

®



ELECTRIC CHAIN HOIST



Black Bear Corporation

No. 21 2007

RECEIVED

OPERATION MANUAL & PARTS LIST

SERIES: BLFD-024

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 CHAIN HOIST.



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1. FOREWORD

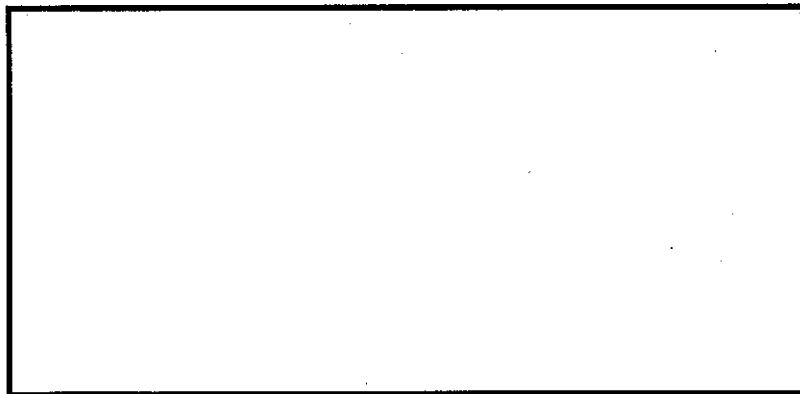
This manual contains important information to help you properly install, operate and maintain the **Black Bear** electric chain hoist for maximum performance, economy and safety.

Please study its contents thoroughly before putting the electric Chain 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 chain 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 chain hoists.

Table 2-1 Specifications

Item		Detail	
Working temperature range (°C)		-5 to +40	
Working humidity range (%)		85 or less	
Protection	Hoist	IP 54	
	Push button Switch	IP 54	
Electric power supply		Single phase	100V~120V 200V~240V 50/60 HZ
Noise level (dB)		75	
Chain size	WLL (working load limit) (kg)	Nominal diameter (mm)	Pitch (mm)
	240kg	4.0	12

- 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 Lift

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

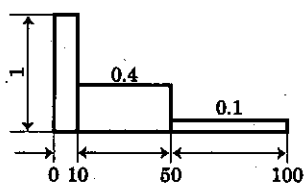
Black Bear BLFD-024 single phase electric chain hoists have been designed for grade 1Am in the FEM regulations. (FEM 9.511)

Details are provided in Table 2-2.

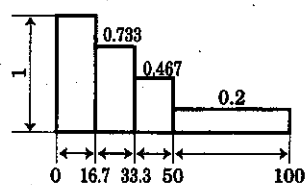
Average daily operating time and total operating time are determined by load distribution.

Table 2-2 Mechanical classification

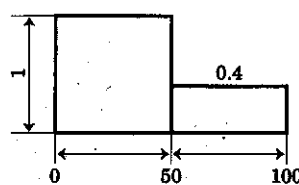
Load Spectrum (Load distribution)	Definitions	Cubic mean value	Average daily operating time(h)	Total operating time(h)
1 (light)	Mechanisms or parts thereof, usually subject to very small loads and in exceptional cases only to maximum loads.	$k \leq 0.50$	2 - 4	6300
2 (medium)	Mechanisms or parts thereof,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



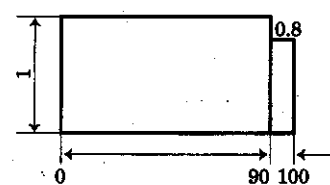
% operating time
Load spectrum 1



% operating time
Load spectrum 2



% operating time
Load spectrum 3



% operating time
Load spectrum 4

2.3 Safety Devices

(1) 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.

(2) 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.

(3) Limit Switches

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

(4) Emergency stop device

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

(5) Shock protection

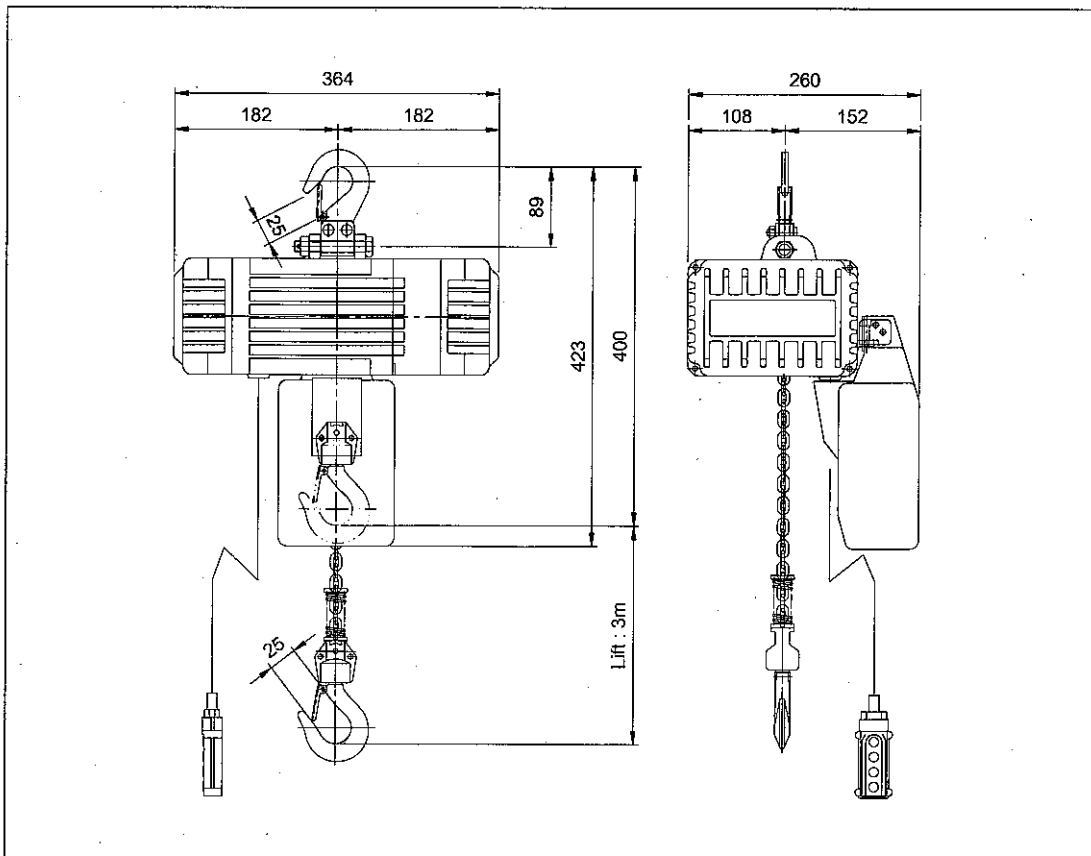
It cannot run, when you push the button for anti-direction in "UP" or "DOWN" running. You must wait over 1 second.

