SINGLE AND THREE BRUSHES DRY-N-SHINE
INSTALLATION MANUAL
Part # XXX

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Equipment Requirements

<table>
<thead>
<tr>
<th>ELECTRICAL</th>
<th>POWER:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ONE 120 VAC 15 AMPS 1PH CIRCUIT +</td>
</tr>
<tr>
<td></td>
<td>TOP WHEEL ONLY: ONE 208 VAC 20 AMPS 3PH CIRCUIT</td>
</tr>
<tr>
<td></td>
<td>OR ONE 480 VAC 15 AMPS 3PH CIRCUIT</td>
</tr>
<tr>
<td></td>
<td>TOP WHEEL AND SIDE WHEELS:</td>
</tr>
<tr>
<td></td>
<td>ONE 208 VAC 15 AMPS 3PH CIRCUIT</td>
</tr>
<tr>
<td></td>
<td>OR ONE 480 VAC 20 AMPS 3PH CIRCUIT</td>
</tr>
<tr>
<td></td>
<td>+ ONE 120VAC 15A CIRCUIT FOR SIGNS</td>
</tr>
<tr>
<td>CONTROL:</td>
<td>2 OR 3 SIGNALS FROM CW CONTROLLER (24-240V AC-DC)</td>
</tr>
<tr>
<td></td>
<td>+ ONE SIGNAL FROM MASTER CONT RELAY (24-240V AC-DC)</td>
</tr>
<tr>
<td>PNEUMATICS</td>
<td>3 SCFM</td>
</tr>
<tr>
<td>WATER</td>
<td>10 GPM @ 40 PSI</td>
</tr>
</tbody>
</table>

Notes and safety Symbols

Where necessary, important points will be highlighted in this manual, using the following symbols:

**NOTE:** PROVIDES FURTHER INFORMATION!

**STOP!** PRECAUTION TO TAKE TO AVOID EQUIPMENT MALFUNCTION OR ERROR!

**WARNING!** DANGEROUS SITUATION WHICH MAY CAUSE EQUIPMENT DAMAGE, PERSONAL INJURIES OR FATALITIES!
Always follow all “Notes”, “Warnings” and instructions. Failure to do so may have serious consequences on the overall performance of the equipment and/or the safety of the people working on the equipment!

## Installation Material:

### SINGLE WHEEL DRY N’SHINE INSTALLATION MATERIAL

<table>
<thead>
<tr>
<th>LI</th>
<th>DESCRIPTION</th>
<th>HARDWARE</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TOP WHEEL</td>
<td>WEDGE ANCHORS 5/8” X 6”</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEVELING SHIMS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2” RUBBER HOSE</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2” HOSE GEAR CLAMPS</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/8” OD POLYETHYLENE TUBING BLACK</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>CROSS BEAM</td>
<td>WEDGE ANCHORS 1/2” X 3-3/4”</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEVELING SHIMS</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>CONTROL PANEL</td>
<td>WEDGE ANCHORS 3/8” X 3”</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/4” RUBBER HOSE</td>
<td>10“</td>
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<tr>
<td></td>
<td></td>
<td>3/4” HOSE GEAR CLAMPS</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>L.E.D. POWER SUPPLY</td>
<td>CONCRETE SCREWS 1/4” X 1-1/2”</td>
<td>2</td>
</tr>
</tbody>
</table>

### THREE WHEELS DRY N’SHINE INSTALLATION MATERIAL

<table>
<thead>
<tr>
<th>LI</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>TOP WHEEL</td>
<td>WEDGE ANCHORS 5/8” X 6”</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEVELING SHIMS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2” RUBBER HOSE</td>
<td>70</td>
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<tr>
<td></td>
<td></td>
<td>1/2” HOSE GEAR CLAMPS</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/8” OD POLYETHYLENE TUBING BLACK</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>SIDE WHEELS</td>
<td>WEDGE ANCHORS 5/8” X 6”</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEVELING SHIMS</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>1/2” RUBBER HOSE</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HOSE BARBED TEE 1/2”X1/2”X1/2”</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2” HOSE GEAR CLAMPS</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>CROSS BEAM</td>
<td>WEDGE ANCHORS 1/2” X 3-3/4”</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEVELING SHIMS</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CONTROL PANEL</td>
<td>WEDGE ANCHORS 3/8” X 3”</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/4” RUBBER HOSE</td>
<td>10“</td>
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<tr>
<td></td>
<td></td>
<td>3/4” HOSE GEAR CLAMPS</td>
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<tr>
<td>6</td>
<td>L.E.D. POWER SUPPLY</td>
<td>CONCRETE SCREWS 1/4” X 1-1/2”</td>
<td>2</td>
</tr>
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## Utilities Requirements:

### SINGLE TOP WHEEL REQUIREMENTS:

<table>
<thead>
<tr>
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</table>
THREE WHEELS SYSTEM REQUIREMENTS:

Installation Procedures

- Upon receiving your MCWW equipment, open all boxes and crates and verify that you have all the required components and that there is no damage to the equipment. Also verify that you have all your installation materials.

- Remove packaging material covering your DRY-N-SHINE ™ TOP WHEEL and bring it to the wash in the area where it will be installed and verify that the area is sufficiently large for the DRY-N-SHINE ™ WHEELS WORKING ENVELOPE and DIMENSIONS (see Picture #1 though #20).

