
OWNER'S MANUAL

LUBRICANT FREE AIR POWERED CHAIN HOIST TCL SERIES

3 Ton and 6 Ton Capacity

Code Number 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.

HARRINGTON
A **KITO** GROUP COMPANY



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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.

NOTICE

INTENDED USE OF HOIST/TROLLEY HOIST and Owner's Manual

The TCL hoists are intended only for vertical lifting service of freely suspended, unguided loads. In addition to lifting service of freely suspended, unguided loads, TCL when coupled with a trolley is to be used to traverse these loads on a single girder beam.

The TCL hoists are not intended to lift greater than rated loads, lift, support or transport people nor lift loads over people.

The TCL hoists are intended to be operated by persons who have read and understood the operation section of the TCL owner's manual, all warnings and are familiar with the TCL hoist controls.

⚠ 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 hoist types. Therefore, all instructions and parts information may not apply to any one type or size of specific hoist. Disregard those portions of the instructions that do not apply.

Record your hoist's Code and Serial Number (see **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 hoist.

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.

Equipment described herein may be used in the design and manufacture of cranes or monorails. Additional equipment or devices may be required for the crane and monorail to comply with applicable crane design and safety standards. The crane designer, crane manufacturer, or user is responsible to furnish these additional items for compliance. Refer to ANSI/ASME B30.17, "Safety Standard for Top-Running Single Girder Cranes"; ANSI/ASME B30.2 "Safety Standard for Top-Running Double-Girder Cranes"; and ANSI/ASME B30.11 "Safety Standard for Underhung Cranes and Monorails".

If a below-the-hook lifting device or sling is used with a hoist, refer to ANSI/ASME B30.9, "Safety Standard for Slings" or ANSI/ASME B30.20, "Safety Standard for Below-the-Hook Lifting Devices".

Hoists, trolleys and cranes, used to handle hot molten material may require additional equipment or devices. Refer to ANSI Z241.2, "Safety Requirements for Melting and Pouring of Metals in the Metalcasting Industry".

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 AIR PRESSURE IS PRESENT IN THE HOIST, IN THE SUPPLY OF COMPRESSED AIR TO THE HOIST, AND IN THE CONNECTIONS BETWEEN COMPONENTS.

Before performing ANY maintenance on the equipment, de-energize the supply of compressed air to the equipment, and lock and tag the supply device in the de-energized position. Refer to ANSI Z244.1, "Personnel Protection - Lockout/Tagout of Energy Sources."

Only trained and competent personnel should inspect and repair this equipment.

NOTICE

It is the responsibility of the owner/user to install, inspect, test, maintain, and operate a hoist in accordance with ANSI/ASME B30.16, "Safety Standard for Overhead Hoists", OSHA Regulations. If the hoist is installed as part of a total lifting system, such as an overhead crane or monorail, it is also the responsibility of the owner/user to comply with the applicable ANSI/ASME B30 volume that addresses that type of equipment.

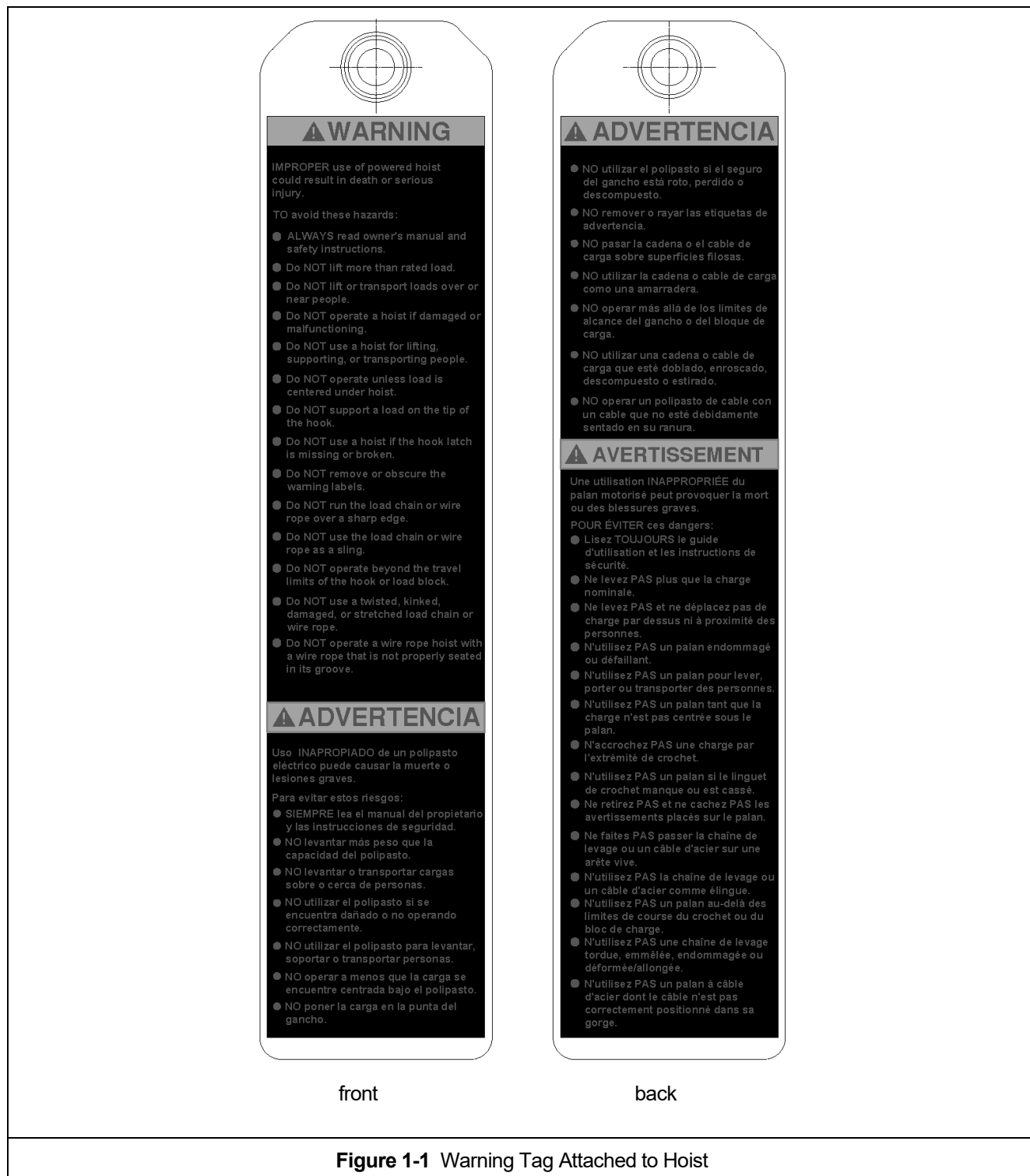
It is the responsibility of the owner/user to have all personnel that will install, inspect, test, maintain, and operate a hoist read the contents of this manual and applicable portions of ANSI/ASME B30.16, "Safety Standard for Overhead Hoists" and OSHA Regulations. If the hoist is installed as part of a total lifting system, such as an overhead crane, the applicable ANSI/ASME B30 volume that addresses that type of equipment must also be read by all personnel.

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

A regular schedule of inspection of the hoist in accordance with the requirements of ANSI/ASME B30.16 should be established and records maintained.

1.2 Warning Tags and Labels

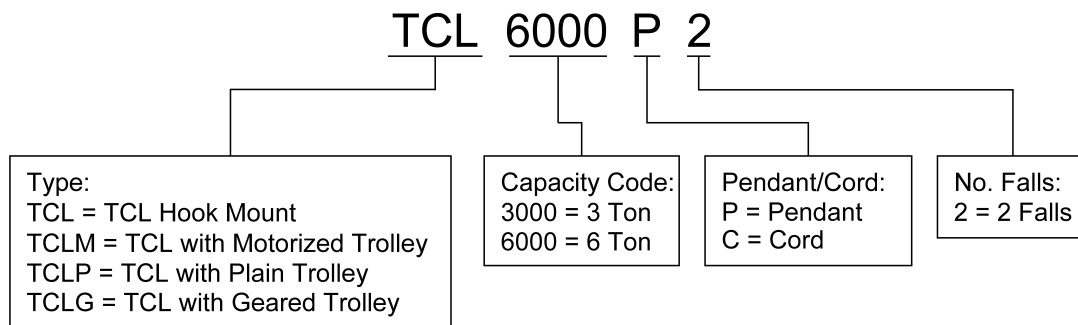
The warning tag illustrated below in Figure 1-1 is supplied with each hoist shipped from the factory. If the tag is not attached to your hoist (for pendant control, the warning tag is attached to the pendant hose; for the pull cord control, the warning tag is attached to the up cord), order a tag from your dealer and install it. See parts list in the parts section of this manual. Read and obey all warnings attached to this hoist. Tag is not shown actual size.



2.0 Technical Information

2.1 Specifications

2.1.1 Product Code



2.1.2 Operating Conditions and Environment

Temperature range: -4° to +158°F (-20° to +70°C)

Relative Humidity: 85% or less

Noise Level: 84 dba maximum @ 1 meter when lifting/lowering rated load

Supply Air: 60 to 90 pounds per square inch

Air Consumption: 30 to 90 cubic feet minute

Air Lubrication Requirements: "Optional" Minimum 10 to 15 drops per minute (0.2-0.3 cc/min) of oil

Air Filtration Requirements: Maximum 5 micron air filter or finer

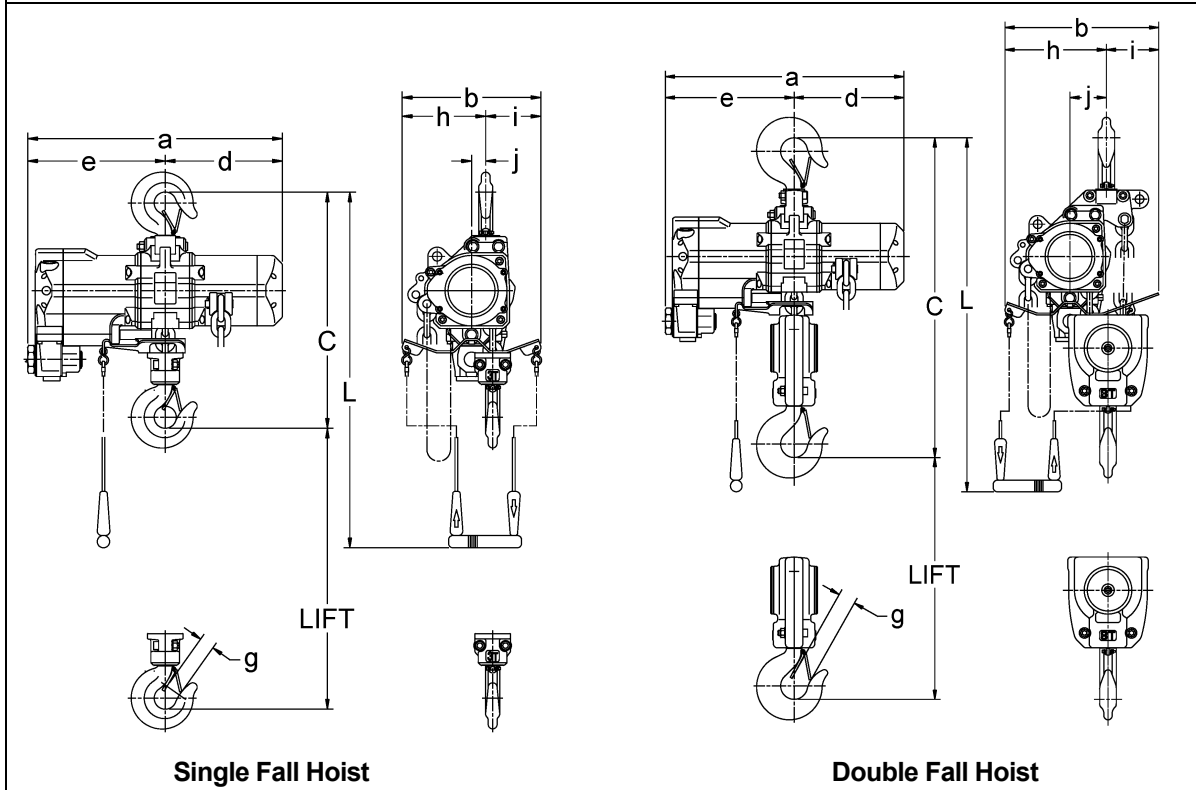
Load Limiter: Adjustable; Factory set to 125% of rated capacity

Table 2-1 Hoist Specifications											
	Cap. (Tons)	Product Code	Standard Lift (ft)	Push Button Hose or Cord L (ft)	Up/Down Speeds (ft/min @ 90 psi)		Up/Down Air Consumption Rates (cubic ft/min @ 90 psi)		Load Chain Diameter (mm) x Chain Fall Lines	Net Weight (lbs)	Weight for Additional One Foot of Lift (lbs)
					No Load	w/Full Load	No Load	w/Full Load			
Pendant Model	3	TCL3000P	10	8.6	24 / 14	10 / 22	131 / 124	106 / 141	12.5 x 1	225	2.3
	6	TCL6000P2		8.6	12 / 7.2	4.9 / 11	131 / 124	106 / 141	12.5 x 2	295	4.6
Cord Model	3	TCL3000C	10	7.3	24 / 14	10 / 22	131 / 124	106 / 141	12.5 x 1	223	2.3
	6	TCL6000C2		7.3	12 / 7.2	4.9 / 11	131 / 124	106 / 141	12.5 x 2	293	4.6

2.2 Dimensions

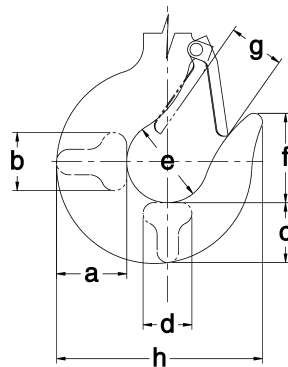
Table 2-2 TCL with Pendant Control Dimensions										
The image contains two sets of technical drawings. The left set is for a 'Single Fall Hoist' and the right set is for a 'Double Fall Hoist'. Each set includes a side view showing the hoist body and a hook, and a top view showing the hook's profile. Dimensions are labeled with letters: 'a' is the width of the hoist body; 'b' is the width of the hook; 'c' is the height from the base to the hook; 'd' is the width of the hook's base; 'e' is the width of the hoist body at the hook's base; 'g' is the height from the base to the hook's base; 'h' is the height from the base to the hook's base; 'i' is the width of the hook's base; 'j' is the width of the hook's base. The lift height 'L' is indicated for both types.										
Cap. (Tons)	Product Code	Headroom C (in)	a (in)	b (in)	d (in)	e (in)	g (in)	h (in)	i (in)	j (in)
3	TCL3000P	21.1	22.7	12.3	10.4	12.2	1.3	7.4	4.9	1.3
6	TCL6000P2	30.3	22.7	14.6	10.4	12.2	1.7	9.6	5.0	3.5

Table 2-3 TCL with Cord Control Dimensions



Cap. (Tons)	Product Code	Headroom C (in)	a (in)	b (in)	d (in)	e (in)	g (in)	h (in)	i (in)	j (in)
3	TCL3000C	21.1	22.7	12.3	10.4	12.2	1.3	7.4	4.9	1.3
6	TCL6000C2	30.3	22.7	14.6	10.4	12.2	1.7	9.6	5.0	3.5

