



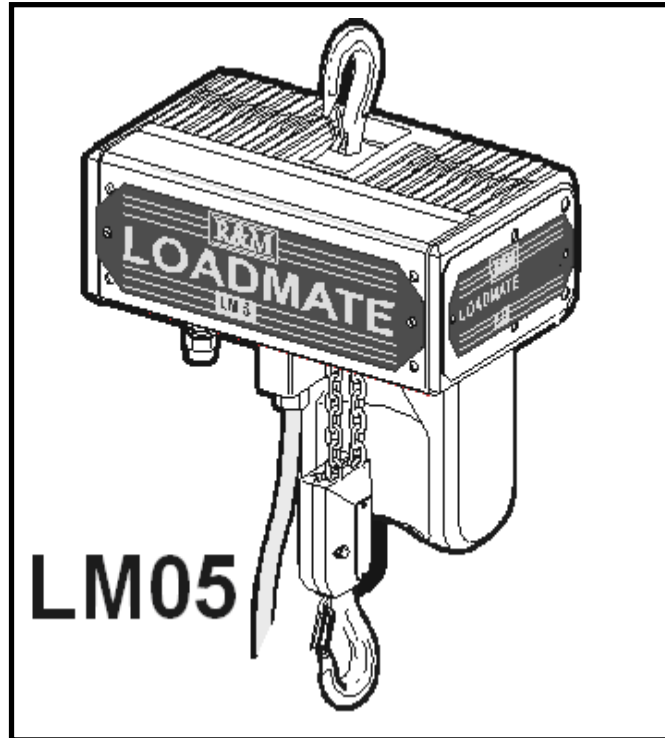
R&M Materials Handling, Inc
Springfield, Ohio USA
☎: 800 955-9967
www.rmhoist.com

LoadMate® Chain Hoist
LM05 Series II Manual
Helical Gearing
April 2005

LM05 SERIES II

Helical Gearing

LoadMate® CHAIN HOIST



INSTALLATION & MAINTENANCE MANUAL

JOB NO.: _____

SERIAL NO.: _____

(RECORD HOIST SERIAL NUMBER FOR FUTURE REFERENCE)



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1 INTRODUCTION

1.1 Contact Information

Please do not hesitate to use the following contact information in the event that you require assistance:

R&M MATERIALS HANDLING, INC.
4501 Gateway Boulevard
Springfield, OH 45502

General Telephone: 937 - 328-5100
Toll Free Telephone (US): 800 - 955-9967

General Fax: 937 - 325-5319
Parts Dept. Fax (US): 800 - 955-5162
Parts Dept. Fax (other): 937 - 328-5162

Website: www.rmhoist.com

1.2 Warranty

All sales are subject to the R&M MATERIALS HANDLING, INC. [Standard Terms and Conditions of Sale](#) and [Product Warranty](#). Copies are available upon request from R&M MATERIALS HANDLING, INC. (also available from website) and are expressly incorporated by reference hereto.

1.3 Disclaimer

This Manual has been prepared by **R&M MATERIALS HANDLING, INC.** to provide information and suggestions for hoist installation, maintenance, and inspection personnel. This manual should be used in conjunction with the **LoadMate® Electric Chain Hoist Operator's Manual** to train safe operating practices to all personnel associated with hoist operations and maintenance.

It is **NOT** intended that the recommendations in this manual take precedence over existing plant safety rules and regulations or OSHA regulations. However, a thorough study of the following information should provide a better understanding of proper installation, maintenance, and inspection procedures that are to be followed in order to afford a greater margin of safety for people and machinery in the area of hoist operations.

It must be recognized that this is a manual of recommendations for the Hoist Installation, Maintenance, and Inspection personnel and its use is permissive not mandatory. It is the responsibility of the hoist owner to make personnel aware of all federal, state, and local codes and regulations. The owner is responsible for providing instruction and insuring that certain installation, maintenance, and inspection personnel are properly trained.

1.4 Safety



The Safety Alert Symbol is used in this manual to indicate hazards and to alert the reader to information that should be known, understood, and followed in order to avoid DEATH or SERIOUS INJURY.

Read and understand this manual before using the hoist.

Important issues to remember during installation, operation, maintenance, and inspection are provided at the hoist control stations, at various locations on the hoist, in this manual, and in the [LoadMate® Electric Chain Hoist Operator's Manual](#). These issues are indicated by **DANGER**, **WARNING**, or **CAUTION** instructions or placards, that alert personnel to potential hazards, proper operation, load limitations, and more.



DANGER: Indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.



WARNING: Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.



CAUTION: Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Taking precedence over any specific rule, however, is the most important rule of all:

“USE COMMON SENSE”

It is a responsibility of the hoist owner / user to establish programs to:

1. Train and designate hoist operators, and
2. Train and designate hoist inspectors / maintenance personnel.

The words **SHALL** and **SHOULD** are used throughout this manual in accordance with definitions in the ASME B30 standards as follows:

SHALL indicates a rule is mandatory and must be followed.

SHOULD indicates a rule is a recommendation, the advisability of which depends on the facts in each situation.



Hoist operation, hoist inspection, and hoist maintenance personnel training programs should be based on requirements in accordance with the latest edition of:

- **ASME B30.16 Safety Standard for Overhead Hoists (Underhung)**

Such training should also provide information for compliance with any Federal, State, or Local Code requirements, and existing plant safety rules and regulations.

If an overhead hoist is installed as part of an overhead crane or monorail system, training programs should also include requirements in accordance with the latest editions, as applicable, of:

- **ASME B30.2 Safety Standard for Overhead and Gantry Cranes, Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist**
- **ASME B30.11 Safety Standard for Monorails and Underhung Cranes**
- **ASME B30.17 Safety Standard for Overhead and Gantry Cranes, Top Running Bridge, Single Girder, Underhung Hoist**

NOTICE

It is a responsibility of the owner / user to install, inspect, test, maintain, and operate a hoist in accordance with the ASME B30.16 Safety Standard, OSHA Regulations, and ANSI / NFPA 70, National Electric Code. If the hoist is installed as part of a total lifting system, it is also the responsibility of the owner / user to comply with the applicable ASME B30 volume that addresses other types of equipment used in the system.

Further, it is the responsibility of the owner / user to require that all personnel who will install, inspect, test, maintain, and operate a hoist read the contents of this manual, [LoadMate® Electric Chain Hoist Operator's Manual](#), ASME B30.16 Safety Standards for Overhead Hoists (Underhung), OSHA Regulations, and ANSI / NFPA 70, National Electric Code. If the hoist is installed as part of a total lifting system, all personnel must also read the applicable ASME B30 volume that addresses other types of equipment used in the system.

⚠ DANGER

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

R&M MATERIALS HANDLING, INC. has no direct involvement or control over the hoist's operation and application. Conforming to good safety practices is the responsibility of the owner, the user, and it's operating personnel.

Only those Authorized and Qualified Personnel who have shown that they have read and have understood this manual and the [LoadMate® Electric Chain Hoist Operator's Manual](#) should be permitted to operate the hoist.

The owner / user **SHALL** insure that all Operators read and understand the [LoadMate® Electric Chain Hoist Operator's Manual](#) prior to operating the hoist.



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1.5 Placards and Instructions

READ and OBEY all Danger, Warning, Caution, and Operating Instructions on the hoist and in this manual and **LoadMate® Electric Chain Hoist Operator's Manual**. Make sure that all placards are in place and legible.

Failure to comply with safety precautions in this manual and on the hoist is a safety violation that may result in serious injury, death, or property damage.

2 INSTALLATION



Before installing, removing, inspection, or performing any maintenance on a hoist, the main switch shall be de-energized. Lock and tag the main switch in the de-energized position in accordance with ANSI Z244.1. Follow other maintenance procedures outlined in this manual and ASME B30.16.

2.1 General

Prior to installation, the unit shall be checked thoroughly for damage during shipment or handling at the job site.

Each complete electric chain hoist is load tested at the factory at 125% of the nameplate-rated capacity.

All hoists are designed for the type of mounting specified by the purchaser. The adequacy of the supporting members (monorail beams, cranes, hangers, supports, framing, etc.) is the responsibility of user / owner and shall be determined or verified by qualified personnel.

Read the instructions contained in this manual and the [LoadMate® Electric Chain Hoist Operator's Manual](#) as well as any other related manuals. Observe the warning tags attached to the unit before the installation is started.

2.2 Lubrication

The hoist gear case comes completely pre-lubricated with grease.

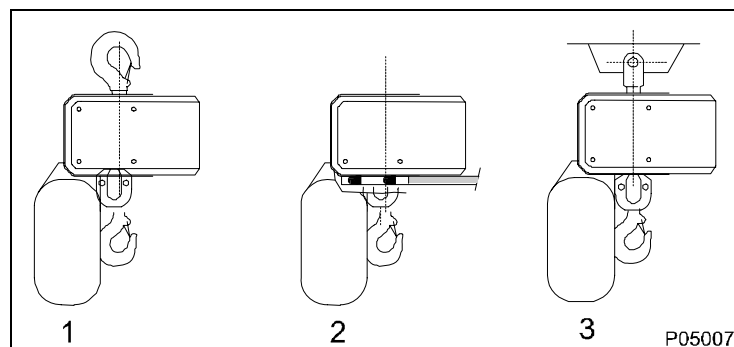
Note: Open trolley wheel gearing has not been greased at the factory. See the trolley manual for proper gear lubricant to use before installing hoist.

The load chain requires lubrication prior to first use. Chain lubricant is included with shipment of each new chain hoist.

2.3 Mounting

Below are three types of mounting:

1. Hook Mounted
2. Base Mounted
3. Coupling Mounted
4. Trolley Mounted – NOT SHOWN – is accomplished via a Hook or Trolley Coupling to the Trolley Assembly.





For all trolley-mounted hoists, refer to appropriate trolley manual for trolley installation instructions.

After a trolley-mounted hoist has been assembled to a beam, check for balance. Each trolley-mounted hoist is balanced at the factory for “as shipped” condition. Any auxiliary devices (radio control, lights, hose reels, etc.) furnished and mounted by “others” may require additional counterweight. Hoists must hang straight without a load or there will be a noticeable “kick” when a load is applied to the hook. An unbalanced hoist / trolley may result in damage to equipment.

2.4 Load Hook Throat Opening



ANSI B30.16 recommends that the throat opening of a load hook be measured and recorded prior to putting a hoist into service and that a gage be made to provide a quick visual inspection for a bent hook as required during routine inspections. Record this information before initial start-up. See Section 5.8 for more detailed hook information.

2.5 Electrical Connection

The user / owner must provide the main power supply hardware (cable, conductor bar, fuses, disconnect switch, etc.).



- Make sure that the power supply voltage is the same as that shown on hoist serial plate / nameplate.
- Make sure that fuses and other current overload devices are in place to protect the power supply.
- Make sure that power cable or conductors have sufficient capacity to maintain the hoist supply voltage by ± 5 percent of nominal voltage under all operating conditions. Poor voltage regulation may cause motor overheating or sluggishness, and chattering / inoperative motor brake(s) and controls.
- Do not use power supply cables with solid conductors.

2.6 Three Phase Power Connections

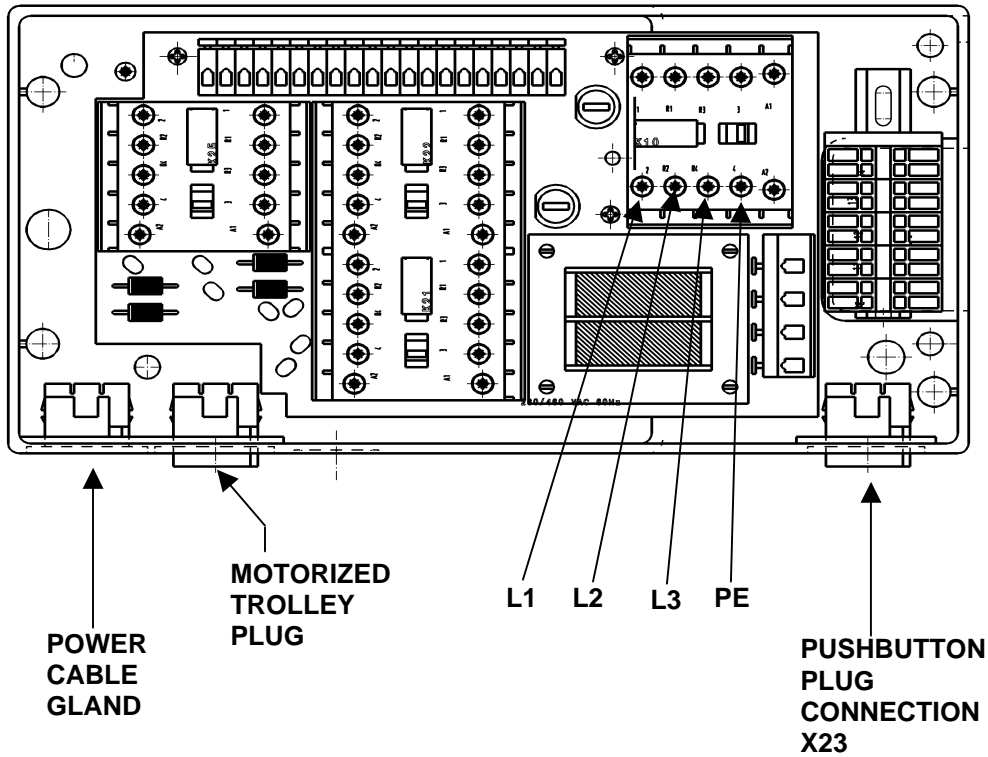


Figure 2.1

1. Remove the control box cover.
2. Insert the power supply cable through the cable gland.
3. Connect phases L1, L2, L3, PE (GROUND) to mainline contactor K10.
4. Tighten the terminal screws
5. Tighten the cable gland or connector to secure the cable.
6. Connect push button assembly to X23.
7. Connect motorized trolley (optional).
8. Close the control enclosure cover.

2.7 Single Phase Power Connections

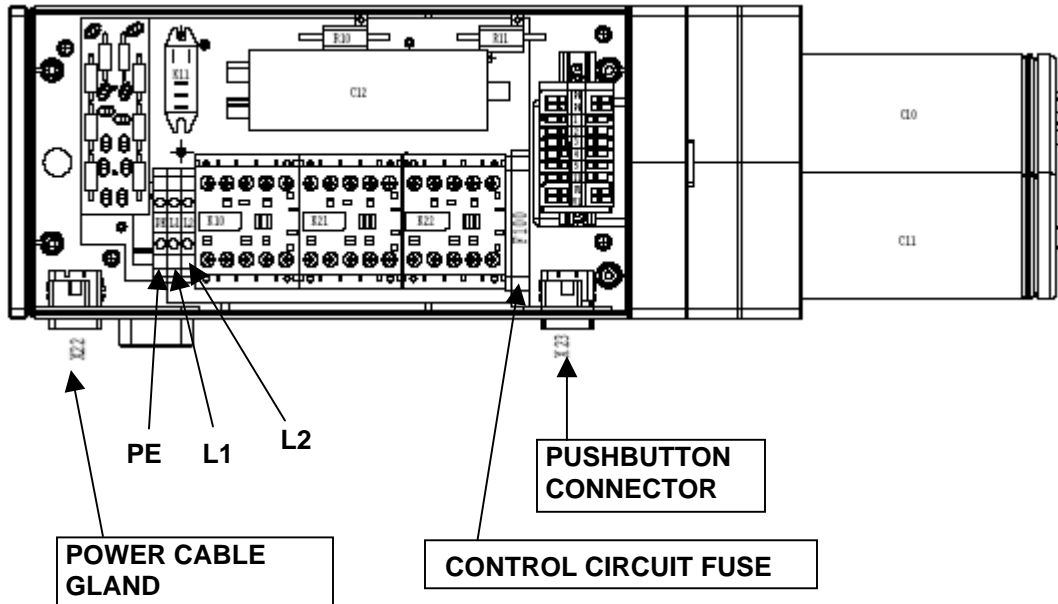


Figure 2.2

1. Remove the control box cover.
2. Insert power supply through the power cable gland.
3. Make the following connections:
 - Connect power lead to L1
 - Connect neutral lead to L2
 - Connect ground lead to PE
4. Check terminals to insure they are tight.
5. Close the box.
6. Check the hoist operation

3 INITIAL START-UP



Before connecting power to hoist, check all “motion” buttons on pendant control assembly to make sure that they operate freely without binding or sticking. Check pendant cable and strain relief connection to ensure that they are not damaged.

3.1 General

Initial start-up procedures are as follows:

- Read all attached **WARNING** tags and placards affixed to hoist.
- Oil load chain generously over entire length of chain.
- Make sure that load chain is not twisted. If so, untwist load chain before using.
- Make sure fall stop is placed at least 6” [150 mm] from last chain link on free end.
- Install chain container.
- If furnished, make sure that trolley wheels have proper spacing in relation to beam flange. See appropriate trolley manual for details.
- Check direction of hook travel to make certain that it corresponds to respective control button that is depressed. That is, does hook travel “UP” when **UP BUTTON** is depressed? If OK, go to section 3.3. If not, proceed to section 3.2 for correcting direction of travel.

3.2 Correcting the Direction of Hook Travel



DO NOT change control leads in pushbutton enclosure or at motor relays. DO NOT change nameplates on pushbutton assembly. The upper/lower safety limit switch is wired in series with “UP” control circuit as furnished from factory. Changing pushbutton control leads or nameplates will prevent the upper safety travel limit switch from functioning properly.

Reversing any two power leads of a three-phase AC motor will reverse the direction of rotation.

- Reverse any two leads of a three-phase power at the main power source or at connections to motor. **Do not change internal wiring of hoist.**
- After changing two of the main power leads, recheck direction of rotation. Press “UP” button only. If hook travel goes in “UP” direction, proceed to section 3.3. If not, redo section 3.2.

3.3 Operational Checks – No Load

- Check hoist motor brake function. Run empty load block up or down to check that load block does not drift more than 1.0 inch [25mm]. If so, adjust brake as described in Section 5.3 of this manual.
- Run empty load block down to check that fall stop (located on free end of load chain) makes proper contact with upper / lower travel safety limit switch and that limit switch functions properly.
- Run empty load block up to check that load block makes proper contact with upper / lower travel safety limit switch and that limit switch functions properly.
- Run empty load block up and down several times while checking for proper tracking of load chain.



3.4 Operational Checks – With Load

- After completion of no-load operational tests, the user /owner should perform a full load test even though each complete hoist is load tested at factory.
- Lift a near capacity load about one (1) foot [30cm] above floor level. Check that the brake holds load. Also, check stopping capability of brake when lifting to a stop and lowering to a stop.
- Move trolley the full length of monorail or crane beam. Check for any binding of trolley wheels on flange and/or interference at splice joints, hanger connections / bolts, etc.
- Check contact with stops. Contact with stops **SHALL** only be made with trolley bumpers. Stops that are designed to make contact with wheels **SHALL NOT** be used.



4 HOIST OPERATION



BEFORE PROCEEDING WITH THE NORMAL OPERATION OF THIS HOIST, THE OPERATOR/(S) SHALL BE TRAINED IN ACCORDANCE WITH THE [LoadMate® Electric Chain Hoist Operator's Manual](#) AS SUPPLIED WITH THIS HOIST.

FAILURE TO READ AND COMPLY WITH ANY ONE OF THE LIMITATIONS NOTED IN THIS MANUAL AND THE [LoadMate® Electric Chain Hoist Operator's Manual](#) FURNISHED WITH THIS HOIST CAN RESULT IN PRODUCT FAILURE, SERIOUS BODILY INJURY OR DEATH, AND / OR PROPERTY DAMAGE.

REFER TO SECTION 1.0 OF THIS MANUAL FOR CONTACT INFORMATION IF YOU NEED ANY ADDITIONAL ASSISTANCE.



