
# INSULATED TELESCOPING AERIAL DEVICE

SPECIFICATIONS – Van Mounted

31July2002

It is the intent of the following specifications to set minimum requirements for an INSULATED 29 foot bottom of platform, 34 foot working height, telescoping aerial device with an end 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 OSHA and ANSI/SIA A92.2-2001 standards, without exception.

## GENERAL SPECIFICATIONS

| | |
|---|---|
| Height to bottom of platform | 29 feet, 2 inches |
| Working height | 34 feet, 2 inches |
| Horizontal reach from center line | 22 feet, 8 inches |
| Standard platform capacity | 300 pounds |
| Maximum platform capacity | 350 pounds |

Rotation shall be 540° non-continuous

The aerial device shall be primed with an epoxy primer and finish painted white with hardened enamel to match Ford and General Motors bright white color. Components must be painted or powder coated prior to assembly.

Aerial unit weight may not exceed 1,700 pounds.

## STABILITY

The completed unit shall be capable of passing ANSI/SIA A92.2-2001 stability test when mounted on a cargo van of a minimum 9,000 pounds GVWR with 3,900 pounds FAWR. The use of torsion bar, outriggers or ballast for stability is unacceptable.

## HYDRAULIC SYSTEM

Operating pressure shall be a maximum of 2200 PSI. Operating oil volume shall be 2.5 to 3.0 GPM for lift operation. An open center type hydraulic system shall be provided. Unit shall be equipped with a 10 micron filter in the return line and a 100-mesh screen at the suction port of the 10 gallon oil reservoir.

Boom elevation/lowering and extension/retraction shall be done with double acting hydraulic cylinders with holding valves integral to the cylinder. Any other manner of either boom elevation/lowering or extension/retraction is unacceptable. In addition, holding valves bolted to the cylinders are unacceptable.

A 3-way solenoid valve integral to the lower control valve shall be provided to divert hydraulic flow from the control valve to the reservoir. A pressure relief valve also integral to the lower control valve shall protect the hydraulic system. The relief valve setting must be at 2200 PSI.

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 must be available for field repair.

**PEDESTAL**

The pedestal shall be 0.25 inch thick steel welded into a rectangular structure with a 1.0 inch top plate. The hydraulic reservoir will be a separate component mounted inside the pedestal for protection. The reservoir will include a sight glass visible through the pedestal side indicating oil level and temperature. The hydraulic reservoir is to be constructed of steel and powder coated for maximum cooling and protection from corrosion. Hydraulic reservoirs integral to the pedestal or mounted external of the pedestal are not acceptable.

**TURRET**

The turret assembly shall be a welded assembly with 0.50 inch thick sides and 0.75 inch thick base plate. The turret and pedestal will be fastened to the rotation system with 0.63 inch diameter grade 5 hex head capscrews tightened to a specified torque with a thread lock to prevent loosening.

**ROTATION DRIVE**

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 properly sized to allow the use of 0.63 inch diameter grade 5 hex head capscrews for attachment to the pedestal and turret. Grade 8 fasteners are not acceptable due to their questionable availability. 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 an exposed hexagonal end for manual rotation.

**BOOM ASSEMBLY**

The telescopic boom shall articulate from 14° below horizontal to 77° above horizontal by means of a 3.5 inch bore cylinder. The outer boom shall be a minimum of 6 inch by 10 inch steel tube. The inner boom shall be 5 inch by 7 inch fiberglass with a 0.38 inch wall. A 30 inch length of the fiberglass boom shall be non-tracking over any slide pads or rollers providing a **minimum insulation gap of 30 inches.** Extended, the insulation gap shall be a minimum of 42 inches. The fiberglass boom will be filament wound using oven cured epoxy resin for consistent strength. Hand layed up booms or booms made with catalyst cured polyester resins are not acceptable. The fiberglass inner boom shall have a gelcoat finish with a painted topcoat to provide maximum water resistance. The inner boom to be dielectrically tested and rated per ANSI A92.2-2001 for Category C— 46Kv and Below, fully retracted.

Boom extension/retraction shall be accomplished with a hydraulic cylinder attached between the outer and inner boom. The stroke of the hydraulic cylinder will limit extension. Any other means of limiting extension is unacceptable. The use of hydraulic or electric motors, cables, chains or electrical limit systems for extension is not acceptable. Holding valves in the extension cylinder must hydraulically prevent boom creep in both directions. Mechanical boom latches or pilot operated hydraulic valves to prevent boom creep are not acceptable.

