WASHWORLD

Section 6 – Maintenance

Figure 6-1. Rail Mounted Washworld Razor System

6.1 General Information

WARNING

Before preparing any maintenance procedures read and understand the Safety Section of this manual. Improper performance or lack of critical information could result in personal injury, equipment damage, or death.

Washworld encourages our customers to perform maintenance and repairs whenever necessary. However servicing complex components, within the normal warranty period may void the Washworld warranty and any specified warranty extended by the manufacturer of OEM products.

CAUTION

After performing maintenance, do a walk around inspection (WAI). Remove tools and foreign objects from the equipment, reinstall and securely fasten all guards and enclosure doors. Contact with exposed or moving components can cause serious personal injury.

WARNING

DO NOT TAMPER with complex components such as: manual control devices, safety devices, power supplies, printed circuit boards, and, programmable controllers, not specifically authorized by Washworld. Inc.

Section 6 - Maintenance

Performance and service life of this equipment is dependent on proper care and maintenance of the equipment. During operation, be aware of any unusual noises, equipment vibration, smells, leakage or abnormal temperatures that may signal the early signs of equipment failure.

6.1.1 Safety Features

WARNING

DO NOT TAMPER with complex components such as: manual control devices, safety devices, power supplies, printed circuit boards, and, programmable controllers, not specifically authorized by Washworld, Inc.

DANGER

Shut down and lock out all electrical power before attempting any maintenance. When performing maintenance that requires electrical power, use EXTREME CAUTION when working in the area of electrical current. Unintended start-up or contact with exposed or moving components can cause severe personal injury or death.

The main electrical disconnect is located on the side of the Ultimate Control Cabinet (UCC), which is typically placed next to the pump station in the equipment room/enclosure. Refer to Figure 6-2.

Place the main electrical disconnect switch in the ON position to enable all electrical systems. Place the main electrical disconnect in the OFF position to disable all electrical systems.

There are (2) System STOP Buttons. One button is located on the main UCC Enclosure. The second STOP Button is on the Joystick Control Panel, typically located on the outer wall of entrance end of the bay. Pressing either System STOP Button, stops (if operating), or prevents (if Idle) all operation of the Washworld Razor Wash Unit. Refer to Figure 6-3.

Rotate each STOP Button 1/4 turn clockwise to enable the electrical system.

Figure 6-2. Ultimate Control Cabinet (UCC)

Figure 6-3. Joystick Control Panel

Section 6 - Maintenance

6.2 Daily Maintenance

It is necessary to observe at least one full wash cycle to ensure proper wash operation. Check for any abnormal operation, noises, vibrations or tracking problems during the observation.

1. Observe at least one car wash from in the bay and one wash from the equipment room.
   a. Ensure that the carriage and trolley are riding smoothly over the rails, verify belts are not loose.
   b. Ensure that the hose and wiring in the E-Chain, is tracking properly and not kinking or binding.
   c. Ensure that the soap is flowing properly and is being delivered in a uniform manner over the entire surface.
   d. Check that all nozzles are delivering the proper amount of soap/wax.
   e. Check for blocked nozzles in the underbody wash system, spray arch, Flex pass arches and triple foam heads (optional).
   f. Inspect the hoses, tubing and fittings for leaks, blockages, mechanical binding or hose damage. Repair or replace, as required.
2. Inspect the Instruction Signs for proper operation and burned out bulbs. Repair or replace, as required.
3. Inspect the carriage and trolley drive belts for proper tension. Adjust as needed.
   a. To adjust the carriage drive belt:
   1) Park the machine all the way at the exit end of the bay.
   2) Tension the belt from the entrance end using the belt tensioner (refer to figure 6-5) until the top of the belt is **1" (25 mm)** below the top surface of the carriage rail at the center point of the rails. Refer to figure 6-4.

NOTE: *Verify both carriage belts are tensioned the same and carriage frame is sitting square on the rails to eliminate possible tracking problems.*

   b. To adjust the trolley drive belt:
   1) Park the trolley in the center of the carriage frame.
   2) Place a straight edge across the top of the trolley rails near the passenger side of the carriage and measure from the straight edge to the top of the belt. Note this measurement. Refer to figure 6-6.
   3) Place the straight edge across the top of the rails next to the trolley (centered on the rails). This measurement should be **¼" (6 mm)** greater than the previous measurement. Refer to figure 6-7.
   4) If adjustment is necessary: Tighten or loosen the tensioning bolts of the idler pulley located on the passenger side carriage endplate. Refer to figure 6-8.

