Wireless Mobile Column Lift Systems

BPW-10-6-AJ model

1. DESCRIPTION:

This description is for a heavy-duty, battery operated adjustable carriage mobile lifting system with wireless communication, consisting of 6 columns, which are capable of lifting 18,000 pounds per column or up to 108,000 lbs per set. Each lifting column shall be mobile and easily positioned to the tires/wheels of the vehicle for lifting. The heavy-duty mobile lifting system is described in such detail as to procure an item that is ready for installation and use.

(a) The lifting system must be manufactured in the United States of America.

(b) The system will be finished in OSHA safety green.

(c) The lifting system shall have the capacity to lift heavy-duty vehicles with weights up to 108,000 lbs with a 6-column Mobile Lifting System.

(d) The Mobile Lifting System needed shall be "ALI/ETL" CERTIFIED.

(e) Each column shall weigh no more than 1,241 lbs permitting ease of movement during placement and storage of the lifts when not in use.

(f) The lifting height shall be a minimum of 69 inches.

(g) The same 6-column mobile lifting system must have the capacity and attachments to engage small sized tires as well. Using any 2-columns and the front and rear light truck adapter accessories, this system must be able to raise smaller type vehicles and trailers from frame engaging points front and rear. This will leave wheels and tires free for maintenance.

(h) This system shall have an Explosion Proof Rating of Class I, Division II.

(i) The lifting system specified shall provide a factory-direct or a company certified service technician to set up the equipment and maintain the equipment.

(j) Repair parts availability within 48 hours

2. REQUIREMENTS:

The mobile lifting system will be the standard product of the manufacturer and will be of heavy-duty quality, intended for continuous use. It is intended that the subject equipment, all components and accessories shall be a commercially available product of the manufacturer. It shall be of the manufacturer's current design and carried in stock or can be produced in a reasonable period of time. All parts shall be new and unused.

All lifting columns must be "backwards compatible" with earlier versions of like design so that column can be added at a later time if the system needs to be extended for higher capacities. The systems shall be extendable up to 8 columns.

2.1 CONSTRUCTION:

In accordance with the new American National Standards Institute (ANSI) requirements "Safety Standard for Automotive Lift Construction, Testing and Validation", ANSI/ALI ALCTV-2017, where applicable. Each post shall be tested, witnessed and verified by a Nationally Recognized Testing Laboratory (NRTL) for operational and physical conformance to the ANSI/ALI ALCTV-2017, UL-201 Standard for Safety of Garage Equipment and CAN/CSA C22.2 No.0, 14, 68 and 100 Canadian Standard. The certified posts shall be NRTL listed, both electrically and structurally, and bear the ALI/MET label of compliance.

3. SUPPORT COLUMN:

- **The support column shall be a single, heavy-duty wide flange I-Beam, with a section module not less than 7 inches wide.**
- **The I-Beam should be a solid, one piece, hot-rolled steel column.**
- The flanges of the beam shall be precision-machined to allow smooth operation of the lift carriage rollers.
- Three quarter inch (3/4") diameter counter-bores on two-inch (2") centers shall be machined vertically into the web of the I-Beam, to provide an indent for operation of the mechanical safety lock.

3.1 LIFTING CARRIAGE:

- **ADJUSTABLE CARRIAGE**: The mobile column lift system shall offer a standard adjustable carriage with width range of 20.47"to 35.43" (520mm to 900mm) and 13" fork length.
- The lift carriage assembly shall form a box-like structure around the support column and be guided with four (4) bushings.

- The bearing shafts shall insert from the outside and provide for easy removal for inspection or replacement of bushings.
- Each carriage shall have a removable access panel on the front and rear for easy entry to all safety solenoids and switches. This will allow for easy maintenance.

3.2 SUPPORT BASE:

- The support base shall be mobile; complete with casters both rigid and swivel caster shall be provided.
- A hydraulic jack shall be mounted on the steering end and shall be capable of raising the base above the floor one and three quarter inches (1.75") to provide adequate clearance when moving lifting post over uneven surfaces
- The hydraulic jack shall have a built-in bypass safety valve that provides for self-lowering if weight is applied to lift while jack is still in the raised position.
- A handle shall be attached to the steering mechanism and be spring-loaded to the vertical position.

