
OWNER'S MANUAL

MOTORIZED TIE ROD JIB CRANE 311M Series (& 752 Fitting Kit)

½ Ton through 3 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.

TIGER TRACK
JIBS & GANTRIES  BY HARRINGTON

Table of Contents

Section	Page Number
1.0 Important Information and Warnings.....	3
1.1 Terms and Summary	
1.2 Warning Tags and Labels	
2.0 Technical Information.....	6
2.1 Specifications	
2.2 Dimensions	
2.3 Crane Terms	
3.0 Pre-operational Procedures.....	10
3.1 Pre-Assembly	
3.2 Crane Installation	
3.3 Drive Installation	
3.4 Electrical and Final Assembly	
3.5 Flat Cable Installation	
3.6 Torque Limiter	
4.0 Operation.....	16
4.1 Introduction	
4.2 Shall's and Shall Not's for Operation	
4.3 Jib Boom Operation	
4.4 Trolley Operation	
4.5 Hoist Operation	
4.6 Shut-Down Instructions	
5.0 Inspection.....	19
5.1 Crane Inspection	
6.0 Lubrication.....	20
6.1 Crane Lubrication	
6.2 Gear Motor Lubrication	
7.0 Troubleshooting.....	21
8.0 Warranty.....	22
9.0 Parts Information.....	23

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 Tiger Track 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 Tiger Track's cranes because of necessity in interpreting these instructions. Harrington Hoists, Inc. 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 an electrical or welding 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."

Electrical equipment described herein is designed and built in compliance with Tiger Track's interpretation of ANSI/NFPA 70, "National Electrical Code". The system designer, system manufacturer, crane designer, crane manufacturer, installer, or user is responsible to assure that the installation and associated wiring of these electrical components is in compliance with ANSI/NFPA 70, and all applicable Federal, State and Local Codes.

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.

DANGER

HAZARDOUS VOLTAGES ARE PRESENT IN THE CONTROL BOX, OTHER ELECTRICAL COMPONENTS, AND CONNECTIONS BETWEEN THESE COMPONENTS FOR MOTORIZED JIB CRANES.

Before performing ANY mechanical or electrical maintenance on the equipment, de-energize (disconnect) the main switch supplying power to the equipment; as well as lock and tag the main switch in the de-energized position. Refer to ANSI Z244.1, "Personnel Protection – Lockout/Tagout of Energy Sources".

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 Tiger Track 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

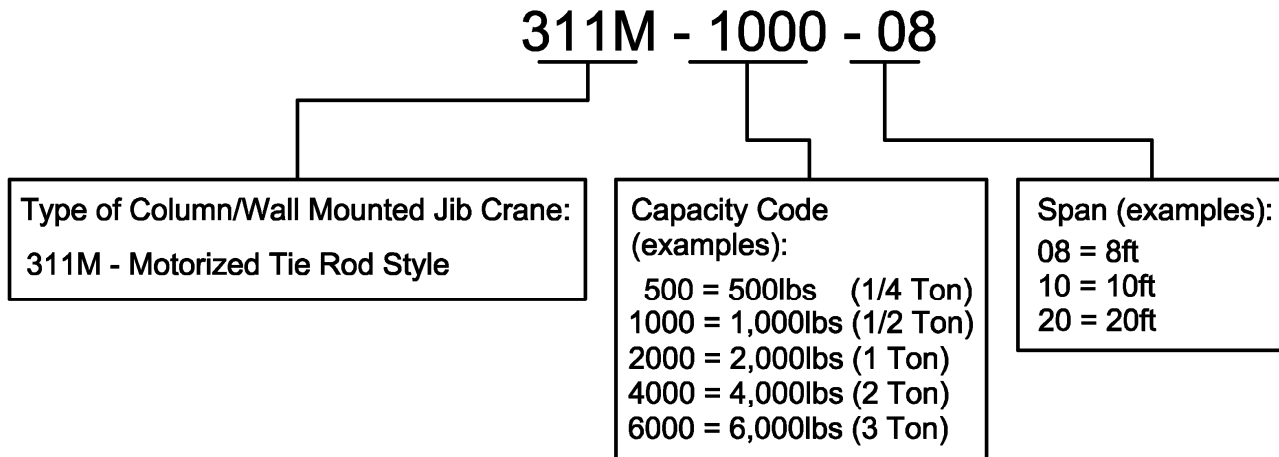
This crane may be part of a lifting system including a hoist and trolley. It is the responsibility of the owner of such a lifting system to ensure that the lifting system be equipped with warning labels in accordance with applicable industry standards.

2.0 Technical Information

2.1 Specifications

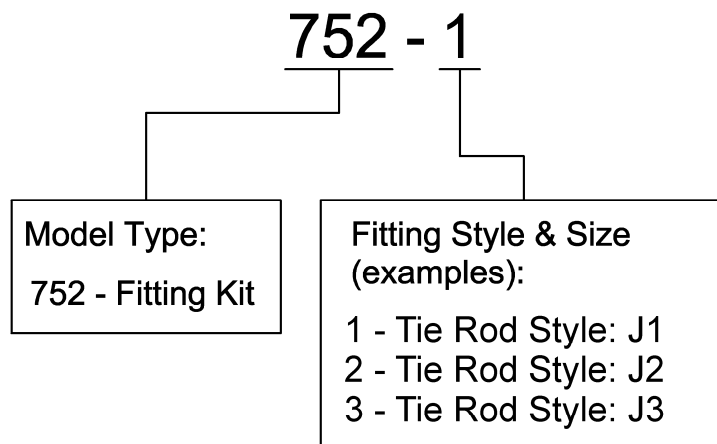
2.1.1 Product Code for Tie Rod Jib

(Tie Rod Style Jib includes 752 fitting kit, boom, tie rods, boom/tie rod connection hardware, end stops, and end stop hardware. Mounting hardware is supplied by others.)



2.1.2 Product Code for Tie Rod Jib Fitting Kit

(Fitting Kit includes fittings only. This kit is for customers providing boom, tie rods, tie rod/stem connection hardware, mounting hardware, etc.)



2.1.3 Operating Conditions and Environment

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

Relative Humidity: 85% or less

Supply Voltage: VFD standard: 208/230V-3-60, 460V-3-60 or Special Voltages/Frequencies Available

