OPERATION MANUAL

This operation manual is intended as an instruction manual for trained personnel who are in charge of installation, maintenance, repair etc.

Before equipment use, please read this operation manual

Version # MH-0214

2721 NE 4th Ave Pompano FL 33064| 1-888-4-A-HOIST

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1.0 WARRANTY

Every product is thoroughly inspected and tested before it is shipped from the factory. If any problem develops within one year, return the product prepaid to the factory. If an inspection reveals that the problem is caused by defective workmanship or material, repairs will be made without charge and the product will be returned with the shipping prepaid.

Excluded Items

This warranty does not cover:

- Deterioration caused by normal wear, abuse, chemical or abrasive actions, improper maintenance or excessive heat.
- Problems resulting from repairs, modifications, or alterations made by people other than factory or ACI representatives.
- If the product has been abused or damaged due to an accident.
- If repair parts or accessories other than ACI equipment are used on the product; they are warranted only to the extent that they are warranted by the manufacturer of said parts or accessories.

Remarks

EXCEPT AS STATED HERE, ACI MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES FOR A PARTICULAR PURPOSE.

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 NOT use equipment to lift, support or otherwise transport people.
DO NOT suspend unattended loads over people.

2.0 SAFETY PRECAUTIONS

2.1 Safety Alert Symbols

Throughout this manual are steps and procedures that can prevent hazardous situations, the following symbols are used to identify the degree or level of hazard seriousness.

DANGER, WARNING AND CAUTION NOTICE

Symbol	Description
	**Danger** Indicates an imminently hazardous situation which, if not avoided, **will result in death or serious injury** and property damage.
	**Warning** Indicates an imminently hazardous situation which, if not avoided, **could result in death or serious injury** and property damage.
	**Caution** Indicates a potentially hazardous situation which, if not avoided, **may result in minor or moderate injury** or property damage.
	**Notice** Notifies people of installation, operation or maintenance information which is important but not directly hazard related.

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

3.0 INSTALLATION

3.1 Unpacking

Once package has been opened, carefully inspect the hoist frame, hooks, chain and control station for damage that may have occurred during shipment. If damage is found please contact your ACI representatives immediately at, toll free 1-866-424-6478.

⚠WARNING

Operating a unit with obvious external damage may cause load to drop and could result in personal injury and/or property damage.

To avoid injury: Carefully check unit for external damage prior to installation.

Make sure to check that the power supply to which the hoist is to be connected matches the information shown on the identification plate located on the bottom of the hoist.

Before using the hoist, fill in the information below:

Model Number: _____
Serial Number: _____
Purchase Date: _____

3.2 Pre-installation Checks

- Check for transit damage.
- Check that all fasteners and joints are tight and secure.
- Check the capacity of the lifting unit and bottom block.
- Check that all external wiring is in good order.
- Check that the load chain is in good order.

3.3 Power Supply System

To insure proper operation, to avoid damage to the hoist and electrical system, and to reduce the risk of electrical shock or fire, the branch circuit supplying power to the hoist must:

- Be in accordance with the National Electrical Code (ANSI/NFPA-70) and applicable National, State and Local codes.
- Effectively ground the hoist in accordance with the National Electrical Code and other applicable codes. Proper grounding provides a path with the least resistance for the electrical current to travel reducing the risk of electrical shock. The standard power cord is equipped with a three prong plug, used with our 115V-1PH-60HZ unit. Make sure that the receptacle opening that receives the longest prong is properly grounded.
- Have ample capacity to prevent excessive voltage drop during starting and operation. 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 20 amps and the system should have #14 AWG or larger, wiring.
- Include slow blow type fuses or inverse trip time circuit breakers to permit the hoist to start and accelerate the load.

- Include a disconnecting means capable of being locked in the 'open' position.

3.4 Connection to the Electrical Supply

An adequate supply system is required along the total length of travel (where appropriate). The supply voltage and frequency, at which the hoist operates, is marked on the motor rating plate. It is imperative to check before connecting the unit that these figures correspond with those of the supply voltage.

3.5 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 amount. If you are not sure of the weight the structure can hold, consult a registered engineer and the local building codes.

⚠WARNING

Suspending the hoist from an inadequate support could allow the hoist and load to fall and cause personal injury and/or property damage. Make sure that the structure has sufficient strength to withstand several times the hoist and its rated load amount. Using the upper hook, hang the hoist from the support. Make sure the hoist is solidly held in the uppermost part of the hook arc and the latch is tightly against the hook tip.

3.6 Hook and Eye Suspension Hoists

The suspension point should be of a correct size to admit the top hook or eye of the hoist and allow it to rest properly on the saddle. It must be adequate to support the hoist while it is being operated at its maximum capacity (safe working load).

3.7 Load Chain

The chain should feed smoothly into and away from the hoist and hook block (¼ ton and 1 ton). If the chain binds, jumps or is noisy, First clean and lubricate the chain, if trouble persists inspect chain and mating parts for wear, distortion and other damages.

3.8 Load Chain Lubrication

Always lubricate load chain weekly or more frequently depending on severity of service. Lubricate load chain with a light coat of Lubriplate Bar and Chain Oil 10-R (Fiske Bros. Refining Co.) or equal lubricant. Be sure the lubricant reaches the bearing surfaces between the links. Remove the excess oil from the chain.

⚠WARNING

Used motor oils contain unknown carcinogenic materials. Never use used motor oils as a chain lubricant. Only use Lubriplate Bar and Chain Oil 10-R or equal lubricant as a lubricant for the load chain.

3.9 Chain Container

For installations where the slack chain hanging from the hoist may be objectionable or hazardous, the use of a chain container is recommended.

⚠WARNING

Do not attempt to store more chain in the chain container than what is specified for the hoist or serious damage to hoist may result and hazardous conditions may be created.

3.9.1 Installation of Standard Chain Container

1. Remove both bolts from the chain container mounting bracket (see Figure 3.9.1.1).
2. Attach the chain container to the bracket.
3. Reinsert the bolts.

Figure 3.9.1.1

4.0 OPERATION

4.1 Test and Operational Checks

On completion of installation, but before the hoist is put into regular service, the following procedure should be carried out:

- Record the hoist's Code, Lot and Serial Number from the name plate on the hoist.
- Check that the hoist is properly installed to either a fixed point or trolley, whichever applies.
- If hoist is installed on a trolley, ensure that:
  - The trolley is properly installed on the beam.
  - The stops for the trolley are correctly positioned and securely installed on the beam.
- Isolate the power supply.
- Check that all mechanical and electrical joints and connections are tight and secure.
- Check that all nuts, bolts and split pins (cotter pins) are securely fastened.
- Confirm proper operation:
  - Before operating read and become familiar with this manual.
  - Before operating check to ensure that the hoist and trolley meet the Inspection, Testing and Maintenance requirements of ANSI/ASME B30.16.
  - Before operating check that nothing will interfere with the full range of the hoist's (and trolley's) operation.
- Switch on the power supply.
- Run lightly with no load, throughout the full extent of the hoist and check that the operation is smooth at all times.
- Check the operation of the hoist brake, run under light load and full load conditions.

