Waterblasting Technologies

SH8000
Training Manual

40,000 PSI Stripe Hog® Waterblasting System

Waterblasting Technologies

The World Leader in
Marking Removal, Rubber Removal,
Surface Preparation & Pavement Cleaning!

Welcome

Congratulations on your appointment to operate the Stripe Hog / Bull. You are joining a team of about 150 operators represented in more than 20 countries across 5 different continents around the globe. We are a proud team and for good reason. We are a team dedicated to improving the way road marking Removal is done. We are the best trained, operate the best equipment, and are sincerely committed to the highest quality of workmanship. The results of our dedication and commitment are safer roads, a greener environment, less costly job sites, and higher profits for the companies we represent.

We are the best trained because Waterblasting Technologies offers the most comprehensive training in marking removal available anywhere in the world. Industry standard is one day of has been awarded the Gold Medal in the traffic industry for quality and design for the last 5 years in a row.

Actually since the very first Stripe Hog was offered to the marketplace. The Stripe Hog / Bull has become the standard for Stripe Removal Equipment using Ultra High Pressure Water just about everywhere on the planet. There are now more Stripe Hogs operating on our planet than the other top two selling brands combined. It's not that our competition is poor, it's just that the design and ingenuity of the Stripe Hog is remarkably better. The best part is that we are just scratching the surface in making improvements.

Until now road marking removal has been just another job that has to be done in order to put down new markings or reconfigure traffic patterns. The result was deep gouges in the road surface which meant that the road owners must resurface, standing water that presents a road hazard, and huge volumes of dust. The Stripe Hog and its team of operators is quickly making these scenarios a memory of bygone days. That's why we're proud!

In just a few days you'll join this team as a certified Stripe Hog / Bull Operator and we are all anxious to welcome you.

Thank you in advance for the contributions you bring.

Curtis J Crocker
Training Coordinator
Waterblasting Technologies

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Waterblasting Technologies Training Schedule

Day 1

7:30 – 10:00 Classroom – PowerPoint Class One
Introduction to Waterblasting Technologies and the Stripe Hog – PowerPoint

10:00 – 10:15 Break

10:15 – 12:00 Truck
Truck and System Orientation

12:00 – 1:00 Lunch

1:00 – 4:30 Truck
Start up Pre-Inspection – Filling Water Tanks and Activating Systems - Installing Spray Bars and Nozzles – Purging the System - Start up (instructor) – shutdown (instructor)
Repair Through Shaft (Instructor - Hands on)

Day 2

7:30 – 9:00 Classroom – PowerPoint Class 2
Review of UHP and Vacuum System, day 2 & Summery of SH8000 Overview Notes
Dwell Time – Spray Bars - Nozzles Sizes – Spray Bar Configuration – Blasting Theory and Operation

9:00 – 9:15 Break

9:15 – 11:00 Classroom – PowerPoint Class 3
Start Up and Shut Down Procedures and Check Lists – Lubrication Points – Maintenance, Suggested Inventory – Part Ordering and Customer Service

11:00 – 12:00 Truck
Pre-start Inspection and Lubrication

12:00 – 1:00 Lunch

1:00 – 4:30 Truck
Student Operator Start Up with check list
Student Operator basic operation
Student Operator shutdown with check list

Waterblasting Technologies Training Schedule

Day 3

7:30 – 9:00 Truck
Rebuild UHP Pump (Instructor hands on)
Changing Spray Bars and purging system

9:00 – 9:15 Break

9:15 – 11:30 Truck
Startup and Students Operate Truck (Instructor support and coaching)

11:30 – 12:30 Lunch

12:30 – 4:30 Truck
Students operate the truck on their own (Instructor support and coaching)

Day 4

7:30 – 3:00 Truck
Students operate the truck on their own (Instructor support and coaching)

Notes:
Day 4 is reserved as a makeup day and provides the opportunity for additional hands on training and coaching.

Operator Information Form

Date _____

Company Name _____

Training Level

Basic ☐ **Advanced** ☐ **Master** ☐

OPERATOR INFORMATION

Operator Name _____
(as it will appear on certificate)

Title _____

Address _____

_____

_____

_____

Shirt Size _____

Phone _____

Cell Phone _____

E-Mail _____

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Operator Required Knowledge

- The UHP Pump produces up to 12 gallons per minute according to its RPM's
- PSI is controlled by the quantity of nozzles, their sizes, and supplied GPM
- The Stripe Hog functions best between 34 k and 38 k psi / 2,344 - 2,620 bar
- A loss of pressure is because of oversized, worn, or damaged Nozzles, Leaking Seals or Dirty Filters
- Excellent Removal is dependent on excellent nozzles
- Damage to the surface is because of improper DWELL TIME
- Debris Removal is dependent on proper Airflow at the Blast Head (ABH)
- ABH is limited by a dirty filter, leaking seals, damaged or blocked lines
- A properly maintained machine is the best antidote to downtime
- Cleanliness is always imperative

I Will:

- Maintain my machine according to the Maintenance Matrix and Lubrication Chart
- Always work with appropriate nozzles, configurations and nozzle conditions
- Seek to Master Dwell Time principles to affect 95% removal & no damage
- Call Waterblasting Technologies Support with any questions or problems
- Waterblasting Technologies Support is available 24/7 at: 011 – 772-223-7393

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SH8000 Systems Overview

LESSON	Notes
1) Water and Recovery Tanks a. Clean Water - CLEAN ENOUGH TO DRINK b. Debris - Solids and liquids Drain water each time you stop blasting Drain Water when more than ¾ full Empty all water storage before dumping – CLEAN & DIRTY	• Clean Water • Never • Empty all _____ Before _____
2) Water System a. Ultra High Pressure (UHP) Pump - Piston type < 40 k psi Cannot draw its own water b. Charge Pump - Centrifugal type <60 psi Serves water to UHP Pump – Driven by hydraulic motor c. Dump Valve – Releases pressure back to the Clean Water Tank d. Manual Bypass Valve – Provides for setting High psi at set engine rpm's with flows lower than 10 gpm. e. Filters – Usually the cause of Low Charge psi 10 micron **"NOMINAL"** 1 micron **"ABSOLUTE"**	• High Pressure Pump Needs • Charge Pump • Dump Valve and Manual Bypass Valve • Filters
3) Hog Head a. Arm – "HOG ARM" b. Blast Heads c. Spray Bar – **"The Goose that Lays The Golden Egg"**	• Hog Arm • Blast Heads • Spray Bar
4) Vacuum System a. Vacuum Blower – Casted Steel – **CLOSE TOLERANCES** – no **FOD** b. Filter Canister – Houses filter / dries the air - **DRAIN OFTEN** c. Kunkle Valves - Operates at -7 PSI	• Remember that vacuum • Vacuum Blower is a positive Displacement air pump vulnerable to: • Filter Canister • If the system:
5) Control System – All controls are electric over a. Air – Switches Gearbox between Drive and Operate Modes b. Hydraulic – 3 pumps power the Drive Train, Implements & Circulation	• All operations • Electric switches
6) Power System a. Truck Engine – 415 hp b. Transmission – Allison c. Gear Box – allows two modes of operation Drive Mode – Transport to and from worksite Work Mode – Hydra Static – Hydraulic Operations – UHP pump – Vac	• All Operations • Transmission • Gearbox Allows

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SH8000 Features & Functions

I General Overview

A General Functions and Characteristics

1. Stores clean and dirty water (Tank)
2. Pressurizes clean water to 60 psi (Charge Pump)
3. Boosts Pressure to 40K psi (High Pressure Pump)
4. Removes road markings (Hog Head)
5. Vacuums waste into debris tank (Vacuum System)
6. Operations controlled in the cab (Electrical System)
7. One engine powers all functions (Hydraulic System)

B Main Components - Builds on General functions

1. Tank
   (a) Clean Water – must clean enough for your baby girl to drink
   (b) Dirty Water – filtered to 100 microns

SH8000 Features & Functions

2. Water System

(a) Charge Pump – pre-charges the system with 40 – 60 psi
(b) High Pressure Pump – boosts pressure to 40 K psi
(c) Dump Valve – normally open reduces psi. Close to increase psi.
(d) Manual Bypass Valve – adjust psi manually under low flow conditions
(e) Filters – MUST BE CHANGED OFTEN
  (i) 10 Micron – Bag type, catches larger particles
  (ii) 1 Micron – clogs much faster than 10 micron

3. Hog Head

(a) Hog Arm – Use Float mode on the ground. Do not run over Reflective Markers
(b) Blast Heads
  1. Through Shaft – The world leader in Swivel Shaft Technology
    a. Swivel Nut – never more than finger tight. DO NOT USE TOOLS
    b. Swivel Seal Adapter – notice weep holes if 3/8" x 7/8" is not sealed
    c. Swivel Seal – note weep holes to indicate Seal needs replaced
    d. Brass Backup Ring – Install onto Swivel Tip first. Clean well
    e. Thrust Assembly Cover – clean well when changing Swivel Seal
    f. Upper Swivel Shaft Seal – Install cup side up
    g. Water Seal – Apply even pressure when installing
    h. Silicone Seal – normal to appear smashed. Change when cut.
    i. 25 mm Screws – only buy from WT. Special processes used to produce
    j. Gland Nut – hold down while removing. Torqued to 50 ft lbs.
    k. Swivel Tip – Replace if Swivel Seals wear quickly. Never allow to leak. Check sealing surface for cuts, abrasion, or wear.
    l. Swivel Shaft – Check Swivel Tip Seat for cuts, abrasion, or wear. Can be lapped using special tool from WT. Do Not Use Swivel Tip to Lap.
    m. Viton Seal – installs onto Swivel Shaft in groove provided. Replace if cut
    n. Jam Nut – Torque to 50' lbs. Install and remove using Spanner Tool
    o. Counter Washer – for future use
    p. Spanner Nut – Set Torque with Spanner Tool by Hand tightening then backing off one hole. Anchor tool in place with two 25mm screws.
    q. Screws (4)
    r. Thrust Assembly Housing – remove and install carefully to protect seals
    s. Seal – should be 3/16" below line. Apply pressure to outside ring only.
    t. Shim – appears to float. Very important piece, do not lose.
    u. Thrust bearing – moves thrust from center of assembly to the housing.
    v. Grease Seal – no good after removing. Removal bends it.
    w. Hydraulic Motor – New motors have a break-in period of an hour +/-
(c) Spray Bar – Choose the right one for the job at hand. WT carries 7 types

SH8000 Features & Functions

4. Vacuum System

(a) Blower – vulnerable to damage by foreign material, i.e. dirty water and debris
(b) Filter Canister – Drain often. Change filter when vac pressure is over -7
(c) Kunkle Valves – Never cover the opening. This valve protects the system

5. Electrical System

(a) Console – energized by the PTO switch. Controls all functions of the SH
(b) Control Panel – junction for all wires from Console to their components.
(c) Circuit Breaker – 50 amps, mounted on the Battery compartment

6. Hydraulic System

(a) Gearbox
(b) Hydrostatic Pump
(c) Hydrostatic Motor
(d) Implement Pump
(e) Manifold
(f) Circulation Pump

II Specific Functions of Main Components

A Tank

(a) Clean Tank

i. Stows 2700 US gallons of clean water
ii. Provides auxiliary cooling reservoir

(b) Debris Tank

i. 1700 US gallons capacity
ii. Removes water and debris from the air on its way from the Blast Head to the Vacuum Blower and stores it for disposal
iii. Separates water from the debris, provides for easy discharge of the filtered water and conveniently dumps the relatively dry debris

2. Water System

a. Charge Pump - powered by hydraulics it draws clean water from the storage tank and serves it at 60 psi to the High Pressure Pump and the Heat Exchanger. Its controls are both manual and electric. The manual controls are ball valves externally mounted on the Truck chassis and the electrical controls are on the Console. Its performance is adjusted by a needle valve located on the Tree.

b. High Pressure Pump - belt driven by the Gear Box it accepts 12gpm of clean water from the Charge Pump at 60 psi, boosts it to 40K psi and provides it to the Dump Valve, Manual Bypass Valve and the Hog Head. It is electrically controlled from the console simultaneously with the Vacuum Blower by the 40k Clutch switch.

c. Dump Valve – a normally open valve that controls the water pressure to the Blast Head by either allowing or disallowing water to be diverted back to the Clean Water Storage Tank. It is controlled on the console by the Start/Stop switch and is operated by a valve located on the Tree. It is either full on or full off.

d. Manual Bypass Valve – Provides a method for bypassing varying amounts of water back to the Storage Tank. Very useful when the engine's rpm needs to be set higher and water demand is lower which causes an overpressure situation.

e. Filters – located in the supply line 10 Micron and 1 Micron filters clear the water of undesired contaminants immediately before the High Pressure Pump.

f. Optional Heat Exchanger - transfers the heat from the trucks cooling system into the Clean Water Storage Tank

SH8000 Features & Functions

3. Hog Head

a. Hog Arm – Anchors the Hog Head to the Stripe Hog and provides for positioning it. It must be in the Float Mode when it is on the ground during operation.

b. Hog Head - Hydraulically powered it utilizes the 12gpm @ 40K psi to remove road markings. It also holds the vacuum lines so that the debris can be collected. Its functions are individually controlled from inside the truck cab.

c. Spray Bar – Perhaps the most important piece on the Stripe Hog it holds the nozzles and "does the work" of removal. The entire Stripe Hog System has been developed to support the work of this invaluable tool. Great care should be taken when handling it especially when it is removed from the Blast Head.

4. Vacuum System

a. Blower - provides the air movement necessary to collect the debris at the Blast Head and deposit it into the Debris Tank. Made of casted steel it is very strong but vulnerable to debris.

b. Filter Canister – much more than a simple housing for the Vacuum Filter it uses cyclonic action to preclean the air and keeps the filter operating at optimum performance for a longer period of time thus lengthening its service life.

c. Kunkle Valves – Set to open at -7 psi the Kunkle Valves protect the Debris Tank from collapsing and ensure that the Blower maintains sufficient airflow.

5. Electrical System

a. Console – houses the electrical components that control the functions of the Stripe Hog equipment i.e. fuses, switches, terminal strips, and computer chips. It is protected by a 50amp circuit breaker mounted on the side of the battery compartment.

b. Control Panel – A junction box that provides for weather proof connections to relays and terminal strips. Wires come directly to it from the Console and from there are distributed to individual solenoids and relays. Generally speaking power comes into the Panel on the left side of the terminal strips and out on the right. The wires are each numbered for easy identification.

c. Circuit Breaker – Mounted on the side of the Chassis Battery Compartment it provides protection to the Stripe Hog Electrical System.

SH8000 Features & Functions

6. Hydraulic System

a. Gearbox – installed in the drive line it distributes power from the transmission by way of the drive shaft to either the differential (In Drive Mode) or to 3 Hydraulic Pumps and the 40 K clutch (In Operate Mode)

b. Hydrostatic Pump – provides minute adjustments to control forward and reverse speeds of up to 4 mph and is capable of changing directions instantly without damaging itself or the driveline.

c. Hydrostatic motor – installed on the back of the gearbox it accepts flow from the Hydrostatic pump and turns the differential while in Operate Mode.

d. 40 K Clutch – Controlled by air pressure it is located inside the Gearbox and drives the output shaft to the High Pressure Pump and Blower. It is controlled by an on/off switch on the Console.

e. Tree - Provides centralized mounting of hydraulic, and air operated equipment and controls on the exterior of the cab.

SH8000 Features & Functions

B The parts breakdown of Main Components

1. Water Storage Tank
   a. Clean Tank– do not over pressurize
      1. Manhole- convenient access to interior, Keep locked
      2. Inlet ports - for Dump Valve and Heat Exchanger
      3. Pressure Relief Port - helps alleviate excessive pressure during filling, never close
      4. Fill Valve - provides convenient access for filling
      5. Sight Tube - shows water level at all times
      6. Discharge Ball Valves – allows for releasing unwanted water
      7. Fill Hose- connects to Clean Water source
      8. Hoses for diffusing hot water from Heat Exchanger
      9. Baffles – help prevent surges while driving or stopping

   b. Debris Tank – do not over vacuum
      1. Door- Always follow specific procedure to seal
      2. Inlet port – 4" for debris to enter. Uses a "T" not an elbow to increase service life.
      3. Kunkle Valve – Never seal it closed. Opens to relieve excess vacuum and protect tank from collapse.
      4. Glass Bubble – Use to check debris level
      5. Sight Tube - shows water level at all times
      6. Discharge Valve – for releasing unwanted water
      7. Cage – Provides larger surface area for bag to drain
      8. Binders – pull door against seal. NEVER OVERTIGHTEN
      9. Inlet for Bilge Pump
      10. Ball and Basket – emergency air flow control
      11. Debris Bag – Biodegradable filters to 100 Micron
      12. Remote Control – operates hydraulic valve to power up and down. Holding the up or down control button too long can damage the hoist.
      13. Vacuum Gauge – gives an external vacuum reading inside the tank

2. Water System
   a. Charge Pump – (Never run with less than 10 psi or more than 70psi)
      1. Hydraulic motor
      2. Pump Housing
      3. Impeller
      4. Misc seals

SH8000 Features & Functions

b. High Pressure Pump – rebuild every 100 hrs

1. Drive Pulley and Belt – Poly Chain 7 – 10 yrs
2. Crankcase – Gear Oil reservoir-oil should be clear not white
3. Frame / Head
4. Stub Shafts (3)
5. Splash Guards (3) helps protect seals from water intrusion
6. Plungers (3 carbide) Do not drop or hit with hard objects
7. Connector Clamps (3) never separate the halves
8. Stuffing Box (3)
   a. Gland Nut – Clean all orifices
   b. Packing – Change 75 – 150 hrs as needed
   c. Brass Sleeve
   d. Guide Bushing (carbide) do not drop or hit with hard object
   e. Gland Nut o-ring
   f. Brass Sleeve o-ring
9. Stuffing Box (Face) Seal (3)
10. Manifold – adjust the hinge to hold its weight
11. Univalve (3) – needs seal surfaces lapped every 100 hrs
    a. High Pressure valve
    b. Low Pressure Valve
    c. Spring
    d. Spring Retainer
    e. Retaining Ring (Split)
    f. Low Pressure o-rings (2)
    g. White Back-up Ring
    h. High Pressure seal – more reliable without the small o-ring
    i. Retaining Ring
12. High Pressure Gauge
13. Anti Vibration Gland Nut
14. Rupture Disc Holder (2) Use sticker supplied with Rupture disc to ID which disc is installed inside.
15. Port Adapter
16. Water Lube Harness
    a. Needle Valve (3)
    b. Lube Hose (3) – ¼" airline.
17. Trunion
18. Pump Wrench (Jetstream Tool)

c. Dump Valve - check for leakage under high psi by disconnecting the hose

a. Shut-off cartridge – check for cuts, check spring

SH8000 Features & Functions

3. Blast Head
   a. Shroud 8/10 or 14" – replace brushes often, brush should touch the ground
   b. Spray Bar (multiple sizes) – most important piece on the Stripe Hog
   c. Hydraulic motor / s – turn the Swivel Shaft
   d. Swivel Shaft – transitions from a non moving hose to a spinning Spray Bar.
   e. Swivel (Shaft) Seal – change between 8 & 20 hrs
   f. Block – holds the Hog Head components together
   g. Dirt Shield Gasket – Grease impregnated felt gasket. Change as necessary.
   h. Deflector Ring – Only finger tighten
   i. Swivel Shaft Timing Pulley – removes and installs easily. Watch keyway
   j. Hydraulic Timing Pulley – Taper Lock bushing type.
   k. Wheels – grease daily

4. Vacuum Blower – No serviceable Parts, NEVER ALLOW WATER INSIDE

5. Electrical System – separate from chassis system
   a. Console - Power supplied direct from truck batteries. A relay allows the ignition system to override the electrical circuit by way of the PTO Switch.
   b. PTO Switch - energized by ignition system, initiates all functions of SH
   c. All wires terminate only in cabinet mounted on Tree and are numbered on each end.
   d. Components are all numbered same as the wire leading to them.
   e. 50 amp Breaker – protects the electrical system, located on side of battery

6. Hydraulic System
   a. Gear Box
      1. Air activated pistons
      2. Hydra Static Pump
      3. Hydraulic Motor
      4. Hydraulic Implement Pump
      5. Gear Box Lubrication Pump
      6. 40K Clutch
   b. Tree
      1. Hydraulic Fluid cooler
      2. Hydraulic Manifold
   c. Manifold – ports are stamped and solenoids marked

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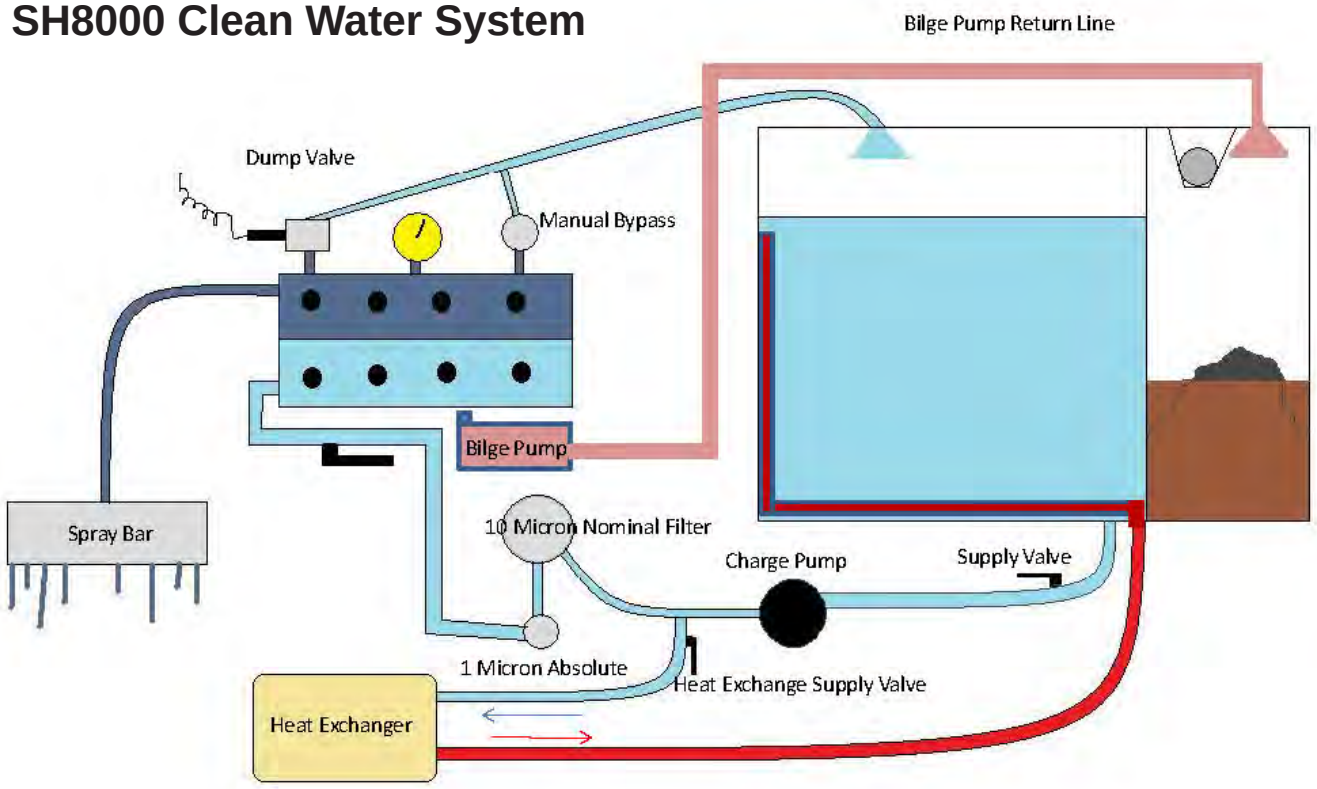
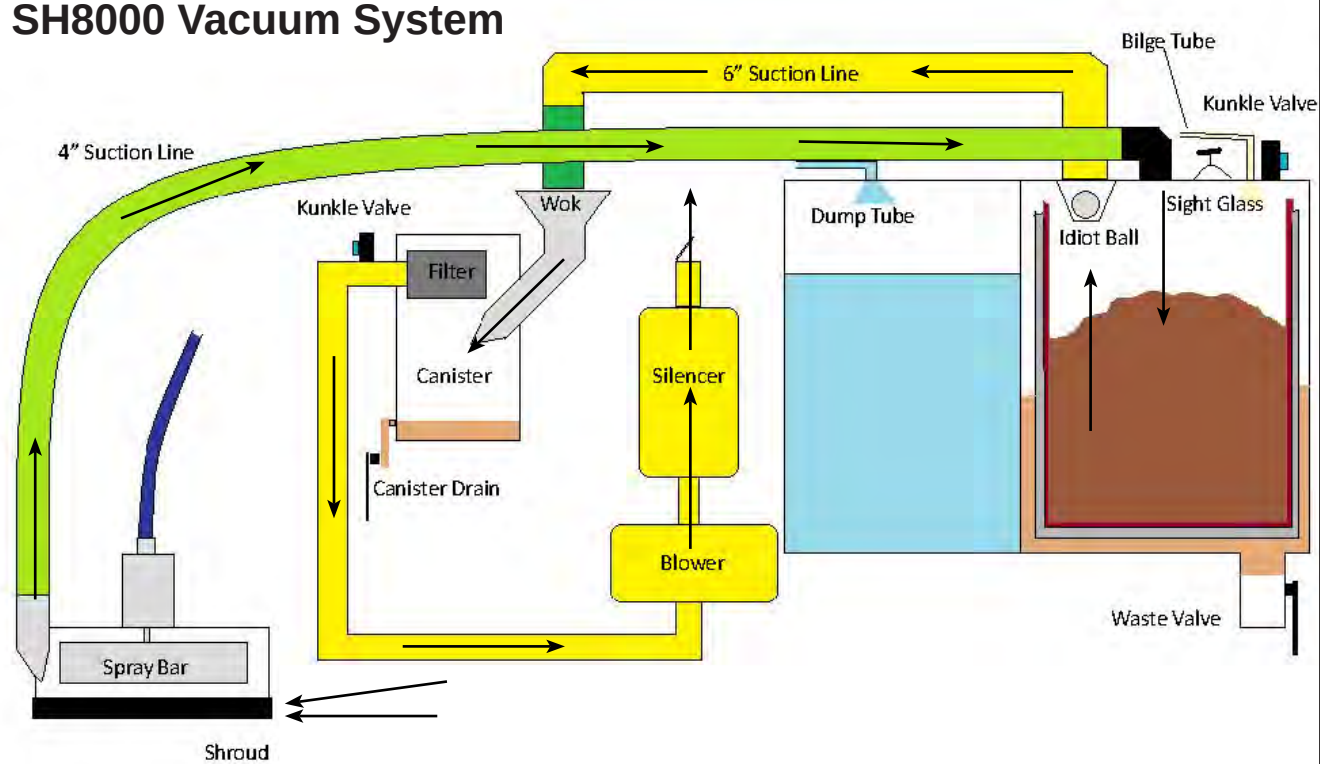
Clean Water and Vacuum Systems

SH8000 Clean Water System

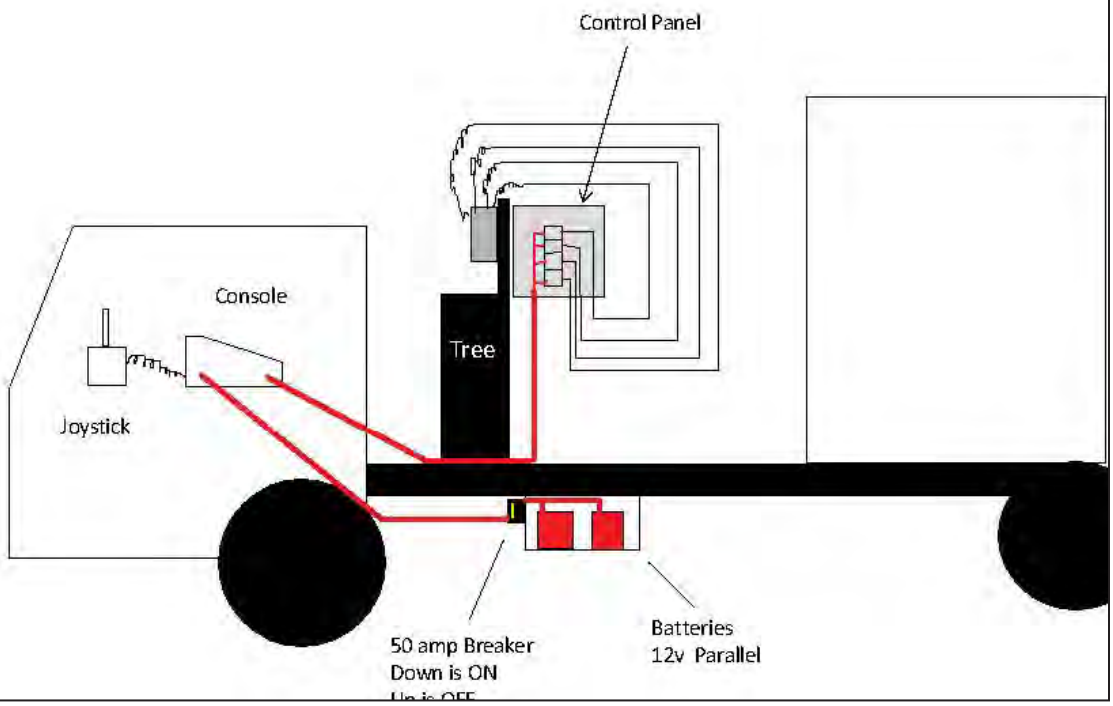


SH8000 Vacuum System

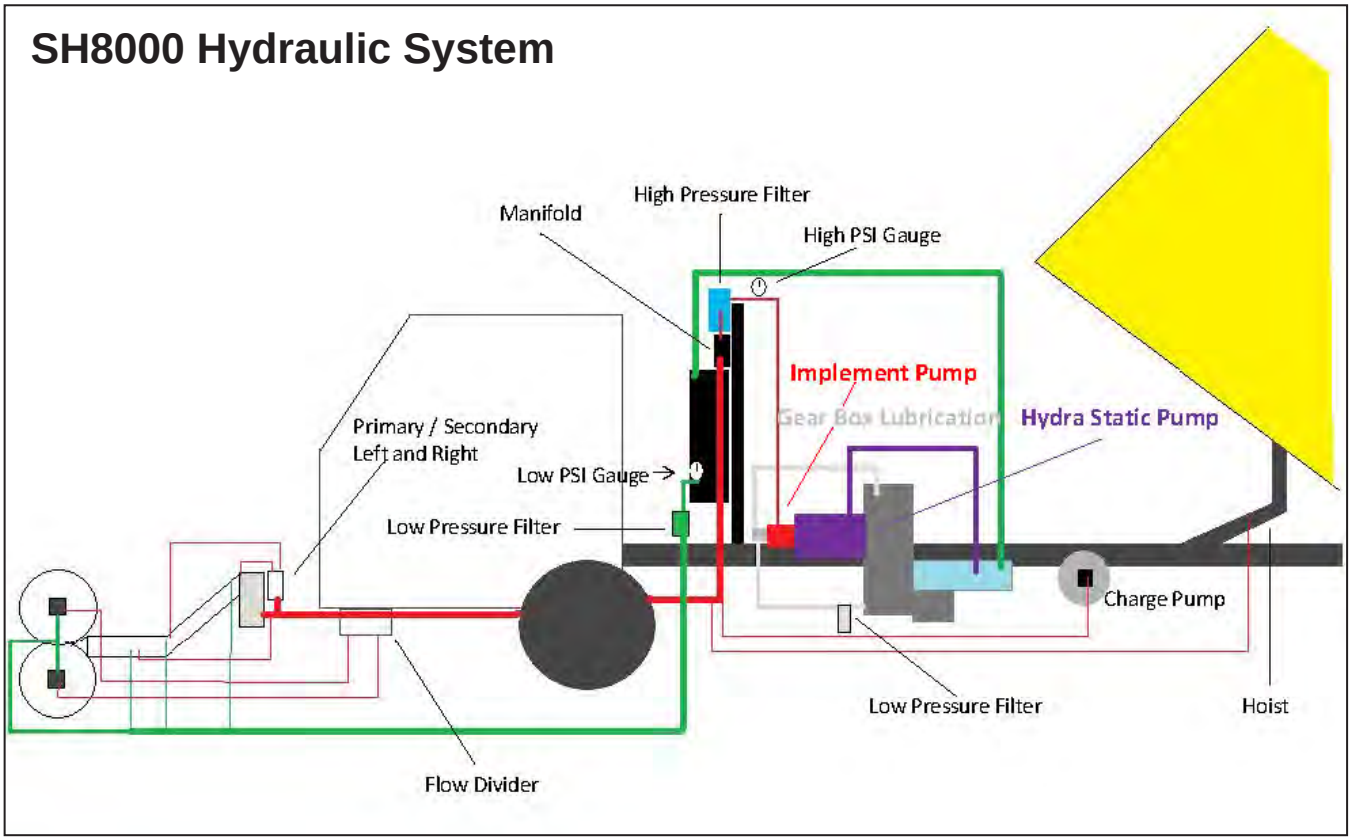


Electrical and Hydraulic Systems

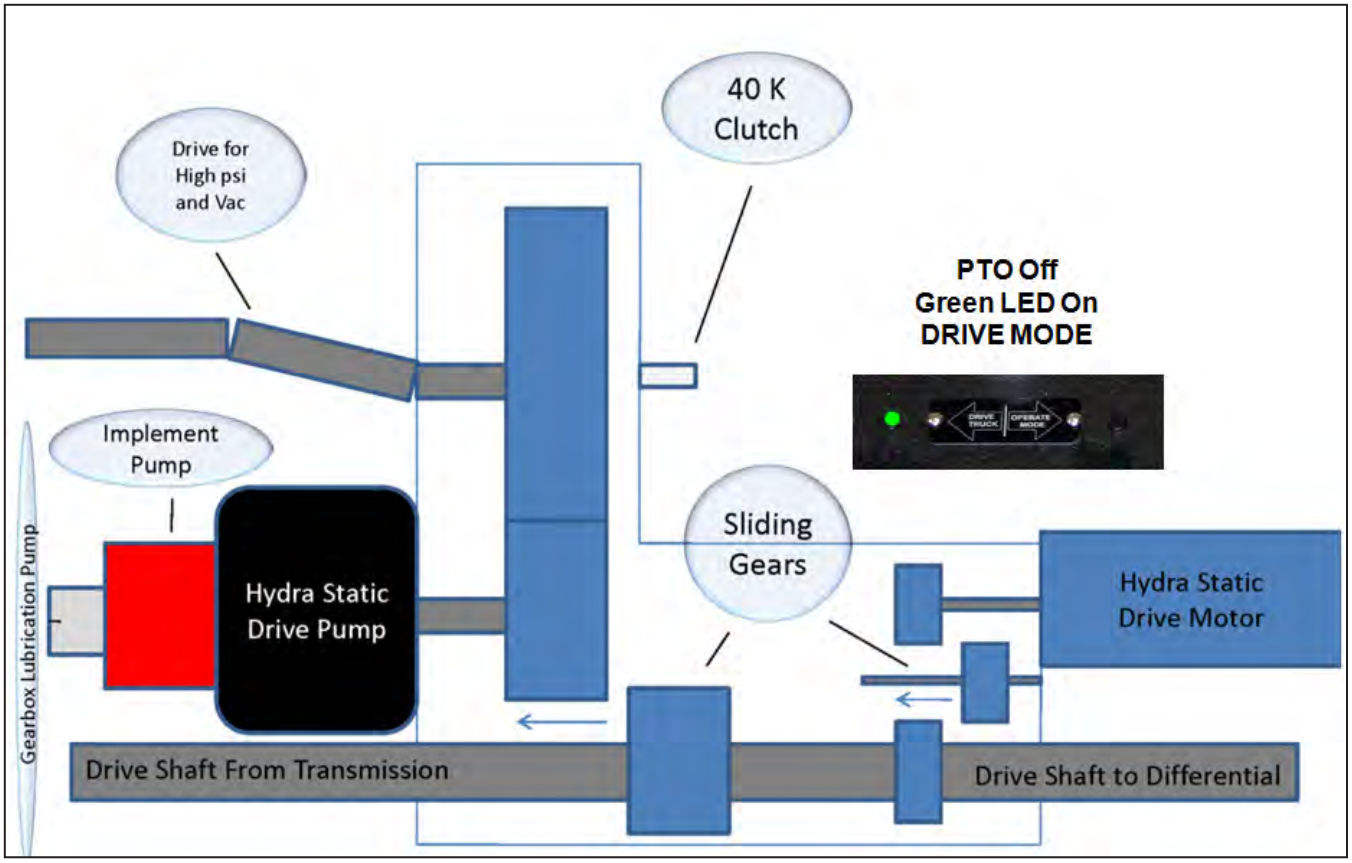
SH8000 Electrical System

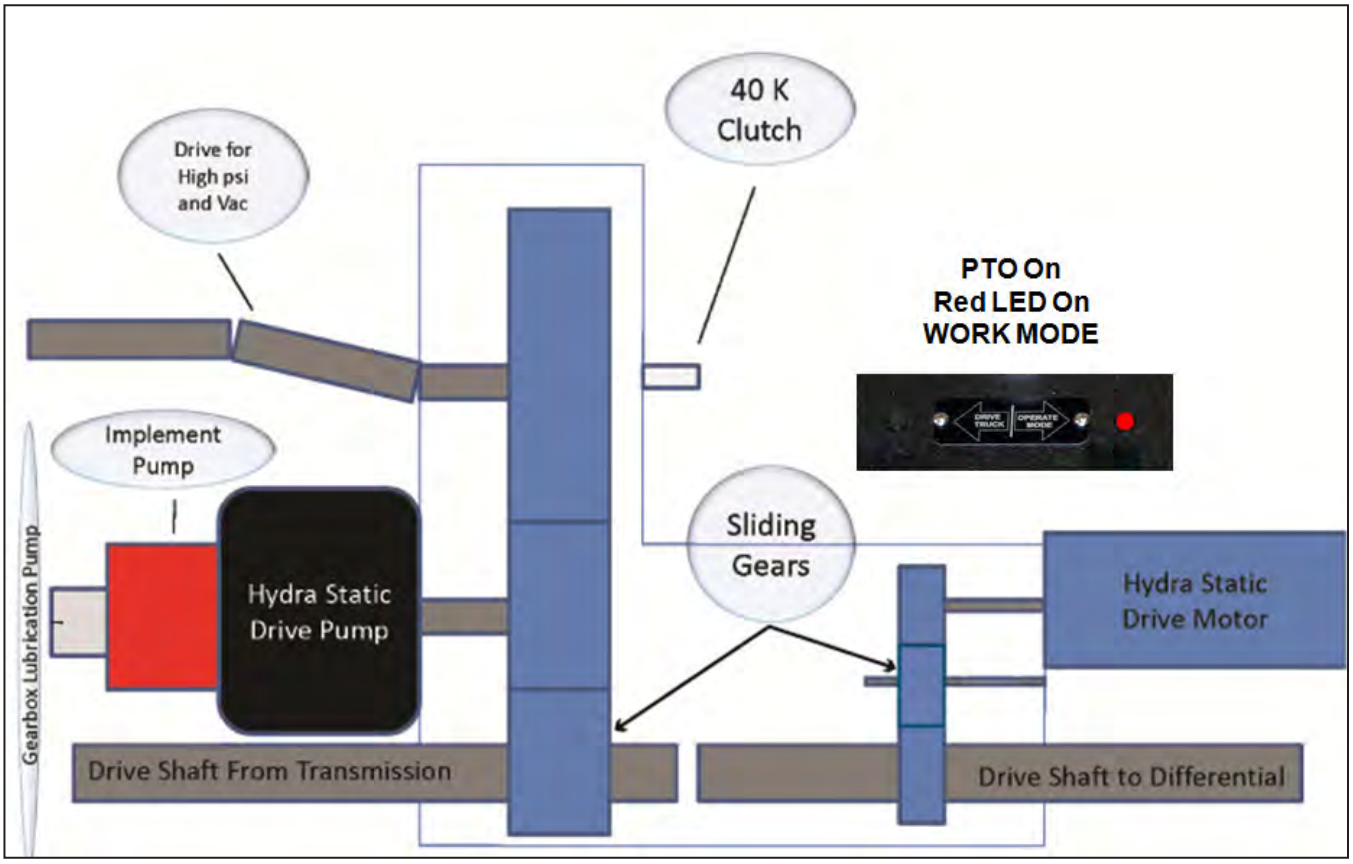


SH8000 Hydraulic System



PTO Engaged and Disengaged





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Foreman's Parts Box #2

SH8000 Order Form - 2008

Foreman's Parts Box #2

QTY	List $	Price Each	Line Totals	Part #	Description
	$ -		$ -	MP4024-005	Nozzles, High Cohesive, .005"
	$ -		$ -	MP4024-007	Nozzles, High Cohesive, .007"
	$ -		$ -	MP4024-009	Nozzles, High Cohesive, .009"
	$ -		$ -	MP4024-011	Nozzles, High Cohesive, .011"
	$ -		$ -	MP4024-013	Nozzles, High Cohesive, .013"
	$ -		$ -	MP4024-015	Nozzles, High Cohesive, .015"
	$ -		$ -	MP4034	Plug Assy, Recessed Allen Key
	$ -		$ -	MP4024-000	Plug, High Cohesive
	$ -		$ -	MP4024-000B	Plug, High Cohesive 7/16"
	$ -		$ -	MP2253	Seal, Swivel Shaft
	$ -		$ -	MP1008	Seal, Brass Button
	$ -		$ -	FT38hpx5mm	3/8" HP x 5 mm Adapter(for Hog Head)
	$ -		$ -	FT38hpx78	3/8" HP x 7/8 Type M Adapter (or hog head)
	$ -		$ -	FT916hpx78	9/16" HP x 7/8 Type M Adapter(dump valve)
	$ -		$ -	FT916hpx5mm	9/16" HP x 5mm Type M Adapter(dump valve)
	$ -		$ -	FT78hpx78c	7/8" HP Type M Connector(for tractor hose)
	$ -		$ -	FT916hpxPLUG	Plug Stub, 9/16" HP
	$ -		$ -	FT916hpxGLNDNUT	Gland Nut, 9/16" HP
	$ -		$ -	MP1020-06-14	6" 14 Nozzle Spray Bar
	$ -		$ -	MP1020-08	8" 8 Nozzle Spray Bar
	$ -		$ -	MP1020-0816	8" 16 Nozzle Spray Bar
	$ -		$ -	MP1020-1016	10" 16 NozzleSpray Bar
	$ -		$ -	MP1020-14	14" Spray Bar
	$ -		$ -	MP1020-1430	14" 30 Nozzle Spray Bar
	$ -		$ -	MP1025-06-14 Assy	6" 14 Nozzle Spray Bar Protector
	$ -		$ -	MP1025-08 Assy.	8" 8 Nozzle Spray Bar Protector
	$ -		$ -	MP1025-0816 Assy.	8" 16 Nozzle Spray Bar Protector
	$ -		$ -	MP1025-1016 Assy	10" 16 Nozzle Spray Bar Protector
	$ -		$ -	MP1025-14 Assy	14" Spray Bar Protector (Set of 2, Left & Right)
	$ -		$ -	MP1025-1430Assy	14" 30 Nozzle Spray Bar Protector (set of 2)

Stripe Hog Spare Parts Package Parts Box # 1

				Part #	Description
	$ 25.00		$ -	T-8810	3/8-24 standard tap
	$ -		$ -	1128846	6/32 x 2" screw
	$ -		$ -	HD4025-200	2" Cotter Pin
	$ -		$ -	62518	4 oz. Anti-seize Lubricant
	$ -		$ -	HD4000-12WH	Wheel, Rubber w/Steel Inner 4"
	$ -		$ -	HD4000-12-STEEL	Wheel, Steel 4"
	$ -		$ -	HD4000-06WHRB	Wheel, Rubber 6"
	$ -		$ -	HD4000-12WHRB	Wheel, Rubber w/Steel Inner 4"
	$ -		$ -	HD6000-12-STEEL	Wheel, Steel 6"
	$ -		$ -	STY1025C	Seal, Raceway for 10" Caster
	$ -		$ -	STY1025C-1-8-4	Caster, 10" Assy, w/ seal
	$ -		$ -	HD4000-12-10	Wheel, 10" with mold on rubber
	$ -		$ -	MP4000-11	Plate, Caster, Front
	$ -		$ -	MP4000-09	Plate, Caster, Rear
	$ -		$ -	MP4000-DBL	Plate, Caster, Double
	$ -		$ -	Brush 10" Assy.	Brush Assy. 10" Shroud

Foreman's Parts Box #2

	$ -		$ -	Brush 14" Assy	Brush Assy. 14" Shroud
	$ -		$ -	SM9001-10	Shroud, 8-10"
	$ -		$ -	SM9001-14	Shroud, 14"
	$ -		$ -	T-6452	Tool, Swivel Seal Removal
	$ -		$ -	MP6504	Nut, Swivel
	$ -		$ -	MP6524	Adapter, Swivel Seal
	$ -		$ -	MP2752	Ring, Brass Backup
	$ -		$ -	MP2010	Assembly, Swivel Shaft (w/bearings)
	$ -		$ -	MP10025S	Housing, Swivel
	$ -		$ -	BR1001	Seal, Upper Swivel Shaft Water
	$ -		$ -	BR1002	Bearing, Upper Swivel Shaft
	$ -		$ -	MP1001	Shaft, Swivel
	$ -		$ -	50105-001	Tip, Thru Shaft, Swivel, Hoghead
	$ -		$ -	283807ADL-VITON	Seal, 28 x 38 x 7mm
	$ -		$ -	9396K113	O-ring, 2" x 21/8 x 1/16 width, silicone
	$ -		$ -	9396K21	O-ring, 9/16 x 11/16 x 1/16 width, Viton
	$ -		$ -	5154T69	Seal, 25 x 52 x 8mm
	$ -		$ -	203800ADL	Seal, 20 x 38 x 5mm
	$ -		$ -	315207 ADL	Seal, 31 x 52 x 7mm
	$ -		$ -	SH-GR	Swivel Shaft Grease - Mobil PolyRex EM
	$ -		$ -	SHBL-GR	Roots Blower Bearing Grease - Shell Darina SD 2
	$ -		$ -	BR1003	Bearing, Lower Swivel Shaft (thrust)
	$ -		$ -	BR1003R	Bearing, Lower Swivel Shaft (radial)
	$ -		$ -	BR4000-11	Seal, Cover Top, (Hog Head)
	$ -		$ -	MP4000-1T	Cover, Top
	$ -		$ -	HD4000-07	Bolt, Cover Top to Swivel Housing
	$ -		$ -	HD4000-04	Bolt, Cover Top to Housing Block
	$ -		$ -	BR1007	Ring,Snap, 1"
	$ -		$ -	BR1006-A	Key, Shaft, 1/4" x 3/4" Mod.
	$ -		$ -	MP4000-1A	Housing, Block
	$ -		$ -	BR1008	Pulley, Timing (Swivel Shaft)
	$ -		$ -	BR4000-12R1	Seal, Cover Bottom, (Hog Head)
	$ -		$ -	MP4000-1B	Cover, Bottom
	$ -		$ -	HD4000-06	Bolt, Cover Bottom to Housing Block
	$ -		$ -	MP1006	Ring, Deflector (dirt shield)
	$ -		$ -	MP1006FG-1	Gasket, Dirt Shield
	$ -		$ -	HD4000-08	Bolt, Hydraulic Motor to Housing Block
	$ -		$ -	HD4000-09	Washer, Lock, Hydraulic Motor to Housing Block
	$ -		$ -	HY113	Motor, Hog Head Rotation
	$ -		$ -	MP4000-18	Extender, Motor Shaft
	$ -		$ -	BR1006-A	Key, Motor Shaft Extender
	$ -		$ -	BR1004	Bushing, Taper Lock
	$ -		$ -	BR1005	Pulley, Timing (Hyd. Motor Shaft)
	$ -		$ -	BR4000-10K	Belt, Timing, 18" x 3/4"
	$ -		$ -	SH6008-P	Lube, Silicone (1 oz)
	$ -		$ -	T-8125	Tool, O-ring & Seal
	$ -		$ -	MP4046	Seat, Dump Valve
	$ -		$ -	MP4042	Pin, Dump Valve
	$ -		$ -	MP4049	Piston, Dump Valve
	$ -		$ -	MP4048	Tube, Dump
	$ -		$ -	HD4043	Spring, Dump Valve
	$ -		$ -	BR4045	O-ring, Dump Valve Pin
	$ -		$ -	BR4050	O-ring, seat
	$ -		$ -	K53476	Cartridge, Shut-off Valve (New tractor dump valve)
	$ -		$ -	K51865	Tube, Diffuser (New tractor dump valve)

JetStream Spare Parts Package

Qty	Part #	Description

Foreman's Parts Box #2

	$ -		$ -	K27485	Disc, Rupture, 50K
	$ -		$ -	K28616	Disc, Rupture 45K
	$ -		$ -	K54099	Sleeve, Brass Spacer, Stuffing Box #8
	$ -		$ -	K27482	Bushing, Carbide, Stuffing Box #8
	$ -		$ -	K26482	Seal, Stub Shaft Oil (Pony Rod)
	$ -		$ -	K26480	O-ring, Stub Shaft Seal Plate
	$ -		$ -	K53564	Plunger #8 Clamp Style
	$ -		$ -	K51737	Coupling, Plunger (brass)
	$ -		$ -	K54119	Packing #8 4240
	$ -		$ -	K53496	Valve, Uni
	$ -		$ -	K54144	Seal Kit, Univalve, 40K
	$ -		$ -	K54102	Nut, Gland
	$ -		$ -	K26465	O-ring, Gland Nut
	$ -		$ -	K53610	Catridge, Hydro-Throttle
	$ -		$ -	K53609	Seal, Hydro-Throttle Ring (White)
	$ -		$ -	K27533	Seal, Hydro-Throttle Ring (Black)
	$ -		$ -	K54100	Box, Stuffing
	$ -		$ -	K54126	Seal, Stuffing Box Face
	$ -		$ -	K53574	Plug, 40K Top Conn
	$ -		$ -	K27503	O-ring, Male Port
	$ -		$ -	K53726	Cartridge AY, 40K Bypass
	$ -		$ -	K25127	O-ring, Bypass Cartridge Large
	$ -		$ -	K53729	Ring, Bypass Cartridge Large Buna (white)
	$ -		$ -	K53593	Seal Ring (White), Fitting
	$ -		$ -	K27537	Seal Ring (Black), Fitting
	$ -		$ -	K27538	Retaining Ring, Fitting Seal
	$ -		$ -	K26523	O-ring, #8 Brass Spacer Sleeve
	$ -		$ -	K27505-2	Filter, Cartridge, 1 Micron
	$ -		$ -	K26767-1M	Filter Bag, 1 Micron Nominal
	$ -		$ -	K53476	Cartridge, Shut-off Valve
	$ -		$ -	K25194	O-ring, Shut-off Valve Cartridge Large
	$ -		$ -	K53468	Ring, Shut-off Valve Cartridge Large Buna (white)
	$ -		$ -	K25190	O-ring, Shut-off Valve Cartridge Small
	$ -		$ -	K53730	Ring, Shut-off Valve Cartridge Small Buna (white)
	$ -		$ -	K27522	Spring, Shut-off Valve Cartridge
	$ -		$ -	K51865	Tube, Diffuser
	$ -		$ -	K27489	Guage, 40K Pressure
	$ -		$ -	BC00M25P125	Fitting, Connector, 1/4" tube x 1/8" pipe thread

Spare Hoses

				Part #	Description
	$ -		$ -	HS-40K5mm-9	Hose, 5mm Type M x 9' No Cover
	$ -		$ -	HS-40K-5mm-11.5	Hose, 5mm Type M x 11.5' No Cover
	$ -		$ -	HS-40K-7/8-5C	Hose, 7/8" Type M x 5' 40K w/cover
	$ -		$ -	HS-40K-7/8-11C	Hose, 7/8" Type M x 11' 40K w/cover
	$ -		$ -	HS-40K-7/8-21C	Hose, 7/8" Type M x 21' 40K w/cover
	$ -		$ -	HS-40K-7/8-47-C	Hose, 7/8" Type M x 47' 40K w/cover

Vac/Tank Spare Parts Package

				Part #	Description
	$ -		$ -	P-120818	Filter, Pleated Polyester, Large, Single, Washable
	$ -		$ -	ST3000-Bag100	Bag, Dump/Filter, 100 micron for ST4100
	$ -		$ -		

Operations Manual

	$ -		$ -	SHMANUAL	Manual, Stripe Hog Operations/Maintenance

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SH8000 Maintenance Check Lists

Date _____

Mileage _____ Technician _____

PTO Hours _____

Fluids

__ **Engine Oil** – 15w/40 Synthetic

__ Checked / added

__ Changed oil / filter

__ **Automatic Transmission**

__ Checked / added

__ Changed oil / filter

__ **Hydraulic Fluid** - Type AV 68

__ Checked / added

__ Changed

__ **High PSI Pump** Oil-80/90 Gear Oil

__ Checked / added

__ Changed

__ **Engine Coolant**

__ Checked / added

__ Changed oil / filter

__ **Rear Drive Axle Differential**

__ Checked / added

__ Changed - 80 / 90 Gear Oil

__ **Front Drive Axle Differential**

__ Checked / added

__ Changed - 80 / 90 Gear Oil

__ **Power Steering**

__ Checked / added

__ Changed oil / filter

__ **Blower**

__ Changed Oil

__ Grease

__ **Gearbox**

__ Dexron III fluid / filter

__ 80 / 90 Gear Oil Left Side

__ 80 / 90 Gear Oil Right Side

SH8000 Maintenance Check Lists

Mechanical

__ **Hog Head**

- __ **Belts**
  - __ Checked
  - __ Changed
- __ **Hydraulic Motors**
  - __ Checked
  - __ Changed
- __ **Spray Bars**
  - __ Checked

__ **Drive Shafts** – <u>check for play</u>

- __ Main to Gearbox
- __ Secondary to Differential
- __ Third to Rearmost Axle
- __ Output to Pump / Blower
- __ PTO to Hydrostatic Pump

__ **Lights –** check for proper function

- __ Head Lamps
- __ Directionals
- __ Strobes and Work lamps

__ **Swivel Shafts**

- __ Checked
- __ Changed

__ **Charge Pump**

- __ Builds pressure
- __ Water Leaks
- __ Oil Leaks

__ **Gearbox**

- __ Shifts to Drive/Work Mode
- __ Clutch Disengages/Engages
- __ Filings on magnetic plug
- __ Leaks

__ **Dump Bed**

- __ Hydraulics Strong / Weak
- __ Action Fast / Slow

__ **High Pressure Hoses**

- __ Check for leaks

SH8000 Maintenance Check Lists

Mechanical (Cont'd)

__ **High Pressure Pump**

- __ Uni Valve wear
- __ Stuffing Boxes
- __ Splash Guards in place
- __ Belt Tension
- __ Oil Seals
- __ Plunger wear

__ **Blower**

- __ Belt Tension
- __ Filter
- __ Kunkle Valves
- __ Vacuum Hose
- __ Wok Seal

__ **Debris Tank**

- __ Door Seal
- __ Shut Off Ball / Basket
- __ Cage

__ **Clean Water Tank**

- __ Man Way
- __ Fill Valves

__ **Air System**

- __ Compressor building psi
- __ Lines (Leaks)
- __ Holding Tanks - Bleed
- __ Parking Brake Holding
- __ Psi holding while braking

__ **Electrical**

- __ Panels sealing
- __ All switches functioning
- __ All circuits functioning

__ **Hydraulics**

- __ Hoses - chafing / leaking
- __ Flows adjusted properly
- __ Cooling Fan

Recommended Tools and Supplies

LOCATION	Number	Item
Truck	1	Metal Clip Board
Tool Box	1	4” Needle Nose Pliers
Tool Box	1	Screw Drive Set – All Sizes – Phillips and Flat Blade
Tool Box	1	Medium Vise Grip Pliers
Tool Box	1	¼ & 3/8 Drive SAE / Metric Socket Set
Tool Box	1	12” Channel Lock Pliers
Tool Box	1	12” Crescent Wrench
Tool Box	1	14” Crescent Wrench
Tool Box	1	2 lb Rubber Hammer
Tool Box	2	¾” Combination Wrench
Tool Box	1	Metric Allen Wrench Set
Tool Box	1	SAE Allen Wrench Set
Tool Box	1	Ball Peen Hammer
Storage	1	Bottle Hand Cleaner
Truck	2	Duck Tape
Truck	1	Fire Extinguisher
Truck	1	First Aid Kit
Storage	1	Funnel
Storage	1	Gallon Engine Coolant
Storage	1	Gallon Motor Oil
Storage	1	Gallon Transmission Fluid
Storage	2	Grease Guns (each loaded with different grease)
Storage	1	Shell Darina Micro Gel Grease
Storage	1	Ultra Duty EP NLFI 2 – Multi-Purpose Grease
Storage	1	Hydrant Wrench
Storage	1	Jet Stream Tool
Storage	1	Jumper Cables
Storage	1	Measuring Wheel
Tool Box	1	25’ Measuring Tape
Truck	1	Paper Towels
Truck	1	Leather Gloves
Truck		Rain Coats for Crew
Truck	1	Road Atlas
Truck	20	Safety Ear Plugs
Truck	2	Pair Safety Glasses
Truck	2	Hard Hats
Truck	2	Safety Triangles
Truck	2	Safety Vests – DOT Class
Truck	1	Skip Counter
Truck	1	Tire Pressure Gauge
Truck	1	Window Cleaner
Storage	10	Zip Ties Large
Truck	2	Cans of Brake Cleaner

Technical Support

24 / 7 CUSTOMER SERVICE

- Waterblasting 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 Waterblasting 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 Waterblasting Technologies, Inc.
- 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 10AM Eastern Standard Time

CUSTOMER SERVICE HOT LINE - 772-223-7393
www.waterblastingtechnologies.com
www.stripehogsupport.com

Waterblasting Technologies, INC 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 WATERBLASTING TECHNOLOGIES, INC! FAILURE TO HEED THIS WARNING MAY RESULT IN DAMAGE TO COMPONENTS AND SEVERE INJURY OR DEATH!

