RM of Whitehead
Request for Bids (RFB)
2015 Acres International – Pumper Emergency Vehicle

SECTION 1 – EXECUTIVE SUMMARY

This Request for Bids (RFB) invites bidders to submit a Bid to Purchase the listed fire apparatus strictly on an "as is, where is." The objective of this RFB is to coordinate the sale of an emergency vehicle to the highest bidder in conjunction with tendering a replacement.

Ownership of the apparatus will only be transferred following the delivery of a replacement procured by the RM of Whitehead separate to this RFB. Bidders must be prepared to provide a deposit of 50% and accept delayed transfer of ownership, subject to vendor timelines.

The successful bidder will be responsible for all labour, materials, and equipment required to remove the apparatus from the Owner's facility. The RM is not liable for any faults discovered after the sale of the apparatus and the apparatus is sold without warranty.

The RM reserves the right to reject any or all bids and has set a minimum accepted value of $350.000.00

SECTION 2 – INFORMATION AND COMMUNICATION

2.1. Inquiries

All inquiries regarding the RFB documents must be submitted at least five (5) business days before the submission deadline. Inquiries received after this date may not be answered.

Inquiries can be submitted via email, over the phone, or in person at the RM Office. For inquiries regarding the RF documents, potential bidders are to contact:

James Maxon, CAO
RM of Whitehead
204-752-7761 (ext.3)
cao@rmofwhitehead.ca

2.2. Inspection of Apparatus

For inspection of the apparatus or technical inquiries, arrangements can be made by contacting:

Kelly Crossen, Fire Chief
RM of Whitehead Fire Department
whfiredept@gmail.com

The apparatus is located at:

RM of Whitehead Fire Hall
Dumbarton Street
Alexander, MB

SECTION 3 – SUBMISSION DEADLINE AND METHODS OF DELIVERY

3.1. Deadline to Submissions

Any bids must be submitted to the RM by May 29, 2026, 4:30 p.m. to be considered valid and eligible.

3.2. Delivery Method

Sealed bids may be submitted by mail or in person to the RM Office addressed with:

RM of Whitehead
Box 107
517 2nd Ave
Alexander, MB
R0K 0A0

3.3. Late Submissions

Submissions received after the deadline will not be eligible bids unless no other valid bids have been received. This remains applicable to any submissions received after the deadline via mail services.

SECTION 4 – BID CONDITIONS & REVIEW

4.1. Sealed Bids

Bids must be provided sealed and confidential through methods such as a windowless envelope or manila folder.

4.2. Reserve Bid

The RM of Whitehead reserves the right to reject any Bid that does not meet a minimum value of $350,000.

4.3. Evaluation

All valid bids submitted will be opened by staff within five (5) business days of the deadline with preference given to the highest offer. **Award of the contract is not final until approved by the RM of Whitehead Council.**

4.4. Award

The successful Bidder will be determined by the highest offered value for the apparatus and the ability to:

(a) The ability to deposit 50% of the successful Bid within the required period;
(b) Enter an agreement with respect to the delayed transfer of ownership.

SECTION 5 – TERMS AND CONDITIONS

5.1. Warranty

There is no warranty implied or otherwise with the sale of the apparatus and will be accepted as is. The RM will not be liable for any faults discovered after the sale and transfer of ownership of the apparatus. The RM will have a full inspection conducted prior to transfer of ownership with any necessary repairs completed at the expense of the RM.

5.2. Payment

The Bidder will be required to provide a deposit of payment in the amount of 50% of the accepted bid, due within 14-days of award and entering into an agreement with the RM of Whitehead. Remainder of purchase price will be required prior to transfer of ownership.

5.3. Availability

The Bidder accepts that transfer of ownership will not occur until the RM has received and placed in service their replacement Pumper Emergency Vehicle. This is recognized as being at an anticipated period of 24 – 36 months. The RM will make the 2015 Acres International vehicle available to the Bidder within 7-days of receiving the replacement apparatus and remainder of purchase amount has been remitted.

5.4. Communication

The RM will be in regular communication with the Vendor and commits to communicating regular updates to the Bidder on progress and any reasonable expectations for taking possession of the 2015 Acres International Pumper.

5.5. Protections

In the event of loss of the 2015 Acres International prior to delivery of the replacement and transfer of ownership, the RM of Whitehead will return the deposit amount to the Bidder.

SECTION 6 – SPECIFICATIONS

Model Profile
2016 7400 SFA 4X2 (SA525)

APPLICATION:	Fire/Pumper (Emergency)
MISSION:	Requested GVWR: 35000. Calc. GVWR: 37000 Calc. Start / Grade Ability: 42.37% / 3.04% @ 55 MPH Calc. Geared Speed: 78.3 MPH
DIMENSION:	Wheelbase: 266.00, CA: 147.10, Axle to Frame: 67.00
ENGINE, DIESEL:	{Navistar N9} EPA 10, SCR, 330 HP @ 2000 RPM, 950 lb-ft Torque @ 1200 RPM, 2200 RPM Governed Speed, 330 Peak HP (Max)
TRANSMISSION, AUTOMATIC:	{Allison 3500EVS_P} 5th Generation Controls; Wide Ratio, 6-Speed; With Double Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder, With 80,000-lb GVW & GCW Max.
CLUTCH:	Omit Item (Clutch & Control)
AXLE, FRONT NON-DRIVING:	{Meritor MFS-14-143A} Wide Track, I-Beam Type, 14,000-lb Capacity
AXLE, REAR, SINGLE:	{Dana Spicer S26-190D} Single Reduction, 26,000-lb Capacity, R Wheel Ends, Driver Controlled Locking Differential Gear Ratio: 5.38
CAB:	Conventional 6-Man Crew Cab
TIRE, FRONT:	(2) 315/80R22.5 UNISTEEL G291 (GOODYEAR) 491 rev/mile, load range J, 18 ply
TIRE, REAR:	(4) 12R22.5 G622 RSD (GOODYEAR) 482 rev/mile, load range H, 16 ply
SUSPENSION, RR, SPRING, SINGLE:	Vari-Rate; 31,000-lb Capacity, With 4500 lb Auxiliary Rubber Spring
FRAME REINFORCEMENT:	Outer "C" Channel, Heat Treated Alloy Steel (120,000 PSI Yield); 10.813" x 3.892" x 0.312"; (274.6mm x 98.9mm x 8.0mm); 480.0" (12192mm) Maximum OAL
PAINT:	Cab schematic 100GM Location 1: 2304, Red (Prem) Chassis schematic N/A

Code	Description
SA52500	Base Chassis, Model 7400 SFA 4X2 with 266.00 Wheelbase, 147.10 CA, and 67.00 Axle to Frame.
1570	TOW HOOK, FRONT (2) Frame Mounted
1CBU	FRAME RAILS Heat Treated Alloy Steel (120,000 PSI Yield); 10.125" x 3.580" x 0.312" (257.2mm x 90.9mm x 8.0mm); 480.0" (12192) Maximum OAL
1GBP	FRAME REINFORCEMENT Outer "C" Channel, Heat Treated Alloy Steel (120,000 PSI Yield); 10.813" x 3.892" x 0.312"; (274.6mm x 98.9mm x 8.0mm); 480.0" (12192mm) Maximum OAL
1LEH	LICENSE PLATE HOLDER Single Plate, Swing Type, Mounted Below Front Bumper
1LMY	BUMPER, FRONT Full Width, Aerodynamic, Chrome Plated Steel; 0.189" Material Thickness
1WEX	WHEELBASE RANGE 266" (675cm) Through and Including 311" (790cm)
2ARV	AXLE, FRONT NON-DRIVING {Meritor MFS-14-143A} Wide Track, I-Beam Type, 14,000-lb Capacity
	Notes : The following features should be considered when calculating Front GAWR: Front Axles; Front Suspension; Brake System; Brakes, Front Air Cam; Wheels; Tires.
3ADD	SUSPENSION, FRONT, SPRING Parabolic, Taper Leaf; 14,000-lb Capacity; With Shock Absorbers
	Includes : SPRING PINS Rubber Bushings, Maintenance-Free
	Notes : The following features should be considered when calculating Front GAWR: Front Axles; Front Suspension; Brake System; Brakes, Front Air Cam; Wheels; Tires.
4091	BRAKE SYSTEM, AIR Dual System for Straight Truck Applications
	Includes : BRAKE LINES Color and Size Coded Nylon : DRAIN VALVE Twist-Type : DUST SHIELDS, FRONT BRAKE : DUST SHIELDS, REAR BRAKE : GAUGE, AIR PRESSURE (2) Air 1 and Air 2 Gauges; Located in Instrument Cluster : PARKING BRAKE CONTROL Yellow Knob, Located on Instrument Panel : PARKING BRAKE VALVE For Truck : QUICK RELEASE VALVE Bendix On Rear Axle for Spring Brake Release: 1 for 4x2, 2 for 6x4 : SLACK ADJUSTERS, FRONT Automatic : SLACK ADJUSTERS, REAR Automatic : SPRING BRAKE MODULATOR VALVE R-7 for 4x2, SR-7 with relay valve for 6x4
	Notes : Rear Axle is Limited to 23,000-lb GAWR with Code 04091 BRAKE SYSTEM, AIR and Standard Rear Air Cam Brakes Regardless of Axle/Suspension Ordered.
4722	DRAIN VALVE {Bendix DV-2} Automatic; With Heater; for Air Tank
	Includes : DRAIN VALVE Mounted in Wet Tank
4AZA	AIR BRAKE ABS {Bendix AntiLock Brake System} Full Vehicle Wheel Control System (4-Channel)
4EBT	AIR DRYER {Bendix AD-IP} With Heater
	Includes : AIR DRYER LOCATION Inside Left Rail, Back of Cab
4ESX	BRAKE CHAMBERS, FRONT AXLE {Haldex} 20 SqIn
4EVL	BRAKE CHAMBERS, REAR AXLE {Haldex GC3030LHDHO} 30/30 Spring Brake

Code	Description
	Includes : BRAKE CHAMBERS, SPRING (2) Rear Parking; WITH TRUCK BRAKES: All 4x2, 4x4; WITH TRACTOR BRAKES: All 4x2, 4x4; 6x4 & 6x6 with Rear Tandem Axles Less Than 46,000-lb. or GVWR Less Than 54,000-lb.
4JCJ	BRAKES, FRONT, AIR CAM S-Cam; 16.5" x 5.0"; Includes 20 Sq. In. Long Stroke Brake Chambers
	Notes : The following features should be considered when calculating Front GAWR: Front Axles; Front Suspension; Brake System; Brakes, Front Air Cam; Wheels; Tires.
4NDB	BRAKES, REAR, AIR CAM S-Cam; 16.5" x 7.0"; Includes 30/30 Sq.In. Long Stroke Brake Chamber and Spring Actuated Parking Brake
	Notes : The following features should be considered when calculating Rear GAWR: Rear Axles; Rear Suspension; Brake System; Brakes, Rear Air Cam; Brake Shoes, Rear; Special Rating, GAWR; Wheels; Tires.
4SBC	AIR COMPRESSOR {Bendix Tu-Flo 550} 13.2 CFM Capacity
5708	STEERING COLUMN Tilting
5CAL	STEERING WHEEL 2-Spoke, 18" Diam., Black
5PSA	STEERING GEAR {Sheppard M-100} Power
7BET	EXHAUST SYSTEM Switchback Horizontal Aftertreatment Device, Frame Mounted Right Side Under Cab; for use with Single Long Horizontal Tail Pipe, Frame Mounted Right Side Back of Cab
7SDM	ENGINE EXHAUST BRAKE for Navistar N9/10 I6 Engines; Electronically Activated
7WCA	TAIL PIPE Horizontal, Exits Right Side Outside of Body
7WZX	SWITCH, FOR EXHAUST 3 Position, Momentary, Lighted Momentary, ON/CANCEL, Center Stable, INHIBIT REGEN, Mounted in IP Inhibits Diesel Particulate Filter Regeneration When Switch is Moved to ON While Engine is Running, Resets When Ignition is Turned OFF
8000	ELECTRICAL SYSTEM 12-Volt, Standard Equipment
	Includes : BATTERY BOX Steel with Plastic Lid : DATA LINK CONNECTOR For Vehicle Programming and Diagnostics In Cab : FUSES, ELECTRICAL SAE Blade-Type : HAZARD SWITCH Push On/Push Off, Located on Top of Steering Column Cover : HEADLIGHT DIMMER SWITCH Integral with Turn Signal Lever : HEADLIGHTS (2) Sealed Beam, Round, with Chrome Plated Bezels : JUMP START STUD Located on Positive Terminal of Outermost Battery : PARKING LIGHT Integral with Front Turn Signal and Rear Tail Light : RUNNING LIGHT (2) Daytime, Included With Headlights : STARTER SWITCH Electric, Key Operated : STOP, TURN, TAIL & B/U LIGHTS Dual, Rear, Combination with Reflector : TURN SIGNAL SWITCH Self-Cancelling for Trucks, Manual Cancelling for Tractors, with Lane Change Feature : TURN SIGNALS, FRONT Includes Reflectors and Auxiliary Side Turn Signals, Solid State Flashers; Flush Mounted : WINDSHIELD WIPER SWITCH 2-Speed with Wash and Intermittent Feature (5 Pre-Set Delays), Integral with Turn Signal Lever : WINDSHIELD WIPERS Single Motor, Electric, Cowl Mounted : WIRING, CHASSIS Color Coded and Continuously Numbered
8718	POWER SOURCE Cigar Type Receptacle without Plug and Cord
8GXB	ALTERNATOR {Leece-Neville AVI160P2003} Brush Type; 12 Volt 240 Amp. Capacity, Pad Mount, With Remote Sense

Code	Description
8HAA	BODY BUILDER WIRING To Rear of Frame, With Stop, Tail, Turn, and Marker Lights Circuits, Ignition Controlled Auxiliary Feed and Ground, Less Trailer Socket
8MKL	BATTERY SYSTEM {International} Maintenance-Free, (3) 12-Volt 1950CCA Total
8RMA	RADIO AM/FM/WB/Clock/Bluetooth/USB Input/3MM Auxiliary Input, MP3, Apple Device Play & Control, Bluetooth for Phone & Music, with Multiple Speakers
8VAY	HORN, ELECTRIC Disc Style
8WBW	JUMP START STUD Remote Mounted Includes : JUMP START STUD Mounted to Battery Box
8WCL	HORN, AIR Black, Single Trumpet, Air Solenoid Operated
8WEE	SWITCH, AIR HORN, PASSENGER Fire Truck Application; Momentary Switch Located in Instrument Panel Close to Passenger, Driver Also To Activate Switch at Steering Wheel
8WPH	CLEARANCE/MARKER LIGHTS (5) {Truck Lite} Amber LED Lights, Flush Mounted on Cab or Sunshade
8WPZ	TEST EXTERIOR LIGHTS Pre-Trip Inspection will Cycle all Exterior Lamps Except Back-up Lights
8WRG	BATTERY BOX Aluminum With Plastic Cover, 30" Wide, 2, 3 or 4 Battery Capacity, Mounted Left Side Back of Fuel Tank
8WSK	SWITCH, BODY CIRCUITS, REAR for Bodybuilder; With 6 Momentary Switches in Instrument Panel; One Power Module, With 6 Channels, 20 Amp Per Channel and 80 Amp Max Output, Switches Control the Power Modules Through Multiplex Wiring, Mounted at Rear on Frame
8WTK	STARTING MOTOR {Delco Remy 38MT Type 300} 12 Volt; less Thermal Over-Crank Protection
8WWJ	INDICATOR, LOW COOLANT LEVEL With Audible Alarm
8XAH	CIRCUIT BREAKERS Manual-Reset (Main Panel) SAE Type III With Trip Indicators, Replaces All Fuses Except For 5-Amp Fuses
8XHD	BATTERY DISCONNECT SWITCH 300 Amp; Locks with Padlock, Cab Mounted, Disconnects Charging Circuits
9585	FENDER EXTENSIONS Rubber
9HAN	INSULATION, UNDER HOOD for Sound Abatement
9HBM	GRILLE Stationary, Chrome
9HBN	INSULATION, SPLASH PANELS for Sound Abatement
9WAC	BUG SCREEN Front End; Mounted Behind Grille
9WBC	FRONT END Tilting, Fiberglass, With Three Piece Construction; for 2007 & 2010 Emissions
9WBT	GRILLE EMBER SCREEN Mounted to Grille and Cowl Tray to Keep Hot Embers out of Engine and HVAC Air Intake System
10060	PAINT SCHEMATIC, PT-1 Single Color, Design 100 Includes : PAINT SCHEMATIC ID LETTERS "GM"
10761	PAINT TYPE Base Coat/Clear Coat, 1-2 Tone
10769	PAINT CLASS Premium Color
11001	CLUTCH Omit Item (Clutch & Control)
12959	BLOCK HEATER, ENGINE {Phillips} 120 Volt/1250 Watt