Table 2-4 Top and Bottom Hook Dimension*

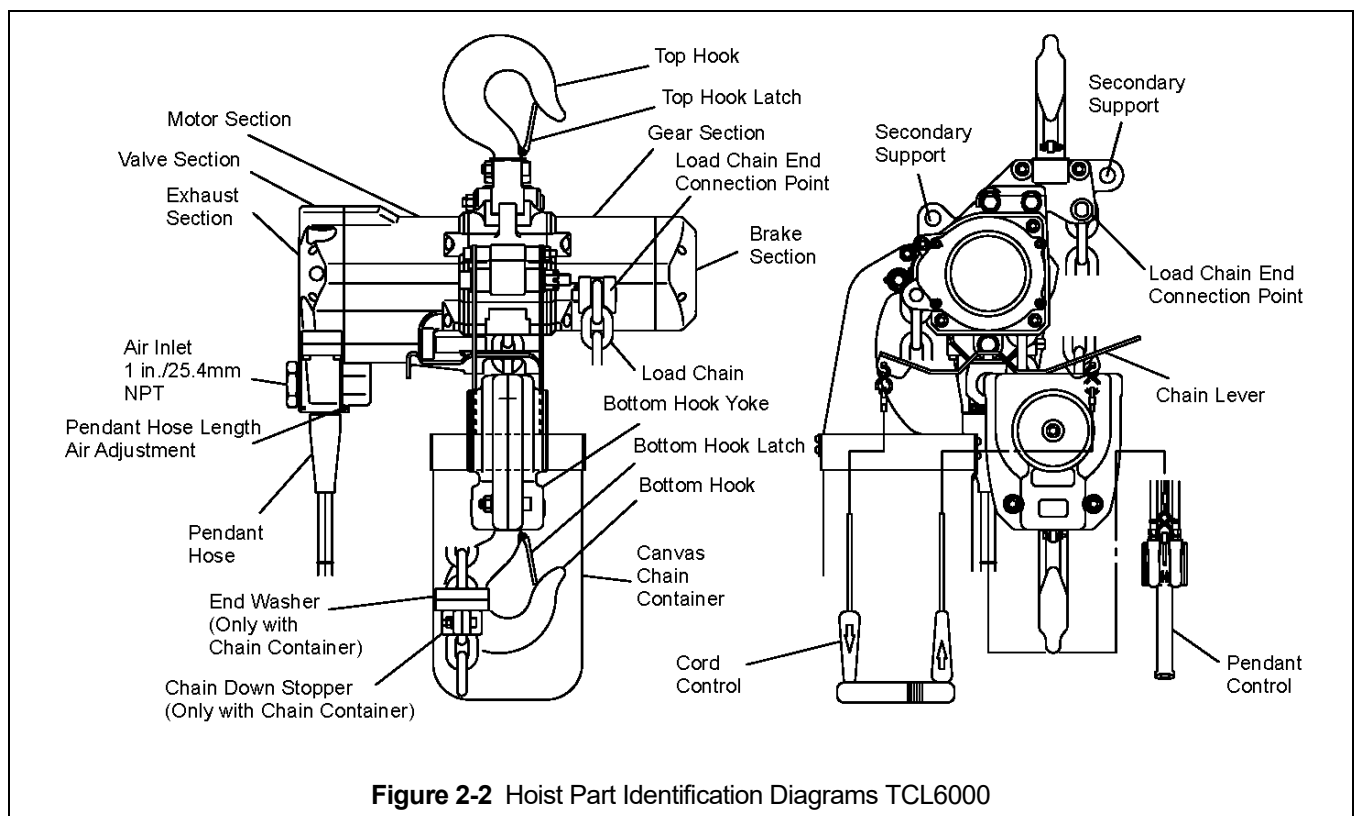
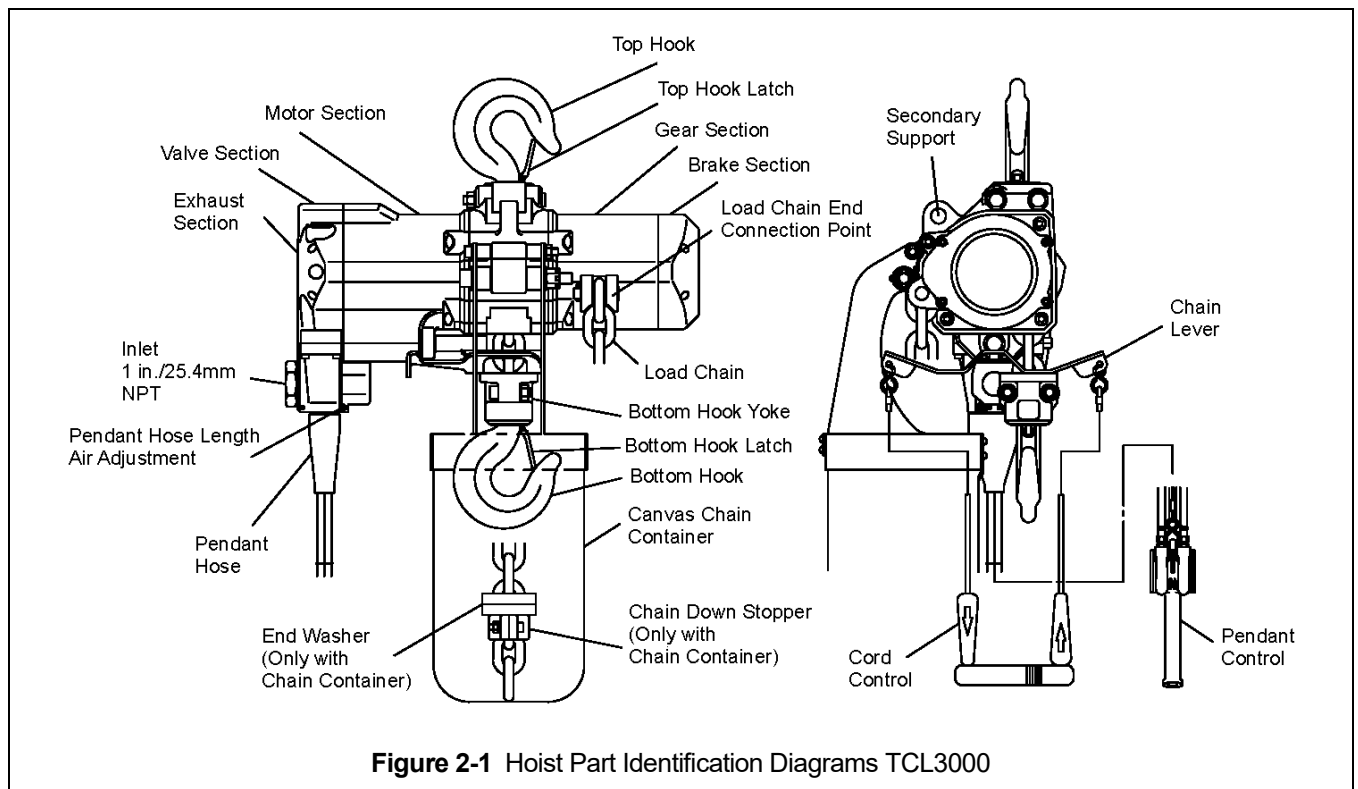


Units = inch

Product Code	a	b	c	d	e	f	g	h
TCL3000	2.0	1.5	1.8	1.3	2.0	2.4	1.3	5.9
TCL6000	2.3	1.6	1.9	1.6	2.6	2.8	1.7	6.8

*Refer to **Section 5.7** for inspection dimensions and limits.

2.3 Part Names



3.0 Preoperational Procedures

3.1 Air Supply System Requirements

- 3.1.1 **NOTICE** Pressure and Flow – Verify that the air supply system has capacity to supply your air hoist with required pressure and flow. Otherwise the hoist may operate poorly or may fail to operate. See Section 3.2.
- 3.1.2 **⚠ CAUTION** Lubrication – The hoist is equipped with a lube-free vane motor that does not require lubrication of the supply air for operation. However, if the hoist supply air is lubricated, there is no disadvantage. For further information, Refer to Section 3.3.
- 3.1.3 **⚠ CAUTION** Air Quality – Good air quality is essential to prevent damage to your hoist and to ensure its proper operation. The air must be clean and free of debris such as dirt and rust. Refer to Section 3.4 for filtration requirements. The air must also be dry; free of moisture and water. Refer to Section 3.5.

3.2 Air Supply Capacity And Regulation

- 3.2.1 Capacity – The air supply system must be capable of delivering the required airflow (cfm) to the hoist inlet port. Without the required airflow the hoist will not operate properly or may not operate at all. See Section 2.0 for your hoists air consumption requirements. In determining if your system is capable of supplying the required airflow, consider the following:
- Capacity of compressor(s) and tank
 - Other air consuming equipment
 - Flow restrictions such as pipes, hoses, valves and fittings
- Inadequate capacity will cause a significant drop in pressure when the hoist is operated, and could cause poor performance or failure to operate.
- 3.2.2 Regulation – The hoist requires a constant supply of air at a pressure of between 60 and 90 psi. If the air supply is not regulated or is regulated at a pressure greater than 90 psi, then a regulator must be used. The regulator may be located anywhere upline of the lubricator in the air supply to the hoist.

3.3 Lubrication

- 3.3.1 **⚠ CAUTION** The TCL hoists do not require supply air lubrication for safe operation; however if the hoist air is lubricated, there is no disadvantage. If using lubrication, follow the guidelines below for best results. The lubricator must be located as follows:
- 1) **Best location** – At the hoist inlet. In this case the lubricator can be either the mist type or drop type.
 - 2) **Second best location** – No more than 15 feet away from the hoist, at the same elevation or above the hoist inlet. In this case the mist type lubricator must be used.
 - 3) **Third best location** – No more than 15 feet away below the hoist. In this case the mist type lubricator must be used.
- 3.3.2 **⚠ CAUTION** The lubricator must be set to deliver the equivalent of 10 to 15 drops of oil per minute (0.2-0.3 cc/minute). The hoist's exhaust will emit a fine oil mist when properly lubricated.

3.4 Filtration

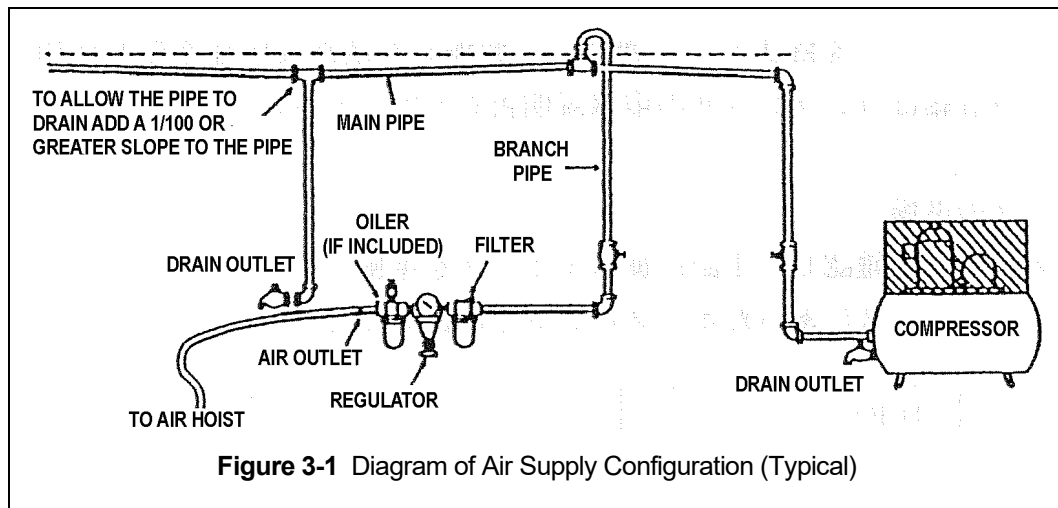
- 3.4.1 **⚠ CAUTION** The air entering the hoist inlet must not contain any particulate greater than 5 microns in size. Therefore, the hoist must have a 5 micron filter in its air supply. The filter must be upstream of the lubricator.
- 3.4.2 The filter servicing the hoist can also service other hoists and air consuming equipment. In this case, the air filter must be sized for the total air consumption of the equipment it is servicing.

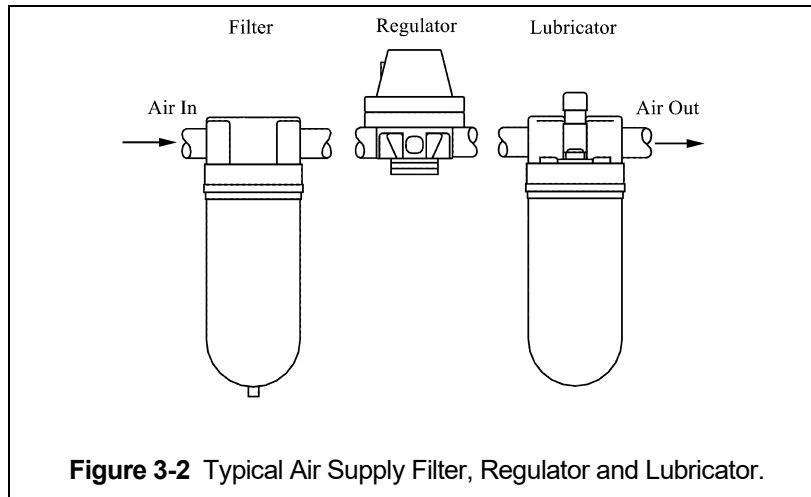
3.5 Air Dryer

- 3.5.1 **⚠ CAUTION** To prevent corrosion and hoist malfunction, employ an air dryer in the air supply system to ensure that dry air is supplied to the hoist. If there is moisture in the air supplied to the hoist, this moisture will cause corrosion on internal hoist components during periods when the hoist is idle leading to hoist malfunction.

3.6 Piping, Hoses And Fittings

- 3.6.1 **⚠ CAUTION** System Configuration – The system should be configured as shown in Figure 3-1. Since moisture tends to accumulate in compressed air systems, corrosion may result if the system is not periodically drained.
- Arrange for a drain in the air supply piping at the lowest point in the piping.
 - Periodically drain the system to remove moisture/water from the system and to prevent corrosion.
 - Filter, regulator (if equipped), and lubricator must be arranged in the order shown in Figure 3-2.



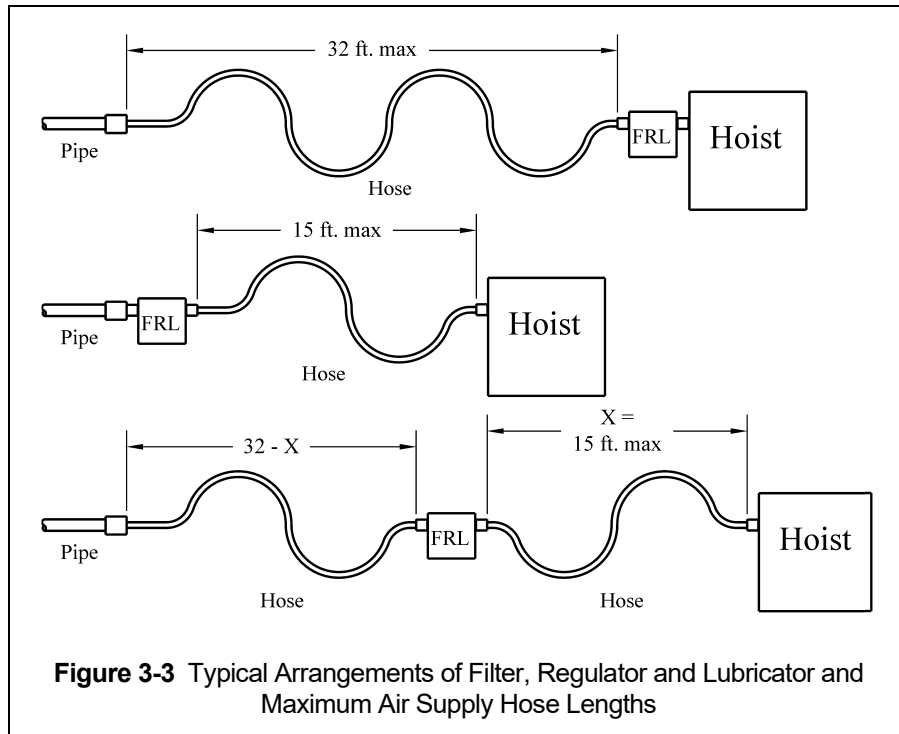


3.6.2 **NOTICE** Piping – Pipe should be sized to accommodate the hoist airflow requirements. Table 3-1 gives recommended pipe sizes.

Table 3-1 Air Supply Pipe and Hose Sizes		
Model	Diameter of Supply Pipe	Diameter of Supply Hose
TCL3000, TCL6000	Inside diameter 1.0 inch or larger	Inside diameter 0.75 inch or larger

3.6.3 **NOTICE** Hoses – The connection from the air supply system piping to the hoist must be made with a flexible pressure hose. Due to normal line losses in air supply lines:

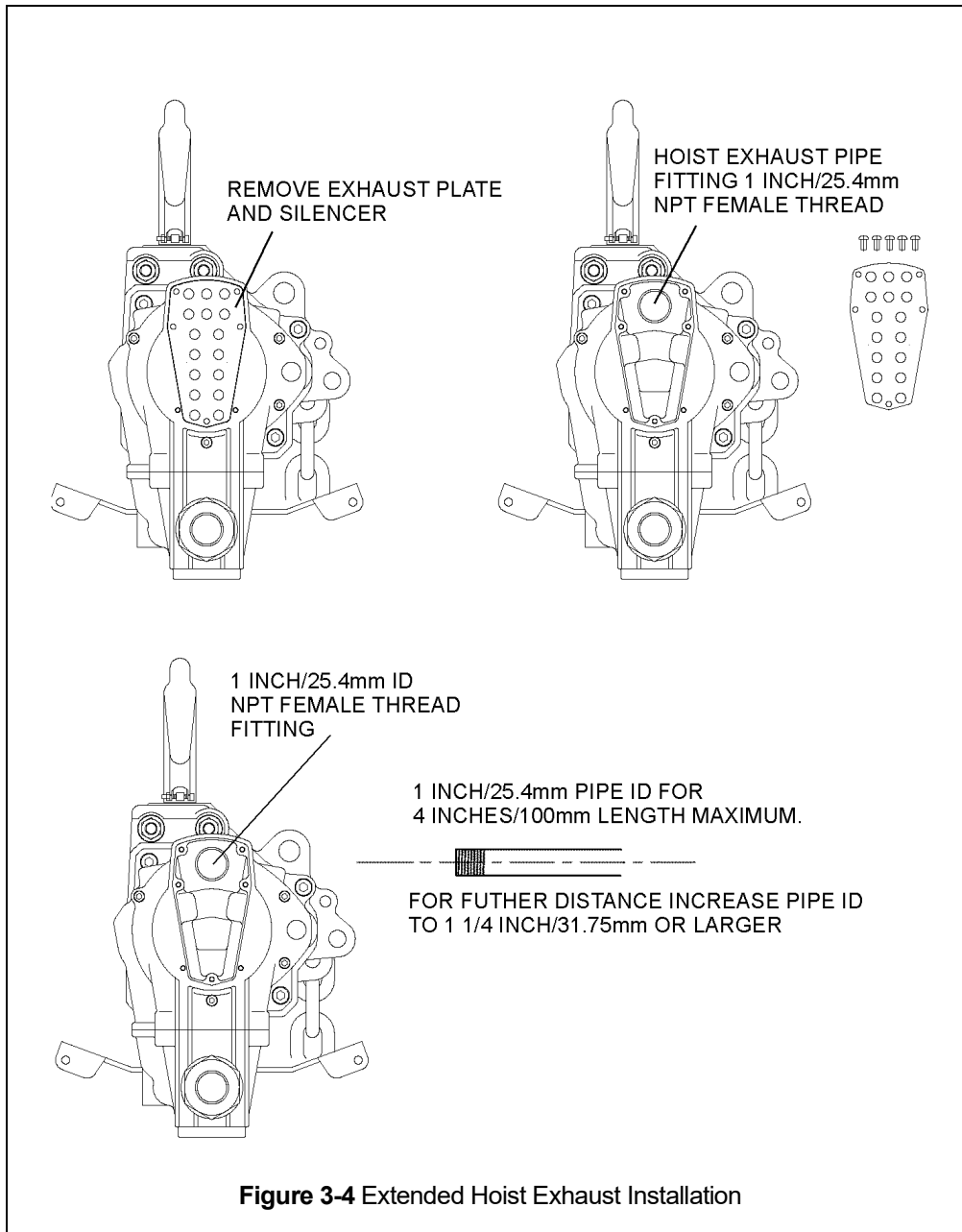
- Do not use hose smaller than specified in Table 3-1, and
- Limit the length of the hose to that specified in Figure 3-3.
- If your application exceeds these requirements consult factory.
- The use of “Quick Couplers” is to be avoided. Quick Couplers restrict the air flow that will affect hoist performance.



- 3.6.4 **⚠ CAUTION** Fittings – Important considerations regarding fittings in the hoist's air supply include:
- When connecting air supply components, remove all dirt or debris from the connecting surfaces of the hoses, pipes, fittings, or threaded fasteners to prevent contaminants from entering the hoist.
 - Keep airflow restrictions such as quick disconnect fittings, bends, elbows, and adapters to a minimum.
- 3.6.5 **⚠ CAUTION** Before connecting the hoist to its air supply line; perform the proper draining and purging procedures to prevent contaminants or moisture from entering the hoist.