⚠CAUTION

Check supply voltage before everyday use. If the voltage varies more than 10% of the rated value, electrical devices may not function normally.

⚠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.

Verify and correct all chain irregularities prior to operating the hoist.

4.2 Operation Personnel

For independent operation or maintenance of chain hoist, the owner may only employ persons as following:

- Must be at least 18 years of age.
- Must be mentally and physically suitable.
- Those who have been instructed in the operation and/or maintenance of the chain hoist and have proven their qualification to the owner in this respect. In addition to theoretical training, instruction also includes sufficient practical operating experience as well as acquiring the ability to identify defects which are a hazard to safe operations.

4.3 Product Warnings

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

DO NOT…

- **DO NOT** operate the hoist until you have read the Operating, Maintenance and parts manual.
- **DO NOT** operate a damaged or malfunctioning hoist.
- **DO NOT** use the hoist to lift, support or transport people.
- **DO NOT** operate the hoist until all personnel are clear of the supported load.
- **DO NOT** lift loads over personnel.
- **DO NOT** remove or obscure the warning labels on the hoist.
- **DO NOT** operate a hoist on which the safety place cards or decals are missing or illegible.
- **DO NOT** operate a hoist which has been modified without the manufacturer's approval or without certification that it is in conformity with ANSI/ASME B30 volumes.
- **DO NOT** use hoist with twisted, kinked, damaged or worn load chain.
- **DO NOT** use load chain as a sling or wrap the chain around the load.
- **DO NOT** operate a hoist unless the load slings or other approved single attachments are properly sized and seated in the hook saddle.
- **DO NOT** lift more than the rated load for the hoist.
- **DO NOT** operate unless load is centered under the hoist properly.
- **DO NOT** apply the load unless load chain is properly seated in the chain sprocket(s).

- **DO NOT** apply load if bearing prevents equal loading on all load supporting chains.
- **DO NOT** operate hoist when it is restricted from forming a straight line from hook to hook in the direction of loading.
- **DO NOT** attempt to lengthen the load chain or repair the damaged load chain.
- **DO NOT** apply the load to the tip of the hook or to the hook latch.
- **DO NOT** operate beyond the limits of the load chain travel.
- **DO NOT** leave the load (supported by the hoist) unattended unless specific precautions have been taken.
- **DO NOT** operate a hoist until it has been securely attached to a suitable support.
- **DO NOT** allow the load chain or hook to be used as an electrical or welding ground.
- **DO NOT** allow the load chain or hook to be touched by a live welding electrode.

DO…

- **DO** shut down a hoist that malfunctions or performs unusually and report such malfunction.
- **DO** make sure that the hoists limit switches function properly.
- **DO** warn personnel of an approaching load.
- **DO** take up slack carefully – make sure the load is balanced and the load holding action is secure before continuing.
- **DO** protect the hoist's load chain from weld splatter or other damaging contaminants.

4.4 Product Cautions

⚠CAUTION

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

DO NOT:

- **DO NOT** allow your attention to be diverted from operating the hoist.
- **DO NOT** allow the hoist to be subjected to sharp contact with other hoist, structures or objects through misuse.
- **DO NOT** adjust or repair the hoist unless qualified to perform such adjustments or repairs.
- **DO NOT** use the hoist overload limiting clutch to measure the load.

DO:

- **DO** inspect the hoist regularly, replace damaged or worn parts and keep appropriate records of maintenance.
- **DO** maintain firm footing or be otherwise secured when operating the hoist.
- **DO** check brake function by tensioning the hoist prior to each lift operation.
- **DO** lubricate load chain per hoist manufacturer's recommendations.
- **DO** use Mechanics Hoist MH recommended parts when repairing the hoist unit.
- **DO** use the hook latches. Latches are to retain slings, chains, etc. under slack conditions only.

- **DO** make sure the hook latches are closed and not supporting any parts of the load.
- **DO** make sure the load is free to move and will clear all obstructions.
- **DO** avoid swinging the load or hook.
- **DO** make sure the hook travel is in the same direction as shown on the controls.

5.0 INSPECTION

5.1 General

The inspection procedure 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 assigned or selected 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 at work.
- Normal Service: A 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: A service which involves operation within the rated load limit which exceeds normal service.
- Severe Service: A service which involves normal or heavy service with abnormal operating conditions.

5.2 Inspection Classification

The inspection procedure for hoist 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 designated as Frequent and Periodic, with respective intervals between inspections as defined below.

⚠CAUTION

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.

FREQUENT INSPECTIONS - Frequent inspections are visual examinations by the operator or other designated personnel with interval 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.

PERIODIC INSPECTIONS - Periodic inspections are visual inspections by a designated person with interval per the following criteria.

- Normal Service – Yearly
- Heavy Service – Semi-Annually
- Severe Service – Quarterly
- Special or Infrequent Service – As recommended by a qualified person before the first occurrence.

5.3 Frequent Inspection

Inspections should be made on a frequent basis in accordance with Table 6.3.1. Included in these Frequent Inspections are observations made during operation for any defects or damage that might appear between Periodic Inspections. Frequent Inspections shall be made by a designated person to ensure that the hoist is maintained in safe working condition.

Table 6.3.1

FREQUENT INSPECTION
1. Check all functional operating mechanisms for maladjustment and unusual sounds.
2. Check the operation of the limit switch and associated components.
3. Check the hoist braking system for proper operation.
4. Check the hooks in accordance with ANSI/ASME B30.10.
5. Check the hook latch operation.
6. Check the Load Chain for twists, cracks, dents, wear and obstructions.
7. Check the Load Chain reeving.

5.4 Periodic Inspection

Inspections should be made on a Periodic basis in accordance with Table 6.4.1. Evaluation and resolution of the results of Periodic Inspections shall be made by a designated person to ensure that the hoist is maintained in safe working condition.

⚠WARNING

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 6.4.1

PERIODIC INSPECTION
1. Complete the requirements of Frequent Inspection.
2. Check to ensure there is no evidence of loose bolts, nuts or rivets.
3. Check to ensure there is no evidence of damage or excessive wear of load and idler sheaves.
4. Check to ensure there is no evidence of damage to hook retaining nuts or collars and pins, and welds or rivets used to secure the retaining members.
5. Check to ensure the warning label is properly attached to the hoist and legible.
6. Check to ensure the function labels on the pendant control stations are legible.
7. Check to ensure there is no evidence of worn, corroded, cracked or distorted parts such as load blocks, suspension housing, chain attachments, clevises, yokes, suspension bolts, shafts, gears, bearings, pins and rollers.
8. Check to ensure there is no evidence of damage to the supporting structure or trolley, if used.
9. Check to ensure there is no evidence of damage to the end connections of the load chain.
10. Check to ensure there is no evidence of excessive wear on motor or load brake.
11. Check to ensure there is no electrical apparatus for signs of pitting or any deterioration of visible controller contacts.

