ELECTRIC CHAIN HOIST

OPERATION MANUAL
&
PART LIST

SERIES: ADVANTAGE 100

#P000009427

ACE WORLD COMPANIES

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 “ACE” ELECTRIC CHAIN HOIST.

CONTENTS

1. FOREWORD

This manual contains important information to help you properly install, operate and maintain the ACE 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 “ACE” electric chain hoist will give you many years of Satisfactory service.

Should you have any queries, please contact:

Ace Wold Companies
10200 Jacksboro Hwy
Fort Worth, TX 76135
1-817-237-7700

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

2. MAIN SPECIFICATIONS

2.1 Specifications

The following specifications are common to all ACE electric chain hoists.

Table 2-1 Specifications

Item		Detail	
Working temperature range (℃)		-5 to +40	
Working humidity range (%)		85 or less	
Protection	Hoist	IP 42	
	Push button	IP 65	
Electric power supply		Three Phase, 460V, 60 Hz	
Noise Level (dB)	Single speed hoist	81	
Chain Size	Wll (working load limit) (t)	Nominal diameter (mm)	Pitch (mm)
	1T	7.1	20.2

Remarks: (1) Contact an authorized ACE 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.

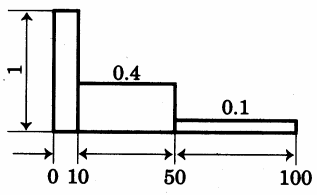
ACE electric chain hoists have been designed according to FEM regulations (FEM 9.511)

Details are provided in Table 2-2.

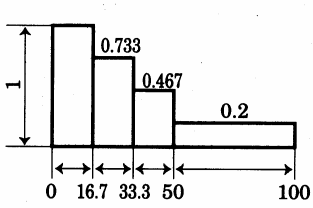
Average daily operating time and total operating time are determined by load distribution.

Table 2-2 Mechanical classification

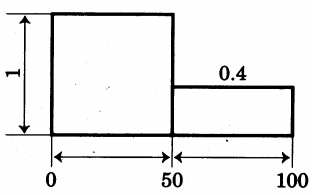
Load Spectrum (Load distribution)	Definitions	Cubic mean value	Average daily Operation time(h)				
1 (light)	Mechanisms or parts thereof, usually subject to very small loads and in exceptional cases only to maximum loads.	k≦0.50	0.25-0.5	0.5-1	1-2	2-4	4-8
2 (medium)	Mechanisms or parts thereof, usually subject to small loads but rather often to maximum loads.	0.50<k ≦0.63	0.12-0.25	0.25-0.5	0.5-1	1-2	2-4
3 (heavy)	Mechanisms or parts thereof, usually subject to medium loads but frequently to maximum loads.	0.63<k ≦0.80	≦0.12	0.12-0.25	0.25-0.5	0.5-1	1-2
4 (very heavy)	Mechanisms or parts thereof, usually subject to maximum of almost maximum loads.	0.80<k ≦1.00	-	≦0.12	0.12-0.25	0.25-0.5	0.5-1
FEM			1Dm	1Cm	1Bm	1Am	2m



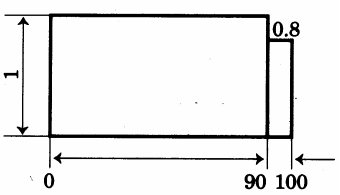
% operating time
Load spectrum 1



% operating time
Load spectrum 2



% operating time
Load spectrum 3



% operating time
Load spectrum 4

2.3 Safety Devices

(1) Motor brake

"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 bottom hook is capable of 360° swivel and fitted with safety latch to ensure safe lifting.

(4) Phase error relay

The Phase error relay circuit has been exclusively developed to prevent motor from running when the phase are incorrectly connected.

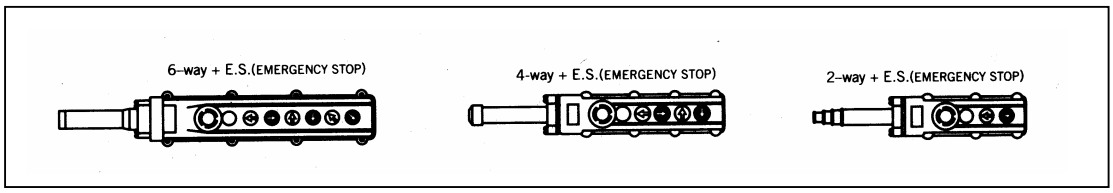
(5) Limit Switches (except YSE series)

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

(6) 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.

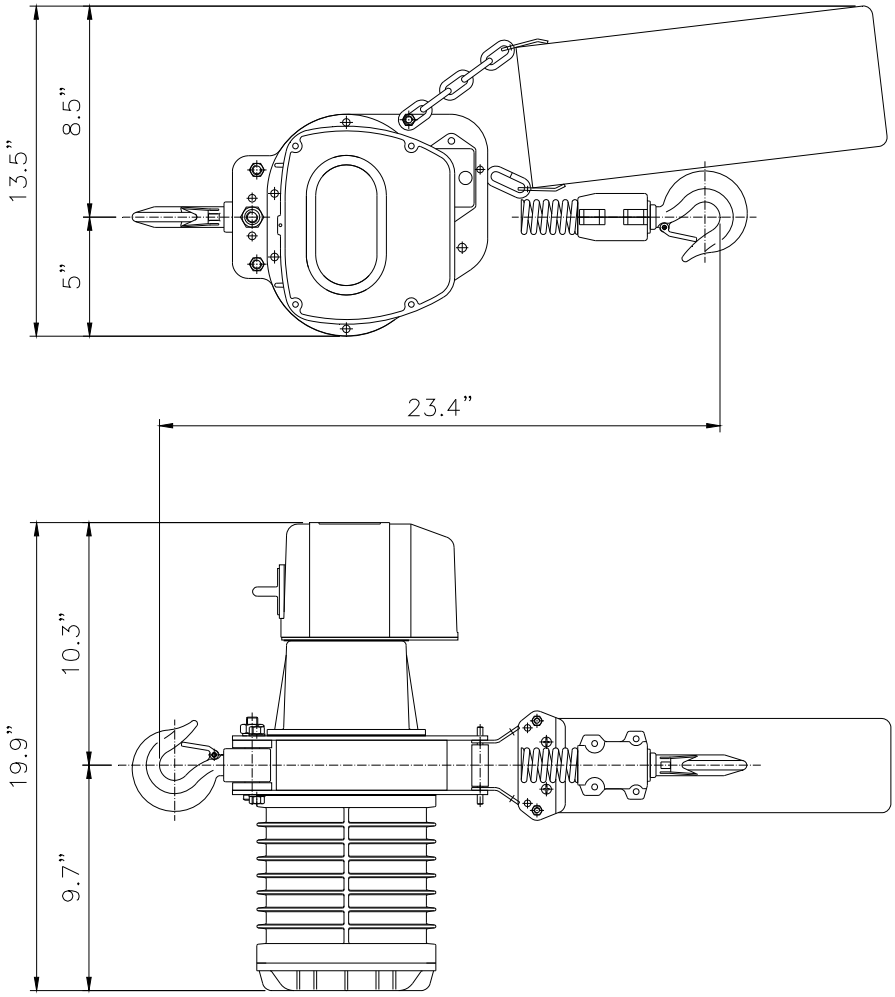
Turning it to the right will release the lock and to enable re-starting. (Illust. 1)



