

®



ELECTRIC WIRE ROPE HOIST



OPERATION MANUAL & PARTS LIST

SERIES:

SUBH-(D)-200	TUAH-(D)-100
SUCH-(D)-300	TUBH-(D)-200
SUDH-(D)-500	TUCH-(D)-300
SUEH-(D)-750	TUDH-(D)-500
SUFH-(D)-1000	TUEH-(D)-750
SUFI-(D)-1500	TUFH-(D)-1000
	TUFI-(D)-1500

CHENG DAY MACHINERY WORKS CO., LTD.

SAFETY-IMPORTANT

The use of any hoist and trolley presents some risk of personal injury or property damage.

That risk is greatly increased if proper instructions and warnings are not followed. Before using this hoist, each user should become thoroughly familiar with all warnings, instructions and recommendations herein.



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



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1. FOREWORD

This manual contains important information to help you properly install, operate and maintain the Black Bear electric wire rope hoist for maximum performance, economy and safety. Please study its contents thoroughly before putting the electric wire rope hoist into operation. By practicing correct operation, procedures and by carrying out the preventative maintenance recommendations, you will be assured of dependable service. In order to help us to supply correct spare parts quickly, please always specify,

(1) Hoist model

(2) Serial number

(3) Part number, plus the description.

We trust that you will find this "Black Bear" electric wire rope hoist will give you many years of satisfactory service.

Should you have any queries, please contact :



(Please ask for a company's stamp from your local agent)

2. MAIN SPECIFICATIONS

2.1 Specifications

The following specifications are common to all Black Bear electric wire rope hoists.

Table 2-1 Specifications

Item		Detail
Working temperature range()		-20 to +40
Working humidity range (%)		85 or less
Protection	Hoist	IP 20
Electric power supply		Three Phase, 200~600V, 50/60 Hz
Noise Level (dB)	Single speed hoist	81
	Dual Speed hoist	81
Wire Rope diameter	WLL (working load limit)(t)	Nominal diameter (mm)
	1T(2200lbs)	6.3 6x37-A
	2T (4400 lbs)	8 6x37-A
	3T (6600 lbs)	10 IWRC 6xFi(29)-B
	5T (11000 lbs)	10 IWRC 6xFi(29)-B
	7.5T (16500 lbs)	12 IWRC 6xFi(29)-B
	10T (22000 lbs)	14 IWRC 6xFi(29)-B
	15T (33000 lbs)	14 IWRC 6xFi(29)-B

Remarks: (1) Contact an authorized Black Bear dealer for information on using the hoist outside the working temperature or humidity range.

(2) Intended use: This hoist has been designed for vertically lifting and lowering load under normal atmospheric conditions of work place.

(3) Noise levels were measured at a distance of 1m horizontally from the hoists during normal operation.

2.2 Mechanical Classification (Grade) and Life

Safety and life for electric wire rope hoists are guaranteed only when the said equipment is operated in accordance with the prescribed grade.

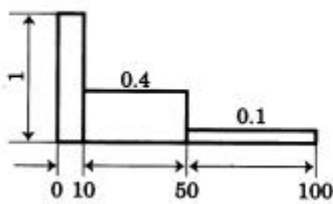
Black Bear electric wire rope hoists have been designed according to FEM regulations (FEM 9.511).

Details are provided in Table 2-2.

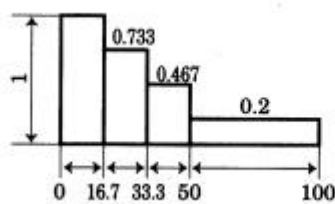
Average daily operating time and total operating time are determined by load distribution.

Table 2-2 Mechanical classification

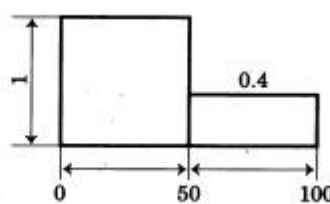
Load Spectrum (Load distribution)	Definitions	Cubic mean value	Average daily operating time (h)	Total operating time (h)
1 (light)	Mechanisms or parts thereof, usually subject to very small loads and in exceptional cases only to maximum loads.	$k \leq 0.50$	2-4	6300
2 (medium)	Mechanisms or parts thereof, usually subject to small loads but rather often to maximum loads.	$0.50 < k \leq 0.63$	1-2	3200
3 (heavy)	Mechanisms or parts thereof, usually subject to medium loads but frequently to maximum loads.	$0.63 < k \leq 0.80$	0.5-1	1600
4 (very heavy)	Mechanisms or parts thereof, usually subject to maximum or almost maximum loads.	$0.80 < k \leq 1.00$	0.25-0.5	800



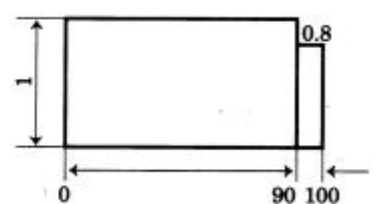
% operating time
Load spectrum 1



% operating time
Load spectrum 2



% operating time
Load spectrum 3



% operating time
Load spectrum 4

2.3 Safety Devices

(1) Motor brake

"AC Electro-Magnetic Brake" is of a unique design in its field. It features simultaneous motor braking upon switching off power even under full load condition.

(2) Mechanical load brake

The mechanical load brake can hold a full capacity load independent of motor brake.

This brake assures that load does not accelerate while being lowered.

(3) Hook and hook latch

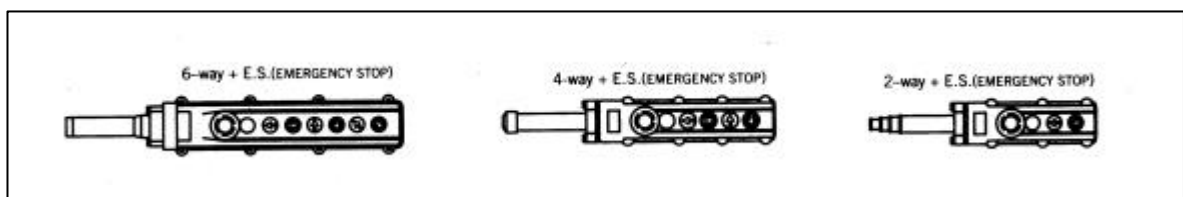
The hook is drop - forged from high tensile steel and heat treated for strength and toughness. The button hook is capable of 360° swivel and fitted with safety latch to ensure safe lifting.

