EFFECTIVE: January 19, 2026

OWNER'S MANUAL

SPARK RESISTANT AIR POWERED CHAIN HOIST TCE SERIES

¼ Ton through 6 Ton Capacity

Code, Lot and Serial Number

⚠ WARNING

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

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HOISTS AND CRANES

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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.

⚠ WARNING

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 3.13.8 and Figure 10-1) 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. The hoists in this manual have different spark resistant ratings. Be sure to check the Equipment Group and Expolsive Atmosphere designation of your hoist and only order replacement parts designed for that product.

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.

Equipment must remain as supplied/specified by manufacturer in order to maintain the hoist/trolley Equipment Group and Expolsive Atmosphere designation.

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 ASTM-E-2349, “Standard for Safety Requirements in Metal Casting: Sand Preparation, Molding, and Core Making; Melting and Pouring; and Cleaning and Finishing”.

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

Confirm the Equipment Group and Explosive Atmosphere designation required for your application. (See section 1.3 Explanation of ATEX) Consider consultation with an authorized ATEX compliance consultant if unsure of applications requirements.

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.

1.3 Explanation of ATEX Directive and Markings

Hoists intended for use in potentially explosive atmospheres require measures to reduce the risk of explosions. Requirements for such measures come from the European EC Machinery Directive 2006/42/EC and ATEX Directive 2014/34/EU, commonly referred to as the ATEX Directive (ATEX is from the French ATmospheres EXplosibles), and its supporting standards.

The explosion protection and prevention measures for non-electrical equipment such as air hoists differ from those applied to electrical equipment. Requirements for non-electrical equipment are provided in the ISO 80079 series of standards. Air hoists that meet the appropriate requirements of the ISO 80079 standards satisfy the ATEX Directive and can be used in potentially explosive atmospheres.

Harrington's TCE hoists use the "constructional safety" type of protection in accordance with ISO 80079 *Non-electrical equipment intended for use in potentially explosive atmospheres - Part 5: Protection by constructional safety 'c'*. This standard defines constructional safety as ignition protection in which constructional measures are applied so as to protect against the possibility of ignition from hot surfaces, sparks and adiabatic compression generated by moving parts. Constructional measures that satisfy ISO 80079 include use of materials that reduce or eliminate the risk of sparks produced by impact or friction. This can generally be considered equivalent to the term "spark-resistant features."

The ATEX Directive and the ISO 80079 standards require detailed markings to assure the hoists are used correctly. These markings define the applications, the type and duration of the potentially explosive atmospheres, the type of protection, and the maximum surface temperature.

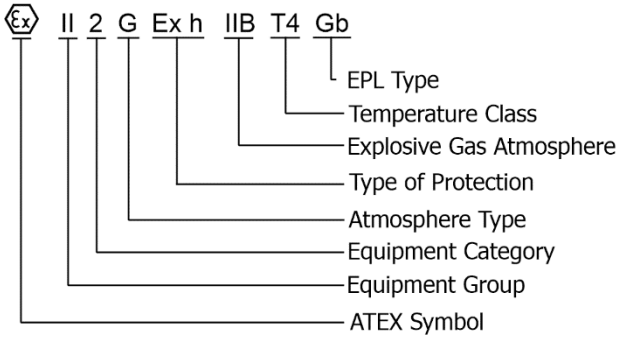
Reference **Table 1-1** for ATEX marking explanation.

⚠ WARNING Hoist/trolley shall NOT be modified to alter the original Equipment Group and Expolsive Atmosphere designation as supplied/specified by manufacturer. All replacement components must remain as supplied/specified by manufacturer in order to maintain the hoist/trolley Equipment Group and Expolsive Atmosphere designation as supplied/specified by the manufacturer.

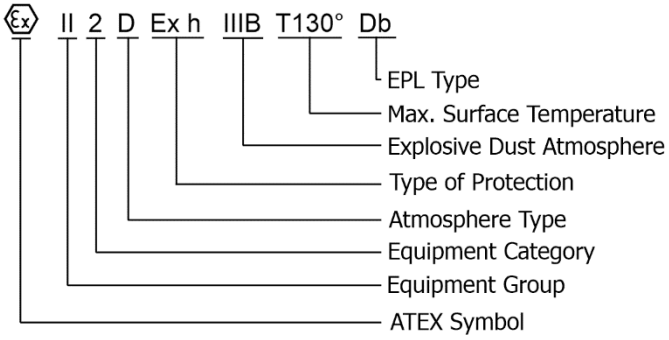
***Please see the internal "Declaration of Conformity" (end of manual) and EDOC1360 for additional ATEX information.**

Table 1-1 ATEX Rating Explanation

ATEX Gas Designation



ATEX Dust Designation



Marking	Definition	TCE "IIB"
ATEX Symbol	Equipment suitable for potentially explosive atmospheres in accordance with the ATEX Directive.	Ex
Equipment Group	'I' means suitable for use in mines susceptible to firedamp and/or coal dust. 'II' means suitable for non-mine locations that could be endangered by potentially explosive atmospheres.	II
Equipment Category	'1' means for use in areas where an explosive atmosphere is present continuously, for long periods, or frequently. **⚠ WARNING** Product not suitable for use in Equipment Category 1. '2' means for use in areas where an explosive atmosphere is likely to occur in normal operation. '3' means for use in areas where an explosive atmosphere is unlikely to occur in normal operation.	2
Atmosphere Type	'G' means suitable for Gas. 'D' means suitable for Dust.	GD
Type of Protection	This letter indicates the type of protection method used. There are several, "Ex h" represents ignition hazard caused by non-electric equipment in explosive atmospheres.	h
Temperature Class	Designation that indicates the maximum surface temperature the hoist will have during normal operation. There are several designations.	T4
Explosive Gas Atmosphere	Designation that indicates the type of gases, vapors and mists the hoist is suitable for. Designations applicable to Equipment Group II: 'IIA' means atmosphere containing methane, propane, or similar gases. 'IIB' means atmosphere containing ethylene or similar gases.	IIB

Table 1-1 ATEX Rating Explanation - Continued		
Explosive Dust Atmosphere	Designation that indicates the type of Combustible Flyings, Non-Conductive Dusts and Conductive Dusts the equipment is suitable for. Designations applicable to Equipment Group II: 'IIIA' means Combustible Flyings: Cotton, jute, hemp etc. 'IIIB' Non-Conductive Dust: Foodstuffs (e.g. sugar, flour, grain & additives), paper and wood.	IIIB
Maximum Surface Temperature	The maximum surface temperature the hoist will have during normal operation.	T130°C
Equipment Protection Level (EPL Type)	EPL Type of Gb: Equipment for explosive gas atmosphere. Equipment has a 'high' level of protection in normal operation or event of predictable malfunctions. EPL Type of Db: Equipment for combustible dust atmosphere. Equipment has a 'high' level of protection in normal operation or event of predictable malfunctions.	Gb/Db

Actual Nameplate Markings:

TCE-IIB Hoist and Hoist/Trolley Combinations:

⟨Ex⟩ II 2G Ex h IIB T4 Gb

⟨Ex⟩ II 2D Ex h IIIB T130°C Db

⚠ WARNING To maintain spark resistant rating for **ATEX IIB** class, hoist must be equipped with manufacturer's nickel-plated load chain and bronze hooks.

⚠ WARNING Hoist/trolley shall NOT be modified to alter the original Equipment Group and Expolsive Atmosphere designation as supplied/specified by manufacturer. All replacement components must remain as supplied/specified by manufacturer in order to maintain the hoist/trolley Equipment Group and Expolsive Atmosphere designation.

NOTICE The ATEX rating for a hoist and trolley "package" is limited by the component with the lowest spark resistance rating.



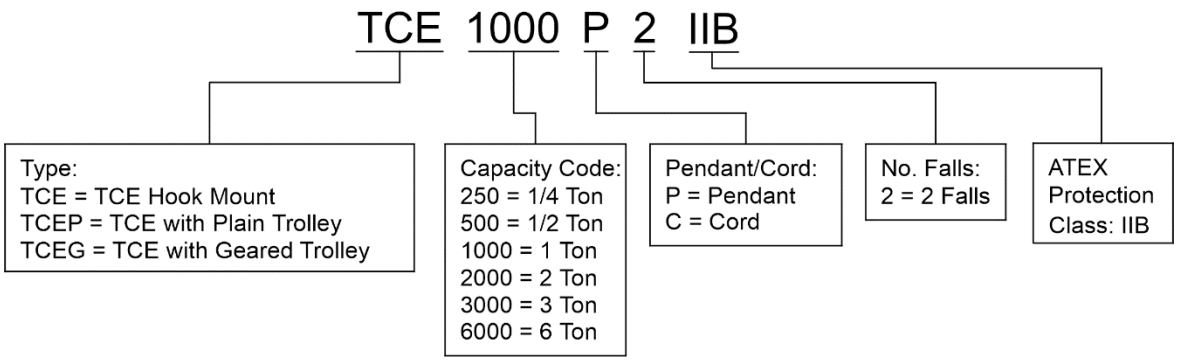
Bilingual Version

Figure 1-1 Warning Tag Attached to Hoist

2.0 Technical Information

2.1 Specifications

2.1.1 Product Code



2.1.2 Operating Conditions and Environment

Temperature range:	+14° to +140°F (-10° to +60°C)
Relative Humidity:	85% or less
Noise Level:	83 dba maximum @ 1 meter when lifting rated load 93 dba maximum @ 1 meter when lowering rated load – TCE250, TCE500, TCE1000
	84 dba maximum @ 1 meter when lifting/lowering rated load – TCE3000, TCE6000
Supply Air:	60 to 90 psi (0.4 to 0.6 MPa)
Air Consumption:	60 to 75 cfm (1.7 to 2.1 m^3/min)
Air Lubrication Requirements:	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 – TCE3000, TCE6000

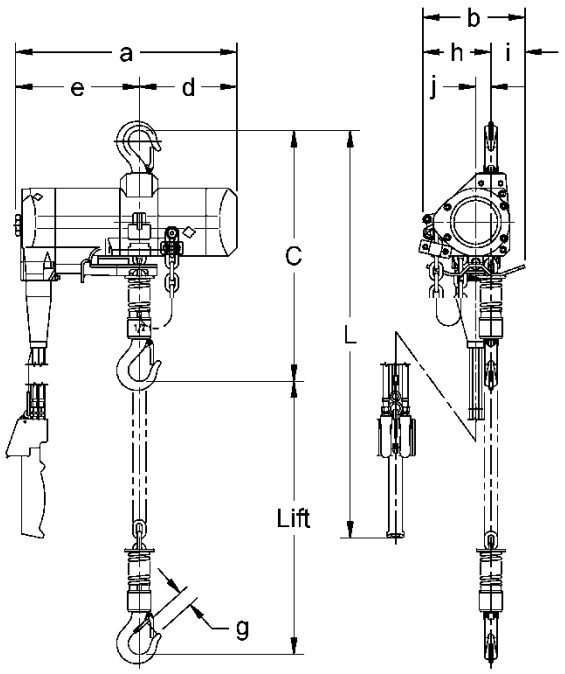
⚠ WARNING Extreme operating conditions and environment (sea water, extreme heat/cold, etc.) can result in increased component wear and decreased service life.

Table 2-1 Hoist Specifications

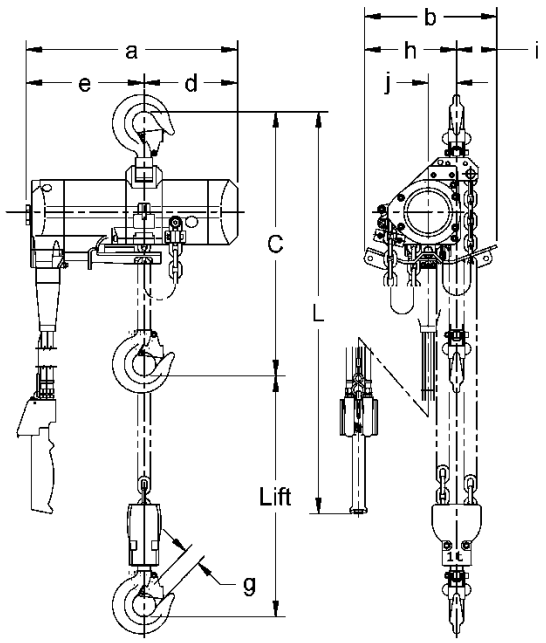
	Cap. (Tons)	Product Code	Standard Lift (ft)	Push Button Hose L (ft)	Up/Down Speeds (ft/min @ 90 psi)		Up/Down Air Consumption Rates (cubic ft/min @ 90 psi)		Load Chain Diameter (mm) x Chain Fall Lines	Net Weight (lbs)	Weight for Additional One foot of Lift (lbs)
					No Load	w/Full Load	No Load	w/Full Load			
Pendant Model	1/4	TCE250P-IIB	10	8.1	207/125	112/207	78/67	64/74	6.3 x 1	46	0.6
	1/2	TCE500P-IIB			108/62	56/112	74/64	60/71	6.3 x 1	46	0.6
	1	TCE1000P2-IIB			54/31	28/56	74/64	60/71	6.3 x 2	58	1.2
	3	TCE3000P-IIB		8.6	37/23	18/38	148/141	124/152	12.5 x 1	217	2.3
	6	TCE6000P2-IIB			18/12	9/19	148/141	124/152	12.5 x 2	284	4.6
Cord Model	1/4	TCE250C-IIB	10	7.3	207/125	112/207	78/67	64/74	6.3 x 1	44	0.6
	1/2	TCE500C-IIB			108/62	56/112	74/64	60/71	6.3 x 1	44	0.6
	1	TCE1000C2-IIB			54/31	28/56	74/64	60/71	6.3 x 2	56	1.2
	3	TCE3000C-IIB			37/23	18/38	148/141	124/152	12.5 x 1	215	2.3
	6	TCE6000C2-IIB			18/12	9/19	148/141	124/152	12.5 x 2	282	4.6

2.2 Dimensions

Table 2-2 TCE with Pendant Control Dimensions



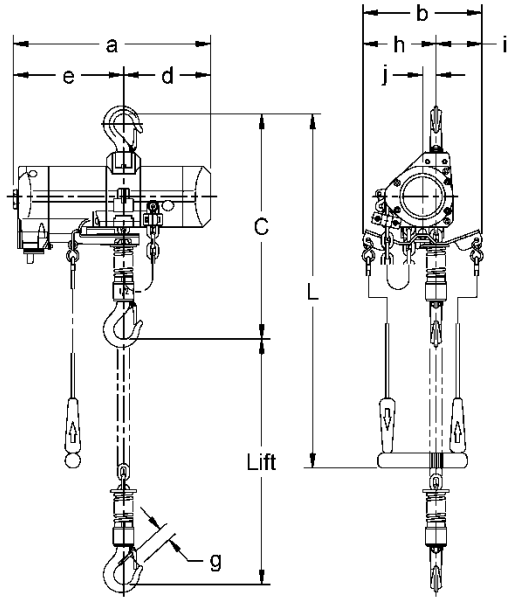
Single Fall Hoist



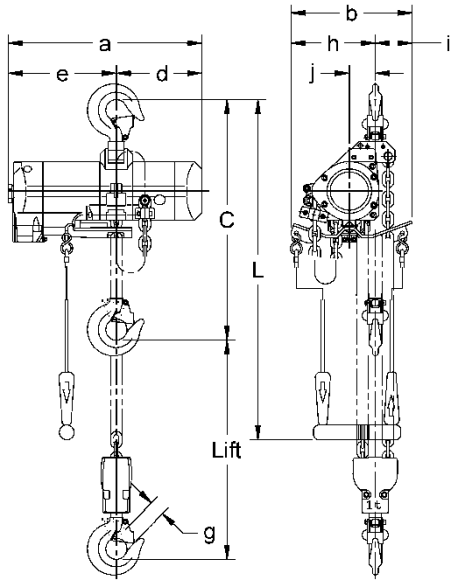
Double Fall Hoist

Cap. (Tons)	Product Code	Headroom C (in)	a (in)	b (in)	d (in)	e (in)	g (in)	h (in)	i (in)	j (in)
1/4	TCE250P-IIB	16.3	14.4	6.6	6.4	8.0	1.0	4.4	2.2	1.0
1/2	TCE500P-IIB	16.3	14.4	6.6	6.4	8.0	1.0	4.4	2.2	1.0
1	TCE1000P2-IIB	18.0	14.4	9.0	6.4	8.0	1.1	6.3	2.7	1.9
3	TCE3000P-IIB	21.1	22.7	12.4	10.4	12.2	1.3	7.4	4.9	1.3
6	TCE6000P2-IIB	30.3	22.7	14.6	10.4	12.2	1.7	9.6	5.0	3.5

Table 2-3 TCE with Cord Control Dimensions



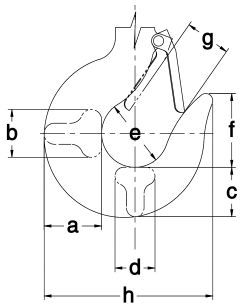
Single Fall Hoist



Double Fall Hoist

Cap. (Tons)	Product Code	Headroom C (in)	a (in)	b (in)	d (in)	e (in)	g (in)	h in)	i (in)	j (in)
1/4	TCE250C-IIB	16.3	14.4	8.7	6.4	8.0	1.0	5.3	3.3	1.0
1/2	TCE500C-IIB	16.3	14.4	8.7	6.4	8.0	1.0	5.3	3.3	1.0
1	TCE1000C2-IIB	18.0	14.4	9.0	6.4	8.0	1.1	6.3	2.7	1.9
3	TCE3000C-IIB	21.1	22.7	12.4	10.4	12.2	1.3	7.4	4.9	1.3
6	TCE6000C2-IIB	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
TCE250-IIB	0.6	0.8	0.6	0.8	1.4	1.3	1.0	2.9
TCE500-IIB	0.6	0.8	0.6	0.8	1.4	1.3	1.0	2.9
TCE1000-IIB	1.4	0.9	1.1	0.9	1.6	1.6	1.1	4.2
TCE3000-IIB	2.0	1.5	1.8	1.3	2.0	2.4	1.3	5.9
TCE6000-IIB	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

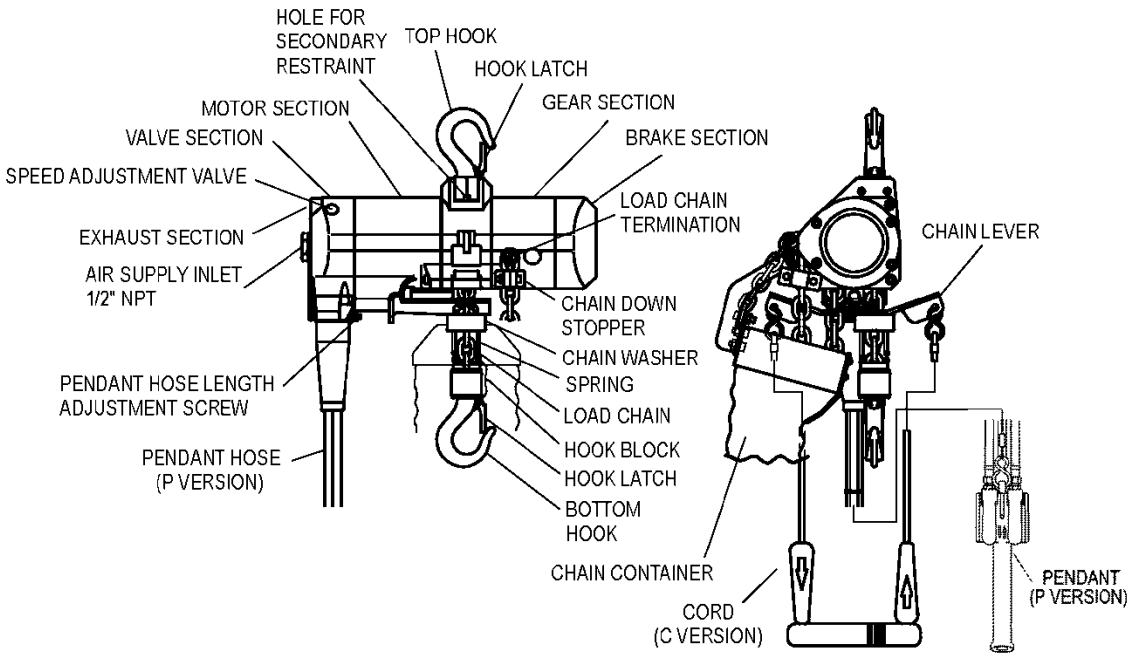


Figure 2-1 Hoist Part Identification Diagrams – TCE250C/P and TCE500C/P

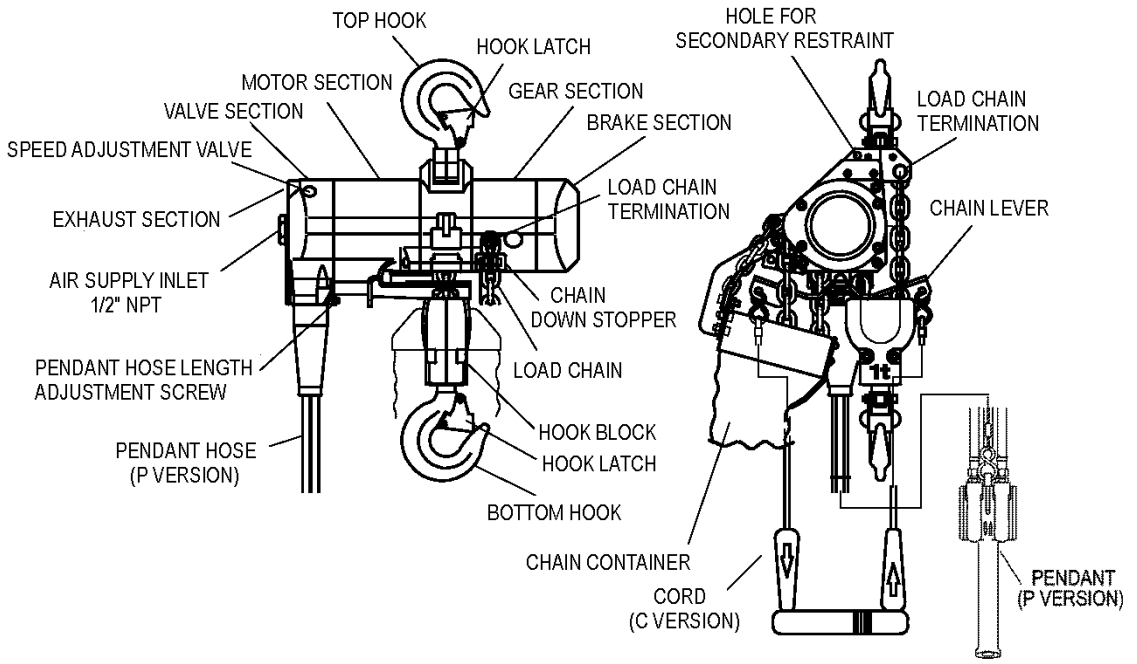


Figure 2-2 Hoist Part Identification Diagrams – TCE1000C2/P2

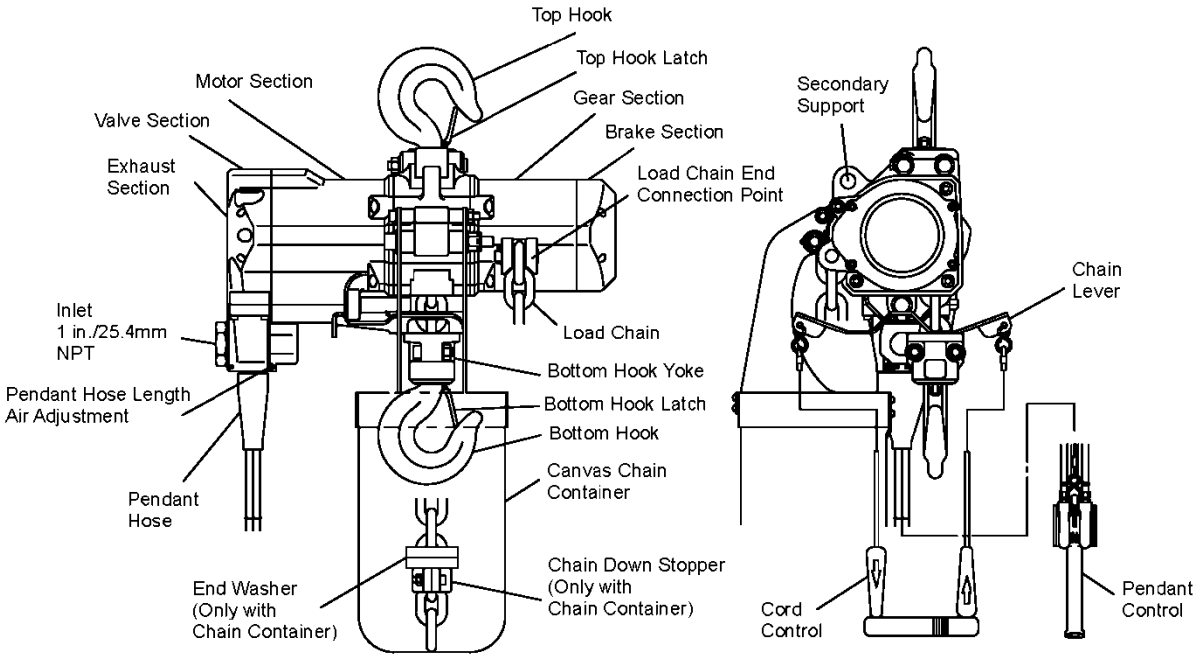


Figure 2-3 Hoist Part Identification Diagrams TCE3000C/P

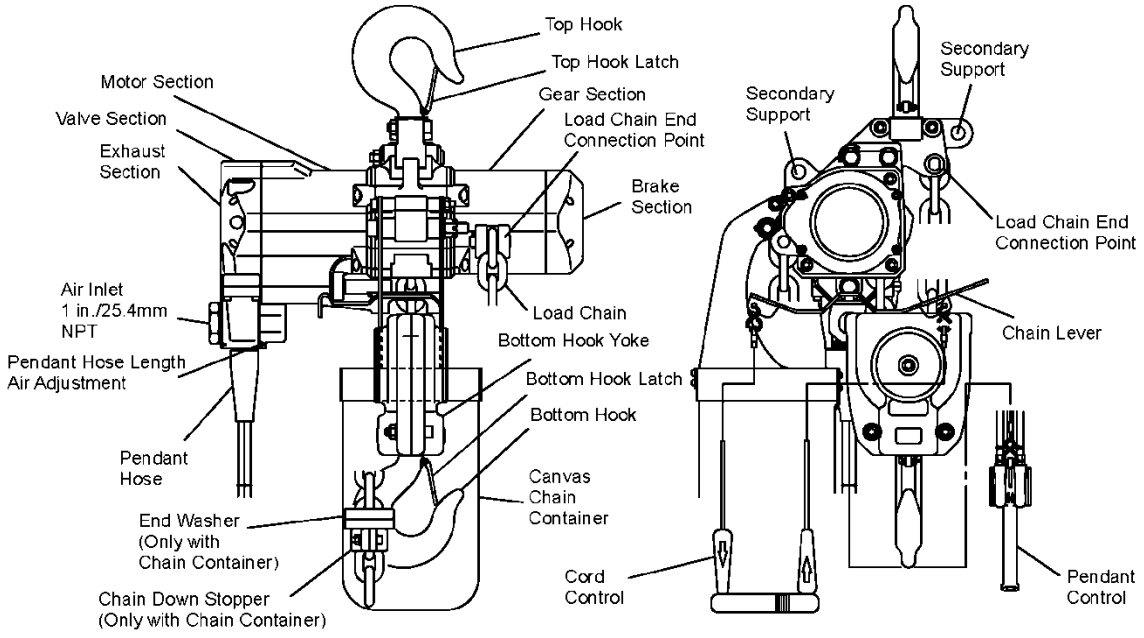


Figure 2-4 Hoist Part Identification Diagrams TCE6000C2/P2

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 **NOTICE** Proper air pressure is critical for optimal performance. A pressure level that is too high may result in increased hoist running speed which may lead to increased component wear in addiition to increased maintenance intervals. Low pressure will result in significantly reduced speeds or hoist may not operate at all.

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 volume 60 to 75 cfm (1.7 to 21 m³/min) to the hoist inlet port. Without the required airflow volume 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

NOTICE Inadequate air flow volume 60 to 75 cfm (1.7 to 21 m³/min) 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 to 90 psi (0.4 to 0.6 MPa). 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 air supply to the hoist (or lubricator if installed).

3.3 Lubrication

3.3.1 **⚠ CAUTION** The TCE-IIB hoist must be supplied with its own air supply lubricator. The air supply 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 Air 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. If using a lubricator, the filter must be upstream.

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 in sized for the total air consumption of the equipment it is servicing.

3.4.3 It is highly recommended to use a filter with automatic draining capability, to prevent excessive moisture accumulation.

3.5 Air Dryer - ⚠ 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, and
- 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.

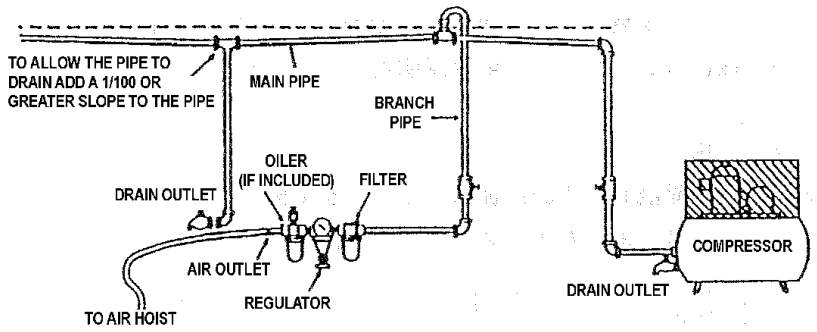


Figure 3-1 Diagram of Air Supply Configuration (Typical)

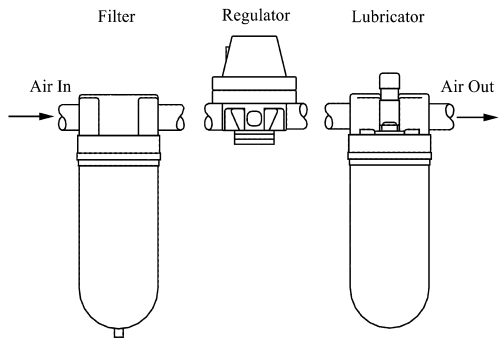


Figure 3-2 Typical Air Supply Filter with auto drain, Regulator, and Lubricator (if included).

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
TCE250 TCE500 TCE1000	Inside diameter ¾ inch or larger	Inside diameter ½ inch or larger
TCE3000 TCE6000	Inside diameter 1 inch or larger	Inside diameter ¾ 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.

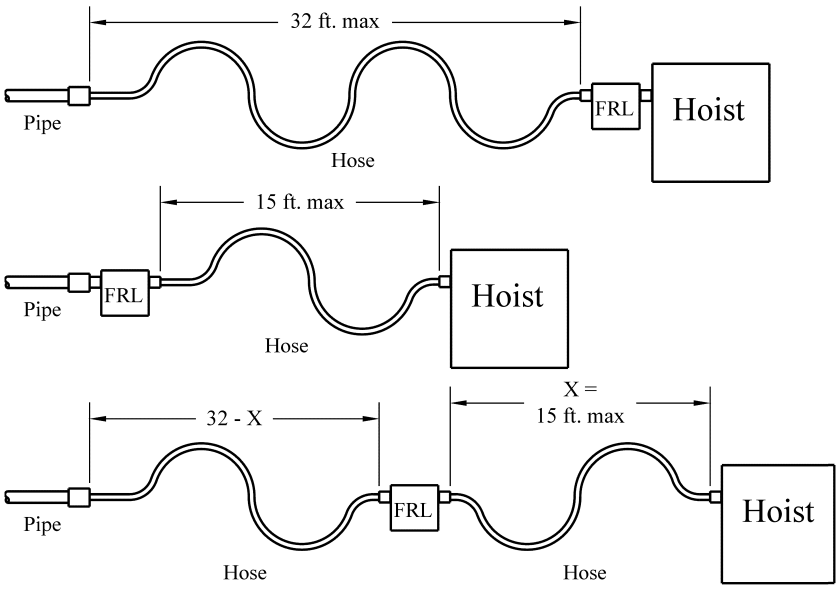


Figure 3-3 Typical Arrangements of Filter, Regulator and Lubricator and Maximum Air Supply Hose Lengths

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.

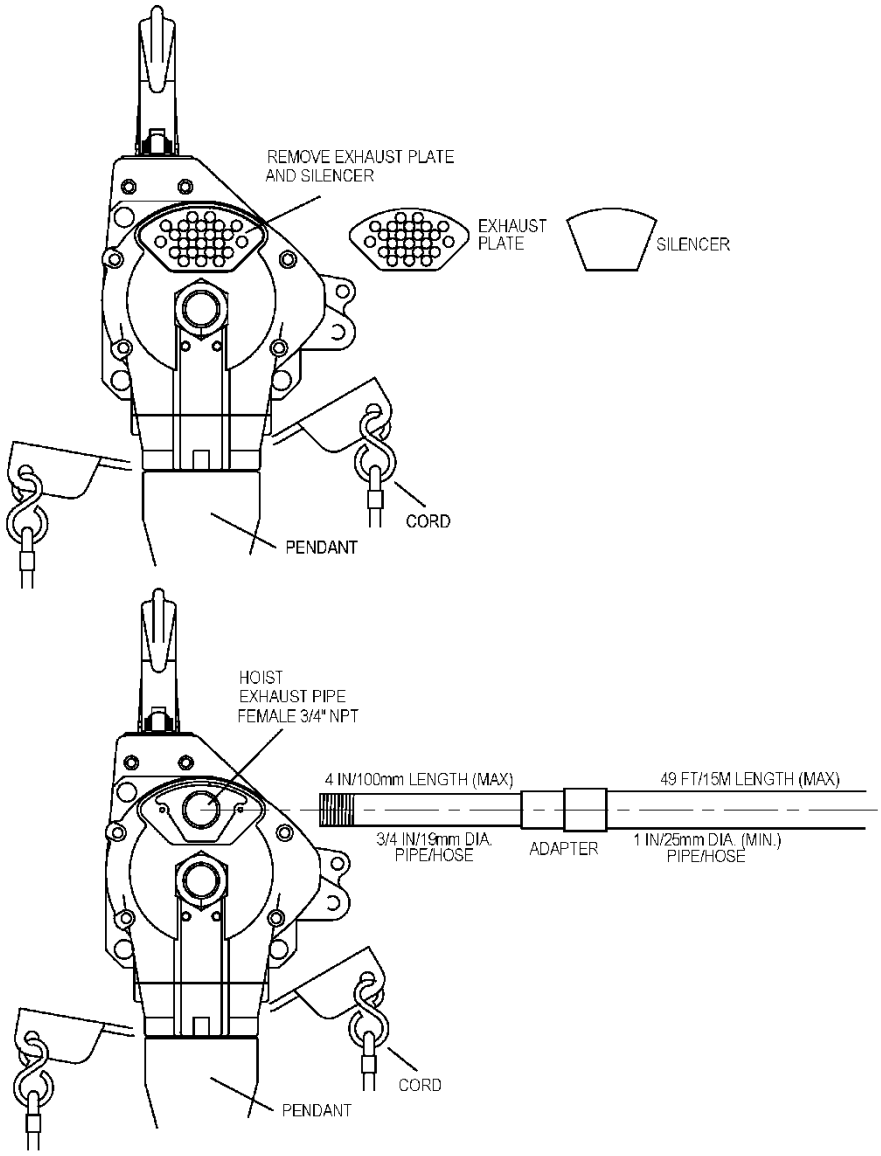


Figure 3-4 Extended Hoist Exhaust Installation – TCE250, TCE500, TCE1000

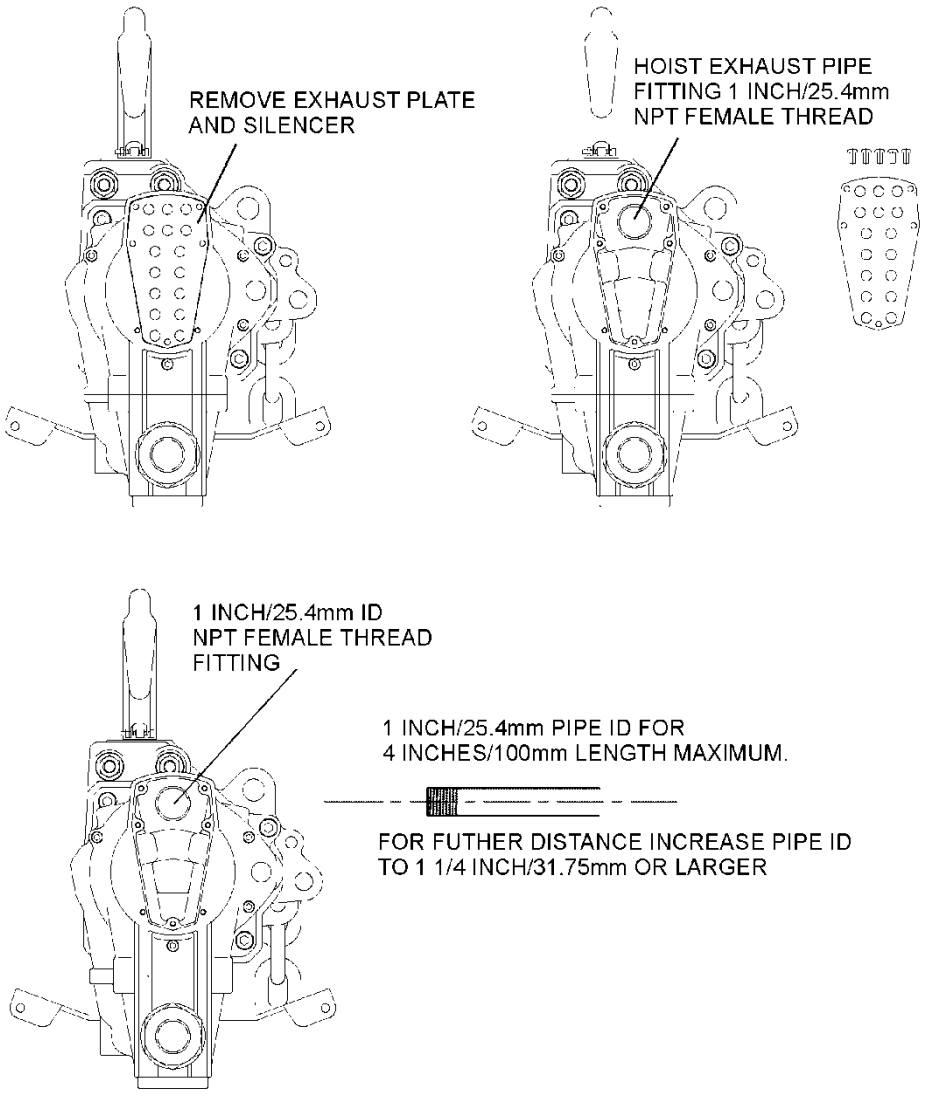


Figure 3-5 Extended Hoist Exhaust Installation – TCE3000 and TCE6000

3.8 Mounting Location

3.8.1 **⚠ WARNING** Prior to mounting the hoist ensure that the suspension and it 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.

3.8.2 For applications requiring a “Secondary Restraint” a “hole” has been provided in the hoist Top Hook Yoke. Reference Figure 3-5.

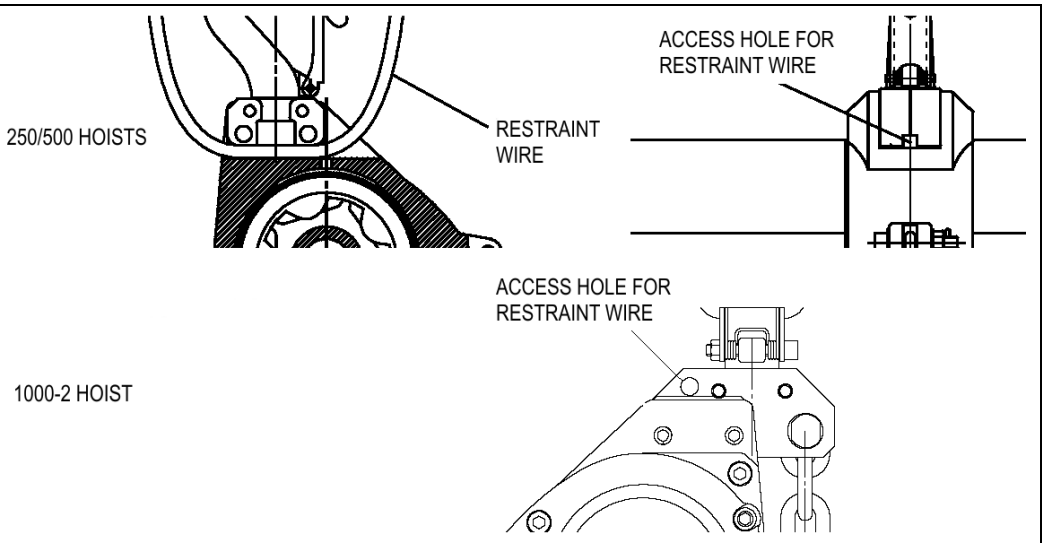


Figure 3-6 Hoist "Secondary Restraint" Configuration

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".

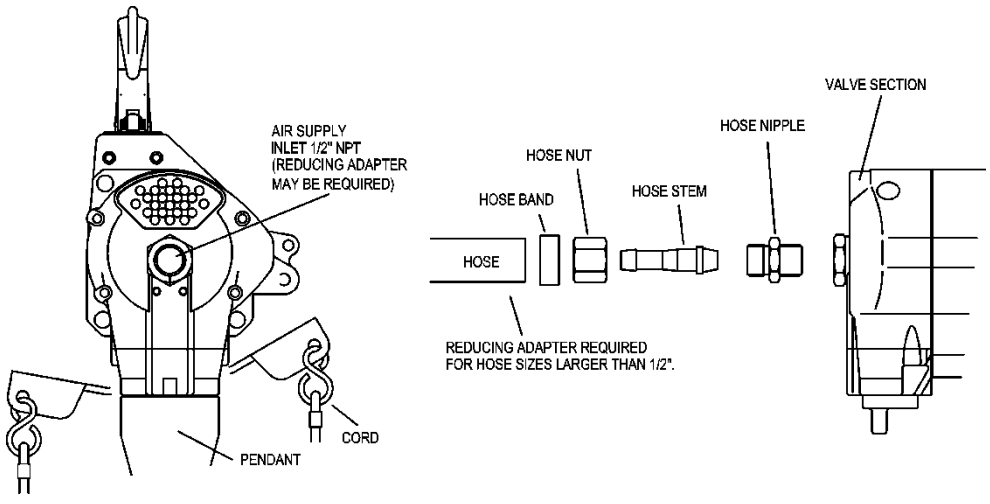


Figure 3-7 Air Supply Connection to Hoist – Cord or Pendant Models

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 Make connections to air supply; reference Figure 3-7. Use a reducing adapter at the hoist valve section for hose sizes larger than 1/2".

3.9.5 **NOTICE** Where conditions dictate, the installation sequence can be reversed by mounting the hoist first (Section 3.10) followed be connecting the air supply.

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.

3.10.5 **NOTICE** When coupled with a trolley, all TCE hoists must be mounted to the trolley using a lug /suspender only. Use of the top hook to mount to the trolley is prohibited.

3.11 Optional Chain Container

3.11.1 Follow instructions below to install the optional chain container. Refer to Figure 3-8.

1) Attach the metal bracket on top of the chain container to the lower boss on the side of the hoist body using the M8 Socket Bolt, Washers, Nut and Split Pin provided.

2) Attach the support chain to the upper boss on the side of the hoist body using the M6 Socket Bolt, Washers, Nut and Split Pin provided.

3) Make sure all fasteners on the chain container and chain attachment points are secure and that the split pins are sufficiently bent.

4) Feed the Chain into the Chain Container beginning with the no-load end. Take care to avoid twisting or tangling the Chain.

5) **⚠ CAUTION** Do not use the Chain Container if any parts are damaged or if any fasteners/hardware are missing.

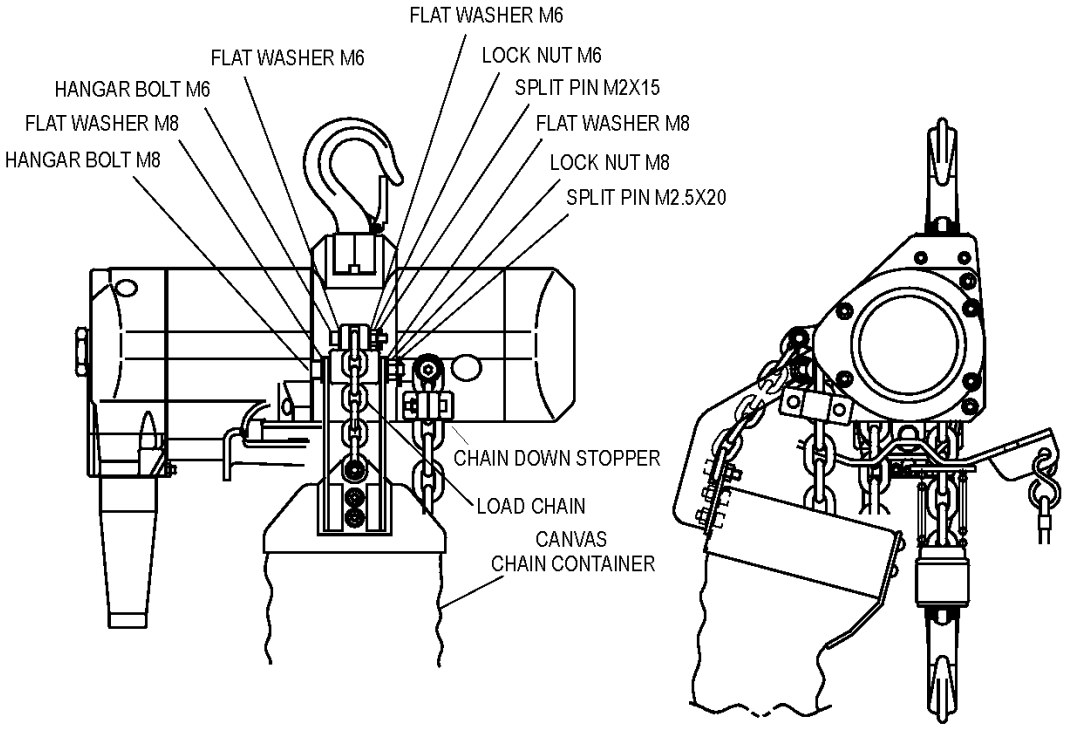


Figure 3-8 Chain Container Installation

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.

3.12.2 Connections and fittings must be kept clean and care taken to prevent dirt, debris and moisture from entering the hoist.

3.12.3 Recommended practice for removing the hoist from an installation:

1) Verify the hoist operates correctly by running the hoist briefly (with well lubricated air, if desired), noting any malfunctions or abnormal noises.

2) Shut off the air supply to the hoist, bleed off any pressure in the system then disconnect the air supply line.

3) Inject a small quantity (approximately 20 drops) of turbine oil (see Section 6.0) into the hoist's inlet port

4) 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 to 90 psi (0.4 to 0.6 MPa) at the hoist's inlet port before trying to operate the hoist.

3.13.2 **⚠ WARNING** In the event of loss of air supply, be aware that a load can be lowered by intentionally or unintentionally performing any of the following: pulling on the control cord in the down direction, manually operating the control yoke in the down direction, or operating the twist rod control in

the down direction. Releasing the control cord, or moving the control yoke back to its center/neutral position will stop and hold the load. Only a qualified person should perform a load lowering operation in this manner because with loss of air supply the load cannot be raised. Failure to follow safe operating procedures outlined in this manual when performing this operation could result in serious injury or death. See Section 4.6 “Special Operation – Lowering the load without air supply”.

3.13.3 **⚠ 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 load chain irregularities before conducting the first hoist operation. See Figures 3-9 and 3-10.

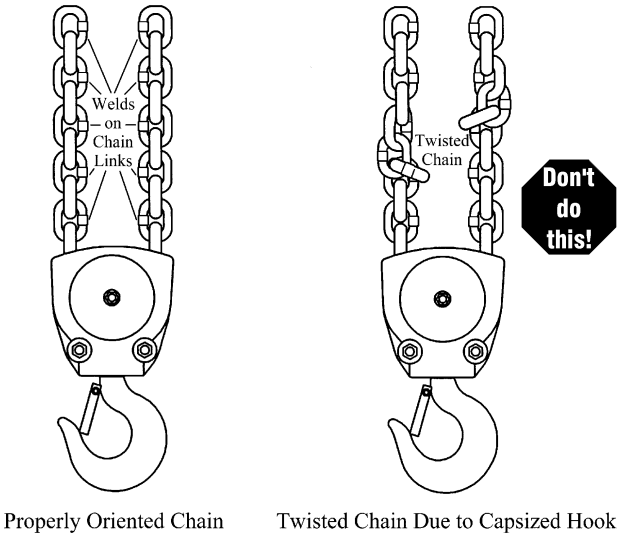


Figure 3-9 Twist in Load Chain

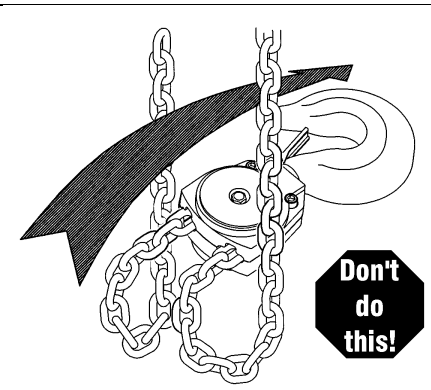
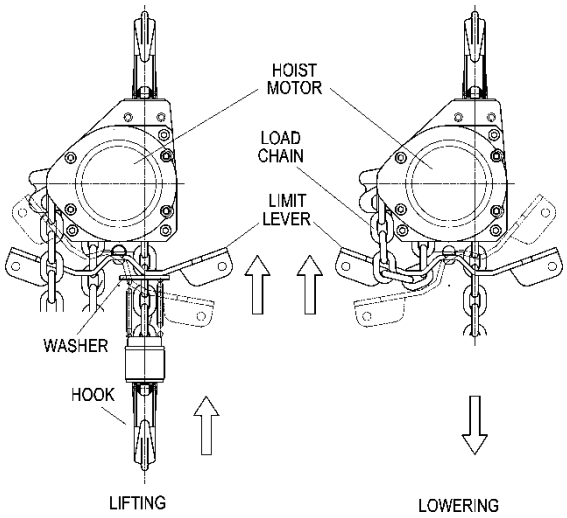


Figure 3-10 Capsized Hook and Load Chain

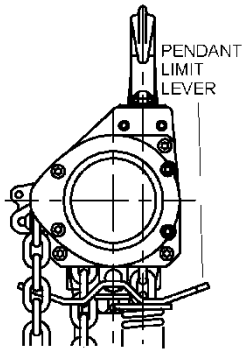
3.13.4 **⚠ WARNING** Ensure the load chain is adequately lubricated according to Section 6.2.

3.13.5 **⚠ 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.

3.13.6 **⚠ WARNING** Verify that the Chain/Limit Lever is operational and can move freely in both the up and down directions. For reference see Figure 3-11.

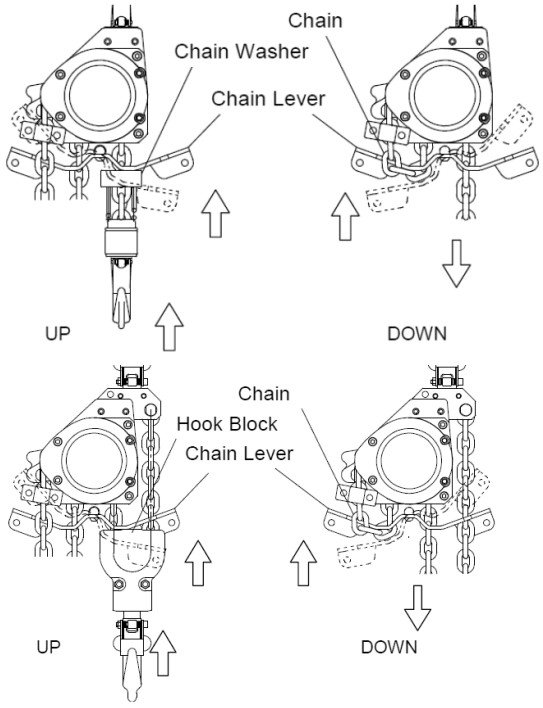


TCE250, TCE500 and TCE1000



NOTE: Different Limit Lever

TCE250 and TCE500



TCE3000 and TCE6000

Figure 3-11 Limit Switch Components

3.13.7 Measure and record the “K” dimension of all hooks on hoist. See Table 5-7 under Section 5, “Inspection”. Always use the same side of the hook to measure and record the "K" dimension.

3.13.8 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.

3.13.9 Ensure that the hoist is properly installed to either a fixed point, or trolley, whichever applies.

3.13.10 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.

3.13.11 Ensure that all nuts, bolts and split (cotter) pins are sufficiently fastened.

3.13.12 For hoists with pendant controls, ensure that the Pendant Hoses and Strain Relief wire are properly attached to the hoist. See Section 7.3

3.13.13 For hoists with cord controls, ensure that the Cords are properly attached to the hoist. See Section 7.4

3.13.14 **⚠ CAUTION** Check Air Supply - Check air supply before everyday use. Ensure proper air quality and air pressure.

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

3.13.16 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.

3.13.17 Proceed with trial operation to confirm proper operation.

- **⚠ CAUTION** Make sure hook travel is in the same direction as shown on controls.
- Initially operate slowly under no load in both directions. Verify controls agree with hoist direction.
- Perform inspections per Section 5.4, “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 and trolley.
- **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** use lifting equipment with sharp edges in contact with the hook to prevent damage to bronze plating of TCE-IIB hooks.
- **NOT** modify/alter trolley, hoist or its components.
- **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.
- **NOT** allow the upper hook, lower hook, chain, pendant or body of air hoist and trolley to come into strong contact with other objects to prevent ignition.
- 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.
- **NOT** Over pull cord control, damage to pull cord and or hoist may result.
- 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 below. To stop motion, release the lever switches.

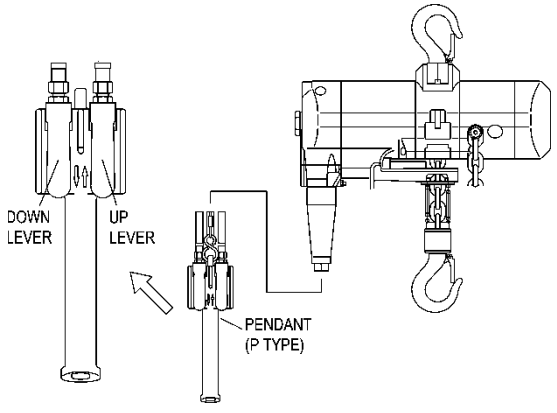


Figure 4-1 Pendant Control

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.

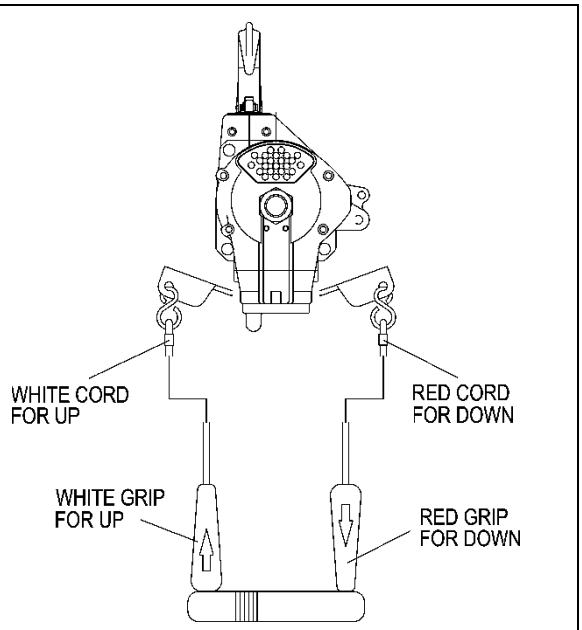


Figure 4-2 Cord Control

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

4.3.5 **⚠ CAUTION** Use caution when pulling the control cords as excessive pulling force may cause damage to pull cord and or hoist.

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 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. Refer to Figure 4-3.

4.4.2 For the cord type control, adjust the speed by varying the amount of pull on the cord. Refer to Figure 4-3.

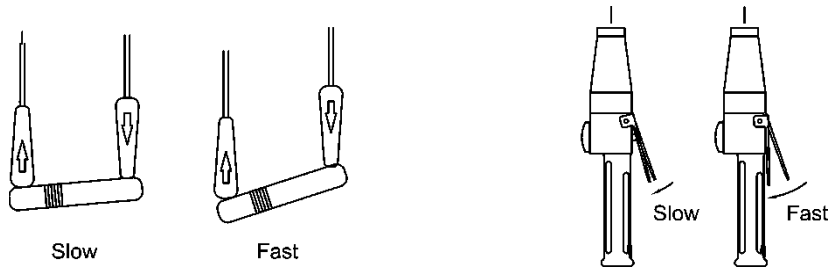


Figure 4-3 Cord and Pendant Control Speed Adjustment

4.5 Speed Adjustment Controls

4.5.1 The hoist is equipped with speed adjustment controls. The controls allow the hoist lifting and lowering speeds to be reduced for those applications requiring slower speeds or better speed control. The speed adjustment controls are set for the highest speed from the factory. The speed adjustment controls are located on top of the valve section of the hoist as shown in Figure 4-4.

4.5.2 **⚠ CAUTION** The hoist must be stopped when adjusting the lifting and lowering speeds.

4.5.3 To reduce the lifting/lowering speeds remove the speed adjustment covers to gain access to the speed adjustment screws as shown in Figure 4-4. The covers may be plastic or aluminum. Viewed from the valve side of the hoist, the lowering adjustment screw is on the left and the lifting adjustment screw is on the right. The lifting and lowering adjustment mechanisms are not connected, allowing separate adjustments for lifting and lowering speeds.

4.5.4 Referring to Figure 4-4 the hoist is at the highest speed when the screw is in the "vertical" position and at the lowest speed when in the "horizontal" position. Speed adjustment can be made between these positions.

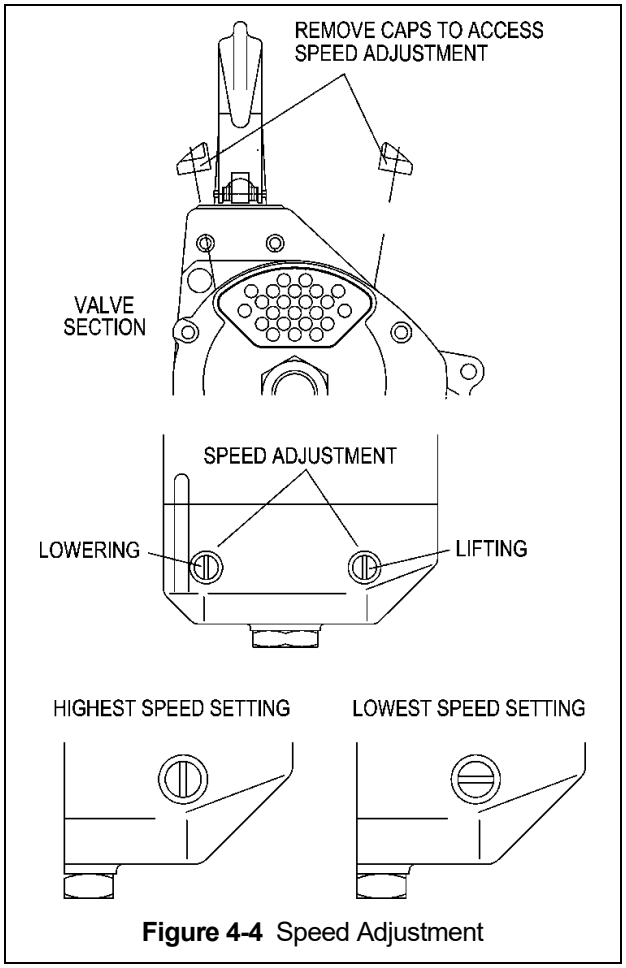


Figure 4-4 Speed Adjustment

4.6 Pendant Controllability Adjustment

4.6.1 The standard pendant hose length is 8.1 ft. (2.47m) For longer pendant hose lengths the speed controllability from the pendant may be diminished. Pendant hose length should not be more than 16.5 ft (5m). Consult the factory if longer lengths are needed. The reduction in speed control is a result of pressure loss due to the longer pendant hose. The pendant hose extension adjustment control provides a screw adjustment method to reduce the air pressure loss to provide normal pendant/hoist operation. The adjustment screw is set fully open from the factory for normal operation and to allow the fine feathering feature.

4.6.2 To adjust the pendant air pressure, locate the hex nut and hex screw as shown in Figure 4-5. The adjustment screw on the left is for adjusting the lowering speed and the adjustment screw on the right is for adjusting the lifting speed.

4.6.3 Adjustment is accomplished by loosening the hex nut with a 2.5mm wrench and turning the hex head screw clockwise. Once correct operation is obtained securely tighten the hex nut.

4.6.4 **⚠ CAUTION** If the adjustment screw is tighened too tight the fine feathering feature will be reduced or lost.

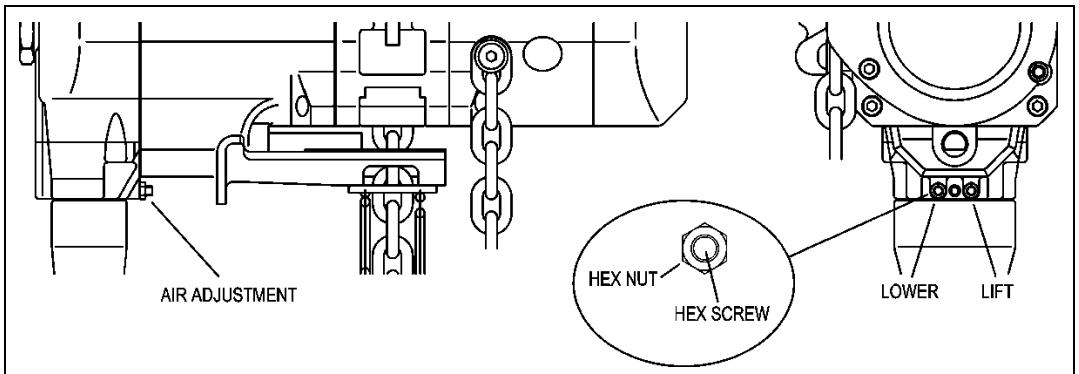


Figure 4-5 Pendant Controllability Adjustment

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** - a person selected or assigned as being competent to perform the specific duties to which he/she is assigned.
- **Qualified Person** - a 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.

The inspection frequency is based on ANSI/ASME B30.16 and shall be determined by a qualified person based on the intended operation conditions and their effects on critical hoist components.

- **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.

⚠ WARNING The Hoist and Trolley use coated components to meet the applicable Equipment Group and Explosive Atmosphere designation. Inspection of all surfaces is critical to ensure coatings are not worn resulting in uncoated metal to metal contact which can compromise the product's ability to perform as intended in its respective Equipment Group and Explosive Atmosphere designation. All replacement components must remain as supplied/specified by manufacturer in order to maintain the hoist/trolley Equipment Group and Explosive Atmosphere designation.

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 three 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 three general classifications are herein designated as PREOPERATION, FREQUENT and PERIODIC, with respective intervals between inspections as defined below.

5.2.3 PREOPERATION Inspection - visual inspection with records not required, performed before the first use of each shift.

5.2.4 FREQUENT Inspection - visual examinations with records not required, 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.

5.2.5 PERIODIC Inspection - visual inspection with records of external conditions to provide the basis for a continuing evaluation. An external coded mark on the hoist is an acceptable identification in lieu of records. This inspection is to be performed 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 Preoperation Inspection

5.3.1 The preoperational inspection shall be performed before the first use of each shift in accordance with Table 5-1, "Preoperation Inspection". Included in these PREOPERATION Inspections are visual observations of the hoist.

Table 5-1 Preoperational Inspection
All functional operating mechanisms for maladjustment and unusual sounds.
Operation of limit switch and associated components
Hooks for gross damage, that may be an immediate hazard
Hook latch operation
Load chain for gross damage, that may be an immediate hazard
Presence of Chain Down Stopper

5.4 Frequent Inspection

5.4.1 Inspections should be made on a FREQUENT basis in accordance with Table 5-2, "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.

WARNING Maintenance of trolley/hoist SHALL NOT be performed in potentially explosive environments.

Table 5-2 Frequent Inspection
All functional operating mechanisms for maladjustment and unusual sounds.
Operation of limit switch and associated components
Hoist braking system for proper operation
Air valves and components for leakage or damage
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 3.13 and 7.2
Bronze coating on TCE-IIB top and bottom hooks.

5.5 Periodic Inspection

5.5.1 Inspections should be made on a PERIODIC basis in accordance with Table 5-3, "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. Location of maintenance work must be carried out in a safe place and not a potentially explosive environment.

5.5.2 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 5-3 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.
Top Hook/Yoke Gap excessive wear
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, including presence of chain down stopper.

5.6 Occasionally Used Hoists

5.6.1 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 above.
- Hoist Idle More Than 1 Year: Inspect per PERIODIC Inspection criteria of Section 5.5 above.

5.7 Inspection Records

5.7.1 Dated inspection reports and records should be maintained at time intervals corresponding to those that apply for the hoist's PERIODIC interval per Section 5.2.5. These records should be stored where they are available to personnel involved with the inspection, maintenance, or operation of the hoist.

5.7.2 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.

5.8 Inspection Methods and Criteria

5.8.1 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 5-4 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 Lever	Function	Proper operation. Actuation of limit lever 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. Inspect bronze plating on TCE-IIB hooks to ensure no bare metal is present. Compromised coating may cause ignition.	Replace.
Hooks - Fretting wear	Measure	The “u” dimension should not be less than minimum value listed in Table 5-7**.**	Replace.
Hooks - Stretch	Measure	The “K” dimension should not exceed the maximum value for replacement from Table 5-7 (See Section 3.12).	Replace.
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, 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.
Top Hook/Yoke Gap	Measure	Should not be less than the Minimum Value for Replacement listed in Table 5-8.	Replace Top Hook and Yoke.
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.
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.

Table 5-4 Hoist Inspection Methods and Criteria			
Item	**Method**	**Criteria**	**Action**
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 and Wire Diameter	Measure	The "P" dimension should not be greater than discard value listed in Table 5-9. The “d" dimension should not be less than discard value listed in Table 5-9.	Replace. Inspect Load Sheave (and Idle Sheave for multiple fall hoists).
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 should be installed properly, including chain down stopper - refer to Section 7.2.	Reeve/Install chain properly. Insure presence of chain down stopper.
Chain Spring -	Visual	Chain springs should not be deformed or compressed.	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 and significant wear and corrosion. The “L” and "W" dimension should not be greater than maximum value listed in Table 5-6.	Replace
Motor Brake	Measure, Visual	Motor brake dimension should be within the allowable limits of Table 5-5. See Section 7.1 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.

Table 5-4 Hoist Inspection Methods and Criteria			
Item	**Method**	**Criteria**	**Action**
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.

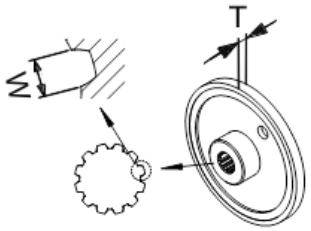
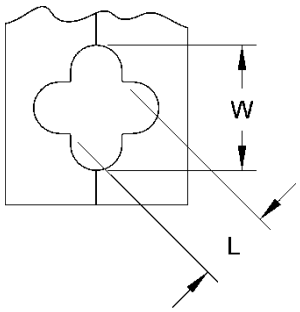
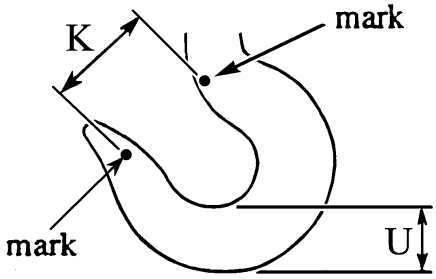
Table 5-4 Brake Disc Dimensions		
		
Hoists	**Std Dimension Inch (mm)**	**Minimum Value for Replacement Inch (mm)**
TCE250,TCE500,TCE1000, TCE3000 TCE6000	T = 0.31 (8) W = 0.10 (2.6)	T = 0.29 (7.3) W = 0.11 (2.8)

Table 5-6 Chain Separator Dimensions



Hoists	Std Dimension Inch (mm)	Maximum Value for Replacement Inch (mm)
TCE250, TCE500, TCE1000	L = 0.51 (13) W = 0.95 (24)	L = 0.63 (16) W = 1.04 (26.5)
TCE3000, TCE6000	L = 1.08 (27.5) W = 2.01 (51.0)	L = 1.16 (29.5) W = 2.09 (53.0)

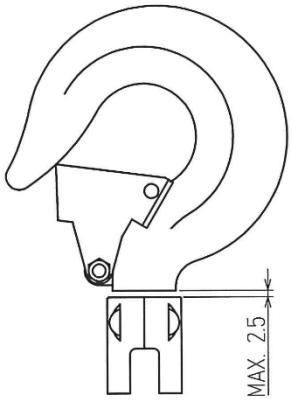
Table 5-7 Top Hook & Bottom Hook Dimensions



Dimensions K and U should be measured and recorded below prior to any use when the hook is first placed into service.

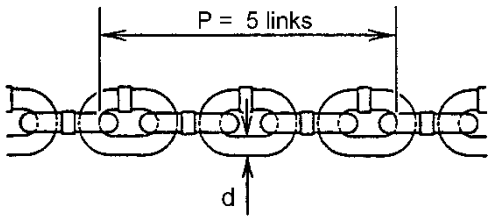
Hoists	Recorded Dimension When New	Maximum/Minimum Value for Replacement
TCE250 TCE500 TCE1000 TCE3000 TCE6000	Top Hook K = _____ Top Hook U = _____	For K if the measured dimension exceeds 1.05 times the recorded new dimension, the hook should be replaced. For U if the measured dimension is less than .9 times the recorded new dimension, the hook should be replaced.
	Bottom Hook K = _____ Bottom Hook U = _____	

Table 5-8 Top Hook/Yoke Gap Wear Limit Dimension

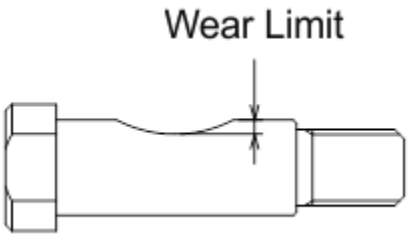


Capacity Code	Minimum Value for Replacement Inch (mm)
TCE250, TCE500, and TCE1000	0.11(7/64) inch/(2.8mm)
TCE3000	0.11(7/64) inch/(2.8mm)
TCE6000	0.14(9/64) inch/(3.5mm)

Table 5-9 Chain Dimensions



Product Code	"P" Dimension inch (mm)		"d" Dimension inch (mm)	
	Standard	Discard	Standard	Discard
TCE250, TCE500, and TCE1000	3.76 (95.5)	3.82 (96.9)	0.25 (6.3)	0.22 (5.7)
TCE3000, TCE6000	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)**
TCE6000	0.004 (0.1)

6.0 Lubrication

6.1 Air Hoist Lubrication

6.1.1 The TCE-IIB hoist requires lubrication for proper function. The oil in the air supply is the primary source of lubrication to the hoist. Therefore, a dedicated air supply lubricator must be used with the TCE-IIB hoist. See Section 3.0 for lubrication requirements

6.1.2 **⚠ CAUTION** 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 6-2 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 an 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.

6.2.4 Machine or gear oil (grade ISO VG 46 or 68 oil or equivalent) may be used as an alternative lubricant but must be applied more frequently.

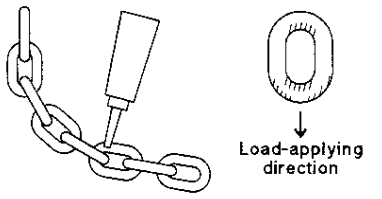


Figure 6-1 Chain Grease Application

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.

6.2.7 **⚠ WARNING** Do not use corroded chains due to risk of ignition.

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 6-2 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, Machine or gear oil	- HHI Chain Grease P/N ER1BS1551 - NLGI No. 0 - ISO VG 46-68 or equivalent
Hook bearings & suspension pins	Top & Bottom hook sets	Grease	National Lubricating Grease #3
Gears and Bearings	Gear Section	Grease	National Lubricating Grease #2

7.0 Maintenance and Handling

7.1 Brake

7.1.1 The hoist brake is not adjustable.

7.1.2 Inspect the brake disc in accordance with Section 5.7, Table 5-5.

7.1.3 The following is the hoist brake inspection procedure. Refer to Figure 7-1.

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/Tagout of Energy Sources”.

2) Gradually and evenly back out 4 Hex Socket Cap Screws (A) from Brake Cover (B) from Gear Case (J) to slowly decrease spring tension (C) of Brake Piston (D) against Brake Disc (E).

3) Remove Brake Cover (B), Brake Piston (D), Springs (C), and O-Rings from Gear Case (J). Set parts aside for reassembly.

4) Remove Brake Disc for inspection and measurement. Refer to "Motor Brake" in Table 5-5, "Hoist Inspection Methods and Criteria".

5) Prior to reassembly, clean all surfaces of debris, dirt and loose paint. Apply a light film of grease to all O-Ring seals.

6) Reassemble in reverse order. Torque all mounting hardware evenly during the reassembly process.

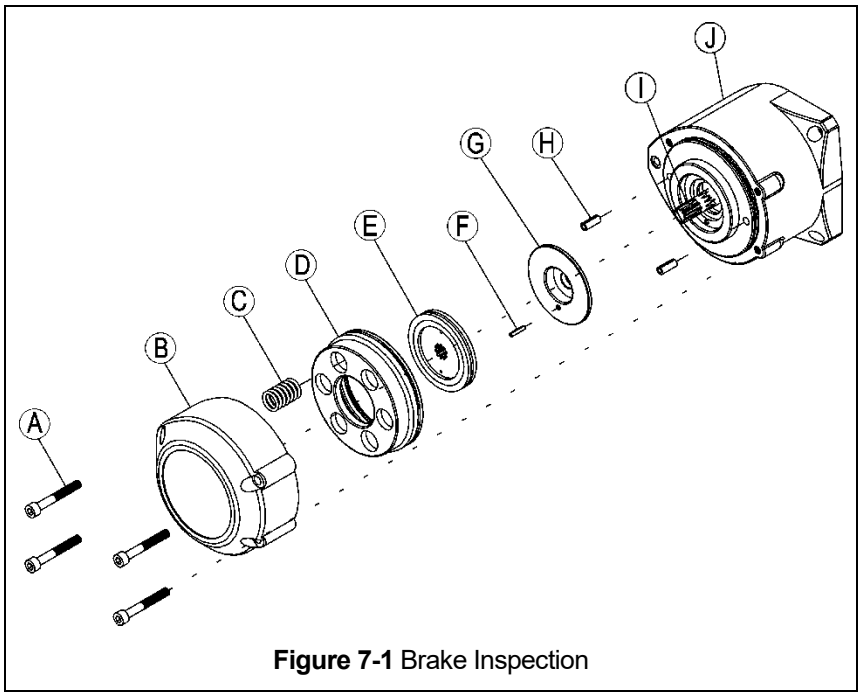


Figure 7-1 Brake Inspection

⚠ WARNING Replacing or upgrading the hoist with Non-ATEX rated components may result in ignition of flammable substances.

7.2 Load Chain

7.2.1 Lubrication and Cleaning – Refer to Section 6.2.

7.2.2 Replacement

1) **⚠ CAUTION** An air supply line must be connected to the hoist in order to perform the following procedures.

7) **⚠ 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.

8) Remove the Bottom Hook Complete Set and Button Head Screw connecting the no-load end of the chain to the hoist body. Keep the Bottom Hook Complete Set and Button Head Screw for reuse on new chain. Carefully operate the hoist in the down direction to remove old chain.

9) **⚠ 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.

10) **⚠ CAUTION** Invert the hoist such that the chain separator openings are facing up and tilt the hoist approximately 30° as shown in Figure 7-3. 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.

11) **⚠ 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.

12) Ensure that 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 7-4 and Figure 7-5. Install chain down stopper on the second link from the no-load end. Refer to Figure 7-2, below.

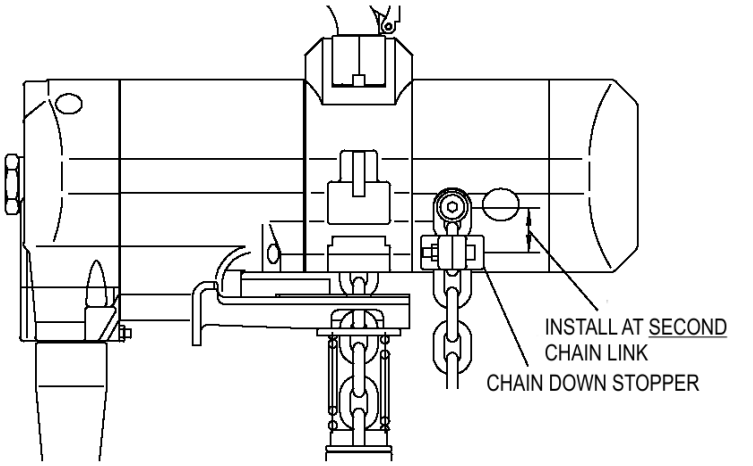


Figure 7-2 Chain Down Stopper Installation

13) After installation has been completed, perform steps outlined in Section 3.13 "Preoperational Checks and Trial Operation".

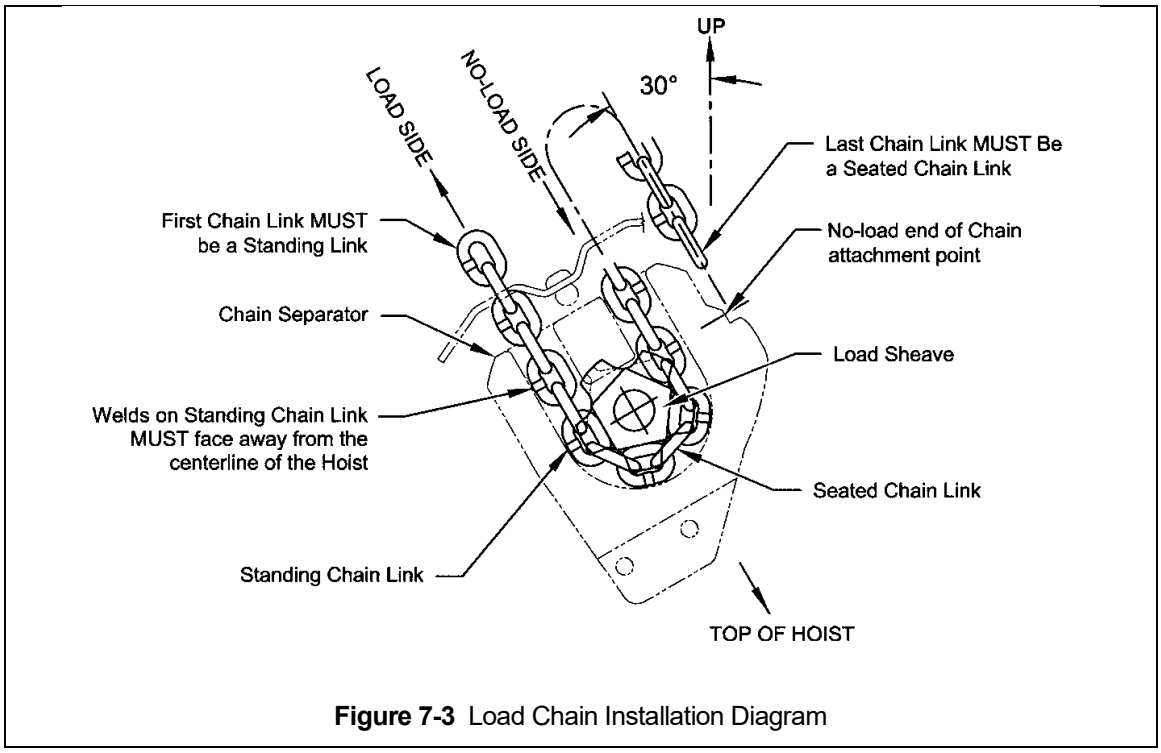


Figure 7-3 Load Chain Installation Diagram

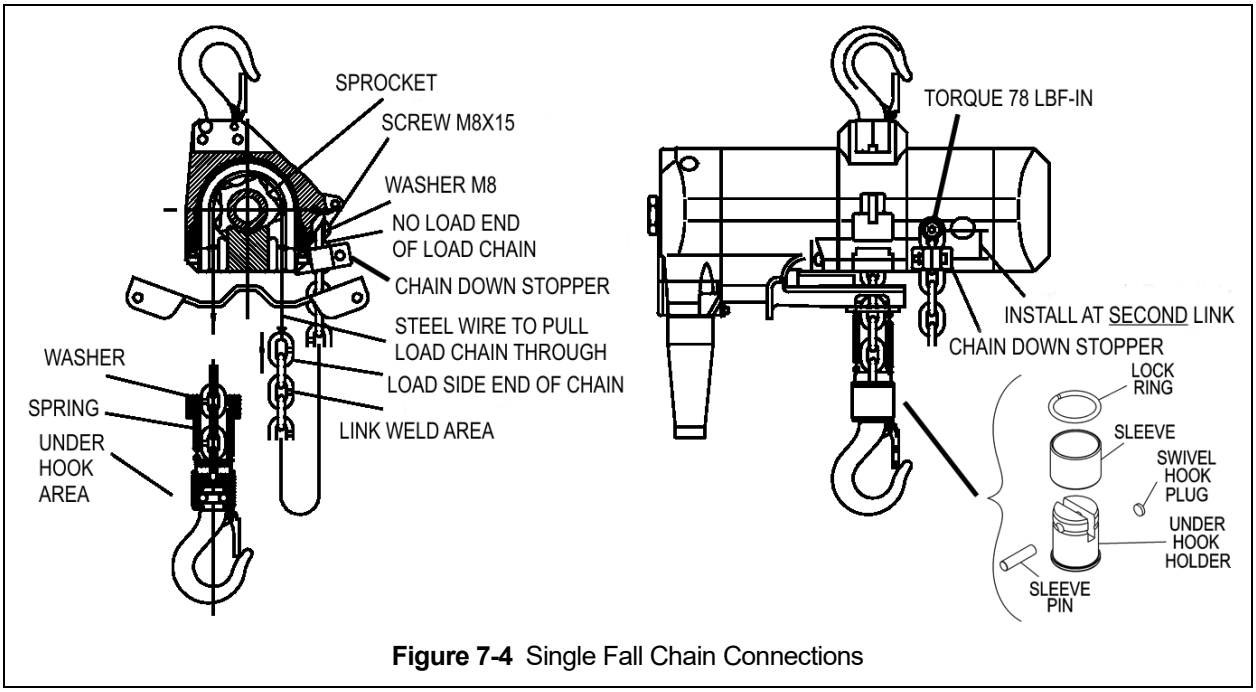


Figure 7-4 Single Fall Chain Connections

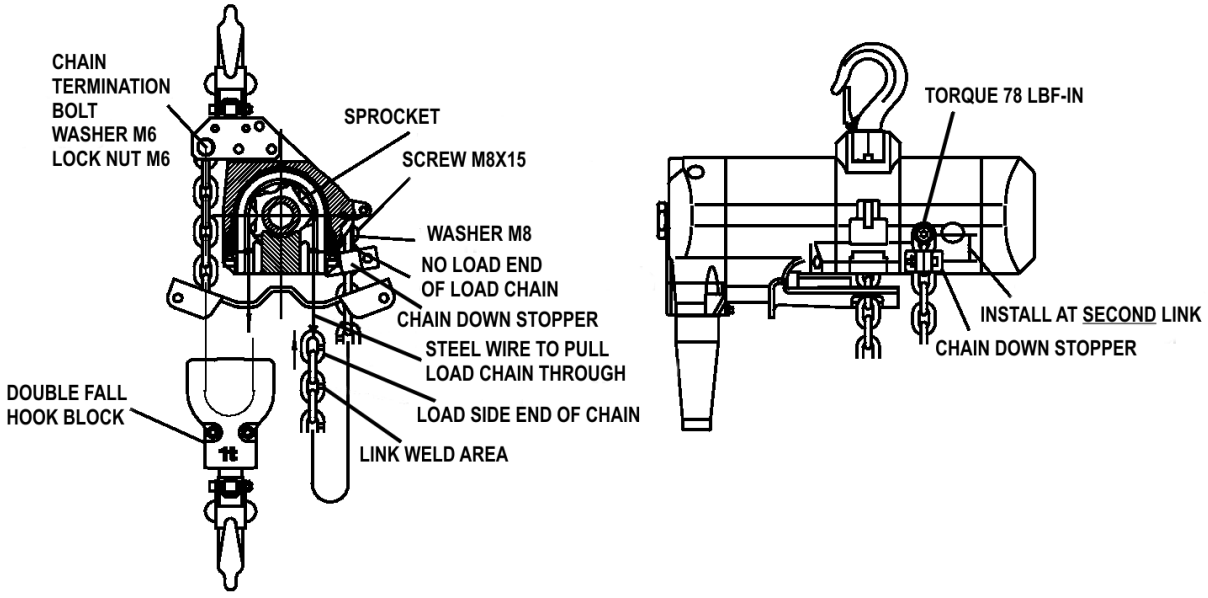


Figure 7-5 Double Fall Chain Connections

7.3 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 7-6.

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 7-6 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) **⚠ CAUTION** Be sure to attach the strain relief to specified position as shown below. The strain relief serves as the ground wire for the pendant and prevents the surface of the pendant cover from being charged. If the strain relief is not attached to the specified position as shown below, the spark resistant function of the pendant may be lost.

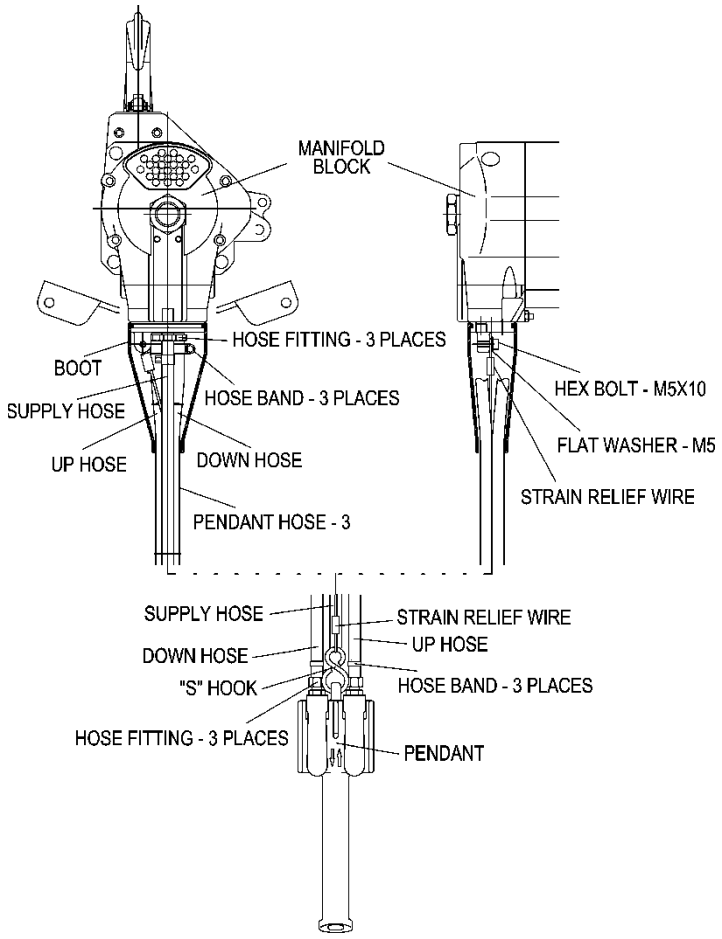


Figure 7-6 Pendant Hose Connections

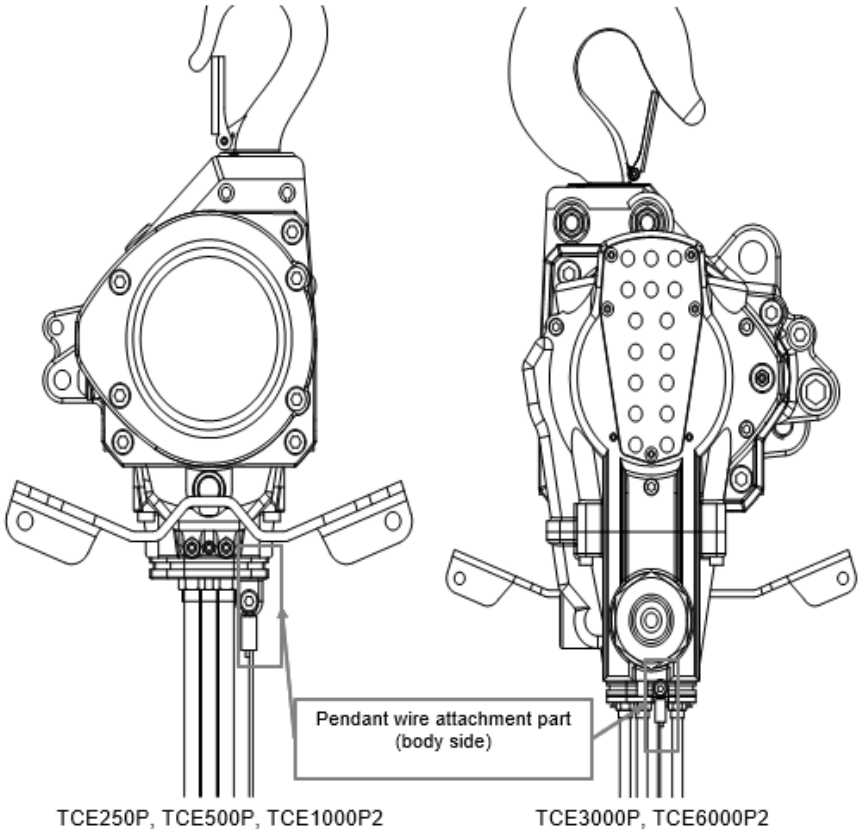


Figure 7-7 Pendant Strain Relief Ground Wire

7.3.2 The surface of the pendant shall be wiped off daily with a damp cloth to reduce the generation of static electricity. Do NOT use a dry cloth as it can generate static electricity.

7.4 Pull Cord

7.4.1 The following procedure covers the installation of the Pull Cord (Parts List Figure Number 401) and the Handles. Refer to Figure 7-7.

1) Lever that is attached to the Limit Shaft on the hoist. Ensure the WHITE Handle is attached to the UP Chain Lever side and the RED Handle is attached to the DOWN Chain Lever side.

2) **⚠ CAUTION** Operate hoist and make sure the direction of hook travel agrees with the Chain Lever direction.

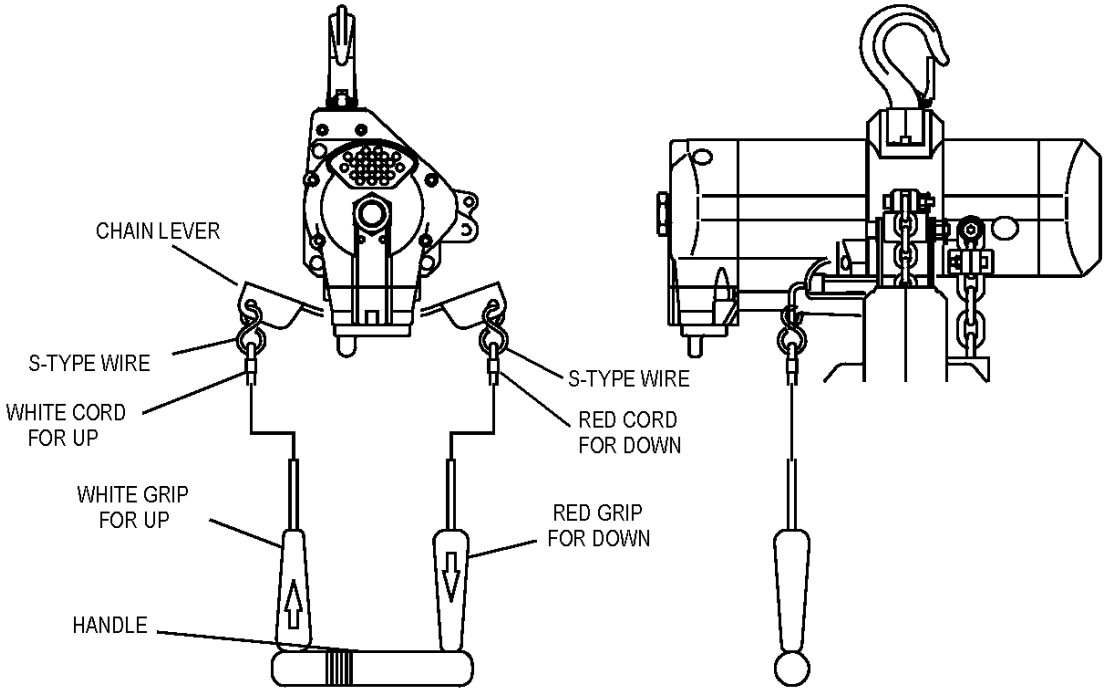


Figure 7-8 Cord Control

7.5 Load Sheave Inspection

7.5.1 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 7-8 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 2 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.

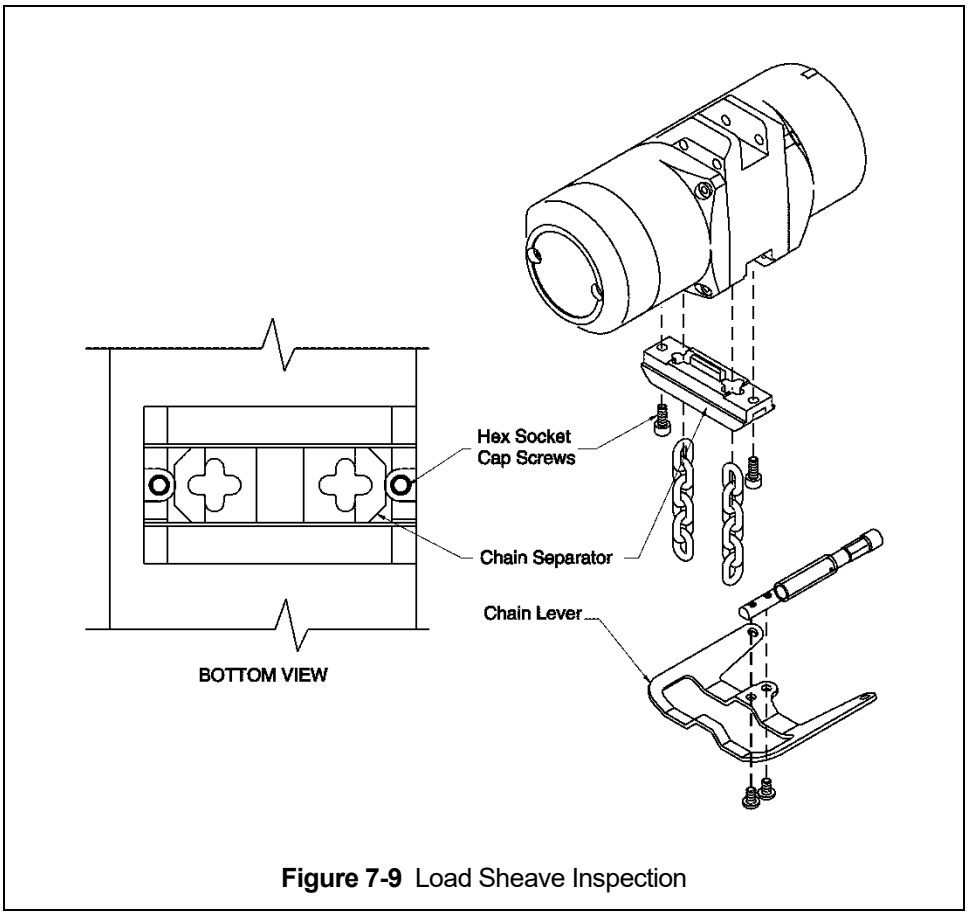


Figure 7-9 Load Sheave Inspection

7.6 Storage

7.6.1 Whenever the hoist is to be placed into storage, place extra, at least 3cc, lubricating oil 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

7.5.1 For hoist installations that are outdoors, the hoist should be covered and protected from the weather at all times.

7.5.2 Avoid hoist oxidation by using suitable treatment and lubricating all mechanisms.

7.5.3 **NOTICE** 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.

7.5.4 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.

7.5.5 **NOTICE** 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.

7.5.6 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 volume, 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 control hose(s)	Correct or repair the bend or crimp in control hose(s)
	Hoist is overloaded.	Reduce the load to the rated capacity of hoist.
Lifting speed is slow	Low air volume or 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.

Table 8-1 Troubleshooting Guide		
Symptom	**Cause**	**Remedy**
	Bending or crimping of pendant control hose(s)	Correct or repair the bend or crimp in control hose(s)
	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 volume, pressure or loss of air supply.	Repair or adjust air supply or filters.
Hoist moving in wrong direction (pendant control)	Pendant control hoses are terminated to incorrect ports on hoist body.	Connect the control tubes in accordance with Section 7.3.

Table 8-1 Troubleshooting Guide (continued)		
Symptom	**Cause**	**Remedy**
Hoist lowers but will not lift	Hoist is overloaded.	Reduce load to hoist rated capacity.
	Faulty pendant control or control hose(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	If spool 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.

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.

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10.0 Parts Information

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 3.13.8 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 hoists in this manual have different spark resistant ratings. Be sure to check the rating of your hoist and only order replacement parts designed for that product as called out in the parts list.

⚠ WARNING All replacement components must remain as supplied by manufacturer in order to maintain hoists Equipment Group and Expolsive Atmosphere designation. Hoist shall NOT be modified to alter the original Equipment Group and Expolsive Atmosphere designation as supplied by manufacturer.



Figure 10-1 **TCE-IIB** Nameplate

The parts list is arranged into the following sections:

Section Page

10.1 Motor, Valve Body and Controls..... 59

10.2 Brake, Gears and Load Suspension Components..... 67

10.3 Chain Container Assembly..... 71

10.4 Rebuild Kits..... 72

10.1 Motor, Valve Body and Controls ¼ through 1 Ton

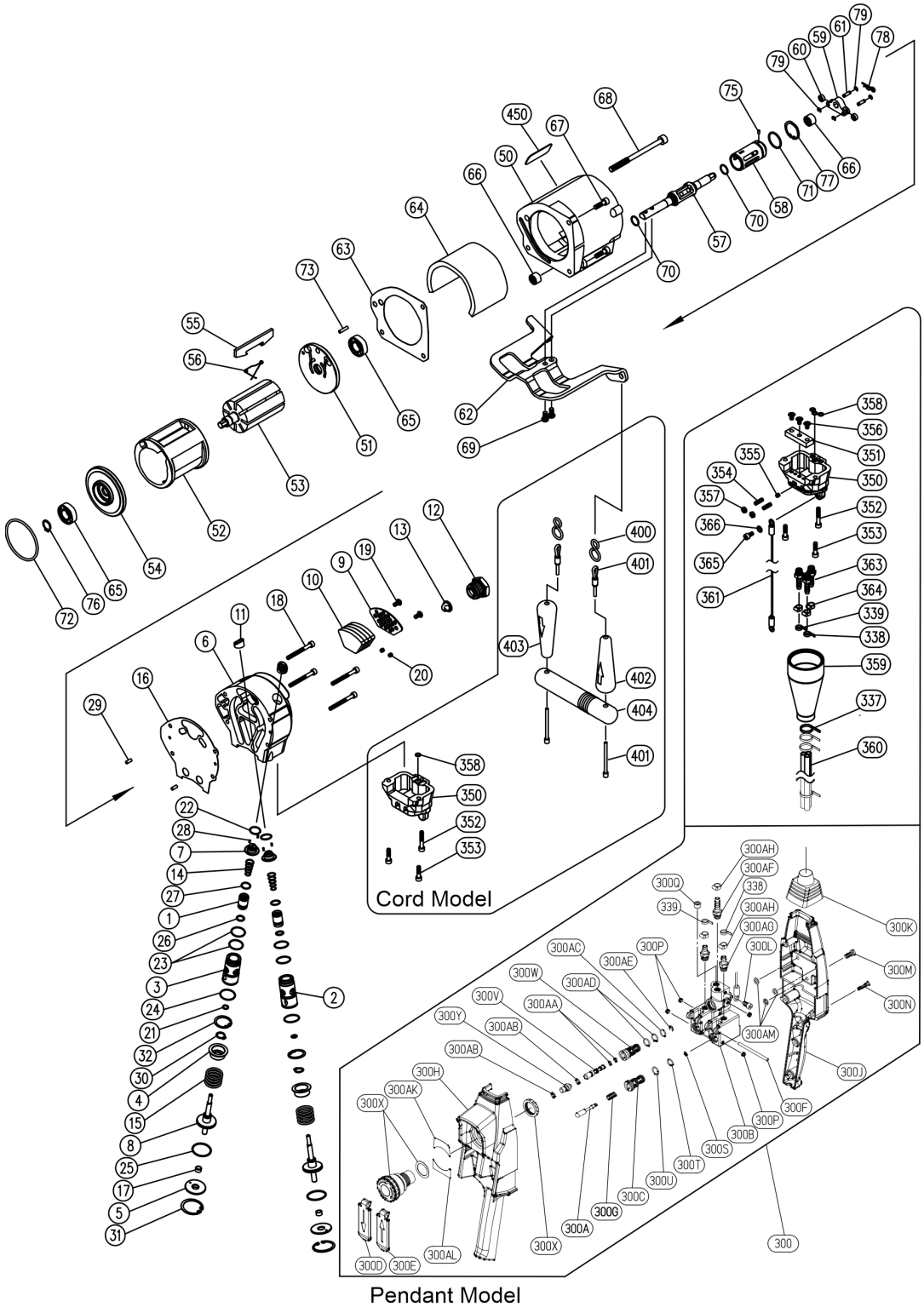


Figure 10-2 Motor, Valve Body and Controls – ¼ through 1 Ton

Figure Number	Name	Parts per hoist	Part Number
1	Throttle Valve	2	AH420215VB0
2	Valve Bushing (Up)	1	TCS426230E90
3	Valve Bushing (Down)	1	TCS426230F00
4	Spring Seat	2	TCS426230C70
5	Valve Cap	2	TCS426230A20
6	Valve Body	1	TCS426230060
7	Bush Cap	2	TCS426230A30
8	Piston	2	TCS426230C60
9	Exhaust Plate TCE IIB	1	TCS426230810
10	Silencer (S)	4	TCS137402023
11	Adjust Cap	2	TCS426230A10
12	Inlet Bushing TCE IIB	1	TCR134703070
13	Screen	1	TCR136803032
14	Valve Spring	2	AH130802030
15	Spring	2	TCS130802224
16	Valve Gasket	1	TCS136102165
17	Bushing	2	TCS130219705
18	Socket Bolt	4	9091235
19	Button-Head Screw	2	AH131905010
20	Set Screw	2	TCR132105005
21	O-Ring	2	TCR131103005
22	O-Ring	2	AH131103013
23	O-Ring	4	AH131103016
24	O-Ring	2	AH131103017
25	O-Ring	2	TCS131117023
26	O-Ring	2	AH131118012
27	O-Ring	2	TCS131103011
28	Spring Pin	4	9148101
29	Spring Pin	2	TCR130604010
30	Retaining Ring	2	9047112
31	Retaining Ring	2	9047232
32	Retaining Ring	2	9047225
50	Motor Case	1	TCS426230790
51	Rear Plate	1	TCS426230180
52	Cylinder	1	TCS426230160
53	Rotor	1	TCS426230150
54	Front Plate	1	TCS426230170
55	Vane	8	TCS137102035
56	Lift Spring	8	TCR130802235
57	Limit Shaft	1	TCS426230460
58	Limit Shaft Bushing	1	TCS426230A40
59	Limit Lever	1	TCS426230140
60	Bearing	2	9001233
61	Roller Shaft	2	TCS426230120
62	Chain Lever TCE 1000C2/P2	1	TCS426251110
63	Motor Gasket	1	TCS136102166
64	Silencer (M)	1	TCS137402024
65	Bearing	2	9000102
66	Needle Bearing	2	TCS130151210
67	Socket Bolt	3	9091250
68	Socket Bolt	1	90912147
69	Socket Bolt	2	9091248

Figure Number	Name	Parts per hoist	Part Number
70	O-Ring	2	TCS131103012
71	O-Ring	1	TCS131103019
72	O-Ring	1	TCS131102009
73	Spring Pin	1	9148152
75	Spring Pin	1	91481169
76	Retaining Ring	1	9047115
77	Retaining Ring	1	9047228
78	Hair Pin Cotter	1	AH130790008
79	Retaining Ring	4	TCS130303003
450	Brand Name Plate	1	AH137309264
451	Warning Tag	1	WTAG7

Cord Model Only:

Figure Number	Name	Parts per hoist	Part Number
62	Chain Lever TCE250/500	1	TCS426230110
350	Under Cover	1	TCS426233470
352	Socket Bolt	1	9091231
353	Socket Bolt	2	9091229
358	O-Ring	3	TCR131103004
400	S-Type Wire	2	TCR130802081
402	Grip (White, Up)	1	AH136602625
403	Grip (Red, Down)	1	AH136602626
404	Handle	1	AH136602627
401R	Red Cord (Down)	2	9013102
401W	White Cord (Up)	2	9013101

10.1 Motor, Valve Body and Controls ¼ through 1 Ton

Pendant Model Only:

Figure Number	Name	Parts per hoist	Part Number
62	Chain Lever TCE250/500	1	TCS426351110
300	Pendant Valve Assembly	1	TCE420248VRD
300A	Throttle Valve	2	TCR420218VB0
300B	Valve Body	1	TCE420228VR0
300C	Bushing	2	TCS420218VF0
300D	Lever D	1	TCK420223W40
300E	Lever U	1	TCK420223W30
300F	Lever Pin	1	TCK130402053
300G	Spring	2	TCS130802220
300H	Front Case	1	TCE420239W50
300J	Rear Case	1	TCE420239W60
300K	Boot	1	TCK136608254
300L	Hex Socket Head Cap Screw	1	TCE131705010
300M	Cross Recessed Head Screw	3	TCK132405014
300N	Cross-Recessed Head Tapping Screw	6	TCK132904220
300P	Hex Socket Set Screw	4	TCR132105005
300Q	Hex Socket Pipe Plug	1	TCR134902003
300S	O-Ring	2	TCS131109001
300T	O-Ring	2	TCR131103008
300U	O-Ring	2	TCS131103009
300V	Emergency Valve	1	TCK420224V61
300W	Emergency Bushing	1	TCK420228V50
300X	Emergency Switch	1	TCK136690503
300Y	Push Rod	1	TCK420228W00
300AA	O-Ring	2	TCR131103002
300AB	O-Ring	2	TCR131103004
300AC	O-Ring	1	TCR131103008
300AD	O-Ring	2	TCS131103009
300AE	Retaining Ring	1	TCK130303004
300AF	Hose Nipple	1	TCS135106301
300AG	Hose Nipple S	2	TCK426230E80
300AH	Hose Band	3	TCK137501012
300AK	Yellow Sticker T	1	TCE137316004
300AL	Yellow Sticker B	1	TCE137316005
300AM	Washer	3	TCE131307105
330	Hose Fitting	3	TCS135106302
332	Hose Clamp	3	TCS137501013
335	S-Type Wire	1	TCR130802081
337	Cable Tie - Red	4	TCS137502034
338	Cable Tie - White	2	TCS137502036
339	Cable Tie - Black	2	TCS137502037
350	Under Cover	1	TCS426230470
351	Pendant Air Silencer	1	TCS137402033
352	Socket Bolt	1	9091231
353	Socket Bolt	2	9091229
354	Set Screw	2	TCS132105016
355	Set Screw	1	TCR132105005
356	Flat Head Machine Screw	3	9096566
357	Hex Nut	2	9093417
358	O-Ring	3	TCR131103004
359	Boot	1	AH136608250
360	Pendant Hose	3@FT	TCS137240925
361	Strain Relief Wire	1	9013120
363	Hose Fitting	3	TCS135106301
364	Hose Clamp	3	9013155
365	Socket Bolt	1	9091225
366	Washer	1	9012511
350	Under Cover	1	TCS426230470
358	O-Ring	1	TCR131103004

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10.1 Motor, Valve Body and Controls 3 through 6 Ton

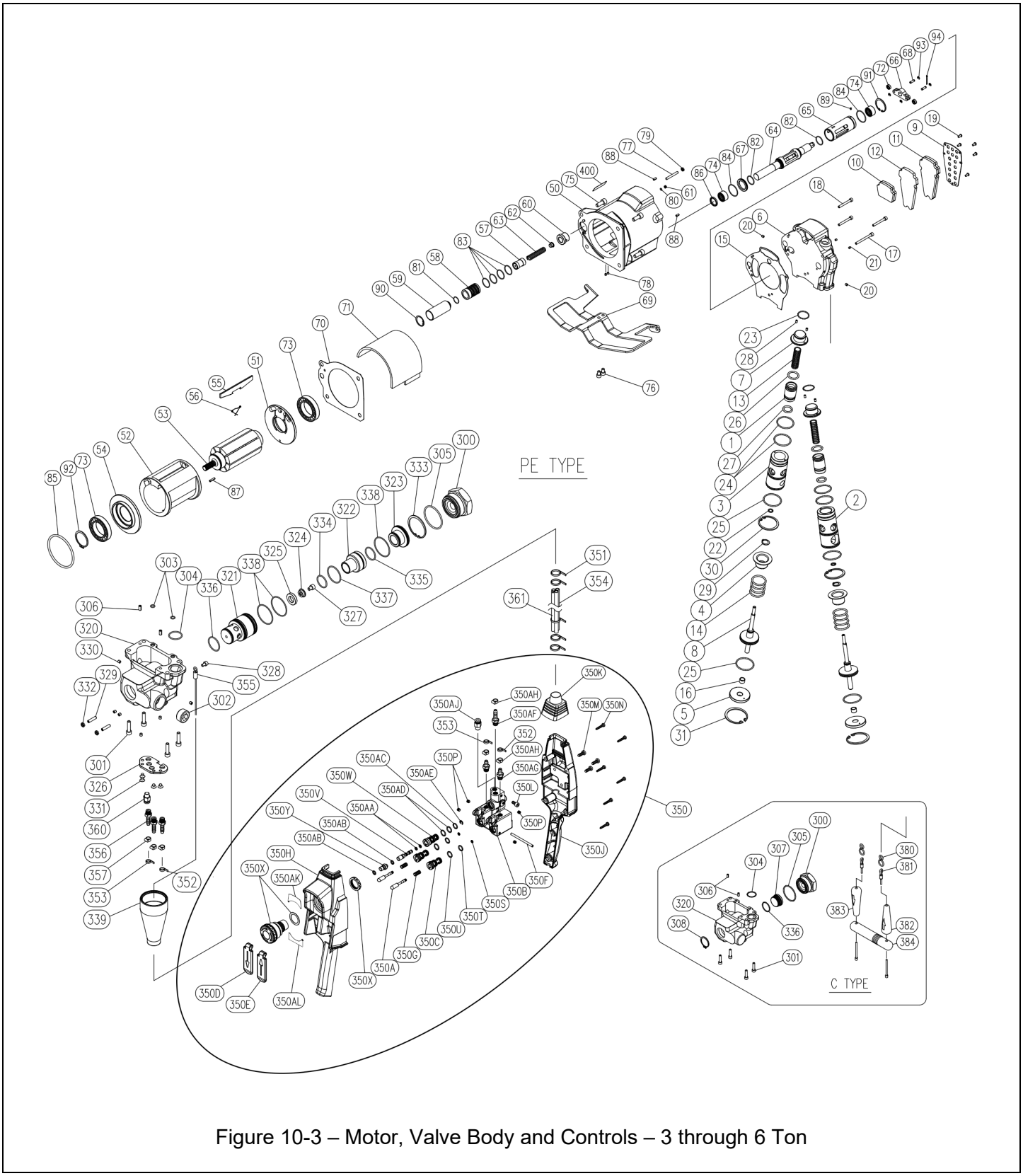


Figure 10-3 – Motor, Valve Body and Controls – 3 through 6 Ton

10.1 Motor, Valve Body and Controls 3 through 6 Ton

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
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	1	TCK425806110
70	Motor Gasket	1	TCK136102172
71	Silencer M CP	1	TCK425806K0B
72	Bearing (605ZZ)	2	9000505
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	9091256
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	TCK425806L0B
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:

*Qty: 4 or 6 depending upon hoist type

Figure Number	Name	Parts per hoist	Part Number
300	Inlet Bushing (NPT) CP	1	TCK425806L0B
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	TCE420229VRD
350A	Throttle Valve	2	TCR420218VB0
350B	Valve Body	1	TCS420226VR0
350C	Bushing	2	TCS420218VF0
350D	Lever Pin	1	TCS130402071
350E	Lever	2	TCS420218VH0
350F	Spring	2	TCS130802220
350G	Set Screw (Hex Skt, M6X6)	1	TCS132106006
350H	O-Ring, S-3 (HS90)	2	TCS131109001
350J	O-Ring, S-10	2	TCR131103008
350K	O-Ring, S-11.2	2	TCS131103009
350L	Hose Fitting	3	TCS135106302
350M	Hose Clamp	3	9013155
350N	S-Type Wire	1	TCR130802081
350P	Hex Socket Set Screw	4	TCR132105005
350Q	Hex socket pipe plug	1	TCR134902003
350S	o-ring	2	TCS131109001
350T	o-ring	2	TCR131103008
350U	o-ring	2	TCS131103009
350V	Emergency valve	1	TCK420224V61
350W	Emergency bushing	1	TCK420228V50
350X	Emergency switch	1	TCK136690503
350Y	Push rod	1	TCK420228W00
350AA	o-ring	2	TCR131103002
350AB	o-ring	2	TCR131103004
350AC	o-ring	1	TCR131103008
350AD	o-ring	2	TCS131103009
350AE	Retaining ring	1	AH130303004
350AF	Hose nipple	1	TCS135106301
350AG	Hose nipple	2	TCK426230E80
350AH	Hose band	3	TCK137501012
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

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10.2 Brake, Gears and Load Suspension Components- ¼ through 1 Ton

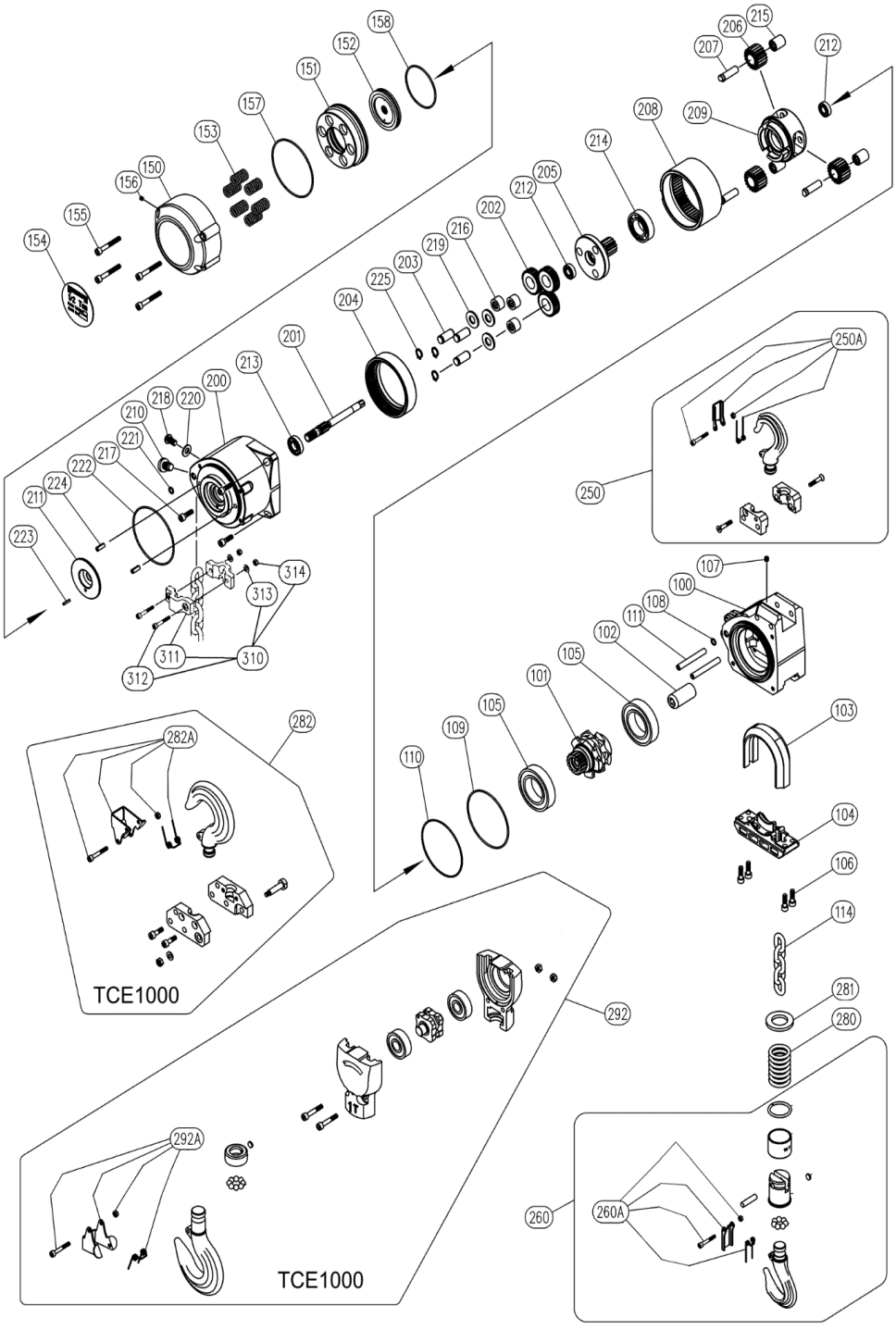


Figure 10-4 Brake, Gears, and Load Suspension Components – ¼ through 1 Ton

Figure Number	Name		Parts per hoist	Part Number
100	Center Housing		1	TCS426230A00
101	Load Sheave		1	TCS426230A50
102	Coupling		1	TCS426230200
103	Chain Guide		1	TCS426230350
104	Chain Separator		1	TCS426230360
105	Bearing		2	9000508
106	Socket Bolt		4	9091250
107	Set Screw		1	TCS132106006
108	O-Ring		1	TCS131103006
109	O-Ring		1	TCS131103052
110	O-Ring		1	TCS131117043
111	Spring Pin		2	TCS130608060
113	Chain Container Assembly		AR	TCSS2623055C
114	Load Chain	TCE IIB	FT	LCER005NP
150	Brake Cover		1	TCS426230410
151	Brake Piston		1	TCS426230400
152	Brake Disk		1	TCS426230430
153	Disk Spring		6	TCR130802213
154	Name Plate	TCE250-IIB	1	TCE137301115
		TCE500-IIB	1	TCE137301116
		TCE1000-IIB	1	TCE137301117
155	Socket Bolt		4	9091255
156	Set Screw		1	TCR132105005
157	O-Ring		1	TCS131103052
158	O-Ring		1	TCS131103045
200	Gear Case		1	TCS426230310
201	First Pinion	TCE250	1	TCS426351A60
		TCE500/1000		TCS426230A60
202	First Star Gear	TCE250	3	TCS426351A70
		TCE500/1000		TCS426230A70
203	First Pin		3	TCS426230A80
204	First Ring Gear		1	TCS426230E10
205	Second Pinion	TCE250	1	TCS426351E20
		TCE500/1000		TCS426230E20
206	Second Star Gear		3	TCS426230E30
207	Second Pin		3	TCS426230E40
208	Second Ring Gear		1	TCS426230E50
209	Cage		1	TCS426230240
210	Lock Screw		1	TCS426230890
211	Brake Plate		1	TCS426230900
212	Bearing		2	9001232
213	Bearing		1	TCS130120004
214	Bearing		1	9000105
215	Needle Bearing		3	TCS130131020
216	Needle Bearing		3	TCS130131212
217	Socket Bolt		3	9091250
218	Button Head Screw		1	9738076

Figure Number	Name		Parts per hoist	Part Number
219	Washer		3	TCS131307012
220	Washer		1	9012513
221	O-Ring		1	TCS131103006
222	O-Ring		1	TCS131103052
223	Spring Pin		1	9148125
224	Spring Pin		2	9148198
225	Retaining Ring		3	9047112
250	Top Hook Complete Set	TCE250-IIB	1	TCE426121L1C
		TCE500-IIB	1	TCE426121L1C
250A	Top Hook Latch Assembly	TCE250/500-IIB	1	TCS420645P1L
260	Bottom Hook Complete Set	TCE250-IIB	1	TCE426119L2D
		TCE500-IIB	1	TCE426121L2D
260A	Bottom Hook Latch Assembly	TCE250/500-IIB	1	TCS420645P1L
310	Chain Down Stopper Complete		1	TCR420620JFC
311	Chain Down Stopper		2	TCR420620JF0
312	Hex Socket Bolt M5x22		2	TCR131705022
313	Hex Nut M5		2	TCR134401005
314	Spring Washer M5		2	TCR131301005

TCE 1000 Top Hook Assembly

282	Top Hook Complete Set	1	TCE426123L1C
282A	Top Hook Latch Assembly	1	TCS426221S3G

TCE 1000 Lower Hook Assembly

292	Bottom Hook Complete Set	1	TCE426123L2D
292A	Bottom Hook Latch Assembly	1	TCS426221S3G

10.2 Brake, Gears and Load Suspension Components- 3 through 6 Ton

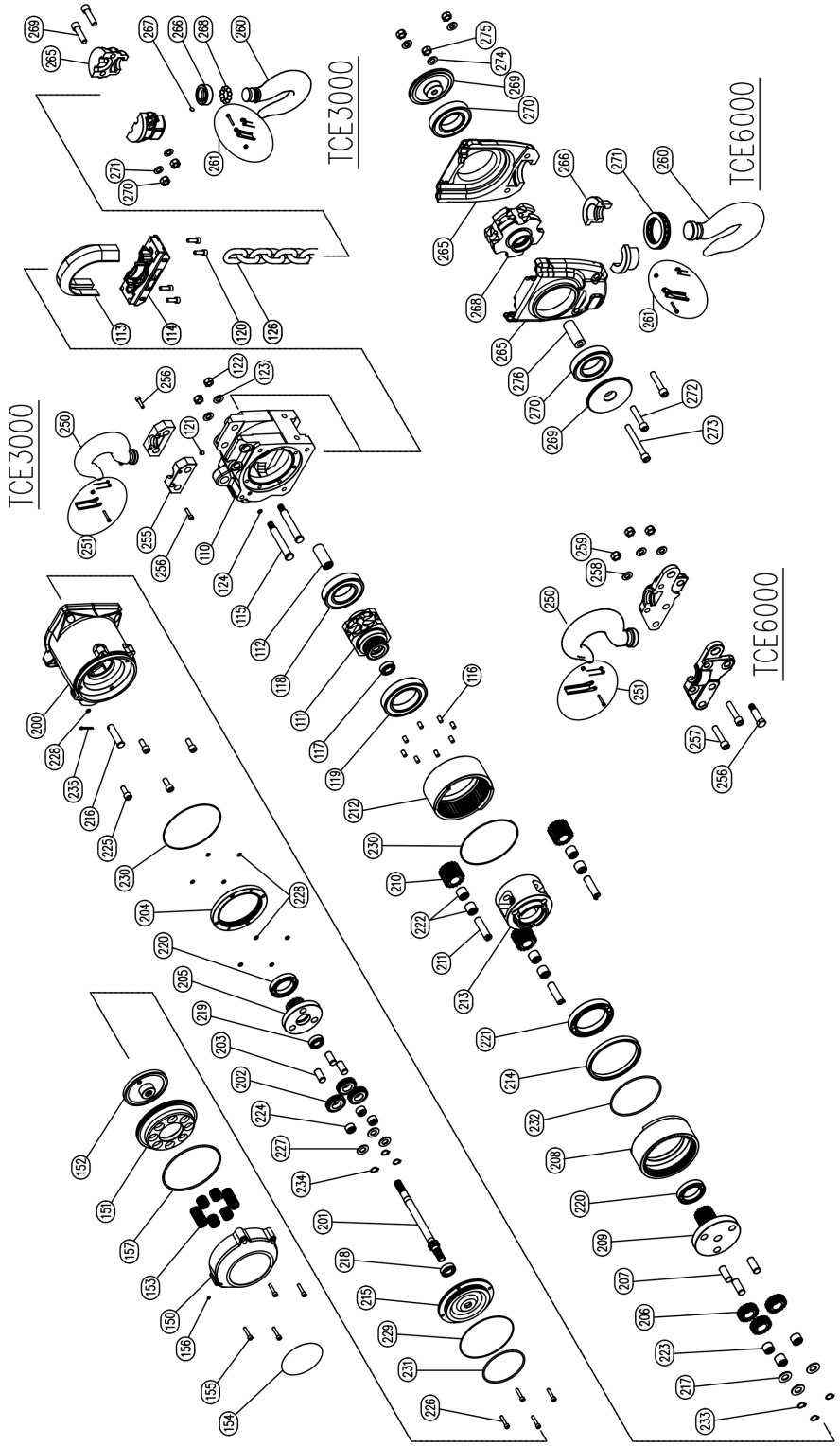


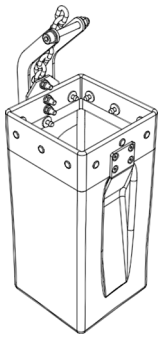
Figure 10-5 Brake, Gears, and Load Suspension Components – 3 through 6 Ton

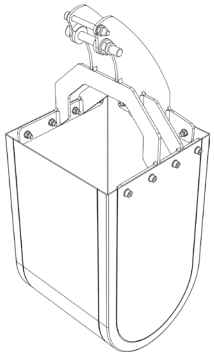
10.2 Brake, Gears and Load Suspension Components- 3 through 6 Ton

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		FT	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	TCE3000	1	TCE137301118
		TCE6000	1	TCE137301119
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

Figure Number	Name		Parts per hoist	Part Number
222	Needle Bearing (TA1620Z)		6	TCK130131621
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 (M4X25)		1	9009434
250	Top Hook Complete Set	TCE3000	1	TCE426125Q8C
		TCE6000	1	TCE426127Q8C
251	Top Hook Latch Assembly	TCE3000	2	TCK420655P1L
		TCE6000	2	TCK420890P1L
255	Hook End Piece	TCE3000	1	TCK425806570
		TCE6000	1	TCK425810570
256	Hex Flat Head Mach. Screw (M6X25)	TCE3000	2	9091251
	Hook Joint Bolt	TCE6000	1	TCK425810580
257	HSHCS (M12X55)	TCE6000	2	90912119
258	Spring Washer (M12)	TCE6000	3	TCK131301012
259	U-Nut M12	TCE6000	3	E2D853125
260	Bottom Hook Complete Set	TCE3000	1	TCE426125Q9C
		TCE6000	1	TCE426127Q9C
261	Bottom Hook Latch Assembly	TCE3000	1	TCK420655P1L
		TCE6000	1	TCK420890P1L

10.3 Chain Container Assembly (ATEX Rated) - ¼ through 6 Ton

Canvas Chain Container	Hoist Capacity	Max Lift		ATEX Rating	Part Number
		(m)	(ft.)		
	TCE250/500	20	65	IIB	8391101
	TCE1000-2	10	32	IIB	

Stainless Steel Chain Container	Hoist Capacity	Max Lift		ATEX Rating	Part Number
		(m)	(ft.)		
	TCE250/500	12	39	IIB	8391102
	TCE1000-2	6	19	IIB	
	TCE250/500	20	65	IIB	8391103
	TCE1000-2	10	32	IIB	
	TCE250/500	34	111	IIB	8391104
	TCE1000-2	17	55	IIB	
	TCE3000	10	32	IIB	8391105
	TCE6000-2	5	16	IIB	
	TCE3000	20	65	IIB	8391106
	TCE6000-2	10	32	IIB	

10.4 Maintenance Kits- ¼ through 1 Ton

TCE 250-1000 Hoist Rebuild Parts:

Figure Number	Name	Part Number	Parts per hoist	
			P/N TCS426231D5D Pendant Controlled Hoist Rebuild Kit	P/N TCS426235D5D Cord Controlled Hoist Rebuild Kit
10	Silencer (S)	TCS137402023	4	4
16	Valve Gasket	TCS136102165	1	1
21	O-Ring (S-7)	TCR131103005	2	2
22	O-Ring (S-15)	AH131103013	2	2
23	O-Ring (S-20)	AH131103016	4	4
24	O-Ring (S-22)	AH131103017	2	2
25	O-Ring (AS568-023)	TCS131117023	2	2
26	O-Ring (AS568-012 HS90)	AH131118012	2	2
27	O-Ring (S-12.5)	TCS131103011	2	2
55	Vane	TCS137102035	8	8
56	Lift Spring	TCR130802235	8	8
63	Motor Gasket	TCS136102166	1	1
64	Silencer (M)	TCS137402024	1	1
70	O-Ring S-14	TCS131103012	2	2
71	O-Ring S-24(Air Inlet Swivel)	TCS131103019	1	1
72	O-Ring (G-65)	TCS131102009	1	1
108/221	O-Ring (S-8)	TCS131103006	2	2
109/157/222	O-Ring (S-90)	TCS131103052	3	3
110	O-Ring (AS568-043)	TCS131117043	1	1
158	O-Ring (S-65)	TCS131103045	1	1
351	Pilot Silencer (Pendant Only)	TCS137402033	1	N/A
358	O-Ring (S-6)	TCR131103004	3	1

10.4 Maintenance Kits - 3 through 6 Ton

TCE3000/6000 Air Motor Maintenance Kit No. TCKAH0002010:

Figure Number	Name	Parts per hoist	Part Number
010	Pilot Silencer (SS)	2	TCK137402055
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

TCE3000/6000 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

TCE3000/6000 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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