



**Appendix A – Revised Specifications
RFP for Term Contract #72250
Structural Fire Engines**

1 Specifications dated: 4/27/11

2 **COMMERCIAL GENERAL LIABILITY INSURANCE**

3 Certification of insurance coverage will be enclosed per Section 3 of RFP for Term Contract #72250.

4 **NFPA 2009 STANDARDS**

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

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

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

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

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

15 **NFPA COMPLIANCY**

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

20 **TOTAL VEHICLE ASSESSMENT CERTIFICATION**

21 The apparatus will be third-party, independent, audit-certified to the current edition of NFPA 1901
22 standards. The certification includes: all design, production, operational, and performance testing
23 of the apparatus.

24 **PUMP TEST**

25 The pump will be tested, approved, and certified at the manufacturer's expense. The test results
26 and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified
27 brake horsepower curve; and the manufacturer's record of pump construction details will be
28 forwarded to the Fire Department.

29 **GENERATOR TEST**

30 If the unit has a generator, the generator will be tested, approved, and certified at the
31 manufacturer's expense. The test results will be provided to the Fire Department at the time of
32 delivery.

33 **BREATHING AIR TEST**

34 If the unit has breathing air, Underwriters Laboratories will draw an air sample from the air system
35 and certify that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air*
36 *Quality for Fire and Emergency Services Respiratory Protection*.

37 **INSPECTION TRIP(S)**

38 The bidder will provide three (3) factory inspection trip(s) for three SFO personnel customer
39 representative(s). The inspection trip(s) will be scheduled at times mutually agreed upon between
40 the manufacturer's representative and the customer. All costs such as travel, lodging and meals will
41 be the responsibility of the bidder.



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42 **ONSITE TRAINING**

43 Within 2 weeks from time of delivery, prior to vehicle acceptance, the contractor shall provide a
44 factory-trained technician to inspect the finished vehicle, prepare vehicle for service and complete
45 final adjustments to all operating systems. After acceptance, the technician shall conduct on-site
46 training for the operator familiarization for each SFO SFFD shift, and for one shift for Fleet Services
47 Division of operations and basic maintenance familiarization.

48

49

50 -

51 **APPROVAL DRAWING**

52 A drawing of the proposed apparatus will be prepared and provided to the purchaser for approval
53 before construction begins. The finalized and approved drawing will become part of the contract
54 documents. This drawing will indicate the chassis make and model, location of the lights, siren,
55 horns, compartments, major components, etc.

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

58 **FINAL DRAWING**

59 There will be a revised drawing of the truck with all the changes made during production provided at
60 pickup.

61 **DRAWING, PRELIMINARY LAYOUT, PUMP OPERATOR'S PANEL**

62 A detailed drawing, to scale, of the pump operator's panel will be provided for the purpose of
63 illustrating the standard location(s) of controls and discharges on the pump operator's panel. The
64 drawing will not be meant as an approval, or final construction drawing, rather it will be used as an
65 illustration drawing of a standard panel layout. This drawing will include all of the gauges and
66 controls located on the pump operator's panel.

67

68 **BID BOND**

69 All bidders will provide a bid bond or money order or a cashier's check or certified check as security
70 for the bid in the total of \$50,000 to accompany their bid. Any bid bond will be issued by a Surety
71 Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in
72 Department Circular 570. The bid bond will be issued by an authorized representative of the Surety
73 Company and will be accompanied by a certified power of attorney dated on or before the date of
74 bid. The bid bond will include language, which assures that the bidder/principal will give a bond or
75 bonds as may be specified in the bidding or contract documents, with good and sufficient surety for
76 the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for
77 the prompt payment of labor and material furnished in the prosecution of the contract.

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



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83 contradiction or inconsistency between this provision and any other document or assertion, this
84 provision will prevail.

85 **PERFORMANCE BOND AND LABOR AND MATERIALS BOND**

86 The successful bidder will provide, within ten (10) days after from the receipt of the Notice of
87 Conditional Award/Notice of Tentative Award, and along with a signed copy of the contract, a
88 performance bond and a labor and materials bond, which guarantees performance of all terms and
89 conditions of the contract and of the Basic One (1) Year Limited Warranty agreement. The
90 performance bond and the labor and materials bond will specifically cover the performance of the
91 contract according to its terms and conditions, as well as payment of all related bills and
92 encumbrances. This performance bond and the labor and materials bond will be issued by a surety
93 company who is listed by the U.S. Treasury Department's list of approved sureties, as published in
94 Circular 570, as of the bid date. The performance bond and the labor and materials bond will be
95 issued in an amount equal to 100% of the contract amount and will be dated concurrent to, or
96 subsequent to, the date of the contract.

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

104 **COMPLY:** Y for YES E for Exception

105

106 **SEATING CAPACITY**

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

108 **COMPLY:** Y for YES E for Exception

109

110 **WHEELBASE**

111 The wheelbase of the vehicle will be 184.25.

112 **COMPLY:** Y for YES E for Exception

113

114 **GVW RATING**

115 The gross vehicle weight rating will be 49,800.

116 **COMPLY:** Y for YES E for Exception

117

118 **FRAME**

119 The following frame specifications may be substituted with specifications of comparable
120 performance and capabilities.



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

129 **COMPLY:** Y for YES E for Exception

130

131 **FRONT NON DRIVE AXLE**

132 The Oshkosh TAK-4[®], or equivalent substitute, front axle will be of the independent suspension
133 design with a ground rating of 22,800 pounds.

134 Upper and lower control arms will be used on each side of the axle. Upper control arm castings will
135 be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of
136 55,000-psi yield ductile iron.

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

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

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

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

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

146 The kingpin bearing will be of low friction design and be sealed for life.

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

148 The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.

149 The steering linkage will provide proper steering angles for the inside and outside wheel, based on
150 the vehicle wheelbase.

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

153 **COMPLY:** Y for YES E for Exception

154

155 **SHOCK ABSORBERS**

156 Heavy-duty telescoping shock absorbers (KONI) or equivalent substitute will be provided on the
157 front suspension.

158 **COMPLY:** Y for YES E for Exception



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160 **REAR AXLE**

161 The rear axle will be a Meritor™, Model RS-26-185, or equivalent substitute, with a capacity of
162 27,000 pounds.

163 **COMPLY:** Y for YES E for Exception

164

165 **TOP SPEED OF VEHICLE**

166 A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 68 MPH.

167 **COMPLY:** Y for YES E for Exception

168

169 **OIL SEALS**

170 Oil seals will be provided on the rear axle.

171 **COMPLY:** Y for YES E for Exception

172

173 **FRONT SUSPENSION**

174 Front Oshkosh TAK-4™, or equivalent substitute, independent suspension will be provided with a
175 minimum ground rating of 22,800 pounds.

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

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

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

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

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

189 **COMPLY:** Y for YES E for Exception

190

191 **REAR SUSPENSION**

192 Rear suspension will be a Hendrickson FMX 272 EX, or equivalent substitute, air ride with a ground
193 rating of 27,000 pounds. The suspension will have the following features:

194 - Heavy-duty shock absorbers to protect air springs from overextension



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- 195 - Heavy-duty torque rods and bushings
- 196 - Premium, heavy-duty rubber bushings require no lubrication
- 197 - Integrated stabilizer design results in greater stability
- 198 - Low spring rate air springs for excellent ride quality
- 199 - Dual height control valves to maintain level vehicle from side to side

200 **COMPLY:** Y for YES E for Exception

201

202 **ANTI-LOCK BRAKE SYSTEM**

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

211 **COMPLY:** Y for YES E for Exception

212

213 **ANTI-LOCK BRAKE SYSTEM WARRANTY**

214 The Wabco ABS system, or equivalent substitute, will come with a **three (3) year or 300,000 mlie**
215 **parts and labor warranty.**

216 **COMPLY:** Y for YES E for Exception

217

218 **BRAKES**

219 The service brake system will be full air type.

220 The front brakes will be Knorr/Bendix, or equivalent substitute, disc type with a 17.00" ventilated
221 rotor for improved stopping distance.

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

223 The rear brakes will be Meritor™ 16.50" x 7.00", or equivalent substitute, cam operated with
224 automatic slack adjusters.

225 **COMPLY:** Y for YES E for Exception

226

227 **ENGINE BRAKE**

228 A Jacobs Engine Brake, or equivalent substitute, is to be installed with the controls located on the
229 instrument panel within easy reach of the driver.



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

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

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

235 **COMPLY:** Y for YES E for Exception

236

237 **AIR COMPRESSOR, BRAKE SYSTEM**

238 The air compressor will be a Bendix BA-921, or equivalent substitute, with 15.8 cubic feet per
239 minute output at 1250 RPM.

240 **COMPLY:** Y for YES E for Exception

241

242 **BRAKE SYSTEM**

243 The brake system will include:

244 - Bendix-Westinghouse, or equivalent substitute, dual brake treadle valve with vinyl covered foot
245 surface

246 - One heated automatic moisture ejector on air dryer

247 - Total air system capacity of 4,362 cubic inches

248 - Two (2) air pressure gauges with red warning light and audible alarm, that activates when air
249 pressure falls below 60 psi

250 - MGM, or equivalent substitute, spring set parking brake system

251 - Parking brake operated by a Bendix-Westinghouse PP-1, or equivalent substitute, control valve

252 - A parking "brake on" indicator light on instrument panel

253 - Bendix-Westinghouse SR-1, or equivalent substitute, valve, in conjunction with a double check
254 valve system, will provide an automatic spring-brake application at 40 psi

255 - Wabco System Saver 1200, or equivalent substitute, air dryer with spin-on coalescing filter
256 cartridge

257 **COMPLY:** Y for YES E for Exception

258

259 **BRAKE LINES**

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

262 **COMPLY:** Y for YES E for Exception

263



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264 **AIR INLET**

265 One (1) air inlet with male coupling will be provided. It will allow station air to be supplied to the
266 apparatus brake system through a shoreline hose. The inlet will be located on the driver side seat
267 riser. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the
268 "wet" tank of the brake system. A mating female coupling will also be provided with the loose
269 equipment.

270 **COMPLY:** Y for YES E for Exception

271

272 **AIR TANK, ADDITIONAL**

273 An additional air tank with 1454 cubic inch displacement will be provided to increase the capacity of
274 the air system. This tank will be dedicated for air horn use.

