STRIPE HOG SH7500

OPERATIONS MANUAL

HOG™ TECHNOLOGIES

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WARNING

INCORRECT USE OF HIGH PRESSURE WATERBLASTING EQUIPMENT MAY CAUSE SERIOUS INJURY OR EVEN DEATH.

INEXPERIENCED PERSONNEL ATTEMPTING TO USE THIS EQUIPMENT MAY CAUSE EXTENSIVE DAMAGE TO CERTAIN COMPONENTS, BYSTANDERS, OR PERIPHERAL PROPERTY

DO NOT USE THIS EQUIPMENT WITHOUT PROPER SUPERVISION AND TRAINING.

ALL OPERATING AND MAINTENANCE PERSONNEL MUST BE THOROUGHLY TRAINED IN SAFE OPERATION BY A HOG TECHNOLOGIES CERTIFIED TRAINER, IN THE INSTALLATION AND MAINTENANCE OF THIS EQUIPMENT, AND PROVIDED WITH ADEQUATE SUPERVISION.

BEFORE ATTEMPTING TO CONNECT, OPERATE, OR REPAIR THIS EQUIPMENT, THOROUGHLY READ THESE INSTRUCTIONS AND ANY SAFETY WARNING OR INSTRUCTION PAMPHLETS INCLUDED WITH YOUR SHIPMENT.

FOR ANY QUESTIONS CONCERNING SAFE OPERATIONS AND MAINTENANCE PROCEDURES, CONTACT YOUR HOG TECHNOLOGIES REPRESENTATIVE PRIOR TO USE.

(772) 223-7393 OR (877) 964-7312
HOG TECHNOLOGIES
WWW.HOGTECHNOLOGIES.COM

Table of Contents

Section 4:
Lubrication & General Maintenance

Section 5:
Scheduled Maintenance

Table of Contents

Congratulations on your recent purchase of the Stripe Hog! The Stripe Hog is the world's most advanced equipment for removing pavement markings and runway rubber deposits. Your purchase demonstrates your commitment to excellence and positions you as a world leader in the removal of road surface markings and/or airport runway rubber deposits.

Hog Technologies is excited to welcome you and your crew to the Stripe Hog Operators' Team. Together we embrace the challenge of constantly developing our equipment, knowledge and skills so that our highways will be safer for all who rely on them and our pavement surfaces will last longer for those who pay for them. The Stripe Hog, in the hands of a trained/certified/licensed operator with this work ethic, will be a fitting complement to our mutual commitment to excellence.

As you know, no machine is capable of outperforming its operator so we have designed a training experience that will equip your operators with the tools needed to maximize productivity and minimize operational expenses while building our mutual reputation of no surface damage. This manual is designed to be used by operators trained by Hog Technologies. During the training experience your team will be given the basic knowledge and skills necessary to maintain, operate, troubleshoot and repair your Stripe Hog.

Please take the time to read this operation manual before attempting to operate your Hog Technologies system. This manual is an important aid in the operation and maintenance of your new equipment. The information is intended as a guide and cannot cover every question you may have about your Stripe Hog or every operating situation. We encourage you to contact Hog Technologies for any additional information you might need. We provide support to our customers for all of the equipment we sell. We maintain an experienced support team that is available 24 hours a day 7 days a week along with a well-stocked inventory of parts and accessories for your convenience. Please contact us for any and all of your support issues and questions toll free at (877) 223-7393 or online at www.hogtechnologies.com or www.stripehogsupport.com

From our family to yours we would like to take a moment to say thank you from all of us at Hog Technologies! We look forward to many successful years working together to provide maximum productivity at minimal operational cost without damage. Only together can we both succeed!

Hog Technologies Limited Warranty

Hog Technologies warrants its components to be free from defects in material and workmanship while under normal use and service. Hog Technologies will, at its option, either repair or replace free of charge any such part that appears to us to be defective in material or workmanship during the warranty period. The warranty evaluation by Hog Technologies as to the cause of the defect shall be conclusive.

For approved warranty shipments, Hog Technologies will provide no charge Fed-ex ground or Fed-Ex Economy shipping. If customer requests expedited shipping, the difference in the shipping costs will be invoiced to the customer.

Hog Technologies reserves the right to request the component(s) to be returned, freight pre-paid, for analysis before proceeding with any warranty claim. The customer shall be responsible for payment of any replacement components requested. If the warranty claim is approved by Hog Technologies, credit will be issued for the components under warranty.

No warranty is made, either expressed or implied, for defects, failures or malfunctions resulting from corrosion, misapplication, over-pressurization, insufficient or lack of maintenance and any modifications to the component as supplied by Hog Technologies.

Any components replaced during the period of warranty will be warranted only during the period of the initial warranty, and no extensions shall be made, unless in writing by Hog Technologies in addition to the provision of the terms of the original warranty.

Hog Technologies will not be liable for damage, abnormal wear or consequential damage to their system components resulting from the use of replacement components that are not furnished by Hog Technologies.

Hog Technologies will not be liable for charges incidental to the removal of damaged or defective components, lost time and profits, or any consequential damages resulting from failure of the component.

Hog Technologies reserves the right to make improvements to future models without the need to retrofit or upgrade prior models. Hog Technologies shall not be obligated to perform retrofits and/or modifications to components manufactured prior to the incorporation of the new design and specifications.

Components that are not originally manufactured by Hog Technologies, including but not limited to, the truck chassis, Jetstream Pump, OMSI (Gear Box), Dresser Roots Blower, are warranted only to the extent of the original manufacturer's warranty and are subject to their allowance to us if found defective by them. Copies of other manufacturers warranty statements are supplied at the time of sale. Hog Technologies will assist with warranty claims on components not originally manufactured by Hog Technologies.

*For approved warranty claims that include labor: If such labor is provided at customer location and not at Hog Technologies headquarters, Hog Technologies reserves the right to invoice customer for reimbursement of travel-related expenses.

Hog Technologies Warranty Schedule
Warranty starts from the date of acceptance by the purchaser. Date of acceptance shall be defined as the time that the Stripe Hog is received by the purchaser. Acceptance of the Stripe Hog shall imply agreement to the terms and conditions of this warranty.

- **1 - 365 Days: 100% Parts and 100% Labor ***

High pressure, waterblasting equipment can cause serious injury or even death if it is not operated or maintained properly. This manual has been written to include a number of safety instructions to assure the safe operation and maintenance of the equipment. These instructions are in the form of a General Safety Section as well as individual NOTICE, CAUTION, WARNING and DANGER statements. There are also WARNING AND DANGER LABELS located on some components. You should read these warnings carefully and make sure you understand the nature of the hazard as well as the precautions and recommended procedures required to ensure your safety. The following definitions apply:

CAUTION

HAZARDS OR UNSAFE PRACTICES WHICH COULD RESULT IN MINOR PERSONAL INJURY OR PRODUCT AND PROPERTY DAMAGE.

WARNING

HAZARDS OR UNSAFE PRACTICES WHICH COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH.

DANGER

INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.

NOTICE:
INDICATES A SITUATION WHICH CAN CAUSE DAMAGE TO THE MACHINE, PERSONAL PROPERTY, AND/OR THE ENVIRONMENT OR CAUSE THE EQUIPMENT TO OPERATE IMPROPERLY.

IMPORTANT NOTE:
Every precaution has been taken by Hog Technologies to reduce the risks associated with possible injury and damage from electrical faults, high pressure water and hydraulic components or mechanical failure. However, your own precaution and good maintenance procedures are necessary in order to maintain a safe working environment.

All instructions given in this book are as seen from the rear looking forward. Common industry terminology is used throughout the manual.

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1.1 General Safety

Use Professional Training

Operating high pressure waterblasting equipment requires professional training, including safe work practices and procedures. Only professionally trained personnel should be allowed to setup, operate, or maintain high pressure waterblasting equipment. If you have not completed the Hog Technologies basic training course you will be a danger to yourself and others. The velocity of water at the nozzle tip exceeds that of a bullet coming out of a gun. Contact with the high pressure blast can result in the loss of a limb or water injection into the bloodstream. If injection occurs in a vulnerable part of the body death may result.

Always Read Instructions

Read this manual and all other equipment operation manuals and instructions prior to using any Hog Technologies product. Contact Hog Technologies (877-HOG ROAD) should any questions arise.

Major Component Operation Manuals

The suppliers of some major components such as truck chassis, tractors, engines, pumps, and drive units, provide their own operation manuals which have been included with your equipment. You should read the information in this manual and the manuals of other manufacturers completely and have a thorough understanding of all component systems and their proper operation before operating your equipment.

REMEMBER - IT IS YOUR RESPONSIBILITY TO ENSURE THAT YOUR EQUIPMENT IS SAFE FOR YOU AND YOUR CREW. ALWAYS EXERCISE GOOD JUDGMENT WHEN INSTALLING OR REPAIRING EQUIPMENT AND WHILE OPERATING WATERBLASTING EQUIPMENT.

Work Area Safety

Remember, safety is first! Only set up to work in areas properly protected from traffic and other hazards. Individuals being struck by vehicles or mobile equipment lead to many work zone fatalities or injuries. Work zones need traffic controls identified by signs, cones, barrels and barriers. You should always wear high visibility clothing with a fluorescent background and made of retro--reflective material to be more visible to motorists and reduce the possibility of an accident. Work stations should always be illuminated.

Outfit all operators with proper safety apparel. Always use eye protection to shield from projected debris. Use ear protection to protect from noise levels generated from pump, vacuum and waterblasting heads. It is very important to wear steel toed boots that provide good traction on slippery surfaces such as on top of water and debris tanks.

Never wear loose clothing. Loose clothing can get caught on moving or rotating parts causing serious injury or even death.

Most ultra-high pressure waterblasting operations generate noise levels above 90 dB. Hearing protection is required in accordance with OSHA standards.

OSHA's Permissible Noise Exposure	
90 dB	8.0 hours
92 dB	6.0 hours
95 dB	4.0 hours
97 dB	3.0 hours
100 dB	2.0 hours
102 dB	1.5 hours
105 dB	1.0 hours
110 dB	30 minutes
115 dB	15 minutes

WARNING

ALL PERSONNEL EXPOSED TO 90 DB OR GREATER NOISE LEVELS SHOULD RECEIVE INSTRUCTION IN THE CORRECT USE OF EAR PROTECTION SO THAT THEIR NOISE EXPOSURE LIES WITHIN THE LIMITS SPECIFIED BY OSHA. NEVER ALLOW ANYONE NEAR THE WORK AREA WITHOUT PROPER EAR PROTECTION.

REMEMBER: ULTRA-HIGH PRESSURE BLASTING CAN CAUSE DEBRIS TO BE PROJECTED UNEXPECTEDLY IN AND AROUND THE WORK AREA THAT CAN CAUSE SEVERE INJURY. MAKE SURE ALL PERSONNEL STAY CLEAR OF THE BLASTING AREA AND USE HARD HATS, EYE AND EAR PROTECTION.

Always be sure your work area is clear of people whenever the ultra-high pressure pump is engaged. When working on the waterblasting head with an operator in the cab of the truck you should always make sure you can see his hands.

Use Only Products Intended for High Pressure waterblasting Use

Know the pressure ratings of all equipment being used and never exceed the service rating of the weakest component. This system is designed to work with pressures up to but not exceeding 40,000 psi (2758 bar). Ultra-High Pressure replacement parts must have a stated minimum burst rating of 1.5 times the maximum operating pressure. All equipment pressure rating and warning tags should be left intact.

Product changes

Hog Technologies is committed to the continuous improvement of our products. As a result, some of the equipment described in this manual or pictured in the catalog may change or no longer be available.

All information, illustrations, and specifications contained in this manual are based on the latest product information available at the time of publication. Hog Technologies reserves the right to make changes at any time, without notice, in colors, materials, equipment, specifications, and models.

If you have questions about the equipment on your Stripe Hog, please contact the Customer support Department at (877) HOG ROAD or (001) 772-223-7393.

Never Alter a Hog Technologies Product

Do not alter any product without written consent from the manufacturer. Any alterations could have serious consequences including bodily harm or death. Alterations without manufacturer consent will void the warranty.

Inspect Equipment

Inspect the condition of all components prior to use. Do not use any item that is in questionable condition. Use only components which are marked with the recommended operating pressure. Never exceed the operating pressure of the weakest component in the system.

IMPORTANT NOTE:
YOUR HOG TECHNOLOGIES EQUIPMENT USES INTERNAL COMBUSTION ENGINES AND FLAMMABLE FUEL. EVERY PRECAUTION HAS BEEN TAKEN BY HOG TECHNOLOGIES TO REDUCE THE RISKS ASSOCIATED WITH POSSIBLE INJURY AND DAMAGE FROM FIRE OR EXPLOSION, BUT YOUR OWN PRECAUTION AND GOOD MAINTENANCE PROCEDURES ARE NECESSARY TO ENSURE THE SAFE OPERATION OF YOUR EQUIPMENT.

Store Components Properly

Protect all components from damage when not in use. Secure for travel.

Freezing Conditions

The water and vacuum systems, hoses and the waterblasting head should be drained of all water or filled with an antifreeze solution. For the 40K pump system, refer to pump manufacturer's procedures for maintaining equipment in freezing climates. If the unit is operated in freezing temperatures or even temperatures below 60 degrees Fahrenheit, it is necessary to operate the system with the high pressure pump engaged and the engine set at IDLE speed only, until the oil temperature rises above 60 degrees Fahrenheit.

1.2 Blasting Safety

Safety First – ALWAYS!

Whenever the high pressure pump is engaged for setting pressure or operations, always be sure work area is clear of people, hands, feet, etc. before engaging the high pressure (DUMP VALVE 40K) switch.

WARNING

INJURIES FROM ULTRA-HIGH PRESSURE WATERBLASTING ARE VERY SERIOUS AND CAN RESULT IN A FATALITY. ALWAYS MAKE SURE ALL PERSONNEL ARE A SAFE DISTANCE FROM THE WORK AREA BEFORE THE PRESSURE PUMP IS ENGAGED. NEVER PUT HANDS, FEET OR ANY PART OF YOUR BODY IN OR NEAR THE HIGH PRESSURE STREAM.

Check Water Supply

Use only clean water in any Ultra-High Pressure system. ***DO NOT*** *accept water drawn from retention ponds, canals or other non-potable sources.*

Purge System
Before attaching a spray bar to the Hog Head assembly, engage the high pressure pump at low speed to purge the system. Any dirt or debris in the system can clog nozzle orifices and cause system pressure to spike excessively, causing damage to components.

Check Waterblasting Heads
Check blasting heads for smooth and proper operation before each shift. Do not use equipment that has not been checked thoroughly.

Check Control Components
Check all switches and control panel devices to ensure each is working properly before beginning operations. Do not use equipment if any device is malfunctioning.

Use Safety Protection
Always use eye protection to protect eyes from projected debris. Use ear protection to protect from noise levels generated from pump, vacuum and waterblasting operations.

WARNING

ULTRA-HIGH PRESSURE BLASTING CAN CAUSE DEBRIS TO BE PROJECTED UNEXPECTEDLY IN AND AROUND THE WORK AREA THAT CAN CAUSE SEVERE INJURY. MAKE SURE ALL PERSONNEL STAY WELL CLEAR OF THE BLASTING AREA AND USE HARD HATS, EYE AND EAR PROTECTION.

Know Your Surroundings
Always be aware of, and pay attention to your surroundings. – i.e. - truck, hoses, people, walls, moving vehicles, live lanes of traffic, etc.

Test System
With the spray bar and high cohesive nozzles installed, operate the pump at low pressure to check for nozzle accuracy and leaks in spray bars, connections or nozzles. Should any repairs or adjustments be necessary, disengage the pump to relieve all pressure before making any required repairs or adjustments.

CAUTION

TO AVOID POSSIBLE INJURY AND DAMAGE TO EQUIPMENT, USE ONLY THOROUGHLY TRAINED PERSONNEL TO PERFORM MAINTENANCE OR REPAIRS. ALWAYS TEST ALL COMPONENTS AT LOW PRESSURE.

Start at Low Pressure
Always start blasting with the system at low pressure (low RPM) and slowly increase RPM to operating pressure. Engage and disengage 40K switch two times at operating pressure to check the operation of the blasting head and dump valve before starting blasting operations.

Set System Pressure
With system operating properly, set your pressure according to methods described by pump manufacturer's instructions. Refer to the Pump operating manual for specifications and instructions.

Check Dumping Pressure
When setting pressure ***ALWAYS*** ensure that the system pressure drops to less than 100 psi (7 bar) immediately when the DUMP VALVE 40K STOP switch is pressed. If this does not relieve system pressure immediately to below 100 psi (7 bar) when released, do not use the unit until repairs are made to the dump valve.

Use the Minimum Pressure Required
Do not exceed the operating pressure of the system's lowest pressure-rated component. All equipment pressure rating and warning tags should be left intact.

Be Prepared
If the equipment malfunctions or a malfunction is suspected, immediately stop all blasting activity and relieve the pressure in the system before attempting any repair. Always follow manufacturer's repair instructions.

Never Blast When Stopped
Always make sure Ultra-High Pressure is disengaged before forward or reverse motion is stopped. Damage to road surface will occur if blasting continues when the truck is brought to a stop.

WARNING

MOST HIGH PRESSURE WATERBLASTING OPERATIONS PRODUCE NOISE LEVELS THAT EXCEED 90 DB WHICH CAN CAUSE PERMANENT HEARING LOSS.

ALL OPERATORS AND SUPPORT PERSONNEL MUST WEAR EAR PROTECTION IN ACCORDANCE WITH OSHA STANDARDS AND PROVISIONS SHOULD BE MADE FOR REGULAR INSPECTION AND MAINTENANCE.

REMEMBER: ULTRA-HIGH PRESSURE BLASTING CAN CAUSE DEBRIS TO BE PROJECTED UNEXPECTEDLY IN AND AROUND THE WORK AREA THAT CAN CAUSE SEVERE INJURY. MAKE SURE ALL PERSONNEL STAY WELL CLEAR OF THE BLASTING AREA AND USE HARD HATS, EYE AND EAR PROTECTION.

1.3 Nozzle Safety

Check Flow Rating

Combined nozzle flow rate must be compatible with the pump discharge and pressure rating. Refer to the nozzle flow chart in this manual.

Check Pressure Rating

Use only nozzles with a manufacturer's pressure rating of at least the pump's operating pressure or a burst rating of no less than 60,000 psi (4,137 BAR.)

Check Orifices

Prior to installation, make sure the nozzles have no clogged orifices. Also, check to ensure nozzles are sharp and not excessively worn.

Check Connections

Be sure to never force a nozzle into the blasting head. Clean threads to ensure nozzle is not cross-threading. Use an ample amount of anti-seize on threads only, never on the seat of the nozzle. Inspect the seat area on nozzle to ensure a tight seal. If it is damaged, do not use.

Clogged Nozzles

If a nozzle appears clogged, immediately disengage pump. Remove any clogged nozzles and replace with new nozzles. Any particles of the smallest size will clog nozzles. Clogged nozzles can create excessive pressure in pump.

Remove Nozzle from Service if:

A) Nozzle is split or damaged.

B) Nozzle is clogged.

C) Nozzle water spray is fanned out.

D) Nozzle's ability to hold pressure is suspect.

E) Nozzle's hex head is worn excessively from blasting.

F) Nozzle threads are damaged.

1.4 Hose Safety

General

Ultra-High Pressure hoses are tough, but not invincible. They require proper care and handling to achieve the normal service life of 300 - 600 hours. If the hoses are abused, the service life will be much shorter.

Stretched or abused hose can fail prematurely and unexpectedly, which could cause injury to personnel. Hoses that have been exposed to excessive stretching or kinks should be removed from service and discarded.

Check Connections

Check the condition of the connection threads prior to connecting any fittings or hoses. Use an anti-seize compound on all fittings and hoses to prevent "galling," as galling will destroy the threads, fittings and/or hose ends.

Tighten Connections

Properly tighten all high pressure connections. Usually, snug plus a 15% tightening will properly seal connections.

Take Proper Care of Your Hose

A) Protect the hose from contact with sharp objects, abrasive surfaces and foot or wheel traffic.

B) Never subject Ultra-High Pressure hose to a tight radius (less than 30" (.8 m) or pull on a coiled hose. Always make sure the hoses are straight with no coils before pulling on the hose to deploy it.

C) Never pull hard on an Ultra-High Pressure hose or expose the hose to heavy loads like dragging equipment or deploying long lengths of hose. This can stretch the hose and weaken it. Never pull more than 25 feet of hose by a coupler or fitting. Always move long lengths of hose by the hose itself to keep the strain off the fittings.

D) When using a tractor or a hog tool, always operate the equipment well within the maximum distance to avoid straining or damaging hoses.

Check Burst Rating

Do not use an Ultra-High Pressure hose that does not have a listed burst rating or with a burst rating of less than 60,000 PSI (4,137 BAR).

Retire Hose from Service if:

A) Cover is damaged and reinforcing wires are exposed to rust and corrosion.

B) Cover is loose and/or has blisters or bulges.

C) Hose has been crushed or kinked.

D) End fitting shows evidence of damage, slippage or leakage.

E) Hose has been exposed to pressures of 2 times the operating pressure.

F) Hose has been stressed or stretched.

Check Dump Valve Water Hose

Any hose used for returning dumped water back to the pump or vacuum line must have a large enough diameter and psi strength so that potentially dangerous release pressure is allowed full flow and release pressure is contained safely. Keep hose in good condition.

1.5 High Pressure Fitting Safety

Fitting Ratings

Use high pressure fittings with a rating of 60,000 psi (4137 BAR.)

Check Fittings

Do not use fittings that have been cross threaded or have damaged threads.

Fitting Connections

Use anti-seize compound on ***all*** hose and fitting connections to prevent galling. Do NOT apply anti-seize to the seating area of any connections.

1.6 Dumping Safety

A) Always drain all the liquid from the debris tank before dumping the solids.

B) Always dump on level ground, never uneven or sloped ground.

C) Always choose solid ground, not soft sand or wet soil.

D) Always use the remote control to tilt the tank.

E) Make sure the operator and all personnel are well clear of the truck before tilting the tank.

F) Never allow personnel under a raised tank without safety supports in place.

G) Always be careful to avoid any pinch points which could cause injury.

DANGER

AN INJURY CAUSED BY HIGH PRESSURE WATERJETS CAN BE SERIOUS. YOU SHOULD READ THIS WARNING STATEMENT CAREFULLY AND ALWAYS CARY THE MEDICAL INFORMATION CARD WITH YOU.

- **IN THE EVENT OF ANY WATERJET INJURY:**
- **SEEK MEDICAL ATTENTION IMMEDIATELY. DO NOT DELAY.**
- **INFORM THE DOCTOR OF THE CAUSE OF THE INJURY.**
- **SHOW THE DOCTOR THE MEDICAL INFORMATION CARD OR THIS WARNING STATEMENT AND NOTE TO PHYSICIAN BELOW.**
- **TELL THE PHYSICIAN WHAT TYPE OF WATERJET PROJECT WAS BEING PERFORMED AT THE TIME OF THE ACCIDENT AND THE SOURCE OF THE WATER.**

MEDICAL ALERT

NOTE TO PHYSICIAN

This patient may be suffering from a waterjet injury. Evaluation and management should parallel that of a gunshot injury. The external manifestations of the injury cannot be used to predict the extent of internal damage. Initial management should include stabilization and a thorough neurovascular examination. X-rays can be used to asses subcutaneous air and foreign distant from the site of the injury. Injuries to extremities can involve extensive nerve, muscle, vessel damage as well as cause a distal compartment syndrome. Injuries to the torso can involve internal organ damage. Surgical consultation should be obtained. Aggressive irrigation and debridement is recommended. Surgical decompression and exploration may also be necessary. Angiographic studies are recommended preoperatively if arterial injury is suspected. Bandages with a hygroscopic solution ($mgso_4$) and hyperbaric oxygen treatment have been used as adjunctive therapy to decrease pain, edema and subcutaneous emphysema. Unusual infections with uncommon organisms in immunocompetent patients have been seen; the source of the water is important in deciding on initial, empiric antibiotic treatment, and broad-spectrum intravenous antibiotics should be administered. Cultures should be obtained.

SH7500 Stripe Hog

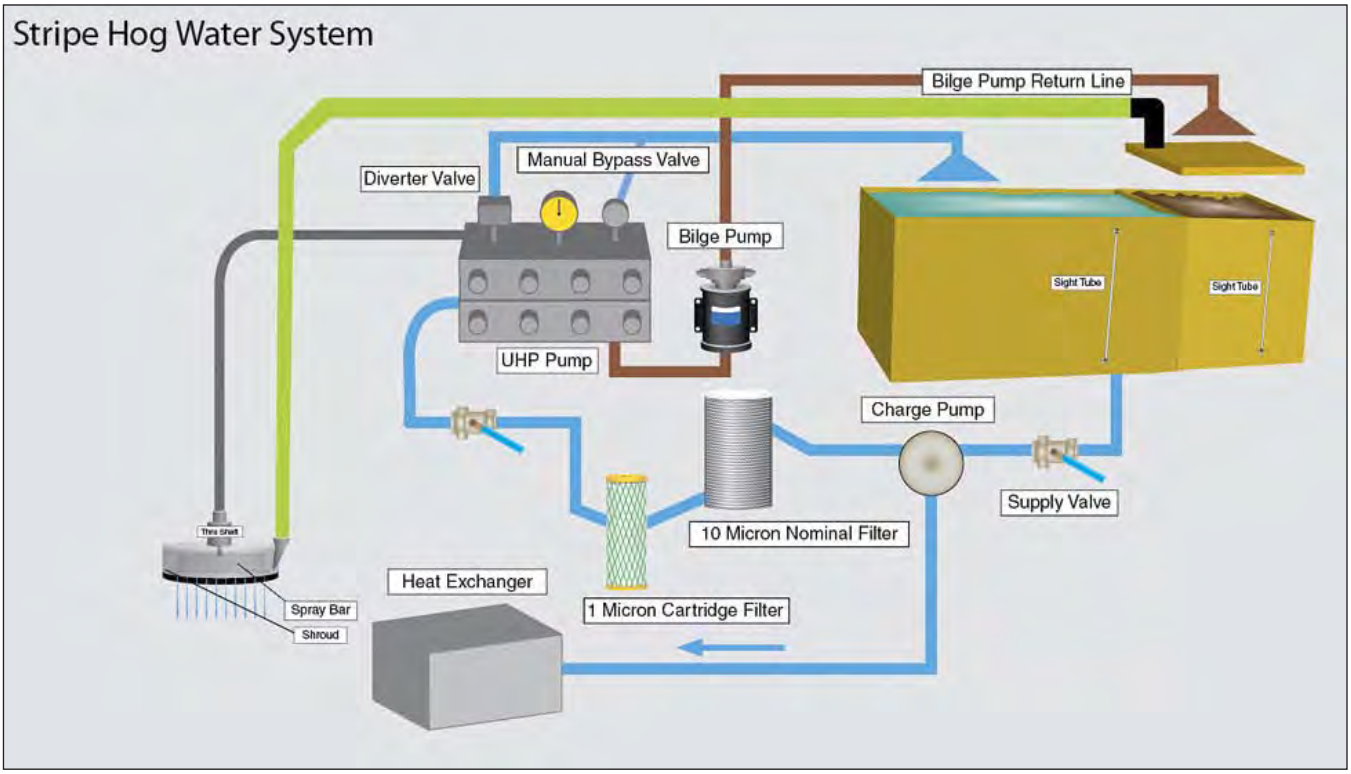
2.1 Stripe Hog System Introduction

The SH7500 waterblasting system is mounted to the truck chassis and powered by the truck engine through a transmission PTO and a gearbox PTO. The waterblasting system includes an Ultra-high pressure water system, vacuum system, water and debris tanks, hydraulic system, hydrostatic drive system and DC electrical system.

Most components are controlled by switches in the cab mounted control panel and Joystick. Others are controlled by switches in the remote control or switch panels located on the chassis.

The systems also supports the connection of the optional HT1000 Ground Hog when the job requires the extended reach and/or additional maneuverability.

The operation and maintenance requirements for the engine, drive train and chassis components are unique to the manufacturer and the selected options. Each truck chassis manufacturer provides owners information manuals with their product. It is important that you read the manuals carefully and become familiar with the proper care and operation of engine, drive system, chassis, safety equipment and all components of your truck chassis.



2.2 Ultra-high Pressure Water System

The ultra high waterblasting system consists of two water storage tanks, charge pump, Ultra-High Pressure (UHP) pump, high pressure hoses and the Hog Head. Switches and the joystick in the control panel enable the operator to control all aspects of the high pressure blasting system from the cab of the truck.

Each manufacturer of the high pressure waterblasting system components provides an information and operating manual with its product. It is extremely important that you read the manuals and become familiar with the proper care and operation of the components before operating the waterblasting system.

⚠ WARNING ⚠

HIGH PRESSURE WATER FROM SPRAY JETS OR RUPTURED HOSES CAN CAUSE SEVERE INJURY OR EVEN DEATH. ALWAYS BE SURE WORK AREA IS CLEAR OF PEOPLE, HANDS, FEET, ETC., BEFORE ENGAGING THE DUMP VALVE 40K SWITCH TO ACTIVATE THE ULTRA-HIGH PRESSURE SYSTEM.

Clean Water Tank

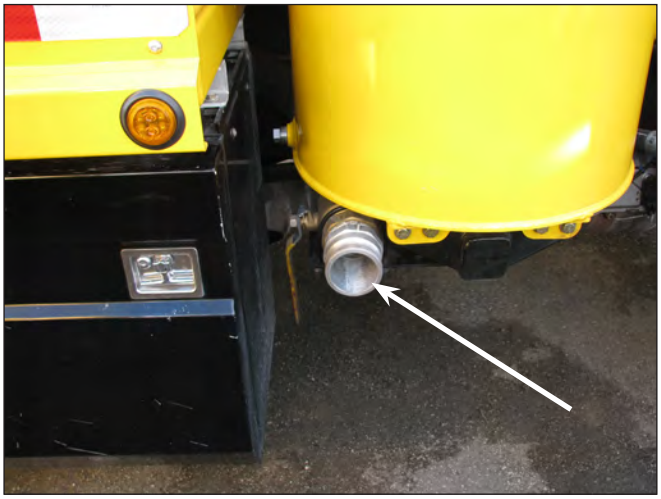
The clean water tanks are mounted to the chassis just forward of the debris tank and made of plastic to reduce corrosion and provide a supply of clean, fresh water to the charge pump. A site tube on the side of the forward tank indicates the water level and a valve on the passenger side, just below the tank allows for quick draining.

An optional hose and quick connect coupler at the rear of the truck provides a connection to an optional trailer mounted water tank to provide additional water which dramatically increases working time between refills. A three-way valve in the intake hose allows the operator to select to use the trailer tank, main tanks or the truck and trailer tanks simultaneously. To avoid water supply problems to the charge water and UHP pumps, always make sure the valve is set to the desired position before waterblasting operations begin.

Typical Clean Water Tank Configuration & Fill Connection

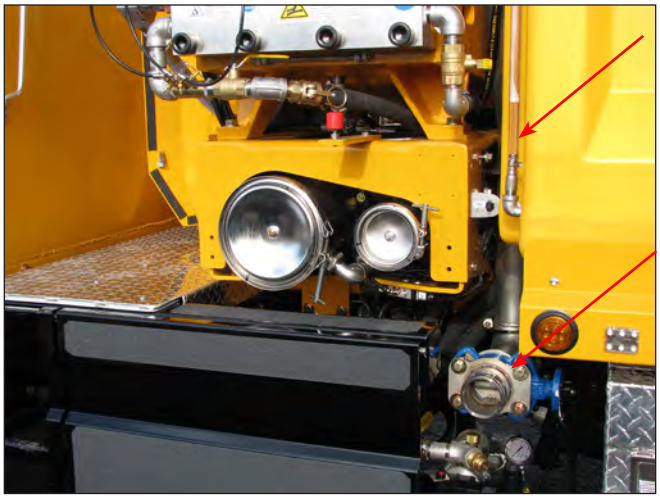
Note:
If your truck is equipped with the optional trailer mounted water tank, it is important that the three-way valve be set to select only the main tanks when not using the trailer mounted tank. If the valve is set to select the trailer tank or to use the truck and trailer tanks simultaneously, the charge pump will suck air and not provide water to the UHP pump. This can cause severe damage to both pumps.

The clean water fill connection accommodates large hoses that are typically connected to a metered source like a fire hydrant to expedite the filling of the tank. Operators must always monitor the tank closely during filling operations as the flow of water from a hydrant will be greater than the flow capacity of tank air vent. Overfilling the tank will cause excessive pressure and damage the tank.



Clean Water Tank Drain Valve

Clean Water Tank Three Way Valve



Typical Clean Water Fill Connection, Valve and Site Tube

Only use potable water (clean enough to drink) to increase the service life of the components in the Ultra-High Pressure system. Always flush the water source for several minutes prior to filling the tank to help ensure that no debris enters the system. Additionally, the tank should be flushed frequently with clean, fresh water to prevent the accumulation of debris that may accidently enter the tank.

There is a 3" ball valve on the passenger side bottom of the tank that allows for quick draining of the tanks when flushing is required and complete draining for system winterization. Another 3" valve on the passenger side provides drainage for the wastewater bladder in the rear clean water tank. A large man-way hatch on the top of each tank provides access to the interior of the tank or wastewater bladder for inspection or to facilitate cleaning.

Remember that the wastewater bladder displaces clean water in the tank as it fills, causing the site gauge to show more water than is actually in the tanks. The site gauge is intended to provide an accurate indication of the water level during filling operations only. It is not a reliable level indicator during operation when the debris tank transfer pump is being used to collect recovered wastewater.

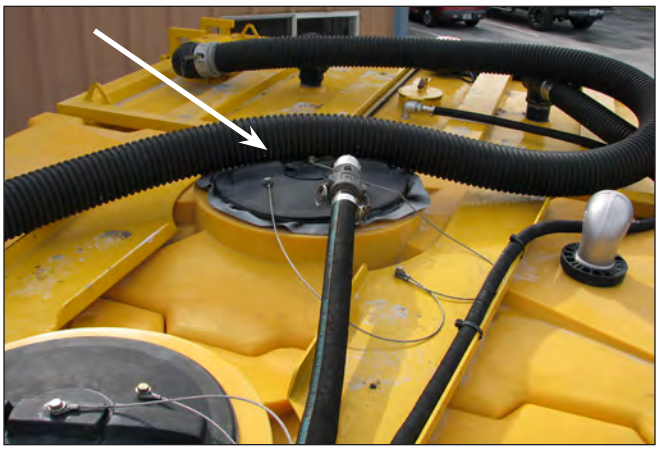
Use actual blasting time during operation with an average pump consumption of 8-9 gallons (30-34 liters) per minute to estimate the remaining clean water in the tank. To ensure maximum clean water volume, always completely drain the wastewater bladder before filling the clean water tank.

Clean Water Fill Connection & Valve

Front Clean Water Tank Man-Way Hatch

WARNING

ENTERING THE WATER TANKS CAN BE DANGEROUS, PARTICULARLY IN HOT WEATHER. PERSONNEL ENTERING THE TANK ARE SUBJECT TO SLIPS AND FALLS, POOR VENTILATION, HEAT EXHAUSTION, OR OTHER INJURIES COMMON TO WORKING IN CONFINED SPACES WITH LIMITED VENTILATION. NO ONE SHOULD ENTER THE FRESHWATER TANKS WITHOUT NOTIFYING A COWORKER OR ANOTHER PERSON FIRST. THE PERSON WORKING INSIDE THE TANK SHOULD ALSO KEEP THE TRUCK IGNITION KEYS WITH HIM TO ENSURE THE UNIT CANNOT BE ACCIDENTALLY DRIVEN WITH HIM OR HER INSIDE. ANOTHER TEAM MEMBER SHOULD ALWAYS STAY IN CONSTANT COMMUNICATION WITH THE PERSON INSIDE THE TANK TO ENSURE THEY ARE SAFE AND BE ABLE TO PROVIDE ASSISTANCE IF NECESSARY.



Rear Clean Water Tank & Wastewater Bladder Man-Way Hatch

Charge Water Pump

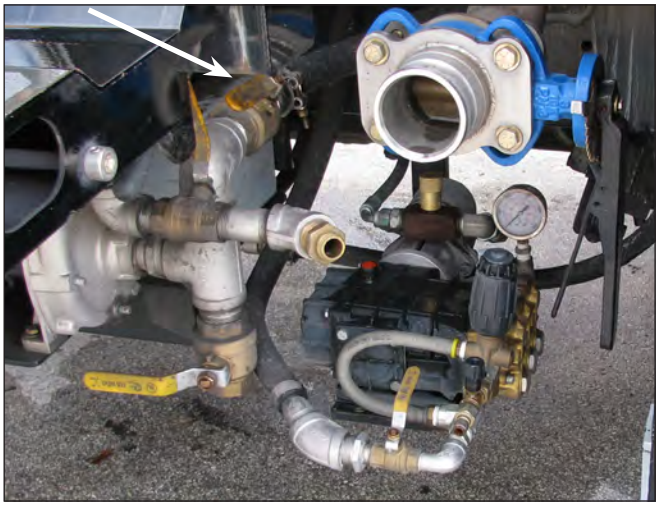
The water tanks provide clean fresh water to the low pressure charge pump. It is powered by the waterblasting hydraulic system that is activated by the transmission PTO. The pump delivers a constant supply of water to the Ultra-High Pressure (UHP) Pump and should maintain a minimum of at least 40 PSI (2.8 Bar) on the Charge Pressure gauge in the control panel.

A supply valve located between the clean water tank and the charge water pump controls the flow of water. Always make sure there is at least a half a tank of water and the supply valve is open prior to engaging the charge water pump. If the charge water pump is engaged while this valve is closed or there is no water in the clean water tank, you will not be able to achieve required UHP pump charge water pressure and the charge pump impeller or UHP pump will likely be damaged.

Charge Pump & Drain Valve

Note:
The UHP pump can cavitate if the charge water pressure drops below 25 PSI (1.7 Bar.) Cavitation can cause severe damage to the UHP pump and should never be allowed to occur. You should always monitor the charge water pressure and never operate the UHP pump when charge water pressure drops below 30 PSI (2.1 Bar.)

The charge water pump is activated by engaging the transmission PTO and pressing the rocker switch labeled CHARGE PUMP on the control panel in the cab of the truck. (Refer to Startup Procedure in the Waterblasting Operation section of this manual) Once activated, a green light will



Charge Water Pump Supply Valve

illuminate to confirm the charge water pump is engaged. The charge pressure gauge located on the top of the control panel must be monitored closely when engaging the charge water pump. Once engaged, the pressure should rise immediately above 10 psi (7 BAR) and continue climbing to the normal operating pressure of approximately 60-70 psi (4 BAR).

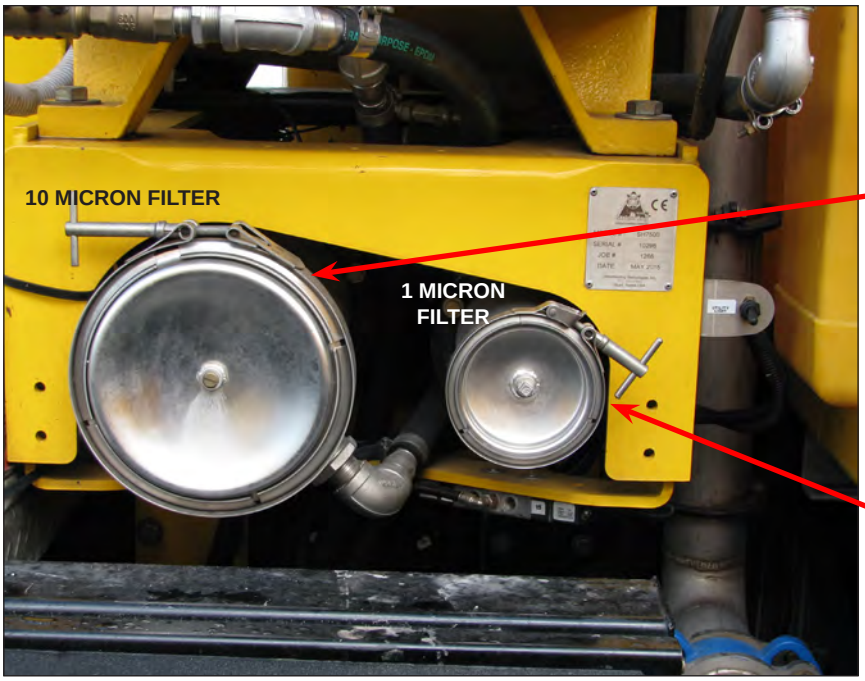
Water supply problems to the charge pump are indicated by low water pressure or by the sound of the pump. Fluctuating pump RPM, inconsistent high pitch whines and fluctuating charge water pressure are indications of a water supply problem to the charge pump. If the pressure does not immediately rise and the pump is whining, immediately turn the charge pump off. Make sure the supply valve is open, check both filters and/or bleed the air from the system. Operators should be familiar with the normal sound of the pump and stop blasting if the sound changes. Find and correct the problem before waterblasting operations resume.

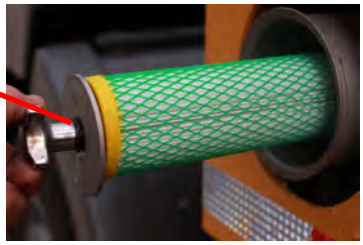
Charge Pump Switch In Control Panel

CAUTION

THE UHP PUMP CAN CAVITATE IF THE CHARGE WATER PRESSURE DROPS BELOW 25 PSI (2 BAR.) CAVITATION CAN CAUSE SEVERE DAMAGE TO THE UHP PUMP AND SHOULD NEVER BE ALLOWED TO OCCUR. YOU SHOULD ALWAYS MONITOR THE CHARGE WATER PRESSURE AND NEVER OPERATE THE UHP PUMP WHEN THE CHARGE WATER PRESSURE DROPS BELOW 30 PSI (2 BAR.)

NOTICE:
UHP SYSTEMS ARE EQUIPPED WITH A PRESSURE SAFETY SWITCH THAT WILL DEACTIVATE THE DUMP VALVE IF CHARGE WATER PRESSURE DROPS BELOW 30 PSI (2 BAR).





Two Stage Filter System

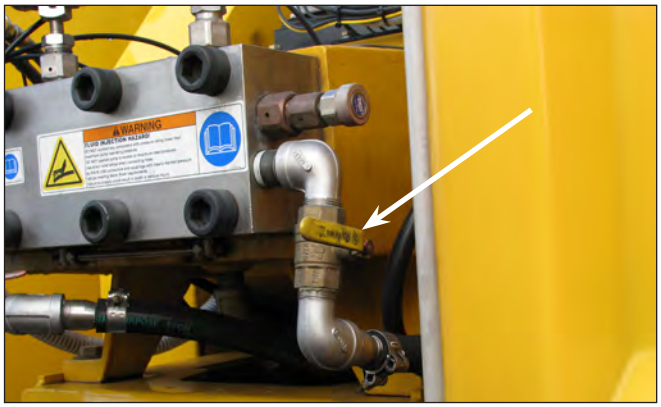
Filters

A two stage filter system in the supply line between the charge pump and high pressure pump removes any small debris that may accidentally find its way into the water supply tanks. The first stage filter is a 10 micron (Nominal) filter to trap larger particles. The second stage filter is a 1 micron (Absolute) filter to trap smaller particles that pass through the first filter.

The filters are critical to the proper operation of the high pressure blasting system and should be checked frequently and replaced as necessary. Dirty charge water filters are the number one reason for low charge water pressure that can cause the UHP pump to cavitate and reduce the flow of lube water to the packing seals in the UHP pump. Therefore it is normal and recommended that the filters be checked frequently and changed whenever the charge water pressure drops below 40 PSI (2.8 Bar.)

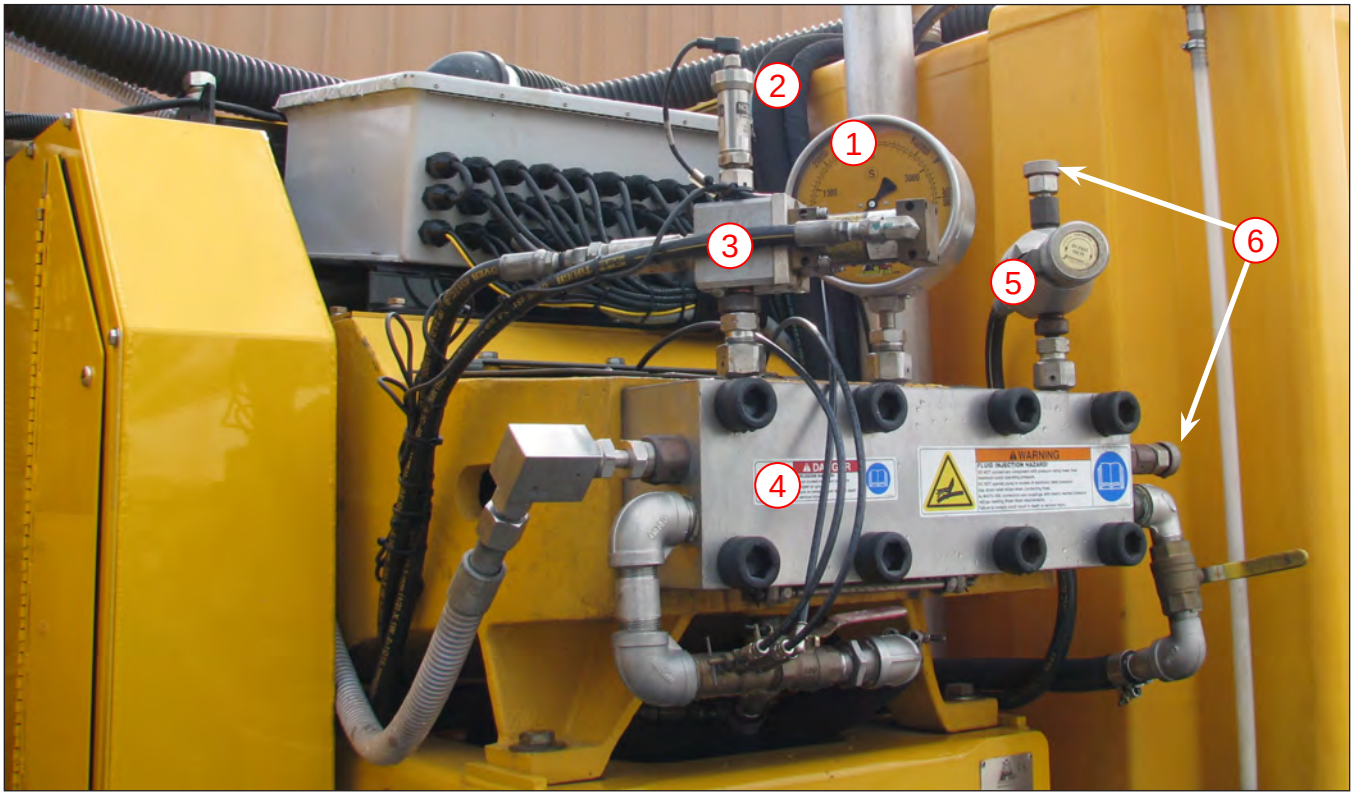
Operating with dirty filters can cause:

- Unwanted particles forced through the filter resulting in premature failure of the parts.
- Cavitation in the UHP pump which will result in damage to the pump.
- Reduced flow of lube water to the packing seals which could damage the seals.



Charge Water/Low Pressure Purge/Flush Valve

Remember that the filters can be under pressure. Always make sure the charge pump is off, the transmission PTO and OMSI PTO are disengaged and the pressure has been bled from the system before removing the filter caps. You should also thoroughly flush the filter canisters and charge water system when the filters are changed and before activating the Ultra-High Pressure system. A purge valve located on the low pressure (charge water) side of the pump can be opened to purge the system after a filter change or to flush the charge water side of the pump if the system becomes contaminated.



Ultra-High Pressure Pump Components

1. High Pressure Gauge
2. High Pressure Sensor
3. Diverter Valve
4. High Pressure Pump Manifold
5. Manual Bypass Valve
6. Rupture Discs

Ultra-High Pressure Pump

The Ultra-High Pressure pump (UHP) is a positive displacement pump that requires a constant water supply from the charge water pump at a minimum of 30 PSI (2 BAR) to operate properly and prevent cavitation. The operator must monitor the charge water pressure closely and immediately shutdown the waterblasting system if the charge water pressure drops below 30 psi (2 BAR) to protect the charge water pump from running dry and protect the UHP pump from damage due to overheating and cavitation.

The high pressure pump is powered by the main truck engine through the OMSI Drive PTO that is activated by the PTO switch in the control panel. The PTO switch also activates the solenoid which enables the hydraulic rotation of the spray bar that is controlled by the Head Rotation dial. The transmission PTO switch on the truck dash activates the hydraulic system. Green LED lights in the console switches illuminate to indicate the pump and spray bar hydraulic rotation are activated. When the system is activated, the DUMP VALVE 40K switch activates or turns off high pressure water to the Hog Head spray nozzles.

When the high pressure is turned off by the DUMP VALVE 40K switch, the diverter valve (dump valve) located on the UHP pump is activated to divert the water from the Hog Head pressure lines to the bypass line and back to the clean water tank. The dump valve is a safety feature that enables high pressure water supplied to the blast head to be immediately reduced to less than 100 PSI (7 Bar) at any time without causing damage to the high pressure lines and components.

Maximum operating pressure for the UHP pump of 40,000 PSI (2,758 Bar) @ 8.5 gallons (32 Liters) per minute is achieved at maximum engine operation RPM (Typically 1800 RPM). Ultra-high water pressure is monitored by the High Pressure analog gauge on the pump and a digital gauge in the control panel.

PTO, Dump Valve 40K & Charge Pump Switches In Control Panel
Charge Pressure & High Pressure Digital Gauges

High pressure is controlled by the RPM of the engine and/or by adjusting the manual bypass valve on the pump. Since engine RPM also controls the level of vacuum, adjusting the pressure using the manual bypass valve is beneficial when maximum engine RPM is required for developing and maintaining proper vacuum for the debris recovery system and less than maximum waterblasting pressure or gallons per minute is desired for the material being removed or the waterblasting tools being used.

The gallons per minute (GPM) produced by the Ultra-High Pressure pump is determined by pump RPM, plunger diameter, length of stroke and number of plungers. Once the UHP pump is engaged, it continually displaces water provided by the charge water pump. The charge water travels through the low pressure side of the UHP pump manifold, then through a set of 3 univalves into the 3 stuffing boxes. The plungers then force the water back through the high pressure side of the univalves and manifold. These univalves are critical to the operation of the UHP pump as they facilitate two functions at the same time. They allow low pressure water from the charge water pump to enter the stuffing box and Ultra-High Pressure water to flow into the high pressure side of the manifold. Once the water is forced back through the manifold, it is directed out to the blasting head or back to the clean water tank by the dump valve. Without these valves it would be impossible to separate the high and low pressure water from each other. Hog Technologies recommends that you keep 3 fully serviced univalves in your spare parts system to prevent downtime.

Dump Valve (Diverter Valve)

The dump valve is a safety feature that is located on the UHP pump manifold and controlled by the DUMP VALVE 40K switch in the cab control panel. When activated, high pressure water is diverted to the blasting head. When deactivated, water is diverted from the blasting head to the clean water tank, immediately eliminating high pressure water at the blasting head. The dump valve assembly consists of a hydraulic cylinder, shutoff cartridge, diffuser tube and digital high pressure sensor.

The shutoff cartridge is located inside the body of the diverter valve assembly. It is generally open and controlled by the DUMP VALVE 40K switch in the cab control panel. When the DUMP VALVE

40K switch is on, the shutoff cartridge is closed by the hydraulic cylinder forcing all high pressure water to the blasting head. When the DUMP VALVE 40K switch is off, the hydraulic cylinder opens the shutoff cartridge, diverting high pressure water from the blasting head directly to the bypass hose and the clean water tanks. This allows the UHP pump to remain operating at maximum capacity, ready to provide high pressure to the blasting head immediately.

Note:
A pressure switch in the charge water supply line near the UHP pump monitors charge water pressure and automatically shuts down the UHP system by disengaging the OMSI Drive PTO if charge water pressure drops below 30 PSI (1.7 Bar). This is a safety feature to prevent damage to the UHP pump from cavitation caused by low charge water pressure.

When setting pressure ***ALWAYS*** ensure that the system pressure drops to less than 100 PSI (7 BAR) immediately when the DUMP VALVE 40K switch is turned off. If system pressure does not immediately drop below 100 PSI when the dump valve is activated, do not use the equipment until repairs are made to the dump valve.

Manual Bypass Valve

The Manual Bypass Valve is located on top of the UHP pump Manifold. The operator can open or close the valve to increase or decrease water volume and pressure to the blasting heads while maintaining optimum engine RPM and torque.

The Manual Bypass assembly consists of a manual adjustment knob, bypass cartridge, diffuser tube, bypass hose and a rupture disc. During high pressure blasting operations, turning the adjustment knob on the manual bypass valve clockwise will decrease the flow of water through the bypass cartridge and system, increasing water volume and pressure to the blasting heads. Turning the adjustment knob counterclockwise will divert more of the high pressure water flow through the manual bypass cartridge to the bypass hose and clean water tanks, reducing water volume and pressure to the blasting heads. Bypassing a large volume of water through the manual bypass valve at high pressure can cause the water temperature to rise in excess of 210 degrees Fahrenheit (99 C).

Typical Dump Valve

Manual Bypass Valve & Rupture Disc

Hot water can significantly reduce the service life of the packing seals in the high pressure pump.

When setting initial blasting pressure, always open the manual bypass valve completely, set the engine and UHP pump to maximum operating RPM and close the diverter valve. Then slowly close the manual bypass valve while monitoring the high pressure gauge until the desired operating pressure is achieved. The manual bypass valve continuously recirculates a small volume of water back to the clean water tank. Once the

desired blasting pressure is set, high pressure to the blasting heads can be turned on or off using the diverter valve controlled by the DUMP VALVE 40K switch.

Rupture Discs

There are two rupture discs installed on the high pressure side of the UHP pump that protect the high pressure waterblasting system against unusually high spikes in pressure. The rupture discs are designed to burst and immediately relieve pressure if the water pressure in the ultra-high pressure system exceeds the disc burst rating.

One rupture disc is set to rupture or burst at a higher psi than the other, typically 50,000 psi (3447 BAR) for one disc and 56,000 psi (3861 BAR) for the other. This design is a safety feature to ensure both rupture discs do not burst at the same time which could damage components in the ultra-high pressure system. The burst rating for each rupture disc is calculated based on 1.25 times the maximum operating pressure of the UHP system and 1.4 times the maximum operating pressure of the UHP pump.

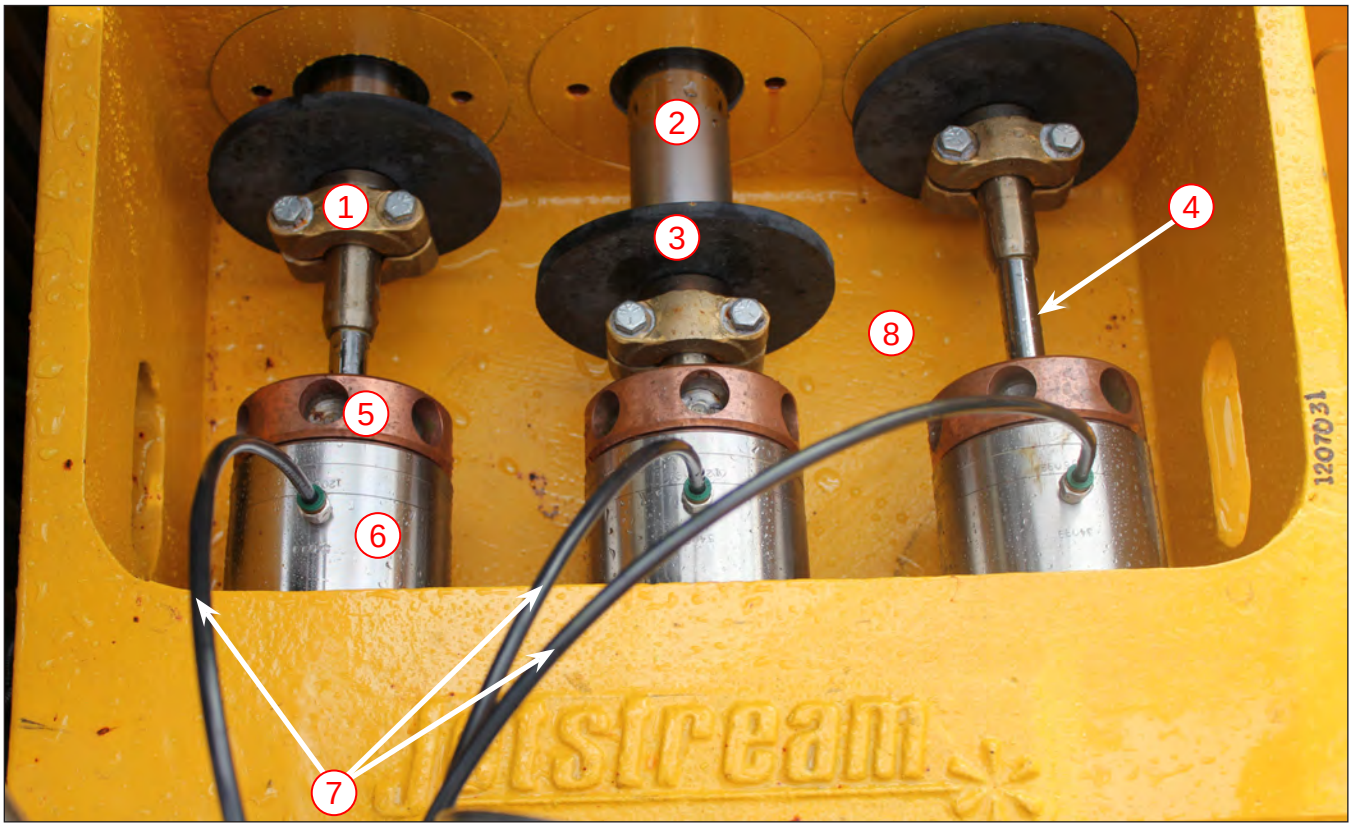
Never operate the system without the properly rated rupture discs installed. If a rupture disc bursts it will have to be replaced prior to resuming waterblasting operations. (Refer to Rupture Disc Replacement Procedure in the maintenance section of this manual). Always find and correct the problem that caused the rupture disc to burst before reactivating the machine. Test the high pressure circuit at low pressure after replacing a rupture disc to verify proper system operation before resuming high pressure operations.

WARNING

EXCESSIVE PRESSURE IN THE HIGH PRESSURE BLASTING SYSTEM CAN CAUSE EXTENSIVE DAMAGE TO EQUIPMENT AND SEVERE INJURY OR EVEN DEATH TO PERSONNEL. IF A RUPTURE DISC BURSTS IT USUALLY INDICATES A PROBLEM THAT NEEDS TO BE CORRECTED BEFORE WATERBLASTING OPERATIONS CAN RESUME. NEVER INSTALL RUPTURE DISCS WITH A HIGHER BURST RATING THAN RECOMMENDED.

Typical 50,000 PSI (3,448 BAR) Rupture Disc On UHP Manifold

Typical 56,000 PSI (3,861 BAR) Rupture Disc On Manual Bypass Valve



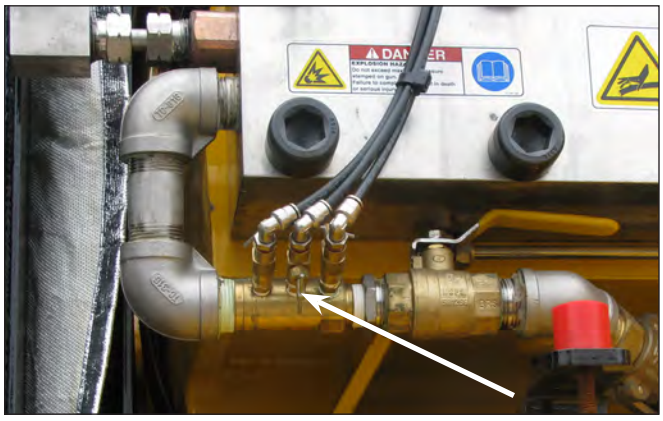
UHP Pump Bilge & Bilge Compartment Components

1. Coupling
2. Pony Rod (Connecting Rod)
3. Deflector
4. Plunger
5. Gland Nut
6. Stuffing Box
7. Lubrication Lines
8. Bilge

Packing Lube Water And Bilge Pump

There are three (3) stuffing boxes, packing seals and plungers in the Ultra-high pressure pump that must be continuously lubricated and cooled to achieve maximum life expectancy. Lubrication and cooling water for the plungers and packing seals is provided by lubrication lines connected to the charge water supply line just below the UHP pump manifold.

A metering valve on each line controls the flow of water to the stuffing box. The flow of water to the stuffing box should be checked at the beginning of each shift and periodically during operation. This should be done with the transmission PTO engaged, the charge pump activated and the engine at idle. There should be a steady flow of water from the back of each gland nut. Insufficient water flow to packing glands could cause the stuffing box to overheat and crack or damage to the packing seals or the plunger. Packing seals



Charge Water Supply Line & Metering Valves

can also be damaged if the metering valves are open to wide, allowing excessive water flow to packing glands. For more information on adjusting the flow of lubrication and cooling water, refer to the Jetstream Pump Operation manual.

Packing lubrication and cooling water is drained from the high pressure pump by a bilge pump drain system. The system is completely automatic and activated whenever the main circuit breakers are activated. A fuse in the control panel protects the bilge pump circuit from an overload.

Water drains from the high pressure pump cooling water sump (bilge) by gravity to a sump box equipped with an automatic switch that is connected to the bilge pump. When the water level in the sump box raises enough to activate the automatic switch, the bilge pump is activated and pumps the water from the sump box to the debris tank. When the water level in the sump box is lowered, the switch will turn the pump off.

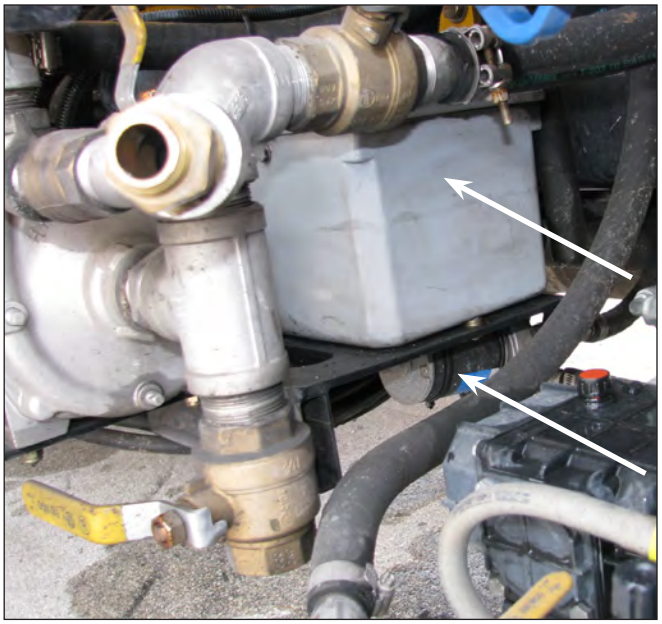
The sump automatic switch and inside of the sump box are accessed by removing the sump box lid. It is important to periodically remove the lid to inspect the switch and clean out accumulated debris that can restrict water flow to the pump.

Information and owner's manuals for the bilge drain system components are included with this manual. Refer to this information for additional operation and service data.