3.3 MOTOR, BRAKE AND DRIVE:

- Each motor shall be a minimum of 2hp.
- The motor shall be equipped with a spring-loaded brake. This mechanism eliminates the need to engage a manual locking mechanism while working on the vehicle.
- The brake shall have a means for attaching a handle, which allows manual release of the brake for lowering of lift should an electrical power failure occur without disassembly of the motor or enclosures to perform intended function.
- The motor shall be sealed and self-lubricating.
- A reduction gearbox shall be provided for connecting the motor to the ball screw drive assembly.
- The motor/drive assembly must utilize a back drive mode which recharges the batteries upon carriage decent, increasing the time intervals between recharge cycles.

3.4 BALL SCREW AND NUT DRIVE:

- The Mechanical lifting drive shall be a recirculating ball bearing screw shaft and nut.
    - Brass or bronze type nuts or “acme” threaded spindles are not acceptable due to:
        - Parasitic nature of design causes additional maintenance costs
        - Additional maintenance of cleaning spindle
    - Hydraulic lifting cylinders are not acceptable due to:
        - Inherent leaking of hydraulic fluid
        - Additional weight of columns reduces mobility of lifts
        - Difficulty to synchronize the lifting posts
        - Additional maintenance of fluid replacement
        - Inconsistent operation at lower temperatures
- The ball screw shall be the ball bearing type and shall be completely self-contained within the nut.

- There shall be no separate or external races on the nut for re-circulating the ball bearings.
- Lubrication of the ball screw shaft and nut shall not be necessary more than twice a year.
- A Zerk® type fitting shall be provided at the top of the nut to perform necessary lubrication.

3.5 MECHANICAL SAFETY DEVICE:

- A redundant mechanical wedge-type safety device, independent of the ball screw shaft and nut, shall be provided.
- The safety device shall automatically wedge between the lifting carriage and the I-Beam creating a secure, redundant measure of safety.
- A proximity switch shall be provided which automatically stops operation of all lifting posts when mechanical safety lock engages or if an obstacle comes in contact with the lifting carriage during descent

3.6 ELECTRICAL CONTROLS:

The following electrical controls shall be provided (all electrical components shall be watertight):

- All wiring shall be labeled with numbers corresponding to it on electrical/schematic to assist in troubleshooting.
- All switches will be watertight to prevent the entry of moisture.

3.6.1 LIFTING COLUMN CONTROLS:

- Shall be mounted into a watertight plastic enclosure.
- All circuitry shall be on a printed circuit board (PCB) interfacing with all control wiring, motion detection and speed control.
- Each PCB will have self-diagnostic lights, indicating operation mode.
- The PCB shall be furnished with moisture protection.
- The Column Controls shall enable user defined operation between three (3) different modes of operation
    - Automatic Mode “A”
        - In automatic mode, all columns operated simultaneously, the LED display will indicate the “A” Mode
    - Single Mode “S”
        - LED Display shows indicates “S” when selector switch is in single column position allowing the use of a single, user defined, column.
    - Group Mode “G”
        - In group mode the user defines which lifting columns of the system are used during operation, the LED display will indicate the “G” mode.
- When a safety device has been activated the LED Display shall be capable of showing the user a specific Error Code to assist the user in determining cause of shutdown.

- All up and down switches must be dead-man type, requiring constant pressure by an operator to raise or lower.

- UPPER POSITION & SYNCHRONIZATION PROXIMITY SWITCH
    - One no contact proximity switch per column shall ensure stopping of unit when carriages have reached their top position
    - The same switch shall ensure synchronization between all columns in lifting system.

- LOWER POSITION PROXIMITY SWITCH
    - No contact proximity switch stops the operation of unit when lift assembly has reached the fully lowered position.

- MECHANICAL SAFETY LOCK SWITCH
    - Switch shall be a no contact proximity switch and is actuated by the ball screw nut when the mechanical safety lock engages
    - If an obstruction blocks the lifting carriage from lowering, the proximity switch will shut the entire system off.
    - All switches shall be the water-resistant type.