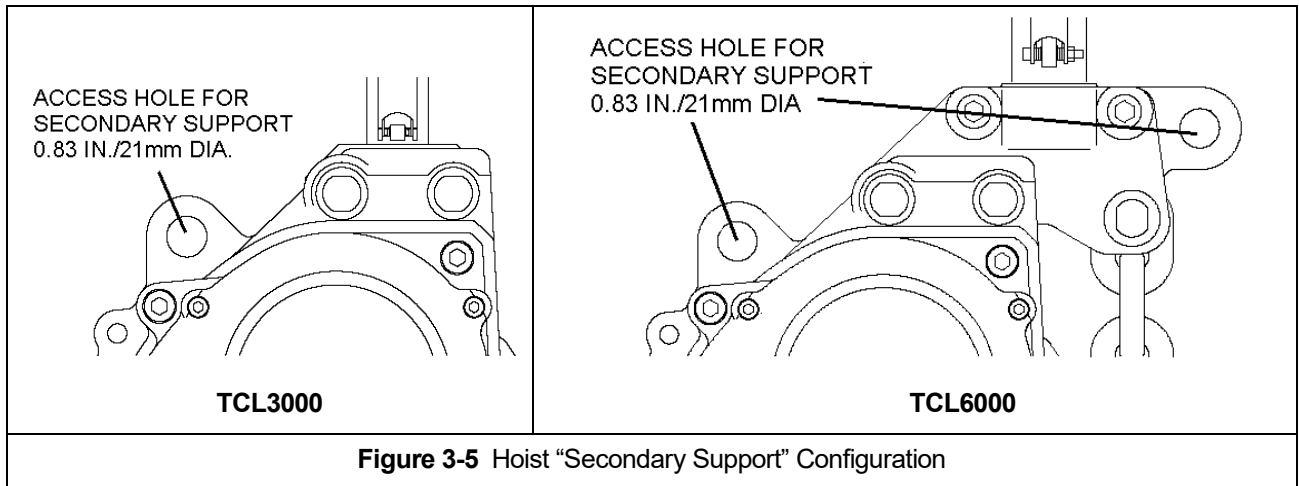
3.7 Exhaust Control

- 3.7.1 Some hoist applications require the hoist exhaust to be expelled outside the immediate environment. To accommodate this need it is possible to extend the hoist exhaust to another area. Figure 3-4 describes the method to extend the hoist exhaust.



3.8 Mounting Location

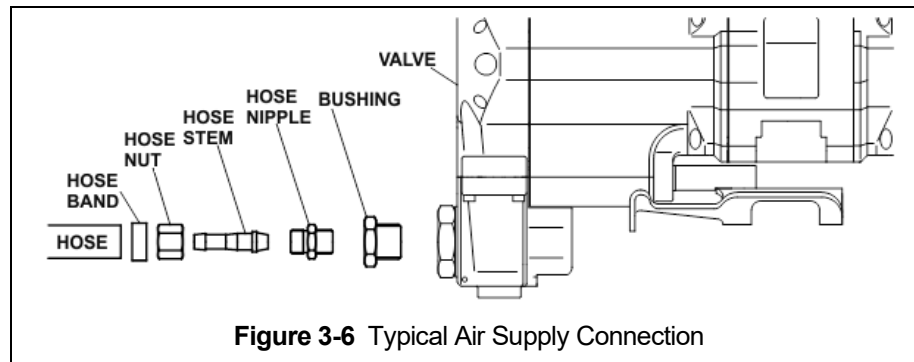
- 3.8.1 **⚠ WARNING** Prior to mounting the hoist ensure that the suspension and its supporting structure are adequate to support the hoist and its loads. If necessary consult a professional that is qualified to evaluate the adequacy of the suspension location and its supporting structure.
- 3.8.1 For applications requiring a “Secondary Support” a support attachment location has been provided in the hoist Top Hook Yoke/Hoist Body. Reference Figure 3-5.



3.8.3 **NOTICE** See Section 7.7 for outdoor installation considerations.

3.9 Connecting Hoist to Air Supply

3.9.1 **⚠ WARNING** HAZARDOUS AIR PRESSURE IS PRESENT IN THE HOIST, IN THE SUPPLY OF COMPRESSED AIR TO THE HOIST, AND IN THE CONNECTIONS BETWEEN COMPONENTS.



3.9.2 Shut off the air supply and stop the airflow completely. Lock out and tag out in accordance with ANSI Z244.1 "Personnel Protection – Lockout/Tagout of Energy Sources".

3.9.3 **⚠ CAUTION** Before connecting the air supply hose to the hoist, always purge the air hose to clear any debris and water.

3.9.4 Apply approximately 10-15 drops (0.2-0.3 cc/min) of turbine oil (see approved lubricant under Section 6.0 Lubricants) into the hose before attaching to the hoist.

3.9.5 Make connections to air supply; reference Figure 3-6. Use a reducing adapter at the hoist valve section for hose sizes larger than 3/4 inch NPT.

3.9.6 **NOTICE** Where conditions dictate, the installation sequence can be reversed by mounting the hoist first (Section 3.9) followed by connecting the air supply (Section 3.6).

3.10 Mounting the Hoist

3.10.1 Manual Trolley – Follow instructions in Owner's Manual provided with the trolley.

3.10.2 Motorized Trolley – Follow instructions in Owner's Manual provided with the trolley.

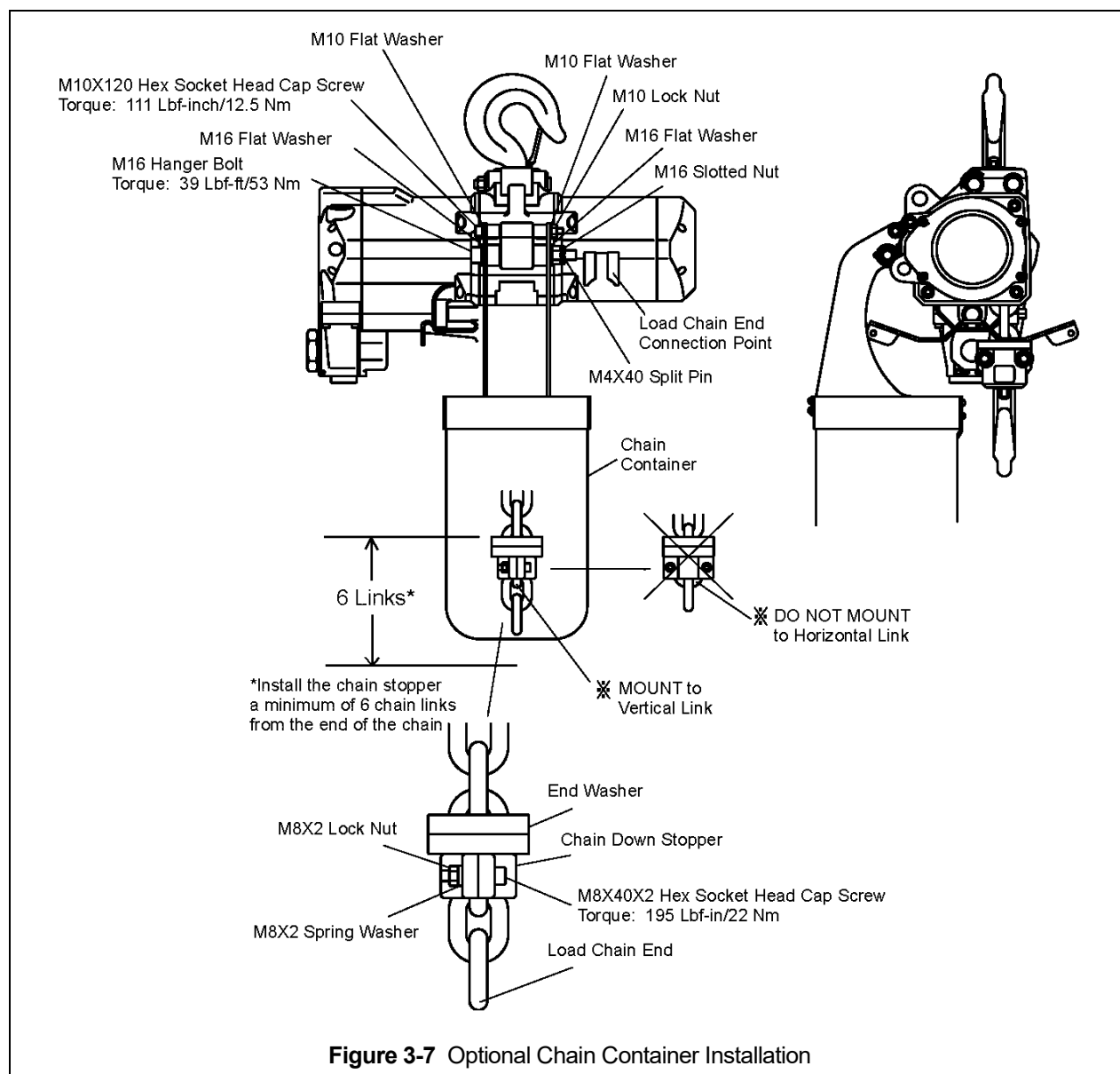
3.10.3 Hook Mounted to a Fixed Location – Attach the hoist's top hook to the fixed suspension point.

3.10.4 **⚠ WARNING** Ensure that the fixed suspension point rests on the center of the hook's saddle and that the hook's latch is engaged .

3.11 Optional Chain Container

3.11.1 For installation of the optional bag style chain container refer to Figure 3-7 and perform the following:

- Make sure all end stoppers are installed correctly. See Figure 3-7 and section 7.3.
- Torque all fasteners to the values shown.
- Feed the chain into the chain container beginning with the free end. Take care to avoid twisting or tangling the chain.
- Do not use the chain container if any parts are damaged or if any fasteners/hardware are missing.

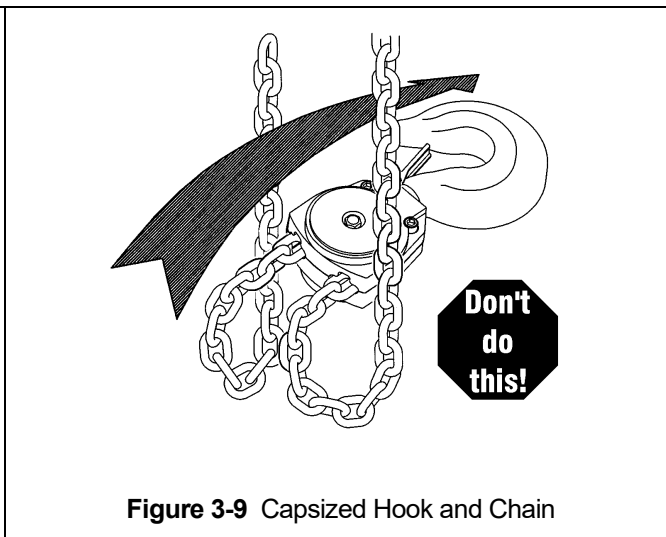
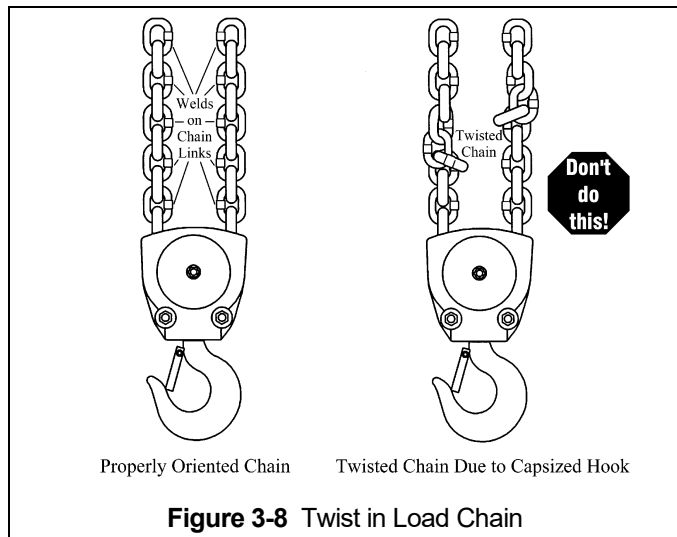


3.12 Non-Stationary Application

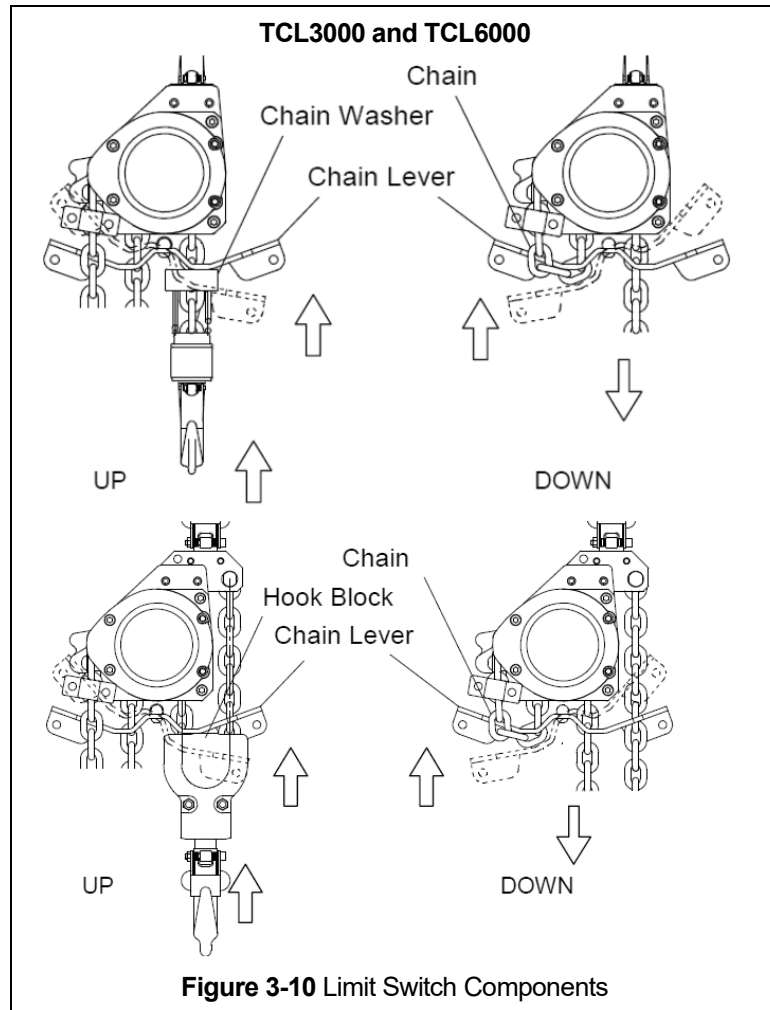
- 3.12.1 For applications such as rental fleets or construction sites where the hoist is moved from place-to-place, a filter and lubricator are still required. Consult factory for recommended methods.
- 3.12.1 Connections and fittings must be kept clean and care taken to prevent dirt, debris and moisture from entering the hoist.
- 3.12.2 Recommended practice for removing the hoist from an installation:
- Run the hoist briefly with well lubricated air
 - Disconnect the air supply line
 - Inject a small quantity (approximately 20 drops) of oil into the hoist's inlet port
 - Plug the inlet port

3.13 Preoperational Checks and Trial Operation

- 3.13.1 **⚠ CAUTION** Check for the availability of required operating air pressure of between 60 PSI to 90 PSI at the hoist's inlet port before trying to operate the hoist.
- 3.13.2 **⚠ WARNING** Verify that the load chain is not twisted or tangled and that the bottom hook is not capsized prior to operating the hoist. Correct all chain irregularities before conducting the first hoist operation. See Figures 3-8 and 3-9.



- 3.13.3 **⚠ WARNING** Confirm the adequacy of the rated capacity for all slings, chains, wire ropes and all other lifting attachments before use. Inspect all load suspension members for damage prior to use and replace or repair all damaged parts.
- 3.13.4 **⚠ WARNING** For Models TCL3000 and TCL6000 verify that the chain/limit lever is operational and can move freely in both the up and down directions. For reference see Figure 3-10.



- 3.13.5 For Models TCL3000 and TCL6000 verify that the chain/limit lever is operational and can move freely in both the up and down directions.
- 3.13.6 Measure and record the "K" dimension of all hooks on hoist. See Table 5-6 under Section 5, "Inspection". Always use the same side of the hook to measure and record the "K" dimension.
- 3.13.7 Record the hoist Code Number and Serial Number (from the nameplate on the hoist – see Section 10) in the space provided on the cover of this manual.
- 3.13.8 Ensure that the hoist is properly installed to either a fixed point, or trolley, whichever applies.
- 3.13.9 If hoist is installed on a trolley, ensure that
- trolley is properly installed on the beam, and
 - stops for the trolley are correctly positioned and securely installed on the beam.
- 3.13.10 Ensure that all nuts, bolts and split (cotter) pins are sufficiently fastened.
- 3.13.11 For hoists with pendant controls, ensure that the pendant's air tubing and wire cable are properly attached to the hoist. See Section 7.4.
- 3.13.12 **⚠ CAUTION** Check Air Supply - Check air supply before everyday use. Ensure proper air quality and air pressure.

3.13.13 **⚠ CAUTION** if using an air lubricator, check the lubricator for proper function and adequate oil level.

3.13.14 Confirm proper operation.

- Before operating read and become familiar with Section 4 - Operation.
- Before operating ensure that the hoist (and trolley) meets the Inspection, Testing and Maintenance requirements of ANSI/ASME B30.16.
- Before operating ensure that nothing will interfere with the full range of the hoist's (and trolley's) operation.

3.13.15 Proceed with trial operation to confirm proper operation.

- Initially operate slowly under no load in both directions. Verify controls agree with hoist direction.
- Perform inspections per Section 5.3, "Frequent Inspections".

4.0 Operation

4.1 Introduction

DANGER

DO NOT WALK UNDER A SUSPENDED LOAD

WARNING

HOIST 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, AND THE OPERATION SECTIONS OF ANSI/ASME B30.16 and ANSI/ASME B30.10. THE OPERATOR SHALL ALSO BE REQUIRED TO BE FAMILIAR WITH THE HOIST AND HOIST CONTROLS BEFORE BEING AUTHORIZED TO OPERATE THE HOIST OR LIFTING SYSTEM.

