Sterling Rail, Inc.™

Reconditioned

Proceco Traction Motor Washer

Model HD 72x72-G-10,000-3-SC

Price: $125,000

1. Scope – Washer

To prewash, wash and rinse locomotive traction motors, with three (3) separate solutions in the same machine.

The work cycle is automatic.

This machine uses a cleaning solution consisting of hot water with a mild alkaline solution . This mild caustic solution does not attack the varnish coating of the windings. Carbon dust and road soil are removed very well by the scrubbing action of the solution spray. Any greasy deposits including lubricant on the pinion are dissolved by the hot detergent solution.

A typical cleaning cycle would be 15 minutes pre-wash, 15 minutes wash and 15 minutes rinse. That means that one load requires approximately 45 minutes in the machine.

If 15 minutes are allowed for loading and unloading of machine, one load can be handled per hour.

1.1 Loads – Washer

The machine will accept the following work pieces per load:

One (1) only	completely assembled traction motor – placed with axis horizontal – to be prewashed by outer nozzle pipe.
One (1) only	traction motor stator frame – placed with axis vertically – to be washed on outside, top and bottom by outer nozzle pipe.
	OR
Six (6)	traction motor armatures – placed on periphery of turntable with axis vertically - to be washed on all sides by outer nozzle pipe.

The machine will also clean the other traction motor and main generator components such as pinion, end covers, bearing housings, bearings, brush holders, etc. These parts to be placed on special parts rack. It also will clean any other parts not larger than 72" in diameter by 72" high and not heavier than 10,000 pounds.

A typical production for an eight (8) hour shift would be four (4) traction motors processed as follows:

- Two (2) hours to pre-wash four (4) completely assembled traction motors.
- Four (4) hours to wash four (4) stator frames
- One (1) hour to wash four (4) rotors
- One (1) hour to wash remaining motor parts.
- Eight (8) hours total.

Note: These machines can also handle main generator stators and armatures.

2. Design and Construction

2.1 Spray Cabinet and Tank

The tank and the spray cabinet form one integral assembly, fabricated of ¼" hot rolled mild steel plate. Heavy plate construction guarantees structural integrity under load, long life without distortion, misalignment and wear. Large mass of machine housing offers quiet operation

Large solution tank volume reduces likelihood of foaming since agitation caused by pumping action is reduced, and contamination is allowed to settle. Frequency of tank clean out is also reduced, in direct proportion to tank volume.

Insulation

Vertical walls of the solution tank and vertical walls of the spray cabinet as well as the door and the roof are covered with 1" rigid foam insulation (R value 7.2) which is protected from mechanical abuse by an outer shell of 16 gauge cold rolled mild steel sheet. Insulation reduces heat loss during washing and stand-by.

Also, solution tank has tight fitting covers so that airspace under covers provides additional insulation against heat losses.

2.2 Door and Turntable Assembly

Door and turntable assembly is pivoted on bearings and hydraulically actuated, complete with power pack and controls.

The turntable is of welded construction and rotates on cylindrical and taper roller bearings well protected from spray solution. Rated to support a full load placed at half its radius, a safety factor of 4:1 is used in sizing the steel support structure.

The turntable rotates by means of a positive friction drive, which consists of a chrome-plated roller chain running around the periphery of the turntable driven by a gear motor mounted on the door-turntable assembly. The tension of this roller chain is adjustable to permit slippage of the chain on the turntable rim in case a falling work piece obstructs the free rotation of the table. This drive system assures positive rotation of the turntable at full load and at eccentric load. A turntable jog push button is provided to permit jogging of the turntable when the door is in its open position, to facilitate loading and unloading of work pieces.

Door has safety door latch, locking it positively in closed position. Latch is non self-locking preventing operators from locking themselves inside the cabinet accidentally. The door is also equipped with a quick-release, locking latch, which firmly stabilizes door in open position during loading.

The door seal is an all steel labyrinth type design and effectively contains spray and steam inside the spray cabinet. This door seal is absolutely maintenance free and not subject to any deterioration.

2.3 Solution Handling and Maintenance

Circulation Pump

The circulation pump is a PROCECO vertical process pump with submerged wet end and no shaft contact seal, thereby eliminating potential seal maintenance problems. This pump uses a choke-ring arrangement for sealing which makes it ideally suited for this application as it is capable of handling hot caustic cleaning solutions heavily contaminated by abrasive dirt. There is no stuffing box or mechanical seal, and therefore, there is no possibility of cleaning solution leaking onto the floor. The pump can be removed from the machine without draining the solution, as discharge piping is above the solution tank cover.

