
OWNER'S MANUAL

FREE STANDING JIB CRANE 351/352 Series

1/2 Ton through 5 Ton Capacity

Product Code and Serial Number

WARNING

This equipment should not be installed, operated or maintained by any person who has not read and understood all the contents of this manual. Failure to read and comply with the contents of this manual can result in serious bodily injury or death, and/or property damage.



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1.0 Important Information and Warnings

1.1 Terms and Summary

This manual provides important information for personnel involved with the installation, operation and maintenance of this product. Although you may be familiar with this or similar equipment, it is strongly recommended that you read this manual before installing, operating or maintaining the product.

Danger, Warning, Caution and Notice - Throughout this manual there are steps and procedures that can present hazardous situations. The following signal words are used to identify the degree or level of hazard seriousness.

⚠ DANGER Danger indicates an imminently hazardous situation which, if not avoided, **will** result in **death or serious injury**, and property damage.

⚠ WARNING Warning indicates an imminently hazardous situation which, if not avoided, **could** result in **death or serious injury**, and property damage.

⚠ CAUTION Caution indicates a potentially hazardous situation which, if not avoided, **may** result **minor or moderate injury** or property damage.

NOTICE Notice is used to notify people of installation, operation, or maintenance information which is important but not directly hazard-related.

⚠ CAUTION

These general instructions deal with the normal installation, operation, and maintenance situations encountered with the equipment described herein. The instructions should not be interpreted to anticipate every possible contingency or to anticipate the final system, crane, or configuration that uses this equipment. For systems using the equipment covered by this manual, the supplier and owner of the system are responsible for the system's compliance with all applicable industry standards, and with all applicable federal, state and local regulations/codes.

This manual includes instructions and parts information for a variety of crane types. Therefore, all instructions and parts information may not apply to any one type or size of a specific crane. Disregard those portions of the instructions that do not apply.

Record your crane's Model and Serial Number (see Crane Drawing and **Section 9**) on the front cover of this manual for identification and future reference to avoid referring to the wrong manual for information or instructions on installation, operation, inspection, maintenance, or parts.

Use only Harrington authorized replacement parts in the service and maintenance of this crane.

WARNING

Equipment described herein is not designed for and **MUST NOT** be used for lifting, supporting, or transporting people, or for lifting or supporting loads over people.

Equipment described herein should not be used in conjunction with other equipment unless necessary and/or required safety devices applicable to the system, crane, or application are installed by the system designer, system manufacturer, crane manufacturer, installer, or user.

Modifications to upgrade, rerate, or otherwise alter this equipment shall be authorized only by the original equipment manufacturer.

Cranes, used to handle hot molten material may require additional equipment or devices. Refer to ASTM E2349 "Standard Practice for Safety Requirements in Metal Casting Operations: Sand Preparation, Molding, and Core Making; Melting and Pouring; and Cleaning and Finishing".

Only trained and competent personnel should inspect and repair this equipment. Only competent erection personnel familiar with standard fabrication practices should be employed to assemble Harrington's cranes because of necessity in interpreting these instructions. Harrington is not responsible for quality of workmanship performed during crane installation.

Consult with a qualified structural engineer to determine if your support structure is adequate to support the loads generated by anchor bolt force, overturning moment, or axial load of your crane.

Crane cannot be utilized as a ground: a separate ground wire is required.

Overloading and improper use can result in injury.

All welds must meet American Welding Society (AWS) specification D14.1 "Specification for Welding of Industrial and Mill Cranes and other Material Equipment."

Failure to read and comply with any one of the limitations noted herein can result in serious bodily injury or death, and/or property damage.

NOTICE

It is the responsibility of the owner/user to install, inspect, test, maintain, and operate a crane in accordance with the applicable portions of OSHA Specification 1910.179 "Overhead and Gantry Cranes," ANSI B30.11, "Monorails and Underhung Cranes," and any other applicable standards.

It is the responsibility of the owner/user to have all personnel that will install, inspect, test, maintain, and operate a crane read the contents of this manual and applicable portions of OSHA Specification 1910.179 "Overhead and Gantry Cranes," ANSI B30.11, "Monorails and Underhung Cranes," and any other applicable standards.

If the crane owner/user requires additional information, or if any information in the manual is not clear, contact Harrington or the distributor of the crane. Do not install, inspect, test, maintain, or operate this crane unless this information is fully understood.

A regular schedule of inspection of the crane in accordance with the requirements of OSHA Specification 1910.179 "Overhead and Gantry Cranes," ANSI B30.11, "Monorails and Underhung Cranes," and any other applicable standards should be established and records maintained.

Dimensions and figures contained in this manual are for reference only and may differ for your particular application. Please refer to the Foundation Drawing and Jib Crane Drawing included with crane.

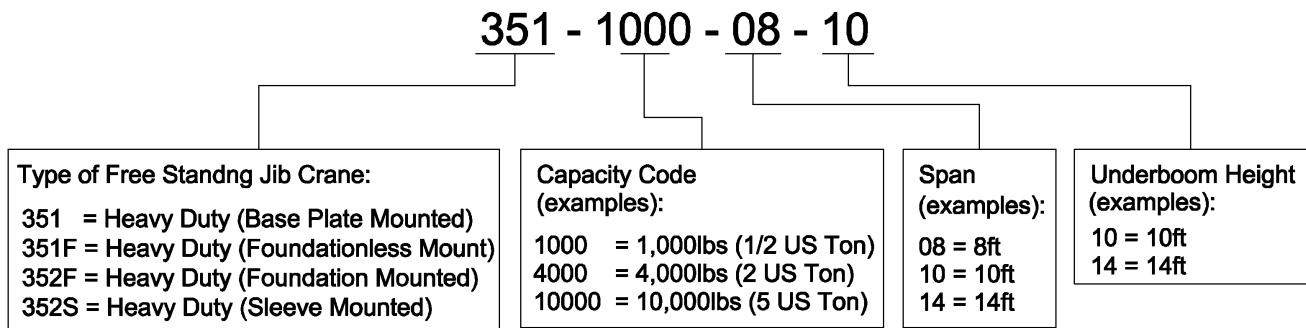
1.2 Warning Tags and Labels

This crane may be part of a lifting system including a hoist and trolley. It is the responsibility of the owner of such a lifting system to ensure that the lifting system be equipped with warning labels in accordance with applicable industry standards.

2.0 Technical Information

2.1 Specifications & Dimensions

2.1.1 Product Code



2.1.2 Operating Conditions and Environment

Temperature range: -30°F to +150°F (-34°C to 66°C)