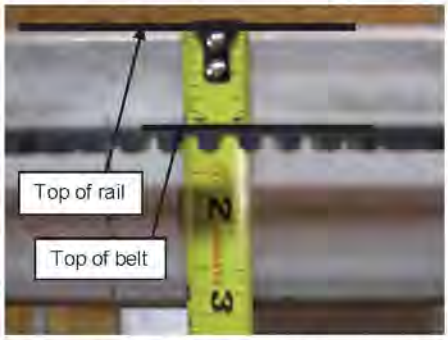

Figure 6-4. Carriage drive belt tensioned

Figure 6-5. Carriage drive belt tensioner

Figure 6-6. Trolley drive belt at idle end

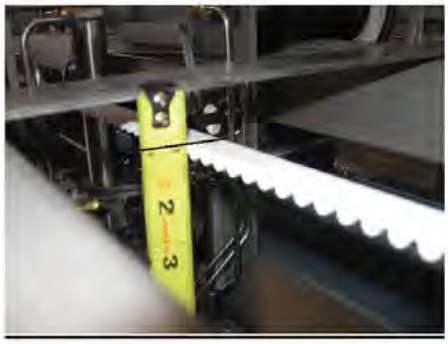

Figure 6-7. Trolley drive belt tensioned

Figure 6-8. Trolley belt tensioning bolts

4. Inspect the solution levels in the barrels. Add solution or replace solution barrels, as required.
5. Inspect the pressure gauges on the pump station panel. Refer to Figure 6-9.
   a. Ensure that the solution pump is between 190-200 psi.
   b. Ensure that the high pressure pump is between 1000-1150 psi.
   c. Ensure high pressure pump w/RCS pass is between 300-500 psi.
   d. Ensure air regulator for low-pressure applications is between 40-60 psi.
   e. Ensure air regulator for triple foam application is between 30-40 psi.
6. Inspect the carriage rollers and trolley rollers for smooth operation, wear, dirt or grease buildup. Clean or repair as required.
7. Inspect crankcase bearings for leaks, damaged seals, and loose cover fasteners. Check for valve seal leaks, water leaks, and loose fittings. Repair leaks immediately, as required.

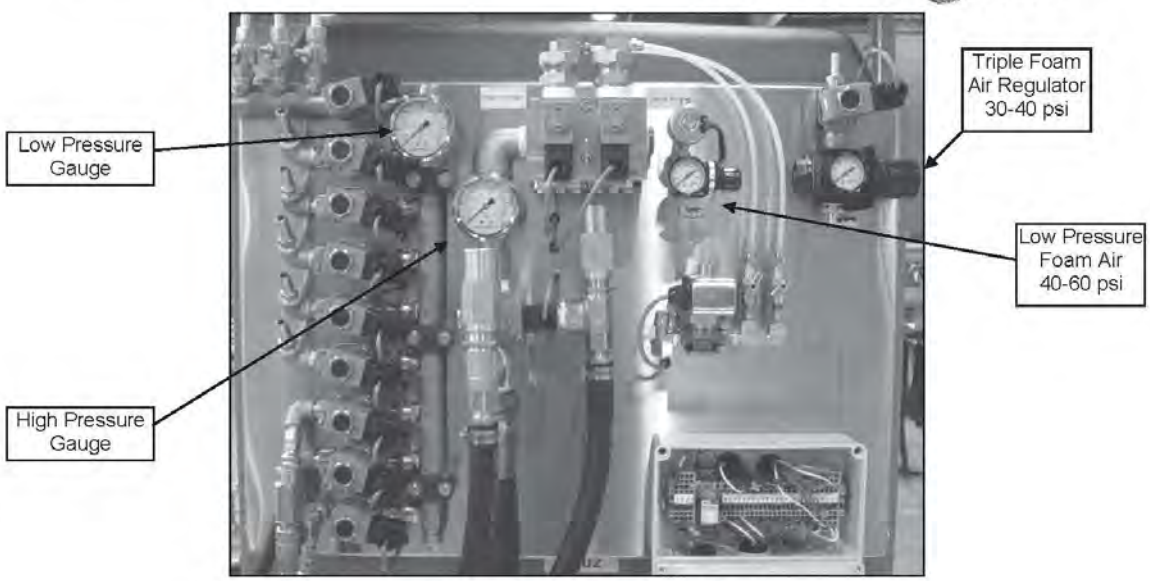

Figure 6-9. Pump Station Control Panel

6.3 Bi-Weekly Maintenance Checks

The following inspections should be made a minimum two times per month:

1. Inspect the Rollers and belt drive system for smooth operation, wear, dirt or grease buildup or damage. Clean, replace or repair as necessary. Refer to Figure 6-10.

