

OPERATING, MAINTENANCE & PARTS MANUAL

ELECTRIC CHAIN



CM[®] SHOPSTAR[®] VS

Before installing hoist, fill in the information below.

Model Number _____

Serial No. _____

Purchase Date _____

Please provide Serial Number when ordering parts.

CAPACITIES:

250 LBS (113 KG)

300 LBS (136 KG)

500 LBS (226 KG)

550 LBS (250 KG)

600 LBS (272 KG)

1,000 LBS (453 KG)

1,100 LBS (500 KG)

Follow all instructions and warnings for inspecting, maintaining and operating this hoist.

The use of any hoist presents some risk of personal injury or property damage. That risk is greatly increased if proper instructions and warnings are not followed. Before using this hoist, each operator should become thoroughly familiar with all warnings, instructions and recommendations in this manual. **Retain this manual for future reference and use.**

Forward this manual to operator. Failure to operate equipment as directed in manual may cause injury.

Columbus McKinnon Corporation
205 Crosspoint Parkway
Getzville, NY 14068



CM HOIST PARTS AND SERVICES ARE AVAILABLE IN THE UNITED STATES AND IN CANADA

PARTS FOR YOUR HOIST ARE AVAILABLE FROM YOUR LOCAL AUTHORIZED REPAIR STATION.
FOR THE NAME OF THE NEAREST PARTS OR SERVICE CENTER, VISIT OUR WEB SITE WWW.CMWORKS.COM
OR CALL OUR CUSTOMER SERVICE DEPARTMENT AT 1-800-888-0985.



WARNING

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

1. **NOT** operate a damaged, malfunctioning or unusually performing hoist.
2. **NOT** operate the hoist until you have thoroughly read and understood this Operating, Maintenance and Parts Manual.
3. **NOT** operate a hoist which has been modified without the manufacturer's approval or without certification that it is in conformity with ANSI/AMSE B30 volumes.
4. **NOT** lift more than rated load for the hoist.
5. **NOT** use hoist with twisted, kinked, damaged, or worn load chain.
6. **NOT** use the hoist to lift, support, or transport people.
7. **NOT** lift loads over people.
8. **NOT** operate a hoist unless all persons are and remain clear of the supported load.
9. **NOT** operate unless load is centered under hoist.
10. **NOT** attempt to lengthen the load chain or repair damaged load chain.
11. Protect the hoist's load chain from weld splatter or other damaging contaminants.
12. **NOT** operate hoist when it is restricted from forming a straight line from hook to hook in the direction of loading.
13. **NOT** use load chain as a sling, or wrap chain around load.
14. **NOT** apply the load to the tip of the hook or to the hook latch.
15. **NOT** apply load unless load chain is properly seated in the chain sprocket(s).
16. **NOT** apply load if bearing prevents equal loading on all load supporting chains.
17. **NOT** operate beyond the limits of the load chain travel.
18. **NOT** leave load supported by the hoist unattended unless specific precautions have been taken.
19. **NOT** allow the load chain or hook to be used as an electrical or welding ground.
20. **NOT** allow the load chain or hook to be touched by a live welding electrode.
21. **NOT** remove or obscure the warnings on the hoist.
22. **NOT** operate a hoist on which the safety placards or decals are missing or illegible.
23. **NOT** operate a hoist unless it has been securely attached to a suitable support.
24. **NOT** operate a hoist unless load slings or other approved single attachments are properly sized and seated in the hook saddle.
25. Take up slack carefully - make sure load is balanced and load holding action is secure before continuing.
26. Shut down a hoist that malfunctions or performs unusually and report such malfunction.
27. Make sure hoist limit switches function properly.
28. 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. To avoid such a potentially hazardous situation, THE OPERATOR SHALL:

1. Maintain firm footing or be otherwise secured when operating the hoist.
2. Check brake function by tensioning the hoist prior to each lift operation.
3. Use hook latches. Latches are to retain slings, chains, etc. under slack conditions only.
4. Make sure the hook latches are closed and not supporting any parts of the load.
5. Make sure the load is free to move and will clear all obstructions.
6. Avoid swinging the load or hook.
7. Make sure hook travel is in the same direction as shown on the controls.
8. Inspect the hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
9. Use CM Hoists recommended parts when repairing the unit.
10. Lubricate load chain per hoist manufacturer's recommendations.
11. **NOT** use the hoist's overload limiting clutch to measure load.
12. **NOT** use limit switches as routine operating stops. They are emergency devices only.
13. **NOT** allow your attention to be diverted from operating the hoist.
14. **NOT** allow the hoist to be subjected to sharp contact with other hoists, structures, or objects through misuse.
15. **NOT** adjust or repair the hoist unless qualified to perform such adjustments or repairs.

SAFETY PRECAUTIONS

Each Shopstar Electric Chain Hoist is built in accordance with the specifications contained herein and at the time of manufacture complies with our interpretation of applicable sections of *American Society of Mechanical Engineers Code (ASME) B30.16 "Overhead Hoists," the National Electrical Code (ANSI/NFPA 70) and the Occupational Safety and Health Act (OSHA). Since OSHA states the National Electrical Code applies to all electric hoists, installers are required to provide current overload protection and grounding on the branch circuit section in keeping with the code. Check each installation for compliance with the application, operation and maintenance sections of these articles.

The safety laws for elevators, lifting of people and for dumbwaiters specify construction details that are not incorporated into the hoists. For such applications, refer to the requirements of applicable state and local codes, and the American National Safety Code for elevators, dumbwaiters, escalators and moving walks (ASME A17.1). Columbus McKinnon Corporation cannot be responsible for applications other than those for which CM equipment is intended.

*Copies of this standard can be obtained from ASME Order Department, 22 Law Drive, PO Box 2300, Fairfield, NJ 07007- 2300, U.S.A., www.asme.org, 800-843-2763.



THIS SYMBOL POINTS OUT IMPORTANT SAFETY INSTRUCTIONS WHICH IF NOT FOLLOWED COULD ENDANGER THE PERSONAL SAFETY AND/OR PROPERTY OF YOURSELF AND OTHERS. READ AND FOLLOW ALL INSTRUCTIONS IN THIS MANUAL AND ANY PROVIDED WITH THE EQUIPMENT BEFORE ATTEMPTING TO OPERATE YOUR Shopstar HOIST.

HOIST SAFETY IS UP TO YOU...

⚠ WARNING
DO NOT LIFT MORE THAN RATED LOAD.
DO OPERATE WITH MANUAL POWER ONLY (ONE OPERATOR)

CHOOSE THE RIGHT HOIST FOR THE JOB...

Choose a hoist with the capacity for the job. Know the capacities of your hoists and the weight of your loads.

Then match them.

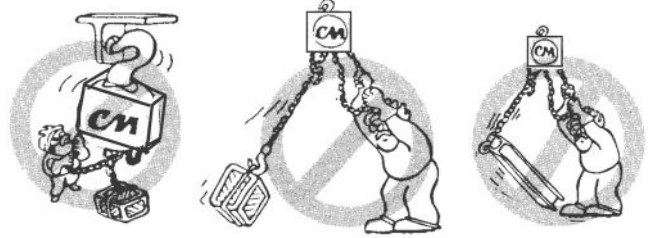
The application, the size and type of load, the attachments to be used and the period of use must also be taken into consideration in selecting the right hoist for the job.

Remember, the hoist was designed to ease our burden and carelessness not only endangers the operator, but in many cases, a valuable load.



⚠ WARNING
DO NOT PULL AT AN ANGLE. BE SURE HOIST AND LOAD ARE IN A STRAIGHT LINE.
DO NOT USE LOAD CHAIN AS A SLING.

USE HOIST PROPERLY



Be sure hoist is solidly held in the uppermost part of the support hook arc.

Be sure hoist and load are in a straight line. Do not pull at an angle.

Be sure load is hooked securely. Do not tip load the hook. Do not load hook latch. Hook latch is to prevent detachment of load under slack chain conditions only.

Do not operate with hoist head resting against any object. Lift the load gently. Do not jerk it.



⚠ WARNING
DO NOT OPERATE DAMAGED OR MALFUNCTIONING HOIST.
DO NOT OPERATE WITH TWISTED, KINKED, OR DAMAGED CHAIN.

INSPECT

All hoists should be visually inspected before use, in addition to regular, periodic maintenance inspections.

Inspect hoists for operations warning notices and legibility.

Deficiencies should be noted and brought to the attention of supervisors. Be sure defective hoists are tagged and taken out of service until repairs are made.

Under no circumstances should you operate a malfunctioning hoist.



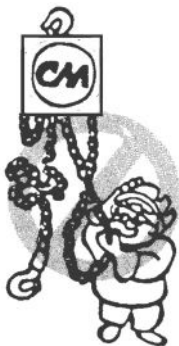
Check for gouged, twisted, distorted links and foreign material. Do not operate hoists with twisted, kinked, or damaged chain links.

Load chain should be properly lubricated.

Hooks that are bent, worn, or whose openings are enlarged beyond normal throat opening should not be used. If latch does not engage throat opening of hook, hoist should be taken out of service.

Chains should be checked for deposits of foreign material which may be carried into the hoist mechanism.

Check brake for evidence of slippage under load.



⚠ WARNING
DO NOT LIFT PEOPLE OR LOADS OVER PEOPLE

PRACTICE CAUTION ALWAYS

Do not lift co-workers with a hoist.

Make sure everyone is clear of the load when you lift.

Do not remove or obscure operational warning notices.

OPERATOR SERVICE

CLEANING

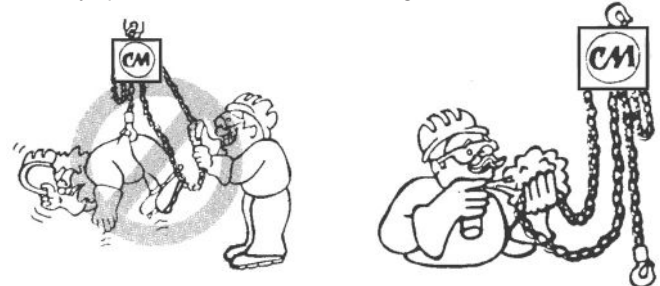
Hoists should be kept clean and free of dust, dirt, moisture, etc., which will in any way affect the operation or safety of the equipment.

LUBRICATION

Chain should be properly lubricated.

AFTER REPAIRS

Carefully operate the hoist before returning it to full service.