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

HOIST 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.

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

HOIST 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.

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

OVERHEAD HOISTS ARE INTENDED ONLY FOR VERTICAL LIFTING SERVICE OF FREELY SUSPENDED UNGUIDED LOADS. DO NOT USE HOIST FOR LOADS THAT ARE NOT LIFTED VERTICALLY, LOADS THAT ARE NOT FREELY SUSPENDED, OR LOADS THAT ARE GUIDED.

NOTICE

- Read ANSI/ASME B30.16 and ANSI/ASME B30.10.
- Read the hoist manufacturer's Operating and Maintenance Instructions.
- Read all labels attached to equipment.

The operation of an overhead hoist involves more than activating the hoist's controls. Per the ANSI/ASME B30 standards, the use of an overhead hoist is subject to certain hazards that cannot be mitigated by engineered features, but only by the exercise of intelligence, care, common sense, and experience in anticipating the effects and results of activating the hoist's controls. Use this guidance in conjunction with other warnings, cautions, and notices in this manual to govern the operation and use of your overhead hoist.

4.2 Shall's and Shall Not's for Operation

WARNING

Improper operation of a hoist 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 hoist.
- **NOT** operate a hoist 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 hoist that has been modified without the manufacturer's approval or without certification that it is in conformity with ANSI/ASME B30 volumes.
- **NOT** lift more than rated load for the hoist.
- **NOT** use hoist with twisted, kinked, damaged, or worn chain.
- **NOT** use the hoist to lift, support, or transport people.
- **NOT** lift loads over people.
- **NOT** operate a hoist unless all persons are and remain clear of the supported load.
- **NOT** operate unless load is centered under hoist.
- **NOT** attempt to lengthen the load chain or repair damaged load chain.
- Protect the hoist's load chain from weld splatter or other damaging contaminants.
- **NOT** operate hoist when it is restricted from forming a straight line from hook to support in the direction of loading.
- **NOT** use load chain as a sling or wrap load chain around load.
- **NOT** apply the load to the tip of the hook or to the hook latch.
- **NOT** apply load unless the load chain is properly seated in the load sheave (and idle sheave for hoist with two chain falls).
- **NOT** apply load if bearing prevents equal loading on all load-supporting chain.
- **NOT** operate beyond the limits of the load chain travel.
- **NOT** leave load supported by the hoist unattended unless specific precautions have been taken.
- **NOT** allow the load chain or hook to be used as an electrical or welding ground.
- **NOT** allow the load chain or hook to be touched by a live welding electrode.
- **NOT** remove or obscure the warnings on the hoist.
- **NOT** operate a hoist on which the safety placards or decals are missing or illegible.
- **NOT** operate a hoist unless it has been securely attached to a suitable support.
- **NOT** operate a hoist unless load slings or other approved single attachments are properly sized, and seated in the hook saddle.
- **NOT** use the hoist in such a way that could result in shock or impact loads being applied to the hoist.
- Take up slack carefully – make sure load is balanced and load-holding action is secure before continuing.
- Shut down a hoist that malfunctions or performs unusually and report such malfunction.
- Make sure hoist limit lever functions properly.
- Warn personnel before lifting or moving a load.
- Warn personnel of an approaching load.

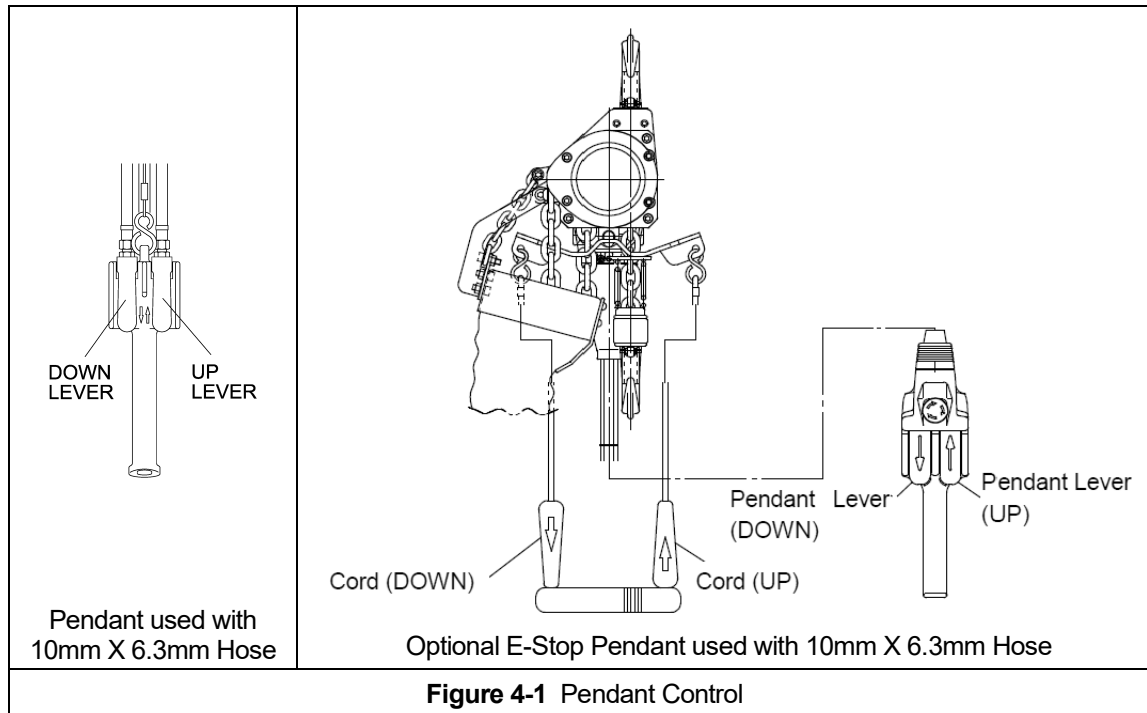
CAUTION

Improper operation of a hoist 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:**

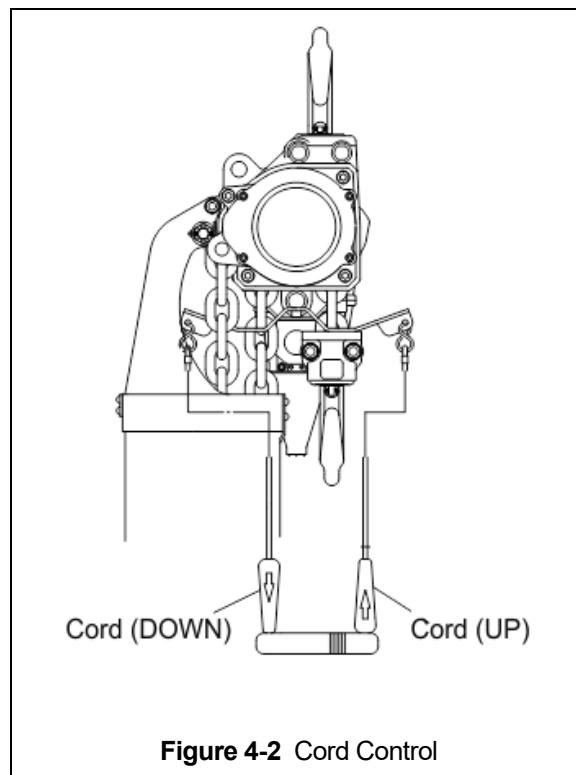
- Maintain a firm footing or be otherwise secured when operating the hoist.
- Check brake function by tensioning the hoist prior to each lift operation.
- Use hook latches. Latches are to retain slings, chains, etc. under slack conditions only.
- Make sure the hook latches are closed and not supporting any parts of the load.
- Make sure the load is free to move and will clear all obstructions.
- Avoid swinging the load or hook.
- Make sure hook travel is in the same direction as shown on controls.
- Inspect the hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
- Use the hoist manufacturer's recommended parts when repairing the unit.
- Lubricate load chain per hoist manufacturer's recommendations.
- **NOT** use the hoist load limiting or warning device to measure load.
- **NOT** use limit lever as a routine operating stop. It is an emergency device only.
- **NOT** allow your attention to be diverted from operating the hoist.
- **NOT** allow the hoist to be subjected to sharp contact with other hoists, structures, or objects through misuse.
- **NOT** adjust or repair the hoist unless qualified to perform such adjustments or repairs.

4.3 Hoist Controls

- 4.3.1 For hoists mounted to motorized trolleys follow the control instruction included in the trolley's Owner's Manual.
- 4.3.2 Pendant Control - When using the pendant control depress the up lever to raise the hoist or the down lever to lower the hoist as shown in Figure 4-1. To stop motion release the lever switches.



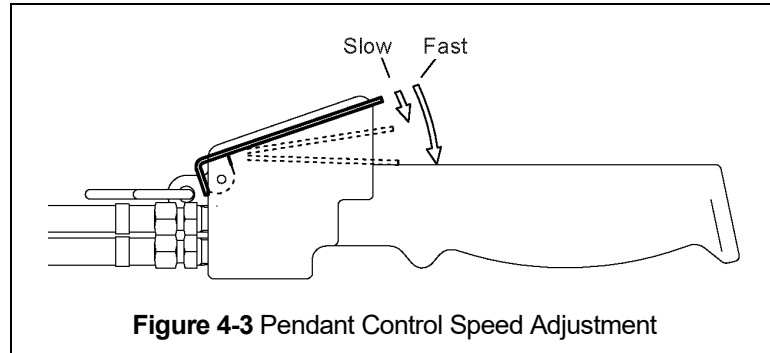
- 4.3.3 Cord Control – When using a hoist with cord control, pull down on the appropriate colored cord to raise or lower the hoist. White indicates the raise control and red indicates lowering control. Release the cords to stop the hoist. Refer to Figure 4-2 below.



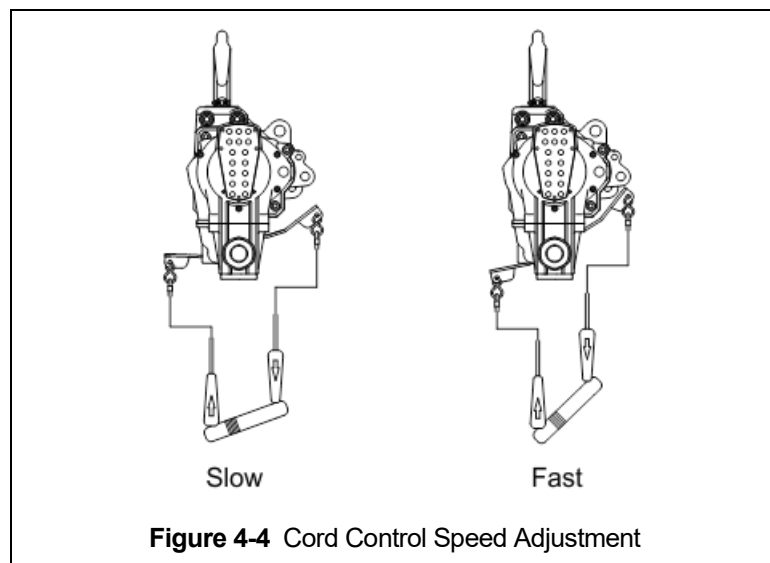
- 4.3.4 **⚠ CAUTION** Make sure the motor completely stops before reversing direction.

4.4 Adjusting the Controls

- 4.4.1 For pendant control, the speed can be adjusted by the amount the lever is depressed. As shown below in Figure 4-3, by depressing the lever slightly, you will be able to control the hoist's motions slowly and with more precision. By depressing the lever further, the speed of the hoist will be increased until the lever is fully depressed.



- 4.4.2 For the cord type control, adjust the speed by varying the amount of pull on the cord. Refer to Figure 4-4.



4.5 Operation of the Load Limiter

- 4.5.1 If a hoist is used to lift a load that exceeds the hoist's rated capacity, the load limiter will cause the hoist to automatically stop lifting.
- 4.5.2 If the hoist stops lifting automatically, lower and remove the load from the hoist.
- 4.5.3 If the load is at or below the hoist's capacity rating and the hoist stops lifting automatically, the load limiter may need adjustment.
- Check air line pressure to ensure adequate pressure at the hoist.
 - If pressure is adequate, adjust the load limiter. For load limiter adjustment, refer to Section 7.

5.0 Inspection

5.1 General

- 5.1.1 The inspection procedure herein is based on ANSI/ASME B30.16. The following definitions are from ANSI/ASME B30.16 and pertain to the inspection procedure below.
- **Designated Person** – person selected or assigned as being competent to perform the specific duties to which he/she is assigned.
 - **Qualified Person** – person who, by possession of a recognized degree or certificate of professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.
 - **Normal Service** – that distributed service which involves operation with randomly distributed loads within the rated load limit, or uniform loads less than 65% of rated load for not more than 25% of the time.
 - **Heavy Service** – that service which involves operation within the rated load limit which exceeds normal service.
 - **Severe Service** – that service which involves normal or heavy service with abnormal operating conditions.

5.2 Inspection Classification

- 5.2.1 Initial Inspection – prior to initial use, all new, altered, or modified hoists shall be inspected by a designated person to ensure compliance with the applicable provisions of this manual.
- 5.2.2 Inspection Classification – the inspection procedure for hoists in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the hoist and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as FREQUENT and PERIODIC, with respective intervals between inspections as defined below.
- 5.2.3 FREQUENT Inspection – visual examinations by the operator or other designated personnel with intervals per the following criteria:
- Normal service – monthly
 - Heavy service – weekly to monthly
 - Severe service – daily to weekly
 - Special or infrequent service – as recommended by a qualified person before and after each occurrence.
- 5.2.4 PERIODIC Inspection – visual inspection by a designated person with intervals per the following criteria:
- Normal service – yearly
 - Heavy service – semiannually
 - Severe service – quarterly
 - Special or infrequent service – as recommended by a qualified person before the first such occurrence and as directed by the qualified person for any subsequent occurrences.

5.3 Frequent Inspection

- 5.3.1 Inspections should be made on a FREQUENT basis in accordance with Table 5-1, "Frequent Inspection." Included in these FREQUENT Inspections are observations made during operation for any defects or damage that might appear between Periodic Inspections. Evaluation and resolution of the results of FREQUENT Inspections shall be made by a designated person such that the hoist is maintained in safe working condition.

Table 5-1 Frequent Inspection
All functional operating mechanisms for maladjustment and unusual sounds.
Operation of limit switch and associated components
Hoist braking system for proper operation
Hooks in accordance with ANSI/ASME B30.10
Hook latch operation
Load chain in accordance with Section 5.7
Load chain reeving for compliance with Section 3.12 and 7.3
Air valves and components for leakage or damage

5.4 Periodic Inspection

- 5.4.1 Inspections should be made on a PERIODIC basis in accordance with **Table 5-2**, "Periodic Inspection." Evaluation and resolution of the results of PERIODIC Inspections shall be made by a designated person such that the hoist is maintained in safe working condition.
- 5.4.2 For inspections where load suspension parts of the hoist are disassembled, a load test per ANSI/ASME B30.16 must be performed on the hoist after it is re-assembled and prior to its return to service.

Table 5-2 Periodic Inspection
Requirements of frequent inspection.
Evidence of loose bolts, nuts, or rivets.
Evidence of worn, corroded, cracked, or distorted parts such as load blocks, suspension housing, chain attachments, clevises, yokes, suspension bolts, shafts, gears, bearings and pins.
Evidence of damage to hook retaining nuts or collars and pins, and welds or rivets used to secure the retaining members.
Evidence of damage or excessive wear of load and idler sheaves.
Evidence of excessive wear on motor vanes or on load brake.
Evidence of damage of supporting structure or trolley, if used.
Function labels on pendant control stations for legibility.
Warning label properly attached to the hoist and legible (see Section 1.2).
End connections of load chain.

5.5 Occasionally Used Hoists

5.5.1 Hoists that are used infrequently shall be inspected as follows prior to placing in service:

- Hoist Idle More Than 1 Month, Less Than 1 Year: Inspect per FREQUENT Inspection criteria of Section 5.3.
- Hoist Idle More Than 1 Year: Inspect per PERIODIC Inspection criteria of Section 5.4.

5.6 Inspection Records

- 5.6.1 Dated inspection reports and records should be maintained at time intervals corresponding to those that apply for the hoist's PERIODIC interval per **Section 5.2.4**. These records should be stored where they are available to personnel involved with the inspection, maintenance, or operation of the hoist.
- 5.6.2 A long range chain inspection program should be established and should include records of examination of chains removed from service so a relationship can be established between visual observation and actual condition of the chain.

5.7 Inspection Methods and Criteria

- 5.7.1 This section covers the inspection of specific items. The list of items in this section is based on those listed in ANSI/ASME B30.16 for the Frequent and Periodic Inspection. In accordance with ANSI/ASME B30.16, these inspections are not intended to involve disassembly of the hoist. Rather, disassembly for further inspection would be required if frequent or periodic inspection results so indicate. Such disassembly and further inspection should only be performed by a qualified person trained in the disassembly and re-assembly of the hoist.

Table 5-3 Hoist Inspection Methods and Criteria

Item	Method	Criteria	Action
Functional operating mechanisms.	Visual, Auditory	Mechanisms should be properly adjusted and should not produce unusual sounds when operated.	Repair or replace as required.
Limit Switch	Function	Proper operation. Actuation of limit switch should stop hoist.	Repair or replace as required.
Chain Lever/Limit Lever Assembly	Visual, Function	Lever should not be bent or significantly worn and should be able to move freely.	Replace.
Braking System	Function	Braking distance should not exceed approximately five chain links.	Repair or replace as required.
Hooks - Surface Condition	Visual	Should be free of significant rust, weld splatter, deep nicks, or gouges.	Replace.
Hooks - Fretting wear	Measure	The "u" dimension should not be less than minimum value listed in Table 5-6.	Replace.
Hooks - Stretch	Measure	The "K" dimension should not exceed the maximum value for replacement from Table 5-6 (See Section 3.12).	Replace.