Illust. 1

2.4 Main Specifications and Dimensions:

Model	ADVANTAGE 100
S.W.L.	2200 lbs
Hoist Speed	18 ft/min
Hoist Power	2.0Hp x 4P
Power Supply	3Phase 60Hz 230/460V-110V
Load Chain	ø7.1 x 20.2 mm
Chain Fall	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)

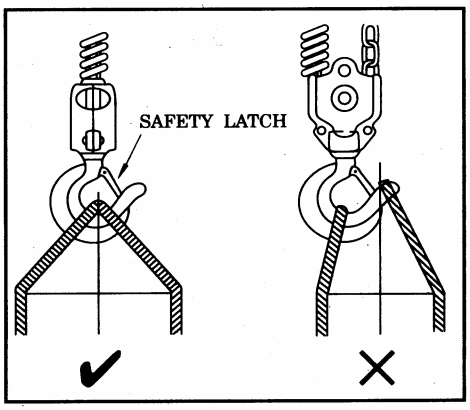
DANGER

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.

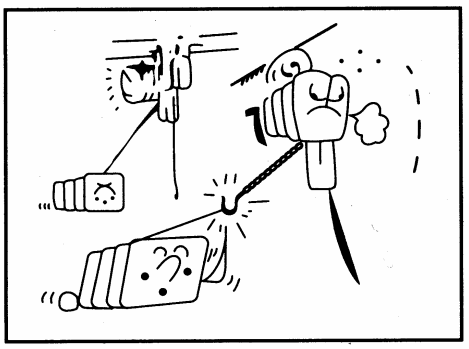
(6) Always make sure the hoist motor completely stops before reversing.

(7) Always leave the pendant button switch cable and bottom hook load chain vertically static after completion of operation, never leave them at any position, which may allow them swing or slip.

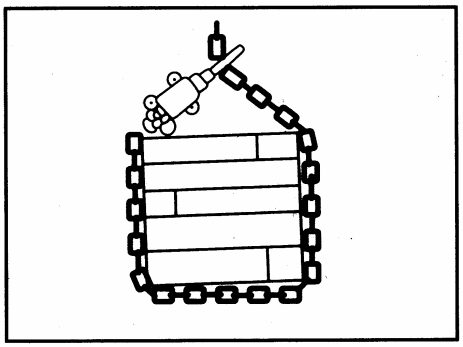
(8) Sling must be applied to load evenly and centrally to ensure correct balance. Never lift any object which is insecure or out of balance.

(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)

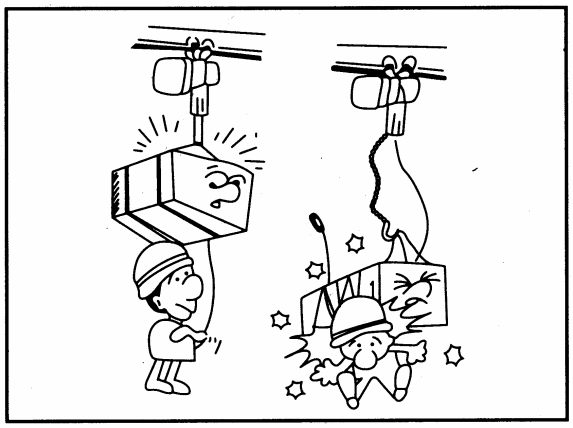
WARNING

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.

(17) Bucket Specifications:

Key No.	Bucket No.	Chain Size (mm)	Chain Length (m)	Bucket Size(mm)	Material
200772	2	7.1	5.6-8.9	150×100×380L	Canvas
200773	3	7.1	9.0-13.5	150×100×470L	Canvas
200774	4	7.1	13.6-20.5	150×100×560L	Canvas
200775	5-1	7.1	18.5	210×140×465×t2	Steel
200776	5-2	7.1	18.6-25.5	210×160×545×t2	Steel
200777	5-3	7.1	25.6-30.5	210×160×665×t2	Steel
200778	5-4	7.1	30.6-40.5	210×170×815×t2	Steel
200779	5-5	7.1	40.6-50.5	210×170×975×t2	Steel
200780	5-6	7.1	50.5-60.5	210×180×1135×t2	Steel

※ Remember to change bucket if the length of chain increased.

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 set
2. Power cable	3 meters
3. Push button control switch	1 piece

Table. 4-1

4.2 Voltage

CAUTION

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

4.3 Installation

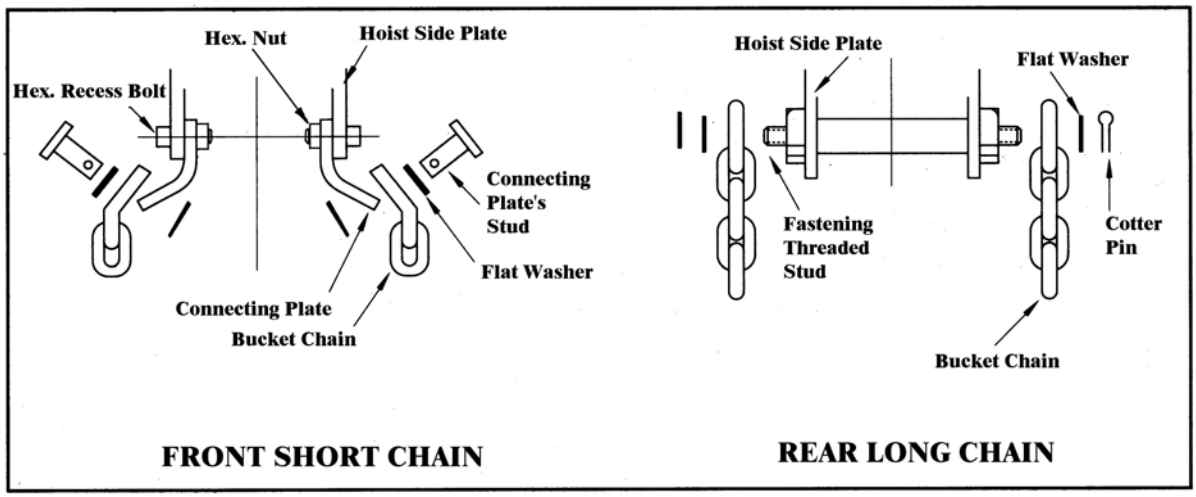
WARNING

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.

NOTE: If the hoist is to be suspended from an electric trolley, assembly may be eased by firstly removing the top hook, just attaching hoist top hook to the trolley load plate.