5.5 Occasionally Used Hoist

Hoists that are infrequently used shall be inspected as follows before placing the hoist in service:

- Hoist idle more than one year: Inspect per Periodic Inspection.
- Hoist idle more than one month, less than one year: Inspect per Frequent Inspection.

5.6 Inspection Reports

- Dated inspection reports and records should be maintained for the hoist Periodic Inspection intervals. These records should be stored where they are available to personnel involved with the inspection, maintenance or operation of the hoist.
- A long range chain inspection program should be established and should include records of an examination of the chains that are removed from service to create a relationship between visual observation and actual condition of the chain.

5.7 Inspection Methods and Criteria

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 volumes listed under the General heading on the previous pages, 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 certified or qualified person trained in the disassembly and re-assembly of the hoist.

Table 5.7.1
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
Braking System Operation	Function	Braking distance with rated capacity 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 “F” and “T” dimensions should not be less than discard value listed in Dimensions & Specifications Table 3.1.5.	Replace
Hooks (stretch)	Measure	The “D” dimension should not exceed the measured value for discard from Dimensions & Specifications Table 3.1.5.	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 or gouges. Holes should not be elongated, fasteners should not be loose and there should be no gap between mating parts.	Tighten or replace as required
Hooks (swivel bearing)	Visual, Function	Bearing parts and surfaces should not show significant wear. They should be free of dirt, grime and deformations. Hook should rotate freely with no roughness.	Clean/Lubricate, or replace as required
Hooks (hook latches)	Visual, Function	Latch should not be deformed. Attachment of latch to hook should not	Replace

		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.	
Load Chain (surface condition)	Visual	Should be free of rust, nicks, gouges, dents and weld spatter. Links should not be deformed or show signs of abrasion. Surfaces where links bear on one another should be free of significant wear.	Replace
Load Chain (pitch and wire diameter)	Measure	The “G” dimension should not be greater than maximum value listed in Chain Wear Dimensions Table 3.1.6. The “E” dimension should not be less than minimum value listed in Chain Wear Dimensions Table 3.1.6.	Replace. Inspect Load Sheave by qualified personnel
Load Chain (lubrication)	Visual, Auditory	Entire surface of each link should be coated with lubricant and free of dirt/grime. Chain should not emit cracking noise when hoisting a load.	Clean/Lubricate
Load Chain (reeving)	Visual	Chain should be reeved properly through load sheave. Chain, cushion rubbers, washers and stoppers should be installed properly.	Reeve/ Install chain properly
Chain Container	Visual	Container should not be damaged. Brackets should not be deformed or missing.	Replace
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
Bolts, Nuts and Rivets	Visual, Check with proper tool	Bolts, nuts and rivets should not be loose.	Tighten or replace as required
Motor Brushes	Measure, Visual	The “B” dimension should not be less than minimum value listed in Motor Brush Dimensions Table 3.1.4	Replace
Gear Box oil	Visual ,Function	Oil for the gear box is pre-supplied with a new hoist. Refer to table Gear Brakes Table 7.3.1.	Replace
Contactor Contacts	Visual	Contacts should be free of significant pitting or deterioration.	Replace
Cushion Rubber	Visual	Should be free of significant deformation.	Replace
Pendant (switches)	Function	Depressing and releasing push buttons should make and break contacts in switch contact block and result in corresponding electrical continuity or open circuit. Push buttons should be interlocked either mechanically or electrically to prevent simultaneously energizing of circuits for opposing motions. Example: Up and Down	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 (wiring)	Visual	Wire connections to switches in pendant should not be loose or damaged.	Tighten or repair
Pendant (cord)	Visual, Electrical Continuity	Surface of cord should be free from nicks, gouges and abrasions. Each conductor in cord should have 100% electrical continuity even when cord is flexed back and forth. Pendant cord strain relief cable should absorb the entire load associated with forces applied to the pendant.	Replace
Pendant (labels)	Visual	Labels denoting functions should be legible.	Replace
Warning Labels	Visual	Warning labels should be affixed to the hoist 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

5.8 Chain Inspection

- First, clean chain with a non-caustic/non-acid type solvent and make a link by link inspection for nicks, gouges, twisted links, weld splatter, corrosion pits, striations (minute parallel lines), cracks in weld areas, wear and stretching. A chain with any of these defects must be replaced before use.
- When checking the chain for wear, check the part of the chain that goes through the lift wheel of the hoist most often. Check the interlink area of the chain links for the point of maximum wear. Measure and record the stock diameter at this point of the link. Then measure stock diameter in the same area on a link that does not pass through the lift wheel. Compare these two measurements. If the stock diameter of the worn link is 0.010 inches or more than the stock diameter of the unworn link, the chain must be replaced.
- Use only a 'Knife-edge' caliper to eliminate the possibility of false reading by not measuring full pitch length.
- Check the chain for stretch with a vernier caliper. Select an unused, un-stretched section of chain then measure and record the length. Measure and record the same length on a worn section of chain. Obtain the amount of stretch and wear by subtracting the measurement of the unworn section from the worn section. If the result is greater than 0.145 inch, the chain must be replaced.
- These chains are specially heat treated and hardened, they should never be repaired.

⚠WARNING

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.

NOTICE

A worn chain can be an indication of worn hoist components. For this reason, the hoist's chain guide, hook block and lift wheel should be examined for wear and replaced as necessary when replacing worn chain.

⚠WARNING

Use of commercial or other manufactures' chain and parts to repair MH Hoists may cause load loss. Use only factory supplied replacement load chain and parts. Chain and parts may look alike, but factory original chain and parts are made of specific materials or processed to achieve specific properties.

6.0 MAINTENANCE AND REPAIR

6.1 Cutting the Chain

The load chain is hardened and is difficult to cut. The following methods are recommended when cutting a length of new chain from stock or cutting off worn chain. **Always wear eye protection when cutting the load chain.**

- Use a grinder and nick the link on both sides, then secure the link with a vise and break off the chain link with a hammer.
- Use a 7" minimum diameter by 1/8" thick abrasive wheel (or type recommended by your wheel supplier) that will clear the adjacent links.

⚠WARNING

Cutting chain can produce flying particles. Wear eye protection. Place shield over chain to prevent flying objects.

