OPERATION & PARTS MANUAL

Jetting & Lubrication Pump

2325D/2325E

Pump S/N: FA45103F (2325D) & FA45914F (2325E)

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SERVICE • RELIABILITY • INNOVATION

Introduction

This manual contains important safety, operation, maintenance, and parts information for your Akkerman 2325D/2325E Jetting & 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 2325D/2325E Jetting & 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 2325D/2325E Jetting & 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.

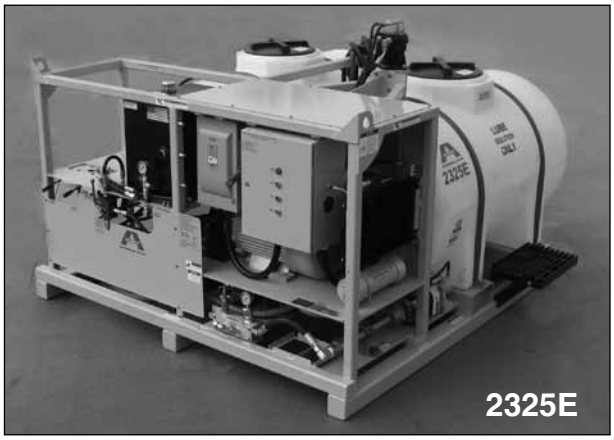
⚠WARNING Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

⚠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.

2325D



2325E

Akkerman Jetting & Lubrication Pumps

The 2325D/2325E Jetting & Lubrication Pump is designed for the GBM jetting and lubrication system though it can be used in other lubrication applications. The jetting pump system aides the GBM cutting process by lubricating cutter bits and spoils during excavation. The lubrication pump system assists with lubricating the pilot tubes, casing and augers and product pipe by reducing friction and easing the jacking process.

If you find any errors with this manual or know of ways to improve procedures, please let us know.
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.

NOTES

Contents

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.

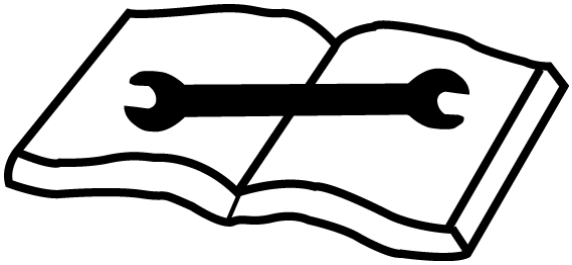
ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

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.

HYDRAULIC OIL/FLUIDS UNDER PRESSURE

⚠WARNING Escaping oil or other 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 oil or fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

LOCKOUT/TAGOUT POWER BEFORE SERVICING

⚠DANGER Failure to lockout power before servicing will cause severe personal injury or death.

LOCKOUT power before attempting to make repairs or adjustments to this equipment, unless otherwise indicated. Proper lockout will prevent accidents and save lives. Performing the lockout will also prevent the equipment from moving or operating unexpectedly.

The 2325E Jetting & Lubrication Pump is powered by high voltage electricity. LOCKOUT/TAGOUT main power supply before servicing. Electrical repairs must be performed only by a certified electrician.

INSPECT ELECTRICAL CONNECTIONS - 2325E

⚠WARNING Regularly inspect electrical connections to be sure they are secure. Failure to do so could cause an explosion if moisture enters a unsecured electrical connection.

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.

MAINTAIN BATTERY SAFELY - 2325D

⚠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.

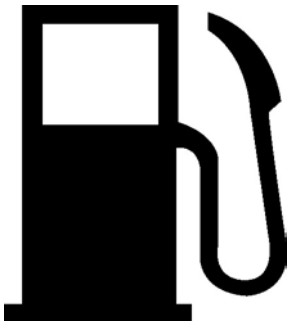
Charge a battery only in a well-ventilated area.

Never charge a frozen battery.

PRESSURIZED COOLING SYSTEM - 2325D

⚠WARNING Cooling system under pressure. Explosive release of HOT engine coolant can cause severe burns. SLOWLY remove the radiator cap ONLY if the engine is cool.

REFUELING - 2325D



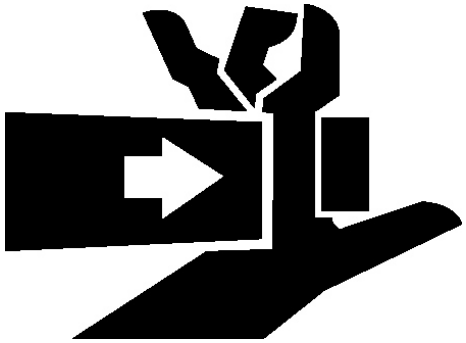
⚠WARNING Fires and explosions can cause serious injury or death.

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.

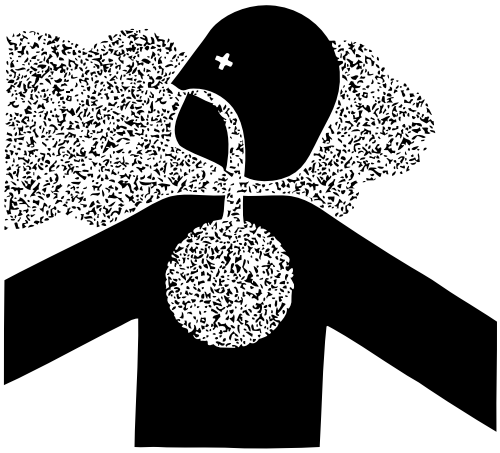
FIRE PREVENTION

⚠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.

BEWARE OF EXHAUST FUMES - 2325D



⚠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.

PRACTICE SAFE MAINTENANCE

⚠WARNING Unexpected movement may cause serious personal injury.

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

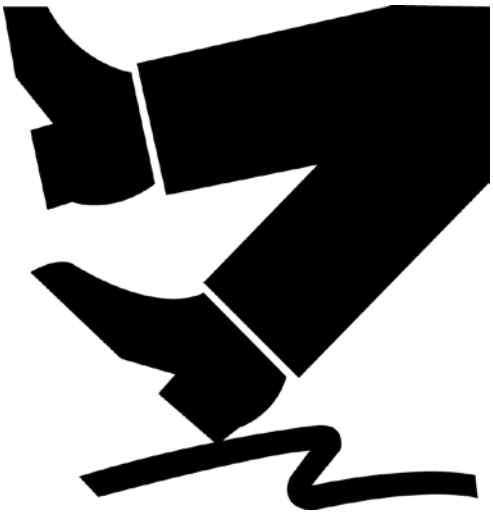
Only trained and qualified personnel should perform any maintenance or repairs.

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.

USING A PRESSURE WASHER WAND

⚠WARNING Using the jetting 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.

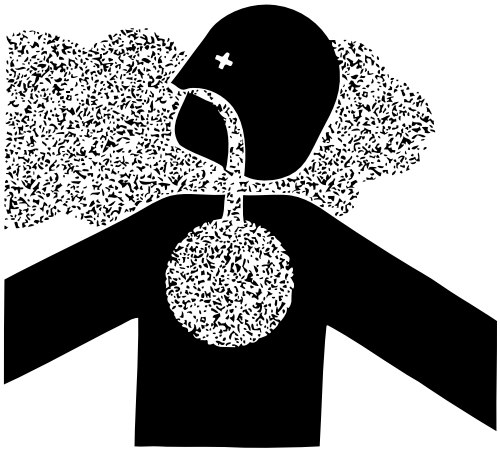
Wear safety glasses and gloves, and depending on the wand use, a particle mask may be necessary.

EXPOSURE TO DANGEROUS CHEMICALS

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

BEFORE mixing chemicals or other agents in the jetting and/or lubrication tanks, be sure the area is well ventilated and other personnel removed from the area.

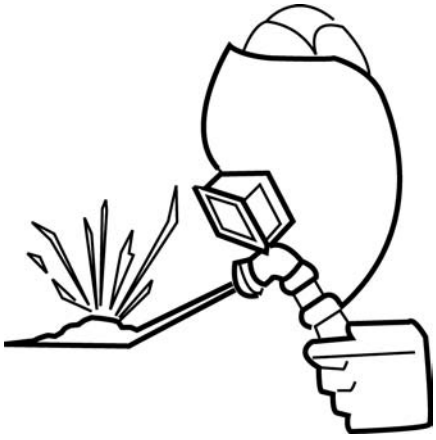
Use proper personal protective equipment per the chemical manufacturer's instructions.



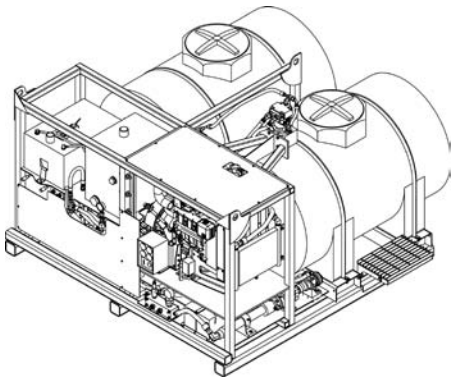
UNAUTHORIZED WELDING

⚠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.

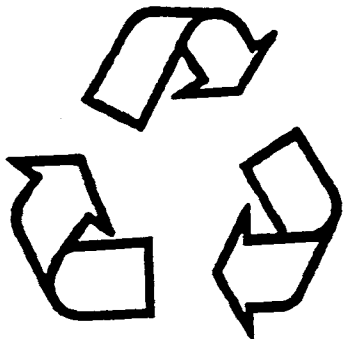
Inspect equipment for damage. If damaged, repair or replace immediately.

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.

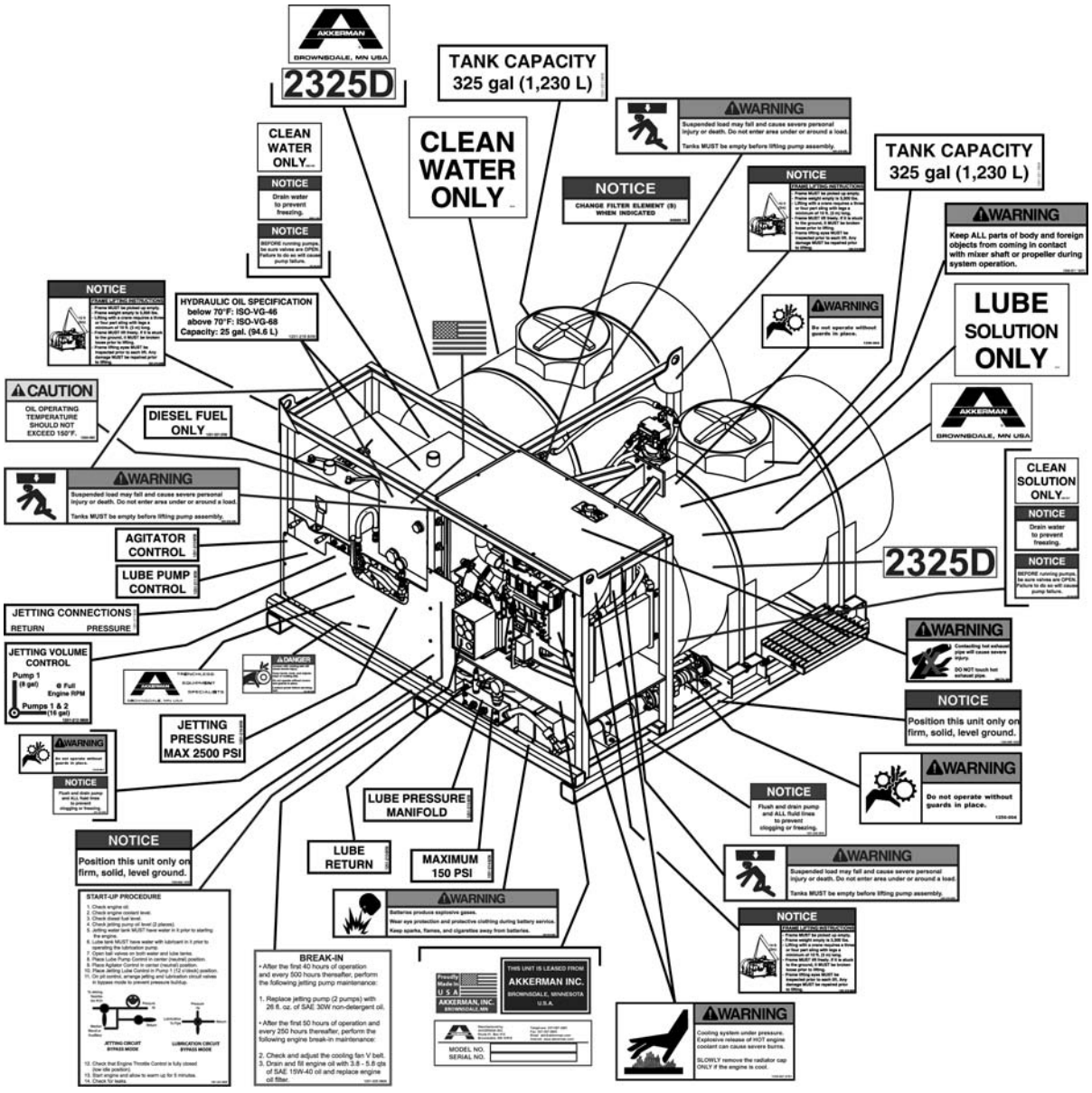
NOTES

Decals

Keep all 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.

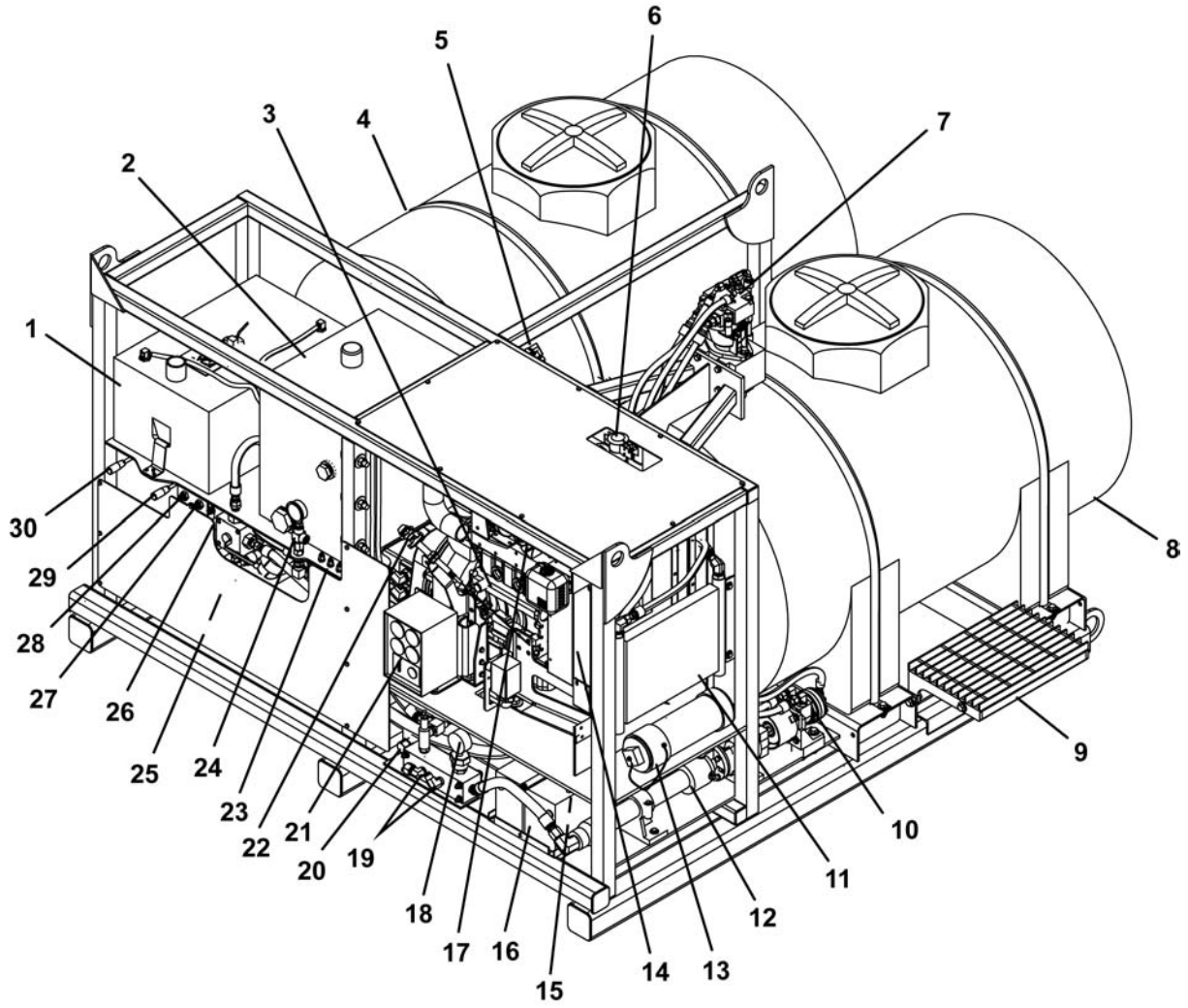


Jetting & Lubrication Pump 2325D Shown

NOTES

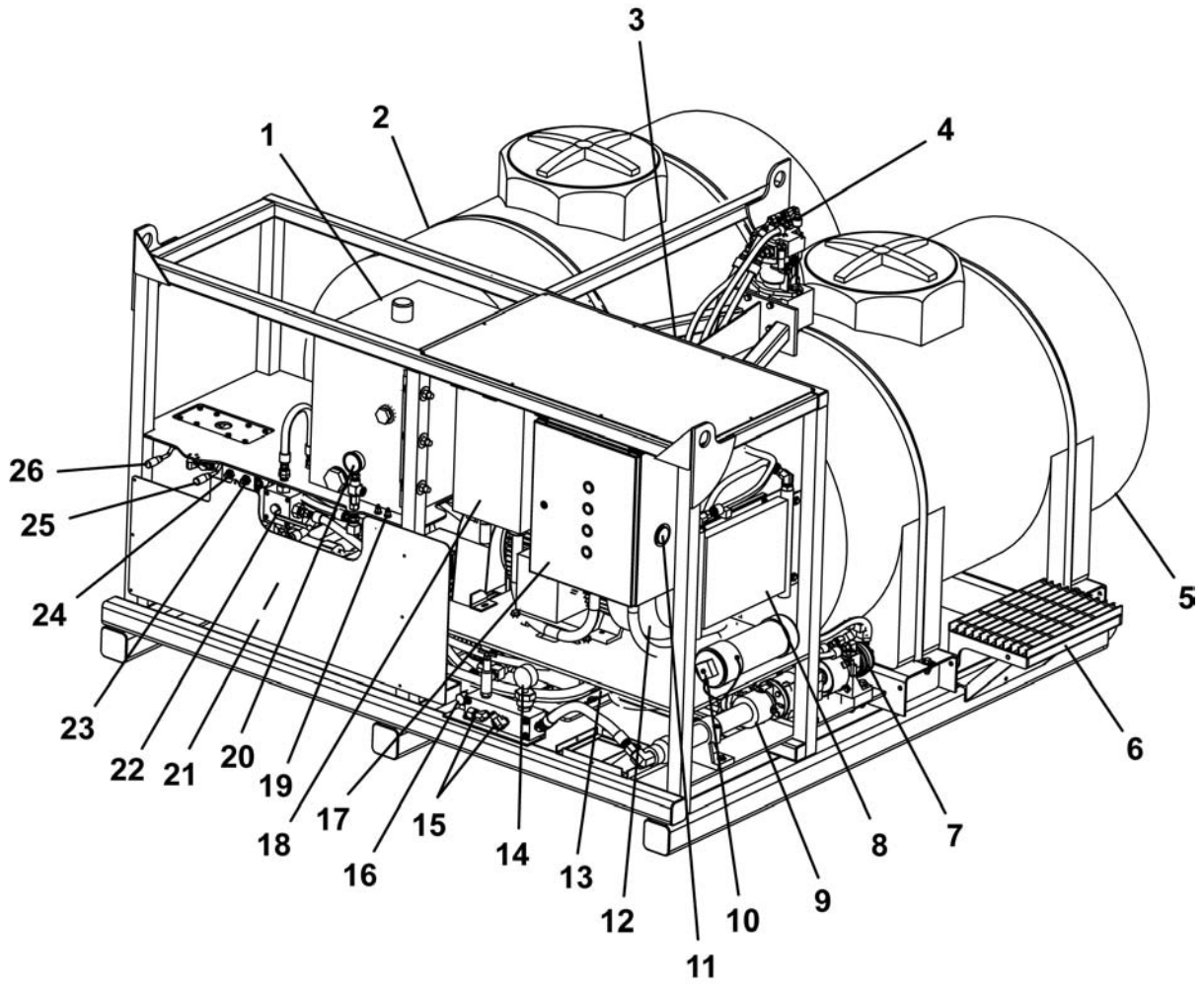
Terminology

JETTING & LUBRICATION PUMP - 2325D



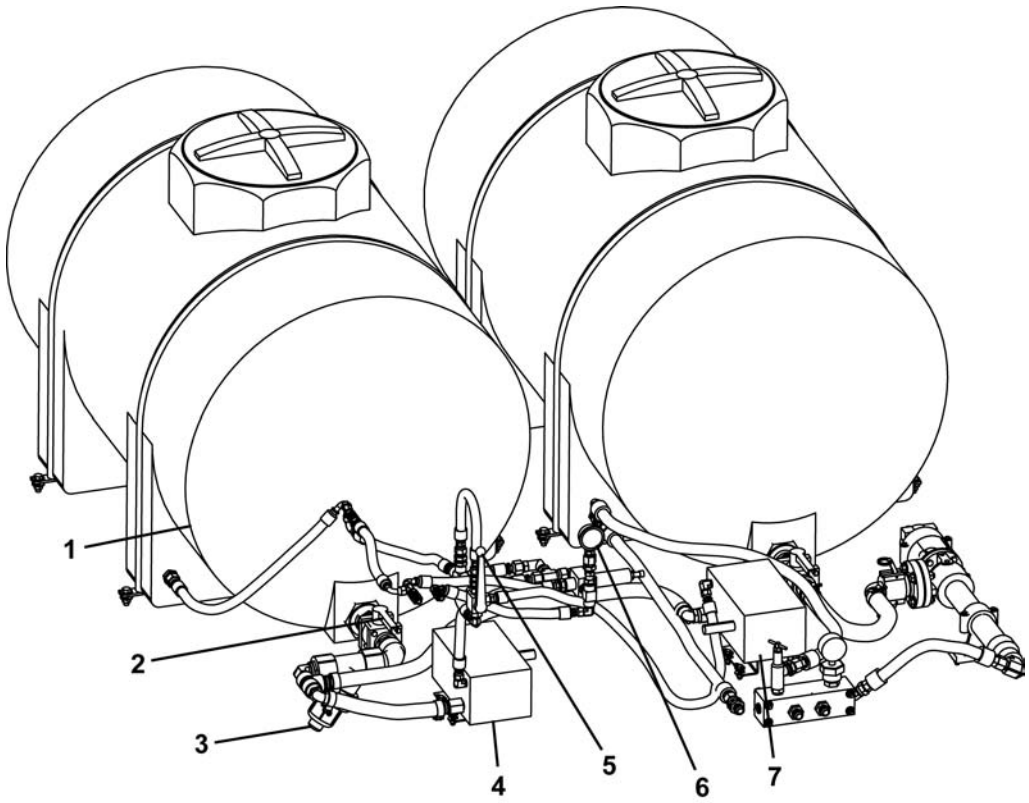
1. Diesel Fuel Tank (18 gal.)
2. Hydraulic Tank (25 gal.)
3. Diesel Engine
4. Jetting Tank (325 gal.)
5. Hydraulic Pressure Filter
6. Exhaust Raincap
7. Agitator Assembly
8. Lubrication Tank (325 gal.)
9. Step
10. Hydraulic Motor
11. Oil Cooler
12. Lubrication Pump
13. Manual Storage Tube
14. Radiator
15. Jetting Pump #2
16. Battery
17. Air Cleaner
18. Lube Pressure 150 psi Max
19. Lube Pressure Manifold
20. Lube Return
21. Engine System Control
22. Throttle
23. Remote Grease Bank
24. Jetting Pressure 2500 psi Max
25. Jetting Pump #1
26. Jetting Volume Control
27. Pressure Jetting Connection
28. Return Jetting Connection
29. Lube Pump Control
30. Agitator Control

JETTING & LUBRICATION PUMP - 2325E



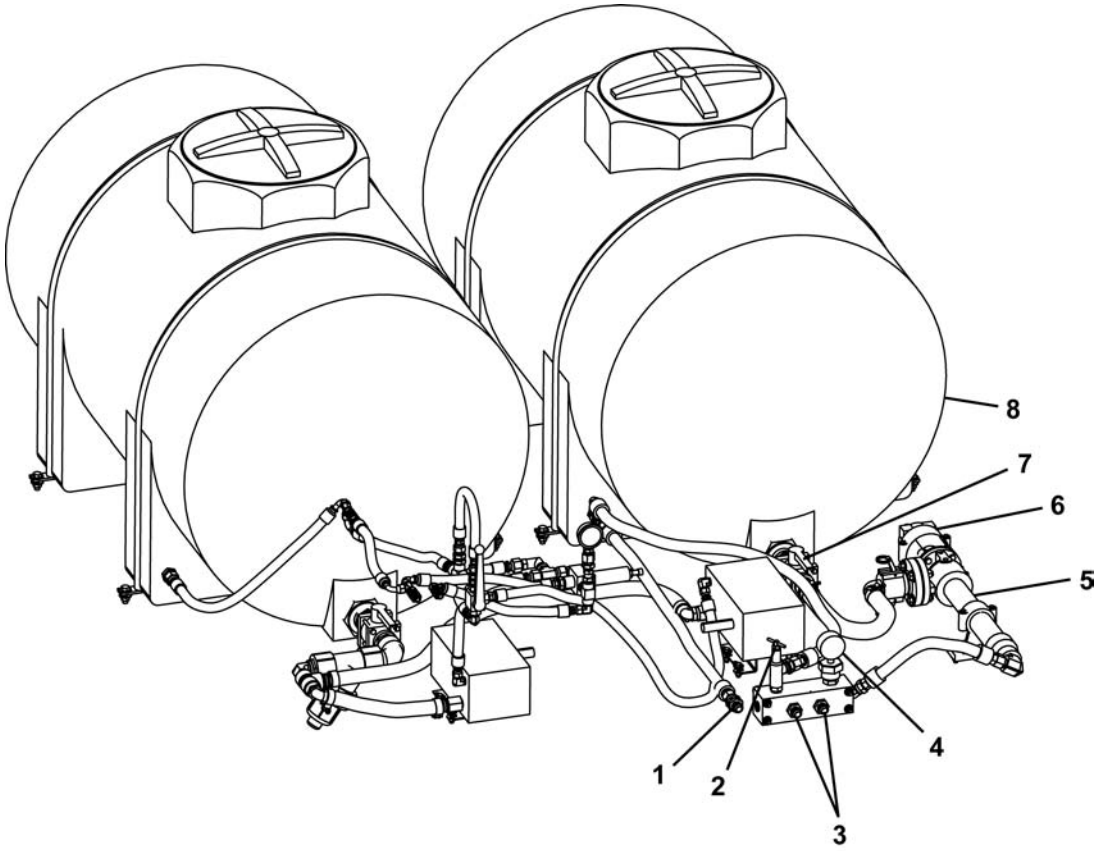
1. Hydraulic Tank (25 gal.)
2. Jetting Tank (325 gal.)
3. Hydraulic Pressure Filter
4. Agitator Assembly
5. Lubrication Tank (325 gal.)
6. Step
7. Hydraulic Motor
8. Oil Cooler
9. Lubrication Pump
10. Manual Storage Tube
11. Hourmeter
12. Electric Motor 30 HP
13. Jetting Pump #2
14. Lube Pressure 150 psi Max
15. Lube Pressure Manifold
16. Lube Return
17. Control Panel
18. Main Power Disconnect Switch
19. Remote Grease Bank
20. Jetting Pressure 2500 psi Max
21. Jetting Pump #1
22. Jetting Volume Control
23. Pressure Jetting Connection
24. Return Jetting Connection
25. Lube Pump Control
26. Agitator Control

JETTING ASSEMBLY



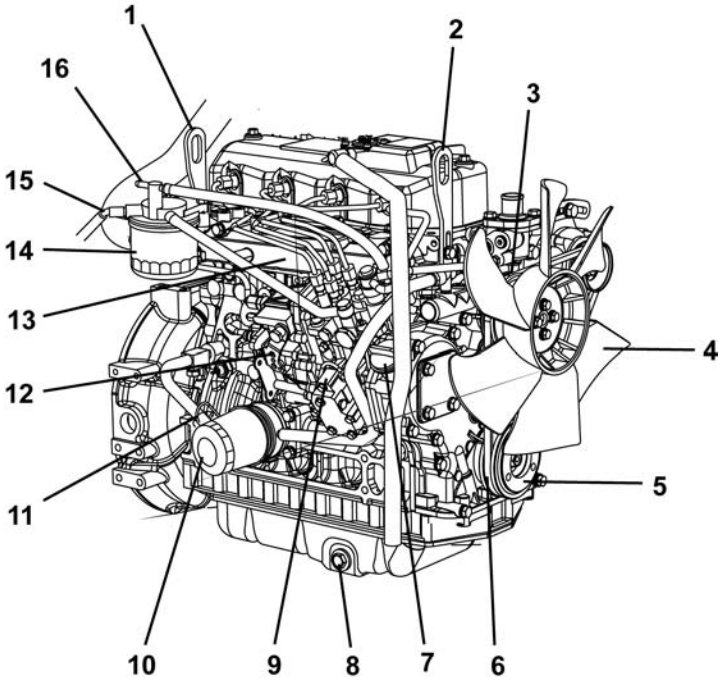
1. Jetting Tank 325 gal.
2. Tank Shut Off Valve
3. Strainer & Element
4. Jetting Pump #1
5. Jetting Volume Control
6. Jetting Pressure 2500 psi Max.
7. Jetting Pump #2

LUBRICATION ASSEMBLY



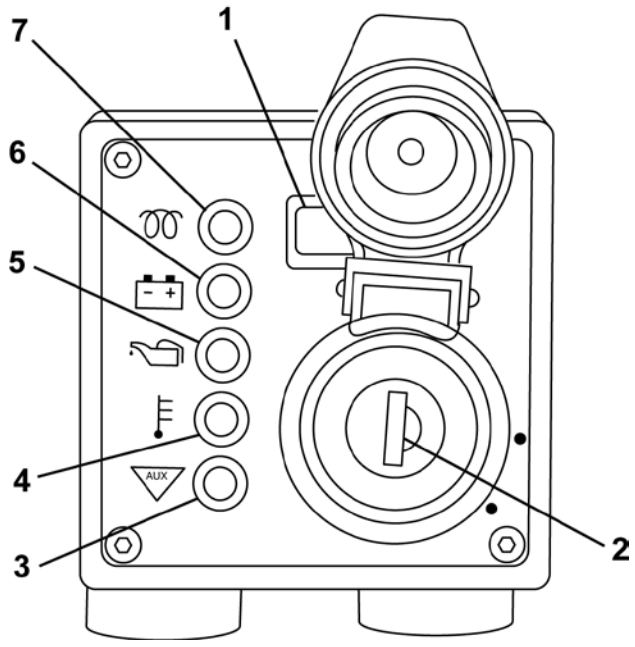
1. Lube Return Connection
2. Relief Valve - Factory Set
3. Lube Pressure Connections
4. Lube Pressure 150 psi Max.
5. Lubrication Pump
6. Hydraulic Motor
7. Tank Shut Off Valve
8. Lubrication Tank 325 gal.

ENGINE - 2325D



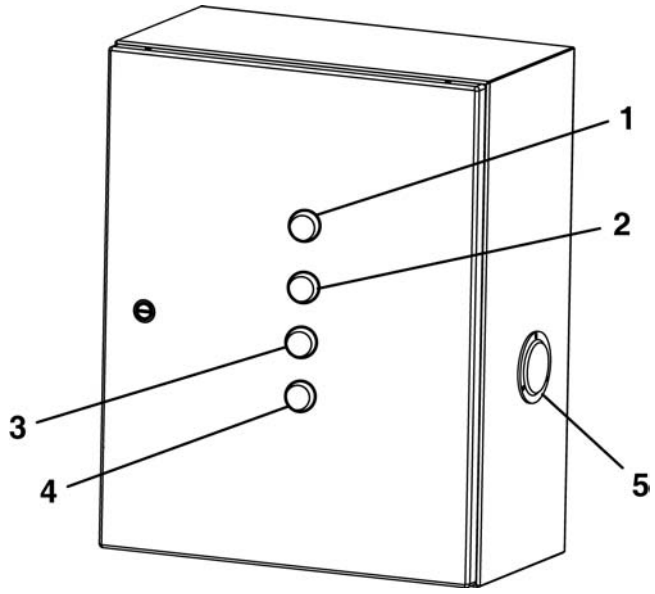
1. Lifting Eye
2. Lifting Eye
3. Engine Coolant Pump
4. Engine Cooling Fan
5. Crankshaft V-Pulley
6. V-Belt
7. Side Filler Port (Engine Oil)
8. Drain Plug
9. Fuel Injection Pump
10. Engine Oil Filter
11. Dipstick
12. Governor Lever
13. Intake Manifold
14. Fuel Filter
15. Fuel Inlet
16. Fuel Return To Fuel Tank

ENGINE SYSTEM CONTROL - 2325D



1. Hourmeter
2. Key Switch
3. Auxiliary
4. Engine Coolant Temperature
5. Engine Oil Pressure
6. Battery Charging
7. Pre-Heat

CONTROL PANEL - 2325E



1. Fault Light
2. Start Switch
3. Stop Switch
4. Reset Switch
5. Hourmeter

NOTES

Controls & Instruments

AGITATOR

The agitator control is a bi-directional control that operates the lubrication system agitator to properly mix the lubricant. The middle position is neutral. The up or down position regulates the agitator direction.

Before starting jetting and lubrication pump, or when not using the lubrication system, be sure to place the control in neutral position.

LUBE PUMP CONTROL

The Lube Pump control is a two position valve that regulates the operation of the lubrication pump.

Operate the control as follows:

Up - Neutral

Down - Pump System ON

Before starting jetting and lubrication pump, or when not using the lubrication system, be sure to place the control in neutral position.

NOTICE NEVER operate the lubrication pump with plain water. Doing so will cause pump damage.

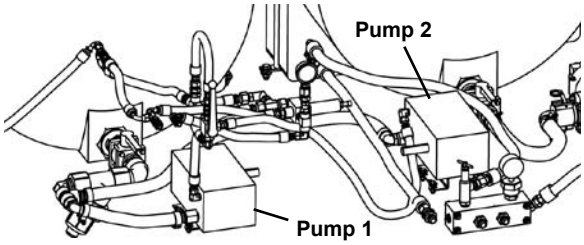
JETTING VOLUME CONTROL

NOTICE The jetting system operates as soon as the engines starts. Be sure the Jetting Volume control is at Pump 1 (8 gallons) position to reduce load on engine at start up. Be sure there is enough water in the tank to cover inlet.

The Jetting Volume control regulates the jetting water volume at full engine RPM by selecting the desired jetting pump combination as follows:

12 o'clock - Pump 1 - 8 gal/min

3 o'clock - Pumps 1 and 2 - 16 gal/min



NOTICE Reducing the engine RPM will reduce the jetting volume.

TANK SHUT OFF VALVES

The jetting and lubrication shut off valves are used to open and close the tank outlets.

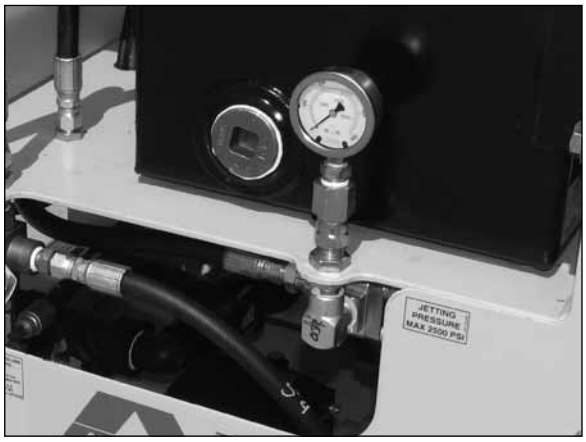
NOTICE BOTH tank shut off valves MUST be open before starting the 2325D/2325E jetting and lubrication pump. Failure to do so will cause damage to jetting and lubrication pumps.

Jetting Tank Shut Off Valve Shown in Closed Position

PRESSURE GAUGES

Use the pressure gauges to monitor the jetting and lubrication pressures.

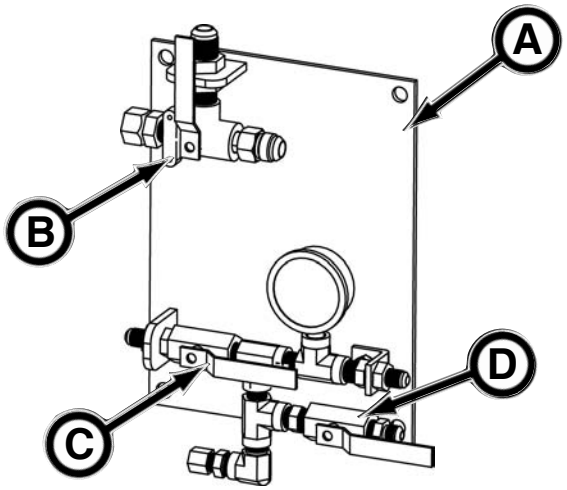
Jetting:
Maximum pressure @ full engine RPM is 2,500 psi (17,237 kPa).



Lubrication:
Maximum pressure @ full engine RPM is 150 psi (1,034 kPa).

JETTING & LUBRICATION SHAFT CONTROL

The shaft control (A) allows the operator to control the jetting and lubrication from the launch or reception shafts. It is connected directly to the 2325D/2325E jetting and lubrication pump pressure and return ports.



LUBRICATION

The lubrication circuit provides lubrication to the:

- outside of casings using the reaming head
- outside of product pipe using the Powered Cutter Head
- outside of product pipe using the Powered Reaming Head

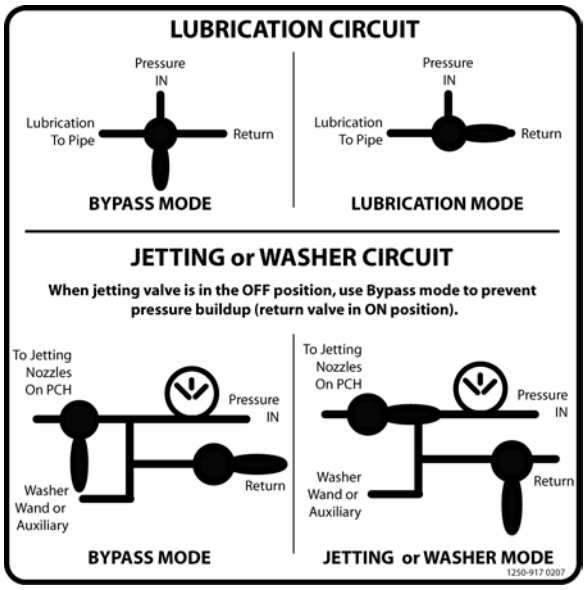
Use the lubrication circuit ball valve (B) to control the lubrication to pipe (Lubrication Mode) or to tank (Bypass Mode).

JETTING

The jetting circuit provides jetting/lubrication to:

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

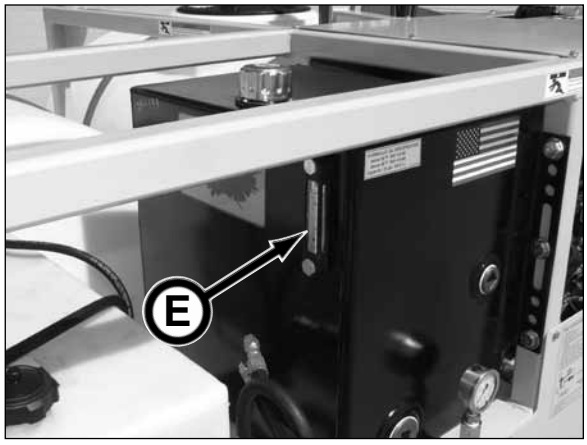
Use a combination of the jetting circuit ball valves (C and D) to control jetting to component, washer wand or auxiliary (Jetting or Washer Mode), or to tank (Bypass Mode).



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

HYDRAULIC TANK

The hydraulic tank provides hydraulic oil for the agitator and lubrication pump motors. The tank includes a temperature and sight gauge (E).



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 25 gal. (94.6 L).

KEY START SWITCH - 2325D

NOTICE For additional engine information, refer to your engine operation manual.

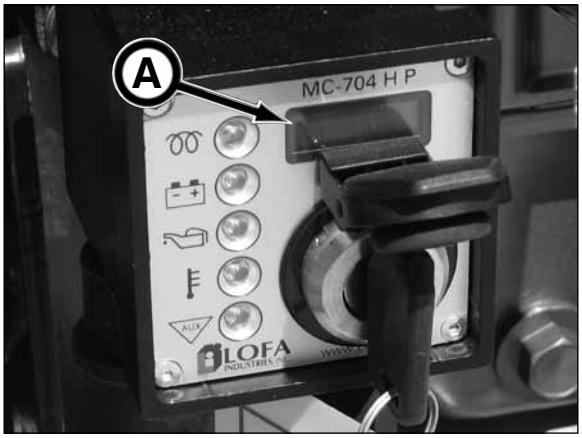
The three-position key start switch controls the engine electrical system. When the key switch is turned clockwise to START, the engine will crank. When the engine starts, release the key and it will automatically return to the ON position.

OFF - Electric current to the gauges and indicators is shut off. The key can be inserted and removed in this position. When shutting down the engine, allow engine to idle, without load for 5 minutes. This will allow engine components to slightly cool before the engine is shut down.

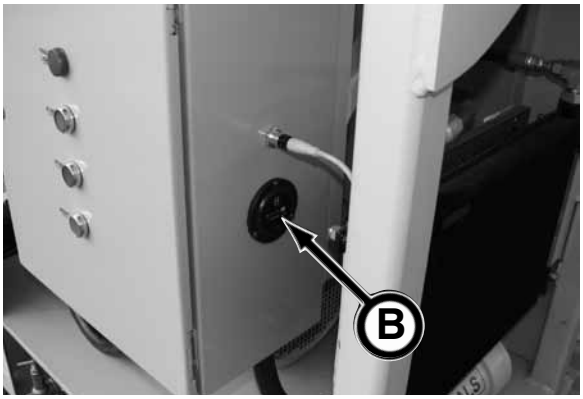
ON - This is the position the key will be in when the engine is running. When the engine is not running, use this position to energize the gauges, indicators, electric fuel pump and auxiliary devices.

START - Turn the key to this position to start the engine. NEVER hold the key in the START position for longer than 15 seconds or the starter motor will overheat.

HOURMETER



2325D
The hourmeter display (A) shows the total number of hours the engine has run.

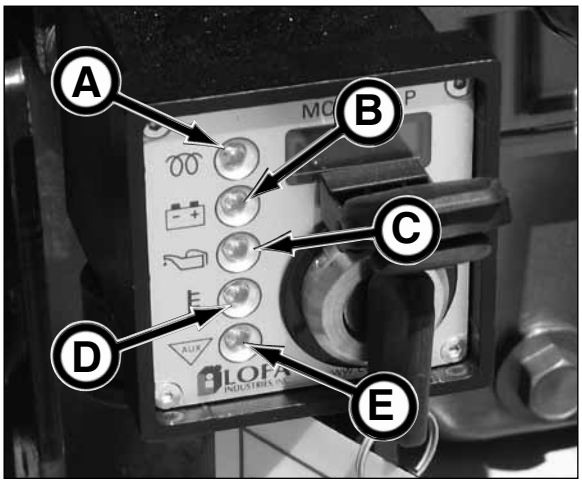


2325E
The hourmeter (B) registers in full and 1/10ths hours.

ENGINE SYSTEM CONTROLS - 2325D

NOTICE For additional engine information, refer to your engine operation manual.

The engine system controls consist of a group of illuminated indicators representing the current status of the engine.



Pre-Heat (A)
This function is automatically activated when the key switch is turned to the ON position. The indicator flashes for several seconds and when it goes out, the key can be turned to the START position.

Battery (B)
Light illuminates until engine is running and alternator is supplying charging current.

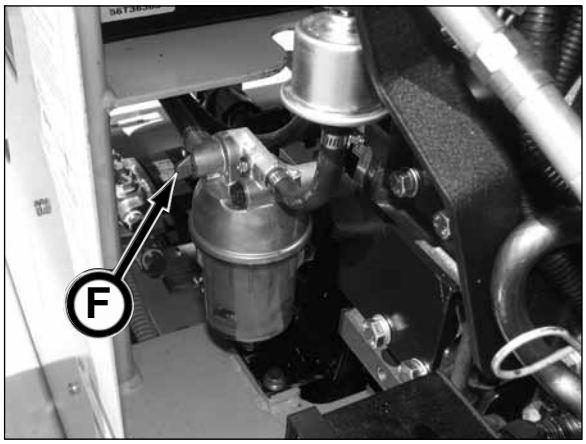
Engine Oil Pressure (C)
Light illuminates until the engine is running and the oil pressure is within normal limits.

Engine Coolant Temperature (D)
Light illuminates momentarily at start up. If light reappears while engine is running, the engine is overheating.

Auxiliary (E)
Light illuminates momentarily at start up. Used for special applications (refer to your engine operation manual).

ENGINE FUEL SHUTOFF - 2325D

NOTICE For additional engine information, refer to your engine operation manual.



The engine is equipped with an engine fuel shutoff (F) on the fuel filter/water separator. NEVER attempt to run the engine without the fuel shutoff in the ON position.

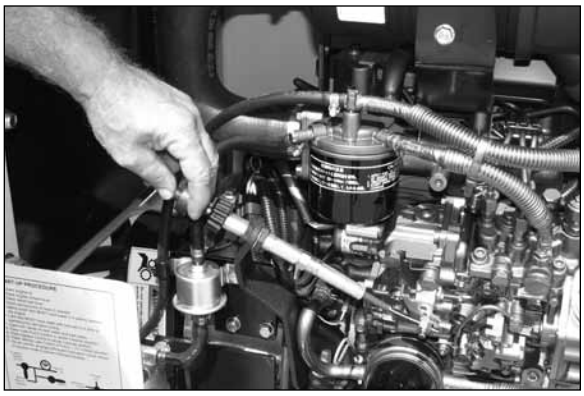
Operate the shutoff as follows:
12 o'clock - ON
3 o'clock - OFF

ENGINE THROTTLE - 2325D

NOTICE For additional engine information, refer to your engine operation manual.

Use the engine throttle to increase or decrease the engine speed.