Table 5-3 Hoist Inspection Methods and Criteria			
Item	Method	Criteria	Action
Hooks - Bent Shank or Neck	Visual	Shank and neck portions of hook should be free of deformations	Replace.
Hooks - Yoke Assembly	Visual	Should be free of significant rust, weld splatter, nicks, and gouges. Holes should not be elongated, fasteners should not be loose, and there should be no gap between mating parts.	Clean/Lubricate, or replace as required.
Hooks - Swivel Bearing	Visual, Function	Bearing parts and surfaces should not show significant wear, and should be free of dirt, grime and deformations. Hook should rotate freely with no roughness.	Clean/lubricate, or replace as required.
Top Hook/Yoke Gap	Measure	Gap should not be greater than maximum value listed in Table 5-7.	Replace.
Hooks - Idle Sheave and Axle (Bottom Hook on Double Fall Hoist)	Visual, Function	Pockets of Idle Sheave should be free of significant wear. Idle Sheave surfaces should be free of nicks, gouges, dirt and grime. Bearing parts and surfaces of Idle Sheave and Axle should not show significant wear. Idle Sheave should rotate freely with no roughness or significant free play.	Clean/lubricate, or replace as required.
Hooks - Hook Latches	Visual, Function	Latch should not be deformed. Attachment of latch to hook should not be loose. Latch spring should not be missing and should not be weak. Latch movement should not be stiff - when depressed and released latch should snap smartly to its closed position.	Replace.
Load Chain - Surface Condition	Visual	Should be free of rust, nicks, gouges, dents and weld splatter. Links should not be deformed, and should not show signs of abrasion. Surfaces where links bear on one another should be free of significant wear.	Replace.
Load Chain - Pitch	Measure	The "P" dimension should not be greater than maximum value listed in Table 5-8.	Replace, inspect Load Sheave (and Idle Sheave for double fall hoist).
Load Chain - Lubrication	Visual, Auditory	Entire surface of each chain link should be coated with lubricant and should be free of dirt and grime. Chain should not emit cracking noise when hoisting a load.	Clean/lubricate (see Sections 6.0).
Load Chain - Reeving	Visual	Chain should be reeved properly through Load Sheave (and Idle Sheave for double fall hoist) - refer to Section 3.13. Chain and stoppers should be installed properly - refer to Section 7.3.2.	Reeve/Install chain properly.
Chain Container (Optional)	Visual	Container should not be damaged. Brackets should not be deformed or missing	Replace

Table 5-3 Hoist Inspection Methods and Criteria

Item	Method	Criteria	Action
Chain Springs	Visual	Chain springs should not be deformed or compressed.	Replace
Chain Container (optional)	Visual	Container should not be damaged. Brackets should not be deformed or missing.	Replace
Bolts, Nuts and Rivets	Visual, Check with Proper Tool	Bolts, nuts and rivets should not be loose.	Tighten or replace as required.
Housing and Mechanical Components	Visual, Auditory, Vibration, Function	Hoist components including load blocks, suspension housing, chain attachments, clevises, yokes, suspension bolts, shafts, gears, bearings, pins and rollers should be free of cracks, distortion, significant wear and corrosion. Evidence of same can be detected visually or via detection of unusual sounds or vibration during operation.	Replace
Chain Separator	Visual, Measure	The Chain Separator should be free of cracks, distortion, significant wear and corrosion. The "L" and "W" dimension should not be greater than maximum value listed in Table 5-5.	Replace
Motor Brake	Measure, Visual	Motor brake dimension should be within the allowable limits of Table 5-4. See Section 7.2 for gaining access to motor brake. Braking surfaces should be clean, free of grease/oil and should not be glazed.	Replace
Load Sheave	Visual	Pockets of Load Sheave should be free of significant wear. See Section 7.5 to gain visual access to the load sheave.	Replace.
Pendant Control Levers	Visual, Function	Depressing and releasing pendant control levers should cause hoist to operate.	Repair or replace as necessary.
Pendant - Housing	Visual	Pendant housing should be free of cracks and mating surfaces of parts should seal without gaps.	Replace.
Pendant - Tubing	Visual, auditory	Tubing to pendant control switches should not be loose or be leaking air.	Repair or replace as necessary.
Pendant - Labels	Visual	Labels denoting functions should be legible.	Replace.
Warning Labels	Visual	Warning Labels should be affixed to the hoist (see Section 1.2) and they should be legible.	Replace
Hoist Capacity Label	Visual	The label that indicates the capacity of the hoist should be legible and securely attached to the hoist.	Replace.

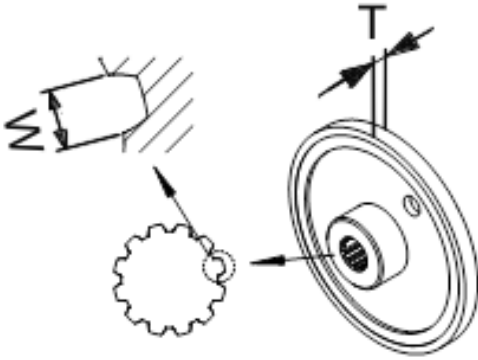
Table 5-4 Brake Disc Dimensions		
		
Hoists	Std Dimension Inch (mm)	Minimum Value for Replacement Inch (mm)
TCL3000, TCL6000	T = 0.31 (8) W = 0.10 (2.6)	T = 0.29 (7.3) W = 0.11 (2.8)

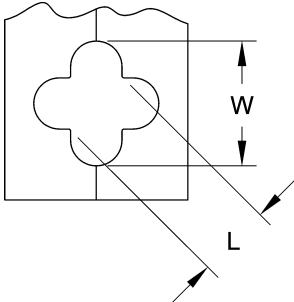
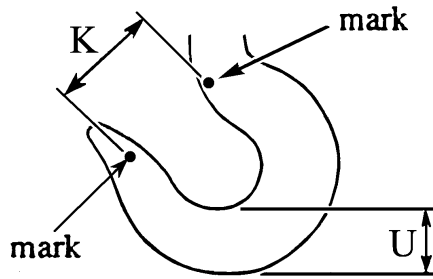
Table 5-5 Chain Separator Dimensions		
		
Hoists	Std Dimension Inch (mm)	Maximum Value for Replacement Inch (mm)
TCL3000, TCL6000	L = 1.08 (27.5) W = 2.01 (51.0)	L = 1.16 (29.5) W = 2.09 (53.0)

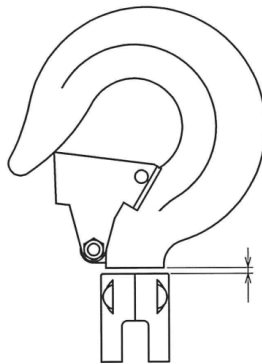
Table 5-6 Top Hook & Bottom Hook Dimensions



Dimensions K and U do not have a controlled tolerance; therefore they should be measured and recorded below prior to the hoist being placed into service. The measured K and U values will be the dimensional reference for hook inspection.

Hoists	Parts View Figure No.	Recorded Dimension When New	Maximum/Minimum Value for Replacement
TCL3000	2-5	Top Hook K = _____ Top Hook U = _____	For K if the measured dimension exceeds 1.05 times the recorded new dimension, the hook should be replaced.
	2-5	Bottom Hook K = _____ Bottom Hook U = _____	
TCL6000	2-6	Top Hook K = _____ Top Hook U = _____	For U if the measured dimension is less than 0.9 times the recorded new dimension, the hook should be replaced.
	2-6	Bottom Hook K = _____ Bottom Hook U = _____	

Table 5-7 Top Hook/Yoke Gap Wear Limit Dimension



NOTE: Hook image does not represent actual hook.

Capacity Code	Minimum Value for Replacement Inch (mm)
TCL3000	0.11(7/64) inch/(2.8mm)
TCL6000	0.14(9/64) inch/(3.5mm)

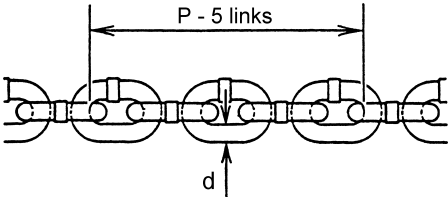
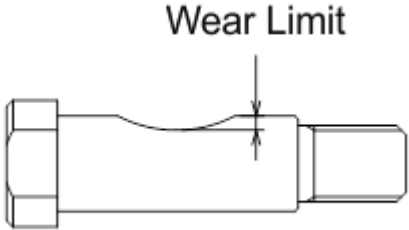
Table 5-8 Chain Wear Dimensions				
				
Capacity Code	“P” Dimension inch (mm)		“d” Dimension inch (mm)	
	Standard	Discard	Standard	Discard
TCL3000, TCL6000	7.52 (191)	7.74 (196.7)	0.49 (12.5)	0.44 (11.3)

Table 5-9 Hook Joint Bolt Dimension	
	
Capacity Code	Wear Limit Minimum Value for Replacement inch (mm)
TCL6000	0.004 (0.1)

6.0 Lubrication

6.1 Air Hoist Lubrication

- 6.1.1 This hoist is equipped with a lube-free vane motor that does not require lubrication of the supply air for operation. However, if the hoist supply air is lubricated, there is no disadvantage. See Section 3.0 for lubrication requirements.
- 6.1.2 **⚠ CAUTION** If optional lubrication is desired, lubrication to the motor will be provided primarily by the air supply lubricator. The recommended amount is 10-15 drops/minute (0.2-0.3 cc/min). Refer to Table 6-1 below for the approved lubricant for use with your air hoist.
- 6.1.3 Additional lubrication to the reduction gears is not necessary. When disassembling the hoist for service or repair, apply new grease to the gears before reassembling the hoist.

6.2 Load Chain Lubrication

- 6.2.1 For longer life, the load chain should be lubricated.
- 6.2.2 The load chain lubrication should be accomplished after cleaning the load chain with acid free cleaning solution.
- 6.2.3 Apply Harrington lubricating grease (Part No. ER1BS1951) or an equivalent to industrial general lithium grease, NLGI No. 0, to the bearing surfaces of the load chain links as indicated by the shaded areas in Figure 6-2. Also apply the grease to the areas of the load chain (shaded areas in Figure 6-2) that contact the load sheave. Insure that the grease is applied to the contact areas in the load sheave pockets.

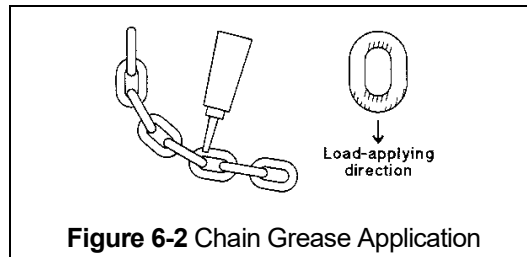


Figure 6-2 Chain Grease Application

- 6.2.4 Machine or gear oil (grade ISO VG 32-56 or equivalent) may be used as an alternative lubricant but must be applied more frequently.
- 6.2.5 The chain should be lubricated every 3 months (more frequently for heavier usage or severe conditions).
- 6.2.6 For dusty environments, it is acceptable to substitute a dry lubricant.

6.3 Hooks and Suspension Components

- 6.3.1 Hooks - Bearings should be cleaned and lubricated at least once per year for normal usage. Clean and lubricate more frequently for heavier usage or severe conditions.
- 6.3.2 Suspension Pins - Lubricate at least twice per year for normal usage; more frequently for heavier usage or severe conditions.

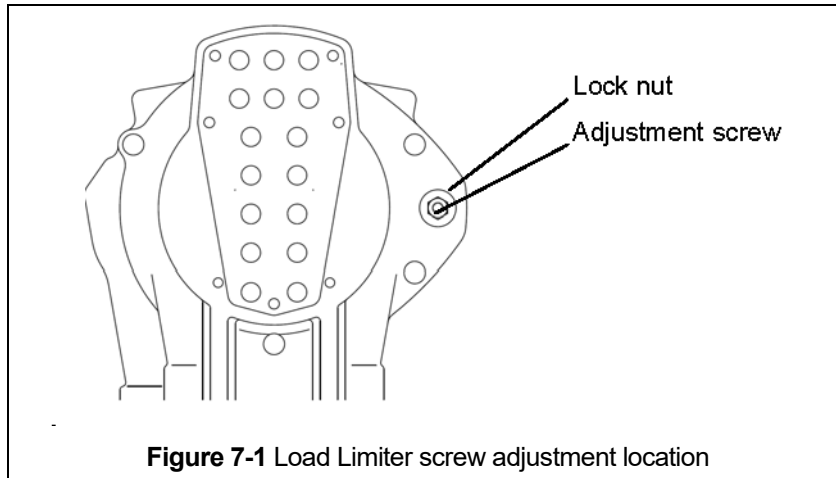
Table 6-1 Table of Approved Lubricants			
Application	Part Location	Lubrication	Grade
Air motor, if lubricated	Lubricator	Turbine Oil	ISO VG 32-56 or equivalent

Load chain & pocket wheel	Load chain	Grease or Machine/gear oil	- HHI Chain Grease P/N ER1BS1551 - NLGI No. 0 - ISO VG 32, 46, 68 or equivalent
Hook bearings & suspension pins	Top & bottom hook sets	Grease	National Lubricating Grease #3 or equivalent
Gears and Bearings	Gear Section	Grease	Shell Gadus S2 V220 2, Shell Alvania EP Grease R000, R00, R0, 1, 2 or equivalent

7.0 Maintenance and Handling

7.1 Load Limiter

- 7.1.1 The purpose of the load limiter is to prevent using the hoist in an overload situation. When lifting, the hoist will stop automatically if the load is above the rated capacity of the hoist.
- 7.1.2 The adjustment is factory set to actuate at approximately 125% of rated capacity (based on supply air pressure of 90 PSI). Note: the load limiter may need adjustment to compensate for air supply pressures significantly less than 90 PSI.



7.1.3 Adjustment Procedure

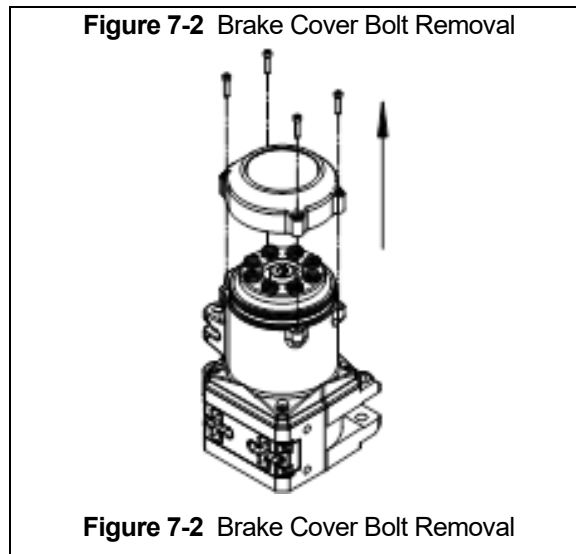
- 1) Before proceeding with the load limiter adjustment, note the following:
 - a. **⚠ WARNING** Adjusting the load limiter involves operating the hoist. Personnel involved in the adjustment procedure should read, understand, and follow Section 4, "Operation".
 - b. For the adjustment procedure, the hoist should be connected to an air supply (see Section 3.1) and it should initially be without a load on its hook.
 - c. Start this procedure with an unloaded hoist. All adjustments to the load limiter should be made with the load in a resting position so that the load chain is not tensioned.
 - d. For the adjustment procedure: OUT means the counter-clockwise (CCW) direction, and IN means the clockwise (CW) direction.
 - e. The pressure of the air supply at the hoist's inlet port (acceptable range is 60 to 90 PSI) affects the performance of your air hoist, including the actuation point of the load limiter. Therefore, ensure that during the adjustment procedure the air pressure at the hoist's inlet port is the same as that which the hoist will experience in normal operation. The relationship between air supply pressure and load limiter actuation is:
 - for a given load limiter setting, as pressure decreases, the actuation point increases.
 - f. When the load limiter is adjusted and working properly, the hoist will operate and lift the load a short distance before the load limiter automatically stops lifting.
- 2) Refer to Figure 7-1. Loosen the lock nut and slowly turn the adjustment screw OUT until it is loose and no longer is in contact with the internal load limiter spring – as this occurs the screw should become easier to turn. Stop turning the screw once it is loose and easier to turn.

- 3) Turn the adjustment screw IN just enough so that it begins to contact the internal load limiter spring – as this occurs the screw should become slightly harder to turn.
- 4) Put a load equal to the desired actuation point on the hoist's hook (do not exceed 125% of the hoist's rated capacity). Begin to slowly lift the load, and then increase the lifting speed. Return the load to its resting position so the load chain is not under tension.
- 5) If the load limiter prevents lifting, turn the adjustment screw IN one full turn.
- 6) Repeat steps 4 and 5 until the load limiter allows lifting.
- 7) Turn the adjustment screw OUT $\frac{3}{4}$ of a turn.
- 8) Attempt to lift the rated capacity load again, beginning slowly, and then increasing the lifting speed.
- 9) If the load limiter does not allow lifting, then turn the adjustment screw IN $\frac{1}{4}$ turn.
- 10) Repeat steps 8 and 9 until the load limiter allows lifting.
- 11) Turn the adjustment screw IN $\frac{1}{4}$ turn. Then, while holding the adjustment screw, tighten the lock nut to secure the setting.

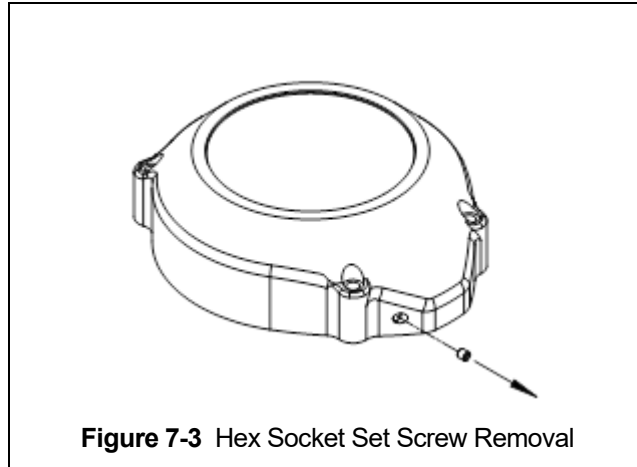
7.2 Brake

- 7.2.1 The hoist brake is not adjustable.
- 7.2.2 Inspect the brake disc in accordance with Section 5.7, Table 5-3, and Table 5-4.
- 7.2.3 The following is the hoist brake inspection procedure.

