OPERATION MANUAL

Lubrication & Bentonite Pump

1325B

Pump S/N: FA08269F

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SERVICE • RELIABILITY • INNOVATION

Introduction

This manual contains important safety, operation, maintenance and parts information for your Akkerman 1325B Bentonite & Lubrication Pump. You must read and understand this manual, the engine operation manual and any additional equipment manuals before you operate and maintain this equipment. Keep this manual with your 1325B Bentonite & Lubrication Pump at all times. Additional copies of this manual may be purchased from the Akkerman Aftermarket Support Department, or downloaded from the Akkerman web site at www.akkerman.com.

The contractor is responsible for the overall safety program on the job site. Use this manual as a part of the safety program.

The use of second rate parts could affect the efficient performance of the 1325B Bentonite & Lubrication Pump. ALWAYS use genuine Akkerman parts.

Understand safety signal words, DANGER, WARNING, CAUTION, SAFETY INSTRUCTIONS, and NOTICE. When you see these words in this manual or on safety decals mounted on your equipment, follow the safety message to avoid personal injury and/or property damage.

⚠DANGER Indicates an extremely hazardous situation which, if not avoided, WILL result in death or serious injury.

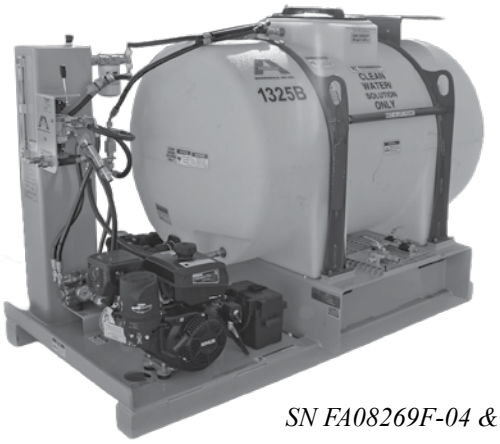
⚠WARNING Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation, which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.

SAFETY INSTRUCTIONS Usually consists of individual messages stating procedures or actions that must be followed for the safe operation of a product.

NOTICE Identifies potential property damage and important installation, operator, or maintenance information.

SN FA08269F-01 thru 03



SN FA08269F-04 & After

Akkerman 1325B Bentonite & Lubrication Pump

The 1325B Bentonite & Lubrication Pump is designed for the GBM lubrication system though it can be used in other lubrication applications. In the GBM jetting application, the pump system aides the GBM cutting process by lubricating the cutter bits and spoils during excavation. In the GBM lubrication application, the pump system assists with lubricating the pilot tubes, casing and augers and product pipe by reducing friction and easing the jacking process. The unit is capable of displacing a viscosity (Marsh Funnel) as high as 100 seconds.

If you find any errors with this manual or have any suggestions for improvement, please let us know. Email your comments via the Akkerman web site (Contact Us web page), or mail your suggestions to: Akkerman Inc, ATTN: Technical Publications, 58256 266th Street, Brownsdale, MN 55918.

Akkerman Inc. reserves the right to improve its product without notice or obligation.

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NOTES

Safety

BE ALERT FOR SAFETY INFORMATION

When you see this safety alert symbol on your equipment or in this manual, be alert to the possibility of personal injury or property damage.

Read all safety information.

Keep safety decals clean and in good condition. Replace missing or damaged safety decals.

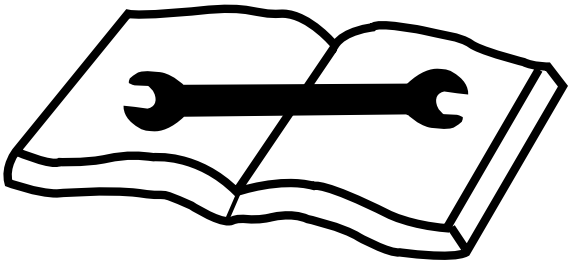
ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

READ OPERATOR'S MANUAL

⚠WARNING Unsafe operation or maintenance can cause severe injury or death.

Read and understand the Operator's Manual before operating or servicing this equipment.

Any unauthorized modifications will void the warranty.



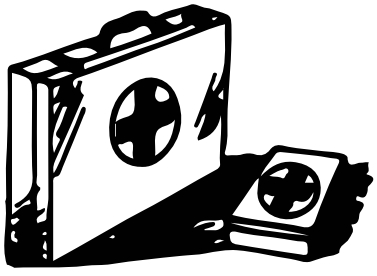
WEAR PROTECTIVE CLOTHING

Wear OSHA approved protective clothing, such as hard hat, gloves, safety goggles, earmuffs or ear plugs, face shield, and steel-toed boots, when operating and servicing this equipment.

Wear reasonably close fitting clothing and remove jewelry before working on or near this equipment. This will help prevent the danger of catching them in moving parts or controls.

KEEP FIRST-AID KIT ACCESSIBLE

Keep a first-aid kit handy and properly maintained. Call 9-1-1 for emergencies.



FLUIDS UNDER PRESSURE

⚠WARNING Escaping fluids under pressure can penetrate your skin causing serious injury.

Release all pressure before performing maintenance or repairs. Never weld near pressurized fluid lines.

DO NOT use your hands to check for leaks. When searching for leaks, use a piece of wood or cardboard.

Contact medical help immediately if any fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

BEWARE OF SUSPENDED LOADS

⚠WARNING Suspended loads may fall and cause severe personal injury or death.

If a hydraulic hose, chain, or cable from the boom of a crane or excavator breaks, the boom and/or load can fall instantly.

Do not enter area under or around a load.

USING A PRESSURE WASHER WAND

⚠WARNING Using the lubrication pump with a pressure washer wand can generate enough fluid pressure and velocity to penetrate skin resulting in serious personal injury.

Contact medical help immediately if fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

NEVER point the wand towards a person or animal.

Be sure to release pressure after use and before performing maintenance to prevent accidental fluid injection.

Wear safety glasses and gloves, and depending on the wand use, a particle mask may be necessary.

AVOID CONTACT WITH MIXER SHAFT & PROPELLER

⚠WARNING Contacting shaft or propeller may cause serious injury.

Keep ALL parts of body and foreign objects from coming in contact with mixer shaft or propeller during operation.

MAINTAIN BATTERY SAFELY

⚠WARNING Batteries produce explosive gases.

Wear eye protection and protective clothing during battery service.

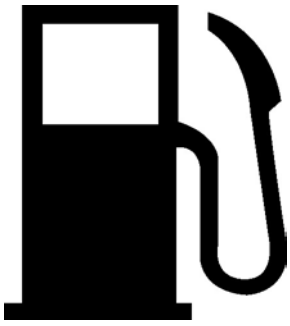
Keep sparks, flames, and cigarettes away from batteries.

Contact with battery acid can cause severe burns. Flush immediately and thoroughly with clean water. Get medical attention immediately.

Charge a battery only in a well-ventilated area.

Never charge a frozen battery.

REFUELING



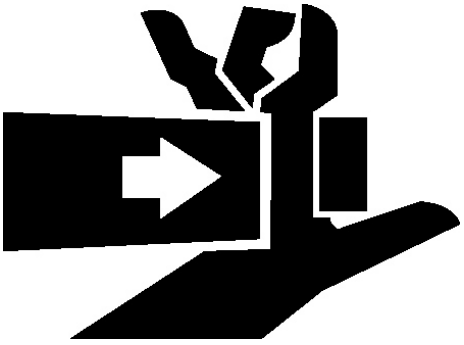
⚠WARNING Fires and explosions can cause serious injury or death.

Handle fuel with care. It is highly flammable.

DO NOT refuel while smoking or when near open flame or sparks.

Always stop engine before refueling.

AVOID PINCH POINTS



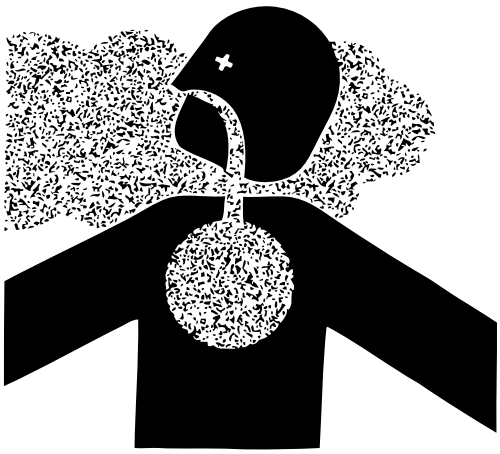
⚠WARNING Moving parts or the mishandling of parts can cause severe personal injury.

Keep hands away from moving parts.

Watch your fingers, hands, and legs while equipment is in operation.

Handle parts carefully to avoid crushing and pinch point hazards.

EXPOSURE TO DANGEROUS CHEMICALS



⚠WARNING Exposure to chemicals may cause serious injury or death.

BEFORE mixing chemicals or other agents in the water tank, be sure the area is well ventilated and other personnel removed from the area.

Use proper personal protective equipment (PPE) per the chemical manufacturer's instructions.

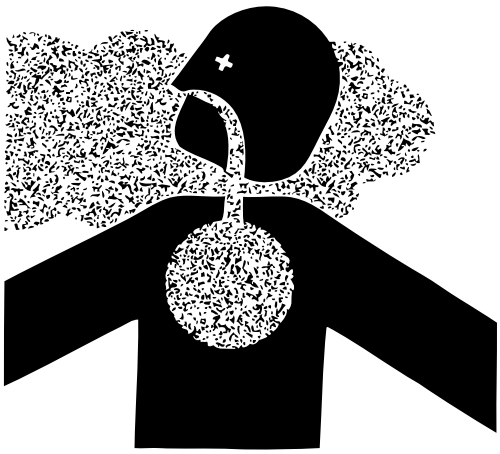
EXPLOSIVE FUEL

⚠WARNING Explosive fuel can cause fires and severe burns.

Do not fill the fuel tank while the engine is hot or running.

Have a fire extinguisher available at all times. Keep the fire extinguisher fully charged.

BEWARE OF EXHAUST FUMES



⚠WARNING Exposure to engine exhaust fumes can cause severe injury or death. Always work in a properly ventilated area.

If it is necessary to run an engine in an enclosed area, use the proper equipment to safely remove the exhaust fumes from the working area.

FIRE PREVENTION

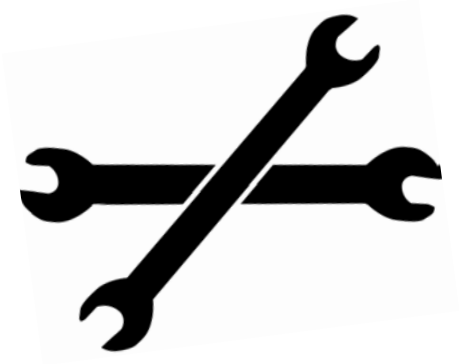
⚠CAUTION Fires can cause injury or property damage.

Keep equipment clean. Remove all debris from equipment.

Have a fire extinguisher available at all times. Keep the fire extinguisher fully charged.

PRACTICE SAFE MAINTENANCE

⚠WARNING Unexpected movement may cause serious personal injury.



Shutdown engine before performing any maintenance, adjustments, or removing obstructions.

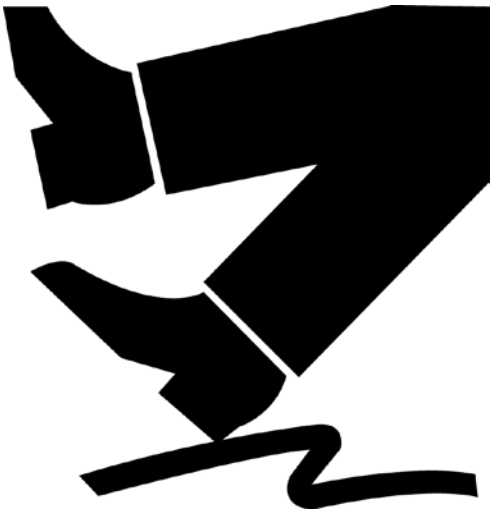
Only trained and qualified personnel should perform any maintenance or repairs.

Keep the area around the equipment clean and dry when performing maintenance.

Do not service the machine while it is in operation.

Replace worn or damaged parts. Remove grease, oil, or debris buildup.

SLIPPERY WHEN WET



⚠WARNING Slips and falls can cause serious personal injury.

Ensure firm footing in wet or slippery conditions.

Replace skid-resistant material if it is damaged or missing to prevent slips and falls.

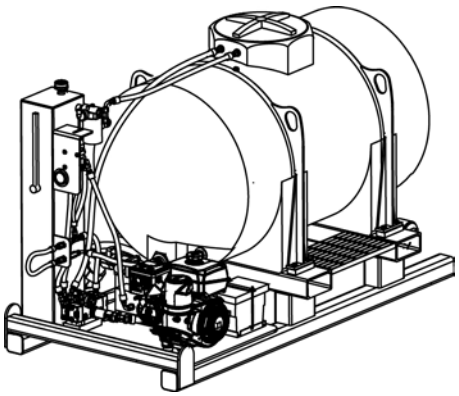
Remove any buildup of grease, oil, or debris.

UNAUTHORIZED WELDING

⚠WARNING Unauthorized welding can cause structural failure resulting in possible injury or death.

Do not weld on any structural member. Unauthorized welding or repair will void the warranty.

REGULARLY CLEAN AND INSPECT EQUIPMENT



Remove any grease, oil, or debris buildup to avoid potential injury or equipment damage.

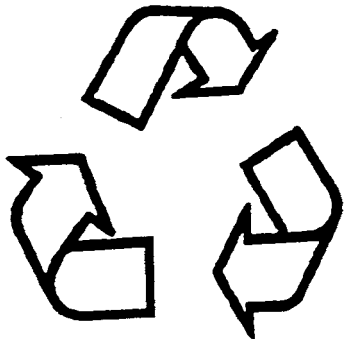
Inspect equipment for damage. If damaged, repair or replace immediately.

KEEP JOB SITE CLEAN AND ORGANIZED

⚠WARNING Tripping can cause serious personal injury.

Be sure to keep job site clean and organized.

RECYCLE WASTE



Follow local, state, federal, and international regulations when recycling or disposing of waste. Waste includes fluids/oil, fuel, filters, coolant, and batteries.

Use leakproof containers when draining fluids/oil. Do not pour waste on the ground, down a drain, or into any water source.

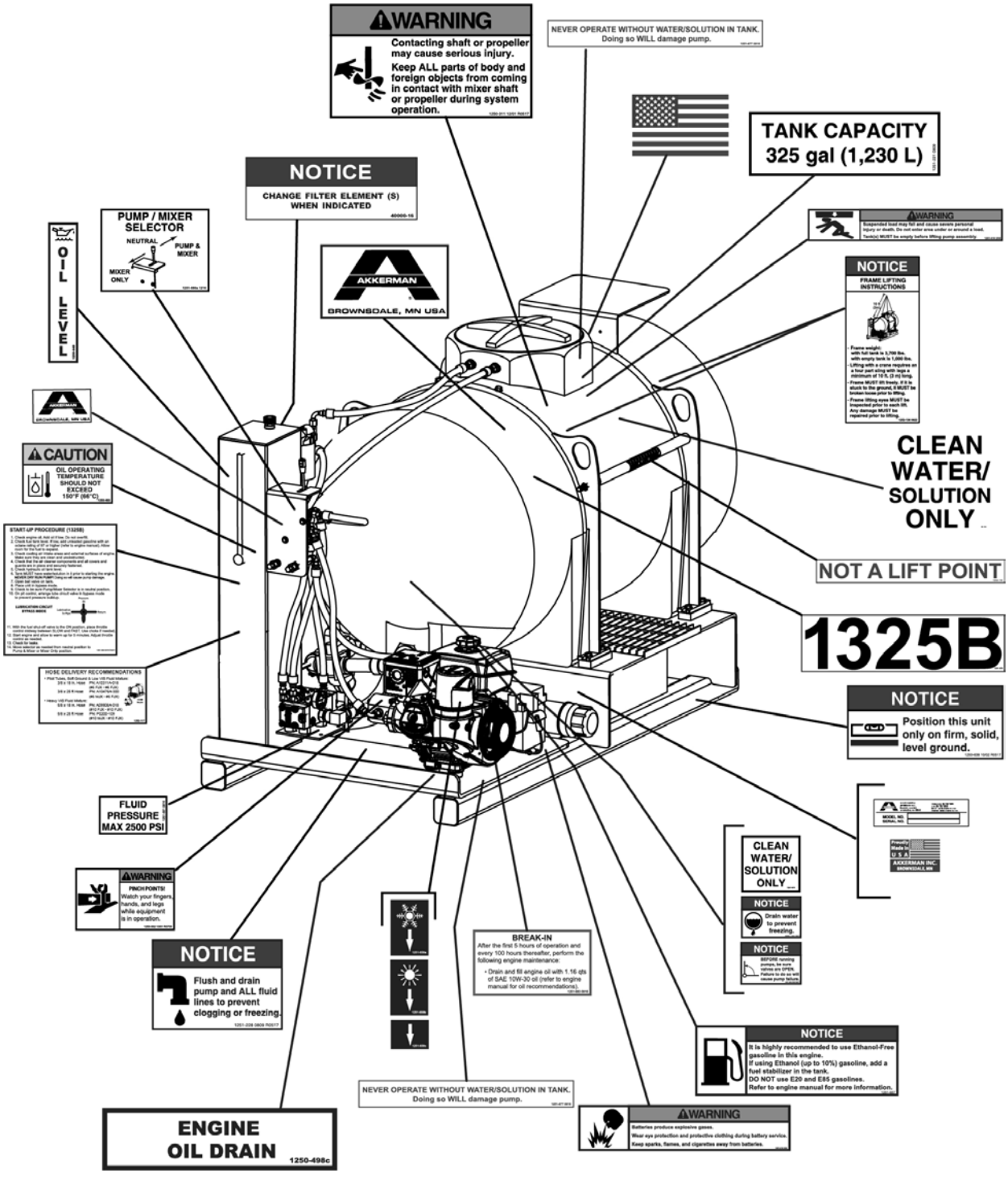
NOTES

Decals

Keep all operational and safety decals clean and readable. Use soft cloth, water, and a mild soap to clean the decals if they are too dirty to read. DO NOT clean decals with solvent. Solvent can damage them. Replace safety decals immediately if they are damaged, missing, or hard to read.

Serious injury or property damage can occur if safety instructions are not followed. Contact your Akkerman Aftermarket Support representative for free replacement safety decals.

If a part is replaced that has a decal on it, apply a new decal to the replacement part. Before applying a new decal, be sure the surface is clean and dry.

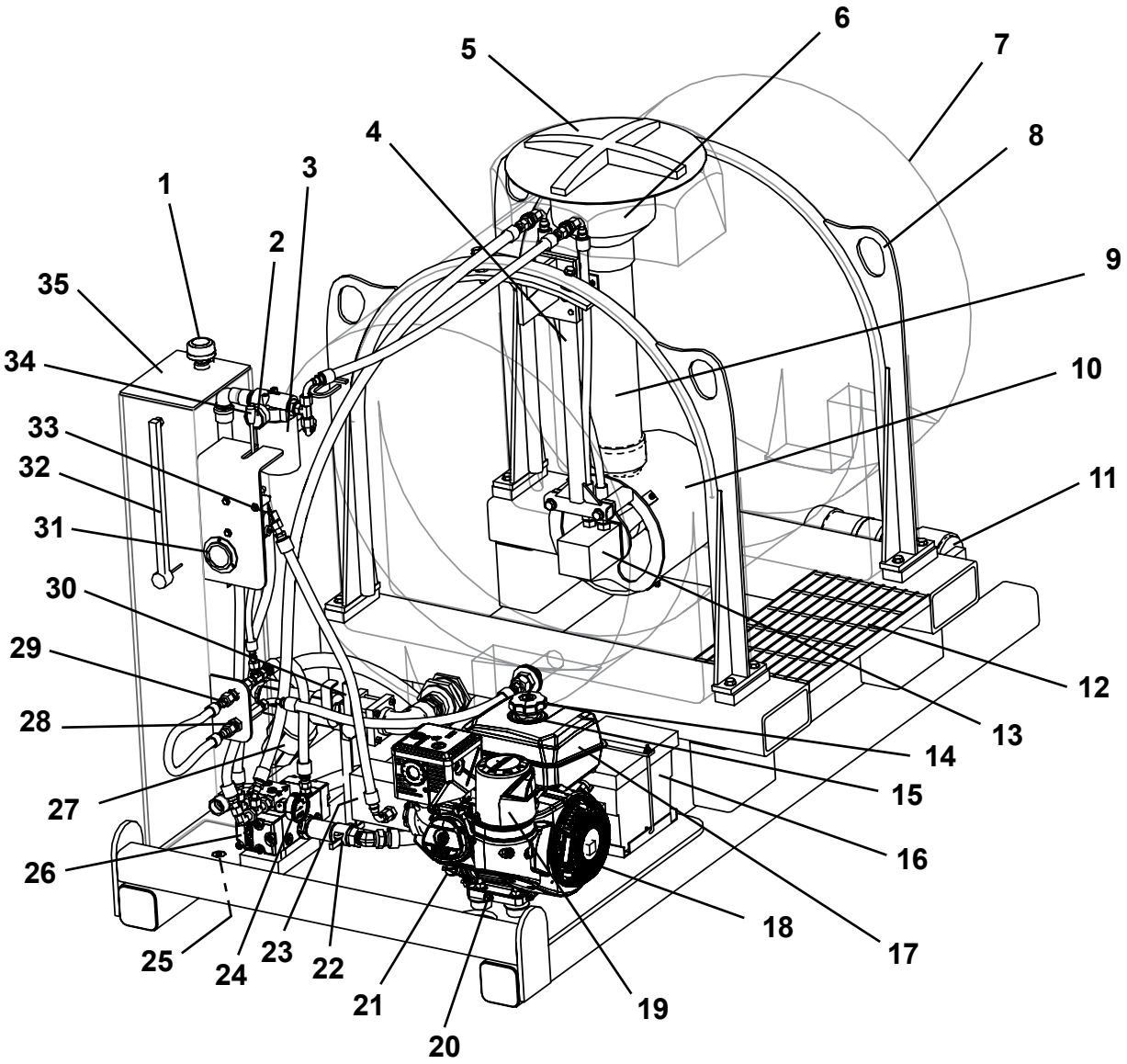


SN FA08269F-04 & After Shown

NOTES

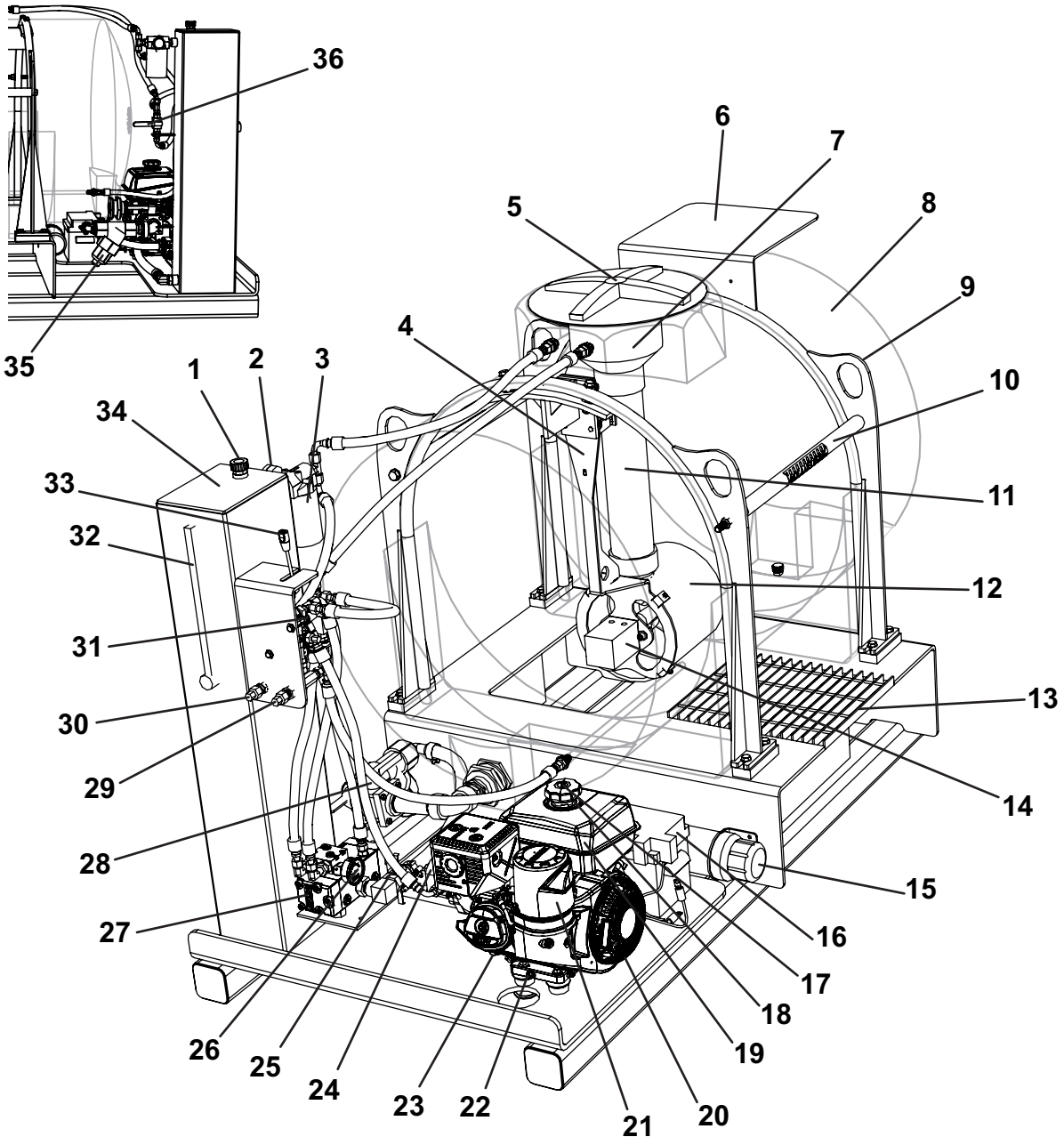
Terminology

1325B BENTONITE & LUBRICATION PUMP SN FA08269F-01 THRU 03



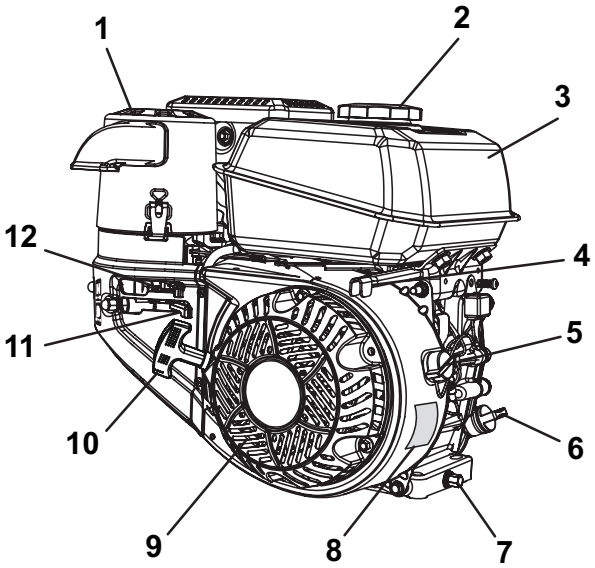
1. Oil Fill Cap & Tank Breather
2. Filter Indicator
3. Return Filter
4. Mixer/Agitator Mount
5. Tank Lid
6. Removable Reducer Coupling
7. Tank 325 gal. (1,230 L)
8. Lift Eye
9. Mix Tube
10. Agitator Chamber
11. Manual Canister
12. Step
13. Mixer Motor With Propeller
14. Fuel Fill Cap
15. Fuel Tank Filter
16. Battery
17. Fuel Tank 1.9 Gal. (7.3 L)
18. Gasoline Engine 14 HP
19. Engine Air Cleaner
20. Engine Oil Drain Plug
21. Engine Dipstick/Fill Cap
22. Cam Lock Hose Assembly
23. Hydraulic Pump
24. Piston Pump Fluid Pressure Gauge
25. Hydraulic Tank Drain Plug
26. Piston Pump 6 GPM
27. Strainer & Element
28. Return Connection
29. Pressure Connection
30. Tank Shut Off Valve
31. Fluid Pressure Gauge
32. Hydraulic Oil Level & Temperature Gauge
33. Directional Valve
34. Mixer/Pump Selector
35. Hydraulic Tank 15 Gal. (57 L)

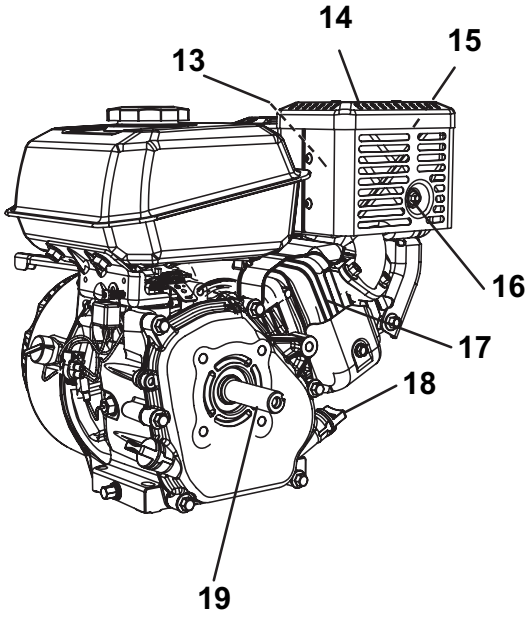
1325B BENTONITE & LUBRICATION PUMP SN FA08269F-04 & AFTER



1. Oil Fill Cap & Tank Breather
2. Filter Indicator
3. Return Filter
4. Mixer/Agitator Mount
5. Tank Lid
6. Shelf
7. Hopper
8. Tank 325 gal. (1,230 L)
9. Lift Eye
10. Lifting Brace (SN 72 & After)
11. Mix Tube
12. Agitator Chamber
13. Step
14. Mixer Motor With Propeller
15. Manual Canister
16. Battery
17. Fuel Fill Cap
18. Fuel Tank Filter
19. Fuel Tank 1.9 gal. (7.3 L)
20. Gasoline Engine 14 HP
21. Engine Air Cleaner
22. Engine Oil Drain Plug
23. Engine Dipstick/Fill Cap
24. Hydraulic Pump
25. Cam Lock Hose Assembly
26. Piston Pump Fluid Pressure Gauge
27. Piston Pump 6 GPM
28. Tank Shut Off Valve
29. Return Connection
30. Pressure Connection
31. Directional Valve
32. Hydraulic Oil Level & Temperature Gauge
33. Pump/Mixer Selector
34. Hydraulic Tank 15 gal. (57 L)
35. Strainer & Element
36. Mixer Control (Later models)

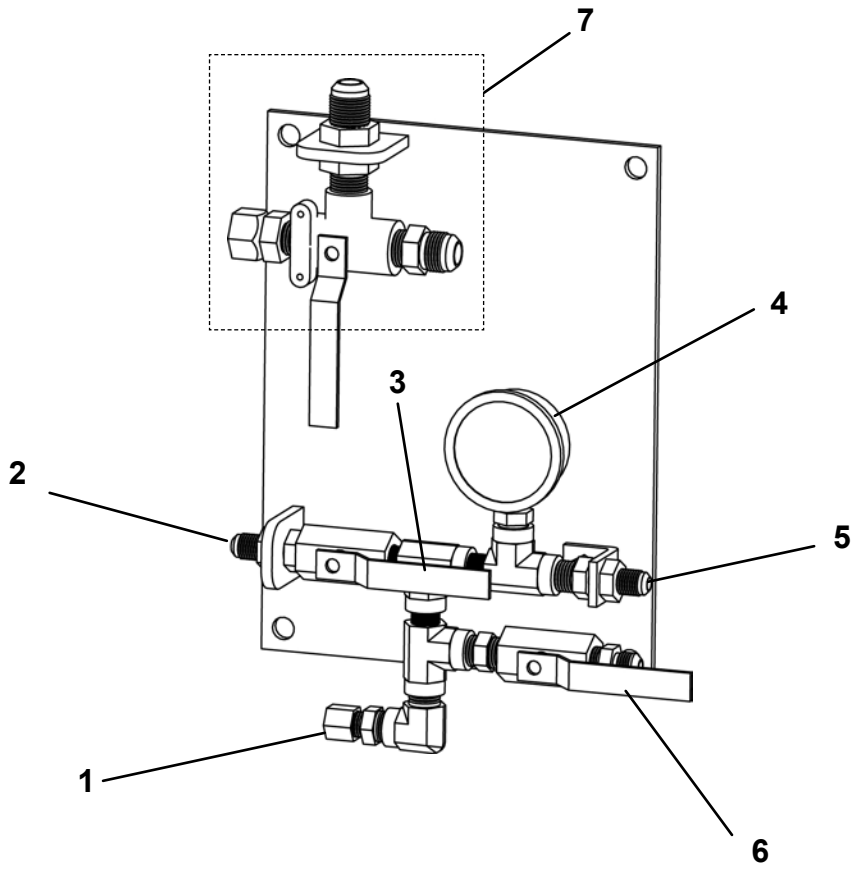
ENGINE





1. Air Cleaner
2. Fuel Tank Cap
3. Fuel Tank
4. Throttle Lever
5. Electric Start Switch
6. Dipstick/Oil Fill
7. Oil Drain Plug
8. Serial & Data Label
9. Grass/Debris Screen
10. Retractable Starter Handle
11. Fuel Shutoff
12. Choke Lever
13. Spark Plug
14. Muffler Shield
15. Muffler
16. Muffler Screen
17. Cooling Fins
18. Dipstick/Oil Fill
19. Drive Shaft

PUMP SHAFT CONTROL



1. Washer Wand or Auxiliary Jetting Pressure OUT
2. Tooling Pressure OUT
3. Pressure Shutoff Valve
4. Pressure Gauge 2,500 psi Max.
5. Pressure IN
6. Return Shutoff Valve
7. Circuit Control*

* Not used with 1325B; auxiliary lubrication pump required.

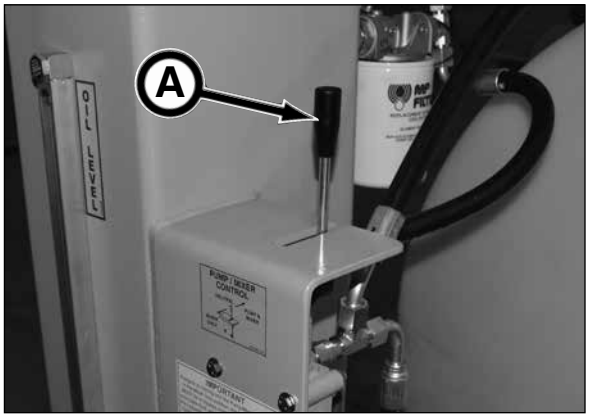
Controls & Instruments

PUMP/MIXER SELECTOR

The Pump/Mixer Selector (A) is used to regulate the fluid for engine startup, tank recirculation, solution mixing and tooling lubrication by controlling the fluid pump and the in-tank agitator (mixer) functions as follows:

Pump & Mixer	- Forward Position
Neutral	- Middle Position
Mixer Only*	- Back Position

Before starting pump engine, there must be enough water/solution in the tank to cover inlet and the pump/mixer selector MUST be in the neutral position.
* The mixer control must be at the ON position.



MIXER CONTROL (LATER MODELS)

The mixer control (B) regulates the hydraulic oil to the mixer motor.

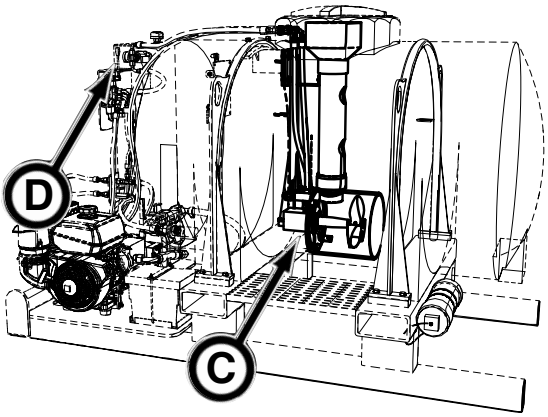
With the mixer control in the ON (9 o'clock) position, the hydraulic oil will flow to the mixer motor and then return to tank. If the Pump/Mixer selector is at the Mixer only position, the mixer control must be at the ON position, otherwise the mixer will not operate.

With the mixer control in the OFF position (6 o'clock), the hydraulic oil will flow back to tank thus bypassing the mixer. If the Pump/Mixer selector is at the Pump & Mixer position, only the pump will operate, no mixing.

IN-TANK AGITATOR (MIXER)

The in-tank agitator system (C) aggressively mixes liquid based polymers and bentonite up to a viscosity (Marsh Funnel) of 100 seconds to prevent fluid settlement during mixer only or pump & mixer control functions. The agitator is controlled with the Pump/Mixer Selector (D). The mixer control must be in the Mixer On position.

Before starting pump, be sure the Pump/Mixer Selector is in the neutral position.

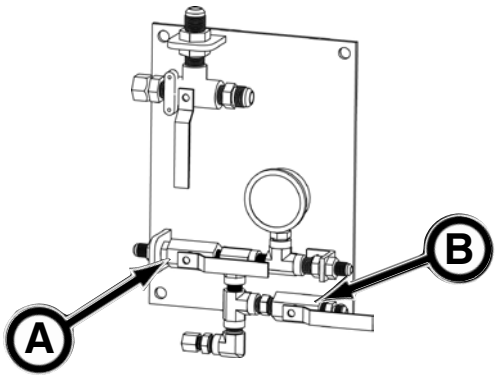


TANK SHUT OFF VALVE

The shut off valve is used to open and close the tank outlet.

NOTICE The tank shut off valve MUST be open before starting the 1325B Pump. Failure to do so could cause damage to pump.

FLUID VOLUME CONTROL

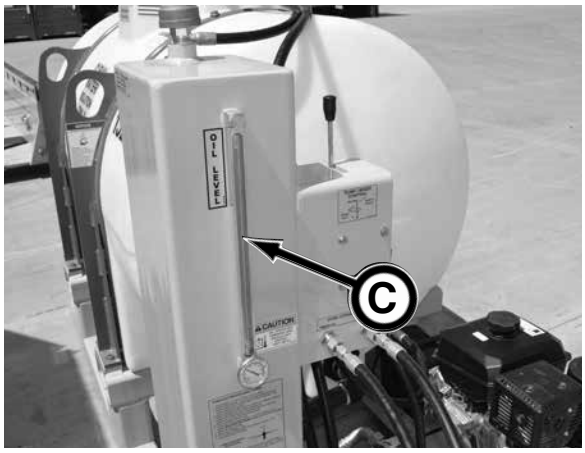


Use the pressure (A) and return (B) shutoff valves on the pump shaft control to adjust the fluid volume.

NOTICE Reducing the engine RPM will also reduce the fluid volume.

HYDRAULIC TANK

The hydraulic tank provides hydraulic oil for the fluid pump and mixer motor. The tank includes a temperature and sight gauge (C).



Fill oil until fluid reaches high mark on sight gauge.

Recommended hydraulic oil:

Ambient Temp.	Hydraulic Oil
below 70°F (21°C)	ISO 46
above 70°F (21°C)	ISO 68

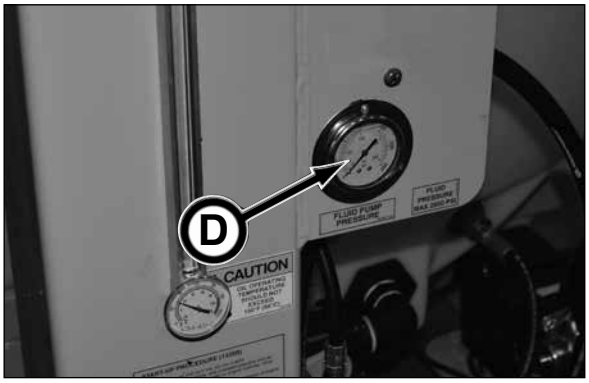
NOTICE Do not mix oil manufacturers or grades.