PLEASE COMMUNICATE WITH YOUR LOCAL MOTOR CITY WASH WORKS REPRESENTATIVE FOR ANY DAMAGE TO YOUR EQUIPMENT!
Pic #7: Working Envelope to CV Trap Door for Sngl. D/S Top Wheel with Supershiner

Pic #8: Equipment Location

Pic #9: Working Envelope to Exit Wall for Sngl. P/S Top Wheel with Supershiner

Pic #10: Equipment Location

Pic #11: Working Envelope to CV Trap Door for Sngl. P/S Top Wheel with Supershiner

Pic #12: Equipment Location
**IMPORTANT NOTE:**

**PAY PARTICULAR ATTENTION TO THE PROXIMITY OF THE LAST DRYER PRODUCERS.**

**KEEP THE LAST DRYER PRODUCERS AS FAR AS POSSIBLE AND/OR POINTED AWAY FROM THE EXIT AND YOUR DRY N'SHINE WHEELS.**

**THE AIR FLOW COMING FROM A DRYER PRODUCER LOCATED TOO CLOSE TO THE TOP WHEEL OR ANY OF THE SIDE WHEELS MAY INTERFERE WITH THE CLOTH AND REDUCE YOUR DRY N'SHINE EFFICIENCY AND/OR MAY BE THE CAUSE OF DAMAGES TO VEHICLES.**
Installation Procedures (following):

SINGLE TOP WHEEL SYSTEM ONLY:

☐ FOR DRIVER SIDE TOP WHEEL:
Position the frame on the DRIVER SIDE OF THE CONVEYOR with the two arms pointing toward the exit. Locate the frame entrance side to proper distance from exit according to the conveyor trap door or to the wall shown on pictures one thru four (see above). Position the inside edge of the inside leg **21 INCHES** to the OUTSIDE EDGE OF THE OUTSIDE GUIDE RAIL (see Picture #22). The base plates should be located about 30” from the inside edge of the inside guide rail.

☐ FOR PASSENGER SIDE TOP WHEEL:
Position the frame on the PASSENGER SIDE OF THE WASH BAY with the two arms pointing toward the exit. Position the inside edge of the inside leg **112 INCHES** to the OUTSIDE EDGE OF THE OUTSIDE GUIDE RAIL (see Picture #23).

![Pic #22: D/S Distance to Outside Guide Rail](image1)

![Pic #23: P/S Distance to Outside Guide Rail](image2)

![Pic #24: Level Frame (1)](image3)

![Pic #25: Level Frame (2)](image4)
Level the frame in both directions (see Picture #24 and #25). Secure to the floor using 5/8” X 5” WEDGE ANCHOR BOLTS (one for each floor mount holes).

Attach the belt to the arm (see Picture #26) and secure the 3/8-16 fastener holding the belts mount with the provided Loctite®.

If your Top Wheel is installed on passenger side, reposition the DRIVE ARM ADAPTOR PLATES toward the wash bay center line like shown on picture #27 below.

Locate the DRIVE UNIT ASSEMBLY and mount to the adaptor plates as shown in pictures #28 or 29. Position the drive unit so that the DRIVER SIDE EDGE OF THE BRUSH should be lined-up with the OUTSIDE EDGE OF THE CONVEYOR OUTSIDE GUIDE RAIL.

PASSENGER SIDE TOP WHEEL:
MOUNT THE ADAPTOR PLATES JUSTIFIED TOWARD THE CENTER LINE AS SHOWN IN PIC #27
Remove the compression plates at the end of the hub and slide two FOAM SPACERS and a LARGE PLASTIC DISC. Slide a cloth disc and follow with foam spacers like shown on the picture below.

Terminate with ONE OR TWO FOAM SPACER in order to get at least 2-1/2” of compression from the compression plates. Reinstall the two compression plates.

MAKE SURE TO ALTERNATE THE CLOTH DISC FLAP UP AND DOWN BETWEEN EACH DISC. FAILURE TO DO SO MAY CAUSE THE TOP WHEEL BRUSH TO “WOBBLE” WHEN RUNNING AND MAY LEAD TO PREMATURE WEAR OF YOUR TOP WHEEL.
Raise the Top Wheel arm with a GENIE LIFT™ to its highest position and lock the wheel arm from coming down by using a large pry bar or a piece of 1” PLUMBING PIPE SCHEDULE 80 in the hole below the arm (see picture #31)

With the COUNTERWEIGHT ARM sitting at its lowest position and secure 9 X 1” COUNTERWEIGHTS (5 IN THE TOP SLOT AND 4 IN THE BOTTOM SLOT). Test if the top is sufficiently counter-balanced from the counter weights. Add one or two 1/4” COUNTERWEIGHTS to the counterweight arm box (see picture #32 and 33) until both arms are properly balanced. Test by raising and lowering manually the top wheel and confirm that the wheel is PROPERLY BALANCED: Move the arms and make sure that the brush remains still at any position. It is desired to have the top wheel perfectly balanced or slightly heavier than the counter weight arm.
Locate the cross beam and secure to the top wheel frame (see picture #34). Mount the cross beam leg on the other end of the cross beam.
Using the pictures below, locate and mount the DRY N' SHINE sign and BEATER BAR mounts to the cross beam.

Finally mount the SIGN, the SPLASH GUARD and the sonar to the cross beam (see picture 34, 35 and 36)

Locate the boxes containing the COLOR SKINZ™ covers and install on each of the legs and arms (see below).

SINGLE TOP WHEEL (SINGLE WHEEL) WITH TIRE SHINER SYSTEM:

FOR DRIVER SIDE TOP WHEEL:
Position the DRIVER SIDE SUPERSHINER according to its installation manual and according to the conveyor trap door or to the wall shown on pictures five thru twelve (see early section). Position the Supershiner brushes assemblies on top of the conveyor guide rail (see Picture #37).

Positions the top wheel frame close to its desired position (see Picture #37) according to the recommended distances shown on pictures 5 thru 12. Cut the conveyor outside guide rail following the Supershiner installation manual recommendations. Secure and level the Supershiner with anchor bolts.

Remove the SQUARE CONNECTING BAR between the two Supershiner base plate and position the top wheel according to previous instruction. Secure and level the top wheel frame.

Position and secure the PASSENGER SIDE SUPERSHINER according to its installation manual.

Follow the installation instruction previously described for the rest of the top wheel.
FOR PASSENGER SIDE TOP WHEEL:
Position the PASSENGER SIDE SUPERSHINER according to its installation manual and according to the conveyor trap door or to the wall shown earlier in this manual. Secure and level the Supershiner. Remove the SQUARE CONNECTING BAR between the two Supershiner base plate and position the top wheel according to previous instruction. Secure and level the top wheel frame.

Position the DRIVER SIDE SUPERSHINER according to its installation manual. Position the Supershiner brushes assemblies on top of the conveyor guide rail and then cut the conveyor outside guide rail following the Supershiner installation manual recommendations. Secure and level the Supershiner with anchor bolts.