Increase Speed: Depress throttle button and pull out throttle cable to desired speed and then release throttle button.



Decrease Speed: Depress throttle button and push in throttle cable to desired speed and then release throttle button.

MAIN POWER DISCONNECT SWITCH - 2325E

⚠DANGER Hazardous voltage. Disconnect and lock out power from source before servicing.

The main power disconnect switch (A) controls the ON/OFF power of the 2325E Jetting and Lubrication Pump.

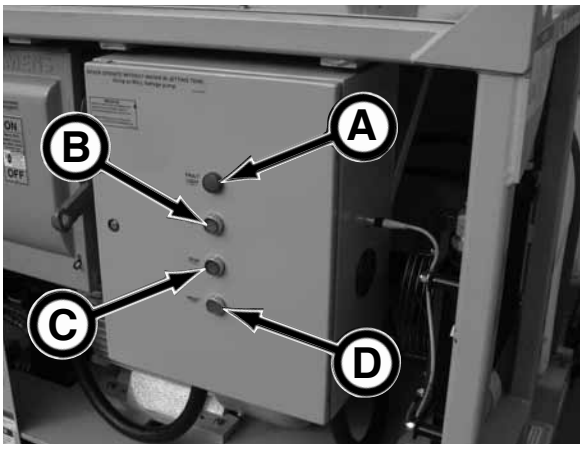
Operate the switch as follows:

Up - ON
Down - OFF

NOTICE The main power disconnect switch must be ON to start up the electric motor.

CONTROL PANEL - 2325E

The 2325E control panel consists of the start (B) and stop (C) switches, the fault light (A) and fault reset (D) switch.



With the main power disconnect switch ON, start and stop the electric motor by depressing the Start and Stop switches.

The control panel is also equipped with a Soft Start System to protect the 30 HP electric drive motor. The Soft Start system eliminates the hard starting and stopping of the electric drive motor. This system is pre-programmed at the factory. In the event that a fault occurs in the Soft Start System, the fault light illuminates and the soft start system prevents the electric drive motor from starting. The soft start system will require troubleshooting. Once the fault is resolved, the reset switch must be depressed before the motor will restart.

NOTES

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.

	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. A qualified electrician must check that all electrical connections are properly secured and grounded prior to operation.
	5. (2325E) BEFORE connecting to 480V power source, be sure the Main Power Disconnect switch is in the OFF position.
	6. (2325E) Once power is properly connected, flip main power disconnect switch ON and check for proper motor rotation. If not, lock out power and switch phase connections and retest.
	7. Water must be in jetting tank and a lube solution in the lubrication tank prior to start up.
	8. Place Jetting Volume control in the Pump 1 (12 o'clock) position.
	9. Be sure pit lubrication control is in Bypass position.
	10. Agitator control must be in neutral position.
	11. Place Lube Pump control in neutral position.
	12. The tank shutoff valves on both tanks MUST be open prior to starting the pump.
	13. All pump connections must be secure to prevent cavitation.
	14. Clean strainer before operating pump.
	15. USE ONLY CLEAN WATER SOURCE.
	16. Check engine diesel fuel level. Add as needed.
	17. (2325D) Check engine oil level. Add as needed.
	18. Check hydraulic oil level. Add as needed.
	19. Check belt tension. Tighten as needed.
	20. Check controls and switches for proper operation. Repair or replace if damaged or worn.
	21. Remove combustible or flammable materials from equipment. Store materials properly.
	22. Inspect equipment for damage. Repair or replace as needed.
	23. Thoroughly clean equipment of mud and dirt.
	24. Be sure all covers and guards are in place before operation.
	25. Check for loose or missing hardware. Replace damaged or missing hardware.
	26. Check for worn, loose, or damaged wire connections. Repair or replace wiring connections.
	27. Tighten loose clamps or fittings.
	28. Check for fluid leaks. Repair leak or replace components.
	29. 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 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. Before operating, inspect equipment and conduct repairs as needed.
8. Test the electrical motor for proper rotation prior to operating the jetting & lubrication pump.
9. Test air monitoring and ventilation detectors for proper operation. Never enter a tunnel or shaft without combustible gas detectors and oxygen deficient 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 valves on BOTH tanks MUST be open and filled with water prior to starting the engine. Failure to do so will cause damage to jetting and lubrication pumps.
14. Check all fluid levels (fuel, hydraulic, engine oil, jetting/lubrication pump) 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 before start up.
18. Stop engine/electric motor before making repairs, adjustments, or removing obstructions from mixing tanks.
19. Eye, ear and respiratory protection MUST be worn by operator while filling tanks with chemicals such as wetting agents, polymer, etc.
20. Never dry run or operate pump with tank shutoff valves closed.
21. Flush and drain pumps, suction manifold, and ALL fluid lines to prevent clogging or freezing.
22. Keep ALL parts of the body and foreign objects from coming in contact with mixer shaft or propeller during pump operation.
23. 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.
24. If repairs are necessary to equipment, before making repairs, be sure to lockout tagout power source to prevent accidental starting of equipment.
25. 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.

SETTING UP JETTING & LUBRICATION PUMP

1. Position the 2325D/2325E Jetting & Lubrication Pump on firm, level ground near desired area of use.

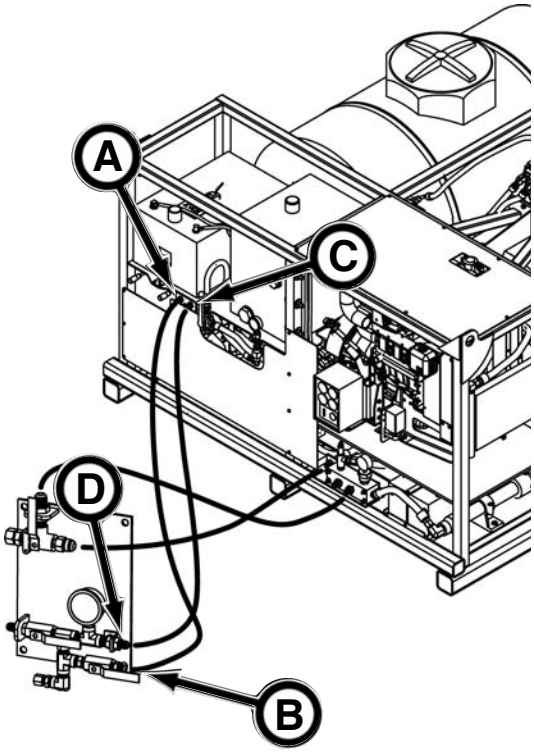
⚠WARNING Do not position the jetting & lubrication pump near the edge of shaft where the ground may be unstable and cause a slide or cave-in. Doing so could cause severe injury or death.

2. Connect the jetting (3/8 in.) and lubrication (1/2 in.) hoses to the pump and shaft control as follows:

JETTING CIRCUIT

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

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



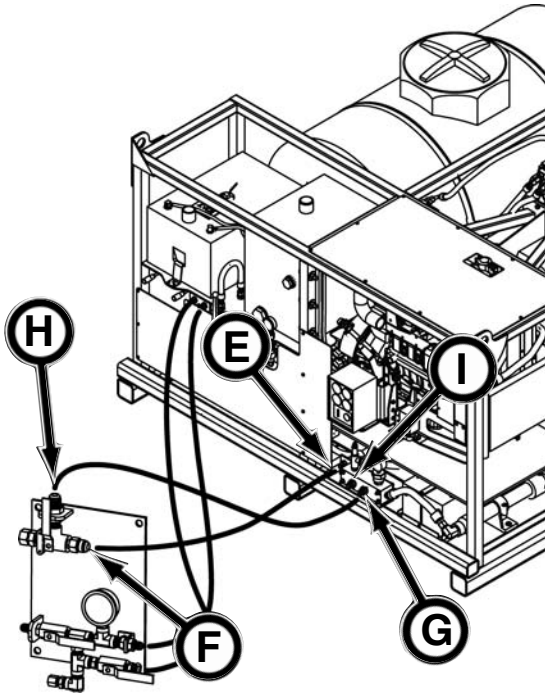
LUBRICATION CIRCUIT

c. Connect the lube hose to pump lube return connection (E) and lube return connection (F) on shaft control.

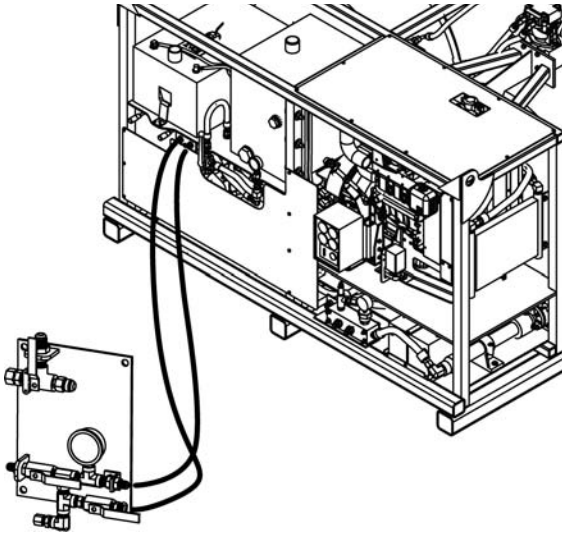
d. Connect the lube hose to pump pressure connection (G) and lube Pressure IN connection (H) on shaft control.

e. Be sure one of the connections on the lube pressure manifold (I) is capped.

3. Once the jetting and lubrication hoses are properly connected, proceed to Jetting Circuit Hookup and/or Lubrication Circuit Hookup in the next few pages.



JETTING CIRCUIT HOOKUP



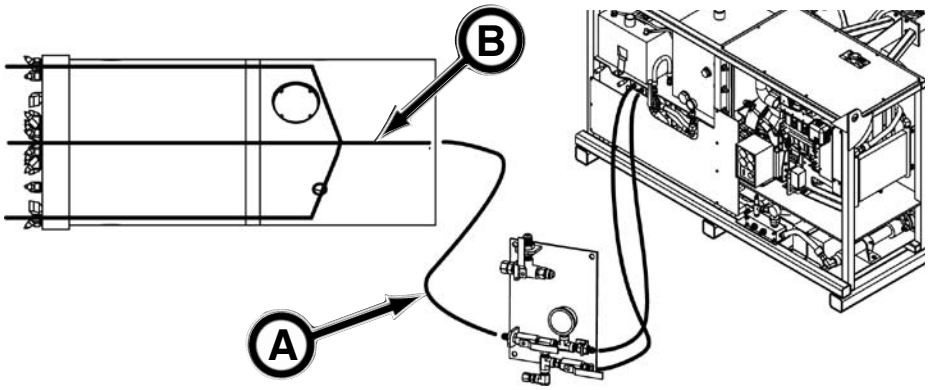
The jetting circuit provides jetting/lubrication to:

- jetting nozzles on Powered Cutter Head
- jetting on Powered Reaming Head
- 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
- washer wand or auxiliary

Hookup jetting based on the jetting requirement as follows:

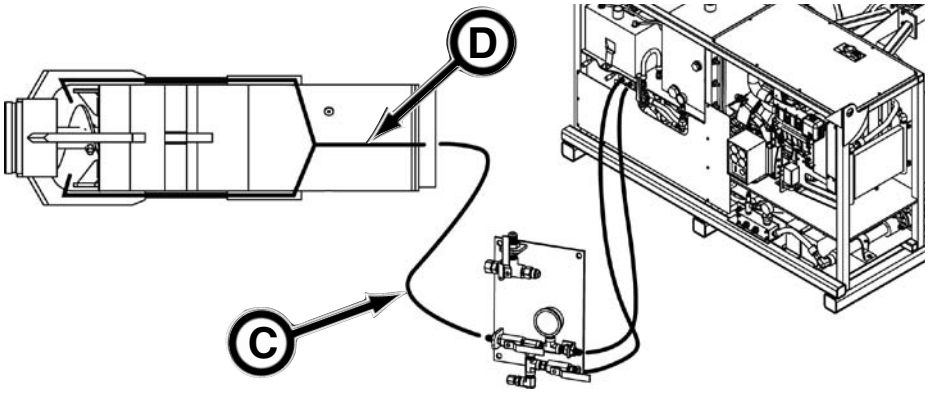
1. Powered Cutter Head Jetting Nozzles

Connect the jetting hose (A) from the shaft control to the jetting hose (B) in the rear of the Powered Cutter Head.



2. Powered Reaming Head Jetting

Connect the jetting hose (C) from the shaft control to the jetting hose (D) in the rear of the Powered Reaming Head in the launch shaft.



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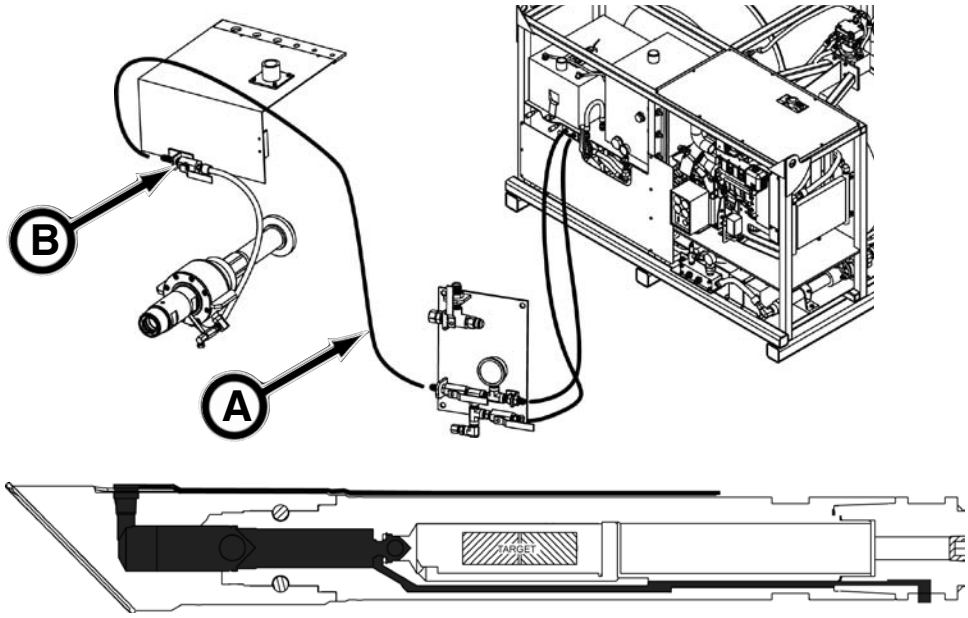
Jetting Circuit Hookup (continued)

3. Lubricating Outside Of Pilot Tubes

Connect the jetting 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 port.

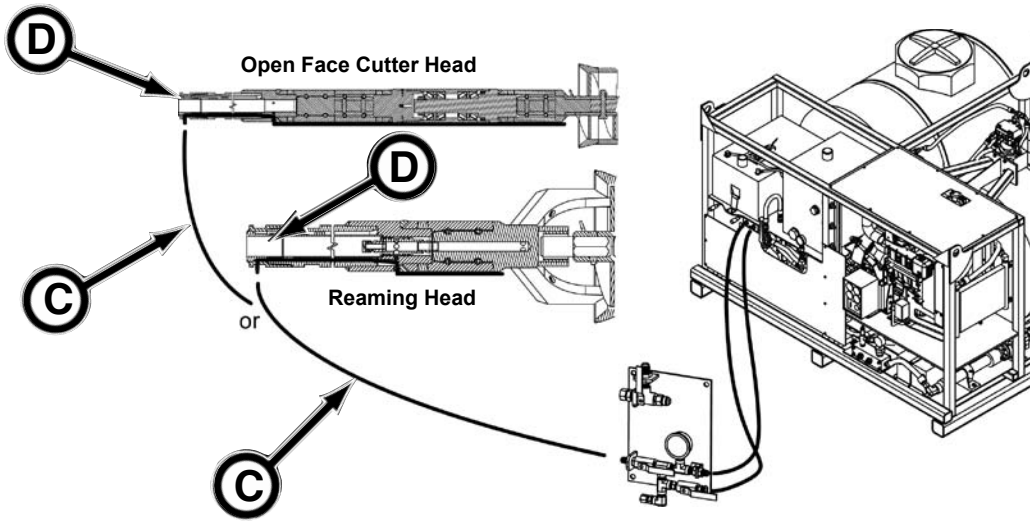
- control the lubrication flow so there is no lubrication flowing out of the pilot tubes in the launch shaft.
- before loosening pilot tube joints, vent the fluid into a catch pan to relieve pressure and prevent the fluid from entering the inner tube of the pilot tube.
- NEVER use Bore Gel or equivalent in annular space of pipe tubes. Clogging of annular space will result.



4. Lubricating Spoils For Reaming Head or Open Cutter Head

Connect the jetting hose (C) from the shaft control to the fluid connector (D) 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.



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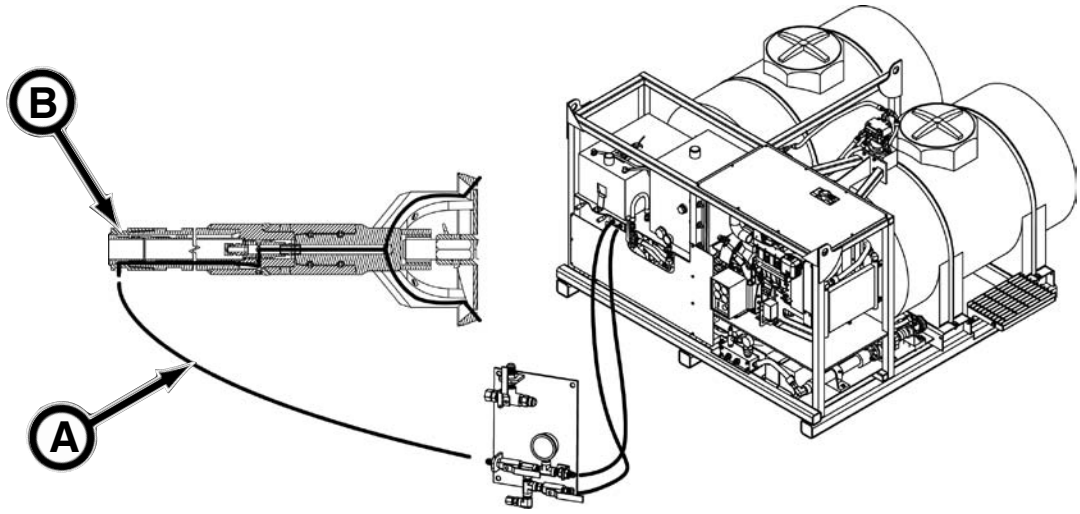
Jetting Circuit Hookup (continued)

5. Lubricating Outside Of Casing With Reaming Head Assembly

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

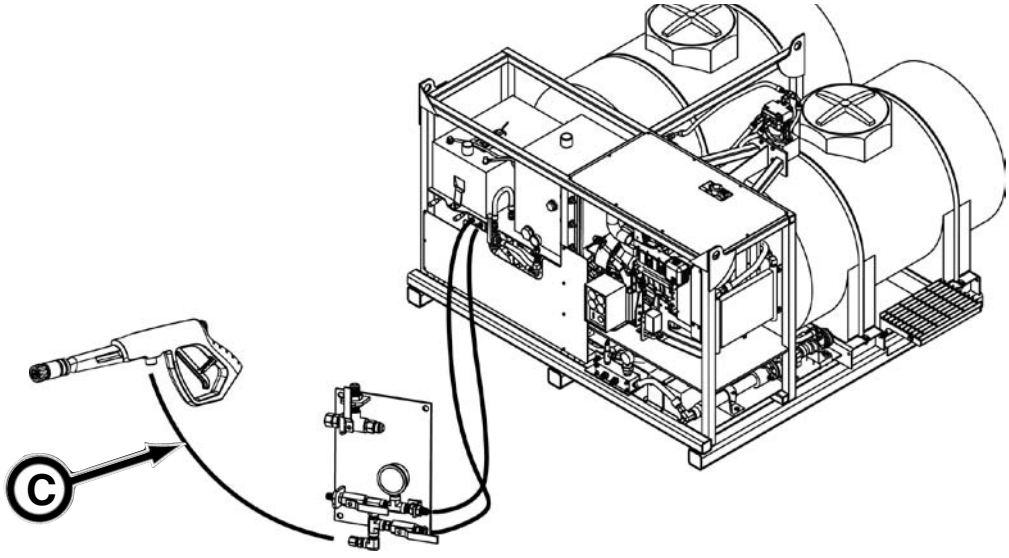
- the lubricant flows through the dual walled pilot tubes, pilot tube adapter, and out the lubrication ports on the reaming head arms to lubricate the outside of casings.



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 jetting pump with a pressure washer wand can generate enough fluid pressure and velocity to penetrate skin resulting in serious personal injury.

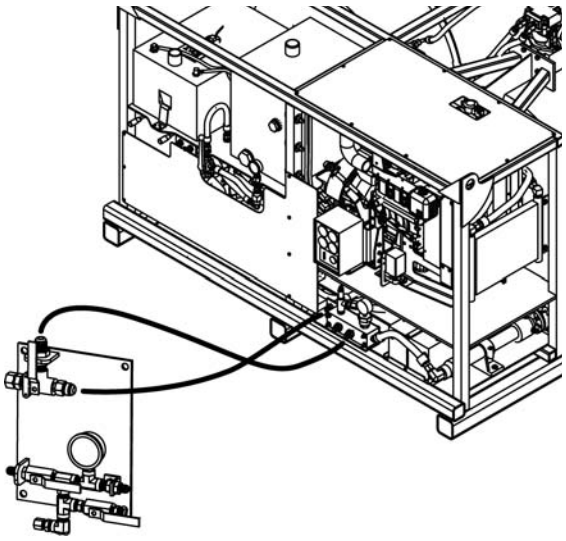
Contact medical help immediately if fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

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.

LUBRICATION CIRCUIT HOOKUP



The lubrication circuit provides lubrication to the:

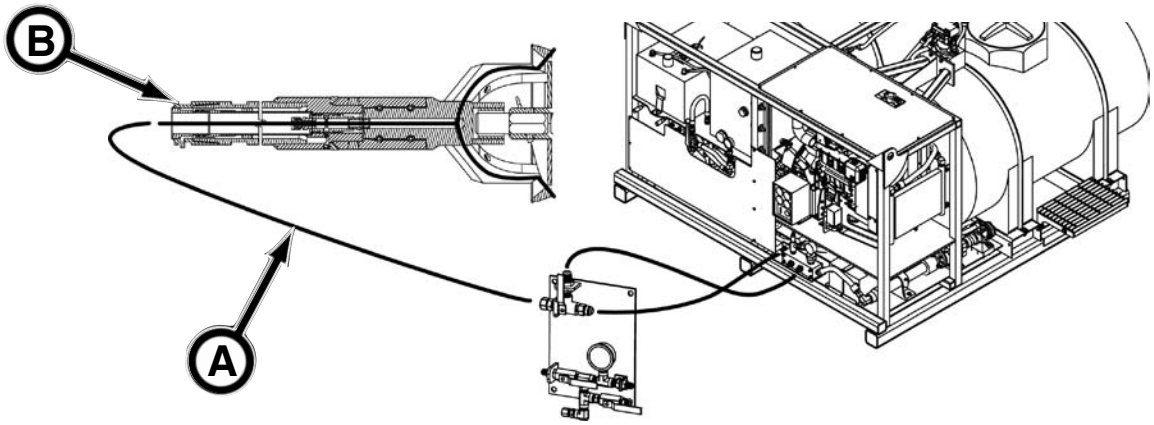
- outside of casings using the reaming head
- outside of product pipe with the Powered Cutter Head
- outside of product pipe with the Powered Reaming Head

Hookup lubrication based on the lubrication requirement as follows:

1. Lubricating Outside Of Casing Using Reaming Head Lubrication Ports

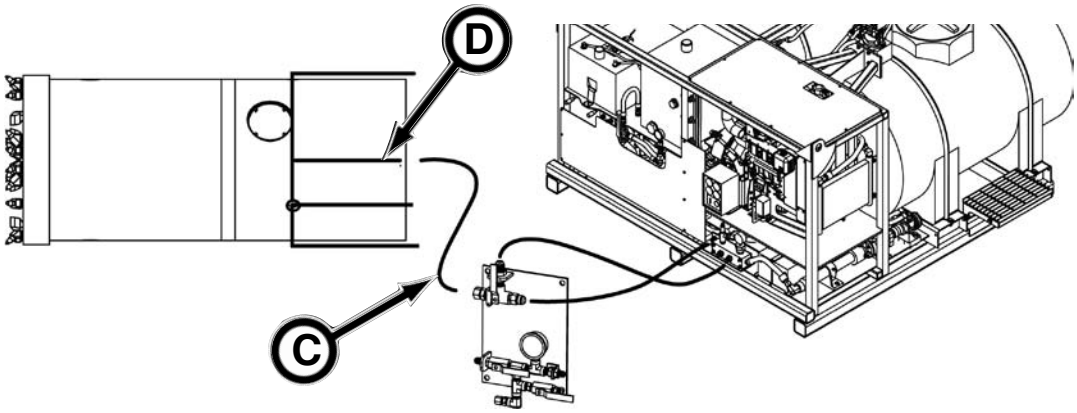
Connect the lubrication hose (A) from the shaft control to the supply hose (B) connected to the fluid connector in the reaming head.

- the lubricant will flow through the supply hose into the reaming head fluid connector and out the lubrication ports of the reaming head arms to lubricate the outside of casings.



2. Lubricating Outside Of Product Pipe Using Powered Cutter Head Lubrication Ports

Connect the lubrication hose (C) from the shaft control to the lubrication hose (D) in the rear of the Powered Cutter Head.



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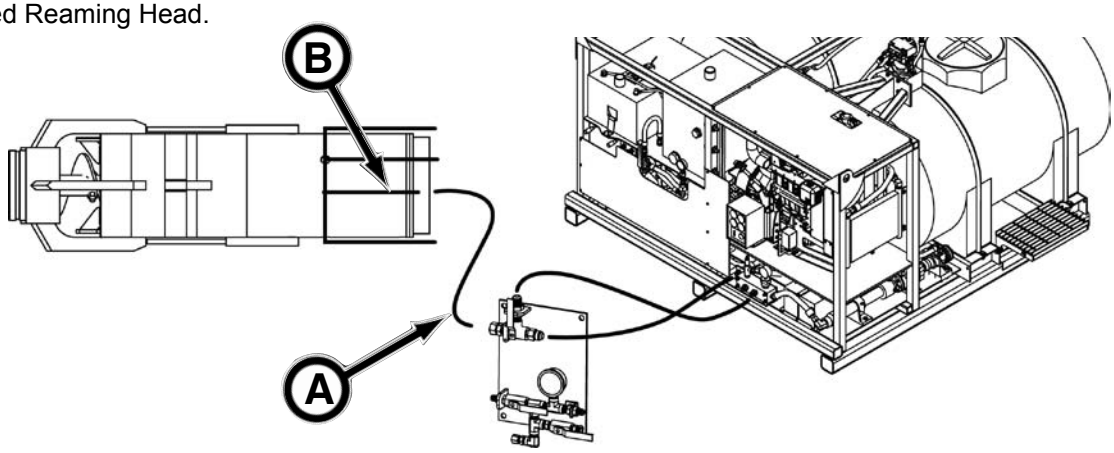
Lubrication Circuit Hookup (continued)

3. Lubricating Outside Of Product Pipe Using Powered Reaming Head Lubrication Ports

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



JETTING GUIDELINES

The amount of jetting depends on ground conditions. If the spoils consist of a slurry substance, the amount of jetting should be reduced.

Only use jetting when advancing pipe to prevent over excavating.

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

Before shutting down jetting, 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.

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.

Use of EZ-Mud®, Con Det® or equivalent can be used in jetting circuit. NEVER use Bore-Gel® or equivalent in the jetting circuit. Clogging will result.

LUBRICATION GUIDELINES

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

Only lubricate while advancing to prevent the lubricant from flowing into launch shaft or into the cutter face causing plugging, resulting in decreased productivity.

Use of Bore-Gel® or equivalent can be used in lubrication circuit.

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

Casing/PRH/PCH 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/PCH 20	2.5 gal	750 gal
PCH 22.5	3.0 gal	900 gal
PCH 28.5	4.0 gal	1,200 gal
PCH 36	4.5 gal	1,350 gal
PCH 44	5.5 gal	1,650 gal

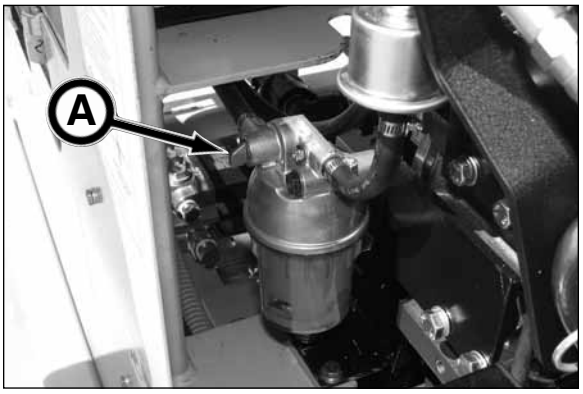
STARTING THE ENGINE - 2325D

NOTICE For proper new engine break-in, refer to your engine operation manual. And for any additional engine information including cold weather starting, refer to your engine operation 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, fuel and engine coolant leaks.
   - Check for damaged or missing parts and fasteners.
   - Check the electrical harnesses for cracks, abrasions, and damaged or corroded connectors.
   - Check hoses for cracks, abrasions, and damaged loose or corroded clamps.
   - Check and clean radiator fins as necessary.
   - Check the fuel filter/water separator for presence of water and contaminants. If you find water or contaminants, drain the fuel filter/water separator and then prime the fuel system.

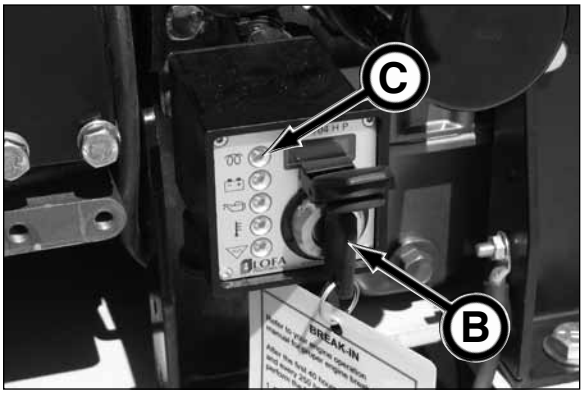
2. Be sure the fuel shutoff control (A) is in the ON (12 o'clock) position.



3. Turn the key switch (B) to the ON position until the Pre-Heat indicator light (C) flashes for several seconds and then goes out.

4. Turn the key clockwise to the START position. Release the key as soon as the engine starts. The key switch will return to the ON position.

   If the engine fails to start, refer to the engine operation manual for the proper starting procedure.



NOTICE NEVER hold the key switch in the START position for longer than 15 seconds. Otherwise the starter will overheat.

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5. While the engine is running, check the engine system control indicators. If the engine has reached operating temperature, all of the indicators should be off. If any indicators are on, shut down the engine and troubleshoot the problem.

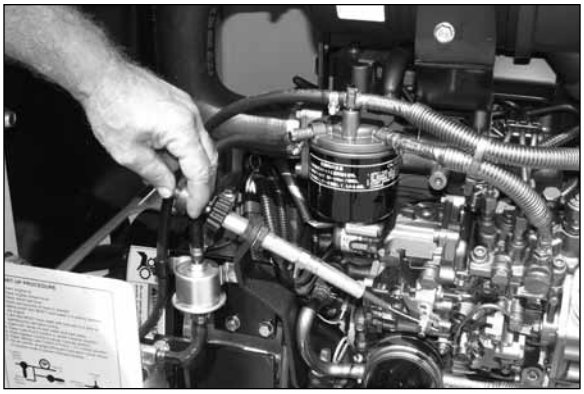
NOTICE The engine has a break-in period of 40-50 hours. Refer to your engine operation manual for proper operation during break-in period.

6. Use the engine throttle to increase engine speed by depressing throttle button and pulling out throttle cable to desired speed and then release throttle button.

SHUTTING DOWN THE ENGINE - 2325D

1. Reduce engine speed to low idle by depressing throttle button and pushing in throttle cable.

2. Run the engine at low idle for at least five minutes before shutting down.

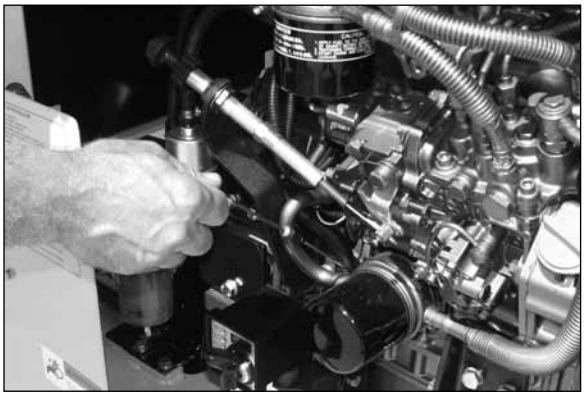


3. Turn the key switch to the OFF position and remove key from switch to prevent accidental starting.

4. If the engine will not be used for an extended period of time, refer to the engine operation manual on Long Term Storage.

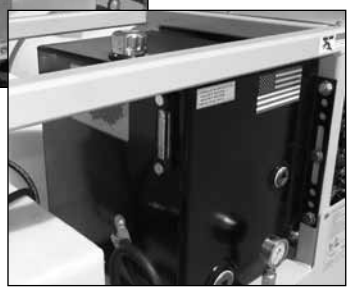
START UP PROCEDURE - 2325D

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



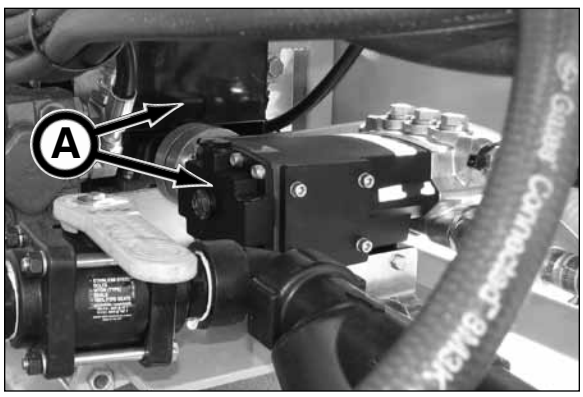
1. Check the engine oil. Add oil if necessary.

2. Check engine coolant level.



3. Check diesel fuel level. Add fuel if necessary.

4. Check hydraulic oil tank level. Add hydraulic oil if necessary.



5. Check jetting pump oil level (A) (2 places) with dipstick. Add SAE 30W non-detergent oil if necessary.

(Continued on next page)

6. Clean jetting tank strainer.

7. Fill jetting tank with CLEAN water before starting the engine. Replace tank lid securely to prevent foreign objects from entering tank.

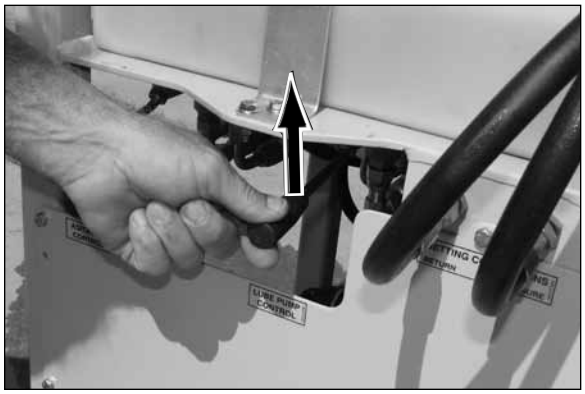
NOTICE Once the engine starts, the jetting pump starts immediately.

8. Fill the lubrication tank with CLEAN water and lubricant before starting the engine. Replace tank lid securely to prevent foreign objects from entering tank.

9. Open tank shut off valves on BOTH jetting and lubrication tanks.

NOTICE NEVER dry run pumps. Doing so will result in pump damage.

10. Place Lube Pump Control in neutral (UP) position.



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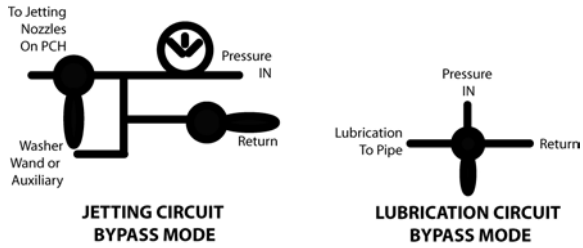
11. Place Agitator Control in neutral (center) position.

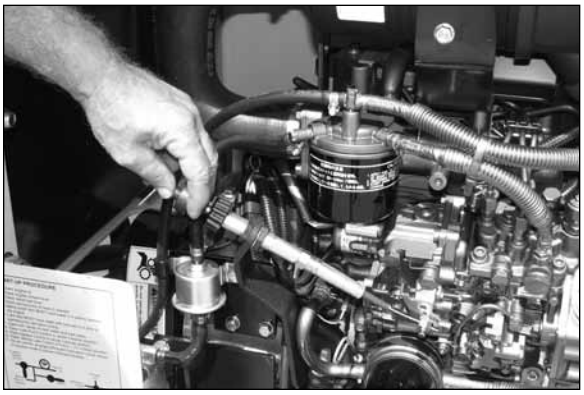
12. Place Jetting Lube Control in Pump 1 (12 o'clock) position.

13. On shaft control, arrange jetting and lubrication circuit valves in bypass mode to prevent pressure buildup.



14. Be sure Engine Throttle Control is fully closed or low idle position.

15. Remove all personnel away from jetting and lubrication pump.



16. Start engine and allow engine to warm up for five minutes before applying a load.

NOTICE The engine has a break-in period of 40-50 hours. Refer to the engine operation manual for more information.

17. Check for leaks.

SETTING UP THE ELECTRIC MOTOR - 2325E

⚠DANGER Hazardous voltage.

Failure to lockout power before connecting power leads or performing service, WILL cause severe personal injury or death.

LOCKOUT TAGOUT main power supply BEFORE connecting power leads or performing service. Electrical connections and repairs must be performed only by a certified electrician.

1. Turn OFF power source and perform lockout/tagout procedure.

2. Test to ensure no voltage is present.

3. Be sure main power disconnect switch (A) is in the OFF position.

4. Connect the 2325E power cables to a 480 VAC, 60 cycle, 3 phase power source.

5. Proceed to Start Up Procedure - 2325E in this section.

STARTING THE ELECTRIC MOTOR - 2325E

1. Set up the electric motor for operation. Refer to Setting Up The Electric Motor - 2325E in this section.

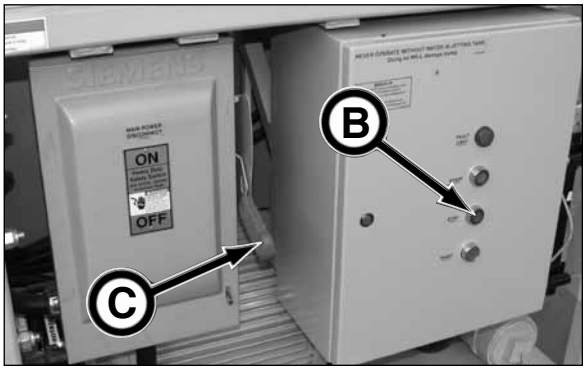
2. Proceed to Start Up Procedure - 2325E in this section. DO NOT start the electric motor without following the start up procedure. Doing so may cause pump damage. NEVER dry run pumps.

SHUTTNG DOWN THE ELECTRIC MOTOR - 2325E

1. Depress Stop switch (B).

2. Move main power disconnect switch (C) down to the OFF position.

3. Perform lockout/tagout procedure to main power source to prevent any accidental starting of the 2325E Jetting & Lubrication Pump.



START UP PROCEDURE - 2325E

⚠DANGER Hazardous voltage.

Failure to lockout power before connecting power leads or performing service, WILL cause severe personal injury or death.

LOCKOUT TAGOUT main power supply BEFORE connecting power leads or performing service. Electrical connections and repairs must be performed only by a certified electrician.

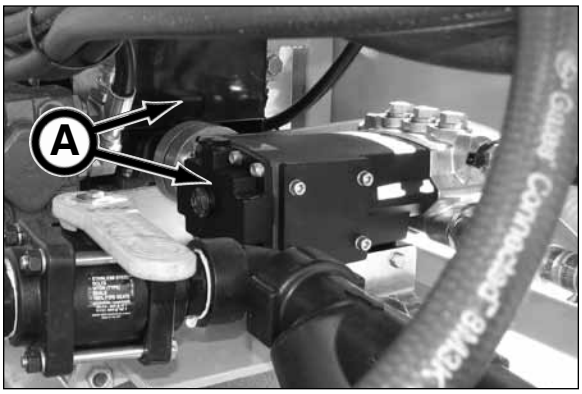
1. Set up the electrical motor for operation. Refer to Setting Up Electrical Motor - 2325E in this section.

2. Be sure main power disconnect switch (A) is in the OFF position.

3. Check hydraulic oil tank level. Add oil if necessary.

(Continued on next page)

4. Check jetting pump oil level (A) (2 places) with dipstick. Add SAE 30W non-detergent oil if necessary.



5. Clean jetting tank stainer.

6. Fill jetting tank with CLEAN water before starting the electric drive motor. Replace tank lid securely to prevent foreign objects from entering tank.

NOTICE Once the electric drive motor starts, the jetting pump starts immediately.

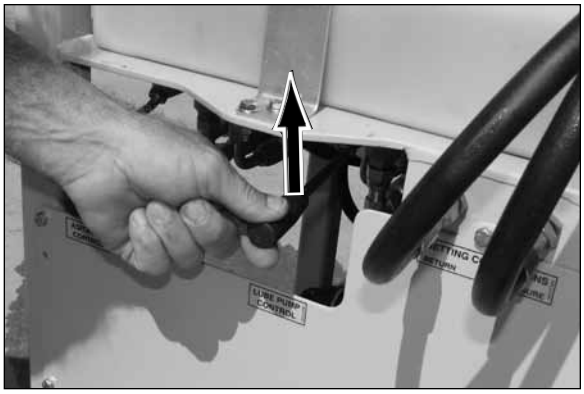
7. Fill the lubrication tank with CLEAN water and lubricant before starting the electric drive motor. Replace tank lid securely to prevent foreign objects from entering tank.

8. Open tank shut off valves on BOTH jetting and lubrication tanks.

NOTICE NEVER dry run pumps. Doing so will result in pump damage.

(Continued on next page)

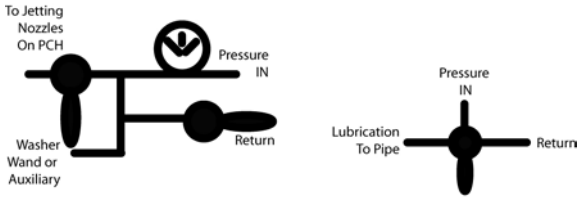
9. Place Lube Pump Control in neutral (UP) position.



10. Place Agitator Control in neutral (center) position.

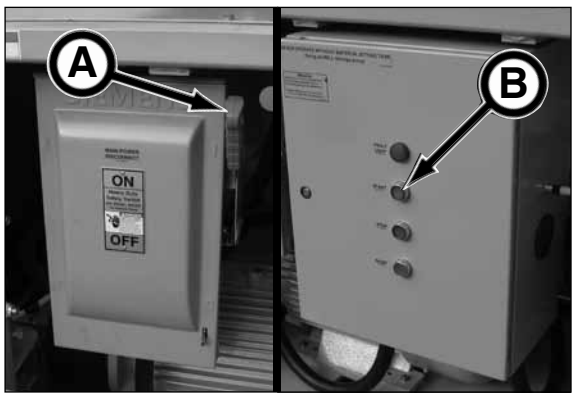
11. Place jetting volume control in Pump 1 (12 o'clock) position.

12. On shaft control, arrange jetting and lubrication circuit valves in bypass mode to prevent pressure buildup.



13. Move main power disconnect switch (A) to the ON position, depress Start switch (B) and check motor rotation.

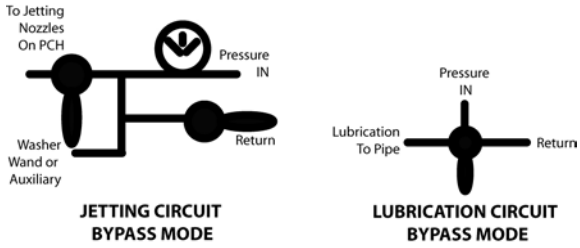
14. Check for leaks.



MIXING JETTING TANK

1. Place shaft control jetting circuit valves in bypass mode.

2. Disconnect pressure hose and place into jetting tank. Be sure hose is secured to prevent hose from accidently flying out of tank.



JETTING CIRCUIT BYPASS MODE

LUBRICATION CIRCUIT BYPASS MODE

3. Place Jetting Lube Control in Pump 1 (12 o'clock) position.

4. Open jetting tank shut off valve.

5. Start engine (2325D) or electric motor (2325E).

6. Pour EZ-Mud®, Con Det® or equivalent into tank, following instructions on container.

7. If increased mixing is necessary, place Jetting Lube Control in Pump 2 (3 o'clock) position.

8. Once mixing is complete, shut down engine or electric motor.

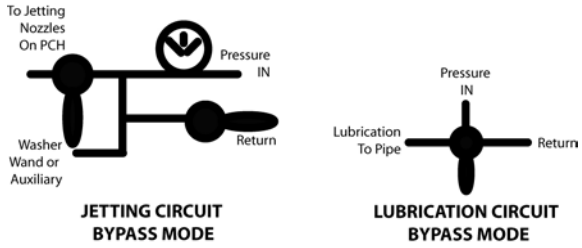
9. After engine or electric motor is shut down and water is no longer pumping, remove pressure hose from tank.

10. Reconnect pressure hose.

11. Jetting is now available for use.

MIXING LUBRICATION TANK

1. Place shaft control jetting and lubrication circuit valves in bypass mode.



2. Open jetting tank shut off valve to prevent dry running the jetting pumps. Be sure water is in tank.

3. Place Agitator Control in neutral (center) position.

4. Start engine (2325D) or electric motor (2325E).

5. Move Agitator Control to the up or down position depending on the desired direction of the agitator.

NOTICE Periodically changing the agitator direction may help prevent solids from building up in areas of the tank.

6. Pour Bore-Gel® or equivalent into tank, following instructions on container.

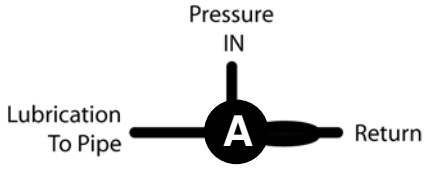
7. Once mixing is complete, move shaft control valves to begin lubricating.