Hydraulic oil tank capacity is 15 gal. (57 L).

PRESSURE GAUGES

Fluid Pressure Gauge
(SN FA08269F-01 thru 03 Only)
Use the fluid pressure gauge (D) to monitor the fluid pressures.

Maximum pressure @ full engine RPM is 2,000 psi (13,790 kPa).



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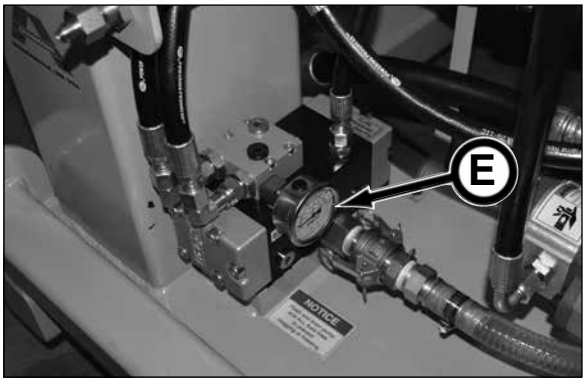
Piston Pump Pressure Gauge
The piston pump pressure gauge (E) displays the hydraulic oil pressure of the piston pump.

Maximum pressure @ full engine RPM is 2,000 psi (13,790 kPa).



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ENGINE IGNITION SWITCH

NOTICE For additional engine information, refer to your engine owner's manual.

Turn key switch (A) clockwise to START. Release key when engine starts.

Turning the key to OFF will shut down engine.

When lubrication pump operation is complete, be sure key is to the OFF position to prevent drain on the battery.

There is an auxiliary retractable starter (B) if the electronic starter should fail or battery is dead.

Slowly pull starter handle until just past compression, then stop. Return starter handle, pull handle straight out with a firm, smooth and steady motion to start.

ENGINE FUEL SHUTOFF

NOTICE For additional engine information, refer to your engine owner's manual.

The engine is equipped with a fuel shutoff valve (C). NEVER attempt to run the engine without the fuel shutoff in the ON position.

Operate the shutoff as follows:

Lever fully towards engine - ON
Lever fully away from engine - OFF

Engine Fuel Shutoff Shown in Off Position

ENGINE CHOKE CONTROL

NOTICE For additional engine information, refer to your engine owner's manual.

Using the engine choke control (D) will aid in the starting of the engine by restricting the flow of air to the combustion chamber. This creates a richer fuel-air mixture allowing the fuel inside the cold engine to ignite more easily. Once the engine warms the choke control must be readjusted to allow the engine to run normally.

The choke position for starting will vary depending upon ambient temperature.

Operate the choke control as follows:

Lever fully towards engine - OFF
Lever fully away from engine - ON

Engine Choke Control Shown in On Position

ENGINE THROTTLE

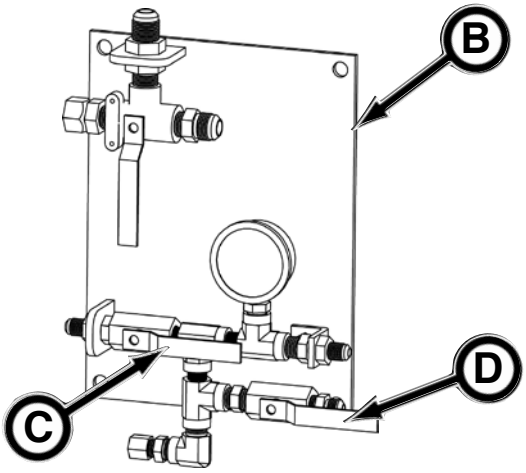
NOTICE For additional engine information, refer to your engine owner's manual.

Use the engine throttle (A) to increase or decrease the engine speed.

Increase Speed:
Move throttle lever towards rabbit (Fast)

Decrease Speed:
Move throttle lever towards turtle (Slow)

PUMP SHAFT CONTROL

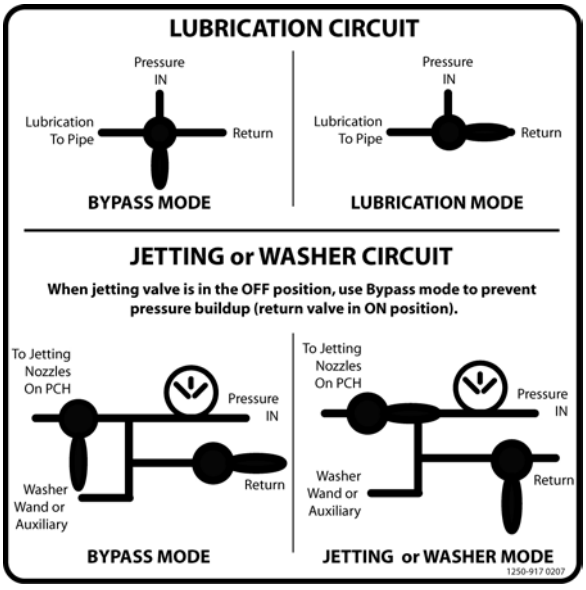


The shaft control (B) allows the operator to control the lubrication from the launch or reception shafts. The control is connected directly to the 1325B pump pressure and return ports.

Use a combination of the circuit ball valves (C and D) to control water/solution to component, washer wand or auxiliary, or to tank (Bypass Mode).

The control provides lubrication to:

- steering head for lubrication to outside of pilot tubes
- pilot tube adapter for lubrication to spoils for reaming head or open cutter head
- jetting on Powered Reaming Head
- washer wand or auxiliary



NOTICE The washer wand or auxiliary is available in either the Jetting/Washer Mode or Bypass Mode.

ENGINE AIR CLEANER COVER

The engine air cleaner is equipped with a cover that can be rotated to recycle engine heat to provide easier engine starting in cold weather.

NOTICE Be sure air cleaner cover is properly positioned. Running engine with the air cleaner cover in the cold weather operation position in normal conditions can damage the engine.

1. Clean area around the air cleaner assembly and cover.

2. Release the air cleaner cover from base by loosening the two latches.

3. Rotate cover to align the proper ambient operating position icon to the housing base arrow:

   Normal (Sun) Operation
   Position: 35° to 40°F & Above

   Cold Weather (Snowflake) Operation
   Position: 35° to 40°F & Below

NOTICE **Carburetor Icing:** Running engine with cover positioned for cold weather operation in normal conditions can damage engine. Carburetor icing can take place when certain combinations of temperature and humidity exist. Result of carburetor icing is rough running at idle or low speed as well as black or white smoke. To reduce likelihood of carburetor icing, air cleaner cover can be rotated to draw warmer air from muffler side.

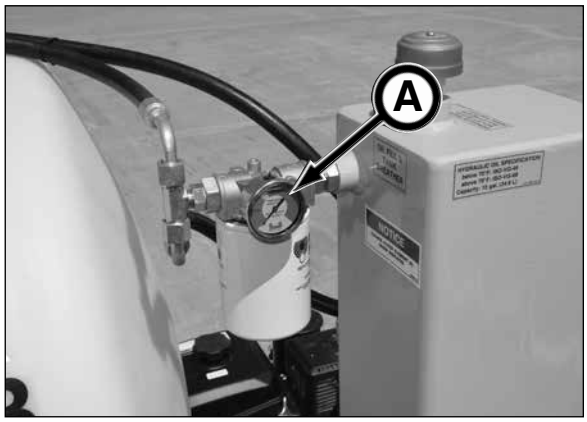
4. Secure the cover to the housing with the two latches.

Normal (Sun) Operation Position

Cold Weather (Snowflake) Operation Position

HYDRAULIC RETURN FILTER INDICATOR

To prevent over or under servicing of the hydraulic return filter, a filter indicator (A) has been installed on the return filter housing.



The green OK zone indicates that the filter is functioning properly.

The yellow zone indicates that the filter will soon require replacement.

When the needle on the gauge is in the red CHANGE zone, replace filter as soon as possible to prevent pump damage (for more information, refer to Check Hydraulic Return Filter in section 9, Periodic Maintenance).

Pre-Start Inspection

⚠WARNING Do not operate this equipment until you read, study, and understand this manual, the engine operation manual, and any other equipment manuals that may be used. A daily inspection of the equipment must be performed to prevent severe personal injury or death and equipment damage.

The contractor is fully responsible for the safety of all personnel on the job site. Check with the contractor that all site preparation requirements are in place. Be sure to comply with all MSHA and OSHA regulations, such as: an active safety program is in practice, a confined space permit (if needed) is issued, personal protective equipment is being worn; flammable, combustible, and hazardous materials are properly stored; and a lockout/tagout procedure is in place.

Use the following checklist ✓ as a guide for your daily pre-start inspection or shift change. Make a copy of this Pre-Start Inspection checklist. Once it is complete, check off, initial and date each item and file the copy as a record of maintenance.

	1. Follow the MSHA (Mining Safety & Health Administration) and OSHA (Occupational Safety & Health Administration) regulations.
	2. Contractor is responsible for all personnel to wear proper protective equipment on the job site. Replace equipment if defective.
	3. Combustible, toxic and oxygen deficiency detectors MUST be in place, tested, and in proper working condition.
	4. Water/solution must be in tank prior to start up.
	5. Be sure Pump/Mixer Selector is in neutral position.
	5. Be sure pump shaft control is in Bypass position.
	6. The tank shutoff valve MUST be open prior to starting the pump.
	7. All pump connections must be secure to prevent cavitation.
	8. Clean strainer before operating pump.
	9. USE ONLY CLEAN WATER SOURCE.
	10. Check engine gasoline level. Add as needed.
	11. Check engine crankcase oil level. Add as needed.
	12. Check hydraulic reservoir oil level. Add as needed.
	13. Check engine cooling air intake areas and external surfaces of engine. Be sure they are clean and unobstructed.
	14. Check engine air cleaner components are in place and securely fastened.
	15. Check controls and switches for proper operation. Repair or replace if damaged or worn.
	16. Remove combustible or flammable materials from equipment. Store materials properly.
	17. Inspect equipment for damage. Repair or replace as needed.
	18. Thoroughly clean equipment of mud and dirt.
	19. Be sure all shrouds, covers and guards are in place and securely fastened before operation.
	20. Check for loose or missing hardware. Replace damaged or missing hardware.
	21. Check for worn, loose, or damaged wire connections. Repair or replace wiring connections.
	22. Tighten loose clamps or fittings.
	23. Check for fluid leaks. Repair leak or replace components.
	24. If operating in freezing weather, be sure to constantly circulate water/solution to prevent freezing.
	25. Keep job site clean and organized.

NOTES

Operation

OPERATING GUIDELINES

⚠WARNING Do not operate this equipment until you read, study, and understand this manual, your engine owner's manual and any additional equipment manuals before you operate this equipment. Failure to do so, could result in severe personal injury or death.

1. Before operating, read and understand the Safety, Pre-Start Inspection, and Operation sections.
2. Do not operate this equipment while under the influence of alcohol, drugs, or medication.
3. Follow all Federal, State, and Local safety regulations and procedures.
4. Be sure OSHA prescribed safety protective equipment is being worn by all personnel.
5. Be sure the area is safe for operation. Keep work site clean and orderly.
6. Have a fully charged fire extinguisher on the job site at all times.
7. Position the pump on level ground. Engine damage from insufficient lubrication will occur if it exceeds the maximum angle of operation (refer to engine owner's manual).
8. Before operating, inspect equipment and conduct repairs as needed.
9. Test air monitoring and ventilation detectors for proper operation. Never enter a tunnel or shaft without combustible gas detectors and oxygen deficiency detectors.
10. Never walk or work under any part of the excavator or crane and suspended loads.
11. Do not make any modifications to any Akkerman products. Doing so could cause structural failure and will void the warranty.
12. Check shields and guards. They must be in place and undamaged prior to operation.
13. The tank shutoff valve MUST be open and the tank filled with water/solution prior to starting the engine. Failure to do so will cause damage to pump after prolonged use without water.
14. Check all fluid levels (gasoline tank, hydraulic oil, engine oil) before operating.
15. Remove combustible or flammable materials from equipment.
16. Test all controls and switches to make sure they operate properly.
17. Place all controls in neutral or bypass mode before start up.
18. Eye, ear and respiratory protection MUST be worn by operator while filling tank with chemicals such as wetting agents, polymer, etc.
19. Never dry run or operate pump with tank shutoff valve closed.
20. In cold weather operation, constantly circulate water/solution to prevent freezing.
21. At daily shutdown or if pump will not be operated for a prolonged period of time in freezing weather, flush and drain pump and ALL fluid lines to prevent clogging or freezing.
22. If using a pressure washer wand, NEVER point the wand towards a person or animal. Also, be sure to release pressure after use and before performing maintenance to prevent accidental fluid injection.
23. If repairs are necessary to equipment, before making repairs, be sure to lockout tagout power source to prevent accidental starting of equipment.
24. If this manual is lost, contact your Akkerman Aftermarket Support Representative for a new manual or download this manual from the Akkerman web site at www.akkerman.com.

LUBRICATION GUIDELINES

The lubrication type or mixture is based on soil conditions, consistency, clay, sand, cobble, etc. Your polymer supplier can help you with the proper lubrication mixture based on your Geotech report for the project.

Displaceable Ground

- Control the flow so there is no lubrication flowing out of the pilot tubes in the launch shaft.

- As a guideline, **typical usage of lubricant in pilot tube annular space is approximately 1 gal per foot**. For example, on a 300 ft drive, approximately 300 gallons will be required.

Soft Rock With Tri-Hawk® Drill Bit

- Control the flow so there is lubrication flowing (flush cuttings) out of the pilot tubes in the launch shaft.

- **As a guideline, use up to 4 gpm of lubricant to flush cuttings to launch shaft and for cooling of tool.**

Before shutting down the lubrication pump, loosening pilot tube joints or adding additional pilot tubes, vent the fluid into a catch pan to relieve pressure and prevent the fluid from entering the inner tube of the pilot tube.

If using a lubricant other than clean water during pilot tube installation, the lubricant in the pilot tubes **MUST** be flushed with clean water before removing pilot tubes from the reception shaft. Remove the steering head, and use clean water to flush the pilot tubes until the water is clear and free of sediment. Failure to do so will result in the clogging of the fluid and/or sight path of the pilot tubes.

Use of polymers and bentonite with fluid mixtures up to 100 seconds (Marsh Funnel) viscosity can be used in the 1325B Bentonite & Lubrication Pump.

If the polymer/bentonite mixture is less than 50 seconds (Marsh Funnel) viscosity, connect 3/8 in. and 25 ft return and pressure hoses from the return and pressure connections on the pump and shaft control.

If the polymer/bentonite mixture is greater than 50 seconds (Marsh Funnel) viscosity, connect 5/8 in. and 25 ft return and pressure hoses from the return and pressure connections on the pump and shaft control.

Refer to Lubrication Hoses in the Parts section of this manual for hose part numbers.

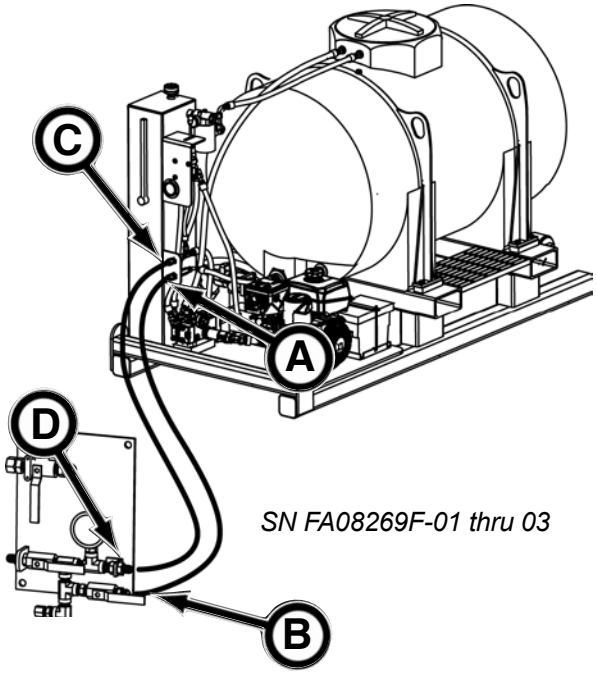
As a guideline, typical usage of lubricant in overcut annular space is approximately:

Casing/PRH Size	Lubricant Per Ft	Lubricant Per 300 Ft Drive
11” Casing	1.5 gal.	450 gal.
14”/16” Casing/PRH 14/16	2.0 gal.	600 gal.
20” Casing/PRH 20	2.5 gal.	750 gal.

SETTING UP LUBRICATION PUMP

1. Position the 1325B Bentonite & Lubrication Pump on firm, level ground near desired area of use.

⚠WARNING Do not position the lubrication pump near the edge of shaft where the ground may be unstable and cause a slide or cave-in. Doing so could cause severe injury or death.



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2. Connect the lubrication hoses to the pump and shaft control as follows:

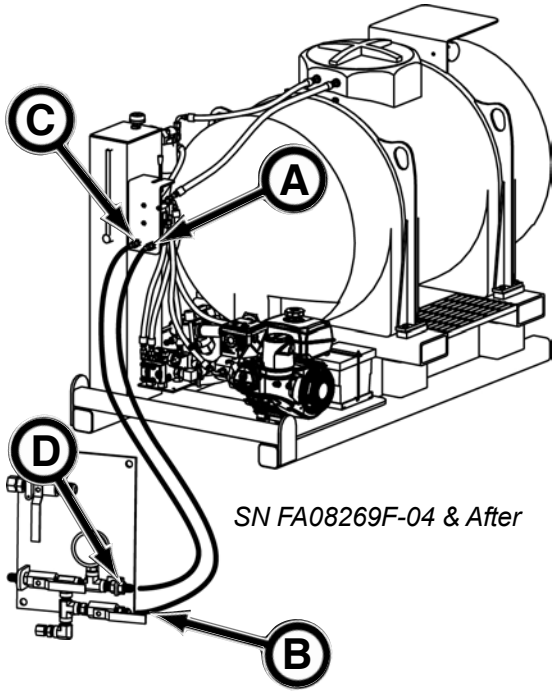
NOTICE Use the 3/8 in. hose for low visocity fluid mixture and 5/8 in. hoses for heavy viscocity fluid mixture.

   a. Connect the lubrication hose to pump return connection* (A) and lubrication return connection (B) on shaft control.

   b. Connect the lubrication hose to pump pressure connection* (C) and lubrication Pressure IN connection (D) on shaft control.

   *Use the 3/8 or 5/8 in. by 18 in. hose assemblies to make the appropriate male/female connections as needed. Refer to Lubrication Hoses in the Parts section of this manual for hose part numbers.

3. Once the hoses are properly connected, proceed to Circuit Hookup on the next page.



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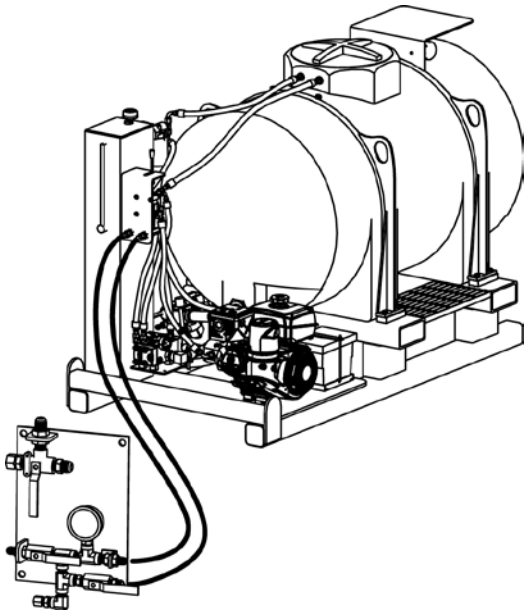
LUBRICATION CIRCUIT HOOKUP



The lubrication circuit provides lubrication/bentonite to:

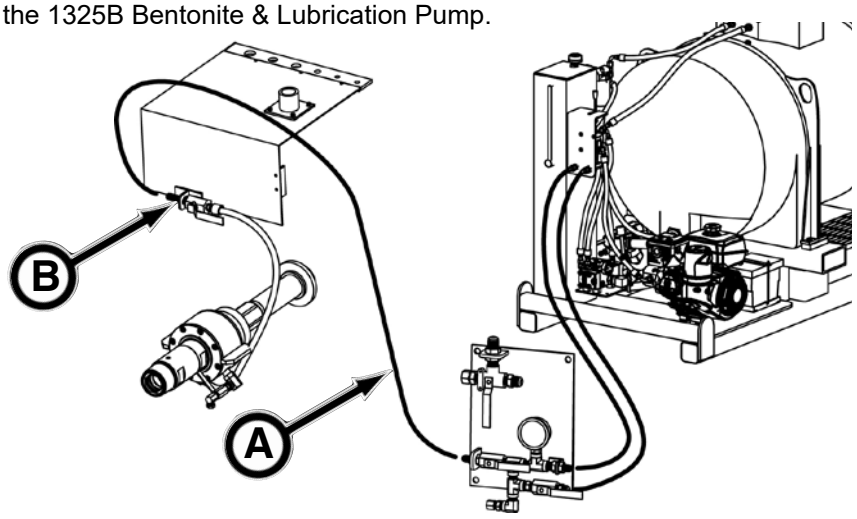
- steering head for lubrication to outside of pilot tubes
- pilot tube adapter for lubrication to spoils for reaming head or open cutter head
- pilot tube adapter and reaming head for lubricating the outside of the casings
- jetting on Powered Reaming Head
- washer wand or auxiliary

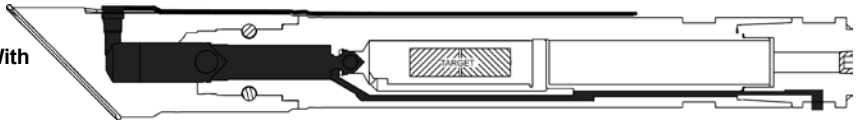
Hookup hoses based on the jetting/lubrication requirement as follows:

1. Lubricating Outside Of Pilot Tubes

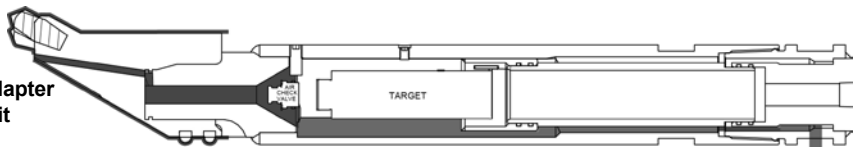
Connect the lubrication hose (A) from the shaft control to the lube control valve (B) on the GBM. The lube control on the GBM is connected to the drive swivel which allows the lubricant to flow through the dual walled pilot tube annular space and out the steering head/Tri-Hawk® drill bit port.

- Displaceable Ground: control the lubrication flow so there is no lubrication flowing out of the pilot tubes in the launch shaft.
- Soft Rock With Tri-Hawk® drill bit: control the lubrication flow so there is lubrication flowing (flush cuttings) out of the pilot tubes in the launch shaft.
- Before loosening pilot tube joints, vent the fluid into a catch pan to relieve pressure and prevent the fluid from entering the inner tube of the pilot tube.
- Use of polymers and bentonite with fluid mixtures up to 100 seconds (Marsh Funnel) viscosity can be used in the 1325B Bentonite & Lubrication Pump.





Steering Head Adapter With Steering Head Bit Fluid Path



Pilot Tube To Tri-Hawk® Adapter With Tri-Hawk® Drill Bit Fluid Path

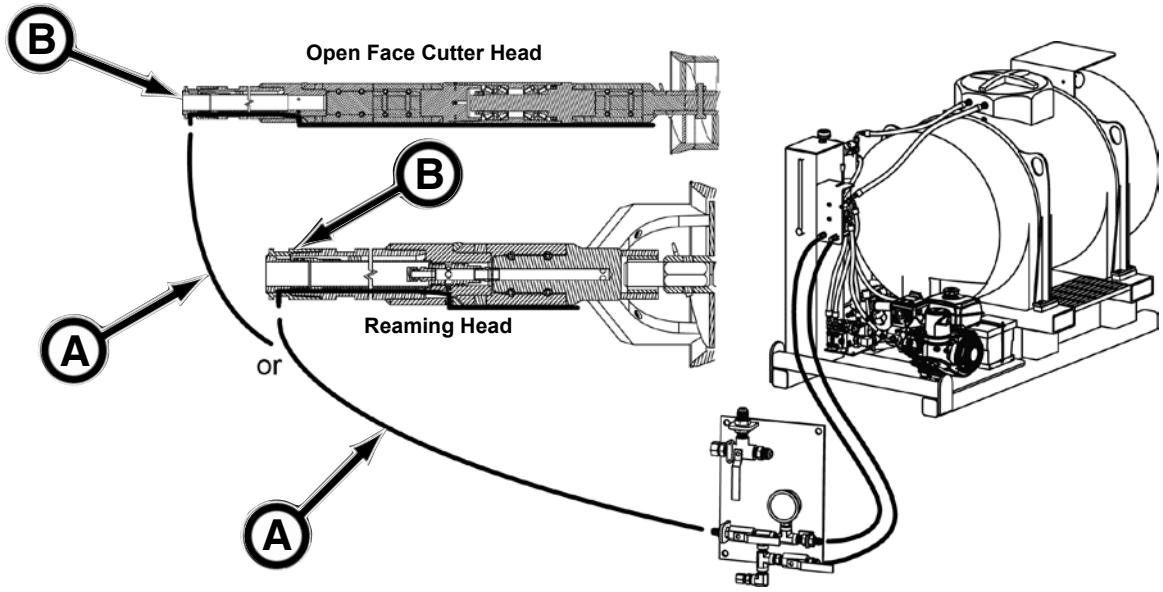
(Continued on next page)

Lubrication Circuit Hookup (continued)

2. Lubricating Spoils For Reaming Head or Open Cutter Head

Connect the lubrication hose (A) from the shaft control to the fluid connector (B) in reception shaft.

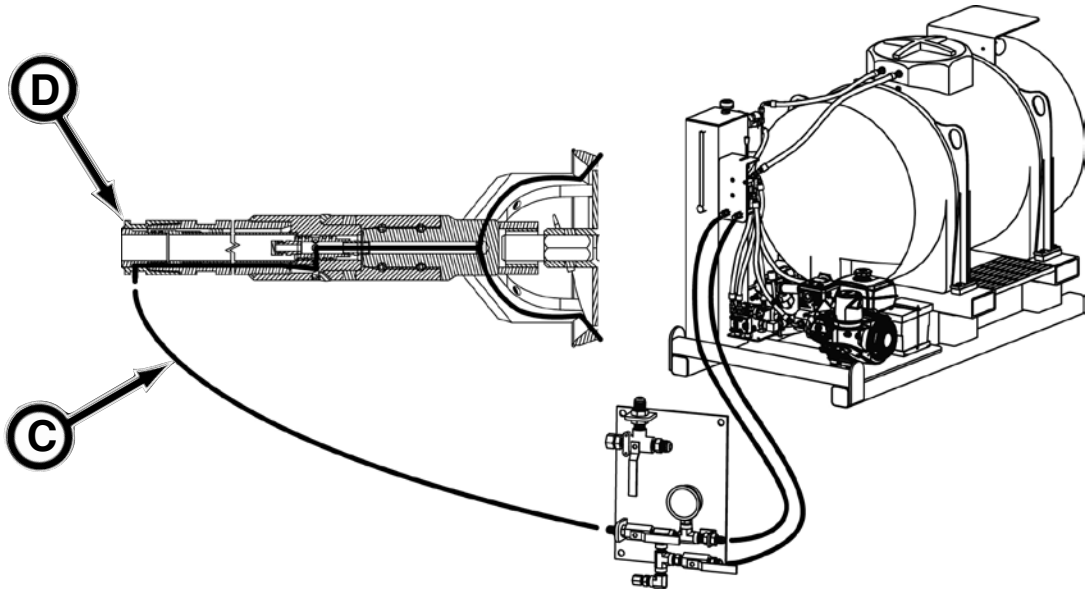
- the lubricant flows through the dual walled pilot tubes and out the lubrication port on the pilot tube adapter to lubricate the spoils for the reaming head or open face cutter head.



3. Lubricating Outside Of Casing With Reaming Head Assembly

Connect the lubrication hose (C) from the shaft control to the fluid connector (D) in reception shaft.

- the lubricant flows through the dual walled pilot tubes, pilot tube adapter, and out the lubrication ports on the reaming head arms to lubricate the outside of casings.



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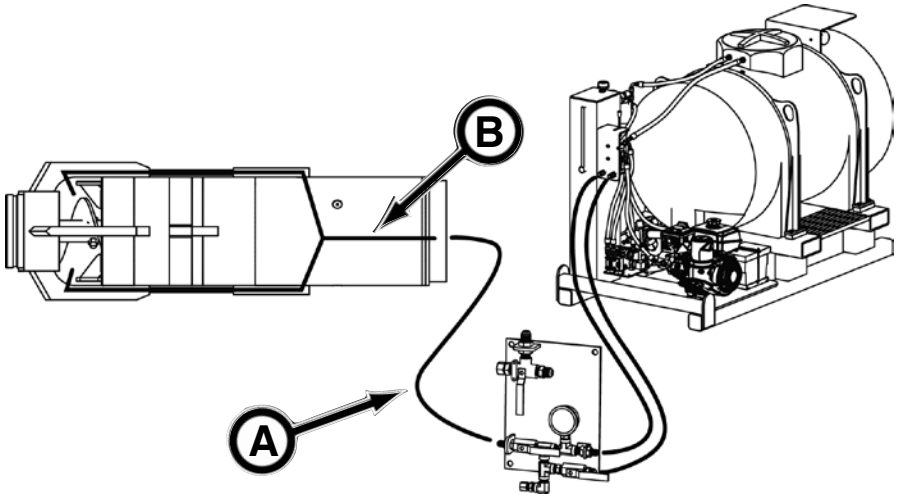
Lubrication Circuit Hookup (continued)

4. Powered Reaming Head Jetting

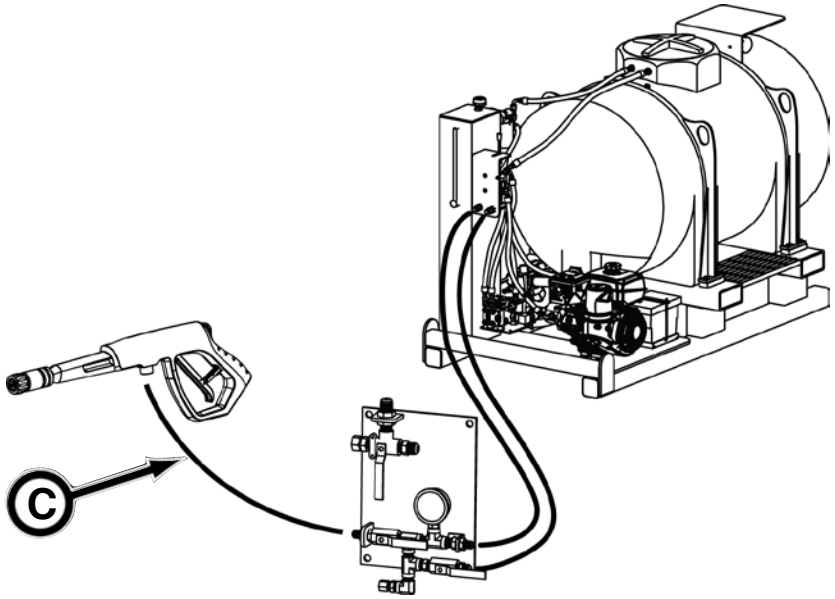
Connect the lubrication hose (A) from the shaft control to the lubrication hose (B) in the rear of the Powered Reaming Head in the launch shaft.



6. Using Pressure Washer Wand or Auxiliary

Connect the jetting hose (C) from the shaft control to the washer wand or other auxiliary device.

- Refer to the wand or auxiliary device operation manual for the proper safe operation.



⚠WARNING Using the lubrication pump with a pressure washer wand can generate enough fluid pressure and velocity to penetrate skin resulting in serious personal injury.

Contact medical help immediately if fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

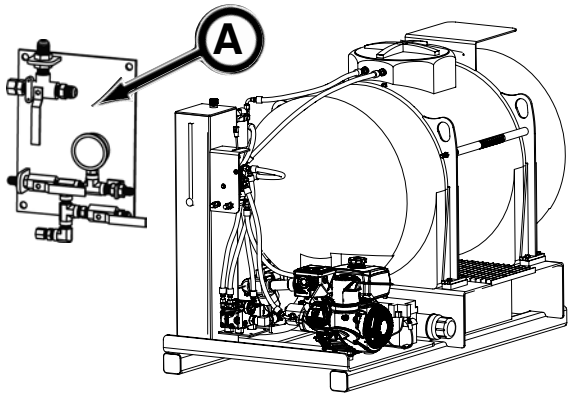
NEVER point the wand towards a person or animal.

Be sure to release pressure after use and before performing maintenance to prevent accidental fluid injection.

Wear safety glasses and gloves, and depending on the wand use, a particle mask may be necessary.

USING SHAFT CONTROL FOR LUBRICATION

Use the ball valve(s) to control the lubrication circuit on shaft control (A) as follows:

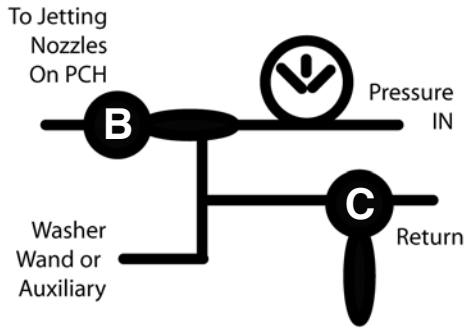


1. Set up Lubrication Pump (refer to Setting Up Lubrication Pump in this section)

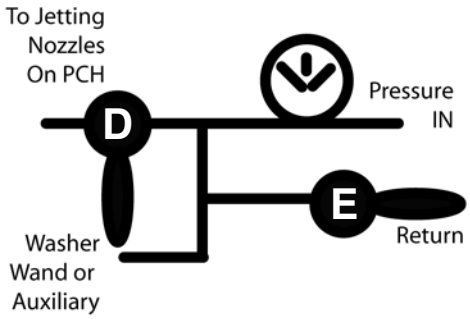
2. Hookup lubrication circuit to tooling (refer to Lubrication Circuit Hookup in this section).

3. Perform start up procedure (refer to Start Up Procedure in this section).

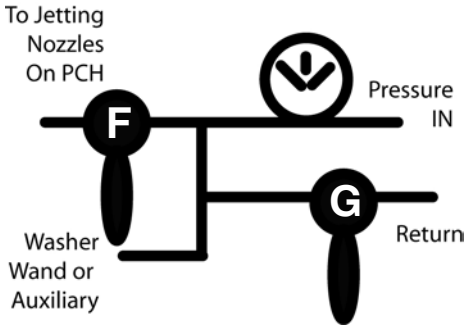
5. Move pump shaft control ball valves (B and C) as shown to lubricate:
   - Steering head for lubrication to outside of pilot tubes
   - Pilot tube adapter for lubrication to spoils for reaming head or open cutter head
   - Jetting nozzles on PRH
   - Washer wand or auxiliary



6. Move ball valve (D & E) as shown to:
   - Return solution to tank or bypass



7. Move ball valve (F & G) as shown to:
   - Use washer wand or other auxiliary device



STARTING THE ENGINE

NOTICE For proper new engine break-in, cold weather starting, and any additional engine information, refer to your engine owner's manual.

1. Visually check the following items. If any leaks are found, shut down the engine and perform repairs as needed.

   - Check for engine oil and fuel leaks.
   - Check for damaged or missing parts and fasteners.
   - Check the electrical harnesses for cracks, abrasions, and damaged or corroded connectors.

2. Move the fuel shutoff valve to the ON position.

3. Move the throttle control midway between the Rabbit (Fast) and Turtle (Slow).

4. For a cold engine, move the choke control to the ON position. A warm engine typically does not require the choke on.

NOTICE The choke position for starting may vary depending upon temperature and other factors. Once engine is running and warm, turn choke control to the OFF position.

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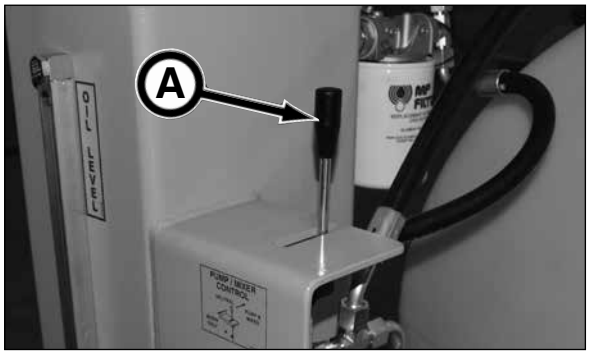
5. Place Pump/Mixer Selector (A) in the Neutral position.



6. Turn the key switch clockwise to the START position. Release the key as soon as the engine starts. The key switch will return to the ON position.
   If starter does not turn engine over, shut off starter immediately. Do not crank engine. Refer to engine owner's manual.

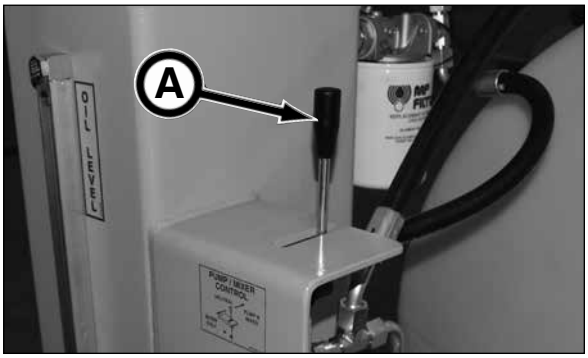
NOTICE Never crank engine continuously for more than 10 seconds, otherwise starter will overheat. Allow a 60 second cool down period between starting attempts.

If using retractable starter, the key switch must be in the ON position before attempting to start. SLOWLY pull starter handle until just past compression and then STOP! Return starter handle and pull firmly with a smooth, steady motion to start engine.

7. Gradually return choke control to OFF position after engine starts and warms up.

8. Adjust throttle control as needed.

SHUTTING DOWN THE ENGINE



1. Place Pump/Mixer Selector (A) in the Neutral position.

2. Reduce engine speed to low idle by moving throttle control to Turtle (Slow) position.

3. Allow the engine to run at idle for 30 to 60 seconds before shutting down.

4. Turn the key switch to the OFF position and remove key from switch to prevent accidental starting.

5. Move the fuel shutoff valve to the OFF position.

START UP PROCEDURE

Use the following procedure to properly start up the lubrication pump.

1. Check the engine oil. Add oil if necessary using SAE 15W-30 oil (refer to engine owner's manual for oil recommendations). Do not overfill.

2. Check fuel tank level. If low, add unleaded gasoline with an octane rating of 87 or higher (refer to engine owner's manual). Leave room for fuel to expand.

3. Check cooling air intake areas and external surfaces of engine. Be sure they are clean and unobstructed.

4. Check that the air cleaner components and all covers and guards are in place and securely fastened.

NOTICE Be sure air cleaner cover is positioned to the proper normal (sun) operation or cold weather (snow flake) operation position. Running engine in the cold weather operation position in normal conditions can damage the engine.

Normal Operation Position: 35° to 40°F & Above
Cold Weather Operation Position: 35° to 40°F & Below

(Continued on next page)

5. Check hydraulic tank oil level. Oil should be visible on sight gauge (A). Add oil if necessary using
   below 70°F: ISO-VG-46
   above 70°F: ISO-VG-68

6. Close tank shut off valve and remove and clean jetting tank strainer.

7. Replace strainer and secure strainer cap.

8. Fill tank with CLEAN water/solution before starting the engine. Replace tank cover securely to prevent foreign objects from entering tank.