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5 MAINTENANCE

5.1 Basic Hoist Construction

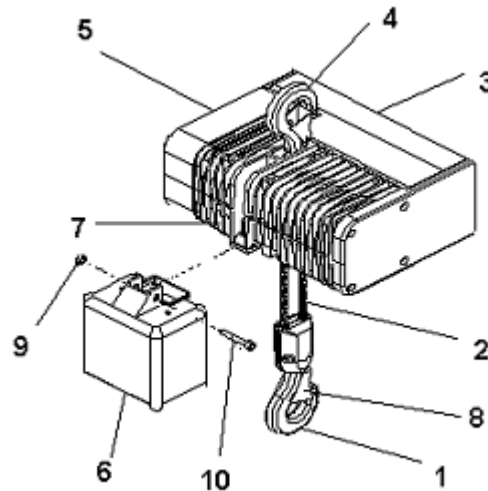


FIGURE 5.1

- 1 - LOAD BLOCK ASSEMBLY (2-FALL SHOWN)
- 2 - LOAD CHAIN
- 3 - ELECTRICAL CONTROL ENCLOSURE
- 4 - TOP HOOK
- 5 - HOIST GEAR BOX ASSEMBLY
- 6 - CHAIN CONTAINER & HARDWARE
- 7 - HOIST BODY / MOTOR
- 8 - LOAD HOOK SAFETY LATCH
- 9 - FASTENER
- 10 - PIN

5.2 Motor / Body

The hoist motors are designed to provide dependable hoisting service. The standard motors are enclosed for IP55 rated protection against normal hazards of dust and moisture. The motor bearings are sealed and do not require further greasing.

The hoist body is constructed of aluminum and requires no maintenance. Remove from service and replace the hoist body if damaged.



5.3 Hoist Motor Brake and Load-Limiting Device

The hoisting motor is equipped with a D.C. electromagnetic disc brake. The brake brings the load to a smooth and quick stop and holds the load when the motor is not energized. An energized coil releases the hoist brake to allow the hoisting motor to run freely when in use.

The load-limiting device is a slip clutch and it is integrated into the design of the hoist motor brake. Even if the clutch slips, once power is removed, the brake will engage to stop and hold the load.

5.3.1 Slip Clutch Operation

When the motor brake is energized, ITEM 5 pulls ITEM 8 away from ITEM 9. ITEM 9 is free to rotate. ITEM 4 applies pressure to ITEM 9 that forces ITEM 9 to engage ITEM 10. The face-to-face contact between ITEMS 9 & 10 creates an adjustable slip clutch between the motor and the load chain sprocket.

As ITEM 2 is tightened, ITEM 4 applies more pressure on the interface between ITEMS 9 & 10. More pressure increases the load capacity of the hoist and less pressure decreases the capacity of the hoist. The ITEM 2 is adjusted to allow the hoist to lift 110 – 125 percent of the rated capacity of the hoist.

In the event that the slip clutch begins to slip during the lifting or lowering process, release the hoist motion control button to stop the motor. This will de-energize the brake. ITEM 8 will now press against ITEMS 9 & 10 to stop rotation and slippage between ITEMS 9 & 10. This will stop and hold the load. Re-adjustment of ITEM 2 will be necessary to eliminate slipping. See section 5.3.2.

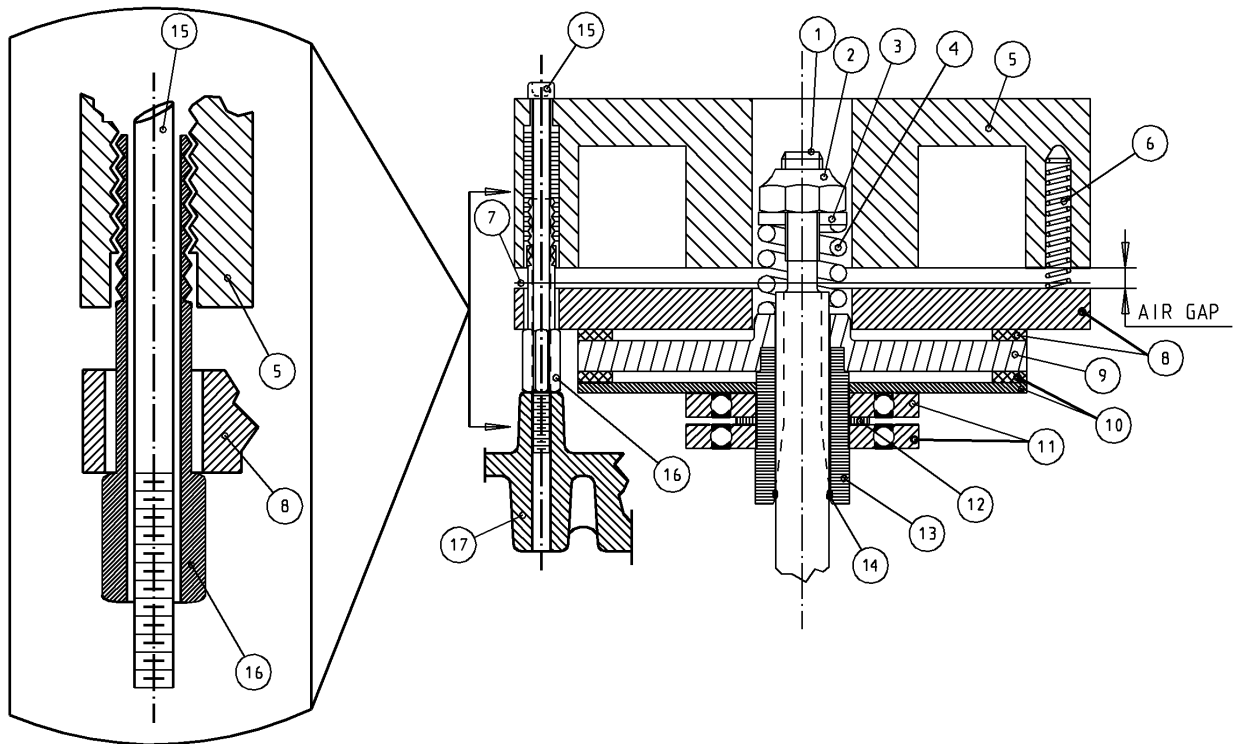


Figure 5.2

ITEM	DESCRIPTION
1	MOTOR SHAFT
2	ADJUSTING NUT
3	WASHER
4	SPRING
5	MAGNET ASSEMBLY
6	SPRING
7	SPACER
8	THRUST DISC
9	ROTOR
10	DISC
11	BEARING
12	BEARING SPACER
13	DRIVE HUB
14	O-RING
15	MOUNTING SCREW
16	ADJUSTING SLEEVE
17	BRAKE HOUSING



SEE FIGURE 5.2

Make sure the motor is not running before placing tool on the nut to adjust it. Do not touch any moving components.

The slip-clutch generates heat when slipping. ITEMS 9 & 10 absorb this heat. When these items become too hot, setting clutch may be difficult due to unstable behavior of friction surfaces. If this happens, allow brake & clutch assembly to cool before trying to re-adjust slip-clutch.

Decreasing torque too much when adjusting slip-clutch will allow a suspended load to free-fall when trying to lift. If this is to occur, once power is removed, the brake will engage to stop and hold the load.

5.3.2 Slip Clutch Adjustment after Installation

1. Hook a load of at least 110 percent but not more than 125 percent of nameplate capacity.
2. Remove plastic cap from inspection hole in brake cover.
3. Raise load at slow speed and fast speed to test slip clutch operation.
4. Insert a socket (13mm) through inspection hole, and slide it over nut (item 2 - Figure 5.2).
Turn nut in required direction:
 - Turn nut **clockwise to increase** the torque.
 - Turn nut **counterclockwise to decrease** the torque.
5. Repeat steps 3 and 4 until load can be barely lifted in fast speed. **CAUTION: DO NOT OVERHEAT.** If overheated, clutch may not adjust due to instability of friction surfaces.
6. Once adjustment is completed, install plastic cap.
7. Check function of clutch at 100 percent of nameplate-capacity while in fast speed.



NOTICE

The slip clutch / Torque Limiter is a safety device to prevent overloading of the hoist. This device is not intended for use as means to measure the weight of load being lifted.



5.3.3 Hoist Motor Brake Adjustment (See Figure 5.2)

If maximum air gap of brake has been reached or will be exceeded before next inspection, readjust air gap.

Minimum air gap
X = 0.008" [0.2 mm]

Maximum air gap
X = 0.020" [0.5 mm]

Before adjusting brake, remove load. Per ANSI Z244.1, lockout and tag main disconnect switch in de-energized position. Follow other maintenance procedures outlined in this manual and ASME B30.16.

1. Remove brake cover and gasket.
2. With a feeler gauge, check three (3) places near each mounting bolts to measure air gap (X) between brake thrust disc (item 8) and coil (item 5).
3. To adjust air gap use a 0.008" feeler gauge and proceed as follows:
 - A. Loosen motor brake mounting screws (item 15).
 - B. To **reduce** air gap, tighten three adjusting sleeves (item 16).
 - C. To **increase** air gap, tighten three adjusting sleeves (item 16).Repeat step "A" until air gap is snug against feeler gauge and is measures the same in three places.
4. Check brake operation. Run load block up and down several times without a load to test operation of brake. Then, lift a capacity load about one foot above floor, stop, and check that brake holds load.
5. Install gasket and brake cover.

5.4 Load Chain



A hoist SHALL NEVER be used if the load chain shows any evidence of mechanical damage or excessive wear. Never use the load chain as a sling. Use only original equipment chain as supplied by a factory authorized source. Improper load chain storage or installation can render the load chain unusable prior to the first lift.

5.5 Maintenance Inspection

A qualified person **SHALL** be designated to routinely conduct an in-depth inspection of the load chain (See Section 6 – Preventative Maintenance for schedule recommendations). This designated person **SHALL** inspect load chain using good judgment in evaluating the remaining service life. Any deterioration of load chain resulting in appreciable loss of original strength **SHALL** be noted and evaluated.

An in-depth inspection **SHALL** include a written record that is dated and signed by the inspector.

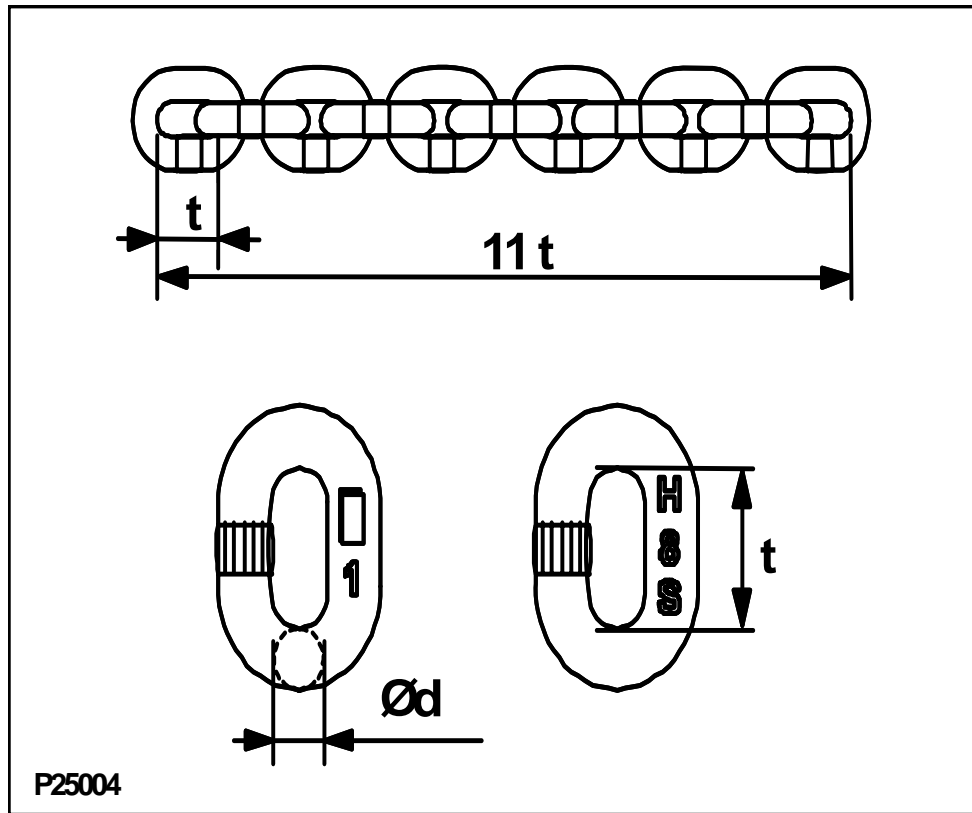


Figure 5.3

Measure the following chain dimensions at several points on chain: (Figure 5.3)

- Dimensions of one link ($d \times t$) where, d = diameter and t = pitch
- Length over 11 links ($11 t$)

Replace load chain if any one of these dimensions exceed maximum allowed wear.

Maximum allowed wear:

Minimum link diameter allowed (d):	0.1693" [4.30 mm] MINIMUM
Maximum pitch allowed (t):	0.5157" [13.10 mm] MAXIMUM
Maximum length allowed (11t):	5.5216" [140.25 mm] MAXIMUM

NOTICE

If load chain needs replaced, then inspect chain guide and chain (load) wheel on hoist and idler sprocket in 2-fall load block for excessive wear. A chain sprocket showing evidence of scored pockets or sharp edges generated from wear SHALL be replaced. A worn chain sprocket or idler sprocket can greatly reduce the life of load chain.



5.6 Load Chain Specifications (see Figure 5.3)

Chain Specification:	Load chain
Chain type:	Standard
Diameter (d) x pitch (t):	0.189" (4.8 mm) /0.492" (12.5 mm)
Class:	DAT
Grade:	H8S or HE G80 RAS
Maximum working stress:	19,652 lbs/in ² (135.5 N/mm ²)
Hardened surface:	580 or 700 HV (Vickers Hardness)
Thickness:	0.0039" (0.1 mm) to 0.0079" (0.2 mm)
Standard:	DIN 5684 - 8
Marking (10 x t):	1 or 16 H 8 S or A 8
Maximum working load per one fall:	1100 lbs. (500 kg)
Breaking load:	6519.50 lbs (29 kN)
Maximum breaking stress:	116,030 lbs/in ² (800 N/mm ²)
Total breaking elongation:	>10% min.
Weight for 100 links:	1.5 lbs. (0.680 kg)

5.7 Removing the Load Chain

1-FALL CHAIN

1. Remove load from hook block assembly.
2. Remove load block assembly from load chain. Some disassembly of 1-fall load block is required.
3. Attach the chain insert tool to the end of bottom block end of the chain.
4. Run hoist in "UP" direction until all of chain is in container. Stop the hoist with the insertion tool remaining in the hoist ready for the new chain.
5. Remove chain container with all of old chain in chain container.
6. Remove fall stop from old chain and save for use with new chain.

2-FALL CHAIN

1. Remove load from hook block assembly.
2. Run hoist in "UP" direction until hook block assembly is about 1.0 foot [30cm] from hoist body.
3. Unfasten load chain from chain anchor mounted on hoist body.
4. Remove load block assembly from load chain by allowing chain to run through it. Attach the chain insert tool to the bottom block end of the chain.
5. Run hoist in "UP" direction until all of the chain is in the container. Stop the hoist with the insertion tool remaining in the hoist ready for the new chain.
6. Remove chain container with old chain.
7. Remove fall stop from old chain save for use with new chain.

5.8 Installing the Load Chain

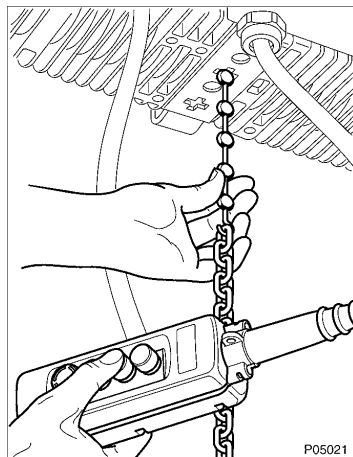


Figure 5.4

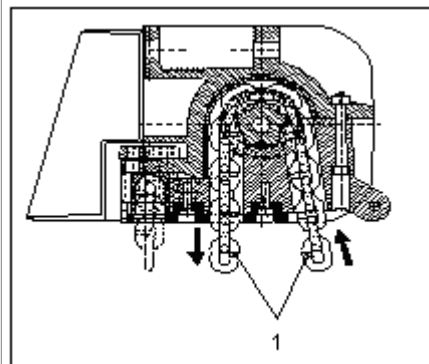
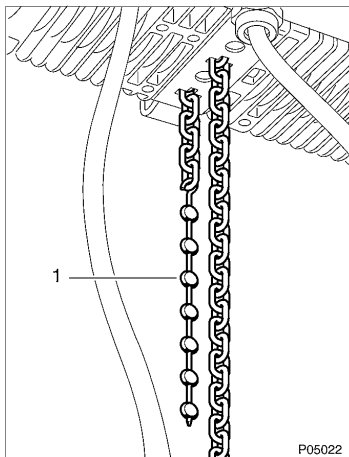


Figure 5.5

1-FALL CHAIN INSTALLATION

1. Attach last link of chain onto hook of CHAIN INSERTION TOOL (item 1, Figure 5.4).
2. If the insertion tool is not in the hoist (removal procedure), insert other end of CHAIN INSERTION TOOL into chain opening closest to chain container side.

⚠ CAUTION

Make sure the chain weld on chain link faces inward toward chain wheel pocket on hoist load sprocket. See Figure 5.5.

3. Run hoist “UP” in slow speed to feed chain through chain sprocket out other side.
4. Attach fall stop at least 6.0 inches [150 mm] from end of chain (chain container side). Attach load block assembly on other end of load chain. Refer to Figure 5.6 for details.
5. Make sure that load chain is not twisted or deformed.
6. Attach chain container.

2-FALL CHAIN INSTALLATION

1. If the chain insertion tool is not in the hoist (removal procedure), attach last link of chain onto hook of CHAIN INSERTION TOOL (item 1, Figure 5.4).
2. Insert other end of CHAIN INSERTION TOOL into chain opening closest to chain container.

⚠ CAUTION

For a 2-Fall load block assembly, make sure the chain weld on chain link faces inward toward chain wheel pocket on hoist and away from idler sprocket of hook block assembly. See figure 5.5. Follow steps outlined below:

3. Run hoist in slow speed to feed chain through chain sprocket. Continue running until about 2.0 feet [60cm] of chain is available out the other side.

4. Slide chain onto idler sprocket of load block making sure not to twist chain while inserting it. Link weld must face away from idler sprocket on load block assembly.
5. Attach chain anchor and chain to hoist body. Tighten chain anchor bolts per recommended torque settings in Section 6.4.
6. Attach fall stop 6.0 inches [150 mm] from end of chain (chain container side). See Figure 5.6 for details.
7. Make sure that chain is not twisted or kinked.
8. Attach chain container.

After chain installation:

1. Without a load, run chain up and down a few times to make sure load chain is not twisted. If so, remove chain twist.
2. Lubricate load chain.

5.9 Fall Stop Assembly

The slack fall stop is a safety not a functional stop. The fall stop must be located at least (6.0) inches [150mm] from end of load chain.

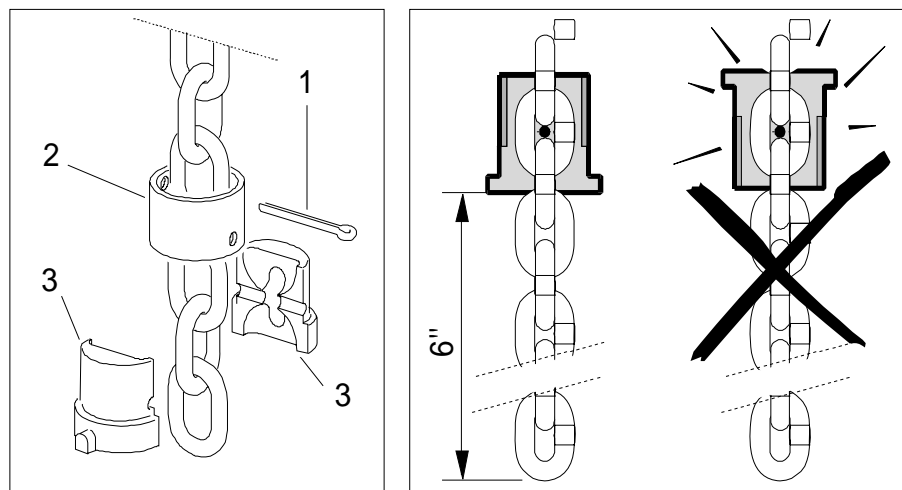


Figure 5.6

5.10 Removing fall stop (Figure 5.6)

1. Remove cotter pin (item 1).
2. Slide up the tube (item 2).
3. Remove the two fall stop halves (item 3).
4. Slide tube (item 2) off load chain.

