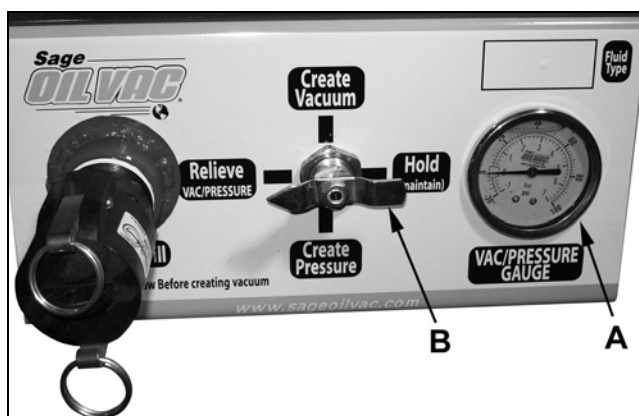


Product Tank Fill Cap

4. Install and lock cap (C).

2.2.3 ESTABLISH AIR PRESSURE IN NEW PRODUCT TANK

1. Check air pressure/vacuum gauge (A) on appropriate control panel. If vacuum exists, move valve (B) to Relieve to relieve vacuum.
2. Rotate control panel valve (B) to Create Pressure.



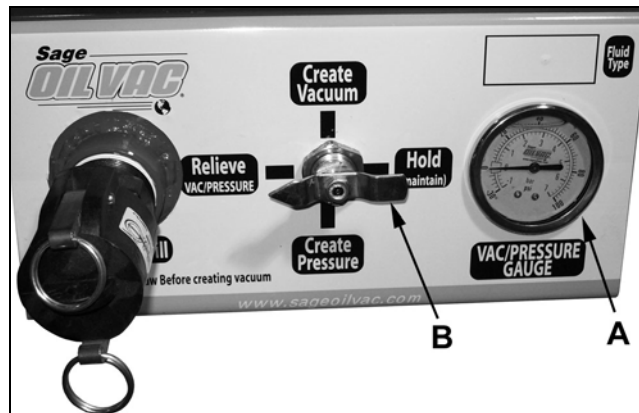
Control Panel Valve

3. Allow compressor to bring product tank to optimal air pressure of 60-65 psi. New product tank is now pressurized for fluid transfer.

3.6 USED PRODUCT DISPOSAL

This outlines the disposal of waste product at authorized disposal sites. This procedure will vary depending on site conditions.

1. Check air pressure/vacuum gauge (A) on appropriate control panel. If vacuum exists, move valve (B) to Relieve to relieve vacuum.
2. Rotate control panel valve (B) to Create Pressure.



Control Panel Valve

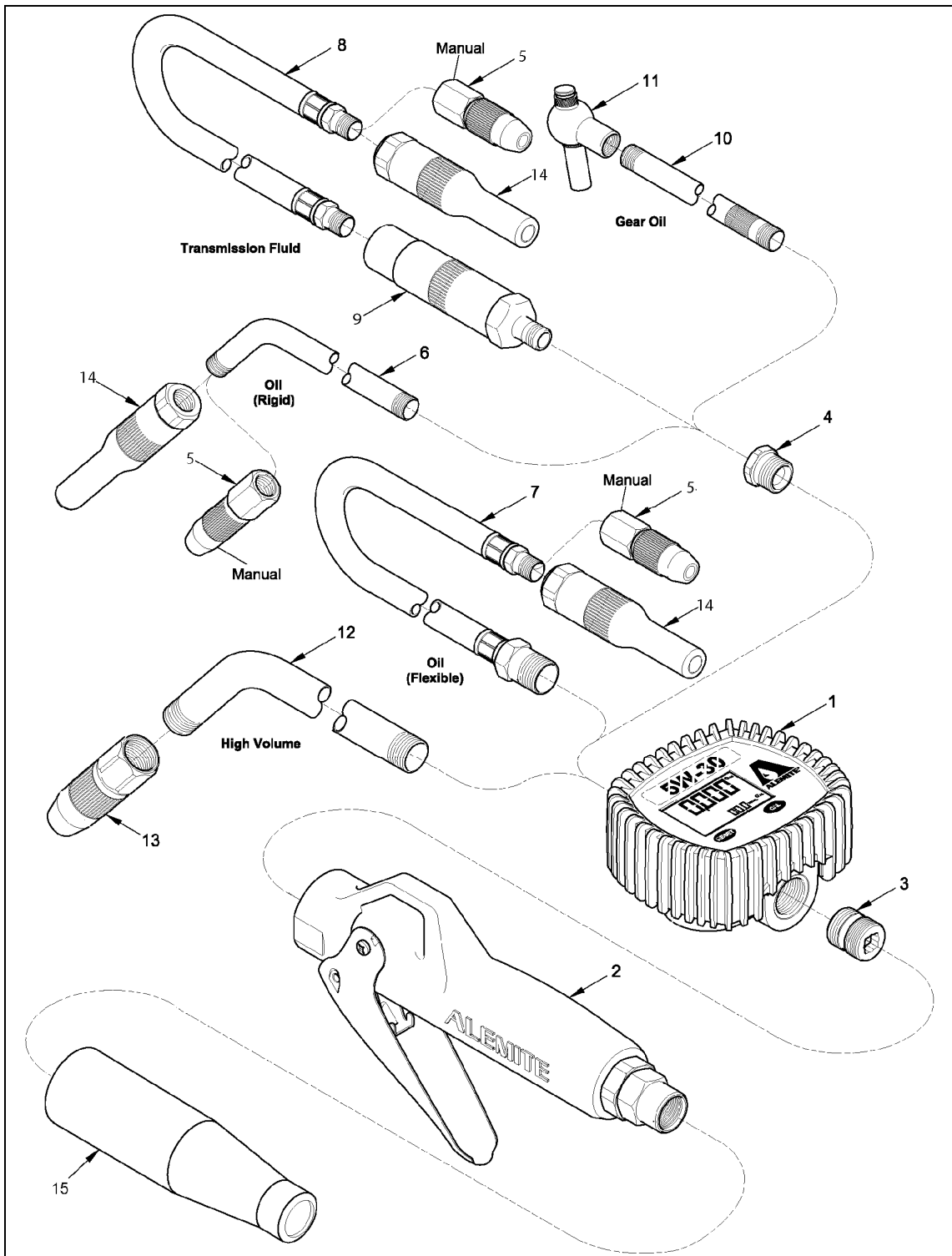
3. Allow compressor to bring product tank to optimal air pressure of 60-65 psi. New product tank is now pressurized for fluid transfer.
4. Identify proper used product receptacle for each fluid type for disposal.
5. Connect integrated offload hose to used product disposal receptacle. Verify both connections are secure.
6. Open used product tank discharge valve to start evacuation of waste fluids.
7. Monitor fluid level gauge on used product tank until the tank is empty. Allow air pressure to purge offload hose.
8. Close used product tank air inlet valve.
9. Close used product tank discharge valve
10. Disconnect integrated offload hose from used product disposal receptacle.
11. Wipe up any dripped or residual fluids that remain if necessary.

Note: Repeat the above indented steps for each used product tank to be emptied. In some cases, such as centralized disposal sites, multiple tanks and multiple products may be disposed simultaneously.

3 PARTS

3.1 METERS AND HANDLES

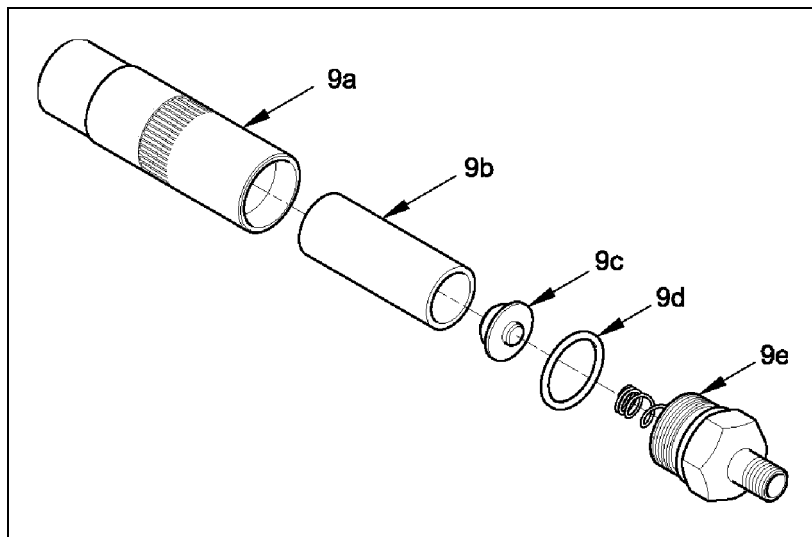
3.1.1 ELECTRONIC-METERED CONTROL VALVE



Electronic-Metered Control Valve

Item Number	Part Number	Description	Quantity	Notes
1	AA-367-001	Meter Assembly	1	Includes 2, 3, 5, 7, 15
2	339100	Handle Assembly	1	
3	338706	Nipple, ½" (NPTF)	1	
4	51891	Bushing, ½" (NPT) x ½" (NPT)	1	
5	339084	Nozzle, Manual	1	
6	338702	Extension, Curved	1	
7	338709	Hose, ½" NPT x ½" NPT	1	
8	317860-1	Hose, ¼" NPT x ¼" NPT	1	
9	321203	Filter Assembly (40 Micron)	1	See Section 7.5.2
10	320421	Extension, Straight ¼" NPT	1	
11	318400-2	Nozzle, Automatic W/Manual Lock	1	See Section 7.5.3
12	339149	Extension, Curved ½" NPT	1	
13	340084	Non-Drip Nozzle, High Volume Manual	1	
14	B339800	Non-Drip Nozzle, Automatic		
15	340626	Swivel Protector		
	340626-1	Swivel Protector, Black		
	340626-2	Swivel Protector, Yellow		
	340626-3	Swivel Protector, Green		
	340626-4	Swivel Protector, Red		
	340626-5	Swivel Protector, Blue		

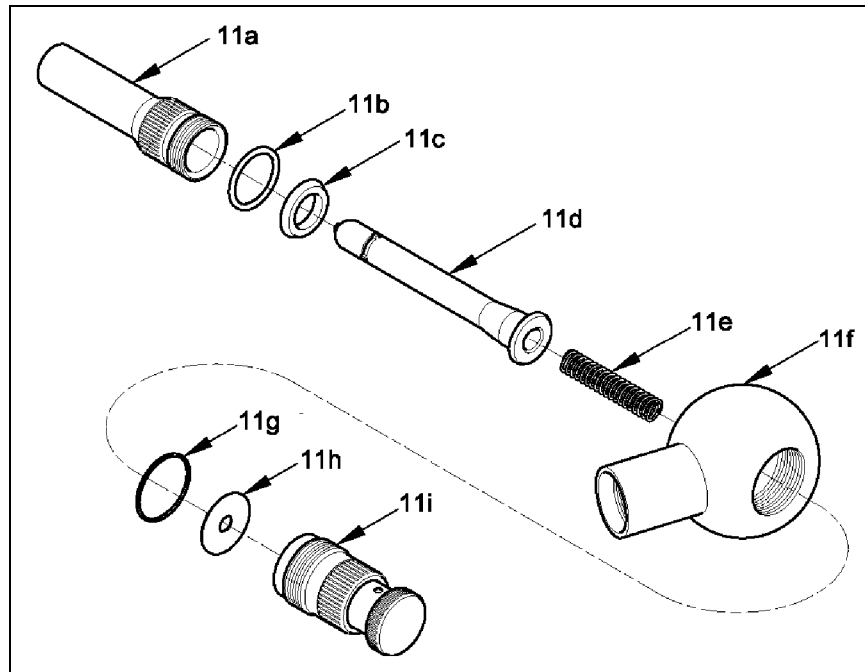
3.1.2 METER FILTER ASSEMBLY



Meter Filter Assembly

Item Number	Part Number	Description	Quantity	Notes
9a		Body	1	
9b	321191	Filter Tube	1	
9c		Stud	1	
9d	X171001-14	O-Ring, ¾" ID x 15/16" OD	1	Package Of Ten
9e		Spring and Adapter Assembly	1	

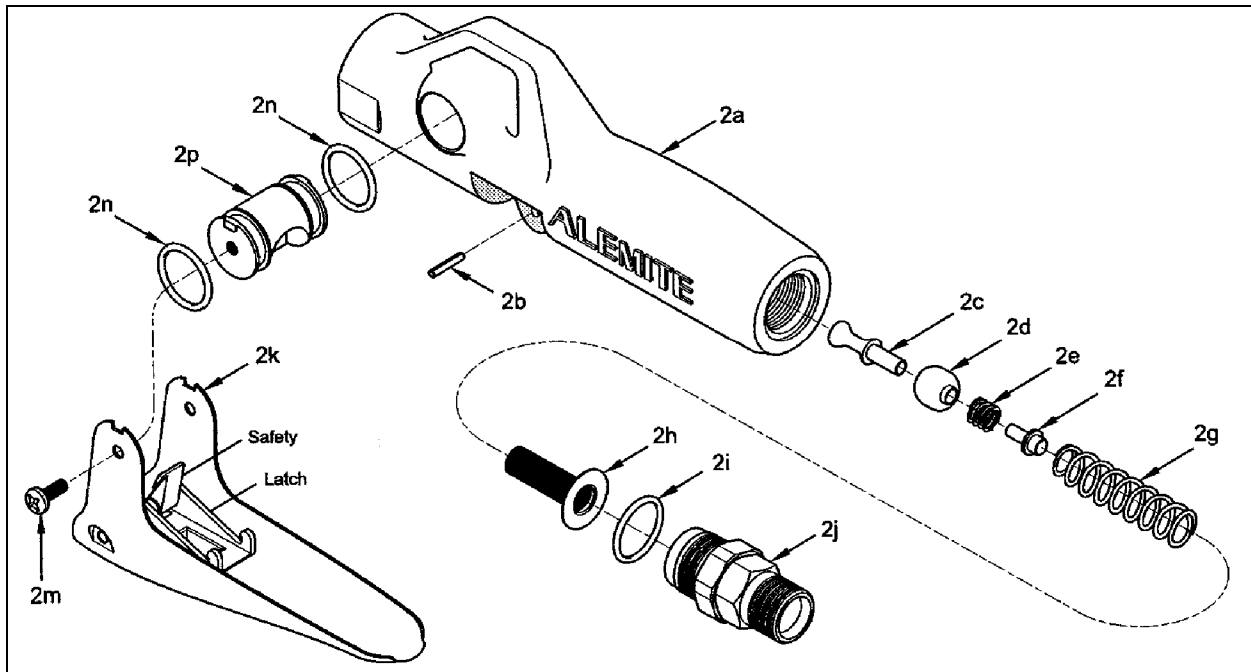
3.1.3 METER NOZZLE



Meter Nozzle Assembly

Item Number	Part Number	Description	Quantity	Notes
11a	3679	Nozzle	1	
11b	339100	O-Ring, ½" ID x 5/8" OD	1	Order Kit 393518
11c	338706	V-Block	1	Order Kit 393518
11d	51891	Stem	1	Order Kit 393518
11e	339084	Spring	1	Order Kit 393518
11f	338702	Body, Angle	1	
11g	338709	Gasket	1	Order Kit 393518
11h	317860-1	Washer	1	Order Kit 393518
11i	321203	Screw Assembly	1	

3.1.4 METER HANDLE



Meter Nozzle Assembly

Item Number	Part Number	Description	Quantity	Notes
2a		Body	1	Order 339100
2b		1/8 x 5/8" Roll Pin	1	Order Kit 393676
2c		Push Rod	1	Order Kit 393676
2d		Seal	1	Order Kit 393676
2e		Spring, Small	1	Order Kit 393676
2f		Spring Support	1	Order Kit 393676
2g	339063	Compression Spring	1	
2h	339064	Strainer (40-Mesh)	1	
2i	X171009-17	13/16" ID x 1" OD O-Ring	1	Also In Kit 393676
2j	339656	Swivel Assembly	1	
2k		Lever Assembly	1	Order Kit 393677
2m		10-24 x 3/8" Screw	2	Order Kit 393676 or 393677
2n	X171000-10	1/2" ID x 11/16" OD O-Ring	2	Also In Kit 393676
2p	339055	Cam	1	

1.1 WARRANTY SERVICE OR RETURNS

Call 1-877-645-8227 and select option 1 between the hours of 8am to 5pm CST.