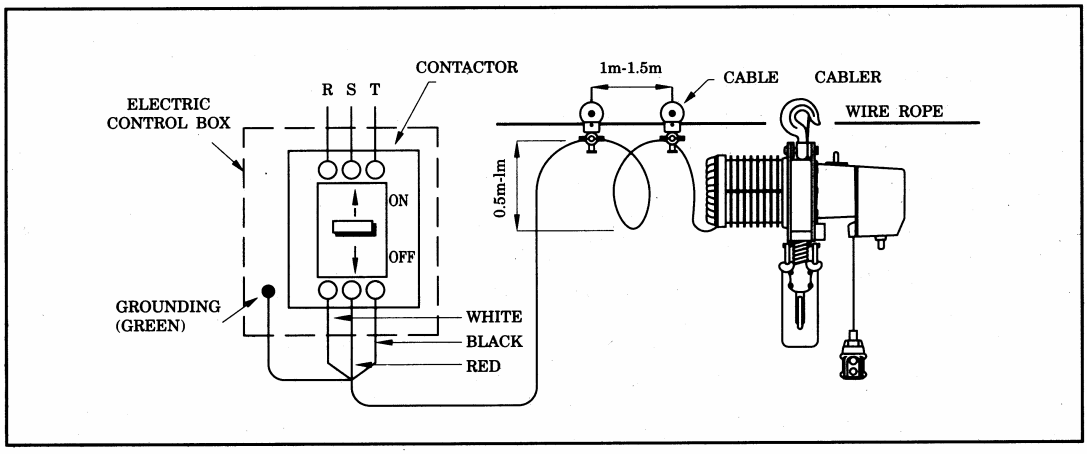
(2) Assemble chain bucket.



Illust. 6

(3) Connect power supply to hoist and operate the push button switch. This operation must be

carried out by a trained person.



(4) Operation Test

(a) Firmly push ⬇ switch button to lower load chain until the limit spring 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.

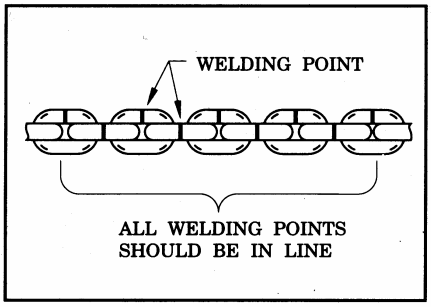
(c) Check the emergency stop device function (if fitted):
While holding down either ⬆ or ⬇ button on the push button switch, push the emergency stop button. Check that the hook stops when the emergency stop button is pushed. Also, check the hoist does not move in response to the push button switch. Finally, 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.

(d) 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.

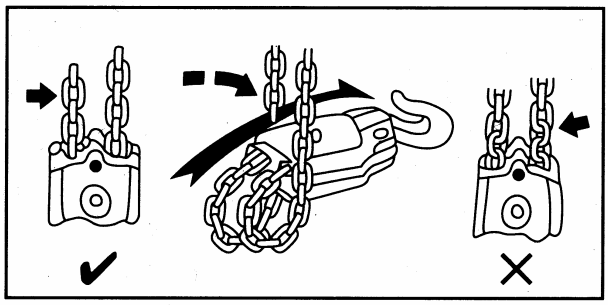
(e) Check chain position. Weld joints on links must face the same direction (Illust. 8), correct chain operation can only be achieved when all joints are vertically in line.

CAUTION

The bottom hook on multi-fall hoist must never be rotated as Shown below. (Illust. 9)



Illust. 8



Illust. 9

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 gear box lubricant after first 500 hours of operation, thereafter every 3 months and lubricant accordingly.

NOTE: WE RECOMMEND USING A LUBRICANT OIL EQUIVALENT TO ISO VG460.

(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) Well lubricated load chain.

(2) Monthly inspection

WARNING

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

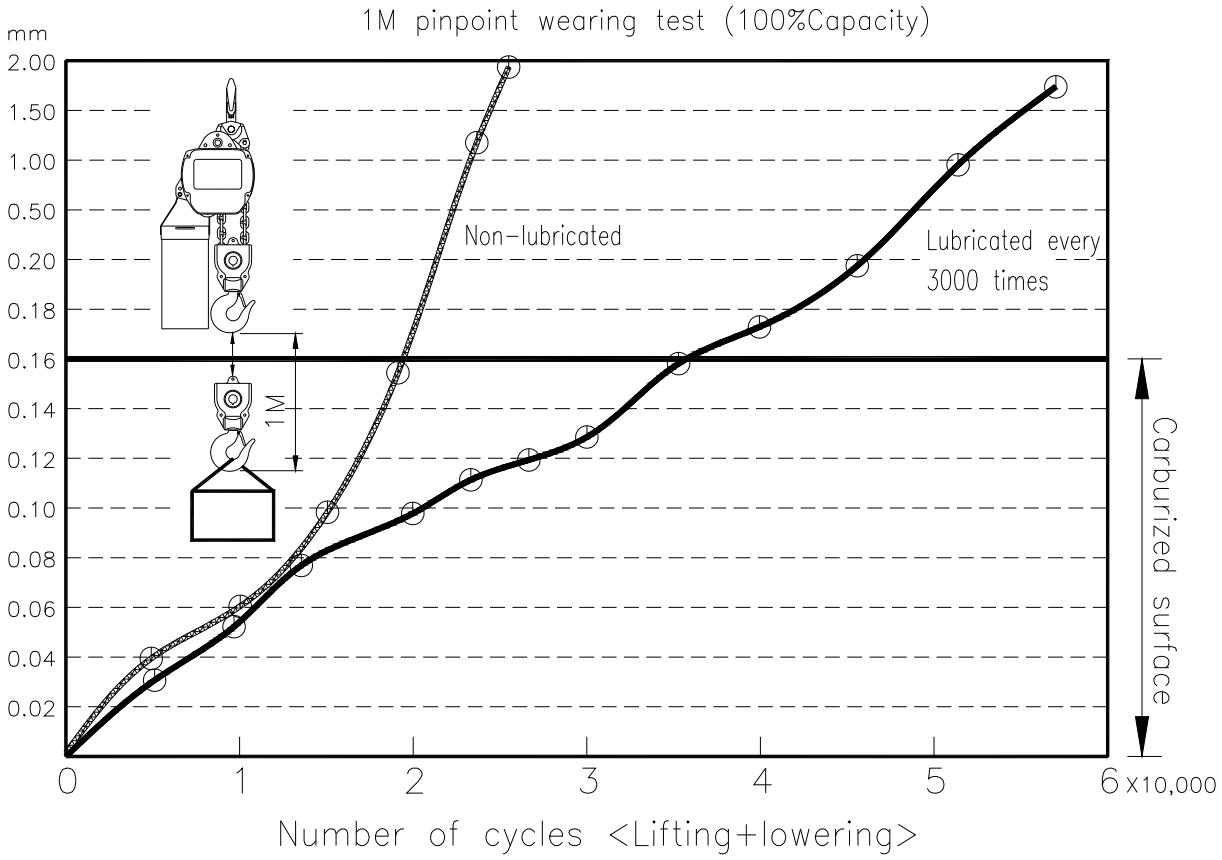
(a) Load chain:

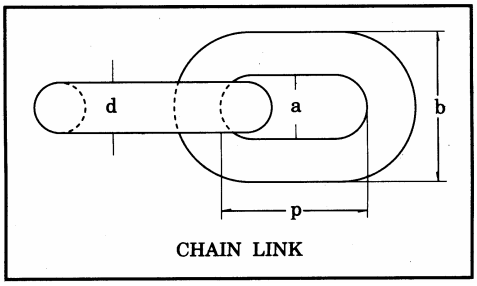
Distorted, elongated or worn chain link will not sit properly on the load sprocket wheel and may cause chain breakage and/or damage to hoist unit. To ensure safe and efficient operation, the chain links must be checked for their pitch (inside length), inside width and outside width monthly according to following table 6-2-a at page 18.