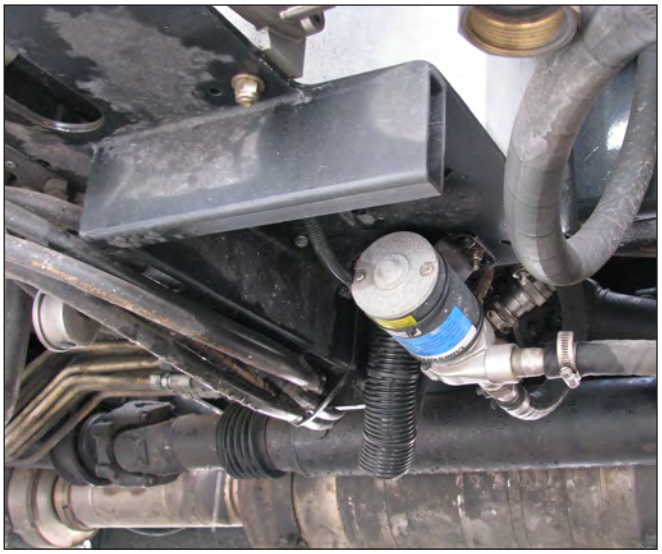
The following bilge pump system components should be inspected daily or at the start of each shift:

- Inspect the cooling water sump (bilge) in the UHP pump. Clean any debris that may restrict drainage to the bilge pump system.
- Inspect the drain hoses and sump system for loose fittings.
- Monitor the operation of the bilge pump system at the start of each shift to make sure the pump and automatic switch are working properly.

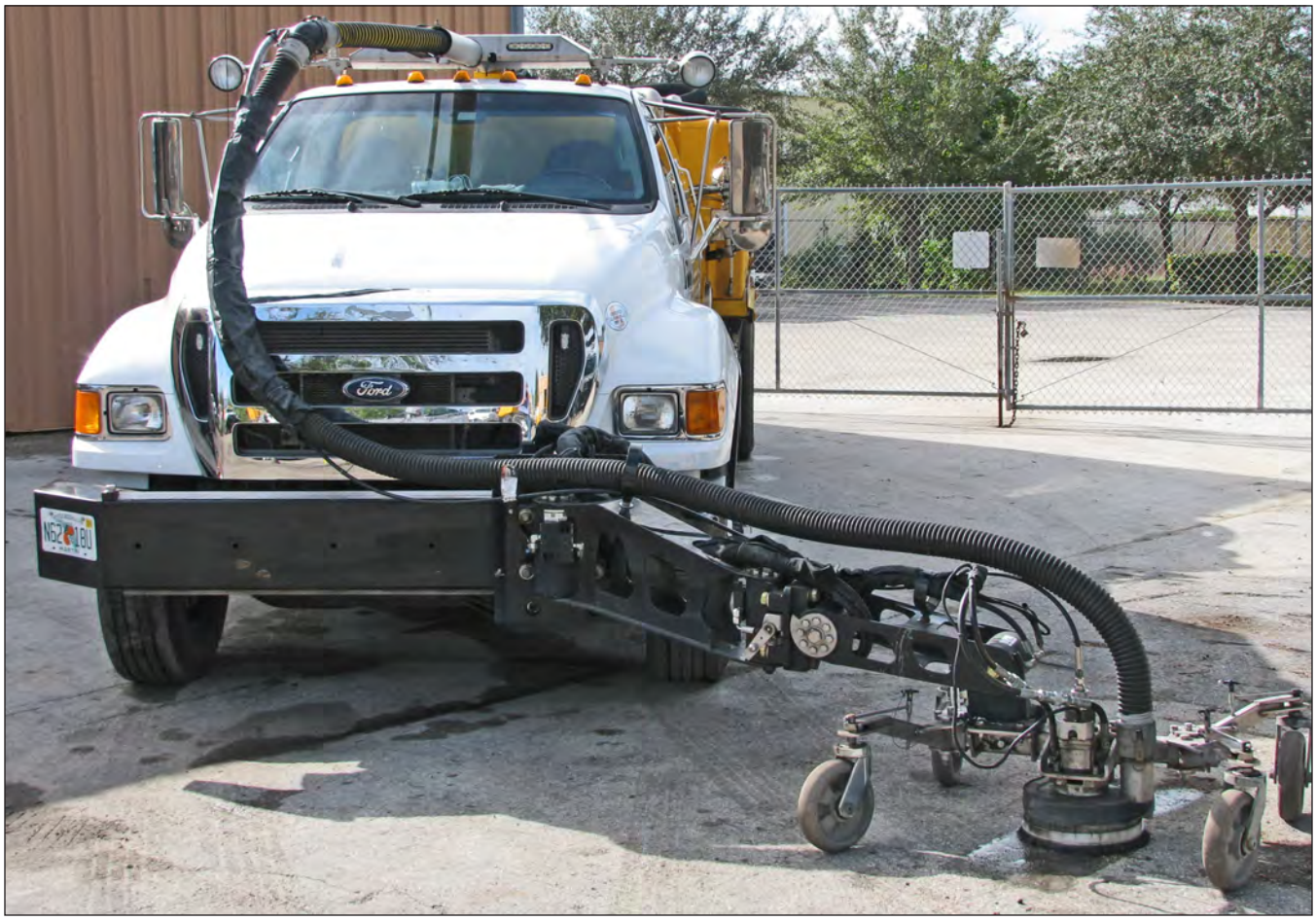
NOTICE:
IT IS IMPORTANT TO PERIODICALLY INSPECT THE BILGE BOX AND REMOVE ANY DEBRIS OR CONTAMINANTS THAT MAY HINDER THE PERFORMANCE OF THE AUTOMATIC FLOAT SWITCH. YOU SHOULD USE WATER BASED GREASE SOLVENT TO CUT ANY OIL THAT ACCUMULATES IN THE BILGE BOX.



Bilge Pump & Sump Below UHP Pump



Bilge Pump



Hog Arm & Hog Head

2.3 Hog Arm and Hog Heads

Overview

The Hog Arm assembly is mounted to the front of the chassis, just forward of the bumper. All functions of the Hog Head and arm are controlled by the joystick and switches in the control panel. The hydraulic system provides the power for all functions of the Hog Arm and the power to drive the hydraulic thru-shaft motor that rotates the spray bar.

The hydraulic system is powered by the truck engine and transmission. It is activated by the PTO switch (SYSTEM ON) in the truck dash panel. The truck must be in Work mode with the PTO engaged and transmission in gear before the hydraulic system will operate. (Refer to the Startup procedure in the Waterblasting Operation section of this manual).

Joystick & Control Panel

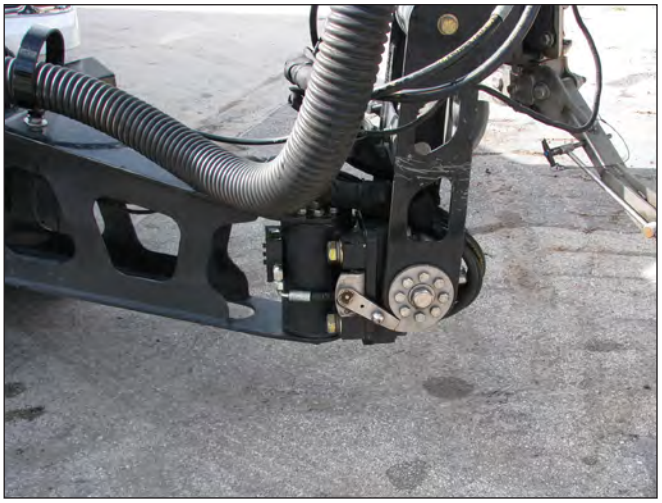
Control Panel & Float Switch

Arm Safety Lock Released

Hog Arm

The SH7500 is equipped with 4-Axis Hog Arm. The arm is a two stage design allowing the operator to move the entire arm side to side or only move the forward section using controls in the joystick.

The arm can also be set to float. Float mode is activated by pressing the FLOAT switch in the control panel and should always be used whenever waterblasting operations are underway. Float mode releases all up and down hydraulic pressure from the arm allowing the blasting head and arm to move freely up or down with the contour of uneven surfaces, preventing damage to the blasting heads and arm during removal operations. The Hog Arm can be moved from left to right but cannot be raised up or down while in float mode.



Arm Safety Lock Engaged

WARNING

ACTIVATING FLOAT MODE WHEN THE BLASTING HEADS ARE OFF THE GROUND OR WITH ARM IN THE UPRIGHT POSITION WILL RELEASE HYDRAULIC PRESSURE AND CAUSE THE ARM AND BLASTING HEADS TO DROP SUDDENLY WHICH WILL RESULT IN MAJOR DAMAGE TO COMPONENTS AND COULD CAUSE SEVERE INJURY TO PERSONNEL.

ALWAYS MAKE SURE THE ARM AND BLASTING HEADS ARE IN THE FULL DOWN POSITION WITH THE BLASTING HEAD CASTOR WHEELS FIRMLY ON THE GROUND BEFORE ENGAGING FLOAT MODE.

When the Hog Arm is raised to the full up position, the arm safety lock will automatically engage to secure the arm in the up position for transit. This lock is a safety feature that prevents the Hog Arm from being lowered accidentally while the vehicle is operating in Drive mode.

The operator must release the safety lock manually before the Hog Arm can be lowered. To release the lock, make sure the truck is stopped with the parking brake set. Raise the arm slightly, then manually rotate the lock lever away from the cam until it seats in the release detent. The detent holds the lock lever away from the cam and prevents the safety lock from automatically engaging during blasting operations.

To engage the safety lock, rotate the lever toward the cam until it rests against the cam. A spring in the hinge will hold the lever against the cam and automatically engage the lock lever when the Hog Arm is raised to the full up position.

NOTICE:
To release the lock, the hydraulic system will have to be engaged and the Hog Head raised to relieve the strain on the lever. Additionally, the lock lever should be secured with a plastic tie wrap or other type of fastener to ensure it cannot accidentally release while driving if the spring fails.

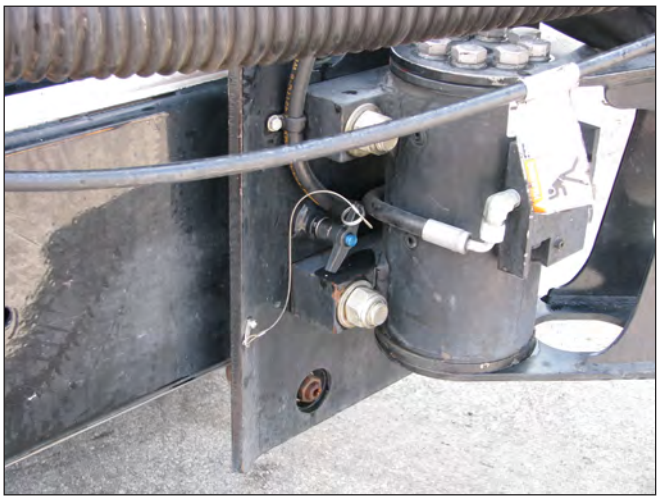
Hog Arm Slide Track

Hog Arm Slide Track (Optional)

An optional slide track Hog Arm mounting system is an available option that enables the operator to manually move the arm to either side of the truck or any place in between. The Hog Arm is mounted to a special chassis plate that rides on heavy duty rollers and slide tracks on the front of the chassis. A quick release T-handle lock pin secures the arm in the selected position.

To slide the arm to a different position, lower the arm to the full down position with the blasting head wheels on the surface. Activate float mode to eliminate hydraulic up or down pressure, then remove the pin and slide the arm and blasting head to the desired position. Secure the assembly with the lock pin.

Refer to the Waterblasting Operation section for additional instructions on operating the Hog Arm slide track system.



Slide Track T-Handle Lock Pin

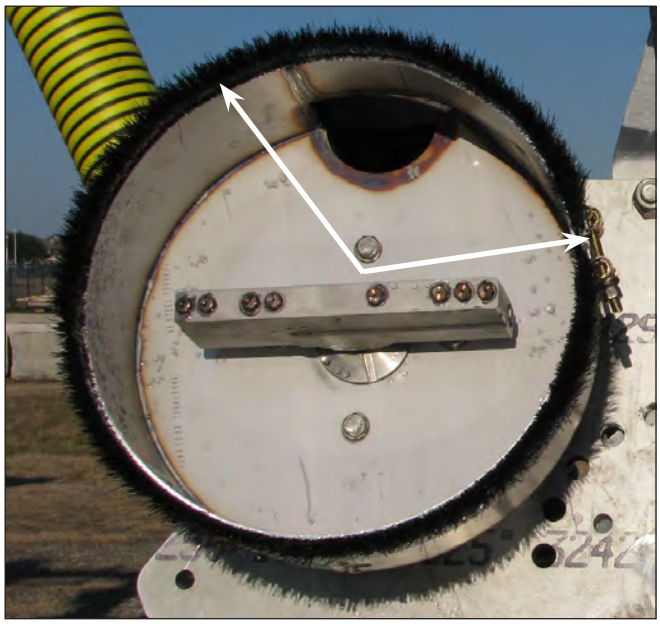
Hog Head In Operation

2.4 Hog Head

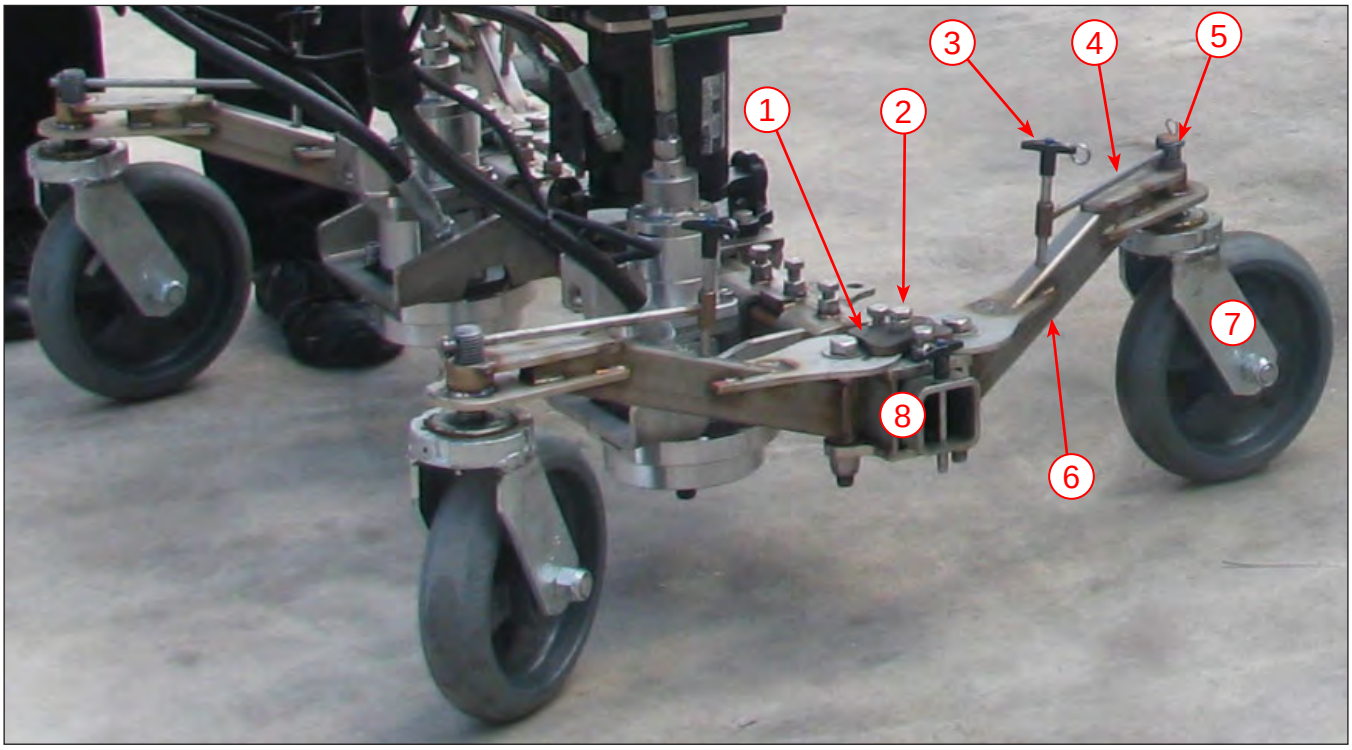
The Hog Head (blasting head) assembly is a single blasting head design mounted on the end of the Hog Arm. The blasting head is supported by a tubular head plate chassis with four heavy duty castor wheels that support the blasting head at a preset height to prevent the spray bar and shroud from contacting the pavement.

A wear brush clamped to the shroud provides a partial seal between the blasting head assembly and pavement. The wear brush regulates vacuum air flow into the shroud and reduces the amount of debris and water exiting the blasting head during blasting operations.

The wear brush is a important safety feature of the Hog Head and must be adjusted as it wears and replaced as necessary. It should always be adjusted so the brushes are making light contact with the pavement.



Typical Wear Brush & Wear Brush Clamp



Tubular Head Plate Caster Wheels, Arms & T-Handle Pins

1. Adjustable Friction Plate
2. Friction Plate Bolt & Jam Nut
3. T-Handle Pin
4. Height Adjustment Rod
5. Castor Wheel Assembly Threaded Shaft
6. Castor Wheel Support Arm
7. Castor Wheel Assembly
8. Tubular Head Plate

NOTICE:
ALWAYS MAKE SURE TO CHECK THE HOG HEAD FOR SMOOTH AND PROPER OPERATION BEFORE EACH SHIFT. DO NOT USE EQUIPMENT THAT HAS NOT BEEN CHECKED THOROUGHLY.

The spray bar is rotated by a special hydraulic powered “thru-shaft” motor. The center of the rotating shaft is drilled to allow high pressure water to pass through the shaft to the spray bar. Spray bar rotation is controlled by the HEAD ROTATION speed dial on the control panel.

The Hog Head design allows the operator to choose several different length spray bars for specific removal widths. The operator can choose spray bar rotation speeds between 700 and 3000 RPM.

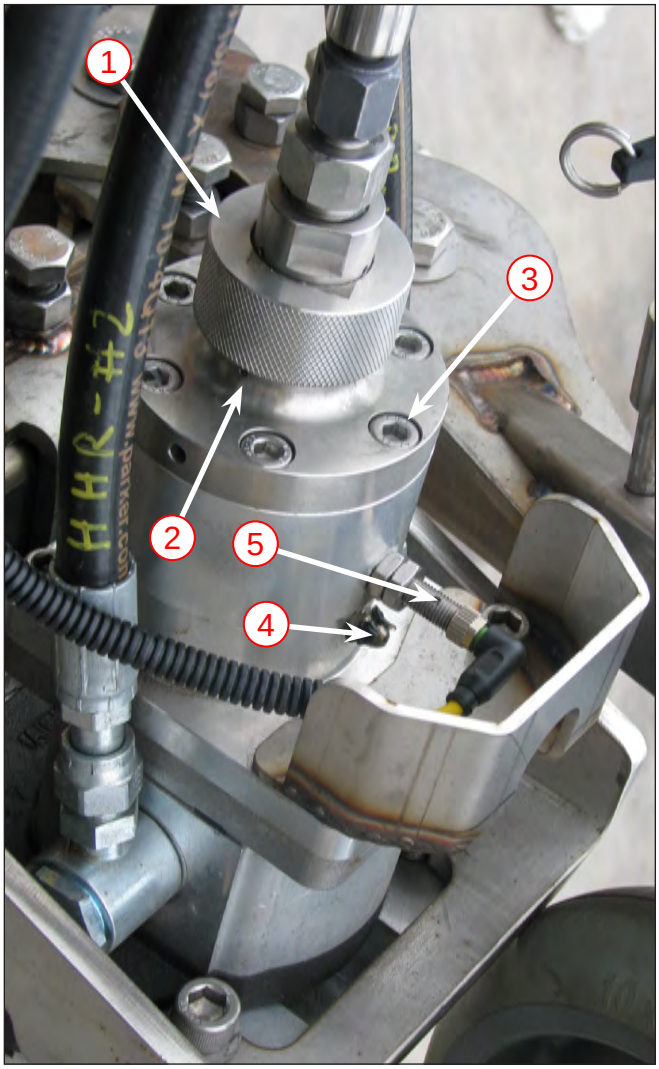
The flexible design of the tubular head plate allows the operator to configure the blasting head in a variety of configurations to accommodate different waterblasting operations. It is equipped with four adjustable heavy duty castors wheels that support the blasting head and prevent the spray bar and shroud from touching the road surface. The castor wheels are attached to heavy duty arms mounted to the tubular head plate. The arms swivel to allow the wheel location to be adjusted to avoid hazards such as rumble strips and road reflectors or to accommodate other operating situations. The arms are secured in position by adjustable friction plates with a bolt and jam nut locking system. The arms are adjusted by loosening the jam nut and moving the arm to the desired position. Then tighten the jam nut to secure the arm.

The castor wheel mount assemblies are threaded to provide spray bar/blasting head height adjustment. T-handle adjustment rods attached to each castor wheel assembly are used to rotate the threaded shaft to move the wheels up or down. The rods are designed to hold the castor wheel adjustment and keep the blasting head at the desired height. Blasting head height adjustment should be checked before each shift and the wheel castors should be inspected for damage and excessive wear daily. The castors and wheels should be greased daily for maximum life expectancy.

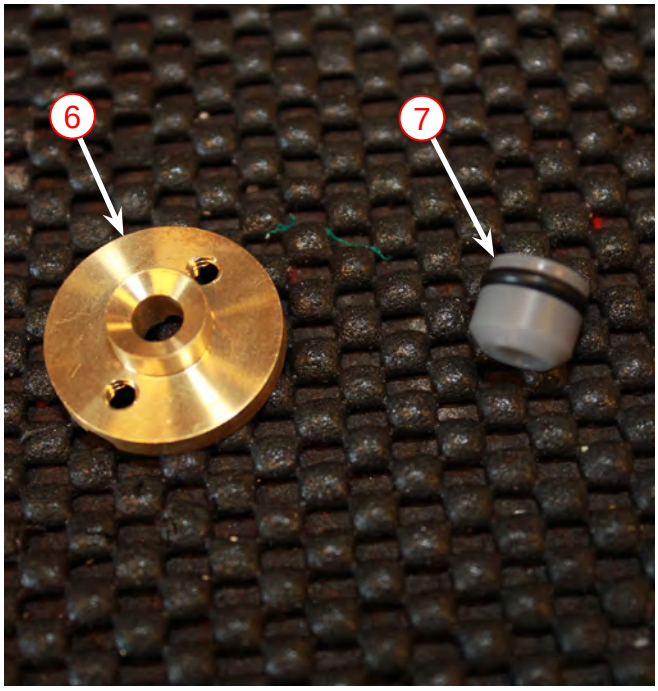
Refer to the Waterblasting Operation and Maintenance sections of this manual for additional information on the operation and maintenance of the castor wheels and blasting head assemblies.

NOTICE:
FOR MAXIMUM PRODUCTION, STANDOFF DISTANCE SHOULD NEVER BE MORE THAN ONE (1) INCH.

Caster Wheel Adjustment Rods & T-Handle Pins



Thru-shaft Motor Components



Swivel Seal & Brass Backup Ring

1.	Swivel Nut
2.	Swivel Seal Weep Hole
3.	Thru-shaft Cover
4.	Grease Fitting
5.	Speed Sensor
6.	Brass Backup Ring
7.	Swivel Seal

2.5 Thru-shaft, Spray Bars, Protectors And Nozzles

Thru-shaft Motor

The hydraulic powered thru-shaft motor rotates the spray bar on the blasting head assembly. The center of the rotating shaft is drilled to allow high pressure water to pass through the shaft to the spray bar. A specially designed swivel seal and brass backup ring create a water tight, high pressure seal at the connection of the high pressure hose to the thru-shaft. The hose is secured to the rotating shaft housing by the swivel nut.

The swivel nut is hand tightened only. If the nut becomes loose, the hose will wobble and damage the swivel seal. Additionally, if the swivel nut is overtightened by using a pipe wrench or pliers, the swivel seal will be damaged. The swivel nut must be checked daily to ensure it is tight and that the swivel seal is not leaking. Any water dripping from the weep holes just below the swivel nut while the system is pressurized indicates the seal is leaking and must be replaced. Operating the blasting head with a leaking swivel seal will cause complete failure of the seal, stopping blasting operations.

The RPM of the thru-shaft motor is controlled by the HEAD ROTATION speed dial on the control panel. A speed sensor on the thru-shaft motor housing continuously monitors the RPM of the thru-shaft/spray bar and displays the speed on the digital HEAD ROTATION speed gauge in the panel. During blasting operations, the operator can monitor the RPM of the spray bar and make adjustments as necessary.

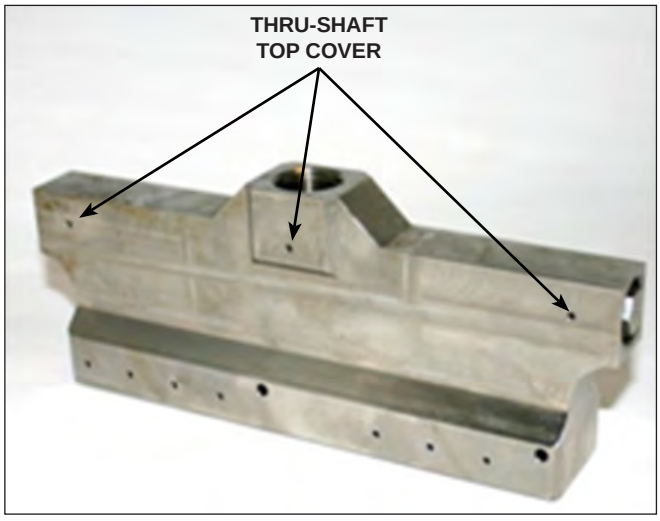
Head Rotation Speed Dial & Head Rotation Speed Gauge

⚠ CAUTION ⚠

THE THRU-SHAFT MOTOR BEARINGS MUST BE LUBRICATED DAILY WITH THE GREASE SPECIFIED IN THE MAINTENANCE MATRIX. FAILURE TO LUBRICATE THE BEARINGS DAILY OR USING GREASE OTHER THAN THE GREASE SPECIFIED BY HOG TECHNOLOGIES WILL VOID THE WARRANTY.

Spray Bar

The spray bar is a quick change design that is attached to the threaded thru-shaft. Spray bars are constructed of high quality stainless steel and available in various sizes ranging from six inches to thirty six inches. Aggressive and non-aggressive spray patterns are available for all heads.



Typical Spray Bar, Protector & Weep Holes

Spray bar selection is determined by requirements of the removal application being performed. The width of the spray bar selected is critical. When removing paint lines, it should be sized to the width of the line whenever possible. In most situations, the spray bar selected should be 2” wider than the width of the line to reduce the potential for damage and increase productivity by concentrating the blasting pressure over the painted line.

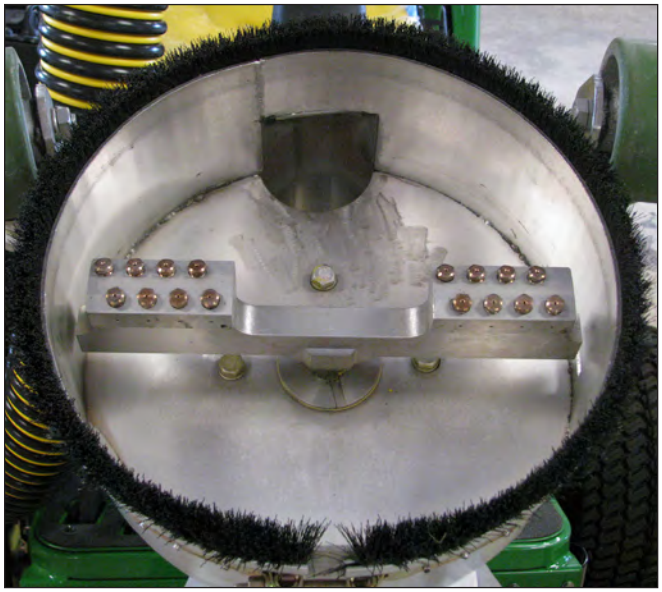
The following should be considered when selecting a spray bar:

- The size of the line marking. The spray bar should be 2” wider than the marking.
- The type of marking being removed. (Paint, thermal or rubber)
- The thickness of the material being removed.
- The type of road surface. (Concrete or asphalt)
- Profile requirements per job specifications.

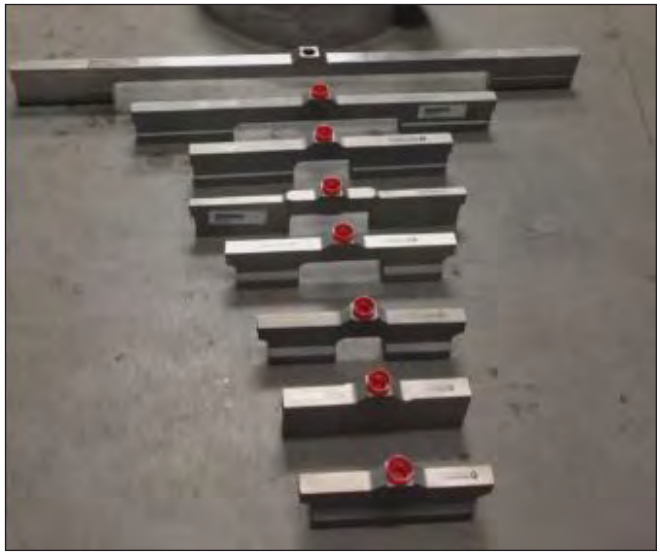
Hog Technologies offers a variety of spray bar and blasting head configurations to meet requirements of all types of removal projects. Examples of available spray bar configurations are included in the Waterblasting Operation section of this manual. You can also contact our customer support department for assistance in selecting the correct spray bar and/or nozzle configuration for your project at (877) HOG-ROAD.

Refer to the Maintenance section of this manual for instructions to install or replace spray bars and nozzles.

NOTICE:
AFTER INSTALLATION OF NEW NOZZLES AND/OR A SPRAY BAR, THE WEEP HOLES ON ALL HIGH PRESSURE FITTINGS SHOULD BE CHECKED FOR LEAKS UNDER PRESSURE. THIS SHOULD BE DONE PRIOR TO REPLACING THE SPRAY BAR PROTECTORS. THERE SHOULD NOT BE ANY WATER LEAKING FROM THE WEEP HOLES. ANY LEAKAGE IS AN INDICATION OF AN INSTALLATION ERROR, NOZZLE NOT SEATED CORRECTLY OR A DAMAGED COMPONENT.



Typical Spray Bar & Nozzles



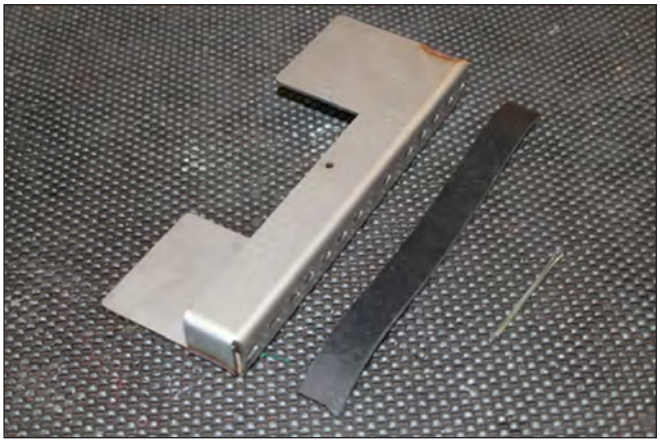
Various Spray Bar Sizes

CAUTION

BEFORE ATTACHING THE NEW SPRAY BAR TO THE HOG HEAD ASSEMBLY, ENGAGE CHARGE PUMP AT LOW PRESSURE TO PURGE THE SYSTEM. ANY DIRT OR DEBRIS IN THE SYSTEM CAN CLOG NOZZLE ORIFICES AND CAUSE SYSTEM PRESSURE TO SPIKE EXCESSIVELY CAUSING DAMAGE TO COMPONENTS OR RUPTURE DISCS ON THE UHP PUMP TO BURST.

Spray Bar Protector

Each spray bar is equipped with a spray bar protector that is held in place with one or two cotter pins. The spray bar protector shields the nozzles and spray bar from damage caused by debris during blasting operations. Never perform waterblasting operations without the spray bar protector installed as this will dramatically shorten the life of the nozzles and spray bar.



Typical Spray Bar Protector & Gasket

Nozzles

Ultra-High Pressure is produced by restricting the flow of water at the nozzles on the blasting head. Each nozzle delivers a stream of water at extremely high pressure that is determined by nozzle orifice size and it's Gallon Per Minute (GPM) flow at desired pressure. The performance ranges from least aggressive (.005") to most aggressive (.015"). The condition of the nozzles is critical to removal performance and maintaining a tight, cohesive stream as water is forced through the nozzles. Maximum productivity and 98% removal without damage requires nozzles to be in excellent condition. Nozzles should be inspected before the start of each shift as part of the pre-operation check or when the operator notices a loss in pressure or a change in performance while blasting. If visual inspection of the nozzle spray pattern indicates that the pattern is not in the # 1-4 quality range as indicated on the Nozzle Quality Guide in this section, the nozzle must be replaced.

Blasting Head With Spray Bar Protector Installed

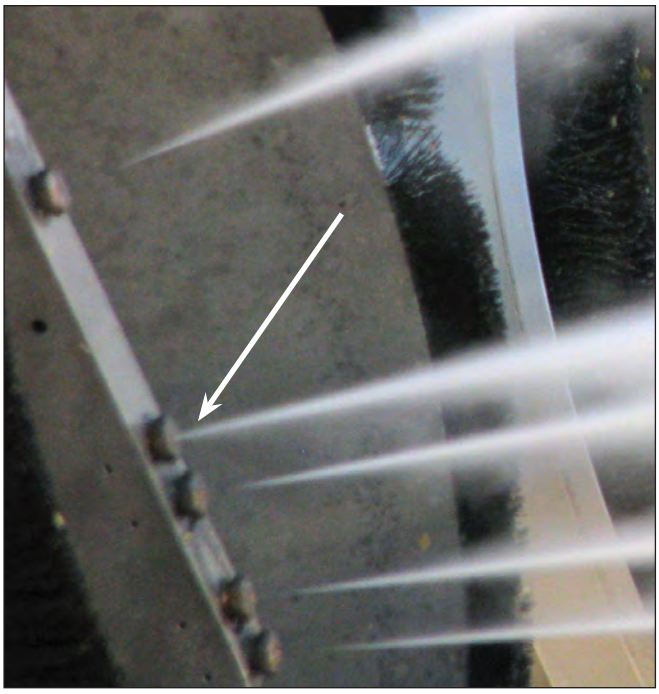
Testing and inspecting nozzles:

To inspect and test the nozzles, raise the arm to the full up position and set the parking brake. Make sure the waterblasting system is shutdown, then remove the spray bar protector. The protector will disrupt the spray pattern causing inaccuracies when inspecting or testing nozzle performance.

Once the spray bar protector is removed and all personnel are well clear of the blasting head, activate the UHP system and set the operating pressure to a safe level. Make sure the head rotation speed dial is set to 0 so the spray bar does not rotate. Staying well clear of the water jets, no closer than 18", visually inspect the spray pattern of each nozzle. If the spray is tight with a cohesive stream for 1/2 -1 1/2 inches from the nozzle, it rates as grade 4 or better (Refer to the Nozzle Quality Guide in this section of the manual) and it is good.

Spray Bar Nozzle

Good Nozzle Spray Pattern



Nozzles Showing Bad Spray Pattern
Nozzle Must Be Replaced

DANGER

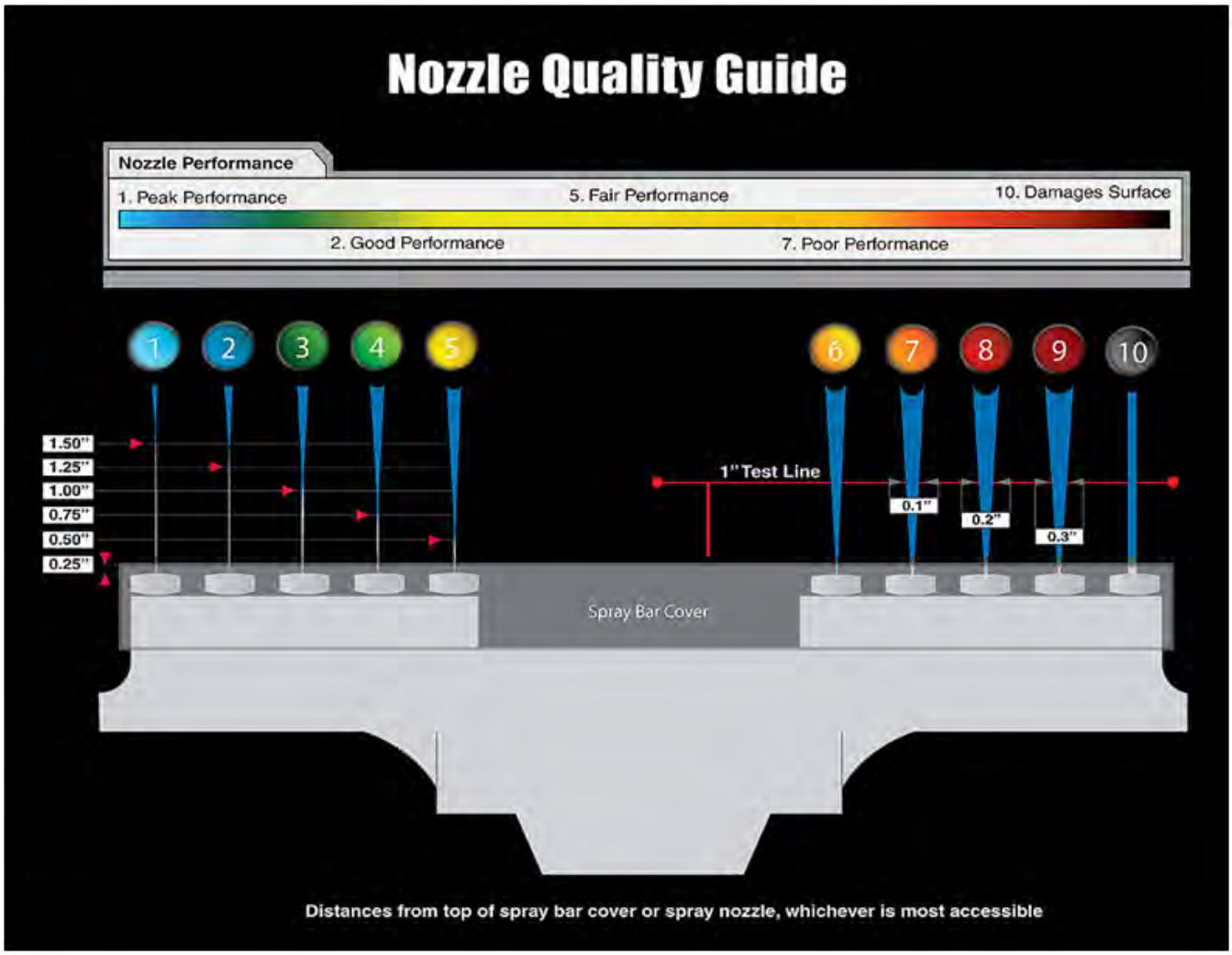
THE HIGH PRESSURE STREAM FROM THE SPRAY NOZZLES CAN CAUSE SEVERE INJURY OR DEATH IF IT COMES IN CONTACT WITH HANDS, FEET OR ANY PART OF A PERSON'S BODY. IT CAN ALSO PROJECT LOOSE DEBRIS IN THE AREA OF THE HOG HEAD WITH ENOUGH FORCE TO CAUSE SERIOUS INJURY, PARTICULARLY TO THE EYES. HIGH PRESSURE WATER CAN TEAR OFF SKIN AND INJECT WATER DIRECTLY INTO THE BLOOD STREAM WHICH CAN BE FATAL. ALWAYS DEACTIVATE THE HIGH PRESSURE SYSTEM BEFORE RAISING THE HOG HEAD AND MAKE SURE THE AREA IS CLEAR OF PEOPLE, HANDS AND FEET BEFORE ENGAGING THE PTO, CHARGE WATER DUMP VALVE AND 40K SWITCHES TO ACTIVATE THE HIGH PRESSURE SYSTEM TO TEST AND INSPECT THE NOZZLES WITH THE HOG HEAD RAISED.

If a nozzle rates as a 5 or higher on the Nozzle Quality Chart, it is worn or damaged and must be replaced. Nozzles are easy and quick to replace. Refer to the nozzle replacement procedure in the Maintenance section of this manual for detailed instructions for replacing nozzles.

Nozzles typically last 12-16 hours of blast time, however, you can experience shorter or longer nozzle life, depending on the source and quality of water being used. Any dirt or debris in the system can clog a nozzle orifice causing a spike in the high pressure system which will rupture the burst discs and could cause damage to components.

NOTICE:
NOZZLES MUST ALWAYS BE CHECKED WITH THE SPRAY BAR PROTECTOR REMOVED TO AVOID INACCURATE READINGS. START THE PUMP AT LOW PRESSURE AND SLOWLY INCREASE TO OPERATING PRESSURE TO CHECK NOZZLE QUALITY AND FOR LEAKS ON THE SPRAY BAR, NOZZLES AND HOSES. SHUTDOWN THE WATERBLASTING SYSTEM AND TRUCK ENGINE TO RELIEVE ALL WATER AND HYDRAULIC PRESSURE BEFORE MAKING ANY REQUIRED REPAIRS OR ADJUSTMENTS. TO INCREASE THE LIFE EXPECTANCY OF THE SPRAY BARS AND NOZZLES, ALWAYS REMEMBER TO INSTALL THE SPRAY BAR PROTECTORS BEFORE RESUMING BLASTING OPERATIONS.

You can select different nozzle sizes in a variety of spray bar configurations to accommodate the material to be removed and the type of substrate. The Nozzle Quality Guide in this section and Spray Bar Configuration Diagrams located in the Waterblasting Operation section will provide assistance in choosing the right nozzle configurations for most removal applications. The number of nozzles in a spray bar should be considered in every removal situation. The number of nozzles and the nozzle orifice size will determine the aggressiveness of the spray bar. As operators becomes more experienced, nozzle selection becomes easier. You can also contact Hog Technologies Customer Support toll free at (877) HOG-ROAD for assistance in selecting the proper spray bar and nozzle configuration for your job.



A nozzle should be removed from service if any of the following are indicated:

- Nozzle is split or damaged
- Nozzle is clogged
- Nozzle water spray is fanned out
- Nozzle's ability to hold pressure is suspect
- Nozzle's hex head is worn excessively from blasting
- Nozzle threads are damaged

When replacing nozzles make sure to check the flow and pressure rating. Use only nozzles with a manufacturer's pressure rating of at least the UHP pump's maximum operating pressure. We recommend that you only use nozzles, high pressure hoses and fittings supplied by Hog Technologies to ensure the nozzles and other components are compatible with your Ultra-High Pressure water-blasting system.

Shroud

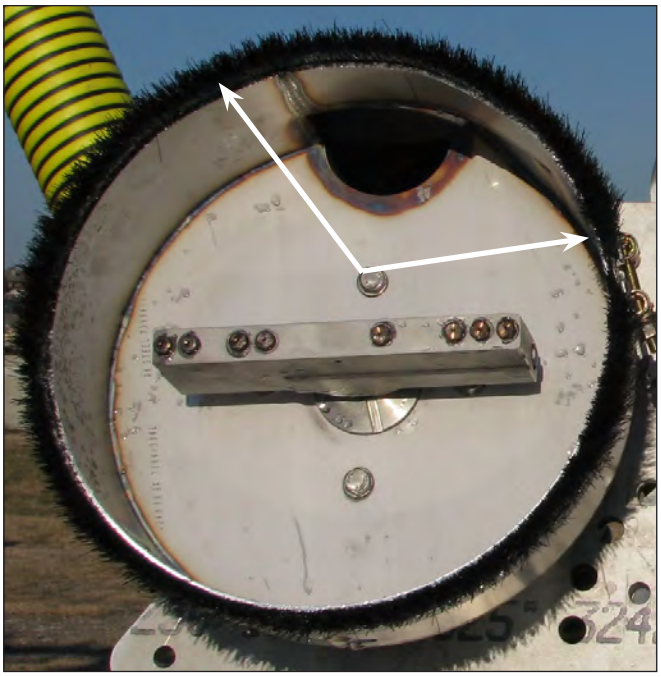
The shroud is the heavy duty stainless steel housing attached to the bottom of the thru-shaft motor housing that encases the spray bar, keeping water and debris contained for optimal vacuum extraction. The vacuum hose is connected to the top of the shroud by cam lock connectors. Shrouds are available in various sizes to accommodate a variety of spray bar lengths.

Wear Brush

The wear brush clamped to the bottom of the shroud provides a partial seal between the shroud and pavement. The wear brush regulates vacuum air flow into the shroud and reduces the amount of debris and water exiting the blasting head during waterblasting operations. The wear brush is an important safety feature of the blasting head system. It must be adjusted as it wears and replaced as necessary. The brush assembly should be adjusted so the brushes are always making light contact with the pavement.

To adjust the wear brush, lower the blasting heads to the ground and note the gap between the wear brush and the pavement. Loosen the brush clamp on the shroud, then slide the wear brush enough to eliminate the gap. Tighten the clamp and recheck. Readjust if necessary.

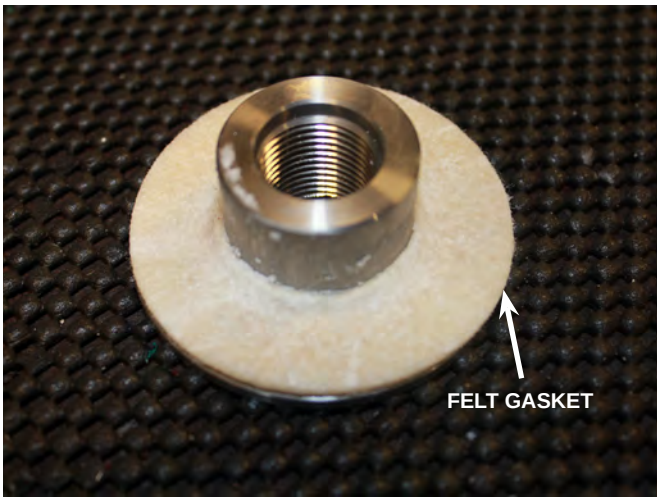
Refer to the Maintenance section of this manual for additional information on adjusting and replacing the wear brush.



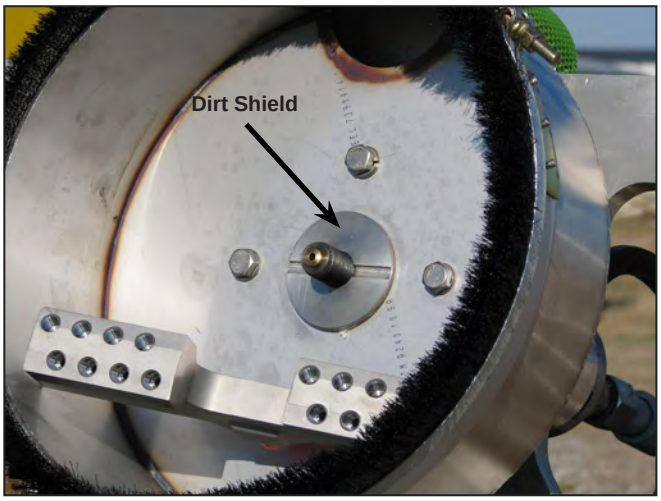
Typical Wear Brush & Wear Brush Clamp

Dirt Shield

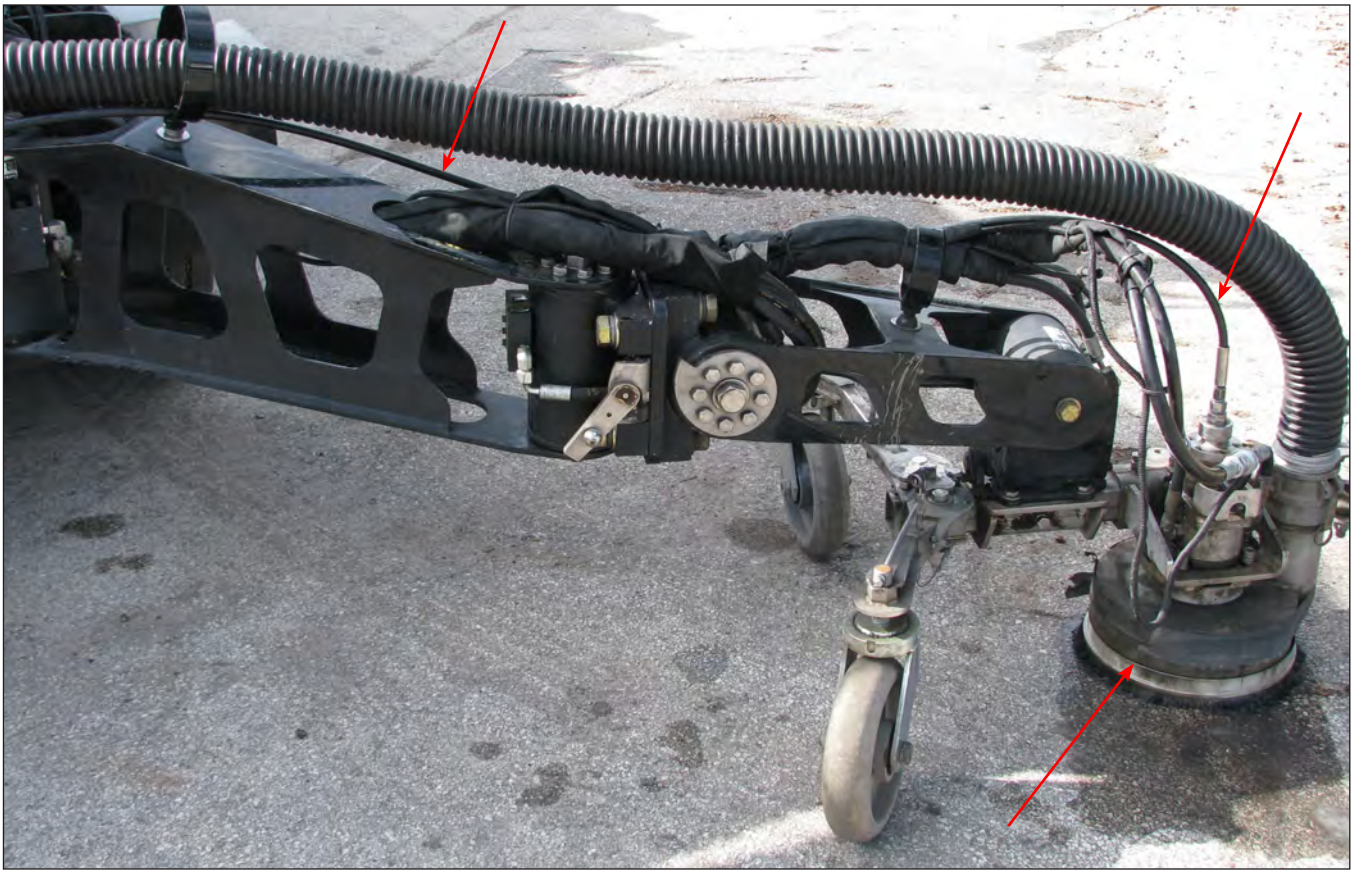
The dirt shield is a felt gasket and threaded stainless steel flat washer that protects the thru-shaft seals and bearings from dirt and debris during ultra-high pressure blasting operations. It is located between the spray bar and the shroud. The shield and felt gasket protects the shroud from damage while the spray bar is rotating. The dirt shield should be inspected prior to the start of each shift as part of the pre-start procedure and replaced if it becomes worn or damaged. When installing a dirt shield, it should be adjusted finger tight. If it is set too tight it will prevent the spray bar from rotating. (Refer to the Dirt Shield Installation procedure in the Maintenance section of this manual for instructions for replacing the dirt shield).



Dirt Shield & Felt Gasket



Dirt Shield Installed



Blasting Head & Ultra-High Pressure Hose

2.6 High Pressure Hoses, Connections & Fittings

The ultra-high pressure hoses used in the waterblasting system are tough but not invincible. They require proper care and handling to achieve maximum life expectancy. Only use high pressure hoses with an operating pressure rating of 40,000 psi (2758 Bar) and a listed burst rating of 60,000 psi (4,137 Bar). The primary ultra-high pressure hose transfers the water from the UHP pump to the blasting head. The hose is secured to the blasting head thru-shaft with the swivel nut. A swivel seal and brass backup ring are installed in the fitting at the swivel nut connection creating a Ultra-High pressure seal while allowing the thru-shaft to rotate freely. The swivel seal has a life expectancy of approximately 12 to 16 hours depending on the quality of water.

All high pressure hoses, fittings and connections have weep holes. Water leaking from a weep hole while the system is pressurized indicates that there is a worn or defective seal, loose connection or a damaged part. It is critical that the operator and/or maintenance personnel inspect the ultra-high pressure hoses, hose connections and fittings prior to the start of each shift, periodically throughout the shift and anytime there is a loss in pressure. Any hose, fitting or component that shows signs of deterioration, wear or leakage should be replaced immediately and before operating any high pressure waterblasting equipment. A more thorough inspection of all high pressure pumps and components should be conducted at each routine service interval.

Take proper care of your hoses:

A) Protect the ultra-high pressure hose from contact with sharp objects, abrasive surfaces, foot and/or wheel traffic.

B) Never subject an ultra-high pressure hose to a coil diameter less than 10" (.25 m) or pull on a coiled hose. Always make sure the hose is straight with no coils before pulling on the hose to deploy it.

C) Never pull hard on an ultra-high pressure hose or expose the hose to heavy loads like dragging equipment or deploying long lengths of hose. Never pull more than 25 feet of hose by a coupler or fitting. Always move long lengths of hose by the hose itself to keep the strain off the fittings.

WARNING

HIGH PRESSURE HOSES OF INFERIOR QUALITY OR OF A LOWER PRESSURE RATING THAN SPECIFIED BY HOG TECHNOLOGIES CAN RESULT IN DAMAGE TO EQUIPMENT AND/OR SEVERE INJURY TO PERSONNEL. NEVER USE REPLACEMENT HOSES WITH UNKNOWN PRESSURE RATINGS OR RATED LESS THAN REQUIRED SPECIFICATIONS.

WHEN REPLACING DAMAGED OR WORN HOSES YOU SHOULD ONLY USE HIGH PRESSURE HOSES PURCHASED FROM HOG TECHNOLOGIES WITH AN OPERATING PRESSURE RATING OF AT LEAST 40,000 PSI (2758 BAR.) THESE HOSES ARE DIFFICULT TO FIND. YOU SHOULD ALWAYS KEEP SPARES ON THE TRUCK AS SUGGESTED IN THE SPARE PARTS SYSTEM.

Retire hose from service if:

A) Cover is damaged and reinforcing wires are exposed to rust and corrosion.

B) End fitting shows evidence of damage or is leaking.

C) Hose has been kinked, crushed, stretched or coiled tighter than the minimum bend radius.

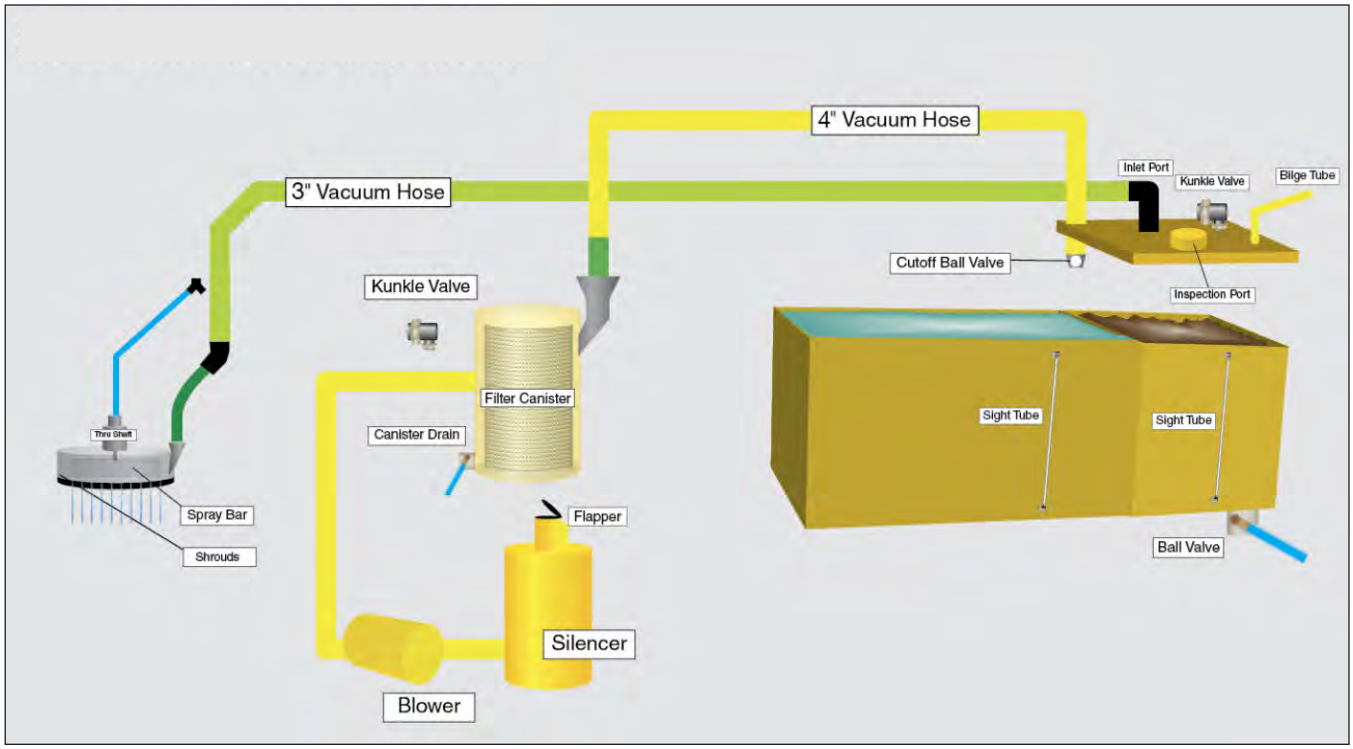
When replacing or connecting fittings or hoses always inspect the threads and use an anti-seize compound on all threads to prevent "galling." (Refer to the High pressure hose installation procedure in the Maintenance section of this manual). Galling is the term for thread damage that occurs from heat buildup in the threads of stainless steel fittings. This will destroy the threads and cold weld the fittings together before they are tight. To prevent system contamination, do not get anti-seize on the seat area of any high pressure water fitting. Always inspect and test the system with the blasting head up following repairs or at the start of each shift by operating the system at low pressure. Then slowly bring the equipment up to operating pressure while carefully monitoring the replaced components for any leaks. If a leak is detected, pressure down the system, tighten the fitting or hose and then check again until no leaks are detected.

WARNING

HIGH PRESSURE WATER FROM NOZZLES OR RUPTURED HOSES CAN CAUSE SEVERE INJURY. ALWAYS MAKE SURE TO CHECK YOUR WORK AREA TO ENSURE IT IS CLEAR OF PEOPLE BEFORE ACTIVATING THE PTO, CHARGE PUMP AND DUMP VALVE 40K SWITCHES TO ACTIVATE THE ULTRA-HIGH PRESSURE SYSTEM.

WARNING

REFER TO THE GENERAL SAFETY SECTION OF THIS MANUAL FOR A LIST OF PRECAUTIONS TO BE OBSERVED WHEN OPERATING OR SERVICING ULTRA-HIGH PRESSURE EQUIPMENT. USE ONLY THOROUGHLY TRAINED PERSONNEL TO PERFORM MAINTENANCE OR REPAIRS ON THE HIGH PRESSURE SYSTEM.



Debris Recovery System

2.7 Debris Recovery System

Overview

The vacuum system is powered by the main truck engine and is activated whenever the OMSI Drive PTO is engaged. The blower creates vacuum in the filter canister, debris tank, vacuum hoses and Hog Head. A filter located in the filter canister protects the blower.

Flexible hoses with quick disconnect fittings provide vacuum to the Hog Head shroud. Special swivel brackets allow the hose to move with the Hog Head.

The blower bearings require lubrication daily using special grease specified by the blower manufacturer. Refer to the Lubrication Chart in the Lubrication & General Maintenance section of this manual and the blower manufacturer's manual for lubrication specifications or additional information on the operation and maintenance of the blower.

The vacuum is monitored by a digital gauge in the control panel and an optional gauge on the debris tank. It is adjusted by increasing or decreasing the engine RPM. Thus, maximum vacuum, -7 inHg (178 mmHg) is typically achieved at 1800 RPM (Maximum engine operating RPM). Relief valves (Kunkle valves) on the vacuum filter canister and debris tank will automatically open if excessive vacuum in the system occurs. Always test the valves and all vacuum hose connections at the start of each shift to ensure the valves are operating properly and there are no vacuum leaks in the system.

Blower components have extremely small tolerances and must be protected from the debris. The vacuum filter should be cleaned daily. The canister is equipped with a door in the side that provides easy access to the filter and a means to inspect the canister for excessive debris, water or to clean the filter. There is a manual drain valve at the bottom to remove water from the canister as needed. Make sure the vacuum system is shutdown before opening the canister door or attempting to drain the water. Never leave the drain valve open when the vacuum system is operating.

Hog Arm, Hog Head & Vacuum Hoses

Note:
Make sure the drain valve is closed, the canister door seal is clean and the door is properly latched before operating the vacuum system. The system will not be able to develop enough vacuum if the canister door is not sealed and latched or the drain valve is open.

It is normal for some water to travel to the vacuum filter canister, therefore, it should be drained each time the debris tank is drained or at least once every 2 hours of operation. Remember that excessive water in the canister can pass through the filter and cause severe damage to the blower. Always make sure the OMSI PTO is disengaged to stop the vacuum blower before draining the filter canister and always close the drain valve when draining is complete.

Vacuum Hoses

The primary vacuum hose runs from the cutoff ball valve connection on top of the debris tank to the vacuum hose connection on the vacuum filter canister. Another 3" debris suction vacuum hose runs from the debris inlet elbow on the top of the debris tank to the Hog Head. The hoses are equipped with quick connectors at the Hog Head end that allows additional vacuum hoses to be added or for servicing Hog Head vacuum hoses and components. Other quick connectors provide access to other components of the vacuum system.

Consistent and proper vacuum is important to the proper operation of the vacuum system. Debris buildup, kinks, damage or leaks will cause a reduction in vacuum at the blasting head, reducing the efficiency of operation or cause operations to stop completely. Many problems with vacuum hoses are caused by damage or kinks. You should avoid tight bends and maximize the radius of all hose curves to minimize the chance of a kink. It is very important to protect the hoses from contact with sharp objects, abrasive surfaces, foot or wheel traffic and to inspect the hoses daily to ensure

there is no damage, signs of chaffing or kinks. The inside walls of vacuum hoses develop wear points caused from the high velocity of abrasive debris traveling inside the hoses. The wear points are most prevalent in the outside radius of tight bends near the blast head and where the debris hose rises above the truck cab. The life of the hoses in these areas can be extended by rotating the hoses 120^0 once each week.

Some types of debris will buildup on the inside walls of the hoses to the point where it restricts debris flow in the system and reduces vacuum at the blast head. Debris buildup inside the hoses can be removed by tapping the outside walls with a dead blow hammer while the system is operating at maximum vacuum. This will flex the hose walls and cause the debris to break off and be sucked into the debris tank.

Damaged vacuum hose can be repaired by cutting out the damaged area and splicing in new hose. Temporary repairs can be made using duct tape.

Blower And Silencer

The blower is powered by the truck engine and activated whenever the truck is in WORK mode and the PTO switch is on. It is driven by the OMSI PTO and a poly chain carbon belt. To avoid damaging the belt you must periodically check the belt tension and adjust as necessary using the adjusting bolts on the mounting base of the blower. The tension specification for a new belt is different than the tension specification of a used belt with 20 hours or more of usage. Proper belt tension is extremely important. ***Never over tighten the belt.*** Drive belts are extremely strong and can cause severe damage to the PTO, pulleys and blower. Refer to the Maintenance section of this manual for belt tension specifications and instructions for adjusting the drive belt.