1.2 ORDER PARTS

Call 1-877-645-8227 and select option 3 between the hours of 8am to 5pm CST.

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2.1 SAFETY ALERT SYMBOLS AND SIGNAL WORDS

This Owner's Manual does not cover all of the specific details necessary for every possible combination of trailer, tow vehicle, hitch and equipment. Therefore, you must read, understand and follow the instructions given by the tow vehicle, trailer hitch and equipment manufacturers, as well as the instructions in this manual.

Sage Oil Vac trailers are built with components produced by various manufacturers. Some of these items have separate instruction manuals. Where this manual indicates that you should read another manual, and you do not have that manual, contact Sage Oil Vac or your dealer for assistance.

The safety information in this manual is denoted by the safety alert symbol: ^

The level of risk is indicated by the following signal words.

^ DANGER

DANGER – Immediate hazards which **WILL** result in severe personal injury or death if the warning is ignored.

^ WARNING

WARNING – Hazards or unsafe practices which **COULD** result in severe personal injury or death if the warning is ignored.

^ CAUTION

CAUTION – Hazards or unsafe practices which could result in minor or moderate injury if the warning is ignored.

NOTICE

NOTICE – Practices that could result in damage to the trailer or other property.

2.2 OIL VAC EQUIPMENT HAZARDS

Read and follow all of the instructions in this manual and the instructions provided by the manufacturer before operating the accessories.

2.2.1 NOISE

Hearing protection must be worn while operating this machine. Failure to follow these instructions may result in hearing loss.

Safety Information

^ WARNING

Risk of hearing loss.

This machine produces extremely loud noise.

Hearing protection is required while operating this machine.

2.2.2 PRESSURIZED TANKS

The new and used product tanks may be pressurized. Verify that all pressure is relieved before opening valves (unless offloading used product), removing filters or caps on tanks. Failure to do so could cause serious injury.

^ WARNING

Pressure hazard.

Relieve pressure before filling product tanks.

Failure to do so could cause serious injury.

2.2.3 HOSES AND FITTINGS

The hoses and fittings on your Sage Oil Vac may get extremely hot during operation. Contact with these parts may cause serious burns.

^ WARNING

Burn hazard.

Hoses and fittings may be extremely hot during operation

Contact with these parts may cause serious burns.

2.2.4 COMPRESSOR

Before operating the compressor, you must read and fully understand the compressor manufacturer's instructions. If you do not have the manufacturers' instructions, contact Sage Oil Vac or your dealer for assistance.

Carbon Monoxide is an odorless gas that can cause death. Avoid any actions or areas that expose you to carbon monoxide.

Safety Information

^ WARNING

Operating the compressor can lead to death or serious injury by:

- Carbon Monoxide
- Fire and Explosion

Avoid any actions or areas that expose you to carbon monoxide.

Do not refuel a running compressor or refuel near ignition sources.

^ WARNING

The exhaust from this engine contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

^ WARNING

Risk of fire or explosion.

Do not smoke or use an open flame within 50 feet of the unit.

Verify that correct grounding procedures have been followed prior to operation.

If fluid is spilled, stop operation and notify safety personnel.

2.2.5 SAFETY WARNING LABELS



Figure 1 - Located On Top Of Used Filter Receptacle

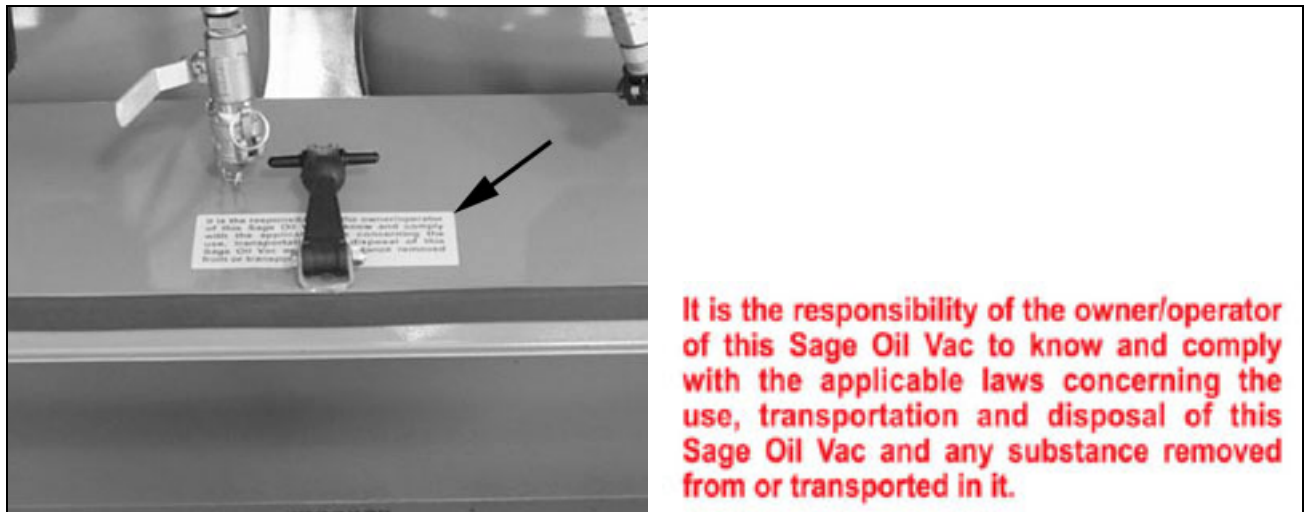


Figure 2 - Located On Top Of Used Filter Receptacle



Figure 3 - Located On Top Of Used Filter Receptacle



Figure 4 - Located On Top Of Used Filter Receptacle



Figure 5 - Located On Top Of New Product Tank

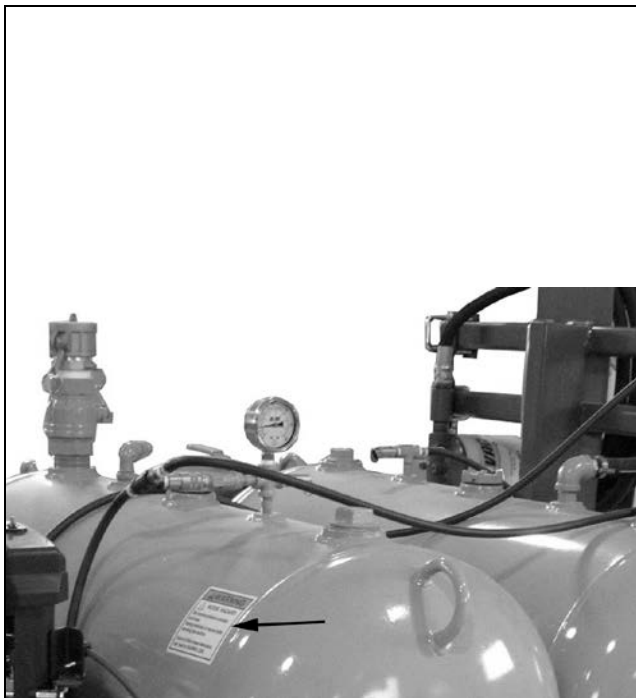


Figure 6 - Located On Top of New Product Tank

Safety Information

^ WARNING

To protect you and others against death or serious injury, all of the labels shown must be on the equipment and must be legible.

If any of these labels are missing or cannot be read, call Sage Oil Vac, Inc. at 806-372-7559 or dealer for replacement labels.

2.3 REPORTING SAFETY DEFECTS

If you believe that your vehicle has a defect that could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Sage Oil Vac, Inc.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Sage Oil Vac, Inc.

To contact NHTSA, you may either call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153), go to <http://www.safercar.gov>; or write to: Administrator, NHTSA, 400 Seventh Street, SW., Washington, DC 20590. You can also obtain other information about motor vehicle safety from <http://www.safercar.gov>.

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Operation

Follow all of the safety precautions and instructions in this manual to ensure safety of persons, cargo, and satisfactory life of the trailer.

3.1 COMPONENT OVERVIEW

- **Fluid Tanks**

Sage Oil Vac units are equipped with fluid tanks. Depending on configuration, there may be New Fluid tanks, Used Fluid tanks or both. New fluid tanks can be filled with a variety of materials but are typically used for petroleum products (i.e. Motor Oil, Transmission/Hydraulic Fluid). The used oil tanks contain used fluids for transport to appropriate disposal facilities. The tanks are fabricated from heavy gauge steel and are pressure tested to withstand day-to-day operation of the equipment. Current Sage Oil Vac models have between two and six fluid tanks allowing for a variety of fluids both new and used. Fluid tanks range in size from 5 gallons to 250 gallons.

- **Storage**

Trailer and skid mounted Sage Oil Vac systems also feature optional weather-tight storage boxes. This enables the operator to bring tools and equipment to the maintenance location.

- **Hoses and Lines**

Sage Oil Vac systems employ several types of hoses and fittings. Air lines which run from the air compressor to the fluid tanks are equipped with quick disconnect fittings for easy transfer from tank to tank. Pressure fluid lines connect the fluid tanks to the equipment being serviced. These pressure lines may be outfitted with ½-inch flush face quick disconnects (Professional Series Oil Vac models) or ½-inch standard hydraulic quick disconnect. "Cam and groove" style fittings in both ¾-inch and 1-inch sizes are also available.

- **Remote Panel**

The skid is equipped with a remote panel at the rear of the skid. That panel is equipped with combination vacuum/pressure gauges for new and used product tanks that show regulated air pressure in pounds per square inch (PSI) or vacuum in the associated tank in inches of Mercury (Hg). The panel also has valves to remotely control tank pressure/vacuum for each tank, a compressor relief valve (drain valve), and a choke and engine switch for operating the compressor engine.

- **Air Compressors and/or Air Source**

The Sage Oil Vac can be equipped with three types of air compressors or a "vacuum generator". Smaller models may use an electric air compressor or a "vacuum generator". An external compressed air source is required when using a "vacuum generator". Larger models are typically equipped with a gasoline or diesel powered air compressor.

- **Fluid Flow Meter**

Sage Oil Vac systems may incorporate both inline and handheld flow meters. Meter type is dependent on customer preference and application.

- **Hose Reel/Wrap**

Sage Oil Vac systems may be equipped with manual hose wraps or automatic retractable hose reels for hose storage.

- **Grease System**

A heavy-duty air grease system is an option on larger Sage Oil Vac models. The trailer chassis or skid is equipped with a mounting point for grease drums. Grease is supplied using air pressure from the on board compressor.

- **Used Filter Receptacle**

Most Sage Oil Vac systems also include a used filter receptacle. Used filters drain inside the receptacle. The fluid drained from the filters is then evacuated to the used fluid tank through a vacuum fluid hose that is permanently connected to the receptacle.

- **Drain Pan System**

Sage Oil Vac offers a unique drain pan system. The drain pan is mounted on plastic casters with a pull handle. There is a connection for the Sage Oil Vac used product hose to evacuate used fluids. Drain pans are available in two capacities: 17 gallons and 10 gallons.

Operation

- **Auxiliary Lighting System**

Larger Sage Oil Vac systems can be equipped with auxiliary lighting systems. These systems are operated by current from vehicle towing trailer or on-board batteries.

- **Heated New Fluid Tanks**

Sage Oil Vac offers options for heated new fluid tanks. Custom silicone rubber heaters that go on the outside of existing tanks and circulation tubing heat system for new fluid tanks.

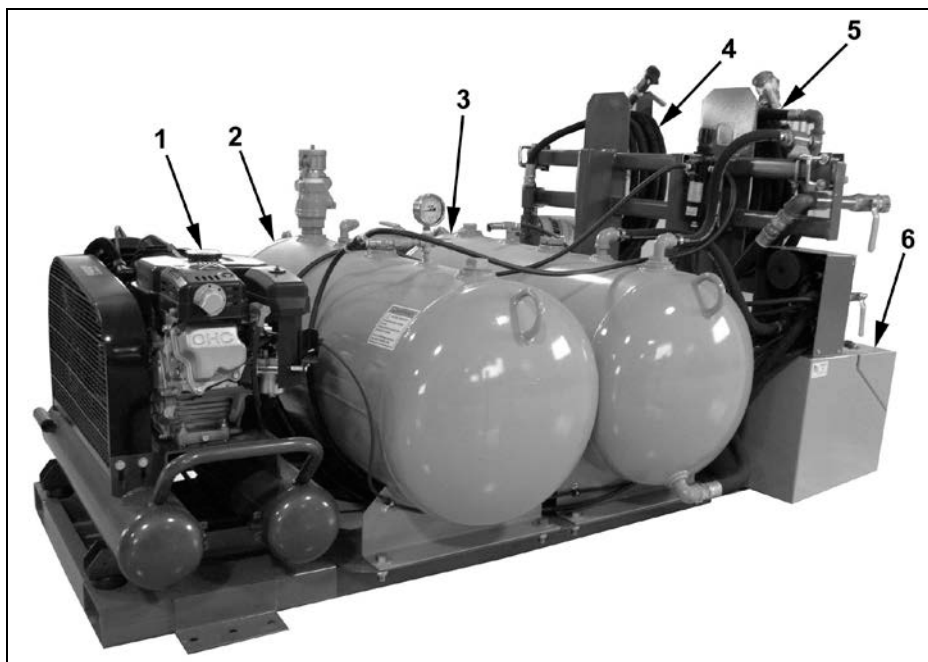


Figure 1 - Component Identification

1 – Air Compressor/Vacuum Generator
2 – New Product Tank
3 – Used Product Tank

4 – New Product Hose
5 – Used Product Hose
6 – Used Filter Receptacle

3.2 AIR COMPRESSOR OPERATION

Before operating the compressor, you must read and fully understand the compressor manufacturer's instructions. If you do not have the manufacturers' instructions, contact Sage Oil Vac or your dealer for assistance.

This manual provides you with basic start up and shut down procedures for the electric/recoil start gasoline engine powered air compressor. Your Sage Oil Vac may be equipped with an electric start gasoline engine or a diesel powered air compressor. Refer to the Owner's Manual provided with the compressor for additional safety, operation and maintenance information.

The exhaust from the compressor engine contains carbon monoxide. Carbon monoxide is an odorless gas that can cause death. Avoid any actions or areas that expose you to carbon monoxide. Do not operate the compressor engine in an enclosed building or confined area.

^ WARNING

The exhaust from this engine contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

Operation

^ WARNING

Operating a compressor can lead to death or serious injury by:

- Carbon Monoxide
- Fire and Explosion

Avoid any actions or areas that expose you to carbon monoxide.

Do not refuel a running compressor or refuel near ignition sources.

^ WARNING

Risk from moving parts.

Never operate the compressor with guards or shields removed.

Never touch moving parts.

