



FRONT RANGE FIRE APPARATUS

**7600 Miller Court
Frederick, CO 80504
303-449-9911
1-800-334-9911
www.FrontRangeFire.com**

**DUANE DOUCETTE
303-304-6118
DuaneD@frontrangefire.com**



PERFORM. LIKE NO OTHER.™

Front Range Fire Apparatus

QUOTATION:

TO: Bill Davis

FROM: Duane Doucette

CUSTOMER: Denver International Airport

DATE: 08/05/2014

DESCRIPTION: Velocity Pumper



CONTRACT: \$689,250

INTEREST DISCOUNT: (\$23,000)

TOTAL \$666,250

Due within 30 days of contract



Option List

8/4/2014

Customer: Denver, City and County-DIA
Representative: Doucette, Duane
Organization: Front Range Fire Apparatus, Ltd
Requirements Manager:
Description: DIA Velocity 4x2 Pumper 2015
Body: Pumper, Long, Alum, 2nd Gen
Chassis: Velocity Chassis (Big Block), 2010

Bid Number: 569
Job Number:
Bid Date: 06-01-2014
Stock Number:
DBVersion: 02.00.0534.0000

Line	Option	Type	Option Description	Qty
1	0671399		Boiler Plates, Pumper Fire Department/Customer - Denver Fire Department Operating/In conjunction W-Service Center - Operating Miles - 50 Miles Number of Fire Dept/Municipalities - 10 Bidder/Sales Organization - Front Range Fire Apparatus Delivery - Delivery representative Dealership/Sales Organization, Service - Front Range Fire Apparatus	1
2	0661794		Single Source Compliance	1
3	0584456		Manufacture Location: Appleton, Wisconsin	1
4	0584452		RFP Location: Appleton, Wisconsin	1
5	0588609		Vehicle Destination, US	1
6	0670275		Unit to be Similar in some Aspects, Excluding Pump Panel Fill in Blank - unit delivered in 2012. job number 25594	1
7	0533316		Comply NFPA 1901 Changes Effective Jan 1, 2009, With Exceptions	1
8	0533347		Pumper/Pumper with Aerial Device Fire Apparatus	1
9	0588611		Vehicle Certification, Pumper	1
10	0661778		Agency, Apparatus Certification, Pumper/Tanker, U.L.	1
11	0008036		Career/Paid Department	1
12	0000000	STF	Inspection trip #1 - when - number of people Location - at the customer location for a preconstruction conference. Qty, - 02	2
12	0000000	STF	Inspection trip #2 - when - number of people Location - at the factory for a post paint inspection Qty, - 02	2
12	0000000	STF	Inspection trip #3 - when - number of people Location - at the factory for a delivery inspection Qty, - 02	2
13	0537375		Unit of Measure, US Gallons	1
14	0030006		Bid Bond not requested	1
15	0582800		Performance Bond, 100 Percent w/25 Percent Warranty Bond, 1 Yr, and Payment Bond	1
16	0000007		Approval Drawing	1
17	0087832		Drawing, Preliminary Layout, Pump Panel, Control Zone, Reference Only	1
18	0002928		Electrical Diagrams	1
19	0564202		Velocity Chassis (Big Block), 2010	1
20	0021009		Overall Length, Target Size - approximately 32' - 5.25"	1
21	0000110		Wheelbase Wheelbase - 197.00"	1
22	0000070		GVW Rating GVW rating - 50,000 pounds	1
23	0000203		Frame Rails, 13.38 x 3.50 x .375, Qtm/AXT/Imp/Vel/Dash CF	1
24	0020018		Frame Liner not Req'd	1
25	0508849		Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel	1
26	0010427		Suspension, Front TAK-4, 22,800 lb, Qtm/AXT/Imp/Vel/DCF/Enf	1
27	0087572		Shock Absorbers, KONI, on TAK-4 Qtm/AXT/Imp/Vel/DCF/Enf	1
28	0000322		Oil Seals, Front Axle	1
29	0078244		Tires, Front, Michelin, XZY3 (wb), 425/65R22.50, 20 ply	1

Line	Option	Type	Option Description	Qty
30	0019611		Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot	1
31	0000310		Request for Turning Radius Report	1
32	0530466		Axle, Rear, Meritor RS26-185, 27,000 lb, Imp/Vel/Dash CF	1
33	0544250		Top Speed of Vehicle, 65 MPH	1
34	0010556		Suspen, Rear, Reyco, Spring, 27,000 lb	1
35	0000485		Oil Seals, Rear Axle	1
36	0000482		Driver Controlled Differential Lock, Single Axle	1
37	0070728		Tires, Rear, Michelin, XDN2, 12R22.50, 16 ply, Single	1
38	0019625		Wheels, Rear, Alcoa, 22.50" x 8.25", Aluminum, Hub Pilot, Single	1
39	0568081		Tire Balancing, Counteract Beads	1
40	0545391		Tire Pressure Monitoring Valve Cap	1
			Qty, Tire Pressure Ind - 6	
41	0012001		Chains, Insta-Chain automatic tire, Custom	1
42	0097571		Mud Flaps, Mounted even with Fenderetts	1
			Location - front	
			Qty, - 1	
43	0002045		Mud Flaps, w/logo front & rear	1
44	0544802		Chocks, Wheel, SAC-44-E, Folding	1
			Qty, Pair - 01	
45	0544806		Mounting Brackets, Chocks, SAC-44-E, Folding, Horizontal	1
			Location, Wheel chock - under D1 per the drawing	
			Qty, Pair - 01	
46	0593760		ESC/ABS/ATC Wabco Brake System, Single Rear Axle, 2010	1
47	0030185		Brakes, Knorr/Bendix 17", Disc, Front, TAK-4	1
48	0000740		Brakes, Meritor, Cam, Rear, 16.50 x 8.63"	1
49	0020784		Air Compressor, Brake, Cummins/Wabco 18.7 CFM	1
50	0000785		Brake Reservoirs, Three	1
51	0568012		Air Dryer, Wabco System Saver 1200, 2010	1
52	0000790		Brake Lines, Nylon	1
53	0000856		Air Inlet, with Kussmaul Air Eject	1
			Location, Air Coupling(s) - k) DS Rear Body	
			Qty, Air Coupling (s) - 1	
54	0000860		Outlet, Air, with shut off valve	1
			Location, Air Coupling(s) - o) DS Frt Body Compt	
			Qty, Air Coupling (s) - 1	
55	0004200		Hose, Air 25' length, w/air chuck	2
			Qty, - 02	
56	0014130		Air Tank, Additional for Extra Air Horn Capacity	1
57	0522855		Aux Braking Systems, Simultaneous Operation	1
58	0666612		Engine, Cummins ISX12, 500 hp, 1645 ft-lb, W/OBD, EPA 2013, Vel	1
59	0001244		High Idle w/Electronic Engine, Custom	1
60	0678027		Engine Brake, Jacobs Compression Brake, Cummins Engine, with Allison Retarder	1
			Switch, Engine Brake - e) ISC/ISM/ISL9/ISX Hi Med Lo	
61	0552334		Clutch, Fan, Air Actuated, Horton Drive Master	1
62	0123135		Air Intake, w/Ember separator, Imp/Vel	1
63	0565965		Exhaust System, 5", 2010 DD13, ISX engine, Horizontal, Officer Side	1
64	0521146		Exhaust, Modified for Plymovent System, 7.00", 2007/2010 Engines	1
65	0557543		Radiator, Imp/Vel	1
66	0511426		Cooling Hoses, Silicone	1
67	0001125		Fuel Tank, 65 Gallon, Left Side Fill	1
68	0001129		Lines, Fuel	1
69	0582182		DEF Tank, 4.5 Gallon, DS Fill, Rearward of Rear Axle, Common Dr	1
			Door, Material & Finish, DEF Tank - Polished Stainless	
70	0552777		Fuel Pump for Repriming	1
71	0582243		Shutoff Valves, Fuel Line @ Primary Filter, Cummins	1
72	0553019		Cooler, Engine Fuel, Imp/Vel, AXT, Qtm, Saber, Dash CF	1
73	0578959		Fuel/Water Separator, Racor Inline	1
74	0642591		Trans, Allison 5th Gen, 4000 EVS PR, Imp/Vel/Vel SLT/Dash CF	1
			Trans. retarder capacity - d. low/1300, 4000 EVS	
			Trans, retarder control - l) Auto 1/3, 2/3, 3/3	

Line	Option	Type	Option Description	Qty
75	0510876		Transmission, Shifter, 6-Spd, Push Button Trans, ratio - 3000 EVS, 6Spd	1
76	0698377		Transmission Oil Cooler, Champ Retarder Cooler, with Modine External Sump Cooler	1
77	0001375		Driveline, Spicer 1810	1
78	0669988		Steering, Sheppard M110 w/Tilt, TAK-4, Eaton Pump, w/Cooler	1
79	0001544		Not Required, Steering assist cylinder on front axle	1
80	0509230		Steering Wheel, 4 Spoke without Controls	1
81	0690274		Logo/Emblem, on Dash Text, Row One - Denver Text, Row Two - Fire Text, Row Three - Department	1
82	0034671		Lube System, Vogel, 22 Point, w/TAK-4 Suspension Location - best location	1
83	0123625		Bumper, 19" Extended, Imp/Vel	1
84	0510226		Lift & Tow Package, Imp/Vel, AXT, Dash CF	1
85	0002270		Tow Hooks, Chrome	1
86	0659326		Center Tray Not Required	1
87	0511008		Tray, Hose center, 19" bumper w/inside Air Horns, Imp/Vel Grating, Bumper extension - Grating, Rubber Capacity, Bumper Tray - 08) 125' of 1.50"	1
88	0072353		Cover, Alum Treadplate, (notched) For Hose Tray Location - The cover will be located over the tray in the middle Qty, Hose Tray Covers - 1 Stay arm, Tray Cover - b) Pneumatic Stay Arm	1
89	0547106		Lights, Fog, PIAA 2110, 15213 Halogen Bulb (Rect) , Under Bumper	1
90	0668315		Cab, Velocity FR, 7010 Raised Roof	1
91	0667982		Engine Tunnel, ISX, Impel/Velocity FR	1
92	0677478		Rear Wall, Exterior, Cab, Aluminum Treadplate	1
93	0122466		Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel	1
94	0123176		Grille, Bright Finished, Front of Cab, Impel/Velocity	1
95	0002224		Scuffplates, S/S At Cab Door Jambs Material Trim/Scuffplate - c) S/S, Polished	1
96	0527032		Trim, S/S Band, Across Cab Face, Rect Lights, Velocity Material Trim/Scuffplate - e) S/S, Patterned Turnsignal Covers - No Covers	1
97	0087357		Molding, Chrome on Side of Cab	1
98	0032189		Mirrors, Ramco, 6000PCHR, Heated/Remote, w/Heated/Remote Convex, Door Mount	1
99	0667937		Door, Full Height, Velocity FR 4-Door Cab, Raised Roof	1
100	0655511		Door Panel, Brushed Stainless Steel, Impel/Velocity 4-Door Cab	1
101	0667905		Storage Pockets w/ Elastic Cover, Recessed, Impel/Velocity FR	1
102	0667902		Controls, Electric Windows, All Cab Doors, Impel/Velocity FR	1
103	0555485		Steps, 4-Door Full Tilt Cab, Std, Imp/Vel	1
104	0509649		Lights, Cab and Crew Cab Access Steps, P25, LED w/Bezel, 1 Light Per Step	1
105	0002140		Fenders, S/S on Cab	1
106	0122479		Window, Side of C/C, Fixed, Imp/Vel	1
107	0552935		Trim, Cab Side Windows, Velocity	1
108	0667980		Window, (2), Front of Crew Cab, 10" Raised Roof, Impel/Velocity FR	1
109	0509286		Not Required, Windows Rear of Crew Cab, Imp/Vel	1
110	0558334		Not Required, Trim, Cab Rear Windows, No Rear Windows	1
111	0667945		Cab Interior, Vinyl Covered Walls, Velocity FR Color, Cab Interior Vinyl/Fabric - a) Silver/Gray	1
112	0667943		Cab Interior, Paint Color, Impel/Velocity FR Color, Cab Interior Paint - a) gray	1
113	0509532		Floor, Rubber Padded Cab & Crew Cab, Imp/Vel, Dash CF	1
114	0667936		Heater/defroster, Dual Zone Control, Impel/Velocity FR	1
115	0640885		Air Conditioning, Impel/Velocity FR, Dual Zone Control, Center Mt, Hinge Acc Pnl	1
116	0543257		Grab Handles, Driver Door Post & Passenger Dash panel, Imp/Vel	1
117	0002526		Light, Engine Compt, All Custom Chassis	1
118	0122516		Fluid Check Access, Imp/Vel, AXT	1
119	0583042		Side Roll and Frontal Impact Protection	1

Line	Option	Type	Option Description	Qty
120	0000109		Seating Capacity, Cab Qty, - 06	6
121	0697005		Seat, Driver, Pierce PS6, Premium, Safety, Air Ride Hi-Back	1
122	0696994		Seat, Officer, Pierce PS6, Premium, Safety, Air Ride, SCBA	1
123	0656795		Radio Compt, Behind Frt Passenger Seat, Imp/Vel	1
124	0122183		Seat, Rr Facing C/C, DS Outboard, Pierce PS6, Premium, Safety, SCBA	1
125	0102783		Not Required, Seat, Rr Facing C/C, Center	1
126	0122186		Seat, Rr Facing C/C, PS Outboard, Pierce PS6, Premium, Safety, SCBA	1
127	0695189		Cabinet, EMS, Forward Facing, DS, 21 Wide x 64 High x 14 Deep, Lt Feature Door, EMS Cabinet - Amdor Roll Up Dr, No Lock Light, Tall EMS Compt - Amdor, Both Sides	1
128	0122744		Seat, Forward Facing C/C, Center, (2) Pierce PS6, Premium Safety, SCBA	1
129	0695182		Cabinet, EMS, Forward Facing, PS, 21 Wide x 64 High x 14 Deep, Lt Feature Door, EMS Cabinet - Amdor Roll Up Dr, No Lock Light, Tall EMS Compt - Amdor, Both Sides	1
130	0042264		Shelf, Adjustable, EMS Compt, 1.25" Lip Location - three (3) in each EMS cabinet Qty, Shelf - 06	6
131	0511300		Upholstery, Seats In Cab, All Imperial 1200, Pierce PS6 Color, Cab Interior Vinyl/Fabric - h) Gray/Black	1
132	0543991		Bracket, Air Bottle, Hands-Free II, Cab Seats Qty, - 05	5
133	0627339		Seat Belt, Ready Reach Seat Belt Color - Red	1
134	0553393		Seat Belt Height Adjustment, Imp/Vel, Dash CF Qty, - 06	6
135	0627014		Pick Not Required, Seat Belt Color Selected in Seat Belt Option 627339	1
136	0566465		Seat Belt Monitoring, NFPA 2009, Command Zone Color Display	1
137	0543133		Bracket, Helmet Holder, Zico UHH-1 Qty, Helmet Storage Brkt - 6	1
138	0647638		Lights, Dome, Weldon Dual LED 4 Lts Color, Dome Lt - Red & White Color, Dome Lt Bzl - Grey Control, Dome Lt White - Door Switches and Lens Switch Control, Dome Lt White - Door Switches and Lens Switch Control, Dome Lt Color - Lens Switch	1
139	0631776		Not Required, Overhead Map Lights	1
139	0000000	STF	Handlights, (2), Streamlight, SL45 HID, 12v, DIA 07/24/2014 Location, lights - one at the rear of the engine tunnel left side and one in the D3 compartment on forward wall	1
140	0544516		Spotlight, Handheld Cab, Specialty Lighting 2150-1 Location, lights - near officer	1
141	0568369		Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Velocity 2010, Dash CF	1
142	0509511		Air Restriction Indicator, Imp/Vel, AXT, Dash CF	1
143	0543751		Light, Do Not Move Apparatus Alarm, Do Not Move Truck - Pulsing Alarm	1
144	0509042		Messages, Open Door/Do Not Move Truck, Imp/Vel, Vel SLT, AXT, Dash CF	1
145	0509921		Switching, Cab, Membrane, Impel/Velocity/Quantum, AXT MUX, Dash CF Location, Emerg Sw Pnls - Driver's Side Overhead	1
146	0555915		Wiper Control, 2-Speed with Intermittent, Impel/Velocity, Dash CF	1
147	0548009		Wiring, Spare, 20 A 12V DC 1st Qty, - 01 12vdc power from - Battery direct Wire termination - s) stud Location - in the electronics box over the engine	1
148	0548006		Wiring, Spare, 15 A 12V DC 2nd Qty, - 02 12vdc power from - Battery direct Wire termination - p) 15 amp power point plug Location - panel #9	2
149	0548004		Wiring, Spare, 15 A 12V DC 1st Qty, - 04	4

Line	Option	Type	Option Description	Qty
149			12vdc power from - Battery direct Wire termination - b) butt splice Location - two (2) in the front of the cab behind panel #9 and two (2) in the rear, tucked into the center seat riser	
150	0528869		Labels, Power Distribution, Job Specific, VEL/IMP/Qtm/AXT/DCF	1
151	0087852		Vehicle Information Center, 7" Color Display, MUX	1
152	0543930		Vehicle Data Recorder, Dual Module	1
153	0696438		Antenna Mount, Custom Chassis, Cable Routed to Radio Box Location - on the driver and passenger side cab roof just to the rear of the lightbar Qty, - 02	2
154	0509965		Pierce Command Zone, Advanced Electronics and Control System, Diagnostic LEDs	1
155	0509732		Electrical System, Impel/Velocity/Velocity SLT	1
156	0079166		Batteries, (4) Exide Grp 31, 950 CCA each, Threaded Stud	1
157	0008621		Battery System, Single Start, All Custom Chassis	1
158	0123174		Battery Compartment, Imp/Vel	1
159	0579436		Charger, Sngl Sys, Kussmaul, 1200, 091-187-12-Remote, 40 Amp	1
160	0012782		Location, Charger, Front Left Side Body Compartment Location - high on the rear wall D3, high as possible, mouted horizontally, takes up most of the upper compartment	1
161	0536099		Location, Battery Charger Indicator, Driver's Step Area	1
162	0016856		Shoreline, 15A 120V, Kussmaul Auto Eject, "Super" Color, Kussmaul Cover - d) yellow Connection, Shoreline - the battery charger and the 6 place outlet in the crew cab Qty, Shoreline - 1	1
163	0026800		Shoreline Location Location, Shoreline (s) - 05) DS Rear bulkhead	1
164	0529667		Cover, Protection Battery Box IO Modules	1
165	0656404		Alternator, 320 amp, Leece-Neville 4909AA, Ext Rectifier, Duct	1
166	0695819		Sealer (Gorp), No Gorp Req'd on Elect Connections Execpt Fuel Sender	1
167	0540367		Programming, Multi-Plex, Changes Per Hour Location - Whelen 800 AOA lights Qty, - 02 Fill in Blank - activate with ignition switch and de-activate with the emergency master. The separate switch labeled "Airport Light" shall also operate the lights	2
168	0092582		Load Manager/Sequencer, MUX Enable/Disable Hi-Idle - d)High Idle disable	1
169	0648716		Headlights, Rectangular Halogen, Imp/Vel	1
170	0648425		Light, Directional, Whelen 600 LED Combination, Cab Corners, Imp/Vel/AXT/Qtm/DCF Color, Lens, LED's - m)match LED's	1
171	0648256		Light, Directional, Whelen M6T LED Arrow, Recessed, Angle Bracket, Back of Cab	1
172	0648074		Lights, Clearance/Marker/ID, Front, P25 LED, 7 Lts	1
173	0090155		Lights, Identification/Clearance, Rear, Truck-Lite, 35017R LED	1
174	0551870		Lights, Tail, Whelen M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir w/Flange Color, Lens - Colored	1
175	0551875		Lights, Backup, Whelen M6BUW, LED	1
176	0663884		Bracket, License Plate & Light, P25 LED, Temp Under Tailbrd Location - under tailboard driver side	1
177	0589905		Alarm, Back-up Warning, PRECO 1040	1
178	0566520		Indicator, Back-up Warning, Ultrasonic 4-zone Location - next to driver - see photo of the locations of the sensors on the rear bumper on the S:drive	1
179	0521285		Light, Directional/Marker, Intermediate Light, Truck-Lite Model 60115Y LED	1
180	0695735		Lights, Perimeter Scene Cab Exits, Truck-Lite 44310C LED Z location - Cab, Perimeter Scene - Cab, 4dr Custom	1
181	0695553		Lights, Perimeter Scene, Truck-Lite 44310C LED Pump Panel/Rear Step Area, 4lts Switch, Location, Perim - cab rocker switch	1
182	0545689		Lights, Perimeter Scene, Amdor LumaBar H2O, AY-9500-020, 20" LED, Brkt Qty, Lights - 01	1

Line	Option	Type	Option Description	Qty
182			Location, lights - under pump panel platfor step to meet ground lighting requirements	
183	0556360		Lights, Step, P25 LED 4lts	1
184	0690442		Light, FRC, 12V FCA530-V15, LED, Push Up, Side Mount 1st Location, lights - driver side back of cab each side Qty, - 01 To Do Not Move Truck Lt - c) Connected to Lt Switch, Lt Control 1 DC,1 - e) Pump Operators Panel Switch, Lt Control 2 DC,2 - e) No Control Switch, Lt Control 3 DC,3 - d) No Control Switch, Lt Control 4 DC,4 - d) No Control	1
185	0690440		Light, FRC, 12V FCA530-V15, LED, Push Up, Side Mount 2nd Location, lights - passenger side back of cab Qty, - 01 To Do Not Move Truck Lt - c) Connected to Lt Switch, Lt Control 1 DC,1 - e) Pump Operators Panel Switch, Lt Control 2 DC,2 - e) No Control Switch, Lt Control 3 DC,3 - d) No Control Switch, Lt Control 4 DC,4 - d) No Control	1
186	0590009		Light, Visor, Whelen, 12V PCP2B Pioneer LED Fld/Spt, Blk 1st Qty, - 02 Location, driver's/passenger's/center - 1DS & 1PS Switch, Lt Control 1 DC,1 - a) DS Switch Panel Switch, Lt Control 2 DC,2 - g) PS Switch Panel Switch, Lt Control 3 DC,3 - d) No Control	2
187	0066259		Lights, Deck, Betts (2), (1) Spot, (1) Flood, w/white housing	1
188	0645676		Lights, Not Required, Hose Bed, Deck Lights At Rear	1
189	0645681		Lights, Not Required, Rear Work, Deck Lights At Rear	1
190	0036960		Switch, Radio Master, w/40 Amp Breaker	1
191	0645687		Lights, Rear Scene, Whelen, M6ZC LED, 1st Location, lights - one each side of rear bulkheads recessed Qty, - 02 Control, Rear Scene Lts - Cab Switch Panel DS	2
192	0060016		Pumper, Long, Alum, 2nd Gen	1
193	0554271		Body Skirt Height, 20"	1
194	0028297		Tank, Water, 750 Gallon, Poly, Long	1
195	0003405		Overflow, 4" Water Tank, Poly	1
196	0028104		Foam Cell Required	1
197	0553725		Restraint, Water Tank, Heavy Duty, Special Type Tank, 4x4, or Export	1
198	0003429		No Direct Tank Fill Req'd	1
199	0003424		(No Dump Valve required)	1
200	0048710		Jet Assist Not Req'd	1
201	0030007		(No Dump Chute Required)	1
202	0514778		Not Required, Switch, Tank Dump Master	1
203	0126633		Hose Bed, Aluminum, Pumper	1
204	0003482		Hose Bed Capacity, Additional Capacity, Hosebed - 300' X 1.75", 500' X 2.5", 500' X 2.5", 500' X 2.5", 300' X 1.75"	1
205	0003488		Divider, Hose Bed, Unpainted Qty, Hosebed Dividers - 4	4
206	0003469		Liner, S/S, Both Side Walls and Front Wall	1
207	0522722		Cover, Hose Bed, Aluminized Neoprene, w/Hooks at Frt Color, Vinyl Cover - f) gray	1
208	0067106		Special Fasteners, Hose Bed Cover, Velcro w/ Metal, (Denver)	1
209	0013512		Runningboard, 12.75" Deep	1
210	0689621		Tailboard, 16" Deep	1
211	0690037		Wall, Rear, Smooth Aluminum/Body Material Material, Rear Wall Inboard Facing Surfaces - Aluminum Diamondplate	1
212	0003531		Tow Bar, Under Tailboard	1
213	0077384		Bumper, Rear, Aluminum Treadplate, Raised	1
214	0003518		Morton Cass Insert in Running Boards	1
215	0003516		Morton Cass Insert in Tailboard	1

Line	Option	Type	Option Description	Qty
216	0003561		Construction, Compt, Alum, Pumper	1
217	0063662		DS 161" Rollup, Full Height Front & Rear, FDLER	1
218	0063669		PS 161" Rollup, Full Height Front & Rear, FDLER	1
219	0642596		Doors, Rollup, Robinson, Body, w/Robinson Dr Switches	6
			Location - all body doors	
			Qty, Door Accessory - 06	
			Color, Roll-up Door - acc) ROM satin aluminum	
			Latch, Roll-up Door - Lift-bar	
220	0083701		Rear - Rollup Dr/44.50" FF	1
221	0040832		Door, Roll-up, Robinson, Rear Compt, W/Robinson Dr Switch	1
222	0554995		No Body Modification Required	1
223	0003918		Pull Strap for Doors	6
			Qty, Door Accessory - 06	
			Location, Door Accessory - all doors except rear door	
224	0551416		Lights, Compt, On Scene Solutions, LED & Truck-Lite Model 79384	7
			Location - each compartment	
			Qty, - 07	
225	0687146		Shelf Tracks, Painted	6
			Qty, Shelf Track - 06	
			location - with shelves	
226	0687112		Shelves, Adjustable, 500 lb Capacity, Full Width/Depth, Painted	13
			Qty, Shelf - 13	
			Location, Shelf - two (2) in upper P1, one (1) in P2, three (3) in upper P3, two (2) in upper D1, three (3) in upper D3, one (1) in R1, one (1) in D2	
227	0003984		Tray, 250 lb Slide-out, 2" Sides - Adj. Height	2
			Location - P3,D1	
			Qty, Tray (slide-out) - 02	
228	0647091		Tray, Floor Mounted, Slide-Out, 500lb, 2.00" Sides, 2G	1
			Qty, - 01	
			location - P1	
			Material - paint to match compt interior	
229	0529812		Access Panel, Compartment Wall, 1/4 Turn Fasteners	1
			Location - in the left front compartment	
			Size - size to fit	
			Fill in Blank - intake relief valve	
230	0656031		Compt, Backboard Storage, Over Pump	1
			Size, Backboard - 16.00" x 72.00" x 1.50" thick each	
			Door, Material & Finish, Storage - Aluminum Treaplate	
			Latch, Door, Storage - Lift and Turn Latch, Pair	
			Qty, Backboard Troughs - 2	
			Location, Backboard/Stokes Storage Over Pump - Forward, Crosslays	
			Access, Backboard/Stokes Compt - Both	
231	0003908		Partition, Trans Rear Compt	2
			Qty, Partition - 02	
			Location, Partition - c) both sides	
232	0004033		Rub Rail, Aluminum Extruded, Side of Body, Xtra Space (.50")	1
233	0510626		Fender Crowns, Rear, S/S, Wider Than Std.	1
234	0519849		Not Required, Hose, Hard Suction	1
235	0595906		Handrails, Side Pump Panels (3)	1
236	0588719		Handrails, Beavertail, Full Length DS, Offset PS	1
237	0004146		Handrail, Rear, Below Hose Bed, Full Width	1
238	0657524		Compt, Air Bottle, Single, Round, Fender Panel	3
			Qty, Air Bottle Comp - 3	
			Door Finish, Fender Compt - Polished	
			Location, Fender Compt - Single - DS Fwd, Single - PS Fwd and Single - PS Rear	
			Location, Fender Compt - Single - DS Fwd, Single - PS Fwd and Single - PS Rear	
			Location, Fender Compt - Single - DS Fwd, Single - PS Fwd and Single - PS Rear	
			Latch, Air Bottle Compt - Flush Lift & Turn	
			Insert, Air Bottle Compt - Rubber Matting	