3.6.2 LIFT CARRIAGE MOVEMENT DETECTOR:

A no-contact proximity switch shall be provided that detects the up and down movement of the lift carriage and if any of the following occurs, stops operation of all lifting posts:

- Lifting carriage does not move up or down
- Lifting carriage moves up or down faster or slower that other lifting posts by preset limit, this proximity switch shall momentarily stop the applicable column(s) and synchronize the columns during operation

3.6.3 WIRELESS COMMUNICATION:

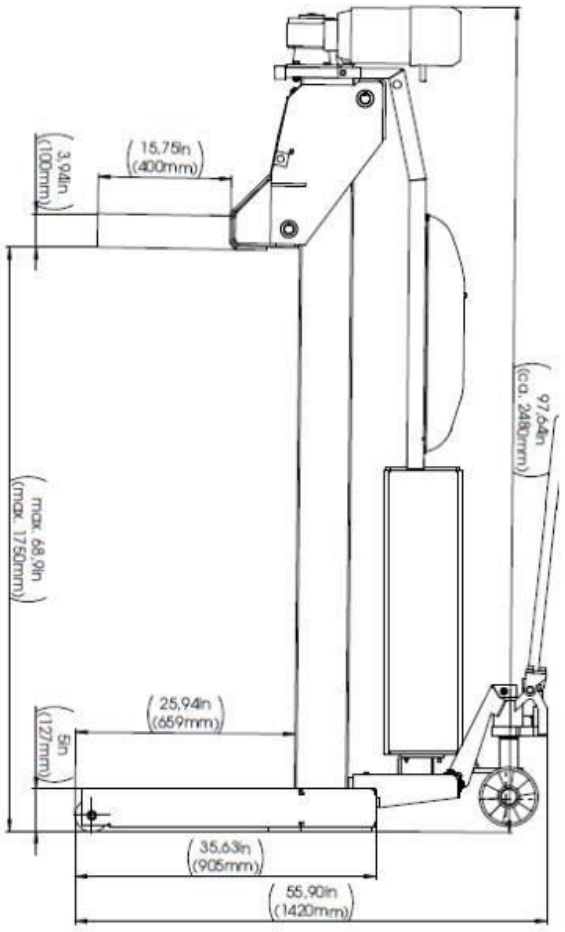
- The lifts shall be free to move without any restriction from communication cables.
- The Wireless Systems shall allow for up to eight columns to be selected on one communication channel.
- Each lift system shall have a minimum of 10 communication channels that will allow for multiple sets of Battery Powered Wireless Mobile Column Lifts to be operated at the same time close to one-another without interference.
- Wireless communication will have an automatic frequency control (AFC) to insure that once the communication was established for a set of lifts, no other unit will interfere with the initial communication and will automatically select another channel.
- The Lifts will communicate on an ISM Band that will allow for a digital narrow-band channel filtering for precise and safe operation.
- For secure communication, the wireless system needs to be certified to Level SIL 2 according to IEC 61508 Standards for Secure Data Transfer, in order to avoid interference with any type of radio communication equipment. (Airport, Military, Emergency Services etc.)

3.6.4 POWER SOURCE:

- Each column shall be powered by four Deep Cycle Sealed Batteries 12 VDC combined to provide stable 48 VDC. The 48 VDC on board power supply shall incorporate a built in recharging system. The battery charger should be self contained and standard 110V outlets shall be sufficient to use for charging the batteries.
- The Battery Charger shall have multiple input voltages to ensure use capabilities if the lifting system is deployed overseas.
- **Battery enclosure shall be located behind lifting column and shall provide for easy access to all batteries at ground level.**
- The main power shall be fused between the primary power switch and the motor/control circuits to protect against overload. Columns without input power fusing are not acceptable.
- When fully charged, the on board battery power system shall be capable of 25 lifting/lowering cycles at full capacity and 45 lifting cycles at half load. Lifting systems not capable of at least 20 lifting/lowering cycles at full capacity are unacceptable.

3.7 SPECIFIC SIZES AND CAPACITY:

Load Capacity per column:	18,000 lbs.
Load per set of 6:	108,000 lbs
Lifting / Lowering Speed:	160 sec / 117 sec
Max. Height of Column:	97.6" (2480mm)
Max. Raised Height:	69" (1752mm)
Length of column:	56" (1387mm)
Width of column:	45.27" (1092mm)
Length of Lifting Fork:	13" (330mm)
Width Range of Standard Adjustable Carriage:	20.47"-35.43" (520mm-900mm)
Max. Tire Size: w/ standard carriage w/ reduction sleeves	 12R-24.00 to 10.00-20.00 Down to 13"
Turning Circle:	54" (1371mm)
Supply Voltage:	Battery operated 110V/60Hz Single Phase
Fuse Protection:	15A
Motor Power:	2 hp (1.65KW)
Weight per column:	1,241 lbs (563kg)



ALL WIRELESS LIFT MODEL OPTIONS:

Model	Capacity Per Post	Carriage Width	Fork Length
BPW-6-M	12,000 lbs.	32.28 in. (820mm)	16 in.
BPW-6-AJ	12,000 lbs.	20.47 in - 35.43 in. (520mm - 900mm)	15 in.
BPW-9-M	16,000 lbs.	32.28 in. (820mm)	16 in.
BPW-9-AJ	16,000 lbs.	20.47 in - 35.43 in. (520mm - 900mm)	15 in.
BPW-10-AJ	18,000 lbs.	20.47 in - 35.43 in. (520mm - 900mm)	13 in.

