SPECIFICATIONS

INSULATED 42 FT. WORKING HEIGHT ARTICULATING AERIAL DEVICE

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It is the intent of the following specifications to set minimum requirements for an INSULATED 37 ft. bottom of platform, 42 ft. working height rear mounted aerial device with a side mounted one-man platform. These specifications must be considered minimum requirements. Any exceptions to these specifications must be so stated in your bid. All units must meet or exceed OSHA and ANSI/SIA A92.2-2015 standards, without exception.

GENERAL SPECIFICATIONS

Height to bottom of platform*	37 ft. (11.27m)
Working height*	42 ft. (12.80m)
Horizontal reach from centerline	30 ft. (9.14m)
Stowed Height	10 ft. 8 in. (3.25m)
Rated capacity of platform	350 lbs. (159kg)

*Based on a 40 inch (1.02m) chassis frame height.

The major components of the aerial device shall be powdercoated white. Special colors are available. Small parts shall be powdercoated or painted black. Components are to be painted or powder coated prior to assembly.

Aerial device, power sources, and all mounting attachments shall not exceed 2,000 lbs. (909kg) weight.

STABILITY

Completed unit shall be capable of passing ANSI/SIA A92.2-2015 stability test when mounted on a cab/chassis of at least 15,000 GVWR. Use of counterweight, torsion bar or outriggers may be required for stability. If outriggers are used for stability, an outrigger/boom interlock system shall be provided to prevent aerial lift operation unless the outriggers have made contact with the ground. It also previents outrigger operation if the aerial lift is in operation. A control valve shall be provided on each side of the rear of the body to provide visibility of each outrigger during operation.

HYDRAULIC SYSTEM

Operating pressure shall be a maximum of 3000 PSI (207bar). Operating oil volume shall be 3.0 to 3.5 GPM (11.4 to 13.2lpm) for lift operation. An open center type hydraulic system shall be used. Unit shall be equipped with a 10 micron filter in the return line and a 100 mesh screen at the suction port of the 15 gallon (57l) oil reservoir. The system pressure relief to be integral to the lower control valve.

Double acting hydraulic cylinders equipped with an integral holding valve shall provide boom motion. The upper boom to articulate through the use of a hydraulic cylinder attached directly to the lower boom and a four bar linkage to the upper boom. Articulation through use of cables or chains is unacceptable. The upper and lower boom cylinders shall be identical for ease of service.

All hydraulic adapters must be machined from forgings. Brazed hydraulic adapters are not acceptable. Hydraulic hose to be non-conductive Parker 518C with permanent crimped on fittings. Reusable fittings can be used for field repair.

PEDESTAL

The pedestal shall be 0.25 in. (6.4mm) steel welded into a rectangular structure with a 1.0 in. (25.4mm) top plate. The hydraulic reservoir will be a separate component mounted inside the pedestal for protection. The reservoir will include a sight glass indicating oil level and temperature. The hydraulic reservoir is to be constructed from steel and powder coated for maximum cooling and protection from corrosion. Hydraulic reservoirs integral to the pedestal are not acceptable. The rotation drive will be fastened to the pedestal with 0.63 in. (16.0mm) diameter grade 5 hex head cap screws tightened to a specified torque. Rotation cap screws to be installed with a thread locking liquid to prevent loosening.

TURRET

The turret assembly will be a welded assembly with 0.63 in. (16.0mm) sides and a 0.75 in. (19.1mm) base plate. The turret will be fastened to the rotation system with 0.63 in. (16.0mm) diameter grade 5 hex head cap screws tightened to a specified torque. Rotation cap screws to be installed with a thread locking liquid to prevent loosening.

ROTATION DRIVE (CHOOSE ONE)

Non-Continuous Rotation

The rotation drive shall be a shear ball bearing with a worm acting directly on helical gear teeth machined on the outer race. The rotation bearing must be sized to allow the use of 0.63 inch (16.0mm) diameter grade 5 hex head capscrews for attachment to the pedestal and turret. The worm must be self locking and hourglass shaped to engage multiple teeth at all times. The rotation bearing, worm and housing must be factory adjusted and not require field adjustment. Separate right angle gearboxes that require periodic adjustment are unacceptable. A removable cover must be provided over the rotation bearing to allow easy access for lubrication of the gear teeth. Rotation shall be limited to 540° non-continuous be means of a mechanical stop. Electric or hydraulic rotation stops are not acceptable. The worm shaft shall have exposed hexagonal end for manual rotation.