USING SHAFT CONTROL FOR JETTING & LUBRICATION

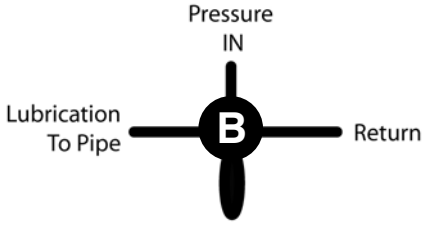
Use the ball valve(s) to control the jetting and lubrication circuits as follows:

Lubrication Circuit

Move ball valve (A) as shown to lubricate:
- outside of casings with reaming head
- outside of product pipe using the PCH
- outside of product pipe using the PRH

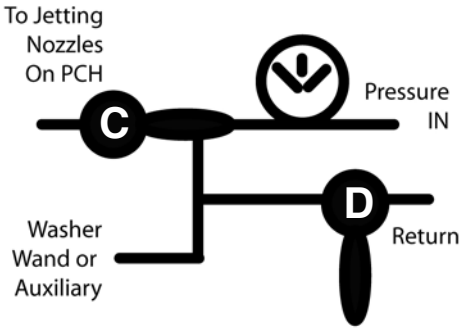


Move ball valve (B) as shown to:
- Return solution to tank or bypass

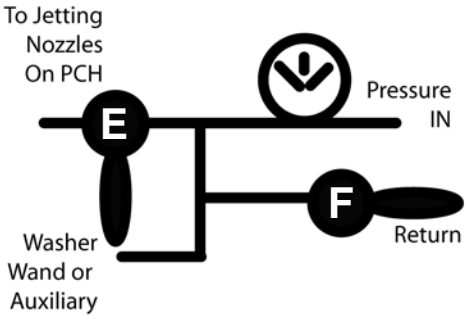


Jetting Circuit

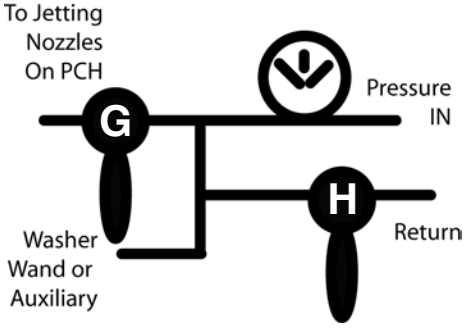
Move ball valves (C and D) as shown to lubricate:
- jetting nozzles on PCH
- jetting nozzles on PRH
- steering head for lubrication to outside of pilot tubes
- pilot tube adapter for lubrication to spoils for reaming head or open cutter head
- washer wand or auxiliary



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



Move ball valve (E & F) as shown to:
- use washer wand or other auxiliary device



CLEANING TANKS

JETTING TANK

⚠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.

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

5. Put water in tank to prevent accidental dry running of pumps.

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

(Continued on next page)

6. Replace strainer.

LUBRICATION TANK

1. Fill tank with clean water.

NOTICE Cleaning lubrication tank with plain clean water is acceptable provided the lubrication pump is not used. Using plain clean water in lubrication tank with the lubrication pump running will cause pump damage.

2. Disconnect hose (A) to lubrication pump.

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

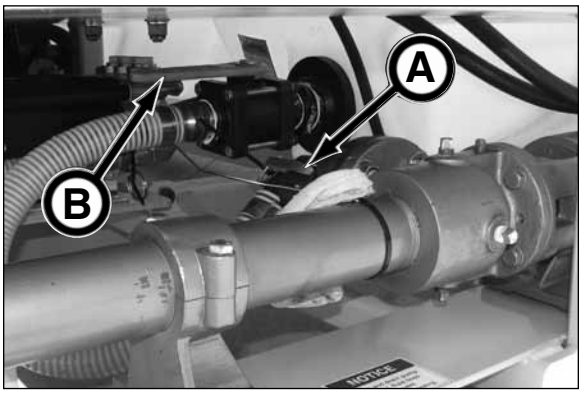
NOTICE To help drain tank, CAREFULLY tip pump towards outlet of drain.

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

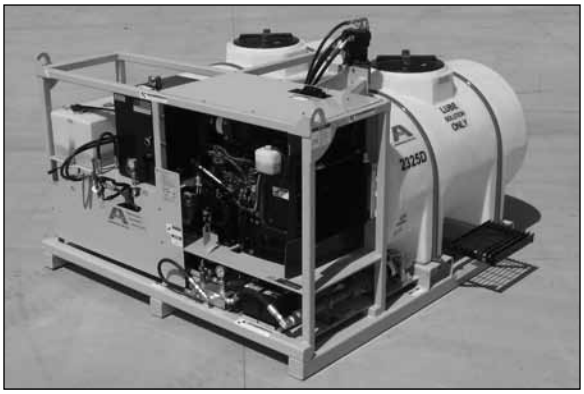
5. Put water/lube solution in tank to prevent accidental dry running of pump.

NOTICE NEVER operate pumps without shut off valve open and tank filled with water/lube solution.

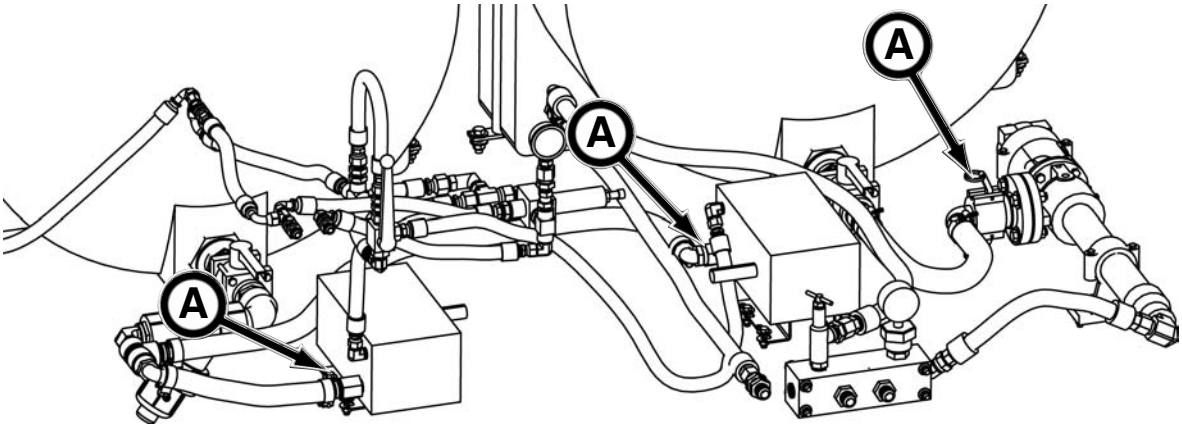
6. Reconnect hose removed in step 2.



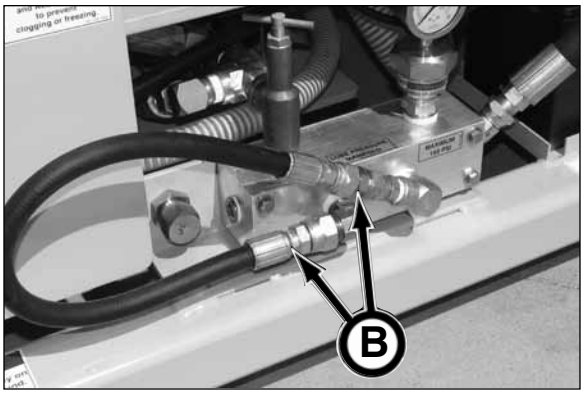
COLD WEATHER PROTECTION - DRAINING SYSTEM



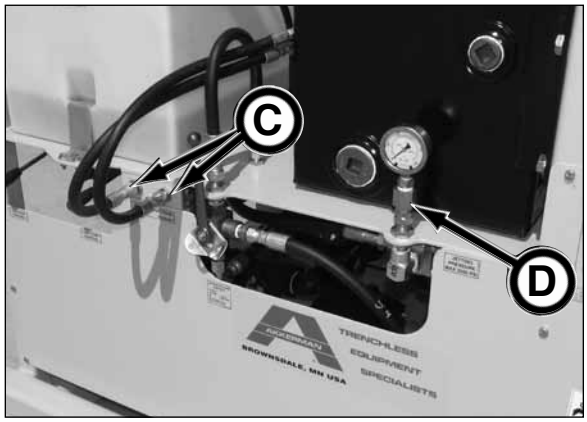
NOTICE To prevent damage to pump components in freezing weather, flush and drain pumps and ALL fluid lines. Failure to do so will cause damage to pump components. If using a RV Anti-Freeze solution for cold weather protection, refer to Cold Weather Protection - Using RV Anti-Freeze Solution in this section.



1. Release cam lock hose assemblies (A) on the two jetting pumps and the lubrication pump.



2. Remove pressure hoses (B) or hose caps from pressure manifold.

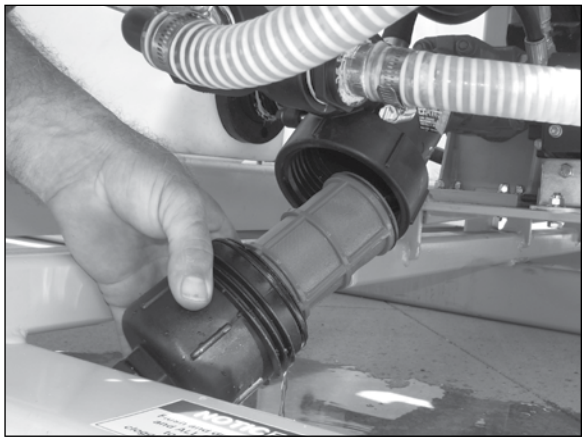


3. Remove pressure and return hoses (C) or hose caps from pressure and return jetting connections.

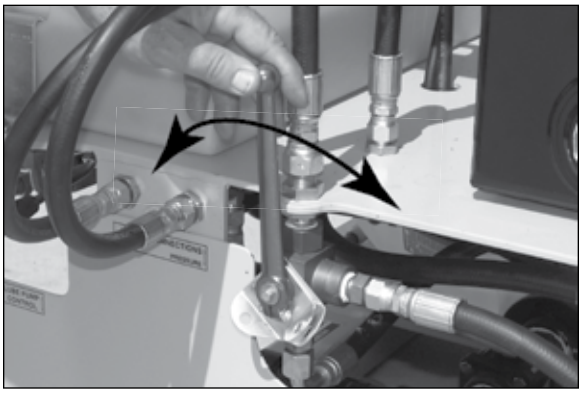
4. Access port on jetting gauge (D) and add compressed air to purge water from system.

(Continued on next page)

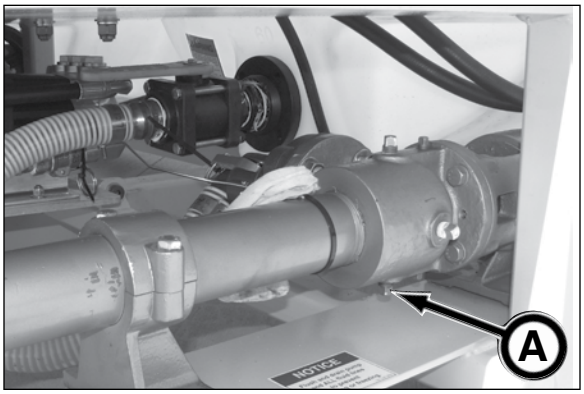
5. Remove strainer.



6. Move Jetting Volume control back and forth to remove trapped water.

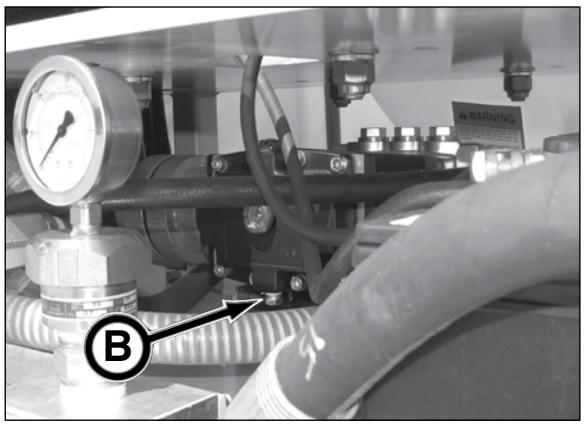


7. Remove drain plug (A) on lubrication pump.



8. Remove drain plug (B) on jetting pumps.

9. Once all fluid is drained:

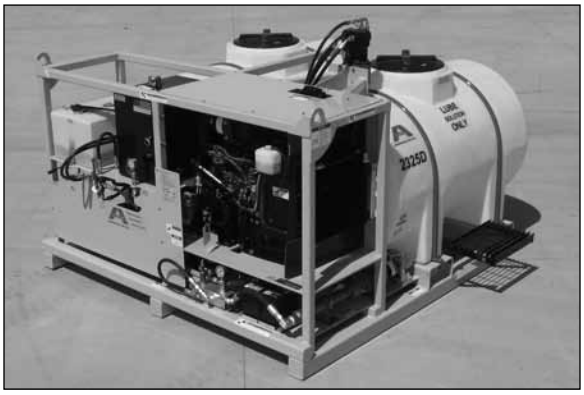


- replace drain plugs on pumps
- reinstall pressure hoses or caps on pressure manifold
- reinstall pressure and return hoses or caps on jetting connections
- reinstall strainer
- replace gauge port plug
- reinstall pump cam lock hose assemblies to pumps and secure open with tie straps

NOTICE NEVER dry run pumps. Doing so will damage pump(s).

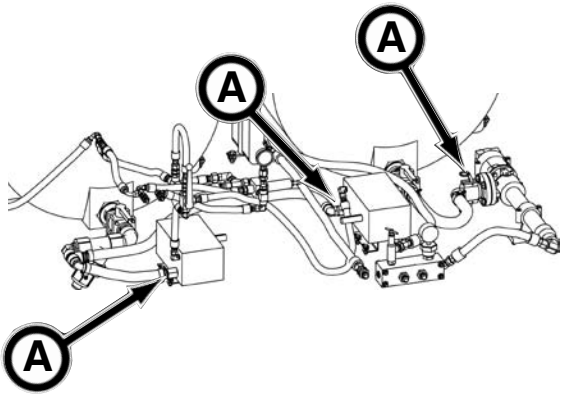
COLD WEATHER PROTECTION - USING RV ANTI-FREEZE SOLUTION

NOTICE **Akkerman Inc. 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 systems MUST be drained or treated with a RV Anti-Freeze solution.

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



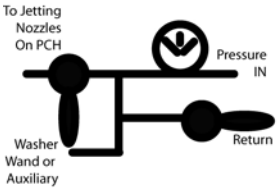
2. If tanks are full, drain tanks by releasing cam lock hose assemblies (A) until 4 - 5 gallons (15 - 19 L) of water are left in each tank. Then reinstall cam lock hose assemblies to pumps. Proceed to step 3.

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

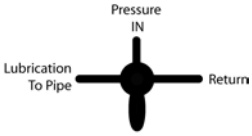
NOTICE Be sure to follow the proper solution instructions on the RV anti-freeze container.

4. Carefully tilt the unit so the tank mixture flows into the shut off valves to prevent drawing air into pumps.

NOTICE NEVER dry run pumps. Doing so will damage pump(s).



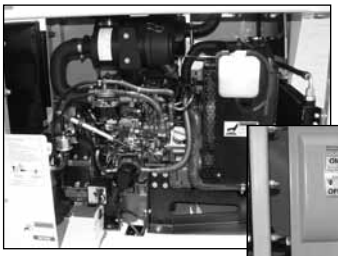
JETTING CIRCUIT BYPASS MODE



LUBRICATION CIRCUIT BYPASS MODE

5. On shaft control, arrange jetting and lubrication circuit valves in bypass mode as shown.

6. Start unit and cycle all pumps for at least two minutes to ensure the liquid/RV anti-freeze mixture is pumped through complete jetting and lubrication systems.



2325D

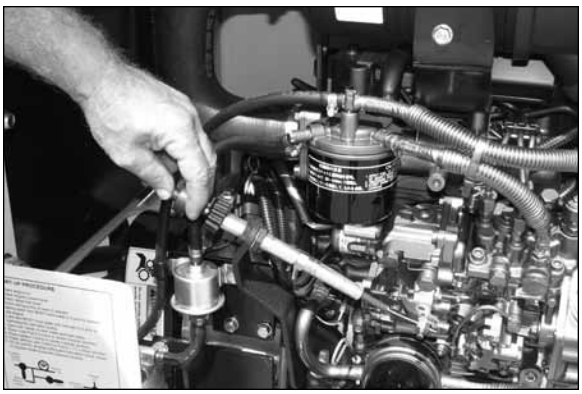
2325E

7a. (2325D) Shut down engine and refer to engine operation manual for cold weather protection.

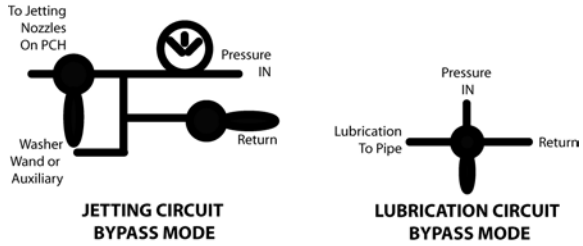
7b. (2325E) Stop electric motor, move main power disconnect switch to OFF position, and perform Lockout Tagout procedure on power source.

DAILY SHUTDOWN - 2325D

1. Reduce engine speed to low idle.

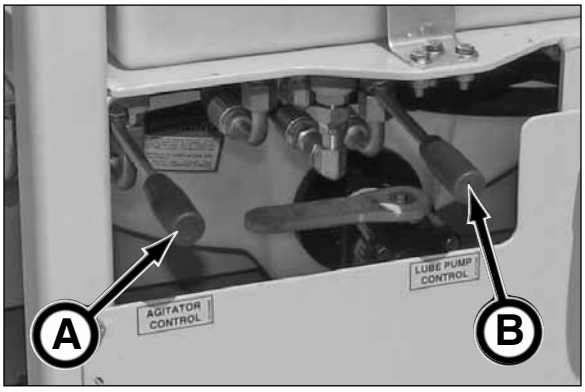


2. On shaft control, arrange jetting and lubrication circuit valves in bypass mode.



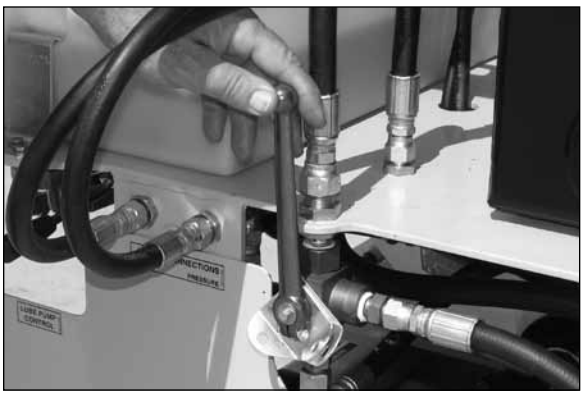
3. Place Agitator control (A) in neutral (center) position.

4. Place Lube Pump control (B) in the neutral (UP) position.



5. Place Jetting Lube control in Pump 1 (12 o'clock) position.

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

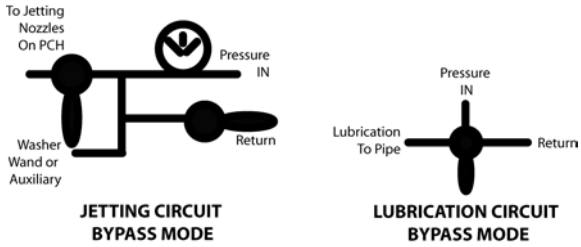


7. Close tank shut off valves on BOTH jetting and lubrication tanks.

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

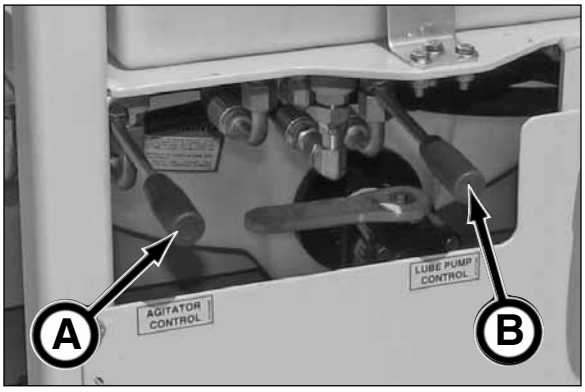
DAILY SHUTDOWN - 2325E

1. On shaft control, arrange jetting and lubrication circuit valves in bypass mode.

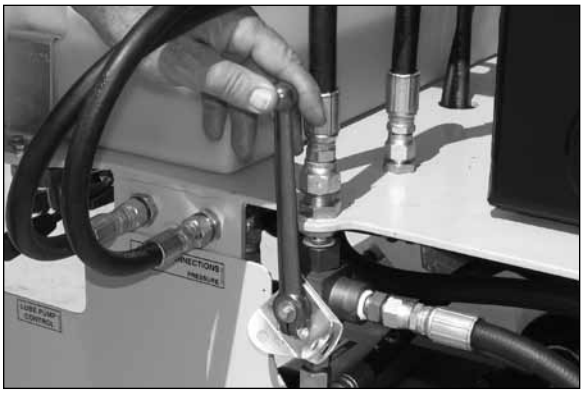


3. Place Agitator control (A) in neutral (center) position.

4. Place Lube Pump control (B) in the neutral (UP) position.



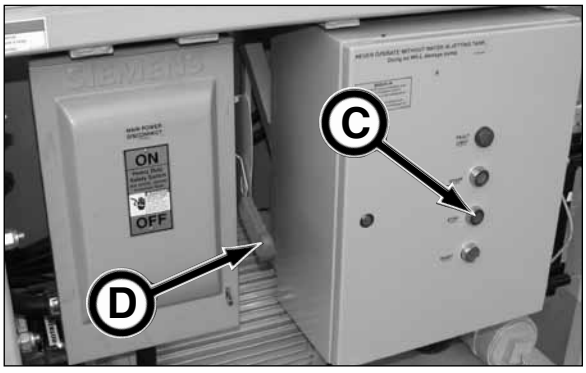
5. Place Jetting Lube control in Pump 1 (12 o'clock) position.



6. Depress Stop switch (C).

7. Move main power disconnect switch (D) down to the OFF position.

8. Perform Lockout Tagout procedure to main power source to prevent any accidental starting of the 2325E Jetting & Lubrication Pump.



9. Close tank shut off valves on BOTH jetting and lubrication tanks.

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

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. Load and unload on level ground.

6. Securely fasten the 2325D/2325E jetting and lubrication pump to trailer floor.

7. BEFORE lifting equipment with a hoist or other lifting device, the equipment lifting eyes and sling must be inspected for damage before lifting.

8. Observe the lifting instructions on the equipment.

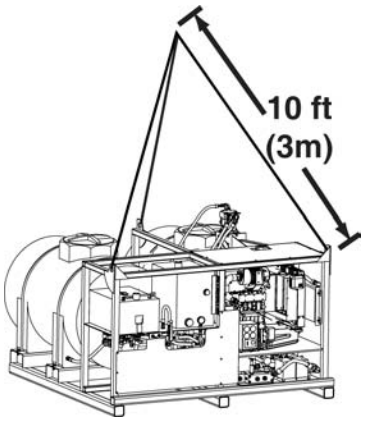
LIFTING INSTRUCTIONS

- Frame weight:
  with full tanks is 8,300 lbs (3,765 kg)
  with empty tanks is 3,150 lbs (1,429 kg)

- Lifting with a crane requires a three or four part sling with legs a minimum of 10 ft (3 m) long.

- Frame MUST lift freely. If it is stuck to the ground, it MUST be broken loose prior to lifting.

- Frame lifting eyes MUST be inspected prior to each lift. Any damage MUST be repaired prior to lifting.



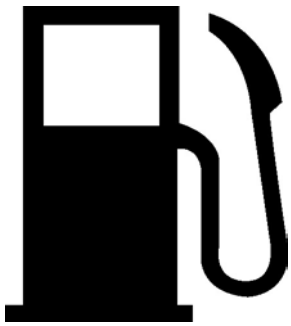
NOTES

Fuels & Lubricants

NOTICE Use of inferior fuel or lubricants will affect the efficient performance of your 2325D/2325E Jetting & 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.

FUEL SPECIFICATIONS - 2325D

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



Diesel fuel specification:
No. 2-D, No. 1-D, ASTM D975-94

The fuel must meet the following properties:
- Fuel cetane number of 45 minimum.

- The sulfur content must not exceed 0.5% by volume. Less than 0.05% is preferred.

- Bio-Diesel fuels (refer to engine manual).

- NEVER mix kerosene, used engine oil, or residual fuels with the diesel fuel.

- Water and sediment in the fuel should not exceed 0.05% by volume.

- Keep the fuel tank and fuel-handling equipment clean at all times.

- Poor quality fuel can reduce engine performance and/or cause engine damage.

- Fuel additives are not recommended. Some fuel additives may cause poor engine performance.

- Ash content not to exceed 0.01% by volume.

- Carbon residue content not to exceed 0.35% by volume. Less than 0.1% is preferred.

- Fuel lubricity: Wear mark of WS1.4 should be Max. 0.018 in at HFRR test.

- Total aromatics content should not exceed 35% by volume. Less than 30% is preferred.

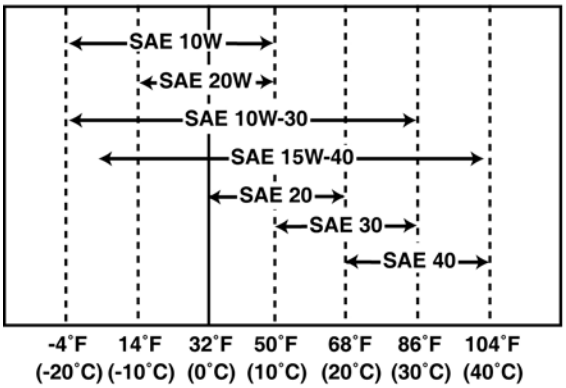
Fuel tank capacity is 18 gal. (68 L).

ENGINE OIL - 2325D

NOTICE For more information on the engine oil specifications, refer to your engine manual.

The engine is filled with SAE 10W30 break-in oil.

Change the oil and filters after the first 40 hours of operation with SAE 15W-40 engine oil or other oil viscosity based on the expected air temperature range during the period between oil changes as shown in chart.



Other oils may be used if they meet or exceed the following:
- API Service Categories CD or higher
- ACEA Service Categories E-3, E-4, and E-5
- JASO Service Category DH-1

The engine oil capacity is 4 qt (3.8 L). Oil level should be within the crosshatches of the dipstick. Do not overfill!

ENGINE COOLANT - 2325D

⚠WARNING Cooling system under pressure. Explosive release of HOT engine coolant can cause severe burns. SLOWLY remove the radiator cap ONLY if the engine is cool.

The engine radiator coolant is filled with a 50% mixture of ethylene glycol engine coolant and soft, distilled, deionized, or demineralized water. NEVER use water only.

Refer to your engine manual for information regarding Long Life Coolant (LLC) or Extended Life Coolant (ELC).

The coolant capacity for the engine and radiator is approximately 5.5 qts (21 L). Do not over fill.

HYDRAULIC TANK

The hydraulic tank is filled with ISO-VG-46 20W Premium Hydraulic Oil.

Use an API GL-1/GL-2 or equivalent when adding or changing lubricant.

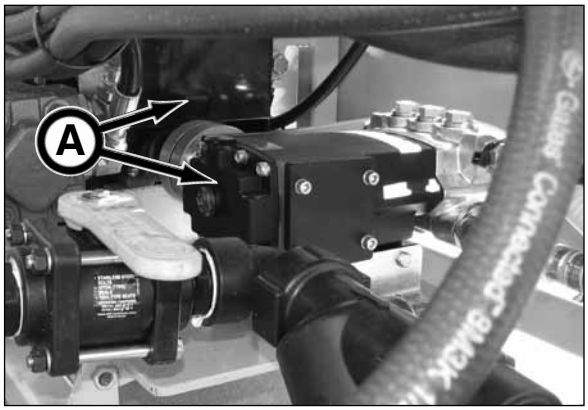
Recommended hydraulic oil:

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 25 gal. (94.6 L).

JETTING PUMP LUBRICANT



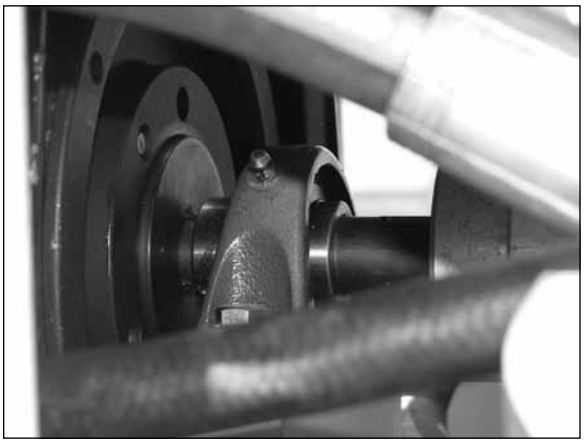
The jetting pumps (A) are filled with Hypro oil.

Use SAE 30W non-detergent oil.

Change the oil after the first 40 hours of operation and every 250 hours thereafter with SAE 30W non-detergent oil.

The pump reservoir capacity is 26 fl oz. (769 ml).

GREASE



The lubrication points are greased with Mobilgrease® XHP222 Premium Lubricating Grease.

The XHP222 grease is a multi-purpose, high performance, high temperature, lithium grease.

Use Mobilgrease® XHP222 Premium Lubricating Grease or equivalent when lubricating the lubrication points.

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.

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.

LOCKOUT POWER BEFORE SERVICING

⚠WARNING Severe personal injury or death can result from unexpected machine movement.

LOCKOUT power before attempting to make repairs or adjustments to this equipment, unless otherwise indicated. Proper lockout will prevent accidents and save lives. Performing the lockout will also prevent the equipment from moving or operating unexpectedly.

HYDRAULIC OIL/FLUIDS UNDER PRESSURE

⚠WARNING Escaping oil or other 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 oil or fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

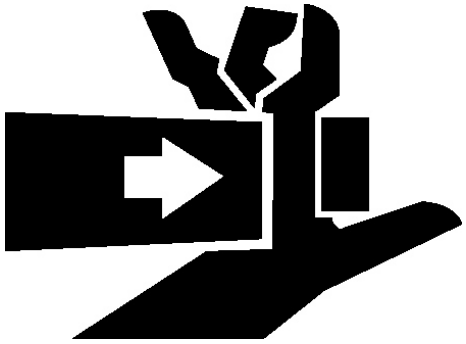
AVOID PINCH POINTS

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

Keep hands away from moving parts.

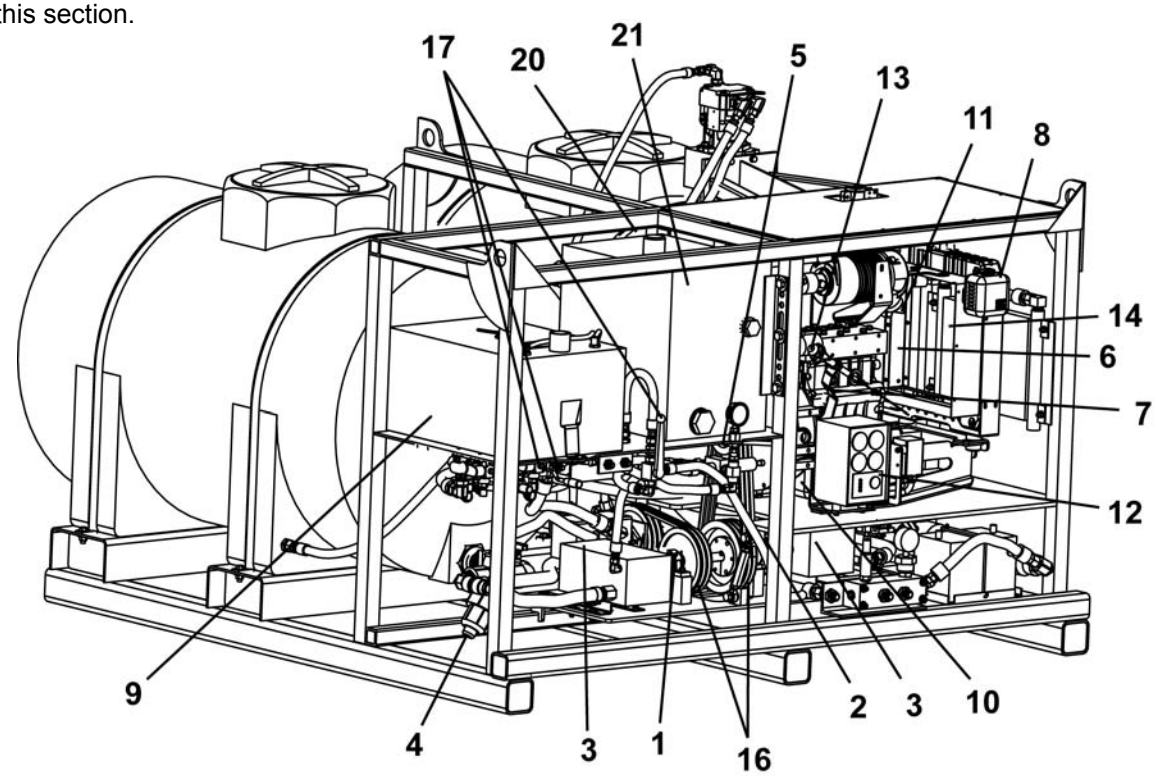
Watch your fingers, hands, and legs while equipment is in operation.

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 procedures later in this section.

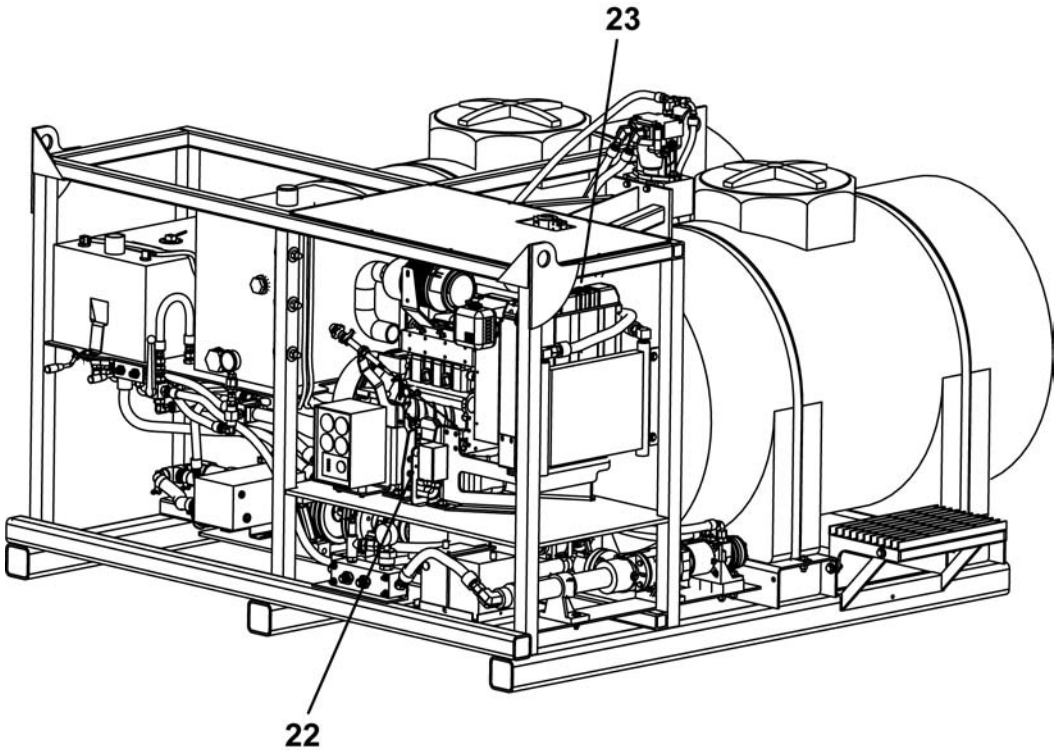


*DAILY OR EVERY 10 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
1.	Jet Pump 1 Bearing	Lubricate	Lubricate with 1 - shot.	Mobil XHP222
2.	Jet Pump 2 Bearing	Lubricate	Lubricate with 1 - shot.	Mobil XHP222
3.	Jet Pump Oil Resv.	Check Oil Level	Add oil as needed.	SAE 30W
4.	Jet Tank Strainer	Clean	If damaged, replace with new.	
5.	Engine Output Shft	Lubricate	Lubricate with 1 - shot.	
6.	Engine	Inspect	Visually inspect for damage.	
7.	Engine Crankcase**	Check Oil Level	Add oil as needed.	See Section 8
8.	Radiator	Check Coolant Level	Add coolant as needed.	See Section 8
9.	Fuel Tank	Check Diesel Fuel Level	Add fuel as needed.	See Section 8
10.	Fuel/Water Separator	Check For Water	Drain until fuel is visible.	
11.	Air Cleaner Dust Unloader	Clean Out		
12.	Engine System	Inspect	Inspect for proper operation.	
13.	Engine Speed Cntl	Check	Check for smooth operation.	
14.	Fan	Inspect Fan & Guard	If damaged, replace with new.	
15.	Guards***	Inspect	Repair or replace if damaged.	
16.	Drive Belts	Inspect	If cracked or worn, replace with new.	
17.	Valves & Levers	Inspect	Inspect for proper operation.	
18.	Wiring & Cables***	Inspect	If damaged, replace with new.	
19.	Decals***	Inspect	If damaged, replace with new.	
20.	Hydraulic Return Filter	Check Indicator	Replace filter as needed per indicator.	Return Filter
21.	Hydraulic Tank	Check Fluid Level	Add hydraulic fluid as needed.	See Section 8

* Refer to your engine operation manual for additional maintenance information.
** During engine break-in period, change the oil and filter for the first time at 50 hours of operation.
*** Not Shown

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

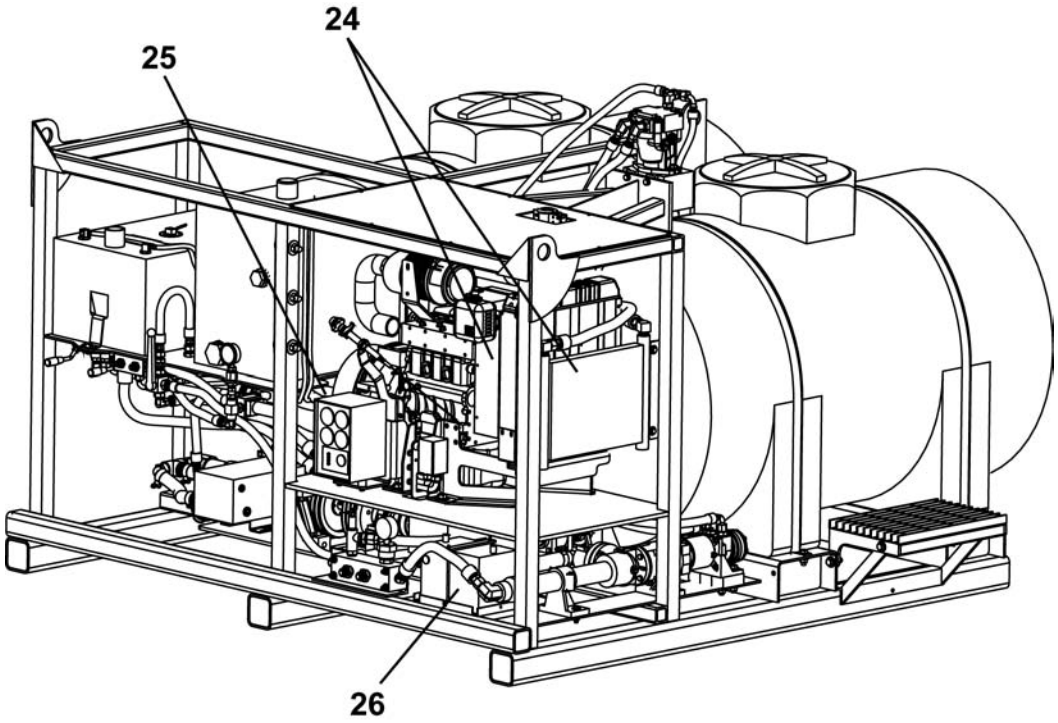


*FIRST 50 HOURS OF OPERATION & EVERY 250 HOURS THEREAFTER

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
22. 23.	Engine Crankcase Cooling V-Belt	Drain & Fill & Filter Check & Adjust	Replace with new oil & filter. .25 - .375 Deflection @ 22 ft lbs	See Section 8

* Refer to your engine operation manual for additional maintenance information.
** During engine break-in period, change the oil and filter for the first time at 50 hours of operation.

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

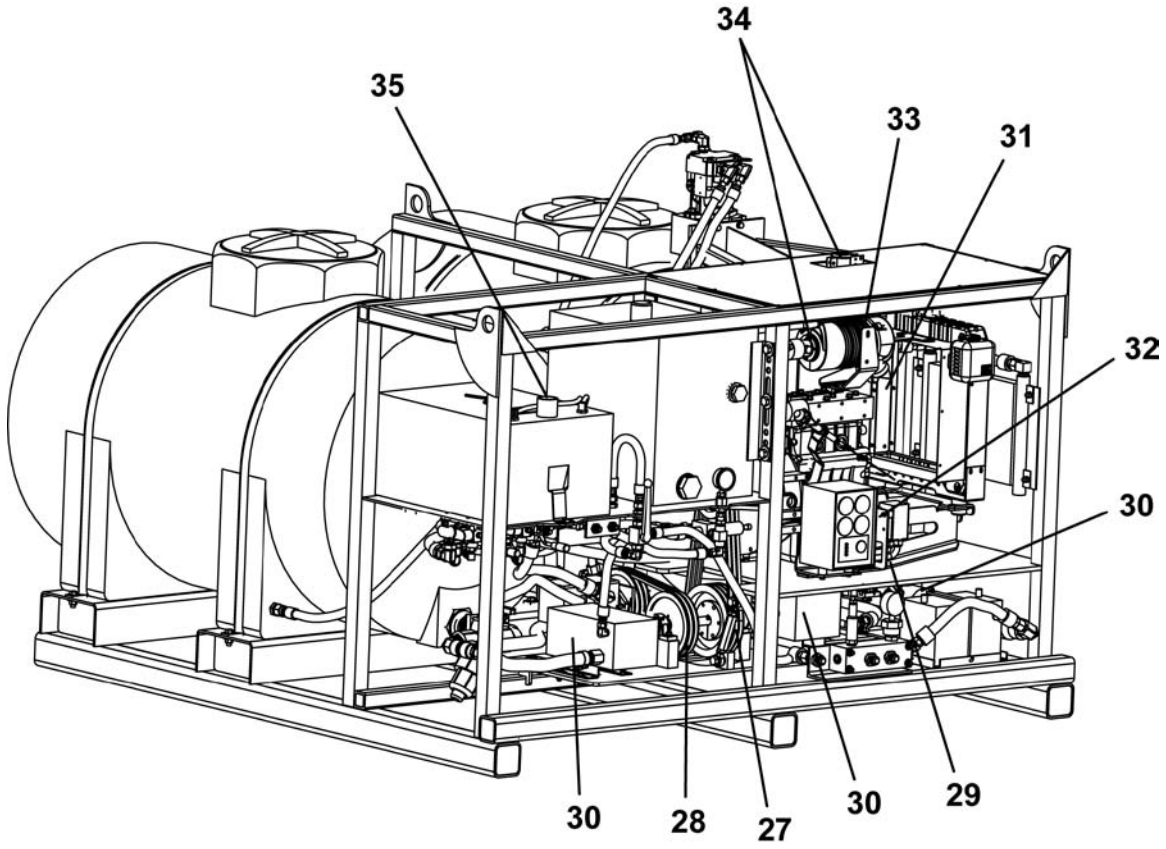


*WEEKLY OR EVERY 50 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
24.	Radiator/Oil Cooler Fins	Check & Clean		
25.	Fuel/Water Separator	Drain		
26.	Battery	Check	Check for damage or frayed cables.	Battery/Cable

* Refer to your engine operation manual for additional maintenance information.
** During engine break-in period, change the oil and filter for the first time at 50 hours of operation.

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

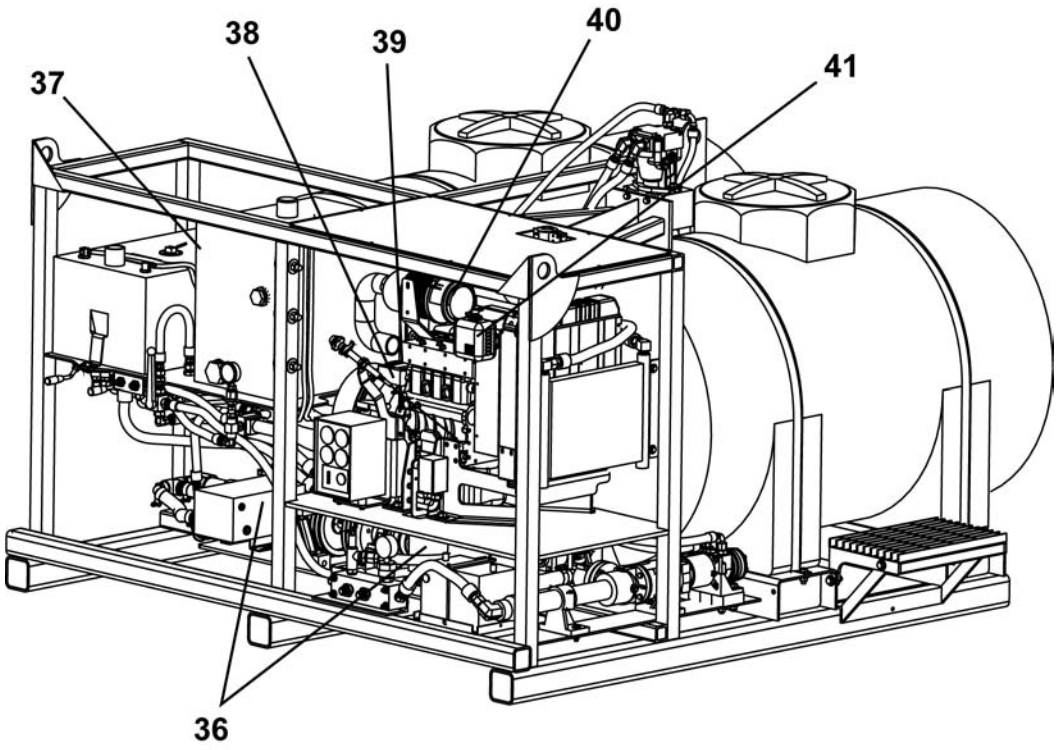


*MONTHLY OR EVERY 250 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
27.	Main Drive Belts	Check Belt Tension	0.23” Deflection @ 6.14 ft lbs	
28.	Hydraulic Pump Drive Belts	Check Belt Tension	0.14” Deflection @ 6.2 ft lbs	
29.	Engine Mtg Bolts	Inspect	If damaged, replace with new.	
30.	Pump & Motor Mounting Bolts	Inspect	If damaged, replace with new.	
31.	Engine V-Belt	Check & Adjust Tension	.25 - .375 Deflection @ 22 ft lbs	
32.	Engine Crankcase	Drain & Fill & Filter	Replace with new oil & filter.	See Section 8
33.	Air Cleaner	Check	If dirty, replace with new.	Element(s)
34.	Air Intake & Exhaust	Inspect		
35.	Fuel Tank Cap	Inspect		

* Refer to your engine operation manual for additional maintenance information.
** During engine break-in period, change the oil and filter for the first time between 50 - 100 hours of operation.

