



League City Volunteer Fire Dept.
League City Tx
S/N 0503426 AERIAL LADDER
RE-MANUFACTURING PROPOSAL

ELEVATING PLATFORM SPECIFICATIONS
REMANUFACTURE AERIAL DEVICE

INTENT OF AERIAL SPECIFICATIONS

It is the intent of this Proposal Specification to describe furnishing and delivery to the Purchaser (also referred to as “Fire Department”), one (1) complete re-manufactured aerial ladder truck (also referred to as “apparatus”) with re-manufacturing process and other details as hereinafter specified. Re-manufacturing will consist of complete dis-assembly of aerial ladder assembly, turntable assembly, tiller cab assembly, trailer assembly and body compartments. Existing major sub weldments will be reused in re-manufacturing process. Third party Non-destructive inspection/test will be completed on each sub weldment which will consist of visual inspection for any defects, magnetic particle test of welds on each ladder section, turntable sub weldment and trailer frame weldment. An ultrasound test will be completed as required to determine material thickness and meet manufacturer specifications. If test results determine weld and defect repairs are required to meet manufacturers and third party criteria, repairs will be completed. If repairs cannot be completed to manufacturers and third party criteria and replacement is required, component will be proposed separately for replacement. Upon Completion of re-manufactured unit a complete In Service Unit Third Party Recertification and NTD test/inspection will be completed, including a 1:1 aerial load test, stability test and generator load test.

With a view to obtaining the best results and the most acceptable apparatus for service in the fire department, these specifications cover only general requirements as to the type of constructions and tests to which the apparatus must conform together with certain details as to finish, equipment and appliances. Details of construction and materials, where not otherwise specified, are left to the discretion of the contractor who shall be solely responsible for the design and construction of all features.

WELDMENT FIXTURES

To ensure the highest levels of quality and ultimate safety, all weldments, outrigger, turntable, ladder sections, pins, bushing, etc. shall be inspected, magnetic particle tested, and ultrasound tested as required.

AERIAL APPARATUS CERTIFICATION - (TYPE I)



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The aerial device shall be tested and certified by a third-party testing company in compliance with the National Fire Protection Association (NFPA) Standard No. 1911 in service aerial test.

All welding on the aerial device shall meet American Welding Society (AWS) D1.1 Structural Welding Code.

The following tests shall be conducted by personnel holding a Level II Certification in accordance with ASNT #CP-189 recommend practices:

1. Nondestructive testing methods shall be incorporated into the inspection to detect defects and improperly secured parts.

a) Magnetic particle inspection shall be conducted on all parts of the ladder, turntable and outriggers before assembly to assure the integrity of the weldments and to detect any discontinuities.

b) Ultrasonic inspection shall be used to detect any flaws in pins, bolts, and other critical mounting components.

2. Functional tests, load tests, stability tests and visual structural examinations shall be performed. These tests shall determine any unusual deflection, noise, vibration, or instability characteristic of the unit.

Upon completion of the preceding inspections, the third-party testing company shall issue a Certificate of Inspection - (Type I) indicating that all specified standards have been satisfied. Aerial manufacturers not utilizing third party, independent testing companies shall not be acceptable. Aerial manufacturers not providing a Type I Certification of Inspection shall not be acceptable.

TESTING CRITERIA

The following stability requirements shall be met by the aerial apparatus when it is in a service-ready condition. Items such as water, hose, ground ladders, loose equipment, etc. shall be removed. Items mounted on the aerial device shall remain mounted.

1:1 Stability Test - A test of the apparatus shall be performed that the ladder sections are so designed and powered to support a load representing 100% of the manufacturer's rated payload capability at maximum horizontal reach and rotated.



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1:1 Stability Test - A test of the apparatus shall be performed that the ladder sections are so designed and powered to support a load representing 100% of the manufacturer's rated payload capability at maximum horizontal reach and rotated with the vehicle on a slope of 5 degrees downward in a direction most likely to cause overturning.

A time test of the apparatus shall be performed to raise the platform from the bedded position, extended to full height and rotated through a 90 degree turn smoothly and without undue vibration in not over 150 seconds.

A water tower test of the apparatus shall be performed to test the ability to discharge 1,000 gallons per minute, 90 degree to the ladder, with the ladder at full extension, 30 degrees elevation.

OPERATION ON GRADES

The aerial shall be capable of being operated in any plane with the aerial turntable being up to 3-1/2 degrees out of level without any reduction of rated capabilities. For slope conditions with the turntable being from 3-1/2 degrees to 8.0 degrees out of level, capabilities shall be reduced by 50%. Operation beyond this limit shall be at the operator's discretion.

AERIAL DEVICE MOUNTING

The steel ladder rest shall be re-used to support the ladder in the travel position. The ladder rest shall be bolted to the chassis frame as close to the front axle as design allows. Stainless steel bedding plates shall be attached to the ladder base section to protect the ladder paint when the unit is in the travel position.

OUTRIGGERS

Four (4) independently controlled out-and-down type outriggers shall be re-used, capable of maximum stability within an 18' stance across the outriggers.

Each jack cylinder will be re-sealed and shall have a 5" internal diameter (bore), 3-1/2" external diameter chrome plated cylinder rod with a 36-3/4" stroke. The outriggers shall have the capability to obtaining 20" of ground penetration for set-up on uneven terrain.