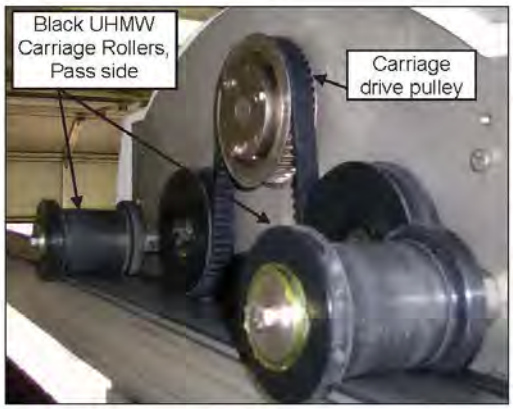

Figure 6-10. Passenger side carriage rollers

NOTE: *Belt tension on both rails must be the same in order for the Razor to "track" evenly on the rails.*

1. Inspect the arch impact proximity switch for proper adjustment and operation. The switch should turn on when the arch is pushed sideways at an angle of approximately 25-30 degrees. Verify the input is on with the switch is triggered (1/10). Refer to Figure 6-11.

Figure 6-11. Arch Impact Proximity Switch

2. Inspect the (7) remaining proximity switches for proper operation, distance from flags 1/4" to 3/16" (4.75-6.35mm) and any visible damage. Refer to Figure 6-12 through Figure 6-15.

Figure 6-12. Trolley Right Limit

Figure 6-13. Trolley Left Limit

Figure 6-14. Front-Mid-Rear Limit Proximity's

Figure 6-15. Width Measure Proximity

Figure 6-16. Arch Proximity Switches

NOTE: *Arch Index Proximity switches should be set a credit cards width between each proximity and the index cam lobes.*

3. Inspect the oil level sight gauge for proper oil level in the high pressure pump crankcase. If the crankcase oil level is below the sight port, add oil, as required per pump manufacturer's recommendation in the Vendor supplied literature.

   Unscrew the crankcase filler plug.

   FOR C.A.T. PUMP 3535, ensure that the crankcase is filled to the sight gauge level with CAT Pump Oil (Part# 43949). Crankcase capacity is 4.2 qts. (4 L).

   FOR GENERAL PUMP 1541, ensure that the crankcase is filled to the sight gauge level with General Pump Oil (Part# 43951). Crankcase capacity is 71 fl. oz. (2.2 qts, 2.1 L).

4. Refer to the Vendor supplied literature for additional information.

5. Inspect the sight gauge for evidence of water in the crankcase (oil is milky/discolored). Repair internal seals, gaskets or "O"-rings immediately.
6. Open the valve on the main water line pre-filter to flush sediment from the filter element. Refer to Figure 6-17.

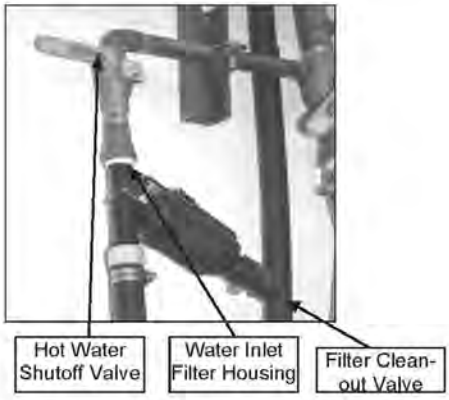

Figure 6-17. Water Line Filter Element

6.4 Monthly Maintenance

The following inspections should be made once per month:

1. Inspect the roller clearance to ensure that the carriage rollers are tracking properly.
2. Inspect the carriage rollers to ensure that they are in contact with the rails during the entire wash cycle. Align rails, as required.
3. Inspect the 3/4" jam nuts that hold the carriage rails to the support brackets, to ensure that they are tight.

DANGER

Shut down and lock out all electrical power before starting pump maintenance. Unintended start-up or contact with exposed or moving components can cause severe personal injury or death.

4. Inspect belt for proper tension and ensure that the motor pulley is properly aligned with the pump drive pulley. Replace drive belt, as required. Refer to Figure 6-18.
5. Inspect all hoses for wear, damage or leaks. Repair or replace damaged hoses/fittings, as required.