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

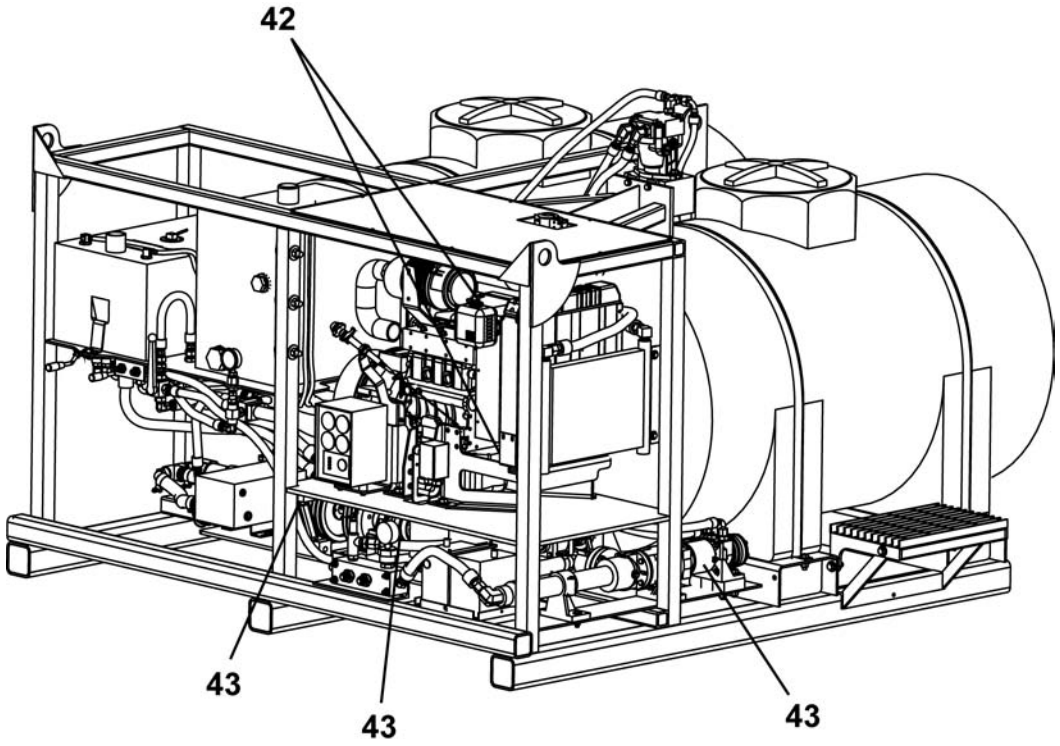


*EVERY 500 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
36.	Jet Pump Oil Reserv.	Drain & Fill (2 Pumps)	26 fl. oz.	SAE 30W
37.	Hydraulic Tank	Drain & Fill	25 gal (94.6 L)	See Section 8
38.	Fuel Filter	Replace		
39.	Fuel System	Prime		
40.	Air Cleaner	Replace Element		
41.	Cooling System	Check		

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

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

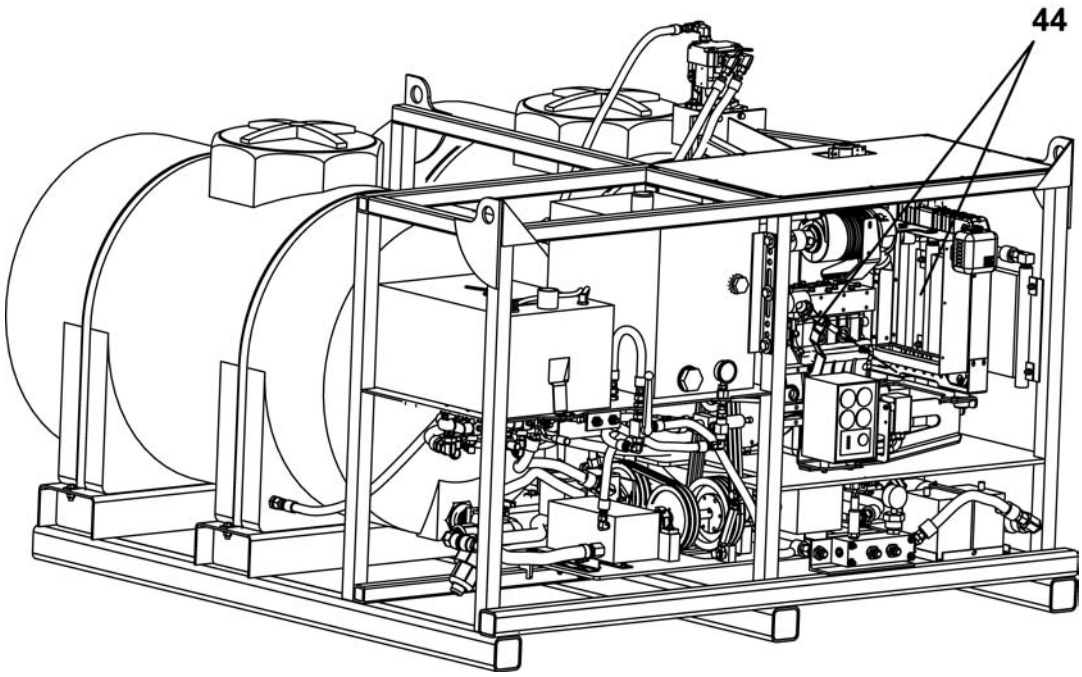


*EVERY 1000 HOURS OR EVERY YEAR OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
42. 43.	Engine Cooling Sys. Drive Couplings	Flush & Fill Lubricate	Refer to engine manual. Lubricate only until grease barely seeps out of seal. Do not overfill.	Water/Anti-Freeze

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

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



*EVERY 2000 HOURS OR EVERY 2 YEARS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
44.	Fuel System & Cooling System Hoses	Replace		

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

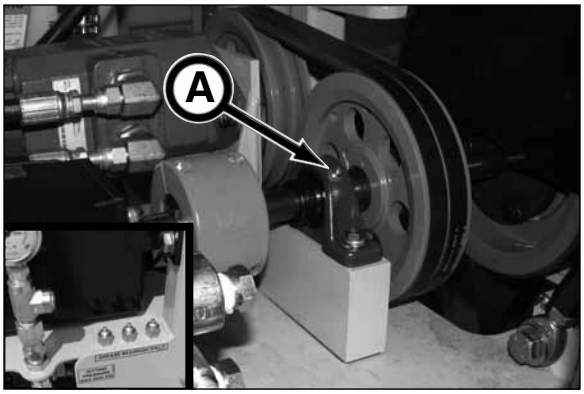
DAILY OR EVERY 10 HOURS OF OPERATION

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

1. LUBRICATE JETTING PUMP 1 BEARING

Lubricate jetting pump 1 pillow block drive shaft bearing (A) with one shot of Mobilgrease® XHP222 or equivalent.

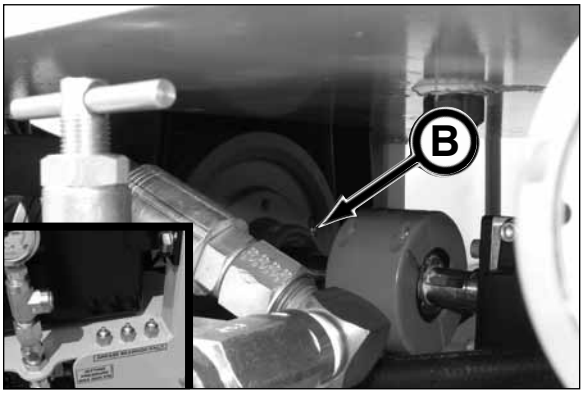
NOTICE Later models have a remote grease bank (see inset) to lubricate the bearing.



2. LUBRICATE JETTING PUMP 2 BEARING

Lubricate jetting pump 2 pillow block drive shaft bearing (B) with one shot of Mobilgrease® XHP222 or equivalent.

NOTICE Later models have a remote grease bank (see inset) to lubricate the bearing.

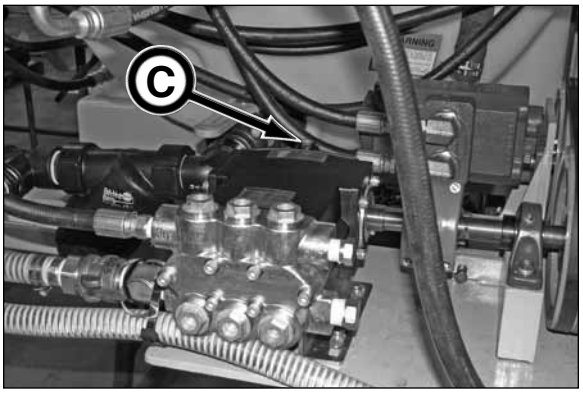


3. CHECK JETTING PUMP OIL RESERVOIR LEVEL

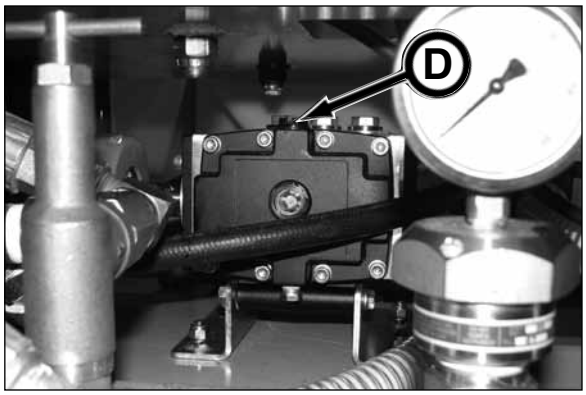
NOTICE The pump manufacturer recommends to change the pump oil after 40 hours of operation.

Check jetting pump oil reservoir level using dipstick (C on jetting pump 1 and D on jetting pump 2).

If needed, fill with SAE 30W non-detergent oil.



Jetting Pump 1

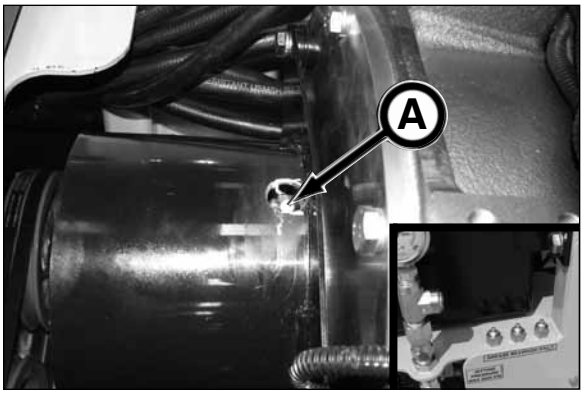


Jetting Pump 2

4. CLEAN TANK STRAINER

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

If damaged, replace with new.



5. LUBRICATE ENGINE OUTPUT SHAFT (2325D)

Lubricate engine output shaft (A) with one shot of Mobilgrease® XHP222 or equivalent.

NOTICE Later models have a remote grease bank (see inset) to lubricate the bearing.

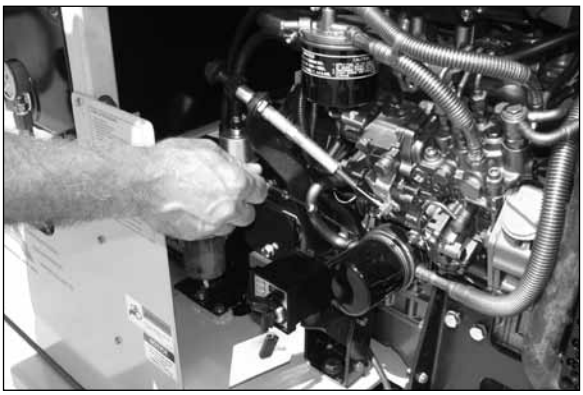
6. INSPECT ENGINE (2325D)

Perform an overall visual inspection of the engine:

- check for engine oil leaks
- check for fuel leaks
- check for engine coolant leaks
- check for damaged or missing parts
- check the electrical harnesses for cracks, abrasions, and damaged or corroded connectors.
- check hoses for cracks, abrasions, and damaged, loose or corroded clamps.
- check and clean radiator fins
- check the fuel filter / water separator for water or other contaminants. Drain until water is no longer visible.

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

7. CHECK ENGINE CRANKCASE OIL LEVEL (2325D)



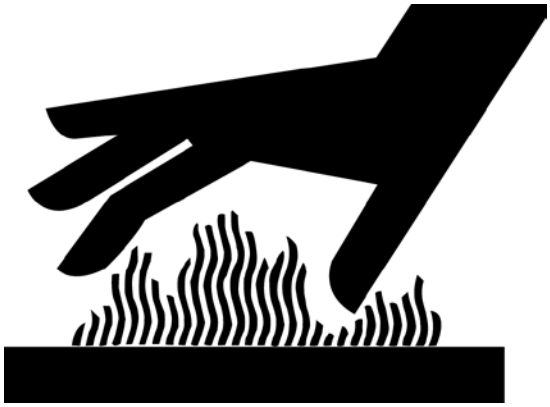
Check engine oil level on dipstick. Do not fill above the top mark on the dipstick.

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

If necessary, add engine oil. See Engine Oil in the Fuels & Lubricants section for the proper oil specification.

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

8. CHECK RADIATOR COOLANT LEVEL (2325D)



⚠WARNING Cooling system under pressure. Explosive release of HOT engine coolant can cause severe burns.
SLOWLY remove the radiator cap ONLY if the engine is cool. DO NOT remove the radiator cap when the engine is hot.

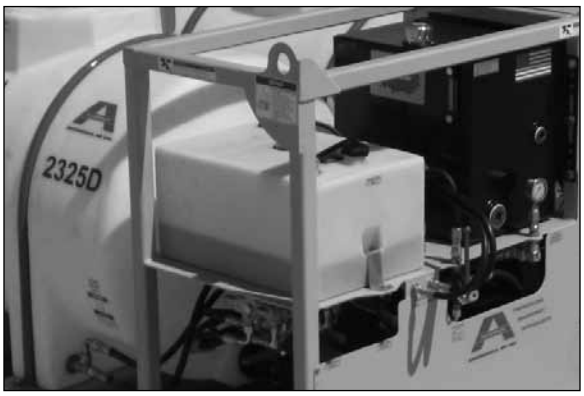
Check the level of the engine coolant in the reserve tank.

When the engine is cold, the level in the reserve tank should be at the LOW COLD mark.

Add additional engine coolant to the reserve tank if necessary. See Engine Coolant in the Fuels & Lubricants section or your engine operation manual for the proper coolant specification.

Engine & Radiator Coolant Capacity is approximately 5.5 qts (21 L)

9. CHECK FUEL TANK LEVEL (2325D)



⚠WARNING Diesel fuel is extremely flammable and explosive. Handle with care. DO NOT refuel while smoking or when near open flame or sparks.

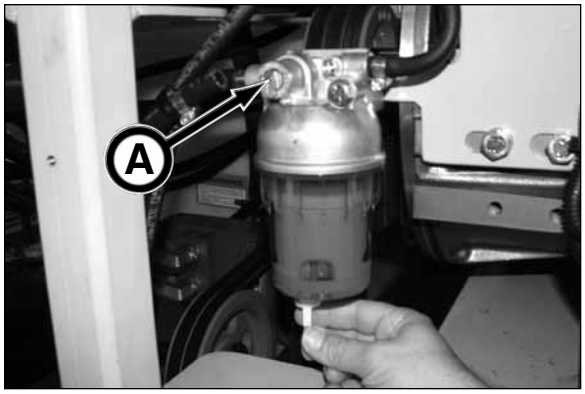
1. Shut off engine before refueling.
2. Clean area around the fuel cap.
3. Remove the fuel cap from the fuel tank.
4. Refuel tank until fuel tank is full. NEVER overfill the fuel tank. Wipe up spills.
5. Replace fuel cap.

NOTICE The fuel system will require priming if any of the following items occur. Refer to Every 500 Hours Of Operation, 39. Priming The Fuel System in this section or your engine operation manual.

- Fuel tank is empty
- Fuel system maintenance such as changing the fuel filter and draining the fuel filter/water separator, or replacing a fuel system component.

10. CHECK FUEL/WATER SEPARATOR (2325D)

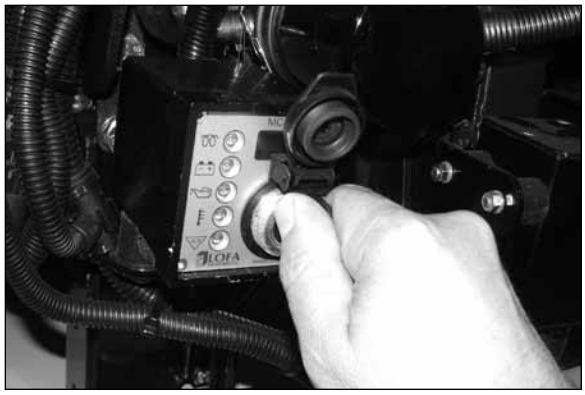
Check the fuel/water separator for water and/or sediment.

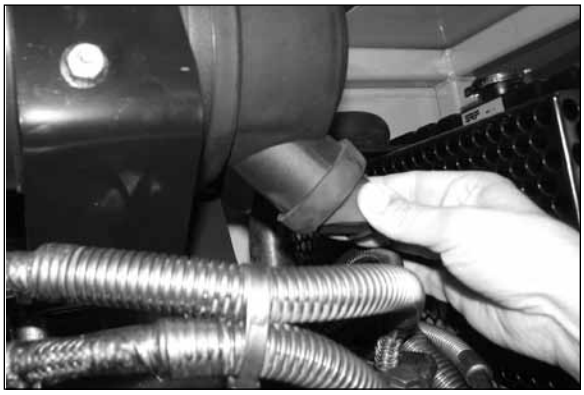


NOTICE The cup of the separator is made from semi-transparent material. In the cup is a red colored float ring. The float ring will rise to the surface of the water to indicate how much water/ sediment needs to be drained.

If water and/or sediment is present:

1. Shut off engine.
2. Place an appropriate size catch pan to collect the water/sediment.
3. Close the fuel shutoff (A).
4. Loosen the drain valve to drain water/sediment.
5. Continue to drain until only fuel is visible.
6. Hand tighten the drain valve. Do not overtighten.
7. Open the fuel shutoff.
8. Prime the fuel system by turning key switch to the ON position for 10 -15 seconds. This will allow the electric fuel pump to prime the fuel system. NEVER use the starter motor to crank the engine to prime the fuel system. Doing so will result in starter damage.
9. Check for leaks.



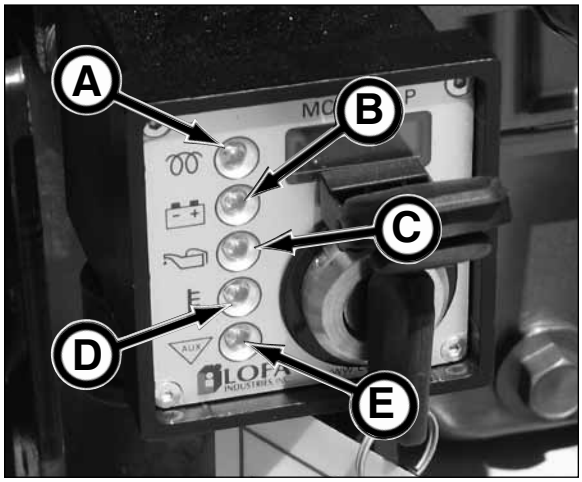


11. CLEAN OUT DUST UNLOADER VALVE (2325D)

Squeeze air cleaner dust unloader valve on air cleaner assembly to release any trapped dirt particles. If the sealing top of the valve is damaged, life of the air filter elements will be greatly reduced.

12. INSPECT ENGINE SYSTEM CONTROL (2325D)

NOTICE For additional engine information, refer to your engine operation manual.



Check the engine system controls to be sure they are operating properly:

Pre-Heat (A)
This function is automatically activated when the key switch is turned to the ON position. The indicator flashes for several seconds and when it goes out, the key can be turned to the START position.

Battery (B)
Light illuminates until engine is running and alternator is supplying charging current.

Engine Oil Pressure (C)
Light illuminates until the engine is running and the oil pressure is within normal limits.

Engine Coolant Temperature (D)
Light illuminates momentarily at start up. If light reappears while engine is running, the engine is overheating.

Auxiliary (E)
Light illuminates momentarily at start up. Used for special applications (refer to your engine operation manual).

13. CHECK ENGINE SPEED CONTROL (THROTTLE) (2325D)

NOTICE For additional engine information, refer to your engine operation manual.

Check throttle for smooth operation. Clean or lubricate as necessary. Check for proper adjustment.

If the throttle does not move smoothly after cleaning or lubrication, replace cable before operating engine.

14. INSPECT FAN & FAN GUARD (2325D)

⚠WARNING NEVER operate engine without fan guard in place. Serious personal injury could result if contact is made with rotating fan.

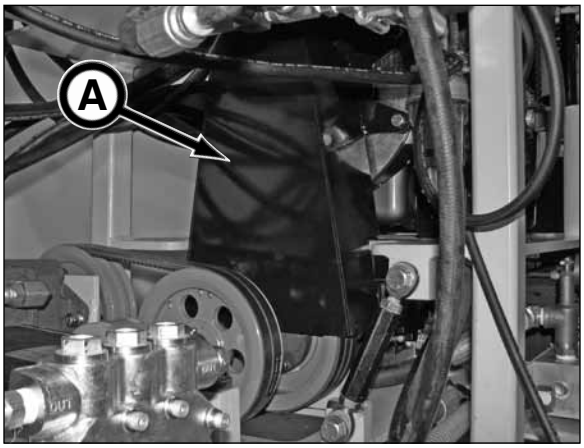
With engine shut off and key removed from key switch to prevent accidental starting, check fan for cracks, and bent or loose blades. Check fan to make sure it is properly mounted. Replace damaged fan and fan guard.

15. INSPECT COVERS & GUARDS

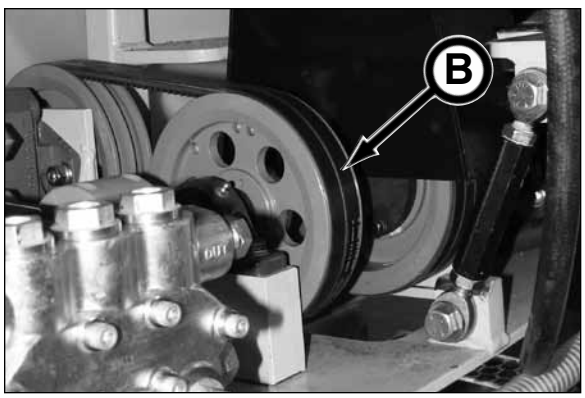
Inspect all guards and covers to be sure they are properly mounted in place, and undamaged. Repair or replace as needed. NEVER operate without covers or guards in place.

16. INSPECT BELTS

Visually inspect the main drive belts (A) and hydraulic pump drive belts (B) for cracking, fraying or material missing. Replace belts as needed.



Main Drive Belts



Hydraulic Pump Drive Belts

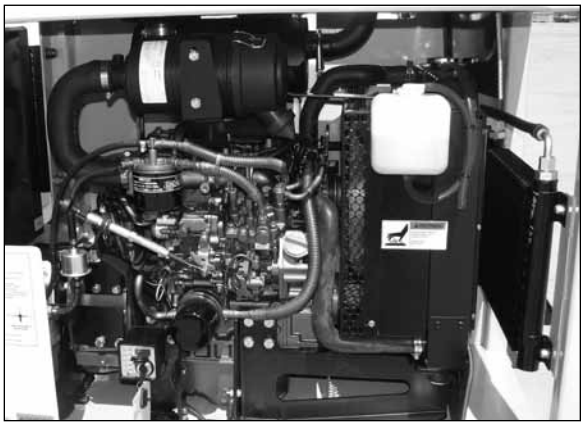
17. INSPECT VALVES AND LEVERS

Inspect valves and levers for proper operation.

Repair or replace as needed.

18. INSPECT WIRING AND CABLES

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

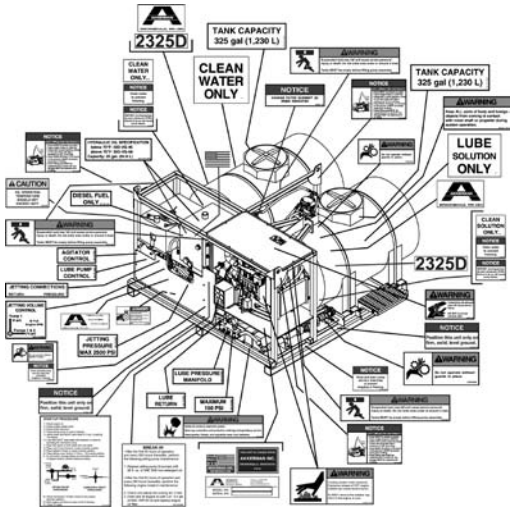


2325D

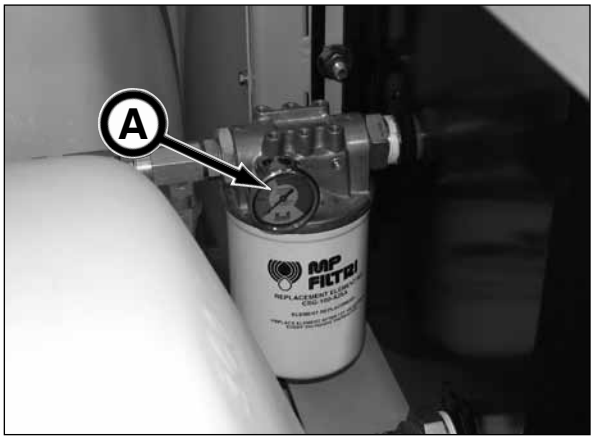
2325E

19. INSPECT DECALS

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



20. 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 engine 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.

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

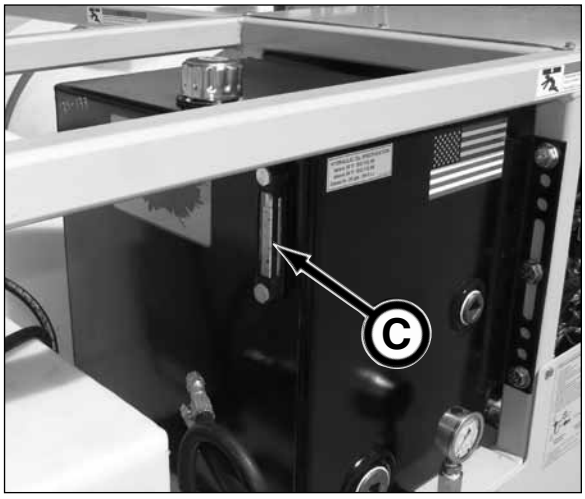
5. Install new filter. Hand tighten only.

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.

21. 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 25 gal. (94.6 L).

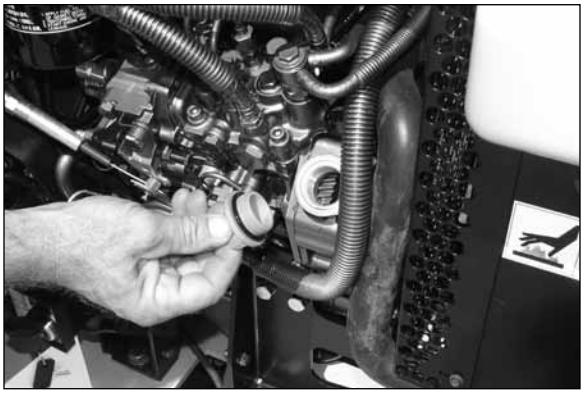
FIRST 50 HOURS OF OPERATION & EVERY 250 HOURS THEREAFTER

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

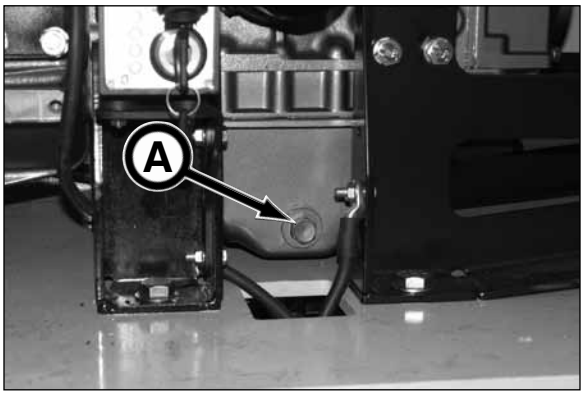
22. CHANGE ENGINE OIL & FILTER (2325D)

1. Start the engine and run to operating temperature.

2. Stop the engine.



3. Clean area around the fill cap. Remove cap. This will allow oil to drain more easily.

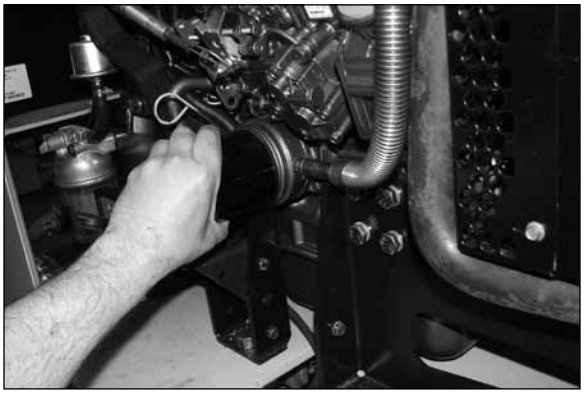


4. Clean area around engine oil drain plug (A).

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

6. Remove drain plug and drain oil into container. Dispose of oil properly.

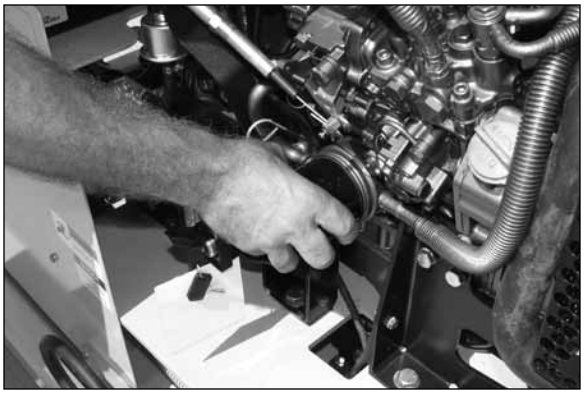
7. Replace drain plug.



8. Clean area around oil filter.

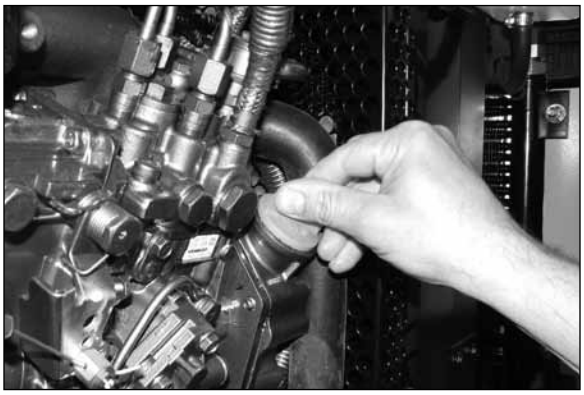
9. Remove oil filter and clean filter mounting pad. Dispose of filter properly.

(Continued on next page)



10. Lubricate gasket on new filter with clean oil.

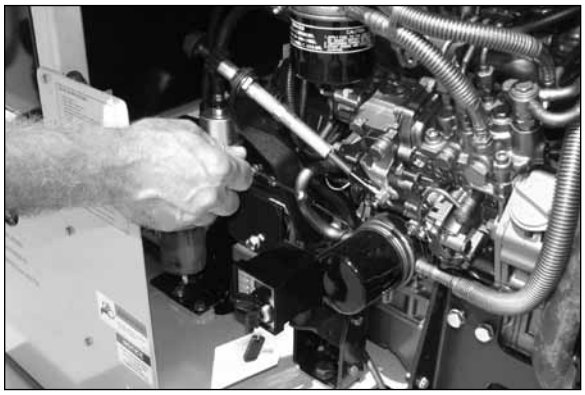
11. Install new filter and hand tighten according to values printed on the filter. Do not overtighten the filter element.



12. Fill engine with engine oil 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. 4 qt (3.8 L)

13. Install fill cap. Clean up spills.



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

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

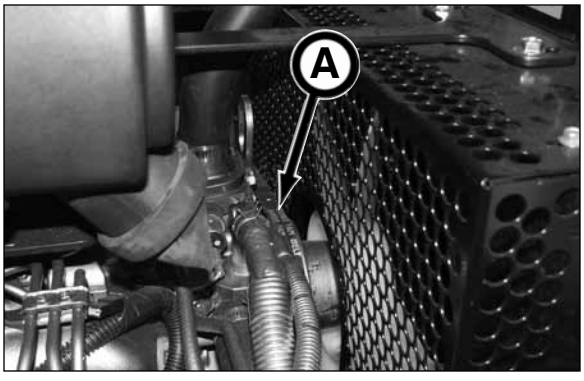
16. Recheck the engine oil level on dipstick and fill as needed. Oil level should be within the crosshatches of the dipstick. Do not overfill!

23. CHECK ENGINE COOLING V-BELT (2325D)

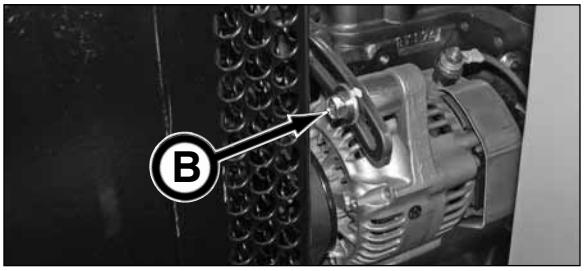
NOTICE Refer to your engine operation manual for more information.

Check engine cooling V-belt for cracking, fraying or wear. Replace belt as needed.

Check the V-belt deflection and adjust as follows:



1. Depress the V-belt down with your thumb (a force of approximately 22 ft lbs (98 N•m) or use a belt tension gauge at location (A). The V-belt deflection should be 0.25 - 0.375 (6.35 - 10 mm).

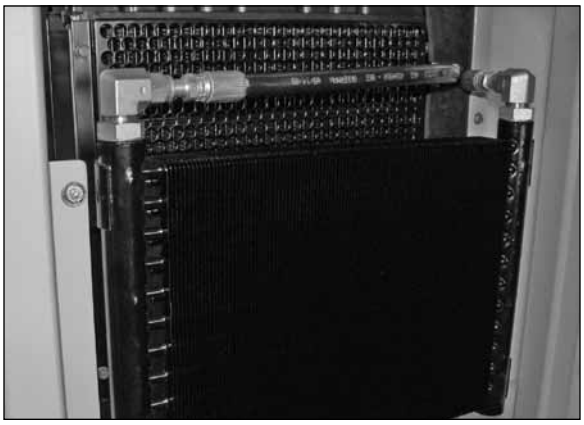


2. Adjust the V-belt tension if necessary. Loosen the set bolt (B) and move the alternator with a pry bar to tighten the V-belt to the proper deflection.

WEEKLY OR EVERY 50 HOURS OF OPERATION

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

24. CHECK RADIATOR (2325D) & OIL COOLER FINS



Check and clean radiator and oil cooler fins.

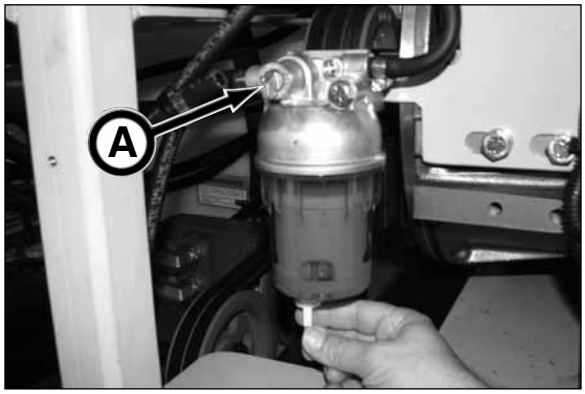
⚠CAUTION When using compressed air, always wear eye protection to prevent injury to eyes.

Use compressed air (maximum 28 psi) to blow off dirt, dust and debris from radiator and oil cooler fins. If there is a large amount of debris on the fins, use a mild soap to thoroughly clean fins and then rinse with water.

25. CHECK FUEL/WATER SEPARATOR (2325D)

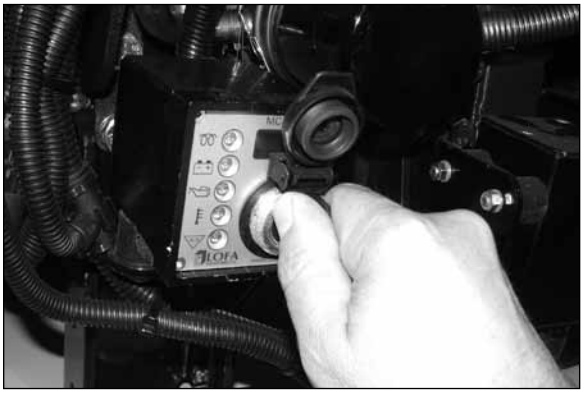
Check the fuel/water separator for water and/or sediment.

NOTICE The cup of the separator is made from semi-transparent material. In the cup is a red colored float ring. The float ring will rise to the surface of the water to indicate how much water/ sediment needs to be drained.



If water and/or sediment is present:

1. Shut off engine.
2. Place an appropriate size catch pan to collect the water/sediment.
3. Close the fuel shutoff (A).
4. Loosen the drain valve to drain water/sediment.
5. Continue to drain until only fuel is visible.
6. Hand tighten the drain valve. Do not overtighten.
7. Open the fuel shutoff.
8. Prime the fuel system by turning key switch to the ON position for 10 -15 seconds. This will allow the electric fuel pump to prime the fuel system. NEVER use the starter motor to crank the engine to prime the fuel system. Doing so will result in starter damage.
9. Check for leaks.



26. CHECK BATTERY (2325D)

⚠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 strap for damage. If damaged, replace with new.

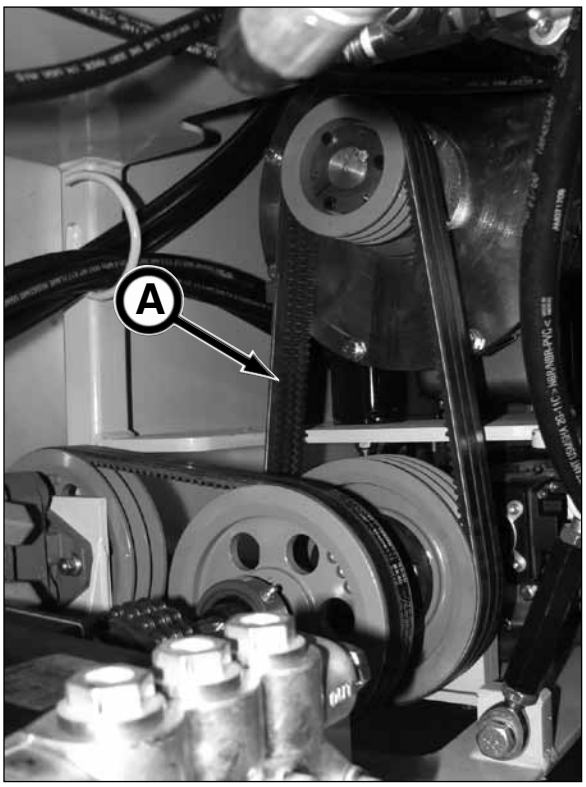
MONTHLY OR EVERY 250 HOURS OF OPERATION

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

27. CHECK MAIN DRIVE BELT TENSION

Check the main drive belt (A) tension for a 0.23” deflection at 6.14 ft lbs.

If the tension requires adjustment, use the following procedure:



1. Remove guard (guard not shown for photographic purposes only). NEVER operate jetting and lubrication pump without main drive belt guard in place.

2. Loosen jam nuts.

3. Rotate adjuster as needed to achieve a 0.23” deflection at 6.14 ft lbs.

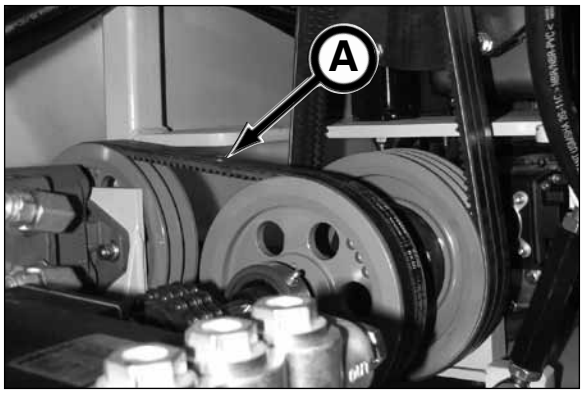
4. Tighten jam nuts.

5. Replace guard (guard not shown for photographic purposes only). NEVER operate jetting and lubrication pump without main drive belt guard in place.

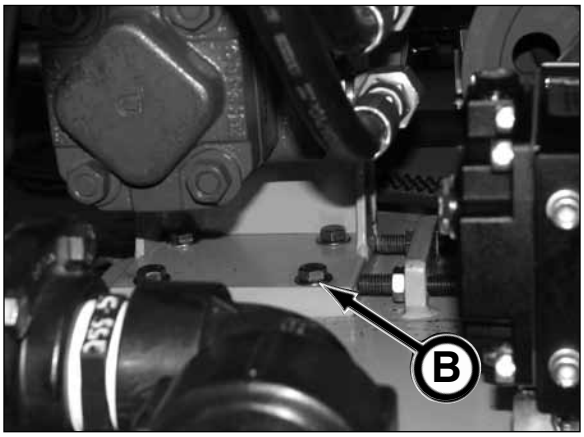
28. CHECK HYDRAULIC PUMP DRIVE BELT TENSION

Check the hydraulic pump drive belt (A) tension for a 0.14” deflection at 6.2 ft lbs.

If the tension requires adjustment, use the following procedure:



1. Loosen four mounting screws (B).

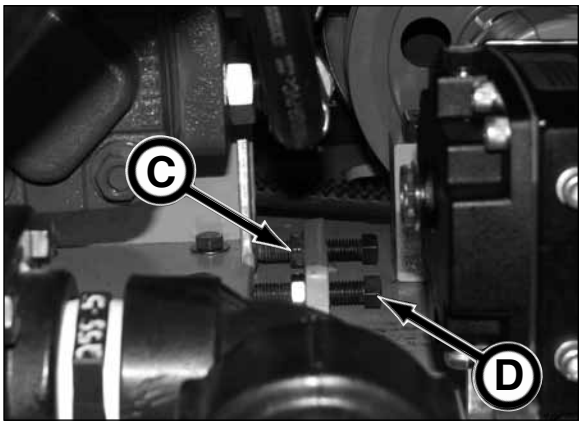


2. Loosen jam nuts (C).

3. Tighten adjustment bolts (D) to achieve 0.14” deflection at 6.2 ft lbs.

4. Tighten jam nuts.

5. Retighten four mounting screws.

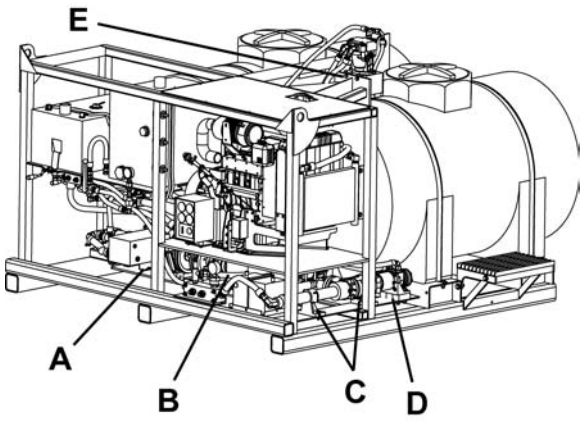


29. INSPECT ENGINE MOUNTS (2325D)

Visually inspect engine mounts for loose hardware or damaged parts.

Tighten all loose hardware and replace defective parts.

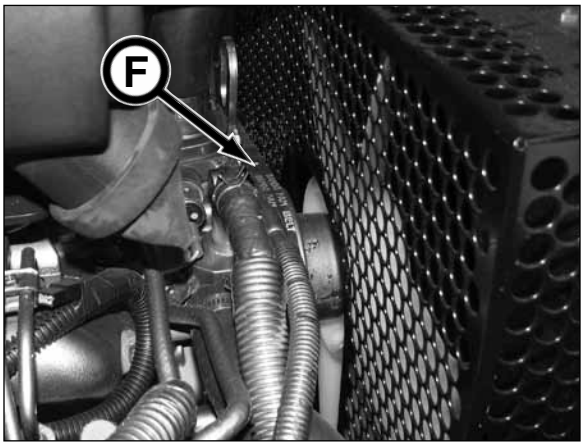
30. INSPECT PUMP & MOTOR MOUNTING BOLTS



Visually inspect pump and motor mounts for loose hardware or damaged parts.

Tighten all loose hardware and replace defective parts.

A - Jetting Pump 1
B - Jetting Pump 2
C - Lubrication Pump
D - Lubrication Motor
E - Mixer Motor



31. CHECK ENGINE V-BELT TENSION (2325D)

Check the engine V-belt tension at location (F), midpoint between pulleys, for a 0.25” - 0.375” deflection at 22 ft. lbs.

If it is necessary to adjust the belt tension, use the following procedure:

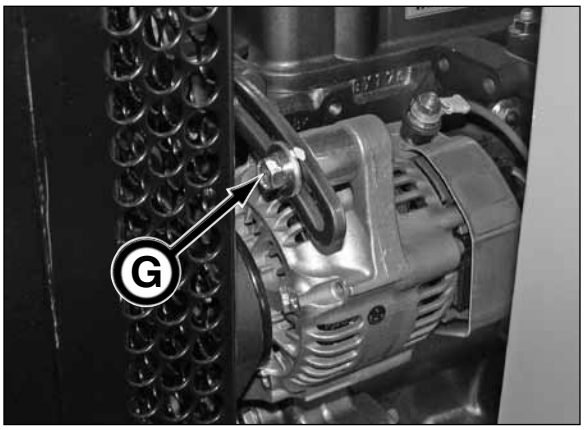
1. Loosen set bolt (G).