The blower bearing housing is equipped with two grease fittings that must be lubricated daily to achieve maximum life expectancy. Refer to the Lubrication & General Maintenance section of this manual and the Blower operation manual for lubrication specifications.

Filter Canister, Blower & Silencer

CAUTION

THE BLOWER BEARINGS MUST BE LUBRICATED DAILY WITH THE GREASE SPECIFIED IN THE MAINTENANCE MATRIX AND THE BLOWER MANUFACTURER. FAILURE TO LUBRICATE THE BEARINGS DAILY OR USING GREASE OTHER THAN THE GREASE SPECIFIED BY HOG TECHNOLOGIES AND THE BLOWER MANUFACTURER WILL VOID THE WARRANTY.

Blower airflow is expelled through a silencer connected to the outlet side of the blower. A flapper installed on the silencer keeps water and debris from entering the system damaging the blower when the unit is shutdown.

Blower components have extremely small tolerances and must be protected from the debris. If debris ever gets into the blower impellers, use paint/lacquer thinner or another non-corrosive cleaner to remove any residue build up inside. It will be necessary to disconnect the hose to the silencer in order to clean the blower. If large debris gets into the blower, it can cause severe damage to the blower.

CAUTION

THE BLOWER'S INTERNAL COMPONENTS HAVE EXTREMELY SMALL TOLERANCES AND MUST BE PROTECTED FROM THE DEBRIS. ANY FOD (FOREIGN OBJECTS OR DEBRIS) INCLUDING EXCESSIVE WATER, CAN CAUSE SEVERE DAMAGE TO THE BLOWER.

Typical Vacuum Canister Access Door & Filter

Filter And Filter Canister

The vacuum filter canister houses the vacuum filter which protects the blower from debris. The filter should be checked at the beginning of each shift and periodically during operation. It is normal for some water vapor to travel from the debris tank to the vacuum filter canister where it will accumulate. Therefore, the canister must be drained at the start of each shift and each time the debris tank is drained to ensure water does not accumulate to an unsafe level filter canister. Excessive water in the canister can pass through the vacuum filter and cause severe damage to the blower. There is a manual drain valve connected to a hose at the bottom of the filter canister to remove accumulated water as required. The engine must be at idle and the PTO disengaged before attempting to drain the canister. Once the water has been drained, close the drain valve to avoid losing vacuum suction during operation. The system will not be able to develop enough vacuum if the canister door is not sealed and latched or when the drain valve is open.

Typical Vacuum Canister Drain

NOTICE:
THE FILTER CANISTER WILL NOT DRAIN IF THE VACUUM SYSTEM IS OPERATING. ALWAYS MAKE SURE THE SYSTEM IS COMPLETELY SHUTDOWN BY REDUCING ENGINE SPEED TO IDLE AND DISENGAGING THE PTO BEFORE DRAINING THE CANISTER.

The vacuum filter is a pleated, reusable filter that is easily accessed through the door on the side of the canister. Once the filter has been removed you should de-grease with detergent and power wash at 2000 psi (138 BAR). A mild solvent solution may be used to clean thermoplastic or tar residue from the filter surface. Always check to ensure there are no damaged areas or holes that could allow debris to get into the vacuum blower or silencer. Replace the filter if it is damaged or shows any sign of deterioration.

Debris Tank Door & Latches

Vacuum / Debris tank

The debris tank is constructed from stainless steel panels. The debris tank door has a manual locking system and watertight inflatable door seal.

The pressurized door seal is supplied compressed air by the truck brake system air supply. A solenoid activated pressure valve controlled by a rocker switch on the rear of the tank inflates or deflates the door seal. Seal pressure is monitored by a gauge mounted to the rear truck chassis below the tank. Normal seal inflated seal pressure is 20-25 psi (1.4 - 1.7 BAR).

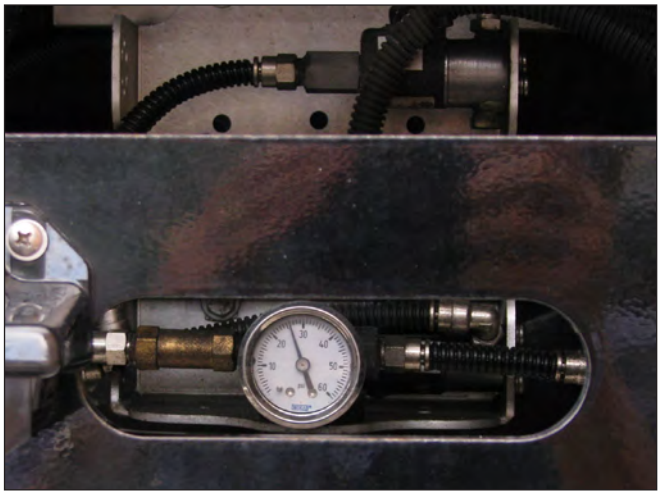
A cutoff ball valve automatically shuts off the vacuum flow if the tank becomes full, protecting the blower system. This valve reduces the possibility of excessive water from damaging the blower. If

Debris Tank Inflatable Door Seal

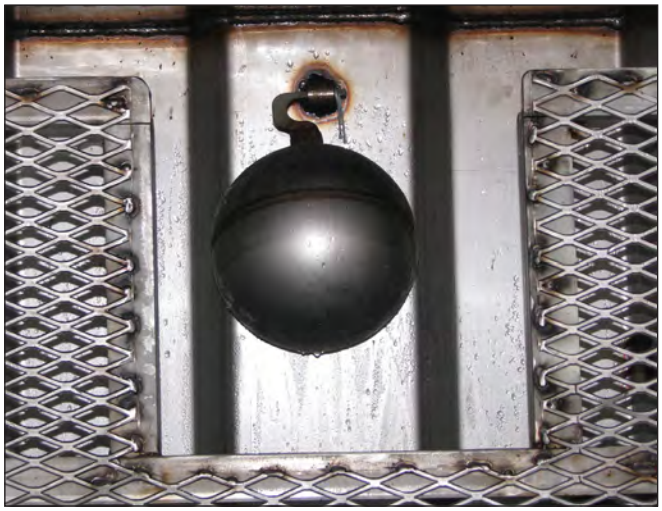
the cutoff ball valve shuts off the vacuum flow, the vacuum relief valves on the tank and vacuum filter canister will automatically open and reduce the vacuum to near 0 to prevent damage to the vacuum system.

A special filter bag (debris bag) is mounted on retaining pins near the top the stainless steel liner inside the debris tank. The vacuum system creates vacuum in the tank and debris mixed with water from the Hog Head flows directly into the debris bag where solid debris and particles over 100 microns are trapped. The filtered water exits the filter bag and flows into the debris tank where it accumulates until it is drained by the drain valve at the bottom of the tank or pumped out by the dirty water pump out system. The filter system allows for quick draining and easy disposal of filtered waste water while retaining the solids, enabling the operator to regain tank capacity.

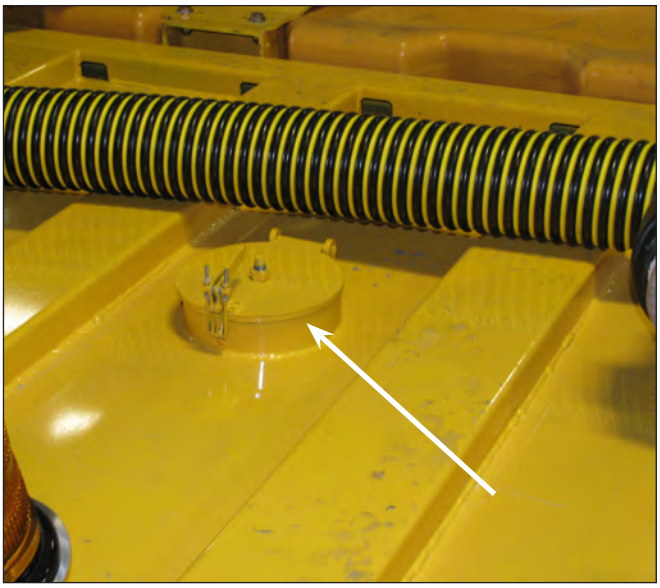
A site tube on the side of the debris tank indicates the recovered water level and an opening inspection port on top of the debris tank is used to monitor the solid waste level. A 4" ball valve allows for quick draining of the tank. Some water can travel to the vacuum filter canister, therefore, it should be drained each time the operator stops the machine or at least once every 2 hours of operation.



Seal Pressure Gauge



Cutoff Ball Valve



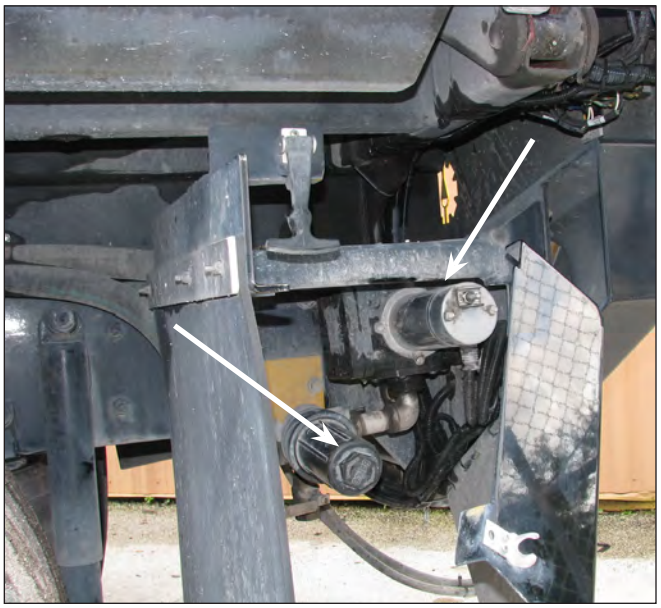
Opening Inspection Port on Top of Debris Tank

Typical Vacuum Canister Kunkle Valve

Filter Bag

The filter bag is biodegradable and designed to slide out of the tank with the debris during dumping. When installing a new bag, make sure to attach the loops at the top of the filter bag on the rear, horizontal side of the hooks in the tank. Do not wrap the loops around vertical section of the hooks. The hooks and loops hold the bag in position during operation and are designed to release the bag and allow it to automatically slide out with the debris during dumping. The bag will not stay in the proper position during operation and may not release properly during dumping if it is not installed properly.

Filtered wastewater is usually clean enough to dump in swales alongside the road, vacant fields and designated areas at airports. It should never be dumped directly into lakes and ponds or any standing water. Always check with the authorities to ensure you are dumping within local guidelines.



Wastewater/Dirty Water Transfer Pump & Strainer

⚠ WARNING ⚠

AN IMPROPERLY INSTALLED DEBRIS BAG MAY NOT RELEASE PROPERLY DURING DUMPING. THIS CAN CAUSE THE LINER TO SEPARATE FROM THE DEBRIS TANK, DAMAGING THE TANK AND/OR CAUSE SEVERE INJURY TO PERSONNEL. ALWAYS MAKE SURE THE DEBRIS BAG IS INSTALLED PROPERLY AND THAT ALL PERSONNEL STAY WELL CLEAR OF THE TRUCK AND DEBRIS TANK DOOR WHEN DUMPING OPERATIONS ARE UNDERWAY.

Control Panel & Dirty Water Pump Switch

⚠ WARNING ⚠

NEVER ROCK OR JERK THE DEBRIS TANK UP AND DOWN TO DISLODGE MATERIAL STUCK IN THE DEBRIS TANK. THIS CAN CAUSE THE HYDRAULIC RAMS AND/OR OTHER COMPONENTS TO FAIL WHICH COULD RESULT IN SEVERE INJURY TO PERSONNEL AND DAMAGE TO THE UNIT.

Wastewater Transfer Pump

The debris transfer pump circuit is activated by the DIRTY WATER PUMP switch in the cab control panel. When the circuit is activated, a diaphragm pump on the chassis below the debris tank will transfer wastewater from the tank to the wastewater bladder.

The operator can choose to operate the system in NORMAL mode, which controls the pump automatically or DISCHARGE mode, which allows the operator to override the automatic float switch and

manually operate the pump. The transfer pump mode is selected using the NORMAL/DISCHARGE switch on the rear of the debris tank.

When NORMAL mode is selected, an automatic float switch on the side of the debris tank controls the water level by activating the pump and moving wastewater from the tank to the wastewater bladder. When wastewater in the sump reaches a predetermined level, the float switch will activate the pump. The float switch will drop when the water level is lowered and automatically turn off the pump.

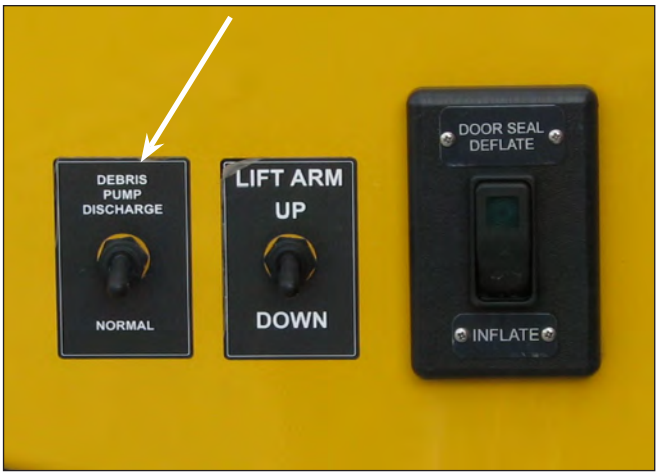
When DISCHARGE mode is selected, the automatic float switch is bypassed. The pump will continue to run until the switch is manually returned to the NORMAL position. The discharge flow from the pump must be continuously monitored while operating the system in DISCHARGE mode and the switch set back to NORMAL mode when pumping is complete. To avoid damage to the pump, always return the mode switch to NORMAL as soon the tank is empty and never leave the switch in DISCHARGE mode.

The debris water pump is a heavy duty, diaphragm pump. It is protected from large debris that could damage the pump by an in-line strainer on the intake side. The strainer canister is equipped with a valve or a drain plug for back flushing and/or draining the canister. The screen should be removed and cleaned periodically or if it becomes clogged. Always make sure the DIRTY WATER PUMP switch is in the OFF position when cleaning or back flushing the strainer. Refer to the Lubrication & General Maintenance section of this manual for instructions on cleaning or back flushing the strainer.

The sump water level and pump out system must be monitored periodically during operation and cleaned as necessary. It is important that the DIRTY WATER PUMP switch is turned ON just before the waterblasting system is activated and turned OFF when waterblasting operations stop.

Gravity Wastewater Drains

Wastewater can also be drained by gravity by opening the drain valve located on bottom side of the tank. To use the gravity drain system, make sure the DIRTY WATER switch is OFF. Open the valve on the passenger side of the tank. Wastewater will continuously flow from the tank while



Debris Pump Switch On Rear Of Debris Tank

Debris Tank Drain Valve

the valve is open. The drain valve system must be monitored periodically during operation and cleaned as necessary.

Debris Tank Dump System

Solid debris is separated from the wastewater by the 100 micron filter bag and needs to be dumped when the debris cage is near full. A hydraulic ram below the tank lifts the passenger side, causing the tank to tilt for easy dumping. The tank is designed with enough ground clearance to empty into most industrial dumpsters.

The hydraulic ram is controlled by switches in a remote control that plugs into the grey junction

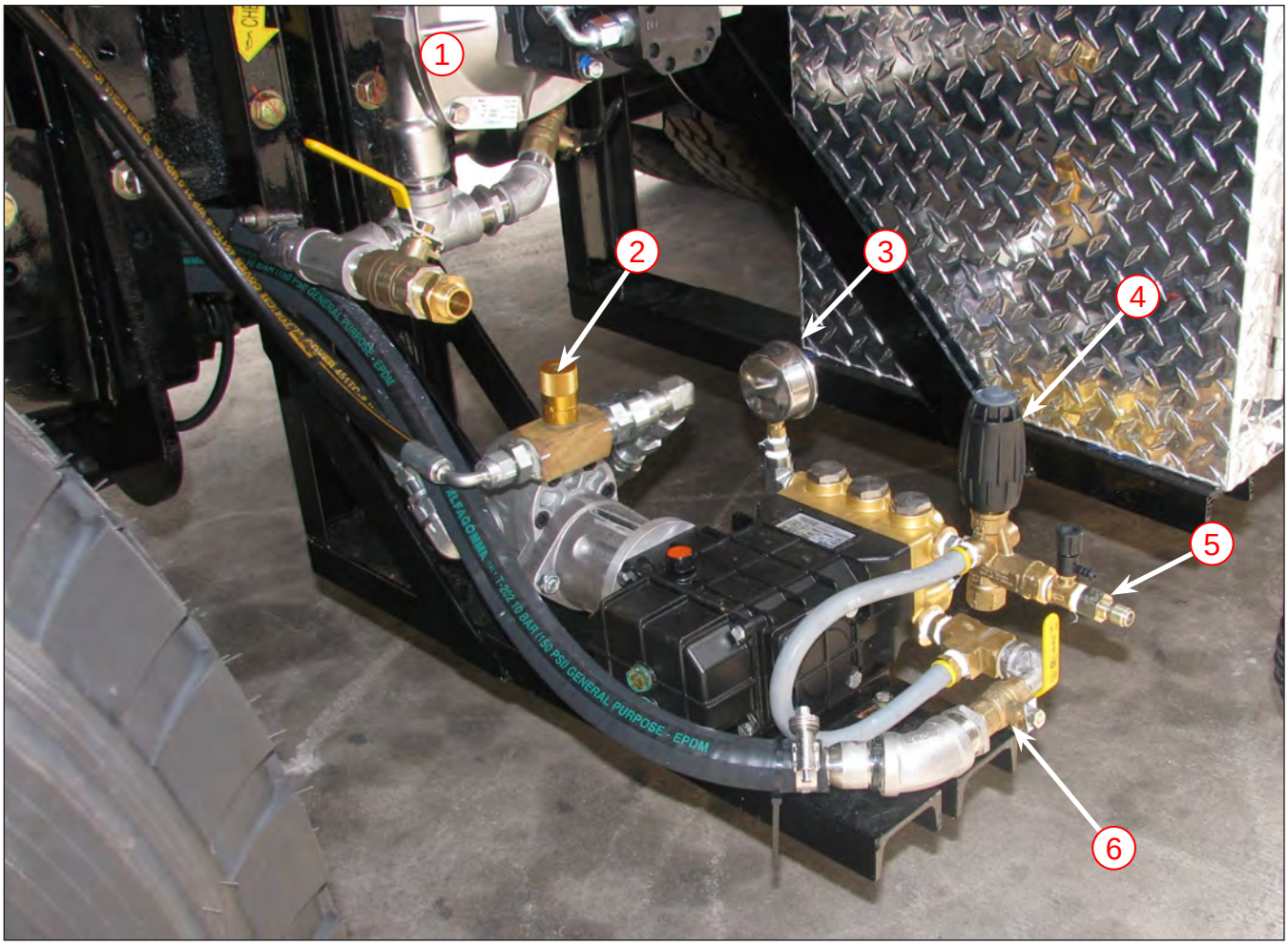
Typical Debris Tank Tilted for Dumping

box located on the side of the driver side tool box. Always make sure the truck is on level, solid ground before dumping debris. After dumping, use a hose to clean the tank and sump thoroughly with fresh water. Then install a new filter bag.

The debris bag should be checked at the beginning of the shift as part of the pre-start procedure or when you believe it may be reaching its capacity. It should also be checked at the end of each shift. Debris should never be left in the cage for a period of more than two days. Debris will harden and conform to the shape of the tank walls making it very difficult to dump.

Always comply with local guidelines and state law when dumping recovered water and debris.

Remote Control Switches



Typical Handheld Pressure Washer

1. Charge Water Pump
2. Hydraulic Flow Control Valve
3. Pressure Gauge
4. Pressure Washer Manual Bypass Valve
5. Quick Disconnect Fitting
6. Clean Water Supply Valve

2.8 Handheld Pressure Washer

A hydraulic powered pressure washer is mounted to the chassis below the charge water pump. It provides up to 4000 psi (276 BAR) to the hand-held spray gun. The pressure hose and spray gun connect to a high pressure disconnect fitting on the pump and are stored in the tool box when the handheld pressure washer is not being used.

The pressure washer is powered by the water-blasting hydraulic system. A manually operated hydraulic flow control valve supplies pressurized hydraulic fluid to the hydraulic motor that powers the pump. The hydraulic flow control valve is equipped with colored rings that indicate the valve setting for reference. Another ball valve on the water line turns the water supply to the pressure pump on or off. Pressurized water from the clean water tank is provided to the pump by the charge water system. Always make sure to close the hydraulic pressure and water ball valves whenever the pump is not being used.

Use the following procedures to activate and shut-down the handheld pressure washer.

Activating the pressure washer:

1. Make sure the truck is parked on level ground with the parking brake set and the engine at idle.

2. Verify that the pressure gauge on the pump indicates 0 pressure, then attach the pressure hose and gun to the quick disconnect fitting.

3. Make sure the truck is in WORK mode with the park brake set.

   - Automatic Transmission - Dash PTO switch and CHARGE PUMP switch in the console are ON and the transmission is in 4/4 Lockup.

   - Manual Transmission - Dash PTO switch and CHARGE PUMP switch in the console are ON and transmission shifted to the correct operating gear.

4. Raise the engine speed to 1000 RPM.

5. Make sure the charge water pump is operating, then open the clean water supply ball valve near the pump.

6. Close the charge water supply ball valve to the Jetstream pump. The valve is located under the manifold of the Jetstream pump. This will supply additional water pressure and flow to the pressure washer pump.

7. Slowly turn the knob on the hydraulic flow control valve counterclockwise until the bottom edge of the knob is even with the green ring to activate the hydraulic motor and set proper RPM for the pump.

8. Monitor pressure to the spray gun with the pressure gauge on the pump and use the pressure washer manual bypass valve to set the desired spray gun pressure. Typical pressure settings range from 2000 psi (138 BAR) to 4000 psi (476 BAR).

Shutting down the pressure washer:

1. Slowly turn the hydraulic flow control valve clockwise until it seats in the closed position to deactivate the hydraulic motor and pressure pump.

2. Slowly close the ball valve on the clean water supply, then briefly pull the trigger on the spray gun to remove pressure in the hose.

3. Verify 0 pressure on the pressure gauge and disconnect the pressure hose and gun.

Hydraulic Pressure Valve Set To Green Ring Water Pressure Gauge

4. Open the charge water supply ball valve to the Jetstream pump. The valve is located below the manifold of the Jetstream pump.

5. Reduce engine speed to idle and properly coil the pressure hose and properly store the hose and gun in the tool box.

WARNING

HIGH WATER PRESSURE ESCAPING FROM A DAMAGED OR DETERIORATED PRESSURE HOSE OR GUN CAN CAUSE SEVERE INJURY TO PERSONNEL. NEVER OPERATE THE HANDHELD PRESSURE WASHER WITH A HOSE OR SPRAY GUN THAT IS DAMAGED OR NOT OPERATING PROPERLY.

ALL HIGH PRESSURE HOSE MAINTENANCE PROCEDURES AND PRECAUTIONS OUTLINED IN THE HIGH PRESSURE HOSES, CONNECTIONS AND FITTINGS SECTION OF THIS CHAPTER APPLY TO THE HANDHELD PRESSURE WASHER SYSTEM.

2.9 Auxiliary Blasting Tool Connection

General

When an optional Ground Hog is connected to the auxiliary connections, the electrical system senses that the tool is connected. The levers on the tool then control Ultra-High Pressure water to the blast head and hydraulic fluid flow to the spray bar thru-shaft motor. Ultra-high pressure water, hydraulic power and vacuum are provided by the truck waterblasting system.

Auxiliary Tool Connection

Control Harness Connection

An electrical harness that runs from the outlet plug on the front of the truck to a plug on the ground hog connects the control switch levers on the tool with the waterblasting electronic control system on the truck. Once the harness is connected, the operator controls the high pressure water and hydraulic systems on the tool blast head with the control switch levers on the tool.

Hydraulic Connection

Hydraulic hoses with quick disconnect fittings are connected from the tool to the truck hydraulic system at the auxiliary tool connection. The hydraulic control lever on the tool provides the operator with full control of the hydraulically activated thru-shaft motor that rotates the spray head.

Ground Hog/Walk Behind Auxiliary Blasting Tool

Vacuum Connection

Hand operated tools like the Ground Hog (Walk behind) are equipped with blast heads that are designed to be attached directly to the vacuum system. The hose quick disconnect fittings provide vacuum from the truck vacuum system to the blast head. Once the hose is connected, vacuum is supplied to the tool whenever the waterblasting system is activated.

Make sure to protect the hoses from damage and abrasion from dragging on the pavement. This is particularly important when working a long distance from the truck. In some situations anti-chaffing protection may need to be added to the hoses to protect them in contact areas.

2.10 Electrical System

Your truck can be equipped with either a 12 volt or 24 volt DC electrical system depending on your location and the chassis manufacturer. The waterblasting electrical system is totally isolated from the truck electrical system.

The waterblasting system is equipped with two heavy duty main circuit breakers on the side of the battery compartment on the driver's side of the chassis. The main circuit breakers protect the waterblasting DC circuits and can function as the main disconnect switch to deactivate the waterblasting electrical system. Fuses in the cab control panel protect accessory circuits activated by the switches. Other in-line fuses and fuses in the outside terminal/OTB box protect other electrical equipment installed by Hog Technologies.

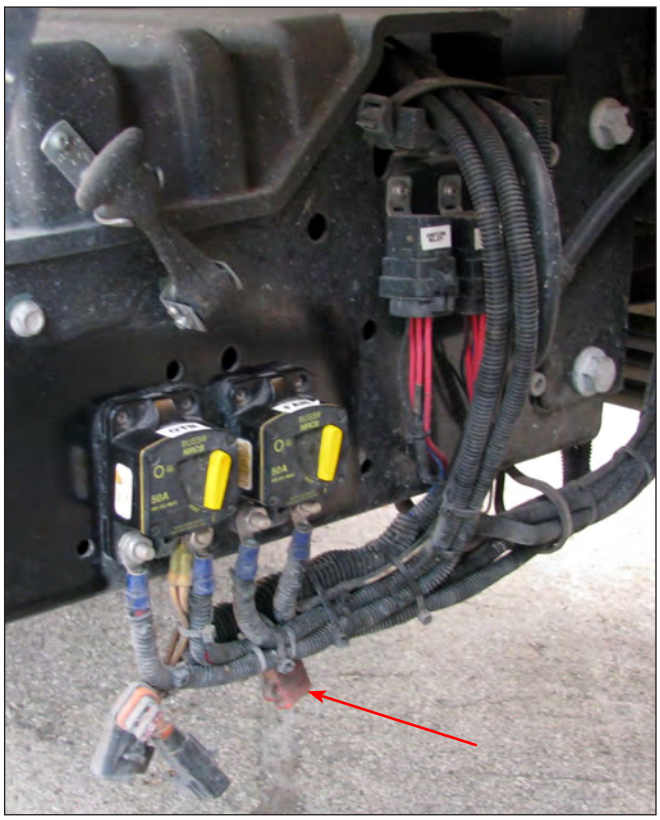
50 AMP Main Circuit Breakers

The 50 amp breakers are connected directly to battery and supply electrical power directly to the control panel and outside terminal/OTB box accessory fuse panels. The breakers must be on to power the waterblasting electrical system.

Each main circuit breaker is equipped with a yellow indicator/reset lever that indicates the status of the breaker (ON or OFF/TRIPPED) and is used to reset the breaker if it trips or to turn the breaker and electrical system off.

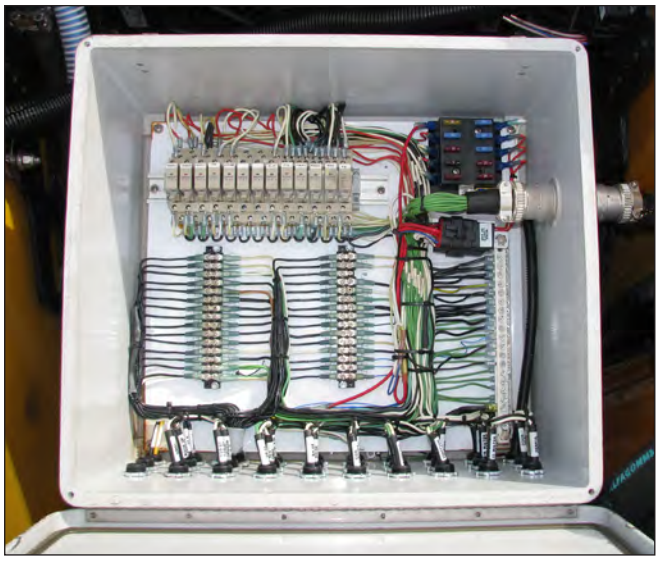
These are heavy duty circuit breakers that typically trip only when there is a fault in the system. If a main breaker trips, you should find and correct the problem before resetting the breaker. The breaker is reset by moving the yellow lever to the ON position.

Each main breaker can be used as a main disconnect switch by manually moving the yellow lever to the OFF or ON position. Move the lever to the ON position to activate the electrical system. Move the yellow lever to OFF position to deactivate the electrical system.

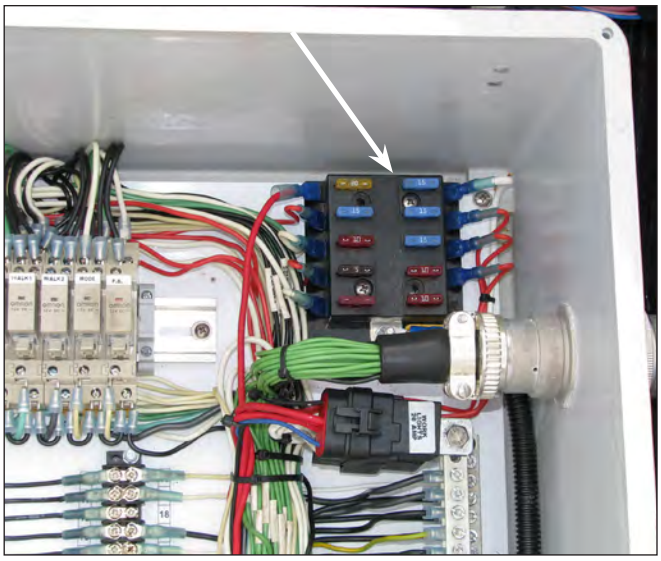


Typical 50 AMP Amp Main Fuses & In-Line Fuse

Typical Main Fuse Reset Lever



Typical Terminal/OTB Box

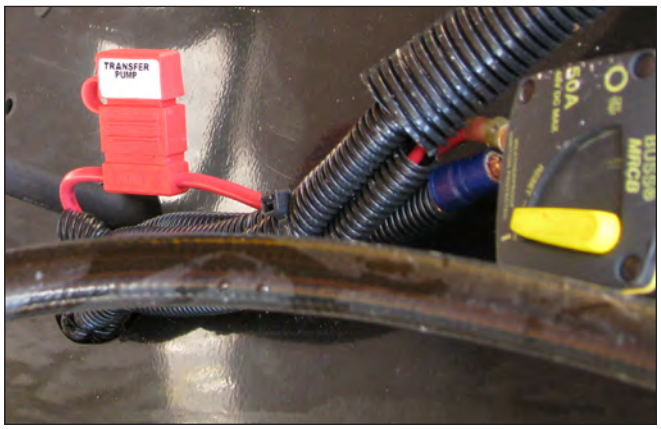


Terminal/OTB Box Fuse Panel

Accessory Circuit Protection

ATC blade type fuses in fuse panels located inside the control panel and terminal/OTB box protect most accessory circuits. In-line fuses protect other circuits.

NOTICE:
THE CIRCUITS PROTECTED BY IN-LINE FUSES WILL VARY. IN-LINE FUSE LOCATIONS WILL ALSO VARY, DEPENDING ON THE ACCESSORY CIRCUIT PROTECTED. THE MOST COMMON LOCATIONS FOR IN-LINE FUSES ARE NEAR THE MAIN CIRCUIT BREAKERS OR INSIDE THE TERMINAL/OTB BOX.



Typical In-line Fuse

The fuses are color coded with the AMP rating printed on the fuse. The fuse body is translucent plastic with the fuse element clearly visible making it easy to identify a blown fuse.

When replacing fuses, never replace the blown fuse with a fuse of a different color or higher amperage in an attempt to correct a circuit that is causing the fuse to blow. Using a higher amperage fuse can cause the circuit to overheat which can damage the circuit and components or cause an electrical fire.

Contact Hog Technologies Customer Service if you need assistance correcting a problem with the waterblasting electrical system.

Control Panel & Joystick

Control Panel Switches

Most functions and features of the waterblasting system are activated by labeled rocker switches, the joystick or dials on the console switch panel in the cab. A green LED light in each switch illuminates when the circuit activated by the switch is on.

The following is a description of the cab control panel switch functions:

FWD/REV

A momentary rocker switch that selects the truck direction of travel by shifting the hydrostatic drive system while the hydraulic system is activated in WORK mode.

DUMP VALVE 40K

Controls the UHP dump valve (diverter valve). When the switch is ON, the dump valve closes and high water pressure from the UHP pump is directed to the spray bar on the blasting head. When the switch is OFF, the dump valve opens and the high pressure water is diverted to the clean water tank. Always make sure the truck is moving and the spray bar is rotating before activating the dump valve.

PTO

- Engages the OMSI PTO and energizes the circuits for all other rocker switches on the control panel, joystick, digital gauges and the cooling fan for the hydraulic system oil cooler. A green LED light in the switch indicates that the PTO switch is on and the panel circuits are energized.

NOTICE:
THE TRANSMISSION PTO MUST BE ENGAGED BY ACTIVATING THE SYSTEM ON SWITCH IN THE CAB DASH TO ACTIVATE THE HYDRAULIC SYSTEM. THE CONTROL PANEL PTO SWITCH MUST BE ON TO ENGAGE THE OMSI PTO, HYDROSTATIC DRIVE, UHP PUMP AND VACUUM BLOWER. THE PTO SWITCH ALSO ENERGIZES THE CIRCUITS FOR ALL OTHER WATERBLASTING SYSTEM SWITCHES, JOYSTICK AND DIGITAL GAUGES IN THE CONTROL PANEL.

MODE
The mode switch selects truck operation mode, either Drive mode or Work mode. Colored LED lights in the control panel indicate the status of the operation mode selected.

- Green light illuminated indicates the truck has been successfully shifted into DRIVE mode. All waterblasting functions are cancelled and the truck is ready for highway operation.
- Red light illuminated indicates the truck has been successfully shifted into WORK mode. The truck highway drive train is disabled, the hydrostatic drive is enabled and all waterblasting functions are available for activation.

CHARGE PUMP
Activates the solenoid valve that supplies pressurized hydraulic fluid to power the charge water pump. A green LED light in the switch indicates the charge pump is activated.

FLOAT SWITCH
Activates and deactivates the float mode feature that enables the Hog Head to float freely over uneven road surfaces. A green LED light in the switch indicates that float mode is engaged.

WORK LIGHTS
Activates the lights that illuminate the blasting area and specific waterblasting system components.

STROBE LIGHTS
Activates the safety strobe lights during operations.

DIRTY WATER PUMP
Activates the automatic and manual switches that control the diaphragm transfer pump that pumps wastewater from the debris tank sump to the wastewater bladder. A green LED light in the switch indicates the transfer pump circuit is activated.

AUX
Reserved for additional waterblasting accessories.

Joystick Control Lever
The joystick controls the motion of the Hog Arm. Move it forward to lower the arm, pull it back to raise it. Move it to the right and the arm moves right, move it left and the arm moves left. Squeeze the red trigger and push left and right to move the secondary section of the Hog Arm left and right. When the joystick is released, the handle automatically returns to the center and the Hog Arm stops in that position.

Mode LED Lights

Speed Dials And Digital Gauges
The speed dials are used to select the desired RPM for the spray bar and the speed of the truck hydrostatic drive.

HEAD ROTATION
The Head Rotation speed dial controls the speed of the spray bar from 0 to maximum speed. Rotating the dial clockwise increases speed. Rotating it counterclockwise reduces speed. Setting the Head Rotation dial to 0 will stop the rotation of the spray bar.

TRUCK SPEED
The Truck Speed dial controls the speed of the truck while in work mode with the hydrostatic wheel down. Rotating the dial clockwise increases speed and rotating it counterclockwise reduces speed. Setting the Truck Speed dial to 0 will stop the truck.

HIGH PRESSURE
A digital gauge that monitors the Ultra-High water pressure to the blasting head.

CHARGE PRESSURE
A digital gauge that monitors the charge water pressure at the UHP pump intake.

VACUUM PRESSURE
A digital gauge that monitors vacuum pressure in the debris recovery system.

HEAD ROTATION
A digital gauge that indicates the current RPM of the thru-shaft/spray bar.

Debris Tank Switches

These switches are mounted on the rear of the debris tank.

DEBRIS PUMP - NORMAL/DISCHARGE

A two position toggle switch that selects the mode for the transfer pump when it is activated by the DIRTY WATER switch in the panel. Move the switch to the NORMAL position to control the pump automatically with the automatic float switch in the debris tank sump. Move the switch to the DISCHARGE position to bypass the automatic switch and manually activate the pump.

LIFT ARM - UP/DOWN

A three position momentary toggle switch that raises and lowers the optional spare Hog Head. The center position is OFF. Move the switch to the UP position to raise the arm. Move the switch to the DOWN position to lower the arm. Release the switch to stop the arm in the desired position.

Typical Debris Tank Switches

DOOR SEAL

A three position rocker switch that inflates or deflates the door seal. The center position is OFF. Move the switch to the INFLATE position to pressurize the seal. Move the switch to the DEFLATE position to release the pressure in the seal. A pressure gauge on the chassis below the switch indicates seal pressure. A pressure sensor and solenoid valve in the seal pressure line automatically limit maximum seal pressure to 20-25 psi (1.4 - 1.7 BAR).

Remote Switch Control

The remote switch control harness plugs into the receptacle on the drivers side tool box. The control allows the operator to control debris tank dumping operations a safe distance from the truck. UP/DOWN switches in the remote control raise or lower the debris tank for dumping.

Refer to the Operation section of this manual for additional information on dumping debris.

Remote Switch Control

2.11 Skip Meter, & Video System

Skip Meter

Most trucks are equipped with a skip meter that records the distance traveled while in Work mode. When the meter is activated, an inductive sensor records the revolutions of the truck drive shaft and converts the readings into linear feet or meters. The data is recorded and saved until the operator deletes it.

There are two toggle switches on the front of the meter. One toggle switch turns the meter ON or OFF, the other toggle switch is used to start the meter when blasting operations begin and stop the meter when operations stop or are paused. Menu buttons select the meter to read in feet or meters and various recording and data modes. An operating manual for the Skip Meter has been included with your Stripe Hog that provides detailed information on its operation and available data modes.

Skip Meter & Video Screen

Video Systems (Optional)

Video systems are optional features that enable better visibility for the operator while blasting operations are underway. The video system can also provide improved visibility while backing the vehicle. Video systems are unique to the options selected. Refer to the truck and video manufacturers information for instructions on operating and maintaining video systems.

Typical Hog Head Mounted Video Cameras

Typical Skip Meter Inductive Pickup On Drive Shaft

2.12 Waterblasting Hydraulic System

Hydraulic System Overview

The waterblasting hydraulic system is activated by the PTO switch (SYSTEM ON) in the truck dashboard and powered by the truck engine and transmission PTO. It is equipped with a pump, large reservoir/cooling tank and in-line filters. A heat exchanger with a thermostatically activated fan cools the hydraulic fluid during operation. Electric solenoid valves, activated by switches in the control panel and joystick, direct hydraulic pressure to the various components. The hydraulic oil level and temperature are monitored by a site gauge and thermometer on the side of the reservoir.

Transmission PTO (SYSTEM ON) Switch

The system is equipped with filters that protect the system from debris. Pressure gauges on the hydraulic manifold and near the filter alert the operator when a filter is dirty and requires changing.

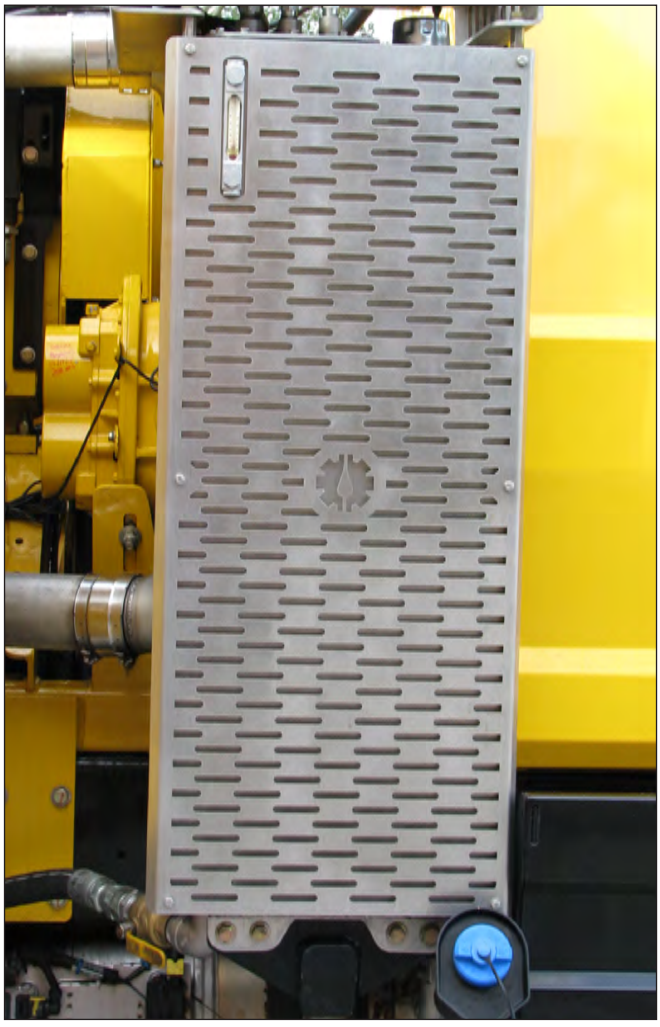
The hydraulic system powers the Hog Head, Hog Arm, UHP system charge water pump, the cylinders that tilt the debris tank and the optional pressure washer. All movement of the Hog Arm and the rotation of the spray bar is activated and controlled by the hydraulic system.

Reservoir

A large reservoir tank mounted on the chassis behind the cab provides the hydraulic fluid for the system. The pump circulates fluid through the manifold, motors, hydraulic cylinders and other components, then back to the tank. A low pressure filter near the reservoir fill fitting cleans the fluid as it flows back into the reservoir.

A sight glass and integrated thermometer is used to monitor fluid level and oil temperature. The fluid level should be maintained within the upper level of the sight glass to ensure adequate fluid for operation.

Hydraulic fluid should be changed and the tank flushed on a regular schedule as stated in the Hog Technologies Maintenance Matrix located in the Maintenance section of this manual.



Hydraulic Fluid Reservoir

NOTICE:
THE HYDRAULIC FLUID TEMPERATURE MUST BE ABOVE 60 DEGREES FAHRENHEIT BEFORE OPERATING THE HYDRAULIC PUMP UNDER LOAD. IF THE FLUID TEMPERATURE IS BELOW 60 DEGREES F (16 C) YOU SHOULD RUN THE MACHINE IN WORK MODE AT IDLE TO CIRCULATE HYDRAULIC FLUID AT LOW PRESSURE UNTIL IT IS WARMED TO OPERATING TEMPERATURE AS INDICATED BY THE THERMOMETER IN THE HYDRAULIC RESERVOIR SIGHT GAUGE. FAILURE TO DO SO COULD RESULT IN DAMAGE TO THE INTERNAL SEALS IN THE PUMP.

Hydraulic System Filters

Clean hydraulic fluid that has not been exposed to excessive temperature or become contaminated is essential to the performance of the system. As pumps, cylinders and components wear, they release tiny metal and rubber particles into the hydraulic fluid. These particles act as a grinding compound as they flow through the system. Ordinary dirt and water are common hydraulic fluid contaminants. Any one of these will contribute to premature failure of hydraulic components. Filters on the low pressure and high pressure hydraulic circuits remove these contaminates and increase the life of the fluid and hydraulic components.

Low Pressure Hydraulic Fluid Filter

Low Pressure filters

The low pressure filter is a cartridge type "Spin On" filter on the top of the reservoir tank. All return fluid passes through the low pressure filter as it flows back into the tank. The filter should be changed at the same time the hydraulic fluid is changed or if it begins to restrict the return flow.

High Pressure Filter Hydraulic Fluid Filter

High Pressure Filter

A special fine micron cartridge type filter is located near the manifold in the high pressure circuit between the manifold and cylinders, motors and other hydraulic components. The filter removes tiny particles that could be released by the hydraulic pump. The filter element is inside a special canister that can withstand the operating pressure on the high pressure side of the pump.

A pressure gauge near the filter monitors the pressure and provides an indication of when the filter element is becoming clogged and must be changed. The element should also be changed when the hydraulic oil is changed.

Hydraulic Manifold

The Hydraulic manifold is mounted to the chassis below the UHP pump. Electric solenoid valves activated by switches in the control panels direct hydraulic pressure to the various components in the waterblasting hydraulic system. It is also equipped with a regulator between the low and high pressure side of the manifold that is used to adjust the low pressure setting. The solenoid valves are a cartridge type design that are easily replaced in the event of a failure.

Hydraulic Motors and Actuators

The charge water pump and spray bar thru-shaft are powered by hydraulic motors. Internal components of the motors are lubricated and cooled by the hydraulic fluid that powers the motor. All hydraulic motors have maximum pressure ratings and RPM settings that should never be exceeded. Most hydraulic motors are designed to rotate in one direction. If a motor needs to be removed for any reason, always make sure to mark the hoses and ports so they will be installed in the correct position. If the hoses are installed in the wrong ports the motor will rotate opposite of the designed rotation which will permanently damage the motor.

Hydraulic Cylinders

Two types of hydraulic actuators are used in the waterblasting hydraulic systems. Rotary, “Helac” cylinders are used on the Hog Arm and conventional ram type cylinders are used to raise the debris tank and the optional lift arm.

Helac cylinders provide a broader range of movement than conventional ram type cylinders. The cylinders and hinged arm joints are integrated so the joint bearings are lubricated by the hydraulic fluid that powers the cylinders, eliminating grease fittings at the joints and reducing maintenance. Helac cylinders are sensitive to air. Consequently, special procedures must be used to bleed air from the cylinders when hoses or other hog arm hydraulic equipment is serviced.

The hydraulic cylinders used to lift the debris tank or lift arm are equipped with special counterbalance valves that prevent the tank from dropping suddenly if a hose ruptures or a fitting fails.

All hydraulic systems and cylinders require special procedures for bleeding air from the system after servicing components or replacing hoses. Contact Hog Technologies if you need assistance in bleeding the air from the hydraulic system.

Hydraulic Manifold, Solenoid Valves & Gauges

Helac Hydraulic Cylinder On Hog Arm

Hydraulic Hoses

The hydraulic system operates at pressures of up to 3,000 psi (207 BAR). Therefore, it is critical that the operator and maintenance personnel inspect the hydraulic hoses, fittings and other components frequently. A visual inspection of the entire hydraulic system should be conducted each day before operating the unit. Any hose or component that is questionable or shows any sign of deterioration, wear or leakage should be replaced

immediately and before operating the unit. A more thorough inspection of the pump and components should be conducted at each routine service interval. Remember that the hydraulic system can be severely damaged if it runs low on fluid.

Protect the hoses from contact with sharp objects or kinks. Never operate the hydraulic system with a damaged hose or a hose that is questionable.

2.13 Hydrostatic Drive Hydraulic System

The Hydrostatic Drive pump is bolted to the OMSI gearbox. It is powered by the truck engine and primary drive shaft connecting transmission to the OMSI drive.

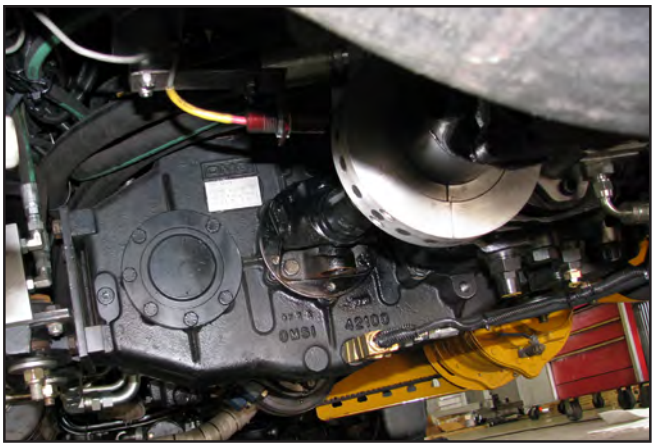
The hydrostatic drive system is activated by the PTO switch on the control panel and controlled by the FWD/REV switch and TRUCK SPEED dial. A swash plate controlled by the FWD/REV switch and the TRUCK SPEED dial in the control panel directs fluid flow and pressure output from the pump, setting the speed and direction of the hydrostatic drive motor. The hydrostatic drive system is a closed loop system that is completely isolated from the waterblasting hydraulic system.

Hydraulic fluid is provided by the hydraulic system reservoir/cooling tank. A circulation pump and a dedicated heat exchanger with cooling fans provide continuous cooling for the hydraulic fluid during operation. Electric solenoid valves, activated by the FWD/REV switch and TRUCK SPEED dial control the fluid flow in the system. An in-line "Spin On" filter cartridge protects the system from debris. A pressure gauge near the filter alerts the operator when the filter is dirty and requires changing.

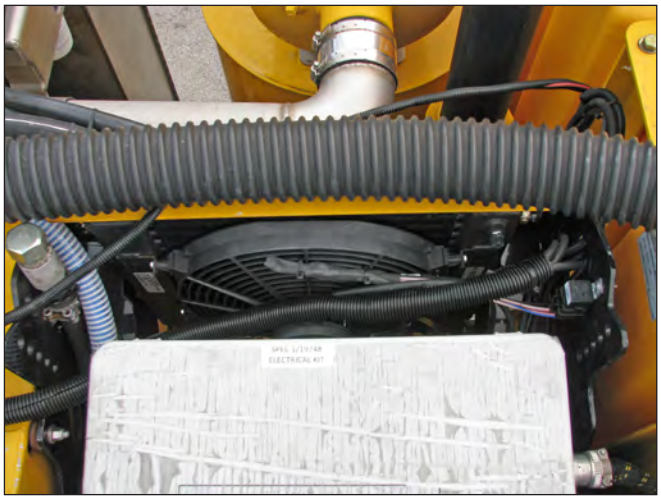
2.14 Fluid Cooler Placement

The SH7500 is equipped with coolers for the engine, transmission, drive train components and hydraulic system. The coolers are located in front of the radiator in the engine compartment, in several locations on the chassis, behind the cab near the high pressure pump, and on top of the hydraulic fluid Reservoir.

The compact size of the SH7500 makes it great for small or large jobs. It is also easy transport from job to job and very efficient. Because the unit is so compact, special consideration must be made



Typical Omsi Drive



Waterblasting Hydraulic Fluid Heat Exchanger

in its design to remove heat from the waterblasting and power systems. This is accomplished by specially designed heat exchangers.

The following are the most common heat exchangers and their function:

Engine Coolant Heat Exchanger (some models)
A rectangular shaped, plate style cooler located behind the front bumper. Cool water from the clean water tank is circulated through the heat exchanger to cool the engine coolant during operation.

Hydraulic Fluid Cooler
A heat exchanger located behind the UHP pump. It is equipped with a fan that will run constantly whenever the hydraulic system is activated.

OMSI Gearbox Cooler

A heat exchanger equipped with thermally controlled cooling fans that is located on top of the hydraulic Reservoir, behind the cab. The OMSI gearbox includes a circulation pump that continuously circulates gearbox oil through the heat exchanger during operation.

The coolers loose efficiency if they become dirty. It is important to inspect the coolers at least once a week and clean them as necessary. This is particularly important with the oil coolers located in the engine compartment near the radiator. Because these coolers are located near the Hog Head, dirt and debris that gets by the Hog Head during blasting operations can build up more quickly in these coolers. As the debris accumulates, the efficiency of the coolers is reduced. If the coolers are not cleaned regularly, debris can buildup to the point where the coolers become ineffective, causing the fluid and components to overheat. This can result in extreme damage to components protected by the coolers.

You should pay particular attention to the engine radiator and the oil coolers mounted in front of it. Accumulated debris in the radiator or the oil coolers can reduce air flow through the radiator, causing the engine and drive train components to overheat. This could result in severe engine and drive train damage.

OMSI Heat Exchanger

2.15 Engine & Transmission

Overview

Power is transferred from the engine to the drivetrain and waterblasting system through the chassis transmission and the OMSI gearbox.

The OMSI gearbox provides two modes of operation that can be selected by the operator; Drive mode for transporting the machine on the highway and WORK mode which activates the hydrostatic drive system that moves the truck at controlled speeds of 0 to 7 mph for waterblasting operations and makes most waterblasting functions available for operation. The PTO on the engine transmission powers the waterblasting hydraulic system pump when activated by the switch in the truck dashboard while in WORK mode.

The engine and the chassis transmission were specified and installed by the chassis manufacturer. Refer to the truck chassis operation manual for additional information on the engine and transmission.

Engine

The chassis engine powers the truck drivetrain and all waterblasting systems and components. Typically, the engine will be operated at maximum full load RPM during waterblasting operations. The actual RPM will vary somewhat, depending on the chassis and selected options. Operating the engine below the minimum required RPM will place excess load on the engine, resulting in poor efficiency and could cause it to overheat.

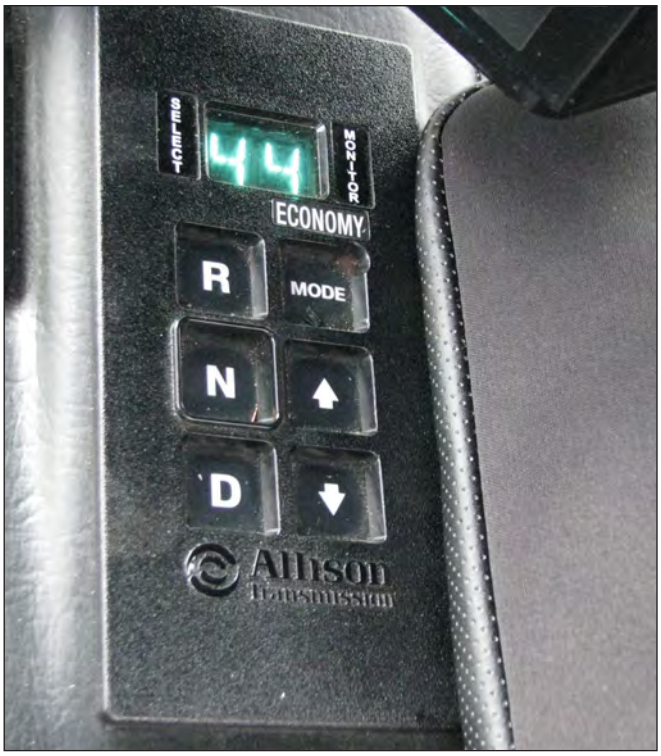
Transmission

The chassis can be equipped with an automatic or manual transmission. No matter which transmission is installed on your truck, it is essential to select the correct gear for proper operation while in WORK mode. The hydrostatic drive and waterblasting systems are designed to operate with the transmission output shaft turning the same RPM as the engine or at a 1 to 1 gear ratio. The following outlines the procedure for selecting the correct gear for WORK mode with automatic and manual transmissions.

Automatic Transmissions

Automatic Transmissions must meet three conditions to provide the proper RPM for the output shaft. The correct input gear must be selected, the correct output gear must be selected and the torque converter must be locked so that it cannot slip. Normally 4th gear on the input and 4th gear on the output is the correct combination. This is called 4/4 Lockup.

All three conditions are programmed into the engine ECM and are automatically selected with Mode switch on the control panel. When the Mode switch is on, it sends a signal to the transmission that tells it to select the pre-programmed conditions when the operator puts it into drive. Since one of the conditions is to lock the torque converter, it is extremely important to turn the Mode switch ON and OFF in the proper sequence to avoid severe damage to the transmission and torque converter. Refer to the Start-up Procedure in the Waterblasting Operation section of this manual.



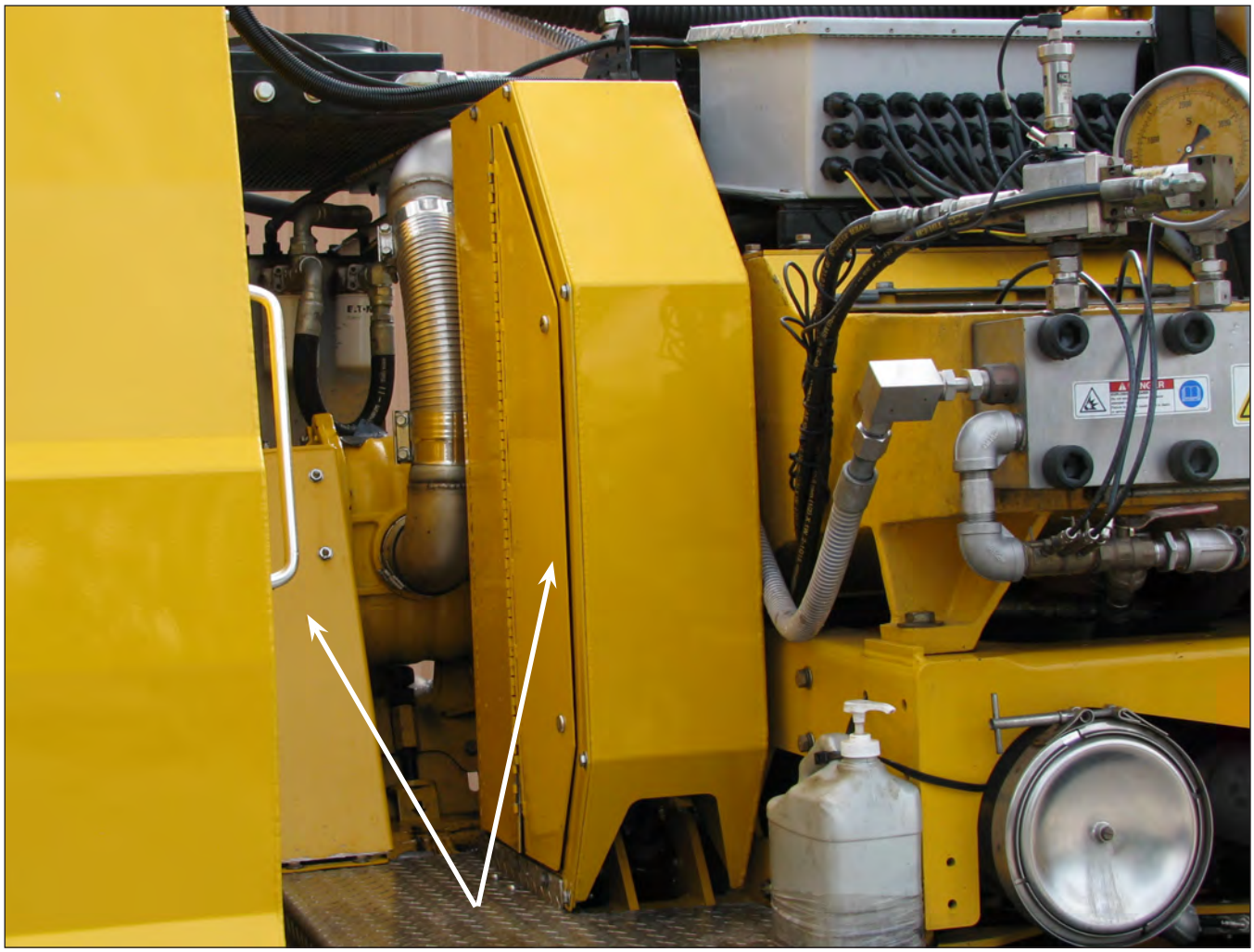
Automatic Transmission Gear Selector & LED Screen
PTO Switch ON & 4/4 Lockup Displayed

Manual Transmissions

On trucks with manual transmissions the operator must manually select the proper gear for WORK mode with the shift lever. The correct gear is chassis specific and is posted on the placard on the back side of the sun visor above the steering wheel in the cab. Selecting a lower gear will typically reduce performance but will not cause damage to any part of the system. Selecting a higher gear than posted on the placard will cause the transmission output shaft to turn too fast which will increase the load on the engine and transmission and exceed the designed maximum RPM limitations for the hydrostatic drive and waterblasting system components.

⚠ CAUTION ⚠

NEVER SELECT A GEAR HIGHER THAN THE GEAR POSTED ON THE PLACARD. SELECTING A HIGHER GEAR WILL RESULT IN SEVERE DAMAGE TO THE ENGINE, TRANSMISSION AND WATERBLASTING SYSTEM.



UHP Pump & Blower Drive Belt Location

2.16 UHP Pump & Blower Drive Belts

The drive belts that connect the OMSI Drive to the high pressure pump and vacuum blower are special carbon fiber industrial belts that are designed for high horsepower applications. The ribbed drive belts are matched to grooved pulleys and have very little stretch. Therefore, they typically don't require adjustment often and proper belt tension is extremely important when adjustment is required. The belts are strong enough to cause severe damage to bearings, shafts and other components if they are set too tight. Additionally, if a belt is too loose, it can ride on top of the grooves and thus become too tight.

The drive belts for the high pressure pump and vacuum blower are different and, therefore, have different tension specifications. Additionally, new belts have a different tension specification than used belts (drive belts with 20 hours or more). Instructions for adjusting the primary drive belts and tension specifications are included in the General Maintenance section of this manual.

WARNING

THE DRIVE BELTS CAN CAUSE SEVERE DAMAGE TO PULLEYS, SHAFTS AND BEARINGS IF THEY ARE ADJUSTED TOO TIGHT OR MISALIGNED. THIS CAN CAUSE SEVERE DAMAGE TO DRIVE SYSTEM COMPONENTS AND INJURY TO PERSONNEL IF DAMAGED COMPONENTS ARE THROWN FROM THE MACHINE. ALWAYS MAKE SURE THE BELTS ARE PROPERLY ALIGNED AND SET TO THE BELT MANUFACTURER'S SPECIFICATIONS WHEN THEY REQUIRE ADJUSTMENT. NEVER OVERTIGHTEN THE BELTS.

Make sure you refer to the belt tension specifications in the Maintenance section of this manual or the belt manufactures information manual when adjusting the belt tension and never overtighten them.

2.17 Access Panels, Ladders & Tool Boxes

Ladders

A ladder on the driver side of the unit provides access to the waterblasting components located on the chassis between the water tanks and the truck cab. The ladder is hinged and has a spring loaded safety pin that locks the ladder in the stored or deployed position. To use the ladder, release the safety pin and swing the ladder out until the pin locks in the deployed position. Return the ladder to the stored position and secure it with the safety pin when service or inspections are complete.

Driver's Side Ladder

Debris Tank Ladder

Another ladder on the passenger side of the debris tank provides access to the top of the tanks. The ladder is hinged and has a spring loaded safety pin that locks the ladder in the stored position. To use a ladder, release the safety pin and rotate the ladder to the down position. Return the ladder to the stored position and secure it with the safety pin when service or inspections are complete.

Access panels

Folding panels on the drivers side provide access to the batteries, main circuit breakers and hydraulic and waterblasting components mounted to the driver's side chassis. To access the batteries or components, release the lock and swing the panel up until it locks in the horizontal position. Release the lock and lower the panels until they lock in the down position when service or inspections are complete.

