

# **DURHAMVILLE FIRE DISTRICT**

## **FIRE APPARATUS SPECIFICATIONS**

### **INDEPENDENT FIRE PUMP MOUNTING**

The fire pump shall be mounted within a separate body module that is not directly connected to the apparatus body. This module shall be mounted to the frame in four locations and in such a manner as to reduce the likelihood of a collision causing the pump casing to crack

The point where the pump module is mounted to the frame shall be reinforced appropriately to carry the expected load for the life of the apparatus.

Plumbing as well as the pump shall be integral with the pump module as much as possible to facilitate the changing of the chassis should the apparatus be involved in a collision.

### **MIDSHIP MOUNT FIRE PUMP**

The pump shall be a Waterous CSUY 1500 GPM fire pump.

The pump shall be a single stage centrifugal class "A" rated fire pump, designed specifically for the fire service.

The fire pump shall be tested and certified by Underwriters Laboratories to perform as listed below:

- 100% of rated capacity at 150 pounds net pressure.
- 70% of rated capacity at 200 pounds net pressure.
- 50% of rated capacity at 250 pounds net pressure.
- 100% of rated capacity at 165 pounds net pressure.

The pump shall comply with the applicable requirements of "Standard for Automotive Fire Apparatus" of the National Fire Protection Association Pamphlet 1901, latest revision.

The pump shall be free from objectionable pulsation under all normal operating conditions.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **IMPELLERS**

The pump impellers shall be bronze, specifically designed for the fire service and accurately balanced for vibration free running. The stripping edges shall be located on opposite sides of the impellers to reduce shaft deflection.

The impeller shaft shall be stainless steel, accurately ground to size and supported at each end by oil or grease lubricated anti-friction ball bearings for rigid, precise support. The bearings used on the impeller shaft shall be automotive type bearings, easily cross referenced and readily available at normal parts or bearing stores.

#### **FLAME PLATED IMPELLER HUBS**

The impeller hubs shall be flame plated with tungsten carbide to a hardness approximately twice that of tool steel to assure maximum pump life and efficiency.

During the flame plating process the base metal shall not be allowed to exceed a temperature of 300 degrees Fahrenheit to prevent altering the metallurgical properties of the impeller material.

#### **PUMP PACKINGS**

The stuffing boxes shall be equipped with two-piece adjustable Grafoil packing glands.

#### **IMPELLER WEAR RINGS**

The pump shall be equipped with replaceable bronze wear rings for increased pump life and minimum maintenance cost.

The wear rings shall be designed to fit into a groove in the face of the impeller hubs forming a labyrinth that, as the clearance increases with age, directs water from the discharge side in several directions eventually exiting outward, away from the eye of the impeller hub.

#### **PUMP CASING**

The pump casing shall be cast as two (2) horizontally split pieces. The casing shall be made of high tensile, close grained gray iron with a minimum tensile strength of 40,000 PSI.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **PUMP TRANSMISSION**

The pump transmission shall be of the latest design, incorporating a high strength involute tooth-form Morse Hy-Vo chain capable of operating at high speeds while providing smooth and quiet transmission of power. Drive and driven sprockets shall be made of alloy steel with teeth of an involute form. Drive line shafts shall be made from alloy steel forgings, hardened and ground to size. Deep groove, anti-friction ball bearings shall be used throughout the pump transmission. The pump shift engagement shall be accomplished by a free sliding collar that uses an internal locking mechanism to insure that the collar will stay in road or pump position.

Primary lubrication for the pump transmission bearings, sprockets and chain shall be provided by a splash system. A supplementary pressure system shall also be employed which shall include a strainer, an oil circulation pump driven by the impeller shaft, and a spray bar inside the case to apply oil to the inside of the chain just before it engages the driven sprocket.

The pump and transmission shall be easily separable. A two piece shaft shall be splined allowing for individual repair of either the pump or transmission, to keep down time to a minimum.

All drive line components shall have a torque rating equal to or greater than the net engine torque multiplied by the torque converter ratio and the first gear ratio.

#### **AIR OPERATED PUMP SHIFT**

The pump shift actuating mechanism shall be air operated from a valve in the cab identified as "PUMP SHIFT". Full instructions for shifting the pump shall be inscribed on the valve plate.

A manual override system shall be supplied for the pump shift should a problem develop in the chassis air brake system. Controls for the override shall be located at the lower right hand corner of the pump panel. Full instructions shall be inscribed on a plate near the pump shift controls.

#### **PUMP SHIFT INDICATING LIGHTS**

There shall be two (2) green pump system shift indicator lights in the chassis cab. The first light shall become energized when the pump has completed it's shift into pump gear and shall be labeled "Pump Engaged". The second light shall become energized when the

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

chassis parking brake has been set, and when the pump and the chassis transmissions have been shifted completely into the correct gears for pumping, this light shall be labeled "OK to Pump".

There shall be one (1) green pump system shift indicator light located on the operator's panel. This light shall only become engaged when the chassis parking brake has been set, and when the pump and the chassis transmissions have been completely shifted into the correct gears. The light shall be located adjacent to the throttle control and shall be labeled "Warning: Do Not Open Throttle Unless Light Is On".

#### **PRIMING PUMP**

The priming pump, priming valve and piping assembly shall be included in the pump assembly. The priming pump shall be an electrically driven rotary vane pump mounted firmly within the pump area. When the priming pump is in use, it shall be automatically lubricated internally from the primer oil tank with oil that is environmentally safe. The pump shall be controlled by a lever on the pump operator's panel. An indicator light on the pump panel shall show when the primer motor is engaged.

The pump shall be capable of creating suction and discharging water from a lift of 10 feet through 20 feet of suction hose of the appropriate size, in not more than 30 seconds starting with the pump dry. It shall be capable of developing a vacuum of 22 inches at an altitude of up to 1000 feet.

#### **DISCHARGE RELIEF VALVE**

The discharge relief valve system shall be positive and quick acting, with have instantaneous hydraulic lock-out that does not require the operator to cancel out or disturb the pressure setting. With the pump operating from draft and delivering its rated capacity at 150 psi, if lines are shut down, the increase in discharge pressure shall not exceed 20 psi.

The relief valve control (Pilot Valve) shall be protected from malfunction due to sand or other sediment in the water by a strainer which may be removed, cleaned and replaced from the operator's panel while the pump is operating and without shutting down the continuous flow of water.

Relief valve indicator lights shall be mounted on the panel adjacent to the pilot valve assembly. The indicator lights shall be Amber, marked Open to indicate the relief valve is bypassing and Green, marked Closed to indicate the relief valve is fully closed.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **HEAT EXCHANGER**

The chassis engine shall have a supplementary cooling system that uses water from the discharge side of the pump to cool the engine coolant through the use of a closed heat exchanger. The water from the pump and the engine coolant shall not be intermixed. This cooling system shall be controlled by a valve on the pump operator's station.

#### **PUMP COOLER**

There shall be one 1/2" pump cooling/recirculating line from the pump tank fill line which is connected directly into the booster tank with a quarter-turn ball valve on operators panel to be labeled "PUMP COOLER ON/OFF".

#### **PUMP COOLER CHECK VALVE**

There shall be a check valve installed in the pump cooler line to prevent tank water from back flowing into the pump when not in use.