2.2 Dimensions

2.2.1 Jib Dimensions

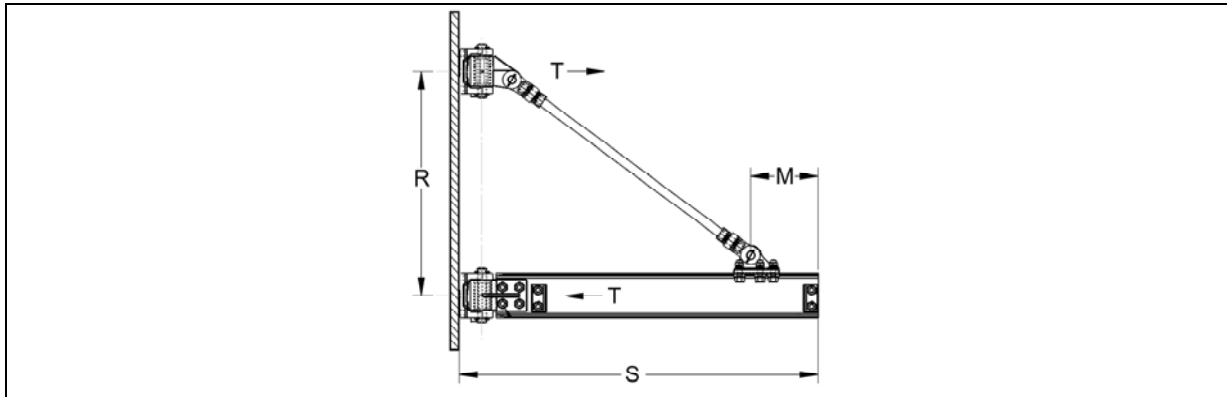


Table 2-1 Model 311 Specifications & Dimensions¹

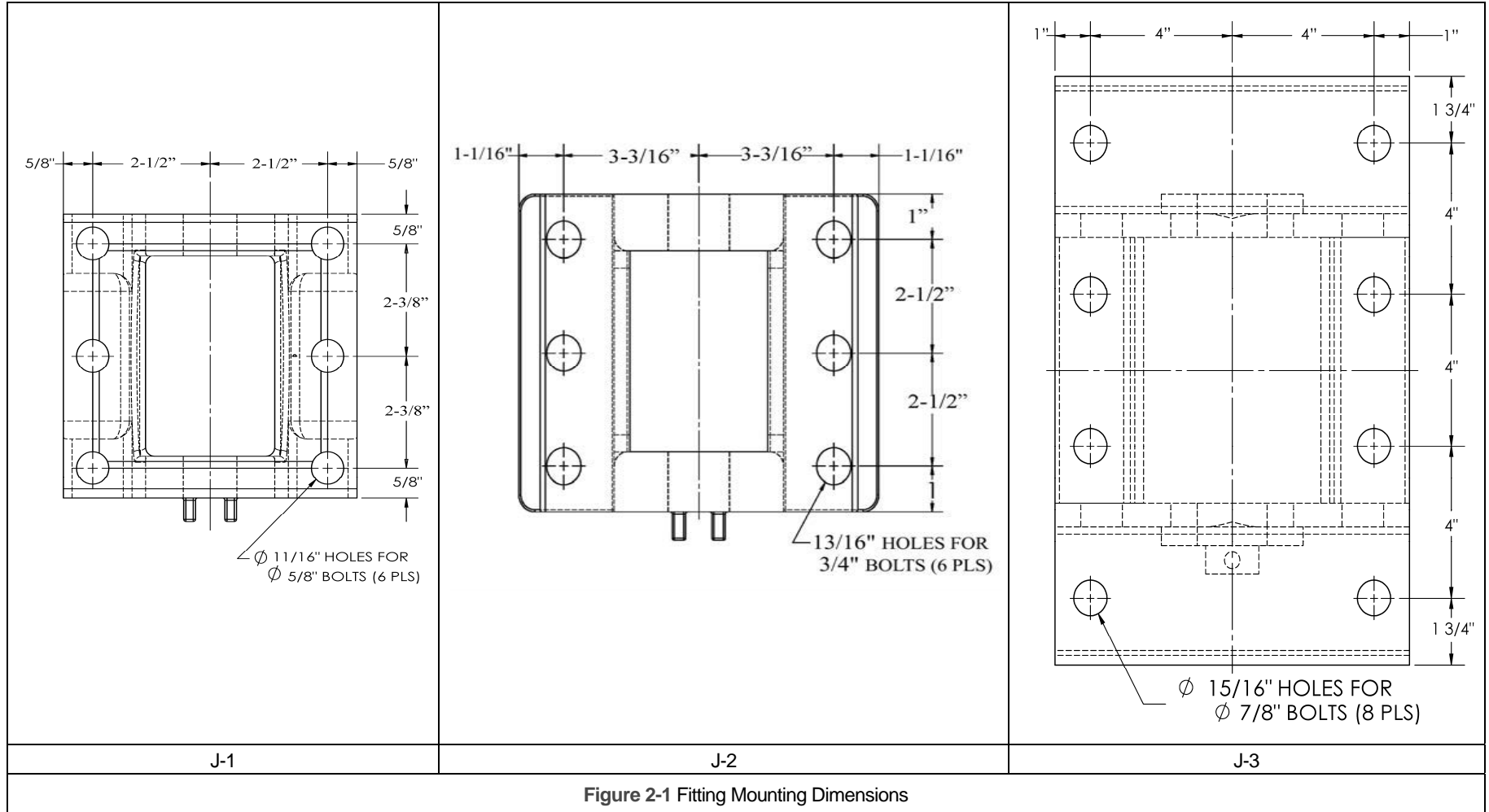
Capacity (Ton)	Product Code	Span S (Feet-Inches)	Beam Size ² I (Inches)	M (Feet-Inches)	R (Feet-Inches)	Thrust & Pull T (Lbs.)	Tie Rod Diameter (Inches)	Tie Rod Length (Feet-Inches)	Fitting No.	Weight (Lbs.)
1/4	311M-500-08	8'-0"								
	311M-500-10	10'-0"								
	311M-500-12	12'-0"								
	311M-500-14	14'-0"								
	311M-500-16	16'-0"								
	311M-500-18	18'-0"								
1/2	311M-1000-08	8'-0"								
	311M-1000-10	10'-0"								
	311M-1000-12	12'-0"								
	311M-1000-14	14'-0"								
	311M-1000-16	16'-0"								
	311M-1000-18	18'-0"								
1	311M-2000-08	8'-0"								
	311M-2000-10	10'-0"								
	311M-2000-12	12'-0"								
	311M-2000-14	14'-0"								
	311M-2000-16	16'-0"								
	311M-2000-18	18'-0"								
2	311M-4000-08	8'-0"								
	311M-4000-10	10'-0"								
	313M-4000-12	12'-0"								
	311M-4000-14	14'-0"								
	311M-4000-16	16'-0"								
	311M-4000-18	18'-0"								
3	311M-6000-08	8'-0"								
	311M-6000-10	10'-0"								
	311M-6000-12	12'-0"								
	311M-6000-14	14'-0"								
	311M-6000-16	16'-0"								
	311M-6000-18	18'-0"								
		20'-0"								

Please refer to the crane drawing and foundation drawing provided with your order for specifications and dimensions

Note: 1 - Other spans, capacities, under boom height, etc. are available. Contact Customer Service.
2- Beam sizes subject to change based on availability

2.2.2 Fitting Dimensions

8



Note: 1 – Refer to crane drawing provided with your order for Fitting Type Number.

2.3 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 Tiger Track 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.
- **Plumb:** in a perfectly vertical position. Plumbing a structure means to adjust the structure to a perfectly vertical position by using a plumb line (a line with a plumb weight).
- **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.
- **Overtipping 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.

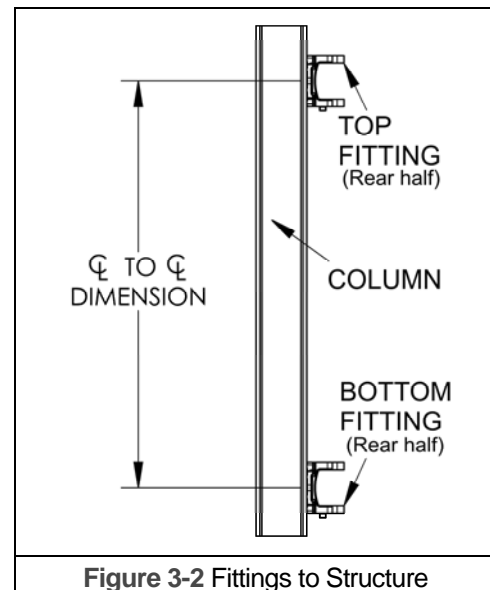
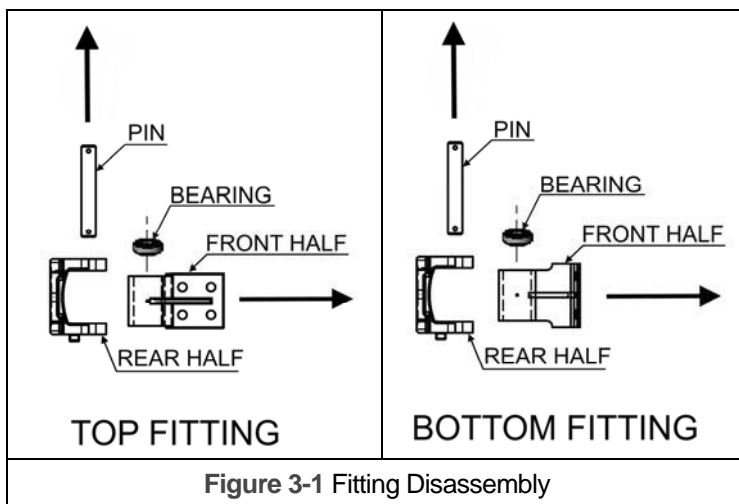
3.0 Preoperational Procedures