2.4 Specification and Dimensions

a. Specification

Rated Power Source		100~120V , 200~240V 60Hz/50Hz	
Type		Dual-Speed Type	
Model		BLFD-012	BLFD-024
Rated Load(kg)		120	240
Motor Output(W)		300	600
Time Rating(min)		15	
Intermittent Duty	Duty Rating (% ED)	30	
	Max. Starting Frequency (times/hr)	180	
Rated Current(A)		6.0 (110V)	10.0 (110V)
		3.0(220V)	5.0(220V)
Lifting Speed(m/min)		0~3.2/12.5 (110V)	0~3.2/11.2 (110V)
		0~3.2/12.5 (220V)	0~3.2/12.5 (220V)
Standard Lift(m)		3	
Push Button Cord(m)Length : L		2.5	
Load Chain Diameter(mm)		4x12	
N.W./G.W.	3m(kg)	16.5/19.5	
	6m(kg)	17.5/20.6	
Packing LxWxH (mm)		500x390x205	

b. Dimensions (mm)



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.

(2)

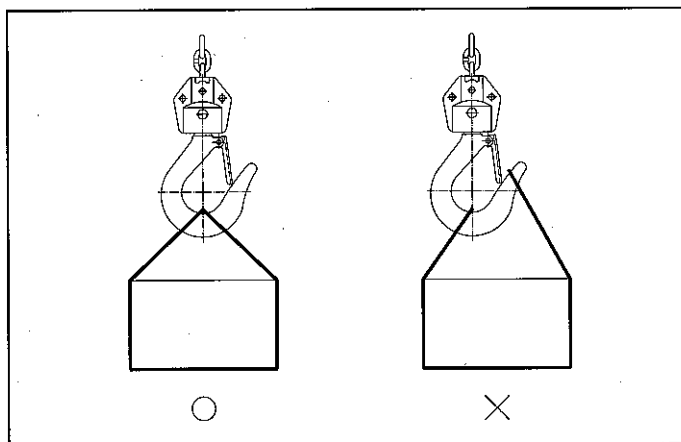


DANGER

Do not use the hoist in explosive atmosphere.

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

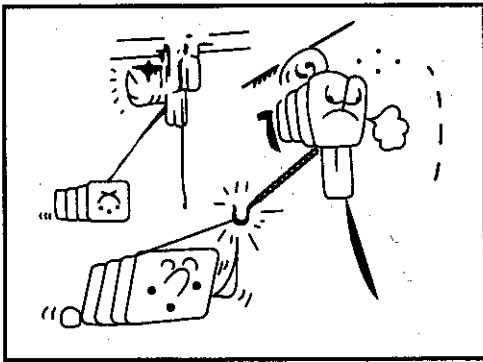
- (a) the correct lifting sling is being used.
- (b) the lifting sling is located in the hook as shown below (Illust. 2) and that a safety latch has been fitted.



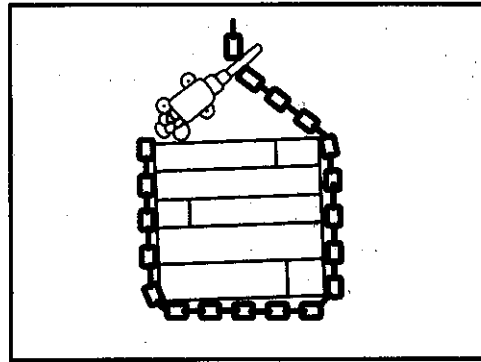
Illust. 2

- (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 load chain 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 load chain as a sling to lift a load. (Illust. 4)



Illust. 3



Illust. 4

(11)



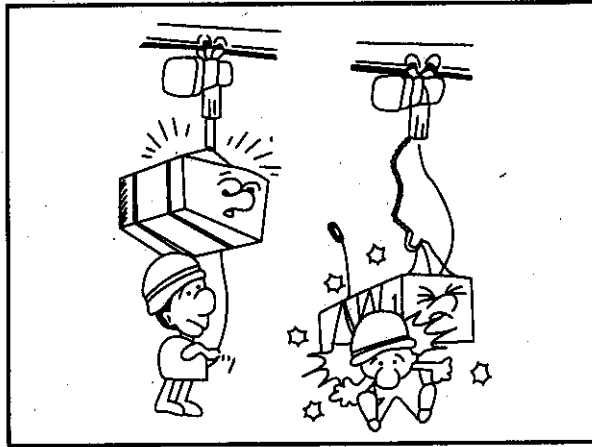
WARNING

Do not use the hoist chain 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 load chain is twisted.