VIOLATIONS OF ANY OF THE WARNINGS LISTED MAY RESULT IN SERIOUS PERSONAL INJURY TO THE OPERATOR OR NEARBY PERSONNEL BY NATURE OF RELEASED LOAD OR BROKEN HOIST COMPONENTS.

FOREWORD

This manual contains important information to help you properly install, operate and maintain your hoist for maximum performance, economy and safety.

Please study its contents thoroughly before putting your hoist into operation. By practicing correct operating procedures and by carrying out the recommended preventive maintenance suggestions, you will experience long, dependable and safe service. After you have completely familiarized yourself with the contents of this manual, we recommend that you carefully file it for future reference.

The information herein is directed to the proper use, care and maintenance of the hoist and does not comprise a handbook on the broad subject of rigging.

Rigging can be defined as the process of lifting and moving heavy loads using hoists and other mechanical equipment. Skill acquired through specialized experience and study is essential to safe rigging operations. For rigging information, we recommend consulting a standard textbook on the subject.

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GENERAL INFORMATION

SPECIFICATIONS

The ShopStar Electric Chain Hoist is a highly versatile materials handling device that can be used to lift loads that are within its rated load capacity. It is available in seven load ratings: 250, 300, 500, 550, 600, 1,000 and 1,100 pounds (113,136, 226, 250, 272, 453, and 500 kg).

Standard features of the ShopStar Electric Chain Hoist include:

- Alloy steel, oblique lay liftwheel that provides constant chain speed and reduces chain wear.
- Hoistaloy® load chain for long and dependable service.
- Grease lubricated, hardened spur gears provide smooth and quiet operation.
- Thermally protected, hoist duty motor.
- Forged steel upper and lower hooks with latch.
- Protector™ that prevents lifting dangerous overloads.
- D.C. disc type motor brake plus regenerative braking.
- 10 foot (3 M) lift. Longer lifts can be supplied on a per order basis.
- 6 foot (1.8 M) power cord with three prong plug for grounding on 115-1-50/60 units. 6 foot (1.8 M) power cord with provisions for grounding is standard on 220-1-50 and three phase units.
- Rugged NEMA 4 (weatherproof) control station is suspended on a TYPE SO cord six feet (2.8 M) below the bottom of the hoist. Longer cords can be provided on a per order basis.
- Lightweight die cast aluminum frames and covers.
- Ball or needle bearings at all rotating points.
- Compact, yet rugged, design provides minimum headroom and long, trouble-free service.
- 13 fpm (3.9m/min) lift speed available on 1100 lb (500 kg) units.
- 19 fpm (5.8 m/min) lift speed available on 1000 lb (453 kg) units.
- 31 fpm (9.4 m/min) lift speeds available on 600 lb (272 kg) units.
- 26 fpm (7.9m/min) lift speed available on 550 lb (250 kg) units.
- 39 fpm (11.9m/min) lift speed available on 500 lb (226 kg) units.
- 63 fpm (19.2 m/min) lift speed available on 250/300 lb (113/136 kg) units.
- 100 thru 240-1-50/60 power. Three phase supplies can be used by connecting 2 of 3 phases.
- UL and cUL listed.
- Lifetime Warranty

REPAIR/REPLACEMENT POLICY

All Columbus McKinnon (CM®) ShopStar Electric Chain Hoists are inspected and performance tested prior to shipment. If any properly maintained hoist develops a performance problem, due to a material or workmanship defect, as verified by CM, repair or replacement of the unit will be made to the original purchaser without charge. This repair/replacement policy applies only to ShopStar Hoists installed, maintained and operated as outlined in this manual, and specifically excludes hoists subject to normal wear, abuse, improper installation, improper or inadequate maintenance, hostile environmental effects and unauthorized repairs/modifications.

WARNING

Alterations or modification of hoist and use of non-original repair parts can lead to dangerous operation and injury.

TO AVOID INJURY

- Do not alter or modify equipment.
- Do use only original replacement parts.

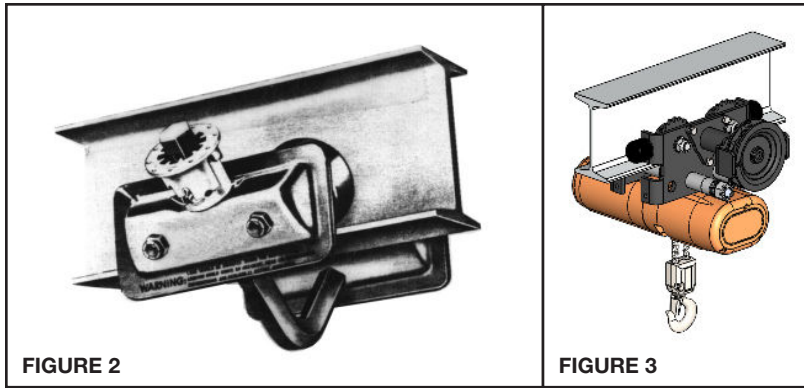
We reserve the right to change materials or design if, in our opinion, such changes will improve our product. Abuse, repair by an unauthorized person, or use of non-CM replacement parts voids the guarantee and could lead to dangerous operation. For full Terms of Sale, see Sales Order Acknowledgment. Also, refer to the back cover for Limitations of Warranties, Remedies and Damages, and Indemnification and Safe Operation.

ACCESSORIES



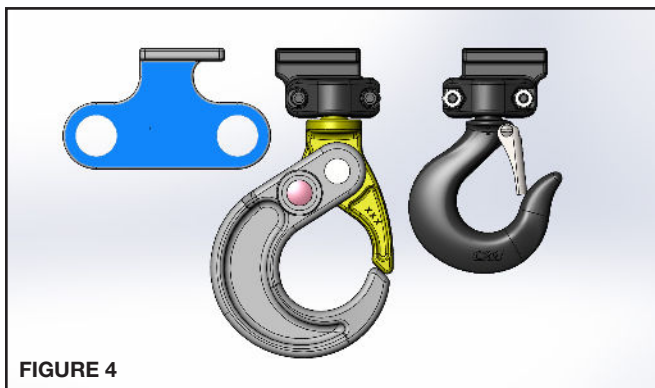
CHAIN CONTAINER

This accessory item (Figure 1) is used to hold the slack chain and it is supplied with mounting hardware and instructions. Chain containers are recommended for those applications where slack chain will interfere with the load or drag on the floor as may more often be the case with the (600, 1,000, and 1,100 lbs., 272, 453, and 500 kg., Double Reeved units). Chain containers are shipped separately and can be furnished for units already in service.



TROLLEYS

The 632 trolley is a light weight, yet rugged, manual push Trolley designed to fit a wide range of monorail beams and negotiate tight turns. (Figure 2) The UT trolley is available in manual and hand geared versions. (Figure 3)



HOOKS

Alternate hook styles are available. (Figure 4) shows UT trolley lug, swivel Latchlok (upper and lower), and swivel latch types.

INSTALLATION

UNPACKING INFORMATION

When received, the hoist should be carefully inspected for damage which may have occurred during shipment or handling. Check the hoist frame for dents or cracks, the external cords for damaged or cut insulation, the control station for cut or damaged enclosure, and inspect the load chain for nicks and gouges.

If shipping damage has occurred, refer to the packing list envelope on the carton for claim procedure. Before installing the hoist, make sure that the power supply to which it will be connected is the same as that shown on the nameplate located on the side of the hoist.

NOTE: See Electrical Installation instructions

MOUNTING THE HOIST

Hang the hoist from its intended support. The structure used to support the hoist must have sufficient strength to withstand several times the load imposed. If in doubt consult a registered engineer and local building codes.

⚠ WARNING
Suspending the hoist from an inadequate support may allow the hoist and load to fall and cause injury and/or property damage.
TO AVOID INJURY
Make sure the structure has sufficient strength to hold several times the weight of the hoist and its rated load. Using the upper hook, hang the hoist from the support. Be sure hoist is solidly held in the uppermost part of the hook arc and the latch is tightly against the hook tip.

POWER SUPPLY AND ELECTRICAL CONNECTIONS

(Refer to Figure 6-7.) To insure proper operation, to avoid damage to hoist and electrical system and to reduce the risk of electric shock or fire, the branch circuit supplying power to the hoist must:

1. Have ample capacity to prevent excessive voltage drop during starting and operation (refer to "Checking for Adequate Voltage at Hoist" on page 3). When determining the size of branch circuit components and conductors, special consideration should be given to the starting current-amps (approximately three times that shown on the hoist identification plate) and the length of the conductors. As a minimum, the system should be rated for 15 amps and it should have #16 AWG, or larger, wiring.
2. Be in accordance with the National Electrical Code (ANSI/NFPA-70) and applicable National, State and Local Codes.
3. Effectively ground the hoist in accordance with National Electrical Code and other applicable codes. Proper grounding provides a path of least resistance for electric current to reduce the risk of electric shock. The power cord of the hoist includes a green-yellow wire for grounding the hoist to the external power supply system. On the standard 115-1-60 units, the power cord is equipped with a three prong plug. Be sure that the receptacle opening that receives the longest prong is properly grounded. If the trolley trackwheels are used as a secondary ground path, each section of the runway must be grounded to the building ground system using metal to metal connections.

⚠ WARNING
Failure to properly ground the hoist presents the danger of electric shock.
TO AVOID INJURY
Permanently ground the hoist as instructed in this manual.

4. Include slow blow type fuses or inverse trip time circuit breakers to permit the hoist to start and accelerate load.
5. Include a disconnecting means capable of being locked in the "open" position.

⚠ WARNING
Failure to provide a proper power supply system for the hoist may cause hoist damage and offers the potential for a fire.
TO AVOID INJURY
Provide the hoist with a 15 amp, minimum, overcurrent protected power supply per the National Electrical Code (ANSI/NFPA 70) and applicable local codes as instructed in this manual.

The hoist contains a PFC (power factor correction) circuit that allows it to operate on a wide voltage input range between 100 volts AC, up to 240 volts AC single phase, either 50/60 Hz. For single phase voltages above 120 volts, remove the 120 volt plug. Attach the cord to a 220-240 volt single phase plug, or hardwire to a junction box. For three phase voltages between 208-240, 50/60 Hz, connect to 2 of the 3 power legs per diagram 7.