(4) Limit Switches

Upper and lower limit switches are fitted for switching off power automatically in case of over lifting or over lowering.

(5) Emergency stop device (optional)

This button is used to stop the hoist in an emergency situation. It is a red, mushroom type button, located in the uppermost position on the pendant. When pressed, power to the equipment is switched off and the button locks automatically. Turning it to the right will release the lock and to enable re-starting. (Illust. 1)



Illust. 1

3. SAFETY RULES



DANGER

The hoist herein is not designed for, and should not be used for, lifting, supporting, or transporting personnel. Any modifications to upgrade , re-rate, or otherwise alter the hoist equipment must be authorized by either the original manufacturer or a qualified professional engineer.

(1) Only the trained personnel are allowed to operate the hoist.

(2)



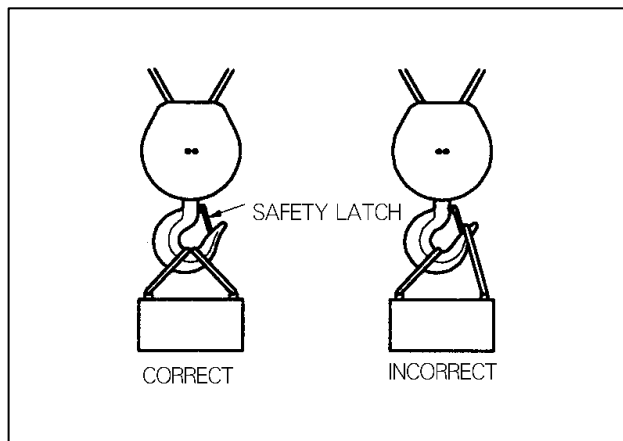
DANGER

Do not use the hoist in explosive atmosphere.

(3) Prior to each lifting operation, it is essential to make sure that:

(a) the correct lifting sling is being used.

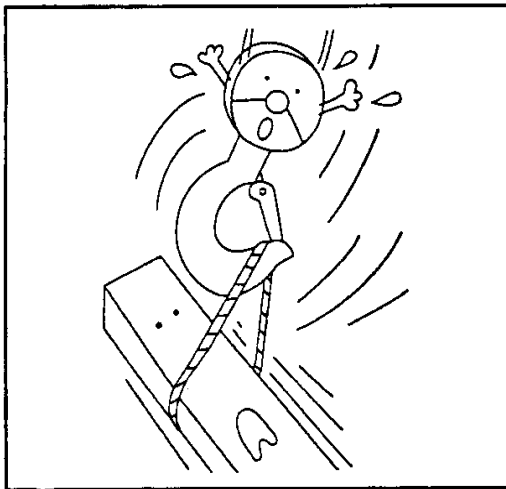
(b) the lifting sling is located in the hook as shown below (Illust. 2) and that a safety latch has been fitted.



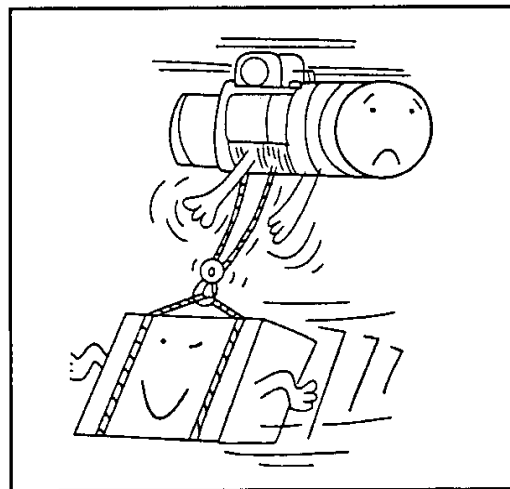
Illust. 2

(c) the object to be hoisted is well secured for direct lifting (a proper lifting frame or apparatus is strongly recommended for direct lifting.)

- (4) Firm and steady button operation is required, never push the button switch intermittently.
- (5) Always avoid excessive inching operation.
- (6) Always make sure the hoist motor completely stops before reversing.
- (7) Always leave the pendant button switch cable and bottom hook vertically static after completion of operation, never leave them at any position, which may allow them swing or slip.
- (8) Sling must be applied to load evenly and centrally to ensure correct balance. Never lift any object which is insecure or out of balance.
- (9) Never use hoist to end or side pull a load. (Illust. 3)
- (10) Never wrap around and hook back the wire rope as a sling to lift a load. (Illust. 4)



Illust. 3



Illust. 4

(11)

 **WARNING**

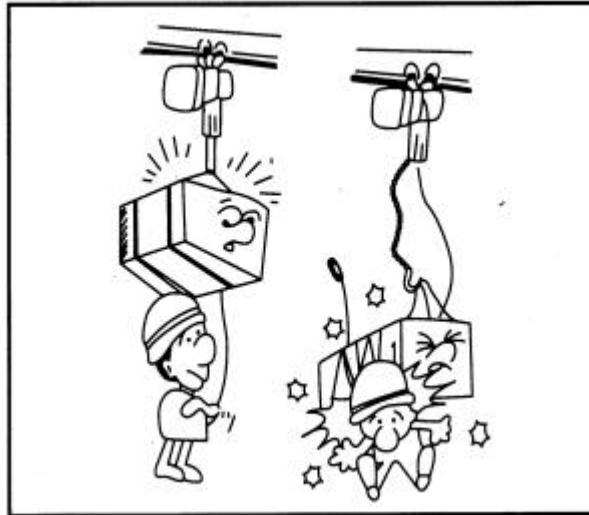
Do not use the Hoist's wire rope as a welding electrode.

(12)



DANGER

Never stand under a raised load (Illust. 5)



Illust. 5

(13) Lifting must always be personally attended, never leave a raised load unattended.

(14) Over-capacity-load lifting is hazardous and should not be undertaken.

(15) Never lift a load when the wire rope is twisted.

(16) Regularly inspect and check the condition of load wire rope. Do not operate with damaged wire rope.

4. INSTALLATION

4.1 Unpacking Information

After removing the hoist from its packing box, carefully inspect the external condition of the electrical cables, contactor, gear box and motor casing for damage.

4.2 Voltage



CAUTION

If power supply deviates from standard by more than $\pm 10\%$, abnormal operation or damage to the motor may result. It is imperative to ensure correct voltage supply before commencing operation.