6.2 Lubrication

- Load Chain: The full length of the chain must be lubricated, including where the chain passes over the chain wheel(s). Ensure that the contact points between the links (i.e. the chain saddles) are adequately lubricated. A small amount of lubrication will greatly increase the life of the load chain. DO NOT allow the chain to run dry. Keep the chain clean and lubricate the chain at regular intervals with Lubriplate Bar and Chain Oil 10-R 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 daily and lubricate the chain several times between cleanings. When lubricating the chain, apply sufficient lubricant to obtain natural run-off and full coverage, especially in the interlink area.

⚠WARNING

Used motor oils contain known carcinogenic materials. Never use used motor oils as a chain lubricant. Only use Lubriplate Bar and Chain Oil 10-R or equal lubricant as a lubricant for the load chain.

- **Gearbox:** For ambient temperature of approx., 50°F to 122°F, a gear oil of Mm2/S at 104°F, with mild high-pressure additives should be used. Examples of the oil types that can be used are:
  - Din 51502 Clp 220
  - E.G. Bp Energol Gr-Xp 20
  - Esso Spartan Ep 220
  - Shell Omala Oil S2 G
  - Mobil gear 630
  - Aral Degol Bg 220

Table 6.2.1
Lubrication Chart

PART	DESCRIPTION	FREQUENCY

Bottom Block	Lubricate chain sprocket bearing and check for a tight fit of securing bolts.	After 50-200 service hours
Chain	Lubricate chain.	After 50-200 service hours or more frequently if needed
Oil	Check oil level and change oil (if needed)	Before each shift

6.3 Replacing Gear Brakes & Oil

Our gear brakes are made of durable copper material but if a brake needs repair, the brake assembly must be replaced in its entirety. Read the instructions below when replacing the gear brakes:

1. Place an empty container under the gear box cap to catch the oil.
2. Open the gear box cap (see Figure 6.3.1).
3. Empty the oil into the container.

The brake assembly is now visible for replacing. Once the brake assembly is replaced, and the unit is sealed, use the five chain links criteria to assure that the brake is working properly. To replace the oil follow the instruction below:

- Follow steps 1-3 above.
- Pour CPC E.P. Lubricant MD 180 and Grease NLGI according to the following chart.

Figure 6.3.1

Table 6.3.1

Model	Grease NLGI (qt)	Oil HD680 (qt)	Total (qt)
MH-010 & MH-020	1/16 qt	1/16 qt	1/8 qt

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WARNING

The lubricants used for the Mechanics Hoist MH may contain hazardous materials that mandate specific handling and disposal procedures. Handle and dispose of lubricants only as directed in applicable material safety data sheets and in accordance with applicable local, state and federal regulations.

6.4 Testing

Before using, all altered, repaired or used hoists that have not been operated for the previous 12 months must be tested by the user for proper operation.

- Test the unit without a load and then test the unit with a light load of 50 pounds (23 kg) times the number of load chain supporting parts to be sure that the hoist operates properly and that the brake holds the load when control is released.
- Next test with a load of 125% of the rated capacity. In addition, hoists in which load sustaining parts have been replaced, you should test the load with 125% of rated capacity by or under an appointed person and a written report prepared for record purposes.
- In accordance with the CMAA 78, it is required to have a 100% load test preformed every four years.

For assistance or additional information on inspection and testing, please contact your ACI representative toll free at 1-866-424-6478.

CAUTION

The hoist **must** only be inspected and maintained by qualified, competent and trained personnel.