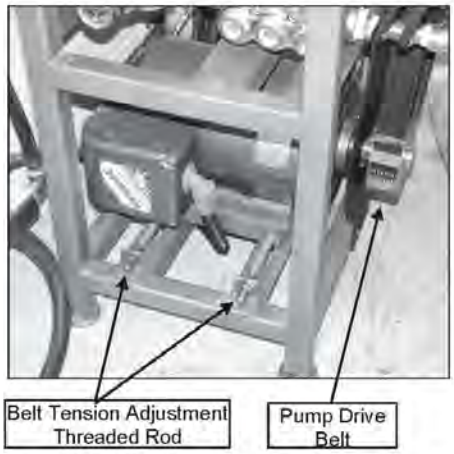

Figure 6-18. HP Pump Motor/Drive Belt Tension

IMPORTANT: *The drive belt should deflect .02 inch (.51 mm) for every inch of center-to-center shaft span with the addition of 5.2-6.8 lbs (7.05-9.2Nm) of force at the center of the span.*

6. Inspect all gear boxes for leaks, worn shafts, worn keyways, freedom of movement, eccentric motion, bent shafts and excessive end play. Drive belt tension and pulley condition. Repair or replace, as required.
7. Inspect the trolley drive belt tension and pulley condition. Repair or replace, as required. Check arch for smooth rotation and proper positioning.

   NOTE: *All gear boxes on the Razor are maintenance free, which do not require change of oil.*
8. Inspect the pump crankcase bearings for leaks, damaged seals, and loose cover fasteners, daily. Check for valve seal leaks, water leaks, and loose fittings. Repair leaks immediately, as required.
9. Inspect the drive belts and couplings for wear, worn keyways, freedom of movement, eccentric motion, or excessive end play. Repair or replace, as required.

10. Inspect the water tank strainers for damage or obstructions. Clean the strainers inside of the pump tank.
11. Clean all solution foot valves.

6.5 Dryer Maintenance

Fans used in High Velocity Dryers are manufactured to very close tolerances using the finest materials available. If maintained properly and operated under normal conditions, they should provide many years of trouble-free service. Although there is no substitute for good judgment and common sense, the following precautions should be followed to ensure safe efficient fan operation.

NOTE: *The following Maintenance recommendations would apply to "ALL" dryer applications such as Wall Mount, Free Standing Arch and On-Board Dryer systems.*

WARNING

Shut down and lock out all electrical power before starting Dryer maintenance. Unintended start-up or contact with exposed or moving components can cause severe personal injury or death.

Fan Inspection

1. Periodically fans should be inspected for any signs of stress fractures and welds throughout entire producer assembly. Remove guard and inlet cone to inspect with flashlight at all surfaces of producer. See Figure 6-19 and 6-20.

Figure 6-19. Dryer Producer

Figure 6-20. Dryer Producer

2. Do not allow fans to come in contact with inlet cones.
3. Keep inlet screen free of all debris.
4. All hardware associated with dryer should be checked for tightness to ensure proper operation and maintain safe operation.
5. Periodically clean all debris clinging to fan blades to maintain precision balance which is critical for safe high speed operation.
6. For On-Board Dryer equipment, inspect carriage rollers, E-Chain assembly for any signs of wear and/or malfunction.
7. When dryer is in operation, listen for any unusual noise or vibration, shutdown immediately if abnormal operation is detected.

   Do not restart Dryer until cause is identified and corrected.

Cleaning

Painted Surfaces:

Soap and water or household cleaners will work satisfactorily. Do not use solvents or harsh degreasers which will destroy the paint and mar the finish. Automotive wax will extend the finish quality.

Aluminum Structures and Housings:

Industrial strength cleaners can be used for the cleaning of the structural parts of dryer. Descale with vinegar or mild acid solution. Rinse immediately with fresh water.

Section 6 - Maintenance

Lubrications:

Most motors are furnished with sealed bearings which would not have grease fittings and would not require grease. If a motor is equipped with grease fittings, then motor may be greased once each year. Apply ¼ - ½ stroke only with a hand grease gun.

Oscillating Arm and Drive Rod Bearings should be greased once a month. Apply two or three strokes only with a hand grease gun. **Do Not Over Grease. Do Not use air powered grease gun** (Use Moly Grease or a product applicable to the wet environment).

On-Board Dryer systems, the carriage rollers should be greased at least once a month to prevent premature failure and smooth operation.

CAUTION

DO NOT OVER-GREASE any fittings. If the grease fittings will not take grease, do not force. Over-greasing will damage the bearing seals and shorten bearing service life.