3.1 Pre-Assembly

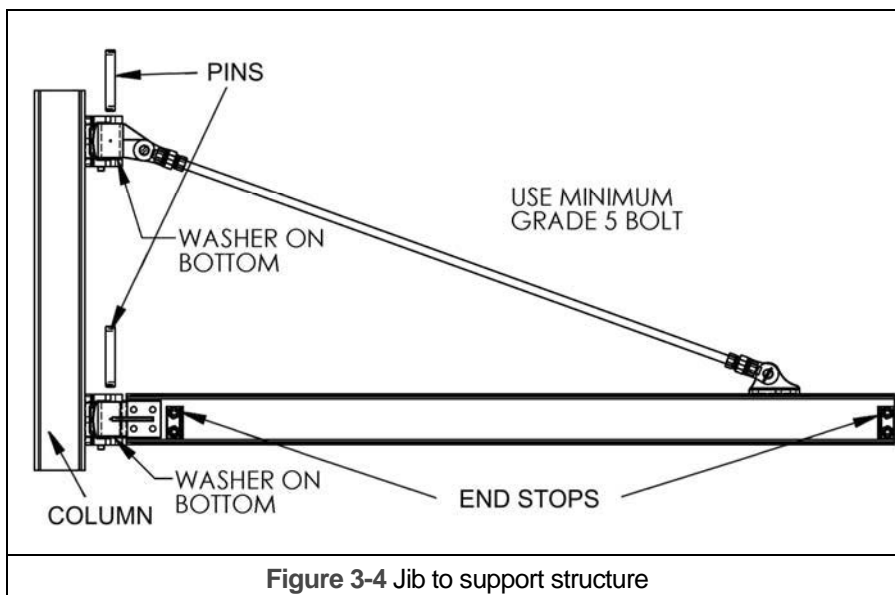
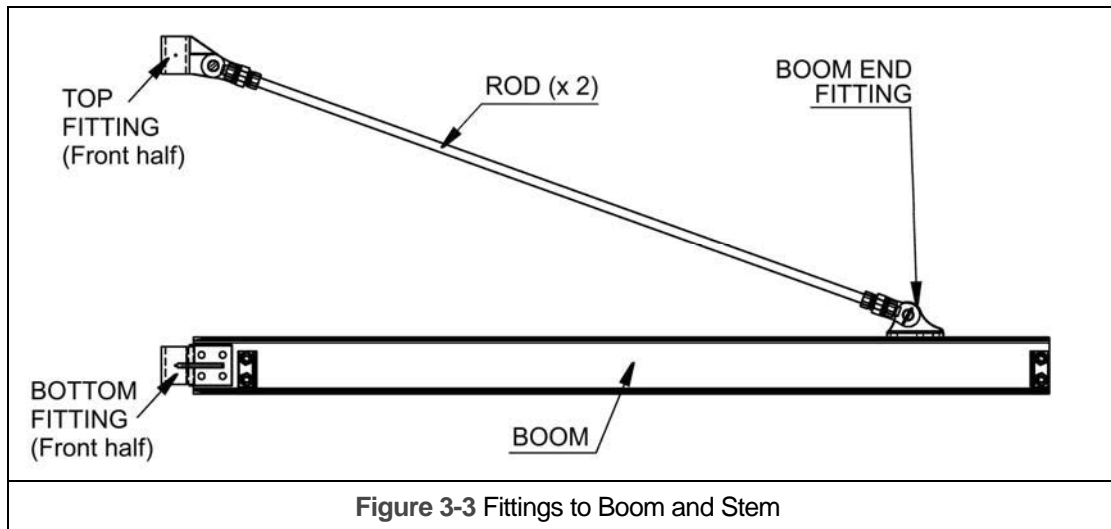
- 3.1.1 **⚠ WARNING** There must be an adequate wall, column, or truss to support the jib crane. Consult a qualified structural engineer to determine if the support structure is adequate to support the thrust and pull of your crane (See Crane Drawing for Thrust and Pull)
- 3.1.2 Ensure there will be sufficient clearance (3" minimum) above the boom throughout the rotation.
- 3.1.3 Check jib crane for physical damage due to shipping.
- 3.1.4 Ensure all capacity stickers and warning labels are clearly visible and properly affixed.
- 3.1.5 Check packing list to ensure no parts have been lost prior to initiating assembly of crane.
- 3.1.6 See Jib Crane Drawing for bolt locations and dimensions.
- 3.1.7 Read entire manual before installing the crane

3.2 Crane 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 Reference Jib Crane Drawing included in the crane information packet.
- 3.2.3 Make sure the support structure is plumb for installation. Prepare the support structure for jib fittings.
- 3.2.4 Disassemble TOP and BOTTOM FITTINGS by removing PINS and separating the REAR HALF from the FRONT HALF. See Figure 3-1.
- 3.2.5 Use the Crane Drawing as a guide to determine the bracket hole layout for the TOP FITTING (Rear Half) and BOTTOM FITTING (Rear Half). Make sure the bracket holes are properly aligned.
- 3.2.6 Drill bolt holes for the TOP FITTING (Rear Half) and BOTTOM FITTING (Rear Half), and bolt them to supporting structure (COLUMN). See Figure 3-2. Do not torque bolts until brackets are plumb. Note: Hardware to bolt fittings to COLUMN is supplied by others.
- 3.2.7 Plumb TOP FITTING and BOTTOM FITTING through pivot holes. If necessary, shim between COLUMN and fittings (shims by others).



- 3.2.8 Bolt the TOP FITTING (Front half) to RODS, and bolt BOTTOM FITTING to BOOM. Bolt the BOOM END FITTING to the BOOM & to the other end of the RODS. (See **Figure 3-3**) Refer to Jib Crane Drawing for hardware sizes, locations and quantities. For torque values, see **Table 3-1**.
- 3.2.9 Reinstall BEARING into FRONT HALF of fittings. (See **Figure 3-1**)
- 3.2.10 Raise jib into position and insert PINS. Ensure WASHERS are installed on the bottom side of each fitting. Secure PINS by inserting cotter pins into the pin holes (See **Figure 3-4**).
- 3.2.11 Check jib for plumbness by permitting crane to swing freely. Make adjustments by shimming where needed. Elevation of BOOM may be adjusted by loosening or tightening NUTS on the RODS. Make adjustments where needed.
- 3.2.12 Ensure all fittings are greased.
- 3.2.13 Check Rotation of jib for alignment, binds, or slow downs. Make sure all obstructions or interferences are removed.
- 3.2.14 Proceed to **Section 3.3** for Drive Installation



Bolt Dia.	Torque (ft.-lbs)
1/4"-20	6
3/8"-16	20
1/2"-13	50
5/8"-11	95
3/4"-10	175
7/8"-9	300

3.3 Drive Installation

3.3.1 Reference Figure 3-5.

3.3.2 **NOTICE** GEAR MOTOR should already be mounted in position on top of jib boom.

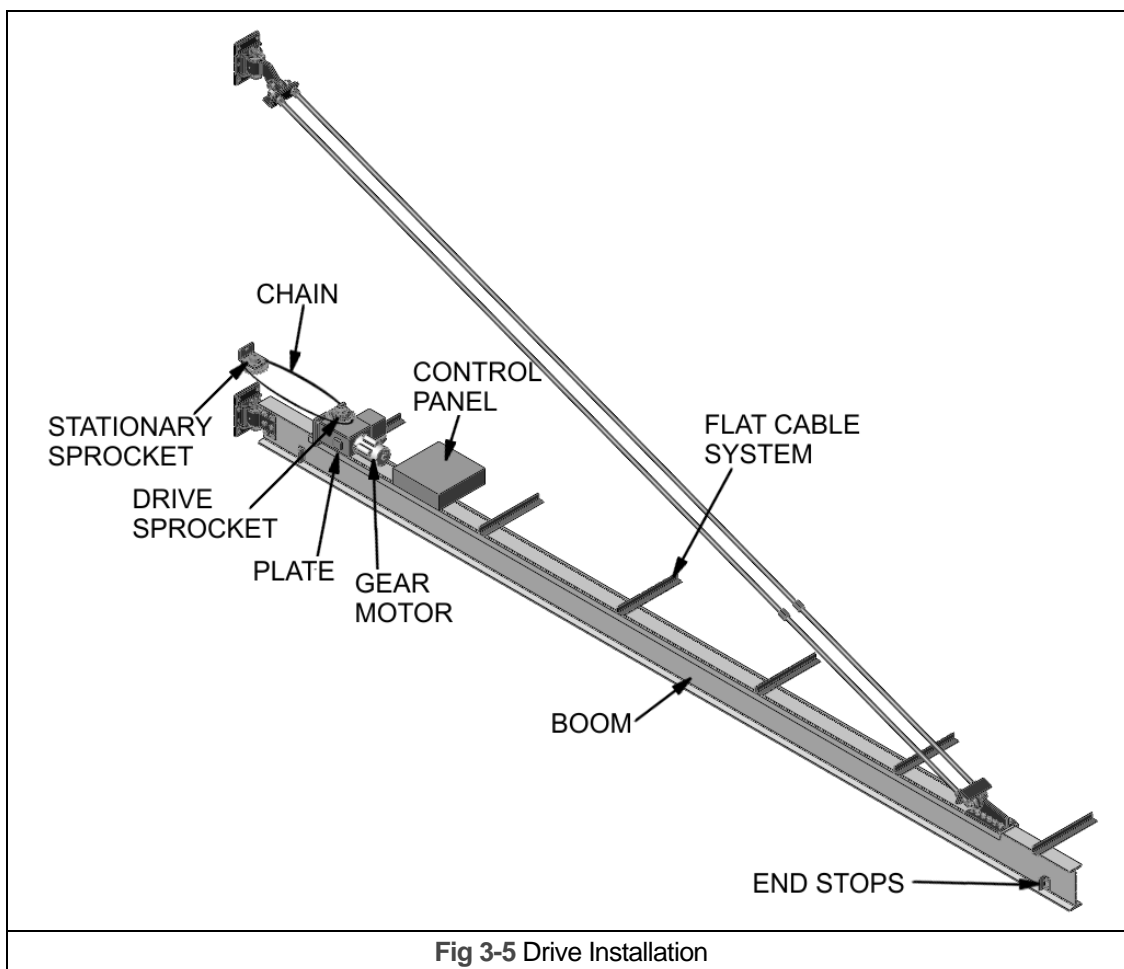
3.3.3 Mount STATIONARY SPROCKET on supporting structure (COLUMN) so that STATIONARY SPROCKET is in alignment with DRIVE SPROCKET (mounting bolts by others).