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

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.

Check and ensure that these items are present.

Each hoist is supplied as standard with the following accessories.

1. Chain bucket	1 piece
2. Power cable	3 meters
3. Separated control cable with PBS and female plug	1 set

Table. 4-1

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



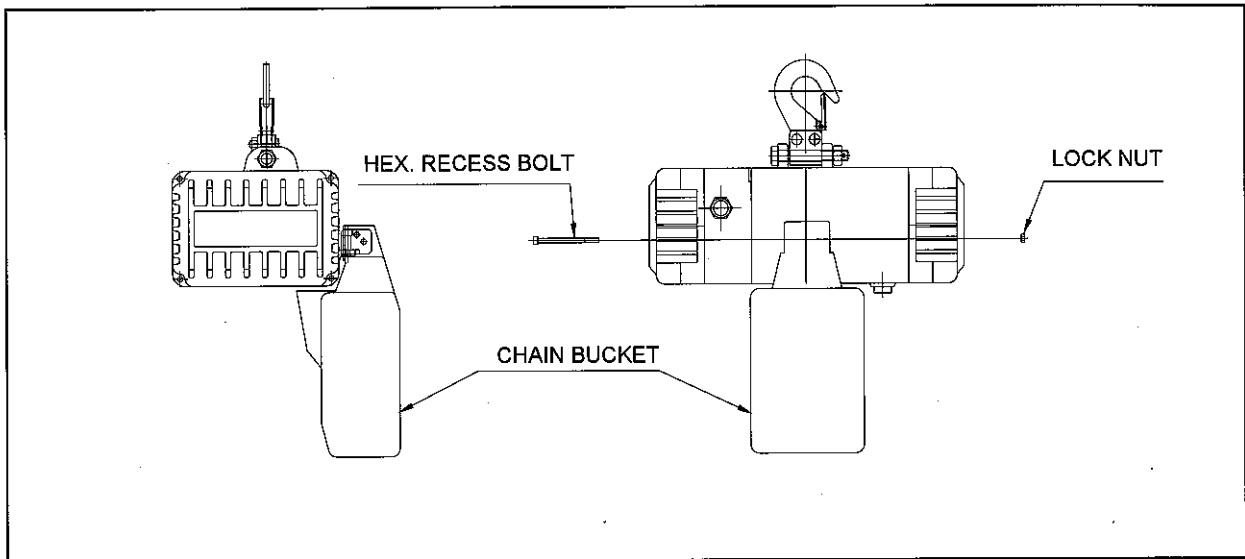
WARNING

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

(1) Prior to installation check and ensure that the top hook assembly is securely attached to the hoist by means of the lock bolt (key No.57, page.20).

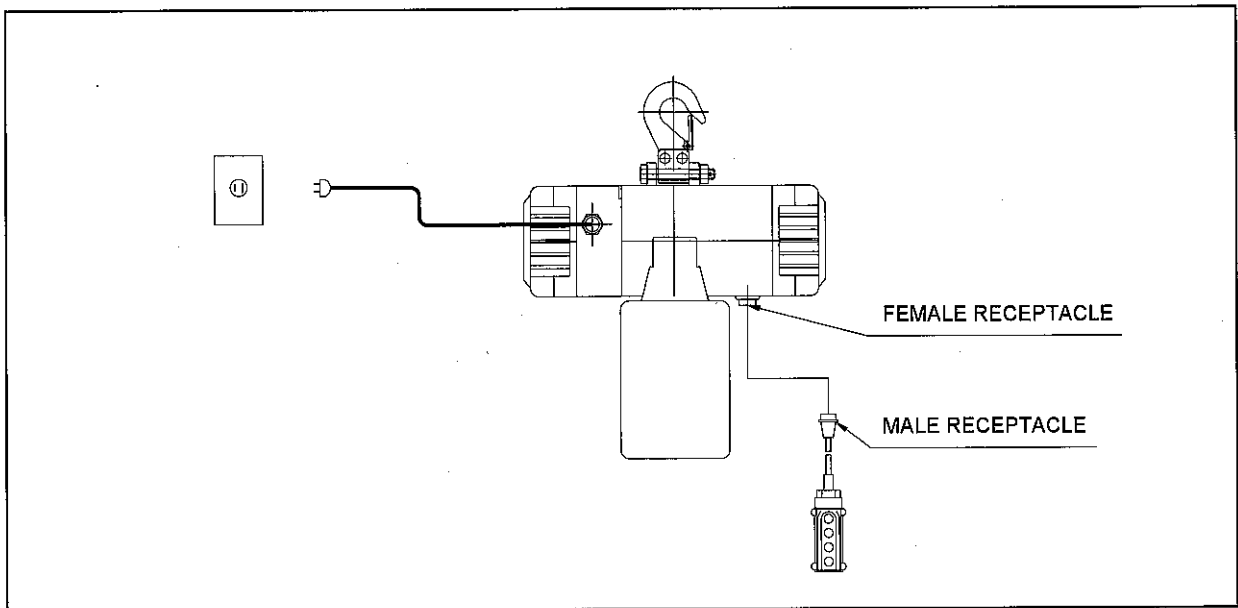
NOTE: If the hoist is to be installed under a trolley, remove the top hook and install the trolley on the hoist.