Line	Option	Type	Option Description	Qty
239	0045527		Horizontal Mounting Tracks for Air Bottle Holders Location, Bracket/comp. - D2 and P2 over the rear wheel each side Qty, - 02 qty, Mounting Studs - 03	2
239	0000000	STF	Ladder, 24' Duo-Safety 900A 2-Sect, Provided By FRFA	1
239	0000000	STF	Ladder, 14' Duo-Safety 775A Roof, Provided By FRFA	1
240	0015036		Rack, Ladder, Hydraulic, Right Side, Air Clamps	1
241	0089550		Brkt, for 10' Folding Ladder Storage on HLR	1
241	0000000	STF	Ladder, Folding, 10' 585A, Duo-Safety, w/Mtg, Provided By FRFA Location, Fold Ladder - b) Hyd Rack	1
242	0509678		Cover,S/S, Over P/S Ladder Rack Air Locks, & D/S Spacer to Match Ht	1
242	0000000	STF	Pole, Pike 10' Akron, Fiberglass, Pumper, Provided by FRFA Qty, Pike Poles - 1 Location - hydraulic ladder rack	1
242	0000000	STF	Pole, Pike 6' DUO Safety, Fiberglass, Provided By FRFA Qty, Pike Poles - 1 Location - hydraulic ladder rack	1
243	0004361		Tubes, Alum, Pike Pole Storage Location - ladder rack Qty, Pike Pole Tubes - 02	2
244	0593072		Steps, Folding, Front of Body, w/LED, Trident Coating, Step - luminescent	1
245	0592995		Steps, Combo Folding Trident w/ LED & Corner, Rear Body Coating, Step - luminescent	1
246	0592990		Step, Folding - Extra, Body Only, Luminescent w/LED, Trident Qty, Folding Step - 02 Location, Additional Step - two on the left front body	2
247	0004460		Pump, Waterous, CMU, 1500 GPM, Two Stage	1
248	0004482		Seal, Mechanical, Waterous	1
249	0091446		Pump Setup Charges N/A	1
250	0559769		Transmission, Pump, Waterous C20 Series	1
251	0535256		Shift, Air w/ Manual Over, Split Shaft, Waterous	1
252	0003148		Transmission Lock-up, EVS	1
253	0004547		Auxiliary Cooling System	1
254	0004485		Valve, Electric Transfer (2 Stage Pump)	1
255	0004513		Valve, Relief Intake, Waterous	1
256	0546803		Controller, Pressure, Class 1 Total Pressure Governor (TPG)	1
257	0072153		Primer, Trident, Air Prime, Air Operated	1
258	0528229		Drain Locations, Special Instructions	1
259	0058516		Manuals, Pump (2), CD	1
260	0089351		Plumbing, Stainless Steel & Hose (Control Zone)	1
261	0064656		Not Required, Black Iron Pipe with S/S Plumbing	1
262	0004645		Inlets, 6.00" - 1250 GPM or Larger Pump	1
263	0004646		Cap, Long Handle Pump Inlet, NST - VLH	1
264	0549882		Valve, w/Relief, DS Inlet, 6", Electric Cntrl, LED, Manual Override, Wat Pump	1
265	0034651		Short Suction Tube, Passenger Side	1
266	0024615		Valves, Full Flow Waterous Side with Akron 8000 Series Valve Qty, Valves - 5	5
267	0004660		Inlet, LH Side, 2.50" Gated	1
268	0004680		Inlet, RH Side, 2.50" Gated	1
269	0016158		Valve, Inlet(s) Recessed, Side Cntrl, "Control Zone" Qty, Inlets - 2	2
270	0004700		Control, Inlet, at Valve	1
271	0092569		No Rear Inlet (Large Dia) Requested	1
272	0092696		No Rear Suction Cap	1
273	0064116		No Rear Inlet Actuation Required	1
274	0009648		No Rear Intake Relief Valve Req'd	1
275	0092568		No Rear Auxiliary Inlet Requested	1
276	0563738		Valve, .75 Bleeder, Aux. Side Inlet, Swing Handle	1
277	0029043		Tank to Pump, (1) 3.00" Valve, 3.00" Plumbing	1
278	0004905		Outlet, 1.50" Tank Fill	1

Line	Option	Type	Option Description	Qty
279	0004940		Outlets, Left Side, 2.50" Qty, Discharges - 02	2
280	0092570		Not Required, Outlets, Left Side Additional	1
281	0004945		Outlet(s), Right Side, 2.50" Qty, Discharges - 02	2
282	0092571		Not Required, Outlets, Right Side Additional	1
283	0654297		Outlet, 5.00" w/4.00" Valve, Right, Electric, Akron Electric Valve Controller	1
284	0648906		Outlet, Front, 2.50" w/2.50" Plumbing Location, Front - top of right bumper Fitting, Outlet - 2.50" NST with 90 degree swivel Drain, Front Outlet - Class 1 Automatic	1
285	0092575		Not Required, Outlet, Rear	1
286	0044930		Outlet, Rear, 2.50", Additional Location - Location will be one left and right side Qty, Discharges - 02	2
287	0004925		Outlet, Front HB, 1.50" w/2.00" plumbing Qty, Discharges - 02 Location, Outlet - c) one (1) each side	2
288	0085076		Caps for 1.50" - 3.00" Discharges - VLH	1
289	0563739		Valve, .75 Bleeder, Discharges, Swing Handle	1
290	0005091		Elbow, Left Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
291	0035094		Not Required, Elbow, Left Side Outlets, Additional	1
292	0025091		Elbow, Right Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
293	0089584		Not Required, Elbow, Right Side Outlets, Additional	1
294	0045099		Not Required, Elbow, Rear Outlets	1
295	0076593		Elbow, Rear Outlets, 45 Degree, 2.50" FNST x 2.5" MNST, VLH, Additional	1
296	0005099		Elbow, Large Dia Outlet, 30 Deg, 5.00" FNST x 5.00" Storz	1
297	0085090		Adapter - 1.50"F NST X 1.50"M Special Qty, Adapter for Outlets - 02 Special Threads - NPSH Location, Adaptor - rear hose bed outlets	2
298	0005085		Adapter, Thread - 2.50"F NST X 2.50"M Special Qty, Adapter for Outlets - 01 Special Threads - NPSH Location, Adaptor - the 2.5" crosslay	1
299	0039313		Adapter, Thread - 5" Storz X 2.5" MNST & Cap Qty, Adapter for Outlets - 01 Location, Adaptor - passenger side large diameter	1
300	0005090		Reducer - 2.50"F NST X 1.50"M Special, w/Cap Qty, Adapter for Outlets - 01 Special Threads - NPSH Location, Adaptor - front bumper discharge	1
301	0062133		Control, Outlets, Manual, Pierce HW if applicable	1
302	0005065		Outlet, 3.00" Deluge Riser	1
303	0029302		No Monitor Requested	1
304	0029304		No Nozzle Req'd	1
305	0005070		Deluge Mount, NPT	1
306	0015140		Crosslay, 1.50" Special Cap or Single Stack, (Pan Style) Capacity, Special Xlay - 300' x 1.5" Qty, Crosslays - 1	1
307	0029203		Crosslay, (1) 2.50" Std Cap, Pan Style	1
308	0029260		Not Required, Speedlays	1
309	0591145		Hose Restraint, Crosslay/Deadlay, Top and Ends, Elastic Netting Qty, - 02	2
310	0015180		Roller, Horiz/Vertical, (2) Crosslays	1
311	0005248		Reel, Booster - Rear Compt., Steel, Roll-up Door Finish, Reel - Painted Gray	1
312	0005279		Switch, Reel Rewind - One at Reel	1
313	0015300		No booster Hose Required (1) Reel	1
314	0005244		Capacity, Hose Reel 200' of 1"	1
315	0007428		Nozzle for Booster Reel Not Req'd	1
316	0005326		Blowout, Hose Reel - Valve at Panel	1

Line	Option	Type	Option Description	Qty
317	0095353		Foam Sys, Husky 12, (Dual Agent) Discharge - the front bumper outlet and the two crosslays Amount of Disc. W/Foam - 3	1
318	0012126		Not Required, CAF Compressor	1
319	0552484		Refill, Foam Tank, Dual Tank, Husky 12	1
320	0028553		Tag, Foam Tank	1
321	0031894		Demonstration, Foam System, at Factory Vehicle, Qty, Training, P - 1 vehicle	1
322	0005446		Foam Cell, 20 Gallon, Not Reduce Water Type of Foam - Class "B" Foam, Brand Name - AFFF	1
323	0505016		Drain, 1.00", Foam Tank #1, Husky 12 Foam System	1
324	0091082		Foam Cell #2, 20 Gallon Type of Foam - Class "B" Foam, Brand Name - ATC Polar Solvant	1
325	0505017		Drain, 1.00", Foam Tank #2, Husky 12 Foam System	1
326	0007575		Pump House, Side Control, 48", "Control Zone"	1
327	0519215		Pump Panel Configuration, Control Zone, Special Layout Information Fill in Blank - similar to job number 25594	1
328	0005525		Material, Pump Panels, Side Control Brushed Stainless	1
329	0005577		Panel, Pump Access - Pass Side and Front	1
330	0035501		Pump House Structure, Std Height	1
331	0005945		Light, Pump Compt	1
332	0586438		Gauges, Engine - Pump Panel, IAT Pressure Controller	1
333	0005601		Throttle Included w/ Pressure Controller	1
334	0549333		Indicators, Engine, Included with Pressure Controller	1
335	0065626		Compt, PS Pump Panel, Insulated, Rectifier	1
336	0044860		Test Port, Electronic, Pump RPM, Waterous Pump	1
337	0005690		Gauges, 6.0" Master, Class 1, 30"-0-600psi	1
338	0005715		Gauge, 3.5" Pressure, Class 1, 30"-0-600psi	1
339	0005651		Gauge, Water Level, IC, Incand 5 Light	1
340	0060753		Water Level Gauge, Whelen PSTANK, LED 1-Light, 4-Level Location - each side of the crew cab to the rear doors Qty, - 02 Activation, Water Level G - b) battery switched	2
341	0062988		Gauge, Foam Level, (2) Tanks, Class 1	1
342	0679660		Light Shield, S/S, On Scene Solutions Light Stik, LED	1
343	0003930		Microphone & Speaker w/Plain Door - Pump Operator's Position, Body Bulkhead	1
344	0508021		Air Horns, (2) Hadley 6" Round in Bumper Inside Frame Location, Air Horn (bmpr) - inside frame each side	1
345	0006064		Control, Air Horn, DS & PS Foot Sw	1
346	0006100		No Electronic Siren	1
347	0046133		No Siren Location	1
348	0076155		No Siren Switch	1
349	0006188		No Speaker	1
350	0550461		Location, Not Required, No Speaker (Q2B)	1
351	0016080		Siren, Federal Q2B	1
352	0006095		Siren, Mechanical, mounted above deckplate Location, Siren, Mech - a) Left	1
353	0026160		Control, Mech Siren, Horn Ring, PS Foot Sw	1
354	0566956	SP	Lightbar, Whelen, Freedom, FN**QLED, 6-R, 4-B, 2-RC, LED Opt Length, WIn Lightbar - 93" Opticom Priority - b) High Color, Lens, LED's - c)clear	1
355	0540451		Light, Front Zone, Whelen M6* LED, Colored Lens, 4lts Q Bezel Color, Lt DS Frnt Outside - r) DS Front Outside Red Color, Lt PS Frnt Outside - r) PS Front Outside Red Color, Lt DS Frnt Inside - w) DS Front Inside White Color, Lt PS Frnt Inside - w) PS Front Inside White	1
356	0653937		Flasher, Headlight Alternating Headlt flash deactivation - b)w/any head lights	1

Line	Option	Type	Option Description	Qty
357	0540687		Lights, Side Zone Lower, Whelen M6* LED, Colored Lens, 3pr, Ovr 25 Location, lights mid - trailing edge of cab Location, lights rear - rear fender panel above wheels Location, lights frt side - b)each side bumper Color, Lt Side Front - r) Side Front Lt Red Color, Lt Side Middle - b) Side Middle Lt Blue Color, Lt Side Rear - r) Side Rear Lt Red	1
358	0634517		Lights, Side, Whelen, M6* LED w/45 Degree Bezel, Cab Corner, pair Qty, Lights, Pair - 1 Control, light - b) side warning Color,Whln Sup600 LED - a) rd/rd Material, Bracket - Polished S/S	1
359	0540777		Lights, Rear Zone Lower, Whelen M6* LED, Colored Lens Color, Lt DS Rear - r) DS Rear Lt Red Color, Lt PS Rear - b) PS Rear Lt Blue	1
360	0006700		Mounting, Lights, Recess In Rear Bulkhead (pair) Location - upper rear scene lights Qty, Lights, Pair - 1	1
361	0098090		Light, Rear Zone Upper, Whelen B6MMR*1P, Super LED beacon Color, Dome, Rear Warning - b)both domes red Control, light - a) rear upper warning Color,Whln Sup700 LED - c) am/am	1
362	0006551		Not Required, Lights, Rear Upper Zone Blocking	1
363	0006615		Mtg, Rear Warn Lts, On Top of Compt	1
364	0529685		Light, Traffic Directing, Whelen TAL85, 46.81" Long LED Activation, Traffic Dir L - c)with the control head	1
365	0551728		Location, Traf Dir Lt, Recessed with S/S Trim	1
366	0530282		Location, Traf Dir Lt Controller, Overhead Switch Panel DS Right End	1
367	0076826		Cup Holder for Telescopic - Pushup - Light Pole Qty, 120/240 Volt Light - 2	2
368	0667191	SP	Light, Airport, Whelen 800DHAP, Strobe Bcn, Pr, Trdplt Brkt @ Rr Cab/Z Brkt Location - one rearward of the lightbar centered on a Z-bracket and the other at the rear of the cab centered on the rear exterior wall, top of light not to extend past the top of the cab roof	1
369	0016794		Receptacle Strip, 15A 120V Outlet, 6-Place, Shoreline Location, Receptacles - keep receptacle strip loose for Customer to install - hard wire from the shoreline to the lower rear engine tunnel area per the photo, department will mount receptacle strip Qty, Receptacles - 01	1
370	0086626		Receptacle, 15A 120V 3-Prong SB Dup, 4 place, Shoreline Location, Receptacles - one (1) in each EMS cabinet, low center of back wall Qty, Receptacles - 02	2
371	0519547		Brand, Hydraulic Tool System, TNT	1
372	0652716		Reel, Hyd, Mounting Provisions for Future Installation Qty, Reel - 1 Brand, Model, Age of Tool - Hannay reel with 100' of capacity, see photo for reference Location - P1 body compartment	1
372	0000000	STF	Fluid, Mineral Oil, One Gallon (fills 1 reel), Provided By FRFA Qty, - 1	1
372	0000000	STF	Hose, Hydra., TNT, 100', Twin Line, Provided By FRFA Location - right rear compartment Qty, - 1 Color, Hydraulic Hose 1 - f) red/red Color, Hydraulic Hose 2 - n) no hose required Color, Hydraulic Hose 3 - n) no hose required Color, Hydraulic Hose 4 - n) no hose required Color, Hydraulic Hose 5 - n) no hose required Color, Hydraulic Hose 6 - n) no hose required	1
372	0000000	STF	Hose, Hydra., TNT, 4'-12', Twin Line, Connection, Provided By FRFA Location - right rear compartment Qty, - 1 Color, Hydraulic Hose 1 - f) red/red	1

Line	Option	Type	Option Description	Qty
372			Color, Hydraulic Hose 2 - n) no hose required Color, Hydraulic Hose 3 - n) no hose required Color, Hydraulic Hose 4 - n) no hose required Color, Hydraulic Hose 5 - n) no hose required Color, Hydraulic Hose 6 - n) no hose required	
372	0000000	STF	Reel, Hyd, 100' Cap., .25" Dual Hose(Hannay) (Any Make Tool), Provided By FRFA Location - right rear Qty, Reel - 1 Brand, Model, Age of Tool - new TNT pump and tools Reel Guide - a) Nylatron guide	1
373	0007150		Bag of Nuts and Bolts Qty, Bag Nuts and Bolts - 1	1
374	0532880		NFPA Required Loose Equipment, Pumper, Provided by Dealer	1
374	0000000	STF	Hose, 6.00" Soft Suction - 15 Ft. Long, Provided By FRFA	1
375	0027023		No Strainer Required	1
376	0538060		Extinguisher, Dry Chemical, Pumper, Provided by Dealer	1
377	0538068		Extinguisher, 2.5 Gal. Pressurized Water, Pumper, Provided by Dealer	1
378	0538070		Axe, Flathead, Pumper, Provided by Dealer	1
379	0538074		Axe, Pickhead, Pumper, Provided by Dealer	1
380	0559573		Paint, Single Color, Custom Paint, Color - Lime yellow #40	1
381	0640911		Paint Chassis Frame Assy, E-Coat, All Joints Sealed Paint Color, Frame Assembly - Black	1
382	0693797		No Paint Required, Aluminum Front Wheels	1
383	0693792		No Paint Required, Aluminum Rear Wheels	1
384	0007738		Paint, Air Conditioner Cover/Mounts to Match Roof	1
385	0007230		Compartment, Painted, Spatter gray	1
386	0544111		Reflective Band, 10" Color, Reflect Band - A - d) blue	1
387	0510041		Reflective across Cab Face, Imp/Vel	1
388	0536954		Stripe, Chevron, Rear, Diamond Grade, Pumper Color, Rear Chevron DG - fluorescent yellow green	1
389	0593225		Stripe, Reflective, Cab Doors Interior, Diamond Grade Color, Reflect Band - A - p) fluorescent yellow green diamond grade	1
390	0033179		Lettering Specifications, Reflective	1
391	0685960		Lettering, Reflective, 3.00", (1-20) Outline, Lettering - No Outline or Shade	1
392	0686038		Lettering, Reflective, 2.00", (61-80) Outline, Lettering - No Outline or Shade	1
393	0685058		Lettering, Reflective, 24.00", Each Qty, Lettering - 02 Outline, Lettering - No Outline or Shade	2
394	0685978		Lettering, Reflective, 18.00", Each Qty, Lettering - 04 Outline, Lettering - No Outline or Shade	4
395	0041534		Emblem, (3) Letter Monogram Style with Lettering, Reflective, Denver, Each Qty, - 02 Location, Emblem - on the front cab doors Color, Reflective - d) blue	2
396	0530793		Emblem, American Flag, Flat (Not Moving), Pair, Mirror Images Qty, - 02 Location, Emblem - rear upper corners of crew cab each side Height, Emblem - e) 8"	2
397	0695610		Emblem, Reflective, Per Dept. Submittal, Each Qty, - 03 Location, Emblem - D2, P2 over wheels and R1 Size, Dept Seal, Reflect - 14" - 16"	3
397	0000000	STF	Service - Oil Samples, 03-31-2009	1
397	0000000	STF	Intercom & Radio Allowance for DIA -10-10-2011	1
397	0000000	STF	Hydraulic Tools, TNT, DIA, 10-25-2011	1
397	0000000	STF	Allison Transmission Service & Parts Manual 01-12-2009 Qty, - 1	1

Line	Option	Type	Option Description	Qty
397	0000000	STF	Cummins Service and Parts Manual, 01-12-2009 Qty, - 1	1
397	0000000	STF	Drive Away Service - Pumper 1/07/11	1
398	0032773		Manuals, Two (2), Fire Apparatus Parts, & (1) CD, Custom Chassis	1
399	0002905		Manuals, Two (2) Chassis Service, Custom	1
400	0032433		Manuals, Two (2) Chassis Operation, Custom	1
401	0030008		Warranty, Basic, 1 Year, Apparatus, WA0008	1
402	0553301		Warranty, Chassis, 3 Year, Velocity/Impel, WA0037	1
403	0696698		Warranty, Engine, Cummins, 5 Year, WA0181	1
404	0684953		Warranty, Steering Gear, Sheppard M110, 3 year WA0201	1
405	0595767		Warranty, Frame, 50 Year, Velocity/Impel, Dash CF, WA0038	1
406	0595245		(No Pick Required)	1
407	0595698		Warranty, Axle, 3 Year, TAK-4, WA0050	1
408	0683925	SP	Warranty, Axle, Rear, Meritor, Waived (Denver/West Metro)	1
409	0652758		Warranty, ABS Brake System, 3 Year, Meritor Wabco, WA0232	1
410	0019914		Warranty, Structure, 10 Year, Custom Cab, WA0012	1
411	0595813		Warranty, Paint, 10 Year, Cab, Pro-Rate, WA0055	1
412	0524627		Warranty, Electronics, 5 Year, MUX, WA0014	1
413	0046369		Warranty, 5-year EVS Transmission, Standard Custom, WA0187	1
414	0685945		Warranty, Transmission Cooler, WA0216	1
415	0688798		Warranty, Water Tank, Lifetime, UPF, Poly Tank, WA0195	1
416	0596025		Warranty, Structure, 10 Year, Body, WA0009	1
417	0681118		Warranty, Robinson, Roll-up Door, 7 Year, WA0206	1
418	0063510		Warranty, Pump, Waterous, 5 Year Parts, WA0225	1
419	0648675		Warranty, 10 Year S/S Pumbing, WA0035	1
420	0657846		Warranty, Foam System, Husky 12, WA0231	1
421	0595820		Warranty, Paint, 10 Year, Body, Pro-Rate, WA0057	1
422	0595412		Warranty, Graphics Lamination, 1 Year, Apparatus, WA0168	1
423	0683627		Certification, Vehicle Stability, CD0089	1
424	0648407		Certification, Engine Installation, Velocity, Cummins ISX12, 2013, CD0111	1
425	0686786		Certification, Power Steering, CD0098	1
426	0667417		Certification, Cab Integrity, Velocity FR	1
427	0548950		Certification, Cab Door Durability, Velocity/Impel, CD0001	1
428	0548967		Certification, Windshield Wiper Durability, Impel/Velocity, CD0005	1
429	0667411		Certification, Electric Window Durability, Velocity/Impel FR	1
430	0549273		Certification, Seat Belt Anchors and Mounting, Imp/Vel/Vel SLT, CD0018	1
431	0667416		Certification, Cab Heater and Defroster, Velocity/Impel FR	1
432	0667415		Certification, Cab Air Conditioning Performance, Velocity/Impel FR	1
433	0545073		Amp Draw Report, NFPA 2009 Edition	1
434	0002758		Amp Draw, NFPA Radio Allowance	1
435	0000018		PUMPER, 2ND GEN	1
436	0000012		PIERCE CHASSIS	1
437	0004713		ENGINE, OTHER	1
438	0046396		EVS 4000 Series TRANSMISSION	1
439	0020011		WATEROUS PUMP	1
440	0020009		POLY TANK	1
441	0028048		FOAM SYSTEM	1
442	0020006		SIDE CONTROL	1
443	0020007		AKRON VALVES	1
444	0020015		ABS SYSTEM	1
445	0658751		Manufacturing Attribute	1