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

278 **COMPLY:** Y for YES E for Exception

279

280 **ALL WHEEL LOCK-UP**

281 An all wheel lock-up system will be installed which will apply air to the front brakes and use the
282 spring brake at the rear.

283 **COMPLY:** Y for YES E for Exception

284

285 **ENGINE**

286 The chassis will be powered by an electronically controlled engine as described below: or equivalent
287 substitute

288 Make: Detroit Diesel ()

289 Model: DD13 ()

290 Power: 500 hp at 1800 rpm

291 Torque: 1650 lb-ft at 1200 rpm

292 Governed Speed: 2080 rpm

293 Emissions Level: EPA 2010, latest and best technology

294 Fuel: Diesel. Engine manufacture must certify that Biodiesel (B20) is an approved fuel.

295 Cylinders: Six (6)

296 Displacement: 781 cubic inches (12.8L)

297 Starter: Delco 39MT ()

298 Fuel Filters: Dual cartridge style with check valve, water separator, and water in fuel sensor



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299 Coolant Filter: Cartridge style with shut off valves on the supply and return line

300 **COMPLY:** Y for YES E for Exception

301

302 **REPTO DRIVE**

303 A rear engine power take off will be provided to drive the water pump. A vibration dampener will
304 be provided between the REPTO and water pump. Transmission PTO's used to drive the water
305 pump will not be allowed due to their lower torque ratings. The rear engine power take off will be
306 the same as used extensively throughout the construction industry. Rear engine PTO's allow for
307 continuous 240 hp and 480 lb-ft torque ratings needed for large pump applications. The rear engine
308 power take off will have the same warranty as the engine provided by the engine manufacturer.

309 **COMPLY:** Y for YES E for Exception

310

311 **ENGINE WARRANTY**

312 The engine will come with a five (5) year or 100,000 mile warranty.

313 **COMPLY:** Y for YES E for Exception

314

315 **ENGINE INSTALLATION CERTIFICATION**

316 The fire apparatus manufacturer will provide a certification, along with a letter from the engine
317 manufacturer stating they approve of the engine installation in the bidder's chassis. The
318 certification will be provided at the time of delivery.

319 **COMPLY:** Y for YES E for Exception

320

321 **ENGINE AIR INTAKE**

322 The air intake with ember separator will be mounted on the driver side of the apparatus, to the
323 front of the engine. The ember separator is designed to prevent road dirt and recirculating hot air
324 from entering the engine.

325 The ember separator will be easily accessible by tilting the cab.

326 **COMPLY:** Y for YES E for Exception

327

328 **EXHAUST SYSTEM**

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

336 **COMPLY:** Y for YES E for Exception



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337

338 **DIESEL EXHAUST FLUID TANK “Optional” only if not required by the engine manufacture.**

339

340 A 4.2 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side
341 body forward of the rear axle. The tank will be constructed of 16-gauge type 304- L stainless steel.

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

343 A fill inlet will be located on the driver's side of the body and be covered with a hinged, spring
344 loaded, stainless steel door that is marked "Diesel Exhaust Fluid Only".

345 The tank will meet the engine manufacturers requirement for 10% expansion space in the event of
346 tank freezing.

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

349 **COMPLY:** Y for YES E for Exception

350

351 **FUEL SEPARATOR**

352 The engine will be equipped with a Racor, or equivalent substitute, in-line spin-on fuel and water
353 separator in addition to the engine fuel filters.

354 **COMPLY:** Y for YES E for Exception

355

356 **ENGINE HEATER**

357 A 1500 watt, 120 volt, immersion type engine heater will be installed with the AC power inlet
358 located to the rear of the driver's door.

359 **COMPLY:** Y for YES E for Exception

360

361 **HIGH IDLE**

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

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

368 **COMPLY:** Y for YES E for Exception

369

370 **COOLANT LINES**

371 Silicone hoses will be used for all engine coolant/heater lines. Hose clamps will be the stainless steel
372 constant torque type to prevent coolant leakage. They will expand and contract according to
373 coolant system temperature thereby keeping a constant clamping pressure on the hose.



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374 **COMPLY:** Y for YES E for Exception

375

376 **RADIATOR**

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

379 For maximum cooling performance, the radiator core will be made of copper fins, having a
380 serpentine design, soldered to brass tubes. The tubes will be welded to brass headers for increased
381 strength, longer road life and solder-boom corrosion protection. Steel supply and return tanks will
382 be bolted to the core headers to complete the radiator assembly. The radiator will be compatible
383 with commercial antifreeze solutions.

384 The radiator will be mounted in parallel with the charge air cooler to avoid drawing preheated air
385 from the charge cooler through the radiator, thus creating efficiencies in cooling performance. The
386 radiator and charge air cooler will be mounted within a steel framework to complete the cooling
387 module. The cooling module will have a minimum total frontal area of 1204 square inches. The
388 cooling module will be mounted in such a manner as to prevent the development of leaks caused by
389 twisting or straining when the apparatus operates over uneven ground. The cooling module will be
390 isolated from the chassis frame rails with rubber isolators.

391 The radiator will utilize a remote mounted de-aeration/expansion tank. For visual coolant level
392 inspection, the de-aeration/expansion tank will have a built-in sight glass. The de-
393 aeration/expansion tank will be equipped with a 15 psi pressure relief cap.

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

396 A fan will be mounted directly to the cooling package and within a molded shroud to minimize the
397 required fan tip clearances and to optimize airflow efficiencies and cooling performance. Shields or
398 baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

399 The fan will be driven by a serpentine belt drive system mounted directly to the cooling
400 module. The belt drive system will include an input hub, a heavy duty fan clutch, and a 10 rib K-
401 Section Poly V belt with automatic tensioner. The input hub will be driven off the engine crank
402 damper pulley utilizing a Spicer 1310 Series driveshaft, or equivalent substitute.

403 **COMPLY:** Y for YES E for Exception

404

405 **FUEL TANK**

406 A 50-gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be
407 constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent.

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

409 A fill inlet will be located on the driver's side of the body and is covered with a hinged, spring loaded,
410 stainless steel door that is marked "Diesel Fuel Only".

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



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

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

415 **COMPLY:** Y for YES E for Exception

416

417 **FUEL COOLER**

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

419 **COMPLY:** Y for YES E for Exception

420

421 **TRANSMISSION**

422 An Allison Gen IV, model EVS 4000P, , electronic, torque converting, automatic transmission or
423 equivalent substitute will be provided.

424 The transmission will be equipped with prognostics to monitor oil life, filter life, and transmission
425 health. A wrench icon on the shift selector's digital display will indicate when service is due.

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

428 A transmission temperature gauge with red light and buzzer will be installed on the cab instrument
429 panel.

430 **COMPLY:** Y for YES E for Exception

431

432 **TRANSMISSION SHIFTER**

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

435 The transmission ratio will be 1st - 3.51 to 1.00, 2nd - 1.91 to 1.00, 3rd - 1.43 to 1.00, 4th - 1.00 to
436 1.00, 5th - 0.75 to 1.00, 6th - 0.64 to 1.00, R - 4.80 to 1.00. or equivalent substitute

437 **COMPLY:** Y for YES E for Exception

438

439 **TRANSMISSION PROGRAMMING**

440 The transmission will be programmed to automatically shift the transmission to neutral when the
441 parking brake is set to simplify operation and increase operational safety.

442 **COMPLY:** Y for YES E for Exception

443

444 **TRANSMISSION COOLER**

445 A shell and tube transmission oil cooler will be provided using engine coolant to control the
446 transmission oil temperature. The cooler will have an aluminum shell and copper tubes. The cooler
447 will be assembled using pressed in rubber tube sheets to mechanically create a reliable seal



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448 between the coolant and the oil. No brazed, soldered, or welded connections will be used to
449 separate the coolant from the oil.

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451

452 **TRANSMISSION COOLER WARRANTY**

453 **Three (3)-year** parts, labor and collateral damage warranty will be provided with this cooler, plus an
454 additional **two (2) years** of parts and labor only coverage. The collateral damage for the first three
455 (3) years will not exceed \$10,000 per occurrence.

456 **COMPLY:** Y for YES E for Exception

457

458 **TRANSMISSION WARRANTY**

459 The transmission will have a **five (5) year/unlimited mileage** warranty covering 100% parts and
460 labor. The warranty will be provided by the Transmission manufacturer.

461

462 **COMPLY:** Y for YES E for Exception

463

464 **DRIVELINE**

465 Drivelines will be a heavy-duty metal tube and be equipped with Spicer 1810, or equivalent
466 substitute, universal joints.

467 The shafts will be dynamically balanced before installation.

468 A splined slip joint will be provided in each driveshaft, slip joint will be coated with Glidecoat or
469 equivalent.

470 **COMPLY:** Y for YES E for Exception

471

472 **STEERING**

473 Dual Sheppard M110, or equivalent substitute, steering gears, with integral heavy-duty power
474 steering, will be provided. The power steering will incorporate a Vickers V20F, or equivalent
475 substitute, three (3)-line hydraulic pump with integral pressure and flow control.

476 The steering wheel will be:

477 - 18.00" in diameter

478 - Capable of tilting and telescoping

479 - Four (4)-spoke design

480 **COMPLY:** Y for YES E for Exception

481



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482 **STEERING WARRANTY**

483 The steering gear will have a three (3) year parts and labor warranty.

484 **COMPLY:** Y for YES E for Exception

485

486 **TIRES**

487 Front tires will be Michelin 425/65R22.50 radials, 20 ply "Hiway Rib" XFE tread ()

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

490 Rear tires will be four (4) Michelin 12R22.50 radials, 16 ply "all position" XZY 3 tread ().

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

493

494 **COMPLY:** Y for YES E for Exception

495

496 **TIRE BALANCE**

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

499

500 **COMPLY:** Y for YES E for Exception

501

502 **LUG NUT COVERS**

503 Chrome plated lug nut covers will be installed on all lug nuts.

504 **COMPLY:** Y for YES E for Exception

505

506 **WHEEL CHOCKS**

507 There will be one (1) set(s) of folding Ziamatic SAC-44-E, aluminum alloy, Quick-Choc , or equivalent
508 substitute, wheel blocks, with easy-grip handle provided.

509 **COMPLY:** Y for YES E for Exception

510

511 **WHEEL CHOCK BRACKETS**

512 There will be one (1) set(s) of Ziamatic SQCH-44-H , or equivalent substitute, horizontal mounting
513 wheel chock brackets provided for the Ziamatic SAC-44-E, or equivalent substitute, folding wheel
514 chocks. The brackets will be mounted per direction.