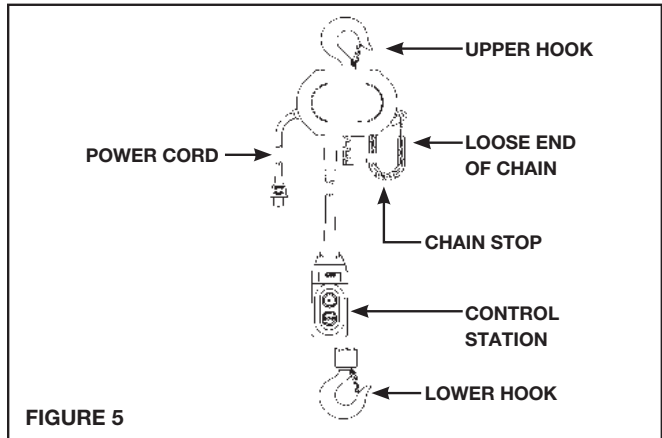


FIGURE 5

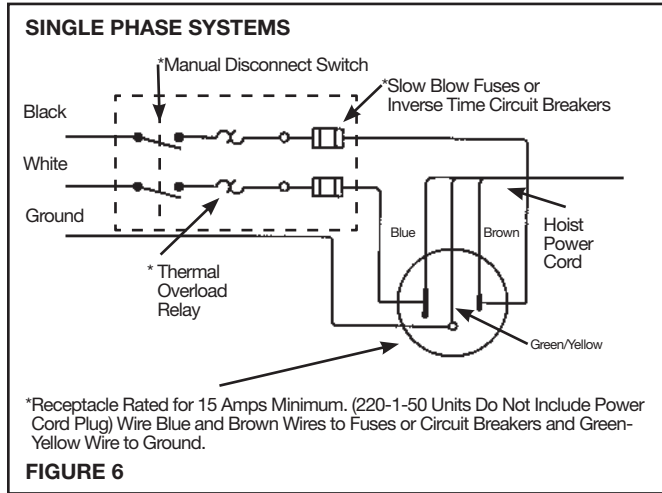


FIGURE 6

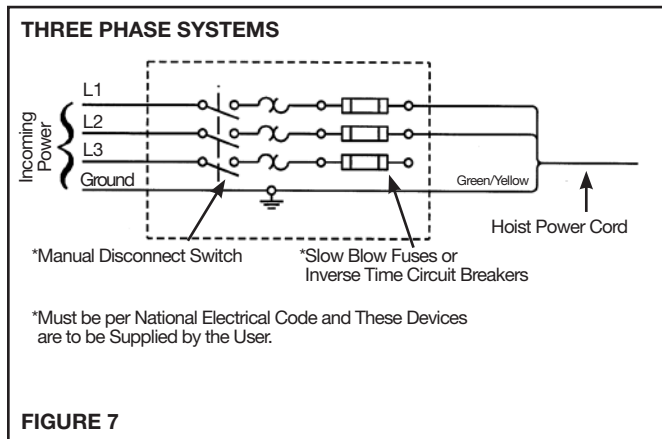


FIGURE 7

HOIST ROTATION

The two power wires can be connected in any order to L1 and L2. This will not affect the direction of operation.

WARNING

Allowing the hook block to run into the bottom of the hoist when raising a load or allowing the chain stop to run into the bottom of the hoist when lowering a load may break the chain and allow the load to drop.

TO AVOID INJURY

Do not allow the hook block or the chain stop to contact the bottom of the hoist.

CHECKING FOR ADEQUATE VOLTAGE AT HOIST

The hoist must be supplied with adequate electrical power for proper operation and to reduce problems that may result from insufficient power (low voltage).

- If the hoist voltage drops to 85 volts, the control will fault and stop the hoist. The voltage must be raised above 90 volts to reset the control and start operation.

For proper operation and to avoid these low voltage problems, voltage (measured at end of the power cord while lifting rated load) should be 100 volts minimum.

***The drop in voltage upon energizing the hoist should not be below the value listed.**

Low voltage can also be caused by using an undersized extension cord to supply power to the hoist. The following charts should be used to determine the size wires in the extension cord in order to minimize the voltage drop between the power source and the hoist.

Maximum Length of Extension Cord	
Wire Size	Wingle Phase Hoist
#16 AWG	100 feet (30M)
#14 AWG	200 feet (61M)

After the hoist is suspended from its support and you have made sure the power supply complies with the requirements on the previous page, the hoist is ready for operation.

On the (600, 1,000, and 1,100 lbs., 272, 453, and 500 kg., Double Reeved units), cut and discard the ties used to hold the two strands of chain together. With no load on the lower hook, depress the "UP" button in the control station and raise the lower hook until it is about 2 feet below the bottom of the hoist. Check both strands of chain for twists. Twists occur if the lower hook block has been capsized between the strands of chain during packing, shipment and/or handling. Reverse the capsize to remove twists.

CHAIN CONTAINER

If the chain container is to be used, attach it to the hoist per the instructions provided.

OPERATING INSTRUCTIONS

The hoist is equipped with a Protector™ that is designed to allow the first gear to slip on an excessive overload. An overload is indicated when the hoist speed slows down, it raises the load in a jerky manner or it will not lift the load at all. Also, some clutching noise may be heard if the hoist is loaded beyond rated capacity. Should this occur, immediately release the “UP” button to stop the operation of the hoist. At this point, the load should be reduced to the rated capacity or the hoist should be replaced with one of the proper capacity. When the excessive load is removed, normal hoist operation is automatically restored.

CAUTION: The Protector™ is susceptible to overheating and wear when slipped for extended periods. Under no circumstance should the Protector be allowed to slip for more than a few seconds.

Due to the above, the hoist is not recommended for use in any application where there is a possibility of adding to an already suspended load to the point of overload. This includes dumbwaiter installations, containers that are loaded in mid-air, etc. Also, if the hoist is used at unusual extremes of ambient temperatures, above 150° F (65°C), or below 15°F (-9°C), changes in lubricant properties may permit the hoist to raise larger loads than under normal operating conditions and present possibility of damage or injury.

There are no electrical switches to stop the operation of the hoist at the upper and lower limits of lift. As a result, it is necessary to release the push button in the control station to stop the hoist before the hook block or chain stop contacts the bottom of the hoist frame. If the hook block or chain stop contacts the hoist frame, the Protector™ will function to stop the hoisting or lowering operation and protect the hoist components from damage. However, continued, prolonged or repeated slipping of the Protector™ will damage the Protector™ and cause overheating of the internal hoist components.

- When lifting, raise the load only enough to clear the floor or support and check to be sure that the attachments to the hook and load are firmly seated. Continue lift only after you are assured the load is free of all obstructions.
- Do not load the hoist beyond the rated capacity shown on the brake end cover. Overloading can cause immediate failure of some load-carrying parts or create a defect causing subsequent failure at less than rated capacity. When in doubt, use the next larger capacity of the ShopStar Hoist.
- Do not use this or any other overhead materials handling equipment for lifting persons.
- Stand clear of all loads and avoid moving a load over heads of other personnel. Warn personnel of your intention to move a load in their area.
- Do not leave the load suspended in the air unattended.
- Permit only qualified personnel to operate unit.
- Do not wrap the load chain around the load and hook onto itself as a choker chain. Doing this will result in:
 - The loss of the swivel effect of the hook which could mean twisted chain and a jammed liftwheel.
 - The chain could be damaged at the hook.
- On the (600, 1,000, and 1,100 lbs., 272, 453, and 500 kg., Double Reeved) hoists, check for twists in the load chain. A twist can occur if the lower block has been capsized between the strands of chain. Reverse the capsize to remove twist.
- Do not allow a load to bear against the hook latch. The latch is to help maintain the hook in position while the chain is slack before taking up the slack chain.

⚠ WARNING

Allowing the hook block to run into the hoist when raising a load or allowing the chain stop to run into the hoist when lowering a load may break the chain and allow the load to drop.

TO AVOID INJURY

Do not allow the hook block or the chain stop to contact the hoist frame.

⚠ WARNING

Allowing a load to bear against the hook latch and/or hook tip can result in loss of load.

TO AVOID INJURY

Do not allow a load to bear against the hook latch and/or hook tip. Apply load to hook bowl or saddle only.

- Take up a slack load chain carefully and start load easily to avoid shock and jerking of hoist chain. If there is any evidence of overloading, immediately lower the load and remove the excess load.
- Do not allow the load to swing or twist while hoisting.
- Never operate the hoist when flammable materials or vapors are present. Electrical devices produce arcs or sparks that can cause a fire or explosion.
- STAY ALERT!** Watch what you are doing and use common sense. Do not use the hoist when you are tired, distracted or under the influence of drugs, alcohol or medication causing diminished control.

Black Station for Hoists with Contactor

Control Station

Depress to move load hook towards hoist

Depress to move load hookaway from hoist



FIGURE 8

Hoist operation is controlled by depressing the control station push buttons. (Refer to Figure 8) Depressing the “UP” push button will move the load hook toward the hoist; depressing the “DOWN” push button will move the load hook away from the hoist. The “UP” and “DOWN” buttons are momentary type and the hoist will operate in the selected direction as long as the button is held in the depressed position. Release the push button and the hoist will stop.

- When preparing to lift a load, be sure that the attachments to the hook are firmly seated in hook saddle. Avoid off center loading of any kind, especially loading on the point of the hook.

HOIST OPERATIONAL MODES:

Four modes of pendant operation are available:

- (1) 3-step infinitely variable mode; (2) 3-step /3 speed mode;
- (3) 2-step infinitely variable mode; (4) 2-step/2 speed mode.

The mode of operation as well as operational parameters are configurable through an external serial interface (described in the communications section below). The speed of the hoist operation is determined by the force that is applied to the UP or DOWN buttons. There are 4 distinct levels, or switch positions, for both switches. These switch positions can be characterized in the following manner:

- (1) Position 0-resting position, the switch is not pressed.
- (2) Position 1-the switch is pressed to the 1st position down;
- (3) Position 2-the switch is pressed to the 2nd, or middle, position down;
- (4) Position 3-the switch is pressed to the 3rd, or bottom, position down; (3 step pendants only)

3-STEP INFINITELY VARIABLE

When both the UP and DOWN buttons are at position 0, the hoist is stopped and the brake is set. Pressing either the UP or DOWN button will result in the following actions at the listed positions:

- (1) Position 1- moving from position 0 to position 1 will cause the brake to release and the hoist to accelerate to the minimum programmed speed. Moving from position 2 to position 1 will cause the hoist to decelerate from the current speed down to the minimum programmed speed.
- (2) Position 2- this will hold the present running speed.
- (3) Position 3- moving from position 2 to position 3 will cause the hoist to accelerate from the present speed up to the maximum programmed speed.