5.11 Installing fall stop (Figure 5.6)

1. Slide tube (item 2) onto load chain.
2. Position two fall stop halves (item 3) on a chain link so that the fall stop will be at least 6 inches [150mm] from end of load chain.
3. Slide tube (item 2) down over two fall stop halves (item 3).

4. Insert and secure cotter pin (item 1).

5.12 Chain Container

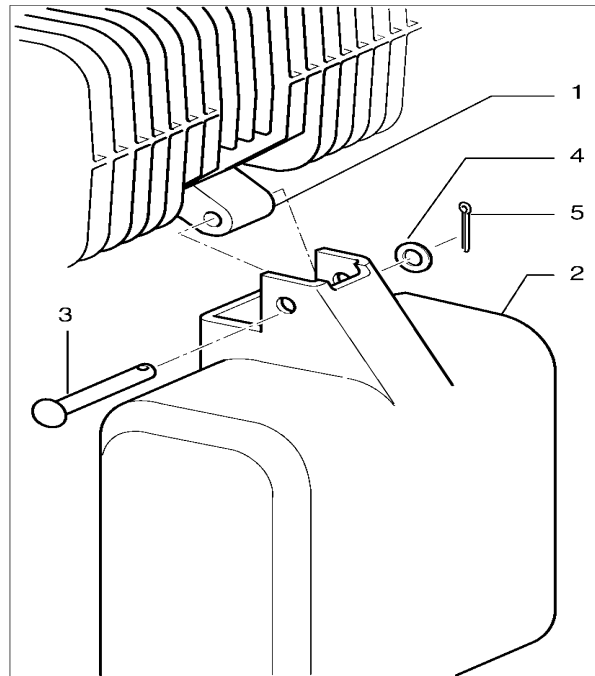


Figure 5.7



Chain container must be installed for effective operation of travel limit switch.

Removing Chain Container (Figure 5.7)

1. Remove cotter pin (item 5) from end of pin (item 3).
2. Pull pin (item 3) out while supporting chain container (item 2).
3. Remove chain container (item 2).

Installing Chain Container (Figure 5.7)

1. Insert load chain into chain container (item 2). Position chain container (item 2) onto hoist mounting bracket (item 1).
2. Align holes and insert pin (item 3) through container (item 2) and hoist mounting bracket (item 1).
3. Place washer (item 4) onto pin (item 3).
4. Insert and secure cotter pin (item 5).

5.13 Upper and Lower Travel Safety Limit Switch

The Upper and Lower Travel Limit Switch is an automatic reset type switch and connected to the control circuit. The switch housing is recessed into the underside of hoist body.

The upper and lower limit switches are emergency protection devices and are not to be used as a continuous stop.

The hook block activates the upper limit switch as it contacts the limit switch that is located on bottom side of hoist body. Once the switch is activated, the “UP” circuit is opened. The fall stop activates the lower limit switch when hook block is lowered to its lowest travel position. The limit switch is activated and opens the “down” circuit.

The lower limit position is adjustable between the lowest travel and maximum lift. It is adjusted by repositioning the fall stop assembly on free end of load chain. The fall stop **SHALL** always be located at least 6 inches [150mm] from end of last chain link. The upper limit position is adjustable only when an additional fall stop assembly is added between the hook block assembly and the hoist body.

5.14 Upper and Lower Rotary Travel Limit Switch (Optional Only on 3-Phase Units)

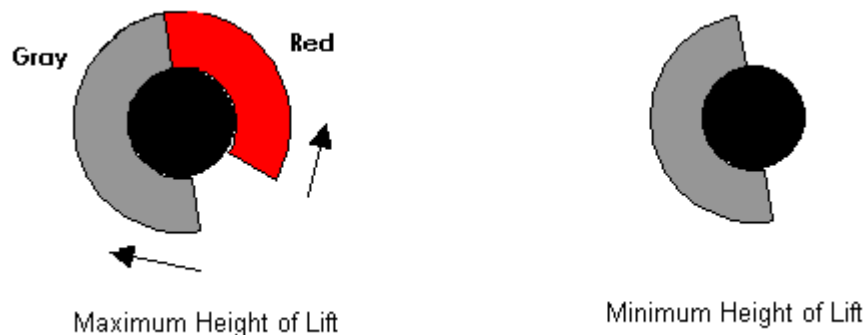
The rotary limit switch is adjustable and provides over-travel protection for the upper and lower limits of hoist travel. The limit switch is connected to the control circuit.

Note: Not available on Single Phase – 115 Volt Models

Note: Rotary limit switch assembly cannot be added to a Hoist. The Hoist must have the rotary limit switch assembly provided at time of initial production.

Adjustment

The position of the air-gap between the two discs (red – gray) determines the stopping place. This position can be found by gently turning the two discs. The length of air gap determines length of reset play in opposite direction.



To reset the rotary limit once it has tripped, the load block assembly must travel approximately 11” [27cm] in opposite direction.

5.15 Hooks

Check hooks for deformation or cracks. Hooks must be replaced if throat opening has increased by more than 15%, or if throat opening has more than 10-degree twist from plane of straight hook.

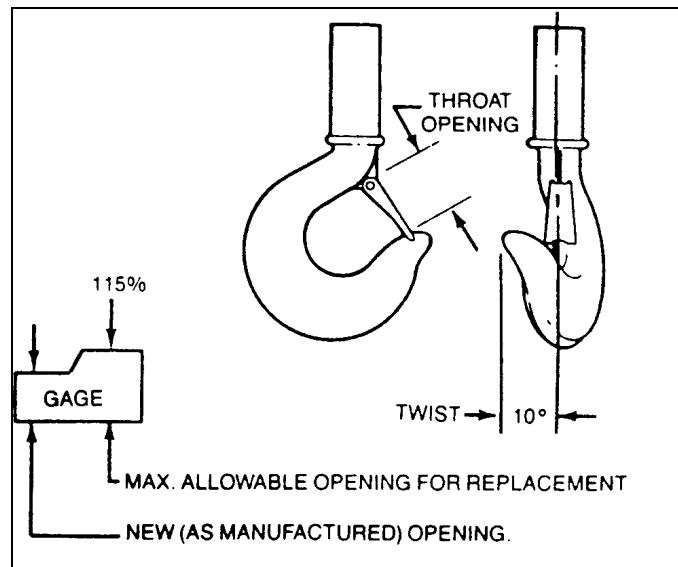


Figure 5.9

Due to many types and sizes of hooks that can be furnished and/or specified by the user / owner, it is recommended that user / owner measure the actual throat opening of hook as originally furnished. See Figure 5.9. Record the throat dimension on above sketch. Retain as a permanent record. This record can then be used for determining when hook must be replaced due to deformation or excessive throat opening.

⚠ CAUTION

Abuse or overloading of hoist is indicated when any hook is twisted or has a throat opening in excess of normal. Other load bearing components SHALL be checked for damage.

Safety latches SHALL be replaced if missing, bent, or broken.

A safety latch SHALL function properly at all times.

Repairing hooks by welding or reshaping is strictly forbidden.

5.17 Top Hook

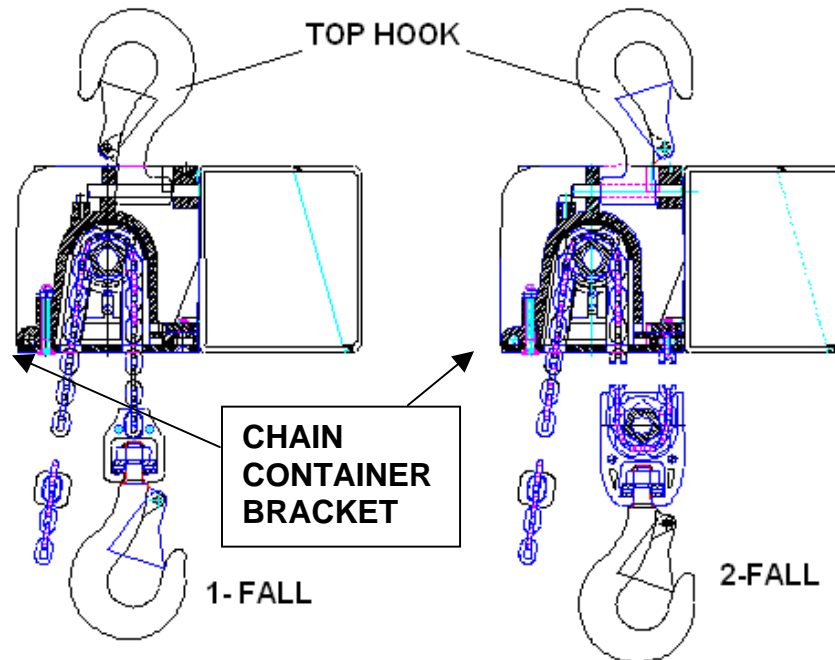


Figure 5.11



Before removing Top Hook, de-energize the power to the hoist per ANSI Z244.1 and make certain that any load is removed from the load hook. Also support the total weight of the hoist, including chain, prior to removing the Top Hook.

Removing Top Hook

1. Place hoist on workbench. Protect limit switches on bottom side of hoist.
2. Remove screw and retaining washer.
3. Pull pins out and remove hook.



Proper installation of top hook is critical for hoist balance.

Installing Top Hook

1. Place hoist on workbench. Protect limit switches on bottom side of hoist.
2. Determine number of chain falls: 1-fall or 2-fall – Reference Figure 5.11
3. Select proper placement of top hook relative to number of chain falls:
 If 1-fall, align top hook so that tip of hook faces toward chain container.



If 2-fall, align top hook so that tip of hook faces away from chain container.

4. Place hook into the slot on hoist body. Verify that top hook saddle and load hook saddle are in line with each other. Install pins and retaining washer. Secure retaining washer with screw.

5.18 Control Changes and Fuses

The control panel components are assembled onto a Printed Circuit (PC) Board. The layouts and wiring diagrams found within this section are for standard hoist controls. The hoist motor brake rectifier is an integral part of the Printed Circuit (PC) Board.

Two-speed hoists are available for 208, 230, 460, and 575 volt three-phase power supplies. The two-speed hoists can only be connected to the specified serial plate voltage.

Three-phase single-speed hoists are available and re-connectable for 208, 230, and 460 volts. Single-phase single-speed hoists are also available with 115 volt one-phase power supply.

Control Circuit Fuses

The control fuse for three-phase control panels is located in a vertical, cylindrical fuse holder mounted to the printed circuit board. There are two holders identified as position F100 or F101. The supply voltage determines which location the fuse is inserted. See Figure 5.12 for a typical panel view. The top rotates loose for replacement. There is only one top; therefore, the fuse is located in the position with the top.

The control fuse for the Single-Phase 115V control panels is located in a fuse holder attached to the din rail beside the contactor. See Figure 2.2 Section 2.7. The top of the fuse holder flips open so that a fuse can be removed or installed.

POWER SUPPLY	CONTROL VOLTAGE	FUSE SIZE
3 – PHASE	115 VAC	500 mA
3 – PHASE	48 VAC	630 mA
1 - PHASE	115 VAC	250 mA

Three-phase Single-speed Voltage Changes:

Proceed as follows:

- 1) Use a straight slot screwdriver and remove the cap on top of the fuse holder. There is only one cap for two fuse holders, locations F100 and F101. The fuse is located in the fuse holder with the cap. Place control circuit fuse into correct fuse holder position depending on supply voltage.
 - 208 volts position F101
 - 230 volts position F100
 - 460 volts position F100
- 2) Connect hoist motor leads on terminal strip **X5** per appropriate single speed wiring diagram.



- 3) Connect hoist motor brake leads (see panel layouts and wiring diagrams)
 - 208 / 230V (-) brake lead to **X7** and (+) brake lead to **K21**
 - 460V (-) brake lead to **K21** and (+) brake lead to **K21**
- 4) Consult Motorized Trolley Manual (if applicable)



Motorized trolley drives are not voltage re-connectable. Consult the motorized trolley manual if a voltage change over is required.

5.19 Three-phase Control Panel – Two-speed Hoist – 208/230/460 Volts

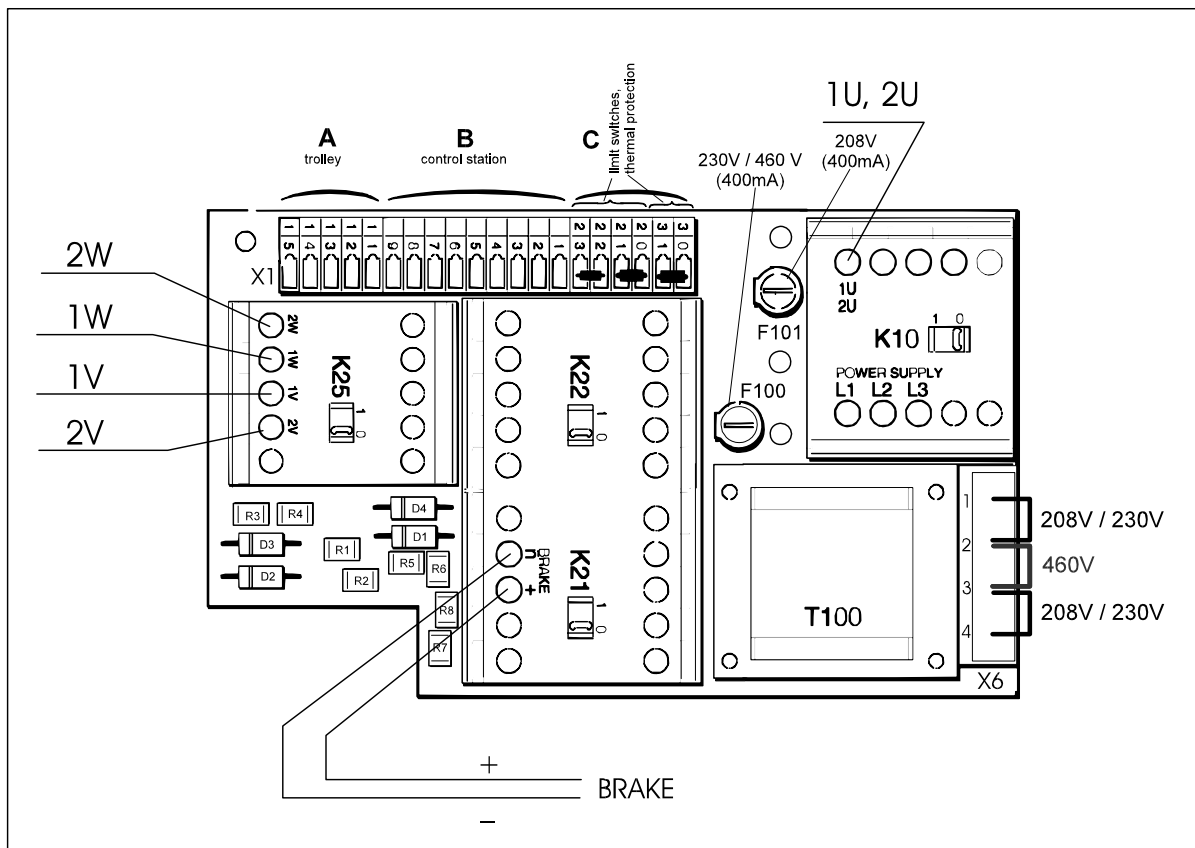
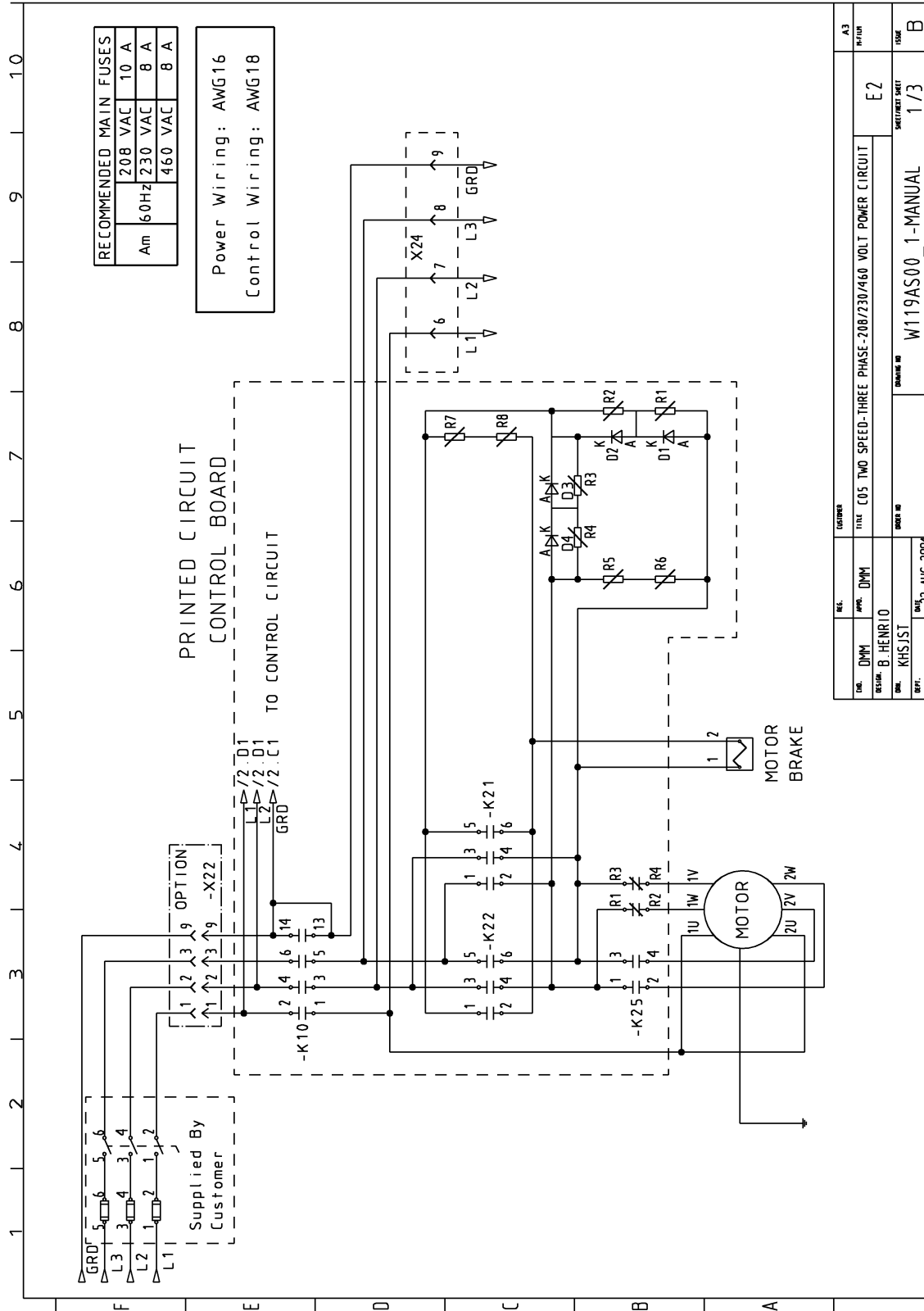