Chain Wearing Test

Load Spectrum	Cubic mean Value	Using times	
		Non-lubricated	Lubricated
1 (Light)	50%	75000	175000
2 (Medium)	63%	55500	129500
3 (Heavy)	85%	30000	70000
4 (Very heavy)	100%	15000	35000

Above testing data under lifting height 1M





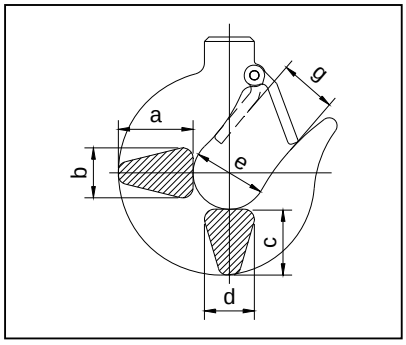
CHAIN LINK

Dia.-Meter (mm) (d)	Load (ton)	Inside Length (mm) (p)	Inside Width (mm) (a)	Outside Width (mm) (b)
7.1	1/2~3	20.2	8.9	23.6

Table 6-2-a

(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)



Capacity		Dimensions(mm)					
	T						
	B	a	b	c	d	e	g
1 Ton	T	33	23	29	23	40	28
	B						

T :Top hook B :Bottom hook

Table 6-2-b

(c) Limit Switches:

WARNING

A qualified electrician should perform this inspection.

Check correct operation of the limit switches. Clean thoroughly and apply a thin lubrication to ensure correct operation.

(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.

(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.

Chain Gauge – Wear and Stretch Measuring

(1) The chain gauge is useful and convenience for measuring.

(2) Please use a chain gauge to measure the chain pitch and diameter, such as illustrations (1) and (2).

(3) Every chain ring must be measured, and the chain must be replaced when one of chain ring is wear or stretch.

(4) It will be a cutting-out possibility if you use a chain fall either wear or stretch during operation.

(5) Do not replace a chain fall by yourself and do please contact specific either service centers or contractors to help you out.

(6) The chain fall must be replaced whole instead of a partial part.

(7) The load sheave, regulator, and chain compressing wheel must be replaced the same time as you do a second time replacement.

Remark :

(1) Chain must be perfect condition without any defects and attachments.

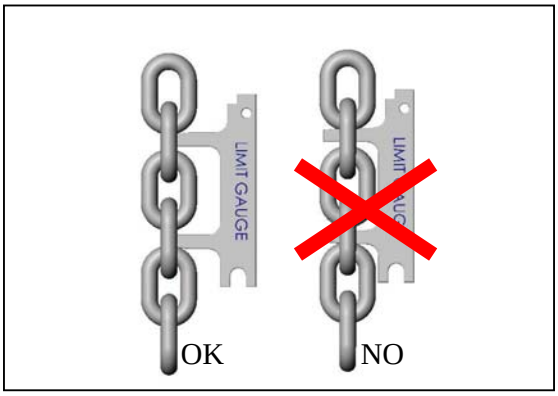


Illustration (1)
Chain pitch measure

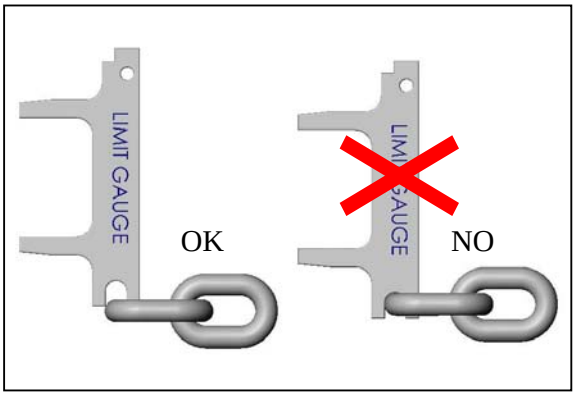
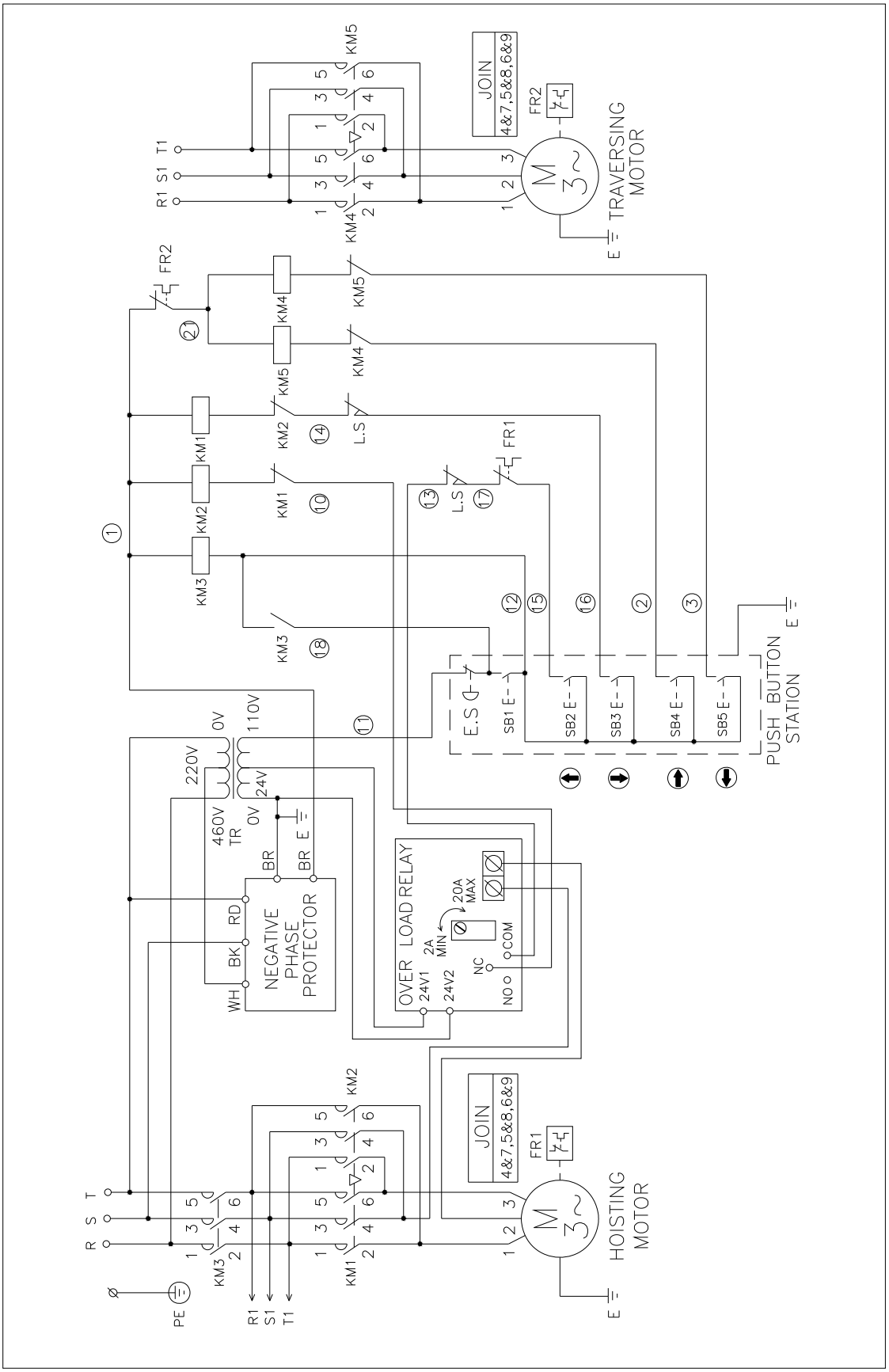


