HEAVY DUTY THREE BRUSH COMBO ROLLOVER WASH SYSTEM

A. Manufacturer's Reference

Specifications and drawings are based on a Westmatic Heavy Duty 3 brush combination wrap-around rollover with overlapping side brushes manufactured by the Westmatic Corporation, (866-747-4567) or approved equal.

The system shall be produced by a manufacturer of established reputation with a minimum of five (**5**) years experience supplying the specific equipment specified here in.

The brush unit, pumping stations and all electrical controls shall be designed, assembled and supplied by one manufacturer.

Lists of rollover wash system installations made by the bidder shall be provided. This list shall include such rollover vehicle wash installations made by the bidder in the last five (**5**) years.

The manufacturer shall provide the name of the contact person at each location who is familiar with the operation and maintenance of the wash system.

Based on the information supplied and discussions with contact persons named, the owner will determine the acceptability of the proposed supplier and the equipment.

B. General Description

This heavy-duty model is a three-brush combination rollover wash capable of washing a high volume of various sizes and styles of vehicles.

The machine shall control the wash process to provide a consistent wash result without relying on the judgment of individual drivers.

This system is capable of washing the front and rear of the vehicles several times on a single pass and includes a special mirror protection program. The machine shall fully control the degree of brush pressure delivered to the vehicle and automatically adjust as required.

The wash functions of this system shall be operated automatically.

The system shall be delivered complete with all control systems, metering devices, drive motors, and brush assemblies.

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C. Vehicle Wash Operation

1. Vehicles entering the wash area will stop just before entering the gantry. The driver is signaled to **STOP** by a red light (Optional).
2. The driver selects the wash program on the free standing touch control panel and starts the machine. (w/ or w/o high pressure)
3. The brushes move into the front of the vehicle. The front area is cleaned by a side-to-side and **overlapping motion or the roof brush depending on selected wash program**.
4. Once the front cleaning function is complete, the brushes will withdraw and move automatically around the mirrors **"Mirror Protection Program**".
5. The machine is now washing the sides and the roof of the vehicle.
6. The side brushes shall then move into the back of the vehicle, cleaning with a side-to-side and **overlapping motion or the roof brush depending on selected wash program**. Alternate program choices are available to accommodate differing styles of vehicles within the fleet.
7. Once the rear has been cleaned, the machine starts to rinse the vehicle and then return to home position. The driver is signaled to **EXIT** the wash by a green light (Optional).

D. Features/Performance/Construction

Brush Machine Housing

All frame and steel components shall be *hot dipped galvanized*. The frame structure of the gantry is to be enclosed with painted galvanized sheet metal. Each side of the gantry shall have a cabinet door, gaining access to machine components and controls. All gearboxes and motors are to be encased inside the machine for the highest quality of protection against water. Floor rails shall be *hot dipped galvanized* and equipped with derailing protection system. The gantry shall be direct driven via VFD-motors. (Variable Frequency Drive) *Chain drive is unacceptable*.

All frame structures shall be hot dip galvanized. *Aluminum or Stainless Steel is unacceptable*.

Brushes

The system shall be equipped with 2 vertical side brushes and 1 horizontal roof brush. The side brushes 1 and 2 shall be suspended and full length, capable of washing the vehicle's front if desired, as well as, the rear of the vehicle multiple times with an overlapping movement. This set of brushes will also wash the vehicle's sides and shall be equipped with an **automated mirror avoidance program**. This function shall be capable of multiple programs to accommodate various styles of vehicle that exists in the fleet presently, and any future styles that may be procured during the lifetime of the wash system. *Pneumatics is not acceptable.*

Brush pressure is to be electrically driven, with the inclusion of an amperage meter for brushes 1, 2 and 3 which is to constantly monitor pressure on the vehicle's surface. The movements of the overlapping side brushes are electrically controlled with electrical motors and worm gear boxes via maintenance free belts. *Via gravity alone, pneumatics or hydraulics are not acceptable*. The movement of the roof brush is electrically controlled with electrical motors and worm gear boxes via maintenance free belts. *Chains are not acceptable*.