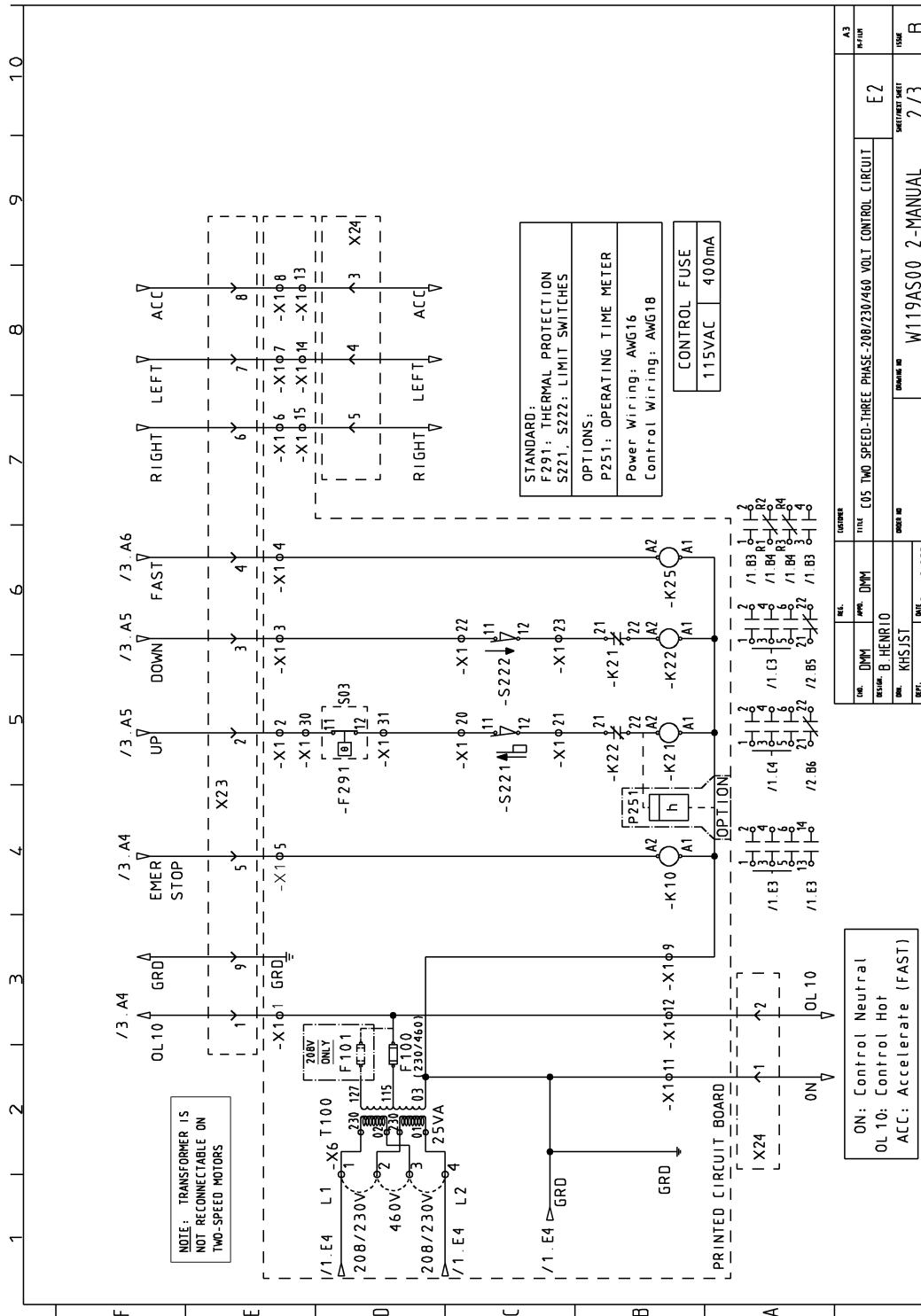
Figure 5.12

L1	HOIST POWER SUPPLY – PHASE 1
L2	HOIST POWER SUPPLY – PHASE 2
L3	HOIST POWER SUPPLY – PHASE 3
PE	POWER SUPPLY GROUND
X1	TERMINAL STRIP ON PRINTED CIRCUIT BOARD
X6	TERMINAL STRIP ON CONTROL TRANSFORMER – NOTE JUMPER CONNECTIONS
BRAKE (-)	BRAKE COIL SUPPLY (NEGATIVE)
BRAKE (+)	BRAKE COIL SUPPLY (POSITIVE)
X23	PUSH BUTTON PLUG CONNECTION
X24	MOTORIZED TROLLEY PLUG CONNECTION
K10	MAIN LINE CONTACTOR
K21	HOIST “UP” CONTACTOR
K22	HOIST “DOWN” CONTACTOR
K25	HOIST TWO-SPEED FAST CONTACTOR
T100	CONTROL TRANSFORMER
F100	FUSE HOLDER POSITION 230 VOLT OR 460 VOLT SUPPLY
F101	FUSE HOLDER POSITION 208 VOLT ONLY
1U, 2U	MOTOR SUPPLY LEADS
1V	MOTOR SUPPLY LEAD
2V	MOTOR SUPPLY LEAD
1W	MOTOR SUPPLY LEAD
2W	MOTOR SUPPLY LEAD

5.20 Three-phase – Two-speed Hoist – 208/230/460 volts – Power Circuit



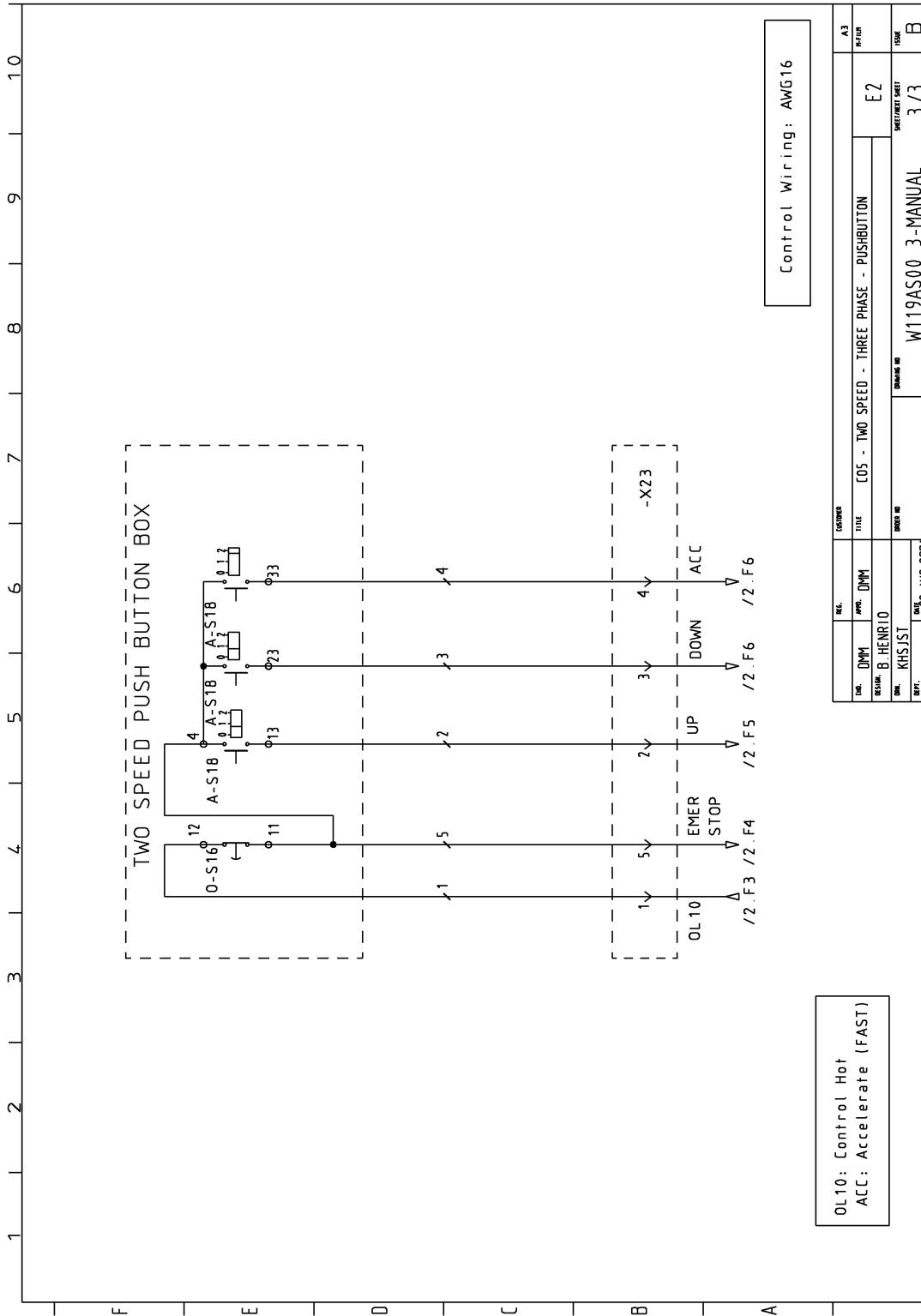
5.21 Three-phase Two-speed Hoist – 208/230/460 volts – Control Circuit



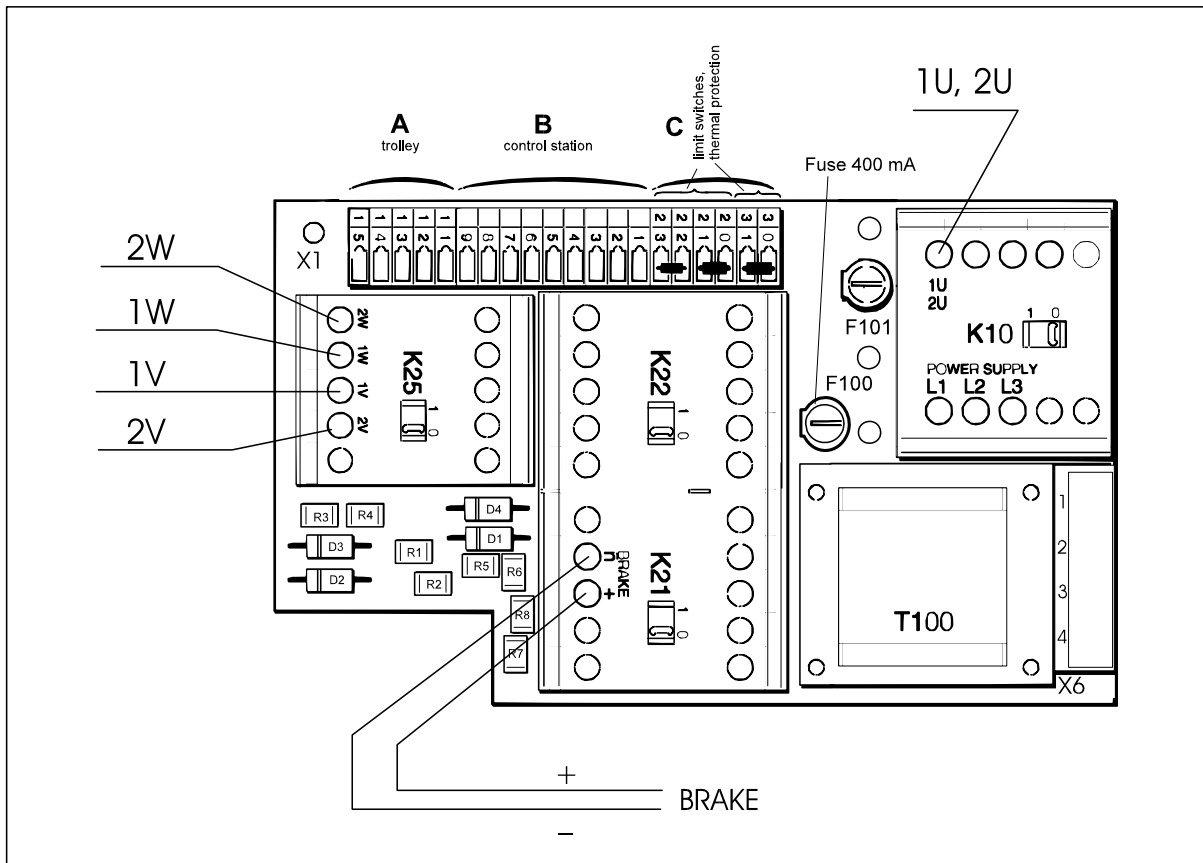
REV.	DATE	BY	CHKD	TITLE
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5.22 Three-phase Two-speed Hoist – 208/230/460 volts – Push Button

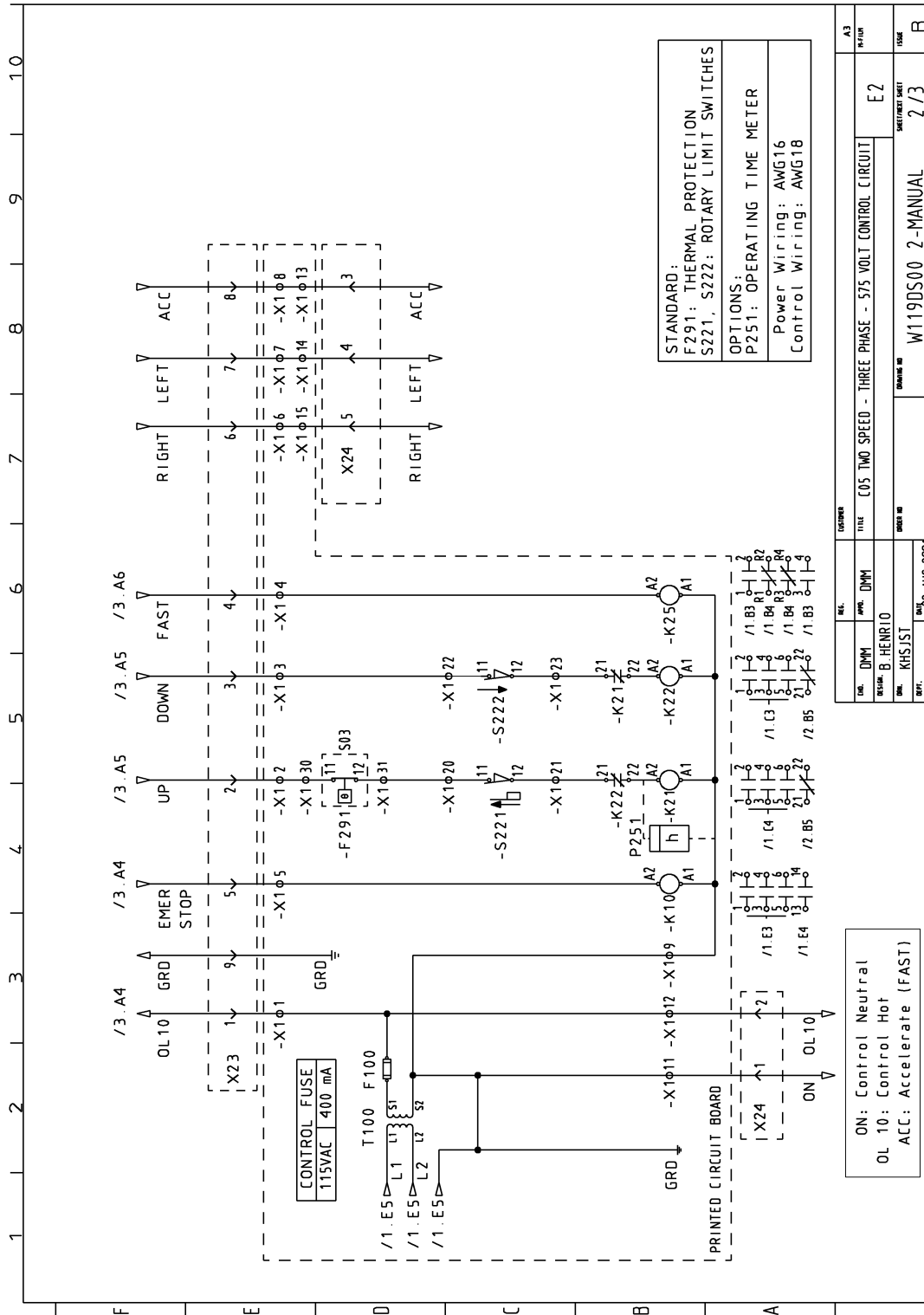


5.23 Three-phase Control Panel – Two-speed Hoist – 575 volts



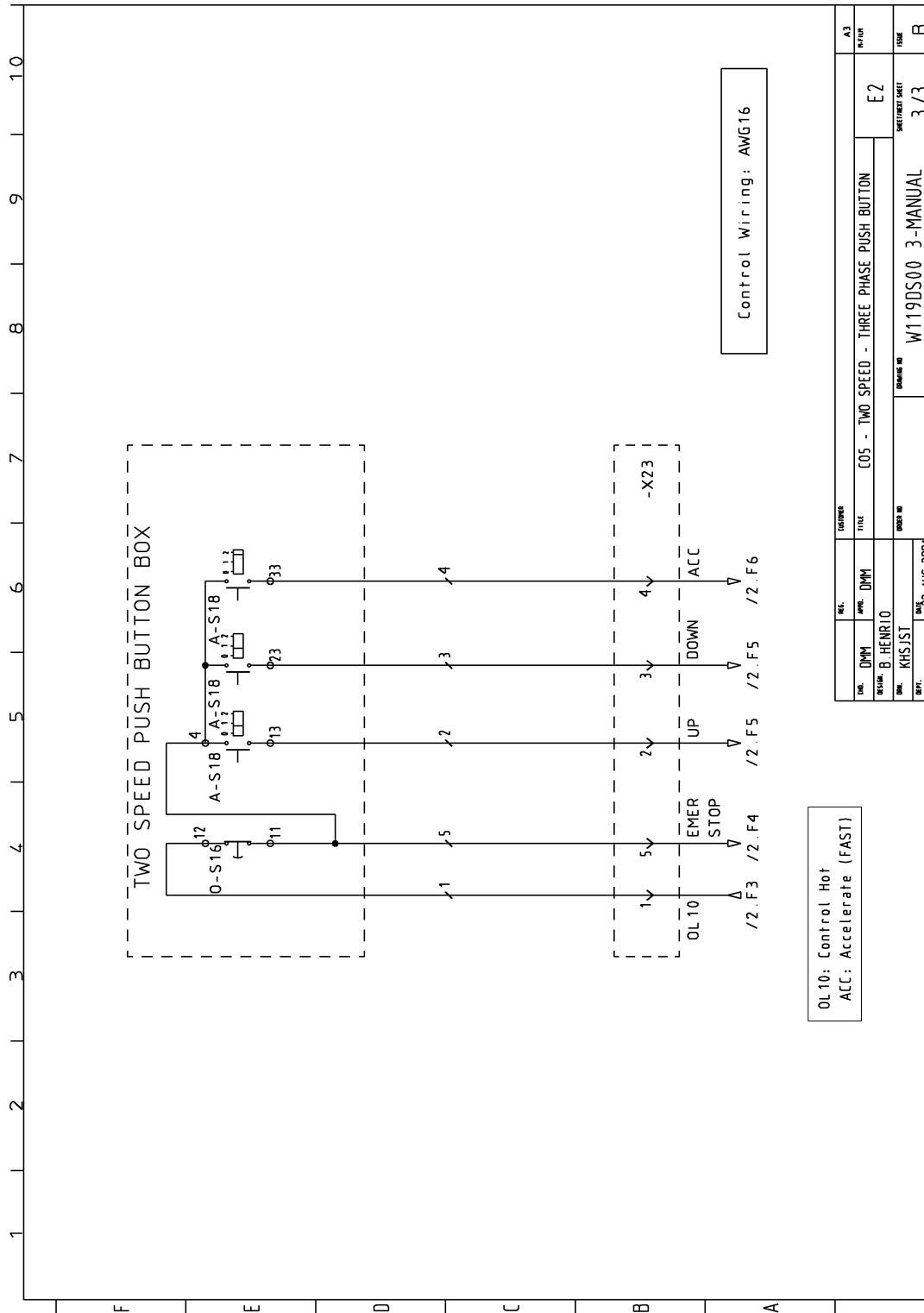
L1	HOIST POWER SUPPLY – PHASE 1
L2	HOIST POWER SUPPLY – PHASE 2
L3	HOIST POWER SUPPLY – PHASE 3
PE	POWER SUPPLY GROUND
X1	TERMINAL STRIP ON PRINTED CIRCUIT BOARD
X6	TERMINAL STRIP ON CONTROL TRANSFORMER – NOTE JUMPER CONNECTIONS
BRAKE (-)	BRAKE COIL SUPPLY (NEGATIVE)
BRAKE (+)	BRAKE COIL SUPPLY (POSITIVE)
X23	PUSH BUTTON PLUG CONNECTION
X24	MOTORIZED TROLLEY PLUG CONNECTION
K10	MAIN LINE CONTACTOR
K21	HOIST “UP” CONTACTOR
K22	HOIST “DOWN” CONTACTOR
K25	HOIST TWO-SPEED FAST CONTACTOR
T100	CONTROL TRANS FORMER
F100	FUSE HOLDER POSITION
1U, 2U	MOTOR SUPPLY LEADS
1V	MOTOR SUPPLY LEAD
2V	MOTOR SUPPLY LEAD
1W	MOTOR SUPPLY LEAD
2W	MOTOR SUPPLY LEAD