Jack cylinders shall be equipped with dual, integral counterbalance holding valves which shall maintain cylinder position in the event of hydraulic system failure.



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The extension of the horizontal beams shall be accomplished by an re-sealed extension cylinder which as a 3" internal diameter (bore), 2" diameter cylinder rod, and a 65-1/2" stroke.

All cylinders shall be fully enclosed within telescoping jack boxes to protect the cylinder rods against damage which may occur while on the fire ground.

Five (5) slide pads shall be provided for each outrigger assembly to provide smooth operation and to extend the life of the outrigger.

OUTRIGGER PADS

The existing outrigger pads shall be floating, self-leveling pads fabricated with ½" thick steel plate providing 154 square inches of contact per outrigger. These 14" diameter steel pads use a double knuckle design to connect to the outrigger allowing the pad to be self-leveling for total contact with uneven terrain for optimum load distribution.

AUXILIARY OUTRIGGER PADS

The Four (4) auxiliary outrigger pads shall be re-used for additional load distribution on soft surfaces. Each pad shall be fabricated of 3/8" x 24" x 24" 6061-T6 high strength aluminum alloy and shall have a handle for easy use of the 576 square inch flat pad.

OUTRIGGER LEVELING INDICATORS

Two (2) bubble type leveling indicators shall be provided at the rear of the apparatus, one (1) each side to assist in outrigger set-up and leveling of the apparatus.

OUTRIGGER DEPLOYMENT WARNING ALARM

An outrigger deployment warning device shall be inspected and re-used to warn personnel in the vicinity of the apparatus that the outriggers are in motion. Whenever an outrigger control handle is utilized, the device shall produce a pulsing tone, separate and distinctive from that of other audible warning systems provided on the apparatus. When the outrigger control device is released to its neutral position, the signal shall cease. The warning device shall have a two-position switch to enable the dB level to be raised or lowered.

SAFETY FEATURES



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The outrigger system shall provide the following safety features:

All components will be inspected, cleaned and re-used

1. A system to ensure that all outrigger beams are fully extended before the jack cylinders can be lowered.
2. An outrigger interlock system to prevent raising of the aerial prior to all outriggers' being in firm contact with the ground. Green indicator lights shall be provided at the outrigger control stations to indicate circuit completion.
3. A momentary override safety switch to allow operator discretionary placement of an outrigger jack with the beam at less than full extension.
4. A ladder cradle/outrigger interlock system shall be provided to prevent the lifting of the aerial from the nested position until the operator places all jacks in the load supporting configuration. A limit switch at the ladder rest shall prevent operation of the outriggers once the aerial has been elevated from the nested position.

For the safety of personnel and equipment, no exceptions shall be allowed to this interlock system.

OUTRIGGER CONTROLS

All controls will be inspected cleaned and re-used

Two (2) illuminated outrigger control stations shall be re-used at the rear most corners of the body, one (1) each side.

Each outrigger shall be independently controlled in both in/out and up/down modes to allow vehicle set-up in restricted areas or on uneven terrain. However, it shall not be possible to lower the jacks unless all outrigger beams have been fully extended or the operator actuates the momentary override switch to allow discretionary placement of an outrigger beam.

The following features shall be provided at each control station, clearly identified and suitably illuminated for ease of operation: Fast Idle Switch (Each Side), Momentary Safety Switch, Outrigger Control Handles, "Outrigger Deployed" Indicators and Emergency Power Unit Switch (EPU).

REFURBISH AERIAL LADDER SECTIONS



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The existing ladder sections shall be placed in fixtures as described under weldments, assuring uniformity, re-place ability, or changeability, and shall be welded in accordance with American Welding Standards (AWS) criteria by certified welders.

All welds shall be third party inspected to include visual inspection, magnetic particle tested, and ultrasound test on material as required. All weld repairs will be completed to pass inspection requirements. Visual inspection will include identifying gouges, dents, and damage to structural members to determine if these are within manufacturer's specifications. Notification of these repairs will be given and determination on the extent of damage and repair.

Ladder rungs shall be covered with replaceable rubber covers that shall be serrated for traction and held in place with a weather resistant adhesive and metal clips. Due to high maintenance cost and difficulty in replacement of anti-slip rung surface and the inability to provide a safe surface during icing conditions.

PLATFORM SPECIFICATIONS

The existing aerial platform support structure consisting of high strength steel tubing, angles, and channels shall be stripped of paint and third party inspected. Any weld defect will be repaired. It will then be repainted. The handrails, floor and support structure shall be assembled to enable each component to be unbolted from each other for ease of replacement should a component of the platform be damaged.

Four (4) heavy duty rubber bumpers shall be installed under the platform to prevent damage to the platform when the unit is placed on the ground or on the edge of a building. The bumpers shall be bolted directly to the structural framework of the platform.

PLATFORM COVERINGS

For maximum safety, the operator in the platform shall be protected by rigidized stainless steel protective shields. The shields shall be provided on the sides of the platform, behind the gates, the side and front surface of each front corner gate, front of platform and the entire underside of platform. The shield shall be cleaned and re-used.

FLOOR

The platform floor shall be cleaned, inspected and re-used. The floor shall be a one-piece assembly which extends out past the platform handrail structure 8.00" on each side and 9.00" at the forward gate corners, making transfer in and out of the platform easier.