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Should pressure become too high due to malfunction or driver error, the system shall automatically shut down to prevent damage. The cause of the shut down shall be indicated on the touch control panel. Reactivation of the system shall be achieved by resetting the alarm/breaker switch.

Brush pressure is to be self monitoring and self adjusting to pre-programmed levels prior to the commencement of each wash.

Bristles shall be polyethylene material that is "X" grooved to facilitate water and detergent delivery. The tips shall be flagged to provide soft touch to prevent scratching to glass and paint. Each brush section shall consist of a pliable plastic backing which is mounted to a 4-3/4 inches hot dip galvanized steel shaft with a wall thickness of 0.16 inch. *Aluminum is not acceptable.* The design shall be such that all sections for the side brushes shall be **full density***. Sections of half density brushes are not acceptable*.

Brushes shall have a provision of water and detergent delivery. The mixture of detergent to brushes shall be adjustable from the floor level allowing for adaptation to wash conditions. Piping shall be galvanized with brass spray tips.

Brushes are to be driven by energy efficient and durable electrical motors 3,5 Hp, 60Hz (2,6 kW.)

Supply Cables and Cable Support

The festoon system shall consist of a C-profile with trolley wagons. All steel details shall be hot dipped galvanized including the brackets for fastening to the wall.

Final Rinse Arch

The final rinse spray arch shall consist of a 3/4 inch galvanized pipe equipped with no less than 16 brass spray tips, mounted on a galvanized frame. *Components such as plastic tips, or PVC pipe, are not acceptable.*

The system shall provide a complete rinse utilizing no more than 47 GPM @ 60 PSI.

Automatic Detergent Application System

Automated mixing of concentrated detergent solutions and water. The chemical metering system shall be capable to adjust mixtures in the ratio range of 1:1 to 100:1. All adjustment controls are to be at the floor level.

The metering system is to include a 10 gallon holding tank with by-pass circulation to prevent chemical separation.

Chemicals to the components of the wash are to be delivered by a 1/2 hp electrical stainless steel centrifugal pump. The pump chosen is to be equipped with a filter to ensure chemical purity.

The chemical arch shall deliver approximately 4 gallons per minute at 60 PSI, to provide efficient and economical vehicle coverage.

The pump and mixing tank are to be mounted on a hot dip galvanized stand.

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The spray pipes shall be manufactured of Stainless Steel. Spray tips shall be brass and equipped with quick disconnects and anti siphon valves.

Automatic High Pressure System

To be used as a "Touchless" high-pressure in combination with or without brushes.

Hot dipped galvanized, ASTM high-pressure pipes.

The high pressure arch is to utilize water delivered by a 30 Hp pump that is rated for max 350 PSI at 119 GPM including pneumatic stainless steel valves to prevent pump working against closed valve. The pump shall have stainless steel impeller and pump housing.

Approximately *420 Gallons* (1600 litres) storage capacity shall be included for water. Automatic low level pump shut off switch, automatic high level and filling switch. The tank contains a solenoid valve to activate fresh water filling in event of failure or other malfunction of the water recycling system (Optional). The buffer tank can be elevated from the floor, and supported by a hot dip galvanized frame.

Spinner nozzles are unacceptable.

Tire Guide Rails

The tire guide rails shall be flared at the entrance to facilitate entrance into the wash. The guide rails shall be constructed of 4-inch tubular steel pipe. Rail height is not to exceed 6 inches. All sections shall be smoothly finished to avoid damage to tires. Rails are to be anchored to the floor with 1/2 inch galvanized or non-corrosive concrete lag bolts. (10 feet on each side)

All components of the tire guide rails shall be hot dip galvanized steel.