(Continued on next page)

9. Open tank shut off valve .

NOTICE NEVER dry run pump. Doing so may result in pump damage.

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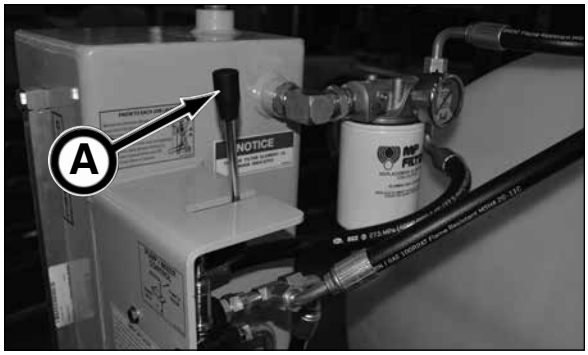
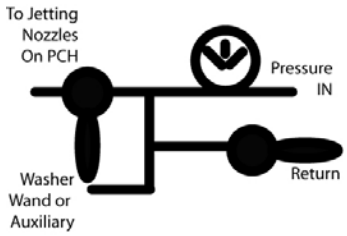
10. Place Pump/Mixer Selector (A) in the Neutral position.

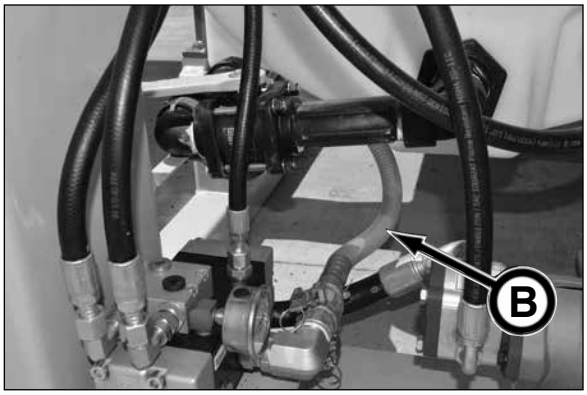


11. If shaft control is hooked to lubrication pump, arrange circuit valve in bypass mode to prevent pressure buildup in tooling.



JETTING CIRCUIT BYPASS MODE

12. Before start up, check to be sure liquid is visible in clear tube (B) from tank to pump. When initially filling tank with liquid, an air lock may result between the tank outlet and the strainer assembly.
    If this should occur, slowly open stainer assembly cap to release air until liquid is visible in clear tube.
    DO NOT start engine if there is an air lock. Otherwise pump damage will occur if it operates without liquid for a prolonged period of time.



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13. Remove all personnel away from lubrication pump.

14. Start engine (refer to Starting The Engine in this section) and allow engine to warm up for five minutes before applying a load.

NOTICE The engine has a break-in period in the first 5 hours of operation. Refer to the engine owner's manual for more information.

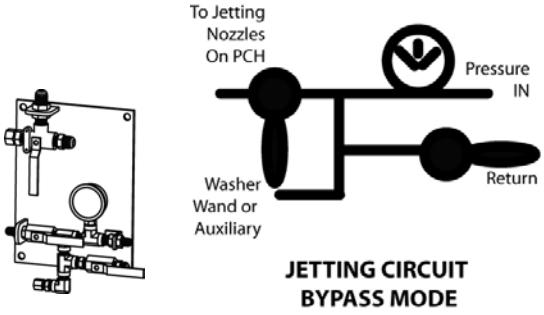
15. Check for leaks.

DAILY SHUTDOWN

1. Reduce engine speed to low idle by moving throttle control to Turtle (Slow) position.

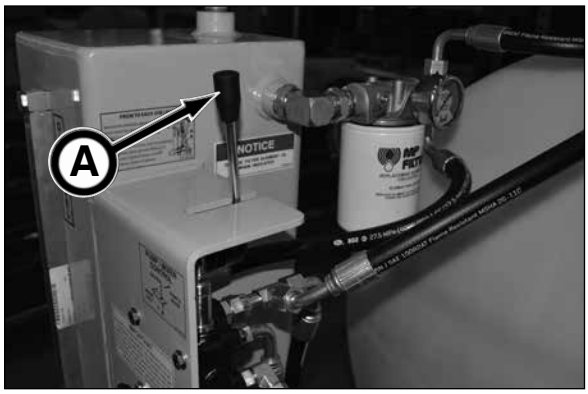
2. Allow the engine to run at idle for 30 to 60 seconds before shutting down.

3. On shaft control, arrange jetting circuit valves in bypass mode.



JETTING CIRCUIT BYPASS MODE

4. Place Pump/Mixer Selector (A) in the Neutral position.



5. Shutdown engine. Refer to Shutting Down The Engine in this section.

(Continued on next page)

6. Move the fuel shutoff valve to the OFF position.

7. Close tank shut off valve on tank.

8. If the potential of freezing weather exists, refer to Cold Weather Protection in this section.

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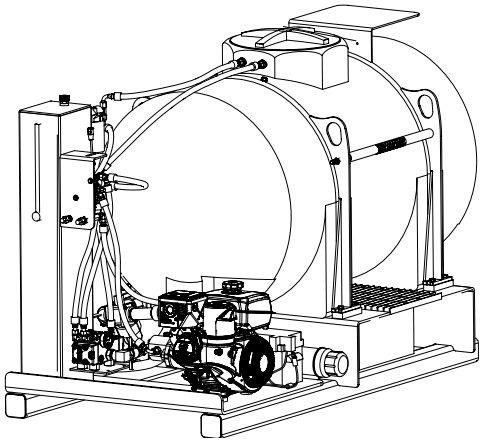
MIXING TANK

⚠WARNING Exposure to chemicals may cause serious injury or death. **BEFORE** mixing chemicals or other agents in the water tank, be sure the area is well ventilated and other personnel removed from the area. Use proper personal protective equipment (PPE) per the chemical manufacturer's instructions.

The 1325B Bentonite and Lubrication Pump is capable of mixing liquid based polymers and bentonite up to 100 seconds (Marsh Funnel) viscosity.



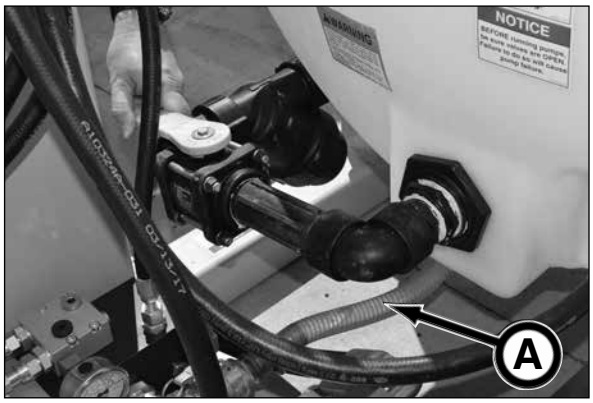
1. Fill water tank with clean water as needed per instructions on lubricant packaging.

NOTICE Before mixing polymers and bentonite, the water should be stabilized to the following pH and hardness levels:

pH	8.5 - 9.5
Water Hardness	do not exceed 200 ppm (depending on lubricant)

Note:
1. Pure water is neutral with a pH level of 7.
2. Soda ash helps lower water hardness as well as raise the pH simultaneously.

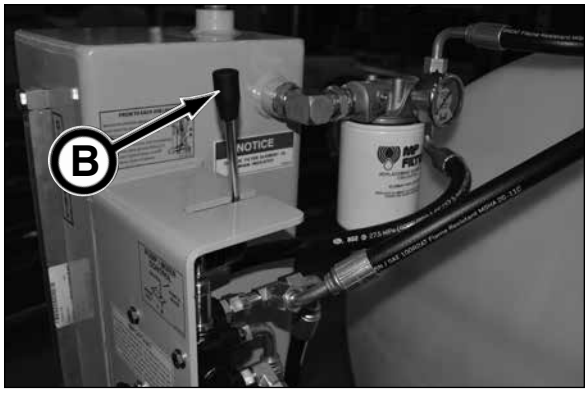
2. Open tank shut off valve.



NOTICE Be sure fluid is visible in clear tube (A) from tank outlet to fluid pump before starting engine. If not, an air lock is present and must be released by opening stainer assembly cap until fluid flows into clear tube. Otherwise, fluid from tank will not be pumped, causing pump damage when it operates without liquid for a prolonged period of time.

3. Place Pump/Mixer Selector (B) to the Neutral position.

4. Start engine. **Run engine at full rpm to maximize the mixing efficiency.**

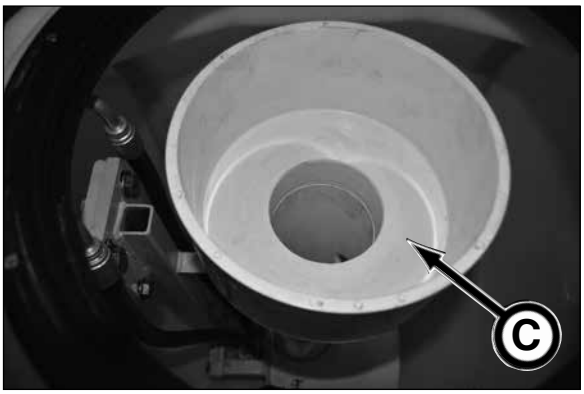


5. Move Pump/Mixer Selector to the Mixer position.

NOTICE (Models with Mixer Control) Be sure mixer control is turned to the ON position, otherwise the mixer will not operate.

6. Remove tank lid to gain access to hopper (C).

7. Gradually pour lubricant into hopper in tank, following instructions on packaging (for example, depending on material, add material through the hopper at a rate not to exceed 3 - 5 minutes per 50 pounds).

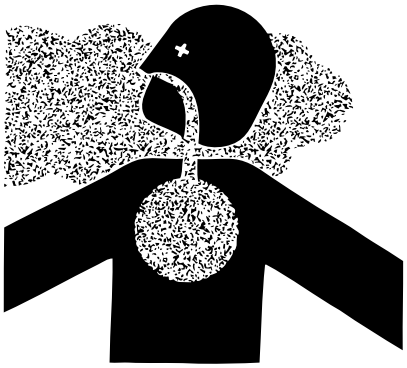


8. Replace tank lid to prevent foreign objects from entering the tank.

9. Allow time for proper mixing of solution, typically 15 - 20 minutes. Follow instructions on packaging.

10. The tank solution is now available for use.

CLEANING TANK



⚠WARNING Exposure to chemicals may cause serious injury or death.

BEFORE mixing chemicals or other agents in the water tank, be sure the area is well ventilated and other personnel removed from the area.

Use proper personal protective equipment (PPE) per the chemical manufacturer's instructions.

⚠WARNING Do not allow anyone to enter tank. Tank fumes or becoming accidentally trapped may cause severe injury or death.

1. Fill tank with clean water.

2. Remove strainer.

3. Open tank shut off valve to flush tank with clean water.

NOTICE To help drain tank, CAREFULLY tip pump towards outlet of drain.

(Continued on next page)

NOTICE If needed, the hopper can be removed from mix tube assembly for ease of cleaning tank. Be sure to replace hopper on mix tube assembly after cleaning.

4. Continue using clean water to flush the tank and water system components until the water is clear and free of sediment. Failure to do so will result in clogging of the fluid in the tank, hoses and/or components.

5. Once tank is clean and water emptied, close tank shut off valve.

6. Put enough water in tank to cover outlet to prevent accidental dry running of pump.

NOTICE NEVER operate pump without shut off valve open and tank filled with water.

IMPORTANT: If operating in freezing weather, the tank must be drained or a RV anti-freeze solution must be added to the tank to prevent component damage. Refer to Cold Weather Protection in this section.

7. Replace tank cover.

8. Replace strainer.

NOTES

COLD WEATHER OPERATION

Freezing temperatures during the tunneling process, creates the necessity to prepare the site and equipment for the cold weather. Failure to do so will cause damage to components and supporting equipment. Refer to Cold Weather Protection in this section for more information.

There are various methods of keeping equipment from freezing:

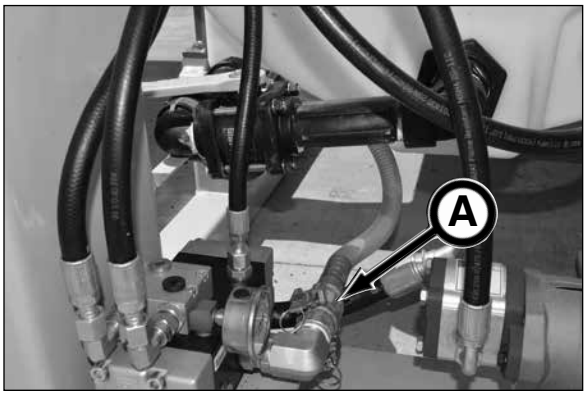
- The 1325B was designed to fit in a quadcon container to provide a means to efficiently operate the pump in cold weather.
- When working with water, it needs to be constantly circulated to prevent freezing. Otherwise the equipment must be drained and/or treated with a RV anti-freeze solution to prevent freezing.
- If the 1325B Lubrication and Bentonite Pump will be shut off for a considerable length of time and the temperature is at or below freezing, the fluid must be drained or treated with RV anti-freeze.
- Water tanks must be drained or treated with RV anti-freeze.
- Drain hoses to prevent freezing and keep low areas properly drained to prevent freezing damage.
- For all equipment, use proper lubricant based on ambient temperature to prevent damage.
- Use compressed air to purge a system of water. Be sure the discharge valve is open before doing so.
- Install heaters for hydraulic systems.

If systems were shut down for freezing weather, be sure to start systems slowly and let them run for at least five minutes to allow for warm up and in the case of a pump, to displace any surface ice that may have accumulated in the fluid before going back to full operation mode.

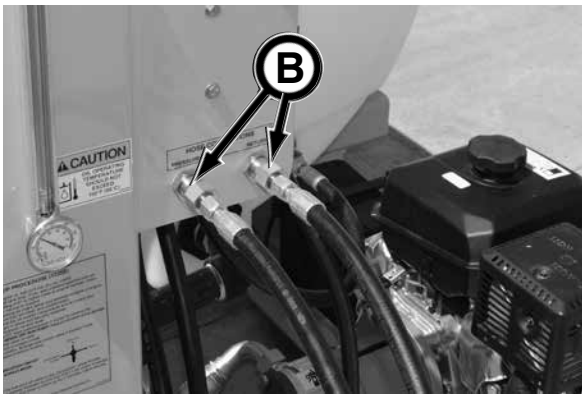
Remember it is also critical to keep the work site safe and employees comfortable during the freezing weather. Good training, supervision, proper clothing and limiting personal exposure to the weather is essential for keeping personnel and equipment safe on the job site.

COLD WEATHER PROTECTION - DRAINING SYSTEM

NOTICE To prevent damage to pump components in freezing weather, flush and drain pumps and ALL fluid lines. Failure to do so will cause damage to pump components. If using a RV Anti-Freeze solution for cold weather protection, refer to Cold Weather Protection - Using RV Anti-Freeze Solution in this section.



1. Release cam lock hose assembly (A) on the pump.

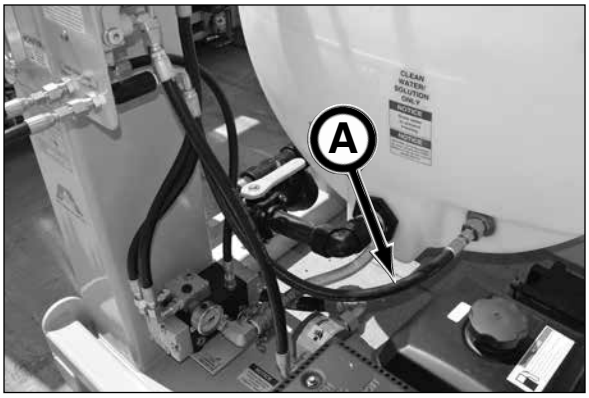


2. Remove pressure and return hoses or hose caps from pressure and return connections (B).

3. Remove strainer.

(Continued on next page)

4. Remove tank return hose (A).

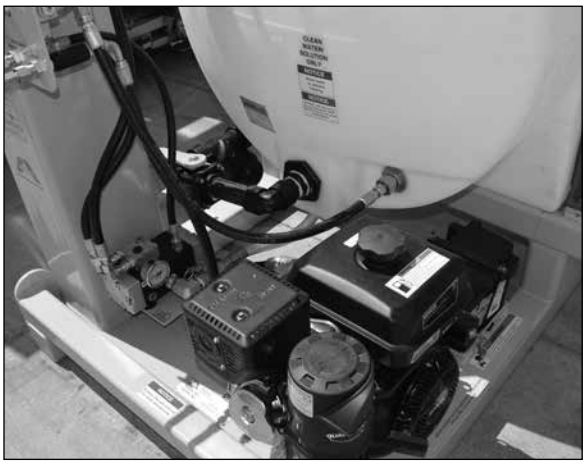


5. Open tank shut off valve.

6. Once all fluid is drained:

- reinstall pump cam lock hose assembly to pump
- reinstall pressure and return hoses or caps on connections
- reinstall strainer and cap
- replace tank return hose

NOTICE NEVER dry run pump. Doing so will damage pump.



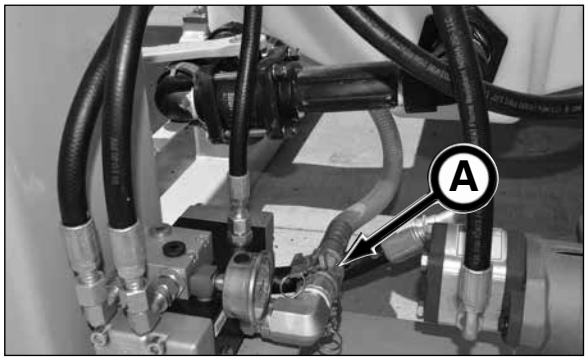
COLD WEATHER PROTECTION - USING RV ANTI-FREEZE SOLUTION

NOTICE **Akkerman Inc. HIGHLY recommends draining the system for cold weather protection. If the customer decides to use RV anti-freeze solution for cold weather protection, the customer is responsible for any damages occurred.**

NOTICE To prevent component damage in freezing weather, the pump system MUST be drained or treated with a RV Anti-Freeze solution.

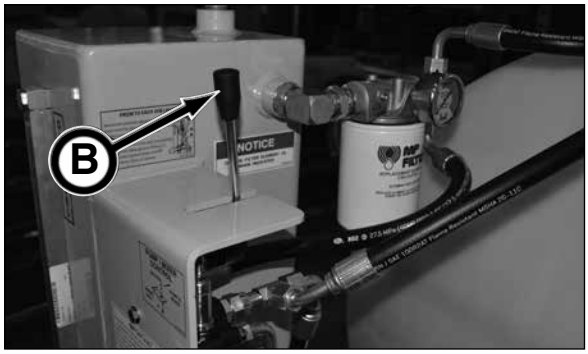
1. If tank is empty add approximately 4 - 5 gallons (15 - 19 L) of clean water. Proceed to step 3.

2. If tank is full, drain tank by releasing cam lock hose assembly (A) until 4 - 5 gallons (15 - 19 L) of water/solution is left in tank. Then reinstall cam lock hose assembly to pump. Proceed to step 3.



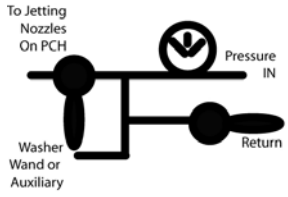
3. Add 4 - 5 gallons (15 - 19 L) of RV anti-freeze into tank. Be sure there is a 50/50 mixture of liquid to RV anti-freeze in the tank.

NOTICE Be sure to follow the proper solution instructions on the RV anti-freeze container.



4. Place Pump/Mixer Selector (B) to the Neutral position.

5. On shaft control, arrange valves in bypass mode as shown.



JETTING CIRCUIT BYPASS MODE

NOTICE NEVER dry run pump. Doing so will damage pump.

6. Start engine and move Pump/Mixer Selector to the Pump/Mixer position. Cycle pump for at least two minutes to ensure the liquid/RV anti-freeze mixture is pumped through complete system.

NOTICE (Models with Mixer Control) Be sure mixer control is turned to the ON position, otherwise the mixer will not operate.

7. Place Pump/Mixer Selector in Neutral position. Shut down engine and refer to engine owner's manual for cold weather protection.

Transporting

TRANSPORTING GUIDELINES

1. Know the local, state, and federal transportation regulations
2. Obtain required permits for transporting.
3. Remove any obstacles from the trailer floor.
4. Clean debris from equipment.
5. (1325B without tank braces) Drain the tank BEFORE lifting equipment with a hoist or other lifting device.
   (1325B with tank braces) Unit can be lifted with a full tank using a crane, hoist or other lifting device.
6. Be sure to inspect the equipment lifting eyes and sling for damage before lifting.
7. Observe the lifting instructions on the equipment.
8. Load and unload on level ground.
9. Securely fasten the 1325B Bentonite & Lubrication Pump to trailer floor.

LIFTING INSTRUCTIONS

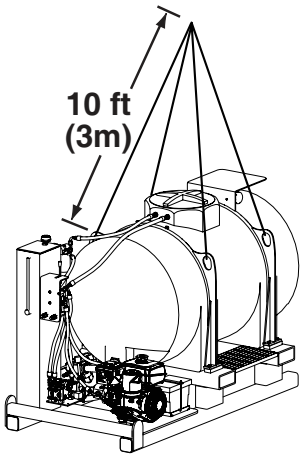
⚠WARNING Suspended load may fall and cause serious injury or death. DO NOT enter area under or around a suspected load.

⚠WARNING Damaged tank braces could cause suspended load to fall and cause serious injury or death. Inspect tank braces and hardware before lifting.

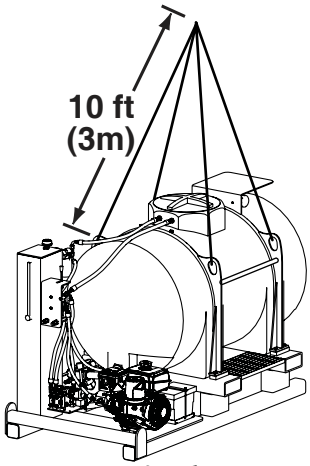
⚠CAUTION Damage to the pump assembly may result from a falling pump.

- Frame weight:
  with full tank: 3,700 lbs (1,678 kg)
  with empty tank: 1,000 lbs (454 kg)
- Lifting with a crane requires a four part sling with legs a minimum of 10 ft (3 m) long.
- (1325B without tank braces*) Drain the tank BEFORE lifting equipment with a hoist or other lifting device, DO NOT LIFT it when the tank is FULL with a crane, hoist or other lifting device.
- (1325B with tank braces) Unit can be lifted with a full tank using a crane, hoist or other lifting device.
- Frame MUST lift freely. If it is stuck to the ground, it MUST be broken loose prior to lifting.
- Frame lifting eyes and tank braces MUST be inspected prior to each lift. Any damage MUST be repaired prior to lifting.
- If the tank is full and must be moved, a properly rated forklift for the weight of the pump assembly can be used.

* Refer to the parts section, Bentonite & Lubrication Pump Tank Brace Assembly for ordering.



*1325B Bentonite & Lubrication Pump WITHOUT tank braces**



1325B Bentonite & Lubrication Pump WITH tank braces

NOTES

Fuels & Lubricants

NOTICE Use of inferior fuel or lubricants will affect the efficient performance of your 1325B Bentonite & Lubrication Pump. Always use high quality fuel and lubricants as specified in this section. Refer to the Periodic Maintenance section for proper lubrication quantity, maintenance intervals, and procedures.

NOTICE For more information on maintaining your fuel and additional fuel specifications, refer to your engine owner's manual.

FUEL SPECIFICATIONS

⚠WARNING Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well ventilated, unoccupied buildings, away from sparks or flames. Spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Never use gasoline as a cleaning agent.

It is highly recommended to use Ethanol-Free gasoline in this engine. If using Ethanol (up to 10%) gasoline, add a fuel stabilizer in the tank. **DO NOT** use E20 and E85 gasolines. Refer to engine manual for more information.

The fuel must meet the following requirements:

- Clean, fresh, unleaded gasoline.
- Octane rating of 87 (R+M)/2 or higher.
- In countries using the Research Method, use Research Octane Number (RON) 90 octane minimum.
- Gasoline up to 10% ethyl alcohol, 90% unleaded is acceptable.
- Methyl Tertiary Butyl Ether (MTBE) and unleaded gasoline blend (max 15% MTBE by volume) are approved.
- Other gasoline/alcohol blends including E15, E20 and E85 are NOT to be used and are NOT approved. Any failures resulting from use of these fuels will not be warranted.
- Do not add oil to gasoline.
- Do not overfill fuel tank. Leave enough room in tank for fuel to expand.
- Do not use gasoline older than 30 days.
- Effects of old, stale or contaminated fuel are not warrantable.

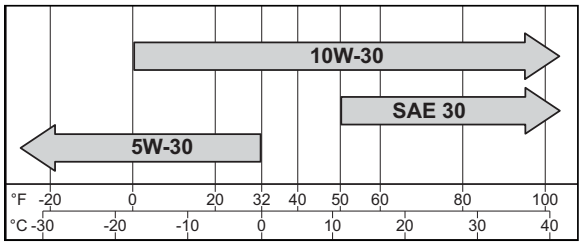
Fuel tank capacity is 1.8 gal. (6.8 L).

ENGINE OIL

NOTICE The engine manufacturer offers an all-season synthetic oil, 10W-50 Kohler® Pro, for a 300 hour oil change interval. For more information on the engine oil specifications, refer to your engine owner's manual.

The engine is filled with SAE 10W-30 oil.

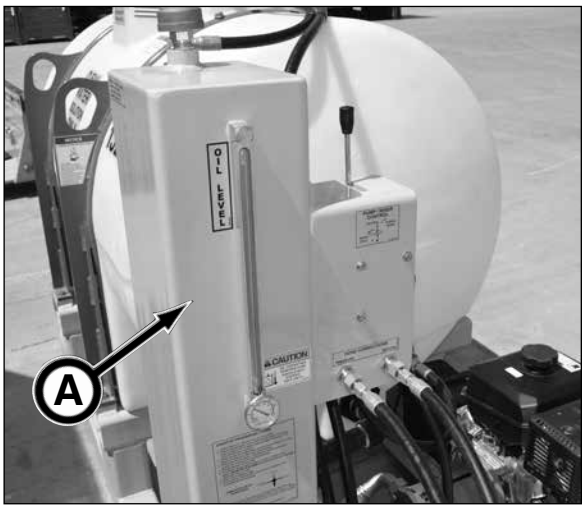
Change the oil and filters after the first 5 hours of operation and every 100 hours thereafter with SAE 10W-30 engine oil or other oil viscosity based on the expected air temperature range during the period between oil changes as shown in chart.



Other high quality detergent oils, including synthetic, of API (American Petroleum Institute) service class SJ or higher are acceptable.

The engine oil capacity is approximately 1.16 qt (1 L). Oil level should be within the crosshatches of the dipstick. Do not overfill!

HYDRAULIC TANK OIL



The hydraulic tank (A) is factory filled with ISO-VG-68, a premium AW (All-Weather) hydraulic oil.

Use ISO-VG-68 or equivalent when adding or changing lubricant.

Recommended: hydraulic oil:

Ambient Temp.	***Hydraulic Oil***
below 70°F (21°C)	ISO 46
above 70°F (21°C)	ISO 68

NOTICE Do not mix oil manufacturers or grades.

Hydraulic oil tank capacity is 15 gal. (57 L).

STORING LUBRICANTS

Your equipment can operate at maximum performance only if clean lubricants are used. Use clean containers to handle all lubricants.

Lubricants should be stored in an area protected from dust, moisture, and other contaminates.

All lubricants must be stored at least 100 ft (30.5 m) from the portal, entrance to the tunnel, launch shaft or reception shaft.

NOTES

Periodic Maintenance

⚠WARNING Review the Safety section in this manual before performing maintenance. Failure to do so, could cause severe injury or death.

The requirements for maintenance are shown on the maintenance charts in this section. Intervals of maintenance are based on normal operating conditions. If operating under more difficult conditions, use a shorter time interval between maintenance.

FLUIDS UNDER PRESSURE

⚠WARNING Escaping fluids under pressure can penetrate your skin causing serious injury.

Release all pressure before performing maintenance or repairs. Never weld near pressurized fluid lines.

DO NOT use your hands to check for leaks. When searching for leaks, use a piece of wood or cardboard.

Contact medical help immediately if any fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

USING A PRESSURE WASHER WAND

⚠WARNING Using the lubrication pump with a pressure washer wand can generate enough fluid pressure and velocity to penetrate skin resulting in serious personal injury.

Contact medical help immediately if fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

NEVER point the wand towards a person or animal.

Be sure to release pressure after use and before performing maintenance to prevent accidental fluid injection.

Wear safety glasses and gloves, and depending on the wand use, a particle mask may be necessary.

AVOID PINCH POINTS

⚠WARNING Moving parts or the mishandling of parts can cause severe personal injury.

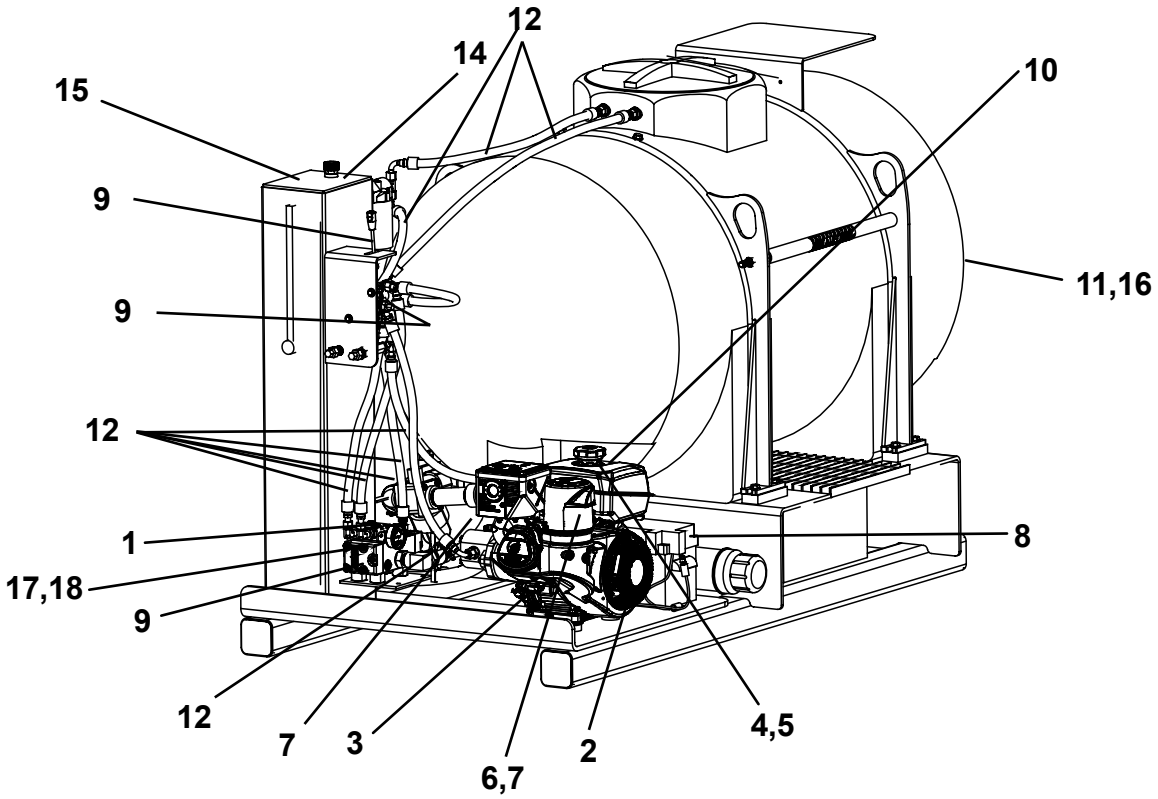
Keep hands away from moving parts.

Watch your fingers, hands, and legs while equipment is in operation.

Handle parts carefully to avoid crushing and pinch point hazards.

MAINTENANCE CHARTS

NOTICE Use the item number in the chart to refer to the detailed maintenance instructions later in this section.

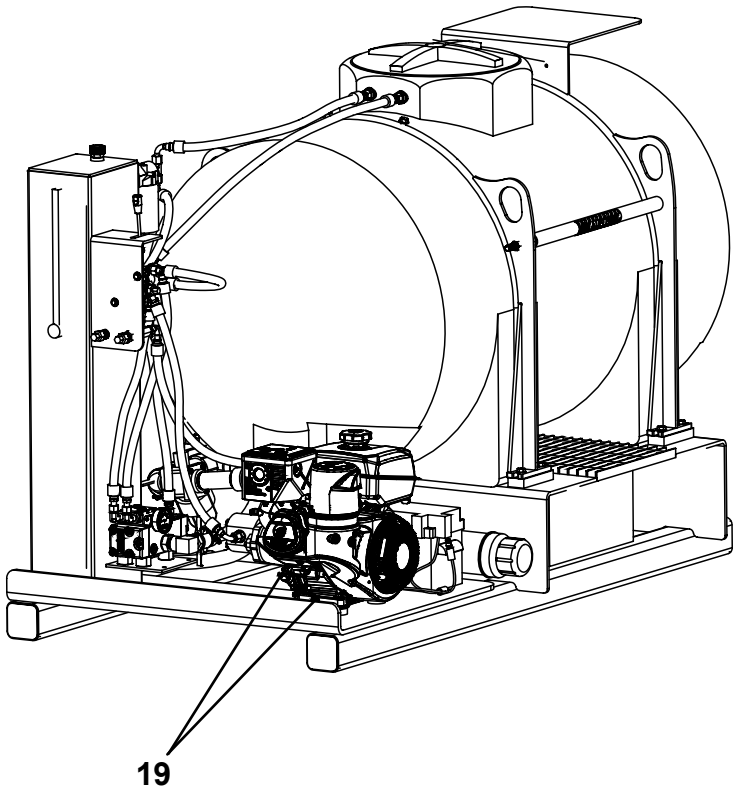


*DAILY OR EVERY 10 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
1.	Tank Strainer	Clean	If damaged, replace with new.	Tank Strainer
2.	Engine	Inspect	Visually inspect for damage.	
3.	Engine Crankcase**	Check Oil Level	Add oil as needed.	SAE 10W-30
4.	Fuel Tank	Check Fuel Level	Add fuel as needed.	See Section 8
5.	Fuel Tank	Clean Filter	Remove any accumulation.	Filter
6.	Air Cleaner & Precleaner***	Check	Keep area clean.	
7.	Air Intake & Cooling Areas	Check	Keep areas clean.	
8.	Covers & Guards	Inspect	Replace if damaged.	
9.	Valves & Levers	Inspect	Inspect for proper operation.	
10.	Wiring & Cables	Inspect	If damaged, replace with new.	
11.	Water/Solution Tank	Inspect	Repair or replace if damaged.	
12.	Hoses & Tube	Check	Replace if damaged.	
13.	Decals^	Inspect	If damaged, replace with new.	
14.	Hyd Return Filter	Check Indicator	Replace filter per indicator.	Return filter
15.	Hydraulic Tank	Check Fluid Level	Add hydraulic fluid as needed.	See Section 8
16.	Water/Solution Tank	Flush	Flush in freezing weather or is idle for more than a day.	
17.	Hydraulic Pump	Inspect & Clean	Visually inspect for leakage, replace seal kit as needed. Remove debris.	
18.	Tank Braces	Inspect	Check tank braces.	

* Refer to your engine owner's manual for additional maintenance information.
** During engine break-in period, change the oil for the first time at 5 hours of operation & every 100 hours.
*** Perform more frequently under extremely dusty, dirty conditions.
^ Not Shown

NOTICE Use the item number in the chart to refer to the detailed maintenance instructions later in this section.

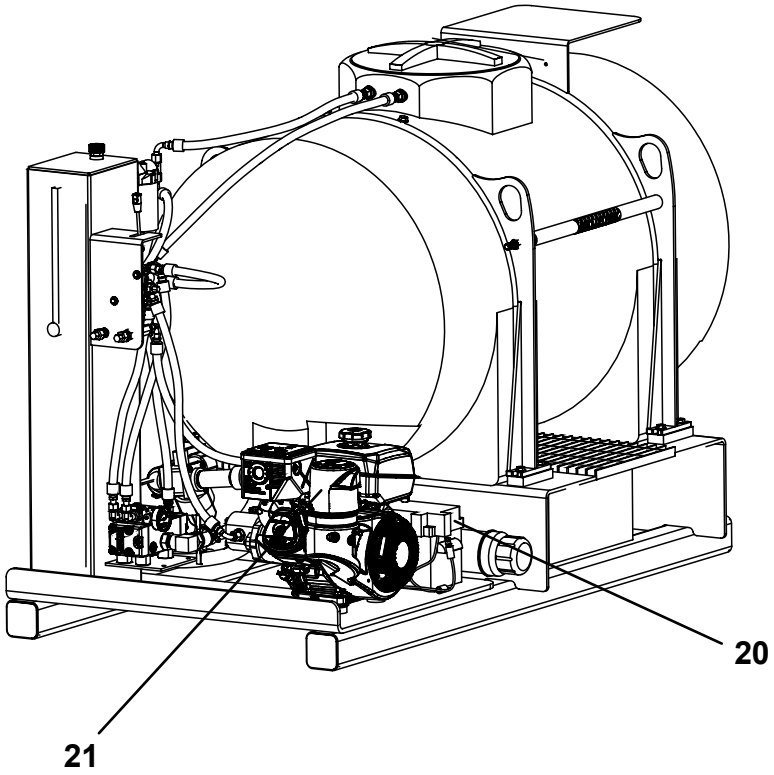


*FIRST 5 HOURS OF OPERATION & EVERY 100 HOURS THEREAFTER

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
19.	Engine Crankcase	Drain & Fill	Replace with new oil.	SAE 10W-30

* Refer to your engine owner's manual for additional maintenance information.

NOTICE Use the item number in the chart to refer to the detailed maintenance instructions later in this section.

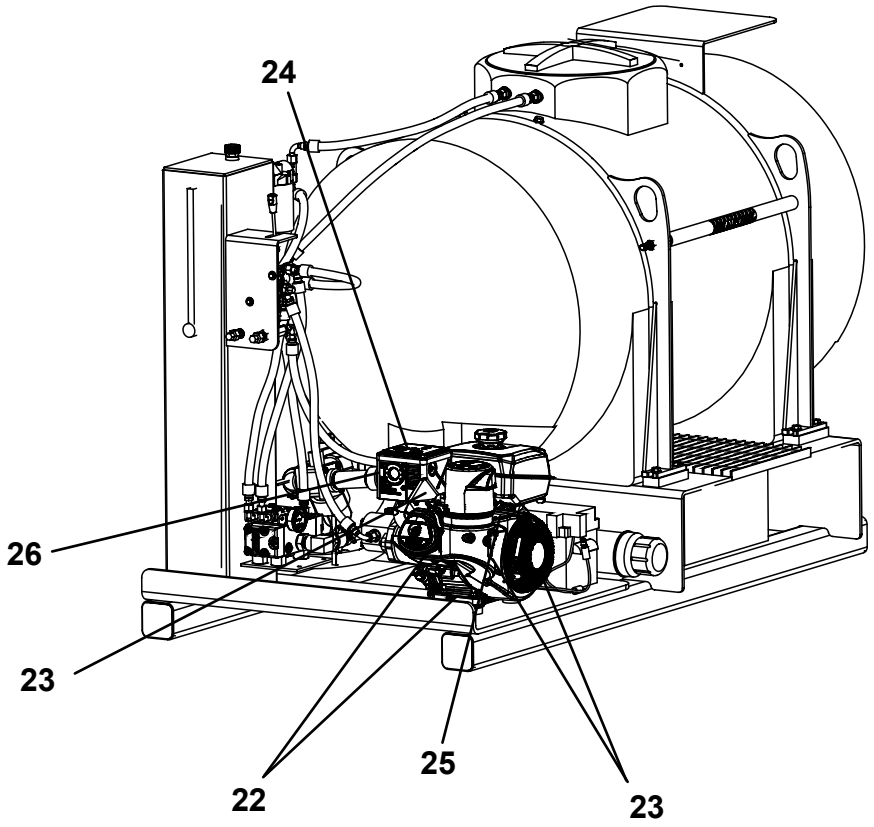


*WEEKLY OR EVERY 50 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
20.	Battery	Check	Check for damage or frayed cables.	Battery/cable
21.	Precleaner	Clean or replace		

* Refer to your engine owner's manual for additional maintenance information.