515 **COMPLY:** Y for YES E for Exception

516



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517 **HUB COVERS (front)**

518 Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be
519 provided.

520 **COMPLY:** Y for YES E for Exception

521

522 **HUB COVERS (rear)**

523 A pair of stainless steel high hat hub covers will be provided on rear axle hubs.

524 **COMPLY:** Y for YES E for Exception

525

526 **MUD FLAPS**

527 Mud flaps will be installed behind the rear wheels.

528 **COMPLY:** Y for YES E for Exception

529

530 **SPARE TIRE**

531 A 425/65R22.50, 20 ply spare tire to match the vehicle's front tires will be provided, mounted on an
532 aluminum wheel.

533 **COMPLY:** Y for YES E for Exception

534

535 **SPARE TIRE**

536 A spare tire, 12R22.5, 16 ply, to match the vehicle's rear tires will be provided mounted on a
537 polished aluminum disc wheel.

538 **COMPLY:** Y for YES E for Exception

539

540 **TIRE PRESSURE MANAGEMENT**

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

544 The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between
545 20 and 120 psi. The sensor will activate an integral battery operated LED when the pressure of that
546 tire drops 8 psi.

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

549 **COMPLY:** Y for YES E for Exception

550

551 **CAB**

552 The cab will be designed specifically for the fire service and manufactured by the chassis builder.



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- 553 The following cab specifications may be substituted with specifications of comparable performance
554 and capabilities.
- 555
- 556 Construction of the cab will consist of high strength 5052-H32 .125" aluminum welded to extruded
557 aluminum framing.
- 558 The cab will be built by the apparatus manufacturer in a facility located on the manufacturer's
559 premises.
- 560 Cab will be approximately 96.00" wide, with an overall height (from the cab roof to the ground) of
561 approximately 108.00". The overall height listed will be calculated based on a truck configuration
562 with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water
563 weight, no loose equipment weight and no personnel weight. Larger tires, wheels and suspension
564 will increase the overall height listed.
- 565 Crew cab will be of the totally enclosed design, with access doors constructed in the same manner
566 as the front cab doors.
- 567 Cab will be a full tilt design, allowing easy maintenance of the engine compartment. The engine will
568 be accessible when the cab is titled and will also be removable when the cab is tilted.
- 569 Provisions for checking the engine and transmission oil will be provided on the engine tunnel and
570 must be accessible without tilting the cab.
- 571 Cab will be isolated from the chassis inputs by four (4) rubber load cushions and will be tilted by an
572 electric/hydraulic pump connected to two (2) cab lift cylinders. Cab will then be locked down by a 2-
573 point automatic locking mechanism that actuates after the cab has been lowered.
- 574 Cab entrance steps will be enclosed and automatically drop down when the door is opened and rise
575 up when the door is closed. Both cab step assemblies will be of simplistic and identical design.
- 576 The steps will be operated by a switch (air spool valve) on the cab doorframe, which is connected to
577 an air cylinder, that activates both the up and down operation of the steps.
- 578 A dedicated air supply tank will be furnished for the step air system, to assure an adequate air
579 supply for the up and down activation.
- 580 Each step, when in the stored position, will be totally enclosed to protect the mechanisms from road
581 debris and moisture.
- 582 Each step assembly will be designed in a three (3)-step arrangement, with each step spaced no more
583 than 16.00" apart, providing easy cab entry and egress.
- 584 Each step surface will be a minimum of 160 square inches.
- 585 The step surface will be constructed out of a non-slip material that will also be self-draining.
- 586 Cab and crew cab doors will be approximately 32.00" wide x 61.00" high.
- 587 Crew cab doors will be located on the side of the cab.
- 588 Cab and crew cab doors will be equipped with automotive type rubber, continuous perimeter bulb
589 seal on the door opening to ensure a weather tight fit.



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- 590 Polished stainless steel scuffplates will be installed on the inside of all cab doors, extending from the
591 bottom of the door to 12.00" above the floor line.
- 592 Cab doors will be constructed of aluminum with a double pan design.
- 593 The upper area of each door will be contoured into the roof and include a contoured tinted window
594 feature that provides better visibility on the interior and to the exterior of the cab.
- 595 Flush mounted, chrome plated paddle type door handles will be provided on the interior and
596 exterior cab and crew cab doors.
- 597 The cab doors will be provided with interior locks as required by FMVSS 206. The locks will include
598 exterior keyed locks to prevent locking occupants out of the cab. A plunger will actuate the locks.
- 599 The door hinges will be stainless steel piano type with a .25" pin.
- 600 Cab and crew cab will be designed to optimize room and allow complete visual and audio
601 communications between all fire fighters.
- 602 The engine tunnel will be constructed out of .125" aluminum and will be tapered at the top to allow
603 for more driver and passenger elbow room.
- 604 The engine tunnel inside the cab will not exceed 20.00" from the cab floor to the top of the engine
605 tunnel.
- 606 The width of the engine tunnel inside the cab will not exceed 26.00" on the top tapered surface and
607 41.00" at the floor area.
- 608 The engine tunnel will also taper and narrow towards the rear as it extends into the crew cab
609 area. The width of the engine tunnel on the top tapered surface at the rear will not exceed 20.00",
610 therefore providing optimum room for the fire fighters seated in the crew cab rear facing seats.
- 611 The engine hood will be insulated for protection from heat and sound. The noise insulation keeps
612 the DBA level within the limits stated in the current NFPA series 1900 pamphlet.
- 613 The driver and officer will have a flat floor area measuring a minimum of 21.50" wide (door to
614 engine tunnel) and 28.00" long (front to rear seat riser).
- 615 The dimension from the back edge of the steering column to the driver's seat back (seat in rearmost
616 position) will be a minimum of 30.00".
- 617 A 20.00" slip resistant handrail will be provided adjacent to all door openings to assist with entrance
618 into the cab.
- 619 Circular inner fender liners in the wheel wells will be provided.
- 620 Heavy-duty black rubber mud flaps will be installed on the cab behind the front wheels.
- 621 Bright aluminum treadplate will be overlaid on the outside rear wall of the crew cab except for
622 areas that are not typically visible when the cab is lowered.
- 623 A contoured molded fiberglass housing will be installed on the front of the cab. The housing will be
624 painted to match the cab. A contoured aluminum grille, headlight bezel and wrap around band
625 consisting of three (3) separate bright finished sections will be installed on the front of the housing.



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591 bottom of the door to 12.00" above the floor line.
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596 exterior cab and crew cab doors.
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607 41.00" at the floor area.
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610 therefore providing optimum room for the fire fighters seated in the crew cab rear facing seats.
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616 position) will be a minimum of 30.00".
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622 areas that are not typically visible when the cab is lowered.
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624 painted to match the cab. A contoured aluminum grille, headlight bezel and wrap around band
625 consisting of three (3) separate bright finished sections will be installed on the front of the housing.



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660 **CAB PUMP ENCLOSURE**

661 The rear of the cab will be made to house the fire pump and pump panel below the forward facing
662 crew cab seats.

663 **COMPLY:** Y for YES E for Exception

664

665 **AUXILIARY AIR COMPRESSOR**

666 An auxiliary air compressor will be furnished to supply air for the cab step system. The air
667 compressor will be a 12-volt DC and wired directly to the batteries. The compressor will have a
668 rating of .5 CFM at 100 psi. The compressor will insure fully automatic step operation at all times.

669 **COMPLY:** Y for YES E for Exception

670

671 **CAB FLOOR**

672 The cab and crew cab flooring will be covered with heavy-duty rubber matting.

673 **COMPLY:** Y for YES E for Exception

674

675 **CREW CAB WINDOWS**

676 On each side of the crew cab, a window, with tinted glass, will be provided. A contoured window,
677 with tinted glass, will also be provided above the side crew cab window and match the contoured
678 windows in the cab doors.

679 The rear wall of the crew cab will have two (2) windows, each being approximately 8.00" wide x
680 14.00" high.

681 **COMPLY:** Y for YES E for Exception

682

683 **ELECTRIC OPERATED CAB DOOR WINDOWS**

684 All four (4) cab doors will be equipped with electric operated windows with flush mounted
685 automotive style switches.

686 The driver's side lower instrument panel will also have three (3) controls, officer's door window and
687 both crew cab door windows.

688 **COMPLY:** Y for YES E for Exception

689

690 **FENDER CROWNS**

691 Stainless steel fender crowns will be installed at the cab wheel openings. The fender crowns will
692 have a radius outside corner that will allow the fender crown to extend out further than the
693 standard width crown, thus extending beyond the sidewall of the front tires and allow the crew cab
694 doors to open fully.

695 **COMPLY:** Y for YES E for Exception

696



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697 **DOOR JAM SCUFFPLATES**

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

700 **COMPLY:** Y for YES E for Exception

701

702 **STRIPE (On Paint Break)**

703 There will be a gold leaf stripe provided on the paint break. The stripe will be on both sides of cab
704 and in place of chrome molding.

705 **COMPLY:** Y for YES E for Exception

706

707 **CAB LIFT**

708 A hydraulic cab lift system will be provided consisting of an electric powered hydraulic pump, dual
709 lift cylinders, and necessary hoses and valves.

710 Lift controls will be on a panel located on the pump panel or front area of the body in a convenient
711 location.

712 Cab will be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates
713 after the cab has been lowered.

714 The hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally
715 descending when the control is located in the tilt position.

716 A redundant mechanical stay arm will automatically be engaged once the cab has been fully
717 raised. Before lowering the cab, this device must be disengaged using the stay arm control located
718 near the cab raise/lower switch.

719 **COMPLY:** Y for YES E for Exception

720

721 **INTERLOCK, CAB LIFT TO PARKING BRAKE**

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

725 **COMPLY:** Y for YES E for Exception

726

727 **MIRRORS**

728 Velvac, model 2025, or equivalent substitute, low mount chrome mirrors, , will be mounted, one (1)
729 on each of the cab door's side. The mirror will include a replaceable 62.00 sq. inch flat glass and a
730 30 sq. inch convex glass. Overall mirror dimensions will be approximately 8.50" wide x 13.75"
731 high. Mirror head will have a highly polished chrome finish.

732 Both flat mirror heads will be adjustable by an electric remote control switch inside the cab within
733 easy reach of the driver. Convex mirror heads will be adjusted manually.