3.2.1 STARTING THE COMPRESSOR ENGINE

Note: For oil check locations and for oil and fuel requirements, see the compressor and engine owner's manuals provided with your Sage Oil Vac. If you do not have these manuals, contact Sage Oil Vac or your dealer for assistance.

1. Check the engine oil level.
2. Check the compressor crankcase oil level.
3. Check the engine to compressor drive belt tension.
4. Move the fuel valve lever (1) to the OPEN position. See Figure 2.
5. To start a cold engine, pull the choke lever (2) to the CLOSED position. To start a warm engine, leave the choke lever (2) in the OPEN position. See Figure 3.
6. Move the throttle lever (3) away from the MIN position about 1/3 of the way toward the MAX position. See Figure 2.
7. Starting with engine switch: Turn the engine switch (4) to the START position. See Figure 3.

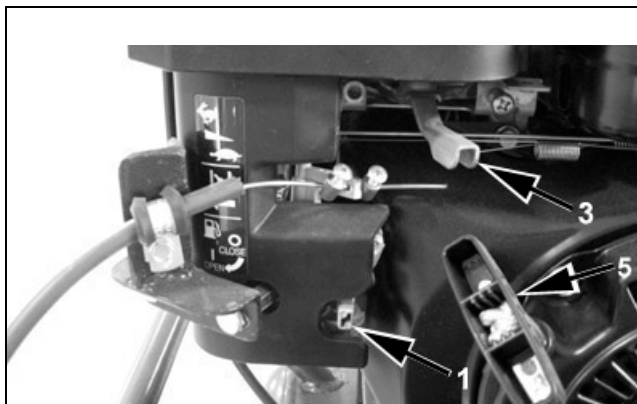


Figure 2 - Fuel Lever and Throttle Lever

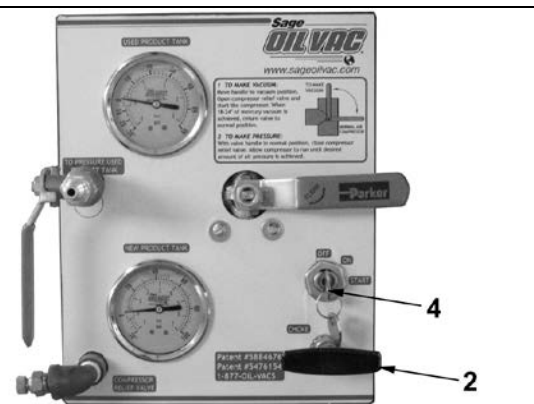


Figure 3 - Choke and Engine Switch

7. Starting with recoil starter: Pull the recoil starter grip (5) lightly until you feel resistance, then pull briskly to start engine. Allow the starter grip to return gently to the engine, do not allow grip to snap back. See Figure 2.

3.2.2 STOPPING THE COMPRESSOR ENGINE

1. Move the throttle lever to the MIN Position.
2. Turn the engine switch to the OFF position.
3. Move the fuel valve lever to the OFF position.

3.3 PREPARE SYSTEM FOR USE

This section covers the procedures you will normally be using in operating the Sage Oil Vac family of equipment.

^ WARNING

Risk of fire or explosion.

Do not smoke or use an open flame within 50 feet of the unit.

Verify that correct grounding procedures have been followed prior to operation.

If fluid is spilled, stop operation and notify safety personnel.

^ WARNING

Burn hazard.

Hoses and fittings may be extremely hot during operation

Contact with these parts may cause serious burns.

^ WARNING

Risk of hearing loss.

This machine produces extremely loud noise.

Hearing protection is required while operating this machine.

3.3.1 VISUAL EQUIPMENT INSPECTION

The steps described below are to ensure that the Sage Oil Vac system is prepared for use. Failure to follow these steps may prevent operation of the system or create a safety hazard.

Note: Inspection items are dependant on equipment model.

- Inspect all hoses, nozzles, fittings, tanks and related parts for damage, cracking and signs of leakage and missing parts.
- Inspect static discharge grounding wire and reel to assure proper connection to nozzle assembly.
- Inspect engine for damage, leaks and missing parts.
- Inspect compressor for damage, leaks and missing parts.
- Verify that fire extinguisher is properly charged.
- Place all valves in the closed position.

Operation

- Check all fluid tank level gauges for the presence of fluids. If the used fluid tank is above the 90% level, proceed to used product disposal location after completing the visual equipment inspection.
- Verify that the vacuum/pressure gauges read zero.
- Check the compressor engine fuel level. If the fuel level is low, refuel using the appropriate fuel type. See compressor Owners' Manual for fuel specification.
- Check the compressor oil level. If the compressor oil level is low, add oil. See compressor owner's manual for oil specification.
- Secure the toolbox latch or lid.
- Secure the used filter receptacle latch or lid.
- Ensure that the hoses are coiled on holder and their dust covers are installed and secure.
- Drain any moisture from the compressor tanks and ensure the drain valves are closed.
- Ensure that the new fluid fill cam-lock cap and the used fluid disposal cam-lock cap are secure.

3.4 FILL NEW PRODUCT TANK

Note: Special consideration must be given to the following steps. For exact specifications on which type of fluid should be used consult the equipment service manuals.

The new product tank can be filled by pouring fluid directly into the fluid intake nozzle or by siphoning from a drum or barrel with vacuum. The following steps describe the vacuum method.

3.4.1 CREATE VACUUM IN NEW PRODUCT TANK

The new product tank can be filled by pouring fluid directly into the fluid intake nozzle or by siphoning from drum or barrel with vacuum. Create a vacuum in the new product tank by following the steps below.

1. Check that the vacuum/pressure gauge (1) reads zero, indicating no pressure or vacuum in the new product tank. See Figure 4. If there is pressure in the new fluid tank to be filled, relieve pressure by disconnecting the air hose (if necessary) and opening the ball valve at the air intake. After pressure is relieved, close the air intake ball.

^ WARNING

Pressure hazard.

Relieve pressure before filling product tanks.

Failure to do so could cause serious injury.



Figure 4 - Remote Panel Gauge

Operation

2. Attach the used product hose to the quick connect fitting to make vacuum fitting (2). See Figure 5.



Figure 5 - Quick Disconnect Fitting to Make Vacuum

3. Open the air compressor tank drain valve (3). See Figure 6.



Figure 6 - Compressor Drain Valve

4. Start the compressor or operate the vacuum generator.

Note: See section 6.2 or the separate compressor operation instructions.

5. Place the 3-way valve (4) in the vacuum position as shown in Figure 7 to and described in decal (5).

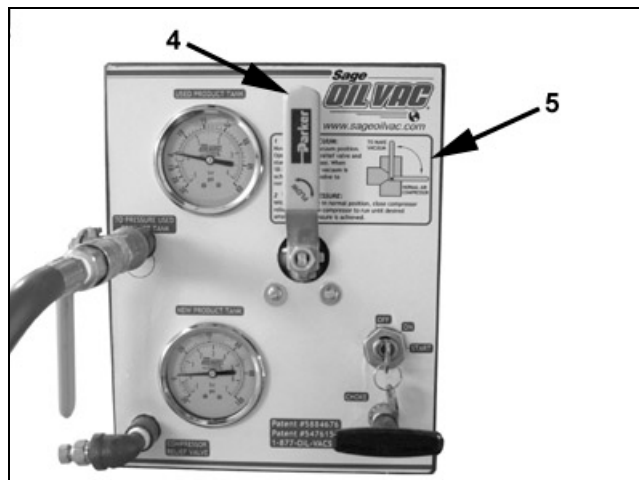


Figure 7 - 3-Way Valve in Vacuum Position

6. Open the used product hose ball valve.
7. Observe the vacuum/pressure gauge until approximately -20 inches (Hg-Mercury) of vacuum is reached.

Note: There is no risk of damage to equipment if operator allows compressor to run for extended periods building vacuum. Once the maximum amount of vacuum is achieved the compressor will simply run until stopped by the operator.

8. Place the 3-way valve (4) in the normal air compressor position as shown in Figure 8.



Figure 8 - 3-Way Valve in Air Compressor Position

9. Stop the compressor engine.
10. The Sage Oil Vac system is now prepared to fill the new fluid tank using the vacuum method.

3.4.2 FILL NEW PRODUCT TANK USING BARREL STRAW

1. Retrieve the barrel straw. See Figure 9.

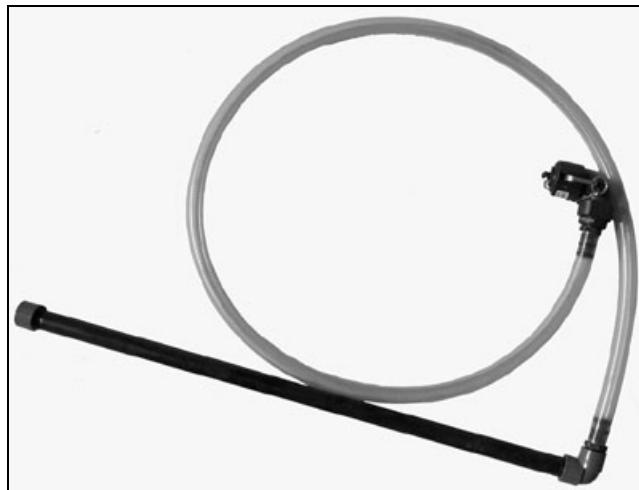


Figure 9 - Barrel Straw

2. Verify that the product tank fill nozzle valve (1) is closed as shown in Figure 10.
3. Remove the cam-lock cap (2) from the new product tank fill nozzle. See Figure 10.

Operation

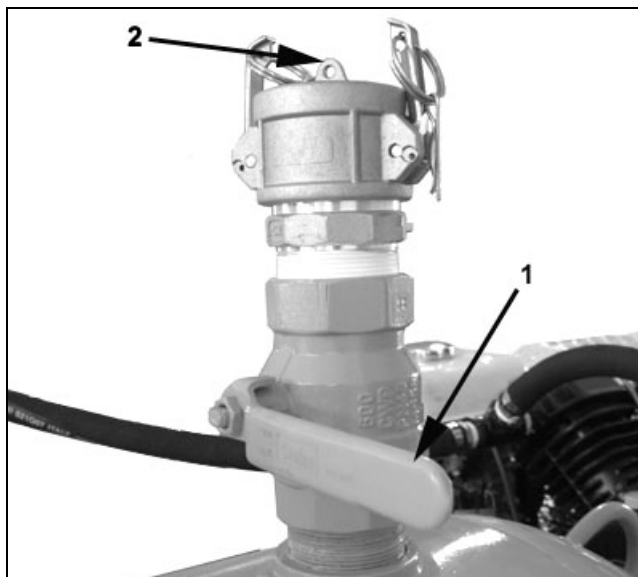


Figure 10 - Fill Valve and Cam-Lock Cap

4. Attach the barrel straw to the new product tank fill nozzle. Secure the connection using the cam lock levers on the connector.
5. Ensure that the new product container is the proper fluid for the new fluid tank you are going to fill.
6. Insert the barrel straw into the new product container.
7. Open the new product fill nozzle ball valve (3). See Figure 11 (valve shown in the closed position).

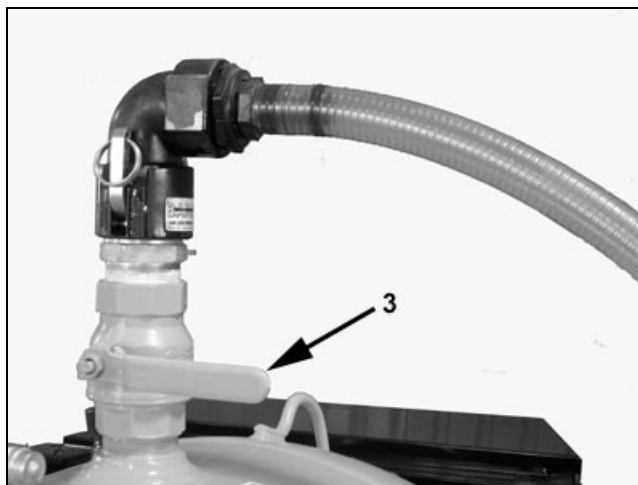


Figure 11 - New Product Fill Valve

8. Monitor the product barrel or drum level, the new product tank level gauge and vacuum.

Note: If there is insufficient vacuum to fill the tank, you will have to follow the steps to create a vacuum to fill the new fluid tank to desired level.

Note: Additional vacuum may be supplied by leaving the used product hose open and attached to the new product tank. Care should be taken to ensure the new product tank is not filled beyond the 90% recommended capacity. Overfilling the new product tank could result in new fluid entering the used product tank.

9. Close the new product tank fill nozzle valve when tank is no more than 90% full.
10. Close the used product hose valve.
11. Carefully remove the barrel straw from the new product container. Invert and elevate the barrel straw and open new product tank fill nozzle valve for a few seconds to clear the tool.

^ CAUTION

Risk of fluid spillage.

There may be traces of fluid in the barrel straw that can spill out during removal.

12. Remove and store the barrel straw.
13. Replace the new product tank fill nozzle cam lock cap.
14. Remove and secure the used product hose.
15. Re-establish vacuum in the used product tank by restarting the compressor and moving the 3-way valve to the vacuum position. This prepares the used product tank for operation.

Note: Repeat the above steps for each new product tank to be filled.

3.4.3 ESTABLISH AIR PRESSURE IN THE NEW PRODUCT TANK

1. Check the air pressure/vacuum gauges on the new product tank or remote panel. If vacuum exists open the air inlet valve to relieve vacuum.
2. Connect the air hose from the compressor to the new product tank.
3. Close the compressor tank drain valves.
4. Place the 3-way valve in the normal air compressor position. See Figure 12.



Figure 12 - 3-Way Valve in Air Compressor Position

5. Allow the compressor to bring the product tank to optimal air pressure of 60-65 psi. The compressor will reduce engine speed when compressor tank pressure reaches optimum pressure. The new product tank is now pressurized for fluid transfer.

3.5 BASIC FLUID CHANGE

The following steps describe a basic fluid change:

1. Identify the equipment and which services it requires.
2. Select the correct new product type.
3. Warm the equipment engine to normal operating temperature.
4. Place the drain pan in position under equipment to catch fluid (For equipment not equipped with Sage Oil Vac fittings).
5. Stop the equipment engine.

Operation

^ CAUTION

Risk of burn injury.

Equipment, engine, filters and fittings may be hot.

Wear appropriate protective devices.



Figure 13 - Filter Stinger

6. Locate the equipment filter if applicable.
7. Change the equipment filter if applicable or remove oil in the filter with the filter stinger using steps 8-14 below.
8. Obtain the filter stinger and attach the appropriate used product hose.
9. Puncture the fluid filter with the filter stinger. Open the used product hose valve to drain the target engine fluid filter.
10. There will be a distinct sound when the filter drain is complete. Open and close the used product hose valve 3-4 times to evacuate residual fluid from the tool and the hose.
11. Elevate filter stinger and open and close the used product hose valve 3-4 times to allow excess fluid to be recovered by vacuum.
12. Close the used product hose valve.
13. Disconnect the used product hose from the filter stinger.
14. Store fluid Filter Stinger.
15. Attach the used product hose to the target equipment fluid drain adapter if applicable.

Note: If there is no adapter available, select the appropriate drain attachment or use drain pan.