Code	Description
	Includes : BLOCK HEATER SOCKET Receptacle Type; Mounted below Drivers Door
12NWE	ENGINE, DIESEL {Navistar N9} EPA 10, SCR, 330 HP @ 2000 RPM, 950 lb-ft Torque @ 1200 RPM, 2200 RPM Governed Speed, 330 Peak HP (Max)
	Includes : AIR COMPRESSOR AIR SUPPLY LINE Naturally-Aspirated (Air Brake Chassis Only) : ANTI-FREEZE Red Shell Rotella Extended Life Coolant; -40 Degrees F/ -40 Degrees C; for MaxxForce and Navistar Engines : COLD STARTING EQUIPMENT Intake Manifold Electric Grid Heater with Engine ECM Control : CRUISE CONTROL Electronic; Controls Integral to Steering Wheel : ENGINE OIL DRAIN PLUG Magnetic : ENGINE SHUTDOWN Electric, Key Operated : FUEL FILTER Included with Fuel/Water Separator : FUEL/WATER SEPARATOR Fuel/Water Separator and Fuel Filter in a Single Assembly; With Water-in-Fuel Sensor; Engine Mounted : GOVERNOR Electronic : OIL FILTER, ENGINE Spin-On Type : WET TYPE CYLINDER SLEEVES
12THZ	FAN DRIVE {Horton Drivemaster Polar Extreme} Direct Drive Type, Two Speed, With Residual Torque Device for Disengaged Fan Speed
	Includes : FAN Nylon
12UCW	RADIATOR Aluminum, Cross Flow, Series System; 1228 SqIn Core and 648 SqIn Charge Air Cooler and With Transmission Oil Cooler
12UNR	FEDERAL EMISSIONS EPA, OBD and GHG Certified for Calendar Year 2015; N9 & N10 Engines
12VBC	AIR CLEANER Single Element
	Includes : GAUGE, AIR CLEANER RESTRICTION Air Cleaner Mounted
12VXT	THROTTLE, HAND CONTROL Engine Speed Control; Electronic, Stationary, Variable Speed; Mounted on Steering Wheel
12VZA	ENGINE CONTROL, REMOTE MOUNTED Provision for; Includes Wiring for Body Builder Installation of PTO Controls; With Ignition Switch Control for MaxxForce and Navistar post 2007 Emissions Electronic Engines
12WBR	FAN OVERRIDE Manual; With Electric Switch on Instrument Panel, (Fan On With Switch On)
13ATN	TRANSMISSION, AUTOMATIC {Allison 3500EVS_P} 5th Generation Controls; Wide Ratio, 6-Speed; With Double Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder, With 80,000-lb GVW & GCW Max.
13WBL	TRANSMISSION SHIFT CONTROL {Allison} Push-Button Type; for Allison 3000 & 4000 Series Transmission
13WLP	TRANSMISSION OIL Synthetic; 29 thru 42 Pints
13WUE	ALLISON SPARE INPUT/OUTPUT for Emergency Vehicle Series (EVS); Fire/Pumper, Tank, Aerial/Ladder
13WYU	SHIFT CONTROL PARAMETERS Allison 3000 or 4000 Series Transmissions, 5th Generation Controls, Performance Programming
14AHL	AXLE, REAR, SINGLE {Dana Spicer S26-190D} Single Reduction, 26,000-lb Capacity, R Wheel Ends, Driver Controlled Locking Differential . Gear Ratio: 5.38
	Includes : REAR AXLE DRAIN PLUG (1) Magnetic, For Single Rear Axle
	Notes

Code	Description
	: The following features should be considered when calculating Rear GAWR: Rear Axles; Rear Suspension; Brake System; Brakes, Rear Air Cam; Brake Shoes, Rear; Special Rating, GAWR; Wheels; Tires. : When Specifying Axle Ratio, Check Performance Guidelines and TCAPE for Startability and Performance
14VAJ	SUSPENSION, RR, SPRING, SINGLE Vari-Rate; 31,000-lb Capacity, With 4500 lb Auxiliary Rubber Spring
	Notes : The following features should be considered when calculating Rear GAWR: Rear Axles; Rear Suspension; Brake System; Brakes, Rear Air Cam; Brake Shoes, Rear; Special Rating, GAWR; Wheels; Tires.
15SRE	FUEL TANK Top Draw; D Style, Non Polished Aluminum, 19" Deep, 50 U.S. Gal., 189 L Capacity, with Quick Connect Outlet, Mounted Left Side, Under Cab
15WDG	DEF TANK 7 U.S. Gal. 26.5L Capacity, Frame Mounted Outside Left Rail, Under Cab
16196	CAB Conventional 6-Man Crew Cab
	Includes : ARM REST (2) Molded Plastic; One Each Door : COAT HOOK, CAB Located on Rear Wall, Centered Above Rear Window : CUP HOLDERS Two Cup Holders, Located in Lower Center of Instrument Panel : DOME LIGHT, CAB Rectangular, Door Activated and Push On-Off at Light Lens, Timed Theater Dimming, Integral to Console, Center Mounted : GLASS, ALL WINDOWS Tinted : GRAB HANDLE, CAB INTERIOR (1) "A" Pillar Mounted, Passenger Side : GRAB HANDLE, CAB INTERIOR (2) Front of "B" Pillar Mounted, One Each Side : GRAB HANDLE, CAB INTERIOR (4) Two Each Side, Rear Door Mounted at Hinge Side and "C" Pillar Mounted : INTERIOR SHEET METAL Upper Door (Above Window Ledge) Painted Exterior Color : STEP (8) Two Steps Per Door
	Notes : 43.9" CA Loss
16HBB	GAUGE CLUSTER English With Metric Electronic Speedometer
	Includes : GAUGE CLUSTER (6) Engine Oil Pressure (Electronic), Water Temperature (Electronic), Fuel (Electronic), Tachometer (Electronic), Voltmeter, Washer Fluid Level : ODOMETER DISPLAY, Miles, Trip Miles, Engine Hours, Trip Hours, Fault Code Readout : WARNING SYSTEM Low Fuel, Low Oil Pressure, High Engine Coolant Temp, and Low Battery Voltage (Visual and Audible)
	Notes : Standard in Canada
16HCL	SEATBELT WARNING PREWIRE Includes Seat Belt Switches and Seat Sensors for all Belted Positions in the Cab and a Harness Routed to the Center of the Dash for the Aftermarket Installation of the Data Recorder and Seatbelt Indicator Systems, for 4 to 6 Seat Belts
16HGH	GAUGE, OIL TEMP, ALLISON TRAN
16HHE	GAUGE, AIR CLEANER RESTRICTION {Filter-Minder} With Black Bezel Mounted in Instrument Panel
16HKT	IP CLUSTER DISPLAY On Board Diagnostics Display of Fault Codes in Gauge Cluster
16HLJ	GAUGE, DEF FLUID LEVEL
16JAJ	SEAT, PASSENGER {H.O. Bostrom Tanker 450} for SCBA with SecureAll Locking System, Non-Suspension, High Back, Vinyl, Adjusters, 7-Degree Back Angle, With Covered Back, International Logo on Headrest
16JJG	SEAT, DRIVER {H.O. Bostrom Sierra Air 100} NFPA Compliant, Air Suspension, High Back, Vinyl with Covered Back and International on Headrest for Fire Truck

Code	Description
	Includes : SEAT BELT 3-Point, Lap and Shoulder Belt Type
16RDZ	SEAT, REAR {H.O. Bostrom Tanker 400CT} for SCBA with SecureAll Locking System, Three Individual Seats on One Riser, Non Suspension, High Back, Vinyl, With Covered Back and International on Head Rest
16SDC	GRAB HANDLE (2) Chrome Towel Bar Type With Anti-Slip Rubber Inserts; for Cab Entry, Mounted Left and Right, Each Side at "B" Pillar
16SDD	GRAB HANDLE, ADDITIONAL EXT (2) Chrome; Towel Bar Type With Anti-Slip Rubber Inserts; Mounted Left and Right Side on Exterior, Rear of Rear Doors, With Crew Cab
16SDU	MIRRORS (2) {Lang Mekra} Styled; Rectangular, 7.09" x 15.75" & Integral Convex Both Sides, 102" Inside Spacing, Breakaway Type, Thermostatically Controlled Heated Heads, Power Both Sides, Clearance Lights LED, Bright Finish Heads & Brackets
16VCA	SEAT BELT All Red; 4 to 6
16WCT	AIR CONDITIONER {Blend-Air} With Integral Heater & Defroster
	Includes : HEATER HOSES Premium : HOSE CLAMPS, HEATER HOSE Mubea Constant Tension Clamps : REFRIGERANT Hydrofluorocarbon HFC-134A
16WJS	INSTRUMENT PANEL Center Section, Flat Panel
16WKY	HVAC FRESH AIR FILTER
16WLE	STORAGE POCKET, DOOR Molded Plastic, Full Width; Mounted on Passenger Door
16WSG	CAB INTERIOR TRIM Deluxe; for Crew Cab
	Includes : "A" PILLAR COVER Molded Plastic : CAB INTERIOR TRIM PANELS Cloth Covered Molded Plastic, Full Height; All Exposed Interior Sheet Metal is Covered Except for the Following: with a Two-Man Passenger Seat or with a Full Bench Seat the Back Panel is Completely Void of Covering : CONSOLE, OVERHEAD Molded Plastic; With Dual Storage Pockets with Retainer Nets and CB Radio Pocket : DOOR TRIM PANELS Molded Plastic; Driver and Passenger Doors : FLOOR COVERING Rubber, Black : HEADLINER Soft Padded Cloth : INSTRUMENT PANEL TRIM Molded Plastic with Black Center Section : STORAGE POCKET, DOOR (1) Molded Plastic, Full-Length; Driver Door : SUN VISOR (2) Padded Vinyl with Driver Side Toll Ticket Strap, Integral to Console
16WSK	CAB REAR SUSPENSION Air Bag Type
16XWD	SUNSHADE, EXTERIOR Aerodynamic, Painted Roof Color; Includes Integral Clearance/Marker Lights
27DHH	WHEELS, FRONT DISC; 22.5" Polished Aluminum, 10-Stud (285.75MM BC) Hub Piloted, Flanged Nut, Metric Mount, 9.00 DC Rims; With Steel Hubs
	Notes : Aluminum Wheels not Painted or Coated : Compatible Tire Sizes: 12R22.5, 295/75R22.5, 295/80R22.5, 315/80R22.5
28DRA	WHEELS, REAR DUAL DISC; 22.5" Polished Aluminum Outer Wheel, With Steel Inner Wheel; 10-Stud (285.75MM BC) Hub Piloted, Flanged Nut, Metric Mount, 8.25 DC Rims, With Steel Hubs
	Notes : Aluminum Wheels not Painted or Coated : Compatible Tire Sizes: 11R22.5, 12R22.5, 255/70R22.5, 255/80R22.5, 265/75R22.5, 275/70R22.5, 275/80R22.5, 295/75R22.5, 295/80R22,5

Code	Description
60AAD	BDY INTG, REMOTE POWER MODULE (2) {SPECIAL} Mounted Under Cab or On Battery Box; Max. 20 amp. per Channel, Max. 80 amp. Total per Power Module; Includes 1 Module With Switch Pack Containing 6 Latched Switches and 1 Module With Hardware Only
60AAM	BDY INTG, POWER MODULE AUX (1) Mounted on the Driver's Side Frame Rail at Rear of Frame; Up to 6 Outputs & 6 Inputs, Max. 20 Amp. per Channel, Max. 80 Amp. Total
60AJS	BDY INTG, DASH IND. LT RED (2) for Optional Usage Customer to Program
60AJW	BDY INTG, DASH IND. LT GREEN (2) for Optional Usage Customer to Program
60AKK	BDY INTG, HEADLIGHTS, WIG WAG High Beam Wig Wag With Park Brake Interlock, Park Brake Disables Wig Wag
7382158102	(4) TIRE, REAR 12R22.5 G622 RSD (GOODYEAR) 482 rev/mile, load range H, 16 ply
7702540190	(2) TIRE, FRONT 315/80R22.5 UNISTEEL G291 (GOODYEAR) 491 rev/mile, load range J, 18 ply
OBD001	AXLE, PUSHER, LIFT TYPE, ID omit
	Services Section:
40107	WARRANTY Standard for WorkStar 7300/7400 (4x2, 4x4, 6x4, 6x6), Effective with Vehicles Built January 2, 2014 or Later, CTS-2002

Chassis
The chassis shall be supplied with the above specifications.

Running Boards
There shall be (2) custom embossed aluminum running boards installed on the chassis, (1) unit below both driver & officer cab doors. The factory installed running boards shall be removed and replaced with custom fabricated units manufactured with NFPA compliant, skid resistant, embossed aluminum checkerplate. This will hide the painted steel running board brackets, air tanks and provide an enhanced appearance.

Cab Console
There shall be an aluminum console installed in the cab between the driver and passenger seat. The console shall feature a hinge-up top lid to allow for easy access to interior electrical. A mobile radio, siren control, traffic advisor control & vehicle data recorder control are all components that can be neatly flush-mounted into the hinge-up lid. On the interior of the lid, a 12 volt power supply buss bar shall be installed to allow for hook-up of these item, plus future installations.
The console shall be finished with a speckle coat scratch resistant paint finish.

Battery Charger
There shall be a 15 Amp Kussmaul Battery Charger installed beside the driver seat fastened to the floor. An auto-eject shore line receptacle shall be installed at the driver-side running board area. The shore line shall be wired to a duplex receptacle beside the battery charger. The charger shall be plugged into this receptacle.
A LED bar graph battery charge indicator shall be installed at the driver seat base.

Air Pump 12 Volt
There shall be a 12 volt air pump installed in the chassis cab, behind the console. This pump shall maintain chassis air brake system pressure when plugged-in at the shore line. The pump shall start at 60 psi and stop at 90psi.

Indicator Lamp
There shall be a Green LED Master-Battery-On lamp installed at the skirt below the driver cab door. The lamp shall illuminate when the mastery battery switch is on.

Vehicle Data Recorder
In accordance with the new NFPA "2009" Apparatus Standard, a Vehicle Data Recorder (VDR) shall be installed. The VDR shall monitor vehicle speed, acceleration, deceleration, engine speed, engine throttle position, anti-lock braking system event, seat occupied status, seat belt status, master optical warning device switch position, 24hr time clock & date.
The data shall be stored at the sampling rate in a 48-hour loop. Memory shall be sufficient to record 100 engine hours' worth of minute-by-minute summary showing the above-mentioned data.
When the memory capacity is reached the system shall erase the oldest data first.
All data stored on the VDR shall be uploadable by the user to a computer and importable into a data management software package.
Software shall be delivered with the apparatus that will run on both Windows and Apple operating systems and produce the following formatted reports from the uploaded data:
1. Raw second-by-second data over a specified date/time range
2. Daily log for the time the engine is running for a given date (minute-by-minute output of all values)
3. Weekly summary (maximum values each hour for each day of the week)
4. Monthly summary (maximum values each day for each day of the month)

Tire Pressure Monitor
There shall be a Real Wheels Tire Pressure Monitor Kit installed on the apparatus. The kit shall include six (6) valve stem pressure sensors, one (1) for each tire. Upon installation, the sensor records the tire pressure and if the pressure drops by 8psi, a Red LED lamp will flash on the sensor to alert and indicate a low tire pressure.