734 The mirror heads will also be heated with the control within easy reach of the driver.



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735 Each mirror will be provided with an LED directional light.

736 **COMPLY:** Y for YES E for Exception

737

738 **BUMPER**

739 A one (1) piece, ten (10) gauge, 304-2B type polished stainless steel bumper, a minimum of 10.00"
740 high, will be attached to a bolted modular extension frame constructed of 50,000 psi tensile steel
741 "C" channel mounted directly behind it to provide adequate support strength.

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

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

748 **COMPLY:** Y for YES E for Exception

749

750 **GRAVEL PAN**

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

754 **COMPLY:** Y for YES E for Exception

755

756 **TOW HOOKS**

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

761 **COMPLY:** Y for YES E for Exception

762

763 **CAB INTERIOR**

764 The cab instrument panel will be padded and covered with 46 ounce, leather grain vinyl, resistant to
765 oil, grease and mildew.

766 The door panels will be covered with a high impact ABS plastic.

767 The cab dash fascias will be a wrap-around design to provide easy access of controls and will be
768 constructed out of high impact ABS plastic.

769 The headliner will be installed in both forward and rear cab sections. Headliner material will be
770 vinyl. A sound barrier will be part of its composition. The headliner material will be installed on an
771 aluminum sheet and securely fastened to interior cab ceiling.



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772 The forward portion of the cab headliner will provide easy access for servicing electrical wiring or for
773 other maintenance needs without removing the entire unit.

774 **COMPLY:** Y for YES E for Exception

775

776 **CAB INTERIOR UPHOLSTERY**

777 The cab interior upholstery will be dark silver gray.

778 **COMPLY:** Y for YES E for Exception

779

780 **INTERIOR PAINT (Cab)**

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

783 **COMPLY:** Y for YES E for Exception

784

785 **GRAB HANDLE**

786 A black rubber covered grab handle will be mounted on the lower portion of the driver's side and
787 passenger's side cab entrances to assist in entering the cab. The grab handle will be securely
788 mounted to the post area.

789 **COMPLY:** Y for YES E for Exception

790

791 **DRIVER SEAT**

792 The seat will be a cam action type, with air suspension. To maintain optimal seat position and ride
793 quality for a broader range of occupant sizes, the suspension will be provided with a height control
794 valve that automatically positions the seat in the center of the suspension travel (1.88") when the
795 occupant sits down. For increased convenience, the seat will include manual controls to adjust the
796 height (1.12" travel) and horizontal (6.00" travel) position. The manual horizontal control will be a
797 towel-bar style located below the forward part of the seat cushion. To provide flexibility for
798 multiple driver configurations, the seat will have a reclining back adjustable from 20 degrees back to
799 45 degrees forward. The seat back will be a high back style, and will include minimum 7.50" deep
800 side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00"
801 deep foam cushions.

802 The seat will be furnished with a three-point, shoulder type seat belt. To provide quick, easy use for
803 occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and
804 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the
805 seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the
806 seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic
807 retractors that will provide ease of operation in the normal seating position.

808 **COMPLY:** Y for YES E for Exception

809



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810 **OFFICER SEAT**

811 The seat will be a fixed type, with no suspension. To provide flexibility for multiple passenger
812 configurations, the seat will have a reclining back adjustable from 20 degrees back to 0 degrees
813 forward. The seat back will be a high back style and will include minimum 7.50" deep side bolster
814 pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam
815 cushions. To ensure safe operation, the seat will be equipped with seat belt sensors in the seat
816 cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

817 The seat will be furnished with a three-point, shoulder type seat belt. To provide quick, easy use for
818 occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and
819 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the
820 seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the
821 seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic
822 retractors that will provide ease of operation in the normal seating position.

823 **COMPLY:** Y for YES E for Exception

824

825 **REAR FACING PASSENGER SIDE OUTBOARD SEAT**

826 There will be one (1) rear facing seat provided at the passenger side outboard position in the crew
827 cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions
828 designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be
829 equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm
830 indicating a seat is occupied but not buckled. The seat back will be an SCBA back style with 7.5
831 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for
832 maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to
833 accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by
834 unbolting, relocating, and re-bolting it in the desired location.

835 The seat will be furnished with a three-point, shoulder type seat belt. To provide quick, easy use for
836 occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and
837 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the
838 seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the
839 seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic
840 retractors that will provide ease of operation in the normal seating position.

841 **COMPLY:** Y for YES E for Exception

842

843 **REAR FACING DRIVER SIDE OUTBOARD SEAT**

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

849 The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include
850 minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be
851 adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA

1



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852 cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in
853 the desired location.

854 The seat will be furnished with a three-point, shoulder type seat belt. To provide quick, easy use for
855 occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and
856 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the
857 seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the
858 seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic
859 retractors that will provide ease of operation in the normal seating position.

860 **COMPLY:** Y for YES E for Exception

861

862 **FORWARD FACING CENTER SEATS**

863 There will be two (2) forward facing seats provided at the center position in the crew cab. The seat
864 backs will be a high back style with 7.5 degree fixed recline angle, and will include minimum 7.50"
865 deep side bolster pads for maximum support. For optimal comfort, the seats will be provided with
866 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To
867 ensure safe operation, the seats will be equipped with seat belt sensors in the seat cushion and belt
868 receptacle that will activate an alarm indicating a seat is occupied but not buckled.

869 The seats will be furnished with three-point, shoulder type seat belts. To provide quick, easy use for
870 occupants wearing bunker gear, the seat belts will have a minimum 130.00" shoulder length and
871 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the
872 seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the
873 seat cushion, providing easy accessibility. The seat belts will be furnished with dual automatic
874 retractors that will provide ease of operation in the normal seating position.

875 **COMPLY:** Y for YES E for Exception

876

877 **RADIO COMPARTMENT**

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

882 **COMPLY:** Y for YES E for Exception

883

884 **SEAT UPHOLSTERY**

885 All Seats Inc. 911 () seat upholstery will be gray woven with black Imperial 1200 material ().

886 **COMPLY:** Y for YES E for Exception

887

888 **AIR BOTTLE HOLDERS**

889 All SCBA type seats in the cab will have a Ziamatic model ULLH SCBA () or equivalent substitute
890 holder bracket. This bracket will be compliant with the current NFPA 1901 standards and will include
891 a backplate, two (2) seats, a footplate and the model LLS ("Load & Lock") strap to hold the bottle in



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892 the bracket. The bracket seats will be a "one size fits all" style seat and will accommodate SCBA
893 cylinders from the high pressure 30-minute to the high pressure 60-minute. Seats will be adjustable
894 up and down by unbolting, relocating, and rebolting in the desired position.

895 **COMPLY:** Y for YES E for Exception

896

897 **SEAT BELTS**

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

899 **COMPLY:** Y for YES E for Exception

900

901 **SHOULDER HARNESS HEIGHT ADJUSTMENT**

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

905 **COMPLY:** Y for YES E for Exception

906

907 **SEAT BELT MONITORING SYSTEM**

908 A seat belt monitoring system (SBMS) will be provided. The SBMS will be capable of monitoring up
909 to ten (10) seat positions indicating the status of each seat position with a green or red LED indicator
910 as follows:

911 Driver Seat:

912 Seat Occupied Buckled Green

913 No Occupant Unbuckled Not Illuminated

914 The driver seat will not include an occupant sensor. The display indication for the driver seat will
915 illuminate red any time the parking brake is released and the driver seat belt is not buckled.

916 All Other Seats:

917 Seat Occupied Buckled Green

918 Seat Occupied Unbuckled Red

919 No Occupant Buckled Red

920 No Occupant Unbuckled Not Illuminated

921 Alarm:

922 The SBMS will include an audible alarm that will be activated when a red illumination condition
923 exists and the parking brake is released, or a red illumination condition exists and the transmission is
924 not in park.

925 **COMPLY:** Y for YES E for Exception

926



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927 **HELMET HOLDER**

928 There will be six (6) Zico UHH-1, or equivalent substitute, helmet holder bracket(s) provided in the
929 cab. The brackets will provide quick access and secure storage of the helmet(s). The bracket
930 location(s) will be determined at time of final inspection.

931 The two (2) inboard forward facing crew cab seats will be split apart approximately 8.00" to provide
932 additional room at each seat position.

933 **COMPLY:** Y for YES E for Exception

934

935 **ENGINE COMPARTMENT LIGHT**

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

938 **COMPLY:** Y for YES E for Exception

939

940 **CAB INTERIOR LIGHTING**

941 Auxiliary lights will be provided in the cab and consisting of:

942 - Two (2) Weldon, Model 8081, () or equivalent substitute Red/Clear dome light located, one (1) on
943 the officer side and one (1) on the driver side, controlled by the following:

944 Clear forward light controlled by the door switch and the lens switch.

945 Red rearward light controlled by the lens switch.

946 - Two (2) Adjustable Map Lights: With switches mounted on the cab ceiling

947 - A Courtesy Light at Each Door Opening: Controlled by automatic door switches

948 **COMPLY:** Y for YES E for Exception

949

950 **CREW CAB INTERIOR LIGHTING**

951 Auxiliary lights will be provided in the crew cab and consist of:

952 - Two (2) Weldon, Model 8081, () or equivalent substitute red/clear dome lights located one (1) each
953 side, controlled by the following:

954 Clear forward light controlled by the door switch and the lens switch.

955 Red rearward light controlled by the lens switch.

956 - A courtesy light at each door opening, controlled by automatic door switches

957 **COMPLY:** Y for YES E for Exception

958

959 **CAB HEATER**

960 There will be a 40,000 BTU heater in the cab located below the right side cab dash. The
961 heater/defroster ventilation will be built into the design of the cab dash instrument panel. The



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962 heater ducts will be vented in a manner to provide heat directed towards the officer and the
963 driver. The defroster ducts will be designed to provide maximum defrosting capabilities for the
964 windshield. Adjustable defroster louvers will be provided for directing airflow to the side cab door
965 windows.

966 Heater defroster controls will be located on the cab dash within easy reach of the driver.

967 **COMPLY:** Y for YES E for Exception

968

969 **AIR CONDITIONING**

970 A high performance, customized air conditioning system will be furnished inside the cab and crew
971 cab. The air conditioning systems will be capable of cooling the average cab temperature from 100
972 degrees Fahrenheit to 75 degrees Fahrenheit within 30 minutes at 50% relative humidity. The
973 cooling performance test will be run only after the cab has been heat soaked at 100 degrees
974 Fahrenheit for a minimum of 4 hours.