Illustration (2)
Diameter measure

7. TROUBLESHOOTING

7.1 Wiring Diagrams

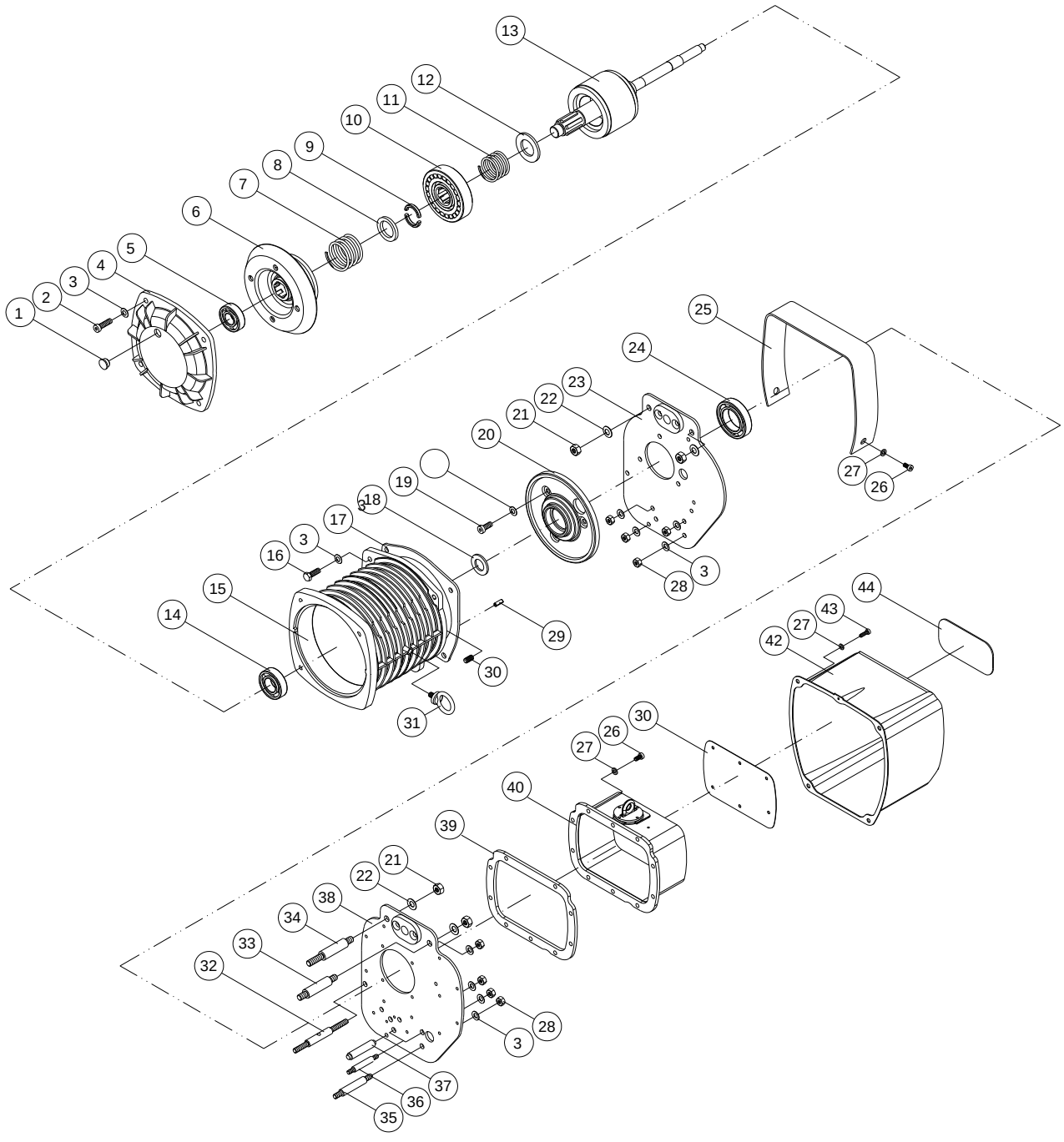


7.2 Troubleshooting and Remedial Action

SITUATION	CAUSE	REMEDY
Hoist will not operate	(1) Phase error relay operated due to incorrect phase connections.	Reverse any two phase connections
	(2) Blown power fuse or tripped power circuit breaker.	Check supply requirements and refuse/reset breaker to meet requirements
	(3) Blown control circuit fuse.	Check fuse for correct rating and replace
	(4) Broken/disconnected power or control circuit wire.	Locate and repair/reconnect
	(5) Low supply voltage	Check if 10% reduction in voltage, have mains supply checked
	(6) Motor hums but does not rotate	Check phases to motor-insulate and repair
	(7) Emergency stop button release pushed (if fitted)	Check the cause as necessary
	(8) Faulty contactor	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
Hoist runs but can't lift rated load(YSE-Series)	Clutch Slipping	Tighten adjusting nut and reverse $1\frac{1}{8}$ circle
Abnormal sound on load chain/chain sprocket	(1) Chain dry (2) Worn chain sprocket	Lubricate Replace load chain and chain sprocket
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

