



INDUSTRIAL JIB CRANES



INTRODUCTION

A crane is a type of machine, generally equipped with a hoist rope, wire ropes or chains, and sheaves, that can be used both to lift and lower materials. A jib crane is a type of overhead lifting device that's often used in a smaller work cell area for repetitive and unique lifting tasks. Jib cranes are extremely versatile and can also be paired with overhead bridge cranes to maximize production. It is mainly used for lifting heavy things and transporting them to other places. The device uses one or more simple machines to create mechanical advantage and thus move loads beyond the normal capability of a human. Cranes are commonly employed in the transport industry for the loading and unloading of freight, in the construction industry for the movement of materials, and in the manufacturing industry for the assembling of heavy equipment. Jib cranes are fairly simple in design but can have capacities ranging anywhere from 250 lbs. to 15 tons in some applications. Their ergonomic design is very appealing in a production environment because they can increase worker productivity, reduce workplace injuries, and improve safety.

MAIN COMPONENTS

- Boom
- Mast
- Control switch
- Trolley
- Electric motor
- Pneumatic Assembly or Hydraulic assembly
- Hook

CONSTRUCTIONAL DETAILS

For the most part, jib cranes have a very basic design and construction. Compared to workstation cranes and bridge or gantry cranes, they're simple to operate, and require less maintenance because they have less parts that could potentially breakdown or fail. **Boom** is the horizontal beam that the trolley travels back and forth on in the jib crane. **Mast** is the vertical beam used to support the boom on freestanding and mast type jib crane systems. The **movable hoist** is used to lift the load, position it and lower a load to the required place. **Trolley** assembly



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is used for moving the hook to the required place for lifting the load. The motion of the trolley can be manual, motorized, or pneumatic. The trolley carries the hoist, wire rope or chain, and the hook along the entire length of the boom. On free standing and mast type jib cranes, you can achieve 360° of boom rotation. On wall and column-mounted jib cranes, you can achieve 180-200° of rotation.

The electric collector rings or pneumatic air lines can be added to the top or bottom of the mast to provide rotation assistance and allow for continuous 360° boom rotation. On motorized or air-powered jib systems, you a push button controller is used to control the rotation of the boom, as well as the motion of the trolley and the lifting and lowering motion of the hoist. Multi-speed or variable speed controls are available for the hoist and trolley. If the crane is located close to a wall or other obstruction, **a rotation stop** will limit the crane's motion before it collides with a nearby object. The components of the jib system is galvanized to resist corrosion for outdoor applications. Also, special control enclosures can be designed for explosion proof applications, and other environments where heat, dust and dirt, or moisture may be a factor.

DIFFERENT TYPES OF JIB CRANE SYSTEM

FREE STANDING JIB CRANE



This is the most common type of jib crane because they can be installed virtually anywhere including indoors or outdoors. Freestanding jib systems can be used underneath large bridge crane systems, or in open areas where they can support individual work cells. They can



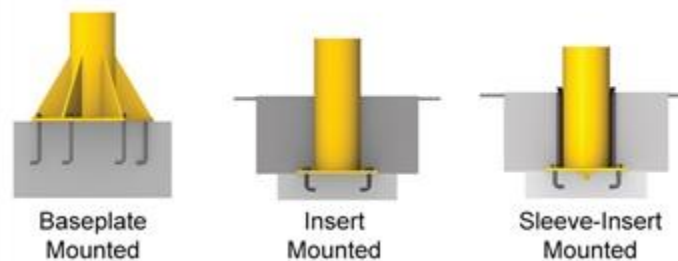
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be used outdoors at marinas or loading docks, and indoors for machining and assembly operations where multiple jibs can be used in conjunction for staged operation.

Typically, freestanding jib crane systems can accommodate:

- Spans up to 50'
- Capacities up to 15 tons
- 360° of rotation
- Boom heights up to 40'

There are three main designs for freestanding jib cranes, in terms of how they can be mounted and installed:



- **Base-Plate Mounted:** These are the easiest to install and the most popular design. The mast is secured by bolting a base plate onto a reinforced concrete foundation and then reinforcing the mast with gussets.
- **Foundation/Insert Mounted:** These have a welded steel plate at the bottom of the mast which is anchored during the first-pour concrete footing. A second concrete pour supports the mast—eliminating the need for gussets.
- **Sleeve-Insert Mounted:** A sleeve is welded to a steel plate, which is used to position the sleeve by anchoring it to a first-pour concrete footing. A second pour then supports the sleeve and the mast is inserted into the sleeve, leveled, and then welded in place. This design allows for relocation of the jib system, if necessary, without damaging the mast.

Compared to other jib crane systems, freestanding systems offer the highest capacities, longest spans, and greatest amount of rotation. However, freestanding jib cranes are among the most expensive systems and the most permanent setup due to the special foundation that is required to anchor and secure the crane and support the load during a lift.



FOUNDATIONLESS JIB CRANE

Foundationless jib cranes are another type of freestanding jib crane that are slab-mounted and bolted to 6" reinforced concrete for indoor use. These types of jib crane systems don't require a special poured foundation and can be installed almost anywhere in a facility as long as the area meets the requirements of the manufacturer. Because there's no special foundation required, these jib cranes can be installed faster because you don't have to wait for a poured concrete foundation to cure. They can also be easily relocated within a facility, if necessary.



Foundationless Jib Cranes

Typically, foundationless jib cranes can accommodate:

- 9-16' spans
- Capacities up to 1,000 lbs.
- 360° rotation
- Boom heights up to 20'

While their ease of installation, cost-effectiveness, and portability make freestanding jib cranes attractive for certain applications, they do have a much lower capacity than typical freestanding jib cranes with a poured foundation.

MAST TYPE JIB CRANE

Mast type jib cranes are a cost-effective alternative to freestanding systems because they don't require a special foundation. Mast type jib cranes only need 6" of reinforced concrete



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to support the crane because they require additional support from an existing overhead support beam or structure.



Typically mast type jib cranes can accommodate:

- 10-40' spans
- Capacities up to 10 tons
- 360° rotation
- Boom heights up to 40' (distance from floor to overhead top support)

Mast type jib cranes are similar to freestanding systems and can be used for the same type of heavy-duty/high-productivity applications. However, they do require an overhead beam or support structure to provide support in addition to the foundation.

ARTICULATED TYPE JIB CRANE

Compared to traditional jib cranes with one boom, articulating jib cranes have two swivel arms that can lift loads around corners and columns, and reach into or under machinery and containers. The primary boom arm allows for 200° swivel and the outer arm allows for up to 360° of rotation—providing a greater coverage area and more flexibility closer to the mast or column.

Articulating jib systems can be floor-mounted, wall-mounted, ceiling-mounted, or mounted on a bridge or track system. The variety of configurations allows for precise load positioning and spotting loads around obstructions, through open doors, or rotating in close to the mast or building column—an area where it can be more difficult to maneuver traditional jibs.



Articulating jib cranes can accommodate:

- Spans up to 16'
- Capacities up to 1 ton
- 360° rotation for freestanding and ceiling-mounted systems
- 180° inner arm/360° outer arm for wall-mounted systems

For heavier duty and more frequent lifts, an articulating jib crane might not be the best choice. Their design won't allow for higher capacity lifts and their span is somewhat limited.

APPLICATION

- Used in automobile assembly section for lifting the heavy components for assembling.
- Used in automobile service centers for lifting heavy weight components like engines.
- Used in ports for carrying the heavy loads
- Used in many manufacturing sectors.