975 A roof mounted condenser with a BTU rating sufficient to meet and exceed the performance
976 specification, will be installed on the cab roof.

977 Two (2) evaporator units will be installed in the cab, one (1) in the cab dash, just to the front of the
978 officer, and one (1) in the crew cab, mounted to the ceiling. The evaporator units will have an
979 adequate BTU rating to meet the performance specifications.

980 Adjustable air outlets will be strategically located on the evaporator cover per the following:

981 Two (2) will be in the drivers side dash

982 Two (2) will be in the officers side dash

983 Four (4) will be directed towards the crew cab area

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

985 The air conditioner will be controlled by a single electronic control panel. For ease of operation, the
986 control panel will include variable adjustment for temperature and fan control and be conveniently
987 located on the dash in clear view of the driver. The control panel will include robust levers for both
988 fan speed and temperature adjustment.

989 **COMPLY:** Y for YES E for Exception

990

991 **INTERIOR CAB INSULATION**

992 The cab and crew cab walls will be insulated with 1.50" insulation to reduce heat transfer into the
993 cab.

994 The insulation will be covered with a vinyl liner or a metal panel painted to match the interior.

995 **COMPLY:** Y for YES E for Exception

996



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- 997 **CAB INSTRUMENTATION**
- 998 The cab instrument panel will include gauges, telltale indicator lamps, an LCD display, control
- 999 switches, alarms, and a diagnostic panel. The function of the instrument panel controls and
- 1000 switches will be identified by a label adjacent to each item. Actuation of the headlight switch will
- 1001 illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless
- 1002 necessary. The cab instruments and controls will be conveniently located within the forward cab
- 1003 section, forward of the driver. The gauge assembly and switch panels are designed to be removable
- 1004 for ease of service and low cost of ownership.

- 1005 **COMPLY:** **Y for YES** **E for Exception**

- 1006

- 1007 **GAUGES**
- 1008 The gauge panel will include the following nine (9) ivory faced gauges with black bezels to monitor
- 1009 vehicle performance:

- 1010 Voltmeter gauge (volts):
- 1011 Low volts (11.8 VDC)
- 1012 Amber caution indicator on the information center with intermittent alarm
- 1013 Amber check gauge light on indicator light display
- 1014 High volts (15 VDC)
- 1015 Amber caution indicator on the information center with Intermittent alarm
- 1016 Amber check gauge light on indicator light display
- 1017 Very low volts (11.3 VDC)
- 1018 Red warning indicator on the information center with a steady alarm
- 1019 Amber check gauge light on indicator light display
- 1020 Very high volts (16 VDC)
- 1021 Red warning indicator on the information center with a steady tone alarm
- 1022 Amber check gauge light on indicator light display
- 1023 Engine Tachometer (RPM)
- 1024 Speedometer MPH
- 1025 Fuel level gauge (Empty - Full in fractions):
- 1026 Low fuel (1/8 full)
- 1027 Amber caution indicator on the information center with intermittent alarm
- 1028 Amber check gauge light on indicator light display
- 1029 Very low fuel (1/32 full)
- 1030 Red warning indicator on the information center with steady tone alarm

1



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- 1031 Amber check gauge light on indicator light display
- 1032 Engine Oil pressure Gauge (PSI):
- 1033 Low oil pressure to activate engine warning lights and alarms
- 1034 Red caution indicator on the information center with steady alarm
- 1035 Amber check gauge light on indicator light display
- 1036 Front Air Pressure Gauges (PSI):
- 1037 Low air pressure to activate warning lights and alarm
- 1038 Red warning indicator on the information center with steady alarm
- 1039 Amber check gauge light on indicator light display
- 1040 Rear Air Pressure Gauges (PSI):
- 1041 Low air pressure to activate warning lights and alarm
- 1042 Red warning indicator on the information center with steady alarm
- 1043 Amber check gauge light on indicator light display
- 1044 Transmission Oil Temperature Gauge (Fahrenheit):
- 1045 High transmission oil temperature activates warning lights and alarm
- 1046 Amber warning indicator on the information center with intermittent alarm
- 1047 Amber check gauge light on indicator light display
- 1048 Engine Coolant Temperature Gauge (Celsius):
- 1049 High engine temperature activates an engine warning light and alarms
- 1050 Amber caution indicator on the information center with intermittent alarm
- 1051 Amber check gauge light on indicator light display
- 1052 **COMPLY:** **Y for YES** **E for Exception**
- 1053
- 1054 **INDICATOR LAMPS**
- 1055 To promote safety, the following telltale indicator lamps will be located on the instrument panel in
- 1056 clear view of the driver. The indicator lamps will be "dead-front" design that is only visible when
- 1057 active. The colored indicator lights will have descriptive text or symbols.
- 1058 The following amber telltale lamps will be present:
- 1059 Low coolant
- 1060 Trac cntl (traction control) (where applicable)
- 1061 Check engine
- 1062 Check trans (check transmission)



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- 1063 Air rest (air restriction)
- 1064 Check Gauges
- 1065 DPF (engine diesel particulate filter regeneration)
- 1066 Air inlet heater (wait to start) (where applicable)
- 1067 HET (engine high exhaust temperature) (where applicable)
- 1068 ABS (antilock brake system)
- 1069 MIL (engine emissions system malfunction indicator lamp) (where applicable)
- 1070 Regen inhibit (engine emissions regeneration inhibit) (where applicable)
- 1071 Trans temp (transmission temperature)
- 1072 Side roll fault (where applicable)
- 1073 Front air bag fault (where applicable)
- 1074 The following red telltale lamps will be present:
 - 1075 Seat belt
 - 1076 Parking brake
 - 1077 Stop engine
- 1078 The following green telltale lamps will be present:
 - 1079 Left turn
 - 1080 Right turn
 - 1081 Battery on
- 1082 The following blue telltale lamps will be present:
 - 1083 High beam
- 1084 **COMPLY:** Y for YES E for Exception
- 1085
- 1086 **ALARMS**
- 1087 Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a
- 1088 warning message is present.
- 1089 Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided
- 1090 whenever a caution message is present without a warning message being present.
- 1091 Any active audible alarm will be able to be silenced by holding the ignition switch at the top position
- 1092 for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently
- 1093 chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a
- 1094 reminder to the operator that a caution or warning condition still exists. Any new warning or
- 1095 caution condition will enable the steady or pulsing tones respectively.



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1096 **COMPLY:** Y for YES E for Exception

1097

1098 **INDICATOR LAMP AND ALARM PROVE-OUT**

1099 A system will be provided which automatically tests telltale indicator lights and alarms located on
1100 the cab instrument panel. Telltale indicators and alarms will perform prove-out at initial power-up
1101 to ensure proper performance.

1102 **COMPLY:** Y for YES E for Exception

1103

1104 **CONTROL SWITCHES**

1105 For ease of use, the following controls will be provided immediately adjacent to the cab instrument
1106 panel within easy reach of the driver. All switches will have backlit labels for low light
1107 applications.

1108 Headlight/Parking light switch: A three (3)-position maintained rocker switch will be provided. The
1109 first switch position will deactivate all parking and headlights. The second switch position will
1110 activate the parking lights. The third switch will activate the headlights.

1111 Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be
1112 provided. The first switch position decreases the panel backlighting intensity to a minimum level as
1113 the switch is held. The second switch position is the default position that does not affect the
1114 backlighting intensity. The third switch position increases the panel backlighting to a maximum level
1115 as the switch is held.

1116 Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The
1117 first switch position will deactivate vehicle ignition. The second switch position will activate vehicle
1118 ignition. The third momentary position will disable the Command Zone audible alarm if held for
1119 three (3) to five (5) seconds.

1120 Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch
1121 position is the default switch position. The second switch position will activate the vehicle's
1122 engine. The switch actuator is designed to prevent accidental activation.

1123 Hazard switch will be incorporated into the steering column.

1124 Heater and defroster controls.

1125 Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer
1126 controls will be provided. The windshield wiper control will have high, low, and intermittent modes.

1127 Parking brake control: An air actuated push/pull park brake control.

1128 Chassis horn control: Activation of the chassis horn control will be provided through the center of
1129 the steering wheel.

1130 **COMPLY:** Y for YES E for Exception

1131



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1132 **CUSTOM SWITCH PANELS**

1133 The design of cab instrumentation will allow for emergency lighting and other switches to be placed
1134 within easy reach of the operator thus improving safety. There will be positions for up to three (3)
1135 switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine
1136 tunnel console facing the driver, and up to three (3) switch panels in the overhead console on the
1137 officer's side. All switches have backlit labels for low light applications.

1138 High idle engagement switch: A momentary membrane switch with integral indicator lamp will be
1139 provided. The switch will activate and deactivate the high idle function when pressed and
1140 released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to
1141 engage. A green indicator lamp integral to the high idle engagement switch will indicate when the
1142 high idle function is engaged.

1143 "Ok To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high
1144 idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

1145 Diesel particulate filter regeneration switch (where applicable).

1146 Diesel particulate filter regeneration inhibit switch (where applicable).

1147 **COMPLY:** Y for YES E for Exception

1148

1149 **DIAGNOSTIC PANEL**

1150 A diagnostic panel will be accessible while standing on the ground and will be located inside the
1151 driver's side door left of the steering column. The diagnostic panel will allow diagnostic tools such
1152 as computers to connect to various vehicle systems for improved troubleshooting providing a lower
1153 cost of ownership. Diagnostic switches will allow engine and ABS systems to provide blink codes
1154 should a problem exist. The diagnostic panel will include the following:

1155 Engine diagnostic port

1156 Transmission diagnostic port

1157 ABS diagnostic port

1158 Roll sensor diagnostic port

1159 USB diagnostic port

1160 Engine diagnostic switch (blink codes flashed on check engine telltale indicator)

1161 ABS diagnostic switch (blink codes flashed on ABS telltale indicator)

1162 **COMPLY:** Y for YES E for Exception

1163

1164 **CAB LCD DISPLAY**

1165 A display will be mounted in the driver side of the cab within easy reach of the driver.

1166 Rack down will be shown on the display (no telltale indicator lamp).

1167 - Air Restriction Indicator (electronic with indicator light).