#### **PUMP LUBRICATION**

Grease zerks shall be installed in a convenient location and connected to the pump lubrication points by copper tubing.

#### **INTAKE RELIEF VALVE**

There shall be an Elkhart 40-41 intake relief valve installed on the suction side of the pump. The valve shall be the preset type, adjustable from 75 to 250 PSI, and shall be designed to prevent vibration from altering the setting.

The relief outlet shall be directed below the pump with the discharge terminating in a 2-1/2" male NST connection.

The discharge shall be away from the pump operator and labeled "Do Not Cap".

#### **PUMP DRAIN VALVE**

A manifold drain valve assembly shall be supplied. This drain shall provide the capability to drain the entire pump by pulling a single control. The valve assembly shall consist of a stainless steel plunger in a bronze body with multiple ports. The drain valve control shall be mounted on the left side pump panel and identified as "Pump Drain".

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **PUMP MANUALS**

Two (2) Pump Operation & Maintenance manuals shall be supplied at the time of delivery.

#### **RIGHT SIDE PUMP ACCESS DOOR**

There shall be a single panel treadplate door above the right hand side panel to allow access to the pump compartment. A pop-latch shall be installed to keep the door closed and a gas strut to keep the door open.

An automatic door switch shall be installed to illuminate the pump compartment when the door is opened. The door shall also be tied into the hazard warning light in the chassis cab area. An aluminum sill protector shall be installed on the bottom opening to protect the paint against scratching and scuffing.

#### **SILL PROTECTOR**

There shall be one (1) aluminum scuff plate shall be installed in the lower sill area of the pump access door opening to protect the edge from paint chipping and scuffing while the pump is being serviced.

#### **STEAMER SUCTION INLETS**

There shall be two (2) 6" male steamer inlets. One on each side of the apparatus. The suction fittings shall include a removable die cast zinc screen to provide cathodic protection for the pump thus reducing corrosion.

#### **STEAMER CAPS**

Each steamer inlet, not utilizing a piston relief valve, shall have a chrome plated long handle cap with NST threads.

#### **SHORT STEAMER BARRELS**

To accommodate valves without exceeding the legal overall body width, shorter steamer barrels shall be installed on both sides of the apparatus.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **GATED SUCTION INLETS**

All suction valves shall be brass, quarter-turn, full flow, swing-out type. The valves shall be designed in such a manner that the action of water against the regulating element will not affect its position.

Each valve shall be individually attached to the manifold of the pump with galvanized pipe. The plumbing to the valve shall contain a minimum of elbows to keep friction loss to a minimum.

The valves located in the pump compartment area shall be partially recessed behind the panel with the portion of the valve that contains water protected from the elements.

#### **INTAKE DRAINS**

Each gated intake shall be equipped with a 3/4" quarter turn bleeder valve. The bleeder valve shall be equipped with a chrome plated bar type handle to provide a positive grip while personnel are wearing gloves.

#### **INTAKE TRIMPLATES**

Gated intakes shall have a polished cast aluminum trimplate around the intake valve and fitting. The trimplate shall be easily removable without the need to disturb the valve.

#### **SLOW CLOSE MECHANISMS**

Gated intakes that are 3" or larger with the exception of the tank to pump inlet shall be equipped with a mechanism to prevent changing the position of the valve from full open to full close, or vice-versa, in less than 3 seconds.

#### **INTAKE STRAINERS**

Intakes shall have a removable or accessible strainer provided inside each external intake.

#### **2-1/2" LEFT HAND GATED INTAKE**

There shall be one (1) 2-1/2" gated intake on the left side of the pump compartment with a 2-1/2" NST female chrome swivel. A 2-1/2" chrome plated plug shall be supplied and attached to the bezel by means of a chain.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **PUMP DISCHARGES**

All discharge valves shall be Akron brand, quarter-turn, full flow, swing-out type. The flow regulating element of each valve shall not change its position under any condition of operation involving discharge pressures to the maximum pressure of the pump. The means to prevent a change in position shall be incorporated in the operating mechanism and shall be permitted to be manually controlled.

#### **DRAIN VALVES**

Each discharge 2-1/2" or larger, with the exception of the crosslays and hard to access plumbing, shall be equipped with an Akron 3/4" quarter turn drain between the valve and the discharge. A chrome plated bar type handle shall be provided on each drain valve to facilitate use with a gloved hand.

Drain valves shall be located in a row just above the running board on each side of the apparatus pump compartment to reduce clutter in the main pump panel area. Each drain valve shall be color coded to match the appropriate line it is connected to.

The drain valves shall be connected to the individual valves with flexible hose that is routed in such a manner as to assure complete drainage. Discharge from the drain valves shall be routed to below the apparatus.

#### **AUTOMATIC DRAINS**

Crosslay and hard to access discharges shall be equipped with Class 1, model 34AD automatic drains. These drains shall open whenever the pressure in the discharge line drops below 5 PSI.

The drains shall be located in areas that will allow the entire line to drain effectively. More than one drain shall be used in lines that are uneven along their length.

The outlets of the drain valves shall be extended with hoses to below the chassis frame rails.

#### **DISCHARGE ELBOWS**

All discharges that are 2" or larger and are 42" or more above grade shall be equipped with a downward pointing elbow of 30 degrees or more.

# **DURHAMVILLE FIRE DISTRICT**

## **FIRE APPARATUS SPECIFICATIONS**

### **DISCHARGE CAPS**

All discharges, not designated as a preconnect, shall have a chrome cap. Caps for discharges 3-1/2" and smaller shall be secured to the apparatus with suitable chains.

### **SLOW CLOSE MECHANISMS**

Discharges that are 3" or larger shall be equipped with a valve mechanism to prevent changing the position of the valve from full open to full close, or vice-versa, in less than 3 seconds as required by NFPA.

### **TRIMPLATES**

All discharges shall have a polished aluminum cast trimplate and an adhesive applied, color coded name tag.

### **LEFT SIDE DISCHARGES**

There shall be two (2) 2-1/2" NST discharges on the left side of the pump compartment.

There shall be two (2) 2-1/2" x 1-1/2" NST chrome reducers/adapters with 1-1/2" chrome caps and chains.

### **RIGHT SIDE DISCHARGES**

There shall be one (1) 2-1/2" NST discharge on the right side of the pump compartment.

There shall be one (1) 2-1/2" x 1-1/2" NST chrome reducer/adaptor with a 1-1/2" chrome cap and chain.

### **RIGHT SIDE L.D.H. DISCHARGE**

There shall be one (1) 4" NST discharge located on the right side pump panel. The discharge shall have a 3-1/2" Akron valve.

The valve shall be controlled by an Elkhart RC-10 slow-closing remote linear output screw-type actuator. The actuator housing and push-rod shall be constructed of light weight extruded aluminum.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

A precision needle thrust bearing and hardened thrust washers shall assure smooth, efficient operation and accurate flow and pressure control capability. A 5" cast aluminum handwheel shall allow for compact through-the-panel installation.

The valve status indicator module shall provide the pump operator with the status of the valve at a glance. Red shall mean fully closed; Green shall mean fully opened; Yellow shall indicate a gated position.

Incandescent lamps shall provide a reliable signal with a wide viewing angle even in bright sun light. Reliable solid state valve position sensors shall be water and lubricant resistant; the integrated circuit board and lamp sockets shall be completely encased in epoxy for total protection from elements.