Electrical Analysis

8/4/2014

Bid #: 569

Sales Rep: Doucette, Duane

Desc: DIA Velocity 4x2 Pumper 2015

Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0000000	Reel, Hyd, 100' Cap., .25" Dual Hose(Hannay) (Any Make Tool),		0.00	36.00	0.00
0001244	High Idle w/Electronic Engine, Custom		0.00	1.20	0.00
0002526	Light, Engine Compt, All Custom Chassis		0.00	1.60	0.00
0004485	Valve, Electric Transfer (2 Stage Pump)		0.00	0.00	0.20
0005248	Reel, Booster - Rear Compt.,Steel, Roll-up Door		0.00	36.00	0.00
0005945	Light, Pump Compt		0.00	1.80	0.00
0006064	Control, Air Horn, DS & PS Foot Sw		0.00	0.83	0.00
0012001	Chains, Insta-Chain automatic tire, Custom		0.00	1.50	0.00
0016080	Siren, Federal Q2B		0.00	100.00	0.00
0032189	Mirrors, Ramco, 6000PCHR, Heated/Remote, w/Heated/Remote		0.00	0.00	8.00
0044860	Test Port, Electronic, Pump RPM, Waterous Pump		0.00	0.00	0.08
0060753	Water Level Gauge, Whelen PSTANK, LED 1-Light, 4-Level		0.00	0.00	1.00
0062988	Gauge, Foam Level, (2) Tanks, Class 1		0.00	0.00	1.00
0065626	Compt, PS Pump Panel, Insulated, Rectifier		0.00	0.00	1.00
0072153	Primer, Trident, Air Prime, Air Operated		0.00	0.01	0.00
0079166	Batteries, (4) Exide Grp 31, 950 CCA each, Threaded Stud		0.00	3.00	0.00
0095353	Foam Sys, Husky 12, (Dual Agent)		0.00	5.00	0.00
0122466	Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel		0.00	180.00	0.00
0543751	Light, Do Not Move Apparatus		0.00	2.00	0.00
0544516	Spotlight, Handheld Cab, Specialty Lighting 2150-1		0.00	7.81	0.00
0547106	Lights, Fog, PIAA 2110, 15213 Halogen Bulb (Rect) , Under Bumper		0.00	8.59	0.00
0548004	Wiring, Spare, 15 A 12V DC 1st		0.00	0.00	60.00
0548006	Wiring, Spare, 15 A 12V DC 2nd		0.00	0.00	30.00
0549333	Indicators, Engine, Included with Pressure Controller		0.00	0.35	0.00
0551875	Lights, Backup, Whelen M6BUW, LED		0.00	3.20	0.00
0552777	Fuel Pump for Repriming		0.00	6.00	0.00
0589905	Alarm, Back-up Warning, PRECO 1040		0.00	0.50	0.00
0593760	ESC/ABS/ATC Wabco Brake System, Single Rear Axle, 2010		0.00	6.00	0.00
0634517	Lights, Side, Whelen, M6* LED w/45 Degree Bezel, Cab Corner, pair		0.00	2.70	1.80
0645687	Lights, Rear Scene, Whelen, M6ZC LED, 1st		0.00	0.00	4.00
0653937	Flasher, Headlight Alternating		0.00	0.00	0.08
0667191	Light, Airport, Whelen 800DHAP, Strobe Bcn, Pr, Trdplt Brkt @ Rr		0.00	0.00	5.50
0667902	Controls, Electric Windows, All Cab Doors, Impel/Veloccity FR		0.00	26.00	0.00
0667936	Heater/defroster, Dual Zone Control, Impel/Veloccity FR		0.00	0.00	12.10
0678027	Engine Brake, Jacobs Compression Brake, Cummins Engine, with		0.00	0.42	0.00
0690440	Light, FRC, 12V FCA530-V15, LED, Push Up, Side Mount 2nd		0.00	0.00	13.00
0548009	Wiring, Spare, 20 A 12V DC 1st	LM	0.00	0.00	20.00
0590009	Light, Visor, Whelen, 12V PCP2B Pioneer LED Fld/Spt, Blk 1st	LM	0.00	0.00	24.00
0640885	Air Conditioning, Impel/Veloccity FR, Dual Zone Control, Center Mt,	LM	0.00	0.00	96.50
0690442	Light, FRC, 12V FCA530-V15, LED, Push Up, Side Mount 1st	LM	0.00	0.00	13.00
0002758	Amp Draw, NFPA Radio Allowance	NFPA	5.00	0.00	0.00
0005651	Gauge, Water Level, IC, Incand 5 Light	NFPA	1.23	0.00	0.00
0063662	DS 161" Rollup, Full Height Front & Rear, FDLER	NFPA	4.50	0.00	4.50
0063669	PS 161" Rollup, Full Height Front & Rear, FDLER	NFPA	4.50	0.00	4.50
0066259	Lights, Deck, Betts (2), (1) Spot, (1) Flood, w/white housing	NFPA	7.80	0.00	0.00
0083701	Rear - Rollup Dr/44.50" FF	NFPA	0.90	0.00	0.90
0087852	Vehicle Information Center, 7" Color Display, MUX	NFPA	1.20	0.00	0.00
0090155	Lights, Identification/Clearance, Rear, Truck-Lite, 35017R LED	NFPA	0.25	0.25	0.50
0092582	Load Manager/Sequencer, MUX	NFPA	0.56	0.56	0.00
0098090	Light, Rear Zone Upper, Whelen B6MMR*1P, Super LED beacon	NFPA	6.00	0.00	0.00
0509649	Lights, Cab and Crew Cab Access Steps, P25, LED w/Bezel, 1 Light	NFPA	1.00	0.00	0.00
0521285	Light, Directional/Marker, Intermediate Light, Truck-Lite Model 60115Y	NFPA	0.25	0.25	0.00

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



Electrical Analysis

8/4/2014

Bid #: 569

Sales Rep: Doucette, Duane

Desc: DIA Velocity 4x2 Pumper 2015

Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0529685	Light, Traffic Directing, Whelen TAL85, 46.81" Long LED	NFPA	2.08	0.00	0.00
0535256	Shift, Air w/ Manual Over, Split Shaft, Waterous	NFPA	1.00	0.00	0.00
0540451	Light, Front Zone, Whelen M6* LED, Colored Lens, 4lts Q Bezel	NFPA	1.80	5.40	1.80
0540687	Lights, Side Zone Lower, Whelen M6* LED, Colored Lens, 3pr, Ovr 25	NFPA	5.40	8.10	0.00
0540777	Lights, Rear Zone Lower, Whelen M6* LED, Colored Lens	NFPA	1.80	2.70	0.00
0545689	Lights, Perimeter Scene, Amdor LumaBar H2O, AY-9500-020, 20"	NFPA	0.12	0.00	0.00
0546803	Controller, Pressure, Class 1 Total Pressure Governor (TPG)	NFPA	1.70	0.00	0.00
0551870	Lights, Tail, Whelen M6BTT* Red LED Stop/Tail & M6T* Amber LED	NFPA	0.83	2.49	0.00
0555915	Wiper Control, 2-Speed with Intermittent, Impel/Velocit, Dash CF	NFPA	2.10	8.40	0.00
0556360	Lights, Step, P25 LED 4lts	NFPA	1.00	0.00	0.00
0566956	Lightbar, Whelen, Freedom, FN**QLED, 6-R, 4-B, 2-RC, LED Opt	NFPA	16.80	0.20	0.00
0568012	Air Dryer, Wabco System Saver 1200, 2010	NFPA	7.81	0.00	0.00
0568369	Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Velocit 2010,	NFPA	1.26	0.00	0.00
0582182	DEF Tank, 4.5 Gallon, DS Fill, Rearward of Rear Axle, Common Dr	NFPA	0.60	11.40	0.00
0586438	Gauges, Engine - Pump Panel, IAT Pressure Controller	NFPA	0.30	0.00	0.00
0642591	Trans, Allison 5th Gen, 4000 EVS PR, Imp/Vel/Vel SLT/Dash CF	NFPA	2.00	2.00	0.00
0647638	Lights, Dome, Weldon Dual LED 4 Lts	NFPA	0.80	0.80	0.00
0648074	Lights, Clearance/Marker/ID, Front, P25 LED, 7 Lts	NFPA	0.49	0.00	0.00
0648256	Light, Directional, Whelen M6T LED Arrow, Recessed, Angle Bracket,	NFPA	1.80	2.70	0.00
0648425	Light, Directional, Whelen 600 LED Combination, Cab Corners,	NFPA	0.70	0.70	0.00
0648716	Headlights, Rectangular Halogen, Imp/Vel	NFPA	5.46	7.82	0.00
0663884	Bracket, License Plate & Light, P25 LED, Temp Under Tailbrd	NFPA	0.07	0.00	0.00
0666612	Engine, Cummins ISX12, 500 hp, 1645 ft-lb, W/OBD, EPA 2013, Vel	NFPA	6.00	0.00	0.00
0668315	Cab, Velocity FR, 7010 Raised Roof	NFPA	6.80	10.20	0.00
0679660	Light Shield, S/S, On Scene Solutions Light Stik, LED	NFPA	2.00	0.00	0.00
0695182	Cabinet, EMS, Forward Facing, PS, 21 Wide x 64 High x 14 Deep, Lt	NFPA	2.50	0.00	2.50
0695189	Cabinet, EMS, Forward Facing, DS, 21 Wide x 64 High x 14 Deep, Lt	NFPA	2.50	0.00	2.50
0695553	Lights, Perimeter Scene, Truck-Lite 44310C LED Pump Panel/Rear	NFPA	1.08	0.00	0.00
0695735	Lights, Perimeter Scene Cab Exits, Truck-Lite 44310C LED	NFPA	1.08	0.00	0.00
0656404	Alternator, 320 amp, Leece-Neville 4909AA, Ext Rectifier, Duct	S	0.00	0.00	0.00
Load Totals:			111.07	494.48	308.46

Note: Minimum Continuous Load is in "Blocking Right of Way" mode.(Reference current edition of NFPA 1901)

Note: Intermittent Load items are not factored in on any alternator load comparisons. These items are included on the report for reference only and should be looked at as amp draw exclusion items. (Reference current edition of NFPA 1901)

Note: Total Connected Load "Demand" represents Total Connected Load minus any Load Managed items

Alternator Output at Idle: 187.00

Minimum Continuous Load	
Supply:	187.00
Demand:	111.07
Variance:	75.93

Alternator Output at Governed Speed: 286.00

Total Connected Load	
Supply:	286.00
Demand:	266.03
Variance:	19.97

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



Turning Performance Analysis

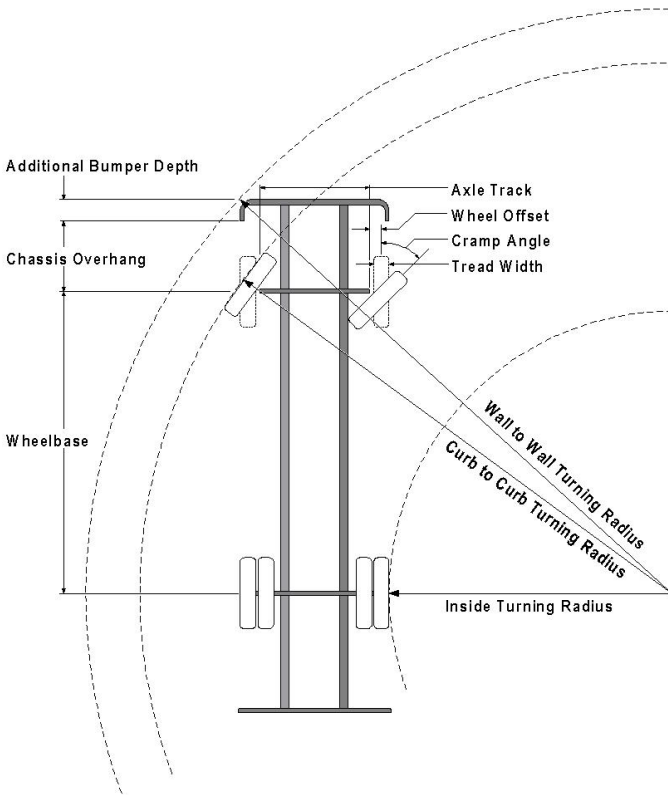
08/04/2014

Bid Number: 569

Department: Denver, City and County-DIA

Chassis: Velocity Chassis (Big Block), 2010

Body: Pumper, Long, Alum, 2nd Gen



Parameters:

Inside Cramp Angle:	45°
Axle Track:	82.92 in.
Wheel Offset:	4.68 in.
Tread Width:	16.6 in.
Chassis Overhang:	78 in.
Additional Bumper Depth:	19 in.
Front Overhang:	97 in.
Wheelbase:	197 in.

Calculated Turning Radii:

Inside Turn:	15 ft. 4 in.
Curb to curb:	29 ft. 7 in.
Wall to wall:	34 ft. 7 in.

Comments:

Category	Option	Description
Axle, Front, Custom	0508849	Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel
Wheels, Front	0019611	Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot
Tires, Front	0078244	Tires, Front, Michelin, XZY3 (wb), 425/65R22.50, 20 ply
Bumpers	0123625	Bumper, 19" Extended, Imp/Vel

Notes:

Actual Inside cramp angle may be less due to highly specialized options.

Curb to Curb turning radius calculated for 9.00 inch curb.

Definitions:

Inside CrampAngle	Maximum turning angle of the front inside fire.
Axle Track	King-pin to King-pin distance of front axle.
Wheel Offset	Offset from the center line of the wheel to the King-pin.
Tread Width	Width of the tire tread.
Chassis Overhang	Distance of the center line of the front axle to the front edge of the cab. This does not include the bumper depth.
Additional Bumper Wheel	Depth that the bumper assembly adds to the front overhang.
Wheelbase	Distance between the center lines of the vehicles front and rear axles.
Inside Turning Radius	Radius of the smallest circle around which the vehicle can turn.
Curb to Curb Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures assumes a curb height of 9 inches.
Wall to Wall Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures takes into account any front overhang due to chassis , bumper extensions and or aerial devices.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



Front Range Fire Apparatus is pleased to submit to Denver Fire Department for a **Pierce® triple combination pumper** per your request for quotation. The following paragraphs will describe in detail the apparatus, construction methods, and equipment. This will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

PIERCE MANUFACTURING was founded in 1913. Since then we have been building bodies with one philosophy, "BUILD THE FINEST". Our skilled craftsmen take pride in their work, which is reflected, in the final product. We have been building fire apparatus since the early "forties" giving Pierce Manufacturing over 60 years of experience in the fire apparatus market. Pierce Manufacturing has built and put into service more than 51,000 apparatus, including more than 27,000 on Pierce custom chassis designed and built specifically for fire and emergency applications. Our Appleton, Wisconsin facility has over 757,000 total square feet of floor space situated on approximately 97 acres of land. Our Bradenton, Florida facility has 300,000 square feet of floor space situated on approximately 38 acres of land.

Our beliefs in high ethical standards are carried through in our commitments to all with whom we do business and our ethical standards do not change. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we (nor our parent company) engage in or have been convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

Pierce has only one brand of fire apparatus "Pierce", ensuring you are receiving top of the line product that meets your specification.

In accordance with the current addition of NFPA 1901 standards, will specify whether the fire department, manufacturer, or apparatus dealership will provide required loose equipment.

Images and illustrative material are as accurate as known at the time of publication, but are subject to change without notice. Images and illustrative material is for reference only, and may include optional equipment and accessories and may not include all standard equipment.

GENERAL DESIGN AND CONSTRUCTION

To control quality, ensure compatibility, and provide a single source for service and warranty, the custom cab, chassis, pump module and body will be entirely designed, assembled/welded and painted in Pierce owned manufacturing facilities. This includes, but not limited to the cab weldment, the pumphouse module assembly, the chassis assembly, the body and the electrical system.

QUALITY AND WORKMANSHIP

Pierce has set the pace for quality and workmanship in the fire apparatus field. Our tradition of building the highest quality units with craftsmen second to none has been the rule right from the beginning and we demonstrate that ongoing commitment by: Ensuring all steel welding follows American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding follows American Welding society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding follows American welding Society B2.1-2000 requirements for structural welding of sheet metal. Our flux core arc welding uses alloy rods, type 7000 and is performed to American Welding Society standards A5.20-E70T1. Furthermore, all employees classified as welders are tested and certified to meet the American welding Society codes upon hire and every three (3) years thereafter. Pierce also employs and



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

Pierce Manufacturing operates a Quality Management System under the requirements of ISO 9001. These standards sponsored by the International Organization for Standardization (ISO) specify the quality systems that are established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance is included.

In addition to the Quality Management system, we also employ a Quality Achievement Supplier program to insure the vendors and suppliers that we utilize meet the high standards we demand. That is just part of our overall "Quality at the Source" program at Pierce.

To demonstrate the quality of our products and services, a list of at least ten (10) fire departments/municipalities that have purchased vehicles for a second time is provided.

DELIVERY

The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty. A qualified delivery representative shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in proper operation, care and maintenance of the equipment delivered.

MANUAL AND SERVICE INFORMATION

At time of delivery, complete operation and maintenance manuals covering the apparatus will be provided. A permanent plate will be mounted in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

SAFETY VIDEO

At the time of delivery Pierce will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. This video will address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.

PERFORMANCE TESTS

A road test will be conducted with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus when fully loaded will not have less than 25 percent nor more than 50 percent on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. The apparatus will meet NFPA 1901 acceleration and braking requirements.

SERVICE AND WARRANTY SUPPORT

Pierce dealership support will be provided by Front Range Fire Apparatus by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within fifty (50) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyauwega, Wisconsin and Bradenton, Florida. Pierce also maintains a dedicated parts facility of over 100,000 square feet in Appleton, Wisconsin. The parts facility stocks in excess of \$5,000,000 in parts dedicated



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



to service and replacement parts. The parts facility employs a staff dedicated solely for the distribution and shipment of service and replacement parts.

Service parts for the apparatus can be found via Pierceparts.com which, is an interactive online tool that delivers information regarding your specific apparatus as well as the opportunity to register for training classes.

As a Pierce customer you have the ability to view the complete bill of materials for your specific apparatus, including assembly drawings, piece part drawings, and beneficial parts notations.

You will also have the ability to search the complete Pierce item master through a parts search function which offers all Pierce SKU's and descriptions offered on all Pierce apparatus.

Published component catalogs, which include proprietary systems along with an extensive operators manual library is available for easy reference.

Pierce Manufacturing maintains a dedicated service and warranty staff of over 35 personnel, dedicated to customer support, which also maintains a 24 hour 7 day a week toll free hot line, four (4) on staff EVTs, and offers hands-on repair and maintenance training classes multiple times a year.

COMMERCIAL GENERAL LIABILITY INSURANCE

Certification of insurance coverage will be enclosed.

SINGLE SOURCE MANUFACTURER

Pierce Manufacturing, Inc. provides an integrated approach to the design and manufacture of our products that delivers superior apparatus and a dedicated support team. From our facilities, the chassis, cab weldment, cab, pumphouse (including the sheet metal enclosure, valve controls, piping and operators panel) and body will be entirely designed, tested, and hand assembled to the customer's exact specifications. The electrical system either hardwired or multiplexed, will be both designed and integrated by Pierce Manufacturing. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by Pierce as a single source manufacturer. Pierce's single source solution adds value by providing a fully engineered product that offers durability, reliability, maintainability, performance, and a high level of quality.

Your apparatus will be manufactured in Appleton, Wisconsin.

SPECIAL INSTRUCTIONS

The apparatus will be designed and built to match the unit delivered in 2012. Job number 25594. However, some variation may be necessary due to changes in our manufacturing processes or our product offering. Revisions in NFPA guidelines and/or other regulations may also affect our ability to match the previous unit.

NFPA 2009 STANDARDS

This unit will comply with the NFPA standards effective January 1, 2009, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces will be supplied with delivery of the apparatus.

A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company will designate, in writing, who is qualified to witness and certify test results.

NFPA COMPLIANCY

Apparatus will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated as "non-NFPA".

VEHICLE INSPECTION PROGRAM CERTIFICATION

To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, will be third-party, audit-certified through Underwriters Laboratory (UL) that it is built and complies with all applicable standards in the current edition of NFPA 1901. The certification will include: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.

A placard will be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

PUMP TEST

Underwriters Laboratory (UL) will test, approved, and certify the pump. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the pump manufacturer's record of pump construction details will be forwarded to the Fire Department.

GENERATOR TEST

If the unit has a generator, Underwriters Laboratory (UL) will test, approved, and certify the generator. The test results will be provided to the Fire Department at the time of delivery.

BREATHING AIR TEST

If the unit has breathing air, Pierce Manufacturing will draw an air sample from the air system and have the sample certified that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*.

INSPECTION TRIP #1

An inspection trip will be provided for two (2) people. Trip will take place at the customer location for a preconstruction conference. .

INSPECTION TRIP #2

An inspection trip will be provided for two (2) people. Trip will take place at the factory for a post paint inspection, customer will pay their own expenses.

INSPECTION TRIP #3

An inspection trip will be provided for two (2) people. Trip will take place at the factory for a delivery inspection, customer will pay their own expense.

BID BOND, NOT REQUESTED

A bid bond will not be included. If requested, the following will apply:



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



All bidders will provide a bid bond as security for the bid in the form of a 5% bid bond to accompany their bid. This bid bond will be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond will be issued by an authorized representative of the Surety Company and will be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond will include language, which assures that the bidder/principal will give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.

PERFORMANCE BOND, 1 YEAR

The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required. Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included. Owner agrees that the penal amount of this bond will be simultaneously amended to 25 percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type will not exceed one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

APPROVAL DRAWING

A drawing of the apparatus will be prepared and provided to the purchaser for approval before construction begins. The Pierce sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the purchaser showing any changes made to the approval drawing.

DRAWING, PRELIMINARY LAYOUT, PUMP OPERATOR'S PANEL

A detailed drawing, to scale, of the pump operator's panel will be provided for the purpose of illustrating the standard location(s) of controls and discharges on the pump operator's panel. The drawing will not be meant as an approval, or final construction drawing, rather it will be used as



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



an illustration drawing of a standard panel layout. This drawing will include all of the gauges and controls located on the pump operator's panel.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

VELOCITY™ CHASSIS

The Pierce® Velocity™ is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt-type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy-duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required. The chassis will be the manufacturer's first line tilt cab.

TARGET OVERALL LENGTH

The target overall length of the apparatus will be approximately 32' - 5.25".

WHEELBASE

The wheelbase of the vehicle will be 197.00".

GVW RATING

The gross vehicle weight rating will be 50,000 pounds.

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb. over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb. over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated .38" thick steel, with 3.50" wide flanges.

FRONT NON DRIVE AXLE

The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 22,800 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



Camber at load will be zero degrees for optimum tire life.

The ball joint bearing will be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle. The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

FRONT SUSPENSION

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 22,800 lb.

The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

Each wheel will have torsion bar type spring. In addition, each front wheel end will also have energy absorbing jounce bumpers to prevent bottoming of the suspension.

The suspension design will be such that there are at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.

FRONT SHOCK ABSORBERS

Heavy-duty telescoping shock absorbers (KONI) will be provided on the front suspension.

FRONT OIL SEALS

Oil seals with viewing window will be provided on the front axle.

FRONT TIRES

Front tires will be Michelin 425/65R22.50 radials, 20 ply all-position XZY3 wide base tread, rated for 22,800 lb. maximum axle load and 65 mph maximum speed.

The tires will be mounted on Alcoa© 22.50" x 12.25" polished aluminum disc type wheels with a ten (10) stud, 11.25" bolt circle.

TURNING RADIUS REPORT

A turning radius analysis of the custom Pierce chassis will be included. This analysis will provide information on the inside turning radius, the outside turning radius, the curb to curb turning radius, and the wall to wall turning radius.

REAR AXLE

The rear axle will be a Meritor™, Model RS-26-185, with a capacity of 27,000 lb.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



TOP SPEED OF VEHICLE

A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 65 MPH.

REAR SUSPENSION

The rear suspension will be a Reyco Model 79KB with a ground rating of 27,000 lb. Spring hangers and mounting components will be cast. The suspension utilizes two (2) attaching points with variable rate spring cams and rubber bushed adjustable torque arms.

REAR OIL SEALS

Oil seals will be provided on the rear axle.

DRIVER CONTROL DIFFERENTIAL LOCK (DCDL)

A rear axle will be equipped with a driver controlled differential lock (DCDL).

The control will be located within easy reach of the driver. An indicator light will be provided next to the control switch.

REAR TIRES

Rear tires will be four (4) Michelin 12R22.50 radials, 16 ply all season XDN2 tread, rated for 27,120 lb. maximum axle load and 75 mph maximum speed.

The tires will be mounted on Alcoa© 22.50" x 8.25" polished aluminum disc wheels with a ten (10) stud 11.25" bolt circle.

TIRE BALANCE

All tires will be balanced with Counteract balancing beads. The beads will be inserted into the tire and eliminate the need for wheel weights.

TIRE PRESSURE MANAGEMENT

There will be a VECSAFE LED tire alert pressure management system provided that will monitor each tire's pressure. A chrome plated brass sensor will be provided on the valve stem of each tire for a total of six (6) tires.

The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 20 and 120 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops eight (8) psi.

Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start blinking.

AUTOMATIC TIRE CHAINS

One (1) pair of Insta-Chain automatic tire chains will be provided at the rear. The system will be electric-over-air operated with a locking switch on the cab instrument panel to prevent accidental activation of the system. The system may be engaged at speeds up to 25 mph and operated at speeds up to 35 mph.

MUD FLAP EVEN WITH FENDERETTS

A mud flap shall be installed so it is even with the outside fenderetts.

MUD FLAPS

Mud flaps with a Pierce logo will be installed behind the front and rear wheels.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



WHEEL CHOCKS

There will be one (1) pair of Ziamatic SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

WHEEL CHOCK BRACKETS

There will be one (1) pair of Ziamatic SQCH-44-H style horizontal mounting wheel chock brackets provided for the Ziamatic SAC-44-E folding wheel chocks. The brackets will be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets will be mounted under D1 per the drawing.

ELECTRONIC STABILITY CONTROL

A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.

The system will monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system will automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.

The system will monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system will selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco 4S4M, anti-lock braking system. The ABS will provide a four (4) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any wheel begins to lockup, a signal will be sent to the control unit. This control unit will then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

AUTOMATIC TRACTION CONTROL

An anti-slip feature will be included with the ABS. The Automatic Traction Control will be used for traction in poor road and weather conditions. The Automatic Traction Control will act as an electronic differential lock that will not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) will work with the engine ECU, sharing information concerning wheel slip. Engine ECU will use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. A "mud/snow" switch will be provided on the instrument panel. Activation of the switch will allow additional tire slip to let the truck climb out and get on top of deep snow or mud.

BRAKES

The service brake system will be full air type.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Meritor™ 16.50" x 8.63" cam operated with automatic slack adjusters.

AIR COMPRESSOR, BRAKE SYSTEM

The air compressor will be a Cummins/Wabco with 18.7 cubic feet per minute output.

BRAKE SYSTEM

The brake system will include:

- Bendix dual brake treadle valve with vinyl covered foot surface
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 4,362 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, will be provided with an automatic spring brake application at 40 psi

The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

- Wabco System Saver 1200 air dryer with spin-on coalescing filter cartridge
- 100 Watt Heater

BRAKE LINES

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

AIR INLET WITH AUTOMATIC EJECT

One (1) air inlet with Kussmaul Air Eject will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will automatically disconnect the air line when the truck is started. It will be equipped with a male coupling and be located on the driver side rear bulkhead of body. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female coupling will also be provided with the loose equipment.

AIR OUTLET

One (1) air outlet will be installed with a female coupling and shut off valve, located in the front body compartment on driver side. This system will tie into the "wet" tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

Female coupling and male fitting will be .25" thread.

A mating male fitting will be provided with the loose equipment.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



AIR HOSE

There shall be two (2) twenty-five (25) ft. length(s) of air hose will be furnished with fittings. An air chuck will be provided with the air hose. The air chuck will fit the valve stems that are provided on the tires.

AIR TANK, ADDITIONAL

An additional air tank with 1,454 cubic inch displacement will be provided to increase the capacity of the air system. This tank will be dedicated for air horn use.

The air tank will be primed and painted to meet a minimum 750 hour salt spray test. To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

The output flow of the engine air compressor varies with engine RPM. Full compressor output is only achieved at governed engine speed. Engine speed may be limited by generators, pumps and other PTO driven options.

AUXILIARY BRAKING SYSTEMS

When two (2) separate auxiliary braking systems are installed on a unit they will be programmed or wired to provide separate or simultaneous operation.