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1168 **COMPLY:** Y for YES E for Exception

1169

1170 **SWITCH PANELS**

1171 The emergency light switch panel will have a master switch for ease of use plus individual switches
1172 for selective control. Each switch panel will contain eight (8) membrane-type switches each rated
1173 for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will
1174 include non-functioning black appliques. Documentation will be provided by the manufacturer
1175 indicating the rated cycle life of the switches. The switch panel(s) will be located in the "overhead"
1176 position above the windshield on the driver side overhead to allow for easy access.

1177 The switches will be membrane-type and also act as an integral indicator light. For quick, visual
1178 indication the entire surface of the switch will be illuminated white whenever backlighting is
1179 activated and illuminated red whenever the switch is active. For ease of use, a 2-ply, scratch
1180 resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center
1181 of the switch. The label will allow light to pass through the letters for ease of use in low light
1182 conditions.

1183 **COMPLY:** Y for YES E for Exception

1184

1185 **ELECTRICAL POWER CONTROL SYSTEM**

1186 The primary power distribution will be located behind the driver's seating position and be easily
1187 accessible for simplified maintenance and troubleshooting. Additional electrical distribution centers
1188 will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection,
1189 and control components. The electrical distribution centers will be located strategically throughout
1190 the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will
1191 be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be
1192 accessible without the need for additional tools.

1193 Distribution centers located throughout the vehicle will contain battery powered studs for customer
1194 installed equipment thus providing a lower cost of ownership.

1195 Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical
1196 circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and
1197 component damage when subjected to extreme current overload. General protection circuit
1198 breakers will be Type-I automatic reset (continuously resetting). When required, automotive type
1199 fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct
1200 current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

1201 **COMPLY:** Y for YES E for Exception

1202

1203 **SOLID-STATE CONTROL SYSTEM**

1204 A solid-state electronics based control system will be utilized to achieve advanced operation and
1205 control of the vehicle components. A fully computerized vehicle network will consist of electronic
1206 modules located near their point of use to reduce harness lengths and improve reliability. The
1207 control system will comply with SAE J1939-11 recommended practices.



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- 1208 The control system will operate as a master/slave system whereas the main control module
1209 instructs all other system components. The system will contain patented Mission Critical software
1210 that maintains critical vehicle operations in the unlikely event of a main controller error. The system
1211 will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications
1212 providing a lower cost of ownership.
- 1213 For increased reliability and simplified use, the control system modules will include the following
1214 attributes:
- 1215 Green LED indicator light for module power
- 1216 Red LED indicator light for network communication stability status
- 1217 Control system that self tests continually throughout vehicle operation
- 1218 No moving parts due to transistor logic
- 1219 Software logic control for NFPA mandated safety interlocks and indicators
- 1220 Integrated electrical system load management without additional components
- 1221 Integrated electrical load sequencing system without additional components
- 1222 Customized control software to this vehicle's configuration
- 1223 Factory and field reprogrammable to accommodate changes to the vehicle's operating parameters
- 1224 USB connection to the main control module for troubleshooting and programming
- 1225 To assure long life and operation in a broad range of environmental conditions, the solid-state
1226 control system modules will meet the following specifications:
- 1227 Module circuit board will meet SAE J771 specifications.
- 1228 Operating temperature from -40C to +70C
- 1229 Storage temperature from -40C to +70C
- 1230 Vibration to 50g
- 1231 IP67 rated enclosure
- 1232 Totally protected against dust
- 1233 Totally protected against the effect of temporary immersion between 15 centimeters and one (1)
1234 meter
- 1235 Operating voltage from eight (8) volts to 16 volts DC
- 1236 The main controller will activate status indicators and audible alarms designed to provide warning of
1237 problems before they become critical.
- 1238 **COMPLY:** Y for YES E for Exception
- 1239



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1240 **CIRCUIT PROTECTION AND CONTROL DIAGRAM**

1241 Copies of all job-specific, computer network input and output (I/O) connections will be provided
1242 with each chassis. The sheets will indicate the function of each module connection point, circuit
1243 protection information (where applicable), wire numbers, wire colors and load management
1244 information.

1245 **COMPLY:** Y for YES E for Exception

1246

1247 **ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS**

1248 The on-board information center will include the following diagnostic information:

1249 Text description of active warning or caution alarms

1250 Simplified warning indicators

1251 Amber caution light with intermittent alarm

1252 Red warning light with steady tone alarm

1253 All control system modules, with the exception of the main control module, will contain on-board
1254 visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed,
1255 transparent module housing near the face of the module. One LED for each input or output will be
1256 provided and will illuminate whenever the respective input or output is active. Color coded labels
1257 within the modules will encompass the LEDs for ease of identification. The LED indicator lights will
1258 provide point of use information for reduced troubleshooting time without the need for an
1259 additional computer.

1260 **COMPLY:** Y for YES E for Exception

1261

1262 **ADVANCED DIAGNOSTICS**

1263 An advanced, Windows-based, diagnostic software program will be provided for this control
1264 system. The software will provide troubleshooting tools to service technicians equipped with an
1265 IBM compatible computer.

1266 The service and maintenance software will be easy to understand and use and have the ability to
1267 view system input/output (I/O) information.

1268 **COMPLY:** Y for YES E for Exception

1269

1270 **INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM**

1271 A system will be provided which automatically tests basic indicator lights and alarms located on the
1272 cab instrument panel.

1273 **COMPLY:** Y for YES E for Exception

1274



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1275 **VOLTAGE MONITOR SYSTEM**

1276 A voltage monitoring system will be provided to indicate the status of the battery system connected
1277 to the vehicle's electrical load. The system will provide visual and audible warning when the system
1278 voltage is below or above optimum levels.

1279 The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

1280 **COMPLY:** Y for YES E for Exception

1281

1282 **DEDICATED RADIO EQUIPMENT CONNECTION POINTS**

1283 There will be four (4) studs provided in the primary power distribution center located on top of the
1284 engine tunnel for the two-way radio equipment.

1285 The studs will consist of the following:

1286 12-volt 40-amp battery switched power

1287 12-volt 100-amp ground

1288 12-volt 60-amp ignition switched power

1289 2-volt 60-amp direct battery power

1290 **COMPLY:** Y for YES E for Exception

1291

1292 **ENHANCED SOFTWARE**

1293 The solid-state control system will include the following software enhancements:

1294 Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the
1295 doors close.

1296 Cab and crew cab dome lights will dim after ten (10) seconds or immediately if the vehicle is put into
1297 gear.

1298 All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is
1299 released

1300 Cab and crew cab perimeter/step lights will remain on for ten (10) seconds for improved visibility
1301 after the doors close.

1302 Cab and crew cab perimeter/step lights will dim after ten (10) seconds or immediately if the vehicle
1303 is put into gear.

1304 **COMPLY:** Y for YES E for Exception

1305

1306 **EMI/RFI PROTECTION**

1307 To prevent erroneous signals from Crosstalk contamination and interference, the electrical system
1308 will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency
1309 emissions. An advanced electrical system will be used to ensure radiated and conducted



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1310 electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed
1311 at their source.

1312 The apparatus will have the ability to operate in the electromagnetic environment typically found in
1313 fire ground operations to ensure clean operations. The electrical system will meet, without
1314 exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for
1315 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC test results from
1316 the original test vehicle and will certify that the vehicle meets SAE J551/2 and SAE J1113/41 Region
1317 1, Class 4 EMR for 15KHz 950MHz requirements.

1318 EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The
1319 electrical system will be designed for full compatibility with low-level control signals and high-
1320 powered two-way radio communication systems. Harness and cable routing will be given careful
1321 attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

1322 **COMPLY:** Y for YES E for Exception

1323

1324 **INFORMATION CENTER**

1325 An information center employing a 7" diagonal color LCD display will be encased in an ABS plastic
1326 housing.

1327 The information center will have the following specifications:

- 1328 - Operate in temperatures from -40 to 185 degrees F
- 1329 - An Optical Gel will be placed between the LCD and protective lens
- 1330 - Five weather resistant user interface switches
- 1331 - Black enclosure with gray decal
- 1332 - Sunlight Readable
- 1333 - Linux operating system
- 1334 - Minimum of 400nits rated display

1335 **COMPLY:** Y for YES E for Exception

1336

1337 **OPERATION**

1338 The information center will be designed for easy operation for everyday use.

1339 The page button will cycle from one screen to the next screen in a rotating fashion.

1340 A video button will allow a NTSC signal into the information center to be displayed on the
1341 LCD. Pressing any button while viewing a video feed will return the information center to the
1342 vehicle information screens.

1343 A menu button will provide access to maintenance, setup and diagnostic screens.

1344 All other button labels will be specific to the information being viewed.

1345 **COMPLY:** Y for YES E for Exception



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1346

1347 **GENERAL SCREEN DESIGN**

1348 Where possible, background colors will be used to provide "At a Glance" vehicle information. If
1349 information provided on a screen is within acceptable limits, a green background will be used. If a
1350 caution or warning situation arises the following will occur:

1351 - An amber background/text color will indicate a caution condition.

1352 - A red background/text color will indicate a warning condition.

1353 Every screen will include the following:

1354 - Exterior Ambient Temperature

1355 - Time (12 or 24 hour mode)

1356 - Text Alert Center:

1357 - The information center will utilize an "Alert Center" to display text messages for audible alarm
1358 tones. The text messages will be written to identify the item(s) causing the audible alarm to
1359 sound. If more than one (1) text message occurs, the messages will cycle every second until the
1360 problem(s) have been resolved. The background color for the "Alert Center" will change to indicate
1361 the severity of the "warning" message. If a warning and a caution condition occur simultaneously,
1362 the red background color will be shown for all alert center messages.

1363 - Button Labels: A label for each button will exist. The label will indicate the function for each active
1364 button for each screen. Buttons that are not utilized on specific screens will have a button label
1365 with no text.

1366 **COMPLY:** Y for YES E for Exception

1367

1368 **PAGE SCREENS**

1369 The Information center will include the following screens:

1370 Load Manager Screen: A list of items to be load managed will be provided. The list will provide:

1371 - Description of the load

1372 - Individual load shed priority: The lower the priority number the earlier the device will be shed
1373 should a low voltage condition occur.

1374 - Load Status: The screen will indicate if a load has been shed (disabled) or not shed.