Relative Humidity: 85% or less

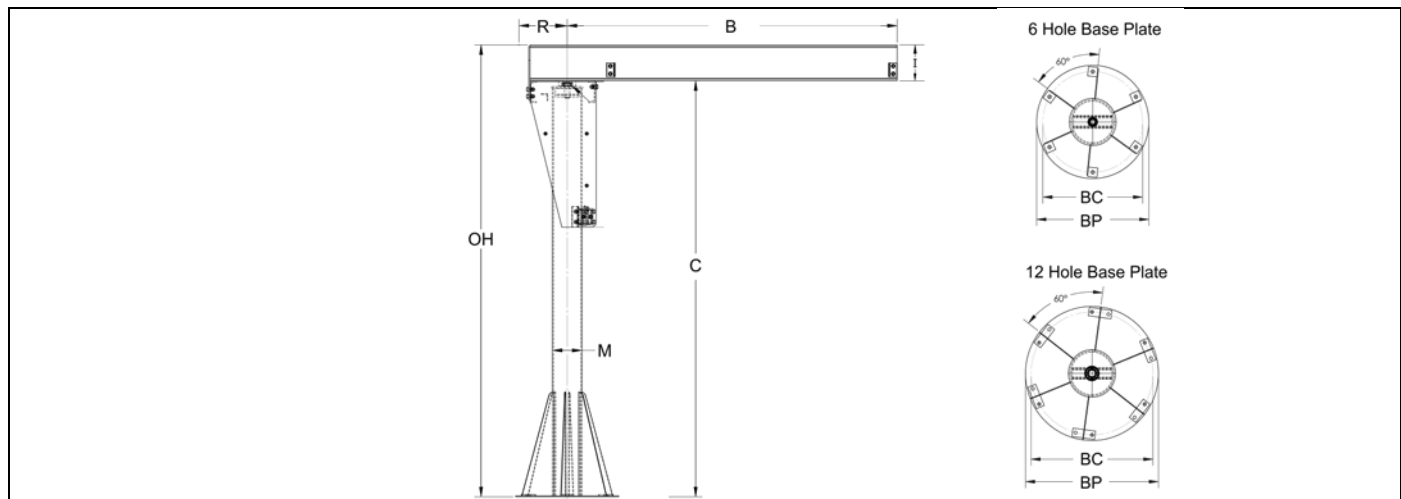


Table 2-1 Model 351 Specifications & Dimensions^{1,2}

Capacity (US Ton)	Product Code	Span B (Feet- Inches)	Underboom Height C (Feet-Inches)	Overall Height OH (Feet-Inches)	Beam Size ³ I (Inches)	Mast Diameter M (Inches)	Rotation Clearance R (Inches)	Bolt Circle Diameter BC (Inches)	Base Plate Diameter BP (Inches)	# of Bolts	Weight (Lbs.)	Foundation (Feet)
1/2	351-1000-08-10	8'-0"	10'-0"	10'-10"	10"	8"	14"	26"	30"	6	890	4' x 4' x 4'
	351-1000-10-10	10'-0"		10'-10"	10"	8"	14"	26"	30"	6	940	4' x 4' x 4'
	351-1000-12-10	12'-0"		10'-8"	8"	12"	15"	32"	36"	6	950	4.5' x 4.5' x 3.5'
	351-1000-14-10	14'-0"		10'-10"	10"	12"	15"	32"	36"	6	1090	5.5' x 5.5' x 3.5'
	351-1000-16-10	16'-0"		11'-0"	12"	12"	16"	32"	36"	6	1250	5.5' x 5.5' x 3.5'
	351-1000-18-10	18'-0"		11'-0"	12"	12"	16"	32"	36"	6	1415	5.5' x 5.5' x 3.5'
	351-1000-20-10	20'-0"		11'-0"	12"	14"	16"	32"	36"	6	1630	6' x 6' x 3.5'
	351-1000-08-12	8'-0"	12'-0"	12'-8"	8"	12"	15"	32"	36"	6	945	4' x 4' x 4'
	351-1000-10-12	10'-0"		12'-8"	8"	12"	15"	32"	36"	6	1110	4' x 4' x 4'
	351-1000-12-12	12'-0"		12'-10"	10"	12"	15"	32"	36"	6	1300	4.5' x 4.5' x 3.5'
	351-1000-14-12	14'-0"		12'-10"	10"	12"	15"	32"	36"	6	1440	5.5' x 5.5' x 3.5'
	351-1000-16-12	16'-0"		13'-0"	12"	12"	15"	32"	36"	6	1650	5.5' x 5.5' x 3.5'
	351-1000-18-12	18'-0"		13'-0"	12"	14"	16"	32"	36"	6	1990	5.5' x 5.5' x 3.5'
	351-1000-20-12	20'-0"		13'-3"	15"	14"	16"	32"	36"	6	2350	6' x 6' x 3.5'
	351-1000-08-14	8'-0"	14'-0"	14'-8"	8"	12"	15"	32"	36"	6	1010	4' x 4' x 4'
	351-1000-10-14	10'-0"		14'-8"	8"	12"	15"	32"	36"	6	1050	4' x 4' x 4'
	351-1000-12-14	12'-0"		14'-10"	10"	12"	15"	32"	36"	6	1180	4.5' x 4.5' x 3.5'
	351-1000-14-14	14'-0"		15'-0"	12"	12"	16"	32"	36"	6	1465	5.5' x 5.5' x 3.5'
	351-1000-16-14	16'-0"		15'-0"	12"	14"	16"	32"	36"	6	1600	5.5' x 5.5' x 3.5'
	351-1000-18-14	18'-0"		15'-3"	15"	14"	16"	32"	36"	6	2000	5.5' x 5.5' x 3.5'
	351-1000-20-14	20'-0"		15'-3"	15"	14"	16"	32"	36"	6	2080	6' x 6' x 3.5'
1	351-2000-08-10	8'-0"	10'-0"	10'-10"	10"	12"	15"	32"	36"	6	940	5.5' x 5.5' x 3.5'
	351-2000-10-10	10'-0"		10'-10"	10"	12"	15"	32"	36"	6	990	5.5' x 5.5' x 3.5'
	351-2000-12-10	12'-0"		10'-10"	10"	12"	15"	32"	36"	6	1040	5.5' x 5.5' x 3.5'
	351-2000-14-10	14'-0"		11'-0"	12"	14"	16"	32"	36"	6	1360	6' x 6' x 3.5'
	351-2000-16-10	16'-0"		11'-3"	15"	14"	16"	32"	36"	6	1700	7' x 7' x 3.5'
	351-2000-18-10	18'-0"		11'-3"	15"	14"	16"	32"	36"	6	1785	7' x 7' x 3.5'
	351-2000-20-10	20'-0"		11'-3"	15"	16"	22"	32"	36"	12	2200	7' x 7' x 4'
	351-2000-08-12	8'-0"	12'-0"	12'-10"	10"	12"	15"	32"	36"	6	1010	5.5' x 5.5' x 3.5'
	351-2000-10-12	10'-0"		12'-10"	10"	12"	15"	32"	36"	6	1060	5.5' x 5.5' x 3.5'
	351-2000-12-12	12'-0"		12'-10"	10"	14"	16"	32"	36"	6	1300	5.5' x 5.5' x 3.5'
	351-2000-14-12	14'-0"		13'-0"	12"	14"	16"	32"	36"	6	1560	6' x 6' x 3.5'
	351-2000-16-12	16'-0"		13'-3"	15"	14"	16"	32"	36"	6	1810	7' x 7' x 3.5'
	351-2000-18-12	18'-0"		13'-3"	15"	16"	20"	42"	48"	12	2230	7' x 7' x 3.5'
	351-2000-20-12	20'-0"		13'-3"	15"	16"	20"	42"	48"	12	2320	7' x 7' x 4'
	351-2000-08-14	8'-0"	14'-0"	14'-10"	10"	12"	15"	32"	36"	6	1075	5.5' x 5.5' x 3.5'
	351-2000-10-14	10'-0"		14'-10"	10"	12"	15"	32"	36"	6	1125	5.5' x 5.5' x 3.5'
	351-2000-12-14	12'-0"		14'-10"	10"	14"	16"	32"	36"	6	1395	5.5' x 5.5' x 3.5'
	351-2000-14-14	14'-0"		15'-3"	15"	14"	16"	32"	36"	6	1835	6' x 6' x 3.5'
	351-2000-16-14	16'-0"		15'-3"	15"	16"	22"	44"	48"	12	2220	7' x 7' x 3.5'
	351-2000-18-14	18'-0"		15'-3"	15"	16"	22"	44"	48"	12	2360	7' x 7' x 3.5'
	351-2000-20-14	20'-0"		15'-6"	18"	16"	22"	44"	48"	12	2700	7' x 7' x 4'

Capacity (US Ton)	Product Code	Span B (Feet- Inches)	Underboom Height C (Feet-Inches)	Overall Height OH (Feet-Inches)	Beam Size ³ I (Inches)	Mast Diameter M (Inches)	Rotation Clearance R (Inches)	Bolt Circle Diameter BC (Inches)	Base Plate Diameter BP (Inches)	# of Bolts	Weight (Lbs.)	Foundation (Feet)
2	351-4000-08-10	8'-0"	10'-0"	11'-0"	12"	14"	22"	32"	36"	6	1260	6' x 6' x 3.5'
	351-4000-10-10	10'-0"		11'-0"	12"	14"	22"	32"	36"	6	1350	6' x 6' x 3.5'
	351-4000-12-10	12'-0"		11'-3"	15"	14"	22"	32"	36"	6	1555	7' x 7' x 3.5'
	351-4000-14-10	14'-0"		11'-3"	15"	16"	22"	44"	48"	12	1735	7' x 7' x 4'
	351-4000-16-10	16'-0"		11'-6"	18"	16"	28"	44"	48"	12	2220	8' x 8' x 4'
	351-4000-18-10	18'-0"		11'-6"	18"	18"	28"	44"	48"	12	2600	8' x 8' x 4'
	351-4000-20-10	20'-0"		11'-6"	18"	18"	29"	44"	48"	12	2710	8' x 8' x 4'
	351-4000-08-12	8'-0"	12'-0"	13'-0"	12"	14"	16"	32"	36"	6	1370	6' x 6' x 3.5'
	351-4000-10-12	10'-0"		13'-0"	12"	14"	16"	32"	36"	6	1460	6' x 6' x 3.5'
	351-4000-12-12	12'-0"		13'-3"	15"	16"	20"	44"	48"	12	1975	7' x 7' x 3.5'
	351-4000-14-12	14'-0"		13'-3"	15"	16"	20"	44"	48"	12	2060	7' x 7' x 4'
	351-4000-16-12	16'-0"		13'-6"	18"	16"	20"	44"	48"	12	2340	8' x 8' x 4'
	351-4000-18-12	18'-0"		13'-6"	18"	18"	22"	44"	48"	12	2740	8' x 8' x 4'
	351-4000-20-12	20'-0"		13'-6"	18"	20"	22"	48"	54"	12	3175	8' x 8' x 4'
	351-4000-08-14	8'-0"	14'-0"	15'-0"	12"	14"	16"	32"	36"	6	1480	6' x 6' x 3.5'
	351-4000-10-14	10'-0"		15'-0"	12"	14"	16"	32"	36"	6	1570	6' x 6' x 3.5'
	351-4000-12-14	12'-0"		15'-3"	15"	16"	22"	44"	48"	12	2100	7' x 7' x 3.5'
	351-4000-14-14	14'-0"		15'-6"	18"	16"	22"	44"	48"	12	2365	7' x 7' x 4'
	351-4000-16-14	16'-0"		15'-6"	18"	18"	22"	44"	48"	12	2725	8' x 8' x 4'
	351-4000-18-14	18'-0"		15'-6"	18"	20"	28"	48"	54"	12	3225	8' x 8' x 4'
	351-4000-20-14	20'-0"		15'-8"	20"	20"	28"	48"	54"	12	3570	8' x 8' x 4'
3	351-6000-08-10	8'-0"	10'-0"	11'-3"	15"	16"	22"	44"	48"	6	1680	7' x 7' x 4'
	351-6000-10-10	10'-0"		11'-3"	15"	16"	22"	44"	48"	12	1810	7' x 7' x 4'
	351-6000-12-10	12'-0"		11'-3"	15"	16"	22"	44"	48"	12	1900	7' x 7' x 4'
	351-6000-14-10	14'-0"		11'-6"	18"	18"	22"	44"	48"	12	2380	8' x 8' x 4'
	351-6000-16-10	16'-0"		11'-6"	18"	20"	28"	48"	54"	12	2800	9' x 9' x 4'
	351-6000-18-10	18'-0"		11'-8"	20"	20"	28"	48"	54"	12	3125	9' x 9' x 4'
	351-6000-20-10	20'-0"		12'-0"	24"	24"	29"	48"	54"	12	3860	9' x 9' x 4'
	351-6000-08-12	8'-0"	12'-0"	13'-3"	15"	16"	20"	44"	48"	6	1800	7' x 7' x 4'
	351-6000-10-12	10'-0"		13'-3"	15"	16"	20"	44"	48"	12	1880	7' x 7' x 4'
	351-6000-12-12	12'-0"		13'-3"	15"	16"	20"	44"	48"	12	2025	7' x 7' x 4'
	351-6000-14-12	14'-0"		13'-6"	18"	18"	22"	44"	48"	12	2525	8' x 8' x 4'
	351-6000-16-12	16'-0"		13'-6"	18"	20"	28"	48"	54"	12	2960	9' x 9' x 4'
	351-6000-18-12	18'-0"		13'-8"	20"	20"	28"	48"	54"	12	3300	9' x 9' x 4'
	351-6000-20-12	20'-0"		13'-8"	24"	24"	29"	48"	54"	12	4050	9' x 9' x 4'
	351-6000-08-14	8'-0"	14'-0"	15'-3"	15"	16"	22"	44"	48"	6	1930	7' x 7' x 4'
	351-6000-10-14	10'-0"		15'-3"	15"	16"	22"	44"	48"	12	2065	7' x 7' x 4'
	351-6000-12-14	12'-0"		15'-3"	15"	18"	22"	44"	48"	12	2300	7' x 7' x 4'
	351-6000-14-14	14'-0"		15'-6"	18"	20"	28"	48"	54"	12	3005	8' x 8' x 4'
	351-6000-16-14	16'-0"		15'-8"	20"	20"	28"	48"	54"	12	3310	9' x 9' x 4'
	351-6000-18-14	18'-0"		15'-8"	20"	24"	29"	48"	54"	12	3810	9' x 9' x 4'
	351-6000-20-14	20'-0"		16'-0"	24"	24"	29"	48"	54"	12	4230	9' x 9' x 4'
5	351-10000-08-10	8'-0"	10'-0"	11'-6"	18"	20"	15"	48"	54"	12	2100	9' x 9' x 4'
	351-10000-10-10	10'-0"		11'-6"	18"	20"	15"	48"	54"	12	2210	9' x 9' x 4'
	351-10000-12-10	12'-0"		11'-6"	20"	24"	16"	48"	54"	12	2600	9' x 9' x 4'
	351-10000-14-10	14'-0"		11'-8"	20"	24"	16"	48"	54"	12	2860	9' x 9' x 4'
	351-10000-16-10	16'-0"		12'-0"	24"	24"	16"	54"	60"	12	3575	Consult
	351-10000-18-10	18'-0"		12'-0"	24"	30"	38"	66"	72"	12	3735	Consult
	351-10000-20-10	20'-0"		12'-1/2"	24"	30"	38"	66"	72"	12	5630	Consult
	351-10000-08-12	8'-0"	12'-0"	13'-6"	18"	20"	28"	48"	54"	12	2210	9' x 9' x 4'
	351-10000-10-12	10'-0"		13'-6"	18"	20"	28"	48"	54"	12	2320	9' x 9' x 4'
	351-10000-12-12	12'-0"		13'-8"	20"	24"	28"	48"	54"	12	2740	9' x 9' x 4'
	351-10000-14-12	14'-0"		13'-8"	20"	24"	28"	48"	54"	12	3020	9' x 9' x 4'
	351-10000-16-12	16'-0"		14'-0"	24"	24"	30"	54"	60"	12	3765	Consult
	351-10000-18-12	18'-0"		14'-0"	24"	30"	38"	66"	72"	12	3925	Consult
	351-10000-20-12	20'-0"		14'-1/2"	24"	30"	38"	66"	72"	12	5940	Consult
	351-10000-08-14	8'-0"	14'-0"	15'-6"	18"	20"	28"	48"	54"	12	2310	9' x 9' x 4'
	351-10000-10-14	10'-0"		15'-6"	18"	20"	28"	48"	54"	12	2420	9' x 9' x 4'
	351-10000-12-14	12'-0"		15'-8"	20"	24"	28"	48"	54"	12	3040	9' x 9' x 4'
	351-10000-14-14	14'-0"		15'-8"	20"	24"	29"	48"	54"	12	3585	9' x 9' x 4'
	351-10000-16-14	16'-0"		16'-0"	24"	24"	29"	54"	60"	12	3955	Consult
	351-10000-18-14	18'-0"		16'-0"	24"	30"	38"	66"	72"	12	5010	Consult
	351-10000-20-14	20'-0"		16'-1/2"	24"	30"	38"	66"	72"	12	6260	Consult

Note: 1 - For Models 351F, 352F or 352S, please refer to Foundation Drawing and Jib Crane Drawing included with crane for all specifications and dimensions.

