Electric Chain Hoist

OPERATION MANUAL
&
PARTS LIST

Series:

- ☐ WNH-012
- ☐ WNH-025
- ☐ WNH-050
- ☐ WNH-100

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 and to maximize performance, economy and safety.

Please study its contents thoroughly before putting the electric chain hoist into operation. By practicing correct operating 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 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

Table 2-1 Specifications

Item		Detail	
Working temperature range (℃)		-5 to +40	
Working humidity range (%)		85 or less	
Protection	Hoist	IP 55	
	Push button	IP 65	
Electric power supply		Three Phase,220V~600V, 60Hz Three Phase,220V~600V, 50Hz	
Noise Level (dB)		75	
Chain Size	Type	Nominal diameter (mm)	Pitch (mm)
	WNH-012	4.0	12.0
	WNH-025	6.3	19.1
	WNH-050	7.1	20.2
	WNH-100	8.0	24

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 loads under normal atmospheric conditions.

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

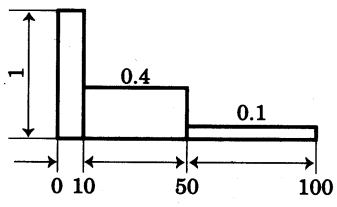
2.2 Mechanical Classification (Grade) and Life

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

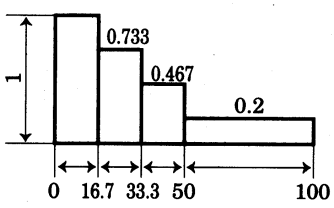
Black Bear electric chain hoists have been designed for grade 2m in the FEM Regulations (FEM 9.5.11). Details are provided in Table 2-2. Average daily operating time and total operating time are determined by load distribution.

Table 2-2 Mechanical classification

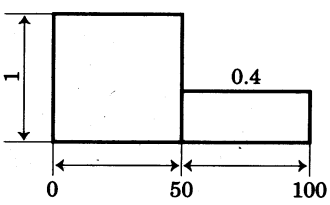
Load Spectrum (Load distribution)	Definitions	Cubic mean value	FEM 2m	FEM 2m
			Average daily Operation time (h)	Total operating time (h)
1 (light)	Mechanisms or parts thereof, usually subject to very small loads and in exceptional cases only to maximum loads.	k≦0.50	4 - 8	12500
2 (medium)	Mechanisms or parts thereof, usually subject to small loads but rather often to maximum loads.	0.50<k ≦0.63	2 - 4	6300
3 (heavy)	Mechanisms or parts thereof, usually subject to medium loads but frequently to maximum loads.	0.63<k ≦0.80	1 - 2	3200
4 (very heavy)	Mechanisms or parts thereof, usually subject to maximum of almost maximum loads.	0.80<k ≦1.00	0.5 - 1	1600



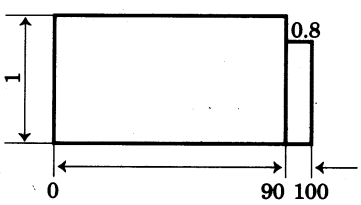
% operating time
Load spectrum 1



% operating time
Load spectrum 2



% operating time
Load spectrum 3



% operating time
Load spectrum 4

2.3 Safety Devices

(1) Motor brake

The “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) 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 a safety latch for added security.

(3) Overload protection device

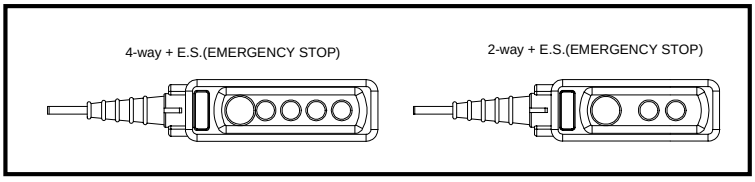
Overload protection device in the form of a slipping clutch prevents damage due to overloading.

(4) Limit switches

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

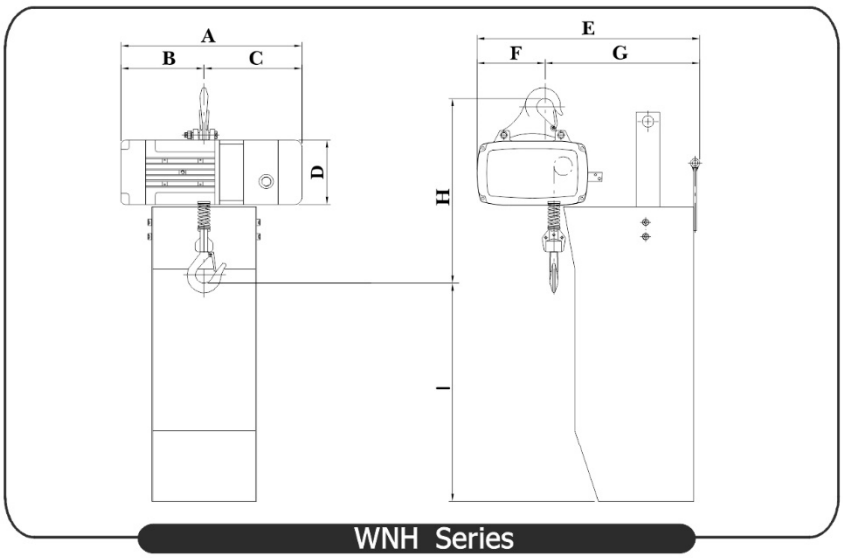
(5) Emergency stop device

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

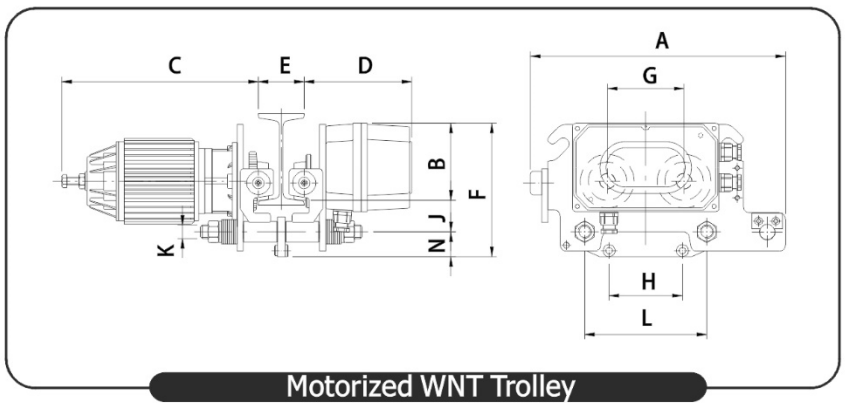
2.4 Specifications and Dimensions



WNH Series

Model	S.W.L. (kg)	Lift (m)	Dimension (mm)									Load Chain	Hoisting				E.D. Rating (%)	Load Chain Fall No.	N.W. / G.W. (kg)
			A	B	C	D	E	F	G	H	I	Dia X pitch (mm)	Speed (m/min)		Motor Power (kW) (Pole)				
													50 Hz	60 Hz	50 Hz	60 Hz			
WNH-012	125	80	380	175	205	135	472	143	329	376	460	ϕ4.0 x12.0	20	20	0.6x2P	0.6x2P	40	1	58/60
WNH-025	250	80	468	221	247	156	534	186	353	485	701	ϕ6.3 x19.1	20	20	1.6x2P	1.6x2P	40	1	111/113
WNH-050	500	80	488	240	248	170	554	188	366	520	710	ϕ7.1 x20.2	20	20	2.5x2P	2.5x2P	40	1	145/148
WNH-100	1000	80	488	240	248	170	624	188	436	520	750	ϕ8.0 x24.0	10	10	2.5x2P	2.5x2P	40	1	145/148

※Operates on single voltage between 220V~600V, 3 ph ※24V or 110V control voltage for operator safety.



Motorized WNT Trolley

Model	Dimension (mm)												Speed (m/min)		Motor Power (kw) (Pole)	N.W. (kg)	Min radius of carve (m)
	A	B	C	D	E	F	G	H	L	J	N	K	50 Hz	60 Hz			
WNT-012	418	124.5	325	180	75-125	217	125.5	120	200	51.5	41	7/8"-9UNC (Ø22.2)	20	24	0.12x2P	45	1.3
WNT-025	418	124.5	325	180	75-125	215	125.5	95.5	200	51.5	39	7/8"-9UNC (Ø22.2)	20	24	0.12x2P	45	1.3
WNT-050	444	124.5	325	180	75-125	215	125.5	120	200	51.5	39	7/8"-9UNC (Ø22.2)	20	24	0.18x2P	45	1.3
WNT-100	479	124.5	325	180	75-125	215	125.5	120	200	51.5	39	7/8"-9UNC (Ø22.2)	20	24	0.18x2P	45	1.3

※Different flange with options available on request. Maximun:300mm

3.SAFETY RULES

DANGER

This hoist 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.

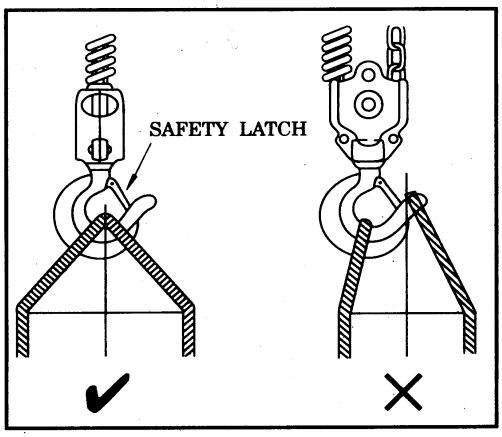
Do not use the hoist in explosive atmosphere.

Only trained personnel are allowed to operate the hoist.

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)

Firm and steady button operation is required. Never push the button switch intermittently.

Always avoid excessive inching operation.

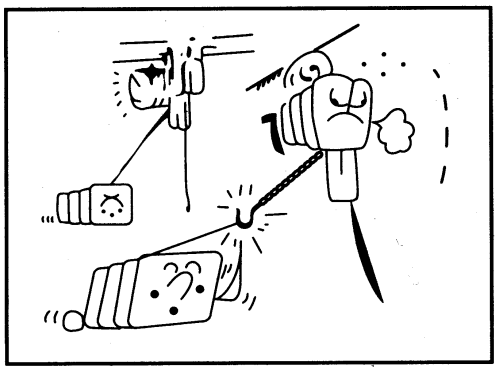
Always make sure the hoist motor completely stops before reversing.

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 to swing or slip.