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For safety of transfer to or from the platform, the platform floor and outside platform step shall be on the same level. The two (2) front corners of the floor shall be cut at an angle, allowing the platform to be maneuvered closer to buildings.

HANDRAIL STRUCTURE

The existing handrail structure shall be re-used. The structure will be stripped of paint and third party inspected. Any weld defect will be repaired. It will then be repainted.

PLATFORM/LADDER ACCESS GATE

A gate shall be re-used between the platform and the fly ladder section. The gate shall be spring-loaded and shall automatically return to the closed position at all times. The gate shall push upward and/or inward to the platform from the fly section. The gate shall not move if pushed against from inside the platform. A pin type lock assembly shall be installed which shall lock the gate in the stored position for additional safety.

PLATFORM LEVELING SYSTEM

A platform leveling system shall be provided and so designed that the platform, together with its rated payload, can be supported and maintained level in relation to the turntable, regardless of the elevation of the ladder.

Platform leveling shall be accomplished by hydraulic circuitry that is independent from the main hydraulic system with an interconnecting control valve.

The leveling of the platform shall be accomplished by the following two (2) systems working together.

1. The existing dual master/slave hydraulic cylinder shall be re-sealed and re-used. The leveling of the platform shall feature a dual master/slave system with each side capable of maintaining the platform level. Two (2) 3" bore master cylinders shall be mounted between the turntable and the ladder base section; and two (2) 3" bore slave cylinders shall be mounted between the ladder fly section and the platform. Master/slave cylinders shall be equipped with spherical swivel bushings to extend cylinder seal life and provide a non-rigid, cushioned suspension of the platform.



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As the platform is raised or lowered, hydraulic fluid shall be transferred between the master and slave cylinders, thus maintaining the platform level. The slave cylinder shall be mounted outside of the platform for maximum platform space utilization.

2. Auto-leveling system - An automatic level sensing device, located in the platform, shall be provided to ensure that the platform is always level. The leveling system shall provide the following safety features:

- a. The leveling system shall be so designed that with the platform raised to its maximum elevation, the platform slave cylinders shall be fully retracted, thus making tipping of the platform impossible should a hydraulic failure occur.
- b. Leveling cylinders shall have hydraulic holding valves to prevent the platform from tipping should the hydraulic lines be severed.
- c. The slave cylinders shall be mounted outside the platform for maximum utilization of space and for safety of personnel from moving cylinders.

PLATFORM MOUNTING

The platform shall be suspended from the tip of the fly section in a manner that provides a cushioning effect when the vehicle encounters road irregularities. The steel platform support weldment shall be pinned to the end of the fly; and the hydraulic cylinders shall be attached at a point below the pinning point and to the fly section behind the pinning point to create a load absorbing triangle which utilizes the cushioning effect of the cylinders in the design.

SAFETY BELT CONNECTIONS

Four (4) stainless steel safety belt connection U-bolts shall be installed in the handrail of the platform to enable connection of ladder safety belts. Two (2) loops shall be located in the front top handrail and two (2) at the upper rear of the platform.

STEEL LIFTING EYES

Two (2) welded steel lifting eyes shall be installed under the platform one (1) each side of the platform centerline. Each eye shall be of the "U" shape design and attached directly to the support structure of the platform. The lifting eyes shall have a capacity of 500 lbs. each or a combined capacity of 1000 lbs.



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Any weight attached to the lifting eyes must be subtracted from the capacities indicated in the platform capacity load chart located in the platform.

PLATFORM EQUIPMENT STORAGE COMPARTMENTS

Two (2) aluminum diamond plate compartments shall be re-used and attached to each exterior rear corner of the aerial ladder platform. The compartments shall be sectioned off and provided with a separate access doors. Each door shall be furnished with a push-to-release door latch.

PLATFORM CLEARANCE LIGHTS

New LED clearance lighting will be installed.

ELEVATION SYSTEM

Two (2) existing double-acting lift cylinders shall be re-sealed and re-used and provide smooth, precise elevation from minus 6 degrees to plus 80 degrees. Lift cylinders shall be attached to a lifting beam which distributes equal force to each side of the ladder base section. The lifting beam shall apply all lifting forces in a plane parallel to the vertical center line of the base and side rails.

The elevation cylinders shall be pinned to the front structure of the turntable weldment and within the upper section of the triangulated lifting structure, one (1) each side of the ladder.

Elevation cylinders shall have a 7" internal diameter (bore); 5" cylinder rod diameter and a 78" stroke. The elevation cylinders shall be equipped with integral (on the cylinder) holding valves to prevent the unit from falling should the charge lines be severed at any point within the hydraulic system. A hydraulic holding valve shall be provided in the elevation circuit to retain the aerial ladder in its bed when the vehicle is in motion.

The elevation cylinders shall be provided with both rod and piston "hydraulic cushions". The cushions shall serve to decelerate the cylinder near the end of its stroke resulting in a smooth stop at full cylinder stroke.

ROTATION SYSTEM

A 40.29" diameter external tooth mono race bearing shall be inspected and re-used for 360 degree continuous rotation in either direction. The bearing shall have a minimum rated moment of



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523,000 ft. lbs. To ensure proper bearing installation and long service life, surfaces of both the open base bearing plate and the turntable bearing plate shall be milled. Units that do not have milled bearing surfaces shall not be acceptable.