Axle Trim Front
There shall be chromed ABS axle trim installed on the front axle. The trim shall be single-piece and cover the axle and wheel lugs to provide a pleasing appearance.

Axle Trim Rear
There shall be Chromed ABS Axle Trim installed on the back axle. The trim shall be single-piece and cover the axle and wheel lugs to provide a pleasing appearance.

Antennas & Mobile Radio(s)
There shall be two (2) mobile radio antenna cables installed on the chassis cab roof. The cables shal be routed to the cab console for hook-up to the mobile radios.

Mobile Radio to be supplied by the Fire Department Acres to Install Radio

~~**Backup Camera**~~
~~There shall be a "Rear View Safety" Backup Camera installed on the dash of the cab. The system shall be supplied with the following features:~~
~~1 - Color CCD Weather Proof Heated Camera with 28 Infra-red Illuminators~~
~~1 - 7" TFT LCD Color Monitor with Universal Mount/Stand and Wire~~
~~1 - 3 Channel Multiplexer Control Unit~~
~~1 - 66' Cable for Camera~~
~~1 - Remote Control~~
~~1 - Power Connection Wire~~
~~1 - Double RCA + Power Converter (to connect external audio, video and power)~~
~~1 - Screw Kit for installation~~

NOT INSTALLED

Top-Control Pumphouse
There shall be a top-control pumphouse installed immediately behind the chassis cab. A 24" transverse walk-way shall be included, fabricated from embossed aluminum checkerplate for enhanced traction. At the pumphouse side of the walk-way, a pump access panel shall be included with quick-release fasteners to allow improved access for pump service.
The structure shall be fabricated from 1/4" wall aluminum extruded profiles, the alloy being 6061-T6. All welding shall be performed by CWB certified aluminum welders.

Two (2) cross-lay hose beds shall be fabricated on top of the pumphouse. The floor of the hose beds shall be slotted to allow for water drainage and air recirculation.
An aluminum checkerplate cover shall be attached, hinged at the back with stainless steel piano hinge. Black vinyl tarps shall be attached to the crosslay cover on both sides. A bungee cord sewn into the bottom shall restrain the tarp.
Three (1) stainless steel rollers (two (2) vertical on each side and one (1) horizontal) shall be installed to guide the hose to and from the crosslays.

Aluminum checkerplate shall be fastened to the back of the chassis cab to protect the cab paint from abrations.

Stainless steel panels shall be attached to both sides of the pumphouse. The lower intake/discharge panels shall be bolted in place. Stainless trim rings with a rubber backing shall be installed at each of the adapters to seal of for heat retention. The upper panels shall be hinged on both sides to allow fast and easy access for pump service. All side panels shall be type 304 polished stainless steel. The under-side of the pumphouse (vertically front & rear) shall be completely closed off with aluminum panels as effectively as possible. Dual pans shall be installed meeting on center and shall be easily removable with the simple pull-and-turn of a spring loaded catch.

There shall be an LED light strip installed above the pump panels, one (1) on each side of the pumphose. A stainless steel protective cover shall be installed above the light strip. The light switch shall be installed at the pump operators panel.

Safety Bars
There shall be Fire-Research "Man-Saver" 20" Safety Bars installed on each side of the pump-house walk-way, attached to the pump-house at approximately waist level. These bars shall hinge-up and/or inward, but not down or outward, providing protection for the pump operator from inadvertently stepping off the walk-way. The bars shall be upholstered with "Yellow Hi-Vis" vinly.

Heaters Pumphouse
There shall be two (2) Red Dot 35'000btu heaters installed in the pumphouse, one (1) on each side at frame level. Coolant shall be routed through 5/8" thermal hose from the engine for the source of heat. Quarter-turn brass ball valves shall be installed at the engine. This allows the user to close the circuits if required. The activation switch shall be at the cab dash within convenient reach of the operator. The switch shall be color-coded Yellow (International) for easy recognition.

Heat Exchanger Engine
There shall be a stainless steel stacked plate heat exchanger installed in the pumphouse compartment to assist in cooling the engine in hot climates. This heat exchanger shall be spliced into the pumphouse heater coolant supply/return lines. A 3-way valve shall be installed at the heat exchanger.
With the 3-way valve in the summer position, the hot coolant shall bypass the pumphouse heaters and flow through the heat exchanger and back to engine. Placing the 3-way valve in the winter position, bypasses the heat exchanger and allows hot coolant to flow through the pumphouse heaters and back to engine.
A quarter-turn brass valve shall be installed at the pump operators panel. Water from the fire pump discharge manifold shall be piped to this valve and on to the heat exchanger. A water strainer shall be installed to strain the cooling water before it enters the heat exchanger. A flush line shall be piped from the dirty side of the strainer to the pumphouse side panel with a 3/4" lift handle style brass ball valve. The pump operator can periodoically open this valve to flush the strainer. The cooling water valve shall be labeled Engine Cooler, and the flush valve Cooling Water Flush.

Engine Cooler
There shall be an engine cooler water supply circuit installed. A 1/4-turn valve shall be installed at the pump operators panel. Water supply shall be taken from the pump discharge manifold, plumbed through this valve and routed to the inlet of the engine heat exchanger. An inlet strainer shall strain the water before it enters the heat exchanger. This cooling water shall then be routed back to the booster tank.

Pump Cooler
There shall be a pump cooler circuit installed. A 1/4-turn valve shall be installed at the pump operators panel. Opening this valve allows water to flow from the discharge side of the pump manifold to the booster tank.

Waterous Fire Pump
There shall be a Waterous Model CSPA (1250 US GPM) Single Stage PTO Fire Pump installed.

Pump
The pump shall be of single stage construction and shall comply with all applicable requirements of the latest standards for automotive fire apparatus of the National Fire Protection Association, NFPA 1901-2009, and shall have a rated capacity of 1250 US-GPM (1050 Imp Gal). The Pump shall be free from objectionable pulsation and vibration under all normal operating conditions.

Pump Body
The pump body shall be close-grained, gray iron and must be horizontally split in two sections for easy removal of the entire impeller shaft assembly, and designed for complete servicing from the bottom of the truck without disturbing setting of the pump in the chassis or apparatus piping which is connected to the pump. Pump body halves shall be bolted together on a single horizontal face to minimize leakage and facilitate reassembly.

Discharge Manifold
The discharge manifold shall be cast as an integral part of the pump body assembly and shall provide at least three full 3-1/2 inch openings for ultimate flexibility in providing various discharge outlets for maximum efficiency, and shall be located as follows:
• One outlet on the right side of the pump body
• One outlet on the left side of the pump body
• One outlet directly on top of the pump discharge manifold

Impeller
The impeller shall be bronze with double suction inlets, accurately balanced (mechanically and hydraulically), labyrinth type, wear rings that resist water bypass and loss of efficiency due to wear.

Wear Rings
The wear rings shall be bronze, and shall be easily replaceable to restore original pump efficiency and eliminate the need for replacing the entire pump casing due to wear.

Impeller Shaft
The impeller shaft shall be stainless steel, accurately ground to size. The impeller shaft shall be of two-piece construction separable between the pump and pump transmission to allow true separation of the transmission from the pump without disassembly of either component.

Anti-Friction Bearings
The impeller shaft shall be supported at each end by oil or grease lubricated anti-friction ball bearings for rigid and precise support. Bearings shall be protected from water and sediment by suitable seal housings, flinger rings, and oil seals. No sleeve type bearings shall be used.

Pump Transmission
The pump transmission shall be rigidly attached to the pump body assembly and be of latest design incorporating a high strength, involute tooth form Morse™ HV chain drive capable of operating at high speeds to provide smooth, quiet transfer of power.

Chelsae PTO
There shall be a Chelsae "Hot-Shift" Power-Take-Off installed on the left-side of the chassis transmission. This PTO shall power the fire pump and can be used for both stationary and pump-and-roll applications. The PTO shall be pressure lubricated with synthetic oil from the chassis allison automatic transmission.

Coupler Shaft
There shall be a 1410 Series Drive-Shaft Coupler-Shaft installed. One end shall be connected to the Chelsae PTO with a companion flange. The other end shall include a yoke and hanger bearing with a mounting bracket attached to the chassis frame rail. The hanger bearing shall include a rubber bushing to absorb drive line vibrastions.

Coupler Shaft
There shall be an intermediate 1410 Series Drive-Shaft Coupler-Shaft installed. One end shall be connected to the first coupler shaft. The other end shall include a yoke and hanger bearing with a mounting bracket attached to the chassis frame rail.

Slip Shaft
There shall be a 1410 Series Drive-Shaft Slip-Shaft installed. One end shall be connected to the coupler-shaft. The other end shall include a slip-yoke, attached to the fire pump. The drive-shaft assembly shall be machine balanced prior to installation.

Fire Pump Frame
The fire pump frame shall be manufactured from 3/8" mild steel plate. Angles shall be bolted to both chassis frame rails with grade 8 bolts. These angles shall have flanges formed for the pump frame channels to bolt onto. Four (4) Rubber Vibration Isolation Mounts shall be installed between the pump frame and chassis frames to assist in reducing drivline & pump vibration. All frame components shall be painted with a rust prevention coating.

Pump Seal
The seal housings shall be equipped with two-piece glands to permit adjustment or replacement of packing without disturbing pump. Lantern rings shall be located at inner ends of seal housings so that all rings of packing can be removed without removal of the lantern rings. Water shall be fed into seal housing lantern rings for proper lubrication and cooling when the pump is operating.

Pump Overheat Protection
There shall be a pump overheat protection system installed. The system shall include a thermal valve at the pump discharge manifold that opens automatically when the water temperature reaches 140 degrees F and dumps to atmosphere. An LED lamp shall be installed at the pump operators panel that flashes once the water temperature reaches 180 degrees F. A push-button switch shall be included to test the lamp function.

Fire Pump Engage Switch Cab
There shall be a momentary rocker switch installed at the chassis dash to engage the fire pump. This switch shall be 2-position, press top for pump-on and lower for pump-off.

Fire Pump Engage Switch Pump-House
There shall be an additional pump engage switch installed at the pump operators control panel. This switch shall be momentary like the cab switch. The Cab switch shall be blue in color.

Both circuits shall be driven by International's Diamond Logic Electrical System. The cab circuit shall require the engine to be at idle for the fire pump to engage. The pump control panel circuit shall require the engine to be at idle, the transmission to be in neutral & the park brake engaged for the fire pump to engage. Both circuits shall be programmed to dis-engage the fire pump at a road travelling speed, to prevent running the fire pump in-advertantly at road speeds.

Pump Primer
There shall be a 12volt electric pump primer installed, attached to the pump module, inside the pump-house. The primer shall be an environment friendly oil-less version and not require lubrication oil.

Priming Valve
There shall be a vacuum-activated priming valve installed at the pump intake manifold. An electric push-button primer switch shall be installed at the pump-operators position. The priming valve shall automatically open once the priming pump generates a vacuum & the close when the priming operation stops.

Primer Selector Valve
There shall be primer selector valve installed at the pump-operators panel. This valve shall allow the pump operator to select either the main pump, the driver-side intake or the officer-side intake. Being able to select the driver or officer-side intake allows for priming up to a gated intake. Once primed, the operator can open that gated intake and close the tank supply for an un-interrupted water supply source change. A Label shall be included to indicate the desired priming port.

6" Intake Bleeders
There shall be an intake bleeder valve installed for each 6" gated intake to bleed air from the intakes when receiving water supply from a positive pressure supply source.

Foam Proportioner
There shall be an Waterous "Aquis 2.5" Foam Proportioner Installed.

Operator Interface Terminal
The Operator Interface Terminal (OIT), mounted on the pump operator's panel allows the operator to perform the following functions:
Provide rotary dial control of foam proportioning rates from 0.1% to 1%, in infinite increments
Calibrate flow rate
Flashes and then displays a steady "low concentrate" warning when the foam concentrate tank runs low - system shuts off after two minutes
Flash a "no concentrate" warning when the foam concentrate tank is empty
Flash an "error" warning with associated code in the event of an electronic malfunction
Provide a manual back-up mode, controlled by the operator

Flowmeter
A paddlewheel-type flowmeter, installed in the process manifold upstream of the foam injection point, connects to the microcontroller. A flowmeter tee, constructed of stainless steel or brass with Victaulic groove outer connections and threaded NPT inner connections at each end of the tee, is provided for connection to the apparatus plumbing. The Flowmeter Tees shall be 2.5" ID (750 GPM / 2800 L/min).

Foam Pump
The 12 volt, electric motor driven, positive displacement triplex plunger foam pump is equipped with an aluminum crankcase, ball bearings, forged brass pump body and manifold, solid ceramic plungers, stainless steel check valves and piston guides, Buna packing and preset thermal and pressure relief valves. The foam pump is rated at 2.5 GPM @ 150 psi (9.46 l/min @ 10 bar) with operating pressures up to 450 psi (32 bar). Maximum electrical load of 40 amps @ 12 VDC. A pump motor electronic driver, located inside the controller housing, receives signals from the microcontroller and powers the 1/2 hp (.4 kW) electric motor in a variable speed duty cycle to ensure that the correct amount of foam concentrate set by the pump operator is injected into the water stream.

Control Cables and Connectors
The cables for interconnection of the control unit, OIT, temperature sensor and flowmeter are electrically shielded to prevent radio frequency or electromechanical interference.

Low Tank Level Switch
A low tank level float switch, installed in the foam concentrate tank and connected to the control unit, alerts the operator to low foam supply conditions.

Foam Inject Check Valve
A brass and stainless steel check valve provided in the foam concentrate line at the foam injection point prevents water backflow into the foam supply reservoirs.

Foam System Support
The AQUIS™ is equipped wit PC-Connectivity which allows a qualified technician to perform upgrades, diagnostics and monitor system functions in real-time. The system can also be remotely monitored using any PC with Internet access, allowing technicians to easily connect to the Waterous dedicated website to assure proper operation and to update the foam system software by uploading new features and functions as they become available.

6" Intake Left Electric
There shall be a 6" M NH intake installed on the left-side of the fire pump. The intake shall include an electric butterfly valve, installed inside the pumphouse. This keeps the valve in a warm winter-time environment and removes the traditional bulk of a piston-intake-valve from the out-side. The valve controller is installed at the pump operator control panel.
A 3/4" lift-style drain valve shall be included. The intake and drain valve shall be labelled to indicate their function. The label shall be color-coded burgundy.

6" Intake Right Electric
There shall be a 6" M NH intake installed on the right-side of the fire pump. The intake shall include an electric butterfly valve, installed inside the pumphouse. This keeps the valve in a warm winter-time environment and removes the traditional bulk of a piston-intake-valve from the out-side. The valve controller is installed at the pump operator control panel.
A 3/4" lift-style drain valve shall be included. The intake and drain valve shall be labelled to indicate their function. The label shall be color-coded burgundy.

Intake Relief Valves
There shall be two (2) 2.5" TFT intake relief valves installed, one on the out-side of the left 6" intake and one on out-side of the right 6" intake. The relief valves shall be adjustable to set the desired setpoint.

Intake Aux Left-Rear 2.5"
There shall be a 2.5" auxiliary intake installed at the left-side pump panel behind of the 6" intake. An Elkhart Brass ball valve with stainless steel ball and remote valve actuator shall be included. The valve actuator shall be a positive locking t-handled lever at the pump operator panel. A high-quality push-pull cable shall be installed between the valve lever and the valve.

The intake shall include a 2.5" female swivel adapter and chromed plug, chained to the pump panel. A strainer shall be included.

A 3/4" lift-handle drain valve shall be installed on the intake. The intake and drain valve shall be labeled with a color-coded burgundy label. The threads shall be WCT.

Intake Aux Right-Rear 2.5"
There shall be a 2.5" auxiliary intake installed at the right-side pump panel behind of the 6" intake. An Elkhart Brass ball valve with stainless steel ball and remote valve actuator shall be included. The valve actuator shall be a positive locking t-handled lever at the pump operator panel. A high-quality push-pull cable shall be installed between the valve lever and the valve.

The intake shall include a 2.5" female swivel adapter and chromed plug, chained to the pump panel. A strainer shall be included.