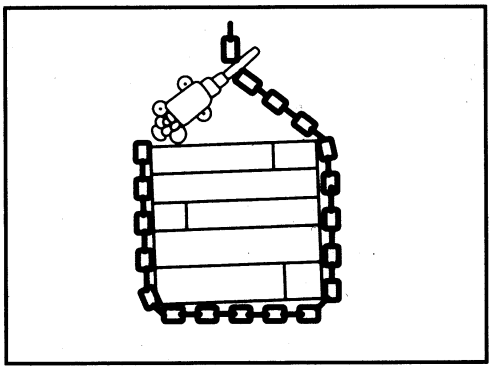
Slings must be applied to load evenly and centrally to ensure correct balance. Never lift any object which is insecure or out of balance.

Never use hoist to end or side pull a load. (Illust. 3)

Never wrap around and hook back the load chain as a sling to lift a load. (Illust. 4)



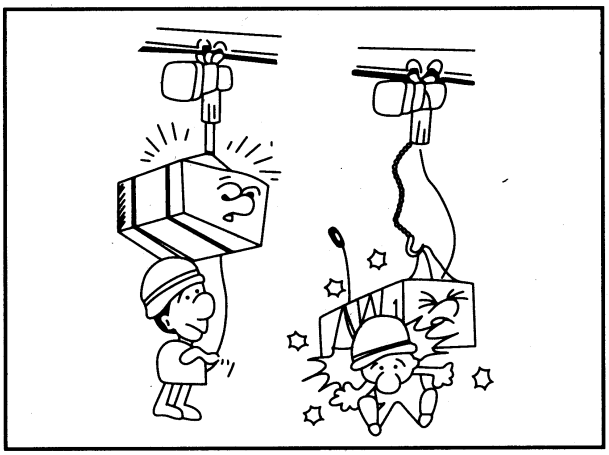
Illust. 3



Illust. 4

Do not use the hoist chain as a welding electrode.

Never stand under a raised load (Illust. 5)



(Illust. 5)

Lifting must always be personally attended. Never leave a raised load unattended.

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

Never lift a load when the load chain is twisted.

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, gearbox 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	0.5 meter
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

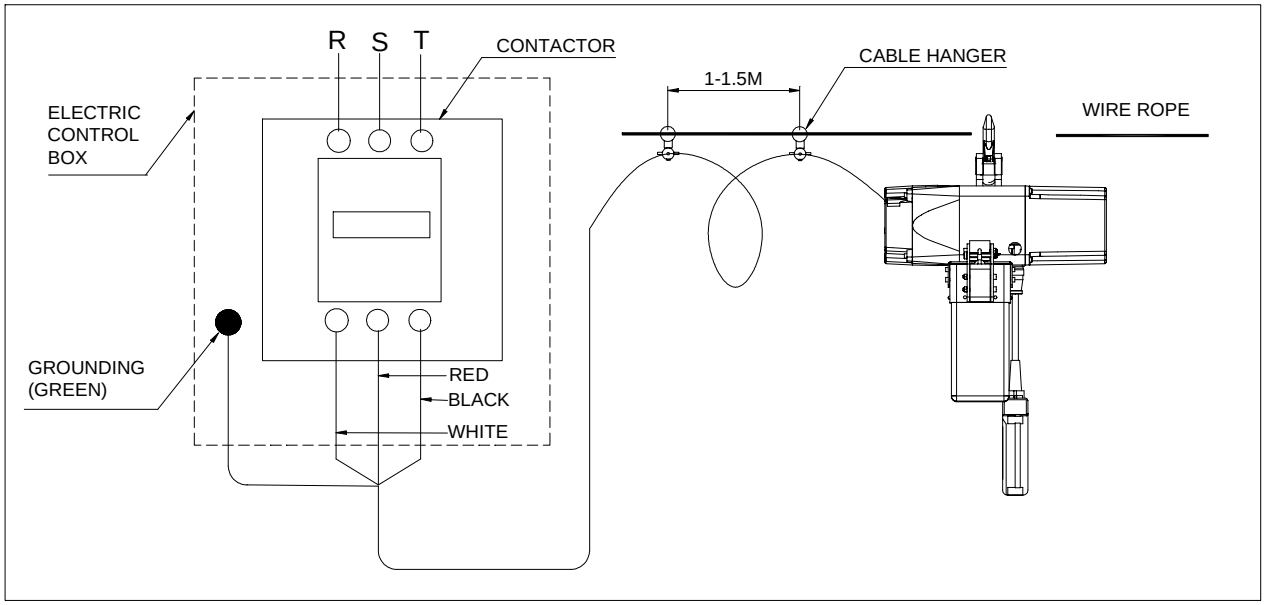
WARNING

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

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, attaching it to the trolley load plate, them refitting the top hook to the hoist.

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



Illust. 7

Operation Test

(a) Please reverse any two connections while the direction is incorrect.

(b) Firmly push ⬇ switch button to lower load chain until the limit spring touches the limit switch. Power should be cut off automatically.

(c) Firmly push ⬆ switch button to check the collection of load chain into chain bucket.

(d) Check the emergency stop device function :

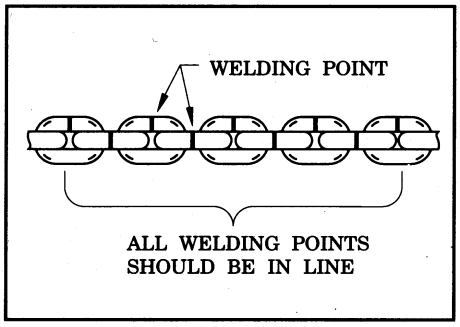
While holding down either ⬆ or ⬇ button on the push button switch, push the emergency stop button. Check that the hook stops when the emergency stop button is pushed. Also, check the hoist does not move in response to the push button switch. Finally, check that the emergency stop device pops out when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

(e) Check load chain lubrication (It has been lubricated at our works, but the lubricant may dry out during transportation). It is also advisable to keep a small amount of lubricant in the chain bucket to keep the chain in an oil bath.

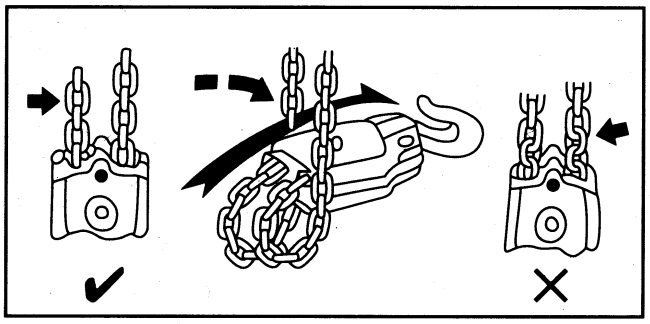
(f) Check chain position. Weld joints on links must face the same direction (Illust. 8). Correct chain operation can only be achieved when all joints are vertically in line.

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 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.

(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 followings:

(a) Correct power supply.

(b) “Up”, “Down” and “Emergency Stop” test runs under no load.

(c) Correct motor performance.

(d) No abnormal or excessive noise.

(e) No malfunction of the bottom hook safety latch.

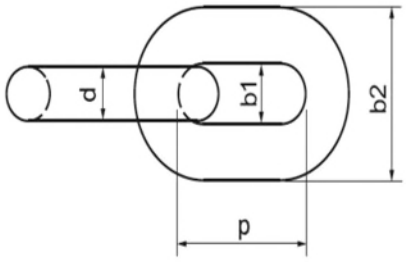
(f) Proper function of moving/turning parts and brake.

(g) Well-lubricated load chain.

2. Monthly inspection

(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.



CHAIN LINK

Dia-Meter (mm) (d)	Load (t)	Inside Length (m/m) (p)	Inside Width (m/m) (b1)	Outside Width (m/m) (b2)	Breaking Load (kN)
Ø4.0	125	12.0	5.0	13.6	20.1
Ø6.3	250	19.1	7.9	21.4	50
Ø7.1	500	20.2	8.1	23.2	63.3
Ø8.0	1000	24.0	10	28	80

Table 6-2-a

WARNING

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

Measuring

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

(2) Please use a chain gauge to measure the chain pitch and diameter, per 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 in part.

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

Note **:** Chain must be in perfect condition without any defects.

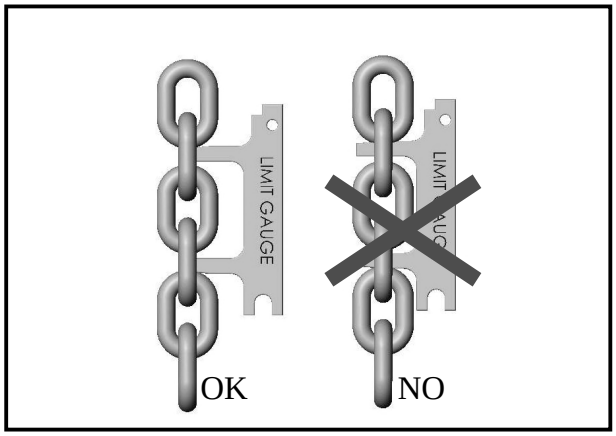


Illustration (1) Chain pitch measure

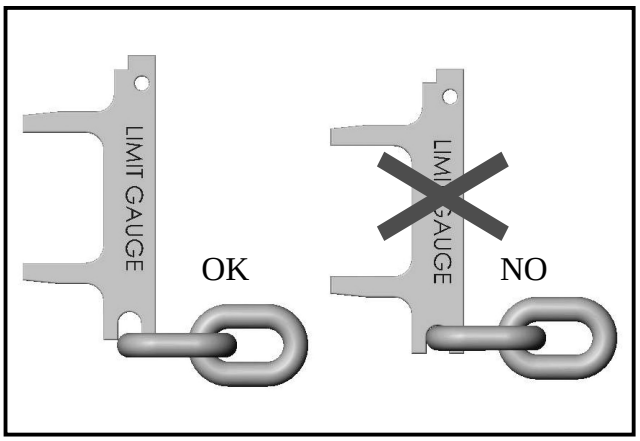
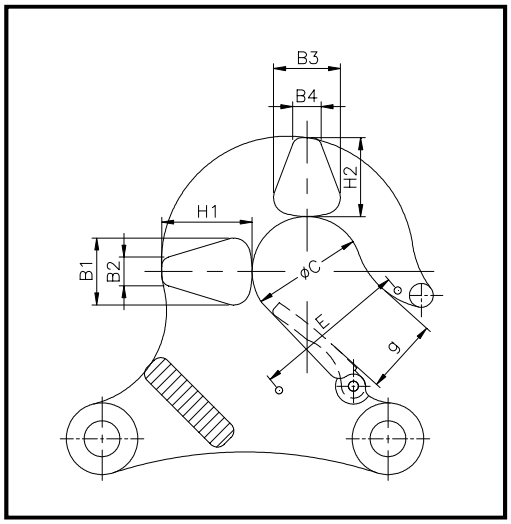