2. With a pry bar, move the alternator to tighten the belt to 0.25” - 0.375” deflection at 22 ft. lbs.

3. Tighten set bolt.

4. Check the belt for cracks, oil or wear. If any of these conditions exist, replace the belt.

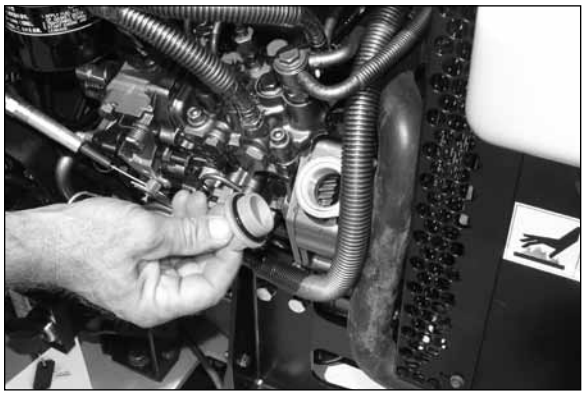
5. When installing a new belt, the tension should be 0.1875” - 0.3125” deflection at 22 ft. lbs. After this tension adjustment, run the engine for at least 5 minutes. Then recheck the belt tension for a 0.25” - 0.375” deflection at 22 ft. lbs.



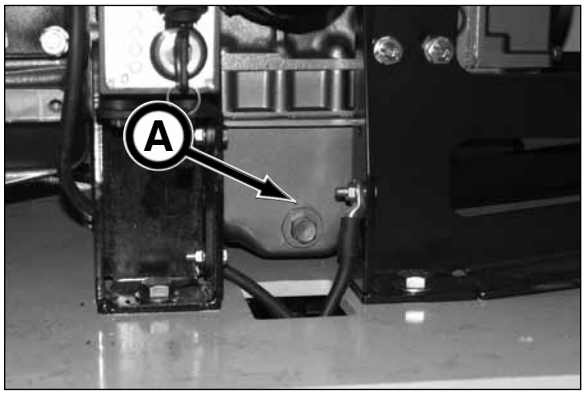
32. CHANGE ENGINE OIL & FILTER (2325D)

1. Start the engine and run to operating temperature.

2. Stop the engine.



3. Clean area around the fill cap. Remove cap. This will allow oil to drain more easily.

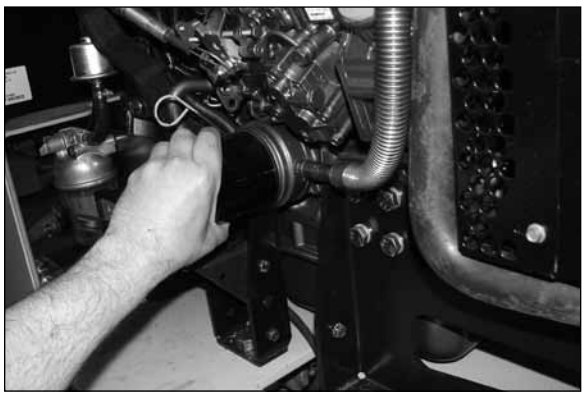


4. Clean area around engine oil drain plug (A).

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

6. Remove drain plug and drain oil into container. Dispose of oil properly.

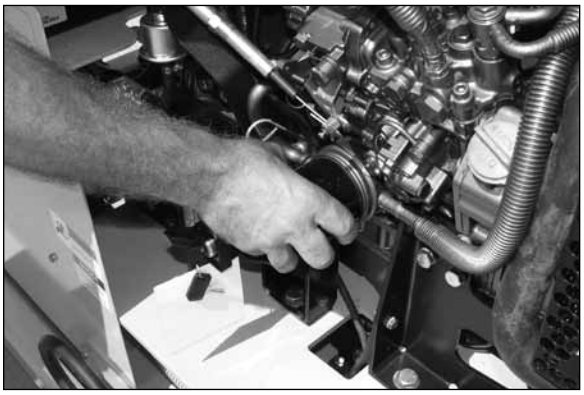
7. Replace drain plug.



8. Clean area around oil filter.

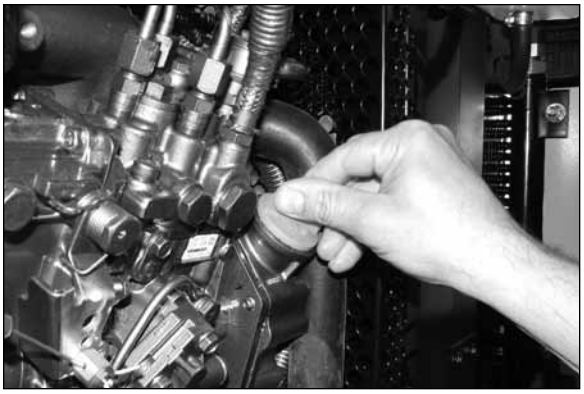
9. Remove oil filter and clean filter mounting pad. Dispose of filter properly.

(Continued on next page)



10. Lubricate gasket on new filter with clean oil.

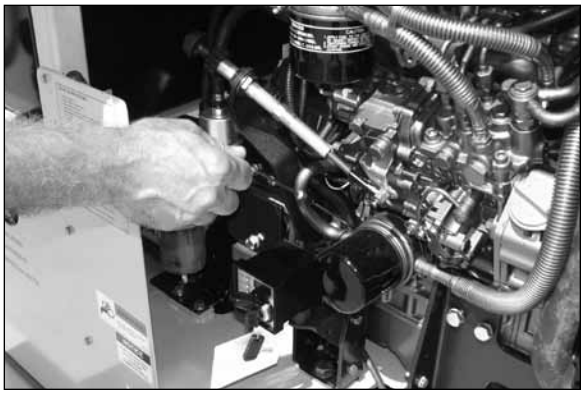
11. Install new filter and hand tighten according to values printed on the filter. Do not overtighten the filter element.



12. Fill engine with engine oil 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 level should be within the crosshatches of the dipstick.

    Oil Capacity ..... 4 qt (3.8 L)

13. Install fill cap. Clean up spills.



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

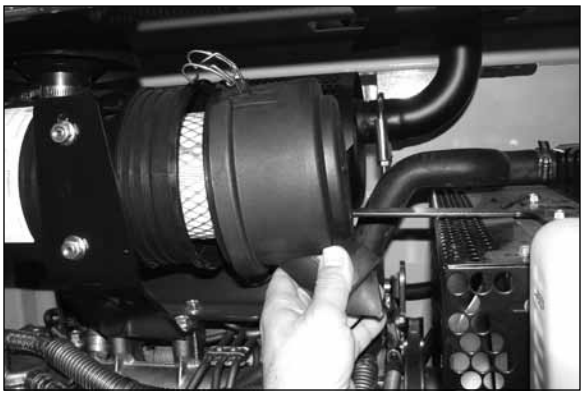
15. After the engine is warm, shut if off and let it sit for 10 minutes.

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

33. CHECK AIR CLEANER FILTER ELEMENT (2325D)

Periodically check air cleaner filter element for dirt and dust buildup. The engine performance efficiency is drastically affected with a clogged filter element.

1. Clean area around the air cleaner assembly.



2. Unlatch and remove cover.

3. Gently remove element. Bumping the element against air cleaner housing may contaminate the clean side of the filter housing with dirt and dust.

4. The element may be able to be cleaned if it is not excessively dirty or oily. Refer to your engine operation manual for more information.

5. Thoroughly clean the inside of the filter housing with a clean, damp cloth. Dirt left in the filter housing will shorten the life of the filter element.

(Continued on next page)

6. Carefully install a new or cleaned filter element by applying pressure by hand at outer rim of filter.

NOTICE Do not use latches on cover to force filter into air cleaner. Using cover to force filter into housing will damaged cleaner housing.

7. Reinstall the air cleaner cover properly by matching the arrow on the cover with the arrow on the filter housing.

8. Secure the cover to the housing with the latches.

34. INSPECT AIR INTAKE & EXHAUST CONNECTIONS (2325D)

Inspect all air intake and exhaust connections. Tighten clamps as needed and replace defective parts.

35. INSPECT & CLEAN FUEL TANK CAP (2325D)

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

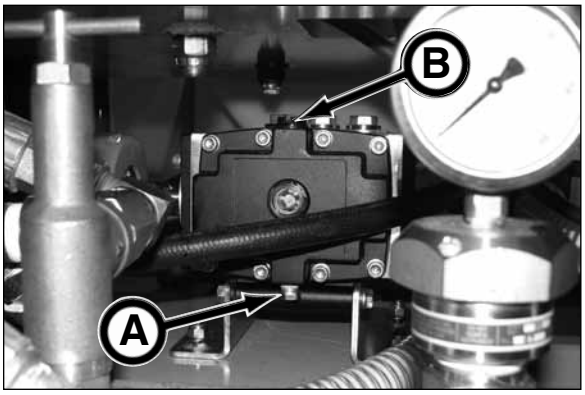
Remove cap and clean any debris or dirt from cap body.

EVERY 500 HOURS OF OPERATION

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

36. DRAIN & FILL JETTING PUMP OIL RESERVOIR

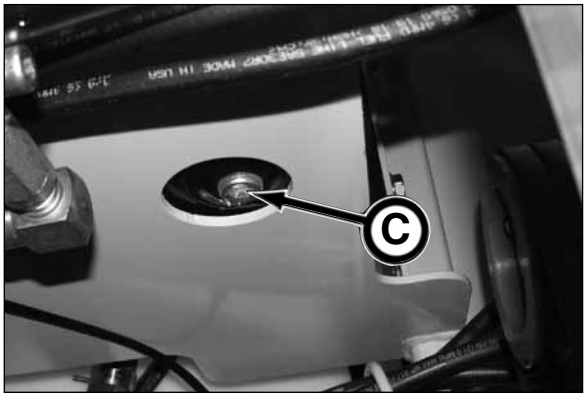
1. Remove drain plug (A) and drain oil into a catch pan.
2. Replace drain plug.
3. Remove dipstick/fill cap (B).
4. Fill approximately 26 fl. oz of SAE 30W non-detergent oil.
5. Check oil level using dipstick.
6. Drain and fill the other jetting pump oil reservoir.



Jetting Pump 2 Shown

37. DRAIN & FILL HYDRAULIC TANK

1. Remove drain plug (C) and drain oil into a catch pan. DO NOT allow oil to contact the hydraulic pump or main drive belts.
2. Replace drain plug.

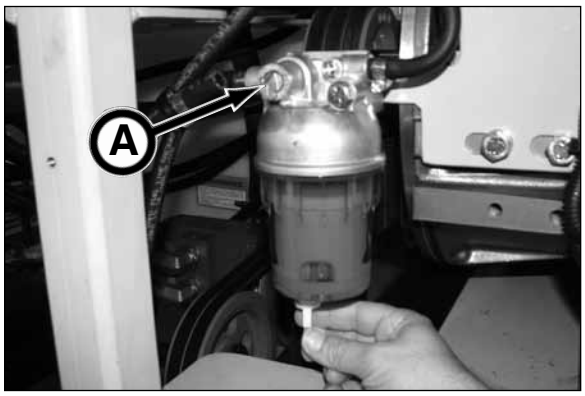


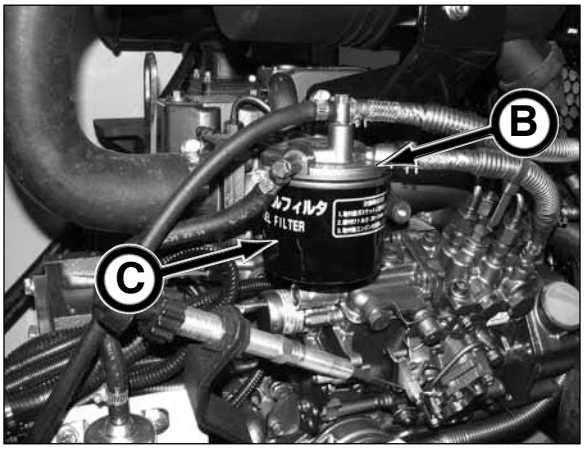
3. Remove fill cap.
4. Fill tank with approximately 25 gal (94.6 L) of ISO-VG-46 20W Premium Hydraulic Oil or refer to Hydraulic Tank in the Fuels & Lubricants section for more information.
5. Replace fill cap.

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

38. REPLACE FUEL FILTER (2325D)

1. Stop the engine and allow to cool.
2. Close the fuel shutoff (A) on the fuel/water separator.
3. Clean area around the fuel filter assembly (B).
4. Remove the fuel filter (C) with a filter wrench.
5. Clean the fuel filter assembly mounting surface.
6. Apply a small amount of diesel fuel to the gasket of the new fuel filter.
7. Install the new fuel filter. Hand tighten until it comes in contact with the mounting surface. Use a filter wrench to tighten it one additional turn. Otherwise, follow the installation instructions on the fuel filter.
8. Open the fuel shutoff.
9. If water and/or sediment in the fuel/water separator, drain the contaminants.
10. Prime the fuel system. Refer to 39. Priming Fuel System in this section.
11. Check for fuel leaks.





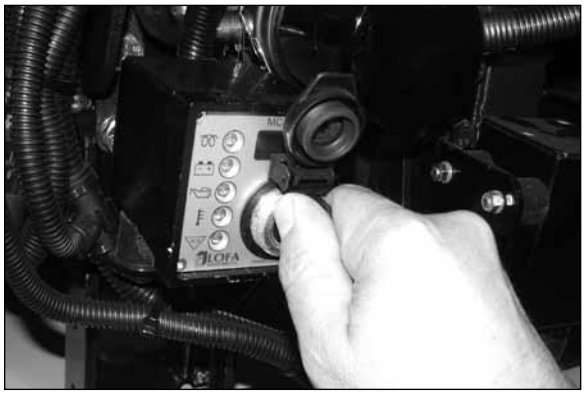
39. PRIMING FUEL SYSTEM (2325D)

Whenever the fuel system has been opened up for service such as changing the fuel filter and draining the fuel filter/water separator, replacing a fuel system component, or running out of fuel and fuel has been added to the fuel tank, the fuel system must be primed.

1. Turn key switch to the ON position (do not crank engine) for 10 - 15 seconds. This will allow the electric fuel pump to prime the fuel system.

NOTICE NEVER use the starter motor to crank the engine and prime the fuel system. Doing so will result in starter damage.

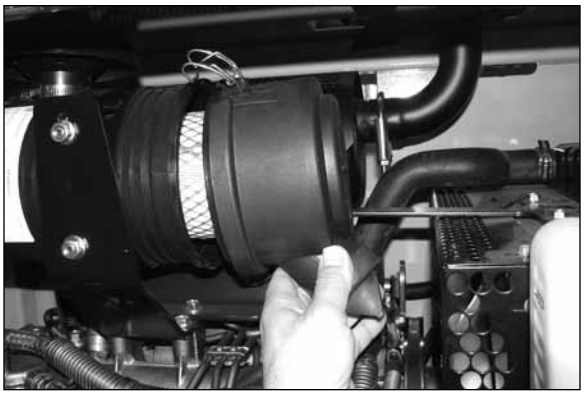
2. Check for leaks.



40. REPLACE AIR CLEANER ELEMENT (2325D)

Replace the air cleaner element every 500 hours of operation regardless if it is not damaged or dirty.

1. Clean area around the air cleaner assembly.



2. Unlatch and remove cover.

3. Gently remove filter element. Bumping the element against air cleaner housing may contaminate the clean side of the filter housing with dirt and dust.

4. Properly dispose of filter element.

5. Thoroughly clean the inside of the filter housing with a clean, damp cloth. Dirt left in the filter housing will shorten the life of the filter element.

(Continued on next page)

6. Carefully install a new filter element by applying pressure by hand at outer rim of filter.

NOTICE Do not use latches on cover to force filter into air cleaner. Using cover to force filter into housing will damage cleaner housing.

7. Reinstall the air cleaner cover properly by matching the arrow on the cover with the arrow on the filter housing.

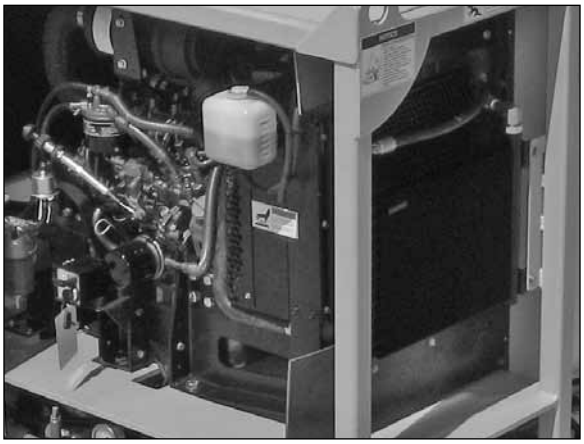
8. Secure the cover to the housing with the latches.

41. CHECK COOLING SYSTEM (2325D)

⚠WARNING Cooling system under pressure. Explosive release of HOT engine coolant can cause severe burns. SLOWLY remove the radiator cap ONLY if the engine is cool.

1. Visually check the cooling system for leaks. Tighten all clamps securely.

2. Check to be sure the coolant level is at the bottom of the filler neck. Add coolant mixture if needed. Refer to Engine Coolant in the Fuels & Lubricants section of this manual.



3. Inspect all cooling system hoses. If the hoses are found to be in a hard, weak, or cracked condition, replace the hose(s).

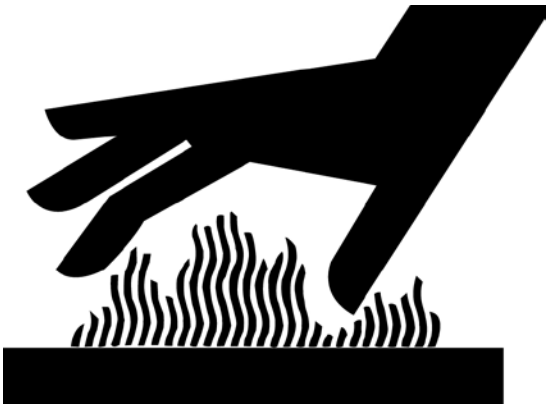
4. Check the radiator for bent fins. Carefully straighten fins.

5. Check the inlet and outlet tubes for cracks, kinks, dents, or fractured seams. Repairs must be made by a qualified radiator technician.

6. Check the effectiveness of the coolant solution. Refer to your engine operation manual for more information.

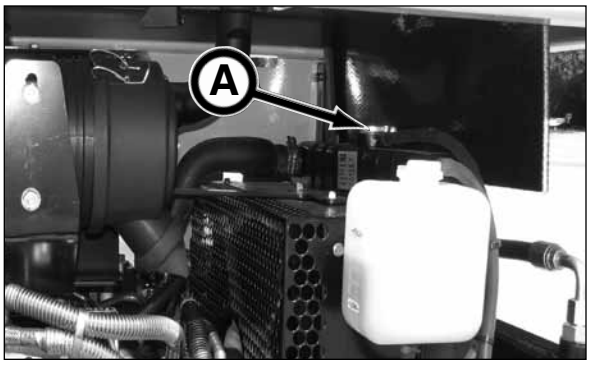
EVERY 1000 HOURS OF OPERATION

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

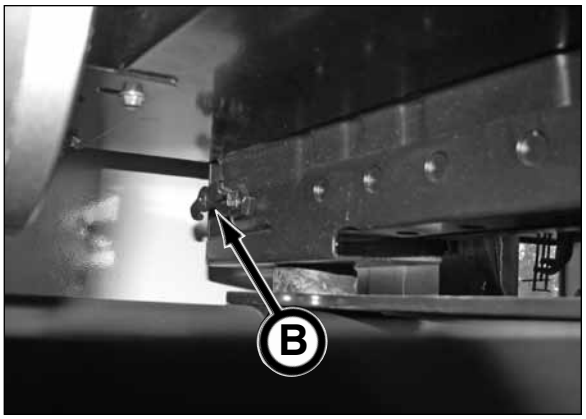


42. FLUSH & FILL COOLING SYSTEM (2325D)

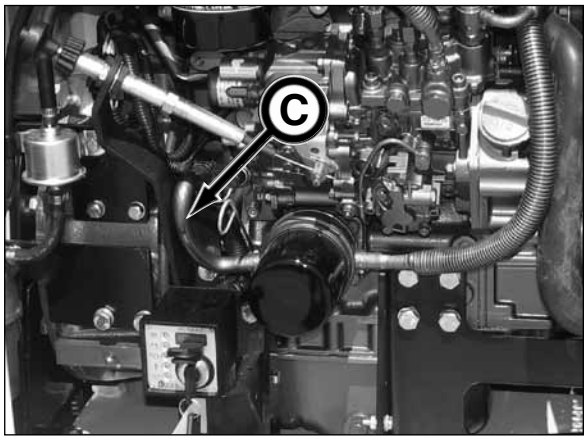
⚠WARNING Cooling system under pressure. Explosive release of HOT engine coolant can cause severe burns. SLOWLY remove the radiator cap ONLY if the engine is cool.



1. Wearing gloves and eye protection, slowly remove the radiator cap (A).



2. Open radiator drain valve (B). Drain all coolant into catch pan. Dispose of coolant properly.

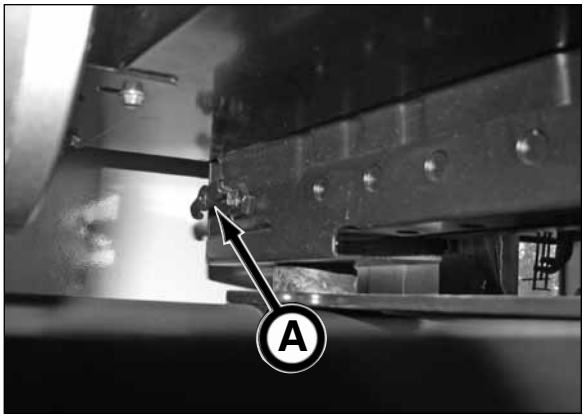


3. Drain the coolant from the engine block into a catch pan by removing hose (C). Dispose of coolant properly.

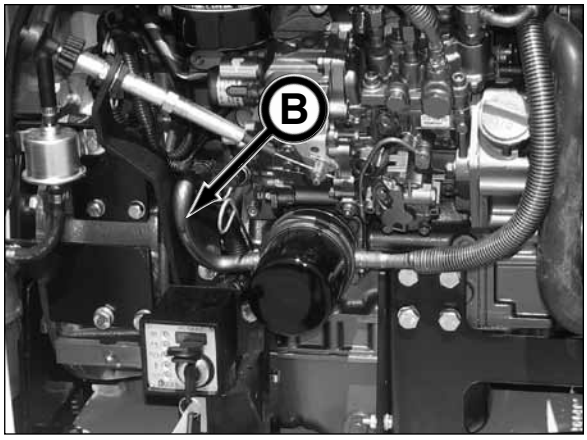
4. After draining the engine coolant, flush the radiator and engine block to remove any rust, scale and contaminants.

(Continued on next page)

5. Close the radiator drain valve (A).

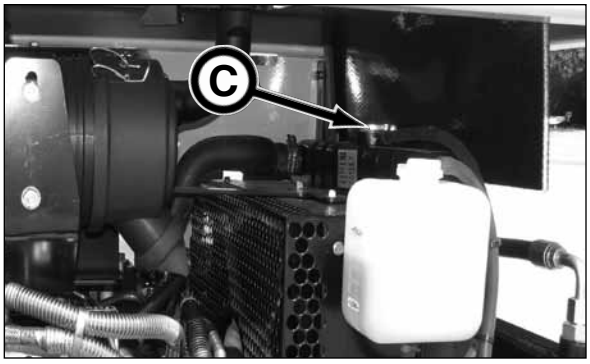


6. Reinstall the coolant hose (B).



7. Fill coolant (refer to Engine Coolant in the Fuels & Lubricants section) into radiator.

8. Replace radiator cap (C).



9. Start engine and operate it for 5 minutes to circulate the water/coolant mixture.

10. Shut off engine.

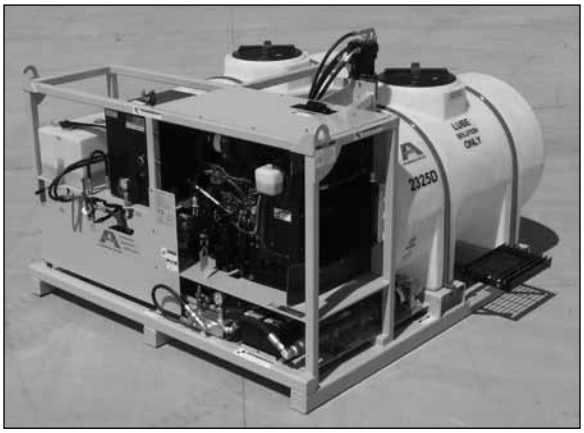
11. SLOWLY remove radiator cap.

12. Check radiator coolant level and fill as needed for coolant to reach the bottom of the filler neck.

13. Replace radiator cap.

14. Start engine and run it until it reaches operating temperature. This will mix the coolant uniformly and circulate it throughout the system.

15. Shut off engine. Check coolant level and add if necessary. Check entire coolant system for leaks.

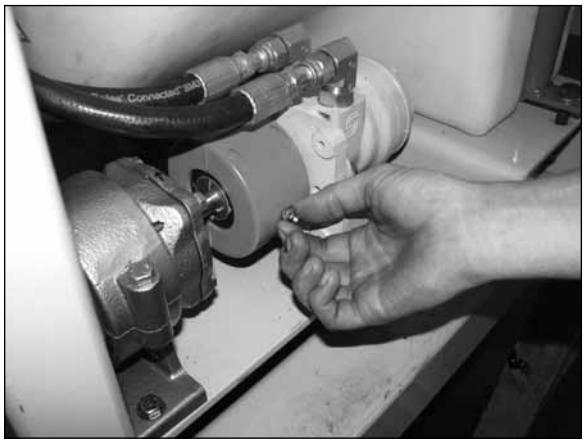


43. LUBRICATE DRIVE COUPLINGS

There are three drive couplings (Jetting Pump 1, Jetting Pump 2, and Lubrication Pump) that must be lubricated at every 1000 hours of operation.

1. Remove plug in coupling.

2. Install 1/8” grease fitting.



3. Lubricate drive couplings (A) (3 places) until grease just barely seeps out of seal with Mobilgrease® XHP222 or equivalent. DO NOT OVERFILL!

4. Remove grease fitting and retain for future use.

5. Reinstall plug fully into coupling.

⚠WARNING NEVER operate jetting and lube pump with grease fittings in couplings. Doing so may cause severe injury from contact with rotating grease fitting.

6. Be sure to lubricate all three drive couplings.

EVERY 2000 HOURS OR EVERY 2 YEARS OF OPERATION

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

44. REPLACE FUEL SYSTEM & COOLING SYSTEM HOSES (2325D)

Regularly check the fuel system and engine coolant system hoses. If they are cracked or degraded, replace them. Replace the hoses at least every two years.

NOTES

Storage

PREPARING FOR STORAGE

1. Repair worn or damaged parts.
2. Wash all equipment and tanks thoroughly.
3. Flush and drain pumps and all fluid lines to prevent clogging or freezing during storage.
4. Lubricate all grease points.
5. (2325D) Drain engine oil, replace filter and refill engine with oil specified in Fuels & Lubrication section.
6. (2325D) Drain water and sediment from fuel system. Dispose of water and sediment properly. Then prime fuel system.
7. (2325D) Add proper fuel stabilizer for a full tank. Fill fuel tank completely.
8. (2325D) Store diesel fuel in plastic, aluminum, or steel containers specially coated for diesel fuel storage.
9. Loosen all belts.
10. (2325D) Clean air cleaner.
11. (2325D) Restart engine and operate machine long enough to warm the oil. Check for leaks after machine warms up.
12. (2325D) 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.
13. Repaint equipment where necessary.
14. Drain hydraulic oil, flush oil reservoir, change hydraulic filter, and refill hydraulic tank. Check for leaks.
15. Wipe up lube spills. Dispose of rags and trash properly.
16. If possible, store equipment under cover and out of the weather in a ventilated area.
17. (2325D) If the engine to be stored for a long period of time, refer to your engine operation manual.

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. (2325D) Charge battery and install it.
5. (2325D) Check coolant level. If coolant is low, check for leaks and add coolant as required.
6. Adjust engine, main drive, and hydraulic pump drive belt tension.
7. Check for leaks. Repair or replace as necessary.
8. Check hydraulic oil level. If fluid is low, check for leaks and add oil as required. Also, check condition of the oil; be sure there is no water in the oil.
9. Check hydraulic return filter indicator. Replace filter as needed per indicator.
10. Check jetting tank strainer. Clean as needed. If damaged, replace with new.
11. Check condition of all hoses and connections. Tighten, repair or replace with new as needed.
12. Before operating, cycle hydraulic functions several times to purge air from hydraulic system.
13. (2325D) Refer to your engine operation manual on how to restore engine to service.
14. (2325D) If diesel fuel is stored for more than a month prior to use, or there is a slow turnover in fuel tank or supply tank, add a fuel conditioner or equivalent to stabilize the fuel and prevent water condensation. Refer to your engine operation manual for more information.
15. Review this Operator's Manual.

Troubleshooting

NOTICE For additional engine troubleshooting information, refer to your engine operation manual.

Problem	Cause	Solution
Engine does not start (2325D).	Fuel shutoff is in the OFF position.	Move fuel shutoff in ON position.
	Electric fuel pump is not plugged in.	Plug in fuel pump.
	No fuel in fuel tank.	Fill fuel tank.
	Jetting & lube control not in bypass.	Move control to bypass mode.
	If engine still does not start, contact your Akkerman Aftermarket Support Representative.	
Motor does not start (2325E).	Power source not hooked up.	Hook up power source.
	Main power disconnect switch OFF.	Flip switch ON.
	Wrong phase.	Rewire connection.
	Soft Start Fault light illuminated.	Troubleshoot.
	If motor still does not start, contact your Akkerman Aftermarket Support Representative.	
Cannot reach maximum pressure on jetting pumps.	Relief valve is not set properly.	Adjust relief to 2500 psi max.
	Belts loose.	Retighten belt tension.
	Jetting circuit in bypass mode.	Reset to jetting/washer mode.
	If max. pressure still cannot be reached, contact your Akkerman Aftermarket Support Representative.	
Jetting pump(s) pulsating.	Air in water supply.	Add more water in jetting tank and check pump inlet connections.
	Dirty stainers.	Clean strainers.
	Cam locks not engaged.	Be sure cam locks are fully engaged.
	Pump check valves damaged.	Replace check valves.
	If jetting pumps continue to pulsate, contact your Akkerman Aftermarket Support Representative.	
No water discharge out of jetting pump.	No water in tank.	Fill tank.
	Ball valve on tank closed.	Open jetting tank ball valve.
	Strainer plugged.	Clean strainer.
	Inlet hose damaged.	Replace hose.
	If no water still does not discharge out of jetting pump, contact your Akkerman Aftermarket Support Representative.	

(Continued on next page)

Problem	Cause	Solution
Agitator does not operate.	Pump not rotating due to belt slippage.	Adjust belt.
	Oil level low.	Add oil.
	Relief valve set too low.	Adjust to 2,000 psi.
	Bearing failure.	Replace bearing.
	If agitator still does not operate, contact your Akkerman Aftermarket Support Representative.	
No flow from lubrication pump.	No lube solution in tank.	Fill tank.
	Pump not rotating.	Activate valve.
	Incorrect rotation.	Switch A & B supply hoses to drive motor.
	Stator is stuck due to improper lubrication.	Replace stator and be sure to use proper lube mixture.
	If there still is no flow from the lube pump, contact your Akkerman Aftermarket Support Representative.	
Hydraulics are running hot.	Dirty oil cooler.	Clean oil cooler.
	Rubber seal around radiator is missing.	
	Low relief valve setting.	Adjust valve to 2500 psi max.
	Pump(s) worn.	Replace pump(s).
	If the hydraulics continue to run hot, contact your Akkerman Aftermarket Support Representative.	
Premature belt wear.	Pulley(s) are misaligned.	Readjust pulley(s).
	Belts slipping.	Retighten belt tension.
	If belts continue to wear prematurely, contact your Akkerman Aftermarket Support Representative.	
Drive coupling failure.	No grease in coupling.	Grease couplings per Periodic Maintenance section.
	Coupling misalignment.	Realign shaft.
	If drive coupling continues to fail, contact your Akkerman Aftermarket Support Representative.	

SOFT START FAULT CODES (2325E)

A decal listing the soft start fault codes is located on the inside door of the control panel. Only a qualified technician should make changes to the soft start controller.

NOTICE A complete Cutler-Hammer Soft Starter User manual is available on-line at http://www.eaton.com/ecm/groups/public/@pub/@eaton/@ee/documents/content/1081448138286.pdf

2325E Fault Codes

Troubleshooting Fault Table

Fault Code	Possible Problem	Possible Solution
4	Low Control Voltage Fault – The external 24V power supply voltage is dropping below the minimum required to control the motor.	Use recommended 24V power supplies with enough current sourcing capability to close contactors. Verify correct wire size used to connect power supply to S811. (See power supply specification for more details.) Verify connections are secure.
6	Phase Loss Fault – Extreme phase imbalance condition. Incoming phase disconnected, blown fuse.	Repair broken connection, replace fuse.
7	Phase Imbalance Fault – The imbalance of the incoming phases exceeds the trip threshold.	Correct imbalance problem with mains. Increase the xx Imbalance Fault xx parameters or disable the fault if the other issues cannot be resolved. Make sure your system can tolerate the imbalance.
11	Jam Fault – While in bypass an obstruction has slowed or stalled the motor resulting in extreme motor current.	Disconnect power from S811 and any other equipment and remove obstruction. Jam Fault can be disabled if trips occur during normal operation. Over Current Fault will provide protection at a higher current threshold.
14	Overload Fault – Motor has been overloaded for an extended period of time.	Reduce the motor's load. Verify the Overld Trip FLA and/or Ovrld Trip Class if the overloads are infrequent and are set to match the motor and system. Note: Exceeding nameplate ratings will shorten equipment life. If fault happens during motor start: verify the control system is not exceeding the specified maximum starts per hour. Increase the initial torque to bring the motor up to speed faster.
42	Under Voltage Fault – Incoming AC line voltage below trip threshold. Device connected to incorrect mains supply voltage.	Connect to correct supply voltage. Verify Motor Rated Volt is set to correct value. It may be necessary to reduce this setting for soft mains.
43	Over Voltage Fault – Incoming AC line voltage above trip threshold. Device connected to incorrect mains supply voltage.	Connect to correct supply voltage. Verify Motor Rated Volt is set to correct value. It may be necessary to increase this setting for high mains.
44	Motor Voltage Phase Reversal Fault – incoming line phase rotation sequence opposite of device setting.	Set Phase Sequence to match incoming sequence. If motor is turning in wrong direction swap two motor connection leads. If mains leads need to be changed, swap incoming leads and set Phase Sequence to match incoming sequence. If an upstream reverser is used, disable Phase Rev Fault.
61	Mains AC Voltage Loss Fault – fuses blown, disconnect open, or breaker tripped.	Replace fuses, close disconnect, or reset breaker.
63	Motor Stall Fault – S811 could not engage the bypass contactors at the end of the motor start time because the start current was too high. Motor did not reach full speed during the start time.	Lengthen Soft Start Time and/or increase Initial Torque . Loads that are heavily loaded during a start such as fans will often need an initial torque setting much greater than the factory default.

NOTES

Specifications

JETTING & LUBRICATION PUMP

Dimensions:

Height ..... 64 in. (1,625 mm)
Width ..... 86.75 in. (2,205 mm)
Length ..... 93 in. (2,360 mm)
Weight (empty tanks) ..... 3,150 lbs. (1,429 kg)
(full tanks) ..... 8,300 lbs. (3,765 kg)

Power Unit:

2325D
Diesel Engine @ 3,000 rpm ... 30 HP (22.5 kW)
2325E
Electric Motor @ 1,750 rpm ... 30 HP (22.5 kW)

Drive System:

Belt Direct Driven from Engine to Jetting Pump

Fluid Capacities

Fuel Tank (2325D)..... 18 gal. (68 L)
Jetting Tank ..... 325 gal (1,230 L)
Lubrication Tank ..... 325 gal (1,230 L)
Hydraulic Tank ..... 25 gal (94.6 L)
Engine Oil (2325D)* ..... 4 qt (3.8 L)
Engine Coolant (2325D) ..... 5.5 qt (21 L)

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

Pump Units

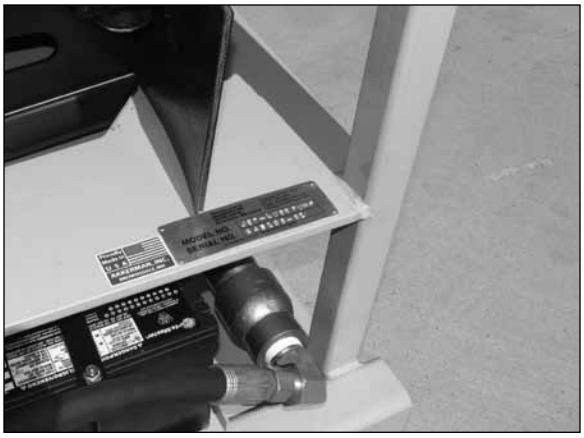
Jetting Pump (Two): .....Piston pump
Pump Flow
Pump 1 ..... 8 gpm (0 - 30 L/min)
Pump 1 & 2 ..... 16 gpm (0 - 60 L/min)
Speed ..... 1,725 rpm
Max. Pressure Rating ..... 2,500 psi (17,237 kPa)

Lubrication Pump With Agitator:
..... Progressive cavity pump
Pump Flow ..... 4 gpm (15 L/min)
Speed ..... 550 rpm
Max. Pressure Rating ..... 150 psi (1,034 kPa)
Agitator (bidirectional) ..... 1,050 rpm

NOTES

Identification Numbers

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



JETTING & LUBRICATION PUMP

Model Number _____

Serial Number _____

NOTES

Material Safety Data Sheets

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

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

To ensure a prompt response to your MSDS 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 under normal use and service for a period of 90 days. This warranty does not apply to normal wear items such as cutter teeth, filters, etc. Akkerman Inc. does not warrant the fitness of its equipment for a particular purpose or application.

NOTES

Parts

Contents

INTRODUCTION

This parts manual contains assembly illustrations of the Akkerman 2325D/2325E Jetting & 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 manual 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 Jetting & 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.

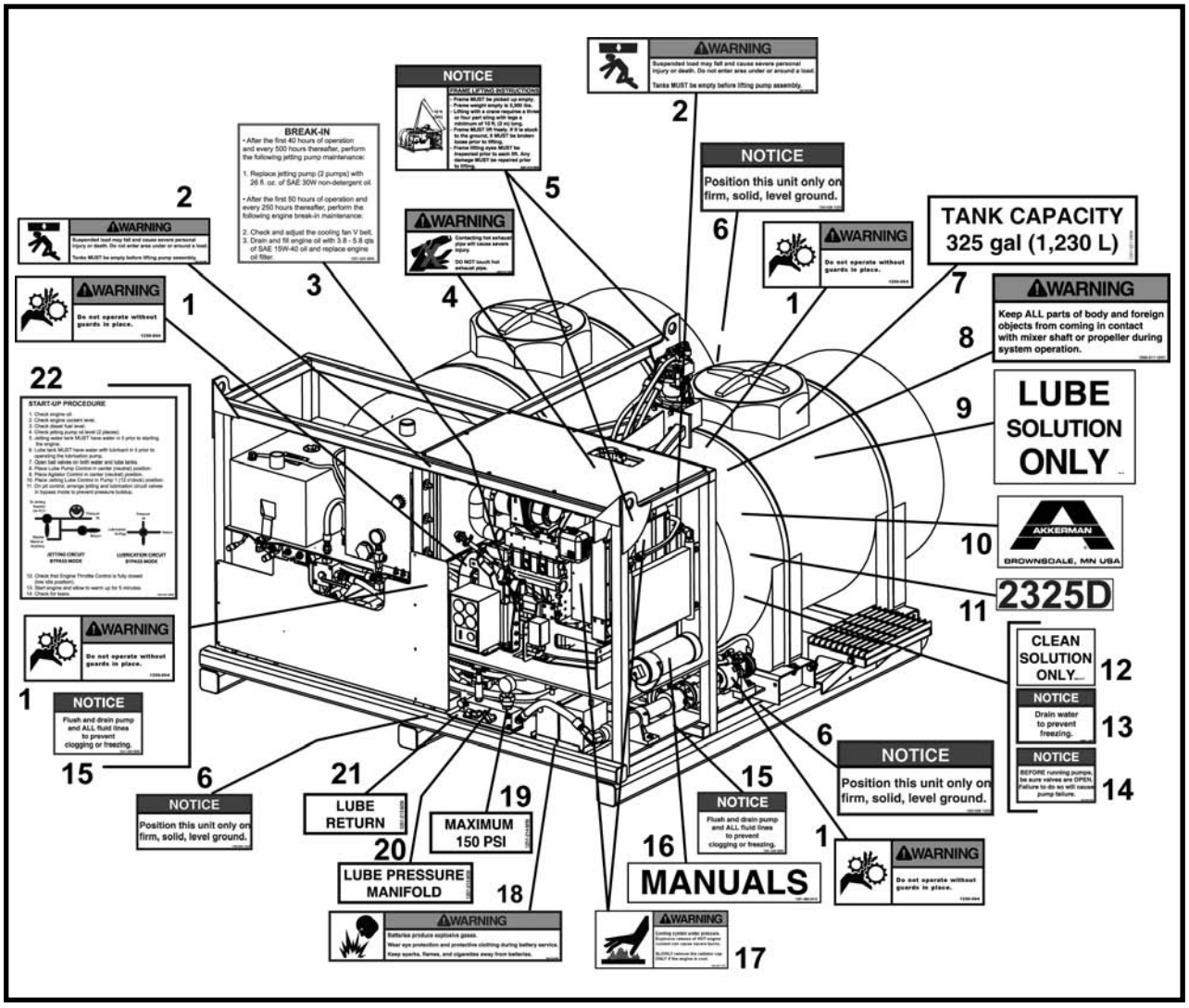
HARDWARE SPECIFICATION
All Akkerman products are assembled with SAE Grade 8 bolts, nuts, and washers. ALWAYS use matched fastener hardware when replacing or repairing the unit.

If you find any errors with this manual or have any suggestions for improvement, please let us know. 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.