TOP AND SIDE WHEELS SYSTEM (THREE WHEELS):

Identify which of the layout resembles the most to your installation shown on pictures #13 thru 20. Use instructions previously described for the top wheel and Supershiner (if applicable) and locate the side wheels (High Boys) according to previous instructions.

Secure and level the High Boys with 5/8” X 6” wedge anchor bolts to the floor.

Locate the driver side BEATER BAR and mount to the driver side High-Boy (see Picture #38). Locate the SPLASH GUARD and mount to the beater bar. Repeat the same procedure for the passenger side.

Finally, secure the hub to the wheel shaft: loosen the fasteners of the large boss clamp and slide on the brush shaft> Tighten the fasteners back evenly.
Pic #38 High Boys with Beater Bar and Splash Guard

Pic #39 High Boys Hub
Verify that the WHITE PLASTIC SPACERS are already secured in each hub channel (see Picture #38)

Start loading the bottom hub (or the bottom part of the hub) with FOUR FOAM SPACERS following by one 18" BLACK DISC. Slide ONE CLOTH DISC and then another FOUR FOAM SPACERS. Alternate between CLOTH DISC and FOAM following the instruction shown on picture #40 until 16 CLOTH DISCS ARE INSTALLED.

MAKE SURE TO ALTERNATE THE CLOTH DISC FLAP UP AND DOWN BETWEEN EACH DISC. FAILURE TO DO SO MAY CAUSE THE SIDE WHEEL TO "WOBBLE" WHEN RUNNING AND MAY LEAD TO PREMATURE WEAR OF YOUR TOP WHEEL

If desired, the wheel can be TILTED TOWARD THE VEHICLE for a better coverage of the vehicle side window area. To tilt the wheel against the vehicle, loosen the bolts holding the head assembly (see Picture #40 and 41) and tilt the head toward the entrance of the wash. Tighten the bolts.
**Electrical Installation:**

There are different electrical requirements for the Dry N' Shine according to which system you purchased. Typically, a system will require a separate 3 phase circuit as well as two single phase (see below): One single phase circuit for the Dry N'Shine control box and one additional circuit for the horizontal Dry N'Shine sign mounted on the top wheel and any additional optional vertical Dry N'Shine signs.

**SINGLE WHEEL SYSTEM AT 208VAC-2PH NEED A CIRCUIT CAPABLE OF 20AMPS**
+ TWO SEPARATE 120VAC-1PH-15AMPS CIRCUITS (see Picture #43 below)

**SINGLE WHEEL SYSTEM AT 480VAC-3PH NEEDS A CIRCUIT CAPABLE OF 15AMPS**
+ TWO SEPARATE 120VAC-1PH-15AMPS CIRCUITS

**THREE WHEELS SYSTEM AT 208VAC-2PH NEED A CIRCUIT CAPABLE OF 40AMPS**
+ TWO SEPARATE 120VAC-1PH-15AMPS CIRCUITS

**SINGLE WHEEL SYSTEM AT 480VAC-3PH NEED A CIRCUIT CAPABLE OF 20AMPS**
+ TWO SEPARATE 120VAC-1PH-15AMPS CIRCUITS

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**YOUR SUPERSHINER DOES NOT REQUIRE ANY ELECTRICAL SUPPLY. IT IS ENTIRELY CONTROLLED BY THE CAR WASH CONTROLLER**

- Bring 3 phase power to the Dry N'Shine control box. Bring also **ONE 120VAC-1PH CIRCUIT** to the control box and **ONE 120VAC-1PH CIRCUIT** to the Dry N'Shine horizontal sign flasher unit (see picture #44). Connect according to the electrical drawings included in the box.

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**IMPORTANT NOTES:**

VERIFY THE VOLTAGE BEFORE CONNECTING.
THE SYSTEM VOLTAGE APPEARS ON THE BACK OF THE CONTROL BOX DOOR, ON THE ELECTRICAL DRAWINGS AND ON EACH VARIABLE FREQUENCY DRIVE (VFD)
CONNECTING YOUR DRY N'SHINE TO THE WRONG 3PH VOLTAGE SOURCE WILL CAUSE EQUIPMENT DAMAGE, PERSONAL INJURIES AND/OR FATALITIES!
DO NOT PUNCH HOLES ON TOP OF ENCLOSURE.
DOING SO WILL VOID YOUR WARRANTY

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10-21-13  www.motorcitywashworks.com
Pic #46: 480VAC SNGL WHL Control Panel
Pic #47: 208VAC THREE WHLS Control Panel
Pic #48: 480VAC THREE WHEELS Control Panel
Your Dry N’Shine also requires a few CONTROL SIGNALS from your car wash controller:

**ONE TOP WHEEL READY SIGNAL:** This signal will bring the top wheel down. The signal has to be programmed to bring the top wheel down soon enough in order to meet ahead of the vehicle. The signal can be any voltage between 24 to 240 VOLTS AC or DC.

**ONE SONAR READY SIGNAL:** This signal enables the sonar before the vehicle shows up in the Dry N’Shine. The SONAR READY SIGNAL has to be programmed to TURN ON WHEN THE FRONT OF THE VEHICLE SHOWS UP UNDER THE SONAR. The signal can be any voltage between 24 to 240 VOLTS AC or DC.

**ONE SIDE WHEEL READY SIGNAL (FOR THREE WHEELS SYSTEM ONLY!):** This signal will bring the side wheels in. The signal has to be programmed to bring the side wheels in soon enough in order to meet ahead of the vehicle. The signal can be any voltage between 24 to 240 VOLTS AC or DC.

**IMPORTANT NOTE:**

THE SONAR READY SIGNAL IS AN IMPORTANT COMPONENT OF YOUR DRY N’SHINE SYSTEM. THE SIGNAL HAS TO BE PERFECTLY TIMED FROM YOUR CAR WASH CONTROLLER. THE SIGNAL HAS TO BE ON ONLY WHEN THE FRONT OF THE VEHICLE REACHES THE PHYSICAL LOCATION UNDER THE SONAR AND THEN TURNED OFF WHEN THE REAR REACHES THE SAME LOCATION. MANY SAFETY FEATURES BUILT IN YOUR DRY N’SHINE SYSTEM DEPENDS ON THE SONAR READY SIGNAL AND ITS ACCURACY TO TURN ON WITH THE FRONT AND TURNED OFF AT THE REAR. NOT DOING SO MAY CAUSE EQUIPMENT DAMAGE AND/OR

**ONE E-STOP OK SIGNAL (FOR SAFETY PURPOSE):** This signal will enable the Dry N’Shine and its components to RUN IF ANY OF THE WASH E-STOP IS NOT PUSHED. The signal has to be always ON and then turns OFF if any of all the wash E-STOP button is pushed. The signal can be any voltage between 24 to 240 VOLTS AC or DC.