An attractive brushed metal engraved escutcheon plate shall complement the high quality appearance of the fire apparatus.

#### **ELBOW ADAPTER**

One (1) SnapTite model AS40T40NEL, 4" NST female x 4" storz 30 degree elbow adapter with 4" storz blind cap shall be supplied with the apparatus at the time of delivery.

#### **CROSSLAY PRECONNECT HOSE BED**

Crosslay preconnects shall have 90 degree elbow type swivel on discharge outlets. There shall be fiberglass Dura-Dek flooring installed under the crosslay hose beds for ventilation and drainage.

The divider between the hosebed areas shall be fabricated of 3/16" aluminum. It shall be mounted in a channel on each end for adjustability.

There shall be two (2) 1-1/2" crosslays above the side mount control panel. The crosslays shall be plumbed with 2 1/2" full flow valves and 2 1/2" piping. Each crosslay shall terminate with a 2 1/2" male threads and be supplied with a 2 1/2" x 1 1/2" male nst adapter.

Each crosslay hosebed shall have a minimum capacity of 200' of double jacketed 1-3/4" fire hose.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **HOSE BED PRECONNECT**

There shall be one (1) 2 -1/2" preconnect located in the right side of the hosebed. The connection shall be full forward in the hose bed and terminating with a 2.5" nst male. Control shall be through a valve with "T" handle control on the pump operators panel.

#### **DELUGE MONITOR**

There shall be one (1) 3" riser pipe for a deluge monitor installed above the pump panel, centered in front of the hose bed. The riser pipe shall be installed with a 3" valve, controlled from the pump operator's panel.

One (1) demountable Akron Apollo style 3416 deluge monitor shall be installed. The monitor shall allow for 360 degrees of rotation and be able to move 90 degrees above and 15 degrees below the horizontal. The monitor shall be complete with style 2499 stacked tips, style 3488 stream shaper and a portable ground base with 4" storz connection.

The color of the monitor shall remain the same color as the monitor manufacturer's standard color.

There shall be a Task Force Tips Extend-A-Gun model XG-18 installed on the deck gun plumbing. The Extend-A-Gun shall provide greater clearance of apparatus lights, equipment and personnel. It shall be operable in either the raised or lowered position and shall provide a full 360 degree rotation. The extension shall be wired to the compartment open door circuitry to warn if left in the extended position.

#### **WATER TANK**

The water tank shall have a capacity of 1,700 U.S. gallons.

The exterior of the tank tub shall have a white finish, fill tower and tank lids shall have a gold finish. Tank shall be a female, molded, machine reinforced/hand molded process.

One (1) piece "seamless" molded tank tub design. It shall be built in a dual schedule procedure, "ultimate insurance against possible leaks." Tank shall be F.R.P. molded construction, comprised of fiber strand and woven fiber matting, molded together by wax free pure Pol-E resin. Also, one (1) final interior finish pure Pol-E resin throughout the tank to insure a maintenance free water tank.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

Minimum molded thickness shall be: 1/2" floor, 1/2" to 3/8" bulkheads and sides, 5/16" baffles. For superior structural strength tank walls and bulkheads having a 24 square inch area or greater shall be composite molded construction, using 1/4" composite material, between 1/8" thick molded F.R.P. material.

The tank shall be equipped with longitudinal and transverse baffles which exceed NFPA 1901 requirements. All baffles shall be attached to the interior of the tank tub with fiber strand, woven stitched fiber matting and wax free pure pol-e resin, bonded both sides of connected joint to insure maximum interior structural support. The longitudinal center baffle shall also support the fully removable bolt lid, to insure support for hose bed weight load.

The tank shall be equipped with a fully removable bolt on lid, designed to allow full access into the tank. Lid shall be composite molded construction. Lid shall be bolted in place with stainless steel bolts, with no parts of the bolts making contact with the tank contents. Bolts shall be around the full perimeter of the top of the tank and full length of longitudinal center baffle. Bolt pattern shall be on 4" centers around the perimeter and 8" centers through the longitudinal center baffle. Lid shall be sealed with a full perimeter close cell neoprene gasket. Lid shall have one (1) access hole for liquid level indicator.

The tank shall be equipped with a 12" square fill tower, with a spring loaded hinged lid and removable non-ferrous screen type strainer. Tank shall have a serial number bonded under the fill tower lid and wired to the exterior lid flange. The fill tower shall be marked "Water Fill."

The tank shall be equipped with a 4" I.D. overflow/air vent pipe from fill tower, through interior of tank, through floor of tank directly behind chassis rear wheels. Exiting pipe opening shall be recessed up into the floor of the tank so that the pipe does not extend below tank floor surface.

The tank mounting shall be a simple cradle style, held in with an upper hold down structure as specified by CFP. After fabrication the cradle shall be hot dip galvanized for maximum protection.

The tank shall rest on the main body support structure above the chassis frame, approximately 24" apart, consisting of 3" members. At these points of contact, hard rubber shall be installed between the tank and all resting contact points on the structure. The lower portion of the tank shall be cradled in a 4" high subframe, consisting of 1/4" plate steel, 4" high bent, 6" x 6" with ends bent outward 15 degrees, corners welded to the main body supports, one (1) on each lower corner of the tank.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

There shall be one (1) 3" flange with female npt threads incorporated into the tank top at the rear left side corner for future installation of an exterior dry fill. This flange shall have a plug installed.

#### **WATER TANK WARRANTY**

The tank shall be warranted for an unlimited time, after delivery, to the original purchaser. The warranty shall not be pro-rated and shall be for 100 percent from all defects in material and workmanship under normal use and service.

The upper portion of the tank shall be cradle in contoured side saddles supported off the main compartment structure at the wheel well area. The mount shall support the lower outward corners of the upper tee section and shall run approximately 72" in length on both sides and lined with hard rubber.

#### **WATER TANK LEVEL GAUGE**

An Innovative Controls model ICI-1400MW weather proof encapsulated (14) high intensity LED light indicator shall monitor the water tank level and shall be mounted on the pump panel.

The tank sensing probe shall be of a chemical resistant PVC with stainless steel sensing port. The cover plate shall be aluminum subplate with outdoor exposure rated composite overlay. The indicator shall have a black background with blue graphics.

#### **MINI TANK GAUGE IN CAB**

A miniature Innovative Controls tank gauge shall be wired into the existing sending unit for the water tank. The readout shall be installed in the chassis cab in a location that is easily seen by the driver.

#### **WATER TANK GAUGE AT REAR**

An Innovative Controls 14-light tank gauge shall be wired into the existing sending unit for the water tank. The readout shall be installed at the rear of the body in close proximity to the rear tank fill connection.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **WATER TANK DRAIN VALVE**

One (1), 1-1/2" tank drain valve shall be provided under the tank sump. The valve shall be operated from the left side of the apparatus and shall have a locking lever to prevent accidental draining of the tank.

#### **TANK TO PUMP CHECK VALVE**

There shall be a check valve between the pump suction and the booster tank valve. The check valve shall eliminate back flow into the water tank when the pump is connected to a pressurized source.

#### **TANK TO PUMP VALVE**

There shall be one (1) 3" full flow ball valve connected with a flexible hose from the tank to the suction side of the pump.

#### **TANK FILL VALVE**

There shall be one (1) 2" full-flow tank fill valve plumbed with 2" plumbing from the pump to the tank.