3-STEP/ 3 SPEED

When both the UP and DOWN buttons are at position 0, the hoist is stopped and the brake is set. Pressing either the UP or DOWN button will result in the following actions at the listed positions:

- (1) Position 1- moving from position 0 to position 1 will cause the brake to release and the hoist to accelerate to the minimum programmed speed. Moving from position 2 to position 1 will cause the hoist to decelerate from the current speed down to the minimum programmed speed.
- (2) Position 2- changing from position 1 or position 3 will cause the speed to accelerate or decelerate to the mid-level programmed speed.
- (3) Position 3- moving from position 2 to position 3 will cause the hoist to accelerate from the present speed up to the maximum programmed speed. Factory default is 2750 motor rpm.

2-STEP INFINITELY VARIABLE

When both the UP and DOWN buttons are at position 0, the hoist is stopped and the brake is set. Pressing either the UP or DOWN button will result in the following actions at the listed positions:

- (1) Position 1- moving from position 0 to position 1 will cause the brake to release and the hoist to accelerate to the minimum programmed speed. Moving from position 2 to position 1 will cause the hoist to hold the current speed.
- (2) Position 2- moving from position 1 to position 2 will cause the hoist to accelerate from the present speed up to the maximum programmed speed.

2-STEP / 2 SPEED

When both the UP and DOWN buttons are at position 0, the hoist is stopped and the brake is set. Pressing either the UP or DOWN button will result in the following actions at the listed positions:

- (1) Position 1- moving from position 0 to position 1 will cause the brake to release and the hoist to accelerate to the minimum programmed speed. Moving from position 2 to position 1 will cause the hoist to decelerate to the minimum programmed speed.
- (2) Position 2- moving from position 1 to position 2 will cause the hoist to accelerate from the minimum programmed speed up to the maximum programmed speed.

COMMUNICATIONS

Hoist operating parameters can be modified and life information can be obtained through an external serial port. The port is accessed by removing a rubber plug located on top of the brake end cover of the hoist, and connecting an optional serial interface cable between the hoist and a computer with available USB port. A serial cable kit can be obtained through Columbus McKinnon. The input parameters can set the following:

- A) The operation mode as controlled by the pendant. See previous sections.
- B) The minimum, medium, and maximum hoist lifting speed.
- C) The hoist acceleration and deceleration rates.

PROTECTION MODES

CURRENT: The hoist will stop movement if the current reaches a preset current limit caused by conditions such as overload or jammed chain.

THERMAL: The hoist circuitry contains four thermistors to monitor the temperature of various components. If an initial temperature threshold is reached, the hoist will go into a "foldback" mode which reduces the maximum operating speed. Greater differences between the current temperature and the threshold will reduce the speed further. If excessive use continues and a second higher limit is reached, the hoist will stop until it has cooled below these limits. Reducing the temperature below the initial limit will allow the hoist to run at full speed. These functions are to prevent additional heat rise and potential damage to the internal components.

INSPECTION

To maintain continuous and satisfactory operation, a regular inspection procedure must be initiated to replace worn or damaged parts before they become unsafe. Inspection intervals must be determined by the individual application and are based on the type of service to which the hoist will be subjected.

The type of service to which the hoist is subjected can be classified as "Normal", "Heavy", or "Severe".

NORMAL SERVICE:

Involves operation with randomly distributed loads within the rated load limit, or uniform loads less than 65 percent of rated load for not more than 25 percent of the time.

HEAVY SERVICE:

Involves operating the hoist within the rated load limit which exceeds normal service.

SEVERE SERVICE:

Normal or heavy service with abnormal operating conditions or constant exposure to the elements of nature. Two classes of inspection - frequent and periodic - must be performed.

FREQUENT INSPECTIONS:

These inspections are visual examinations by the operator or other designated personnel. Records of such inspections are not required. The frequent inspections are to be performed monthly for normal service, weekly to monthly for heavy service, and daily to weekly for severe service, and they should include those items listed in Table 4.

PERIODIC INSPECTIONS:

These inspections are visual inspections of external conditions by an appointed person. Records of periodic inspections are to be kept for continuing evaluation of the condition of the hoist. Periodic inspections are to be performed yearly for normal service, semi-annually for heavy service and quarterly for severe service, and they are to include those items listed in Table 4.

CAUTION: Any deficiencies found during inspections are to be corrected before the hoist is returned to service. Also, the external conditions may show the need for disassembly to permit a more detailed inspection, which, in turn, may require the use of nondestructive type testing.

PREVENTATIVE MAINTENANCE

In addition to the above inspection procedure, a preventive maintenance program should be established to prolong the useful life of the hoist and maintain its reliability and continued safe use. The program should include the periodic and frequent inspections with particular attention being paid to the lubrication of the various components using the recommended lubricants (see page 25).

HOOK INSPECTION

Hooks damaged from chemicals, deformations or cracks, or any visibly apparent bend or twist from the plane of the unbent hook, excessive opening or seat wear must be replaced. Also, hooks that are opened and allow the latch to not engage the tip must be replaced. Any hook that is twisted or has excessive throat opening indicates abuse or overloading of the unit. Inspect other load sustaining parts, hook block screws, load pins and hook block bodies for damage.

On latch type hooks, check to make sure that the latch is not damaged or bent and that it operates properly with sufficient spring pressure to keep the latch tightly against the tip of the hook and allow the latch to spring back to the tip when released. If the latch does not operate properly, it should be replaced. See Figure 9 to determine when the hook must be replaced.

HOOK REMOVE CRITERIA

Based on B30-10 Hooks shall be removed from service if damage such as the following is visible and shall only be returned to service when approved by a qualified person:

- Missing or illegible rated load identification or illegible hook manufacturers' identification or secondary manufacturer's identification.
- Excessive pitting or corrosion.
- Cracks, nicks, or gouges.
- Wear — any wear exceeding 10% of the original section dimension of the hook or its load pin.
- Deformation — any visibly apparent bend or twist from the plane of the unbent hook.
- Throat opening — any distortion causing an increase in the throat opening of 5% not to exceed ¼" (6mm).

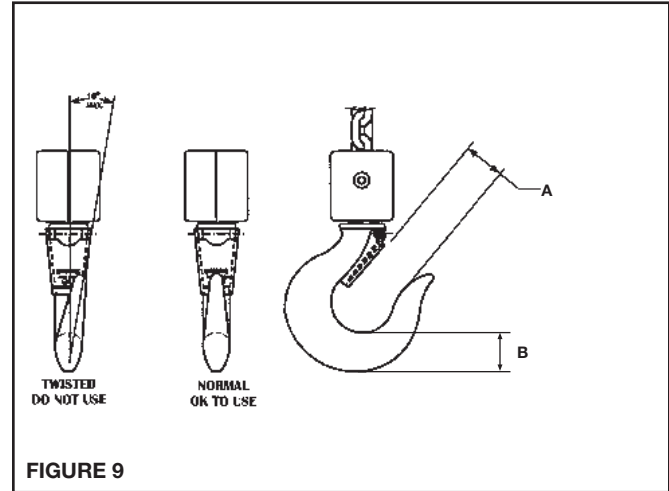


FIGURE 9

- Inability to lock — any self-locking hook that does not lock.
- Inoperative latch — any damaged or malfunctioning latch that does not close the hook's throat.
- Thread wear, damage, or corrosion.
- Evidence of excessive heat exposure or unauthorized welding.
- Evidence of unauthorized alterations such as drilling, machining, grinding, or other modifications.

Models	Latch Type Hook		Latchlok® Hook	
	"A" Max	"B" Min	"A" Max	"B" Min
All Capacities	1.12" (28.5mm)	.71" (18.0mm)	1.48" (37.7mm)	.75" (18.8mm)

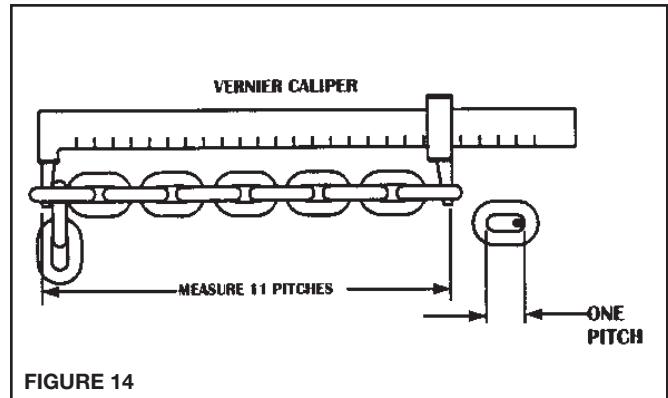
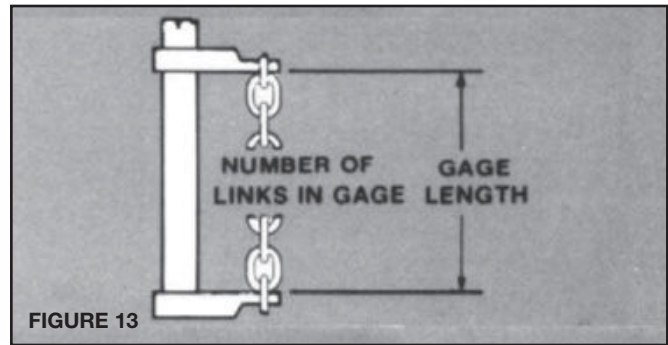
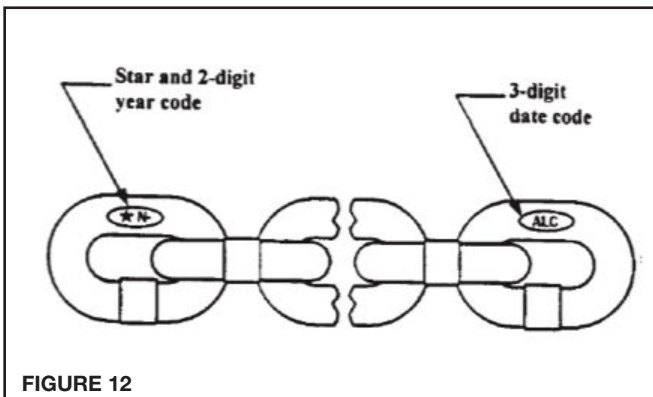
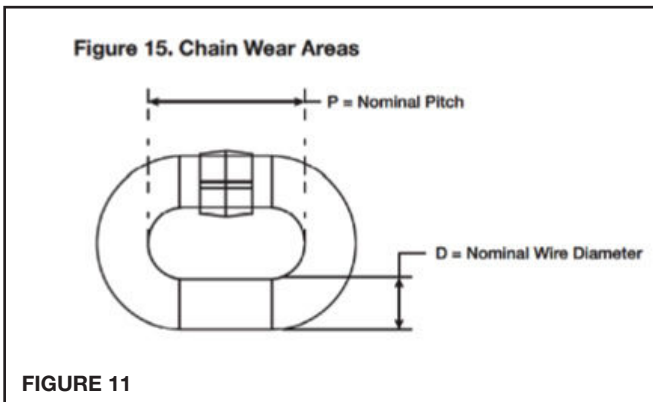
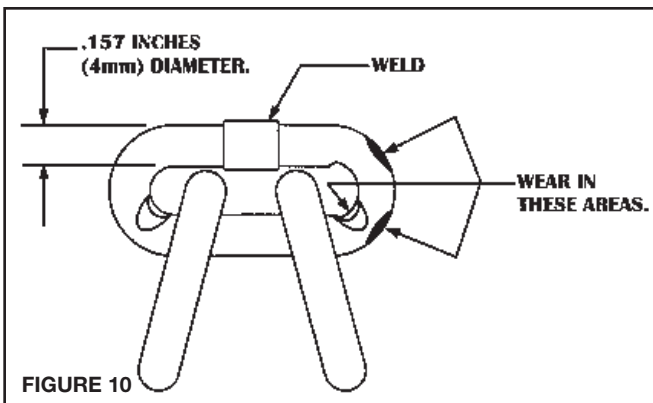
Table 3. Minimum Frequent Inspections			
TYPE OF SERVICE			ITEM
Normal	Heavy	Severe	
Monthly	Weekly to Monthly	Daily to Weekly	a) Brake for evidence of slippage.
			b) Control functions for proper operation.
			c) Hooks for damage, cracks, twists, excessive throat opening, latch engagement and latch operation - see page 12.
			d) Load chain for adequate lubrication, as well as for signs of wear, damaged links or foreign matter - see page 14-15.
			e) Load chain for proper reeving and twists.