6.5 Six Month Maintenance

The following checks should be performed once every six months:

6.5.1 High Pressure Pump Case Oil Level

NOTE: *There are currently two pump styles available for the Razor Vehicle Wash System. Each requires lubricants specific to the pump used. Refer to the Vendor supplied literature for recommended pump case lubricants.*

WARNING

Shut down and lock out all electrical power before starting pump maintenance. Unintended start-up or contact with exposed or moving components can cause severe personal injury or death.

1. Change the oil in the high pressure pump crankcase after an initial week of operation. Thereafter, change the oil every 6 months. Refer to the Vendor supplied literature for additional information.
   a. Place a shallow pan under the crankcase, capable of holding 4.5 quarts of oil.
   b. Remove the oil fill plug from the crankcase. Refer to Figure 6-21 and Figure 6-22.

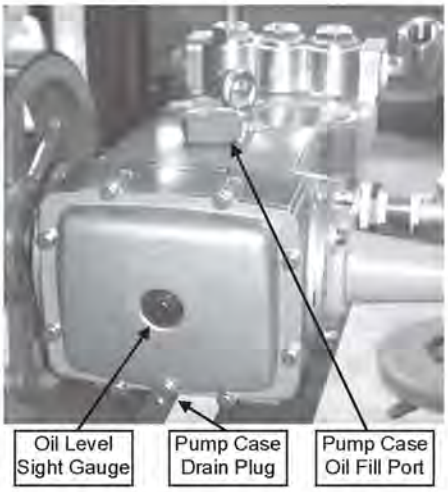

Figure 6-21. CAT Pump Oil Level Port

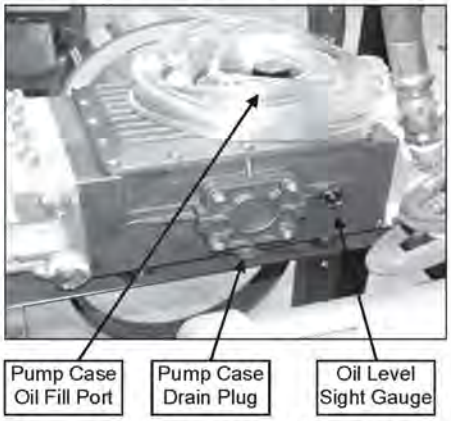

Figure 6-22. General Pump Oil Level Port

   c. Remove the oil drain plug from the crankcase and allow the oil to flow into the oil pan.
   d. When the oil stops dripping, inspect the spent oil for excessive metallic particles. Repair or replace damaged

components. Dispose of the drain oil per local regulations.

e. If no metallic particles are present, reinstall the gear case drain plug. DO NOT OVERTIGHTEN the drain plug!

f. FOR C.A.T. PUMP 3535, ensure that the crankcase is filled to the sight gauge level with CAT Pump Oil (Part# 43949). Crankcase capacity is 4.2 qts. (4 L).

2. g. FOR GENERAL PUMP 1541, ensure that the crankcase is filled to the sight gauge level with General Pump Oil (Part# 43951). Crankcase capacity is 71 fl. oz. (2.2 qts, 2.1 L).

3. Inspect the drive shaft for wear, worn keyways, freedom of movement, eccentric motion, or excessive end-play. Repair or replace, as required.

4. Inspect the pump drive belt for proper tension, excessive wear, cracks, or damage. Refer to Figure 6-11.

IMPORTANT: *The drive belt should deflect .02 inch (.51 mm) for every inch of center-to-center shaft span with the addition of 5.2-6.8 lbs (7.05-9.2Nm) of force at the center of the span.*

WARNING

Shut down and lock out all electrical power before starting pump maintenance. Unintended start-up or contact with exposed or moving components can cause severe personal injury or death.

6.6 Annual Maintenance

The following maintenance should be performed once every 12 months:

1. Replace the (4) carriage rollers (2 white and 2 black) and the (4) trolley rollers (2 white and 2 black). See Figure 6-10 and Figure 6-17.

Figure 6-17. Trolley Rollers

a. White rollers use #M618889.

b. Black rollers use #M618939.

2. Replace underbody and spray arch nozzles.

NOTE: *Loss in High Pressure will generally indicate the need of replacement of nozzles*

a. One set of nozzles cover underbody and spray arch (Part No. WW010-7)

(4) 1508 (on DS wheel spray pipe).

(4) 4003 (on main underbody manifold).

(4) 1508 (on PS wheel spray pipe).

b. Inspect complete Arch assembly for leaks at each connection point.

c. Replace the spray arch "O"-ring seals, as required.