Debris Tank Ladder

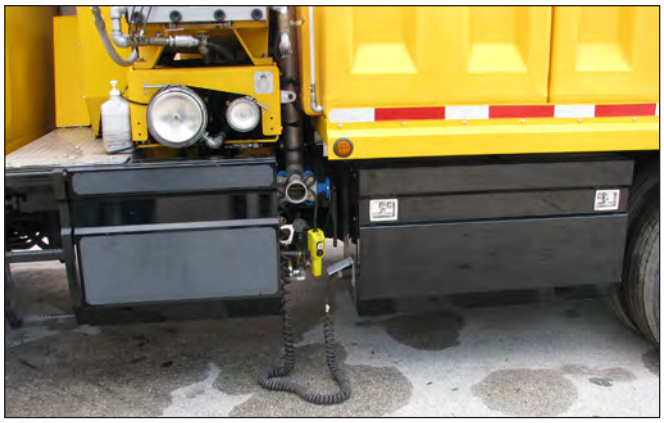
⚠ CAUTION ⚠

ALWAYS MAKE SURE THE LADDERS AND ACCESS PANELS ARE LATCHED IN THE STORED POSITION BEFORE OPERATING THE TRUCK. THE LADDER AND INSPECTION PLATFORM STICK OUT FROM THE SIDE OF THE VEHICLE AND CAN CAUSE DAMAGE TO THE TRUCK OR OTHER VEHICLES IF THEY ARE NOT PROPERLY STORED FOR TRANSPORT.

Tool Boxes

Heavy duty, lockable tool boxes are located on each side of the truck chassis and behind the cab on both sides. The tool boxes are used for storing hoses, fittings, extra parts and tools. Always make sure the tool box doors are closed, latched and locked before operating the truck.

Tool Boxes Behind Cab



Chassis Mounted Tool Boxes

NOTES

SH7500 In Operation

3.1 Start Up/Shutdown Introduction

Before operating the Stripe Hog, check the fluid levels in the truck engine, transmission, OMSI gearbox and hydraulic system. A thorough understanding of the component systems and their operation is essential to the proper operation of the Stripe Hog. Never allow inexperienced and untrained personnel to operate the Stripe Hog. This manual and the associated manufacturers' information is provided to enhance your knowledge of the Stripe Hog. Make sure you have read them carefully and fully understand the truck and all waterblasting components and systems in theory and operation.

To make operation as safe and productive as possible, it is essential to conduct a thorough pre-start inspection before operating the machine. You should walk around the unit and visually inspect the Hog Arm, blasting heads, high pressure hoses, hydraulic hoses, vacuum hoses, and all waterblasting system components for obvious signs of leaks, wear and deterioration. The inspection should be conducted in an orderly and consistent fashion to ensure all critical points are inspected each time. Do not operate the unit until all questionable components are repaired or replaced.

The startup and shutdown procedures described in this section are for a typical truck chassis equipped with an automatic or manual transmission. This information is provided as a general guide and overview of the process for educational purposes. The exact procedure for your truck may be different, depending on the chassis and the options selected. Hog Technologies includes a quick reference placard usually attached to the drivers side sun visor in the cab, that provides the proper startup and shutdown procedures for your specific truck.

NOTICE:
ALWAYS CHECK THE HOG HEAD, NOZZLES AND SPRAY BAR FOR WEAR AND DAMAGE BEFORE EACH SHIFT. REFER TO HIGH PRESSURE HOSES AND NOZZLES IN THE WATERBLASTING SYSTEMS SECTION FOR INFORMATION ON INSPECTING SPRAY BARS AND NOZZLES.

3.2 Pre-Operation Inspection

The pre-operation Inspection in this section and the Pre-Op Check List in Appendix 4 is provided as a guideline. Additional items should be added to the checklist as determined by company policy, your operating environment, and other factors unique to your situation.

The following instructions provide a general overview and introduction to the pre-operation inspection. The Pre-Op Checklist provides an itemized checklist that should be used when performing a pre-operation inspection.

Pre-start Inspection Check List:

1. Check tire condition and air pressure.
2. Inspect all hoses for chaffing and signs of wear.
3. Check fuel levels and make sure you have enough for the shift.
4. Check engine and all systems fluid levels. Refer to the truck and OMSI Drive operating manuals.
5. Check all waterblasting and vacuum components for oil leaks, damaged or loose bolts and parts.
6. Inspect the Hog Head for loose components and damage.
7. Check vacuum canister for water and the vacuum filter. Drain water or clean filter as required.
8. Check the vacuum blower and UHP pump drive belt tension and alignment.
9. Check clean water tank level and fill if necessary.
10. Check that the wastewater bladder is empty. Drain if necessary.
11. Drain debris tank water and check debris level. Empty if necessary.
12. Make sure debris tank door is closed properly and the inflatable seal pressure is correct.
13. Make sure the correct spray bar and nozzles required for the removal project are installed.
14. Visually inspect spray bars and nozzles for damage and excessive wear.

Clean Water Fill Fitting & Valve

15. Make sure all lubrication points, vacuum blower motor bearings and Hog Head thru-shaft bearings are greased with the specified lubricants.
16. Check all controls, switches and lights for proper operation.
17. Make sure the Mobile Spare Parts and Tool Systems are complete and onboard.
18. Conduct a final walk around and visually check all components. Look for obvious problems that may have been overlooked.

3.3 Filling The Clean Water Tank

The clean water fill connection on the passenger side of the tank is a quick connect fitting that accommodates large hoses that are typically connected to a metered source like a fire hydrant to expedite the filling of the tank. Only use potable water (clean enough to drink) to increase the service life of the components in your Ultra-High Pressure system.

Filling the freshwater tank:

1. Open the man-way on the top of the rear fresh water tank and make sure the wastewater bladder is empty, then close and latch the man-way.

NOTICE:
WASTEWATER IN THE BLADDER WILL REDUCE CLEAN WATER TANK CAPACITY. THE WASTEWATER BLADDER MUST BE EMPTY FOR MAXIMUM CLEAN WATER CAPACITY.

2. If this is the first time using the water source, flush for several minutes prior to filling the tank to help ensure that no debris enters the system.
3. Connect the fill hose to the water source and flush hose for several seconds.
4. Open the water tank fill valve and connect the hose to the quick connect fill fitting. Secure the hose to the fitting with the cam-lock levers.
5. Slowly open the source valve to begin filling the tank.
6. Open the 4" ball drain valve on the passenger side of the tank for several seconds to flush out debris that may have accumulated on the bottom of the tank, then close the valve.
7. Monitor the tank sight glass closely during fill operations and close the source valve just before the tank is completely filled.
8. Close the water tank fill valve, release the cam-locks and disconnect the fill hose from the fitting.
9. Remove the fill hose from the water source and drain the hose.
10. Store the hose in a clean, safe location.

⚠ CAUTION ⚠

OPERATORS MUST ALWAYS MONITOR THE TANK CLOSELY DURING FILLING OPERATIONS AS THE FLOW OF WATER FROM A HYDRANT OR OTHER HIGH VOLUME SOURCE CAN BE FAR GREATER THAN THE FLOW CAPACITY OF TANK AIR VENT. OVERFILLING THE TANK WILL CAUSE EXCESSIVE PRESSURE AND DAMAGE THE TANK.

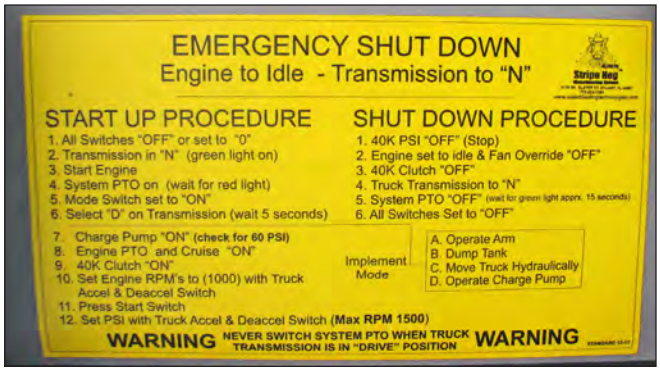
Rear Clean Water Tank Man-Way & Wastewater Bladder

Clean Water Tank Sight Gauge

Control Panel and Joystick

3.4 Truck & Accessory Hydraulic System Startup Procedure

The startup procedure outlined in this section is general and will apply to most trucks. However, your truck may be slightly different, depending on the options selected. ***Always refer to the placard on the back of the visor in the cab for specific startup and shutdown instructions for your truck.***



Typical Automatic Transmission
START UP/SHUT DOWN PROCEDURE Placard On Visor

Starting The Truck And Activating Accessory Hydraulics:

Make sure to complete the Pre-Op checklist prior to initiating this procedure.

1. Make sure the main breakers are on and all switches and speed dials are in the OFF position or set at 0.
2. Be sure the truck transmission is in "N", (NEUTRAL) position and the park brake is set.
3. Start truck engine and allow it to run at idle speed.
4. Engage the hydraulic PTO. The engagement switch is on the dash near your right knee.

5. Watch for the red light on the switch to illuminate and listen for hydraulic pump activation.
6. Engage Stripe Hog PTO located on the joystick box (wait for the red light to illuminate)
7. At this point every mechanical component powered hydraulically except for the hydrostatic drive is fully functional.

3.5 Activating UHP System & Setting Pressure

UHP Activation Option A:

1. Activate the truck and hydraulics system (refer to Truck & Accessory Hydraulic System Startup Procedure section 3.4).
2. Turn the MODE switch on.
3. Make sure the clean water supply valve is open and turn the CHARGE PUMP switch on. Monitor the charge water pressure gauge. Charge water pressure should rise to 35–70 PSI (2.4-4.8 BAR) within 10 seconds.

NOTICE:
IF NO CHARGE WATER PRESSURE OR A LOWER PRESSURE IS INDICATED, THERE IS A PROBLEM THAT MUST BE CORRECTED BEFORE OPERATIONS CAN CONTINUE.

4. With the charge pump activated, check the water flow at the UHP pump stuffing boxes. A steady stream of water should be flowing to cool and lubricate the packing. Adjust the metering valves if necessary.
5. Select “D” (DRIVE) on the truck transmission. Wait until 4 4 is displayed on the transmission LED.
6. When 4 4 is displayed, the truck has been successfully shifted into WORK mode. The UHP pump and vacuum blower are activated and ready for the operator to set the pressure and test the waterblasting system.

⚠ CAUTION ⚠

THE UHP PUMP IS DIRECTLY DRIVEN BY THE OMSI PTO AND WILL BE DAMAGED IF THE PTO SWITCH IS ACTIVATED WITHOUT THE CHARGE PUMP SWITCH ON. ALWAYS MAKE SURE THE HYDRAULIC SYSTEM IS ACTIVATED AND THE CHARGE PUMP SWITCH IS ON BEFORE ENGAGING 4/4.

Transmission PTO Control Switch

Manual By-Pass Valve

7. With the truck in WORK mode, the engine at idle and waterblasting system engaged, raise the Hog Arm to the full up position.
8. Make sure the HEAD ROTATION and TRUCK SPEED dials are set to 0.
9. Position the Hog Head so the spray bar and nozzles are visible.
10. Close the manual by-pass valve (turn the knob clockwise).
11. Activate the truck cruise control and use the SET/ACCEL switch to set the RPM to 1000.
12. Make sure all personnel are well clear of the blasting head and turn the DUMP VALVE 40K switch on to send high pressure water to the spray bar.

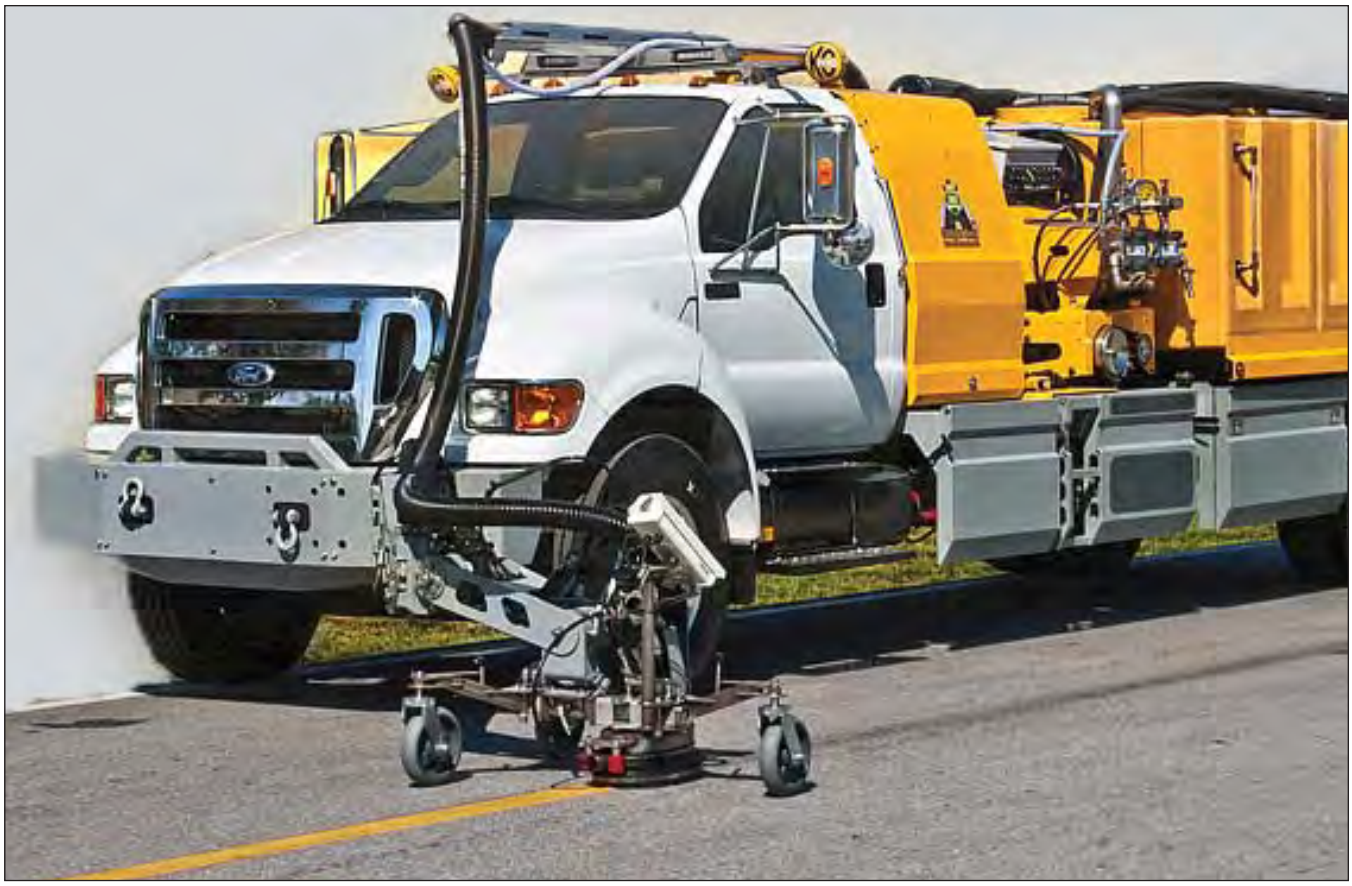
13. Use the cruise control SET/ACCEL switch to slowly increase engine RPM to achieve the desired operating pressure.
14. Check the nozzle spray pattern and the spray bar weep holes for leaks.
15. Check all high pressure hose fittings and the Hog Head for leaks.
16. Turn the HEAD ROTATION on. Rotate the speed dial clockwise to test the spray bar rotation, then turn it off.
17. If necessary, adjust engine speed to achieve the desired blasting pressure. Monitor the digital HIGH PRESSURE gauge in the panel to set the pressure. Note the engine RPM for reference.
18. With high pressure set and the spray bar and nozzles working properly, turn the DUMP VALVE 40K switch off.
19. Lower the blasting head to the pavement, then turn the FLOAT SWITCH on.
20. The truck is now ready to begin waterblasting operations.

UHP Activation Option B:

1. Activate the truck and hydraulics system (refer to Truck & Accessory Hydraulic System Startup Procedure section 3.4).
2. Turn the MODE switch on.
3. Make sure the clean water supply valve is open and turn the CHARGE PUMP switch on. Monitor the charge water pressure gauge. Charge water pressure should rise to 35–70 PSI (2.4-4.8 BAR) within 10 seconds.
4. With the charge pump activated, check the water flow at the UHP pump stuffing boxes. A steady stream of water should be flowing to cool and lubricate the packing. Adjust the metering valves if necessary.
5. Select “D” (DRIVE) on the truck transmission. Wait until 4 4 is displayed on the transmission LED.
6. When 4 4 is displayed, the truck has been successfully shifted into WORK mode. The UHP pump and vacuum blower are activated and ready for the operator to set the pressure and test waterblasting system.
7. With the truck in WORK mode, the engine at idle and waterblasting system engaged, raise the Hog Arm to the full up position.
8. Make sure the HEAD ROTATION and TRUCK SPEED dials are set to 0.
9. Position the Hog Head so the spray bar and nozzles are visible.
10. Open the manual by-pass valve approximately 3-5 turns (rotate counterclockwise)
11. Activate the truck cruise control and use the SET/ACCEL switch to slowly increase engine RPM to desired speed (maximum RPM 1800).
12. Make sure all personnel are well clear of the blasting head and turn the DUMP VALVE 40K switch on to send high pressure water to the spray bar.
13. Slowly start closing the by-pass valve (rotate clockwise) until the desired pressure is achieved.
14. Check the nozzle spray pattern and the spray bar weep holes for leaks.
15. Check all high pressure hose fittings and the Hog Head for leaks.
16. Turn the HEAD ROTATION on. Rotate the speed dial clockwise to test the spray bar rotation, then turn it off.
17. If necessary, adjust engine speed to achieve the desired blasting pressure. Monitor the digital HIGH PRESSURE gauge in the panel to set the pressure. Note the engine RPM for reference.
18. With the pressure set and the spray bar and nozzles working properly, turn the DUMP VALVE 40K switch off.
19. Lower the blasting head to the pavement, then turn the FLOAT SWITCH on.
20. The truck is now ready to begin waterblasting operations.

WARNING

ANY CONTACT WITH HIGH PRESSURE WATER IS VERY DANGEROUS AND CAN BE FATAL! USE EXTREME CAUTION WHILE RAISING OR MOVING HOG HEAD & ARM ASSEMBLY WHEN HIGH PRESSURE IS ENGAGED.



SH7500 In Operation

3.6 Blasting Procedure

Overview

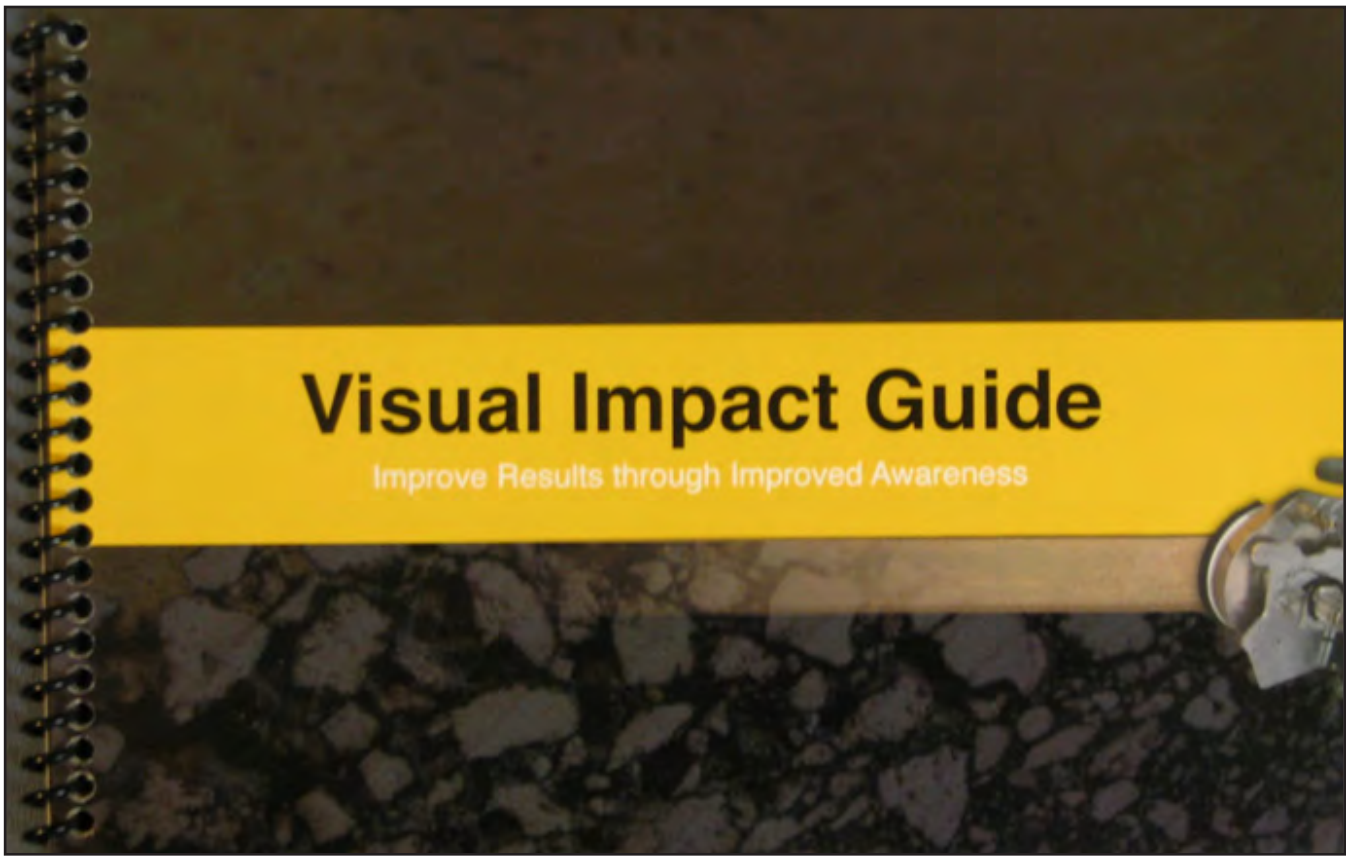
Before you start the job, you should evaluate the pavement and the material to be removed. Choose the appropriate spray bar and nozzles best suited for the job. You should also consider the desired or expected profile of the blasted surface in your selection. There are many variables that affect blasting efficiency, productivity and the profile of the blasted surface. As operators acquire experience, the selection process becomes more refined and easier. Refer to the visual impact guide for additional information.

Generally, large, high volume (.013 - .015) nozzles are the most aggressive and provide faster results. However, they also provide greater potential for damage and a course profile. Consequently, high volume nozzles should be used only on strong pavement (concrete or newer pavement). Small, low volume (.007 - .011) nozzles are less aggressive and will provide somewhat slower results but provide less potential for damage and a smoother profile. Low volume nozzles are well suited for weak pavement (older or damaged pavement). Low volume nozzles are typically a better choice for inexperienced operators on any surface.

Hog Technologies offers an on-site training program that dramatically reduces the learning curve and increases productivity. If you are new to waterblasting, we highly recommend that you consider this factory training for your operators. You can also contact Hog Technologies Customer Service department for assistance in choosing spray bars and nozzles or more information regarding the factory training program.

CAUTION

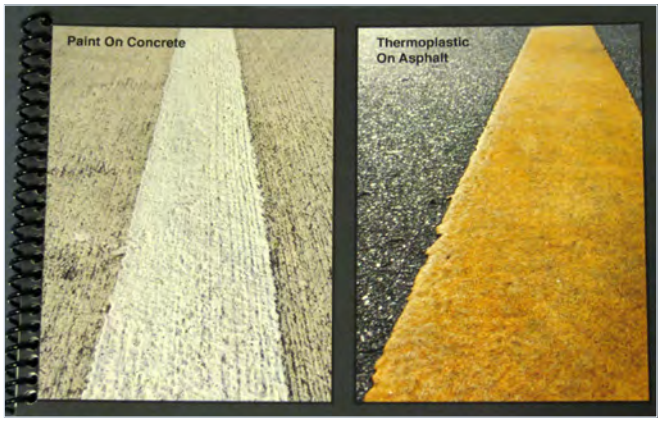
THE PAVEMENT WILL BE DAMAGED IMMEDIATELY IF HIGH PRESSURE BLASTING IS ACTIVATED WITHOUT THE HOG HEAD MOVING. ALWAYS MAKE SURE TRUCK IS MOVING BEFORE SUPPLYING HIGH PRESSURE TO THE BLAST HEAD.



Visual Impact Guide

Before Blasting Operations Begin:

- Evaluate the Pavement and Select a Spray Bar.
- Strong pavement withstands high aggression spray bars. This is generally concrete or new asphalt.
- Cracked pavement is weak and will require a less aggressive spray bars.
- Brittle pavement is a challenge and will require less aggressive spray bars and reduced pressure.
- Consider spray bar width. Choose a spray bar 2” wider than the line being removed to provide steering tolerance plus slight over spray to reduce the potential for missed areas and need to back up and re-do sections.
- Pre-clean the work area with a power broom if necessary before blasting.



Paint On Concrete /Thermoplastic On Asphalt

Hog Arm and Hog Head Operation

1. Activate Hydraulic System (refer to Section 3.4)
2. Make sure all switches and speed dials are in the OFF position or set at 0.
3. Make sure the FLOAT SWITCH is off.
4. Use the joystick in the control panel to raise the arm and take the load off the lock lever.
5. Release the lock lever and rotate it to work mode detent. Then slowly lower the arm and blasting head to the full down position on the pavement.
6. Activate the FLOAT SWITCH to engage float mode.

Control Panel Switches, Speed Dials & Digital Pressure Gauges

Engaging The Waterblasting System

1. Activate Hydraulic and waterblasting systems (refer to Section 3.4)
2. Set the pressure (refer to Section 3.5)
3. Align the truck with the material to be removed, stopping a short distance before the start point for blasting operations.
4. Use the joystick controls to move the blast head to the proper working position.
5. Turn the DIRTY WATER switch ON to activate the wastewater transfer pump system.
6. Set head speed to the desired RPM.
7. Select FWD on the FWD/REV switch and make sure all personnel are clear.
8. Rotate the TRUCK SPEED dial to set the forward speed to a speed slightly faster than the estimated speed necessary to perform removal.

NOTICE:
YOUR INITIAL FORWARD SPEED SETTING SHOULD ALWAYS BE SET TO A SPEED SLIGHTLY FASTER THAN THE ANTICIPATED BLASTING SPEED TO REDUCE THE POSSIBILITY FOR PAVEMENT DAMAGE AS BLASTING BEGINS.

9. With vehicle moving at the desired speed, turn the DUMP VALVE 40K switch on to activate the dump valve and begin waterblasting operations.

Remember, never close the diverter valve while truck is sitting still with the blast heads on the ground.

⚠ CAUTION ⚠

THE UHP PUMP IS DIRECTLY DRIVEN BY THE OMSI PTO AND WILL BE DAMAGED IF THE OMSI DRIVE PTO IS ENGAGED WITHOUT ACTIVATING THE TRANSMISSION PTO AND CHARGE PUMP.

MAKE SURE THE TRANSMISSION PTO AND CHARGE PUMP SWITCHES ARE ACTIVATED TO PROVIDE WATER TO THE UHP PUMP FOR COOLING AND LUBRICATION WHENEVER THE OMSI DRIVE PTO IS ENGAGED. NEVER ENGAGE 4/4 WITHOUT ACTIVATING THE TRANSMISSION PTO AND CHARGE PUMP.

Waterblasting Operation Do's and Don'ts

Do's:

- STOP blasting before stopping the truck. Blasting with the unit stopped will damage the pavement, spray bar and blast head.
- STOP blasting before changing direction.
- If there is any doubt about the correct spray bar for the job, choose a less aggressive spray bar.
- Adjust the forward speed and head rotation to remove 98% of the paint in a single pass to eliminate a second pass and more potential for damage.
- Adjust the pressure for the pavement. Typically a blast pressure between 32,000 and 38,000 psi is used.
- Check and clean the vacuum filter frequently to ensure strong vacuum pressure while blasting. A dirty filter and low vacuum will leave excessive paint chips and debris on the pavement slowing productivity.
- Check the charge pressure before blasting operations begin. Change both filters if charge water pressure is below 60 psi (4 BARS) before beginning operations.
- Monitor the water flow to the stuffing boxes frequently to ensure a steady stream is flowing to cool and lubricate the packing.
- Monitor charge pressure frequently during blasting operations to ensure proper charge water pressure while blasting.
- Check the pavement frequently and watch the outer edges of the lines for damage. Continuously make adjustments as required.

Don'ts

- Do not allow untrained personnel to operate Stripe Hog equipment.
- Do not continue blasting with a damaged nozzle. It can cause damage, wastewater, reduce the power of other nozzles and slow production.
- Avoid running the blast head wheels on rumble strips. Always adjust the Hog Arm and the castor wheel support arms on the blast head to keep the wheels off rumble strips.
- Do not blast directly on sealed joints in the pavement. Especially weather stripping on bridges or runways.
- Do not blast over pavement markers/reflectors. Markers can damage the blast head and spray bar and should be removed prior to blasting.
- Do not blast over damaged or uneven pavement that can damage the blast head and spray bar.
- Do not allow the debris bag to become overfilled. Monitor the bag and dump the bag and tank before they become full.
- Do not allow the charge pump to run out of water. Water is a lubricant that cools the charge water and high pressure pumps. They will be damaged if they run dry. Always monitor the water level in the clean water tanks and refill when they get low.
- Do not activate the PTO switch when the charge pump and transmission PTO are not activated. The charge pump supplies clean water to prime and lubricate the UHP pump.

3.7 Routine Shutdown

The shutdown procedure should be followed each time the waterblasting system is deactivated and the truck is shifted from WORK mode to DRIVE mode.

The procedures in the following instructions provide general instructions for shifting from WORK mode to DRIVE mode will apply to most trucks. However, your truck may be slightly different, depending on the options selected. ***Always refer to the placard on the back of the visor in the cab for specific startup and shutdown instructions for your truck.***

Shutdown procedure:

1. Shutdown high pressure by turning off the DUMP VALVE 40K switch.
2. Stop the truck and set the parking brake.
3. Turn the HEAD ROTATION speed dial to 0.
4. Reduce the engine speed to idle and allow it to run at idle speed.
5. Allow the vacuum blower to operate for a couple of minutes to clear waste water from hoses and dry out the vacuum system.
6. Turn the DIRTY WATER switch off.
7. Turn the Hog Arm FLOAT SWITCH off.

8. Place the Hog Arm lock lever in position against the cam and raise the Hog Head to the full “UP” and locked position.

NOTICE:
THE FLOAT SWITCH MUST BE OFF BEFORE THE HOG ARM CAN BE RAISED.

9. Make sure the Hog Arm locking lever is engaged and secure it with a safety strap to ensure the locking lever cannot accidentally be released during transportation.

10. Make sure the truck is stopped and put the Transmission in “N” *(NEUTRAL)*.

11. Turn the Mode switch OFF. It is important that this switch is off to prevent the truck transmission from engaging 4th gear lock-up when DRIVE is selected causing the truck to surge forward.

12. Turn the PTO switch and CHARGE PUMP switches off. Listen for the PTO to disengage. Then wait for the red light to turn OFF and the green light to turn ON.

13. Turn all other switches and dials on the control panel to OFF or 0.

14. Turn the transmission PTO switch off to disengage the waterblasting hydraulic system.

15. Drain waste water from the vacuum canister. Close the valve when draining is complete.

16. When the truck is parked, set the parking brake and allow the engine to idle for several minutes to cool internal components, then shut off the engine.

WARNING

WATERBLASTING COMPONENTS COULD BE ACTIVATED ACCIDENTLY WHILE DRIVING IF THE PTO DOES NOT DISENGAGE. THIS COULD RESULT IN SEVERE DAMAGE TO THE TRUCK AND/OR INJURY TO PERSONNEL.

ALWAYS MAKE SURE YOU HEAR THE PTO DISENGAGE DURING SHUTDOWN.

Debris Tank & Door

3.8 Dumping Debris

Solid debris (larger than 100 microns) is separated from the wastewater by the filter bag and needs to be dumped when the bag/debris tank is near full. A hydraulic actuator below the tank lifts the passenger side, causing the tank to tilt for easy dumping.

Before dumping debris, be sure you are dumping in an approved dump site and that the truck is on solid, level ground. Then use the following procedure to dump debris from the cage.

1. Put the truck in neutral, set the engine speed to idle, engage the parking brake and disengage the OMSI Drive by turning off the PTO switch. This will deactivate the UHP pump and vacuum blower.
2. Turn off the CHARGE WATER switch to deactivate the charge water pump.
3. Make sure all wastewater is drained from the debris tank sump. Activate the dirty water pump system in DISCHARGE mode or open the gravity drain valve to completely drain the tank. Then shutdown the pump system or close the drain valve.
4. Open the drain valve for the wastewater bladder on the passenger side of the truck and completely drain the bladder. Then close the valve.
5. When draining is complete, move the Door Seal switch on the debris tank control panel to the DEFLATE position to completely deflate the air seal on the debris tank door.

6. Open the latches at the bottom of the debris tank door. Put pressure against the door to hold it closed as the last clamp is removed. The door is held open by a gas spring that will open the door automatically as soon as the last clamp is removed. It is normal for some water to pour out as the door opens so you should be prepared to step back as the last clamp is removed.

7. Perform the startup procedure to activate the transmission PTO and the waterblasting hydraulic system. (Refer to steps 1-5 in section 3.4 Truck & Accessory Hydraulic System Startup Procedure)

8. Attach the cord for the hydraulic system remote control to the receptacle in the driver side tool box.

9. While you and all other personnel stand well clear of the debris tank, press the white UP button to raise the tank and dump the debris. As the tank raises, the filter bag will slide out with the debris.

10. If the debris and bag do not slide out, use a rod or shovel to break up the debris until it is all removed.

⚠ CAUTION ⚠

NEVER ROCK THE TRUCK OR BOUNCE THE HYDRAULIC ACTUATOR TO MAKE THE DEBRIS BAG FALL OUT. THIS JERKING MOVEMENT WILL DAMAGE THE HYDRAULIC ACTUATOR AND POSSIBLY BREAK DEBRIS TANK HINGE PINS OR MOUNT BRACKETS.

11. When dumping is complete, press the black DOWN button and slowly lower the tank. Monitor all hoses and components as the tank is lowered and be prepared to stop if a hose becomes pinched or a component is misaligned.

12. Support the door in the full open position with the safety strut. Then use a hose to clean the tank and liner thoroughly with fresh water. Make sure to the clean the automatic float switch for the pump out system and the cutoff ball valve.

NOTICE:
A HOSE CAN BE ATTACHED TO THE CHARGE WATER PUMP TO USE THE ONBOARD CLEAN WATER SUPPLY TO WASHDOWN THE DEBRIS CAGE AFTER DUMPING.

Remote Switch Control

13. When the tank is clean install a new filter bag. Check that the bag is installed properly and that the debris pump intake line is not blocked. Also make sure the automatic float switch and cutoff ball valve are free.

14. Then thoroughly clean the door seal, close the door and secure it with the clamps.

15. When the door is closed and latched, use the DOOR SEAL switch to inflate the debris door seal. Maximum seal pressure is 20-25 psi (1.4 - 1.7 BAR).

16. Remove and store the remote switch control.

17. Start the engine and follow the startup procedure to engage the OMSI PTO to activate the vacuum system. Then increase engine RPM to achieve maximum vacuum and check the seal area for leaks. If vacuum is leaking around the door, the problem could be that the door didn't close properly, there is debris on the seal, or the seal is damaged. Find and correct the problem before operating the system.

Note:
The system will not be able to develop enough vacuum if the debris tank or filter canister doors are not sealed and closed properly or a drain valve is open.

18. Perform the shutdown procedure to deactivate work mode and place the truck in transport mode.

Repair any problems found during dumping operations before returning the truck to service.

3.9 Emergency Shutdown

WARNING

IF AN EMERGENCY SITUATION INVOLVING THE POTENTIAL FOR PERSONAL INJURY AND/OR EQUIPMENT DAMAGE OCCURS, THE OPERATOR SHOULD ALWAYS SELECT THE EMERGENCY SHUTDOWN PROCEDURE. THIS PROVIDES IMMEDIATE SHUTDOWN OF THE TRUCK AND ALL WATER BLASTING SYSTEMS TO REDUCE THE POSSIBILITY OF INJURY AND DAMAGE TO EQUIPMENT.

To stop all operations immediately use the following procedure:

1. PRESS THE BRAKE PEDAL TO DISENGAGE ENGINE CRUISE CONTROL AND DROP ENGINE RPM TO IDLE SPEED.

2. IMMEDIATELY SHIFT THE AUTOMATIC TRANSMISSION TO “N” (NEUTRAL) AND SHUTDOWN THE ENGINE. THIS WILL INSTANTLY SUSPEND OPERATIONS OF THE ENTIRE SYSTEM.

3. WHEN THE SITUATION PERMITS, RETURN ALL SWITCHES TO THE “OFF” POSITION AND ALL DIALS TO THE “0” SETTING.

3.10 Operating in Freezing Conditions

Shutdown

1. Allow the vacuum blower to operate for a couple of minutes after shutting down the high pressure and charge water pumps to clear waste water from hoses and dry out blower system.
2. Make sure the clean water and debris tanks are drained immediately at the end of each shift.
3. All system hoses and the Hog Head assembly should be drained of all water and/or filled with an anti-freeze solution. (Non alcohol)
4. Refer to the UHP pump manufacturer's procedures for maintaining and operating the pump in freezing climates.
5. Open the drain valve at the charge water pump and allow the hoses and pump to completely drain. With the valve still open, activate the pump briefly to pump out any remaining water, about a cupful. Then close the valve.
6. Remove the debris pump strainer and run the pump briefly to drain the pump hoses. Then clean and reinstall the strainer.
7. Pour 2 gallons of anti-freeze into the high pressure pump stuffing box sump so it will drain to the bilge pump sump system. Allow the bilge pump to run until anti-freeze is visible at the bilge pump hose fitting in the debris tank.
8. Drain the vacuum canister immediately at the end of each shift.
9. Follow all other instructions in the Warm Weather Shutdown Procedure.

⚠ CAUTION ⚠

IF YOU OPERATE IN FREEZING TEMPERATURES OR EVEN TEMPERATURES BELOW 60 DEGREES FAHRENHEIT (16 DEGREES CELSIUS), IT WILL BE NECESSARY TO OPERATE THE SYSTEM, INCLUDING ENGAGING THE BLOWER AND HIGH PRESSURE PUMP, AT IDLE SPEED ONLY UNDER LOAD, UNTIL HYDRAULIC FLUID HEATS UP ABOVE 60 DEGREES FAHRENHEIT (160 CELSIUS).

3.11 Operation Routine Maintenance

Some components of the ultra high pressure water and vacuum systems require preventative routine maintenance during a typical waterblasting shift. This maintenance is considered routine and a component of the waterblasting process. The frequency for maintaining the items listed in this section will vary, depending on the quality of the clean water supply, the overall condition of the waterblasting systems and proficiency of the operators.

A well maintained truck operated by an experienced operator and using water from a very clean source may only require routine maintenance at the beginning or end of each shift. A poorly maintained truck, poor quality clean water supply, or truck that is not being operated properly could require routine maintenance several times during a shift.

The following is a list of the components that require maintenance during a typical waterblasting shift and a brief description of the procedure. Refer to the Lubrication and General Maintenance section of this manual for detailed instructions for maintenance items listed.

The following items typically require maintenance during a typical shift:

- 10 Micron Filter - The filter should be replaced at the start of each shift and may require replacement during the shift if low charge water pressure is indicated. Shutdown the system, remove the filter clamp and cap, then remove and replace the filter. Reinstall and tighten the cap.
- 1 Micron Filter - The filter should be replaced at the start of each shift and may require replacement during the shift if low charge water pressure is indicated. Shutdown the system, remove the filter clamp and cap, then remove and replace the filter. Reinstall and tighten the cap.
- Purge Air From The Charge Water System - If the clean water filters are replaced or the operator allows the clean water tank to run dry, air will be introduced into the charge water system that must be purged before the system will prime and supply clean water to the ultra high pressure pump. Follow the procedure outlined in the Lubrication and General Maintenance section.

- Blast Head Shroud Wear Brush Adjustment - If the wear brush wears or the shroud clamp becomes loose and the brush looses contact with the pavement, the wear brush will need to be adjusted. Make sure the Hog Arm is in the down position with the castor wheels firmly on the pavement. Loosen the clamp and adjust the wear brush so it is making light contact with the pavement, then tighten the clamp.
- Adjust caster wheel height - Adjustment may be required to increase shroud distance from the pavement to clear obstacles like road markers or decrease clearance when no obstacles are present. Remove the safety pin, then rotate the handle on each caster to set the height. Reinsert the safety pin to lock the adjustment.
- Drain Vacuum Canister - The vacuum canister must be checked frequently during operation and drained when more than 6" of water has accumulated in the bottom. Shutdown the vacuum system, uncoil the drain hose and open the canister drain ball valve. Make sure to close the valve and coil the hose before resuming operations.
- Clean The Vacuum Filter - The filter should be cleaned at the start of each shift and may require cleaning during the shift If reduced vacuum pressure is indicated. Shutdown the vacuum system. Open the door on the vacuum canister, then remove and clean the filter. Reinstall the filter, then close and latch the door.
- Drain Debris Tank Water - If the debris tank becomes full of water during a shift, it must be drained to avoid an unexpected vacuum system shutdown. Shutdown the vacuum system and turn on the DIRTY WATER PUMP switch in the control panel. Then move DEBRIS PUMP switch on the debris tank to DISCHARGE or open the tank gravity drain valve. Turn the DIRTY WATER PUMP switch OFF and/or close the drain valve when draining is complete.

4.1 Lubrication & General Maintenance Introduction

Lubrication Points

You should become familiar with the location of all components that require frequent lubrication and include them in the general maintenance schedule. Some of these lubrication points require specialized lubricants. The lubrication points shown in the photos and listed in the Lubrication Charts on the following pages in this section provide a guide to the location of the lubrication points on your machine.

NOTICE:
IT IS NOT POSSIBLE TO SHOW ALL VALVES, HINGES, LATCHES AND SAFETY PINS ON THE LUBRICATION CHARTS. RELATED ITEMS NOT SHOWN SHOULD ALSO BE INCLUDED IN YOUR MAINTENANCE ROUTINE.

Refer to the Maintenance Matrix chart in the Scheduled Maintenance section in this manual and component manufacturer's operating and/or maintenance manuals for lubricant specifications and maintenance schedules.

Some lubrication points require grease daily or weekly. In extremely wet or dirty conditions the requirements could increase. The lubrication frequency outlined in this section should be considered the minimum requirement.

Before operating or performing any maintenance on the vehicle make sure the machine is properly shutdown and secured in the service position.

General Maintenance

Some components of the ultra high pressure water and vacuum systems require daily maintenance or may require maintenance during a typical waterblasting shift. This maintenance is considered routine general maintenance and a component of the waterblasting process. The service procedures for these items are described in this section of the manual. The frequency for maintaining general maintenance items will vary, depending on the quality of the clean water supply, the overall condition of the waterblasting systems and proficiency of the operators.

CAUTION

THE GENERAL MAINTENANCE PROCEDURES OUTLINED IN THIS SECTION MUST BE FOLLOWED EXACTLY TO AVOID DAMAGING COMPONENTS AND/OR VOIDING THE WARRANTY.

Scheduled Maintenance

Components that are typically serviced periodically or at specific hours of operation are considered scheduled maintenance items. The service procedures for those items are described in the Scheduled Maintenance section.

Service Position

Properly shutting down and securing the machine for service is critical to the safety of the operator and/or service personnel.

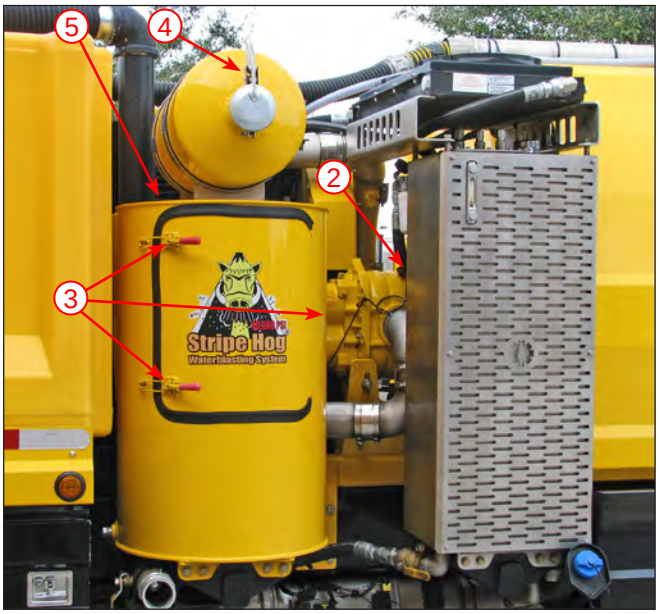
Use the following procedure to place the machine in the service position:

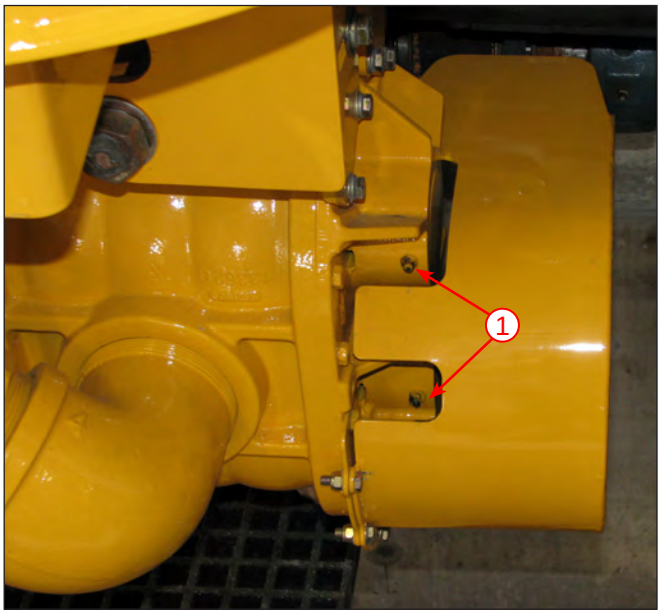
1. Make sure all components lifted hydraulically are in the full down position or properly supported to remove the load from the cylinders and hinges.
2. Shift the truck to Drive Mode before shutdown to prevent accidental activation of waterblasting systems.
3. Park vehicle on a level area and block wheels.
4. Apply parking brake.
5. Shutdown the engine and disable the truck electrical system at the main circuit breaker.
6. Follow all Lockout/tagout and additional shutdown procedures established in your company safety guidelines to complete the service position.

WARNING

SEVERE INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT CAN RESULT IF THE VEHICLE ROLLS OR IS STARTED UNEXPECTEDLY DURING SERVICE. ALWAYS FOLLOW THE RECOMMENDED PROCEDURES TO PLACE THE UNIT IN THE SERVICE POSITION AND APPLY LOCKOUT/TAGOUT PROCEDURES BEFORE ALLOWING ANYONE TO SERVICE COMPONENTS.

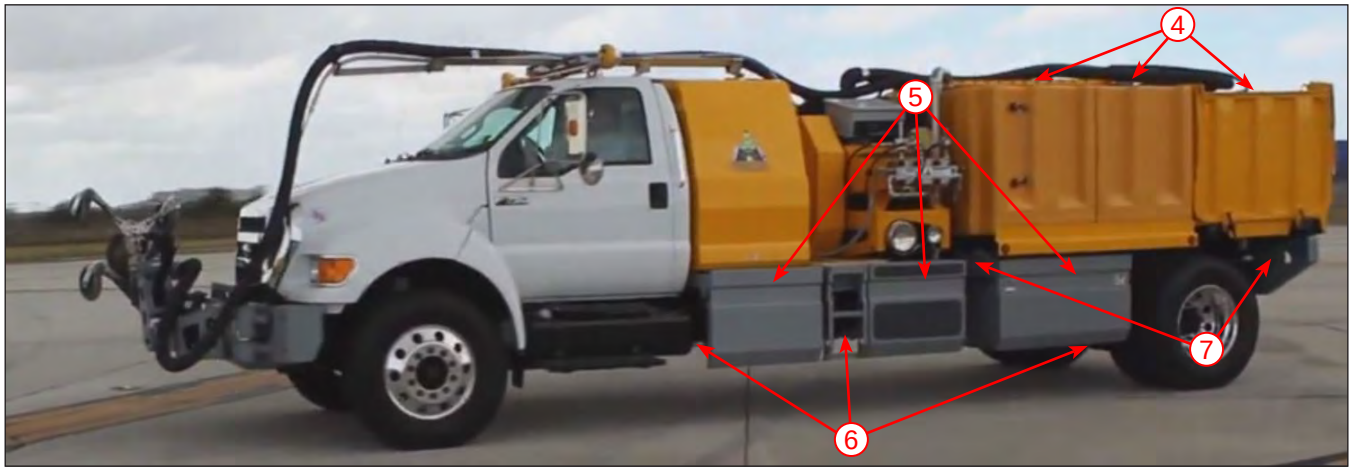
4.2 Lubrication & Grease Point Locations

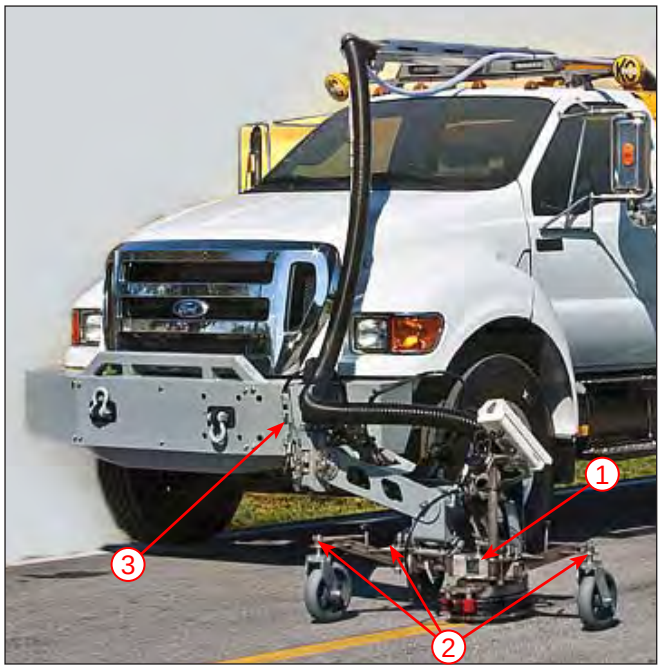


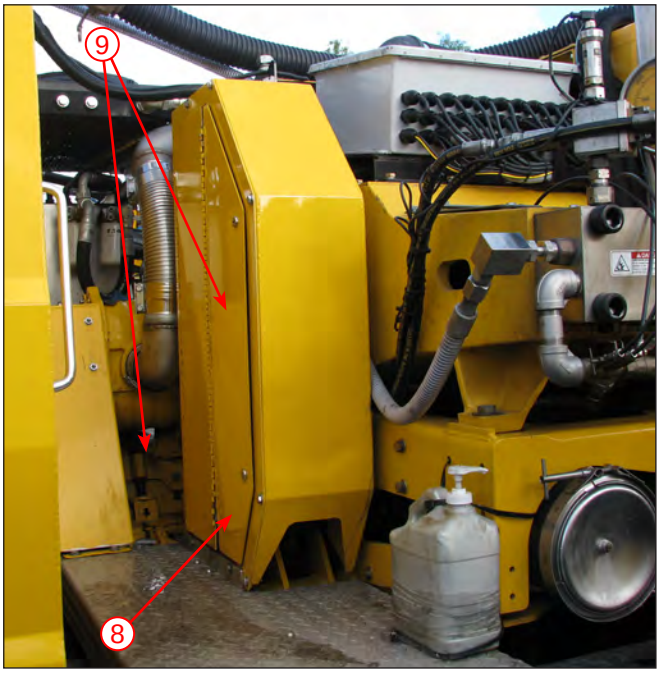


Stripe Hog Lubrication Chart 1

ITEM #	COMPONENT DESCRIPTION		ITEM #	COMPONENT DESCRIPTION
1.	Vacuum Blower Pulley End Bearings		5.	Kunkle Valves
2.	Vacuum Blower Pulley & Pulley End Location (On Blower Behind Hydraulic Tank)		6.	Tool Box & Access Panel Hinges & Latches
3.	Vacuum Door Hinges & Latches		7.	Ball Valves
4.	Silencer Exhaust Flapper Hinges			

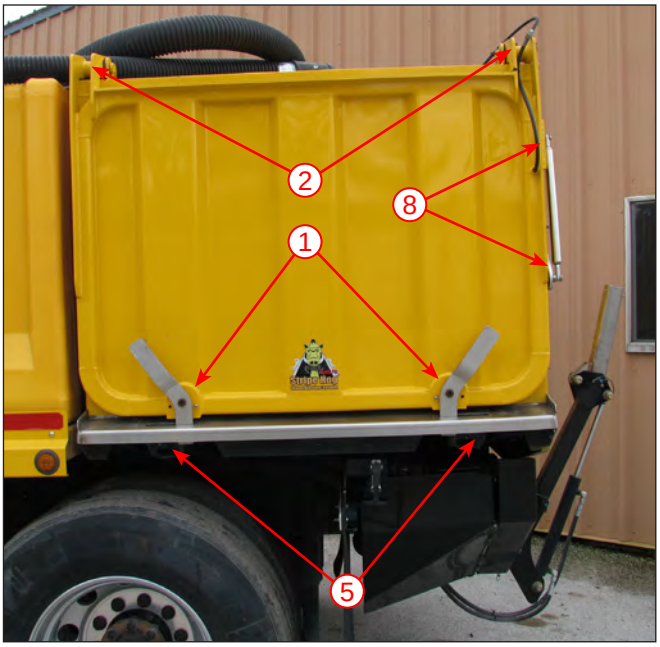


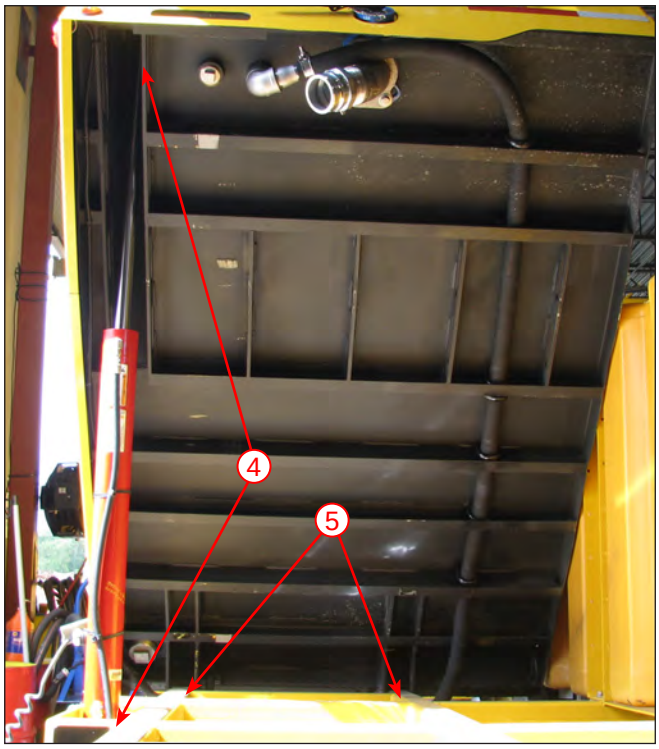




Stripe Hog Lubrication Chart 2

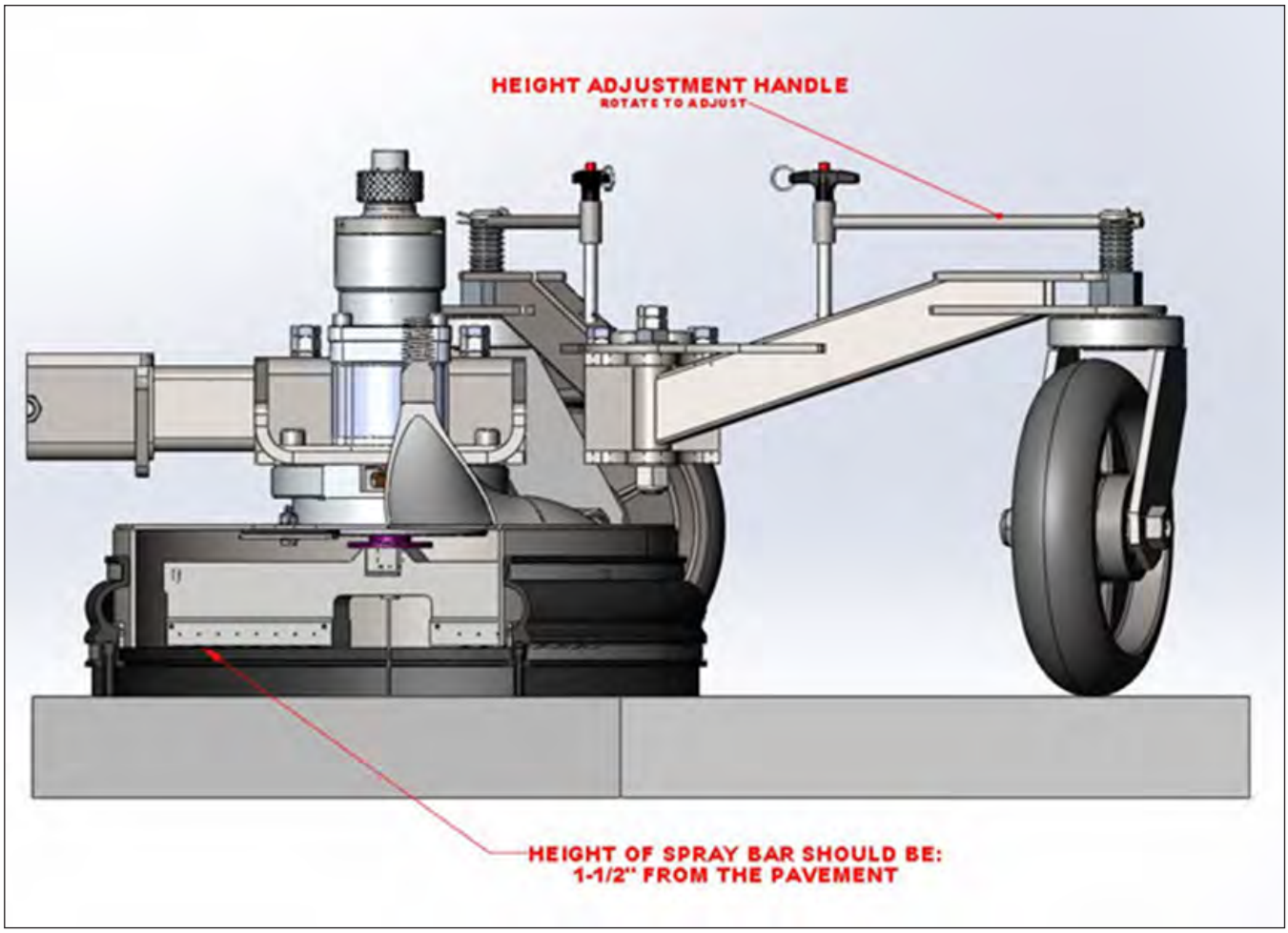
ITEM#	COMPONENT DESCRIPTION		ITEM#	COMPONENT DESCRIPTION
1.	Thru-shaft Motor Bearings		6.	Driveshaft Universal Joints & Spline Shafts
2.	Blast Head Chassis Wheels, Casters & Safety Pins		7.	Ball Valves
3.	Sliding Hog Arm Safety Pin & Locking Lever		8.	UHP Pump Drive Belt Idler Pulley
4.	Man-Way & Inspection Hatches		9.	UHP Pump & Blower Tension Bolts
5.	Tool Box & Access Panel Hinges & Latches			





Stripe Hog Lubrication Chart 3

ITEM #	COMPONENT DESCRIPTION		ITEM #	COMPONENT DESCRIPTION
1.	Debris Tank Door Latches		5.	Debris Tank Tilt Hinges
2.	Debris Tank Door Hinges		6.	Ladder Hinges
3.	Drain Valves		7.	Lift Arm Hinges & Cylinder Bearings
4.	Debris Tank Tilt Cylinder Bearings		8.	Gas Charged Door Lifter



Blasting Head Standoff Adjustment & Standard Setting

4.3 Standoff Adjustment Procedure

The term "Standoff" refers to the height of the spray bar above the pavement. The standoff distance is set by turning the adjustment handle on the threaded end of each caster wheel yoke.

Standoff directly affects removal performance and should be adjusted regularly based on the following considerations:

- Removal performance. Generally the best standoff distance is 1.5" (46 cm) from the nozzles to the pavement. This is the standard factory setting.
- Clearance for obstacles. The standoff should always be set high enough to provide enough clearance for the shrouds and spray bars to clear obstacles permanently attached in the pavement, such as runway lights or road markers.

It is the operator's responsibility to evaluate the pavement surface and permanently attached obstacles, then set the standoff adjustment to provide clearance at the start of each job. Since pavement obstacle height is unique to each location, never assume that the standoff has been correctly set by any other person or operators who have previously used the truck in a similar circumstance.

To set the standoff distance:

1. Make sure the yokes are correctly installed and locked into position.
2. Raise the Hog Arm to the full up with the heads lock perpendicular to the road surface.
3. Turn off the truck and place it in the service position to ensure that the head cannot accidently move.
4. Remove the spray bar cover.

5. Place a straight edge across the bottom of the wheels and below the spray bar to simulate the pavement surface. Measure from the distance from the straight edge to the spray bar to determine the standoff distance.

6. Remove the safety pins and turn the adjustment handles to raise or lower the castor wheels to achieve the desired distance from the straight edge to the spray bar. Remember that 1.5" (46 cm) is the standard standoff distance. Increase the distance if required to clear road obstacles. Make sure to turn each handle the same number of revolutions to keep the blast heads level.

7. Cross check the measurement by placing the straight edge across the other wheels. Readjust the castor wheels as required to level the blast head.

8. Before starting operations, confirm proper clearance by moving the blast heads slowly over a typical obstacle in the pavement on the current job while monitoring the clearance. Make additional adjustments if necessary.

9. Be alert for obstacles that are higher than the standoff clearance during removal operations. You must be prepared to avoid the obstacle or stop the truck and adjust the standoff distance to provide additional clearance.

CAUTION

- It is never acceptable to pass over obstacles in the pavement surface that are high enough to hit the shroud. Pavement obstacles can cause severe damage to blast head components.
- Never allow the blast heads to pass over debris.
- Never allow the blast heads to pass over equipment or markers that can be damaged by the shroud, spray bars or the blast from the water jets.
- Always perform a test pass at the start of each job to confirm adequate standoff clearance before beginning normal removal operations.

4.4 Clean Water Filter Replacement

10 Micron Bag Filter

CAUTION

THE FILTER CANISTER LIDS CAN BE EJECTED FROM THE CANISTER IF THE RETAINER RING IS LOOSENED WHILE THE CHARGE WATER SYSTEM IS PRESSURIZED. THIS CAN RESULT IN DAMAGE TO THE FILTER AND COULD CAUSE INJURY TO PERSONNEL.

ALWAYS MAKE SURE THE WATERBLASTING SYSTEM AND CHARGE PUMP ARE DISENGAGED, THE CLEAN WATER SUPPLY VALVE IS OFF AND THE PRESSURE HAS BEEN BLED FROM THE SYSTEM BEFORE REMOVING THE FILTER LIDS.

NOTICE:
WHEN REINSTALLING THE RETAINER RING, PLACE A SMALL AMOUNT OF ANTI-SEIZE ON THE RETAINER RING BOLT THREADS TO PREVENT GALLING OF THE THREADS.

10 Micron Filter Canister

Typical 10 Micron Bag Style Filter

Replacing the 10 micron filter:

1. Make sure the waterblasting system is shut-down and the truck is in the service position.
2. Close the clean water supply valve and bleed pressure from the charge water system.
3. Remove filter canister lid and retainer ring.
4. Remove the filter and filter cage.
5. Flush the filter canister and cage to remove debris and contaminants if necessary.
6. Place a new filter bag inside the filter cage. Filter bag must be fully expanded to the end of the cage to provide proper filtration and water flow.
7. Push filter and cage into the filter canister until properly seated.
8. Coat the retainer ring threads with anti-sieze and install filter canister lid. Tighten retainer ring bolt.
9. Open the clean water valve and reactivate the waterblasting system. Follow the instructions to bleed air from the charge water system in the next section of this chapter.