Table 4. Minimum Periodic Inspections			
TYPE OF SERVICE			ITEM
Normal	Heavy	Severe	
Yearly	Every 6 Months	Every 3 Months	a) All items listed in Table 4 for frequent inspections.
			b) External evidence of loose screws, bolts, or nuts.
			c) External evidence of worn, corroded, cracked or distorted hook block, suspension screws, gears, bearings, dead end plate, or chain pin.
			d) External evidence of damage to hook retaining nut and pin. Also, check the upper suspension adapter, making sure it is fully seated in the hoist frame and that the screw is tight.
			e) External evidence of damage or excessive wear of the liftwheel and hook block sheave chain pockets. Widening and deepening of the pockets may cause the chain to lift-up in the pocket and result in binding between liftwheel and chain guides or between the sheave and hook block. Also, check the chain guide for wear or burring where the chain enters the hoist. Severely worn or damaged parts should be replaced.
			f) External evidence of excessive wear of brake parts, and brake adjustment - see page 16.
			g) Check the operation of the control station making sure the buttons operate freely and do not stick in either position.
			h) Inspect the electrical cords and cables and control station enclosure for damaged insulation.
			i) Inspect trolley trackwheels for external wear on tread and flange and for wear on internal bearing surfaces as evidenced by a looseness on the stud. Suspension components for damage, cracks, wear and operation. Also check suspension adapter screw for proper tightness - see page 16.
			j) Inspect the loose end ring, loose end screw and dead end block on double reeved units. Replace worn or distorted parts.
			k) Inspect the suspension lug or hook for excess free play or rotation. Replace worn parts as evidenced by excess free play or rotation.
l) Inspect for signs of lubricant leaks at the gasket between the gear housing and back frame. Tighten screws holding back frame to gear housing. If leak persists, repack housing and gears with grease and install a new gasket.			

INSPECTING THE LOAD CHAIN

The chain must be inspected at regular intervals, with a minimum of once annually. As the frequency of use increases, the time intervals between inspections must be reduced. During inspection, the chain must be examined along its entire length, including the hidden parts. If the lifting equipment is frequently operated over the same section of chain along with repeatable stopping positions, a particularly thorough inspection and lubrication is required in that area. Worn chain can be an indication of worn hoist components. For this reason, the hoist's chain guides, hook blocks and liftwheel (sprocket) should be examined for wear and replaced as necessary when replacing chain.

1. Check to see if chain is dirty or poorly lubricated.
2. Clean the chain with a non-caustic/non-acid type solvent and make a link by link inspection for wear or cracks in the links, twisted or deformed links. Chain with any one of these defects must be replaced.
3. Slack the portion of the chain that normally passes over the lift-wheel (sprocket) or idler sprocket on multi-reeved hoist. Examine the chain links for wear (see figure 10). If the wire diameter anywhere on the link measures less than 90% of the nominal wire diameter, the chain must be replaced.



4. Based upon ASME B30.16, 2012 chain should also be checked for elongation. Select an unworn, unstretched length of the chain (at the slack end for example). Suspend the chain vertically under tension and using a knife blade caliper type gauge, measure the outside length of any convenient number of links, 11 is recommended. Measure the same number of links in the used sections and calculate the percentage in increased length. The chain should be replaced if the length of the used portion is more than 2% longer than the unused portion of the chain. Also, if the pitch of any individual link has elongated by more than 5%, the chain should be replaced.

Use only Star (*) grade load chain and original replacement parts. Use of other chain and parts may be dangerous and voids factory warranty.

IMPORTANT: Do not use replaced chain for other purposes such as lifting or pulling. Load chain may break suddenly without visual deformation. For this reason, cut replaced chain into short lengths to prevent use after disposal.

WARNING

Use of commercial or other manufacturer's chain and parts to repair CM hoists may cause load loss.

TO AVOID INJURY

Use only CM supplied replacement load chain and parts. Chain and parts may look alike, but CM chain and parts are made of specific material or processed to achieve specific properties.

MAINTENANCE

CHAIN LUBRICATION

A small amount of lubricant will greatly increase the life of load chain. Do not allow the chain to run dry. Keep it clean and lubricate at regular intervals with Lubriplate® Bar and Chain Oil 10-R (Fiske Bros. Refining Co.) or equal lubricant. Normally, weekly lubrication and cleaning is satisfactory, but under hot and dirty conditions, it may be necessary to clean the chain at least once a day and lubricate it several times between cleanings.

WARNING

Used motor oils contain known carcinogenic materials.

TO AVOID INJURY

Never use used motor oils as a chain lubricant. Only use Lubriplate® Bar and Chain Oil 10-R as a lubricant for the load chain.

When lubricating the chain, apply sufficient lubricant to obtain natural run-off and full coverage, especially in the interlink area.

HOIST LUBRICATION

Refer to Exploded View and Parts List pages 23-25.

WARNING

The lubricants used in and recommended for the ShopStar may contain hazardous materials that mandate specific handling and disposal procedures..

TO AVOID INJURY

Handle and dispose of lubricants only as directed in applicable material safety data sheets and in accordance with applicable local, state and federal regulations

NOTE: To assure extra long life and top performance, be sure to lubricate the various parts of the ShopStar using the lubricants specified below. If desired, these lubricants may be purchased from CM. Refer to page 25 for information on ordering the lubricants.

GEARS

- The Protector™ (620-111) should operate for the normal life of the hoist without service. The device has been lubricated and calibrated by CM and should not be adjusted.

CAUTION: The Protector is to be used with “Century Lubricants HB-11, #3” grease. Do not use any other grease or the Protector will not operate properly and parts could be damaged. The gears and Protector are packed at assembly with grease and should not need to be renewed unless the gears have been removed from the housing and degreased.

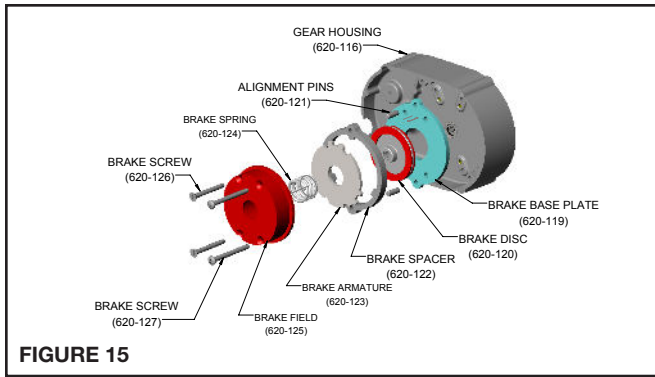


FIGURE 15

CAUTION: Never degrease the Protector or attempt to disassemble this device. Degreasing the Protector may damage parts and using a device that has been degreased may cause erratic, inconsistent operation. If the Protector has been degreased, it must be replaced by a CM calibrated device.

If the gears are removed from the housing, wipe the excess grease off the outside surfaces of the Protector™ with a soft cloth and degrease the remaining gears and housings. Upon reassembly, add 2 oz. of the above grease to gears and housings. Also, coat the spline on the end of the first pinion and shaft with a Molydisulphide lubricant such as Moly-Duolube 67 (Hercules Packing Co.).

BEARINGS

Rotor bearings are pre-lubricated and require no lubrication. Needle bearings are packed at assembly with grease and should not need to be relubricated. However, if the housings, liftwheel or sheave wheel have been degreased, these bearings should be greased using “Century Lubricants HB-11, #3” grease.

SEALS

When reassembling the unit, wipe the inside surface of the seals with “Century Lubricants HB-11 #3” grease.

HOOK BLOCK

If the hook blocks are disassembled for inspection purposes, wipe the grease from the hook knob and the hook knob cavities in the hook blocks. At reassembly, coat the underside of the hook knob and the knob bearing surfaces of cavities in the hook blocks with Molykote BR-2-S (Dow Corning Corp.) grease or equivalent.

CHAIN GUIDE, LIFTWHEEL AND SHEAVE WHEEL

- When the hoist is disassembled for inspection and/or repair, the chain guide, stripper, sheave wheel (on double chain unit) and liftwheel must be lubricated with Lubriplate® Bar and Chain Oil 10-R (Fiske Bros. Refining Co.) prior to reassembly. The lubricant must be applied in sufficient quantity to obtain natural runoff and full coverage of these parts.