NOTICE Use the item number in the chart to refer to the detailed maintenance instructions later in this section.



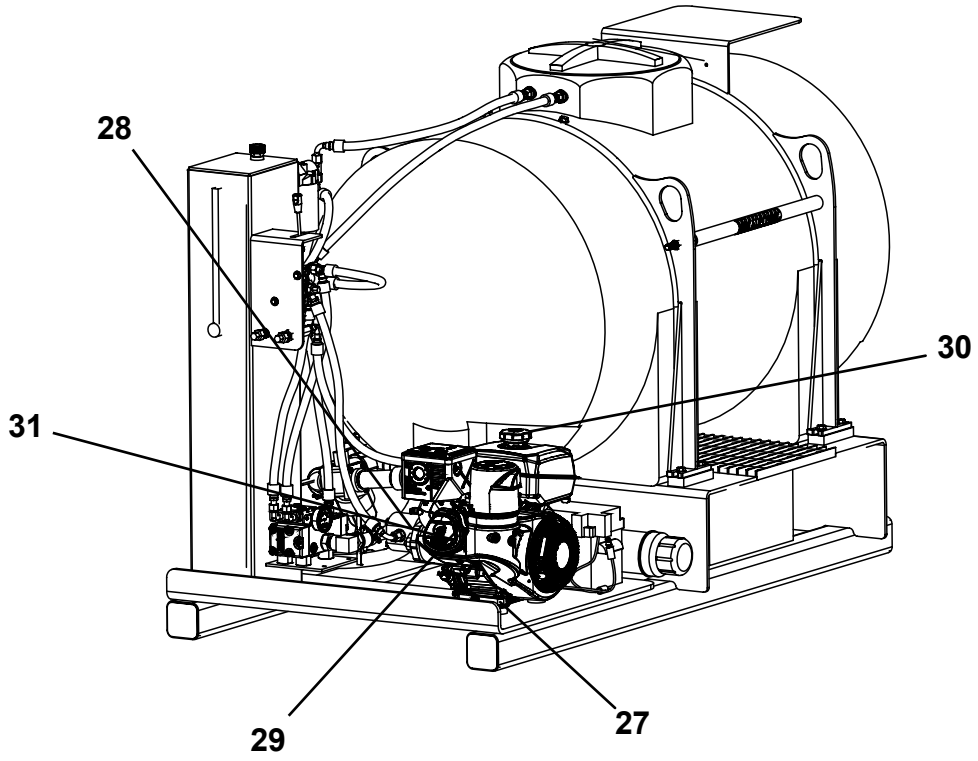
*WEEKLY OR EVERY 50 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
22.	Engine Crankcase**	Drain & Fill	Replace with new oil.	SAE 10W-30
23.	Air Intake/Cooling Areas	Clean		
24.	Spark Plug	Check Condition	Reset gap or replace with new.	Spark Plug
25.	Fuel Valve	Clean	Clean fuel valve cup of debris.	
26.	Muffler Screen	Clean or Replace		Muffler Screen

* Refer to your engine owner's manual for additional maintenance information.

** During engine break-in period, change the oil for the first time at 5 hours of operation and every 100 hours thereafter.

NOTICE Use the item number in the chart to refer to the detailed maintenance instructions later in this section.

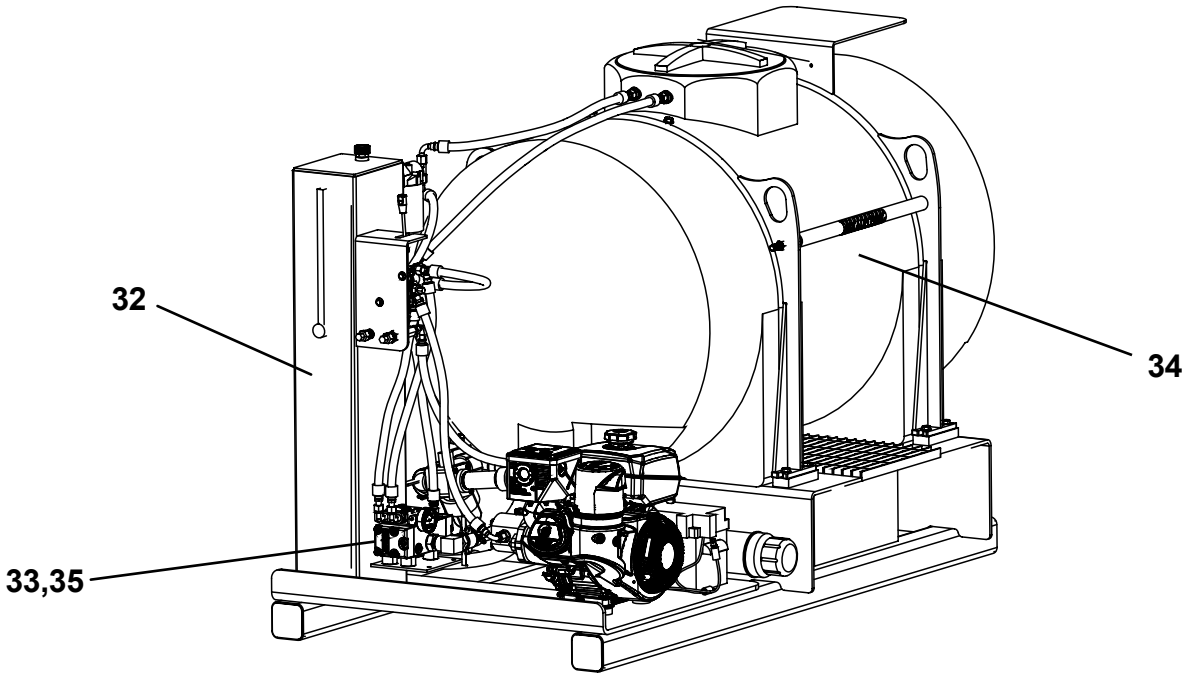


*MONTHLY OR EVERY 200 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
27.	Engine Mtg Bolts	Inspect	If damaged, replace with new.	
28.	Pump Mtg Bolts	Inspect	If damaged, replace with new.	
29.	Air Cleaner	Replace		Element
30.	Fuel Tank Cap	Inspect		
31.	Engine	Service	Refer to Engine Owner's Manual.	

* Refer to your engine owner's manual for additional maintenance information.

NOTICE Use the item number in the chart to refer to the detailed maintenance instructions later in this section.



EVERY 500 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
32.	Hydraulic Tank	Drain & Fill	15 gal (57 L)	See Section 8
33.	Hydraulic Pump	Replace	Replace intake filter.	Filter

AFTER EACH DRIVE

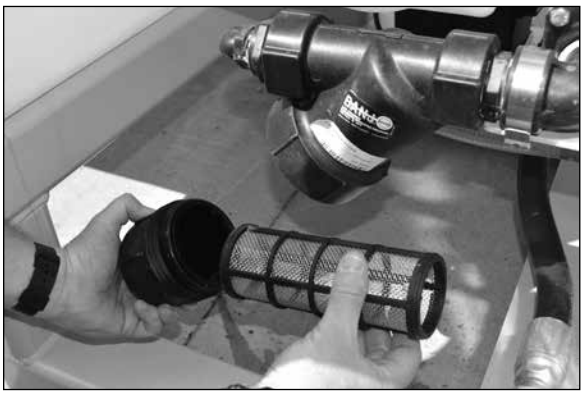
ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
34.	Water/Solution Tank	Flush	Flush tank and prepare for storage.	

EVERY 1,500 HOURS OF OPERATION OR AS NEEDED

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
35.	Hydraulic Pump	Replace	Replace seals.	Seal Kit

DAILY OR EVERY 10 HOURS OF OPERATION

NOTICE Refer to your engine owner's manual for additional maintenance information.



1. CLEAN TANK STRAINER

Clean tank strainer with water or other non-abrasive cleaner.

If damaged, replace with new.

2. INSPECT ENGINE

Perform an overall visual inspection of the engine:

- check for engine oil leaks
- check for fuel leaks
- check for damaged or missing parts

If leaks appear or any parts are damaged, repair or replace before operating the engine.

3. CHECK ENGINE CRANKCASE OIL LEVEL

Check engine oil level on dipstick. Do not fill above the top mark on the dipstick.

ALWAYS keep oil level within the crosshatches on dipstick when operating engine. Oil levels anywhere within crosshatches are considered full.

If necessary, add SAE 10W-30 engine oil. See Engine Oil in the Fuels & Lubricants section for oil specification.

NOTICE After the first 50 hours of operation, replace engine oil.

4. CHECK FUEL TANK LEVEL

⚠WARNING Gasoline is extremely flammable and explosive. Handle with care. DO NOT refuel while smoking or when near open flame or sparks. Do not fill the fuel tank while the engine is hot or running.

Have a fire extinguisher available at all times. Keep the fire extinguisher fully charged.

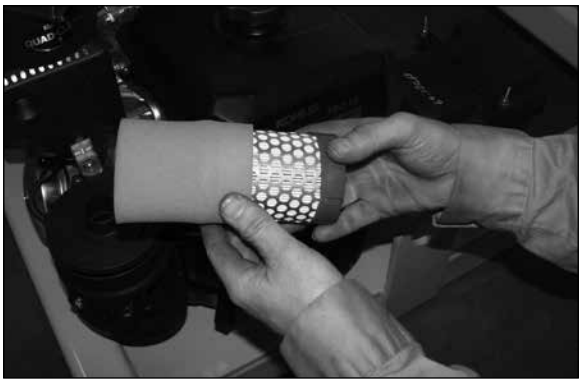
1. Shut off engine before refueling.
2. Clean area around the fuel cap.
3. Remove the fuel cap from the fuel tank.
4. Refuel (refer to section 8 for Fuel Specification) until fuel tank is full. Allow room for the fuel to expand. NEVER overfill the fuel tank. Wipe up spills.
5. Replace fuel cap.

5. CLEAN FUEL TANK FILTER

Clean filter of any accumulation as follows:

1. Shut down engine and remove the fuel tank cap and filter.
2. Clean the filter with solvent. Replace if damaged.
3. Wipe the filter and insert it in filler neck.
4. Replace fuel cap.

6. CHECK AIR CLEANER & PRECLEANER ELEMENTS



1. Check the air cleaner and precleaner elements daily or before starting the engine. Check for buildup of dirt and debris around the air cleaner system including the air cleaner cover and base. Keep this area clean.

2. Also check for loose or damaged components. Replace all bent or damaged air cleaner components.

3. Reinstall the air cleaner cover properly by lining up the cover to the normal (sun) or cold weather (snowflake) operation position.

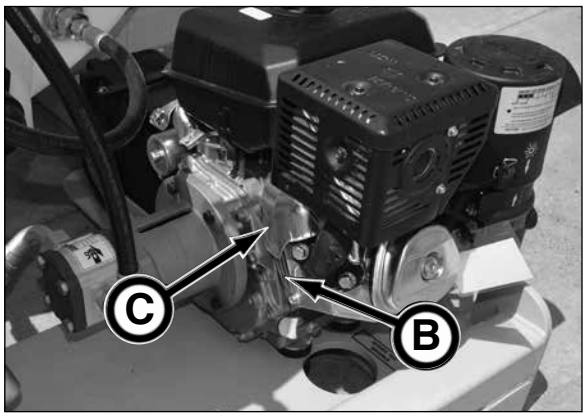
   Normal Operation Position: 35° to 40°F & Above
   Cold Weather Operation Position:
   35° to 40°F & Below

4. Secure air cleaner cover to base with latches and bails.

7. CHECK AIR INTAKE & COOLING AREAS

To ensure proper cooling, be sure the grass screen (A), cooling fins (B), cooling shrouds (C) and other external surfaces of the engine are kept clean at all times.

NOTICE Operating the engine with a blocked grass screen, dirty or plugged cooling fins, and/or cooling shrouds removed, will cause engine damage due to overheating.



8. INSPECT COVERS & GUARDS

Inspect all guards and covers to be sure they are properly mounted in place, and undamaged. Repair or replace as needed. NEVER operate without covers or guards in place.

9. INSPECT VALVES AND LEVERS

Inspect valves and levers for proper operation.

Repair or replace as needed.

10. INSPECT WIRING & CABLES

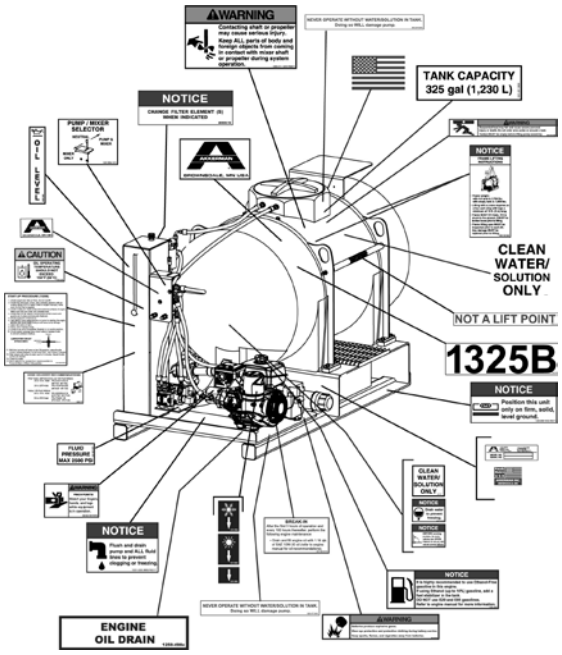
Inspect wiring and cable for cracking, fraying or other damage. Replace as needed.

11. INSPECT WATER/SOLUTION TANK

Inspect water/solution tank for damage. Repair or replace as needed.

12. INSPECT OUTLET TUBE & PRESSURE & RETURN HOSES

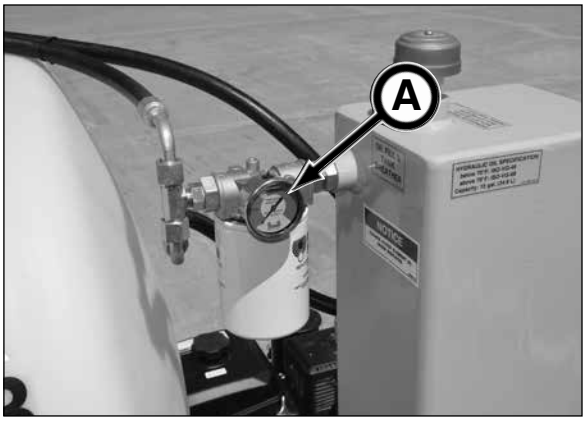
Inspect outlet tube, pressure and return hoses and all hydraulic hoses for cracks, wear or damage. Replace as needed.



13. INSPECT DECALS

Visually inspect all decals so they are clean and readable. Replace decals if they are damaged, missing, or hard to read.

14. CHECK HYDRAULIC RETURN FILTER INDICATOR



To prevent over or under servicing of the hydraulic return filter, a filter indicator (A) has been installed on the return filter housing.

The green OK zone indicates that the filter is functioning properly.

The yellow zone indicates that the filter will soon require replacement.

When the needle on the gauge is in the red CHANGE zone, replace filter as soon as possible to prevent pump damage using the following procedure:

1. Clean and dry area around return filter.

2. Remove filter. Dispose of oil and filter properly.

NOTICE Remove filter gasket if stuck in filter housing.

3. Fill new filter with clean hydraulic oil (refer to Section 8, Fuels & Lubricants for oil specification).

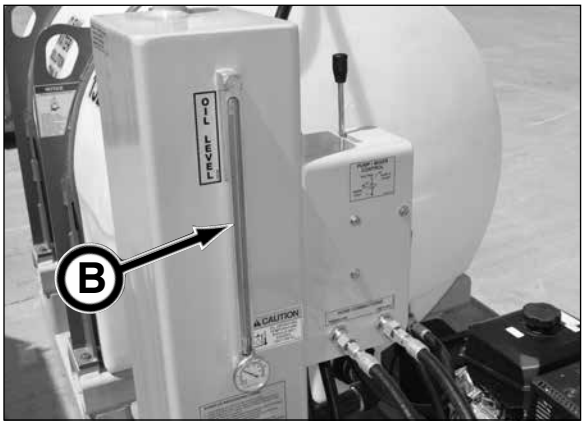
4. Lubricate new filter gasket with a light coating of clean hydraulic oil.

5. Install new filter. Hand tighten only.

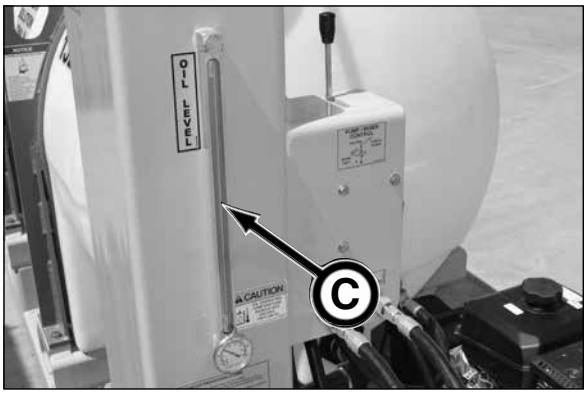
6. Start engine and run at low idle until the hydraulic system is warm. Then check for leaks.

7. Shut down engine.

8. Check hydraulic tank oil level on gauge (B). Add hydraulic oil, if necessary.



15. CHECK HYDRAULIC TANK OIL LEVEL



Check hydraulic tank oil level gauge (C). Add hydraulic oil, if necessary.

The hydraulic tank is filled with ISO-VG-46 20W Premium Hydraulic Oil. Refer to Hydraulic Tank in the Fuels & Lubricants section for more information.

Hydraulic oil tank capacity is 15 gal. (57 L).

16. FLUSH WATER/SOLUTION TANK

The water/solution tank must be flushed with clean water if:

- the water/solution will be sitting idle more than anovernight period. Check the directions on the polymer or bentonite bag/container for additional instructions.

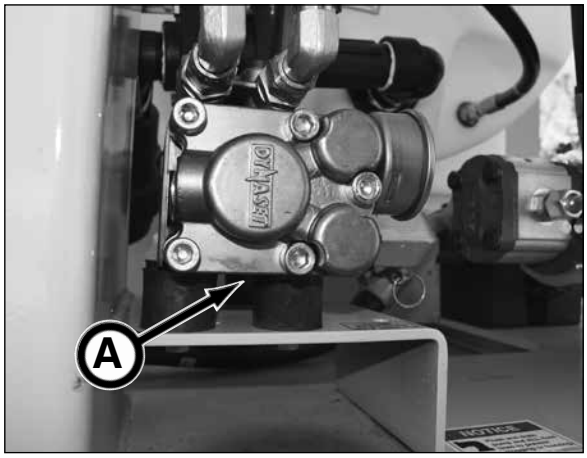
- the water/solution will be sitting idle overnight in freezing weather. The tank will also require draining or adding a RV anti-freeze solution. (refer to Cold Weather Protection in section 6, Operation).

17. INSPECT & CLEAN HYDRAULIC PUMP

Visually inspect fluid drops coming from the pump's leakage detectors. There should be less than 10 drops per minute. If more than 10 drops per minute are present, replace the existing seals.

Refer to Change Seals in the pump user manual.

Clean tank hydraulic pump exterior with water or other non-abrasive cleaner after every work shift.



18. CHECK TANK BRACES

If equipped with tank braces, check that they are secure and no bend is present. Tighten all hardware. Replace damaged hardware or bent braces.

FIRST 5 HOURS OF OPERATION & EVERY 100 HOURS THEREAFTER

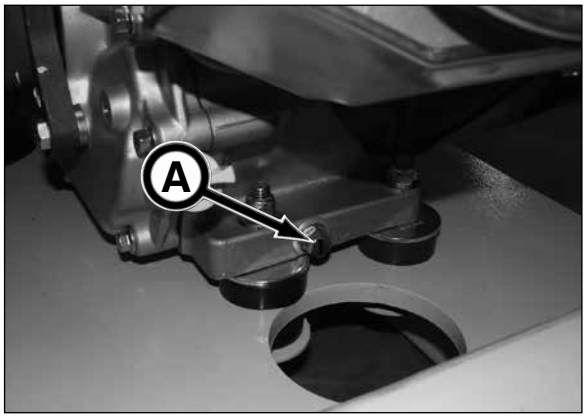
NOTICE Refer to your engine owner's manual for additional maintenance information.

19. CHANGE ENGINE OIL

1. Start the engine and run to operating temperature. This will allow oil to drain more easily.

2. Stop the engine.

3. Clean area around the dipstick/fill cap. Remove cap.



4. Clean area around engine oil drain plug (A).

5. Position a properly sized container to collect waste oil.

6. Remove drain plug and drain oil into container. Recycle oil properly.

7. Replace drain plug.

(Continued on next page)

8. Fill engine with SAE 10W-30 engine oil or other oils specified in the Fuels & Lubricants section. The following fluid capacity is an approximate value. Be sure to check levels after filling. DO NOT OVERFILL.

   Oil Capacity ..... approx. 1.16 qt (1 L)

9. Install fill cap. Clean up spills.

10. Start engine and run until warm for 5 minutes and check for leaks.

11. After the engine is warm, shut if off and let it sit for 10 minutes.

12. Recheck the engine oil level on dipstick and fill as needed. Oil level should be within the crosshatches of the dipstick. Do not overfill!

13. Reinstall dipstick/fill cap.

WEEKLY OR EVERY 50 HOURS OF OPERATION

NOTICE Refer to your engine owner's manual for additional maintenance information.

20. CHECK BATTERY

⚠WARNING Batteries produce explosive gases.

Wear eye protection and protective clothing during battery service.

Keep sparks, flames, and cigarettes away from batteries.

Contact with battery acid can cause severe burns. Flush immediately and thoroughly with clean water. Get medical attention immediately.

Charge a battery only in a well-ventilated area.

Never charge a frozen battery.

Visually check the battery for damage. If damaged replace with new.

Check battery cables for damage or fraying. If damaged, replace with new.

Be sure cables are secured properly to the battery posts and engine mounts.

Inspect battery mount and battery box for damage. If damaged or if parts are missing, replace with new.

21. CLEAN PRECLEANER

Clean the precleaner every 50 hours of operation and more often under extremely dusty or dirty conditions.

1. Clean area around the air cleaner assembly and cover. Then remove the air cleaner cover.

2. Remove the precleaner from the air cleaner element.

3. Wash the precleaner in warm water with a mild detergent.

4. Rinse the precleaner thoroughly until all traces of detergent are eliminated.

5. Squeeze out excess water, though DO NOT WRING otherwise damage will result to precleaner.

6. Allow precleaner to dry.

7. Reinstall the precleaner over the air cleaner element.

NOTICE If precleaner is worn, torn or damaged, replace with new.

8. Slide the precleaner/air cleaner element onto the air cleaner base.

9. Reinstall and secure the air cleaner cover to base at the proper normal (sun) operation or cold weather (snowflake) operation position.

   Normal Operation Position: 35° to 40°F & Above
   Cold Weather Operation Position:
   35° to 40°F & Below

EVERY 100 HOURS OF OPERATION

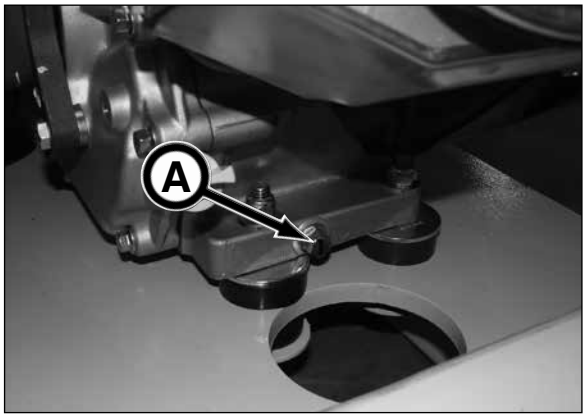
NOTICE Refer to your engine owner's manual for additional maintenance information.

22. CHANGE ENGINE OIL

1. Start the engine and run to operating temperature. This will allow oil to drain more easily.

2. Stop the engine.

3. Clean area around the dipstick/fill cap. Remove cap.



4. Clean area around engine oil drain plug (A).

5. Position a properly sized container to collect waste oil.

6. Remove drain plug and drain oil into container. Recycle oil properly.

7. Replace drain plug.

(Continued on next page)

8. Fill engine with SAE 10W-30 engine oil or other oils specified in the Fuels & Lubricants section. The following fluid capacity is an approximate value. Be sure to check levels after filling. DO NOT OVERFILL.

   Oil Capacity ..... approx. 1.16 qt (1 L)

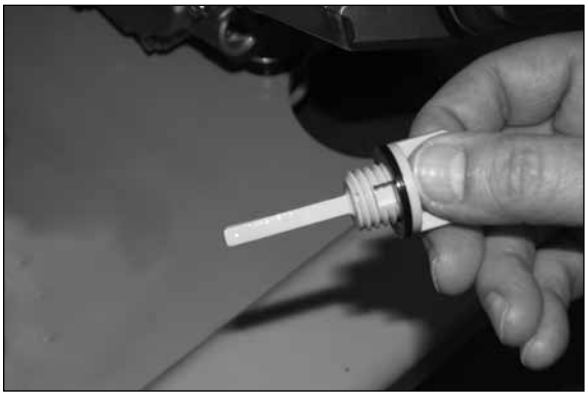
9. Install fill cap. Clean up spills.

10. Start engine and run until warm for 5 minutes and check for leaks.

11. After the engine is warm, shut if off and let it sit for 10 minutes.

12. Recheck the engine oil level on dipstick and fill as needed. Oil level should be within the crosshatches of the dipstick. Do not overfill!

13. Reinstall dipstick/fill cap.



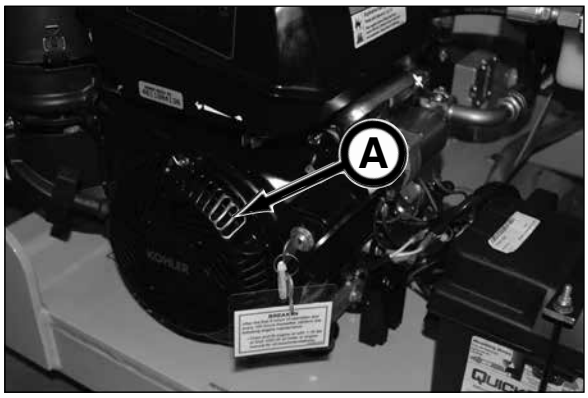
23. CLEAN AIR INTAKE/COOLING AREAS

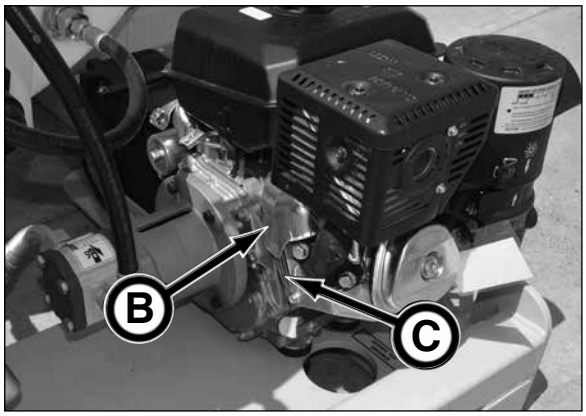
NOTICE Refer to your engine owner's manual for additional maintenance information.

1. Remove blower housing (A) and other cooling shrouds (B) and clean as necessary.

2. Clean the cooling fins (C) and external surfaces as necessary. Be sure to reinstall the cooling shrouds and blower housing,

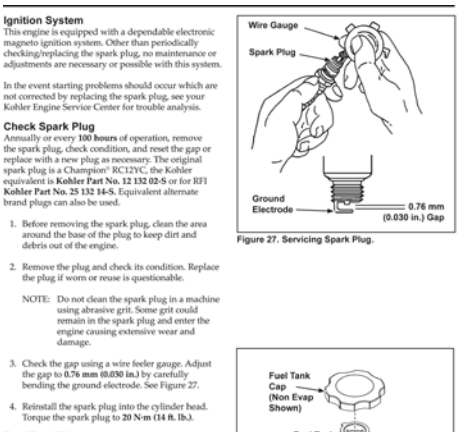
NOTICE Operating the engine with a blocked grass screen, dirty or plugged cooling fins, and/or cooling shrouds removed, will cause engine damage due to overheating.





24. CHECK SPARK PLUG

Remove the spark plug, check condition and reset the gap or replace with a new plug as necessary. Refer to your engine owner's manual for spark plug maintenance instructions.



Ignition System
This engine is equipped with a dependable electronic magneto ignition system. Other than periodically checking/replacing the spark plug, no maintenance or adjustments are necessary or possible with this system.

In the event starting problems should occur which are not corrected by replacing the spark plug, see your Kohler Engine Service Center for trouble analysis.

Check Spark Plug
Annually or every **100 hours** of operation, remove the spark plug, check condition, and reset the gap or replace with a new plug as necessary. The original spark plug is a Champion® RC12YC, the Kohler equivalent is **Kohler Part No. 12 132 02-S** or for RFI **Kohler Part No. 25 132 14-S.** Equivalent alternate brand plugs can also be used.

1. Before removing the spark plug, clean the area around the base of the plug to keep dirt and debris out of the engine.
2. Remove the plug and check its condition. Replace the plug if worn or reuse is questionable.

   NOTE: Do not clean the spark plug in a machine using abrasive grit. Some grit could remain in the spark plug and enter the engine causing extensive wear and damage.
3. Check the gap using a wire feeler gauge. Adjust the gap to **0.76 mm (0.030 in.)** by carefully bending the ground electrode. See Figure 27.
4. Reinstall the spark plug into the cylinder head. Torque the spark plug to **20 N·m (14 ft. lb.)**.

Wire Gauge
Spark Plug
Ground Electrode
0.76 mm (0.030 in.) Gap

Figure 27. Servicing Spark Plug.

Fuel Tank Cap (Non Evap Shown)

25. CLEAN FUEL VALVE CUP

Clean fuel valve cup of any accumulated debris. If the screen becomes clogged or damaged, replace with new. Refer to your engine owner's manual for fuel valve maintenance instructions.

Fuel Valve
Engines are equipped with a fuel valve and integral screen filter located at the inlet of the carburetor. It controls and filters fuel flow from the tank to the carburetor.

Every 100 hours of operation clean fuel valve cup of any accumulated debris. If the screen becomes clogged or damaged replace it.

⚠ WARNING
Explosive Fuel can cause fires and severe burns.
Do not fill the fuel tank while the engine is hot or running.

1. Stop the engine.
2. Remove the securing hardware and the carburetor cover panel. See Figure 29.
3. Turn the fuel valve lever to the "OFF" position.
4. Remove the fuel valve cup. See Figure 30.
5. Clean the fuel valve cup with solvent and wipe it off.
6. Check the O-ring, replace if damaged. Check the screen for blockage or damage, replace if necessary. The new screen must be located on the pick-up tube as shown in Figure 31.
7. Place the O-ring on the screen followed by the fuel valve cup. Rotate the fuel valve cup until it is finger tight. Turn with a wrench 1/2 to 3/4 full turn. See Figure 31.
8. Turn the fuel valve to the "ON" position and check for leaks. If fuel valve cup leaks repeat step 6 and 7.
9. Tighten the tank cap securely.
10. Reinstall the carburetor cover panel securing with hardware removed in step 2.

Fuel Valve
Screw
Nuts
Cover
Screw

Figure 29. Carburetor Cover Panel.

Fuel Valve
Screen
O-ring
Fuel Valve Cup

Figure 30. Fuel Valve Cup, O-ring, and Screen.

Pick-up Tube
Screen
O-ring
Fuel Valve Cup

Figure 31. Pick-up Tube and Screen Orientation.

26. CLEAN MUFFLER SCREEN

Remove and clean or replace the muffler screen. Refer to your engine owner's manual for muffler screen maintenance instructions.

Muffler Screen

Engines are equipped with a muffler screen for operational and environmental safety.

Every **100 hours** of operation, remove and clean or replace the muffler screen following the instructions below.

⚠ WARNING

Hot Parts can cause severe burns.
Do not touch engine while operating or just after stopping.

1. Remove the securing hardware and the muffler screen. See Figure 32.
2. Clean the carbon deposits out of the screen using a wire brush.
3. Check the muffler screen, replace if damaged.
4. Reinstall the muffler screen, securing with the hardware previously removed.

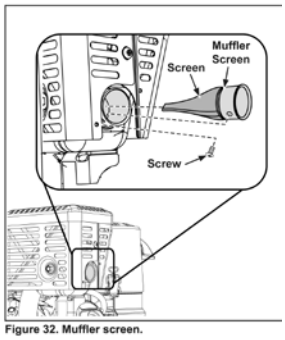


Figure 32. Muffler screen.

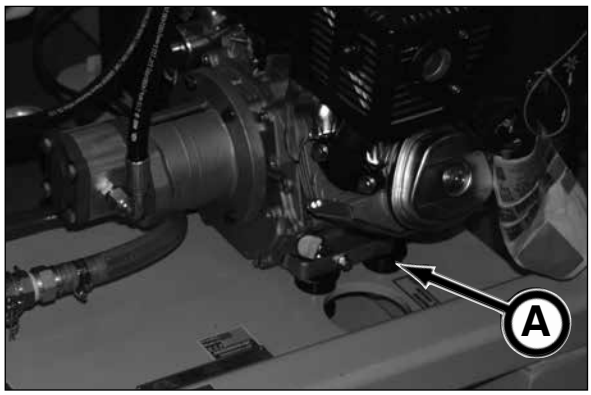
MONTHLY OR EVERY 200 HOURS OF OPERATION

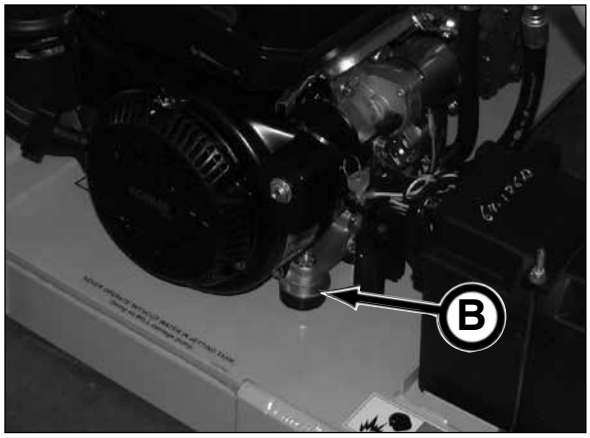
NOTICE Refer to your engine operation manual for additional maintenance information.

27. INSPECT ENGINE MOUNTS

Visually inspect the front (A) and rear (B) engine mounts for loose hardware or damaged parts.

Tighten all loose hardware and replace defective parts.

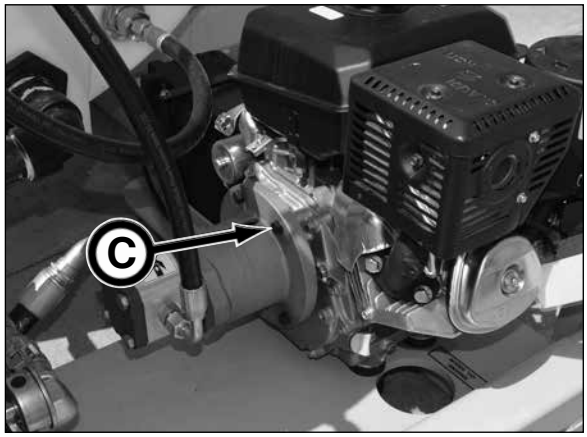




28. INSPECT PUMP MOUNTING BOLTS

Visually inspect pump coupler housing (C) mounting bolts for loose hardware or damaged parts.

Tighten all loose hardware and replace defective parts.

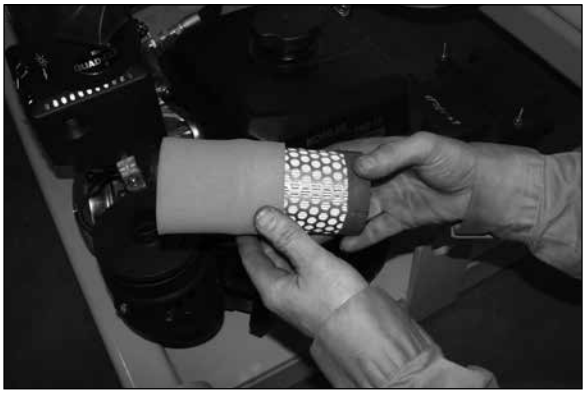


29. REPLACE AIR CLEANER FILTER ELEMENT

Every 200 hours or more often under extremely dusty or dirty conditions, replace the air cleaner filter element.

1. Clean area around the air cleaner assembly and cover.

2. Remove air cleaner cover.



3. Separate the precleaner from the filter element. Dispose of element properly. If necessary, clean the precleaner (refer to 20. Clean Precleaner in this section).

NOTICE DO NOT wash the paper filter element. Doing so will damage the filter.

4. Thoroughly clean air cleaner base and air cleaner cover. Check base and cover for damage or improper fit. Replace as needed. Replace all bent or damaged air cleaner components.

5. Slide a clean precleaner over the new filter element and position properly on air cleaner base.

(Continued on next page)

6. Reinstall the air cleaner cover to base at the proper normal (sun) operation or cold weather (snow flake) operation position.

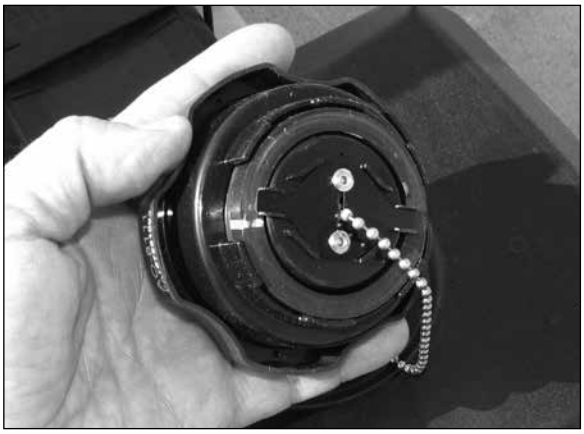
   Normal Operation Position: 35° to 40°F & Above
   Cold Weather Operation Position:
   35° to 40°F & Below

7. Secure the cover to the housing with the two latches.

30. INSPECT & CLEAN FUEL TANK CAP

Inspect cap for damage. If cap is damaged, replace with new.

Remove cap and clean any debris or dirt from cap body.



31. SERVICE ENGINE

Refer to your engine's owner's manual for servicing engine, valve clearance, starter motor drive and decarbonizing combustion chamber.