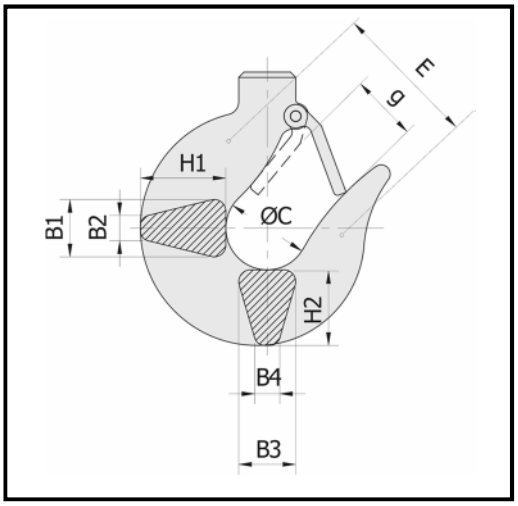
Illustration (2) Diameter measure

(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)



Top Hook



Bottom Hook

Model	Capacity (ton)	Hook	Dimensions (mm)									Allow Stress (kg/mm^2)
			H1	B1	B2	H2	B3	B4	C	g	E	
WNH-012	125kg	T	26.5	17	8	22	17	8	35	22	45	70
		B	20	12	6	20	12	6	36	24	42	70
WNH-025	250kg	T	33	22	10	29	22	10	40	27	55	70
		B	33	23	9	29	23	9	40	28	60	70
WNH-050	500kg	T	38	28	12	33	28	12	46	31	65	100
		B	33	23	9	29	23	9	40	28	60	70
WNH-100	1000kg	T	38	28	12	33	28	12	46	31	65	100
		B	33	23	9	29	23	9	40	28	60	70

Top Hook=T Bottom Hook=B

3. Annual inspection

WARNING

Your dealer should be asked to perform this inspection.

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

(b) Replace gearbox lubricant completely (**WNH-012 / 400C.C., WNH-025/800C.C., WNH-050 &WNH-100 / 1400C.C.**) as following table for your reference.

NOTE：We recommend using lubricant oil equivalent to SHELL OMALA S4 WE 460.

※Table of recommended oils according to DIN 51354

ISO-VG DIN 51519 viscosity At 40℃ mm^2/s (cST)	Approximate viscosity of the VG Categories 50℃ 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-VG DIN 51519 viscosity At 40℃ mm^2/s (cST)	Approximate viscosity of the VG Categories 50℃ mm^2/s (cST)	SHELL	TEXACO	I.P.	AGIP	TOTAL
VG460	251	Omala oil 460	Meropa 460	Mellana 460	Blasia 460	Carter EP 460

The permissible tolerance for each VG category is ±10% of the tabulated values.

(c) Check brake lining for any wear or damage.

(d) On completion of above checks, lift a load several times to ensure good performance of the hoist before starting duty operation.

7. TROUBLESHOOTING

7.1 Wiring Diagrams

(1) 034 for connection of motor leads …….....…… 19
(2) 031 for trolley .....…… 20

The above listed wiring diagram for reference only.
The end user should refer to the wiring diagram stuck to the inside cover of the electric housing.

Our electric specifications apply to the following

(a) 3-Phase

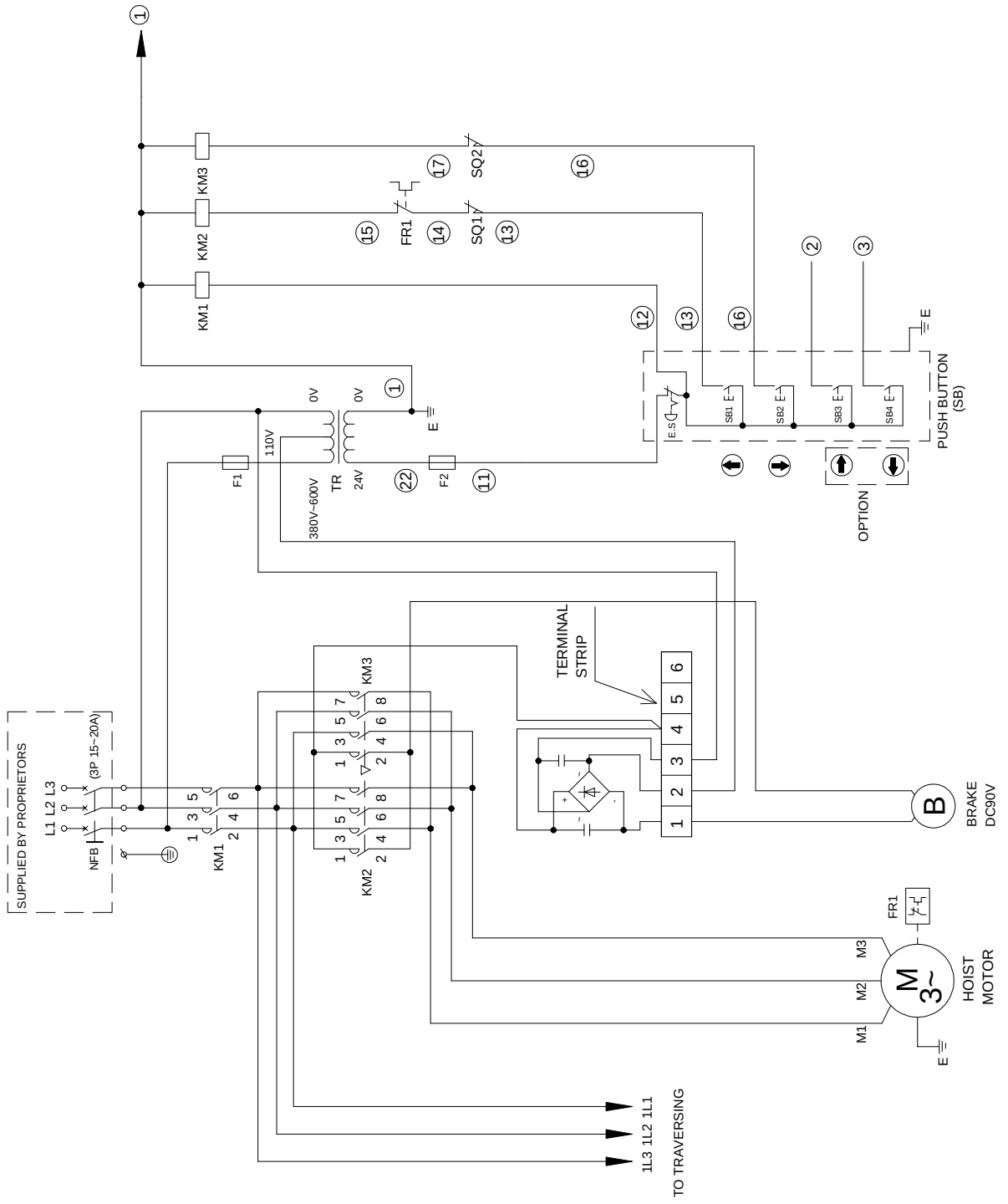
(b) 50Hz&60Hz

Voltage / Hertz	Voltage
50Hz	220V~600V
60HZ	220V~600V

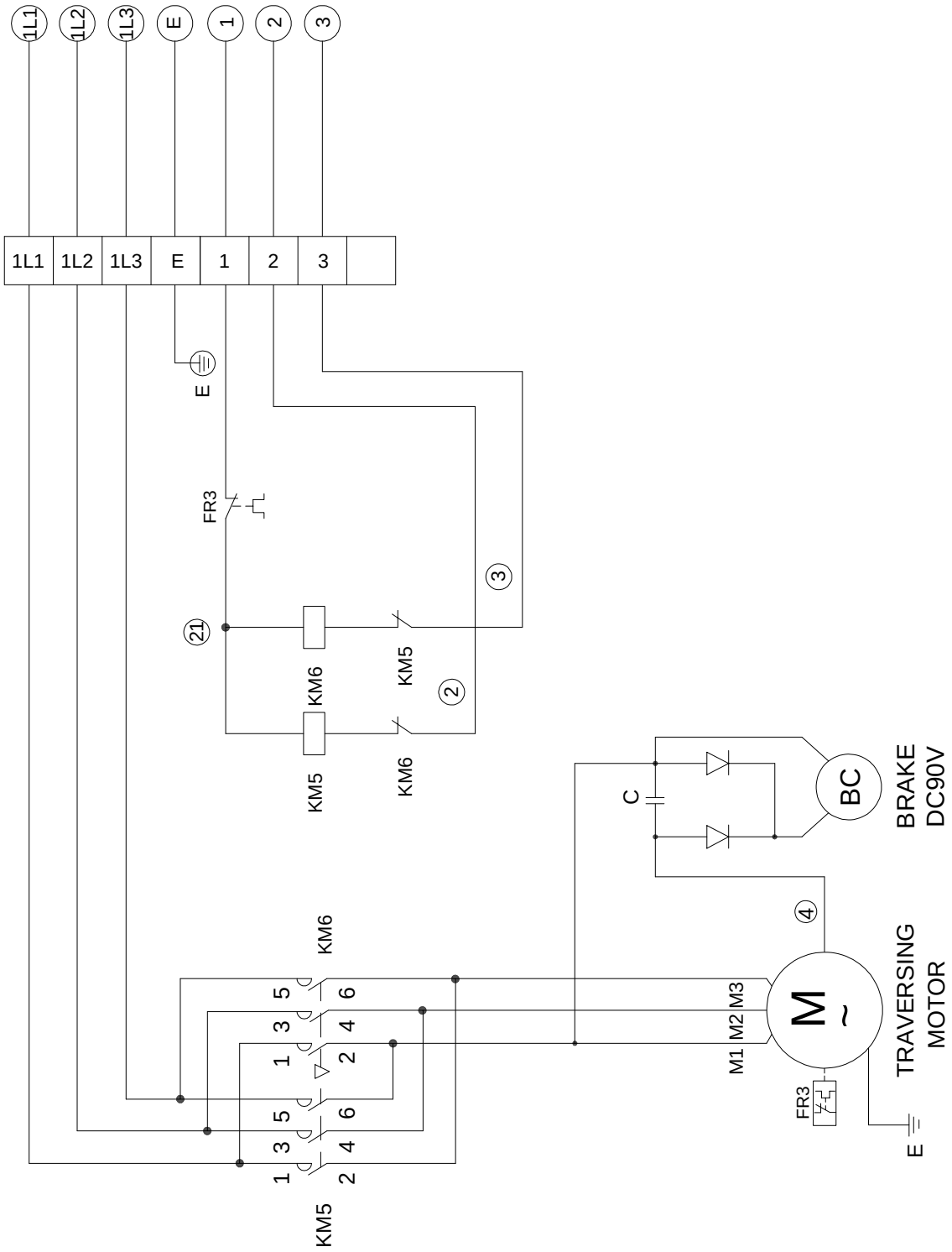
Table 7-1

Warranty Details

1. Warranty Period : One year for Mechanical Spare Parts after purchase the product.
2. Non-Warranty Scope:
   (a) Electrical Spare Parts (ex. Contactor, Pendant, Phase Error Relay, etc.)
   (b) Expense Spare Parts (ex. Chain Bucket, Brake Lining, etc.)
   (c) Damage caused by unsuitable operation.
   (ex. Galvanize plant, Chemical Plant, Dye-work, etc.)
   (d) Damage caused by operate on the wrong electric voltage.
   (e) Damage caused by user amend the product.
   (f) Damage caused by natural disaster.
3. Warranty Scope shall be permitted by Cheng Day Machinery and Within One Year of damaged Mechanical Spare Parts Repair and Replacement.
   (circumstance stated in detail No. 2 are not included.)