2 - Other spans, capacities, under boom height, etc. are available. Contact Customer Service.

3 - Beam sizes subject to change based on availability

2.2 Crane Terms

In order to better understand jib cranes, here are the commonly used terms that are used to specify and design jibs:

- **Anchor Bolts:** Large steel bolts used to mount a base mounted pillar jib crane to the Harrington recommended foundation.
- **Boom:** The horizontal beam on which the hoist trolley travels.
- **Fitting Centers:** The distance, centerline to centerline, between two support brackets (fittings) of a wall mounted jib crane.
- **Capacity:** The maximum live weight that the crane is designed to support.
- **End Stops:** Bolted to each end of the boom to prevent the trolley from falling off of the beam.
- **Foundation:** For free standing pillar base mounted jibs. Foundations are used to support the jib and prevent it from tipping over.
- **Gussets:** Reinforcing plates used to stiffen mast at the base plate.
- **Head:** Houses the roller, and lowers the crushing forces that are imposed on the mast.
- **Height Under the Boom (H.U.B.):** The distance from the finished floor to the underside of the crane boom. To find the underboom, take the height of the load, plus the distance the load is lifted, plus the headroom requirements of the hoist/trolley and any attachments. Extra room in addition to the minimum required H.U.B. may be helpful for crane operations.
- **Mast:** The vertical member of the jib, which supports the crane. Pillar jibs have round pipes as masts.
- **Overall Height:** The highest point of the jib crane (including any hardware). A minimum clearance (usually 3") is required from any overhead obstruction.
- **Hoist:** The actual lifting mechanism (powered by electric, air, or manual movement) that hangs from the trolley that rides on the boom of a jib crane.
- **Trolley:** The mechanism that travels back and forth on the crane boom (powered by electric, air, or manual movement) which the hoist hangs from.
- **Overturning Moment:** The force applied to the mounting structure of a self-supporting pillar jib. This force is caused by suspending a load from the boom, and is at maximum with full load at the end of the boom.
- **Rotation Stops:** Limits the rotation of a pillar base mounted jib crane boom (which are standard at 360°). Stops are field welded to the mast.
- **Span:** The span for a pillar base mounted jib crane is the distance from the center of the mast to the end of the boom. The span for a column mounted crane is measured from the face of the mounting surface to the end of the boom. The span for a mast type jib crane is measured from the center of the vertical mast to the end of the boom.
- **Thrust and Pull:** Thrust and Pull are forces applied to a wall/column mounted jib cranes support structure. Thrust is the pushing force exerted on the structure, and pull is the tensile, or pulling force. Thrust and Pull are equal to each other (but opposite in direction), and are given at maximum with full load at the end of the boom.
- **Clear Span:** The measurement between the end stops on a crane boom.
- **Hook Travel:** The distance that the hook on the hoist travels.

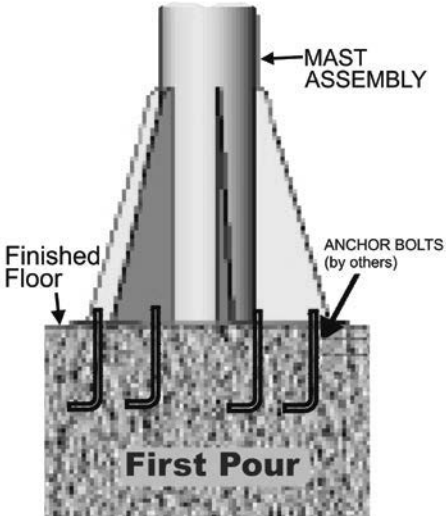
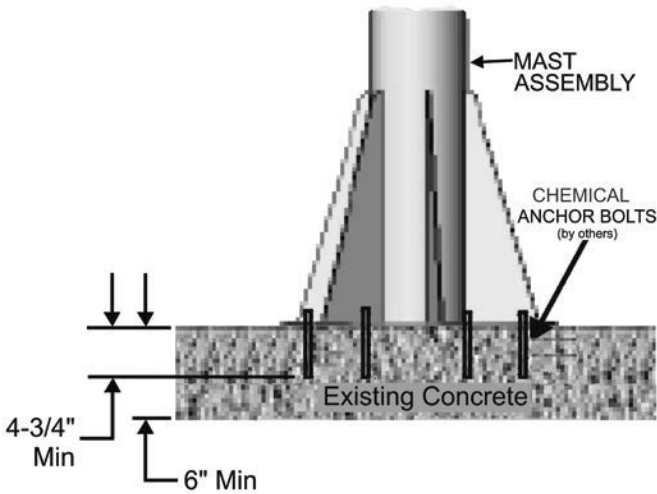
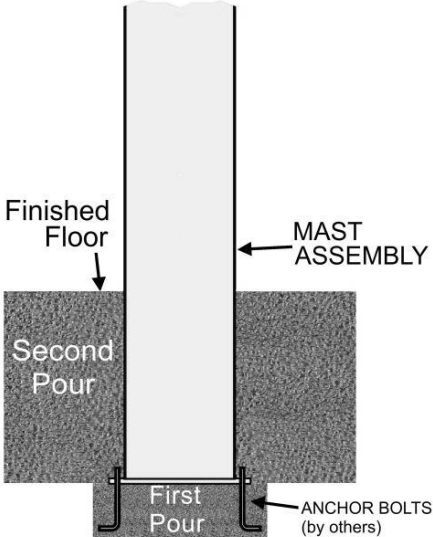
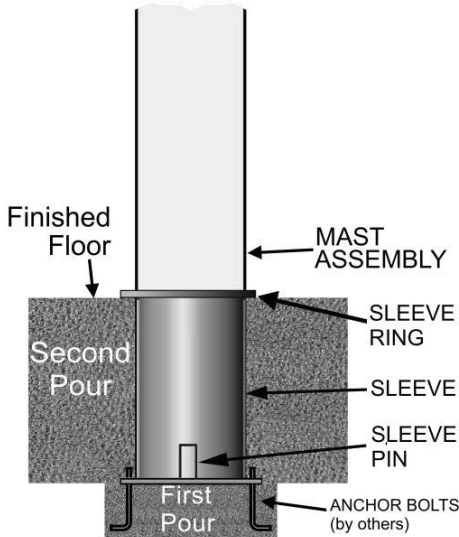
3.0 Preoperational Procedures

3.1 Pre-Assembly

- 3.1.1 Check jib crane for physical damage due to shipping.
- 3.1.2 Ensure all capacity stickers and warning labels are clearly visible and properly affixed.
- 3.1.3 Check packing list to ensure no parts have been lost prior to initiating assembly of crane.
- 3.1.4 See Foundation Drawing and Jib Crane Drawing for bolt locations and dimensions.
- 3.1.5 Read entire manual before installing the crane.
- 3.1.6 Identify crane model (351, 351F, 352F, 352S) - See **Figure 3-1**, **Figure 3-2**, **Figure 3-3**, and **Figure 3-4**. Find the applicable assembly instructions in **Section 3.2** based on your jib crane model type.

CAUTION

Figures are for reference only and may differ for your particular application. Reference Foundation Drawing and Jib Crane Drawing included with crane information packet for specific information.

	
Figure 3-1 – Model 351 (Base Mounted)	Figure 3-2 – Model 351F (Foundationless Mount)
	
Figure 3-3 – Model 352F (Foundation Mounted)	Figure 3-4 – Model 352S (Sleeve Mounted)

3.2 Installation

- 3.2.1 **⚠ WARNING** If multiple cranes were ordered, locate stamped serial number on each crane part for proper part matching during installation. Although crane parts may appear to be identical, each crane is assembled and built separately. All parts that do not have the same stamped serial number may not line up properly for installation.
- 3.2.2 **⚠ WARNING** Consult a qualified structural engineer to determine that your support structure is adequate to support the loads generated by anchor bolt force, overturning moment, or axial load of your crane. Suggested foundation requirements and curing times are recommendations only. Because conditions may vary, consult a qualified professional to verify foundation requirements.
- 3.2.3 **NOTICE** Recommended jib crane foundation requirements are based on a soil pressure of 2500 lbs. per square foot. Recommended concrete for jib crane foundation is 3000 lbs. per square inch of compressive force.
- 3.2.4 **NOTICE** Recommended curing time for foundation/concrete before mast installation is 10 days. Recommended curing time for foundation/concrete before loading crane to full capacity is 28 days.

3.2.5 For Model 351: Heavy Duty – Base Mounted (See Figure 3-1):

- 3.2.5..1 Reference Foundation Drawing and Jib Crane Drawing included in the jib crane information packet.
- 3.2.5..2 Pour foundation with ANCHOR BOLTS located according to BASE PLATE bolt pattern. Ensure the proper length of ANCHOR BOLT is exposed above floor level (see Foundation Drawing).
- 3.2.5..3 After foundation is properly cured, spread grout over foundation approximately 1" thick & same diameter as BASE PLATE (see Foundation Drawing). Grout must be a non-shrink, high compressive machinery type grout.
- 3.2.5..4 Lower MAST ASSEMBLY over ANCHOR BOLTS and set on foundation grout surface (see **Figure 3-1**). Tighten ANCHOR BOLTS until mast is plumb in all directions (see **Figure 3-7**). Grout is soft and will allow BASE PLATE to settle for plumbing procedure.
- ⚠ WARNING** Plumbing of mast assembly is very important and will affect performance of jib crane
- 3.2.5..5 After grout has properly cured, fully tighten ANCHOR BOLTS to manufacturer's specification. Verify that the MAST ASSEMBLY is still plumb.
- 3.2.5..6 Locate THRUST BEARING, lubricate with high grade grease and set on BEARING PIN at the top of the MAST ASSEMBLY (see **Figure 3-8**).
- 3.2.5..7 Proceed to **Section 3.3** to install the HEAD and BOOM ASSEMBLY.