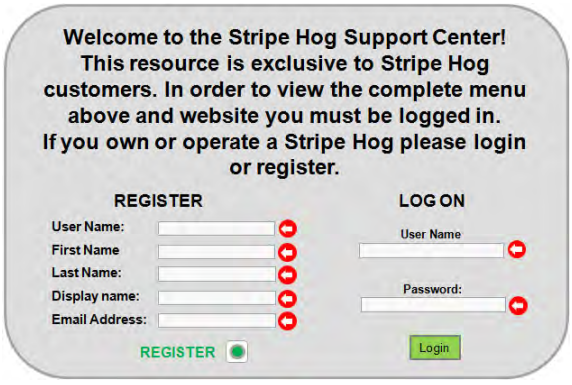
Stripe Hog Support Web Page

You are here Home

Mike Logout

VIDEO HELP

Typical Registration & Logon Window



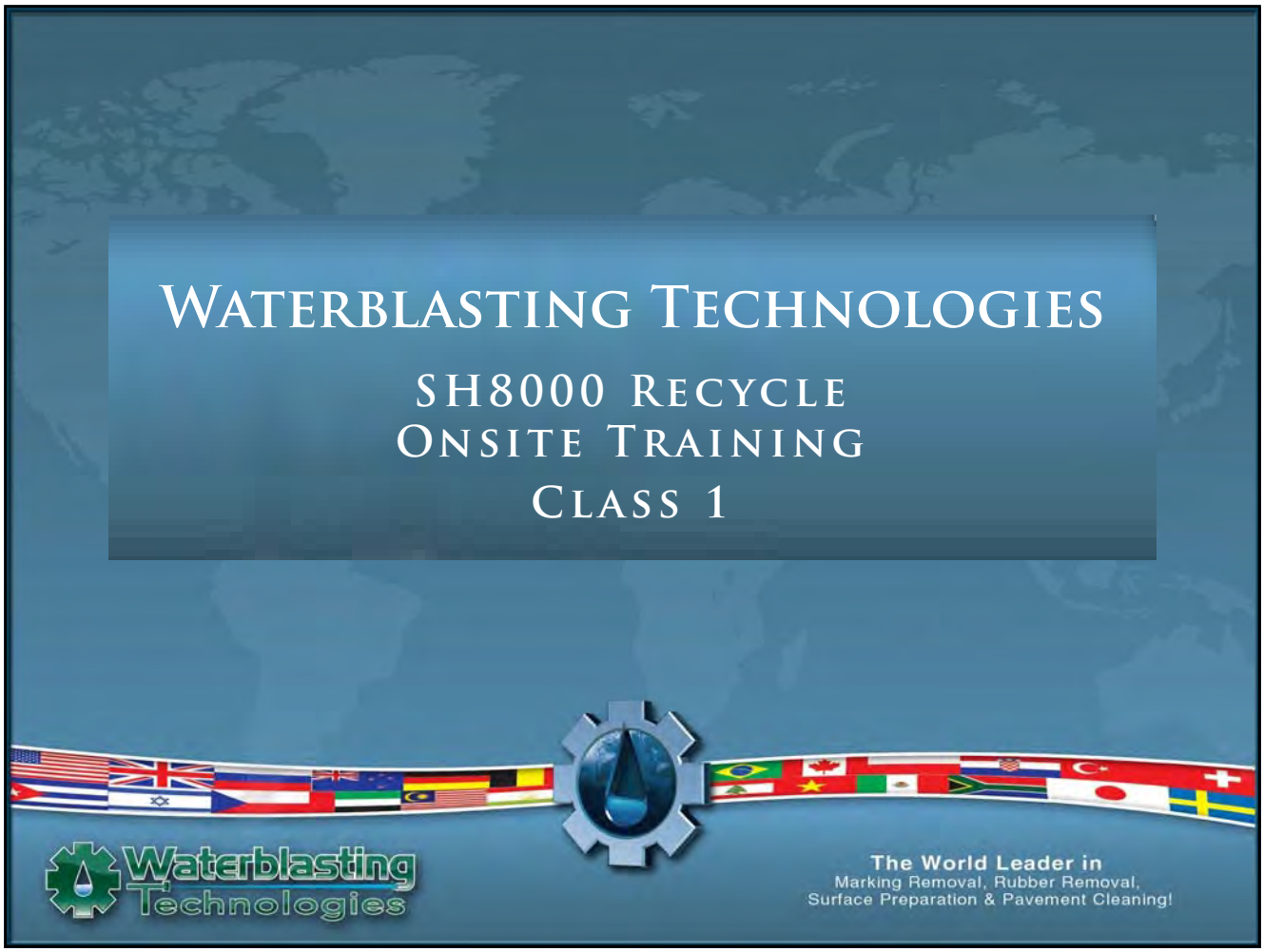
(001) 772-223-7393 This number that will find an available customer support representative 24/7.

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 Waterblasting 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!

I Home I Stripe Hog Training I Ambassador club I Marketing I Stripe Hog Store I Contacts I


WATERBLASTING TECHNOLOGIES
SH8000 RECYCLE
ONSITE TRAINING
CLASS 1
Waterblasting Technologies
The World Leader in
Marking Removal, Rubber Removal,
Surface Preparation & Pavement Cleaning!

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Waterblasting Technologies

SH8000
On Site Training

Training Topics

- Our Company
- Our Products
- SH8000 Components & Systems
- Operating Manual & Factory Support

Company History

Humble Beginnings – Contractor Built

Great Advancements

World Leader

- Contractor Built & Proven
- 12 gpm System
- Dual Blasting Heads
- Vacuum Recovery Standard
- Water/Debris Separation

Shrinking the Stripe Hog

SH8000 Leading the World

Waterblasting Technologies Today

Three Divisions

Waterblasting Technologies

Waterblasting.com

Sheet Metal Unlimited

Global Presence

Headquarters – Stuart, Florida

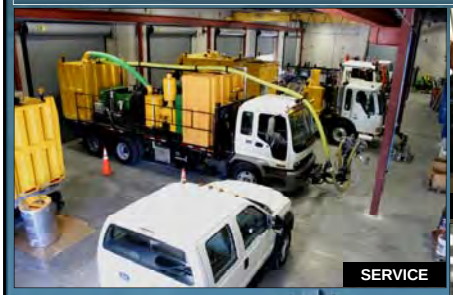
Manufacturing

Fabrication, Sheet Metal and Service

Waterblasting Technologies

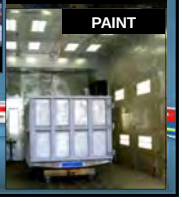
The World Leader in Marking Removal, Rubber Removal, Surface Preparation & Pavement Cleaning!

Sheet Metal Fabrication, Painting & Service



FABRICATION

PAINT



SERVICE

Waterblasting Technologies

The World Leader in Marking Removal, Rubber Removal, Surface Preparation & Pavement Cleaning!

Truck Models & Popular Options

Waterblasting Technologies

The World Leader in Marking Removal, Rubber Removal, Surface Preparation & Pavement Cleaning!

SH8000 Truck System

Waterblasting Technologies

The World Leader in Marking Removal, Rubber Removal, Surface Preparation & Pavement Cleaning!

SH5500 Truck System

Waterblasting Technologies

The World Leader in Marking Removal, Rubber Removal, Surface Preparation & Pavement Cleaning!

SH3000 Skid Mounted System

Waterblasting Technologies

The World Leader in Marking Removal, Rubber Removal, Surface Preparation & Pavement Cleaning!

Popular Optional Equipment

Blasting Tractor

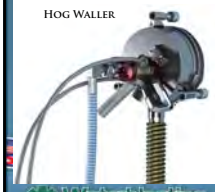
Walk Behind Spray Head

Handheld Spray Head

Popular Optional Equipment

Power Pack

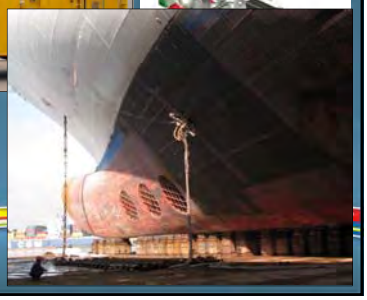
Hog Waller



Custom SH3000 Skid Mounted Units

Custom Containerized Units

Ship Blasting Robot



SH8000 Systems Overview

Systems Overview & Notes

SH8000 Systems Overview

LESSON	NOTES
1) Water and Recovery Tanks. a. Clean Water – CLEAN EROSION TO DRINK b. Debris , Solids and liquids Drain water each time you stop blasting Drain Water when more than ¾ full Empty all water storage before dumping – CLEAN & DIRTY	* Clean Water * Never * Empty all_____Before_____
2) Water System: a. Ultra High Pressure (UHP) Pump - Piston type - 40 kpsi Cannot draw its own water b. Charge Pump – Centrifugal type - 160 psi Serves water to UHP Pump – Driven by hydraulic motor c. Dump Valve – Releases pressure back to the Clean Water Tank d. Manual Bypass Valve – Provides for setting high psi at set engine rpm's with flows lower than 10 gpm e. Filters – Usually the cause of Low Charge psi 10 micron "NOMINAL" 1 micron "ABSOLUTE"	* High Pressure Pump Needs * Charge Pump * Dump Valve and Manual Bypass Valve * Filters
3) Hog Head: a. Arm – "Hog Arm" b. Blast Heads c. Spray Bar – "The Goose that Lays The Golden Egg"	* Hog Arm * Blast Heads * Spray Bar
4) Vacuum System a. Vacuum Blower – Casted Steel – CLOSE TOLERANCES – no FOD b. Filter Canister – Houses filter / drives the air - DRAIN OFTEN c. Kinkle Valves : Operates at 7 PSI	* Remember that vacuum * Vacuum Blower is a Positive Displacement fit pump, not meant to * Filter Canister * If the system
5) Control System – All controls are electric over a. Air – Switches Gearbox between Drive and Operate Modes b. Hydraulic – 3 pumps power the Drive Train, Implements & Circulation	* All operations * Electric Switches
5) Power System: a. Truck Engine – 415 hp b. Transmission – Allison c. Gear Box – allows two modes of operation: Drive Mode – Transport to and from worksite Work Mode – Hydra Static – Hydraulic Operations – UHP pump – Vac	* All operations * Transmission * Gear Box allows

Ultra High Pressure System

Clean Water Tank

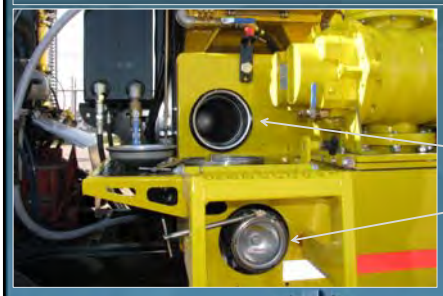
A Successful Process Begins with "Clean Water"

From Fire Hydrants

Charge Water Pump

- Airlocks
- Adjust charge pressure
- Pay attention to pump sounds
- Cavitation

Clean Water Filters

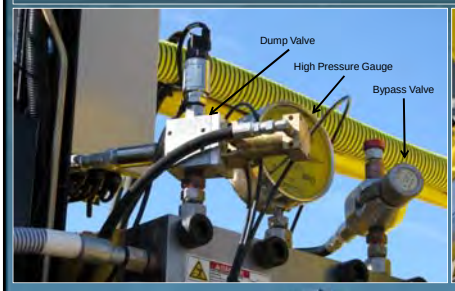


Monitor Charge Water Pressure

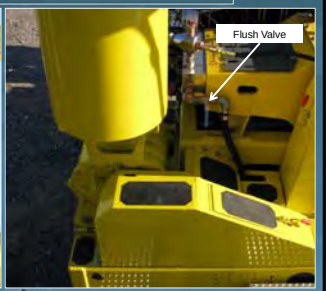
Never Below 40 PSI

Ultra High Pressure (UHP) Pump

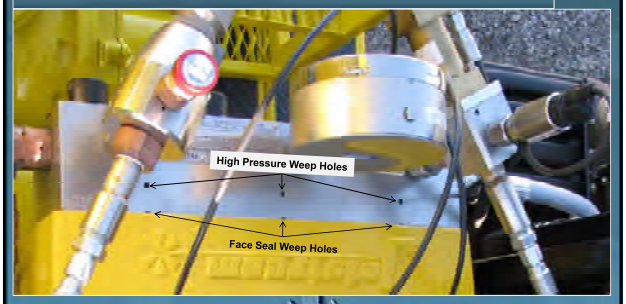
Dump Valve – Manual Bypass Valve – Rupture Disks



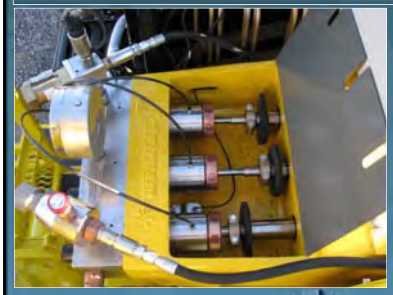
Packing Cooling Lines & Valves



UHP Pump Weep Holes



UHP Pump Packing Cooling Lines



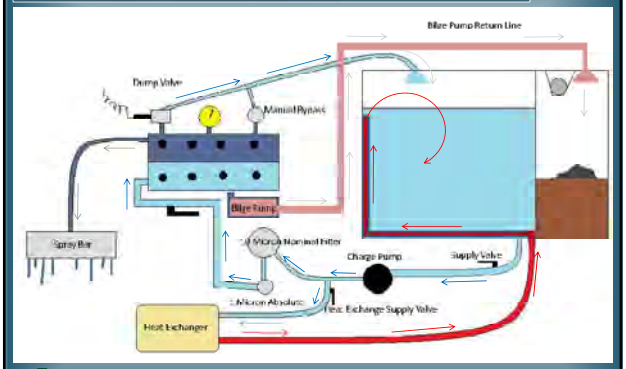
Too Much Flow Wastes Water

Improper Flow Damages Packing Seals

Bilge Pump

Filling the Clean Water Tank

SH8000 Pressure Water System

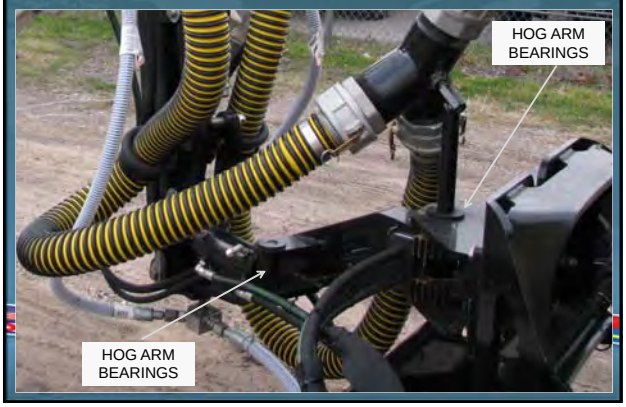


Hog Head

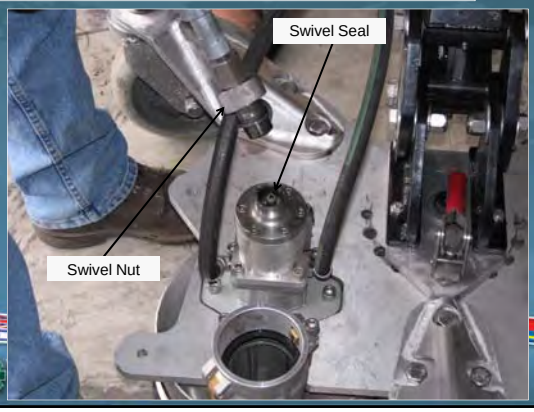
Hog Head

Hog Head & Arm Components

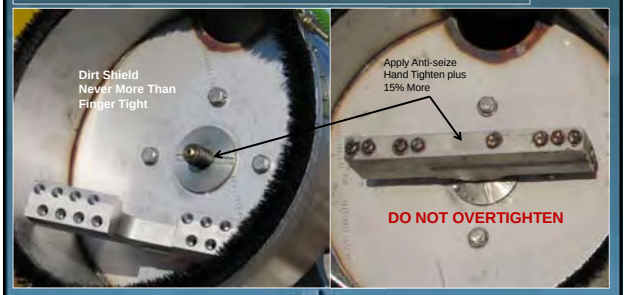
Hog Arm Bearings



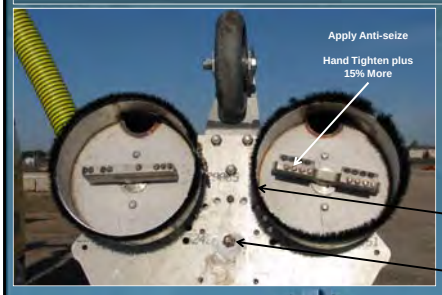
Swivel Nut and Seal



Spray Bar & Nozzles

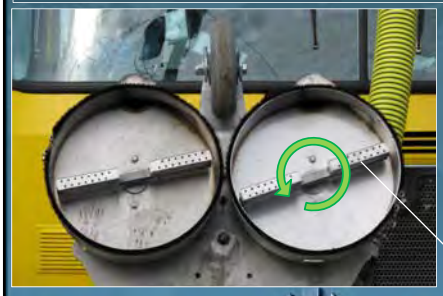


Hog Head Blasting Heads



- Galling Threads
- Avoid Cross Threading
- Start Carefully and Go Easy
- Hand Tighten Nozzles Plus 15% with Wrench
- **REMEMBER** – Never Over Tighten Nozzles

Spray Bar Shields

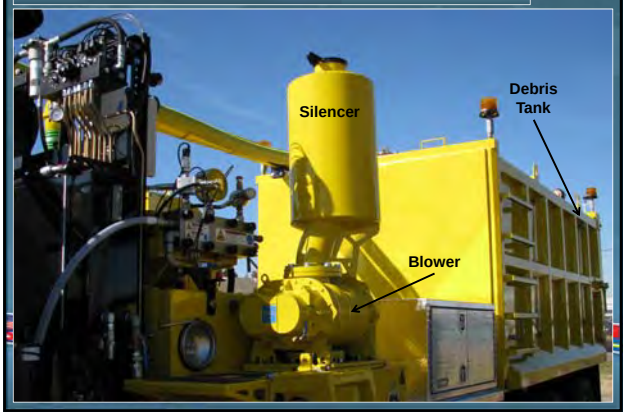


- Vortex
- Spray Bar Sizes
- Install Protectors Properly
- Wear Brush Function
- Wear Brush Adjustment & Replacement

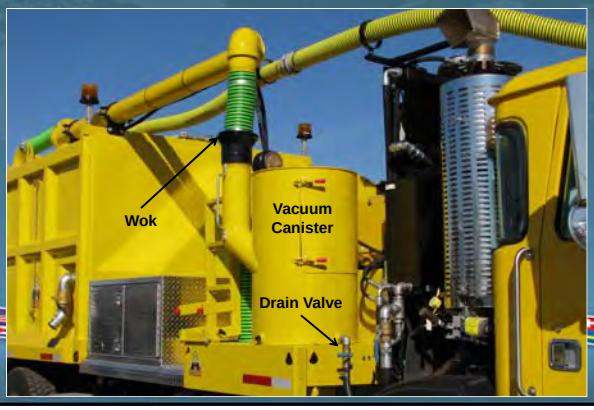
Joy Stick & Main Switch Console

Vacuum System

Vacuum Blower, Silencer, & Debris Tank



Vacuum Filter Canister, Drain Valve & Hoses

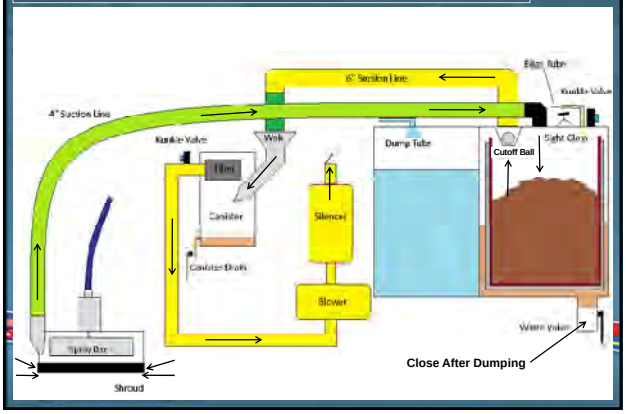


Vacuum Filter & Kunkle Valve

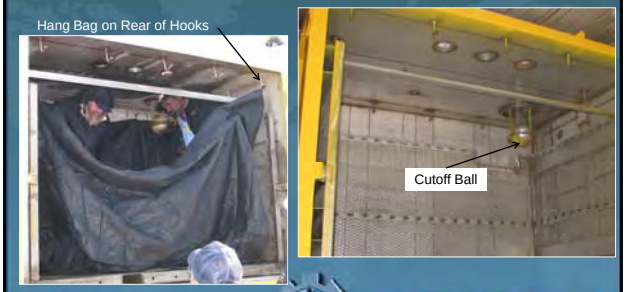
Vacuum System Gauge

Hog Head Vacuum Lines & Y-Connector

SH8000 Vacuum Recovery System



Recovery Tank & Debris Bag



Drain Tanks Before Dumping

WARNING

To reduce the possibility of the truck tipping while dumping, always drain the water from the debris & clean water tanks before raising the tanks to dump debris.

- Water Filtered to 100 Microns
- Close Waste Drain Valve when dumping is complete

DANGER

To avoid Severe damage to the truck or serious injury to personnel, always follow these guidelines before raising the tanks to dump debris:

- ✓ Drain all water from the clean water and debris tanks.
- ✓ Make sure the truck is on flat, solid ground. Never attempt to dump on soft ground or uneven terrain.
- ✓ Make sure there are no overhead power lines near the dumping area.
- ✓ Always secure the recovery door with the safety chain.
- ✓ Make sure the vacuum and water hoses are disconnected at the quick disconnects.
- ✓ Have all personnel stand well clear of the truck and recovery door. The operator should use the remote control and be well clear.
- ✓ Lift the unit slowly and monitor hoses and components as it is raised. Be prepared to immediately lower the unit if there is a problem.
- ✓ Never jerk the truck while dumping the debris. Jerking the truck is unsafe and can damage the truck and/or cause the tank fall.
- ✓ Secure the unit with the safety strut before entering the recovery tank or servicing any component.
- ✓ Lower the unit slowly when dumping operations are complete.

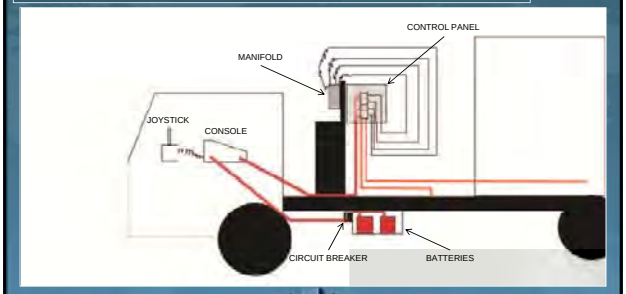
Hydraulic Dumping System

Recovery Tank Door & Seal System

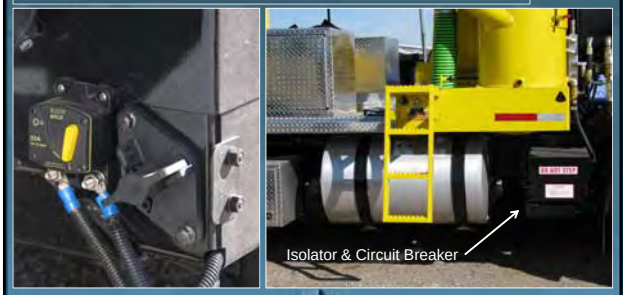
- Door Seal Memory
- Keep Seal Clean
- Use Vacuum to Assist in Clamping Door
- **IMPROPER CLOSING PROCEDURE WILL RESULT IN DAMAGE TO THE DOOR AND SEAL**

Electrical System

SH8000 Electrical System



Batteries, Main Circuit Breaker & Switch



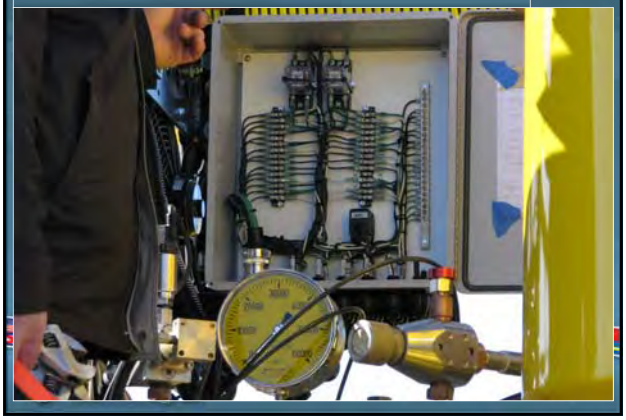
Joy Stick & Main Switch Console

Joy Stick & Main Switch Console

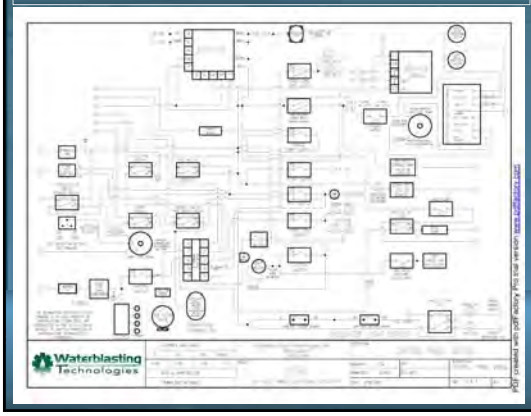
- 25 Wire Harness to main Terminal Box
- All wires are numbered

Fuse Panel

Main Terminal Panel

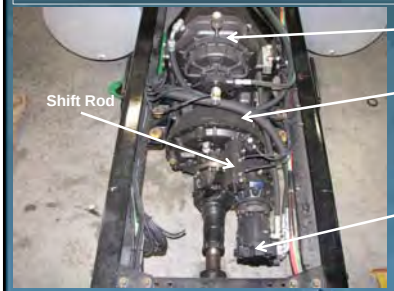


SH8000 Electrical System



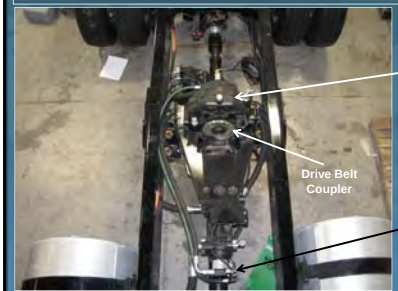
Hydraulic & Drive Systems

Omsi Drive Gear Box & Hydrostatic Drive

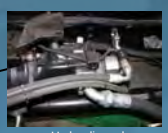


Hydrostatic Drive

Hydraulic Components & Cooling Pumps

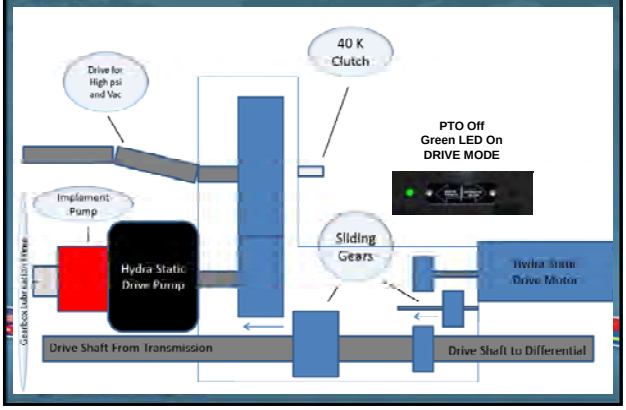


40 K Clutch

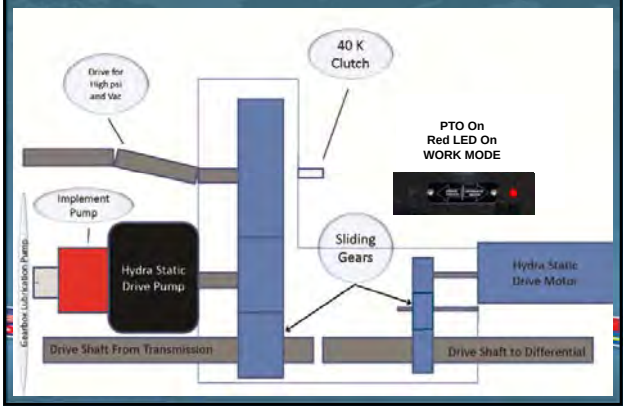


Hydraulic and
Gear Lubrication Pump

PTO & Hydraulic Pumps Disengaged

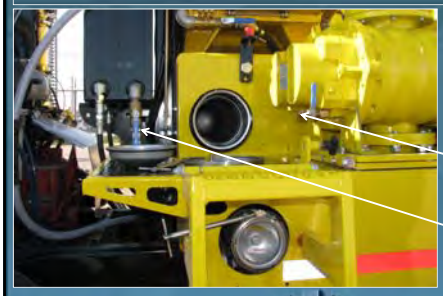


PTO & Hydraulic Pumps Engaged

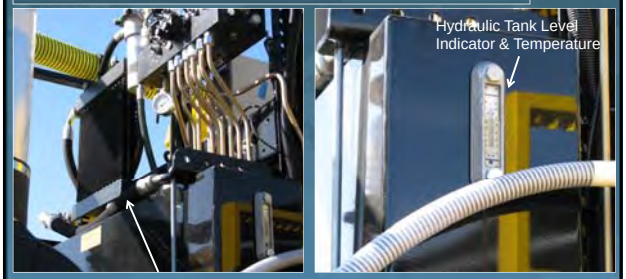


UHP Pump & Vacuum Blower Drive Belts

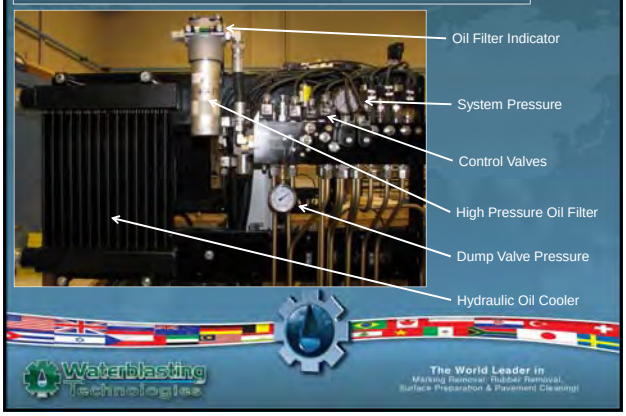
Blower Crankcase & Hydraulic Tank Drain Valves



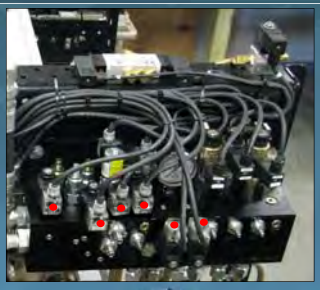
Hydraulic Oil Cooler, Oil Level & Temp



Hydraulic Oil Manifold & Cooler



Hydraulic Control Solenoids



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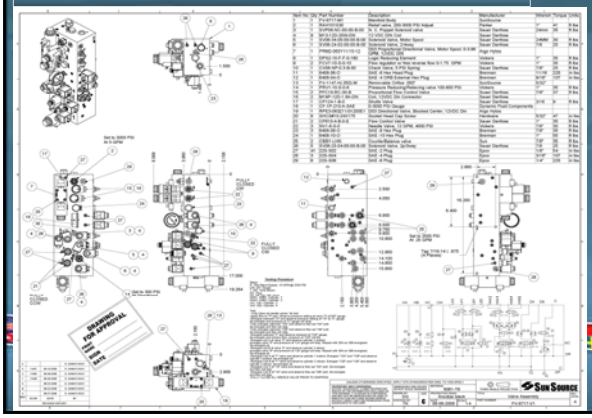
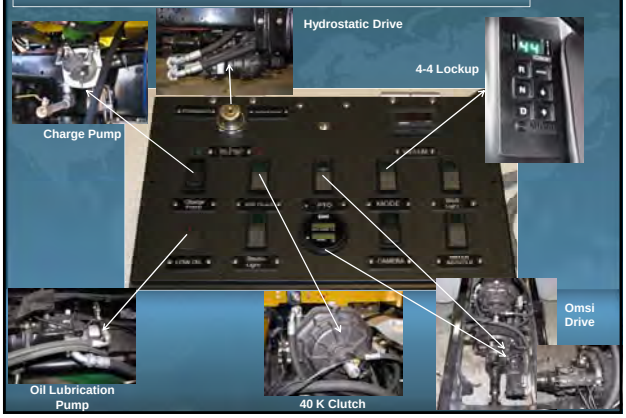
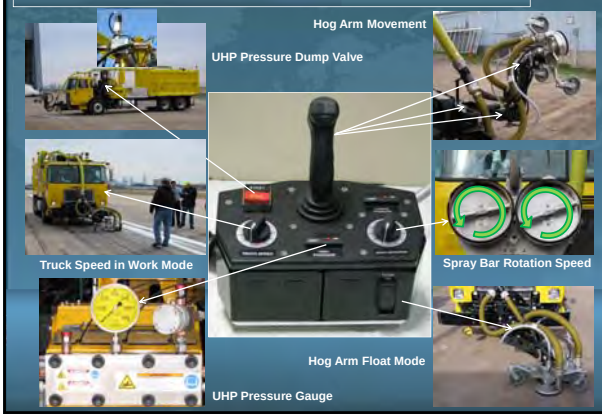
Hydraulic Manifold Schematic



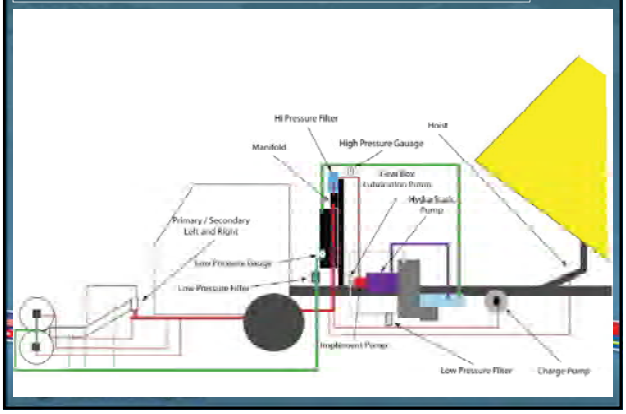
Transmission and PTO Controls



Joy Stick Controls



Hydraulic System Schematic



Operating Manual & Support

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Operating Manual / Cautions & Warnings

Waterblasting Technologies

SH4000/SH8000
Operations Manual

CAUTION

WARNING

DANGER

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Service Matrix & Lubrication Chart

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Technical Support & Parts

24 / 7 Customer Service

- Waterblasting 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 Waterblasting 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 Waterblasting Technologies, Inc.
- 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 10AM Eastern Standard Time.

Customer Service Hot Line 772-223-7393
www.waterblastingtechnologies.com
www.stripehogsupport.com

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Assembly Drawings & Part Lists

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Parts Department and Online Support

www.stripehogsupport.com

Logging on to www.stripehogsupport.com

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

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CLASS ONE
END
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SH8000
On Site Training
Class 2

Training Topics

- Review of Day One
- Update Overview Notes
- Dwell Time
- Nozzles
- Spray Bar Configurations

Day One Review

General Overview - Notes

SH8000 Systems Overview

LESSON	NOTES
1) Water and Recovery Tanks a. Clean Water ~~CLEAN ENOUGH TO DRINK~~ b. Debris - Solids and liquids Drain water each time you stop blasting Drain Water when more than ¾ full Empty **all** water storage before dumping – **CLEAN & DIRTY**	*Clean Water is the beginning of a successful job. Never accept surface water, reclaimed, or water from a tank you cannot verify cleanliness. *Never drain debris water into storm drains, streams, or otherwise standing water. Debris water meets USA EPA guidelines to drain alongside roads and right-of-ways. ***EMPTY ALL WATER CLEAN AND DIRTY BEFORE DUMPING THE BAG**
2) Water System a. Ultra High Pressure (UHP) Pump - Piston type < 40 kpsi Cannot draw its own water b. Charge Pump - Centrifugal type <60 psi Serves water to UHP Pump – Driven by hydraulic motor c. Dump Valve – Releases pressure back to the Clean Water Tank d. Manual Bypass Valve – Provides for setting High psi at set engine rpm's with flows lower than 10 gpm. e. Filters – Usually the cause of Low Charge psi 10 micron **"NOMINAL"** 1 micron **"ABSOLUTE"**	*Diameter of the plunger x the length of stroke x # of strokes per minute = volume of water displaced. PSI is obtained by restriction. Must be fed by 22 psi so it doesn't cavitate. See Wikipedia's free online definition. The HPP is protected from cavitating by a pressure switch that disengages it when the Charge psi drops to within 5 psi of cavitation. * The Charge Pump should never run more than 10 seconds at less than 50 psi *The dump valve is normally open and only closes to force water to the Hog Head. *The Manual Bypass is normally closed
3) Hog Head a. Arm – **"Hog Arm"** b. Blast Heads c. Spray Bar – **"The Goose that Lays The Golden Egg"**	*Hog Arm provides for positioning of the Hog Head. It MUST be in FLOAT MODE when on the ground *Blast Heads refer to the individual assemblies including the Swivel Shaft, Hydraulic Motor, Shroud, and Spray Bar. *Spray Bar must be continually adjusted for optimum performance.
4) Vacuum System a. Vacuum Blower – Carbon Steel – **CLOSE TOLERANCES** – no FUN b. Filter Canister – Houses filter / drain, the air - **DRAIN OFTEN** c. Kumble Valves - Operates at ~7 PSI	*Remember that Vacuum has no ability whatsoever to move debris. Airflow is the key to retrieving debris. *Vac Blower is a Positive Displacement Air Pump. Intolerable to Water or debris of any kind or size. *Three Carbon pins are placed the air before it enters the Blower. *If the system exceeds ~7 PSI performance begins to diminish.
5) Control System – All controls are electric over a. Air – Switches Gearbox between Drive and Operate Modes. b. Hydraulic – 3 pumps power the Drive Train, Implements & Circulation	*An operations are controlled and monitored from inside the cab. *Electric switches manipulate valves located on the Tree to enact hydraulic or Pneumatic pressure to the Implement.
5) Power System a. Truck Engine – 415 hp b. Transmission – Allison c. Gear Box – allows two modes of operation Drive Mode – Transport to and from worksite Work Mode – Hydra Static – Hydraulic Operations – UHP pump – Vac	*Using a single engine allows for much less maintenance and increased dependability. *Tried and proven Transmission *Gear Box allows the use of the Transmission to drive multiple operations; i.e. Hydraulic/Hydrostatic Pumps, 40 K Clutch. Has 3 separate fluids that need checked every day just like engine fluids.

Right Side Overview

Left Side Overview

Operator Required Knowledge & Maintenance

- The UHP Pump produces up to 12 gallons per minute according to its RPM's
- PSI is controlled by the quantity of nozzles, their sizes, and supplied GPM
- The Stripe Hog functions best between 34,000 and 38,000 psi / (2,344 – 2,620 bar)
- A loss of pressure is because of oversized, worn, or damaged nozzles, leaking seals or dirty filters
- Excellent removal is dependent on excellent nozzles
- Damage to the surface is because of improper DWELL TIME
- Debris removal is dependent on proper airflow at the blast head (ABH)
- ABH is limited by a dirty filter, leaking seals, damaged or blocked lines
- A properly maintained machine is the best antidote to downtime
- Cleanliness is always imperative

I Will

- Maintain my machine according to the Maintenance Matrix and Lubrication Chart
- Always work with appropriate nozzles, configurations and nozzle conditions
- Seek to master Dwell Time principles to affect 98% removal & no damage
- Call Waterblasting Technologies Support with any questions or problems
- Waterblasting Techonlogies Support is available 24/7 at: 011 – 772-223-7393

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Dwell Time

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Dwell Time Fundamentals

- Dwell time is the most counter intuitive dynamic of the stripe hog.
- Dwell time is critical to production.
- Mastering dwell time takes experience and a trained eye.
- The principles of dwell time should be applied to avoid undesirable impact to the surface and maximize productivity.

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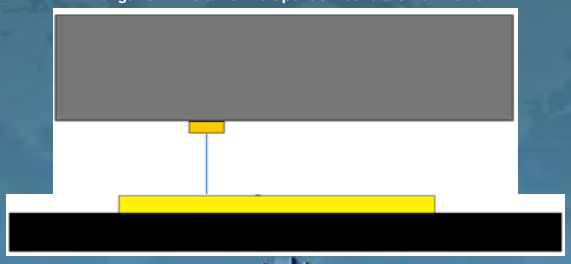
Dwell Time Is:

Length of Time a Nozzle Spends Above a Given Point



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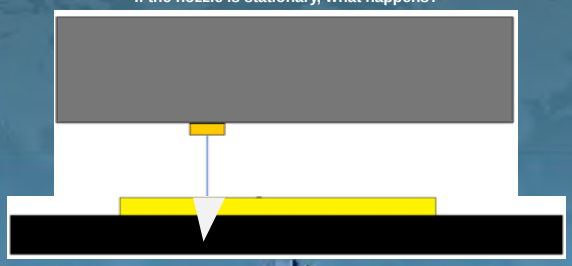
Stationary Nozzle @ 40 K PSI

If the nozzle is stationary, what happens?



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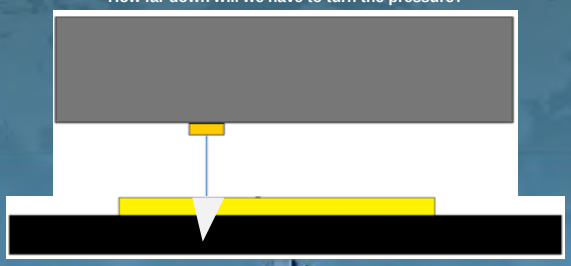
Stationary Nozzle @ 40 K PSI

How far down will we have to turn the pressure?



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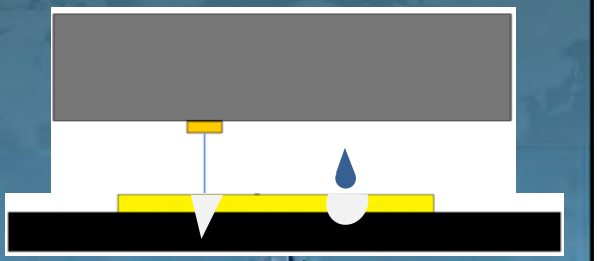
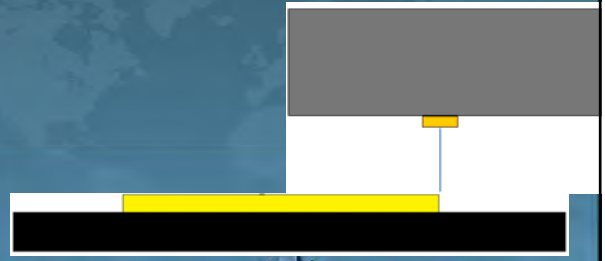
One Drop of Water

After 1000 YRS



Same Nozzle @ 40 K psi Moving @ 1000 mph

No Noticeable Affect



Damage is Not Caused By Pressure

Damage is Caused by Too Much

Dwell Time

Dwell Time Controls

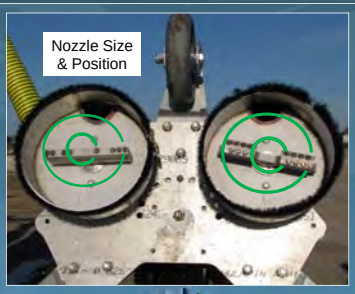
Dwell Time Control - Lateral Movements

Four Types

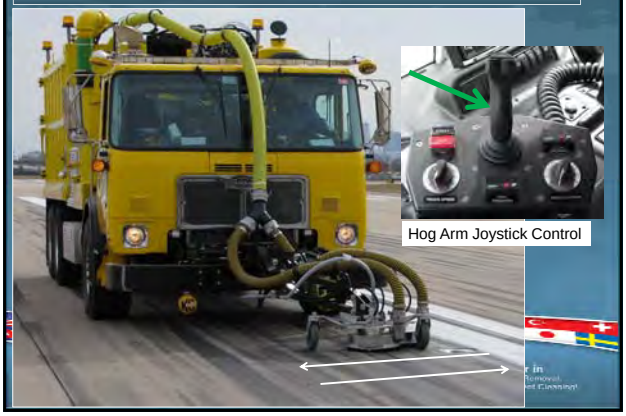
- Truck Speed
- Head Rotation Speed
- Hog Arm Movement – Left to Right
- Nozzle Size and Position

Dwell Time Control

Dwell Time Control



Dwell Time Control – Hog Head Left to Right

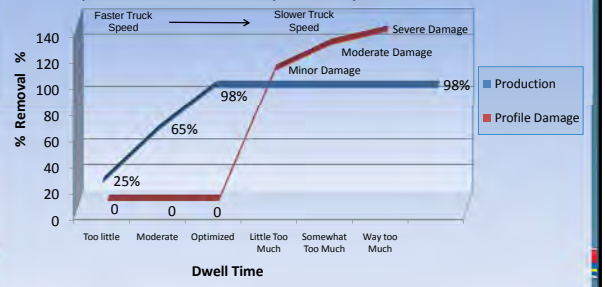


Hog Head and Truck Controls

Profitability, Quality and Production

Proper Dwell Time

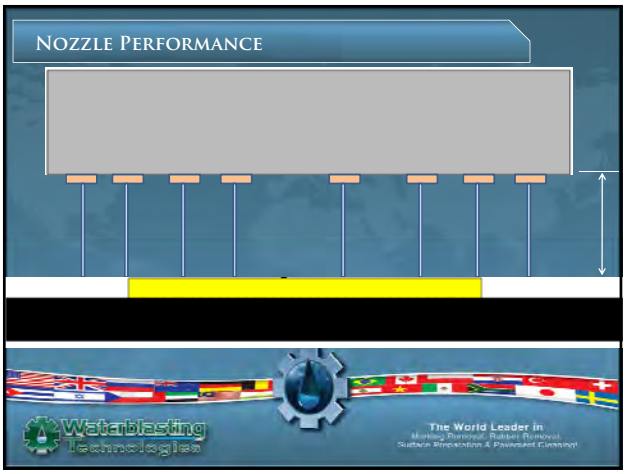
Optimizes Profitability, Quality and Production



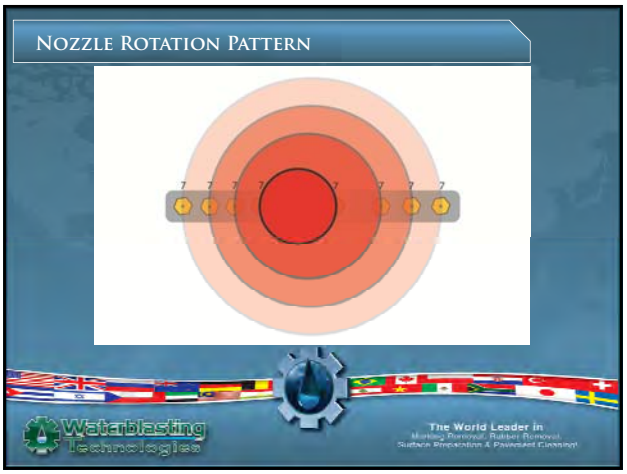
Nozzles And Spray Bars

Nozzle Size & Position

Nozzle Performance

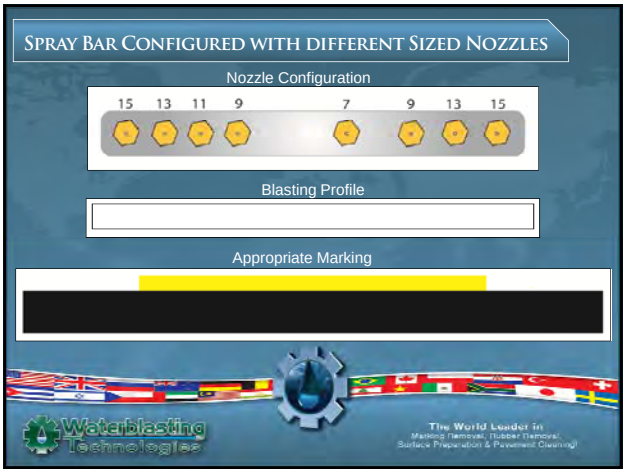


Nozzle Rotation Pattern

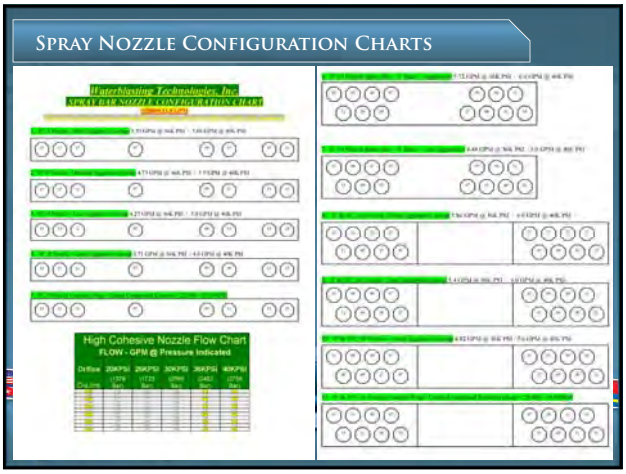


Pavement Marking Profile

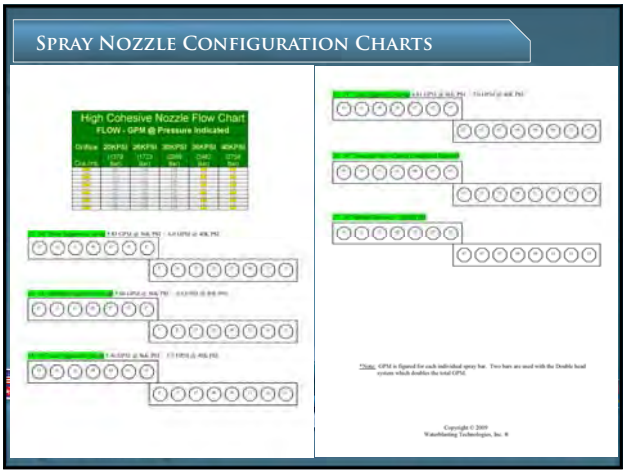
Spray Bar Configured with Different Sized Nozzles



Spray Nozzle Configuration Charts

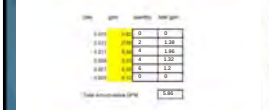


Spray Nozzle Configuration Charts

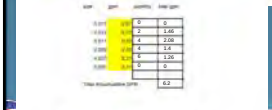


Nozzle Calculation Sheet & Flow Chart

36K Nozzle calculation sheet



40K Nozzle calculation sheet



High Cohesive Nozzle Flow Chart
FLOW - GPM @ Pressure Indicated

Orifice Dia /ins	20KPSI (1379 Bar)	26KPSI (1723 Bar)	30KPSI (2068 Bar)	36KPSI (2482 Bar)	40KPSI (2758 Bar)

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Nozzle Configuration Examples

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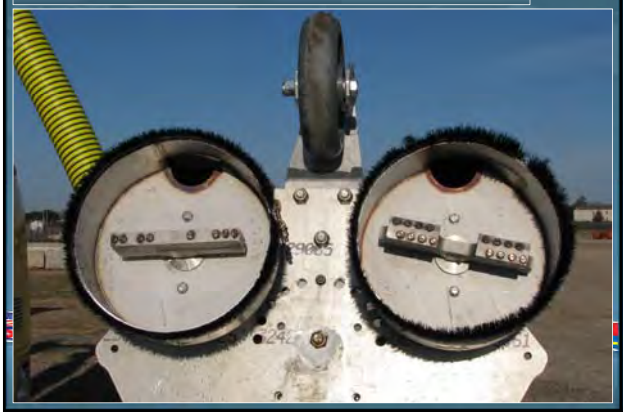
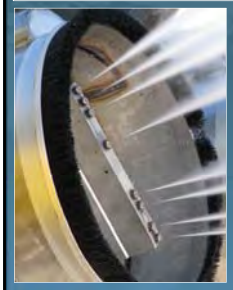
Nozzles Configuration Examples



Typical Cut – 8 Nozzle, Lead Spray Head



Typical 8 Nozzle Cut Profile – 1st Pass

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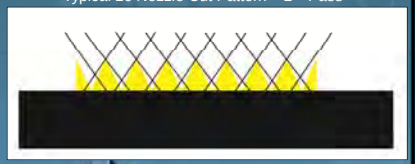
Typical Cut – 16 Nozzle 2ND Spray Head

Typical 16 Nozzle Cut Pattern – 2nd Pass



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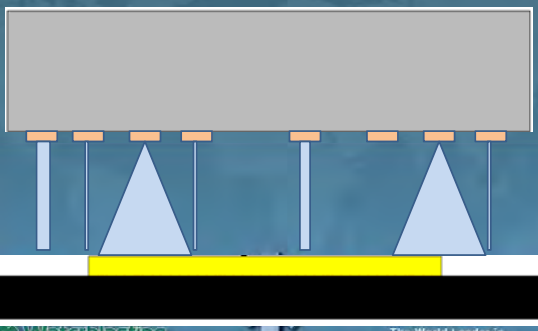
What is this telling you?



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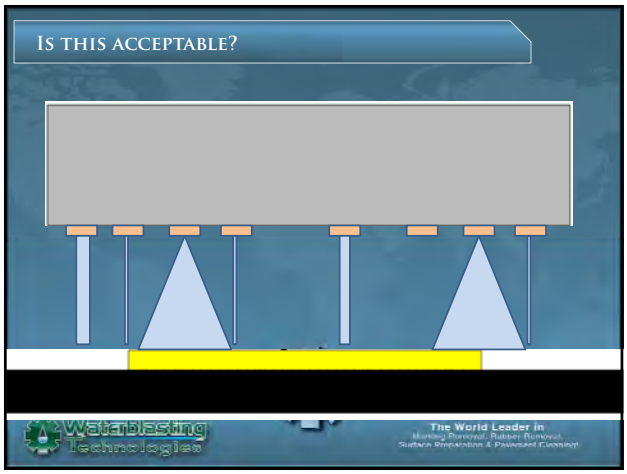
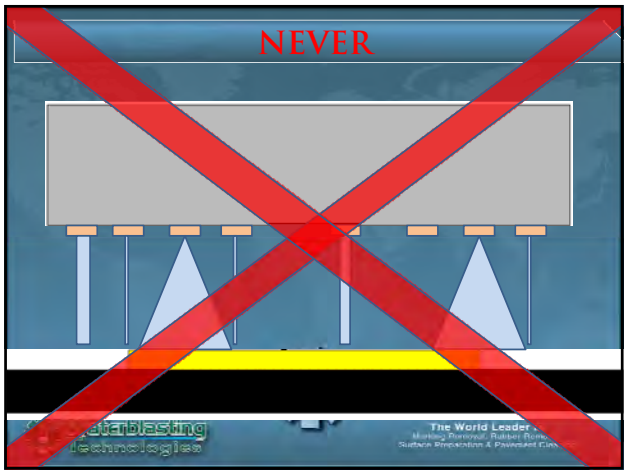
Is this acceptable?

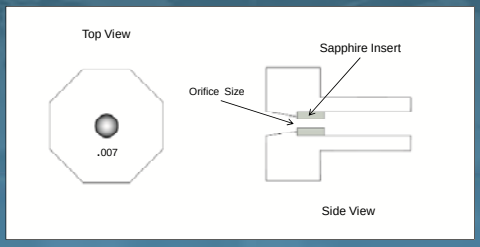


NEVER



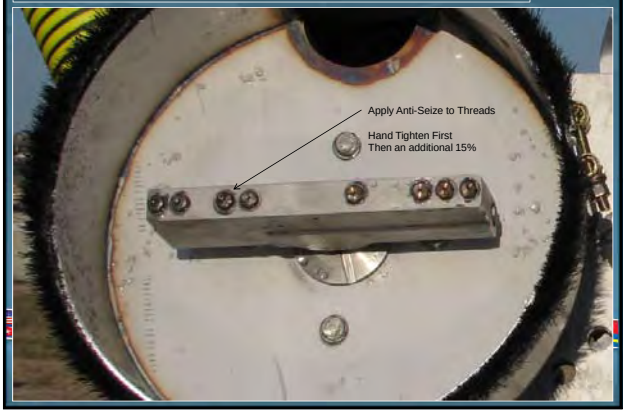
Nozzle Design Installation & Testing

Nozzle Design

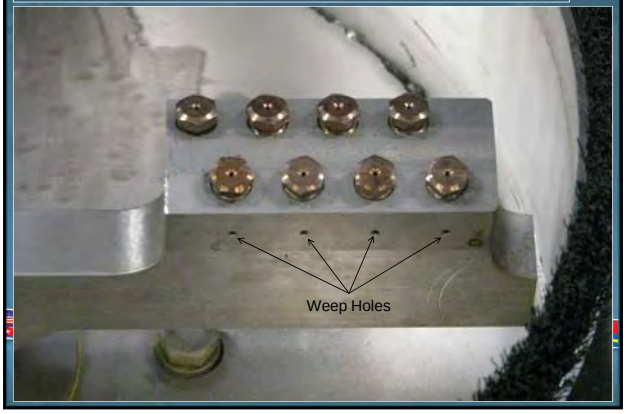


- Nozzles Size in .000 and Stamped on Nozzle
- Sapphire Insert and Orifice Size

Installing Nozzles



Spray Bar Nozzle Design & Features



Nozzle & Spray Bar Shields

Typical 16 Nozzle Spray Pattern

Typical 8 Nozzle Spray Pattern

8 Nozzle Pattern with Worn or Defective Nozzle

Truck Ready to Work

Class Two End

Waterblasting Technologies

SH8000
On Site Training
Class 3

Training Topics

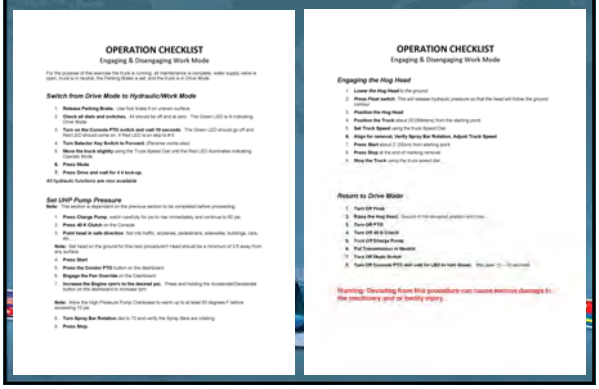
- Startup & Shutdown
- Lubrication Points
- Oil Sump Systems
- Maintenance Matrix

Startup & Shutdown Procedures

Pre-Start Inspection

1. Inspect all hoses for chaffing and signs of wear.
2. Check fuel level and make sure you have enough fuel for the shift.
3. Check truck systems and fluid levels. Refer to the truck operating manual.
4. Check the fluid level and temperature in the hydraulic system.
5. Check all water blasting and vacuum components for oil leaks, damaged or loose bolts and parts.
6. Inspect Hog Head and Arm for loose components and damage.
7. Check that all quick release pins on the ladders and ramps are in place, secure and in good condition.
8. Check vacuum canister for water and the vacuum filter. Drain water or clean filter as required.
9. Check the vacuum and UHP pump drive belt tension and alignment.
10. Check clean water tank level and fill if necessary.
11. Drain waste tank and check debris level. Empty if necessary.
12. Walk around truck and visually check all components and look for obvious problems.

Operation Checklist – Work Mode



OPERATION CHECKLIST
Engaging & Disengaging Work Mode

OPERATION CHECKLIST
Engaging & Disengaging Work Mode

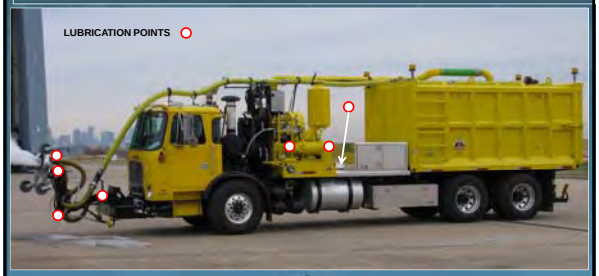
Freezing Conditions Shutdown

- Allow the vacuum blower to operate for a couple of minutes after shutting down the pressure and charge water pumps to clear waste water from hoses and dry out blower system.
- Make sure the clean water and waste tanks are drained immediately at the end of each shift.
- System hoses and Hog Head assembly should be drained of all water or filled with an anti-freeze solution. (non alcohol)
- For 40K UHP Pump and charge pump refer to pump manufacturer's procedures for maintaining equipment in freezing climates.
- Open the drain valve for the charge water hose and charge pump. Allow the water to drain. Activate the pump briefly and allow it to pump out any remaining water….about a cupful.
- 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 waste tank.
- Drain the vacuum canister immediately at the end of each shift.

Lubrication & Maintenance

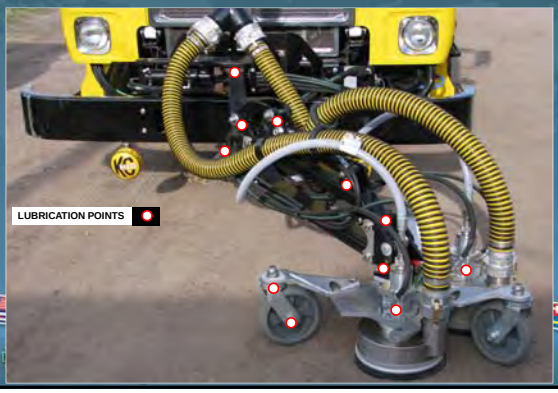
Lubrication Points & Grease Fittings

Primary Lubrication Points – Driver Side & Front



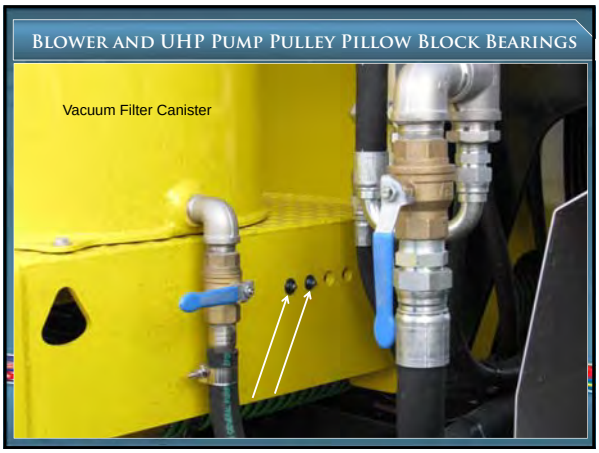
Blower Grease Fittings

Hog Head & Arm Grease Fittings

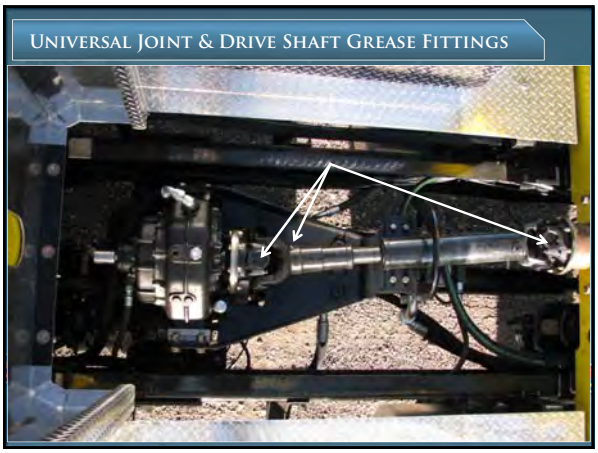


Primary Lubrication Points – Passenger Side

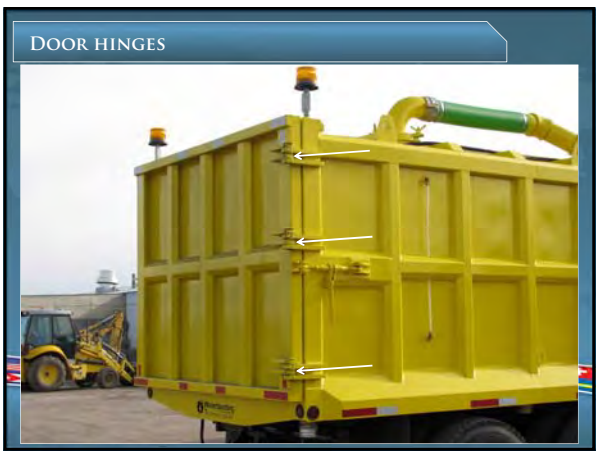
Blower and UHP Pump Pulley Pillow Block Bearings



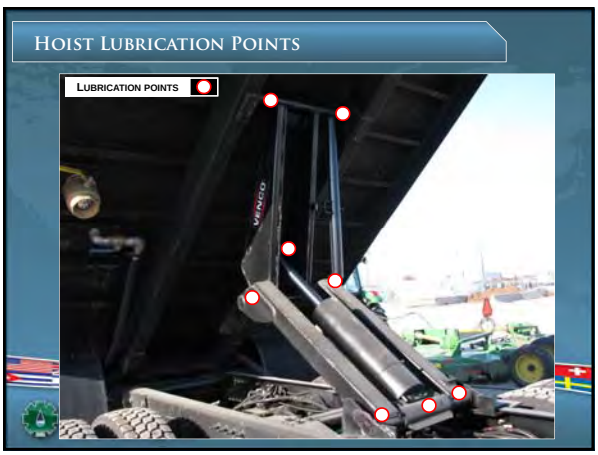
Universal Joint & Drive Shaft Grease Fittings



Door Hinges

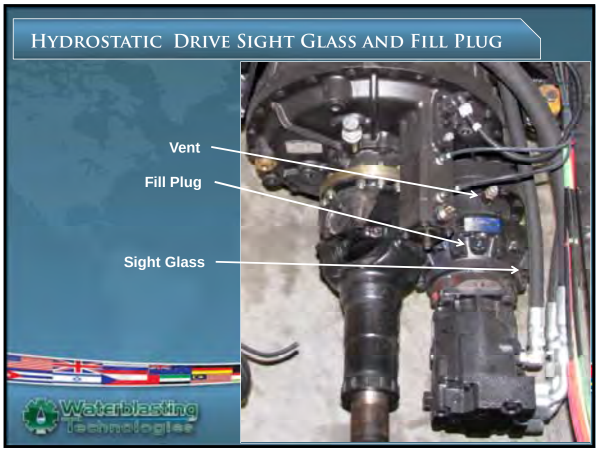


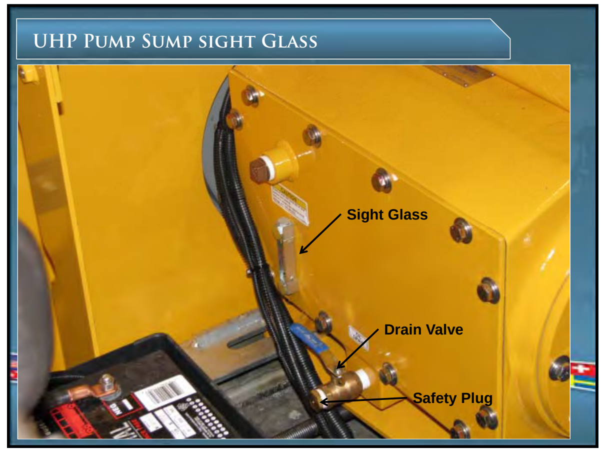
Hoist Lubrication Points

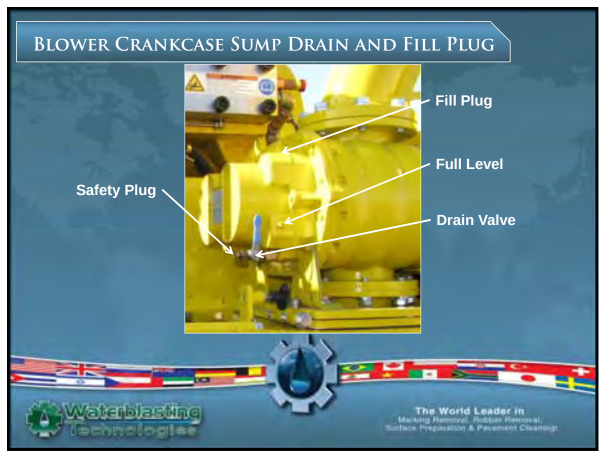


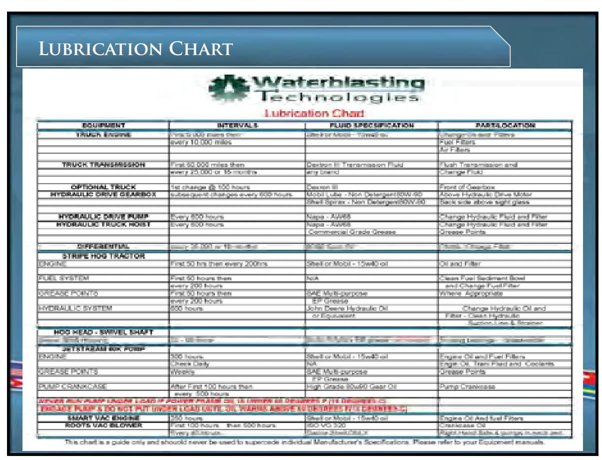
Oil Sump Systems

Omsi Drive Sight Glass and Fill Plug









Lubrication Chart

EQUIPMENT	INTERVALS	FLUID SPECIFICATION	PARTS/LOCATION
TRUCK ENGINE	[illegible] every 10,000 miles	[illegible]	[illegible] Fuel Filters Air Filters
TRUCK TRANSMISSION	First 50,000 miles then every 25,000 or 15 months	Dextron III Transmission Fluid any brand	Flush Transmission and Change Fluid
OPTIONAL TRUCK HYDRAULIC DRIVE GEARBOX	1st change @ 100 hours subsequent changes every 600 hours	Dexron III Mobil Lube - Non Detergent 80W-90 Shell Spirax - Non Detergent 80W-90	Front of Gearbox Above Hydraulic Drive Motor Back side above sight glass
HYDRAULIC DRIVE PUMP	Every 600 hours	Napa - AW68	Change Hydraulic Fluid and Filter
HYDRAULIC TRUCK HOIST	Every 600 hours	Napa - AW68	Change Hydraulic Fluid and Filter
		Commercial Grade Grease	Grease Points
DIFFERENTIAL	[illegible]	[illegible]	[illegible]
STRIPE HOG TRACTOR			
ENGINE	First 50 hrs then every 200hrs	Shell or Mobil - 15w40 oil	Oil and Filter
FUEL SYSTEM	First 50 hours then every 200 hours	N/A	Clean Fuel Sediment Bowl and Change Fuel Filter
GREASE POINTS	First 50 hours then every 200 hours	SAE Multi-purpose EP Grease	Where Appropriate
HYDRAULIC SYSTEM	500 hours	John Deere Hydraulic Oil or Equivalent	Change Hydraulic Oil and Filter - Clean Hydraulic Suction Line & Strainer
HOG HEAD - SWIVEL SHAFT			
[illegible]	[illegible]	[illegible]	[illegible]
JETSTREAM 60K PUMP			
ENGINE	500 hours	Shell or Mobil - 15w40 oil	Engine Oil and Fuel Filters
	Check Daily	N/A	Engine Oil, Trans Fluid and Coolants
GREASE POINTS	Weekly	SAE Multi-purpose EP Grease	Grease Points
PUMP CRANKCASE	After First 100 hours then every 500 hours	High Grade 80w90 Gear Oil	Pump Crankcase
NEVER RUN PUMP UNDER LOAD IF POWER FRAME OIL IS UNDER 60 DEGREES F (15 DEGREES C)			
ENGAGE PUMP & DO NOT PUT UNDER LOAD UNTIL OIL WARMS ABOVE 60 DEGREES F (15 DEGREES C)			
SMART VAC ENGINE	250 hours	Shell or Mobil - 15w40 oil	Engine Oil And fuel Filters
ROOTS VAC BLOWER	First 100 hours then 500 hours Every [illegible]	ISO VG 320 [illegible]	Crankcase Oil Right Hand Side & [illegible]

This chart is a guide only and should never be used to supercede individual Manufacturer's Specifications. Please refer to your Equipment manuals.

Maintenance Matrix

Waterblasting Technologies
System Maintenance Matrix

EQUIPMENT	PART	SERVICE	INTERVAL
HOG HEAD	Wheels	Grease wheels & casters	Weekly (as needed)
	Swivel Shaft	Dis-assemble to inspect bearings and upper swivel housing water seal, replace if necessary, repack lower bearings with Polyflex EM grease	60 - 80 hours
	Swivel Seal	Monitor and change when leaking	12 - 20 hours
Spray Bar / Nozzles	Nozzles	Inspect daily & change when jets are worn and no longer needle sharp	12 - 22 hours
	Spray Bar	check nozzle seats for damage	Every nozzle change
High Pressure Hoses	40K Hose	Check for leaks in fitting or hose jacket	Daily
Hog Arms	[illegible]	[illegible]	[illegible]
	Main Arm Gear	Grease	As needed
Jetstream 40K Pump	Gland Nut	Check tightness before operation	Daily
	Water Lube	Check for proper water flow/lube	Daily
	Water Filters	Check pressure often	Change if pressure is lower than 25 PSI
	Packings	Check for water squirting from rear of gland nut	Every 2 hours - change immediately when leaking
	Valves	Remove valves, inspect and lap seats	Every 100 hours
	Pulsation (in gauge or hoses)	Watch for pulsation in system - determine cause and complete repair	as often as possible during operation
	Pump Crankcase	Gear Oil level / condition	First 100 hours then every 500 hours
System Drive Train	System Drive Shafts	Grease u-joints	Weekly
	Pillow Block Bearings	Grease	Weekly
Roots Vacuum Blower	Blower Crankcase Oil	[illegible]	First 100 hours then every 500 hours
	Blower Drive End Bearings	Grease	Daily
	Idler Pulley Bearing	Grease	Weekly (as needed)
Hydraulic Systems	Truck Hydraulic System	Check fluid level - add as needed	Weekly
	Tractor	Check fluid level - add as needed	Weekly

UHP Pump & Blower Drive Belts

UHP Drive Belts & Belt Tension

Technical Support & Parts

24 / 7 Customer Service

- Waterblasting 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 Waterblasting 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 Waterblasting Technologies, Inc.
- 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 10AM Eastern Standard Time.

Customer Service Hot Line 772-223-7393
www.waterblastingtechnologies.com
www.stripehogsupport.com

SH8000 Stripe Hog

Class Three End

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INTENTIONALLY

Waterblasting Technologies

SH8000/SH8000T Operations Manual

40,000 PSI Stripe Hog® Waterblasting System

We would like to extend to you our “Thank You” for choosing a Stripe Hog™!

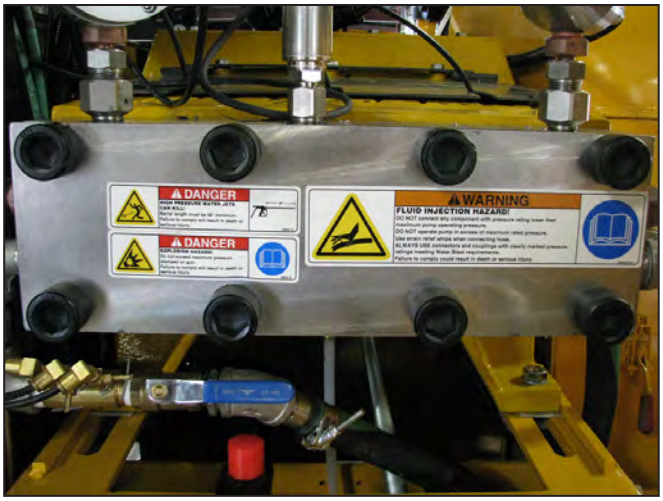
Please take the time to read this operations manual before attempting to operate your waterblasting system. This manual is an important aid in the operation and maintenance of your new equipment. The information is intended as a guide and cannot cover every question you may have about your Stripe Hog and every operating situation. We encourage you to contact Waterblasting Technologies, Inc.® for any additional information you might need. We provide first class support to our customers for all of the equipment we sell. Additionally, we maintain a well stocked inventory of parts and accessories in addition to technical staff with the experience to satisfy all of your support questions. Please contact us for all of your support issues and questions toll-free at (877) 964-7312 and on-line at www.waterblastingtechnologies.com or www.stripehogsupport.com.

Safety

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

Major Component Operation Manuals

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



Caution and Warning Labels on High Pressure Pump

Water Filter Warning Label

REMEMBER - IT IS YOUR RESPONSIBILITY TO ENSURE THAT YOUR EQUIPMENT IS SAFE FOR YOU AND YOUR CREW. ALWAYS EXERCISE GOOD COMMON SENSE WHEN INSTALLING OR REPAIRING EQUIPMENT AND WHILE OPERATING THE STRIPE HOG.

Warranty

The Waterblasting Technologies Limited Warranty Statement is included with this manual. It has been written to be clearly stated and easily understood. If you have any questions after reading the warranty, please contact the Customer Service Department.

Waterblasting Technologies, truck and tractor manufacturers, engine manufacturers, and the suppliers of major components maintain their own manufacturer's warranty and service facilities. Waterblasting Technologies automatically validates your warranty at the time of purchase and does not require a warranty registration card. However, the manufacturers of some major components require a completed warranty registration card to validate their warranty. It is important that you properly complete any warranty registration cards included with your Stripe Hog and mail them back to the manufacturer to register your ownership. This should be done within 15 days of the date of purchase and before the unit is put into service.

IMPORTANT:

The terms and conditions of the Waterblasting Technologies Limited Warranty are outlined in the warranty statement included with this manual. The manufacturer will automatically honor the warranty to the original purchaser for 15 days from the date of purchase. However, during that 15 day period, owners must comply with the steps outlined in the warranty statement to validate their warranty.

All manufacturers are required by the US Government to notify first time owners in the event any defect is discovered "which creates a substantial risk of personal injury to the public." ***It is essential that we have your warranty registration card complete with your name and mailing address in our files so that we can comply with the law if it should become necessary.***

Waterblasting Customer Service will assist you in filling in the serials numbers and other data required on your registration card if you experience difficulty. Your Warranty Registration Card will be added to our permanent files.

Product Changes

Waterblasting Technologies, Inc.® 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. Waterblasting Technologies, Inc.® reserves the right to make changes at anytime, without notice, in colors, materials, equipment, specifications, and models.

If you have questions about the equipment on your Stripe Hog, please contact the Customer Service Department.

Service

All warranty repairs must be authorized by Waterblasting Technologies, Inc. Should a problem develop that is related to faulty workmanship or materials, as stated in the Limited Warranty, you should contact our Customer Service Department to arrange for assistance and prior approval for the necessary repair. ***It is the owner's responsibility to contact Customer Service for prior authorization for warranty service.***

WARNING

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

DO NOT USE THIS EQUIPMENT WITHOUT PROPER SUPERVISION AND TRAINING.

ALL OPERATING AND MAINTENANCE PERSONNEL MUST BE THOROUGHLY TRAINED IN SAFE OPERATION, 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 WATERBLASTING TECHNOLOGIES, INC. REPRESENTATIVE PRIOR TO USE.

(772) 223-7393 OR (877) 964-7312
WATERBLASTING TECHNOLOGIES, INC.
WWW.WATERBLASTINGTECHNOLOGIES.COM

This manual has been written to include a number of safety instructions to assure the safe assembly, operation and maintenance of your Waterblasting Equipment. These instructions are in the form of **DANGER, WARNING, and CAUTION** statements. 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

MMEDIATE HAZARDS WHICH WILL RESULT IN SEVERE PERSONAL INJURY OR DEATH.

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

IMPORTANT NOTE: Your Waterblasting equipment uses internal combustion engines and flammable fuel. Every precaution has been taken by Waterblasting 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.

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Section 6:
General Maintenance

Section 7:
Component Repair

Appendix A:
Drawings and Supplies

Appendix B:

Appendix C:

Appendix D:

Appendix E:

Appendix F:

1.1 General Safety

Use Safety Training
Only trained personnel should be allowed to setup, operate, or maintain this equipment. Water blast operators should be made aware that the water jet nozzles can cause serious bodily injury. Training supervisors should demonstrate the powerful potential damage of the nozzles by showing new trainees the effect of water jets cutting a piece of 2 x 4 wood.

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.*

Work Area Safety
Remember, safety is first! Only set up to work in areas properly protected from traffic and other hazards.

Outfit all operators with proper safety apparel. Hard hats, safety shields or glasses, gloves, ear protection, etc.

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

Use Only Products Intended for High Pressure Waterblasting Use
Know the pressure ratings of all equipment being used and never exceed any operating pressure higher than the rating of the weakest component. This system is designed to work with pressures up to but not exceeding 40,000 psi (2758 bar).

Never Alter a Waterblasting Product
Do not alter any product without written consent from the manufacturer. Any alterations could have serious consequences including bodily harm or death.

Always Read Instructions
Read and follow all the manufacturer's instructions prior to using any waterblasting product. Contact Waterblasting Technologies, Inc. should any questions arise.

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.

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 and essentially the fittings and/or hose ends.

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

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

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

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

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.

Use Only Thoroughly Trained Personnel to Perform Maintenance or Repairs

Low Pressure Test
Following repair, operate the system at low pressure for a test. Bring equipment up to operating pressure slowly.

Freezing Conditions
System hoses and Hog Head assembly should be drained of all water or filled with an anti-freeze solution. For the 40K water blaster, refer to pump manufacturer's procedures for maintaining equipment in freezing climates. If you do decide to operate at freezing temperatures or even temperatures below 60 degrees Fahrenheit, you will need to run system with the high pressure pump engaged at IDLE speed only, under load, until the oil temperature rises above 60 degrees Fahrenheit.

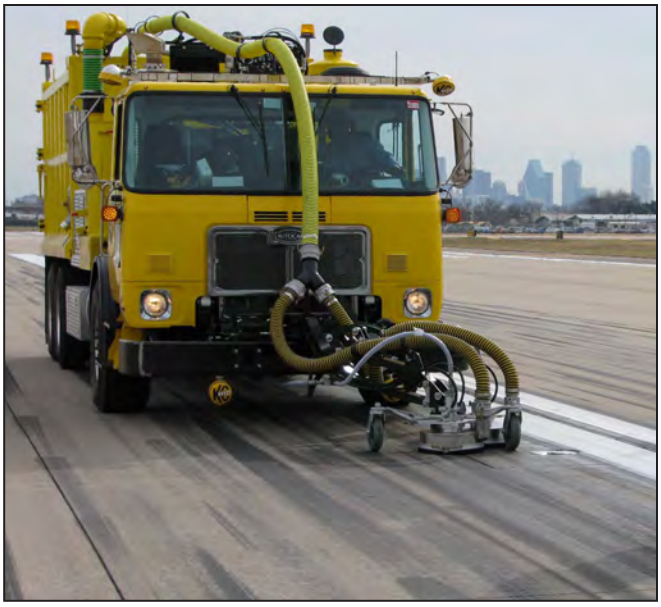
Store Components Properly
Protect all components from damage when not in use. Secure for travel.

1.2 Blasting Safety
Safety First – ALWAYS!
Whenever 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 switch on Stripe Hog.

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 Hog Head
Check the Hog Head for smooth and proper operation before each shift. Do not use equipment that has not been checked thoroughly.



Hog Head

Check Stripe Hog 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.

Stripe Hog Tractor Brake
Always set the tractor brake before beginning any testing, pressure testing system or blasting. The force from blasting head can move tractor backwards causing blast to cross the path of people or equipment.

Use Safety Protection
Always use eye protection from projected debris. Use ear protection to protect from noise levels generated from pump, vacuum and hog head blasting.

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.

Start at Low Pressure
Always start blasting with the system at low pressure slowly increasing to operating pressure. Engage and disengage yellow Ultra High Pressure

High Cohesive Nozzle Flow Chart					
FLOW - GPM @ Pressure Indicated					
Orifice Dia./ins	20KPSI (1379 Bar)	26KPSI (1723 Bar)	30KPSI (2068 Bar)	36KPSI (2482 Bar)	40KPSI (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

lever two times at operating pressure to check operation of Hog Head before starting blasting operations.

Check Your Stripe Hog Dumping Pressure
When setting pressure ALWAYS ensure that the system pressure drops to less than 500 psi (34.475 bar) immediately when yellow lever is released. If this does not relieve system pressure immediately to below 500 psi when released, do not use the Stripe Hog until repairs are made to the dump valve.

Know Your Surroundings
Know your surroundings well – i.e. - truck, hoses, people, walls, moving vehicles, live lanes of traffic, etc.

Never Blast When Stopped
Always make sure yellow Ultra High Pressure lever is disengaged BEFORE forward or reverse motion is stopped. Damage to road surface will occur if blasting continues when Stripe Hog is brought to a stop.

1.3 Nozzle Safety

Check Flow Rating
Nozzles combined flow rating must be compatible with the pump discharge and pressure rating. Refer to your nozzle flow rating chart in this section.

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 54,000 PSI.

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.

Connect Nozzle
Insert the nozzle into blasting head hand tight. Using a 3/8" socket or box end wrench, tighten the nozzle about 15% more. In some situations, it may be necessary to tighten additionally. Be certain the nozzle seat in the blasting head is in good condition. If it is damaged, replace with a new blasting head.

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
Check Pressure Rating
Only Use high pressure hoses with an operating pressure rating of 36,000 - 40,000 psi.

Check Burst Rating
Do not use a high pressure hose that does not have a listed burst rating or with a burst rating of less than 54,000 PSI.

Take Care of Your Hose
Protect the hose from contact with sharp objects, abrasive surfaces and foot or wheel traffic.

Retire Hose from Service if:
A) Cover is damaged and reinforcing wires are exposed to rust and corrosion.

B) Cover is loose, 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.

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 use anti-seize on the seating area of any connections.

1.6 Dumping Safety
A) Drain the Clean Water Tank before dumping. Never leave more than 100 gallons when preparing to dump.

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

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

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

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

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

SH8000 Stripe Hog

2.1 Truck Chassis

Overview

The Stripe Hog SH8000 waterblasting system is mounted on a truck chassis. 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.

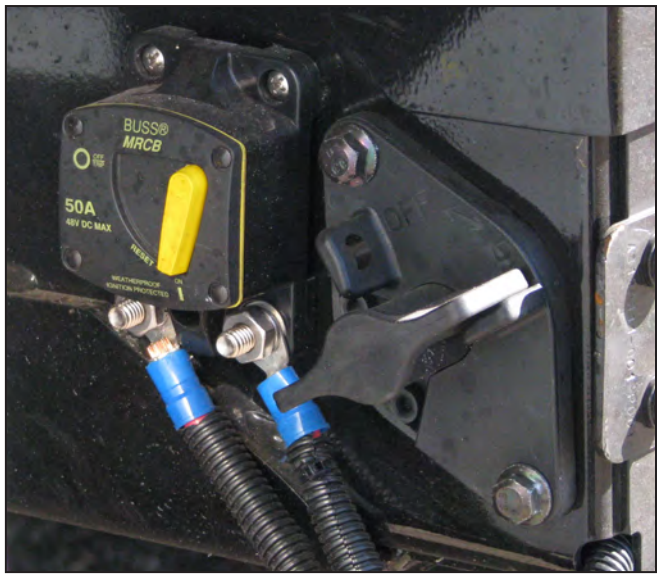
Warranty registration forms are included with the information manuals. All requested information on these forms should be filled out completely and submitted to the dealer or manufacturer as soon as possible.

Truck 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. Some, but not all, trucks are equipped with a main battery switch that activates or deactivates the electrical system. If your truck is equipped with a main battery switch, it is usually located just behind the cab near the batteries. The main battery switch is a safety feature that must be turned to the "ON" position before operating the vehicle or waterblasting components.

All truck chassis are equipped with a heavy duty main circuit breaker located just behind the cab near the batteries. The circuit breaker protects the DC circuit that provides electrical power to the cab control panels and the electric solenoids that activate the functions of the PTO, high pressure waterblasting system, hydraulic system and other electrical equipment installed by Waterblasting Technologies.

The circuit breaker is equipped with a yellow indicator/reset lever that indicates the status of the breaker (ON or OFF) and is used to reset the breaker if it trips. A test button near the lever can be pressed to test the breaker to ensure it is operating properly. This is a heavy duty circuit breaker that typically trips only when there is a fault in the system. If it trips, you should find and correct the problem before resetting the breaker. The breaker is reset by turning the yellow lever to the "ON" position. Contact Waterblasting Technologies Customer Service if you need assistance correcting a problem with the Stripe Hog electrical system.



Typical Battery ON/OFF Switch Main Circuit Breaker

There is another fuse panel inside the main control switch panel in the cab. The fuses in this panel protect the circuits activated by the joystick and control panel switches.

Refer to the information manual for your truck chassis for information on the electrical system on your vehicle.

Video Systems and Dual Side Steering and Controls (Optional)

Video systems and dual side steering are optional features that enable better visibility for the operator while blasting on the passenger side of the vehicle. The video system also provides improved visibility while backing the vehicle. The Hog Head control console is positioned so that it is available to drivers on either side of the vehicle. Refer to the truck and video manufacturers information for instructions on operating and maintaining video systems and dual side steering and controls.

Stripe Hog Skip Meter

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 de-


Skip Meter Inductive Pickup on Drive Shaft

tailed information on its operation and available data modes.

Side Access Ladders

A ladder on each side of the unit provides access to the Stripe Hog tractor pad or other components located on the chassis between the water tank and the truck cab. Each ladder is hinged and has a spring loaded safety pin that locks the ladder in the stored position. To use the 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.

Typical Side Access Ladder

⚠ CAUTION ⚠

ALWAYS RETURN THE LADDER TO THE STORED POSITION AND LOCK IT WITH THE SAFETY PIN BEFORE OPERATING THE TRUCK. THE LADDER STICKS OUT FROM THE SIDE OF THE VEHICLE AND CAN CAUSE DAMAGE TO THE LADDER, TRUCK OR OTHER VEHICLES IF THE TRUCK IS OPERATED WITH AN ACCESS LADDER DOWN.

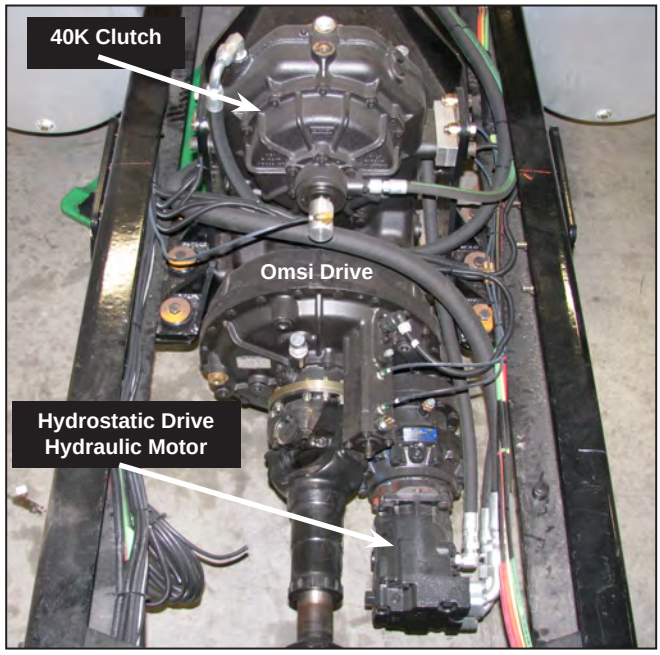
Tool Boxes

Heavy duty, lockable tool boxes are located on the truck chassis. The tool boxes are used for the storage of hoses, fittings, extra parts and tools. Instructions for routine maintenance and adjusting the latches are located on labels attached to the inside of the each door.

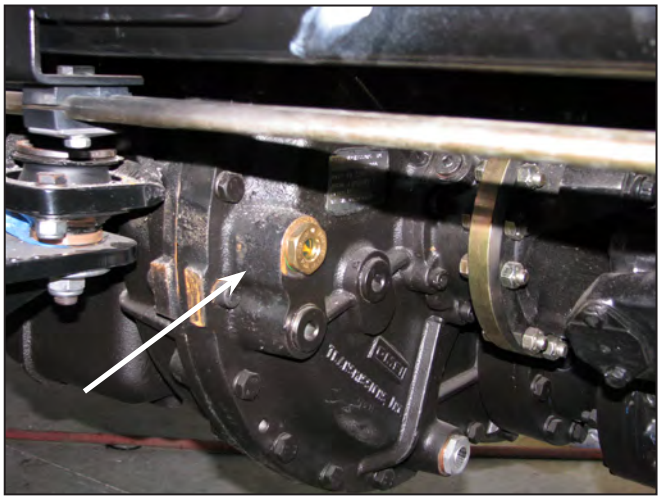
2.2 Truck Power System and PTO

All major components of the Stripe Hog are powered by the truck engine. The primary drive system has two modes, Drive Mode and Work Mode. Drive Mode connects the drive shafts from the transmission directly to the differential and is the normal mode for highway driving. Work Mode disconnects the transmission from the differential and connects it to the hydraulic system that powers the hydrostatic truck drive system and all waterblasting features and components.

Controls in the cab allow the operator to switch quickly between Drive Mode and Work Mode. A specially designed gear-box called the “Omsi Drive” facilitates this operation by transferring the energy in the drive shaft from the differential to a system of hydraulic pumps, PTO clutch, and special belts and pulleys that power the high pressure water pump and vacuum blower. Pneumatically activated control levers on the Omsi Drive shift



Typical Omsi Drive with 40K Clutch



Omsi Drive Sight Glass

the unit from Drive Mode to Work Mode when the PTO switch is activated.

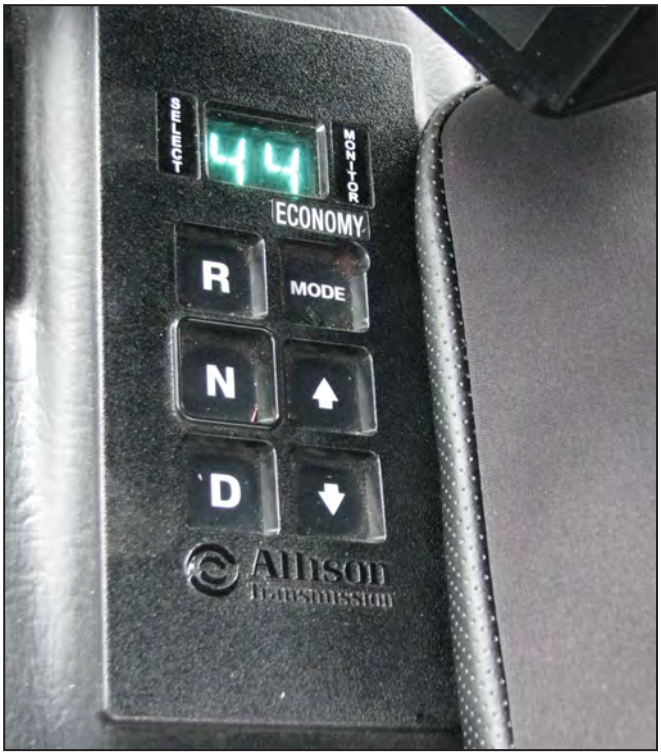
The Omsi Drive, hydrostatic drive and 40K clutch have specific lubrication requirements. The fluid level must be checked weekly to ensure the drive and clutch are full and there are no leaks. The fluid level is monitored by site glasses on the Omsi Drive main gearbox, the hydrostatic drive gearbox and the 40K clutch. Refer to the Omsi Drive operating and maintenance manual for more information on checking fluid levels and routine maintenance for the Omsi Drive and 40K clutch system.

Control Switch Panel

Shifting the Omsi Drive Modes

Changing from Drive Mode to Work Mode and back again is orchestrated by the PTO switch on the control panel inside the cab. The normal vehicle drive train is disabled and the hydrostatic drive system moves the truck whenever the PTO switch and Work Mode is engaged.

When Work Mode is selected, a key switch in the panel is used to select forward or reverse, the Mode switch engages the transmission in the proper Work Mode gear and a speed dial on the joystick controls the truck speed in forward or reverse (0 - 7 mph.) Engine RPM is typically controlled by the truck cruise control that usually can be quickly disengaged by pressing the brake pedal.

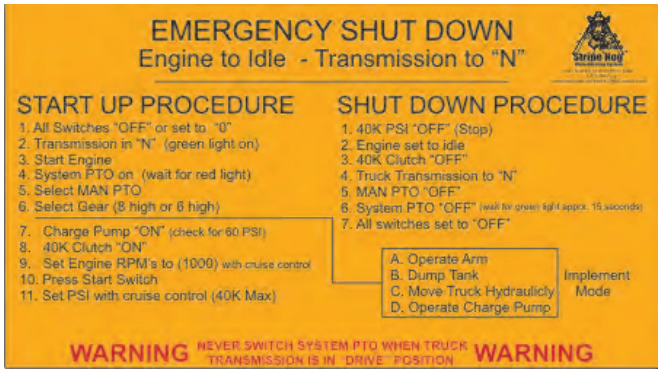


Work Mode Gears Selected with Mode Switch

Always make sure the key switch is in the neutral position and the truck speed dial is set to 0 before engaging Work Mode to avoid the possibility for the truck to surge unexpectedly in forward or reverse when the hydrostatic drive is engaged.

The system should only be engaged into Work Mode when the Stripe Hog is on a job site and ready for operations. The truck must be stopped with the engine at idle and transmission in neutral before the Omsi drive can be shifted from Drive Mode to Work Mode. In-cab instructions are visible to assist in the start-up and shut-down procedures for the operation of the unit. The instructions are specific to each unit as there are differences between truck chassis, transmissions and drive trains. There are also significant differences between foreign and domestic (USA) truck chassis.

The control panel has lighted switches, gauges and indicator lights that show the system function and operation. A green light indicates the system is ready for normal driving. A red light indicates



Typical In-Cab Instruction Label

INSTRUCTION LABEL SHOWN IS A SAMPLE AND MAY NOT BE THE SAME AS THE ACTUAL IN-CAB INSTRUCTIONS ON YOUR STRIPE HOG

the system is engaged for Work Mode operation. It is important when disengaging the system to "LISTEN" for disengagement and then watch for the green light indicating the waterblast system is inoperable. This is necessary to insure none of the waterblasting equipment functions are operable during normal driving of the truck.

WARNING

THE TRUCK COULD SURGE FORWARD OR BACKWARD UNEXPECTEDLY WHEN WORK MODE IS SELECTED IF THE KEY SWITCH IS IN FORWARD OR REVERSE AND/OR THE SPEED CONTROL DIAL IS NOT SET TO 0. ALWAYS MAKE SURE THE TRUCK SPEED CONTROL DIAL IS SET TO 0 AND THE KEY SWITCH IS SET TO NEUTRAL BEFORE ENGAGING "WORK MODE."

Typical Drive Belt Configuration for PTO Clutch Powered UHP Pump and Vacuum Blower

WARNING

IT IS NOT POSSIBLE FOR THE OPERATOR TO SEE PEOPLE OR OBSTACLES THAT ARE IMMEDIATELY BEHIND THE TRUCK IF YOUR UNIT IS NOT EQUIPPED WITH A REAR VIDEO CAMERA. ALWAYS PUT THE TRUCK IN PARK, SET THE PARKING BRAKE AND CHECK BEHIND IT BEFORE DRIVING IN REVERSE. IF YOU HAVE AN ASSISTANT, HAVE HIM STAND AT THE REAR OF THE TRUCK AND DIRECT YOU.

Omsi Drive PTO clutch

The Power Take-Off (PTO) clutch provides power to the belts and pulleys that drive the high pressure pump and vacuum blower. It is a hydraulic, multi-disc clutch that is controlled by the 40K Clutch switch in the control panel and available whenever the Omsi Drive is engaged in Work Mode.

Refer to the Omsi Drive operating manual for additional information on the PTO clutch.

2.3 Primary Drive Belts

The primary drive belts that connect the PTO 40K clutch 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.

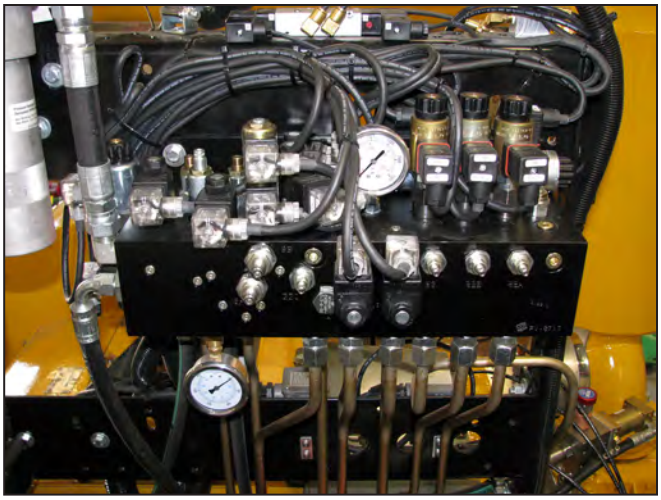
The drive belts for the high pressure pump and vacuum blower are different and, therefore, have different tension specifications. Additionally, new belts have a different tension specification than used belts (drive belts with 20 hours or more). Instructions for adjusting the primary drive belts and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

WARNING

THE PRIMARY 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.

Hydraulic System Reservoir and Fluid Level & Temperature Gauge



Hydraulic System Solenoid Valves and Gauges

2.4 Truck Hydraulic System

General

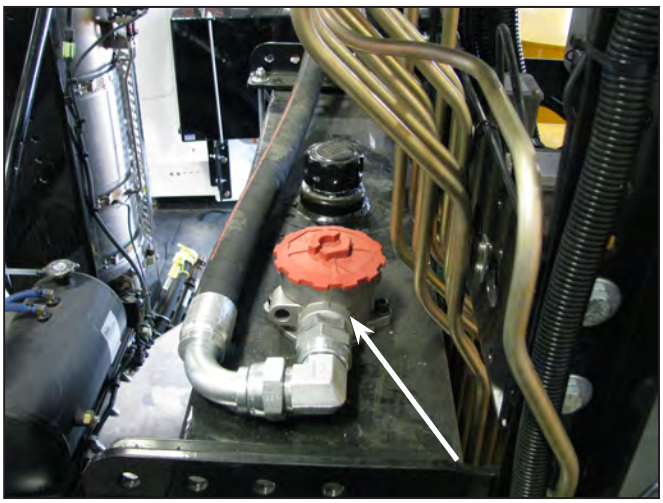
The Hog Head and hydraulic Hog Arm is mounted to the front of the truck. All movement and the rotation of the spray bars are activated and controlled by the hydraulic system.

The hydraulic system is powered by the truck engine activated by the PTO switch in the control switch panel. It is equipped with a pump, large reservoir/cooling tank and an in-line filter. An oil cooler with a thermostatically activated fan cools the hydraulic fluid during operation. Electric solenoid valves activated by switches in the control panels direct hydraulic pressure to the various components. The hydraulic oil level and temperature is monitored by a site gauge and thermometer on the side of the reservoir.

The in-line filter is equipped with an indicator that alerts the operator when the filter is dirty and requires changing. Additional filtration is provided by a filter screen built into the fill cap assembly

The hydraulic system provides the hydraulic power for the hydrostatic truck drive system, the Hog Arm, the hydraulic motors that rotate the Hog Head spray bars and the charge water pump. It also provides hydraulic power to the cylinder that lifts the water and debris tank to dump the debris when the debris tank is full.

Hydraulic System Oil Cooler with Thermostatically Controlled Fan, In-Line Filter and Filter Change Indicator



Hydraulic System Fill Cap and Filter

Truck Mounted Hog Head

2.5 Truck Mounted Hog Head

The Hog Head and Hog Arm are mounted to the front of the chassis, just forward of the bumper. The hydraulic system provides the power for all functions of the Hog Arm and the hydraulic motors that rotate the spray bars on the Hog Heads.

The high pressure water pump provides ultra high waterblasting pressure to the rotating spray bars and the vacuum blower provides the vacuum. A joystick and control switch panel in the cab control all functions of the Hog Head and control arm. The Hog Head is a two blast head design. The blast heads are mounted on one Hog Arm and operate simultaneously.

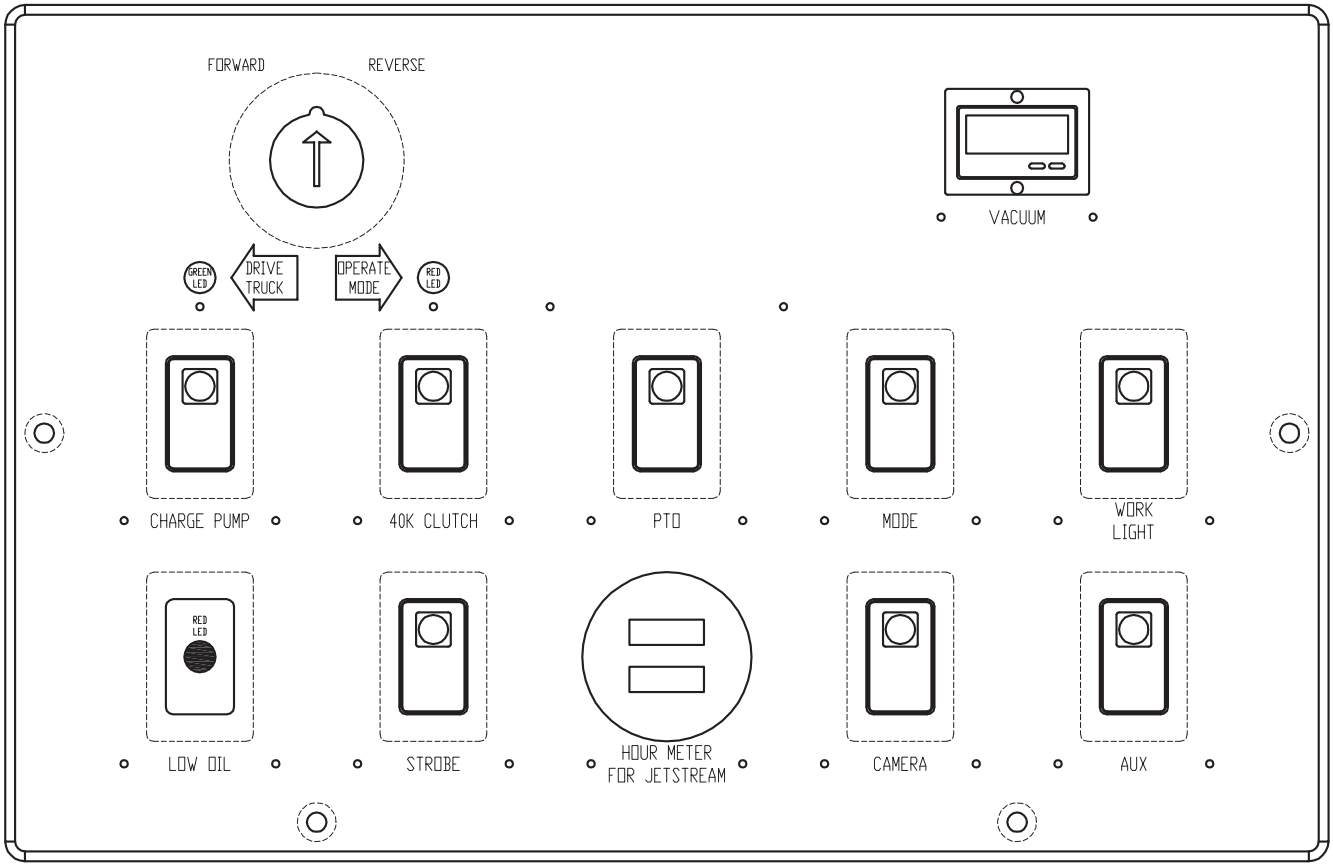
Auxillary connectors for high pressure water and DC power are located on the bumper near the Hog Head. The connection provides high pressure water and DC power for Waterblasting accessories or Hog Tools that can be powered by the SH8000 systems.

Hog Head Hydraulic System

The hydraulic system is powered by the truck engine. The truck must be in “Work Mode” with the PTO engaged before the hydraulic system will operate. A control panel and joystick in the cab controls all hydraulic functions of the Hog Arm. The Hog Head can be moved up and down, right and left or can be set to float, which allows the Hog Head to freely move up and down with the contour of uneven surfaces. When the Hog Arm is raised to the full up position, it will automatically lock. 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 Hog Arm lock manually before it can be lowered. Make sure the truck is stopped with the parking brake set before manually releasing the Hog Arm lock.

Notice:
If the lock will not release, the hydraulic system will have to be engaged and the hog head raised to relieve the strain on the lock. Additionally, the lock handle should be secured with a plastic tie wrap or other type of fastener to ensure it cannot accidentally release while driving.



Typical Control Switch Panel
The panel on your unit may be slightly different

Control Panel and Joystick

Control Panel

All functions and features of the waterblasting system are activated by labeled switches in the main control panel. There are also switches that activate the hydrostatic drive forward and reverse, work lights and strobe lights. Accessory switches activate the optional video system or other optional accessories that may be installed by Waterblasting Technologies. Individual fuses in a fuse panel located inside the control switch panel protect the circuits activated by the switches.

There is no power available to the control panel until the PTO switch is activated. The PTO switch uses power from the truck's ignition system to energize a relay inside the control panel which then provides power to the individual rocker switches that control other functions.

There are two red LED lights and one green LED light on the control panel. The lower red LED light indicates low gear box oil pressure. The upper red LED light indicates the system is engaged into Work Mode. The green LED light indicates the truck is engaged in normal Drive Mode. LED lights in the switches illuminate when the function is activated. If no features are activated by accessory switches, they will be wired in reserve for equipment or options that may be installed at a later date.

It is important to note that once the PTO has been engaged or disengaged, the appropriate LED be lit before engaging the automatic transmission. When the Omsi Drive is engaged in Work Mode, the engine RPM is controlled with the truck cruise control. Typically the RPM is set to provide the desired water pressure and vacuum for the current operation. Normally tapping the brake pedal will immediately deactivate the cruise control and return the engine to idle in either drive mode.

Refer to the truck chassis manual for information on the operation of the cruise control in your truck.

Joystick Panel

The Hog Arm, truck speed (hydrostatic drive in "Work Mode"), and spray bar rotation speed are controlled by the joystick and speed dials in the joystick panel. Separate digital gauges monitor the vacuum, charge pressure and ultra high pressure in the waterblasting system.

Joystick Control Panel with Speed Dials, Pressure Gauges, UHP Switch and Float Mode Switch

The joystick controls the Hog Arm. Move it forward to lower the arm, pull it back to raise it. Move it to the right and the hog arm moves right, move it left and the arm moves left. The "trigger" on joystick controls which stage of the Hog Arm moves right and left with the joystick. When the "trigger" is not activated, the joystick controls the 1st stage of the arm and moves the entire Hog Arm right and left. When the "trigger" is activated, the joystick moves only the 2nd stage of the Hog Arm (the portion forward of the center hinge) for more precise positioning of the Hog Head. When the joystick is released, the handle automatically returns to center and the Hog Arm stops in that position. A rocker switch in the joystick panel activates and deactivates the Hog Head float feature that enables the Hog Head to float freely over uneven contours.

The Truck Speed dial rotates to control the speed of the truck (0-7 MPH) while in "Work Mode" (hydrostatic drive engaged.) The Head Rotation dial controls the speed of the Hog Head spray bars. Rotating the dial clockwise increases speed and rotating it counterclockwise reduces speed. Setting the Truck Speed dial to 0 will stop the truck motion, setting the Head Rotation dial to 0 will stop the rotation of the spray bars.

Hog Heads

The Hog Heads are attached to the end of the Hog Arm. There are two blasting heads supported by a chassis with three heavy duty castors that support the Hog Head at a preset height and prevent the spray bar from contacting the pavement. Spacers on each caster adjust the height of the Hog Head. Adjustment may be required to maintain proper clearance by adding spacers as the castor wheels wear.

Hog Heads, Casters and Wear Brush

The wear brush is clamped to the blast head shroud and provides a partial seal between the Hog Head and the pavement. The wear brush regulates vacuum air flow into the Hog Head and reduces the amount of debris and water exiting the blast head during waterblasting 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.

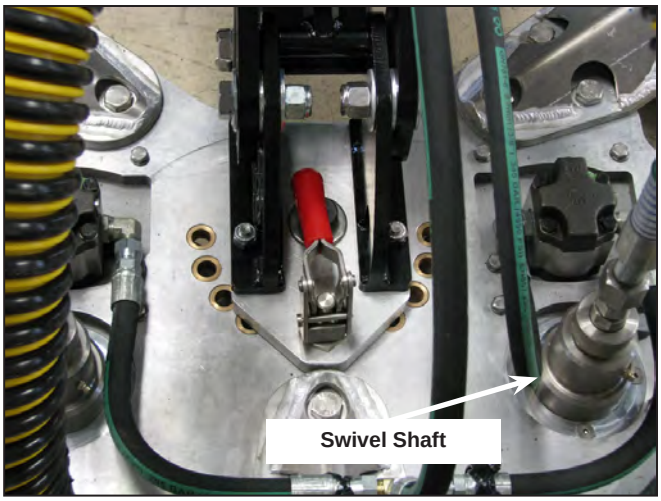
To adjust the wear brush, lower the Hog Head to the ground and note the gap between the wear brush and the pavement. Raise the Hog head, loosen the clamp on the blast head and slide the wear brush enough to eliminate the gap. Tighten the clamp and recheck. Readjust if necessary.

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.

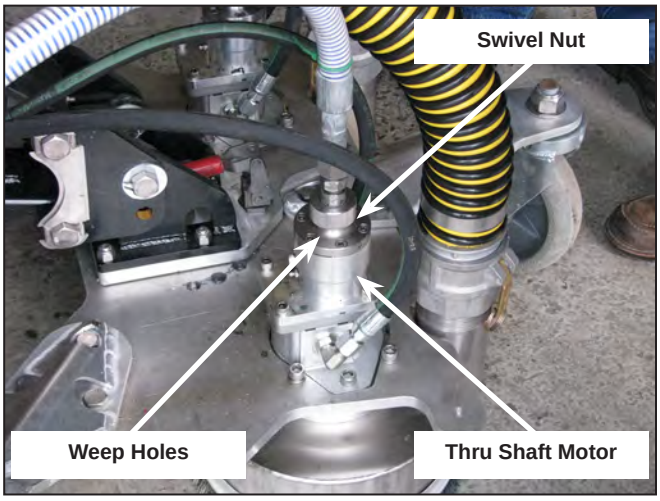
Double Hog Head assemblies swivel to enable the operator to control the width of the blasting area (4"/10.2cm to 28"/71.1cm) or set the Hog Heads to remove two separate lines simultaneously. The head orientation on the Hog Arm can be preset in nine positions using the cam lock pin in the center of the Hog Head. To adjust the position, raise the cam lock lever, swivel the Hog Head to the desired position and lock it in place with the cam lock pin. Additional adjustments to head orientation can be made with the joystick in the cab by changing the blast head orientation in relation to the direction of travel with the Hog Arm.

The spray bar is rotated by a thru-shaft hydraulic motor or a hydraulic motor attached to a belt driven swivel shaft. The rotation speed is controlled by the head rotation dial in the joystick panel. The center of the rotating shaft is drilled to allow high pressure water to pass through the shaft to the spray bar. A special swivel seal assembly provides a positive seal for the connection to the high pressure hose while allowing the thru-shaft to turn freely. The hose is secured to the rotating shaft housing by the swivel nut. The swivel nut is hand tightened. 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 Hog Head with a leaking swivel seal will cause complete failure of the seal, stopping blasting operations and could cause severe damage to the thru-shaft motor or swivel shaft.

The spray bar is a quick change design. Spray bars are available in 6", 8", 10", 14", widths. Aggressive and non-aggressive patterns are available for all heads.



Hog Head Swivel Cam Lock and Belt Driven Swivel Shaft



Typical Thru-Shaft Motor and Swivel Nut

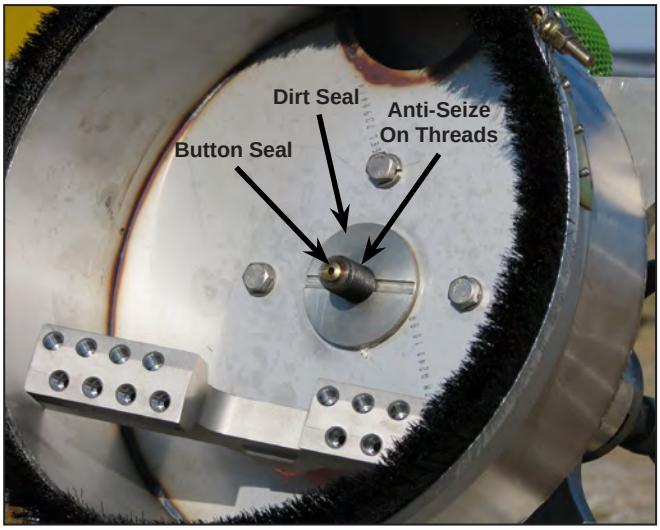

Swivel Seal on Thru-Shaft Motor

If you are new to waterblasting equipment, Waterblasting Technologies offers a variety of spray bar and nozzle configurations to meet the requirements of most paint and rubber removal projects. Examples of available spray bar configurations are included in the Appendix section of the this manual. You can also contact Waterblasting Customer Service for assistance in selecting the right spray bars for your project.

8 and 16 Nozzle Spray Bars

To change a spray bar, hold the shaft by inserting a 3/4" wrench into the slot at the bottom of the thru-shaft housing, located just above the blast head shroud. Twist the spray bar counterclockwise by hand until it is free of the shaft. Purge the blast head at low pressure, then apply anti-seize to the threads, insert a new brass button seal and install the new spray bar by turning it clockwise ***slowly*** until it seats. Then tighten it by turning the spray bar another 15%. Make sure you remove the wrench when the installation is complete.

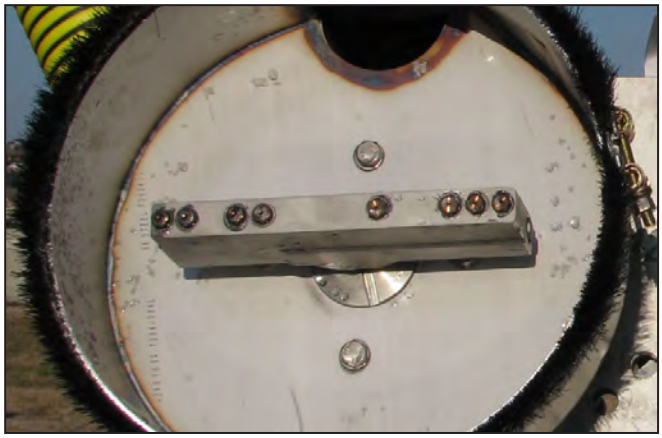
Notice:
Before attaching the new spray bar to the Hog Head Assembly, engage pump at low pressure to purge the system. Any dirt or debris in the system can clog nozzle orifice's and cause system pressure to spike excessively causing damage to components or the rupture discs on the UHP pump to burst. Refer to the Stripe Hog Training DVD for detailed information on changing the spray bar.



Spray Bay Removed and Dirt Shield
Button Seal on Thru-Shaft and Anti-Seize on Threads

The dirt shield that protects the thru-shaft is located between the spray bar and blast head shroud. It consists of a special felt seal that is held against the bottom of the blast head shroud by a stainless steel flat washer threaded on the shaft. The felt seal should be inspected and adjusted whenever the spray bar is removed. The dirt shield should be replaced if it is damaged or worn and be adjusted "finger tight." If it is too tight it will prevent the spray bar from rotating.

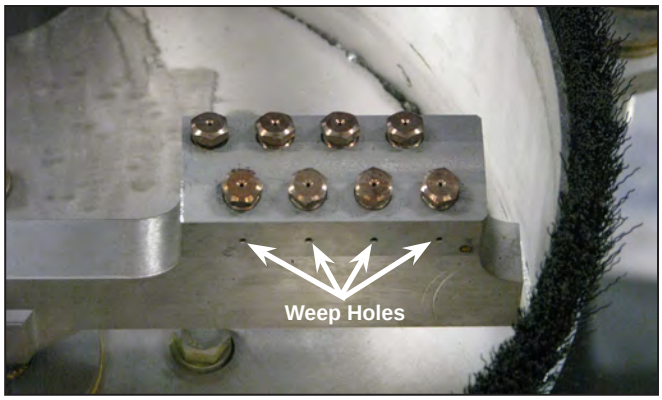
With the spray bar installed, operate the pump at low pressure to check for nozzle accuracy and leaks on the spray bar or nozzles. Water dripping from any of the weep holes in the side of the spray bar indicates that a nozzle is not seated properly. Leaks at the nozzle seats or thru-shaft threads must be corrected before beginning high pressure operations or the spray bar will be ruined. Should any repairs or adjustments be necessary, disengage the pump to relieve all pressure before making any required repairs or adjustments.



Spray Bar and Nozzles Installed
Anti-Seize on Nozzle and Spray Bar Threads

Each spray bar is equipped with a spray bar protector that is held in place with one or two cotter pins, depending on the size of the spray bar. The spray bar protector shields the nozzles and spray bar from damage caused by debris during blasting operations. Never waterblast without the spray bar protector installed. Spray bars and nozzles are expensive and the life of the nozzles and spray bars will be dramatically shortened without the spray bar protector.

Never blast when stopped. Damage to road surface will occur if blasting continues when the stripe hog is brought to a stop.



Spray Bar with Nozzles Installed and Weep Holes

2.6 Waterblast System

The ultra high waterblasting system consists of a water storage tank, charge pump, ultra high pressure (UHP) pump, high pressure hoses and the Hog Heads. Switches in the control and joystick panels in the truck cab or on the tractor enable the operator to control all aspects of the high pressure blasting system from the cab of the truck or the tractor.

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.

Spray Bars with Spray Bar Protectors Installed

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 40K CLUTCH/HIGH PRESSURE SWITCH FOR THE STRIPE HOG.

Clean Water Tank

The forward tank on the rear of the truck chassis is reserved for the pressure water supply. The inner tank is stainless steel to reduce corrosion and provides a supply of clean, fresh water to the charge pump. A site tube on the side of the tank indicates the water level and a 4" valve allows for quick draining of the tank. The fill connection on the passenger side of the tank accommodates large hoses, such as a fire hose, that are typically connected to a metered fire hydrant to expedite the filling of the tank. Make sure to flush the fill source with twice the water flow as used to fill the tank to reduce the risk of debris entering the clean water tank.

Clean Water Tank and Fill

The tank should be flushed frequently with clean, fresh water to prevent the accumulation of debris that may accidently enter the tank during filling. It must be thoroughly cleaned if the tank was filled from a contaminated water source or if the source was not properly flushed prior to filling. A ladder on the side of the tank provides access to the top and a large hatch provides access to the inside of the tank for inspection or to facilitate cleaning, if necessary.

Charge Water System

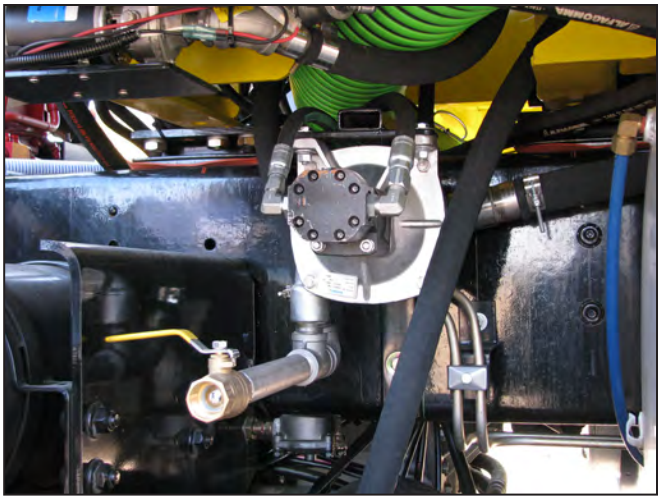
The water tank provides clean fresh water to the low pressure charge pump. The charge pump is hydraulically powered and activated by the Charge Pump switch in the control panel. It delivers water to Ultra High Pressure Pump and should maintain a minimum of 40 PSI (2.8 Bar) on the Charge Pressure gauge located in the Joystick panel. A green LED light in the switch illuminates when the charge pump is activated.

Notice:
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 the charge water pressure drops below 30 PSI (2.1 Bar.)

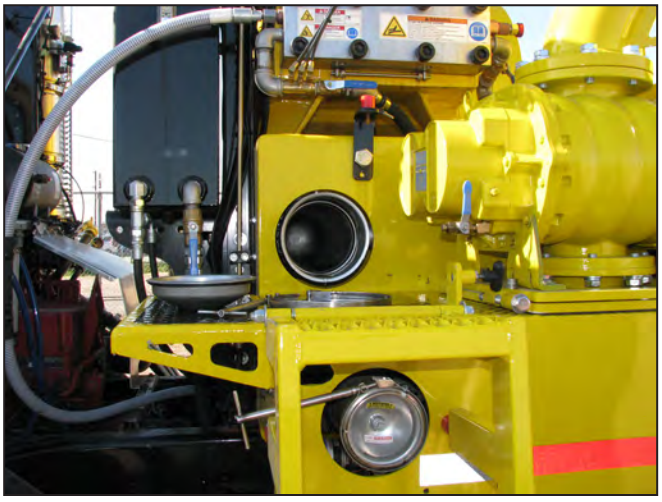
The charge pump impeller will be damaged if the pump is allowed to run dry for more than a few seconds. Always monitor the water level in the clean water tank and make sure you have enough water for the intended shift. Never operate the charge water pump when the water tank is low on water and always stop blasting, turn off the charge pump and disengage the 40K clutch immediately when low water or low charge pressure is observed.

Water supply problems to the charge pump can also be indicated by the sound of the pump. Fluctuating pump RPM, inconsistent high pitch wines, and fluctuating charge water pressures are indications of a water supply problem to the charge pump. You 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.

Two filters in the supply line between the charge pump and high pressure pump remove any small debris that may accidentally find its way into the water supply tank. The first filter is a 10 micron (Nominal) filter to trap larger particles and the second filter is a 1 micron (Absolute) filter to trap small particles that pass through the first filter.



Charge Water Pump and Drain Valve



Charge Water Filters
Top Filter is 10 Micron (Nominal) Bag Type Filter
Bottom is 1 Micron (Absolute) Cartridge Type Filter

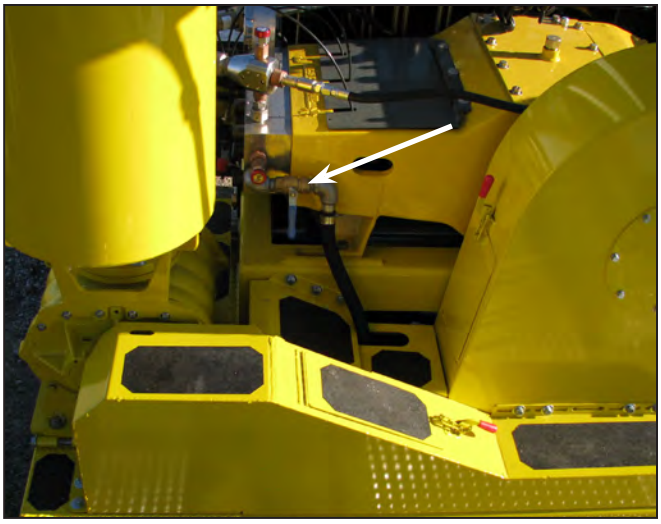
The filters are critical to the proper operation of the high pressure blasting system and should be checked frequently and replaced as necessary. Dirty charge water filters are the number one reason for low charge water pressure that can cause the UHP pump to cavitate and reduce the flow of lube water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

Please remember that the filters can be under pressure. Always make sure the charge pump is

off, the PTO disengaged and the pressure has been bled from the system before removing the filter caps. You should also make sure to thoroughly flush the filter canisters and charge water system when the filters are changed and before activating the UHP pump.

A valve located on the low pressure (charge water) side of the pump can be opened to flush the charge water side of the pump if the system becomes contaminated. This valve is also used to assist in purging the system after a filter change or adding anti-freeze in cold weather operations.

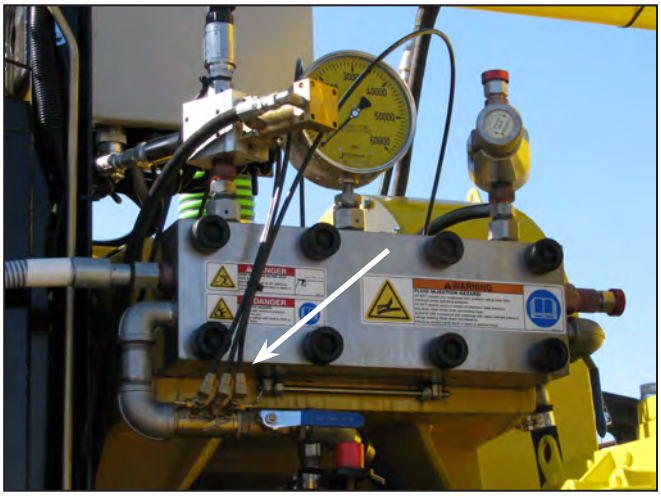
A supply of clean fresh water is critical to the proper operation of a high pressure waterblasting system. You should only use clean fresh water from a potable water source, usually a fire hydrant, and make sure to keep supply hoses and the area around the tank fill valve clean. Never use water drawn from retention ponds, canals or other non-potable sources.



Charge Water/Low Pressure Purge Valve

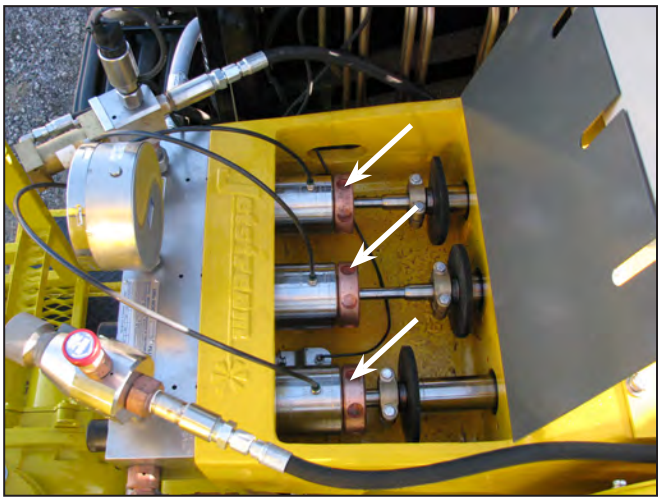
Packing Lube Water and Bilge Pump

Lube and cooling water for the plunger packing is provided by three cooling lines connected to a manifold in the charge water supply line near the pump connection. A metering valve for each line controls the flow of water to the packing. Lube water is supplied whenever the engine and charge pump are operating.



Packing Lube Water Lines & Metering Valves

The water flow to the packing should be checked at the beginning of each shift by monitoring the flow of water from each packing with the PTO engaged, the charge pump activated and the engine at idle. There should be a noticeable flow of water from each packing. If necessary, use the metering valves to adjust the flow. If no water is flowing from any of the packing glands, find and correct the problem before operating the pump. Refer to the high pressure pump operation manual for more information on adjusting the packing lube water.



Packing Glands and Lube Water Lines

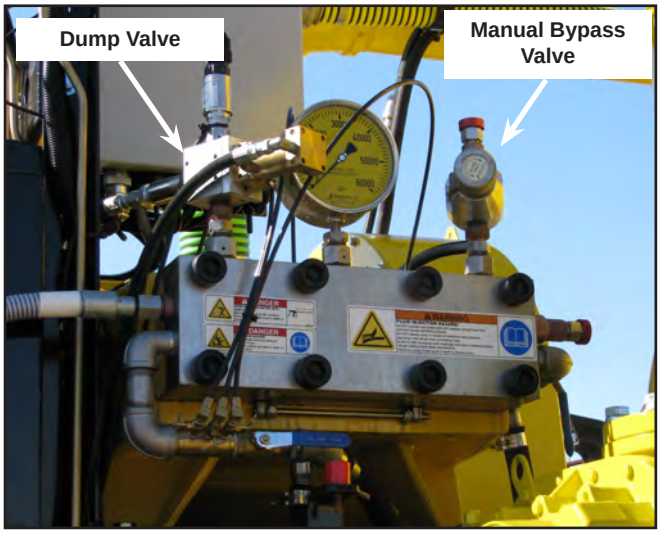
Packing lube water is drained from the high pressure pump by a bilge pump drain system. The system is completely automatic and activated whenever the main battery switch is ON. A fuse in the control switch panel protects the bilge pump circuit from an overload.

Water drains from the high pressure pump 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.

Bilge Pump



UHP Pump, Dump Valve and Manual Bypass Valve

Ultra High Pressure System

Clean, fresh water is supplied to the high pressure pump by the charge pump. The high pressure pump is powered by the main truck engine through the PTO and is activated by the 40K Clutch switch in the control panel. The switch also activates the solenoid which enables the hydraulic rotation of the spray bars that are controlled by the Head Rotation dial. Green LED lights in the switches illuminate to indicate the pump and spray bar hydraulic rotation are activated. When the system is activated, the ON/OFF UHP switch on the joystick console supplies or turns off the high pressure water to the Hog Head spray nozzles.

When the high pressure is turned off by the switch, the 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 the high pressure water supply to the blast head to be immediately reduced to less than 500 PSI (34.474 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) @ 12 gallons (45 Liters) per minute is achieved at maximum engine RPM. (typically 1400 RPM) The water pressure is monitored by the High Pressure gauge on the pump and a digital gauge in the joystick panel. 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 vacuum and less than maximum waterblasting pressure or gallons per minute is desired for the material being removed or the waterblasting tools being used.

The UHP system is activated by engaging the PTO clutch and setting engine RPM to the desired operating pressure setting (typically 800 RPM - 1400 RPM max.) There may be some variation of this depending on the engine and other components unique to your unit. When setting pressure ***ALWAYS*** ensure that the system pressure drops to less than 500 PSI (34.475 Bar) immediately when the UHP switch is turned off. If this does not relieve system pressure immediately to below 500 PSI when released, do not use the equipment until repairs are made to the dump valve.

The high pressure pump is a positive displacement pump that requires a constant water supply at a minimum of 30 PSI (2.1 Bar) from the charge water system to operate properly. Always make sure there is enough water in the tank before engaging the PTO to activate the UHP and charge pump systems. Pressure gauges for the charge water system are near the water filters and on the joystick panel. Pressure gauges for the UHP system are located on the UHP pump and on the

joystick panel. The gauges should be monitored frequently whenever waterblasting operations are underway. If the pressure rises or drops outside of the normal operating range in either system, stop waterblasting operations immediately, turn off the charge pump and disengage the PTO. Then find and correct the problem before resuming blasting operations.

Notice:
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 PTO if the charge water pressure drops below 25 PSI (1.7 Bar.) This is a safety feature to prevent damage to the UHP pump from cavitation caused by low charge water pressure.

Rupture Discs

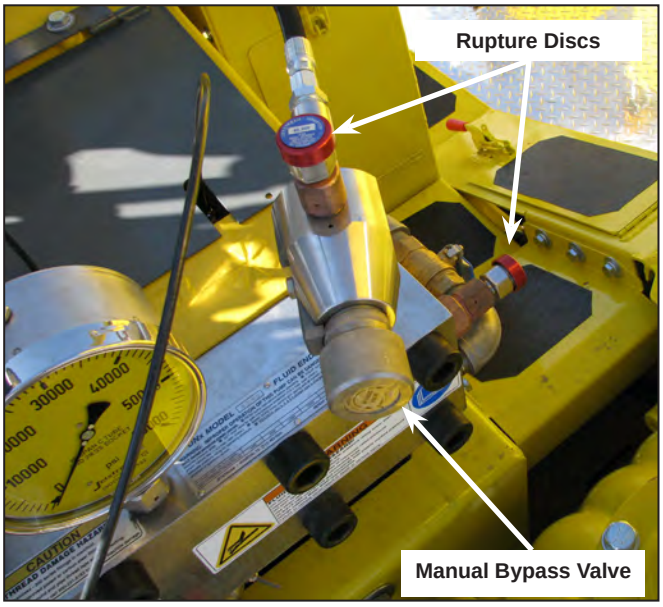
Rupture discs are installed on the high pressure side of the UHP pump to protect the waterblasting system against unusually high spikes in pressure. The discs are designed to burst and immediately relieve pressure when the system water pressure exceeds the disc burst pressure. If a rupture disc bursts it will have to be replaced before waterblasting operations can resume, therefore, you should keep spare rupture discs of the proper pressure rating on hand. You should test the system at low pressure and correct the problem that caused the disc to burst before resuming high pressure operations.

Rupture disc burst pressure ratings are unique to each unit and critical to operator safety. Refer to the label on the rupture disc assembly or contact Waterblasting Customer Service for the correct rupture disc rating for your equipment. ***Never install a rupture disc with a burst pressure rating higher than recommended.***

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.

The filters in the charge pressure line immediately before the UHP pump remove any debris prior



Rupture Discs and Manual Bypass Valve

to the water entering the high pressure system. These filters prevent damage caused by debris in the high pressure system and are critical to the proper operation of the waterblasting system. They should be checked frequently and replaced as necessary, typically daily or when the charge water pressure drops below 40 PSI (2.8 Bar.) Even the smallest debris can cause severe damage to components in the ultra high pressure system.

Refer to the Charge Water System in this section for information on the water filters and the pump manufacturer's operating manual for instructions on operating and maintaining the Ultra High Pressure Pump. You should also refer to the Stripe Hog Training video available on DVD or online at www.stripehogsupport.com for additional instructions on maintaining the high pressure pump.

Each manufacturer of the major UHP 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 PTO AND THE HIGH PRESSURE SWITCH FOR THE STRIPE HOG.

High Pressure Hoses and Fittings

The SH8000 waterblasting system operates at ultra high pressures of up to 40,000 PSI (2,758 Bar). Therefore, it is critical that the operator and maintenance personnel inspect the high pressure hoses, fittings, nozzles and other components frequently. A visual inspection of the high pressure 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 any waterblasting equipment. A more thorough inspection of all high pressure pumps and components should be conducted at each routine service interval.

Check the condition of threads prior to connecting any fittings or hoses. Use an anti-seize compound on all fitting and hose threads to prevent "galling." Galling is the term for thread damage that occurs from heat build up in the threads of stainless steel fittings as they are tightened. Galling will destroy the threads and lockup the fittings before they are tight, destroying the fittings and/or hose ends rendering them unusable. Be careful not to get anti-seize on the seating area of any fitting. Always test the system with the Hog Head up following repairs or at the start of each shift by operating the system at low pressure first. Then slowly bring the equipment up to operating pressure while carefully monitoring the replaced components.

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.

Take care of Your Hoses. Protect the hoses from contact with sharp objects, abrasive surfaces and foot or wheel traffic. Add additional anti-chaffing material to protect hoses when necessary. Never operate the high pressure system with a hose that is questionable.

When replacing damaged or worn hoses, check the burst rating marked on the hose. Do not use a high pressure hose that does not have a listed burst rating or with a burst rating of less than 54,000 PSI (3,723 Bar).

Retire a Hose from Service if:

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

B) Cover is loose, 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 kinked, stressed or stretched.

High Pressure Nozzles and Spray Bars

Each nozzle delivers a stream of water at extremely high pressure. The size and intensity of the stream is determined by orifice size in the nozzle. The performance ranges from least aggressive to most aggressive.

Nozzles typically last 12-16 hours of blast time, however, you could experience shorter or longer nozzle life, depending on the type of surface being blasted. They should be inspected before the start of each shift or when the operator notices a change in performance while waterblasting.

Nozzles are easy to replace and different nozzle sizes in a variety of spray bar configurations can be selected to accommodate the material to be removed and the type of substrate. The nozzle flow chart and spray bar configuration diagrams located in the Safety Information section and Appendix C will provide assistance in choosing the best nozzles for the job. As the operator becomes more experienced, nozzle selection becomes easier. You can also contact Waterblasting Customer Service for assistance in selecting the proper spray bar and nozzle configuration for your job.

To check the nozzles on the Hog Head spray bars, raise the hog head, set the parking brake, activate the high pressure system and set the operating pressure to a safe level. Make sure the head rotation speed dial is set to 0 so the spray bars do not rotate. Staying well clear of the water jets, 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 is good.

Remove Nozzle from Service if:

A) Nozzle is split or damaged;

B) Nozzle is clogged;

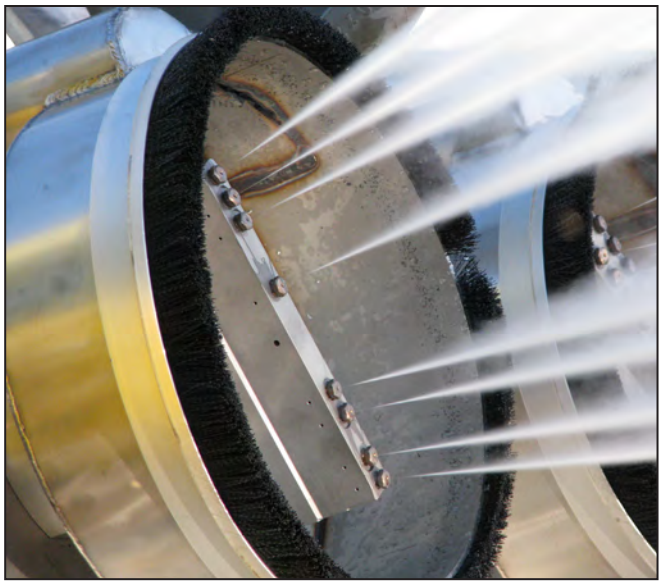
C) Nozzle water spray is fanned out;

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

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

F) Nozzle threads are damaged.

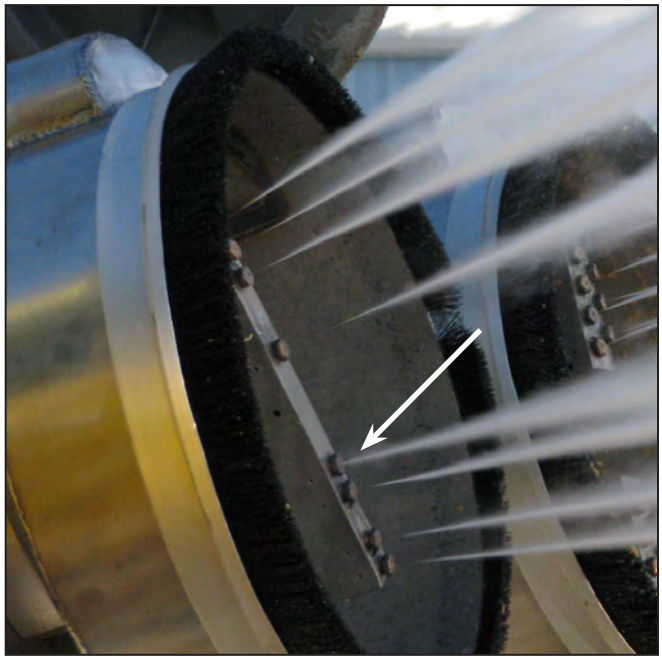
Refer to the Stripe Hog Training video available on DVD or at www.stripehogsupport.com and the Hog Head Maintenance section of this manual for instructions on changing nozzles.



Good Nozzles

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 AND 40K PSI SWITCH FOR THE HIGH PRESSURE SYSTEM TO CHECK THE NOZZLES WITH THE HOG HEAD RAISED.



Bad Nozzle

When replacing nozzles make sure to check the flow and pressure rating and 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 54,000 PSI (3,723 Bar.) We recommend that you only use nozzles, high pressure hoses and fittings supplied by Waterblasting Technologies to ensure the nozzles and other components are compatible with your Ultra High Pressure Water-blasting System.

Prior to installation, make sure the nozzles have no clogged orifices. Also, check to ensure nozzles are sharp and not worn. To prevent galling, make sure to apply anti-seize to the threads before installing the replacement nozzle and be careful not to get anti-sieze on seating area of the nozzles.

Notice:
To increase the life of the spray bars and nozzles, always remember to install the spray bar shield after testing the nozzles and before beginning blasting operations.

2.7 Vacuum System

Vacuum System

The vacuum system is powered by the main truck engine and is activated whenever the PTO and 40K Clutch 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 truck or tractor mounted Hog Head. Special swivel brackets and/or a swing arm boom allow the hose to move with the Hog Head or optional tractor. The boom helps prevent the hoses from dragging on the ground when the tractor or other Hog Tools are used.

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

The vacuum is monitored by a digital gauge in the control switch panel or an optional gauge on the vacuum tank. It is adjusted by increasing or decreasing the engine RPM. Thus, maximum vacuum, -7 PSI (-.5 Bar,) is typically achieved at 1400 RPM (Maximum engine operating RPM.) Relief valves (Kunkle Valves) on top of the vacuum canister and the debris tank will automatically open if they sense excessive vacuum in the system. Always test these valves and all vacuum hose connections at the start of each shift to ensure the valve is operating properly and there are no vacuum leaks in the system.

The 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 and never leave the drain valve open when the vacuum system is operating.

Vacuum Blower System

Vacuum Canister, Kunkle Valve and Drain Valve

Notice:
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 40K Clutch 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, 6" 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 4" debris suction vacuum hose runs from the debris inlet elbow on the top of the debris tank to the Hog Head and/or boom assembly for the tractor. The hoses are equipped with quick connectors at the Hog Head and/or boom and ends that allow additional 4" 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. The SH8000 can provide enough vacuum and water pressure to operate Waterblasting equipment up to 400' from the unit.

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 debris suction 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 or connects to the boom for the optional tractor. The life of the hoses in these areas can be extended by rotating the hoses 120^0 once each week.

Filter Canister and Vacuum Filter

Some types of debris will buildup on the inside walls of the vacuum debris suction 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.

Vacuum / Debris tank

The vacuum/debris tank is constructed from stainless steel panels that provide corrosion resistance and low maintenance. There is a stainless steel cutoff ball valve that 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 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 re-

Cutoff Ball Valve

taining hooks near the top the stainless steel liner in the debris tank. The vacuum system creates vacuum in the tank and debris mixed with water from the Hog Head and vacuum intake hose 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 vacuum tank where it accumulates until it is drained by the drain valve at the bottom of the tank. The filter system allows for quick draining and easy disposal of filtered waste water while retaining the solids, enabling the operator to re-gain tank capacity.

A site tube on the side of the debris tank indicates the recovered water level and a removable 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.

The filtered waste water 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.

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.

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.

Removable Inspection Port on Top of Debris tank

Debris tank Drain Ball Valve

Dumping Debris

Solid debris (larger than 100 microns) is separated from the waste water by the filter bag and needs to be dumped when the debris tank is near full. A Hydraulic ram and tilting mechanism raises the front of the water and debris tanks, causing them to tilt for easy dumping.

To dump the solid debris, turn OFF the 40K Clutch switch to shutdown the UHP Pump and vacuum blower, then disengage the PTO. Completely drain the water from both tanks. Make sure the dump location is on solid, level ground and there are no overhead obstructions or power lines that could be hit by the tanks as they are raised. Disconnect the vacuum and water hoses at the quick release fittings near the tanks. Release the safety chain and loosen the ratchet binders on each side of the debris tank door. Be prepared to stand back when the last ratchet binder is removed as the door will

open slightly and some water will pour out as the binder is removed. Secure the door in the open position with the safety chain.

Attach the cord for the hydraulic lift remote control to the receptacle in the driver's side tool box and engage the PTO to activate the hydraulic system. While you and all other personnel stand well clear of the truck, press the white UP button to raise the tank to dump the debris. Lift the unit slowly and monitor hoses and components as it is raised. Be prepared to immediately lower the tanks if there is a problem.

As the unit raises, the filter bag will normally slide out with the debris. If the debris does not slide out, use a high pressure jet rod to break up the debris until it is all removed. Never use the hydraulics to bounce the tanks or jerk the truck in an effort to remove debris. Jerking the truck or bouncing the hydraulic unit is unsafe and can damage the truck and/or break the ram hinge pins, causing the tanks to fall.

A safety strut that secures the hydraulic dumping system in the up position is incorporated in the linkage next to the hydraulic lifting ram. Always secure the unit with the safety strut before entering the debris tank for any reason or servicing components below the tanks when they are tilted.

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. Pay particular attention

Disconnect Hoses at Quick Disconnect Fittings Before Dumping

Hydraulic Lift Remote Control

Safety Strut

Tanks Tilted to Dump Debris from Debris tank

to the vacuum tube and make sure it aligns with the wok, a funnel shaped fitting on the vacuum filter canister that guides the vacuum tank tube into the fitting on the vacuum canister tube.

Use a hose to clean the debris tank, door jam and seal. Inspect the automatic cutoff ball valve and make sure it is free and not damaged. Then install a new filter bag, making sure it is attached to the liner properly. Close the door, attach the safety chain and secure it by systematically tightening the ratchet binders on each side of the door.

Notice:
The door is designed with a slight bow to facilitate a positive vacuum seal and can be damaged if it is not clamped properly. Make sure to tighten the door binders evenly, pulling each side in a little at a time to ensure a tight even seal.

When the door is secure, start the engine, engage the PTO and turn the 40K Clutch switch ON to activate the vacuum system. Increase the RPM to create maximum vacuum in the debris tank which will pull the door against the seal. Check that the door ratchet binders are still tight. Retighten if necessary.

With the system still at maximum vacuum, check the door 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.

Rear Door Ratchet Binder

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

DANGER

TO AVOID SEVERE DAMAGE TO THE TRUCK OR SERIOUS INJURY TO PERSONNEL, ALWAYS FOLLOW THESE GUIDELINES BEFORE RAISING THE TANKS TO DUMP DEBRIS:

- DRAIN ALL WATER FROM THE CLEAN WATER AND DEBRIS TANKS.
- MAKE SURE THE TRUCK IS ON FLAT, SOLID GROUND. NEVER ATTEMPT TO DUMP ON SOFT GROUND OR UNEVEN TERRAIN.
- MAKE SURE THERE ARE NO OVERHEAD POWER LINES NEAR THE DUMPING AREA.
- ALWAYS SECURE THE RECOVERY DOOR WITH THE SAFETY CHAIN.
- MAKE SURE THE VACUUM AND WATER HOSES ARE DISCONNECTED AT THE QUICK DISCONNECTS.
- HAVE ALL PERSONNEL STAND WELL CLEAR OF THE TRUCK AND RECOVERY DOOR. THE OPERATOR SHOULD USE THE REMOTE CONTROL AND BE WELL CLEAR.
- LIFT THE UNIT SLOWLY AND MONITOR HOSES AND COMPONENTS AS IT IS RAISED. BE PREPARED TO IMMEDIATELY LOWER THE UNIT IF THERE IS A PROBLEM.
- NEVER JERK THE TRUCK WHILE DUMPING THE DEBRIS. JERKING THE TRUCK IS UNSAFE AND CAN DAMAGE THE TRUCK AND/OR CAUSE THE TANK FALL.
- SECURE THE UNIT WITH THE SAFETY STRUT BEFORE ENTERING THE RECOVERY TANK OR SERVICING ANY COMPONENT.
- LOWER THE UNIT SLOWLY WHEN DUMPING OPERATIONS ARE COMPLETE.

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Stripe Hog Tractor Operation

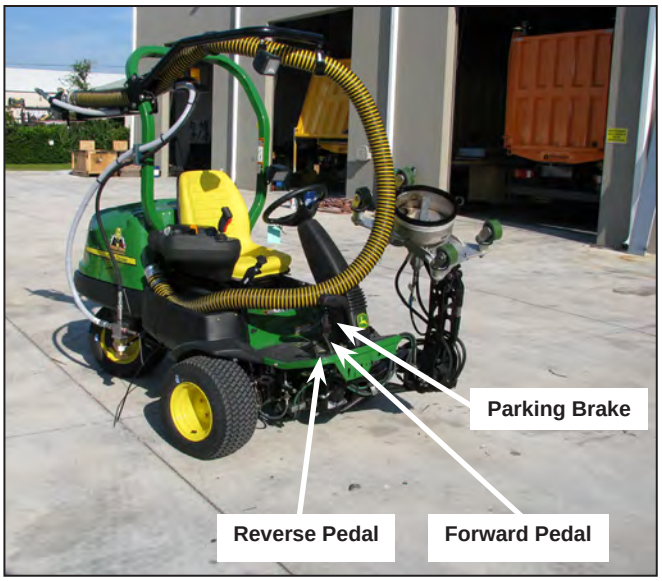
SH8000T and Tractor

3.1 Tractor Controls & Deployment

The optional tractor blasting system is a versatile system that utilizes the SH8000T Ultra High Pressure water and vacuum recovery systems to provide speed and flexibility to the waterblasting process.

The operation and maintenance requirements for the engine, drive train and hydraulic components are stated in the tractor information manual. It is important that you read the manual carefully and become familiar with the proper care and operation of the engine, drive train, hydraulics and safety features for your tractor.

A warranty registration form is included with the tractor information manual. All requested information on this form should be filled out completely and submitted to the dealer or manufacturer as soon as possible.



Tractor Foot Controls

Tractor foot controls

The tractor is equipped with a hydrostatic transmission that is controlled by foot peddles on the tractor. There are three peddles, one for forward, one for reverse and the brake. The brake peddle is the largest of the three peddles and also acts as the parking brake when pressed hard enough to engage the brake locking mechanism. Arrows on each drive peddle indicate the direction the tractor will move when the peddle is pressed. Press the peddle with the forward pointing arrow and the tractor moves forward. Press the peddle with the reverse pointing arrow and the tractor moves

backwards. The further a peddle is pressed, the faster the tractor will go until it reaches the maximum speed for the throttle setting selected. Release the selected peddle and press on the brake to stop the tractor.

WARNING

OPERATING THE TRACTOR WITHOUT COMPLETELY UNDERSTANDING THE FUNCTION OF EACH CONTROL PEDDLE CAN CAUSE THE OPERATOR TO LOSE CONTROL OF THE TRACTOR WHICH COULD RESULT IN DAMAGE TO EQUIPMENT OR SEVERE INJURY TO THE OPERATOR. THE INFORMATION IN THIS MANUAL IS MERELY AN OVERVIEW OF THE TRACTOR CONTROLS AND NOT INTENDED TO COVER ALL ASPECTS OF THEIR OPERATION.

ANYONE THAT OPERATES THE TRACTOR SHOULD READ THE TRACTOR OPERATING MANUAL AND COMPLETELY UNDERSTAND THE PEDDLE AND ENGINE THROTTLE CONTROLS IN THEORY AND OPERATION BEFORE ATTEMPTING TO DRIVE THE TRACTOR. NEVER ALLOW ANYONE TO OPERATE THE TRACTOR UNTIL THEY HAVE READ THE TRACTOR OPERATING MANUAL OR RECEIVED INSTRUCTIONS FROM AN EXPERIENCE OPERATOR.

Tractor Loading and Unloading

The tractor is typically stored and transported on a special landing pad on the chassis. The pad is equipped with tie down locations so that the tractor can be tied down for transport. A folding, heavy duty ramp provides safe and easy loading and unloading for the tractor. The aluminum ramp is equipped with a lift assist system that allows the ramp to be easily raised and lowered by the operator.

The ramp angle can become too steep for the tractor to be safely loaded or unloaded in some situations. Additionally, the Hog Arm can hit the ramp if it is too steep. You should pay attention to the angle of the ramp and compensate for this situation by selecting a different location that reduces the angle when necessary.

To unload the tractor, release the spring loaded safety pin or other safety pin assembly located on the side of ramp that secures it in the up or stored position. Simultaneously lower and unfold the ramp until it is completely open and sitting firmly

on level ground. Make sure the parking brake on the tractor is set, then remove the tie downs. Start the tractor engine and let it warm up for a couple of minutes. Set the throttle slightly above idle, release the parking brake and carefully back the tractor down the ramp. Go slow and pay close attention to the position of the tractor on the ramp during loading and unloading operations. Reverse the process to load the tractor. Note that a slightly higher throttle setting may be required for loading than for unloading.

WARNING

THE TRACTOR CAN SURGE UNEXPECTEDLY IN FORWARD OR REVERSE IF THE THROTTLE IS SET TOO HIGH WHILE LOADING AND UNLOADING THE TRACTOR. THIS CAN CAUSE THE OPERATOR TO LOOSE CONTROL RESULTING IN DAMAGE TO THE EQUIPMENT OR SEVERE INJURY TO THE OPERATOR. ALWAYS MAKE SURE TO SET THE THROTTLE AT A LOW RPM, SLIGHTLY ABOVE IDLE, FOR LOADING AND UNLOADING OPERATIONS.

Typical Loading Ramp Safety Bar and Pin Assembly

Once the tractor is loaded, make sure the parking brake is set and the tractor is secured with the tie downs. Simultaneously raise and fold the ramp and secure it with the safety pin. The pin secures the ramp in the up position and prevents it from swinging out while operating the truck.

Notice:
You should always pay attention to the location of the hoses and make sure they are not snagged or strained. This is particularly important while loading or unloading the tractor.

Loading Ramp Folded

3.2 Tractor Hog Head & Hydraulic Systems

The Hog Head and hydraulic Hog Arm is mounted to the front of the tractor. All movement and the rotation of the spray bars are activated and controlled by the tractor electric and hydraulic systems.

The high pressure water pump system on the SH8000T provides the ultra high waterblasting pressure to the rotating spray bar. A joystick and rocker switches in the console control all functions of the Hog Head and control arm.

Notice:
The tractor throttle setting must be set at 75% or higher to provide enough hydraulic pressure to properly activate the Hog Arm and rotate the spray bar.

Always Be Aware of the Location of the Hoses
Never Strain or Damage the Hoses

Hog Head Hydraulic System

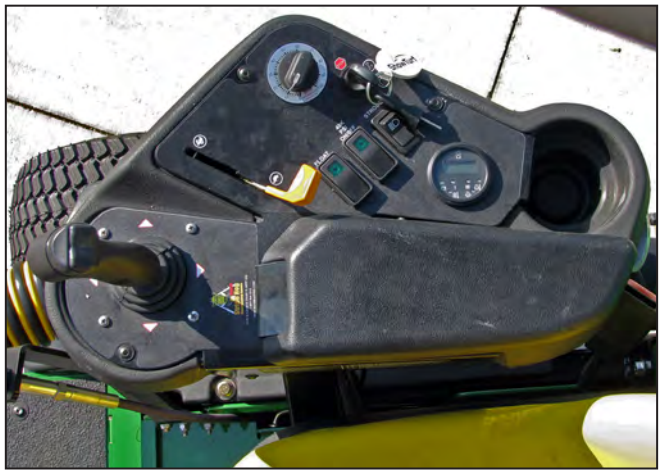
The hydraulic system is powered by the tractor engine. Switches and the joystick on the console control all hydraulic functions of the Hog Arm. The Hog Head can be moved up and down, right and left or can be set to float, which allows the Hog Head to freely move up and down with the contour of uneven surfaces.

Hog Head and Hydraulic Hoses

Joystick

A multi-function joystick on the tractor console controls lateral and vertical movement of the blast head and makes it easy to change nozzles. The Hog Arm and spray bar rotation speed are controlled by the joystick and a speed dial in the console. Separate gauges on the SH8000T monitor the charge pressure and ultra high pressure in the waterblasting system.

The joystick controls the Hog Arm. Move it forward to lower the arm, pull it back to raise it. Move it to the right and the hog arm moves right, move it left and the arm moves left. The “trigger” on joystick controls which stage of the Hog Arm moves right and left with the joystick. When the “trigger” is not activated, the joystick controls the 1st stage of the arm and moves the entire Hog Arm right and left. When the “trigger” is activated, the joystick moves only the 2nd stage of the Hog Arm (the portion forward of the center hinge) for more precise positioning of the Hog Head. When the joystick is released, the handle automatically returns to center and the Hog Arm stops in that position. The Float rocker switch in the console activates and deactivates the Hog Head float feature that enables the Hog Head to float freely over uneven contours. Float mode is recommended for most situations and the most common operating mode for the Hog Arm while waterblasting operations are underway.



Tractor Joystick and Control Panel

The Head Rotation dial controls the speed of the Hog Head spray bar. Rotating the dial clockwise increases speed and rotating it counterclockwise reduces speed. Setting the Head Rotation dial to 0 will stop the rotation of the spray bar.

Head Rotation Speed Dial, Console Rocker Switches and Tractor Multi-Gauge

The computer that controls the joystick functions is mounted below the seat near the battery. The 12-volt circuits for the joystick, console switches and strobe light are protected by in-line fuses located near the battery.

Hog Head

The Hog Head is attached to the end of the Hog Arm. There is one blasting head and four heavy

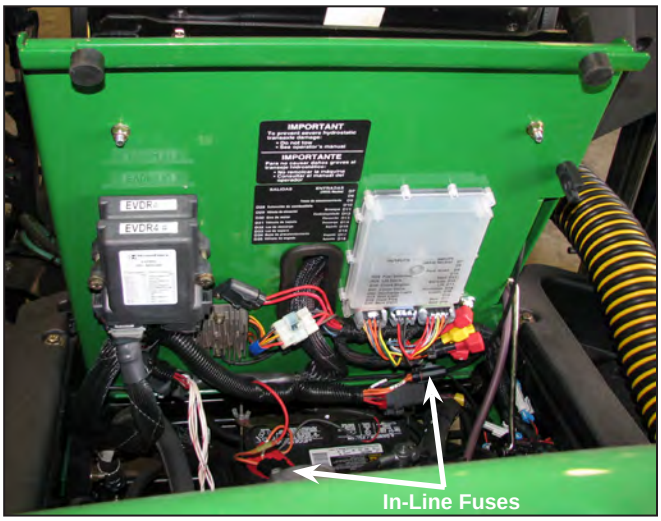
duty castors that support the Hog Head at a preset height and prevent the spray bar from contacting the pavement. Spacers on each caster adjust the height of the Hog Head. Adjustment may be required to maintain proper clearance by adding spacers as the castor wheels wear.

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

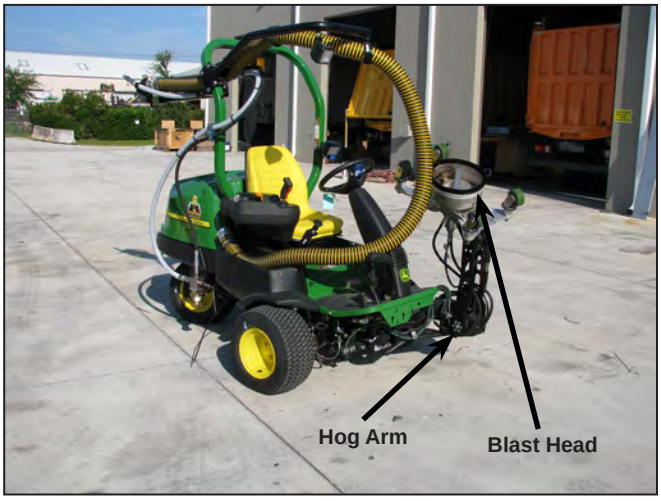
To adjust the wear brush, lower the Hog Head to the ground and note the gap between the wear brush and the pavement. Raise the Hog head, loosen the clamp on the blast head and slide the wear brush enough to eliminate the gap. Tighten the clamp and recheck. Readjust if necessary.

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 thru-shaft hydraulic motor or a thru-shaft rotated by a separate hydraulic motor, depending on the options selected. The rotation speed is controlled by the head rotation dial in the tractor console. The center of the thru-shaft is drilled to allow high pressure water to pass through the shaft to the spray bar. A special swivel seal assembly provides a positive seal for the connection to the high pressure hose while allowing the thru-shaft to turn freely. The hose is secured to the thru-shaft motor or swivel shaft housing by the swivel nut. The swivel nut is hand tightened. 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. It 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 Hog Head with a leaking swivel seal will cause complete failure of the seal, stopping blasting operations and severely damage the thru-shaft motor or swivel shaft.



Joystick Control Panel Computer, Tractor Battery And In-Line Fuses



Hog Arm and Hog Head (Blast Head)

Blast Head, Spray Bar and Wear Brush

The spray bar is a quick change design. Spray bars are available in 6", 8", 10", 14", widths. Aggressive and non-aggressive patterns are available for all heads.

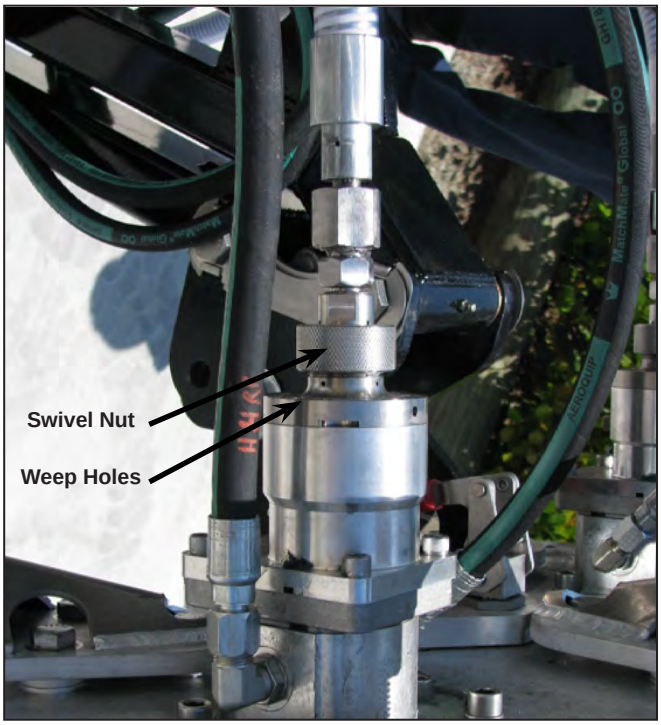
If you are new to waterblasting equipment, Waterblasting Technologies offers a variety of spray bar and nozzle configurations to meet the requirements of most paint and rubber removal projects. Examples of available spray bar configurations are included in the Appendix section of the this manual. You can also contact Waterblasting Customer Service for assistance in selecting the right spray bars for your project.

To change a spray bar, hold the shaft by inserting a 3/4" wrench into the slot at the bottom of the thru-shaft motor or swivel shaft housing, located just above the blast head shroud. Twist the spray bar counterclockwise by hand until it is free of the shaft. Purge the blast head at low pressure, then apply anti-seize to the threads, insert a new brass button seal and install the spray bar by turning it clockwise ***slowly*** until it seats. Then tighten it by turning the spray bar another 15%. Make sure you remove the wrench when the installation is complete.

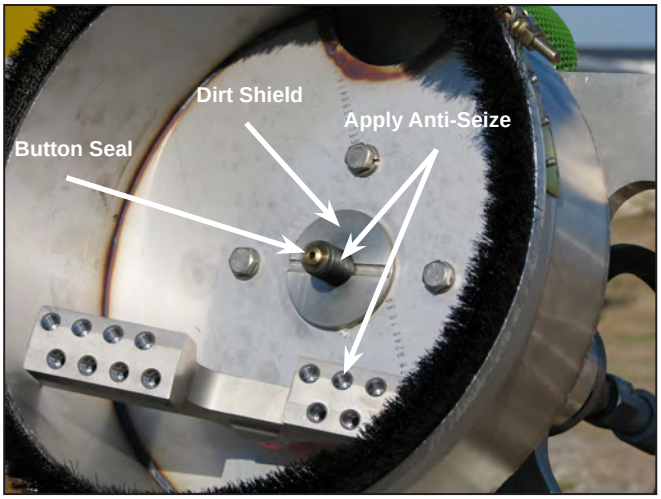
Notice:
Before attaching the new spray bar to the Hog Head Assembly, engage pump at low speed to purge the system. Any dirt or debris in the system can clog nozzle orifice's and cause system pressure to spike excessively causing damage to components or the rupture discs on the UHP pump to burst. Refer to the Stripe Hog Training DVD for detailed information on changing the spray bar.

The dirt shield that protects the thru-shaft motor or swivel shaft bearings is located between the spray bar and blast head shroud. It consists of a special felt seal that is held against the bottom of the blast head shroud by a stainless steel flat washer threaded on the shaft. The felt seal should be inspected and adjusted whenever the spray bar is removed. The dirt shield should be replaced if it is damaged or worn and be adjusted "finger tight." If it is too tight it will prevent the spray bar from rotating.

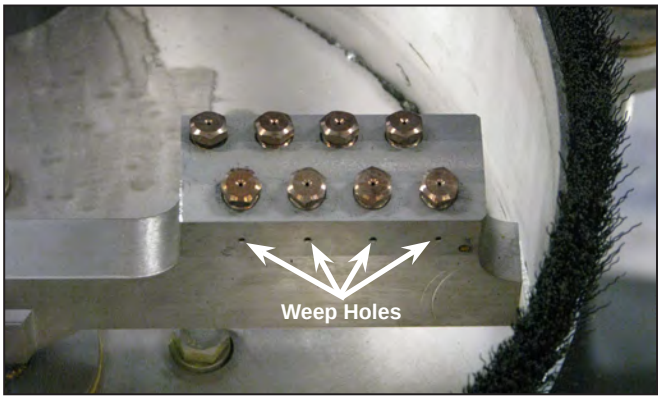
With the spray bar installed, operate the pump at low pressure to check for nozzle accuracy and leaks on the spray bar or nozzles. Water dripping from any of the weep holes in the side of the spray bar indicates that a nozzle is not seated properly. Leaks at the nozzle seats or thru-shaft threads must be corrected before beginning high pres-



Swivel Nut and Weep Holes

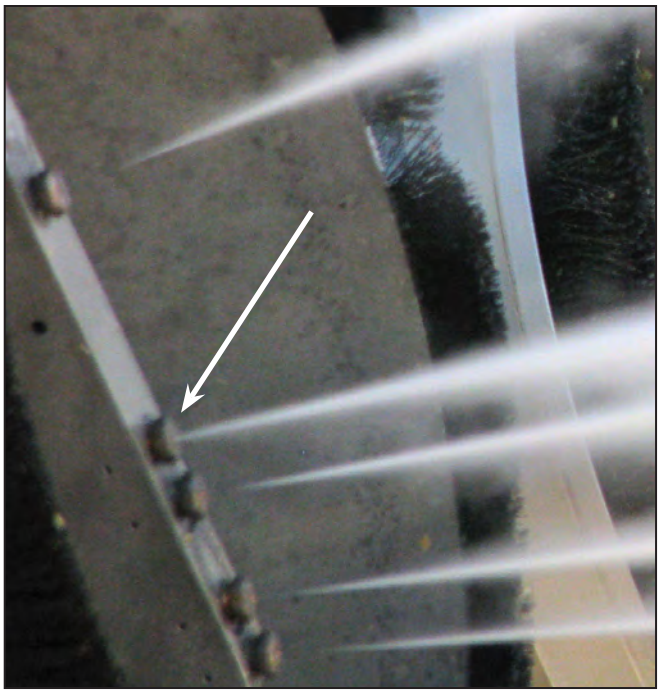


Spray Bar, Button Seal, Thru-Shaft and Dirt Shield



Spray Bar with Nozzles Installed and Weep Holes

Good Nozzle Spray Pattern and No Water at Weep Holes



Bad Nozzle

sure operations or the spray bar will be ruined. Should any repairs or adjustments be necessary, disengage the pump to relieve all pressure before making any required repairs or adjustments.

Each spray bar is equipped with a spray bar protector that is held in place with one or two cotter pins, depending on the size of the spray bar. The spray bar protector shields the nozzles and spray bar from damage caused by debris during blasting operations. Never water blast without the spray bar protector installed. Spray bars and nozzles are expensive and the life of the nozzles and spray bars will be dramatically shortened without the spray bar protector.

Notice:
Never Blast When Stopped. Damage to road surface will occur if blasting continues when the Stripe Hog is brought to a stop.

3.3 Tractor Waterblasting

The tractor Hog Arm and Hog Head are supplied high pressure water and vacuum from the SH8000T waterblasting system. Quick disconnect fittings on the hoses and swing arm booms allow the tractor to be quickly connected to the SH8000T systems and enable unrestricted movement of the tractor around the truck. The operation of the Ultra High pressure water is controlled by the operator on the tractor.

The SH8000T UHP pump is designed to provide high pressure water to two blasting heads at a maximum operating pressure of 40,000 PSI (2,758 Bar) @ 12 gallons (45 Liters) per minute that is achieved at maximum engine RPM. (typically 1400 RPM) The the tractor is equipped with a single blasting head that operates at a maximum pressure of 40,000 PSI (2,758 Bar) @ ***6 gallons (23 Liters) per minute.*** Therefore, the high pressure system must be adjusted to provide the desired pressure at half the volume required for the truck mounted Hog Head. It is extremely important that the pressure and volume be adjusted at the time the high pressure and vacuum systems are switched from the truck mounted Hog Head to the tractor or any other Hog Tool.

DANGER

THE SINGLE BLASTING HEAD ON THE TRACTOR OR ANY OTHER HOG TOOL WILL BE OVERPOWERED BY THE SH8000 HIGH PRESSURE PUMP IF THE SYSTEM IS NOT ADJUSTED TO THE REDUCED VOLUME FOR A SINGLE BLASTING HEAD. FAILURE TO ADJUST THE SYSTEM WILL PROVIDE TOO MUCH PRESSURE TO THE SPRAY HEAD THAT WILL CAUSE THE RUPTURE DISCS TO BLOW AND COULD CAUSE SEVERE DAMAGE TO THE UHP SYSTEM AND/OR INJURY TO THE OPERATOR OR CREW WHEN THE SYSTEM IS ACTIVATED.

WHEN SWITCHING THE UNIT FROM THE MAIN HOG HEAD TO EQUIPMENT WITH A SINGLE BLASTING HEAD, ALWAYS ENGAGE THE TRUCK 40K SWITCH WITH THE ENGINE AT IDLE AND TURN THE DUMP VALVE ON. GRADUALLY INCREASE THE RPM WHILE ADJUSTING THE MANUAL BYPASS VALVE UNTIL THE DESIRED PRESSURE AND VACUUM FOR THE SINGLE BLASTING HEAD IS ACHIEVED THIS PROCEDURE MUST BE DONE BEFORE THE TRACTOR OR HOG TOOL IS USED AND MUST NEVER BE OVERLOOKED.

The water pressure is monitored by the High Pressure gauge on the pump and a digital gauge in the joystick panel. High pressure and water volume are controlled by the RPM of the engine and adjusting the manual bypass valve on the pump. Since engine RPM also controls the level of vacuum, you must use the manual bypass valve to reduce water volume to blasting head as the RPM is increased to achieve the pressure, gallons per minute and vacuum desired for the material being removed and the waterblasting tools being used.

Refer to the Water Blast System (Section 2.6) of this manual for information on waterblasting controls and systems.

High pressure hoses and fittings can be dangerous if a hose fails or a fitting breaks during high pressure blasting. Outfit the tractor operator with proper safety apparel. Additionally, the operator must always be aware of the maximum distance from the truck the hose length will allow. The SH8000T is capable of supporting the tractor with high pressure and vacuum to a maximum distance of 400' from the truck. Always operate the tractor well within the maximum distance to avoid straining or damaging hoses.

40K PSI ON/OFF and Nozzles Test Switch
A dual position rocker switch activates and deactivates the Ultra High water system and lower pressure for testing the nozzles. The center position of the switch is off. Push the top of the switch to close the tractor mounted dump valve and supply high pressure water to the Hog Head. Press the bottom of the switch to supply low pressure to the Hog Head for testing the nozzles.

The START switch in the truck joystick panel must be activated by the truck operator to supply High Pressure to the tractor dump valve. The UHP pressure can then be controlled at the tractor by the tractor operator. The truck operator can also shut down the UHP pressure to the tractor in an emergency by pressing the STOP switch in the joystick panel.

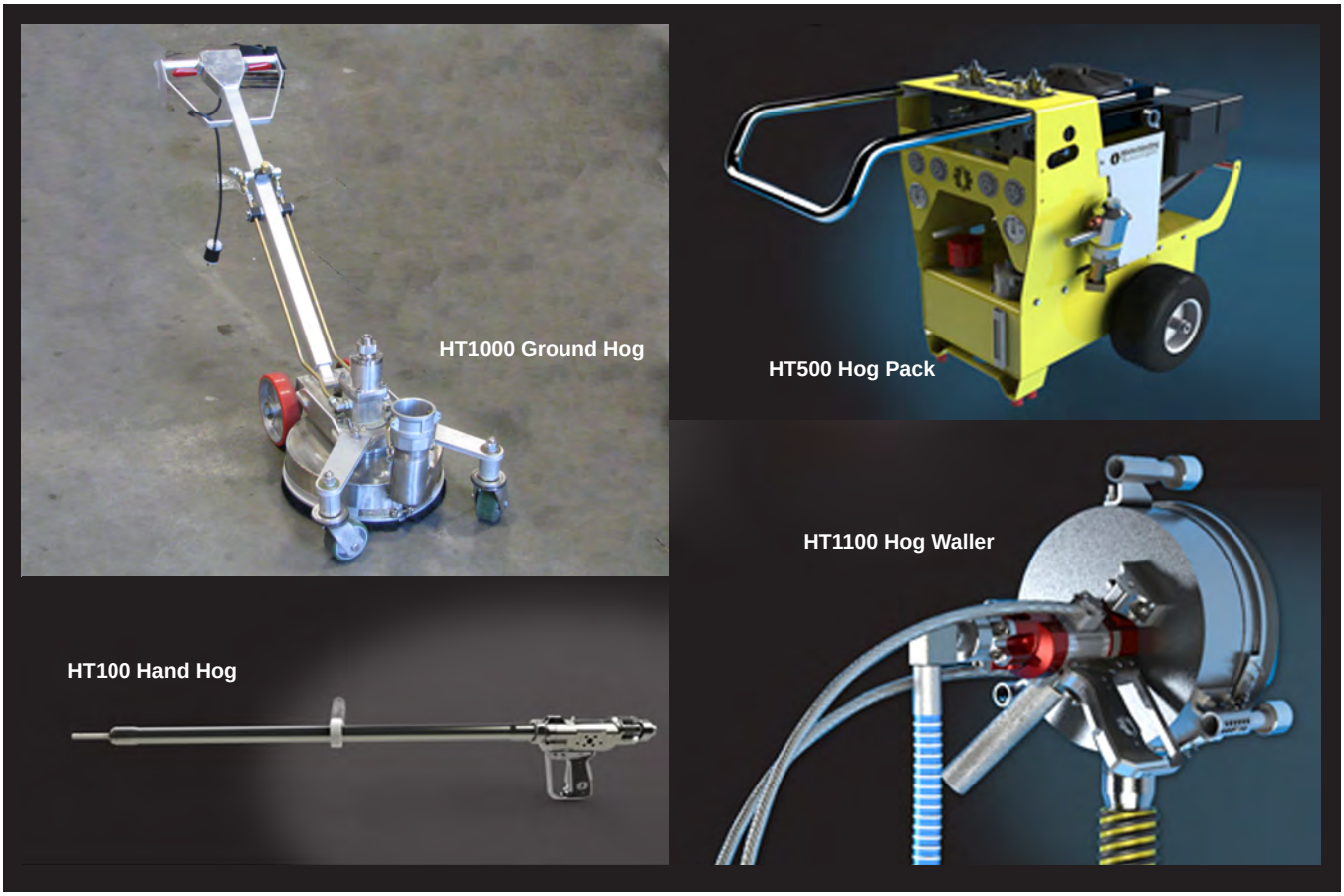
Tractor Vacuum System
The truck powered vacuum system provides the vacuum to the tractor. Flexible hoses with quick disconnect fittings provide vacuum to the tractor Hog Head. Refer to the Vacuum System (section 2.7) in this manual for information on the vacuum system.

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 in contact areas.

Strobe Switch
Activates and deactivates the strobe light on the tractor roll bar.

Work Mode Cruise Control
When the tractor is in "Work Mode", a separate, "Cruise Control" can be used to set the tractor speed (0-7 MPH). To set the speed, rotate the knob on the control. Turn it counterclockwise to increase tractor speed. Rotate it clockwise to decrease tractor speed. An adjustable friction control below the knob increases and decreases friction on the cruise control cable. It should be set just tight enough to prevent the speed setting from changing during operation. The button on top of the throttle knob releases the rotating control and allows the control to be pushed directly to the stop position.

Waterblasting Hog Tools



4.1 Hog Tools (Optional)

Waterblasting Technologies builds a variety of useful attachments called Hog Tools that can be used with the SH8000. The most common tools are the HT1100 Hog Waller, HT1000 Ground Hog and the HT100 Hand Hog. These tools connect to the electrical and hydraulic quick disconnect couplers just behind the bumper on the driver's side of the truck and to the truck UHP and vacuum systems.

This section provides a brief overview of how these tools work with the SH8000 for your information. An operating manual that ships with each Hog Tool provides more detailed information on the operation, safety and maintenance. Handheld, ultra high pressure waterblasting tools can be extremely dangerous if they are not used properly and all safety precautions followed. You should read the operating manual for each tool and completely understand the operation, maintenance and all safety precautions before operating the tool.

WARNING

INJURIES FROM ULTRA HIGH PRESSURE WATERBLASTING CAN BE VERY SERIOUS AND RESULT IN FATAL INJURIES. PROPER OPERATION OF HIGH PRESSURE WATERBLASTING TOOLS IS ESSENTIAL, PARTICULARLY WITH HANDHELD UNITS BECAUSE THE OPERATOR IS CLOSE TO THE BLAST HEAD.

THE FOLLOW PRECAUTIONS APPLY:

- **ALWAYS THE FOLLOW SAFETY GUIDELINES LISTED THE HOG TOOL OPERATION MANUALS.**
- **MAKE SURE ALL SUPPORT PERSONNEL ARE A SAFE DISTANCE FROM THE WORK AREA BEFORE THE PRESSURE PUMP IS ENGAGED.**
- **MAKE SURE THAT THE OPERATOR HAS READ THE MANUAL FOR THE TOOL AND HAS BEEN TRAINED IN THE PROPER USE OF HANDHELD WATERBLASTING EQUIPMENT.**
- **MAKE SURE THE OPERATOR AND ALL PERSONNEL ARE EQUIPPED WITH REQUIRED SAFETY EQUIPMENT INCLUDING HARD HATS, GLOVES, EYE AND EAR PROTECTION, ETC.**
- **NEVER PUT HANDS, FEET OR ANY PART OF YOUR BODY IN OR NEAR THE HIGH PRESSURE STREAM.**
- **NEVER ALLOW AN INEXPERIENCED PERSON TO OPERATE A HANDHELD, HIGH PRESSURE WATERBLASTING TOOL WITHOUT PROPER TRAINING.**

4.2 Hog Tool Waterblast Systems

General

When a Hog Tool is connected to the auxiliary connections, the Waterblasting electrical system senses that a tool is connected and allows the levers on the tool to control the dump valve and hydraulic pressure to the blast head thru-shaft motor. The truck hydraulic system provides the hydraulic power that rotates the spray bar on the Hog Tool. The truck UHP pump and vacuum system provides water pressure and vacuum.

Hydraulic and electrical Systems

Hydraulic hoses with quick disconnect fittings are connected the to the truck hydraulic system. The hydraulic manifold on the truck controls the oil flow and regulates the pressure. Switches and/or control knobs on the Hog Tool provide the operator with control of the hydraulically activated features.

A 12-Volt DC harness runs from the outlet plug on the front of the truck to a plug on the tool and allows the switch lever on the tool to activate the spray head rotation.

High Pressure Waterblasting System

The High Pressure water line runs from the UHP pump and dump valve on the SH8000 to the Hog Tool. The manual bypass valve on the UHP pump and engine RPM is used to adjust the volume and pressure supplied to the tool.

When the SH8000 is connected to a Hog Tool, the high pressure water is controlled by a lever on the tool handle. The control lever activates a switch that sends electrical current to the dump valve on the UHP pump to engage or disengage high water pressure water at the blasting head on the tool.

When the system is activated, it operates much like the truck mounted high pressure water system. The tools must be moving before the high pressure is activated and all waterblasting safety precautions apply.

High pressure hoses and fittings can be dangerous if a hose bursts or a fitting fails during high pressure blasting. Outfit the Hog Tool operator with proper safety apparel. Hard hat, safety shield or glasses, gloves, ear protection, etc.

DANGER

THE SINGLE BLASTING HEAD ON THE TRACTOR OR ANY OTHER HOG TOOL WILL BE OVERPOWERED BY THE SH8000 HIGH PRESSURE PUMP IF THE SYSTEM IS NOT ADJUSTED TO THE REDUCED VOLUME FOR A SINGLE BLASTING HEAD. FAILURE TO ADJUST THE SYSTEM WILL PROVIDE TOO MUCH PRESSURE TO THE SPRAY HEAD THAT WILL CAUSE THE RUPTURE DISCS TO BLOW AND COULD CAUSE SEVERE DAMAGE TO THE UHP SYSTEM AND/OR INJURY TO THE OPERATOR OR CREW WHEN THE SYSTEM IS ACTIVATED.

WHEN SWITCHING THE UNIT FROM THE MAIN HOG HEAD TO EQUIPMENT WITH A SINGLE BLASTING HEAD, ALWAYS ENGAGE THE TRUCK 40K SWITCH WITH THE ENGINE AT IDLE AND TURN THE DUMP VALVE ON. GRADUALLY INCREASE THE RPM WHILE ADJUSTING THE MANUAL BYPASS VALVE UNTIL THE DESIRED PRESSURE AND VACUUM FOR THE SINGLE BLASTING HEAD IS ACHIEVED. THIS PROCEDURE MUST BE DONE BEFORE THE TRACTOR OR HOG TOOL IS USED AND MUST NEVER BE OVERLOOKED.

4.3 Hog Tool Vacuum Systems

The HT1100 Hog Waller and HT1000 Ground Hog are equipped with blast heads that are designed to be attached directly to the SH8000 vacuum system. When the system is activated, it performs much like the vacuum system when it is connected to the tractor blast head. Vacuum is supplied whenever the engine on the SH8000 is running and the 40K clutch is engaged.

Stripe Hog Operation

5.1 Emergency Shutdown

Truck Emergency Shutdown

1. IMMEDIATELY PUT TRUCK TRANSMISSION IN "N" (NEUTRAL) OR SHUTDOWN THE ENGINE. THIS WILL INSTANTLY SUSPEND OPERATIONS OF THE ENTIRE SYSTEM.
2. WHEN THE SITUATION PERMITS, RETURN ALL SWITCHES TO THE "OFF" POSITION AND ALL DIALS TO THE "0" SETTING.

Tractor Emergency Shutdown

1. IMMEDIATELY STOP THE TRACTOR AND TURN THE 40K PSI SWITCH OFF. GET OFF THE TRACTOR AND OUT OF HARMS WAY IF NECESSARY.
2. IMMEDIATELY PUT TRUCK TRANSMISSION IN "N" (NEUTRAL) OR SHUTDOWN THE SH8000 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.

Truck Cab Control Switch Panel

Truck Cab Joystick

5.2 SH8000 Start Up/Shutdown

Before operating the Stripe Hog check the fluid levels in the truck engine, transmission and hydraulic system. A thorough understanding of the component systems and their operation is essential to the proper operation 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 operation of the unit.

You should walk around the unit and visually inspect the Hog Head, high pressure hoses, hydraulic hoses, vacuum hoses, and all waterblasting system components for obvious signs of leaks, wear and deterioration. 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

Tractor Control Panel and Joystick

with an automatic 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. Waterblasting Technologies includes a quick reference card in the cab of the truck, usually attached to the drivers side sun visor, that provides the proper startup and shutdown procedures for your truck.

Notice:
Always check the Hog Head nozzles and spray bars for wear and damage before each shift. Refer to High Pressure Hoses and Nozzles in Section 2.7 (Water Blasting Systems) for information on inspecting spray bars and nozzles).

Notice:
The pavement will be damaged immediately if high pressure blasting is activated without the Hog Head moving. Always make sure truck, tractor or Hog Tool is moving before supplying high pressure to the Hog Head.

Pre-start Inspection Check List:

1. Inspect all hoses for chaffing and signs of wear.
2. Check fuel levels and make sure you have enough for the shift.
3. Check engine and all systems fluid levels. Refer to the truck operating manuals.
4. Check the fluid level in the tractor hydraulic system.
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 that all quick release pins on the ladders and ramp are in place, secure and in good condition.
8. Check vacuum canister for water and the vacuum filter. Drain water or clean filter as required.
9. Check the vacuum blower and UHP pump drive belt tension and alignment.
10. Check clean water tank level and fill if necessary.
11. Drain debris tank water and check debris level. Empty if necessary.
12. Walk around truck and visually check all components and look for obvious problems.

Startup Procedure:

1. Make sure all switches and dials are in the "OFF" position or set at "0".
2. Be sure the truck Transmission is in "N", (*NEUTRAL*) position.
3. Start Truck Engine.
4. Turn the Mode switch "ON".
5. Turn the console PTO switch "ON". Listen for the PTO to engage and then wait for the green (Drive Mode) light to go off and the red (Work Mode) light to turn on.
6. Select "D", (*Drive*), on the truck transmission only when the red light is on. Wait until 4 4 is displayed on the transmission LED.
7. Turn the Charge Pump "ON" - operating pressure should be above 40 PSI (2.8 Bar).
8. Turn the 40K Clutch "ON". The RPM of the vacuum system is set in conjunction with the 40K PSI pump RPM.
9. Turn the truck Cruise Control "ON" - setting RPM to desired level for correct operating pressure setting (800 RPM min. - 1400 RPM max.). There may be some variation of this especially if there is a Stripe Hog Tractor and/or a Bypass Valve for relieving excess water with the system.
10. Use "Start" switch on the joystick box to activate high pressure at the spray bars.
11. Check the nozzle spray pattern and the spray bar weep holes for leaks.
12. Check all High pressure hose fittings and the Hog Head for leaks.
13. With the pressure set and the spray bar and nozzles working properly, press the "STOP" switch on the joystick then lower the Hog Head.
11. Release the truck Parking Brake - truck cannot move hydraulically unless brake is released.
14. The truck operator can now press the "Start" switch and begin blasting operations.

WARNING

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

Shutdown Procedure:

1. Turn high pressure OFF by pressing joystick "Stop" switch.
2. Turn the 40K Clutch and Charge Water switches "OFF".
3. 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.
4. Reduce the engine speed to idle.
5. Raise the Hog Head to the full "UP" and locked position. Make sure the locking lever is engaged and secure it with a plastic tie wrap to ensure the locking lever cannot accidentally be released during transportation.
6. Put the Truck Transmission in "N" *(NEUTRAL)*.
7. Turn the PTO switch to "OFF". Listen for the PTO to disengage and then watch for the red light to turn OFF, the green light to turn ON.

WARNING

IT IS VERY IMPORTANT THAT THE PTO IS FULLY DISENGAGED TO INSURE THAT NONE OF THE FUNCTIONS WILL OPERATE ACCIDENTALLY.

8. Drain waste water from the vacuum canister. Close the valve when draining is complete.
9. Turn the Mode switch to "OFF". It is VERY important that this switch is off to insure that the truck transmission will not go directly into 4th gear lock-up when put into DRIVE causing the truck to lunge forward.
10. Turn all other switches and dials on the control panels to "OFF" or "0".
11. When the truck is parked, set the parking brake and allow the engine to run for several minutes to cool internal components, then shut off the engine.

5.3 SH8000T Tractor Startup/Shutdown

Before operating the ST2500 tractor, check the fluid levels in all components. A thorough understanding of the component systems and their operation is essential to the proper operation the Stripe Hog tractor or any other Hog Tool used with the SH8000. This manual, the manuals for the tractor or Hog Tools and the associated manufacturers' information is provided to enhance your knowledge of the equipment. Make sure you have read them carefully and fully understand the operation of the units.

You should walk around the truck and tractor and visually inspect the high pressure hoses, hydraulic hoses, vacuum hoses, and all waterblasting system components for obvious signs of leaks, wear and deterioration. Do not operate the unit until all questionable components are repaired or replaced.

Notice:
Always check the Hog Head nozzles and spray bars for wear and damage before each shift. Refer to High Pressure Hoses and Nozzles in Section 2.6 (Water Blast Systems) for information on inspecting spray bars and nozzles).

Notice:
The pavement will be damaged immediately if high pressure blasting is activated without the tractor or Hog Tool moving. Always make sure tractor or Hog Tool is moving before supplying high pressure to the Hog Head and spray bar.

Pre-start Inspection Check List:

1. Inspect all hoses for chaffing and signs of wear.
2. Check fuel levels and make sure you have enough for the shift.
3. Check engine, truck systems and tractor fluid levels. Refer to the tractor and engine operating manuals.
4. Check the fluid level in the tractor hydraulic system.
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 that all quick release pins on the ladders and ramp are in place, secure and in good condition.
8. Check vacuum canister for water and the vacuum filter. Drain water or clean filter as required.
9. Check the vacuum blower and UHP pump drive belt tension and alignment.
10. Check clean water tank level and fill if necessary.
11. Drain debris tank water and check debris level. Empty if necessary.
12. Walk around truck and visually check all components and look for obvious problems.

Start UP Procedure:

1. Unload the tractor.
2. Connect the pressure water and vacuum hoses to the tractor and position it for operation.
3. Set the tractor parking brake, start the tractor engine and set the throttle to idle.
4. Make sure all switches are in the “OFF” position and the spray bar speed dial is set at “0”.
5. Start the truck engine.
6. Allow the engine to warm up at idle speed for several minutes.
7. Activate the charge pump and make sure the charge water pressure is above 40 PSI (2.8 Bar.)
8. With the truck engine at idle, follow the truck startup instructions to engage the waterblasting UHP pump and vacuum systems.

At this stage the following implements will function:

A. Operation of charge water Pump.

B. Operation of the UHP Pump.

C. Operation of Vacuum System.

9. With the truck still at idle, the operator on the tractor, all personnel clear and the Hog Head in the “UP” position, turn the 40K PSI switch “ON”.
10. Slowly raise the engine RPM and adjust the manual bypass valve to set the high water pressure and vacuum to the desired levels. (Typically 800 RPM minimum - 1400 RPM max.) There may be some variation of this depending on the blasting equipment attached and/or the manual bypass valve setting. **The RPM of the vacuum system is set in conjunction with the 40K PSI pump RPM.**
11. Check the nozzle spray pattern and the spray bar weep holes for leaks.
12. Check all High pressure hose fittings and the Hog Head for leaks.
13. With the pressure set and the spray bar and nozzles working properly, select the “OFF” position on the 40K PSI switch on the tractor, then lower the Hog Head.
14. The tractor operator can now activate the 40K PSI switch and begin blasting operations.

WARNING

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

Shutdown Procedure:

1. Turn the tractor 40K PSI switch “OFF”.
2. Raise the Hog Head to the full “UP” position.
3. Turn all the switches on the control panel to “OFF” and the speed dial to “0”.
4. Stop the tractor near the truck so there is slack in the hoses.
5. Turn the throttle on the SH8000 engine to idle speed, disengage the PTO, and allow the engine to run for several minutes to cool internal components.
6. Load the tractor. Make sure the tractor is properly secured before traveling. Refer to Tractor Loading and Unloading in Section 3.1 (Tractor Operation) in this manual for more information on loading and properly securing the tractor.
7. Raise the ramp and make sure it is properly secured with the safety pin.

8. Properly store or secure all hoses and make sure the booms are properly secured for travel

9. Shutdown the SH8000 following the instructions in this section.

5.4 Waterblasting Operations

Before you start the job, you should evaluate the pavement you will be working on, the material to be removed, and choose the appropriate spray bars and/or 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 the operator becomes more experienced, the selection process becomes more refined and easier.

Generally, large, high volume (.015 - .017) nozzles are the most aggressive and provide faster results, but more potential for damage and a course profile. 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 less damage potential 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.

Waterblasting 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 Waterblasting Technologies Customer Service department for assistance in choosing spray bars and nozzles or more information regarding the factory training program.

Waterblasting Guidelines:

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 lighter aggression spray bars.
- Brittle pavement is a challenge and will require lighter aggression 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 need to back up and re-do sections.

Do’s

- Pre-clean the work area with a power broom before blasting.
- Stop blasting before stopping the truck or tractor. Blasting with the unit stopped will damage the pavement and Hog Head.
- Stop blasting before changing direction.
- When in doubt, choose a less aggressive spray bar. It is always best to error on the side of caution.
- Adjust the forward speed and head rotation to remove 95% of the paint in a single pass to eliminate a second pass and more potential for damage.
- Adjust the pressure for the pavement. Typically blast pressures between 32,000 and 38,000 PSI are used.
- Check and clean the vacuum filters frequently to ensure strong vacuum pressure while blasting. Dirty filters and low vacuum will leave excessive paint chips and debris on the pavement slowing productivity.
- Check the pavement frequently and watch the outer edges of the lines for damage. Continuously make adjustments as required.

Dont’s

- Do not allow untrained personnel to operate Stripe Hog equipment.
- Do not continue blasting with a damaged nozzle. It can cause damage, waste water, reduce the power of other nozzles and slow production.
- Avoid running the Hog Head wheels on rumble strips. Always adjust the Hog Arm to keep the wheels off the rumble strips.
- Do not blast directly on sealed joints in the pavement. Especially weather stripping on bridges or airfields.
- Do not blast over pavement markers. Markers can damage the blast head and spray bars and should be removed prior to blasting.

- Do not blast over damaged or uneven pavement that can damage the blast head and spray bars.
- Do not allow the Smart Tank to become overfilled. This can cause an unexpected shutdown of the vacuum system. Monitor the tank and empty it before it is full.
- Do not allow the charge pump to run out of water. Water is a lubricant and cools the charge and high pressure pumps. They will be damaged if they run dry. Always monitor the water level in the clean water tank and refill when it gets low.

5.5 Operating in Freezing Conditions

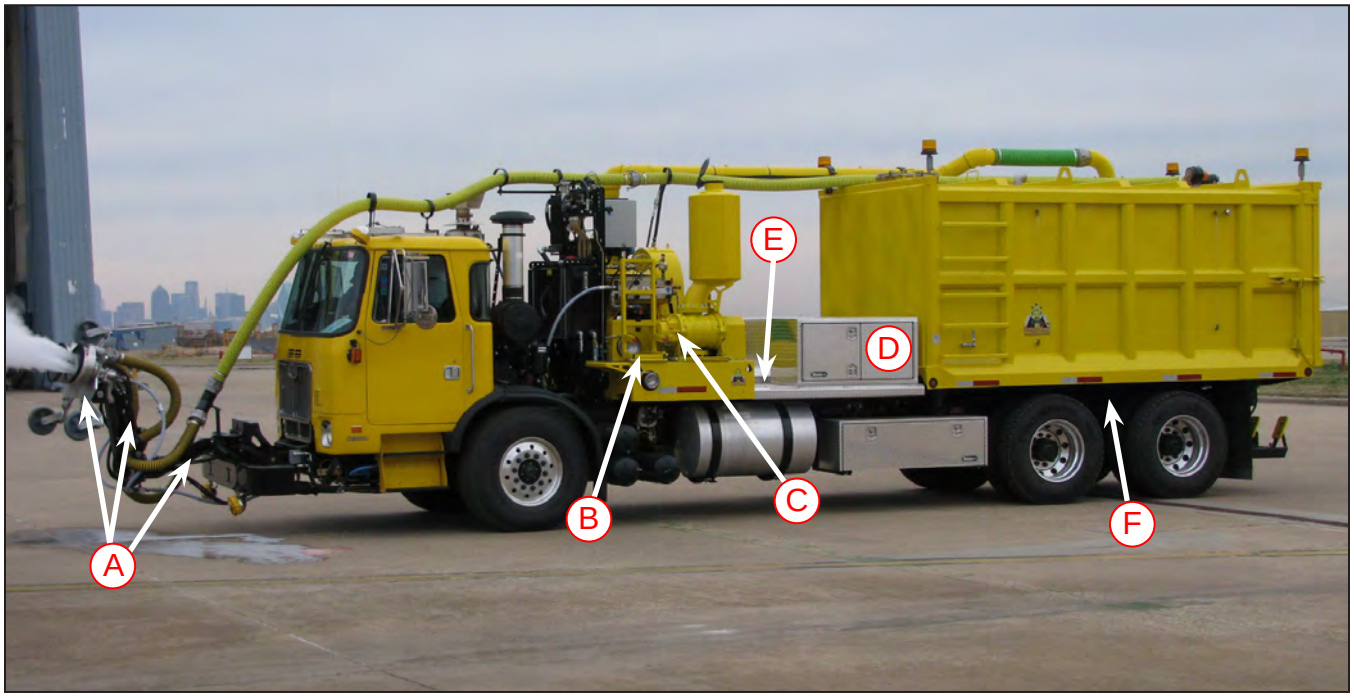
Shutdown

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, including the tractor Hog Head, should be drained of all water and/or filled with an anti-freeze solution. (non alcohol)
4. For the 40K water blaster, refer to pump manufacturer's procedures for maintaining equipment 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. 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.
7. Drain the vacuum canister immediately at the end of each shift.

CAUTION

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

General Maintenance



Drivers Side Lubrication Points

A. Hog Head and Hog Arm	D. Oil Tool Box Door Hinges and Latches
B. Lubricate Ladder & Ramp Hinges and Safety Pins	E. Grease Drive Splines and Universal Joints
C. Grease Blower Bearings	F. Grease Hydraulic Cylinder Hinge Pins

6.1 Lubrication

You should become familiar with the location of all components that require frequent lubrication and include them in the routine maintenance schedule. Some of these lubrication points require specialized lubricants. Refer to the Lubrication Chart in this section and the component manufacturer's operating manuals for lubrication specifications and maintenance schedules.

6.2 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.

Tool Boxes and Ladders

Tool Boxes

- Periodically lubricate all hinges and latch assemblies with a light oil.
- Periodically clean and coat gasket materials with silicone to help keep them pliable.
- Adjust latches as necessary.

Ladders

- Periodically lubricate all hinges.
- Periodically lubricate the retaining ball or sliding shaft on safety pins.
- Replace damaged or worn out safety pins or spring loaded safety latches immediately if the spring becomes weak or damaged.

Stripe Hog Loading Ramp

- Periodically lubricate all hinges.
- Periodically lubricate the ramp assist ball hinges with oil.

Passenger Side Lubrication Points

A. Grease Door Hinges	D. Lubricate All Ball Valves
B. Lubricate Tool Box Hinges and Latches	E. Lubricate Ladder Hinges and Safety Pins
C. Grease Pulley Pillow Block Bearings	F. Lubricate Vacuum Canister Hinges and Latches

- Replace damaged or worn safety pins and bars immediately.

Hydraulic Cylinders Hinge Fittings

- Grease the hinge fittings for the hydraulic cylinders with a general purpose grease weekly.

Vacuum Canister

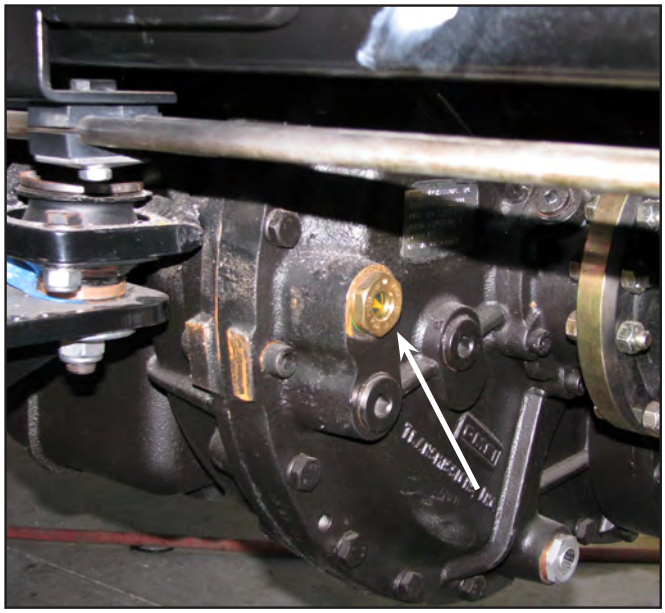
- Lubricate the drain valve with oil and open and close the drain valve weekly.
- Lubricate latches and hinges weekly.

Debris tank

- Grease door hinges weekly.

Pulley Pillow Block Bearings

- Grease weekly.



Omsi Drive Main Gearbox Oil Level Site Glass

Omsi Drive PTO and 40K Clutch

Maintenance schedules for the Omsi Drive and 40K Clutch are outlined in the Omsi Drive operating

manual included with your SH8000. They should be followed exactly.

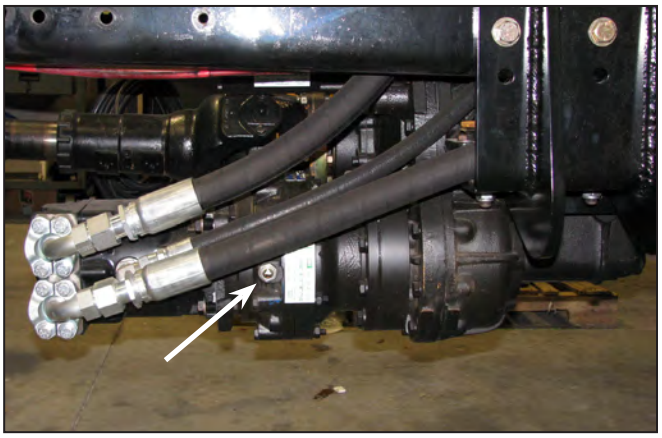
Refer to the Lubrication Chart in this section for lubrication specifications

Weekly:

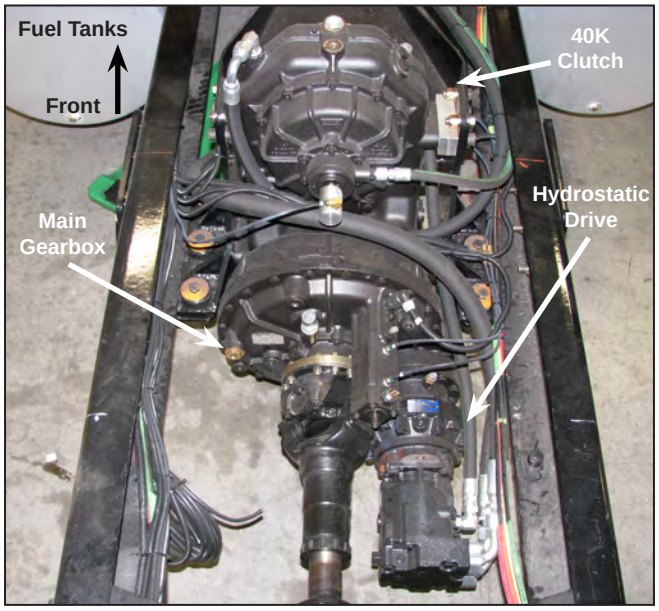
- Check fluid level in the Omsi Drive site glasses and inspect for signs of leakage. There are three site glosses, the main gearbox oil level on the driver side near the frame, the hydrostatic drive gearbox oil level on the passenger side at the hydrostatic motor and on the 40K clutch oil level on the forward passenger side of the Omsi Drive. Refer to the pictures in this section for the site glass locations and add fluid as required.
- Inspect components for loose bolts and universal joints.

Periodic Maintenance:

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



Hydrostatic Drive Gearbox Oil Site glass



Omsi Drive Component Site Glass Locations

6.3 UHP Pump & Vacuum Blower Drive Belts

The primary drive belts that connect the 40K clutch to the UHP pump and vacuum blower are special carbon fiber industrial belts that are designed for high horsepower applications.

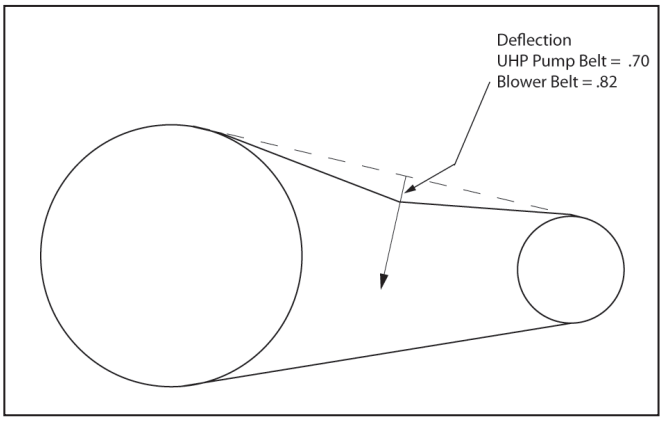
The ribbed drive belts are matched to grooved pulleys and have very little stretch. Therefore, they typically don't need to be adjusted often and proper belt tension is extremely important when adjustment is required. The belts are strong enough to cause severe damage to bearings, shafts and other components 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 Waterblasting Drive Belt Configuration

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.



Checking Belt Tension using the Force Deflection Method

Drive Belt Inspection and Maintenance

Daily:

- The belts must be inspected before each shift for damage, tension and alignment.

Periodic Maintenance:

- Check drive belt tension, pulleys and belt alignment monthly. 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 recommended.

Spring Scale Tester and the Force Deflection Method

The spring scale type tester is used by measuring how much force is required to deflect the belt at the center of its span by a specified distance (force deflection method), as shown in the sketch on this page.

Checking belt tension using the force deflection method:

1. At the center of the span, apply a force perpendicular to the span large enough to deflect the belt on the drive from its normal position. One sprocket should be free to rotate. Be sure the force is applied evenly across the entire belt width. Place a piece of steel or angle iron across the belt width to deflect the entire width of the belt evenly.

2. If it is less than the minimum recommended deflection force, the belt should be tightened. If it is greater than the maximum recommended deflection force, the belt should be loosened.

Typical Gates Sonic Tension Meter

Force Deflection Method Belt Tension Specifications:

UHP pump belt tension

New Belt = .70" (1.8cm) deflection @ 143-154 LBS pressure.

Used Belt (more than 20 hours of operation) = .70" (1.8cm) deflection @ 109 - 120 LBS pressure.

Blower belt tension
New Belt = .82" (2.1cm) deflection @ 37-40 LBS pressure.

Used Belt (more than 20 hours of operation) .82" (2.1cm) deflection @ 30-32 LBS pressure.

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.

Checking belt tension using a sonic tension meter:
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" (.6mm) away from the back of the belt. The Sonic Tension Meter will display the static tension vibration frequency.

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

Notice:
The procedure in this example is for the Gates Sonic Tension Meter shown. Sonic meters from different manufacturers will require procedures unique those meters.
Sonic Meter Belt Tension Frequency Specifications:

UHP Pump Belt Tension Frequency
New Belt = 61-63 Hz

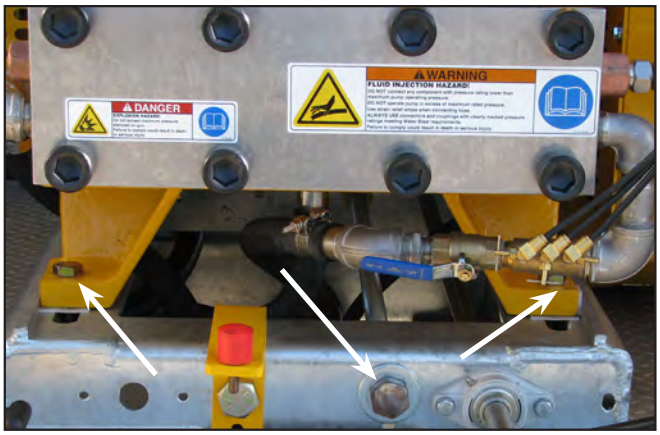
Used Belt (more than 20 hours of operation) = 52-55 Hz
Blower Belt Tension Frequency
New Belt = 46-48 Hz

Used Belt (more than 20 hours of operation) = 39-41 Hz

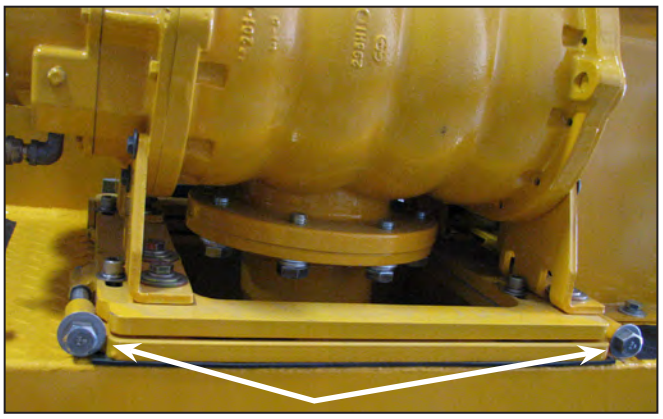
Refer to the belt manufacturer's manual for additional maintenance information on the drive belts.

Drive Belt Adjustment

The UHP pump and vacuum blower are on slotted, adjustable mounts. A threaded adjusting bolt on each side of vacuum blower mount is used for adjusting and aligning the blower drive belt. A single adjusting bolt in the center of the UHP pump mounts is used to adjust the UHP drive belt.



UHP Pump Drive Belt Adjusting Bolts

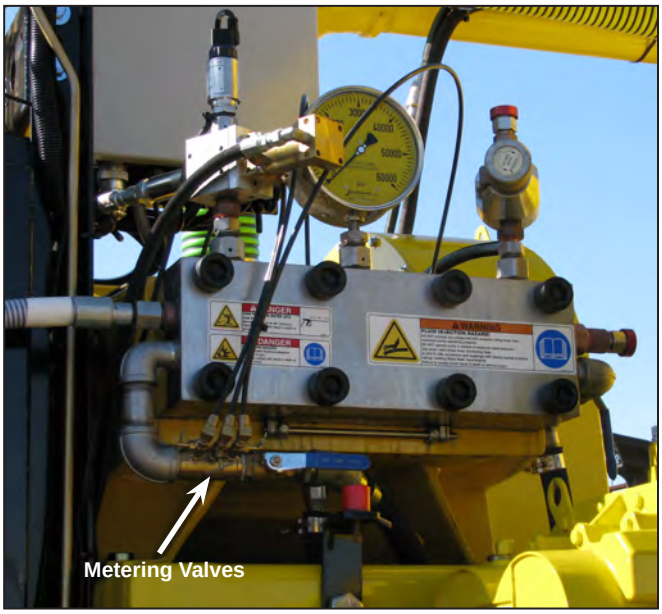

Vacuum Blower Drive Belt Adjusting Bolts

Drive Belt Adjustment Procedure:

1. Loosen the four bolts on the slotted holes on the mounting plate just enough to allow the plate to move. Make sure not to loosen them too much.
2. Rotate the adjusting bolts on each side of the blower mount equally or the use the center bolt on the UHP pump to adjust the belt to the proper specification. Use a spring scale tester or sonic tension meter to achieve proper tension.
3. Check the pulley alignment with a straight edge against the outside face of the drive and driven pulleys to make sure the pulleys are parallel.

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

4. Tighten the bolts on the slotted holes.
5. Start the engine and engage the PTO and activate the 40K clutch at idle speed for 30 seconds.
6. Deactivate the 40K clutch, disengage the PTO and shutdown the engine.
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 or UHP pump will have to be aligned slightly using the mounting plate adjusting bolts. 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.



UHP Pump and Packing Lube Metering Valves

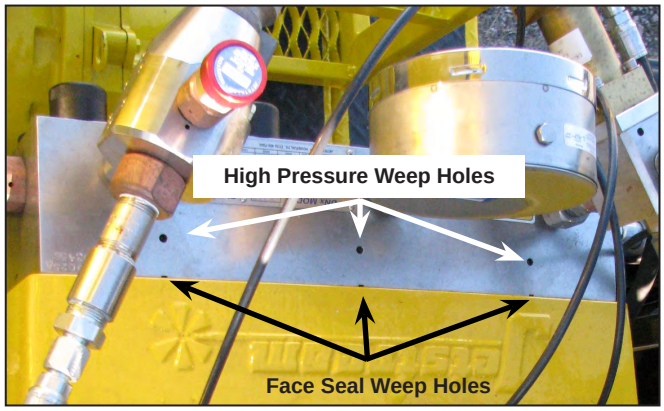
6.4 High Pressure Blasting System & Charge Pump

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

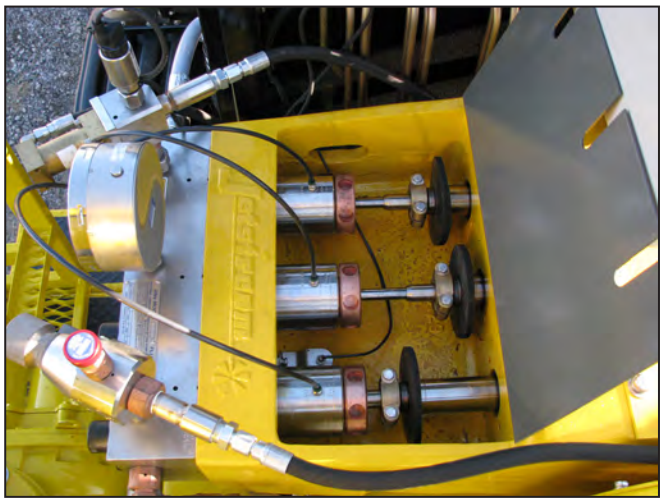
UHP System Inspection and Maintenance

Daily:

- Check for obvious loose mounting nuts and bolts.
- Check all hoses, fittings, valves and seals for leaks and proper operation daily. Repair or replace leaking or malfunctioning components before operating the system.
- There are filters in the water system immediately before the high pressure pump to remove any particulates from the water prior to entering the UHP pump. These filters should be changed when dirty or when the charge pump pressure is 30 PSI (2.1 Bar) or less. The filters are typically replaced daily.
- 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.
- Make sure the cooling water sump and drain are clean for proper drainage.



UHP Pump Weep Holes



UHP Pump Packing Lube Lines and Sump

- Check for water dripping from UHP Pump weep holes during high pressure test. Water dripping from the square holes indicates the face seals are leaking. Water leaking from round high pressure seal indicates the high pressure seals are leaking. Find and correct the problem before waterblasting.
- Test the dump valve for proper operation daily. Never operate the system if the dump valve is not working properly.
- Check the bypass valve and make sure it is operating properly.

Periodic:

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

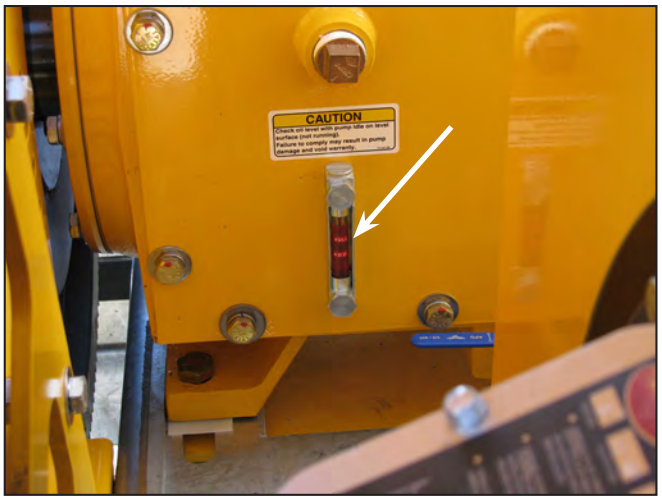
Important:
Make sure to install the safety plug in crankcase drain valve when draining is complete. The safety plug prevents crankcase oil from draining if the valve is accidentally opened.

- Check pulley clearances and drive belt tension at least once each month.
- Check and tighten all mounting bolts and hardware.
- Inspect all hoses and fittings weekly for signs of deterioration, chaffing and leaks. Repair or replace as necessary.
- Inspect and lubricate ball valves periodically. Make sure to open and close all ball valves at least once each month to keep them free and operating properly.
- Inspect and lubricate the manual bypass valve to keep it operating properly.

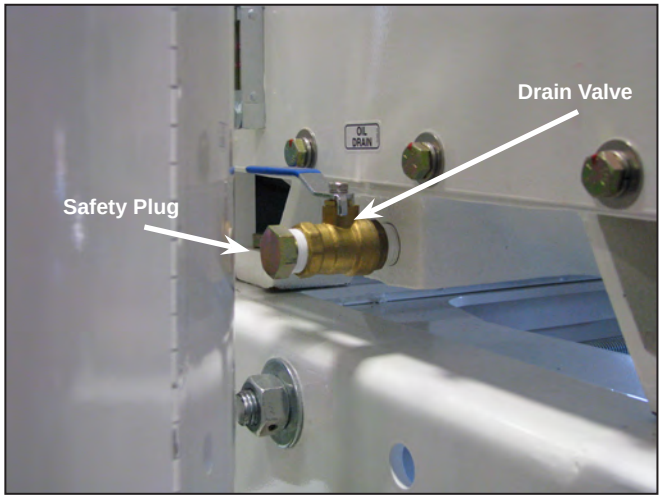
Charge Pump

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

- Periodically inspect the charge pump, hoses and fittings for leaks and signs of wear or deterioration. Any questionable or leaking components should be repaired or replaced before operating the system.



UHP Pump Oil Sump Level Indicator and Oil Fill



Typical UHP Pump Crankcase Drain Valve and Safety Plug

- If the Charge Pump pressure is lower than 25 PSI, replace both of the filters between the charge pump and the high pressure pump.

  To change the filters, make sure the system is not engaged and the switches for the charge water pump and 40K clutch are off. If necessary, relieve the pressure in the system. Refer to the filter installation and maintenance guide included with this manual for detailed information on replacing the filter elements.

Bilge Pump

The bilge pump returns packing cooling and lube water from the ultra high pressure pump to the debris tank. It is a centrifugal pump that requires little maintenance. It can run dry for short peri-

ods without damage, but prolonged dry operation will cause the seals to overheat and damage 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.

Inspection and Routine Maintenance:
Daily:

- Inspect the cooling water sump in the UHP pump daily and clean any debris that may restrict drainage to the bilge pump system.
- Inspect the drain hoses and sump system for loose fittings and leaks daily.
- The bilge pump is activated by an automatic float switch in the drain sump. Monitor the operation of the bilge pump system at the start of each shift to make sure the pump and automatic switch are operating properly.

Periodic:

- Remove the lid for the bilge drain sump box and clean debris that may reduce drainage to the bilge pump or interfere with the operation of the float switch weekly.

6.5 Hog Head Maintenance

The maintenance requirements for the truck and optional tractor mounted Hog Head and Hog Arm assemblies are very similar. The following maintenance procedures apply to both Hog Head units.

Hog Head

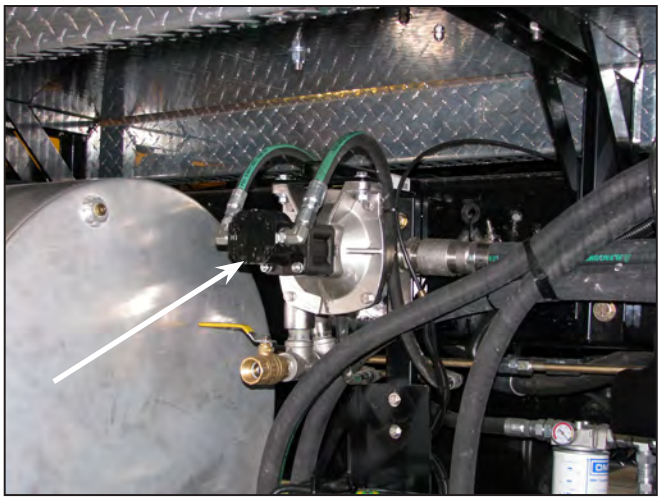
The Hog Head must be inspected daily and serviced as required.

The following service procedures apply.
Daily:

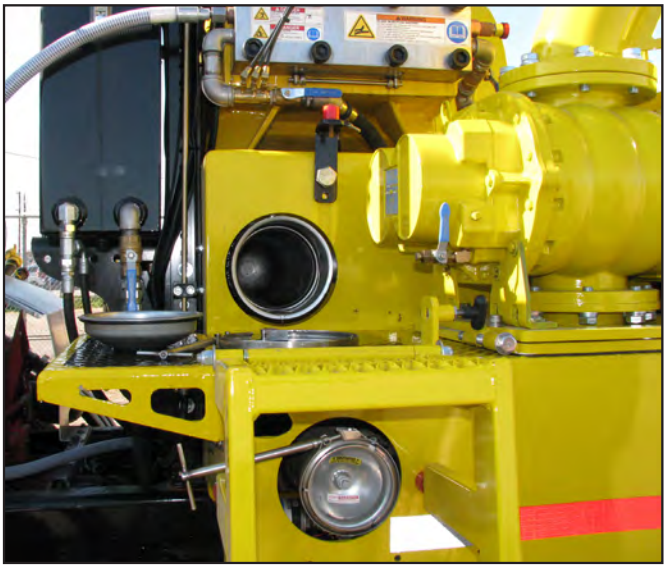
- Grease the thru-shaft bearings daily with the lube specified in the lubrication chart.

Check the wear brush for wear and proper adjustment. Adjust and replace as necessary.

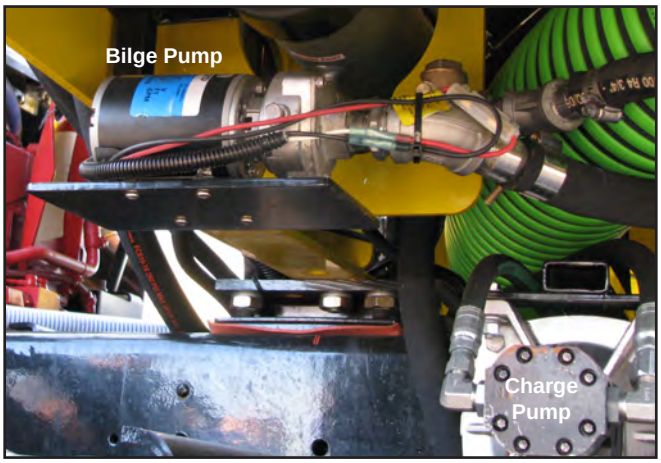
- Check all bolts and wheel nuts for anything loose.



Charge Pump



Charge Water Filters

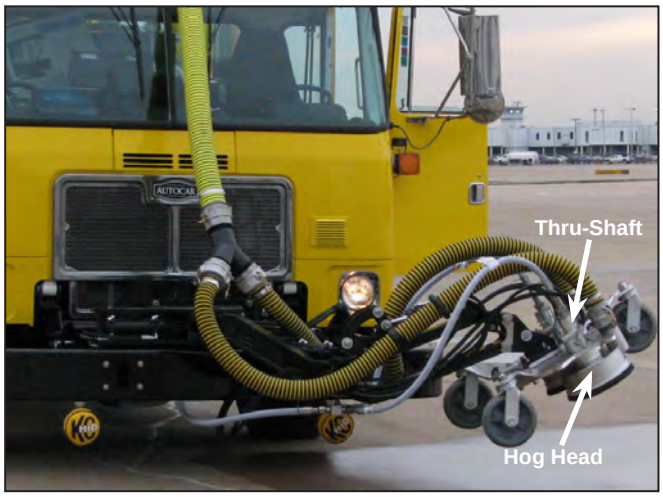


Typical Bilge Pump

- Check hydraulic and high pressure hoses for deterioration and wear. Correct problems or replace questionable components before waterblasting.
- Check hydraulic connections for leaks – tighten if necessary.
- Test and inspect the nozzles and spray bars for proper operation and leaks. Correct any problems or questionable components before waterblasting.
- Check the swivel seal weep holes for leaks.
- Test the optional tractor mounted dump valve for proper operation daily. Never operate the system if the dump valve is not working properly.

Periodic:

- Check wheel casters for height and excessive wear. Add shims to adjust if necessary.
- Clean and grease wheels and caster assemblies weekly.



Truck Mounted Hog Head

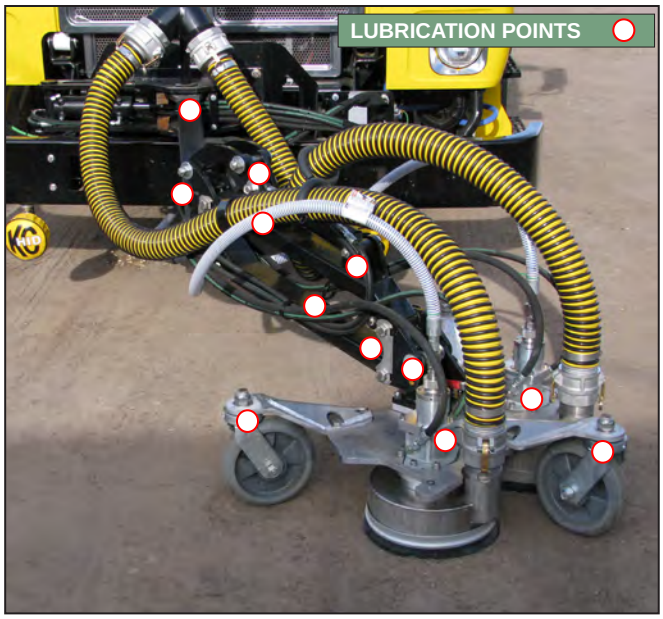
Hog Arm

Daily:

- Check all bolts and nuts. Tighten if necessary.
- Check the Hog Arm lock mechanism and make sure it is latched properly when the truck mounted Hog Arm is in the full up position.
- Check hydraulic and high pressure hoses for deterioration and wear daily. Replace hoses and fittings as necessary.

Periodic:

- Clean and grease Hog Arm bearing assemblies weekly. Note that the tractor Hog Arm bearings are sealed and lubricated by the hydraulic system and do not have grease fittings.
- Lubricate Hog Arm lock mechanism weekly.



Truck Mounted Hog Arm & Hog Head Lubrication Points

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

6.6 Hydraulic System Maintenance

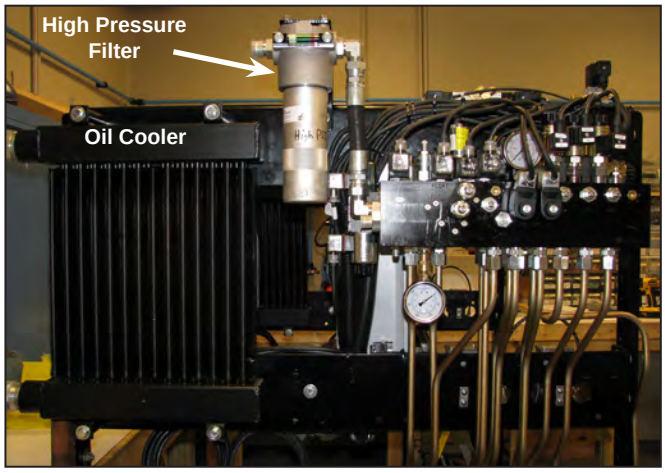
Hydraulic Pump

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

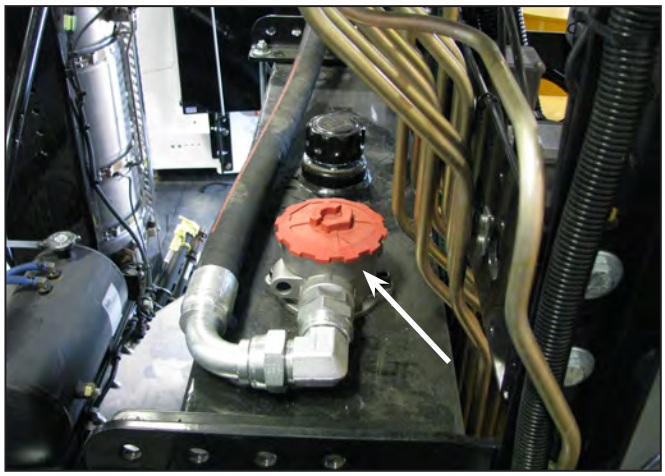
- Check the hydraulic oil level each day or immediately following the repair of a blown hose, leaking fitting or any hydraulic system service. Use only hydraulic oil meeting the manufacturer's specifications. Refer to the Lubrication Chart in this section and the pump manufacturer's operating and information manual for information on the hydraulic system and oil specifications.

- Check all hoses, fittings, valves and seals for leaks and proper operation daily. Repair or replace leaking or malfunctioning components before operating the system.
- Change the 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 as necessary or specified by the pump manufacturer.
- 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.
- 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.
- 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 Lubrication Chart and System Maintenance Matrix in this section for lubrication specifications and maintenance schedules.



Typical Hydraulic System


Hydraulic Oil Fill and Filter

6.7 Vacuum System & Debris tank

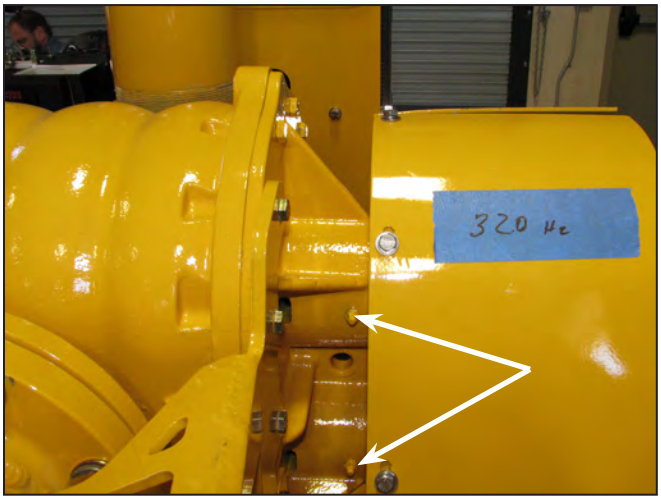
Blower and Filter Canister

The vacuum blower has specific lubrication and maintenance requirements. Refer to the vacuum blower manufacturer's operating manual for lubrication specifications and maintenance schedules.

Be sure vacuum filter is always in good operating condition so it fully protects the blower from collecting vacuumed debris internally. If 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 the Lubrication Chart in this section and the blower manufacturer's operating manual for lubrication specifications and maintenance schedules.

Vacuum System Blower



Blower Pulley End Grease Fittings

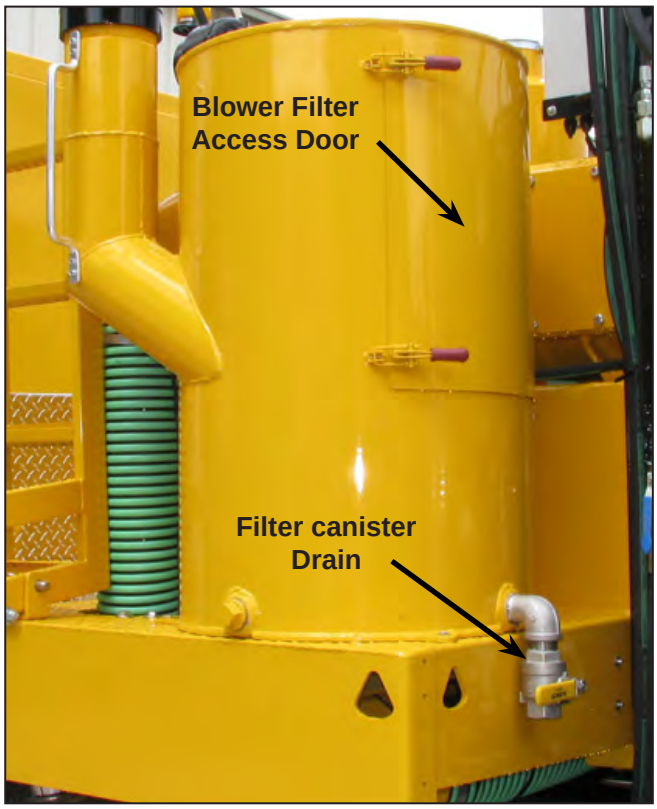
Vacuum Filter and Access Door

Inspection and Routine Maintenance:
Daily:

- Check for obvious loose mounting nuts and bolts.
- Grease blower drive end and idler pulley bearings with the lube specified by the blower manufacturer.
- Check the vacuum canister door seal to ensure good vacuum sealing. Clean or replace the seal if necessary.
- Clean the filter before each shift and drain the filter canister at least once every 2 hours of operation for optimal performance. 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. Be sure the filter media is never damaged leaving 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. Inspect the filter for deterioration and replace if necessary.

Periodic Maintenance:

- Change blower lubricating oil after the first 50 hours and every 500 hours thereafter. Service the blower as recommended in the blower operating manual.



Vacuum System Blower Filter canister and Drain
Hydraulic Fluid Filter

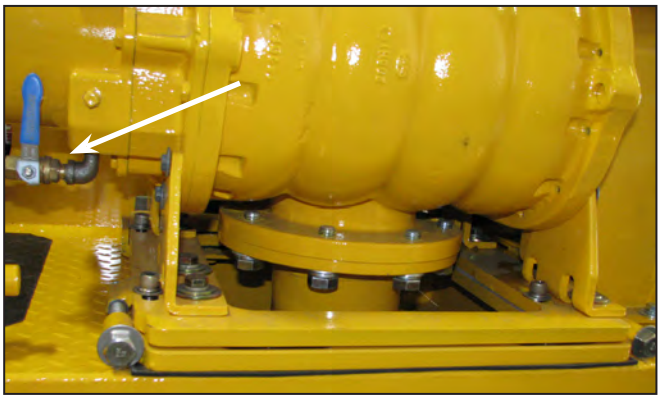
Important:
Make sure to install the safety plug in crankcase drain valve when draining is complete. The safety plug prevents crankcase oil from draining if the valve is accidentally opened.

- Check pulley clearances and drive belt tension at least once each month.
- Check and tighten all mounting bolts and hardware.
- Lubricate filter canister inspection door hinges regularly.
- Check vacuum canister door seal and replace if necessary. Coat the seal periodically with silicone to help keep it pliable.
- Inspect and lubricate drain ball valves periodically. Make sure to open and close all ball valves at least once each month 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 weekly for signs of deterioration, chaffing and leaks. Repair or replace as necessary.

Vacuum Tank and Hoses

Daily:

- Check vacuum hoses regularly for deterioration or cracking. Replace any damaged hoses with new hoses.
- Check hose cam-lock fittings for damage and missing O-rings and replace as needed.
- Check water hoses and connections. Replace if damaged or leaking.
- Check view tubes for cracks or damage and clean or replace as necessary.
- Check vacuum door seal to ensure good vacuum sealing and clean if necessary.
- Clean glass view globes regularly for visibility and check for damage and replace if necessary.
- Grease vacuum door hinges and lubricate ratchet binders regularly.
- Inspect and lubricate ball valves periodically.
- Inspect the cutoff ball valve each time the tank is dumped to insure it is free, not damaged or cracked and operating properly.
- Inspect Hydraulic lift components and hinge pins to ensure they are tight and in good condition.



Blower Crankcase Drain Valve and Safety Plug

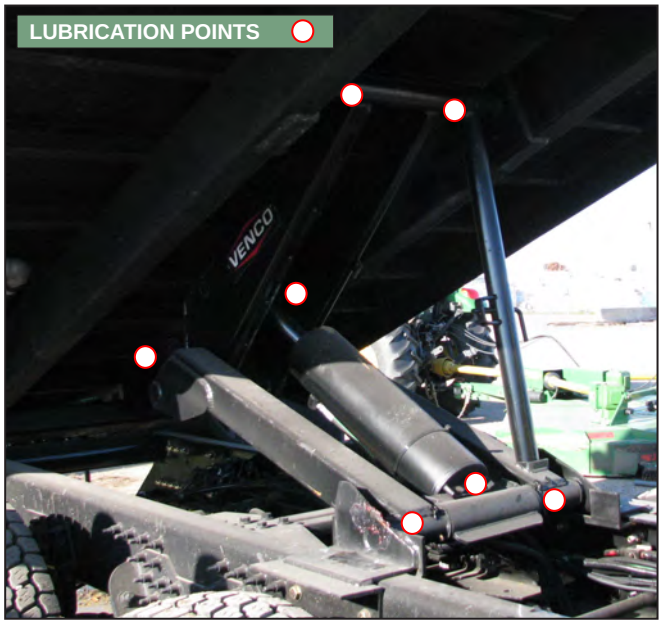
Vacuum Relief Valve (Kunkle Valve) on Vacuum Filter Canister

Debris tank & Typical View Tube

Periodic Maintenance:

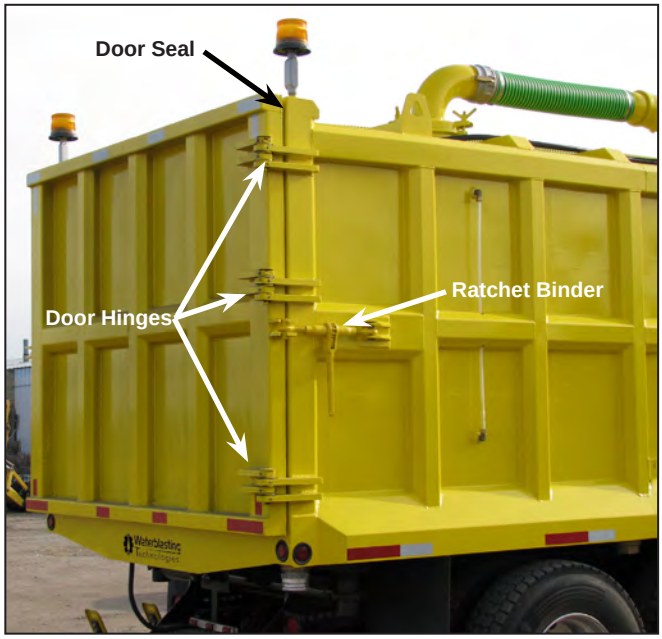
Cutoff Ball Valve

Debris tank Drain Valve



Hydraulic Lift, Safety Strut and Lubrication Points

- Inspect vacuum tank door seal to ensure good vacuum sealing and clean if necessary. Coat the seal periodically with silicone to help keep it pliable.
- Grease vacuum 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.
- Grease the hydraulic lift hinge pins and fittings Weekly.
- Inspect safety strut. Make sure the hinge pins are tight and grease pins weekly.
- Inspect and lubricate ball valves. Make sure to open and close all ball valves at least once each month to keep them free and operating properly.
- Check vacuum hoses regularly for deterioration or cracking. Replace any damaged hoses with new hoses.
- Rotate vacuum hoses in high wear locations weekly to increase their life.
- Inspect the debris liner for worn and broken parts. Clean and replace parts as necessary to keep the liner operating properly.



Debris tank Door, Hinges, Ratchet Binder and Door Seal

6.8 Stripe Hog Tractor (SH8000T)

Proper engine and component maintenance is essential to the performance and reliability of the Stripe Hog tractor. You should perform all recommended maintenance according to John Deere's specifications. Maintenance schedules and procedures are outlined in the tractors owner's manual and the System Maintenance Matrix in this section. They should be followed exactly.

Optional Tractor

Daily Inspection:

- Fuel, oil, coolant leaks.
- Loose bolts, electrical connections.
- Worn belts.
- Trash build up.
- Fuel, lube oil, and coolant levels.
- Air cleaner.
- Hydraulic fluid reservoir level and hydraulic lines for leaks.
- Lubricate and service the Hog Arm and Hog Head as stated in this section.

6.9 Lubrication Chart

Equipment	Component	Intervals	Lubricant Specifications
Truck Engine	Oil and Filter	Refer to truck operating manual	Refer to truck operating manual
Truck Transmission	Oil and Filter	Refer to truck operating manual	Refer to truck operating manual
Truck Differential	Differential Oil	Refer to truck operating manual	Refer to truck operating manual
Omsi Drive	Main Gearbox	After 1st 100 Hours Then every 600 Hours	Mobile Non Detergent 80w90
Omsi Drive	40K Clutch	After 1st 100 Hours Then every 600 Hours	Dextron III Automatic Transmission Fluid
Omsi Drive	Hydrostatic Drive Motor	After 1st 100 Hours Then every 600 Hours	Shell Spirax – Non Detergent 80w90
Hydraulic System	Hydraulic Oil Reservoir	Every 600 Hours	Napa – Aw68
Roots Vacuum Blower	Blower Crankcase Oil	After 1st 50 Hours Then Every 500 Hours	ISO VG 320 Roots Oil High Temp – Synthetic
Roots Vacuum Blower	Pulley End Bearings ***(Grease fittings)***	Daily ***(4 pumps each fitting)***	Shell Darina EP NLGI Grade #2 Grease - Product Code 71522
Jetstream Pump	Grease Points	Weekly	Mobil PolyRex EM Grease
Jetstream Pump	Crankcase Oil	After 1st 100 hours Then Every 500 Hours	High Grade 80w90 Gear Oil
NEVER RUN BLOWER OR JETSTEAM PUMP UNDER LOAD IF CRANKCASE OIL TEMPERATURE IS BELOW 60 DEGREES F (16 DEGREES C) **START ENGINE AND IDLE FOR 10 MINUTES UNDER LOAD UNTIL OIL WARMS ABOVE 60 DEGREES F (16 DEGREES C)**			
Tractor – Engine	Engine Crankcase Oil & Filter	After 1st 50 Hours Then Every 200 Hours	15w40 Shell Rotella Oil 15w40 Mobil Oil
Tractor – Grease Points	Refer to Tractor Manual	After 1st 50 Hours Then Every 200 Hours	Mobil PolyRex EM Grease
Tractor – Hydraulic System	Hydraulic Oil & Filter ***Clean Hydraulic Suction Line & Strainer***	Every 600 Hours	John Deere Hydraulic Oil or Equivalent
Hog Head	Swivel Shaft or Thru-Shaft Motor Bearings	Daily	Mobil PolyRex EM Grease ***No Substitutes***
Hog Head	Chassis Wheels and Casters	Daily	Mobil PolyRex EM Grease
Hog Arm	Hog Arm Bearing Assemblies	Weekly	Mobil PolyRex EM Grease
Hog Arm	Hog Arm Hinges and Other Grease Fittings	Weekly	Mobil PolyRex EM Grease
Unit General Grease Points	Hydraulic Ram Pivots – Door Hinges – Waste Tank Tilt Pins – ETC.	Weekly ***More Frequently if Required***	Mobil PolyRex EM Grease
Unit General Lubrication Points	Vacuum Door Hinges – Ball Valves – Latches – ETC.	Weekly ***More Frequently if Required***	General Purpose Oil
This chart is a guide only and should never be used to supersede individual manufacturer's specifications. Please refer to your equipment manuals.			

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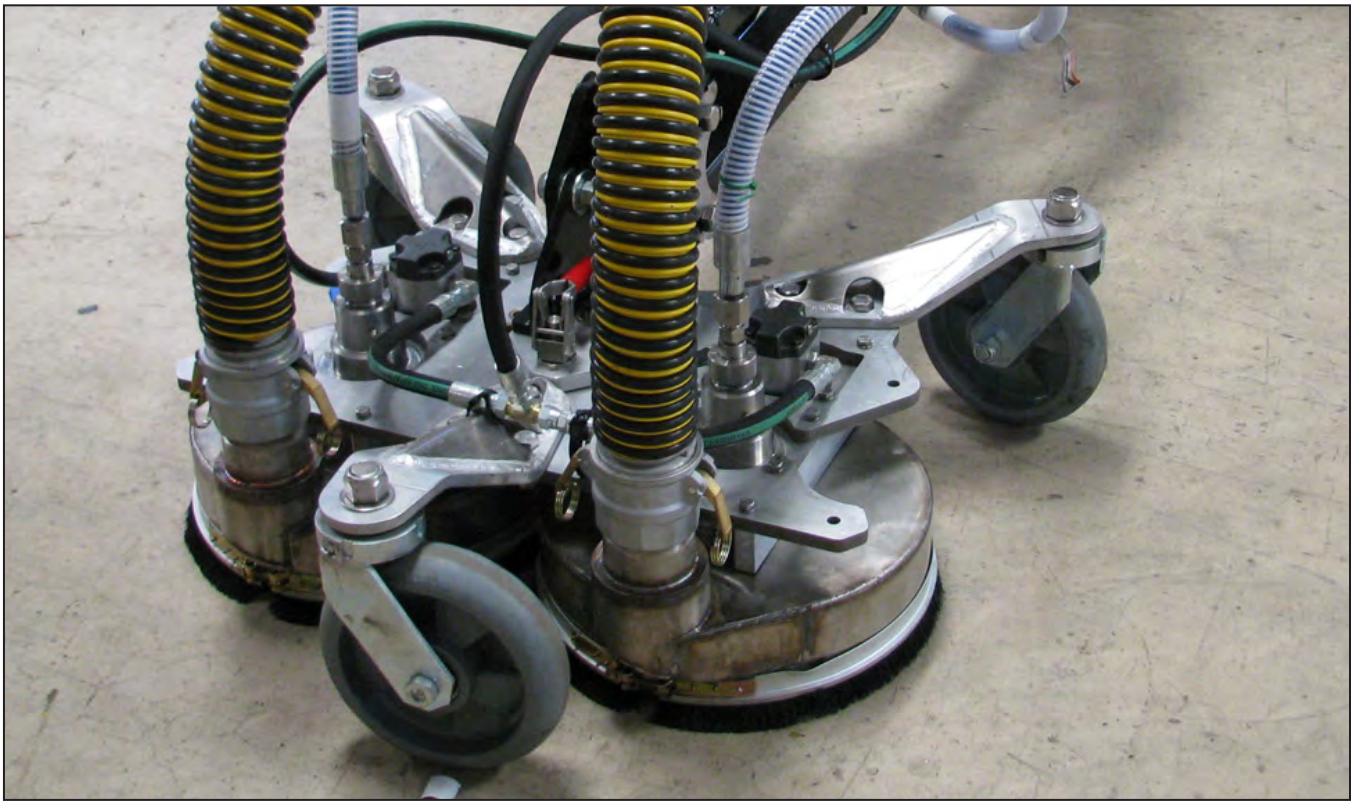
7.1 Swivel Shaft Repair

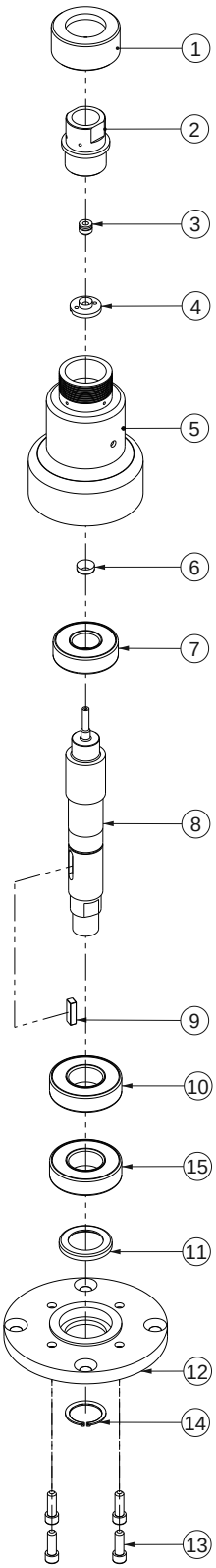
Swivel Seal Replacement

(MP2010 Swivel Shaft Assy. Diagram)

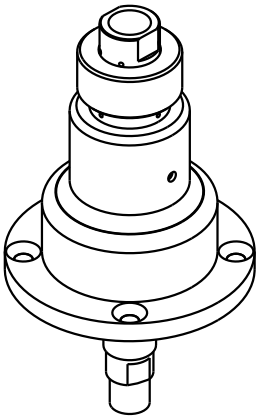
1. Remove UHP hose from top of swivel fittings. Loosen swivel nut (1) and remove. Pull swivel seal adapter (2) up evenly and straight in one motion without any side to side movement.
2. Remove brass back-up ring (4) from swivel seal adapter (2) with two 6/32 screws. Clean thoroughly. Make sure there are no dings, burrs or scratches on beveled flute and center shaft hole of the brass back-up ring (4). If brass back-up ring (4) is damaged, replace with a new one.
3. Use an extractor tool (T-6452) to remove spent swivel seal (3). Clean swivel seal adapter (2) of any debris, including the two pressure relief holes on bottom side.
4. Clean swivel shaft (8) nipple and upper cup of swivel shaft housing (5) area thoroughly, taking care not to get any dirt or debris into shaft center. Re-insert brass back-up ring (4) on swivel shaft nipple. Apply silicone lubricant around outside the swivel seal and of swivel shaft nipple, being careful not to get any inside the swivel shaft center. Slide a new swivel seal (3) onto the swivel shaft nipple with the beveled end facing down to the matching surface of the brass back-up ring (4).
5. Carefully replace swivel seal adapter (2) into swivel shaft housing (5) pressing straight down without any side to side motion. Be certain swivel seal adapter is fully inserted – failure to completely insert this will result in housing and adapter damage. Reconnect & tighten swivel nut (1). Reconnect UHP hose.



Hog Head Assembly



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	MP6504	NUT, SWIVEL MPMA
2	1	MP6524	ADAPTER, SWIVEL SEAL
3	1	MP2253	SEAL, SWIVEL
4	1	MP2752	RING, BRASS BACKUP
5	1	MP10025S	HOUSING, SWIVEL SHAFT
6	1	BR1001	SEAL, UPPER SWIVEL SHAFT
7	1	BR1002	BEARING, UPPER SWIVEL SHAFT
8	1	MP1001	SWIVEL SHAFT
9	1	BR1006	KEY, SHAFT & BUSHING
10	2	BR1003	BEARRING, LOWER SWIVEL SHAFT
11	1	BR4000-11	SEAL, COVER TOP
12	1	MP4000-1T	COVER, TOP (MAIN BODY HOUSING)
13	4	HD4000-07	BOLT, COVER TOP TO SWIVEL HOUSING
14	1	BR1007	RING, SNAP, 1"
15	1	BR1003R	BEARRING, SWIVEL SHAFT, LOWER, RADIAL



MP 2010 SWIVEL SHAFT ASSEMBLY

REV 3
7-27-06

	NAME	SIGNATURE	DATE
DRAWN	DG		3/20/06
CHECKED			
ENG APPR			
MFG APPR			

3341 SE SLATER ST STUART, FL 34997
(772) 223-7393

DO NOT SCALE DRAWINGS

WATERBLASTING TECHNOLOGIES

MATERIAL: ---

DESCRIPTION: SWIVEL SHAFT ASSEM

TOLERANCES UNLESS NOTED

.X	.XX	.XXX	ANGLES
± .025	± .010	± .005	± .5

PART NUMBER: MP2010

SIZE 11"x17"

REV.

DWG. NO. 1

DATE: Wednesday, October 11, 2006 9:42:36 AM

SHEET 1 OF 1

Swivel Shaft Assembly Cleaning / Disassembly

(MP2010 Swivel Shaft Assy. Diagram)

In the event of repetitive swivel seal failure, it is necessary to remove the swivel shaft (8) and clean the swivel shaft housing (5) of all debris.

1. Follow Swivel Shaft Replacement steps 1 – 5. (Below)
2. With swivel shaft (8) removed, clean the debris cavity in the upper swivel shaft seal (6) of all debris. Using a fine pick or wire, run through weep holes (total of 4) in top rim of swivel shaft housing (5) to dislodge debris build-up.
3. Once debris is loose, carefully pick fragments from swivel hole in the housing. Take care not to damage the rubber lip of upper swivel shaft seal (6).
4. Repeat steps 2 & 3, flushing with water and/or air until area is clean of debris. Do not use brake or carburetor cleaner as it will deteriorate the rubber seal.
5. Next, inspect the bearings (7, 10 & 15) for wear, debris or roughness. If you have any question on the life and performance of the bearings, replace them. If they are in good working order, clean with a solvent and re-pack with grease.
6. Reassemble swivel shaft (8) assembly into swivel shaft housing (5). When inserting swivel shaft (8) with bearings, insert only until bearings are flush with the edge of the swivel shaft housing (5); the top cover (12) will put shaft into proper position when tightened. Replace top cover (12) and snap ring (14).

Swivel Shaft Replacement

(MP2010 Swivel Shaft Assembly Diagram)

1. Remove UHP hose, swivel nut (1), swivel seal adapter(2), brass backup ring (4) and swivel seal (3) from top of swivel shaft assembly.
2. Lift the Hog Head and place a 3/4" wrench through shroud slot and onto swivel shaft (8) flats and remove spray bar. Next, remove brass button seal.
3. Using a large flat screwdriver, remove dirt shield and felt gasket (MP1006FG-1) from the swivel shaft (8), unscrewing counterclockwise, with ¾" wrench on shaft until loose.
4. Remove 4 allen bolts holding complete swivel shaft assembly in place. Gently and firmly pull swivel shaft assembly (MP2010) up out of the housing block.
5. Remove snap ring (14). Remove top cover (12) attached to the swivel shaft housing (5) by unscrewing the four ¼ - 20 cap screws (13). Holding the threaded end, pull swivel shaft (8) out of the swivel shaft housing. It may be necessary to tap on bottom of swivel shaft housing (5) with a rubber or plastic hammer to remove the shaft assembly.
6. Clean and inspect upper swivel shaft seal (6) and top cover seal (11) and replace if necessary.
7. Insert a new swivel shaft assembly (*). When inserting swivel shaft (8) with bearings, insert only until bearings are flush with the edge of the swivel shaft housing (5); the top cover (12) will put shaft into proper position when tightened. Reassemble top cover (12) to swivel shaft housing (5). Replace snap ring (14). Replace brass backup ring (4), swivel seal (3), swivel seal adapter (2) and swivel nut (1) making sure all parts are in place correctly and tightened.
8. Making sure the timing belt is on the swivel shaft pulley correctly, place new/rebuilt swivel shaft assembly (MP2010) through the swivel shaft pulley in the block. Be sure the shaft key (9) is correctly inserted in shaft and pulley. Press the swivel shaft assembly (*) down by hand.
9. Replace shaft dirt shield and felt gasket, brass button seal and spray bar onto the bottom of the swivel shaft, being very careful no dirt gets inside shaft. Any amount of dirt will ruin your nozzles. Keep this area very clean!

Shaft Assembly combined parts:

1. Swivel shaft (8),
2. Upper swivel shaft bearing (7),
3. Lower swivel shaft bearings (10 & 15)
4. Lower Swivel shaft radial bearing (15)

Swivel Shaft Drive Belt Replacement

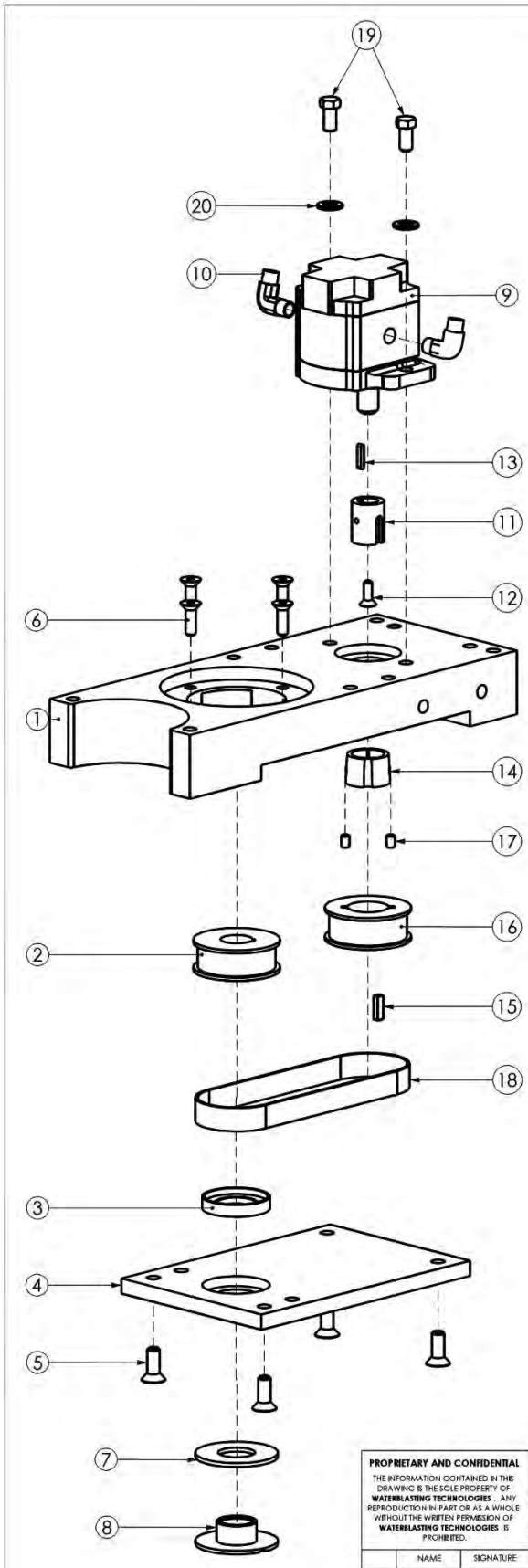
(MP3010 Hog Head Block Assy. Diagram)

1. Remove spray bar, dirt shield (8) and felt gasket (7), shroud and bottom plate (4). Clean area good, replace bottom cover seal (3) if necessary. Check for any noticeable reasons for belt breaking. Simply slip a new belt on and reassemble.

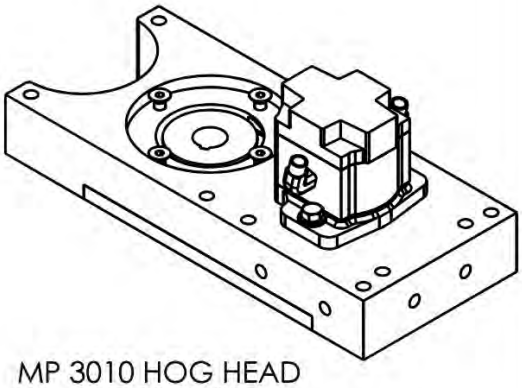
Hydraulic Motor Replacement

(MP3010 Hog Head Block Assy. Diagram)

1. Lift up entire head assembly. Remove spray bar, brass button seal, and dirt shield (8) and felt gasket (7). Remove 3 bolts (9/16") that hold the shroud to the bottom of the housing block (1).
2. Remove hydraulic hoses, keeping feed line separate from return line. Insert hydraulic line hose plugs to reduce fluid loss.
3. Remove 4 flat head screws (5) holding bottom cover (4). Remove bottom cover (4) and clean thoroughly inside block.
4. Using an allen wrench, remove allen screws (17) from taper lock bushing (14) and timing pulley (16). Insert one Allen screw into center hole in bushing/pulley and tighten to remove the bushing from the pulley. It may be necessary to tap lightly on the timing pulley (16) to help break the bushing loose from the shaft. Be careful not to lose shaft & bushing key (15).
5. Loosen the 9/16" bolts (29) holding the hydraulic motor (9) to the top of the block. Lift the hydraulic motor off the block.
6. Re-install a new motor by reversing steps E-A.
7. Make sure timing pulley (16) is installed with clearance to the housing block (1) and is aligned with the swivel shaft pulley (2) to ensure belt alignment. Use loctite on the small 10-32 Allen screws (17) that tighten taper lock bushing into the pulley.
8. Re-install the bottom cover (4) with screws, shroud, dirt shield (8) and felt gasket (7), brass button seal, and spray bar.



ITEM NO.	PART NUMBER	DESCRIPTION	MP3010/QTY.
1	MP4000-1A	HOUSING BLOCK	1
2	BR1008	PULLEY, TIMING (SWIVEL SHAFT)	1
3	BR4000-12	SEAL, BOTTOM COVER	1
4	MP4000-1B	COVER, BOTTON (MAIN BODY HOUSING)	1
5	HD4000-06	BOLT, COVER BOTTOM TO HOUSING BLOCK	4
6	HD4000-04	BOLT, COVER TOP TO HOUSING BLOCK	4
7	MP1006-FG	FELT GASKET	1
8	MP1006	SHIELD, DIRT	1
9	HY113	MOTOR, HOG HEAD ROTATION	1
10	FY4000-17	FITTING, HYDRAULIC MOTOR	2
11	MP4000-18	EXTENDER, MOTOR SHAFT	1
12	1173882	SCREW FLAT HEAD 1/4-20 x 3/4 SS	1
13	BR1006-A	KEY, MOTOR SHAFT EXTENDER	1
14	BR1004	BUSHING, TAPER LOCK	1
15	BR1006	KEY, SHAFT & BUSHING	1
16	BR1005	PULLEY, TIMING (HYD. MOTOR)	1
17	BR1005 (SET SCREW)	SET SCREW (COMES W/ BR1005 PULLEY)	2
18	BR4000-10	BELT, TIMING	1
19	HD4000-08	BOLT, HYD MOTOR TO HSNG BLOCK	2
20	87925186	WASHER, SPLIT LOCK, 3/8 SS	2



MP 3010 HOG HEAD BLOCK ASSY

REV 3
7-20-06

PROPRIETARY AND CONFIDENTIAL
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Waterblasting Technologies
3341 SE SLATER ST STUART, FL 34997
(772) 223-7393

DO NOT SCALE DRAWINGS

WATERBLASTING TECHNOLOGIES

	NAME	SIGNATURE	DATE
DRAWN	DG		3/20/06
CHECKED			
ENG APPR.			
MFG APPR.			

MATERIAL: —

TOLERANCES UNLESS NOTED

.X	.XX	.XXX	ANGLES
± .025	± .010	± .005	± .5

DESCRIPTION: HOG HEAD BLOCK ASSY

PART NUMBER: MP3010

SIZE 11"x17"

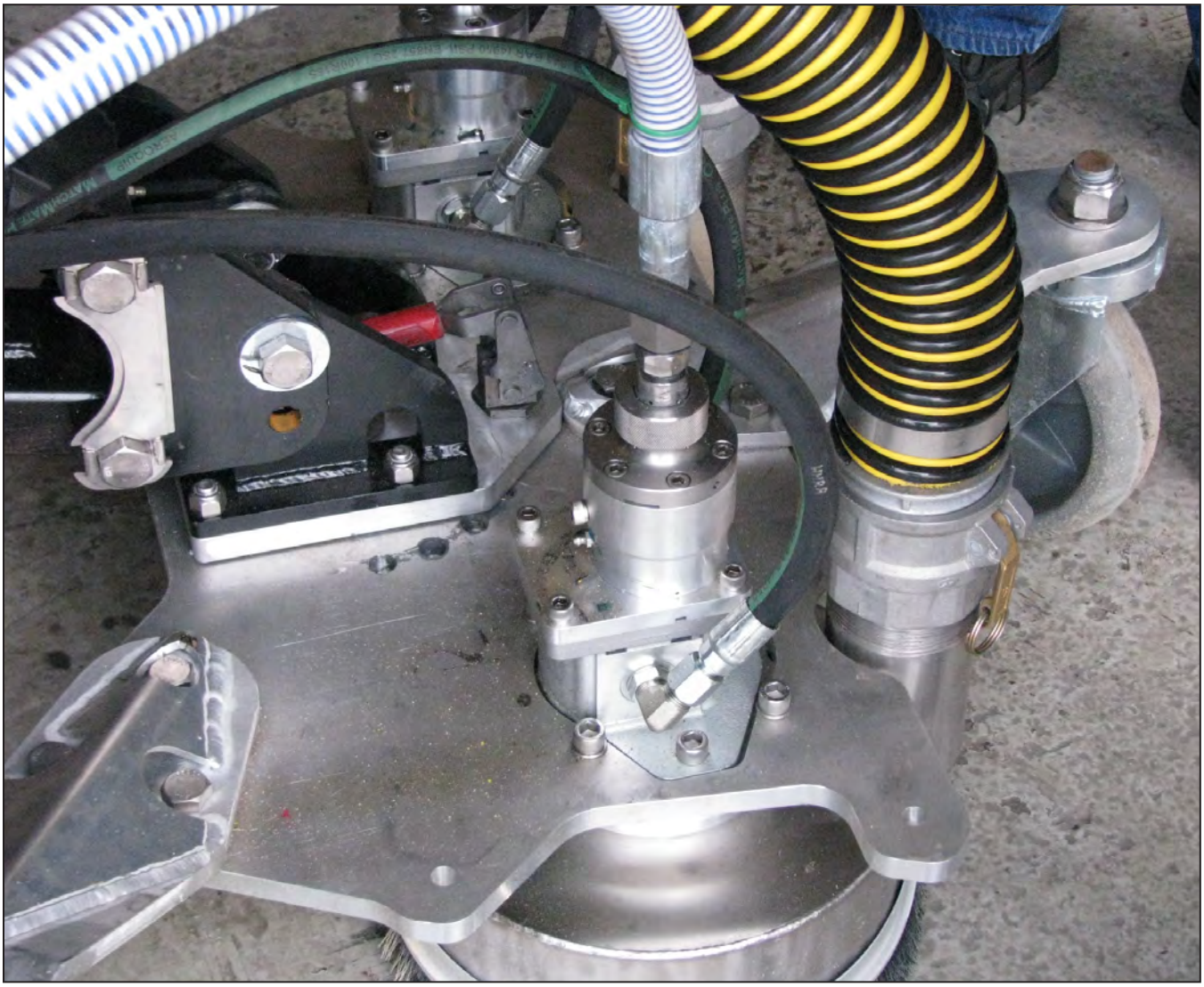
REV:

DWG. NO. 1

DATE: Thursday, July 20, 2006 12:02:05 PM

SHEET 1 OF 1

7.2 Thru-Shaft Motor Bearing Pre-Load



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 Waterblasting 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)

Notice:
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.

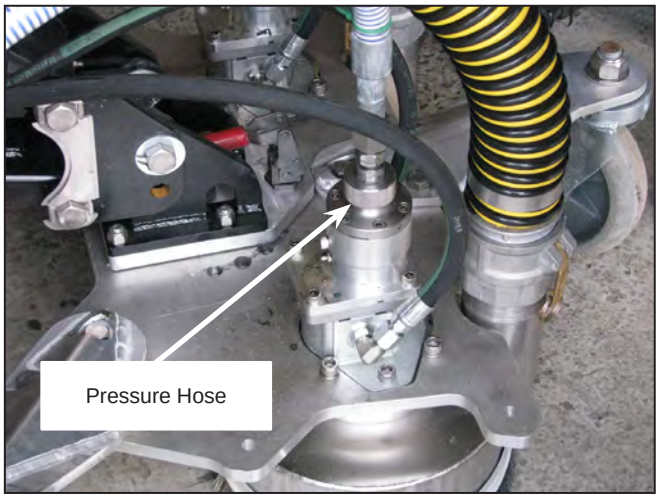


Figure 1: High pressure hose on top of the thru-shaft motor

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.

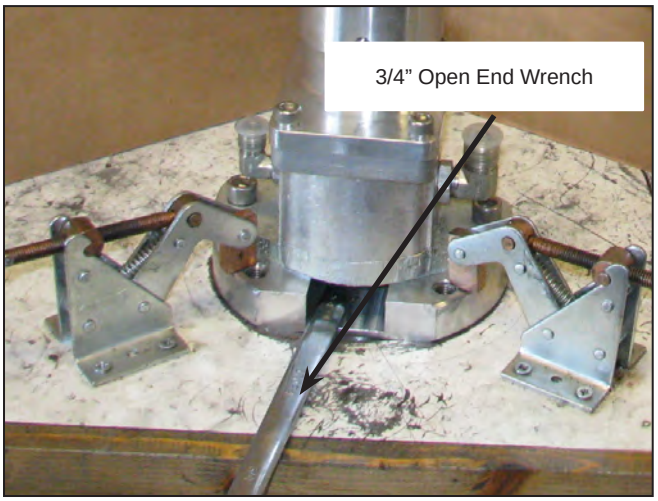


Figure 3: Thru-shaft motor on work bench showing position of slot and 3/4" open end wrench.

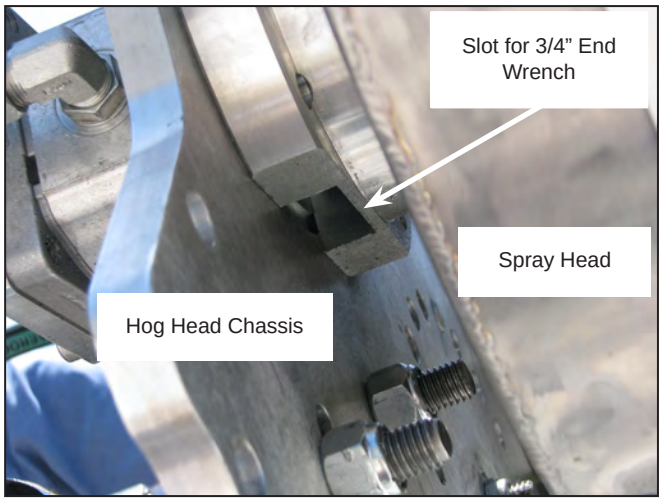


Figure 4: Location of slot in thru-shaft motor mounted on hog head for 3/4" open end wrench.

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.

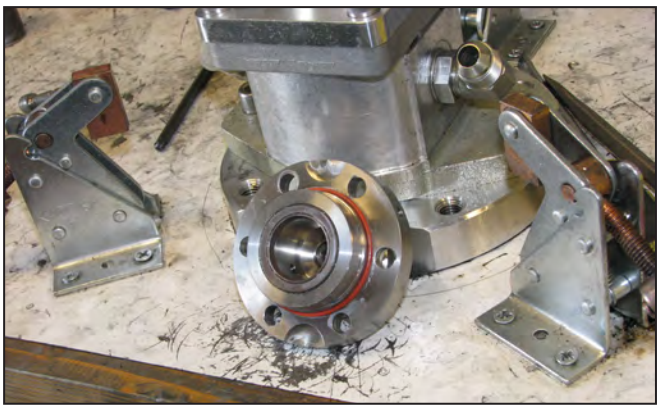


Figure 6: Thrust housing cap removed. Note the O-ring seal and the slots for the screwdrivers. Make sure the cap and O-ring is in good condition and clean.

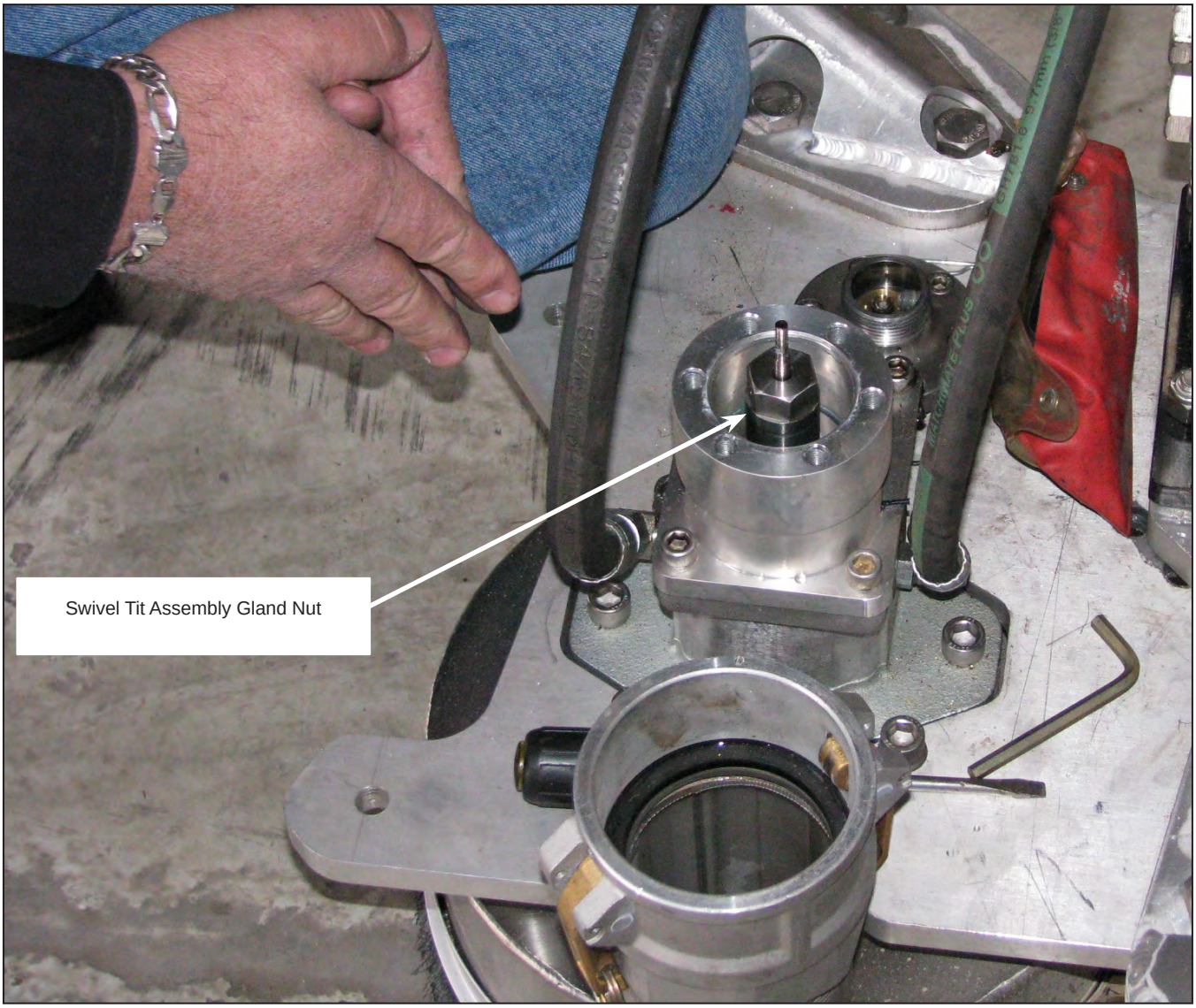


Figure 7: Swivel Tit assembly/gland nut to be removed by turning counterclockwise with a 15/16" deep well socket or box end wrench.

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

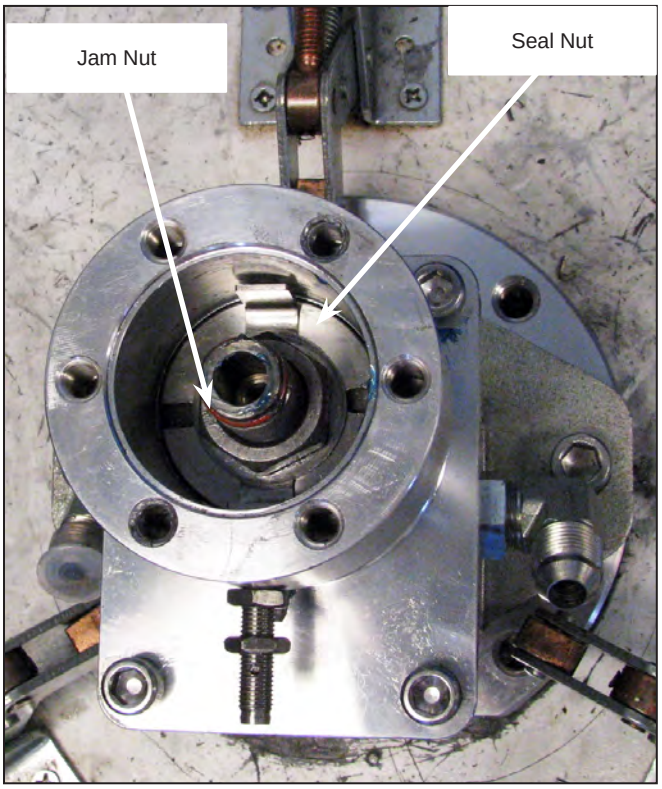


Figure 9: Jam nut and seal nut. Make sure to loosen Jam nut 4 full turns first.

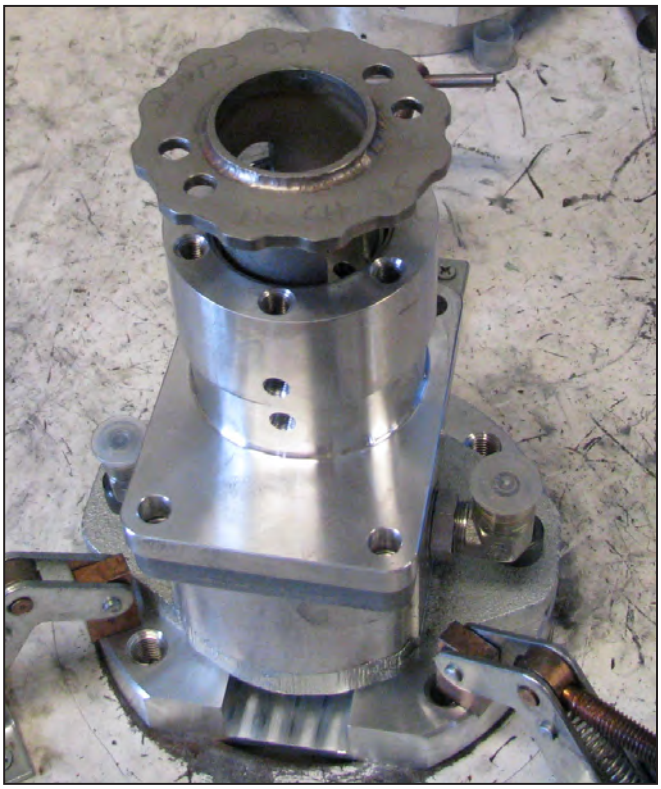


Figure 10: Use spanner socket (weldment tool) to turn seal nut.

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.

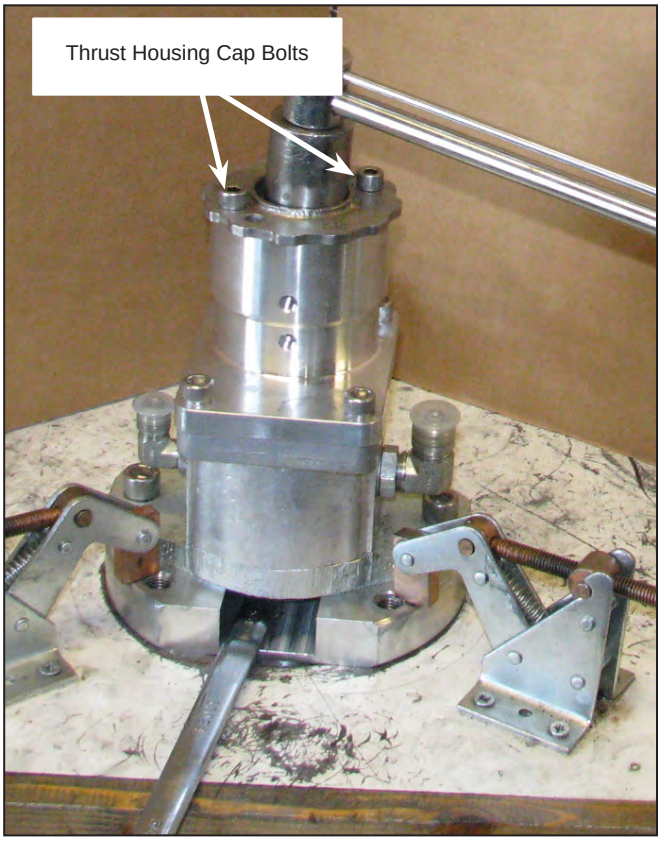


Figure 11: Spanner socket secured with thrust housing cap bolts.

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 socket 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 at the top of the thru-shaft greased and the threads below the seal coated with anti-seize.

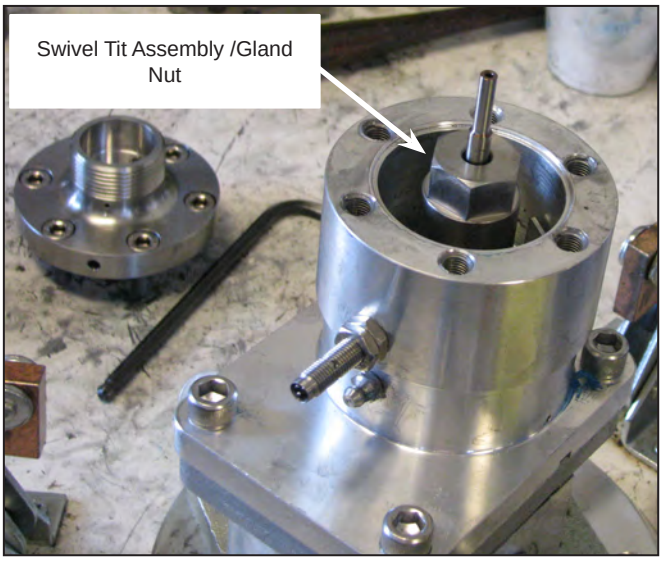


Figure 14: Swivel tit assembly/gland nut installed on the thru-shaft and torqued to 50 Ft lbs.

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.

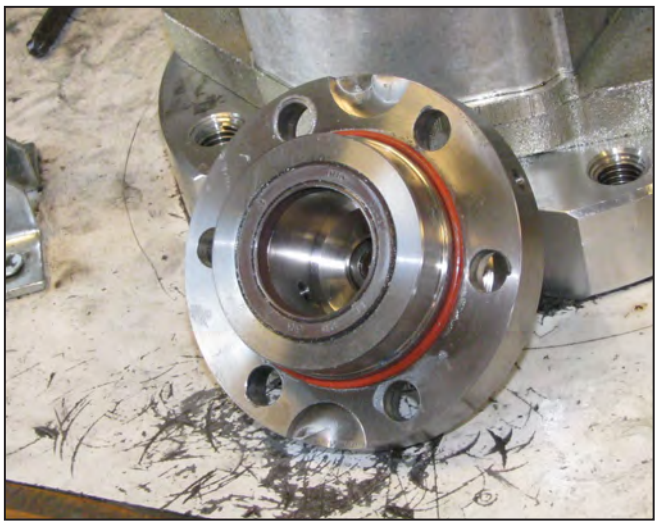


Figure 15: Inspect and grease the O-ring seal on the thrust housing cap.

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.

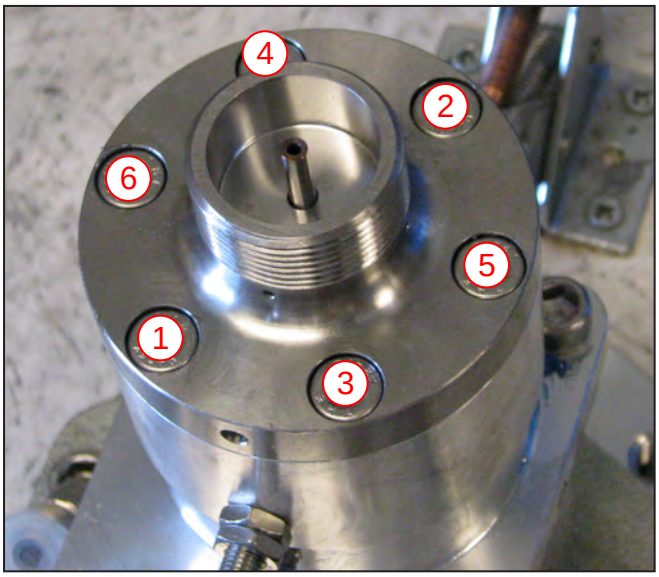


Figure 16: Apply anti-seize to the thrust housing bolts and tighten them in a crisscross pattern to "snug" using a 6mm Allen wrench.

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

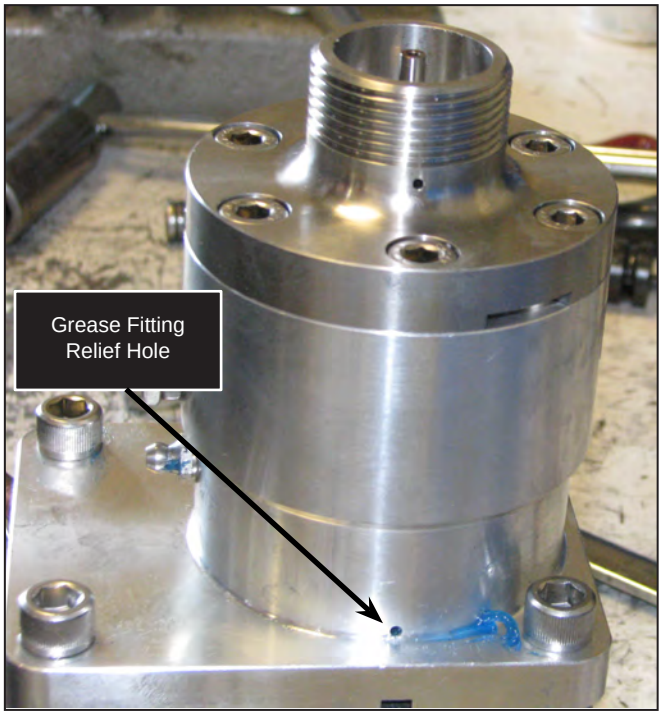


Figure 18: Thru-shaft bearing grease fitting and grease relief holes in thrust housing base.

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 Waterblasting 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.

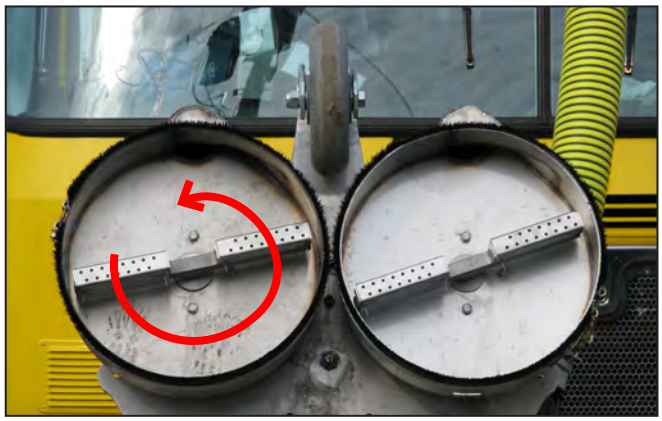


Figure 19: Counterclockwise spray head rotation. Operate 1st 15 minutes at maximum rpm with no water pressure.

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

WARNING

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.

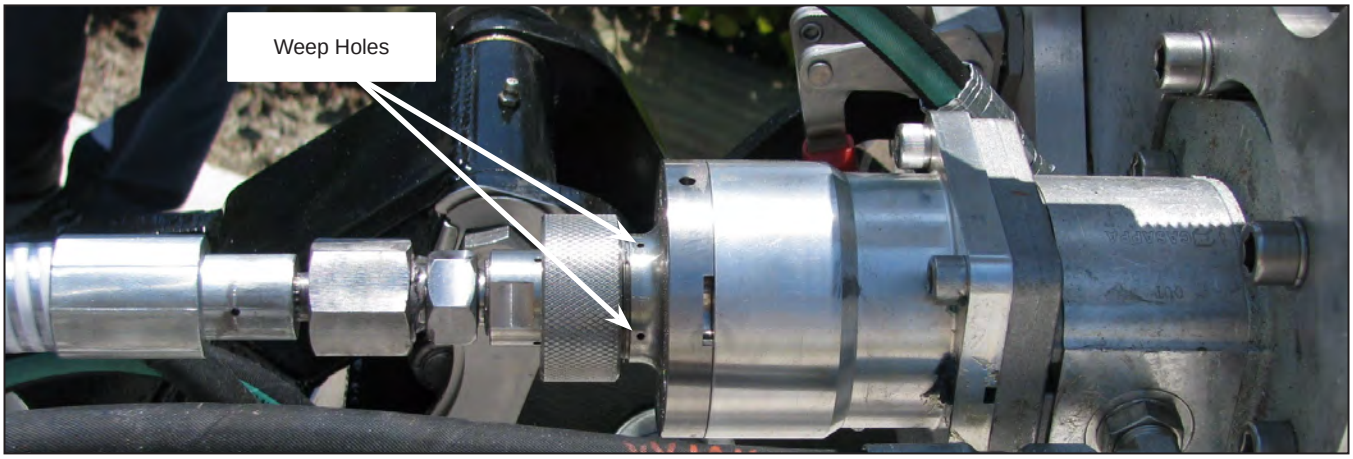
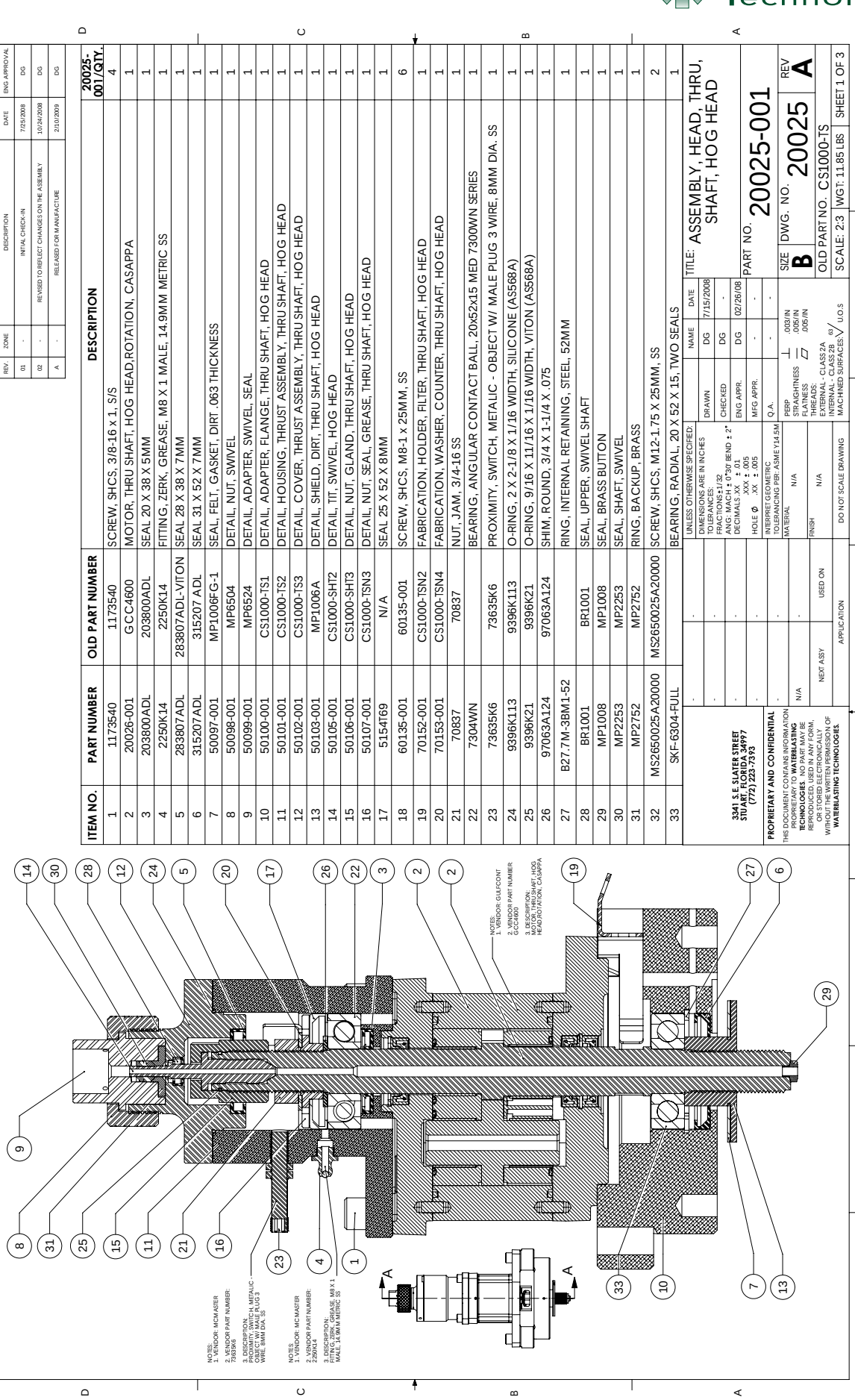


Figure 21: Check for water dripping from weep holes just below the high pressure water hose connection.



ITEM NO.	PART NUMBER	OLD PART NUMBER	DESCRIPTION	20025-001/QTY.
1	1173540	1173540	SCREW, SHCS, 3/8-16 x 1, S/S	4
2	20026-001	GCC4600	MOTOR, THRU SHAFT, HOG HEAD,ROTATION, CASAPPA	1
3	203800ADL	203800ADL	SEAL 20 X 38 X 5MM	1
4	2250K14	2250K14	FITTING, ZERK, GREASE, M8 X 1 MALE, 14.9MM METRIC SS	1
5	283807ADL	283807ADL-VITON	SEAL 28 X 38 X 7MM	1
6	315207ADL	315207 ADL	SEAL 31 X 52 X 7MM	1
7	50097-001	MP1006FG-1	SEAL, FELT, GASKET, DIRT .063 THICKNESS	1
8	50098-001	MP6504	DETAIL, NUT, SWIVEL	1
9	50099-001	MP6524	DETAIL, ADAPTER, SWIVEL, SEAL	1
10	50100-001	CS1000-TS1	DETAIL, ADAPTER, FLANGE, THRU SHAFT, HOG HEAD	1
11	50101-001	CS1000-TS2	DETAIL, HOUSING, THRUST ASSEMBLY, THRU SHAFT, HOG HEAD	1
12	50102-001	CS1000-TS3	DETAIL, COVER, THRUST ASSEMBLY, THRU SHAFT, HOG HEAD	1
13	50103-001	MP1006A	DETAIL, SHIELD, DIRT, THRU SHAFT, HOG HEAD	1
14	50105-001	CS1000-SHT2	DETAIL, TIT, SWIVEL, HOG HEAD	1
15	50106-001	CS1000-SHT3	DETAIL, NUT, GLAND, THRU SHAFT, HOG HEAD	1
16	50107-001	CS1000-TSN3	DETAIL, NUT, SEAL, GREASE, THRU SHAFT, HOG HEAD	1
17	5154T69	N/A	SEAL 25 X 52 X 8MM	1
18	60135-001	60135-001	SCREW, SHCS, M8-1 x 25MM, SS	6
19	70152-001	CS1000-TSN2	FABRICATION, HOLDER, FILTER, THRU SHAFT, HOG HEAD	1
20	70153-001	CS1000-TSN4	FABRICATION, WASHER, COUNTER, THRU SHAFT, HOG HEAD	1
21	70837	70837	NUT, JAM, 3/4-16 SS	1
22	7304WN		BEARING, ANGULAR CONTACT BALL, 20x52x15 MED 7300WN SERIES	1
23	73635K6	73635K6	PROXIMITY, SWITCH, METALIC - OBJECT W/ MALE PLUG 3 WIRE, 8MM DIA. SS	1
24	9396K113	9396K113	O-RING, 2 X 2-1/8 X 1/16 WIDTH, SILICONE (AS568A)	1
25	9396K21	9396K21	O-RING, 9/16 X 11/16 X 1/16 WIDTH, VITON (AS568A)	1
26	97063A124	97063A124	SHIM, ROUND, 3/4 X 1-1/4 X .075	1
27	B27.7M-3BM1-52		RING, INTERNAL RETAINING, STEEL, 52MM	1
28	BR1001	BR1001	SEAL, UPPER, SWIVEL SHAFT	1
29	MP1008	MP1008	SEAL, BRASS BUTTON	1
30	MP2253	MP2253	SEAL, SHAFT, SWIVEL	1
31	MP2752	MP2752	RING, BACKUP, BRASS	1
32	MS2650025A20000	MS2650025A20000	SCREW, SHCS, M12-1.75 X 25MM, SS	2
33	SKF-6304-FULL		BEARING, RADIAL, 20 X 52 X 15, TWO SEALS	1

REV.	ZONE	DESCRIPTION	DATE	ENG APPROVAL
01	-	INITIAL CHECK-IN	7/25/2008	DG
02	-	REVISED TO REFLECT CHANGES ON THE ASSEMBLY	10/24/2008	DG
A	-	RELEASED FOR MANUFACTURE	2/10/2009	DG

WATERBLASTING TECHNOLOGIES REVISIONS

NOTES:
1. VENDOR: MCMASTER
2. VENDOR PART NUMBER: 7983K96
3. DESCRIPTION: PROXIMITY, SWITCH, METALIC - OBJECT W/ MALE PLUG 3 WIRE, 8MM DIA. SS

NOTES:
1. VENDOR: MCMASTER
2. VENDOR PART NUMBER: 2250X14
3. DESCRIPTION: FITTING, ZERK, GREASE, M8 X 1 MALE, 14.9MM METRIC SS

NOTES:
1. VENDOR: GUEFCONT
2. VENDOR PART NUMBER: GCC4600
3. DESCRIPTION: MOTOR, THRU SHAFT, HOG HEAD,ROTATION, CASAPPA

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

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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 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
NEXT ASSY USED ON
APPLICATION
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

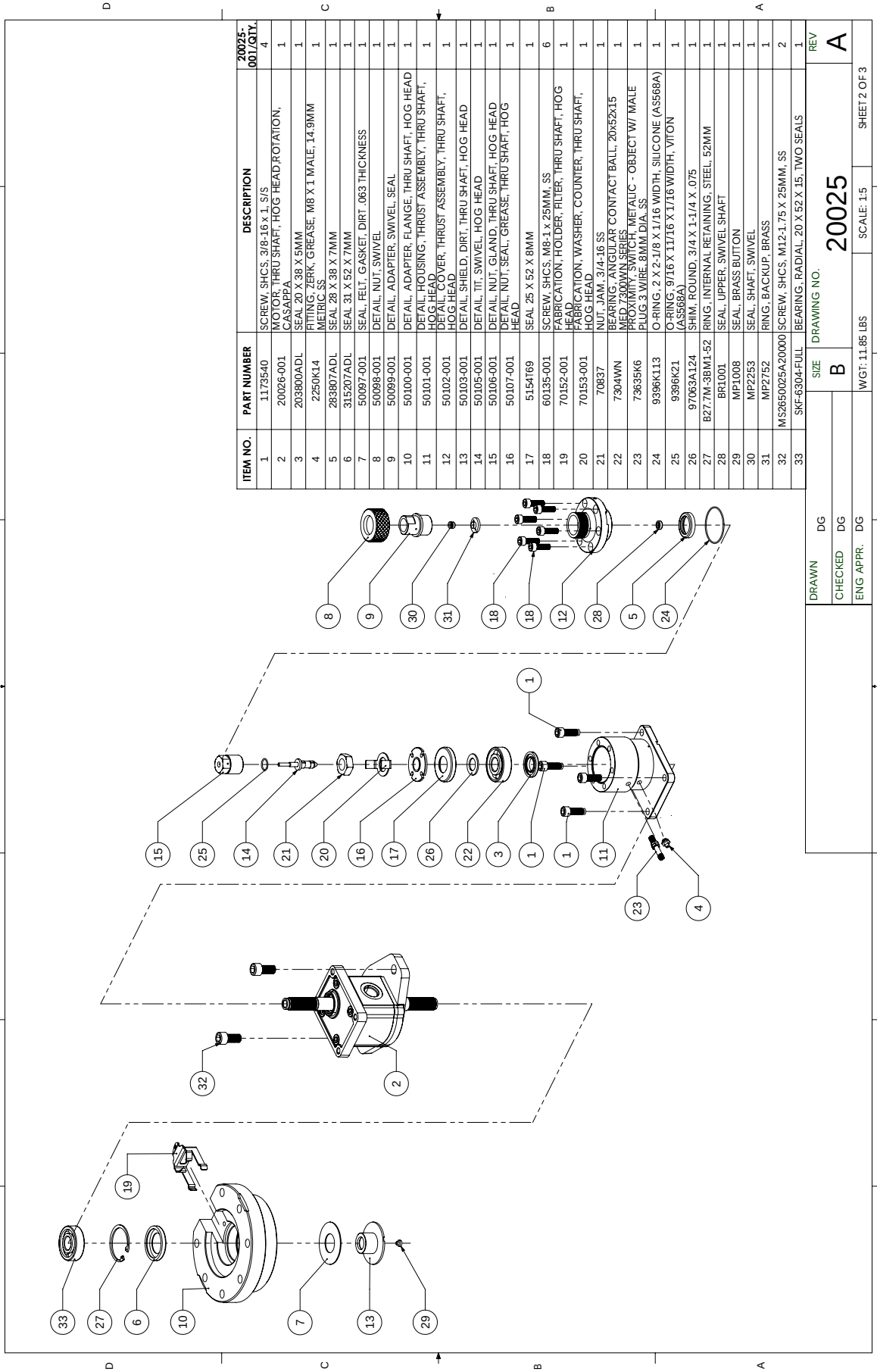
TITLE: ASSEMBLY, HEAD, THRU, SHAFT, HOG HEAD

PART NO. 20025-001

SIZE B | DWG. NO. 20025 | REV A

OLD PART NO. CS1000-TS

SCALE: 2:3 | WGT: 11.85 LBS | SHEET 1 OF 3



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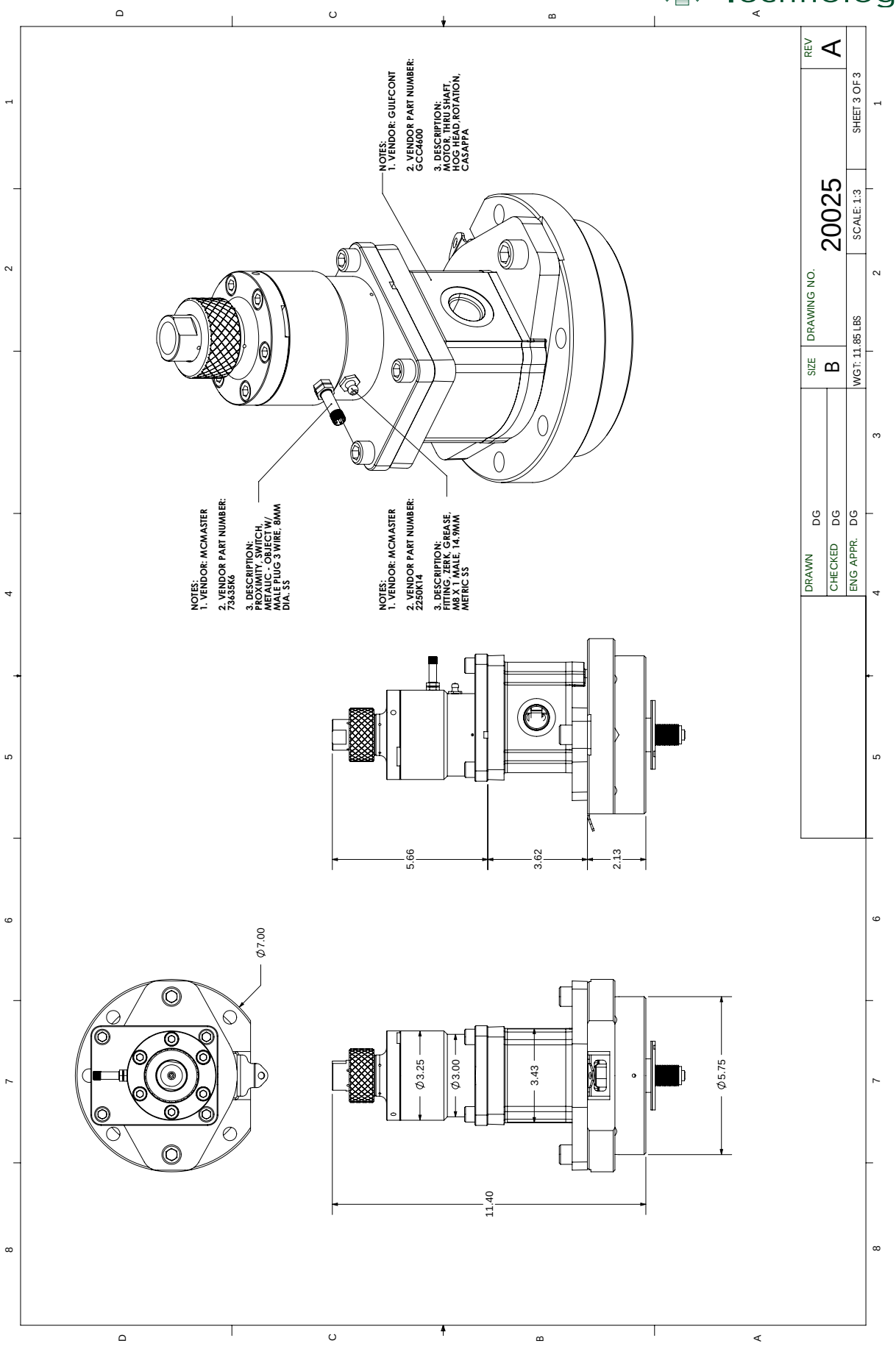
6	315207ADL	SEAL 31 X 52 X 7MM	1
7	50097-001	SEAL, FELT, GASKET, DIRT .063 THICKNESS	1
8	50098-001	DETAIL, NUT, SWIVEL	1
9	50099-001	DETAIL, ADAPTER, SWIVEL SEAL	1
10	50100-001	DETAIL, ADAPTER, FLANGE, THRU SHAFT, HOG HEAD	1
11	50101-001	DETAIL, HOUSING, THRUST ASSEMBLY, THRU SHAFT, HOG HEAD	1
12	50102-001	DETAIL, COVER, THRUST ASSEMBLY, THRU SHAFT, HOG HEAD	1
13	50103-001	DETAIL, SHIELD, DIRT, THRU SHAFT, HOG HEAD	1
14	50105-001	DETAIL, TIT, SWIVEL, HOG HEAD	1
15	50106-001	DETAIL, NUT, GLAND, THRU SHAFT, HOG HEAD	1
16	50107-001	DETAIL, NUT, SEAL, GREASE, THRU SHAFT, HOG HEAD	1
17	5154T69	SEAL 25 X 52 X 8MM	1
18	60135-001	SCREW, SHCS, M8-1 x 25MM, SS	6
19	70152-001	FABRICATION, HOLDER, FILTER, THRU SHAFT, HOG HEAD	1
20	70153-001	FABRICATION, WASHER, COUNTER, THRU SHAFT, HOG HEAD	1
21	70837	NUT, JAM, 3/4-16 SS	1
22	7304WN	BEARING, ANGULAR CONTACT BALL, 20x52x15 MED 7300WN SERIES	1
23	73635K6	PROXIMITY, SWITCH, METALIC - OBJECT W/ MALE PLUG 3 WIRE, 8MM DIA, SS	1
24	9396K113	O-RING, 2 X 2-1/8 X 1/16 WIDTH, SILICONE (AS568A)	1
25	9396K21	O-RING, 9/16 X 11/16 X 1/16 WIDTH, VITON (AS568A)	1
26	97063A124	SHIM, ROUND, 3/4 X 1-1/4 X .075	1
27	B27.7M-3BM1-52	RING, INTERNAL RETAINING, STEEL, 52MM	1
28	BR1001	SEAL, UPPER, SWIVEL SHAFT	1
29	MP1008	SEAL, BRASS BUTTON	1
30	MP2253	SEAL, SHAFT, SWIVEL	1
31	MP2752	RING, BACKUP, BRASS	1
32	MS2650025A20000	SCREW, SHCS, M12-1.75 X 25MM, SS	2
33	SKF-6304-FULL	BEARING, RADIAL, 20 X 52 X 15, TWO SEALS	1

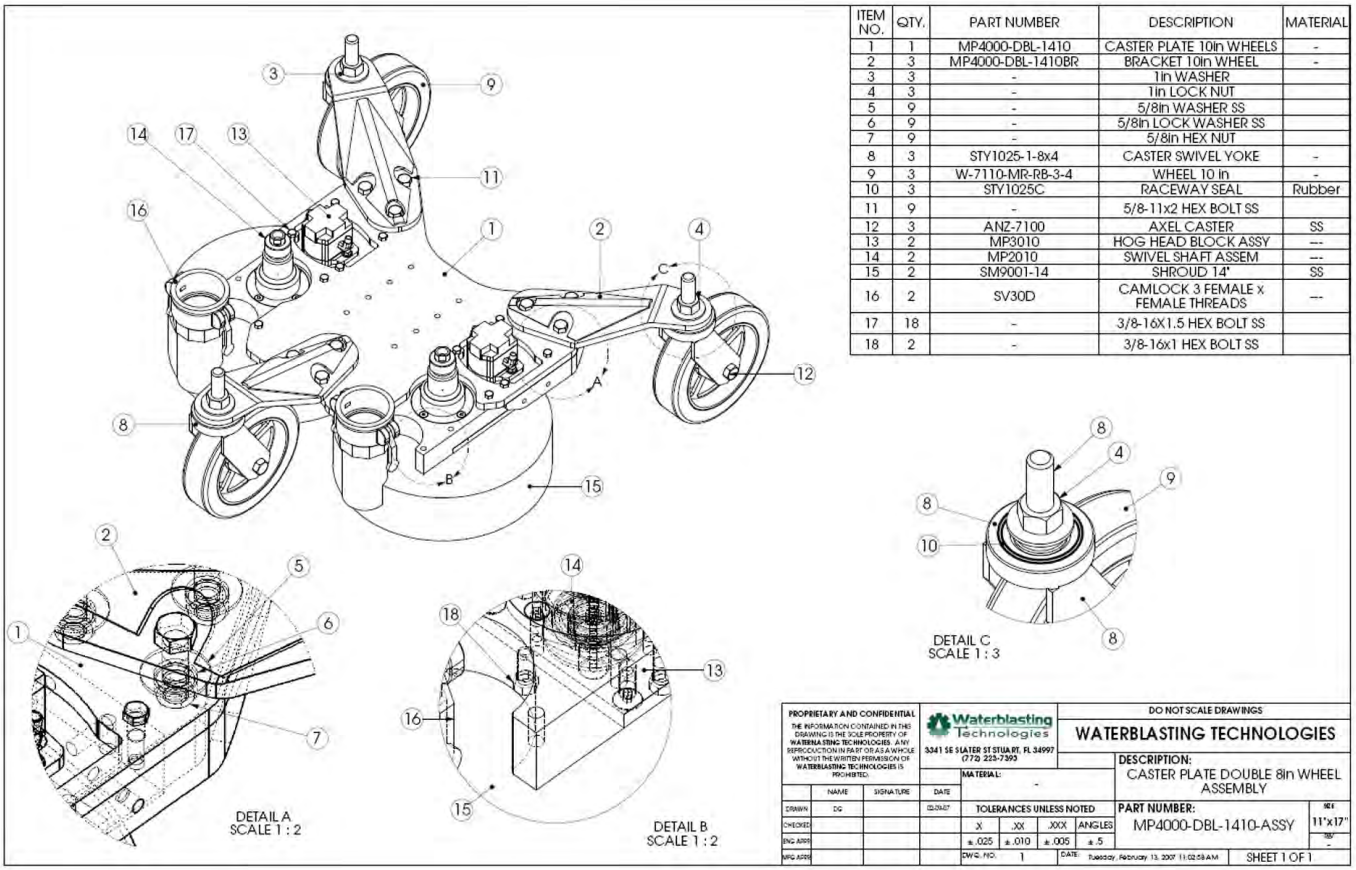
		SIZE	DRAWING NO.	REV
DRAWN	DG	B	20025	A
CHECKED	DG			
ENG APPR.	DG	WGT: 11.85 LBS	SCALE: 1:5	SHEET 2 OF 3


NOTES:
1. VENDOR: GULFCONT
2. VENDOR PART NUMBER:
GCC4600
3. DESCRIPTION:
MOTOR, THRU SHAFT,
HOG HEAD ROTATION,
CASAPPA
NOTES:
1. VENDOR: MCMASTER
2. VENDOR PART NUMBER:
7363SK6
3. DESCRIPTION:
PROXIMITY, SWITCH,
METALIC - OBJECT W/
MALE PLUG 3 WIRE, 8MM
DIA. SS
NOTES:
1. VENDOR: MCMASTER
2. VENDOR PART NUMBER:
2256KT4
3. DESCRIPTION:
FITTING, ZERK, GREASE,
M8 X 1 MALE, 14.9MM
METRIC SS
5.66
3.62
2.13
Ø7.00
Ø3.25
Ø3.00
3.43
Ø5.75
11.40
DRAWN DG
CHECKED DG
ENG APPR. DG
SIZE B
DRAWING NO. 20025
REV A
WGT: 11.85 LBS
SCALE: 1:3
SHEET 3 OF 3

7.3 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.



ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	MATERIAL
1	1	MP4000-DBL-1410	CASTER PLATE 10in WHEELS	-
2	3	MP4000-DBL-1410BR	BRACKET 10in WHEEL	-
3	3	-	1in WASHER	
4	3	-	1in LOCK NUT	
5	9	-	5/8in WASHER SS	
6	9	-	5/8in LOCK WASHER SS	
7	9	-	5/8in HEX NUT	
8	3	STY1025-1-8x4	CASTER SWIVEL YOKE	-
9	3	W-7110-MR-RB-3-4	WHEEL 10 in	-
10	3	STY1025C	RACEWAY SEAL	Rubber
11	9	-	5/8-11x2 HEX BOLT SS	
12	3	ANZ-7100	AXEL CASTER	SS
13	2	MP3010	HOG HEAD BLOCK ASSY	---
14	2	MP2010	SWIVEL SHAFT ASSEM	---
15	2	SM9001-14	SHROUD 14"	SS
16	2	SV30D	CAMLOCK 3 FEMALE x FEMALE THREADS	---
17	18	-	3/8-16X1.5 HEX BOLT SS	
18	2	-	3/8-16x1 HEX BOLT SS	

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DESCRIPTION: CASTER PLATE DOUBLE 8in WHEEL ASSEMBLY

MATERIAL: -

	NAME	SIGNATURE	DATE
DRAWN	DG		02-24-07
CHECKED			
ENG APPR			
MFG APPR			

TOLERANCES UNLESS NOTED: X ±.025 | .XX ±.010 | .XXX ±.005 | ANGLES ± .5

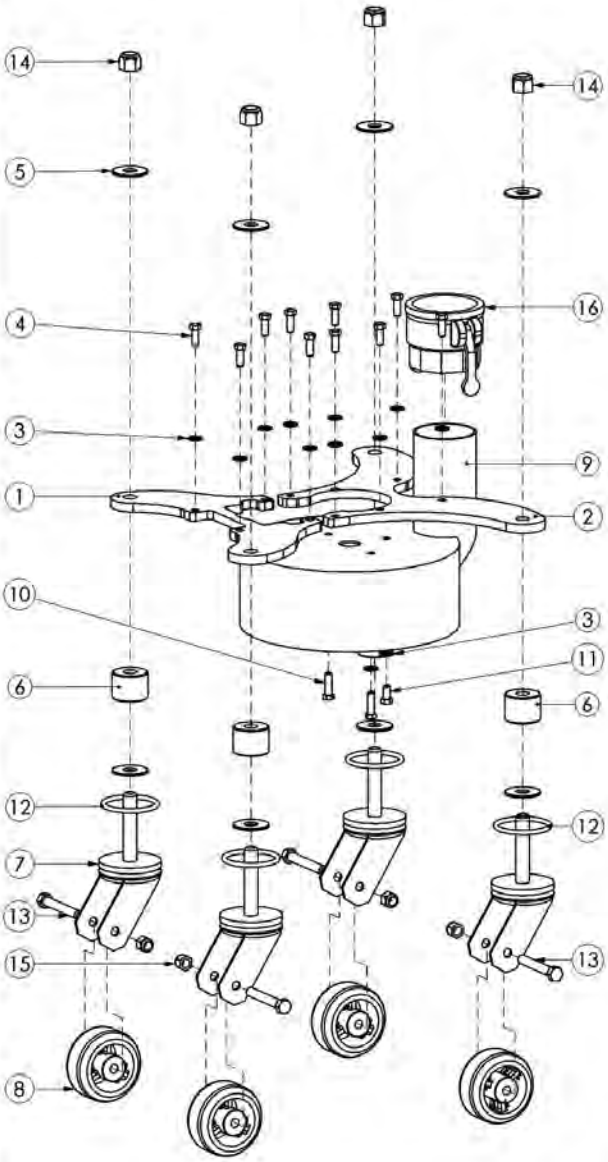
PART NUMBER: MP4000-DBL-1410-ASSY

SIZE 11"x17"

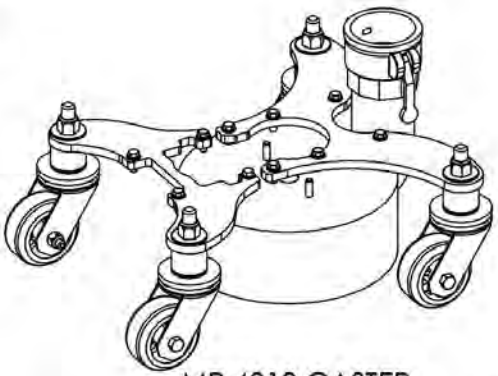
DWG. NO. 1

DATE: Tuesday, February 13, 2007 11:02:59 AM

SHEET 1 OF 1



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	13
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	HD4000-12AH	AXEL CASTER	4
14	HD4000-16	NUT, CASTER	4
15	87337568	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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	NAME	SIGNATURE	DATE
DRAWN	DG		8/20/06
CHECKED			
ENG APPR			
MFG APPR			

MATERIAL: —

TOLERANCES UNLESS NOTED

.X	.XX	.XXX	ANGLES
± .025	± .010	± .005	± .5

DESCRIPTION: CASTER PLATE ASSY

PART NUMBER: MP4010

SIZE: 11"x17"

DWG. NO. 1

DATE: Thursday, July 20, 2006 2:34:56 PM

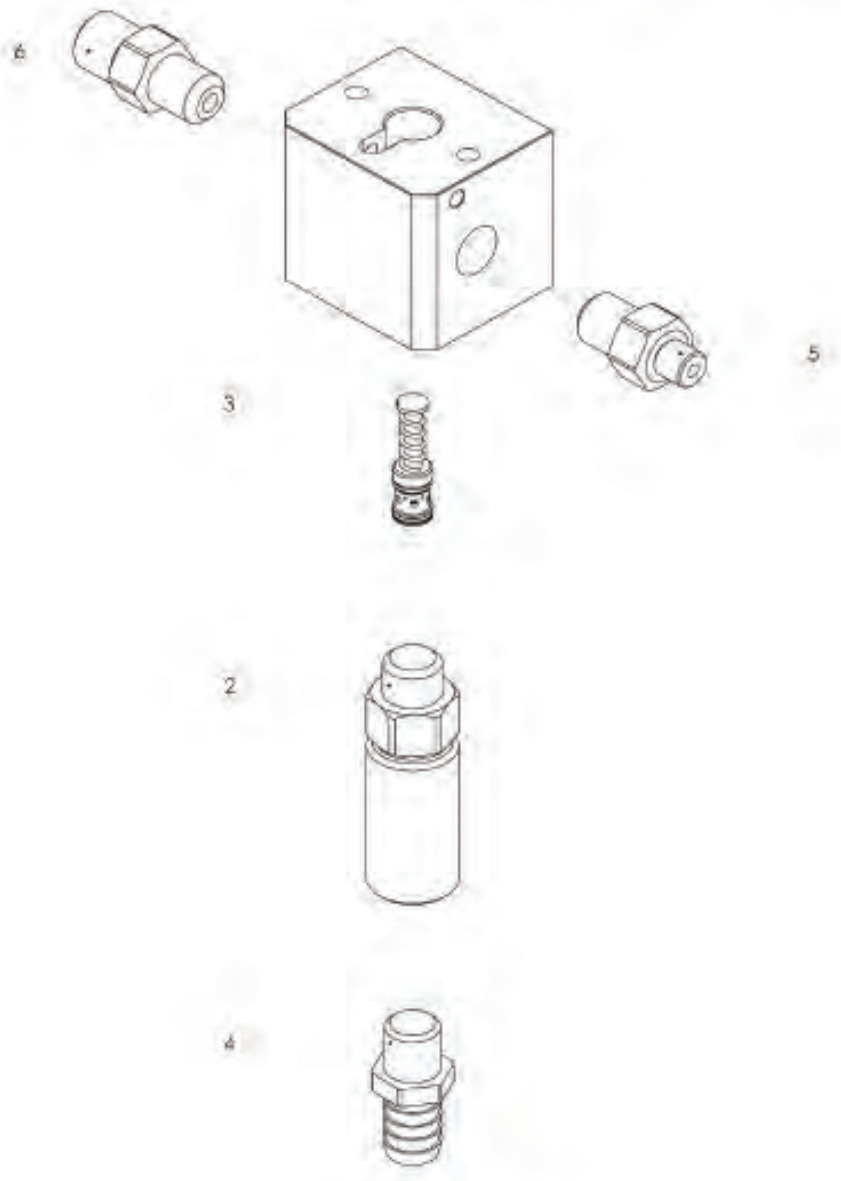
SHEET 1 OF 1

7.4 Stripe Hog Dump Valve Assemblies & Diagrams

Tractor Dump Valve and Shut-off (diverter) Valve Repair
(Hydraulically operated)

1. Remove diffuser tube (2) with cartridge (3). Remove cartridge (3) from slotted end and replace with a new cartridge (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	FT916HPX76	HOSE FITTING



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WATERBLASTING TECHNOLOGIES

DESCRIPTION: HYDRAULIC OPERATED DIVERTER VALVE

TOLERANCES UNLESS NOTED

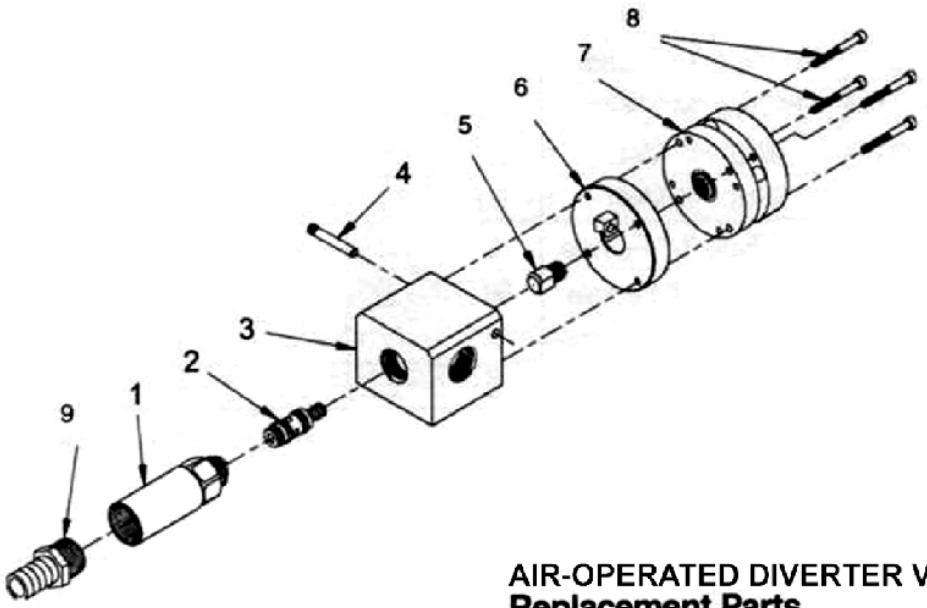
PART NUMBER:

11" x 17"

7.5 Shut-Off (Dump) Valve Repair

(Truck Air Operated Diverter Valve Diagram)

1. Remove diffuser tube (1) with cartridge (2). Remove cartridge (2) from slotted end and replace with a new cartridge (2). Replace diffuser tube (1) into valve body (3).
2. Periodic maintenance of air actuator is necessary. Remove cap screws (8) to disassemble air cylinder (7). Clean thoroughly, check o-rings, apply silicone lubricant and reassemble.



AIR-OPERATED DIVERTER VALVE
Replacement Parts

Item	Part Number	Description
1	K51865	Diffuser
2	K53476	C-40 Cartridge
3	K53547	Body
4	K26454	Pin
5	K53425	Pusher
6	K53424	Mounting Plate
7	K27252	Air Cylinder
8	K27108	Capscrew
9	K25797	Hose Fitting

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DESCRIPTION:
AIR-OPERATED DIVERTER VALVE

	NAME	SIGNATURE	DATE
DRAWN			
CHECKED			
ENG APPR			
MFG APPR			

MATERIAL:

TOLERANCES UNLESS NOTED

.X	.XX	.XXX	ANGLES
± .025	± .010	± .005	± .5

PART NUMBER:

SIZE 11"x17"

REV.

DWG. NO. 1

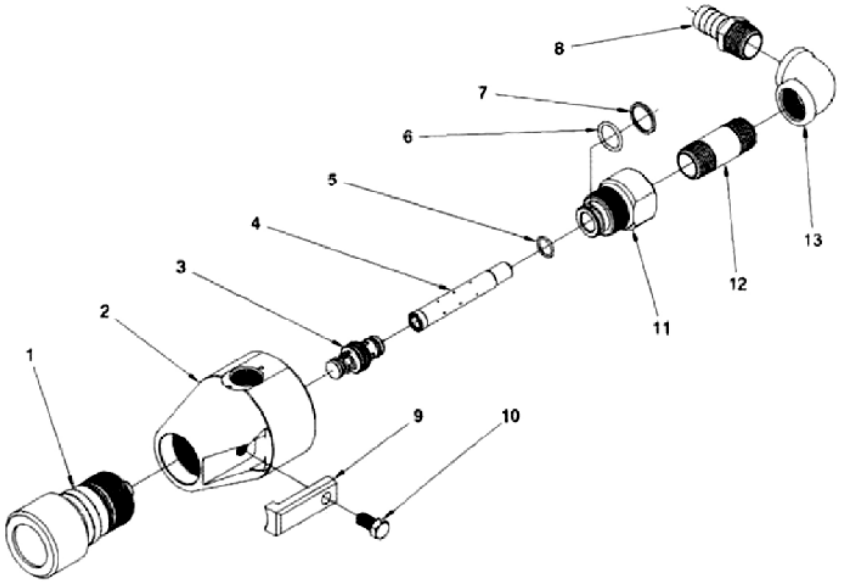
DATE: Friday, April 14, 2006 52919 PM

SHEET 1 OF 1

7.6 Manual Bypass Valve Repair

(Bypass Valve Assy. Diagram)

1. Remove outlet adapter (11). 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.
2. Check diffuser (4) for damage or wear from bypass water.
3. Check all O-rings, replace any that are damaged. Lubricate all O-rings with silicone lubricant.
4. Replace cartridge (3) and reassemble to the bypass valve body (2) making sure to anti-seize all stainless steel threads.



BYPASS VALVE

Replacement Parts

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	Back-Up Ring
8	K25797	Hose Fitting
9	K50796	Locking Arm
10	K25594	Capscrew
11	K53720	Outlet Adapter
12	K27645	Nipple
13	K27646	Elbow
Not Shown	K25933	Outlet Hose (Order in Feet)

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WATERBLASTING TECHNOLOGIES

DESCRIPTION: BYPASS VALVE

	NAME	SIGNATURE	DATE
DRAWN			
CHECKED			
ENG APPR			
MFG APPR			

MATERIAL:

TOLERANCES UNLESS NOTED

.X	.XX	.XXX	ANGLES
± .025	± .010	± .005	± .5

PART NUMBER:

SIZE 11"x17"

REV.

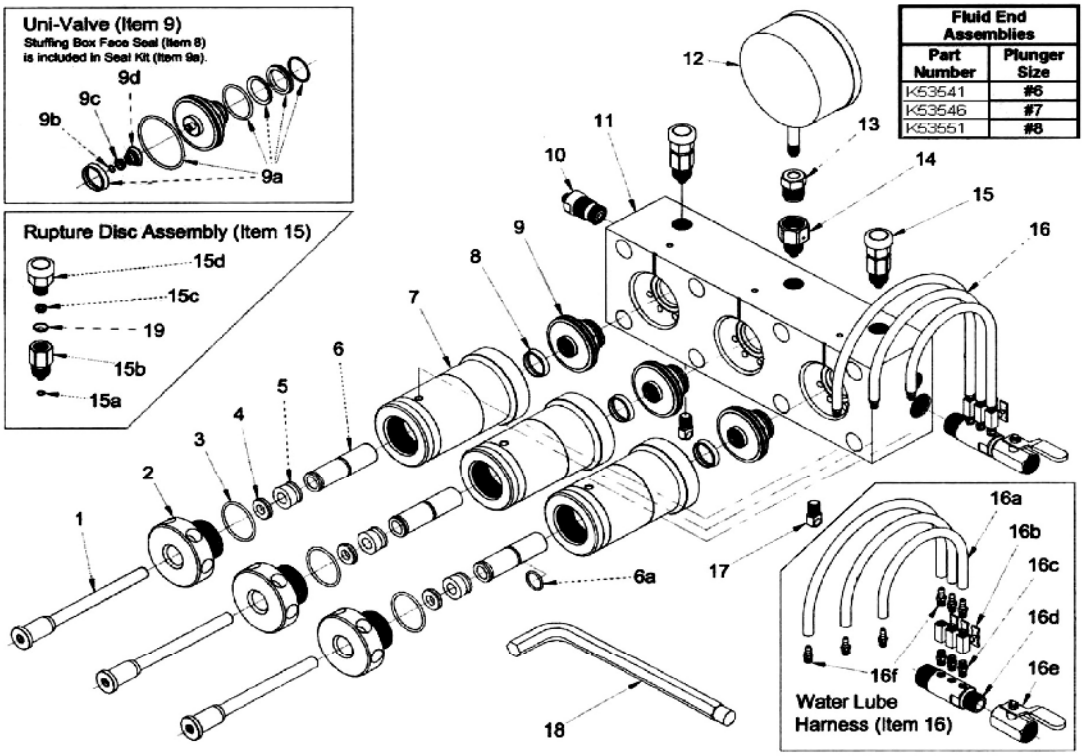
DWG. NO. 1

DATE: Friday, April 14, 2006 52919 PM

SHEET 1 OF 1

Drawings and Supplies

FLUID END REPLACEMENT PARTS



Item	Part Number	Description
1	K53562	#6 Plunger
	K53563	#7 Plunger
	K53564	#8 Plunger
2	K54102	Gland Nut
3	K26465	O-Ring
4	K27480	#6 Guide Bushing
	K27481	#7 Guide Bushing
	K27482	#8 Guide Bushing
5	K54117	#6 Packing
	K54118	#7 Packing
	K54119	#8 Packing
6	K54097	#6 Sleeve
	K54098	#7 Sleeve
	K54099	#8 Sleeve
6a	K26522	O-Ring
7	K54100	Stuffing Box
8	K54126	Stuffing Box Seal
9	K53496	Uni-Valve

Item	Part Number	Description
9a	K54144	Seal Kit
9b	K28803	Retaining Ring
9c	K53493	Spring Retainer
9d	K27510	Spring
10	K53672	Adapter, Pump Discharge x 9/16" Type "M" Male
	K53673	Adapter, Pump Discharge x 7/8" Type "M" Male
	K53990	Adapter, Pump Discharge x 3/8" HP Female
	K53989	Adapter, Pump Discharge x 9/16" HP Female
11	K53457	Manifold
12	K27489	Gage, 0-60,000 PSI
13	K28091	Anti-Vibration Gland Set
14	K53573	Adapter, Male Port x 9/16" HP Female
15	K53506	Rupture Disc Holder

Item	Part Number	Description
15a	K27503	O-Ring
15b	K53577	Base
15c	K53579	Hold-Down Ring
15d	K53580	Cap
16	K53796	Water Lube Harness
16a	K26470	Hose (Order in Feet)
16b	K27476	Needle Valve
16c	K26466	Nipple
16d	K53793	Lube Manifold
16e	K27102	Ball Valve
16f	K26875	Hose Fitting
17	K51660	Trunnion
18	K50890	Pump Wrench
19	K28576	Disc, 35,000 PSI Burst
	K28577	Disc, 40,000 PSI Burst
	K28616	Disc, 45,000 PSI Burst
	K27485	Disc, 50,000 PSI Burst
	K27486	Disc, 56,000 PSI Burst

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	NAME	SIGNATURE	DATE
DRAWN			
CHECKED			
ENG APPR			
MFG APPR			

MATERIAL:

TOLERANCES UNLESS NOTED

.X	.XX	.XXX	ANGLES
± .025	± .010	± .005	± .5

DWG. NO. 1

DESCRIPTION: FLUID END REPLACEMENT PARTS

PART NUMBER:

SIZE 11"x17"

REV.

DATE: Friday, April 14, 2006 5:29:19 PM

SHEET 1 OF 1

Recommended Tools and Supplies

LOCATION	Number	Item
Truck	1	Metal Clip Board
Tool Box	1	4” Needle Nose Pliers
Tool Box	1	Screw Drive Set – All Sizes – Phillips and Flat Blade
Tool Box	1	Medium Vise Grip Pliers
Tool Box	1	¼ & 3/8 Drive SAE / Metric Socket Set
Tool Box	1	12” Channel Lock Pliers
Tool Box	1	12” Crescent Wrench
Tool Box	1	14” Crescent Wrench
Tool Box	1	2 lb Rubber Hammer
Tool Box	2	¾” Combination Wrench
Tool Box	1	Metric Allen Wrench Set
Tool Box	1	SAE Allen Wrench Set
Tool Box	1	Ball Peen Hammer
Storage	1	Bottle Hand Cleaner
Truck	2	Duck Tape
Truck	1	Fire Extinguisher
Truck	1	First Aid Kit
Storage	1	Funnel
Storage	1	Gallon Engine Coolant
Storage	1	Gallon Motor Oil
Storage	1	Gallon Transmission Fluid
Storage	2	Grease Guns (each loaded with different grease)
Storage	1	Shell Darina Micro Gel Grease
Storage	1	Ultra Duty EP NLFI 2 – Multi-Purpose Grease
Storage	1	Hydrant Wrench
Storage	1	Jet Stream Tool
Storage	1	Jumper Cables
Storage	1	Measuring Wheel
Tool Box	1	25’ Measuring Tape
Truck	1	Paper Towels
Truck	1	Leather Gloves
Truck		Rain Coats for Crew
Truck	1	Road Atlas
Truck	20	Safety Ear Plugs
Truck	2	Pair Safety Glasses
Truck	2	Hard Hats
Truck	2	Safety Triangles
Truck	2	Safety Vests – DOT Class
Truck	1	Skip Counter
Truck	1	Tire Pressure Gauge
Truck	1	Window Cleaner
Storage	10	Zip Ties Large
Truck	2	Cans of Brake Cleaner

Troubleshooting Guide

Problem

HOG HEAD

Noises and Vibrations:
- Loose blower belts or pump belts - adjust or replace belts
- Blower or drive belts out of alignment - align and adjust belts
- Hog Head rotation extremely high - turn head rotation dial counterclockwise to reduce head speed

Hog Arm won't raise:
- Float mode activated - disengage float function
- Hydraulics not engaged - engage 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

Head doesn't spin or spins slowly
- Hydraulics not engaged - make sure PTO is engaged to activate hydraulic system
- Debris packed around thru-shaft or spray bar - clean thru-shaft or spray bar
- Blast head belt worn out - replace blast head belt
- Hog Head Shroud is concave and not convex - repair or replace shroud
- Flow control is shut off - turn on flow ball valve
- 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

WATER LEAKS

Hose fitting indicator port leaking:
- Fitting Loose - tighten fitting or replace hose and fitting

Fluid end manifold leaking at rectangular hole in manifold block:
- Stuffing box seal is worn out - replace stiffing box ring seal

Fluid end manifold leaking at round hole on top of manifold block:
- Valve seals worn - replace valve seal or valve

Weep holes dripping at high pressure hose connection on thru-shaft motor:
- Loose swivel nut - hand tighten swivel nut
- Leaking swivel seal - remove spent seal, check shaft nipple, clean thoroughly and replace with new seal
- Cracked swivel or thru-shaft - remove shaft assembly and disassemble to inspect shaft and replace if damaged or cracked on nipple end

Problem

HIGH PRESSURE SYSTEM PROBLEMS

Low inlet pressure - 25 PSI or less:

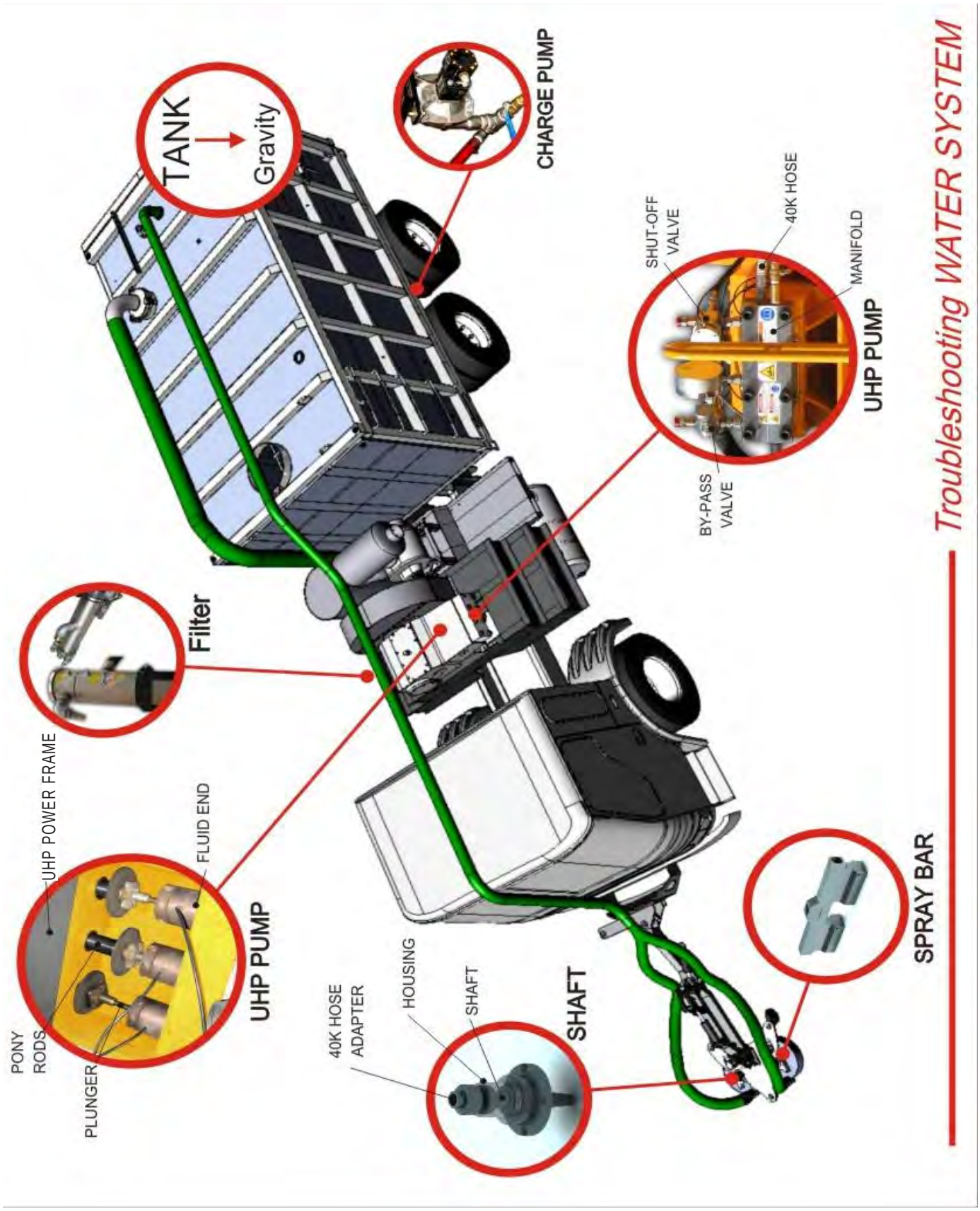
- Dirty nominal and absolute filters are clogged with particulate - change filter bag and cartridge
- Low or no inlet water pressure - check to see that water charge pump is on and fresh water valve to charge pump is open
- Empty water tank - fill tank with water
- Clogged or damaged impeller on pump - disassemble pump face and clean impeller or replace with a new impeller
- Cracked water line allowing air to be sucked in - check and find any leaks and repair
- Low hydraulic fluid flow to charge pump - check hydraulic fluid level and flow
- Debris in water line from tank - flush or replace with new line

Low outlet pressure - in High Pressure system:

- Insufficient engine RPM - raise RPM of engine
- Warn or blown nozzles - change nozzles
- Oversized nozzles - refer to chart to correct nozzle pattern
- Leaks - hoses, fittings, nozzles, pump valves or seals - tighten or replace, check valves for heat indicating internal bypass
- Worn or missing button seal between spray bar and shaft - replace with new button seal
- Air lock in fluid end - remove rupture disc assembly or side port fitting, engage pump and run up to high RPM to remove air from the manifold
- Low inlet water pressure - change dirty water filters - cartridge & bag (also 20 micron in recycle mode)
- Low or no inlet water pressure - check to see that water charge pump is on and valve to charge pump is open
- 40K clutch slipping - check clutch oil level or repair clutch
- Leaking packing - determine which is leaking and change, flush and replace
- Leaking or cracked valves - check face of manifold for heat to find leaking valve and replace or rebuild
- Diverter valve (dump valve) cartridge leaking - remove return hose and check cartridge, if leaking remove diffuser tube and replace cartridge
- By-pass valve cartridge leaking - remove diffuser tube and replace cartridge
- Leaking swivel seal - remove spent seal, check shaft nipple, clean thoroughly and replace with new seal
- Cracked swivel or thru-shaft - remove shaft assembly and disassemble to inspect shaft and replace if damaged or cracked on nipple end

Fluctuation or pulsing of 40K gauge or inlet pressure gauge:

- Valve may be pitted or cracked - remove valve and check seats for damage - replace or rebuild
- Leaking packing - determine which is leaking and change, flush and replace
- 40K clutch slipping - check clutch oil level or repair clutch


Troubleshooting WATER SYSTEM
TANK
Gravity
CHARGE PUMP
SHUT-OFF VALVE
40K HOSE
MANIFOLD
UHP PUMP
BY-PASS VALVE
Filter
UHP POWER FRAME
FLUID END
UHP PUMP
PONY RODS
PLUNGER
40K HOSE ADAPTER
HOUSING
SHAFT
SHAFT
SPRAY BAR

Problem

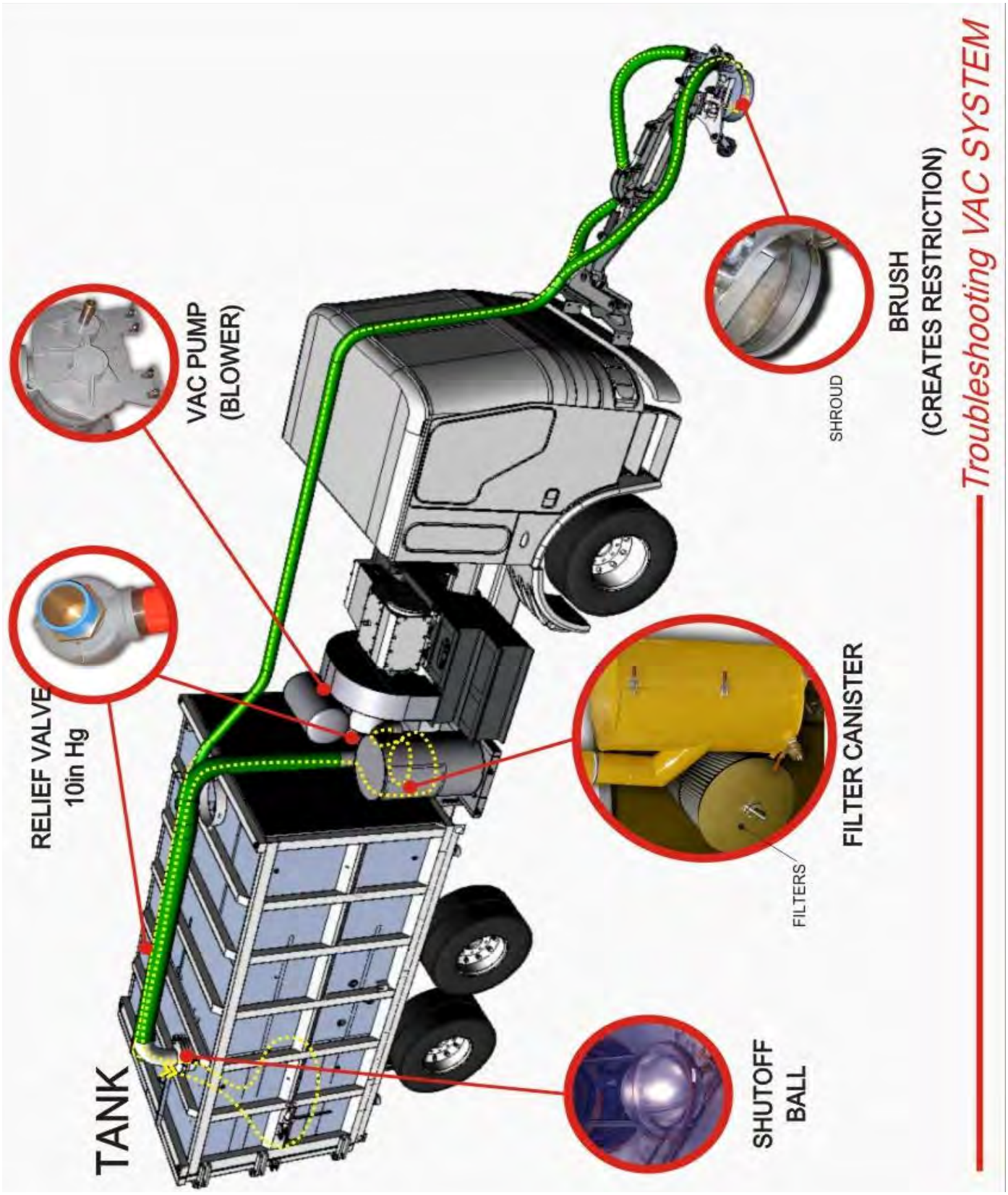
VACUUM SYSTEM PROBLEMS

Vacuum Loss or Failure:

- vacuum blower is not engaged - activate 40K switch to activate vacuum system
- Vacuum RPM not high enough - adjust RPM higher
- Vacuum filter dirty & clogged - rinse with hose or replace if too badly clogged
- Worn or improperly adjusted shroud brush - adjust or replace brush
- Broken vacuum hose or fitting - inspect hoses & fittings and replace any parts damaged
- Vacuum line plugged with debris - remove clogged hose, flush to remove blockage or replace with new hose if necessary
- Slipping or damaged vacuum belt - tighten belt or replace if worn badly
- Debris tank door leaking air or water - Compressor is not inflating seal - check compressor and repair if necessary. Seal is dirty - clean seal. Seal is damaged - replace damaged seal.
- Debris tank 4" dump valve open - clear valve of any debris and close tightly; if valve still leaks, it may be necessary to replace worn valve
- Relief valve stuck open - lubricate plate & stem and work it in and out to be sure it is free
- Vacuum filter canister door seal leaking - replace seal to eliminate vacuum leak
- Vacuum filter canister drain ball valve leaking or open - clean valve of any debris; if it is still leaking, it may be necessary to replace worn valve

Relief valves stuck open & whistling:

- A blockage in vacuum hose between the tank and the Hog Head - locate and remove blockage
- Clogged vacuum filter - Clean or replace vacuum filter and clean canister tank bottom
- High water/debris level lifting shut-off ball in debris tank - Empty water from debris tank and dump debris - clean shut-off ball to keep it from sticking shut, replace debris bag, clean door seal and close


Troubleshooting VAC SYSTEM
VAC PUMP
(BLOWER)
BRUSH
(CREATES RESTRICTION)
SHROUD
RELIEF VALVE
10in Hg
FILTER CANISTER
FILTERS
TANK
SHUTOFF
BALL

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SH8000 Specifications

LENGTH (varies slightly depending on truck chassis)	37 ft / 11.3 m
WIDTH (varies slightly depending on truck chassis)	10 Ft / 3 m
HEIGHT	12.5 Ft / 3.8 m
EMPTY WEIGHT W/O tractor (estimated w/ fuel, water & vacuum tanks empty)	38,000 lbs / 17,237 kg
WEIGHT W/O tractor (estimated W/ fuel,water & vacuum tanks full)	68,000 lbs / 30,844 kg
VACUUM/DEBRIS TANK VOLUME	1,500 gal / 5,678 ltr
CLEAN WATER TANK	2700 gal / 10,221 ltr
BLOWER	Dresser Roots U-RAI 615
BLOWER CFM	1389 cfm
MAXIMUM SYSTEM VACUUM	13 INHGV UHP PUMP
UHP PUMP	Jetstream 4240
UHP PUMP GPM	12 gpm / 45 ltr
MAXIMUM UHP Pressure	40,000 PSI / 2,722 bar
BLOWER DRIVE BELT	Gates Poly Chain 14MGT-2520-37 (USA) - 14MGT-2660-37 International)
BLOWER DRIVE BELT TENSION (new)	46 to 48 Hz (USA) - 47 to 49 Hz (International)
BLOWER DRIVE BELT TENSION (used - over 20 hours)	39 to 41 Hz (USA) - 40 to 43 Hz (International)
UHP PUMP DRIVE BELT	Gates Poly Chain 14MGT-3500-90 (USA) - 14MGT-3850-90 (International)
UHP PUMP DRIVE BELT TENSION (new)	61 to 63 Hz (USA) - 49 TO 52 Hz (International)
UHP PUMP DRIVE BELT TENSION (used)	52 to 55 Hz (USA) - 42 to 45 Hz (International)

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Pre-Start Inspection

1. Inspect all hoses for chaffing and signs of wear.
2. Check fuel level and make sure you have enough for the shift.
3. Check truck systems and fluid levels. Refer to the engine operating manual.
4. Check the fluid level and temperature in the hydraulic system.
5. Check all water blasting and vacuum components for oil leaks, damaged or loose bolts and parts.
6. Inspect the hog head for loose components and damage.
7. Check that all quick release pins on the ladders and ramps are in place, secure and in good condition.
8. Check vacuum canister for water and the vacuum filter. Drain water or clean filter as required.
9. Check the vacuum and UHP pump drive belt tension and alignment.
10. Check clean water tank level and fill if necessary.
11. Drain debris tank and check debris level. Empty if necessary.
12. Walk around truck and visually check all components and look for obvious problems.

Notice:

If you operate at freezing temperatures or even temperatures below 60 degrees Fahrenheit (16^0 Celsius), it will be necessary to operate the system, including engaging the blower and high pressure pump, at IDLE speed only under load, until oil heats up above 60 degrees Fahrenheit (16^0 Celsius).

Warm Weather Shutdown

1. Turn high pressure OFF with joystick “Stop” switch.
2. Turn the 40K Clutch and Charge Water switches “OFF”.
3. 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.
4. Reduce the engine speed to idle.
5. Raise the Hog Head to the full “UP” and locked position. Make sure the locking lever is engaged and secure it with a plastic tie wrap to ensure the locking lever cannot accidentally be released during transportation.
6. Put the Truck Transmission in “N” *(NEUTRAL)*.
7. Turn the PTO switch to “OFF”. Listen for the PTO to disengage and then watch for the red light to turn OFF, the green light to turn ON.

IT IS VERY IMPORTANT THAT THE PTO IS FULLY DISENGAGED TO INSURE THAT NONE OF THE FUNCTIONS WILL OPERATE ACCIDENTALLY.

8. Drain waste water from the vacuum canister. Close the valve when draining is complete.
9. Turn the Mode switch to “OFF”. It is VERY important that this switch is off to insure that the truck transmission will not go directly into 4th gear lock-up when put into DRIVE causing the truck to lunge forward.
10. Turn all other switches and dials on the control panels to “OFF” or “0”.
11. When the truck is parked, set the parking brake and allow the engine to run for several minutes to cool internal components, then shut off the engine.

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. For the 40K water blaster, refer to pump manufacturer's procedures for maintaining equipment 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. 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.

7. Drain the vacuum canister immediately at the end of each shift.

Notice:

If you operate at freezing temperatures or even temperatures below 60 degrees Fahrenheit (16^0 Celsius), it will be necessary to operate the system, including engaging the blower and high pressure pump, at IDLE speed only under load, until oil heats up above 60 degrees Fahrenheit (16^0 Celsius).

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Spray Bar Configuration and Nozzles

1) 8”, 8 Nozzle - Most Agressive set-up. | 5.39 GPM @ 36K psi | 5.69 GPM @ 40K psi

2) 8”, 8 Nozzle - Medium Agressive set-up. | 4.73 GPM @ 36K psi | 5.0 GPM @ 40K psi

3) 8”, 8 Nozzle - Less Agressive set-up. | 4.27 GPM @ 36K psi | 5.0 GPM @ 40K psi

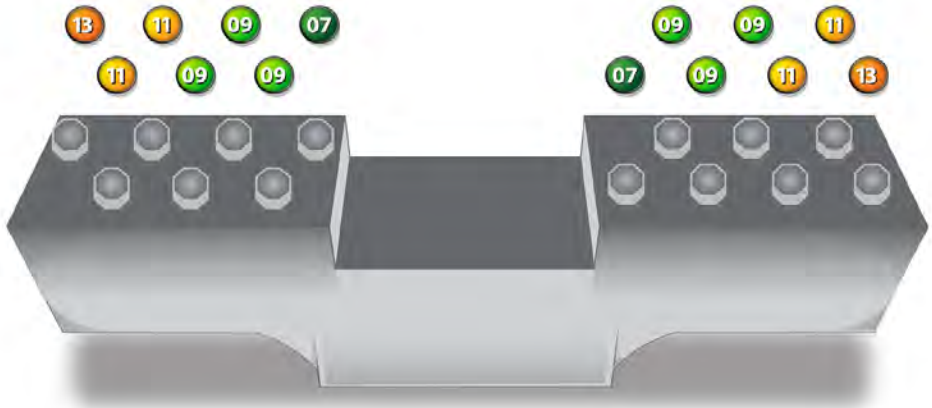
4) 8", 8 Nozzle -Least Agressive set-up. | 3.71 GPM @ 36K psi | 3.93 GPM @ 40K psi

5) 8", 8 Nozzle - Concrete Prep/Curing Compound Removal - 25,000 - 35,000psi | 5.48 GPM @ 40K psi

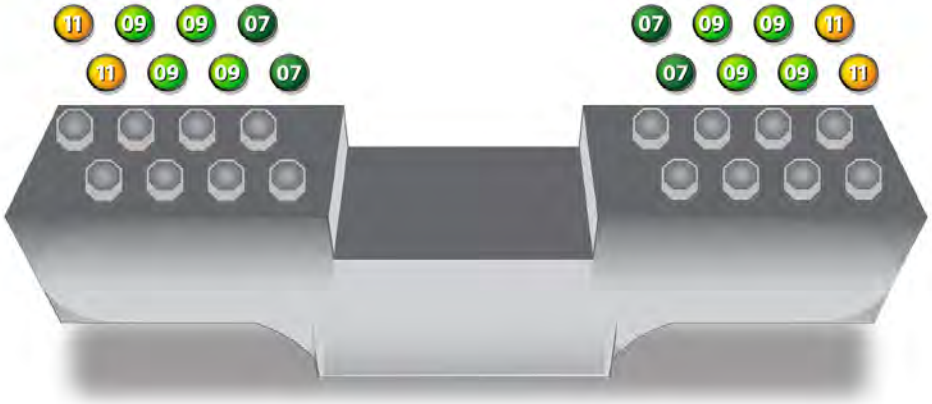
High Cohesive Nozzle Flow Chart

FLOW - GPM @ Pressure Indicated

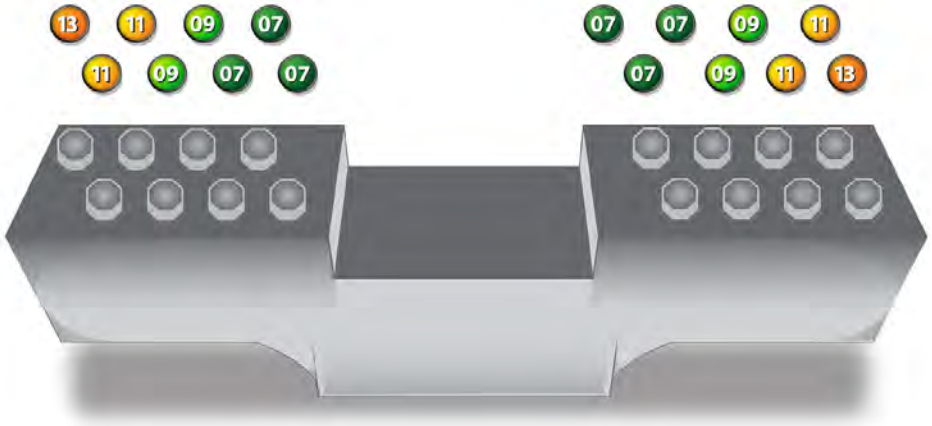
Orifice Dia./ins	20KPSI (1379 Bar)	26KPSI (1723 Bar)	30KPSI (2068 Bar)	36KPSI (2482 Bar)	40KPSI (2758 Bar)
0.005	0.08	0.09	0.09	0.10	0.11
0.006	0.11	0.12	0.13	0.15	0.15
0.007	0.15	0.17	0.18	0.20	0.21
0.008	0.19	0.22	0.24	0.26	0.28
0.009	0.25	0.28	0.30	0.33	0.35
0.010	0.30	0.35	0.37	0.41	0.43
0.011	0.37	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



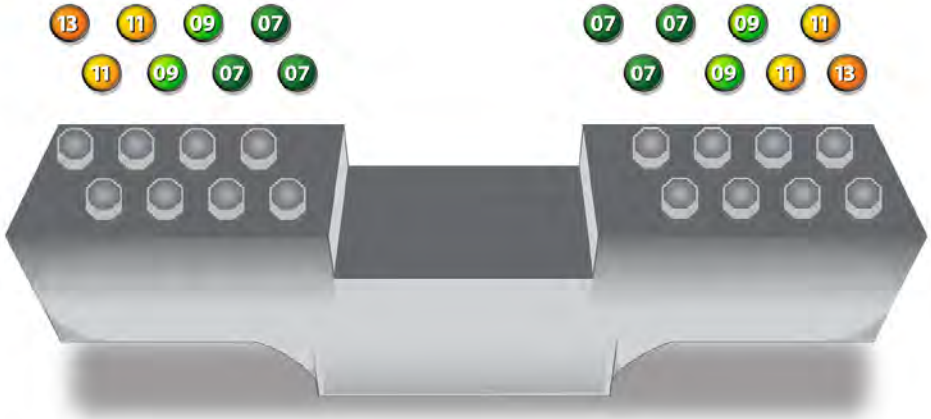
6) 6” 14 Nozzle Spray Bar - 4” lines - Argessive. | 5.72 GPM @ 36K psi | 6.0 GPM @ 36K psi



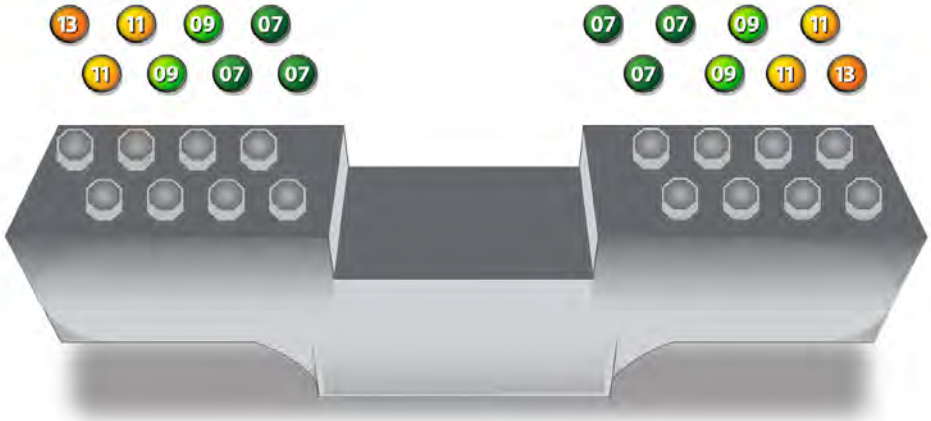
7) 6”, 14 Nozzle Spray Bar - 4” lines - Less Aggressive 4.48 GPM @ 36K psi / 4.74 GPM @ 40K psi



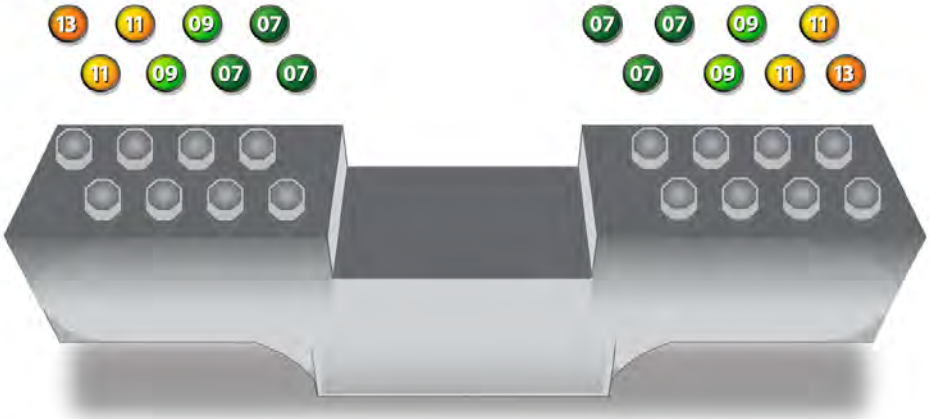
8) 8” - 10”, 16 Nozzle - Most Aggressive set up. 5.4 GPM @ 36K psi / 5.72 @ 40K psi



9) 8” & 10”, 16 Nozzle - Less Aggressive set-up. 5.4 GPM @ 36K psi / 5.72 @ 40K psi



10) 8” & 10”, 16 Nozzle - Less Aggressive Set-up. 4.82 GPM @ 36K psi / 5.1 GPM @ 40K psi



11) 8” & 10”, 16 Nozzle Concrete Prep - Curing Compound removal set-up - 25,000 35,000 psi

12) 14” Most Aggressive set-up. 5.83 GPM @ 36K psi / will not achieve 40K psi

13) 14” Most Aggressive set-up. 5.66 GPM @ 36K psi / 5.98 GPM @ 40K psi

14) 14” Less Aggressive set-up. 5.46 GPM @ 36K psi / 5.78 GPM @ 40K psi

15) 14” Least Aggressive set-up. 4.81 GPM @ 36K psi / 5.09 GPM @ 40K psi

16) 14” Concrete PRep - Curing Compound Removal. Will not achieve 40K psi

14” Rubber Removal - 30,000K psi

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.

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Technical Support

24 / 7 CUSTOMER SERVICE

- Waterblasting 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 Waterblasting 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 Waterblasting Technologies, Inc.
- 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 10AM Eastern Standard Time

CUSTOMER SERVICE HOT LINE - 772-223-7393
www.waterblastingtechnologies.com
www.stripehogsupport.com

Waterblasting Technologies, INC will not be responsible for damages or loss caused by substituted parts purchased locally or from another vendor or manufacturer.

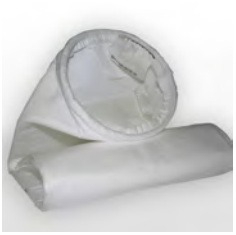
WARNING

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 WATERBLASTING TECHNOLOGIES, INC! FAILURE TO HEED THIS WARNING MAY RESULT IN DAMAGE TO COMPONENTS AND SEVERE INJURY OR DEATH!

Stripe Hog Support Web Page

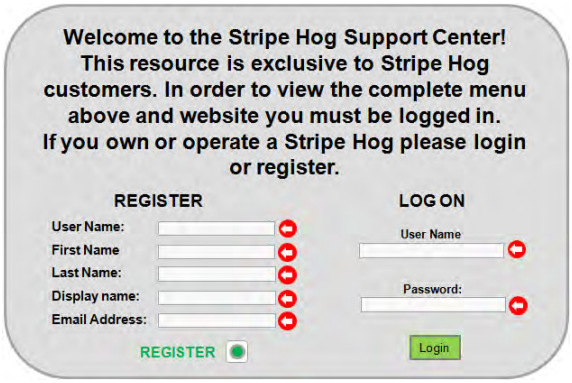
You are here Home

Mike Logout



VIDEO HELP

Typical Registration & Logon Window



(001) 772-223-7393 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 Waterblasting 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!

I Home I Stripe Hog Training I Ambassador club I Marketing I Stripe Hog Store I Contacts I

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