8.Drawings and Parts List

MOTOR EXPLOSION & HOUSING

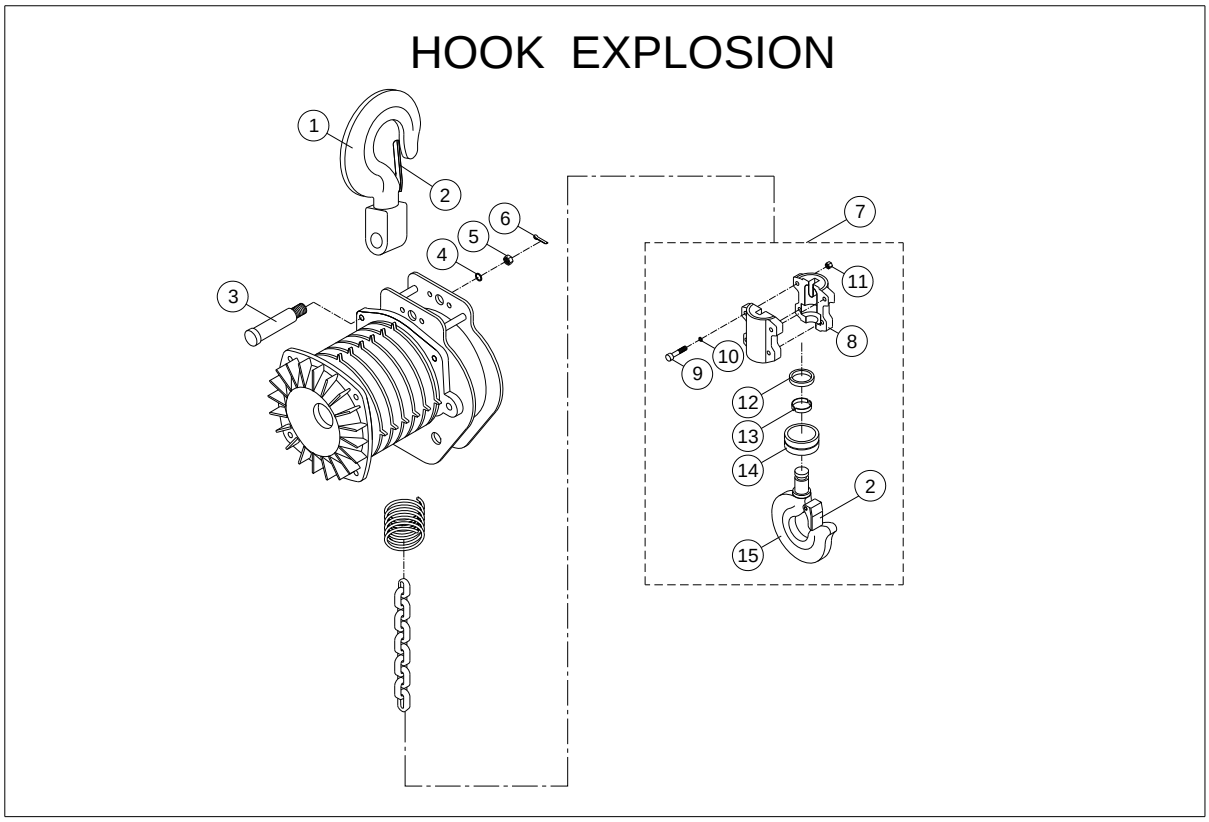


MOTOR ASSEMBLY & HOUSING

KEY NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT
			ADVANTAGE 100
1		Dust Stopper	1
2		Hex. Recess Bolt<M8×1.25×30L>	4
3		Spring Washer<M8>	17
4		Motor End Cover	1
5		Bearing<6204 2RS>	1
6		Brake Drum	1
7		Brake Spring	1
8		End Spacer	1
9		Load Brake Gear Spacer	2
10		Electro-Magnetic Brake Controller	1
11		Spindle Spring	1
12		Spring Pad	1
13		Motor Rotor	1
14		Bearing<6005 ZZ>	1
15		Motor Stator Ass'y	1
16		Hex. Recess Bolt<M8×25L>	2
17		Gasket 5#	1
18		Corrugated Washer<6204>	1
19		Hex. Recess Bolt<M8×20L>	3
20		Flange	1
21		Hex. Nut<M10×1.5>	4
22		Spring Washer<M10>	9
23		Motor Front Plate Ass'y	1
24		Bearing<6008 ZZ>	1
25		Rubber Cover	1
26		Hex. Recess Bolt<M6×12L>	12
27		Spring Washer<M6>	20
28		Hex. Nut<M8×1.25>	8
29		Spring Pin<φ3×16L>	1
30		Threaded Stud<M8×16L>	1
31		Eye Bolt<M8×1.25>	1

MOTOR ASSEMBLY & HOUSING

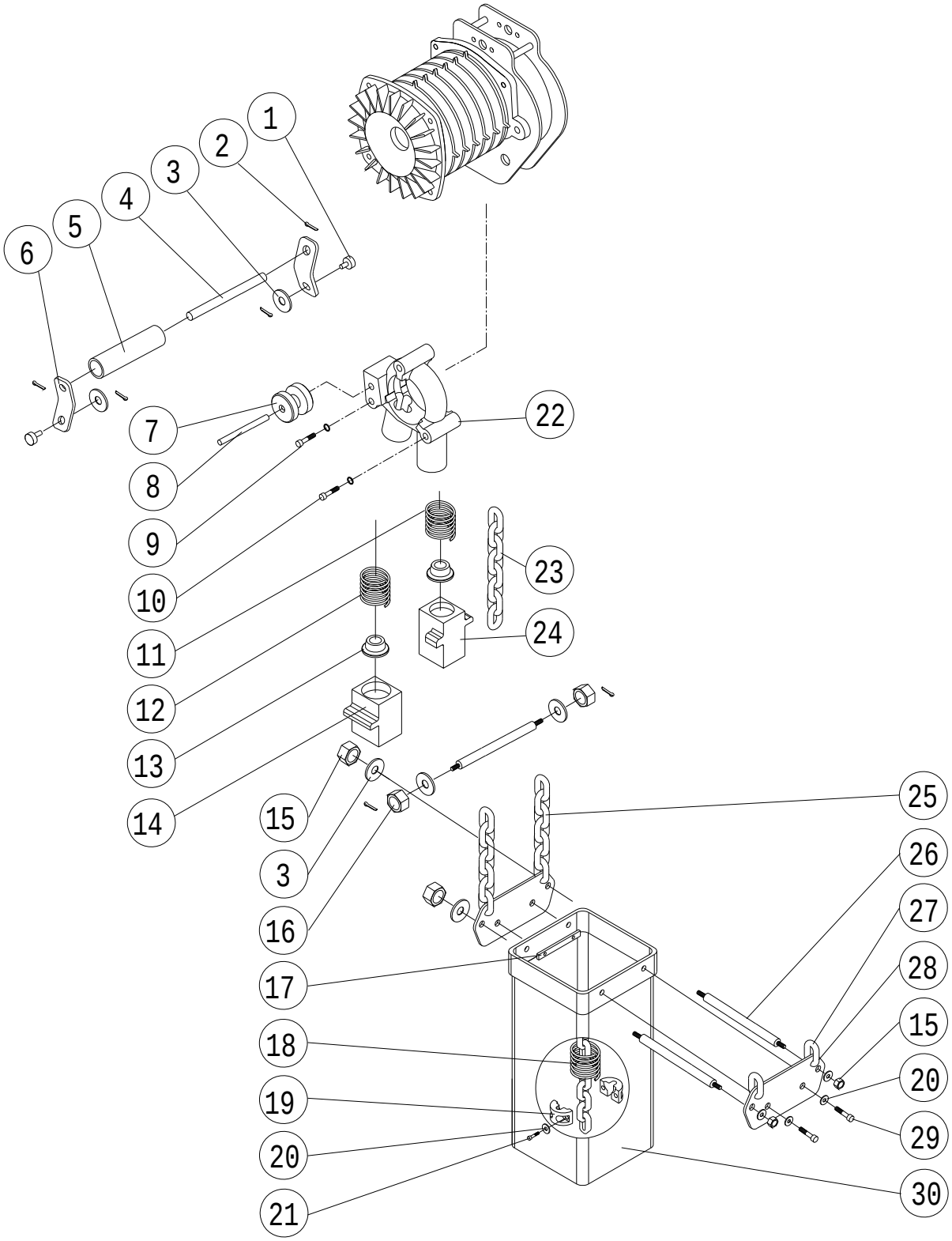
KEY NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT
			ADVANTAGE 100
32		Lock Stud C	1
33		Lock Stud B	1
34		Lock Stud A	1
35		Lock Stud D	1
36		Lock Stud E	2
37		Lock Pin	1
38		Gearbox Endplate	1
39		Gasket 23#	1
40		Gearbox Casing	1
41		Gasket 24#	1
42		Electric Comp Oneness Casing	1
43		Hex. Recess Bolt<M6×1.0×16L>	4
44		Name Plate	1