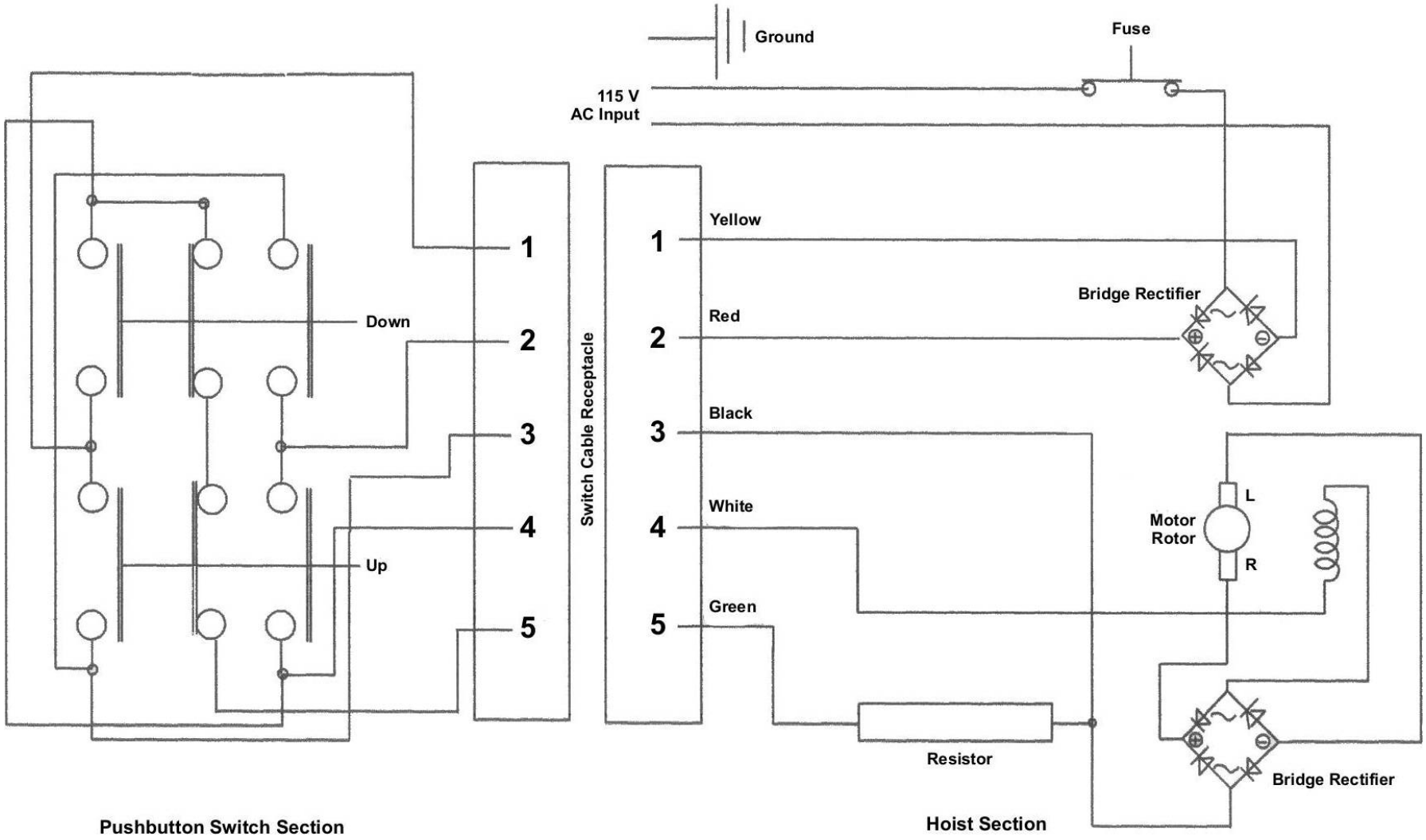
7.0 TROUBLESHOOTING

Table 7.1

Symptom	Cause	Remedy
Hoist will not operate	Loss of power	Check circuit breakers, switches, fuses and connections on power lines/cable.
	Wrong voltage or frequency	Check voltage and frequency of power supply against the rating on the nameplate of the motor.
	Hoist overload	Reduce load to within rated capacity of hoist.
	Improper, loose or broken wire in the hoist electrical system	Shut off power supply, check wiring connections on hoist control panel and inside push button pendant.
	Brush wear	Inspect both motor brushes per Motor Brush Dimensions Table (page 6). and replace, if necessary.
	Fuses burned out	Replace fuses.
	Motor burned out	Replace motor frame/stator, shaft/rotor and any other damaged parts.
Hoist lifts but will not lower	Faulty switch in pendant	Check electrical continuity. Check electrical connections. Replace or repair as needed.
	Broken conductor in pendant cord	Check the continuity for each conductor in the cable. If one is broken, replace the entire cable.
Hoist lowers but will not lift	Hoist overload	Reduce load to within rated capacity of hoist.
	Worn friction clutch	Repair by a qualified person trained in the repair of hoists and proper friction clutch adjustment procedures. Replace as needed.
	Broken conductor in pendant cord	Check the continuity for each conductor in the cable. If one is broken, replace the entire cable.
	Faulty switch in pendant	Check electrical continuity. Check electrical connections. Replace or repair as needed.
	Low voltage in hoist's power supply	Determine cause of low voltage and bring to within plus or minus 5% of the voltage specified on the motor nameplate. The voltage should be measured at the hoist contactor.
Hoist will not lift rated load or does not have the proper lifting speed	Hoist overload	Reduce load to within rated capacity.
	Low voltage in hoist's power supply	Determine cause of low voltage and bring to within plus or minus 5% of the voltage specified on the motor nameplate. The voltage should be measured at the hoist contactor.
	Faulty friction clutch	If abnormal operation or slippage occurs do NOT attempt to disassemble or adjust the Mechanical Load Brake with Friction Clutch. Replace the worn or malfunctioning Mechanical Load Brake with Friction Clutch as an assembly with a new, factory adjusted part.
Load drifts excessively when hoist is stopped	Motor demagnetized	Motor demagnetizing is generally caused from using the hoist beyond its duty rating. Replace stator assembly and reduce usage to comply with the duty rating stated.
	Improper gear oil	Replace oil with the correct gear oil.
Hoist operates intermittently	Loose connection in circuit	Check all wires and terminals for bad connections. Replace as needed.
	Collectors making poor contact	Check movement of spring loaded arm, weak spring, connections and shoe. Replace as needed.
	Broken conductor in pendant cord	Check for intermittent continuity in each conductor in the pendant cord. Replace the entire pendant cord if continuity is not constant.

8.0 WIRING DIAGRAM

Wiring Diagram



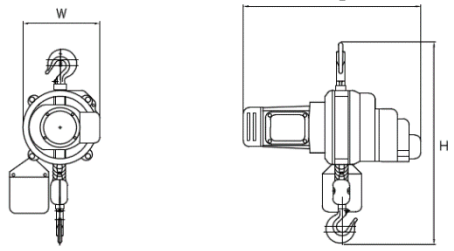
9.0 DIMENSIONS & SPECIFICATIONS

Table 9.1

Model	MH-005	MH-010	MH-020
Capacity (Ton)	1/4	1/2	1
Standard Lift (Ft)	10	10	10
Control Cable (Ft)	10	10	10
Operation Voltage (Single)	115V	115V	115V
Cycle (HZ)	60	60	60
Motor Power (HP) / Motor Amperage Full Load	1.8/16.5	1.8/16.5	1.8/16.9
Lifting Speed (FPM)	16	16	8
Duty-Rate (ED %)	30%	30%	30%
NO. of Starts Per Hour	300	300	300
International Protection (IP) /(NEMA) *	IP 54 / NEMA 4	IP 54 / NEMA 4	IP 54 / NEMA 4
Insulation Class	F	F	F
Gross Weight (lb)	53	53	62

***** *There is no direct conversion between NEMA types and IP codes*

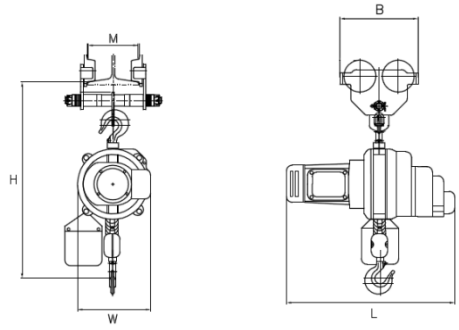
Table 9.2



Hook Mounted

Model	H	L	W
MHH-005	17	16.75	7.5
MHH-010			
MHH-020	19.75		8.5
All measurements in inches.			

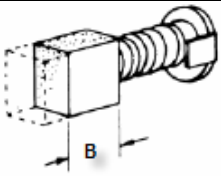
Table 9.3



Push Trolley Mounted

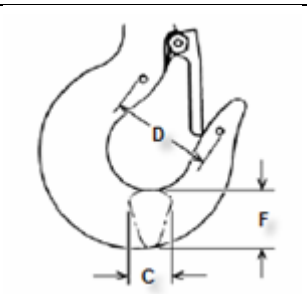
Model	H	L	W	B	M
MHH-005	22	16.75	7.5	8	1.75 - 5.5
MHH-010					
MHH-020	24		8.5	9.5	2.75 - 8
All measurements in inches.					

Table 9.4
Motor Brush Dimensions



Capacity (Ton)	"B" Dimension (inch)
	Discard
¼ to 1	0.24

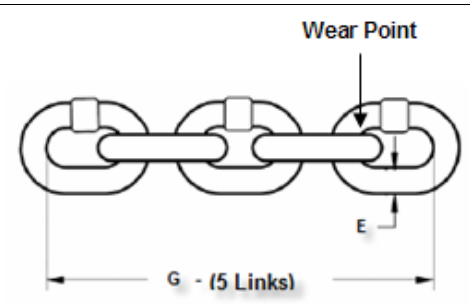
Table 9.5



Capacity (Ton)	Hook	D (in)*		C (in)		F (in)	
		Standard	Discard	Standard	Discard	Standard	Discard
¼ to 1	Bottom	1.54	1.62	0.75	0.71	0.94	0.89
	Top	1.54	1.62	0.75	0.71	0.94	0.89

These values are nominal since the dimension is not controlled to a tolerance. The "D" dimension should be measured when the hook is new, this becomes a reference measurement. Subsequent measurements are compared to this reference to make determinations about hook deformation/stretch.