In this case, it will be the transmission retarder and the Jake Brake. They will be set up so when the retarder comes on, the Jake will activate at the same time.

The Jake will start on deceleration and the transmission retarder will also start on brake application.

ENGINE

The chassis will be powered by an electronically controlled engine as described below:

Make: Cummins

Model: ISX12

Power: 500 hp at 1800 rpm

Torque: 1645 lb.-ft. at 1200 rpm

Governed Speed: 2100 rpm

Emissions Level: EPA 2013

Fuel: Diesel

Cylinders: Six (6)

Displacement: 729 cubic inches (11.9L)

Starter: Delco 39MT

Fuel Filters: Spin-on style primary filter with water separator & water-in-fuel sensor. Secondary spin-on style filter.

Coolant Filter: Engine mounted spin-on style with shut-off valve.

The engine will include On-board diagnostics (OBD), which provides self-diagnostic and reporting. The system will give the owner or repair technician access to state of health information for various vehicle sub systems. The system will monitor vehicle systems, engine and aftertreatment. The system will illuminate a malfunction indicator light on the dash console if a problem is detected.

HIGH IDLE

A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle."

ENGINE BRAKE

A Jacobs engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver will be able to turn the engine brake system on/off and have high, medium and low setting.

The high setting of the brake application will activate and work simultaneously with the variable geometry turbo (VGT) provided on the engine.

The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

The ABS system will automatically disengage the auxiliary braking device, when required.

CLUTCH FAN

A Horton fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position.

ENGINE AIR INTAKE

An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, rotomolded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.

EXHAUST SYSTEM

The exhaust system will include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the SCR device and will be 5.00" in diameter. An insulation wrap will be provided on all exhaust pipe between the turbo and SCR to minimize the transfer of heat to the cab. The exhaust will terminate horizontally ahead of the passenger side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

EXHAUST MODIFICATION

The exhaust pipe will be brought out from under the body at a 90 degree angle from the truck. The tail pipe will extend a minimum of 2.00" past the body, adaptable for the Plymovent system. The diameter of the pipe will be 7.00". There will be a clearance of 4.00" completely around the pipe once past the side of the body. A stop will be provided on the tail pipe that will prevent the nozzle from sliding too far on.

RADIATOR

The radiator and the complete cooling system will meet or exceed NFPA and engine manufacturer cooling system standards.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. No solder joints or leaded material of any kind will be acceptable in the core assembly. The radiator core will have a minimum frontal area of 1434 square inches. Supply and return tanks made of glass-reinforced nylon will be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.

There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators. The radiator assembly will include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

A drain port will be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

A heavy-duty fan will draw in fresh, cool air through the radiator. Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Silicone hoses will be used for all engine/heater coolant lines installed by the chassis manufacturer.

Hose clamps will be stainless steel "constant torque type" to prevent coolant leakage. They will react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

FUEL TANK

A 65-gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent.

To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.

A .75" drain plug will be located in a low point of the tank for drainage.

A fill inlet will be located on the left hand side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

A .50" diameter vent will be installed from tank top to just below fuel fill inlet.

The fuel tank will meet all FHWA 393.67 requirements including a fill capacity of 95 percent of tank volume.

All fuel lines will be provided as recommended by the engine manufacturer.

DIESEL EXHAUST FLUID TANK

A 4.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body rearward of the rear axle. The tank will be constructed of 16-gauge type 304- L stainless steel.

A .50" drain plug will be provided in a low point of the tank for drainage.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



A fill inlet will be provided and marked "Diesel Exhaust Fluid Only". The fill inlet will be located adjacent to the engine fuel inlet behind a common hinged, spring loaded, polished stainless steel door on the driver side of the vehicle.

The tank will meet the engine manufacturer's requirement for 10 percent expansion space in the event of tank freezing.

The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

AUXILIARY FUEL PUMP

An auxiliary electric fuel pump will be added to the fuel line for priming the engine. A switch located on the cab instrument panel will be provided to operate the pump.

FUEL SHUTOFF

A fuel line shutoff valve will be installed on both the inlet and outlet of the primary fuel filter.

FUEL COOLER

An air to fuel cooler will be installed in the engine fuel return line.

FUEL SEPARATOR

The engine will be equipped with a Racor in-line spin-on fuel and water separator in addition to the engine fuel filters.

TRANSMISSION

An Allison 5th generation, model EVS 4000PR, electronic, torque converting, automatic transmission with retarder will be provided.

Two (2) PTO openings will be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).

A transmission temperature gauge, with red light and audible alarm, will be installed on the cab instrument panel.

The transmission retarder control will be activated 33 percent by release of the accelerator pedal or 66 percent by slight application of the brake pedal, or 100 percent by heavy application of brake pedal. A second on/off switch is provided to activate and deactivate the auto apply portion.

The transmission will have the 1300 ft. lb. torque (low) spring setting for retardation force.

The transmission retarder will have a master "on/off" switch on the instrument panel. A red indicator light will be provided to warn that the transmission is being overworked.

The retarder will be wired to the brake lights so they are energized when the retarder is slowing the vehicle down.

The ABS system will automatically disengage the auxiliary braking device when required.

TRANSMISSION SHIFTER

A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

The transmission ratio will be 1st - 3.49 to 1.00, 2nd - 1.86 to 1.00, 3rd - 1.41 to 1.00, 4th - 1.00 to 1.00, 5th - 0.75 to 1.00, 6th - 0.65 to 1.00, R - 5.03 to 1.00.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



TRANSMISSION COOLER

A Champ shell and tube oil cooler will be provided using engine coolant to control the transmission retarder oil temperature. The cooler will have an aluminum shell and copper tubes. The cooler will be assembled using two (2) pressed in rubber tube sheets (one on each end), creating a reliable mechanical seal between the coolant and the oil.

SUMP COOLER

A Modine plate and fin transmission oil cooler will be provided using engine coolant to control the transmission sump oil temperature.

DRIVELINE

Drivelines will be a heavy-duty metal tube and be equipped with Spicer 1810 universal joints. The shafts will be dynamically balanced before installation. A splined slip joint will be provided in each driveshaft, slip joint will be coated with Glidecoat or equivalent.

STEERING

Dual Sheppard M110 steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and an Eaton model VN20F hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

STEERING WHEEL

The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a four (4)-spoke design.

LOGO AND CUSTOMER DESIGNATION ON DASH

The dash panel will have an emblem containing the Pierce logo and customer name. The emblem will have three (3) rows of text for the customer's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text will be: Denver

The second row of text will be: Fire

The third row of text will be: Department

AUTOMATIC CHASSIS LUBRICATION

A Vogel Automatic Lubrication System will be provided. The lubrication will be supplied while the vehicle ignition switch is active to allow a uniform application of grease to the locations listed. The electronic control unit that forms part of the system will activate the pump after an adjustable interval time. The unit will control and monitor pump operation and report any faults via an indicator light on the driver's dashboard of the cab.

The lubrication system reservoir, which requires a 15.00" wide x 14.50" high x 6.25" deep mounting area, will be located best location on the apparatus.

- TAK- 4 Control Arm Pivot Points
- Rear Axle Slack Adjusters



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- Rear Axle Brake Cam Screws
- Rear Suspension Spring Pins
- Rear Suspension Shackle Pins
- Walking Beam Pins Tandem axle, if applicable

BUMPER

A one (1) piece, ten (1) gauge, 304-2B type polished stainless steel bumper, a minimum of 10.00" high, will be attached to a bolted modular extension frame constructed of 50,000 psi tensile steel "C" channel mounted directly behind it to provide adequate support strength.

The bumper will be extended 19.00" from front face of cab.

Documentation will be provided, upon request to show that the options selected have been engineered for fit-up and approval for this modular bumper extension. A chart will be provided to indicate the option locations and will include, but not be limited to the following options: air horns, mechanical sirens, speakers, hose trays (with hose capacities), winches, lights, discharge, and suction connections.

GRAVEL PAN

A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and cab face. The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.

LIFT AND TOW MOUNTS

Mounted to the frame extension will be lift and tow mounts. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems.

The lift and tow mounts with eyes will be painted the same color as the frame.

TOW HOOKS

Two (2) chromed steel tow hooks will be installed under the bumper and attached to the front frame members. The tow hooks will be designed and positioned to allow up to a 6,000 pound straight horizontal pull in line with the centerline of the vehicle. The tow hooks will not be used for lifting of the apparatus.

HOSE TRAY

A hose tray, constructed of aluminum, will be placed in the center of the bumper extension.

The tray will have a capacity of 125' of 1.50" double jacket cotton-polyester hose.

Black rubber grating will be provided at the bottom of the tray. Drain holes are also provided.

COVER, HOSE TRAY

A bright aluminum treadplate cover will be provided over the one (1) hose tray.

The cover will be notched allowing the hose to be preconnected to the hose connection.

The cover will be attached with a stainless steel hinge and located: The cover will be located over the tray in the middle.

A lift and turn latch will secure the cover in the closed position and a pneumatic stay arm will hold the cover in the open position.

FOG LIGHTS

Two (2) PIAA Model 2110 rectangular halogen fog lamps, with clear lenses, will be provided one (1) on each side under the front bumper.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



The fog lamp switch will include an internal indicator. This switch will be properly identified and installed on the switch panel within reach of the driver. The parking, tail, side marker and license plate lamps will be activated by the headlamp switch prior to the activation of these fog lights. The fog lights will be able to switch on or off independently of the low beam headlights. The front fog lights will be reset to an off position whenever the headlight switch or the vehicle ignition switch is set to the off position. The fog lights will be deactivated when the high beam headlights are activated, when the headlight switch is turned off or when the ignition switch is turned off.

CAB

The Velocity™ cab will be designed specifically for the fire service and will be manufactured by Pierce Manufacturing.

To provide quality at the source and single source customer support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

For reasons of structural integrity and enhanced occupant protection, the cab will be of heavy duty design, constructed to the following minimal standards.

The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar will be constructed of 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar will also be constructed from 0.25" heavy wall extrusions.

The rear wall will be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 7.50" x 3.50" x 0.125" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick supports on each side of the engine tunnel. The cross-cab support will be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides.

The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area will also be supported with three (3) 0.50" plates bolted together that also provide the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

The cab will be a full-tilt style. A three (3)-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 112.00". The raised portion will start at the most forward point of the B-pillar and continue rearward to the back of the cab. The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level.

To reduce injuries to occupants in the seated positions, proper head clearance will be provided.

The floor-to-ceiling height inside the forward cab will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 62.95" in the center position and 68.75" in the outboard positions.

The crew cab will measure a minimum of 57.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.

FENDER LINERS

Full-circular, aluminum, inner fender liners in the wheel wells will be provided.

PANORAMIC WINDSHIELD

A one (1)-piece, safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The 0.114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

SUNVISORS

Two (2) smoked Lexan sunvisors, 7.75" x 28.12" long, will be provided. The sunvisors will be located above the windshield with one (1) mounted on each side of the cab.

WINDSHIELD WIPERS

Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather. The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance.

FAST SERVICE ACCESS FRONT TILT HOOD

A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also provide complete access to the windshield wiper motor and components. The hood will be contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



hood will include air cylinders to hold the hood in open and closed positions, and a heavy duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the Pierce logo. The two (2)-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

ENGINE TUNNEL

To provide structural strength, the engine tunnel sidewalls will be constructed of .50" aluminum plate that is welded to both the .25" firewall and .38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered.

The engine tunnel will be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel will be covered with 1.00" thick polyether foam that is reinforced with an aluminized face. Thermal rating for this insulation will be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The insulation will keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.

CAB REAR WALL EXTERIOR COVERING

The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

CAB LIFT

A hydraulic cab lift system will be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves. The hydraulic pump will have a backup manual override, for use in the event of an electrical failure.

The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended). The cab will be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab.

The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the driver side between the chassis and cab frame when cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

Cab Lift Interlock

The cab lift safety system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



GRILLE

A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.

DOOR JAMB SCUFFPLATES

All cab door jambs will be furnished with a polished stainless steel scuffplate, mounted on the striker side of the jamb.

FRONT CAB TRIM

A 10.00" band of 22 gauge patterned stainless steel trim will be installed across the front of the cab, from door hinge to door hinge. The trim band will be centered on the head lights and applied with two (2)-sided tape. A 0.625" self-adhesive trim strip will be applied around the perimeter of the trim band.

There will be no covers provided over the painted cab corner where the cab turn signals are located.

MOLDING (On Sides of Cab)

Chrome molding will be provided on both sides of cab.

MIRRORS

One (1) Ramco, Model 6000-PCHR, polished aluminum mirror will be mounted on each of the cab doors. The mirrors will be 9.25" wide x 13.50" high with a convex section. The mirror head will have a highly polished aluminum finish.

The flat glass in each mirror will be heated and adjustable, with remote controls that are convenient to the driver.

The convex section in each mirror will be heated and adjustable, with remote controls that are convenient to the driver.

DOORS

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 76.46" high. The crew cab doors will be located on the sides of the cab and will be constructed in the same manner as the forward cab doors. The crew cab doors will measure a minimum of 37.87" wide x 85.50" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of .125". The exterior door skins will be constructed from .090" aluminum. The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands. Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The locks will be capable of activating when the doors are open or



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

A full length, heavy duty, stainless steel, piano-type hinge with a .38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

The cab steps at each cab door location will be located inside the cab doors to protect the steps from weather elements.

DOOR PANELS

The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable without disconnecting door and window mechanisms.

RECESSED POCKET WITH ELASTIC COVER

To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior will be provided with recessed storage pockets. The pockets will be 6.50" wide x 2.12" high x 6.00" deep. The pockets will be provided with a perforated elastic material cover to secure the equipment in the pocket. The pockets will be installed in all available mounting locations of the overhead console.

ELECTRIC WINDOW CONTROLS

Each cab entry door will be equipped with an electrically operated tempered glass window. A window control panel will be located on the door panel within easy reach of the respective occupant. Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1/2 second. The driver control panel will contain a control switch for each cab door's window. All other door control panels will contain a single switch to operate the window within that door. The window switches will be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.

CAB STEPS

The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 31.00" wide, and the crew cab steps will be 24.25" wide with an 8.00" minimum depth. The inside cab steps will not exceed 18.00" in height and be limited to two (2) steps. Three (3) step entrance designs will not be acceptable due to safety concerns. A slip-resistant handrail will be provided adjacent to each cab door opening to assist during cab ingress and egress.

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED, step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step, in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light. The lights will be activated when the adjacent door is opened.

FENDER CROWNS

Stainless steel fender crowns will be installed at the cab wheel openings.

CREW CAB WINDOWS

One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the front cab door. The windows will be sized to enhance light penetration into the cab interior. The windows will measure 20.00" wide x 20.50" high.

WINDOWS INTERIOR TRIM

For improved aesthetics, the cab side windows will include a vacuum formed ABS interior trim panel.

FRONT WINDOWS FOR RAISED ROOF

To enhance both visibility out of and light penetration into the crew cab, two (2) bonded windows will be provided in the front slanted portion of the raised roof. Each window will be approximately 15.00" wide x 7.00" high. The profile of the glass will match the painted metal side sheet opening, creating a uniform threshold appearance. The windows will be bonded to the vehicle using urethane adhesive.

CAB INTERIOR

With safety as the primary objective, the wrap-around style cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.

The center console will be a high impact ABS polymer and will be easily removable for access to the defroster. The center console will include louvers strategically located for optimal air flow and defrost capability to the windshield.

The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface.

To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided.

To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.

To provide a deluxe automotive interior, the engine tunnel, side walls and rear wall will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew.

The headliner will be installed in both forward and rear cab sections. The headliner panel will be a composition of an aluminum panel covered with a sound barrier and upholstery.

The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by painted aluminum covers. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery will be dark silver gray. All cab interior materials will meet FMVSS 302 (flammability of interior materials).

INTERIOR PAINT (Cab)

A rich looking interior will be provided by painting all the metal surfaces inside the cab gray, vinyl texture paint.

CAB FLOOR

The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a .25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

CAB DEFROSTER

To provide maximum defrost and heating performance, a 54,961 BTU heater-defroster unit with 558 SCFM of air flow will be provided inside the cab. The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable metal cover will be installed over the defroster unit. The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the 1-piece windshield. The defroster ventilation will be built into the design of the cab dash instrument panel and will be easily removable for maintenance. The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

CAB/CREW CAB HEATER

Two (2) 36,702 BTU auxiliary heaters with 276 SCFM (each unit) of air flow will be provided inside the crew cab, one (1) in each outboard rear facing seat riser. The heaters will include high performance dual scroll blowers (one (1) for each unit). Outlets for the heaters will be located below each rear facing seat riser and below the fronts of the driver and passenger seats, for efficient airflow. An extruded aluminum plenum will be incorporated in the cab structure that will transfer heat to the forward cab seating positions.

The heater-defroster and crew cab heaters will be controlled by an integral electronic control panel. The heater control panel will allow the driver to control heat flow to the front and rear independently. The control panel will include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel will include highly visible, progressive LED indicators for both fan speed and temperature.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



AIR CONDITIONING

Due to the large space inside the cab, a high-performance, customized air conditioning system will be furnished. A 19.1 cubic inch compressor will be installed on the engine.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 64 degrees Fahrenheit in the forward section of the cab, and 69 degrees Fahrenheit in the rear section of the cab, at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

A roof-mounted condenser with a 63,000 BTU output that meets and exceeds the performance specification will be installed on the cab roof.

The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel.

The evaporator will include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

There will be a hinge on the forward edge of the filter cover and two (2) quarter turn fasteners with a knob on the rear edge to allow easy access.

The evaporator unit will have a 49,000 BTU (4.08 tons) rating that meets and exceeds the performance specifications. Adjustable air outlets will be strategically located on the evaporator cover per the following:

Four (4) will be directed towards the drivers location

Four (4) will be directed towards the officers location

Nine (9) will be directed towards crew cab area

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

The air conditioner will be controlled by dual zone integral electronic control panels for the heater, defroster and air conditioner. The cab control panel will be located in the center console. For ease of operation, the control panels will include variable adjustment for temperature and fan control.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling. Headliners will be constructed from a .20" high density polyethylene corrugated material. Each headliner will be wrapped with a .25" thick foil faced poly damp low emissivity foam insulation barrier for acoustic and thermal control.

Designed for maximum sound absorption and thermal insulation, the rear cab wall will be insulated with a 1.50" thick open cell acoustical foam. The thermal protection of the foam will provide and R-value of four (4) per 1.00" thickness.

GRAB HANDLE

A black rubber covered grab handle will be mounted on the door post of the driver side cab door to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and windshield.

A long rubber grab handle will be mounted on the dash board in front of the officer.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



ENGINE COMPARTMENT LIGHT

An engine compartment light will be installed under the engine hood, of which the switch is an integral part. Light will have a .125" diameter hole in its lens to prevent moisture retention.

ACCESS TO ENGINE DIPSTICKS

For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface. The door will be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel.

The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional tube will be provided for filling the engine oil.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.

CAB SAFETY SYSTEM

The cab will be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and will include the following:

- A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.
- A slave SRS sensor will be installed in the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag will be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the three (3)-point seat belt.
- A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the three (3)-point seat belt.
- Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.
- Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

FRONTAL IMPACT PROTECTION

The SRS system will provide protection during a frontal or oblique impact event. The system will activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis will have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor will activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.

The SRS system will deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag.
- Passenger side knee bolster air bag.
- Air curtains mounted in the outboard bolster of outboard seat backs.
- Suspension seats will be retracted to the lowest travel position.
- Seat belts will be pre-tensioned to firmly hold the occupant in place.

SIDE ROLL PROTECTION

The SRS system will provide protection during a fast or slow 90-degree roll to the side, in which the vehicle comes to rest on its side. The system will analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

The SRS system will deploy the following components in the event of a side roll:

- Air curtains mounted in the outboard bolster of outboard seat backs.
- Suspension seats will be retracted to the lowest travel position.
- Seat belts will be pre-tensioned to firmly hold the occupant in place.

SEATING CAPACITY

The seating capacity in the cab will be six (6).

DRIVER SEAT

A Pierce PS6® seat will be provided in the cab for the driver. The seat design will be a cam action type with air suspension. For increased convenience, the seat will include electric controls to adjust the rake (15 degrees), height (1.12" travel) and horizontal (7.75" travel) position. Electric controls will be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back will be a high back style with manual lumbar adjustment lever, for lower back support, and will include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever will be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control).

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- A suspension seat safety system will be included. When activated in the event of a side roll, this system will pretension the seat belt, then retract the seat to its lowest travel position.

The seat will be furnished with a three (3)-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

OFFICER SEAT

A Pierce PS6 seat will be provided in the cab for the passenger. The seat will be a cam action type with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not belted.

The seat back will be an SCBA back style with 7.50 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system. Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

A suspension seat safety system will be included. When activated, this system will pretension the seat belt and then retract the seat to its lowest travel position.

The seat will be furnished with a three (3)-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

RADIO COMPARTMENT

A compartment for the radio amplifier will be located on the floor of the cab behind the front passenger seat. A lift-up door with a chrome plated lift and turn latch will be provided for access. The compartment will be constructed of smooth aluminum and painted to match the cab interior. The radio control will be located in the overhead console on the passenger side.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



REAR FACING DRIVER SIDE OUTBOARD SEAT

There will be One (1) rear facing, Pierce PS6 seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle. It will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style with 7.50 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system. Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

A seat safety system will be included. When activated this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a three (3)-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

REAR FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) rear facing, Pierce PS6 seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled. The seat back will be an SCBA back style with 7.50 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system. Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

A seat safety system will be included. When activated this system will pretension the seat belt and firmly hold the occupant in the event of a side roll.

The seat will be furnished with a three (3)-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

EMS COMPARTMENT

An EMS compartment, 21.00" wide x 64.00" high x 14.00" deep with one (1) Amdor roll up door, non-locking, with white finish will be provided in the crew cab.

The compartment will be constructed of smooth aluminum, and painted to match the cab interior.

COMPARTMENT LIGHT

There will be two (2) white Amdor LED strip lights installed, one (1) each side of the compartment opening. The lights will be controlled by an automatic door switch.

FORWARD FACING CENTER SEATS

There will be two (2) forward facing, Pierce PS6® seats provided at the center position in the crew cab. For optimal comfort, the seats will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seats will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

The seat backs will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seats will include the following feature incorporated into the side roll protection system. A seat safety system will be included. When activated this system will pretension the seat belts around the occupants to firmly hold them in place in the event of a side roll.

The seats will be furnished with three (3)-point, shoulder type seat belts. To provide quick, easy use for occupants wearing bunker gear, the seat belts will have a minimum 130.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belts will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

EMS COMPARTMENT

An EMS compartment, 21.00" wide x 64.00" high x 14.00" deep with one (1) Amdor roll up door, non-locking, with white finish will be provided in the crew cab.

The compartment will be constructed of smooth aluminum, and painted to match the cab interior.

COMPARTMENT LIGHT

There will be two (2) white Amdor LED strip lights installed, one (1) each side of the compartment opening. The lights will be controlled by an automatic door switch.

SHELVING

There will be six (6) shelves provided in the EMS compartment. Each shelf will be constructed of .090" aluminum with a 1.25" up-turned lip. Shelving will be infinitely adjustable by means of a threaded tightener sliding in a track.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



The location will be three (3) in each EMS cabinet.

SEAT UPHOLSTERY

All Pierce PS6 seat upholstery will be gray woven with black Imperial 1200 material.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G. Bracket designs with manual restraints (belts, straps, buckles) that could be inadvertently left unlocked and allow the SCBA to move freely within the cab during an accident, will not be acceptable. There will be a quantity of five (5) SCBA brackets.

SEAT BELTS

All seating positions in the cab and crew cab will have red seat belts.

The belts will also include the Ready Reach® D-loop assembly to the shoulder belt system. The Ready Reach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with three (3)-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter.

A total of six (6) seating positions will have the adjustable shoulder harness.

SEAT BELT MONITORING ON COMMAND ZONE COLOR DISPLAY

A seat belt monitoring screen will be provided on the Command Zone color display. The system will be capable of monitoring up to ten (10) seating positions in the cab with green and red seating icons illuminated as follows:

- Seat Occupied Buckled Green Icon
- Seat Occupied Unbuckled Red Icon
- Seat Not Occupied Buckled Red Icon
- Seat Not Occupied Unbuckled No Icon

The seat belt monitoring screen will become active on the Command Zone color display when:

- The park brake is released:
- and there is any occupant seated but not buckled or any belt buckled without an occupant:
- and there are no other Do Not Move Truck conditions present. As soon as all Do Not Move Truck conditions are cleared, the seat belt monitoring screen will be activated.

The seat belt monitoring screen will be manually selected anytime the Command Zone color display is powered.

The seat belt monitoring screen will be accompanied by an audible alarm that will activate when a red seat icon condition exists and the parking brake is released.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



HELMET HOLDER

There will be six (6) Zico UHH-1 helmet holder bracket(s) provided in the cab. The brackets will provide quick access and secure storage of the helmet(s). The bracket location(s) will be determined at time of final inspection at Pierce mfg.

CAB DOME LIGHTS

There will be four (4) Weldon 808* series, dual LED dome lights with grey bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white.

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

HAND HELD SPOTLIGHT

A Specialty Lighting, Model 2150-1, hand held spotlight will be installed near officer. The light will be furnished with a 9 foot coil cord.

CAB INSTRUMENTATION

The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.

GAUGES

The gauge panel will include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:

- Voltmeter gauge (Volts)
 - Low volts (11.8 VDC)
 - Amber indicator on gauge assembly with alarm
- High volts (15 VDC)
 - Amber indicator on gauge assembly with alarm
- Very low volts (11.3 VDC)
 - Amber indicator on gauge assembly with alarm
- Very high volts (16 VDC)
 - Amber indicator on gauge assembly with alarm
- Tachometer (RPM)
- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
- Fuel level gauge (Empty - Full in fractions)
 - Low fuel (1/8 full)
 - Amber indicator on gauge assembly with alarm
- Very low fuel (1/32) fuel
 - Amber indicator on gauge assembly with alarm
- Engine oil pressure gauge (PSI)
 - Low oil pressure to activate engine warning lights and alarms



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- Red indicator on gauge assembly with alarm
- Front air pressure gauge (PSI)
 - Low air pressure to activate warning lights and alarm
 - Red indicator on gauge assembly with alarm
- Rear air pressure gauge (PSI)
 - Low air pressure to activate warning lights and alarm
 - Red indicator on gauge assembly with alarm
- Transmission oil temperature gauge (Fahrenheit)
 - High transmission oil temperature activates warning lights and alarm
 - Amber indicator on gauge assembly with alarm
- Engine coolant temperature gauge (Fahrenheit)
 - High engine temperature activates an engine warning light and alarm
 - Red indicator on gauge assembly with alarm
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)
 - Low fluid (1/8 full)
 - Amber indicator on gauge assembly with alarm

All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

CONTROL SWITCHES

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.

Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.

The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.

High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. The "Ok to Engage High Idle" indicator lamp must be active for the high idle function



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

"Ok to Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be activated with vehicle ignition.

Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.

Heater, defroster, and optional air conditioning control panel: A control panel with membrane switches will be provided to control heater/defroster temperature and heater, defroster, and air conditioning fan speeds. A green LED status bar will indicate the relative temperature and fan speed settings.

Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

CUSTOM SWITCH PANELS

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.

DIAGNOSTIC PANEL

A diagnostic panel will be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel will allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches will allow engine and ABS systems to provide blink codes should a problem exist.

The diagnostic panel will include the following:

- Engine diagnostic port



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (where applicable)
- Command Zone USB diagnostic port
- Engine diagnostic switch (blink codes flashed on check engine telltale indicator)
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

CAB LCD DISPLAY

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours

The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm will be provided.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator will activate a pulsing alarm when the parking brake is released.

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the gauge panel LCD located forward of the steering wheel directly in front of the driver whenever the "Do Not Move Truck" light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Hatch Door Open
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliqués. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated red whenever the switch is active. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



SPARE CIRCUIT

There will be two (2) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

The positive wire will be connected directly to the battery power.

The negative wire will be connected to ground.

Wires will be protected to 15 amps at 12 volts DC.

Power and ground will terminate panel #9.

Termination will be with 15 amp, power point plug with rubber cover.

Wires will be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be four (4) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power.
- The negative wire will be connected to ground.
- Wires will be protected to 15 amps at 12 volts DC.
- Power and ground will terminate two (2) in the front of the cab behind panel #9 and two (2) in the rear, tucked into the center seat riser.
- Termination will be with heat shrinkable butt splicing.

Wires will be sized to 125 percent of the protection.

The circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

The positive wire will be connected directly to the battery power.

The negative wire will be connected to ground.

Wires will be protected to 20 amps at 12 volts DC.

Power and ground will terminate in the electronics box over the engine.

Termination will be with 3/8" studs and plastic covers.

Wires will be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

POWER DISTRIBUTION LABEL

Grav-o-ply labels will be provided for each power distribution box (engine, transmission, cab, etc.) on the truck according to the job specific IO sheets.

INFORMATION CENTER

An information center employing a 7.00" diagonal color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel will be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Black enclosure with gray decal
- Sunlight Readable
- Linux operating system
- Minimum of 400nits rated display
- Display can be changed to an available foreign language

OPERATION

The information center will be designed for easy operation for everyday use.

The page button will cycle from one screen to the next screen in a rotating fashion.

A video button will allow a NTSC signal into the information center to be displayed on the LCD. Pressing any button while viewing a video feed will return the information center to the vehicle information screens.

A menu button will provide access to maintenance, setup and diagnostic screens.

All other button labels will be specific to the information being viewed.

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used. If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition.
- A red background/text color will indicate a warning condition.

Every screen will include the following:

- Exterior Ambient Temperature
- Time (12 or 24 hour mode)

Text Alert Center:

- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.

Button Labels: A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



PAGE SCREENS

The Information center will include the following screens:

Load Manager Screen: A list of items to be load managed will be provided. The list will provide:

- Description of the load
- Individual load shed priority: The lower the priority number the earlier the device will be shed should a low voltage condition occur.
- Load Status: The screen will indicate if a load has been shed (disabled) or not shed.

"At a Glance" color features are utilized on this screen

Do Not Move Truck: The Do Not Move Truck screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicated:

- Driver Side Cab Door
- Passenger's Side Cab Door
- Driver Side Crew Cab Door
- Passenger's Side Crew Cab Door
- Driver Side Body Doors
- Passenger's Side Body Doors
- Rear Body Door(s)
- Ladder Rack (if applicable)
- Deck Gun (if applicable)
- Light Tower (if applicable)
- Hatch Door (if applicable)
- Stabilizers (if applicable)
- Steps (if applicable)

Chassis Information: The following information will be shown:

- Engine RPM
- Fuel Level
- Battery Voltage
- Engine Coolant Temperature
- Engine Oil Pressure

"At a Glance" color features are utilized on this screen

Active Alarms List: This screen will show a list of all active text messages. The list items text will match the text messages shown in the "Alert Center". The date and time the message occurred is displayed with each message in the list.

MENU SCREENS

The following screens will be available through the Menu button:

View System Information: A detailed list of vehicle information:



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- Battery Volts
- Pump Hours
- Transmission Oil Temperature
- Pump Engaged
- Engine Coolant Level
- Engine Oil Level
- Oil level will only be shown when the engine is not running
- Power Steering Level

Set daytime and nighttime Display Brightness:

- Brightness: Increase and decrease
- Default setting button

Configure Video Mode:

- Set Video Contrast
- Set Video Color
- Set Video Tint

Set Startup Screen:

- Choose the screen that will be active at vehicle power-up

Set Date & Time:

- 12 or 24 hour format
- Set time
- Set date

View Active Alarms:

- Shows a list of all active alarms
- Date and time of the occurrence is shown with each alarm
- Silence alarms
- All alarms are silenced

System Diagnostics:

- Module type and ID number
- Module version

Module diagnostics information:

- Input or output number
- Circuit number connected to that input or output
- Circuit name (item connected to the circuit)
- Status of the input or output



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- Power and Constant Current module diagnostic information:
- Button functions and button labels may change with each screen.

VEHICLE DATA RECORDER

A vehicle data recorder (VDR) will be provided. The VDR will be capable of reading and storing vehicle information.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A CD provided with the apparatus will include the programming to download the information from the VDR. A USB cable can be used to connect the VDR to a laptop to retrieve required information.

The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:

- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position (7-12 Seating Capacity)
- Seat Belt Buckled Status - Yes/No by Position (7-12 Seating Capacity)
- Master Optical Warning Device Switch - On/Off
- Time - 24 Hour Time
- Date - Year/Month/Day

RADIO ANTENNA MOUNT

There will be two (2) standard 1.125", 18 thread antenna-mounting base(s) installed on the driver and passenger side cab roof just to the rear of the lightbar on the cab roof with high efficiency, low loss, coaxial cable(s) routed to the radio box. A weatherproof cap will be installed on the mount.

ELECTRICAL POWER CONTROL SYSTEM

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

COMMAND ZONE CONTROL SYSTEM

A solid-state electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices. The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership. For increased reliability and simplified use the control system modules will include the following attributes:

- Green LED indicator light for module power
- Red LED indicator light for network communication stability status
- Control system self-test at activation and continually throughout vehicle operation
- No moving parts due to transistor logic
- Software logic control for NFPA mandated safety interlocks and indicators
- Integrated electrical system load management without additional components
- Integrated electrical load sequencing system without additional components
- Customized control software to the vehicle's configuration
- Factory and field reprogrammable to accommodate changes to the vehicle's operating parameters
- Complete operating and troubleshooting manuals
- USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the Command Zone control system modules will meet the following specifications:

- Module circuit board will meet SAE J771 specifications
- Operating temperature from -40C to +70C
- Storage temperature from -40C to +70C
- Vibration to 50g
- IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)
- Operating voltage from eight (8) volts to 16 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

CIRCUIT PROTECTION AND CONTROL DIAGRAM

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS

The on-board information center will include the following diagnostic information:

Text description of active warning or caution alarms

Simplified warning indicators

Amber caution light with intermittent alarm

Red warning light with steady tone alarm

All control system modules, with the exception of the main control module, will contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output will be provided and will illuminate whenever the respective input or output is active. Color-coded labels within the modules will encompass the LEDs for ease of identification. The LED indicator lights will provide point of use information for reduced troubleshooting time without the need for an additional computer.

ADVANCED DIAGNOSTICS

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with an IBM compatible computer.

The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

VOLTAGE MONITOR SYSTEM

A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

The studs will consist of the following:

12-volt 40-amp battery switched power

12-volt 60-amp ignition switched power

12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

ENHANCED SOFTWARE

The Command Zone control system will include the following software enhancements:

All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

EMI/RFI PROTECTION

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL HARNESSING INSTALLATION

All 12-volt wiring and harnessing installed by the apparatus manufacturer will conform to specification PM-QA W-101: Pierce manufacturing Wiring Harness Specification.

To ensure rugged dependability, all wiring harnesses installed by the apparatus manufacturer will conform to the following specifications:

SAE J1128 - Low tension primary cable

SAE J1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring

SAE J163 - Low tension wiring and cable terminals and splice clips

SAE J2202 - Heavy duty wiring systems for on-highway trucks

NFPA 1901 - Standard for automotive fire apparatus

FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses

SAE J1939 - Serial communications protocol

SAE J2030 - Heavy-duty electrical connector performance standard

SAE J2223 - Connections for on board vehicle electrical wiring harnesses

NEC - National Electrical Code

SAE J561 - Electrical terminals - Eyelet and spade type

SAE J928 - Electrical terminals - Pin and receptacle type A



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



For increased reliability and harness integrity, harnesses will be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes will not be allowed.

Wiring will be run in loom or conduit where exposed, and have grommets or other edge protection where wires pass through metal. Wiring will be color, function and number coded.

Wire colors will be integral to each wire insulator and run the entire length of each wire.

Harnessing containing multiple wires and uses a single wire color for all wires will not be allowed. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. All wiring installed between the cab and into doors will be protected by an expandable rubber boot to protect the wiring. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment will be installed utilizing the following guidelines:

1. All wire ends not placed into connectors will be sealed with a heat shrink end cap. Wires without a terminating connector or sealed end cap will not be allowed.
2. All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
3. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
4. For low cost of ownership, electrical components designed to be removed for maintenance will be quickly accessible. For ease of use, a coil of wire will be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.
5. Corrosion preventative compound will be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation of the plug.
6. Any lights containing non-waterproof sockets in a weather-exposed area will have corrosion preventative compound added to the socket terminal area.
7. All electrical terminals in exposed areas will have DOW 1890 protective Coating applied completely over the metal portion of the terminal.
8. Rubber coated metal clamps will be used to support wire harnessing and battery cables routed along the chassis frame rails.
9. Heat shields will be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust will be protected by a heat shield.
10. Cab and crew cab harnessing will not be routed through enclosed metal tubing. Dedicated wire routing channels will be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab will allow for easy routing of additional wiring and easy access to existing wiring.
11. All braided wire harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



12. All standard wiring entering or exiting the cab will be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus manufacturer will conform to the following requirements:

SAE J1127 - Battery Cable

SAE J561 - Electrical terminals, eyelets and spade type

SAE J562 - Nonmetallic loom

SAE J836A - Automotive metallurgical joining

SAE J1292 - Automotive truck, truck-tractor, trailer and motor coach wiring

NFPA 1901 - Standard for automotive fire apparatus

Battery cables and battery cable harnessing will be installed utilizing the following guidelines:

13. All battery cables and battery harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date.
14. Splices will not be allowed on battery cables or battery cable harnesses.
15. For ease of identification and simplified use, battery cables will be color coded. All positive battery cables will be red in color or wrapped in red loom the entire length of the cable. All negative battery cables will be black in color.
16. For ease of identification, all positive battery cable isolated studs throughout the cab and chassis will be red in color.
17. For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus will be coated to prevent corrosion.

ELECTRICAL COMPONENT INSTALLATION

All lighting used on the apparatus will be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. Lights using an apparatus metal structure for grounding will not be allowed.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests will be recorded and provided to the purchaser at time of delivery.

BATTERY SYSTEM

There will be four (4) 12 volt Exide, Model 31S950X3W, batteries that include the following features will be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 3800 CCA at 0 degrees Fahrenheit
- 760 minutes of reserve capacity
- Threaded stainless steel studs



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

BATTERY SYSTEM

A single starting system will be provided.

An ignition switch and starter button will be located on the instrument panel.

MASTER BATTERY SWITCH

A master battery switch, to activate the battery system, will be provided inside the cab within easy reach of the driver.

An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be installed on the battery box on the driver's side. This will allow enough room for easy jumper cable access.

BATTERY CHARGER

There will be a Kussmaul 1200, Model 091-187-12-Remote battery charger provided. A bar graph display indicating the state of charge will be provided.

The charger will have a maximum output of 40 amps and a fully automatic regulation.

The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to the battery charger.

BATTERY CHARGER LOCATION

The battery charger will be located in the left body compartment, adjacent to the battery compartment, mounted high on the rear wall D3, high as possible, mounted horizontally, takes up most of the upper compartment .

The battery charger indicator will be located in the driver's step area.

KUSSMAUL AUTO EJECT FOR SHORELINE

One (1) shoreline inlet will be provided to operate the dedicated 120-volt circuits on the truck without the use of the generator.

The shoreline receptacle (s) will be provided with a NEMA 5-15, 120 volt, 15 amp, straight blade Kussmaul Super auto eject plug with a yellow weatherproof cover. The cover is spring loaded to close, preventing water from entering when the shoreline is not connected.

The unit is completely sealed to prevent road dirt contamination.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



A solenoid wired to the vehicle's starter is energized when the engine is started. This instantaneously drives the plug from the receptacle.

An internal switch arrangement will be provided to disconnect the load prior to ejection to eliminate arcing of the connector contacts.

The shoreline will be connected to the battery charger and the 6 place outlet in the crew cab.

A mating connector body will also be supplied with the loose equipment.

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side rear bulkhead of body.

COVER IO MODULE

A cover will be fabricated and installed to the rear face of the driver side battery box to cover the electrical IO modules for protection. The cover will protect the modules from the outside elements as much as possible without having to be water tight.

ALTERNATOR

There will be a Leece-Neville, Model 4909AA, alternator provided. It will have a rated output current of 320 amps, as measured by SAE method J56. The alternator will feature an external, regulator and rectifier. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output

The external rectifier will be mounted in the pumphouse on the passenger's side and will be easily accessible for servicing. It will also be located for maximum air flow for cooling purposes. This will include a vertical air duct running up the outside of the pumphouse and up into the cargo area. Air duct will be enclosed and exit out the passenger's side cargo sheet with knockouts for the hot air to escape.

Rectifier storage compartment will have a vertically hinged stainless steel door with louvers installed. Door will be hinged to the rearward side and be held in place with a lift and turn fastener.

NO GRAY SEALER REQUIRED

No gray dial electric sealer will be placed on any of the electrical connections.

The exception to this will be the fuel sender terminal. The fuel sender terminal will be sealed.

CHANGE PROGRAM - PER HOUR

There will be two (2) hours charged for reprogramming of the chassis.

The Whelen 800 AOA lights will be programmed to activate with ignition switch and de-activate with the emergency master. The separate switch labeled "Airport Light" shall also operate the lights.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

System voltage monitoring.

A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.

Sixteen available electronic load shedding levels.

Priority levels can be set for individual outputs.

High Idle to not be controlled by the load manager.

If enabled:

"Load Man Hi-Idle On" will display on the information center.

Hi-Idle will not activate until 30 seconds after engine start up.

Individual switch "on" indicator to flash when the particular load has been shed.

The information center indicates system voltage.

The information center includes a "Load Manager" screen indicating the following:

Load managed items list, with priority levels and item condition.

Individual load managed item condition:

ON = not shed

SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

Cab Heater and Air Conditioning

Crew Cab Heater (if applicable)

Crew Cab Air Conditioning (if applicable)

Exhaust Fans (if applicable)



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



Third Evaporator (if applicable)

HEADLIGHTS

There will be four (4) rectangular halogen lights mounted in the front quad style, chrome trim housing on each side of the cab grille:

- The outside light on each side will contain a halogen low and high beam module.
- The inside light on each side will contain a halogen high beam module only.

DIRECTIONAL LIGHTS

There will be two (2) Whelen 600 series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be the same color as the LED's.

ADDITIONAL DIRECTIONAL LIGHTS

There will be two (2) Whelen, Model M6T, amber LED arrow directional lights provided on the exterior back of the cab, one (1) on each side.

These lights will be mounted low on the back wall of the crew cab in 15 degree recessed angle brackets.

CAB CLEARANCE/MARKER/ID LIGHTS

There will be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield.
- Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.

REAR ID/MARKER DOT LIGHTING

The three (3) identification lights located at the rear will be installed per the following:

- Truck-Lite, Model 35017R, LED lights
- As close as practical to the vertical centerline
- Centers spaced not less than six (6) inches or more than twelve (12) inches apart.
- Red in color
- All at the same height

The four (4) clearance lights located at the rear will be installed per the following:

- Truck-Lite, Model 35017R, LED lights
- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline
- All at the same height



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- As near the top as practical
- To be visible from the rear and the side
 - One (1) each side, facing the side
 - One (1) each side, facing the rear

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

The rear stop/tail and directional LED lighting will consist of the following:

- Two (2) Whelen®, Model M6BTT, red LED stop/tail lights
- Two (2) Whelen, Model M6T, amber LED arrow turn lights

The lights shall be provided with color lenses.

Each light will be installed separately at the rear with Whelen, Model M6FC, chrome flanges. There will be two (2) Whelen Model M6BUW, LED backup lights with chrome trim provided.

LICENSE PLATE BRACKET

There will be one (1) license plate bracket located below the tailboard on a removable bolt-on bracket located under tailboard driver side.

A white LED light will illuminate the license plate. A polished stainless steel light shield will be provided over the light that will direct illumination downward, preventing white light to the rear.

BACK-UP ALARM

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

BACK-UP OBSTACLE SENSING SYSTEM

A SenseStat, model MA-ODSS-4M17BT, ultrasonic backing sensor system with 4 individual zones and an LED distance display will be provided.

The system will detect objects that are up to eight (8) feet from the rear of the vehicle reading each of four (4) separate sensors, and displaying the distance to the one that is closest to an object.

A 3.5"W x 2.9"L x 1.6"H, four (4) column color LED display located next to driver - see photo of the locations of the sensors on the rear bumper on the S:drive will show the direction and location of the obstacle. The display will show the distance from the sensor to the obstacle in meters or in feet & fractions of a foot to the sensor that is closest to an object. There will be an 800Hz audible alarm with volume control integrated into the display

INTERMEDIATE LIGHT

There will be one (1) pair, of Truck-Lite, Model 60115Y, amber, LED, turn signal, marker lights furnished, one (1) each side, horizontally in the rear fender panel.

A stainless steel trim will be included with this installation.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



PERIMETER SCENE LIGHTS, CAB

There will be a Truck-lite, Model 44310C, 4.00", 12 volt DC white LED light, with Model 40700 grommet mount and Model 95948 pigtail provided for each cab door. Lighting will be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits, which will be activated automatically when the exit doors are opened and by the same means as the body perimeter lights.

PERIMETER SCENE LIGHTS, BODY

There will be a total of four (4) Truck-Lite, Model 44310C, 4.00" 12 volt DC white LED lights with Model 40700 grommet mount and Model 95948 pigtail provided on the apparatus. Two (2) lights will be provided under the rear step area and two (2) lights will be provided under the pump panel running boards. The lights will be spaced one (1) each side of apparatus and have a clear lens. The perimeter scene lights will be activated by a switch in the cab

ADDITIONAL PERIMETER LIGHTS

There will be one (1) light additional Amdor Luma Bar H2O, Model AY-9500-020, 20.00" LED perimeter light sticks provided under pump panel platform step to meet ground lighting requirements.

The lights will be activated by the same means as the body perimeter lights.

STEP LIGHTS

Four (4) white LED step lights will be provided. One (1) step light will be provided on each side, on the front compartment face and two (2) step lights at the rear to illuminate the tailboard. In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

These step lights will be actuated with the pump panel light switch.

All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.

12 VOLT LIGHTING

There will be two (2) Whelen Pioneer PCP2B, black 12 volt LED combination spotlight and floodlight(s) provided on the front visor, one (1) on the driver's side and one (1) on the passenger's side.

The light will be controlled by the following:

a switch at the driver's side switch panel

a switch at the passenger's side switch panel

no additional switch location

These light(s) may be load managed when the parking brake is set.

12 VOLT LIGHTING

There will be one (1) Fire Research Evolution, Model FCA530-V15, 12 volt DC LED scene light(s) provided on push up, side mount pole(s), located passenger side back of cab.

The light(s) will be controlled in the following way:

a switch at the pump operator's panel

no additional switch location

no additional switch location

no additional switch location



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



These light(s) may be load managed when the parking brake is applied.
These lights will be connected to the Do Not Move Truck Indicator circuit.

12 VOLT LIGHTING

There will be one (1) Fire Research Evolution, Model FCA530-V15, 12 volt DC LED scene light(s) provided on push up, side mount pole(s), located driver side back of cab each side.

The light(s) will be controlled in the following way:

a switch at the pump operator's panel

no additional switch location

no additional switch location

no additional switch location

These light(s) may be load managed when the parking brake is applied.

These lights will be connected to the Do Not Move Truck Indicator circuit.

DECK LIGHTS

Two (2) Betts deck lights with swivel mount will be provided at the rear of the truck, one (1) each side.

One (1) light will be a model 325003 flood light equipped with an incandescent type bulb, 2 wire, and a switch on the light.

One (1) light will be a model 325007 spot light equipped with a halogen type bulb, 2 wire, and a switch on the light.

The body of these lights are to be painted white.

SWITCH, RADIO MASTER W/40 AMP BREAKER

A master switch will be provided for the radio operating electrical system to include a 40 amp breaker. The wiring will terminate beneath the officers seat, in the radio compartment.

REAR SCENE LIGHT(S)

There will be two (2) Whelen, Model M6ZC, LED scene light(s) with chrome flange(s) installed at the rear of the apparatus, one each side of rear bulkheads recessed.

The light(s) will be controlled by a switch at the driver's side switch panel.

The light(s) may be load managed when the parking brake is set.

WATER TANK

Booster tank will have a capacity of 750 gallons and be constructed of polypropylene plastic by United Plastic Fabricating, Incorporated.

Tank joints and seams will be nitrogen welded inside and out.

Tank will be baffled in accordance with NFPA Bulletin 1901 requirements.

Baffles will have vent openings at both the top and bottom to permit movement of air and water between compartments.

Longitudinal partitions will be constructed of .38" polypropylene plastic and will extend from the bottom of the tank through the top cover to allow for positive welding.

Transverse partitions will extend from 4.00" off the bottom of the tank to the underside of the top cover.

All partitions will interlock and will be welded to the tank bottom and sides.

Tank top will be constructed of .50" polypropylene. It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



Tank top will be sufficiently supported to keep it rigid during fast filling conditions. Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump that is 8.00" long x 8.00" wide x 6.00" deep will be provided at the bottom of the water tank.

Sump will include a drain plug and the tank outlet.

Tank will be installed in a fabricated cradle assembly constructed of structural steel.

Sufficient crossmembers will be provided to properly support bottom of tank. Crossmembers will be constructed of steel bar channel or rectangular tubing.

Tank will "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on. Stops or other provision will be provided to prevent an empty tank from bouncing excessively while moving vehicle.

Mounting system will be approved by the tank manufacturer.

Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00" long.

Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

WATER TANK RESTRAINT

A heavy-duty water tank restraint will be provided.

HOSE BED

The hose bed will be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength.

The hose bed width will be 68.00" inside and the upper and rear edges of side panels have a double break for rigidity.

The upper inside area of the beavertails will be covered with brushed stainless steel to prevent damage to painted surface when hose is removed.

The flooring of the hose bed will be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats will be 0.50" x 4.50" with spacing between the slats for hose ventilation.

Hose bed will accommodate 300' X 1.75", 500' X 2.5", 500' X 2.5", 500' X 2.5", 300' X 1.75".

HOSE BED DIVIDER

Four (4) adjustable hosebed dividers will be furnished for separating hose.

Each divider will be constructed of a .125" brushed aluminum sheet fitted and fastened into a slotted, 1.50" diameter radiused extrusion along the top, bottom, and rear edge.

Divider will be fully adjustable by sliding in tracks, located at the front and rear of the hose bed.

Divider will be held in place by tightening bolts, at each end.

Acorn nuts will be installed on all bolts in the hose bed which have exposed threads.

The interior vertical surfaces of the hose bed sides and front will be lined with stainless steel.

These liners will serve as scuffplates, protecting the painted surfaces.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



HOSE BED COVER

The hose bed cover will be silver and gray aluminized neoprene furnished with a Velcro fastening strip across the front and along the sides of the cover. The cover will be made 2" longer so it hangs over the front of the hosebed. This section will have grommets installed in the cover and hooks will be installed onto the front vertical surface of the cross divider to prevent the cover from coming off. The grommets can be slipped over the hooks to maintain cover at front. A snap fastener will also be installed in each corner to prevent the wind from lifting the cover at high speeds. A flap will be provided at the rear of the hose bed cover. The rear flap will have an additional weights and two shock cord hold downs so that it cannot flap in the wind.

HOSE BED COVER FASTENERS

The Velcro strips for the hose bed cover will be held down by creating a fabric pocket with Velcro and canvas, then a metal strip will be installed. This will be fastened with screws every 16".

The Velcro will have the loop section fastened to the truck, and the hook section on the cover.

RUNNING BOARDS

Running boards will be fabricated of .125" bright aluminum treadplate.

Each running board will be supported by a welded 2.00" square tubing and channel assembly, which will be bolted to the pump compartment substructure.

Running boards will be 12.75" deep and spaced .50" away from the pump panel.

A splashguard will be provided above the running board treadplate.

TAILBOARD

The tailboard will also be constructed of .125" bright aluminum treadplate and spaced .50" from the body, as well as supported by a structural steel assembly.

The tailboard area will be 16.00" deep.

The exterior side will be flanged down and in for increased rigidity of tailboard structure.

REAR WALL, SMOOTH ALUMINUM/BODY MATERIAL

The rear facing surfaces of the center rear wall will be smooth aluminum.

The rear facing surfaces of the bulkheads, the surface to the rear of the side body compartments, will be smooth and the same material as the body.

Any inboard facing surfaces below the height of the hosebed will be aluminum diamond plate.

TOW BAR

A tow bar will be installed under the tailboard at center of truck.

Tow bar will be fabricated of 1.00" CRS bar rolled into a 3.00" radius.

Tow bar assembly will be constructed of .38" structural angle. When force is applied to the bar, it will be transmitted to the frame rail.

Tow bar assembly will be designed and positioned to allow up to a 30-degree upward angled pull of 17,000 lb., or a 20,000 lb. straight horizontal pull in line with the centerline of the vehicle.