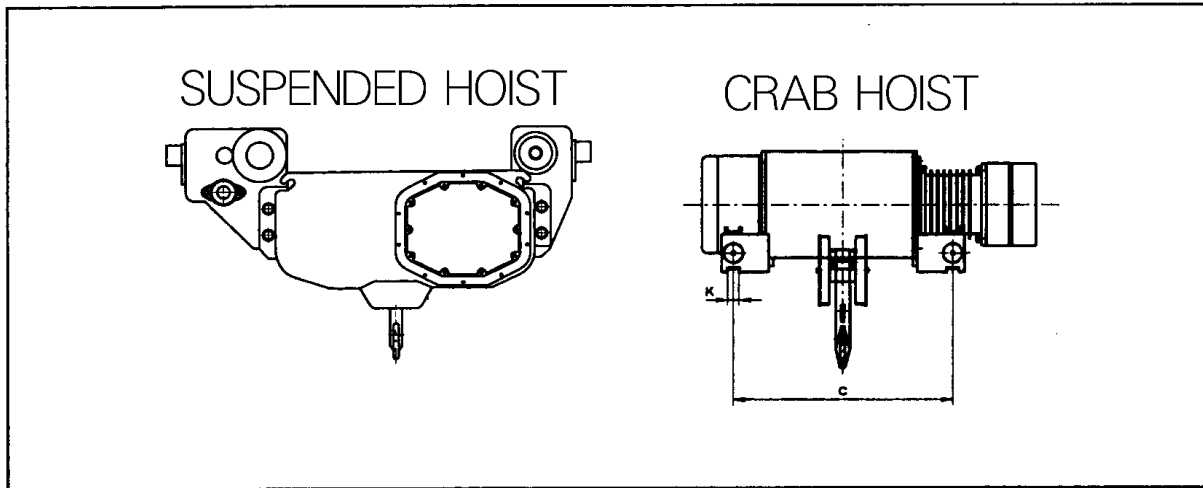
4.3 Installation



WARNING

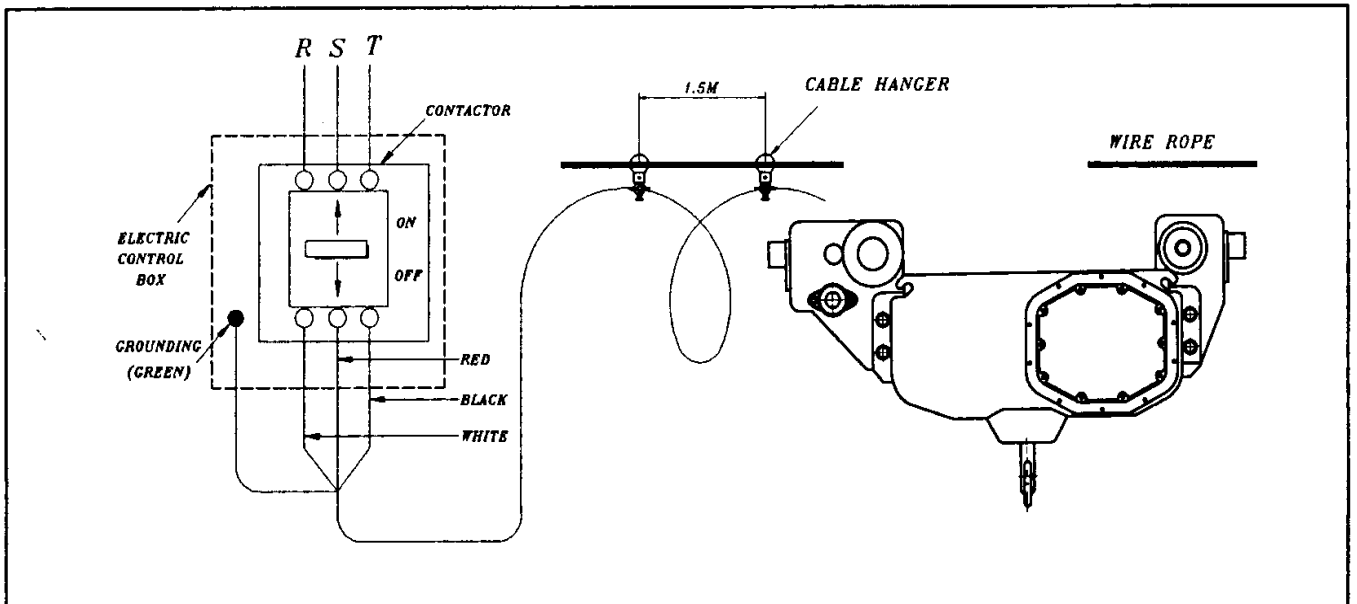
Connection to power supply before installation procedures having been completed is strictly prohibited.

- (1) Prior to installation , the crab hoist should check dimension “C” & “K” confirm to the rails span over the girder and rail specification, if hoist is suspended from an electric trolley, please check trolley’ s span is confirm to beam’ s width . (Please refer to Illust. 6)




Illust. 6


- (2) Connect power supply to hoist and operate the push button switch. This operation must be carried out by a trained person. If hoist won’ t run after power connection, might due to phase error relay in function, just change any two of power cable connection in switch box then will run normally.





illust. 7

(3) Operation Test

(A) Firmly push itch button to lower bottom hook until the wire rope still have at least 3 round over the drum.

(B) Firmly push itch button to check the winding of wire rope to drum evenly spread over the groove.

(C) Check the emergency stop device function (if fitted):

While holding down either  or  button on the push button switch, push the emergency stop button. Check that the hook stops when the emergency stop button is pushed. Also, check the hoist does not move in response to the push button switch. Finally, check that the emergency stop device pops out when turned to the right and that operation can be resumed thereafter. If the equipment fails to pass another above checks, check the wiring and automatic locking function of the emergency stop device.

5. OPERATION

After running test and checks have been completed, the hoist will be ready for normal operation.



WARNING

Since dealing with heavy loads may involve unexpected danger, all of the "SAFETY RULES" (Ref 3.) must be followed and the operator must be aware of the following points while using the hoist.

- (1) The operator must have a clear and unobstructed view of the entire working area before operating the hoist.
- (2) The operator must check that the entire working area is safe and secure before operating the hoist.
- (3) When using the hoist with a motorized trolley, the operator must take care to prevent excessive load swinging by sympathetic use of the trolley controls.

6. MAINTENANCE AND INSPECTION



DANGER

Do not perform maintenance on the hoist while it is carrying a load except monthly checking for the brake or limit switch.