034
SUPPLIED BY PROPRIETORS
L1 L2 L3
(3P 15~20A)
NFB
KM1
KM2
KM3
TERMINAL STRIP
BRAKE DC90V
HOIST MOTOR
FR1
M3
M2
M1
1L3 1L2 1L1
TO TRAVERSING
380V~600V
TR
110V
24V
0V
F1
F2
SQ1
SQ2
PUSH BUTTON (SB)
SB1
SB2
SB3
SB4
OPTION

031


1L1
1L2
1L3
E
1
2
3
FR3
21
KM6
KM5
KM5
KM6
KM6
KM5
C
BC
BRAKE
DC90V
4
M ~
M1 M2 M3
TRAVERSING
MOTOR
FR3
E

7.2 Troubleshooting and Remedial Action

SITUATION	CAUSE	REMEDY
Hoist will not operate	(1) Broken/disconnected power or control circuit wire.	Locate and repair/reconnect
	(2) Low supply voltage	Check if 10% reduction in voltage, have main supply checked
	(3) Motor hums but does not rotate	Check phases to motor-insulate and repair
	(4) Emergency stop button release pushed	Check the cause as necessary
	(5) 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 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 (2 falls)	(1) Chain dry (2) Worn chain sprocket (2 falls)	Lubricate Replace load chain and chain sprocket (2 falls)
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 LISTS

(1) MOTOR ASSEMBLY & HOUSING B.O.M ……22

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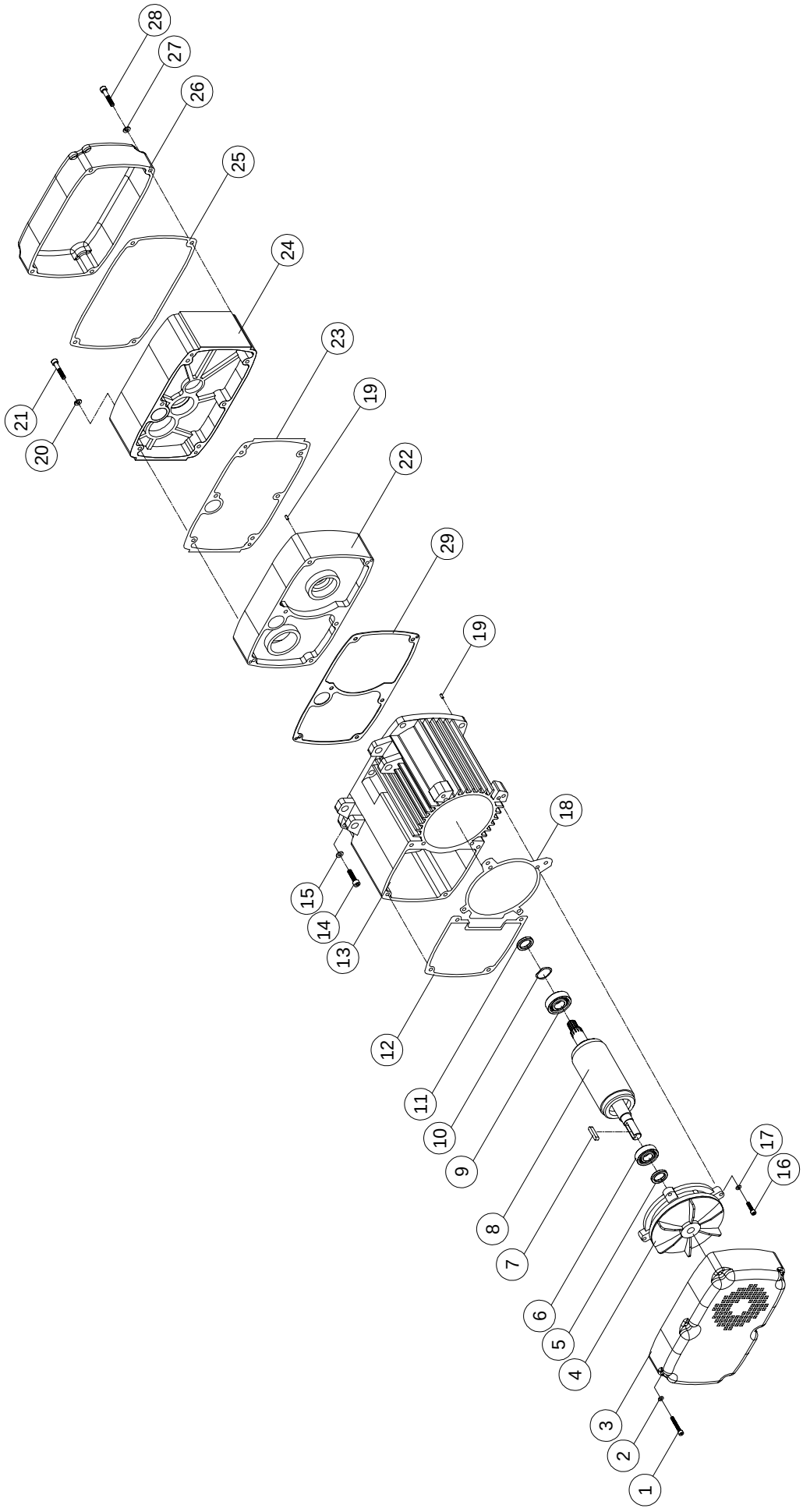
MOTOR EXPLOSION & HOUSING



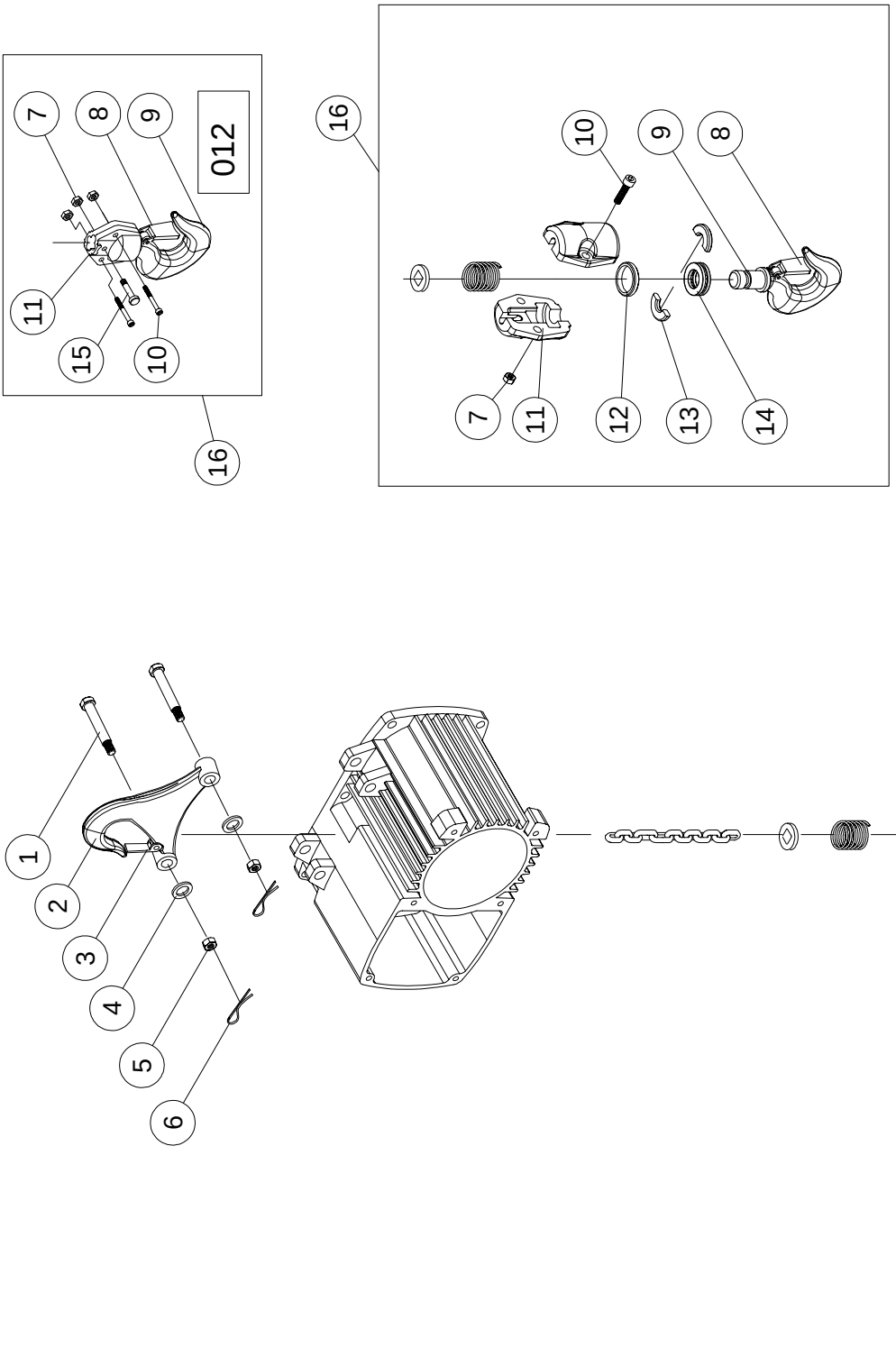
MOTOR ASSEMBLY & HOUSING

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT			
			012	025	050	100
1	408330	Hex. Recess Bolt <M5×0.8×45L>	6			
	408331	Hex. Recess Bolt <M5×0.8×50L>		6		
	408337	Hex. Recess Bolt <M6×1.0×60L>			6	6
2	400854	Spring Washer <M5>	6	6		
	400855	Spring Washer <M6>			6	6
3	301410K	End Cover	1			
	208809K			1		
	301419K				1	1
4	100448	Brake Ass'y	1			
	100449			1		
	100504				1	1
5	400932	Oil Seal <Ø15×Ø30×7t>	1			
	404413	Oil Seal <Ø17×Ø35×8t>		1		
	400186	Oil Seal <Ø20×Ø35×8t>			1	1
6	400111	Bearing <6202 ZZ>	1			
	400732	Bearing <6203 ZZ>		1		
	400130	Bearing <6204 ZZ>			1	1
7	400947	Key <5×5×25L>	1	1		
	400960	Key <5×5×30L>			1	1
8	100315	Motor Rotor	1			
	100316			1		
	100311				1	1
9	400732	Bearing <6203 ZZ>	1			
	400130	Bearing <6204 ZZ>		1		
	400143	Bearing <6205 ZZ>			1	1
10	400577	Wave Washer <6204>		1		
	407553	Wave Washer <6205>			1	1
11	404487	Oil Seal <Ø17×Ø28×6t>	1			
	401801	Oil Seal <Ø20×Ø30×7t>		1		
	412249	Oil Seal <Ø25×Ø45×8t>			1	1
12	402562	End Cover Gasket	1			
	402563			1		
	402564				1	1
13	107834	Motor Stator Ass'y	1			
	107853			1		
	107859				1	1