3.2.6 Model 351F: Light Duty – "Foundationless" Mount (Mounted to existing floor):

- 3.2.6..1 Reference the Jib Crane Drawing included in the jib crane information packet.
- 3.2.6..2 **⚠ WARNING** Consult a qualified structural engineer to determine that your support structure is adequate to support the loads generated by anchor bolt force, overturning moment, or axial load of your crane. Customer is responsible for determining adequacy of the existing concrete floor prior to mounting
- 3.2.6..3 **⚠ WARNING** Existing concrete must be a minimum of 6" thick reinforced 3000 lbs. per square inch, with a soil content of 3,000 lbs. per square foot. Concrete in and around mounting site must be consistent and free of any cracks, joints, seams, walls, or wearing within a 6' x 6' area.
- 3.2.6..4 **⚠ WARNING** Installer is responsible for providing proper anchors for install based on diameter and jib crane reactions.
- 3.2.6..5 Install chemical ANCHOR BOLTS with a *minimum* of 4-3/4" embedment (See **Figure 3-2**). ANCHOR BOLT must have a minimum of two threads above nut after installation

- 3.2.6.6 Spread mechanical grout over floor approximately 1" thick & the same diameter as BASE PLATE. See Foundation Drawing. Grout must be a non-shrink, high compressive machinery type grout.
- 3.2.6.7 Lower MAST ASSEMBLY over ANCHOR BOLTS and set on foundation grout surface. Tighten ANCHOR BOLTS until MAST ASSEMBLY is plumb in all directions (see **Figure 3-7**). Grout is soft and will allow BASE PLATE to settle for plumbing procedure.

⚠ WARNING Plumbing of mast assembly is very important and will affect performance of jib crane

- 3.2.6.8 After grout has properly cured, fully tighten ANCHOR BOLTS to manufacturer's specification. Verify that the MAST ASSEMBLY is still plumb.
- 3.2.6.9 Proceed to **Section 3.3** "Head and Boom Installation"

3.2.7 For Model 352F: Heavy Duty – Foundation Mounted (See Figure 3-3):

- 3.2.7.1 Reference Foundation Drawing and Jib Crane Drawing included in the jib crane information packet.
- 3.2.7.2 Excavate proper sized area to prepare for crane foundation (see Foundation Drawing).
- 3.2.7.3 First Pour – Refer to Foundation Drawing for anchor bolt location to set ANCHOR BOLTS in first pour.
- 3.2.7.4 After concrete has hardened and ANCHOR BOLTS are set, spread mechanical grout over mounting area approximately 1-1/4" thick. Grout must be a non-shrink, high compressive machinery type grout.
- 3.2.7.5 Lower MAST ASSEMBLY over ANCHOR BOLTS and set on foundation grout surface. Tighten ANCHOR BOLTS until mast is plumb in all directions (see **Figure 3-7**). Grout is soft and will allow for proper plumbing of MAST ASSEMBLY.

⚠ WARNING Plumbing of mast assembly is very important and will affect performance of jib crane.

- 3.2.7.6 After grout has properly cured, fully tighten ANCHOR BOLTS to manufacturer's specifications so that MAST ASSEMBLY does not move during second pour. Verify MAST ASSEMBLY is still plumb.
- 3.2.7.7 Second Pour - After MAST ASSEMBLY is set and grout has dried, reference Foundation Drawing and proceed with second pour using reinforcing rods as shown on the Foundation Drawing.
- 3.2.7.8 After concrete has properly cured, locate THRUST BEARING, lubricate with high grade grease and set on BEARING PIN at the top of the MAST ASSEMBLY (see **Figure 3-8**).
- 3.2.7.9 Proceed to Section 3.3 to install the HEAD and BOOM ASSEMBLY.

3.2.8 For Model 352S: Heavy Duty – Sleeve Mounted (See Figure 3-4):

- 3.2.8.1 Reference Foundation Drawing and Jib Crane Drawing included in the jib crane information packet.
- 3.2.8.2 Excavate proper sized area to prepare for crane foundation (see Foundation Drawing).
- 3.2.8.3 First Pour – Refer to Foundation Drawing for location to set ANCHOR BOLTS in first pour.
- 3.2.8.4 After concrete has hardened and ANCHOR BOLTS are set, spread mechanical grout over mounting area approximately 1-1/4" thick. Grout must be a non-shrink, high compressive machinery type grout.

⚠ WARNING Plumbing of sleeve is very important and will affect performance of jib crane.

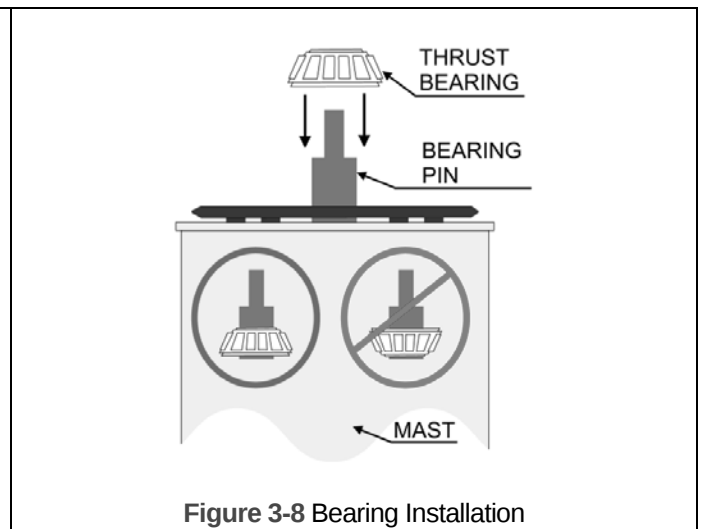
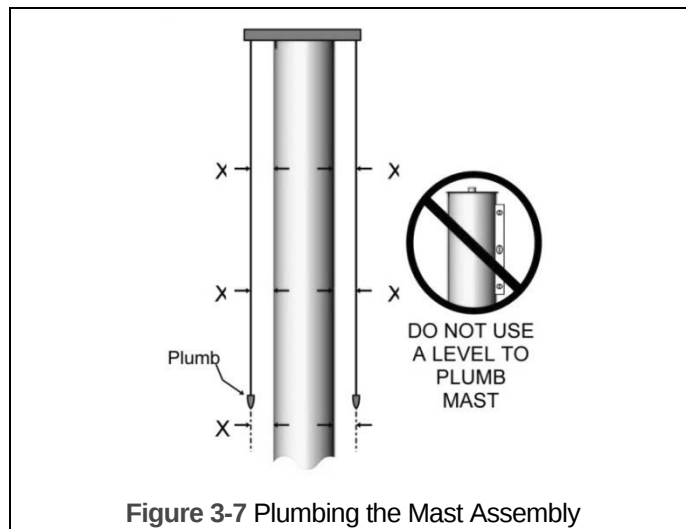
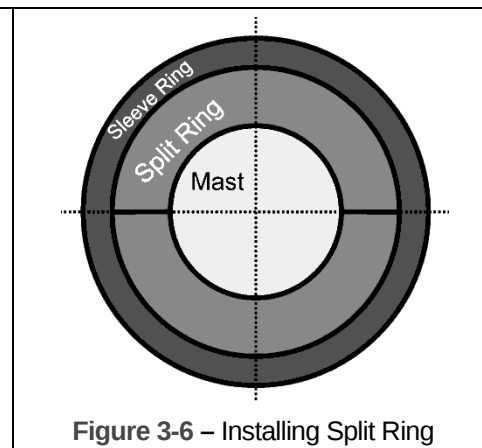
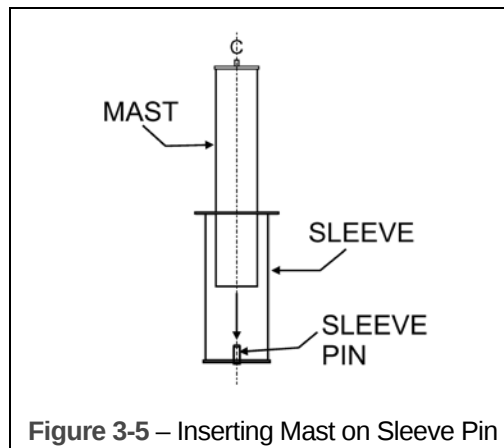
- 3.2.8..5 Install SLEEVE and tighten bolts making sure the SLEEVE is plumb in all directions (see **Figure 3-7**). Grout is soft and will allow for proper plumbing of SLEEVE.
- 3.2.8..6 After grout has properly cured, fully tighten ANCHOR BOLTS to manufacturer's specifications so that SLEEVE does not move during second pour. Verify SLEEVE is still plumb.
- 3.2.8..7 Second Pour - Reference Foundation Drawing and proceed with second pour using reinforcing rods as shown on Foundation Drawing. Make sure SLEEVE RING is resting on top of poured foundation (see **Figure 3-4**)

After Concrete has Properly Cured:

- 3.2.8..8 Insert MAST into SLEEVE and allow the bottom hole of MAST to slide over SLEEVE PIN (see **Figure 3-5**)

⚠ WARNING Plumbing of mast assembly is very important and will affect performance of jib crane.

- 3.2.8..9 Plumb MAST ASSEMBLY in all directions (see **Figure 3-7**). Make sure MAST ASSEMBLY remains plumb throughout **step 9**.
- 3.2.8..10 Place SPLIT RINGS provided around bottom part of MAST resting on top of SLEEVE RING (see **Figure 3-6**). Tack weld SPLIT RING into position to MAST and SLEEVE RING. After SPLIT RING is tack welded into proper position check once more that mast has remained plumb then weld SPLIT RING all around MAST and weld SPLIT RING completely around to SLEEVE RING. Verify MAST is still plumb.
- 3.2.8..11 Locate THRUST BEARING, lubricate with high grade grease and set on BEARING PIN at the top of the MAST (see **Figure 3-8**).
- 3.2.8..12 Proceed to **Section 3.3** to install HEAD and BOOM ASSEMBLY.



3.3 Head and Boom Installation

- 3.3.1 Reference **Figure 3-9** for general assembly layout. Reference Jib Crane Drawing for bolt sizes and locations.
- 3.3.2 Depending on size of crane and machinery available for installation, the BOOM ASSEMBLY and HEAD ASSEMBLY can be pre-assembled for mounting to MAST ASSEMBLY. Use the following procedure if this is the desirable installation method (if an alternative method is preferred, continue to **Step 3.3.3**).
 - 3.3.2..1 Bolt the BOOM ASSEMBLY to HEAD ASSEMBLY at BOOM BACK PLATE and FRONT SUPPORT with bolts provided.
 - 3.3.2..2 Remove SPACER RODS if necessary.
 - 3.3.2..3 Lift entire assembly (BOOM and HEAD) over top of the MAST and make sure BEARING HOUSING is properly seated on THRUST BEARING.
 - 3.3.2..4 Replace SPACER RODS if removed (continue to **Step 3.3.4**).
- 3.3.3 Installation of HEAD ASSEMBLY and BOOM ASSEMBLY in separate pieces:
 - 3.3.3..1 Place HEAD ASSEMBLY on MAST ASSEMBLY with the top plate of HEAD ASSEMBLY resting on top plate of MAST ASSEMBLY. Be sure that the THRUST BEARING is centered in HEAD ASSEMBLY's top plate cut-out. Remove SPACER RODS if necessary.
 - 3.3.3..2 Set BOOM ASSEMBLY on top of THRUST BEARING making sure BEARING HOUSING is lined up with THRUST BEARING.
 - 3.3.3..3 Fasten BOOM ASSEMBLY to HEAD ASSEMBLY using bolts provided at BOOM BACK PLATE and FRONT SUPPORTS. See torque specs in **Table 3-1**.
 - 3.3.3..4 Replace spacer rods if removed (continue to **Step 3.3.4**).
- 3.3.4 Lubricate rollers in ROLLER CAGE ASSEMBLY with high grade grease.
- 3.3.5 Under no load condition, adjust the BOOM ASSEMBLY so that the far end of the boom is $\text{span(in.)}/300$ above the horizontal. To adjust desired BOOM ASSEMBLY elevation loosen and tighten TENSION BOLTS on ROLLER CAGE ASSEMBLY while moving the tip of BOOM ASSEMBLY up or down. Ensure rollers are making full contact with MAST ASSEMBLY.
- 3.3.6 Rotate BOOM ASSEMBLY slowly and check around 360° degrees for binds or slow down spots. Remove interference if any.
- 3.3.7 Check all bolt connections including ANCHOR BOLTS and tighten if necessary.
- 3.3.8 If applicable, install MECHANICAL ROTATION STOPS – See **Section 3.4**.
- 3.3.9 Bolt two inner TROLLEY STOPS to BOOM ASSEMBLY. Slide Hoist/Trolley onto BOOM ASSEMBLY, then bolt two remaining TROLLEY STOPS to BOOM ASSEMBLY. (For units with Tight Wire Kit, refer to **Section 3.5**).
- 3.3.10 The unit should be ready for operation. Please call Product Support with any questions during install.