Table 9.6
Chain Wear Dimensions



Capacity (Ton)	"G" Dimension (inch)		"E" Dimension Wear Limit (inch)	
	Standard	Discard	Standard	Discard
¼ to 1	3.78	3.96	0.25	0.22

***** *Chain wear will occur in section of chain that passes thru the sheave.***

10.0 EXPLODED VIEWS & PARTS LISTS

10.1 Repair Parts – Ordering Instructions

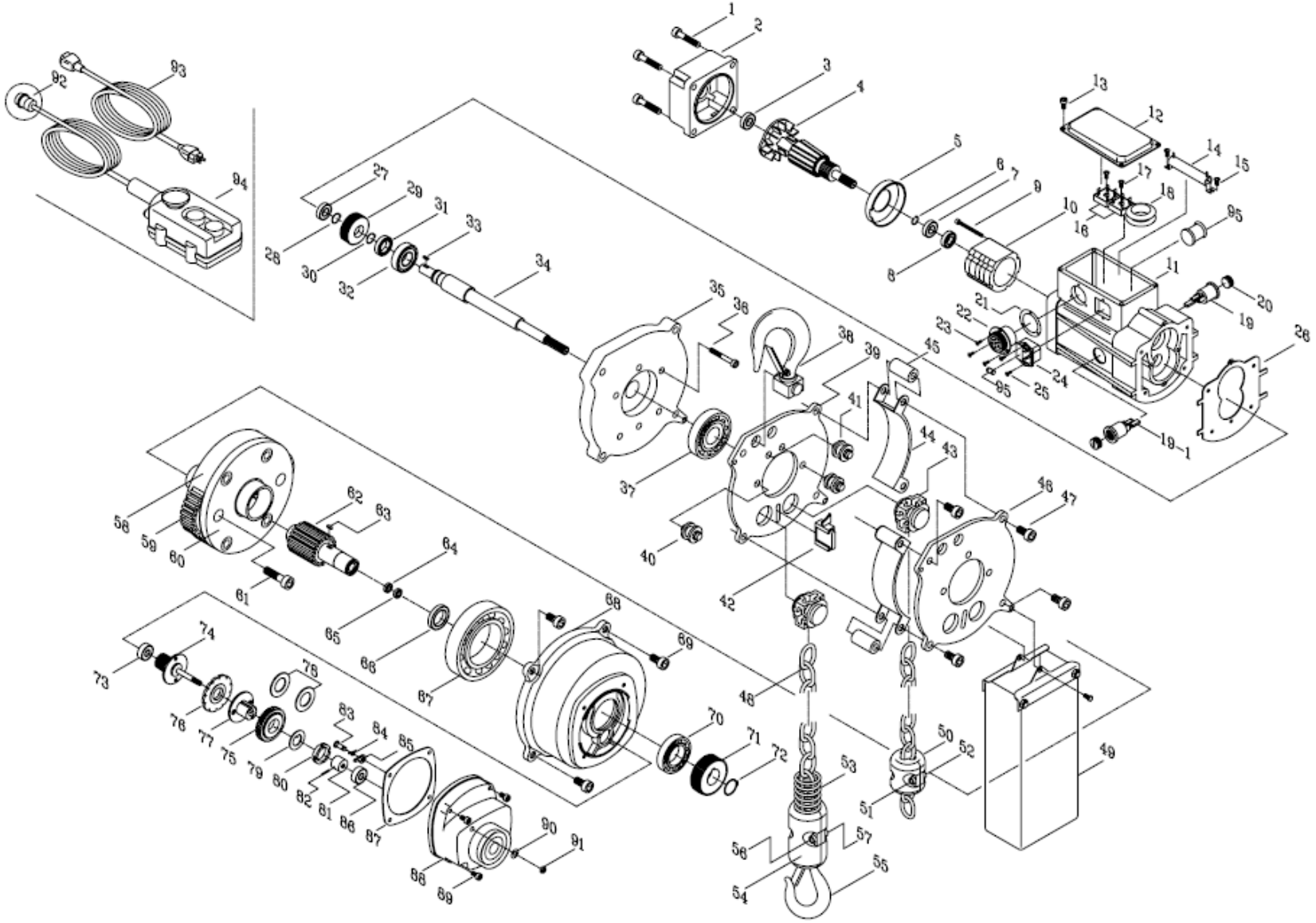
This parts and instruction manual contains information required to install and maintain your hoist. To insure prompt service, each repair parts order should be placed with ACI, and must contain the following information:

- Serial number and Model number from the hoist name plate, located on the side of the hoist.
- Voltage, Amp and Horse Power from the hoist name plate, located on the side of the hoist.
- Hoist capacity from the hoist name plate, located on the side of the hoist.
- Hoist Speed from the hoist name plate, located on the side of the hoist.
- Item number of part from the part list.
- Part name from the part list.
- Part number from the part list.
- Quantity of parts requested.