3.3.4 Loosen mounting bolts of GEAR MOTOR. Slide GEAR MOTOR as close as possible to supporting structure (COLUMN). GEAR MOTOR is mounted on PLATE with slotted holes for chain tensioning.

3.3.5 Wrap CHAIN around DRIVE SPROCKET and connect it to the STATIONARY SPROCKET using offset and connector links.

3.3.6 Adjust CHAIN to proper tension by re-positioning GEAR MOTOR and then tighten mounting bolts.

3.3.7 Proceed to **Section 3.4** for Electrification & Final Assembly.



3.4 Electrification and Final Assembly

3.4.1 **WARNING** Do not bring main power to CONTROL PANEL until installation is complete.

3.4.2 Install FLAT CABLE SYSTEM (see **Section 3.5**). If applicable, install roving pendant station.

3.4.3 Bolt two inner END STOPS to BOOM. Slide trolley hoist on BOOM, then bolt two remaining END

STOPS to BOOM. Make sure trolley hoist hits the END STOP and not the jib STEM. Move END STOPS to correct location if needed.

- 3.4.4 Connect FLAT CABLE wires to hoist/trolley through cord grip/connector. Wire hoist/trolley using wiring diagram or wire labels if interfacing was purchased.
- 3.4.5 Wire wireless radio remote system to hoist/trolley (if applicable).
- 3.4.6 Check all wire connections with wiring diagrams provided.
- 3.4.7 Check brake and motor wiring in jib motor for proper voltage hook up.
- 3.4.8 Check thru the door disconnect for proper function and set in off position prior to applying power.
- 3.4.9 With jib power source OFF, bring main power into CONTROL PANEL.
- 3.4.10 Turn power ON and check mainline contactor function.
- 3.4.11 If mainline contactor pulls in, proceed to next step. If contactor does not pull in, check all wiring again. If no missed connections are found, contact Product Support before proceeding.

▲ CAUTION Incorrect wiring of crane system may damage crane components.

- 3.4.12 Using pendant station controls, rotate BOOM slowly without load and check around its entire rotation for binds or slow down spots. Remove interference if any.
- 3.4.13 Check phasing for proper rotation direction.
- 3.4.14 Check the flat cable system operation by running the entire flat cable system back and forth several times over the entire track length to ensure proper operation. Ensure that festooning cannot be snagged or pinched.

▲ WARNING Be sure that the cable loop from the lead trolley saddle to the hoist/trolley connections does not place any side pull on the lead trolley. Cable must clear all other equipment.

- 3.4.15 Test all motions first without load, then with load.
- 3.4.16 **▲ WARNING** If any malfunctions occur, power off system immediately and trouble shoot system (See Trouble shooting guide in **Section 7.0**).
- 3.4.17 **▲ WARNING** All motorized systems should be wired from a lockable fused safety disconnect (by others) for shut down during emergency or maintenance).
- 3.4.18 If applicable, weld rotational limit switch baffles at desired locations on the fittings or supporting structure (COLUMN). Make sure they will align and make contact with limit switch (located on the end of the BOOM nearest the support structure).

▲ WARNING Turn OFF system power during baffle installation and follow lockout/tagout procedures.

- 3.4.19 If applicable, install limit switch arm on the end of the pre-installed limit switch. Test for functionality of limit switch after crane installation is complete and before crane is put in service.

- 3.4.20 **▲ WARNING** Read gear motor manual before crane use.

- 3.4.21 **▲ WARNING** Read VFD drive instruction manual before crane use.

- 3.4.22 **▲ CAUTION** Refer to VFD drive instruction manual for any error codes.

- 3.4.24 Adjust TORQUE LIMITER to proper torque before applying load to jib crane (see **Section 3.6**).

- 3.4.24 **NOTICE** If the torque limiter is not set correctly, the drive sprocket may slip and the crane may not rotate properly.

- 3.4.25 Please call Product Support with any questions during install

3.4 Flat Cable Installation

- 3.5.1 **⚠ WARNING** Make sure power supply is disconnected before installing, repairing, or working in the proximity of any electrical system. Only qualified electrical personnel should install or repair the electrification/flat cable system.
- 3.5.2 Reference **Figure 3-6**.
- 3.5.3 Install TRACK SUPPORT ANGLES to top of I beam using bolts provided.
- 3.5.4 Install TRACK HANGERS on CROSSARM SUPPORTS. Leave the clamping bolts loose.
- 3.5.5 Install one TRACK ANCHOR HANGER in place of the standard TRACK HANGER at the end CROSSARM SUPPORT.
- 3.5.6 Slide C-TRACK sections into TRACK HANGERS. Butt C-TRACK CHANNELS together and secure with TRACK JOINTS. Firmly tighten TRACK JOINT clamping bolts, TRACK HANGER clamping bolts, and ANCHOR HANGER bolts ensuring that the C-TRACK is straight.
- 3.5.7 Install the END CLAMP onto the cable-storage end of the track.
- 3.5.8 Insert INTERMEDIATE TROLLEYS into the C-TRACK. Be sure all trolleys float freely within the track.
- 3.5.9 Insert TOW TROLLEY as the last of the trolleys. When installing a "Push Button" track, install the CONTROL UNIT TROLLEY as the last of the trolleys on that track.
- 3.5.10 Install the END STOP on the track end opposite the END CLAMP. Securely tighten the nut.
- 3.5.11 If applicable, install the tow chain on the equipment to be electrified and attach it to the TOW TROLLEY. If a tow arm was ordered, it should be centered within the TOW TROLLEY.
- 3.5.12 Connect flat cable to knock out hole in CONTROL PANEL using provided cord grip. Make wire connections in CONTROL PANEL (see wiring diagram).
- 3.5.13 If applicable, connect 12c flat cable from roving pendant station to pre-drilled knock out hole in CONTROL PANEL using pre-attached cord grip. Make wire connections in CONTROL PANEL.