**VERY IMPORTANT SAFETY ISSUE:**

AN EMERGENCY STOP BUTTON IS PART OF A SYSTEM INTENDED FOR USE IN EMERGENCY CONDITIONS TO TRY TO LIMIT OR AVERT HARM TO SOMEONE OR SOMETHING BECAUSE OF THE AUTOMATIC NATURE OF THE DRY N’SHINE START AND STOP. THE E-STOP OK SIGNAL BECOMES A CRITICAL PART OF YOUR WORKERS AND/OR PUBLIC PROTECTIVE MEASURES. UNDERSTAND AND INTERCONNECT THE CAR WASH EMERGENCY STOP CIRCUIT WITH YOUR DRY N’SHINE CONTROLLER SHOULD BE RECOGNIZED HAS A PRIORITY FOR YOUR INSTALLER AND/OR ELECTRICAL CONTRACTOR.
Pull wires from your car wash controller to the Dry N’Shine control box: 6 WIRES for a Single Wheel system (top wheel only) and 8 WIRES for a three wheels system (top wheel and side wheels). These wires will be used for the different READY signals and the E-STOP OK signal.

**IMPORTANT NOTE:**
DO NOT PUNCH HOLES ON TOP OF ENCLOSURE.
DOING SO WILL VOID YOUR WARRANTY

Your Dry N’Shine also comes with equipment many already supplied with extended cables (see picture #49 below):

1- THE SONAR SENSOR W/50 FEET OF 4C/20 SHIELDED CABLE
2- THE TOP WHEEL CONTROL W/ 50 FEET OF 7C/18AWG CABLE
3- THE E-STOP/BEEPER ASSEMBLY W/50 FEET OF 5C/18AWG CABLE
4- FINALLY, THE SIGN W/10’ CABLE

Locate the E-Stop/Beeper assembly and install in proximity of the Dry N’Shine top wheel. The E-Stop/Beeper is used to stop the operation of the wash or the Dry N’Shine at any moment if needed in case of an emergency. The Beeper will be used to warn the operator or any person located in the vicinity before your Dry N’Shine start a scheduled drying or washing operation or before a manual operation. Pull the cable back to the control box and, using the appropriate cord connector (see Picture #48), pull into the enclosure.

Install the “CAUTION” sign (see picture #51) near the Dry N’Shine top wheel and its emergency stop button.
□ Install the SONAR under main beam (if not already done) like shown on picture #34. Pull the cable to the control box and using the Micro DC female connector mounted on the bottom of the control box, connect the sonar.

□ Pull the HOOD SENSOR EMITTER PHOTO-EYE thru the cross beam and mount onto the passen

□ Pull the TOP WHEEL CONTROL BOX cable to the control box using the appropriate cord connector (see Picture #48), pull into the enclosure. The control box mounted on your top wheel is used as a junction box for three air valves (TOP WHEEL DOWN, COUNTER BALANCE and THREE POSITIONS) as well as two indicator lights: SONAR READY and TRUCK DETECT light. The SONAR READY light will be used to synchronized the SONAR READY SIGNAL with the front of the vehicle being washed while the TRUCK DETECT light will confirm when an open bed have been detected.

□ Pull a new Low Voltage cable 2 Conductors 14 AWG from the sign to the flasher unit. Connect the flasher unit power cord into a 120VAC outlet. From the car wash controller, connect one OUTPUT FUNCTION to the flasher unit control input.

□ Pull a 4 CONDUCTOR #14 AWG cable (300 or 600 VOLT RESISTANT) from the top wheel motor to the control box and using one of the knock-out holes available. If your system includes a set of HIGH-BOYS SIDE WHEELS pull an additional 4 CONDUCTOR #14 AWG cable (300 or 600 VOLT RESISTANT) for each motor, one for DRIVER SIDE and one for PASSENGER SIDE.

□ Pull a pair of wire from the CAR WASH E-STOP STRING (chose the closest car wash e-stop junction box) to the Dry N’Sshine control box.

□ Connect all the wire in the control box according to the electrical diagram below: Single wheel system (picture #52) or three wheels system (picture #53).
Pic #52 Control Box Connection Layout for Single Wheel System
Pic #53 Control Box Connection Layout for Three Wheel System
Connect each motor cable to the **1.5 HP DRIVE MOTORS: TOP WHEEL AND SIDE WHEELS** (if applicable).

**NOTES:** EACH MOTOR ELECTRICAL CABLES ARE NOT CONNECTED TO THE MOTOR LEADS WHEN SHIPPED FROM THE FACTORY. OPEN THE MOTOR CONNECTION BOXES AND CONNECT TO THE MOTOR LEADS FOLLOWING THE APPROPRIATE CONNECTION DIAGRAM BELOW OR ON THE MOTOR PLATE (PICTURES #54) AND FOR PROPER VOLTAGE

- **Pic #54 Motor Connections**
- **Pic #55 Top Wheel Connection Box**

If you have purchase the **THREE WHEEL SYSTEM**, in order to access the electrical motors, loosen the top bolt located on the entrance side of the arm flange (see Picture #56 below) and remove the three other bolts secured through the flange (see Pictures# 57 and 58) and then **TILT THE HEAD ASSEMBLY DOWNWARD TOWARD THE ENTRANCE OF THE WASH** until the brush is laying flat on the floor. Remove the cover from the motor (see Picture #59) and connect the cable into the motor. Reinstall the cover and reposition the head assembly.

- **Pic #56: Loosen Head Bolt**
- **Pic #57: Remove Head bolt**
Pneumatic Installation:

- Your DRY N’SHINE TOP WHEEL requires a supply of compressed air capable of 3 SCFM @ 100 PSI.