The bearing shall be bolted to the turntable and bolted to the open base support plate, using seventy-one (71) 7/8" diameter Grade 8 bolts. A planetary drive gear box, powered by a hydraulic motor, shall provide precision rotation control throughout 360 degrees of rotation. A spring-applied, hydraulically-released disc type brake shall be furnished to provide positive braking of the turntable assembly against reactionary forces such as water flow and gravity.

The turntable rotation bearing shall be easily accessible for lubrication and retorting of bolts from the turntable side, for ease of access.

ROTATION LIMITING SYSTEM

An new aerial ladder rotation limiting system shall be installed to notify and prevent the operator from rotating the aerial ladder into a restricted position due to a "short-set" outrigger configuration. The system shall enable the operator to place the aerial ladder in a 180 degree rotation to the opposite side of the apparatus than that of the "short-set" outriggers only. Indicator lights shall be provided on the turntable control console to indicate outrigger not deployed status.

In order to rotate the aerial ladder with a outrigger "short-set", the aerial interlock override control momentary switch located in the turntable control console shall require to be continuously activated while rotation of the aerial is in process. The system shall be capable of rotating the ladder slightly past the centerline of the apparatus on the "short-set" side to enable bedding of the ladder within the travel support structure without system cutoff.

EXTENSION/RETRACTION SYSTEM

A full hydraulic powered extension and retraction system of the ladder shall be provided through dual hydraulic cylinders and cables, each capable of operating the ladder in the event of failure of one of the systems.

The extension cylinders shall be re-sealed and re-used and have a 3-1/4" internal diameter (bore) with 1-1/2" diameter double rod and 155" stroke. The extension/retraction cylinders shall be equipped with integral (on the cylinder) holding valves to prevent the unit from falling should the charge lines be severed any point within the hydraulic system.



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The extension cylinders shall be provided with both rod and piston "hydraulic cushions". The cushions shall serve to decelerate the cylinder near the end of its stroke resulting in a smooth stop at full cylinder stroke. Each double rod cylinder shall be installed with both rod ends attached to the base section, permitting the cylinder barrel to travel fore and aft through the length of the base section. The extension cylinders shall be so designed that the cylinder rods are in tension at all times thus eliminating the possibility of bending or buckling of the cylinder rods.

Cylinders in excess of 25 feet with the rod extended, or that require the attachment of the rod to the mid-section, shall not be desirable for two (2) reasons that are not consistent with the level of quality desired by the purchaser:

1. Rod attachment to the mid-section requires that the lower rung rail cannot be sealed from the atmosphere and therefore long-term corrosion cannot be adequately controlled.
2. The cylinder shall be subjected to the buckling forces caused by normal ladder deflection.

Cables attached to the base and mid ladder sections shall be routed over sheave wheels on the base section and cylinder barrel. This cabling arrangement shall act as a stroke multiplier to provide full-power ladder extension and retraction. Extension of the ladder sections shall be accomplished by the movement of the cylinder barrel toward the turntable end of the base section, thus providing better weight distribution when the ladder is extended.

Retraction of the ladder sections shall be accomplished by movement of the barrel toward the outboard end of the base section, thus providing better weight distribution between front and rear axles of the apparatus when stowed in the travel position. Dual extension/retraction cables shall have a minimum static safety factor of 5:1 and shall be of the following diameters: Mid-Section Extension: 1/2" / Mid-Section Retraction: 7/16" / Fly Section Extension: 7/16" / Fly Section Retraction: 3/8".

LADDER SLIDE MECHANISM

All ladder slide pads shall consist of ultra-high molecular weight (UHMW) synthetic material with a sliding coefficient of friction of 0.05. Slide pads shall be used on both upper and lower bearing surfaces and to control side sway of the sections.

EXTENSION INDICATOR

The base section handrails shall be provided with red Scotch-Lite reflective striping and numbers to indicate the extension of the aerial device. The stripes and numbers shall be spaced to indicate



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each 10 feet of aerial extension beyond the fully retracted position. An additional stripe shall be provided between the numbered stripes to indicate each 5 feet of aerial extension.

HYDRAULIC SYSTEM

The hydraulic system shall provide power in as efficient a manner as possible. The system shall use a piston type load sensing pump and shall be capable of operating under any red load condition and aerial position normal engine idle (slow idle) or governor controlled fast idle. The piston pump shall be capable of generating sufficient flows to allow multiple function operation without significant loss of speed. This pump will be inspected and re-used.

For size and weight considerations, The 60 gallon (maximum) oil reservoir shall be cleaned, checked for leaks and re-used. The reservoir shall be equipped with a gated drain line; and a gated suction line shall be provided between the oil reservoir and the hydraulic pump. The reservoir shall have a magnetic rod, a drain plug, an oil level sight glass and an easily accessible fill cap.

The system shall be equipped with both a pressure and a return line filter of no greater than 10 micron in mesh size. Filters shall be equipped with easily visible dirt alarms. Both filters shall be protected by bypass circuits to protect the system from extreme contamination caused by the breakdown of a neglected filter and subsequent release of previously trapped particles into the system.

The hydraulic system cylinders shall be sized and rated in accordance with previously described structural safety factors.

All hydraulic hoses and steel lines used in the system shall have 4:1 safety factor based upon burst pressure. Hoses shall be of the steel braided, rubber covered type and shall be properly sized to reduce heat build-up during prolonged periods of operation.

The system shall not be dependent upon an auxiliary cooler to control system temperature.