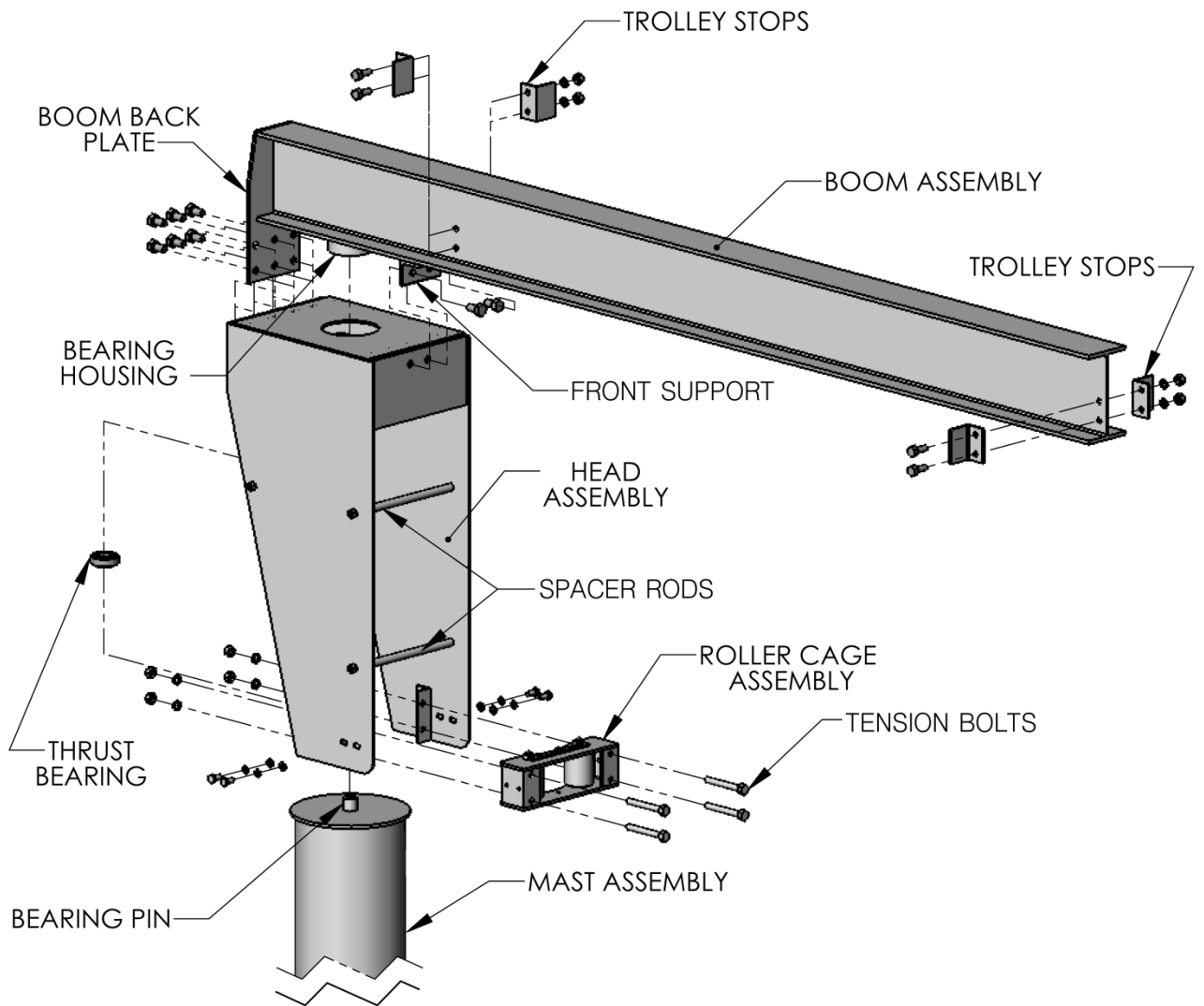
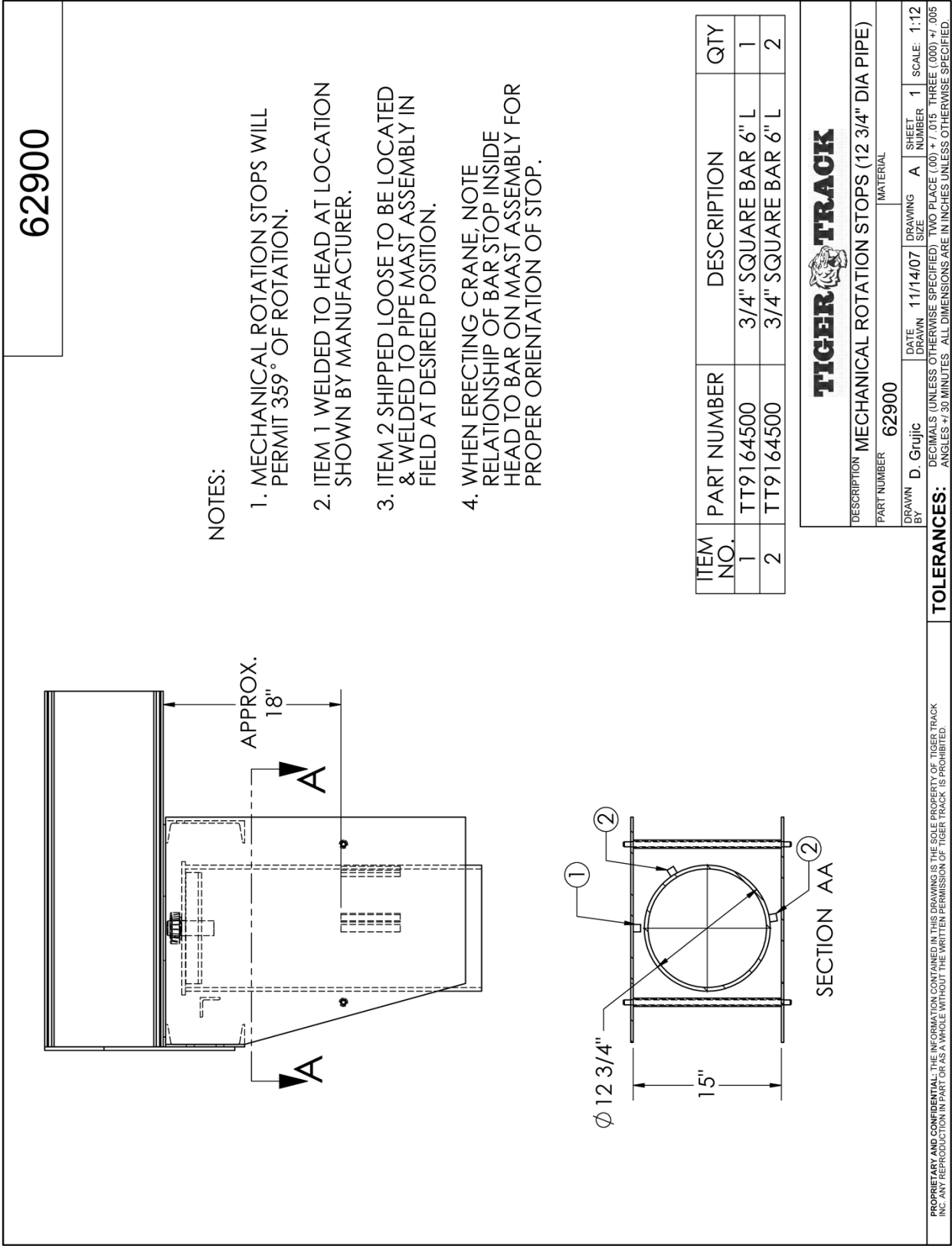


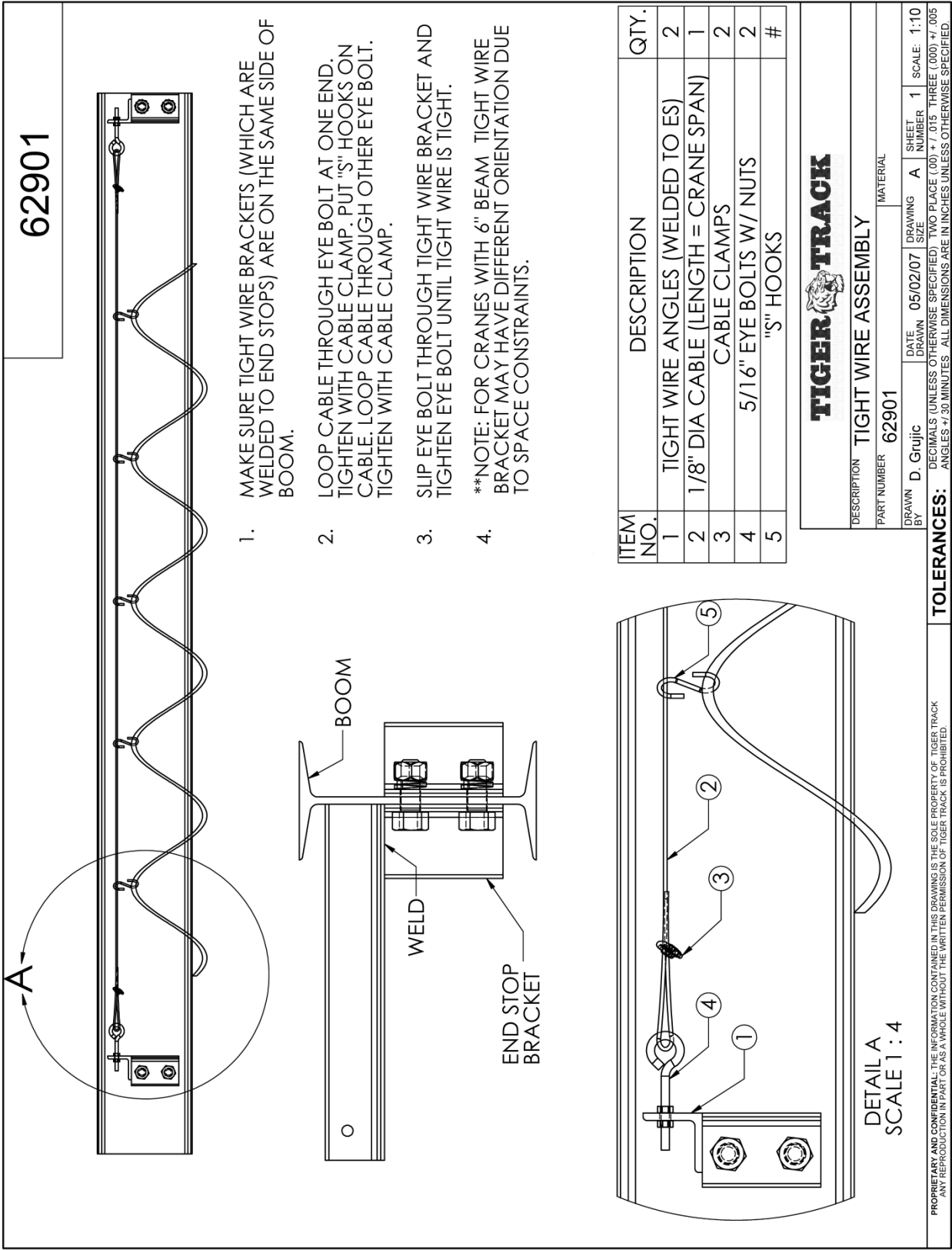
Figure 3-9 Heavy Duty Jib Crane Assembly