JETTING & LUBRICATION PUMP DECALS - RIGHT VIEW

2325D



ITEM	QTY	PART NO.	DESCRIPTION
1	4	1250-004	DECAL, Warning Keep Guards In Place
2	2	1251-018	DECAL, Warning Suspended Loads
3	1	1251-225	DECAL, Break-In
4	1	1250-777a	DECAL, Warning Hot Exhaust
5	2	1251-219	DECAL, Notice Lifting Instructions
6	3	1250-638	DECAL, Notice Position Level Ground
7	1	1251-221	DECAL, Tank Capacity 325 gal
8	1	1250-311	DECAL, Warning Keep Away From Propeller
9	1	1251-015	DECAL, Lube Solution Only
10	1	1251-246	DECAL, Akkerman, Large
11	1	1251-227	DECAL, Model 2325D
12	1	1251-017	DECAL, Clean Solution Only
13	1	A3000-1	DECAL, Notice Drain Water
14	1	1251-023	DECAL, Notice Open Valves
15	2	1251-228	DECAL, Notice Flush and Drain
16	1	1251-283	DECAL, Manuals
17	2	1250-697	DECAL, Warning Cooling System
18	1	1251-016	DECAL, Warning Battery Explosive

(Continued on next page)

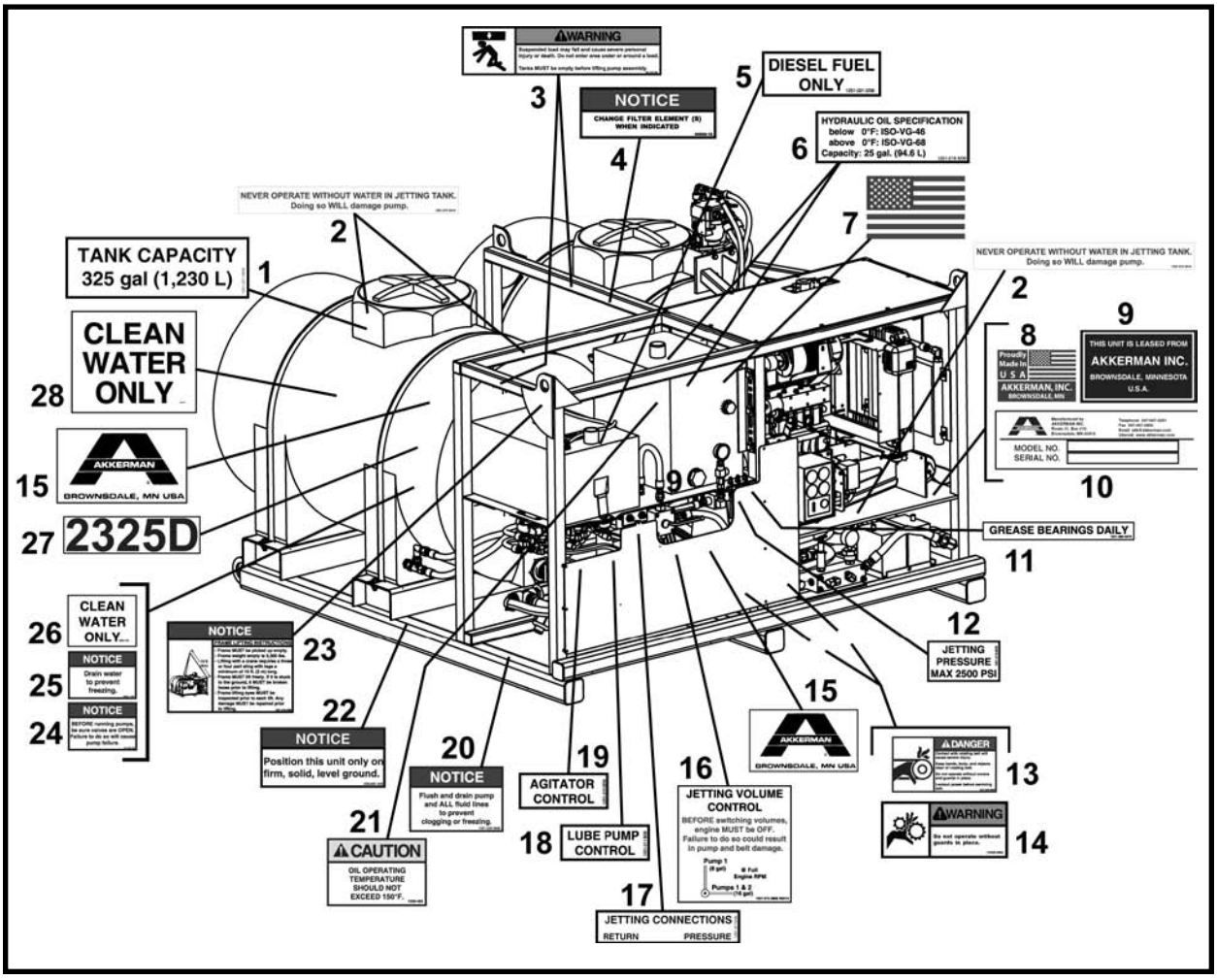
JETTING & LUBRICATION PUMP DECALS - RIGHT VIEW

2325D

ITEM	QTY	PART NO.	DESCRIPTION
19	1	1251-214	DECAL, Maximum 150 PSI
20	1	1251-215	DECAL, Lube Pressure Manifold
21	1	1251-213	DECAL, Lube Return
22	1	1251-224	DECAL, 2325D Start-Up Procedure

JETTING & LUBRICATION PUMP DECALS - LEFT VIEW

2325D



ITEM	QTY	PART NO.	DESCRIPTION
1	1	1251-221	DECAL, Tank Capacity 325 gal
2	3	1251-273	DECAL, Never Operate Without Water
3	2	1251-018	DECAL, Warning Suspended Loads
4	1	40000-16	DECAL, Notice Change Filter
5	1	1251-021	DECAL, Diesel Fuel Only
6	2	1251-218	DECAL, Hydraulic Oil Specification
7	1	1250-558	DECAL, USA Flag Small
8	1	1250-544	DECAL, Made in USA
9*	1	1250-098	DECAL, Lease
10	1	REF	PLATE, Serial Number
11	1	1251-265	DECAL, Grease Bearings Daily
12	1	1251-216	DECAL, Jetting Pressure Max 2500 PSI
13	2	1251-236	DECAL, Danger Rotating Belt
14	2	1250-004	DECAL, Warning Keep Guards In Place
15	2	1251-246	DECAL, Akkerman, Large
16	1	1251-212	DECAL, Jetting Volume Control
17	1	1251-217	DECAL, Jetting Connections
18	1	1251-211	DECAL, Lube Pump Control
19	1	1251-210	DECAL, Agitator
20	1	1251-228	DECAL, Notice Flush and Drain

(Continued on next page)

JETTING & LUBRICATION PUMP DECALS - LEFT VIEW

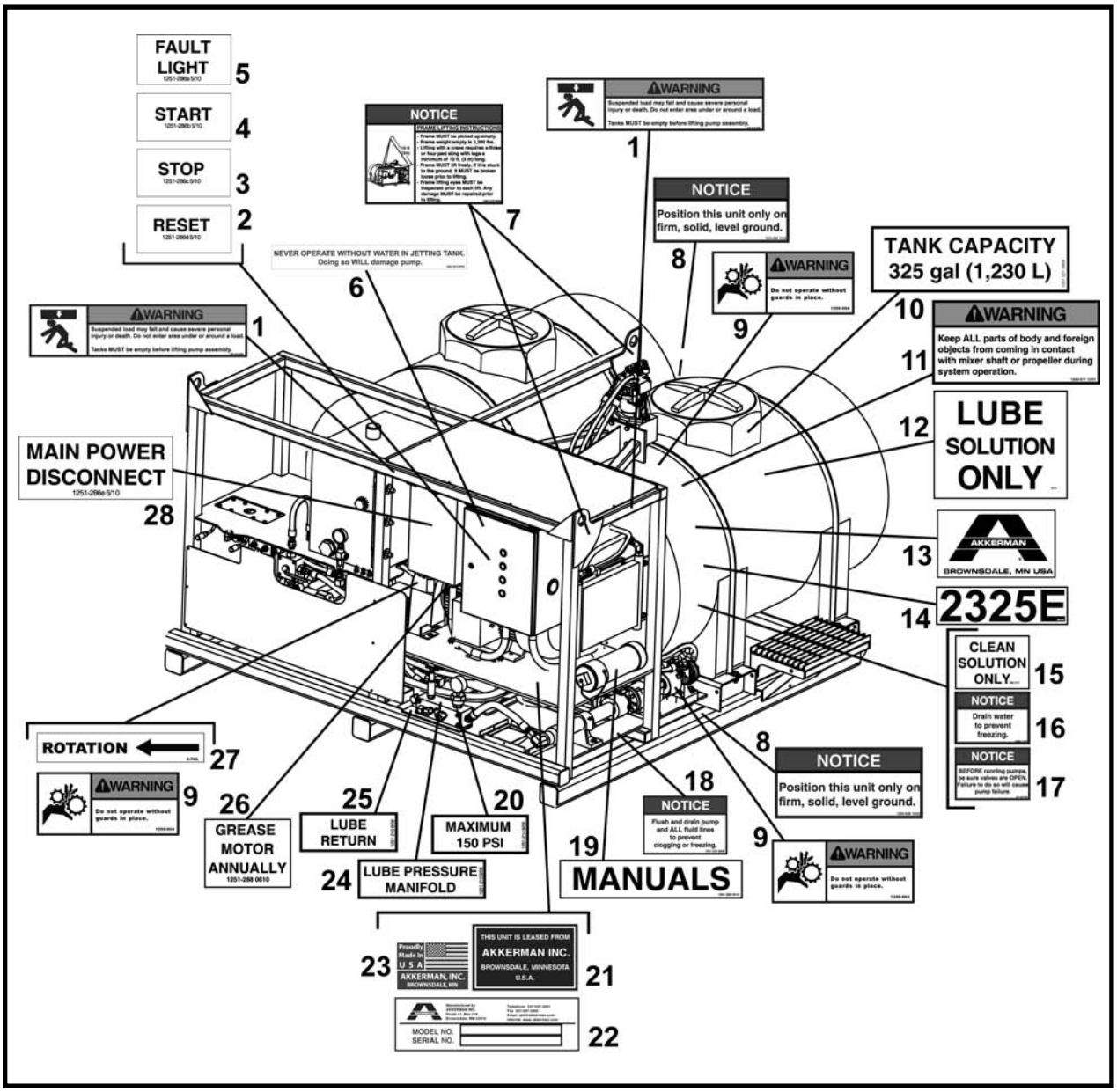
2325D

ITEM	QTY	PART NO.	DESCRIPTION
21	1	1250-483	DECAL, Caution Oil Temp
22	1	1250-638	DECAL, Notice Position Level Ground
23	1	1251-219	DECAL, Notice Lifting Instructions
24	1	1251-023	DECAL, Notice Open Valves
25	1	A3000-1	DECAL, Notice Drain Water
26	1	1250-743	DECAL, Clean Water Only
27	1	1251-227	DECAL, Model 2325D
28	1	1250-742	DECAL, Clean Water Only

* Note: Decal used only on leased equipment.

JETTING & LUBRICATION PUMP DECALS - RIGHT VIEW

2325E



ITEM	QTY	PART NO.	DESCRIPTION
1	2	1251-018	DECAL, Warning Suspended Loads
2	1	1251-286d	DECAL, Control Panel, Reset
3	1	1251-286c	DECAL, Control Panel, Stop
4	1	1251-286b	DECAL, Control Panel, Start
5	1	1251-286a	DECAL, Control Panel, Fault Light
6	1	1251-273	DECAL, Never Operate Without Water
7	2	1251-219	DECAL, Notice Lifting Instructions
8	2	1250-638	DECAL, Notice Position Level Ground
9	3	1250-004	DECAL, Warning Keep Guards In Place
10	1	1251-221	DECAL, Tank Capacity 325 gal
11	1	1250-311	DECAL, Warning Keep Away From Propeller
12	1	1251-015	DECAL, Lube Solution Only
13	1	1251-246	DECAL, Akkerman, Large
14	1	1251-285	DECAL, Model 2325E

(Continued on next page)

JETTING & LUBRICATION PUMP DECALS - RIGHT VIEW

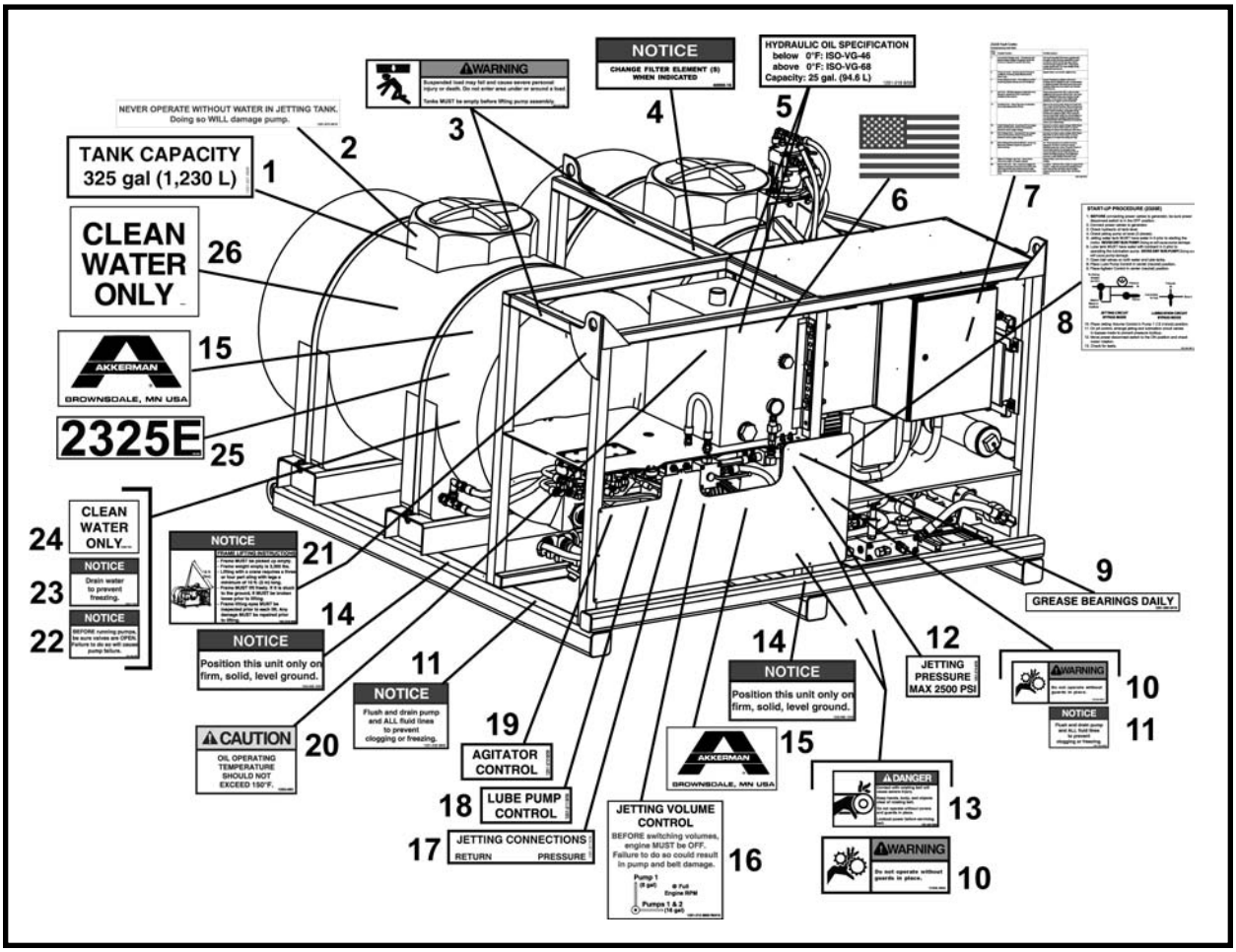
2325E

ITEM	QTY	PART NO.	DESCRIPTION
15	1	1251-017	DECAL, Clean Solution Only
16	1	A3000-1	DECAL, Notice Drain Water
17	1	1251-023	DECAL, Notice Open Valves
18	1	1251-228	DECAL, Notice Flush and Drain
19	1	1251-283	DECAL, Manuals
20	1	1251-214	DECAL, Maximum 150 PSI
21*	1	1250-098	DECAL, Lease
22	1	REF	PLATE, Serial Number
23	1	1250-544	DECAL, Made in USA
24	1	1251-215	DECAL, Lube Pressure Manifold
25	1	1251-213	DECAL, Lube Return
26	1	1251-288	DECAL, Grease Motor Annually
27	1	3-700L	DECAL, Rotation Left
28	1	1251-286e	DECAL, Main Power Disconnect

* Note: Decal used only on leased equipment.

JETTING & LUBRICATION PUMP DECALS - LEFT VIEW

2325E



ITEM	QTY	PART NO.	DESCRIPTION
1	1	1251-221	DECAL, Tank Capacity 325 gal
2	1	1251-273	DECAL, Never Operate Without Water
3	2	1251-018	DECAL, Warning Suspended Loads
4	1	40000-16	DECAL, Notice, Change Filter
5	2	1251-218	DECAL, Hydraulic Oil Specification
6	1	1250-558	DECAL, USA Flag Small
7	1	1251-289	DECAL, 2325E Soft Start Fault Codes
8	1	1251-284	DECAL, 2325E Start-Up Procedure
9	1	1251-265	DECAL, Grease Bearings Daily
10	3	1250-004	DECAL, Warning Keep Guards In Place
11	2	1251-228	DECAL, Notice Flush and Drain
12	1	1251-216	DECAL, Jetting Pressure Max 2500 PSI
13	2	1251-236	DECAL, Danger Rotating Belt
14	2	1250-638	DECAL, Notice Position Level Ground
15	1	1251-246	DECAL, Akkerman, Large
16	1	1251-212	DECAL, Jetting Volume Control
17	1	1251-217	DECAL, Jetting Connections
18	1	1251-211	DECAL, Lube Pump Control
19	1	1251-210	DECAL, Agitator
20	1	1250-483	DECAL, Caution Oil Temp
21	1	1251-219	DECAL, Notice Lifting Instructions

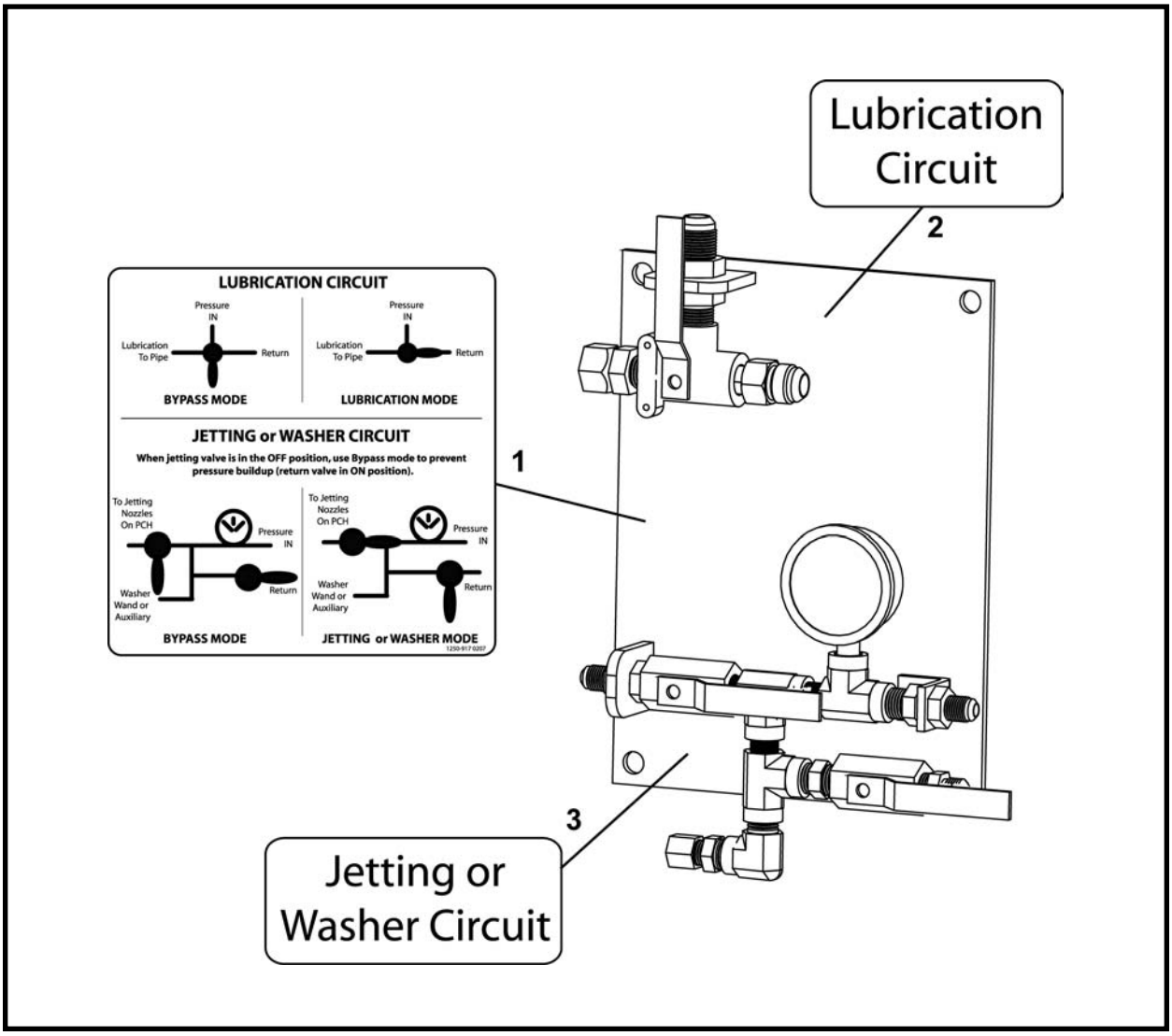
(Continued on next page)

JETTING & LUBRICATION PUMP DECALS - LEFT VIEW

2325E

ITEM	QTY	PART NO.	DESCRIPTION
22	1	1251-023	DECAL, Notice Open Valves
23	1	A3000-1	DECAL, Notice Drain Water
24	1	1250-743	DECAL, Clean Water Only
25	1	1251-285	DECAL, Model 2325E
26	1	1250-742	DECAL, Clean Water Only

JETTING & LUBRICATION PUMP SHAFT CONTROL DECALS

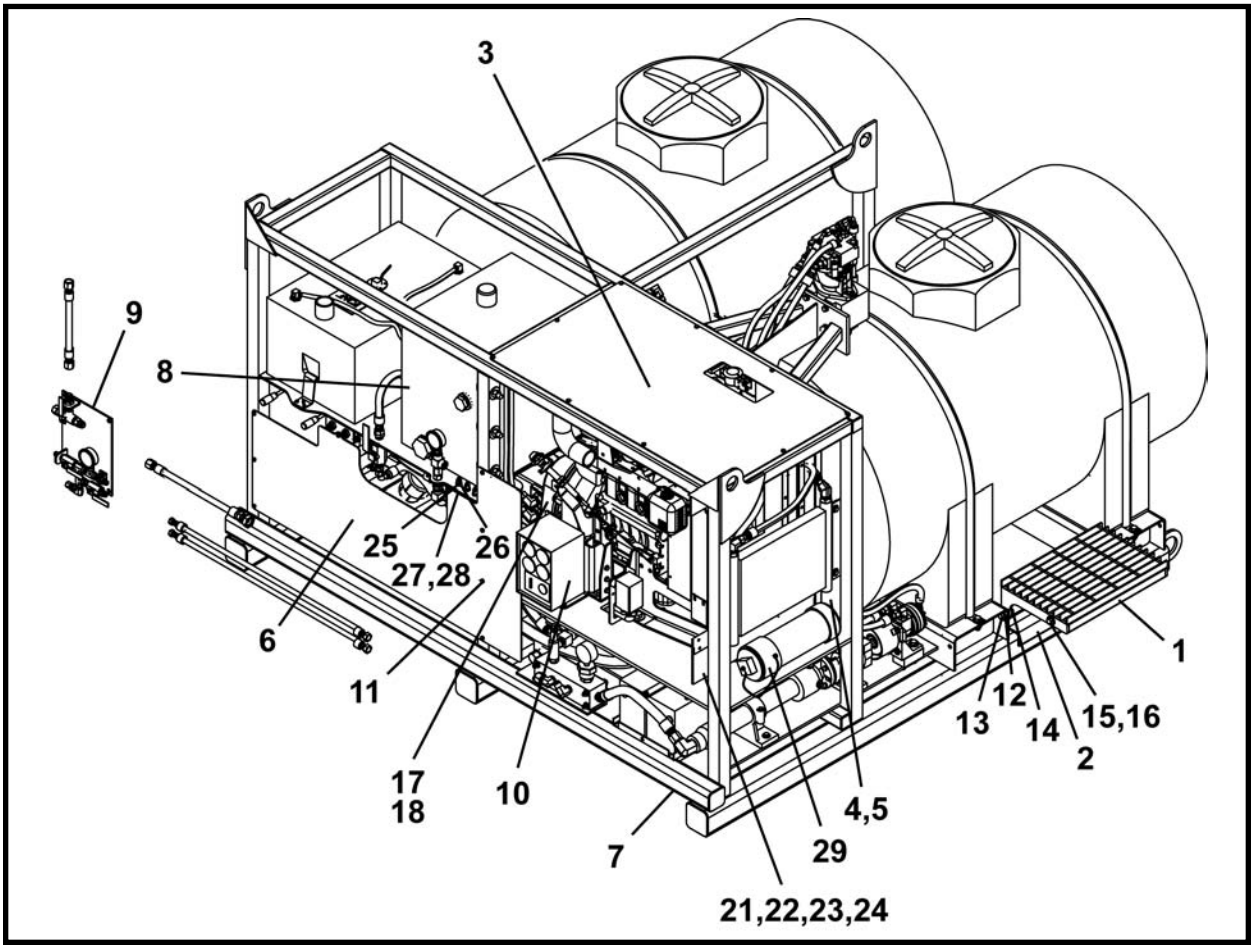


ITEM	QTY	PART NO.	DESCRIPTION
1	1	1250-917a	DECAL, Lubrication-Jetting-Washer Control
2	1	1250-917b	DECAL, Lubrication Circuit
3	1	1250-917c	DECAL, Jetting Or Washer Circuit

NOTES

JETTING & LUBRICATION PUMP FINAL ASSEMBLY, FA45103F

2325D



ITEM	QTY	PART NO.	DESCRIPTION
0	1	FA45103F	JETTING & LUBRICATION PUMP FINAL ASSEMBLY
1	1	A45054A	STEP
2	1	A45057A	BRACE, Step
3	1	A45082P	COVER, Top
4	1	A45083P	COVER, Rear Right
5	1	A45084P	COVER, Rear Left
6	1	A45085P	COVER, Front
7	1	A45024A	FRAME
8	1	A45115A	ASSEMBLY, Hydraulic
9	1	A45116A	ASSEMBLY, Water
10	1	A45117A	ASSEMBLY, Drive
11	31	P0001-04-002	BOLT, 1/4 UNC x .5
12	12	P0040-008	WASHER, Flat Hardened 1/2
13	2	P0001-08-007	BOLT, 1/2 UNC x 1.75
14	4	P0003-08-000	NUT, 1/2 UNC
15	2	P0001-08-012	BOLT, 1/2 UNC x 3
16	2	A45170P	BUSHING
17	1	A45175P	GUARD, Belt
18	1	A45171A	WELDMENT, Belt Guard
19*	1	A45113A	KIT, Jetting & Lube Hose
20*	1	A45339A	KIT, Assembly Fitting
21	2	A45178P	RUBBER, Short
22	1	A45179P	RUBBER, Long
23	2	A45180P	PLATE, Short Backer

(Continued on next page)

JETTING & LUBRICATION PUMP FINAL ASSEMBLY, FA45103F

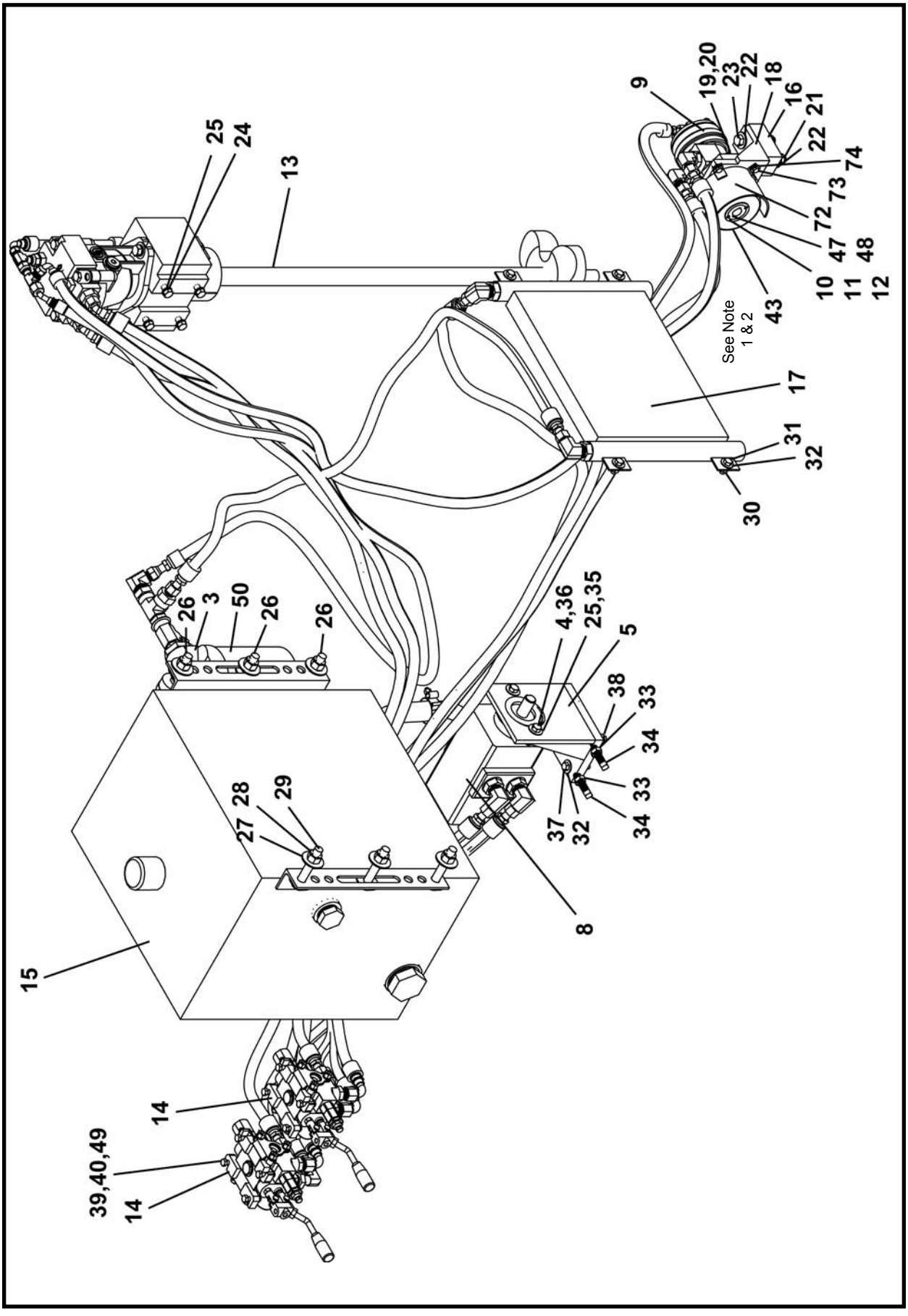
2325D

ITEM	QTY	PART NO.	DESCRIPTION
24	1	A45181P	PLATE, Long Backer
25**	3	P0063-024	FITTING, Grease Line
26**	3	P0063-004	FITTING, Grease - Straight
27**	3	P0300-759	ADAPTER, Grease Fitting
28**	3	P0200-108	ASSEMBLY, Hose
29**	1	A45904A	ASSEMBLY, Document Tube

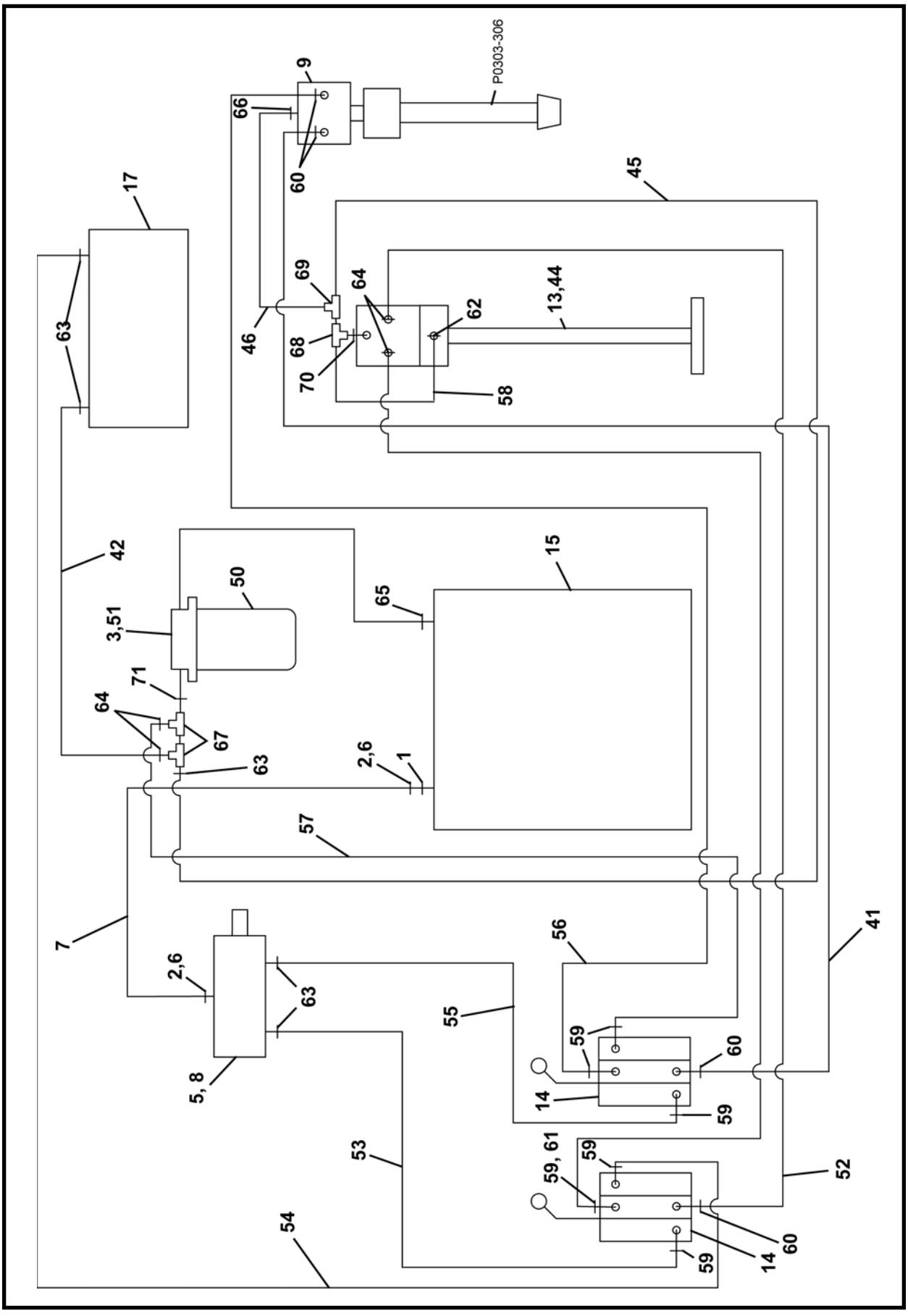
* Not Shown

** Originally equipped on SN FA45103F-5 & After. These items can be added to SN FA45103F-4 & Before.

HYDRAULIC ASSEMBLY, A45115A



HYDRAULIC ASSEMBLY, A45115A



HYDRAULIC ASSEMBLY, A45115A

ITEM	QTY	PART NO.	DESCRIPTION
0	1	A45115A	HYDRAULIC ASSEMBLY
1	1	A45114P	FITTING
2	2	P0220-223	FITTING, 20 INSERT-90-20MB
3	1	P0309-144B	HEAD, Filter With 25 PSI Bypass
4	2	P0001-07-006	BOLT, 7/16 UNC x 1.5
5	1	A45093A	BRACKET, Mounting
6	2	P0201-205	T CLAMP
7	14	P0201-227	T CLAMP
8	1	P0303-345	PUMP, Hydraulic
9.1	1	P0304-175	MOTOR (SN FA45103F-1 thru 7, 9 & After) (FA45914F-1 & After)
9.2	1	P0304-331	MOTOR (SN FA45103F-8 Only)
10	1	P0305-191	SPROCKET, Coupling
11	1	P0305-193	SPROCKET, Coupling
12	1	P0305-195	CHAIN
13***	1	A44421A	ASSEMBLY, Agitator
14	2	P0302-673	VALVE, Single Detent
15	1	P0125-133	RESERVOIR, Hydraulic 25 gal
16	2	A44442P	BRACKET, Riser
17	1	P0125-129	OIL COOLER
18	1	P0304-142	BRACKET
19	2	P0001-06-006	BOLT, 3/8 UNC x 1.5
20	10	P0045-006	WASHER, Lock 3/8
21	4	P0013-08-000	NUT, Lock 1/2
22	8	P0040-008	WASHER, Hardened Flat 1/2
23	4	P0001-08-012	BOLT, 1/2 UNC x 3
24	4	P0001-07-005	BOLT, 7/16 UNC x 1.25
25	4	P0045-007	WASHER, Lock 7/16
26	3	P0001-10-007	BOLT, 5/8 UNC x 1.75
27	12	P0040-010	WASHER, Hardened Flat 5/8
28	6	P0013-10-000	NUT, Lock 5/8
29	3	P0001-10-014	BOLT, 5/8 UNC x 3.5
30	4	P0003-06-000	NUT, 3/8
31	4	P0001-06-004	BOLT, 3/8 UNC x 1
32	12	P0040-006	WASHER, Hardened Flat 3/8
33	2	P0007-08-000	NUT, Jam 1/2
34	2	P0034-08-008	SCREW, Square Head Set 1/2 UNC x 2
35	2	P0040-007	WASHER, Hardened Flat 7/16
36	2	P0003-07-000	NUT, 7/16
37	4	P0001-06-008	BOLT, 3/8 UNC x 2
38	4	P0013-06A-000	NUT, Course Nylock 3/8
39	8	P0040-005	WASHER, Hardened Flat 5/16
40	8	P0003-05-000	NUT, 5/16
41*	1	A10491A-093	ASSEMBLY, Hose 1/2 x 93
42*	1	A10491A-063	ASSEMBLY, Hose 1/2 x 63
43	1	P0305-196	ASSEMBLY, Chain Cover
44	2	A45185A	GUARD, AGITATOR
45*	1	A10380A-054	ASSEMBLY, Hose 3/8 x 54
46*	1	A10314A-088	ASSEMBLY, Hose 1/4 x 88
47	1	P0305-192	BUSHING, Tapered 3/4”
48	1	P0305-194	BUSHING, Tapered 1
49	8	P0001-05-005	BOLT, 5/16 UNC x 1.25
50	1	P0309-145	ELEMENT, Filter
51	1	P0301-105	GAUGE, Filter Indicator

(Continued on next page)

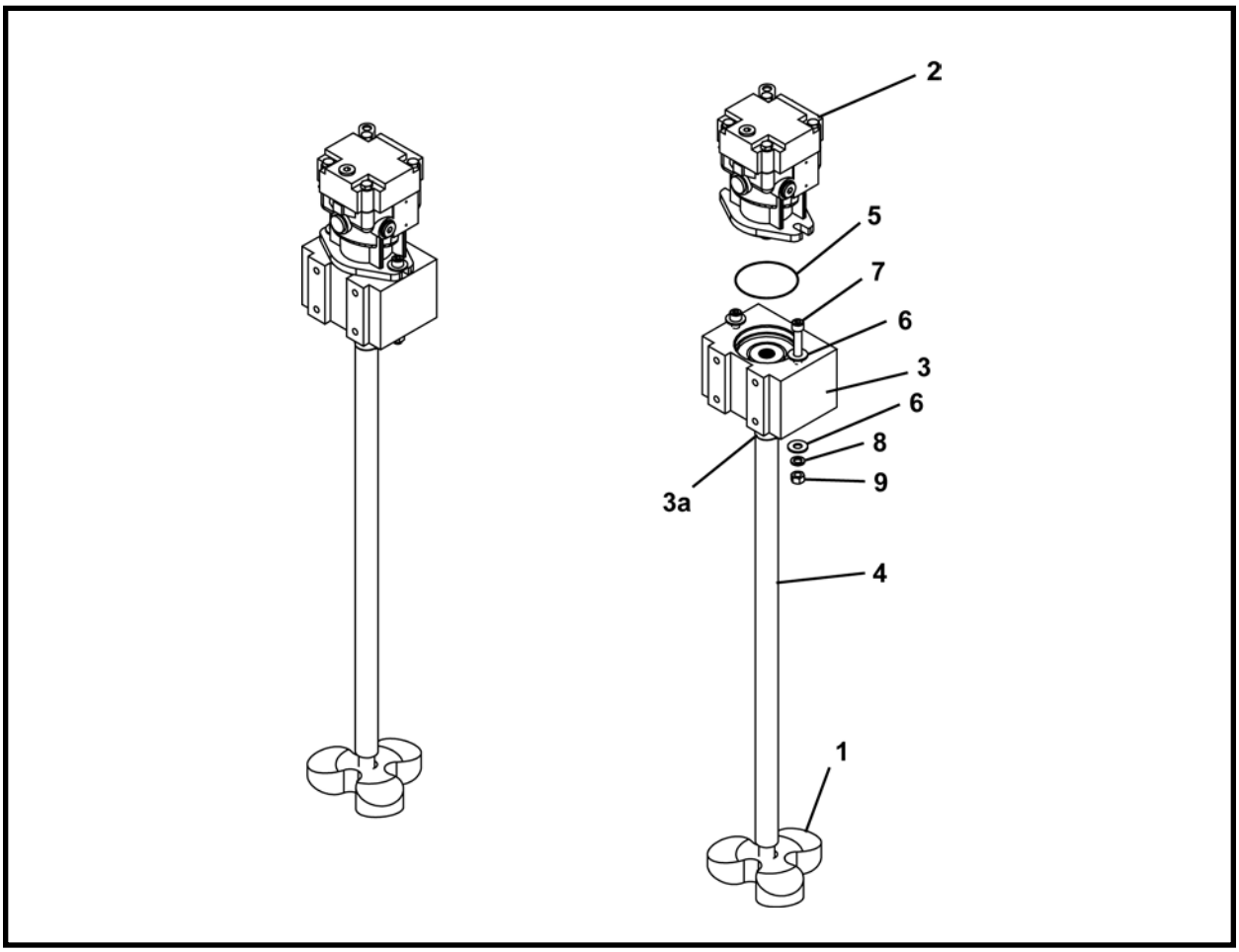
HYDRAULIC ASSEMBLY, A45115A

ITEM	QTY	PART NO.	DESCRIPTION
52*	2	A09911A-100	ASSEMBLY, Hose 1/2 x 100
53*	1	A09912A-042	ASSEMBLY, Hose 1/2 x 42
54*	1	A09912A-103	ASSEMBLY, Hose 1/2 x 103
55*	1	A09912A-036	ASSEMBLY, Hose 1/2 x 36
56*	1	A09912A-093	ASSEMBLY, Hose 1/2 x 93
57*	1	A09912A-050	ASSEMBLY, Hose 1/2 x 50
58*	1	A10314A-012	ASSEMBLY, Hose 1/4 x 12
59**	6	P0300-300	FITTING, 08MFOR-10MB
60**	4	P0300-302	FITTING, 08MFOR-10MB90
61**	1	P0300-317	FITTING, 08MFOR-08FFORX90
62**	1	P0300-326	FITTING, 04MFOR-04MP90
63**	5	P0300-373	FITTING, 08MFOR-12MB90
64**	4	P0300-375	FITTING, 08MFOR-12MB
65**	1	P0300-414	FITTING, 20MB-20MP
66**	1	P0300-427	FITTING, 04MFOR-04MB90
67**	2	P0300-536	FITTING, 12MB-12FB-12FB
68**	1	P0300-602	FITTING, 06MFOR-06MFOR-06FFORX
69**	1	P0300-613	FITTING, 06MFOR-06FFORX-06MFOR
70**	1	P0300-634	FITTING, 06MFOR-10MB
71**	1	P0300-658	FITTING, 20MB-12FB
72	1	A45685A	GUARD, Coupling
73	2	P0001-04-002	BOLT, 1/4 UNC x .5
74	2	P0040-004	WASHER, Hardened Flat 1/4

* Included in A45113A Kit, Hose
** Included in A45339A Kit, Fitting
*** Refer to this section for parts breakdown.

NOTE:
1. Grease chain coupling after installation prior to operating.
2. Tapered bushing set screw torque, 55 in-lbs.

AGITATOR ASSEMBLY, A44421A

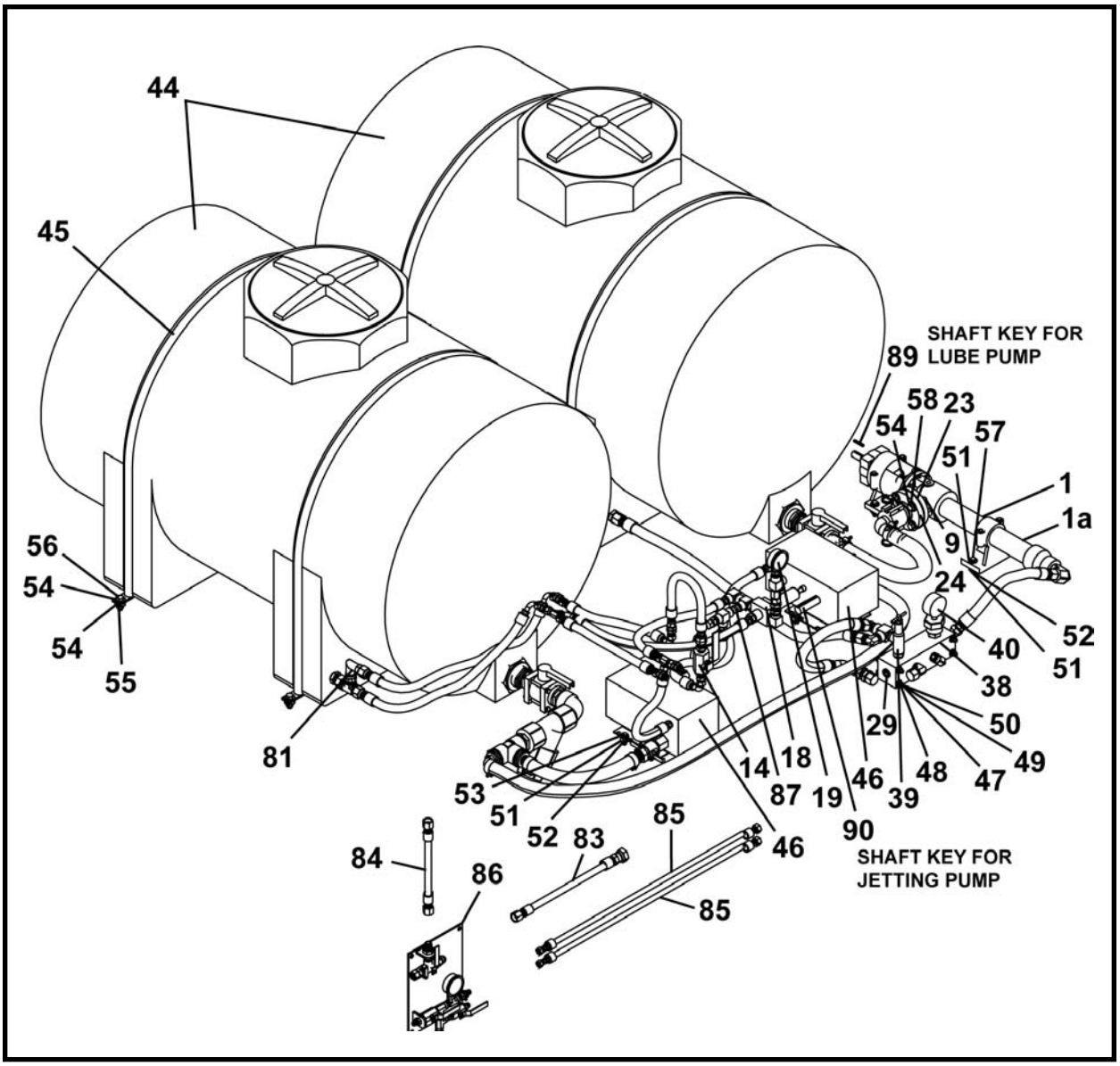


ITEM	QTY	PART NO.	DESCRIPTION
0	1	A44421A	AGITATOR ASSEMBLY
1	1	A46252P	PROPELLER, 10”
2*	1	P0304-176	MOTOR
3*	1	P0302-520	ADAPTER, Bearing Load (Includes item 3a)
3a	1	P0302-520A	SEAL, Shaft
4	1	A44418P	SHAFT, Agitator
5	1	P0088-187	ORING
6	4	P0040-008	WASHER, Hardened Flat 1/2
7	2	P0031-08-024	SCREW, Socket Head Cap 1/2 UNC x 6
8	2	P0045-008	WASHER, Lock 1/2
9	2	P0003-08-000	NUT, 1/2

* If replacing motor, item 2, remove output shaft seal from new motor prior to installation.
** If replacing bearing, item 3, remove input seal from new bearing prior to installation.