A 3/4" lift-handle drain valve shall be installed on the intake. The intake and drain valve shall be labeled with a color-coded burgundy label. The threads shall be WCT.

Intake Tank-To-Pump
There shall be a 3.5" suction line installed between the poly tank and the fire pump. This line shall be plumbed into the front of the poly tank with a 90 degree elbow extending into the tank sump on the inside of the tank. This eliminates the need to have any outside of body plumbing preventing freezing in cold climates.

There shall be a check valve installed in the tank to pump line to prevent water from back flowing to the tank.

An Elkhart Brass ball valve with stainless steel ball and remote valve actuator shall be included. The valve actuator shall be a positive locking t-handled lever at the pump operator panel. A high-quality push-pull cable shall be installed between the valve lever and the valve. The tank to pump line shall flow the water capacity per current NFPA standards.

Discharge 2.5" Left Front
There shall be a 2.5" Discharge located on the left-side of the pump-house towards the front. An Elkhart Brass 2.5" ball valve with stainless steel ball and remote valve actuator shall be included. The valve actuator shall be a positive locking t-handled lever at the pump operator panel. A high-quality push-pull cable shall be installed between the valve lever and the valve. The discharge shall include a 30 degree droop and chromed cap, chained to the pump panel.
There shall be a 2.5" stainless steel dual-scale Psi/Kpa discharge pressure gauge installed for this discharge. A 3/4" - lift style bleeder/drain valve shall be installed for the discharge at the base of the pump panel. The discharge and drain valve shall be labeled with a yellow color-coded label. The threads shall be WCT.

Discharge 2.5" Left Rear
There shall be a 2.5" Discharge located on the left-side of the pump-house towards the rear. An Elkhart Brass 2.5" ball valve with stainless steel ball and remote valve actuator shall be included. The valve actuator shall be a positive locking t-handled lever at the pump operator panel. A high-quality push-pull cable shall be installed between the valve lever and the valve. The discharge shall include a 30 degree droop and chromed cap, chained to the pump panel.
There shall be a 2.5" stainless steel dual-scale Psi/Kpa discharge pressure gauge installed for this discharge. A 3/4" - lift style bleeder/drain valve shall be installed for the discharge at the base of the pump panel. The discharge and drain valve shall be labeled with a white color-coded label. The threads shall be WCT.

Discharge 2.5" Right Front
There shall be a 2.5" Discharge located on the right-side of the pump-house towards the front. An Elkhart Brass 2.5" ball valve with stainless steel ball and remote valve actuator shall be included. The valve actuator shall be a positive locking t-handled lever at the pump operator panel. A high-quality push-pull cable shall be installed between the valve lever and the valve. The discharge shall include a 30 degree droop and chromed cap, chained to the pump panel.
There shall be a 2.5" stainless steel dual-scale Psi/Kpa discharge pressure gauge installed for this discharge. A 3/4" - lift style bleeder/drain valve shall be installed for the discharge at the base of the pump panel. The discharge and drain valve shall be labeled with a Blue color-coded label. The threads shall be WCT.

Discharge 4.0" Right Rear
There shall be a 4" Discharge located on the right-side of the pump-house towards the rear. An Elkhart Brass 3.0" valve & slo-close valve actuator shalll be included with a 30-degree droop, 4" stortz fitting & cap. The cap shall be chained to the pump panel. The valve actuator shall be a positive locking t-handled lever at the pump operator panel. A high-quality push-pull cable shall be installed between the valve lever and the valve.
There shall be a 2.5" stainless steel dual-scale Psi/Kpa discharge pressure gauge installed for this discharge. A 3/4" - lift style bleeder/drain valve shall be installed for the discharge at the base of the pump panel. The intake and drain valve shall be labeled with a Black color-coded label. The threads shall be stortz.

Discharge Deluge 3"
There shall be a 3" discharge line installed, plumbed to the top of the pumphouse with stainless steel piping for a monitor installation. An Elkhart Brass ball valve with stainless steel ball and remote slo-close valve actuator shall be included. The valve actuator shall be a positive locking t-handled lever at the pump operator panel. A high-quality push-pull cable shall be installed between the valve lever and the valve. There shall be a 2.5" stainless steel dual-scale Psi/Kpa discharge pressure gauge installed for this discharge. The discharge shall be labeled with silver color-coded labels.

PORTABLE MONITOR TOP AND EXTEND-A-GUN PACKAGE

A Task Force Tips Crossfire model # XFC-73 portable lightweight monitor package consisting of monitor top, Master Stream 1000 and 1250S series nozzle, Extend-A-Gun and installation bracket set shall be supplied.

Task Force Tips Crossfire, model portable monitor top shall be provided. This top only portion with quick release swivel joint shall be designed for use on truck mounted risers and TFT Safe-Tak 1250 series portable bases. The monitor shall include safety devices that include a locking button which locks the quick release lever when monitor is pressurized, and a 1/4 turn rotational lever lock that secures the horizontal rotation and provides a visual indication that the monitor rotation is locked. For corrosion resistance the monitor shall be constructed from hardcoat anodized aluminum with a red powder coat interior and exterior finish.

The monitor shall have a 3-1/4" waterway for delivery of up to 1250 GPM with low friction loss. Vertical elevation shall be controlled through use of a handwheel controlled stainless steel worm gear which allows full travel to the safety stop point of 35 degrees above horizontal with seven rotations of the wheel. When positioned on a truck mounted riser the monitor shall be able to be used below the 35 degree stop point through release of the spring loaded safety pin.

An automatic drain to remove remaining water and avoid freezing shall be included. Integral stainless steel stream straightener and pressure gauge shall be included.

Task Force Tips Master Stream series nozzle shall be provided. The nozzle shall be designed for use on monitors, ladder pipes, deluge guns and aerial platforms. For corrosion resistance the nozzle shall be constructed for lightweight hardcoat anodized aluminum.

The nozzle shall have a UV resistant rubber bumper with integral teeth designed to produce a finger free fog pattern shall be included. A halo ring shall be included to assist with stream shape control. The nozzle shall be suitable for foam solution application and designed to accept the Task Force Tips FJ-LX-M low expansion air aspirating attachment. The nozzle shall be configured with a female swivel rocker lug coupling.

Task Force Tips manually telescoping waterway shall be installed. The waterway shall be capable of being lowered to deck level (or into a monitor well) for storage and transportation and shall be capable of being raised to an extended height by lifting a quick release latch located at the base of the extension tube. This latching device shall be capable of locking the waterway in either the raised or lowered position while maintaining the ability to horizontally rotate the monitor device 360 degrees.

A sensor shall be located on the waterway that signals a 12 volt indicator light installed in the cab to illuminate to indicate that the monitor is raised.

The aluminum riser shall have a 3" waterway; hardcoat anodized finish and be furnished with a 3" inlet and a Task Force Tips Crossfire coupling outlet.

A Task Force Tips bracket set shall be installed. The set shall be designed to securely mount the Extend-A-Gun telescoping waterway. The components shall be covered by a five-year warranty.

Foam Manifold (A)
There shall be a 2.5" stainless steel foam manifold (A) installed. An Elkhart Brass check valve shall be included to prevent foam solution to back flow to the clean water manifold. A 3/8" brass drain valve shall be installed at the lower pump panel to drain the foam manifold. The drain valve shall be labeled Foam Manifold Drain.

Foam Manifold (B)
There shall be a secondary foam manifold installed. This manifold shall be constructed of stainles steel and include three (3) 2" valve flanges. Three (3) 2" foam capable discharges shall be plumbed/routed from this manifold.

Crosslay #1 Foam
There shall be a crosslay hose bed installed on top of the pumphouse, as crosslay #1. An Elkhart Brass 2.0" ball valve with stainless steel ball and remote valve actuator shall be included. The valve actuator shall be a positive locking t-handled lever at the pump operator panel. A high-quality push-pull cable shall be installed between the valve lever and the valve.

The discharge shall be plumbed with high-pressure flexible hose with crimped stainless steel fittings. A brass 1.5" male NPSH swivel elbow shall be included, installed in the hose-bed bottom.

There shall be a 2.5" stainless steel dual-scale Psi/Kpa discharge pressure gauge installed for this discharge. A 3/4" - lift-style bleeder/drain valve shall be installed for the discharge at the base of the pump panel. The valve lever and drain valve shall be labeled with a color-coded label. *This discharge shall be foam capable.*

Crosslay #2 Foam
There shall be a crosslay hose bed installed on top of the pumphouse, as crosslay #2. An Elkhart Brass 2.0" ball valve with stainless steel ball and remote valve actuator shall be included. The valve actuator shall be a positive locking t-handled lever at the pump operator panel. A high-quality push-pull cable shall be installed between the valve lever and the valve.

The discharge shall be plumbed with high-pressure flexible hose with crimped stainless steel fittings. A brass 1.5" male NPSH swivel elbow shall be included, installed in the hose-bed bottom.

There shall be a 2.5" stainless steel dual-scale Psi/Kpa discharge pressure gauge installed for this discharge. A 3/4" - lift-style bleeder/drain valve shall be installed for the discharge at the base of the pump panel. The valve lever and drain valve shall be labeled with a color-coded label. *This discharge shall be foam capable.*

Electrical System Diamond Logic

International has developed a method to control electrical loads on the vehicle without running individual wires from each switch to the load. An electronic device called a Remote Power Module (RPM) accomplishes this. This module is used to control power to various devices on the vehicle from switches inside the cab. The RPM is connected to the Electrical System Controller via the Body Builder J1939 data link. The only wires connected to the RPM are battery power (for driving the loads), data link cable (which includes power and ground to operate the module), and a wire for each device operated by the RPM. Each module receives power from a 4-gauge cable, protected by a fusible link, connected to the battery stud of the starter motor or the battery depending on the location of the RPM.

Each generic RPM has the ability to operate up to 6 devices of 20 AMPS or less, but not exceed 80 AMPS for the entire module. Each RPM comes with a 6-pack of switches that is inserted into the center section of the instrument panel. The switch panel is connected to the switch data bus that communicates switch operation to the Electrical System Controller, which communicates that operation to the RPM. The lamp indicator on the instrument panel switch will always display the current status of the output channel as long as the ignition key is in the ACCESSORY or IGNITION position. Each RPM in-cab switch operates with the key in the ACCESSORY or IGNITION position.

This method of wiring shall be utilized on this chassis and is referred to as (mulit-plex wiring). The method substantially reduces wiring harness requirements while enhancing electrical trouble shooting.

Power Distribution Panel

All body electrical equipment installed by the apparatus manufacturer shall conform to current automotive electrical system standard, the latest Federal DOT standards, and the requirements of the applicable NFPA Apparatus Standard. Twisted pair shielded wire shall be provided within the electrical system for noise reduction.

The wiring harness shall conform to SAE J-1128 with SXL temperature properties. All exposed wiring shall be run in loom with a minimum 200 degree Fahrenheit rating. All wiring looms shall be properly supported and attached to body members along the entire run. All wiring shall be mounted so as to provide protection from water and heat. All connections shall be crimp type with heat shrink tubing with insulated shanks to resist moisture and foreign debris such as grease and road grime. Weather-resistant connectors shall be provided throughout to ensure the integrity of the electrical system. All wiring looms shall be properly supported and attached along the entire run. At any point where wire or looms must pass through metal, rubber grommets shall be installed to protect the wire from abrasion.

All wiring shall be individually coded every 2" on the insulation to allow for easy identification. The numbering shall be continuous, along the entire length of the harness.

The main low voltage chassis to body interface point and distribution panel shall be provided at the rear of the body in a location providing easy service access. The distribution panel shall be labeled and shall contain the body electrical power distribution equipment. The distribution panel shall be located so as not to reduce useable compartment space. An electrical harness quick-disconnect shall be provided to facilitate easy removal of the body, should such a procedure become necessary.

Switch Panel - Diamond Logic

All electrical equipment switches shall be mounted in the cab dash convenient to the operator. The switch panel shall be factory supplied/installed by International. Emergency warning light switches shall be of the rocker type. For easy night time operation an integral indicator light shall be provided to indicate when the circuit is energized. All switches shall be appropriately identified as to their function.

The following switches shall be colored to better identify those circuits:

* Master Warn Switch = RED

* Pumphouse Heat Switch = YELLOW
* Pump Engage (PTO) or Road-Pump (Splitshaft) Switch = BLUE
* CAF Engage (if equipped) = YELLOW

PRESSURE GOVERNOR and ENGINE MONITORING DISPLAY

Fire Research PumpBoss series PBA400-A00 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8". The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored engine information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring. Inputs from the pump discharge and intake pressure sensors shall be electrical.

The following continuous displays shall be provided:
Engine RPM; shown with four daylight bright LED digits more than 1/2" high
Check engine and stop engine warning LEDs
Engine oil pressure; shown on a dual color (green/red) LED bar graph display
Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
Transmission Temperature: shown on a dual color (green/red) LED bar graph display
Battery voltage; shown on a dual color (green/red) LED bar graph display
Pressure and RPM operating mode LEDs
Pressure / RPM setting; shown on a dot matrix message display
Throttle ready LED.

A dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and night time operation.
The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:
High Battery Voltage
Low Battery Voltage (Engine Off)
Low Battery Voltage (Engine Running)
High Transmission Temperature
Low Engine Oil Pressure
High Engine Coolant Temperature
Out of Water (visual alarm only)
No Engine Response (visual alarm only).

The program features shall be accessed via push buttons located on the front of the control module. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor and monitoring pressure display shall be programmed at installation for a specific engine.

Water Tank Level Display
A Fire Research TankVision model WLA200-A00 water tank level indicator kit shall be installed at the pump operators panel. The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of aluminum, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall place on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

Remote Tank Level Lights
Two (2) Whelen Strip-Lite™ series 5mm LED model # PSTANK remote water tank level lights shall be provided. The 12v water level light shall incorporate 24 green, 24 blue, 24 amber, and 24 red 5mm LEDs and a clear non-optic hard coated polycarbonate lens. The four colored LED light versions indicate the fluid level in the water tank. The green LEDs indicates a full tank, the blue indicates half, the amber indicates quarter, and red indicates empty. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The lens shall be sealed and resistant to water, moisture, dust, and other environmental conditions.

The encapsulated PC board shall provide additional protection against environmental elements. The solid state water level light shall be vibration resistant. An installation kit including mounting hardware shall be provided for surface mounting. The customer will supply the tank sensor for the water level light. The PSTANK will contain a 12" non-terminated pigtail. The PSTANK light requires only a 9/32" wire access hole and two self-tapping screws for mounting. A Branch guard mounting option is sold separately. The PSTANK light is covered by a five year factory warranty.

The lights shall be installed, one (1) on the left-side & one (1) on the right-side of the pumphouse.

Foam Tank Level Display
A Fire Research TankVision model WLA260-A01 foam tank tank indicator kit shall be installed at the pump operators panel. The kit shall include an electronic indicator module, a pressure sensor, and a 20' sensor cable. The indicator shall show the volume of Class A foam concentrate in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of aluminum, and have a distinctive green label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a datalink to connect remote indicators. Low foam warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the foam tank near the bottom. No probe shall place on the interior of the tank. The foam tank vent shall be installed on the foam fill tower. Wiring shall be weather resistant and have automotive type plug-in connectors.

Master Gauges & Test Ports
There shall be one (1) Master Vacuum and one (1) Master Pressure gauge assembly installed at the pump operators panel. The gauges shall be stainless steel, 4" diamater. The vacuum gauge shall have a scale of -30 to 400 psi (0-2750 kpa). The pressure gauge shall have a scale of 0-400 psi (0-2750 kpa). Two (2) pump test ports shall be included. The gauges and the test ports shall be part of a chromed bezel for a pleasing appearance.

Master Drain Valve
There shall be a Master Pump Drain Valve installed at the base of the driver-side pump panel. The valve shall be a rotary type.

Water Tank Poly
A 1000 (IMP) gallon Poly Rectangular Tank shall be supplied. The tank shall be rectangular with a pinned baffle design. The booster tank shall be completely removable without disturbing or dismounting the apparatus body structure.

A T-Tank shall not be accepted due to the loss of side compartment space.