#### **DIRECT TANK FILL**

There shall be one (1) 4" tank fill plumbed directly to the tank located at the rear of the body under the Newton dump valve. One (1) Fireman's Friend valve shall be provided. The 4" fill shall terminate with a chrome plated 4" plug and chain.

#### **NEWTON DUMP VALVES (SIDE)**

One (1) 10" x 10" Newton Dump Valve shall be provided and installed on the left and one (1) on the right front of the water tank, above the running boards. The valves shall have a manual actuator for opening and closing.

The valves shall be of steel construction and shall be painted job color to match the apparatus.

# **DURHAMVILLE FIRE DISTRICT**

## **FIRE APPARATUS SPECIFICATIONS**

### **NEWTON DUMP VALVE (REAR)**

A 10" x 10" Newton Dump Valve shall be provided and installed on the rear of the water tank, above the running board. The valve shall have a manual actuator for opening and closing.

The valve shall be of steel construction and shall be painted job color to match the apparatus.

There shall be a drip pan installed inside the rear compartment to help prevent any back fill water from entering the compartment.

### **GRIP STRUT STEP OVER REAR DUMP**

There shall be one (1) grip strut step measuring 24" wide x 10" deep installed over the rear Newton dump valve to provide a safe stepping area for firefighters when reloading the hose bed and shall act as a guard to prevent firefighters from standing on the valve and causing damage.

### **NEWTON TELESCOPING EXTENSION CHUTE FOR DUMP VALVE**

There shall be three (3), 10" steel telescoping extension chutes provided on the dump valves. The chutes shall aid in directing water when the dump valve is actuated. The chutes shall be painted job color.

### **OPERATOR'S CONTROL PANEL**

The side mount operator's control panel shall be on the left side of apparatus with all valves, valve control levers, and instruments neatly arranged for easy access and visibility from the operator's location.

### **VALVE CONTROLS**

All valves shall be controlled by a quarter turn locking type push/pull control with direct linkages and universal yokes. Those valve controls which are not the rack and sector type shall have a dual rod guide mechanism with follower to insure that all handles move straight in and out with no sideways or up and down travel to cause binding.

Control rods shall be galvanized and have chrome guides through the panel.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

The centerline of any valve control shall be no more than 72 inches vertically above the platform that serves as the pump operator's position.

#### **COLOR CODED LABELS**

Adhesive applied, color coded labels shall be installed at all instruments and controls.

#### **PUMP PANEL CONSTRUCTION**

The operator's control panel and the right side pump panel shall be fabricated from 1/8", 5052-H32, aluminum covered with a black thermoplastic polyurethane coating that is capable of withstanding the effects of extreme weather and temperature. The panels shall be removable for service.

#### **PUMP PANEL LIGHTS**

The pump operator's control panel and the right side pump panel shall each be illuminated by a minimum of four (4) lights. Each light assembly shall consist of a stainless steel or chrome plated base with a plastic or lexan lens to protect the lamp from the elements.

The pump panel lights shall become energized upon setting the parking brake so the gauge information provided may be consulted at any time the apparatus is parked.

A stainless steel shield shall be installed over the pump panel lights to further protect them from the elements and to act as a reflector for additional illumination.

#### **INSTRUMENT PANEL**

The instrument and gauge panel shall be hinged to swing down providing access for service.

There shall be an access door on right side of the pump compartment above the side panel. The compartment door shall be hinged and made as large as possible.

The master pump gauges shall be 4-1/2" diameter, liquid filled, -30-0-400 PSI compound gauges.

There shall be eight (8) Class 1 individual pressure gauges. Each gauge shall be the liquid filled compound type reading 0-400 PSI and shall be a minimum of 2-1/2" in diameter. The gauges shall be designated for each discharge.

# DURHAMVILLE

## FIRE DISTRICT

### FIRE APPARATUS SPECIFICATIONS

The master pump gauges and individual pressure gauges shall have white faces with black numbers and lettering.

All water carrying gauge lines shall be flexible polypropylene tubing. The tubing shall be routed in such manner as to prevent chaffing and wear yet allow for easy visual inspection.

There shall be one (1) superior quality vernier type hand throttle, with positive locking quick-center release to control the fuel supply to the engine.

The hand throttle shall be located so that it can be easily controlled from the pump operators position with all gauges in full view.

The following shall be located at the pump operator's panel:

- A superior quality vernier type hand throttle shall be installed at the pump panel to regulate the engine rpm. There shall be a positive locking quick release center.
- There shall be a Class 1 Enfo III, electronic engine status display, installed on the pump operator's panel. The display shall provide the following information to the operator: Engine RPM, Oil Pressure, Coolant Temperature, and Voltage. Alarm outputs shall be provided with the oil pressure, coolant temperature, and high or low voltage. The display shall have an easy to read, bright red LED display.
- Operator instrument panel lights.
- Pressure and vacuum test gauge adapter with 1/4" chrome plugs.
- Pump shift indicating light.
- Class 1 round handle type pump cooling valve control.
- Class 1 round handle type engine cooling valve control.
- Electric primer activating lever with indicating light.
- Mechanical pump revolution adapter drive with cap to check revolutions of fire pump impeller.

# DURHAMVILLE

## FIRE DISTRICT

### FIRE APPARATUS SPECIFICATIONS

- Innovative Controls water tank level indicator.

#### **BODY**

The body shall have a five (5) year structural integrity warranty.

All body compartments shall be fabricated of 1/8", 5052-H32, smooth aluminum plate. The complete body shall be fabricated using break and bend techniques to form strong yet flexible Uni-Body structures.

The main body and the pump compartment shall be fabricated as individual units. Both the body and pump compartment shall be fabricated using precision holding fixtures to ensure proper dimensions. All attachment points shall be heavily reinforced.

The under structure of the rear step area shall consist of a framework for added strength. The corners of the rear step area shall be trimmed with cast aluminum corners.

#### **REAR WHEEL WELLS**

The fenders shall be integral with the body sides and compartments. Fender wells shall be constructed with bolt-on removable full circular inner liners for ease of cleaning and maintenance.

There shall be sufficient clearance to allow the use of tire chains with the apparatus fully loaded. The running boards and rear step shall have 3" channel edges and shall be fabricated from 1/8" aluminum plate.

#### **REAR FENDERETTES**

There shall be two (2) rear polished aluminum fenderettes, one on each side. The fenderettes shall be bolted to the apparatus body using nylon washers to space them slightly away from the body to reduce build-up of road grime. The fenderettes shall be constructed of .080 polished aluminum.

#### **GRIP STRUT INSERTS**

There shall be Grip Strut inserts fabricated into the step area of the side running board and the rear step area.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **SWEEP OUT TYPE COMPARTMENTS**

The side compartments shall have sweep out type floors. All the compartments shall be made to the largest practical dimensions to provide maximum storage capacity.

#### **DOOR CONSTRUCTION**

The lap type compartment doors shall be of double panel construction. The outer panel shall be fabricated of .190, 5052-H32 aluminum and the inner panel of .125, 3003-H14 aluminum.

There shall be a heavy duty automotive type extruded rubber molding installed on the overlap area of the doors to insure a weatherproof seal and prevent water from collecting in the door sills.