DANGER

Before performing maintenance do not forget to affix tags to the power source and the push button switch reading: "DANGER", "EQUIPMENT BEING REPAIRED".

6.1 Maintenance

- (1) Check the level of gearbox lubricant after first 500 hours of operation, thereafter every 3 months and lubricant accordingly.

Note: We recommend using lubricant oil equivalent to ISO VG460 as table of following annual inspection.

- (2) Always keep the hoist unit dry and never misuse it in a manner likely to reduce its durability.
- (3) When it is necessary to keep the unit outdoors, a protective covering should be fitted.

6.2 Inspection

- (1) Daily inspection: Before starting daily operation, check the following,
 - (a) Correct power supply.
 - (b) "Up", "Down" and "Emergency stop" (where fitted) test runs under no load.
 - (c) Correct motor performance.
 - (d) No abnormal or excessive noise.
 - (e) No malfunction of the bottom hook safety latch.
 - (f) Proper function of moving/turning parts, limit switches and brake.
 - (g) The condition of wire rope and winding evenly over the drum.
 - (h) Wire rope out of the bottom block's wheel groove or not.

(2) Monthly inspection

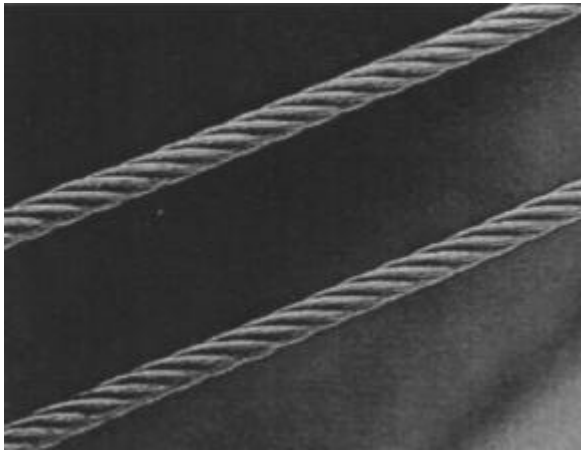


WARNING

Always use the hoist manufacture's recommended parts when repairing a hoist.

(a) Wire rope:

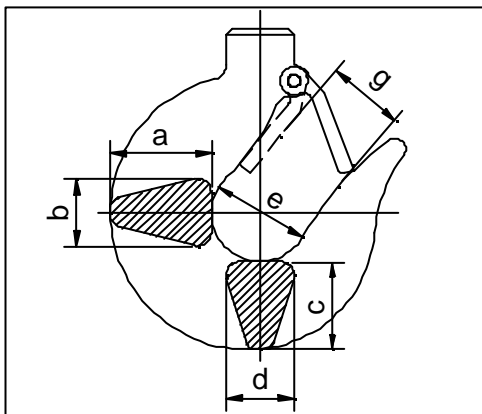
- a-1: Any single strain of wire breaking. Breaking of strains more than 10% should replace new wire rope.
- a-2: Any distorted, deform , itching and rusty of wire rope.
- a-3: Wire rope fixing fasteners being deforming of losing.



Rope Dia. (m/m)d	Model Being Used	Construction	Specified Breaking Load(lb)
6.3	TUAH(D)-100	(6×37)-A	2150
8	SUBH(D)-200 TUBH(D)-200	(6×37)-A	3470
10	SUCH(D)-300 TUCH(D)-300 SUDH(D)-500 TUDH(D)-500	IWRC6×Fi(29)-B	6900
12	SUEH(D)-750 TUEH(D)-750		9940
14	SUFH(D)-1000 TUFH(D)-1000 SUFH(D)-1500 TUFH(D)-1500		13500

(b) Load hook:

Check hook with care. If hook shows crack deformation or wear in excess of 10% of its original size, it should be replaced (Ref. following table)



Capacity (T)	a	b	c	d	e	g	Allowable Stress(lb)
1	39	27	39	27	39	27	7000
2	54	36	47	36	56	41	7000
3	57	38	52	38	60	45	7000
5	75	48	68	48	75	56	7000
7.5	85	60	77	60	85	62	7000
10	100	65	95	60	100	65	7000
15	120	87	110	85	120	82	7000

(c) Limit Switches



WARNING

A qualified electrician should perform this inspection.

Check correct operation of the limit switches to prevent the drum from over winding.

(3) Annual inspection



WARNING

Your dealer should be asked to perform this inspection.

(a) Check gearing for any excessive wear or damage.

(b) Replace gearbox lubricant completely.

Oil volume of gearbox

Ton	1	2	3	5	7.5	10-15	20	25-40
Gear Box NO.	UA	UB	UC	UD	UE	UF	UG	UG
U.S. gal	1.98	1.98	2.64	2.64	6.6	6.6	8.98	8.98
Liter	7.5	7.5	10	10	25	25	34	34

Gear Oil No : COSMO # W460

NOTE: 1 (U.S. gal) = 3.78537 Liter

Recommended oils according to DIN 51354

ISO-VGDIN 51519 viscosity At 40 °C mm ² /s(cST)	Approximate viscosity of the VG Categories 50 °C mm ² /s(cST)	ARAL	BP	ESSO	MOBIL OIL
VG460	251	Aral Degol BG 460-BMB 460	BP Energol GR-XP 460	Spartan EP-460	Mobilgear 634

ISO-VGDIN 51519 Viscosity At 40 °C mm ² /s(cST)	Approximate viscosity of the VG Categories 50 °C mm ² /s(cST)	SHELL	TEXACO	I.P.	AGIP
VG460	251	Omala oil 460	Meropa 460	Mellana 460	Blasia 460

(c) Check brake lining and ratchet pawl for emergency braking any wear or damage.

(d) Check operation of pawl spring.

(e) After reassembly of above check, lifting a load several times to ensure good performance of the hoist before starting duty operation.