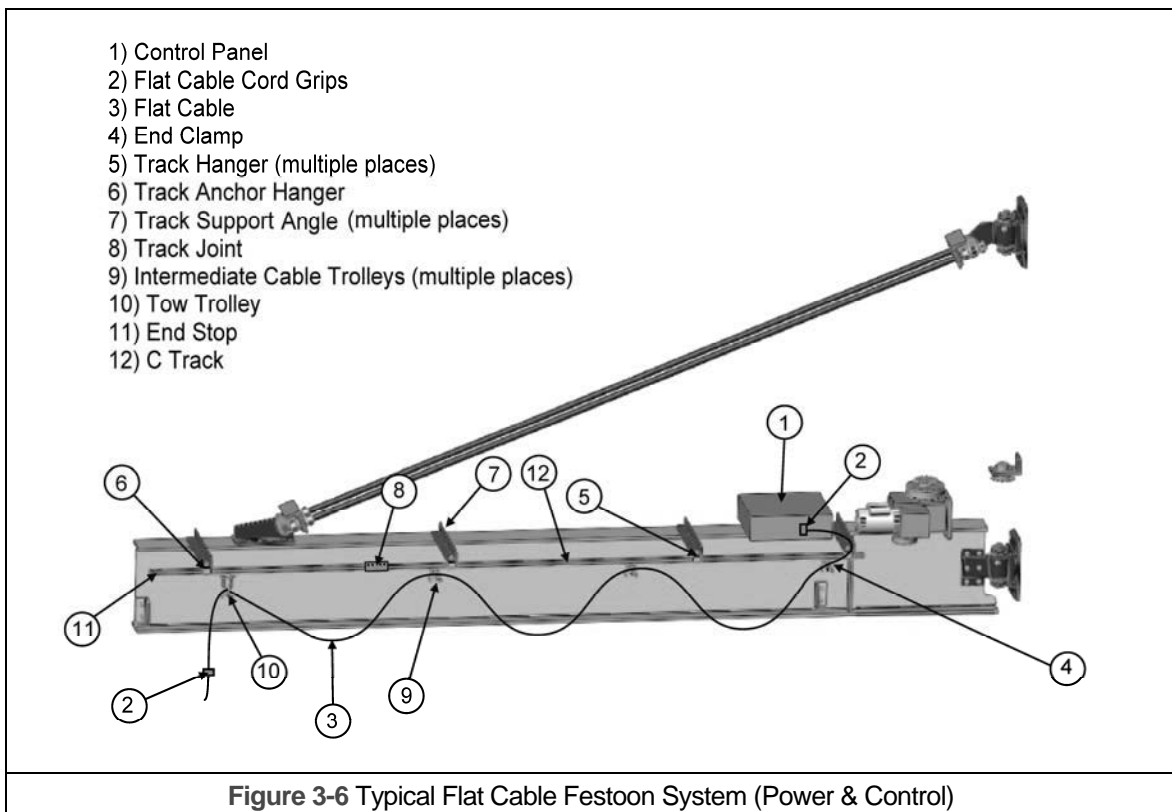


Figure 3-6 Typical Flat Cable Festoon System (Power & Control)

3.5 Torque Limiter

3.6.1 Installation (see Figure 3-7)

- 1) In addition to the Torque Limiter, obtain a center member, usually a sprocket. Ensure that it is finished according to the specifications shown in the literature. Select a bushing to fit the bore and width of the center member.
- 2) Back off the three ADJUSTING NUT SCREWS four full turns.
- 3) Remove the ADJUSTING NUT, SPRING RETAINER, SPRING, PRESSURE PLATE, and one FRICTION DISC.
- 4) Ensure that the FRICTION DISCS are free of oil or moisture.
- 5) Install the BUSHING over the HUB and pilot the center member over the bushing. Re-assemble the friction disc, pressure plate with the smooth side to the friction disc, spring, spring retainer with pilot facing the spring, and the adjusting nut.
- 6) Advance the ADJUSTING NUT to a finger tight position, ensuring that the SPRING is piloted on the SPRING RETAINER.

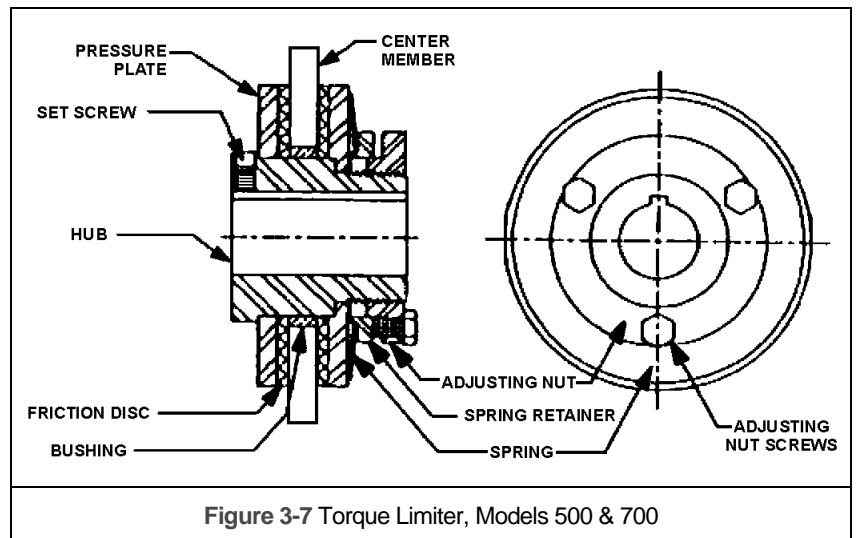
3.6.2 Run in Procedure (see Figure 3-7)

- 1) It is recommended that the unit be “run in” by slipping the center member.
- 2) Ensure that the three ADJUSTING NUT SCREWS are backed off four turns and that the ADJUSTING NUT is in a finger tight position.
- 3) Match mark the ADJUSTING NUT and HUB. Back off the ADJUSTING NUT 1 ½ turns for the 500 model, or 2 ¼ turns for the 700 model. Tighten the three ADJUSTING NUT SCREWS alternately until the heads bottom.
- 4) Slip the center member for 3-4 minutes at approximately 60 rpm.
- 5) Install the Torque Limiter on the shaft with a key and tightens the SET SCREW in the HUB.

3.6.3 To Adjust Torque (see Figure 3-7)

- 1) Ensure that the three ADJUSTING NUT SCREWS are backed off four full turns and that the ADJUSTING NUT is in a finger tight position.
- 2) Match mark the ADJUSTING NUT with the HUB. Back off the ADJUSTING NUT the number of turns that correspond to the desired break away torque as shown in Table 3-2)
- 3) Tighten the three ADJUSTING NUT SCREWS alternately until the heads bottom

Model	No. of springs	Approximate Break Away Torque (LB-FT)			
500	1	90	150	200	250
	2	120	300	350	400
TURNS		1 ½	1	¾	0
700	1	300	400	530	620
	2	450	600	750	900
TURNS		2	1 ¾	1 ¼	0



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 HOIST 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," ASMEB30.16, 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 end stops are in place
- Ensure that all bolts are tight and have lock washers
- **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 top and bottom jib fittings per crane manufacturer's recommendations.
- **NOT** use limit switches as routine operating stops. They are back up devices only
- **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.

4.6 Shut-Down Instructions

Whenever the operator leaves the crane, the procedure below should be followed:

- 4.6.1 Raise all hooks to an intermediate position.
- 4.6.2 Spot the crane at an approved designated location.
- 4.6.3 Secure the beam in the shut-down position or storage area. If the crane is an outdoor application and it has a tie down loop, secure tightly especially in high wind areas
- 4.6.4 .Check the crane, hoist, and hook storage positions to be sure there is no interference with other pieces of equipment that may be operating in the area.
- 4.6.5 Place all controls in the **"OFF"** position.
- 4.6.6 Turn the main switch to the **"OFF"** position.
- 4.6.7 Make a visual check before leaving the crane.

5.0 Inspection

5.1 Crane Inspection

⚠ WARNING When inspecting any electrical equipment (flat cable system, control panel, junction box, entry collector, etc.), use proper lockout/tagout procedures before performing the inspection.