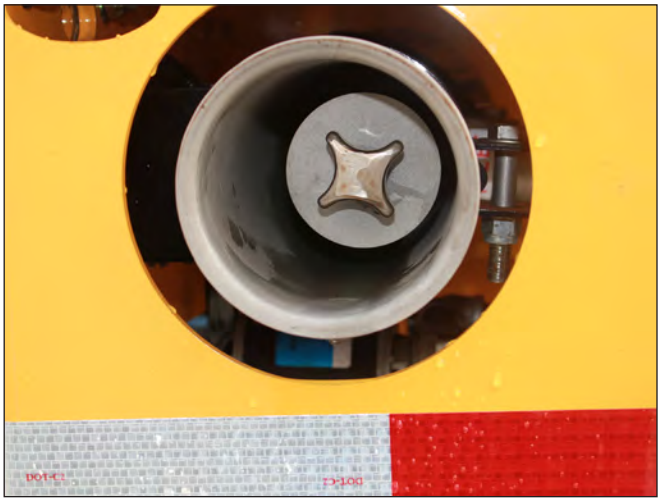
1 Micron Cartridge Filter

Follow all the precautions outlined in the previous section for the 10 micron filter.

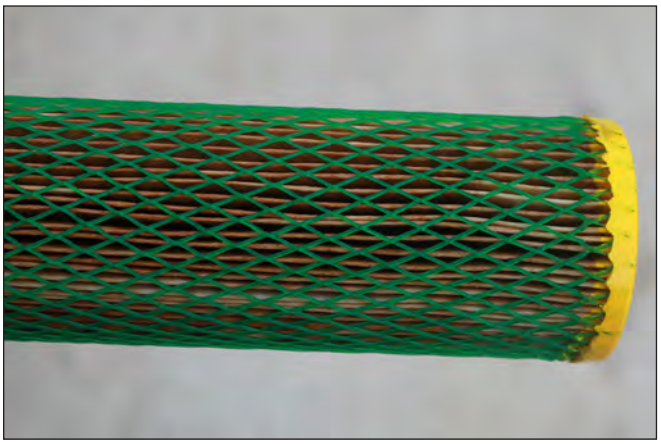
Replacing the 1 micron filter:

1. Make sure the waterblasting system is shut-down and the truck is in the service position.
2. Close the clean water supply valve and bleed pressure from the charge water system.
3. Remove filter canister lid and retainer ring.
4. Remove the filter retainer bolt and filter. Then flush filter canister to remove debris and contaminants with clean, fresh water.
5. Apply a thin coat of anti-sieze to the filter retainer bolt threads.
6. Insert the new filter and retainer bolt into the filter canister. Hand tighten the retainer bolt just enough to seat the filter (snug). ***Make sure not to over tighten the bolt and collapse the filter cartridge.***
7. Coat the retainer ring threads with anti-sieze and install filter canister lid.
8. Open the clean water valve, reactivate the waterblasting system and follow the instructions to purge air from the charge water system in the next section of this chapter.
9. Activate the charge pump and flush the low pressure side of the pump and charge water system using the flush valve before operating the UHP pump after changing the filters.

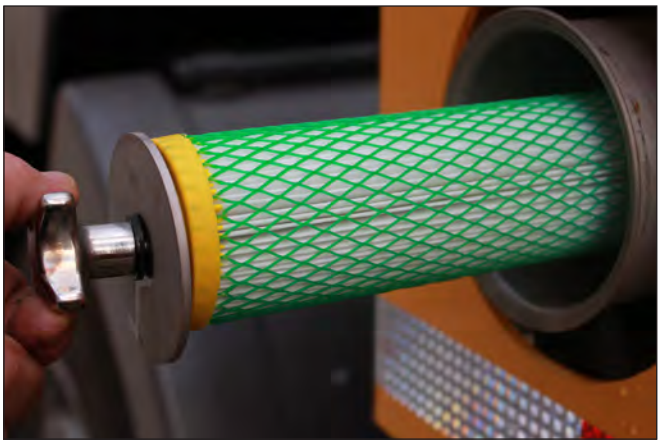
1 Micron Filter Canister



Filter Retainer Hand Bolt



Typical Dirty Filter



Clean Filter Installation

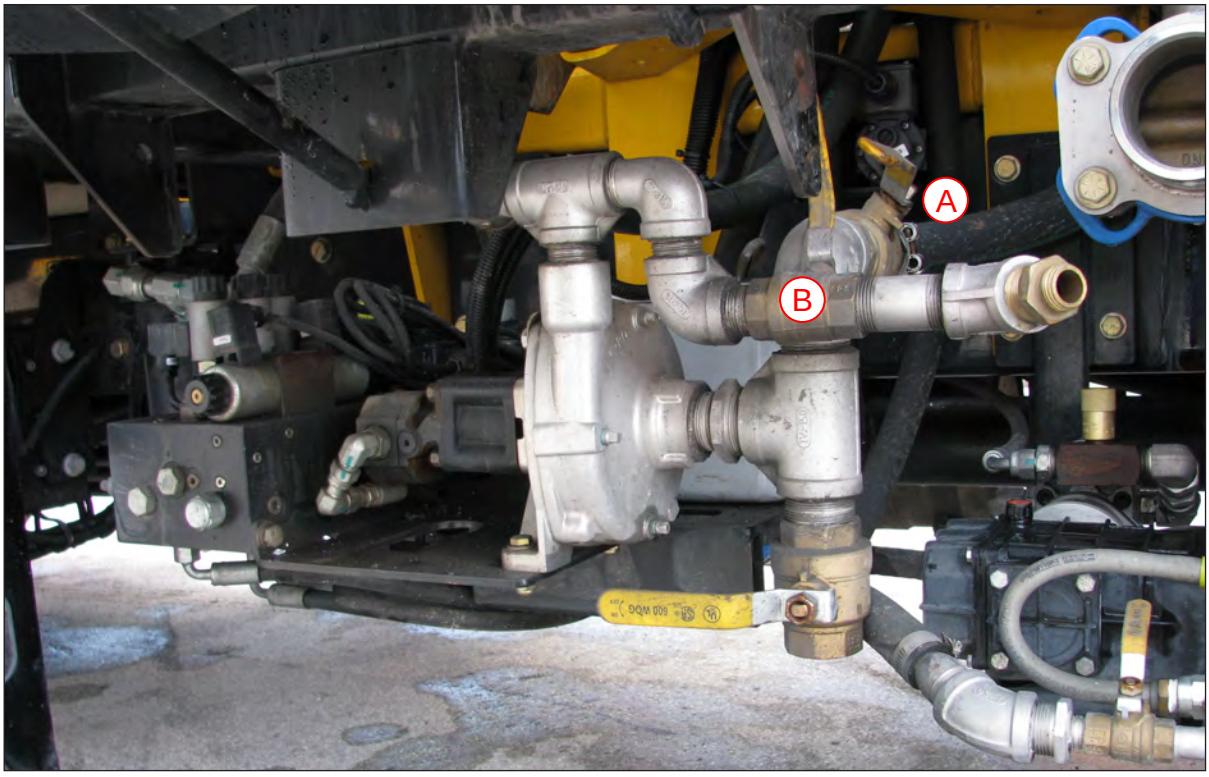
4.5 Bleeding Air From Charge Water Pump

Air must be bled from the charge water system when the filters are changed, the clean water tank is run dry or anytime the charge water system is serviced.

Use the following procedure to bleed air from the charge water system:

1. Reactivate the truck and the waterblasting system in Work mode by following the steps in the Start Up Procedure. The truck engine must be at idle.
2. Open the clean water supply valve and turn on the charge water pump.
3. While the charge pump is running, open the discharge valve on the charge water pump for 2 or 3 seconds, then close the valve.
4. Immediately repeat step 3 while monitoring the charge water pressure gauge in the control panel.
5. If pressure does not rise to the normal charge water pressure range within a few seconds, repeat step 3 until pressure rises to the normal range (60 psi - 4 BAR).

Charge Water Pressure Gauge



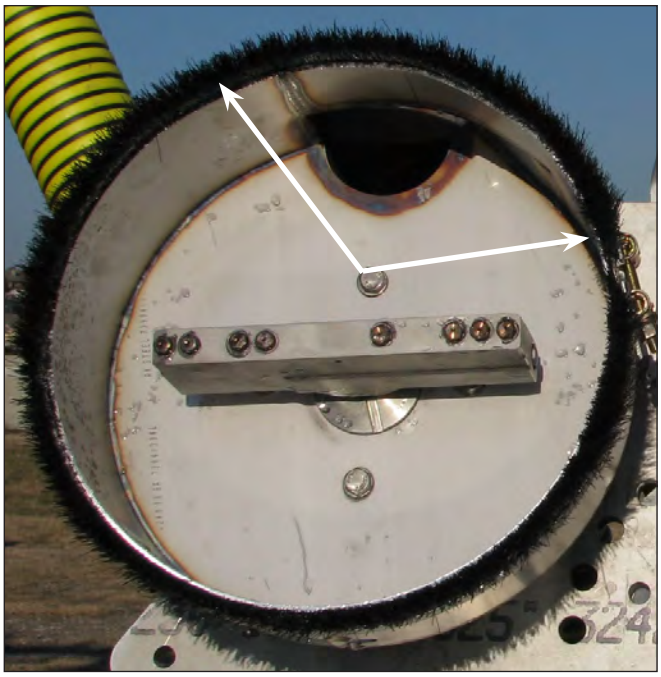
A) Clean Water Supply Valve / B) Charge Water Pump Discharge Valve

4.6 Wear Brush Assembly Adjustment

The wear brush bristles will slowly wear during operation. Consequently, the wear brush will require adjustment periodically to keep the bristles in contact with the pavement to provide proper vacuum air flow. It will also need to be adjusted when the standoff distance is increased or when the shroud and/or wear brush is replaced.

Use the following procedure to adjust the wear brush assembly:

1. Make sure the truck is in WORK mode and lower the hog head onto a level surface.
2. Turn on the FLOAT switch to be sure the heads are flat with the surface.
3. Shutdown the waterblasting system and place the truck in service position.
4. Note the gap between the bottom of the brush and the surface.
5. Loosen the brush clamp on the blast head.
6. Tap the brush down evenly using a dead blow hammer until the bristles are just touching the surface and the gap is eliminated.
7. Make sure the brush bristles are not pressed hard against the pavement. If the brush is set too tight against the surface, it will cause premature wear to the bristles resulting in reduced vacuum air flow and accelerated brush wear.
8. Tighten the clamp and recheck. Readjust if necessary.



Typical Wear Brush & Wear Brush Clamp

Proper Wear Brush Contact

4.7 Dirt Shield Replacement

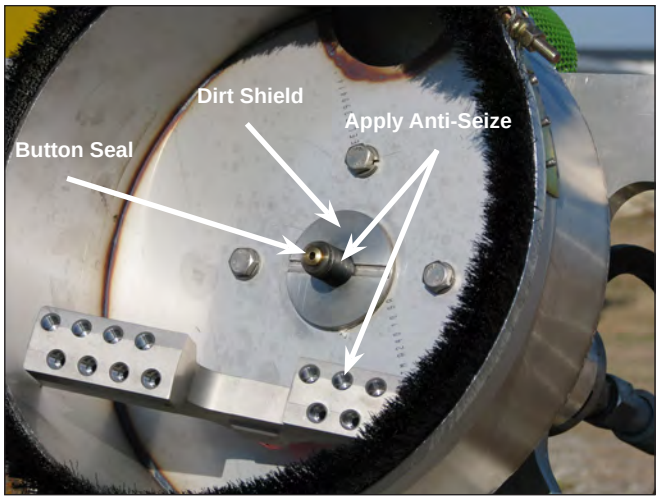
The dirt shield should be inspected daily to ensure it is tightened properly and that the felt seal is in good condition.

Use the following procedure to replace a damaged or worn felt seal:

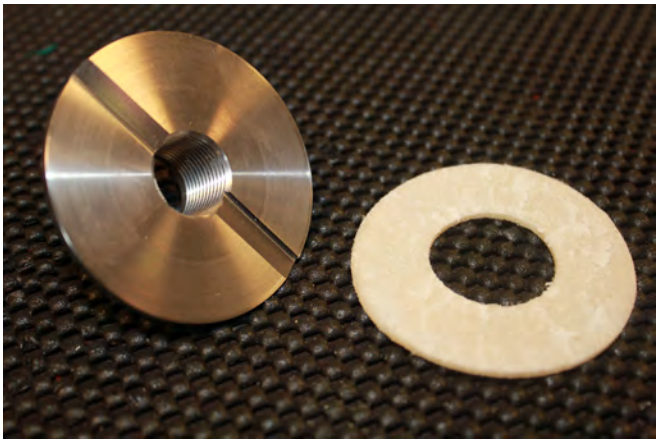
1. Make sure the waterblasting system is shut-down and the truck is in the service position.
2. Hold the thru-shaft so it won't turn with a 3/4" (19 mm) wrench inserted in the slot at the base of the thru-shaft motor.
3. Turn the spray bar counterclockwise by hand until it is free of the shaft.
4. Remove brass button.
5. Use a stainless steel wire brush to clean the dirt from the thru-shaft threads.
6. While still holding the thru-shaft with the wrench, remove the dirt shield by turning it counterclockwise.
7. Remove the felt seal. Then clean the dirt shield and shroud.
8. Place a new felt seal on the dirt shield and apply a light coating of anti-sieze to the thru-shaft threads.
9. Hold the thru-shaft with the 3/4" (19 mm) wrench, install the new dirt shield and hand tighten.

NOTICE:
ONLY HAND TIGHTEN THE DIRT SHIELD. NEVER USE TOOLS TO TIGHTEN THE DIRT SHIELD. IF THE DIRT SHIELD IS TIGHTENED MORE THAN HAND TIGHT IT WILL CAUSE THE SPRAY BAR TO ROTATE SLOWLY OR NOT ROTATE AT ALL.

10. Reactivate the truck and the waterblasting system by following the steps in the Start Up Procedure.
11. Purge the blast head at low pressure to remove debris that could clog the nozzles.
12. Shutdown the waterblasting system and return the truck to the service position.



Typical Dirt Shield Installation



Brass Dirt Shield & Felt Seal

13. Install a new brass button seal, hold the thru-shaft with the wrench and reinstall the spray bar.
14. Hand tighten the spray bar by turning it clockwise ***slowly*** until it stops. Then seat the seal by turning the spray bar another 15%. Make sure you remove the wrench when the installation is complete.
15. Install the spray bar protector.

Typical Spray Bar With Protector Installed

Spray Bar Protector, Cotter Pin & Gasket

4.8 Nozzle Installation

The condition of the nozzles is critical to removal performance and maintaining a tight, cohesive stream as water is forced through the nozzles. Maximum productivity and 98% removal without damage requires all nozzles to be in excellent condition. Nozzles should be inspected before the start of each shift as part of the pre-operation check or when the operator notices a loss in pressure or a change in performance while blasting. If visual inspection of the nozzle spray pattern indicates that the pattern is not in the # 1-4 quality range as indicated on the Nozzle Quality Guide, the nozzle must be replaced.

Use the following procedure when replacing nozzles:

1. Make sure the Hog Arm and blasting heads are in the full up position and locked with the safety pin.
2. Make sure the waterblasting system is shut-down with the truck in the service position.
3. Remove the spray bar protector cotter pin and the spray bar protector.
4. Remove worn or damaged nozzles.
5. Reactivate the truck and the waterblasting system by following the steps in the Start Up Procedure.
6. Turn the charge pump on and flush debris from the spray bar with low charge pressure water.
7. Once the spray bar is flushed, deactivate the waterblasting system and return the truck to the service position.

8. Apply a light coat of anti-seize to the threads on the new nozzles.
9. Install the nozzles into the spray bar being careful not to get any anti-sieze on the seat area of the nozzle or the spray bar.
10. Tighten each nozzle finger tight, then torque to 10 ft lbs.
11. Reactivate the truck and the waterblasting system by following the steps in the Start Up Procedure.
12. Set the Head Rotation speed dial to 0, then turn the PTO switch on to activate the ultra high pressure water system.
13. Make sure all personnel are well clear of the blasting heads, then press the DUMP VALVE 40K switch to activate the high pressure system and set the operating pressure to a safe level. Staying well clear of the water jets, no closer than 18", visually inspect the spray pattern of each nozzle.
14. Confirm at least a 1 inch, needle tight, water jet is coming from each nozzle.
15. Deactivate the waterblasting system and shutdown the truck.
16. Replace the spray bar protective cover and gasket.

Typical Spray Bar & Nozzle

Nozzle Pressure Test - All Nozzles Good

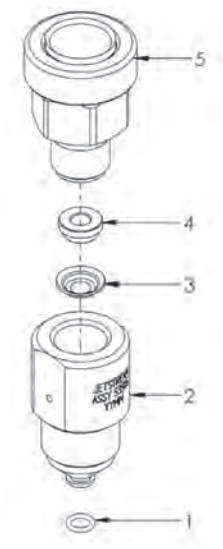
4.9 Rupture Disc Replacement

If a rupture disc bursts, find and correct the problem that caused excessive pressure, then use the following procedure to replace the rupture disc. Refer to the drawing at the bottom of this page for additional reference.

Replacing the rupture disc:

1. Make sure the waterblasting system is shutdown with the truck in the service position.
2. Use two wrenches, one to prevent the base from turning and the other to turn the rupture disc cap, to remove the rupture disc cap assembly from the base.
3. Remove the hold down ring from the base (Item 4 in drawing below) and set it in a clean, safe location.
4. Remove the blown rupture disc.
5. Insert a new rupture disc into the base assembly. Be sure it is the same pressure rating as the one being replaced.
6. Place the hold down ring on top of the rupture disc.
7. Install the rupture disc cap assembly on the base and tighten to specification.

Typical Rupture Disc Rating

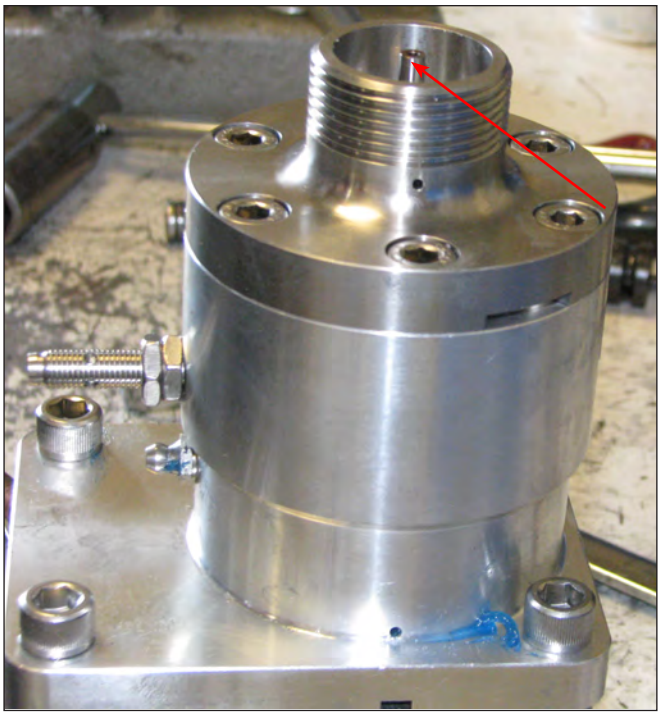


#	DESCRIPTION
1	O-ring
2	Base 40K Male Port 9/16” High Pressure Male
3	Rupture Disc
4	Hold Down Ring
5	Cap

Rupture Disc & Holder Assembly

Typical Rupture Disc On Manual By-Pass Valve

Thru-shaft Cover Housing & Swivel Nut



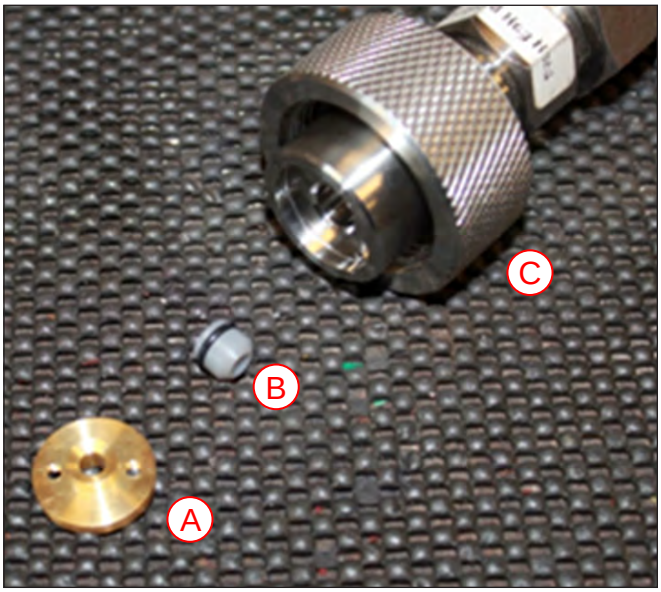
Swivel Tit In Thru-shaft Cover Housing

4.10 Swivel Seal Replacement

The swivel seal must be inspected at the start of each shift and replaced at the first sign of leakage to avoid damage to the swivel nut and thru-shaft cover housing. Swivel seal leakage is indicated by water dripping from the weep holes in the housing just below the swivel nut.

Use the following procedure to replace the seal:

1. Make sure the waterblasting system is shut-down and the truck is in the service position.
2. Loosen the swivel nut on the top of the thru-shaft motor. Be sure to pull the hose and adapter straight up so you don't bend the swivel tit inside the fitting.
3. Rotate the end of the high pressure hose toward you until the swivel seal adapter is visible.



A. Brass Back-Up Ring

B. Swivel Seal

C. Swivel Nut Assembly

4. Insert two 6-32 screws into the brass back-up ring. Tighten the screws evenly to push the brass back-up ring out of the high pressure hose adapter.
5. Once the brass back-up ring is removed, inspect the swivel seal seat and the edges of the seat in the back-up ring closely. If there is any sign of wear or damage, replace the brass back-up ring. It is recommended that the back-up ring be replaced every 3rd or 4th swivel seal replacement.
6. Insert the swivel seal removal tool into the bottom of the worn swivel seal and turn counterclockwise until the tool grips the swivel seal. Continue turning the tool counterclockwise while pulling on the swivel seal until the seal is removed.
7. Make sure all debris has been cleaned out of the swivel seal adapter and the thrust housing cap at the top of the thru-shaft motor.
8. Apply a small amount of silicone grease on the O-ring for the swivel seal and on the swivel tit. This provides lubrication for the seal and swivel tit at startup when the swivel seal connection and thru-shaft are dry.
9. Install the brass back-up ring onto the swivel tit with the beveled seat facing up. Make sure the brass back-up ring is seated completely.
10. Install the lubricated swivel seal onto the swivel tit with the beveled edge facing down. Be sure the swivel seal is seated against the brass back-up ring.
11. Make sure the swivel seal adapter is perfectly aligned with the thru-shaft motor and install the swivel seal adapter onto the thru-shaft motor.
12. Hand tighten the swivel nut.

NOTICE:
IT IS VERY IMPORTANT TO KEEP THE ADAPTER ALIGNED STRAIGHT RELATIVE TO THE THRU-SHAFT MOTOR WHILE PUSHING THE ADAPTER OVER THE SWIVEL SEAL AND ONTO THE THRU-SHAFT COVER HOUSING. IF THE ADAPTER IS NOT STRAIGHT, THE SWIVEL TIT COULD BECOME BENT OR BROKEN DURING INSTALLATION.

NEVER USE TOOLS TO TIGHTEN THE SWIVEL NUT. THE SWIVEL SEAL AND NUT WILL BE DAMAGED IF THE NUT IS TIGHTENED MORE THAN HAND TIGHT.

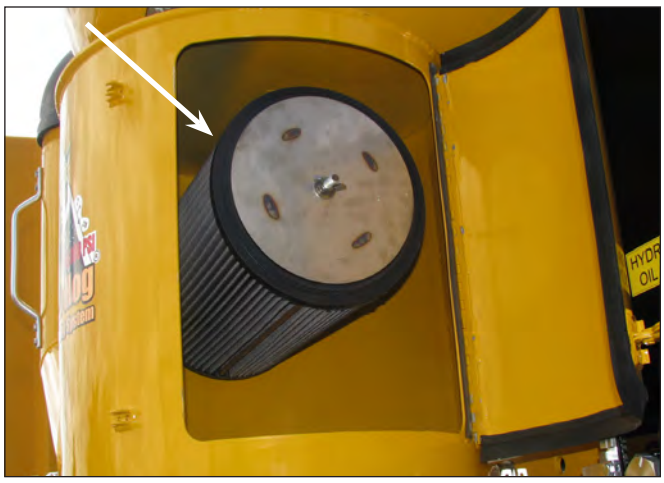
4.11 Vacuum Canister & Filter

The vacuum filter canister houses the vacuum filter to protect the blower from debris and should be checked at the beginning of each shift. It is normal for water vapor to travel from the debris tank to the vacuum filter canister and gradually accumulate. Therefore, the canister should be drained at the start of each shift, each time the debris tank is drained and whenever the vacuum filter is serviced to ensure excess water does not collect to an unsafe level in the bottom of the filter canister. There is a manual drain valve at the bottom of the filter canister to remove excess water as needed.

The filter canister contains a pleated, reusable vacuum filter that can be easily removed through the door on the side of the canister. The vacuum filter should be inspected and cleaned before each shift.

Use the following procedure to drain the canister and remove and clean the vacuum filter:

1. Make sure the waterblasting system is shutdown and the truck is in the service position.
2. Open the filter access door and drain accumulated water from the canister. Close the valve when draining is complete.
3. Remove the wing nut that secures the vacuum filter to the canister and remove the filter.
4. Use a detergent degreaser to cut the oil and grease, then power wash the filter with pressure not exceeding 2000 psi.
5. Thoroughly inspect the filter for holes and damage. Replace the filter if its condition is questionable, it is damaged or has holes that could allow debris to get into the blower.
6. Install the cleaned or new filter and secure it with the wing nut. Hand tighten the wing nut. ***Make sure not to over tighten the wing nut and collapse the filter.***
7. Close and latch the filter access door.



Typical Vacuum Canister Access Door & Filter

Typical Vacuum Canister Drain

Typical Pleated Vacuum Filter

4.12 Debris Recovery Tank & Dirty Water Transfer Pump

Daily:

- Check hose cam-lock fittings for damage and missing O-rings. Replace as needed.
- Check view tube for cracks or damage and clean or replace as necessary.
- Check debris tank door seal to ensure good vacuum sealing and clean if necessary.
- Inspect the cutoff ball valve and automatic float switch each time the tank is dumped to ensure they are free, not damaged or cracked and operating properly.
- Make sure the intake fitting for the debris pump is not plugged. Clean intake as necessary.
- Inspect and clean Dirty Water Pump Strainer.
- Inspect Hydraulic lift components and hinge pins to ensure they are tight and in good condition.

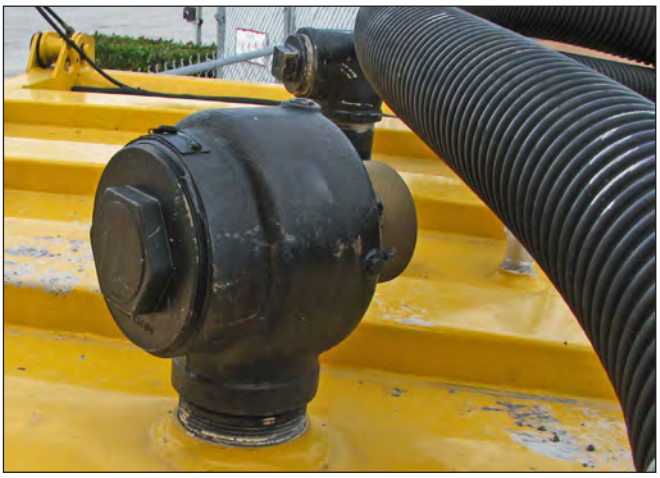
Weekly/50 Hour Maintenance:

- Grease the hydraulic lift hinge pins and fittings.
- Inspect safety strut. Make sure the hinge pins are tight and lubricate pins.
- Lubricate the debris door gas spring pivot hinge pins.
- Lubricate inspection port hinges and latch.
- Remove and clean
- Lubricate and manually activate Kunkle valves to keep them free and operating properly
- Inspect the debris tank liner for worn and broken parts. Clean and replace parts as necessary to keep the liner operating properly.

Monthly/200 Hour Maintenance

- Inspect debris tank door seal and inflation pressure to ensure good vacuum sealing and clean if necessary. Coat the seal with silicone to help keep it pliable.
- Grease debris tank door hinges. Check the stainless steel cutoff ball valve that automatically shuts off the vacuum flow if the tank becomes full. Make sure it is free and not cracked or damaged. Clean or replace if necessary.

Debris Recovery Tank



Kunkle Valve

Debris Tank Inflatable Door Seal

- Inspect and lubricate ball valves. Make sure to open and close all ball valves to keep them free and operating properly.

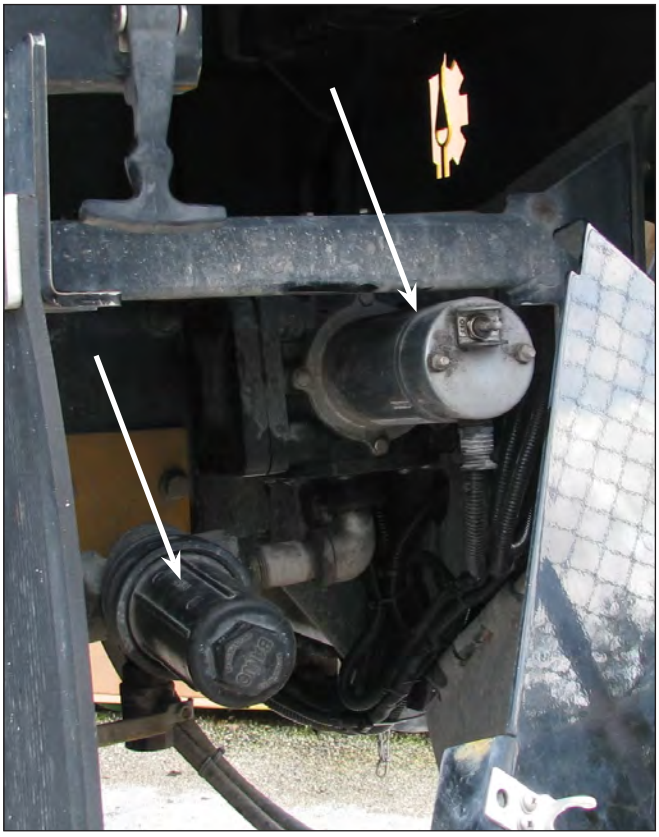
Dirty Water Pump and Strainer:

The debris pump is a self priming, heavy duty diaphragm pump that moves dirty water from the debris tank to the wastewater bladder. The pump requires no routine maintenance, however, the strainer must be cleaned at least daily or when the flow of dirty water becomes restricted.

Cleaning the Debris Pump Strainer:

1. Make sure the waterblasting system is shut-down and the truck is in the service position.
2. Rotate the strainer canister counterclockwise to release it. Then remove the canister.
3. Remove and clean the screen with fresh water.
4. Thoroughly flush out the filter canister.
5. Lubricate the O-ring lightly with silicon or Teflon grease and reinstall the screen and canister.
6. The pump will automatically prime when it is activated by the float switch in the debris tank or by activating the DEBRIS PUMP switch in the DISCHARGE position when the waterblasting system is activated.

Debris Tank Drain Valve



Dirty Water Pump & Strainer

NOTES

5.1 Scheduled Maintenance Introduction

Most components of the water blasting system require specific maintenance at scheduled intervals recommended by the component manufacturer or Hog Technologies. Maintenance schedules and service procedures for the primary components of the water blasting system are covered in this section.

The information on components manufactured and supplied by other manufacturers outlined in this section is a general overview of the maintenance recommended and steps required. Always refer to the component manufacturer's manuals for more detailed information and additional maintenance information.

The Maintenance Matrix at the end this section identifies the recommended service and/or lubrication intervals for each primary component of the water blasting system. You should become familiar with the maintenance and lubrication requirements of all components. Some of the lubrication points on components such as the blower, UHP pump and thru-shaft motor bearings require specialized lubricants. The use of any lubricant other than the lubricant specified will void the warranty on those components.

The maintenance intervals outlined in this section are considered typical for units used in normal operating conditions. Units used in extremely dirty conditions, high temperatures or other severe duty applications will require more frequent service.

CAUTION

THE SCHEDULED MAINTENANCE PROCEDURES IN THIS SECTION MUST BE FOLLOWED EXACTLY TO AVOID DAMAGING COMPONENTS AND/OR VOIDING THE WARRANTY.

5.2 Truck Maintenance

Engine and Chassis

Proper engine and chassis maintenance is essential to the proper performance and reliability of the Stripe Hog truck. You should perform all recommended maintenance according to the manufacturers' specifications. Maintenance schedules and procedures are outlined in the truck owner's manual. They should be followed exactly.

OMSI Drive Gearbox-Fluid Level Plug Location

OMSI Drive PTO

Maintaining the fluid levels and performing routine maintenance is extremely important in the OMSI Drive system. Maintenance schedules are outlined in the OMSI Drive operating manual included with your truck. They should be followed exactly.

Refer to the Lubrication Chart and Maintenance Matrix in this section for lubrication specifications.

Weekly/50 Hour Maintenance:

- Check fluid level in the OMSI Drive and inspect for signs of leakage. The fluid level is checked by removing the plug on the drivers side rear of the OMSI Drive. The fluid level should be maintained within .5" (1.3 cm) of the plug threads. Refer to the pictures in this section for the fluid level plug location and add fluid as required.
- Inspect components for loose bolts and universal joints.

Periodic Maintenance:

- Grease drive shaft splines and universal joints monthly/200 hours.
- Change fluid in OMSI Drive components as recommend in the operators manual.

5.3 Periodic Maintenance Items

The primary components in the water blasting system have specific stated service intervals. Other components that support primary equipment require periodic inspection and routine maintenance. Many of those items are mentioned in this section.

Tool Box Door Hinges And Latches.

Monthly/200 Hours:

- Lubricate and inspect all hinges.
- Inspect and lubricate latches. Replace damaged or worn out latches immediately.

Ladders And Inspection Panels

Monthly/200 Hours:

- Lubricate and inspect all hinges.
- Inspect and lubricate safety pins and latches. Replace damaged or worn out safety pins immediately if the spring becomes weak or damaged.

Safety Pins

Weekly/50 Hours:

- Lubricate the retaining ball or sliding shaft on safety pins.
- Inspect and test for proper operation. Replace damaged, corroded or worn out pins immediately.

Hog Arm Transport Lock Lever

Weekly/50 Hours:

- Lubricate hinge and detent ball.
- Inspect and test for proper operation. Repair if damaged or worn immediately.

Ball Valves

Monthly/200 Hours:

- Open and close ball valves at least once each month to keep them free and operating properly.
- Lubricate and inspect valve shafts and handles. Replace if badly corroded.

Charge Water Pump And Hoses

Weekly/50 Hours:

- Inspect the charge water pump, hoses and fittings for leaks and signs of wear or deterioration. Any questionable or leaking component should be repaired or replaced before operating the system.
- Run the pump and listen for unusual noises and proper operation. Find and correct the cause of unusual noises or erratic operation.

Bilge Pump And Automatic Switch

Weekly/50 Hours:

- Supply water to the high pressure pump stuffing box sump and monitor the operation of the bilge automatic switch, bilge pump and drain system. Correct any problems found.

Monthly/200 Hours:

- Remove the lid on the automatic switch sump and clean out accumulated debris that could interfere with the switch operation or water flow to the pump.
- Test the switch for proper operation.

Debris Tank Transfer Pump And Automatic Switch

Weekly/50 Hours:

- Remove and clean the debris pump strainer screen. Test the pump for proper operation.
- Fill the debris tank with water to a level slightly above the automatic switch. Monitor the operation of the automatic switch, transfer pump and drain system. Correct any problems found.

Monthly/200 Hours:

- Thoroughly clean and flush the float for the automatic switch with clean water. Make sure the switch moves freely.
- Test the switch for proper operation.

Blasting Head Thru-Shaft Motor

Weekly/50 Hours

- Adjust bearing pre-loads. (Refer to section 5.21 Thru-Shaft Motor Bearing Pre-Load)

5.4 UHP Pump & Vacuum Blower Drive Belts

The primary drive belts that connect the OMSI Drive PTO to the UHP pump and vacuum blower are special carbon fiber industrial belts that are designed for high horsepower applications.

The ribbed drive belts are matched to grooved pulleys and have very little stretch. Therefore, they typically don't need to be adjusted often and proper belt tension is extremely important when adjustment is required. The belts are strong enough to cause severe damage to bearings, shafts and other components if they are set too tight. Additionally, if a belt is too loose, it can ride on top of the grooves in the pulleys and become too tight.

Make sure you follow the instructions and set the tension to proper specifications when adjusting the drive belts. Never overtighten them.

Typical Pillow Block Bearings and Grease Fittings

⚠ WARNING ⚠

OVERTIGHTENED DRIVE BELTS CAN CAUSE SEVERE DAMAGE TO PULLEYS, SHAFTS AND BEARINGS IF THEY ARE ADJUSTED TOO TIGHT OR MISALIGNED. ALWAYS MAKE SURE THE BELTS ARE PROPERLY ALIGNED AND SET TO THE MANUFACTURES SPECIFICATIONS WHEN THEY REQUIRE ADJUSTMENT AND NEVER OVERTIGHTEN THE BELTS.

Drive Belt Inspection and Maintenance

Daily:

- The belts must be inspected before each shift for damage, tension and alignment.
- Check and grease drive pulley pillow block bearings and idler pulleys.

Monthly/200 Maintenance:

- Check drive belt tension, pulleys and belt alignment. Adjust or replace as required.

Checking Belt Tension

The proper way to check belt tension is to use a tension tester. While a simple spring scale type tester will do the job, the more sophisticated Sonic Tension Meter is highly recommended.

Typical Gates Sonic Tension Meter

Checking Belt Tension

Sonic Tension Meter Method

The Sonic Tension Meter detects the vibration frequency in the belt span and converts that measurement into the actual static tension in the belt.

Begin by entering the belt unit weight, belt width, and the span length. To measure the span vibration, press the “Measure” button on the meter, tap the belt span and hold the microphone approximately 1/4” (.6 mm) away from the back of the belt. The tension meter will display the static tension vibration frequency.

If the frequency is lower than the minimum recommended, the belt should be tightened. If it is higher than the maximum recommended frequency the belt should be loosened.

Note:
The procedure in this example is for the Gates Sonic Tension Meter shown. Sonic meters from different manufacturers or sonic tension meter APPS available for some smart phones will require procedures unique those meters or APPS.

Sonic Meter Belt Tension Frequency Specifications

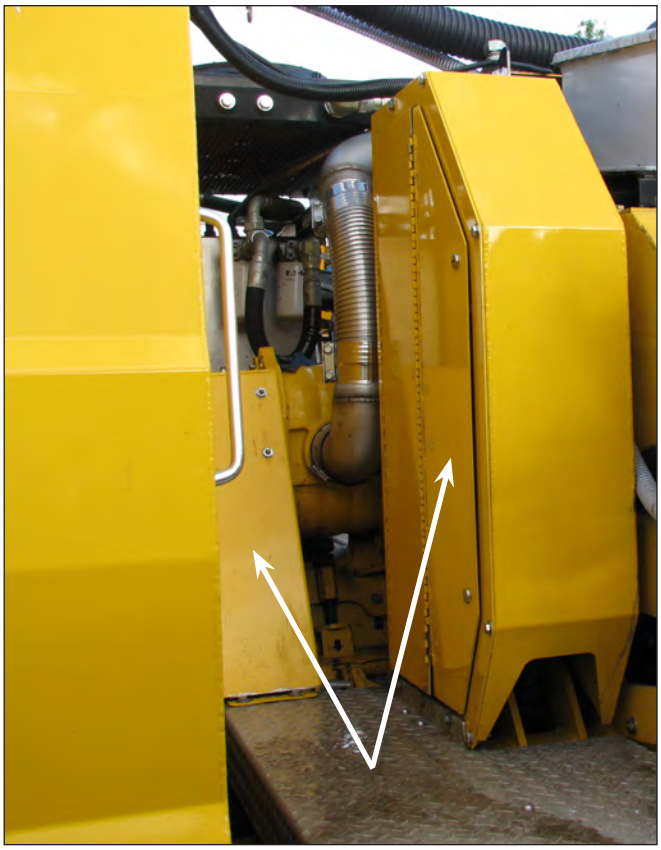
UHP Pump Belt Tension Frequency
New Belt = 58-61 Hz

Used Belt
(More than 20 hours of operation) = 50-53 Hz

Blower Belt Tension Frequency
New Belt = 36-37 Hz

Used Belt
(More than 20 hours of operation) = 30-32 Hz

Refer to the belt manufacturer’s manual for additional maintenance information on the drive belts.



Blower & UHP Pump Belt Guards & Access Plates

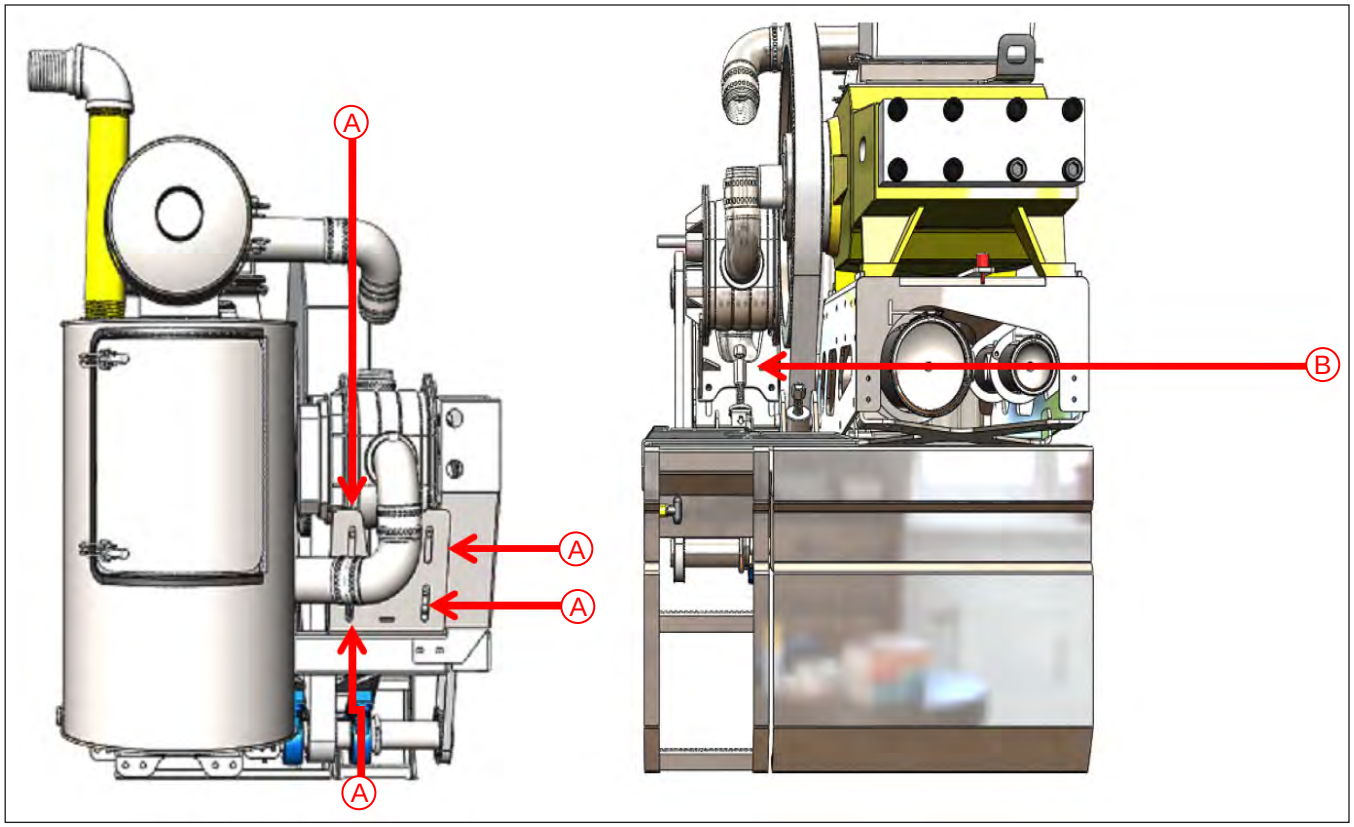
Drive Belt Adjustment Procedures

Vacuum Blower

The vacuum blower is on adjustable mounts. A threaded adjusting bolt on the blower mount is used for adjusting the blower drive belt tension.

Make sure the waterblasting system is shutdown and the truck is in the service position. Then use the following procedure to adjust the vacuum blower belt.

1. Loosen the four bolts in the slotted holes on the mounting plate just enough to allow the plate to move. Make sure not to loosen them too much.
2. Loosen the blower mount adjusting bolt jam nut and rotate the adjusting bolt to adjust the belt to the proper specification. Use a spring scale tester or sonic tension meter to achieve proper tension.
4. Tighten the bolts in the slotted holes and the adjusting bolt jam nut.



Blower Pump Belt Adjustment Bolts Location
A. Slotted Blower Mount Bolts B. Blower Adjustment Bolt

Important:
Tighten the mount bolts in the slotted holes and recheck the belt tension and alignment. Readjust as necessary to achieve correct belt tension and / or alignment.

5. Start the engine and follow the startup procedure to engage the waterblasting system and operate the OMSI Drive PTO at idle speed for 30 seconds.
6. Disengage the PTO and return the truck to the service position.
7. Check that the belt is riding on the center of the pulleys. If it is not centered and riding hard on either side of the pulleys, the blower will have to be aligned by moving the mount slightly in the slotted bolt holes. Repeat alignment and tension steps until the belt is set to the proper tension and centered on the pulleys.
8. Tighten the mounting bolts securely.

Blower Belt Mounting Bolts & Adjusting Bolt

UHP Pump

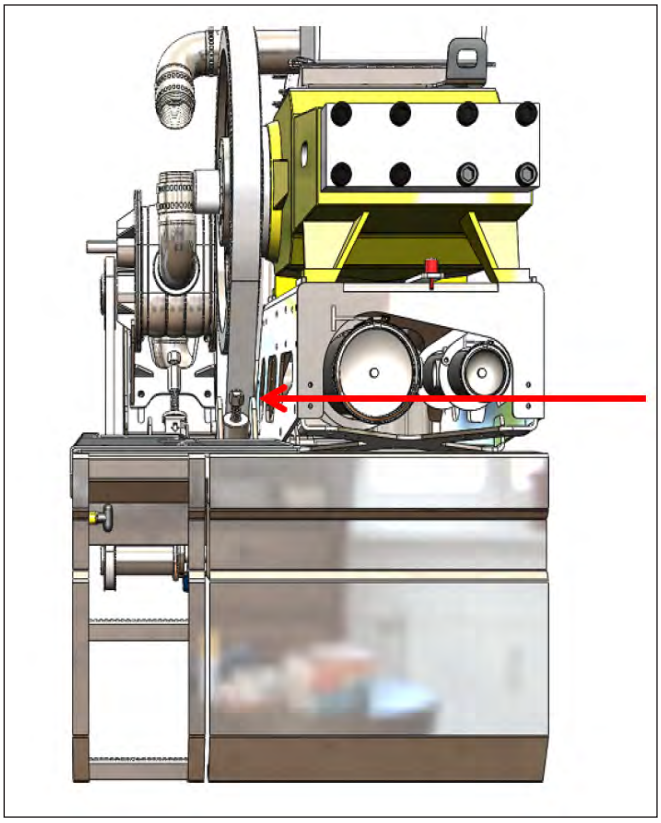
NOTICE:
BEFORE THE UHP PUMP BELT CAN BE ADJUSTED, THE VACUUM BLOWER BELT MUST BE LOOSENED. ADJUST THE VACUUM BLOWER BELT TO SPECIFICATIONS WHEN THE UHP PUMP BELT ADJUSTMENT PROCEDURES ARE COMPLETED.

A threaded adjusting bolt on the UHP pump drive belt idler pulley is used for adjusting the drive belt tension.

Make sure the waterblasting system is shutdown and the truck is in the service position. Then use the following procedure to adjust the UHP pump belt.

1. Loosen the jam nut on the UHP pump belt idler pulley adjustment bolt.
2. Rotate the adjusting bolt to adjust the belt to the proper specification. Use a spring scale tester or sonic tension meter to achieve proper tension.
4. Tighten the adjusting bolt jam nut.
5. Start the engine and follow the startup procedure to engage the waterblasting system and operate the OMSI Drive PTO at idle speed for 30 seconds.
6. Disengage the PTO and return the truck to the service position.
8. Tighten the mounting bolts securely.

Note:
Apply grease to the threads of the blower and UHP pump adjusting bolts each time the belts are adjusted to help prevent corrosion and ensure the adjusting bolts will turn when adjustment is required.



UHP Pump Adjusting Bolt

UHP Pump Belt Tension Pulley & Adjusting Bolt

5.5 High Pressure Hose Installation

The high pressure hoses should be inspected weekly or every 50 hours and replaced as required. Use the following procedure when replacing a pressure hose.

When replacing damaged or worn high pressure hoses, check the burst rating marked on the hose. Always use a replacement hose with an equal or greater pressure rating.

Replacing a high pressure hose:

1. Make sure the water blasting system is shutdown with the truck in the service position.
2. To avoid contamination that could clog nozzles, always make sure hose fittings and the area around the hose connections are thoroughly cleaned.
3. Remove the old high pressure hose and cap the fittings to prevent contamination.
4. If the hose to be replaced is routed through a tight area, use the 7/8" hose coupler fitting in the Spare Parts System and attach an end of the new hose to the fitting on the old hose. Cap the other fitting on the new hose to prevent contamination, then carefully pull the old hose out while guiding the new hose into place.
5. If the new hose will be routed on its own and not pulled through by the old hose, cap both ends to prevent contamination and carefully route the hose into position.
6. Verify the routing of the hose, making sure it is not in contact with sharp edges or near a source of heat that could damage the hose. Install anti-chaffing or heat deflectors to protect the hose if necessary.
7. Remove the caps and apply a light coat of anti-seize to the threads of each fitting. Then attach the fittings and tighten to specifications.
8. Remove the spray bar protector.
9. Hold the thru-shaft so it won't turn with a 3/4" (19 mm) wrench inserted in the slot at the base of the thru-shaft motor.
10. Turn the spray bar counterclockwise by hand until it is free of the shaft.
11. Remove brass button.

Typical High Pressure Water Hose

12. Use a stainless steel wire brush to clean the dirt from the thru-shaft threads.
13. Reactivate the truck and the waterblasting system by following the steps in the Start Up Procedure.
14. Activate the charge water system and purge the blast head at low pressure to remove debris that could have entered the system while changing the hose.
15. Shutdown the water blasting system and return the truck to service position.
16. Apply a light coat of anti-sieze to the thru-shaft threads.
17. Install a new brass button seal, hold the thru-shaft with the wrench and reinstall the spray bar.
18. Tighten the spray bar by turning it clockwise ***slowly*** until it stops. Then seat the seal by turning the spray bar another 15%. Make sure you remove the wrench when the installation is complete.
19. Install the spray bar protector and gasket.
20. Reactivate the truck and the waterblasting system by following the steps in the Start Up Procedure. Operate the Ultra-High Pressure system to check the new high pressure hose for leaks.

5.6 Ultra High Pressure Pump Scheduled Maintenance

The 40K UHP pump operates at very high pressure and has specific lubrication and maintenance requirements. Refer to the Maintenance Matrix in this section and the pump manufacturer's operating and maintenance manual for lubrication specifications and maintenance schedules.

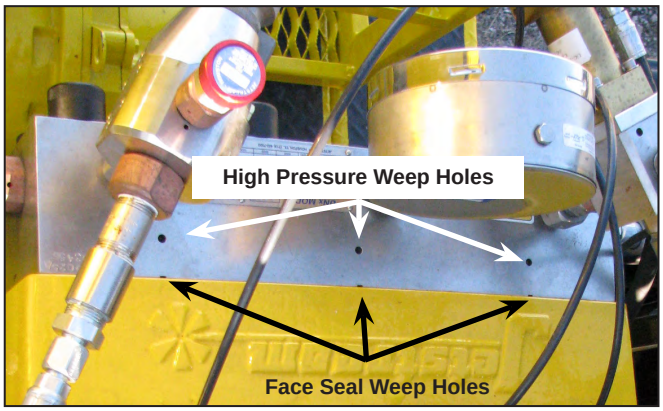
Daily Inspection and Maintenance

- Check the crankcase lubricating oil level.

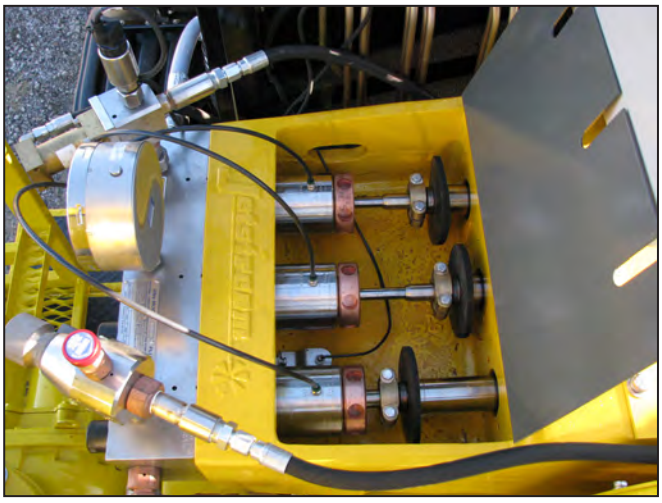
NOTICE:
THE PROCEDURE FOR CHECKING THE CRANKCASE OIL LEVEL IS DIFFERENT FOR WHEN THE PUMP HAS NOT BEEN OPERATING FOR 5 OR MORE HOURS AND WHILE THE PUMP IS IN OPERATION. REFER TO UHP PUMP CRANKCASE OIL LEVEL CHECK PROCEDURE IN THIS SECTION FOR THE CORRECT PROCEDURES FOR CHECKING THE CRANKCASE OIL.

- Check for obvious loose mounting nuts and bolts.
- Inspect all hoses, fittings, valves and seals for leaks and proper operation. Repair or replace leaking or malfunctioning components before operating the system.
- Make sure cooling water is flowing to the plunger packing seals when the charge water is activated. Constant water flow is essential to lubricate and cool the seals. Adjust flow with the metering valves or replace packing if necessary.
- Make sure the cooling water sump and drain are clean for proper drainage.
- Check for water dripping from the UHP Pump manifold weep holes during the high pressure test. Water dripping from the square holes indicates the face seals are leaking. Water leaking from round holes indicates the high pressure seals are leaking. Find and correct the problem before beginning water blasting operations.
- Test the dump valve for proper operation daily. Never operate the system if the dump valve is not working properly.

UHP Pump & Packing Lube Metering Valves



UHP Pump Weep Holes



UHP Pump Packing Lube Lines & Sump

100 Hour Maintenance

Perform all daily maintenance along with the items outlined in this section.

- Change crankcase lubricating oil after the first 100 hours when the pump is new and every 500 hours thereafter.
- Service the Univalves. Refer to High Pressure Pump Univalve Service in this manual and the high pressure pump operation and maintenance manual for instructions and additional information.

Important:
Make sure to install the safety plug in crankcase drain valve when oil draining is complete. The safety plug prevents crankcase oil from draining if the valve is accidentally opened.

200 Hour Maintenance

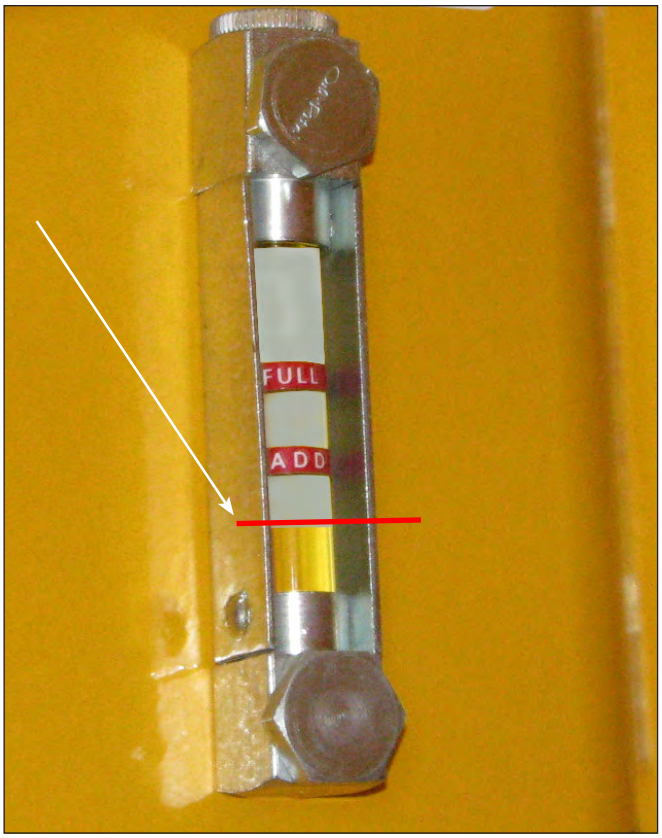
Perform all daily and 100 hour maintenance along with the items outlined in this section.

- Check and tighten all mounting bolts and hardware.
- Check and tighten plunger coupling bolts.
- Inspect and lubricate the dump valve to keep it operating properly.
- Inspect and lubricate the manual by-pass valve to keep it operating properly.

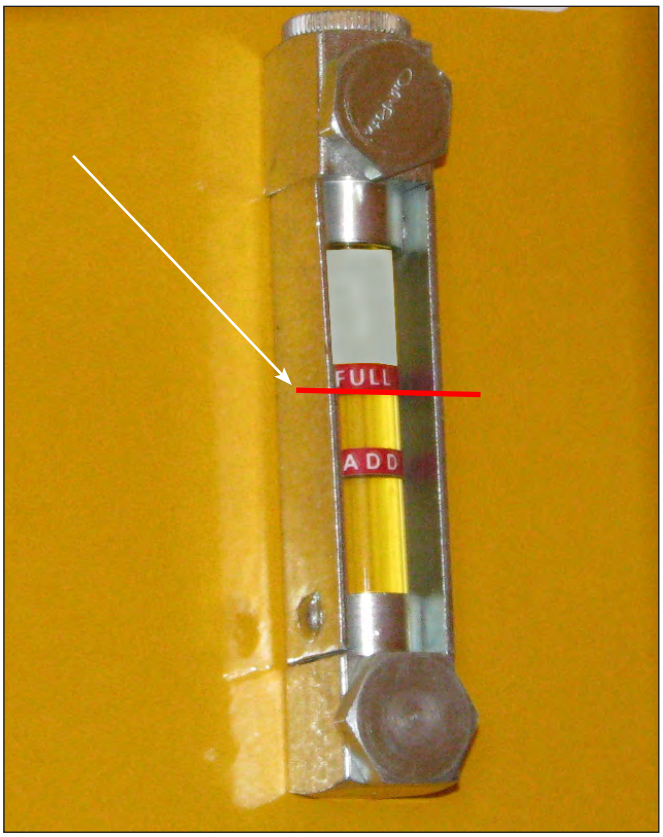
500 Hour Maintenance

Perform all daily, 100 and 200 hour maintenance along with the items outlined in this section.

- Change UHP pump crankcase lubricating oil.



Crankcase Oil Level - Pump Running



Crankcase Oil Level - Pump Shutdown 5 To 8 Hours

5.7 Checking UHP Pump Oil Level & Changing Crankcase Oil

Checking Oil Level

Jetstream UHP pumps have specific procedures for checking the crankcase oil while the pump is operating and when it is shutdown. Following the correct procedure is critical to maintaining the correct oil level and to prevent the possibility of overfilling the crankcase, which will damage the pump.

The pump power end uses a splash/gravity oil circulation system for internal lubrication and oil distribution. The crankcase has an upper sump that is filled by the splashing action of the crankshaft as it rotates. Oil slowly drains from the upper sump through small holes which provide lubrication to certain components that would not be properly lubricated otherwise.

The upper sump holds a large volume of oil that drains very slowly back into the main sump. Consequently, there is a significant difference in the oil level while the pump is operating and when it is shutdown. It takes 5 to 8 hours for oil in the upper sump to completely drain to the main sump after the pump is shutdown. As a result, the pump must sit overnight before an accurate crankcase oil level is indicated in the sight glass when the pump is not operating.

Because of the crankcase design, the most accurate way to check the oil level during operation is while the pump is running. The following section outlines the procedures for checking the crankcase oil level with the pump running or when the pump is shutdown. Always make sure the truck is parked on level ground with the wheels blocked before checking the crankcase oil level.

Crankcase Oil Level - Pump Operating:

1. Make sure the crankcase oil level is at the full mark, then activate the charge pump and start the engine to activate the high pressure pump.
2. Operate the pump for 3 to 5 minutes to allow the upper sump to fill and the oil level in the main sump to stabilize.
3. With the pump still engaged, check the oil level in the sight gauge. The oil level should be half way between the ADD mark and the bottom of the sight gauge.

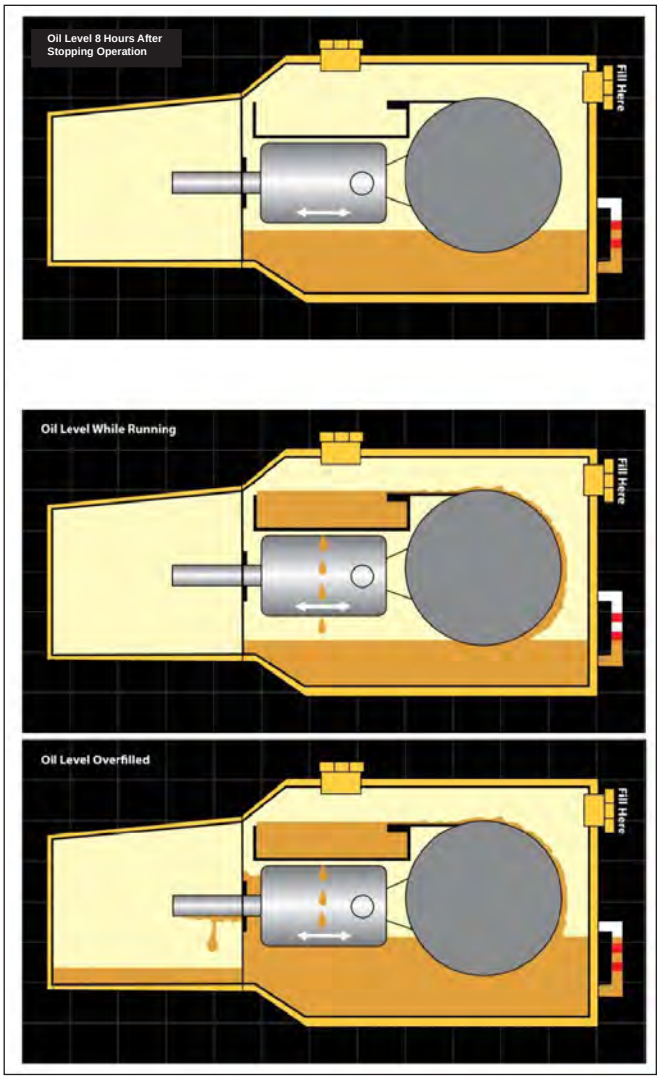
Crankcase Oil Level - Pump Not Operating:

1. Make sure the pump has been shutdown for at least 5 to 8 hours or overnight.
2. Check the oil level in the sight gauge. The oil level should be right at the FULL line.
3. If the oil level is less than half way between the FULL and ADD marks on the sight gauge, oil must be added to the crankcase.