7. TROUBLESHOOTING

7.1 Wiring Diagrams

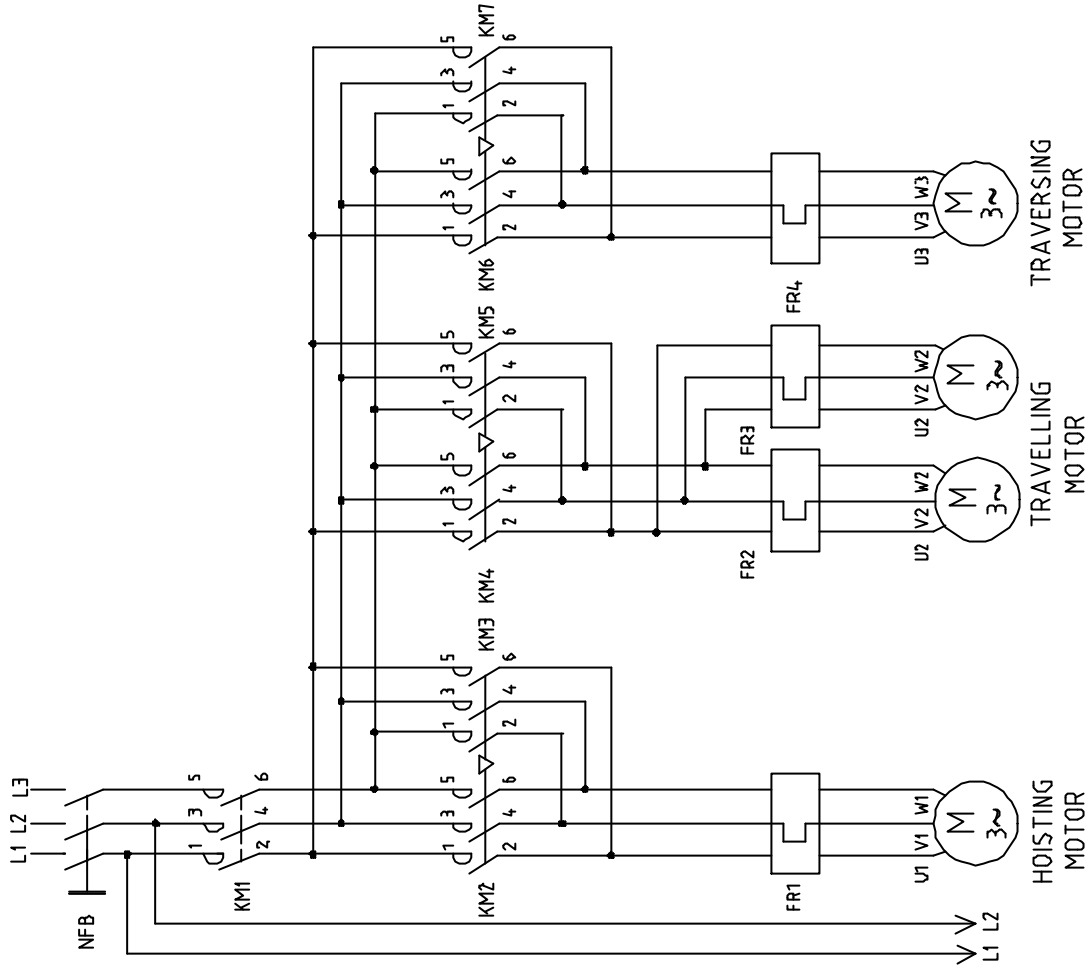
- (1) Single Speed Wiring Diagram.....17
- (2) Dual Speed Wiring Diagram (Hoisting)18
- (3) Dual Speed Wiring Diagram (Hoisting, Traversing)19
- (4) Dual Speed Wiring Diagram (Hoisting, Traversing, Traveling)20

7.1.1 The above models are available in the following specification:

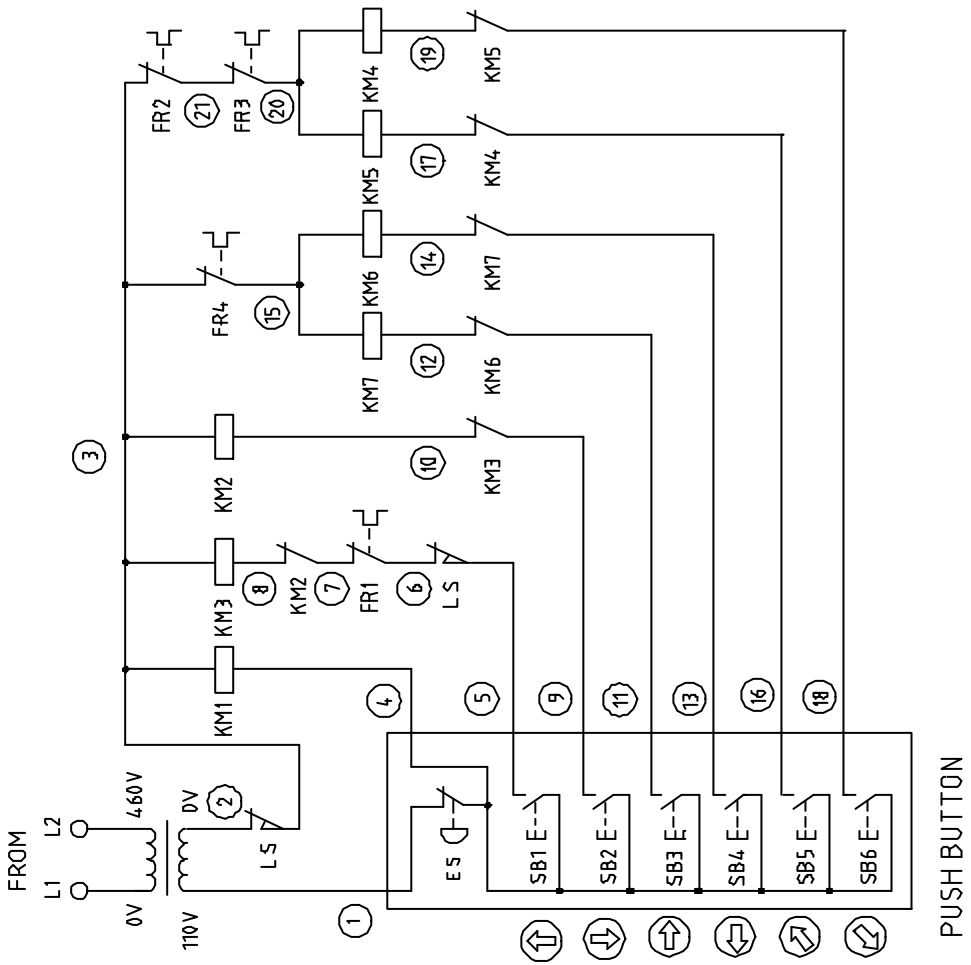
- (a) 3-Phase
- (b) 50 or 60 Hertz
- (c) Single voltage