1375 "At a Glance" color features are utilized on this screen

1376 Do Not Move Truck: The Do Not Move Truck screen will indicate the approximate location and type
1377 of item that is open or is not stowed for travel. The actual status of the following devices will be
1378 indicated:

1379 - Driver Side Cab Door

1380 - Passenger's Side Cab Door

1381 - Driver Side Crew Cab Door



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- 1382 - Passenger's Side Crew Cab Door
- 1383 - Driver Side Body Doors
- 1384 - Passenger's Side Body Doors
- 1385 - Rear Body Door(s)
- 1386 - Ladder Rack
- 1387 - Deck Gun
- 1388 - Light Tower
- 1389 - Hatch Door
- 1390 - Stabilizers (if applicable)
- 1391 - Steps
- 1392 - Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause
- 1393 damage to the apparatus if the apparatus is moved, will cause an "Alert Center" message if the
- 1394 parking brake is disengaged.
- 1395 Chassis Information: The following information will be shown:
- 1396 - Engine RPM
- 1397 - Fuel Level
- 1398 - Battery Voltage
- 1399 - Engine Coolant Temperature
- 1400 - Engine Oil Pressure
- 1401 "At a Glance" color features are utilized on this screen
- 1402 Active Alarms List: This screen will show a list of all active text messages. The list items text will
- 1403 match the text messages shown in the "Alert Center". The date and time the message occurred is
- 1404 displayed with each message in the list.
- 1405 **COMPLY:** Y for YES E for Exception
- 1406
- 1407 **MENU SCREENS**
- 1408 The following screens will be available through the Menu button:
- 1409 View System Information: A detailed list of vehicle information:
- 1410 - Battery Volts
- 1411 - Pump Hours
- 1412 - Transmission Oil Temperature
- 1413 - Pump Engaged



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- 1414 - Engine Coolant Level
- 1415 - Engine Oil Level
- 1416 - Oil level will only be shown when the engine is not running
- 1417 - Power Steering Level
- 1418 Set daytime and nighttime Display Brightness:
- 1419 - Brightness: Increase and decrease
- 1420 - Default setting button
- 1421 Configure Video Mode:
- 1422 - Set Video Contrast
- 1423 - Set Video Color
- 1424 - Set Video Tint
- 1425 Set Startup Screen:
- 1426 - Choose the screen that will be active at vehicle power-up
- 1427 Set Date & Time:
- 1428 - 12 or 24 hour format
- 1429 - Set time
- 1430 - Set date
- 1431 View Active Alarms:
- 1432 - Shows a list of all active alarms
- 1433 - Date and time of the occurrence is shown with each alarm
- 1434 - Silence alarms
- 1435 - All alarms are silenced
- 1436 System Diagnostics:
- 1437 - Module type and ID number
- 1438 - Module version
- 1439 - Module diagnostics information:
- 1440 - Input or output number
- 1441 - Circuit number connected to that input or output
- 1442 - Circuit name (item connected to the circuit)
- 1443 - Status of the input or output



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- 1444 - Power and Constant Current module diagnostic information
- 1445 Button functions and button labels may change with each screen.

1446 **COMPLY:** Y for YES E for Exception

1447

1448 **VEHICLE DATA RECORDER**

1449 A vehicle data recorder (VDR) will be provided. The VDR will be capable of reading and storing
1450 vehicle information. The VDR will be capable of operating in a voltage range from 8VDC to
1451 16VDC. The VDR will not interfere with, suspend, or delay any communications that may exist on
1452 the CAN data link during the power up, initialization, runtime, or power down sequence. The VDR
1453 will continue operation upon termination of power or at voltages below 8VDC for a minimum of
1454 10ms.

1455 The information stored on the VDR can be downloaded through a USB port mounted in a convent
1456 location determined by cab model. A CD provided with the apparatus will include the programming
1457 to download the information from the VDR. A USB cable can be used to connect the VDR to a laptop
1458 to retrieve required information.

1459 The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN
1460 inputs:

- 1461 Vehicle Speed - MPH
- 1462 Acceleration - MPH/sec
- 1463 Deceleration - MPH/sec
- 1464 Engine Speed - RPM
- 1465 Engine Throttle Position - % of Full Throttle
- 1466 ABS Event - On/Off
- 1467 Seat Occupied Status - Yes/No by Position (7-12 Seating Capacity)
- 1468 Seat Belt Buckled Status - Yes/No by Position (7-12 Seating Capacity)
- 1469 Master Optical Warning Device Switch - On/Off
- 1470 Time - 24 Hour Time
- 1471 Date - Year/Month/Day

1472 **COMPLY:** Y for YES E for Exception

1473

1474 **BATTERY SYSTEM**

1475 Six (6) 12 volt, Deka Model 1131XMF, or equivalent substitute, batteries that include the following
1476 features will be provided:

- 1477 - 1000 CCA (cold cranking amps)
- 1478 - 185 reserve capacity



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- 1479 - High cycle
- 1480 - Maintenance free
- 1481 - Group 31
- 1482 - Rating of 6000 CCA at 0 degrees Fahrenheit
- 1483 - 1110 minutes of reserve capacity
- 1484 - Threaded posts
- 1485 **COMPLY:** Y for YES E for Exception

1486

BATTERY SYSTEM

- 1488 A single starting system will be provided.
- 1489 An ignition switch and starter button will be located on the instrument panel.

1490 **COMPLY:** Y for YES E for Exception

1491

MASTER BATTERY SWITCH

1493 A master battery switch, to activate the battery system, will be provided inside the cab within easy reach of the driver.

1495 An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

1497 **COMPLY:** Y for YES E for Exception

1498

BATTERY COMPARTMENTS

1500 Batteries will be placed on non-corrosive mats and be stored in well-ventilated compartments located under the cab.

1502 Heavy-duty battery cables will be used to provide maximum power to the electrical system. Cables will be color-coded.

1504 Battery terminal connections will be coated with anti-corrosion compound. Battery solenoid terminal connections will be encapsulated with semi-permanent rubberized compound.

1506 **COMPLY:** Y for YES E for Exception

1507

JUMPER STUDS

1509 One (1) set of battery jumper studs with plastic color-coded covers will be installed on the front side of battery box on the driver's side. This will allow enough room for easy jumper cable access.

1511 **COMPLY:** Y for YES E for Exception



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1512

1513 **BATTERY CHARGER/ AIR COMPRESSOR**

1514 A Kussmaul Pump Plus 1200, model 091-9-1200 () single output battery charger/air compressor
1515 system, or equivalent, will be provided. A display bar graph indicating the state of charge will be
1516 included.

1517 The automatic charger will maintain one (1) set of batteries with a maximum output current of 40
1518 amps.

1519 The 12-volt air compressor will be installed to maintain the air system pressure when the vehicle is
1520 not in use.

1521 The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to this
1522 battery charger.

1523 Battery charger/compressor will be located in the front left body compartment.

1524 The battery charger indicator will be located on the driver's seat riser.

1525 **COMPLY:** Y for YES E for Exception

1526

1527 **ALTERNATOR**

1528 A C.E. Niehoff, model C680-1 alternator, or equivalent substitute, will be provided. It will have a
1529 rated output current of 430 amp as measured by SAE method J56. It will also have a custom three
1530 (3)-set point voltage regulator, manufactured by C. E. Niehoff, or equivalent substitute. The
1531 alternator will be connected to the power and ground distribution system with heavy-duty cables
1532 sized to carry the full rated alternator output.

1533 **COMPLY:** Y for YES E for Exception

1534

1535 **RADIO ANTENNA MOUNT**

1536 Antenna mounting base(s), Model MATM or equivalent substitute with 25 feet of coax cable and
1537 weatherproof cap, will be provided for a two way radio. The mount(s) will be located per direction
1538 on the cab roof just to the rear of the front cab seats. The cable will be routed to the officer side
1539 seat box and the instrument panel.

1540 There will be four (4) provided.

1541 **COMPLY:** Y for YES E for Exception

1542

1543 **SPARE CIRCUIT**

1544 There will be three (3) pair of wires, including a positive and a negative, installed on the apparatus.

1545 The above wires will have the following features:

1546 The positive wire will be connected directly to the battery power.

1547 The negative wire will be connected to ground.



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- 1548 Wires will be protected to 10 amps at 12 volts DC.
1549 Power and ground will terminate behind the officer seat and one at each forward facing crew seat.
1550 Termination will be with six (6) position terminal strip.
1551 Wires will be sized to 125% of the protection.
1552 This circuit(s) may be load managed when the parking brake is set.

1553 **COMPLY:** Y for YES E for Exception

1554

1555 **SPARE CIRCUIT**

1556 There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

1557 The above wires will have the following features:

1558 The positive wire will be connected directly to the battery power.

1559 The negative wire will be connected to ground.

1560 Wires will be protected to 40 amps at 12 volts DC.

1561 Power and ground will terminate behind the officer dash panel.

1562 Termination will be with 3/8" studs and plastic covers.

1563 Wires will be sized to 125% of the protection.

1564 This circuit(s) may be load managed when the parking brake is set.

1565 **COMPLY:** Y for YES E for Exception

1566

1567 **ELECTRONIC LOAD MANAGER**

1568 An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt
1569 electrical system, automatically reducing the electrical load in the event of a low voltage condition,
1570 and automatically restoring the shed electrical loads when a low voltage condition expires. This
1571 ensures the integrity of the electrical system.

1572 The system will include the following features:

1573 System voltage monitoring.

1574 A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on
1575 and off.

1576 Sixteen available electronic load shedding levels.

1577 Priority levels can be set for individual outputs.

1578 High Idle will not be controlled by the load manager.

1579 If enabled:

1580 "Load Man Hi-Idle On" will display on the information center.



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- 1581 Hi-Idle will not activate until 30 seconds after engine start up.
1582 Individual switch "on" indicator to flash when the particular load has been shed.
1583 The information center indicates system voltage.
1584 The information center includes a "Load Manager" screen indicating the following:
1585 Load managed items list, with priority levels and item condition.
1586 Individual load managed item condition:
1587 ON = not shed
1588 SHED = shed
1589 **COMPLY:** Y for YES E for Exception

1590

1591 **SEQUENCER**

1592 A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset
1593 sequence thereby protecting the alternator from power surges. This sequencer operation will allow
1594 a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12
1595 volt load to prolong the life of the alternator.

1596 Emergency light sequencing will operate in conjunction with the emergency master light switch.
1597 When the emergency master switch is activated, the emergency lights will be activated one by one
1598 at half second intervals. Sequenced emergency light switch indicators will flash while waiting for
1599 activation.