16. Open the used product hose valve and drain the equipment fluid. There will be a distinct sound and slight hose vibration when vacuum drain is complete.
17. Place the used filter in the used filter receptacle.
18. Flush the used filter receptacle by opening used fluid filter receptacle evacuation valve on the used product tank for a few seconds to evacuate any fluid that has drained from the used filter.
19. Close the used product hose valve. Open and close the used product hose valve 3-4 times to facilitate oil removal.
20. Disconnect and store the used product hose.
21. Select the appropriate new product hose. New fluid may be installed by a top feed access such as the oil filler cap or by connecting the new product hose to the drain adapter if available.
22. Connect the hand-held flow meter if applicable. Reset the hand-held flow meter by pressing the meter counter reset button. See Figure 14.



Figure 14 - Flow Meter Reset Button

23. Attach the new product hose to the equipment drain adapter or position the hose to apply top feed.
24. Open the meter valve if applicable.
25. Open the new product hose valve and fill to the recommended level by observing the flow meter or checking the equipment dipstick.
26. Close the new product hose valve and meter valve upon completion.

Note: For certain fluid changes the equipment must be started and allowed to operate for a few seconds (To fill filters, etc) before the fluid level can be checked.

27. Top off fluid level if necessary
28. Disconnect and store the new product hose, fluid meter and filler tubes as necessary.
29. Wipe off any dripped or residual fluids that remain on the equipment or fittings if necessary.
30. Replace all dust caps and protective covers.

3.6 USED PRODUCT DISPOSAL

See Section 10 for agencies you may contact regarding waste oil disposal in your state.

This outlines the disposal of waste product at authorized disposal sites. This outline assumes that the disposal hose assembly is attached to the disposal vessel. This procedure will vary depending on site conditions.

- Identify the proper used product receptacle for each fluid type for disposal.
- Relieve vacuum from the used product tank if vacuum exists.
- Connect the used product tank to the used product disposal receptacle. Verify the connections at both the used product tank and the disposal vessel are secure using the cam-lock connector.
- Connect the compressor air supply hose to the used product tank air inlet and open air inlet valve (1). See Figure 15.
- Open the used product tank discharge valve (2) to start evacuation of waste fluids.

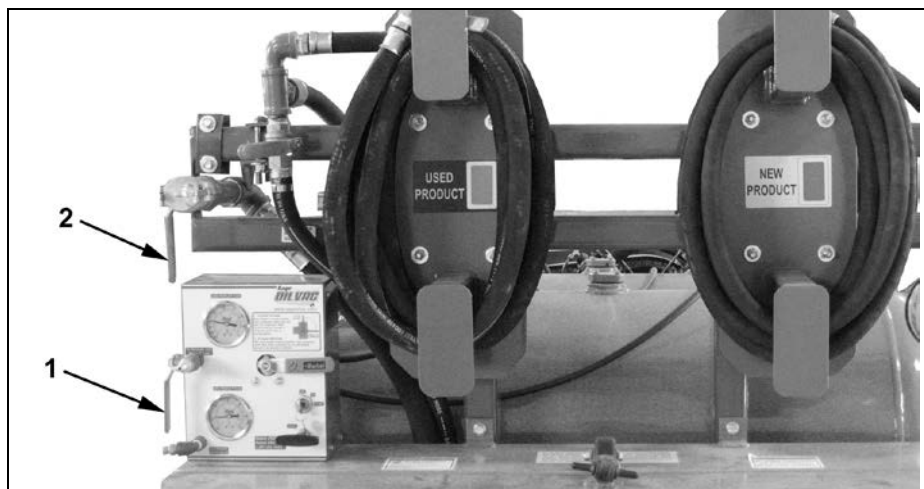


Figure 15 - Used Product Disposal

- Start compressor to pressurize the used product tank.
- Monitor the fluid level gauge on the used product tank until the tank is empty. Allow air pressure to purge the disposal hose.
- Close the used product tank air inlet valve.
- Close the used product tank discharge valve
- Disconnect the used product disposal hose and replace the cam-lock cap.
- Wipe up any dripped or residual fluids that remain if necessary.

Note: Repeat the above indented steps for each used product tank to be emptied. In some cases, such as centralized disposal sites, multiple tanks and multiple products may be disposed simultaneously.

3.7 HEATER OPERATION

The following steps describe how to operate the heater without running the truck:

1. Locate 110 volt cord to the battery charger. The volt cord can be found on the driver's side between the cab and bed of the truck. See Figure 16.



Figure 16- 110 Volt Cord

2. Plug into 110 volt power source. It is necessary to keep the battery charger plugged in while running the heater otherwise the batteries in the truck will run down at night causing the heater to shut off. See Figure 16.
3. Turn heater on by moving the toggle switch upward to the on position. This switch is located directly above the truck's ignition switch. The toggle switch will illuminate when the heater is powered up. See Figure 17.

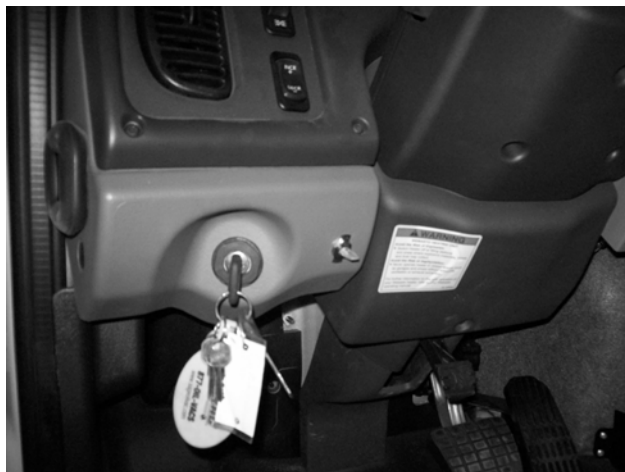


Figure 17- Toggle Switch

4. Insure that the heater is working by listening for ignition and feeling the exhaust for heat. The heater is located below the bed of the truck on the passenger side towards the front of the bed. See Figure 18.

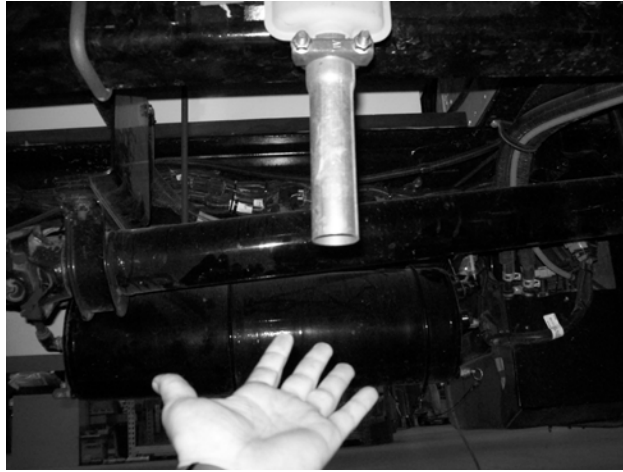


Figure 18- Feeling Exhaust for Heat

5. Allow heater to run all night for best results. Insure that the heater has enough fuel to run all night.

In order to run the heater while truck is running skip steps one and two above repeat steps 3-5.

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Drawings And Parts

This section contains exploded view drawings, spare parts and part numbers for the Sage Oil Vac System. For spare parts on the compressor engine, see your engine manual or dealer.

4.1 AIR COMPRESSOR

4.1.1 AIR TANK

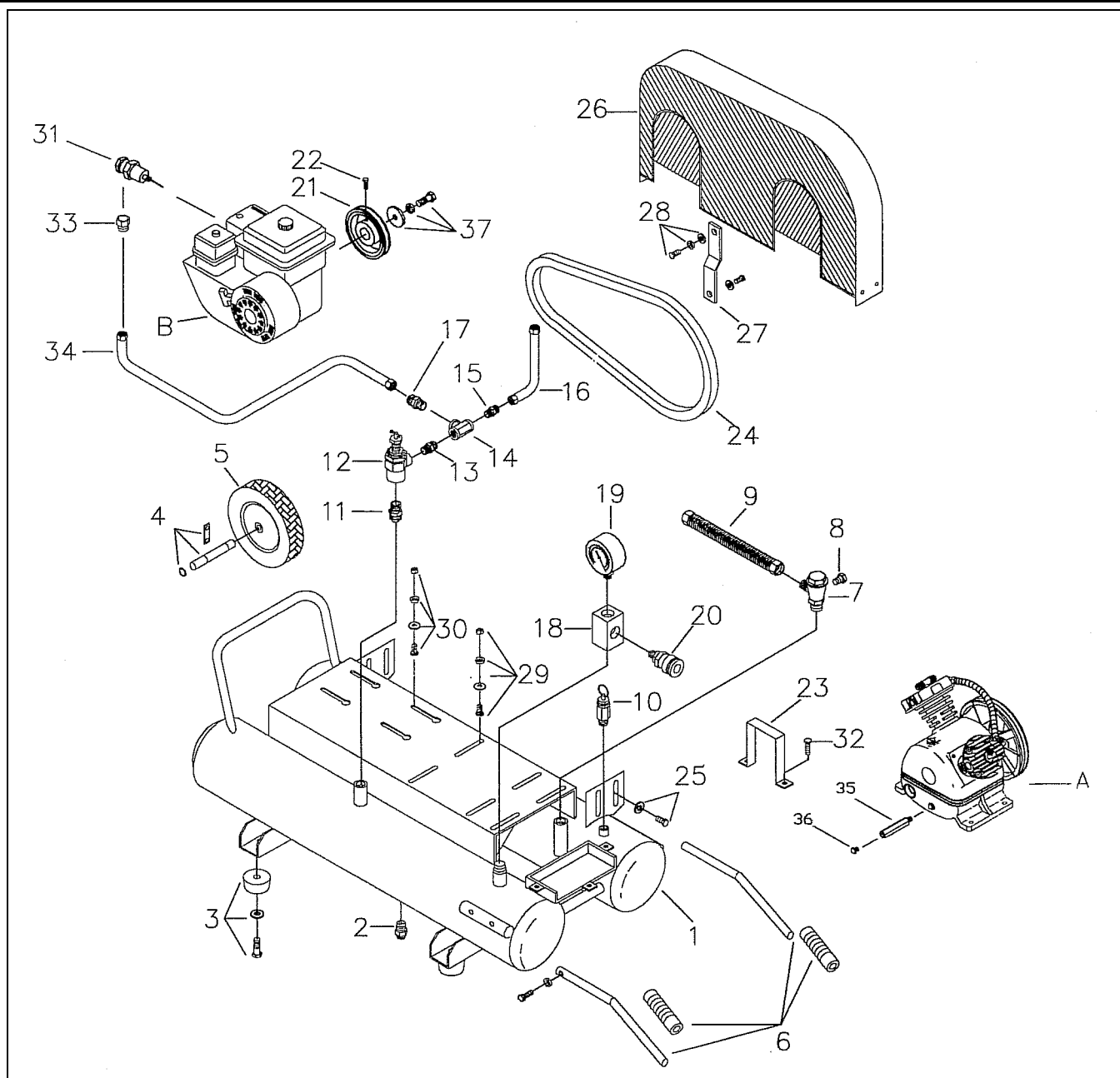


Figure 4.1.1 - Air Tank

Air Tank Spare Parts List

Item Number	Part Number	Description	Quantity	Notes
A	PUK-60	Bare Pump	1	
B	028-60RE	Engine (Subaru Robin EX170 6HP with Starter)	1	
1	3401386	Air Receiver (Tank)	1	
2	2405011	Drain Valve	2	
3	2433015A	Rubber Pad Set	4	
4	2418022A	Tank Wheel Axle	1	
5	2402032B	Tank Wheel	1	
6	3432030-A	Grip Set	1	
7	2414025T	Check Valve	1	
8	2N33-001	Plug	1	
9	3B2-04*440	Discharge Tube Set	1	
10	84006009	Pressure Relief Valve	1	
11	2N01-002	Nipple	1	
12	041-PV125FN-000	Pilot Valve	1	
13	2N01-01N01N	Nipple	1	
14	2N03-C111NF	Brass 3-Way Manifold	1	
15	2N01-01T02HS	Nipple	1	
16	3B2-02*350	Unloading Tube Set	1	
17	2N15-C01TW02M	Nipple	1	
18	2N04-C2234N	Brass 4-Way Pipe	1	
19	2D12-25V20KL	Pressure Gauge	1	
20	07MS3/8M-1-C	Quick Coupler	1	
21	3PGF-040A1W0615	Engine Pulley	1	
22	2B07-SM08*16	Set Screw	2	
23	2B07-SM08*16	Battery Bracket	2	
24	2N31-A51	V-Belt (US A-50)	1	
25	2B00-FM08*015W	Hex Bolt Set	5	
26	3426013	Belt Guard	1	
27	3427072	Bracket	1	
28	2B00-MF06*020VW	Hex Bolt Set	1	
29	2B08-FM08*30-M	Bolt Set (Pump Side)	4	
30	068-0516N16C5-0	Bolt Set (Engine Side)	4	
30	066-I0516-U01	Washer	4	
30	066-I0516-L00	Lock Washer	4	
30	070-0516N18H13	Nut	4	
31	031-S090P175RC	Engine Throttle Control	1	
32	2B00-FM5*020	Bolt	2	
33	070-0108N-01	Nut Fitting	1	
33	070R-01N-01	Tube Restraint Sleeve	1	
34	063-NL01X900	Tube (Pilot Valve to Engine Throttle Control)	1	
35	2305002	Oil Draining Tube	1	
36	2N33-001	Plug	1	
37	068-0516N24H5-0	Bolt	1	
37	066-I0516-L00	Lock Washer	1	
37	066-I0516-F00	Fender Washer	1	