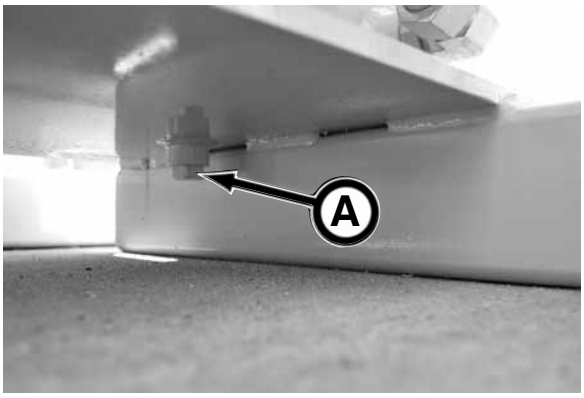
EVERY 500 HOURS OF OPERATION

32. DRAIN & FILL HYDRAULIC TANK

1. Remove drain plug (A) and drain oil into a properly sized catch pan.

2. Replace drain plug.

3. Properly dispose of used oil.

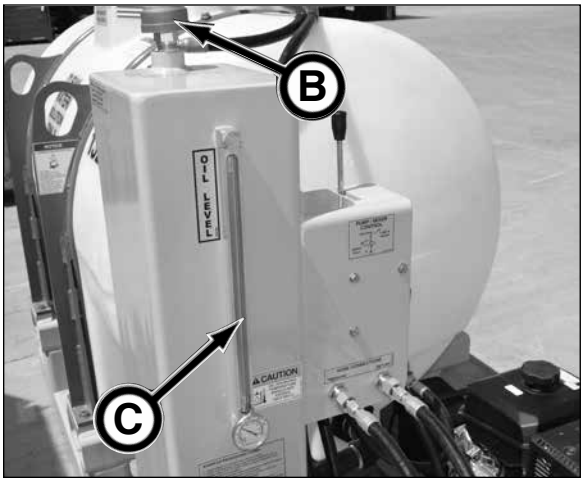


4. Remove oil fill cap.

5. Fill tank with approximately 15 gal. (57 L) of ISO-VG-68 Premium AW Hydraulic Oil or refer to Hydraulic Tank in the Fuels & Lubricants section for more information.

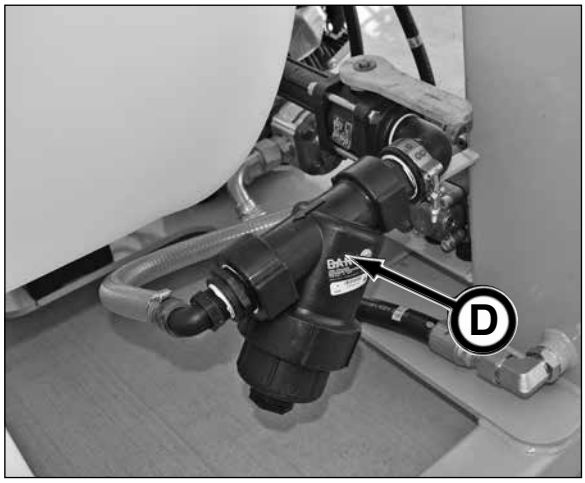
6. Replace fill cap.

7. Check oil level with oil level gauge (D).



33. REPLACE PUMP FLUID INTAKE FILTER

Refer to Change pump fluid intake filter (D) in the pump user manual.



AFTER EACH DRIVE

34. FLUSH & CLEAN WATER/SOLUTION TANK

After each drive, the 1325B Bentonite & Lubrication Pump must be flushed and cleaned, and then either drained completely or add RV anti-freeze to the water system so the pump will be ready for the next drive.

1. Flush and clean water system by using clean water to flush the tank and water system components until the water is clear and free of sediment. Failure to do so will result in clogging of the fluid in the tank, hoses and/or components. Refer to Cleaning Tank in section 6, Operation for more information.

2. Once tank and water system is clean, completely drain system or add RV anti-freeze to the water system. Refer to Cold Weather Protection in section 6, Operation for more information.

EVERY 1,500 HOURS OF OPERATION OR AS NEEDED

35. REPLACE HYDRAULIC PUMP SEALS

Refer to the your Hydraulic Pump user manual for for seal replacing instructions.

NOTES

Storage

PREPARING FOR STORAGE

1. Repair worn or damaged parts.

2. Wash all equipment and tank thoroughly.

3. Drain tank. Flush and drain pump and all fluid lines including to prevent clogging or freezing during storage. Be sure to also remove and clean tank strainer.

4. Drain engine oil and refill engine with oil specified in Fuels & Lubrication section.

5. If engine will be out of service for 2 months or more:
   - Completely empty fuel system (run engine until the tank and system are empty) OR add fuel treatment to fuel tank and run engine for 2 - 3 minutes to get stabilized fuel in fuel system.
   - Change oil. Remove spark plug and pour about 1 oz of engine oil into cylinder. Replace spark plug and crank engine slowly to distribute oil.

6. Clean air cleaner.

7. Restart engine and operate machine long enough to warm the oil. Check for leaks after machine warms up.

8. Remove battery (negative cable first) and store it in a cool, dry place. Remove corrosion from cables and battery case. Use baking soda to neutralize acid. Place battery on wood (not concrete) and connect a small trickle charger to it to maintain charge; or charge battery every 30 days it is in storage, if necessary.

9. Repaint equipment where necessary.

10. Wipe up lube spills. Dispose of rags and trash properly.

11. Store equipment in a clean, dry, ventilated location.

12. If the engine to be stored for a long period of time, refer to your engine owner's manual.

13. Clean and drain lubrication hoses. Store indoors to minimize UV damage.

REMOVING FROM STORAGE

1. Clean equipment thoroughly.
2. Check to make sure all decals are clean and readable.
3. Check condition of wires and cables. Repair or replace as necessary.
4. Charge battery and install it.
5. Check for leaks. Repair or replace as necessary.
6. Check tank strainer. Clean as needed. If damaged, replace with new.
7. Check condition of all hoses and connections. Tighten, repair or replace with new as needed.
8. Check oil levels in hydraulic tank and engine crankcase. Add oil if necessary (refer to section 8, Fuels & Lubricants for oil specifications).
9. Fill tank with clean water.
10. Refer to your engine owner’s manual on how to restore engine to service.
11. Review this Operation Manual.

Troubleshooting

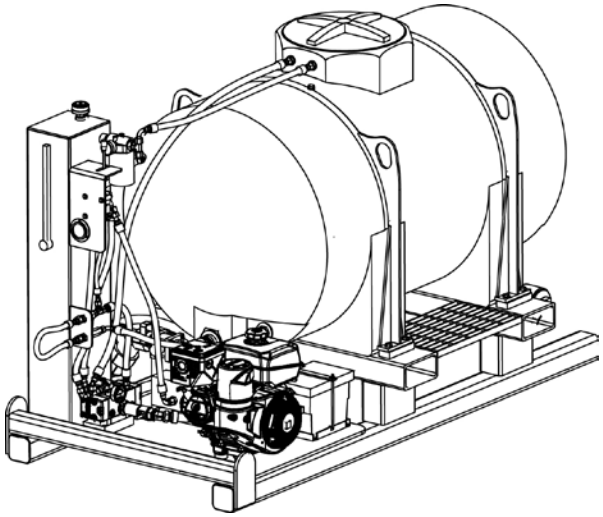
NOTICE For additional engine troubleshooting information, refer to your engine owner's manual.

Problem	Cause	Solution
Engine does not start.	Fuel shutoff is in the OFF position.	Move fuel shutoff in ON position.
	No fuel or improper fuel in fuel tank.	Fill fuel tank.
	Selector valve not in neutral position.	Move selector to neutral position.
	Low oil level.	Add oil to engine crankcase.
	Engine overloaded.	Release load.
	Dirty air cleaner.	Replace air cleaner.
	Air cleaner cover in incorrect operation position.	35°-40°F & below - Cold weather 35°-40°F & Above - Normal
	If engine still does not start, contact your Akkerman Aftermarket Support Representative.	
Pump cannot reach maximum pressure.	Pump shaft control in bypass mode.	Reset to lubrication/jetting/washer mode.
	Relief valve is not set properly.	Adjust relief to 2,500 psi max.
	If max. pressure still cannot be reached, contact your Akkerman Aftermarket Support Representative.	
Lubrication pump is pulsating.	Air in water supply.	Add more water/solution in tank and check pump inlet connections.
	Dirty tank strainer.	Clean tank strainer.
	Outlet cam lock is not engaged.	Be sure cam lock is fully engaged.
	Hydraulic oil level is low.	Fill hydraulic oil tank as needed.
	If pump continues to pulsate, contact your Akkerman Aftermarket Support Representative.	
No water discharge out of pump.	No water in tank.	Fill tank.
	Selector is in neutral or mixer position.	Move selector to Pump position.
	Ball valve on tank closed.	Open tank ball valve.
	Strainer plugged.	Clean strainer.
	Inlet hose damaged.	Replace hose.
	Air lock between tank and strainer.	Release air lock by loosening strainer until fluid flows.
	If no water still does not discharge out of pump, contact your Akkerman Aftermarket Support Representative.	
Mixer not functioning.	Selector valve is in neutral position.	Move selector to Mixing position.
	Mixer control is in OFF position.	Move control to Mixer ON position.
	Hydraulic oil level is low.	Fill hydraulic oil tank as needed.
	If mixer is still not functioning contact your Akkerman Aftermarket Support Representative.	

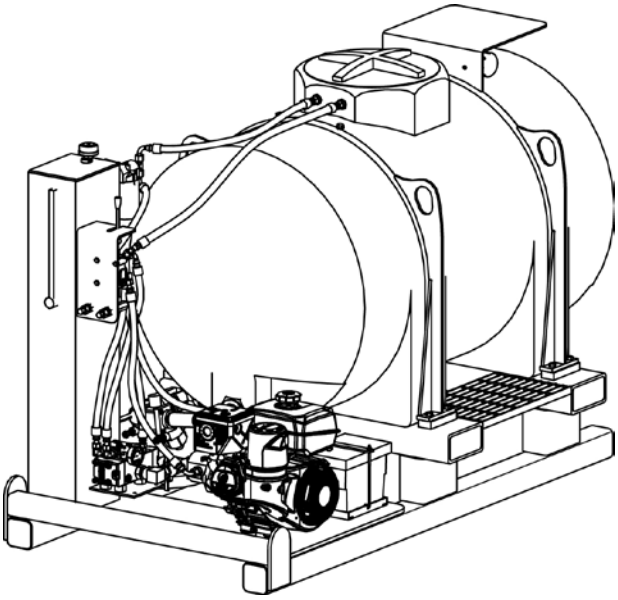
NOTES

Specifications

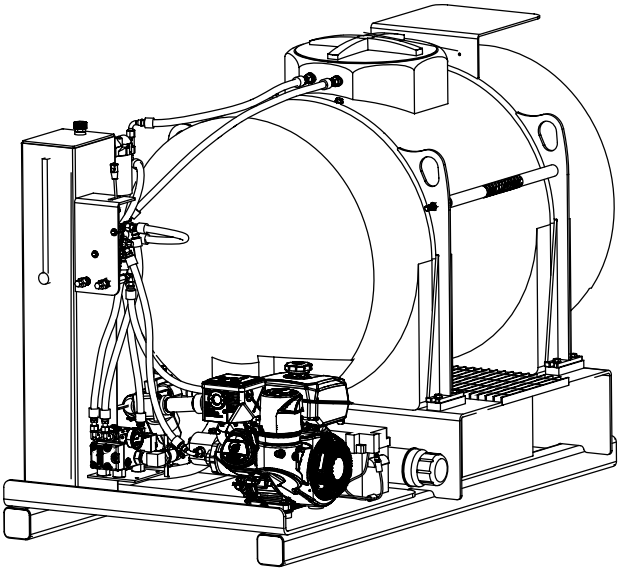
1325B BENTONITE & LUBRICATION PUMP



SN FA08269F-01 thru 03



SN FA08269F-04 thru 71



SN FA08269F-72 & After

Dimensions:

Height ..... 58 in. (1,473 mm)
Width ..... 46.5 in. (1,181 mm)
Length ..... 88.25 in. (2,242 mm)
Weight (empty tank)..... 1,000 lbs. (454 kg)
(full tank)..... 3,700 lbs. (1,678 kg)

Power Unit:

Gasoline Engine @ 3,600 rpm ..... 14 HP (10.4 kW)

Drive System ..... Direct Drive

Agitator ..... Hydraulic-Driven, In-tank

Fluid Pump

Pump Flow
1,000 psi ..... 6 gpm (22.7 L/min)
1,500 psi ..... 4 gpm (15.1 L/min)
Pressure Rating (Max.) .....2,000 psi (13,790 kPa)
Capability ..... solution up to 100 seconds (MF)
MF - Marsh Funnel

Fluid Capacities

Fuel Tank..... 1.8 gal. (6.8 L)
Water Tank ..... 325 gal (1,230 L)
Engine Oil* ..... 1.16 qt (1 L)
Hydraulic Reservoir ..... 15 gal. (57 L)

* Oil level must be within the crosshatch marks of the dipstick.

TORQUE CHART

Use these torque values as a guideline when tightening hardware unless otherwise specified in this manual.

Lubricated Coarse UNC Threads Grade 8 Fasteners			**Lubricated Fine UNF Threads Grade 8 Fasteners**		
Bolt Size	**Torque ft. lbs.**	**(N·m)**	**Bolt Size**	**Torque ft. lbs.**	**(N·m)**
1/4 - 20	10	(14)	1/4 - 28	11	(15)
5/16 - 18	20	(27)	5/16 - 24	22	(30)
3/8 - 16	35	(47)	3/8 - 24	39	(53)
7/16 - 14	56	(76)	7/16 - 20	62	(84)
1/2 - 13	85	(115)	1/2 - 20	96	(130)
9/16 - 12	123	(167)	9/16 - 18	137	(186)
5/8 - 11	170	(231)	5/8 - 18	192	(260)
3/4 - 10	301	(408)	3/4 - 16	336	(456)
7/8 - 9	450	(610)	7/8 - 14	500	(678)
1 - 8	680	(922)	1 - 12	740	(1003)
1-1/8 - 7	960	(1302)	1-1/8 - 12	1030	(1397)
1-1/4 - 7	1360	(1844)	1-1/4 - 12	1500	(2034)
1-1/2 - 6	2360	(3200)	1-1/2 - 12	2660	(3607)

Identification Numbers

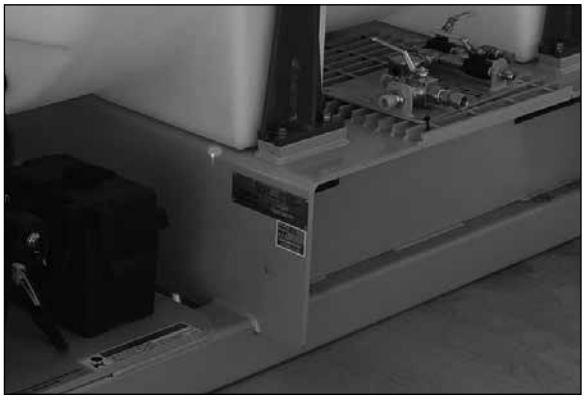
Model and serial numbers are required when ordering parts or requesting service information. Record your model and serial numbers below.

1325B BENTONITE & LUBRICATION PUMP

Model Number _____

Serial Number _____

Earlier models



Later models

NOTES

Safety Data Sheets

The Federal Occupational, Safety, and Health Administration (OSHA) Standard 29 CFR 1910.1200, require that specific safety data sheets (SDS) be available to employees before operating this equipment. This may include information on substances contained in this equipment such as fuel and gear lubricant.

Akkerman Inc. will provide, at no cost, SDS which apply to its product line. Simply contact your Akkerman Aftermarket Support representative for a copy.

To ensure a prompt response to your SDS request, include your return address (including zip or postal code) and the equipment's model numbers and serial numbers with your request.

NOTES

Warranty

Akkerman, Inc. warrants that all equipment manufactured by it be free from defects due to workmanship or material when normally used and serviced for a period of 90 days from the date of shipment by Akkerman, Inc. Normal wear and tear to the equipment, including, but not limited to cutter teeth, filters, etc. are not covered by this warranty. Akkerman, Inc. does not warrant that the equipment meets the requirements of any particular safety code or rule governing equipment classification. If the Customer has questions about local safety codes, rules or ordinances, authorities local to the project should be consulted.

In order to be considered as a potential warranty claim, the components in question must be returned to Akkerman, Inc. (freight prepaid) for factory inspection and analysis, and determination of warranty applicability. No warranty is provided for electronics or electrical components of any kind. The validity of all warranty claims are subject to the discretion and determination of the Akkerman Aftermarket Support Department. All such determinations are final.

NOTES

Parts

Contents

INTRODUCTION

This parts section of the manual contains assembly illustrations of the Akkerman 1325B Bentonite & Lubrication Pump. The illustrations in this manual are intended to show typical construction of various parts. In some instances, the details of parts illustrated may not exactly represent their actual appearance, but will help to identify parts performing the same functions.

LOCATING PARTS
This parts section is organized to help you locate parts information quickly. An Alphabetical Index, Section 17, is provided to determine the page number of the assembly a part is used. If the part number is known,the Numerical Index, Section 18, can also be utilized to find the page number of the assembly.

USE GENUINE AKKERMAN PARTS
The use of second-rate parts could affect the efficient performance of the Bentonite & Lubrication Pump. ALWAYS use genuine Akkerman parts.

PARTS ORDERING
To order fast, accurate, and reliable parts service, call (800) 533-0386, (507) 567-2261, or fax (507) 567-2720, and provide the following information.

1. Model Number
2. Serial Number
3. Part Number, Description, and Quantity
4. Shipping Preference

MEASUREMENTS
The unit of measure in this manual is in inches unless indicated otherwise.

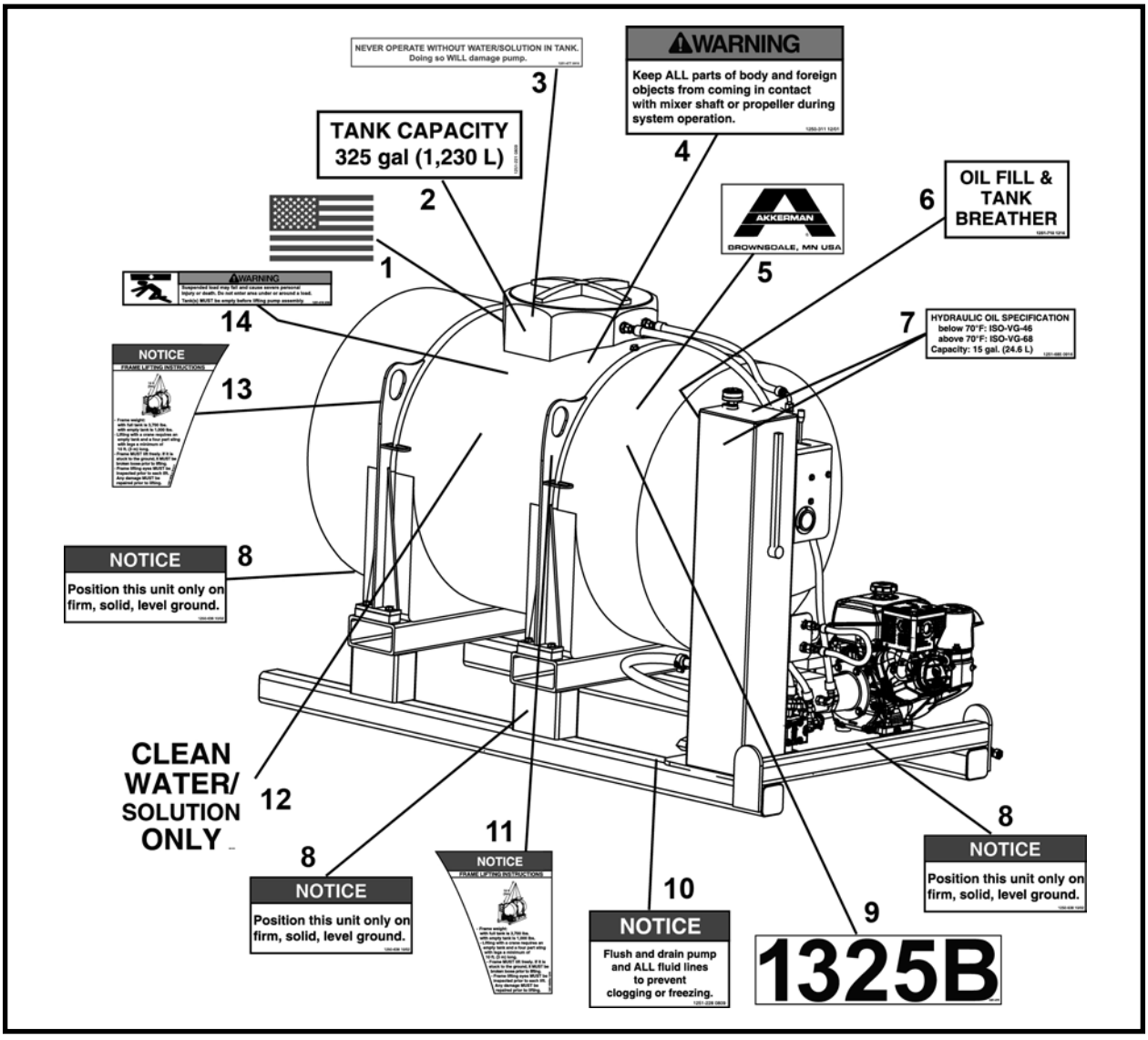
HARDWARE SPECIFICATION
All Akkerman products are assembled with SAE Grade 8 bolts, nuts, and washers. ALWAYS use matched fastener hardware when replacing or repairing the unit.

If you find any errors with this manual or have any suggestions for improvement, please let us know. Email your comments via the Akkerman web site (Contact Us web page), or mail your suggestions to: Akkerman Inc, ATTN: Technical Publications, 58256 266th Street, Brownsdale, MN 55918.

Akkerman Inc. reserves the right to improve its product without notice or obligation.

1325B BENTONITE & LUBRICATION PUMP DECALS - LEFT VIEW, 1255-012

1325B (SN FA08269F-01 THRU 03)



ITEM	QTY	PART NO.	DESCRIPTION
0	1	1255-012	KIT, Decal 1325B
1	1	1250-558	DECAL, USA Flag Small
2	1	1251-221	DECAL, Tank Capacity 325 gal
3	1	1251-677	DECAL, Never Operate Without Water/Solution
4	1	1250-311	DECAL, Warning, Contact With Mixer
5	1	1251-246	DECAL, Akkerman, Large
6	1	1251-710	DECAL, Oil Fill & Tank Breather
7	2	1251-685	DECAL, Hydraulic Oil Specification
8	3	1250-638	DECAL, Notice Position Level Ground
9	1	1251-675	DECAL, Model 1325B
10	1	1251-228	DECAL, Notice, Flush Pump & Lines
11	1	1251-684RA	DECAL, Notice, Lifting Instructions - Right
12	1	1251-678	DECAL, Clean Water/Solution Only
13	1	1251-684LA	DECAL, Notice, Lifting Instructions - Left
14	1	1251-018	DECAL, Warning, Suspended Loads

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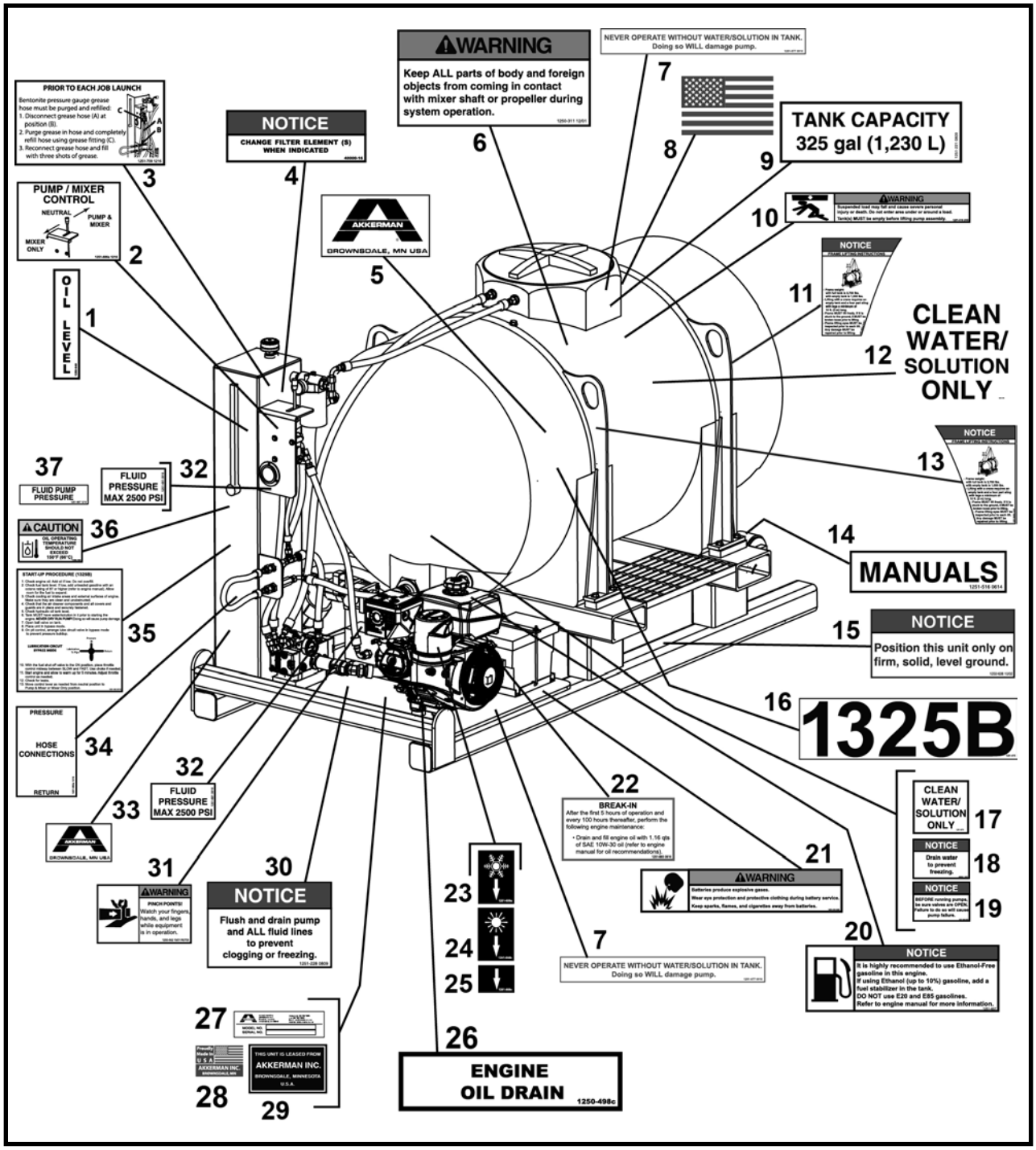
1325B BENTONITE & LUBRICATION PUMP DECALS - RIGHT VIEW, 1255-012

1325B (SN FA08269F-01 THRU 03)



ITEM	QTY	PART NO.	DESCRIPTION
0	1	1255-012	KIT, Decal 1325B
1	1	1250-649	DECAL, Oil Level
2	1	1251-686A	DECAL, Pump/Mixer Control
3	1	1251-709	DECAL, Prior To Each Job Launch
4	1	40000-16	DECAL, Notice, Change Filter Element
5	1	1251-246	DECAL, Akkerman, Large
6	1	1250-311	DECAL, Warning, Contact With Mixer
7	2	1251-677	DECAL, Never Operate Without Water/Solution
8	1	1250-558	DECAL, USA Flag Small

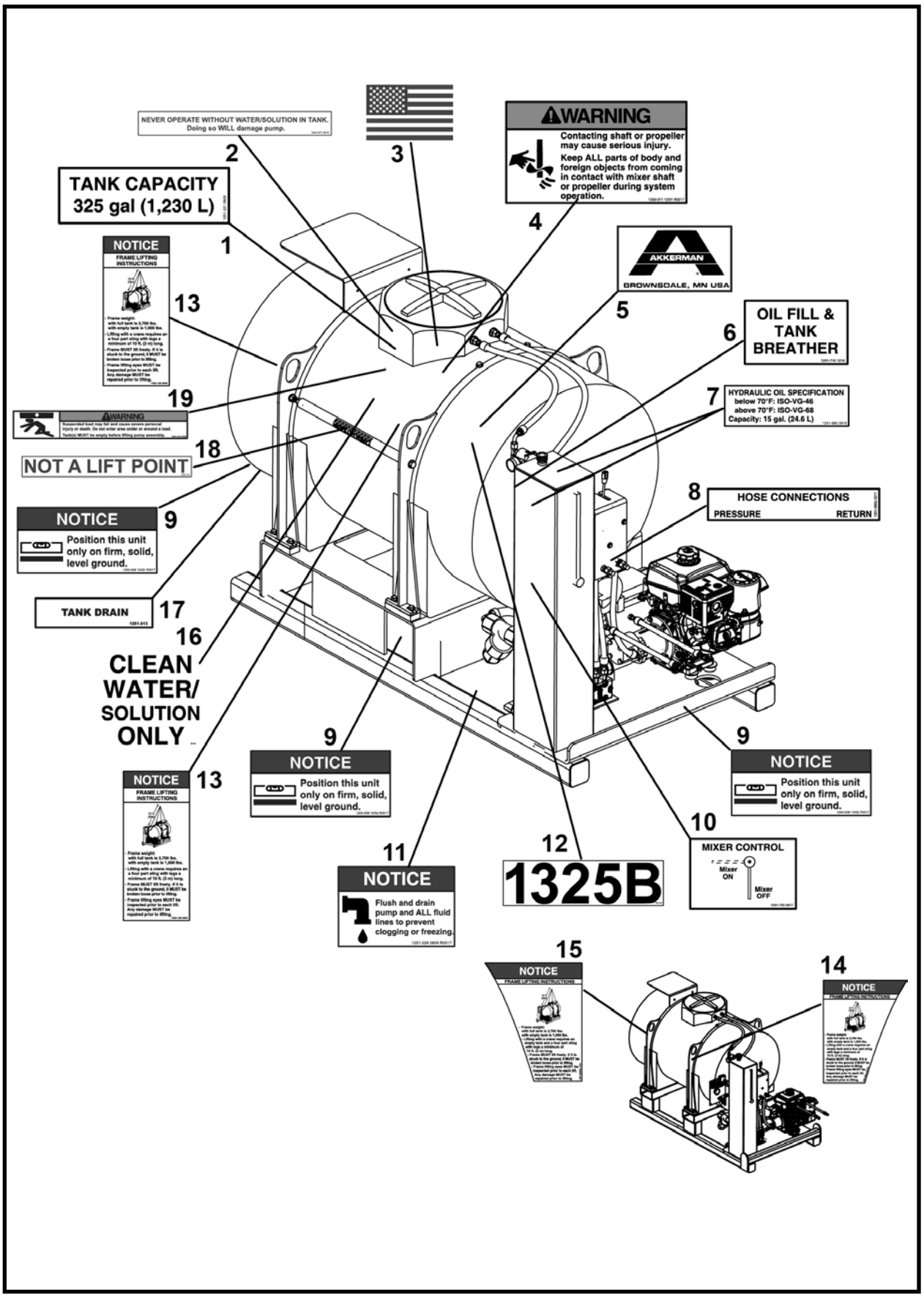
1325B BENTONITE & LUBRICATION PUMP DECALS - RIGHT VIEW, 1255-012

1325B (SN FA08269F-01 THRU 03)

ITEM	QTY	PART NO.	DESCRIPTION
9	1	1251-221	DECAL, Tank Capacity 325 gal
10	1	1251-018	DECAL, Warning, Suspended Loads
11	1	1251-684LA	DECAL, Notice, Lifting Instructions - Left
12	1	1251-678	DECAL, Clean Water/Solution Only
13	1	1251-684RA	DECAL, Notice, Lifting Instructions - Right
14	1	1251-516	DECAL, Manuals
15	1	1250-638	DECAL, Notice Position Level Ground
16	1	1251-675	DECAL, Model 1325B
17	1	1251-679	DECAL, Clean Water/Solution Only
18	1	A3000-1	DECAL, Notice, Drain Water
19	1	1251-023	DECAL, Notice, Open Valves
20	1	1251-657	DECAL, Notice, Use Ethanol-Free Gasoline
21	1	1251-016	DECAL, Warning, Battery Explosive
22	1	1251-683	DECAL, Break-In
23	1	1251-658A	DECAL, Air Cleaner Operation Winter
24	1	1251-658B	DECAL, Air Cleaner Operation Summer
25	1	1251-658C	DECAL, Air Cleaner Arrow
26	1	1250-498	DECAL, Engine Oil Drain
27	1	REF	PLATE, Serial Number
28	1	1250-544	DECAL, Made in USA
29	1	1250-098	DECAL, Lease (Used on Leased Equipment)
30	1	1251-228	DECAL, Notice, Flush and Drain Pump
31	1	1250-562	DECAL, Warning, Pinch Points
32	2	1251-681	DECAL, Fluid Pressure 2,500 psi
33	1	1251-247	DECAL, Akkerman, Medium
34	1	1251-680A	DECAL, Hose Connections
35	1	1251-682	DECAL, Start-Up Procedure
36	1	1250-483	DECAL, Caution, Oil Operating Temperature
37	1	1251-687	DECAL, Fluid Pump Pressure

1325B BENTONITE & LUBRICATION PUMP DECALS - LEFT VIEW, 1255-011

1325B (SN FA08269F-04 & After)



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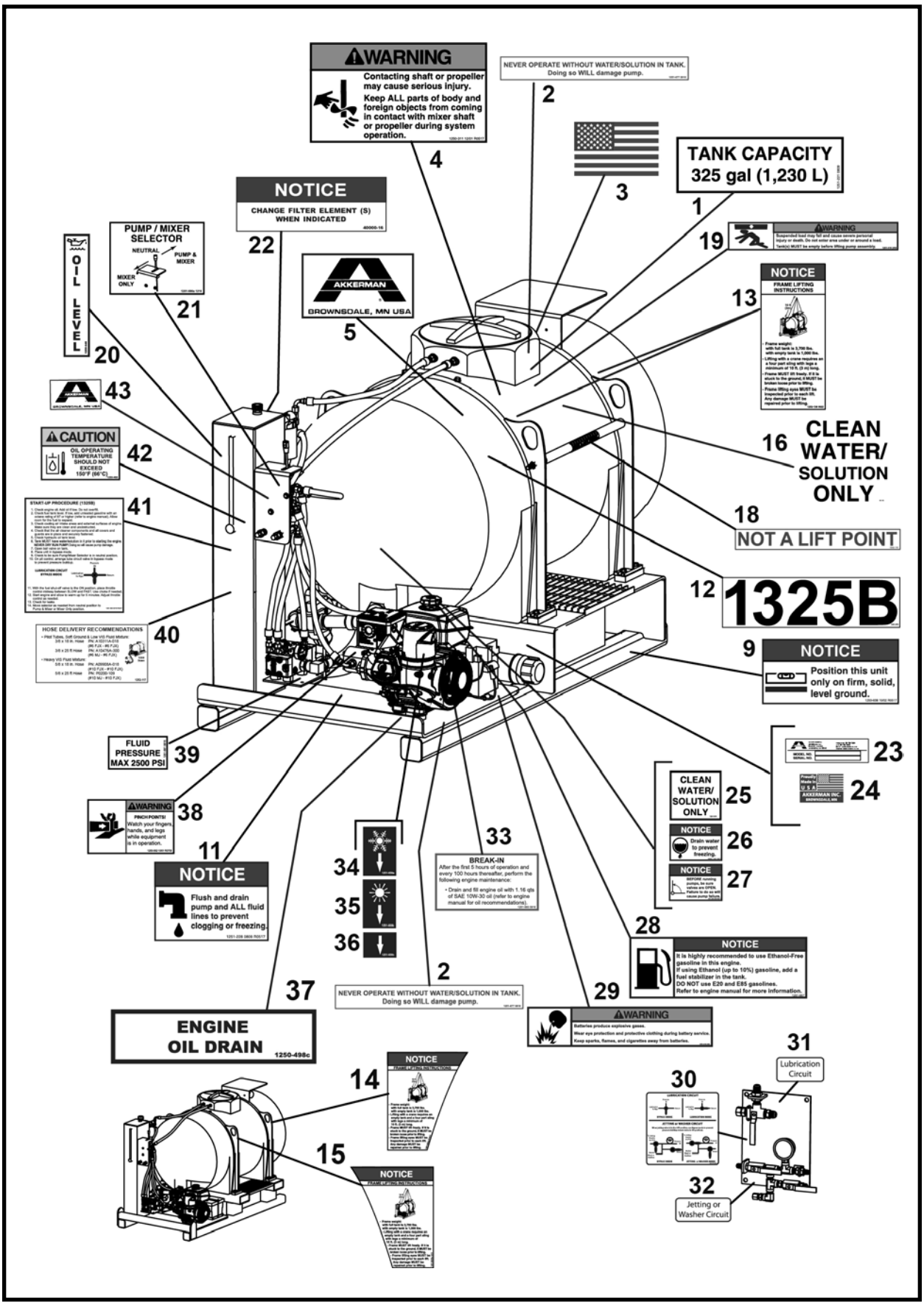
1325B BENTONITE & LUBRICATION PUMP DECALS - RIGHT VIEW, 1255-011

1325B (SN FA08269F-04 & After)



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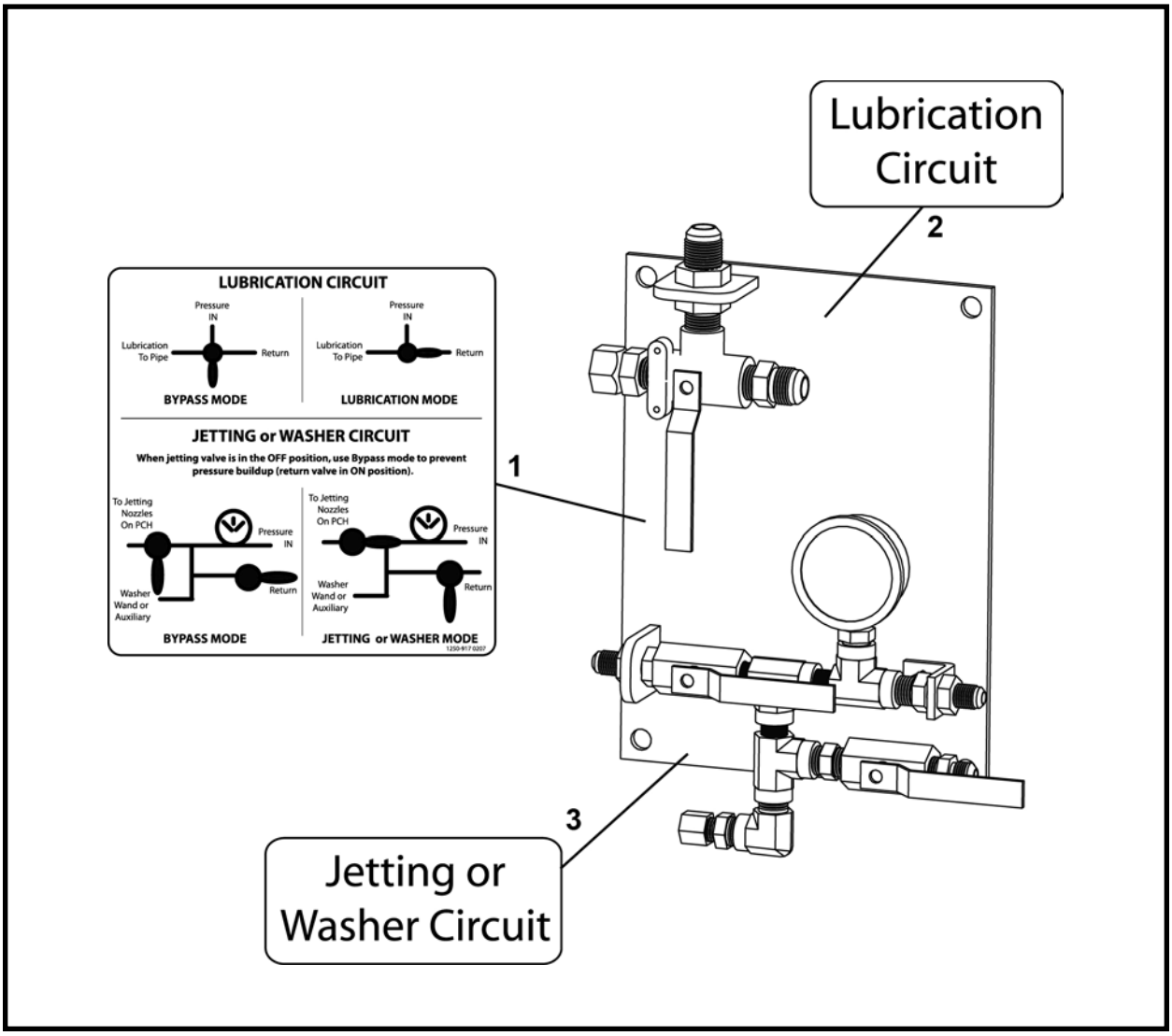
1325B BENTONITE & LUBRICATION PUMP DECALS, 1255-011

1325B (SN FA08269F-04 & After)

ITEM	QTY	PART NO.	DESCRIPTION
0	1	1255-011	KIT, Decal 1325B
1	2	1251-221	DECAL, Tank Capacity 325 gal
2	2	1251-677	DECAL, Never Operate Without Water/Solution
3	2	1250-558	DECAL, USA Flag Small
4	2	1250-311	DECAL, Warning Contact With Mixer
5	2	1251-246	DECAL, Akkerman, Large
6	1	1251-710	DECAL, Oil Fill & Tank Breather
7	2	1251-685	DECAL, Hydraulic Oil Specification
8	1	1251-680B	DECAL, Hose Connections
9	4	1250-638	DECAL, Notice Position Level Ground
10	1	1251-753	DECAL, Mixer Control (Later Models)
11	2	1251-228	DECAL, Notice Flush Pump & Lines
12	2	1251-675	DECAL, Model 1325B
13*	4	1252-138	DECAL, Notice Lifting Instructions (With Brace)
14	2	1251-684LA	DECAL, Notice Lifting Instructions - Left (Without Brace)
15	2	1251-684RA	DECAL, Notice Lifting Instructions - Right (Without Brace)
16	2	1251-678	DECAL, Clean Water/Solution Only
17	1	1251-813	DECAL, Tank Drain
18	2	1252-110	DECAL, Not A Lift Point
19	2	1251-018	DECAL, Warning, Suspended Loads
20	1	1250-649	DECAL, Oil Level
21	1	1251-686A	DECAL, Pump/Mixer Selector
22	1	40000-16	DECAL, Notice Change Filter Element
23	1	REF	PLATE, Serial Number
24	1	1250-544	DECAL, Made In USA
25	1	1251-679	DECAL, Clean Water/Solution Only
26	1	A3000-1	DECAL, Notice Drain Water
27	1	1251-023	DECAL, Notice Open Valves
28	1	1251-657	DECAL, Notice Use Ethanol-Free Gasoline
29	1	1251-016	DECAL, Warning Battery Explosive
30	1	1250-917A	DECAL, Lubrication-Jetting-Washer Control
31	1	1250-917B	DECAL, Lubrication Circuit
32	1	1250-917C	DECAL, Jetting or Washer Circuit
33	1	1251-683	DECAL, Break-In
34	1	1251-658A	DECAL, Air Cleaner Operation Winter
35	1	1251-658B	DECAL, Air Cleaner Operation Summer
36	1	1251-658C	DECAL, Air Cleaner Arrow
37	1	1250-498	DECAL, Engine Oil Drain
38	1	1250-562	DECAL, Warning Pinch Points
39	1	1251-681	DECAL, Fluid Pressure 2500 PSI
40	1	1252-117	Decal, Hose Delivery Recommendations
41	1	1251-682	DECAL, Start-Up Procedure
42	1	1250-483	DECAL, Caution, Oil Operating Temperature
43	1	1251-247	DECAL, Akkerman, Medium

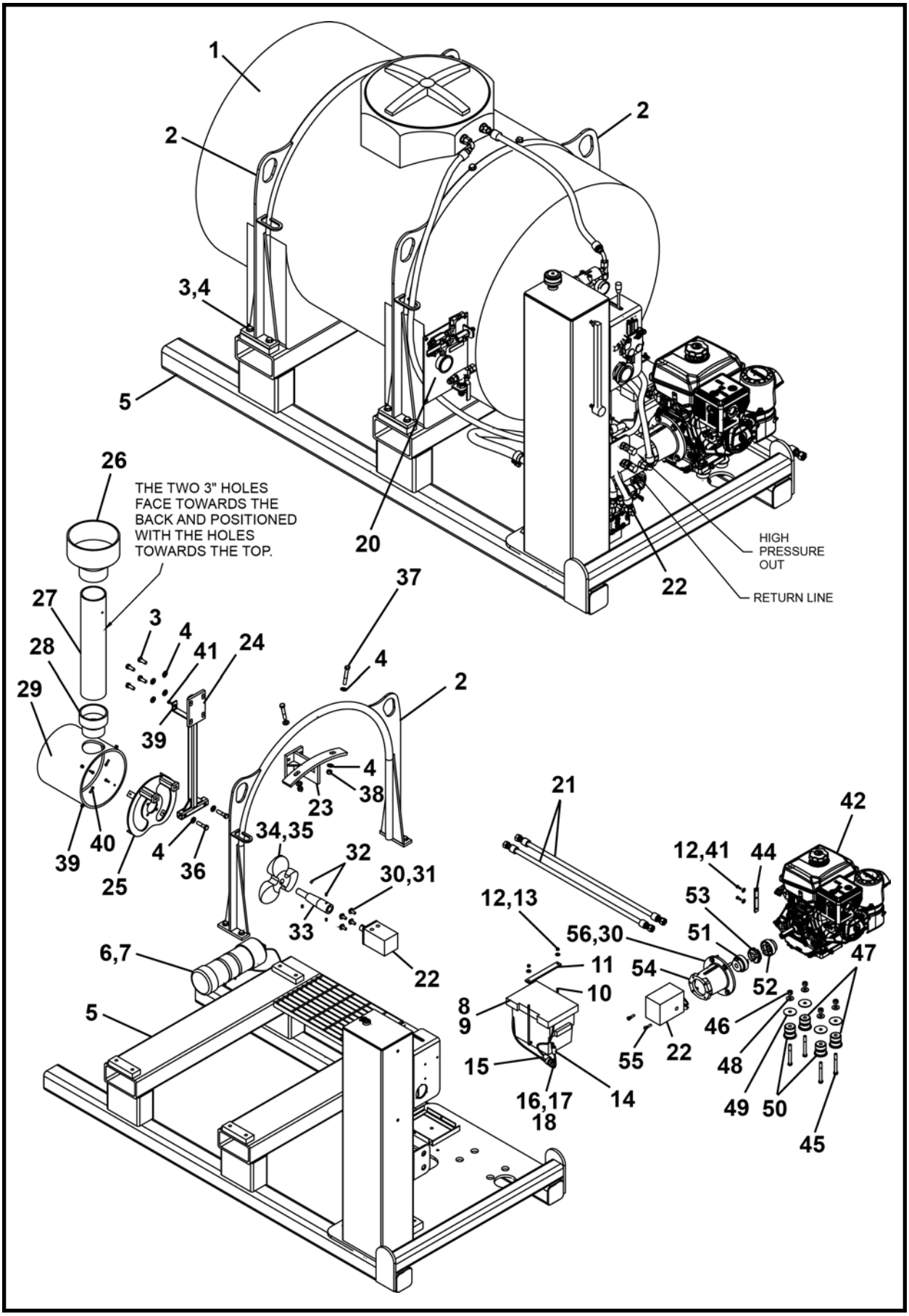
* If equipped with tank brace assemblies, unit may be hoisted with a full tank.

JETTING & LUBRICATION PUMP SHAFT CONTROL DECALS



ITEM	QTY	PART NO.	DESCRIPTION
1	1	1250-917A	DECAL, Lubrication-Jetting-Washer Control
2	1	1250-917B	DECAL, Lubrication Circuit
3	1	1250-917C	DECAL, Jetting or Washer Circuit

1325B BENTONITE & LUBRICATION PUMP ASSEMBLY, FA08269F
SN: FA08269F-01 THRU 03



1325B BENTONITE & LUBRICATION PUMP ASSEMBLY, FA08269F
SN: FA08269F-01 THRU 03

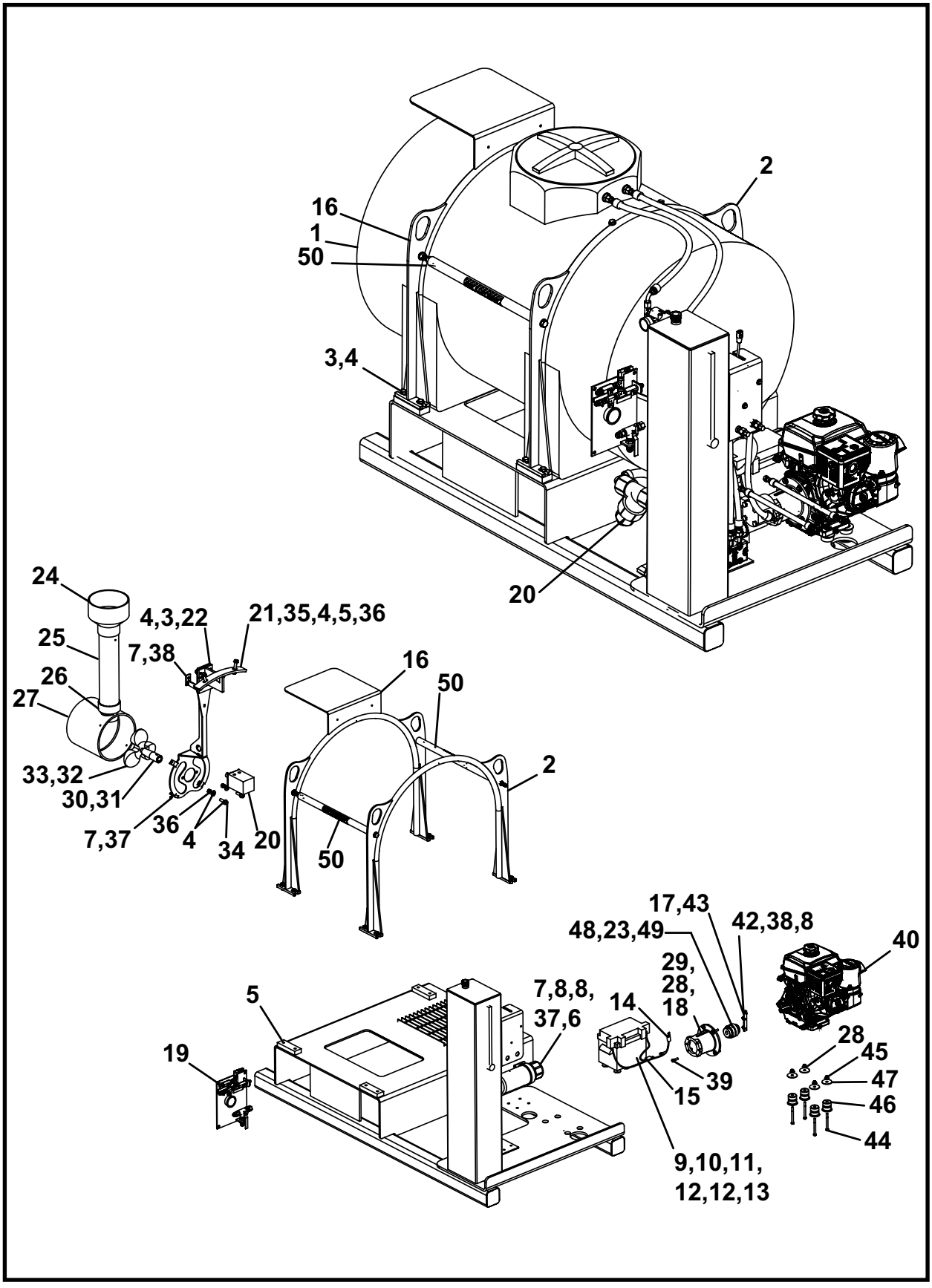
ITEM	QTY	PART NO.	DESCRIPTION
0	1	FA08269F	1325B BENTONITE & LUBRICATION PUMP ASSEMBLY
1	1	A48401P	TANK, 325 Gallon (Includes item 1a)
1a	1	P0258-003A	LID, 325 Gallon Tank
2	2	A47891A	LIFT EYE
3	28	P0001-08-005	BOLT, Hex 1/2 UNC x 1.25
4	18	P0040-008	WASHER, Hardened Flat 1/2
5	1	A08270A	SKID, Pump
6	1	A45904A	ASSEMBLY, Document Tube (Includes items 6a - 6c)
6a	2	P0035-001A	SCREW, Self Drilling #8 x 5/8
6b	2	P0040-001	WASHER, #8
6c	14 LI	P0094-017	CHAIN, #10 Single Jack
7	2	P0201-307	CLAMP
8	1	P0064-126	BATTERY
9	1	P0064-126A	BOX, Battery
10	2	A47870P	ROD, Battery Box Clamp
11	1	A47871P	BAR, Battery Cross Bar Clamp
12	4	P0040-004	WASHER, Hardened Flat 1/4
13	2	P0003-04-000	NUT, 1/4 UNC
14	1	A47872A-023	ASSEMBLY, Positive Cable
15	1	A47873A-023	ASSEMBLY, Negative Cable
16	1	P0055-126	CLAMP, Tubing
17	2	P0001-05-003	BOLT, Hex 5/16 UNC x .75
18	2	P0040-005	WASHER, Hardened Flat 5/16
19	1	A47879P	SUPPORT, Strainer
20*	1	A43749A	CONTROL, Jetting & Lube Shaft
21**	2	P0201-313	HOSE, Pit
22*	1	A08278A	HYDRAULIC & WATER ASSEMBLY
23	1	A48424A	MOUNT, Agitator
24	1	A48473A	MOUNT, Agitator Brace
25	1	A48412A	AGITATOR, Front
26	1	P0258-066	COUPLING, Reducing
27	1	A48477P	TUBE, Bentonite Mix
28	1	P0258-067	COUPLING, Reducing
29	1	A48478P	TUBE, Agitator Mix
30	8	P0040-006	WASHER, Hardened Flat 3/8
31	4	P0001-06-004	BOLT, Hex 3/8 UNC x 1
32	4	P0032-002	SCREW, Socket Set 5/16 x .375
33	1	A48479P	SHAFT, Agitator
34	1	A48411P	PROPELLER
35	1.7 LI	P0047-003	KEY
36	2	P0001-08-008	BOLT, Hex 1/2 UNC x 2
37	2	P0001-08-008	BOLT, Hex 1/2 UNC x 3
38	2	P0013-08A-000	NUT, Nyloc 1/2 UNC
39	5	P0013-04-000	NUT, Lock 1/4
40	4	P0020-14-205	SCREW, Truss Head 1/4 UNC x 1
41	3	P0001-04-003	BOLT, Hex 1/4 UNC x .75
42	1	P0125-146	ENGINE, 14HP Electric Start
43***	1.4 QT	P0126-005	OIL, SAE10W-30
44	1	A47874P	MOUNT, Volt Reg
45	4	P0001-07-016	BOLT, Hex 7/16 UNC x 4
46	4	P0013-07-000	LOCK NUT, 7/16UNC
47	2	P0059-082	MOUNT, Vibration Damping
48	4	P0040-007	WASHER, Hardened Flat 7/16
49	4	A47348P	PLATE, Washer Motor Mount
50	2	P0059-080	MOUNT, Vibration Damping
51	1	P0305-247	COUPLER
52	1	P0305-240	COUPLING HALF
53	1	P0305-241	INSERT
54	1	P0305-248	MOUNT
55	2	P0001-05-005	BOLT, Hex 5/16 UNC x 1.25
56	4	P0001-06-006	BOLT, Hex 3/8 UNC x 1.5

LI - Linear Inch QT - Quart

* Refer to this section for parts information. ** Hydraulic & Water Assembly, A08278A is no longer available, replace with A08240A. *** Not Shown

1325B BENTONITE & LUBRICATION PUMP ASSEMBLY, FA08269F

SN: FA08269F-04 & After



1325B BENTONITE & LUBRICATION PUMP ASSEMBLY, FA08269F

SN: FA08269F-04 & After

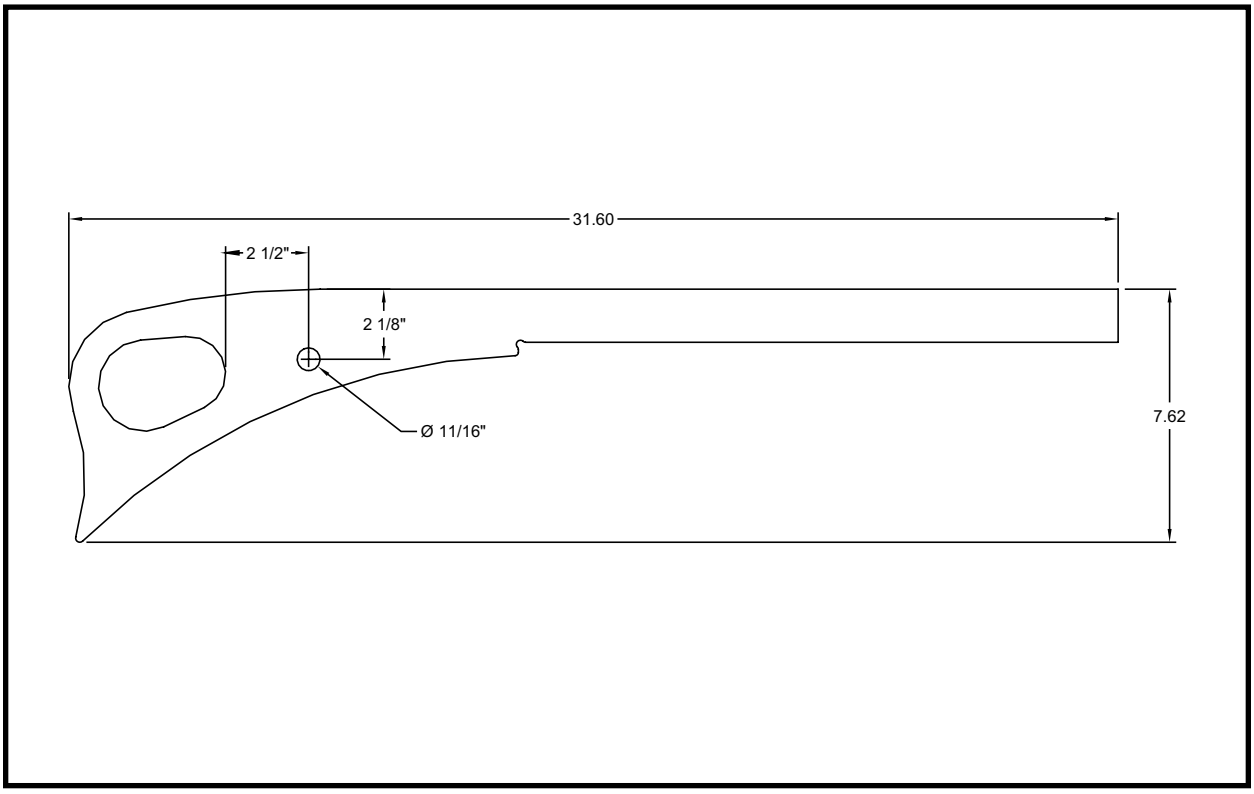
ITEM	QTY	PART NO.	DESCRIPTION
0	1	FA08269F	1325B BENTONITE & LUBRICATION PUMP ASSEMBLY
1	1	A48401P	TANK, 325 Gallon (Includes item 1a)
1a	1	P0258-003A	LID, 325 Gallon Tank
2	1	A47891A	LIFT EYE
3	12	P0001-08-005	BOLT, Hex 1/2 UNC x 1.25
4	20	P0040-008	WASHER, Hardened Flat 1/2
5.1	1	A08270A	SKID, Pump (SN FA08269F-04 thru 16)
5.2	1	A08299A	SKID, Pump (SN FA08269F-17 & After)
6.1	1	P0095-128	CANISTER, Manual (SNFA08269F-91 & Before)
6.2	1	P0095-133	CANISTER, Manual (SNFA08269F-92 & After)
7	7	P0013-04-000	NUT, Nyloc 1/4 x 20
8	6	P0040-004	WASHER, Hardened Flat 1/4
9	1	P0064-126	BATTERY
10	1	P0064-126A	BOX, Battery
11	4	P0001-04-004	BOLT, Hex 1/4 UNC x 1
12	8	P0042-013	WASHER, Hardened 1/4 x 9/32
13	4	P0003-04-000	NUT, 1/4 UNC
14	1	A47872A-023	ASSEMBLY, Positive Cable
15	1	A47873A-023	ASSEMBLY, Negative Cable
16	1	A08283A	SHELF
17	2	P0040-005	WASHER, Hardened Flat 5/16
18	1	P0305-248	MOUNT
19*	1	A43749A	CONTROL, Jetting & Lube Shaft
20.1*	1	A08278A	HYDRAULIC & WATER ASSEMBLY (SN FA08269F-04 thru 16)
20.2*	1	A08297A	HYDRAULIC & WATER ASSEMBLY (SN FA08269F-17 & After)
21	1	A48424A	MOUNT, Agitator
22.1	1	A48473A	MOUNT, Agitator Brace (SN FA08269F-30 & Before) (Includes item 22.1a)
22.1a	1	A48775A	AGITATOR, Front
22.2	1	A08330A	MOUNT, Agitator Brace (SN FA08269F-31 & After)
23	1	P0305-241	INSERT
24	1	P0258-066	COUPLING, Reducing
25	1	A48477P	TUBE, Bentonite Mix
26	1	P0258-067	COUPLING, Reducing
27	1	A48478P	TUBE, Agitator Mix
28	8	P0040-006	WASHER, Hardened Flat 3/8
29	4	P0001-06-006	BOLT, Hex 3/8 UNC x 1.5
30	4	P0032-002	SCREW, Socket Set 5/16 x .375
31	1	A48479P	SHAFT, Agitator
32	1	A48411P	PROPELLER
33	1.75 LI	P0047-003	KEY
34	2	P0031-08-007	SCREW, Socket Head Cap 1/2 UNC x 1.75
35	2	P0001-08-012	BOLT, Hex 1/2 UNC x 3
36	4	P0013-08A-000	NUT, Nyloc 1/2 UNC
37	6	P0020-14-205	SCREW, Truss Head 1/4 UNC x 1
38	3	P0001-04-003	BOLT, Hex 1/4 UNC x .75
39	2	P0031-06-005	BOLT, Hex 5/16 UNC x 1.25
40	1	P0125-146	ENGINE, 14HP Electric Start
41**	1.4 QT	P0126-005	OIL, SAE 10W-30
42	1	A47874P	MOUNT, Volt Reg
43	1	PM08A-1.25-020	BOLT, Hex - Zink
44	4	P0001-06-016	BOLT, Hex 3/8 UNC x 4
45	4	P0013-06A-000	NUT, Nyloc 3/8 UNC
46	4	P0059-080	MOUNT, Vibration Damping
47	4	A47348P	PLATE, Washer Motor Mount
48	1	P0305-247	COUPLER
49	1	P0305-240	COUPLING HALF
50***	2	A61173A	BRACE (SN FA08269F-72 & After)
51**	1	1255-011	KIT, DECAL 1325B (SN FA08269F-04 & After)
52**	REF	1255-012	KIT, DECAL 1325B (SN FA08269F-01 thru 03)
53**	1	050112A	MANUAL, Operation/Parts 1325B

LI - Linear Inch QT - Quart

* Refer to this section for parts information.

** Not Shown *** Order Qty. (2) A61173A Tank Brace Assembly for SN FA08269F-71 & Before, refer to this section.

BENTONITE & LUBRICATION PUMP TANK BRACE ASSEMBLY, A61173A
SN: FA08269F-71 & Before



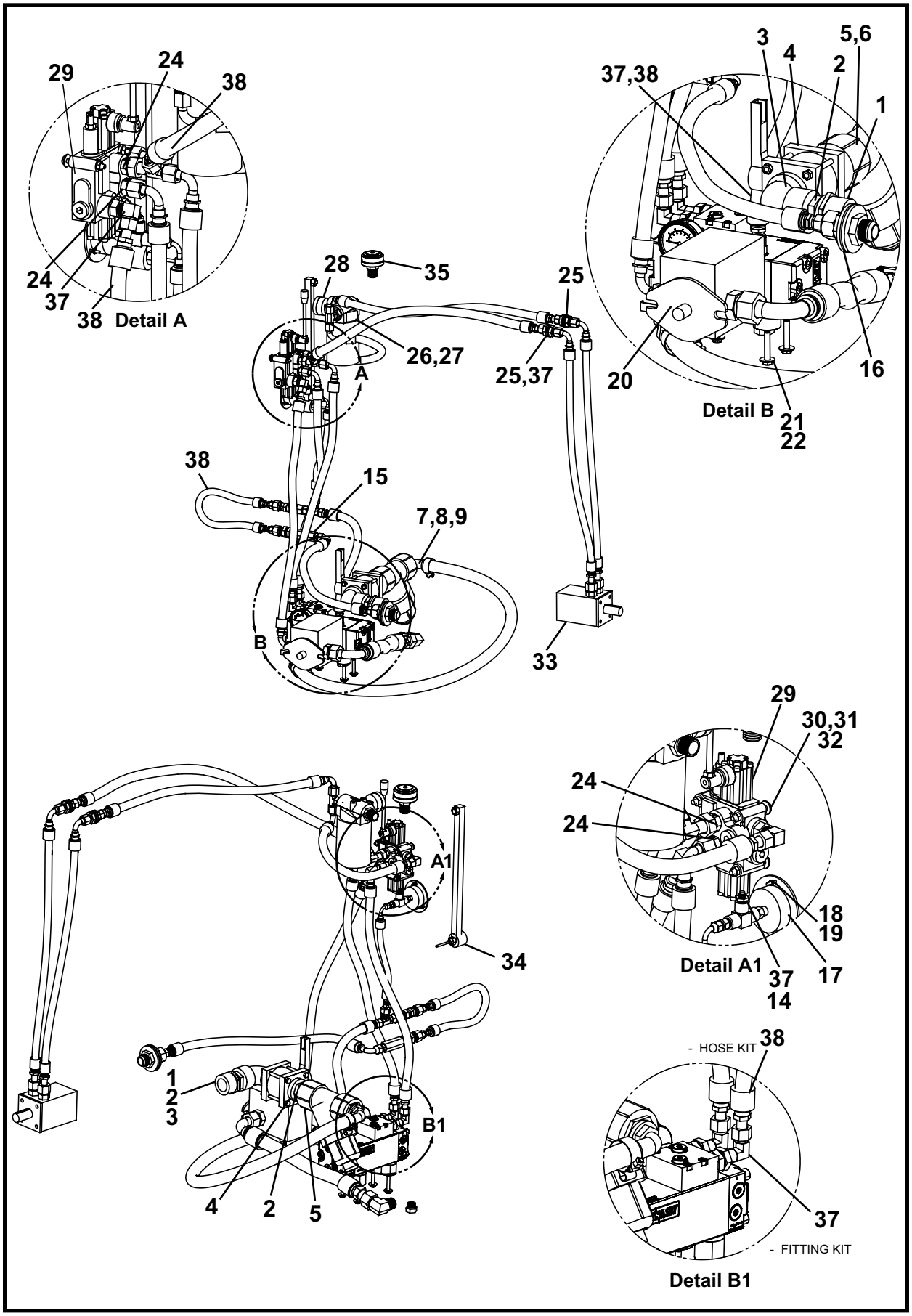
ITEM	QTY	PART NO.	DESCRIPTION
0*	1	A61173A	ASSEMBLY, Tank Brace
1	1	A61177P	ROD, Tank Strap Brace
2	1	P0001-10-006	BOLT, Hex 5/8 UNC x 1.5
3	1	A61176P	ROD, Threaded 5/8 x 6
4	4	P0040-010	WASHER, Hardened Flat 5/8
5	3	P0003-10-000	NUT, 5/8 UNC
6	1	1252-110	DECAL, Not A Lift Point
7**	2	1252-138	DECAL, Notice Lifting Instructions (With Brace)

* Two assemblies are required per pump unit.
** Not included in A61173A assembly.

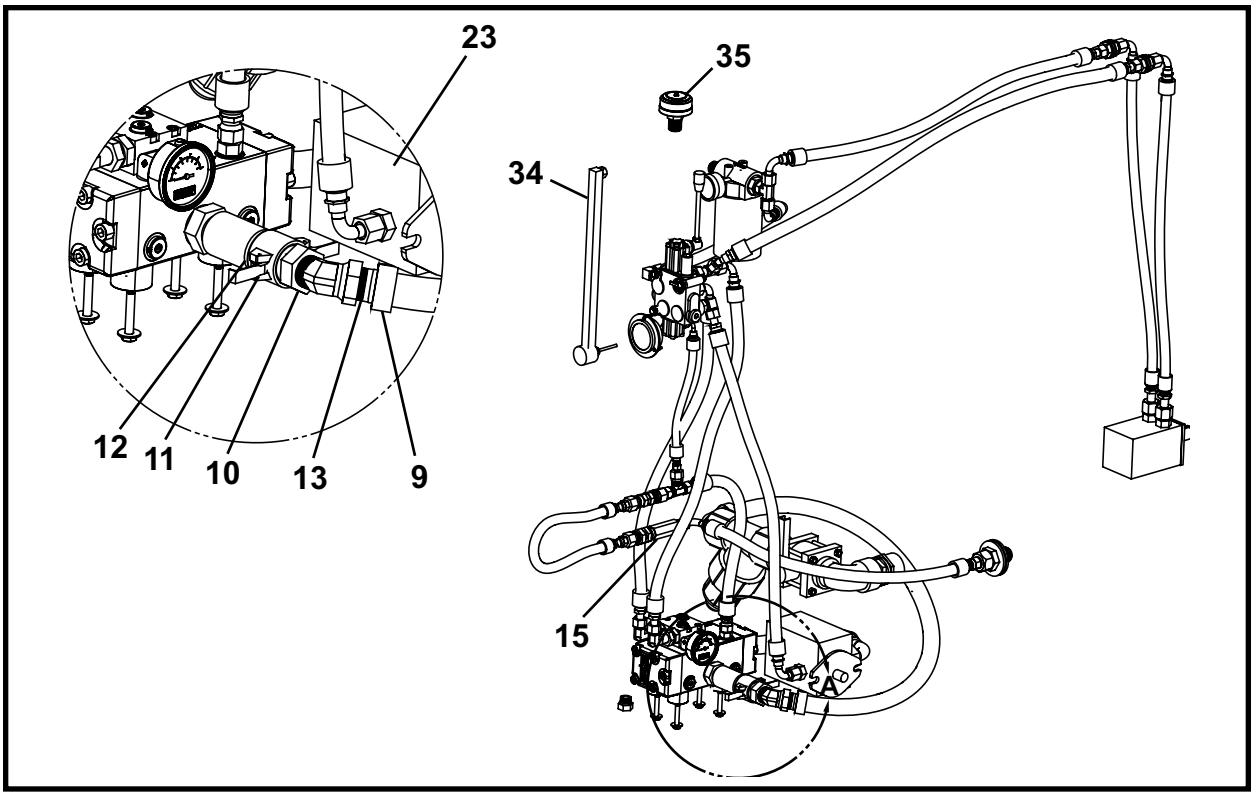
NOTE: The 1325B Bentonite & Lubrication Pump Tank Brace Assembly is used to add tank braces to the tank straps so the 1325B Bentonite & Lubrication Pump can be lifted with a full tank. Refer to the illustration for tank strap drilling and tank brace installation instructions.

NOTES

1325B HYDRAULIC & WATER ASSEMBLY, A08278A
SN: FA08269F-01 THRU 03



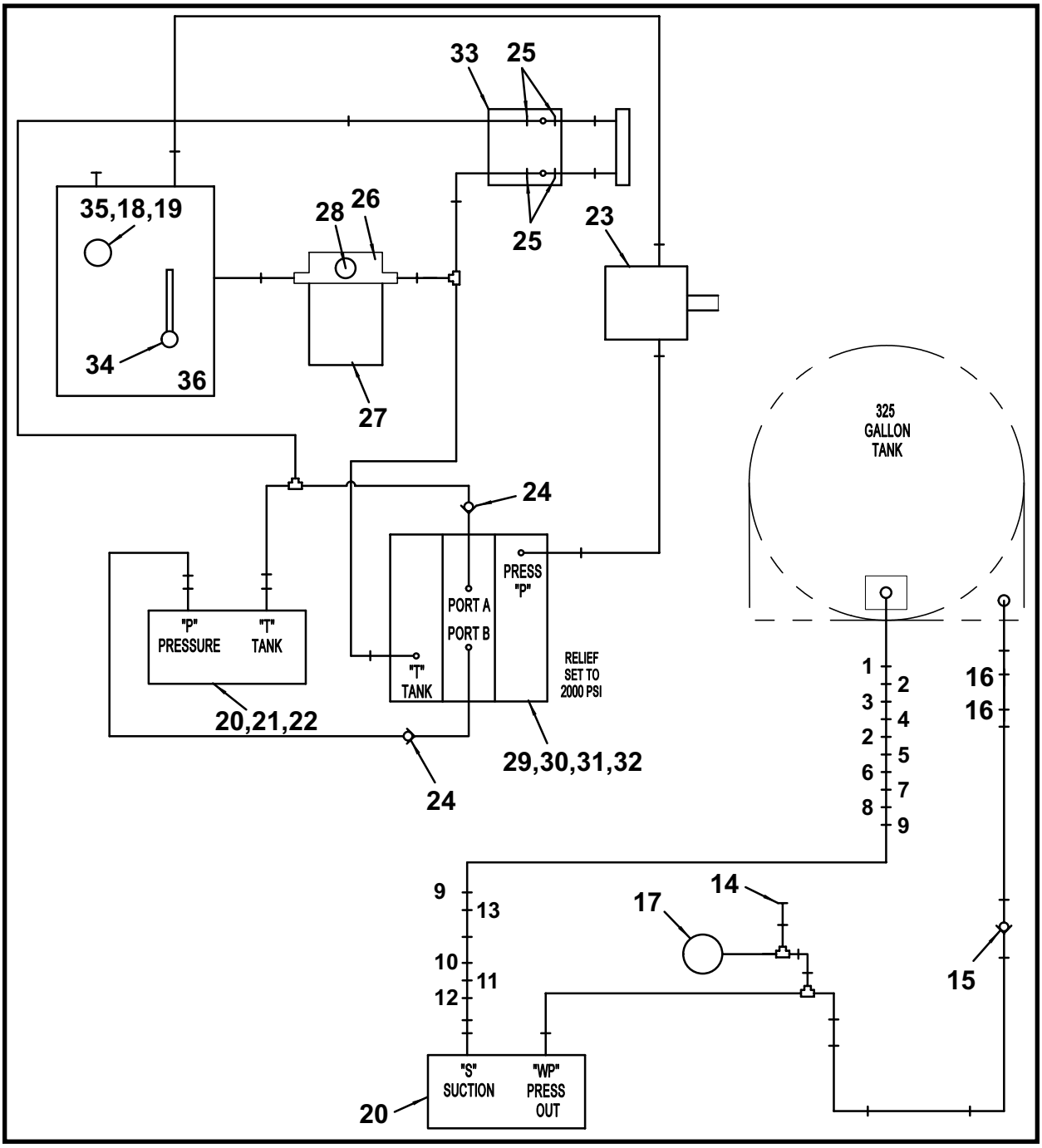
1325B HYDRAULIC & WATER ASSEMBLY, A08278A
SN: FA08269F-01 THRU 03



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08278A	HYDRAULIC & WATER ASSEMBLY
1	1	P0258-004	REDUCER
2	2	P0258-005	NIPPLE, 1 1/2
3	1	P0258-018	ELBOW, 1-1/2
4	1	P0258-006	VALVE, 1 1/2
5	1	P0258-012	STRAINER, Line 1-1/2 (Includes item 5a)
5a	1	P0085-338	O-RING
6	1	P0251-800	FILTER, Screen
7	1	P0258-013	BUSHING, Reducer
8	1	P0258-015	SHANK, Hose
9	2	P0201-299	CLAMP
10	1	P0100-024	PLUG
11	1	P0100-023	CAM LOCK
12	1	P0400-005	COUPLING, Pipe
13	1	P0423-124	ADAPTER, Hose
14	1	P0063-004	FITTING, Grease 1/8
15	1	P0302-102	VALVE, Check
16	2	PM40-030	WASHER, Flat - M30
17	1	P0301-123	GAUGE
18	3	P0017-06-750	SCREW, Round Machine 6/32 x .75
19	3	P0013-02-000	NUT, Nyloc 6-32
20***	1	P0303-399	PUMP, Bentonite (Includes items 20a - 20b)
20a	1	P0303-399A	KIT, Seal
20b	1	P0303-399B	KIT, Water Valve
21	4	P0040-005	WASHER, Hardened Flat 5/16
22	4	PM08A-1.25-065	SCREW, Cap M8
23	1	P0303-400	PUMP
24	2	P0302-701	VALVE, Check
25	4	P0040-012	WASHER, Hardened Flat 3/4
26	1	P0309-217	FILTER HEAD
27	1	P0309-217A	ELEMENT, Filter
28	1	P0301-105	GAUGE, Filter Indicator
29	1	P0302-696	VALVE (Includes item 29a)
29a	1	P0302-696A	CARTRIDGE, Valve

(Continued on next page)

1325B HYDRAULIC & WATER ASSEMBLY, A08278A
SN: FA08269F-01 THRU 03

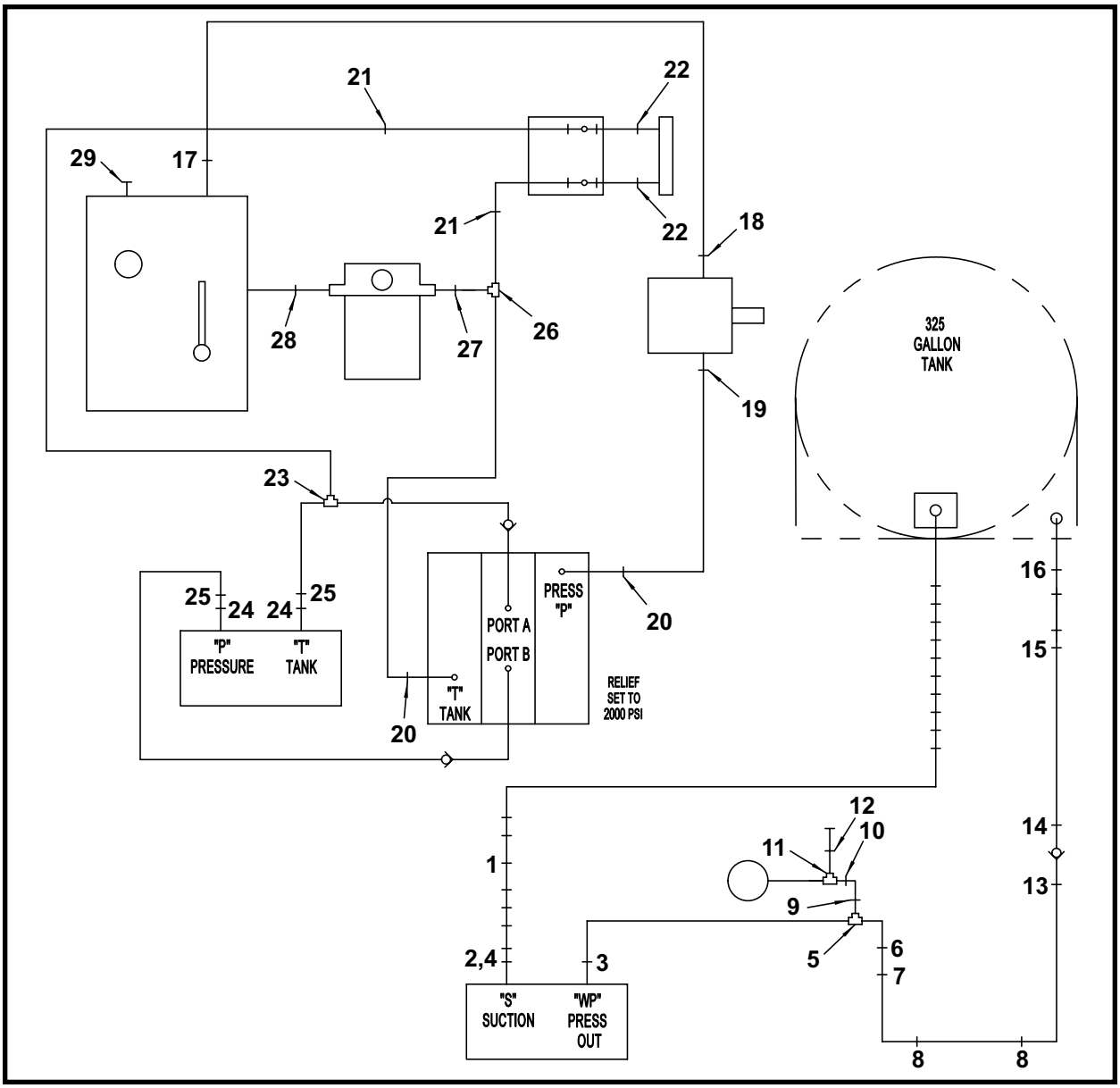


ITEM	QTY	PART NO.	DESCRIPTION
30	3	P0001-04-010	BOLT, Hex 1/4 UNC x 2.5
31	3	P0003-04-000	NUT, 1/4 UNC
32	3	P0040-004	WASHER, Hardened Flat 1/4
33****	1	P0304-332	MOTOR
33a	1	P0304-332A	KIT, Seal
34	1	P0301-141	GAUGE, Sight
35	1	P0308-110	BREATHER
36**	60 QT	P0126-038	OIL, Hydraulic AW 68
37*	1	A08267A	KIT, Fitting
38*	1	A08268A	KIT, Hose

QT - Quart
* Refer to this section for parts information.
** Not shown. *** Bentonite Pump P0303-399 is no longer available, replace with P0303-894.
**** Motor P0304-332 is no longer available, replace with P0304-353.

NOTES

HYDRAULIC & WATER FITTING KIT, A08267A
SN: FA08269F-01 THRU 03

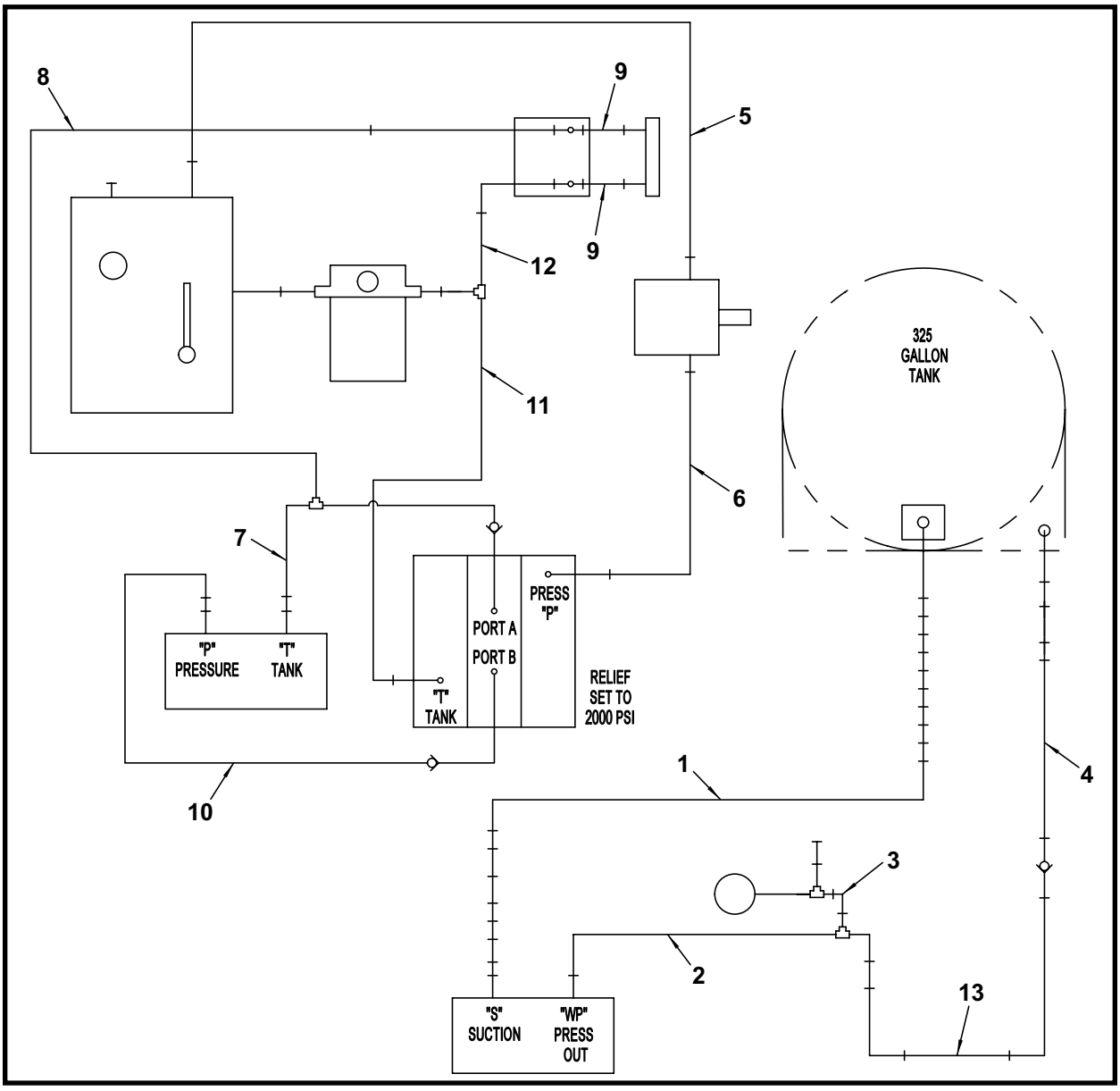


ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08267A	KIT, Fitting
1	1	P0300-215	ADAPTER, Swivel
2	1	P0300-882	FITTING, 16MP-12MBSPT
3	1	P0300-724	FITTING, 06MFFOR-06MBSPP
4	1	P0300-719	FITTING, 12MBSPP-BONDED SEAL
5	1	P0300-412	FITTING, 08MJ-08FJX-08MJ
6	1	P0300-873	FITTING, 10FJ-08MJ
7	1	P0300-868	FITTING, 10MJ-10MJBKHD
8	2	P0300-147	FITTING, 10FJ-6MJ
9	1	P0300-334	FITTING, 08FJ-04MJ
10	1	P0300-249	FITTING, 04MJ-04MP
11	1	P0300-031	FITTING, 04FP-04FP-04FP
12	1	P0300-204	FITTING, 04MP-02FP
13	1	P0300-567	FITTING, 10MJ-08MPBKHD
14	1	P0300-053	FITTING, 08MJ-08MP

HYDRAULIC & WATER FITTING KIT, A08267A
SN: FA08269F-01 THRU 03

ITEM	QTY	PART NO.	DESCRIPTION
15	1	P0300-867	FITTING, 16FJ-08MJ
16	1	P0300-308	FITTING, 16MJ-16MJBKHD
17	1	P0300-371	FITTING, 16MFFOR-16MB90
18	1	P0300-479	FITTING, 16MFFOR-12MB
19	1	P0300-300	FITTING, 08MFFOR-10MB
20	2	P0300-316	FITTING, 08MFFOR-08MB90
21	2	P0300-595	FITTING, 08MFFOR-08MFFOR-BKHD
22	2	P0300-300	FITTING, 08MFFOR-10MB
23	1	P0300-318	FITTING, 08MFFOR-08FFORX-08MFFOR
24	2	P0300-689	FITTING, 08FFOR-08MBSPP
25	2	P0300-317	FITTING, 08MFFOR-08FFORX90
26	1	P0300-726	FITTING, 08MFOR-08MFOR-08MB
27	1	P0300-565	FITTING, 12MORB-08FORB
28	1	P0300-884	FITTING, 12MB-12MB
29	1	P0300-060	FITTING, 10MB-PLUG

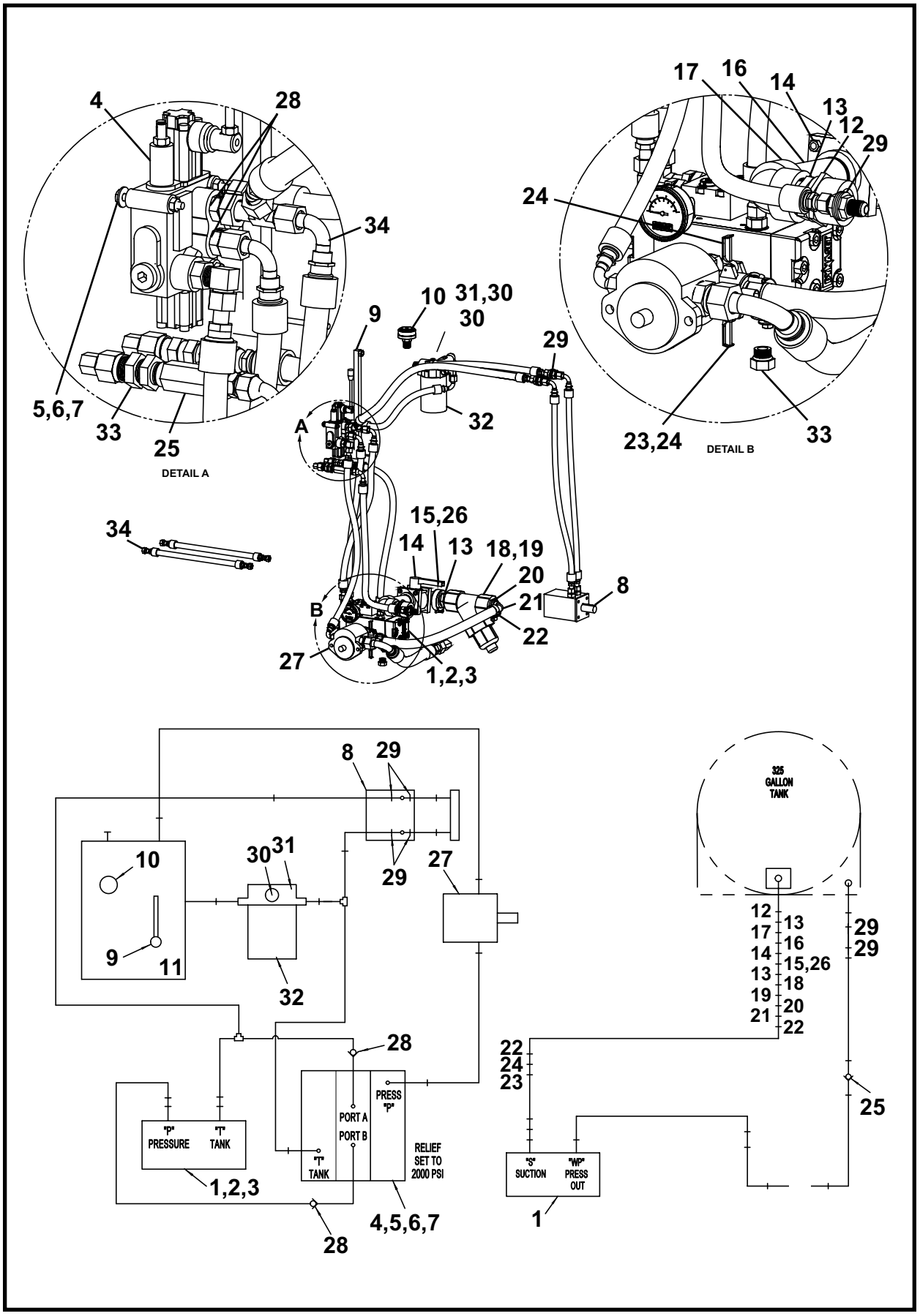
HYDRAULIC & WATER HOSE KIT, A08268A
SN: FA08269F-01 THRU 03



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08268A	KIT, Hose
1	1	P0201-238-048	HOSE ASSEMBLY, Suction 1 x 48
2	1	A10045A-018	HOSE ASSEMBLY, 1/2 x 18
3	1	A10405A-013	HOSE ASSEMBLY, 1/4 x 13
4	1	A10361A-028	HOSE ASSEMBLY, 1/2 x 28
5	1	A10343A-021	HOSE ASSEMBLY, 1 x 21
6	1	A10324A-032	HOSE ASSEMBLY, 1/2 x 32
7	1	A10324A-034	HOSE ASSEMBLY, 1/2 x 34
8	1	A09911A-040	HOSE ASSEMBLY, 1/2 x 40
9	2	A09873A-031	HOSE ASSEMBLY, 1/2 x 31
10	2	A10324A-031	HOSE ASSEMBLY, 1/2 x 31
11	1	A10324A-020	HOSE ASSEMBLY, 1/2 x 20
12	1	A10311A-018	HOSE ASSEMBLY, 3/8 x 18

NOTES

1325B HYDRAULIC & WATER ASSEMBLY, A08278A
SN: FA08269F-04 thru 12



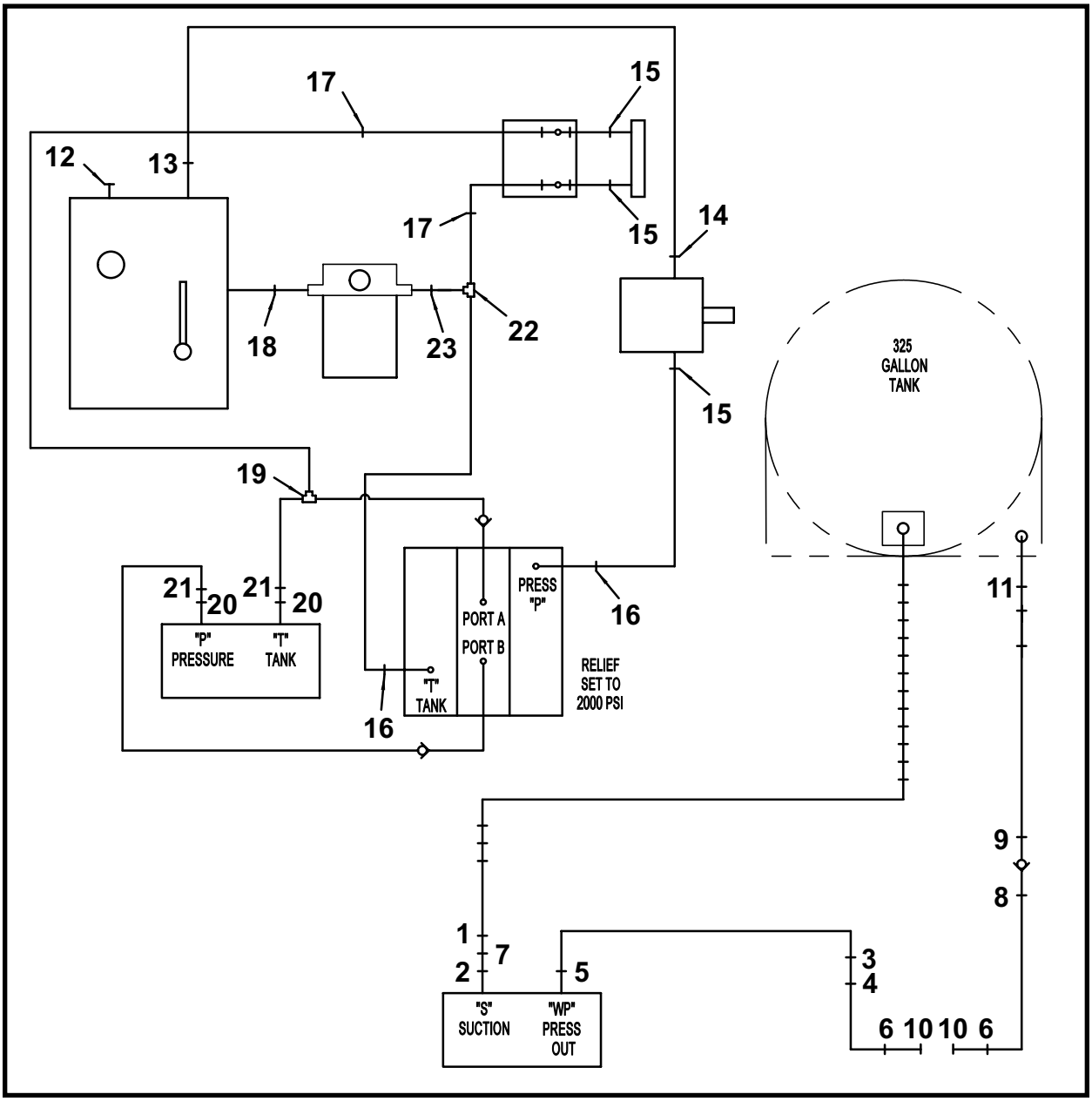
1325B HYDRAULIC & WATER ASSEMBLY, A08278A
SN: FA08269F-04 thru 12

ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08278A	HYDRAULIC & WATER ASSEMBLY
1***	1	P0303-399	PUMP, Bentonite (Includes items 1a - 1b)
1a	1	P0303-399A	KIT, Seal
1b	1	P0303-399B	KIT, Water Valve
2	4	P0040-005	WASHER, Hardened Flat 5/16
3	4	PM08A-1.25-016	SCREW, Hex M08x1.25x10 10.9
4	1	P0302-696	VALVE, Block (Includes item 4a)
4a	1	P0302-696A	CARTRIDGE, Valve
5	3	P0001-04-010	BOLT, Hex 1/4 UNC x 2.5
6	3	P0003-04-000	NUT, 1/4 UNC
7	3	P0040-004	WASHER, Hardened Flat 1/4
8****	1	P0304-332	MOTOR
8a	1	P0304-332A	KIT, Seal
9	1	P0301-141	GAUGE, Sight
10	1	P0308-110	BREATHER
11**	60 QT	P0126-038	OIL, Hydraulic AW-68
12	1	P0258-004	REDUCER
13	2	P0258-005	NIPPLE
14	1	P0258-006	VALVE, Port
15	1	P0258-018	ELBOW
16	1	P0258-070	NIPPLE
17	1	P0258-069	ELBOW
18	1	P0258-012	STRAINER 1-1/2
19	1	P0251-800	FILTER, Screen
20	1	P0258-013	BUSHING, Reducer
21	1	P0258-015	SHANK, Hose
22	2	P0201-299	CLAMP, Radiator
23	1	P0100-122	COUPLER, Cam & Groove
24	1	P0100-121	COUPLER, Cam & Groove
25	1	P0302-102	VALVE, Check
26	1	P0201-247	CLAMP, T-Bolt
27	1	P0303-400	PUMP
28	2	P0302-701	VALVE, Check
29	6	P0040-012	WASHER, Hardened Flat 3/4
30	1	P0301-105	GAUGE, Filter Indicator
31	1	P0309-217	FILTER HEAD
32	1	P0309-217A	ELEMENT, Filter
33*	1	A08267A	KIT, Fitting
34*	1	A08268A	KIT, Hose

QT - Quart

* Refer to this section for parts information.
** Not shown.
*** Bentonite Pump P0303-399 is no longer available, replace with P0303-894.
**** Motor P0304-332 is no longer available, replace with P0304-353.

HYDRAULIC & WATER FITTING KIT, A08267A
SN: FA08269F-04 thru 12



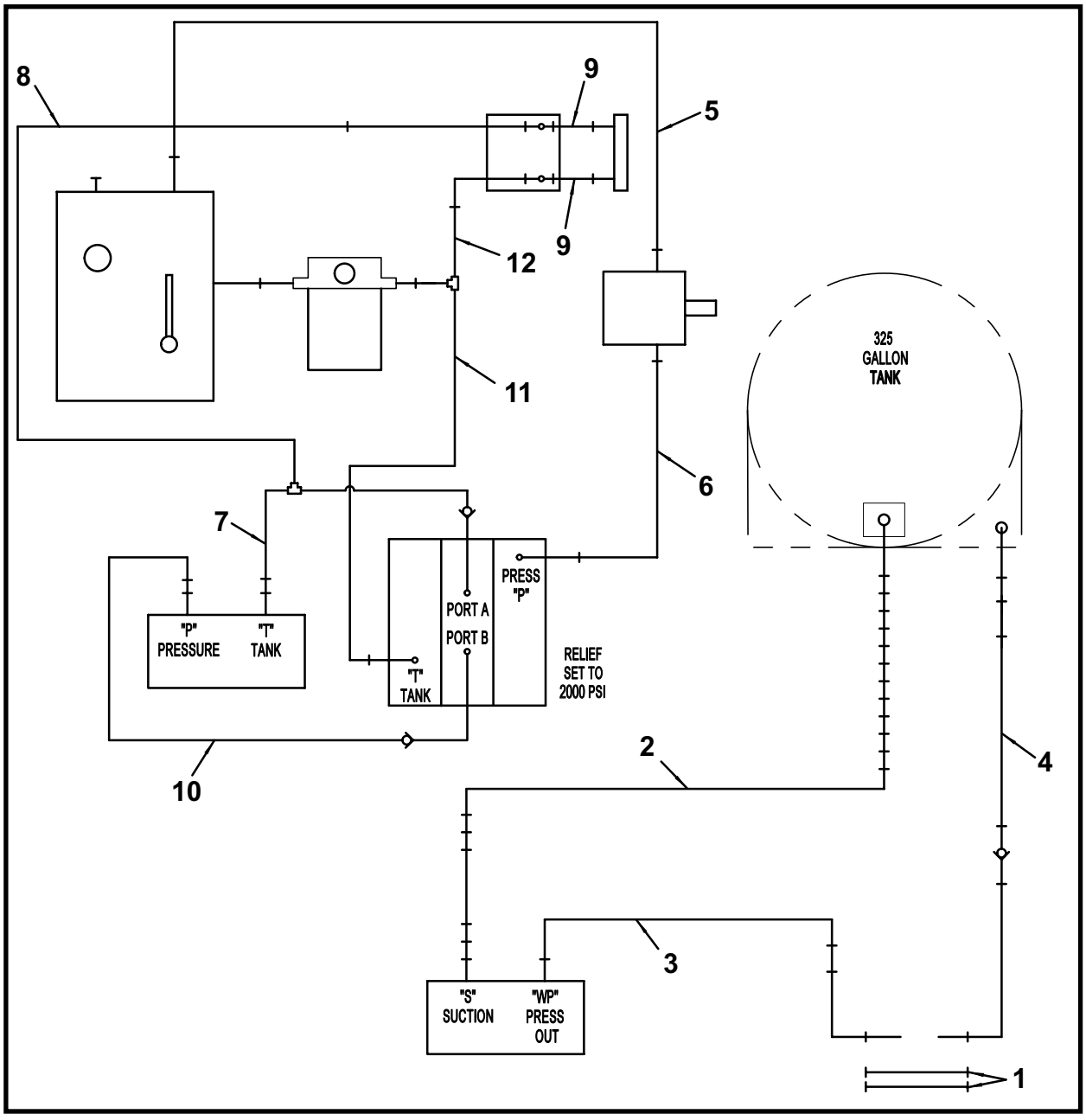
ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08267A	KIT, Fitting
1	1	P0300-057	FITTING, 16MP-16FP90
2	1	P0300-719	FITTING, 12MBSPP
3	1	P0300-873	FITTING, 10FJ-08MJ
4	1	P0300-868	FITTING, 10MJ-10MJBKHD
5	1	P0300-724	FITTING, 06MFFOR-06MBSPP
6	2	P0300-147	FITTING, 10FJ-6MJ
7	1	P0300-882	FITTING, 16MP-12MBSPP
8	1	P0300-567	FITTING, 10MJ-08MPBKHD
9	1	P0300-053	FITTING, 08MJ-08MP
10	2	P0300-126	CAP, 3/8 x 9/16
11	1	P0300-325	FITTING, 08MJ-08MJBKHD
12	1	P0300-060	PLUG, 10MB-PLUG

(Continued on next page)

HYDRAULIC & WATER FITTING KIT, A08267A
SN: FA08269F-04 thru 12

ITEM	QTY	PART NO.	DESCRIPTION
13	1	P0300-371	FITTING, 16MFFOR-16MB90
14	1	P0300-479	FITTING, 16MFFOR-12MB
15	3	P0300-300	FITTING, 08MFFOR-10MB
16	2	P0300-316	FITTING, 08MFFOR-08MB90
17	2	P0300-595	FITTING, 08MFFOR-08MFFOR-BKHD
18	1	P0300-884	FITTING, 12MB-12MB
19	1	P0300-318	FITTING, 08MFFOR-08FFORX-08MFFOR
20	2	P0300-689	FITTING, 08MFFOR-08MBSPP
21	2	P0300-317	FITTING, 08MFFOR-08FFORX90
22	1	P0300-726	FITTING, 08MFOR-08MFOR-08MB
23	1	P0300-565	FITTING, 12MORB-08FORB

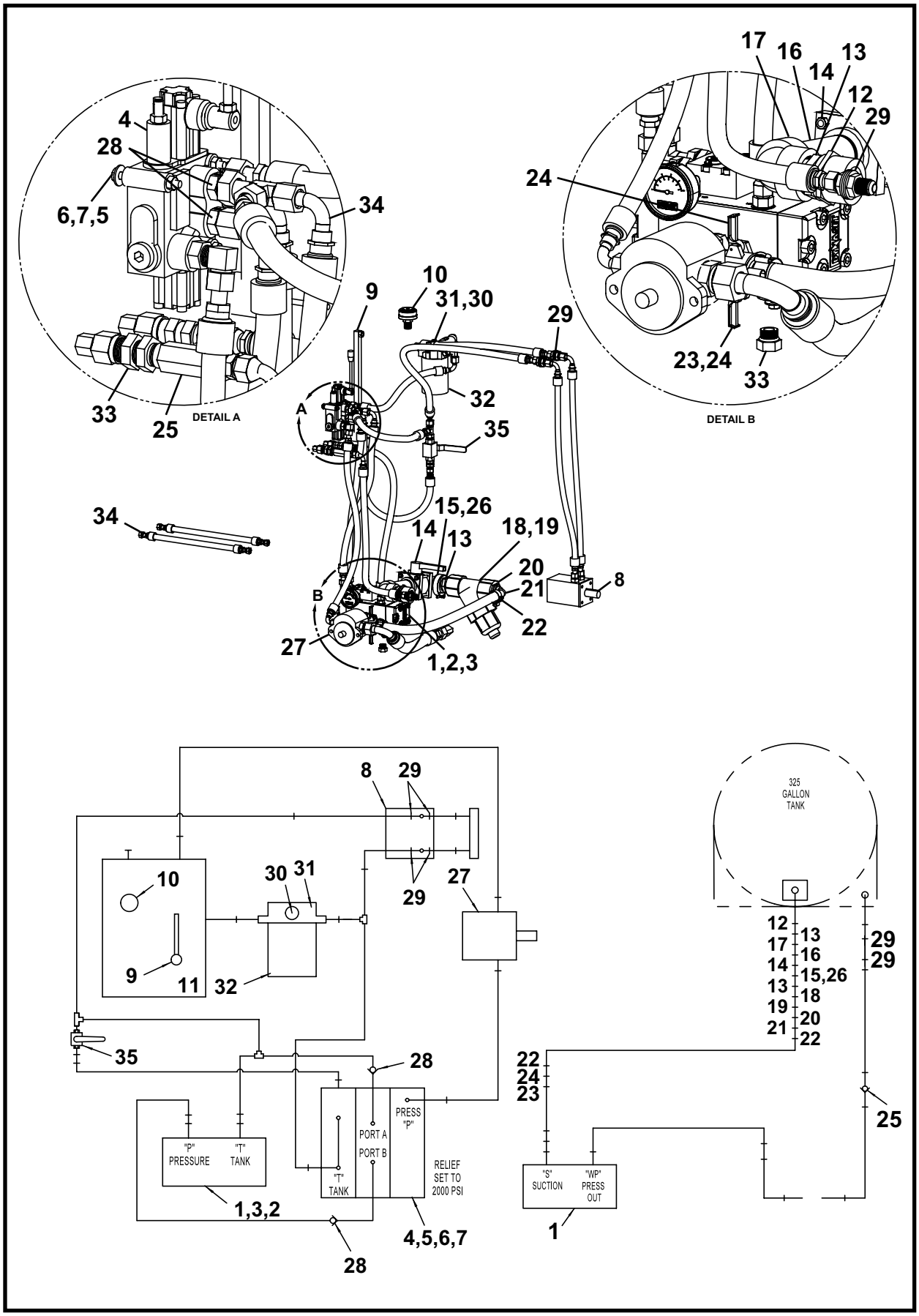
HYDRAULIC & WATER HOSE KIT, A08268A
SN: FA08269F-04 thru 12



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08268A	KIT, Hose
1	2	A10311A-018	HOSE ASSEMBLY, 3/8 x 18
2	1	P0201-238-024	HOSE ASSEMBLY, Suction 1 x 24
3	1	A10045A-027	HOSE ASSEMBLY, 3/8 x 27
4	1	A10361A-033	HOSE ASSEMBLY, 1/2 x 33
5	1	A10343A-021	HOSE ASSEMBLY, 1 x 21
6	1	A10324A-030	HOSE ASSEMBLY, 1/2 x 30
7	1	A10324A-027	HOSE ASSEMBLY, 1/2 x 27
8	1	A09911A-043	HOSE ASSEMBLY, 1/2 x 43
9	2	A09912A-031	HOSE ASSEMBLY, 1/2 x 31
10	1	A10324A-025	HOSE ASSEMBLY, 1/2 x 25
11	1	A10324A-020	HOSE ASSEMBLY, 1/2 x 20
12	1	A10324A-033	HOSE ASSEMBLY, 1/2 x 33

NOTES

1325B HYDRAULIC & WATER ASSEMBLY, A08278A
SN: FA08269F-13 Thru 16

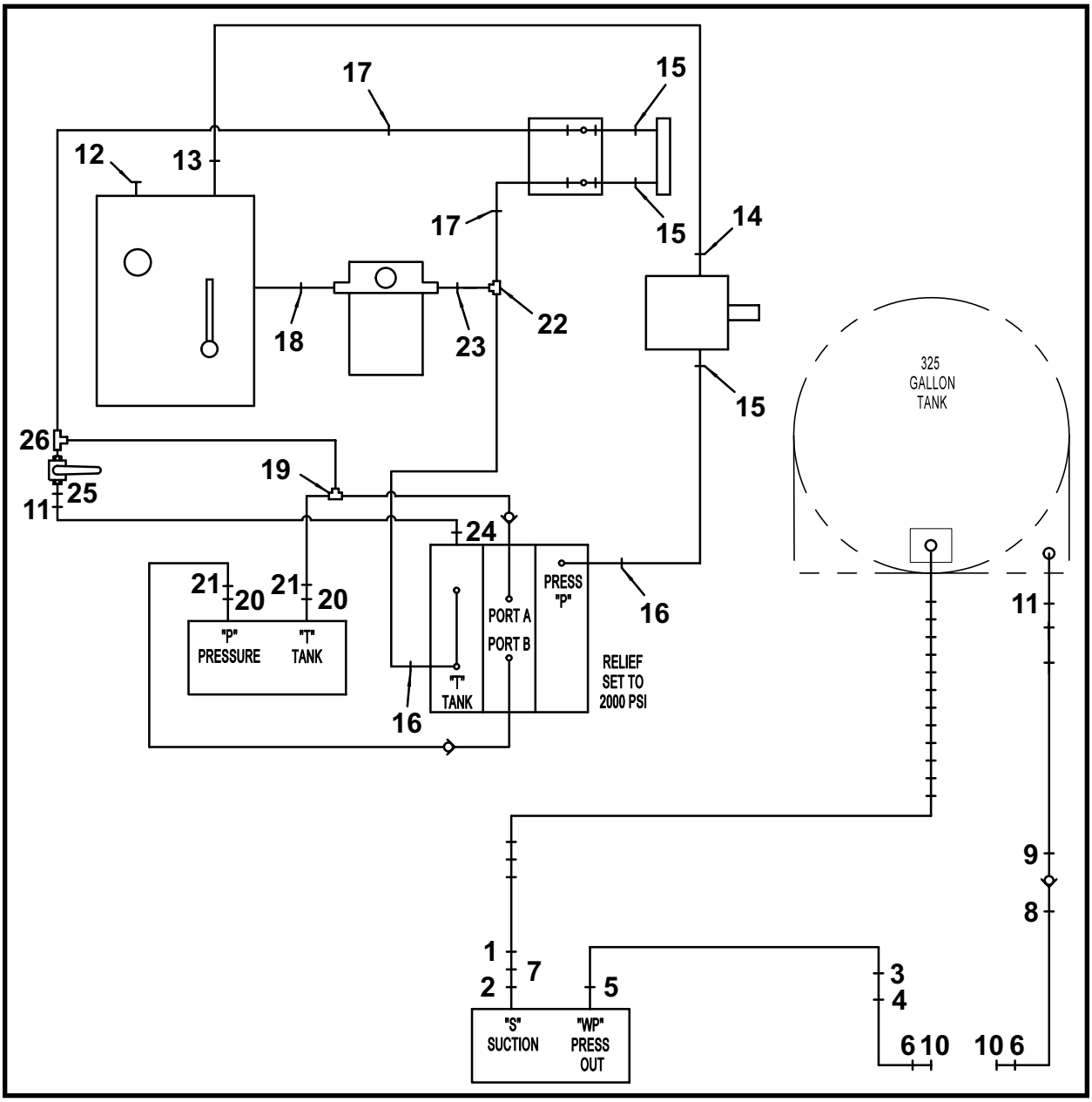


1325B HYDRAULIC & WATER ASSEMBLY, A08278A
SN: FA08269F-13 Thru 16

ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08278A	HYDRAULIC & WATER ASSEMBLY
1***	1	P0303-399	PUMP, Bentonite (Includes items 1a - 1b)
1a	1	P0303-399A	KIT, Seal
1b	1	P0303-399B	KIT, Water Valve
2	4	P0040-005	WASHER, Hardened Flat 5/16
3	4	PM08A-1.25-016	SCREW, Hex M08x1.25x10 10.9
4	1	P0302-696	VALVE, Block (Includes item 4a)
4a	1	P0302-696A	CARTRIDGE, Valve
5	3	P0001-04-010	BOLT, Hex 1/4 UNC x 2.5
6	3	P0003-04-000	NUT, 1/4 UNC
7	3	P0040-004	WASHER, Hardened Flat 1/4
8****	1	P0304-332	MOTOR
8a	1	P0304-332A	KIT, Seal
9	1	P0301-141	GAUGE, Sight
10	1	P0308-110	BREATHER
11**	60 QT	P0126-038	OIL, Hydraulic AW-68
12	1	P0258-004	REDUCER
13	2	P0258-005	NIPPLE
14	1	P0258-006	VALVE, Port
15	1	P0258-018	ELBOW
16	1	P0258-070	NIPPLE
17	1	P0258-069	ELBOW
18	1	P0258-012	STRAINER 1-1/2
19	1	P0251-800	FILTER, Screen
20	1	P0258-013	BUSHING, Reducer
21	1	P0258-015	SHANK, Hose
22	2	P0201-299	CLAMP, Radiator
23	1	P0100-122	COUPLER, Cam & Groove
24	1	P0100-121	COUPLER, Cam & Groove
25	1	P0302-102	VALVE, Check
26	1	P0201-247	CLAMP, T-Bolt
27	1	P0303-400	PUMP
28	2	P0302-701	VALVE, Check
29	6	P0040-012	WASHER, Hardened Flat 3/4
30	1	P0301-105	GAUGE, Filter Indicator
31	1	P0309-217	FILTER HEAD
32	1	P0309-217A	ELEMENT, Filter
33*	1	A08267A	KIT, Fitting
34*	1	A08268A	KIT, Hose
35	1	P0302-801	VALVE, Ball

QT - Quart
* Refer to this section for parts information.
** Not shown.
*** Bentonite Pump P0303-399 is no longer available, replace with P0303-894.
**** Motor P0304-332 is no longer available, replace with P0304-353.

HYDRAULIC & WATER FITTING KIT, A08267A
SN: FA08269F-13 Thru 16



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08267A	KIT, Fitting
1	1	P0300-057	FITTING, 16MP-16FP90
2	1	P0300-719	FITTING, 12MBSPP
3	1	P0300-873	FITTING, 10FJ-08MJ
4	1	P0300-868	FITTING, 10MJ-10MJBKHD
5	1	P0300-724	FITTING, 06MFFOR-06MBSPP
6	2	P0300-147	FITTING, 10FJ-6MJ
7	1	P0300-882	FITTING, 16MP-12MBSPP
8	1	P0300-567	FITTING, 10MJ-08MPBKHD
9	1	P0300-053	FITTING, 08MJ-08MP
10	2	P0300-126	CAP, 3/8 x 9/16
11	2	P0300-325	FITTING, 08MJ-08MJBKHD
12	1	P0300-060	PLUG, 10MB-PLUG

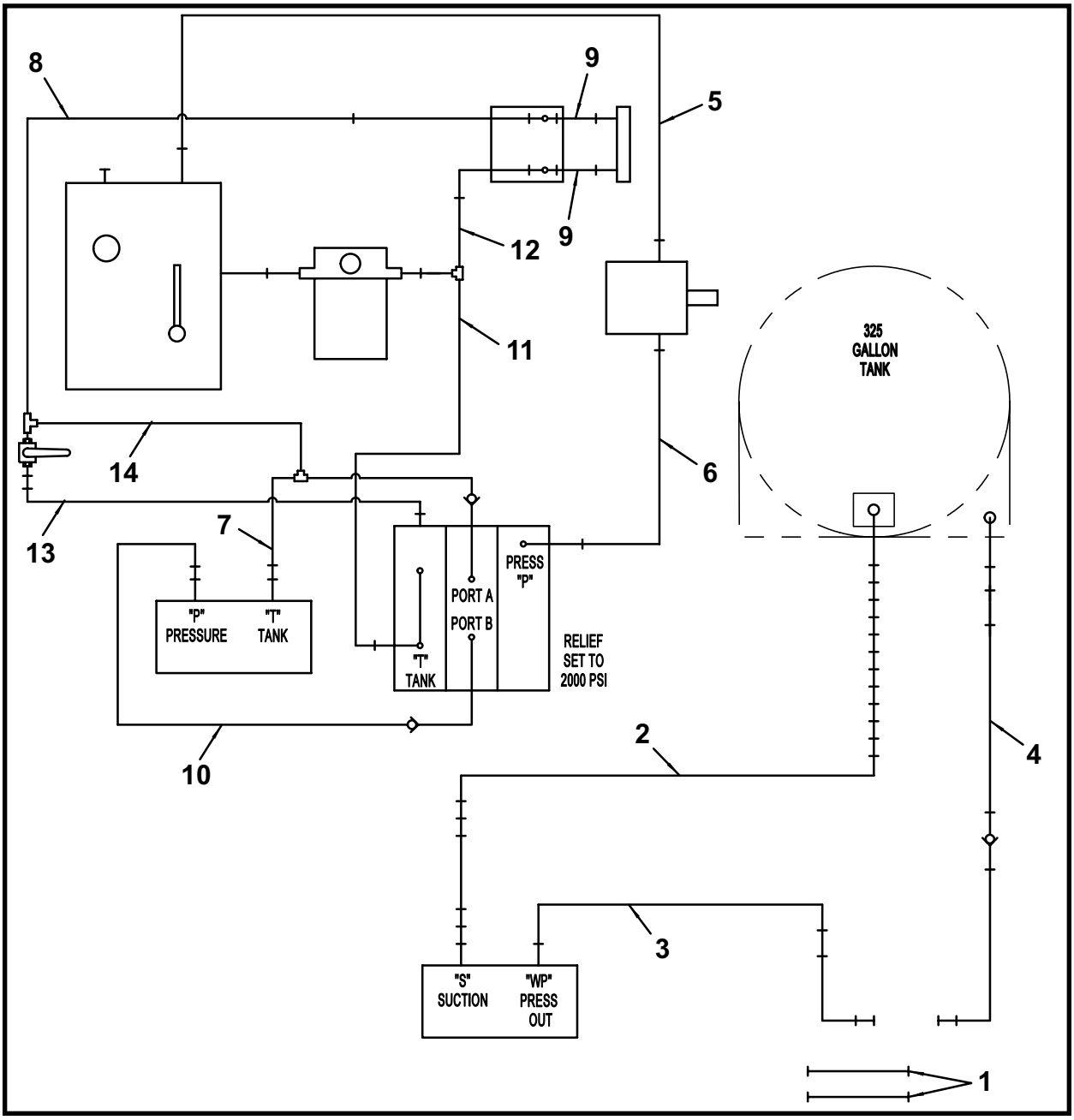
(Continued on next page)

HYDRAULIC & WATER FITTING KIT, A08267A
SN: FA08269F-13 Thru 16

ITEM	QTY	PART NO.	DESCRIPTION
13	1	P0300-371	FITTING, 16MFFOR-16MB90
14	1	P0300-479	FITTING, 16MFFOR-12MB
15	3	P0300-300	FITTING, 08MFFOR-10MB
16	2	P0300-316	FITTING, 08MFFOR-08MB90
17	2	P0300-595	FITTING, 08MFFOR-08MFFOR-BKHD
18	1	P0300-884	FITTING, 12MB-12MB
19	1	P0300-318	FITTING, 08MFFOR-08FFORX-08MFFOR
20	2	P0300-689	FITTING, 08MFFOR-08MBSPP
21	2	P0300-317	FITTING, 08MFFOR-08FFORX90
22	1	P0300-726	FITTING, 08MFOR-08MFOR-08MB
23	1	P0300-565	FITTING, 12MORB-08FORB
24	1	P0300-305	FITTING, 08MFFOR-08MB
25	1	P0300-332	FITTING, 08OR
26	1	P0300-535	FITTING, 08MFOR-08MB-08MFOR

HYDRAULIC & WATER HOSE KIT, A08268A

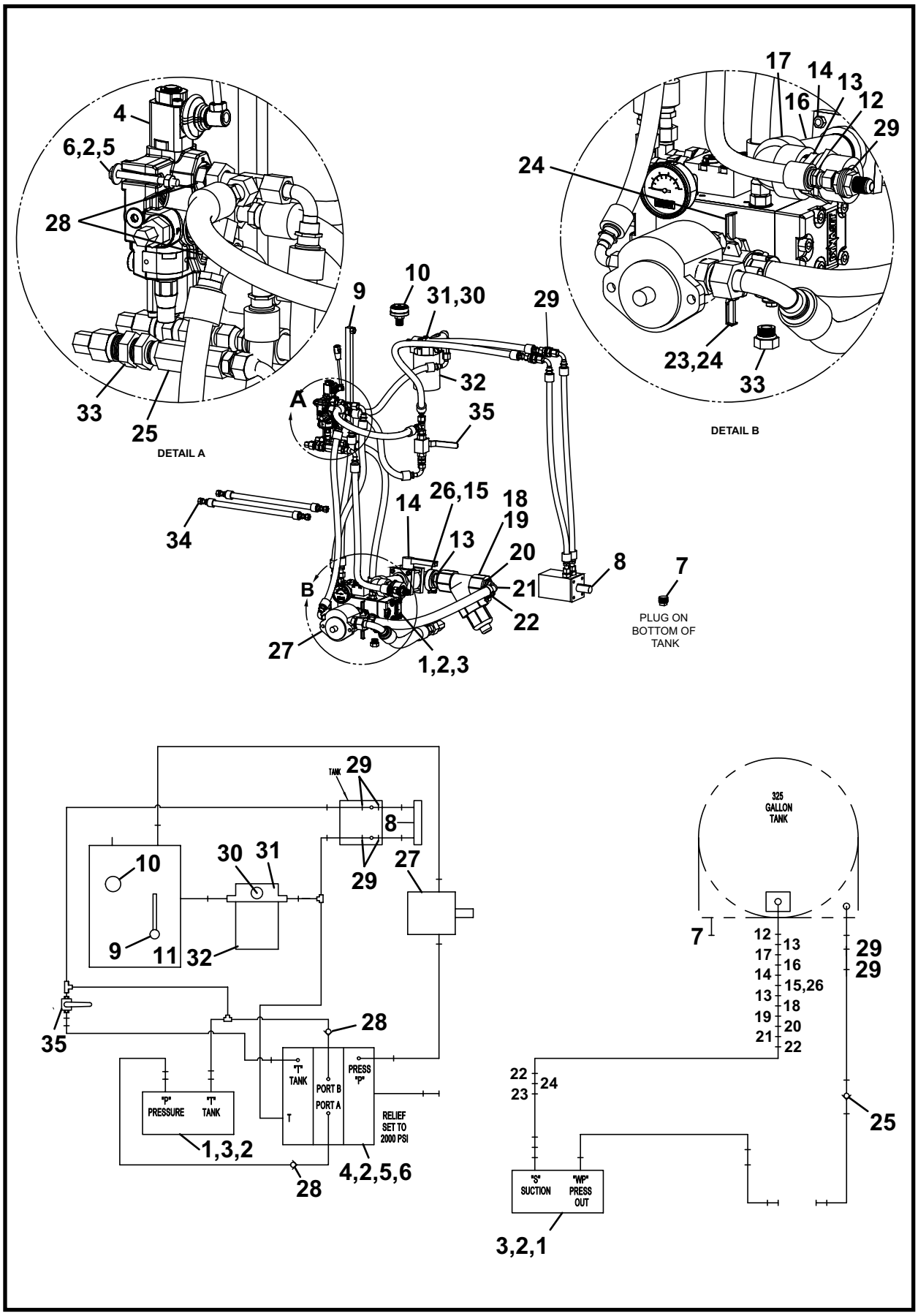
SN: FA08269F-13 Thru 16



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08268A	KIT, Hose
1	2	A10311A-018	HOSE ASSEMBLY, 3/8 x 18
2	1	P0201-238-024	HOSE ASSEMBLY, Suction 1 x 24
3	1	A10045A-027	HOSE ASSEMBLY, 3/8 x 27
4	1	A10361A-033	HOSE ASSEMBLY, 1/2 x 33
5	1	A10343A-021	HOSE ASSEMBLY, 1 x 21
6	1	A10324A-030	HOSE ASSEMBLY, 1/2 x 30
7	1	A10324A-027	HOSE ASSEMBLY, 1/2 x 27
8	1	A09911A-043	HOSE ASSEMBLY, 1/2 x 43
9	2	A09912A-031	HOSE ASSEMBLY, 1/2 x 31
10	1	A10324A-025	HOSE ASSEMBLY, 1/2 x 25
11	1	A10324A-020	HOSE ASSEMBLY, 1/2 x 20
12	1	A10324A-033	HOSE ASSEMBLY, 1/2 x 33
13	1	A10068A-028	HOSE ASSEMBLY, 1/2 x 28
14	1	A09911A-019	HOSE ASSEMBLY, 1/2 x 19

NOTES

1325B HYDRAULIC & WATER ASSEMBLY, A08297A
SN: FA08269F-17 & After

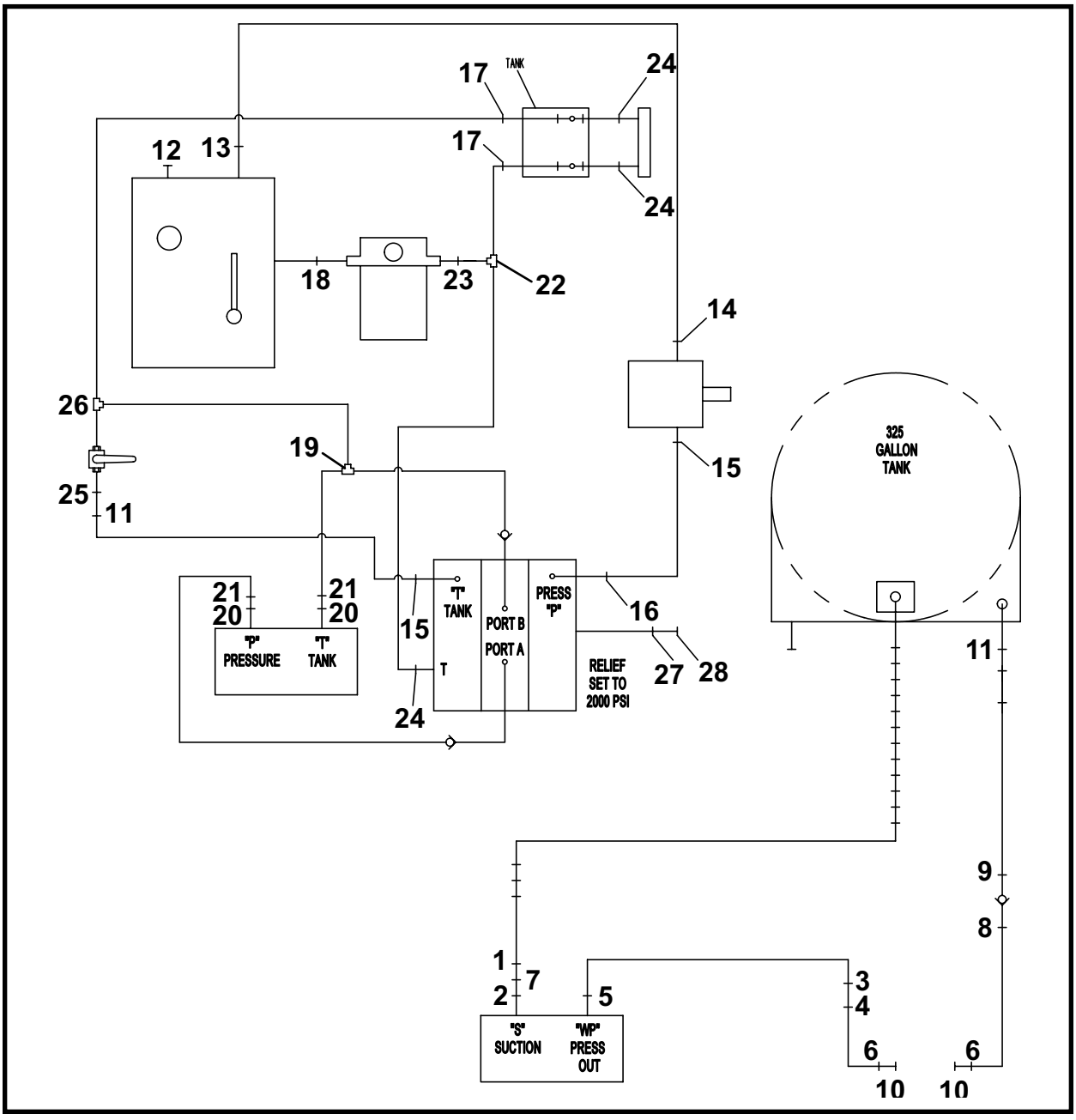


1325B HYDRAULIC & WATER ASSEMBLY, A08297A
SN: FA08269F-17 & After

ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08297A	HYDRAULIC & WATER ASSEMBLY
1.1***	1	P0303-399	PUMP, Bentonite (SN FA08269F-81 & Before), (Includes items 1.1a - 1.1b)
1.1a	1	P0303-399A	KIT, Seal
1.1b	1	P0303-399B	KIT, Water Valve
1.2	1	P0303-894	PUMP, Bentonite (SN FA08269F-82 & After), (Includes items 1.2a - 1.2f)
1.2a	1	P0303-894A	KIT, Seal
1.2b	1	P0303-894B	KIT, Water Valve
1.2c	1	P0303-894C	KIT, Piston
1.2d	1	P0303-894D	KIT, Block
1.2e	1	P0303-894E	GAUGE, Pressure
1.2f	1	P0303-894F	KIT, O-Rings
2	4	P0040-005	WASHER, Hardened Flat 5/16
3	4	PM08A-1.25-016	SCREW, Hex M08x1.25x10 10.9
4	1	P0302-803	VALVE, Block
5	3	P0001-04-009	BOLT, Hex 5/16 UNC x 2.25
6	3	P0003-04-000	NUT, 1/4 UNC
7	1	P0258-075	PLUG, Threaded
8.1****	1	P0304-332	MOTOR (SN FA08269F-33 & Before) (Includes item 8.1a)
8.1a	1	P0304-332A	KIT, Seal
8.2	1	P0304-353	MOTOR (SN FA08269F-34 & After)
9	1	P0301-141	GAUGE, Sight
10	1	P0308-102	BREATHER
11**	60 QT	P0126-038	OIL, Hydraulic AW-68
12	1	P0258-004	REDUCER
13	2	P0258-005	NIPPLE
14	1	P0258-006	VALVE, Port
15	1	P0258-018	ELBOW
16	1	P0258-070	NIPPLE
17	1	P0258-069	ELBOW
18	1	P0258-012	STRAINER 1-1/2 (Includes items 18b - 18d)
18b	1	P0258-012B	O-RING, Housing
18c	1	P0258-012C	O-RING, Strainer
18d	1	P0258-012D	CAP
19	1	P0251-800	FILTER, Screen
20	1	P0258-013	BUSHING, Reducer
21	1	P0258-015	SHANK, Hose
22	2	P0201-299	CLAMP, Radiator
23	1	P0100-122	COUPLER, Cam & Groove
24	1	P0100-121	COUPLER, Cam & Groove
25	1	P0302-102	VALVE, Check
26	1	P0201-247	CLAMP, T-Bolt
27	1	P0303-400	PUMP
28	2	P0302-701	VALVE, Check
29	6	P0040-012	WASHER, Hardened Flat 3/4
30	1	P0301-105	GAUGE, Filter Indicator
31	1	P0309-217	FILTER HEAD
32	1	P0309-217A	ELEMENT, Filter
33*	1	A08296A	KIT, Fitting
34*	1	A08320A	KIT, Hose
35	1	P0302-801	VALVE, Ball

QT - Quart
* Refer to this section for parts information.
** Not shown.
*** Bentonite Pump P0303-399 is no longer available, replace with P0303-894.
**** Motor P0304-332 is no longer available, replace with P0304-353.

HYDRAULIC & WATER FITTING KIT, A08296A
SN: FA08269F-17 & After

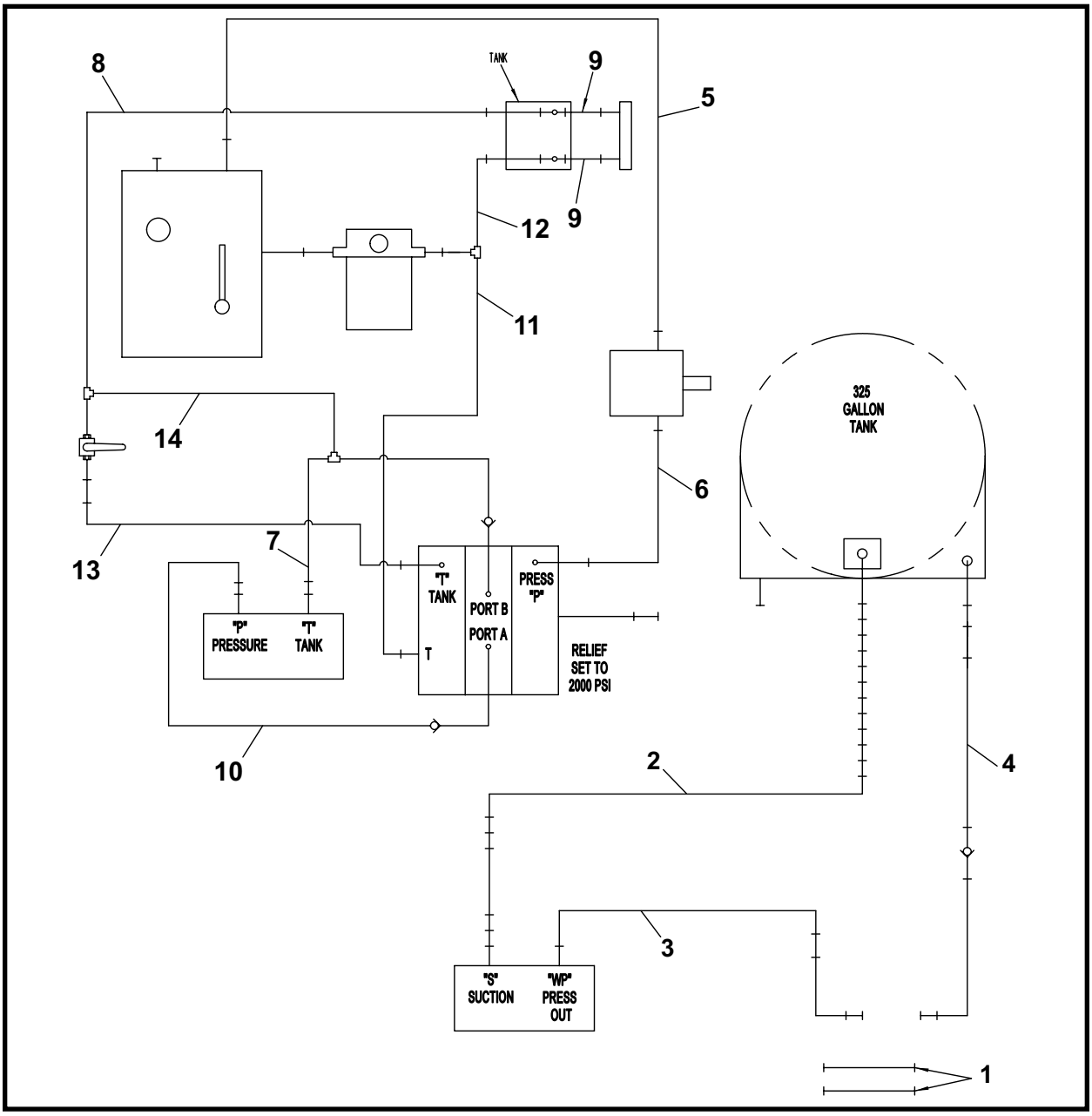


ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08296A	KIT, Fitting
1	1	P0300-057	FITTING, 16MP-16FP90
2	1	P0300-719	FITTING, 12MBSPP
3	1	P0300-873	FITTING, 10FJ-08MJ
4	1	P0300-868	FITTING, 10MJ-10MJBKHD
5	1	P0300-724	FITTING, 06MFFOR-06MBSPP
6	2	P0300-147	FITTING, 10FJ-6MJ
7	1	P0300-882	FITTING, 16MP-12MBSPP
8	1	P0300-567	FITTING, 10MJ-08MPBKHD
9	1	P0300-053	FITTING, 08MJ-08MP
10	2	P0300-126	CAP, 3/8 x 9/16
11	2	P0300-325	FITTING, 08MJ-08MJBKHD
12	1	P0300-060	PLUG, 10MB-PLUG

HYDRAULIC & WATER FITTING KIT, A08296A
SN: FA08269F-17 & After

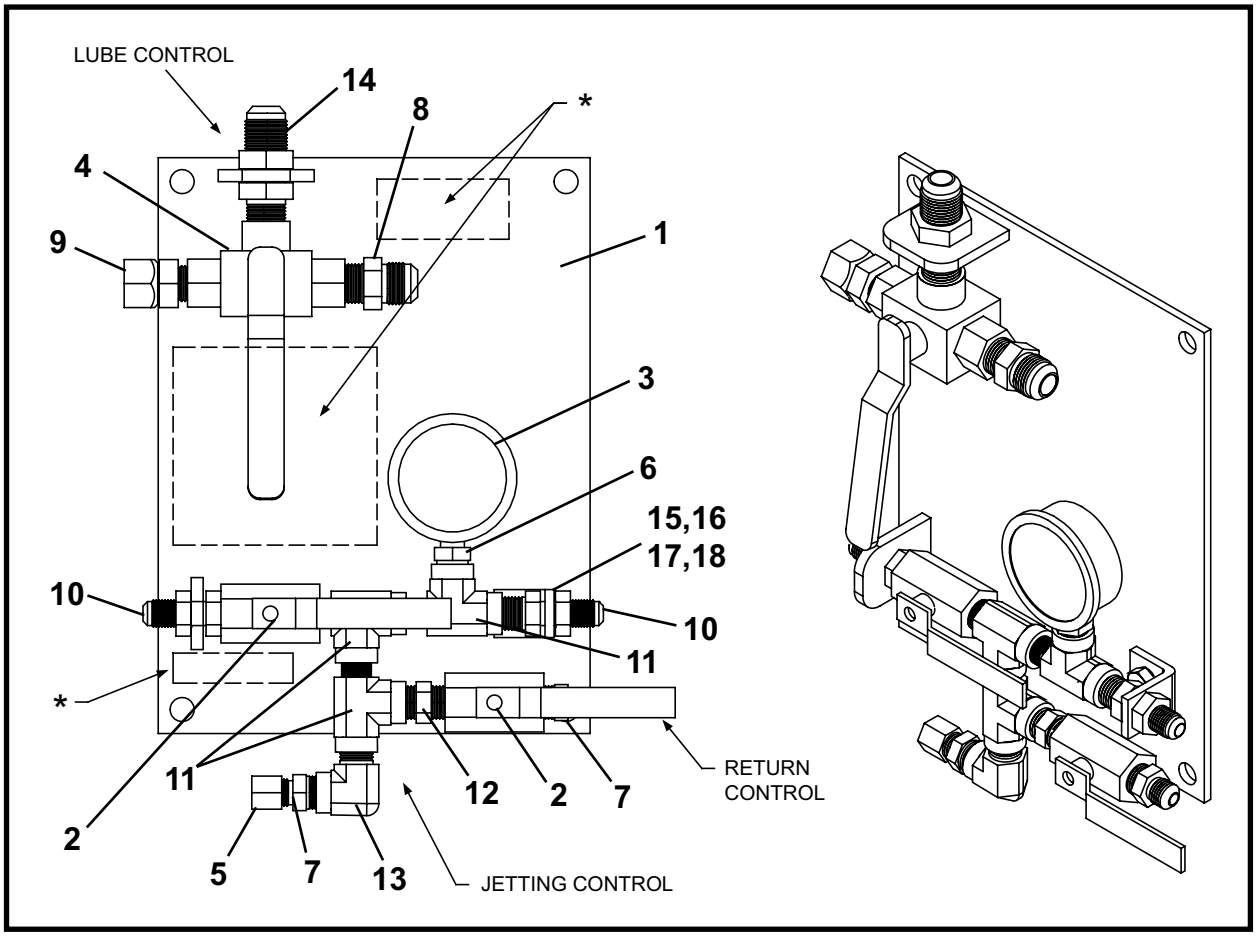
ITEM	QTY	PART NO.	DESCRIPTION
13	1	P0300-371	FITTING, 16MFFOR-16MB90
14	1	P0300-479	FITTING, 16MFFOR-12MB
15	2	P0300-302	FITTING, 08MFFOR-10MB
16	1	P0300-316	FITTING, 08MFFOR-08MB90
17	2	P0300-595	FITTING, 08MFFOR-08MFFOR-BKHD
18	1	P0300-884	FITTING, 12MB-12MB
19	1	P0300-318	FITTING, 08MFFOR-08FFORX-08MFFOR
20	2	P0300-689	FITTING, 08MFFOR-08MBSPP
21	2	P0300-317	FITTING, 08MFFOR-08FFORX90
22	1	P0300-726	FITTING, 08MFOR-08MFOR-08MB
23	1	P0300-565	FITTING, 12MORB-08FORB
24	3	P0300-302	FITTING, 08MFFOR-10MB90
25	1	P0300-332	FITTING, 08OR
26	1	P0300-535	FITTING, 08MFOR-08MB-08MFOR
27	1	P0300-272	FITTING, 04MJ-08MB
28	1	P0300-259	CAP, 04FJ

HYDRAULIC & WATER HOSE KIT, A08320A
SN: FA08269F-17 & After



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A08320A	KIT, Hose
1	2	A10311A-018	HOSE ASSEMBLY, 3/8 x 18
2	1	P0201-238-024	HOSE ASSEMBLY, Suction 1 x 24
3	1	A10045A-027	HOSE ASSEMBLY, 3/8 x 27
4	1	A10361A-033	HOSE ASSEMBLY, 1/2 x 33
5	1	A10343A-021	HOSE ASSEMBLY, 1 x 21
6	1	A10324A-030	HOSE ASSEMBLY, 1/2 x 30
7	1	A10324A-027	HOSE ASSEMBLY, 1/2 x 27
8	1	A09911A-043	HOSE ASSEMBLY, 1/2 x 43
9	2	A09912A-039	HOSE ASSEMBLY, 1/2 x 39
10	1	A10324A-025	HOSE ASSEMBLY, 1/2 x 25
11	1	A10324A-020	HOSE ASSEMBLY, 1/2 x 20
12	1	A10324A-033	HOSE ASSEMBLY, 1/2 x 33
13	1	A9853A-021	HOSE ASSEMBLY, 1/2 x 21
14	1	A10372A-021	HOSE ASSEMBLY, 1/2 x 21

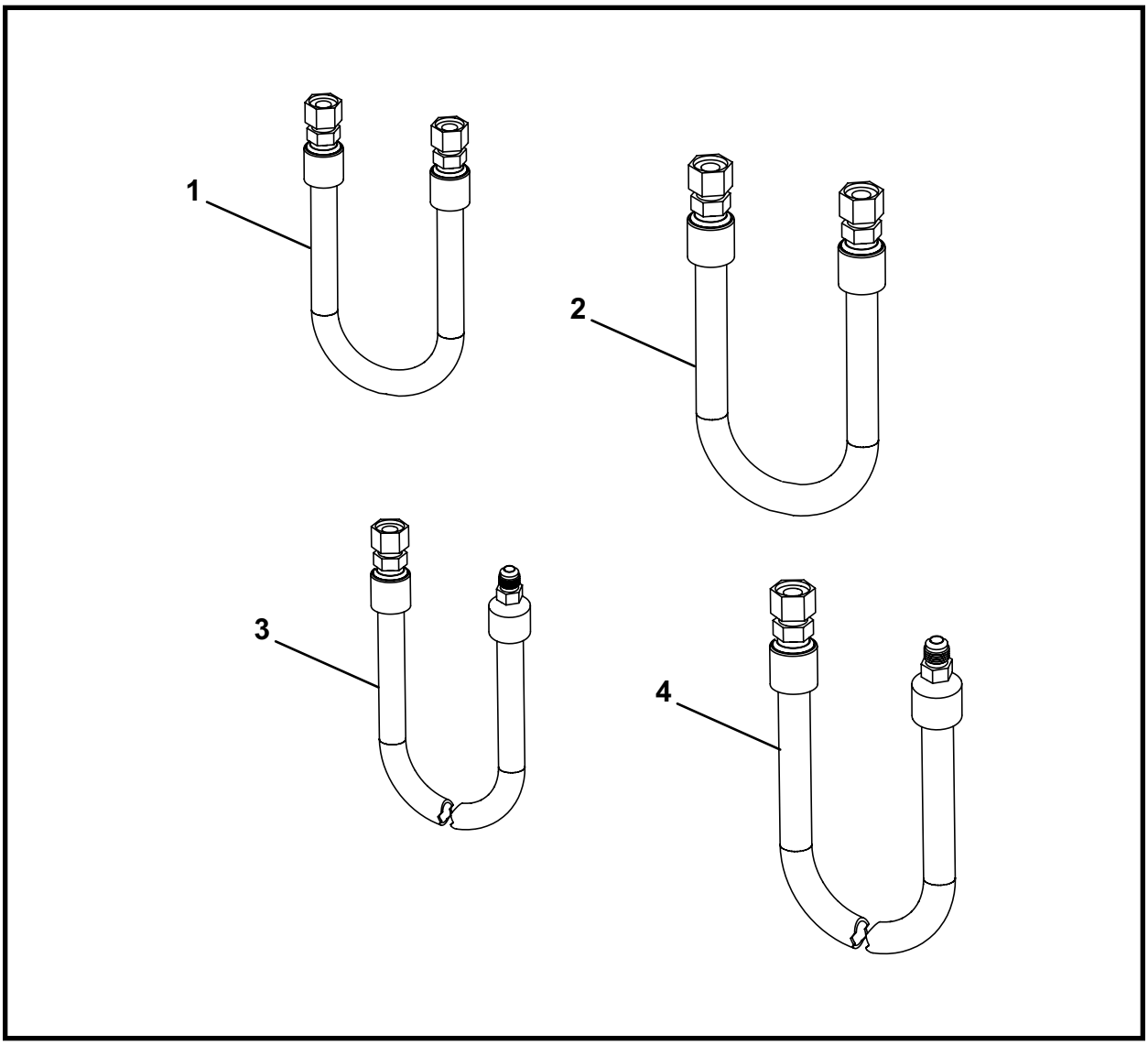
JETTING & LUBRICATION SHAFT CONTROL, A43749A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A43749A	JETTING & LUBRICATION SHAFT CONTROL
1	1	A43757A	MOUNT, Pit Control
2	2	P0302-507	VALVE, Ball 3/8” 2000 psi
3	1	P0301-100	GAUGE, Pressure 5000 psi
4	1	P0302-802	VALVE, Ball 3-Way
5	1	P0300-126	FITTING, 06FJ-CAP
6	1	P0300-093	FITTING, 06MP-04FPS
7	2	P0300-130	FITTING, 06MJ-06MP
8	1	P0300-142	FITTING, 10MJ-08MP
9	1	P0300-399	FITTING, 08MP-10FJX
10	2	P0300-568	FITTING, 6MJ-6MPBKHD
11	3	P0300-569	FITTING, 6MP-6FP-6FP
12	1	P0300-570	FITTING, 6MP-6MP
13	1	P0300-571	FITTING, 6MP-6FP90
14	1	P0300-567	FITTING, 10MJ-8MPKBHD
15	1	A43754P	BRACKET, Pit Control
16	1	P0001-06-004	BOLT, Hex 3/8 UNC x 1
17	1	P0040-006	WASHER, Hardened Flat 3/8
18	1	P0003-06-000	NUT, Hex 3/8 UNC

* Decals 1250-917A, 1250-917B, 1250-917C

LUBRICATION HOSES



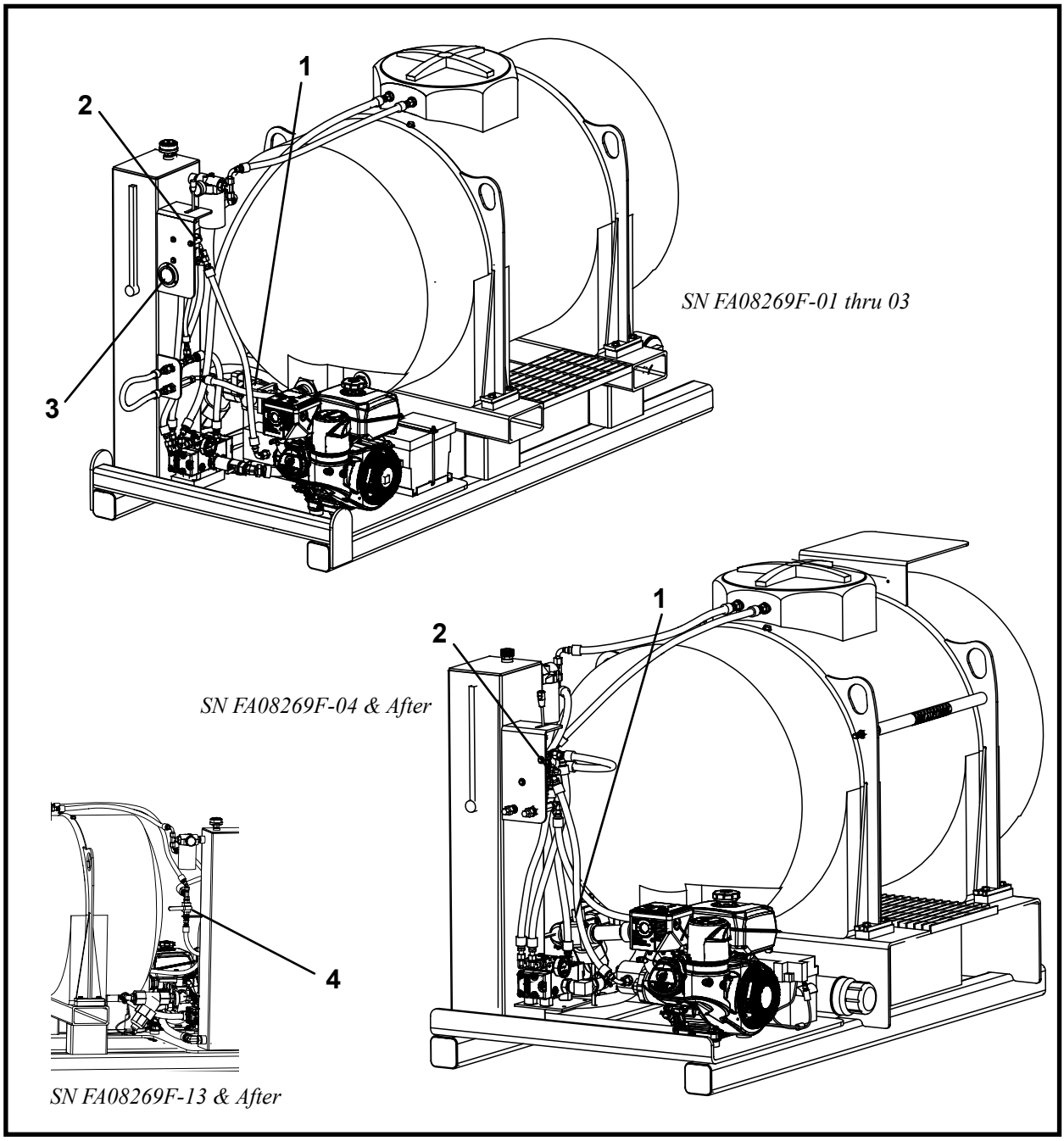
ITEM	QTY	PART NO.	DESCRIPTION
1	2	A10311A-018	HOSE ASSEMBLY, 3/8 x 18
2	2	A09908A-018	HOSE ASSEMBLY, 5/8 x 18
3	2	A10476A-300	HOSE ASSEMBLY, 3/8 x 25'
4	2	P0200-109	HOSE ASSEMBLY, 5/8 x 25'

NOTE:

- Use 3/8 hoses for 50 seconds (Marsh Funnel) viscosity or less
- Use 5/8 hoses for 50 seconds (Marsh Funnel) viscosity or greater

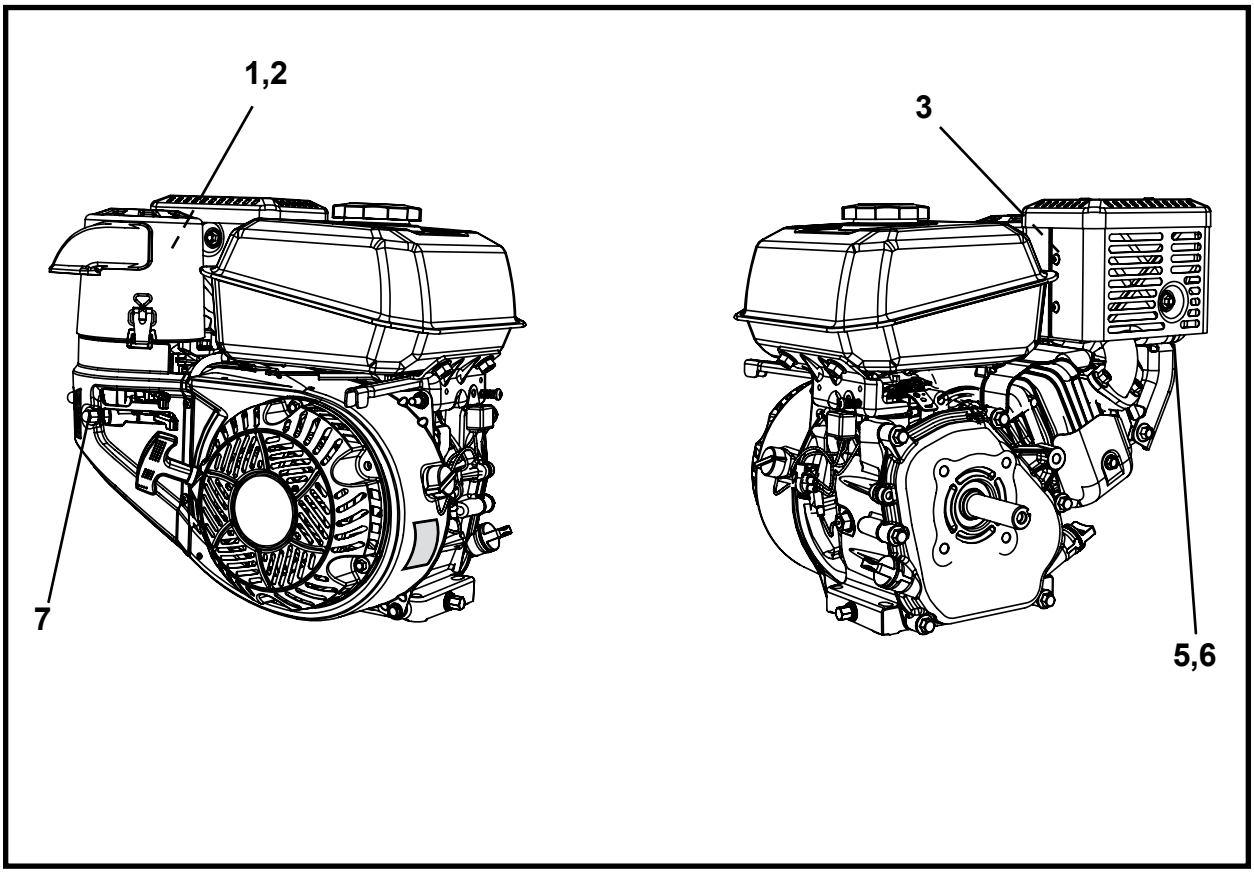
Refer to Lubrication Guidelines in the Operation section of the Operation manual.

NOTES



ITEM	QTY	PART NO.	DESCRIPTION
1	1	P0258-006	VALVE, Port 1-1/2
2.1	1	P0302-696	VALVE, Control (Includes item 2a) (SN FA08269F-1 Thru 16)
2.1a	1	P0302-696A	CARTRIDGE, Valve
2.2	1	P0302-803	VALVE, Control (SN FA08269F-17 & After)
3	1	P0301-123	GAUGE, Pressure 3000 psi (SN FA08269F-01 thru 03 Only)
4	1	P0302-801	VALVE, Mixer Control (SN FA08269F-13 & After)

ENGINE, 14 HP, P0125-146



ITEM	QTY	PART NO.	DESCRIPTION
0	1	P0125-146	ENGINE, 14 HP
1	1	P0125-146A	FILTER, Precleaner
2	1	P0125-146B	FILTER, Air
3	1	P0125-146C	SPARK PLUG
4	1	P0125-146D	KIT, Carburetor (Not Shown)
5	1	P0125-146E	GASKET, Exhaust (verify locations)
6	1	P0125-146F	ELBOW, Exhaust
7	1	P0125-146G	MODULE, Ignition

For engine parts, contact your local Kohler® engine distributor.

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WARNING

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