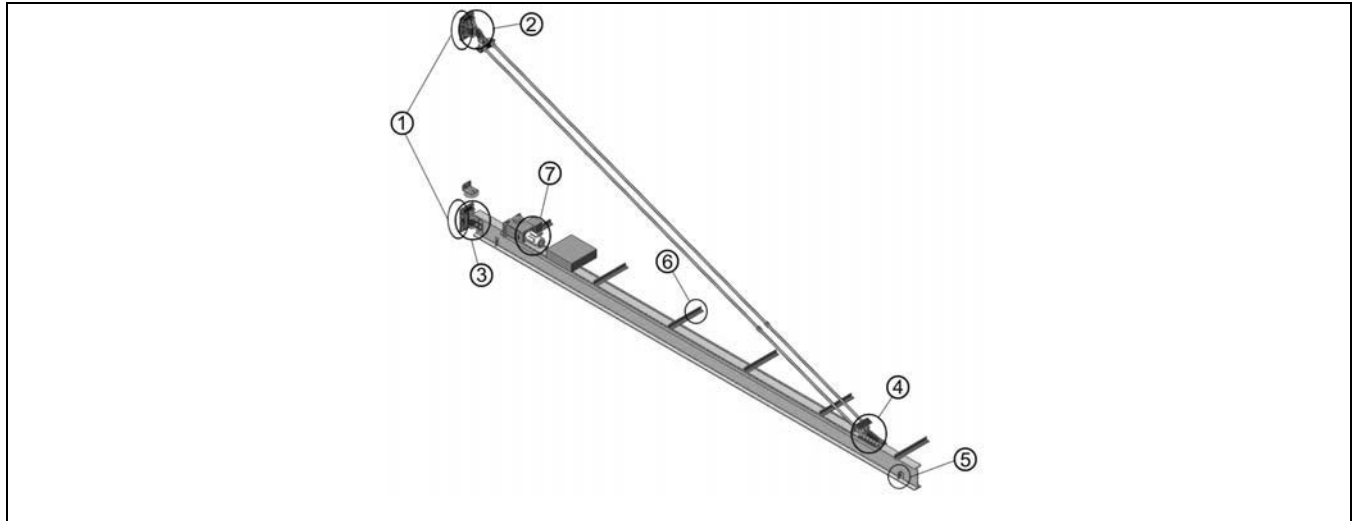


Table 5-1 Crane Inspection

Fig No.	Item	Inspection	Frequency
1	Mounting Bolts	Check that the lock-washers are fully compressed and the nuts are tightened to manufacturer's specifications.	Every 500 hours Or 3 months
2	Upper Fitting Assembly	Check that the lock-washers are fully compressed and the nuts are tightened to the proper torque specs from Table 3-1 . Make sure cotter pin is securely fastened into fitting pin hole. Make sure fittings are well lubricated per Section 5 and locked into place.	Every 500 hours Or 3 month
3	Lower Fitting Assembly	Check that the lock-washers are fully compressed and the nuts are tightened to the proper torque specs from Table 3-1 . Make sure cotter pin is securely fastened into fitting pin hole. Make sure fittings are well lubricated per Section 5 and locked into place.	Every 1000 hours Or 6 month
4	Boom End Fitting Assembly	Make sure cotter pins are securely fastened into fitting pin hole. Make sure fittings are well lubricated per Section 5 . Check that the lock-washers are fully compressed and the nuts are tightened to the proper torque specs from Table 3-1 .	Every 500 hours Or 3 month
5	End Stops	Check that the lock-washers are fully compressed and the nuts are tightened to the proper torque specs from Table 3-1	Every 500 hours Or 3 months
6	Flat Cable System	Check all rollers for wear. Check that the lock-washers are fully compressed and the nuts are tightened to manufacturer's specifications. Check cable clamps on all trolleys (ensure cables remain secure. Inspect cable for any cuts or cracks, check C-channel for wear, and clear the running surface of debris.	Every 500 hours Or 3 months
7	Gear Motor	See Table 5-2 in Gear Motor Supplement	-
-	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 overall crane and check any operator reports. If any flaws or problems are found, the crane should be taken out of service and reported 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 Crane Lubrication

- 6.1.1 The most economical way to maintain a jib crane and keep it in good operating condition is to lubricate all moving parts regularly.
- 6.1.2 Regular inspection of all parts should be made and all loose parts should be adjusted. Parts that become worn should be replaced immediately.
- 6.1.3 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.
- 6.1.4 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.
- 6.1.5 The roller bearings on the jib crane require lubrication. They are serviced by pressure type fittings.
- 6.1.6 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
- 6.1.7 If Texaco products are not available, equivalent lubricants are satisfactory.

6.2 Gear Motor Lubrication – See Section 6.2 in Gear Motor Supplement

7.0 Troubleshooting

Table 7-1 Troubleshooting Guide for Crane		
Symptom	Cause	Remedy
Jib crane does not rotate	AC contactor coil does not pull in (or does not stay pulled in) when "ON" is pressed	Verify there are no blown fuses in jib panel. Verify pendant wiring is intact. Verify the control transformer fuse did not blow. Check for drive controller alarm.
	Motor shaft is not turning (with TEFC motors, if fan is blowing air, then motor shaft is turning)	Verify motor leads are secure.
	Shaft or drive reducer does not turn	Tighten torque limiter
	Drive controller has an error code	Note error code and reference remedy in drive controller manual
Jib crane rotates in one direction only	Pendant wiring is damaged	Verify pendant wiring is intact.
	Torque limiter is not properly adjusted	Adjust torque limiter (see Section 3.6)
	Limit switch is not properly wired	Properly wire limit switch (see Wiring Diagram)
Boom is drifting	Fittings are not plumb	Shim between supporting structure and fittings accordingly
	Fittings are misaligned	Align fitting holes properly
Jib crane does not rotate smoothly	Debris in bearings	Remove debris
	Fittings are misaligned	Align fitting holes properly
Jib crane does not rotate a complete rotation	Crane boom has an obstruction	Remove any obstruction

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.

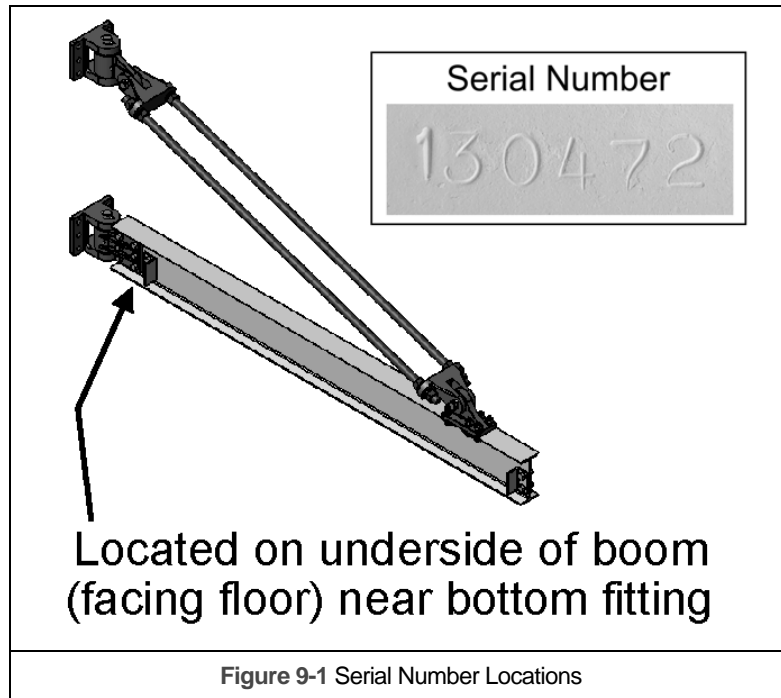
Should any defect in material or workmanship occur during the above time period in any product, as determined by Harrington Hoist’s inspection of the product, Harrington Hoists, Inc. agrees, at its discretion, either to replace (not including installation) or repair the part or product free of charge 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.....	24
9.2 Control Panel.....	26
9.3 Flat Cable	28
9.4 Labels.....	30