Drawings And Parts

4.1.2 AIR COMPRESSOR PUMP

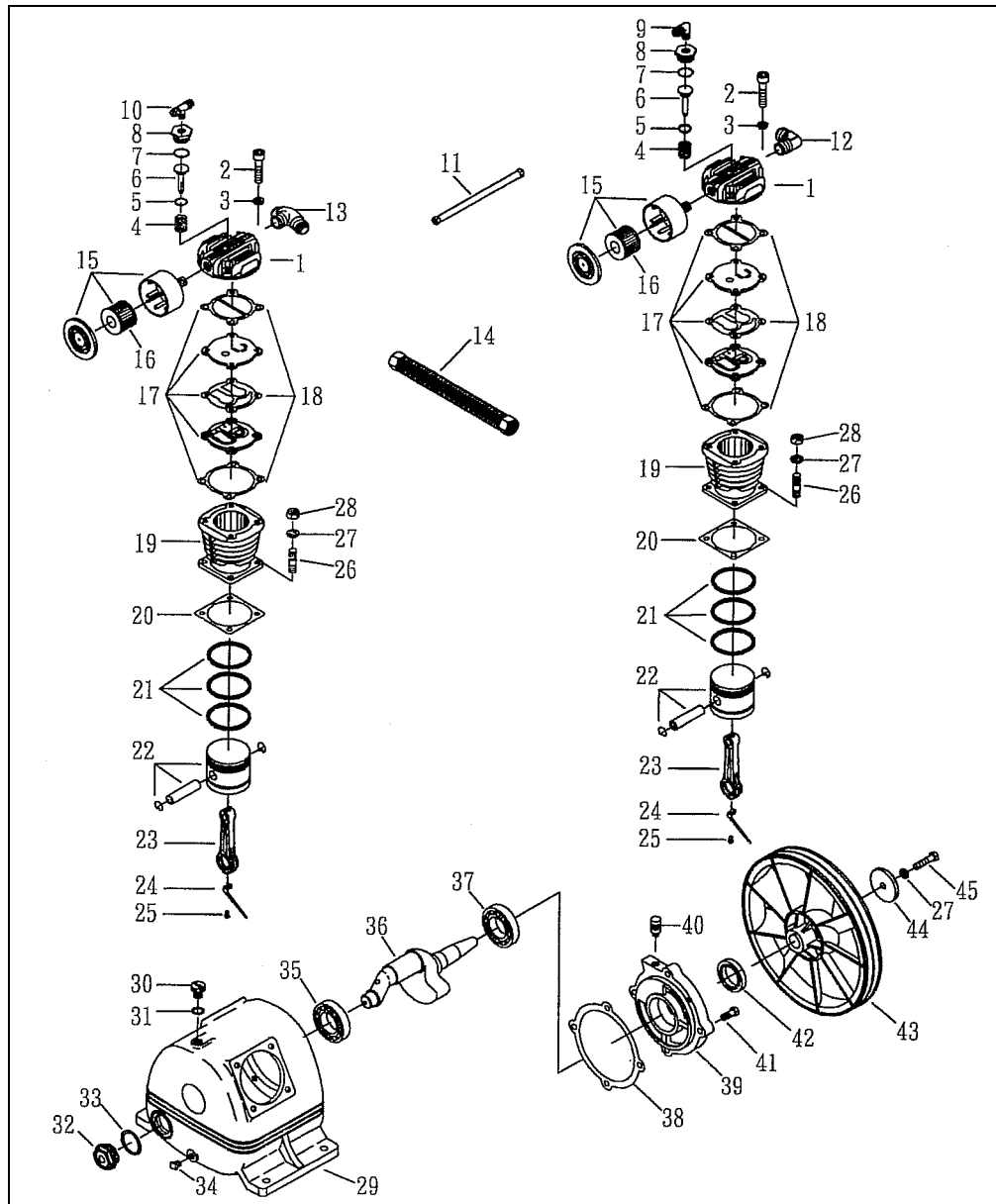


Figure 4.1.2 - Air Compressor Pump

Drawings And Parts

Air Compressor Pump Spare Parts List

Item Number	Part Number	Description	Quantity	Notes
1	3101055	Cylinder Head	2	
2	2B01-M06*040	Hex Socket Head Bolt	8	
3	2B33-M06	Split Lock Washer	8	
4	2S03-001	Spring (Head Unloader)	2	
5	2N52-P06V	O-Ring	2	
6	2113006	Piston (Head Unloader)	2	
7	2N52-P16*3V	O-Ring	2	
8	2B26-001	Cap (Head Unloader)	2	
9	2N06-01T02H	Elbow	1	
10	2N09-02H01T02H4	Tee	1	
11	3B2-02*475	Tube Kit	1	
12	2N06-04T04H	Elbow	1	
13	2N09-04H04T04H1	Tee	1	
14	3B2-04*240	Discharge Tube Kit	1	
15	2140020A	Air Filter	2	
16	1807 (2142013)	Filter Element	2	
17	3B13-AC07	Inlet and Outlet Valve Assembly	2	
18	3B71-PK20	Valve Plate Gasket Kit	2	
19	3201035	Cylinder	2	
20	2G04-003	Cylinder Gasket	2	
21	3B32-65	Piston Ring Kit	2	
22	3B31-65	Piston Kit	2	
23	2315028	Rod	2	
24	2317017	Oil Splasher	2	
25	2B02-FM5*010	Bolt (+)	2	
26	2B11-001	Stud Screw	8	
27	2B33-M08	Split Lock Washer	9	
28	2B20-FM08	Hex Nut	8	
29	3301015	Crankcase	1	
30	2319003	Oil Filling Cap	1	
31	2G11-005	Oil Filling Cap Gasket	1	
32	2303004	Oil Sight Gauge	1	
33	2G11-003	Oil Sight Gauge Gasket	1	
34	2N33-001	Oil Draining Plug	1	
35	2N35-6204	Bearing	1	
36	3304038	Crankshaft and Counterweight	1	
37	2N35-6205Z	Bearing	1	
38	2G06-008	Rear Bearing End Gasket	1	
39	3311015	Rear Bearing End	1	
40	2321002	Breather	1	
41	2B00-SM08*020	Hex Bolt	4	
42	2N50-TC24*47*07	Oil Seal	1	
43	3PBA-105A124	Pulley	1	
44	2B30-08*35*35	Flat Washer	1	
45	2B00-SM08*035A	Hex Bolt	1	

4.1.3 WATER TRAP/AIR REGULATOR

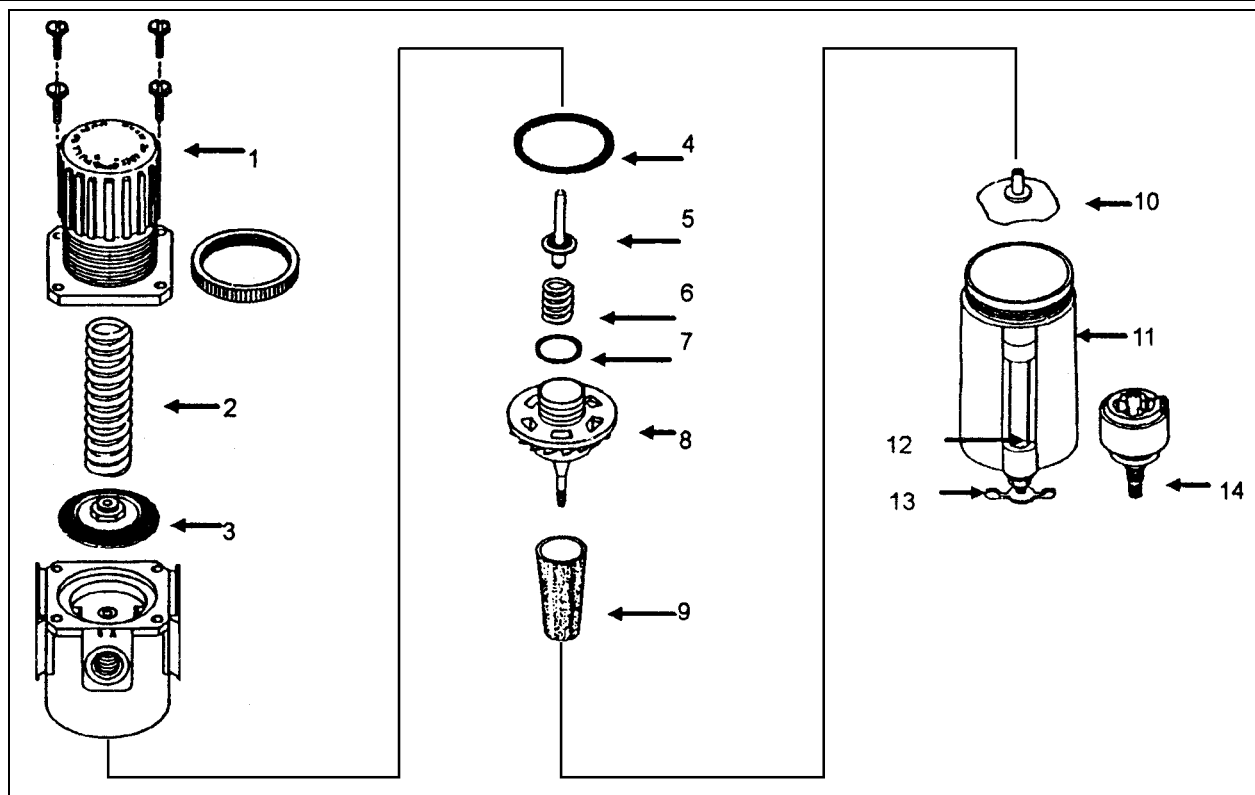


Figure 4.1.3 - Water Trap/Air Regulator

Item Number	Part Number	Description	Quantity	Notes
	AC-754-001	Water Trap/ Air Regulator (Complete)	1	
1	SC35	Regulator Bonnet Repair Kit	1	
	SC35T	Regulator Bonnet Repair Kit (T-Handle)	1	
2	SK35	Adjustment Spring	1	2-125
	SK35L	Adjustment Spring	1	2-60
	SK35H	Adjustment Spring	1	2-250
3	DK35	Diaphragm Repair Kit		Relieving
	DK35N	Diaphragm Repair Kit		Non-Relieving
5, 6, 7, 8, 10	VKB75	Valve Kit		
9	EK35 (Std)	Element		40 Micron
	EK35-3	Element		3 Micron
	EK35-5	Element		5 Micron
	EK35-20	Element		20 Micron
	EK35-90	Element		90 Micron
11	BKF35	Bowl Kit, Plastic	1	
	BKF45M	Bowl Kit, Metal	1	Inc 4, 11, 13
	BKF45W	Bowl Kit, Metal		Inc 4, 11, 12, 13
14	5200	Auto Drain Kit	1	Optional
	AC-000-002	Mounting Bracket	1	

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4.2 NEW AND USED FLUID TANKS

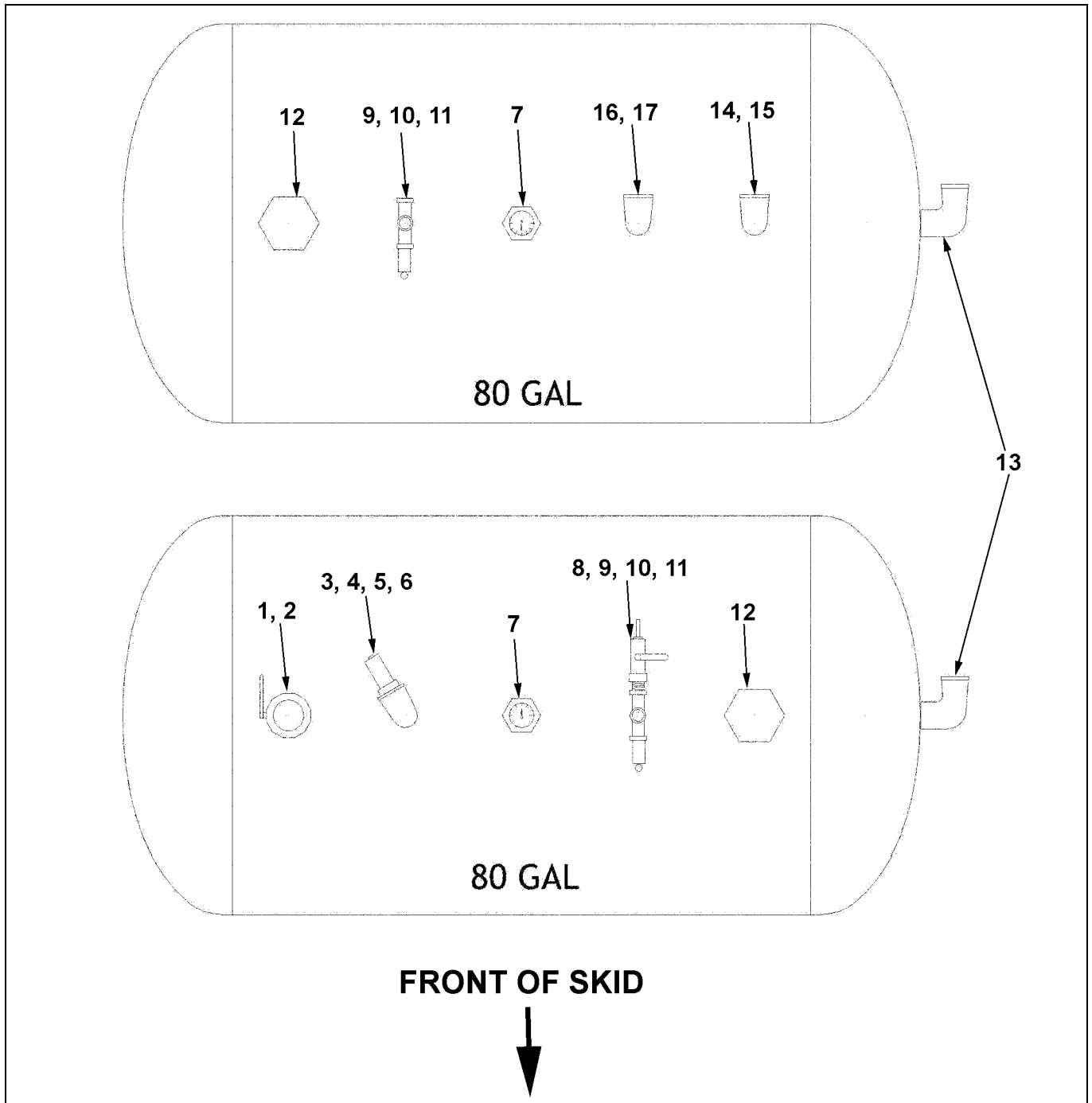


Figure 4.2 - 80 Gallon Tank Fittings

Drawings And Parts

Item Number	Part Number	Description	Quantity	Notes
1	PF-032-005	2" Close Nipple	1	
2	BV-032-001	2" Ball Valve	1	
3	PF-012-008	¾ x ½" Bushing	1	
4	PF-008-003	½" Street L	1	
5	PF-008-001	½" Close Nipple	1	
6	HF-008-001	Pioneer Male Coupler	1	
7		Gauge	2	
8	BV-004-003	¼" Ball Valve	1	
9	PF-004-014	¼" 4-Way Cross	2	
10	PF-004-011	¼" Male Coupling	2	
11	PF-004-001	¼ x 1-1/2" Nipple	3	
12	PF-032-010	2" Plug	2	
13	PF-016-005	1" Street L	2	
14	PF-032-003	¾ x 2" Bushing	1	
15	PF-012-004	¾" Street L	1	
16	PF-012-005	¾" Check Valve	1	
17	PF-012-006	¾" Elbow	1	