All of the compartment doors shall utilize an offset polished stainless steel continuous hinge connected to both the body and the door with stainless steel bolts and nuts. The hinge shall be designed in such a manner that, when open, the door does not intrude into the door opening area. The hinge pin shall be stainless steel with a minimum diameter of 1/4".

#### **COMPARTMENT DOOR HANDLES**

Compartment door handles shall be Hansen 79L stainless steel recessed type with bi-directional bent "D" type handles. There shall be an adjustable Eberhard 3-206U single point center latch with double catch furnished on all compartments.

#### **COMPARTMENT DOOR HOLDERS**

Cleveland spring loaded door holders shall be furnished on all swing-out compartment doors to hold the door open or closed. The spring loaded door holder shall close the door automatically when the door is positioned over center.

Pressurized gas filled cylinders shall be furnished on all lift-up compartment doors to raise and hold the door in the open position. Gas filled cylinders shall close the door automatically when the door is positioned over center.

On compartments having double doors, the secondary door shall have a latch mechanism to secure the door when the primary door is opened.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **COMPARTMENT VENTING**

Each body compartment shall be properly vented in a manner that will reduce the amount of dirt and water that may enter the compartment.

Venting shall be directly to the atmosphere rather than into another compartment which would only spread moisture throughout the body rather than dissipate it.

#### **COMPARTMENT LIGHTING**

All compartments, including the pump compartment, shall be furnished with a light mounted on the ceiling of the compartment unless otherwise specified. Each compartment light shall be activated by an automatic door switch.

Lighting shall be installed in any compartment with 4 cubic feet of storage capacity or greater, or any compartment with a door opening of 144 square inches or more.

All compartments, utilizing a horizontally hinged swing-up door, shall have two (2) lights recessed into the door. These lights shall be activated by an automatic door switch.

#### **MUDFLAPS**

Four (4) mudflaps shall be installed, two at the front and two at the rear. The mudflaps shall be a minimum of 3/8" thick to prevent "sailing".

#### **FOLDING STEPS**

All steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of at least 500 pounds. Steps shall be provided at any area that personnel may need to climb and shall be adequately lighted. Each folding step shall have two large open slots to prevent buildup of ice or mud and to provide a handhold when necessary.

#### **BODY RUBRAILS**

Bright dip anodized and polished aluminum rubrails measuring 1-1/2" x 3/8" shall be spaced 5/8" from the body using non-corrosive nylon spacers and secured by aluminum bolts. The ends shall be angled toward the body for safety and a pleasing appearance.

# **DURHAMVILLE FIRE DISTRICT**

## **FIRE APPARATUS SPECIFICATIONS**

### **DRI-DEK COMPARTMENT FLOORING**

All compartment floors that do not have permanently mounted equipment shall be protected with Dri-Dek flooring tiles. The tiles shall be black with yellow angled leading edges.

### **REAR TOW EYE**

There shall be one rear tow eye directly below the rear chassis frame. The tow eye shall have a 15,000# straight pull rating.

### **COMPARTMENT SCUFF PLATES**

Aluminum scuff plates shall be installed in the bottom sill area of all major equipment carrying compartments to reduce paint damage from equipment. The scuff plates shall be attached using a permanent bonding double sided tape.

### **RUNNING BOARD HOSE COMPARTMENT (RIGHT)**

There shall be one (1), hosewell provided for storage of soft suction hose. The hosewell shall have a storage capacity of 3.90 cubic feet. The hosewell shall be located recessed in the right side running board and the floor of the hosewell shall have Dri-Dek installed. Drain holes shall be drilled in the corners of the hosewell to allow for proper drainage.

### **REAR TRANSVERSE COMPARTMENT**

The rear side compartments shall have no bulkheads to separate them from the low rear compartment thus forming one large compartment at the rear of the apparatus where long tools or bulky equipment may be stored.

### **LEFT SIDE COMPARTMENTS**

There shall be one (1) low compartment ahead of the rear wheels. This compartment shall have a door opening of approximately 28" high x 42" wide and shall have a usable depth of approximately 24". This compartment shall have double vertically hinged swing-out doors.

There shall be three (3) high side compartments. Each compartment shall have a door opening of approximately 30" high x 48" wide and shall have an approximate usable depth of 13". Each compartment shall have a horizontally hinged lift-up door.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

There shall be one (1) low compartment behind the rear wheels. This compartment shall have a door opening of approximately 28" high x 30" wide and shall be transverse. This compartment shall have a single vertically hinged swing-out door.

#### **RIGHT SIDE COMPARTMENTS**

There shall be one (1) low compartment ahead of the rear wheels. This compartment shall have a door opening of approximately 28" high x 42" wide and shall have an approximate usable depth of 24". This compartment shall have double vertically hinged swing-out doors.

There shall be one (1) compartment behind the rear wheels. This compartment shall have a door opening of approximately 28" high x 30" wide and shall be transverse. This compartment shall have a single vertically hinged swing-out door.

#### **REAR COMPARTMENT**

There shall be two (2) low compartments, one each side of the dump valve. Each compartment shall have a door opening of approximately 16" wide x 32" high and shall have an approximate usable depth of 30". Each compartment shall have a single vertically hinged swing-out door.

There shall be a fire extinguisher compartment with bracket on the left rear of the apparatus. The upper section of this compartment shall have storage for one (1) hard suction hose and two (2) pike poles.

#### **DUNNAGE COMPARTMENT**

There shall be a dunnage compartment above the pump compartment. The floor of this compartment shall be removable Dura Dek to allow access to the pump compartment.

#### **SHELVING CHANNELS**

There shall be two Strut channels installed in three (3) compartments for future shelves. The channels shall be installed in the left side high side compartments.

#### **ROLL OUT EQUIPMENT TRAY**

There shall be one (1) heavy duty 500 lb capacity roll out equipment tray installed on the apparatus. The tray shall be constructed of aluminum and shall have a sanded finish. The tray shall have a mechanism that will either secure it in the full out or full in position.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

A stainless steel scuff plate shall be installed on the inside surface of the compartment door to prevent the tray from removing paint if deployed while the door is not fully open. The tray shall be located as determined at the pre-construction conference.

#### **HOSE BED**

The hose bed compartment shall have a minimum of 55 cubic feet of storage space and shall be not less than 67" in width.

#### **HOSE BED COVER**

The front portion of the hose bed shall be covered with a single sheet of aluminum diamond plate. The cover shall be hinged in the front and extend the full width of the hose bed. The cover shall extend two (2) feet back and shall have a handle placed in the middle suitable for grasping with the gloved hand.

#### **HOSE BED FLOORING**

The floor of the hose bed compartment shall be constructed of Dura-Dek fiber reinforced plastic material. The flooring shall be fabricated of "T" beam pultrusions in parallel connected with cross slats that are first mechanically bonded and then epoxied, forming a large sheet.

The top portion of each "T" cross section shall measure 1-1/4" wide and 3/16" thick with beaded ends. The vertical portion shall be 3/8" thick, beading out at the bottom to a thickness of 1/2" and tall enough to result in an overall height of 1". The "T" sections shall be spaced 3/4" apart to allow for drainage and ventilation.

Each "T" beam shall be constructed utilizing a core of 250,000 continuous glass fiber strands that are high in resistance to tension, compression and bending. An outer sheath consisting of a continuous strand mat to prevent lineal splitting and shipping shall surround the core.