The system shall be capable of generating full rated flow capacities at no more than 1500 rpm. Each function shall be protected by a system relief valve and/or individual circuit relief valves, preset at the factory. Maximum preset system pressure shall be 2750 psi.

The existing three-function hydraulic proportional valve bank will be tested and re-used and shall control ladder functions. The valve shall be located at the turntable with direct linkage controls. Three (3) aerial control actuators shall be located at the aerial control station to provide "Raise/Lower"; "Extension/Retraction" and "Swing Left/Right" functions.



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The hydraulic system shall be capable of simultaneous outrigger functions or simultaneous aerial functions.

RE-MANUFACTURED COMBINATION HYDRAULIC, WATER AND ELECTRIC SWIVEL

Hydraulic power to the turntable hydraulic circuits shall be provided through a three-port, high pressure hydraulic swivel permitting 360 degrees continuous rotation of the turntable.

Water shall be transferred to the aerial waterway by means of a 5" internal diameter water swivel, permitting 360 degree continuous rotation.

Electric power to the turntable electric circuits shall be comprised of a minimum of twenty-six (26) ring collector assembly, permitting 360 degree continuous rotation of the turntable.

12 VOLT EMERGENCY HYDRAULIC SYSTEM

The apparatus shall be equipped with a 12 volt emergency hydraulic power system. The emergency system shall be electrically driven from the truck batteries and shall be capable of limited ladder functions to stow the ladder and outriggers in case of primary hydraulic pump failure. The hydraulic pump will be tested and re-used

Two (2) spring loaded switches shall be provided, one (1) on each side outrigger control station, to activate the emergency power unit.

POWER TAKE-OFF (PTO)

The apparatus shall re-use the "Clutch-Shift" PTO driven by the chassis drive train. A red indicator light shall be located in the cab next to the PTO switch to show when the PTO is engaged.

The PTO shall only engage with the chassis spring brake set and the transmission in neutral (or drive if the fire pump is engaged) to prevent unintentional movement of the chassis during hydraulic system operation.

For the safety of personnel and equipment, no exceptions shall be allowed to this neutral safety system.

TURNTABLE TREADPLATE

The existing steel tubing support structure shall be reused, to support the turntable diamond plate.



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94" wide x 95" long non-skid aluminum diamond plate shall be furnished around the turntable weldment. The diamond plate shall be furnished with a 1-1/2" lip on all sides.

An aluminum diamond plate access step shall be provided at the heel of the ladder. The vertical surface of the heel pin step to the rear face of the turntable shall not be less than 22 inches to obtain maximum room at the base of the aerial ladder. The diamond tread plate will be cleaned and re-used

SAFETY RAILING - TURNTABLE

The existing forty-two inch (42") high safety railing shall be cleaned re-used on the sides and rear of the turntable. The safety railing shall be constructed of 1-1/4" diameter heavy duty stainless steel knurled tubing. Brackets shall be polished stainless steel type. A vinyl covered safety chain shall be provided across each corner opening with chrome plated snap style clips.

CRADLE ALIGNMENT INDICATORS

Aluminum arrows with red Scotch-Lite coating shall be provided on the turntable surface, and on the apparatus body to indicate the alignment of the aerial ladder with the ladder travel cradle. The indicators shall be suitably illuminated for night time operation.

AERIAL CONTROL STATION - TURNTABLE CONSOLE

A new aerial control console shall be installed and located on the driver's side of the apparatus when the aerial is in the travel position to reduce damage from overhanging tree limbs. The components shall be clearly identified and suitably illuminated for ease of operation.

Deadman Foot Switch: A switch to safeguard against accidental movement of the aerial ladder. The aerial ladder function controllers shall remain inactive while the foot switch is not depressed.

Master Electrical Power Switch: A two (2) position, push/pull power switch shall be provided on the control panel. The switch shall be wired so that electric platform controllers are activated when the master switch is in the "ON" position, and electrical power is deactivated when in the "OFF" position.

Ladder Function Controllers: Three (3) ladder function controllers located on the turntable control console to provide elevation, extension, and rotation operational control of the aerial device. These controls shall be arranged to permit the operator to regulate the speed of these operations within the safe limits as determined by the manufacturer.



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Fast Idle Switch: A toggle switch located on the control panel to activate the Engine Fast Idle.

Platform Auxiliary Leveling Switches: A guarded switch located on the control panel to hydraulically re-level the platform as needed. A mushroom switch located on the control panel to deactivate the auxiliary platform leveling system.

Load Chart: The manufacturer's load chart, installed within view from the operator's console and properly illuminated for easy reference by the operator. The load chart shall indicate the manufacturer's recommended safe aerial loading and capacity weights at all angles of elevation and all extensions of the ladder.

Elevation Angle Indicator: A bubble-type indicator mounted in clear view of the operator to indicate the aerial device's angle of elevation.

Rung Alignment Indicator: A light located on the control panel to indicate that aerial ladder rungs are properly aligned for safe climbing.

Outrigger "Not Deployed" Indicator Light: A red indicator light shall be provided on the turntable console that shall be illuminated while the outriggers are not in a load supporting position. The light shall turn off once the outriggers are properly locked in position.

Hydraulic Oil Pressure Gauge: A 5000 psi hydraulic oil pressure gauge shall be provided and installed to indicate the overall pressure of the hydraulic system.

CONTROL CONSOLE COVER

The existing hinged metal cover with exterior white finish shall be provided for the T/T control console.