HOOK ASSEMBLY

KEY NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT
			ADVANTAGE 100
1		Top Hook	1
2		Safety Latch Ass'y	2
3		Lock Bolt	1
4		Spring Washer<M12>	1
5		Hex. Nut<M12×1.75>	1
6		Cotter Pin<3/32" ×1"L>	1
7		Bottom Hook Ass'y	1
8		Bottom Hook Cover Set	2
9		Hex. Recess Bolt<M6×1.0×30L>	4
10		Spring Washer<M6>	4
11		Lock Nut<M6×1>	4
12		End Spacer	1
13		Load Brake Gear Spacer	2
14		Thrust Bearing<2904>	1
15		Bottom Hook	1

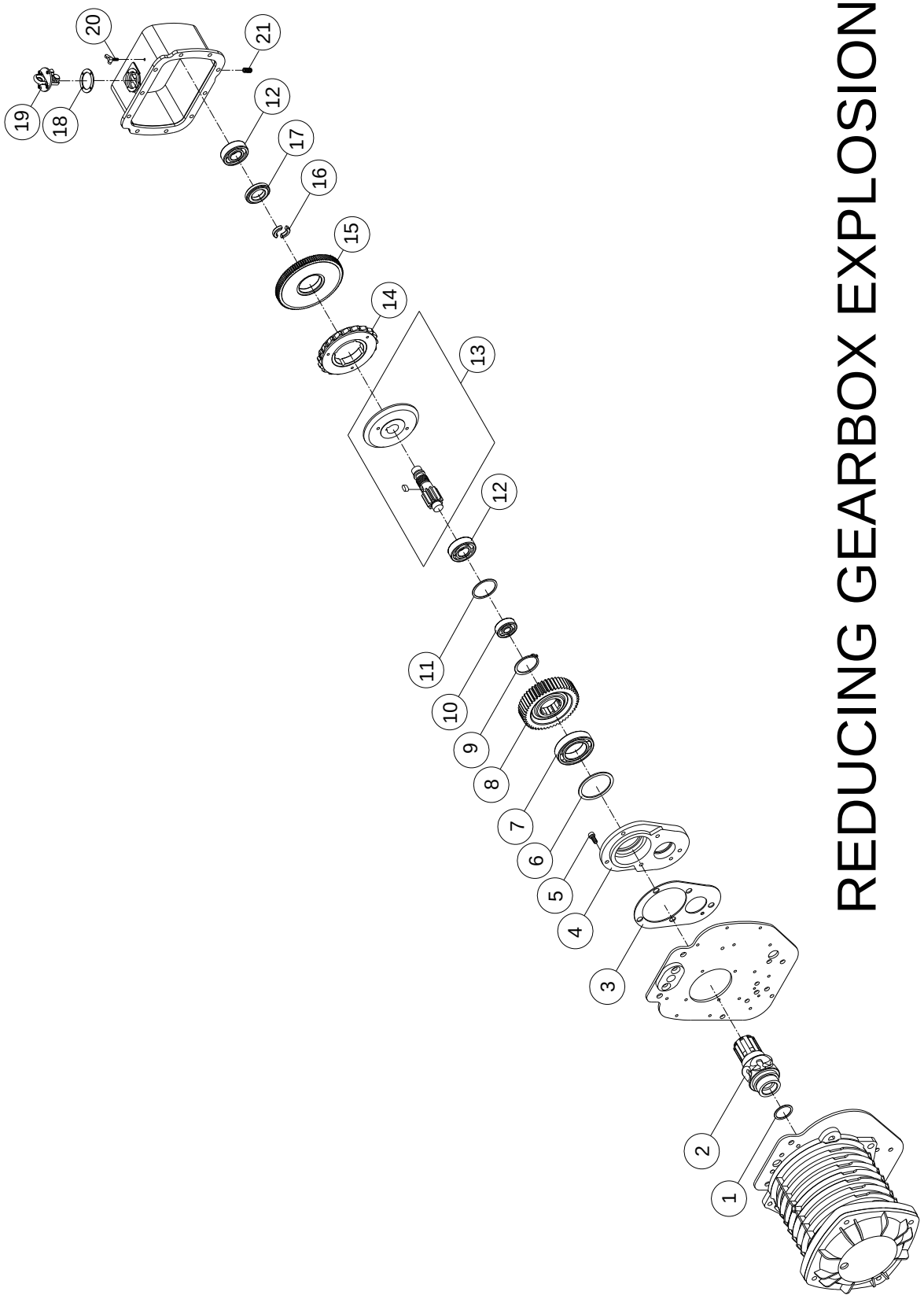
LOAD CHAIN EXPLOSION



LOAD CHAIN SECTION

KEY NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT
			ADVANTAGE 100
1		Pin	2
2		Cotter Pin<3/32"x1"L>	6
3		Flat Washer< φ 22x1.5mm>	4
4		Lock Pin	1
5		Retaining Tube	1
6		Bucket Retaining Pad	2
7		Chain Compressing Wheel	1
8		Compressing Wheel Axle	1
9		Hex. Recess Bolt<M8x1.25x20L>	3
10		Spring Washer<M8>	3
11		Guide Spring A	1
12		Guide Spring B	1
13		Bushing	2
14		Guide Tube B	1
15		Nut<M6x1.0>	4
16		Nut<M8x1.25>	2
17		Bucket Inner Plate	2
18		Limit Spring C	2
19		Chain Stopper	2
20		Spring Washer<M6>	8
21		Hex. Recess Bolt<M6x1.0x20L>	2
22		Regulator	1
23		Load Chain	6M
24		Guide Tube A	1
25		Bucket Chain	2
26		Holding Stud	2
27		Bucket Chain	2
28		Bucket Side Plate	2
29		Cross Headed Screw <M6x1.0x12L>	4
30		Chain Bucket Ass'y	1