**WARNING!**
IT IS IMPERATIVE TO SUPPLY THE TOP WHEEL PNEUMATIC SYSTEM WITH “CLEAN DRY COMPRESSED AIR”
ANY AMOUNT OF MOISTURE, VAPORIZED OIL OR ANY OTHER IMPURITIES WITHIN THE MAIN AIR SUPPLY MAY AFFECT THE PERFORMANCE OF THE EQUIPMENT AND LEAD TO PREMATURE WEAR OR MAJOR DAMAGE TO THE ACCELERATOR™ DELIVERY SYSTEM OR ITS COMPONENTS

- Bring a 3/8” OD polyflow tubing air line from the main compressed air supply to the AIR PANEL MAIN AIR SUPPLY FITTING (see Picture # 60).
If you have purchased the three wheel system, bring a 3/8” OD polyflow tubing air lines from the main compressed air supply to the **HIGH BOYS (SIDE WHEELS) AIR PANEL AIR SUPPLY** (see Picture #61).

- **Pull and connect ONE 3/8” RED AIRLINE TUBE** from the **EXTEND AIR VALVE** located on the air Panel to cylinder back end of the **P-S BRUSH**.

- **Pull and connect ONE 3/8” BLUE AIRLINE TUBE** from the **D-S EXTEND AIR REGULATOR** located on the air Panel to the cylinder back end of the **D-S BRUSH**.

- **Pull and connect ONE 3/8” BLACK AIRLINE TUBE** from the **4 WAY SOLENOID AIR VALVE** to the wash bay, **BETWEEN THE TWO BRUSHES** and tee off to each **BRUSH** rod end cylinders.
Water Feed Installation:

- Your DRY-N-SHINE TOP WHEEL requires ONE 3/4" HOSES from fresh water supply feeding the DILUTION STATION (see Picture #61) and then ONE 1/2" HOSES from the dilution station to the top wheel water manifold mounted on the beater bar.

- If you have purchased the three wheel system with a set of HIGH BOYS, pull ONE 1/2" HOSES to both Side Wheels by teeing the hose above the first wheel. Connect the hose to the second dilution station outlet IDENTIFIED HIGH BOYS (see Picture #61-B). Connect the other end to each water manifold mounted to the side wheels beater bar.
INTRODUCTION TO DRY N' SHINE 101:

Your DRY 'N SHINE™ is not the first FRICTION DRYING SYSTEM ever sold in the car wash industry, but we think it's the first to live up to the promise of consistently producing dry cars, one after the other, all day long, while using less horse power. Your DRY 'N SHINE™ was designed to overcome the two major obstacles of “old style” friction drying machines: The first obstacle for the old machines was dirt. Even though the drying machine was supposed to be wiping clean cars, the drying material quickly became contaminated with dirt over a few days time and eventually transferred the dirt back onto the vehicles. The old solution was to rotate two sets of material, requiring constant labor and attention.

Your DRY 'N SHINE™ beats the dirty drying material problem with a PROGRAMMABLE AUTOMATIC WASH AND RINSE CYCLE that cleans and rinses the drying material when the carwash is closed. This feature launders the drying material without any labor or constant attention. Simply set the self-cleaning wash cycle to run during closed hours and your DRY 'N SHINE™ machine will be ready to go when your carwash opens in the Morning! The second problem was over saturated drying material. Old style drying material used was an artificial leather “shammy”, or a very thick, fast absorbing synthetic material which quickly became saturated and rendered ineffective. Those materials do not dry out quickly enough to continue drying more than a few cars in a row.

Your DRY 'N SHINE™ handles the over saturation issue with a PROGRAMMABLE AUTOMATIC SPIN DRY CYCLE that dramatically accelerates evaporation in between cars. This feature has the ability to INCREASE THE RPM of the drying wheels when they are not in contact with a vehicle, using centrifugal force to push water to the outer diameter of the drying wheel. Then the drying wheels RPM are increased again, forcing the material to make contact with a BEATER BAR allowing the material to “extract” any accumulated water from the outer diameter of the drying wheels. The spin dry cycle allows the drying wheel to always remain in a state of absorption and therefore always effective.

Your DRY 'N SHINE™ offers great customer appeal and a load of added value. It’s able to effectively remove the last 20% of water droplets still remaining on vehicles directly following a 50 or 70HP forced air dryer at a continuous operating rate of 100 CARS PER HOUR without reaching the point of saturation. It’s the first mechanical drying machine that can consistently produce dry cars, one after the other, all day long, while quietly using less horse power and offering exciting revenue opportunities.

FUNDAMENTALS:

Your DRY 'N SHINE™ comes in two versions: A SINGLE WHEEL SYSTEM (TOP WHEEL ONLY) or a THREE WHEELS SYSTEM (TOP WHEEL AND HIGH BOYS SIDE WHEELS). Three INPUT SIGNALS from your car wash controller are required for a single top wheel system: One to start the top wheel to come down and spin (TOP WHEEL READY SIGNAL), one to turn ON the sonar sensor (SONAR READY SIGNAL) and finally one to enable the system to run or to stop (E-STOP OK SIGNAL) during an emergency stop condition in the wash. None of the signal has to be programmed with a “LOOK BACK” feature. The SONAR READY SIGNAL in particular, has to be programmed to accurately to be ON when the front of the vehicle reaches under the physical position of the sonar sensor: NO MORE, NO LESS! The signal has to also be turned OFF when the rear of the vehicle reaches the sonar position. A fourth signal is required for a THREE WHEELS SYSTEM: a signal to extend the side wheels and spin the brushes (SIDE WHEELS READY SIGNAL).

It is important to understand that the accuracy of the different ready signals synchronized with the vehicle receiving the service will greatly influence the level of quality and efficiency delivered by your DRY 'N SHINE™ system. For example, many safety features built-in your DRY 'N SHINE™ depend on the SONAR READY SIGNAL:

1. Starts the sensor which is looking for truck open bed which when detected will retract the top wheel avoiding it to go down in the bed.
2. Starts a COUNTERBALANCE air pressure that lightens the TOP WHEEL during the very front of the car and stops it beyond the wipers area.
3. Slows down the TOP WHEEL RPM during the very front of the car and stops it beyond the wipers area.
4. Turns ON the HIGH HOOD PHOTO-EYES which looks for an oversized vehicle hood, forcing the top wheel to raise about a foot before the vehicle reaches the brush, preventing possible damages to your equipment.

