CORROSION REDUCTION POLICY FOR SUTPHEN AERIAL APPARATUS

The Sutphen Corporation has in place a formal corrosion reduction program and detailed assembly procedures, designed solely to reduce and eliminate the possibility of corrosion. Formal program guidance follows the processes as set forth in ASTMB117.

STEEL PARTS PAINT PROCESS

- Components that are carbon steel, such as: frame rails, frame cross members , pump module sub-frame, rear body sub-frame , fuel beam, motor mounts, aerial base, torsion bars, jack tubes, turn table, and all steel weldment and bracketry mounted on aerial booms, shall be coated with a high performance, two component, reinforced inorganic zinc rich primer with a proven cathodic protection makeup preferably Cathacoat 302HB.

- The surface shall be bead blasted, clean, and free of all salts, chalk and oils prior to application. Where the primer has been broken during the frame assembly process the area shall be touched up with the same material to reestablish the seal. Prior to finish paint a second primer, Devran 201 shall be applied. Once the assembly of the frame is complete and the second primer is applied, the entire assembly shall be covered with a high quality top coat paint; Imron elite.

ELECTRO PLATING

- Steel brackets such as the main aerial hinge pin and sheave caps shall be Zinc or cadmium plated to protect against corrosion. Plating shall be in accordance with ASTM B663.

FASTENERS

- In any area that a stainless steel screw or bolt head is to come in contact with aluminum or steel, painted or non-painted, the fastener shall have the underside of the head pre-coated with nylon. The nylon coating shall act as a barrier between the fastener head and the metal or painted surface.

- When bolting together stainless steel the pan-head bolts with nylon coating under the head, a stainless washer with a rubber backing, and a Stover flange nut to secure the bolt, shall be utilized.

- When mounting aluminum components such as a step to the apparatus body, stainless steel washers with rubber backing shall be used. All mounted components shall utilize barrier material between the two surfaces. Where steel structural fasteners are used, they are to be Grade 8 for the proper shear strength with yellow zinc coating to fight off corrosion. The use of Grade 5 bolts even though they are cadmium plated, is not acceptable.

- All mechanical Huck type fasteners shall be of the same material being secured.

- Whenever possible all component mounting holes shall be pre-drilled and taped prior to the paint process to further reduce the corrosion opportunity. If a hole must be drilled into a previously painted surface, then the barrier must re-established. A flange-type nutsert with a gasket under the flange, will be utilized in this case.

- When the situation allows, the number of stainless trim screws used , shall be kept to a minimum. Structural tape and/or adhesive shall be used where possible for mounting trim to the body or cab.

- Dynatex Boltlocker or Threadlocker shall be used on the threads of the screw, bolts or nutserts, If a pre-treated screw or bolt is not available. This will seal threads from moisture and prevent the fasteners from loosening.

- All lubricant and cut shavings shall be removed, before applying any thread lock or sealent material.

BARRIER TAPE

- Barrier tape shall be used on the backsides of all lights, fittings, and trim pieces, or other components when bolting them to the apparatus. Barrier tape shall also be used when attaching stainless steel over an aluminum or painted surfaces, or when attaching aluminum tread plate to the stainless steel.

  All instances of dis-similar metals contacting each other require the addition of barrier tape between the metals where contact is made.

- All metal surface shall be free from oil or dirt by cleaning the surface with a 50/50 mix of alcohol and water, prior to applying the tape.

GASKETS

- All gaskets shall be attached with acrylic adhesive and shall be manufactured from closed cell foam.

ROLLUP DOORS

- Barrier tape shall be used on the frame opening, top and sides to act as a barrier between the aluminum door rail and the painted door opening surface.

- The standard policy shall be followed in regards to the threaded fasteners securing the door components.

HINGED DOORS

- Barrier tape shall be applied to the painted surface of the body and on the painted hinge side of the door.

- It shall be ensured that the hinge fits into the extrusion frame properly, with no weld beads interfering with the door fit. Not under any circumstances shall the hinge touch the body directly Truss head bolt with the nylon coating under the head shall be used to secure the hinge.

ELECTRICAL GROUNDING

- Grounding straps shall be installed consisting of a minimum 2-gauge strap bolted to the chassis frame.
- From the cab to the right side frame rail
- From the alternator to the right side frame rail
- From the pump module frame to the right side truck frame
- From the hydraulic and pump module framework
- From the pump mount to the truck frame rail
- From the body module to the right side truck frame

- Proper grounding will help eliminate many electrical issues, and will reduce the possibility for electrolysis and galvanic corrosion to occur, as a result of impressed current be presented to the chassis, and body. All electrical connection points shall be sprayed with electrical sealer.

- When installing foam system pump wiring the power shall be routed from a dedicated breaker to a power solenoid, and then to the power terminal provided by the foam system OEM . Particular attention shall be paid to the grounding detail for wire size and good grounding practices.

SALT SPRAY TESTING

- Salt Spray Testing shall be used to confirm the relative resistance to corrosion of coated and uncoated metallic specimens, when exposed to a salt spray climate at an elevated temperature. Test specimens shall be placed in an enclosed chamber and exposed to a continuous indirect spray of neutral (pH 6.5 to 7.2) salt water solution, which falls-out on to the specimens at a rate of 1.0 to 2.0 ml/80cm²/hour, in a chamber temperature of +35C. This climate shall be maintained under constant steady state conditions.

METHOD

- Salt fog testing shall be performed by placing samples in a test cabinet that has been designed in accordance with Paragraph 4 (Apparatus) of ASTM B117 and operated in accordance with Paragraph 10 (Conditions) of ATSM B117.

- A 5% salt solution, prepared by dissolving sodium chloride into water that meets the requirements of ASTM D1193 Specification for Reagent Water, Type IV is supplied to the chamber. At the time the samples are placed in to test, the cabinet should be pre-conditioned to the operating temperature of 35°C and fogging a 5% salt solution at the specified rate. The fog collection rate is determined by placing a minimum of two 80 sq. cm. funnels inserted into measuring cylinders graduated in ml. inside the chamber. One collection device shall be located nearest the nozzle and one in the farthest corner.

ORIENTATION

- Unless otherwise agreed upon, the samples are placed at a 15-30 degree angle from vertical or tested in the "installed" position. This orientation allows the condensation to run down the specimens and minimizes condensation pooling. Overcrowding of samples within the cabinet should be avoided. An important aspect of the test is the utilization of a free-falling mist, which uniformly settles on the test samples. Samples should be placed in the chamber so that condensation does not drip from one to another.

TEST DURATIONS

- Test durations shall be 500 hours except for sample rotation and daily monitoring of collection rates, the cabinet should remain closed for the duration of the test.