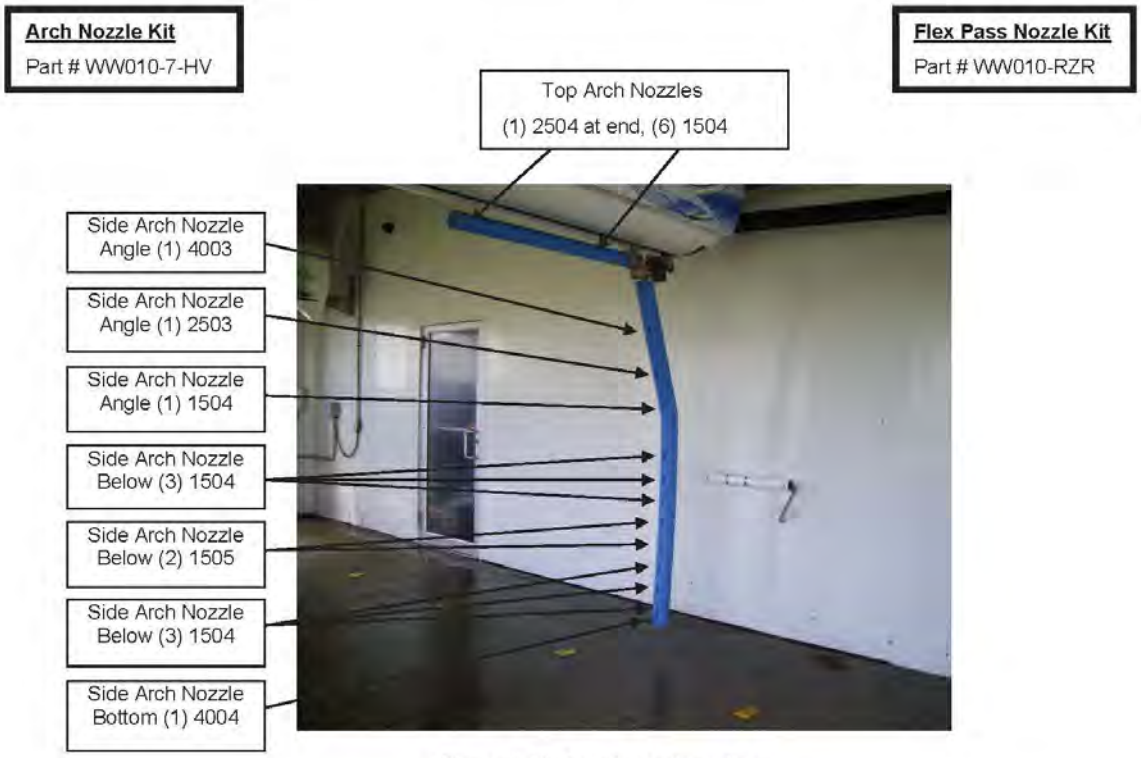

Figure 6-18. Nozzle configuration

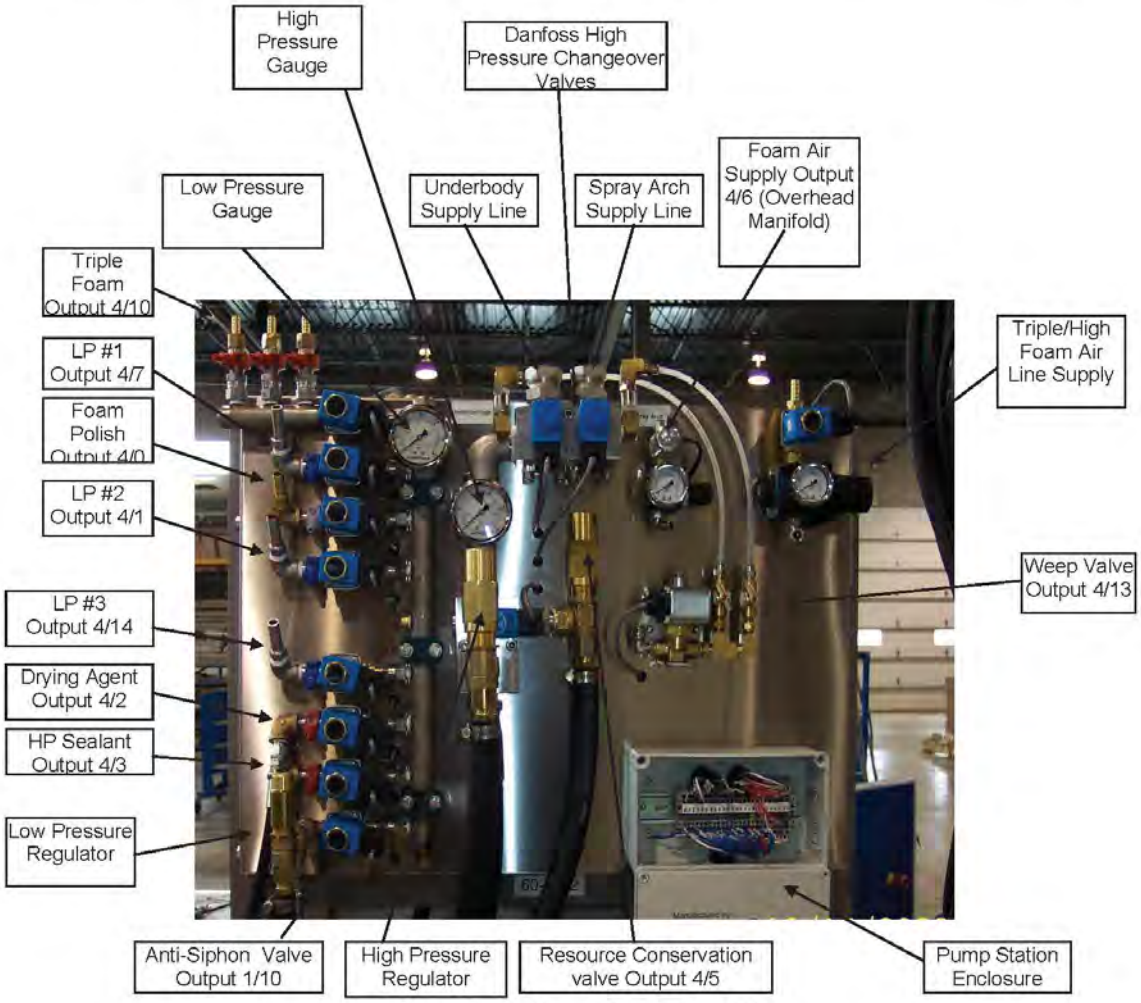

Figure 6-19. Pump station Panel

3. Replace the (9) solenoid valves located on the pump station panel. Refer to Figure 6-19.
   a. Solenoid valves use #61930.
4. Replace the injectors located on the pump station panel.
   a. For (3) presoak use .086 injectors.
   b. For (1) foam wax .083 injector.
   c. For (2) drying agent and high pressure sealant solenoids use .057 injectors.
   d. For (3) Triple foam solenoids use .070 injector.
5. Replace the hot water line pre-filter element.
   a. Turn OFF the hot water inlet ball valve.
   b. Unscrew the filter element housing.
   c. Remove and inspect the pre-filter element mesh for blockage or damage. Replace the filter element, as required.

6.7 Every 5000 Cycles Maintenance

The following maintenance should be performed after every 5000 wash cycles. Access the "Maintenance Menu" to determine the number of wash cycles.

6.7.1 Periodic Lubrication