The DRY 'N SHINE™ HIGH BOYS SIDE WHEELS also comes with a slow down feature that is turned ON after the SIDE WHEEL READY SIGNAL is turn on. The slow down is typically programmed to reduce the brush RPM from the front fender of the car until beyond the antenna. The slow down allows for a safer “passage” of the brush thru the vehicle’s antenna. All the listed features are user selectable and can be PROGRAMMED thru the HMI (Human-Machine Interface) located on the front door of the control box.

Your DRY ‘N SHINE™ has an AUTOMATIC WASH and DRY CYCLE that can also be programmed using the HMI. The wash and dry cycles can be set to cycle at night allowing your DRY ‘N SHINE™ to be ready for the next day. It has a WASH CYCLE, a RINSE CYCLE and a DRY CYCLE. Most operators may program only the rinse cycle once a week or every two weeks and not used the wash cycle at all. Or use the wash and rinse cycle but only once a month. The DRY ‘N SHINE™ brushes may get dirty while picking-up whatever dirt or soil left on the vehicle after the wash. Finding the proper process for the laundering cycles may have to be determined further later after operating your DRY ‘N SHINE™ for a while and adjusting the programming according to the specificity of your wash. Commercial laundry detergent can be used for the wash cycle.

IMPORTANT NOTE:
USE ONLY NEUTRAL DETERGENT FOR WASH CYCLE
DO NOT USE ANY DEGREASER OR SOLVENT BASED PRODUCT
The DRY ‘N SHINE™ has also a programmable SPIN DRY CYCLE that can be programmed thru the HMI to run between cars, allowing the brushes to spin at a faster RPM for a period of time and then increase its RPM, forcing the brush material to hit the BEATER BAR extracting water of the brush.

**NAVIGATING YOUR HMI:**
The HMI or Human-Machine Interface allows the user to monitor your Dry N’Shine thru a graphic based visualization of different screens, messages and warning lights as well as changing default values related to the functioning of your equipment, customizing the behavioral aspect, enabling or disabling specific functions per user preferences. Your Dry N’Shine HMI comes already with default values already programmed sufficient for initial start-up: Your Dry N’Shine control is ready to go “out-of-the-box”!

**MAIN SCREEN:**

![HMI Main Screen](image)

This is the default screen that is shown at power-up. The screen displays the different other screen you may navigate to as well as status information. It also displays the selector buttons for TWO TOP WHEELS. Top wheel #1 is the regular top wheel in a SINGLE WHEEL SYSTEM or THREE WHEEL SYSTEM. The top wheel #2 buttons are used only with a FOUR WHEELS SYSTEM operating two top wheels.

- Allow the user to NAVIGATE to other screen: TOP WHEEL SETTING, SIDE WHEEL SETTING, SELECT DAYS TO WASH, DRYING SETTING, AUTO/MAN CONTROL, HMI SETTING, TOP WHEEL ALT and finally PLC CLOCK.
- Allow the user to ENABLE/DISABLE the top wheel
- Display your Dry N’Shine status: SYSTEM IDLE or SYSTEM STOPPED or DRYING MODE etc.
- Display time and date.
TOP WHEEL SETTING SCREEN:

This screen is used to set AFTER HOURS WASH CYCLES and DRYING CYCLES for the top brush material. Remember, your DRY 'N SHINE™ brushes will get dirty and will pick-up soil left on the vehicle after the wash process. The WASH and RINSE CYCLE will clean the brushes on a periodic base. The WASH and RINSE CYCLES are fully programmable and can be customized to accommodate users requirements. The WASH CYCLE consist of a succession of soap applications (SOAP TIME), agitations (BEATER BAR TIME) and rinse cycle (RINSE TIME) that are programmable in sequences and quantity.

The default setting (see Picture #66) allows for about 10 seconds of SOAP TIME where the brush will spin and for 10 second a solution of water and detergent (preferably commercial laundry detergent) from the dilution station will be sprayed on the brush. Ten seconds is typically long enough to “purge” the water line of fresh water from previous rinse cycle and apply a small amount of soapy water on the brushes. The SOAP TIME is then follow by a BEATER BAR WITH SOAP TIME spinning the brush faster, forcing it to make contact with the beater bar “agitating” and washing the brush material. This cycle can be repeated again. The default setup allows two complete wash cycles (# OF SOAP CYCLE).

IMPORTANT NOTE:
THE RINSE AND SOAP TIME SHOULD NEVER BE PROGRAMMED LONGER THAN 20-30 SECONDS. IT IS PREFERABLE TO REPEAT SHORTER CYCLES THAN GET THE WHEELS TOO WET.
Then, following the wash cycles, a 20 seconds cycle of **BEATER BAR WITH RINSE TIME** where the nozzle manifold is spraying water only (after the soap is purged from the line) while agitating on the beater bar for the final rinse cycles. Followed by **(PRE BEATER BAR SPIN TIME)** where the brushes spins for 30 seconds followed by a 10 seconds rinse (**RINSE TIME**). This process will be repeated 5 times (**NUMBER OF RINSE CYCLE**). Finally, the brush will go through a succession of 30 seconds beater bar cycles (**BEATER BAR ON TIME**) followed by a 30 seconds of spin cycle (**BEATER BAR OFF TIME**). This pattern will be repeated two times (**NUMBER OF BEATER BAR CYCLES**) and then followed by a final spin cycle (**SPIN TIME**) of 3000 second or 50 minutes. The final spin time allows the brush to dry completely after a wash and rinse process. You may have to increase this value during extremely humid or colder season.

The screen is also used to set the reaction time of the brush retract (**SONAR DETECT**) after an open bed is detected on a pick-up truck. The **ON DELAY** timer delays the retract after the bed have been detected, allowing the brush to “finish” the cab of the truck while the **OFF DELAY** timer keep the brush retracted after the sonar reaches the end of the truck box.