4.3 METERS AND HANDLES

4.3.1 ELECTRONIC-METERED CONTROL VALVE

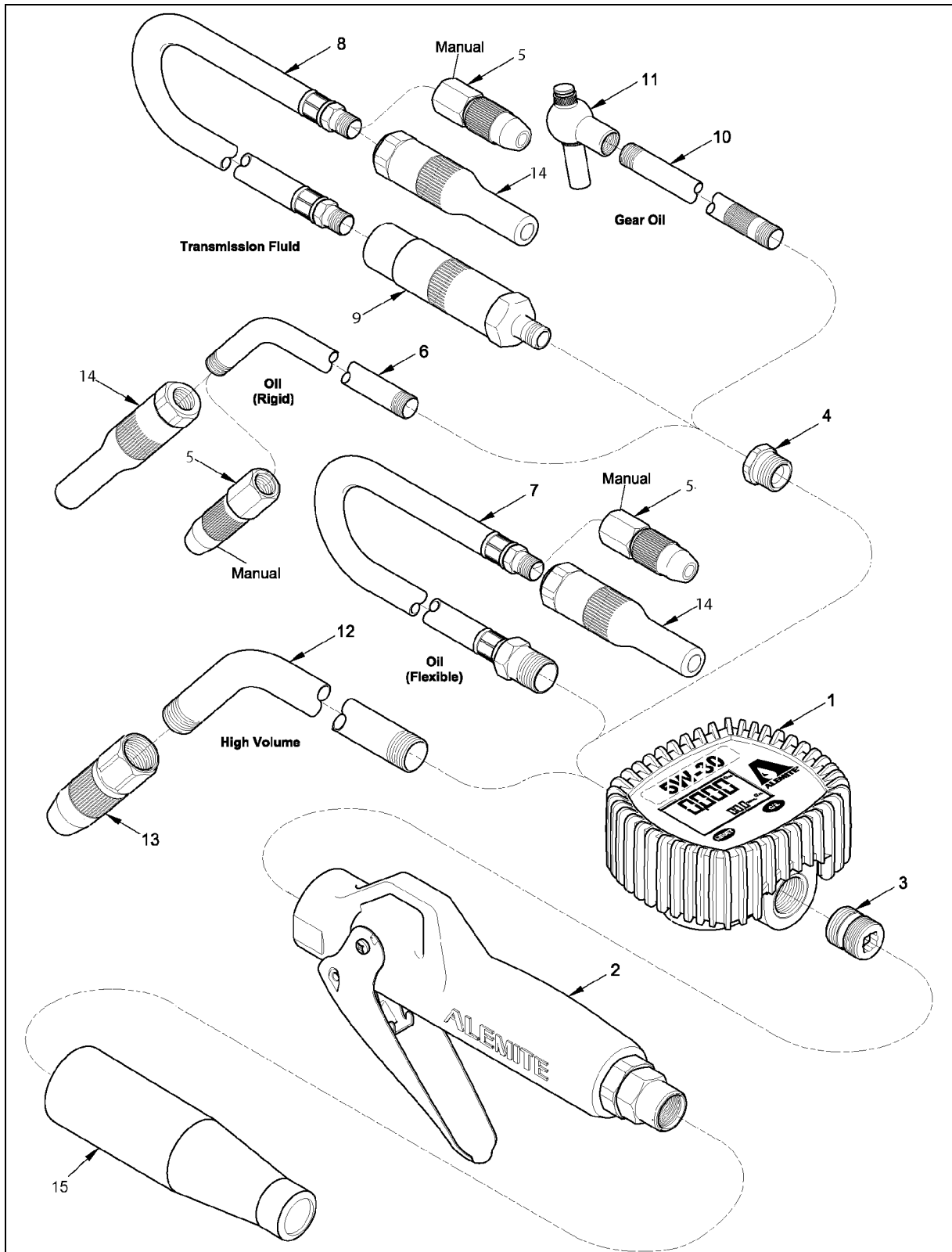


Figure 4.3.1 - Electronic-Metered Control Valve

Drawings And Parts

Item Number	Part Number	Description	Quantity	Notes
1	AA-367-001	Meter Assembly	1	Includes 2, 3, 5, 7, 15
2	339100	Handle Assembly	1	
3	338706	Nipple, ½" (NPTF)	1	
4	51891	Bushing, ½" (NPT) x ½" (NPT)	1	
5	339084	Nozzle, Manual	1	
6	338702	Extension, Curved	1	
7	338709	Hose, ½" NPT x ½" NPT	1	
8	317860-1	Hose, ¼" NPT x ¼" NPT	1	
9	321203	Filter Assembly (40 Micron)	1	See Section 7.5.2
10	320421	Extension, Straight ¼" NPT	1	
11	318400-2	Nozzle, Automatic W/Manual Lock	1	See Section 7.5.3
12	339149	Extension, Curved ½" NPT	1	
13	340084	Non-Drip Nozzle, High Volume Manual	1	
14	B339800	Non-Drip Nozzle, Automatic		
15	340626	Swivel Protector		
	340626-1	Swivel Protector, Black		
	340626-2	Swivel Protector, Yellow		
	340626-3	Swivel Protector, Green		
	340626-4	Swivel Protector, Red		
	340626-5	Swivel Protector, Blue		

4.3.2 METER FILTER ASSEMBLY

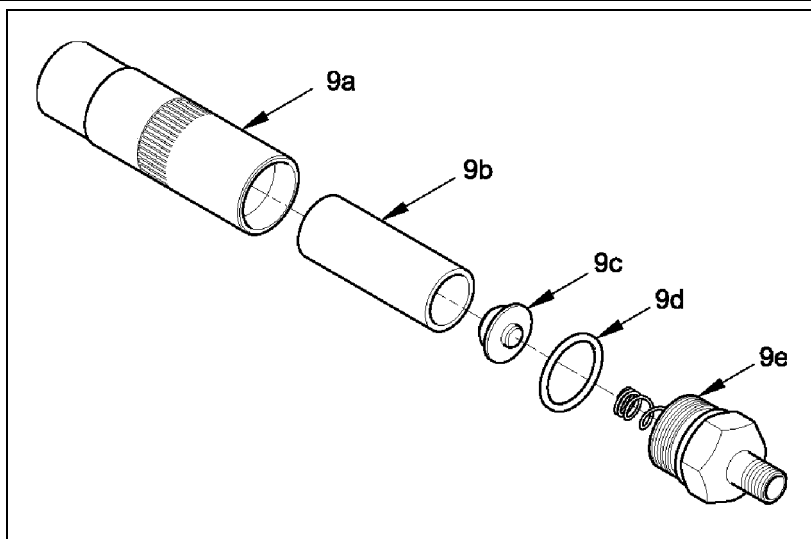


Figure 4.3.2 - Meter Filter Assembly

Item Number	Part Number	Description	Quantity	Notes
9a		Body	1	
9b	321191	Filter Tube	1	
9c		Stud	1	
9d	X171001-14	O-Ring, ¾" ID x 15/16" OD	1	Package Of Ten
9e		Spring and Adapter Assembly	1	

Drawings And Parts

4.3.3 METER NOZZLE

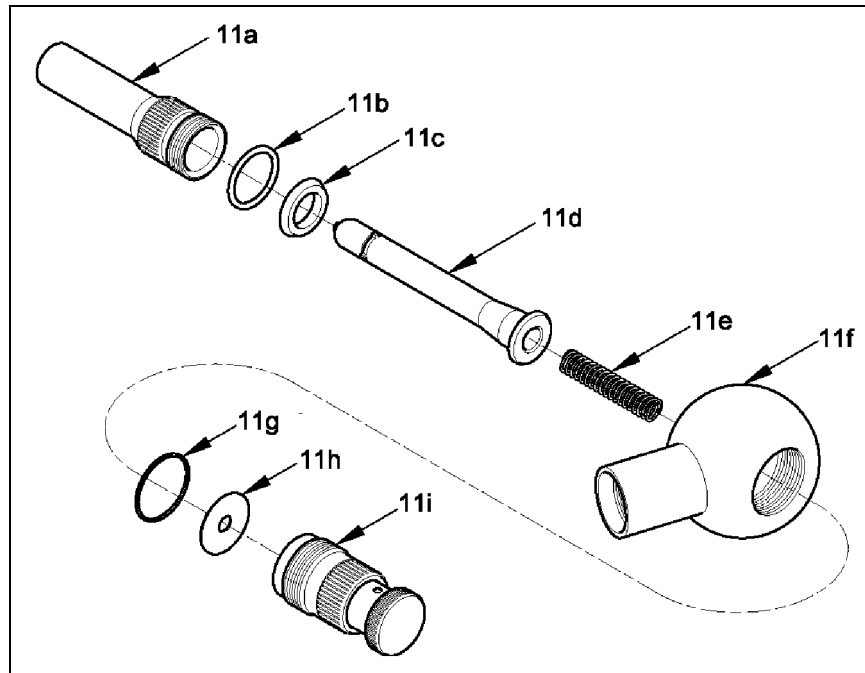


Figure 4.3.3 - Meter Nozzle Assembly

Item Number	Part Number	Description	Quantity	Notes
11a	3679	Nozzle	1	
11b	339100	O-Ring, ½" ID x 5/8" OD	1	Order Kit 393518
11c	338706	V-Block	1	Order Kit 393518
11d	51891	Stem	1	Order Kit 393518
11e	339084	Spring	1	Order Kit 393518
11f	338702	Body, Angle	1	
11g	338709	Gasket	1	Order Kit 393518
11h	317860-1	Washer	1	Order Kit 393518
11i	321203	Screw Assembly	1	

Drawings And Parts

4.3.4 METER HANDLE

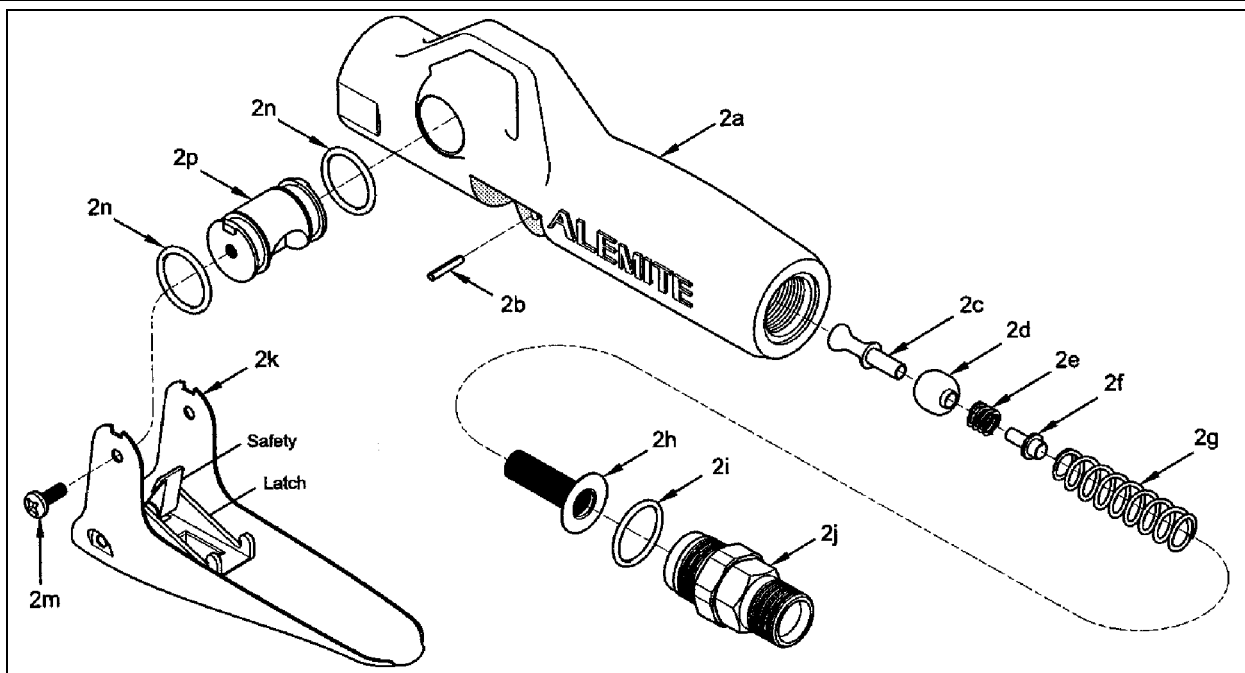


Figure 4.3.4 - Meter Nozzle Assembly

Item Number	Part Number	Description	Quantity	Notes
2a		Body	1	Order 339100
2b		1/8 x 5/8" Roll Pin	1	Order Kit 393676
2c		Push Rod	1	Order Kit 393676
2d		Seal	1	Order Kit 393676
2e		Spring, Small	1	Order Kit 393676
2f		Spring Support	1	Order Kit 393676
2g	339063	Compression Spring	1	
2h	339064	Strainer (40-Mesh)	1	
2i	X171009-17	13/16" ID x 1" OD O-Ring	1	Also In Kit 393676
2j	339656	Swivel Assembly	1	
2k		Lever Assembly	1	Order Kit 393677
2m		10-24 x 3/8" Screw	2	Order Kit 393676 or 393677
2n	X171000-10	1/2" ID x 11/16" OD O-Ring	2	Also In Kit 393676
2p	339055	Cam	1	

4.4 FILTER STINGER

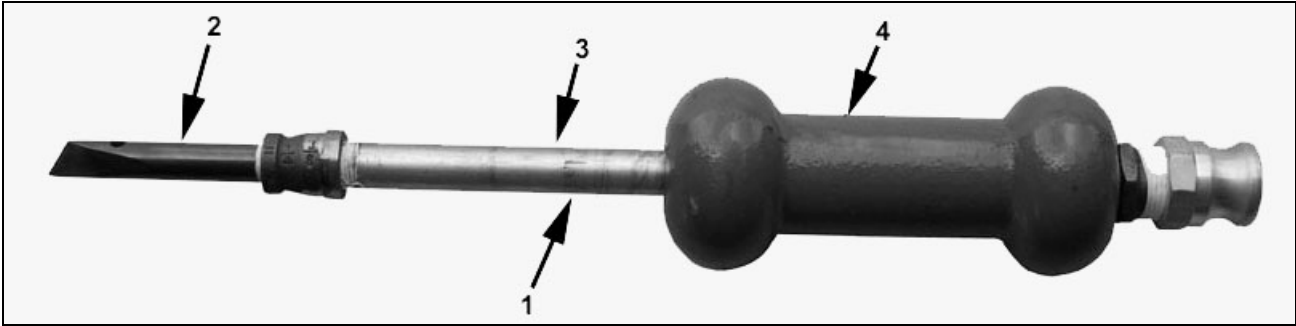


Figure 4.4 - Filter Stinger

Item Number	Part Number	Description	Quantity	Notes
1	MA-008-001	Filter Stinger Assembly	1	Complete Assembly
2	PF-006-007	Tungsten Filter Poker	1	
3	PF-006-007	3/8 x 12" Galvanized Nipple	1	
4	PF-005-001	5 lb. Slide Hammer	1	

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4.5 BARREL STRAW

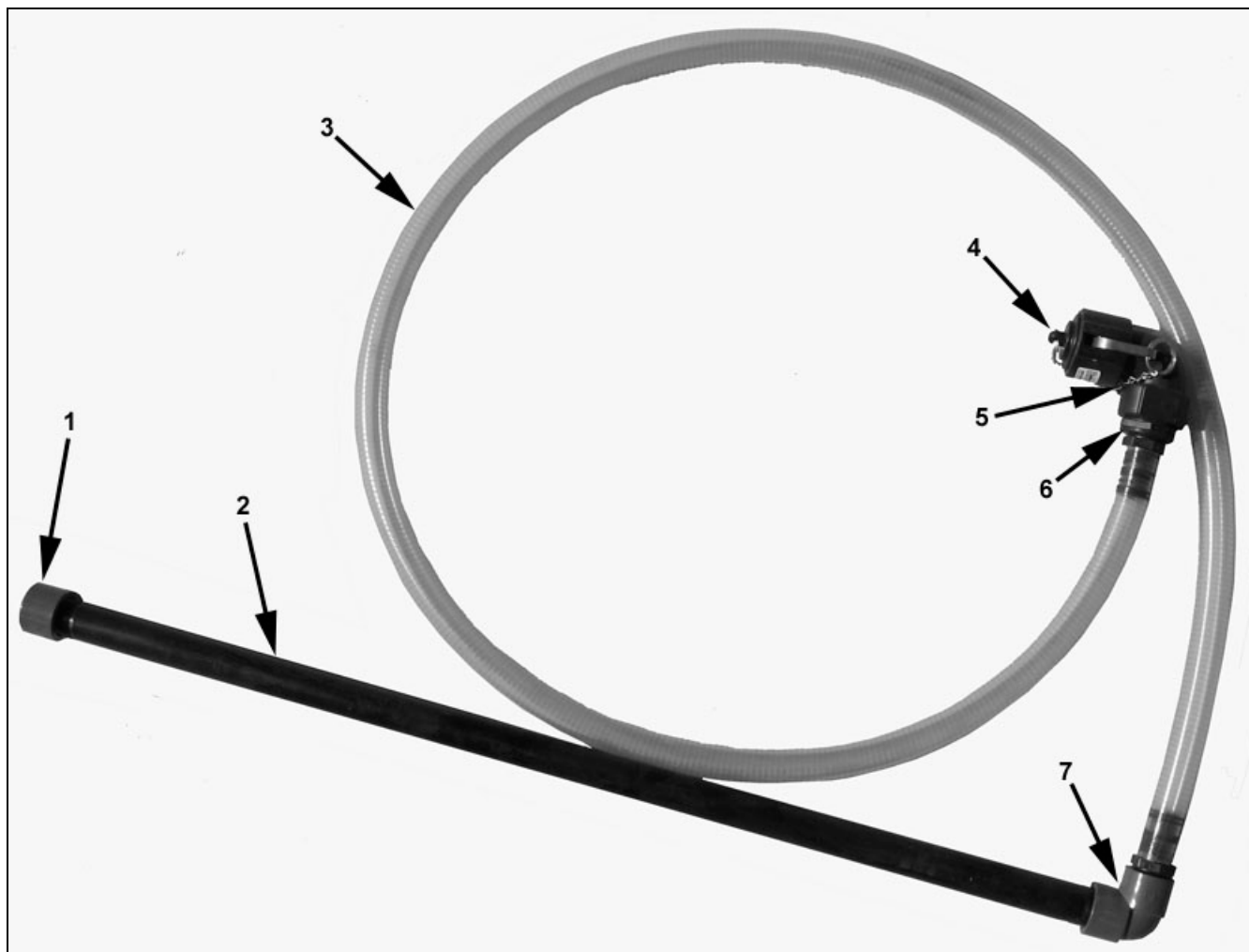


Figure 4.5 - Barrel Straw

Item Number	Part Number	Description	Quantity	Notes
1	PF-020-023	1-1/4" PVC Female Cap	1	
2	PF-020-020	1-1/4" Polypro PVC Pipe	1	
3	HE-020-007	1-1/4" Hose	1	
4	CL-032-005	2" Cam Plug	1	
5	CL-032-004	2" Plastic Female Cam Elbow	1	
6	PF-032-011	2" x 1-1/4" Poly Bushing	1	
7	PF-020-021	1-1/4" PVC Elbow	1	