MOTOR ASSEMBLY & HOUSING

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT			
			012	025	050	100
14	408342	Hex. Bolt <M8×1.25×20L>	6			
	408346	Hex. Recess Bolt <M8×1.25×35L>		6		
	408339	Hex. Recess Bolt <M8×1.25×25L>			6	6
15	400856	Spring Washer <M8>	6	6	6	6
16	400417	Hex. Recess Bolt <M5×0.8×20L>	4			
	405020	Hex. Recess Bolt <M5×0.8×25L>		4		
	400008	Hex. Recess Bolt <M6×1.0×25L>			4	4
17	400093	Spring Washer <M5>	4	4		
	400094	Spring Washer <M6>			4	4
18	402565	Brake Gasket	1			
	402566			1		
	402567				1	1
19	400615	Pin <Ø5×12L>	4	4	4	4
20	400094	Spring Washer <M6>	6	6	6	6
21	405022	Hex. Recess Bolt <M6×1.0×40L>	6			
	405023	Hex. Recess Bolt <M6×1.0×45L>		6		
	400010	Hex. Recess Bolt <M6×1.0×55L>			6	6
22	200960K	Gearbox	1			
	208883K			1		
	200976K				1	1
23	402597	Gearbox Gasket	1			
	402557			1		
	402603				1	1
24	200959K	Gearbox Cover	1			
	208811K			1		
	200977K				1	1
25	402568	Electric Cover Gasket	1			
	402569			1		
	402570				1	1
26	300834K	Electric Cover	1			
	300384K			1		
	300839K				1	1
27	400854	Spring Washer <M5>	4	6		
	400855	Spring Washer <M6>			6	6
28	408330	Hex. Recess Bolt <M5×0.8×45L>	4	6		
	408333	Hex. Recess Bolt <M6×1.0×25L>			6	6
29	402558	Motor Gasket		1		

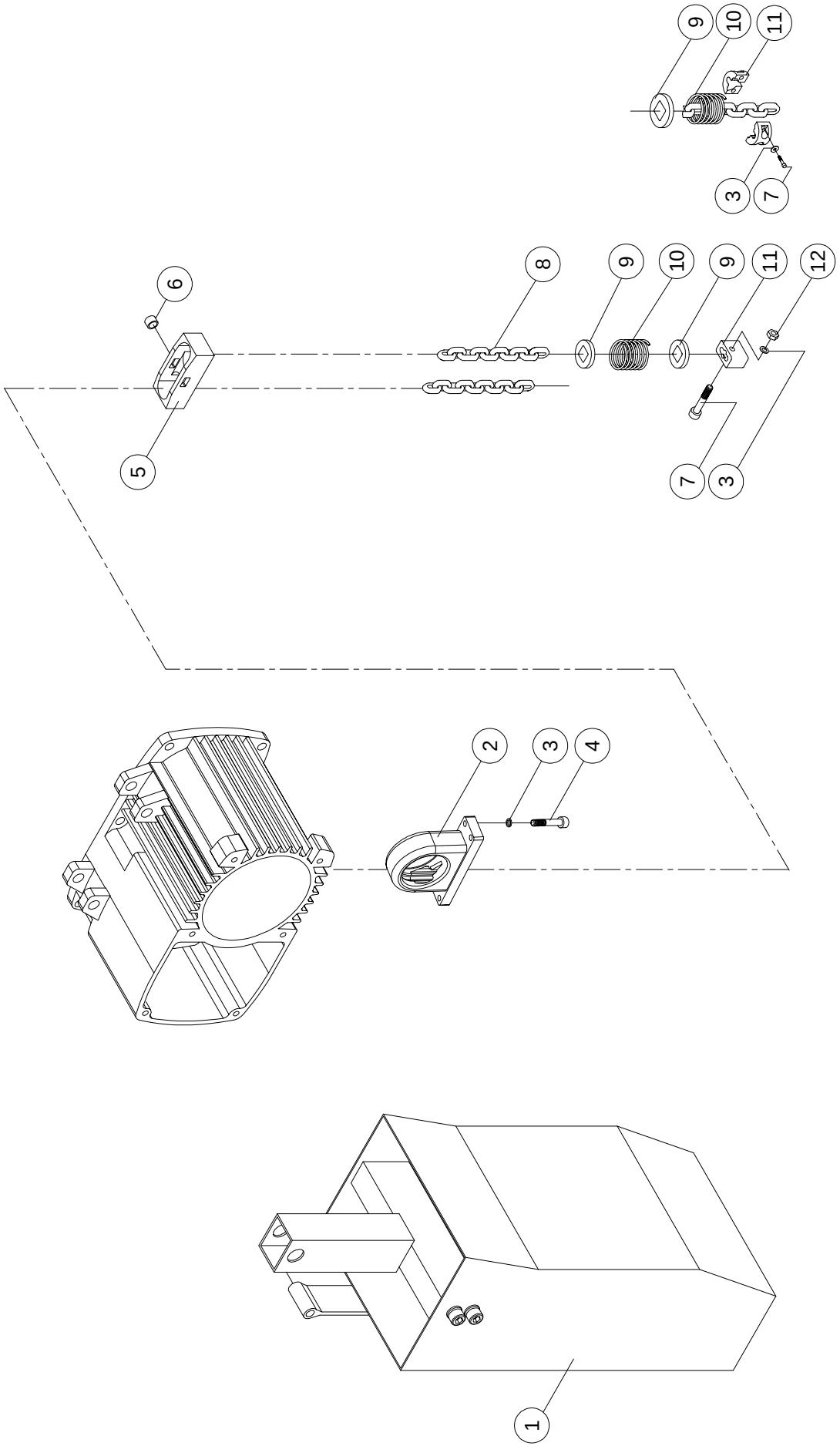
HOOK EXPLOSION



HOOK ASSEMBLY

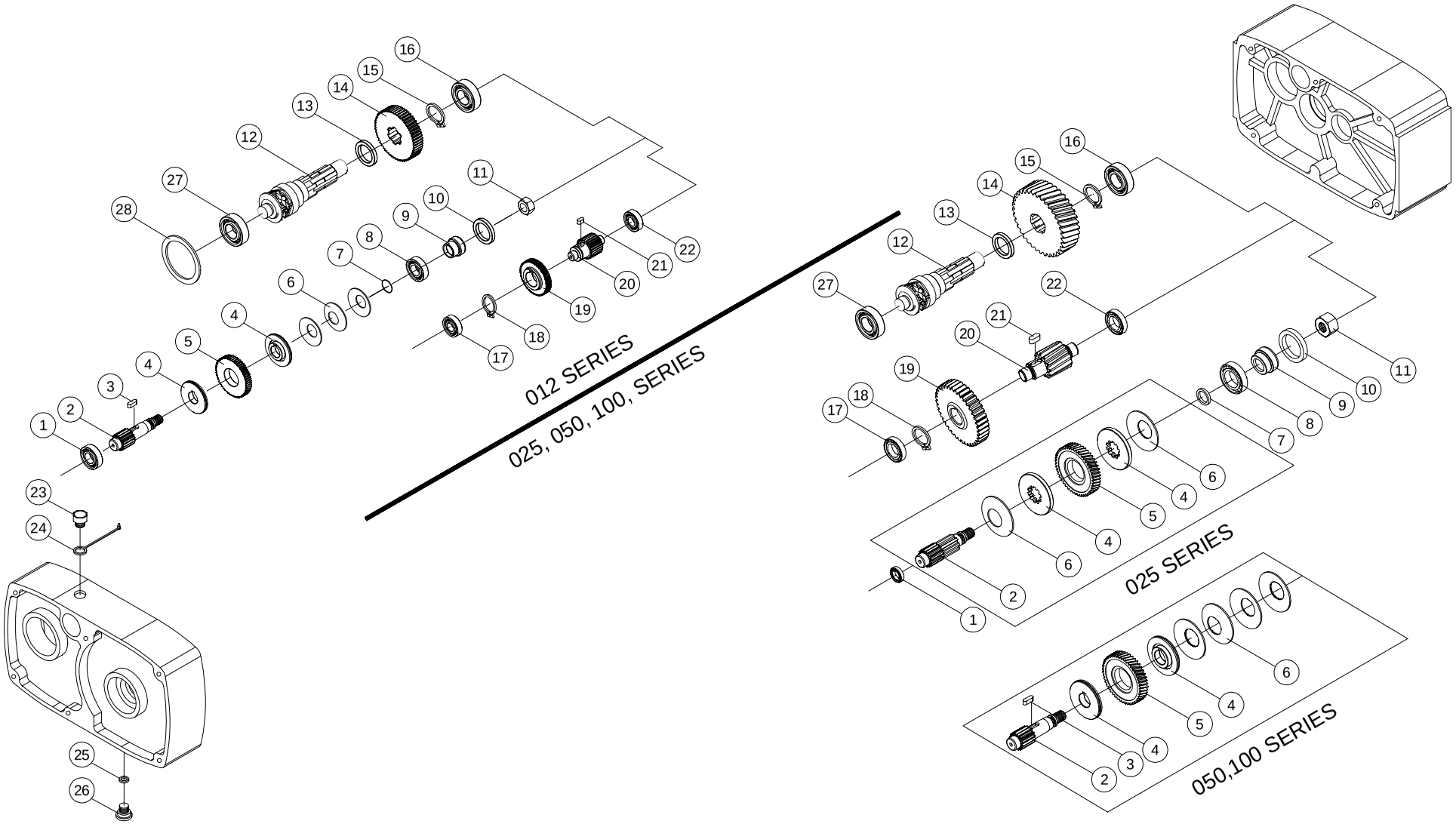
NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT			
			012	025	050	100
1	201368	Lock Bolt <Ø15×69L>	2			
	201310	Lock Bolt <Ø18×88L>		2	2	2
2	200016K	Top Hook Ass'y	1			
	208812K			1		
	200018K				1	1
3	400487	Safety Latch Ass'y	1	1	1	1
4	400096	Spring Washer <M10>	2			
	400097	Spring Washer <M12>		2	2	2
5	400082	Nut <M10×1.5>	2			
	400084	Nut <M12×1.75>		2	2	2
6	400610	Cotter Pin <Ø3×30L>	2	2	2	2
7	400646	Nylon Nut <M5>	3			
	400088	Nylon Nut <M8×1.25>		2	2	2
8	200480	Safety Latch Ass'y	1			
	400487			1	1	1
9	201372K	Bottom Hook Ass'y	1			
	209496K			1	1	1
10	408329	Hex. Recess Bolt <M5×0.8×20L>	2			
	408339	Hex. Recess Bolt <M8×1.25×25L>		2	2	2
11	201371K	Bottom Block Cover	2			
	268308K			2		
	268309K				2	
	268310K					2
12	200131	End Spacer		1	1	1
13	200127	Half Spacer		2	2	2
14	400830	Thrust Bearing <51102>	1			
	400157	Thrust Bearing <2904>		1	1	1
15	200445	Spring Pin <Ø10×25.5L>	1			
16	201370K	Bottom Hook Cover Ass'y	1			
	271031K			1		
	271032K				1	
	271033K					1