Hertz \ Voltage	Single Voltage
50 Hz	220
60 Hz	to 600

SINGLE SPEED WITH EMERGENCY STOP

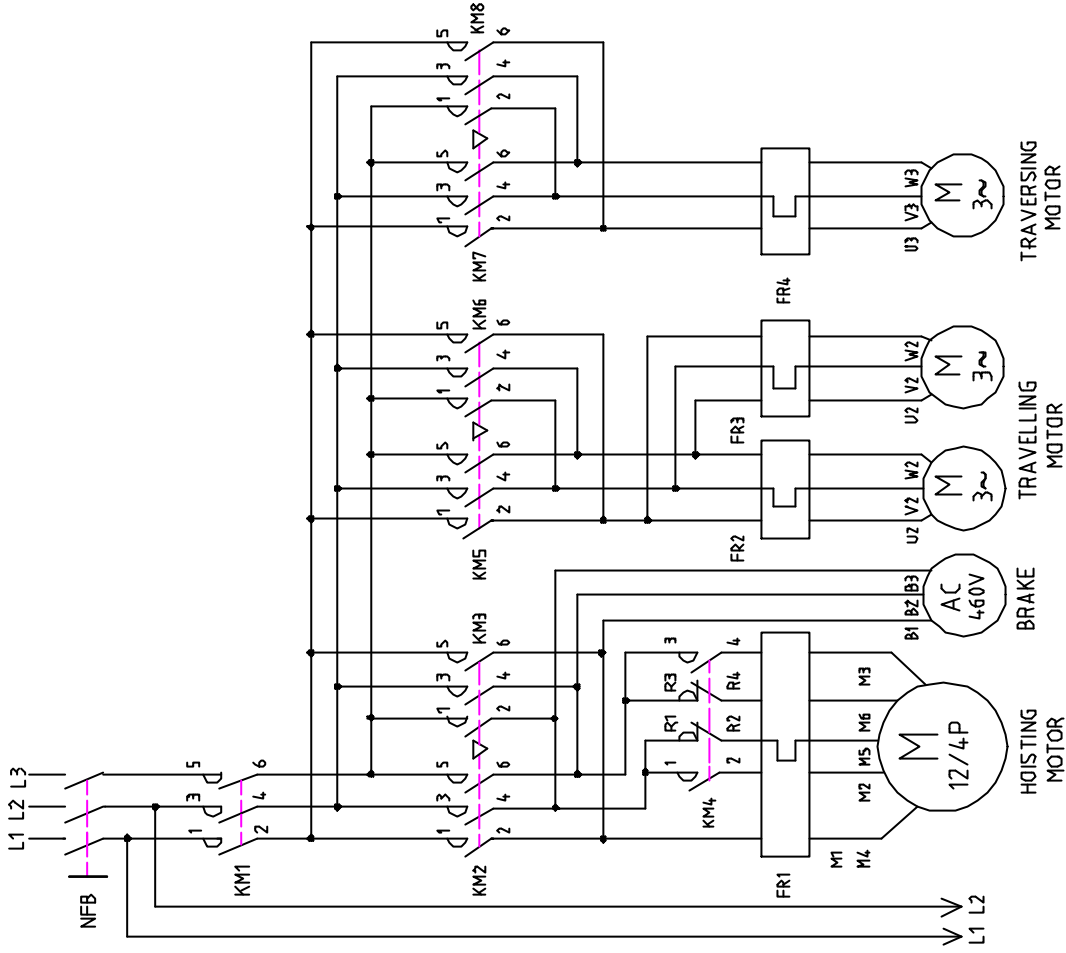


MAIN CIRCUIT WIRING DIAGRAM

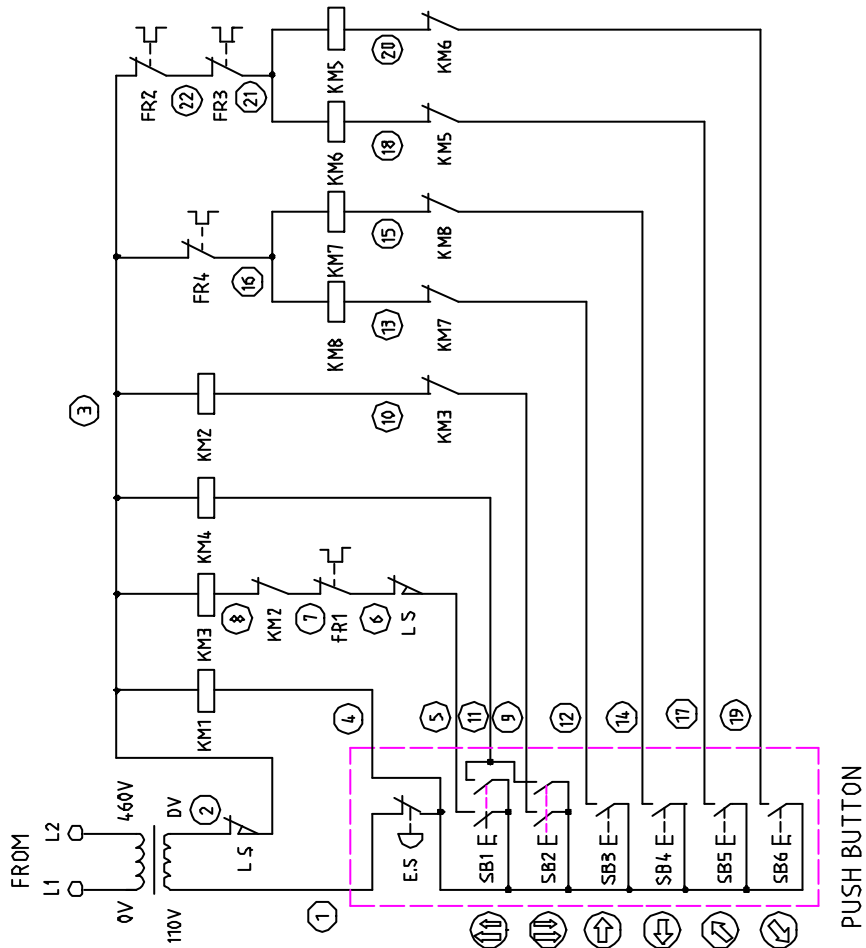


CONTROL CIRCUIT WIRING DIAGRAM

DUAL SPEED WITH EMERGENCY STOP (HOISTING)