SPECIALTY WIRELESS LIFT MODEL OPTIONS:

Model	Capacity Per Post	Carriage Width	Fork Length
BPW-6-XXW	12,000 lbs.	48.23 in. (1,225mm)	
BPW-8-20	15,000 lbs.	31.5 in. (800mm)	
BPW-8-20W	15,000 lbs.	35.43 in. (900mm)	20 in.
BPW-9-XW	16,000 lbs.	36.61 in. (930mm)	16 in.

3.8 ACCESSORIES – Must be ALI Certified

The following accessories are optional with the Mobile Vehicle Lifting System:

- **MOBILE SUPPORT STANDS:**
    - Mobile Support Stand, Tall (Model AB-6-20) - The support stand shall have a capacity of 18,000 pounds with a cradle support pad. The stand shall be adjustable from 46.25" to 78.8", in increments of three inches (3"). Each stand shall be equipped with a gas spring for assistance in height adjustments. Further, the stand shall be designed and engineered to sustain three (3) times its rated load carrying capacity and finished in OSHA safety green. Two (2) wheels and a handle shall be provided for easy maneuvering of stand(s).
    - Screw-Fine Adjustment (Model SP-75) - For Model AB-6-20 mobile support stand. Adjustable from 2"-4". Shall be made of a five-sixteenth inch (5/16") steel plate with threaded head, allowing the mounting pad to make direct contact with the vehicle frame.
- **SMALL WHEEL ADAPTERS**: Each adapter shall be made to slide over the current lifting fork of the lift system providing a reduction in the opening between the lifting forks on individual columns. This reduction allows for vehicles with smaller tire / wheel diameters to be raised.
- **CHASSIS CROSSBEAM:** The crossbeam shall be made easy to locate into position using four heavy duty casters. Each end of the crossbeam shall have provisions to saddle on to the forks of two adjacent columns. Each crossbeam shall come with two adjustable adapters that will slide along the top of the crossbeam section. Each of the crossbeams will have a capacity of 32,000 lbs.
- **LIGHT VEHICLE ADAPTER (Optional with Cart):** A pair of Light Vehicle Adapters shall be provided with each Lifting System. Each Light Vehicle Adapter shall be constructed using heavy-duty plate and two (2) pieces rectangular tubing as the support structure per single Light Vehicle Adapter. Each support pad shall have a threaded piece for fine

adjustment to allow the operator easy and accurate adjustment of each individual support point. Each support pad shall allow the usage of different height adapters in 2" increments. The support pad structure shall allow the usage of differently shaped support pads, such as a fork pad or a round adapter pad.

3.9 REQUIRED TECHNICAL MANUALS: Complete operation and service manuals with troubleshooting information and parts breakdown shall be provided.

3.10 TRAINING OF PERSONNEL: Supplier or manufacturer of equipment shall provide operator and maintenance training upon installation of equipment.

4. QUALITY ASSURANCE PROVISIONS:

4.1 INSPECTION: The buyer reserves the right to perform such inspections as deemed necessary to assure material and pieces conform to the prescribed requirements. Upon receipt this equipment shall be inspected by Quality Assurance to assure that the equipment is of quality design and construction and that it fully conforms to this specification.

5. SUBMITTAL DATA:

5.1 STATEMENT OF CONFORMITY: Each bidder is required to submit a positive statement as to whether or not the items offered fully conform to the terms of this specification. A duly authorized agent of the supplier shall sign the certificate.

6. SAFETY REQUIREMENTS:

Equipment shall comply with Title 29 of Federal Regulations, Part 1910 and National Safety Standards. The equipment shall comply with all applicable OSHA Standards and shall have safety devices wherever parts, components are hazardous to the operator and environment.

Manufacturer Reserves The Right To Change Specification Without Notice.

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