Adding Oil

When oil is required, it can be added through the breather port at the top of the crankcase or through the back plate fill port, depending on which port is most accessible on your unit. Always clean the area around the fill port before removing the plug to add oil to reduce the possibility of dirt and debris entering the crankcase when the fill plug is removed.

It is best to add oil using the back plate fill port when possible. The oil will be added directly to the main oil sump and the level will register immediately on the sight gauge. When the breather port at the top of sump is used, oil is added to the upper sump and it can take several hours before the oil will drain to the main sump and the correct oil level will be indicated on the sight gauge.



UHP Pump Oil Level

CAUTION

THE FOLLOWING PRECAUTIONS APPLY TO AVOID DAMAGE TO THE PUMP:

- **NEVER RUN THE PUMP WHEN THE OIL LEVEL IS NOT VISIBLE IN THE SIGHT GAUGE.**
- **DO NOT OVERFILL OIL SUMP.**
- **ONLY USE A HIGH GRADE, NON DETERGENT 80W90 GEAR OIL IN JETSTREAM PUMPS.**
- **JETSTREAM PUMPS DO NOT CONSUME OIL DURING OPERATION. A SIGNIFICANT LOSS OF OIL IS AN INDICATION OF A LEAK SOMEWHERE IN THE PUMP CRANKCASE. OIL LEAKS NEED TO BE REPAIRED AS SOON AS POSSIBLE IN ORDER TO PROTECT THE ENVIRONMENT AND THE PUMP.**

⚠ WARNING ⚠

OPERATING THE PUMP LOW ON OIL WILL CAUSE SEVERE DAMAGE TO THE POWER END OF THE PUMP.

UNDER NO CIRCUMSTANCES SHOULD YOU RUN THE PUMP IF THERE IS NO OIL SHOWING IN THE SIGHT GAUGE.

Changing Crankcase Oil

The crankcase is filled with 80w90 high grade non detergent gear oil that is a high viscosity and flows slowly at room temperature or below. Since many crankcases hold up to 5 gallons (19 liters) of oil, it is best to operate the pump long enough to raise the temperature of the oil to normal operating temperature before draining the oil.

Draining the crankcase oil:

1. Make sure the water blasting system is shut-down with the truck in the service position.
2. Remove the safety plug at the oil drain ball valve fitting.
3. Attach a drain hose to the ball valve fitting and route the hose to a suitable waste oil container capable of handling at least 6 gallons (23 liters) of oil.
4. Open the drain valve and drain the oil.
5. When draining is complete, close the valve and insert the safety plug. Make sure the safety plug is clean to avoid contamination. Tighten the plug to specifications.
6. Wipe up any spilled oil and properly dispose of the waste oil and oil soaked rags.

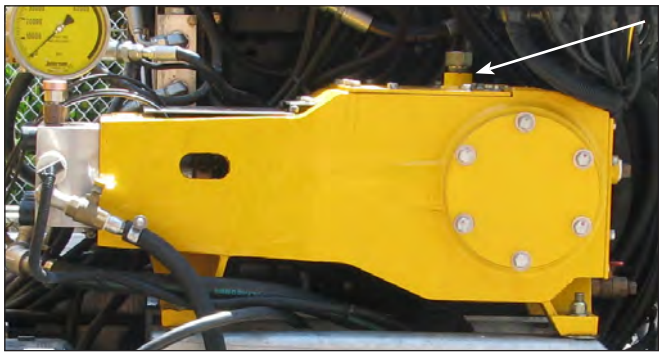
Crankcase Oil Drain Valve & Hose

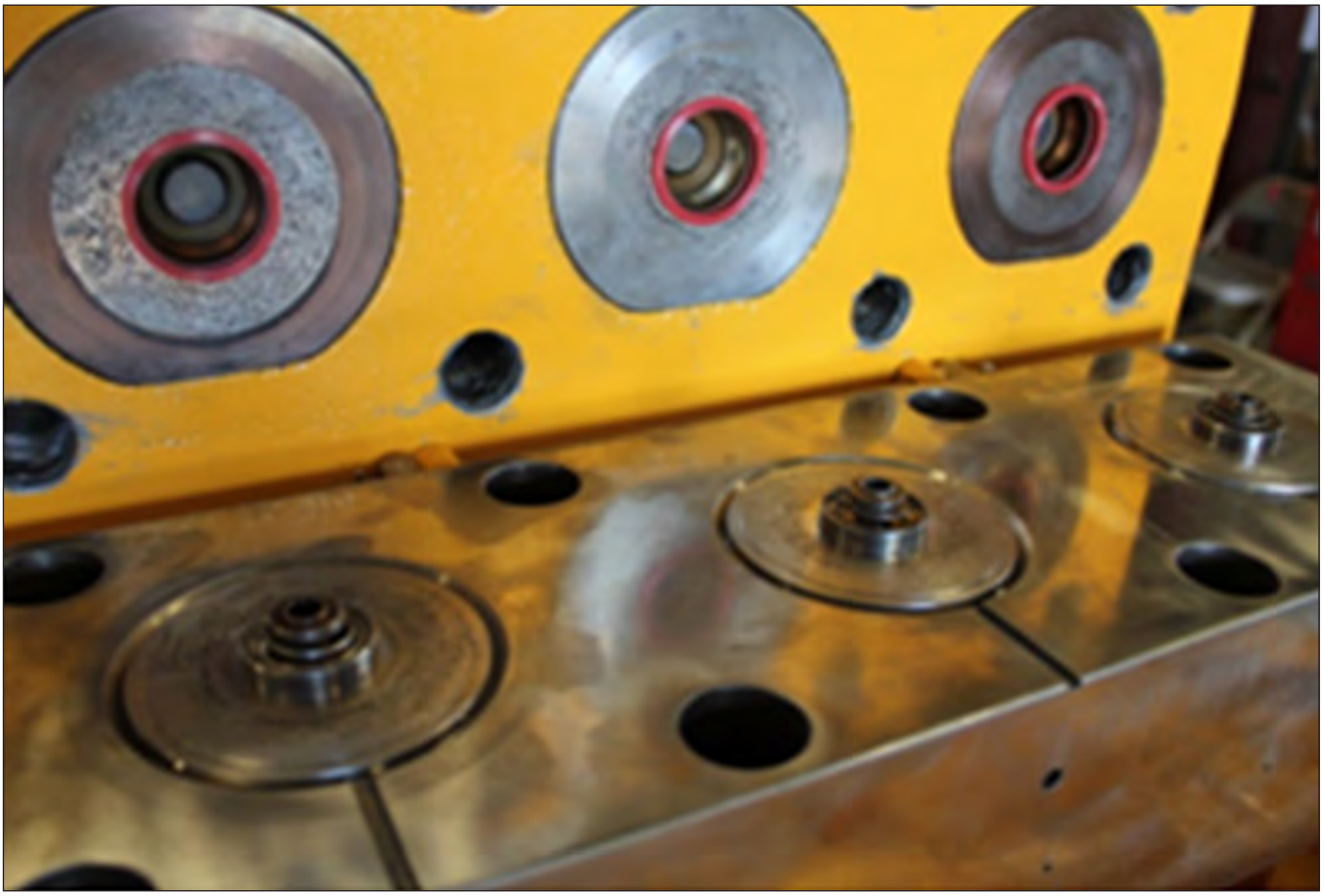
Filling the crankcase with fresh oil:
When refilling the crankcase, oil can be added through the breather port at the top of the crankcase or through the back plate fill port, depending on which port is most accessible on your unit. Always clean the area around the fill port before removing the plug to add oil, this reduces the possibility of dirt and debris entering the crankcase when the fill plug is removed.

We recommend that the back plate fill port be used to fill the crankcase whenever possible. The oil will be added directly to the main oil sump and the level will register immediately on the sight gauge. When the breather port at the top of sump is used, oil is added to the upper sump and it can take several hours before the oil drains to the main sump and the correct oil level is indicated on the sight gauge.

1. Clean the area around the back plate fill port and remove the plug.
2. Make sure the drain valve is closed and the safety plug is installed in the valve fitting and tightened.
3. Add the recommended amount of high grade, non-detergent, 80w90 gear oil to the crankcase. Refer to the pump manufacturer's Operation and Maintenance manual for the correct quantity of gear oil.
4. Verify the crankcase oil level when filling is complete following the instructions for checking the oil level in the previous section of this chapter.
5. Make sure the fill plug is clean and insert the plug into the filler port. Tighten the plug to specifications.
6. Wipe up any spilled oil and properly dispose of the waste oil and oil soaked rags.

Back Plate Fill Port - Preferred Oil Fill Location


Typical Breather Port - Do Not Use To Fill Oil



5.8 High Pressure Pump Univalve Service

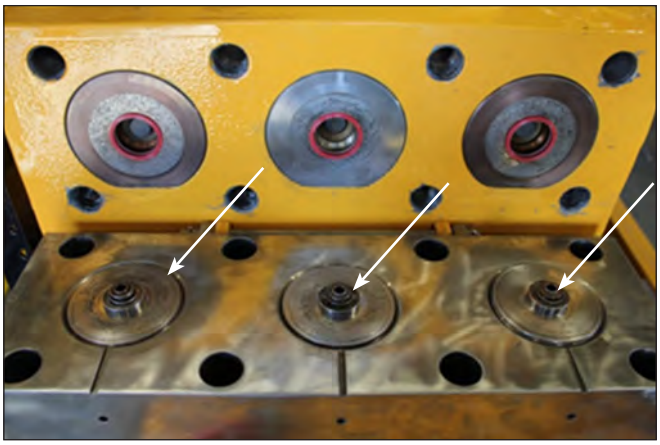
The Univalve cartridges will require service every 100 hours or if the following conditions are present:

- Water leakage appears at weep holes in the top of the manifold.
- Pump discharge is pulsating or erratic with charge water pressure in the normal operating range.
- The valves are suspected as the cause of other poor pump performance symptoms.

NOTICE:
ALWAYS CHECK FOR WATER DRIPPING FROM THE UHP PUMP WEEP HOLES DURING HIGH PRESSURE TEST. WATER DRIPPING FROM THE SQUARE HOLES INDICATES THE FACE SEALS ARE LEAKING. WATER LEAKING FROM THE ROUND HOLES INDICATES THE HIGH PRESSURE VALVE SEALS ARE LEAKING.

Removing Univalves:

1. Make sure the water blasting system is shut-down with the truck in the service position.
2. Remove the valves using a 2 lb hammer and 7/8" Allen wrench (Jetstream tool) to loosen the 8 head bolts in an "X" pattern. Finish removing by hand or with an impact wrench.
3. Rotate the hinged UHP pump manifold until it is resting on the support.
4. There is a groove machined into each Univalve. Use two flat screwdrivers placed at opposite sides of the valve to extract each one.
5. Cover the manifold with a clean rag to protect the sockets from dirt and other contamination.



Univalves Installed In Head

Figure 1: A. Univalve Body & Seat - B. Suction Valve

Installing Univalves:

1. Clean the valve sockets to make sure no dirt and debris enters the UHP pump.
2. Lubricate the sockets and Univalve cartridges with the grease provided in the Mobile Spare Parts System.
3. Set the valve cartridge in place. Rock the cartridge slightly until it drops into position.
4. Use the palm of your hands and press equally on each side to press the valve cartridges into place.
5. Replace the face seal in each stuffing box. Use grease to help hold it in place during assembly.
6. Apply a thin coat of anti seize to the head bolt threads.
7. Carefully rotate the head into position, insert the head bolts and tighten finger tight.
8. Tighten the head bolts evenly in a crisscross sequence beginning with the center bolts. Tighten the bolts snug.
9. Finish tightening the head bolts in a crisscross sequence beginning with the center bolts using the 2 lb hammer and the 7/8" Jetstream tool. Hit the Jetstream tool 3 times with the hammer.

NOTICE:
IT IS A GOOD IDEA TO REMOVE THE UHP HOSE AND FLUSH THE UHP MANIFOLD WITH WATER BEFORE SETTING PRESSURE.

Lapping Valves And Seats

The suction valve seat surfaces in the Univalve cartridges should be lapped every 100 hours to remove small pits or grit inclusions as preventative maintenance. Slight damage in the seating surface can also be repaired with the lapping procedure.

Lapping a valve to the seat creates a unique suction valve to Univalve cartridge seat seal. If the valve is moved to another cartridge, it must be lapped to that seat for a proper seal.

Disassemble and lap the valve and seat of one Univalve cartridge at a time to keep the parts with that cartridge. Always inspect the valve cartridge for damage, then separate the suction valve from the cartridge and lay the parts out on a clean surface. Inspect them thoroughly for damage. If any component is cracked or badly pitted or worn, it will have to be replaced. Refer to the legend in this section for descriptions of wear, damage and imperfections that will need to be addressed.

If the suction valve and seat are in acceptable condition or a new cartridge and suction valve is being installed, use the following procedure to lap the valve and seat.

Lapping the seating surfaces:

1. Separate the suction valve from the valve cartridge.
2. Carefully inspect the valve seat and the suction valve to make sure they are in acceptable condition.

LEGEND

Shiny Line	Indicates a cut or a crack
Cuts caused by a leak	Can be lapped if not too deep
Cracks in the univalve	Cannot be repaired, replace the univalve
Shiny dot is a pit caused by calcium	Can be lapped out
"V" shape on top of a hole	Can be lapped out, check the inner wall of the univalve for damage

Figure 2: A. Univalve Body - B. Suction Valve Valve Cartridge Rotated 90⁰ Counterclockwise

Figure 3: A. Univalve Body - B. Suction Valve Suction Valve Rotated 90⁰ Clockwise

3. Apply approximately 1/8 teaspoon of 600 grit lapping compound to the valve seat and spread evenly.
4. Hold the body of the Univalve cartridge (A) in one hand and the suction valve (B) in the other. Figure 1.
5. Push the two parts together.
6. Use approximately 5 lbs of pressure on the suction valve (B) and rotate it 180 degrees clockwise, then 180 degrees counterclockwise on the valve cartridge seat (A).
7. Each 180 degree clockwise/180 degree counterclockwise movement is considered one rotation. Complete 5 rotations.
8. Rotate valve cartridge (A) 90 degrees counterclockwise while maintaining the position of suction valve (B). Repeat steps 6 and 7. Figure 2.
9. Rotate suction valve (B) 90 degrees clockwise while maintaining the position of valve cartridge (A). Repeat 6 and 7. Figure 3.

Figure 4: A. Univalve Body - B. Suction Valve Valve Cartridge Rotated 90⁰ Clockwise

10. Rotate valve cartridge (A) 90 degrees counterclockwise while maintaining the position of suction valve (B). Repeat steps 6 and 7. Figure 4.
11. Continue steps 6-9 for 2 minutes at about 120 rotations per minute.

12. Remove the suction valve and clean both pieces thoroughly with brake cleaner. Be sure to thoroughly clean the holes in the Univalve to ensure no debris can get in the new grit. Blow off the components with compressed air after cleaning them with brake cleaner.

(Steps 3-11 = One Cycle)

13. Inspect the sealing surfaces on both pieces very carefully to determine whether to stop or to complete another cycle. The shiny places are evidence of damage and/or wear. Consult the legend to determine the cause and indications of typical wear patterns

14. If additional cycles are required, apply 1/8 teaspoon of 150 grit lapping compound to the suction valve, then repeat steps 3-12 until the shiny spots are no longer visible and the surface is perfectly smooth with a consistent color.

15. Alternate grit sizes every 3 or 4 cycles until lapping is complete. The final cycle should always be completed with 600 grit compound.

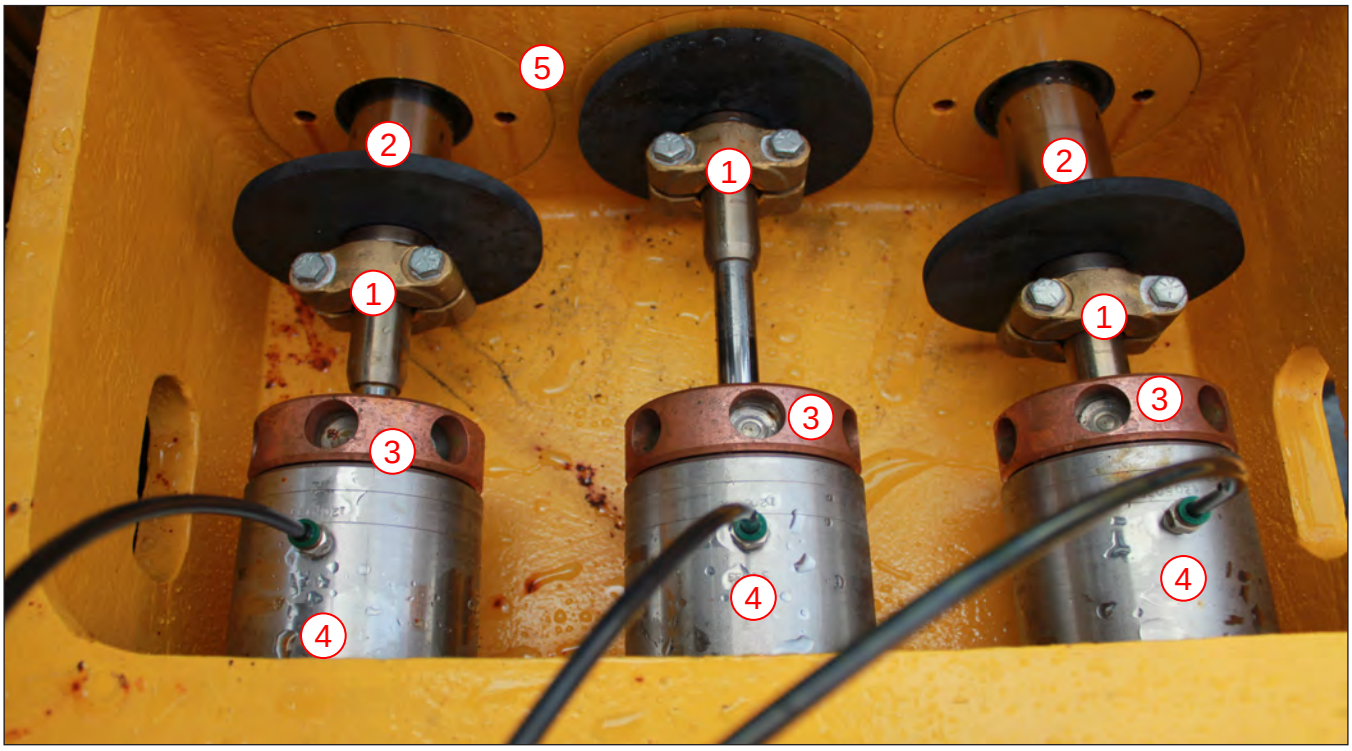
16. Follow the same procedure for the discharge valve on the other side of the Univalve cartridge.

17. Reassemble the Univalve with new O-rings and seals.

18. Lubricate the O-rings and seals with the grease provided in Mobile Spare Parts System box # 2.

19. Reinstall the Univalve cartridges into the manifold.

NOTICE:
NEVER USE DRY COMPOUND WHEN LAPPING UNIVALVES. KEEP 3 FULLY LAPPED UNIVALVES ON HAND TO AVOID DOWNTIME. NEVER USE UNAPPROVED MACHINERY SUCH AS DRILLS TO SPEED UP THE LAPPING PROCESS.



Jetstream Ultra High Pressure Pump Bilge

1. Plunger Coupling & Bolts
2. Pony Rods
3. Glandnuts
4. Stuffing Boxes
5. Power Frame

5.9 High Pressure Pump Stuffing Box Packing Replacement

The packing creates the seal at the Ultra-High Pressure pump plungers in the stuffing boxes. When excessive water begins flowing through a stuffing box, the packing will need to be replaced.

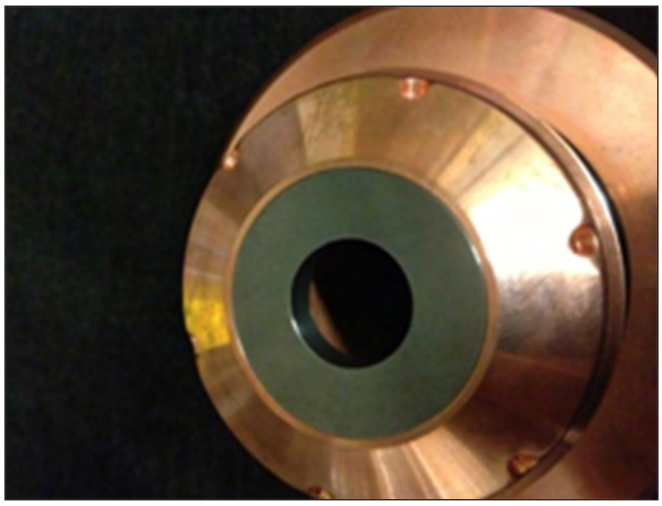
Typical Packing Replacement

The procedure in this section is for packing that is worn and leaking excessively, but is not stuck.

Use the following procedure to replace the packing:

1. Identify the stuffing box with the worn or damaged packing.
2. Shutdown the UHP pump, charge water pump and the water blasting system. Then place the truck in the service position.
3. Rotate the high pressure pump to move the pony rod all the way back against the power frame at the crank shaft end of the pump. This will provide the clearance required to remove the gland nut and plunger.
4. Use the 7/8" Allen wrench (Jetstream tool) supplied in the Hog Technologies tool system. Insert the round end of wrench into the hole on the gland nut. Use a 2 lb hammer to hit the Jetstream tool in a counterclockwise direction to loosen the gland nut.
5. Use a ratchet wrench and 9/16" socket to remove the brass plunger coupling bolts and nuts.
6. Remove the gland nut, plunger and packing assembly. If the packing will not come out, refer to the stuck packing removal procedure in this chapter.
7. Remove the old packing from the plunger. Then clean debris out of the stuffing box and the lubrication holes in the gland nut.
8. Check the carbide guide bushing for nicks, cracks, breaks or excessive wear. Replace if necessary.

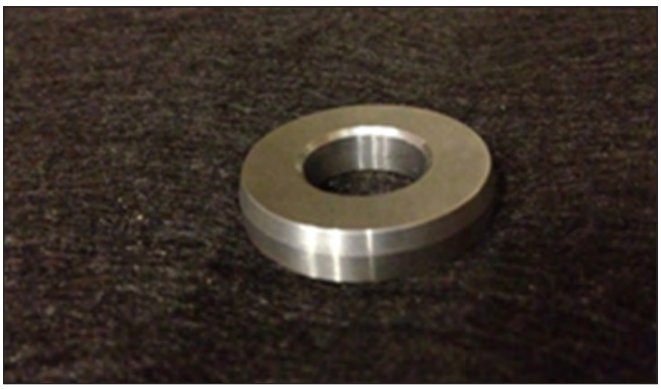
Stuffing Box, Glandnut, Packing & Plunger



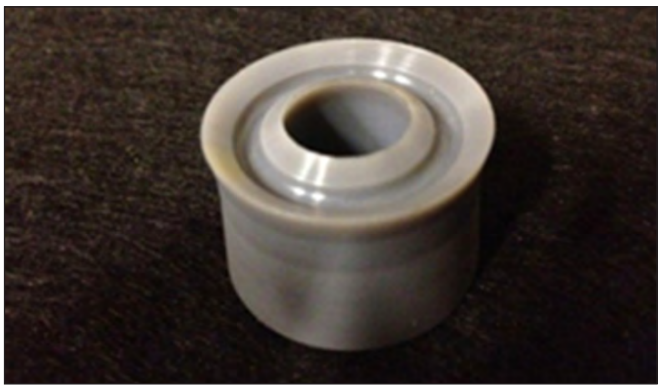
Guide Bushing or Carbide Ring

9. Check the plunger for scoring and wear. Polish or replace if necessary.
10. Reinstall the guide bushing in the gland nut and apply anti-seize to the gland nut threads.
11. Insert the plunger fully into the gland nut. Be careful to not dislodge the guide bushing.
12. Install new packing onto the plunger. Push it tight against the guide bushing.
13. Carefully install the plunger, packing and gland nut assembly into the stuffing box
14. Hand tighten the gland nut. Then insert the Jetstream Tool into the gland nut and hit the tool three times with the hammer in a clockwise direction to tighten.

Plunger



Carbide Ring



Packing

15. Slide the plunger back against the pony rod. Reinstall the plunger coupling to the plunger and pony rod. Make sure both halves of the plunger coupler face the same way.
16. Tighten the coupler bolts evenly to specifications.
17. Reactivate the truck and the waterblasting system by following the steps in the Start Up Procedure.
18. Turn on the charge water pump and verify that the lubrication water is flowing normally. Use the metering valves to adjust water flow to the packing if necessary.
19. Verify proper operation.

Stuck Packing Replacement Procedure

Use this procedure to free the packing when it is stuck in the stuffing box and attempts to remove it following the standard procedure have failed.

NOTICE:
THE STEPS IN THIS PROCEDURE SHOULD ONLY BE PERFORMED AS A LAST RESORT. IT WILL REQUIRE THE TRUCK TO BE PLACED IN WORK MODE WITH THE WATERBLASTING SYSTEM ACTIVATED BY FOLLOWING THE STEPS IN THE START UP PROCEDURE.

1. Perform steps 1 thru 6 in the typical packing replacement procedure.
2. Thread the gland nut back into the stuffing box 3 full turns. Make sure at least 3 threads are engaged in the stuffing box.
3. Pull the plunger out until it is against the pony rod. It is important for the plunger to be against the pony rod to prevent damage to the plunger from being forced out of the stuffing box suddenly by charge water pressure which will be activated in the next step.
4. Make sure both water supply valves are open and all personnel are clear of all waterblasting components. Activate the truck and waterblasting system following the steps in the Startup Procedure. ***Do not activate the PTO switch.***
5. Make sure all personnel are well clear of all waterblasting components and turn on the charge pump for 5 seconds then turn it off.
6. Shutdown the water blasting system and return the truck to the service position.
7. Remove the gland nut from the back of the stuffing box. The charge water pressure should have pushed the damaged packing out.
8. If packing is still stuck, repeat steps 1 through 7. The damaged packing is usually pushed out on the first try, however, several attempts may be required in some cases.

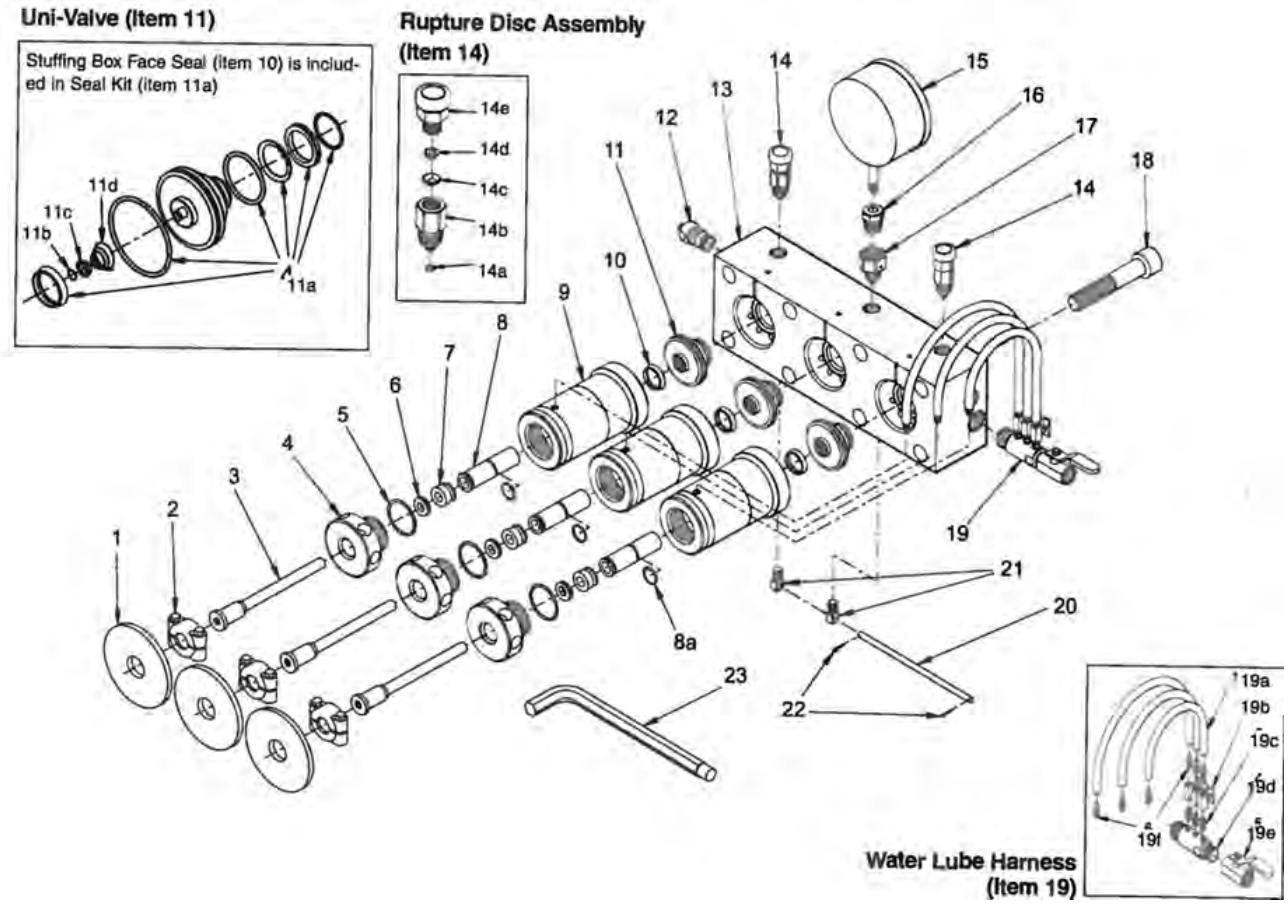
NOTICE:
IF THIS OPTION FAILS, THE HIGH PRESSURE MANIFOLD WILL NEED TO BE OPENED TO REMOVE THE STUFFING BOX AND EXTRACT THE PACKING.

Once the packing has been removed from the stuffing box, continue with steps 6 thru 19 in the typical packing replacement procedure.

DANGER

ENGAGING THE PTO SWITCH DURING THE STUCK PACKING PROCEDURE WILL ENGAGE THE UHP PUMP DRIVE SYSTEM CAUSING SEVERE DAMAGE TO THE GLAND NUT, STUFFING BOX AND PLUNGER. IT COULD ALSO RESULT IN INJURY TO PERSONNEL. ALWAYS MAKE SURE THE PTO SWITCH IS NOT ACTIVATED AT ANY TIME DURING THE STUCK PACKING REMOVAL PROCEDURE.

5.10 Ultra High Pressure Pump Assembly



ITEM	PART NUMBER	DESCRIPTION
1	K26488	Deflector
2	K51737	Plunger Coupling
3	K53562	#6 Plunger
	K53563	#7 Plunger
	K53564	#8 Plunger
4	K54102	Gland Nut
5	K26465	O-ring
6	K27480	#6 Guide Bushing
	K27481	#7 Guide Bushing
	K27482	#8 Guide Bushing
7	K54117	#6 Packing
	K54118	#7 Packing
	K54119	#8 Packing
8	K54097	#6 Sleeve

Ultra High Pressure Pump

ITEM	PART NUMBER	DESCRIPTION
	K54098	#7 Sleeve
	K54099	#8 Sleeve
8a	K26523	O-ring
9	K54100	Stuffing Box
10	K54126	Stuffing Box Seal
11	K53496	Uni-Valve
11a	K54144	Seal Kit
11b	K27538	Retaining Ring
11c	K55232	Spring Retainer
11d	K27510	Spring
12	K53673	7/8” Type “M” Male
13	K53457	Manifold
14	K53506	Rupture Disc Holder
14a	K27503	O-ring
14b	K53577	Base
14c	K27485	Disc, 50,000 psi burst pressure
	K27486	Disc, 56,000 psi burst pressure
14d	K53579	Hold down Ring
14e	K53580	Cap
15	K27489	Gauge (0-60,000 psi)
16	K28091	Anti-vibration Gland Set
17	K53573	Adapter, Male Port x 9/16” HP Female
18	K26501	Manifold Bolt
19	K53796	Water Lube Harness
19a	K26470	Hose (order in feet)
19b	K27476	Needle Valve
19c	K26466	Nipple
19d	K53793	Lube Manifold
19e	K27102	Ball Valve
19f	K26875	Hose Fitting
20	K50296	Trunnion Rod
21	K51660	Trunnion
22	K26469	Cotter Pin
23	K50890	Pump Wrench

5.11 Dump Valve Assembly

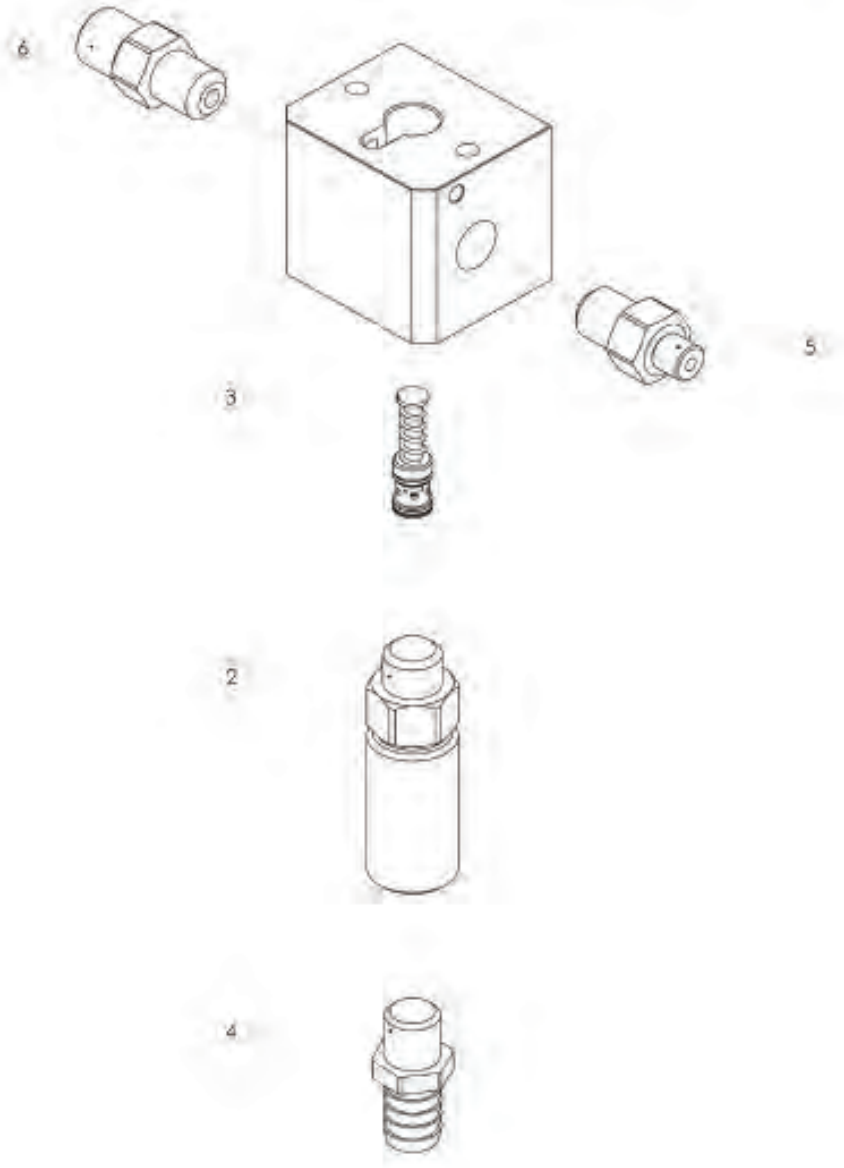
The dump valve should be inspected and lubricated every 200 hours to keep it operating properly. Replace components as required.

Dump Valve Repair

(Hydraulically operated)

1. Remove diffuser tube (2) with cartridge (3).
2. Remove cartridge (3) from slotted end and replace with a new cartridge (3).
3. Replace diffuser tube (2) into valve body (1).

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	K53547	BODY
2	1	K51865	DIFFUSER
3	1	K53476	C-40 CARTRIDGE
4	1	K25797	HOSE FITTING
5	1	FT916HPX5mm	HOSE FITTING
6	1	FT916HPX78	HOSE FITTING

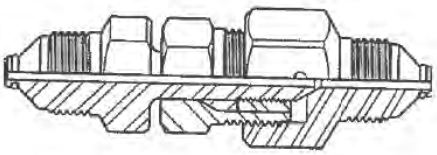


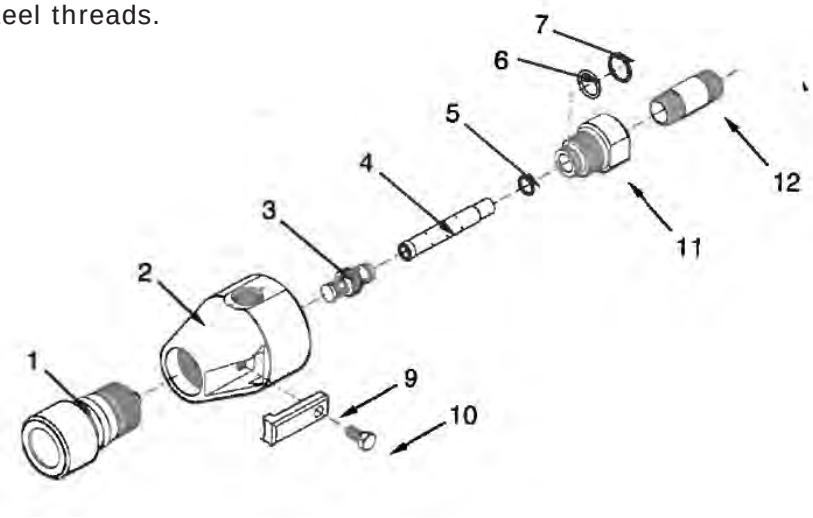
5.12 Manual Bypass Valve

The manual bypass valve should be inspected and lubricated every 200 hours to keep it operating properly. Replace components as required.

Manual Bypass Valve Repair

1. Remove outlet adapter (11).
2. Pull cartridge (3) out. If cartridge (3) is stuck together and not releasing pull the pin and cartridge body apart to inspect the seats for cuts and other damage. Replace the cartridge as necessary.
3. Check diffuser (4) for damage or wear from bypass water.
4. Check all O-rings, replace any that are damaged. Lubricate all O-rings with silicone lubricant.
5. Replace cartridge (3) and reassemble to the bypass valve body (2) making sure to anti-seize all stainless steel threads.





ITEM	PART NUMBER	DESCRIPTION
1	K52145	Adjustment Knob
2	K53714	Body
3	K53726	Cartridge
4	K53727	Diffuser
5	K26453	O-ring
6	K27642	O-ring
7	K53725	Backup Ring
9	K50796	Latching Arm
10	K25594	CapScrew
11	K53720	Outlet Adapter
12	K27645	Nipple
Not Shown	K25933	Outlet Hose (Order in Feet)

5.13 Vacuum Blower Scheduled Maintenance

Blower and Filter Canister

The vacuum blower operates at an extremely high RPM and has specific lubrication and maintenance requirements. It is also very susceptible to damage from debris because of the tight tolerances in the blower impellers. Refer to the Maintenance Matrix in this section and the blower manufacturer's operating manual for lubrication specifications and maintenance schedules.

Be sure the vacuum filter is always in good operating condition so it fully protects the blower from collecting vacuumed debris internally. If paint debris ever gets into the blower impellers, use a paint or lacquer thinner or other non-corrosive cleaner to remove any residue build-up inside. It will be necessary to remove the silencer in order to clean the blower. Remember that if large debris gets into the blower, it can cause severe damage to the blower. Refer to Vacuum Canister & Filter in the General Maintenance section of this manual for instructions on maintaining the vacuum system and cleaning the filter.

Daily Inspection and Maintenance

- Check for obvious loose mounting nuts and bolts.
- Check the oil level in the gear end of the blower. It should be within 1/4" of the overflow plug threads.
- Grease blower drive end bearings with the lubricant recommended by the blower manufacturer.
- Clean the vacuum filter before each shift and drain the filter canister at least once every 2 hours of operation. Filters may be cleaned with a pressure washer up to 2000 PSI (138 bars). A mild solvent solution may be used to clean thermoplastic or tar residue from the filter surface.
- Inspect the filter for holes or thin areas that could allow vacuumed water or debris to get into the vacuum blower or silencer. Clean, secure filtration is necessary to keep your vacuum blower in good operating condition. Replace if necessary.
- Check the vacuum canister door seal. Clean or replace the seal if necessary.

500 Hour Maintenance (New Blower)

Perform all daily maintenance along with the items outlined in this section.

- Change blower gear case lubricating oil after the first 100 hours and every 500 hours thereafter. Service the blower as recommended in the blower operating manual.

Important:
Make sure to install the safety plug in crankcase drain valve when draining is complete. The safety plug prevents crankcase oil from draining if the valve is accidentally opened.

200 Hour Maintenance

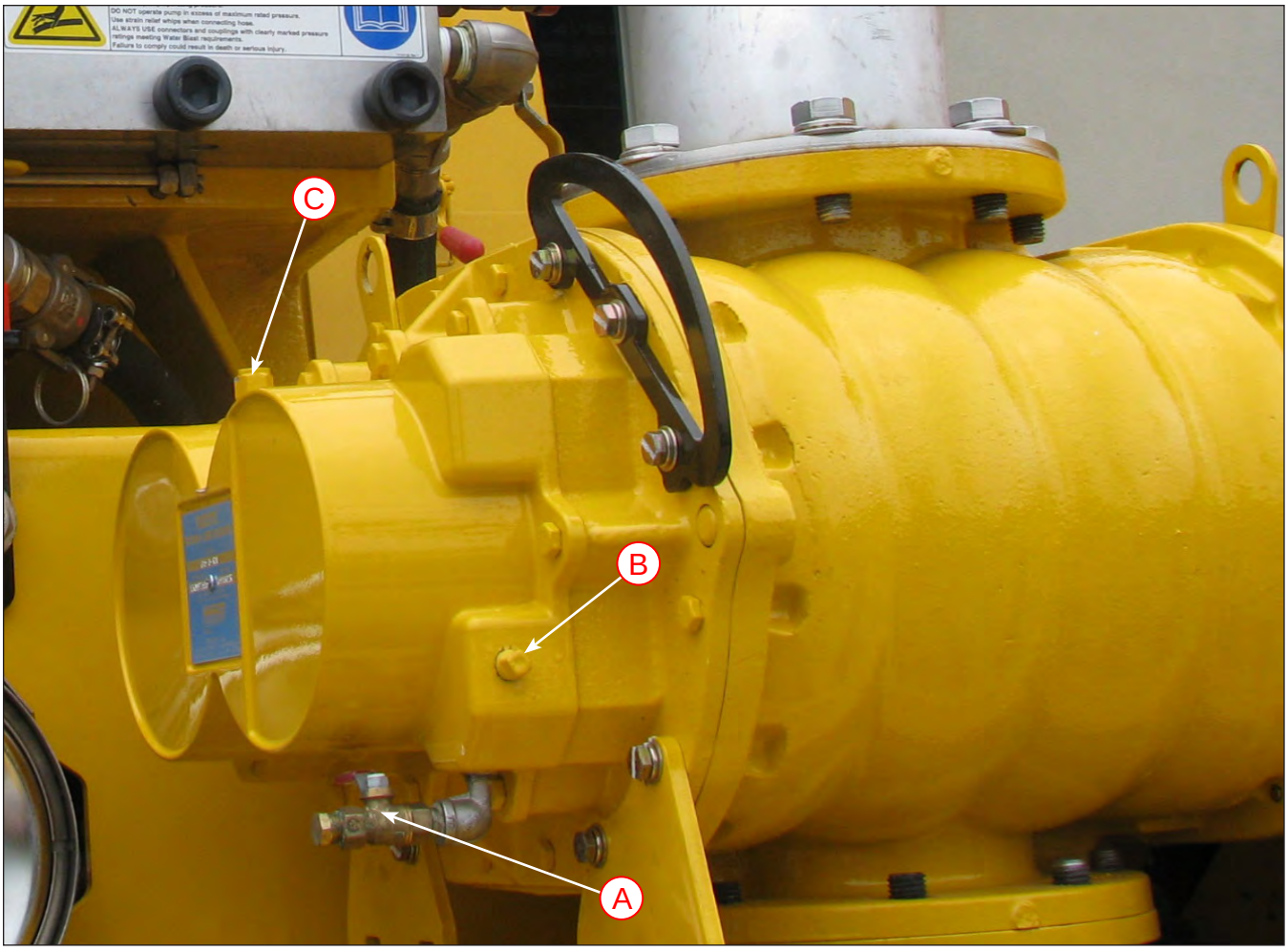
Perform all daily maintenance along with the items outlined in this section.

- Check pulley clearances and drive belt tension.
- Inspect and tighten all mounting bolts, hose clamps and hardware.
- Lubricate drain ball valve. Make sure to open and close all ball valves at least once every 200 hours to keep them free and operating properly.
- Inspect, clean and lubricate the vacuum relief valves to keep them operating properly.
- Inspect all hoses and fittings for signs of deterioration, chaffing and leaks. Repair or replace as necessary.
- Tap vacuum hose walls with a dead blow hammer while the system is operating at maximum vacuum to flex the hose walls and cause built up debris to break off and be sucked into the debris tank.
- Inspect and rotate the vacuum hoses 120^0 to increase the life of the hoses.

500 Hour Maintenance

Perform all daily and 200 hour maintenance along with the items outlined in this section.

- Change blower gear case lubricating oil. Service the blower as recommended in the blower operating manual.



Typical Vacuum Blower Gear Case Drain, Oil Level & Oil Fill Plugs
A. Drain Valve & Safety Plug B. Overflow Plug C. Breather/Oil Fill Plug

5.14 Checking & Changing Blower Gear Case Oil

The blower gear case oil level should be checked daily or at least every 50 hours of operation. The oil should be changed every 500 hours.

When changing or checking the gear case oil, always clean the area around the breather and overflow plugs before they are removed. This will reduce the possibility of dirt and debris from entering the gear case when the fill plugs are removed.

Checking The Gear Case Oil Level

1. Make sure the waterblasting system is shutdown with the truck in the service position and on level ground.
2. Remove the overflow plug on the side of the gear case. The oil should be within 1/4" of the bottom of the plug threads.
3. If the oil is low, remove the breather plug and add oil until the oil level is even with the bottom of the overflow hole.
4. Replace the breather and overflow plugs. Tighten to specifications.

Changing the Gear Case Oil

Draining the gear case:

1. Make sure the waterblasting system is shutdown with the truck in the service position and on level ground.
2. Remove the safety drain plug at the oil drain ball valve fitting.

3. Attach a drain hose to the ball valve fitting and route the hose to a suitable waste oil container capable of handling at least 2 quarts (2.9 Liters) of oil.
4. Open the drain valve and drain the oil.
5. When draining is complete, close the valve and insert the safety plug. Make sure the safety plug is clean to avoid contamination. Tighten the plug to specifications.

NOTICE:
NOT ALL BLOWERS ARE EQUIPPED WITH A VALVE AND DRAIN PLUG. SOME ARE EQUIPPED WITH A DRAIN PLUG ONLY.

Refilling the gear case:

1. Clean the area around the breather plug on the top of the gear case and remove the plug.
2. Make sure the drain valve is closed and the safety plug is installed in the valve fitting and tightened.
3. Add the recommended amount and type of gear oil to the gear case. Refer to the blower manufacturer's Operation and Maintenance manual and/or the Maintenance Matrix in this chapter for the correct quantity and type of gear oil.
4. Verify the gear case oil level when filling is complete following the instructions for checking the oil level in the previous section of this chapter.
5. Make sure the breather plug is clean and insert the plug into the port. Tighten to specifications.
6. Wipe up any spilled oil and properly dispose of the waste oil and oil soaked rags

Typical Vacuum Blower Drain Valve & Safety Drain Plug

Note that not all blowers are equipped with a drain valve and are equipped only with a drain plug. The blower drain system shown is for reference purposes only and the drain system on your truck may be different.

Blast Head Vacuum Hoses

5.15 Vacuum Hose Replacement & Rotation Procedure

Debris buildup, kinks, clogs or leaks in the system will cause a reduction in airflow at the blasting heads, reducing the efficiency of operation or causing operations to stop completely. Debris buildup inside the hoses can be removed by periodically tapping the outside walls with a dead blow hammer while the system is operating at maximum vacuum. This will flex the hose walls and cause built up debris to break off and be sucked into the debris tank.

The internal walls of vacuum hoses develop wear points caused from the high velocity of abrasive debris traveling inside the hoses. The wear points are most prevalent in the outside radius of tight bends near the blasting heads and where the debris hose rises above the truck cab.

The life of the hoses in these areas can be extended by rotating the hoses 120^0 every 200 hours. Vacuum hoses should be inspected daily and replaced as needed.

Make sure the waterblasting system is shutdown with the truck in the service position before rotating or replacing vacuum hoses.

NOTICE:
DAMAGED VACUUM HOSES CAN BE REPAIRED USING DUCT TAPE AS A TEMPORARY SOLUTION TO EXTEND THE LIFE OF THE VACUUM HOSE.

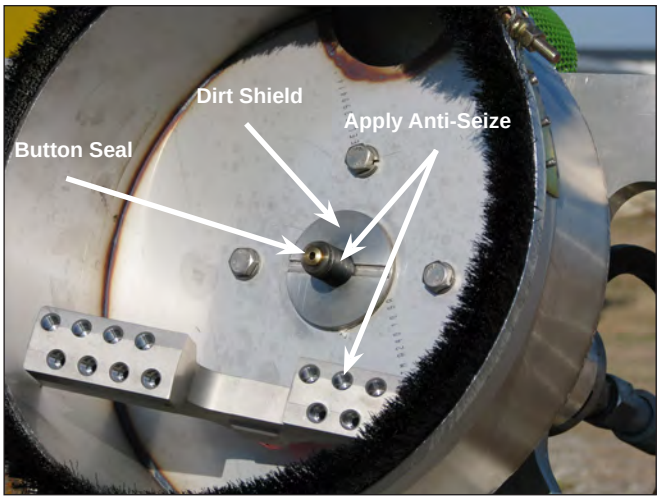
Vacuum Hose Replacement

1. Release the cam locks at the hose connection fittings.
2. Remove the old vacuum hose assembly.
3. If the cam lock fittings are in good condition and can be reused, cut the old hose off of the fittings. Then install the fittings in the new vacuum hose.
4. Connect the new vacuum hose assembly and close the cam locks.

Vacuum Hose Rotation

1. Mark the position of the hose, then release the cam locks at the hose fittings.
2. Using the marks as a reference, rotate the hose 120 degrees.
3. Secure the hose in the new position with the cam locks.

Shroud Installed



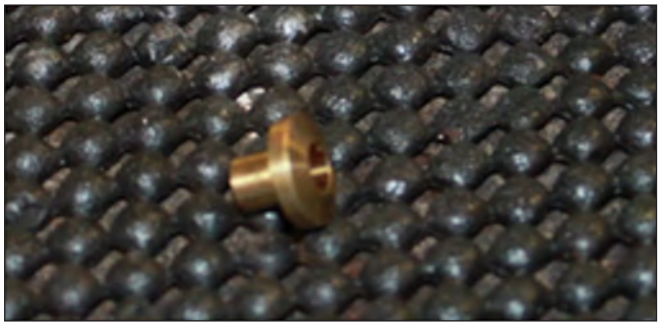
Spray Bar & Dirt Shield Components

5.16 Hog Head Shroud Installation

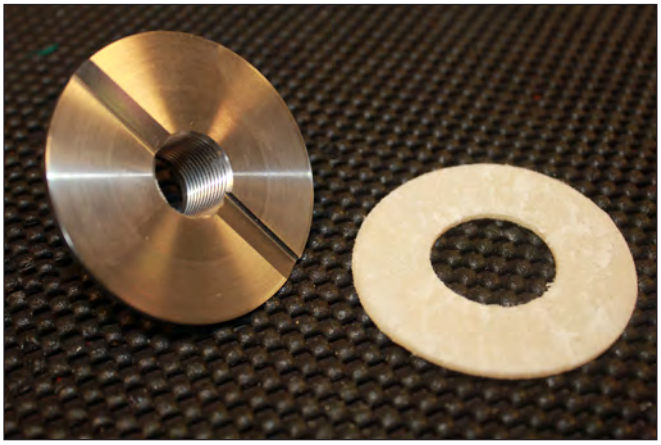
If the shroud becomes damaged, it must be replaced following the steps outlined in this section.

Removing the shroud:

1. Raise the Hog Arm and blasting heads to the full up position and lock them with the safety pin.
2. Make sure the waterblasting system is shutdown with the truck in the service position.
3. Remove the vacuum hose from the shroud.
4. Remove the spray bar protector.
5. Hold the thru-shaft with a 3/4" (19 mm) wrench inserted in the slot at the base of the thru-shaft motor to prevent it from turning.
6. Turn the spray bar counterclockwise by hand until it is free of the shaft.
7. Remove Brass button.
8. Use a stainless steel wire brush to clean the dirt from the thru-shaft threads.
9. While still holding the thru-shaft with the wrench, remove the dirt shield by turning it counterclockwise.
10. Remove felt seal. Then clean the dirt shield and shroud.
11. Loosen and remove the bolts holding the shroud in place.
12. Remove the shroud from the blast head.



Typical Spray Bar Button Seal



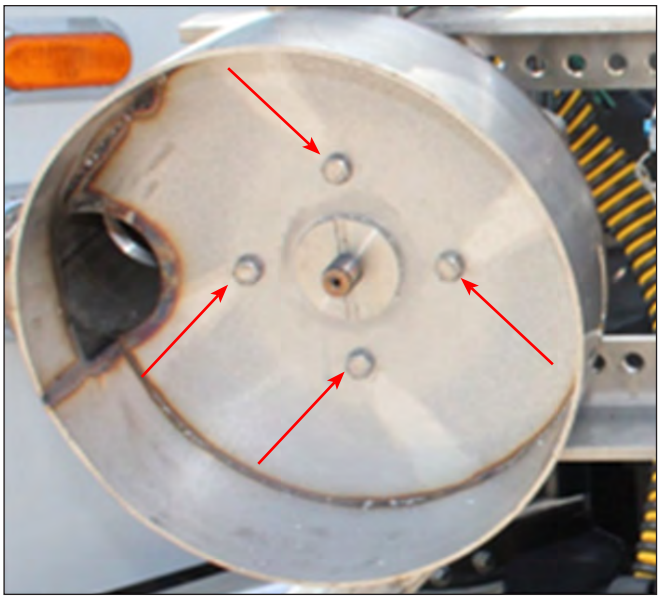
Dirt Shield & Felt Seal

Installing a new shroud:

1. Clean the bottom of the thru-shaft motor housing of dirt and debris.
2. Place the new shroud on the housing and align the bolt holes. Insert the shroud bolts and tighten finger tight.
3. Clean the dirt shield and install a new felt seal.
4. Apply anti-seize to the thru-shaft shaft threads and hold the thru-shaft with the 3/4" (19 mm) wrench.
5. Install the dirt shield and seal. Adjust the shroud slightly if necessary to align the center hole in the shroud with the shoulder on the dirt seal.
6. Verify shroud alignment and hand tighten the dirt shield.

NOTICE:
ONLY HAND TIGHTEN THE DIRT SHIELD. NEVER USE TOOLS TO TIGHTEN THE DIRT SHIELD. IF THE DIRT SHIELD IS TIGHTENED MORE THAN HAND TIGHT IT WILL CAUSE THE SPRAY BAR TO ROTATE SLOWLY OR NOT ROTATE AT ALL.

7. With the dirt shield installed, tighten the shroud bolts to specifications.
8. Activate the truck and waterblasting system following the steps in the Startup Procedure.
9. Activate the charge water system and purge the blast head at low pressure to remove debris that could clog the nozzles.
10. Shutdown the waterblasting system and return the truck to the service position.
11. Install a new brass button seal, hold the thru-shaft with the wrench and reinstall the spray bar.
12. Tighten the spray bar by turning it clockwise ***slowly*** until it stops. Then seat the seal by turning the spray bar another 15%. Make sure you remove the wrench when the installation is complete.
13. Install the spray bar protector.
14. Reinstall the vacuum hose to the shroud.



Shroud Mounting Bolts

Spray Bar Protector, Cotter Pin & Gasket

5.17 Hydraulic System Scheduled Maintenance

Hydraulic System

The hydraulic pump operates at very high pressure and has specific maintenance requirements. You should perform all recommended maintenance according to the pump manufacturers' specifications.

Hydraulic fluid should be changed and the tank flushed on a regular schedule in accordance with Waterblasting and the hydraulic component manufacture's recommendations. Waterblasting recommends changing the fluid at least once every 600 hours.

Daily Inspection and Maintenance

- Check the hydraulic fluid level each day or immediately following the repair of a blown hose, leaking fitting or any hydraulic system service.
- Inspect all hoses, fittings, valves and seals for leaks and proper operation. Repair or replace leaking or malfunctioning components before operating the system.
- Check the pressure indicator on the high pressure filter and make sure it is well within the green zone. Change the filter cartridge when the indicator moves near or into the red zone.
- Monitor the cooling fan operation and make sure it is activating when necessary, sounds normal and pulls a strong flow of air through the cooler.

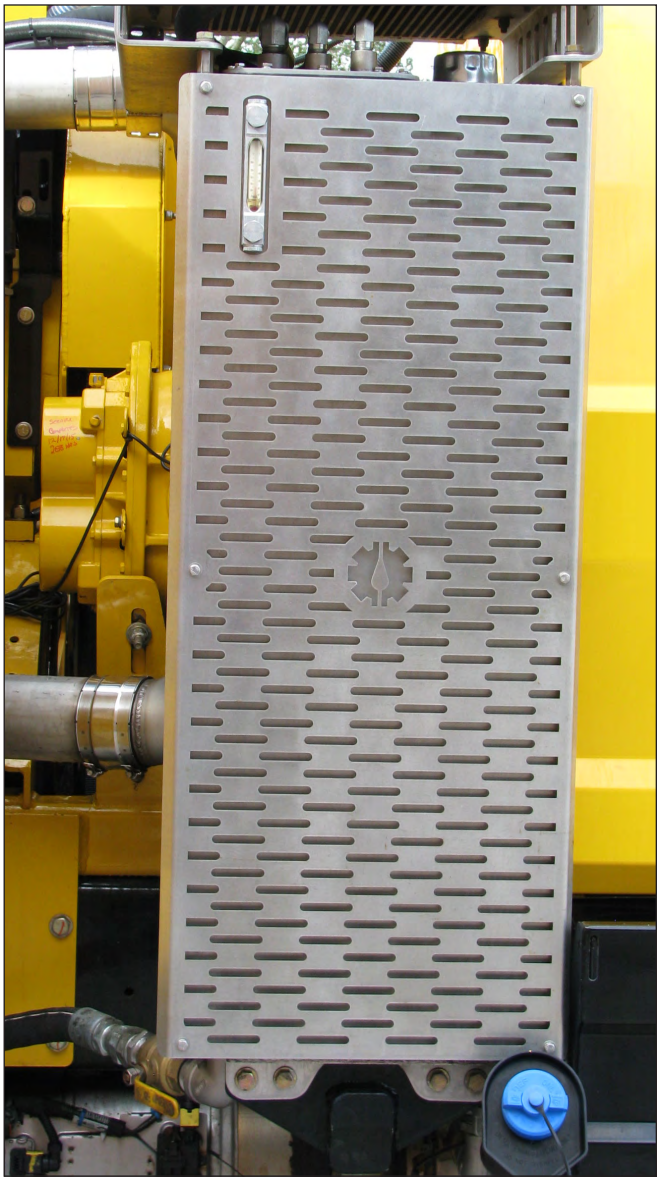
Refer to the Maintenance Matrix in this section for fluid specifications.

200 Hour Inspection and Maintenance

- Change the low pressure filter in the return line at the hydraulic oil reservoir fill cap. The filter removes any debris that may enter the system and should be changed every 200 hours or more frequently if necessary.
- Inspect the cooling fins for the oil cooler and clean as necessary. The cooler is critical in maintaining acceptable oil temperatures in the hydraulic system and must be kept clean to maintain efficiency.

600 Hour Inspection and Maintenance

- Drain hydraulic fluid and flush hydraulic tank.



Hydraulic Fluid Reservoir

5.18 Changing Hydraulic Fluid & Flushing Tank

The reservoir tank is equipped with a removable clean out/inspection plate on the top of the tank. When the fluid is changed, the clean out plate should be removed to inspect the tank and remove any sludge or debris accumulated on the bottom. It also provides access to the strainers on the supply tubes. Only qualified service technicians should drain and flush the system or replace hydraulic fluid filters.

⚠ WARNING ⚠

ALWAYS DEPRESSURIZE THE HYDRAULIC SYSTEM BEFORE REMOVING ANY HYDRAULIC COMPONENTS, HOSES OR FITTINGS. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY OR DEATH.

NOTICE:

- **BEFORE PERFORMING ANY MAINTENANCE PROCEDURE, MAKE SURE THE WATERBLASTING SYSTEM IS SHUTDOWN WITH THE TRUCK IN THE SERVICE POSITION AND ON LEVEL GROUND.**
- **MAKE SURE THE HYDRAULIC TANK, FILTERS AND ALL RELATED COMPONENTS ARE THOROUGHLY CLEANED BEFORE SERVICING TO PREVENT CONTAMINATION.**
- **MAKE SURE ALL PARTS ARE CLEAN BEFORE FINAL ASSEMBLY.**

Drain & Flush the hydraulic tank and replace the pick tube filter:

1. Make sure the hydraulic system is not pressurized and the fluid is cool.
2. Remove the fill cap to allow air to enter the tank as the fluid drains.
3. Drain the tank into a suitable container by removing one of the hydraulic lines.
4. When the tank is drained, loosen the bolts securing the inspection plate and remove the plate. Use a bright light to inspect for sludge buildup and other contamination.
5. Remove sludge and contaminates, then flush the tank until it is clean using fresh hydraulic fluid.
6. Clean the screens on the pickup tubes.
7. Reinstall the plate. Tighten bolts in a crisscross pattern to secure the plate.
8. Flush the tank again with fresh fluid to remove contaminates from installing the pickup tubes and inspection plate. Then install the removed hydraulic line.
9. Add fluid until the tank is full. Monitor the fluid level using the sight gauge.
10. Replace the fill cap and tighten.

Low Pressure Filters & Tank Inspection Plate

5.19 Replacing Hydraulic Filters

Before performing any maintenance procedure, make sure the waterblasting system is shutdown with the truck in the service position.

Low Pressure Filters

The low pressure filters are spin on type filters located in the return line near the top of the tank. Use the following procedure to change the filters.

Changing the low pressure filter element:

1. Use a filter wrench and rotate the filters counterclockwise to remove them.
2. Lubricate the seal on the new filters with hydraulic fluid.
3. Install the filters and hand tighten.
4. Inspect the filters for leaks when the hydraulic system is activated.

High Pressure Filter

The high pressure filter is a cartridge type filter located in a special high pressure canister. Use the following procedure to change the filter.

This filter is in the hydraulic system high pressure circuit near the hydraulic manifold. Make sure to verify that all pressure is bled from the system before removing the filter canister. Monitor the hydraulic pressure gauge to verify 0 pressure in the system.

Changing the high pressure filter element:

1. Verify 0 pressure in the system, then use a socket wrench to loosen the bolt at the bottom of the filter canister.
2. Remove the canister and dirty filter element from the filter head.
3. Thoroughly clean the filter canister and install the new element.
4. Place a new seal on the canister and lubricate with hydraulic fluid.
5. Replace the canister and tighten bolt to specifications.
6. Monitor the filter closely for leaks when the hydraulic system is activated.

Note:
Refer to the manufacturer's operating and service manuals for additional information and instructions for servicing the hydraulic system.

High Pressure Filter

5.20 Winterization & Storage Procedures

When operating the truck in freezing temperatures, it is extremely important to properly winterize the water and vacuum systems whenever the truck is shutdown.