(2) Assemble chain bucket.





Illust. 6

(3) Plug power supply to hoist and operate the push button switch. This operation must be carried out by a trained person.





Illust. 7

(4) Operation Test

- (a) Firmly push  switch button to lower load chain until the chain end buffer touches the limit switch. Power should be cut off automatically.
- (b) Firmly push  switch button to check the collection of load chain into chain bucket.
- (c) Check load chain lubrication. (It has been lubricated at our works, but the lubricant may dry out during transportation) Any readily available lubricant is recommended. It is further advisable to keep a small amount of lubricant in chain bucket to allow chain in oil bath.

(d) Check the emergency stop device function :

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 plain trolley, the operator must take care to prevent excessive load swinging by sympathetic push trolley movements.

6. MAINTENANCE AND INSPECTION



DANGER

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



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 gear box lubricant after first 100 hours of operation, thereafter every 3 months and lubricant accordingly. Lubricant use Cosmos Gear SE 150 or equivalent.
- (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 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) well lubricated load chain.

(2) Monthly inspection

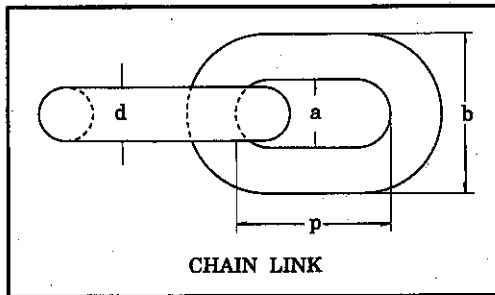


WARNING

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

(a) Load chain:

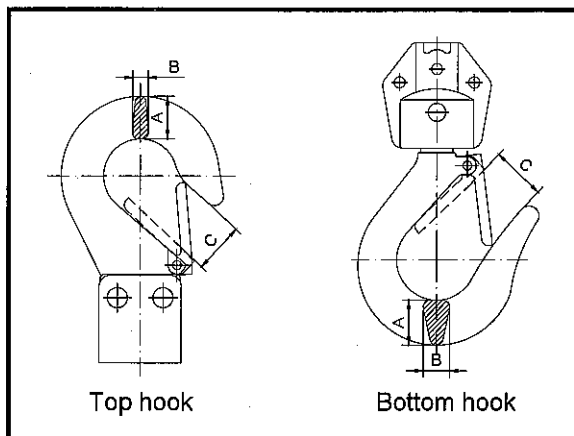
Distorted, elongated or worn chain link will not sit properly on the load sprocket wheel and may cause chain breakage and/or damage to hoist unit. To ensure safe and efficient operation, the chain links must be checked for their pitch (inside length, inside width) and outside width monthly according to following table.



Dia-Meter (mm) (d)	Inside Length (mm) (p)	Inside Width (mm) (a)	Outside Width (mm) (b)
4.0	12.0	5.0	14.0

(b) Load hook:

Check hook with care. If hook shows crack deformation or wear in excess of 5% of its original size, it should be replaced. (Ref. following table)



	Dimensions (mm)		
	A	B	C
Top hook	19	7	23
Bottom hook	20	12	25

(3) Annual inspection



WARNING

Your dealer should be asked to perform this inspection.

- (a) check gearing for any excessive wear or damage.
- (b) replace gear box lubricant completely.
- (c) check brake lining and ratchet pawl for 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

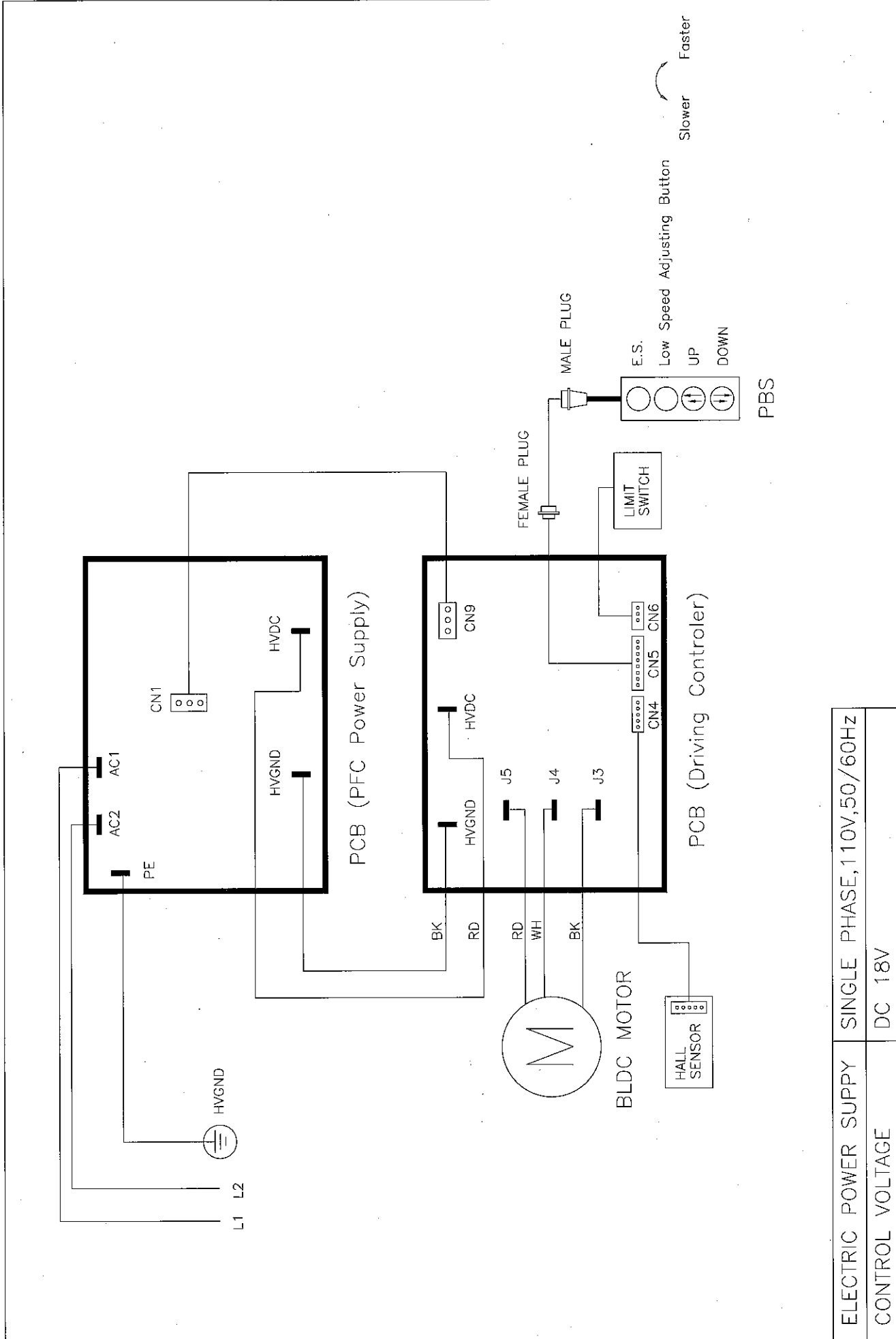
- (1) 110V – 1Ph – 50/60Hz power supply (with Emergency Stop).....17
- (2) 220V – 1Ph – 50/60Hz power supply (with Emergency Stop).....18