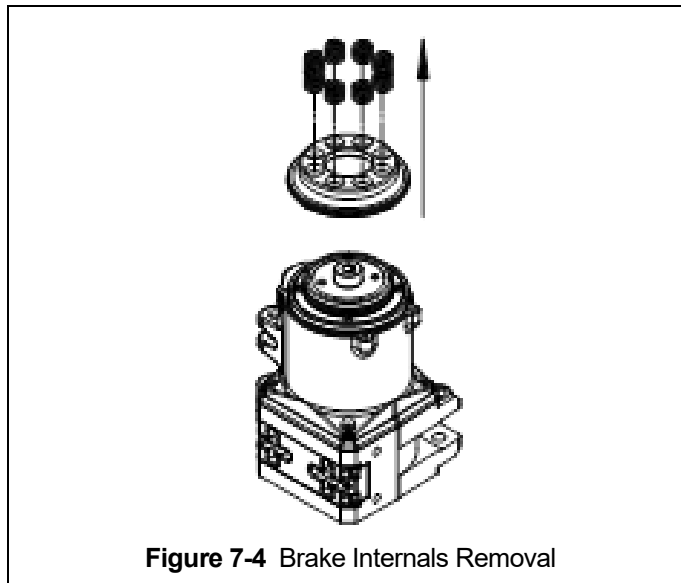
- 1) **⚠ WARNING** HAZARDOUS AIR PRESSURE IS PRESENT IN THE HOIST, IN THE SUPPLY OF COMPRESSED AIR TO THE HOIST, AND IN THE CONNECTIONS BETWEEN COMPONENTS. Shut off the air supply and stop the airflow completely. Lock out and tag out in accordance with ANSI Z244.1 "Personnel Protection -Lockout/Tag out of Energy Sources".
- 2) Gradually and evenly back out 4 Hex Socket Cap Screws from Brake Cover as shown in Figure 7-2.



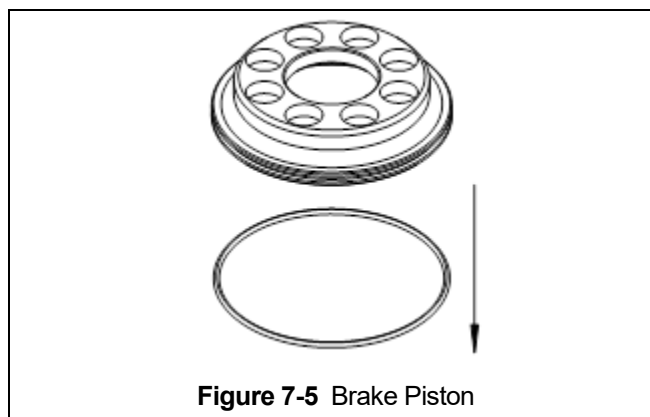
- 3) Remove the Hex Socket Set Screw from the Brake Cover as shown in Figure 7-3.



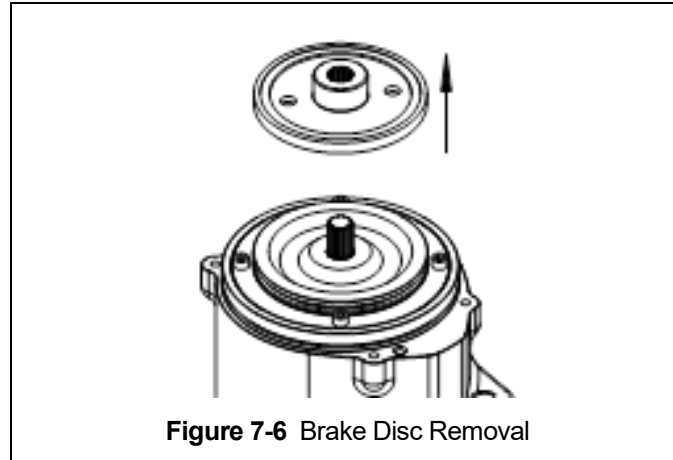
- 4)** Remove the Brake Cover, Brake Piston, and Springs from the Gear Case, as shown in Figure 7-4.



- 5)** Remove the O-ring from the Brake Piston as shown in Figure 7-5. If the Brake Piston has any cracking, it must be replaced.



- 6) Remove the Brake Disc, as shown in Figure 7-6. Measure the thickness of the Brake Disc and the width of the center splines according to Table 5-4.
- 7) Prior to reassembly, clean all surfaces of debris, dirt and loose paint. Apply a light film of grease to all O-Ring seals.
- 8) Reassemble in reverse order. Torque all mounting hardware evenly during the reassembly process.



7.3 Load Chain

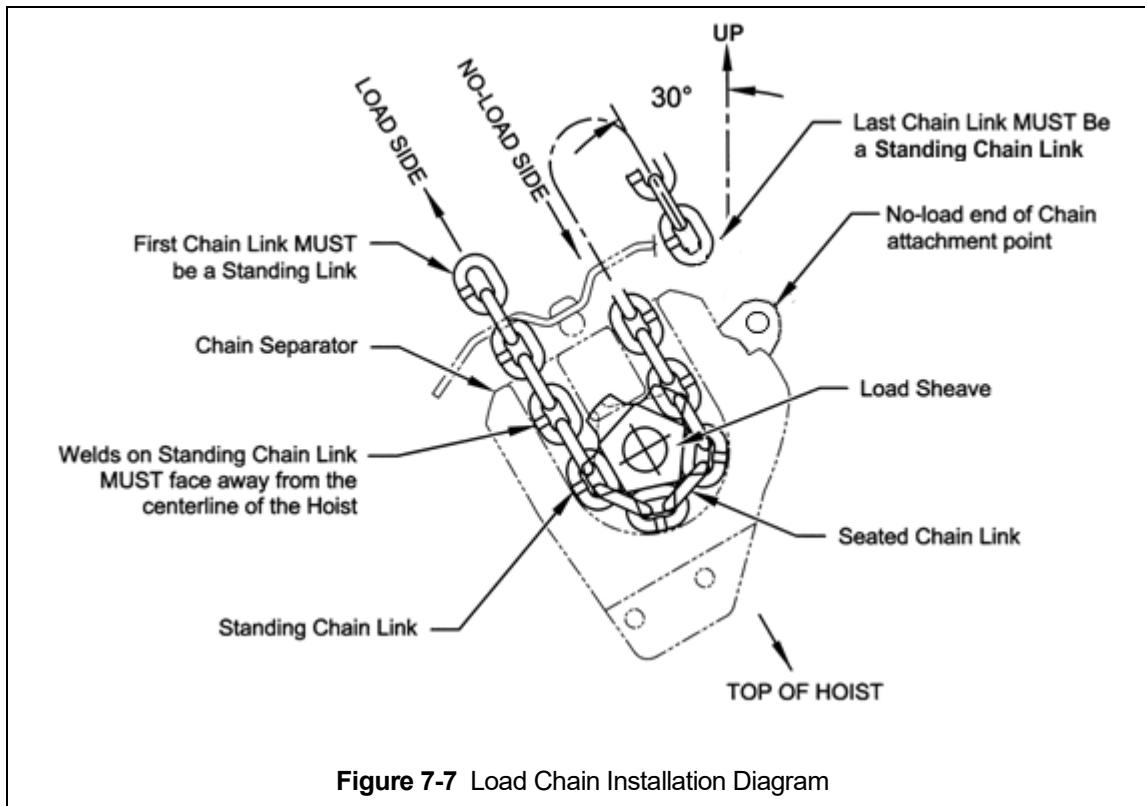
7.3.1 Lubrication and Cleaning – Refer to Section 6.2.

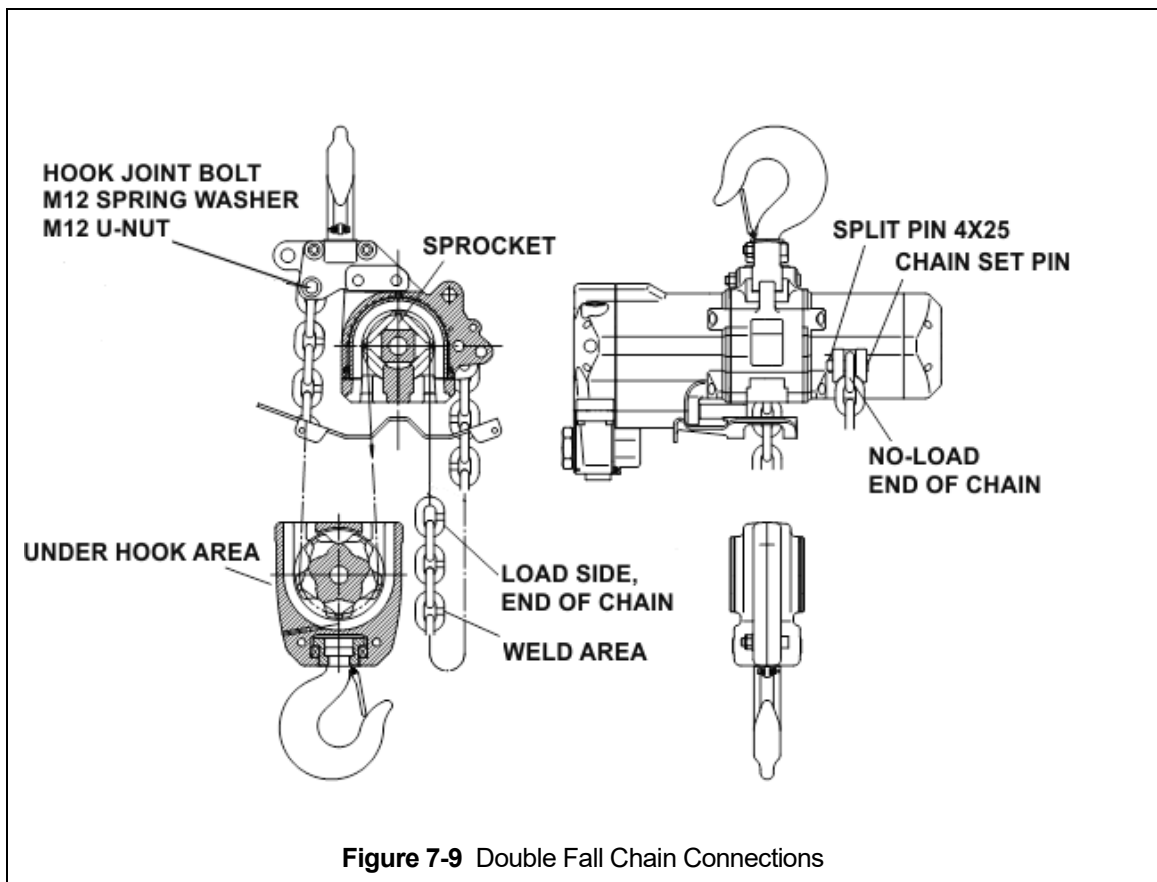
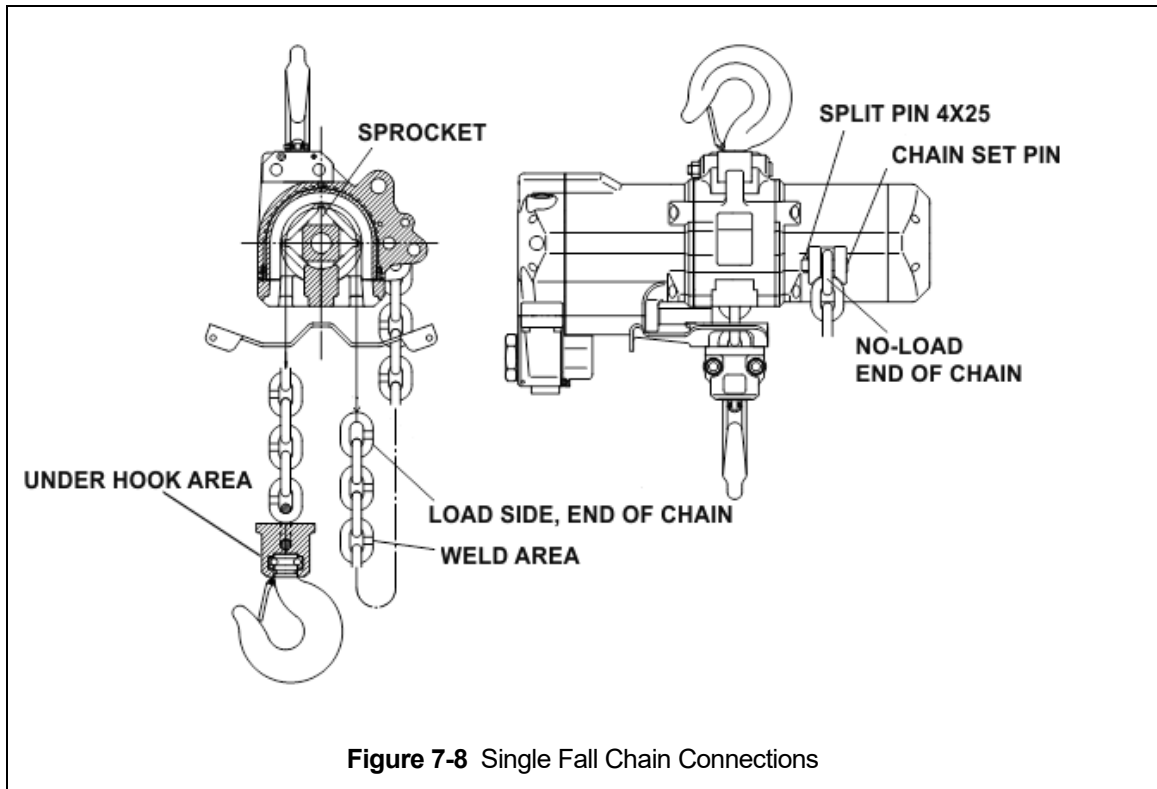
7.3.2 Replacement

- 1) **⚠ CAUTION** An air supply line must be connected to the hoist in order to perform the following procedures.
- 2) **⚠ WARNING** Be certain that the replacement chain is obtained from Harrington and is the exact size, grade and construction as the original chain. The new load chain must have an even number of links so that the end links are oriented 90° from each other.
- 3) Remove the Bottom Hook Complete Set, as well as the Chain Set Pin and Split Pin connecting the no-load end of the chain to the hoist body. Keep the Bottom Hook Complete Set, Chain Set Pin, and Split Pin for reuse on new chain. Carefully operate the hoist in the down direction to remove old chain.
- 4) **⚠ CAUTION** When replacing load chain, check for wear on mating parts, i.e. Load Sheave, Chain Guides, Bottom Hook Complete Set and replace parts if necessary. If the load chain is being replaced due to damage or wear out, destroy the old chain to prevent its reuse.
- 5) **⚠ CAUTION** Invert the hoist such that the chain separator openings are facing up and tilt the hoist approximately 30° as shown in Figure 7-7. Insert the chain into the chain separator on the no-load side opening making certain that the first link is a standing link and that its weld is facing away from the centerline of the hoist.
- 6) **⚠ CAUTION** Operate the hoist as slowly as possible in the down direction to catch the Load Chain and pull it through the hoist. Make sure the chain feeds smoothly while operating the hoist. If binding occurs, stop and reverse the hoist direction to the back the chain out. Reinsert the

chain again while gradually operating hoist controls. Continue until a sufficient quantity of Chain is fed through the hoist to attach the Bottom Hook Complete Set.

- 7) Ensure that of the Chain remains free of twists and attach the no-load end of the chain to the hoist body with the Flat Washer and Button Head Screw. Reinstall the Bottom Hook Complete Set. Torque the Button Head Screw to 78 lbf-in. Refer to Figure 7-8 and Figure 7-9.
- 8) After installation has been completed, perform steps outlined in Section 3.13 "Pre-operational Checks and Trial Operation".

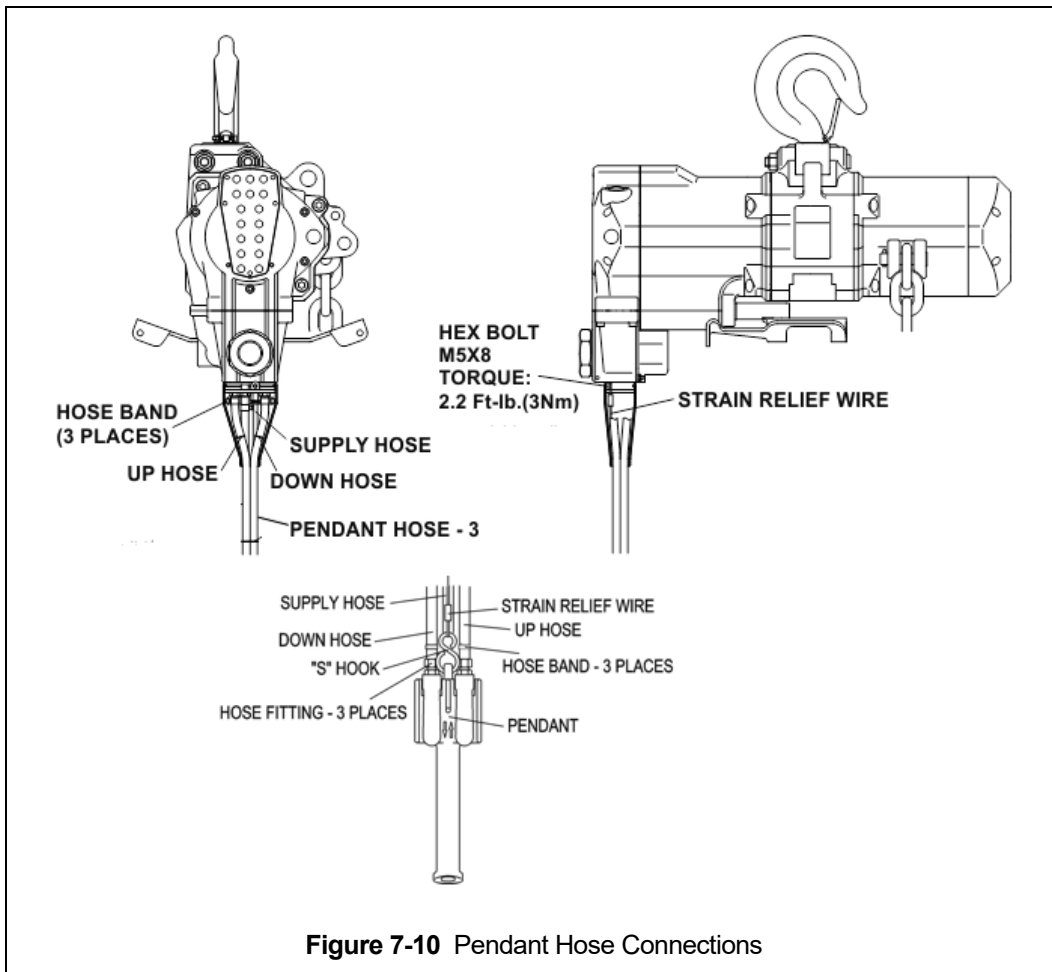




7.4 Pendant

7.3.1 The following procedure covers the installation of the Pendant Hose (Parts List Figure Number 360) and the Pendant Valve. Refer to Figure 7-10.

- 1) Place boot on the ends of the Pendant Hoses to be attached to the Manifold Block on the hoist.
- 2) Attach pendant hose to hoist body using the one-piece fittings and screw type clamps (hose bands).
- 3) Attach pendant hoses to the pendant valve using the 2 piece fittings and crimp type hose clamps (hose bands). Refer to Figure 7-10 for the correct placement of the Hoses.
- 4) Attach the Strain Relief wire S-Hook on the Pendant Valve and Manifold Block using the S-Hook.
- 5) Slide the Boot in to place over the Hose Fittings at the Manifold Block on the hoist.
- 6) **⚠ CAUTION** Operate hoist and make sure the direction of hook travel agrees with the control levers on the Pendant Valve.



7.5 Load Sheave Inspection

7.4.1 Perform this inspection by removing the chain separator and viewing the load sheave while operating the hoist slowly, with no load, and in accordance with Section 4 "Operation". Refer to Figure 7-11 and remove the chain separator as follows:

- 1) **⚠ CAUTION** An air supply line must be connected to the hoist in order to perform the following procedures.
- 2) Remove 4 Socket Bolts attaching the Chain Separator to the Wheel Housing and drop the Chain Separator down.
- 3) Inspect the Load Sheave. Refer to "Load Sheave" in Table 5-3, "Hoist Inspection Methods and Criteria".
- 4) Reverse the procedure to reassemble the hoist.

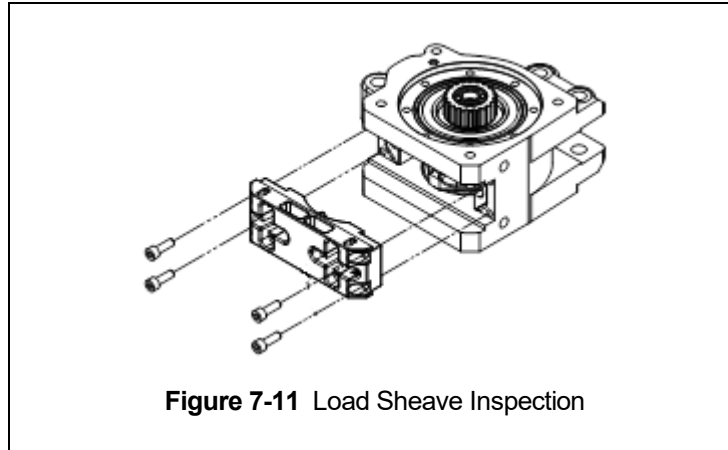


Figure 7-11 Load Sheave Inspection

7.6 Storage

- 7.6.1 Whenever the hoist is to be placed into storage, place extra lubricating oil (minimum 3cc) into the air inlet opening and circulate the air motor before plugging the inlet. Make certain that no debris, dirt or moisture is allowed to enter the air hoist through air inlet opening during preparations for storage.
- 7.6.2 The storage location should be clean and dry.
- 7.6.3 Care should be take to not damage any of the air hoses, fittings and cords.

7.7 Outdoor Installation

- 7.7.1 For hoist installations that are outdoors, the hoist **MUST BE** covered and protected from the weather at all times.
- 7.7.2 Avoid hoist oxidation by using suitable treatment and lubricating all mechanisms.
- 7.7.3 Possibility of corrosion on components of the hoist increases for installations where salt air and high humidity are present. The hoist may require more frequent lubrication.
- 7.7.4 In order to prevent internal corrosion from occurring, the hoist must be operated using proper quality air at least once per week by raising and lowering the hoist one full cycle. Make frequent and regular inspections of the unit's condition and operation.
- 7.7.5 Note: the possibility of corrosion in the valve section of the hoist increases for areas where salt air and high humidity are present. For such situations you may need to operate your hoist more often than once per week.
- 7.7.6 For hoist installations where temperature variations introduce condensation into the hoist additional inspection and more frequent lubrication may be required.

7.8 Operational Environment

7.8.1 Non-conforming environment

A non-conforming environment is defined as one with any or all of the following.

- Explosive gases or vapor.
- Organic solvents or volatile powder
- Excessive amounts of powder and dust of general substances
- Excessive amount of acids or salts.
- Refer to Section 2.1.2 for allowable environmental conditions.

8.0 Troubleshooting

WARNING

HAZARDOUS AIR PRESSURE IS PRESENT IN THE HOIST, IN THE SUPPLY OF COMPRESSED AIR TO THE HOIST, AND IN CONNECTIONS BETWEEN COMPONENTS.

Before performing ANY maintenance on the equipment, de-energize the supply of compressed air to the equipment, and lock and tag the supply device in the de-energized position. Refer to ANSI Z244.1, "Personnel Protection - Lockout/Tagout of Energy Sources."

Only Trained and competent personnel should inspect and repair this equipment.

Table 8-1 Troubleshooting Guide

Symptom	Cause	Remedy
Does not operate	Lack of air pressure or loss of air supply.	Repair or adjust air supply or filters.
	Seizure of Main Spool, Brake Spool, or Air Motor.	Repair at service facility.
	Seizure of brake or brake mechanism fails to release.	Repair at service facility.
	Bending or crimping of pendant hose or control tubes	Correct or repair bend or crimp in hose and/or tubes
	Hoist is overloaded.	Reduce the load to the rated capacity of hoist.
Lifting speed is slow	Low air pressure at hoist inlet port.	Repair or adjust air supply or filters. Check for air line obstruction.
	Air supply hose or piping is too small.	Replace hose or piping sizes with recommended sizes in Section 3.0.
	Malfunction of brake.	Repair at service facility.
	Bending or crimping of pendant control hoses(s).	Correct or repair the bend or crimp in control hose(s).
	Lack of sufficient oil in air supply to hoist	Increase oil in air supply to hoist in accordance with requirements in Section 3.0.
	Exhaust Silencer clogged	Clean or replace.
	Air flow capacity of compressed air system insufficient	Increase air flow capacity of compressed air system to requirements in Section 2.0.
	Air motor vanes or bearings worn	Repair at service facility.
	Air supply to hoist contains dirt or debris	Filter the air supply to the hoist in accordance with the requirements in Section 3.0.
Unable to lift rated load	Lack of air pressure or loss of air supply.	Repair or adjust air supply or filters.
	Improper adjustment of load limiter.	Adjust Load Limiter. See Section 7.1.
	Air leak between the two chambers in the Top Cover	Correct or repair to eliminate air leak.

Table 8-1 Troubleshooting Guide

Symptom	Cause	Remedy
Hoist moving in wrong direction (pendant control)	Pendant control hoses are terminated to incorrect ports on hoist body.	Connect the control hose(s) in accordance with Section 7.4.
Hoist lowers but will not lift	Hoist is overloaded.	Reduce load to hoist rated capacity.
	Faulty pendant control or control tube(s)	Repair or replace pendant control or control hose(s).
	Lack of air pressure or partial loss of or leakage in air supply.	Repair or adjust air supply or filters.
Hoist continues running after pendant or cord is released	Control Valves	Inject approx. 20 drops of oil into inlet port to lubricate the main spool. If spool still sticks, repair at service facility.
	Valve in Pendant Handle stuck	Repair at service facility
Hoist drifts excessively when hoist is stopped	Brake is not holding.	Repair brake at service facility.
	Motor vanes leaking.	Replace motor vanes and springs at service facility.

9.0 Warranty

Buyer must notify HHI in writing within sixty (60) days of discovery of any alleged defect, if within the applicable warranty period.

All products sold by HHI are warranted to be free from defects in material and workmanship from date of shipment by HHI for the following periods:

- 1 year – Electric and Air Powered Hoists (excluding (N)ER2 Hoists and EQ/SEQ Hoists), 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 Hoists, EQ/SEQ Hoists, (T)EM/(T)SEM hoists, and RY Hoists**
- 5 years – Manual Tiger Track Jibs and Gantries, Hoist Motor Brakes for EQ/SEQ, (T)EM/(T)SEM, and RY**
- 10 years – (N)ER2 Brake, TNER Hoist Motor Brake, Tiger Track Workstation Cranes and Monorails**

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 HHI's inspection of the product, HHI agrees, at its discretion, either to replace (not including installation) or repair the part or product free of charge. For customers in the U.S., delivery shall be made F.O.B. HHI's place of business. For international customers, delivery shall be made FCA HHI place of business, United States of America (Incoterms 2010).

No warranty claim will be honored without a valid proof of purchase. Customer must obtain a Return Goods Authorization as directed by HHI or its 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 HHI's warranty, the customer will be responsible for the costs of returning the product.

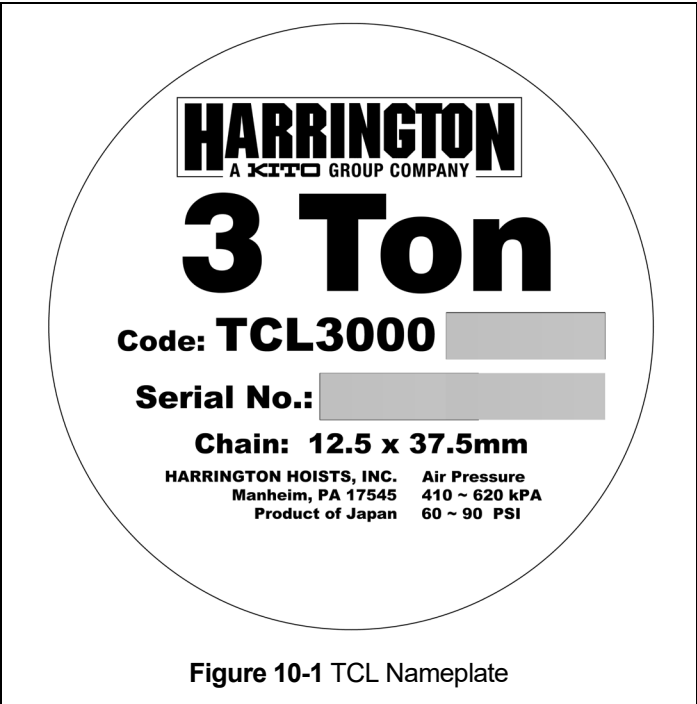
HHI DISCLAIMS ANY AND ALL OTHER WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, AS TO THE PRODUCT'S MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HHI WILL NOT BE LIABLE FOR DEATH, INJURIES TO PERSONS OR PROPERTY OR FOR INCIDENTAL, CONTINGENT, SPECIAL OR CONSEQUENTIAL DAMAGES, LOSS OR EXPENSE ARISING IN CONNECTION WITH THE USE OR MISUSE OF THE PRODUCTS, REGARDLESS OF WHETHER THE DAMAGE, LOSS OR EXPENSE RESULTS FROM ANY ACT OR FAILURE TO ACT BY HHI, WHETHER NEGLIGENT OR WILLFUL, OR FROM ANY OTHER CAUSE.

10.0 Parts List

A complete parts list is available from Harrington Hoists and is supplied separately with your hoist. The parts list is also available from Harrington's web site (www.harringtonhoists.com) or from any Harrington facility (see back cover of this manual).

When ordering Parts, please provide the Hoist code number located on the Hoist nameplate (see Figure 10-1 below).

Reminder: Per Sections 3.12.6 and 1.1 to aid in ordering Parts and Product Support, record the Hoist code number and serial number in the space provided on the cover of this manual.



The parts list is arranged into the following sections:

Section	Page
10.1 Motor, Valve Body and Controls.....	51
10.2 Brake, Gears and Load Suspension Components.....	54
10.3 Chain Container Assembly.....	57
10.4 Hoist Maintenance Kits.....	58

The letters C and P designate "Cord" and "Pendant" controlled hoists. Hoists with 2 parts or falls of load chain have a "-2" designator following the model number.

10.1 Motor, Valve Body and Controls

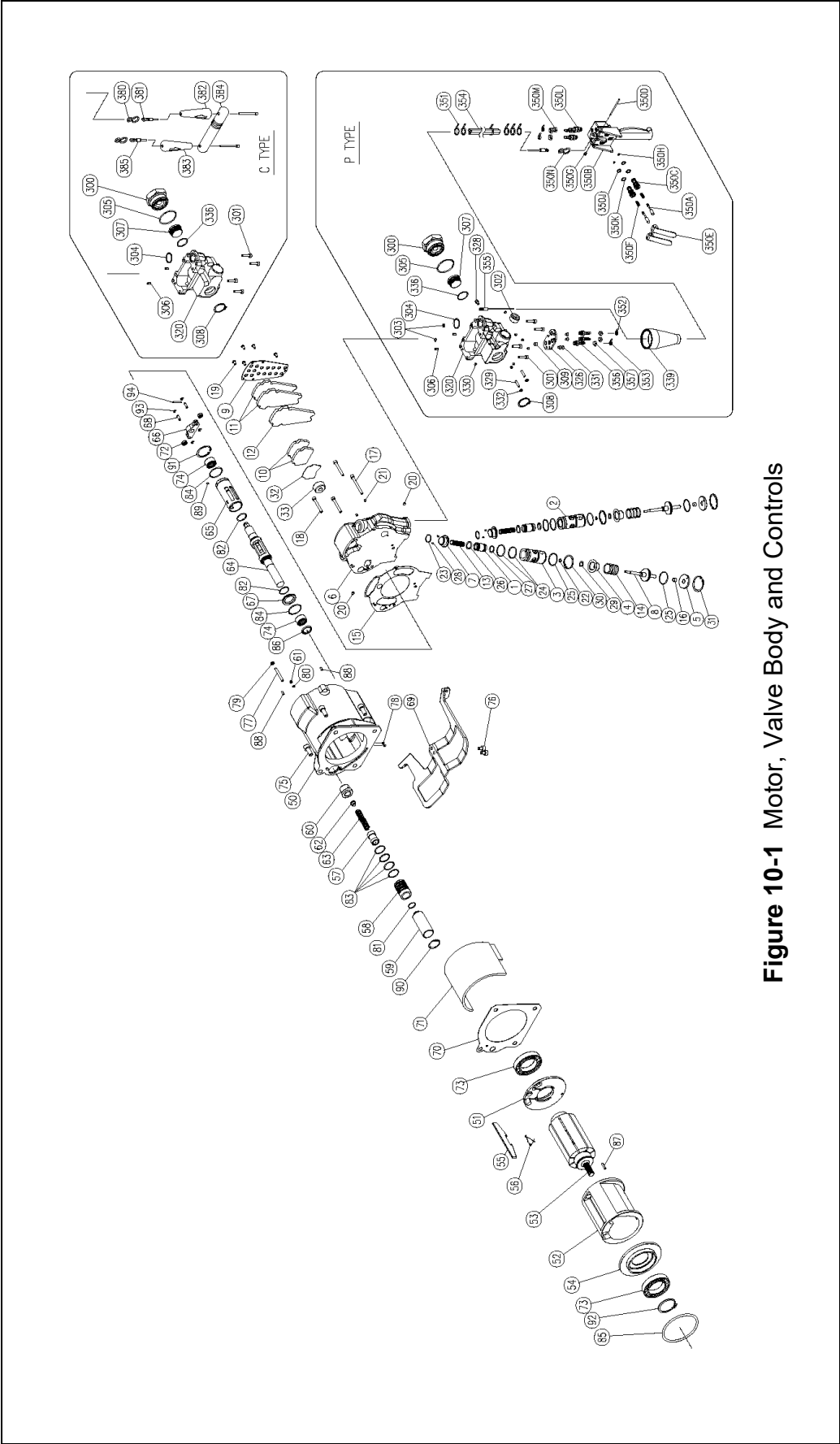


Figure 10-1 Motor, Valve Body and Controls

10.1 Motor, Valve Body and Controls

Figure Number	Name	Parts per hoist	Part Number
1	Throttle Valve	2	TCK425806J80
2	Valve Bushing (Up)	1	TCK425806E90
3	Valve Bushing (Down)	1	TCK425806F00
4	Spring Seat	2	TCK425806C70
5	Valve Cap	2	TCK425806A20
6	Valve Body	1	TCK425806060
7	Bushing Cap	2	TCK425806A30
8	Piston	2	TCK425806C60
9	Exhaust Plate	1	TCK425806810
10	Silencer (SS)	2	TCK137402055
11	Silencer (SL)	2	TCK137402056
12	Silencer (F)	1	TCK137402057
13	Spring (11.4X46X1.4)	2	TCK130802227
14	Spring (26X32.3X2.6)	2	TCK130802228
15	Valve Gasket	1	TCK136102171
16	Bearing (K5B0807)	2	TCK130216001
17	Hex Socket Head Cap Screw (M6X65)	1	9091259
18	Hex Socket Head Cap Screw (M6X50)	3	9091256
19	Hex Socket Head Button Screw (M5X10)	5	TCK131905010
20	Set Screw (6X6)	2	TCS132106006
21	Hex Set Screw (M5X5)	2	90005843
22	O-Ring (S-7)	2	TCR131103005
23	O- Ring (S-20)	2	AH131103016
24	O- Ring (S-30)	4	TCR131103024
25	O- Ring (S-32)	4	TCR131103026
26	O- Ring (AS568-115)	2	TCK131117115
27	O- Ring (AS568113(HS90))	2	TCK131118113
28	Spring Pin (3X5)	4	TCK130603005
29	Snap Ring (Ext. S-12)	2	TCK130302012
30	Snap Ring (Int. H-36)	2	TCK130301036
31	Retaining Ring (H-40)	2	TCK130301040
32	Silencer (ST)	1	TCL137402068
33	Choke Plug	1	TCL425842P70
50	Motor Case	1	TCK425806790
51	Rear Plate	1	TCK425806180
52	Cylinder	1	TCK425806160
53	Rotor	1	TCK425806150
54	Front Plate	1	TCK425806170
55	Vane	8	TCK137102036
56	Vane Spring	8	TCR130802235
57	Limit Spool	1	TCK425806J40
58	Limit Spool Bushing	1	TCK425806J30
59	Limit Retainer (F)	1	TCK425806J50
60	Limit Retainer (B)	1	TCK425806J60
61	Limit Plug	1	TCK425806J70
62	Spring Seat	1	TCR426307Z50
63	Spring (13X67X2)	1	TCK130802226
64	Limit Shaft	1	TCK425806460
65	Limit Shaft Bushing	1	TCK425806A40
66	Limit Lever	1	TCK425806140
67	Limit Washer	1	TCK425806J90
68	Roller Shaft	2	TCK425806120
69	Chain Lever	TCL3000	TCK425806110
		TCL6000	TCK425810110
70	Motor Gasket	1	TCK136102172
71	Silencer M CP	1	TCK425806K0B
72	Bearing (605ZZ)	2	9000505