NOTE: *Unless otherwise noted use JETLUBE™ Grease (Part # 4359).*

Before adding grease to the fittings, wipe the grease fittings with a clean rag.

CAUTION

DO NOT OVER-GREASE any fittings. If the grease fittings will not take grease, do not force. Over-greasing will damage the bearing seals and shorten bearing service life.

1. Grease the (8) trolley fittings on the trolley grease block. Refer to Figure 6-20.

Figure 6-20. Trolley Grease Fittings

2. Grease the (5) passenger's side, carriage grease fittings. See Figure 6-21.
3. Grease the (5) driver's side, carriage grease fittings. Refer to Figure 6-22.

Figure 6-21. Carriage Roller Grease Fittings
(Passenger Side)

Figure 6-22. Carriage Roller Grease Fittings
(Drivers Side)

4. Grease the (2) 90°Swivel tube fittings (one each side) Refer to Figure 6-23.

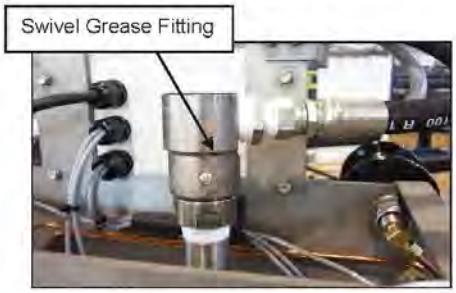

Figure 6-23. Straight Swivel Grease Fittings

CAUTION

DO NOT OVER-GREASE any fittings. If the grease fittings will not take grease, do not force. Over-greasing will damage the bearing seals and shorten bearing service life.