All pivot pins shall have a minimum tensile strength of 100,000 PSI. Pins shall be zinc plated for corrosion resistance and have non-lube bearings at all points of movement.

Hoses and control circuits shall be housed inside a plastic hose carrier housed inside of the boom. The hose carrier and inner boom slide pads must be accessible for service without removing the inner boom from the outer boom.

**PLATFORM (CHOOSE ONE)**

For End Mounted Platform

The platform shall be mounted to the end of the boom and be automatically leveled with a master/slave hydraulic leveling system. The slave cylinder shall include holding valves integral to the cylinder. Holding valves bolted to the cylinder are unacceptable. The hydraulic leveling system shall include an electrically controlled valve to allow platform leveling adjustments from the upper and lower controls. An additional valve assembly shall provide dual pilot operated check valves and dual circuit relief valves to prevent leakage from the system and to protect the system from damage. The platform shall be one-piece fiberglass, 24 inch by 24 inch by 42 inch with a molded step to the curbside. A non-skid surface will be bonded into the step surface. Self adhesive non-skid strips are not acceptable.

For Manually Rotated Platform

A manual platform rotator shall be provided to allow positioning of the platform at 45° or 90° from the end of the boom. This shall provide for positioning of the platform for optimal work access. The platform shall be automatically leveled with a master/slave hydraulic leveling system. The slave cylinder shall include holding valves integral to the cylinder. Holding valves bolted to the cylinder are unacceptable. The hydraulic leveling system shall include an electrically controlled valve to allow platform leveling adjustments from the upper and lower controls. An additional valve assembly shall provide dual pilot operated check valves and dual circuit relief valves to prevent leakage from the system and to protect the system from damage. The platform shall be one-piece fiberglass, 24 inch by 24 inch by 42 inch with a molded step to the curbside. A non-skid surface will be bonded into the step surface. Self adhesive non-skid strips are not acceptable. (This option increases the maximum horizontal side reach to 23 feet, 4 inches)

For Hydraulically Rotated Platform

A hydraulic platform rotator shall be provided to allow infinite positioning of the platform up to 90° to either side of the boom. This shall provide for positioning of the platform for optimal work access. The platform shall be automatically leveled with a master/slave hydraulic leveling system. The slave cylinder shall include holding valves integral to the cylinder. Holding valves bolted to the cylinder are unacceptable. The hydraulic leveling system shall include an electrically controlled valve to allow platform leveling adjustments from the upper and lower controls. An additional valve assembly shall provide dual pilot operated check valves and dual circuit relief valves to prevent leakage from the system and to protect the system from damage. The platform shall be one-piece fiberglass, 24 inch by 24 inch by 42 inch with a molded step to the curbside. A non-skid surface will be bonded into the step surface. Self adhesive non-skid strips are not acceptable. (This feature increases the maximum horizontal side reach to 23 feet, 5 inches)

**MOUNTING**

The pedestal base shall be mounted with a low profile 0.63 in. plate resting on spacers placed through the floor. The base plate is bolted to the frame by the use of spacers that isolate the pedestal from the body floor. Mounting that attaches to or sandwiches the floor is unacceptable. The van roof will be cut for installation of a roof bellows. The bellows shall be mounted with the use of backing strips to prevent tearing and sealed to prevent leakage.

A 30 in. bumper extension shall be provided with a non-skid finish. The extension shall have an additional stoplight built into the platform access step. A boom rest with rubber pad molded to a steel plate and ratchet tie down strap shall be mounted on the rear drip rail. Rubber pads not molded to a steel plate are unacceptable.

**CONTROLS (CHOOSE ONE)**

For On/Off Electric Conrols

The upper controls shall be mounted to the platform and include a single handle joystick for one handed operation of inner boom extension/retraction, outer boom raise/lower, and rotation control. Electric switches in the joystick are to be environmentally sealed for weather protection. A fiber optic system shall be provided to operate the control valve in the pedestal and to provide maximum dielectric protection for the operator. Controls mounted to the boom are unacceptable. In addition, full pressure controls are not acceptable due to their weight and backpressure, particularly in cold temperatures. Two rechargeable batteries shall be provided to operate the fiber optic control system. A battery charger shall be permanently installed inside the chassis cab. Each battery shall be capable of operating the system for at lease 12 hours. A low battery alarm at the upper controls shall be included. The upper controls shall be equipped with an emergency stop control at the platform. The lower controls shall include an environmentally sealed keyed master switch and environmentally sealed toggle switches capable of overriding the upper controls.