Continuous Rotation

The rotation drive shall be a shear ball bearing with a worm driving directly on helical gear teeth machined on the outer race. The rotation bearing must be sized to allow the use of 0.63 inch (16.0mm) diameter grade 5 hex head capscrews for attachment to the pedestal and turret. The worm must be self locking and hourglass shaped to engage multiple teeth at all times. The rotation bearing, worm and housing must be factory adjusted and not require field adjustment. Separate right angle gearboxes that require periodic adjustment are unacceptable. A removable cover must be provided over the rotation bearing to allow easy access for lubrication of the gear teeth. Rotation shall be continuous using a hydraulic swivel and electrical slip rings for hydraulic oil flow and elcectical signals. The worm shafts shall have exposed hexagonal end for manual rotaton.

BOOM ASSEMBLY

The aerial device shall be an overcenter articulating type. The steel section of the upper boom is to be fabricated from 5 in. x 7 in. (127.0mm x 177.8mm) high strength/low alloy steel tubing with a minimum yield strength of 70,000 PSI. The lower boom shall also be fabricated from 5 in. x 7 in. (127.0mm x 177.8mm) steel tubing and operate from - 8 degrees to plus 93 degrees. The upper boom shall travel up to 180° relative to the lower boom.

The mechanical leveling system includes #60 roller chain, 0.50 in. (12.7mm) steel rods in the lower boom and 0.50 in. (12.7mm) fiberglass rods in the upper boom. Leveling and tension adjustment is at the knuckle and includes hex turnbuckles for ease of adjustment. Hose guides to be included to isolate the leveling system from the hoses at the knuckle and turret. Exterior mounted leveling systems and/or systems using leveling cables are not acceptable.

A section of the upper boom shall be constructed of filament wound fiberglass reinforced plastic using epoxy resin and oven cured for consistent strength. Hand layed up booms or catalyst cured polyester resins are not acceptable. The upper boom shall be dielectrically tested and certified to meet ANSI A92.2-2015 for Category C or D, 46kV and Below. An insulation gap from 42 in. (1.07m) to 118 in. (3.00m) is available.

All pivot pins shall have a minimum tensile strength of 150,000 PSI. Pins shall be zinc plated and have non-lube bearings at all points of boom movement.

Hoses and airlines for aerial lift operation are housed inside the booms for protection. Cordura sleeves are also provided at the elbow and near the platform for additional hose and airline protection.

PLATFORM

The platform base shall be mounted to the side of the boom and be automatically leveled by the mechanical leveling system. It shall be molded fiberglass, 24 in. x 24 in. x 42 in. (0.61m x 0.61m x 1.07m) with a smooth surface on the inside and outside with a step bonded to a wall at 90 degrees to the mounting ribs. A non-skid surface will be applied to the step surface. Self adhesive non-skid strips are not acceptable.

MOUNTING

The pedestal base shall be mounted directly to cross members underneath the body floor independent of the body. The cross mememberss shall be secured to the chassis frame with four shear plates using two 0.63 in. (16.0mm) diameter Grade 8 hex head cap screws in each shear plate. The body floor must be removed to allow the pedestal base to be bolted directly to the cross members and isolate it from the body. Mounting that attaches to or sandwiches the floor is unacceptable.

Platform access steps from the body load space are required. A boom rest with a rubber pad molded to a steel plate and ratchet tie down strap shall be mounted in the body load space. Rubber pads not molded to a steel plate or plastic dipped boom rests are unacceptable. A single tie down strap must secure both the upper and lower booms.

LOWER CONTROLS

The lower controls shall be individual levers actuating a manual hydraulic valve providing feathering operation. The lower controls shall be capable of overriding the upper controls. An enable control and emergency stop control must be provided at the lower controls. In addition, engine start/stop, emergency lowering and throttle control must be provided at the lower controls, if applicable.

UPPER CONTROLS (CHOOSE ONE)

Individual Lever Controls

The upper controls shall actuate a manual hydraulic valve providing feathering operation. The upper controls must be mounted on the platform support and remain level with the platform. Individual locking lever controls must be provided to protect against inadvertent operation. An emergency stop control, hydraulic tool selector, if required, and the boom controls must be integral to a single valve assembly. The boom control levers at the platform shall automatically return to neutral position and lock when released.

Single Stick Controls

The upper controls shall actuate a manual hydraulic valve providing feathering operation. The upper controls must be mounted on the platform support and remain level with the platform. A single handle joystick shall be provided for one handed operation of lower boom raise and lower, upper boom fold and unfold and boom rotation. A lever in the single stick control handle must be actuated as an enable control before the boom controls are operable to protect against inadvertent operation. An emergency stop control, hydraulic tool selector, if required, enable control and the boom controls must be integral to a single valve assembly.