The sheath shall also serve to draw the protective resin to the bar surface. Both reinforcements shall be pulled through an isophthalic polyester resin, treated with antimony trioxide for fire resistance, to form a solid length.

The flooring shall then be protected with a polyurethane coating to screen out ultraviolet rays. This bright white coating shall be baked on and shall provide a pleasing contrast when installed in the apparatus.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **TANK GAUGE ACCESS**

At the front of the flooring shall be a removable stainless steel cover to provide access to the tank gauge sending unit without the need to remove the flooring.

#### **HOSE BED PARTITION**

There shall be one (1) hose bed partition fabricated of Galvanneal steel. The partition shall be mounted on galvanized slide rails at the front and rear of the hose bed. The slide rails shall allow full movement of the hose partition along the width of the hose bed providing for different hose load capacities.

#### **GROUND LADDERS**

The full compliment of ground ladders shall be stored in a compartment off the rear of the apparatus, below the hosebed, on the right side of the apparatus behind the folding tank rack. There shall be a door on this compartment with stainless steel hinge and “D” handle closure. The ladders shall be stored on edge for ease of removal in individual slides.

The following ladders shall be furnished by body builder at the time of delivery:

- One (1) 10' folding attic ladder. Duo Safety 585A
- One (1) 14' roof ladder. Duo Safety 775A
- One (1) 24' two section extension ladder. Duo Safety 900A

#### **PIKE POLE STORAGE**

In addition to the two (2) pike pole tubes located in the upper portion of the left hand rear fire extinguisher compartment, one (1) PVC pike pole tube shall be located in the ladder storage compartment.

#### **HARD SUCTION HOSE**

Hard suction storage shall be as follows: One (1) length shall be stored in the fire extinguisher compartment on the left side of the apparatus and one (1) length shall be stored in a specially built compartment on the top of the right side lower compartments. The top of this compartment shall form the catwalk on which the folding tank rack shall be mounted.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

The following hard suction hose shall be supplied by body builder at the time of delivery: Two (2) 6" sections of flexible PVC hard suction hose. These sections of hose shall be as long as possible using the full length of the body, minimum of 12'.

#### **FOLDING TANK STORAGE RACK**

A stainless steel fold down port-a-pond rack shall be provided for a 2,500 gallon folding water tank. It shall be fabricated from '304' stainless steel ornamental tubing. The diameter of the tubing shall not be less than 1-1/2" inches in diameter. It shall be mounted to the passenger side of the apparatus catwalk by two (2) 4F "Satin" finish stainless steel pads with stainless steel hinges.

The pond rack shall have two (2) LB-19 stainless steel latches so that it may be contained in a secure, upright position when not in use. When folded to the down position, it must be in an area where two (2) men can easily remove the folding tank.

Four (4) protective ends shall be placed on the rack to eliminate any sharp edges.

It shall be designed so that the hinges do not support the rack and tank while in the upright position.

There shall be a 4F satin finish air foil put in front of the folding tank to help keep the wind from entering the tank when in the traveling position. A switch on the rack will activate the "Do Not Move Apparatus" light in the cab when not fully stowed.

One (1) 2,500 gallon Fol-da-Tank shall be provided with the apparatus. The tank shall be constructed of 22 oz. vinyl material with a steel frame. Color of the tank shall be determined at the pre-construction conference.

#### **RUNNING BOARDS AND WALKWAYS**

The running boards shall be constructed of structural material that is integral with the body. They shall be overlaid with aluminum treadplate material to provide a slip resistant surface.

#### **TREADPLATE OVERLAYS**

Aluminum treadbrite plate overlays shall be sprayed with a clear coat sealer on back side that is pliable and resistant to scratches and chips to provide an insulating barrier between dissimilar metals when it is bolted to the body. After painting and final construction,

# DURHAMVILLE

## FIRE DISTRICT

### FIRE APPARATUS SPECIFICATIONS

overlays shall be additionally sealed at the edges with a caulking compound that will stay pliable throughout the life of the apparatus.

The degree of slip resistance shall be in accordance with NFPA 1901, latest revision. Overlays shall be installed that are totally insulated from the overlay with nylon shoulder washers that extend into the hole that is drilled into the aluminum. Nylon cap nuts shall be employed where bolts may damage equipment or cause injury. Treadplate overlays shall be provided in the following areas:

- Walkways, running boards, upper intermediate and rear step.
- Front compartment vertical areas on both sides.
- All rear inside faces and vertical areas below rear intermediate step.
- All rear inside faces and vertical areas above rear intermediate step.
- The top surface of all side compartments, bending over the edge and then bending out, forming a driprail.
- Chassis step and chassis fuel tank.
- Top surface of storage area above ladders on the right side.
- Right side above lower compartments extending down over the body side and then flanged out forming a driprail above compartment doors.

### HAND RAILS, GRAB RAILS AND STEPS

Hand rails shall be constructed of ribbed extruded aluminum of not less than 1-1/4" in diameter. All railing escutcheons and brackets shall be stainless steel or chrome plated, and shall be bolted to the body with stainless steel bolts. The lower bracket on all vertical handrails shall have a drain hole drilled in it at the lowest point. Hand rails shall be provided in the following areas:

- Grab handle on top of catwalk on the left side of the apparatus in front of the tank fill tower.
- Horizontal intermediate rear hand rail.
- Rear vertical hand rail from top of body to rear step, one on each side of body.

# **DURHAMVILLE FIRE DISTRICT**

## **FIRE APPARATUS SPECIFICATIONS**

- Short handrail at the top of the hosebed on left side.
- Short handrail at the top of hosebed on right side.
- Two (2) chrome folding steps on left front compartment.
- One (1), chrome folding step on right front compartment.
- Four (4), aluminum corner steps, two on each rear corner of body.

### **TAIL LIGHTS, CLEARANCE LIGHTS**

There shall Weldon model 3700 series tail lights and backup lights installed on the rear of the apparatus. Two (2) red brake tail lights, two (2) amber arrow turn lights, and two (2) back up lights shall be supplied. The lights shall be mounted in a cast aluminum housing, three on each side of the apparatus.

### **CLEARANCE LIGHTS/REFLECTORS**

Clearance lights and reflectors to comply with I.C.C. regulations shall be supplied.

### **12 VOLT ELECTRICAL SYSTEM**

Wiring harnesses shall be the automotive type, engineered specifically for the builder's apparatus, and shall meet the following criteria. Under no circumstances shall diodes, resistors, or fusible links be located within the wiring harness. All such components must be located in an easy to access wiring junction box or the main circuit breaker area.

All wire shall meet white book, baseline advanced design transit coach specification and Society of Automotive Engineers recommended practices. It shall be stranded copper wire core with cross linked polyethylene insulation complying with SAE specification J1128. Each wire shall be hot stamp function coded every three inches starting one inch from the end and continuing throughout the entire harness. In addition to function coding, each wire shall be number and color coded.

All terminals on the ends of the wiring harness shall be soldered unless a crimping tool or machine is used that gives an even and precise pressure for the terminal being used. All terminals shall be pull tested to insure their integrity.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **12 VOLT MAIN ELECTRICAL PANEL**

A main electrical panel shall be located in the rear surface of the left front lower compartment, next to the chassis frame rail. The compartment shall be highly weather resistant and shall not reduce the size of the compartment. The panel shall contain a board with permanent sockets for relays, diode blocks, and automatic reset circuit breakers. The board shall be screwed to the back of the compartment and shall have permanent leads, each one routed to a predetermined pin of the correct main bulkhead connector. The bulkhead connectors shall be physically attached to the bottom of the box. The connectors shall be Deutsch type.