Table 3-1 Torque Specifications	
BOLT DIA.	TORQUE
1/4" - 20	6 ft.-lbs.
3/8" - 16	20 ft.-lbs.
1/2" - 13	50 ft.-lbs.
5/8" - 11	95 ft.-lbs.
3/4"-10	175 ft.-lbs.
7/8" - 9	300 ft.-lbs.

3.4 Mechanical Rotation Stops



3.5 Tight Wire Assembly



4.0 Operation

4.1 Introduction

The suggestions below are not intended to take precedence over existing plant safety rules and regulations or OSHA regulations. It is the responsibility of the owner to make personnel aware of all federal, state and local rules and codes, and to make certain operators are properly trained.

DANGER

DO NOT WALK UNDER A SUSPENDED LOAD
KEEP HANDS CLEAR OF ROTATING PARTS

WARNING

CRANE OPERATORS SHALL BE REQUIRED TO READ THE OPERATION SECTION OF THIS MANUAL, THE WARNINGS CONTAINED IN THIS MANUAL, INSTRUCTION AND WARNING LABELS ON THE CRANE OR LIFTING SYSTEM, APPLICABLE ANSI AND OSHA SAFETY STANDARDS, AND THE CRANE OPERATOR'S MANUAL PUBLISHED BY THE CRANE MANUFACTURER'S ASSOCIATION OF AMERICA (CMAA). THE OPERATOR SHALL ALSO BE REQUIRED TO BE FAMILIAR WITH THE CRANE AND CRANE CONTROLS BEFORE BEING AUTHORIZED TO OPERATE THE CRANE OR LIFTING SYSTEM.

CRANE OPERATORS SHOULD BE TRAINED IN PROPER RIGGING PROCEDURES FOR THE ATTACHMENT OF LOADS TO THE HOIST HOOK.

CRANE OPERATORS SHOULD BE TRAINED TO BE AWARE OF POTENTIAL MALFUNCTIONS OF THE EQUIPMENT THAT REQUIRE ADJUSTMENT OR REPAIR, AND TO BE INSTRUCTED TO STOP OPERATION IF SUCH MALFUNCTIONS OCCUR, AND TO IMMEDIATELY ADVISE THEIR SUPERVISOR SO CORRECTIVE ACTION CAN BE TAKEN.

CRANE OPERATORS SHOULD HAVE NORMAL DEPTH PERCEPTION, FIELD OF VISION, REACTION TIME, MANUAL DEXTERITY, HEARING, AND COORDINATION.

CRANE OPERATORS SHOULD **NOT** HAVE A HISTORY OF OR BE PRONE TO SEIZURES, LOSS OF PHYSICAL CONTROL, PHYSICAL DEFECTS, OR EMOTIONAL INSTABILITY THAT COULD RESULT IN ACTIONS OF THE OPERATOR BEING A HAZARD TO THE OPERATOR OR TO OTHERS.

CRANE OPERATORS SHOULD **NOT** OPERATE A CRANE OR LIFTING SYSTEM WHEN UNDER THE INFLUENCE OF ALCOHOL, DRUGS, OR MEDICATION.

NOTICE

- Read OSHA Specification 1910.179 "Overhead and Gantry Cranes," ANSI B30.11, "Monorails and Underhung Cranes," ASME B30.16, and any other applicable standards.
- Read the hoist manufacturer's Operating and Maintenance Instructions.
- Read all labels attached to equipment.

4.2 Shall's and Shall Not's for Operation

WARNING

Improper operation of a crane can create a potentially hazardous situation which, if not avoided, could result in death or serious injury, and substantial property damage. To avoid such a potentially hazardous situation **THE OPERATOR SHALL:**

- **NOT** operate a damaged, malfunctioning or unusually performing crane.
- **NOT** operate a crane until you have thoroughly read and understood Manufacturer's Operating and Maintenance Instructions or Manuals.
- Be familiar with operating controls, procedures, and warnings.
- **NOT** operate a crane that has been modified without the manufacturer's approval
- **NOT** lift more than rated load for the crane/hoist/trolley.
- **NOT** use the crane to lift, support, or transport people.
- **NOT** lift loads over people.
- **NOT** operate a crane unless all persons are and remain clear of the supported load.
- **NOT** operate unless load is centered under hoist.
- **NOT** leave load supported by the crane/hoist unattended unless specific precautions have been taken.
- **NOT** allow the crane to be used as an electrical or welding ground.
- **NOT** remove or obscure the warnings on the crane.
- **NOT** operate a crane on which the safety placards or decals are missing or illegible.
- **NOT** operate a crane that has any changes in rolling effort or unusual noises.
- Warn personnel before lifting or moving a load.
- Warn personnel of an approaching load.
- Ensure that endstops are in place.
- Ensure that all bolts are tight and have lockwashers.
- **NOT** put hands near rotating parts.

CAUTION

Improper operation of a crane can create a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, or property damage. To avoid such a potentially hazardous situation **THE OPERATOR SHALL:**

- Maintain a firm footing or be otherwise secured when operating the crane.
- Make sure the load is free to move and will clear all obstructions.
- Avoid swinging the load or hook.
- Inspect the crane regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
- Use the crane manufacturer's recommended parts when repairing the unit.
- Lubricate the roller bearings per crane manufacturer's recommendations.
- **NOT** allow your attention to be diverted from operating the crane.
- **NOT** allow the crane to be subjected to sharp contact with other cranes, structures, or objects through misuse.
- **NOT** adjust or repair the crane unless qualified to perform such adjustments or repairs.
- Ensure that festooning cannot be snagged or pinched.

4.3 Jib Boom Operation

- 4.3.1 Verify the hook is high enough to clear any obstruction before using the boom of the jib crane.
- 4.3.2 Ensure the jib boom is directly over the load before lifting the load.
- 4.3.3 Start moving the jib boom slowly and bring it up to speed gradually.
- 4.3.4 Reduce the speed of the boom as it approaches the desired position.

4.4 Trolley Operation

Refer to the trolley's operating instructions.

4.5 Hoist Operation

Refer to the hoist's operating instructions.

5.0 Inspection

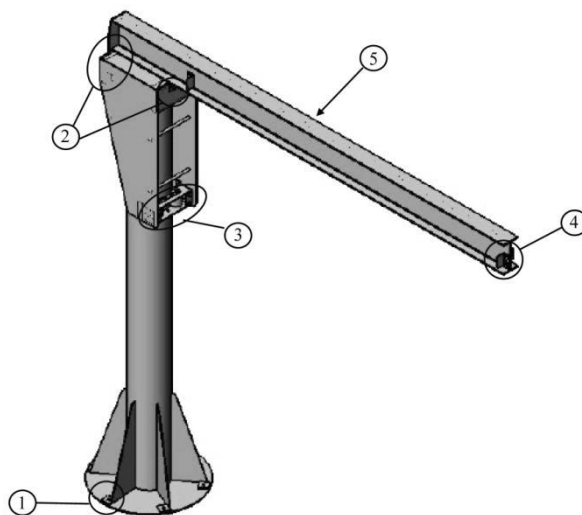


Table 5-1 Crane Inspection

Figure No.	Item	Inspection	Frequency	
1	Anchor Bolts	Check that the lock-washers are fully compressed and the nuts are tightened to manufacturer's specifications.	351	Every 500 hours Or 3 months
	Chemical Anchor Bolts		351F	Once per month
2	Boom & Head Assembly Hardware	Check that the lock-washers are fully compressed and the nuts are tightened the proper torque specs from chart 1-L (see installation page).	Every 500 hours Or 3 month	
3	Thrust Bearings	Make sure both roller bearings are evenly touching the mast, adjust if needed. Grease if needed.	Every 1000 hours Or 6 months	
4	End Stop/ Tight Wire Kit	Check that the lock-washers are fully compressed and the nuts are tightened the proper torque specs from chart 1-L (see installation page).	Every 500 hours Or 3 months	
5	Leveling Boom Kit	Verify that the end of the boom is at the point of span(in.)/300 above level.	Every 1000 hours Or 6 months	
-	Additional Items	Conduct a general inspection of all additional items you may have purchased.	Every 1000 hours Or 6 months	
-	General	Conduct a visual inspection of the crane overall and speak with the crane operator about the crane's performance, if any flaws are noticed take crane out of service and report to manufacturer immediately.	Every 1000 hours Or 6 months	

⚠ WARNING

Any changes in rolling effort or unusual noises must be immediately identified and corrected.

6.0 Lubrication

- 6.1** The most economical way to maintain a jib crane and keep it in good operating condition is to lubricate all moving parts regularly.
- 6.2** Regular inspection of all parts should be made and all loose parts should be adjusted. Parts that become worn should be replaced immediately.
- 6.3** The lubrication interval varies with the use of the machine. A crane operating 24 hours a day, 7 days a week, should demand lubrication once a week. Whereas a standard duty crane, operating eight hours a day on a five day week should be lubricated once every two to three weeks. Cranes under a standby classification, being used once or twice a month, should be lubricated at least once every six months.
- 6.4** The actual interval from one lubrication to the next depends entirely upon the type and length of operation to which the crane is subjected. These factors are variable and sometimes cannot be definitely determined. In this case, the crane operator or maintenance engineer would determine when the crane should be lubricated.
- 6.5** The roller bearings on the jib crane require lubrication. They are serviced by pressure type fittings.
- 6.6** The recommended lubricants for these bearings are:
 - Texaco Marfax No. 0 for below 32 degrees F
 - Texaco Marfax No. 1 for above 32 degrees F
- 6.7** If Texaco products are not available, equivalent lubricants are satisfactory.