The above listed wiring diagram for reference only.

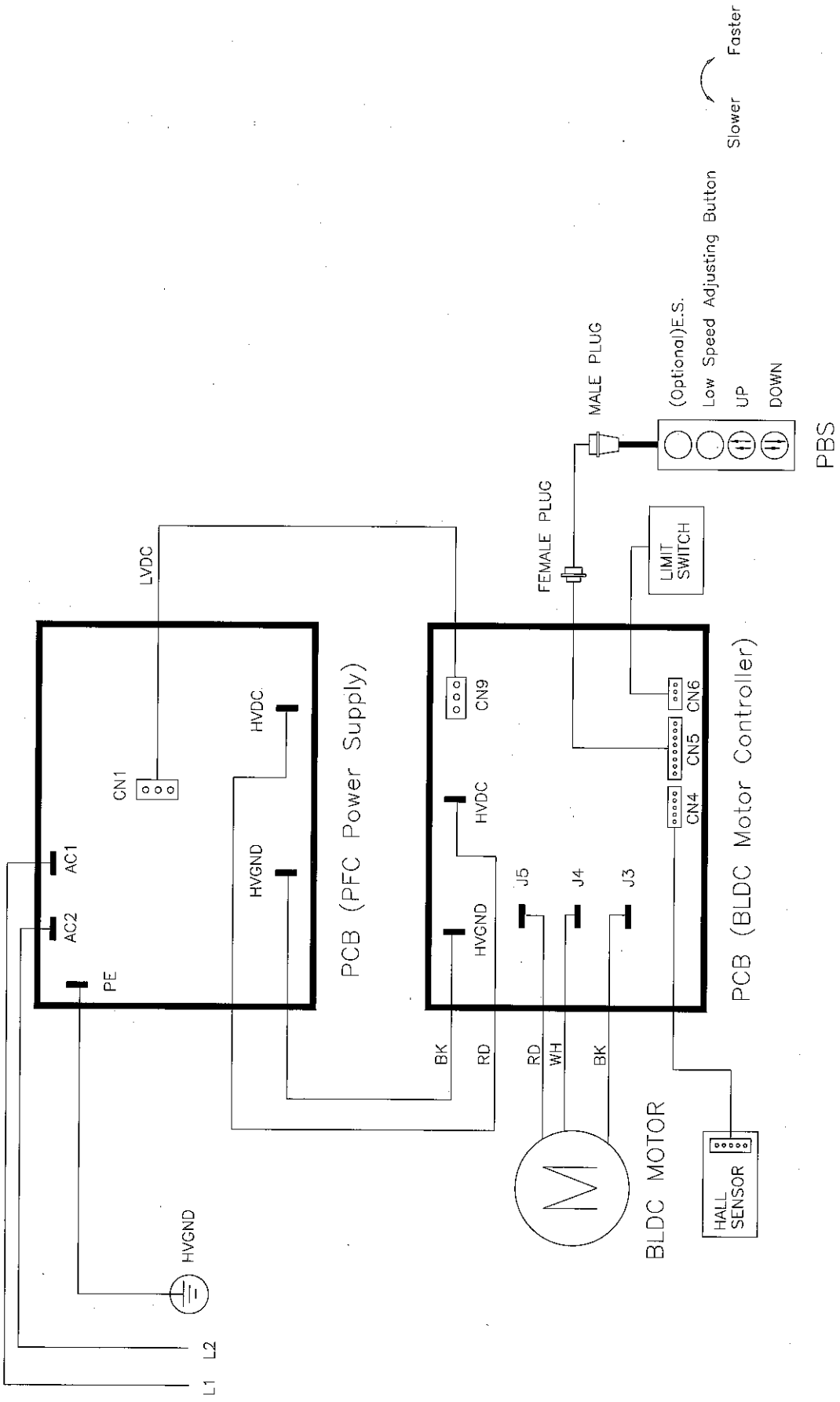
The end user should refer to the wiring diagram stuck to the inside cover of electric housing.