LOAD CHAIN

Refer to page 15 for lubrication of the load chain.

TROLLEY LUBRICATION

See appropriate trolley manual.

EXTERIOR FINISH

The exterior surface of the hoist has a durable, scratch resistant baked powder coating. Normally, the exterior surfaces can be cleaned by wiping with a cloth.

ELECTRIC BRAKE

The brake is non-adjustable with a nominal .004 inch (0.102 mm) air gap and the brake disc must be replaced when the air gap reaches .012 inch (0.305 mm). The brake spacer should be no more than .012 inch (0.305 mm) thicker than the combined thickness of the brake disc and armature plate. Refer to Figure 16, pg. 17.

To inspect the brake gap, disconnect the hoist from power and remove the PFC end cover. (128)

<p>WARNING</p>
<p>Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.</p>
<p>TO AVOID INJURY</p>
<p>Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.</p>

1. Refer to Figure 15 and disassemble the brake. Depress and hold the field assembly (125) while removing the four brake screws (126 & 127). The field assembly is under spring pressure and will spring-out if not held. Examine the base plate (119), brake disc (120) and armature (123) for excessive wear, scoring or warpage. Make sure the brake disc is not glazed, the coil firmly fixed in the field (125) and the brake spring (124) is not damaged. Worn, scored, warped, glazed or damaged parts should be replaced before preceding.
2. Refer to Figure 15 and assemble the brake. Depress and hold the field assembly (125), while installing the four brake screws through the brake parts and mount the brake on the gear housing (116). Tighten the four brake screws (126 & 127) to 25 in-lb (2.8 N-m).

PROTECTOR

The Protector™ should operate for the normal life of the hoist without service. The device has been lubricated and calibrated and it should not be adjusted. If the Protector™ is not operating properly (see testing on page 21), it must be replaced with a properly calibrated unit from the factory.

PREVENTATIVE MAINTENANCE

A preventative maintenance program should be established to prolong the useful life of the hoist and maintain its reliability and continued safe use. The program should include the periodic and frequent inspections with particular attention being paid to the lubrication of the various components using the recommended lubricants (see page 25).

ELECTRICAL DATA

The only devices that can be checked are the power cord, pendant and cable assembly, wiring harness, and brake coil. The brake coil has a resistance of approximately 1,120 ohms. The operation of the pendants can be seen in the wiring diagram shown on page following page. The continuity of the above components can be checked with an ohm meter. The circuit boards located in the end covers are not repairable and must be replaced if all other items have been checked for faults and the hoist is still inoperable.

Always disconnect unit from the power supply system before removing hoist covers or the back cover of control station.

⚠ WARNING

Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.

TO AVOID INJURY:

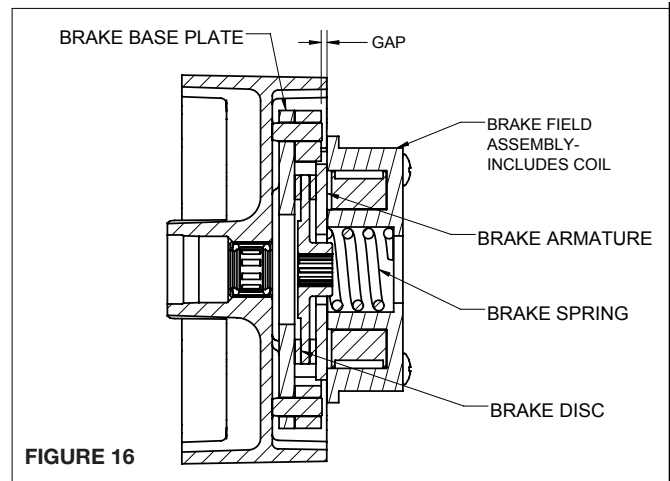
Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.

AMP DRAW FOR 300, 500, 600, 1000 LBS UNITS (136, 226, 272, 453 KG UNITS)

Hertz	Volts	Amps UP	Amps DOWN
60	100	7.6	0.08
60	110	6.85	0.09
60	120	6.14	0.09
60	208	3.57	0.06
60	230	3.22	0.06
50	100	7.55	0.11
50	110	6.75	0.10
50	220	3.33	0.07
50	240	3.02	0.06

AMP DRAW FOR 550, 1100 LBS UNITS (250, 500 KG UNITS)

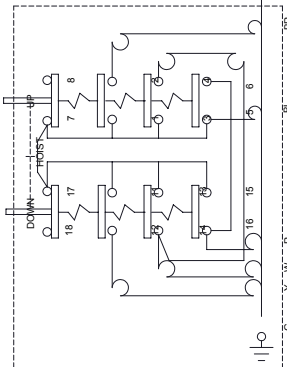
Hertz	Volts	Amps UP	Amps DOWN
60	100	5.10	0.07
60	110	4.60	0.10
60	120	4.25	0.09
60	208	2.43	0.06
60	230	2.24	0.06
50	100	5.30	0.10
50	110	4.70	0.08
50	220	2.26	0.06
50	240	2.12	0.06



ELECTRICAL WIRING DIAGRAMS

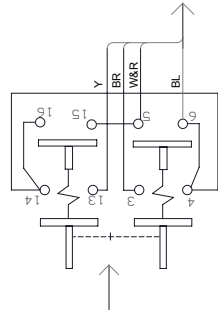
FUNCTIONAL BLOCK WIRING DIAGRAM

3 STEP PENDANT



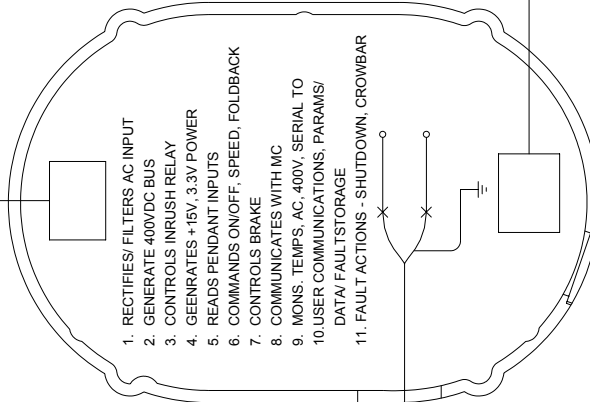
OR

2 STEP PENDANT



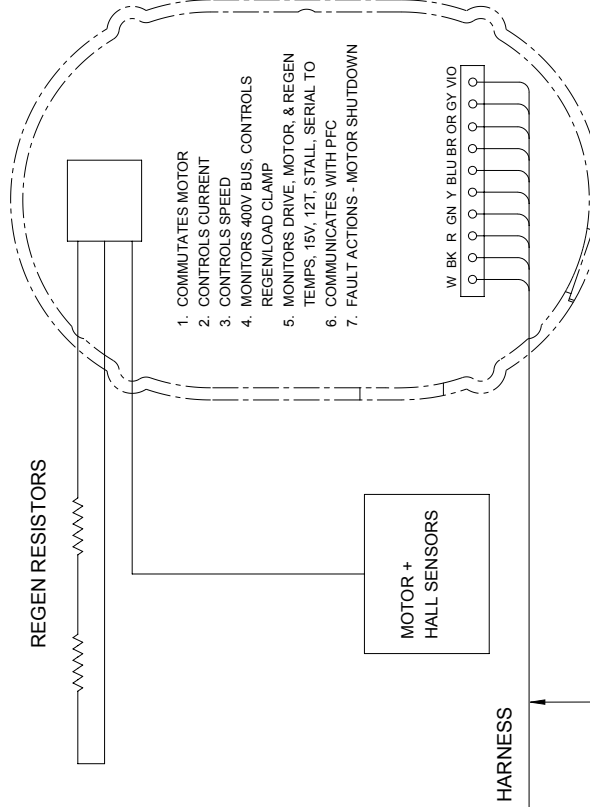
100 - 240 VAC
SINGLE PHASE

6 PIN PENDANT HEADER



10 PIN HEADER
FOR HARNESS

14 PIN HEADER



REGEN RESISTORS

MOTOR +
HALL SENSORS

HARNESS

400VDC BUS, BRAKE
CONTROL, SERIAL
TX/RX, ISOLATED,
15V SUPPLY

W BK R GN Y BLU BR OR GY VIO

TROUBLESHOOTING

Always disconnect unit from the power supply system before removing hoist covers or the back cover of control station

Problem	Probable Cause	Remedy
1. Hook does not respond to control station.	A. No voltage at hoist.	A. Check for blown fuse or circuit breaker, or open disconnect switch in main line or branch circuit. Replace fuse, reset circuit breaker, or close switch.
	B. Open control circuit due to loose connections or broken wire in circuit.	B. Use wiring diagram to check electrical continuity of wiring and control station contacts. Use wiring diagram to check electrical continuity of wiring and control station contacts. Repair wiring or replace defective part.
	C. Wrong voltage or frequency.	C. Make sure the power supply to the hoist is the same as that shown on the I.D. tag on the bottom of the hoist.
	D. Low voltage.	D. Check power supply system to make sure it complies with the requirements listed under "POWER SUPPLY AND ELECTRICAL CONNECTIONS" starting on page 8.
	E. Brake not releasing due to open or shorted coil, or binding brake disc or armature.	E. Check coil continuity and connections. Make sure brake disc slides freely on the 1st pinion spline. Check for broken brake spring. Remove any brake dust from components of the brake assembly.
	F. Excessive load.	F. Reduce load to capacity limit as indicated on I.D. tag and capacity labels.
2. Hook lowers but will not raise.	A. Excessive load.	A. See item 1F.
	B. Hoisting circuit is OPEN due to loose connections or broken wires in circuit, or control station is not making contact.	B. See item 1B.
3. Hook raises but will not lower.	A. Hoisting circuit is OPEN due to loose connections or broken wires in circuit, circuit, or control station is not making contact.	A. See item 1B.
4. Hook does not stop promptly.	A. Brake slipping.	A. Check electric brake (page 16). Check to make sure brake disc is free to move on 1st pinion. Check for warped brake disc, base plate, armature. Clean brake dust from assembly.
	B. Excessive load.	B. See item 1F.
5. Hoist operates sluggishly.	A. Excessive load.	See item 1F.
	B. Brake dragging.	See item 1E.
	C. Hoist is too hot.	See thermal protection on page 11.
6. Motor overheats (Hoist will not run up or down)	A. Excessive load.	A. See item 1F.
	B. Brake dragging.	See item 1E.
	C. Extreme external heat.	Hoist ambient temperature must be reduced below 104°F (40°C). Provisions should be made to ventilate the space around the hoist and/or shield it from radiant heat.