Vacuum and UHP System Shutdown and Winterizing

Water freezing in vacuum system components can cause serious damage to the blower, silencer, filter separator, drain valves and other vacuum system components. Water freezing in UHP components can cause serious damage to pumps, filter canisters, valves and other UHP system components.

It is important to follow the proper procedure when shutting down the vacuum and UHP systems during cold weather operations or for winter storage to ensure all water is removed from critical areas and those systems are protected with antifreeze.

Completely draining the UHP and vacuum systems is difficult and time consuming. Consequently, circulating antifreeze through the system is the preferred method to winterize the water blasting system.

For trucks operating daily during freezing weather, this method provides much quicker startup and shutdown procedures. The procedure requires a 50/50 mixture of water and glycol based RV potable water system antifreeze to be circulated through the system to protect components from freezing.

35 to 40 US gallons (132 to 152 liters) of premixed antifreeze at a 50/50 water antifreeze ratio is required to properly winterize the UHP and vacuum systems. Make sure you have enough antifreeze on hand before starting the winterizing procedure.

⚠ CAUTION ⚠

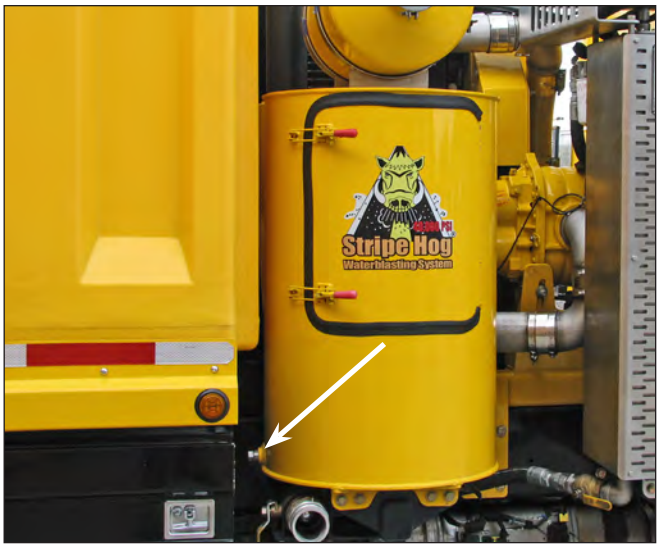
NEVER USE ALCOHOL BASED ANTIFREEZE SOLUTIONS TO WINTERIZE THE WATER BLASTING SYSTEM. USING ALCOHOL BASED ANTIFREEZE SOLUTIONS TO WINTERIZE THE HIGH PRESSURE WATER SYSTEM WILL DESTROY THE SEALS AND O-RINGS

Debris Tank & Wastewater Bladder Drain Valves

Use the following procedure to shutdown and winterize the water blasting system:

1. Shutdown high pressure water to the blast head by turning off the DUMP VALVE 40K switch.
2. Stop the truck and set the parking brake.
3. Turn the HEAD ROTATION switch off.
4. Reduce the engine speed to idle.
5. Allow the vacuum blower to operate for a couple of minutes to clear waste water from hoses and dry out the vacuum system.
6. Turn the DIRTY WATER switch OFF.
7. Follow the Shutdown Procedure to shutdown the waterblasting system and place the truck in the service position.
8. Drain all water from the clean water tank, wastewater bladder and debris tank.
9. Open the clean water fill valve and allow all water to drain from the fill pipe.
10. If the machine will be shut down for an extended period, dump the debris tank and completely clean the tank with clean fresh water. Make sure to thoroughly flush the drain valve and allow all water to completely drain from the tank and valves.

11. UHP water system hoses, the vacuum filter canister and all blasting head components should be drained of all water.
12. Remove the spray bar and store it.
13. Open the bleeder valve at the charge water pump and allow hoses to completely drain. With the valve still open, activate the pump briefly to pump out any remaining water, then close the valve.
14. Remove the dirty water pump strainer and run the pump briefly to drain the pump hoses, then clean and reinstall the strainer.
15. Pour 20 gallons of 50/50 antifreeze mixture into the clean water tank.
16. Activate the truck and waterblasting system following the steps in the Startup Procedure.
17. With the engine at idle, activate the charge water pump, then turn on the DUMP VALVE 40K switch until antifreeze flows from the thru-shaft in the blasting head for 20 or 30 seconds. Then turn off the DUMP VALVE 40K switch.
18. Shutdown the waterblasting system.
19. Disconnect the pressure hose running from the 1 micron filter to the charge pressure safety switch at the switch fitting.
20. Activate the waterblasting system and activate the charge water pump until antifreeze flows from the hose fitting for several seconds.
21. Shutdown the waterblasting system.



Typical Vacuum Canister Drain

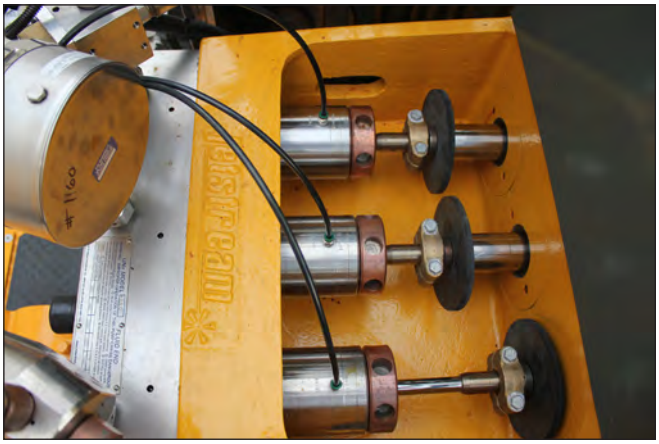

Charge Pump Bleeder Valve


Typical Charge Pressure Safety Switch & Pressure Hose Fitting


Dirty Water Pump Strainer

NOTICE:
THE CHARGE PRESSURE SAFETY SWITCH DEACTIVATES THE DUMP VALVE WHEN CHARGE PRESSURE DROPS BELOW 30 PSI (2 BAR) TO PROTECT THE UHP PUMP. IF WATER FREEZES IN THE PRESSURE SWITCH HOSE, IT WILL SENSE LOW CHARGE PRESSURE AND PREVENT THE DUMP VALVE FROM ACTIVATING.

22. Pour 2 gallons 50/50 antifreeze mixture into the high pressure pump stuffing box sump so it will drain to the bilge pump sump system. Allow the bilge pump to run until antifreeze flows from the bilge pump hose fitting in the wastewater bladder for several seconds.
23. Thoroughly clean the vacuum filter canister and the filter.
24. Pour 10 gallons of 50/50 antifreeze mixture into the wastewater bladder. Open the wastewater bladder drain valve until antifreeze flows from the valve. Then close the valve.
25. Make sure the debris tank is lowered to the full down position. Close the door and inflate the seal.
26. Pour 10 gallons of 50/50 antifreeze mixture into the debris tank. Activate the wastewater transfer pump until antifreeze flows from the hose fitting in the wastewater bladder for 20 or 30 seconds. Then turn off the pump.
27. Open the debris tank gravity drain valve until antifreeze flows from the valve. Then close the valve.
28. Shutdown the waterblasting system (Section 3.4) and truck engine.
29. Turn off the PTO switch and all other control panel switches.
30. When winterizing the Ultra-High Pressure pump, refer to pump manufacturer's procedures for additional instructions for operating and maintaining UHP pumps and equipment in freezing climates.
31. Follow all other instructions in the Routine Shutdown Procedure.



UHP Pump Stuffing Box Sump

Typical Vacuum Filter Access Door & Filter

Clean Water Tank & Wastewater Bladder Access

Reactivating a truck winterized with antifreeze:
Note that the steps in this procedure are intended to recover as much of the antifreeze from the system as possible.

1. Add clean fresh water to the clean water tank.
2. Activate the truck and waterblasting system following the steps in the Startup Procedure.
3. Position the blasting head over a container to collect the antifreeze.
4. With the engine at idle, activate the DUMP VALVE 40K switch and allow clean water to flow and push all the antifreeze out the blasting head into a container.
5. Once the water flows clear, turn off the CHARGE PUMP switch, then turn the PTO switch off.
6. Shutdown the waterblasting system and return the truck to the service position.
7. Install spray bar
8. At this point you're ready to continue with complete startup procedure. (Refer to the System Startup Procedure in Section 3)

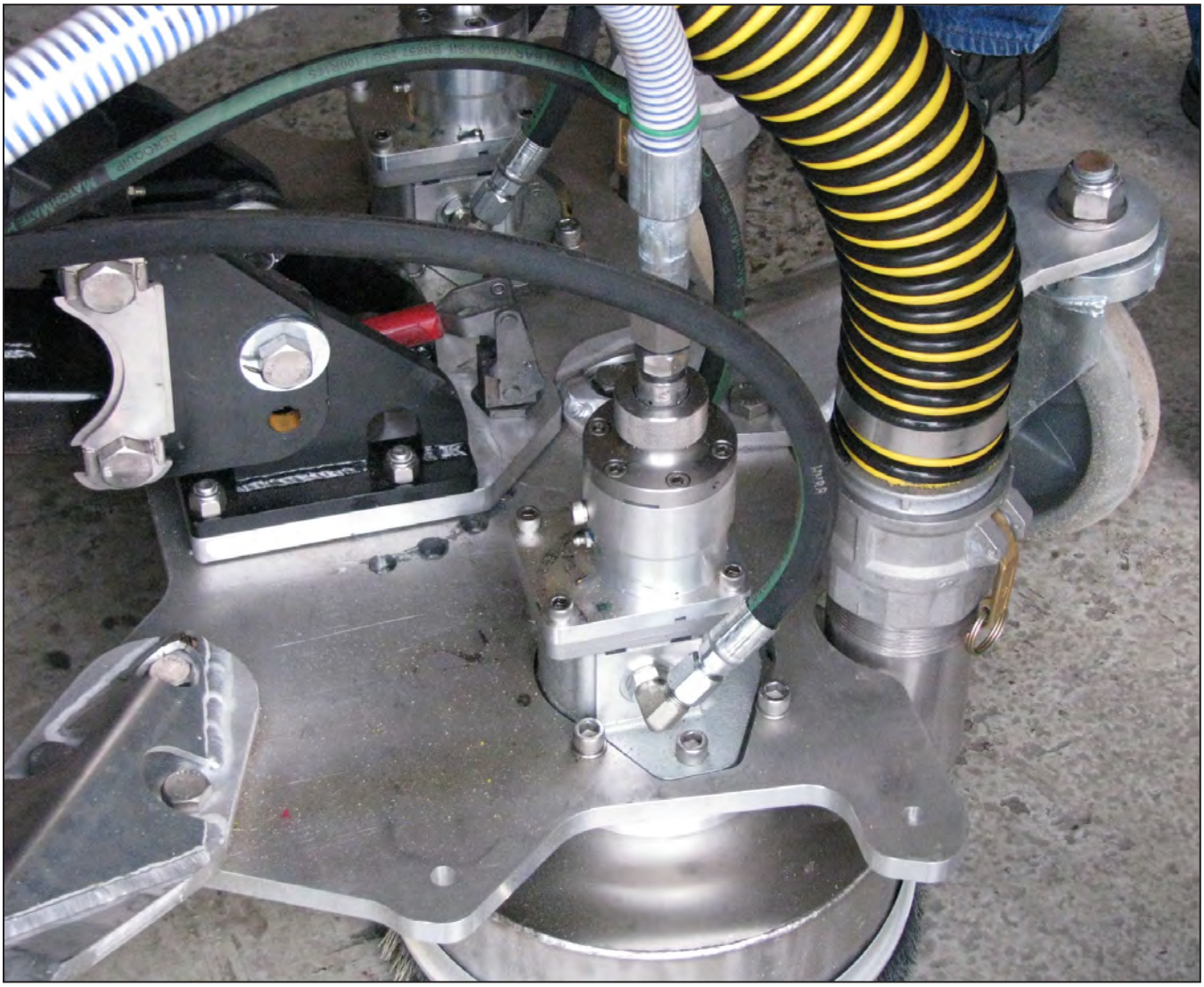
NOTICE:
IF YOU ARE INTENDING TO REUSE THE RECOVERED ANTIFREEZE, MAKE SURE TO TEST IT AND MAKE SURE THE ANTIFREEZE MIXTURE HAS NOT BECOME DILUTED TO THE POINT WHERE IT WILL NOT PROTECT THE WATER SYSTEM AT THE EXPECTED TEMPERATURES.

REMEMBER THAT THE ANTIFREEZE WILL BE SLIGHTLY DILUTED EACH TIME THE SYSTEM IS WINTERIZED, WHICH WILL CAUSE THE FREEZE PROTECTION TEMPERATURE TO RISE. THE AMOUNT OF DILUTION WILL VARY, DEPENDING ON THE VOLUME OF FRESHWATER IN THE SYSTEM AT THE TIME OF WINTERIZATION.

CAUTION

TO AVOID SERIOUS DAMAGE TO WATER BLASTING HYDRAULIC COMPONENTS WHEN OPERATING IN FREEZING TEMPERATURES OR TEMPERATURES BELOW 60 DEGREES FAHRENHEIT (16^0 CELSIUS), IT IS NECESSARY TO OPERATE THE HYDRAULIC SYSTEM AND OTHER WATER BLASTING COMPONENTS INCLUDING THE BLOWER AND HIGH PRESSURE PUMP, WITH THE ENGINE AT IDLE, UNTIL THE HYDRAULIC FLUID REACHES A TEMPERATURE OF 60 DEGREES FAHRENHEIT (16 DEGREES CELSIUS) OR ABOVE.

5.21 Thru-Shaft Motor Bearing Pre-Load



Introduction

The bearing preload setting in the thru-shaft hydraulic motor that spins the spray head is critical to the proper operation of the thru-shaft motor. The bearings are carefully preset at the factory. Then, each motor is run for several hours to break-in the bearings and components. When break-in is complete, the bearing preload is reset and the motors are tested again on the truck and with pressure applied. This normally ensures trouble free operation of the thru-shaft motors and they don't require further adjustment.

Even though every effort is made at the factory to ensure the through shaft motors are properly broken-in and will provide trouble free operation, there are situations where the bearing preload will need to be reset after the truck has been operating in the field for a period of time. Setting the bearing preload is not difficult and will not take much time. The following instructions will guide you through the bearing preload process and provide the information you need to do the job properly and in the shortest possible time.

The Instructions provide information on the tools and materials you will need as well as the step by step process. You can save time by reading the instructions completely before beginning and making sure you have all the tools and supplies you will need readily available.

If you have any questions or require assistance, please don't hesitate to contact Hog Technologies Customer Service at 772-223-7393.

Tools and Materials Required

Tools

2 - Medium Sized Flat Blade Screwdrivers

1 - Medium Sized Channel Lock Pliers

1 - 3/4” (19mm) Open End Wrench

1 - 15/16” (24mm) Open End Wrench

1 - 15/16” (24mm) Box End Wrench

1 - 15/16” (24mm) Deep Well Socket

1 - 1 1/8” (28mm) Deep Well Socket

1 - 1/2” Drive Rachet Wrench

1 - 1/2” Drive Torque Wrench

1 - Spanner socket (weldment tool)
(Supplied in your Truck Tool Kit)

1 - 6 mm Allen Wrench

Supplies

- Anti-Seize
- Grease Gun and Multi-Purpose Grease
- Rags or Paper Towels
- 9396K21 O-ring (Supplied in Spare Parts Kit)

Note:
Use anti-seize compound on bolt and thru-shaft threads and threaded hose connections to prevent galling.

WARNING

INJURIES FROM ULTRA-HIGH PRESSURE WATERBLASTING IS VERY SERIOUS AND CAN RESULT IN A FATALITY. ALWAYS MAKE SURE ALL PERSONNEL ARE A SAFE DISTANCE FROM THE WORK AREA BEFORE THE PRESSURE PUMP IS ENGAGED. NEVER PUT HANDS, FEET OR ANY PART OF YOUR BODY IN OR NEAR THE HIGH PRESSURE STREAM.

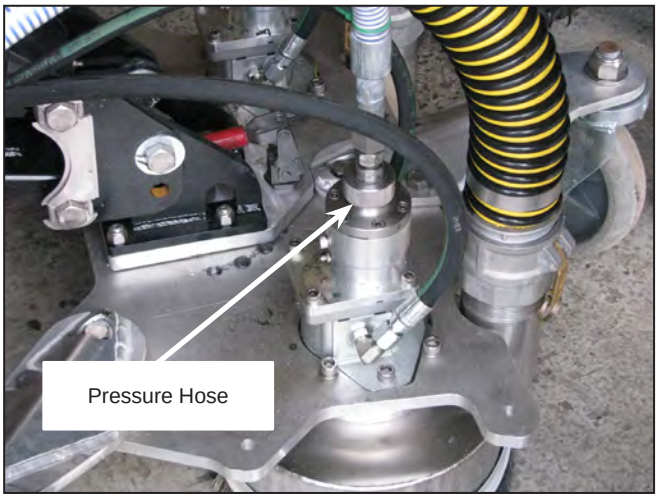


Figure 1: High pressure hose on top of the thru-shaft motor

Figure 2: High pressure hose removed

Step 1
Remove the High Pressure Hose
Remove the high pressure hose from the top of the thru-shaft motor by tuning the hand nut at the base of the hose counterclockwise. If the hand nut is too tight to turn by hand, use the channel lock pliers to free it, then continue loosening it by hand. Figure 1 and 2.

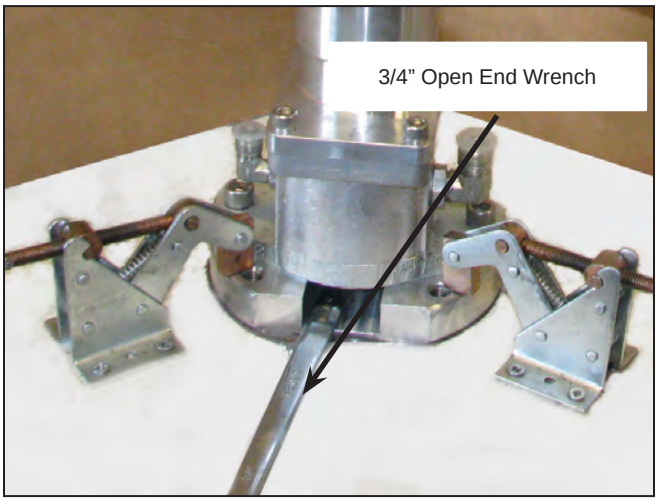


Figure 3: Thru-shaft motor on work bench showing position of slot and 3/4" open end wrench.

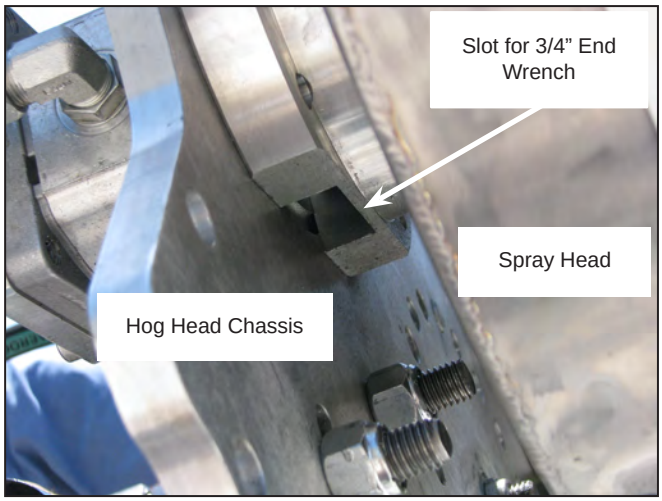


Figure 4: Location of slot in thru-shaft motor mounted on hog head for 3/4" open end wrench.

Step 2
Insert Wrench to Hold Thru-Shaft
Insert the 3/4" (19mm) open end wrench through the slot in the base of the thru-shaft motor. The slot is located between the hog head chassis and the spray head. Figure 3 and 4.

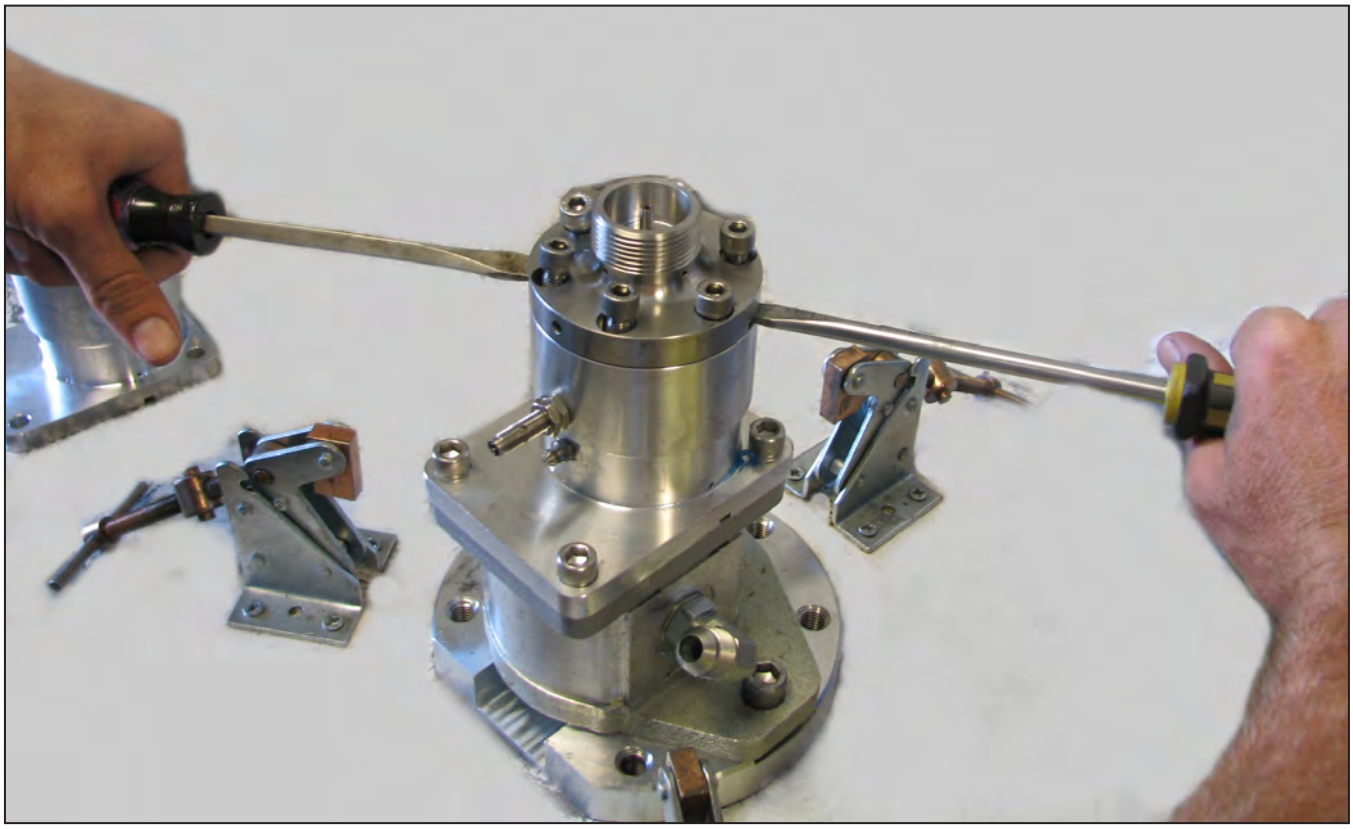


Figure 5: Use two medium flat head screwdrivers to remove the thrust housing cap. Note that the bolts are loose and left in place to prevent thrust housing cap from falling and being damaged during removal.

Step 3
Remove Thrust Housing Cap

Use a 6mm Allen wrench to remove the 6 Allen head bolts that secure the thrust housing cap to the thrust housing. Make sure to leave each bolt loose and turned 3 threads in as shown in figure 5. The loosened bolts will allow the cap to be removed and prevent the possibility of the cap falling once it is free from the thrust housing.

Use the two medium sized, flat head screwdrivers and insert them into the slots at each side of the base of the thrust housing cap. Slowly and carefully twist the screwdrivers to work the cap evenly off the thrust housing until it is free. Figure 5.

Note that the O-ring seal in the thrust housing cap will provide some resistance until it is clear of the thrust housing. The cap will tend to “pop” slightly when the O-ring clears the base.

Once the thrust housing cap is free, remove the Allen bolts and the cap.

Inspect the cap and O-ring seal for damage. Replace O-ring if necessary and place the cap assembly in a safe, clean location. Figure 6.

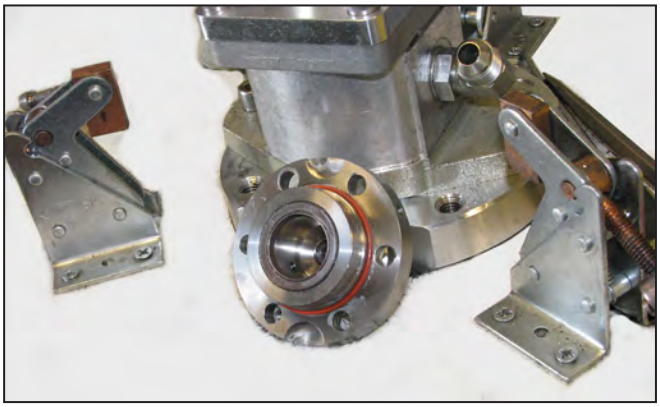


Figure 6: Thrust housing cap removed. Note the O-ring seal and the slots for the screwdrivers. Make sure the cap and O-ring is in good condition and clean.

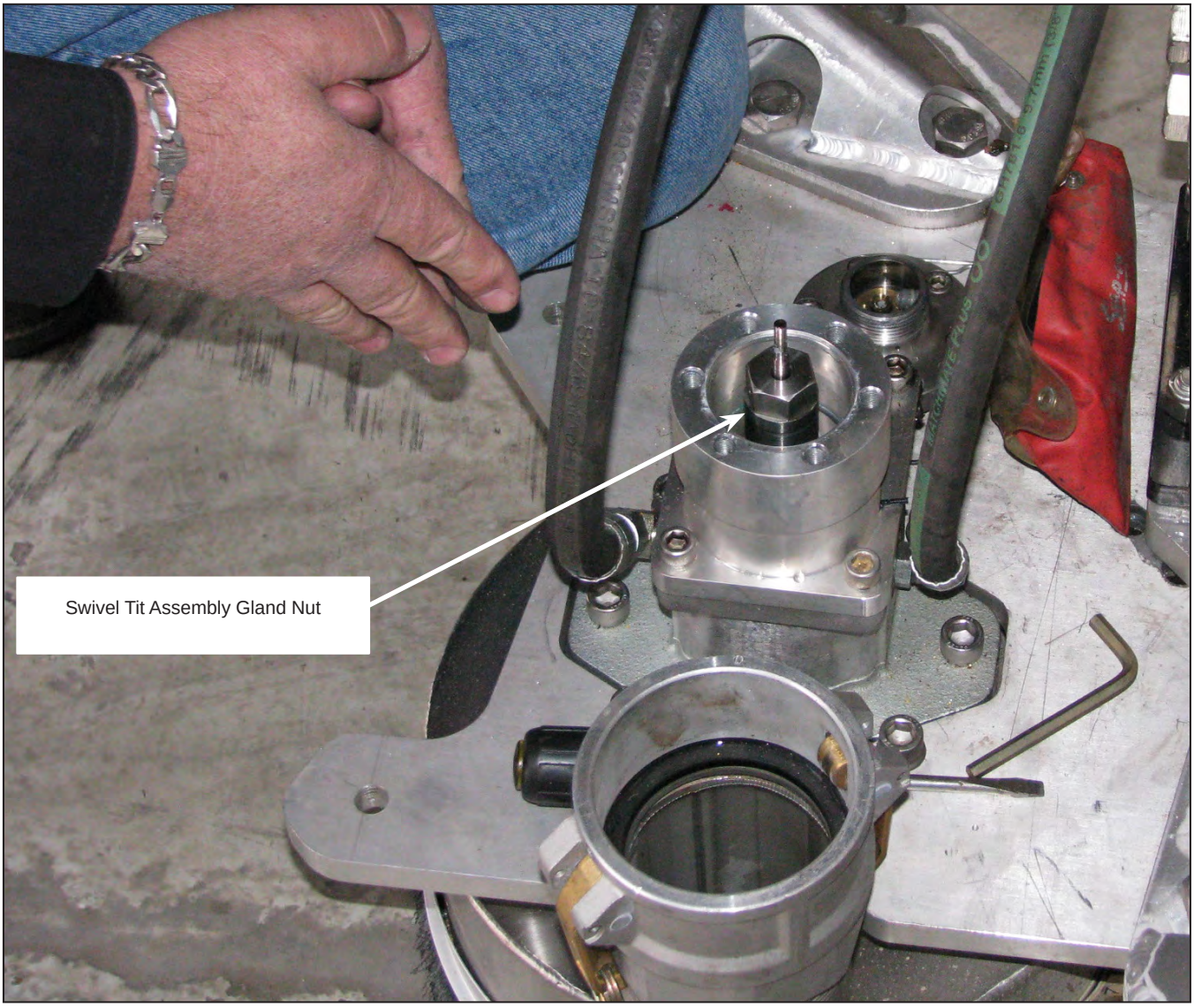


Figure 7: Swivel Tit assembly/gland nut to be removed by turning counterclockwise with a 15/16" deep well socket or box end wrench.

Step 4
Remove Swivel Tit Assembly/Gland Nut
While holding the thru-shaft with the 3/4" (19mm) open end wrench through the slot in the motor base, use a 15/16 (24mm) deep well socket or box end wrench to remove the swivel tit assembly/ gland nut by turning it counterclockwise. Inspect the swivel tit assembly and set it in a safe, clean location. Figure 7 and 8.

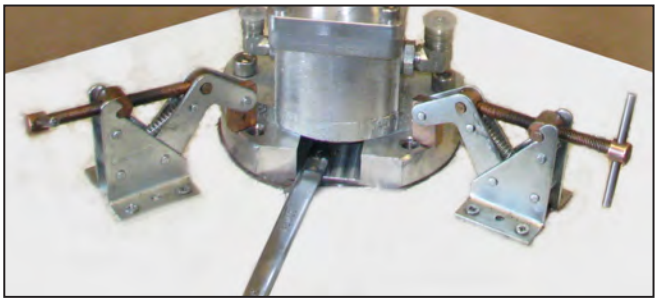


Figure 8: 3/4" (19 mm) open end wrench holding thru-shaft and preventing it from turning while removing swivel tit assembly/gland nut.

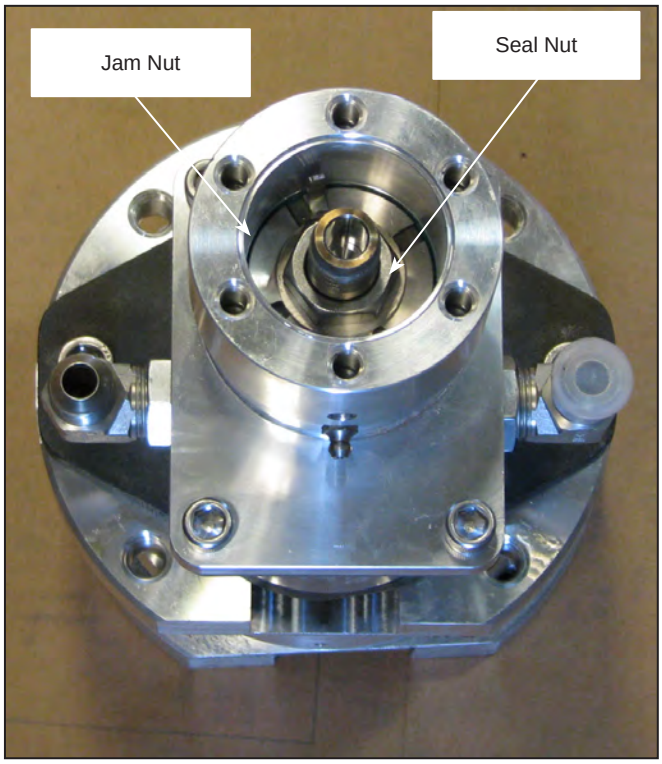


Figure 9: Jam nut and seal nut. Make sure to loosen Jam nut 4 full turns first.

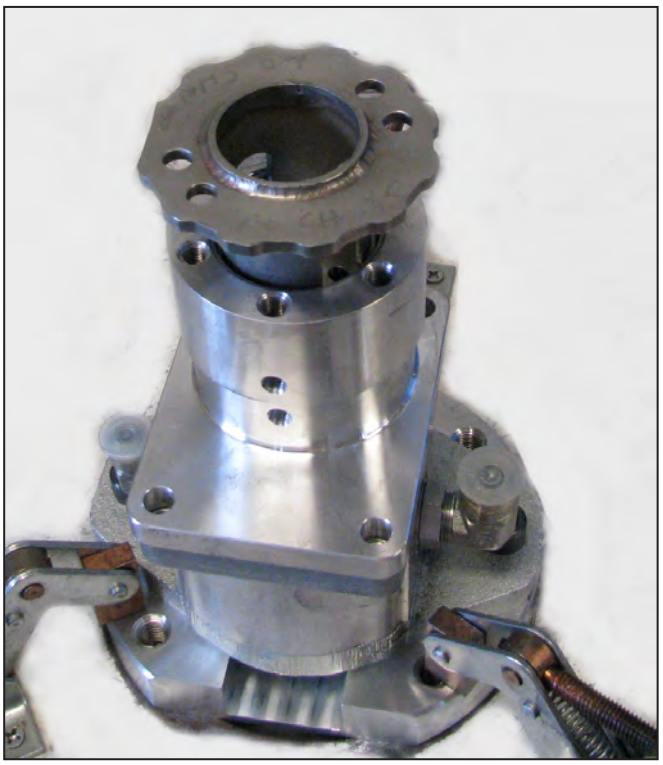


Figure 10: Use spanner (weldment tool) to turn seal nut.

Step 5

Loosen Jam Nut and Set the Bearing Preload

While holding the thru-shaft with the 3/4" (19mm) open end wrench through the slot in the motor base, use a 1 1/8" (28mm) deep well socket to loosen the jam nut by turning it counterclockwise. Loosen the jam nut 4 full turns and stop. Figure 8 and 9.

While holding the thru-shaft with 3/4" (19mm) open end wrench, use the spanner socket (weldment) tool to Loosen the seal nut 2 full turns. Then put a rag on the spanner socket for padding and tighten the seal nut as tight as you can by hand to set the bearing. Figure 8 and 10.

Once the bearing is set, loosen the seal nut 2 full turns.

Hold the thru-shaft firmly with the 3/4" (19mm) open end wrench and use the spanner socket to hand tighten the seal nut until it is "snug." ***Do not over-tighten!!*** Figure 8 and 10.

Then hold the thru-shaft firmly with 3/4" open end wrench so it doesn't move at all and set the bearing preload by carefully loosening the spanner socket and seal nut one bolt hole. Then thread 2 - 3/8" thrust housing cap bolts through the holes in the spanner socket and into the threaded holes in the thrust housing to hold the spanner socket in that position. Figure 11.

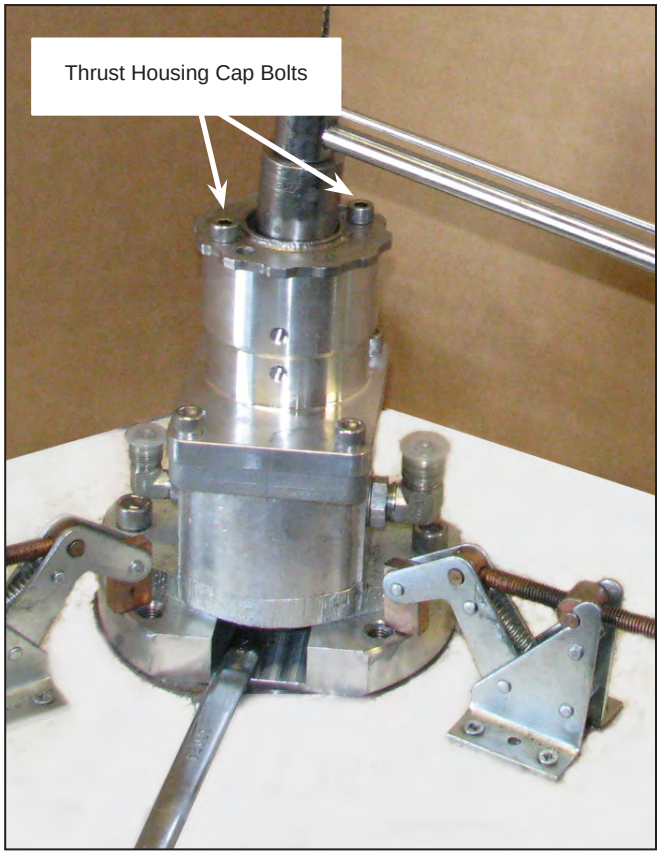


Figure 11: Spanner tool secured with thrust housing cap bolts.

WARNING

WHEN LOOSENING THE SPANNER SOCKET AND SEAL NUT ONE BOLT HOLE TO SET THE BEARING PRELOAD OR WHEN TIGHTENING THE JAM NUT, IT IS CRITICAL THAT THE THRU-SHAFT IS HELD FIRMLY WITH THE 3/4" (19MM) OPEN END WRENCH SO THAT IT DOES NOT MOVE AT ALL. IF THE WRENCH AND THRU-SHAFT MOVE DURING THIS PROCEDURE, THE BEARING PRELOAD WILL BE INCORRECT AND THE THRU-SHAFT MOTOR WILL NOT OPERATE PROPERLY.

IF THE THRU-SHAFT MOVES DURING WHILE SETTING THE BEARING PRELOAD, YOU MUST REPEAT STEP 5 TO ENSURE PROPER BEARING PRELOAD.

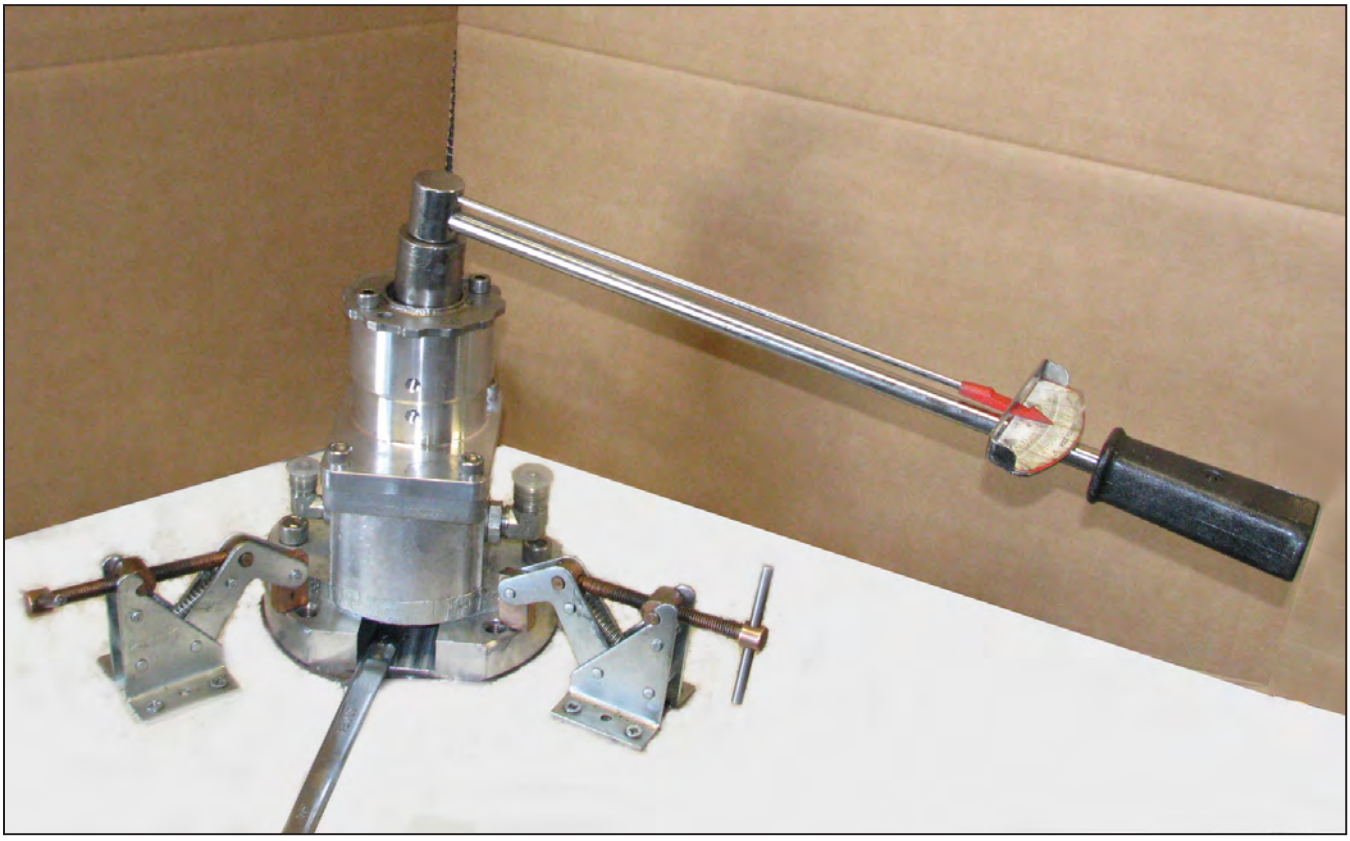


Figure 12: Thrust housing cap bolts securing the spanner tool are snug and a torque wrench and 1 1/8" deep well socket is used to tighten the jam nut to 50 Ft lbs.

Step 6
Set the Jam Nut Torque and Remove Spanner socket (Weldment Tool)

Tighten the bolts holding the spanner socket to "snug."

While holding the thru-shaft with the 3/4" (19mm) open end wrench through the slot in the motor base and the spanner socket held with the thrust housing cap bolts, use a 1 1/8" (28mm) deep well socket and a torque wrench to tighten the jam nut to 50 ft lbs. Figure 12. ***Make sure the thru-shaft and 3/4" (19mm) open end wrench do not move at all during this procedure!!***

Remove the thrust housing cap bolts from the spanner socket and remove it from the housing. Now it is safe to move the thru-shaft.

Figure 13: O-ring seal seat at the top of the thru-shaft greased and the threads below the seal coated with anti-seize.

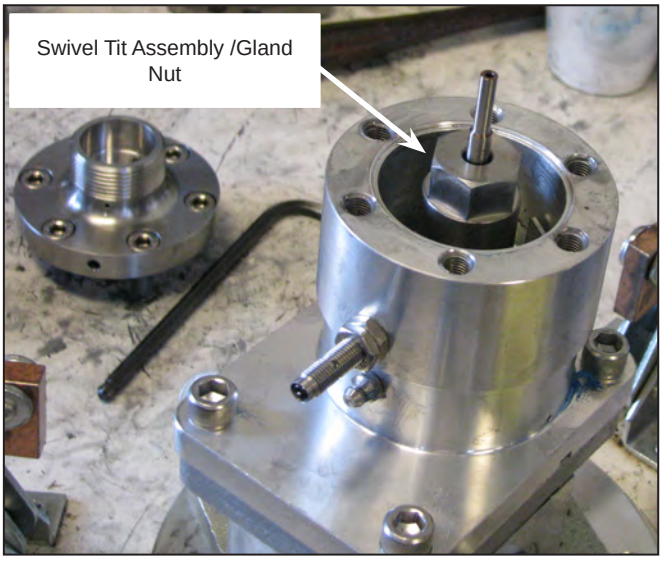


Figure 14: Swivel tit assembly/gland nut installed on the thru-shaft and torqued to 50 Ft lbs.

Step 7

Install the Swivel Tit Assembly/Gland Nut.

Inspect the O-ring seal near the top of the thru-shaft and make sure it is not damaged. Replace the O-ring if it shows any sign of nicks, cuts, deterioration or wear. Then apply a light layer of grease to the O-Ring. The grease will help the swivel tit assembly slide over the O-ring and reduce the possibility for the O-ring to be pushed out of the seat or damaged as the swivel tit assembly is installed. Figure 13.

Apply anti-seize to the thru-shaft threads. The anti-seize is extremely important and will prevent the stainless steel threads on the shaft and swivel tit assembly from galling and seizing. ***If anti-seize is not used and the threads seize, the thru-shaft and the swivel tit assembly will be ruined and the thru-shaft motor will have to be completely disassembled and rebuilt!!***

While holding the thru-shaft with the 3/4" (19mm) open end wrench, install the swivel tit assembly/gland nut and hand tighten. Then use a 15/16" (24mm) deep well socket and a torque wrench to tighten swivel tit assembly/gland nut to 50 ft lbs. Figure 14.

Step 8

Install the Thrust Housing Cap.

Inspect the O-ring seal in the thrust housing cap. Replace the O-ring if it shows any sign of nicks, cuts, deterioration or wear. Then apply light layer of grease to the O-Ring. The grease will help the cap assembly slide into the torque housing and reduce the possibility for the O-ring to be pushed out of the seat or damaged as the assembly is installed. Figure 15.

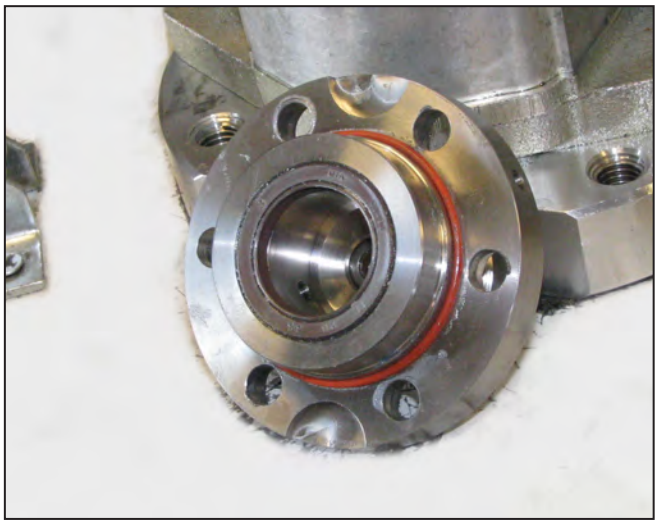


Figure 15: Inspect and grease the O-ring seal on the thrust housing cap.

Step 8 (cont)
Set the thrust housing cap on top of the thrust housing and carefully press it into the housing. Align the bolt holes in the cap to the threaded holes in the thrust housing. Apply Anti-seize to the 3/8" Allen bolts and hand tighten using a crisscross pattern. Use the 6mm Allen wrench to tighten the thrust housing cap bolts to "snug" using a crisscross pattern. Figure 16.

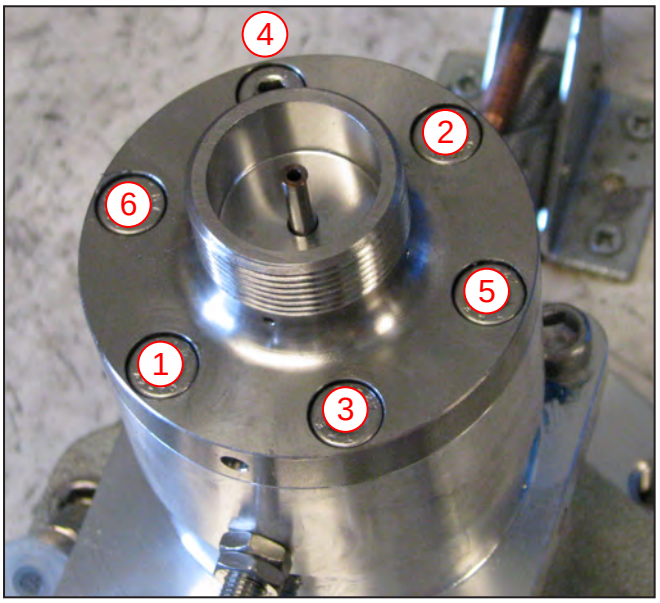


Figure 16: Apply anti-seize to the thrust housing bolts and tighten them in a crisscross pattern to snug using a 6 mm Allen wrench.

Figure 17: Apply anti-seize to the thrust housing threads and install the high pressure water line.

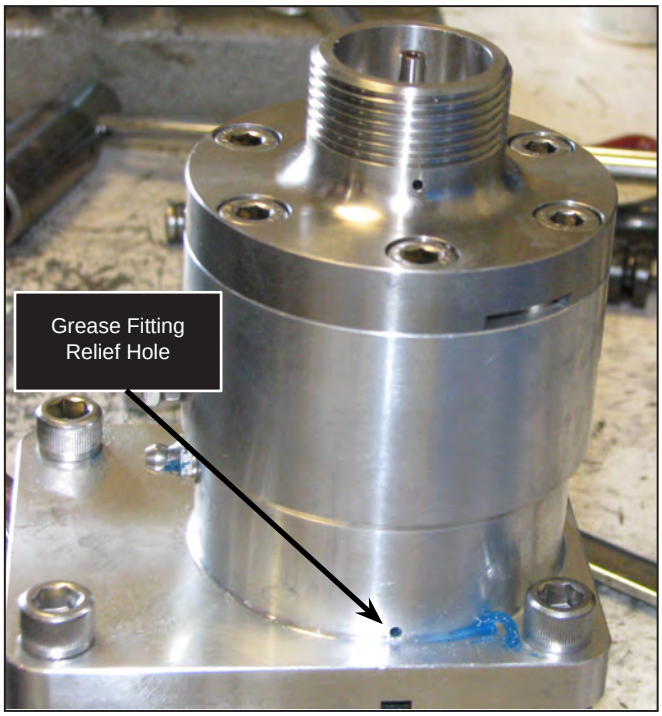


Figure 18: Thru-shaft bearing grease fitting and grease relief holes in thrust housing base.

Step 9
Install the High Pressure Water Hose and Grease the Thru-Shaft Bearings.
Apply anti-seize to the threads on the top of the thrust housing cap and install the high pressure water hose. Hand tighten the hand nut on the pressure hose.

Use a grease gun and apply grease to the thru-shaft bearing until grease comes out of the relief hole on the side of the thrust housing.

Step 10

Run the Thru-Shaft Motor Without Water Pressure, Then Under Full Water Pressure.

Remove all tools and materials from the hog head and raise it to the full up position.

Activate the hydraulic system and run the thru-shaft motor at maximum rpm for 15 minutes. ***Make sure not to apply water pressure during this step.***

Running motor without water pressure will fully test the thru-shaft motor operation and allow the bearings and seals to work themselves in. If the spray bar does not turn initially, use a 2' piece of wood or a broom handle to rotate the spray head counterclockwise to get it started. Figure 19.

If the thru-shaft motor is assembled properly, it will start on its own each time it is activated from this point forward. If it continues to stall on start up, contact Hog Technologies Customer Service for assistance.

Once the initial run up is complete and with the spray head still turning at maximum rpm, make sure all personnel are well clear of the spray head and apply full water pressure. Run the thru-shaft motor for another 15 minutes. Figure 20.

When testing is complete and with the unit still running at maximum pressure, check the weep holes in the thrust housing cap just below the high pressure hose connection for water leakage. If water is dripping from the holes, the swivel seal in the hose fitting will need to be changed. If no water is dripping from the weep holes and the spray bar is still rotating at maximum rpm, your unit is ready to be put back into service. Figure 21.

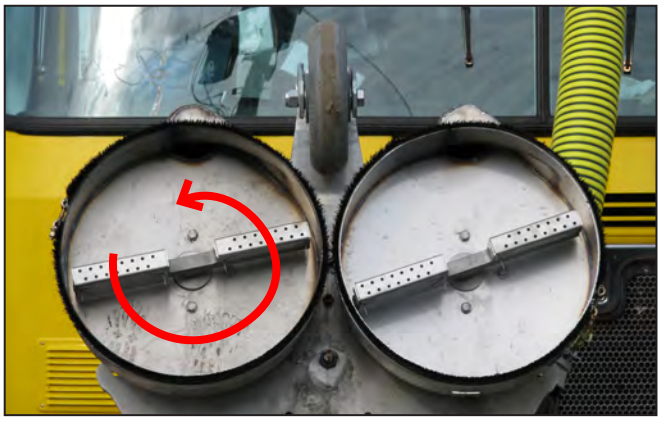


Figure 19: Counterclockwise spray head rotation. Operate 1st 15 minutes at maximum rpm with no water pressure.

Figure 20: Operate another 15 minutes at maximum rpm and full water pressure.

WARNING

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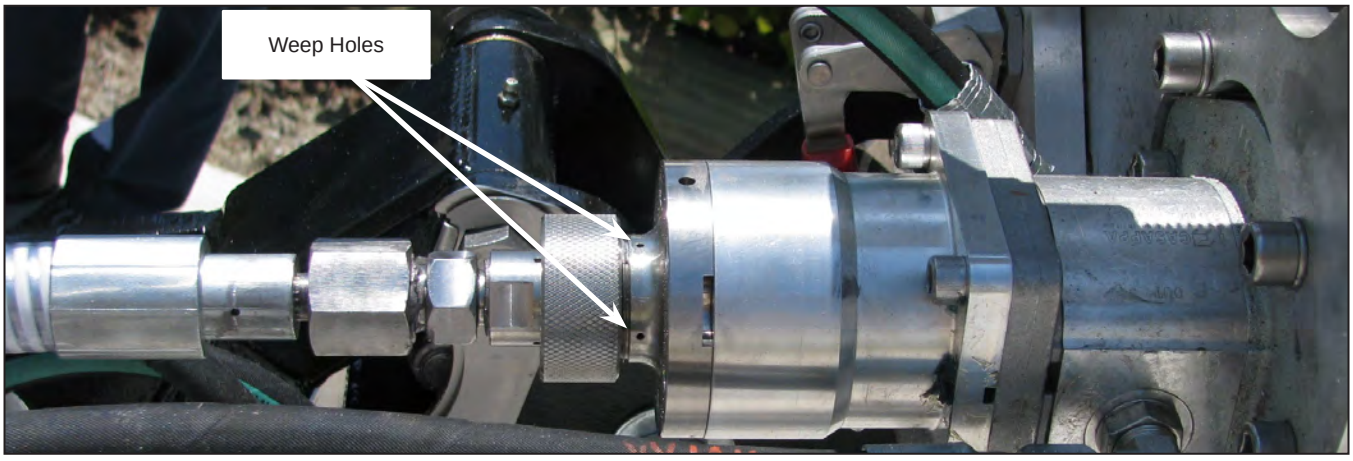
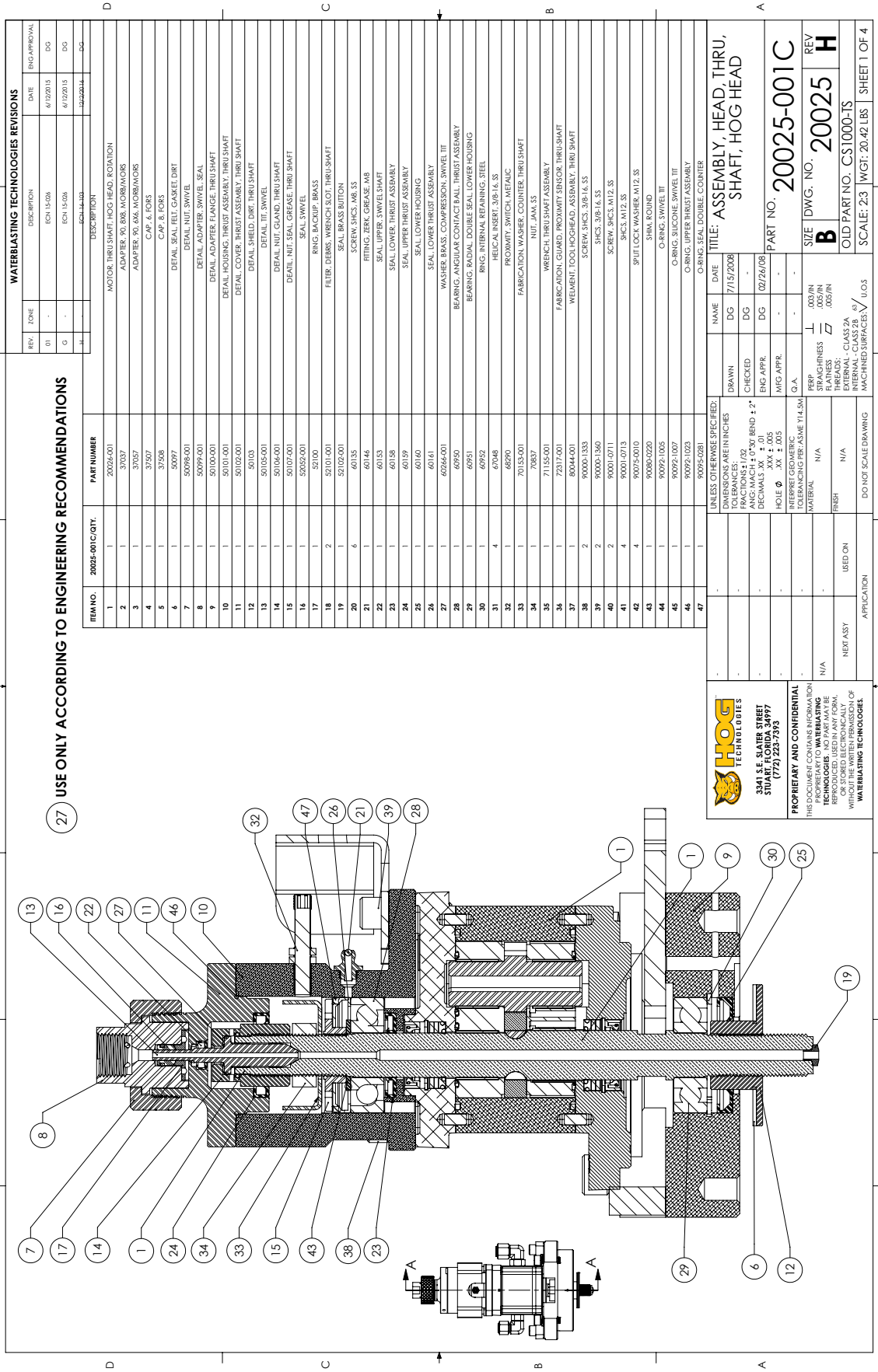


Figure 21: Check for water dripping from weep holes just below the high pressure water hose connection.