Our electric specifications can be done according to following.

- (a) 1 – Phase
- (b) 50Hz or 60Hz
- (c) 100V~120V or 200V~240V



ELECTRIC POWER SUPPLY	SINGLE PHASE, 110V, 50/60HZ
CONTROL VOLTAGE	DC 18V

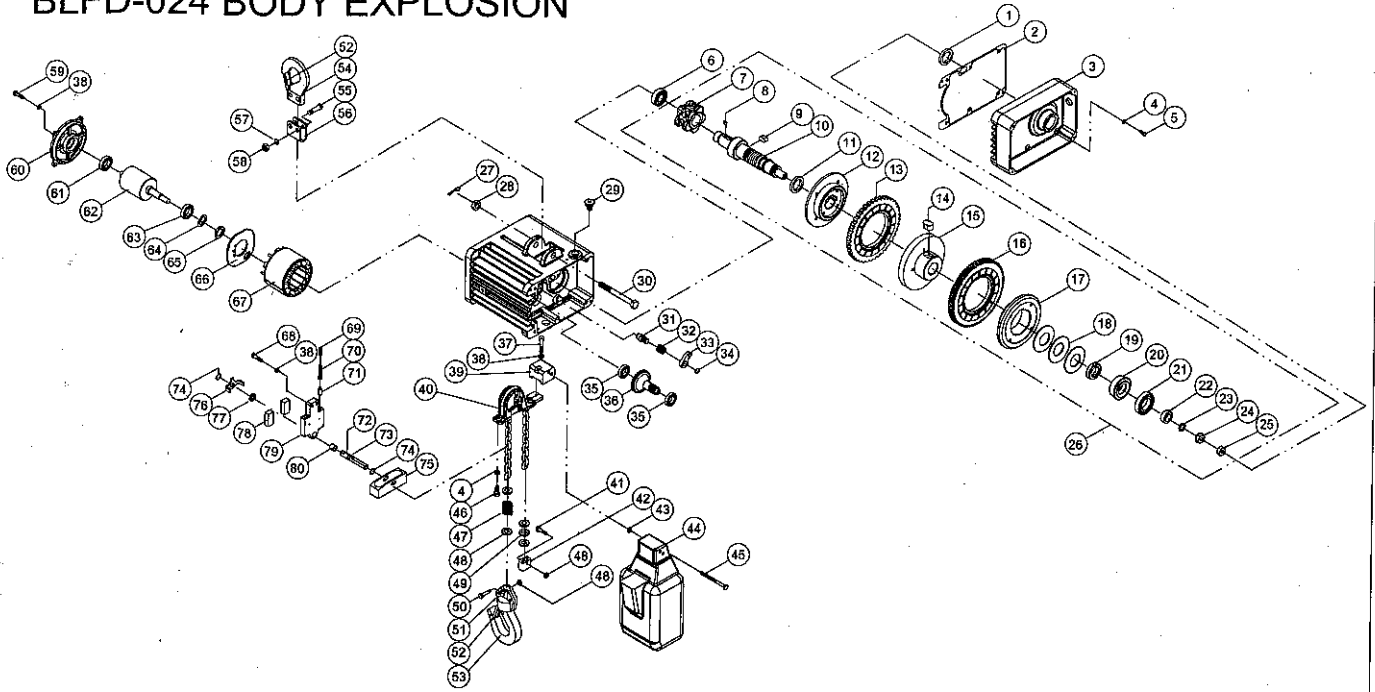


ELECTRIC POWER SUPPLY	SINGLE PHASE, 220V, 50/60HZ
CONTROL VOLTAGE	DC 18V

7.2 Troubleshooting and Remedial Action

SITUATION	CAUSE	REMEDY
Hoist will not operate	(1) Phase error relay operated due to incorrect phase connections.	Check the phase connections of controller & the wire's color of BLDC motor for correct Ref. Page 16 or 17
	(2) Blown power fuse or tripped power circuit breaker.	Check supply requirements and refuse/reset breaker to meet requirements Contact your authorized "Black Bear" dealer- if high voltage fuse was blown
	(3) Blown control circuit fuse.	Check fuse for correct rating and replace
	(4) Broken/disconnected power or control circuit wire.	Locate and repair/reconnect (take the power supply away until 10 min. later)
	(5) Low supply voltage	Check if 10% reduction in voltage, have mains supply checked
	(6) Motor hums but does not rotate	Check motor-insulate and wire connection
	(7) Emergency stop button release pushed	Check the cause as necessary
	(8) The button of PBS is fixed	Release the button of PBS
	(9) The button or Elect. wire of PBS is broken	Replace or repair it (take the power supply away until 5 min. later)
	(10) Broken/isconnected limit switch	Locate and repair/reconnect
Brake slips	Abrasion of motor brake	Replace
Hoist runs but does not lift	(1) Clutch slipping	Contact your authorized "Black Bear" dealer.– this adjustment needs to be carried out on a test rig
Abnormal sound on load chain/chain sprocket	(1) Chain dry	Lubricate
	(2) Worn chain sprocket	Replace load chain and chain sprocket
Electric shock	(1) Poor earth connection	Provide correct earth connection
	(2) Accumulated foreign matter/ moisture on electrical parts	Remove foreign matter/dry electrical parts
Oil leak	(1) No oil plug	Attach the normal oil plug
	(2) Loose fitting of oil plug	Fasten the plug tightly
	(3) No plug packing	Attach normal packing
	(4) Worn or deteriorated oil packing	Attach the new packing

BLFD-024 BODY EXPLOSION



BLFD-024 BODY PARTS B.O.M.