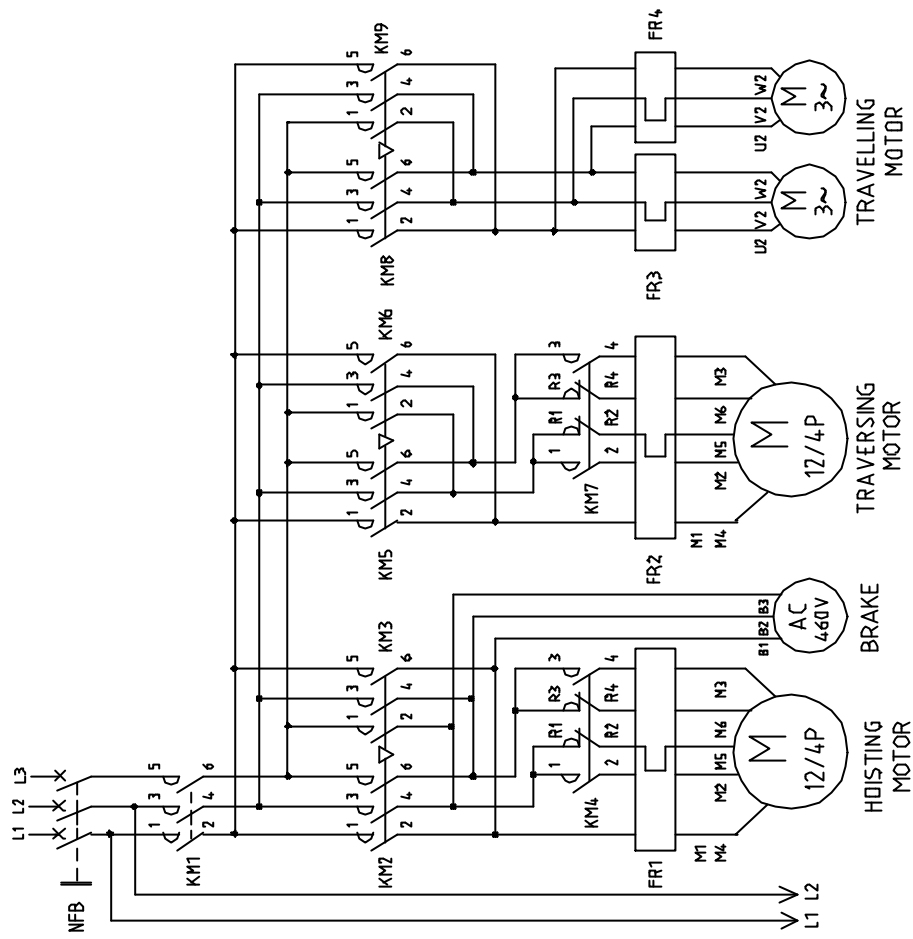
MAIN CIRCUIT WIRING DIAGRAM



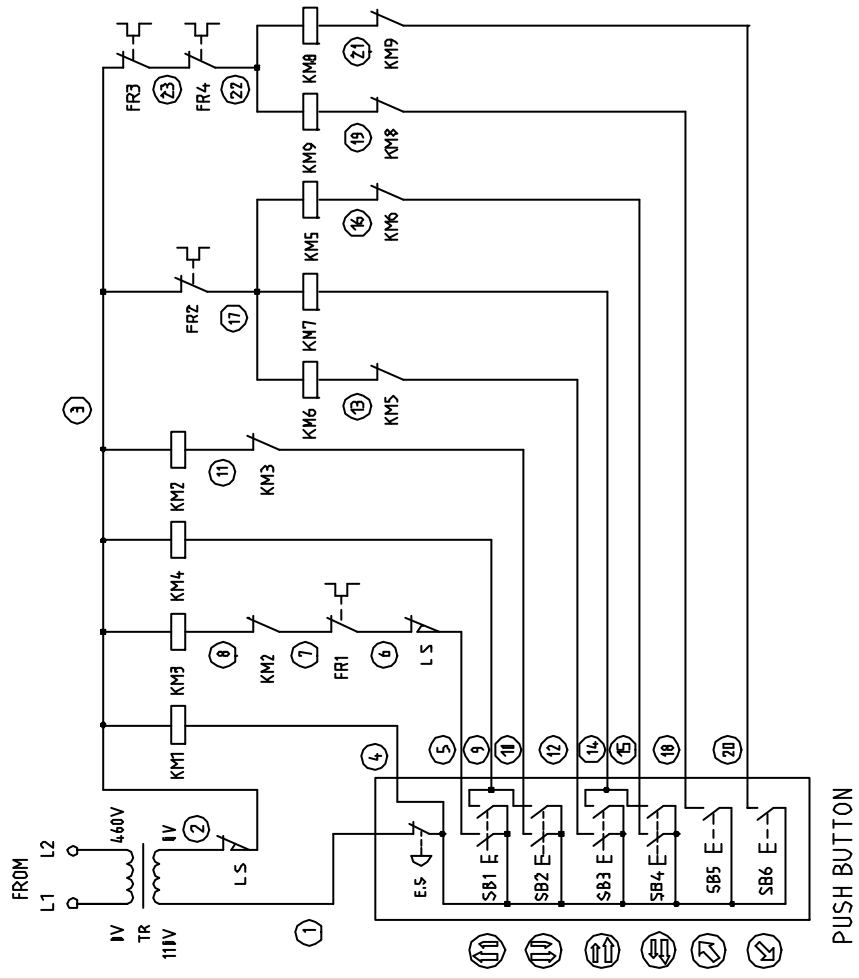
CONTROL CIRCUIT WIRING DIAGRAM

B30049

DUAL SPEED WITH EMERGENCY STOP (HOISTING AND TRAVERSING)