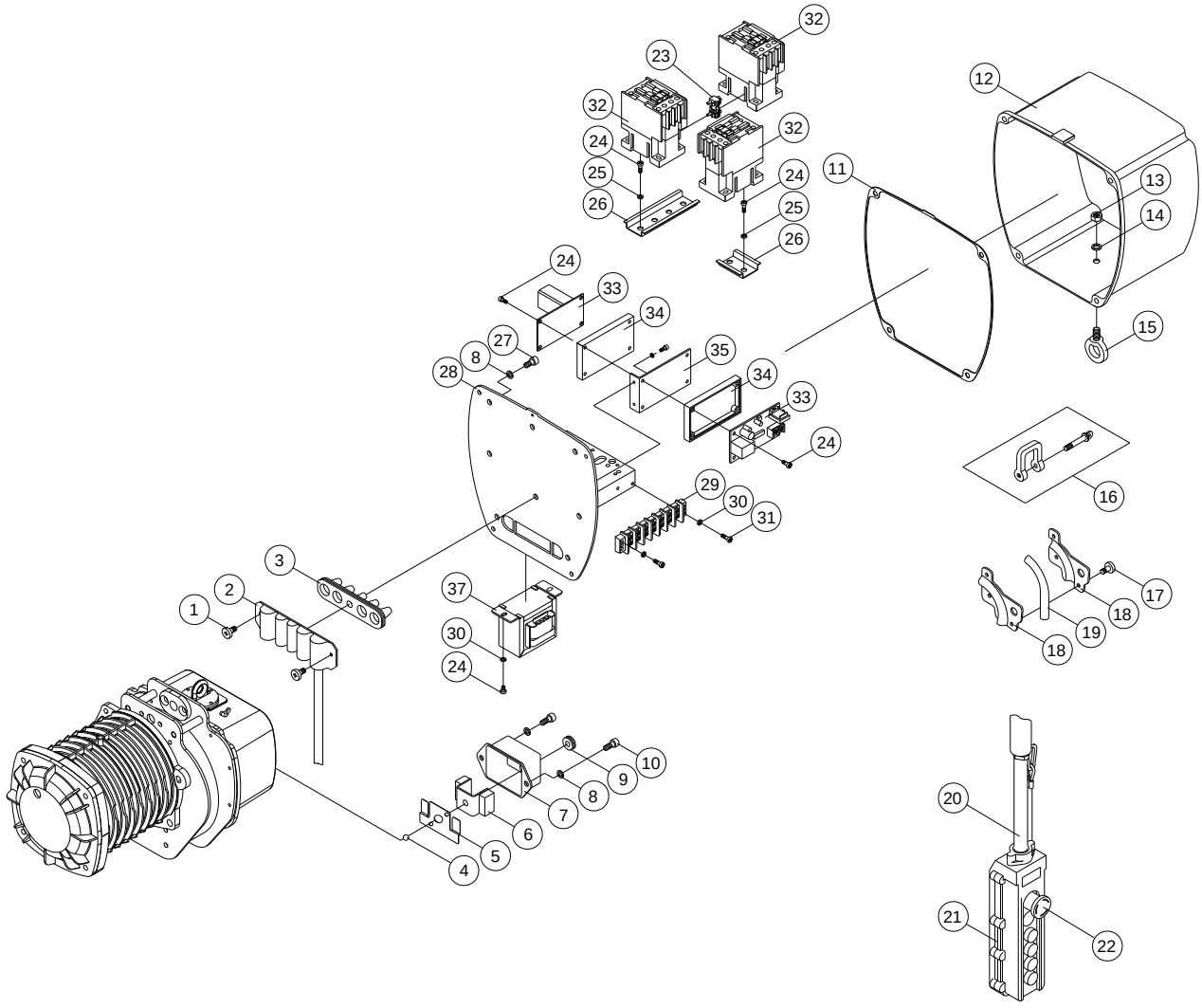
REDUCING GEARBOX EXPLOSION



REDUCING GEARBOX

KEY NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT
			ADVANTAGE 100
1		Oil Seal<17x28x6t>	1
2		Load Sheave	1
3		Gasket 3#	1
4		Flange	1
5		Hex. Recess Bolt<M6x1.0x16L>	5
6		Oil Seal<42x55x9t>	1
7		Bearing<6008>	1
8		Load Brake Gear (4th Gear)	1
9		Retaining Ring<S-40>	1
10		Bearing<6301>	1
11		Oil Seal<25x40x6t>	1
12		Bearing<6203>	2
13		Load Brake Gear Shaft Ass'y(3rd Gear)	1
14		Ratchet Wheel	1
15		Intermediate Gear(2nd.Gear)	1
16		Load Brake Gear Spacer	2
17		End Spacer	1
18		Gasket 4#	1
19		Ratchet Pawl Bracket Ass'y	1
20		Wing Nut<M4x0.7>	1
21		Oil Plug<1/8"PT>	1

ELECTRIC EXPLOSION



ELECTRIC PARTS

KEY NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT
			ADVANTAGE 100
1		Cross Headed Screw<M5x0.8x12L>	2
2		Wire Holder	1
3		Wire Holder Rubber Cap	1
4		Carbon Steel Ball	2
5		Leaf Spring	1
6		Limit Switch Ass'y	1
7		Limit Switch Cover	1
8		Spring Washer<M6>	8
9		Rubber Cap	1
10		Hex. Recess Bolt<M6x1.0x8L>	2
11		Gasket 26#	1
12		Electric Comp Oneness Casing	1
13		Hex. Nut<M8x1.25>	1
14		Spring Washer<M8>	1
15		Eye Bolt	1
16		Shackle	1
17		Cross Headed Bolt<M6x1.0x12L>	3
18		Power Cable Holder(Left)	1
		Power Cable Holder(Right)	1
19		Power Cable	3M
20		Pendant Cable With Wire Rope "Built In"	3M
21		Push Button Switch(Indirect)	1
22		Emergency Stop	1
23		Mechanical Interlock	1
24		Cross Headed Bolt<M4x0.7x6L>	10
25		Flat Washer	4
26		Contactor Rail(2PC)	1
		Contactor Rail(1PC)	1
27		Hex. Recess Bolt<M6x1.0x12L>	6
28		Components Front Plate	1
29		Terminal Block	2
30		Spring Washer<M4>	6

ELECTRIC PARTS

KEY NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT
			ADVANTAGE 100
31		Cross Headed Bolt<M4x0.7x12L>	4
32		Magnetic Contactor(3A1a1b)	3
33		Negative Phase Protector (N.P.P)	1
34		N.P.P/E.O Box	2
35		N.P.P Holding Plate	1
36		Electric Overload(E.O)	1
37		Transformer	1