LOAD CHAIN EXPLOSION



LOAD CHAIN ASSEMBLY

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT			
			012	025	050	100
1	268268	Chain Bucket 14#	1			
	268287	Chain Bucket 15#		1	1	
	268296	Chain Bucket 16#				1
2	208871	Chain Regulator	1			
	208872			1		
	208873				1	
	208874					1
3	400093	Spring Washer <M5>	4			
	400094	Spring Washer <M6>		4	4	4
4	400003	Hex. Recess Bolt <M5×0.8×16L>	4			
	400006	Hex. Recess Bolt <M6×1.0×16L>		4	4	4
5	202473	Collision Block	1			
	202474			1		
	202475				1	1
6	201388	Spacer <Ø15×12L>		1		
7	400417	Hex. Recess Bolt <M5×0.8×20L>	1			
	400007	Hex. Recess Bolt <M6×1.0×20L>		2	2	2
8	408709	Chain <Ø4.0×12>	80.3			
	408708	Chain <Ø6.3×19.1>		80.4		
	408707	Chain <Ø7.1×20.2>			80.5	
	408703	Chain <Ø8.0×20.2>				80.5
9	200442	Limit Stopper Ass'y	4			
	200310			2	2	
	268351					6
10	408485	Spring	2			
	408502			2	2	
	408558					2
11	200441	Chain Stopper	1			
	200200			1	1	1
12	400646	Nylon Nut <M5>	1			



GEAR BOX EXPLOSION

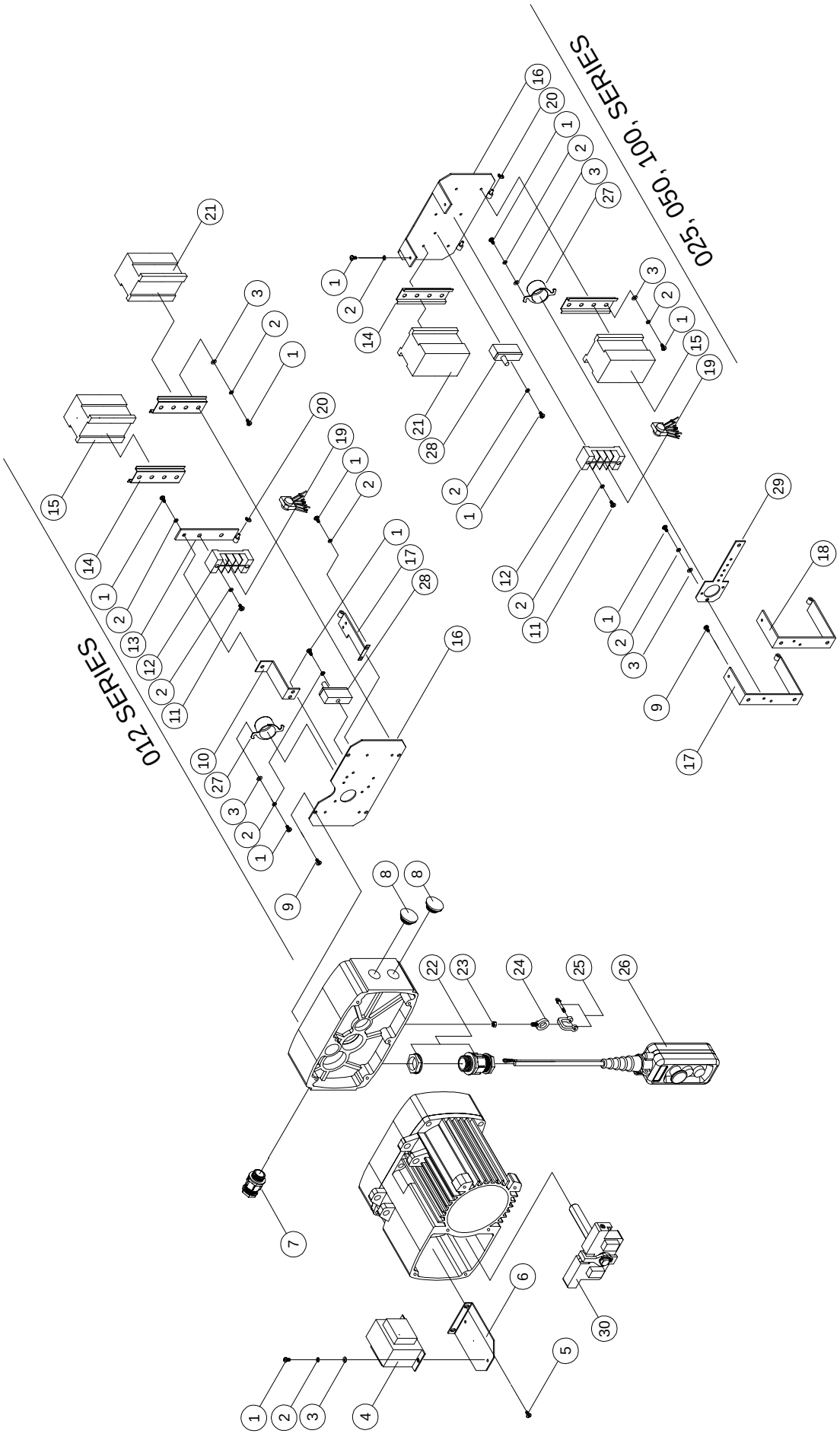
GEAR BOX ASSEMBLY

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT			
			012	025	050	100
1	407869	Bearing <6002 ZZ>	1			
	407839	Bearing <6000 ZZ>		1		
	400694	Bearing <6203 Z>			1	1
2	208878	3rd Gear <M1 33T>	1			
	208884	3rd Gear <M2×15T>		1		
	208888	3rd Gear <M2×20T>			1	
	208892	3rd Gear <M2×13T>				1
3	405933	Key <5×5×15L>	1	1		
	400960	Key <5×5×30L>			1	1
4	201362	Brake Disc	2			
	208890			2		
	201345				2	2
5	201357	2nd Gear <M0.8×60T>	1			
	200941	2nd Gear <M1.25×46T>		1		
	201348	2nd Gear <M1.5×46T>			1	1
6	407324	Disc Spring <Ø34×Ø16.3×2.0t>	3			
	408403	Disc Spring <Ø40×Ø16.3×2.0t>		3	4	4
7	404343	O-Ring <Ø9×Ø15×3>	1	1	1	1
8	407868	Bearing <6904 ZZ>	1			
	407858	Bearing <6905 ZZ>		1	1	1
9	201363	Oil Seal Bushing <Ø25×21L>	1			
	208891	Oil Seal Bushing <Ø30×19>		1		
	201343	Oil Seal Bushing <Ø30×23L>			1	1
10	400943	Oil Seal <Ø25×Ø35×5t>	1			
	404411	Oil Seal <Ø30×Ø40×6t>		1	1	1
11	404552	Nylon Nut <M12×1.25>	1			
	400090	Nylon Nut <M12×1.25>		1	1	1
12	208875	Load Sheave	1			
	208882			1		
	208894				1	
	208897					1
13	400893	Oil Seal <Ø30×Ø42×8t>	1			
	404476	Oil Seal <Ø32×Ø62×10t>		1		
	404401	Oil Seal <Ø40×Ø72×12t>			1	1
14	208881	6th Gear <M1.25×51T>	1			
	200945	6th Gear <M2.25×36>		1		
	201306	6th Gear <M2.5×54T>			1	1
15	400192	Retaining Ring <S-25>	1			
	404161	Retaining Ring <S-38>			1	1
16	407840	Bearing <6004 ZZ>	1			
	400130	Bearing <6204 ZZ>		1		
	400803	Bearing <6205 Z>			1	1

GEAR BOX ASSEMBLY

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT			
			012	025	050	100
17	407867	Bearing <6001 ZZ>	1			
	400111	Bearing <6202 ZZ>		1		
	400695	Bearing <6204 Z>			1	1
18	400191	Retaining Ring <S-20>	1			
	400192	Retaining Ring <S-25>			1	1
19	208879	4th Gear <M1×48T>	1			
	208885	4th Gear <M2×33T>		1		
	208889	4th Gear <M2×36T>			1	
	208893	4th Gear <M2×43T>				1
20	201301	5th Gear <M1.25×18T>	1			
	200944	5th Gear <M2.25×12T>		1		
	201305	5th Gear <M2.25×12T>			1	1
21	400961	Key <6×6×10L>	1			
	400963	Key <6×6×15L>		1		
	400974	Key <8×8×20L>			1	1
22	407867	Bearing <6001 ZZ>	1			
	400111	Bearing <6202 ZZ>		1		
	400787	Bearing <6205 Z>			1	
23	200926	Hexagan Oil Plug	1	1	1	1
24	200927	Air Plug	1	1	1	1
25	400225	O-Ring <Ø8×Ø12×2>	1	1	1	1
26	400600	Lubricant Drain Bolt	1	1	1	1
27	400732	Bearing <6203 ZZ>	1			
	400108	Bearing <6006 ZZ>		1		
	407861	Bearing <6206 ZZ>			1	
	407852	Bearing <6305 ZZ>				1
28	208877	Gasket	1			