Finally, on the top right hand side of the screen the **HOOD SENSOR** button is used to set the duration of hood sensor **PHOTO-EYES** looking for **TRUCK OVERSIZED HOOD** across the top brush. The photo-eyes are set at 45” off the floor. When the photo-eye beam is broken during the first few seconds after the **SONAR READY SIGNAL** is ON, the three positions air valve is then turned ON allowing the three position cylinder mounted on the top wheel to extend by about 6” and raising the top wheel brush by about 12” permitting the brush an easier transition across the front of the vehicle to the hood.

**SIDE WHEELS SETTING SCREEN:**

![Side Wheels Wash Settings Screen](Pic #67 Side Wheels Wash Settings Screen)
The **SIDE WHEELS SETTING SCREEN** is used to set **AFTER HOURS WASH CYCLES** and **DRYING CYCLES** for the side brush material. This screen is operational **ONLY IF YOU HAVE A THREE WHEEL DRY N’SHINE SYSTEM**. Changing any value of this screen will not affect any aspect of your system if you are operating a **SINGLE TOP WHEEL** system.

The functions and data are similar to the **TOP WHEEL WASH AND DRY SETTING** but applies to the side wheels only. The programming is similar as the top wheel. Please refer to **TOP WHEEL SETTING SCREEN** directions for programming. The screen also come programmed with default values from the factory.

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**IMPORTANT NOTE:**

THE SIDE BRUSHES MAY GET CONTAMINATED WITH DIRT AND SOIL QUICKER THAN THE TOP BRUSH BECAUSE OF THE AREA COVERED: WHEELS, TIRES, WHEEL WELL, RUNNING BOARD, ECT. YOU MAY HAVE TO CLEAN THE SIDE BRUSHES SLIGHTLY MORE OFTEN THAN THE TOP BRUSH

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**DAYS TO WASH SETTING SCREEN:**

![Pic #68 Days To Wash Settings Screen]

The **DAYS TO WASH SETTING SCREEN** is your wash cycles calendar screen allowing you to chose the time of the day and which days of the week laundering the brushes is desirable as well as how many washes before “laundry day”. The time has to be entered has “military time” example: 22:00 is 10:00 PM by night. If no wash is desired, you may not select any day or increase the **WASH AFTER THE NUMBER OF CARS** value to its maximum.
The DRYING SETTING SCREEN is used to program the different parameters for the brushes SPIN DRY CYCLE for top and side wheels between cars, helping to dry by mechanically extracting the excess of water from the cloth material maintaining it in a state of absorption and therefore always effective.

The screen starts with SPIN PRE-BEATER BAR TIME which sets how long the brush will spin after it left the last vehicle before it start to “beat” the material against the beater bar. After the SPIN PRE-BEATER BAR TIME value elapsed, the RPM of the wheel increases for the pre-set time of the BEATER BAR ON TIME value. Then the brush RPM slows down and spin for another period of time pre-set of the BEATER BAR OFF TIME value. This cycle will be repeated 3 times as shown on NUMBER OF BEAT BAR CYCLE value. Finally, the brush will then spin for a longer period of time determined by the value in POST BEATER BAR SPIN TIME value then stop.

During the SPIN DRY CYCLE, the process will be interrupted each time a READY SIGNAL is sent again to the Dry N’Shine or if the emergency stops is pushed at any time.

**WARNING:**

The screen is also used to set the condition in which the SPIN DRY CYCLES will enable automatically by entering a value of how many vehicles to service before starting the SPIN DRY CYCLES. The condition of the wash and of the
air dryers in particular will have direct influences on how long your dry N'Shine performs during a normal day before **SPIN DRY CYCLES** are needed between cars. If the dryers don’t have any producers addressing the vehicle’s below the window area, your Dry N'Shine side wheels may become wet sooner than normal, lower the value of the **DURING THE DAY CPM** (car per minute). The next value **TIME USE TO CALCULATE CPM (MIN)** is the “block time” the total car value is calculated. Example: if the total reaches 20 cars **DURING THE DAY** calculated for a period (block) of time of 20 minutes, the **SPIN DRY CYCLES** will then start as soon as 20 cars per hour of throughput is reached based on a 20 period or 80 CPH of production.

To start the **SPIN DRY CYCLES** sooner, decrease the number of car **DURING THE DAY CPM** value. A value of 0 will disable the **SPIN DRY CYCLE**.

**WIPER/ANTENNA SETTING SCREEN:**

The **WIPER/ANTENNA SETTING SCREEN** is used to program the delay before operation and the total time of operation of the **COUNTER BALANCE AIR PRESSURE** for top wheel 1 and 2 (only 2 with a dual top wheel system) and the **SPEED SLOW DOWN** for the top and side wheels. The optional **SIDE WHEEL LOCKING VALVE** is currently not used.

The **SLOW SPEED ON** value for the **SIDE WHEELS** is the time the wheels take before its **RPM** slows down starting from the **SIDE WHEEL READY SIGNAL**. The **SLOW SPEED ON** value indicates how long (in seconds) the RPM will remain lower. You may want to set the **SLOW SPEED ON** value long enough to have the side wheels in slow speed until the brushes are beyond the antenna for an average vehicle. The **SLOW SPEED ON** value for the **TOP WHEEL** is the times the wheel takes before its **RPM** slows down starting from the **SONAR READY SIGNAL**. The **SLOW SPEED ON** value indicates how long (in seconds) the RPM will remain lower. You may want to set the **TOP WHEEL SLOW SPEED ON** value long enough to have the wheel in slow speed until it reaches beyond the windshield for an average vehicle.
The **COUNTERBALANCE VALVE** value is used to control the time the counterbalance air valve is turned ON on the top wheel, lightening the weight of the wheel allowing for a better transition from the front of the vehicle beyond the windshield.

**IMPORTANT NOTE:**

DO NOT KEEP THE TOP WHEEL COUNTERBALANCED TOO LONG BEYOND THE WINDSHIELD. DOING SO MAY PREVENT THE TOP WHEEL TO COME DOWN ON THE TRUCK OF A SEDAN STYLE VEHICLE, DIMINISHING THE PERFORMANCE OF YOUR DRY N’SHINE

**PLC CLOCK SETTING SCREEN:**

The **PLC CLOCK** setting screen is used to verify the time entered as well as modifying the time displayed on the **HMI MAIN SCREEN**. The time is military time. Save any change by pressing "**SET PLC CLOCK TO HMI CLOCK**" button like shown below.