Tow bar design will have been fully tested and evaluated using strain gauge testing and finite element analysis techniques.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



REAR BUMPER

A bright aluminum treadplate bumper will be provided at the rear of the truck. The bumper will be approximately 4.00" high, full width, it will be located at the rear of the truck. The bumper will be approximately 9.25" deep and mounted just below the body. The rear edge of the bumper will be raised.

Morton Cass will be inserted in the running boards.

Morton Cass will be inserted in the tailboard.

COMPARTMENTATION

Body and compartments will be fabricated of .125", 5052-H32 aluminum.

Side compartments will be an integral assembly with the rear fenders.

Circular fender liners will be provided for prevention of rust pockets and ease of maintenance.

Compartment flooring will be of the sweep out design with the floor higher than the compartment door lip.

The compartment door opening will be framed by flanging the edges in 1.75" and bending out again .75" to form an angle.

Drip protection will be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate or polished stainless steel.

The top of the compartment will be covered with bright aluminum treadplate rolled over the edges on the front, rear and outward side. These covers will have the corners welded.

Side compartment covers will be separate from the compartment tops.

Front facing compartment walls will be covered with bright aluminum treadplate.

All screws and bolts which protrude into a compartment will have acorn nuts on the ends to prevent injury.

UNDERBODY SUPPORT SYSTEM

Due to the severe loading requirements of this pumper a method of body and compartment support suitable for the intended load will be provided.

The backbone of the support system will be the chassis frame rails which is the strongest component of the chassis and is designed for sustaining maximum loads.

The support system will include .375" thick steel vertical angle supports bolted to the chassis frame rails with .625" diameter bolts.

Attached to the bottom of the steel vertical angles will be horizontal angles, with gussets welded to the vertical members, which extend to the outside edge of the body.

A steel frame will be mounted on the top of these supports to create a floating substructure which will result in a 500 lb. equipment support rating per lower compartment.

The floating substructure will be separated from the horizontal members with neoprene elastomer isolators. These isolators will reduce the natural flex stress of the chassis from being transmitted to the body.

Isolators will have a broad load range, proven viability in vehicular applications, be of a failsafe design and allow for all necessary movement in three (3) transitional and rotational modes.

The neoprene isolators will be installed in a modified V three (3)-point mounting pattern to reduce the natural flex of the chassis being transmitted to the body.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



AGGRESSIVE WALKING SURFACE

All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards.

LOUVERS

Louvers will be stamped into compartment walls to provide the proper airflow inside the body compartments and to prevent water from dripping into the compartment. Where these louvers are provided, they will be formed into the metal and not added to the compartment as a separate plate.

TESTING OF BODY DESIGN

Body structural analysis has been fully tested. Proven engineering and test techniques such as finite element analysis, stress coating and strain gauging have been performed with special attention given to fatigue, life and structural integrity of the cab, body and substructure.

Body will be tested while loaded to its greatest in-service weight.

The criteria used during the testing procedure will include:

- Raising opposite corners of the vehicle tires 9.00" to simulate the twisting a truck may experience when driving over a curb.
- Making a 90 degree turn, while driving at 20 mph to simulate aggressive driving conditions.
- Driving the vehicle at 35 mph on a washboard road.
- Driving the vehicle at 55 mph on a smooth road.
- Accelerating the vehicle fully, until reaching the approximate speed of 45 mph on rough pavement.

Evidence of actual testing techniques will be made available upon request.

COMPARTMENTATION, DRIVER'S SIDE

A full height, roll-up door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 44.00" wide x 57.25" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment will be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 38.25" wide x 57.25" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

A roll-up door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 25.38" high x 12.00" deep. The height of the compartment will be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The clear door opening of this compartment will be 58.25" wide x 25.12" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

A full height, roll-up door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.50" wide x 58.25" high x 12.00" deep. A section of this compartment will be 25.88" deep x 47.50" wide x 26.00" high directly behind the rear



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



wheels. The height of the compartment will be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 44.75" wide x 58.25" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

COMPARTMENTATION, PASSENGER'S SIDE

A full height, roll-up door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 44.00" wide x 58.25" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment will be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 38.25" wide x 58.25" high. Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

A roll-up door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 25.38" high x 12.00" deep. The height of the compartment will be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The clear door opening of this compartment will be 58.25" wide x 25.12" high. Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

A full height, roll-up door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.50" wide x 58.25" high x 12.00" deep. A section of this compartment will be 25.88" deep x 47.50" wide x 26.00" high directly behind the rear wheels. The height of the compartment will be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 44.75" wide x 58.25" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

SIDE COMPARTMENT DOORS

There will be six (6) compartment doors installed on the side compartments, double faced, aluminum construction, satin aluminum and manufactured by R-O-M Corporation.

The slats will be double wall box frame extrusion. The exterior surface will be flat and the interior surface will be concave to help loose equipment fall to the ground and prevent it from jamming the door.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



Between each slat will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments.

A stainless steel lift bar to be provided for opening the door and located at the bottom of each door with latches on the outer extrusion of the door frame. A ledge to be supplied over lift bar for additional area to aid in closing the door. The lift bar will be located at the bottom of the door and have latches on the outer extrusion of the door frame. A ledge will be supplied over the lift bar as additional area to aid in closing the door.

Each door will have a 4.00" counter balance to assist in lifting.

A heavy-duty Robinson brand magnetic switch will be used for the control of "open compartment door" warning lights. The switch will be located all body doors.

COMPARTMENTATION, REAR

A roll-up door compartment above the rear tailboard will be provided.

Interior dimensions of this compartment will be 40.00" wide x 47.38" high x 25.88" deep in the lower 38.75" of height and 15.75" deep in the remaining upper portion. Depth of the compartment will be calculated with the compartment door closed.

A louvered, removable access panel will be furnished on the back wall of the compartment.

Rear compartment will be open into the rear side compartments.

Clear door opening of this compartment will be 33.25" wide x 38.75" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

REAR COMPARTMENT DOOR

The rear compartment door will be a roll-up style door with a satin finish. The door will be double faced aluminum construction and manufactured by Roll-O-Matic Corporation.

The slats will be a double wall box frame extrusion. The exterior surface will be flat and the interior surface will be concave to help loose equipment fall to the ground and prevent loose equipment from jamming the door.

Between each slat will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments.

Each door will have a 4.00" counter balance to assist in lifting.

A heavy-duty Robinson brand magnetic switch will be used for the control of "open compartment door" warning lights.

PULL STRAP, DOORS

The six (6) compartment doors, located all doors except rear door, will be provided with pull straps.

COMPARTMENT LIGHTING

There will be seven (7) compartments with On Scene Solutions LED compartment light strips.

The compartments with these strip lights will be located each compartment. Two (2) strip lights will be installed vertically, one (1) each side of the compartment door opening. The lights will be sized to accommodate the compartment door opening.

The remaining compartments will include 6.00" diameter Truck-Lite, Model: 79384, lights in each enclosed compartment. Each light will have a number 1076 one filament, two wire bulb. Opening the compartment door, will automatically turn the compartment lighting on.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



MOUNTING TRACKS

There will be six (6) sets of tracks for mounting shelf(s) in with shelves. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be painted to match the compartment interior.

ADJUSTABLE SHELVES

There will be 13 shelves with a capacity of 500 pounds provided. The shelf construction will consist of .188" aluminum with 2.00" sides. Each shelf will be painted to match the compartment interior. Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

The shelves will be held in place by .12" thick stamped plated brackets and bolts.

The location will be two (2) in upper P1, one (1) in P2, three (3) in upper P3, two (2) in upper D1, three (3) in upper D3, one (1) in R1, one (1) in D2.

PULL-OUT ADJUSTABLE HEIGHT TRAY

There will be two (2) slide-out trays with 2.00" sides and a capacity of 250 lb. provided.

Capacity rating will be in the extended position.

Slides will be equipped with ball bearings for ease of operation and years of dependable service.

Tray location will be P3, D1.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for it will be located at the front of the tray for ease of use with a gloved hand.

Each tray will be adjustable up and down within the compartment.

SLIDE-OUT FLOOR MOUNTED TRAY

There will be one (1) floor mounted slide-out tray(s) with 2.00" sides provided P1. Each tray will be rated for up to 500lb in the extended position. The tray(s) will be constructed of a minimum .13" aluminum with welded corners. The finish will be painted to match compartment interior.

There will be two undermount-roller bearing type slides rated at 250lb each provided. The pair of slides will have a safety factor rating of 2.

To ensure years of dependable service, the slides will be coated with a finish that is tested to withstand a minimum of 1,000 hours of salt spray per ASTM B117.

To ensure years of easy operation, the slides will require no more than a 50lb force for push-in or pull-out movement when fully loaded after having been subjected to a 40 hour vibration (shaker) test under full load. The vibration drive file will have been generated from accelerometer data collected from a heavy truck chassis driven over rough gravel roads in an unloaded condition.

Proof of compliance will be provided upon request.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

ACCESS PANEL

A removable access panel will be provided in the left front compartment. This panel will be size to fit and will be held in place with 1/4 turn fasteners. It will provide access to intake relief valve.

BACKBOARD STORAGE

A transverse area over the pump and forward of the crosslays will hold two (2) storage troughs.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



A blister will be supplied at each side to enclose the backboards due to their length. The backboards will be accessible from either side of the vehicle through the aluminum treadplate door(s) with a pair of lift and turn latches. The size of the backboard(s) to be stored will be 16.00" x 72.00" x 1.50" thick each.

PARTITION, TRANSVERSE REAR COMPARTMENT

Two (2) partitions will be bolted in place to separate driver and passenger side rear compartments from the rear tailboard compartment.

RUB RAIL

Bottom edge of the side compartments will be trimmed with a bright aluminum extruded rub rail. Trim will be 2.12" high with 1.38" flanges turned outward for rigidity. The rub rails will not be an integral part of the body construction, which allows replacement in the event of damage. The rub rails will be spaced out far enough to protect the lift bars on the rollup doors.

BODY FENDER CROWNS

Stainless steel fender crowns will be provided around the rear wheel openings. These fender crowns must be wide enough to prevent splashing onto the body from the specified tires. A rubber welting will be provided between the body and the crown to seal the seam and restrict moisture from entering. A dielectric barrier will be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

HARD SUCTION HOSE

Hard suction hose will not be required.

HANDRAILS

The handrails will be 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface.

Chrome plated end stanchions will support the handrail. Plastic gaskets will be used between end stanchions and any painted surfaces.

Drain holes will be provided in the bottom of all vertically mounted handrails.

- One (1) handrail will be provided above each side pump panel.
- One (1) vertical handrail will be provided on the driver's side body, on the front bulkhead door frame.
 - One (1) full length, vertical handrail will be mounted on the driver side rear beavertail.
 - One (1) standard length offset handrail will be mounted on the passenger side rear beavertail.
 - One (1) full width horizontal handrail will be provided below the hose bed at the rear of the apparatus.

AIR BOTTLE STORAGE (Single)

A quantity of three (3) air bottle compartments, 7.75" in diameter x 26.00" deep, will be provided on the driver side forward of the rear wheels, on the passenger side forward of the rear



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



wheels and on the passenger side rearward of the rear wheels. A polished stainless steel door with a chrome plated flush lift & turn latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal. Inside the compartment, black rubber matting will be provided.

MOUNTING TRACKS

There will be two (2) pair of horizontal mounting tracks provided for mounting air bottle brackets in D2 and P2 over the rear wheel each side. Each pair of mounting tracks will be provided with three (3) pair of mounting studs.

EXTENSION LADDER

There will be a 24', two (2) section, aluminum, Duo-Safety, Series 900-A extension ladder provided.

ROOF LADDER

There will be a 14' aluminum, Duo-Safety, Series 775-A roof ladder provided.

HYDRAULIC LADDER RACK

Ground ladders will be mounted above the right side of the hose body in a specially designed swing-down cradle. This cradle will be electric/hydraulic operated. The system design will have been life cycle tested for at least 14 years of dependable service.

An independent hydraulic pump powered by a 12-volt electric motor will operate the hydraulics. Operation of the hydraulic system for the ladder rack by an engine-powered pump will be totally unacceptable. The hydraulic pump and reservoir will be accessible from the ground through a stainless steel inspection door.

The ladder rack will incorporate two hydraulic rotary actuators, one each located inside the front compartment and the rear compartment. The actuators will be completely enclosed within each compartment to eliminate any pinch points while operating the ladder rack. Lifting arms will be attached outside the compartment body to the front and rear actuator. A center-lifting arm built into the compartment space is unnecessary and is unacceptable.

The rack can be designed in certain situations to provide lifting capabilities up to 500lbs. The maximum height of the rack from the ground in the lowered position will be no more than 47.00".

The electric control panel will have a master switch on/off switch, an actuation switch, an operation indicator light and operation instructions. The electric controls will be located in such a manner to allow the operator full view of the area into which the ladders will be lowered. Two (2) air operated safety locks will be furnished to securely maintain the ladder bracket assembly in the travel position. These air operated safety locks will be controlled from the ladder rack control panel.

Ladders will be secured to the brackets with two (2) locks retaining the roof ladder and the extension ladder. The locks will be such that when the roof ladder is removed, the clamps can be moved a half turn to hold the extension ladder in place.

LADDER RACK INTERLOCK AND NOT STOWED INDICATOR LIGHT

An interlock will be provided to prevent operation of the ladder rack unless the apparatus parking brake has been activated.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



A steady red indicator light will be located on the cab instrument panel and illuminated when the hydraulic ladder rack is not in the stowed position. The light will be labeled "Ladder Rack". In addition, the "Do Not Move Apparatus" light located in the cab will be activated when the hydraulic ladder rack is not in the stowed position.

LIGHTS, FLASHING, HYDRAULIC LADDER RACK

Flashing amber lights facing the front and rear will be provided on the ladder rack and activated whenever the rack is in the down position.

LADDER STORAGE, FOLDING LADDER

Mounting provisions will be provided to store a 10' folding ladder on the hydraulic ladder rack.

FOLDING LADDER

One (1) 10' aluminum, Series 585-A Duo-Safety folding ladder will be installed on the hydraulic ladder rack.

LADDER LOCK COVERS & D/S SPACER

A pair of stainless steel covers will be provided over the hydraulic ladder rack air locks on the passenger's side body, and a single spacer will be provided on the driver's side body to match the height of the passenger's side rear light.

PIKE POLE, 10'

One (1) pike pole 10' long Akron with a fiberglass I-beam shaped handle will be provided and located hydraulic ladder rack.

PIKE POLE, 6'

One (1) pike pole, 6' long DUO Safety with a fiberglass handle, will be provided and located hydraulic ladder rack.

PIKE POLE STORAGE

Aluminum tubing will be used for the storage of two (2) pike poles and will be located ladder rack. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate will be provided.

STEPS

A folding step will be provided on the front of each fender compartment. The step will be bright finished, non-skid with a luminescent coating that is rechargeable from any light source and can hold a charge for up to 24 hours. Each step will incorporate an LED light to illuminate the stepping surface. The step can be used as a hand hold with two openings wide enough for a gloved hand.

REAR STEPS

Aluminum treadplate corner steps and bright finished, non-skid folding steps will be provided at the rear. The folding steps will have a luminescent coating that is rechargeable from any light source and can hold a charge for up to 24 hours. Each folding step will incorporate an LED light to illuminate the stepping surface. The folding steps can be used as a hand hold with two openings wide enough for a gloved hand. All steps will provide adequate surface for stepping. Two (2) additional folding steps will be located two on the left front body. The step(s) will be bright finished, non-skid, with a luminescent coating. The luminescent coating is rechargeable



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



from any light source and can hold a charge for up to 24 hours. Each step will incorporate an LED light to illuminate the stepping surface. The step(s) can be used as a hand hold with two openings wide enough for a gloved hand.

PUMP

Pump will be a Waterous CMU 1500 gpm two (2) stage midship mounted centrifugal type.

Pump will be the class "A" type.

Pump will deliver the percentage of rated discharge at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure.

- 70% of rated capacity at 200 psi net pump pressure.

- 50% of rated capacity at 250 psi net pump pressure.

Pump body will be close-grained gray iron, bronze fitted, and horizontally split in two (2) sections for easy removal of the entire impeller shaft assembly (including wear rings).

Pump will be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping.

Pump case halves will be bolted together on a single horizontal face to minimize a chance of leakage and facilitate ease of reassembly. No end flanges will be used.

Discharge manifold of the pump will be cast as an integral part of the pump body assembly and will provide a minimum of three (3) 3.50" openings for flexibility in providing various discharge outlets for maximum efficiency.

The three (3) 3.50" openings will be located as follows: one (1) outlet to the right of the pump, one (1) outlet to the left of the pump, and one (1) outlet directly on top of the discharge manifold.

Impeller shaft will be stainless steel, accurately ground to size. It will be supported at each end by sealed, anti-friction ball bearings for rigid precise support. Impeller will have flame plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply.

Bearings will be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings will be used.

Pump will be equipped with a self-adjusting, maintenance-free, mechanical shaft seal.

The mechanical seal will consist of a flat, highly polished, spring fed carbon ring that rotates with the impeller shaft. The carbon ring will press against a highly polished stainless steel stationary ring that is sealed within the pump body.

In addition, a throttling ring will be pressed into the steel chamber cover, providing a very small clearance around the rotating shaft in the event of a mechanical seal failure. The pump performance will not deteriorate, nor will the pump lose prime, while drafting if the seal fails during pump operation.

Wear rings will be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.

PUMP TRANSMISSION

The pump transmission will be made of a three (3) piece, aluminum, horizontally split casing. Power transfer to pump will be through a high strength Morse HY-VO silent drive chain. By the use of a chain rather than gears, 50% of the sprocket will be accepting or transmitting torque, compared to two (2) or three (3) teeth doing all the work.

Drive shafts will be 2.35" diameter hardened and ground alloy steel and supported by ball bearings. The case will be designed to eliminate the need for water cooling.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



AIR PUMP SHIFT

Pump shift engagement will be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab. A manual back-up shift control will also be located on the driver's side pump panel.

Two (2) indicator lights will be provided adjacent to the pump shift inside the cab. One (1) green light will indicate the pump shift has been completed and be labeled "pump engaged". The second green light will indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light will be labeled "OK to pump".

Another green indicator light will be installed adjacent to the hand throttle on the pump panel and indicate either the pump is engaged and the road transmission is in pump gear, or the road transmission is in neutral and the pump is not engaged. This indicator light will be labeled "Warning: Do not open throttle unless light is on".

The pump shift control in the cab will be illuminated to meet NFPA requirements.

TRANSMISSION LOCK-UP

The direct gear transmission lock-up for the fire pump operation will engage automatically when the pump shift control, in the cab, is activated.

AUXILIARY COOLING SYSTEM

A supplementary heat exchange cooling system will be provided to allow the use of water from the discharge side of the pump for cooling the engine water. The heat exchanger will be cylindrical type and will be a separate unit. The heat exchanger will be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger will be plumbed to the master drain valve.

TRANSFER VALVE

Transfer valve design will be of the latest ball type, of all bronze construction and incorporate a hydraulically balanced seal assembly, minimizing leakage around the ball and assuring maximum pump efficiency.

Transfer valve will operate smoothly and without sticking, even when exposed to sandy or dirty water.

Transfer valve will be operated electrically with a control switch mounted on the pump operator's control panel, with two (2) indicator lights which will indicate "pressure" or "volume". Transfer valve will have the ability to change from series (pressure) operation to parallel (volume) operation without reducing the operating speed of the engine regardless of the operating pressure of the pump, thus maintaining an effective fire stream at the nozzle at all times.

A manual override will be provided in the event of electrical malfunction. The manual override system operates with the use of a removable hand crank located at the left (driver's) side pump panel.

INTAKE RELIEF VALVE

A Watrous relief valve, an integral part of the fire pump, will be installed on the suction side of the pump, preset at 125 psig.

Outlet will terminate below the framrails with a 2.50" National Standard hose thread adapter and an "intake pressure relief outlet - do not cap" warning tag.

Relief valve will have a working range of 75 psig to 250 psig.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



A control mechanism to adjust the pressure will be located behind an access door at the right (passenger) side pump panel.

PRESSURE GOVERNOR

This apparatus will be equipped with a Class1 "Total Pressure Governor" engine/pump governor/throttle system that is connected directly to the Electronic Control Module (ECM) mounted on the engine. The "Total Pressure Governor" is to operate as a pressure sensor (regulating) governor (PSG).

A special preset feature will permit a predetermined pressure of RPM to be set. The preset pressure or RPM will be displayed on the message display of the "Total Pressure Governor". The preset will be easily adjustable by the operator

The pressure sensor governor system will be operable only after the vehicle parking brake has been set, the transmission is in the pumping mode, and the fire pump has been engaged.

The pressure sensor governor system will have two (2) modes of operation: pressure mode or rpm mode.

When in the pressure mode, the PSG system will automatically maintain the discharge pressure set by the operator regardless of flow (within engine/pump operating capabilities).

In the rpm mode, the PSG system will automatically maintain a set engine speed, regardless of engine load (within engine operation capabilities).

A pump cavitation protection feature will be provided which will return the engine to idle should the pump cavitate.

The pressure controller will incorporate monitoring for engine coolant temperature, oil pressure, and battery voltage.

PRIMING PUMP

The priming pump will be a Trident Emergency Products compressed air powered, high efficiency, multistage venturi based AirPrime System, conforming to standards outlined in the current edition of NFPA 1901.

All wetted metallic parts of the priming system are to be of brass and stainless steel construction. One (1) priming control will open the priming valve and start the pump primer.

DRAINS- SPECIAL INSTRUCTIONS

All valves drains/bleeders will be tapped into the lowest point of each plumbing discharge and inlet. (This includes the ports on each valve as well).

PUMP MANUALS

Two (2) pump manuals from the pump manufacturer will be furnished in compact disc format with the apparatus. The manuals will cover pump operation, maintenance, and parts.

PLUMBING

All inlet and outlet plumbing, 3.00" and smaller, will be plumbed with either stainless steel pipe or synthetic rubber hose reinforced with high-tensile polyester braid. Small diameter secondary plumbing such as drain lines will be stainless steel, brass or hose.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping will be equipped with victaulic or rubber couplings.

Plumbing manifold bodies will be ductile cast iron or stainless steel.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



All lines will drain through a master drain valve or will be equipped with individual drain valves. All individual drain lines for discharges will be extended with a hose to drain below the chassis frame.

All water carrying gauge lines will be of flexible polypropylene tubing.

MAIN PUMP INLETS

A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

The main pump inlets will have National Standard Threads with a long handle chrome cap. The cap will be the Pierce VLH, which incorporates a Pierce exclusive thread design to automatically relieve stored pressure in the line when disconnected.

INLET BUTTERFLY VALVE

There will be one (1) butterfly valve provided on the driver's side main pump inlet.

The 6.00" inlet valve will be partially recessed behind the pump panel with a "key hole" shaped stainless steel trim ring around the opening.

A built-in, adjustable pressure relief valve and a 3/4" bleeder valve will be provided on the inlet side of the valve.

Valve will be electrically operated. An electric actuator, with seven (7) valve position LED indicator lights will be provided at the pump operator's panel.

The electric actuator will be furnished with a manual over ride, extended to the pump panel.

SUCTION TUBES, PUMP

The passenger side suction tube on the midship pump will have a "short" suction tube to allow for installation of an adapter without excessive overhang. The suction tube on the driver side will extend 4.50" past the pump panel.

VALVES

Five (5) full flow Waterous valves will be used for the side 2.50" discharges. All remaining ball valves, 3.00" or less, will be Akron Brass brand.

The Waterous valves will have a solid bronze ball that is chromium plated for a hard, durable surface. The spring loaded floating seal assembly requires no adjustment yet provides a tight seal against both pressure and vacuum pressures.

The Akron valves will be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

INLET (Left side)

On the left side pump panel will be one (1) 2.50" auxiliary suction, terminating in 2.50" National Standard Hose Thread. The auxiliary suction will be provided with a strainer, chrome swivel and plug.

INLET (Right side)

On the right side pump panel will be one (1) 2.50" auxiliary suction, terminating in 2.50" National Standard Hose Thread. The auxiliary suction will be provided with a strainer, chrome swivel and plug.

The location of the valve for the two (2) inlets will be recessed behind the pump panel.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



INLET CONTROL

Control for the side auxiliary inlet(s) will be located at the inlet valve.

INLET BLEEDER VALVE

A .75" bleeder valve will be provided for each side gated inlet. The valves will be located behind the panel with a swing style handle control extended to the outside of the panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeders will be routed below the chassis frame rails.

TANK TO PUMP

The booster tank will be connected to the intake side of the pump with heavy duty piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator's panel. Tank to pump line will run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling will be included in this line to prevent damage from vibration or chassis flexing.

A check valve will be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.

TANK REFILL

A 1.50" combination tank refill and pump re-circulation line will be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

LEFT SIDE DISCHARGE OUTLETS

There will be two (2) discharge outlets with a 2.50" valve on the left side of the apparatus, terminating with 2.50"(M) National Standard hose thread adapter.

DISCHARGE OUTLETS (Right Side)

There will be two (2) discharge outlets with a 2.50" valve on the right side of the apparatus, terminating with a male 2.50" National Standard hose thread adapter.

DISCHARGE OUTLET, LARGE DIAMETER

There will be a 5.00" discharge outlet with a 4.00" Akron valve installed on the right side of the apparatus, terminating with a male 5.00" National Standard hose thread.

There will be an Akron electric valve controllers provided at the pump panel. The controller unit will be of true position feedback design, requiring no clutches in the motor or current limiting. The controller will be completely sealed with two (2) button open and close valve position capability and a full color LCD display with backlight.

FRONT DISCHARGE OUTLET

There will be one (1) 2.50" discharge outlet piped to the front of the apparatus and located on the top of the right side of the front bumper.

Plumbing will consist of 2.50" piping and flexible hose with a 2.50" full flow valve with control at the pump operator's panel. A fabricated weldment made of stainless steel pipe will be used in the plumbing where appropriate. The piping will terminate with a 2.50" NST with 90 degree stainless steel swivel.

There will be Class 1 automatic drains provided at all low points of the piping.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



DISCHARGE OUTLET (Rear)

There will be two (2) discharge outlets piped to the rear of the hose bed, Location will be one left and right side. Proper clearance will be provided for spanner wrenches or adapters. Plumbing will consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel. The discharge outlet(s) will terminate with a 2.50" male National Standard hose thread male adapter.

DISCHARGE OUTLET (Front of Hose Bed)

There will be two (2) discharge outlets piped to the one (1) each side of the hose bed near the top of the bed. Plumbing will consist of 2.00" piping with a 2.00" full-flow ball valve controlled at the pump operator's panel. The two (2) discharge outlets will terminate with a 1.50" male National Standard hose thread adapter.