KEY NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT
1	404410	Oil Seal< ϕ 25 \times ϕ 35 \times 7t>	1
2	402586	Gasket #40	1
3	208815	Gearbox	1
4	400094	Spring Washer<M6>	8
5	400418	Hex. Recess Bolt<M6 \times 1.0 \times 30L>	6
6	400110	Bearing<6202 ZZ>	1
7	208834	Load Sheave< ϕ 41.5 \times 25L>	1
8	405924	Key< t5 \times 5 \times 20L>	1
9	400962	Key< t6 \times 6 \times 12L>	1
10	201219	Sheave Spindle< ϕ 30 \times 140L>	1
11	400934	Oil Seal< ϕ 30 \times ϕ 50 \times 8t>	1
12	201321	Brake Body< ϕ 83 \times ϕ 20 \times 17.5L>	1
13	201326	Ratchet Ass'y	1
14	405944	Key< t10 \times 8 \times 16L>	1
15	201322	Brake Bushing< ϕ 83 \times 28.75L>	1
16	201317	4th Gear Ass'y<M1.25 \times 89T \times 10L>	1
17	201323	Brake Flange< ϕ 83 \times ϕ 38 \times 19.1L>	1
18	200404	Disc Spring<633125>	3
19	200272	Load Brake Gear Spacer	2
20	201325	Bush< ϕ 34 \times ϕ 30.5 \times 13.5L>	1
21	400125	Bearing<6003>	1
22	200402	Oil Bush< ϕ 25 \times ϕ 17 \times 9L>	1
23	400226	O-Ring< ϕ 12 \times ϕ 17 \times 2.5>	1
24	200407	Flange Nut<M10 \times 1.5 \times 8L>	1
25	400647	Nut<M10 \times 1.5>	1
26	201200	Over Load Ass'y	1
27	400610	Cotter Pin< ϕ 3 \times 30L>	1
28	400084	Hex. Nut<M12 \times 1.75>	1
29	300523	Philip Machine Screw Ass'y	2
30	208827	Lock Bolt<M12 \times 1.75 \times 85L>	1



DECLARATION OF CONFORMITY



CHENG DAY MACHINERY WORKS CO., LTD.
173 WEN CHIU ROAD, TA CHIA CHEN,
TAICHUNG HSIEN, TAIWAN R.O.C.

We declare under our sole responsibility that the products:
Electric chain hoist : BLFD-024

Working load limit : 240 kgs

To which this declaration relates is in conformity with the following Machinery Directive and Standard:

Machinery Directive 89 / 392 / EEC 1989.

Low Voltage Directive 73 / 23 / EEC.

EMC Directive 89 / 336 / EEC.

ISO 12100-1 (E) (Basic terminology, methodology)

ISO 12100-2 (E) (Technical principles)

EN 418 (Emergency stop equipment, functional aspects)

EN 60204-1 (Electrical equipment of machines)

FEM 9.511 (Classification of mechanisms)

FEM 9.681 (Selection of travel motors)

FEM 9.682 (Selection of lifting motors)

FEM 1.001 (Rules for the design of hoisting appliances)

We will keep the technical documents listed below at our Head Office Factory above mentioned for any concerned national authorities inspection purposes.

- Operation manual for the products.
- Overall drawings of the products.
- Description of methods adopted to meet the Machinery Directive.
- Other technical materials.

We declare moreover as required by the annex IV of Machine Directive 98 / 37 / EC:

-The Marking is placed on the machine

Hoist type / Trolley:.....

Capacity (Ton):.....Serial No:.....

CHENG DAY MACHINERY WORKS CO., LTD.

C. F. HUANG

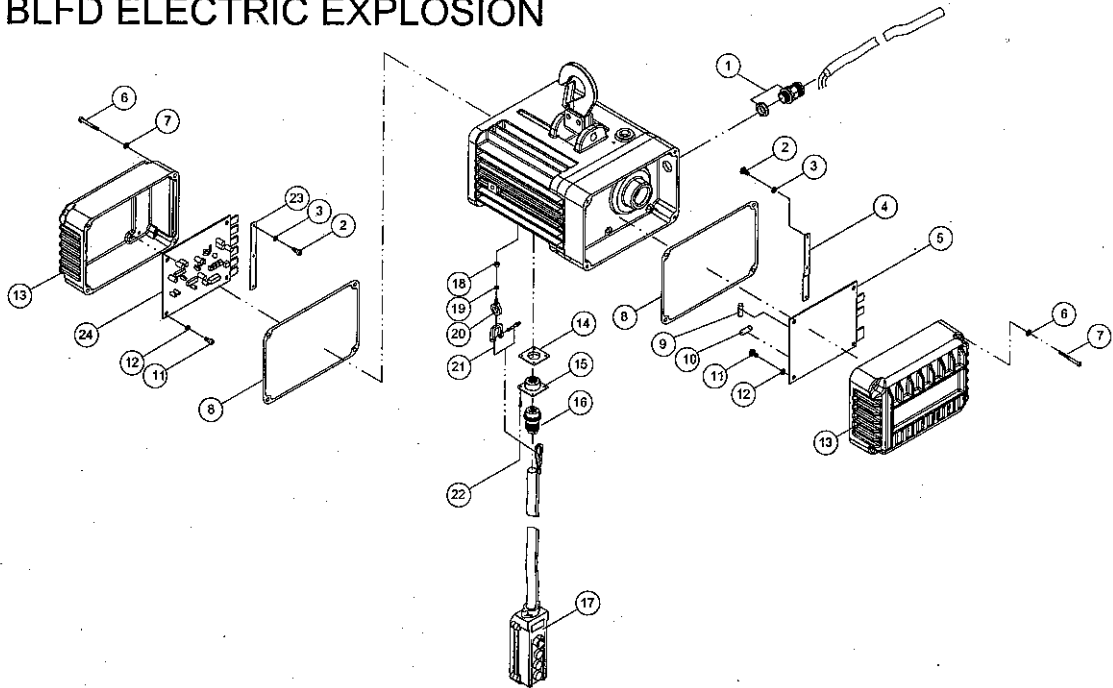
C. F. HUANG
MANAGER
QUALITY ASSURANCE DEPT.