NOTES

WATER ASSEMBLY, A45116A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A45116A	WATER ASSEMBLY
1	1	P0303-306	PUMP, Lubrication (Includes item 1a)
1a	1	P0303-306A	STATOR
2	4	P0258-005	NIPPLE, 1
3	2	P0258-006	VALVE, Port 1-1/2
4	1	P0258-012	STRAINER
5	1	P0258-015	1 MPT X 1 HOSE SHANK 90 DEG
6	2	P0258-013	BUSHING, Reducer
7	2	P0258-004	FLANGE, Poly Tank
8	1	P0258-018	ELBOW
9	4	P0003-08-000	NUT, 1/2
10	1	P0258-043	TEE
11	3	P0423-124	ADAPTER, Hose
12	2	P0416-004	PLUG, Square Head 3/4”
13	2	P0300-012	FITTING, 12MP-08FPS
14	1	P0302-325	VALVE, Ball

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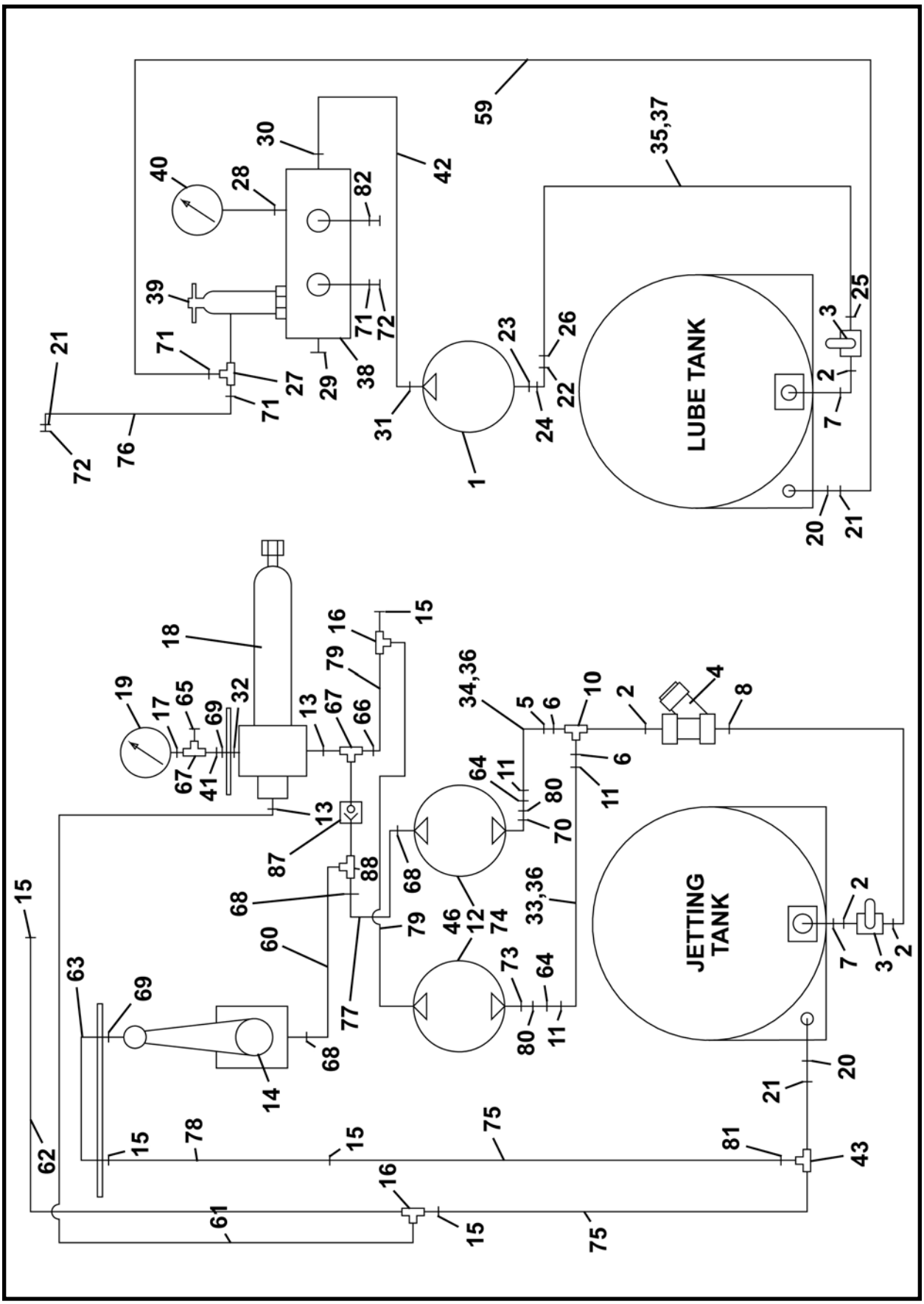
WATER ASSEMBLY, A45116A



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WATER ASSEMBLY, A45116A

ITEM	QTY	PART NO.	DESCRIPTION
15	5	P0300-325	FITTING, 08MJ-08MJBKHD
16	2	P0300-412	FITTING, 08MJ-08FJX-08MJ
17	1	P0300-086	FITTING, 08MP-04FPS
18	1	P0302-525	VALVE, Water
19	1	P0301-100	GAUGE, Pressure 5000 PSI
20	2	P0085-214	O-RING
21	3	P0300-330	FITTING, 12MJ-12MJBKHD
22	1	P0258-009	ADAPTER
23	1	P0258-011	GASKET, Flange
24	1	P0258-010	FLANGE
25	1	P0258-044	BARB, Hose
26	1	P0258-008	COUPLING, Female 90 Degree
27	1	P0300-019	FITTING, 12MP-12FP-12FP
28	1	P0300-013	FITTING, 16MP-16MP
29	1	P0300-045	FITTING, 12MP-HHP
30	1	P0300-191	FITTING, 12MP-12FPX45
31	1	P0300-599	FITTING, 12MJ-20MP90
32	1	P0300-023	FITTING, 12MP-08FP90
33	15 LI	P0201-238	HOSE, Water Suction 1
34	75 LI	P0201-238	HOSE, Water Suction 1
35	24 LI	P0201-239	HOSE, Water Suction 1-1/2
36	4	P0201-205	T CLAMP
37	2	P0201-127	T CLAMP
38	1	A44466P	MANIFOLD
39	1	P0302-349	VALVE, Pressure Relief
40	1	P0301-143	GAUGE & SEAL
41	1	P0300-756	FITTING, 08FP-10FJX
42	1	A09930A-018	ASSEMBLY, Hose 3/4 x 18
43	1	P0300-538	FITTING, 12MJ-12FJ-12MJ
44	2	P0258-003	TANK, 325 Gallon
45	4	P0059-067	BAND
46	2	P0303-344	PUMP, Jetting
47	8	P0040-005	WASHER, Hardened Flat 5/16
48	4	P0045-005	WASHER, Lock 5/16
49	4	P0001-05-016	BOLT, 5/16 UNC x 4
50	4	P0003-05-000	NUT, 5/16
51	24	P0040-006	WASHER, Hardened Flat 3/8
52	12	P0013-06A-000	NUT, Course Nylock 3/8
53	8	P0001-06-005	BOLT, 3/8 UNC x 1.25
54	20	P0040-008	WASHER, Hardened Flat 1/2
55	8	P0013-08-000	NUT, Lock 1/2
56	8	P0001-08-006	BOLT, 1/2 UNC x 1.5
57	4	P0001-06-007	BOLT, 3/8 UNC x 1.75
58	4	P0001-08-009	BOLT, 1/2 UNC x 2.25
59	1	A09932A-040	ASSEMBLY, Hose 3/4 x 40
60	1	A09915A-020	ASSEMBLY, Hose 1/2 x 20
61	1	A09915A-030	ASSEMBLY, Hose 1/2 x 30
62	1	A09916A-018	ASSEMBLY, Hose 1/2 x 18
63	1	A09919A-015	ASSEMBLY, Hose 1/2 x 15
64	2	P0100-024	PLUG, 1
65	1	P0300-079	FITTING, 08MP-HHP
66	1	P0300-032	FITTING, 08MP-08FP90 BRAZED
67	2	P0300-049	FITTING, 08MP-08FP-08FP

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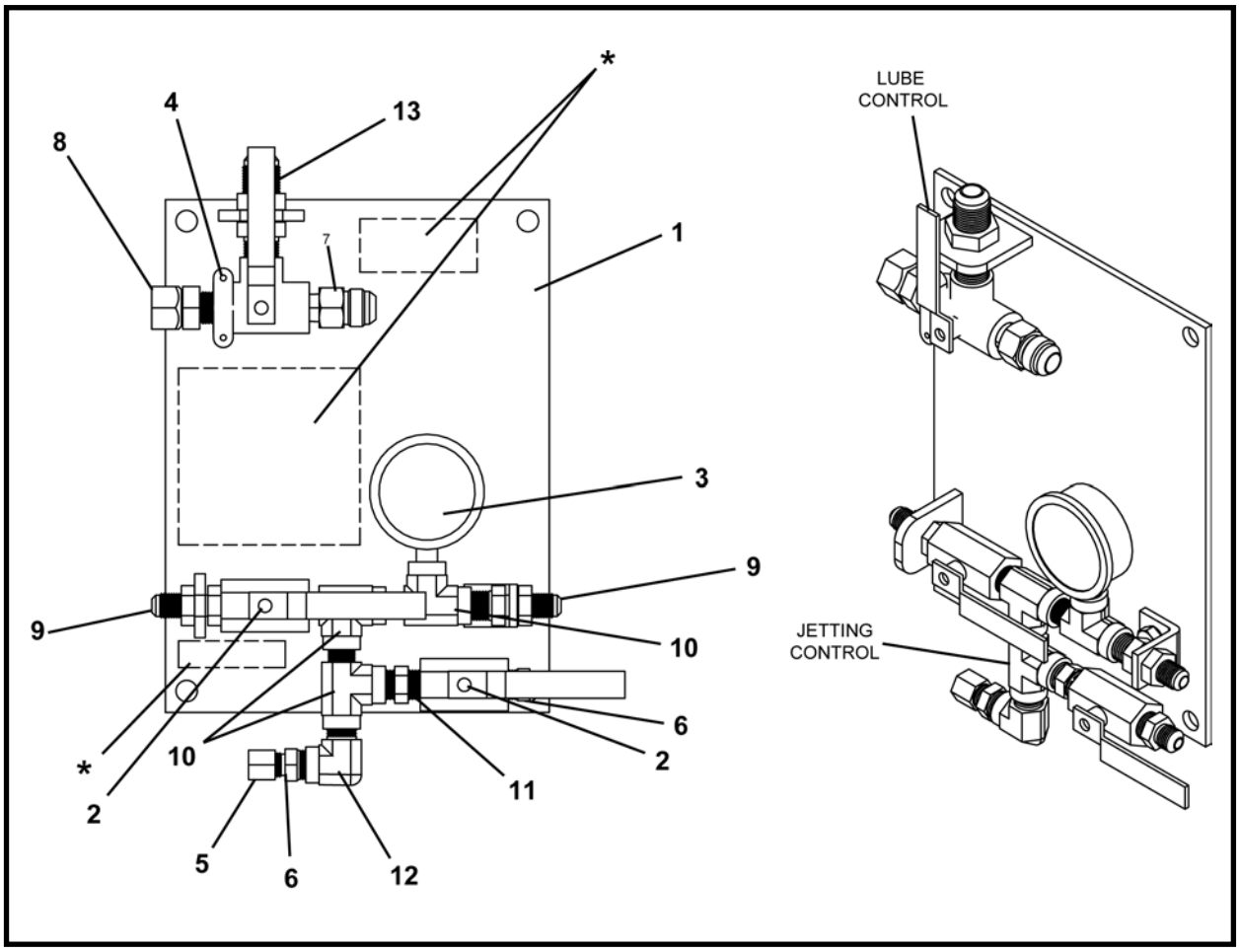
WATER ASSEMBLY, A45116A

ITEM	QTY	PART NO.	DESCRIPTION
68	3	P0300-053	FITTING, 08MJ-08MP
69	2	P0300-567	FITTING, 10MJ-8MPKBHD
70	1	P0300-054	FITTING, 12MP-16FP90
71	3	P0300-064	FITTING, 12MJ-12MP90
72	2	P0300-642	FITTING, 12FJ-CAP
73	1	P0300-047	FITTING, 12MP-16FP
74	2	P0416-003	PLUG, Square Head 1/2
75	2	A09909A-037	ASSEMBLY, Hose 1/2 x 37
76	1	A09931A-022	ASSEMBLY, Hose 3/4 x 22
77	1	A09917A-057	ASSEMBLY, Hose 1/2 x 57
78	1	A09917A-017	ASSEMBLY, Hose 1/2 x 17
79	1	A09918A-021	ASSEMBLY, Hose 1/2 x 21
80	2	P0100-023	SOCKET, 1
81	1	P0300-431	FITTING, 12MJ-12MJX90
82	1	P0300-197	FITTING, 10MJ-12MP90
83	1	A09928A-018	ASSEMBLY, Hose 1/2 x 18
84	1	A09908A-018	ASSEMBLY, Hose 1/2 x 18
85	2	A10071A-036	ASSEMBLY, Hose 3/8 x 36
86	1	A43749A	PCH JETTING & LUBE SHAFT CONTROL
87	1	P0302-688	VALVE, Check
88	1	P0300-016	FITTING, 08FP-08FP-08FP
89	1	A46161P	KEY
90	2	A46160P	KEY

NOTE: Items 83, 84, and 85 adapt the lube pump to the 50’ long lube and jetting hoses used with item 86.

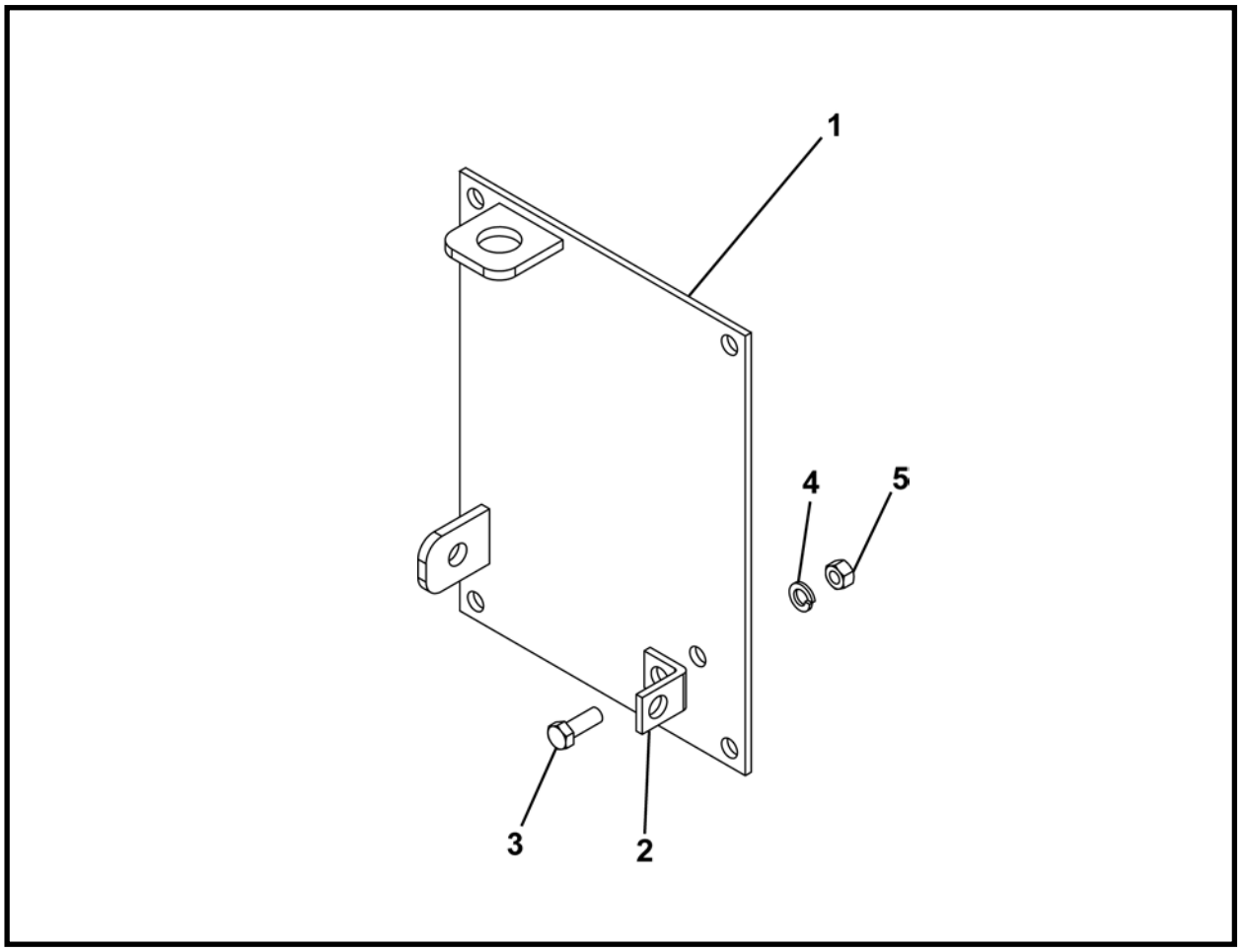
JETTING & LUBRICATION SHAFT CONTROL, A43749A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A43749A	JETTING & LUBRICATION SHAFT CONTROL
1	1	A43758A	ASSEMBLY, PCH SHAFT CONTROL MOUNT
2	2	P0302-507	VALVE, Ball 3/8” 2,000 PSI
3	1	P0301-100	GAUGE, Pressure 5000 PSI
4	1	P0302-512	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

* Decal 1250-917

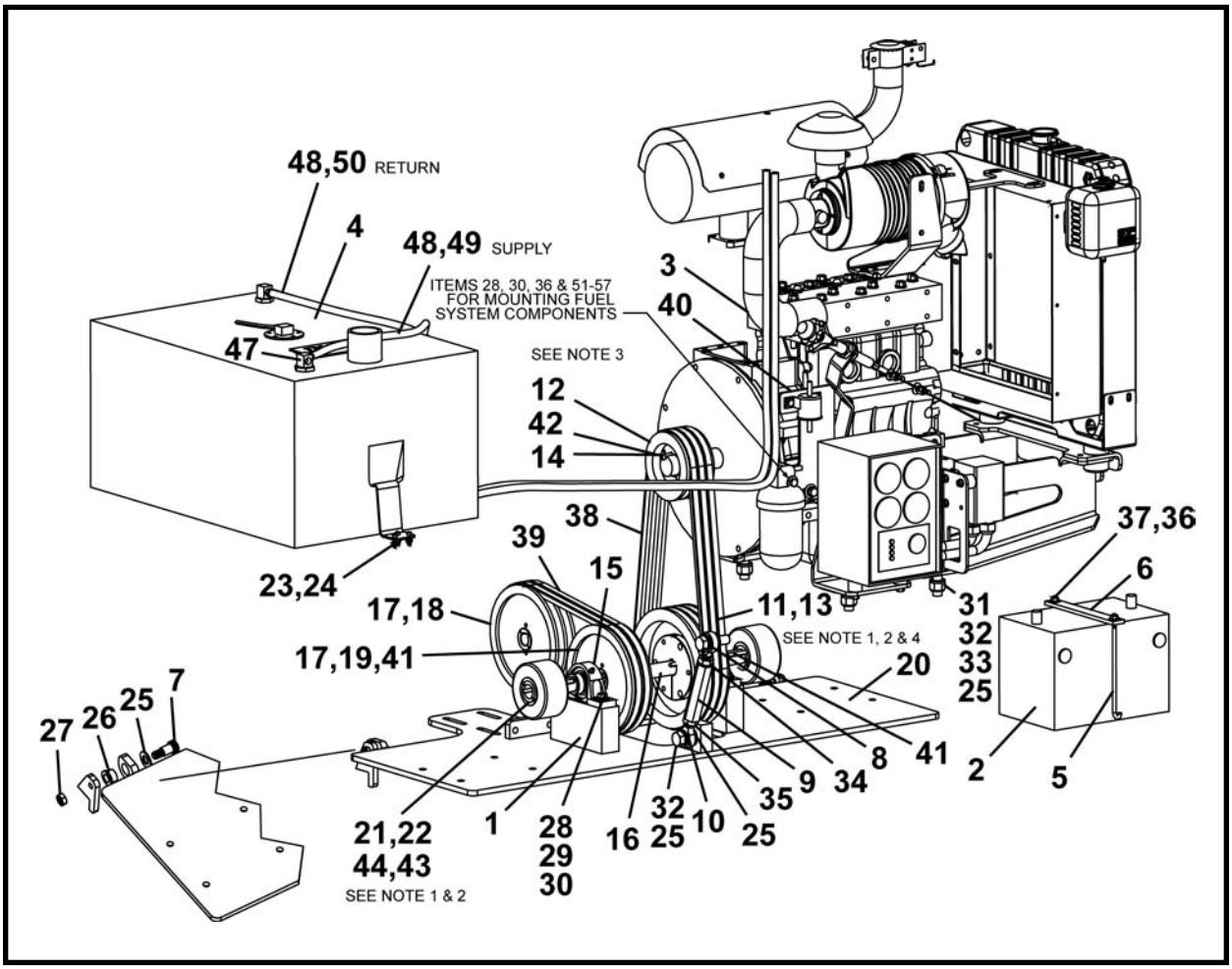
PCH SHAFT CONTROL MOUNT ASSEMBLY, A43758A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A43758A	ASSEMBLY, PCH SHAFT CONTROL MOUNT
1	1	A43757A	WELDMENT, PIT CONTROL MOUNT
2	1	A43754P	BRACKET, Pipe Lube Control
3	1	P0001-06-004	BOLT, 3/8 UNC x 1
4	1	P0045-006	WASHER, Lock 3/8
5	1	P0003-06-000	NUT, 3/8

DRIVE ASSEMBLY, A45117A

2325D



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A45117A	DRIVE ASSEMBLY
1	2	A45027P	MOUNT, Block Bearing
2	1	P0064-019	BATTERY
3	1	P0125-125	ENGINE, 30HP
4	1	P0125-134	TANK, Fuel 18 Gallon
5	2	A44455P	ROD, Battery Clamp
6	1	012945P00	BAR, Cross
7	3	P0030S-10-006	BOLT, Shoulder 5/8 x .75
8	1	P0099-014	ROD, RH
9	1	A45092P	COUPLING
10	1	P0099-015	ROD, LH
11	1	P0114-018	PULLEY, 3 Belt
12	1	P0114-017	PULLEY, 3 Belt
13	1	P0066-120	BUSHING
14	1	P0066-119	BUSHING
15	2	P0065-014	PILLOW BLOCK BEARING
16	1	A45060P	SHAFT
17	2	P0114-016	PULLEY, 2 Belt
18	1	P0066-118	BUSHING
19	1	P0066-117	BUSHING
20	1	A45047A	MOUNT, Pump
21	4	P0305-191	COUPLING SPROCKET

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DRIVE ASSEMBLY, A45117A

2325D

ITEM	QTY	PART NO.	DESCRIPTION
22	4	P0305-194	BUSHING, Tapered
23	6	P0031-1024-003	SCREW, Cap 10-24 x .75
24	6	P0003-02-000	NUT, 10-24
25	11	P0040-010	WASHER, Hardened Flat
26	3	P0066-116	FLANGE, Bearing Bronze 5/8
27	3	P0007-08-000	NUT, Jam 1/2
28	10	P0045-006	WASHER, Lock 3/8
29	8	P0001-06-006	BOLT, 3/8 UNC x 1.5
30	10	P0040-006	WASHER, Hardened Flat 3/8
31	4	P0045-010	WASHER, Lock 5/8
32	6	P0001-10-008	BOLT, 5/8 UNC x 2
33	4	P0013-10-000	NUT, Lock 5/8
34	1	P0008-10-000	NUT, Jam 5/8 UNF
35	1	P0008-10-000A	NUT, Jam 5/8 UNF
36	6	P0040-004	WASHER, Hardened Flat 1/4
37	2	P0003-04-000	NUT, 1/4
38	3	P0067-054	BELT, Drive
39	2	P0067-055	BELT, Drive
40	1	A45017P	PLATE, Puel Filter Mounting
41	4	A46158P	KEYSTOCK
42	1	A46159P	KEYSTOCK
43	2	P0305-195	CHAIN
44	2	P0305-196	ASSEMBLY, Chain Cover
45*	1	A45453A	CABLE, Positive
46*	1	A45454A	CABLE Negative
47	1	P0300-742	BARB, Hose 1/4
48	8	P0201-241	CLAMP, Closed End
49	72 LI	P0201-281	HOSE, Fuel 5/16 x 72
50	75 LI	P0201-240	HOSE, Fuel 1/4 x 75
51	2	P0001-04-003	BOLT, 1/4 UNC x .75
52	2	P0013-04-000	NUT, Nylock 1/4
53	2	P0040-005	WASHER, Hardened Flat 5/16
54	1	P0001-05-012	SCREW, Hex Head Cap 5/16 UNC x 3
55	1	P0003-05-000	NUT, 5/16
56	1	P0045-005	WASHER, Lock 5/16
57	2	P0001-06-003	BOLT, 3/8 UNC x .75

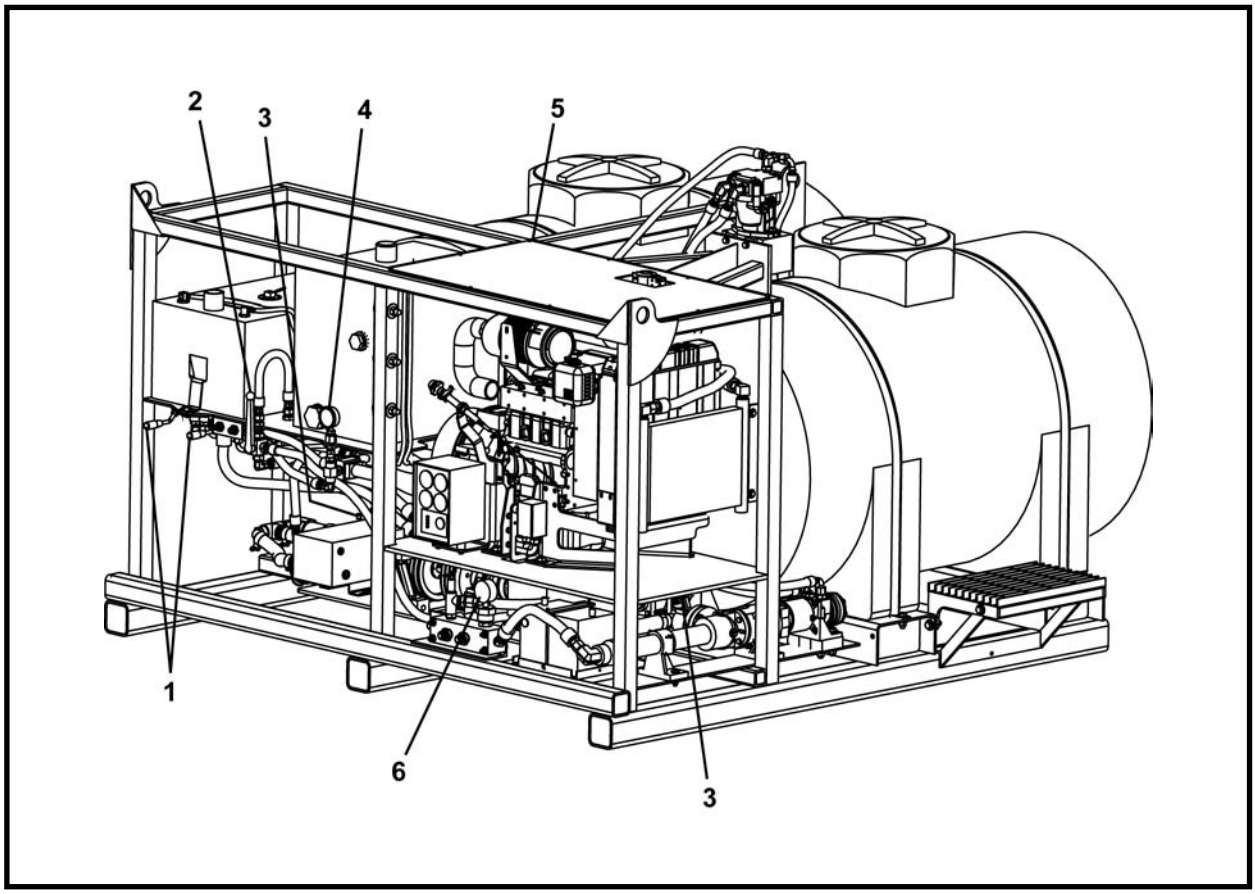
* Not Shown

LI - Linear Inch

NOTE:
1. Grease coupler chain after installation prior to running drive system. Coupler cover should be able to spin freely over top of coupler chain after greasing.
2. Grease shaft bearings prior to running system.
3. Grease engine PTO bearing prior to running system.
4. Set screw torque for tapered bushing is 55 in-lbs.

OPERATOR CONTROLS

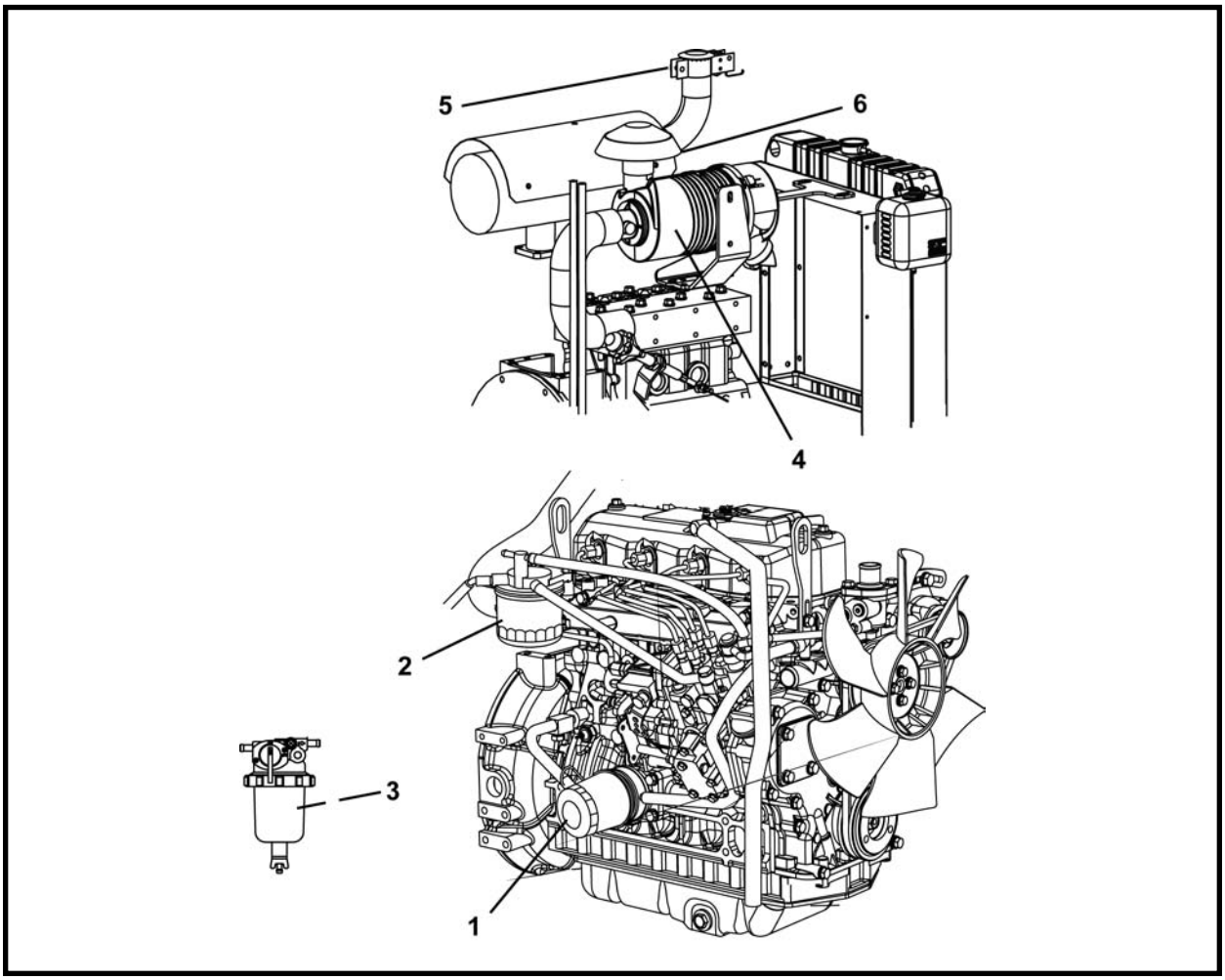
2325D



ITEM	QTY	PART NO.	DESCRIPTION
1	2	P0302-673	VALVE, Single Detent
2	1	P0302-325	VALVE, Ball
3	2	P0258-006	VALVE, Port 1-1/2
4	1	P0301-100	GAUGE, Pressure 5000 PSI
5	1	P0301-105	GAUGE, Filter Indicator
6	1	P0301-143	GAUGE & SEAL

ENGINE, P0125-125

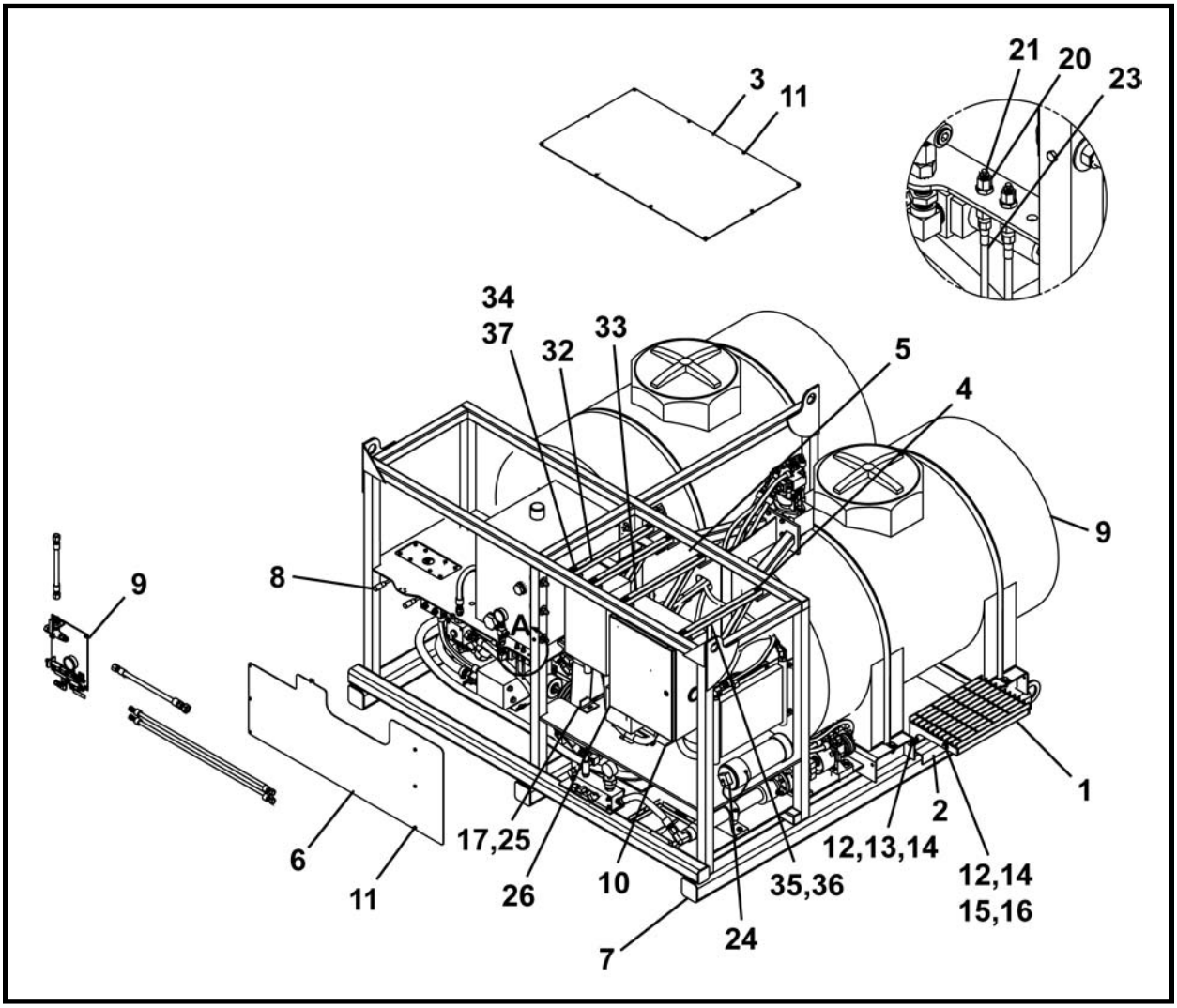
2325D



ITEM	QTY	PART NO.	DESCRIPTION
0	1	P0125-125	ENGINE
1	1	P0125-125A	FILTER, Oil
2	1	P0125-125B	FILTER, Fuel
3	1	P0125-125C	ELEMENT, Fuel Separator
4	1	P0125-125D	ELEMENT, Air Cleaner
5	1	P0125-125E	CAP, Exhaust Rain
6	1	P0125-125F	CLAMP, Exhaust

JETTING & LUBRICATION PUMP FINAL ASSEMBLY, FA45914F

2325E



ITEM	QTY	PART NO.	DESCRIPTION
0	1	FA45914F	JETTING & LUBRICATION PUMP FINAL ASSEMBLY
1	1	A45054A	STEP
2	1	A45057A	BRACE, Step
3	1	A45917P	COVER, Top
4	1	A45083P	COVER, Rear Right
5	1	A45084P	COVER, Rear Left
6	1	A45918P	COVER, Front
7	1	A45024A	FRAME
8	1	A45115A	ASSEMBLY, Hydraulic
9	1	A45116A	ASSEMBLY, Water
10	1	A45915A	ASSEMBLY, Electric Drive
11	31	P0001-04-002	BOLT, 1/4 UNC x .5
12	16	P0040-008	WASHER, Flat Hardened 1/2
13	2	P0001-08-007	BOLT, 1/2 UNC x 1.75
14	4	P0003-08-000	NUT, 1/2 UNC
15	2	P0001-08-012	BOLT, 1/2 UNC x 3
16	2	A45170P	BUSHING
17	1	A45175P	GUARD, Belt
18*	1	A45113A	KIT, Jetting & Lube Hose
19*	1	A45339A	KIT, Assembly Fitting

(Continued on next page)

JETTING & LUBRICATION PUMP FINAL ASSEMBLY, FA45914F

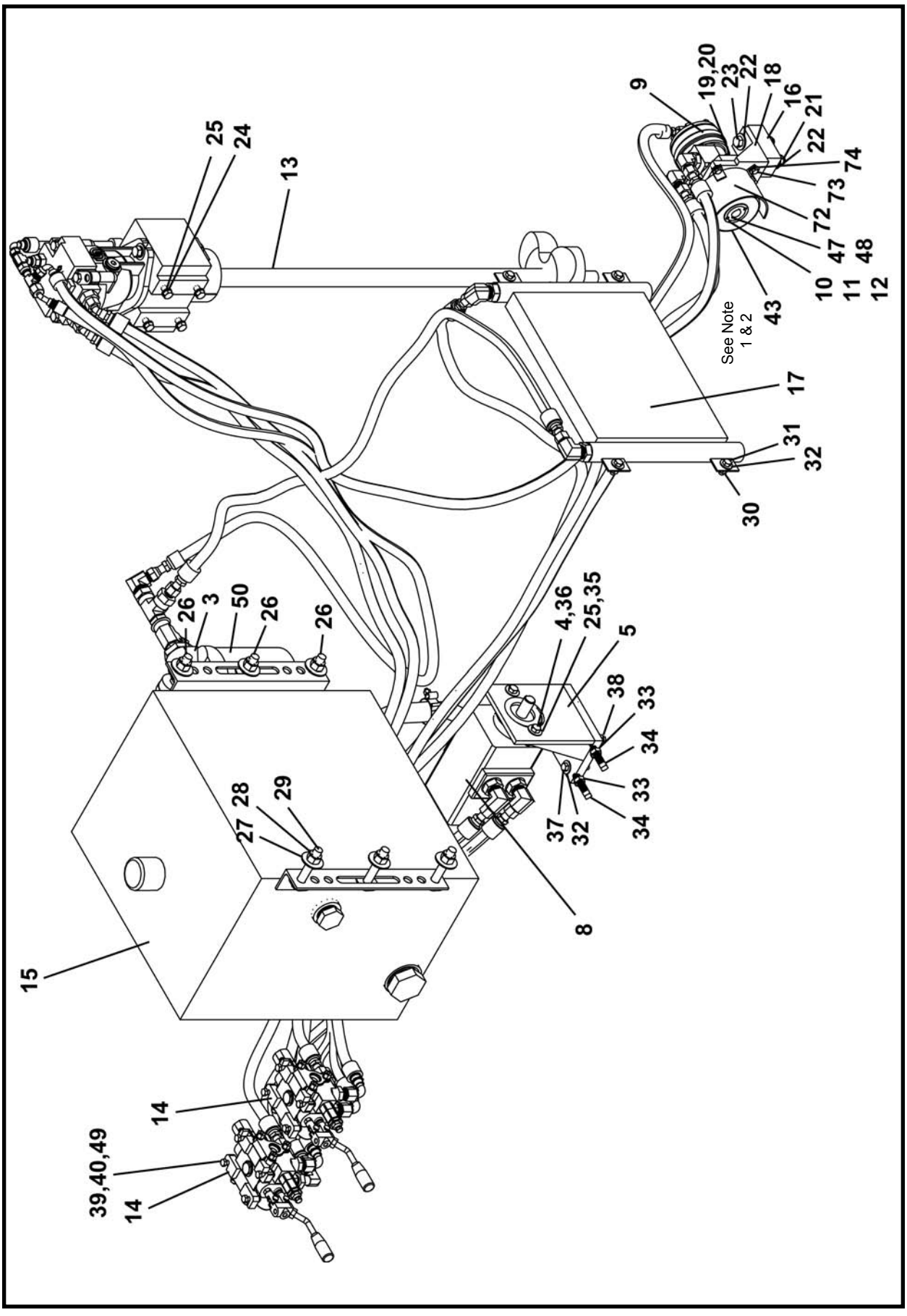
2325E

ITEM	QTY	PART NO.	DESCRIPTION
20	2	P0063-024	FITTING, Grease Line
21	2	P0063-004	FITTING, Grease - Straight
22**	2	P0300-759	ADAPTER, Grease Fitting
23	2	P0200-108	ASSEMBLY, Hose
24	1	A45904A	ASSEMBLY, Document Tube
25	1	A45919A	COVER, Belt
26	1	A45916A	ASSEMBLY, Electrical
27*	2	A45955P	BRACKET, Fan Mount
28*	4	P0003-04-000	NUT, 1/4 UNC
29*	8	P0040-004	WASHER, Hardened Flat 1/4
30*	4	P0001-04-005	BOLT, 1/4 UNC x 1.25
31*	1	P0125-136	FAN
32	1	A46019A	WELDMENT, Disconnect Bracket
33	2	A45962A	WELDMENT, Electrical Box Mount
34	16	P0040-006	WASHER, Hardened Flat 3/8
35	4	P0013-06A-000	NUT, Nylock 3/8
36	4	P0001-06-008	BOLT, 3/8 UNC x 2
37	8	P0001-06-007	BOLT, 3/8 UNC x 1.75

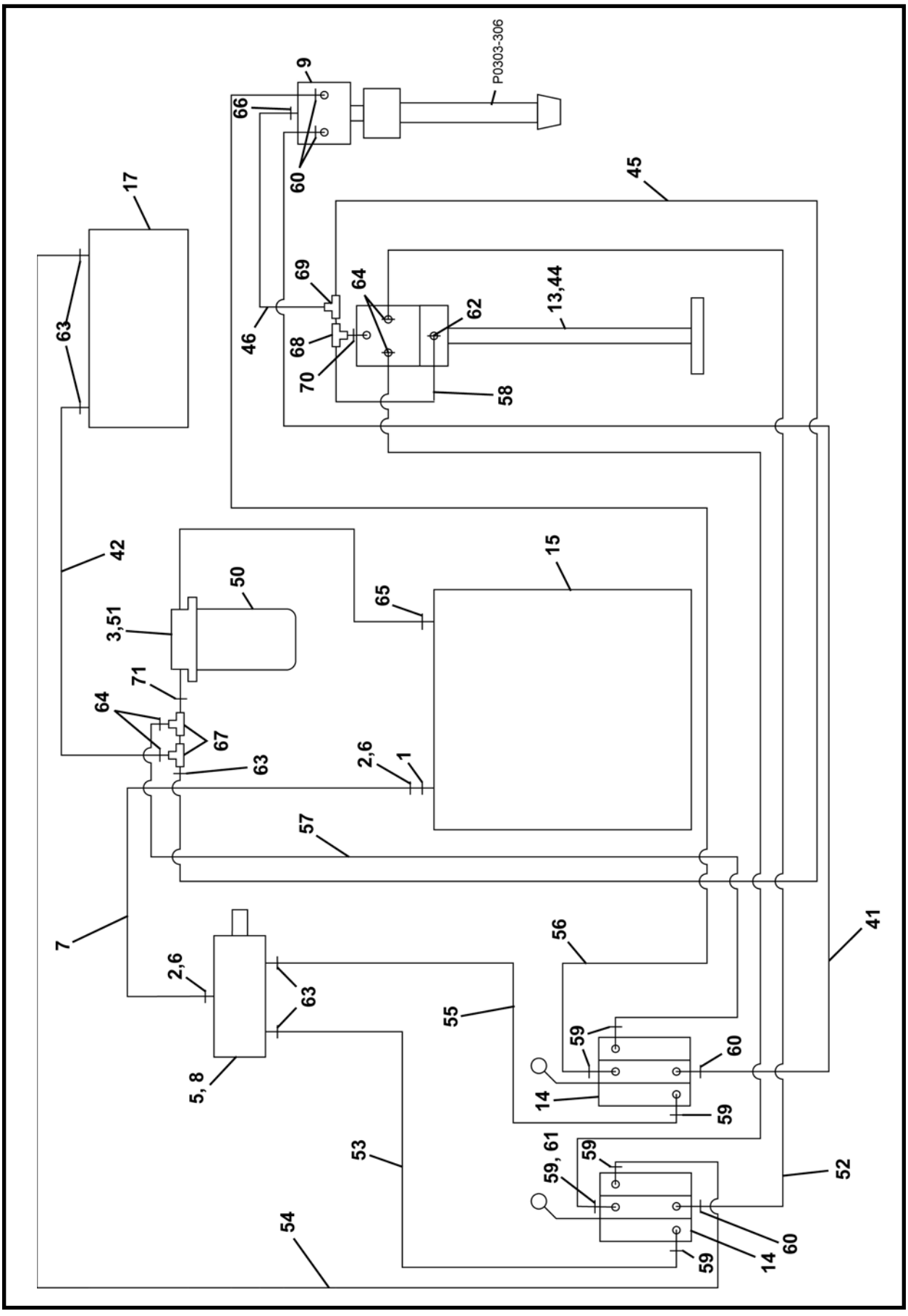
* Not Shown

** Item 22 threads into bearing grease fitting locations to adapt to item 23.

HYDRAULIC ASSEMBLY, A45115A



HYDRAULIC ASSEMBLY, A45115A



HYDRAULIC ASSEMBLY, A45115A

ITEM	QTY	PART NO.	DESCRIPTION
0	1	A45115A	HYDRAULIC ASSEMBLY
1	1	A45114P	FITTING
2	2	P0220-223	FITTING, 20 INSERT-90-20MB
3	1	P0309-144B	HEAD, Filter With 25 PSI Bypass
4	2	P0001-07-006	BOLT, 7/16 UNC x 1.5
5	1	A45093A	BRACKET, Mounting
6	2	P0201-205	T CLAMP
7	14	P0201-227	T CLAMP
8	1	P0303-345	PUMP, Hydraulic
9.1	1	P0304-175	MOTOR (SN FA45103F-1 thru 7, 9 & After) (FA45914F-1 & After)
9.2	1	P0304-331	MOTOR (SN FA45103F-8 Only)
10	1	P0305-191	SPROCKET, Coupling
11	1	P0305-193	SPROCKET, Coupling
12	1	P0305-195	CHAIN
13***	1	A44421A	ASSEMBLY, Agitator
14	2	P0302-673	VALVE, Single Detent
15	1	P0125-133	RESERVOIR, Hydraulic 25 gal
16	2	A44442P	BRACKET, Riser
17	1	P0125-129	OIL COOLER
18	1	P0304-142	BRACKET
19	2	P0001-06-006	BOLT, 3/8 UNC x 1.5
20	10	P0045-006	WASHER, Lock 3/8
21	4	P0013-08-000	NUT, Lock 1/2
22	8	P0040-008	WASHER, Hardened Flat 1/2
23	4	P0001-08-012	BOLT, 1/2 UNC x 3
24	4	P0001-07-005	BOLT, 7/16 UNC x 1.25
25	4	P0045-007	WASHER, Lock 7/16
26	3	P0001-10-007	BOLT, 5/8 UNC x 1.75
27	12	P0040-010	WASHER, Hardened Flat 5/8
28	6	P0013-10-000	NUT, Lock 5/8
29	3	P0001-10-014	BOLT, 5/8 UNC x 3.5
30	4	P0003-06-000	NUT, 3/8
31	4	P0001-06-004	BOLT, 3/8 UNC x 1
32	12	P0040-006	WASHER, Hardened Flat 3/8
33	2	P0007-08-000	NUT, Jam 1/2
34	2	P0034-08-008	SCREW, Square Head Set 1/2 UNC x 2
35	2	P0040-007	WASHER, Hardened Flat 7/16
36	2	P0003-07-000	NUT, 7/16
37	4	P0001-06-008	BOLT, 3/8 UNC x 2
38	4	P0013-06A-000	NUT, Course Nylock 3/8
39	8	P0040-005	WASHER, Hardened Flat 5/16
40	8	P0003-05-000	NUT, 5/16
41*	1	A10491A-093	ASSEMBLY, Hose 1/2 x 93
42*	1	A10491A-063	ASSEMBLY, Hose 1/2 x 63
43	1	P0305-196	ASSEMBLY, Chain Cover
44	2	A45185A	GUARD, AGITATOR
45*	1	A10380A-054	ASSEMBLY, Hose 3/8 x 54
46*	1	A10314A-088	ASSEMBLY, Hose 1/4 x 88
47	1	P0305-192	BUSHING, Tapered 3/4”
48	1	P0305-194	BUSHING, Tapered 1
49	8	P0001-05-005	BOLT, 5/16 UNC x 1.25
50	1	P0309-145	ELEMENT, Filter
51	1	P0301-105	GAUGE, Filter Indicator