5.25 Three-phase - Two-speed Hoist – 575 volts – Control Circuit

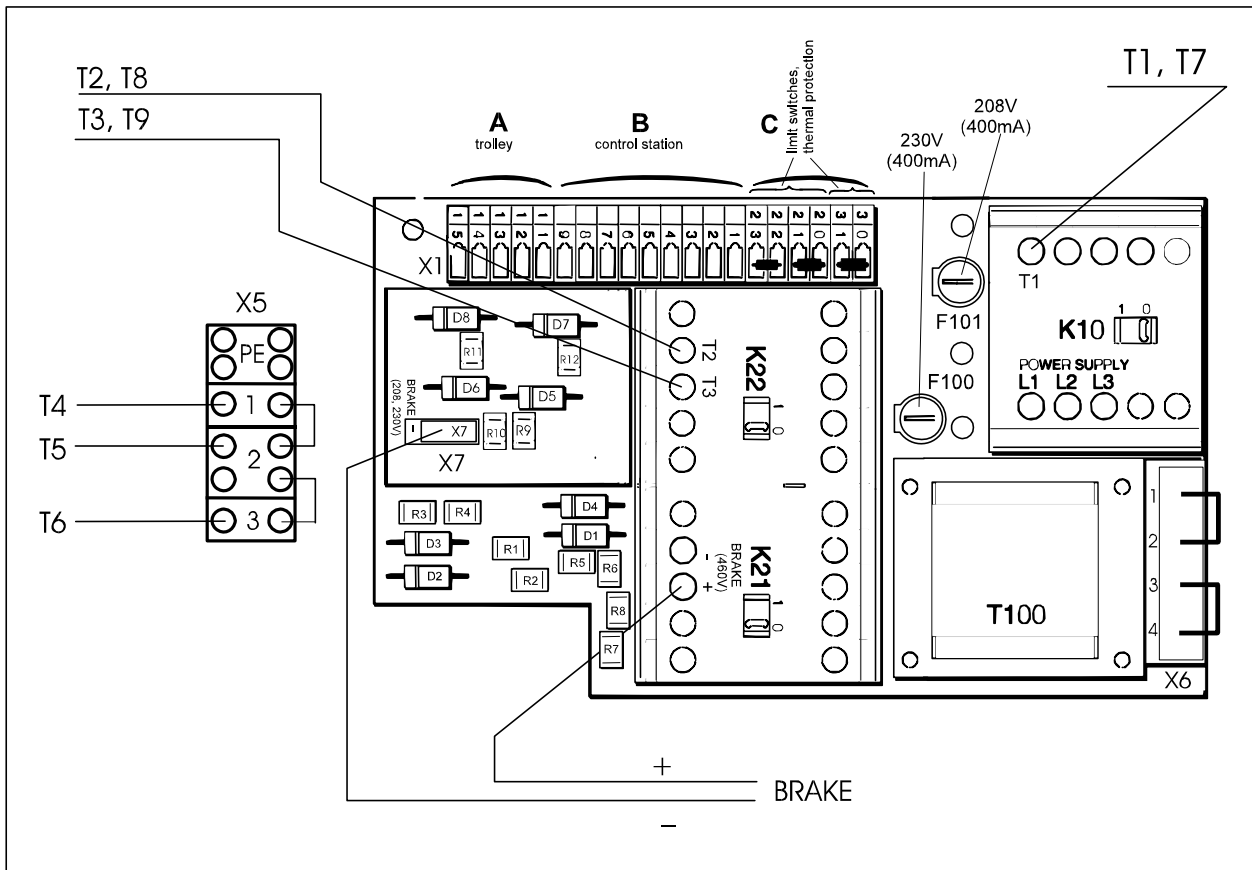




5.26 Three-phase - Two-speed Hoist – 575 volts – Push Button

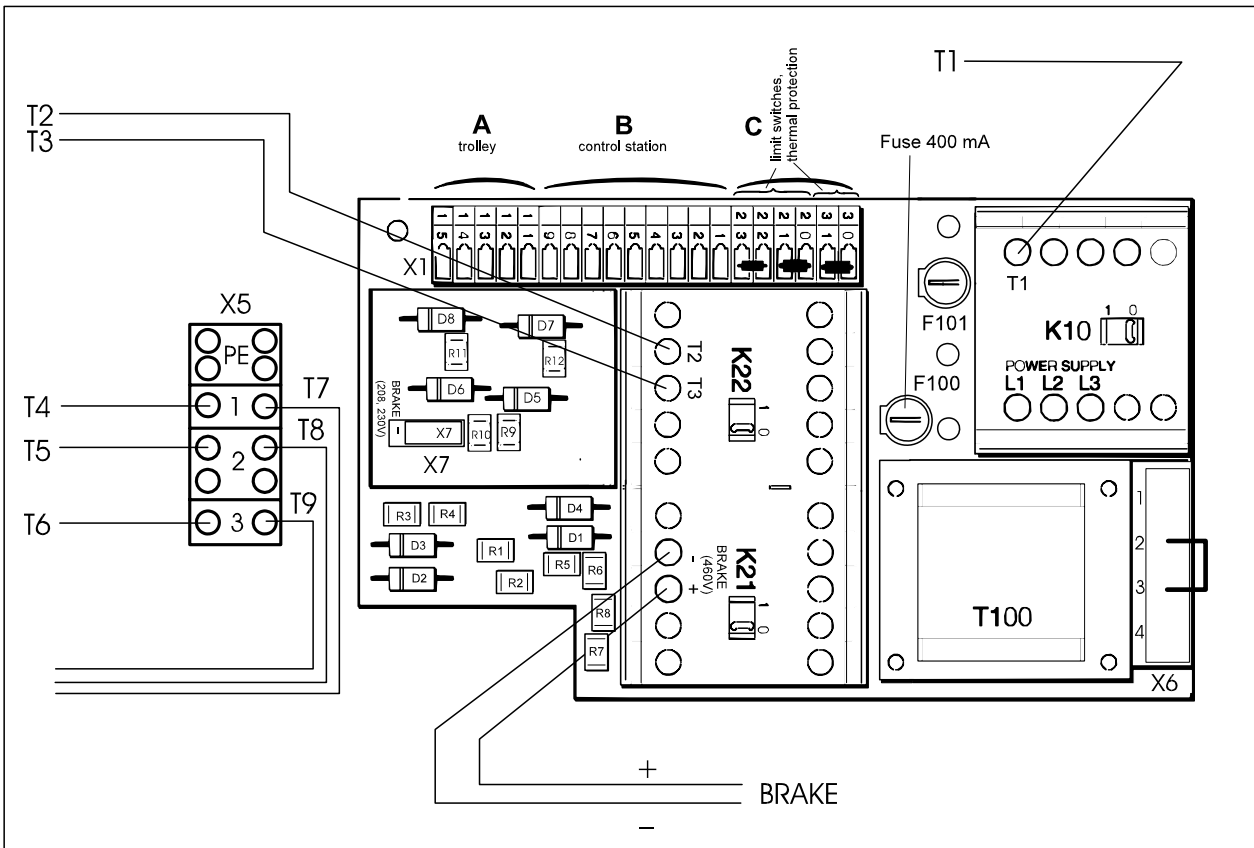


5.27 Three Phase Control Panel – Single Speed Hoist – 208/230 volts



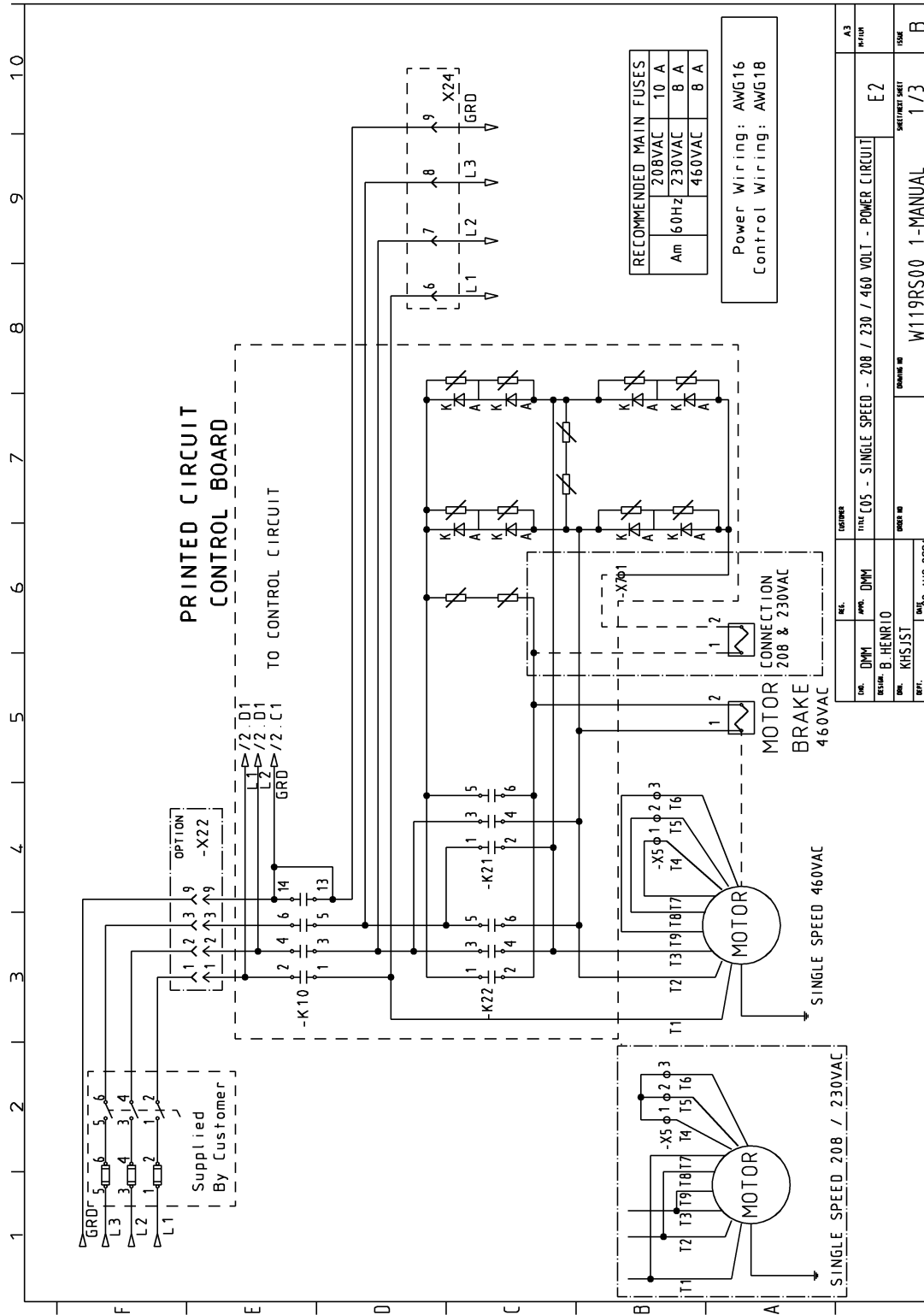
L1	HOIST POWER SUPPLY – PHASE 1
L2	HOIST POWER SUPPLY – PHASE 2
L3	HOIST POWER SUPPLY – PHASE 3
PE	POWER SUPPLY GROUND
X1	TERMINAL STRIP ON PRINTED CIRCUIT BOARD
X6	TERMINAL STRIP ON CONTROL TRANSFORMER – NOTE JUMPER CONNECTIONS
BRAKE (-)	BRAKE COIL SUPPLY (NEGATIVE)
BRAKE (+)	BRAKE COIL SUPPLY (POSITIVE)
X23	PUSH BUTTON PLUG CONNECTION
X24	MOTORIZED TROLLEY PLUG CONNECTION
K10	MAIN LINE CONTACTOR
K21	HOIST “UP” CONTACTOR
K22	HOIST “DOWN” CONTACTOR
K25	HOIST TWO-SPEED FAST CONTACTOR
T100	CONTROL TRANSFORMER
F100	FUSE HOLDER POSITION 230 VOLT OR 460 VOLT SUPPLY
F101	FUSE HOLDER POSITION 208 VOLT ONLY
T1 thru T9	MOTOR SUPPLY LEADS

5.28 Three-phase Control Panel – Single Speed Hoist – 460 volts



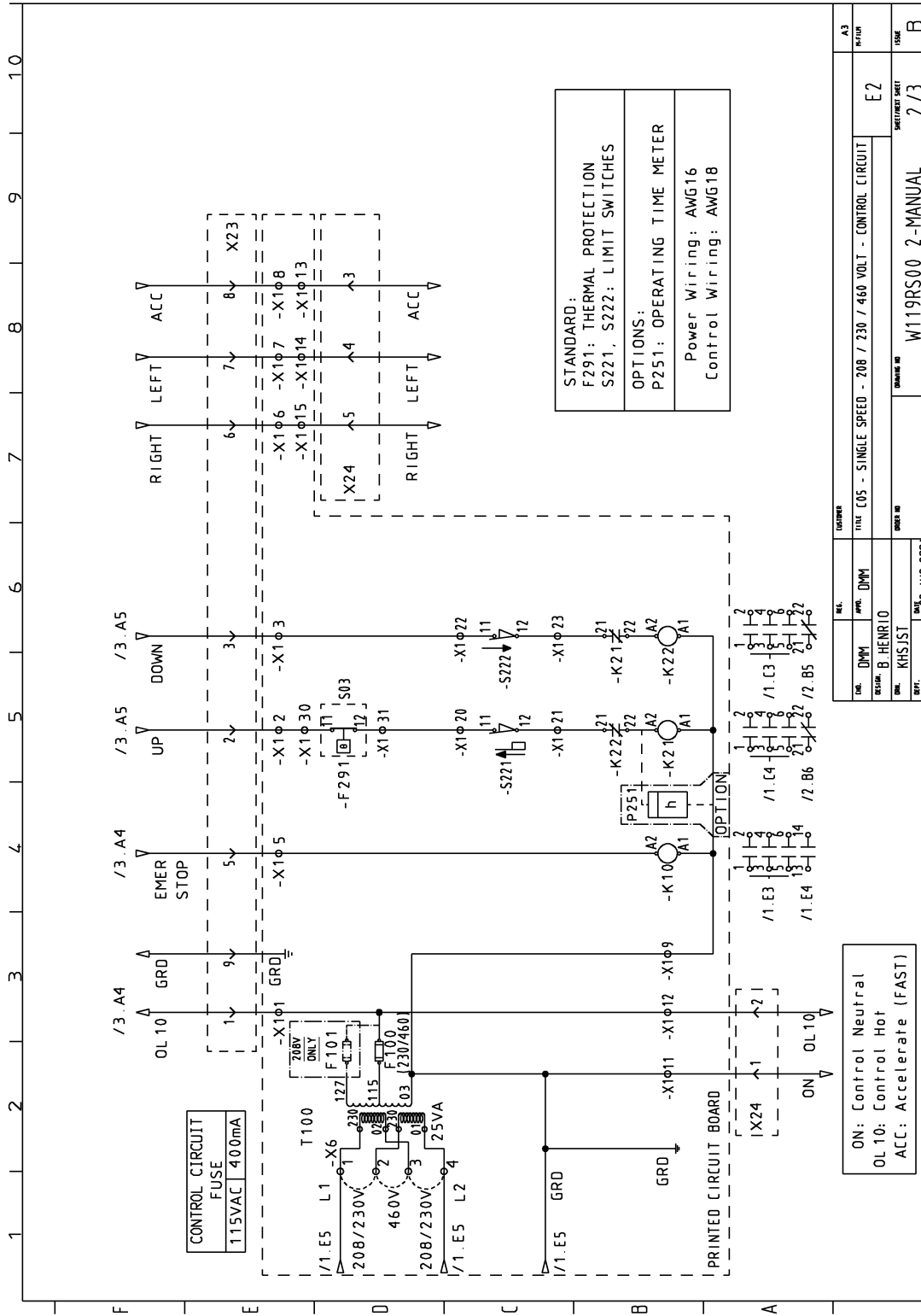
L1	HOIST POWER SUPPLY – PHASE 1
L2	HOIST POWER SUPPLY – PHASE 2
L3	HOIST POWER SUPPLY – PHASE 3
PE	POWER SUPPLY GROUND
X1	TERMINAL STRIP ON PRINTED CIRCUIT BOARD
X6	TERMINAL STRIP ON CONTROL TRANSFORMER – NOTE JUMPER CONNECTIONS
BRAKE (-)	BRAKE COIL SUPPLY (NEGATIVE)
BRAKE (+)	BRAKE COIL SUPPLY (POSITIVE)
X23	PUSH BUTTON PLUG CONNECTION
X24	MOTORIZED TROLLEY PLUG CONNECTION
K10	MAIN LINE CONTACTOR
K21	HOIST “UP” CONTACTOR
K22	HOIST “DOWN” CONTACTOR
K25	HOIST TWO-SPEED FAST CONTACTOR
T100	CONTROL TRANSFORMER
F100	FUSE HOLDER POSITION 460 VOLT SUPPLY
T1 thru T9	MOTOR SUPPLY LEADS