DATE:

BLFD-024 BODY PARTS B.O.M.

KEY NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT
31	200416	Ratchet Pawl Pin< ø 14×27L>	1
32	400832	Ratchet Pawl Spring	1
33	200415	Ratchet Pawl	1
34	400907	Retaining Ring<S-11>	1
35	407845	Bearing<6000>	2
36	200417	2nd & 3rd Gear Set	1
37	408396	Hex. Recess Bolt<M5×0.8×10L>	1
38	400093	Spring Washer<M5>	7
39	208824	Chain Bucket Connector	1
40	208816	Chain Guide	1
41	400417	Hex. Recess Bolt<M5×0.8×20L>	1
42	200441	Chain Stopper<24×19×13.5>	1
43	400646	Lock Nut<M5>	3
44	208813	Chain Bucket<No.1>	1
45	408343	Hex. Recess Bolt<M5×0.8×60L>	2
46	400006	Hex. Recess Bolt<M6×1.0×16L>	2
47	408485	Spring	1
48	200442	Buffer Steel Plate <t4×25.5>	4
49	200443	Rubber Buffer<t4×26>	1
50	200445	Lower Hook Pin< ø10×25.5L>	1
51	201371I	Bottom Hook Cover Set	2
52	200480	Safe Latch Ass'y	2
53	201372I	Bottom Hook	1
54	200456	Top Hook	1
55	200433	Top Hook lock bolt<ø12×29.5L>	2
56	200432	Top Hook Suspension<t20×37×39L>	1
57	400095	Spring Washer<M8>	2
58	400088	Lock Nut<M8×1.25>	2
59	400003	Hex. Recess Bolt<M5×0.8×16L>	4
60	106111	Rear Bearing Bracket	1
61	405569	Bearing<6201ZZ>	1
62	106115	Rotor<300W>	1
	106108	Rotor<600W>	1
63	405569	Bearing<6201ZZ>	1
64	400863	Wave Washer<6201>	1
65	400945	Oil Seal< ø 12×ø 25×7t>	1
66	106118	Hall Sensor Plate	1
67	106120	Stator Ass'y <300W>	1
	106109	Stator Ass'y <600W>	1
68	400417	Hex. Recess Bolt<M5×0.8×20L>	2
69	400587	Threaded Stud<M8×1.25×10L>	2
70	408510	Limit Spring	2
71	208820	Compressing Block	2
72	208822	Limit Control Shaft	1
73	404416	O-Ring	1
74	400188	Retaining Ring <S-10>	2
75	208825	Collision Block	1
76	208821	Limit Pawl	1
77	208823	Limit Washer	1
78	300577	Limit Switch	2
79	208819	Limit End Plate	1
80	405571	Lubricated Bearing	1

BLFD ELECTRIC EXPLOSION



BLFD ELECTRIC PARTS B.O.M.

KEY NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT	
			100V/120V	200V/240V
1	400223	Cable Gland<M16>	1	1
2	408377	Cross Headed Screw<M3×0.5×12L>	6	6
3	405301	Spring Washer<M3>	6	6
4	300588	Holder A	1	1
5	300555	PFC Power Supply<300W-100V/120V>	1	
	300596	PFC Power Supply<300W-200V/240V>		1
	300557	PFC Power Supply<600W-100V/120V>	1	
	300598	PFC Power Supply<600W-200V/240V>		1
6	400854	Spring Washer<M5>	8	8
7	408331	Hex. Recess Bolt<M5×0.8×50L>	8	8
8	402587	Gasket #41	2	2
9	300817	Fuse <5x20-5A>	1	2
10	300818	Fuse <5x20-12A>	1	
11	400049	Cross Headed Screw<M4×0.7×8L>	8	8
12	400092	Spring Washer<M4>	8	8
13	300583	Electrical End Cover	2	2
14	402588	Gasket #42	1	1
15	300616	Female Receptacle	1	1
16	300615	Male Receptacle	1	1
17	300610	P.B.S	1	1
18	400080	Nut<M6x1.0>	1	1
19	400094	Spring Washer<M6>	1	1
20	404803	Eye Bolt< M6x1.0>	1	1
21	400595	Shackle<3/16" >	1	1
22	408601	Cross Headed Screw<M3×0.5×10L>	4	4
23	300587	Holder B	1	1
24	300597	DC Motor Controller<300W>	1	1
	300599	DC Motor Controller<600W>	1	1