Spray Nozzles

Spray nozzles are hydrodynamically designed and arranged on a nozzle pipe to spray from the top vertically downwards, from underneath the turntable vertically upwards through the turntable spokes, and horizontally from the periphery of the turntable towards the center. All spray nozzles are stainless steel vee-jet-nozzles mounted in two 90° elbows each and thereby permit universal adjustment of spray angles. The spray nozzles have a large orifice and supply a fan shaped high velocity, high impact cleaning jet.

Screening of Cleaning Solution

The cleaning solution is recirculated continuously and screened by means of stainless steel wire mesh screens. The openings in the screen are smaller than the orifices of the spray nozzles and therefore eliminate any danger of spray nozzle clogging. The screens are located in the pump bays of the machine and are easily accessible for cleaning by simply removing the cover plate.

Recirculating Second Stage

Consists of partitioned tank with its own heating and pump, parallel spray system, cycle timer, all electric controls and power diverter into 2nd stage tank.

Recirculating Third Stage

Consists of partitioned tank with its own heating and pump, parallel spray system, cycle timer, all electric controls and power diverter into 3rd stage tank.

Automatic Solution Level Control

Uses large 5.5" diameter stainless steel float, float switch and solenoid valve to make up wash solution from city water supply.

Fresh city water for make-up is admitted to third stage only. Second stage make-up water comes from the third stage tank and first stage make-up water comes from the second stage tank. This procedure keeps rinse water cleaner and minimizes water consumption.

Low level cutout safety switch is also installed.

Draining of Cleaning Solution

The bottom of the tank is slanted and at the lowest point of the tank bottom a drain valve is provided to drain the cleaning solution. Standpipe overflow is included. This design allows complete draining of tanks.

2.4 Solution Heating

Gas Fired Auxilliary Boiler transferring heat through tank coils

2.5 Cabinet Exhaust

Exhaust Blower

Consists of suction duct with spray baffle, heavy gauge fabricated radial blower complete with 3-phase motor, v-belt drive, motor controls and cycle timer.

The exhaust may be ducted outside if steam indoors is not desired. A selector switch is provided to permit exhausting during the wash cycle as well as after the wash cycle is finished.

2.7 Finish

All exterior surfaces are finished with two-component epoxy paint, Proceco green. This paint is used for optimal chemical and abrasion resistance.

3. Controls

Solution Controls

- Drain valve and standpipe overflow in each solution tank
- Automatic level control in each solution tank
- Hydraulic flow diverter to return solution to appropriate tank.

Heating Controls – one (1) set per solution tank

- Indicating temperature controller per heating system
- Steam solenoid valve
- Isolating valves
- By-pass valves
- Y-strainer

Electrical Controls

- All controls requiring operator adjustments are mounted on control panel door. All other controls inside dust-tight control cabinet (NEMA 12)
- Main disconnect switch with circuit breaker interlocked with cabinet door.
- Control transformer
- Magnetic starters with circuit breakers for all motors
- SYSTEM START illuminated button
- EMERGENCY STOP button
- All necessary pushbuttons and pilot lights for manual and automatic control.

"Cycle Finished" Signals

- Horn and red light signal when cleaning cycle is completed.

Electrical Standards

- All wiring and terminal blocks are numbered to correspond with numbers on wiring diagram.
- All controls are identified by engraved nameplates corresponding to wiring diagram.
- All electrical components are CSA and/or UL approved and installed in accordance with CSA / NEC standards. Motors are built to NEMA Design B standards. Motor controls are Allen Bradley IEC standard size.

4. Data

Work

- Turntable Diameter ..... 72"
- Maximum Work Height ..... 72"
- Maximum Turntable Capacity ..... 10,000 lbs.

Tank Capacity

- 1st Stage Tank Capacity, approximately .....750 Gallons
- 2nd Stage Tank Capacity, approximately .....750 Gallons
- 3rd Stage Tank Capacity, approximately .....750 Gallons

Pump Capacity

- 1st Stage Pump Capacity ..... 450 GPM @ 70 Psi
- 1st Stage Pump Motor ..... 30 HP / TEFC
- 2nd Stage Pump Capacity ..... 450 GPM @ 70 PSI
- 2nd Stage Pump Motor ..... 30 HP / TEFC
- 3rd Stage Pump Capacity ..... 450 GPM @ 70 PSI
- 3rd Stage Pump Motor ..... 30 HP / TEFC

Turntable Drive Motor ..... 1.5 HP / TEFC

Note: Specifications are subject to change with design improvements

4. **Data (Continued)**

Exhaust / Demister

- Exhaust Blower Capacity .....1500 CFM @ 1" W.C.
- Exhaust Blower Motor.....1.5 HP / TEFC