![Pic #71 HMI Clock Settings Screen](image)
AUTO/MANUAL SCREEN:

This screen is used to force some of the Dry N’Shine functions. To turn ON any of the listed function, PUSH the AUTO/MANUAL button located on top right of the screen (see below). A beeper will now warn you of the imminent start of any of the function then push any of the function buttons.

Pic #72 Auto/Manual Screen

WARNING!
INSURE THAT ALL PERSONAL OR ANYONE ARE CLEAR FROM THE EQUIPMENT BEFORE FORCING ANY OUTPUT ON.

To JOG ON any of the brushes, toggle the ON button of the desired brush (TOP or SIDES) and then input a speed value in the SPD# window.

SPEED #1 IS SLOWDOWN SPEED
SPEED #2 IS DRYING VEHICLE SPEED
SPEED #3 IS SPIN DRY SPEED
AND SPEED $3 IS BEATER BAR SPEED

IMPORTANT NOTE:
SPEED #4 WILL NOT BE OBTAINED UNLESS THE “EXTEND” FUNCTION IS FORCED ON
Start Up Procedures:

- **Turn** ON the power to your DRY N'SHINE control box and confirm that all breakers are ON.

- **Using** the HMI map located at the end of this manual, navigate from the main menu to the different screen and confirm that all the parameters have been entered. Use the following “start-up” parameters screens to verify each screen.
Pic #77 Top and Side Wheels Spin/Dry Settings Screen

Pic #78 Top and Side Wheels Spin/Dry Settings Screen
From the main screen, navigate to the PLC CLOCK setting screen and verify the time entered. Change time setting if required. Save any changes by pressing “SET PLC CLOCK TO HMI CLOCK” button like shown below.

![Pic #79 HMI Clock Settings Screen](image)

Turn ON the AUTO/MANUAL button in order to test TOP WHEEL extend, water and soap valve using “AUTO/MANUAL CONTROL” screen (see picture below). The alarm will beep three times before manually turning ON any output.

![Pic #80 Auto/Manual Screen](image)

**WARNING!**

INSURE THAT ALL PERSONAL OR ANYONE ARE CLEAR FROM THE EQUIPMENT BEFORE FORCING ANY OUTPUT ON.
Force ON the TOP WHEEL motor using the “JOG ON” button. Test each of the four brush speeds.

Maximum Overall Dimensions of Vehicles

- 101” (WITH MIRRORS)
- 90”

Folds in any Oversized Mirrors
Retract Top Wheel for Vehicles with Oversized Spoilers
Retract Top Wheel for Vehicles with Roof Rack
Retract Top Wheel for Vehicles with Front End Taller Than 44” Off the Ground

Pic #81 Vehicle Restrictions
Test a car and confirm that the TOP WHEEL COUNTER BALANCE air valve and the SLOW DOWN turns ON at the front of the vehicle and turn OFF after the windshield area. Adjust the timing using the WIPER/ANTENNA SETTING screen:

1- DECREASING THE “ON TIME” VALUE TURNS THE COUNTER ON SOONER.
2- INCREASING THE “ON TIME” VALUE TURNS THE COUNTER BALANCE ON LATER.
3- DECREASING THE “OFF TIME” VALUE TURNS THE COUNTER BALANCE OFF SOONER.
4- INCREASING THE “OFF TIME” VALUE TURNS THE COUNTER BALANCE OFF LATER.

Test a car and check for light penetration of the TOP WHEEL from the front of the vehicle to beyond the wiper area.

**Brake-in Period:**

- Your Dry N’Shine cloth material has been dyed dark “CHARCOAL” color for aesthetic purpose only. However, the new material may leave a dye residue on the first few 1000 vehicles. Particularly light colored cars. In order to minimize the marking during break-in period, run the brush at speed #3 on manual mode for a few hours before opening your system to the public. Cycle the water ON for a few seconds, a few times while the wheels are spinning and beating against the beater bars in order to wet the cloth and help to rinse away the color from the new cloth.

- Test a car and check for dye residue on the car tested. Repeat the process if needed.
Maintenance:

DAILY:
- Check for water or air leaks, chaffed hoses electrical cable, etc.
- Visually inspect for any sign of wear.
- Move the arms manually and duplicate its regular motion and look for abnormalities: A loose fastener may allow some parts to move or rub and may create a dark “stain” running down the equipment.
- Start the day with a “TEST WASH” and check for proper operation.
- While you are watching the TEST WASH, check for clogged nozzles. If a nozzle is clogged, remove the nozzle body and clean the nozzle by inserting a small piece of wire (a small paper clip wire will be fine!) in the nozzle opening.
- Check also for proper coverage of the brushes
- Check for the overall performance of the equipment on the vehicle: Profiling, cleaning, etc..
- Wash down your equipment and the area around at the end of each day.

MONTHLY:

Each piece of MCWW equipment is assembled with the highest quality bearings and have been factory pre-lubricated, therefore, they do not require supplemental grease for the first month of operation.

Use any lithium-based NLGI #2 grease (ex: Exxon Mobil MOBILITH AW2).

WARNING!
OVERLUBRICATION IS A MAJOR CAUSE OF BEARING FAILURES!
LUBRICATE CONSERVATIVELY!

- After the first month of operation, grease each bearing (see Picture #30 and 31).
- Wash your equipment with a solution made of a mild degreaser and water. Rinse thoroughly.
- Perform daily maintenance.
Warranty and Return Procedure:

Motor City Wash Works warrants this product to be free of defect in material and/or workmanship for a period of one year from the date of purchase. During the warranty period MCWW will at its discretion, at no charge to the customer, repair or replace this product if found defective, with a new or refurbished unit, but not to include costs of removal or installation. Any product returned to MCWW for warranty has to have a Return Material Authorization Number. All shipping costs to MCWW are assumed by the customer. This is only a summary of the MCWW Limited Warranty. Please, communicate with MCWW for our complete warranty. Prior to returning any product to MCWW, the customer must call in for a Return Material Authorization Number and a copy of our Return Material Authorization Form must be completed. The RMA number must be written clearly on the outside of the shipping package and a copy of the form must be included in the package.