Electric Jib Crane

Lifting, carrying and loading are common activities for farmers. Farmers with disabilities or physical limitations may not be able to perform these activities or have weight restrictions issued by their doctors for their safety. The inability to perform these tasks can render a farmer less productive or totally unable to complete a task.

The Electric Jib Crane demonstrated in this description was designed to help farmers with restrictions or physical limitations to avoid secondary injuries while enabling them to complete necessary tasks such as loading or transferring a load.

There are many designs and commercially available products similar to this design. This design is intended to be comprised of commercially available components at a common retailer to make it easy to replicate, while being more cost effective than other commercially-available solutions. However, it should not be considered as a sole solution, more structurally sound, or superior solution. It is for demonstrative purposes only.

This Electric Jib Crane design consists of a 1,000lb max capacity crane. Truck mounted cranes come in many different designs and models and are available at hardware or farm supply retailers. This particular model of crane comes with a manual cable winch, grab hook, one chain slot lock and one sling hook with latch. The boom is raised with a manual hydraulic hand pump. If desired for additional ease of use, this manual hydraulic pump could be replaced by an electric actuator to automate this step. The cable winch raises and
lowers the lifting hook. The crane has a 56” overall height and a 10-1/2” x 10-1/2” base plate. The crane has a reach of 32 3/4” to 49 1/4 “, lift Range of 13” to 90 1/2 “, swivel Angle of 360 Deg, and welded steel construction. The mounting base has predrilled holes, but mounting hardware is not included. For the purposes of this example, the crane was bolted into the bed of a utility vehicle by eight- 3/8 “ bolts, nuts, and flat washers via the pre-drilled holes on the manufacturer’s base plate.

The manual crank was replaced with a commercially available ATV winch, converting it to an electric crank to make it easier to use and eliminate physical strain and risk of injury from the hand crank. Powered winches come in many sizes, capacities and wiring options. For this example, we chose a more economical optional- an electric utility winch. This particular model of winch is 12V battery powered and features a handheld controller, allowing the user to both lift and lower loads with the touch of a button. Large buttons with pictures of function make the controller easy to operate. The winch operates on a durable, all-metal differential 3-stage planetary gear train, operating at 1HP. The manufacturer’s original hand-crank winch was unbolted from the crane mast. The powered winch was attached in the same location. The top mounting hole was sufficient to mount the top of the new power winch, but an additional hole had to be drilled in the mast and tapped in order to accommodate the second mounting bolt.

The cable of the power winch was fed through the top of the crane frame and aligned with the internal pulleys. The load hook was reattached to the end and the unit was ready to use.
CONSIDERTATIONS:

Utilizing all 8 mounting holes ensures maximum connection with the vehicle bed below, and particular caution should be taken in preparing the bed for installation.

The desired location on the vehicle bed for a crane design should be studied both for its integrity and for vital components below the surface that might be damaged by the hole-boring process.

A crane design, similar to this example, should NOT be installed on a vehicle that does not have enough load capacity to support the crane during use. A crane design should also NOT be installed on a bed or surface that shows signs of rust, decay, or is not thick enough to support the load from the crane during use.

Farmers considering surfaces or vehicles that may seem questionable for this use should consult a licensed engineer or technician before constructing a design of this sort.

A design of this nature should NOT be mounted to a vehicle with a dump bed.

This document was created by the North Carolina AgrAbility Partnership as an educational resource for farmers interested in learning more about various types of assistive devices designed to increase independence in an agribusiness. The information and design examples in this document are intended for demonstrative purposes only. Parties attempting to build this or a similar device assumes full responsibility and the North Carolina AgrAbility Partnership and its affiliates cannot be held liable.

**Bill of Materials Used for this Electric Jib Crane Example**

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Price</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vestil Winch Operated Truck Jib Crane — 500/1,000-Lb. Capacity, Model# WTJ-2 (mounting hardware not included)</td>
<td>$299.99</td>
<td>Northern Tool &amp; Equipment</td>
</tr>
<tr>
<td>14</td>
<td>3/8” Bolts with matching washers and nuts</td>
<td>$50.00</td>
<td>Local Hardware store</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>$495.99 OR $434.98</strong></td>
<td></td>
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</tbody>
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The mission of the North Carolina AgrAbility Partnership is to educate and assist individuals engaged in production agriculture who are living with disabilities to enable them to stay actively engaged in production agriculture, agriculture-related occupations, and/or daily life. The North Carolina AgrAbility Partnership serves individuals who are limited by any type of physical, mental, or health-related disability.

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