The booster tank top, sides, and bottom shall be constructed of 1/2" (0.50") black UV-stabilized copolymer polypropylene. The copolymer polypropylene tank material shall be welded together utilizing thermoplastic welding technology. Thermoplastic welding technology, using a clean hot air temperature controlled process, shall ensure that each weld reaches its plasticized state without cold or hot spots. The copolymer polypropylene material shall be used for its high strength and corrosion resistance for a prolonged tank life.
The booster tank shall have one (1) 12" x 12" fill tower with a rearward hinged lid. The fill tower shall be located in the forward driver side corner of the tank and assist with tank ventilation. The fill tower shall include a removable 1/4" (0.25") thick polypropylene screen.
The booster tank shall have two (2) tank plumbing openings on the forward tank wall. One (1) for a 3" tank-to-pump suction line with an anti-swirl plate, and one (1) for a 2.0" tank fill line. A 2" cleanout plug shall be provided at the bottom of the tank sump.
The booster tank shall include longitudinal and latitudinal baffles. The baffles shall be interlocking and thermo welded to the shell of the tank to minimize water surge during travel and provide enhanced road handling stability. The baffle design shall allow water flow in accordance with NFPA during tank filling or pump operations.
A 3" diameter tank overflow pipe shall be provided and routed to dump behind the rear axle. The overflow pipe dumping location shall not affect the rear axle tire traction when moving forward.

Foam Tank Poly
There shall be a 25 Imp Gallon Poly Foam Tank installed. The tank shall be located at the front of the body hose bed, on top of the water tank. The tank shall be seperate of the water tank to prevent cross-contanimation. An 8in diameter threaded lid shall be included for foam fill.
A checkerplate cover shall be installed above the foam tank. This cover shall be manufactured from embossed aluminum checkerplate to allow personnel to safely walk on. The cover shall extend and cover the water tank fill tower as well. A checkerplate lid with d-ring handle is installed to access the fill tower.

Water Tank Drain
A drain port shall be installed in the bottom of the tank sump. The port shall be sealed with a pipe plug.

Body Sub-Frame

The subframe shall consist of aluminum structural square tubing (3" x 3" x .250") and aluminum structural rectangular tubing (3" x 2" x .250"). The 3x2x.250" tubing's shall be positioned above the chassis frame rails, running full length from front to back. The "U" bolts used to fasten body to frame shall wrap-around these structural tubing's.

3" x 3" x .250" square tubing's shall extend outwards into the wheel well openings, in front of and behind the chassis rear wheels. These crossmembers shall then be connected to the floor braces of the wheel well compartment floors with vertical structural members. This design shall transfer body loads directly to chassis frame via the aluminum structure instead of welded joints resulting in exceptional strength.

3x2x.250" rectangular tubing's shall extend full width from side to side at the front and the back of the body. The body compartments shall receive cut-outs, through which these structural tubing's shall insert, again resulting in body loads being transferred to the sub-frame via structure instead of welded joints.

All other crossmembers shall be 3x2x.250" rectangular tubing, welded rigidly to provide a high strength base for proper support of the poly water tank.

The alloy shall be 6061-T6 and shall be welded by CWB (Canadian Welding Bureau) certified welders using the semi-automatic mig welding process. The sub - structure shall be re-enforced with gussets in high stress areas. The sub-frame design shall include sufficient crossmembers to ensure adequate water tank support.

Body Aluminum - High-Side/High-Side

The aluminum body shall be an Extruded Aluminum Body, consisting of proprietary aluminum extruded profiles. These aluminum profiles shall be produced from 6061 series aluminum alloy and shall be of sufficient strength to carry the weight of the body & equipment. The extrusions shall transfer the body & equipment weights to the under-body sub-frame, which shall transfer directly to the chassis frame. This design eliminates any of the compartment walls from functioning as load-bearing members, which could result in body cracking.

All extrusion joints shall be properly prepared/beveled in advance of the welding process. All welding shall be performed by CWB certified welders.

The aluminum material shall be (3/16") 5052 (marine grade) providing enhanced resistance to corrosion and high weld joint efficiencies. The body shall be computer modeled before construction ensuring correct configuration and geometry. After modeling, the sheet-metal parts shall be flattened (electronically) and produced on CNC sheet metal cutting equipment. This will ensure extremely high part tolerances resulting in excellent fit/finishes. Compartment floors shall receive tabs which when assembled, will insert into grooves cut into the compartment side walls. Tab and groove construction removes a high portion of stress loads from welded joints.

Tab and Groove construction also eliminates double wall joints which can trap moisture and encourage corrosion. To prevent (oil canning) all compartment floors shall be re-enforced with a minimum of two (2) structural re-enforcements. All floors shall be of the sweep-out design allowing easy cleaning.

Body to Chassis Frame Attachment

The aluminum body shall be fastened to the chassis frame using 5/8" U bolts. This attachment design also allows for easy body removal should such a procedure become necessary.

Rubber Isolator (Frame to Body)

A full length/width of ¼" neoprene rubber shall be bonded to the chassis frame before the body is installed. This shall serve as an isolator for dissimilar metals.

Body Compartments Left Side

L1

There shall be one (1) compartment on the left side ahead of the rear wheels.

L2
There shall be one (1) compartment on the left side over the rear wheels.
L3
There shall be one (1) compartment on the left side behind the rear wheels.

Body Compartments Right Side
R1
There shall be one (1) compartment on the right side ahead of the rear wheels.
R2
There shall be one (1) compartment on the right side over the rear wheels, justified towards the back to allow space for a hydraulic ladder-rack towards the front.
R3
There shall be one (1) compartment on the right side behind the rear wheels.

Note: Please refer to dimensional drawing for compartment measurements.

Each compartment shall be sealed before an interior coating is applied using a high quality paintable caulking. This will ensure the compartments to be leak free at any of its seams. All compartments will feature vents to allow air re-circulation. The tops of each compartment shall have aluminum checkerplate attached. This will provide for a skid resistant walkway.

Bumper Body Rear
There shall be a bumper installed at the back of the body. Heavy-duty steel plates shall be custom cut and formed to provide a rigid frame for the tailboard to attach to. The bumper support frame assembly shall be fully independant of the body frame, and shall be fastened to the chassis frame rails with grade 8 bolts.
The tailboard shall be formed from embossed aluminum polished checkerplate to promote slip-resistance. A heavy aluminum channel shall be welded to the underside for additional support.

Tow Eyes
There shall be two (2) 1-1/4" chrome plated tow eyes installed at the back of the body. Independant brackets shall be used to attach the tow eyes to the frame rails. This is to prevent stresses from towing to transfer to the body & bumper mounting frames.

Fenders Body
There shall be 14gauge polished stainless steel fender skirts installed at the body wheel wells. Stainless steel hardware shall be used to fasten the fenders. Nylon shoulder washers are installed on each bolt, corrosion control paste is applied to each bolt hole prior to hardware insertion to fasten the skirt.

Fenderetts
There shall be stainless steel fenderetts installed on the body wheel well skirts, fastened to the skirts with stainless steel hardware.

Liners Wheel Well
There shall be wheel well liners installed in each body wheel well. The liners shall be 3/16" non-corrosive ABS material. The liners are fastened with stainless steel hardware, nylon shoulder washers and corrosion control paste on the bolt holes.

Mud Flaps
There shall be heavy-duty mud flaps installed at the rear wheels, attached to the body with stainless steel hardware. The mud flaps shall be 14" high x 24" wide.

Rub Rails Body
There shall be anodized aluminum rub rails installed on the sides of the body, ahead of and behind the rear wheels. Plastic end caps shall be included on each end of the rub rails to provide a pleasing appearance. Stainless steel hardware shall be used to fasten the rub rails. Nylon shoulder washers are installed on each bolt, corrosion control paste is applied to each bolt hole prior to hardware insertion on the lower body.

Steps Body Access Front Left/Right
There shall be two (2) flip-down steps installed, one (1) at the left-upper-front and one (1) at the right-upper-front of the body to access the body and pumphouse top. The steps shall be chromed zinc-aluminum construction. In the down position, the steps shall offer a hand-hold to aid in accessing. A stainless steel kick panel shall be attached to the body above the step to protect body paint.

The next lower step shall be the pumphouse side full-width step, which personnel can access from the pump operator walk-way.

Stairway
There shall be a collapsible stairway installed at the back left-side of the body to access the upper-hose bed. The assembly in its deployed state, shall extend past the back bumper to provide an ergonomic angled stairway. The bottom portion shall hinge-up and neatly fold above the brake/tail/turn lights, collapsing into a vertical compact unit. An over-center latch is used to captivate for storage.

The threads shall incorporate an agressive thread pattern to offer secure slip-free footing.

Handrails shall be attached to both upper stairway stringers for additional support. Additional Handrails are included at the top of hose bed.

Shelving Comp L1
There shall be two (2) aluminum shelves installed in compartment L1, left front. The shelves shall be water-jet cut from 3/16" aluminum sheet, then polished and formed with a 2.5" vertical lip all around. All four corners of the shelve shall be left open for proper drainage. The shelves shall be installed in the compartent on four (4) vertically adjustable aluminum rails. Rubber interlocking floor tile shall be placed on the shelve.

Gear Grid Storage
There shall be a GearGrid Tool Storage System installed in the driver-side body wheel compartment. The storage system shall include a fixed wire grid panel on the compartment back wall and two (2) hinge-out wire grid panels. Tool mount straps are attached to the wire grid panels to place and secure hand tools.
An amber flashing lamp shall be installed on the first hinge-out panel to alert personnel and on-coming traffic.

Shelving Comp L3
There shall be two (2) aluminum shelves installed in compartment L3, left rear. The shelves shall be water-jet cut from 3/16" aluminum sheet, then polished and formed with a 2.5" vertical lip all around. All four corners of the shelve shall be left open for proper drainage. The shelves shall be installed in the compartent on four (4) vertically adjustable aluminum rails. Rubber interlocking floor tile shall be placed on the shelve.

Shelving Comp R1
There shall be two (2) aluminum shelves installed in compartment R1, right front. The shelves shall be water-jet cut from 3/16" aluminum sheet, then polished and formed with a 2.5" vertical lip all around. All four corners of the shelve shall be left open for proper drainage. The shelves shall be installed in the compartent on four (4) vertically adjustable aluminum rails. Rubber interlocking floor tile shall be placed on the shelve.

Shelving Comp R3
There shall be two (2) aluminum shelves installed in compartment R3, right rear. The shelve shall be water-jet cut from 3/16" aluminum sheet, then polished and formed with a 2.5" vertical lip all around. All four corners of the shelve shall be left open for proper drainage. The shelves shall be installed in the compartent on four (4) vertically adjustable aluminum rails. Rubber interlocking floor tile shall be placed on the shelve.

Rollout Tray Spare Bottle
There shall be one (1) Roll-Out Tray installed to carry (8) spare SCBA bottles in a compartment as directed by the fire department. The tray shall be capable of 500lbs static load. A locking device shall allow the tray to be locked in the inner and outer positions.

Flooring Body Compartments
There shall be rubber floor tile installed on the floors of each body compartment. The floor tile shall be interlocking to prevent shifting, and shall be 1/2" in height.

Flooring Hose Bed
There shall be rubber floor tile installed on the floor of the upper body hose bed. The floor tile shall be interlocking to prevent shifting, and shall be 1" in height to allow air circulation for drying.

Hose Bed Divider
There shall be a single hose bed divider installed in the upper hose bed. The divider shall be produced from 3/16" aluminum sheet, and formed for rigidity. The top of the divider shall have a flange, providing a flat surface for support for the hose bed tarp.

Hose Bed Tarp
There shall be a black vinyl tarp installed on the body hose bed. The tarp material shall be FR for fire resistant. 1/4" x 2" aluminum flat bars shall be bonded crosswise at 18" intervals to support the tarp. These bars shall be covered with black vinyl and sown on both sides for a pleasing appearance. 2" Velcro shall be sown on the underside, the length of the tarp. The opposite velcro shall be bonded to the top of the hose bed sides. A trap skirt shall drop down the depth of the hose bed at the rear. Four (4) nylon straps with stainless steel buckles shall be included for securing the tarp.

Rollup Doors
Compartment doors shall be equipped with AMDOR® brand roll-up doors complete with the following features:
- 1" aluminum double wall slats with continuous ball & socket hinge joint designed to prevent water ingression and weather tight recessed dual durometer seals
- Double wall reinforced bottom panel with stainless steel lift bar latching system
- Bottom panel flange with cut-outs for ease of access with gloved hands
- Reusable slat shoes with positive snap-lock securement
- Smooth interior door curtain to prevent equipment hang-ups
- One-piece aluminum door track side frame
- Top gutter with non-marring seal
- Non-marring recessed side seals with UV stabilizers to prevent warping
- Dual leg bottom seal (wear component material to be Type 6 Nylon)
- Door ajar switch system (magnetic) shall be provided by AMDOR.
- Door striker will provide support beneath the lift bar to prevent door curtain bounce and potential false door ajar indications.

Ladder Storage Rack
There shall be a Ziamatic Hydraulic Storage Rack installed on the body, at the officer-side wheel well, towards the front. The storage system shall be operated electrically, from the officer-side pump panel. An Up/Down toggle switch shall be installed. A self-contained hydraulic pump & cylinder shall actuate the system from, vertical for storage to horizontal for accessing the ladder. An mechanical safety latch shall be included to latch system in the stored position.
Two (2) amber LED flashing lights shall be included, one at the front and one at the back of the ladder storage cradle. These lights shall automatically turn-on when the rack moves from its stored position. A "Do Not Move" lamp shall illuminate whenever the system is not in its stored position.

Lightbar Rota-Beam
There shall be a Whelen FR0RRRR LED Lightbar installed on the chassis cab. The Lightbar shall include four (4) Red corner LED Rota-Beam modules, two (2) additional front-facing Red LED Rota-Beam modules, one (1) front-facing White LED Rota-Beam module and two (2) LED alley Lights.

The front-facing white Led module shall automatically turn-on with the master switch once the emergency brake is applied. The same light shall automatically turn-off upon arriving on scene when the emergency brake is applied.

Beacons Rota-Beam
There shall be two (2) Whelen L31 series Super-LED® Rota-Beam beacons installed one each side on the back-top of the body, model # R316RF. The low profile beacon shall incorporate 16 rotating beacon PC boards with three red Super-LEDs installed on each PC board. The rotating beacon PC boards shall be installed on a ballast rotator PC board. The conformal coated PC boards shall provide additional protection against environmental elements. The R316RF shall have 16 TIR LED rotator reflectors installed over the rotating beacon PC boards with a red optic hard coated polycarbonate lens. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The R316RF dome lens shall be sealed to a black die cast aluminum base with an "O" ring gasket assembly to protect from environmental conditions. The R316RF shall have no moving parts or motors to malfunction.

The solid state beacon light shall be vibration resistant. The R316RF will be able to synchronize with up to eight R316 series beacons. The R316RF shall include 32 Scan-Lock™ patterns with varying rotating flash rates. The R316RF shall also contain cruise mode and low power mode. Optional photocell available for low power. The R316RF will contain a 12" non-terminated pigtail. The low profile beacon is covered by a five year factory warranty and available in 24v. The R316RF will meet SAE Class 1 requirements. An installation kit including mounting hardware shall be provided for flat mounting.
The beacons shall be wired into the upper level emergency warning light circuit. Weather proof electrical connectors shall be used to connect the beacons to the apparatus harness.

Flashers Chassis Grille
There shall be two (2) Whelen 600 Series Red LED Rota-Beam™ Model # 6RBR warning lights installed at the chassis grille, one (1) each side. The warning lights shall incorporate Super-LED® technology in a 180° horizontal light spread. The 6RBR configuration shall consist of 30 red Super-LED's installed on ten rotator PC boards. The rotator PC boards shall be installed on a 180° LED rotator beacon PC board. The 6RBR lens/reflector assembly shall consist of ten TIR rotator assembly reflectors installed in front of the rotator PC boards and a red non-optic polycarbonate lens. The warning light, with the aid of four screws, shall have the ability to be installed as a surface mount warning light.
The 6RBR warning light shall include 14 Scan-Lock™ flash patterns including synchronize and low power features. The 6RBR shall meet SAE Class I specifications. The lens/reflector assembly shall be sealed and resistant to water, moisture, dust, and other environmental conditions. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The 6RBR shall be vacuum tested to ensure proper sealing. The PC boards shall be conformal coated for additional protection. The flashers shall be installed in chromed bezels and shall be wired into the lower level emergency light circuit. Weather proof electrical connectors shall be used to connect the flashers to the apparatus harness.
The warning light is covered by a five year factory warranty.