5.29 Three Phase – Single Speed Hoist – 208/230/460 volts – Power Circuit





5.30 Three-phase Single Speed Hoist – 208/230/460 volts – Control Circuit

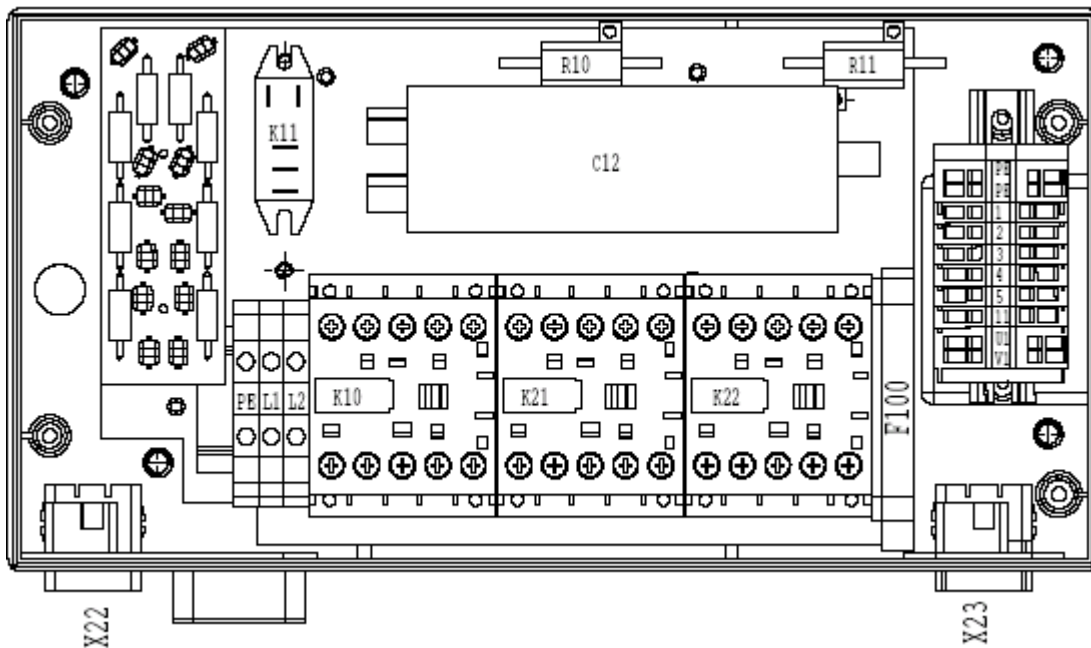


REV.	DATE	BY	CHKD	APP'D	DESCRIPTION
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REV.	DATE	BY	CHKD	APP'D	DESCRIPTION
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REV.	DATE	BY	CHKD	APP'D	DESCRIPTION
1	23 AUG 2004	KHSJST		B.HENRIO	REVISED
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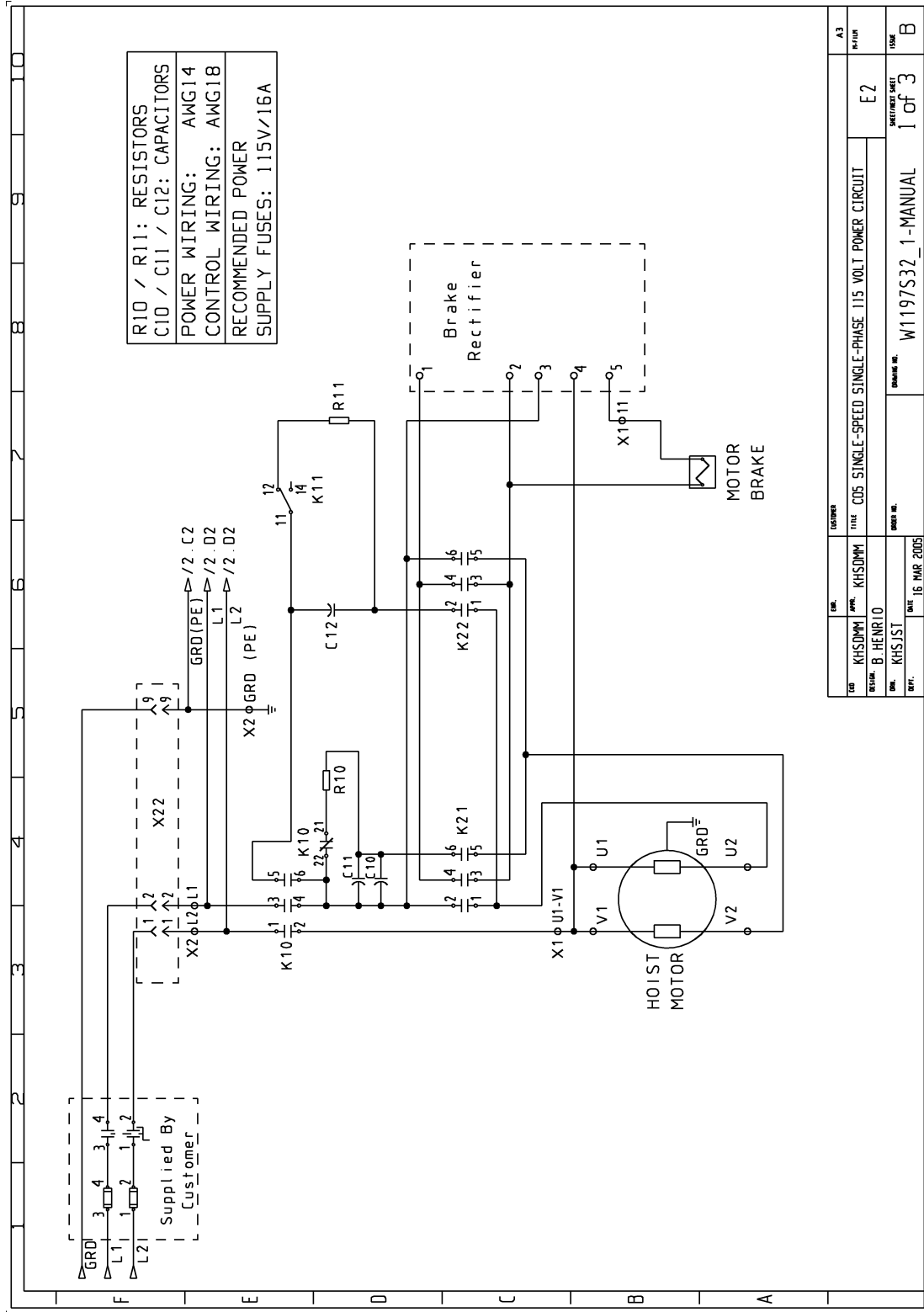
5.32 Single-phase Control Panel – 115V Power Supply



L1	HOIST POWER SUPPLY – POWER PHASE
L2	HOIST POWER SUPPLY – NEUTRAL
PE	POWER SUPPLY GROUND
X1	TERMINAL STRIP ON PRINTED CIRCUIT BOARD
X6	TERMINAL STRIP ON CONTROL TRANSFORMER – NOTE JUMPER CONNECTIONS
BRAKE (-)	BRAKE COIL SUPPLY (NEGATIVE)
BRAKE (+)	BRAKE COIL SUPPLY (POSITIVE)
X22	POWER SUPPLY PLUG (OPTIONAL)
X23	PUSH BUTTON PLUG CONNECTION
X24	MOTORIZED TROLLEY PLUG CONNECTION
K10	MAIN LINE CONTACTOR
K21	HOIST “UP” CONTACTOR
K22	HOIST “DOWN” CONTACTOR
T100	CONTROL TRANS FORMER
F100	FUSE HOLDER POSITION
	MOTOR SUPPLY LEADS

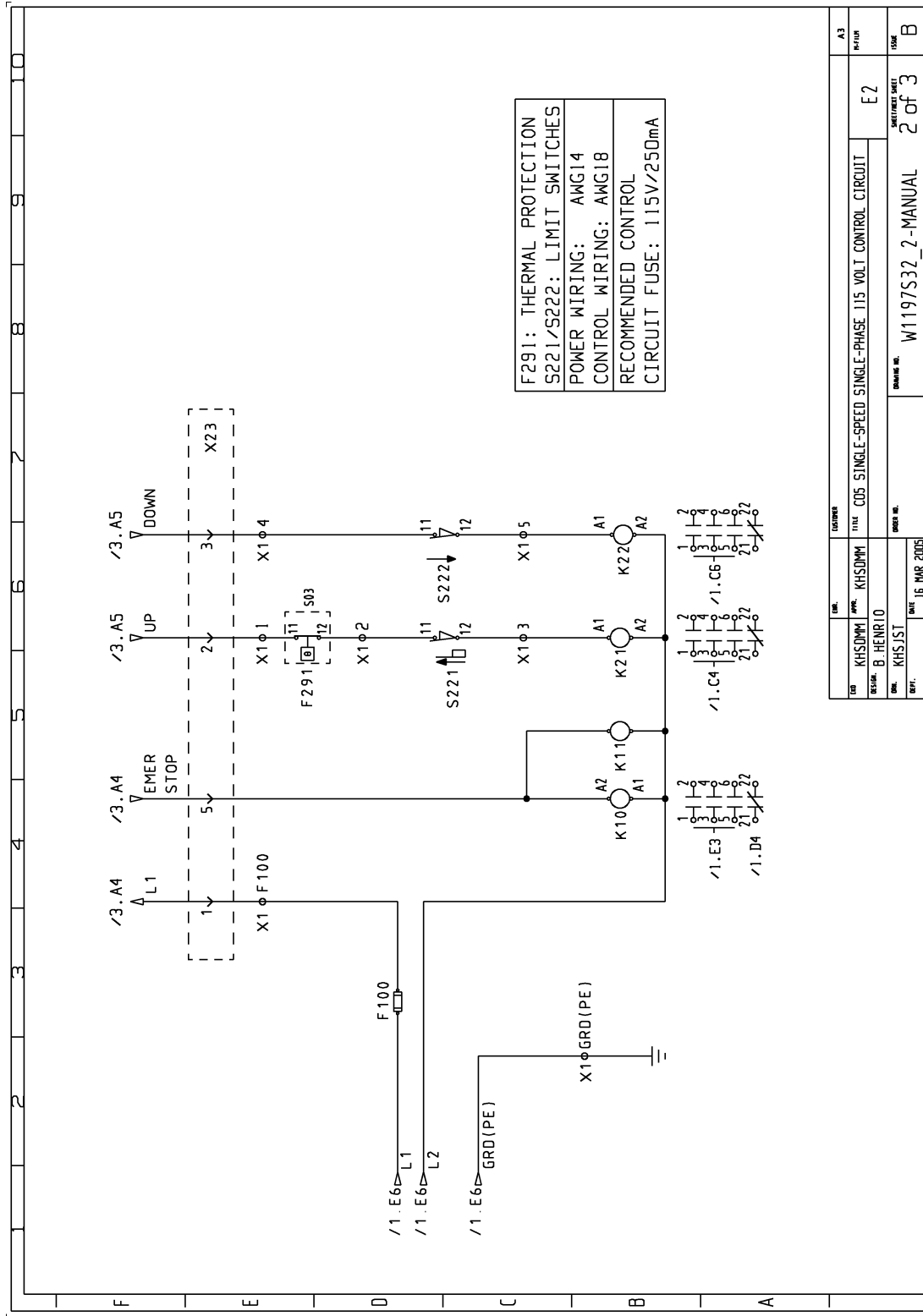


5.33 Single-phase Wiring Diagram – 115V Power Supply



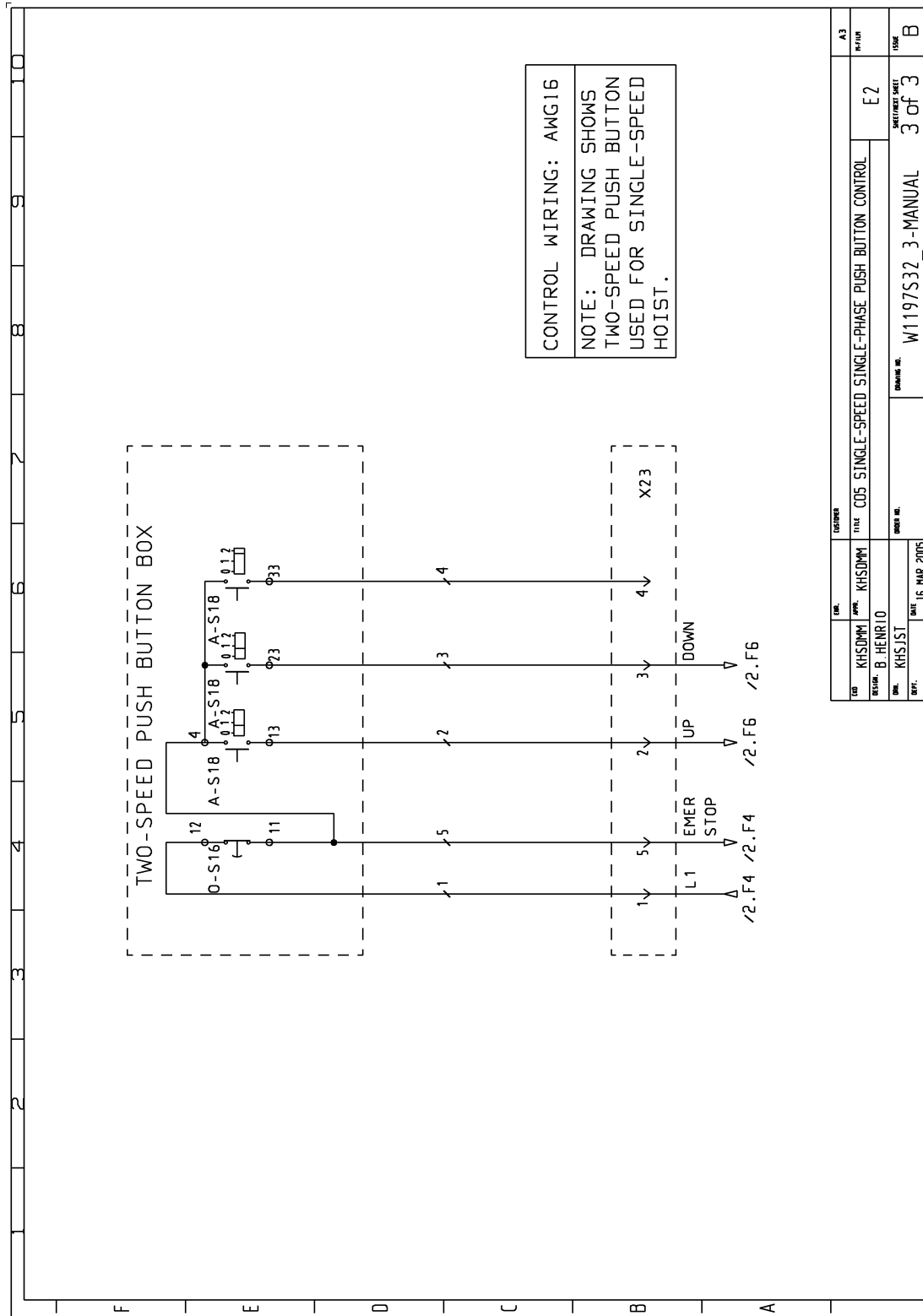


5.34 Single-phase Wiring Diagram – Control Circuit





5.35 Single-phase Wiring Diagram – Push Button





6 PREVENTATIVE MAINTENANCE

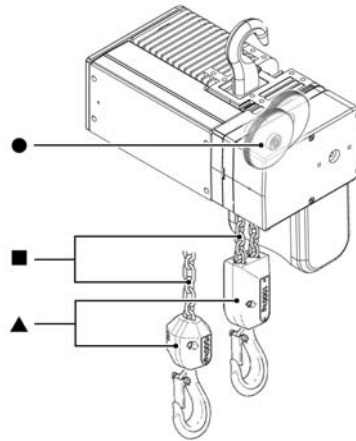
6.1 Recommended Periodic Maintenance and Inspection Table

CHECK	INTERVAL	QUALIFIED PERSON
BRAKE OPERATION – HOLDING & RELEASING	Daily	Operator
LOAD CHAIN FOR VISUAL DAMAGE	Daily	Operator
SUSPENSION SUPPORT FOR P/B ASSEMBLY	Daily	Operator
CLEANLINESS & LUBRICATION OF CHAIN	Daily	Operator
UPPER / LOWER LIMIT SWITCHES	Daily	Operator
CHECK LOAD CHAIN FOR WEAR – MEASURE AND RECORD	Every 3 months	Qualified Inspector
CHECK HOOKS FOR WEAR – MEASURE AND RECORD	Every 3 months	Qualified Inspector
CHECK LOAD BLOCK SCREWS / NUTS FOR TIGHTNESS	Every 3 months	Operator
CHECK TOP HOOK / COUPLING HARDWARE FOR TIGHTNESS	Every 3 months	Operator
CHECK SLIP CLUTCH & HOIST BRAKE ADJUSTMENT	3 to 6 months	Qualified mechanic
LUBRICATE OPEN WHEEL GEARING	3 to 6 months	Qualified mechanic
CHECK WIRE TERMINAL TIGHTNESS	Semi-annually	Qualified mechanic
LUBRICATE 2-FALL LOAD BLOCK IDLER SPROCKET	Annually	Operator
CHECK ALL SCREWS / NUTS FOR TIGHTNESS & CORROSION	Annually	Qualified mechanic
CHECK LOAD BLOCK ROTATION AND LUBRICATION	Annually	Qualified mechanic



INSPECTION INTERVALS SHALL BE SHORTENED IF THE HOIST IS USED MORE FREQUENTLY WITH MAXIMUM LOADS OR IN EXTREME AMBIENT CONDITIONS.

6.2 Lubrication



LUBRICATION POINT	SPECIFICATIONS	ACCEPTABLE LUBRICANTS	QUANTITY
Chain ■	Oil or Liquid grease	Chain lubricating fluid (Ceplattyn or similar) EP-90	As required
Idler sprocket ▲ Slide bearing + bearing	Grease (without MoS2) KP 2 (DIN 51 502) Soap-based lithium Approx. drip point + 500°F Worked penetration 509-563°F Operating temperature - 4°F - +266°F	BP: BP Energrease LS - EP 2 Esso: Unirex N2 Mobil: Mobilgrease HP Shell: Shell Alvanio EP Grease 2	As required
Gears ●	KP 0 K grease (DIN 51502) Soap-based lithium + MoS 2 Approx. drip point + 180°C Worked penetration 355 - 385°C Operating temperature -30°C to + 130°C	Mobil: Mobilgrease special BP: Multi-purpose grease L 21 M Shell: Shell Retimax AM Texaco: Molytex grease EP 2	0.05 liter

Open Wheel Gearing: EP1 Mobilux or equivalent.



6.3 Recommended technical support for various spare parts

SPARE PART	REPLACED BY
Upper chain guide	Qualified electrician & mechanic
Output shaft	Qualified electrician & mechanic
PG cable gland	Qualified electrician
Gear input shaft + adjusting nuts	Qualified mechanic
Motor end cap	Qualified mechanic
Gearing (1st/2nd stage)	Qualified electrician & mechanic
Brake cap/end cap sealing	Qualified mechanic
Other seals and O-rings	Qualified mechanic
Brake-limiter	Qualified electrician
Brake end cap	Qualified mechanic
Lower chain guide	Qualified mechanic
Rubber buffer	Qualified mechanic
Electric box	Qualified electrician
PC-board	Qualified electrician
Plugs	Qualified electrician
Chain	Qualified mechanic
Chain bucket	Qualified mechanic
Slack fall stop	Qualified mechanic
Suspension hook	Qualified mechanic
Hook block (1/1; 2/1)	Qualified mechanic
Control box	Qualified electrician

Once a part has been replaced, check hoist operation per sections 3.3 and 3.4.