A minimum of ten (10), spare circuit breaker sockets shall be supplied. All sockets and equipment shall be clearly labeled.

Any circuit which draws 15 nominal amperes shall be switched through relays. Individual loads shall be wired to individual circuit breakers as much as possible. The circuit breakers shall be sized for the individual load rather than selecting a large circuit breaker and ganging loads on until amperage rating of the circuit breaker is reached.

The main electrical panel shall be fed by three harnesses, one from the cab, one from the pump compartment, and one main harness from the body. The main body harness shall be connected to two individual body harnesses, one for the left side and one for the right side of the body.

Each harness shall be equipped with several spare wires from one end of the harness to the other. At any place where the harness or sub-harness pass through metal, heavy rubber grommets shall be installed to protect it.

#### **12 VOLT SYSTEM SCHEMATIC**

A complete electrical schematic for the apparatus shall be provided. This schematic shall be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.

#### **12 VOLT SYSTEMS TEST**

After completion of the unit, the 12 volt electrical system shall undergo a battery of tests as listed in NFPA Pamphlet 1901, 1999 edition. These tests shall include, but not be limited to; a reserve capacity test, alternator performance test at idle, alternator performance test at full load, and a low voltage alarm test which shall be performed in

# **DURHAMVILLE FIRE DISTRICT**

## **FIRE APPARATUS SPECIFICATIONS**

that order. Certification of the results shall be supplied with the apparatus at the time of delivery.

### **PUMP COMPARTMENT LIGHTS**

There shall one (1) light in the pump compartment. This light shall be activated by an automatic switch in the pump compartment access door and shall be located in a manner that will provide maximum lighting.

### **WALKWAY LIGHTS**

Lights shall be mounted in a manner that illuminates all walkways and steps for safe operation of the apparatus. These lights shall be activated when the parking brake is engaged.

### **GROUND LIGHTING**

Lights shall be installed beneath the apparatus in areas where personnel may be expected to climb on and off of the apparatus. The lights shall illuminate the ground within 30" of the apparatus to provide visibility of any obstructions or hazards.

These areas shall include, but not be limited to, cab doors, side running boards, and the rear step area.

### **REAR WORK LIGHTS**

There shall be a switch at the rear of the apparatus to activate the backup lights when the parking brake is set. This switching circuit shall be deactivated when the parking brake is released.

### **BACK-UP ALARM**

An electronic back-up alarm shall be installed and wired so as to alert personnel any time the transmission is shifted into reverse gear.

### **ENGINE COMPARTMENT WORK LIGHT**

One (1) 12 volt work light with integral switch shall be installed in the chassis engine compartment.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **COMPARTMENT LIGHTS**

Lights in the body compartments shall be activated by an automatic door switch. A minimum of one (1) light shall be installed in each compartment with a storage space of four cubic feet or greater and with a door larger than 144 square inches unless specified otherwise in the body section of these specifications.

#### **MASTER ELECTRICAL MODULE**

There shall be a master electrical module in the chassis cab for all emergency light switches, master switches and gauges. The electrical module shall be vinyl covered. As bucket seats are provided, a free standing module shall be installed between the two front passengers.

A master emergency light switch shall be installed on the electrical module. This switch shall allow the preselection of emergency lights and siren so they may be energized with the flip of a single switch.

#### **HAZARD WARNING LIGHT**

A Southern Vehicle Products "Hot Shot" model 1185H rotating light shall be supplied within the driving compartment to warn of an open compartment or passenger door or any other device which may be open or deployed and which may cause a hazard or damage should the apparatus be moved. The light shall be wired in such a manner that it only will be energized upon release of the parking brake.

A sign shall be placed near the warning light in a conspicuous location, reading "Do Not Move Apparatus When Light Is On."

#### **INTEGRAL LOW VOLTAGE ALARM**

A system shall be installed to monitor the condition of the 12 volt electrical system. Should the system voltage drop below 11.8 volts, both an audible and visual alarm shall alert the driver.

To prevent faulty and intermittent indications, the voltage must be below the alarm point for 120 seconds or more before the alarm system activates. When system voltage exceeds 11.8 volts, it shall automatically reset. This battery monitoring system shall be an integral part of the load management system.

# **DURHAMVILLE FIRE DISTRICT**

## **FIRE APPARATUS SPECIFICATIONS**

### **HIGH IDLE SYSTEM**

A high idle switch shall be installed in the chassis cab. The system shall be wired so it will only work if the vehicle transmission is in park or neutral and the parking brake is set.

### **BATTERY SYSTEM**

There shall be a single battery system with dual batteries. The master battery disconnect system shall have a manual roll switch connected to the batteries, eliminating the need for an isolator.

### **REAR STEP SIGNAL SYSTEM**

A rear step buzzer system shall be installed. It shall consist of a weather proof button at the rear step area with a label reading "1-STOP, 2-GO, 3-BACK UP", and a buzzer in the cab that is activated by the rear step switch.

### **SHORELINE RECEPTACLE**

A flush mount Quick disconnect 110 Volt shoreline receptacle shall be installed on the left side of chassis cab by the driver's door.

### **BATTERY CHARGER/COMPRESSOR**

A Kussmaul Pump-Plus HO combination air compressor/battery charger shall be installed. The system shall receive power from the 110 volt shoreline receptacle and be connected to air brake system and chassis batteries to maintain the vehicle in a constant state of readiness.

A pressure switch shall monitor the chassis air brake system pressure and shall energize the compressor whenever the pressure drops below a predetermined level.

The battery charger shall be completely automatic and contain a dual charge divider.

The batteries shall be automatically charged and maintained in a fully charged state while still being isolated from each other.

# **DURHAMVILLE FIRE DISTRICT**

## **FIRE APPARATUS SPECIFICATIONS**

### **ELECTRICAL SYSTEM MANAGER**

The vehicle's electrical system shall be equipped with a Class 1 Electrical System Manager. The device shall monitor and control the electrical system and be capable of load sequencing, load shedding, automatic or manual load reset, dual battery monitoring, indicating over voltage present and fast idle activation.

The device shall also incorporate an indicator which allows an operator to differentiate levels of battery current discharge rates. The device shall be protected against reverse polarity and shorted outputs, and shall be enclosed in a metal case to enhance EMI/RFI protection.

### **HOSE BED LOADING LIGHTS**

Two (2), Unity AG-R deck lights shall be mounted high at the rear of the apparatus to illuminate the hose bed loading area. These lights shall be energized by a switch located directly on the lamp heads.

### **UPPER ZONE A VISUAL WARNING**

There shall be one (1) Federal Signal model 25RQL-FAST, 52" long light bar installed on the chassis cab roof. The light bar shall be equipped with two (2), 95 flash per minute rotators, one on each end, and two (2), 175 flash per minute rotators.

The light bar shall also be equipped with two (2) cascade mirror assemblies installed between the fast and slow rotators on each end.

The lenses on each end shall be red and the center lens shall be clear. The clear center section shall have the rear facing portion blacked out.

For load management purposes, one of the center rotators may be shed. Both rotators in the clear center shall be deactivated in the Blocking Right of Way mode.