7.0 Troubleshooting

Table 7-1 Troubleshooting Guide		
Symptom	Cause	Remedy
Jib crane boom tip will not adjust to span (in.)/300	Bearing housing on boom is not properly seated on the thrust bearing	Properly seat bearing housing on thrust bearing
Jib crane does not rotate smoothly	Rollers are not making flush contact with the mast	Adjust roller cage pitch by loosening the side bolts (do not remove) on the head assembly that hold the cage in position; then tighten or loosen the top and/or bottom tension bolts to adjust the pitch of the rollers
Jib crane does not rotate a complete rotation	Crane boom has an obstruction	Remove any obstruction
	Bearing housing on boom is not properly seated on the thrust bearing	Properly seat bearing housing on thrust bearing

8.0 Warranty

All products sold by Harrington Hoists, Inc. are warranted to be free from defects in material and workmanship from date of shipment by Harrington for the following periods:

- 1 year – Electric and Air Powered Hoists (excluding (N)ER2 Enhanced Features Models), Powered Trolleys, Powered Tiger Track Jibs and Gantries, Crane Components, Below the Hook Devices, Spare / Replacement Parts**
- 2 years – Manual Hoists & Trolleys, Beam Clamps**
- 3 years – (N)ER2 Enhanced Features Model Hoists**
- 5 years – Manual Tiger Track Jibs and Gantries, TNER Pull - Rotor Motor Brake**
- 10 years – (N)ER2 “The Guardian” Smart Brake**

The product must be used in accordance with manufacturer's recommendations and must not have been subject to abuse, lack of maintenance, misuse, negligence, or unauthorized repairs or alterations.

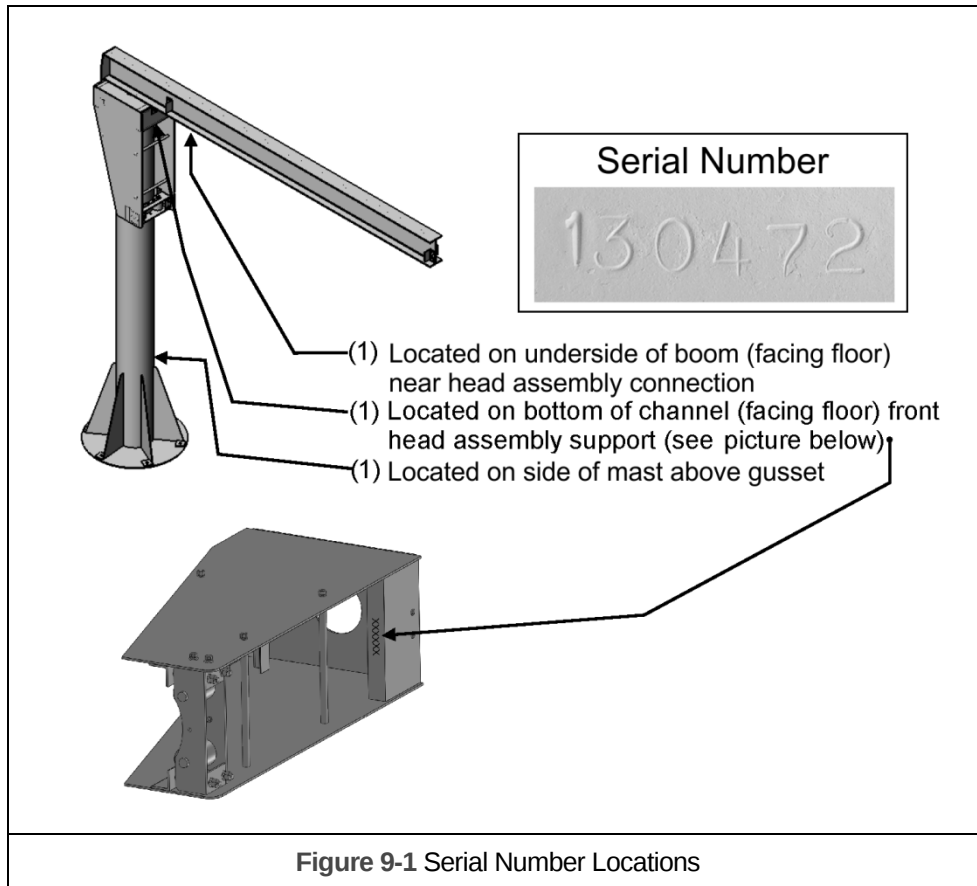
Should any defect in material or workmanship occur during the above time period in any product, as determined by Harrington Hoist's inspection of the product, Harrington Hoists, Inc. agrees, at its discretion, either to replace (not including installation) or repair the part or product free of charge and deliver said item F.O.B. Harrington Hoists, Inc. place of business to customer.

Customer must obtain a Return Goods Authorization as directed by Harrington or Harrington's published repair center prior to shipping product for warranty evaluation. An explanation of the complaint must accompany the product. Product must be returned freight prepaid. Upon repair, the product will be covered for the remainder of the original warranty period. Replacement parts installed after the original warranty period will only be eligible for replacement (not including installation) for a period of one year from the installation date. If it is determined there is no defect, or that the defect resulted from causes not within the scope of Harrington's warranty, the customer will be responsible for the costs of returning the product.

Harrington Hoists, Inc. disclaims any and all other warranties of any kind expressed or implied as to the product's merchantability or fitness for a particular application. Harrington will not be liable for death, injuries to persons or property or for incidental, contingent, special or consequential damages, loss or expense arising in connection with the use or inability whatever, regardless of whether damage, loss or expense results from any act or failure to act by Harrington, whether negligent or willful, or from any other reason.

9.0 Parts Information

When ordering Parts, please provide the crane serial number which is stamped into each crane part (see **Figure 9-1**). The serial number is also located underneath the “Tiger Track” logo.



The parts list is arranged into the following sections:

Section	Page
9.1 Jib Crane Parts.....	26
9.2 Roller Cage Assembly Parts.....	28
9.3 Labels.....	32

9.1 Jib Crane Parts

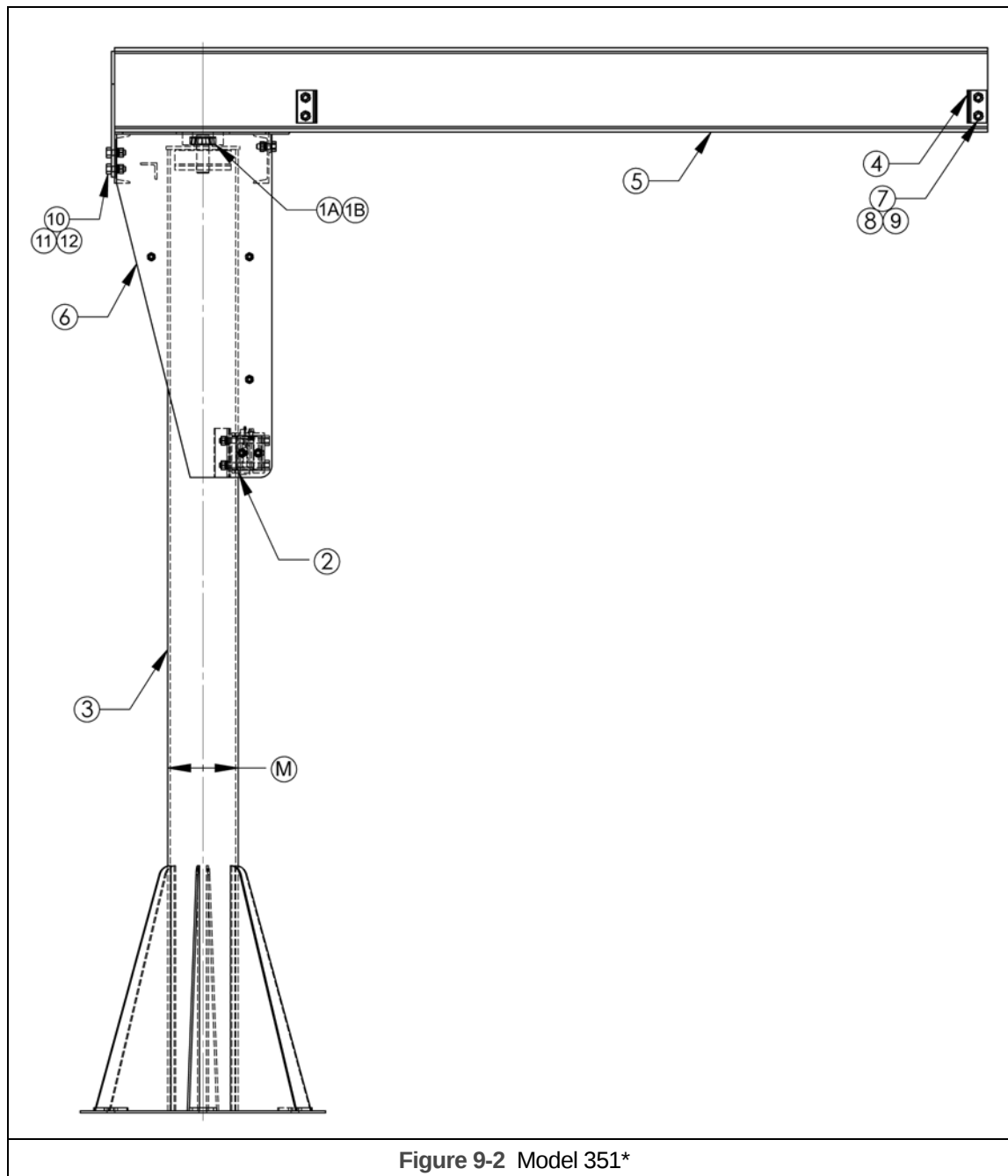


Figure 9-2 Model 351*

*Model 351 is shown for reference, but figure numbers apply for 352S and 352F

9.1 Jib Crane Parts

			MAST DIAMETER M (INCHES)								
Figure No.	Description	Qty	8-5/8"	10-3/4"	12-3/4"	14"	16"	18"	20"	24"	30"
1A	Top Thrust Bearing	1	TTHS3381TB				TTHS6379TB			CALL FACTORY	
1B	Thrust Bearing Cone	1	TTHS3320CN				TTHS6320CN			CALL FACTORY	
2	Roller Cage Assembly	1	TT0110803A	TT0111003A	TT0111203A	TT0111405A	TT0111604A	TT0111803A	TT0112003A	TT0112404A	TT0113004A
3	Mast Assembly	1	SEE BILL OF MATERIALS ON JIB CRANE DRAWING								
4	Trolley Stops	4									
5	Boom Assembly	1									
6	Head Assembly	1									
7	Bolt	-									
8	Lock washer	-									
9	Nut	-									
10	Bolt	-									
11	Lock Washer	-									
12	Nut	-									