Flashers Chassis Fenders
There shall be two (2) Whelen 600 Series Red LED Rota-Beam™ Model # 6RBR warning lights installed at the chassis fenders, one (1) each side. The warning lights shall incorporate Super-LED® technology in a 180° horizontal light spread. The 6RBR configuration shall consist of 30 red Super-LED's installed on ten rotator PC boards. The rotator PC boards shall be installed on a 180° LED rotator beacon PC board. The 6RBR lens/reflector assembly shall consist of ten TIR rotator assembly reflectors installed in front of the rotator PC boards and a red non-optic polycarbonate lens. The warning light, with the aid of four screws, shall have the ability to be installed as a surface mount warning light.
The 6RBR warning light shall include 14 Scan-Lock™ flash patterns including synchronize and low power features. The 6RBR shall meet SAE Class I specifications. The lens/reflector assembly shall be sealed and resistant to water, moisture, dust, and other environmental conditions. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The 6RBR shall be vacuum tested to ensure proper sealing. The PC boards shall be conformal coated for additional protection. The flashers shall be installed in chromed bezels and shall be wired into the lower level emergency light circuit. Weather proof electrical connectors shall be used to connect the flashers to the apparatus harness.
The warning light is covered by a five year factory warranty.

Flashers Body Fenders
There shall be two (2) Whelen 600 Series Red LED Rota-Beam™ Model # 6RBR warning lights installed at the body fenders, one (1) each side. The warning lights shall incorporate Super-LED® technology in a 180° horizontal light spread. The 6RBR configuration shall consist of 30 red Super-LED's installed on ten rotator PC boards. The rotator PC boards shall be installed on a 180° LED rotator beacon PC board. The 6RBR lens/reflector assembly shall consist of ten TIR rotator assembly reflectors installed in front of the rotator PC boards and a red non-optic polycarbonate lens. The warning light, with the aid of four screws, shall have the ability to be installed as a surface mount warning light.
The 6RBR warning light shall include 14 Scan-Lock™ flash patterns including synchronize and low power features. The 6RBR shall meet SAE Class I specifications. The lens/reflector assembly shall be sealed and resistant to water, moisture, dust, and other environmental conditions. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The 6RBR shall be vacuum tested to ensure proper sealing. The PC boards shall be conformal coated for additional protection. The flashers shall be installed in chromed bezels and shall be wired into the lower level emergency light circuit. Weather proof electrical connectors shall be used to connect the flashers to the apparatus harness.
The warning light is covered by a five year factory warranty.

Flashers Body Rear
There shall be two (2) Whelen 600 Series Red LED Rota-Beam™ Model # 6RBR warning lights installed at the body rear lower level, one (1) each side. The warning lights shall incorporate Super-LED® technology in a 180° horizontal light spread. The 6RBR configuration shall consist of 30 red Super-LED's installed on ten rotator PC boards. The rotator PC boards shall be installed on a 180° LED rotator beacon PC board. The 6RBR lens/reflector assembly shall consist of ten TIR rotator assembly reflectors installed in front of the rotator PC boards and a red non-optic polycarbonate lens. The warning light, with the aid of four screws, shall have the ability to be installed as a surface mount warning light.
The 6RBR warning light shall include 14 Scan-Lock™ flash patterns including synchronize and low power features. The 6RBR shall meet SAE Class I specifications. The lens/reflector assembly shall be sealed and resistant to water, moisture, dust, and other environmental conditions. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The 6RBR shall be vacuum tested to ensure proper sealing. The PC boards shall be conformal coated for additional protection. The flashers shall be installed in chromed bezels and shall be wired into the lower level emergency light circuit. Weather proof electrical connectors shall be used to connect the flashers to the apparatus harness.
The warning light is covered by a five year factory warranty.

Traffic Advisor
There shall be a Whelen (46" x 2.875") TAL85W Amber 8-LED Traffic Advisor installed at the back of the body up high. A control panel shall be included, installed at the cab console, flush mounted into the console cover. The High intensity LEDs are rated for over 100,000 hours of service with low, low current consumption. Four operating modes (left, right, split and flash) are selected from a compact, remote control console Model TACTRL1A.

Wig-Wag Headlamps
The chassis manufacturer shall install a wig-wag headlamp system. The system shall operate only with park brake released and low beams, not high beams. Upon arriving on-scene, the wig-wags shall turn-off when the park brake is engaged.

The Wig-Wags shall be supplied the chassis manufacturer.

Siren System
There shall be a Whelen 295SLSC1 Siren System installed, flush mounted into the cab center console. A mic shall be included for the operator to speak through a public address system. A "hands-free" feature shall be included which when selected, allows the driver to start the siren by tapping the vehicle horn, tap again to change siren tone and tap twice to silence.

Siren Speaker
There shall be a Whelen SP123BMC 100-watt Siren Speaker installed at the front bumper. The Chromed bezel shall be included.

DOT Lamps
There shall be a set of Whelen LED 600 Series Brake/Tail/Turn/Back-up Lamps installed in a polished 4-place vertical bezel at the back of the apparatus. The top lamp on each side, shall be an amber arrow for turn function, the second position a red brake lamp, the third position a clear back-up lamp and the lower position a red flasher.

Five (5), 2" round Red LED clearance lamps shall be installed on the back bumper, one (1) on each corner and three (3) on center of the bumper.

Four (4) Red LED clearance lamps shall be installed at the back-top of the body sides, two (2) facing sideways and two (2) facing backwards. One (1), Red LED 3-lamp ID bar shall be installed at the top center of the body.

There shall be two (2) Amber LED turn signal/clearance lamps installed, one (1) on each side at the body fenders.

License Plate Lamp
There shall be a stainless steel bracket installed at the back of the body to carry a license plate. The top of the bracket shall have a formed lip to protect an LED lamp, installed to illuminate the license plate.

Back-up Alarm
There shall be a Pollack 97db Back-up Alarm installed at the back of the apparatus frame area.

Scene Lights Rear
There shall be two (2) Whelen Pioneer Plus™ Model # PFP2 LED scene lights installed, one (1) each side at the back top of the body. The lights shall be installed on pedestals to allow for horizontal and vertical rotation.

The 168 watt +12v DC Pioneer lighthead shall incorporate Super-LED® dual flood light installed in a die-cast white powder coated aluminum housing. The PFP2 configuration shall consist of 60 white Super-LEDs with a clear optic collimator/metalized reflector assembly and a clear non-optic polycarbonate lens. The Pioneer flood light shall have 16,000 usable lumens.

The lens/reflector assembly shall utilize a liquid injected molded silicone gasket to be resistant to water, moisture, dust, and other environmental conditions. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The PFP2 shall be shall be vibration resistant. The Pioneer™ PC boards shall be conformal coated for additional protection. Two breathable membrane patches shall be installed to the bottom of the housing to maintain a consistent internal pressure. The PFP2 shall have extended LED operation with low current consumption and low operating temperature.

The Pioneer light shall be SAE 1113-42 compliant and Class 5 testing for EMI. The PFP2 is covered by a five year factory warranty.

The lights shall be switched from the chassis dash switch panel and automatically turn-on when the transmission is shifted to reverse.

Scene Lights Pumphouse
There shall be two (2) Whelen Pioneer™ Max Series Model # PCP3 LED tele-scopic scene lights installed, one (1) each side of the pumphouse.

The 225 watt +12v DC Pioneer lighthead shall incorporate Super-LED® combination flood/spot light installed in a die-cast white powder coated aluminum housing. The PCP3 configuration shall consist of 24 white Super-LEDs with a clear optic collimator/metalized reflector assembly in the flood light on the upper left level, 24 white Super-LEDs with a clear optic collimator/reflector assembly in the flood light on the upper right level, 24 white Super-LEDs for the spot light with an eight degree TIR reflector on the lower level. The PCP3 shall have a clear non-optic polycarbonate lens. The Pioneer flood/spot light shall have 20,000 usable lumens. The PCP3 shall have independent control of the flood and spot optics.

The lens/reflector assembly shall utilize a liquid injection molded silicone gasket to be resistant to water, moisture, dust, and other environmental conditions. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The PCP3 shall be shall be vibration resistant. The Pioneer PC boards shall be conformal coated for additional protection. Two breathable membrane patches shall be installed to the bottom of the housing to maintain a consistent internal pressure. The PCP3 shall have extended LED operation with low current consumption and low operating temperature.

The Pioneer shall be SAE 1113-42 compliant and Class 5 testing for EMI. The PCP3 is covered by a five year factory warranty.

The lights shall be installed on tele-scopic poles to allow for horizontal & vertical rotation, raising and lowering. Switches shall be installed at the pump operators panel, to activate the lights, two (2) switches for each light to control spot & flood.

Pumphouse Lights Ext
There shall be one (1) 63" LED Strip Light installed below a glare shield to illuminate the pump operator control panel. There shall be two (2) 36" LED Strip Lights installed, one above each side pumphouse panel. The lights shall be switched at the pump control panel.

Step Lights Chassis
There shall be Eight (8) Tecniq LED step lights installed, four (4) each side at the chassis cab entry steps. These lights shall turn-on automatically when a cab door is opened and are also switched by a cab dash switch.

Step Lights Pump Walk-Way
There shall be two (2) Tecniq LED step lights installed, one (1) each side at the pump operators panel. These lights shall be switched by a pump operators panel switch.

Step Lights Pumphouse Sides
There shall be two (2) 18" LED Strip Lights installed below the pumphouse side mid steps. The lights shall be switched at the pump control panel.

Step Lights Body Front Left/Right
There shall be two (2) Tecniq LED step lights installed at the front of the body on the left and right sides to illuminate front of body access steps. These lights shall be switched by a cab dash switch.

Ground Lights Chassis
There shall be four (4) Tecniq LED ground lights installed, two (2) each side beneath each cab entry step to illuminate the ground. These lights shall turn-on automatically when a cab door is opened and are also switched by a cab dash switch.

Ground Lights Pump House
There shall be two (2) Tecniq LED ground lights installed, one (1) each side beneath each pump house step to illuminate the ground. These lights shall turn-on automatically when a cab door is opened and are also switched by a cab dash switch.

Ground Lights Body Front
There shall be two (2) Tecniq LED ground lights installed, one (1) each side beneath the front of body to illuminate the ground. These lights shall turn-on automatically when a cab door is opened and are also switched by a cab dash switch.

Ground Lights Back of Body
There shall be two (2) Tecniq LED ground lights installed, one (1) each side beneath the back of body to illuminate the ground. These lights shall turn-on automatically when a cab door is opened and are also switched by a cab dash switch.

Ground Lights Back Bumper
There shall be two (2) Tecniq LED ground lights installed, one (1) each side beneath the back bumper to illuminate the ground. These lights shall turn-on automatically when a cab door is opened and are also switched by a cab dash switch.

Interior Lights Engine Compartment
There shall be two (2) Tecniq LED interior lights installed, one (1) each side at the engine compartment to illuminate the engine compartment. These lights shall be switched by the ground light switch.

Interior Lights Pump House
There shall be two (2) Tecniq LED interior lights installed, one (1) each side at the pump house compartment to illuminate the pump house. These lights shall be switched by a switch at the pump control panel.

Interior Lighting Body Compartments
All body compartments shall be illuminated by LED strip lighting inserted into the back of the vertical rollup door tracks. One (1) full height strip shall be included on each side. The lighting shall turn-on by a megnetic door switch whenever the door is in the open position.

Ladder Extension
There shall be a Series 900-A 24' Duo-Safety Aluminum Roof Ladder supplied.

Ladder Roof
There shall be a Series 775-A 14' Duo-Safety Aluminum Roof Ladder supplied.

Ladder Folding
There shall be a Series 585-A, 10' Duo-Safety Folding Aluminum Ladder supplied. The ladder shall be fastened to the Zico Ladder Rack with rubber PAC tool mounts.

Suction Hose
There shall be two (2) x 10' lengths of TFT lightweight suction hose supplied with the apparatus. A Folding long-handle female coupling is included. Alum trays shall be attached to the Zico Hyd Ladder Rack to carry the hose. This allows the hose to be loaded/un-loaded from the ground.
Two (2) spring type hose holders are included to restrain the hose.

Strainer
There shall be a 6" NH Basket Strainer supplied with the apparatus.

Pike Poles
There shall be two (2) 12' Fibreglass Handled Pike poles supplied with the apparatus. Two (2) rubber PAC tool mounts shall be included. The Pike Poles shalll be installed on the Zico Hyd Ladder Rack to allow for loading/un-loading from the ground.

Pick Axes
There shall be two (2) 6lb Fibre Glass Handeled Pick Axes supplied with the apparatus. Both axes shall be mounted with rubber PAC tool mounts and a Zinc pocket for the axe head. The axes shall be installed on the Gear-Grid tool storage system.

Haligan Tool
There shall be a 36" Halligan Tool supplied and mounted onto the apparatus. Rubber PAC tool mounts shall be used for installation and shall be installed on the Gear-Grid.

Wheel Chocks
There shall be Two (2) Rubber Wheel Chocks supplied with the apparatus.

Spanner/Hydrant Wrench Sets
There shall be two (2) sets of (2) spanner & (1) hydrant wrench sets supplied and installed onto the apparatus, one (1) set on each side at the pump panels.

Storz Wrench Set
There shall be one (1) Aluminum Storz Wrench Set installed at the officer-side pump panel for use with the storz discharge adapters.

Body Underside Coating
There shall be a rubberized undercoating applied to the underisde of the body. This coating will protect against body corrosion.

Paint Body Compartments
The body compartments shall be coated with Zolatona Silver-Grey speckle-coat paint finish. Prior to the coating the compartment interior seams shall be caulked to prevent leakage.

Paint Process Body
Only the highest quality "BASF" Urethane paint will be used, to provide a high luster and long lasting paint finish. The structure to be painted will have all hardware removed to ensure that all areas are protected by paint. The body will be thoroughly cleaned and sanded, cleaned again, then two coats of BASF primer filler is applied.

The primer filler is then thoroughly sanded, re-cleaned, and prepared for another coat of primer.

A coat of BASF primer is then applied.

Next, a coat of BASF Premier Base Color Coat is applied. This activated base coat delivers long term appearance and durability.

A final coat of BASF Clear is applied to match OEM paint finishes which provides a nonporous, chemical resistant surface giving a high sheen, mar resistant, long lasting finish.
Sikkens warranties paint processes against peeling, cracking, blistering and loss of gloss.
The aluminum body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body.

Chevron Red/Yellow
There shall be Reflexite Red & Yellow 6" reflective chevron striping installed on the back of the body. The design shall be such that from the centerline on the body, the striping shall be applied outwards & downwards at a 45 degree angle. The colors shall be applied alternately.

Reflective Striping
There shall be Reflective Striping installed on the front & sides of the apparatus per NFPA 1901. The side design shall feature a 6" stripe running mid-body and two (2) 1" stripes running, one (1) above and one (1) below the 6" stripe, spaced 1/2" apart. A "Z" pattern shall be applied at the body front door.

The Stripe shall be Reflexite V92 "Daybright".

A proof shall be sent to the Fire Dept for approval before installation.

Decals
There shall be Fire Department Door Decals installed on the chassis cab doors. The design shall be provided or approved by the Fire Dept.

Apparatus Final Test
The apparatus shall be subjected to a final inspection and 3rd party NFPA Test. A non-affiliated organization shall perform the test with calibrated testing equipment. The results of the test shall be included with the operators manual. A label shall be engraved and attached to the pump operators panel, to indicate that the apparatus met the required performance criteria.

Manual
There shall be two (2) operation & maintainence manuals included with the apparatus. The manuals shall be electronic on USB cards.

Warranty
A Warranty policy shall apply to the apparatus. See attachment.