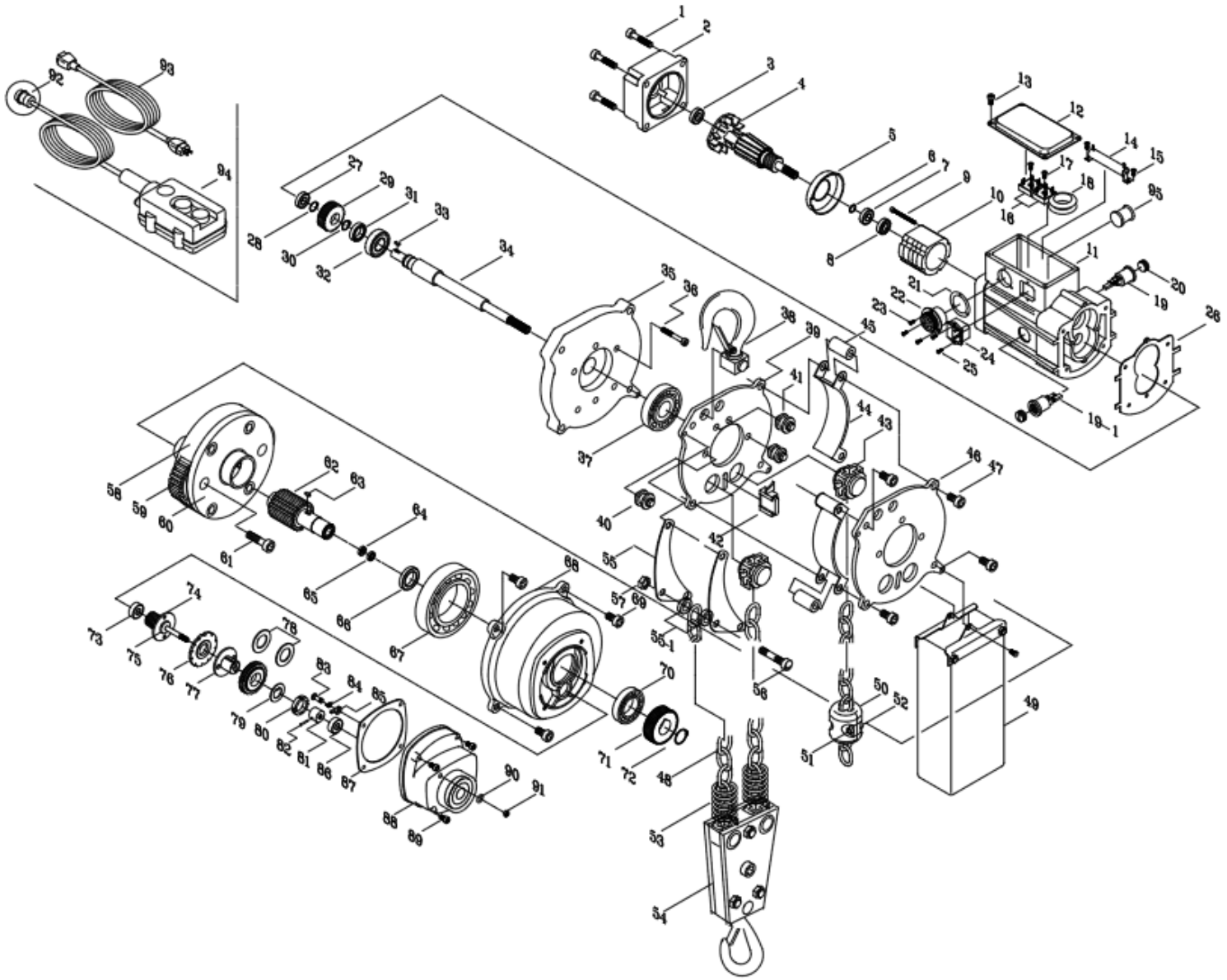
Note: When ordering replacement parts, it is recommended that consideration be given to the need for also ordering such items as gaskets, fasteners, seals, etc. These items may be damaged or lost during disassembly or just unfit for future use because of deterioration from age or service.

Use of commercial or other manufactures' chain and parts to repair MH Hoists may cause load loss. Use only factory supplied replacement load chain and parts. Chain and parts may look alike, but factory original chain and parts are made of specific materials or processed to achieve specific properties.

10.2 Exploded View: MH-005 & MH-010



10.3 Exploded View: MH-020



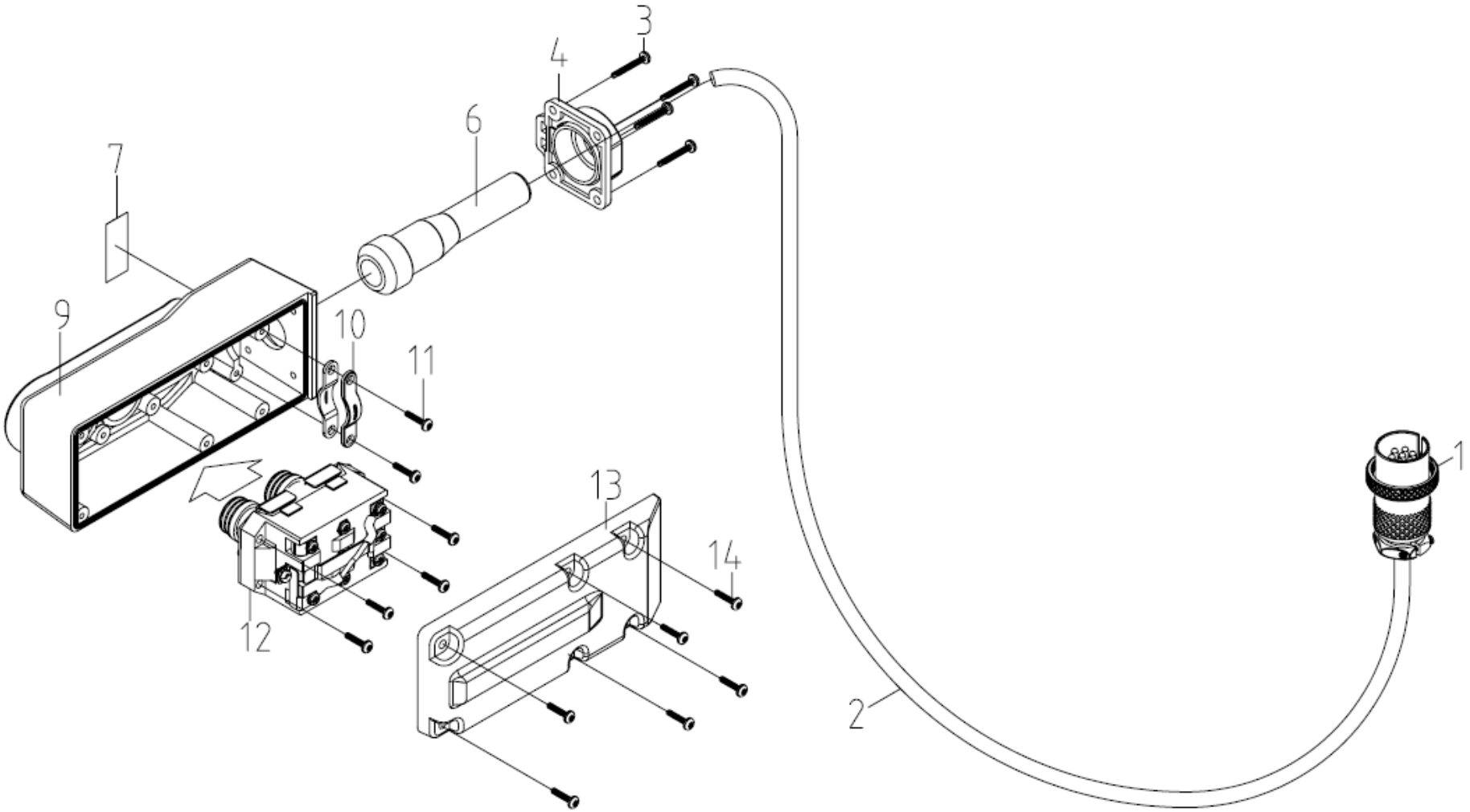
10.4 Parts List: MH-005, MH-010, & MH-020