Controls

The system shall be equipped with self-diagnosing software that indicates any errors, malfunctions, or other stoppages via display on an LCD screen. The nature of the shut down shall be displayed on the XBT-control panel (LCD screen). The terminal has three different color backgrounds depending on the status of the machine. Green for OPERATIONAL MODE, Orange for EMERGENCY STOP and Red for ALARM. The XBT terminal in the machines electric main control box adjusts the load sensitive using power relays. The main control box with the control panel shall be mounted on the left hand side of the gantry.

The system is to include a counter that reveals the number of washes performed, both collectively and in various programs chosen. The system is to contain the capability to perform numerous unique wash programs for differing wash choices. Alternate wash selections can be activated by the driver on a control panel prior to commencing the wash. The M340 PLC-steering shall control and monitor the entire cleaning process.

All electrical components and cabinet shall be UL-listed.

There shall be a total of 4 emergency stop buttons, located on each corner of the machine.

The XBT terminal shall include the following standard functions:

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Wash Program# 1: Conventional School Bus

Wash Program # 2: Transit Bus (Flat nose Bus)

Wash Program # 3: Truck

Wash Program # 4: Minivan

Wash Program # 5: Car

Side Brushes On/Off

Roof Brush On/Off

Detergent Arch On/Off

High Pressure Arch On/Off

Chassis Wash On/Off (Optional)

Manual High Pressure Guns On/Off (Optional)

Manual Shampoo Guns On/Off (Optional)

Manual Degreaser Guns On/Off (Optional)

Start Wash Machine “Enter”

Reset Wash Machine

Roof Brush Up

Side Brushes Apart

Manual Operation (Service Menu)

Drive-through Mode (Optional)

Master Menu

Emergency Stop

Emergency Stop Reset

The manual system shall be capable of over riding the automated programmed selection.

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Warranty

The Westmatic equipment warranty will cover 1 (one) year commencing upon the date of substantial completion. This warranty will cover the repair or replacement of equipment or material that causes any operational disturbances due to design fault, defectiveness in manufacture, or erection, occurring within the stated 1 year period.

Drawings/ Owner Manuals and Training

The supplier shall provide standardized drawings of the system including electrical and plumbing drawings from client supplied connections in the wash bay. If additional drawings are requested the client shall be responsible to complete them. The supplier will provide up to 3 owner's manuals and on site training of up to 8 hours.

.Utility Requirements

- Water: 11/2"-2" cold water (60PSI) feed with *backflow protection* to mutually agreed service areas such as the pump room and wash bay.

- Electrical: 460/480 VAC, 3 phase, 20 A.

- Electrical: 110/115 VAC, 1 phase, 5 A for maneuver supply.

- Electrical: 110/115 VAC, 1 phase, 5 A for Free Standing Touch Control Panel

- Electrical: 460/480 VAC, 3 phase, 60 A for high-pressure pump.

- Electrical: 460/480 VAC, 3 phase, 5 A for detergent pump.

· Phone line: Dedicated phone line for modem in the main control box (Recommended option)

GROUND TANKS INCLUDING OIL WATER SEPARATOR WITH PIPING AND CONDUIT TO EQUIPMENT/PUMP ROOM FOR WATER RECYCLING SYSTEM.

CENTER PIT WITH GRATING FOR WATER RECOVERY AND PARTICULATE CONTROL.

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OPTIONS

Traffic Light

The driver will be directed throughout the wash process with a LED-traffic light (Red/Green).

Lights will interact and be a function of the control system. Traffic lights will be contained in a watertight, stainless steel enclosure

Modem for off-site technical support

The main control panel is to include an optional modem that using the customer supplied dedicated analog phone line that will allow for functions such as off site adjustment to wash programs when desired. (E.g. switching from summer to winter program, or to accommodate reprogramming for a new style of buses purchased). Front and rear wash process can be programmed for multiple passes of the brushes. The modem will also permit off-site technical support, and diagnosis.

WCS-400 Chassis Wash with Side Spray

The undercarriage wash with side spray shall be commenced and stopped by infra red photocells.