* A more detailed explanation of electronics troubleshooting can be found with the CM interface cable kit. This procedure requires use of extracted fault codes from the hoist memory, plus multimeter readings.

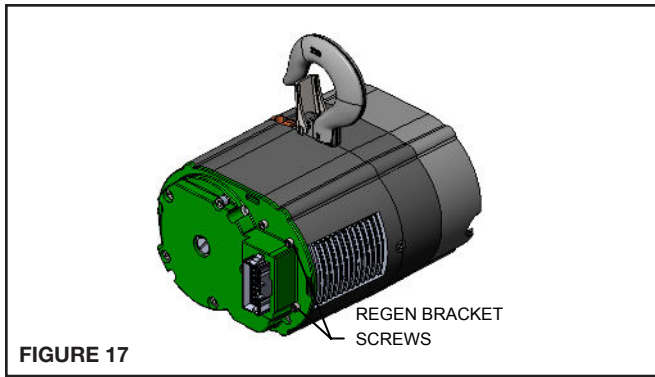


FIGURE 17

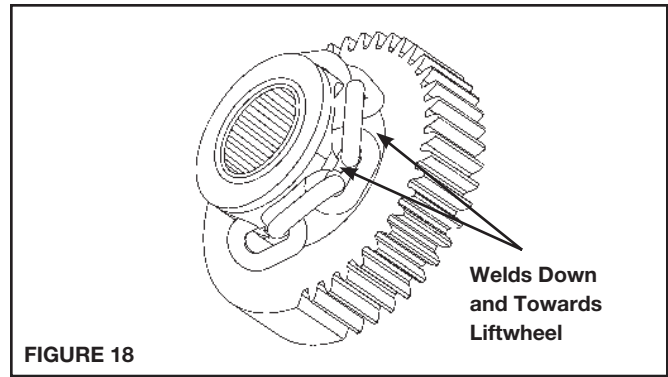


FIGURE 18

DISASSEMBLY-ASSEMBLY INSTRUCTIONS

When disassembling and assembling the ShopStar Hoist, refer to the exploded view and the parts list on pages 23-24. These show the proper relationship of the parts, the names of the parts and the required quantities of the parts. In addition, please observe the following:

1. Needle bearings are pressed into the gear housing (116), main frame (100), liftwheel (109) and lower sheave wheel (161). Unless they are to be replaced, do not attempt to remove these bearings.
2. A liftwheel seal (100a) is pressed into the main frame (100) and a seal (111) is pressed into the end of the liftwheel shaft (110). Be careful that these seals are not cut or damaged during disassembly and reassembly.
3. Refer to page 16 for disassembly, inspection and reassembly of the brake.
4. Do not attempt to disassemble the Protector™ - refer to page 16.
5. Refer to page 15 for lubrication instructions.
6. See next section for load chain removal and installation.
7. Tighten the various screws as follows:

Key No.	Part Name	Seating LB. IN.	Torque NM
105	Pin Retainer Plate Screw	25	2.8
129	Motor Cover Screw	25	2.8
118	Gear Housing Screw	25	2.8
140	Brake End Cover Screw	25	2.8
158	Dead End Plate Screw	125	14.1
143	Hook Retainer Screw	10	1.1
155	Hook Block Screw 600, 1,000, and 1,100 lbs., 272, 453, and 500 kg (Double Reeved) units 250, 300 and 500 lbs (113, 136 and 226 kg)	125	14.1
	(Single Reeved) units	50	5.6
164	Power Cord Ground Screw	20	2.2

8. To remove the stator, first remove the three motor cover screws (129) and pull the motor control end cover a few inches away from the motor. Ground screw (164) must be removed from the motor end bell. Also remove the 10 wiring harness leads from the motor control PCB by individually lifting the spring loaded retention levers on the terminal strip and pulling the wire from the block. Remove the regen bracket screw (141), and loosen the two screws holding the regen bracket to the end bell. (Figure 17)
9. Before assembling the stator, install the pin plate retainer (104) and mounting screws (105). The screws holding the regen bracket to the motor end bell should be partially loosened. Slide the motor into the main frame (100) being careful not to damage the heat transfer tape located on the edge of the regen

bracket. If the motor does not drop all the way in, spin the motor shaft with a flat blade screw driver to align the splines with the first pinion (113). Snug the two regen bracket screws. Install the side regen bracket screw (141), then tighten the two end screws. Install the 10 harness wires into the terminal strip on the motor control PCB. Be sure the color of the wire matches the printing on the PCB. Install the ground wire screw (164). Install the cover and the three mounting screws (129).

10. Properly install the upper hook as shown in Figure 19 & 20, then slide the hook retainer (142) into the cavity on top of the hoist and secure it using hook retainer screw (143). Tighten screw to a seating torque of 10 in-lbs (1.1 N-m).
11. After reassembly, test the unit per instructions on page 21.

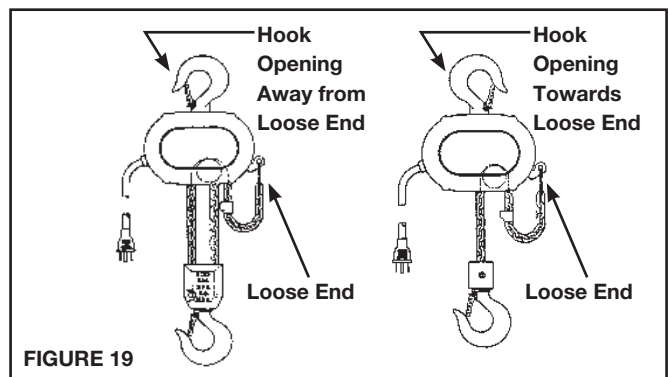


FIGURE 19

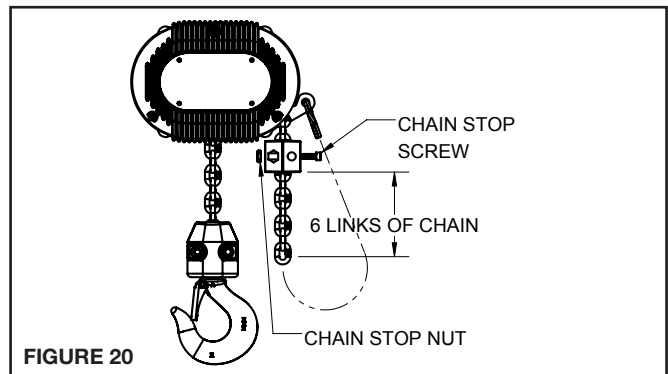


FIGURE 20

REMOVAL AND INSTALLATION OF LOAD CHAIN

⚠ WARNING

Improper installation (reeving) of the load chain can result in a dropped load.

TO AVOID INJURY

- Verify use of proper size and type of hoist load chain for specific hoist.
- Install load chain properly as indicated below.

USE ONLY CM EN (formerly DIN) OR STAR (*) GRADE LOAD CHAIN AND CM REPLACEMENT PARTS. USE OF OTHER CHAIN AND PARTS MAY BE DANGEROUS AND VOIDS FACTORY WARRANTY.

See Figure 12

CUTTING CHAIN

CM® Load chain is hardened and it is difficult to cut. The following methods are recommended when cutting a length of new chain from stock or cutting off worn chain:

1. Use a grinder and nick the link on both sides (Figure 21), then secure the link in a vise and break off with a hammer.
2. Use a 177.8 mm (7 inches) minimum diameter by 3.175 mm (1/8 inch) thick abrasive wheel (or type recommended by wheel supplier) that will clear adjacent links.
3. Use a bolt cutter (Figure 22) similar to the H.K. Porter No. 0590MTC with special cutter jaws for cutting hardened chain (25.4mm-1 inch) long cutting edge.

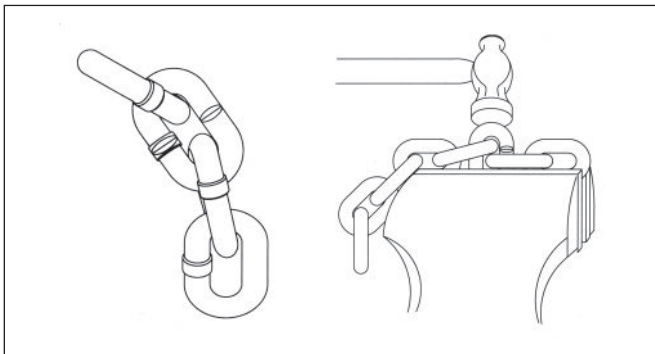


Figure 21. Cutting Chain by Nicking

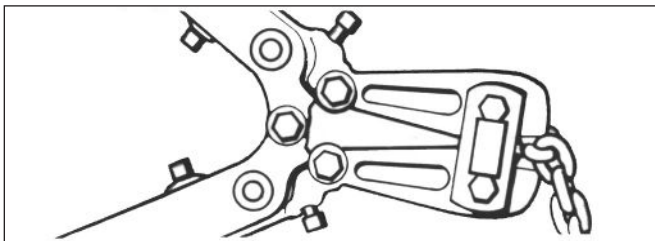


Figure 22. Cutting Chain with a Bolt Cutter

⚠ WARNING

Cutting Chain Can Produce Flying Particles.

TO AVOID INJURY:

- Wear Eye Protection.
- Provide a shield over chain to prevent flying particles.

⚠ WARNING

TESTING OF MECHANICAL OVERLOAD PROTECTION

Before using, all altered, repaired or used hoists that have not been operated for the previous 12 months shall be tested by the user for proper operation. First test the unit without a load and then with a light load of 22.7 kg. (50 lb.) times the number of load supporting parts of load chain to be sure that the hoist operates properly and that the brake holds the load when the control is released. Next test with a load of *125% of rated capacity. In addition, hoists in which load sustaining parts have been replaced should be tested with *125% of rated capacity by or under the direction of an appointed person and written report prepared for record purposes. After this test, check that the Load-limiter functions.

*If Load-limiter prevents lifting of a load of 125% of rated capacity, reduce load to rated capacity and continue test.

NOTE: For additional information on inspection and testing, refer to Code B30.16 "Overhead Hoists" obtainable from ASME Order Department, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300, U.S.A

REPAIR PARTS LIST

WARNING

Using "Commercial" or other manufacturer's parts to repair the CM Shopstar Hoists may cause load loss.