9.1 Jib Crane Parts

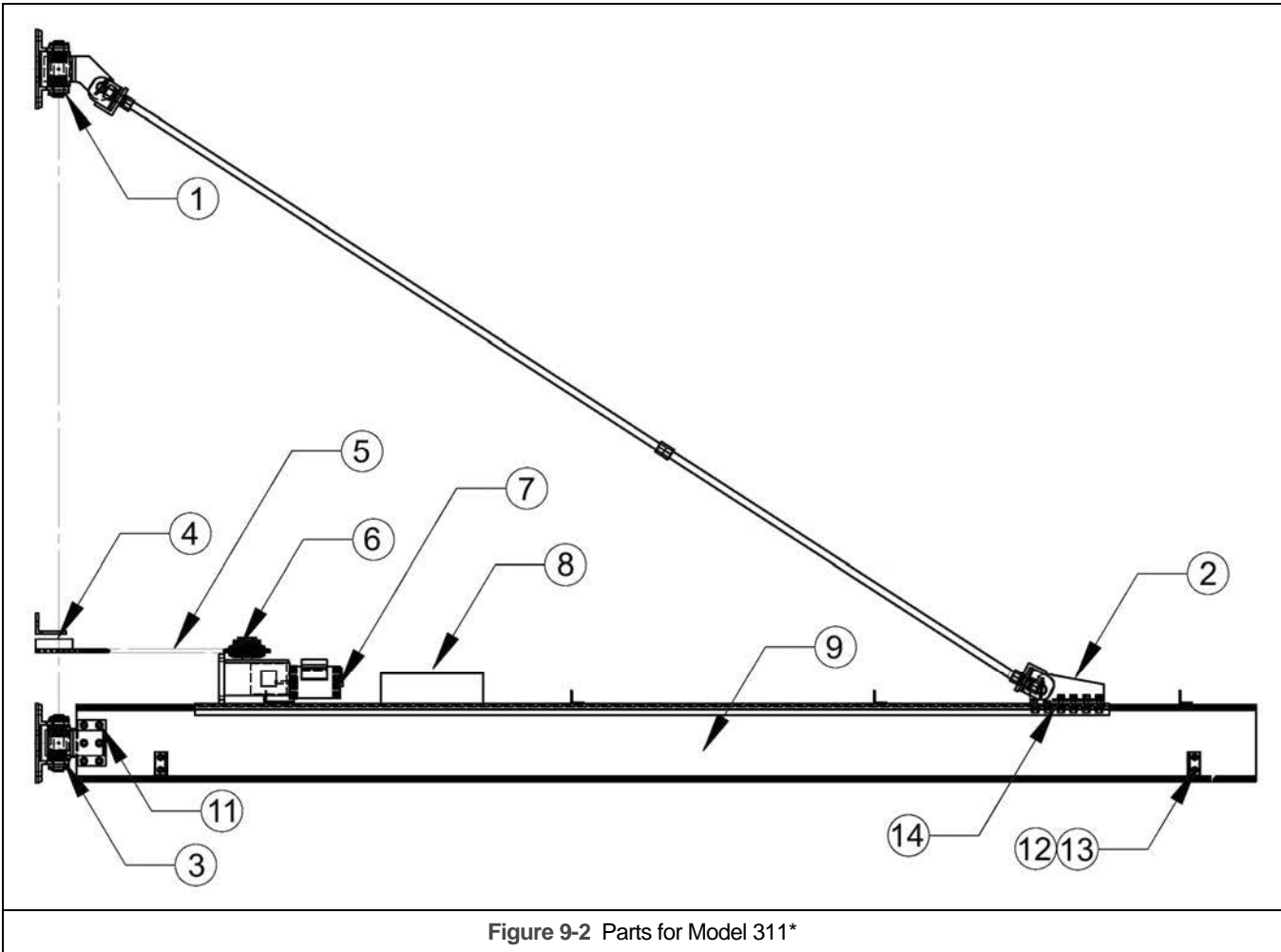


Figure 9-2 Parts for Model 311*

*This figure is for reference only and your specific crane may look different.

9.1 Jib Crane Parts

Figure No.	Description	Qty	Rated Capacity			
			¼ & ½ TON (UP TO 20' SPAN)	1 TON (UP TO 20' SPAN)	2 TON (UP TO 20' SPAN)	3 TON (UP TO 20' SPAN)
1	Top Fitting*	1	SEE CRANE DRAWING FOR FITTING SERIES & SEE TABLE BELOW FOR FITTING PART NUMBERS			
2	Boom End Fitting	1				
3	Bottom Fitting *	1				
4	Stationary Sprocket*	1	TT0390060A*		TT0390080A*	TT0390100A*
5	Drive Chain	1	TT60ARC		T80ARC	TT100ARC
6	Torque Limiter	1	TT500A		TT700A80	TT700A
7	Drive Unit Assembly	1	TTK57R37		TTK67R37	TTK77R37
8	Control Panel Enclosure, VFD	1	TTCS24168			
9	Boom Assembly	1	SEE BILL OF MATERIALS			
10	Stem Assembly	1				
11	Bottom Fitting Hardware	-				
12	End Stops	4				
13	End Stop Hardware	-				
14	Boom End Fitting Hardware	-				

Figure No.	Description	Qty	Fitting Series**		
			J-1	J-2	J-3
1	Top Fitting*	1	TT0601004A*	TT0602004A*	TT0603004A*
2	Boom End Fitting	1	TT0601008A*	TT0602008A*	TT0603008A*
3	Bottom Fitting *	1	TT0601000A*	TT0602000A*	TT0603000A*

* Mounting hardware is supplied by others

** See Crane Drawing for Fitting series

9.2 Control Panel

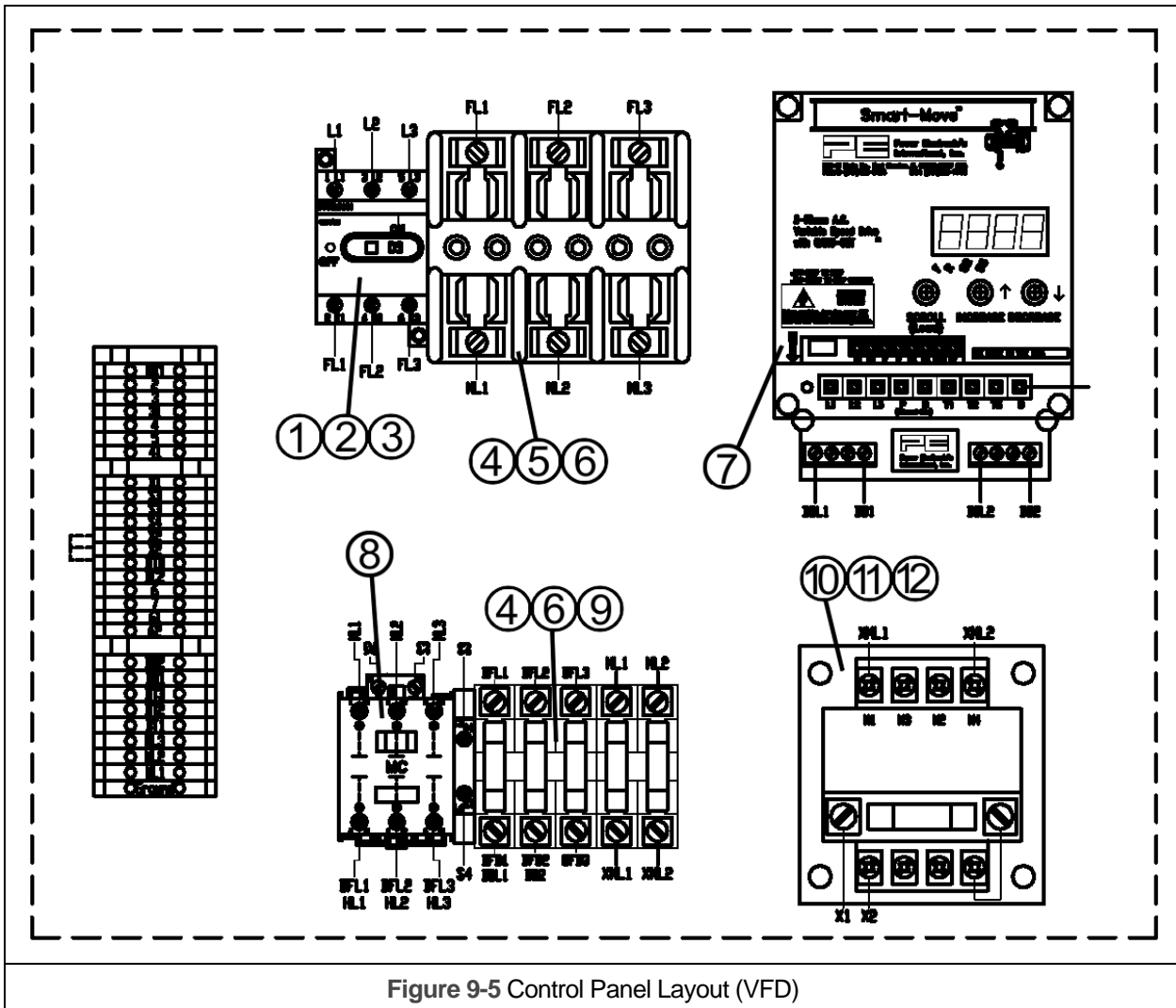


Figure 9-5 Control Panel Layout (VFD)

9.2 Control Panel

Figure No.	Description	Qty	Part Number
1	Selector Switch	1	TTCBDH5S
2	30A Disconnect	1	TTCDNF32A3
3	Operating Shaft	1	TTBDS330S
4	Fuse Block, 30amp	2	TTBM6033PQ
5	Fuse, Midget Time Delay 30amp	3	TTFNQ 30
6	Din Rail Clip	4	TTDRA1
7	Inverter (4amp with brake relay)	1	TTMSM4ARP
8	Main line contactor, 30amp	1	TT100-C30D10
9	Fuse, Midget Time Delay 6amp	1	TTFNQ 6
10	Transformer, 200VA 460/230	1	TT1497DBASX1N
11	Transformer Fuse, Time Delay	1	TTFNM 2.5
12	Surge Suppressor	1	TTRCS1A6