Piping shall be manufactured in ASTM high pressure steel. There shall be no less than 12 Stainless Steel spray tips. Nozzles have displaced locations for optimal spraying effect. The chassis washing equipment is delivered with a protective cover made from a galvanized steel panel. All steel components shall be hot dip galvanized. *Spinner nozzles are unacceptable.*

The system shall allow the operator to use a manual override in circumstances where the under carriage wash is not desired, or if only the under carriage function is desired.

The undercarriage wash is to utilize water delivered by a 20 Hp pump that is rated for max 300 PSI at 80 GPM including pneumatic stainless steel valves to prevent pump working against closed valve. The pump shall have stainless steel impeller and pump housing.

Approximately *420 Gallons* (1600 litres) storage capacity shall be included for water. Automatic low level pump shut off switch, automatic high level and filling switch. The tank contains a solenoid valve to activate fresh water filling in event of failure or other malfunction of the water recycling system (Future Option). The buffer tank can be elevated from the floor, and supported by a hot dip galvanized frame.

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Automatic High Pressure System Alt #2 (1000PSI@74GPM)

To be used as a "TouchLess" high-pressure in combination with or without brushes.

Hot dipped galvanized, ASTM high-pressure pipes.

The high pressure arch is to utilize water delivered by 2x CAT3535 pumps (50Hp) that is rated for max 1000 PSI at 74 GPM including pneumatic stainless steel valves to prevent pump working against closed valve.

- Pumps are delivered mounted on *hot dipped galvanized* pump beds with belt protection.
- Vibration dampers are attached to the floor.
- Two 18,5 kW (25 Hp) electric motors with direct starting. (Total: 50Hp)
- Reduction valve with pressure gauge and connection hoses included.

Approximately *420 Gallons* (1600 litres) storage capacity shall be included for water. Automatic low level pump shut off switch, automatic high level and filling switch. The tank contains a solenoid valve to activate fresh water filling in event of failure or other malfunction of the water recycling system (Future Option). The buffer tank can be elevated from the floor, and supported by a hot dip galvanized floor stand. Exteriors are reinforced with galvanized metal strapping sufficient of sufficient strength to maintain long term integrity of the tank.

Stainless steel nozzles. Spinner nozzles are unacceptable.

WBV-440 Valve Battery (Together with Chassis Wash)

For selecting between undercarriage wash with side spray and high pressure arch.

Made in hot dipped galvanized steel.

Pneumatic valves in stainless steel.

The valve battery shall be constructed so that the pump never can work against closed valve.

Water Recycling System with Ozone Generator

The water recycling through the use of Stainless Steel hydro cyclones shall purify water to a particle size of 10 microns. All reject water shall be discharged into the system.

The hydro cyclone unit with reject basket shall be mounted on a hot dipped galvanized stand.

The system shall include a stainless steel reject accumulator.

The hydro cyclones shall be fed by a multistage centrifugal pump with a minimum pump capacity of 80 gallons per minute. A secondary pump will be a submersible pump minimum pump capacity of 80 gallons per minute. Both pumps shall be engineered for industrial effluent use.

Operation shall be controlled automatically via level regulation.

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The system is to include a water reservoir system with a 400 gallon or greater holding tank for supply of wash water.

The water reservoir system shall elevated from the floor, and supported by a hot dip galvanized floor stand.

The tank is to have an automatic refilling feature via magnetic valve and level regulation. A float system and solenoid valve is to be included to refill with fresh water in event of malfunction preventing the pumps from running dry.

Cycling time and operation is to be fully automatic and programmable to meet the transit agencies needs in consideration of wash frequency and seasonal adjustments.

The water recycling system is to include an ozone generator to eliminate bacterial/organic growth and adjustment of Ph. The need for chemical additives will not be accepted.

The ozone generator shall be programmed to operate in conjunction with the hydro cyclone unit, and shall operate automatically on a 24 hour basis.

Ozone capacity: 1 to 5 grams per hour. The system is to be expandable to meet future needs

Please Note: For more options please contact the manufacturer.