9.2 Roller Cage Assembly Parts

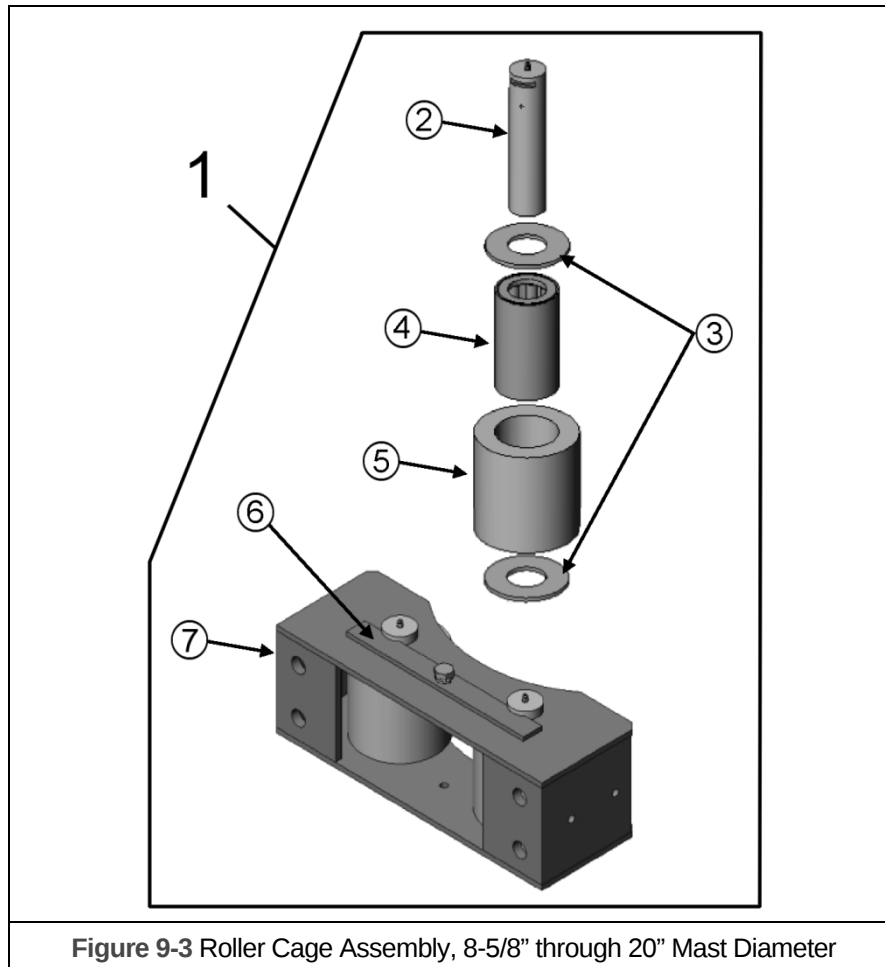


Figure 9-3 Roller Cage Assembly, 8-5/8" through 20" Mast Diameter

9.2 Roller Cage Assembly Parts

Figure No.	Description	Qty	MAST DIAMETER (INCHES)						
			8-5/8"	10-3/4"	12-3/4"	14"	16"	18"	20"
1	Roller Cage Assembly	1	TT0110803A	TT0111003A	TT0111203A	TT0111405A	TT0111604A	TT0111803A	TT0112003A
2	Roller Pin with Zirk Fitting	2	TT0191201			TT0191402	TT0191603		
3	Flat Spacer Washer	4	TT097112501			TT097143801	TT097175001		
4	Roller Bearing	2	TT0700664			TT0700964	TT0700980		
5	Roller	2	TT0181201			TT0181402	TT0181603		
6	Keeper Bar	1	TT2190801	TT2251201		TT2254101	TT2251601	TT2251801	TT2252001
7	Roller Cage Weldment	1	TT0110803	TT0111003	TT0111203	TT0111405	TT0111604	TT0111803	TT0112003

9.2 Roller Cage Assembly Parts

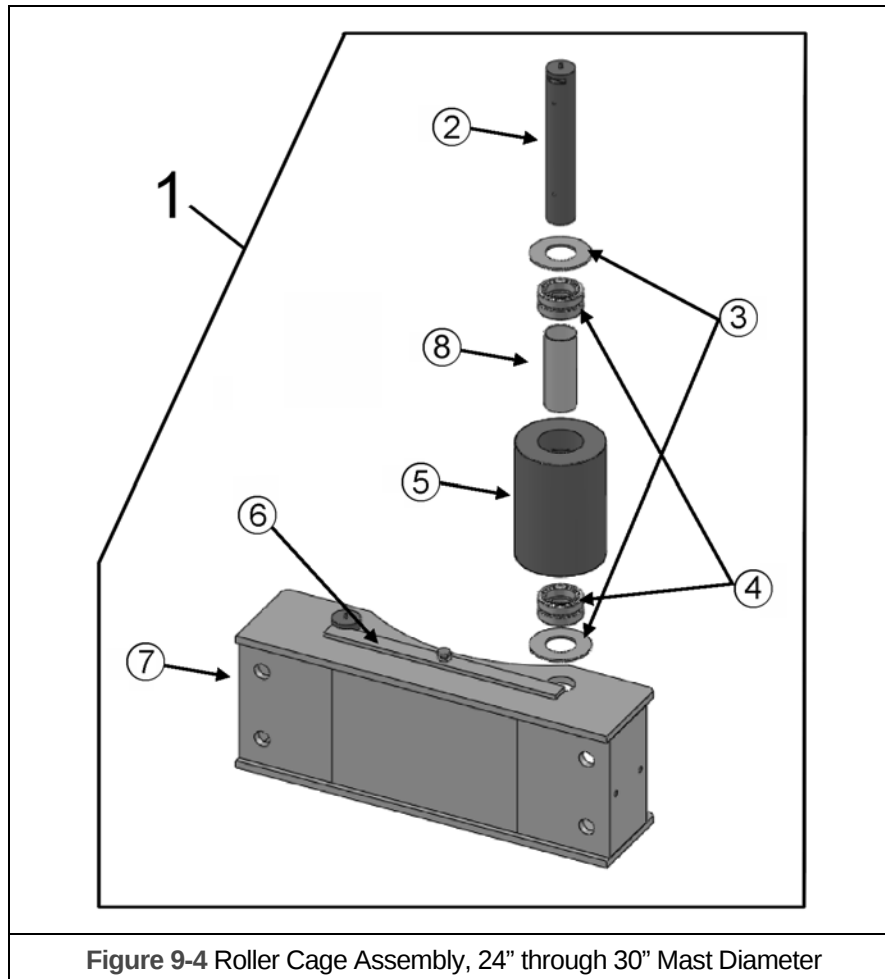
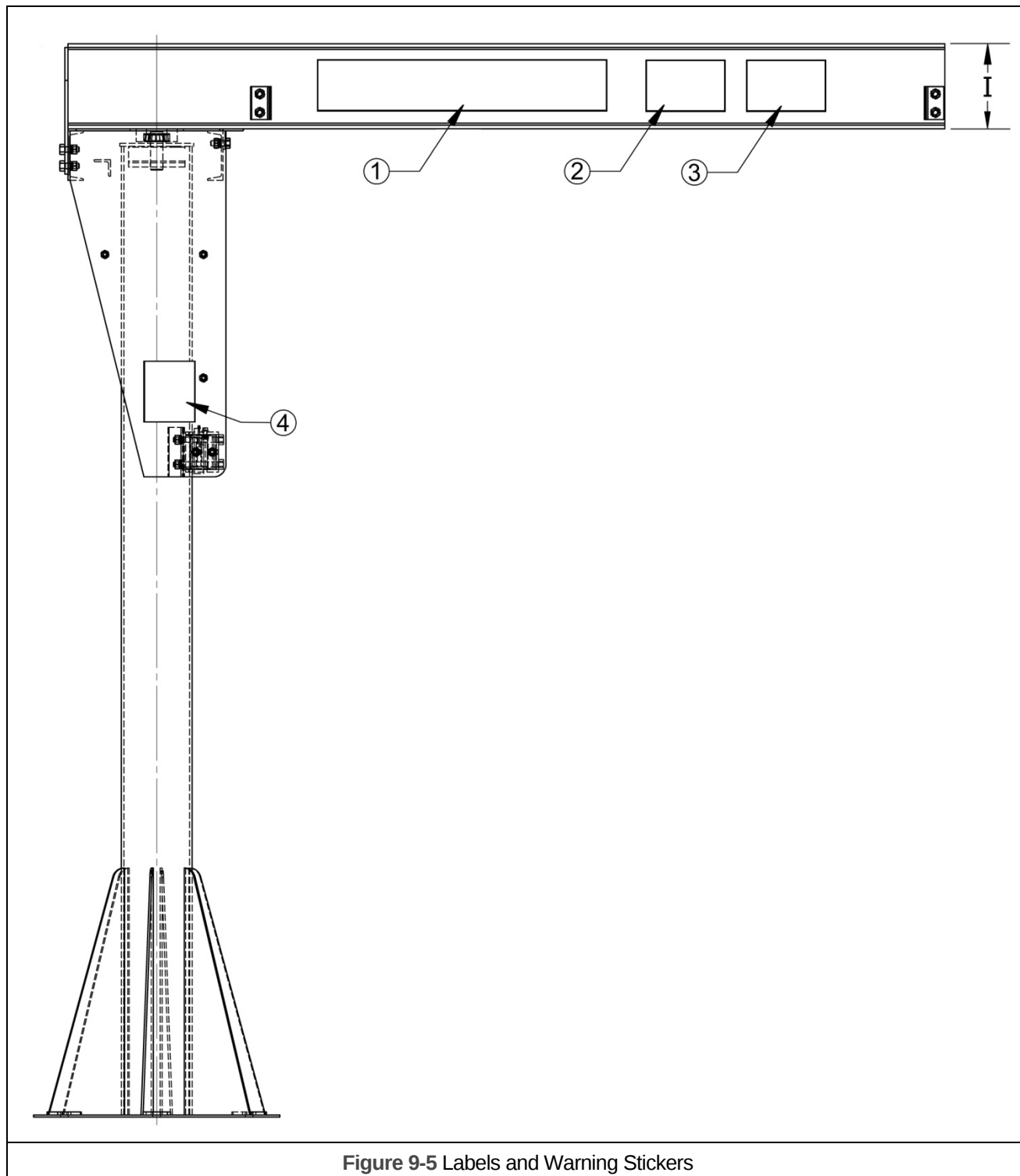


Figure 9-4 Roller Cage Assembly, 24" through 30" Mast Diameter

9.2 Roller Cage Assembly Parts

Figure No.	Description	Qty	MAST DIAMETER (INCHES)	
			24"	30"
1	Roller Cage Assembly	1	TT0112404A	TT0113004A
2	Roller Pin with Zirk Fitting	2	TT0192404	TT0193005
3	Flat Spacer Washer	4	TT097200001	TT097225001
4	Roller Bearing	4	TT0704031	TT0704436
5	Roller	2	TT0182404	TT0183005
6	Keeper Bar	1	TT2252401	TT2383001
7	Roller Cage Weldment	1	TT0112404	TT0113004
8	Bearing Spacer	2	TT0182414	TT0183015

9.3 Labels



9.3 Labels

			BOOM HEIGHT ↓ (INCHES)								
Figure No.	Description	Qty	6	8	10	12	14	16	18	20	24
1	Logo	2	8047301			8047302					
2	Capacity Number, 1	-	8047306								
	Capacity Number, 2		8047307								
	Capacity Number, 3		8047308								
	Capacity Number, 4		8047309								
	Capacity Number, 5		8047310								
	Capacity Number, 6		8047311								
	Capacity Number, 7		8047312								
	Capacity Number, 8		8047313								
	Capacity Number, 9		8047314								
	Capacity Number, 0		8047315								
	Capacity Slash		8047316								
3	Capacity Unit, TON	2	8047303								
	Capacity Unit, LBS		8047304								
	Capacity Unit, KG		8047305								
4	Danger label	2	80472								

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