DISCHARGE CAPS

Chrome plated, rocker lug, caps with chains will be furnished for all side discharge outlets. The caps will be the Pierce VLH, which incorporates a Pierce exclusive thread design to automatically relieve stored pressure in the line when disconnected.

OUTLET BLEEDERS

A .75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

The valves will be located behind the panel with a swing style handle control extended to the outside of the side pump panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders will be located at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders will be routed below the chassis frame rails.

LEFT SIDE OUTLET ELBOWS

The 2.50" discharge outlets, located on the left side pump panel, will be furnished with a 2.50"(F) National Standard hose thread x 2.50"(M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates a Pierce exclusive thread design to automatically relieve stored pressure in the line when disconnected.

RIGHT SIDE OUTLET ELBOWS

The 2.50" discharge outlets, located on the right side pump panel, will be furnished with a 2.50"(F) National Standard hose thread x 2.50"(M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates a Pierce exclusive thread design to automatically relieve stored pressure in the line when disconnected.

The 2.50" discharge outlets, located at the rear of the apparatus, will be furnished with a 2.50"(F) National Standard hose thread x 2.50" (M) National Standard hose thread chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates a Pierce exclusive thread design to automatically relieve stored pressure in the line when disconnected.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



LARGE DIAMETER OUTLET ELBOWS

The 5.00" outlet will be furnished with a 5.00"(F) National Standard hose thread x 5.00" Storz elbow adapter with Storz cap.

ADAPTER

There will be two (2) adapters with 1.50" FNST X NPSH . These adapters will be installed on rear hose bed outlets.

There will be one (1) adapter provided with NPSH installed on the 2.5" crosslay.

ADAPTER, STORZ

There will be one (1) adapter with 5.00" Storz x 2.50" MNST with cap, installed passenger side large diameter.

There will be one (1) adapter with NPSH and cap. These adapters will be installed on front bumper discharge.

DISCHARGE OUTLET CONTROLS

The discharge outlets will incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism will indicate the position of the valve. If a handwheel control valve is used, the control will be a minimum of a 3.9" diameter stainless steel handwheel with a dial position indicator built in to the center of the handwheel.

DELUGE RISER

A 3.00" deluge riser will be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping will be rigidly braced and installed securely so no movement develops when the line is charged. The riser will be gated and controlled at the pump operator's panel.

The deluge riser will have male National Pipe Threads for mounting the monitor.

CROSSLAY HOSE BEDS

One (1) crosslay with 1.50" outlets will be provided. Each bed to be capable of carrying 300' x 1.5" and will be plumbed with 2.00" I.D. pipe and gated with a 2.00" quarter turn ball valve. Outlets to be equipped with a 1.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay controls will be at the pump operator's panel.

The center crosslay dividers will be a pan style, fabricated of .090 aluminum and will provide adjustment from side to side. The divider will be painted job color.

Stainless steel vertical scuffplates will be provided at hose bed ends (each side of vehicle).

Bottom of hose bed ends (each side) will also be equipped with a stainless steel scuffplate.

Crosslay bed flooring will consist of removable perforated brushed aluminum.

CROSSLAY HOSE BED, 2.50"

One (1) crosslay with a 2.50" outlet will be provided. The bed will be capable of carrying 200 feet of 2.50" double jacketed hose and will be plumbed with 2.50" I.D. pipe and gated with a 2.50" quarter turn ball valve.

The outlet will be equipped with a 2.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay control will be at the pump operator's panel.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



The center crosslay dividers will be a pan style, fabricated of .090 aluminum and will provide adjustment from side to side. The divider will be painted job color.

The remainder of the crosslay bed will be painted job color.

Crosslay bed flooring will consist of removable perforated brushed aluminum.

CROSSLAY/DEADLAY HOSE RESTRAINT

Elastic netting will be provided across the top and ends of two (2) crosslay/deadlay opening(s) to secure the hose during travel. The netting will be permanently attached at the top center of the crosslay/deadlay bed and removable on each end.

CROSSLAY ROLLER

A stainless steel roller will be mounted horizontally and vertically at each crosslay opening to aid in hose removal. The vertical rollers will be installed on the dividers and to the front and rear of the crosslays.

BOOSTER HOSE REEL

A Hannay electric rewind booster hose reel will be installed in the rear compartment.

The exterior finish of the reel will be painted #269 gray from the reel manufacturer.

Compartment floor will be covered with bright aluminum treadplate.

Roll-up door for this compartment will not interfere with the hose reel.

A polished stainless steel roller and guide assembly will be provided on each beavertail so the booster hose does not rub against a painted surface.

Discharge control will be provided at the pump operator's panel. Plumbing to the reel will consist of 1.50" Aeroquip hose and a 1.50" valve.

Reel motor will be protected from overload with a sized automatic reset circuit breaker.

An electric rewind control switch will be installed adjacent to the reel.

Capacity of the hose reel will be 200 feet of 1.00" booster hose.

HOSE REEL BLOWOUT

A hose reel blowout will be furnished to blow out any remaining water from the reel. Blowout will be piped from the wet tank of the brake system to the reel, and will be controlled at the pump operator's panel.

FOAM PROPORTIONER

A foam proportioning system will be provided that is an on demand, automatic proportioning, single point, direct injection system suitable for all types of Class A and B foam concentrates, including the high viscosity (6000 cps), alcohol resistant Class B foams. Operation will be based on direct measurement of water flow, and remain consistent within the specified flows and pressures. The system will automatically balance and proportion foam solution at rates from .1 percent to 9.9 percent regardless of variations in water pressure and flow, up to the maximum rated capacity of the foam concentrate pump.

The design of the system will allow operation from draft, hydrant, or relay operation. This will provide a versatile system to meet the demands at a fire scene.

System Capacity

The system will have the ability to deliver the following minimum foam solution flow rates that meet or exceed NFPA requirements at a pump rating of 250 psi.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



200 gpm @ 6 percent
400 gpm @ 3 percent
1200 gpm @ 1 percent

The foam concentrate setting may be adjusted in .1 percent increments from .1 percent to 9.9 percent. Typical settings are .3 percent, .5 percent and 1.0 percent (The maximum capacity will be limited to the plumbing and water pump capacity).

Control System

The system will be equipped with a digital electronic control display located on the pump operator's panel. Push button controls will be integrated into the panel to turn the system on/off, control the foam percentage, direct which foam to use on a multi-tank system, and to set the operation modes (automatic, manual, draft, calibration, or flush).

The percent of injection will have presets for Class A and Class B foam. These presets can be changed at the fire department as desired. The percent of injection will be able to be easily changed at the scene to adjust to changing demands.

In order to minimize the use of abbreviations and interpretations, system information will be displayed on the panel by way of .50 tall LEDs that total 14 characters (two (2) lines of seven (7) each). System on and foam pump on indicator lights will also be included. Information displayed will include mode of operation (automatic, manual, draft, calibration, or flush), foam supply selected (Class A or Class B), water total, foam total, foam percentage, remaining gallons, and time remaining.

The control display will direct a microprocessor, which receives input from the systems water flow meter while also monitoring the position of the foam concentrate pump. The microprocessor will compare the values of the water flow versus the position/rate of the foam pump, to ensure the proportion rate is accurate. One (1) check valve will be installed in the plumbing to prevent foam from contaminating the water pump.

Low Level, Foam Tank

The control head will display a warning message when the foam tank in use is below a quarter tank.

Hydraulic Drive System

The foam concentrate pump will be powered by a hydraulic drive system, which is automatically activated, whenever the vehicle water pump is engaged. A system that drives the foam pump via an electric motor will not be acceptable. A large parasitic electric load used to power the foam pump can cause an overload of the chassis electrical system.

Hydraulic oil cooler will be provided to automatically prevent overheating of the hydraulic oil, which is detrimental to system components. The oil/water cooler will be designed to allow continuous system operation without allowing hydraulic oil temperature to exceed the oil specifications.

The hydraulic oil reservoir will be of four (4) gallons minimum capacity and will also be of sufficient size to minimize foaming and be located to facilitate checking oil level or adding oil without spillage or the need to remove access panels.

Foam Concentrate Pump

The foam concentrate pump will be of positive displacement, self-priming; linear actuated design, driven by the hydraulic motor. The pump will be constructed of brass body; chrome



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



plated stainless steel shaft, with a stainless steel piston. In order to increase longevity of the pump, no aluminum will be present in its construction.

A relief system will be provided which is designed to protect the drive system components and prevent over pressuring the foam concentrate pump

The foam concentrate pump will have minimum capacity for 12 gpm with all types of foam concentrates with a viscosity at or below 6000 cps including protein, fluoroprotein, AFFF, FFFP, or AR-AFFF. The system will deliver only the amount of foam concentrate flow required, without recirculating foam back to the storage tank. Recirculating foam concentrate back to the storage tank can cause agitation and premature foaming of the concentrate, which can result in system failure. The foam concentrate pump will be self-priming and have the ability to draw foam concentrate from external supplies such as drums or pails.

External Foam Concentrate Connection

An external foam pick-up will be provided to enable use of a foam agent that is not stored on the vehicle. The external foam pick-up will be designed to allow continued operation after the on-board foam tank is empty. The external foam pick-up will be designed to allow use with training foam or colored water for training purposes.

Panel Mounted Strainer/External Pick-Up Connection

A bronze body strainer/connector unit will be provided. The unit will be mounted to the pump panel. The external foam pick-up will be one (1) 1.00" male connection with chrome-plated cap integrated to a 2.00" strainer cleanout cap. A check valve will be installed in the pick-up portion of the cleanout cap. A basket style stainless steel screen will be installed in the body of the strainer/connector unit. Removal of the 2.00" cleanout cap will be all that is required to gain access to and remove the stainless steel basket screen. The strainer/connector unit will be ahead of the foam concentrate pump inlet port to insure that all agent reaching the foam pump has been strained.

Pick-Up Hose

A 1.00" flexible hose with an end for insertion into foam containers will be provided. The hose will be supplied with a 1.00" female swivel NST thread swivel connector. The hose will be shipped loose.

Discharges

The foam system will be plumbed to three (3) discharges. The discharges capable of dispensing foam will be the front bumper outlet and the two crosslays.

System Electrical Load

The foam proportioning will not impose an electrical load on the vehicle electrical system any greater than five (5) amps at 12VDC.

Foam Supply Valve

Electric valves will be used for the foam supply. The foam supply valves will be controlled at the foam system control head for ease of operation. The supply valves will be electric, remote controlled, to eliminate air pockets in the foam tank supply hose.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



Maintenance Message

A message will be displayed on the control head to advise when system maintenance needs to be performed. The message will display interval for cleaning the foam strainer, cleaning for the water strainers, and changing the hydraulic oil.

Flush System

The system will be designed such that a flush mode will be provided to allow the system to flush all foam concentrate with clear water. The flush circuit control logic will ensure the foam tank supply valve is closed prior to opening the flush valve. The flush valve will be operated at the foam system control head for ease of operation. The valve will be electrically controlled and located as close to the foam tank supply valve as possible. A manual flush drain valve will be labeled and located under the driver's side running board.

REFILL, FOAM TANKS

The foam system's proportioning pump will be used to fill the Class-A foam tank. This will allow use of the auxiliary foam pick-up to pump the foam from pails or a drum on the ground into the foam tank. A foam shut-off switch will be installed in the fill dome of the tank to shut the system down when the tank is full. The fill operation will be controlled by a mode in the foam system controller stating TANK A FILL. While the proportioner pump is filling the tank, the controller will display FILL TANK A. When the tank is full, as determined by the float switch in the tank dome, the pump will stop and the controller will display TANK A FULL. A separate air operated fill pump, controlled by the foam system controller, will be provided for filling the Class B foam tank. A separate inlet connection, mounted on the pump panel will be provided for this fill system. A foam shut-off switch will be installed in the fill dome of the tank to shut the system down when the tank is full. The connection will be the same as the foam intake connection, in order to allow the use of the foam pick-up hose as the fill hose. The fill operation will be controlled by a mode in the foam system controller stating TANK B FILL. To fill the tank, the controller will start and run the air operated pump. While the pump runs, the controller will display FILL TANK B. When the tank is full, as determined by the float switch in the tank dome, the pump will stop and the controller will display TANK B FULL.

LABEL, FOAM CONTENT

A label will be provided on the foam tank fill dome. This label will be worded "Foam".

FOAM SYSTEM TRAINING

The fire department will order one (1) vehicle with this foam system. The operation of the foam system will be demonstrated at the plant where the apparatus was manufactured.

This demonstration will include:

- A review of the foam system manual, emphasizing key areas
- A walk around review of the system components on the finished truck
- A hands-on foam system start-up and foam discharge session
- Instructions on the use of the manual overrides
- A demonstration explaining the proper way to shut down and flush the foam system.

FOAM TANK

The foam tank will be an integral portion of the polypropylene water tank. The cell will have a capacity of 20 gallons of foam with the intended use of Class B foam. The brand of foam stored



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



in this tank will be AFFF. The foam cell will not reduce the capacity of the water tank. The foam cell will have a screen in the fill dome and a breather in the lid.

FOAM TANK DRAIN

A system of 1.00" foam tank drains will be provided, integrated into the foam systems strainer and tank to foam pump valve management system. The tank to pump hoses running from the tank(s) to the panel mounted strainer will 1.00" diameter. The foam system controller will have a mode that allows for a given foam valve to be opened at will. Flow of foam from the tank valve to the strainer will be usable as a tank drain mode.

An adaptor will be supplied, that allows the 1.00" foam intake screen to assembly to be used as a drain outlet. The standard supplied 1.00" foam pick up hose will be attached to the screen assembly by way of the adapter. The drain mode will allow the operator to open and close the tank valve as required from the control head, to drain foam and re-fill foam containers through the connected hose, without foam spillage beneath the vehicle.

FOAM TANK

The foam tank will be an integral portion of the polypropylene water tank. The cell will have a capacity of 20 gallons of foam with the intended use of Class B foam. The brand of foam stored in this tank will be ATC Polar Solvent. The foam cell will not reduce the capacity of the water tank. The foam cell will have a screen in the fill dome and a breather in the lid.

FOAM TANK DRAIN

A system of 1.00" foam tank drains will be provided, integrated into the foam systems strainer and tank to foam pump valve management system. The tank to pump hoses running from the tank(s) to the panel mounted strainer will 1.00" diameter. The foam system controller will have a mode that allows for a given foam valve to be opened at will. Flow of foam from the tank valve to the strainer will be usable as a tank drain mode.

An adaptor will be supplied, that allows the 1.00" foam intake screen to assembly to be used as a drain outlet. The standard supplied, 1.00" foam pick up hose will be attached to the screen assembly by way of the adapter. The drain mode will allow the operator to open and close the tank valve as required from the control head, to drain foam and re-fill foam containers through the connected hose, without foam spillage beneath the vehicle.

PUMP COMPARTMENT

The pump compartment will be separate from the hose body and compartments so that each may flex independently of the other. It will be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

The pump compartment will be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist.

Pump compartment, pump, plumbing and gauge panels will be removable from the chassis in a single assembly.

PUMP MOUNTING

Pump will be mounted to a substructure which will be mounted to the chassis frame rail using rubber isolators. The mounting will allow chassis frame rails to flex independently without damage to the fire pump.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



PUMP CONTROL PANELS (Left Side Control)

All pump controls and gauges will be located at the left (driver's) side of the apparatus and properly identified.

Layout of the pump control panel will be ergonomically efficient and systematically organized. The pump operator's control panel will be removable in two (2) main sections for ease of maintenance:

The upper section will contain sub panels for the mounting of the pump pressure control device, engine monitoring gauges, electrical switches, and foam controls (if applicable). Sub panels will be removable from the face of the pump panel for ease of maintenance. Below the sub panels will be located all valve controls and line pressure gauges.

The lower section of the panel will contain all inlets, outlets, and drains.

All push/pull valve controls will have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods will be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls will be capable of locking in any position. The control rods will pull straight out of the panel and will be equipped with universal joints to eliminate binding.

IDENTIFICATION TAGS

The identification tag for each valve control will be recessed in the face of the tee handle.

All discharge outlets will have color coded identification tags, with each discharge having its own unique color. Color coding will include the labeling of the outlet and the drain for each corresponding discharge.

All line pressure gauges will be mounted directly above the corresponding discharge control tee handles and recessed within the same chrome plated casting as the rod guide for quick identification. The gauge and rod guide casting will be removable from the face of the pump panel for ease of maintenance. The casting will be color coded to correspond with the discharge identification tag.

All remaining identification tags will be mounted on the pump panel in chrome plated bezels. The pump panel on the right (passenger's) side will be removable with lift and turn type fasteners.

Trim rings will be installed around all inlets and outlets.

The trim rings for the side discharge outlets will be color coded and labeled to correspond with the discharge identification tag.

Pump Panel Configuration

The pump panel configuration will be arranged and installed in an organized manner that will provide user-friendly operation.

Similar to job number 25594.

PUMP AND GAUGE PANEL

The pump and gauge panels will be constructed of stainless steel with a brushed finish. A polished aluminum trim molding will be provided on both sides of the pump panel.

The passenger's side pump panel will be removable and fastened with swell type fasteners.

On the front of the pump house structure, provisions will be provided for access to the pump.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



PUMP COMPARTMENT LIGHT

A pump compartment light will be provided inside the right side pump enclosure and accessible through a door on the pump panel.

A .125" weep hole will be provided in each light lens, preventing moisture retention.

PUMP PANEL GAUGES AND CONTROLS

The following will be provided on the pump and gauge panels in a neat and orderly fashion.

These gauges will be in addition to what is provided with the pressure controller.

- Engine Oil Pressure Gauge: With visual and audible warning
- Engine Water Temperature Gauge: With visual and audible warning
- Tachometer: Electric
- Master Pump Drain Control
- Voltmeter

INSULATED COMPARTMENT IN PUMP PANEL

An insulated compartment will be provided for a rectifier in the passenger's side pump panel. A louvered stainless steel access door will be provided.

TEST PORT

An electronic pump RPM test port will be provided.

GAUGES, VACUUM and PRESSURE

The pump vacuum and pressure gauges will be liquid filled and manufactured by Class 1, Inc.

The gauges will be a minimum of 6.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

The pump pressure and vacuum gauges will be installed adjacent to each other at the pump operator's control panel.

Test port connections will be provided at the pump operator's panel. One will be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They will have 0.25 in. standard pipe thread connections and polished stainless steel plugs. They will be marked with a label.

PRESSURE GAUGES

The individual "line" pressure gauges for the discharges will be interlube filled and manufactured by Class 1.

The gauges will be a minimum of 3.50" in diameter and will have white faces with black lettering.

Gauges will be compound type with a vacuum/pressure range of 30.00"-0-600#.

The individual pressure gauge will be installed as close to the outlet control as practical.

WATER LEVEL GAUGE

An electric water level gauge manufactured by Innovative Controls Inc., will be provided on the operator's panel. The gauge will register water level by means of five (5) brightly colored incandescent lights. The water level indicators will be as follows:

- Full = Green
- 3/4 = Yellow
- 1/2 = Yellow
- 1/4 = Yellow



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- Refill = Red

To further alert the pump operator, the refill light will start flashing when the water level drops below the 1/4 mark.

The level measurement will be based on the sensing of the electrical conductivity of the water in the tank.

The display will be constructed of a solid plastic material to reduce vibrations that can cause broken wires and loose electronic components. The encapsulated design will provide complete protection from water and environmental elements.

The gauge light bulbs will be rated for 15,000 hours. The bulbs will be easily replaced by unscrewing the colored lens cover.

The cover plate panel bezel will be of a chrome plated die cast design. The overlay graphics will be on the inside surface of the composite overlay to provide protection from wear. The composite overlay will be scratch resistant and immune to cleaning solvents and UV light weathering.

The water level probe will be constructed of chemical resistant, PVC plastic with a 3.00" diameter anodized flange. The internal wire connectors and electronics will be fully encapsulated to protect against water, dirt, and vibration. The probe system will not contain moving parts or mechanical switching.

WATER LEVEL GAUGE

There will be two (2) additional water level indicator, Whelen, Model: PSTANK, LED module, installed each side of the crew cab to the rear doors.

This light module will include four (4) colored levels, and function similar to the water level indicator located at the operators panel:

- First green module indicates a full water level.
- Second blue module indicates a water level above 3/4 full.
- Third amber module indicates a water level above 1/2 full.
- Last red module indicates a water level above 1/4 full and empty.
 - Above 1/4 this light will be steady burning.
 - At empty this light will be flashing.

This module will be activated when the battery switch is on.

FOAM LEVEL GAUGE

An electronic foam level gauge will be provided on the operator's panel for each foam tank, that registers foam level by means of five colored LED lights. The lights will be durable, ultra-bright five LED design viewable through 180 degrees. The foam level indicators will be as follows:

- 100% = Green
- 75% = Yellow
- 50% = Yellow
- 25% = Yellow
- Refill = Red

The light will flash when the level drops below the given level indicator to provide an eighth of a tank indication. To further alert the pump operator, the lights will flash sequentially when the foam tank is empty.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



The level measurement will be based on the sensing of head pressure of the fluid in the tank. The display will be constructed of a solid plastic material with a chrome plated die cast bezel to reduce vibrations that can cause broken wires and loose electronic components. The encapsulated design will provide complete protection from foam and environmental elements. An industrial pressure transducer will be mounted to the outside of the tank. The field calibratable display measures head pressure to accurately show the tank level.

LIGHT SHIELD

There will be a polished, 16 gauge stainless steel light shield will be installed over the pump operators panel.

- There will be three (3) On Scene Solutions, Model Night Stick, 18.00" LED lights installed under the stainless steel light shield to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house.
- One (1) pump panel light will come on when the pump is in ok to pump mode.

There will be a light activated above the pump panel light switch when the parking brake is set. This is to afford the operator some illumination when first approaching the control panel. There will be a green pump engaged indicator light activated on at the operator's panel when the pump is shifted into gear from inside the cab.

MICROPHONE AND SPEAKER COMPARTMENT

A microphone and speaker compartment with a polished stainless steel door will be furnished adjacent to the pump operator's panel. The compartment size will be 12.00" high x 9.00" wide x 6.00" deep.

AIR HORN SYSTEM

Two (2) Hadley round air horns with 6.00" bell will be provided and located, in the front bumper, recessed inside frame each side. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent the loss of air, in the air brake system.

AIR HORN CONTROL

The air horns will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

MECHANICAL SIREN, (Auxiliary)

A Federal Q2B siren will be furnished. A siren brake button will be installed on the switch panel.

The control solenoid will be powered up after the emergency master switch is activated. The mechanical siren will be mounted on the bumper deckplate. It will be mounted on the left side. A reinforcement plate will be furnished to support the siren.

The mechanical siren will be actuated by a foot switch on the officer's side and by the horn button in the steering wheel. The driver will have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



LIGHTBAR

One (1) 93.00" Whelen Freedom, model FN**QLED, LED lightbar shall be mounted on the cab roof.

The lightbar shall include the following:

Four (4) red flashing LED modules facing forward.

Four (4) blue flashing LED modules facing forward.

Two (2) red flashing corner LED modules, one in each front corner

One (1) red flashing LED module facing the driver side.

One (1) red flashing LED module facing the passenger side.

One (1) GTT model 795 LED Opticom™ with national standard high priority.

The color of the lenses shall be clear.

Two (2) switches located on a cab switch panel shall control this lightbar.

One (1) switch shall control all the warning lights.

One (1) switch shall control the traffic light controller.

To meet NFPA requirements the traffic light controller shall be disabled when the parking brake is applied.

WARNING LIGHTS (Cab Face)

Four (4) Whelen Model M6* LED flashing warning lights will be installed on the cab face, above the headlights, mounted in a common bezel.

The driver's side front outside warning light to be red.

The driver's side front inside warning light to be white.

The passenger's side front inside warning light to be white.

The passenger's side front outside warning light to be red.

All four (4) lights will include a colored lens that is the same color of the LED's.

There will be a switch located in the cab, on the switch panel, to control the four (4) lights.

The inside lights may be load managed if colored or disabled if white, when the parking brake is set.

HEADLIGHT FLASHER

The high beam headlights will flash alternately between the left and right side.

There will be a switch installed in the cab on the switch panel to control the high beam flash.

This switch will be live when the battery switch and the emergency master switches are on.

The flashing will automatically cancel when the headlight (high or low beam) switch is activated or when the parking brake is set.

SIDE ZONE LOWER LIGHTING

Six (6) Whelen Model M6* LED flashing warning lights with bezels will be located in the following positions:

Two (2) lights, one (1) each side on the bumper extension.

The side front lights to be red.

Two (2) lights, trailing edge of cab.

The side middle lights to be blue.

Two (2) lights, rear fender panel above wheels.

The side rear lights to be red.

All six (6) lights will include a lens that is the same color of the LED's.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



There will be a switch located in the cab on the switch panel to control the lights.

SIDE WARNING LIGHTS

There will be one (1) pair of Whelen, Model M6* LED flashing lights provided.

The lights will be located on the cab corner each side and will be activated with the side warning switch.

The color of the lights will be red Super LED/red lens.

The lights will be mounted on a 45 degree angled forward polished stainless steel bezels.

Any white light will terminate when the parking brake is applied.

REAR ZONE LOWER LIGHTING

Two (2) Whelen, Model M6* LED flashing warning lights with bezels will be located at the rear of the apparatus.

The driver's side rear light to be red.

The passenger's side rear light to be blue.

Both lights will include a lens that is the same color as the LED's.

There will be a switch located in the cab on the switch panel to control the lights.

MOUNTING, RECESS LIGHT

There will be one (1) pair of upper rear warning lights, on the rear bulkheads, recessed into the body. The lights will be flush to the compartment sheet and will be installed upper rear scene lights.

WARNING LIGHTS (Rear of Hose Bed)

Two (2) Whelen model B6MM**P Super LED beacon with lower Super LED flashing warning lights will be provided at the rear of the truck, one (1) each side.

Each light will include a Super LED flashing beacon and a model 70*02F*R Super LED flashing light, mounted in a polished aluminum housing.

The beacons will have red LEDs and be provided with both domes red.

The color of the LED flashing lights will be amber Super LED/amber lens.

A switch will be provided in the cab, on the switch panel to control the beacons. The lower Super 700 LEDs will be activated with the rear upper warning switch.

The rear warning lights will be mounted on top of the compartmentation with all wiring totally enclosed. The rear deck lights will be mounted on the beavertails high as possible.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen model TAL85 46.81" long x 2.84" high x 2.24" deep, amber LED traffic directing light installed at the rear of the apparatus.

The Whelen model TACTLD1 control head will be included with this installation.