(Continued on next page)

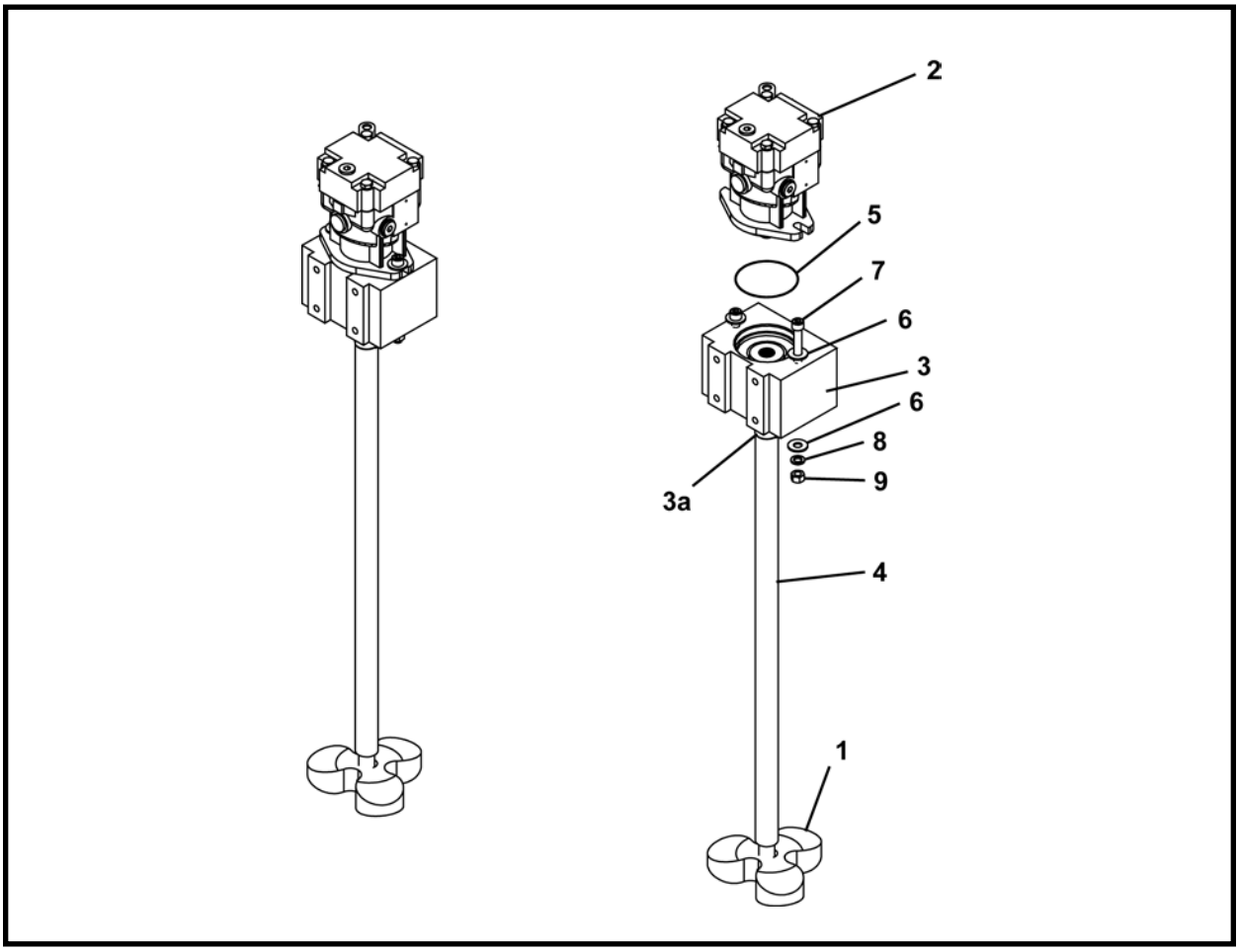
HYDRAULIC ASSEMBLY, A45115A

ITEM	QTY	PART NO.	DESCRIPTION
52*	2	A09911A-100	ASSEMBLY, Hose 1/2 x 100
53*	1	A09912A-042	ASSEMBLY, Hose 1/2 x 42
54*	1	A09912A-103	ASSEMBLY, Hose 1/2 x 103
55*	1	A09912A-036	ASSEMBLY, Hose 1/2 x 36
56*	1	A09912A-093	ASSEMBLY, Hose 1/2 x 93
57*	1	A09912A-050	ASSEMBLY, Hose 1/2 x 50
58*	1	A10314A-012	ASSEMBLY, Hose 1/4 x 12
59**	6	P0300-300	FITTING, 08MFOR-10MB
60**	4	P0300-302	FITTING, 08MFOR-10MB90
61**	1	P0300-317	FITTING, 08MFOR-08FFORX90
62**	1	P0300-326	FITTING, 04MFOR-04MP90
63**	5	P0300-373	FITTING, 08MFOR-12MB90
64**	4	P0300-375	FITTING, 08MFOR-12MB
65**	1	P0300-414	FITTING, 20MB-20MP
66**	1	P0300-427	FITTING, 04MFOR-04MB90
67**	2	P0300-536	FITTING, 12MB-12FB-12FB
68**	1	P0300-602	FITTING, 06MFOR-06MFOR-06FFORX
69**	1	P0300-613	FITTING, 06MFOR-06FFORX-06MFOR
70**	1	P0300-634	FITTING, 06MFOR-10MB
71**	1	P0300-658	FITTING, 20MB-12FB
72	1	A45685A	GUARD, Coupling
73	2	P0001-04-002	BOLT, 1/4 UNC x .5
74	2	P0040-004	WASHER, Hardened Flat 1/4

* Included in A45113A Kit, Hose
** Included in A45339A Kit, Fitting
*** Refer to this section for parts breakdown.

NOTE:
1. Grease chain coupling after installation prior to operating.
2. Tapered bushing set screw torque, 55 in-lbs.

AGITATOR ASSEMBLY, A44421A

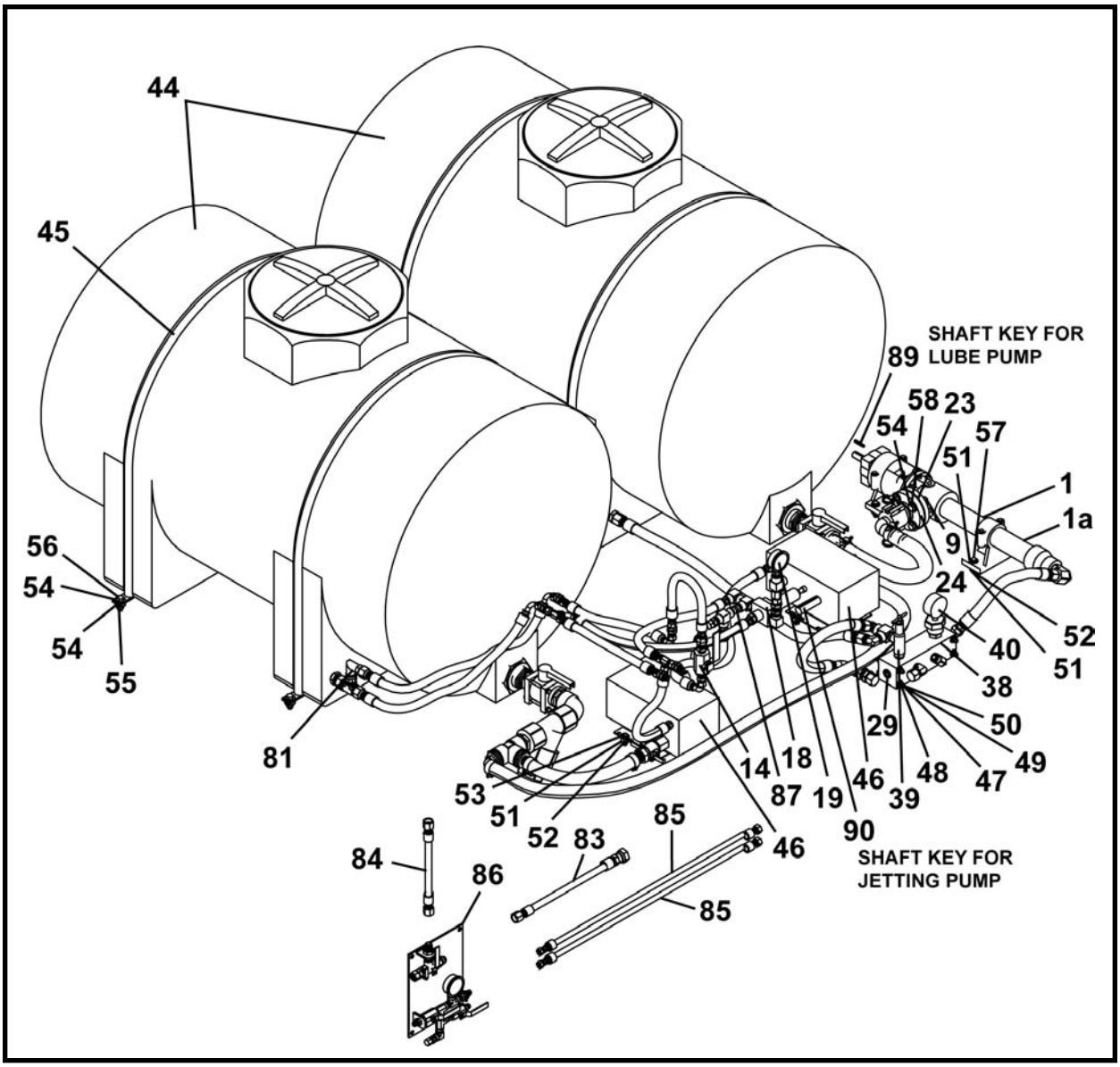


ITEM	QTY	PART NO.	DESCRIPTION
0	1	A44421A	AGITATOR ASSEMBLY
1	1	A46252P	PROPELLER, 10”
2*	1	P0304-176	MOTOR
3*	1	P0302-520	ADAPTER, Bearing Load (Includes item 3a)
3a	1	P0302-520A	SEAL, Shaft
4	1	A44418P	SHAFT, Agitator
5	1	P0088-187	ORING
6	4	P0040-008	WASHER, Hardened Flat 1/2
7	2	P0031-08-024	SCREW, Socket Head Cap 1/2 UNC x 6
8	2	P0045-008	WASHER, Lock 1/2
9	2	P0003-08-000	NUT, 1/2

* If replacing motor, item 2, remove output shaft seal from new motor prior to installation.
** If replacing bearing, item 3, remove input seal from new bearing prior to installation.

NOTES

WATER ASSEMBLY, A45116A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A45116A	WATER ASSEMBLY
1	1	P0303-306	PUMP, Lubrication (Includes item 1a)
1a	1	P0303-306A	STATOR
2	4	P0258-005	NIPPLE, 1
3	2	P0258-006	VALVE, Port 1-1/2
4	1	P0258-012	STRAINER
5	1	P0258-015	1 MPT X 1 HOSE SHANK 90 DEG
6	2	P0258-013	BUSHING, Reducer
7	2	P0258-004	FLANGE, Poly Tank
8	1	P0258-018	ELBOW
9	4	P0003-08-000	NUT, 1/2
10	1	P0258-043	TEE
11	3	P0423-124	ADAPTER, Hose
12	2	P0416-004	PLUG, Square Head 3/4”
13	2	P0300-012	FITTING, 12MP-08FPS
14	1	P0302-325	VALVE, Ball

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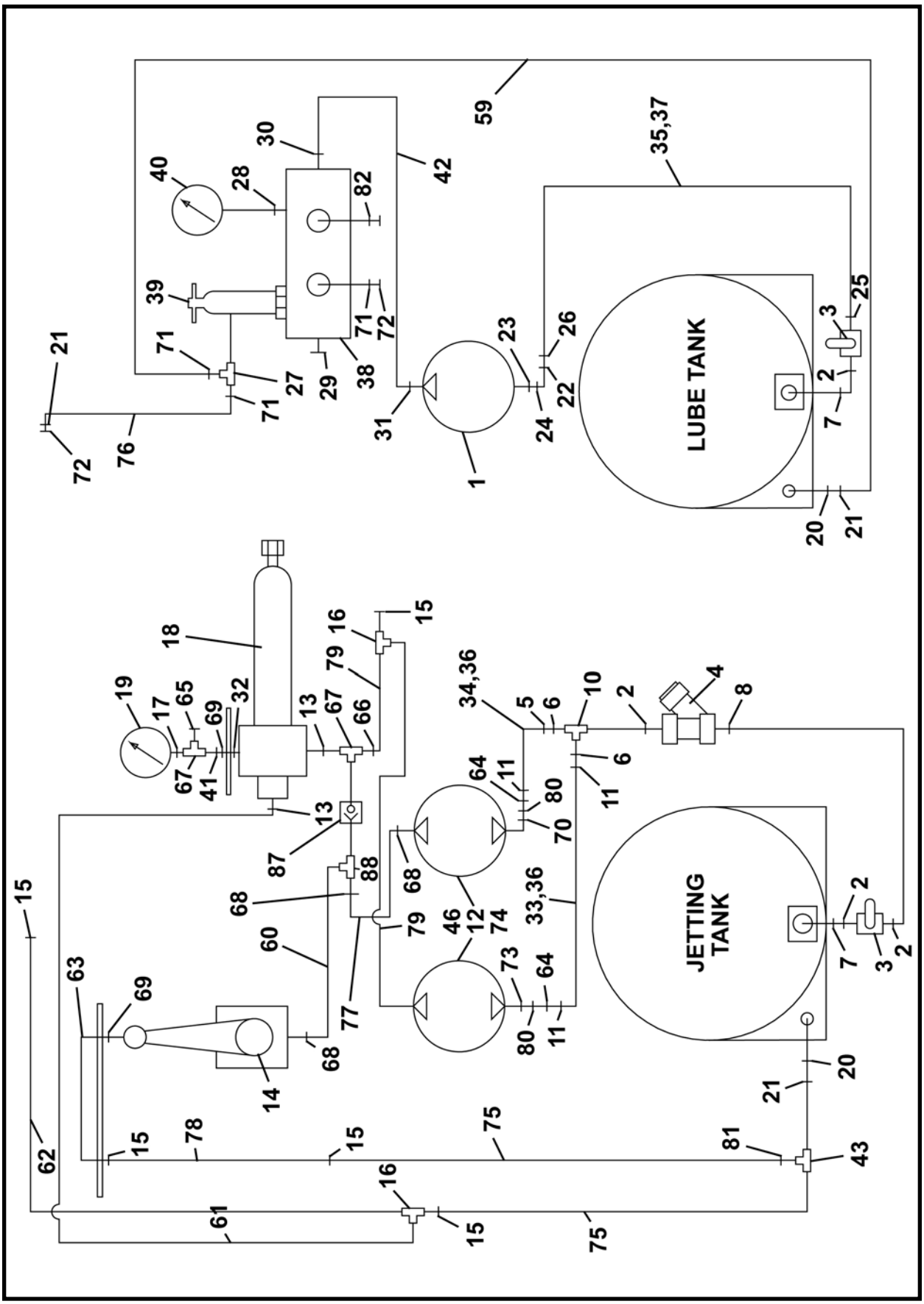
WATER ASSEMBLY, A45116A



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WATER ASSEMBLY, A45116A

ITEM	QTY	PART NO.	DESCRIPTION
15	5	P0300-325	FITTING, 08MJ-08MJBKHD
16	2	P0300-412	FITTING, 08MJ-08FJX-08MJ
17	1	P0300-086	FITTING, 08MP-04FPS
18	1	P0302-525	VALVE, Water
19	1	P0301-100	GAUGE, Pressure 5000 PSI
20	2	P0085-214	O-RING
21	3	P0300-330	FITTING, 12MJ-12MJBKHD
22	1	P0258-009	ADAPTER
23	1	P0258-011	GASKET, Flange
24	1	P0258-010	FLANGE
25	1	P0258-044	BARB, Hose
26	1	P0258-008	COUPLING, Female 90 Degree
27	1	P0300-019	FITTING, 12MP-12FP-12FP
28	1	P0300-013	FITTING, 16MP-16MP
29	1	P0300-045	FITTING, 12MP-HHP
30	1	P0300-191	FITTING, 12MP-12FPX45
31	1	P0300-599	FITTING, 12MJ-20MP90
32	1	P0300-023	FITTING, 12MP-08FP90
33	15 LI	P0201-238	HOSE, Water Suction 1
34	75 LI	P0201-238	HOSE, Water Suction 1
35	24 LI	P0201-239	HOSE, Water Suction 1-1/2
36	4	P0201-205	T CLAMP
37	2	P0201-127	T CLAMP
38	1	A44466P	MANIFOLD
39	1	P0302-349	VALVE, Pressure Relief
40	1	P0301-143	GAUGE & SEAL
41	1	P0300-756	FITTING, 08FP-10FJX
42	1	A09930A-018	ASSEMBLY, Hose 3/4 x 18
43	1	P0300-538	FITTING, 12MJ-12FJ-12MJ
44	2	P0258-003	TANK, 325 Gallon
45	4	P0059-067	BAND
46	2	P0303-344	PUMP, Jetting
47	8	P0040-005	WASHER, Hardened Flat 5/16
48	4	P0045-005	WASHER, Lock 5/16
49	4	P0001-05-016	BOLT, 5/16 UNC x 4
50	4	P0003-05-000	NUT, 5/16
51	24	P0040-006	WASHER, Hardened Flat 3/8
52	12	P0013-06A-000	NUT, Course Nylock 3/8
53	8	P0001-06-005	BOLT, 3/8 UNC x 1.25
54	20	P0040-008	WASHER, Hardened Flat 1/2
55	8	P0013-08-000	NUT, Lock 1/2
56	8	P0001-08-006	BOLT, 1/2 UNC x 1.5
57	4	P0001-06-007	BOLT, 3/8 UNC x 1.75
58	4	P0001-08-009	BOLT, 1/2 UNC x 2.25
59	1	A09932A-040	ASSEMBLY, Hose 3/4 x 40
60	1	A09915A-020	ASSEMBLY, Hose 1/2 x 20
61	1	A09915A-030	ASSEMBLY, Hose 1/2 x 30
62	1	A09916A-018	ASSEMBLY, Hose 1/2 x 18
63	1	A09919A-015	ASSEMBLY, Hose 1/2 x 15
64	2	P0100-024	PLUG, 1
65	1	P0300-079	FITTING, 08MP-HHP
66	1	P0300-032	FITTING, 08MP-08FP90 BRAZED
67	2	P0300-049	FITTING, 08MP-08FP-08FP

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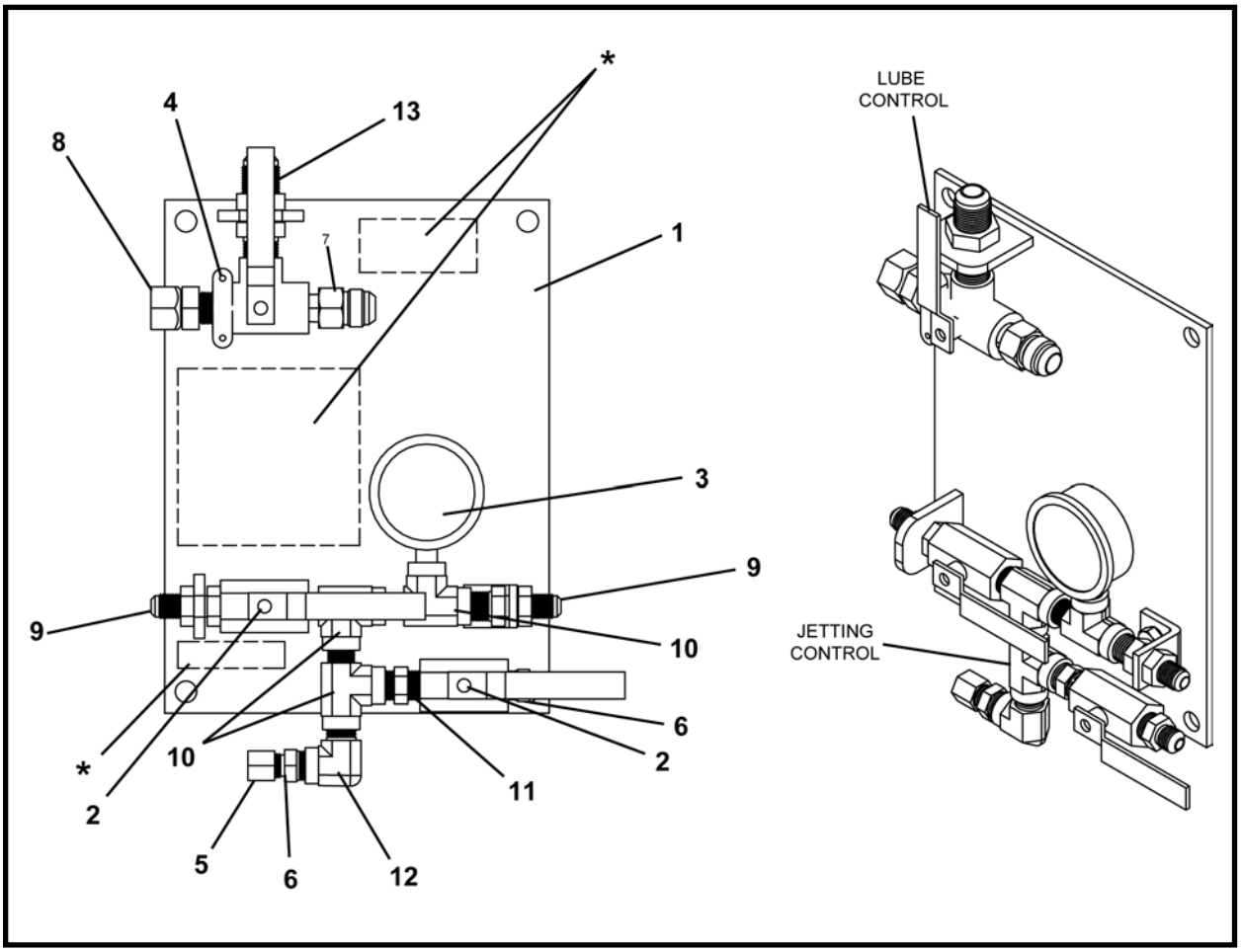
WATER ASSEMBLY, A45116A

ITEM	QTY	PART NO.	DESCRIPTION
68	3	P0300-053	FITTING, 08MJ-08MP
69	2	P0300-567	FITTING, 10MJ-8MPKBHD
70	1	P0300-054	FITTING, 12MP-16FP90
71	3	P0300-064	FITTING, 12MJ-12MP90
72	2	P0300-642	FITTING, 12FJ-CAP
73	1	P0300-047	FITTING, 12MP-16FP
74	2	P0416-003	PLUG, Square Head 1/2
75	2	A09909A-037	ASSEMBLY, Hose 1/2 x 37
76	1	A09931A-022	ASSEMBLY, Hose 3/4 x 22
77	1	A09917A-057	ASSEMBLY, Hose 1/2 x 57
78	1	A09917A-017	ASSEMBLY, Hose 1/2 x 17
79	1	A09918A-021	ASSEMBLY, Hose 1/2 x 21
80	2	P0100-023	SOCKET, 1
81	1	P0300-431	FITTING, 12MJ-12MJX90
82	1	P0300-197	FITTING, 10MJ-12MP90
83	1	A09928A-018	ASSEMBLY, Hose 1/2 x 18
84	1	A09908A-018	ASSEMBLY, Hose 1/2 x 18
85	2	A10071A-036	ASSEMBLY, Hose 3/8 x 36
86	1	A43749A	PCH JETTING & LUBE SHAFT CONTROL
87	1	P0302-688	VALVE, Check
88	1	P0300-016	FITTING, 08FP-08FP-08FP
89	1	A46161P	KEY
90	2	A46160P	KEY

NOTE: Items 83, 84, and 85 adapt the lube pump to the 50’ long lube and jetting hoses used with item 86.

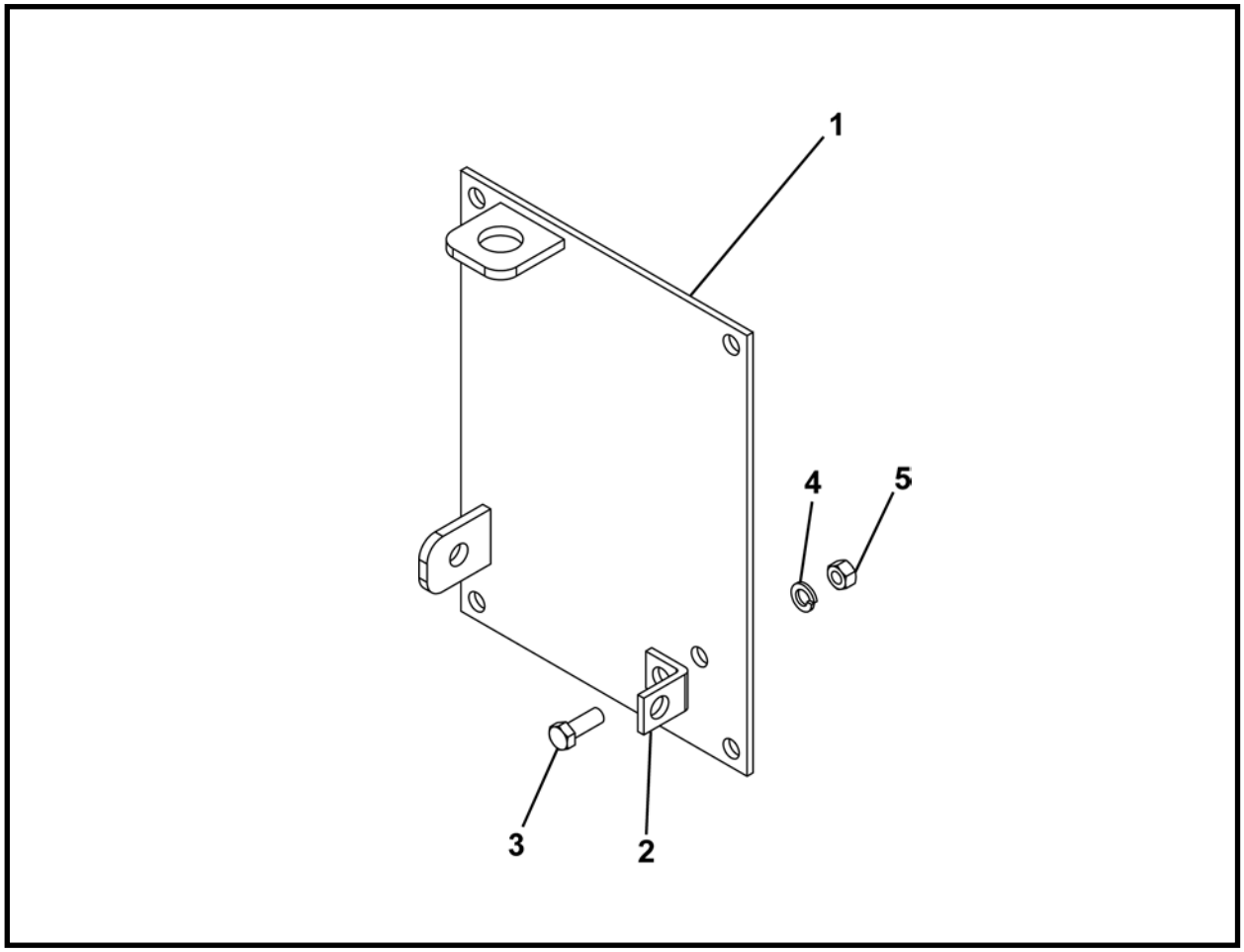
JETTING & LUBRICATION SHAFT CONTROL, A43749A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A43749A	JETTING & LUBRICATION SHAFT CONTROL
1	1	A43758A	ASSEMBLY, PCH SHAFT CONTROL MOUNT
2	2	P0302-507	VALVE, Ball 3/8” 2,000 PSI
3	1	P0301-100	GAUGE, Pressure 5000 PSI
4	1	P0302-512	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

* Decal 1250-917

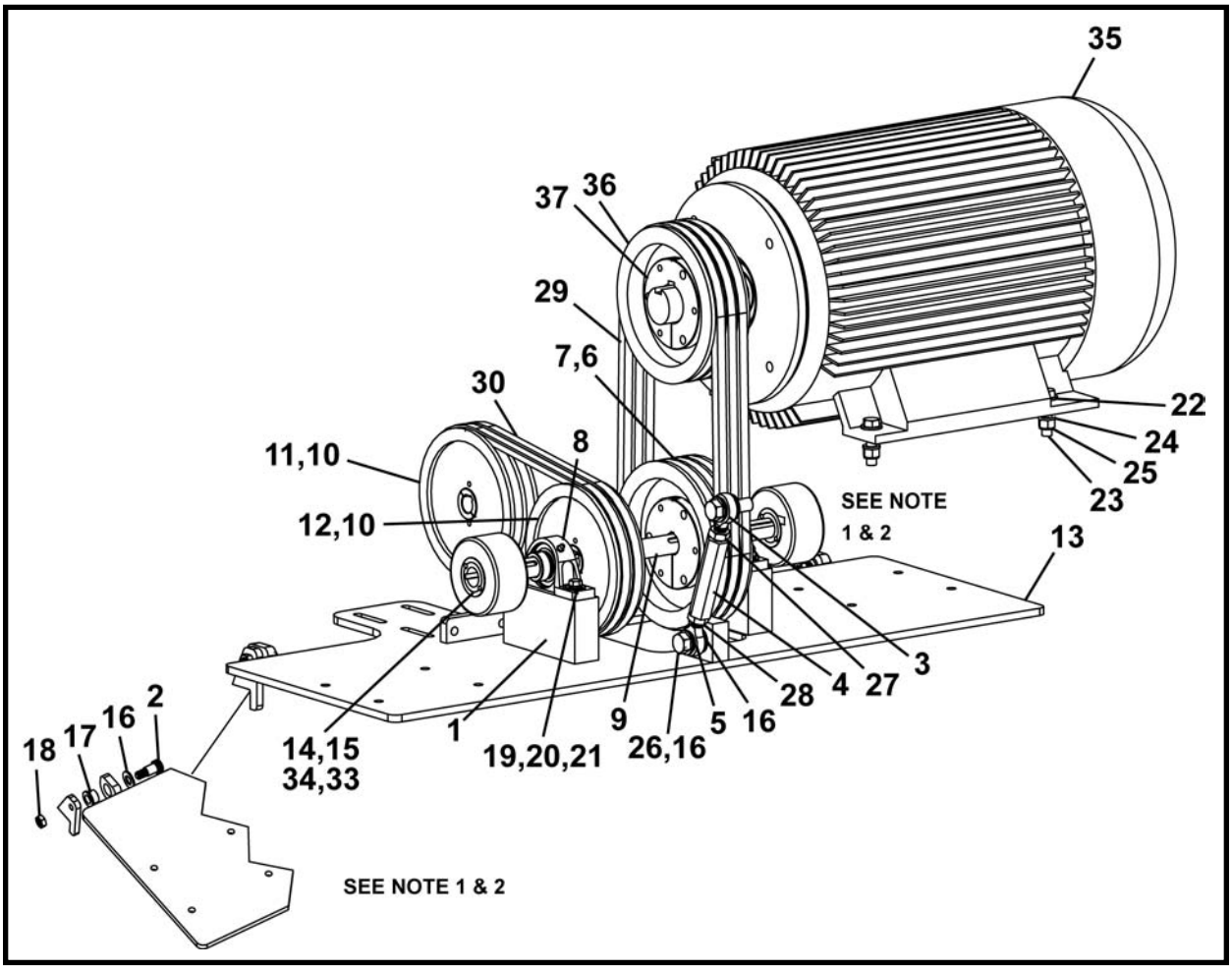
PCH SHAFT CONTROL MOUNT ASSEMBLY, A43758A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A43758A	ASSEMBLY, PCH SHAFT CONTROL MOUNT
1	1	A43757A	WELDMENT, PIT CONTROL MOUNT
2	1	A43754P	BRACKET, Pipe Lube Control
3	1	P0001-06-004	BOLT, 3/8 UNC x 1
4	1	P0045-006	WASHER, Lock 3/8
5	1	P0003-06-000	NUT, 3/8

ELECTRIC DRIVE ASSEMBLY, A45915A

2325E



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A45915A	ELECTRIC DRIVE ASSEMBLY
1	2	A45027P	BLOCK, Bearing Mount
2	3	P0030S-10-006	BOLT, Shoulder 5/8 x 3/4 L
3	1	P0099-0147	ROD END - RH
4	1	A45092P	COUPLING
5	1	P0099-015	ROD END - LH
6	1	P0114-018	SHEAVE, Belt
7	1	P0066-120	BUSHING
8	2	P0065-014	BEARING, Pillow Block
9	1	A45060P	SHAFT
10	2	P0114-016	SHEAVE, Belt
11	1	P0066-118	BUSHING
12	1	P0066-117	BUSHING
13	1	A45047A	WELDMENT, Pump Mount
14	4	P0305-191	SPROCKET, Coupling
15	4	P0305-194	BUSHING, Tapered
16	11	P0040-010	WASHER, Hardened Flat 5/8
17	3	P0066-116	BEARING, Bronze Flange 5/8
18	3	P0007-08-000	NUT, Jam 1/2
19	8	P0045-006	WASHER, Lock 3/8

(Continued on next page)

ELECTRIC DRIVE ASSEMBLY, A45915A

2325E

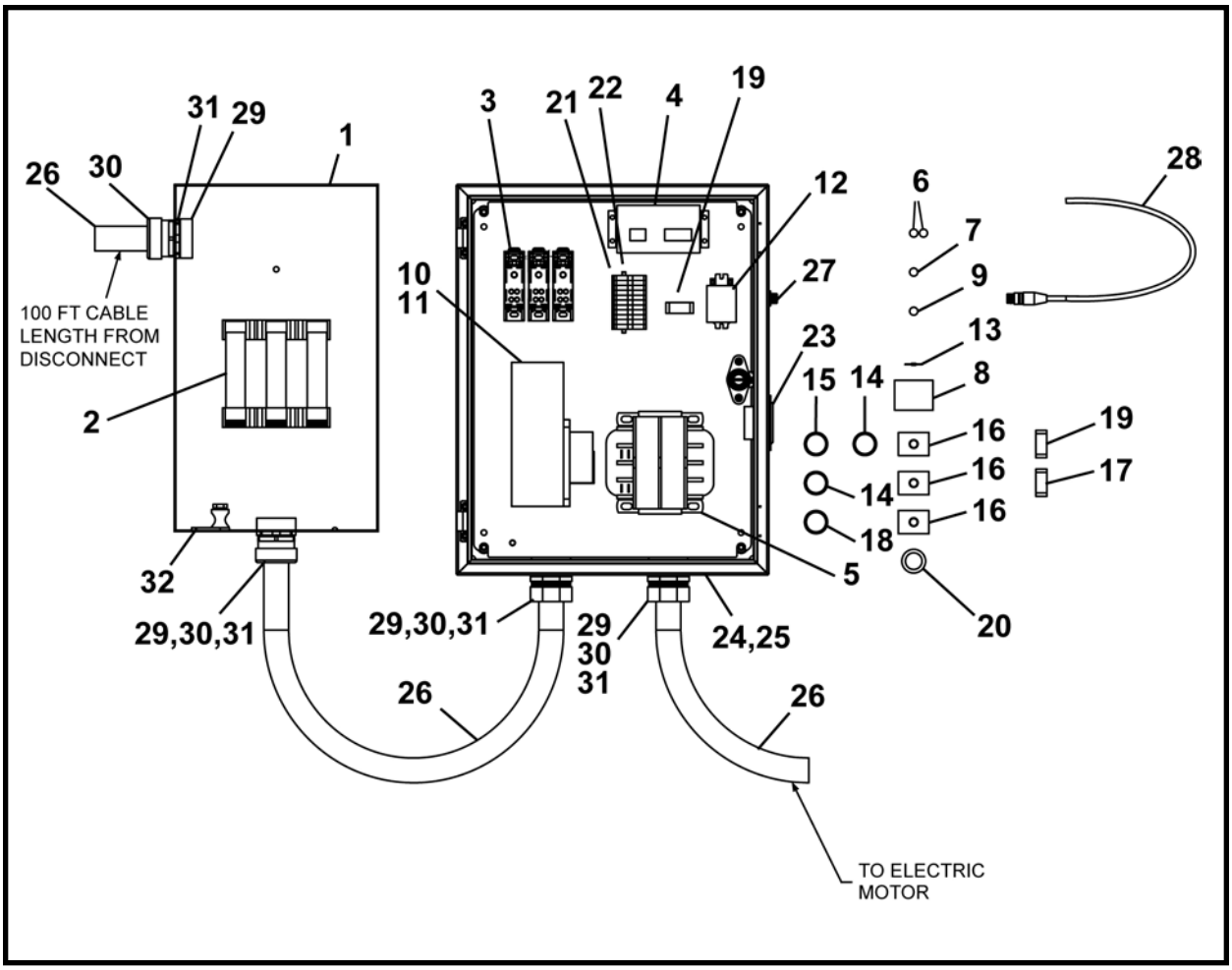
ITEM	QTY	PART NO.	DESCRIPTION
20	8	P0001-06-006	BOLT, 3/8 UNC x 1.5
21	8	P0040-006	WASHER, Hardened Flat 3/8
22	4	P0040-008	WASHER, Hardened Flat 1/2
23	4	P0001-08-008	BOLT, 1/2 UNC x 2
24	4	P0045-008	WASHER, Lock 1/2
25	4	P0013-08-000	NUT, Lock 1/2
26	2	P0001-10-008	BOLT, 5/8 UNC x 2
27	1	P0008-10-000	NUT, Jam 5/8
28	1	P0008-10-000A	NUT, Jam 5/8
29	3	P0067-054	BELT, Drive
30	2	P0067-055	BELT, Drive
31*	3	P0047-005-001.5	KEYSTOCK
32*	1	P0047-005-002.0	KEYSTOCK
33	2	P0305-195	CHAIN
34	2	P0305-196	ASSEMBLY, Chain Cover
35	1	P0304-326	MOTOR, Electric 30HP
36	1	P0072-024	SHEAVE
37	1	P0072-025	BUSHING

* Not Shown

NOTE:
1. Grease coupler chain after installation prior to running drive system. Coupler cover should be able to spin freely over top of coupler chain after greasing.
2. Grease shaft bearings prior to running system.

ELECTRICAL ASSEMBLY, A45916A

2325E



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A45916A	ELECTRICAL ASSEMBLY
1	1	P0310-288	SWITCH, Disconnecct
2	3	P0310-289	FUSE
3	3	P0251-399	BLOCK, Distribution
4	1	P0251-365	POWER SUPPLY
5	1	P0251-398	TRANSFORMER, Control
6	2	P0251-400	FUSE
7	1	P0251-380	FUSE, 3A
8	1	P0251-388	HOLDER, Fuse
9	1	P0310-667	FUSE, 2A
10	1	P0251-366	FAN, Cooling (for Soft Start)
11	1	P0304-327	SOFT START
12	1	P0310-410	RELAY, 30 Amp
13	1	P0310-629	DIODE
14	2	P0310-417A	PUSH BUTTON
15	1	P0310-412F	PUSH BUTTON
16	3	P0310-414F	MODULE, Push Button
17	1	P0310-416AF	BLOCK, Contact
18	1	P0310-411AF	PUSH BUTTON, Green
19	2	P0310-415AF	BLOCK, Contact
20	1	P0056-129F	LIGHT, Red Pilot
21	11	P0310-500	BLOCK, Terminal

(Continued on next page)

ELECTRICAL ASSEMBLY, A45916A

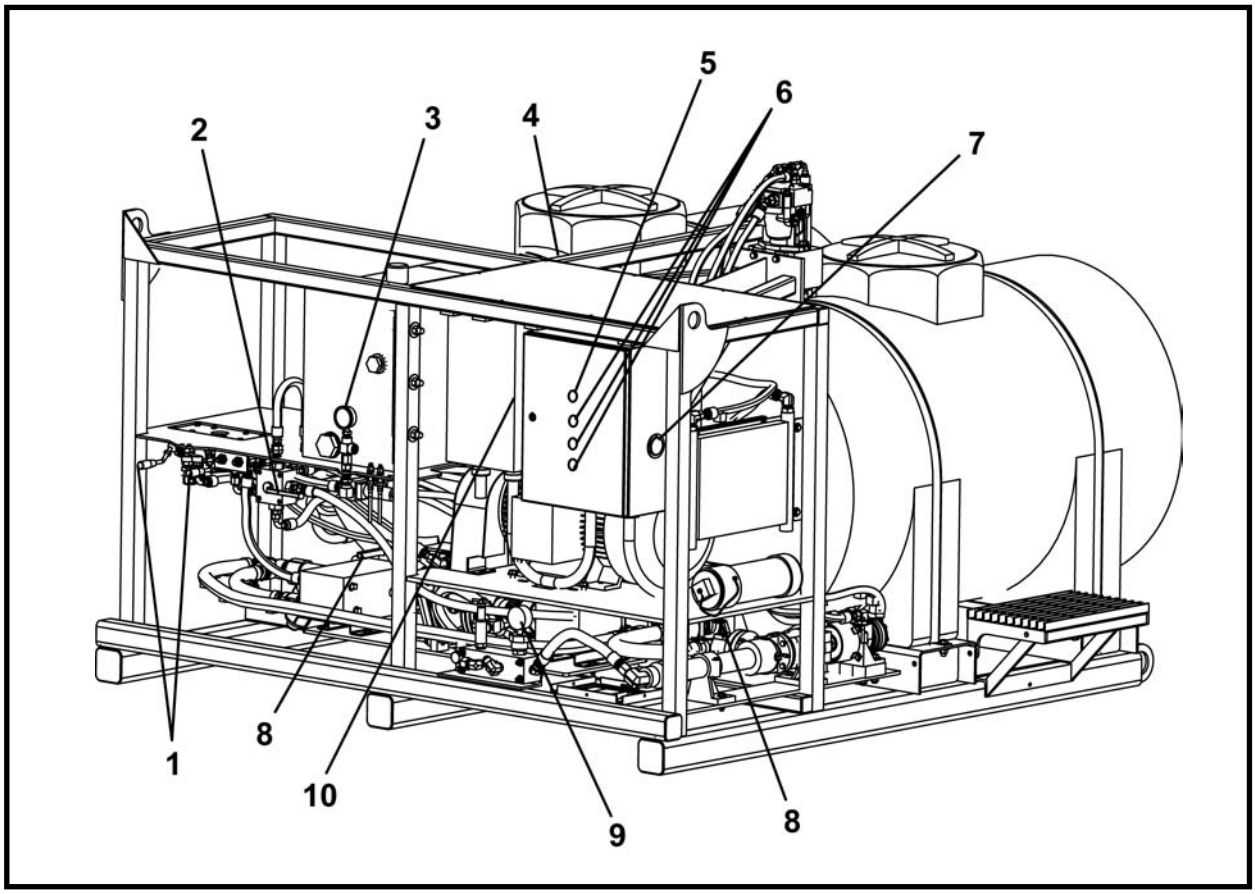
2325E

ITEM	QTY	PART NO.	DESCRIPTION
22	2	P0310-573	JUMPER, Terminal Strip
23	1	P0310-260	HOURMETER
24	1	P0251-395	ENCLOSURE
25	1	P0251-396	PANEL
26	1320 LI	P0054-035	CABLE, 4 GA
27	1	P0054-403	CONNECTOR
28	1	P0054-402	CABLE
29	4	P0311-035	BUSHING, Insulating 1-1/4
30	4	P0311-072	CONNECTOR, Strain Relief 1-1/4
31	4	P0311-021	NUT, Lock 1-1/4

LI - Linear Inch

OPERATOR CONTROLS

2325E



ITEM	QTY	PART NO.	DESCRIPTION
1	2	P0302-673	VALVE, Single Detent
2	1	P0302-325	VALVE, Ball
3	1	P0301-100	GAUGE, Pressure 5000 PSI
4	1	P0301-105	GAUGE, Filter Indicator
5	1	P0056-129F	LIGHT, Red Pilot (Fault Light)
6	3	P0310-416AF	PUSH BUTTON
7	1	P0310-260	HOURMETER
8	2	P0258-006	VALVE, Port 1-1/2
9	1	P0301-143	GAUGE & SEAL
10	1	P0310-288	SWITCH, Disconnect

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NOTES

CALIFORNIA
Proposition 65 Warning
Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.