AERIAL CONTROL - PLATFORM CONSOLE

The existing platform control console shall be inspected re-used and shall include a rung alignment indicator, outrigger not-deployed indicator, aerial function controllers, speed selection switch, a fast idle switch and a momentary safety switch.

Located near the console shall be the operators load chart, elevation angle indicator and intercom controls.

The console shall have a fixed attachment platform location, at the right rear corner of the platform.



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Ladder function controllers shall be grouped in an identical manner as those at the turntable console for simplicity of operation. The controls shall be so designed that the turntable controls shall override those at the platform even if the aerial device is being operated from the platform console. All features shall be clearly identified and suitably illuminated for ease of operation.

AERIAL ELECTRICAL SYSTEM

Electrical power for the aerial device shall be drawn from the chassis electrical system and routed through major segregated circuits and into an electric collector ring assembly. The circuits shall provide power for the aerial device controls, indicators, and interlocks; other circuits shall power auxiliary equipment such as lights, intercom, etc.

The electric collector ring assembly shall provide power for electrical ground, ladder control functions, 12 and 120 volt systems. The collector rings shall be enclosed in a sealed, weatherproof housing to prevent corrosion.

All aerial device wiring shall be multi-conductor, copper 16 gauge (minimum), color-coded, with thermosetting cross-linked polyethylene insulation. All aerial device wiring shall be in pre-engineered harnesses with each circuit identified by number and color code. Harness connections shall be through locking, weatherproof, guided pin connectors.

ENGINE, FAST IDLE ACTUATOR

A fast idle actuator system shall be inspected and re-used and is provided to raise the engine RPM to a pre-set level for proper aerial operation. For the safety of personnel and equipment, the fast idle system shall not activate unless the interlock systems have been applied, the chassis spring brakes are set and the transmission is in neutral or in drive, when the fire pump is engaged. No exceptions shall be acceptable to this system.

The aerial device shall not be dependent upon the fast idle circuit to perform any rated task.

AERIAL HOUR METER

An hour meter shall be installed and wired to the aerial PTO to record hours of hydraulic pump operation. The hour meter shall aid in scheduling preventative maintenance as outlined in the Operator's Manual.

TURNTABLE WORK LIGHTS (OPTION)



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Four (4) 12 volt LED work lights shall be installed on the rear step of the turntable to illuminate the turntable diamondplate area.

OUTRIGGER LIGHTS (OPTION)

Two (2) Truck-Lite 7" diameter, LED red, flashing lights shall be mounted on each inner vertical surface of the outer jack box structure. One (1) light shall face forward while the second light faces rearward. These lights shall be re-used

One (1) Truck-Lite 4" diameter, white LED, ground illumination light shall be located beneath each extending outrigger beam box to illuminate the ground area for night operation.

All outrigger lights shall be activated by the "Ladder Power" switch in the cab to eliminate the need to activate additional switches before starting aerial operations.

COMMUNICATION SYSTEM

Fire Research ACT Intercom model ICA900-112 two-way system shall be installed. The intercom kit shall include two control modules, one that is hands free and one that has a push-to-talk button, two speakers, and cables. The interconnection between control modules shall require two wires. The control modules shall have an volume display and push-button volume control. The hands free module shall constantly transmit to the other module unless the push-to-talk button is pressed.

The intercom shall be designed for exterior use. The control module shall be no more than 2 7/8" high by 5 1/8" wide by 1 7/8". The speaker shall be no more than 5 1/8" high by 5 1/8" wide by 1 1/2" deep. The power requirements for each control module with a speaker shall not exceed 1/2 amp at 12 VDC.

PLATFORM SPOTLIGHT/FLOODLIGHT

New SoBrite LED platform flood lights shall be installed

AERIAL SPOTLIGHTS - REAR LADDER BASE HANDRAIL

New SoBrite Led aerial spot lights shall be installed.



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PLATFORM WARNING LIGHTS

Two new Whelen 700 blue LED warning lights shall be installed.

120 VOLT CIRCUIT TO THE PLATFORM

Two (2) 20 amp electrical circuits utilizing 12 gauge 5 conductor electrical cable shall be provided to the platform. The circuits shall be wired from an enclosure below the turntable through the collector ring assembly.

Two (2) NEMA L5- female, three-prong, twist lock receptacles with environmental covers shall be provided, one (1) each side of the platform.

120 VOLT TELESCOPING LIGHTS, REAR OF PLATFORM

The existing telescoping lights shall be cleaned and re-used

BREATHING AIR SYSTEM

A breathing air system shall be installed on the ladder base section and routed to the aerial ladder platform. The two (2) existing 250 cubic foot, 2265 psi air cylinders, shall be hydrostatic tested and repainted and securely mounted on the ladder base section, one (1) each side. The air cylinders shall be interconnected to a pressure regulator located on the left air cylinder. A shut-off valve on each cylinder shall allow the use of air from either cylinder.

Air from the cylinders shall be routed through a lower cylinder mounted pressure regulator, which shall reduce cylinder pressure to airline pressure, to the platform via reinforced synthetic air hose. the platform, the air shall be filtered through an airline filter and an upper platform mounted pressure regulator to be further reduced from airline pressure to air mask pressure.

Each cylinder shall be lettered "Breathing Air" with a label indicating "High Pressure 2265 PSI Breathing Air" per NFPA 1901 recommendations.