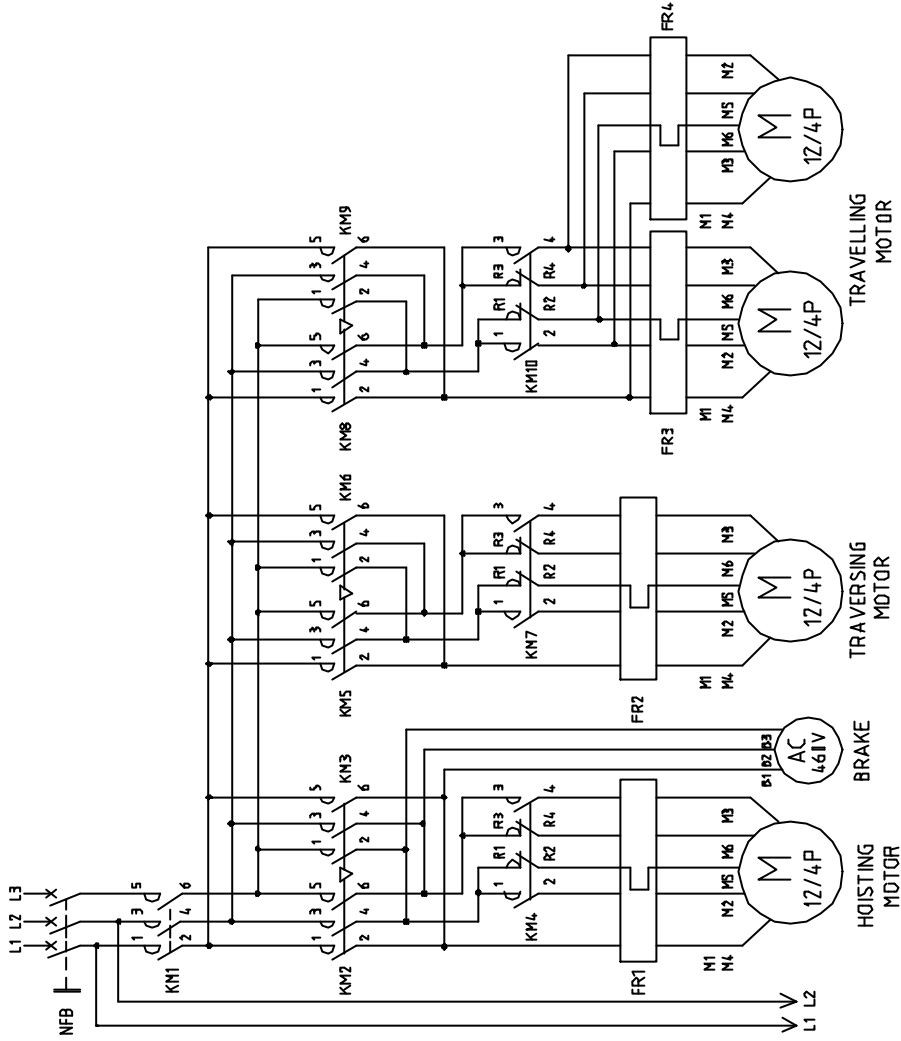
MAIN CIRCUIT WIRING DIAGRAM



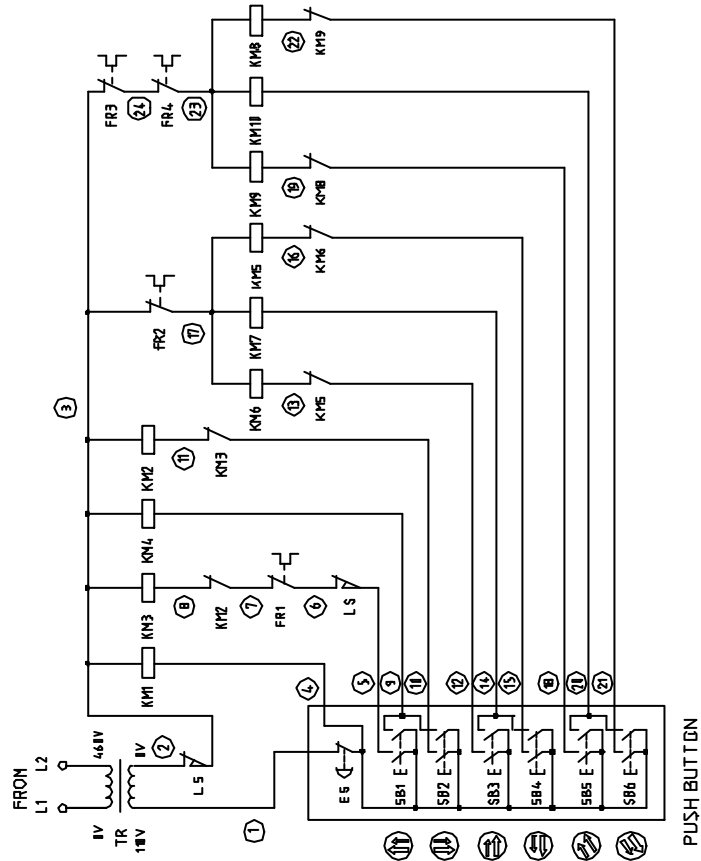
CONTROL CIRCUIT WIRING DIAGRAM

B40064

DUAL SPEED WITH EMERGENCY STOP (HOISTING, TRAVERSING AND TRAVELLING)



MAIN CIRCUIT WIRING DIAGRAM



CONTROL CIRCUIT WIRING DIAGRAM

B40068

7.2 Troubleshooting and Remedial action

SITUATION	CAUSE	REMEDY
Hoist will not operate	(1) Blown power fuse or tripped power circuit breaker (2) Blown control circuit fuse (3) Broken/disconnected power or control circuit wire (4) Low supply voltage (5) Motor hums but does not rotate (6) Emergency stop button release pushed (if fitted) (7) Faulty contactor	Check supply requirements and refuse/reset breaker to meet requirements Check fuse for correct rating and replace Locate and repair/reconnect Check if 10% reduction in voltage, have mains supply checked Check phases to motor - insulate and repair Check the cause as necessary Operate manually if hoist runs then control circuit/coil is faulty - locate fault and repair. If hoist does not run then check main supply. If input supply is correct but there is a faulty output supply then replace the contactor
Hoist will not stop	Welded contacts in contactor	Replace contactor
Brake slips	Abrasion of motor brake	Replace
Abnormal sound on the hoist operation.	(1) Wire rope dry (2) Twisting & bending of wire rope due to frequently side pull. (3) Worn or deteriorated oil packing	Lubricate Replace new wire rope. Replace new wire rope.
Electric shock	(1) Poor earth connection (2) Accumulated foreign matter/ moisture on electrical parts	Provide correct earth connection Remove foreign matter/dry electrical parts
Oil leak	(1) No oil plug (2) Loose fitting of oil plug (3) No plug packing (4) Worn or deteriorated oil packing	Attach the normal oil plug Fasten the plug tightly Attach normal packing Attach the new packing