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Drawings And Parts

4.6 REAR OF SKID

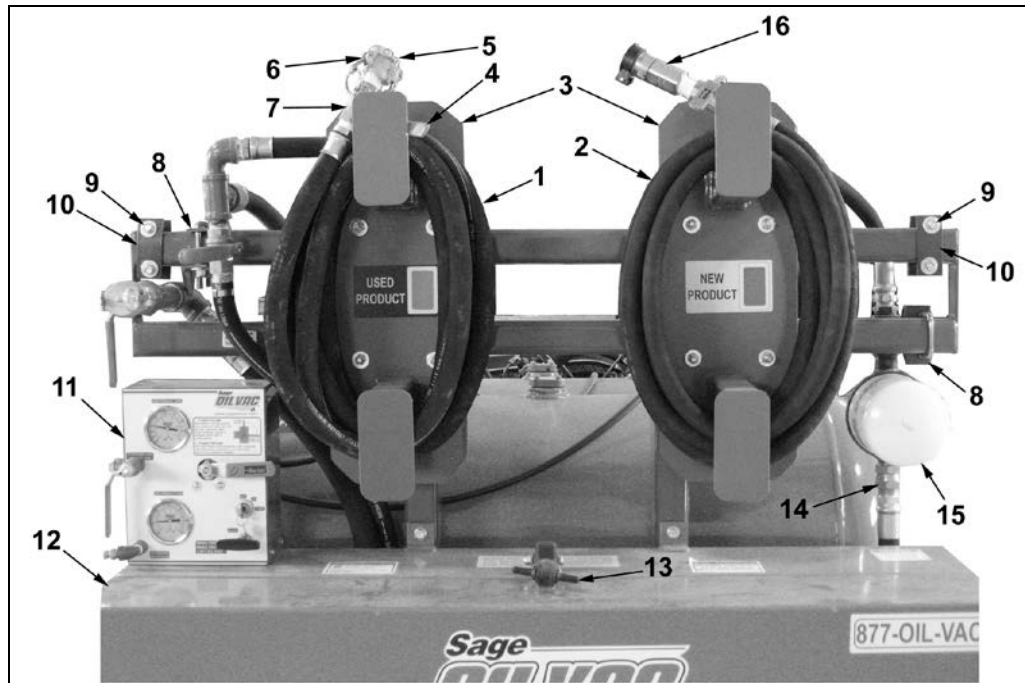


Figure 4.6 - Rear of Skid

Item Number	Part Number	Description	Quantity	Notes
1	HA-012-005	3/4" X 25' Hose	1	
2	HA-012-006	3/4" X 25' Hose	1	
3	AA-000-050	Hose Holder	2	
4	BV-000-003	Ball Valve Handle	2	
5	CL-012-004	3/4" Dust Plug	1	
6	CL-012-001	3/4" Cam Female x Male	1	
7	BV-012-001	3/4" Ball Valve	2	
8	MF-003-001	3-1/2" Filter Brace	2	
9	BF-003-002	U-Bolt for Skid Tie-Down	2	
10	MF-003-002	Bracket for Skid Tie-Down	2	
11	MA-ELC-001	Remote Panel	1	
12	BA-048-001	Used Filter Receptacle	1	
13	BX-000-001	Lid Strap	1	
14	HE-016-011	1" Swivel Adapter	1	
15	PF-000-005	Filter Element	1	
16	HF-008-006	F-A13D 3/4" NPT Holm Female	1	

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4.7 REMOTE PANEL

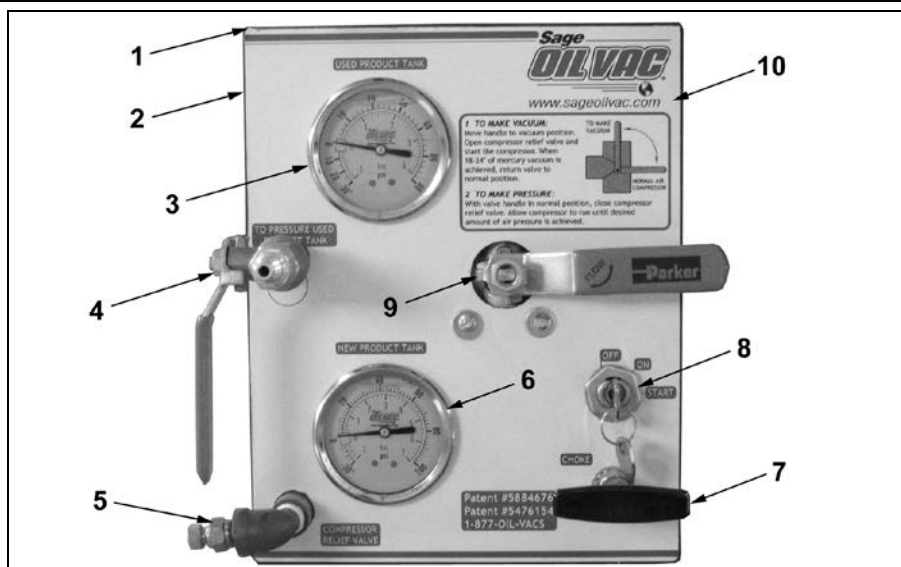


Figure 4.7 - Remote Panel

Item Number	Part Number	Description	Quantity	Notes
1	MA-000-007	Hood for Remote Panel	1	
2	MA-000-005	Front Plate for Remote Panel	1	
3	PF-004-032	Vacuum Gauge	1	
4	BV-004-001	1/4 x 1-1/2" Nipple	1	
5	BV-004-003	Drain Valve	1	
6	PF-004-031	Pressure Gauge	1	
7	AA-075-001	Choke Cable	1	
8	AC-000-011	Ignition Switch	1	
9	BV-012-002	3/4" 3-Way Ball Valve	1	
10	DL-000-038	Panel Decal	1	
	AA-000-029	Wire Stop, Cable	2	
	MA-ELC-001	Remote Panel Assembly		

Drawings And Parts

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4.8 RETRACTABLE REEL

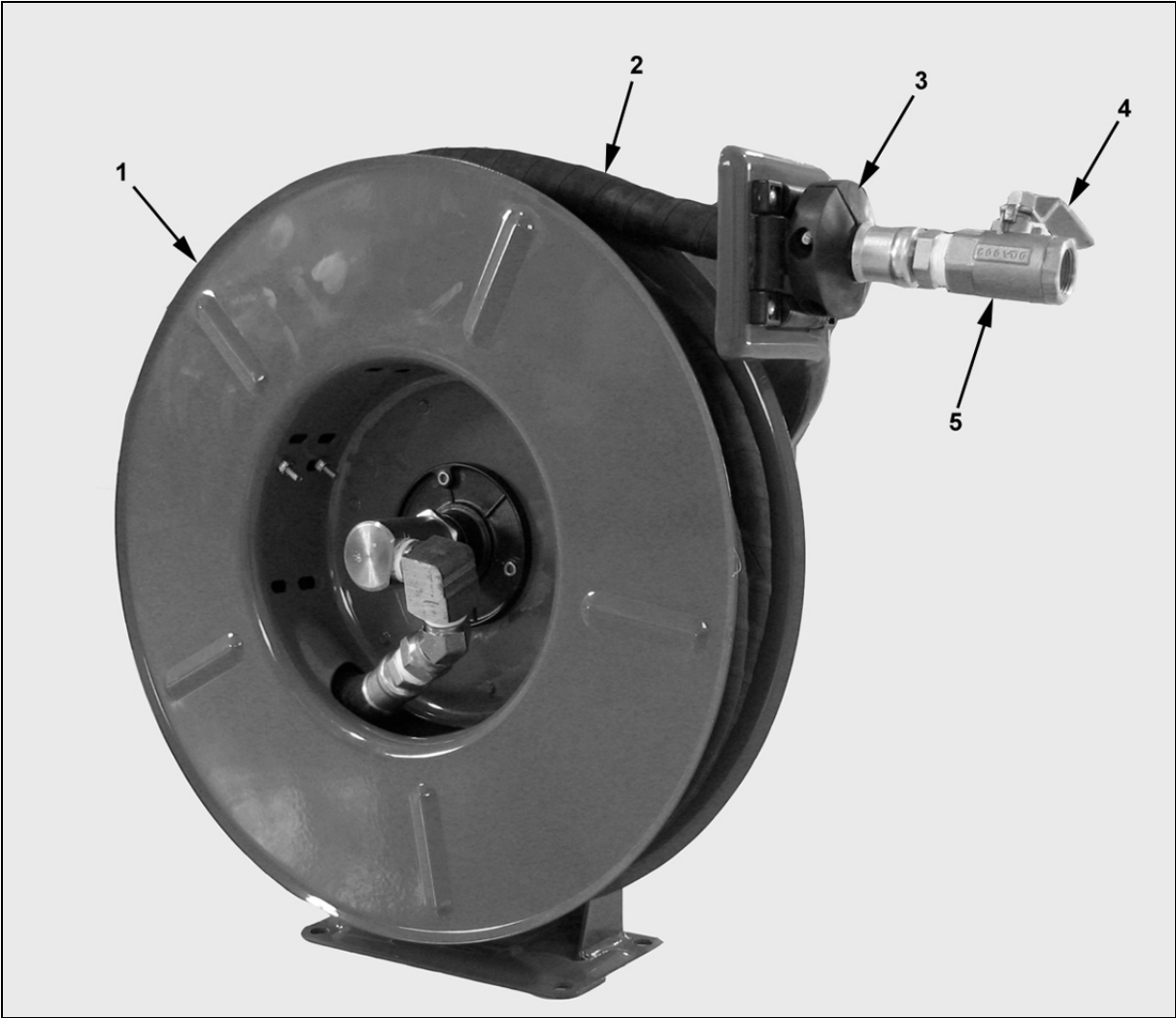


Figure 4.8 - Retractable Reel

Item Number	Part Number	Description	Quantity	Notes
1	RA-012-002	3/4" x 25' Spring Retractable Hose Reel	1	
2	HE-012-014	3/4" AX Delivery Hose	AR	
2	HA-012-016	3/4" 811 Suction Hose	AR	
3	RL-012-004	Ball Stop	1	
4	BV-000-003	Ball Valve Handle	1	
5	BV-012-001	3/4" Ball Valve	1	
	CL-012-004	3/4" Dust Plug	1	
	CL-012-001	3/4" Cam Female x Male	1	
	HF-008-006	F-A13D 3/4" NPT Holm Female	AR	

5	Maintenance	1
5.1	Inspection, Service & Maintenance Charts	2
5.2	Inspect Fluid Handling Equipment	2
5.2.1	Hoses, Fittings and Nozzles.....	3
5.2.2	Inspect Filter/Separator	3
5.2.3	Inspect 3-way valve air filters	3

5.1 INSPECTION, SERVICE & MAINTENANCE CHARTS

You must inspect, maintain and service your equipment regularly to insure safe and reliable operation. If you cannot or are unsure how to perform the items listed here, have your dealer do them. Note: In addition to this manual, also check the relevant component manufacturer's manual.

Before Each Use And Periodically During Use		
Item	Inspection / Service	Manual Section Reference
Oil Vac Hoses, Fittings, Nozzles and Related Parts	Inspect all hoses for signs of damage, cracking and leakage.	Section 5.2
	Inspect couplings for secure connections, damage and leakage.	Section 5.2
	Inspect nozzles for proper operation, damage and missing parts.	Section 5.2
Compressor Motor	Inspect for proper oil level, operation, damage, missing parts and leakage.	Refer to the compressor manual.
Compressor Pump and Tank Assembly	Inspect for proper oil level, operation, damage, missing parts and leakage.	Refer to the compressor manual.

Inspection and Service Each Week		
Item	Inspection / Service	Manual Section Reference
Air Compressor Intake Filter(s)	Inspect for damage, dirt and debris	Refer to the compressor manual.

Every 3 Months or 1000 Hours of Usage		
Item	Inspection / Service	Manual Section Reference
Air Compressor Engine Oil	Change oil.	Refer to the engine manual.

Every Year or 5000 Gallons of Usage		
Item	Inspection / Service	Manual Section Reference
Fresh oil filter	Change filter	Refer to page 19 of the parts section.

Fresh oil filters need to be replaced yearly or every 5,000 gallons, whichever comes first. 10 micron and 25 micron fresh oil filters can be ordered through Sage Oil Vac or cross referenced by a reputable filter supplier.

5.2 INSPECT FLUID HANDLING EQUIPMENT

^ WARNING

Risk of fire or explosion.

Do not smoke or use an open flame within 50 feet of the unit.

Verify that correct grounding procedures have been followed prior to operation.

If fluid is spilled, stop operation and notify safety personnel.

^ WARNING

Risk of hearing loss.

This machine produces extremely loud noise.

Hearing protection is required while operating this machine.

^ WARNING

Pressure hazard.

Relieve pressure before filling product tanks.

Failure to do so could cause serious injury.

^ WARNING

Burn hazard.

Hoses and fittings may be extremely hot during operation

Contact with these parts may cause serious burns.

5.2.1 HOSES, FITTINGS AND NOZZLES

Visually inspect all hoses for damage, cracking and signs of leakage. Inspect all couplings for secure connections, damage and signs of leakage. Replace damaged or leaking parts before using the equipment.

Visually inspect all nozzles for proper operation, damage, signs of leakage and missing parts. Replace parts that do not operate properly, damaged or leaking parts before using the equipment.

5.2.2 INSPECT FILTER/SEPARATOR

Drain any accumulated water in the filter/separator before each use. Visually inspect the filter/separator for signs of leakage or damage. Check for proper operation. Replace filter/separator if not operating properly, damaged or leaking before using the equipment.

5.2.3 INSPECT 3-WAY VALVE AIR FILTERS

Air filters found on the 3-way valve need to be replaced yearly. The air filters on skid systems with a control panel have the air filters located inside the control panel.