6.4 Screw Tightening Torque (lb-ft) Specification

	M5	M6	M8	M10	M12
Standard screws	4	7	18	35	61
Self-tapping screws	4	6	15	30	53

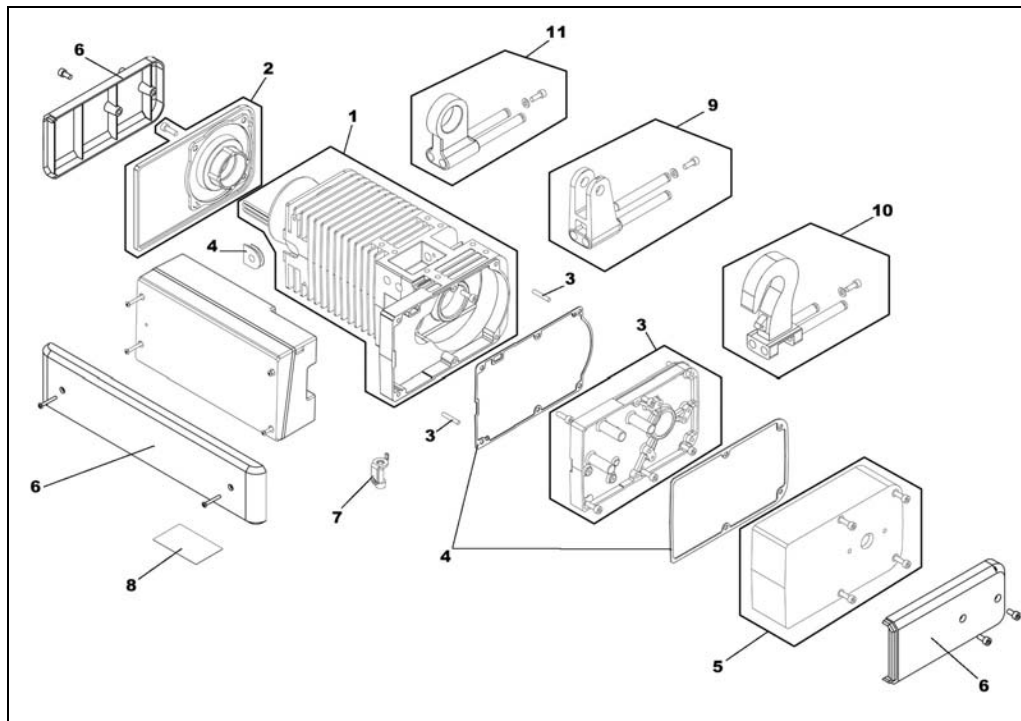


6.5 Troubleshooting

Problem	Possible Cause	Possible Solution
Hoist does not lift or lower load	Emergency stop button is activated	Deactivate button
	Blown fuse	Replace the fuse
	Motor thermal protection activated	Allow motor too cool down
	Pendant plug pin pushed out	Reinstall plug pin
	Contactors terminal screws loose	Tighten screws
	Mainline switch shut off	Turn switch on
Hoist does not lift load	Overload condition	Reduce load
	Slip clutch worn or incorrectly adjusted	Replace wear items or readjust slip clutch torque
	Brake not releasing	Check brake coil resistance. Check air gap setting. Adjust if necessary. Check rectifier output voltage.
Load drifts more than 4 inches [100mm]	Brake lining worn Air gap on brake is too wide	Replace wear items as necessary Adjust air gap setting
Travel direction does not correspond to that indicated on pushbutton	Power supply incorrectly connected	See SECTION 2
Abnormal noises while lifting or lowering	Load chain and its components are not lubricated	Clean and lubricate load chain.
	Load chain is worn	Replace chain
	Chain wheel or chain guide is worn	Replace chain wheel or chain guide
	Idler sprocket is worn	Replace idler sprocket
	A supply phase is missing	Connect the three phases
	Twist or kink in load chain	Remove twist or kink

7 PARTS ILLUSTRATIONS

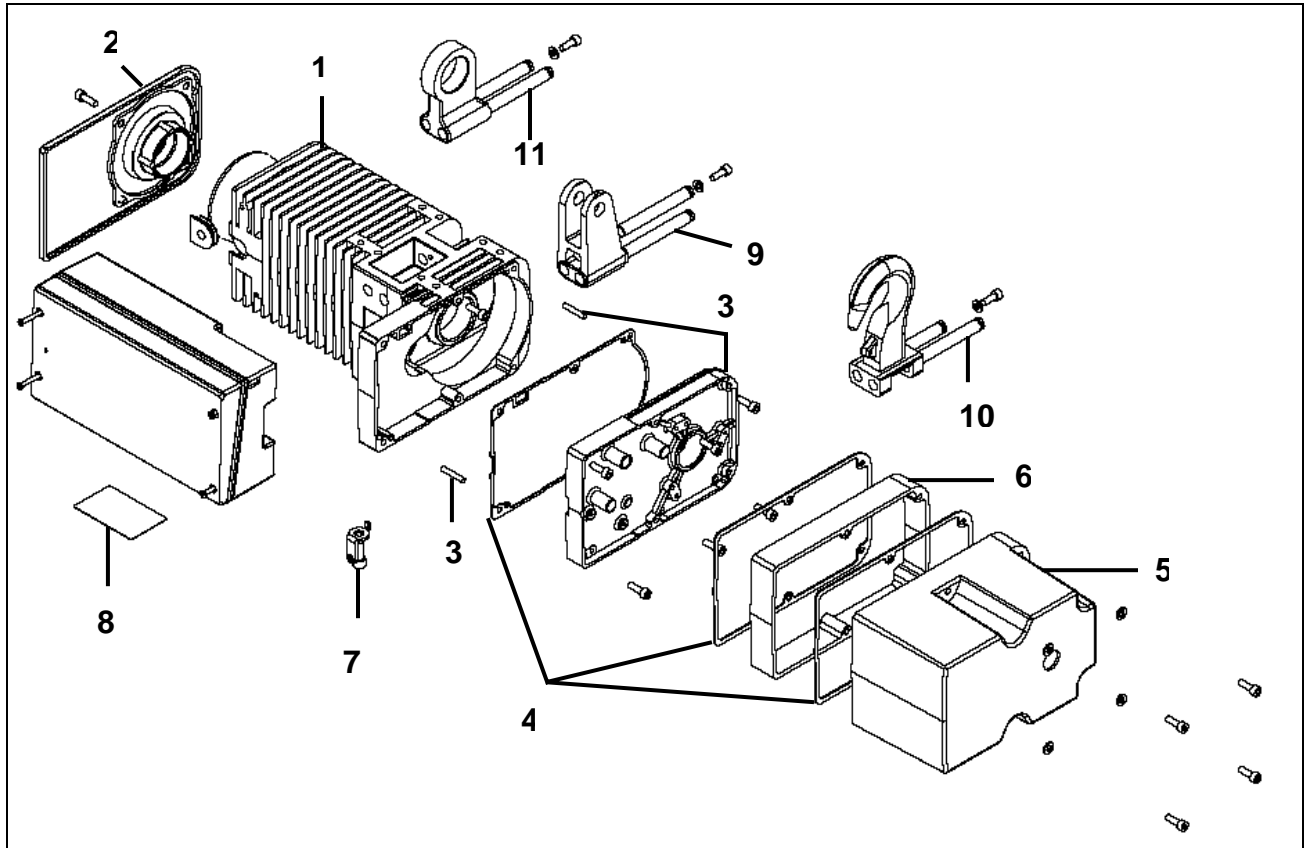
7.1 Hoist Body – Three Phase Power Supply





ITEM	PART NUMBER	DESCRIPTION	QTY
	52309839	COMPLETE HOIST BODY 460V TWO SPEED 32/8 FPM	1
	52309840	COMPLETE HOIST BODY 208/230V TWO SPEED 32/8 FPM	1
	52309841	COMPLETE HOIST BODY 208/230/460V SINGLE SPEED 32 FPM	1
	52309842	COMPLETE HOIST BODY 208/230/460V SINGLE SPEED 16FPM	1
	52309845	COMPLETE HOIST BODY 575V SINGLE SPEED 32 FPM	1
1	N/A	HOIST MACHINED BODY CASTING	1
2	52308741	MOTOR FLANGE ASSEMBLY	1
3	52308742	GEAR SET WITHOUT ROTARY LIMIT SWITCH	1
4	52308768	GEAR & BRAKE COVER SEAL SET	1
5	52308747	BRAKE COVER SET	1
6	2406879001	R&M LM05 BODY BRANDING SET	1
7	2218000	PUSHBUTTON SUSPENSION SET	1
8a	2213309001	HOIST BODY LOAD CAPACITY STICKER – ¼ TON	1
8b	2213309002	HOIST BODY LOAD CAPACITY STICKER – ½ TON	1
8c	2213309003	HOIST BODY LOAD CAPACITY STICKER – 1 TON	1
8d	2213309007	HOIST BODY LOAD CAPACITY STICKER – 250 kg	1
8e	2213309008	HOIST BODY LOAD CAPACITY STICKER – 500 kg	1
8f	2213309009	HOIST BODY LOAD CAPACITY STICKER – 1000 kg	1
9a	2229921	“C” STYLE TROLLEY COUPLING SET – PERPENDICULAR	1
9b	2229920	“C” STYLE TROLLEY COUPLING SET – PARALLEL	1
10a	2219955	TOP HOOK SET – PERPENDICULAR	1
10b	2219954	TOP HOOK SET – PARALLEL	1
11	52308832	RPT STYLE TROLLEY COUPLING SET	1
-	52308744	INSPECTION PORT CAP SET	1
-	2212017	TOP HOOK SAFETY LATCH – STEEL PLATE STYLE	1
-	2213445001	ELECTRICAL HAZZARD WARNING STICKER	1
-	2213445002	ELECTRICAL WIRING INFORMATION STICKER	1

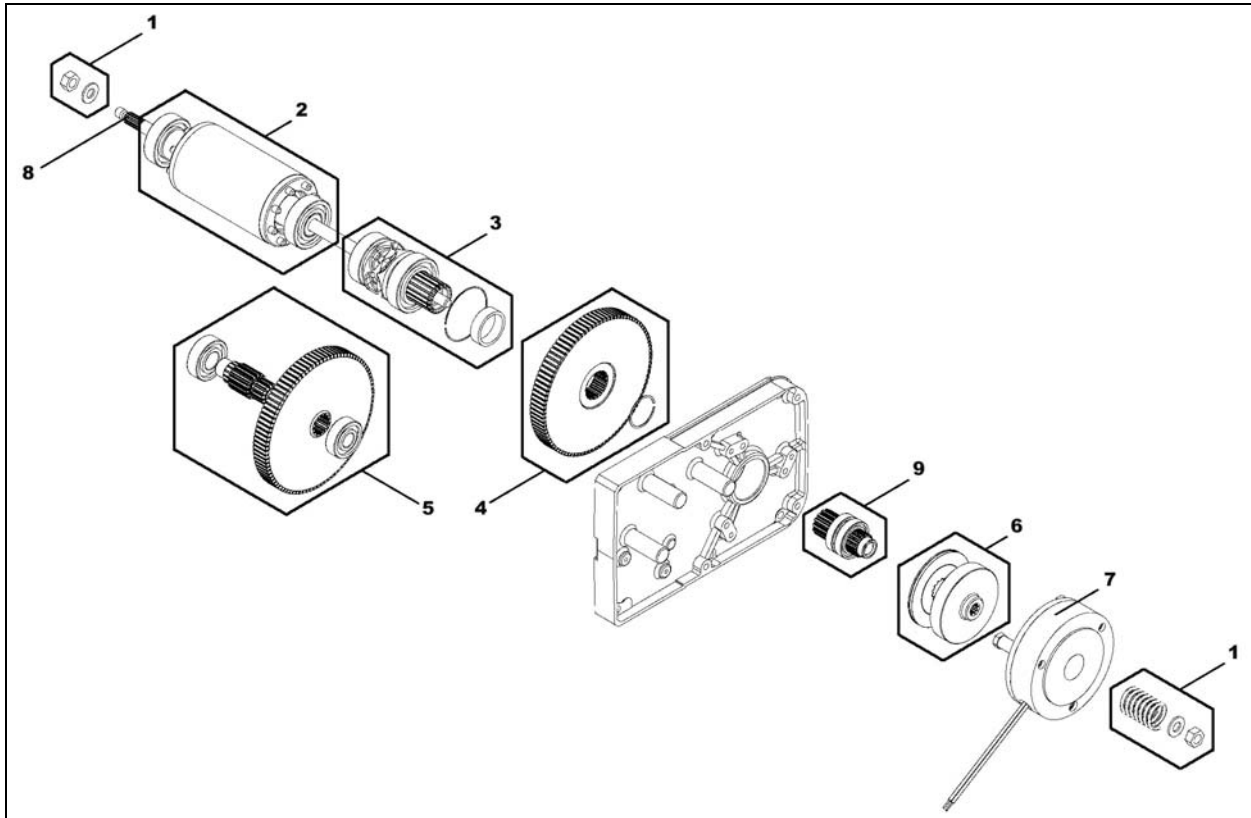
7.2 Hoist Body – Single Phase Power Supply





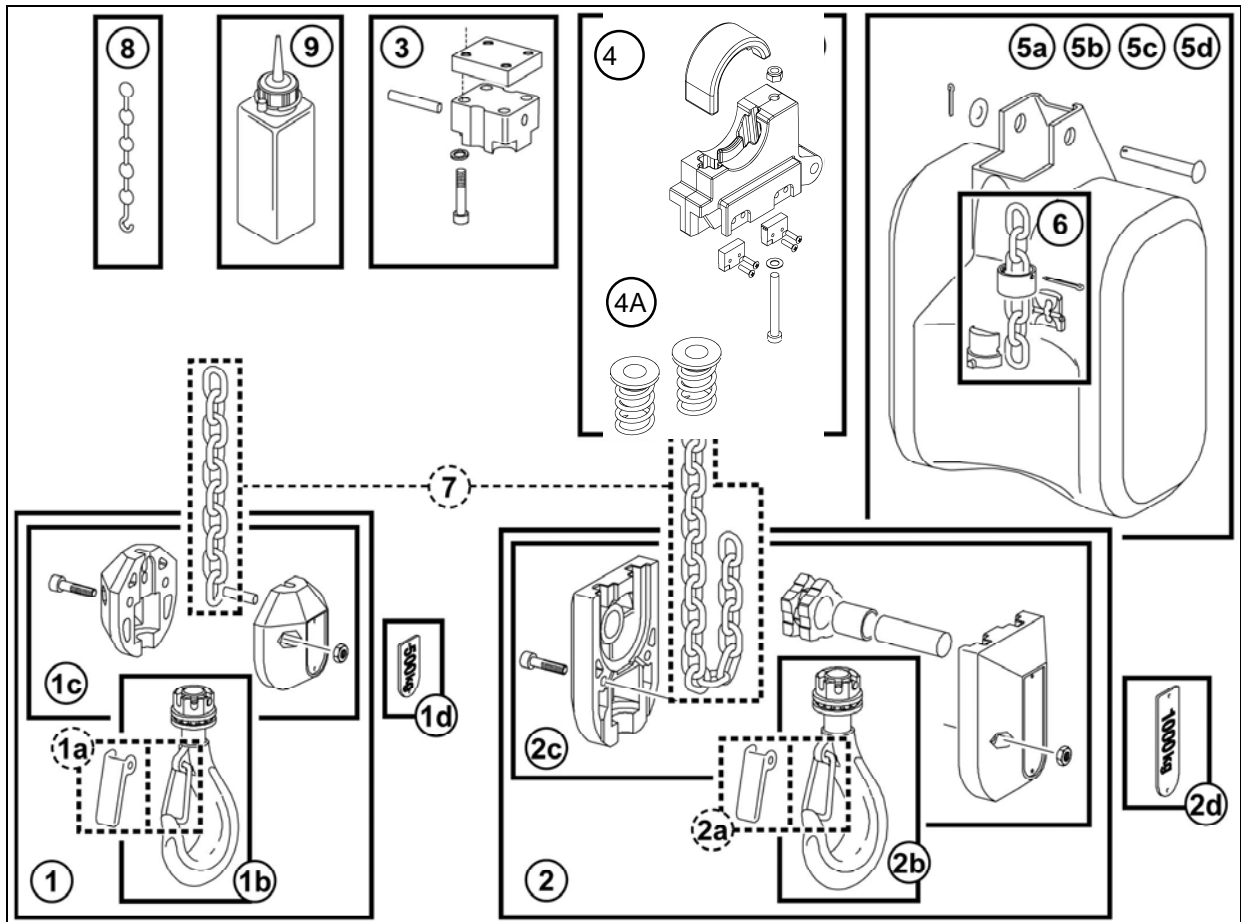
ITEM	PART NUMBER	DESCRIPTION	QTY
-	52315418	BODY & CONTROLS – 115V SINGLE PHASE – 16S	1
1	N/A	MACHINED CASING	1
2	52308741	MOTOR FLANGE ASSEMBLY	1
3	52308742	GEAR COVER WITHOUT ROTARY LIMIT ASSEMBLY	1
4	52308768	GEAR & BRAKE COVER SEAL SET	1
5	52305510	BRAKE COVER SET – SINGLE PHASE UNITS ONLY	1
6	52316243	EXTENSION HOUSING – SINGLE PHASE UNITS ONLY	1
7	2218000	PUSHBUTTON SUSPENSION SET	1
8a	2213309001	BODY CAPACITY STICKER – ¼ TON	1
8b	2213309002	BODY CAPACITY STICKER – ½ TON	1
8c	2213309003	BODY CAPACITY STICKER – 1 TON	1
8d	2213309007	BODY CAPACITY STICKER – 250 KG	1
8e	2213309008	BODY CAPACITY STICKER – 500 KG	1
8f	2213309009	BODY CAPACITY STICKER – 1000 KG	1
9a	2229921	“C” TROLLEY COUPLING SET - PERPENDICULAR	1
9b	2229920	“C” TROLLEY COUPLING SET - PARALLEL	1
10a	2219955	TOP HOOK SET - PERPENDICULAR	1
10b	2219954	TOP HOOK SET - PARALLEL	1
11	52308832	RPT COUPLING SET	1
-	2212017	TOP HOOK SAFETY LATCH – STEEL PLATE TYPE	1
-	52308744	INSPECTION PORT CAP	1
-	2213445001	ELECTRICAL HAZZARD WARNING STICKER	1
-	2213445002	ELECTRICAL WIRING INFORMATION STICKER	1

7.3 Helical Gear Mechanism & Brake



ITEM	PART NUMBER	DESCRIPTION	Qty
1	2211016	SLIP CLUTCH SPRING SET	1
2a	52305652	ROTOR ASSEMBLY – THREE PHASE POWER SUPPLY	1
2b	52315793	ROTOR ASSEMBLY – SINGLE PHASE POWER SUPPLY	1
3	52305659	LOAD CHAIN SPROCKET ASSEMBLY	1
4a	52305473	GEAR SET – 8 M / min.	1
4b	52308850	GEAR SET – 16 M / min.	1
5	52308771	GEAR SET	1
6	52315180	TORQUE LIMITER / SLIP CLUTCH SET	1
7a	52305489	MOTOR BRAKE ASSEMBLY 190 VDC – 208/230/460VAC SS	1
7b	52305488	MOTOR BRAKE ASSEMBLY 100 VDC – 115/208/230VAC TS	1
7c	52305490	MOTOR BRAKE ASSEMBLY 230 VDC – 575VAC TS	1
8	52305461	MOTOR SHAFT	1
9	52305658	PINION SET	1