Apparatus Delivery & Training
The completed apparatus shall be subject to a final inspection. It shall then be delivered to the customers facility under its own power. An authorized company representative shall deliver the apparatus and perform operational training to the Fire Department upon arrival.

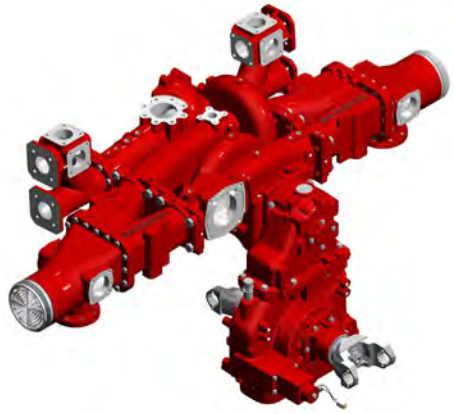
SPECIFICATIONS: VEHICLE MOUNTED: CS

Single Stage Centrifugal Fire Pump

CS Series Pump Performance							
	FLOW			PRESSURE			
Rating	GPM	l/min	l/sec	PSI	bar	kPa	MPa
	750, 1000, 1250	3000, 4000, 5000	50, 65, 80	150	10	1000	1.0

Pump Features

- Two-piece, horizontally-split body
- Lower center of gravity, more room for hose reels, hose beds and other equipment
- Diametrically opposed dual stripping edges
- Double-intake impeller balance radial and axial forces for smooth operation and longer life.
- Reverse-flow, labyrinth-type wears rings for longer pump life
- Braided-flexible graphite (BFG) packing improves heat dissipation, reduces maintenance and minimizes shaft wear.
- Two-piece impeller shaft allows true separation of the pump and pump transmission without disassembling either unit, reducing labor time for repair work.



Simple to Operate

- Power shift system engages the pump with indicating lights confirming the shift is complete.
- Single control activates the priming system, automatically opening the priming valve and starting the primer.
- Single ON-OFF control activates the automatic relief valve systems.

Versatility

The Waterous CS pump was designed with versatility in mind. Waterous offers a complete selection of intake and discharge locations and sizes, and overall piping arrangements.

- Discharge locations are available to meet any need, and sizes from 2-1/2 inches to 5 inches are available.
- Extra large discharge system assures you of the most efficient water delivery system available to the fire service.
- Thoroughly tested to meet NFPA and special contract provisions.

Warranty

Waterous Five-Year Limited Warranty

Conditions of Sales

For details on Waterous Conditions of Sales, refer to F-2190, *Conditions of Sales* located on the Waterous web site at www.waterousco.com or by contacting Waterous.

Optional Equipment (see next page)

- Priming System
- Pressure Control Systems – Discharge and Intake Relief Valves
- Corrosion Protection – Zinc Intake Screens and Anodes
- Overheat Protection Manager
- Drain Valves
- 3-1/2" Tank to Pump Valve
- Discharge Valves
- Pneumatic Shift
- Five-Year Limited Warranty with Total Protection Package (TPP-5)
- Transmissions Available:
    - C20 Chain Drive (Split-Shaft)
    - P Series Chain Drive (PTO Driven)
    - K Series Gear Driven (PTO Driven)

Industry Leading Sales and Support

When you purchase equipment, not only do you get quality products, you get quality service. Our expert service technicians are the best in the business and they are always happy to answer any service questions you might have.

Sales/Applications Assistance
Phone: 651-450-5234 (Press 3)
pumpsales@waterousco.com

Service Assistance
Phone: 651-450-5200
Fax: 800-488-1228
service@waterousco.com

RAISING THE BAR ON INNOVATION, RELIABILITY AND SERVICE.

SPECIFICATIONS: VEHICLE MOUNTED: MODEL CS

Pump Specifications

Casing

Two-piece, horizontally-split, high-tensile, close grained gray iron or bronze (optional). All passageways are carefully matched to assure the very best hydraulic flow characteristics.

Wear Rings

Bronze, reverse-flow, labyrinth-type replaceable wear rings increase pump life and keep maintenance costs to a minimum.

Impellers

Bronze impeller, balanced both mechanically and hydraulically for vibration-free operation. Flame-plated impeller hubs are available optionally to assure longer life despite the presence of abrasives in the water supply.

Impeller Shaft

Heat-treated stainless steel is ground at all critical areas, polished under packing. An exclusive two-piece impeller shaft allows separation of the transmission from the pump without disassembling either component. This simplifies repair procedures, resulting in less down time.

Bearings

Three deep-groove, anti-friction ball bearings, located outside the pumping chamber, give support and proper alignment to the impeller shaft assembly. Bearings are oil or grease lubricated, completely separated from the water being pumped, and protected by seal housings, flinger rings and oil seals.

Shaft Seal

Seal housings on packed pumps are equipped with braided flexible graphite (BFG) rings held in place by a split bronze gland which is fully removable and adjustable. BFG packing improves heat dissipation, reduces maintenance and minimizes shaft wear. Self-adjusting, spring-loaded mechanical seals are available which eliminate leakage and routine maintenance.

Flinger Rings

Located on the impeller shaft between seal housings and bearing housings, flinger rings provide added protection and keep water and foreign matter out of the bearings.

Oil Seals

Standard lip type for lubrication and additional bearing protection from dirt and water.

Pump Characteristics

The Waterous CS pump meets or exceeds all requirements of NFPA standard

Pump Transmissions

C20 Series

Housings: High-strength aluminum, three-piece, horizontally-split.

Drive Ratios: 1.27, 1.41, 1.48, 1.58, 1.69, 1.79, 1.88, 1.97, 2.03, 2.27, 2.46

Shafts: Drive line shafts made from alloy steel forgings, hardened and ground to size, 2.35 inch 46-tooth involute spline.

Drive and Driven Sprockets

Made of steel. All sprockets are hardened and have ground bores.

Drive Chain

Morse HV® high-strength involute form chain.

Bearings

Deep-groove, anti-friction ball bearings give support and proper alignment to the impeller shaft assembly. Bearings are oil-splash lubricated, completely separated from the water being pumped, and protected by a V-ring and oil seals.

Lubrication System

An internal lubrication system delivers lubricant directly to the drive chain. This unique design eliminates the need for an external lubrication pump and auxiliary cooling.

Shift Mechanism

Constant-mesh, two-position sliding collar that engages all teeth simultaneously. In-cab controlled pneumatic shift. An internal locking mechanism provides a positive lock in PUMP or ROAD position.

P Series

Housings: Cast aluminum body

Drive Ratios: 1.71, 1.91, 2.05

Drive & Driven Sprockets

Made of a steel. All sprockets are hardened and have ground bores.

Drive Chain

Morse HV®** high-strength involute form chain.

Bearings

Anti friction ball bearings

Optional Rear Facing Output Shaft

1-3/8-10 SAE spline for Spicer 1280 or 1310 series end yokes

Accessories

The accessories below are available for Waterous CS pumps. For detailed information about these accessories, request each specification sheet by number.

Pneumatic Shift

Air power allows the operator to shift to ROAD or PUMP position by actuating a simple valve. Illuminated LED's signal completion of shift from ROAD to PUMP. See Power Shift, F-1154.

Five-Year Limited Warranty with Total Protection Package (TPP-5)

The Five-Year Limited Warranty with Total Protection Package is a comprehensive warranty that increases your standard warranty to include labor expenses to dismantle, remove and reinstall covered products or parts, F-2626.

Primer

Select an electric rotary vane primer for fast, reliable priming, F-2418.

Pressure Control Systems

Discharge Relief Valve

Simple ON-OFF control permits placing the system in or out of operation in seconds. See Relief Valve, F-897.

Intake Relief Valves

The Waterous intake relief valve is designed to dump excess pressure from the inlet side of the pump. See Intake Relief Valves, F-2192.

Corrosion Protection

Waterous offers replaceable zinc intake screens and anodes to provide corrosion protection. These items are designed to sacrifice the zinc element to galvanic corrosion. Without this protection, galvanic corrosion may damage the iron pump body and fittings.

Overheat Protection Manager

The OPM consists of an illuminated warning light on the operator's panel whenever the pump approaches an overheat condition, F-2422.

Drain Valves

Drains all points of the pump simultaneously with the operation of a single control. F-1158

Tank to Pump Valve

The tank to pump valve is a full-flow 3-1/2 in. diameter ball valve which is attached directly to the pump. The valve is operated by either a 90° spring detent remote control handle or an electric rotary actuator, F-2536.

Discharge Valves

The following Waterous ball-type discharge valves are available: 2-1/2 inch, 3-1/2 inch, rack and sector push-pull, worm gear and electric. Chrome- plated brass ball and hydraulically-balanced seal assembly standard. See Discharge Valves, F-1161.

SPECIFICATIONS – FOAM SYSTEMS: AQUIS™ 2.5

The perfect blend of performance and value

The Aquis™ foam proportioner from Waterous delivers a level of performance and reliability typically reserved for more expensive Class A foam proportioners. Aquis 2.5 features a non-corroding brass body pump as well as sensors that measure water temperature and water flow to create the ideal water to concentrate ratio for superior foam. Dollar for dollar and feature for feature, there's no doubting that Aquis is the finest foam proportioner on earth.

Components:

Microprocessor Controller

AQUIS™ is equipped with a 16-bit, mixed-signal microcontroller with a 60kB flash memory, 2 kB RAM and 12-bit analog to digital converter. This allows the AQUIS™ to receive input from the flowmeter and temperature sensor, controlling the foam pump motor to provide accurate injection into the foam manifold.

Operator Interface Terminal

The Operator Interface Terminal (OIT), mounted on the pump operator's panel allows the operator to perform the following functions:

- Provide rotary dial control of foam proportioning rates from 0.1% to 1%, in infinite increments
- Calibrate flow rate
- Flashes and then displays a steady "low concentrate" warning when the foam concentrate tank runs low - system shuts off after two minutes
- Flash a "no concentrate" warning when the foam concentrate tank is empty
- Flash an "error" warning with associated code in the event of an electronic malfunction
- Provide a manual back-up mode, controlled by the operator

Remote Activation

The system can be activated from an external 12 or 24-volt electrical source, such as a pump-in-gear circuit or engine ignition power which can eliminate one step in the operational sequence. An optional remote start/stop control and cable is available.

Flowmeter

A paddlewheel-type flowmeter, installed in the process manifold upstream of the foam injection point, connects to the microcontroller.

A flowmeter tee, constructed of stainless steel or brass with Victaulic groove outer connections and threaded NPT inner connections at each end of the tee, is provided for connection to the apparatus plumbing. Flowmeter tees are available as follows:

- Standard - 2" ID (400 GPM / 1500 L/min)
- Optional – 2.5" ID (750 GPM / 2800 L/min)

Foam Pump

The 12 or 24-volt, electric motor driven, positive displacement triplex plunger foam pump is equipped with an aluminum crankcase, ball bearings, forged brass pump body and manifold, solid ceramic plungers, stainless steel check valves and piston guides, Buna packing and preset thermal and pressure relief valves.

The foam pump is rated at 2.5 GPM @ 150 psi (9.46 l/min @ 10 bar) with operating pressures up to 450 psi (32 bar). Maximum electrical load of 40 amps @ 12 VDC and 21 amps @ 24 VDC.

A pump motor electronic driver, located inside the controller housing, receives signals from the microcontroller and powers the 1/2 hp (.4 kW) electric motor in a variable speed duty cycle to ensure that the correct amount of foam concentrate set by the pump operator is injected into the water stream.

Control Cables and Connectors

The cables for interconnection of the control unit, OIT, temperature sensor and flowmeter are electrically shielded to prevent radio frequency or electro-mechanical interference.

Low Tank Level Switch (Optional)

A low tank level float switch, installed in the foam concentrate tank and connected to the control unit, alerts the operator to low foam supply conditions.

Waterway Check Valve (Optional)

A full-flow brass body waterway check valve at the inlet end of the foam manifold waterway prevents foam contamination of the fire pump and water supply.

Foam Inject Check Valve

A brass and stainless steel check valve provided in the foam concentrate line at the foam injection point prevents water backflow into the foam supply reservoirs.

Foam System Support

The AQUIS™ is equipped wit PC-Connectivity which allows a qualified technician to perform upgrades, diagnostics and monitor system functions in real-time. The system can also be remotely monitored using any PC with Internet access, allowing technicians to easily connect to the Waterous dedicated website to assure proper operation and to update the foam system software by uploading new features and functions as they become available.

Industry-Leading Sales and Support

When you purchase Waterous equipment, not only do you get quality products, you get quality service. Our expert service technicians are the best in the business and they are always happy to answer any service questions you might have.

Sales / Applications Assistance
Phone: 651-450-5234 (Press 3)
pumps@waterousco.com

Service Assistance
Phone: 651-450-5200
Fax: 800-488-1228
service@waterousco.com

SPECIFICATIONS – FOAM SYSTEMS: AQUIS™ 2.5

System Components - Standard

Components of the complete foam system supplied by Waterous include:

- Operator interface terminal (OIT)
- Pump module with electric motor/motor driver and microcontroller unit
- Foam concentrate strainer
- Shielded electrical cables for connection of all electronic components
- Foam inject check valve
- WYE Strainer
- Flowmeter and Tee - 2” ID
- Installation and operation manual are provided for the unit along with a copy of the warranty policy. The system must be installed and serviced by an authorized Waterous OEM or service center.

System Components - Optional

- Flowmeter Tee - 2.5” ID
- Waterway check valve
- Low level tank switch
- System diagram and rating placards (per NFPA 1901) for pump panel mounting

Installer Supplied Items

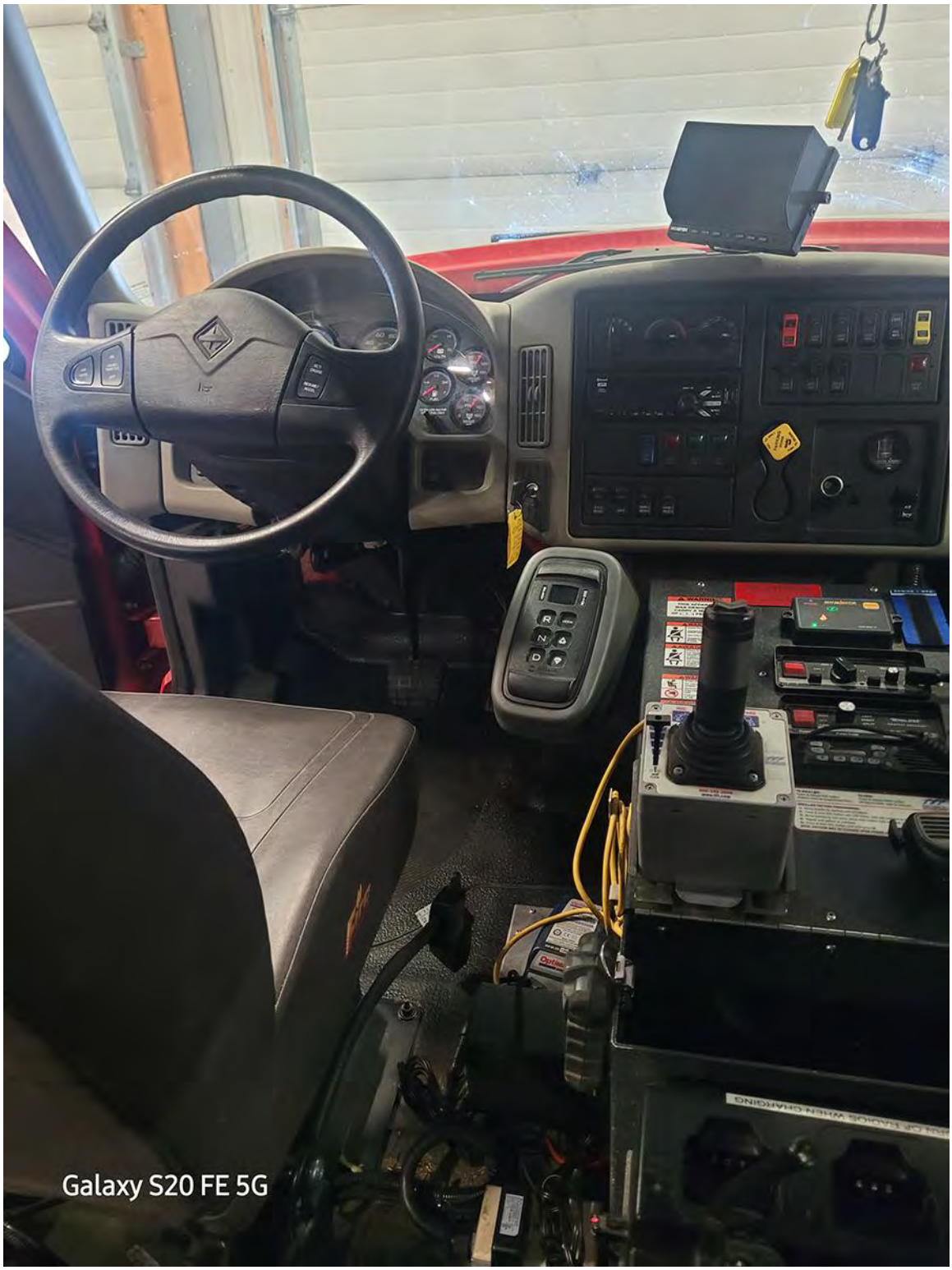
The AQUIS™ 2.5 system includes the major components required for installation with the exception of the following which are to be supplied by the installer:

1. **Foam Concentrate Supply Line(s)**
   Hose(s) and fittings that run from the foam tank to the foam pump inlet should be a minimum of 3/4” inside diameter. Hose and fittings must be rated for a minimum of 23 inches (584.2 mm) Hg of vacuum and 50 psi (3 bar) of pressure. The hose and fittings must be made of corrosion-resistant material and be compatible with the foam concentrates to be used. Foam supply hose shall have a reinforced clear wall as required by NFPA to allow viewing of foam priming operations.
2. **Foam Concentrate Discharge Line**
   Hose(s) and fittings that are routed from the foam pump to the foam injection check valve should be a minimum of 1/2” inside diameter and have a rated working pressure of at least 450 psi (32 bar). The foam discharge hose and fittings must be made of corrosion-resistant material and be compatible with the foam concentrates to be used.
3. **Foam Concentrate Tank**
   Foam concentrate tank shall be supplied that suit the application and needs of the end user. The foam concentrate tank should meet the minimum requirements as published in the applicable NFPA apparatus standards.
4. **Electrical Supply**
   Electrical wiring and circuit protection must be supplied and connected to the apparatus master electrical system as described in the installation manual.

Warranty

The system shall have a one-year limited manufacturer's warranty.

SECTION 7 – PHOTOS

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WATER
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ENGINE 1 WFD
SEATMONITOR
Galaxy S20 FE 5G


WARNING
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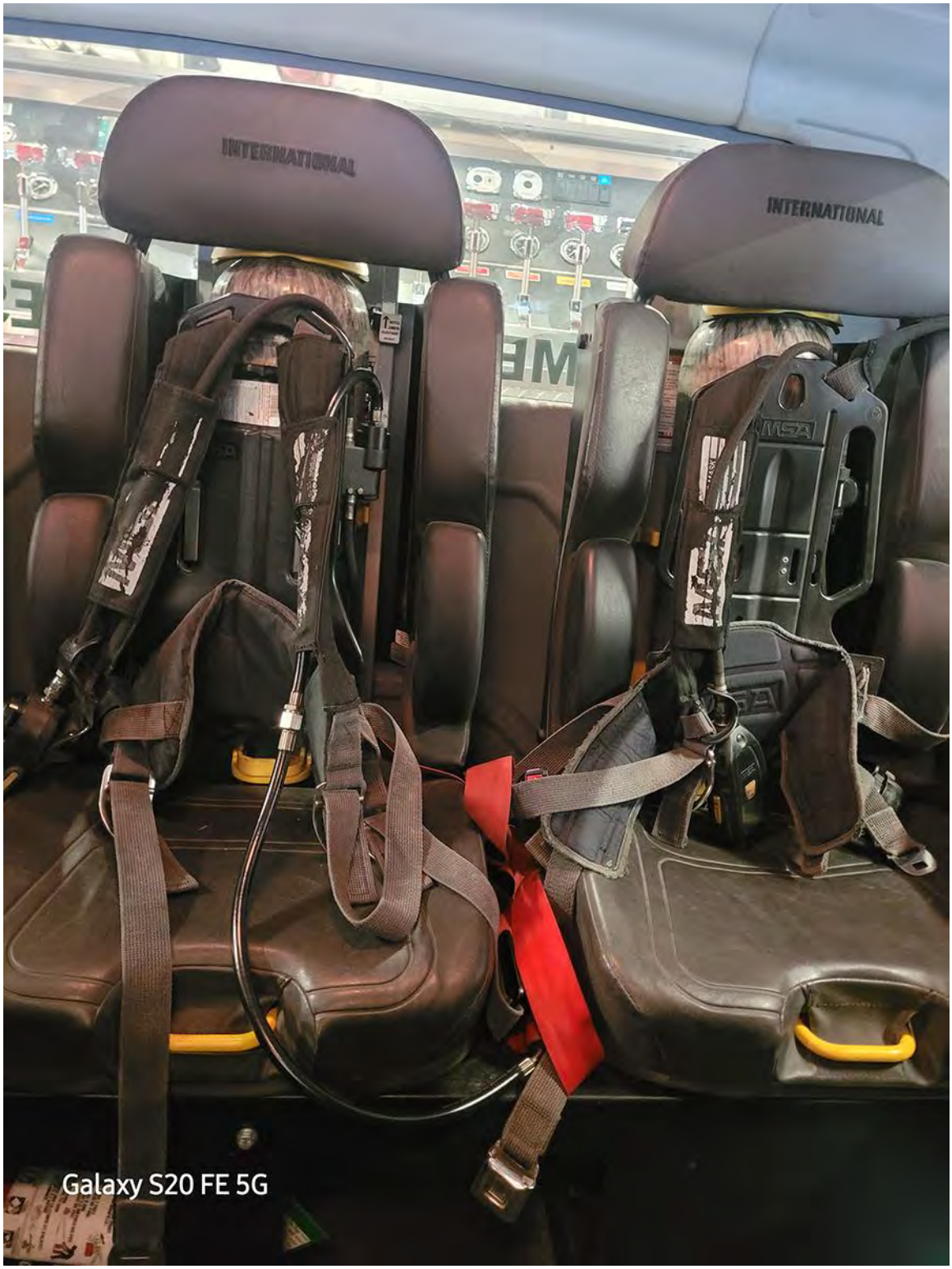
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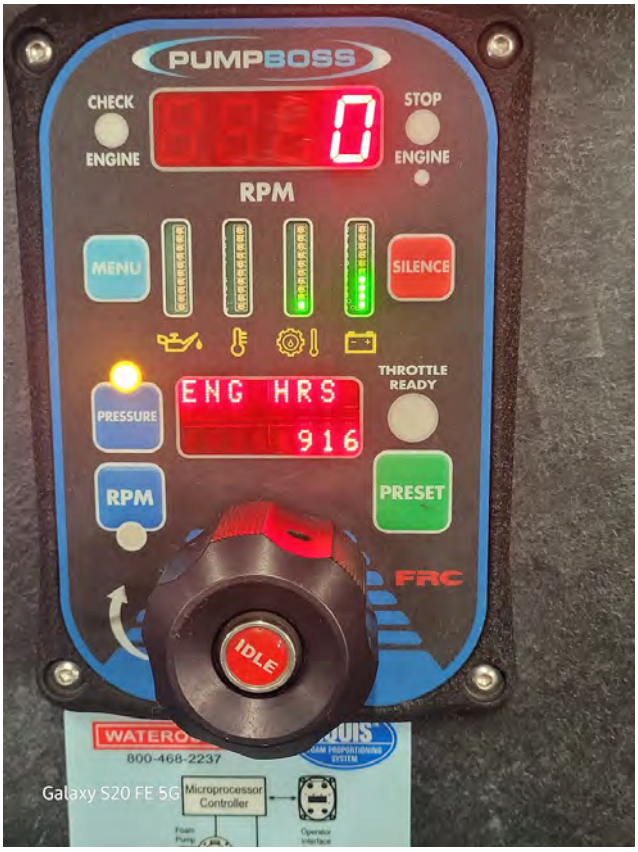
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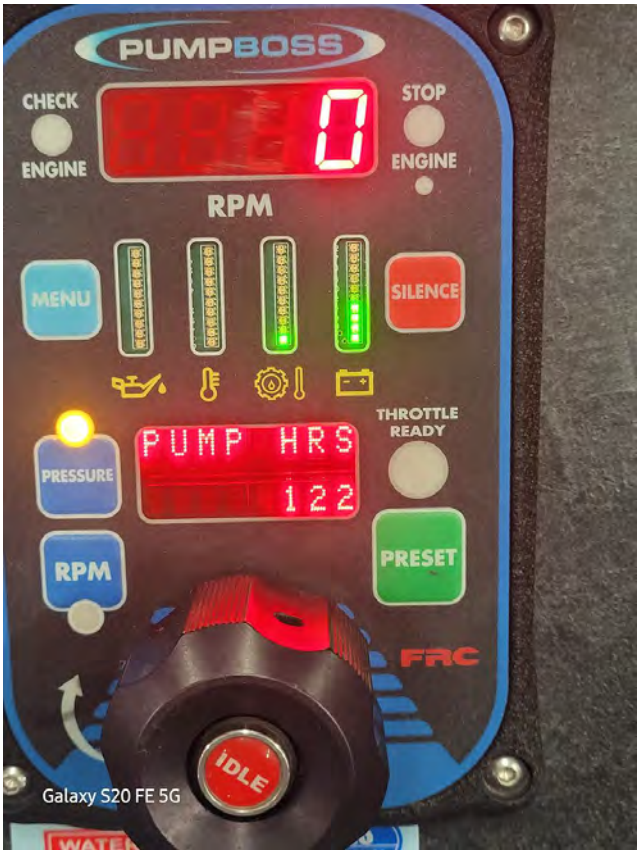
Microprocessor Controller
Galaxy S20 FE 5G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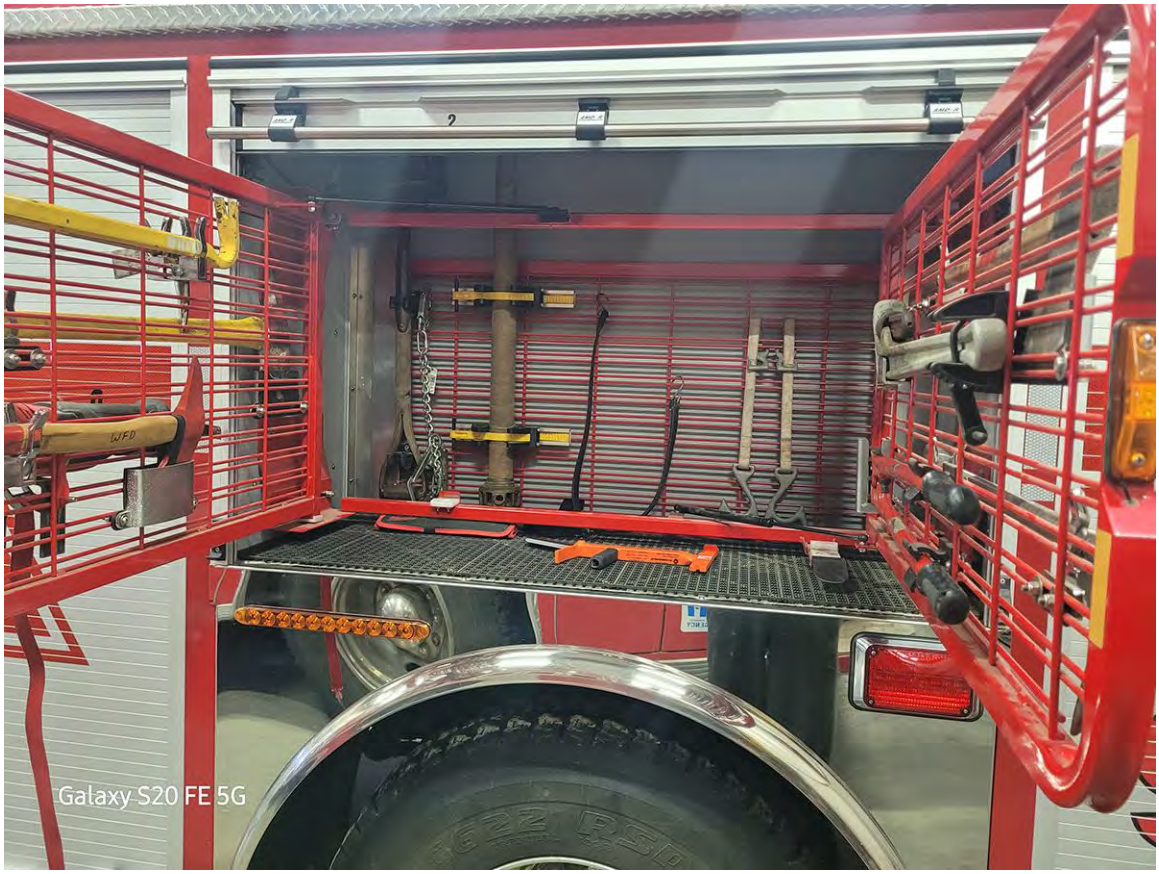
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Galaxy S20 FE 5G


RONA
Galaxy S20 FE 5G


4
Galaxy S20 FE 5G


Galaxy S20 FE 5G
Acres


Zico
YARDLEY, PA
POWERED
EQUIPMENT RACK
DANGER
SUDDEN RACK MOVEMENT MAY
CAUSE INJURY OR DEATH.
1. DOORS MUST BE CLOSED FOR RACK TO OPERATE.
2. BE SURE AREA IS CLEAR OF PERSONNEL BEFORE OPERATING.
3. DO NOT MOVE TRUCK UNLESS RACK IS SECURED.
ON
UP
READY
OFF
DOWN
NOTE: BATTERY SWITCH MUST BE ON FOR OPERATION
FoamFill System
Operating Instructions
1. Connect fill hose assembly to quick connect port.
2. Press red POWER switch to activate system.
3. Press green AUTO switch for Auto Fill Mode.
Green LED will illuminate.
System will activate at low tank level.
Amber LED will flash until tank is filled.
4. Press yellow MANUAL switch for Manual Mode.
Amber LED will flash while filling.
System will operate until tank is full.
If MANUAL switch is held, system will operate until switch is released.
5. Flush system when finished.
6. Refer to Waterous FoamFill Operation Manual for detailed operating instructions.
WATEROUS
FoamFill
POWER
AUTO
POWER
FULL
AUTO
MANUAL
WATEROUS
FOAMFILL CONNECTION
Galaxy S20 FE 5G


EMERGENCY
911
WHITEHEAD
FIRE DEPT.
ENGINE 1
Galaxy S20 FE 5G


WHITEHEAD
FIRE DEPT.
ENGINE 1
EMERGENCY
911
Galaxy S20 FE 5G


Manitoba
CFT 624
Acres
Galaxy S20 FE 5G


Galaxy S20 FE 5G


Acres
Acres
CFT 624
Galaxy S20 FE 5G


Acres
CFT 624
Galaxy S20 FE 5G


Acres
Acres
Galaxy S20 FE 5G


FOAMPRO
FLUSH
Galaxy S20 FE 5G


FoamFill Flush
FILL
FLUSH
2.5" DISCHARGE #3
READY
OFF
FoamFill System
FoamFill
POWER
AUTO
FULL
MANUAL
6.0" DRAFT INLET
OFFICER SIDE
WATERFLOW
FOAMFILL CONNECTION
2.5" AUX INLET #2
DRAINS BELOW
Galaxy S20 FE 5G


Galaxy S20 FE 5G


WHITEHEAD
FIRE DEPT.
ENGINE 1
911
Galaxy S20 FE 5G


WHITEHEAD
FIRE DEPT.
ENGINE 1
Acres
Galaxy S20 FE 5G


WATEROUS
Galaxy S20 FE 5G


Galaxy S20 FE 5G