1600 When the emergency master switch is deactivated, the sequencer will deactivate the warning light
1601 loads in the reverse order.

1602 Sequencing of the following items will also occur, in conjunction with the ignition switch, at half
1603 second intervals:

- 1604 Cab Heater and Air Conditioning
1605 Crew Cab Heater (if applicable)
1606 Crew cab Air Conditioning (if applicable)
1607 Exhaust Fans (if applicable)
1608 Third Evaporator (if applicable)

1609 **COMPLY:** Y for YES E for Exception

1610

1611 **AMP DRAW REPORT**

1612 The bidder will provide, at the time of delivery, an itemized print out of the expected amp draw of
1613 the entire vehicle's electrical system.

1614 The manufacturer of the apparatus will provide the following:

- 1615 1) Documentation of the electrical system performance tests.



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- 1616 2) A written load analysis, which will include the following:
- 1617 A) The nameplate rating of the alternator.
- 1618 B) The alternator rating under the conditions specified per:
- 1619 Applicable NFPA 1901 or 1906 (Current Edition).
- 1620 C) The minimum continuous load of each component that is specified per:
- 1621 Applicable NFPA 1901 or 1906 (Current Edition).
- 1622 D) Additional loads that, when added to the minimum continuous load, determine the total
- 1623 connected load.
- 1624 E) Each individual intermittent load.
- 1625 All of the above listed items will be provided by the bidder per the applicable NFPA 1901 or 1906
- 1626 (Current Edition).
- 1627 **COMPLY:** Y for YES E for Exception

- 1628
- 1629 **EXTERIOR LIGHTING**
- 1630 Exterior lighting will meet or exceed Federal Department of Transportation, Federal Motor Vehicle
- 1631 Safety Standards and National Fire Protection Association requirements in effect at time of proposal.
- 1632 Front headlights will be halogen, round, two (2) mounted in each front trim housing.
- 1633 The directional lights will wraparound on the outside corners of the trim housing. The headlights
- 1634 and directional lights will be in the same housing assembly. An additional directional/marker
- 1635 combination light will be located on each side of cab behind the bumper.
- 1636 Five (5) clearance lights and marker lights will be installed in the "eye brow" trim above the
- 1637 windshields. The lights will be Grote, SuperNova, amber LED lamps or equivalent substitute
- 1638 **COMPLY:** Y for YES E for Exception

- 1639
- 1640 **WARNING LIGHTS (Cab Face)**
- 1641 Four (4) Whelen Model 60*02F*R Super LED lights or equivalent substitute will be installed on the
- 1642 cab face, above the headlights, mounted in common bezels matching the headlight bezel.
- 1643 The outside flashing LEDs will be red Super LED/red lens.
- 1644 The inside steady burning LEDs will be red Super LED/red lens.
- 1645 All of these lights will be activated by the same switch in the cab.
- 1646 To meet NFPA requirements, the inside lights will be disabled if clear when the parking brake is
- 1647 applied.
- 1648 **COMPLY:** Y for YES E for Exception

1649



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1650 **BACK-UP MONITOR**

1651 A backup monitor to consist of a rearview monitor and camera, as well as a signaling buzzer which
1652 shall actuate when the truck is shifted into reverse shall be provided. The camera shall be mounted
1653 on the rear of the vehicle with the monitor on the dash for visibility during backing operations. A
1654 push button switch located at the rear of the vehicle for safely signaling the driver during backing
1655 maneuvers shall also be provided.

1656 **COMPLY:** Y for YES E for Exception

1657

1658 **MANUAL, FIRE APPARATUS PARTS**

1659 Two (2) custom parts manuals for the complete fire apparatus will be provided in hard copy with the
1660 completed unit.

1661 The manual will contain the following:

1662 - Job number

1663 - Part numbers with full descriptions

1664 - Table of contents

1665 - Parts section sorted in functional groups reflecting a major system, component, or assembly

1666 - Parts section sorted in Alphabetical order

1667 - Instructions on how to locate a part

1668 The manual will be specifically written for the chassis and body model being purchased. It will not
1669 be a generic manual for a multitude of different chassis and bodies.

1670 **COMPLY:** Y for YES E for Exception

1671

1672 **SERVICE PARTS INTERNET SITE**

1673 The service parts information included in this manual will be available on the internet or on a CD.

1674 **COMPLY:** Y for YES E for Exception

1675

1676 **MANUALS, CHASSIS SERVICE**

1677 Two (2) chassis service manuals containing parts and service information on major components will
1678 be provided with the completed unit.

1679 The manuals will contain the following sections:

1680 - Job number

1681 - Table of contents

1682 - Troubleshooting

1683 - Front Axle/Suspension

1684 - Brakes



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- 1685 - Engine
1686 - Tires
1687 - Wheels
1688 - Cab
1689 - Electrical, DC
1690 - Air Systems
1691 - Plumbing
1692 - Appendix
1693 The manual will be specifically written for the chassis model being purchased. It will not be a
1694 generic manual for a multitude of different chassis and bodies.
1695 **COMPLY:** Y for YES E for Exception
1696
1697 **MANUALS, CHASSIS OPERATION**
1698 Two (2) chassis operation manuals will be provided.
1699 **COMPLY:** Y for YES E for Exception
1700
1701 **ELECTRICAL WIRING DIAGRAMS**
1702 Three (3) compact discs containing "As-Built" electrical wiring diagrams specifically prepared for the
1703 chassis and body will be provided.
1704 Two (2) CD's will be shipped to the customer after delivery of the vehicle, upon completion of the
1705 wiring diagrams. One (1) CD will be included with the job folder at apparatus builder's facility for
1706 future reference.
1707 Each CD will include the following capabilities:
1708 The capability of viewing each separate diagram.
1709 The capability of zooming in on any section of each separate diagram.
1710 The capability of printing each separate diagram.
1711 The capability of printing each zoomed in area of each separate diagram.
1712 Each CD will include the following items:
1713 Title page, identifying the job number and chassis model.
1714 Table of contents.
1715 Truck specific electrical compartment and instrument layouts for the chassis.
1716 Truck specific electrical compartment layouts for the body.
1717 Applicable drawings from the appropriate standard wiring diagrams.



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- 1718 All truck specific wiring diagrams (special drawings).
1719 Harness drawings for all wiring harnesses used on the chassis.
1720 Harness drawings for all wiring harnesses used on the body.
1721 All truck input and output programming sheets (multiplexed trucks only).
1722 There will be one (1) hard copy of these diagrams required for this unit.
1723 The spiral bound, clear plastic covered hard copies will included everything from the CD's printed on
1724 11" x 17" white paper.
1725
1726 **COMPLY:** **Y for YES** **E for Exception**
1727
1728 **WATER TANK**
1729 Booster tank will have a capacity of 750 gallons and be constructed of UV stabilized ultra high
1730 impact polypropylene plastic by a manufacturer with a minimum of 20 years experience building
1731 tanks, is ISO 9001:2000 certified in all its manufacturing facilities, and has over 50,000 tanks in
1732 service.
1733 The booster tank will be a form-fitting design that serves to keep the tank height as low as
1734 possible. The tank will be no wider than 39.00" at the base to allow for greater compartment depth
1735 and no wider than 53.00" at the top.
1736 Tank joints and seams will be nitrogen welded inside and out.
1737 Tank will be baffled in accordance with NFPA Bulletin 1901 requirements.
1738 Baffles will have vent openings at both the top and bottom to permit movement of air and water
1739 between compartments.
1740 Longitudinal partitions will be constructed of .38" polypropylene plastic and will extend from the
1741 bottom of the tank through the top cover to allow for positive welding.
1742 Transverse partitions will extend from 4.00" off the bottom of the tank to the underside of the top
1743 cover.
1744 All partitions will interlock and will be welded to the tank bottom and sides.
1745 Tank top will be constructed of .50" polypropylene. It will be recessed .38" and will be welded to
1746 the tank sides and the longitudinal partitions.
1747 Tank top will be sufficiently supported to keep it rigid during fast filling conditions.
1748 Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded
1749 to the transverse partitions. Two (2) of the dowels will be drilled and tapped (.50" diameter, 13.00"
1750 deep) to accommodate lifting eyes.
1751 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.
1752 Sump will include a drain plug and the tank outlet.



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- 1753 Tank will be installed in a fabricated cradle assembly constructed of structural steel.
- 1754 Sufficient crossmembers will be provided to properly support bottom of tank. Crossmembers will be
1755 constructed of steel bar channel or rectangular tubing.
- 1756 Tank will "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions,
1757 .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on.
- 1758 Stops or other provision will be provided to prevent an empty tank from bouncing excessively while
1759 moving vehicle.
- 1760 Mounting system will be approved by the tank manufacturer.
- 1761 Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00"
1762 long.
- 1763 Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover.
- 1764 An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately
1765 halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.
- 1766 One (1) sleeve will be provided in the water tank for plumbing to the rear.

1767 **COMPLY:** Y for YES E for Exception

1768

1769 **HOSE BED**

- 1770 The hose body will be fabricated of .125"-5052 aluminum with a 38,000 psi tensile strength.
- 1771 Flooring of the hose bed will be removable aluminum grating with the top surface corrugated to aid
1772 in hose aeration. The grating slats will be a minimum of .50" x 4.50" with spacing between slats for
1773 hose ventilation.
- 1774 Hose bed will accommodate 250' of 2.50" hose / 1500' of 3.00" hose / 250' of 1.75" DJ Hose.
- 1775 Two (2) adjustable hosebed dividers will be used to separate the hose.
- 1776 Each divider will be constructed of a .125" brushed aluminum sheet fitted and fastened into a
1777 slotted, 1.50" diameter radiused extrusion along the top, bottom, and rear edge.
- 1778 Partition will be fully adjustable by sliding in tracks, located at the front and rear of the hose bed.
- 1779 Divider will be held in place by tightening bolts, at each end.
- 1780 Acorn nuts will be installed on all bolts in the hose bed which have exposed threads.

1781 **COMPLY:** Y for YES E for Exception

1782

1783 **HOSE BED COVER**

- 1784 A two (2) section hose bed cover, constructed of .125" bright aluminum treadplate, will be
1785 furnished. The cover will be hinged with full length stainless steel piano hinge. The sides will be
1786 slanted down.
- 1787 The cover will be reinforced so that it can support the weight of a man walking on the cover.