6.7.2 Air System

1. Inspect the airlines, fittings, and regulators for damage, air leaks, wear, and loose fittings. Refer to Figure 6-24.

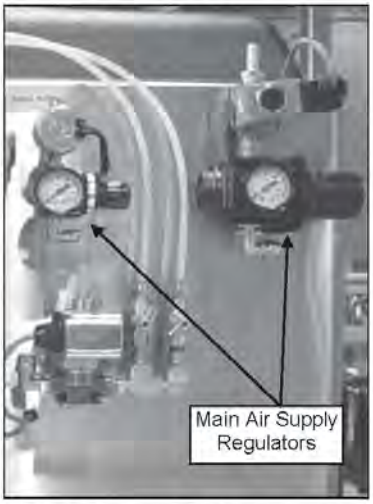

Figure 6-24. Air Regulators on pump panel

1. Check air compressor operating pressure; ensure that it is maintaining line pressure between 100-120 PSI (6.9-8.3 Bar). Condensate should be drained on a regular basis if not supplied with an automatic drain.

WASHWORLD

DANGER

Shut down and lock out all electrical power before attempting any maintenance. When performing maintenance that requires electrical power, use EXTREME CAUTION when working in the area of electrical current. Unintended start-up or contact with exposed or moving components can cause severe personal injury or death.

Maintenance Chart

Task	Period
6.7.3 Lubrication	
Carriage	
Grease Carriage Roller Bearings (Driver's Side).	5000 cycles
Grease Carriage Roller Bearings (Passenger's Side).	5000 cycles
Grease the Drive Belt Guide Pulleys.	5000 cycles
Trolley	
Grease Trolley Rollers.	5000 cycles
Grease the Drive Belt Guide Pulleys.	
Spray Arch	
Grease Spray Arch 90° Swivel.	5000 cycles
High Pressure Pump	
Inspect the Gear Case Oil Level (Fill, as required).	Daily
Change Pump Gear Case Oil.	6 Months
6.7.4 Inspect, Clean or Replace	
Check Drive Belt and Pulleys for wear and proper tension.	Daily
Inspect Spray Nozzles for proper operation/clogging.	Daily
Inspect Instruction Sign Bulbs. Replace faulty bulbs.	Daily
Inspect/ Fill Cleaning Fluid Levels.	Daily
Inspect Carriage Travel Over Rails.	Daily
Inspect Trolley Travel Over Rails.	Daily
Inspect Hoses and fittings for leaks or damage. Repair or replace as required.	Daily
Clean the Air Supply Filter.	Weekly
Clean Water Tank Filters.	Weekly
Inspect Proximity Switches for proper operation.	5000 cycles
Open Relief Valve on Hot Water Line Pre-filter to clean element.	Monthly
Inspect Pump Drive Belt Tension.	6 Months
Inspect Pump Motor Shaft for tight Pulleys, wear, excessive end play.	6 Months
Replace UHMW Nylon Rollers on Trolley and Carriage.	12 Months
Replace Solenoid Valves and Injectors.	12 Months
Replace Underbody and Spray Arch Nozzles.	12 Months
Replace Pump Seals, Gaskets, and "O"-rings as required.	12 Months
Inspect Pump Belt.	12 Months

END OF SECTION


A CONCOURSE
Allegiant
Southwest
B CONCOURSE
Delta
United
C CONCOURSE
Alaska
American
Ticketing
Baggage Claim
Baggage Claim
Rental Car Counters
Ticketing
Upper Level
HOURLY PARKING
GARAGE PARKING
GARAGE PARKING
RENTAL CAR RETURN
FLINT RD.
AIRPORT DR.
TO SPOKANE / COEUR D'ALENE
AIRPORT DR.
SPRINGHILL SUITES BY MARRIOTT
CAR WASH
OUTSIDE PARKING
C CONCOURSE PARKING
WINGATE
RAMADA
MCFARLANE RD.
PARKING ACCESS ROAD
FLINT RD.
ECONOMY 1 PARKING
AIRPORT DR.
FROM SPOKANE / COEUR D'ALENE
TO HIGHWAY 2
AIRPORT DR.
TO TERMINAL / ARRIVALS & DEPARTURES
CELL PHONE WAITING LOT
Airport Event Center