USE ONLY ACCORDING TO ENGINEERING RECOMMENDATIONS
WATERBLASTING TECHNOLOGIES REVISIONS
REV. ZONE DESCRIPTION DATE ENG APPROVAL
01 - ECN 15-026 6/12/2015 DG
G - ECN 15-026 6/12/2015 DG
H - ECN 14-103 12/22/2014 DG
ITEM NO. 20025-001C/QTY. PART NUMBER DESCRIPTION
1 1 20026-001 MOTOR, THRU SHAFT, HOG HEAD, ROTATION
2 1 37037 ADAPTER, 90, 8X8, MORB/MORS
3 1 37057 ADAPTER, 90, 6X6, MORB/MORS
4 1 37507 CAP, 6, FORS
5 1 37508 CAP, 8, FORS
6 1 50097 DETAIL, SEAL, FELT, GASKET, DIRT
7 1 50098-001 DETAIL, NUT, SWIVEL
8 1 50099-001 DETAIL, ADAPTER, SWIVEL, SEAL
9 1 50100-001 DETAIL, ADAPTER, FLANGE, THRU SHAFT
10 1 50101-001 DETAIL, HOUSING, THRUST ASSEMBLY, THRU SHAFT
11 1 50102-001 DETAIL, COVER, THRUST ASSEMBLY, THRU SHAFT
12 1 50103 DETAIL, SHIELD, DIRT, THRU SHAFT
13 1 50105-001 DETAIL, TIT, SWIVEL
14 1 50106-001 DETAIL, NUT, GLAND, THRU SHAFT
15 1 50107-001 DEATIL, NUT, SEAL, GREASE, THRU SHAFT
16 1 52052-001 SEAL, SWIVEL
17 1 52100 RING, BACKUP, BRASS
18 2 52101-001 FILTER, DEBRIS, WRENCH SLOT, THRU-SHAFT
19 1 52102-001 SEAL, BRASS BUTTON
20 6 60135 SCREW, SHCS, M8, SS
21 1 60146 FITTING, ZERK, GREASE, M8
22 1 60153 SEAL, UPPER, SWIVEL SHAFT
23 1 60158 SEAL, LOWER, THRUST ASSEMBLY
24 1 60159 SEAL, UPPER THRUST, ASSEMBLY
25 1 60160 SEAL, LOWER HOUSING
26 1 60161 SEAL, LOWER THRUST ASSEMBLY
27 1 60266-001 WASHER, BRASS, COMPRESSION, SWIVEL TIT
28 1 60950 BEARING, ANGULAR CONTACT BALL, THRUST ASSEMBLY
29 1 60951 BEARING, RADIAL, DOUBLE SEAL, LOWER HOUSING
30 1 60952 RING, INTERNAL RETAINING, STEEL
31 4 67048 HELICAL INSERT, 3/8-16, SS
32 1 68290 PROXIMITY, SWITCH, METALIC
33 1 70153-001 FABRICATION, WASHER, COUNTER, THRU SHAFT
34 1 70837 NUT, JAM, SS
35 1 71155-001 WRENCH, THRU SHAFT ASSEMBLY
36 1 72317-001 FABRICATION, GUARD, PROXIMITY SENSOR, THRU-SHAFT
37 1 80044-001 WELMENT, TOOL HOGHEAD, ASSEMBLY, THRU SHAFT
38 2 90000-1333 SCREW, SHCS, 3/8-16, SS
39 2 90000-1360 SHCS, 3/8-16, SS
40 2 90001-0711 SCREW, SHCS, M12, SS
41 4 90001-0713 SHCS, M12, SS
42 4 90075-0010 SPLIT LOCK WASHER, M12, SS
43 1 90080-0220 SHIM, ROUND
44 1 90092-1005 O-RING, SWIVEL TIT
45 1 90092-1007 O-RING, SILICONE, SWIVEL TIT
46 1 90092-1023 O-RING, UPPER THRUST ASSEMBLY
47 1 90093-0281 O-RING, SEAL, DOUBLE, COUNTER
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/32
ANGULAR: MACH ± 1° BEND ± 2°
DECIMALS: .XX ± .01
.XXX ± .005
HOLE Ø .XX ± .005
INTERPRET GEOMETRIC
TOLERANCING PER: ASME Y14.5M
MATERIAL N/A
FINISH N/A
DO NOT SCALE DRAWING
DRAWN DG 7/15/2008
CHECKED DG -
ENG APPR. DG 02/26/08
MFG APPR. - -
Q.A. - -
PERP .003/IN
STRAIGHTNESS .005/IN
FLATNESS .005/IN
THREADS:
EXTERNAL - CLASS 2A
INTERNAL - CLASS 2B
MACHINED SURFACES: 63 U.O.S.
TITLE: ASSEMBLY, HEAD, THRU, SHAFT, HOG HEAD
PART NO. 20025-001C
SIZE B DWG. NO. 20025 REV H
OLD PART NO. CS1000-TS
SCALE: 2:3 WGT: 20.42 LBS SHEET 1 OF 4
HOG TECHNOLOGIES
3341 S.E. SLATER STREET
STUART, FLORIDA 34997
(772) 223-7393
PROPRIETARY AND CONFIDENTIAL
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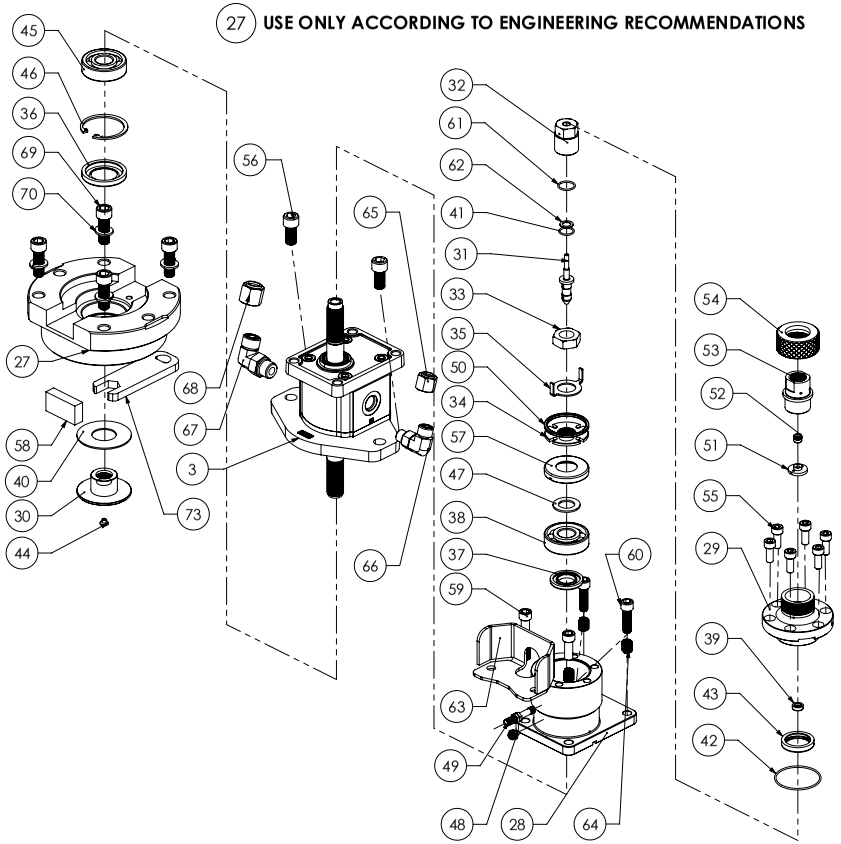
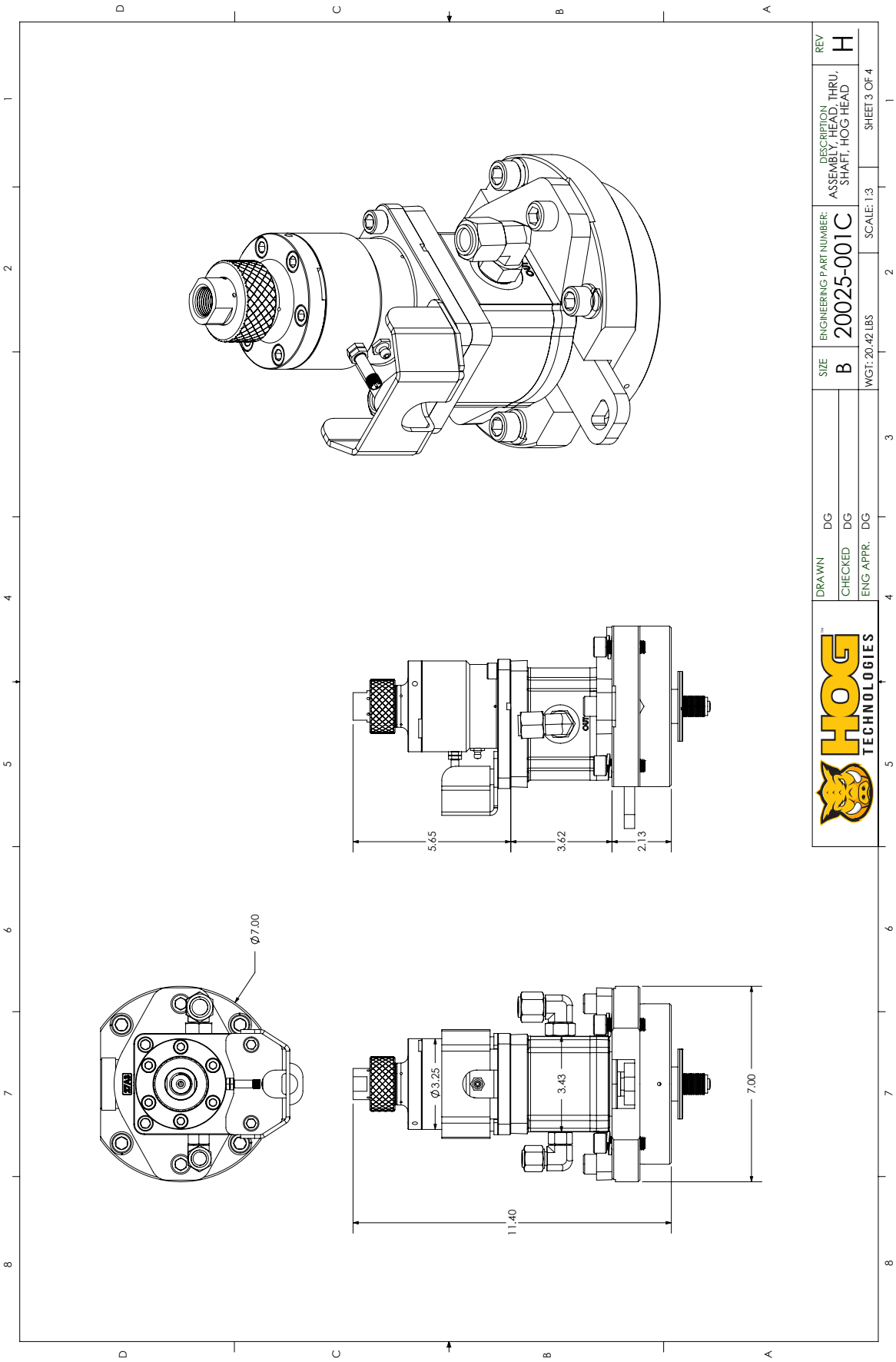
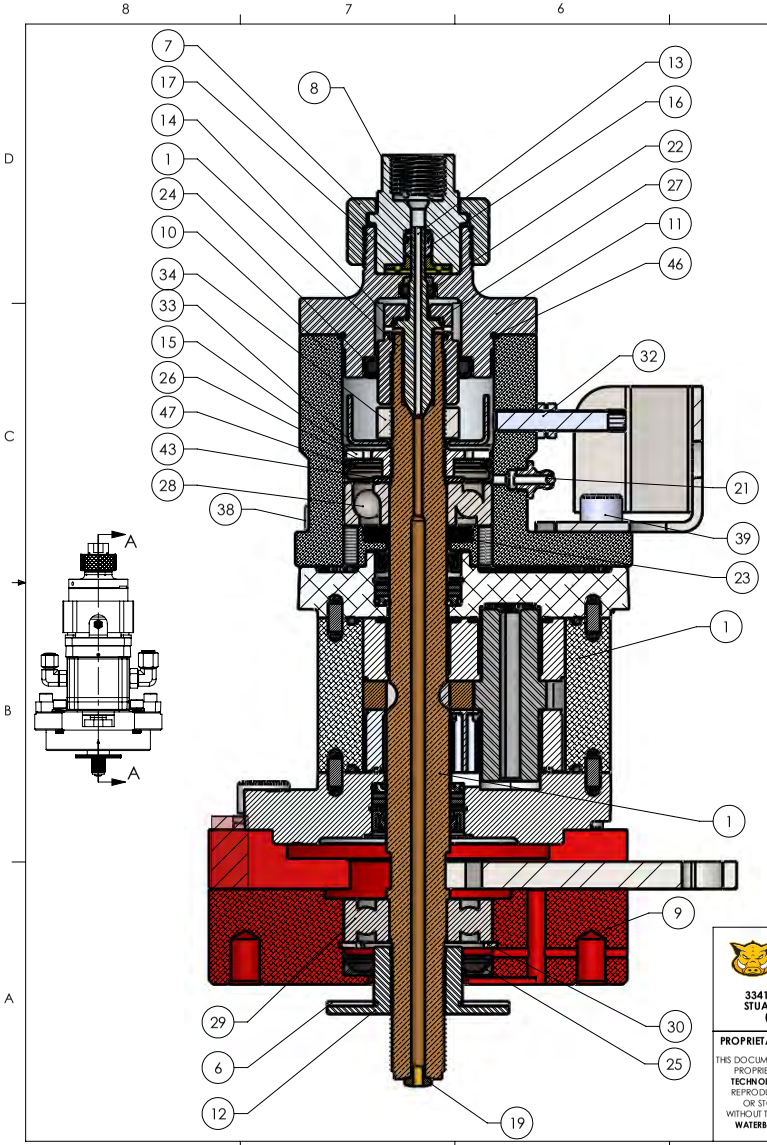
NEXT ASSY USED ON
APPLICATION



ITEM NO.	20025-001C/QTY.	PART NUMBER	DESCRIPTION
1	1	20026-001	MOTOR, THRU SHAFT, HOG HEAD, ROTATION, CASAPPA
2	1	37037	ADAPT, 90, 8X8, MORB/MORS
3	1	37057	ADAPT, 90, 6X6, MORB/MORS
4	1	37507	CAP, 6, FORS
5	1	37508	CAP, 8, FORS
6	1	50097	SEAL, FELT, GASKET, DIRT .063 THICKNESS
7	1	50098-001	DETAIL, NUT, SWIVEL
8	1	50099-001	DETAIL, ADAPTER, SWIVEL, SEAL
9	1	50100-001	DETAIL, ADAPTER, FLANGE, THRU SHAFT, HOG HEAD
10	1	50101-001	DETAIL, HOUSING, THRUST ASSEMBLY, THRU SHAFT, HOG HEAD
11	1	50102-001	DETAIL, COVER, THRUST ASSEMBLY, THRU SHAFT, HOG HEAD
12	1	50103	DETAIL, SHIELD, DIRT, THRU SHAFT, HOG HEAD
13	1	50105-001	DETAIL, TIT, SWIVEL, HOG HEAD 0.0860 BORE
14	1	50106-001	DETAIL, NUT, GLAND, THRU SHAFT, HOG HEAD
15	1	50107-001	DETAIL, NUT, SEAL, GREASE, THRU SHAFT, HOG HEAD
16	1	52052-001	SEAL, SWIVEL
17	1	52100	RING, BACKUP, BRASS
18	2	52101-001	FILTER, DEBRIS, WRECH SLOT, THRU-SHAFT
19	1	52102-001	SEAL, BRASS BUTTON
20	6	60135	SCREW, SHCS, M8 x 1.0 x 20mm, 316 SS
21	1	60146	FITTING, ZERK, GREASE, M8 X 1 MALE, 14.9MM METRIC SS
22	1	60153	SEAL, UPPER, SWIVEL SHAFT
23	1	60158	SEAL 20 X 38 X 5MM
24	1	60159	SEAL 28 X 38 X 7MM
25	1	60160	SEAL 31 X 52 X 7MM
26	1	60161	SEAL 25 X 52 X 8MM
27	1	60266-001	WASHER, BRASS, COMPRESSION, SWIVEL TIT .375in ID x .625in OD. x .025in Thick Rockwell B77
28	1	60950	BEARING, ANGULAR CONTACT BALL, 20x52x15 MED 7300WN SERIES
29	1	60951	BEARING, RADIAL, 20 X 52 X 15, TWO SEALS
30	1	60952	RING, INTERNAL RETAINING, STEEL, 52MM
31	4	67048	HELICAL INSERT, 3/8-16 X 9/16 LONG, 18-8 STAINLESS
32	1	68290	PROXIMITY, SWITCH, METALIC - OBJECT W/ MALE PLUG 3 WIRE, 8MM DIA. SS, 1.5MM Range
33	1	70153-001	FABRICATION, WASHER, COUNTER, THRU SHAFT, HOG HEAD
34	1	70837	NUT, JAM, 3/4-16 SS
35	1	71155-001	WRENCH, 3/4 SIZE, THRU SHAFT ASSEMBLY
36	1	72317-001	FABRICATION, GUARD, PROXIMITY SENSOR, THRU-SHAFT
37	1	80044-001	WELMENT, TOOL HOGHEAD, ASSEMBLY, THRU SHAFT
38	2	90000-1333	SCREW, SHCS, 3/8"-16 X 1", SS
39	2	90000-1360	SHCS, 3/8-16 X 1-1/4, SS
40	2	90001-0711	SCREW, SHCS, M12-1.75 X 25MM, SS
41	4	90001-0713	SHCS, M12-1.75 X 35MM, 18-8 SS
42	4	90075-0010	SPLIT LOCK WASHER, M12, 18-8 SS
43	1	90080-0220	SHIM, ROUND, 3/4 X 1-1/4 X .075
44	1	90092-1005	O-Ring AS568A Dash Number 015 (Viton) 9/16" x 11/16" x 1/16 Width
45	1	90092-1007	O-RING, SILICONE, 11/16" ID X 13/16" OD X 1/16"Ø, AS568A DASH NUMBER 017
46	1	90092-1023	O-RING, 2 X 2-1/8 X 1/16 WIDTH, SILICONE (AS568A)
47	1	90095-0281	O-RING, SEAL, DOUBLE, 1-3/4 X 2 X 1/8 WIDTH VITON (AS568A)

DRAWN	DG	SIZE	ENGINEERING PART NUMBER:	DESCRIPTION	REV
CHECKED	DG	B	20025-001C	ASSEMBLY, HEAD, THRU, SHAFT, HOG HEAD	H
ENG APPR.	DG	WGT: 20.42 LBS	SCALE: 1:5	SHEET 2 OF 4	


5.65
3.62
2.13
Ø7.00
Ø3.25
3.43
7.00
11.40
DRAWN DG
CHECKED DG
ENG APPR. DG
SIZE B
ENGINEERING PART NUMBER: 20025-001C
WGT: 20.42 LBS
SCALE: 1:3
DESCRIPTION ASSEMBLY, HEAD, THRU, SHAFT, HOG HEAD
REV H
SHEET 3 OF 4



27 **USE ONLY ACCORDING TO ENGINEERING RECOMMENDATIONS**

ITEM NO.	20025-001C/QTY.	PART NUMBER	DESCRIPTION
1	1	20026-001	MOTOR, THRU SHAFT, HOG HEAD, ROTATION, CASAPPA
2	1	37037	ADAPT, 90, 8X8, MORB/MORS
3	1	37057	ADAPT, 90, 6X6, MORB/MORS
4	1	37507	CAP, 6, FORS
5	1	37508	CAP, 8, FORS
6	1	50097	SEAL, FELT, GASKET, DIRT .063 THICKNESS
7	1	50098-001	DETAIL, NUT, SWIVEL
8	1	50099-001	DETAIL, ADAPTER, SWIVEL, SEAL
9	1	50100-001	DETAIL, ADAPTER, FLANGE, THRU SHAFT, HOG HEAD
10	1	50101-001	DETAIL, HOUSING, THRUST ASSEMBLY, THRU SHAFT, HOG HEAD
11	1	50102-001	DETAIL, COVER, THRUST ASSEMBLY, THRU SHAFT, HOG HEAD
12	1	50103	DETAIL, SHIELD, DIRT, THRU SHAFT, HOG HEAD
13	1	50105-001	DETAIL, TIT, SWIVEL, HOG HEAD 0.0860 BORE
14	1	50106-001	DETAIL, NUT, GLAND, THRU SHAFT, HOG HEAD
15	1	50107-001	DETAIL, NUT, SEAL, GREASE, THRU SHAFT, HOG HEAD
16	1	52052-001	SEAL, SWIVEL
17	1	52100	RING, BACKUP, BRASS
18	2	52101-001	FILTER, DEBRIS, WRECH SLOT, THRU-SHAFT
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33	1	70153-001	FABRICATION, WASHER, COUNTER, THRU SHAFT, HOG HEAD
34	1	70837	NUT, JAM, 3/4-16 SS
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42	4	90075-0010	SPLIT LOCK WASHER, M12, 18-8 SS
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46	1	90092-1023	O-RING, 2 X 2-1/8 X 1/16 WIDTH, SILICONE (AS568A)
47	1	90095-0281	O-RING, SEAL, DOUBLE, 1-3/4 X 2 X 1/8 WIDTH VITON (AS568A)

HOG TECHNOLOGIES
3341 S.E. SLATER STREET
STUART, FLORIDA 34997
(772) 223-7393

-	-
-	-
-	-
-	-
-	-
N/A	-
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ±1/32
ANG: MACH ± 0°30' BEND ± 2°
DECIMALS .XX ± .01
.XXX ± .005
HOLE Ø .XX ± .005
INTERPRET GEOMETRIC TOLERANCING PER: ASME Y14.5M
MATERIAL N/A
FINISH N/A
DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	DG	7/15/2008
CHECKED	DG	-
ENG APPR.	DG	02/26/08
MFG APPR.	-	-
Q.A.	-	-

PERP ⊥ .003/IN
STRAIGHTNESS — .005/IN
FLATNESS ▱ .005/IN
THREADS:
EXTERNAL - CLASS 2A
INTERNAL - CLASS 2B
MACHINED SURFACES: 63 √ U.O.S

TITLE: ASSEMBLY, HEAD, THRU, SHAFT, HOG HEAD

PART NO. 20025-001C

SIZE	DWG. NO.	REV
B	20025	H

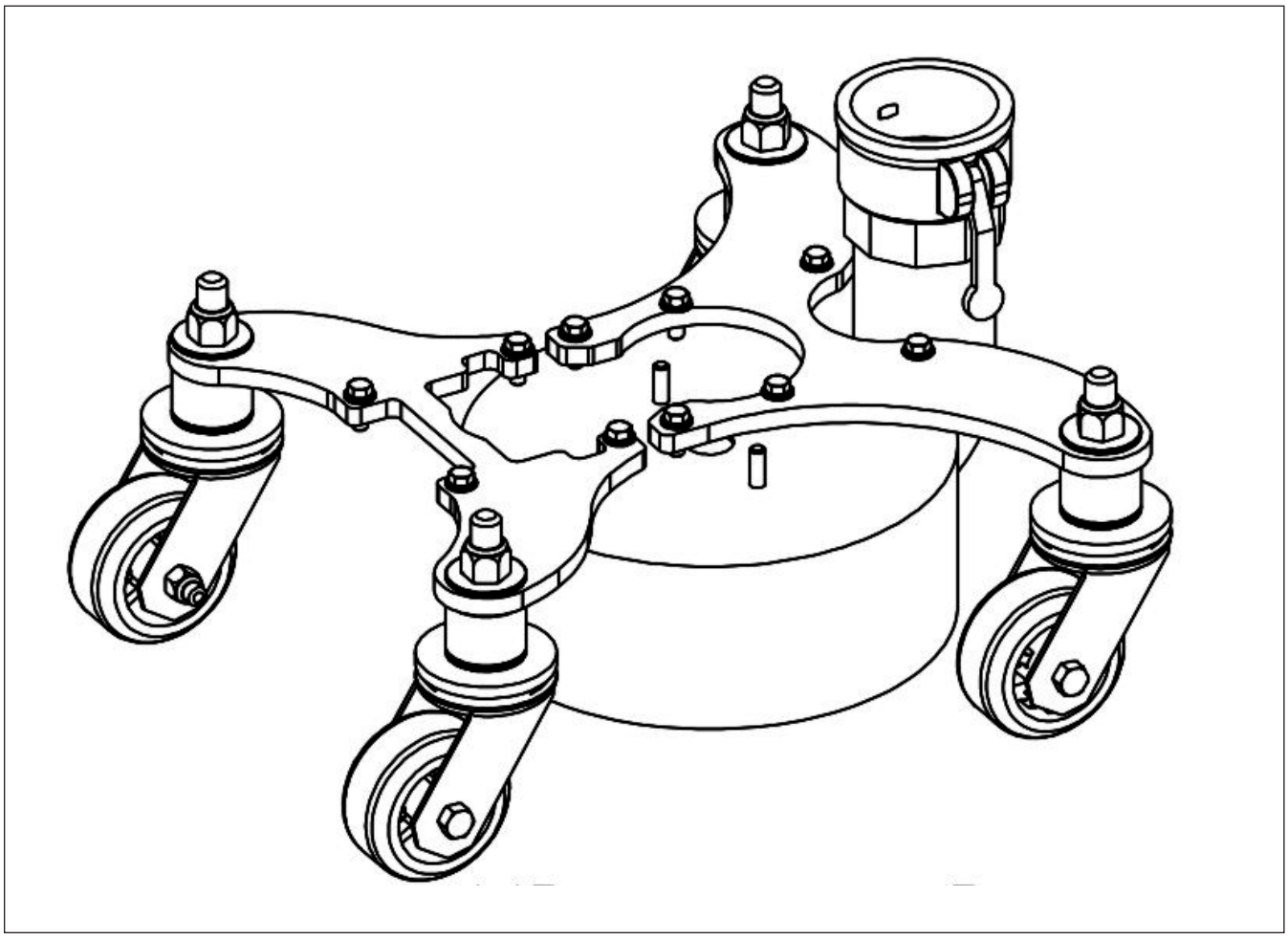
OLD PART NO. CS1000-TS

SCALE: 2:3 | WGT: 20.42 LBS | SHEET 4 OF 4

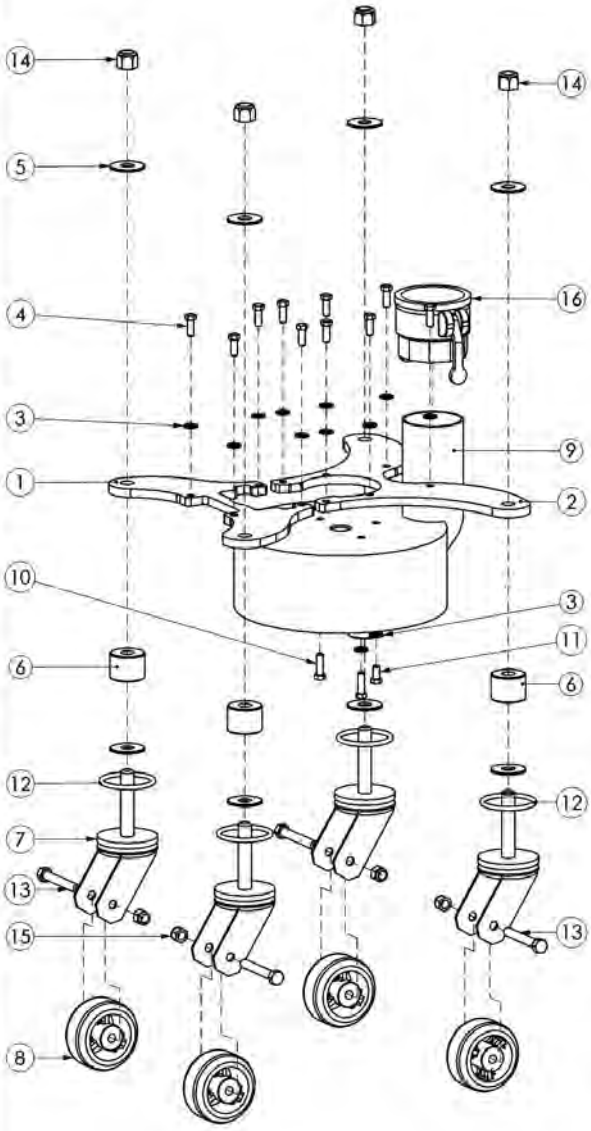
5.22 Caster Wheel Care – Hog Head Assembly

(MP4010 Caster Plate Assy. Diagram)

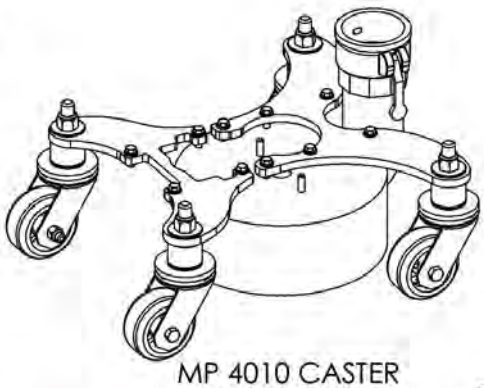
1. Grease wheels and caster bearings daily.
2. If necessary, remove bearing seal to clean bearings in casters. Use degreaser or brake cleaner to remove dirt and paint debris.
3. Replace worn wheels as wear will affect blasting and mobility of Hog Head.



Typical SH7500 Hog Head Assembly Caster Wheels



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	MP4000-09	PLATE, CASTER, REAR	1
2	MP4000-11	CASTER PLATE, FRONT	1
3	87925186	WASHER, SPLIT LOCK, 3/8 SS	12
4	1170105	BOLT	10
5	67490680	WASHER, CASTER FLAT 3/4 STEEL, ZINC PLATED	8
6	MP4000-13	SPACER, CASTER	4
7	HD4000-12C	CASTER, STAINLESS 4"	4
8	HD4000-12-WHRB	WHEEL, RUBBER W-STEEL INNER	4
9	SM9001-10	SHROUD 8" 10"	1
10	HD4020-17	BOLT, PLATE CONNECTOR 3/8 x 1 1/2	2
11	HD4000-08	BOLT, HYD MOTOR TO HSNG BLOCK	1
12	HD4000-12-RS	SEAL, RACEWAY CASTER	4
13	HD4000-12AN	AXEL CASTER	4
14	HD4000-16	NUT, CASTER	4
15	67337568	NUT, NYLOCK 1/2-13 SS	4
16	SV30D	CAMLOCK 3 FEMALE x FEMALE THREADS	1



MP 4010 CASTER
PLATE ASSY

REV 3
7-20-06

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HOG TECHNOLOGIES
3341 SE SLATER ST STUART, FL 34997
(772) 223-7393

DO NOT SCALE DRAWINGS

WATERBLASTING TECHNOLOGIES

	NAME	SIGNATURE	DATE
DRAWN	DG		7/20/06
CHECKED			
ENG APPR.			
MFG APPR.			

MATERIAL: —

DESCRIPTION: CASTER PLATE ASSY

TOLERANCES UNLESS NOTED

.X	.XX	.XXX	ANGLES
± .025	± .010	± .005	± .5

PART NUMBER: MP4010

SIZE: 11"x17"

REV:

DWG. NO. 1

DATE: Thursday, July 20, 2006 2:04:56 PM

SHEET 1 OF 1

5.23 SH7500 Maintenance Matrix

EQUIPMENT	COMPONENT	INTERVALS	LUBRICATION SPECIFICATIONS
Truck Engine	Oil and Filter	Refer to Truck Operating Manual	Refer to Truck Operating Manual
Driveline	Transmission, Drive shafts, Differential	Refer to Truck Operating Manual	Refer to Truck Operating Manual
OMSI	OMSI Filter	Every Oil Change	OMSI Filter
OMSI	Main Gearbox	After 1st 50 Hours Then Every 500 Hours or 12 months	75w90 Gear Oil
Muncie PTO	Jack Shaft	Weekly	Mobil PolyRex EM Grease
Output Shaft	Shaft Between OMSI and Drive Pulleys	Weekly	Mobil PolyRex EM Grease
Pillow Block Bearings	Timken Pillow Block Bearings	Every 800 hours or 12 months	Polyurea NLGI no. 2 Grease
Hydraulic System	Hydraulic Fluid Reservoir	500 hours or yearly	Aw68
Hydraulic System	High Pressure Hydraulic Filter	After First 100 hours then every 500 hours	Hydrauluc Filter
Hydraulic System	Low Pressure Hydraulic Filter	After First 100 hours then every 500 hours	Hydrauluc Filter
Roots Vacuum Blower	Blower Gear Case oil	After First 50 hours and then every 1,000 hours or yearly	ISO VG 320 Roots Oil High Temp - Synthetic
Dresser Roots Blower	Pulley End Bearings (Grease Fittings)	Daily (2 pumps Each Fitting)	Shell GADUS S2 U1000 2 Grease
Howden Roots Vacuum Blower	Pulley End Bearings (Grease Fittings)	Daily (2 pumps Each Fitting)	**Blowers with serial # beginning before 1608A** Shell GADUS S2 U1000 2 Grease **Blowers with serial # beginning with 1608A and later** Royal Purple Synthetic Grease
Tuthill Blower	Pulley End Bearings (Grease Fittings)	Daily (2 pumps Each Fitting)	Tuthill Lithium Complex Grease
Roots Vacuum Blower	Vacuum Filter	Inspect Daily	Clean or Replace
Kunkle Valve	Internal Relief Valve	Cycle several times each week	WD-40 or Equivalent
Jetstream Pump	Uni-valves	Every 100 hours (Lapping Procedure)	NA
Jetstream Pump	Crankcase Oil	After First 100 hours and then every 500 hours	75w90 Gear Oil
Hog Head	Thru-Shaft Motor Bearings	Daily	Mobil PolyRex EM Grease
Hog Head	Thru-Shaft Motor Pre-load Adjustment	Weekly	NA
Hog Arm	Chassis Wheels And Casters	Daily	General Purpose Grease
Hog Arm	Bearings, Hinges and Other Grease fittings	Weekly	General Purpose Grease
General Grease Points	Door Hinges, Debris Tank Tilt Pins, Vacuum Door Hinges, Ball Valves, Latches, ETC	Weekly More Frequently If Required	General Purpose Grease
This chart is a guide only. It should never be to supersede equipment manufacturer's specifications. Please refer to the manufacturer's operation and maintenance manuals for additional information.			

PROBLEM	CAUSE AND SOLUTION
Noises & Vibrations	
Blower system noise and vibration.	• Blower impellers are clogged with paint and debris. Disassemble and clean blower. Rebuild or replace if necessary. • Blower muffler is clogged. Clean muffler. • Blower mount bolts are loose. Tighten Bolts. • Blower or drive belts out of alignment. Align and adjust belts. • Blower belt is loose. Tighten blower belt.
Hog Head noise.	• Hog Head rotation extremely high. Turn head rotation dial counterclockwise to reduce head speed. • Spray bar is hitting shroud (1). Shroud is bent or damaged. Repair or replace shroud. • Spray bar is hitting shroud (2). Thru-shaft motor bearings are loose causing spray bar to hit shroud. Repair thru-shaft motor.
High pressure pump noise.	• UHP pump belt is loose. Tighten UHP pump belt. • UHP pump or drive belts out of alignment. Align and adjust belts. • There is an internal problem with the pump. Repair the pump.
Hog Arm & Hog Head	
Hog arm won't raise.	• Float mode activated. Disengage float function. • Hydraulics not engaged. Engage transmission PTO to activate hydraulic system. • Hydraulic fluid low. Add fluid to the hydraulic fluid reservoir. • Hose or fitting broken or leaking. Tighten loose fitting or replace broken hose or fitting.
Spray bar doesn't spin or spins slowly.	• Hydraulics not engaged. Make sure transmission PTO is engaged to activate hydraulic system. • Debris packed around thru-shaft or spray bar. Clean thru-shaft or spray bar. • Hog Head shroud is concave and not convex. Repair or replace shroud. • Speed dial control is shut off. Turn the speed dial clockwise. • Electric connection is unplugged or no voltage to coil. Check that LED light on coil is lit and repair circuit or replace coil as necessary. • Dirt shield is too tight. Remove dirt shield and install new dirt shield seal. Tighten finger tight.

PROBLEM	CAUSE AND SOLUTION
UHP Pump & High Pressure System	
High pressure and / or charge pressure gauges fluctuating or pulsing.	• Truck engine speed is too low and hydraulic system is not turning the charge pump at proper RPM. Raise engine speed to operating RPM. • Univalve may be pitted or cracked. Remove valve and check seats for damage. Replace or rebuild. • One or more UHP pump stuffing box seals are leaking. Replace leaking seal.
Water dripping from high pressure hose weep holes.	• Hose fitting loose or damaged. Tighten fitting or replace hose and fittings.
Water dripping from fluid end manifold rectangular weep hole in manifold block.	• Face seal is worn or damaged. Replace seal.
Water dripping from fluid end manifold round weep hole on the top of the manifold block.	• Univalve seals worn or damaged. Replace seals or valves.
Water dripping from weep hole on thru-shaft motor high pressure hose connection.	• Swivel nut is loose. Hand tighten swivel nut. • Swivel seal is worn or damaged. Remove and replace worn or damaged seal. • Cracked swivel or thru-shaft. Remove and inspect shaft assembly. Replace damaged or cracked components.
Low charge water pressure. (30 PSI/2 BAR or less).	• Truck engine speed is too low and hydraulic system is not turning the charge pump at proper RPM. Raise engine speed to operating RPM. • Charge water pump is not activated or supply valve is closed. Open supply valve or activate charge water pump. • Dirty clean water filters. Change filter bag and cartridge. • Clean water tank is empty. Fill tank with water. • Clogged impeller on pump. Disassemble pump and clean or replace impeller. • There is an air leak in the suction hose. Find and repair leak. • Debris in water hose from tank. Flush or replace intake water hose.

PROBLEM	CAUSE AND SOLUTION
UHP Pump & High Pressure System	
Dump valve will not activate	• Charge water pressure is below 30 PSI (2 BAR) and the charge pressure safety switch is preventing Dump vale operation. Find and correct the cause of low charge pressure. Refer to Low charge water pressure. • The charge pressure safety switch is defective. Replace safety switch. • Water in the pressure hose between the charge water safety switch and 1 micron filter has frozen. Thaw frozen water in hose. (Cold weather operation only)
Low blasting pressure at nozzles.	• Truck engine speed is too low. Raise engine speed. • Warn or blown nozzles. Change nozzles. • Nozzles are leaking. Tighten or replace nozzles. • Oversized nozzles. Refer to chart to correct nozzle pattern. • Water leaks in UHP hoses, fittings. Tighten loose fittings or replace defective hoses and damaged fittings. • UHP pump valves or seals damaged or worn. Check valves for heat indicating internal bypass. Service or replace valves as required • Worn or missing button seal between spray bar and shaft. Replace button seal. • Air lock in fluid end manifold. Remove rupture disc assembly or the side port fitting, start auxiliary engine and advance engine speed to maximum operating RPM to bleed system and remove air lock. • Low charge water pressure. Refer to low charge water pressure problems. • One or more UHP pump stuffing box seals are leaking. Replace leaking seal or seals. • Dump Valve cartridge leaking. Repair or replace leaking cartridge. • By-pass valve cartridge leaking. Remove diffuser tube and replace cartridge. • Swivel seal is worn or damaged. Replace damaged swivel seal. • Swivel shaft is cracked. Replace damaged swivel shaft.

PROBLEM	CAUSE AND SOLUTION
Vacuum System	
Low vacuum pressure.	• Truck engine speed is too low and PTO is not turning the vacuum blower at proper RPM. Raise engine speed to operating RPM. • Vacuum filter canister door seal leaking. Clean or replace lid seal. • Vacuum canister or debris tank relief valve leaking or stuck open. Clean or replace leaking valve. • Vacuum filter is clogged. Clean or replace vacuum filter.
Vacuum loss or failure.	• Worn or damaged shroud wear brush. Replace wear boot. • A vacuum hose is worn through or damaged. Replace worn or damaged vacuum hose. • Vacuum hose plugged with debris. Hit hose with dead blow hammer to breakup debris. Replace hose if necessary.
Vacuum system relief valve sticks open.	• Debris in relief valve is causing it to stick. Clean and lubricate relief valve. Replace valve if necessary. • Vacuum filter is clogged. Clean or replace vacuum filter. • Vacuum hose is clogged. Clear clogged hose. Replace hose if necessary. • Vacuum hose kinked. Replace kinked hose.

Mobile Tool System

Rubber Hammer
#2 or #4 Hammer
2 Grease Guns with hose
Brass Wire Brush (Big and Small)
Putty Knife/Scraper
12" or 15" Pipe Wrench
Torque Wrench (50 foot lbs.) 3/8" Drive
Feeler Gauges
60-96 Piece Socket Set
Utility Knife (3 pieces)
Tool Box
6 Piece Screw Driver Set
Open End Wrench Set - 1/4"-7/8"
Needle Nose Pliers
Snap Ring Pliers
15" Crescent Wrench (adjustable)
12" Crescent Wrench (adjustable)
12" Channel Lock Pliers
Triangle Metal File (Small)
Pick Set (Dental Pick Type)
Allen Wrench Set (Standard and Metric)
Metric set must include 7mm allen
Deep Socket for Thru-Shaft - 1 1/8"
Deep Socket for Thru-Shaft - 15/16"
Brake Parts Cleaner (3 cans)
Scotch Bright Scratch Pads (Red)
Open End Wrench - 15/16"
Converter 3/8" to 1/2" for Torque Wr.
The mobile tool system has been designed as a complete system of tools required for the Stripe Hog. To reduce unnecessary downtime always ensure your mobile tool system is complete during the Pre-Operational checklist

Mobile Spare Parts System

Ultra High Pressure Pump Spare Parts Organizer Box
Hog Head Spare Parts Organizer Box
Vacuum Recovery System Spare Parts

With each truck we manufacture, Waterblasting Technologies provides a spare parts system. This spare parts system consists of (2) organizer boxes including labels as well as the suggested quantity to keep in the boxes for each component.

To ensure you have what you need when you need it a physical inventory of the spare parts system should be completed at a minimum of once a week. Keeping the spare parts system fully stocked at all times will reduce unnecessary downtime and expedited freight costs.

For further information on your specific spare parts system or to request additional labels or components please contact customer support at (001) (772) 223-7393 or visit StripeHogSupport.com

Daily Report

Date _____/_____/_____

Job Name or Number:	Employee Name:
Total Pump Hours:	Total length of removal:

Removal Type:	If Paint How many layers:

Consumable Used and Quantity:

Nozzles:	Swivel seals:
Brass Backups:	Debri Bags:
Cartridge Filters:	Bag Filters:
Packings:	Brushes:
Spray Bar Protectors:	

Job Summary:

*****Please make a concerted effort to only run the pump while blasting as these start and stop times will directly impact the overall production rates and skew the data******

PRE-OP CHECK LIST

Tires	Grease Points
☐ Tire Pressure - Front	☐ Thru Shaft Motor Bearings
☐ Tire Pressure - Rear	☐ Vacuum blower Bearings
Lighting Systems	☐ Pillow Block Bearings (Combo Skid)
☐ Brake Lights	**Tank System**
☐ Turn Signals	☐ Clean Water Tank Full & Not Leaking
☐ Parking Lights	☐ Fittings, Sight Tubes
☐ 4-Way Lights	☐ Wastewater Bladder Empty
☐ Strobe and Work Lights	☐ Check Vac Hoses For Leaks
☐ Reverse Lights	☐ Debris Bag In Place - Debris Level OK
☐ Headlight: High-Beams	☐ Transfer Pump Strainer Clean
☐ Headlight: Low-Beams	☐ Vacuum Separator Filter Clean
Electrical & Accessories	☐ Vacuum Separator Drum & Wiper Blades OK
☐ Wipers	☐ Debris Tank Door Closed & Latched
☐ Horn	**Hog Head & Spray Bars**
☐ Console Switches	☐ Spray Bar & Nozzles Correct
☐ Back Up Beeper	☐ Nozzles Grade 4 Or Better
☐ DRIVE/WORK LED Lights	☐ Spray Bar Covers In Place
☐ Master Breakers ON	☐ Dirt Shield OK
☐ Digital Gauges Operating	☐ No Loose Components Or Damage
☐ Inspect Electrical Box	**Operational Testing**
General	☐ Truck Engine Operation
☐ Filling Hose And Wrench Onboard	☐ Engage/Disengage Gearbox PTO
☐ Accident/Incident Decals	☐ Engage/Disengage Transmission PTO
☐ All Wires, Brake Lines & Hydraulic Lines Secure	☐ All Switches And Controls Work
☐ All Components Are Neat And Organized	☐ Engage/Disengage Charge Pump
☐ How's My Blasting Decal Present On Truck	☐ Charge Pump_____PSI
☐ Complete Tool Box Per Inventory Sheet	☐ Dump Valve Operation
Mobile Spare Parts and Tool System	☐ Spray Bar Rotation
☐ Mobile Spare Parts System Complete	☐ UHP Pump _____PSI
☐ Mobile Tool System Complete	☐ Hydrostatic Drive Working Correctly
Fluid Levels	☐ Hog Arm Slide Assembly Operation
☐ Truck Engine Oil	☐ Hog Arm Operation
☐ Automatic Transmission Oil	☐ Water filters Clean
☐ Truck Radiator & Coolant Level	☐ Packing Cooling & Lube Water Flow
☐ Gearbox Rear Lube	☐ Vacuum Blower & Filter Operation
☐ Gearbox PTO Lube	☐ Transfer Pump System Operating
☐ Gearbox Hydrostatic Drive Lube	☐ Inflate/Deflate Door Seal Operating
☐ Check OMSI For Oil Leaks	☐ Debris Tank Dump Cylinder Operating
☐ Hydraulic Oil Level	**Belts**
☐ Jetstream Pump Oil	☐ UHP Pump Belt - Tension & Alignment
☐ Truck Fuel Tank Level OK	☐ Blower Belt - Tension & Alignment

Nozzle Configuration Chart

SPRAY BAR NOZZLE CONFIGURATION CHART

Hog Technologies

SPRAY BAR NOZZLE CONFIGURATION CHARTS FOR ALL STRIPE HOG MODELS

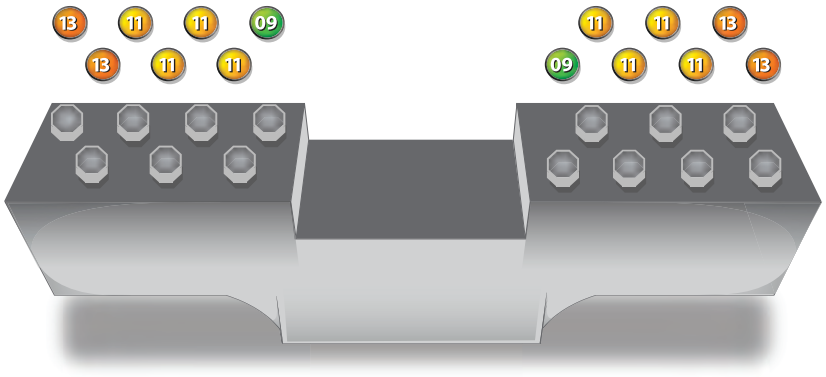
High Cohesive Nozzle Flow Chart - FLOW - GPM @ Pressure Indicated					
Orifice	**20KPSI**	**26KPSI**	**30KPSI**	**36KPSI**	**40KPSI**
Dia./ins	(1379 Bar)	(1723 Bar)	(2068 Bar)	(2482 Bar)	(2758 Bar)
0.005	0.08	0.09	0.09	0.10	0.11
0.006	0.11	0.12	0.13	0.15	0.15
0.007	0.15	0.17	0. 18	0. 20	0. 21
0.008	0.19	0.22	0. 24	0. 26	0. 28
0.009	0.25	0.28	0. 30	0. 33	0. 35
0.010	0.30	0.35	0. 37	0. 41	0. 43
0.011	0.37	0.42	0. 45	0. 49	0. 52
0.012	0.44	0.50	0. 54	0. 59	0. 62
0.013	0.51	0.59	0. 63	0. 69	0. 73
0.014	0.60	0.68	0. 73	0. 80	0. 84
0.015	0.68	0.78	0. 84	0. 92	0. 97

The GPM in each setup is calculated per spray bar.

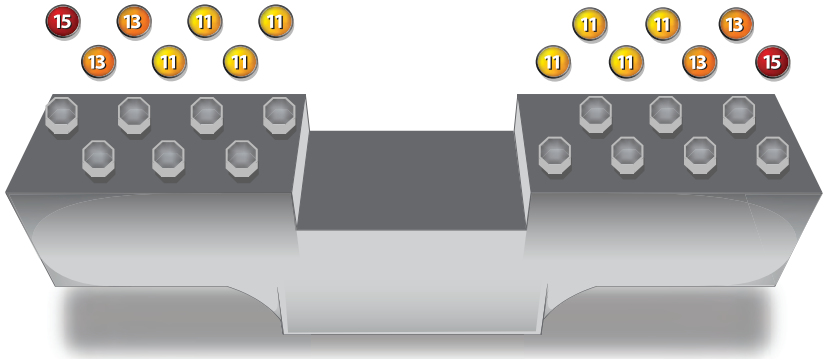
Spray Bar Nozzle Configuration Chart

(These configurations are to be used as a general guide for flat line marking removal which may need to be altered to suit your situation. Configurations are for 9 GPM Units only.)

6”, 14 Nozzle Spray Bar – 4” lines – Least Aggressive 7.34 GPM @ 36K PSI / 7.78 GPM @ 40K PSI



6”, 14 Nozzle Spray Bar – 4” lines – Most Aggressive 8.52 GPM @ 36K PSI / 9.02 GPM @ 40K PSI

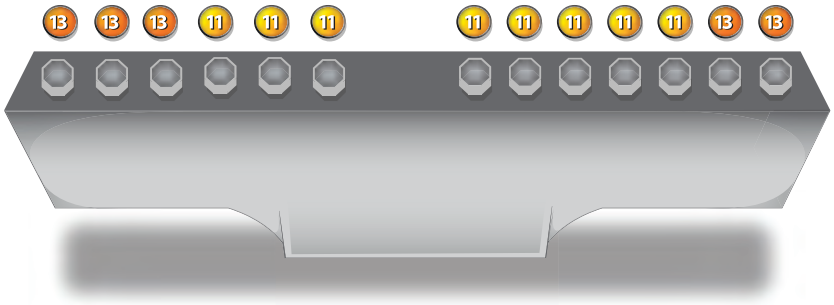


The GPM in each setup is calculated per spray bar.

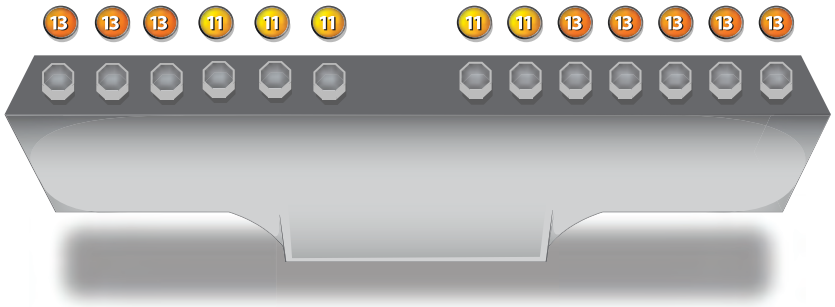
Spray Bar Nozzle Configuration Chart

(These configurations are to be used as a general guide for flat line marking removal which may need to be altered to suit your situation. Configurations are for 9 GPM Units only.)

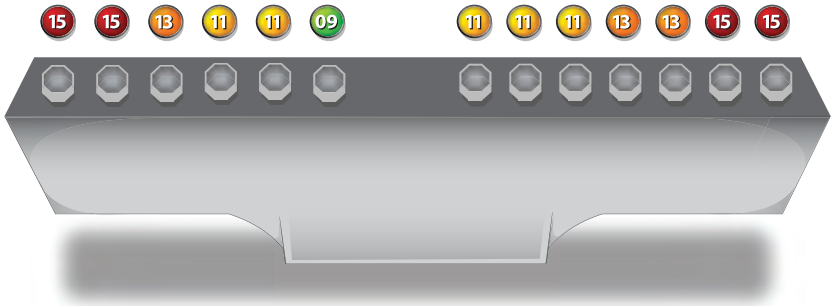
8” Least Aggressive Set Up 7.37 GPM @ 36K / 7.81 GPM @ 40K PSI



8” Medium Aggressive Set Up 7.97 GPM @ 36K /8.44 GPM @ 40K PSI



8” Most Aggressive Set Up 8.53 GPM @ 36K / 9.02 GPM @ 40K PSI

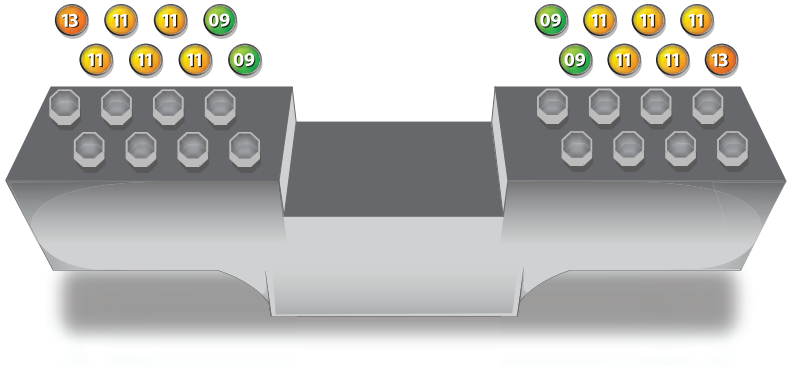


The GPM in each setup is calculated per spray bar.

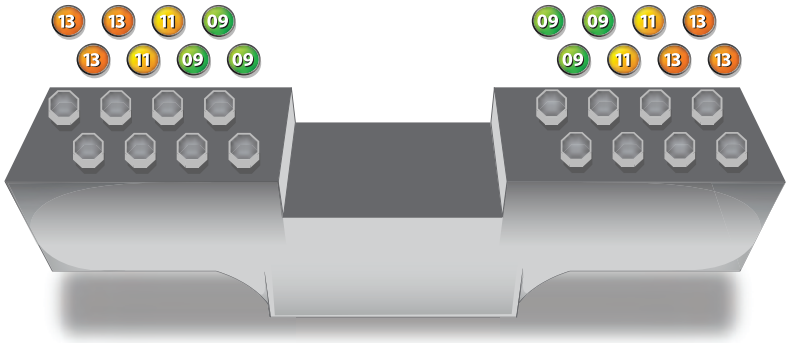
Spray Bar Nozzle Configuration Chart

(These configurations are to be used as a general guide for flat line marking removal which may need to be altered to suit your situation. Configurations are for 9 GPM Units only.)

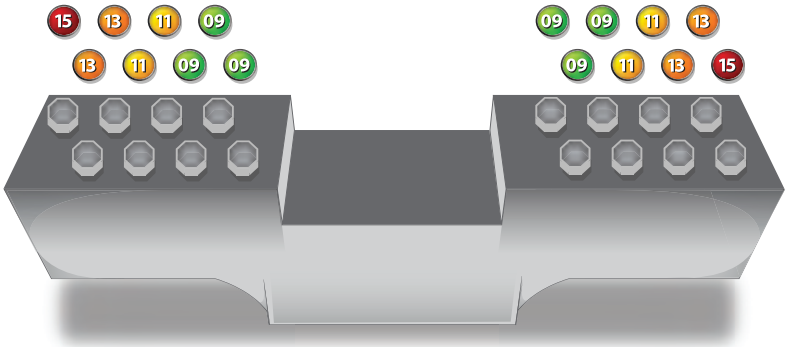
8” & 10”, 16 Nozzle – Least Aggressive set-up 7.60 GPM @ 36K PSI / 8.06 GPM @ 40K PSI



8” & 10”, 16 Nozzle - Medium Aggressive set-up 8.08 GPM @ 36K PSI / 8.56 GPM @ 40K PSI



8”, & 10”, 16 Nozzle - Most Aggressive set-up 8.54 GPM @ 36K PSI / 9.04 GPM @ 40K PSI



The GPM in each setup is calculated per spray bar.

Spray Bar Nozzle Configuration Chart

(These configurations are to be used as a general guide for flat line marking removal which may need to be altered to suit your situation. Configurations are for 9 GPM Units only.)

14” Least Aggressive set-up 7.60 GPM @ 36K PSI / 7.96 GPM @ 40K PSI

14” Medium Aggressive set-up 8.11 GPM @ 36K PSI / 8.55 GPM @ 40K PSI

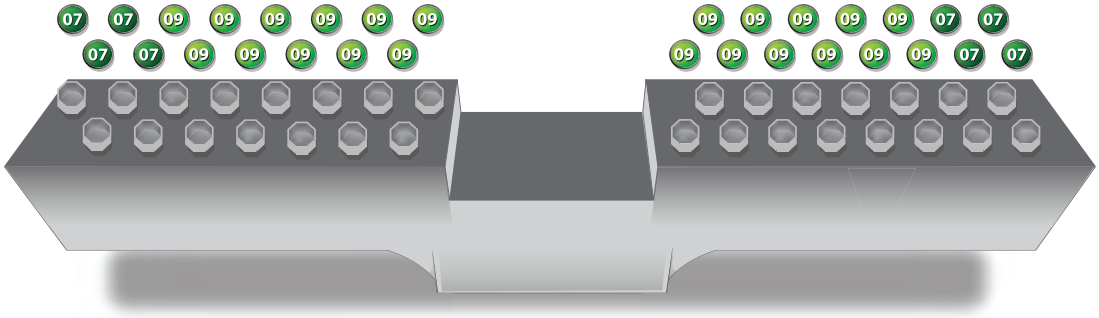
14” Most Aggressive set-up 8.48 GPM @ 36K PSI / 8.96 GPM @ 40K PSI

The GPM in each setup is calculated per spray bar.

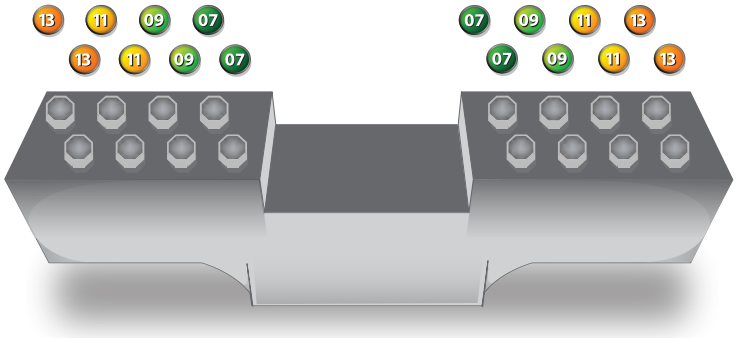
Spray Bar Nozzle Configuration Chart

(These configurations are to be used as a general guide for rubber removal and/or curing compound removal which may need to be altered to suit your situation. Configurations are for 9 GPM Units only.)

14”, 22” & 36”, 30 Nozzle -Rubber Removal and/or Curing Compound Removal – 8.04 @ 30K PSI - 8.45 @ 33K PSI



8” & 10”, 16 Nozzle Curing Compound Removal set-up - 25,000 - 35,000 PSI



The GPM in each setup is calculated per spray bar.

Nozzle Calculation Sheet

36K Nozzle Calculation Sheet

Size	GPM	Quantity	Total GPM

Total Accumulative GPM

40K Nozzle Calculation Sheet

Size	GPM	Quantity	Total GPM

Total Accumulative GPM

Remember to multiply the total by two if you have a two head system. The total should not exceed 11.8 gpm. If it does, you will not achieve pressure.

Remember that the total available gpm varies by 12% for individual machines.

NOTES

Water Blasting Terms

1 Micron Cartridge Filter - Traps smaller particles that may come from the clean water tank and pass through the charge pump.

10 Micron Bag Filter – Traps larger particles that may come from the clean water tank and pass through the charge pump.

100 Micron Debris Bag – Installed in debris tank on hooks to collect debris and filter water.

Ball Valve – ON/OFF valves used to control water flow and draining tanks.

Basic Training Course – 5 days of on-site training to operate and maintain the stripe hog unit.

Bilge Box – box beneath the ultra-high pressure manifold that contains the sump to collect lubrication and cooling water from the UHP pump.

Bilge Pump – Pumps or removes the water from the bilge box to the debris tank.

Blast Head – The shroud and spray bar that deliver high pressure water to the pavement.

Blower – Pulls airflow through the vacuum system.

Brush Assembly – Attaches to the bottom of the shroud providing a partial seal between the blast head and the road surface to reduce the amount of debris and water exiting during water blasting operations.

Wear Brush Clamps – Clamps to the shroud to secure the brush and provide adjustment.

Burst Rating – The PSI at which a component will rupture.

Manual Bypass Valve – Located on the ultra-high pressure pump and used to manually adjust pressure.

Cam Lock Connector – Installed at the end of each vacuum hose fitting to secure the hose.

Castor Plate – Supports the hog head and prevents the spray bar from touching the ground.

Cavitation – Occurs when liquid is subjected to rapid changes of pressure that cause the formation of cavities in the flow of water that can damage equipment.

Charge Pressure – Pressurized water supply to the UHP pump.

Charge Pressure Gauge – Digital gauge that displays the charge pressure in PSI.

Charge Pump – Centrifugal pump that supplies water to the ultra-high pressure pump.

Chassis – Steel frame that holds the truck body and motor.

Circuit Breaker - A device for interrupting an electric circuit to prevent excessive current, as that caused by a short circuit, from damaging components in the circuit or from causing a fire.

Clean Water Level Sensor – Sensor that reads the level of water in the clean water tank and indicates the information on the PLC.

Clean Water Tank – Modular tanks located on the rear of the chassis used to store the clean water supply for the UHP system.

Cutoff Ball Valve – Located inside the debris tank as a safety feature to stop the flow of vacuum if the tank becomes full.

Debris Tank – Collects all debris removed from the road surface through the vacuum hose.

Dirt Shield – Threaded flat washer that protects the lower radial bearing of the thru-shaft from dirt and debris.

Diverter Valve – Safety feature on the ultra-high pressure pump that recirculates water to the blast head or back to the clean water tank.

Double blast head design – Allows two heads to be mounted on the hog arm and operate simultaneously

Felt Gasket – Attaches to the dirt shield to protect the shroud from damage while the spray bar is rotating.

Fill Connection – Located on the driver side of the truck and accommodates large hoses to fill the water tank.

Fill Hose – Hose used to connect fill connection to clean water source.

Fill Valve – Valve that accommodates large hoses used for filling the clean water tank.

Flapper – Installed on the top of the silencer to keep water and debris from entering the system.

Float Mode – Releases up or down hydraulic pressure on the hog arm to allow the hog head assembly to float over uneven surfaces to avoid damage to the blast head.

Forward Tank – Tank on the truck chassis reserved for the clean water tank.

GPM – Gallons per minute of water produced by the ultra-high pressure pump.

Head Rotation Speed Dial – Controls the speed of the blast heads when operating in manual mode.

Hg – Symbol that indicates inches mercury. Used to measure vacuum air flow. Maximum vacuum is -7 inHg

Hog Arm – 5-axis arm that raises, lowers and moves the blast heads right and left.

Hog Head Assembly – Attaches to the front of the chassis and consists of the hog arm, spray bar, shroud, wheels and casters.

Holding Tank – Area below the debris tank that catches the recovered water that drains from the 100 micron debris bag.

Impeller – The rotating internal component in a pump or blower that moves the water or air.

Inlet Port On Debris Tank – Receives water and debris from the vacuum hose connected to the shroud.

Joystick Console – Console in the cab of the truck that houses the joystick, start/stop button, head rotation speed dial, truck speed dial, and digital high pressure and charge pressure gauges, float and forward rocker switches.

Kunkle Valves – Vacuum safety relief valve that opens when there is excessive vacuum.

Manhole – Opening on the top of each clean water tank that provides access to the interior of the tank. This should always remain locked.

Manual Bypass Valve – Manual adjustment valve that releases small amounts of water back to the clean water tank to adjust pressure

Manual High Pressure Gauge – Manual gauge on the UHP pump that displays the operating pressure of the pump.

Metering Valve – Controls the flow of cooling and lubrication water to the stuffing box.

OSHA – Government agency tasked with maintaining a safe and healthy work environment.

PLC – Programmable logic controller located in the cab of the truck and displays digital information on the water blasting system.

Poly Chain Carbon Drive Belt - A high tensile strength belt designed for high horsepower industrial applications. Used to drive the UHP pump and blower.

Potable Water – Clean water that is suitable for drinking.

Pressure Switch 1/2 – Controls the head rotation hydraulic coils. If the charge water pressure drops below 30 psi the pressure switch will stop the heads from spinning.

Pressure switch 18/30 – Controls the OMSI 40K clutch. If the charge water pressure drops below 30 PSI, this pressure switch will disengage the clutch.

PSI – Pounds per square inch, a unit of pressure.

Restriction – Limit the amount of water or air that can pass through a given area.

Retaining hooks – Hooks on the inside of the debris tank used to hold the 100 micron debris bag.

RPM – Revolutions per minute. The revolutions of the engine crankshaft, pump or motor each minute.

Rupture Disc – Pressure relief device to protect equipment from over pressurization.

Shroud – The stainless steel circular component that protects the spray head from debris.

Shutoff Cartridge – Component of the diverter valve that shuts off the flow of water.

Silencer – Muffles the sound of the airflow being pulled through the vacuum blower.

Sight Tube – Clear pipe on side of the clean water tank and debris tank that indicates the level of the water.

Spray Bar – Rectangle stainless steel component that attaches to the thru-shaft and holds the nozzles.

Spray Bar Protector – Cover for the spray bar that shields the nozzles and spray bar from damage caused by debris during blasting operations.

Standoff Distance – Distance from the spray bar to the surface.

Stripe Hog – Ultra high pressure water blasting equipment manufactured by Hog Technologies to remove paint and rubber from road surfaces.

Supply Valve – Located between the clean water tank and the charge pump that is used to control the flow of water.

Swivel Nut – Locks the ultra-high pressure hose onto the thru-shaft.

Swivel Seal – Utilized to create the ultra-high pressure seal required for the ultra-high pressure hose connection.

T-Handle Adjustment Rod – Used to manually adjust the castors and wheels on the hog head assembly.

T-Handle Pin Lock System – Used on the 5-axis hog arm as a safety feature to prevent the hog arm from drifting downward while the truck is in Drive Mode.

Thru-Shaft – Hydraulic thru-shaft motor that connects and rotates the spray bar on the hog head assembly.

Two Stage Filter System – Process of the water passing through 2 filters prior to reaching the ultra-high pressure pump to reduce debris in the system.

Two Way "Y" Connector – Splitter that allows the use of two vacuum hoses from one source.

Ultra High Pressure Hose – Hose rated at 40,000 psi that connects to the thru-shaft and the ultra-high pressure pump.

Ultra High Pressure Pump (UHP Pump) – Piston type positive displacement pump that supplies ultra high water pressure to the spray bars.

Univalve – Separates the high and low pressure water in the Ultra-High Pressure pump.

Vacuum Filter – Filter cartridge inside the vacuum filter canister that traps debris in the vacuum air flow before it enters into the blower.

Vacuum Hose – 4" hose connects to the shroud at the blast head to transport airflow to the debris tank. 6" hose draws airflow from the debris tank to the filter canister.

Vacuum Hose Wear Points – Areas inside a vacuum hose that become worn and weak from abrasion created by the high velocity debris travelling inside the hose.

24 / 7 CUSTOMER SERVICE

Hog Technologies Customer Service Department stands ready to answer your questions and provide technical assistance 24 hours a day, 7 days a week.

Customer Service can also assist you with part orders.

Always contact Hog Technologies Customer Service Department for assistance and cross reference specifications for parts you intend to purchase locally.

PARTS

All replacement parts are available directly through Hog Technologies.

Get the parts you need when you need them.

Next day delivery is available in most locations.

Same day delivery available in some areas for parts ordered before 10 AM Eastern Standard Time

CUSTOMER SERVICE HOT LINE - 772-223-7393
www.hogtechnologies.com
www.stripehogsupport.com

Hog Technologies will not be responsible for damages or loss caused by substituted parts purchased locally or from another vendor or manufacturer.

WARNING

NEVER ATTEMPT TO USE COMMONLY AVAILABLE PLUMBING PARTS, FITTINGS, AND HOSES IN HIGH PRESSURE SYSTEMS! ALL FITTINGS TO BE USED WITH HIGH PRESSURE OPERATIONS MUST BE PROPERLY DESIGNED, STAMPED, RATED AND APPROVED BY HOG TECHNOLOGIES! FAILURE TO HEED THIS WARNING MAY RESULT IN DAMAGE TO COMPONENTS AND SEVERE INJURY OR DEATH!

Stripe Hog Support Web Site

You are here Home

Mike Logout

Typical Registration & Log On Window

VIDEO HELP

Welcome to the Stripe Hog Support Center! This resource is exclusive to Stripe Hog customers. In order to view the complete menu above and website you must be logged in. If you own or operate a Stripe Hog please login or register.

REGISTER

User Name:
First Name
Last Name:
Display name:
Email Address:

REGISTER

LOG ON

User Name

Password:

Login

(0111) (772) 214-1714. This number that will find an available customer support representative 24/7.

We are excited to take your call any hour of the day. Please don't hesitate to call if we can help.

The "Ambassador Club" is added to the site • Tuesday, November 11, 2008

The Ambassador Club is a place for Hog Technologies, Stripe Hog owners and operators to communicate so we all can benefit and become stronger. As an owner/operator of the Stripe Hog you are in an elite group. Welcome!

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