LOW AIR PRESSURE WARNING SYSTEM



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A Class 1 low air pressure warning system shall be inspected and re-used to indicate the amount of air remaining in the breathing air system. The lower station shall provide a visual low pressure warning when air capacity is less than 25% of maximum and an audible alarm when air pressure is less than 20% of maximum. The upper station shall provide an audible alarm when the air volume is less than 20% of maximum.

BREATHING AIR OUTLETS

Two (2) Hansen quick connect couplings shall be re-used, one (1) each side of the platform.

WATERWAY INLET

The aerial waterway shall inspected and re-used and be capable of being supplied by an external water source with intake at the rear of the apparatus. Six inch (6") black iron waterway piping shall be provided from the inlet at the center rear of the apparatus to the water swivel beneath the turntable. The waterway shall be reduced to five inch (5") at the rear inlet connection.

A liquid filled water pressure gauge shall be located near the external aerial inlet.

One (1) 1-1/2" drain valve shall be provided beneath the turntable with control located below the rear external aerial inlet.

A 5" NPT-F x 5" NST-M chrome plated adapter with screen shall be provided on the waterway exterior inlet. A 5" NST chrome plated blind cap shall be provide on the inlet adapter.

ROTATION SWIVEL

Water shall be transferred to the aerial waterway by means of a 5" internal diameter, water swivel which is part of the combination hydraulic/water/electric swivel. The water swivel shall be remanufactured and re-used

HEEL PIN SWIVEL

A swivel elbow located at the heel pins of the ladder shall be rebuilt with new seals and O-rings to permit water tower operation throughout the aerial device's full range of elevation.

TELESCOPIC WATERWAY



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The anodized aluminum telescopic waterway shall be resealed and reinstalled. The telescopic waterway shall consist of a 5" base section tube, 4-1/2" mid section tube, and 4" fly section tube.

PLATFORM WATER SYSTEM

The water swivel that connects the fly section waterway to the platform waterway shall be removed, resealed and reinstalled. The water swivel shall permit water tower operations throughout the aerial device's full range of elevation.

Two (2) 3.00" ID aluminum pipes shall transfer water from the swivel to two (2) 4" gear-operated butterfly valves on the front of the platform. A deck guns shall be re-used and shall bolt onto each of the butterfly valves by means of an 8-bolt mounting flange. The butterfly valves shall enable the deck guns to be shut down for use of the hand lines.

A shower nozzle, located beneath the platform and with direct linkage control from inside the platform, shall be re-used and provided for heat protection of platform personnel. A pressure relief valve set at 165 psi shall be located beneath the platform.

PLATFORM DISCHARGES (2)

There shall be two-(2) New 2-1/2" gated discharges located at the front of the platform. These discharges shall terminate with 2-1/2" Male NST couplings and 2-1/2" FNST x 1-1/2" MNST reducer caps and chains. The discharges will be inspected and re-used

WATERWAY RELIEF VALVE

A 2-1/2" preset pressure relief valve shall be inspected and re-used and installed in the aerial waterway piping system. The relief valve shall be capable of protecting the waterway system by relieving pressure through the dumping of water to the ground.

FLOWMETER (TURNTABLE)

A Class 1 Flow minder shall be inspected and re-used and installed on the turntable control console to provide a visual display of the ladder water system flow (GPM).

Multiplex

The Hawe Multiplex components for the aerial will be removed. A new standard control system will be installed in its place. The system will include a new aerial control valve,



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new controllers located in the platform. A new three function rotation swivel and new rotation interlock system. The Weldon V-Mux system that monitors the outrigger portion of the unit will be re-used.

PAINTING - AERIAL DEVICE

Before any painting, all weldments such as the outrigger beams, turntable, and ladder sections shall be shot panned to work-harden and stress relieve the exterior surface of all weldments and to ensure removal of any surface imperfections to ensure superior paint adhesion to the metal.

The entire painting system shall utilize a single manufacturer's paint for compatibility between primers and finished coats. All painting shall be done in atmosphere controlled spray booths. All seams between adjoining pieces that are not continuously welded shall be caulked to inhibit corrosion.

Before assembly, in preparation for final painting, the outrigger beams, turntable and ladder sections shall be thoroughly cleaned, conforming to good painting practices. The weldments shall then be primed with Epoxy Primer.

The aerial ladder sections shall then be coated with a polyurethane primer sealer. After which, they shall be sprayed with two (2) coats of PPG Polyurethane fleet white paint.

The outrigger beams shall be painted with enamel paint, allowing easy touch-up after extended use. The outrigger beams silver enamel. The torque box will not be removed or repainted.

SCOTCH-LITE OUTRIGGER BEAM STRIPING

Each outrigger beam assembly shall be striped with Scotch-Lite reflective material. The stripes shall be applied to provide a safe appearance when the beams are extended. The color of the stripes shall be white, and the width of each stripe shall be two inches (2").

OPERATOR INSTRUCTIONS, CAUTION, AND WARNING SIGNS

The manufacturer shall supply and affix various operator instruction, caution, and warning signs to the front, sides, rear and inside of the apparatus. The warning signs shall meet the general guidelines of ANSI Z35.1 (Specification for Accident Prevent Signs).

WARRANTY, AERIAL DEVICE PAINT, (1) YR, UNLIMITED HOURS



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Warranted against fading, cracking, checking, lack of adhesion, or material defect.