9.3 Flat Cable

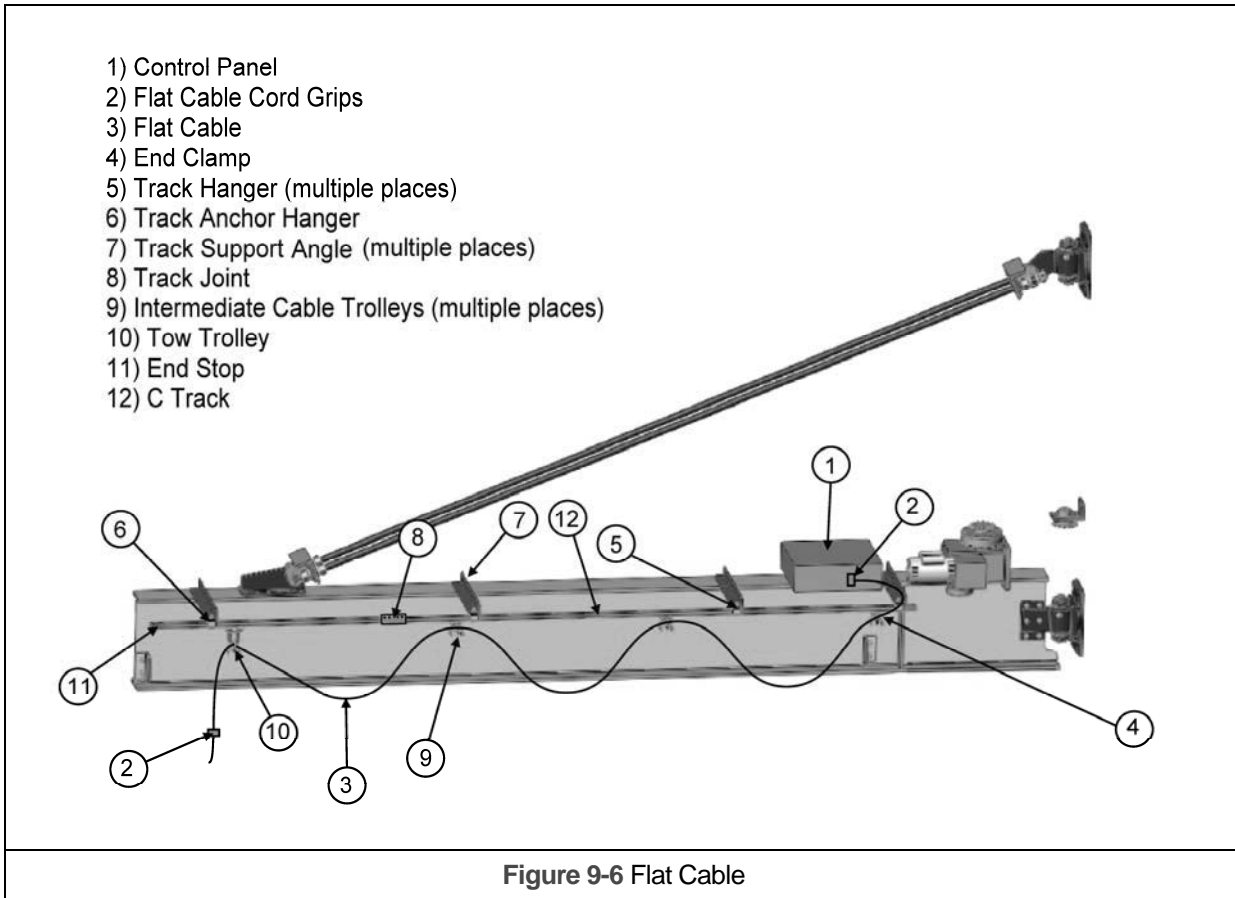


Figure 9-6 Flat Cable

9.4 Flat Cable

Figure No.	Part Name*		Part Number
1	Control Panel Enclosure, VFD	Single Speed	TTC-SD24168
2	Flat Cable Cord Grips	For 4c/10awg	TT35835C
		For 8c/16awg	TT35837D
		For 4c/10awg and 8c/16awg	TT35837J
		For 12c/16awg	TT35838D
3	Flat Cable	4c/10awg	TT22542Y
		8c/16awg	TT22607Y
		2c/16awg	TT23324Y
4	End Clamp		TT21957
5	Track Hanger		TT28510
6	Track Anchor Hanger		TT28511
7	Track Support Angle (6" increments from 12" to 48")		TT4259980
8	Track Joint		TT023210
9	Cable Trolley		TT21991
10	Tow Trolley		TT22168
11	End stop		TT023215
12	C-track		TT534176

*The parts listed above are for standard applications. For parts on optional configurations, refer to Bill of Materials or contact Product Support.

9.4 Labels

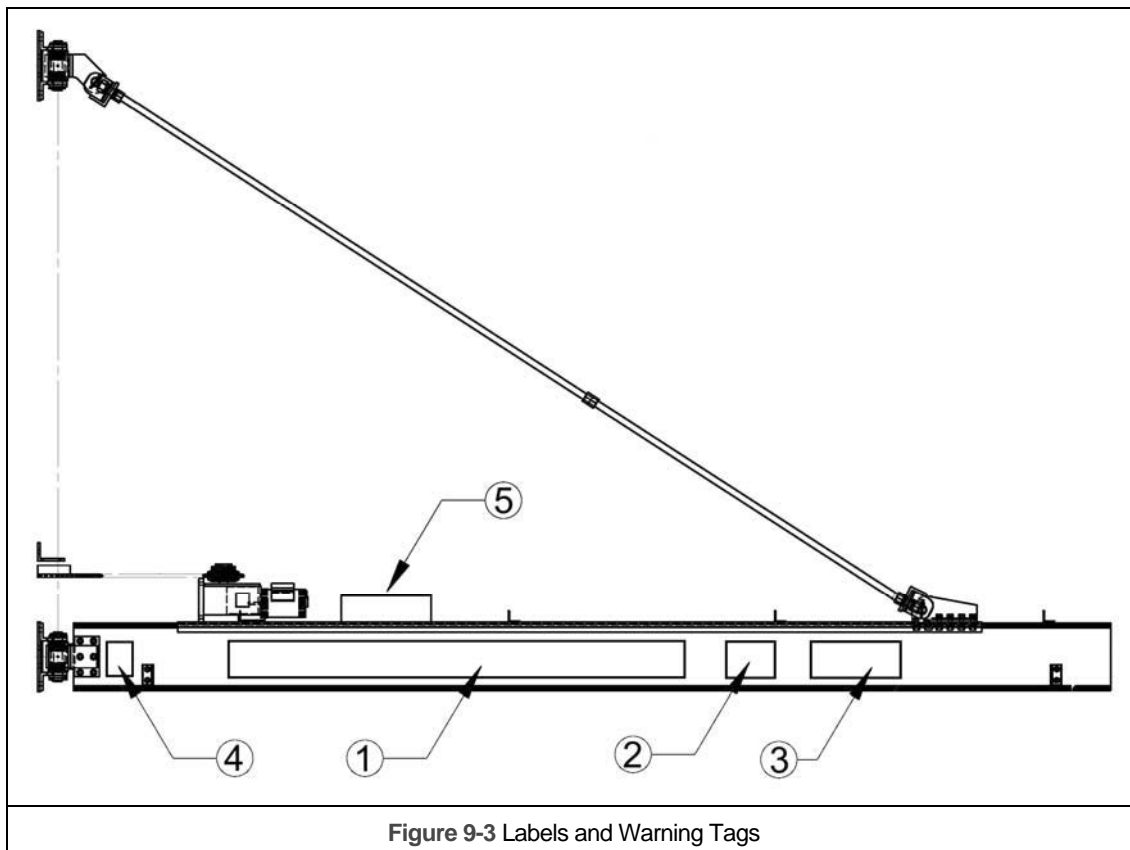


Figure 9-3 Labels and Warning Tags

9.4 Labels

Figure No.	Description	Qty	BOOM HEIGHT I (inches)								
			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								
5	Voltage Label	1	8047317								



Harrington Hoists, Inc.
401 West End Avenue
Manheim, PA 17545

www.harringtonhoists.com

Toll Free: 800-233-3010
Phone: 717-665-2000
Fax: 717-665-2861

TT311M-OM-ENG