The auxiliary warning mode will be activated with the control head only.

This traffic directing light will be recessed with a stainless steel trim plate at the rear of the apparatus as high as practical.

The traffic directing light control head will be located in the driver side overhead switch panel in the right panel position.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



CUP HOLDER

A cup holder will be provided for the Two (2) to securely hold the push-up pole in place while in the lower position.

COMMAND LIGHTS

The apparatus will be equipped with a pair of Whelen, Model 800DHAP, amber strobe beacon lights. The lights will be installed one rearward of the lightbar centered on a Z-bracket and the other at the rear of the cab centered on the rear exterior wall, top of light not to extend past the top of the cab roof.

The front beacon will be installed on a Z-bracket at the rear center of the lightbar and protrude over the lightbar.

The rear beacon will be mounted on an aluminum tread plate bracket installed at the center, rear of cab with all wiring totally enclosed. The top of the light will be flush mounted to the top of the cab

The lights will be used for FAA amber requirement for airport operation, and may not be operated off airport grounds.

The lights will be activated when the ignition is activated, reset with the emergency master and a separate switch labeled "AIRPORT LIGHT".

POWER OUTLET STRIP

A six (6) place power outlet strip will be provided keep receptacle strip loose for Customer to install - hard wire from the shoreline to the lower rear engine tunnel area per the photo, department will mount receptacle strip. The outlet strip will contain 120 volt, 15 amp straight blade receptacles.

The power outlet will be wired to the shoreline input.

One (1) receptacle will be provided.

120 VOLT SHORELINE RECEPTACLE

Receptacle will be a 120 volt, 15 amp, three (3) wire, four (4) outlet household type connected to the shoreline.

There will be two (2) receptacles provided.

One (1) in each EMS cabinet, low center of back wall.

HYDRAULIC REEL MOUNTING PROVISION

Brackets and the appropriate wiring will be provided for future installation of a hydraulic reel. The make and model of the hydraulic reel will be Hannay reel with 100' of capacity, see photo for reference.

Mounting provisions will be provided for future installation of one (1) reel located P1 body compartment.

HYDRAULIC FLUID

One (1) gallon of mineral oil fluid will be provided for the hydraulic tool system. Oil will be ISO viscosity grade 22.

A total of one (1) will be provided.

HYDRAULIC HOSE

A 4'-12' section of TNT high pressure twin hose will be provided.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



The hose will be one (1) continuous length, without unions, and equipped with quick connection type fittings at one end with swivel fittings at the opposite end.

A total of one (1) will be provided.

The colors of the hose will be:

hose 1 red/red

hose 2 n/a

hose 3 no hose required

hose 4 no hose required

hose 5 no hose required

hose 6 no hose required

The hose will be located right rear compartment.

HYDRAULIC HOSE

A 100' section of TNT high pressure twin hose will be provided.

The hose will be one (1) continuous length, without unions, and equipped with quick connection type fittings at the tool end.

A total of one (1) will be provided.

The colors of the hose will be:

hose 1 red/red

hose 2 n/a

hose 3 no hose required

hose 4 no hose required

hose 5 no hose required

hose 6 no hose required

The hose will be located right rear compartment.

HYDRAULIC REEL WITH CAPACITY FOR 100' OF HOSE

A hydraulic hose reel will be provided. The reel will be operated by a 12 volt electric motor controlled by a rewind switch. The motor will be protected by a circuit breaker and the rewind circuit will be protected by a fuse. The switch will be guarded to prevent accidental operation and installed at a height not to exceed 72 inches above the operators standing position.

The reel capacity will be a minimum of 100 feet of .25" I.D. dual hydraulic hose. Surfaces where the hose comes in contact with the reel roller will be constructed of stainless steel, chrome plated steel or plastic.

A Nylatron guide to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the hose from being wound around the reel.

A label will be provided in a readily visible location adjacent to the reel. The label will indicate maximum flow pressure and total cable length.

A total of one (1) reel will be installed right rear.

Reel will be designed for a new TNT pump and tools.

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



NFPA REQUIRED LOOSE EQUIPMENT, PROVIDED BY DEALER

The following loose equipment as outlined in NFPA 1901, 2009 edition, section 5.8.2 and 5.8.3 will be provided by the dealer. All loose equipment will be installed on the apparatus before placed in emergency service, unless the fire department waives NFPA section 4.21.

- 800 ft. (60 m) of 2.50" (65 mm) or larger fire hose.
- 400 ft. (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose.
- One (1) handline nozzle, 200 gpm (750 L/min) minimum.
- Two (2) handline nozzles, 95 gpm (360 L/min) minimum.
- One (1) playpipe with shutoff and 1.00" (25 mm), 1.125" (29 mm), and 1.25" (32 mm) tips.
- One (1) SCBA complying with NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*, for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Four (4) combination spanner wrenches mounted in bracket(s) fastened to the apparatus.
- Two (2) hydrant wrenches mounted in brackets fastened to the apparatus.
- Four (4) ladder belts meeting the requirements of NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components* (if equipped with an aerial device).
- One (1) double female 2.50" (65 mm) adapter with National Hose threads, mounted in a bracket fastened to the apparatus.
- One (1) double male 2.50" (65 mm) adapter with National Hose threads, mounted in a bracket fastened to the apparatus.
- One (1) rubber mallet, for use on suction hose connections, mounted in a bracket fastened to the apparatus.
- Two (2) salvage covers each a minimum size of 12 ft. × 14 ft. (3.7 m × 4.3 m).
- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One (1) automatic external defibrillator (AED).



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, will be carried mounted in brackets fastened to the apparatus.
- If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side will be carried. Any intake connection larger than 3.00" (75 mm) will include a pressure relief device that meets the requirements of 16.6.6.
- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake will be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters will be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

SOFT SUCTION HOSE

There will be a 15 foot length of 6.00" soft suction hose provided with a 6.00" long handle swivel coupling on one (1) end and a 4.50" long handle swivel coupling on the other.

DRY CHEMICAL EXTINGUISHER PROVIDED BY DEALER

NFPA 1901, 2009 edition, section 5.8.3 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus. The extinguisher is not on the apparatus as manufactured. The dealer will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY DEALER

NFPA 1901, 2009 edition, section 5.8.3 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus. The extinguisher is not on the apparatus as manufactured. The dealer will provide and mount the extinguisher.

AXE, FLATHEAD, PROVIDED BY DEALER

NFPA 1901, 2009 edition, Section 5.8.3 requires one (1) flathead axe mounted in a bracket fastened to the apparatus. The axe is not on the apparatus as manufactured. The dealer will provide and mount the axe.

AXE, PICKHEAD, PROVIDED BY DEALER

NFPA 1901, 2009 edition, Section 5.8.3 requires one (1) pickhead axe mounted in a bracket fastened to the apparatus. The axe is not on the apparatus as manufactured. The dealer will provide and mount the axe.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



PAINT - BODY PAINTED TO MATCH CAB

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the custom body will be thoroughly cleaned and prepared for painting. Surfaces that will not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate. Each imperfection on the exterior metal surface will be removed or filled and then sanded smooth for a smooth appearance. All seams will be sealed before painting.
2. Chemical Cleaning and Treatment - The aluminum surfaces will be properly cleaned using a four (4)-phase, high pressure and high temperature acid etching system. All steel surfaces will be properly treated using a three (3)-phase, high temperature, cleaning/phosphatizing system. Surfaces are chemically cleaned to remove all dirt, oil, grease and metal oxides to ensure the subsequent coatings bond well. An ultra-pure water final rinse of 25 parts per million solids or less, will be applied to final rinse all metal surfaces at the conclusion of the metal treatment process. This final rinse ensures all chemical residues are removed and that no minerals, (salts), from the water dry onto the metal surface and remain under the primers and topcoats. These salts can lead to blistering and under film corrosion.
3. Primer/Surfacer Coats - A minimum of two (2) mil dry, (.002), of two component urethane primer/surfacer will be hand applied to the chemically treated metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface. The primer is a high solids and low VOC paint.
4. Hand Sanding to Ultra-Fine Finish - The primer/surfacer coat is lightly sanded with mild abrasive paper to an ultra-smooth finish. This hand finish process is critical to produce the smooth mirror like finish in the topcoat.
5. Sealer Primer Coat - A two (2) component sealer primer coat is applied over the sanded primer to again build toward the final smooth finish. This layer of primer sealer also gives additional corrosion protection.
6. Topcoat Paint - Two (2) coats of an automotive grade, two component acrylic urethane paint are applied to provide the lasting beauty and durability. The acrylic urethane topcoat contains a clear coat resin chemistry that creates the high gloss and depth of image. This type of topcoat provides the best resistance against acid rain and other more common chemicals.
7. Clearcoat - Two (2) coats of an automotive grade two (2) component urethane will be applied. Lap style doors will be clear coated to match the body. Roll-up doors will not be clear coated and the standard roll-up door warranty will apply.

A cyclic corrosion test, (General Motors test GM-9540), of 40 cycles will be required before making changes to the exterior coating process. Exterior coating systems, (excluding the undercarriage components), must achieve a 1/16 or less maximum creep from the scribe for aluminum and an 1/8 or less maximum creep from the scribe for galvanized after 40 cycles in the General Motors GM-9540 test.

Each batch of color topcoat, together with the finish painted vehicle, is tested for precise color match. Visual color match will be checked following ASTM D-1729, (American Standard Testing Methods), procedures using CIE, (International Commission on Illumination), D75 Northern Daylight light source. Instrumental color match will follow ASMT D-2244 procedures with a maximum delta E of 1.0 for whites, 1.4 for yellows, blues, greens and 1.5 for reds.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



All removable items such as brackets, compartment doors, door hinges, trim, etc. will be removed and painted separately to insure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

The cab and the body will be painted Lime yellow #40.

Prior to reassembly and reinstallation of lights, handrails, door hardware and any miscellaneous body items, an isolation tape or gasket material will be used to prevent damage to the finish painted surfaces. A nylon washer will be installed under each acorn nut or metal screw that is fastened directly to a painted body surface.

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current State (his) regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations must have a 99.99 percent efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter means is used, it must have an efficiency rating of 98 percent. Water wash systems will be 99.97 percent efficient.
- Water from water wash booths will be reused. Solids will be removed mechanically on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner. They are used as fuel in kilns used in the cement manufacturing process - thereby extracting energy from a waste material.
- Empty metal paint containers will be cleaned, crushed and recycled to recover the metal.
- Solvents used in clean-up operations will be collected, recycled on-site, or sent off-site for distillation and returned for reuse. Residue from the distillation operation will be used as fuel in off-site cement kilns.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that his manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

PAINT/SEAL CHASSIS FRAME ASSEMBLY

The following components will be treated with epoxy E-coat protection prior to finish paint:

- Two (2) C-channel frame rails

The E-coat process will meet the technical properties shown. Before the frame rails are finish painted, all areas will be sealed with a 3M 2084 metal sealant after the components are torqued to the frame rails:

- The joint between all crossmembers and the frame
- The joint between all spring hangers and the frame.

Duane Doucette

FILM TECHNICAL PROPERTIES		
PROPERTY	TEST METHOD	PERFORMANCE
Color	-	Black
Film Thickness	-	0.5 - 1.5 Mills
Gloss - 60 Degree	ASTM D523	65 - 85
Pencil Hardness	ASTM D3363	2H Minimum
Direct Impact	ASTM D2794	100 in. - lbs. Minimum
Reverse Impact	ASTM D2794	60 in. - lbs. Minimum
Crosshatch Adhesion	ASTM D3359	4B - 5B
Humidity	ASTM D1735	1000 Hours Minimum
Water Immersion	ASTM D870	250 Hours Minimum
Gravelometer	GM9508P	6 Minimum
Throwpower	GM9535P	12 - 15 in.
<small>Cold rolled steel lab panels, Zinc Phosphate pretreatment, 0.6 mils average film thickness, cured 20 minutes @ 350°F.</small>		
PROPERTY	SUBSTRATE PRETREATMENT	SALT SPRAY* 1000 HOURS
Corrosion Resistance	CRS / Zinc Phos / Non-Chrome	1 - 2 mm
<small>*Salt Spray - ASTM B117, cold rolled steel lab panels cured 20 minutes @ 350°F. [Average Total Scribe Creep]</small>		



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



The chassis frame assembly will be finish painted black before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be finish painted are:

- Frame rails
- Cross members
- Axles
- Suspensions
- Steering gear
- Battery boxes
- Bumper extension weldment
- Frame extensions
- Body mounting angles
- Rear Body support substructure (front and rear)
- Pump house substructure
- Air tanks
- Fuel tank
- Castings
- Individual piece parts used in chassis and body assembly

After the chassis frame assembly is finish painted, the following non-torqued joints will be sealed with a SG-510A rust-proofing compound:

-All bolted on chassis components that could be vulnerable to rust, i.e. body mounting angles, air tanks, etc.

To summarize, all metal to metal contact components that are prone to rust, will be protected.

PAINTED AIR CONDITIONING COVER AND MOUNTS

The cover of the air conditioning condenser and the mounting feet will be painted to match the color of the cab roof.

COMPARTMENT INTERIOR PAINT

The compartment interior will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

REFLECTIVE BAND

A 10.00" blue reflective band will be provided across the front of the vehicle and along the sides of the body.

The reflective band provided on the cab face will be below the headlights on the fiberglass.

CHEVRON STRIPING, FRONT & REAR

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus and the front bumper. The rear surface, excluding the rear compartment door, will be covered. The colors will be red and fluorescent yellow green diamond grade. Each stripe will be 6.00" in width.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



This will meet the requirements of NFPA 1901, 2009 edition, which states that 50% of the rear surface will be covered with chevron striping.

CHEVRON STRIPING ON FRONT BUMPER

There will be alternating chevron striping located on the front bumper. The colors will be red and fluorescent yellow green diamond grade. The size of each stripe will be 6.00”.

REFLECTIVE STRIPE, CAB DOORS

A 6.00" x 16.00" fluorescent yellow green diamond grade reflective stripe will be provided across the interior of each cab door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

This stripe will meet the NFPA 1901 requirement.

LETTERING

One (1) to twenty (20) reflective lettering, 3.00" high, with no outline or shade will be provided.

LETTERING

There will be reflective lettering, 18.00" high, with no outline or shade provided. There will be four (4) letters provided.

LETTERING

Sixty-one (61) to eighty (80) reflective lettering, 2.00" high, with no outline or shade will be provided.

LETTERING

There will be reflective lettering, 24.00" high, with no outline or shade provided. There will be two (2) letters provided.

EMBLEMS

There will be two (2) monogram emblem(s) installed on the front cab doors, with "DENVER" above the monogram and "FIRE DEPT." below the monogram.

The monogram and lettering will be made of blue reflective material with black outline.

The design will be the same as on previous units.

EMBLEMS

There will be two (2) pair of American flag emblems, 8.00" high, installed rear upper corners of crew cab each side. The flag will be flat (not moving) and made out of vinyl material. The pair will be mirror images of each other.

EMBLEM

There will be three (3) reflective emblem(s), approximately 14.00" - 16.00" in size, installed D2, P2 over wheels and R1. The emblem will be modeled after the department submitted information (art, patch, etc.).

HYDRAULIC TOOL SYSTEM

TNT hydraulic tool system listed below will be supplied and installed in the right rear body compartment.

- One (1) TNT Pump, BT-6.5



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



- One (1) Spreader, S-100-28
- One (1) TNT RAM, TLS-40
- One (1) TNT Cutter, SLC-28
- One (1) TNT 30' Coil of hose, Red

RADIO/INTERCOM

The radio and intercom equipment listed below will be installed after apparatus is complete:

- One (1) Harris M7300 800 MHz Mobile Radio-Scan Type
- One (1) Harris M7300 800 MHz Mobile Radios-System
- Two (2) MA-Com MAH2-VC3P7 Vehicular Charger
- SetCom System 1300 6 Position Headset Intercom
- System, Driver & Officer will have Radio TXIRX & Intercom. 4 Jump seats will have Radio RX & Intercom System will also have Radio Select Switch for MAICom Radios
- One (1) Icom IC-A210M, Aviation Transceiver with External Speaker & Antenna
- Five (5) Console Brackets

FLUID ANALYSIS

Fluid sample analysis of the engine oil, the transmission fluid, and the cooling system will be provided. Written results of these tests will be provided to DFD Fleet Management.

(one (1)) Cummins engine service and parts manuals will be provided.

(one (1)) Allison Transmission service and parts manuals will be provided.

LOOSE EQUIPMENT

All loose equipment listed below will be installed on the unit and mounting if required.

1	AMEREX ABC DRY CHEM EXTINGUISHER 20LB W/MOUNT
1	AMEREX PW EXTINGUISHER 2.5 GALLON W/MOUNT
1	AMEREX CO2 EXTINGUISHER 20LB W/MOUNT
1	AMEREX HALATRON CHEM 15LB W/MOUNT
1	GRANGER 4' STEP LADDER
1	20FT HEAVY TOW STRAP
1	25' AIR LINE
1	GRAINGER HAMMER
1	GRAINGER PIPE WRENCH
1	ACTION 4 DOUBLE ENDED SPANNER WRENCH SET W/MOUNT (A-ASLWH)
2	ACTION AA-135, DOUBLE 2.5" FNH W/MOUNT (M-25)
2	ACTION AA-136, DOUBLE 2.5" MNH W/ MOUNT (FEM-25)
1	ACTION AA-137, 2.5" FNH X 1" MNH REDUCER W/MOUNT (M-25)
6	ACTION AA-137, 2.5" FNH X 1.5" MNPSH REDUCER W/MOUNT (M-25)
2	ACTION A-01 UNIVERSAL SPANNER WRENCH



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



1	RABBIT TOOL AKA FIRE HOOKS HYDRA RAM I
1	FIRE HOOKS SMALL BOLT CUTTERS (BC-18)
1	FIRE HOOKS 3' BOLT CUTTERS(BC-36)
1	FIRE HOOKS CROW BAR (GNPB-36)
1	FIRE HOOKS NY CLOSET HOOK(RH-4)
1	FIRE HOOKS CM-2 Mallet WITH MOUNTING BRACKET
2	STREAMLIGHT HID LITEBOX WITH VEHICLE MOUNT SYSTEM
3	STREAMLIGHT E-SPOT LITEBOX WITH VEHICLE MOUNT SYSTEM
2	CHECKER RUBBER WHEEL CHOCKS (915)
1	MSA 4GAS DETECTOR (10107603)
1	1 1/2 NPSH AKRON CELLAR NOZZLE (536)
1	2 1/2 NH AKRON CELLAR NOZZLE (535)
1	2 1/2 NH AKRON STACK TIP AND PIPE (3488, 2499)
1	2 1/2 AKRON QUICK ATTACK (777)
1	AKRON FSY-8-VMT, 8LB SLEDGE HAMMER W/MOUNT
1	AKRON PHY-6-HMT PICK HEAD AXE W/MOUNT
1	AKRON FHY-6-HMT FLAT HEAD AXE W/MOUNT
1	AKRON PINCH POINT BAR (PPB-51) W/MOUNT (PPBH)
1	AKRON APOLLO HI RISER (#3433), w/liftoff, direct mount, ground base, 2.5" NH
1	AKRON AKRONMATIC NOZZLE (5160)
1	AKRON 3505 MOUNT FOR APOLLO GROUND BASE
2	AKRON SCOOP SHOVEL (AS-27D)
2	AKRON 12' PIKE POLE STANDARD HOOK (UT-12)
1	AKRON 10' PIKE POLE STANDARD HOOK (UT-10)
1	AKRON 6' PIKE POLE STANDARD HOOK (UT-6)
2	AKRON HOSE CLAMPS W/MOUNT
1	AKRON HYDRANT WRENCH (15)
1	AKRON 443 3 WRENCH HOLDER(1-15/2-10)
1	AKRON IN LINE FLOW PRESSURE GAUGE 2 1/2 (35)
1	AKRON 90 DEGREE ELBOW 2 1/2 (632)
1	AKRON 2393, PLAY PIPE WITH 3 STACKED TIPS, INLET 2.5" NH OUTLET 1.5" NPSH
1	AKRON 4802, 1" NH ASSAULT NOZZLE WITH PISTOL GRIP AND SPINNING TEETH, 40 GPM
4	AKRON 2127, 1.5" NPSH x 1.5" NPSH SHUTOFF WITH YELLOW PISTOL GRIP AND METAL BALE. WITH AN AKRON 4866, 1.5" NPSH MID-RANGE ASSAULT TIP, 175 @ 75 psi, YELLOW BUMPER
4	AKRON 1499, 1.5" NPSH, 15/16" ORIFICE PLAIN TIP
3	AKRON 2125 2.5" NH x 1.5" NPSH SHUTOFF, METAL BALE; WITH AN AKRON 4824, 1.5" NPSH HIGH-RANGE ASSAULT TIP WITH SPINNING



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



	TEETH, 250 @ 75 psi, ORANGE BUMPER
3	AKRON 1499, 1.5" NPSH, 1 1/8" ORIFICE PLAIN TIP
2	AKRON 1499, 1.5" NPSH, 1 1/4" ORIFICE PLAIN TIP
1	5.11 RESPONDER 84 ALS BACKPACK, W/CONTENTS
5	RB-10LG, SAFETY VESTS, 3XL, NFPA
5	CR28SRC64, TRAFFIC CONES, 28" ORANGE W/REFLECTIVE BANDS
2	KEY REELITE 100' x 1" BOOSTER HOSE
1	HARRINGTON GATED SUCTION VALVE, H500S-50-60NH
1	HUMAT 4 WAY HYDRANT VALVE AND BRACKET
1	OVAL STRAPPING HERO RIB, ROLL, BLACK
2	FOL-DA-TANK, SALAVAGE COVERS, SC-12 x 14, 12 oz CANVAS, OLIVE GREEN
2	ZICO BCB, BOLT CUTTER BRACKETS
1	PARATECH 22-000680, 30" HOOLIGAN WITH 22-000605 MOUNTING BRACKETS
3	PAC TOOL LOCKS 1004
5	PAC TOOL LOCKS 1003
12	1.75X50' WHT DJ Polyflow US coated CPLD 1.5 IPT
24	2.5X50 YEL DJ Polyflow Coated CPLD 2.5NH
4	2.0X50 GRN DJ Polyflow Coated CPLD 1.5 IPT
32	3.0X50 WHITE DJ Polyflow Coated CPLD 2.5NH

MANUAL, FIRE APPARATUS PARTS

Two (2) custom parts manuals for the complete fire apparatus will be provided in hard copy with the completed unit.

One (1) compact disc (CD) will also be provided that will include all of the information from the above manual.

The manual will contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate parts

The manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the Pierce website.

The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



MANUALS, CHASSIS SERVICE

Two (2) chassis service manuals containing parts and service information on major components will be provided with the completed unit.

The manuals will contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- Engine
- Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

MANUALS, CHASSIS OPERATION

Two (2) chassis operation manuals will be provided.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

A Pierce basic apparatus limited warranty certificate, WA0008, is included.

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The Pierce custom chassis limited warranty certificate, WA0037, is included.

ENGINE WARRANTY

A Cummins five (5) year limited engine warranty will be provided. A limited warranty certificate, WA0181, is included.

STEERING GEAR WARRANTY

A Sheppard three (3) year limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY

The Pierce custom chassis frame and crossmembers limited warranty certificate, WA0038, is included.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included.

REAR AXLE WARRANTY

The customer has elected to waive the warranty for this axle and opt for simultaneous operation of their auxiliary brakes. The activation of the simultaneous braking systems creates high



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



amounts of torque in excess of the axle manufacturer's recommendations. The entire rear axle warranty will be null and void.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor Wabco™ ABS brake system limited warranty certificate, WA0232, is included.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce custom cab limited warranty certificate, WA0012, is included.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

TRANSMISSION COOLER WARRANTY

The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage and will not exceed \$10,000 per occurrence. A copy of the warranty certificate will be submitted with the bid package.

WATER TANK WARRANTY

A UPF poly water tank limited warranty certificate, WA0195, is included.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce apparatus body limited warranty certificate, WA0009, is included.

ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY

A R-O-M Corporation roll-up door limited warranty shall be provided. The mechanical components of the roll-up door will be warranted against defects in material and workmanship for a period of seven (7) years. The door ajar switch will be warranted for a period of three (3) years and all other electrical components will be warranted for a period of one (1) year. A seven (7) year limited warranty will be provided on painted roll up doors.

The limited warranty certificate, WA0206, is included.

PUMP WARRANTY

A Waterous pump limited warranty certificate, WA0225, is included.

TEN (10) YEAR PUMP PLUMBING WARRANTY

The Pierce apparatus plumbing limited warranty certificate, WA0035, is included.



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



FOAM SYSTEM WARRANTY

The Husky 12 foam system limited warranty certificate, WA0231, is included.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce body limited pro-rated paint warranty certificate, WA0057, is included.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

The Pierce graphics fading and deterioration limited warranty certificate, WA0168, is included.

VEHICLE STABILITY CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of bid.

POWER STEERING CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

CAB INTEGRITY CERTIFICATION

The certification must state that the cab must meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.
- Roof Crush

The cab will be subjected to a roof crush force of 22,050 lbs. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons.

- Additional Roof Crush

The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times.

- Side Impact

The same cab will be subjected to dynamic preload where a 13,275 lb. moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft.-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

- Frontal Impact

The same cab will withstand a frontal impact of 32,600 ft.-lbs. of force using a moving barrier in accordance with SAE J2420.

- Additional Frontal Impact

The same cab will withstand a frontal impact of 65,200 ft.-lbs. of force using a moving barrier, (twice the force required by SAE J2420).



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

The certification will be available at the time of delivery.

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles*. The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

ELECTRIC WINDOW DURABILITY CERTIFICATION

Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb. of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

CAB DEFROSTER CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure and Performance Requirements - Trucks, Buses, and Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

CAB HEATER CERTIFICATION

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters will warm the cab 75 F from a cold-



CITY AND COUNTY OF DENVER PIERCE VELOCITY PUMPER



soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

CAB AIR CONDITIONING PERFORMANCE CERTIFICATION

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 67 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar air conditioning system has been tested and has met these criteria. The certification will be available at the time of delivery.

AMP DRAW REPORT

The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus will provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which will include the following:
 - The nameplate rating of the alternator.
 - The alternator rating under the conditions specified per:
 - Applicable NFPA 1901 or 1906 (Current Edition).
 - The minimum continuous load of each component that is specified per:
 - Applicable NFPA 1901 or 1906 (Current Edition).
 - Additional loads that, when added to the minimum continuous load, determine the total connected load.
 - Each individual intermittent load.

All of the above listed items will be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition).