
OWNER'S MANUAL

AIR POWERED CHAIN HOIST AL/AW/AS SERIES

¼ Ton through 5 Ton Capacity

Code Number and Serial Number

WARNING

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

HARRINGTON
A KITO GROUP COMPANY

Table of Contents

Section	Page Number
1.0 Important Information and Warnings.....	4
1.1 Terms and Summary	
1.2 AW Features and Compliances for Wash Down Application	
1.3 AS Stainless Steel Load Chain	
1.4 Explanation of ATEX Directives and Markings	
1.5 Warning Tags and Labels	
2.0 Technical Information.....	10
2.1 Specifications	
2.2 Dimensions	
3.0 Pre-operational Procedures.....	16
3.1 Environmental Classification	
3.2 Air Supply System Requirements	
3.3 Air Supply Capacity and Regulation	
3.4 Air Lubrication	
3.5 Air Filtration	
3.6 Air Dryer	
3.7 Piping, Hoses and Fittings	
3.8 Mounting Location	
3.9 Connecting Hoist to Air Supply	
3.10 Mounting the Hoist	
3.11 Optional Chain Container	
3.12 Non-Stationary Application	
3.13 Preoperational Checks and Trial Operation	
4.0 Operation.....	24
4.1 Introduction	
4.2 Shall's and Shall Not's for Operation	
4.3 Hoist Controls	
4.4 Adjusting the Controls	

Section	Page Number
4.5 Operation of the Load Limiter	
4.6 Special Operation – Lowering the Load Without Air Supply	
5.0 Inspection.....	31
5.1 General	
5.2 Inspection Classification	
5.3 Frequent Inspection	
5.4 Periodic Inspection	
5.5 Occasionally Used Hoists	
5.6 Inspection Records	
5.7 Inspection Methods and Criteria	
6.0 Lubrication.....	39
6.1 Air Hoist Lubrication	
6.2 Load Chain Lubrication	
6.3 Hooks and Suspension Components	
7.0 Maintenance & Handling.....	40
7.1 Load Limiter	
7.2 Brake	
7.3 Load Chain	
7.4 Pendant	
7.5 Load Sheave Inspection	
7.6 Operational Environment	
7.7 Storage	
7.8 Outdoor Installation	
8.0 Troubleshooting.....	48
9.0 Warranty.....	50
10.0 Parts List.....	52

1.0 Important Information and Warnings

1.1 Terms and Summary

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

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

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

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

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

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

⚠ CAUTION

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

This manual includes instructions and parts information for a variety of 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 on the front cover of this manual for identification and future reference to avoid referring to the wrong manual for information or instructions on installation, operation, inspection, maintenance, or parts.

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

DANGER

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

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

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

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

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

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

Special Conditions for using the hoist in a potentially explosive environment according to its ATEX rating:

- Non-compliance with any of these "Special Conditions" could result in ignition of potentially explosive atmospheres
- The hoist must be used according to the operating conditions recommended in this manual. Exceeding the recommended temperatures or air pressure could result in increased surface temperatures and the hoist can become an ignition source.
- Ensure the hoist is grounded to the equipotential bonding system of the workspace (for example, through accessories such as hoses and air-pressure connections) to prevent ignition hazards from electrostatic discharge.
- Do not allow hard contact of the bottom block, hook, load chain or pendant against other objects. The impact of any hoist component beyond normal use may cause an ignition hazard from sparks.
- If the hoist is installed with a trolley or part of other equipment, ensure that the entire equipment complies with the ATEX requirements needed for the application.
- Regular hoist inspection and maintenance is required to maintain the ATEX rating. That includes checking the hoist for correct operation, and where appropriate, repairs as necessary, to maintain proper material coatings (plating and lubrication), to ensure protection from corrosion, wear, resistance, electrical conductivity, impact strength, ageing resistance and effects of temperature variation. (Examples: material plating loss due to wear will remove resistance to corrosion, spark resistance; lack of bearing lubrication could lead to increased operating temperatures, reducing spark resistance).
- If elevated temperatures or elevated vibration levels are detected, shut the hoist off and discontinue its use until it can be inspected and/or repaired.
- See **Paragraph 1.3** for more ATEX related information.

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

DANGER

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

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

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

NOTICE

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

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

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

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

NOTICE

Harrington AW wash down hoists are designed for applications which require regular washing of lifting equipment. All products should be tested for suitability on a particular application prior to actual use. The Occupational Safety and Health Act of 1970 places the burden of compliance with the owner/employer, not the manufacturer. Many OSHA requirements are not concerned or connected with the manufactured product but are associated with the final installation. It is the owner's and user's responsibility to determine the suitability of a product for any particular use. It is recommended that all applicable industry, trade association, federal, state and local regulations be checked. Read all operating instructions and warnings before operation.

1.2 AW Features and Compliances for Wash Down Application:

- Unpainted aluminum body
- Stainless steel and electroplated external components
- The formulation of NEVASTANE SL chain oil complies with the FDA chapter 21 CFR, 178.3570.
- Zinc plated and blue chromate load chain and hooks
- The formulation of Mobil SHC Polyrex 005 gearbox grease complies with the FDA chapter 21 CFR, 178.3570

1.3 AS Stainless Steel Load Chain

⚠️ WARNING Stainless steel load chain is equipped on AS003/005 models as standard and is optional on AW005 model hoists. Stainless steel load chain has a higher rate of wear than alloy steel load chain. For this reason, the stainless chain should not be used on double fall models, and the service/inspection classification of stainless load chain models should be considered “severe” as defined in Section 5. Refer to Section 5 and 6 for inspection, maintenance, and lubrication requirements.

1.4 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 Directive 94/9/EC, commonly referred to as the ATEX Directive (ATEX is from the French ATmospheres EXplosibles), and its supporting standards.

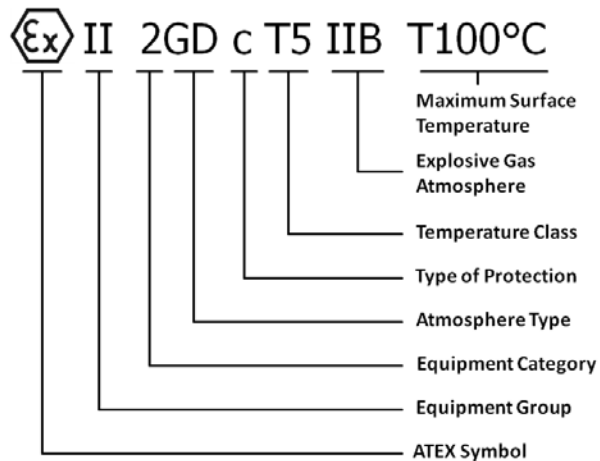
The explosion protection and prevention measures for non-electrical equipment such as air hoists differ from those applied to electrical equipment. Requirements for non-electrical equipment are provided in the EN 13463 series of standards. Air hoists that meet the appropriate requirements of the EN 13463 standards satisfy the ATEX Directive and can be used in potentially explosive atmospheres.

Harrington's AL/W hoists use the “constructional safety” type of protection in accordance with EN 13463-5 *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 EN 13463-5 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 EN 13463 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.

Table 1-1 ATEX Rating Explanation



Marking	Definition	AL/W Hoist	AS Hoist
ATEX Symbol	Equipment suitable for potentially explosive atmospheres in accordance with the ATEX Directive.	Ex	Ex
Equipment Group	<p>'I' means suitable for use in mines susceptible to firedamp and/or coal dust.</p> <p>'II' means suitable for non-mine locations that could be endangered by potentially explosive atmospheres.</p>	II	II
Equipment Category	<p>'1' means for use in areas where an explosive atmosphere is present continuously, for long periods, or frequently.</p> <p>'2' means for use in areas where an explosive atmosphere is likely to occur in normal operation.</p> <p>'3' means for use in areas where an explosive atmosphere is unlikely to occur in normal operation.</p>	2	2
Atmosphere Type	<p>'G' means suitable for Gas.</p> <p>'D' means suitable for Dust.</p>	GD	GD
Type of Protection	This letter indicates the type of protection method used. There are several. "c" means constructional safety.	c	c
Temperature Class	Designation that indicates the maximum surface temperature the hoist will have during normal operation. There are several designations. T5 = 100°C	T5	T5
Explosive Gas Atmosphere	Designation that indicates the type of gases, vapors and mists the hoist is suitable for. Designations applicable to Equipment Group II: <p>'IIA' means atmosphere containing methane, propane, or similar gases.</p> <p>'IIB' means atmosphere containing ethylene or similar gases.</p> <p>'IIC' means atmospheres containing hydrogen, acetylene, or similar gases.</p>	IIB	IIC
Maximum Surface Temperature	The maximum surface temperature the hoist will have during normal operation.	T100°C	T100°C

Actual AL/W Nameplate Marking: II 2GD c T5 IIB T100°C

Actual AS Nameplate Marking: II 2GD c T5 IIC T100°C

1.5 Warning Tags and Labels

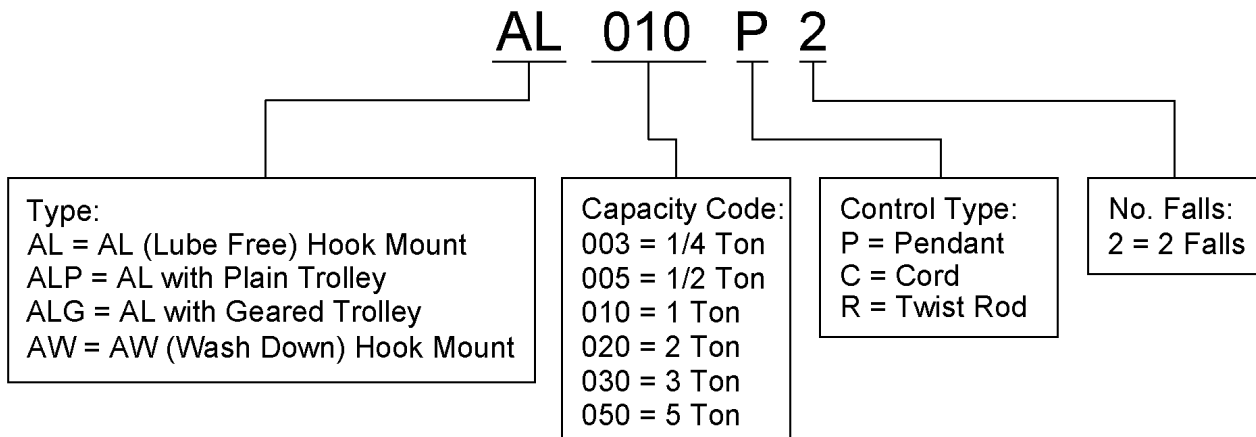
The warning tag illustrated below in **Figure 1-1** is supplied with each hoist shipped from the factory. If the tag is not attached to your hoist (for pendant control, the warning tag is attached to the pendant hose; for the pull cord control, the warning tag is attached to the up cord), order a tag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



2.0 Technical Information

2.1 Specifications

2.1.1 Product Code



Note: "AL/W/S" designations in this manual apply to AL, AW, and AS hoist models

2.1.2 Operating Conditions and Environment

Temperature range:	+14°F(-10°C) to +104°F(+40°C)**
	**[+160°F(+70°C) for non ATEX applications]
Relative Humidity:	85% or less
Altitude:	6,000 ft. (1,830 m) or less
Noise Level:	83 dba maximum @ 1 meter when lifting rated load 83 dba maximum @ 1 meter when lowering rated load
Supply Air Pressure:	90 pounds per square inch
Air Consumption:	64 to 102 cubic feet minute
Air Filtration Requirements:	Maximum 15 micron air filter
Load Limiter:	Adjustable; Factory set to 125% of rated capacity

Table 2-1 Hoist Specifications											
	Cap. (Tons)	Product Code	Standard Lift (ft)	Push Button Hose /Cord /Twist Rod 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	AL/S003P	10	7.5	85 / 66	61 / 105	98 / 64	78 / 72	6.5x1	39	0.6
	1/2	ALW/S005P			78 / 49	41 / 72	102 / 68	81 / 74	6.5x1	39	0.6
	1	ALW/010P2			39 / 25	21 / 36	102 / 68	81 / 74	6.5x2	55	0.6
	2	AL020P			20 / 18	14 / 20	102 / 76	103 / 85	11.5x1	123	1.9
	3	AL030P			20 / 18	10 / 22	102 / 76	86 / 87	11.5x1	123	1.9
	5	AL050P2		8.6	9.8 / 8.9	5.2 / 9.8	102 / 76	85 / 81	11.5x2	234	1.9
Cord Model	1/4	AL/S003C	10	7.5	85 / 66	61 / 105	98 / 64	78 / 72	6.5x1	37.5	0.6
	1/2	ALW/S005C			78 / 49	41 / 72	102 / 68	81 / 74	6.5x1	37.5	0.6
	1	ALW/010C2			39 / 25	21 / 36	102 / 68	81 / 74	6.5x2	53	0.6
	2	AL020C			20 / 18	14 / 20	102 / 76	103 / 85	11.5x1	121	1.9
	3	AL030C			20 / 18	10 / 22	102 / 76	86 / 87	11.5x1	121	1.9
	5	AL050C2		8.6	9.8 / 8.9	5.2 / 9.8	102 / 76	85 / 81	11.5x2	232	1.9
Twist Rod Model	1/4	AL/S003R	10	3.5 to 6.5	85 / 66	61 / 105	98 / 64	78 / 72	6.5x1	39	0.6
	1/2	ALW/S005R			78 / 49	41 / 72	102 / 68	81 / 74	6.5x1	39	0.6
	1	ALW/010R2			39 / 25	21 / 36	102 / 68	81 / 74	6.5x2	54	0.6
	2	AL020R			20 / 18	14 / 20	102 / 76	103 / 85	11.5x1	123	1.9
	3	AL030R			20 / 18	10 / 22	102 / 76	86 / 87	11.5x1	123	1.9
	5	AL050R2		3.5 to 6.5	9.8 / 8.9	5.2 / 9.8	102 / 76	85 / 81	11.5x2	234	1.9

2.2 Dimensions

Table 2-3 A(L/W/S) with Pendant Control Dimensions										
Cap. (Tons)	Product Code	Headroom C (in)	a (in)	b (in)	d (in)	e (in)	g (in)	h (in)	i (in)	j (in)
1/4	AL/S003P	14.8	15.9	7.7	7.2	6.6	1.1	4.8	2.9	0.7
1/2	AL/W/S005P	14.8	15.9	7.7	7.2	6.6	1.1	5.1	2.6	1.0
1	AL/W010P2	17.5	15.9	7.7	7.2	6.6	1.1	5.1	2.6	1.0
2	AL020P	22.6	22.0	11.3	10.4	9.6	2.0	7.8	3.5	1.5
3	AL030P	22.6	22.0	11.3	10.4	9.6	2.0	7.8	3.5	1.5
5	AL050P2	30.9	22.0	13.7	10.4	9.6	2.4	8.9	4.7	2.7

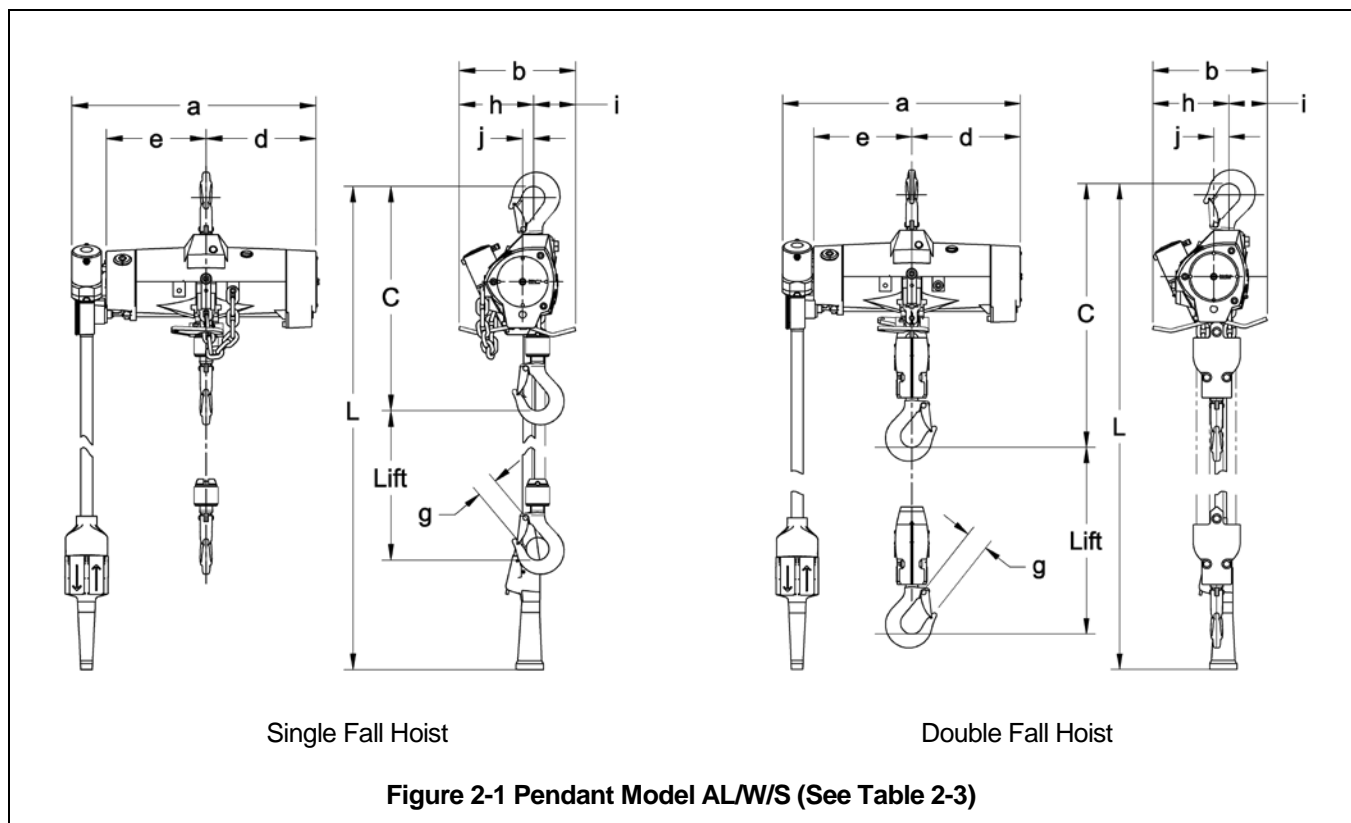


Table 2-4 AL/W/S with Cord Control Dimensions											
Cap. (Tons)	Product Code	Headroom C (in)	a (in)	b (in)	d (in)	e (in)	g (in)	h (in)	i (in)	j (in)	k (in)
1/4	AL/S003C	14.8	15.4	7.7	7.2	6.7	1.1	4.8	2.9	0.7	8.7
1/2	AL/W/S005C	14.8	15.4	7.7	7.2	6.7	1.1	5.1	2.6	1.0	8.7
1	AL/W010C2	17.5	15.4	7.7	7.2	6.7	1.1	5.1	2.6	1.0	8.7
2	AL020C	22.6	21.5	13.7	10.4	9.6	2.0	7.8	5.9	1.5	8.7
3	AL030C	22.6	21.5	13.7	10.4	9.6	2.0	7.8	5.9	1.5	8.7
5	AL050C2	30.9	21.5	13.7	10.4	9.6	2.4	8.9	4.7	2.7	8.7

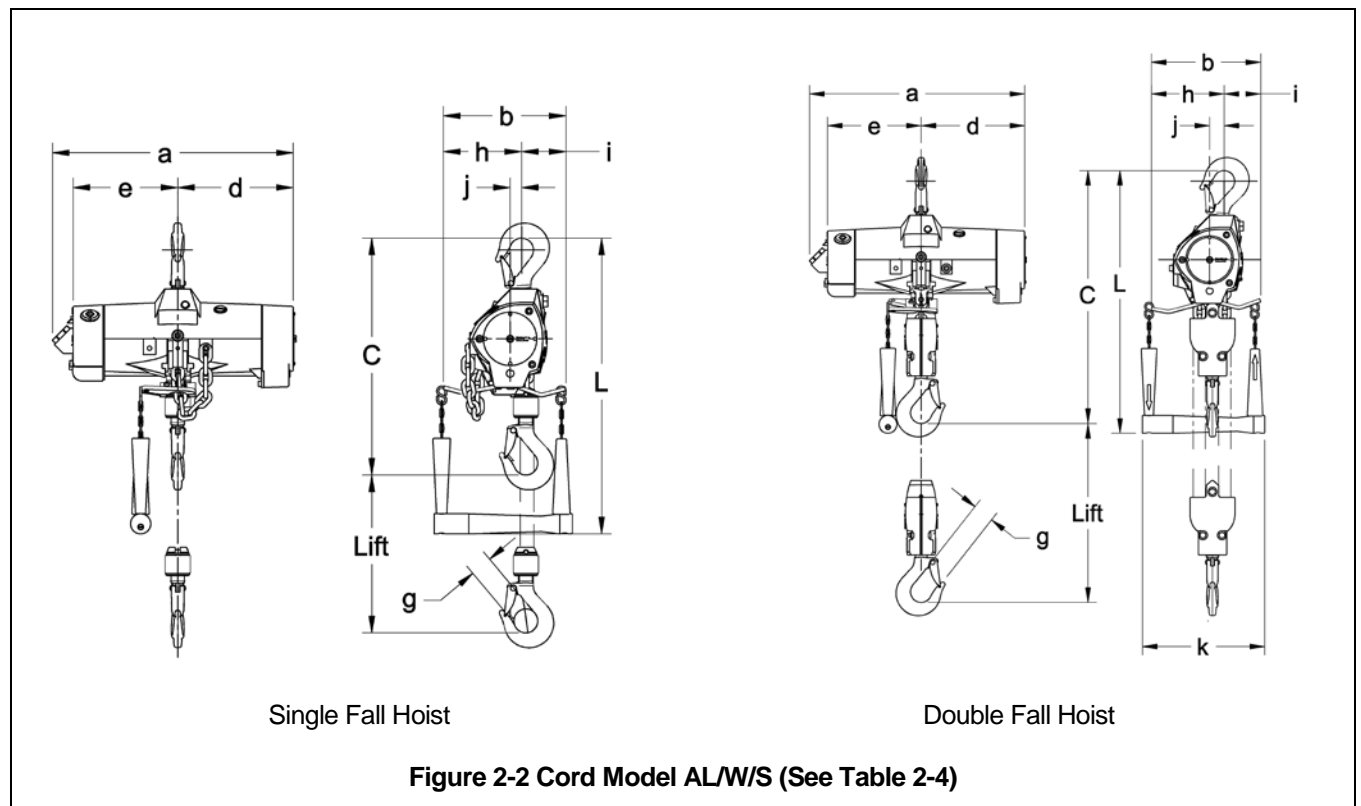


Table 2-5 AL/W/S with Twist Rod Control Dimensions										
Cap. (Tons)	Product Code	Headroom C (in)	a (in)	b (in)	d (in)	e (in)	g (in)	h (in)	i (in)	j (in)
1/4	AL/S003R	14.8	15.4	7.7	7.2	6.7	1.1	4.8	2.9	0.7
1/2	AL/W/S005R	14.8	15.4	7.7	7.2	6.7	1.1	5.1	2.6	1.0
1	AL/W010R2	17.5	15.4	7.7	7.2	6.7	1.1	5.1	2.6	1.0
2	AL020R	22.5	21.5	13.7	10.4	9.6	2.0	7.8	5.9	1.5
3	AL030R	22.5	21.5	13.7	10.4	9.6	2.0	7.8	5.9	1.5
5	AL050R2	30.9	21.5	13.7	10.4	9.6	2.4	8.9	4.7	2.7

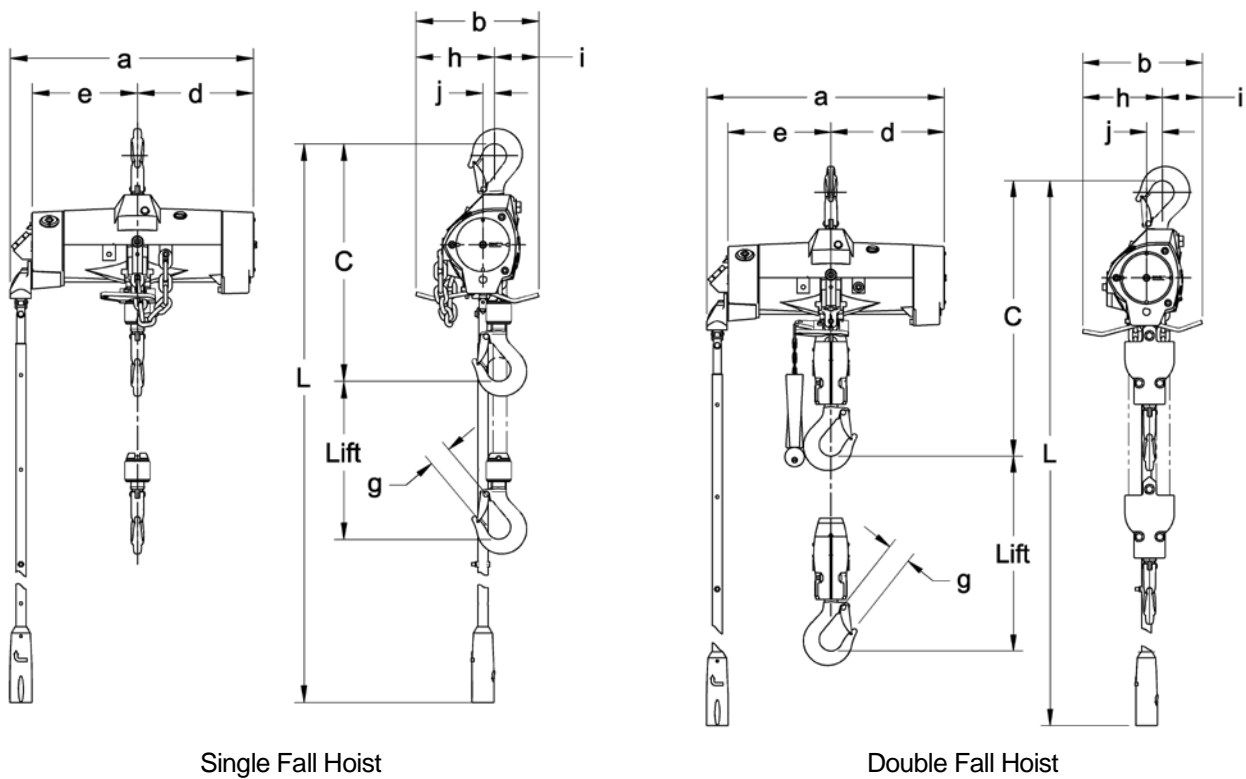
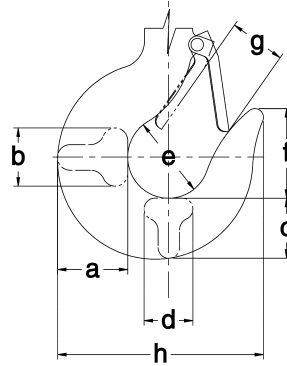


Figure 2-3 Twist Rod Model AL/W/S (See Table 2-5)

Table 2-6 Top and Bottom Hook Dimension*



Units = inch

Product Code	a	b	c	d	e	f	g	h
AL/S003C/P/R	1.02	0.79	1.02	0.79	1.50	1.32	1.14	3.43
AL/W/S005C/P/R	1.02	0.79	1.02	0.79	1.50	1.32	1.14	3.43
AL/W010C2/P2/R2	1.02	0.79	1.02	0.79	1.50	1.32	1.14	3.43
AL020C/P/R	1.65	1.26	1.40	1.10	2.28	2.32	1.97	5.20
AL030C/P/R	1.65	1.26	1.40	1.10	2.28	2.32	1.97	5.20
AL050C2/P2/R2	1.97	1.57	1.73	1.30	2.76	2.72	2.36	6.30

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

3.0 Preoperational Procedures

3.1 Environmental Classification

- 3.1.1 Consult a qualified person to determine ATEX requirements for your specific application/environment.
- 3.1.2 Ensure the hoist's ATEX rating is suitable for the environmental classification. Refer to the hoists nameplate for ATEX rating and reference **Section 1.3** for explanation of ATEX directives and marking.

3.2 Air Supply System Requirements

- 3.2.1 **NOTICE** Pressure and Flow – Verify that the air supply system has capacity to supply the air hoist with required pressure and flow. Otherwise the hoist may operate poorly or may fail to operate. See **Section 3.2**.
- 3.2.2 **CAUTION** Air Quality – Good air quality is essential to prevent damage to the 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**.
- 3.2.3 This hoist is equipped with a lube-free vane motor that does not require lubrication of the supply air for operation. However, if the hoist supply air is lubricated, there is no disadvantage. For further information, see **Section 3.3**.

3.3 Air Supply Capacity And Regulation

- 3.3.1 Capacity – The air supply system must be capable of delivering the required airflow (cfm) to the hoist inlet port. Without the required airflow the hoist will not operate properly or may not operate at all. See **Section 2.0** for the hoist air consumption requirements. In determining if the air supply 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 fittingsInadequate capacity will cause a significant drop in pressure when the hoist is operated, and could cause poor performance or failure to operate.
- 3.3.2 Regulation – The hoist requires a constant supply of air at a pressure of 90 psi to work properly. If the air supply is not regulated or is regulated at a pressure greater than 90 psi, a regulator must be used. The regulator may be located anywhere upline of the lubricator in the air supply to the hoist.

3.4 Air Lubrication

- 3.4.1 AL/W hoists do not require supply air lubrication for safe operation; however if the hoist supply air is lubricated, there is no disadvantage.
- 3.4.2 If using lubrication, follow the guidelines below for the best results. The lubricator must be located as follows:
 - 1) **Best location** – At the hoist inlet. In this case the lubricator can be either the mist type or drop type.
 - 2) **Second best location** – No more than 15 feet away from the hoist, at the same elevation or above the hoist inlet. In this case the mist type lubricator must be used.
 - 3) **Third best location** – No more than 15 feet away below the hoist. In this case the mist type lubricator must be used.

- 3.4.3 **⚠ CAUTION** If a lubricator is used it must be set to deliver the equivalent of 6 to 10 drops of oil per minute (0.1 to 0.2 cc/minute). The hoist's exhaust will emit a fine oil mist when properly lubricated.

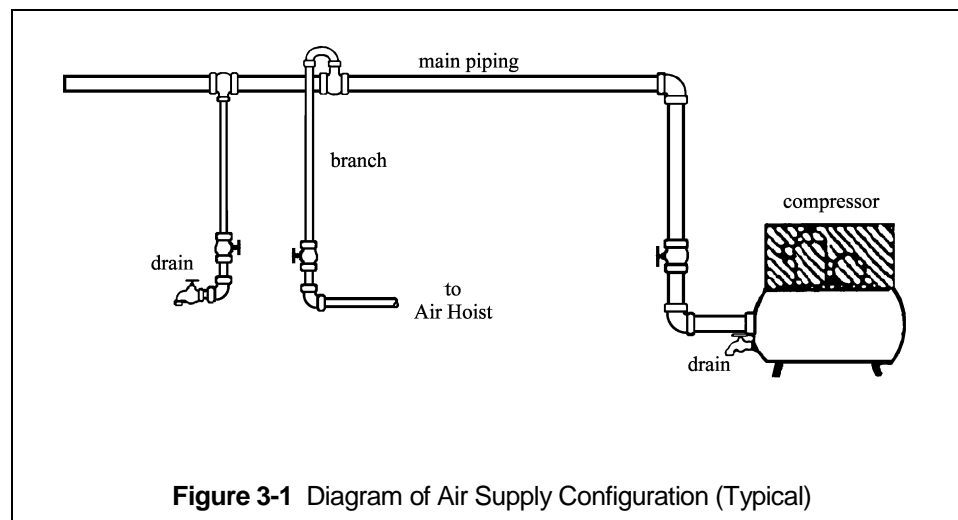
3.5 Air Filtration

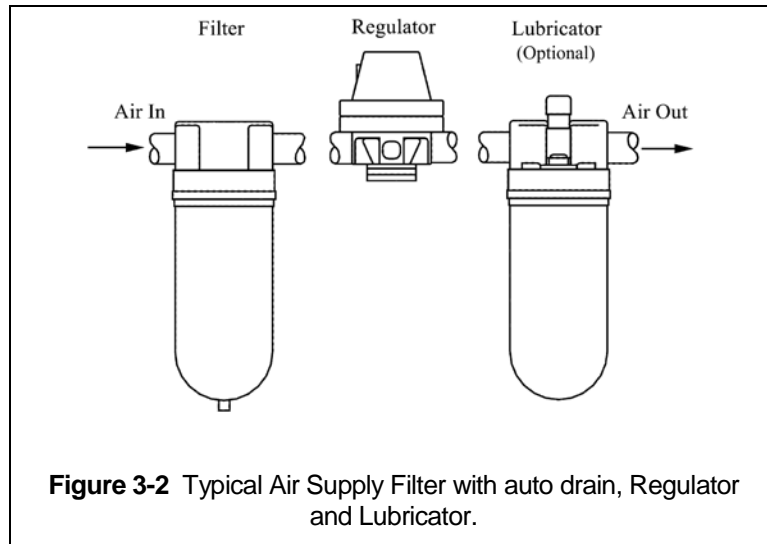
- 3.5.1 **⚠ CAUTION** The air entering the hoist inlet must not contain any particulate greater than 15 microns in size. Therefore, the hoist must have a 15 micron filter in its air supply. If using a lubricator, the filter must be upstream.²
- 3.5.2 The filter servicing the hoist can also service other hoists and air consuming equipment. In this case, the air filter must be sized for the total air consumption of the equipment it is servicing.
- 3.5.3 It is recommended to use a filter with automatic draining capability, to prevent excessive moisture accumulation.

- 3.6 **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.

3.7 Piping, Hoses And Fittings

- 3.7.1 **⚠ 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 (auto draining model), regulator (if equipped), and lubricator must be arranged in the order shown in **Figure 3-2**.



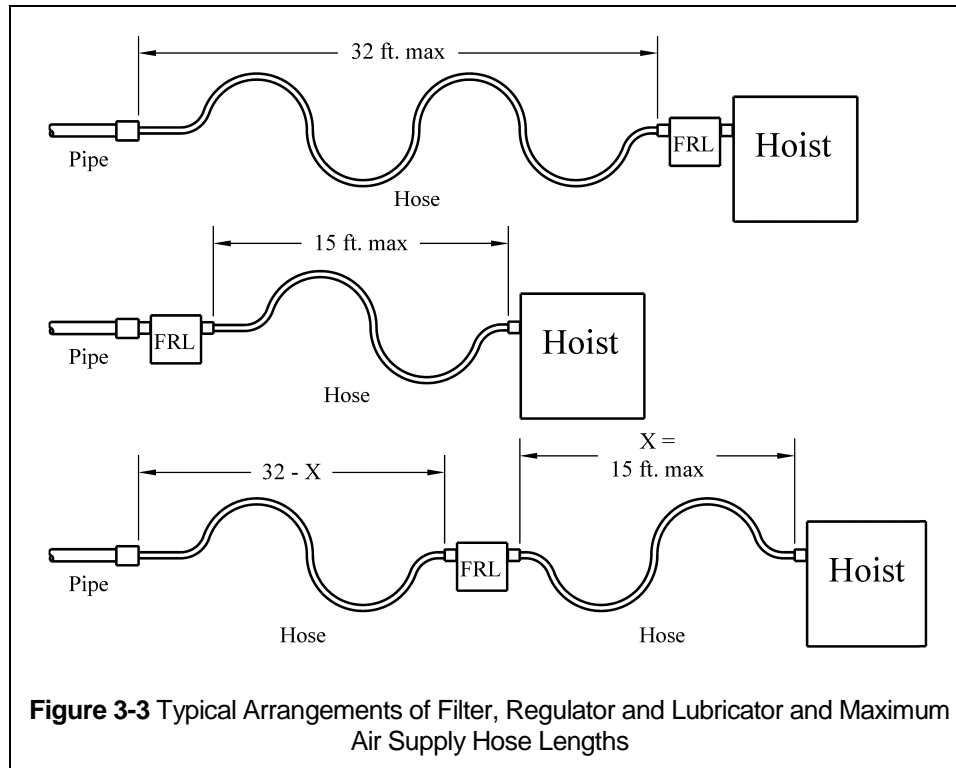


3.7.2 **NOTICE** Piping – Pipe should be sized to accommodate the hoist airflow requirements. Table 3-1 gives recommended pipe sizes.

Table 3-1 Air Supply Pipe and Hose Sizes			
Model	Hose length	Diameter of Supply Pipe	Diameter of Supply Hose
AL003, AL/W/S005, AL/W010, AL020, AL030, AL050	Less than 16ft	Inside diameter 0.75 inch or larger	Inside diameter 0.5 inch or larger
	Greater than 16ft	Inside diameter 0.875 inch or larger	Inside diameter 0.625 inch or larger

3.7.3 **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.



3.7.4 **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.

3.7.5 **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.

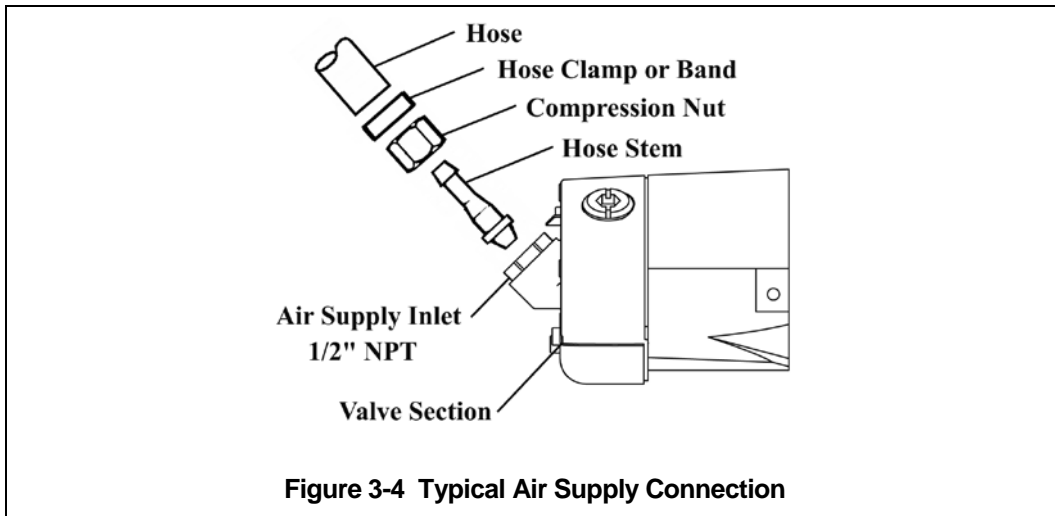
3.8 Mounting Location

3.8.2 **WARNING** Prior to mounting the hoist ensure that the suspension and its supporting structure are adequate to support the hoist and its loads. If necessary consult a professional that is qualified to evaluate the adequacy of the suspension location and its supporting structure.

3.8.3 **NOTICE** See **Section 7.8** for outdoor installation considerations.

3.9 Connecting Hoist to Air Supply

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



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

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

3.9.4 Make connections to air supply; reference **Figure 3-4**. Use a reducing adapter at the hoist valve section for hose sizes larger than 1/2 inch.

3.9.5 **NOTICE** Where conditions dictate, the installation sequence can be reversed by mounting the hoist first (**Section 3.9**) followed by connecting the air supply (**Section 3.8**).

3.10 Mounting the Hoist

3.10.1 Manual Trolley - Follow instructions in Owner’s Manual provided with the trolley.

3.10.2 Motorized Trolley - Follow instructions in Owner’s Manual provided with the trolley.

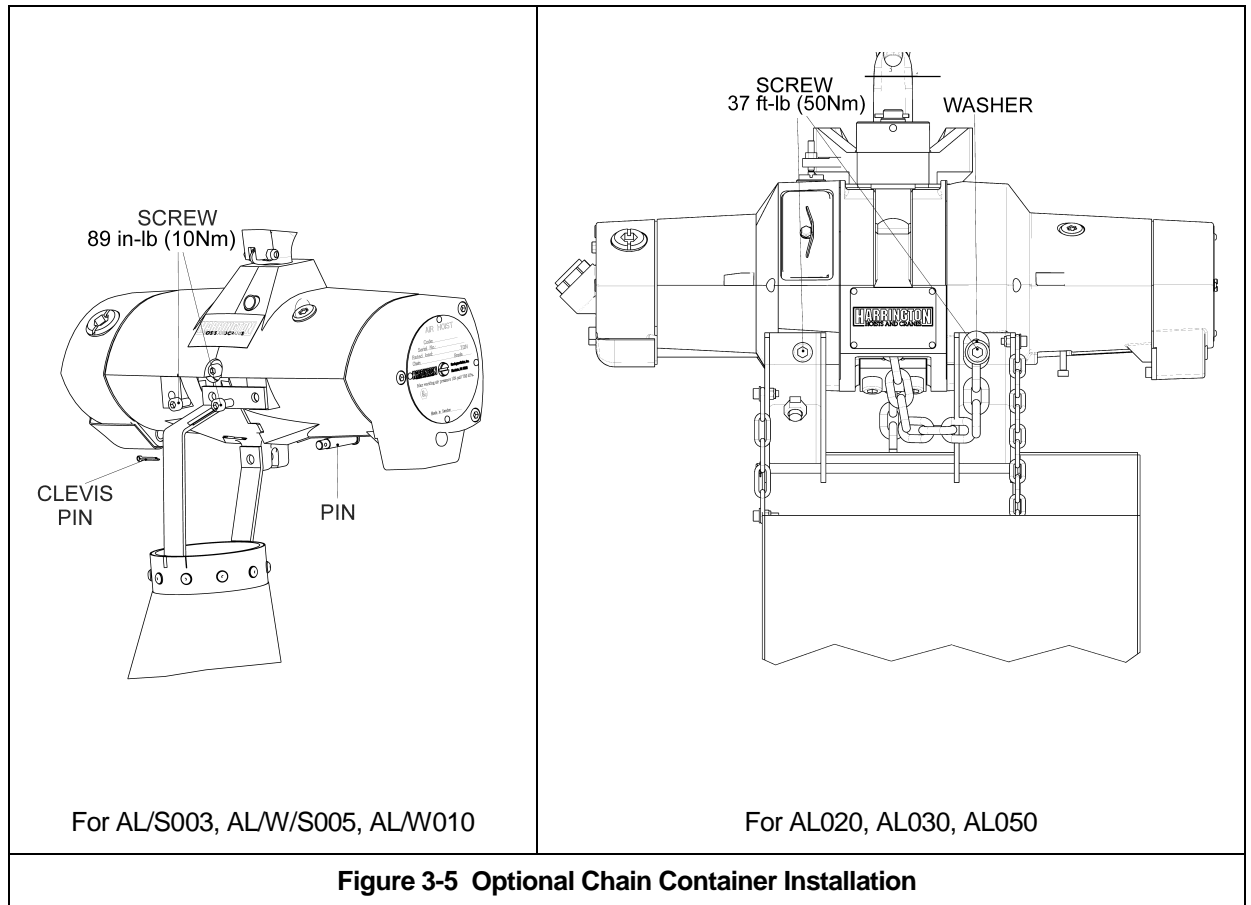
3.10.3 Hook Mounted to a Fixed Location - Attach the hoist’s top hook to the fixed suspension point.

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

3.11 Optional Chain Container

3.11.1 For installation of the optional chain container refer to **Figure 3-5** and perform the following:

- Torque and loctite all fasteners to the values shown.
- Feed the chain into the chain container beginning with the free end. Take care to avoid twisting or tangling the chain.
- Do not use the chain container if any parts are damaged or if any fastener/hardware is missing.



3.12 Non-Stationary Application

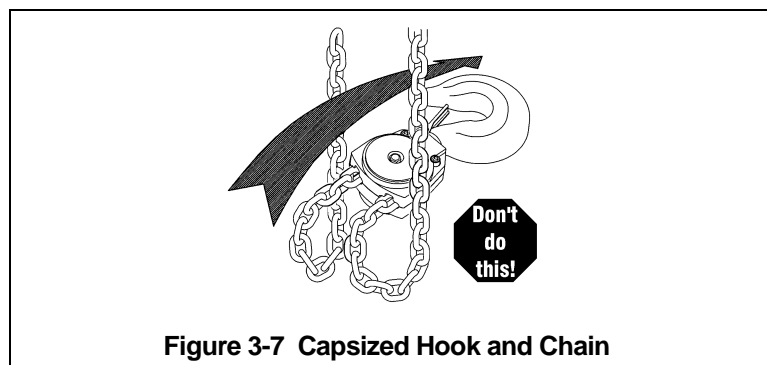
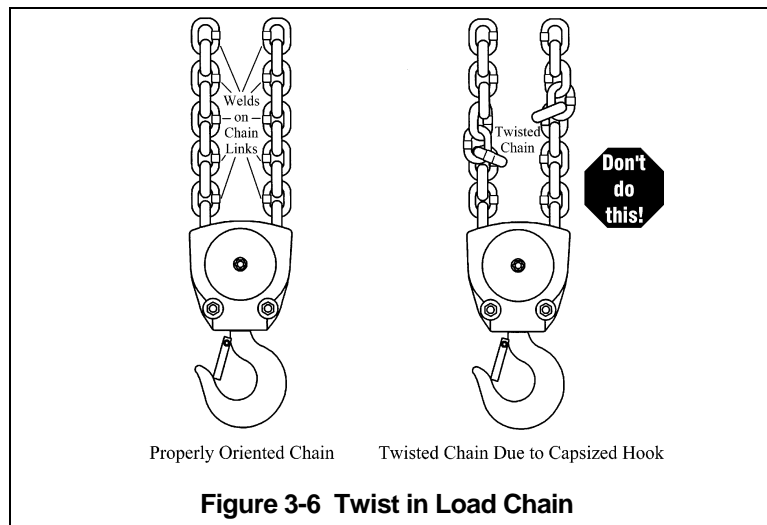
- 3.12.1** For applications such as rental fleets or construction sites where the hoist is moved from place-to-place, a filter may be appropriate. Consult factory for recommended methods.
- 3.12.2** Connections and fittings must be kept clean and care taken to prevent dirt, debris and moisture from entering the hoist.
- 3.12.3** Recommended practice for removing the hoist from an installation:
- Verify the hoist operates correctly (note any malfunctions or abnormal noises)
 - Shut off the air supply to the hoist, bleed off any pressure in the system
 - Disconnect the air supply line
 - Inject a small quantity (approximately 20 drops) of turbine oil (see **Section 6.0**) into the hoist's inlet port
 - Plug the inlet port

3.13 Preoperational Checks and Trial Operation

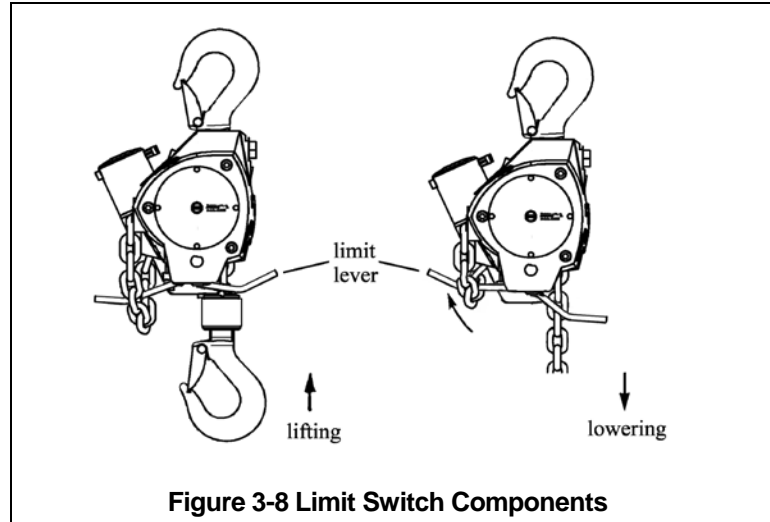
- 3.13.1** **⚠ CAUTION** Check for the availability of required operating air pressure of 90 PSI at the hoist's inlet port before trying to operate the hoist.
- 3.13.2** **⚠ WARNING** In the event of loss of air supply, be aware that a load can be lowered by intentionally or unintentionally performing 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 or twist rod 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 chain irregularities before conducting the first hoist operation. See **Figures 3-6 and 3-7**.



- 3.13.4** **⚠ WARNING** Ensure 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 the Chain/Limit Lever is operational and can move freely in both the up and down directions. For reference see **Figure 3-8**.



- 3.13.7** Measure and record the "K" dimension of all hooks on hoist. See **Table 5-6** under **Section 5**, "Inspection". Always use the same side of the hook to measure and record the "K" dimension.
- 3.13.8** 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's exterior flexible hose is intact and is properly attached to the hoist. Also ensure that the air tubing and strain relief cord inside the pendant hose are properly attached to the hoist. See **Section 7.4**.
- 3.13.13** **⚠ CAUTION** Check Air Supply - Check air supply before everyday use. Ensure proper air quality and air pressure.
- 3.13.14** **NOTICE** If using an air lubricator, check the lubricator for proper function and adequate oil level.
- 3.13.15** 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.
- 3.13.16** 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 that the controls agree with the hoist direction.
 - Perform inspections per **Section 5.3**, "Frequent Inspections".

4.0 Operation

4.1 Introduction

DANGER

DO **NOT** WALK UNDER A SUSPENDED LOAD

WARNING

HOIST OPERATORS SHALL BE REQUIRED TO READ THE OPERATION SECTION OF THIS MANUAL, THE WARNINGS CONTAINED IN THIS MANUAL, INSTRUCTION AND WARNING LABELS ON THE HOIST OR LIFTING SYSTEM, AND THE OPERATION SECTIONS OF ANSI/ASME B30.16 and ANSI/ASME B30.10. THE OPERATOR SHALL ALSO BE REQUIRED TO BE FAMILIAR WITH THE HOIST AND HOIST CONTROLS BEFORE BEING AUTHORIZED TO OPERATE THE HOIST OR LIFTING SYSTEM.

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

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

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

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

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

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

NOTICE

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

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

4.2 Shall's and Shall Not's for Operation

WARNING

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

- **NOT** lift more than rated load for the hoist.
- **NOT** operate unless load is centered under hoist.
- **NOT** use damaged hoist or hoist that is not working properly.
- **NOT** use hoist with twisted, kinked, damaged, or worn chain.
- **NOT** use hoist if the bottom hook is capsized (double fall hoists - see **Section 3.12**).
- **NOT** use the hoist to lift, support, or transport people.
- **NOT** lift loads over people.
- **NOT** apply load unless load chain is properly seated in the load sheave (and idle sheave for hoist with two chain falls).
- **NOT** use the hoist in such a way that could result in shock or impact loads being applied to the hoist.
- **NOT** attempt to lengthen the load chain or repair damaged load chain.
- **NOT** operate hoist when it is restricted from forming a straight line from hook to hook in the direction of loading.
- **NOT** use load chain as a sling or wrap load chain around load.
- **NOT** apply the load to the tip of the hook or to the hook latch.
- **NOT** apply load if binding prevents equal loading on all load supporting chains.
- **NOT** operate beyond the limits of the load chain travel.
- **NOT** operate hoist with missing/damaged chain springs, shock absorbers, stoppers, striker plates or limit locks.
- **NOT** leave load supported by the hoist unattended unless specific precautions have been taken.
- **NOT** allow the chain, or hook to be used as an electrical or welding ground.
- **NOT** allow the chain, or hook to be touched by a live welding electrode.
- **NOT** remove or obscure the warnings on the hoist.
- Be familiar with operating controls, procedures, and warnings.
- Make sure the unit is securely attached to a suitable support before applying load.
- Make sure load slings or other approved single attachments are properly sized, rigged, and seated in the hook saddle.
- Take up slack carefully - make sure load is balanced and load-holding action is secure before continuing.
- Make sure all persons stay clear of the supported load.
- Protect the hoist's load chain from weld splatter or other damaging contaminants.
- Report malfunctions or unusual performances (including unusual noises) of the hoist and remove the hoist from service until the malfunction or unusual performance is resolved.
- Make sure hoist limit switches function properly.
- Warn personnel before lifting or moving a load.
- Warn personnel of an approaching load.

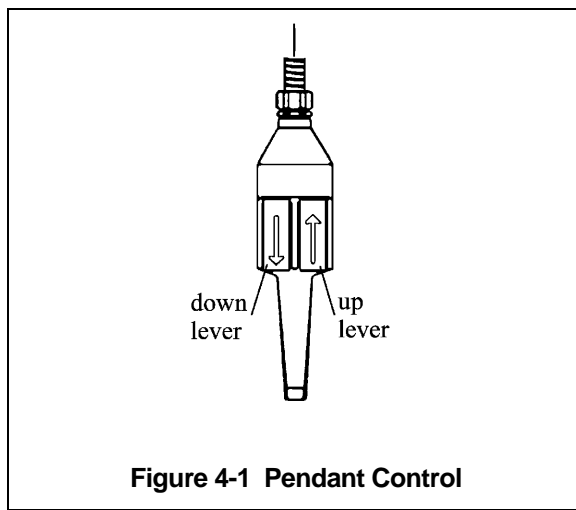
CAUTION

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

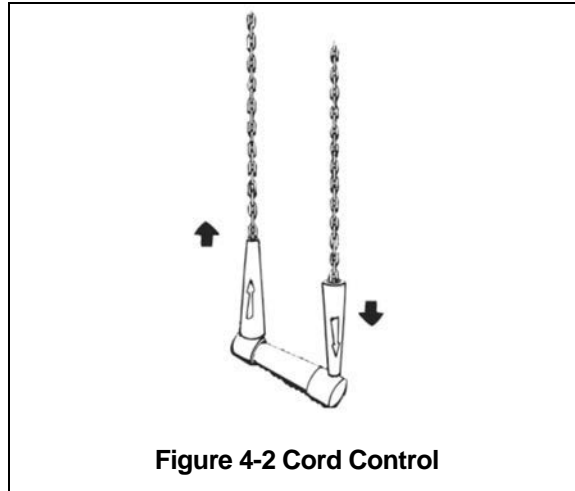
- Maintain a firm footing or be otherwise secured when operating the hoist.
- Check brake function by tensioning the hoist prior to each lift operation.
- Use hook latches. Latches are to retain slings, chains, etc. under slack conditions only.
- Make sure the hook latches are closed and not supporting any parts of the load.
- Make sure the load is free to move and will clear all obstructions.
- Avoid swinging the load or hook.
- Make sure hook travel is in the same direction as shown on controls.
- Inspect the hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
- Use the hoist manufacturer's recommended parts when repairing the unit.
- Lubricate load chain per hoist manufacturer's recommendations.
- **NOT** use the hoist load limiting or warning device to measure load.
- **NOT** use limit switches as routine operating stops. They are emergency devices 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

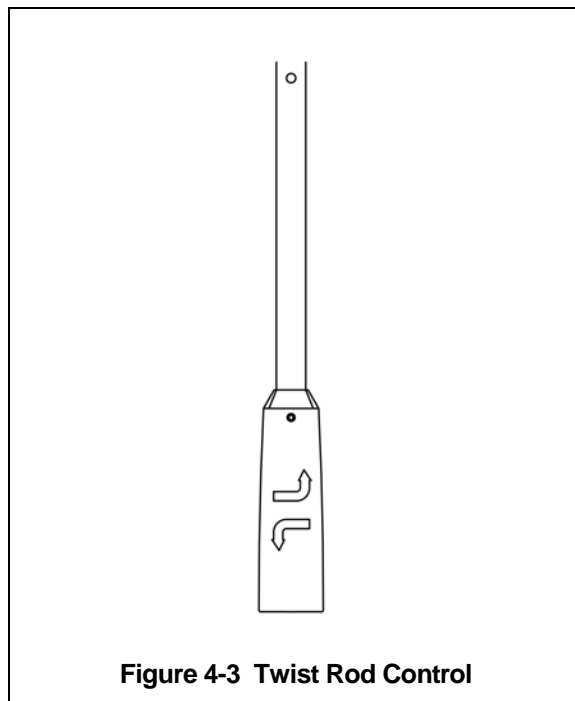
- 4.3.1 For hoists mounted to motorized trolleys follow the control instruction included in the trolley's Owner's Manual.
- 4.3.2 Pendant Control - When using the pendant control depress the up lever to raise the hoist or the down lever to lower the hoist as shown in **Figure 4-1** below. To stop motion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



- 4.3.3 Refer to Section 4.6 for important information on cord control
- 4.3.4 Refer to Section 4.6 for important information on twist rod control
- 4.3.5 Cord Control - When using a hoist with cord control, pull down on the appropriate directional arrow to raise or lower the hoist. White indicates the raise control and red indicates lowering control. Release the cords to stop the hoist. To adjust operation speed, pull the cord handle in the intended direction harder to achieve a higher speed, and lower for a slower speed. Refer to **Figure 4-2** below.



- 4.3.6 Twist Rod Control – When operating a hoist with twist rod control, rotate (twist) the control rod in the direction corresponding with the arrows on the twist rod handle. Refer to **Figure 4-3** below.



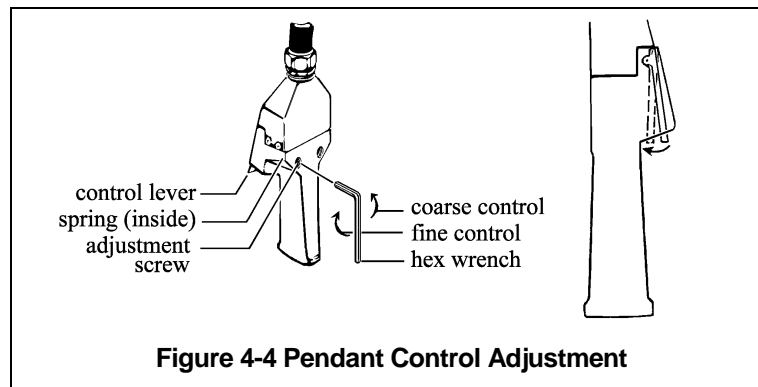
- 4.3.7 **CAUTION** Make sure the motor completely stops before reversing direction.

4.4 Adjusting the Controls

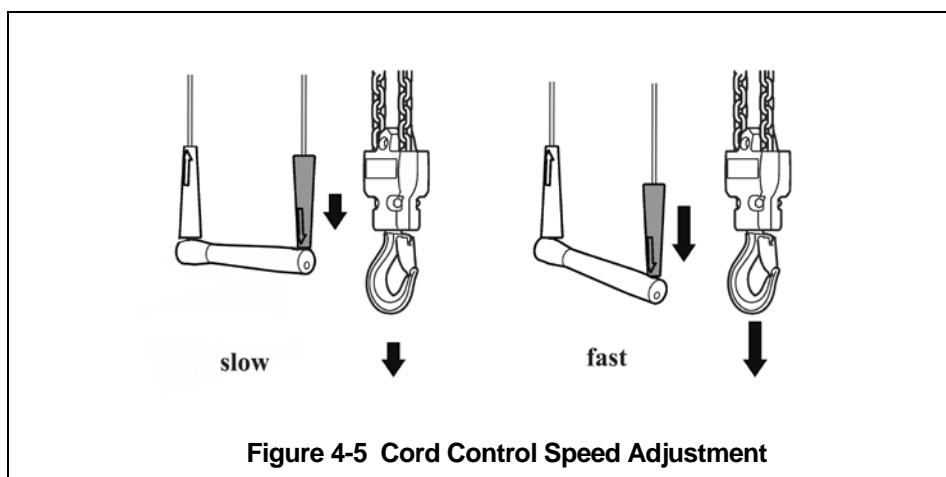
4.4.1 For pendant control, the speed can be adjusted by the amount the lever is depressed. As shown below in **Figure 4-4**, by depressing the lever slightly, you will be able to control the hoist's motions slowly and with more precision. By depressing the lever further, the speed of the hoist will be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

4.4.2 By adjusting the set screw in the pendant, the control can be adjusted to suit the user's needs. Adjusting the screw does not affect the speed of the hoist; it simply changes the feel or stiffness of the lever control. Adjusting the screw sets the position of a small spring plunger and this affects how the plunger interacts with the lever.

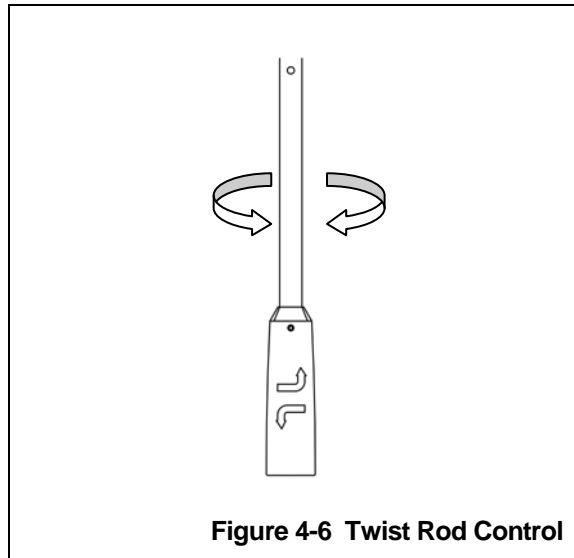
- Turning the screw in causes the spring plunger to be in contact with the lever for more of the lever's travel, resulting in more stiffness and better feel for finer control of hoist motions.
- Turning the screw out reduces the effect that the spring plunger has on the lever control. This makes it easier to depress the lever, which is usually preferred for coarse control (more on/off than variable) of hoist motions.



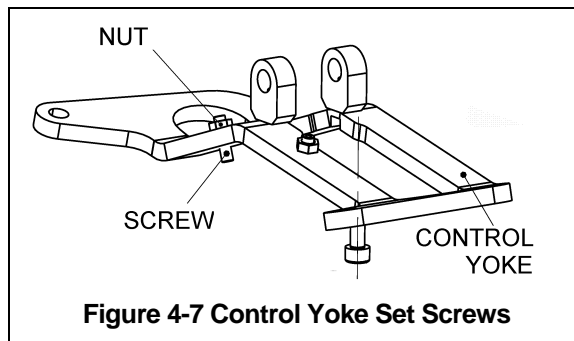
4.4.3 For the cord type control, adjust the speed by varying the amount of pull on the cord. Refer to **Figure 4-5**.



- 4.4.4 For twist rod control, adjust the speed by rotating (twisting) the control rod more for faster speed or less for slower speed in the direction corresponding with the arrows on the twist rod handle. Refer to **Figure 4-6**.



- 4.4.5 The twist rod control length can be adjusted by removing the bolt and locknut that lock the telescoping shafts together. Adjust the length of the twist rod to the desired length by sliding the two shafts to the desired position. Align the adjustment holes in both shafts and reinstall the bolt and lock nut to secure the shafts.
- 4.4.6 As shown in Figure 4-7 below, the control yoke is fitted with two screws and nuts with which the travel in the lifting and lowering directions can be limited. If necessary, the screws can be used for reduction of the lifting and lowering speeds.



4.5 Operation of the Load Limiter (Option)

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

4.6 Special Operation – Lowering the load without air supply

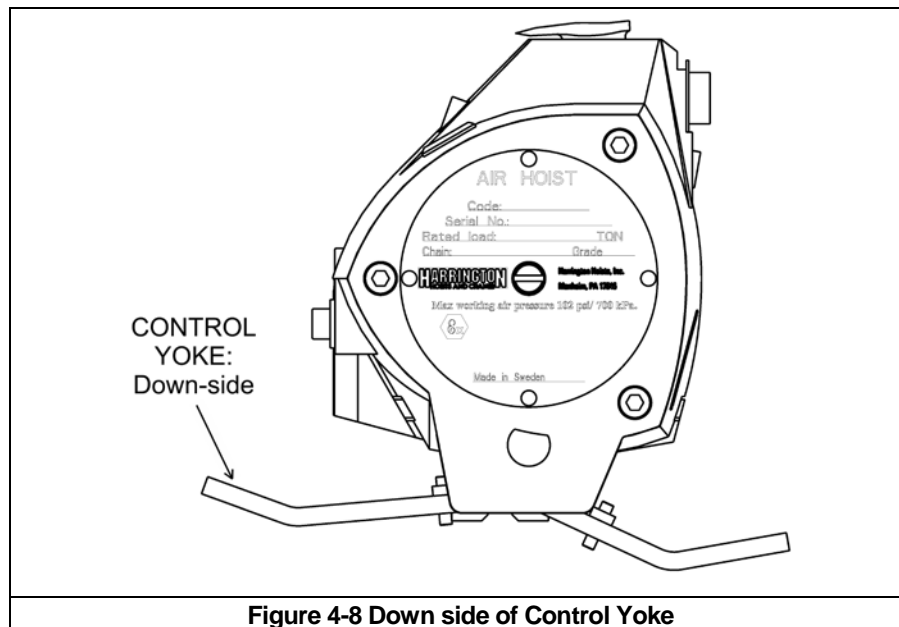
⚠ WARNING In the event of loss of air supply, be aware that a load can be lowered by intentionally or unintentionally performing any of the following: pulling on the control cord in the down direction, manually operating the control yoke in the down direction, or operating the twist rod control in the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

⚠ WARNING Lowering the load using the brake adjustment screw could result in loss of control of load. To avoid this hazard, do not attempt to lower the load by using the brake adjustment screw.

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 or twist rod 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.

⚠ WARNING Lowering the load using the brake adjustment screw could result in loss of control of load. To avoid this hazard, do not attempt to lower the load by using the brake adjustment screw.

- 4.6.1 This operation shall be performed by, or under the direction of a qualified person. All persons in the area of the equipment shall be alerted that this operation is being performed and all persons should stay clear of the supported load.
- 4.6.2 For Pendant control hoists: Affix a cord to the down side of the control yoke (see **Figure 4-8**) in order to control the operation from a safe operating distance. **⚠ WARNING** Moving the control yoke will cause the load to lower. To avoid hazards related to inadvertent load lowering, take precaution to avoid inadvertently moving the control yoke such as when affixing a cord to the control yoke.



- 4.6.3 First gain familiarity by performing a few trial operations. Lower the load a few inches (centimeters) by gently pulling on the cord or gently twisting the twist rod in the down direction.
- 4.6.4 Complete the lowering operation as needed. Disconnect air supply and lockout/tagout the hoist until the air supply issue(s) are corrected.
- 4.6.5 For Pendant control hoists - remove the cord used in step 4.6.2 from the control yoke.

5.0 Inspection

▲WARNING To maintain the ATEX rating it is very important that hoist maintenance and inspection be performed regularly. That includes checking the hoist for correct operation, and where appropriate, repairs as necessary, to maintain proper material coatings; plating and lubrication, to insure protection from corrosion, wear, resistance, electrical conductivity, impact strength, ageing resistance and effects of temperature variation.

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.
 - **Normal Service** – that distributed service which involves operation with randomly distributed loads within the rated load limit, or uniform loads less than 65% of rated load for not more than 25% of the time.
 - **Heavy Service** – that service which involves operation within the rated load limit which exceeds normal service.
 - **Severe Service** – that service which involves normal or heavy service with abnormal operating conditions.

5.2 Inspection Classification

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

5.2.4 PERIODIC Inspection - visual inspection by a designated person with intervals per the following criteria:

- Normal service - yearly
- Heavy service - semiannually
- Severe service - quarterly
- Special or infrequent service - as recommended by a qualified person before the first such occurrence and as directed by the qualified person for any subsequent occurrences.

5.3 Frequent Inspection

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

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

5.4 Periodic Inspection

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

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

5.5 Occasionally Used Hoists

- 5.5.1 Hoists that are used infrequently shall be inspected as follows prior to placing in service:
- Hoist Idle More Than 1 Month, Less Than 1 Year: Inspect per FREQUENT Inspection criteria of Section 5.3 above.
 - Hoist Idle More Than 1 Year: Inspect per PERIODIC Inspection criteria of **Section 5.4** above.

5.6 Inspection Records

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

5.7 Inspection Methods and Criteria

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

Table 5-3 Hoist Inspection Methods and Criteria

Item	Method	Criteria	Action
Functional operating mechanisms.	Visual, Auditory	Mechanisms should be properly adjusted and should not produce unusual sounds when operated.	Repair or replace as required.
Limit Switch	Function	Proper operation. Actuation of limit switch should stop hoist.	Repair or replace as required.
Chain Lever/Limit Lever Assembly	Visual, Function	Lever should not be bent or significantly worn and should be able to move freely.	Replace.
Braking System	Function	Braking distance should not exceed approximately five chain links.	Repair or replace as required.
Hooks - Surface Condition	Visual	Should be free of significant rust, weld splatter, deep nicks, or gouges.	Replace.
Hooks - Fretting wear	Measure	The “u” and “t” dimension should not be less than discard value listed in Table 5-6 .	Replace.
Hooks - Stretch	Measure	The “k” dimension should not exceed 1.10 times the measured and recorded values at the time of purchase (See Section 3.12 and Table 5-6). If recorded “k” values are not available for hooks when new, use nominal “k” values from Table 5-6.	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, and gouges. Holes should not be elongated, fasteners should not be loose, and there should be no gap between mating parts.	Clean/Lubricate, or replace as required.
Hooks - Swivel Bearing	Visual, Function	Bearing parts and surfaces should not show significant wear, and should be free of dirt, grime and deformations. Hook should rotate freely with no roughness.	Clean/lubricate, or replace as required.
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.

Table 5-3 Hoist Inspection Methods and Criteria			
Item	Method	Criteria	Action
Hooks - Hook Latches	Visual, Function	Latch should not be deformed. Attachment of latch to hook should not be loose. Latch spring should not be missing and should not be weak. Latch movement should not be stiff - when depressed and released latch should snap smartly to its closed position.	Replace.
Load Chain - Surface Condition	Visual	Should be free of rust, nicks, gouges, dents and weld splatter. Links should not be deformed, and should not show signs of abrasion. Surfaces where links bear on one another should be free of significant wear.	Replace.
Load Chain - Pitch	Measure	The "P" dimension should not be greater than maximum value listed in Table 5-7 .	Replace, inspect Load Sheave (and Idle Sheave for double fall hoist).
Load Chain - Lubrication	Visual, Auditory	Entire surface of each chain link should be coated with lubricant and should be free of dirt and grime. Chain should not emit cracking noise when hoisting a load. Maintaining proper load chain lubrication is critical to the operation of hoists with stainless chain and AW model hoists that experience frequent wash downs. Failure to keep the chain lubricated will significantly decrease its life.	Clean/lubricate (see Section 6.0).
Load Chain - Reeving	Visual	Chain should be reeved properly through Load Sheave (and Idle Sheave for double fall hoist) - refer to Section 3.12 . Chain should be installed properly - refer to Section 7.3.2 .	Reeve/Install chain properly.
Chain Container	Visual	Container should not be damaged. Brackets should not be deformed or missing. Hardware should not be loose. For AW models and hoists being used in moist environments, check for water accumulation in the chain container. Moisture can remove lubrication from the load chain and accelerate wear and corrosion of the load chain.	Replace or tighten as required. Drain water from chain container, clean and lubricate load chain
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	The Chain Separator should be free of cracks, distortion, significant wear and corrosion. Inspect for excessive wear.	Replace

Table 5-3 Hoist Inspection Methods and Criteria

Item	Method	Criteria	Action
Motor Brake	Measure, Visual	Motor brake component dimensions should be within the allowable limits of Table 5-4 and Table 5-5 . See Section 7.2 for gaining access to motor brake. Braking surfaces should be clean, free of grease/oil and should not be glazed. Springs should not be worn or damaged.	Replace
Load Sheave	Visual	Pockets of Load Sheave should be free of significant wear. See Section 7.5 to gain visual access to the load sheave.	Replace.
Pendant Control Levers	Visual, Function	Depressing and releasing pendant control levers should cause hoist to operate.	Repair or replace as necessary.
Pendant - Housing	Visual	Pendant housing should be free of cracks and mating surfaces of parts should seal without gaps.	Replace.
Pendant - Tubing	Visual, auditory	Tubing to pendant control switches should not be loose or be leaking air.	Repair or replace as necessary.
Pendant - Labels	Visual	Labels denoting functions should be legible.	Replace.
Warning Labels	Visual	Warning Labels should be affixed to the hoist (see Section 1.2) and they should be legible.	Replace
Hoist Capacity Label	Visual	The label that indicates the capacity of the hoist should be legible and securely attached to the hoist.	Replace.
Vane Motor - Vanes	Visual, Measure	Vane height must be a minimum of 18mm	Replace. (Note: if replacement is necessary, all vanes should be replaced)
Vane Motor Cylinder	Visual	Check that the cylinder is not severely scored. A few coarse scorings at the neutral slot is allowed. (Avoid heavy machining or polishing on the cylinder inside. Machining can result in higher risk for decreased tool performance.)	Replace
Air filter	Visual	Check for solid particles greater than 15 micron and excessive water.	Remove particles and drain water. Blow out hose before reconnecting

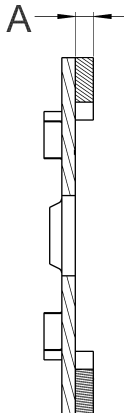
Table 5-4 Brake Pad Dimension		
		
Hoists	“A” Dimension Inch (mm)	
	Standard	Discard
AL/S003, AL/W/S005, AL/W010, AL020, AL030, AL050	T = 0.157 (4)	T = 0.039 (1)

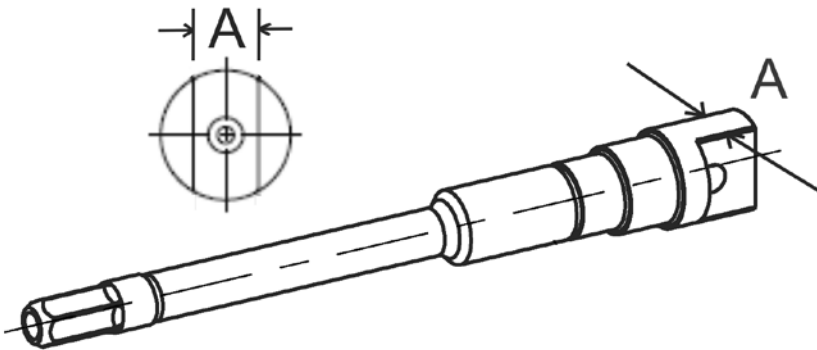
Table 5-5 Brake Shaft Dimension		
		
Hoists	“A” Dimension Inch (mm)	
	Standard	Discard
AL/S003, AL/W/S005, AL/W010, AL020, AL030, AL050	T = 0.309 (7.84)	T = 0.276 (7)

Table 5-6 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.

"k" Measured When New:

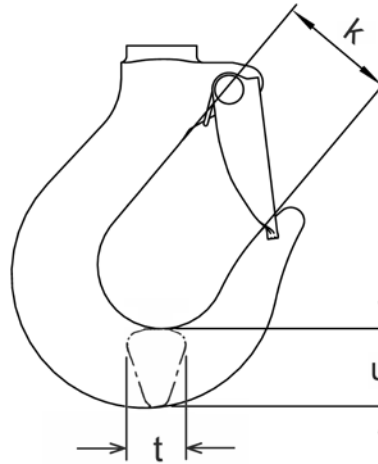
Top: _____

Bottom: _____

"u" Measured When New:

Top: _____

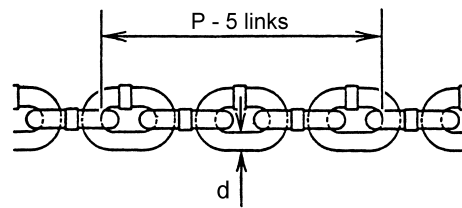
Bottom: _____



Hoists	Nominal "k" Dimension* in (mm)		"u" Dimension in (mm)		"t" Dimension in (mm)	
	Standard	Discard	Standard	Discard	Standard	Discard
AL/S003, AL/W/S005, AL/W010	1.14 (29)	1.26 (32)	0.93 (24)	0.88 (22)	0.79 (20)	0.75 (19)
AL020, AL030	1.97 (50)	2.17 (55)	1.42 (36)	1.35 (34)	1.10 (28)	1.05 (26.6)
AL050	2.4 (61)	2.64 (67)	1.73 (44)	1.65 (42)	1.30 (33)	1.24 (31.4)

*These values are nominal since the dimension is not controlled to a tolerance. The "k" dimensions should be measured when the hook is new - this becomes a reference measurement. Subsequent measurements are compared to this reference measurement in order to determine hook deformation/stretch. See **Table 5-3**, "Hooks - Stretch".

Table 5-7 Chain Dimensions



Capacity Code	"P" Dimension Inch (mm)		"d" Dimension Inch (mm)	
	Standard	Discard	Standard	Discard
AL/S003, AL/W/S005, AL/W010	3.64 (92.5)	3.7 (94)	0.26 (6.5)	0.22 (5.6)
AL020, AL030, AL050	6.50 (165)	6.55 (166.3)	0.45 (11.5)	0.41 (10.4)

6.0 Lubrication

6.1 Air Hoist Lubrication

- 6.1.1 AL/W/S air hoists do not require supply air lubrication. However, if the hoist supply air is lubricated, there is no disadvantage.
- 6.1.2 See **Section 3.0** for lubrication requirements.
- 6.1.3 If one chooses to lubricate the air motor, oil will be provided primarily by the air supply lubricator. The recommended amount is 6-10 drops/minute (0.09 to 0.15/min.). Refer to **Table 6-1** below for the approved lubricant for use with your air hoist.
- 6.1.4 Additional lubrication to the reduction gears is not necessary. When disassembling the hoist for service or repair, change the gear grease before reassembling the hoist. The amount of grease needed is listed below for each model; half of this amount should be applied in the space between the gear rims and housing.

Model	Amount of Grease needed
AL/S003, AL/W/S005, AL/W010	5oz (150cm ³)
AL020, AL030, AL050	10oz (300cm ³)

6.2 Load Chain Lubrication

- 6.2.1 The load chain should be kept clean and lubricated. Clean the load chain with acid free cleaning solution before lubricating.
- 6.2.2 **⚠ WARNING** For longer life, regularly lubricate the load chain in an unloaded condition with machine or gear oil that is ISO VG 46-58 or equivalent for AL/S models. AW models should use food grade H-1 grease Nevastane 5P7 (9014509) or equivalent. Ensure that the oil is applied to the bearing surfaces of the load chain links.
- 6.2.3 For dusty environments, it is acceptable to substitute a dry lubricant.
- 6.2.4 For AW hoist models, verify that the load chain is properly lubricated after each wash down.
- 6.2.5 **⚠ WARNING** Stainless steel load chain is equipped on AS003/005 models as standard and is optional on AW005 model hoists. Stainless steel load chain has a higher rate of wear than alloy steel load chain. For this reason, the stainless chain should not be used on double fall models, and the service/inspection classification of stainless load chain models should be considered "severe" as defined in Section 5.

6.3 Hooks and Suspension Components

- 6.3.1 Hooks - Bearings (balls) and races should be cleaned and lubricated at least once per year for normal usage. Clean and lubricate more frequently for heavier usage or severe conditions.

Table 6-1 Table of Approved Lubricants			
Part			
Brand	Bearings	Gears	Air Lubrication (Optional)
Harrington		AL4320067500	
Exxon	Beacon EP2		Arox EP46
Mobil	Mobilegrease XHP 222	Mobil SHC Polyrex 005	Almo Oil 525
Shell	Alvania EP2		Torcula 32
Texaco	Multifak EP2		Aries 32
Molycote	BR2 Plus		

7.0 Maintenance and Handling

7.1 Load Limiter

⚠ WARNING Regularly check the function of the overload protection device to insure it is not obstructed, for instance due to blockage of the hose. If obstructed, there is a risk of the setting nut gradually working loose and jeopardizing the safety of the load. Ensure that the load is directly below the hoist and is not being side-pulled.

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

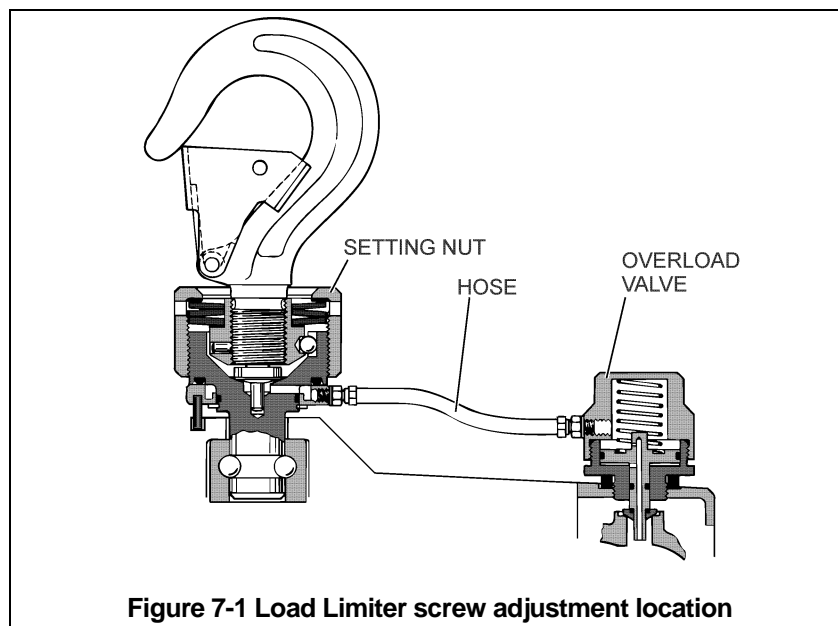


Figure 7-1 Load Limiter screw adjustment location

7.1.3 Adjustment Procedure

- 1) Before proceeding with the load limiter adjustment, note the following:

- a. **⚠ WARNING** Adjusting the load limiter involves operating the hoist. Personnel involved in the adjustment procedure should read, understand, and follow **Section 4**, "Operation".
- b. For the adjustment procedure, the hoist should be connected to an air supply (see **Section 3.1**) and it should initially be without a load on its hook.
- c. Start this procedure with an unloaded hoist. All adjustments to the load limiter should be made with the load in a resting position so that the load chain is not tensioned.
- d. The pressure of the air supply at the hoist's inlet port (90 psi) affects the performance of your air hoist, including the actuation point of the load limiter. Therefore, ensure that during the adjustment procedure the air pressure at the hoist's inlet port is the same as that which the

hoist will experience in normal operation. The relationship between air supply pressure and load limiter actuation is: for a given load limiter setting, as pressure decreases, the actuation point increases.

- e. When the load limiter is adjusted and working properly, the hoist will operate and lift the load a short distance before the load limiter automatically stops lifting.
- 2) Place a load equal to the desired actuation point on the hoist's hook (do not exceed the hoist's rated capacity). However, this load must be at least 80% of the rated load at 90psi. If a still lower releasing limit is required the air pressure has to be decreased below 90psi.
- 3) Using the hook wrench provided, loosen the setting nut (R) so that the load cannot be lifted. Then tighten the nut so much that the load can be lifted again.

⚠ CAUTION The setting nut (R) must not be screwed out so far that it can work loose unintentionally.

- 4) Check that the overload protection device trips in response to a violent movement of the control. After a time lag of approx. 0.5 – 1.0 second the air hoist should gently accelerate to full speed. If necessary, adjust with the setting nut. Loosen the nut if the protection device does not trip and tighten it if full speed is not obtained

7.2 Brake

7.2.1 The disc brake of the air hoist is correctly adjusted upon delivery. If readjustment is necessary, proceed in accordance with the following instructions (reference **Fig 7-2**):

- 1) Remove the load. Turn the setting screw (23) counterclockwise approximately 1 turn
- 2) Connect the hoist to the air supply and run it without load very slowly in the lifting direction. Screw in the setting screw (23) until the hoist stops or clearly slows down
- 3) Turn the setting screw (23) counterclockwise about 1/8 of a turn so that the hoist rotates easily again.

NOTICE If the brake cannot be adjusted in accordance with these directions, the brake shoes and brake disc should be cleaned with a grease solvent

- 4) If there are doubts concerning the brake adjustment, check that the brake is not adjusted too tight by operating the hoist unloaded at 14.5psi (1 bar) air pressure. The hoist should start easily without influence from the brake
- 5) Before using the hoist again, load and lift the intended load – or rated load if possible – a few inches (cm) and check that the brake holds the load in position. Readjust if necessary.

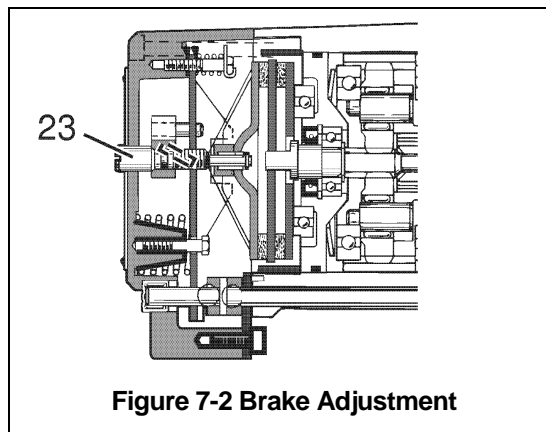
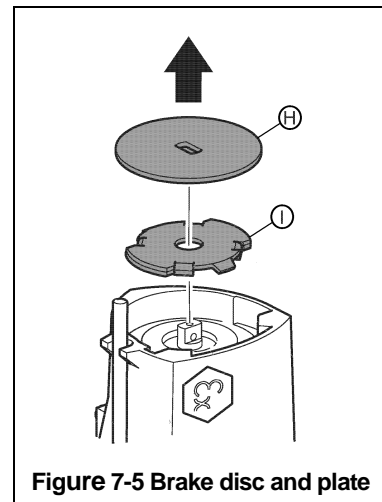
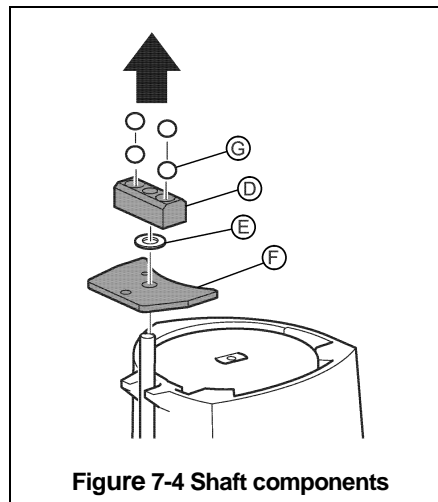
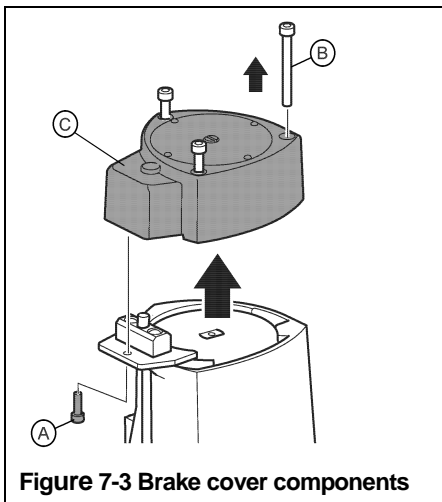


Figure 7-2 Brake Adjustment

7.2.2 Inspect the brake pad in accordance with **Section 5.7, Table 5-3**.

7.2.3 The following is the hoist brake inspection procedure. Refer to **Figure 7-3 to 7-5**.

- 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) Remove the screw on the cover (A), the screws from the brake housing assembly (B), and the brake housing assembly (C) from the housing.
- 3) Remove the key (D), the washer (E), and the cover (F) from the control shaft. Remove the four balls (G) from the key.
- 4) Remove the brake disc (H) and the pressure plate (I). Note: the extra pressure plate (I) is not applicable to AL/S003.
- 5) Inspect and measure brake components according to "Motor Brake" in **Table 5-3**, "Hoist Inspection Methods and Criteria".
- 6) Prior to reassembly, clean all surfaces of debris, dirt and loose paint. The brake disc and pressure plates must be cleaned with trichloroethylene or any "brake cleaner" product.
- 7) Reassemble in reverse order. Apply a thin layer of grease to the four balls (G), and Loctite 243 on the screw threads (B). Torque all mounting hardware evenly during the reassembly process. Tighten brake housing assembly screws (B) with a torque value of 10Nm (7.4 lb-ft) and cover screw (C) with a value of 6Nm (4.4 lb-ft).



7.3 Load Chain

7.3.1 Lubrication and Cleaning – refer to section 6.2.

7.3.2 Replacement

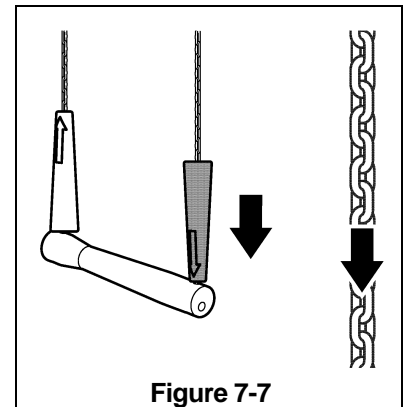
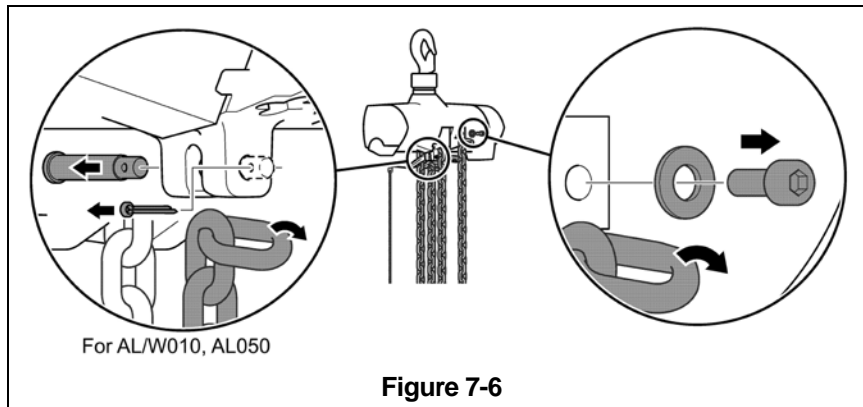
⚠️CAUTION An air supply line must be connected to the hoist in order to perform the following procedures. To avoid damages to the hoist, reduce the air pressure to 14.5psi (1 bar).

⚠️WARNING Be certain that the replacement chain is obtained from Harrington and is the exact size, grade and construction as the original chain.

7.3.2.1 Removing Chain

- 1) Loosen the ends of the chain from the hoist by removing the screw on the hoist body. For AL/W010 and AL050, also remove the locking pin and pull out the pin. (See **Figure 7-6**)
- 2) Remove chain by running the hoist in the down direction (see **Figure 7-7**).

⚠ CAUTION When replacing load chain, check for wear on mating parts, i.e. Load Sheave, Chain Guides and Idler Wheels, and replace parts if necessary. Remove hook set assemblies, stoppers and end connections from the chain for reuse on new chain. If the load chain is being replaced due to damage or wear out, prevent its reuse by destroying the old chain.



7.3.2.2 Installing Chain

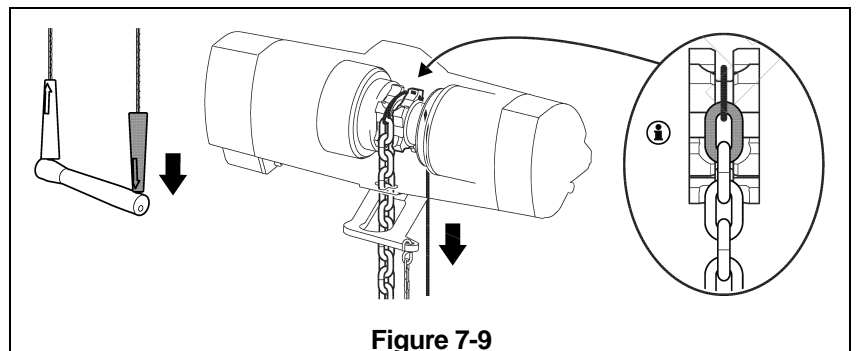
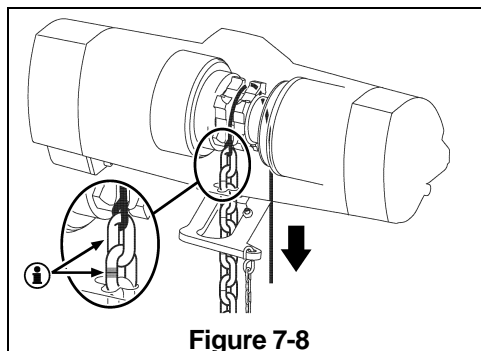
- 1) Attach the end link of the chain to the accompanying steel wire. Pull the link chain into the chain casing; by means of the steel wire (see **Figure 7-8**).

NOTICE Make sure that the first link is flat in relation to the chain wheel and that the subsequent standing links have the weld facing outwards from the center of the load sheave.

- 2) Pull the steel wire and run the air hoist slowly in the lowering direction (see **Figure 7-9**).

⚠ CAUTION Do not operate the hoist in the lifting direction at this stage (jamming risk).

NOTICE Make sure the first link of the chain drops into an indentation of the chain wheel.

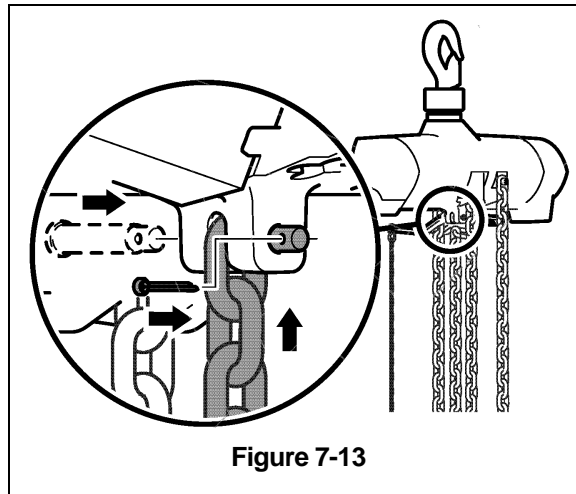
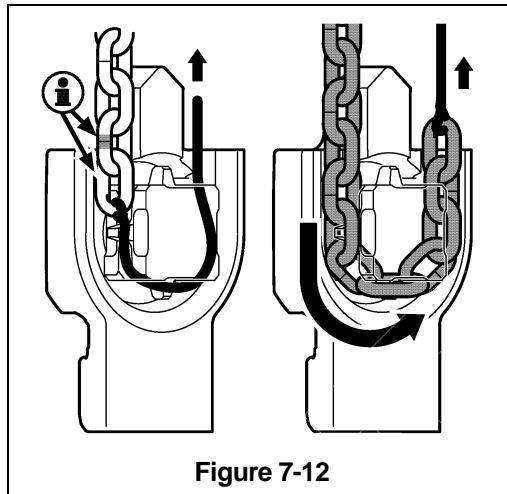
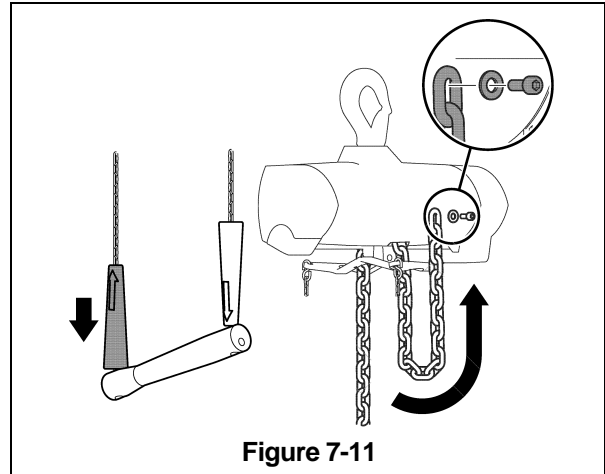
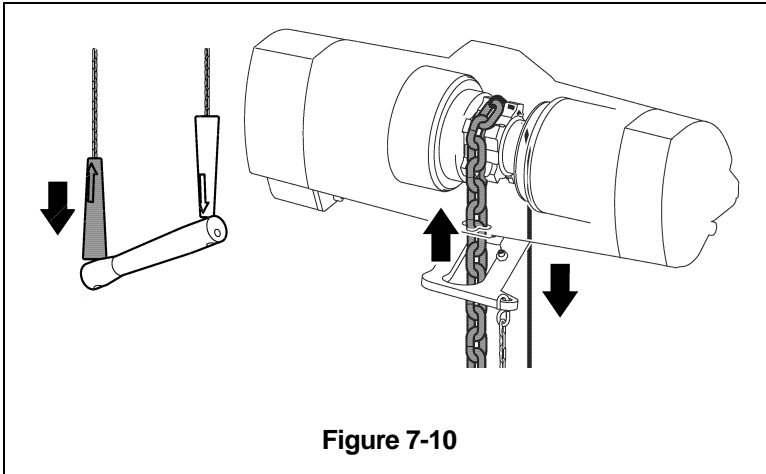


- 3) When the first link is set in the chain wheel, move it slowly in the lifting direction, while continuing to pull the steel wire (see **Figure 7-10**).
- 4) Run the chain through the control yoke. Secure the end link with the screw and washer, without twisting the chain (see **Figure 7-11**).
- 5) For AL/W010 and AL050, pull the chain through the hook using the wire (see **Figure 7-12**). For single fall models, properly fasten the chain end to the hook.

NOTICE

Make sure that the standing links have the weld facing outwards from the center of the chain wheel and that the chain is not twisted.

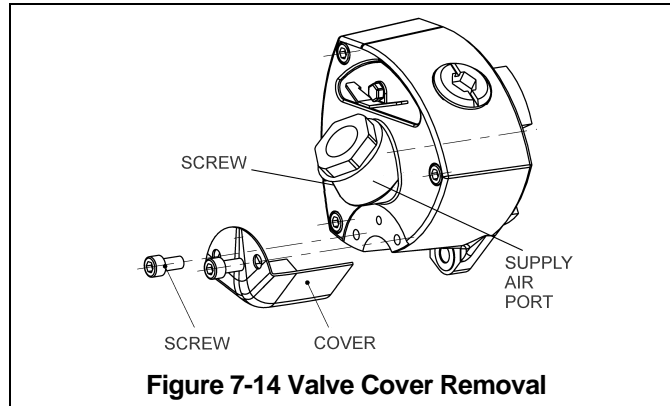
- 6) For ALW010 and AL050, fasten the chain end to the hoist by inserting the pin through the end link of the chain and lock the pin with the clevis pin (see **Figure 7-13**).
- 7) Make sure that the chain runs correctly.
- 8) After installation has been completed, perform steps outlined in **Section 3.12** "Preoperational Checks and Trial Operation".



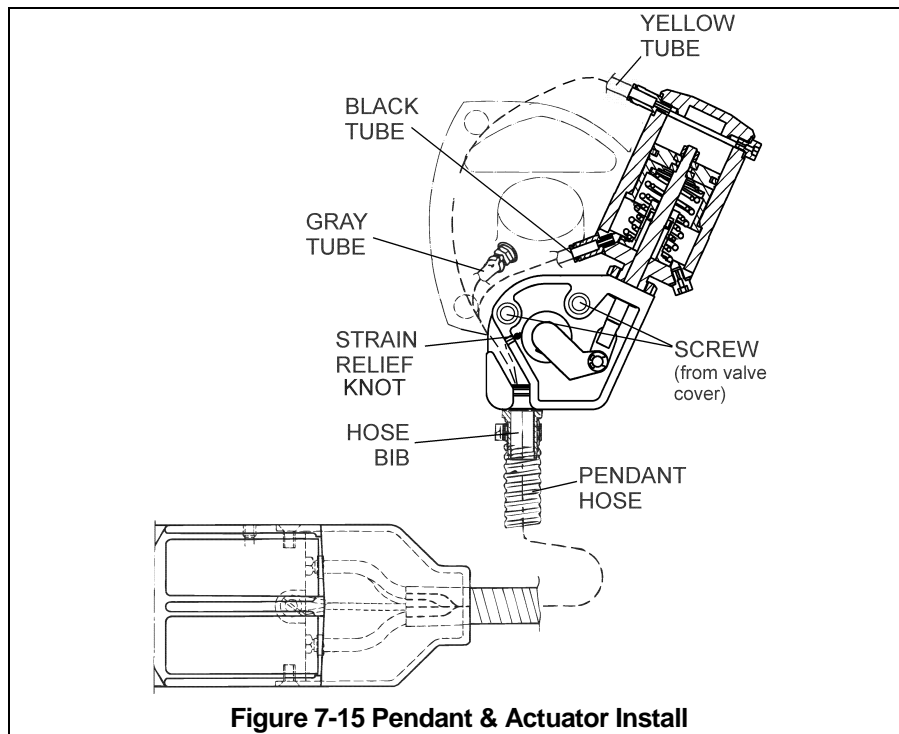
7.4 Pendant

7.4.1 The following procedure covers the installation of a pendant control station.

- 1) Remove the two SCREWS and the VALVE COVER on the valve assembly. Also remove the SCREW on the side of the supply air port (see **Figure 7-14**). Fit the nipple provided at the side of the supply air port where the screw was removed.



- 2) Remove the cover from the actuator assembly and secure the actuator assembly with the same two SCREWS that previously secured the VALVE COVER (See **Figure 7-15**).
- 3) Fit the HOSE BIB underneath the actuator assembly. Attach the PENDANT HOSE to the HOSE BIB with the fitting provided.
- 4) Using **Figure 7-15** as a guide, run the YELLOW TUBE, BLACK TUBE, and GRAY TUBE through the channel in the actuator assembly and attach each tube to the nipple at the designated locations. Run the STRAIN RELIEF through the cutout and tie a knot.
- 5) Re-secure the actuator assembly cover.
- 6) **NOTICE** When attaching tubes take care not to bend or kink tubing. This will result in the air flow being restricted and poor response to the pendant controls.

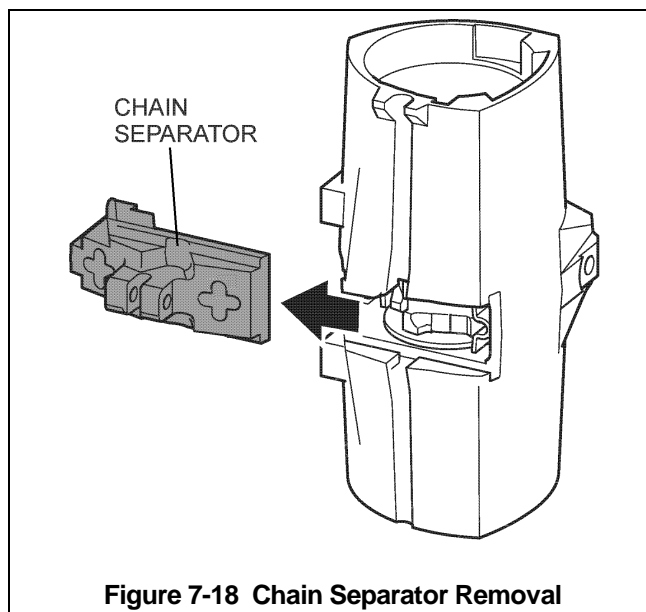
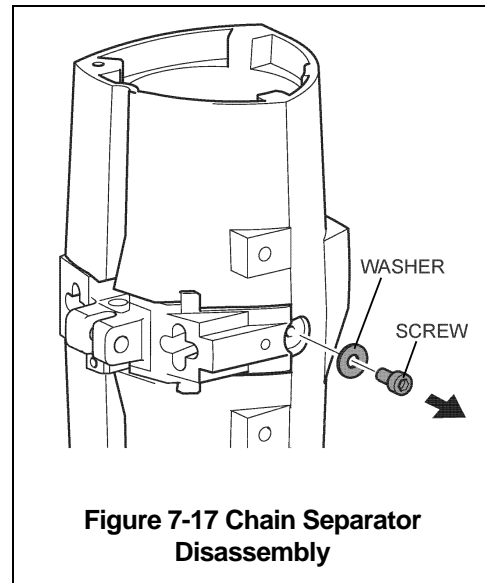
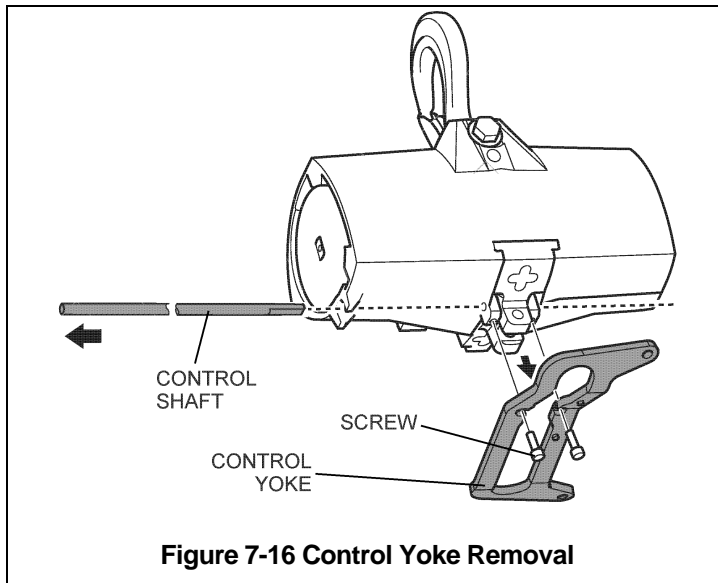


7.5 Load Sheave Inspection

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".

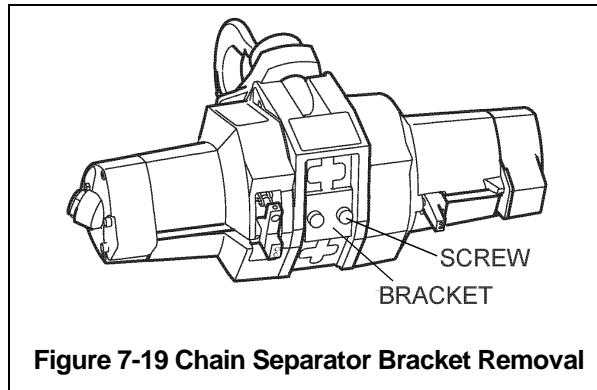
For ALW/S003, 005, 010

- 1) After removing the chain container, the chain, and the brake housing, remove the screws from the control yoke. Remove the control shaft and the control yoke (see **Figure 7-16**).
- 2) Remove the screw and washer from the side of the hoist body (see **Figure 7-17**).
- 3) Remove the chain separator (see **Figure 7-18**).



For AL020, AL030, 050

- 1) After removing the chain container and removing the chain, remove the screws and bracket from the chain separator (see **Figure 7-19**).



7.6 Operational Environment

- 7.6.1 Non-conforming environment – A non-conforming environment is defined as one with any or all of the following.
- Explosive gases or vapor beyond the ATEX rating of the hoist. Reference **Section 2.1.3**.
 - 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.

7.7 Storage

- 7.6.1 The storage location should be clean and dry.
- 7.6.2 Whenever the hoist is to be placed into storage, make certain that no debris, dirt or moisture is allowed to enter the air hoist through air inlet opening during preparations for storage.

7.8 Outdoor Installation

- 7.7.1 For hoist installations that are outdoors, the hoist **MUST** be covered and protected from the weather at all times.
- 7.7.2 Avoid hoist oxidation by using suitable treatment and lubricating all mechanisms.
- 7.7.3 Possibility of corrosion on components of the hoist increases for installations where salt air and high humidity are present. The hoist may require more frequent lubrication. Make regular inspections of the unit's condition and operation.
- 7.7.4 In order to prevent internal corrosion from occurring, the hoist must be operated using proper quality air at least once per week by raising and lowering the hoist one full cycle. Note: the possibility of corrosion in the valve section of the hoist increases for areas where salt air and high humidity are present. For such situations you may need to operate your hoist more often than once per week.
- 7.7.5 For hoist installations where temperature variations introduce condensation into the hoist additional inspection and more frequent lubrication may be required.
- 7.7.6 Refer to **Section 2.1.2** for allowable environmental conditions.

8.0 Troubleshooting

WARNING

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

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

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

Table 8-1 Troubleshooting Guide

Symptom	Cause	Remedy
Does not operate	Lack of air pressure or loss of air supply.	Repair or adjust air supply or filters. Check for air line obstruction.
	Seizure of Valve Spool, or Air Motor.	Repair at service facility.
	Seizure of brake or brake mechanism fails to release.	Repair at service facility.
	Bending or crimping of pendant hose or control tubes	Correct or repair bend or crimp in hose and/or tubes
	Hoist is overloaded	Reduce the load to the rated capacity of hoist.
Lifting speed slow or insufficient lifting capacity	Low air pressure at hoist inlet port.	Repair or adjust air supply or filters. Check for air line obstruction.
	Air supply hose or piping is too small.	Replace hose or piping sizes with recommended sizes in Section 3.0.
	Hoist is overloaded.	Reduce the load to the rated capacity of hoist.
	Vane motor seizing	Repair at service facility.
	Brake incorrectly set.	Adjust brake according to Section 7-2 .
	Inlet strainer clogged	Unscrew adapter and clean strainer.
	Exhaust Silencer clogged	Clean or replace.
	Control yoke movement limitation incorrect	Adjust control yoke.
	Bending or crimping of pendant hoses or control tubes	Correct or repair the bend or crimp in hose and/or control tubes
	Air flow capacity of compressed air system insufficient	Increase air flow capacity of compressed air system to requirements in Section 2.0 .
	Air motor vanes or bearings worn	Repair at service facility.
	Air supply to hoist contains dirt or debris	Filter the air supply to the hoist in accordance with the requirements in Section 3.0 .
Unable to lift rated load	Lack of air pressure or loss of air supply.	Repair or adjust air supply or filters.
	Improper adjustment of load limiter.	Adjust Load Limiter. See Section 7.1 .

Table 8-1 Troubleshooting Guide		
Symptom	Cause	Remedy
Hoist moving in wrong direction (pendant control)	Pendant control tubes are terminated to incorrect ports on hoist body.	Connect the control tubes in accordance with Section 7.4 .
Hoist lowers but will not lift	Hoist is overloaded.	Reduce load to hoist rated capacity.
	Faulty pendant control or control tube(s)	Repair or replace pendant control or control tube(s)
	Lack of air pressure or partial loss of or leakage in air supply.	Repair or adjust air supply or filters.
Hoist drifts excessively when hoist is stopped	Brake requires adjustment.	Adjust brake according to Section 7-2 .
	Oil or grease on brake parts	Dismantle brake and clean all parts. Check thickness of brake linings according to Table 5-3 .
Control system fails to return to neutral position	Control yoke resting against chain guide	Adjust position of control yoke
	Control shaft bent	Change control shaft
	Valve spool seizing	Clean and lubricate valve spool. Also check fitting of valve spool liner
	Valve Spool spring broken	Repair at service facility
	Valve in Pendant Handle stuck	Repair at service facility

9.0 Warranty

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

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

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

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

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

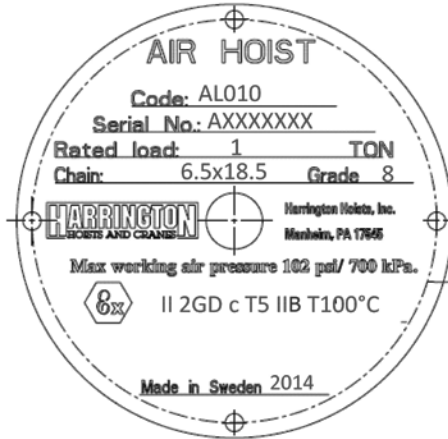
Harrington Hoists, Inc. disclaims any and all other warranties of any kind expressed or implied as to the product’s merchantability or fitness for a particular application. Harrington will not be liable for death, injuries to persons or property or for incidental, contingent, special or consequential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

This Page Intentionally Left Blank

10.0 Parts List

▲WARNING The AL/AS/AW ATEX ratings are dependent upon individual component specifications. When ordering replacement parts, please provide the hoist product code and serial number located on the Hoist nameplate (see fig. below). This ensures replacement components are suitable to retain the hoists ATEX rating.

Reminder: Per **Sections 1.1** and **3.9.1** to aid in ordering Parts and Product Support, record the Hoist product Code number and serial number in the space provided on the cover of this manual.



The parts list is arranged into the following sections:

Section	Page
10.1 Hoist Body	54
10.2 Load Carrying Unit for AL020-AL050	58
10.3 Gear Unit	60
10.4 Brake Unit	64
10.5 Motor Unit	66
10.6 Control Valve Unit	68
10.7 Quick Lowering Valve	70
10.8 Bottom Hook	72
10.9 Control Handles	76
10.10 Service Kits	79
10.11 Small Parts Kits	81

In the column "Parts Per Hoist" a designator is used for parts that apply only to a particular model or option. Refer to Section 2 for hoist model numbers and additional descriptions. The designators are:

AL – AL models
AW – AW models
AS – AS models

Many parts are offered in Service Kits or Parts Kits which are designated as:

S-Kit: Service Kit

P-Kit: Parts Kit

This Page Intentionally Left Blank

AL/S003, AL/W/S005, AL/W010

Note	Tightening Torque	Loctite
A	89 in-lb (10Nm)	243
B	53 in-lb (6Nm)	-
C	132 in-lb (15Nm)	243
D	44 in-lb (5Nm)	243
E	53 in-lb (6Nm)	243
F	89 in-lb (10Nm)	243
G	71 in-lb (8Nm)	243

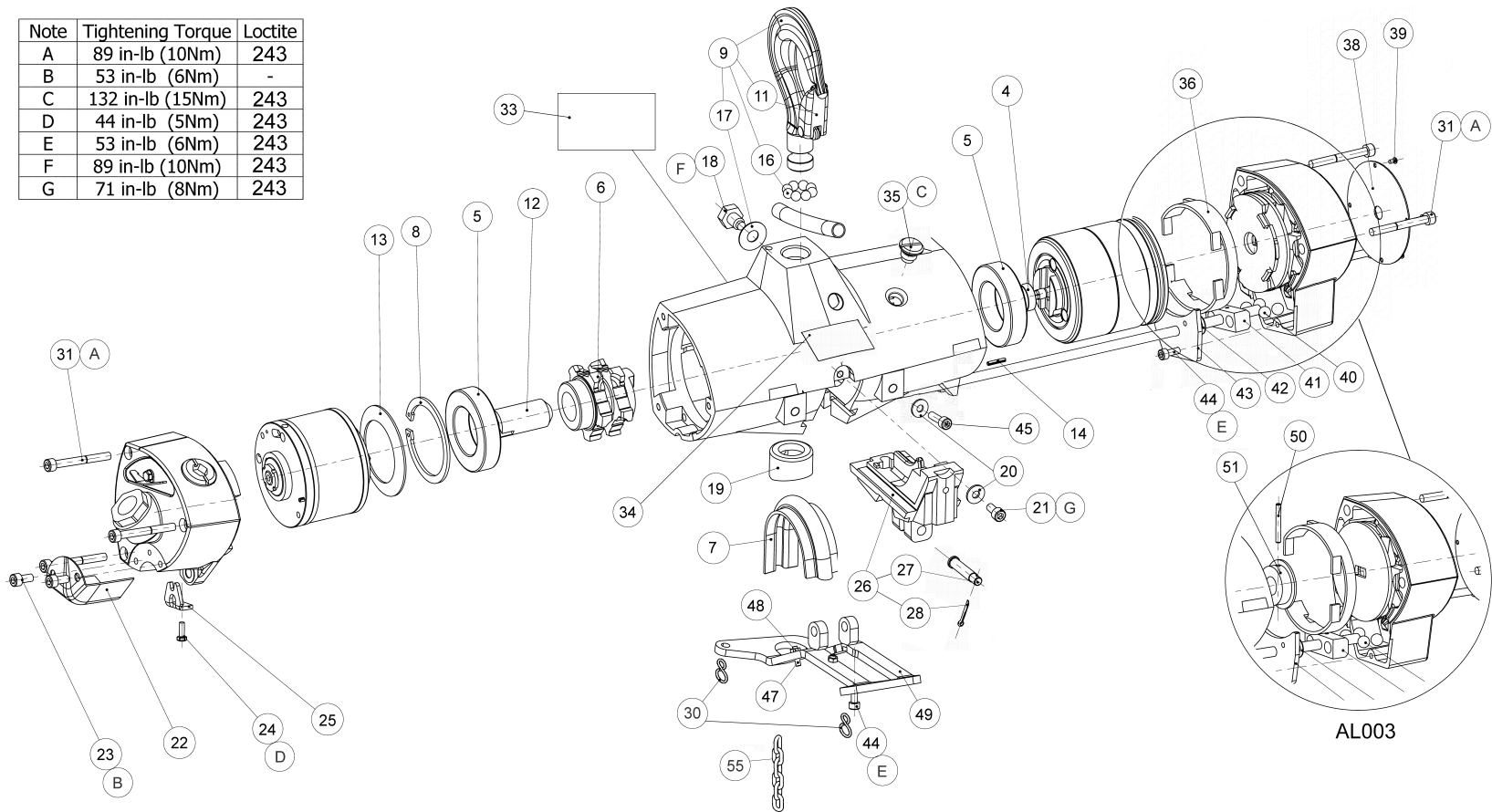


Figure 10-1 Small hoist body

Figure No.	Part Name	Parts Per Hoist		003	005	010	
4	Bearing	1		AL4320065802			
5	Bearing	2		AL4320062900			
6	Load sheave	1		AL4320066700			
7	Chain guide	1		AL4320066600			
8	Snap ring (68x2.5)	1		Hoist P-Kit AL4320078890			
9	Hook Assembly ³	AL/W	1	AL4320200091			
		AS		AS4320249781			
	11	Latch Assembly	AL/W	1	AL4320200190		
			AS		AS4320249800		
16	Ball	8		Hook S-Kit AL4320217090			
17	Lock washer	1		Hook S-Kit* AL4320217090			
12	Coupling	1		Rotor S-Kit AL4320201495			
13	Coned disc spring	1		AL4320067600			
14	Spring Pin (3x16)	1		Motor S-Kit AL4320088497			
18	Screw	AL	1	AL4320066500			
		AW/S		AL4320236400			
19	Hook holder	1		AL4320066300	AL4320073800		
20	Washer (6.4X16X1.5)	2		Hoist P-Kit* AL4320078890			
21	Screw (M6x12)	1		Hoist P-Kit* AL4320078890			
22	Cover (cord)	AL/S	1	AL4320073000			
		AW		AW4320240500			
	Cover (pendant)	AL/S	1	AL4320083300			
		AW		AW4310240900			
23	Screw (M6x12)	2		Valve P-Kit* AL4320079090			
24	Screw (M4x12)	1		Brake S-Kit* AL4320068490 Valve S-Kit* AL4320071490			
25	Angle piece	AL/S	1	AL4320072700			
		AW		AW4320240300			
26	Guide Assembly	AL/S	1	AL4320068890			
		AW		AW4320068891			
27	Pin ¹	1		AL4310107300			
	Cotter pin ¹	1		AL0111125200			
30	S-Hook ²	2		AL4320075200			
31	Screw (M6x55)	1		Hoist P-Kit* AL4320078990 Valve P-Kit* AL4320079090			

Figure No.	Part Name	Parts Per Hoist		003	005	010
32	SR Label	AS	1	AS4150198404		
33	Capacity nameplate	AL/S	1	AL4320215901	AL4320215801	AL4310215701
34	Logo nameplate	1		AL0690110103		
35	Screw	AL	1	AL4310067400		
		AW/S		AW4310236300		
36	Spacer	1		AL4320068500		
38	Nameplate	1		AL4320216004		
39	Rivet	8		AL0244416300		
40	Ball	4		AL0517111600 or Brake S-Kit AL4320068490		
41	Shaft complete			AL4320070190		
				AW4320240290		
42	Washer	1		Brake S-Kit AL4320068490 Valve S-Kit AL4320071490		
43	Cover	AL/S	1	AL4310230600		
		AW		AL4310240000		
44	Screw (M5x16)	2		Brake S-Kit* AL4320068490 Valve S-Kit* AL4320071490		
45	Screw (M6x20)	1		Hoist P-Kit* AL4320078890		
47	Screw (M4x16)	2		Hoist P-Kit* AL4320078890		
48	Nut (M4x3.2)	2		Hoist P-Kit* AL4320078890		
49	Yoke	AL/S	1	AL4320070300		
		AW		AW4320241080		
50	Pin (4x32)	1		Hoist P-Kit AL4320078990		
51	Ring	1		AL4320083400		
55	Chain ^{4,5}	AL	FT	LCAL005		
		AW		LCAW005 (LCAS005-P-AW ⁵)		LCAW005
		AS		LCAS005-P		

1) Parts come with all models, but only need to be installed on 1 ton double fall models

2) Only for cord models

3) Optional safety hook = AL4320073901

4) Optional chain stop = AL4310074091; WTAG12 for AS model = 80587

5)

WARNING

Stainless steel load chain is equipped on AS003/005 models as standard and is optional on AW005 model hoists. Stainless steel load chain has a higher rate of wear than alloy steel load chain. For this reason, the stainless chain should not be used on double fall models, and the service/inspection classification of stainless load chain models should be considered "severe" as defined in Section 5. Refer to Section 5 and 6 for inspection, maintenance, and lubrication requirements.

*) Replacement hardware in service and parts kits is provided as the AW version (stainless steel or electroplated). The torque values provided are acceptable for AL, AW, and AS hardware.

AL020, AL030, AL050*

Note	Tightening Torque	Loctite
A	89 in-lb (10Nm)	243
B	53 in-lb (6Nm)	-
C	132 in-lb (15Nm)	
D	44 in-lb (5Nm)	243
E	53 in-lb (6Nm)	243
F	37ft-lb (50Nm)	243
G	52-63 ft-lb (70-85Nm)	-
H	53 in-lb (6Nm)	243

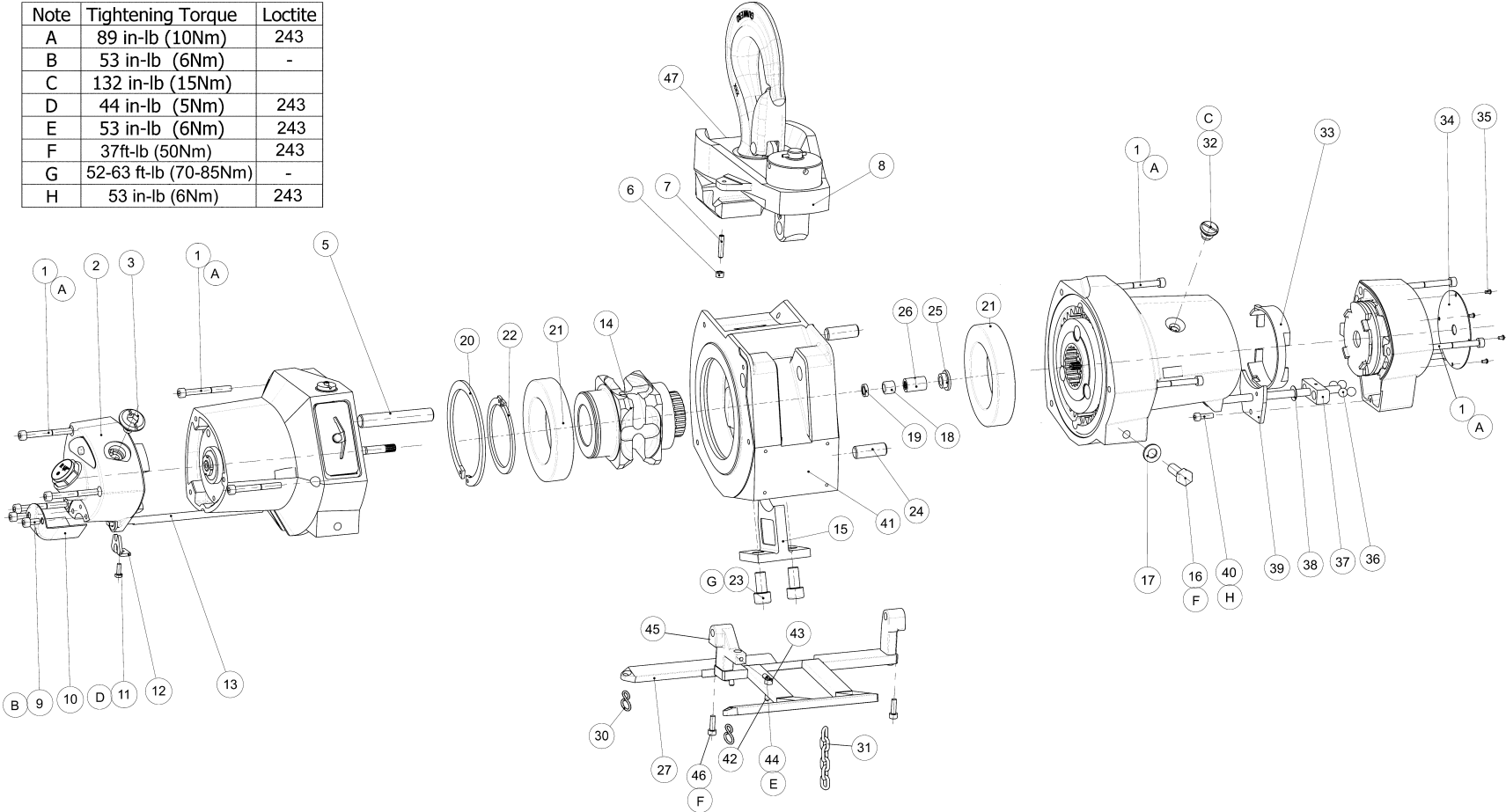


Figure 10-2 Large hoist body

Figure No.	Part Name	Parts Per Hoist	020	030	050
1	Screw (M6x55)	12	Hoist P-Kit* AL4320078990 Valve P-Kit* AL4320079090		
3	Plug	1	AL4320078500		
5	Pin	1	AL4320206400		
6	Nut	1	AL0266210700		
7	Set screw	1	AL0190121000		
9	Screw	2	AL0211124400		
10	Cover	1	AL4320073000		
11	Screw	1	AL0147117103		
12	Angle piece	1	AL4320072700		
13	Shaft	1	AL4320204800		
14	Load Sheave	1	AL4320202800		
15	Stripper	1	AL4320202000		
16	Bolt (w/o container)	1	90933Z50		
	Bolt (w/ container)	2	Qty 1: 90933Z50 Qty 1: 90933Z51 ²		
17	Washer	1	9012516		
18	Needle bearing	1	AL0516401300		
19	Seal ring	1	AL0666800405		
20	Snap ring	1	AL0335216900		
21	Ball bearing	2	AL4320063901		
22	Snap ring	1	AL0335115400		
23	Screw	2	-		
24	Pin	2	AL4310207700		
25	Bushing	1	AL4310203000		
26	Coupling sleeve,	1	AL4320202980		
27	Yoke	1	AL4320202600	AL4320202	

Figure No.	Part Name	Parts Per Hoist	020	030	050
30	S-Hook ¹	2	AL4310075200		
31	Chain	FT	LCAL030		
32	Screw	1	AL4310067400		
33	Spacer	1	AL4310068500		
34	Nameplate	1	AL4310216005		
35	Rivet	12	AL0244416300		
36	Ball	4	Brake S-Kit AL4320068490		
37	Shaft,	1	AL4310204780		
38	Washer	1	Service Kit AL4320068490 Service Kit AL4320071490		
39	Cover	1	AL4310230600		
40	Screw (M5x16)	3	Service Kit* AL4320068490 Service Kit* AL4320071490		
41	Nameplate	1	AL4310216301		
42	Screw	2	AL0190121000		
43	Nut	2	AL0266210700		
44	Set screw	1	AL0196120300		
45	Yoke	1	AL4310202680		AL4310202100
46	Screw	4	AL0211120700		
47	Capacity plate	4	80603	AL4310227101	AL4310227102
48	Capacity Plate	1	AL4310216005		

Parts Notes:

- 1) Only for cord models
- 2) Longer Bolt (90933Z51) to be used for hole where end of chain is terminated to hoist body. See figure 3-5.
- *) Replacement hardware in service and parts kits is provided as the AW version (stainless steel or electroplated). The torque values provided are acceptable for both AL and AW hardware.

AL020, AL030, AL050

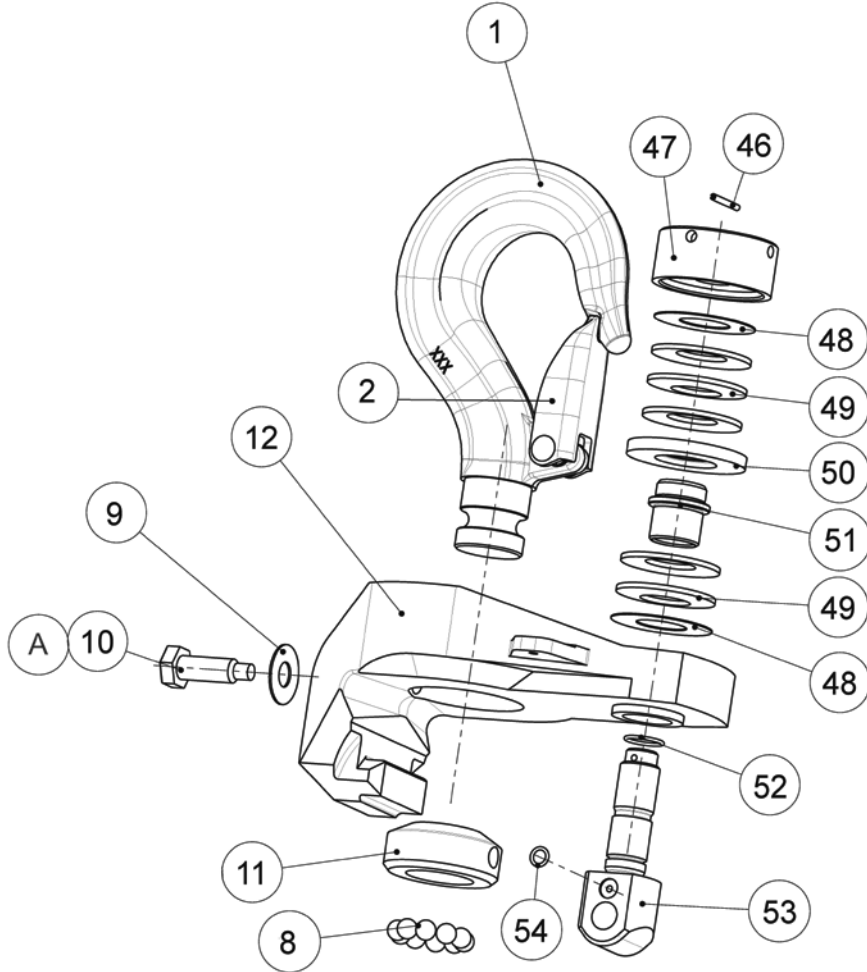


Figure 10-3 AL020, AL030 and AL050 Load Carrying Unit 2

Figure No.	Part Name	Parts Per Hoist	020	030	050
1	Hook Assembly with Bearings	1	AL4320211692		AL4320211792
2	Latch Assembly	1	AL4320215290		AL4320215690
8	Ball	10 (13) ¹	Hook S-Kit AL4320217190		Hook S-Kit AL4320217290
9	Lock washer	1	Hook S-Kit AL4320217190		Hook S-Kit AL4320217290
10	Screw	1	AL4310205900		AL4310206000
11	Bearing ring	1	AL4310205700		AL4310205800
12	Hook holder	1	AL4310205500		AL4310205600
46	Pin	1	AL4320060000		
47	Nut	1	AL4310209300		
48	Washer	2	AL4310207500		
49	Cup spring	5	AL4310079600		
50	Washer	1	AL4310209200		
51	Sleeve	1	AL4310209100		
52	O-ring	1	AL4320062400		
53	Eye bolt	1	AL4310209500		
54	O-ring	1	AL4320061400		

Part Notes:

- 1) Qty in parenthesis () is for AL050.

Service Notes:

Note	Tightening Torque	Loctite
A	7.4 ft-lbs (10 Nm)	243

AL/S003, AL/W/S005, AL/W010

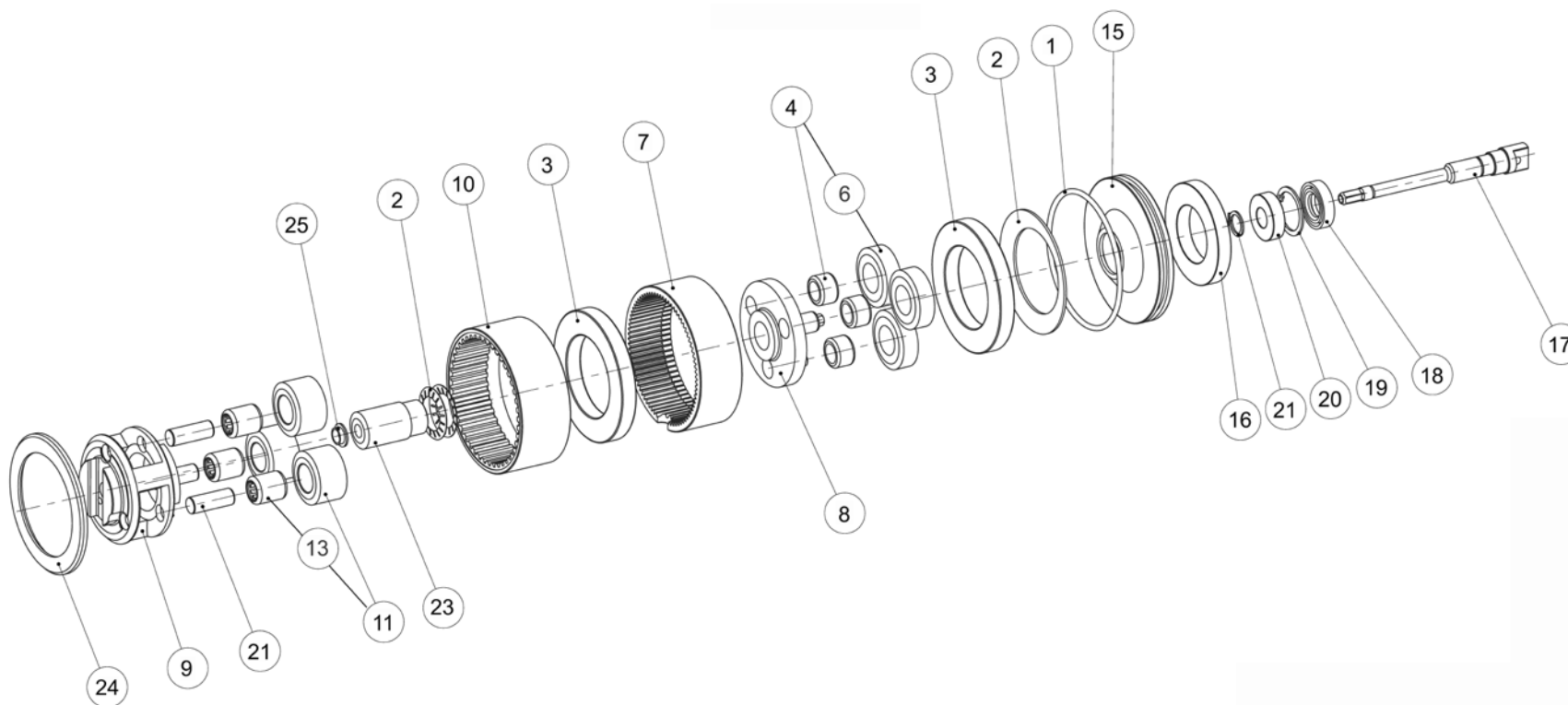


Figure 10-4 Gear Unit, Small body

Figure No.	Part Name	Parts Per Hoist	003	005	010
1	O-ring (79.5x3)	1	Gear S-Kit AL4320217391 Gear P-Kit AL4320079190		
2	Coned disc spring	1	AL4320067700		
3	Bearing	3	AL4230061000		
4	Gear set	1	AL4320067790		
6	Needle Bearing (1212)	3	Gear P-Kit AL4320079190		
7	Gear rim	1	AL4310067900		
8	Planet shaft	1	AL4310067500		
9	Planet shaft	1	AL4310067002		
10	Gear rim	1	AL4310066900		
11	Gear set	1	AL4320202390		
13	Needle Bearing	3	Gear P-Kit AL4320079190		
14	Axle	3	AL4310067300		
15	Cover	1	AL4320068100		
16	Bearing	1		AL4320060700	
17	Shaft	1	AL4320068000		
18	Seal ring (14x28x7)	1	Gear S-Kit AL4320217391 Gear P-Kit AL4320079190		
19	Snap Ring (28x1.2)	1	Gear S-Kit AL4320217391 Gear P-Kit AL4320079190		
20	Ball bearing	1	Gear P-Kit AL4320079190		
21	Snap Ring	1	Gear S-Kit AL4320217391 Gear P-Kit AL4320079190		
23	Gear wheel	1	AL4310067800		
24	Washer	1	AL4310066800		
25	Bushing	1	AL4320067100		

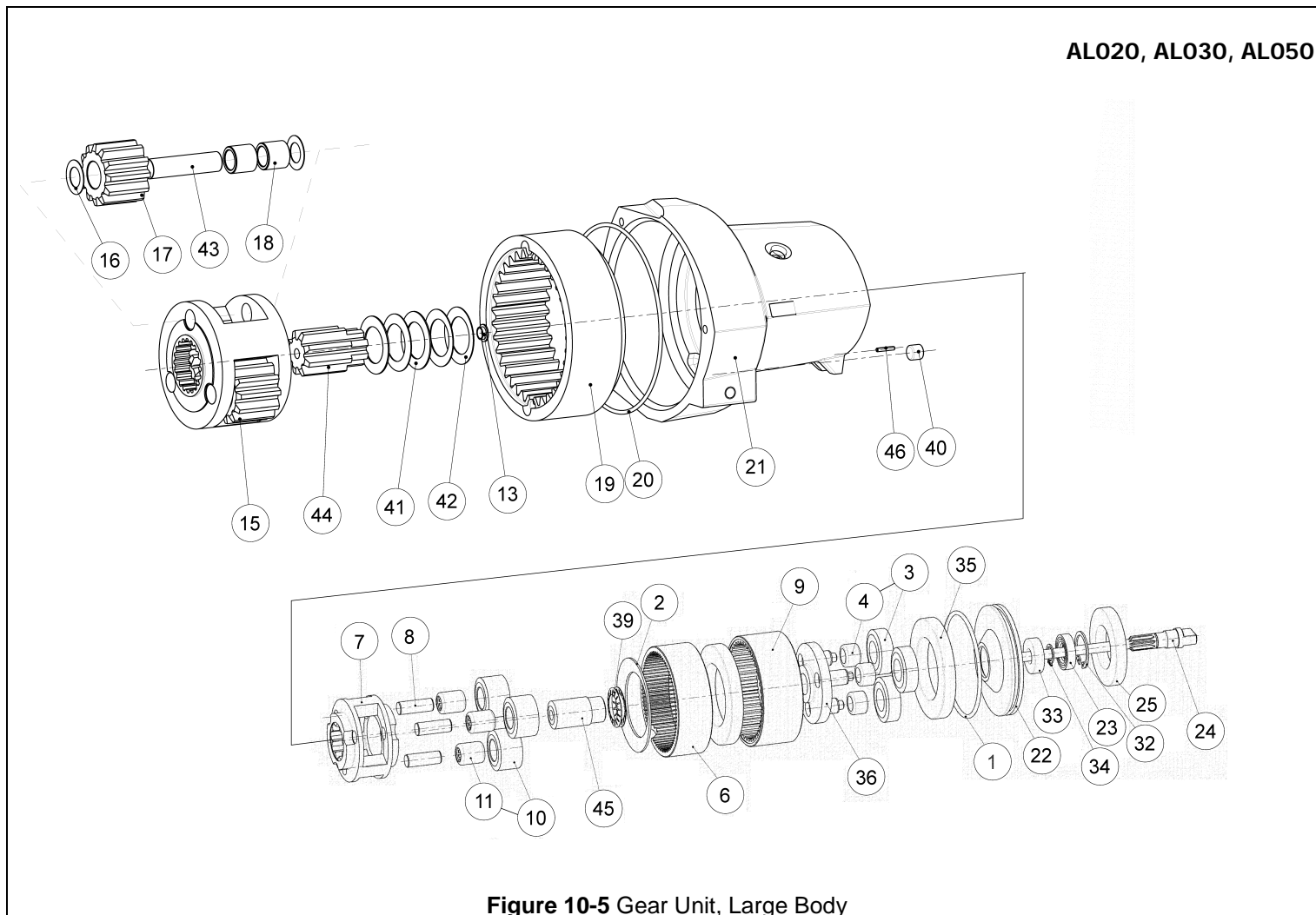


Figure No.	Part Name	Parts Per Hoist	020	030	050
1	O-ring (79.5x3)	1	Gear S-Kit AL4320217391 Gear P-Kit AL4320079190		
2	Coned disc spring	1	AL4320067600		
3	Gear set	1	AL4320067790		
4	Needle Bearing (1212)	3	Gear P-Kit AL4320079190		
6	Gear rim	1	AL4320067900		
7	Planet shaft	1	AL4320203600		
8	Axle	3	AL4320067300		
9	Gear rim	1	AL4320066900		
10	Gear set	1	AL4310202390		
11	Needle Bearing	3	Gear P-Kit AL4320079190		
13	Bushing	1	AL4320067100		
15	Planet shaft	1	AL4310203500		
16	End washer	6	AL0517528001		
17	Gear	3	AL4310203200		
18	Bearing	6	AL0515011800		
19	Gear rim	1	AL4310203400		
20	O-ring	1	AL4320067400		
21	Gear casing	1	AL4310205408		
22	Cover	1	AL4320068100		
23	Seal ring (14x28x7)	1	Gear S-Kit AL4320217391 Gear P-Kit AL4320079190		
24	Shaft	1	AL4320202400		
25	Bearing	1	AL4320060700		
32	Snap ring (28x1.2)	1	Gear S-Kit AL4320217391 Gear P-Kit AL4320079190		
33	Bearing	1	Gear P-Kit AL4320079190		
34	Snap ring	1	Gear S-Kit AL4320217391 Gear P-Kit AL4320079190		
35	Bearing	2	AL4320061000		
36	Planet shaft	1	AL4310067500		
39	Coned disc spring	2	AL4320067700		
40	Bearing	1	AL0516421200		
41	Washer	2	AL0517530001		
42	Coned disc spring	3	AL4320211200		
43	Shaft	3	AL4310203300		
44	Gear	1	AL4310203100		
45	Gear	1	AL4310067800		
46	Pin	1	9148126		

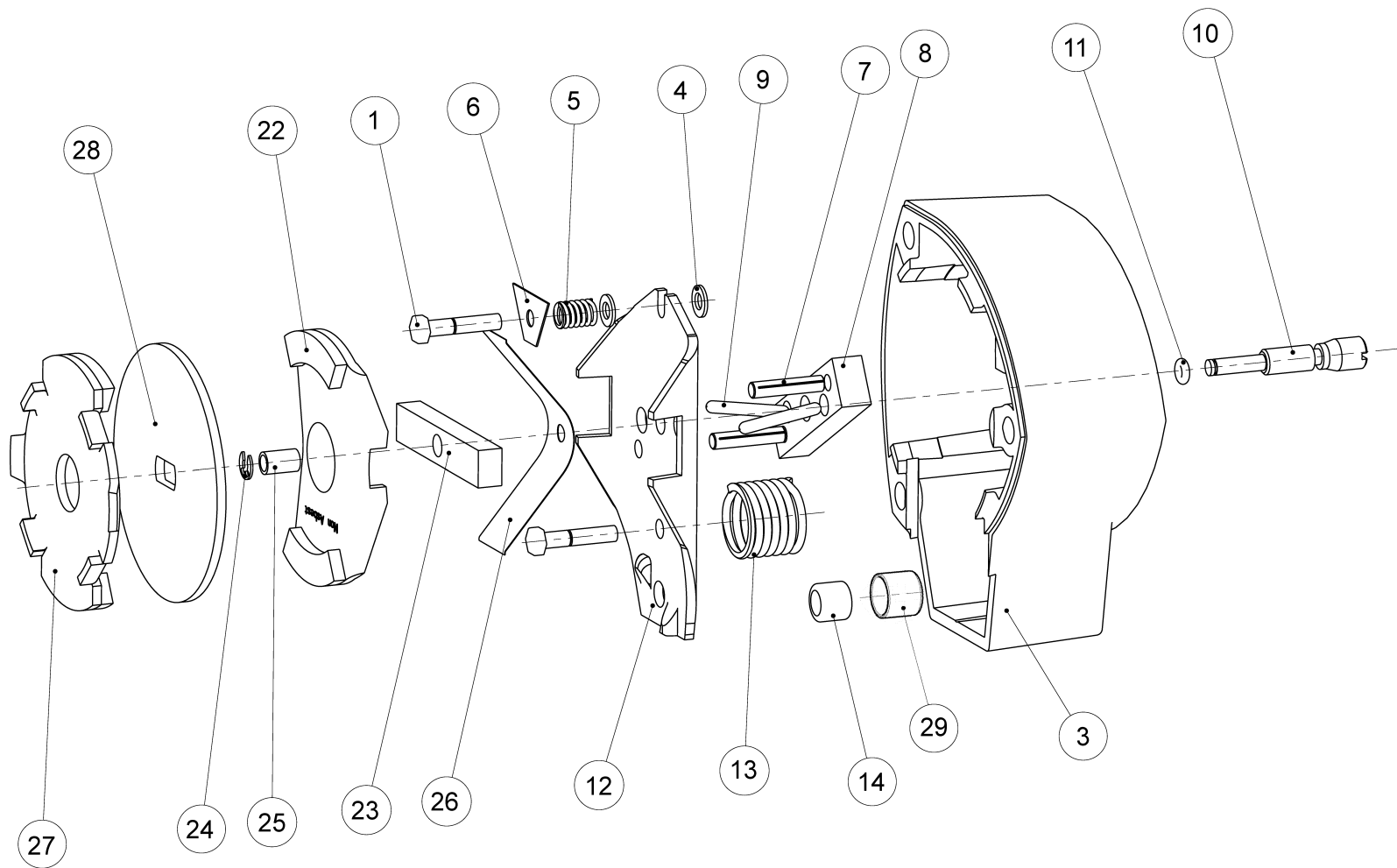


Figure 10-6 Brake Unit Parts

Figure No.	Part Name	Parts Per Hoist	003	005	010	020	030	050
1	Screw (M5x25)	2	Brake P-Kit AL4320078990					
3	Brake casing	1						
4	Washer	2	Brake P-Kit AL4320078990					
5	Spring	1	Brake P-Kit AL4320078990					
6	Lock washer	1	Brake P-Kit AL4320078990					
7	Pin	2	Brake P-Kit AL4320078990					
8	Cross piece	1	AL4310069100					
9	Pin	2	AL4310069500					
10	Adjusting screw	1	AL4320069400					
11	O-ring (3.3x2.4)	1	Brake P-Kit AL4320078990					
12	Yoke	1	AL4320069200					
13	Spring	1	AL4320069001					
14	Needle bearing (8x12x10)	1	Brake P-Kit AL4320078990					
22	Pressure plate, complete	1	Brake S-Kit AL4320068490					
23	Cross piece	1	AL4320069600					
24	Snap ring (4x0.7)	1	Brake S-Kit AL4320068490					
25	Sleeve	1	Brake P-Kit AL4320078990					
26	Spring	1	Brake P-Kit AL4320078990					
27	Pressure plate, complete	1		Brake S-Kit AL4320068490				
28	Brake disc	1	Brake S-Kit AL4320068490					
29	Cover kit (includes 14)	1	AW	AW4320242790				

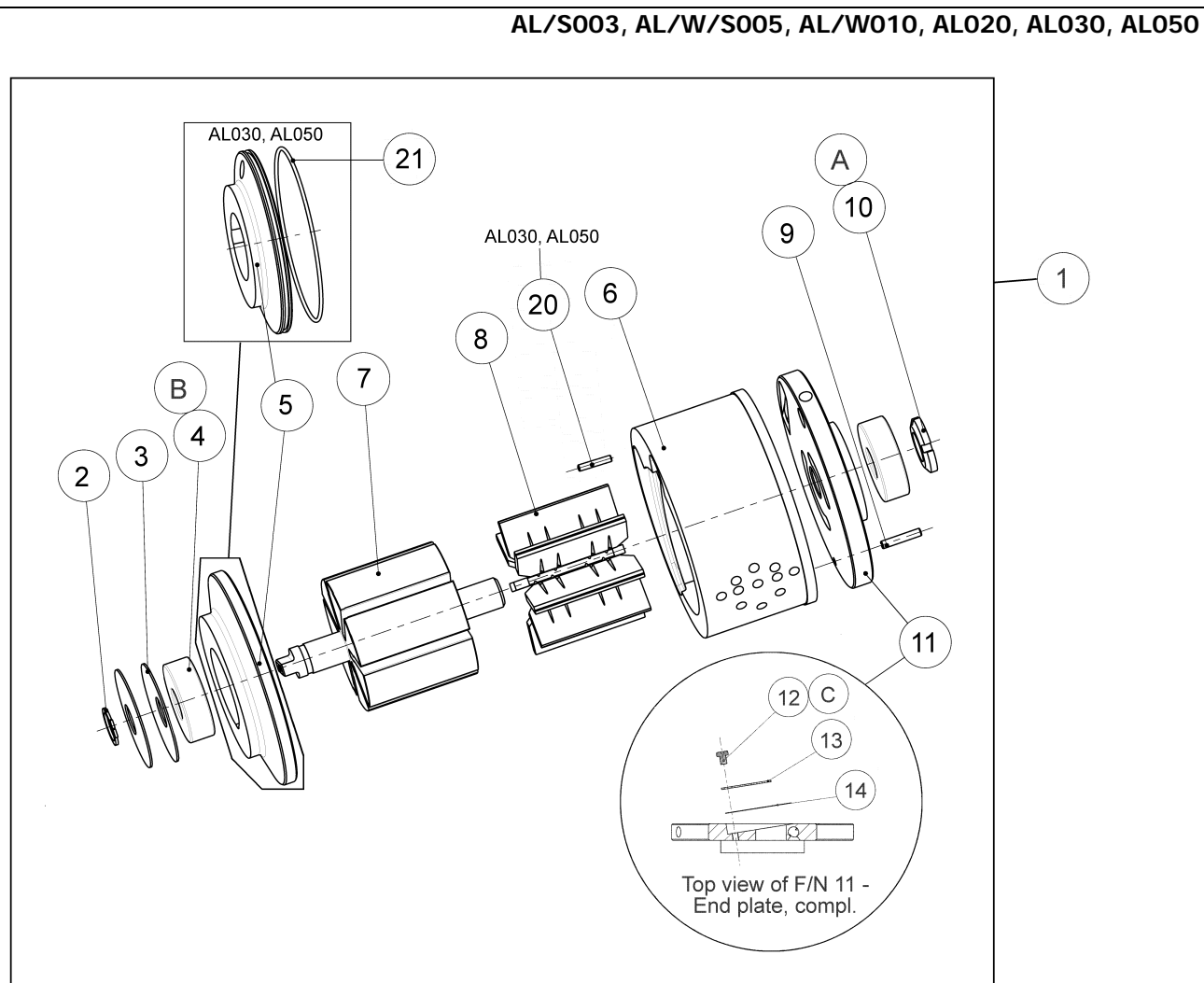


Figure 10-7 Motor Unit Parts

Figure No.	Part Name	Parts Per Hoist	003	005	010	020	030	050
1	Motor Assembly	1	AL4320201494	AL4320201493		AL4320201496		
2	Snap ring	1	Motor S-Kit AL4320088497					
3	Coned disc spring	2	AL4320070700					
4	Ball bearing	2	Motor S-Kit AL4320088497					
5	End plate	1	AL4320070500			AL4320205200		
6	Cylinder	1	AL4320076700	AL4320070800				
7	Rotor	1	Rotor S-Kit AL4320201495					
8	Vane	7	Motor S-Kit AL4320088497					
9	Pin (3x16)	1	Motor S-Kit AL4320088497					
10	Nut	1	Motor S-Kit AL4320088497					
11	End plate, complete	1	AL4320088381	AL4320088380				
12	Screw	1	Motor S-Kit AL4320088497					
13	Support	1	Motor S-Kit AL4320088497					
14	Valve Plate	1	Motor S-Kit AL4320088497					
20	Pin	1				AL0108119400		
21	O-ring	1				AL0663902200		

Service Notes:

Note	Loctite
A	638
B	638 (on rotor side)
C	290

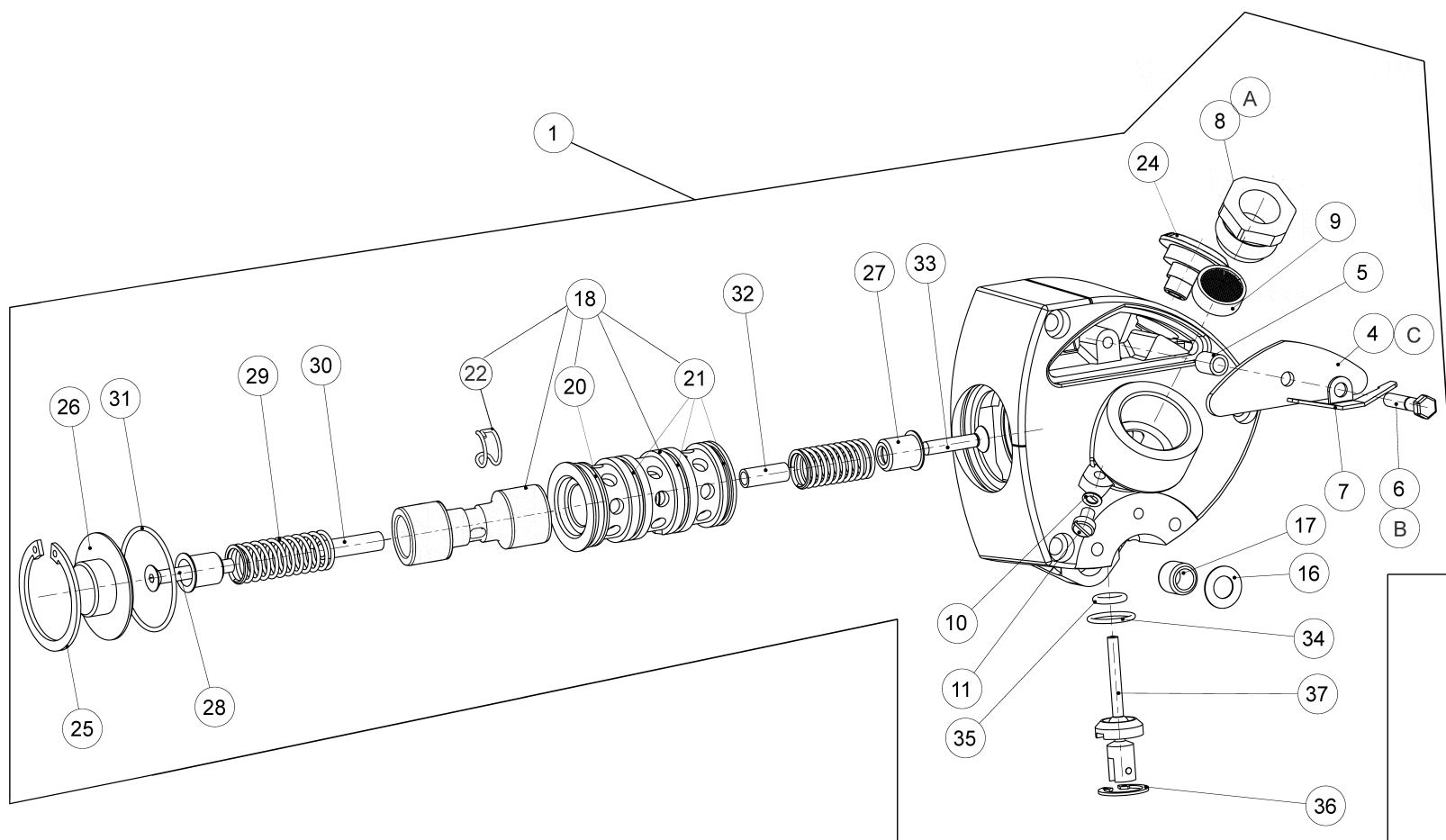


Figure 10-8 Control Valve unit

Figure No.	Part Name	Parts Per Hoist		003	005	010	020	030	050
1	Valve housing assembly	AL/S	1	AL4320071390		AL4310071382			
		AW		AW4320071396					
	4	Silencer	1	AL4320072900					
		Cover				AL4320207800			
	5	Spacer	1	AL4320082800					
	6	Screw (M5x25-8.8)	1	Valve P-Kit AL4320079090					
	7	Support	1	4310 0830 00					
	8	Adapter	1	AL4320067201					
	9	Strainer	1	Motor S-Kit AL4320088497 Gear P-Kit AL4320079190					
	10	Washer	1	AL9125674500					
	11	Screw (M5x6)	1	Valve P-Kit AL4320079090					
	16	Washer	1	Valve S-Kit AL4320071490 Brake S-Kit AL4320068490					
	17	Needle bearing	1	Valve P-Kit AL4320079090					
	18	Valve Assembly	1	AL4320071482					
20	O-ring (26.2x3)	1	Valve S-Kit AL4320071490						
21	O-ring (27.1x1.6)	3	Valve S-Kit AL4320071490						
22	Spring	1	Valve S-Kit AL4320071490						

Figure No.	Part Name	Parts Per Hoist	003	005	010	020	030	050
24	Plug	1	AL4320078500					
25	Snap ring (40x1.75)	1	Valve P-Kit AL4320079090					
26	Cover	1	AL4310072500					
27	Sleeve	2	AL4320072000					
28	Screw (M5x35)	1	Valve P-Kit AL4320079090					
29	Spring	2	AL4320071700					
30	Spacer	1	AL4320071900					
31	O-ring (37.1x1.6)	1	Valve S-Kit AL4320071490					
32	Spacer	1	AL4320071800					
33	Screw (M5x25-10.9)	1	Valve P-Kit AL4320079090					
34	O-ring (15.1x1.6)	1	Valve S-Kit AL4320071490					
35	O-ring (8.3x2.4)	1	Valve S-Kit AL4320071490					
36	Snap ring	1	Valve S-Kit AL4320071490					
37	Lever, complete	1	AL4320072180					

Service Notes (see image):

Note	Tightening Torque	Loctite	Other
A	22 ft-lbs (30Nm)		
B	3.7 ft lbs (5Nm)	243	
C			Universal silicone

70

Figure No.	Part Name	Parts Per Hoist	020	030	050
1	Cover	1	AL4310207600		
2	Motor casing	1	AL4310205308		
4	Needle bearing	1	AL0516421200		
5	Cup Spring	1	AL4320067600		
6	Stopper	2	AL4310212600		
7	Shaft, complete	1	AL4310204600		
9	Silencer	1	AL4320208900		
10	Valve seat	1	AL4310204100		
11	Spacer	1	AL4320082800		
12	Support	1	AL4320083000		
13	Screw	1	AL0147121003		
14	Valve assembly	1	AL4320204480		
23	Chain lock	1	AL4320211900		
24	Shaft	1	AL4320202200		
27	O-ring	1	AL0663611500		
28	Sleeve	1	AL4310203700		
29	Nut	2	AL0266110600		
30	Screw	2	AL0147117103		
31	Silencer	2	AL4320202500		
32	O-ring	2	AL4320062600		
33	Spring	1	AL4320205000		
34	Valve plate	1	AL4320204200		
35	Valve seat	1	AL4320204300		

Service Notes (see image):

Note	Tightening Torque	Other
A	22 ft-lbs (30Nm)	
B	3.7 ft-lbs (5Nm)	
C		Seal with universal silicone

AL/S003, AL/W/S005, AL020, AL030

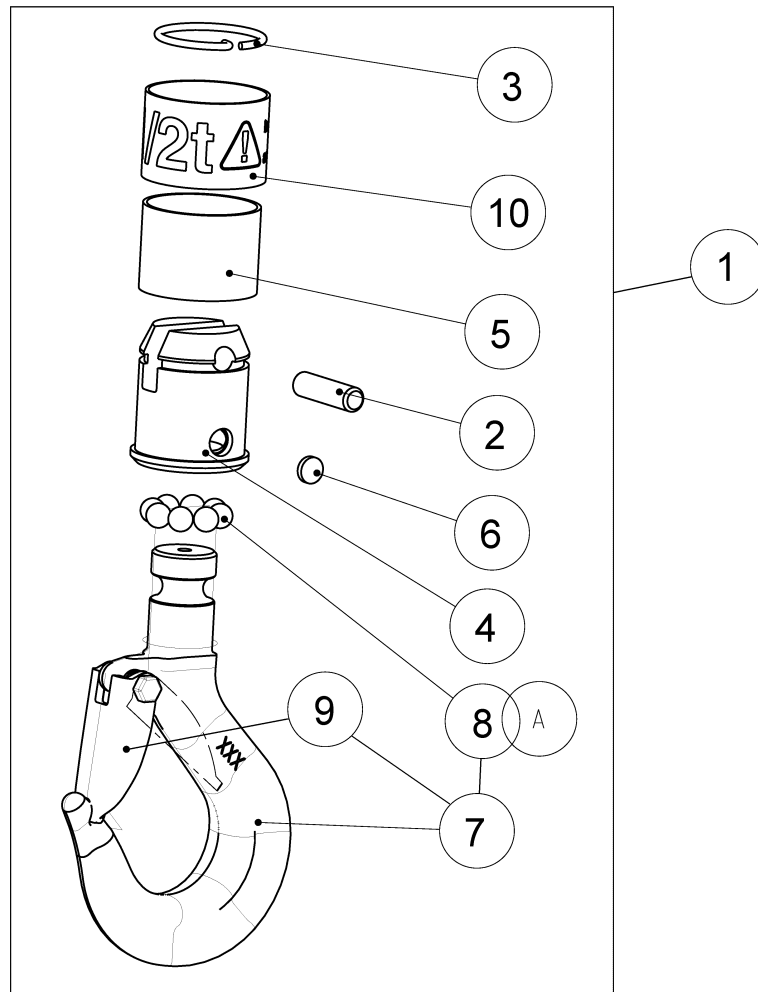


Figure 10-10 Single Fall Bottom Hook

Figure No.	Part Name	Parts Per Hoist		003	005	020	030	
1	Bottom Hook Complete Set	AL/W	1	AL4320073188	AL4320073189	AL4320207087		
		AS		AS4320249980	AS4320249981			
	2	Pin	1	AL4320223401		AL4320207301		
	3	Locking ring	1	AL4320078400		AL4320207400		
	4	Hook holder	AL/W	1	AL4320073101		AL4310207000	
			AS		AS4320249900			
	5	Sleeve	AL/W	1	AL4310073309		AL4320207206	
			AS		AS4320250100			
	6	Plug	1	AL4310073200		AL4320207100		
	7	Hook* Assembly with bearings	AL/W	1	AL4320200091		AL4320211692	
			AS		AS4320249781			
	8	Ball	8	Hook S-Kit AL4320217090		Hook S-Kit AL4320217190		
	9	Latch Assembly	AL/W	1	AL4320200190		AL4320215290	
			AS		AS4320249800			
10	Capacity label	1	AL4320250700	AL4320250600	80604	AL4320250800		

Service Notes (see image):

Note	Lubrication
A	Bearing grease

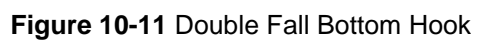


Figure No.	Part Name	Parts Per Hoist	010	050
1	Bottom Hook Complete Assembly	1	AL4320075385	AL4320206587
2	Lock nut	3	AL4320060800	
		6		AL0291111200
3	Spacer	1		AL4310206801
4	Sealing ring	2		AL0666800505
6	Casing half	2	AL4310075302	AL4310206502
7	Washer	1	AL4310073200	AL4310206900
8	Hook Assembly with bearings	1	AL4320200091	AL4320211792
9	Ball ¹	8 (13)	Hook S-Kit AL4320217090	Hook S-Kit AL4320217290
10	Latch Assembly	1	AL4320200190	AL4310215690
11	Label, Ex		AL4310230702	
12	Label, Do not capsize		AL4310250901	AL4310251001
13	Rivet	8	AL0244416300	
14	Capacity Plate	2	AL4310248105	AL4310227102
15	Label, lubricate chain	2	AL4310250900	AL4310251000
16	Bolt	3	AL4320065103	AL4310208700
17	Idle sheave assy	1	AL4320075593	
18	Idle sheave	1	AL4320075503	AL4310206600
19	Axle	1	AL4310075401	AL4310206700
20	Needle bearing	1	AL4320060040	
		2		AL0516400048
21	Washer	2	AL0517528002	AL4310212200
22	Hook holder	1	AL4320075700	AL4310205800

Notes:

1) Qty in () is for AL050

Service Notes (see image):

Note	Tightening Torque	Lubrication
A		Bearing grease
B		Bearing grease
C		Bearing grease
D	52-66 ft-lb (70-90Nm)	
E	7.4 ft-lb (10Nm)	

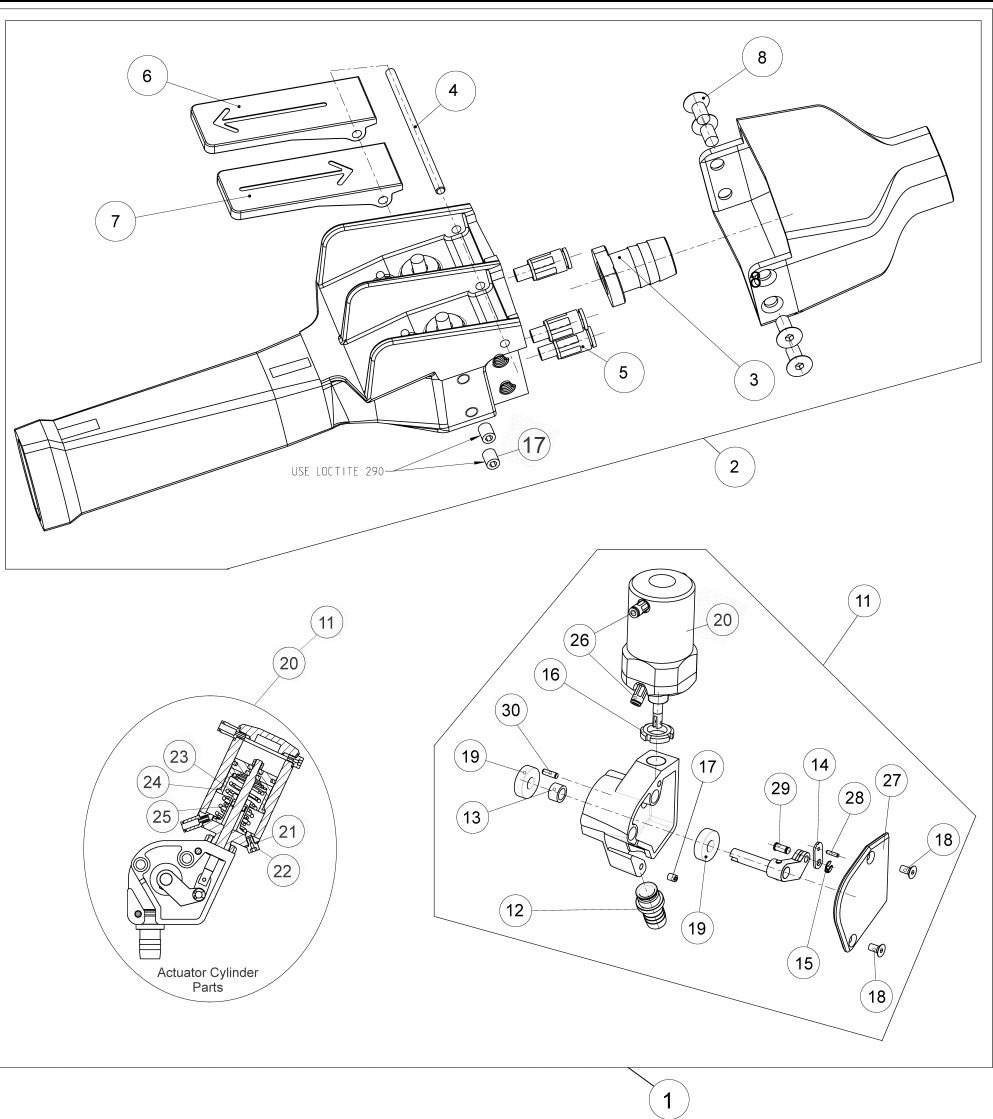


Figure 10-12 Pendant & Actuator Control

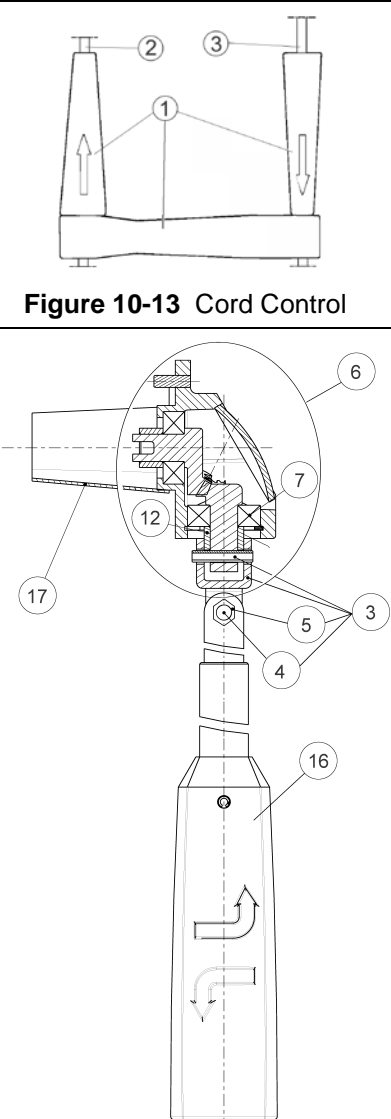


Figure 10-14 Twist rod Control

Pendant and Actuator Control

Figure No.	Part Name	Parts Per Hoist		003P	005P	010P	020P	030P	050P
1	Pendant & Actuator Assembly (with hoses)	AL/S	1	7067795			7067895		
		AW			7072495				
	Pendant & Actuator Assembly (without hoses)	AL/S		AL4320230190			AL4320230290		
		AW		AW4320230191					
2	Pendant Assembly	AL/S	1	AL4320083564					
		AW		AW4320083566					
3	Adapter	1		AL4320231100					
4	Pin	1		AL4320051100					
5	Coupling	3		AL4320061800					
6	Valve Lever (Up)	1		AL4320050502					
7	Valve Lever (Down)	1		AL4320050501					
8	Screw	4		AL4320061100					
11	Actuator	AL/S	1	AL4320081490			AL4320081497		
		AW			AW4320081466				
12	Cylinder adapter	1		AL4320230500					
13	Bushing	1		AL4320077700					
14	Link	1		AL4320082500					
15	Retaining ring	1		AL4320061500					
16	Lock nut	1		AL4320061200					
17	Set screw	1		AL4320060900					
18	Screw	2		AL4320061100					
19	Ball bearing	2		AL4320061700					
20	Cylinder complete	AL/S	1	AL4320082684			AL4320082688		
		AW			AL4320082686				
21	Restrictor screw	2		AL4320230900					
22	Washer	2		AL4320061300					
23	Spring	1		AL4320081900					
24	Spring	1			AL4320082000				
25	Lock ring	1		AL4320061900					
26	Hose fitting	2		AL4320061800					
27	Cover	AL/S	1	AL4320081300					
		AW		AW4320081300					
28	Pin (2.5x10)	1		9148202					
29	Pin	1		AL4320082700					
30	Pin (4x12)	1		9148201					
31	Linkage	1		AL4320084580					

Cord Control

Figure No.	Part Name	Parts Per Hoist	003C	005C	010C	020C	030C	050C
1	Handle Assembly	1	AL4320208590					
2	White Cord (Up)	FT	9013101					
3	Red Cord (Down)	FT	9013102					

Twist Rod Control

Figure No.	Part Name	Parts Per Hoist	003R	005R	010R	020R	030R	050R
1	Twist Rod Assembly	1	AL4320077491					
3	Link Set	1	AL4320087691					
4	Screw	2	AL4320062000					
5	Nut	2	AL4320062100					
6	Gear casing, compl	1	AL4320077481					
7	Ball bearing	2	AL4320062300					
12	Bushing	1	AL4320077700					
16	Handle	1	AL4320078100					
17	Cover	1	AL4320083300					

Description	Qty	003	005	010	020	030	050
Grease 180g for gear	1	AL4320067500					
Hook Service Kit	1	AL4320217090			AL4320217190	AL4320217290	
WASHER	1						
BALL	AL003/ 005/010	8					
	AL030	10					
	AL050	13					
Brake Service Kit	1	AL4320068490					
SCREW (M4x12)	1	AL0211110493					
SCREW (M5x16)	1	AL0211120701					
SNAP RING (4x0.7)	1	AL0335310600					
PRESSURE PLATE, COMPL	1	AL4310068200					
BRAKE DISC	1	AL4310068400					
PRESSURE PLATE, COMPL	1	AL4310069900					
BRAKE PAD	2	AL4310068301					
PRESSURE PLATE	1	AL4310069974					
WASHER	2	AL4310072600					
BALL	4	AL0517111600					
Control Valve Service Kit	1	AL4320071490					
SCREW (M4x12)	1	AL0211110493					
SCREW (M5x16)	1	AL0211120701					
SNAP RING	1	AL0335212000					
O-RING (8.3x2.4)	1	AL0663211500					
O-RING (26.2x3)	1	AL0663212800					
O-RING (15.1x1.6)	1	AL0663612200					
O-RING (27.1x1.6)	3	AL0663612900					
O-RING (37.1x1.6)	1	AL0663613300					
SPRING	1	AL4310071600					
WASHER	2	AL4310072600					

Description	Qty	003	005	010	020	030	050
Motor Service Kit	1	AL4320088497					
NUT	1			AL0295310200			
SNAP RING	1			AL0335111400			
VANE	7			AL4310088407			
STRAINER	1			AL4170047900			
BALL BEARING	2			AL0502109242			
SRING PIN (3X16)	1			AL0108119400			
SCREW	1			AL0160601800			
SUPPORT	1			AL4310088600			
VALVE PLATE	1			AL4310088500			
Rotor Service Kit	1	AL4320201495					
Rotor	1						
Coupling	1			AL4320070400			
Gear Service Kit		AL4320217391					
GREASE KIT	2			AL4320067500			
SNAP RING	1			AL0335111400			
SNAP RING (28x1.2)	1			AL0335213000			
O-RING (79.5x3)	1			AL4320064000			
SEALING RING (14x28x7)	1			AL0666608200			

Description	Qty	003	005	010	020	030	050
Hoist Body Small Parts Kit	1	AL4320078890					
SNAP RING (68x2.5)	1				AL0335215500		
SCREW	1				AL0147121103		
NUT	1				AL0291118503		
WASHER (6.4X16X1.5)	2				AL0300027620		
SCREW (M6x12)	1				AL0211124401		
SCREW (M6x20)	1				AL0211124701		
SCREW (M4x16)	2				AL0147195772		
NUT (M4x3.2)	2				AL0261109011		
Brake Small Parts Kit	1	AL4320078990					
SCREW (M6x55)	3				AL5541708500		
SCREW (M5x25)	2				AL0147121003		
WASHER	2				AL0301211800		
COMPRESSION SPRING	1				AL4310069300		
LOCK WASHER	1				AL4310074700		
PIN	2				AL0106028100		
O-RING (3.3x2.4)	1				AL0663211000		
NEEDLE BEARING (8x12x10)	1				AL0516421200		
SLEEVE	1				AL4310069700		
SPRING	1				AL4310069800		
PIN (4x32)	1				AL0108324600		
Control Valve Small Parts Kit	1	AL4320079090					
SCREW (M6x55)	3				AL5541708500		
SCREW (M5x25-8.8)	1				AL0147121003		
SCREW (M5x6)	1				AL0160605700		
SCREW (M6x12)	2				AL0211124401		
SNAP RING (40x1.75)	1				AL0335210512		
SCREW (M5x35)	1				AL0216121200		
SCREW (M5x25-10.9)	1				AL0216121000		
NEEDLE BEARING	1				AL0516401300		

Description	Qty	003	005	010	020	030	050
Gear Unit Small Parts Kit		AL4320079190					
O-RING (79.5x3)	1	AL0663614000					
NEEDLE BEARING (1212)	3	AL0516402000					
NEEDLE BEARING	3	AL4310211000					
BALL BEARING	1	AL0502120900					
SEALING RING (14x28x7)	1	AL0666608200					
SNAP RING (28x1.2)	1	AL0335213000					
SNAP RING	1	AL0335111400					
STRAINER	1	AL4170047900					
SILDUK	1	AL4170059200					

This Page Intentionally Left Blank



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

www.harringtonhoists.com

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

ALAWASOM-ENG