### **LOWER ZONE A VISUAL WARNING**

There shall be two (2) Federal Signal model GS2F strobe lights installed on the front of the chassis in the lower warning light zone area. The light on the left (driver's side) shall have a red lens and the light on the right (passenger's side) shall have a red lens.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **LOWER ZONE B AND D VISUAL WARNING**

There shall be three (3) Federal Signal model GS2F strobe lights installed on each side of the apparatus. The lights toward the front shall be red, the lights in the middle shall be red and the lights toward the rear shall be red.

#### **UPPER ZONE C VISUAL WARNING**

There shall be two (2) Federal Signal model 100F rotating beacons installed high at the rear of the apparatus, one on each side. The light on the left (driver's side) shall be red and the light on the right (passenger's side) shall be amber.

#### **LOWER ZONE C VISUAL WARNING**

There shall be two (2) Federal Signal model GS2F strobe lights installed low at the rear of the apparatus. The light on the left (driver's side) shall be red and the light on the right (passenger's side) shall be red.

#### **STROBE POWER PACKS**

One (1) Federal Signal model SPS2 strobe power supply shall be installed to modulate the visual warning strobe lights to within NFPA recommendations.

Two (2) Federal Signal model SPS4J strobe power supplies shall be installed to modulate the visual warning strobe lights to within NFPA recommendations.

#### **ELECTRONIC SIREN**

There shall be one (1) Public Safety Code 3692 V-Con electronic siren supplied. The 3692 V-Con siren is a full feature siren with Hi-Lo, a hard-wired microphone, and an air horn.

#### **SIREN SPEAKER**

One (1) Cast Products polished aluminum 100 watt speaker shall be recessed in the front bumper.

#### **PAINTING, LETTERING AND STRIPING**

After the body and components have been fabricated and assembled they shall then be disassembled prior to painting so when the apparatus is completed there will be finish

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

paint beneath the removable components. The apparatus body and components shall be metal finished as follows to provide a superior substrate for painting.

All aluminum sections of the body shall undergo a thorough cleaning process starting with a phosphoric acid rinse to begin the etching process. A phosphatizer shall then be applied to continue the etching process and deposit a protective film on the metal surface. The next step shall consist of a non-chromatic rinse to seal the protective film and rinse off excess solution.

After the cleaning process the body and it's components shall be primed with an epoxy primer and the seams shall be caulked.

All bright metal fittings, if unavailable in stainless steel, shall be heavily chrome plated. Iron fittings shall be copper underplated prior to chrome plating.

One (1) four ounce bottle of acrylic enamel touch-up paint shall be supplied. The apparatus shall be painted with PPG Ditzler polyurethane enamel paint. The apparatus shall be painted to match the existing Fire Department color. The chassis shall be painted by the chassis manufacturer, not the body builder.

#### **22 KARAT GOLD LEAF LETTERING**

The lettering shall be genuine 22K gold leaf adhesive backed letters. The lettering shall be an engine-turn design. The entire lettering shall be covered with a clear vinyl for added protection and durability. Lettering shall match the existing Fire Department scheme.

#### **REFLECTIVE STRIPING**

There shall be a white 4" reflective stripe affixed to the perimeter of the apparatus body and chassis cab.

#### **UNDERCOATING**

The apparatus shall undergo a two (2) step undercoating process. The first step shall be a rubberized polyurethane base compound that is applied after the body has been primed. The materials used shall incorporate unused paint products to reduce the amount of waste released into the environment. This coat shall be applied to all hidden pockets and surfaces that will not be visible after completion.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

As a final step, the entire underside of the body shall be coated with a bituminous based automotive type undercoating when the apparatus is completed. During this application, special care shall be taken to avoid spraying the product on air lines, cables, or other items that would cause normal maintenance to be hindered.

#### **THERMOPLASTIC LINE-X COATING**

In the areas designated below, a two component spray-in-place thermoplastic polyurethane system shall be used for maximum protection of the body and equipment. The system shall utilize flexible 100% solids applied with high pressure impingement-mix polyurethane dispensing equipment.

The coating shall be a fast cure, textured surface, multi-purpose material designed for commercial and industrial applications. It shall exhibit excellent adhesion to the body and serve as a protective, abrasion resistant liner where applied.

The density of the material shall be a minimum of 70 PCF as measured using ASTM test method D-1622.

The taber abrasion resistance shall be a minimum of 0.03% per 1000 cycles as measured utilizing ASTM test method D-4060. The minimum tensile strength as measured using ASTM D-2370 shall be 1540 pounds per square inch.

The coating shall be applied over a properly prepared surface with a highly textured finish in the following areas: All compartment interiors (gray) and pump panel surface (black)

#### **AIR SHORELINE**

There shall be a quick disconnect air fitting with a control valve by the driver's door. The fitting shall allow for filling the "wet" tank for the air brake system from a remote source.

#### **EXHAUST HEAT SHIELD**

There shall be an exhaust heat shield installed on the apparatus. The heat shield shall be between the engine exhaust piping and the bottom of the body compartments. It shall minimize compartments and their contents from being heated by the exhaust from the engine.

# **DURHAMVILLE**

## **FIRE DISTRICT**

### **FIRE APPARATUS SPECIFICATIONS**

#### **SPECIAL LABELS**

A permanent plate shall be mounted in the driver's compartment specifying the quantity and type of the following fluids that may be used in the apparatus for normal maintenance. Where a fluid is not applicable to the unit, the plate shall be marked N/A to inform the service technician who may not be familiar with the apparatus.

1. Engine oil
2. Engine coolant
3. Transmission fluid
4. Pump transmission fluid
5. Pump primer fluid
6. Drive axle fluid
7. Air-conditioning refrigerant
8. Power steering fluid
9. Cab tilt mechanism fluid
10. Transfer case fluid
11. Equipment rack fluid
12. Air compressor system lubricant
13. Generator system lubricant

A permanent plate shall be affixed in the driver's area that states the maximum number of personnel allowed to ride on the apparatus at any time.

A sign shall be affixed in the chassis cab, in plain sight of the driver, that states the overall travel height of the apparatus.

On any gated inlet at the pump operator's position, a permanent label that states "Warning - serious injury or death could occur if inlet(s) is supplied by a pressurized source when the valve is closed."

All other appropriate labels to ensure safe operation of the apparatus shall be permanently affixed in conspicuous locations.

#### **AIR HORNS, BUMPER MOUNTED**

Grover model 1510 stutter tone dual air horns shall be recessed into the front bumper. The horns shall be connected to the chassis air brake system through a low pressure

# **DURHAMVILLE FIRE DISTRICT**

## **FIRE APPARATUS SPECIFICATIONS**

protection valve that will prevent use of the horns when the air brake system pressure is below 80 PSI.

### **WHEEL CHOCKS**

One (1) pair of Zico #SAC-44 wheel chocks shall be provided with the apparatus. The chocks shall be mounted in Zico #SACH-44-H mounting brackets in a location that is easily accessible.

### **NYS INSPECTION**

The apparatus shall be given a New York State inspection prior to delivery and the proper sticker affixed.

### **SERVICE**

The apparatus shall be given an oil change including oil filter and a complete body and chassis lubrication prior to delivery.

### **CHASSIS**

The apparatus shall be mounted on an International model 4900.