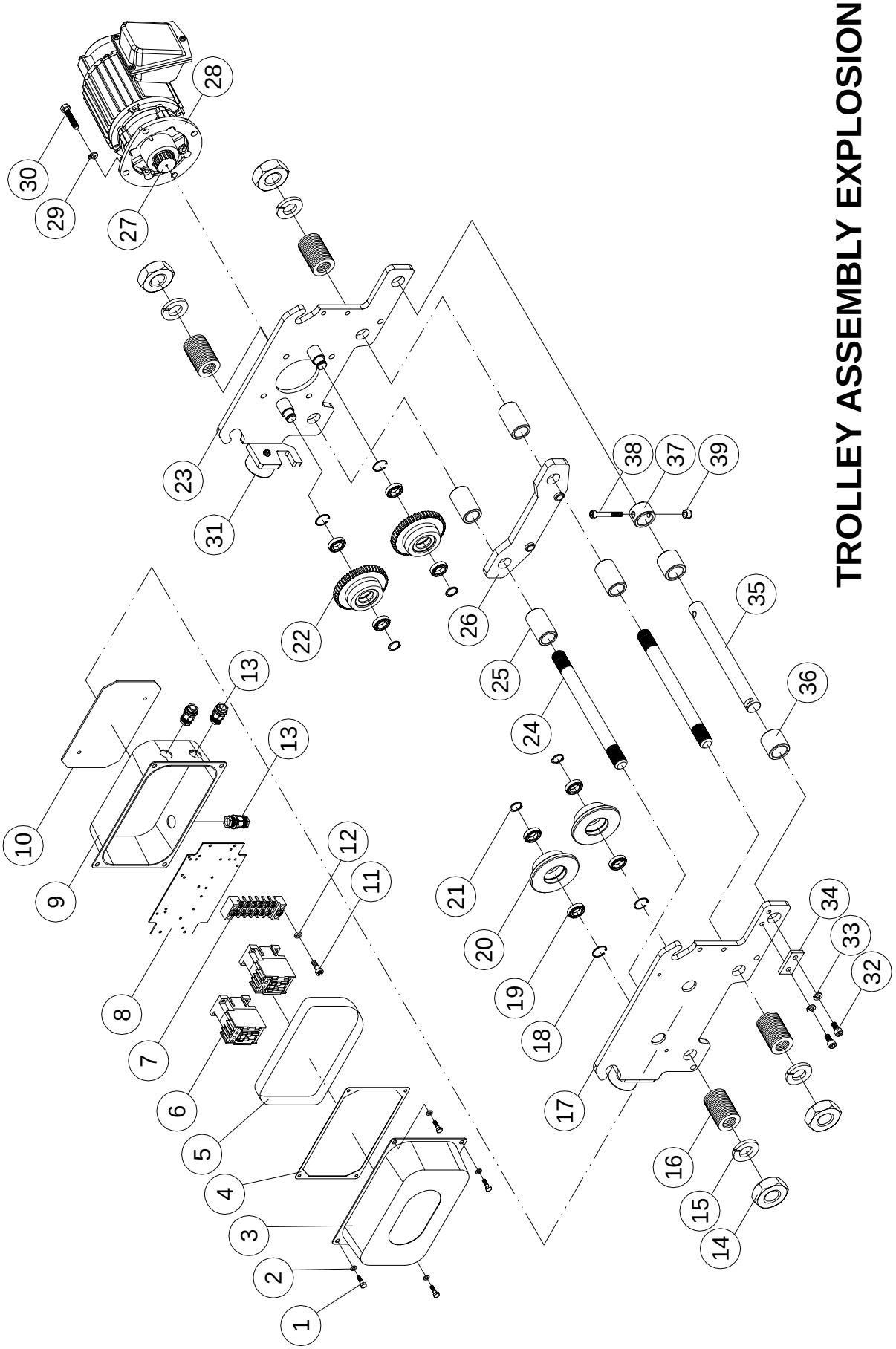
ELECTRIC EXPLOSION



ELECTRIC ASSEMBLY

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT			
			012	025	050	100
1	400048	Cross Headed Screw <M4×0.7×6L>	11	18	18	18
2	400092	Spring Washer <M4>	17	24	24	24
3	400661	Flat Washer <M4>	8	10	10	10
4	300436	Transformer PS-116 220V,380V/24V,48V	1	1	1	1
	300438	Transformer PS-117 230V,460V/48V,110V				
	303766	Transformer PS-129 415V/24V,48V				
	300914	Transformer PS-159 400V/24V,48V				
5	408361	Cross Headed Screw <M5×0.8×8L>	2	2	2	2
6	300628	Transformer Bracket	1	1	1	1
7	400222	Cable Gland <M20>	1	2	2	2
8	408436	Rotation Plug	1	1	1	1
9	408360	Cross Headed Screw <M5×0.8×10L>	4	4	4	4
10	201391	Terminal Plate A	1			
11	400051	Cross Headed Screw <M4×0.7×12L>	2	2	2	2
12	300646	Terminal Block	1			
	300228			1	1	1
13	201392	Bracket Ass'y	1			
14	300079	Contactor Rail	2	2	2	2
15	300045	Contactor <48V 4A>	1	1		
	300065	Contactor <24V 4A>				
	301689	Contactor <48V 4A>			1	1
	301688	Contactor <24V 4A>				
16	201394	Electric Bracket Ass'y	1			
	300382			1	1	1
17	201393	Bracket Located Seat	1			
	300383	Bracket Located Seat A		1	1	1
18	300261	Bracket Located Seat B		1	1	1
19	300143	Rectifier	1	1	1	1
20	404252	E-Retaining Ring <Ø5>	1	2	2	2
21	300044	Contactor <48V 3A1b>	1	1		
	300064	Contactor <24V 3A1b>				
	301693	Contactor <48V 3A1b>			1	1
	301692	Contactor <24V 3A1b>				
22	400941	Cable Gland <M25>	1	1	1	1
23	400087	Nylon Nut <M6>	1	1	1	1
24	404803	Eye Bolt <M6×1.0>	1	1	1	1
25	400595	Shackle <3/16">	1	1	1	1
26	312062	Push Button Switch	1	1	1	1
27	208836	Cover	1			
	208838			1	1	1
28	300589	Fuse Ass'y	1	1	1	1
29	208837	Cover Plate		1	1	1
30	302514	Upper & Lower Limit Switch	1			
	302515			1		
	302516				1	1