PARTS LIST MODEL MH					
ITEM	PART DESCRIPTION	Model MH-005 / MH-010		Model MH-020	
		Part No.	Qty	Part No.	Qty
1	SCREWS	MH001	4	MH001	4
2	MOTOR COVER	MH002	1	MH002	1
3	BEARING	MH003	1	MH003	1
4	ROTOR	MH004	1	MH004	1
5	AIR GUIDING IRON COVER	MH005	1	MH005	1
6	FIXING SPRING	MH006	1	MH006	1
7	BEARING	MH007	1	MH007	1
8	OIL SEAL	MH008	1	MH008	1
9	SCREWS	MH009	2	MH009	2
10	STATOR	MH010	1	MH010	1
11	MAIN BODY BASE	MH011	1	MH011	1
12	WIRING BOX	MH012	1	MH012	1
13	SCREWS	MH013	4	MH013	4
14	RESISTOR	MH014	1	MH014	1
15	SCREWS	MH015	2	MH015	2
16	BRIDGE TYPE RECTIFIER	MH016	2	MH016	2
17	SCREWS	MH017	2	MH017	2
18	RUBBER BAND	MH018	1	MH018	1
19	BASE OF CARBON BRUSH	MH019	2	MH019	2
19-1	CARBON	MH019-1	2	MH019-1	2
20	CARBON BRUSH COVER	MH020	2	MH020	2
21	RUBBER WASHER	MH021	1	MH021	1
22	CONTROL CABLE SOCKET	MH022	1	MH022	1
23	SCREWS	MH023	3	MH023	3
24	POWER SUPPLY INPUT TERM	MH024	1	MH024	1
25	SCREWS	MH025	2	MH025	2
26	INSULATED SHEET	MH026	1	MH026	1
27	BEARING	MH027	1	MH027	1
28	FIXING SPRING	MH028	1	MH028	1
29	FIRST SECTION GEAR	MH029	1	MH029	1
30	FIXING SPRING	MH030	1	MH030	1
31	BEARING	MH031	1	MH031	1
32	BEARING	MH032	1	MH032	1
33	KEY	MH033	1	MH033	1
34	FIRST SECTION GEAR SHAFT	MH034	1	MH034	1

35	GEAR COVER	MH035	1	MH035	1
36	SCREWS	MH036	6	MH036	6
37	BEARING	MH037	1	MH037	1
38	UPPER HOOK	MH038	1	MH038	1
39	LEFT MAIN BODY SHEET	MH039	1	MH039	1
40	CHAIN GUIDING WHEEL	MH040	2	MH040	2
41	UPPER CHAIN GUIDING WHEEL	MH041	2	MH041	2
42	CHAIN PAWL DEVICE	MH042	1	MH042	1
43	CHAIN GUIDER	MH043	2	MH043	2
44	MAIN BODY COVER	MH044	2	MH044	2
45	FIXING ROD OF MAIN BODY	MH045	4	MH045	4
46	RIGHT MAIN BODY SHEET	MH046	1	MH046	1
47	SCREWS	MH047	2	MH047	2
48	CHAIN	MH048	1	MH048	1
49	CHAIN BAG	MH049	1	MH049	1
50	CHAIN STOPPING BLOCK	MH050	1	MH050	1
51	SCREWS	MH051	2	MH051	2
52	NUTS, WASHER	MH052	2	MH052	2
53	CHAIN GUIDE SPRING	MH053	1	MH053	1
54	LOWER HOOK SUSPENSION	MH054A	1	MH054B	1
55	LOWER HOOK	MH055A	1	MH055B	1
56	SCREWS	MH056	2	MH056	1
57	NUTS, WASHER	MH057	2	MH057	1
58	CHAIN GUIDE	MH058	1	MH058	1
59	GEAR SHAFT	MH059	2	MH059	2
60	GEAR SHAFT BASE	MH060	1	MH060	1
61	SCREWS	MH061	4	MH061	4
62	THIRD SECTION OF GEAR SHAFT	MH062	1	MH062	1
63	KEY	MH063	1	MH063	1
64	OIL SEAL	MH064	1	MH064	1
65	BEARING	MH065	1	MH065	1
66	OIL SEAL	MH066	1	MH066	1
67	BEARING	MH067	1	MH067	1
68	GEAR REDUCTION BOX	MH068	1	MH068	1
69	SCREWS	MH069	4	MH069	4
70	BEARING	MH070	1	MH070	1
71	THIRD SECTION GEAR	MH071	1	MH071	1
72	FIXING SPRING	MH072	1	MH072	1
73	BEARING	MH073	1	MH073	1
74	THIRD SECTION GEAR SHAFT	MH074	1	MH074	1
75	KEYLESS GEAR	MH075	1	MH075	1

76	PAWL BRAKE LINING	MH076	1	MH076	1
77	BRAKE DEPRESSOR (LOWER)	MH077	1	MH077	1
78	PRESS DISK TYPE SPRING	MH078	2	MH078	2
79	NUTS FIXING SHEET	MH079	1	MH079	1
80	TORQUE LIMITED NUTS	MH080	1	MH080	1
81	BRAKE DEPRESSOR (UPPER)	MH081	1	MH081	1
82	FIXING PIN	MH082	1	MH082	1
83	CLICK FIXING BOLT	MH083	1	MH083	1
84	CLICK SPRING	MH084	1	MH084	1
85	CLICK	MH085	1	MH085	1
86	PRESS DISK TYPE SPRING	MH086	1	MH086	1
87	PACKING	MH087	1	MH087	1
88	FIRST LAYER GEAR BOX	MH088	1	MH088	1
89	SCREWS	MH089	4	MH089	4
90	WASHER	MH090	1	MH090	1
91	NUTS	MH091	1	MH091	1
92	CONTROL PLUG	MH092	1	MH092	1
93	POWER CABLE SET	MH093	1	MH093	1
94	CABLE SET OF CONTROL SWITCH	MH094	1	MH094	1
95	FUSE	MH095	1	MH095	1

10.5 Exploded View: MH Pendant



10.6 Parts List: MH Pendant

PARTS LIST FOR PENDANT			
ITEM NO.	PART DESCRIPTION	PART NO.	QTY
1	CONNECTOR	PBS-1PH-1	1
2	SWITCH CABLE	PBS-1PH-2	1
3	SCREWS	PBS-1PH-3	4
4	PLASTIC COVER	PBS-1PH-4	1
6	TUBE	PBS-1PH-6	1
7	STICKER	PBS-1PH-7	1
9	PLASTIC COVER	PBS-1PH-9	1
10	SCREWS	PBS-1PH-10	2
11	SCREWS	PBS-1PH-11	2
12	INTERIOR CONNECTOR	PBS-1PH-12	1
13	PLASTIC COVER	PBS-1PH-13	1
14	SCREWS	PBS-1PH-14	6