6	Troubleshooting	1
6.1	Air Compressor Will Not Build Air Pressure	2
6.2	Can Not Build Vacuum In Used Oil Tank	2
6.3	Used Oil Vacuum Is Very Slow	3
6.4	New Oil Delivery Is Very Slow	4
6.5	Vacuum Less Than 10" In Used Oil Tank	4

Troubleshooting

6.1 AIR COMPRESSOR WILL NOT BUILD AIR PRESSURE

1. Verify that the compressor relief valve is closed.	Close the valve if open. 	Does system build air pressure? Yes – Done No – Go to step 2.
2. Verify that the system is not in the vacuum mode.	Check that the 3-way valve is in the pressure position. 	Does system build air pressure? Yes – Done No – Go to step 3.

6.2 CAN NOT BUILD VACUUM IN USED OIL TANK

1. Verify that system is in the vacuum mode.	Check that the 3-way valve is in the vacuum position. 	Does system build vacuum? Yes – Done No – Go to step 2.

Troubleshooting

2. Does the air compressor run at full speed or idle?	If at an idle, open compressor relief valve to relieve pressure.  If at full speed, Go to step 3.	Does system build vacuum? Yes – Done No – Go to step 3.
3. Are the following ball valves closed? - Used filter receptacle sump valve - ¼" ball valve to pressurized used oil tank - Ball valve at end of used oil hose - Offload valve at bottom of used oil tank	Close the open valves.	Does system build vacuum? Yes – Done No – Contact Sage Oil Vac for assistance.

6.3 USED OIL VACUUM IS VERY SLOW

1. Is the equipment oil cold?	Change the oil shortly after engine has been running or run the engine to warm oil to at least 100 degrees F.	Is vacuum normal? Yes – Done No – Go to step 2.
2. Is the vacuum hose fully immersed in the fluid?	Verify that no air is being vacuumed from the source.	Is vacuum normal? Yes – Done No – Go to step 3.
3. Are the used oil hoses restricted?	Check for foreign objects and debris in the used oil hose and connections. If you feel this has occurred, you can pressurize the used oil tank and open the ball valve at the end of the used oil hose. ^ WARNING Please be aware that oil and other foreign objects may come out of the used oil hose with force. It is good practice to use the used filter receptacle as the collection point for this process.	Is vacuum normal? Yes – Done No – Go to step 4.

Troubleshooting

4. Is the drain pan or quick connect fittings restricted?	Check for foreign objects and debris in the drain pan and fittings. Remove any foreign objects or debris.	Is vacuum normal? Yes – Done No – Contact Sage Oil Vac for assistance.
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6.4 NEW OIL DELIVERY IS VERY SLOW

1. Is no-drip end on meter open?	Verify that the meter tip is in the full open position.	Is delivery normal? Yes – Done No – Go to step 2.
2. Is new product ball valve fully open?	Verify that the new product ball valve is in the full open position.	Is delivery normal? Yes – Done No – Go to step 3.
3. Are the quick connects or meter restricted?	Remove the quick connect fitting from the end of the hose and ensure that there is no foreign material restricting flow. Also, quick connect fittings cause pressure drop and will slow down the flow. If necessary, remove the quick connect fittings and plumb the handheld meter or dispensing device into the ball valve at the end of the hose. Ensure that meter does not have restriction on inlet side.	Is delivery normal? Yes – Done No – Go to step 4.
4. Is there ample pressure in the new product tank?	Sage Oil Vac recommends dispensing fresh fluid at pressure as low as 10 psi and as high as 130 psi. If flow is slower than expected try putting more air pressure in the new product tank in which you are dispensing. It may be necessary to adjust the Air Regulator on the system which is factory preset at 60 psi.	Is delivery normal? Yes – Done No – Go to step 5.
5. Are filters restricted?	Sage Oil Vac recommends changing fresh fluid filters once or twice per year; however, it may become necessary to change these filters more often or after an event of fresh fluid with foreign material.	Is delivery normal? Yes – Done No – Contact Sage Oil Vac for assistance.

6.5 VACUUM LESS THAN 10" IN USED OIL TANK

1. Is used product hose ball valve open?	Verify that this valve is closed.	Is vacuum normal? Yes – Done
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Troubleshooting

		No – Go to step 2.
2. Is ¼ inch air inlet on used product tank closed?	Verify that this valve is closed.	Is vacuum normal? Yes – Done No – Go to step 3.
3. Is the compressor relief valve open?	Verify this valve is open allowing compressed air to escape from compressor holding tanks. If the air compressor goes into idle or bypass mode before vacuum is achieved, this is probably the problem. 	Is vacuum normal? Yes – Done No – Go to step 4.
4. Check used product backflow prevention valve.	Your Sage Oil Vac system has a used oil backflow prevention valve located between the elbow connecting to the 3-way valve and the opening in the used oil tank. The valve is designed to keep the used oil tank becoming full and vacuuming fluid into the compressor. It may be possible that the check valve ball is lodged in the “up” position, thus preventing the system from making vacuum in vacuum mode. With the used oil tank at 0 pressure and the air compressor turned off, firmly tap the elbow connecting to the 3-way valve located on top of the used oil tank. This causes the ball to drop into the correct position.	Is vacuum normal? Yes – Done No – Go to step 5.
5. Is the used filter receptacle valve open?	On the used product tank is a 3-way ball valve which controls the suction of the used filter receptacle. If this valve is left open, the user will not be able to achieve the desired amount of vacuum.	Is vacuum normal? Yes – Done No – Contact Sage Oil Vac for assistance.

7 USED OIL DISPOSAL INFORMATION

7 Used Oil Disposal Information 1

7.1 Disposal Of Fluids And Waste 2

Used Oil Disposal Information

7.1 DISPOSAL OF FLUIDS AND WASTE

Improperly disposed of fluids and waste can be harmful to the environment. Do not pour waste on the ground, down a drain or into a water source.

Consult with your local state agencies and the U.S. Environmental Protection Agency to determine what regulations and laws apply to you and/or your business concerning the transport and disposal of fluids and waste.

State	Agency Name	Website	Phone
Alabama	Alabama Department of Environmental Management	http://www.adem.state.al.us/	(334) 271-7700
	Alabama Department of Cons. & Natural Resources	http://www.outdooralabama.com/	(334) 242-3486
Alaska	Alaska Department of Environmental Conservation	http://www.dec.state.ak.us/	(907) 465-5066
Arizona	Arizona Department of Environmental Quality	http://www.azdeq.gov/	(800) 234-5677
	Arizona Fish & Game Department	http://www.gf.state.az.us/	(602) 942-3000
Arkansas	Arkansas Department of Environmental Quality	http://www.adeq.state.ar.us/	(608) 266-2621
California	California Air Resources Board	http://www.arb.ca.gov/homepage.htm	(800) 242-4450
	California Department of Conservation	http://www.consrv.ca.gov/index/	(916) 322-1080
	California Department of Toxic Substances Control	http://www.dtsc.ca.gov/	(800) 728-6942
	California Department of Water Resources	http://www.dwr.water.ca.gov/	(916) 653-6192
	California Environmental Protection Agency	http://www.calepa.ca.gov/	(916) 323-2514
	California Integrated Waste Management Board	http://www.ciwmb.ca.gov/	(916) 341-6300
Colorado	Colorado Revised Statutes Online	http://www.state.co.us/gov_dir/leg_dir/olls/HTML/colorado_revised_statutes.htm	(303) 866-2045
	Colorado Department of Public Health & Environment	http://www.cdphe.state.co.us/index.html	(303) 692-2000
Connecticut	Connecticut Department of Environmental Protection	http://www.ct.gov/dep/site/default.asp	(860) 424-3000
Delaware	Delaware Dept. of Natural Resources & Env. Control	http://www.dnrec.delaware.gov/	(302) 739-9400
D.C.	D.C. Dept. of Health's Environmental Health Admin	http://doh.dc.gov/doh/site/default.asp?dohNav_GID=1787	(202) 671-5000
Florida	Florida Department of Environmental Protection	http://www.dep.state.fl.us/	(850) 245-2118
Georgia	Georgia Department of Natural Resources	http://www.gadnr.org/	(404) 656-3500
	Georgia Environmental Protection Division	http://www.gaepd.org/	(404) 656-4863
Hawaii	Hawaii Department of Land & Natural Resources	http://www.hawaii.gov/dlnr/	(808) 587-0320
Idaho	Idaho Department of Environmental Quality	http://www.deq.state.id.us/	(208) 373-0502
	Idaho Department of Water Resources	http://www.idwr.state.id.us/	(208) 287-4800
Illinois	Illinois Environmental Protection Agency	http://www.epa.state.il.us/	(888) 372-1996
	Illinois Pollution Control Board	http://www.ipcb.state.il.us/	(217) 524-8500
Indiana	Indiana Department of Environmental Management	http://www.ai.org/idem/	(317) 232-8603
	Indiana Department of Natural Resources	http://www.state.in.us/dnr/	(317) 232-4200
Iowa	Iowa Department of Natural Resources	http://www.iowadnr.com/	(515) 281-5918
Kansas	Kansas Department of Health & Environment	http://www.kdheks.gov/	(785) 296-1500
Kentucky	Kentucky Environmental Quality Commission	http://www.eqc.ky.gov/	(502) 564-3410
	Kentucky Department for Natural Resources	http://www.dnr.ky.gov/	(502) 564-6940
	Kentucky Department for Environmental Protection	http://www.dep.ky.gov/	(502) 564-2225
Louisiana	Louisiana Department of Environmental Quality	http://www.deq.louisiana.gov/portal/	(225) 219-5337
Maine	Maine Department of Environmental Protection	http://www.maine.gov/dep/index.shtml	(207) 287-7688
Maryland	Maryland Department of the Environment	http://www.mde.state.md.us/	(410) 537-3000
	Maryland Department of Natural Resources	http://www.dnr.state.md.us/sw_index_flash.asp	(410) 260-8367
Mass.	Mass. Department of Environmental Protection	http://www.mass.gov/dep/dephome.htm	(617) 292-5500
Michigan	Michigan Department of Environmental Quality	http://www.michigan.gov/deq	(517) 373-7660
Minnesota	Minnesota Department of Natural Resources	http://www.dnr.state.mn.us/index.html	(651) 296-6157
	Minnesota Pollution Control Agency	http://www.pca.state.mn.us/	(651) 296-6300
Mississippi	Mississippi Dept. of Environmental Quality	http://www.deq.state.ms.us/MDEQ.nsf/page/Main_Home?OpenDocument	(601) 961-5171
Missouri	Missouri Department of Natural Resources	http://www.dnr.mo.gov/	(800) 361-4827
	Missouri Department of Conservation	http://mdc.mo.gov/	(573) 751-4115
Montana	Montana Department of Environmental Quality	http://www.deq.state.mt.us/index.asp	(406) 444-2929
	Montana Natural Resource Information System	http://nris.mt.gov/	(406) 444-3115
	Montana GIS Data Library	http://nris.mt.gov/gis/default.asp	(406) 444-7693
Nebraska	Nebraska Department of Environmental Quality	http://www.deq.state.ne.us/	(402) 471-2186
Nevada	Nevada Division of Forestry	http://www.forestry.nv.gov/	(775) 684-2500
	Nevada Dept of Conservation and Natural Resources	http://dcnr.nv.gov/	(775) 684-2700

Used Oil Disposal Information

Nevada Division of Environmental Protection	http://ndep.nv.gov/	(775) 687-9366
N. Hampshire . New Hampshire Department of Environmental Services	http://www.des.state.nh.us/	(603) 271-3503
New Jersey..... New Jersey Department of Environmental Protection	http://www.state.nj.us/dep/	(877) 927-6337
New Mexico..... New Mexico Environment Department	http://www.nmenv.state.nm.us/	(505)827-2855
New York..... New York State Dept of Environmental Conservation	http://www.dec.state.ny.us/	(518) 402-8013
North Carolina NC Department of Environment & Natural Resources	http://www.enr.state.nc.us/	(919)733-4984
..... NC Div. of Pollution Prev. & Envir. Assistance	http://www.p2pays.org/	(919) 715-6500
North Dakota.. North Dakota State Water Commission	http://www.swc.state.nd.us/4dlink9/4dcgi/redirect/index.html	(701) 328-2750
..... North Dakota Geological Survey Division	https://www.dmr.nd.gov/ndgs/	(701) 328-8000
..... ND Department of Health – Enviro. Health Section	http://www.health.state.nd.us/ehs/	(701) 328.5150
Ohio..... Ohio Department of Natural Resources (ODNR)	http://www.dnr.state.oh.us/	(614) 265-6879
..... Ohio Environmental Protection Agency	http://www.epa.state.oh.us/	(614) 644-3020
..... Ohio Air Quality Development Authority	http://www.ohioairquality.org/	(614) 224-3383
Oklahoma..... Oklahoma Conservation Commission	http://www.conservation.ok.gov/	(405) 521-2384
..... Oklahoma Department of Environmental Quality	http://www.deq.state.ok.us/	(405) 702-1000
Oregon Oregon Department of Environmental Quality	http://www.oregon.gov/DEQ/	(503) 229-5696
..... Oregon Department of Fish & Wildlife	http://www.dfw.state.or.us/	(503) 947-6000
Pennsylvania.. Pennsylvania Department of Environmental Protection	http://www.depweb.state.pa.us/dep/site/default.asp	(717) 787-2814
..... Pennsylvania Dept. of Cons. & Natural Resources	http://www.dcnr.state.pa.us/	(717) 772-9084
Rhode Island.. Rhode Island Dept of Environmental Management	http://www.dem.ri.gov/	(401) 222-6800
S Carolina..... S Carolina Dept. of Health & Environmental Control	http://www.scdhec.net/	(803) 898-3432
..... South Carolina Department of Natural Resources	http://www.dnr.sc.gov/	(803) 734-9101
South Dakota.. S Dakota Dept. of Environment & Natural Resources	http://www.state.sd.us/denr/denr.html	(605) 773-3151
Tennessee..... Tennessee Dept. of Environment & Conservation	http://www.tennessee.gov/environment/	(615) 532-0109
Texas..... Texas Commission on Environmental Quality (TCEQ)	http://www.tceq.state.tx.us/	(512) 239-1000
..... City of Dallas Air Pollution Control	http://www.dallasair.org/	(214) 948-4435
Utah..... Utah Department of Environmental Quality	http://www.deq.utah.gov/	(800) 458-0145
..... Utah Automated Geographic Reference Center (AGRC)	http://agrc.its.state.ut.us/	(801) 538-3665
Vermont..... Vermont Agency of Natural Resources	http://www.anr.state.vt.us/	(802) 241-3600
Virginia Virginia Department of Environmental Quality	http://www.deq.virginia.gov/	(804) 698-4000
Washington Washington State Department of Ecology	http://www.ecy.wa.gov/	(800) 917-0043
..... Washington State Department of Natural Resources	http://www.dnr.wa.gov/	(360) 902-1004
..... Washington Dept. of Trans. Environmental Services	http://www.wsdot.wa.gov/environment/default.htm	(360) 705-7000
West Virginia.. West Virginia Division of Environmental Protection	http://www.wvdep.org/	(304) 926-0440
Wisconsin Wisconsin Department of Natural Resources	http://www.dnr.state.wi.us/	(608) 266-2621
..... Wisconsin DNR Environmental Protection	http://dnr.wi.gov/environmentprotect/index.html	(608) 266-2621
Wyoming Department of Environmental Quality	http://deq.state.wy.us/	(307) 777-7937