WARRANTY, AERIAL DEVICE, (1) YR

Coverage includes hydraulic system (hoses, lift cylinders, hydro/electric swivel and motors (rotation and extension/retraction cylinders); electrical system (cables); device components (slide pads, extension/retraction cables); waterway components (couplings, plumbing, swivel, and controls).

FORWARD ENCLOSURE AND FIRE PUMP SPECIFICATIONS

Electrical- New

Two (2) forward enclosure LED lights, with manual switch on light, shall be provided in the forward enclosure.

Three (3) LED lights shall be provided for illumination of the gauge panel.

Light switch shall be located on the gauge panel.

Two (2) aluminum hooded panel illumination lights shall be installed, one (1) on each upper corner of the right side pump panel, The lights shall be controlled by the light switch on the gauge panel.

Note: These lights shall be activated when the pump is engaged.

Fire Pump

General Fire Pump

The pump shall have a 20-10-10 pump test completed on it prior to the removal of the pump. Any issues found during the pump test will be recorded and a separate proposal to complete the repairs will be sent for the fire departments approval.

The pump and pump compartment will be removed from the unit and re-installed on the new chassis.

The pump compartment shall have all new tread plate installed.

The pump compartment shall have new pump and gauge panels installed.

All new pressure gauges shall be installed

All pump valves shall be rebuilt and re-used.

All electric valve controls shall be re-used.

All new bezels and labels shall be installed.



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One (1) new Pump Boss Pressure governor shall be installed.
The pump shall have a 20-10-10 pump test at the completion of the build.
The Foam Pro foam system shall be tested and reused.

WATER TANK

General Water Tank

The water tank will be removed, tested for leaks and reinstalled.

CUSTOM APPARATUS BODY SPECIFICATIONS

Body Components – Reconditioned

The body shall be removed from the unit; all body damage will be repaired.
The body will be prepped for paint, painted per customer color specifications and installed on new chassis.
The body shall have all new roll-up doors installed.
The body shall have all new diamond tread plate installed.
The body shall have all new stainless steel outrigger panels and control box door installed.
All compartment trays and shelving shall be cleaned and re-used.
All body steps shall be cleaned and re-used if possible.
The rear bulkhead of the body will be prepped for the installation of Chevron striping.
The generator will be tested. LTC will quote on a change order a price to repair or replace with new.

Reflective Stripe - New

Reflective striping will be installed per NFPA guidelines. The rear of the unit will have chevron striping installed

Electrical Wiring-Body – Reconditioned

The body wiring shall be inspected and repaired as necessary.

ICC Lighting-Body - New

Two (2) amber combination turn/clearance LED lights shall be mounted on the body sides between the rear tandem axles one (1) each side. These lights shall be wired to the turn signal control circuit, four-way flasher circuit, and the headlight switch circuit in the cab.



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Two (2) red clearance LED lights and two (2) red reflectors shall be mounted at the rear of the apparatus, one (1) each side.

Five (5) red clearance LED lights and two (2) red reflectors shall be mounted below the rear of the apparatus and protected from damage.

All clearance lights on the apparatus body shall be activated by the headlight switch.

Rear ICC Body Lights - New

Two (2) LED back-up lights shall be provided on the rear of the apparatus, one (1) each side.

Two (2) LED stop/taillights shall be provided on the rear of the apparatus, one (1) each side.

Two (2) LED directional signals with amber lenses shall be provided on the rear of the apparatus, one (1) each side. Directional shall have black arrows in the center.

Non-Warning Lights - Body - New

One (2) LED compartment light, with automatic door switch, shall be located in the on each side of the enclosed compartment. The lights shall be controlled by a switch in the corner of each compartment opening and wired to the compartment open light in the cab.

One (1) LED compartment light, with individual switch on the base of the light, shall be provided in each of the enclosed ground ladder storage area(s).

One (1) LED light shall be installed, under the top step of the A-frame to illuminate the A-frame style steps leading to the turntable of the aerial device. These lights shall be activated when the handle for the step unlatches the step assembly.

Two (2) LED chrome-plated hooded lights, connected to the headlight switch, shall be provided to illuminate the rear body panel, one (1) each side. A license plate mounting bracket, shall be provided below the hooded light on the left side.

Two (2) SoBrite LED spotlights shall be install on the rear of the body top deck.

Warning Lights and Devices - Body - New

New LED warning lights shall be install per NFPA. The lights shall be controlled by a separate on/off switch located in the cab switch panel and labeled as to function.

110-VOLT SPECIFICATIONS

Generator Reuse the customer supplied generator



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Circuit Breaker Panel - Reconditioned

The circuit breaker panel shall be reused with manual reset circuit breakers as required. Each circuit breaker shall be sized according to its application and properly labeled as to its function. Wiring provided within the circuit breaker panel shall be new and of stranded copper conductor type with ground wired being green in color and neutral wires being white in color. Four (4) NEMA L5 -20 outlets electrical receptacles with weather proof spring loaded covers shall be reused: All receptacles shall be labeled as to voltage, current, phase and amperage rating.

Quartz Lights – Existing

The existing quartz shall be painted and reused.

Generator Test

When installation of the generator is complete, a polarity test, full operational test, and a one-minute 900 volt dielectric test shall be performed on the system. The results of these tests shall be recorded and provided to the customer upon delivery of the completed unit.