Figure Number	Name	Parts per hoist	Part Number
73	Bearing (6010)	2	9000510
74	Needle Bearing (TA2215Z)	2	TCK130132116
75	Hex Socket Head Cap Bolt (M10X 25)	4	9091294
76	Set Screw Hex (M8X12)	2	TCK131708012
77	Hex Socket Cap Screw (M6X50)	1	9091657
78	Hex Set Screw (M5X5)	2	90005843
79	Hex Nut (M6)	1	TCK134403106
80	O-Ring (S-5)	1	AH131103003
81	O-Ring (S-20)	1	AH131103016
82	O-Ring (S-26)	2	TCR131103021
83	O-Ring (S-28)	4	TCR131103022
84	Front Cap O-Ring (S-36)	2	TCK131103029
85	O-Ring (P-100)	1	TCK131101068
86	Dust Seal (OS22294)	1	TCK131246003
87	Spring Pin (5X20)	1	TCK130605020
88	Spring Pin (5X10)	2	TCK130605010
89	Spring Pin (3X5)	1	TCK130603005
90	Retaining Ring (Int. H-32)	1	TCK130301032
91	Retaining Ring (Int. H-40)	1	TCK130301040
92	Retaining Ring (Ext. S-50)	1	TCK130302050
93	Retaining Ring (E-4)	4	TCK130303004
94	Split Pin (2.5X25)	1	TCK130702125
400	Brand Nameplate (HHI)	1	AH137309264

Cord Model Only:

Figure Number	Name	Parts per hoist	Part Number
300	Inlet Bushing (NPT) CP	1	TCL425842P70
301	Hex Socket Head Cap Bolt (M6X25)	4	9091251
304	O-Ring (S-25)	1	TCK131103020
305	O-Ring (AS568-134)	1	TCK131117134
306	Spring Pin (5X10)	2	TCK130605010
307	Plug	1	TCK425807K90
308	Snap Ring (Ext. S-32)	1	TCK130302032
320	Under Cover	1	TCK425806470
336	O-Ring (S-29)	1	TCR131103023
380	S-Type Wire	2	TCR130802081
381W	White Cord (Up)	2	9013101
381R	Red Cord (Down)	2	9013102
382	Grip (White, Up)	1	AH136602625
383	Grip (Red, Down)	1	AH136602626
384	Handle	1	AH136602627

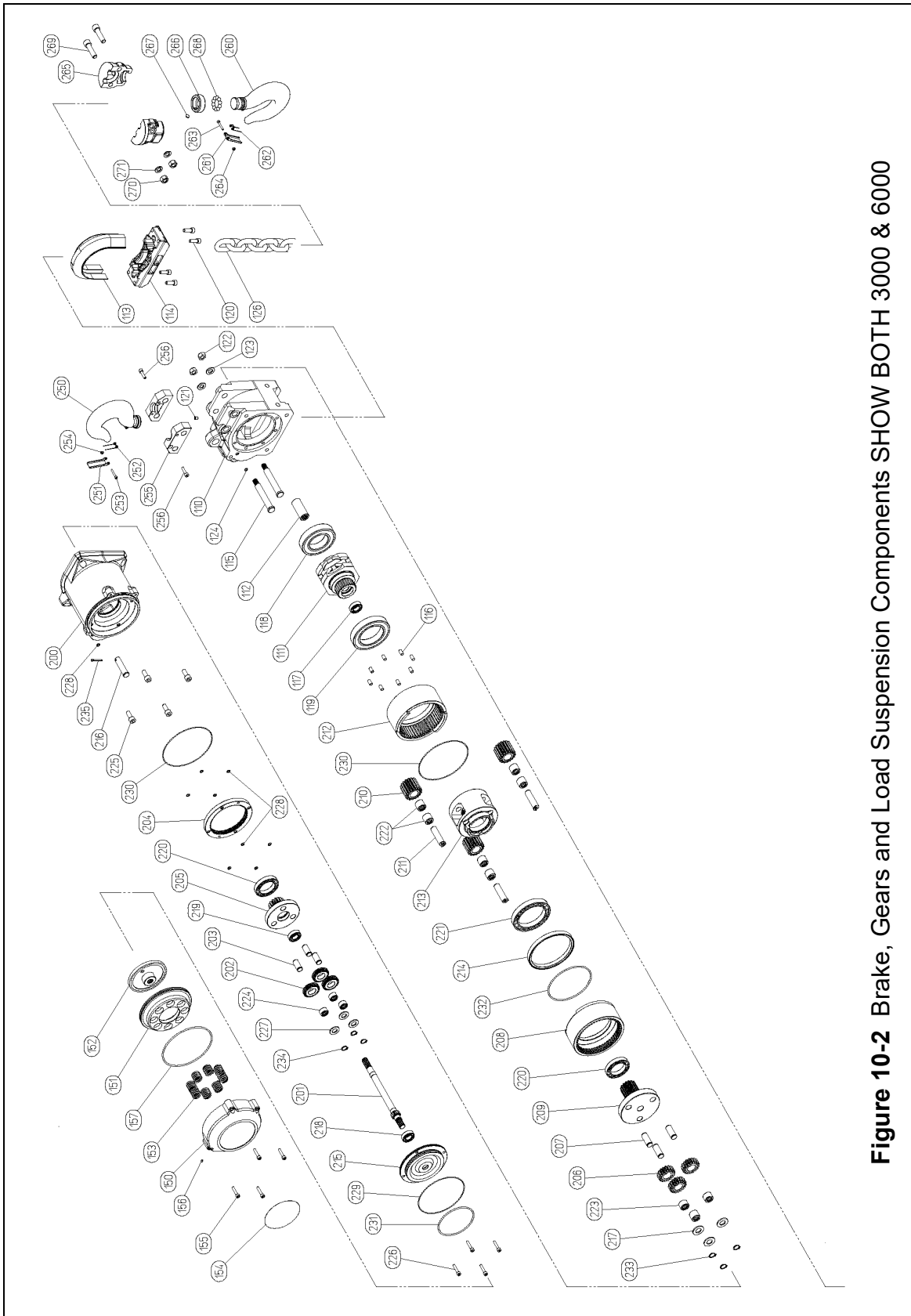
Pendant Model Only:

Figure Number	Name	Parts per hoist	Part Number
300	Inlet Bushing (NPT) CP	1	TCL425842P70
301	Hex Socket Head Cap Bolt (M6X25)	4	9091251
302	Hex Plug (PT ¾ in.)	1	TCK134902011
303	O-Ring (S-7)	2	TCR131103005
304	O-Ring (S-25)	1	TCK131103020
305	O-Ring (AS568-134)	1	TCK131117134
306	Spring Pin (5X10)	2	TCK130605010

307	Plug	1	TCK425807K90
308	Snap Ring (Ext. S-32)	1	TCK130302032
309	Hex Plug (PT1/8 IN.)	1	TCR134902003
320	Under Cover	1	TCK425806470
326	Pilot Silencer	1	TCK137402060
328	Hex Socket Head Cap Bolt (M5X8)	1	9091224
329	Hex Screw (M5X22)	2	TCK132105022
330	Hex Set Screw (M5X5)	7	90005843
331	Cross Head Flat Machine Screw (M5X6)	4	TCK132905206
332	Hex Nut (M5)	2	TCK134403205
336	O-Ring (S-29)	1	TCR131103023
339	Boot	1	AH136608250
350	Pendant Valve Assembly	1	TCS420226VRD
A	Throttle Valve	2	TCR420218VB0
B	Valve Body	1	TCS420226VR0
C	Bushing	2	TCS420218VF0
D	Lever Pin	1	TCS130402071
E	Lever	2	TCS420218VH0
F	Spring	2	TCS130802220
G	Set Screw (Hex Skt, M6X6)	1	TCS132106006
H	O-Ring, S-3 (HS90)	2	TCS131109001
J	O-Ring, S-10	2	TCR131103008
K	O-Ring, S-11.2	2	TCS131103009
L	Hose Fitting	3	TCS135106302
M	Hose Clamp	3	9013155
N	S-Type Wire	1	TCR130802081
351	Cable Tie – Red	4*	TCS137502034
352	Cable Tie – White	2	TCS137502036
353	Cable Tie – Black	2	TCS137502037
354	Pendant Hose	3 @ FT	TCS137240925
355	Strain Relief Wire	1	9013120
356	Hose Fitting	3	TCS135106301
357	Hose Clamp	3	9013155
401	Warning Tag	1	WTAG7

*Qty: 4 or 6 depending upon hoist type.

10.2 Brake, Gears and Load Suspension Components



10.2 Brake, Gears and Load Suspension Components

Figure Number	Name		Parts per hoist	Part Number
110	Center Housing		1	TCK425807A00
111	Load Sheave		1	TCK425807A50
112	Coupling		1	TCK425806200
113	Chain Guide		1	TCK425807350
114	Chain Separator		1	TCK425807360
115	Hanger Pin		2	TCK425806220
116	Dowel Pin		8	TCK426325340
117	Bearing (6003)		1	9000103
118	Bearing (6211ZZ)		1	9000611
119	Bearing (6014ZZ)		1	9000514
120	Hex Socket Head Cap Screw (M8X25)		4	9091273
121	Hex Socket Set Screw (M8X6)		1	TCK132108006
122	U-Nut M12		2	E2D853125
123	Washer M12		2	TCK131307012
124	O-Ring S-7		1	TCK131103005
126	Load Chain		0	LCER0030NP
150	Brake Cover		1	TCK425806410
151	Brake Piston		1	TCK425806400
152	Brake Disk		1	TCK425806430
153	Spring (20.5X21.9X2.9)		8	TCK130802229
154	Name Plate	TCL3000	1	80650
		TCL6000	1	80653
155	Socket Bolt (M6X40)		4	9091254
156	Set Screw		1	TCR132105005
157	O-Ring (AS568-255)		1	TCK131117255
200	Gear Case		1	TCK425806310
201	First Pinion		1	TCK425806A60
202	First Star Gear		3	TCK425806A70
203	First Pin		3	TCK425806A80
204	First Ring Gear		1	TCK425806E10
205	Second Pinion		1	TCK425806E20
206	Second Star Gear		3	TCK425806E30
207	Second Pin		3	TCK425806E40
208	Second Ring Gear		1	TCK425806E50
209	Third Pinion		1	TCK425806K20
210	Third Star Gear		3	TCK425806K30
211	Third Pin		3	TCK425806K40
212	Third Ring Gear		1	TCK425806K50
213	Cage		1	TCK425806240
214	Spacer		1	TCK425806230
215	Brake Plate		1	TCK425806900
216	Chain Set Pin		1	TCK425806K60
217	Second Thrust Washer		3	TCK425806K70
218	Bearing (6003ZZ)		1	9000503
219	Bearing (6003)		1	9000103
220	Bearing (6909)		2	TCK130113009
221	Bearing (6916)		1	TCK130113016
222	Needle Bearing (TA1620Z)		6	TCK130131621

Figure Number	Name		Parts per hoist	Part Number
223	Needle Bearing (TA1616Z)		3	TCK130131617
224	Needle Bearing (TA1512Z)		3	TCK130131513
225	HSHCS (M10X25)		4	9091294
226	HSHCS (M6X30)		4	9091252
227	Washer (M14)		3	TCK131307014
228	O-Ring (S-7)		9	TCR131103005
229	O-Ring (S-135)		1	TCR131103063
230	O-Ring (S-145)		2	TCK131103065
231	O-Ring (AS568-242)		1	TCK131117242
232	O-Ring (AS568-249)		1	TCK131117249
233	Retaining Ring (S-16)		3	TCK130302016
234	Retaining Ring (S-15)		3	TCK130302015
235	Split Pin (4X25)		1	130704025
250	Top Hook	TCL3000	1	TCK425806E60
	Top & Bottom Hook	TCL6000	2	TCK425810E60
251	Hook Latch	TCL3000	1	TCK420655L30
		TCL6000	2	TCK420890L30
252	Hook Latch Spring	TCL3000	1	TCR130802046
		TCL6000	2	
253	HSHCS M4X28	TCL3000	1	9091232
		TCL6000	2	
254	U-Nut M4	TCL3000	1	E2D853125
		TCL6000	2	
255	Hook End Piece	TCL3000	1	TCK425806570
		TCL6000	1	TCK425810570
256	Hex Flat Head Mach. Screw (M6X25)	TCL3000	2	9091251
	Hook Joint Bolt	TCL6000	1	TCK425810580
257	HSHCS (M12X55)	TCL6000	2	90912119
258	Spring Washer (M12)	TCL6000	3	TCK131301012
259	U-Nut M12	TCL6000	3	E2D853125
260	Bottom Hook	TCL3000	1	TCK420875PC1
261	Hook Latch	TCL3000	1	TCK420655L30
262	Hook Spring	TCL3000	1	TCR130802046
263	HSHCS (M4X28)	TCL3000	1	9091232
264	U-Nut M4	TCL3000	1	E2D853125
265	Under Hook Holder	TCL3000	1	TCK425806800
		TCL6000	1	TCK425811801
266	Swivel Hook Outer Bearing Race	TCL3000	1	TCR420875PW0
	Thrust Ring	TCL6000	1 Set	TCK425810710
267	Swivel Hook Plug	TCL3000	1	TCR420875PY0
268	Steel Ball (3/8)	TCL3000	10	TCR130502024
	Free Chain Wheel	TCL6000	1	TCK425811F71

10.2 Brake, Gears and Load Suspension Components

Figure Number	Name		Parts per hoist	Part Number
269	HSHCS (M12X45)	TCL3000	2	90912117
	Under Hook Metal Cover	TCL6000	2	TCK420890QH0
270	Hex Nut (M12)	TCL3000	2	9093433
	Thrust Bearing (6211ZZ)	TCL6000	2	9000611
271	Spring Washer (M12)	TCL3000	2	9012713
	Thrust Bearing (51112)	TCL6000	1	TCK130121112
272	HSHCS (M12X60)	TCL6000	2	90912120
273	HSHCS (M12X100)	TCL6000	1	90912126
274	Spring Washer (M12)	TCL6000	3	9012713
275	U Nut (M12)	TCL6000	3	E2D853125
276	Holder Shaft	TCL6000	1	TCK425811P60

10.3 Chain Container Assembly

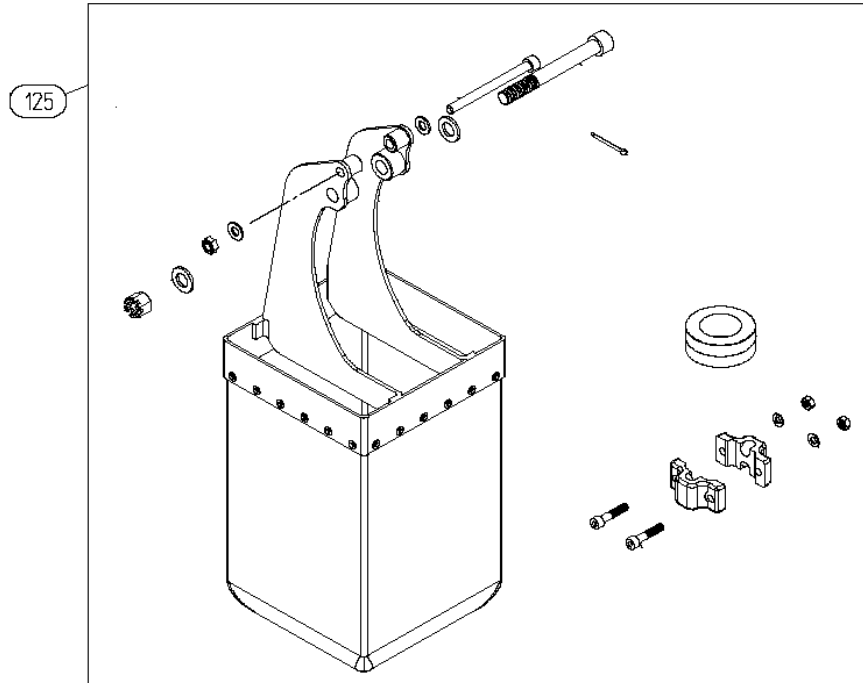


Figure 10-3 Chain Container Assembly (Optional)

Figure Number	Name	Parts per hoist	Part Number
125	Chain Container Assembly	1	TCK42580655C

10.4 Hoist Maintenance Kits

TCL3000/6000 Air Motor Maintenance Kit No. TCKAH0002010:

Figure Number	Name	Parts per hoist	Part Number
010	Pilot Silencer (SS)	2	TCL137402068
011	Silencer (SL)	2	TCK137402056
012	Silencer (F)	1	TCK137402057
015	Valve Gasket	1	TCK136102171
055	Vane	8	TCK137102036
056	Vane/Lift Spring	8	TCR130802235
070	Air Motor Gasket	1	TCK136102172
071	Silencer M CP	1	TCK425806K0B
073	Bearing (6010)	2	TCK130104011
085	O-Ring (P-100)	1	TCK131101068

TCL3000/6000 Valve Maintenance Kit No. TCKAH0002020:

Figure Number	Name	Parts per hoist	Part Number
022	O-Ring (S-7)	2	TCR131103005
023	O- Ring (S-20)	2	AH131103016
024	O- Ring (S-30)	4	TCR131103024
025	O- Ring (S-32)	4	TCR131103026
026	O- Ring (AS568-115)	2	TCK131117115
027	O- Ring (AS568-113(HS90))	2	TCK131118113
304	O- Ring (S-25)	1	TCK131103020
305	O- Ring (AS568-134)	1	TCK131117134
336	O- Ring (S-29)	1	TCR131103023

TCL3000/6000 Brake Maintenance Kit No. TCKAH0002040:

Figure Number	Name	Parts per hoist	Part Number
157	O-Ring (AS568-255)	1	TCK131117255
228	O-Ring (S-7)	9	TCR131103005
229	O-Ring (S-135)	1	TCR131103063
230	O-Ring (S-145)	2	TCK131103065
231	O-Ring (AS568-242)	1	TCK131117242

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