Solution Heating

- Heat Consumption – Washing.....1000 lbs./ Hour
- Steam Pressure..... 80 – 120 PSI
- Source - gas fired auxiliary boiler .....1,000,000 BTU/hour
  - ✓ Optional Solution Heating Burner and Burner Immersion Tube, Extra Cost.....Add 1,500,000 BTU

Total Power Requirement.....35 kW
460 V / 3 Phase / 60 Hz

Dimensions

- Width, approximately..... 13'6"
- Length, approximately..... 25'
- Height..... 20'

Weights

- Weight of Machine, approximately ..... 38,000 lbs.
- Weight of Work Load, Maximum ..... 10,000 lbs.
- Weight of Solutions, approximately..... 25,000 lbs.
- Total Weight on Foundation, approximately..... 78,000 lbs.
- Shipping Weight, approximately..... 45,000 lbs.

Note:

- **Specifications are subject to change with design improvements.**
- **All liquid measures in U.S. Gallons**
- **Dimensions and weight of machine are subject to change according to options selected.**

5. Safety Features

Door Pump Interlock

Pump will operate only when a safety limit switch confirms that the door is closed.

Low Level Cut-out

Safety switch shuts off electric or gas heating if solution level drops below a predetermined limit.

Control Panel Interlock

Mechanical interlock on control panel door.

Safety Guards

All moving parts are protected by suitable guards.

Safety Labels

Warning labels alert operators:

- DISCONNECT POWER BEFORE OPENING CONTROL CABINET
- DO NOT OPEN WHILE PUMPIS RUNNING
- DO NOT ENTER SPRAY CABINET
- HAND HAZARD IF GUARD REMOVED
- HOT ALKALI CLEANING SOLUTION
- MACHINE PIPES HOT
- HIGH VOLTAGE

6. Operation

Operating Procedure

1. Operator loads work pieces onto turntable with crane.
2. Pushes button "DOOR CLOSE."
3. Selects cycle times for PREWASH-WASH-RINSE-EXHAUST.
4. Pushes button "CYCLE START."
5. Machine will automatically sequence through PREWASH-WASH-RINSE-EXHAUST.
6. Pushes button "CYCLE START."

Turntable

Turntable drive is automatically switched with pumps. However, pushbutton is provided for TURNTABLE JOG for convenient positioning of turntable for loading and unloading.

Exhaust

Exhaust blower is switched on automatically after rinse cycle. Adjustable timer provided to set time required to evacuate vapors from cabinet before door opens.

Selector switch to allow exhaust blower also to be on when machine is running.

Economy in Operating Costs

Recommended procedure for changing solutions to conserve chemical, heat and water:

1. Dump prewash solution only.
2. Transfer solution from wash tank into prewash tank. This is done by switching return spout into prewash tank and pumping with wash pump.
3. Transfer rinse water into wash tank. This is done by switching return spout into wash tank and pumping with rinse pump.
4. Fill up rinse tank with fresh water. Fresh water is piped to rinse tank only. To fill wash and prewash tank, solution is transferred out of rinse tank.
5. Adjust chemical concentration by adding chemical into cabinet of machine and circulating respective solution.

An additional purpose of this procedure is to keep wash and rinse solutions as clean as possible and concentrate contaminating material in the prewash tank.

Automatic Solution Make-up

Each tank is equipped with an automatic water make-up system to maintain solution level by adding fresh water.

7. Conditions of Sale

1. By Gulf Systems

- Supply of equipment as described.
- Machine will be completely assembled and cold tested at plant. Customer is invited to be present.
- Complete instruction manuals to be supplied with the machine, including installation and operation instructions, electric and fluid schematics, parts list, maintenance schedules, trouble-shooting instructions and as built general layout drawing.

2. By Customer

- Installation of equipment at destination.
  - 1 only Power connection.
  - 1 only Steam connection.
  - 2 only Condensate connections.
  - 1 only Fresh water connection.
  - 1 only Drain connection.
  - Reassembly of components dismantled for shipment.
  - Reconnection of electrical lines broken for shipment.

Price

Model HD 72x72-G-10,000-3-SC, with Center Nozzle Pipe (CNP)..... **$125,000.00**
Optional Burner Immersion tube and Maxon Burner ..... Add $24,700.00

Conditions of Sale

Delivery .....**14 - 16**Weeks
From Date of Receipt of Purchase Order and Down Payment
Also depending upon backlog at time of order
Payment Terms.....**50%** Due with Order
40% Due before shipment after successful run-off
10% due Net 30 Days
F.O. B.....Gnaddenhutten, OH Plant
Freight ..... Customer Responsibility
Validity of this Quote .....30 Days