TO AVOID INJURY

Use only CM supplied replacement parts. Parts may look similar but CM parts are made of specific materials or processed to achieve specific properties.



ORDERING INSTRUCTIONS

The following information must accompany all correspondence orders for replacement parts:

1. Hoist Model Number from identification plate.
2. Serial number of the hoist stamped below identification plate.
3. Voltage, phase, hertz from the identification plate.
4. Length of lift.
5. Part number of part from parts list.
6. Number of parts required.
7. Part name from parts list.

NOTE: When ordering replacement parts, it is recommended that consideration be given to the need for also ordering such items as gaskets, fasteners, insulators, etc. These items may be damaged or lost during disassembly, or just unfit for future use because of deterioration from age or service.

SHOPSTAR VS PARTS LIST

Item Number	Part Name	NO. Req'd	Part Number
100	Main Frame Assembly (Includes Seal 100A)	1	10001597C
100A	Main Frame Seal	1	20705
101	Chain Guide	1	20304
102	Stripper	1	20305
103	Guide/Stripper Pins	4	20729
104	Pin Retainer Plate	1	20700
105	Pin Retainer Plate Screw	2	20743
106	Frame Pin	2	920720
107	Gasket	1	20755
108	Liftwheel Thrust Washer	2	88638
109	Liftwheel and Gear Assembly (Includes bearing 109A)		
	63 fpm, 250 & 300 lbs. 31 fpm, 600 lbs.	1	20657
	39 fpm, 500lbs. 20 fpm, 1000lbs.	1	20647
	26 fpm, 550 lbs. 13 fpm, 1100 lbs.	1	20664
109A	Liftwheel Bearing	2	88637
110	Liftwheel Shaft	1	20313
111	Liftwheel Shaft Seal	1	20704
112	First Pinion Thrust Washer	2	88639
113	First Pinion	1	20422
114	Protector Thrust Washer	2	88640
115	Protector Assembly		
	63 fpm, 250 & 300 lbs. 31 fpm, 600 lbs.	1	20661
	39 fpm, 500 lbs. 20 fpm, 1000 lbs.	1	20662
	26 fpm, 550 lbs. 13 fpm, 1100 lbs.	1	20660
116	Gear Housing Assembly	1	20350
116A	First Pinion Bearing	1	88635
117	Gear Housing Screw Spacer	4	20964
118	Gear Housing Screw	4	20384
119	Brake Base Plate	1	20419
120	Brake Disc	1	20698
121	Brake Plate Pins	2	920720
122	Brake Spacer	1	20723
123	Armature	1	20420
124	Brake Spring	1	20887
125	Brake Field Assembly	1	10001689
126	Brake Field Screw	2	920740
127	Brake Field Screw	2	10001685
128*	Electrical Wiring Kit (4 parts)	1	10001687
129	Motor Cover Screw	3	10001683
130	Shopstar VS Series Label	1	10001500
131	Series/Capacity Label Screw	8	10001686
132	Power Cord	1	10001803
133	2 Step Pendant, 10' Lift	1	33359606
	2 Step Pendant, 15' Lift		33359611
	2 Step Pendant, 20' Lift		33359616
	3 Step Pendant, 10' Lift		33359506

Item Number	Part Name	NO. Req'd	Part Number
133	3 Step Pendant, 15' Lift	1	33359511
	3 Step Pendant, 20' Lift		33359516
134	Frame Spacer	1	10001598C
135	Ground Jumper	1	10001918
136	Ground Jumper Screw	1	10001684
137	Ground Jumper Nut	1	10001917
138	Cap Plug	1	10001920
139	Capacity Label 250 lb	1	10001513
	Capacity Label 300 lb		10001503
	Capacity Label 500 lb		10001502
	Capacity Label 550 lb		10001504
	Capacity Label 600 lb		10001514
	Capacity Label 1000 lb		10001505
	Capacity Label 1100 lb		10001515
140	Brake Cover Screw	3	10001599
141	Regen Bracket Screw	1	10001684
142	Hook Retainer	1	20713
143	Hook Retainer Screw	1	10392004
144	Loose End Ring	1	20744
145	Caution Label	1	20758
146	Electrical Warning Label	1	24884
147	Warning Label	2	24842
148	Latch Hook Assembly Rigid	1	20650
	Latch Hook Assembly Swivel		10001130
	Latchlok Hook Assembly Swivel		10001297
	UT Trolley Lug		20655
149	Chain (Burnished & Oiled)	A/R	85988
	Chain (Zinc Plated)		85989
150	Chain Stop	2	20428
151	Chain Stop Screw	2	25848
152	Chain Stop Nut	2	982472
153	Latch Hook Assembly	1	23030
	Latchlok Hook Assembly		40618
154	Hook Block (Single Reeve)	2	20995
	Hook Block (Double Reeve)		20739
155	Hook Block Screw	2	82554
156	Hook Block Nut	2	82638
157	Dead End Plate	1	20714
158	Dead End Plate Screw	2	73715
159	Dead End Pin	1	920720
160	Sheave Thrust Washer	2	88639
161	Sheave Wheel Assembly	1	20652
162	Sheave Wheel Bearing	1	88641
163	Sheave Wheel Shaft	1	20318
164	Ground Screw	2	982877
165	Latch Kit	2	595522

*Item 128 consists of (1) PFC end cover/circuit assembly, (1) motor control end cover/circuit assembly, (1) motor/regen resistor assembly, and (1) wiring harness.



LUBRICANTS

Part Number for Packaged Lubricants Used in the ShopStar Electric Chain Hoist (Refer to Page 15 for Lubrication Instructions)		
Lubricant Usage	Type Lubricant	Part Numbers and Package Quantity of Lubricants
Hoist Gears	Grease Century Lubricants HB-11, #3	28605 for 1/2 lb. Can 28616 for 1 lb. Can 28617 for 4 lb. Can
Spline on end First Pinion and Shaft	Oil-Graphite Mixture Hercules Packing Co. Moly Duolube 67	40628 for 1 Pint Can
Load Chain	Oil Fiske Bros. Lubriplate Bar and Chain Oil #10R	28608 for 1 Pint Can 28619 for 1 Gal. Can
Lower Hook Knob	Grease Dow Corning Molykote BR-2-S	28606 for 1/2 lb. Can 28618 for 1 lb. Can

When ordering lubricants, specify the type of lubricant, part number and packaged quantity required.

Touch-up paints for ShopStar Electric Chain Hoist:

Order# *(1) Case (12-12 oz. Aerosol Cans) of Orange Touch-up Paint Part Number 84190.

*Touch-up paints are only available in case quantities.


Note: When painting hoists, also order warning labels, etc. that may be coated during painting.

 WARNING
To Reduce the Risk of Electric Shock or Injury, Use Indoors Only.

RECOMMENDED SPARE PARTS

To ensure continued service of the ShopStar, the following is a list of parts that are recommended to be kept on hand at all times to replace parts that have worn or failed. Parts applicable to your hoist should be stocked.

Key No.	Part Name	Qty. Per Hoist
125	Brake Field Assembly	1
120	Brake Disc	1
148	Upper Hook Assembly	1
153	Lower Hook Assembly	1
165	Upper Latch	1
165	Lower Latch	1
149	Load Chain	

 WARNING
Alterations or modifications of equipment and use of any parts other than Shopstar VS manual hoist repair parts can lead to dangerous operation and injury.
TO AVOID INJURY:
Do not alter or modify equipment. Only use Shopstar VS replacement parts.

WARRANTY

LIMITATION OF WARRANTIES, REMEDIES AND DAMAGES

Note: When ordering parts, always furnish Rated Load, Voltage, Phase, Hertz and Serial Number of hoist on which the parts are to be used. For the location of the nearest Repair Station, see the list located on the inside front cover.

THE WARRANTY STATED BELOW IS GIVEN IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, NO PROMISE OR AFFIRMATION OF FACT MADE BY ANY AGENT OR REPRESENTATIVE OF SELLER SHALL CONSTITUTE AWARRANTY BY SELLER OR GIVE RISE TO ANY LIABILITY OR OBLIGATION.

Seller warrants that on the date of delivery to carrier the goods are free from defects in workmanship and materials.

SELLER'S SOLE OBLIGATION IN THE EVENT OF BREACH OF WARRANTY OR CONTRACT OR FOR NEGLIGENCE OR OTHERWISE WITH RESPECT TO GOODS SOLD SHALL BE EXCLUSIVELY LIMITED TO REPAIR OR REPLACEMENT, F.O.B. SELLER'S POINT OF SHIPMENT, OF ANY PARTS WHICH SELLER DETERMINES TO HAVE BEEN DEFECTIVE or if Seller determines that such repair or replacement is not feasible, to a refund of the purchase price upon return of the goods to Seller.

Any action against Seller for breach of warranty, negligence or otherwise, must be commenced within one year after such cause of action occurs.

NO CLAIM AGAINST SELLER FOR ANY DEFECT IN THE GOODS SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE YEAR FROM THE DATE OF SHIPMENT. Seller shall not be liable for any damage, injury or loss arising out of the use of the goods if, prior to such damage, injury or loss, such goods are (1) damaged or misused following Seller's delivery to carrier; (2) not maintained, inspected, or used in compliance with applicable law and Seller's written instructions and recommendations; or (3) installed, repaired, altered or modified without compliance with such law, instructions or recommendations.

UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES AS THOSE TERMS ARE DEFINED IN SECTION 2-715 OF THE UNIFORM COMMERCIAL CODE.

INDEMNIFICATION AND SAFE OPERATION

Buyer shall comply with and require its employees to comply with directions set forth in instructions and manuals furnished by Seller and shall use and require its employees to follow such instructions and manuals and to use reasonable care in the use and maintenance of the goods. Buyer shall not remove or permit anyone to remove any warning or instruction signs on the goods. In the event of personal injury or damage to property or business arising from the use of the goods, Buyer shall within 48 hours thereafter give Seller written notice of such injury or damage. Buyer shall cooperate with Seller in investigating any such injury or damage and in the defense of any claims arising therefrom.

If Buyer fails to comply with this section or if any injury or damage is caused, in whole or in part, by Buyer's failure to comply with applicable federal or state safety requirements, Buyer shall indemnify and hold Seller harmless against any claims, loss or expense for injury or damage arising from the use of the goods.

WARNING

Alterations or modifications of equipment and use of non-factory repair parts can lead to dangerous operation and injury.

TO AVOID INJURY:

- Do not alter or modify equipment.
- Do use only factory replacement parts.



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