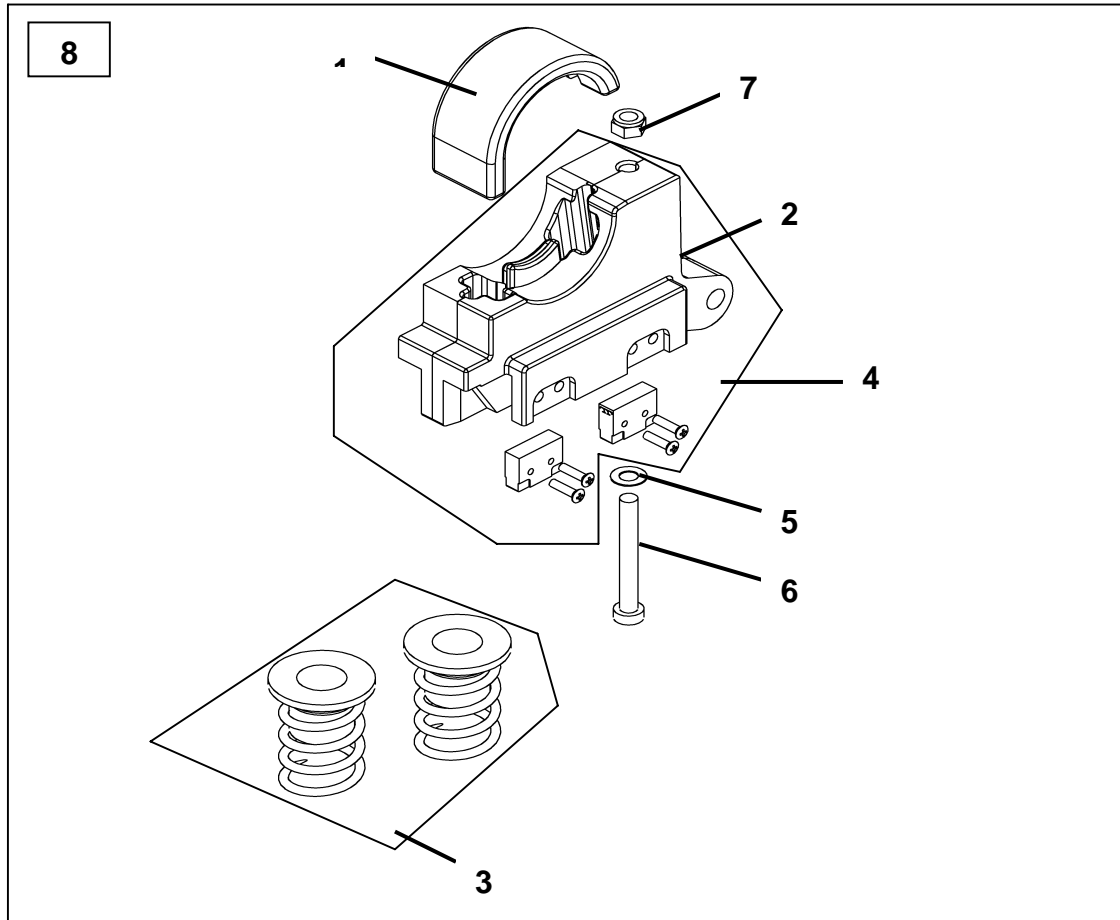
7.4 Lifting Assembly





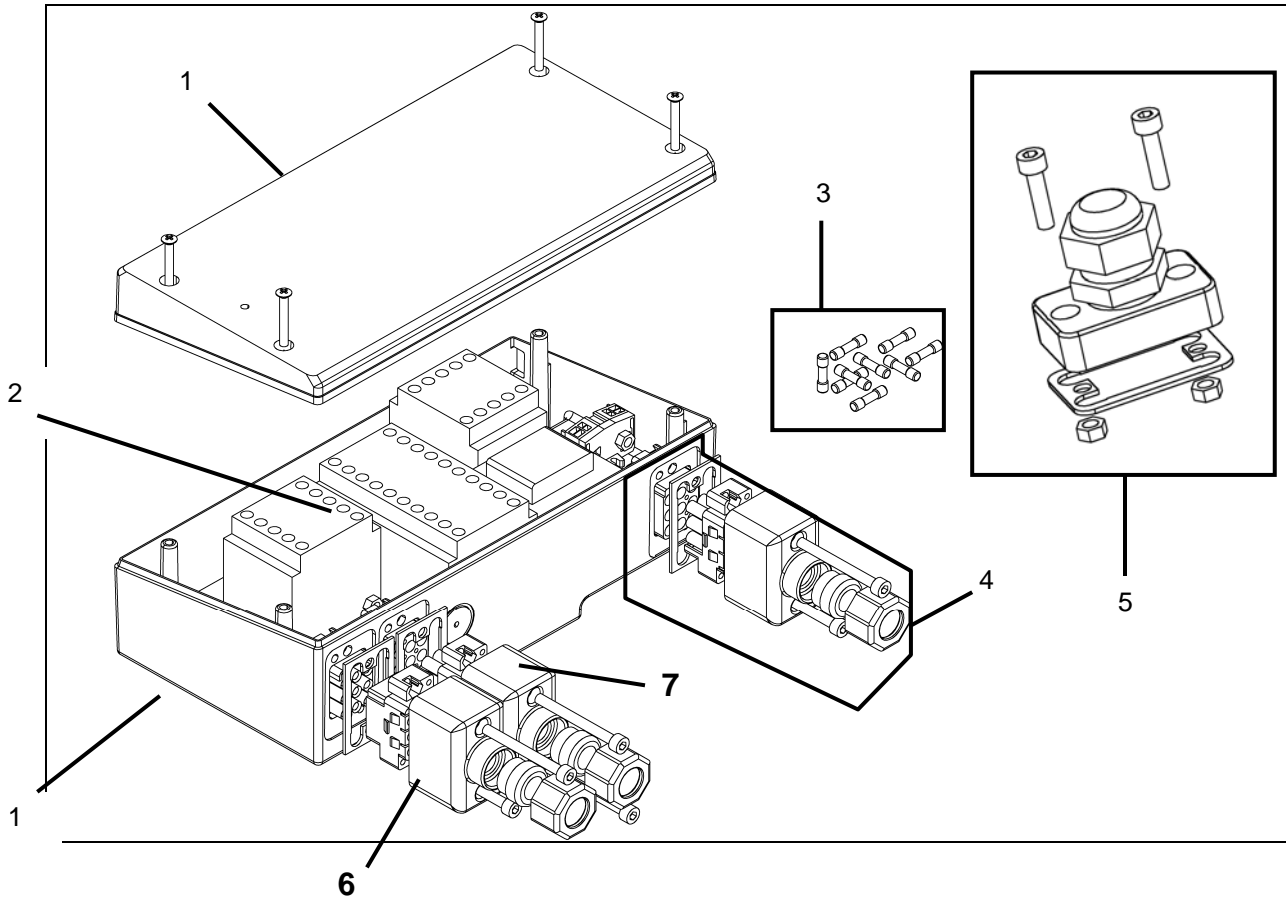
ITEM	PART NUMBER	DESCRIPTION	QTY
1	2219902	1-FALL LOAD BLOCK ASSY - STD HOOK	1
1	2212018	1-FALL LOAD BLOCK ASSY – SELF-LOCKING HOOK	1
1a	001512	1-FALL SAFETY LATCH – WIRE TYPE	1
1a	2212016	1-FALL SAFETY LATCH – STEEL PLATE TYPE	1
1b	2212011	1-FALL LOAD HOOK	1
1b	2217015	1-FALL LOAD HOOK – SELF LOCKING	1
1c	2219985	1-FALL LOAD BLOCK HALVES SET	1
1d	2213308008	1-FALL LOAD BLOCK CAPACITY STICKER – 250 KG	2
1d	2213308009	1-FALL LOAD BLOCK CAPACITY STICKER – 500 KG	2
1d	2213308001	1-FALL LOAD BLOCK CAPACITY STICKER – 1/4 TON	2
1d	2213308002	1-FALL LOAD BLOCK CAPACITY STICKER – 1/2 TON	2
2	2212020	2-FALL LOAD BLOCK ASSY – STD HOOK	1
2	2212028	2-FALL LOAD BLOCK ASSY – SELF-LOCKING HOOK	1
2a	001515	2-FALL SAFETY LATCH – WIRE TYPE	1
2a	2212017	2-FALL SAFETY LATCH – STEEL PLATE TYPE	1
2b	2217004	2-FALL LOAD HOOK – STD HOOK	1
2b	2247015	2-FALL LOAD HOOK – SELF-LOCKING	1
2c	2219987	2-FALL LOAD BLOCK HALVES SET	1
2d	2213333009	2-FALL LOAD BLOCK CAPACITY STICKER – 500 KG	2
2d	2213333010	2-FALL LOAD BLOCK CAPACITY STICKER – 1000 KG	2
2d	2213333002	2-FALL LOAD BLOCK CAPACITY STICKER – ½ TON	2
2d	2213333003	2-FALL LOAD BLOCK CAPACITY STICKER – 1 TON	2
3	52309350	CHAIN ANCHOR SET (2-FALL HOISTS)	1
4	52309351	CHAIN GUIDE ASSEMBLY SET W/ SWITCHES (STANDARD)	1
4a	52293583	SPRING & PLATE SET (SET OF 3)	1
5a	2219990	CHAIN CONTAINER SET – 25FT [8M] MAXIMUM CHAIN LENGTH	1
5b	2249925	CHAIN CONTAINER SET – 50FT [16M] MAXIMUM CHAIN LENGTH	1
5c	2249926	CHAIN CONTAINER SET – 75FT [30M] MAXIMUM CHAIN LENGTH	1
5d	2249932	CHAIN CONTAINER SET – 150FT [50M] MAXIMUM CHAIN LENGTH	1
6	2211050	SLACK FALL STOP ASSEMBLY	1
7a	2213500	LOAD CHAIN – STD ZINC PLATED	N
7b	2213501	LOAD CHAIN – BLACK	N
7c	2213502	LOAD CHAIN – STAINLESS STEEL – CHECK CAPACITY LIMITS	N
8	2211045	LOAD CHAIN INSERTION TOOL	1
9	9995008	CHAIN LUBRICANT	1

7.5 Chain Guide Assembly – With Limit Switches



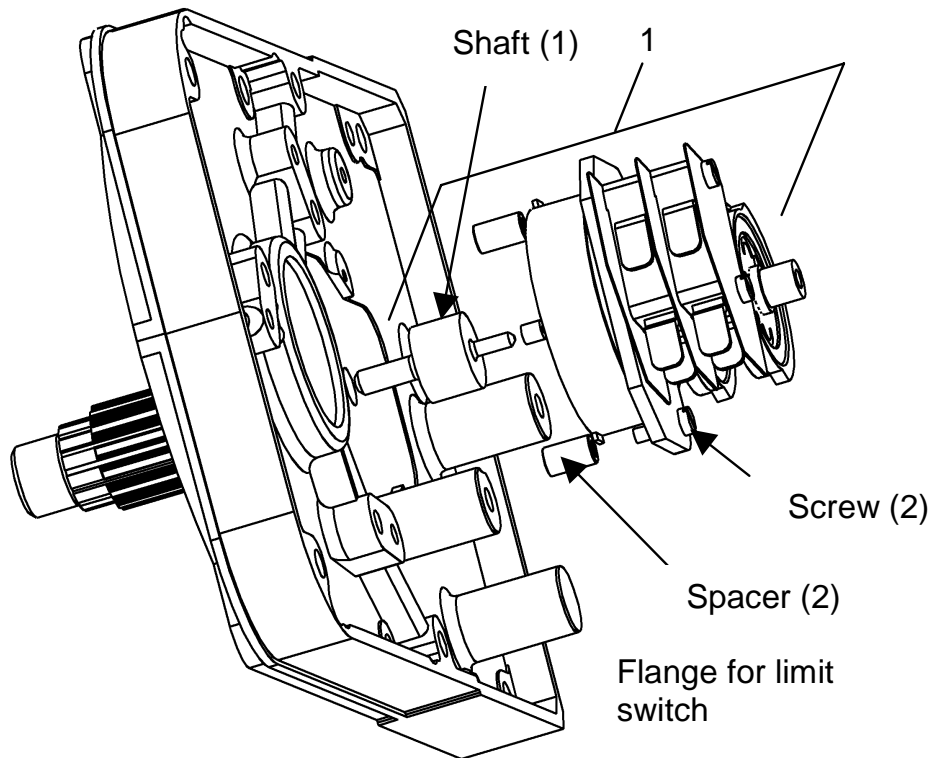
ITEM	PART NUMBER	DESCRIPTION	QTY
1	2214011	UPPER CHAIN GUIDE	1
2	52305493	LOWER CHAIN GUIDE	1
3	52293583	WASHER & SPRING SET (SET OF 3)	1
4	52305660	CHAIN GUIDE WITH LIMIT SWITCHES	1
5	52315431	MOUNTING HARDWARE SET (5 + 6 + 7)	1
8	52315430	COMPLETE LIMIT SWITCH	1

7.6 Controls



ITEM	PART NUMBER	DESCRIPTION	QTY
1	52308791	CONTROL BOX BASE & COVER SET	1
-	2213017	TS CONTROL – 208/230/460V – 115V CONTROL VOLTAGE	1
-	2213016	TS CONTROL – 575V – 115V CONTROL VOLTAGE	1
-	2213018	SS CONTROL - 208/230/460v – 115V CONTROL VOLTAGE	1
2	52305694	HOUR COUNTER 115V CONTROL VOLTAGE	1
3	52314754	115V CONTROL CIRCUIT FUSES - SET OF 10	1
4	2249945	PUSH BUTTON PLUG SET	1
5	2249947	POWER CABLE GLAND SET - STD	1
6	2249982	POWER PLUG SET – OPTIONAL	1
7	2249946	TROLLEY PLUG SET	1

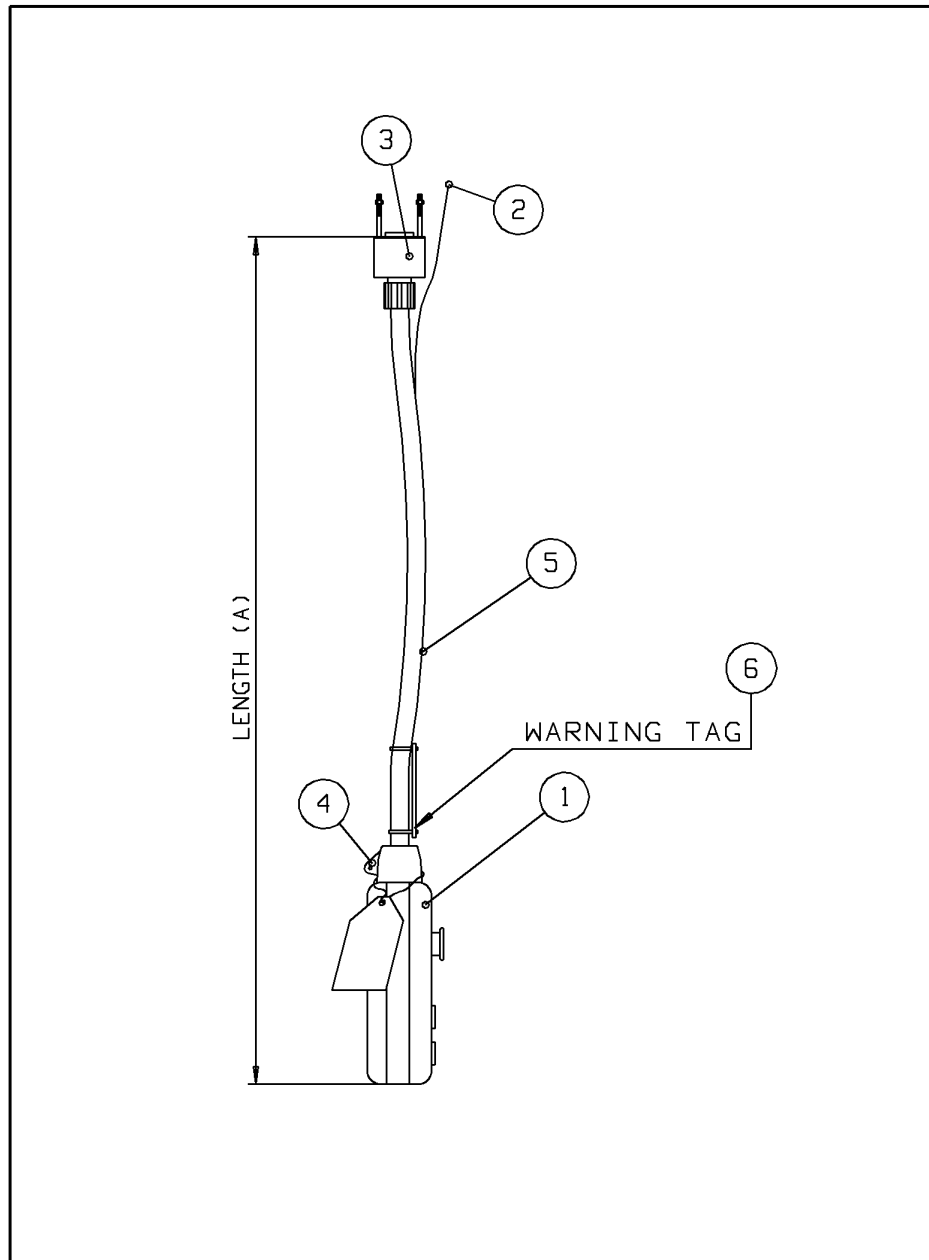
7.7 Rotary Limit Switch



ITEM	PART NUMBER	DESCRIPTION	QTY
1	52314755	2-POS SWITCH SET FOR ≤ 131 FT [40M] OF CHAIN	1

If retrofitting LM05 Series II with a rotary limit switch, replace the gear cover with flange - part number 52305505.

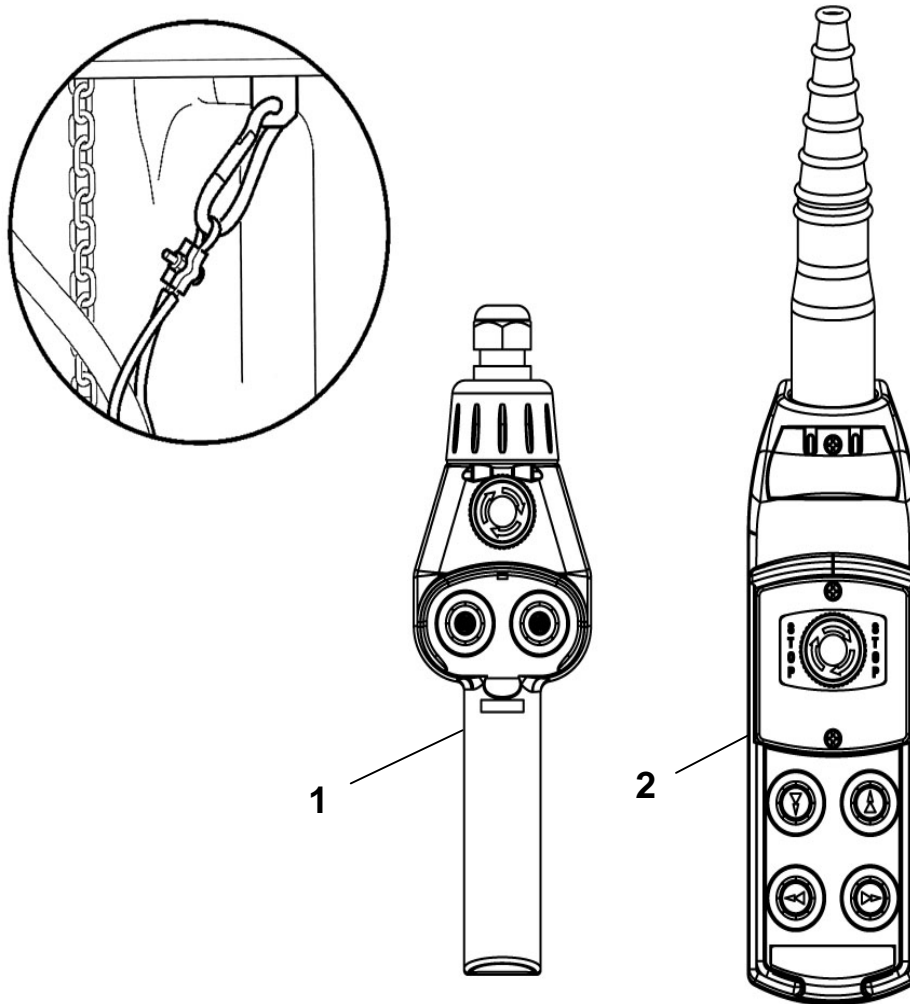
7.8 Push Button Assembly – Vertical Pairs of Buttons





ITEM	PART NUMBER	DESCRIPTION	QTY
-	2309673010	P/B ASSEMBLY – 10 FT, E-STOP, SS HOIST	1
-	2309673015	P/B ASSEMBLY – 15 FT, E-STOP, SS HOIST	1
-	2309673020	P/B ASSEMBLY – 20 FT, E-STOP, SS HOIST	1
-	2309674010	P/B ASSEMBLY – 10 FT, E-STOP, TS HOIST	1
-	2309674015	P/B ASSEMBLY – 15 FT, E-STOP, TS HOIST	1
-	2309674020	P/B ASSEMBLY – 20 FT, E- STOP, TS HOIST	1
-	2309675010	P/B ASSEMBLY – 10 FT, E-STOP, SS HOIST, TS TROLLEY	1
-	2309675015	P/B ASSEMBLY – 15 FT, E-STOP, SS HOIST, TS TROLLEY	1
-	2309675020	P/B ASSEMBLY – 20 FT, E-STOP, SS HOIST, TS TROLLEY	1
-	2309676010	P/B ASSEMBLY – 10 FT, E-STOP, TS HOIST, TS TROLLEY	1
-	2309676015	P/B ASSEMBLY – 15 FT, E-STOP, TS HOIST, TS TROLLEY	1
-	2309676020	P/B ASSEMBLY – 20 FT, E-STOP, TS HOIST, TS TROLLEY	1
1a	2212932011	P/B ENCLOSURE ASSEMBLY: E-STOP, SS HOIST	1
1b	2212932012	P/B ENCLOSURE ASSEMBLY: E-STOP, TS HOIST	1
1c	2212932032	P/B ENCLOSURE ASSEMBLY: E-STOP, SS HOIST, TS TROLLEY	1
1c	2212932033	P/B ENCLOSURE ASSEMBLY: E-STOP, TS HOIST, TS TROLLEY	1
2	2218000	UPPER SUSPENSION KIT	1
3	7285035	PLUG KIT – P/B ASSEMBLY	1
4	-	SUSPENSION UNIT – INCLUDED WITH ITEM 3	1
5	52292266	P/B ELECTRICAL CABLE – 16 GAUGE / 12 CONDUCTOR RPC	1
6	2309414001	R&M OPERATOR'S WARNING TAG - ENGLISH	1

7.9 Push Button Assembly – Horizontal Pairs of Buttons



ITEM	PART NUMBER	DESCRIPTION	QTY
1	52301832	PISTOL GRIP P/B CONTROL ASSEMBLY – TWO SPEED	1
-	2309414001	R&M OPERATOR'S WARNING TAG - ENGLISH	1