SAFETY FEATURES

Counterbalance valves (holding valves) shall lock boom cylinders in position in the event of hydraulic hose failure.

Unit shall have a rotation system that prevents freewheeling in the event of hydraulic failure.

Hoses shall be covered with a cordura sleeve in areas of abrasion.

The lower controls at the pedestal shall override the upper controls at the platform in the event the operator becomes incapacitated.

An enable control and emergency stop control shall be integrated into the lower controls.

Locking devices shall be incorporated into the upper controls per ANSI/SIA A92.2. An emergency stop control shall be integrated into the upper controls.

A fall protection anchor must be attached to the upper boom. Anchors attached to the platform or platform support are not acceptable. A body harness and shock absorbing lanyard must be provided for fall protection.

OPTIONAL EQUIPMENT

CHASSIS ISOLATION SYSTEM

The lower boom shall include an insert made from filament wound fiberglass reinforced plastic using oven cured epoxy resin for consistent strength. Hand layed up sections or catalyst cured polyester resins are not acceptable. The minimum insulation gap shall be 8 inches. The lower boom shall be dielectrically tested and certified to meet ANSI/SIA A92.2.

PLATFORM LINER
A polyethelene liner for the fiberglass platform shall be provided for additional dielectric protection. It shall be dielectrically tested and certified to meet ANSI/SIA A92.2.

MANUAL PLATFORM TILT
A mechanical hinge and latch system is provided for tilting the operator's platform for rescue or cleanout. A separate locking pin prevents inadvertent operation.

HYDRAULIC PLATFORM TILT
A hydraulic cylinder at the turret rotates the leveling system 90° to tilt the operator's platform for rescue or cleanout. The control is integral to the lower control valve. A lock pin prevents inadvertent operation.

EMERGENCY LOWERING (CHOOSE ONE)
HM Hydraulics
With HM hydraulics, an emergency lowering system will be provided that includes a 12or 24VDC power unit located in the pedestal. Power for the 12 or 24VDC power unit is provided by the chassis battery. Controls to actuate the emergency lowering system shall be at the upper and lower controls. This system is intended for intermittent duty.

EHM Hydraulics
With EHM hydraulics, the emergency lowering system shall allow the use of the chassis battery for emergency lowering. The 12VDC power unit is used for normal and emergency operation. Controls to actuate the emergency lowering system shall be at the upper and lower controls.

HYDRAULIC POWER SOURCE (CHOOSE ONE)
HM Hydraulics
Hydraulic power shall be provided by an engine accessory belt driven pump or PTO driven pump providing 3.0 to 3.5 GPM (11.4 to 13.3lpm) at engine idle. The engine stop/start control must be provided at the upper and lower controls.

EHM Hydraulics
Hydraulic power shall be provided by a heavy duty 12 VDC power unit mounted in the pedestal. The power unit must be able to deliver 2.5 GPM (9.5lpm). Power for the 12VDC power unit is provided by two Group 8D batteries charged by the chassis electrical system.

DPM Hydraulics
Hydraulic power shall be provided by a combination of an engine accessory belt drive powered pump or PTO driven pump providing 3.0 to 3.5 GPM (11.4 to 13.3lpm) at engine idle and a heavy duty 12VDC power unit mounted in the pedestal. The power unit must be able to deliver 2.5 GPM (9.5lpm). A control to actuate the 12VDC power unit is provided at the lower controls. The engine stop/start control must be provided at the upper and lower controls. Power for the 12VDC power unit is provided by two Group 8D batteries charged by the chassis electrical system.

HYDRAULIC TOOL CIRCUIT – REQUIRES TWO SPEED THROTTLE
An outlet for hydraulic tools shall be provided at the operator's platform. The circuit includes a selector valve integral to the upper control valve and an outlet manifold. The system is designed for 5 GPM (19lpm). Quick disconnect fittings do not need to be included. A two speed engine throttle is required. At low idle, the pump shall provide 3.0 to 3.5 GPM (11.4 to 13.2lpm) flow for boom operation. At high idle, the pump shall provide 5.0 GPM (19lpm) flow for tool operation.

TWO SPEED THROTTLE
The two speed throttle system shall provide an impulse signal to trigger an alternating relay to provide an electrical signal for the chassis electronic engine control system. The signal shall be activated from the upper or lower controls and increase engine speed for hydraulic tool operation. The signal must be deactivated when the aerial lift master switch is turned off and not reengage when the master switch is turned on.

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