TROLLEY ASSEMBLY EXPLOSION



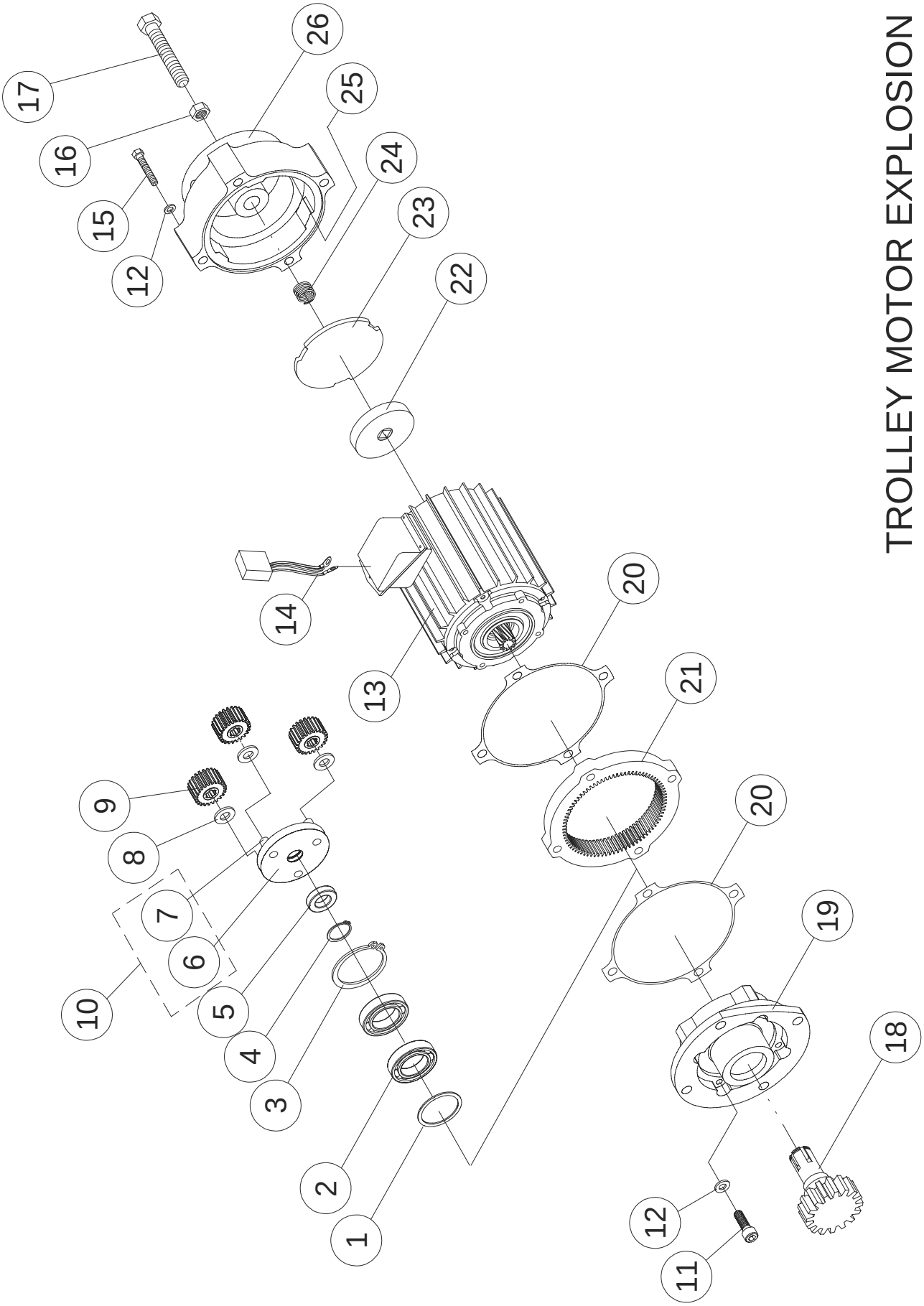
TROLLEY ASSEMBLY

NO.	PARTS CODE	DESCRIPION	Q'TY REQ'D EACH UNIT			
			012	025	050	100
1	400006	Hex. Recess Bolt <M6×1.0×16L>	4	4	4	4
2	400094	Spring Washer <M6>	4	4	4	4
3	300348K	Electric Housing Cover	1	1	1	1
4	402583	Gasket #68	1	1	1	1
5	400266	Rubber Band	1	1	1	1
6	301102	Contactor 48V 3Alalb LC1-D09-E7	2	2	2	2
	301101	Contactor 24V 3Alalb LC1-D09-B7	2	2	2	2
7	300636	Terminal Block	1	1	1	1
8	300388	Steady plate	1	1	1	1
9	300303K	Electric Housing	1	1	1	1
10	402516	Gasket #16	1	1	1	1
11	400052	Cross Headed Screw <M4×0.7×15L>	4	4	4	4
12	400092	Spring Washer <M4>	4	4	4	4
13	400222	Cable Gland <M20>	3	3	3	3
14	400070	Hex. Nut <7/8"×9UNC>	4	4	4	4
15	400102	Spring Washer <7/8">	4	4	4	4
16	203221	Spacer Washer <Ø40×Ø24×1/8">	48	48	48	48
17	202455K	Electric Frame Ass'y	1	1		
	202456K				1	
	202467K					1
18	400922	Retaining Ring <R-40>	4	4	4	4
19	407850	Bearing <6203 ZZ>	4	4	4	4
20	203128	Plain Wheel <Ø88×28L>	2	2	2	2
21	404184	Retaining Ring <S-17>	4	4	4	4
22	203110	Gear Wheel <M2×46T×33L>	2	2	2	2
23	202452K	Motor Frame Ass'y	1	1		
	202453K				1	
	202454K					1
24	408366	Stay Bolt <7/8"×9UNC×265L>	2	2	2	2
25	203151	Position Tube <Ø34×Ø24×56L>	4	4	4	4
26	210324K	Load Bracket	1			
	210314K			1		
	203439K				1	1

TROLLEY ASSEMBLY

NO.	PARTS CODE	DESCRIPION	Q'TY REQ'D EACH UNIT			
			012	025	050	100
27	201772	Transmission Pinion <M2.0×16T>	1	1	1	1
28		Motor <0.12kW>	1	1		
		Motor <0.18kW>			1	1
29	400857	Spring Washer <M10>	4	4	4	4
30	408364	Hex. Headed Bolt <M10×1.5×20L>	4	4	4	4
31	203257	Bumper	2	2	2	2
32	408580	Hex. Headed Bolt <M8×1.25×16>	2	2	2	2
33	400856	Spring Washer <M8>	2	2	2	2
34	200636	Keeper	1	1	1	1
35	202470	Load Axle <Ø25×241>	1	1	1	1
36	202472	Spacer Sleeve <Ø38×Ø27×36>	2	2	2	2
37	202471	Tube <Ø38×Ø27×24>	1	1	1	1
38	408183	Hex. Head Bolt <M8×1.25×50>	1	1	1	1
39	400088	Lock Nut <M8×1.25>	1	1	1	1

TROLLEY MOTOR EXPLOSION

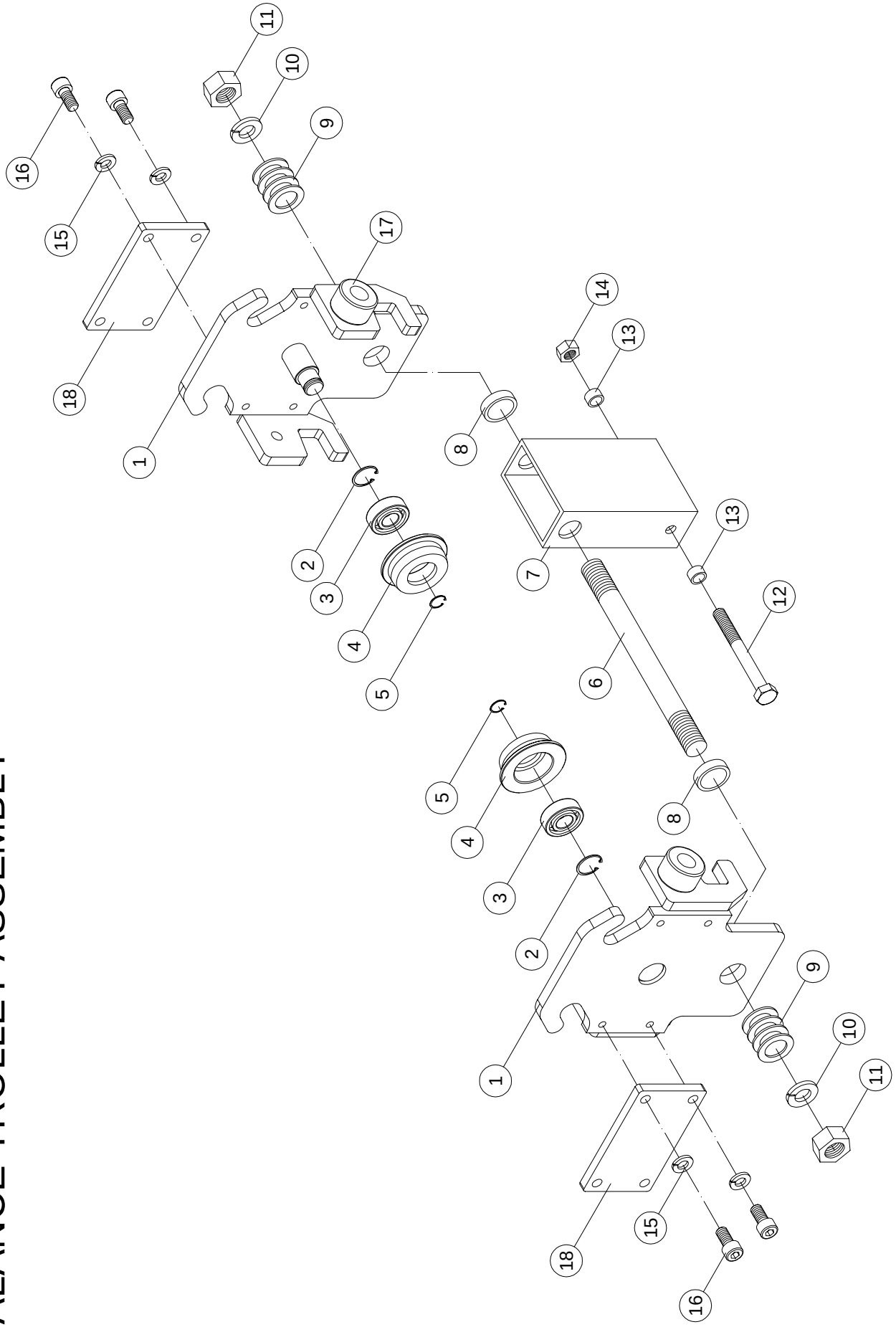


TROLLEY MOTOR ASSEMBLY

NO.	PARTS CODE	DESCRIPION	Q'TY REQ'D EACH UNIT
1	400182	Oil Seal <Ø25×Ø40×6t>	1
2	400695	Bearing <6204 Z>	2
3	400198	Retaining Ring <R-47>	1
4	400191	Retaining Ring <S-20>	1
5	200347	Axle Sleeve	1
6	200328	Reducing Gear Frame	1
7	200392	Planetary Gear Shaft	3
8	400669	Flat Washer <Ø21×Ø11×2t>	3
9	200337	Planetary Gear	3
10	200391	Reducing Gear Frame Ass'y	1
11	405017	Hex. Headed Bolt <M6×1×60L>	4
12	400094	Spring Washer <M6>	8
13		Motor Ass'y	1
14	300142	Rectifier	1
15	408357	Hex. Headed Bolt <M6×1×20L>	4
16	400084	Nut <M12×1.75>	1
17	400030	Hex. Headed Bolt <M12×1.75×30L>	1
18	201772	Transmission Shaft With Pinion <M2.0×16T>	1
19	200320K	Gear Box	1
20	402513	Gear Box Gasket	2
21	200334K	Inner Teeth Gear Sleeve	1
22	100480	Brake Lining Ass'y	1
23	100407	Brake Disc	1
24	400239	Brake Spring	1
25	400258	Brake Coil	1
26	100396K	Brake Drum	1

NO.	Motor Power	PARTS CODE	DESCRIPION	Ø - HZ- V	
13	0.12kW	101475	Motor Ass'y	3Ø 60HZ	220 / 380V
		101476			220 / 440V
		101477			230 / 460V
		101353		3Ø 50HZ	220 / 380V
		101366			400V
		101365			415V
	0.18kW	101465		3Ø 60HZ	220 / 380V
		101466			220 / 440V
		101467			230 / 460V
		101354		3Ø 50HZ	220 / 380V
		101382			400V
		101381			415V

BALANCE TROLLEY ASSEMBLY



BALANCE TROLLEY ASSEMBLY

NO.	PARTS CODE	DESCRIPION	Q'TY REQ'D EACH UNIT			
			012	025	050	100
1	202282	Frame Ass'y	2	2	2	2
2	400922	Retaining Ring <R-40>	2	2	2	2
3	407850	Bearing <6203ZZ>	2	2	2	2
4	203128	Plain Wheel <Ø88×28L>	2	2	2	2
5	404184	Retaining Ring <S-17>	2	2	2	2
6	408366	Stay Bolt <7/8"×9UNC×265L>	1	1	1	1
7	202286	Bracket	1			
	202287			1		
	202288				1	1
8	202204	Position Tube <Ø34×Ø24×12.5>	2	2	2	2
9	203221	Spacer Washer <Ø40×Ø24×1/8">	16	16	16	16
10	400102	Spring Washer <7/8">	2	2	2	2
11	400070	Hex. Nut <7/8"×9UNC>	2	2	2	2
12	400506	Hex. Bolt <M10×1.5×120>	1	1	1	1
13	202285	Position Tube <Ø19.5×Ø12×20>	2	2	2	2
14	400089	Lock Nut <M10×1.5>	1	1	1	1
15	400095	Spring Washer <M8>	8	8	8	8
16	404633	Hex. Bolt <M8×1.25×20>	8	8	8	8
17	206185	Bumper	2	2	2	2
18	202289	Connector Plate <t8×69×150>	2			
	202290	Connector Plate <t8×69×162>		2		
	202291	Connector Plate <t8×69×188>			2	
	202292	Connector Plate <t8×69×258>				2