For Proportional Electric Controls

The upper controls shall include a single control handle for one handed operation of inner boom extension/retraction, outer boom raise/lower and rotation control. Electric switches in the control handle are to be environmentally sealed for weather protection. A fiber optic system shall be provided to operate the control valve in the pedestal and to provide maximum dielectric protection for the operator. Controls mounted to the boom are unacceptable. In addition, full pressure controls are not acceptable due to their weight and backpressure, particularly in cold temperatures. Two rechargeable batteries shall be provided to operate the fiber optic control system. A battery charger shall be permanently installed inside the chassis cab. Each battery shall be capable of operating the system for at least 12 hours. A low battery alarm at the upper controls shall be included. The upper controls shall be equipped with an emergency stop control at the platform. The lower controls shall include an environmentally sealed keyed master switch and environmentally sealed toggle switches capable of overriding the upper controls.

**SAFETY FEATURES**

Counterbalance Valves (Holding Valves) shall lock the elevation, extension and slave leveling cylinders in position in the event of hydraulic line or hose failure.

A dump valve or diverter valve shall divert hydraulic flow away from the control valve in the event of a valve malfunction.

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

A 30 inch fiberglass section must not track over slide pads or rollers for maximum dielectric protection for the operator.

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

Unit must meet OSHA and ANSI/SIA A92.2-2001 standards, without exception.

**ADDITIONAL OPTIONAL EQUIPMENT**

**HYDRAULIC POWER SOURCE (CHOOSE ONE)**

For Engine Driven Hydraulic Pump

Hydraulic power shall be provided by an engine accessory belt driven hydraulic pump of sufficient size to furnish 2.5 to 3.0 GPM at engine idle. Engine stop/start is provided at the upper controls.

For Electric Powered Hydraulic Pump

Hydraulic power shall be provided by a heavy duty 12 VDC motor mounted in the pedestal. The motor must be able to deliver 2.5 to 3.0 GPM. Two group 8D auxiliary batteries shall be supplied mounted in protective containers. The batteries are to be charged from the van alternator when the engine is running.

For Dual Powered Hydraulic System

Hydraulic power shall be provided by either an engine driven hydraulic pump of sufficient size to furnish 2.5 to 3.0 GPM at engine idle or a heavy duty 12 VDC motor mounted in the pedestal. The motor must be able to deliver 2.5 to 3.0 GPM. The system automatically shifts to electric operation when the chassis engine is not running. A control to actuate the 12 VDC motor is provided at the lower controls. Engine stop/start is provided from the upper controls. Two group 8D auxiliary batteries shall be supplied mounted in protective containers. The batteries are to be charged from the van alternator when the engine is running.

**EMERGENCY LOWERING (CHOOSE ONE)**

For Engine Driven Hydraulic Pump

A separate emergency lowering system shall be provided which includes a 12VDC motor located inside the pedestal. Controls to actuate the emergency lowering system shall be at the upper and lower controls.

For Electric Powered or Dual Power Hydraulic Systems

In the event the unit batteries become fully discharged, a control must be provided at both the upper and lower controls to utilize the chassis battery for emergency lowering. The same 12 VDC motor is used for normal and emergency operation.

**HYDRAULIC TOOL CIRCUIT—REQUIRES TWO SPEED THROTTLE**

An outlet for hydraulic tools shall be provided at the operator's platform. The circuit includes selector valve and outlet manifold. The system must be designed for 5 GPM flow. Quick disconnect fittings do not need to be included. A two speed engine throttle is required. At low idle, the pump shall provide 2.5 to 3.0 GPM flow for lift operation. At high idle, the pump shall provide 5 GPM flow for tool operation.

**TWO SPEED THROTTLE (CHOOSE ONE)**

For Mechanical Engine Throttle Controls

A solenoid activated from either the upper or lower controls shall increase the engine idle for hydraulic tool operation. The solenoid must be deactivated for road travel through the keyed aerial master switch.

For Electronic Engine Throttle Controls

The two speed throttle system shall provide an electric 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 circuit must be deactivated for road travel through the keyed aerial master switch.