

United States

MONORAIL

# DUTY ELECTRIC CHAIN HOISTS

MODELS EC-3M ECT-3M & ECC-3

Operating and Maintenance Handbook  
with Parts Lists

Operating Instructions No.1



## PREFACE

Our "DUTY" Electric Chain Hoists and ancillary products are made of the best selected materials, manufactured and processed through up-to-date streamlined production facilities by skilled engineers under severe quality control. Our products are tested in accordance with our own standards for absolute safety, dependable and satisfactory performance with a rigid final inspection before leaving our plants.

## WARRANTY

Our products are guaranteed to be free from any defects in materials or workmanship. If any part or parts proves defective within six months from the date of purchase, we will replace the part no-charge, ex-factory, provided the part claimed defective is returned to our factory through authorized distributors and or agent with transportation prepaid. We, however, reserve the right to decline responsibility for these which repairs are made or attempted by others or misused or carelessly operated or maintained.

## CAUTION – IMPORTANT

## NEVER HOIST HUMANS!

Install and maintain properly to avoid the possibility of personal injury or damage of materials. In the succeeding pages are given important instructions and recommendations to all persons who will install, operate and maintain our products – read thoroughly the contents before use and retain this handbook for future use for safe, dependable and economical operation.

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# 1. OPERATION OF Model EC-3M ELECTRIC CHAIN HOIST

## 1 - 1 BEFORE INSTALLATION

Check the following points on receiving the delivery of your hoist: **1. Model, 2. Capacity, 3. Lifting Range, 4. Length of the Power Source Cable, 5. Length of the Control Cable, 6. Attachments, and 7. Size of Runway Beam** when the hoist is supplied with our standard trolley or **dimension of the trolley** when it is made for specific beam.

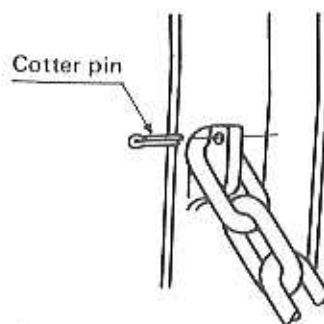
**N.B.** Refer to Page 22 for connecting methods with trolleys.

## 1 - 2 CHAIN COLLECTING BUCKET

The hoist is supplied with a chain collecting bucket as shown in the Table 1 below, unless otherwise expressly arranged. Attach the chain bucket as instructed in the Fig. 1.

**How to fit the chain bucket:**

Fig. 1



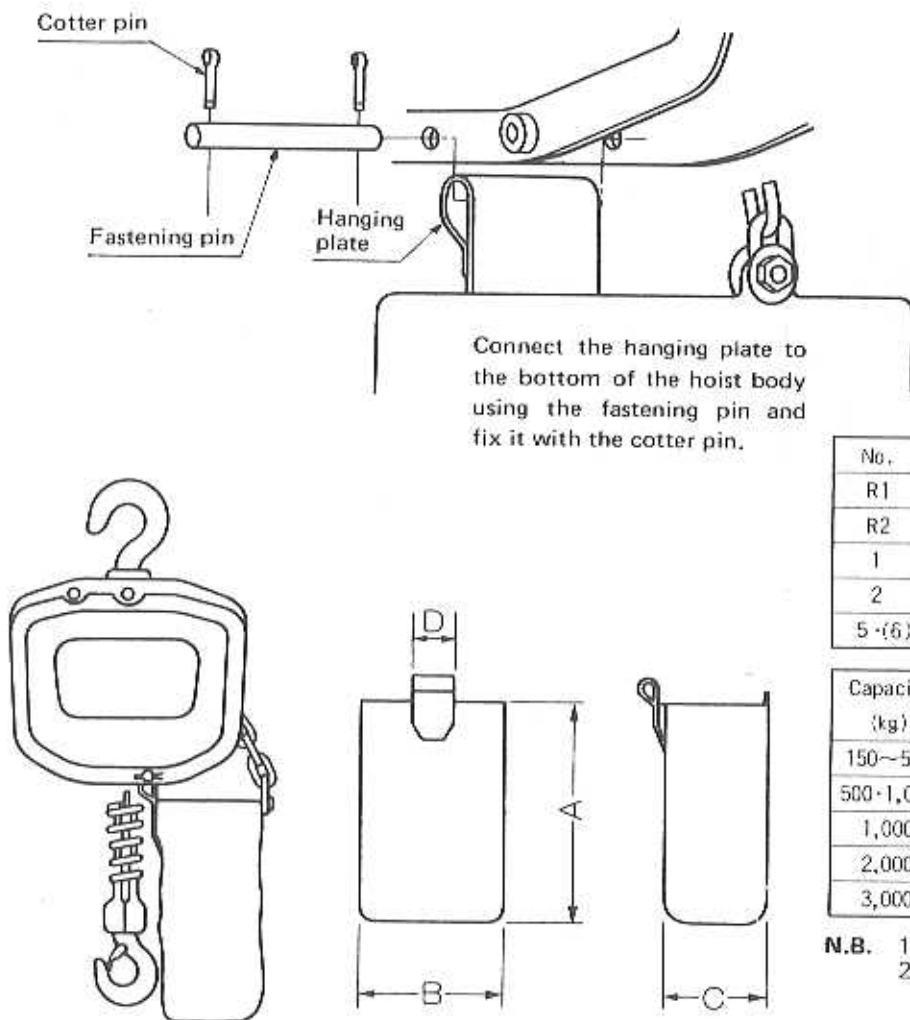
Hook the hanging chain onto the protrudent holder inside the body cover and fasten it with the cotter pin.

Table 1

No.	A	B	C	D
R1	250	160	125	45
R2	350	200	135	
1	250	170	150	65 (45)
2	350	200		
5-(6)	400	260	185	

Capacity (kg)	Load chain diameter X nos. of fall	LIFT (m)			
		4	6	8	
150~500	φ6.3×1	R1		R2	
500-1,000	φ6.3×2	R1	R2	6	
1,000	φ7.1×1	1		2	
2,000	φ7.1×2	1	2	5	S1
3,000	φ7.1×3	2	5	S1	

**N.B.** 1. No.S1 chain bucket is made of steel.  
2. Special top hook or trolley direct-coupling sections will be required when connecting No.S1 chain bucket.



### 1 – 3 ELECTRICAL WIRING

- a) Four-core coloured cords are used for the power source cable consisting of green or yellow/green, black, white and red, of which the green or yellow/green is for earth cord. Connect the cords marked R.S.T. with the power source.
- b) Power source switch and fuse have a great influence on the hoist function and safe operation. Refer to the Table 2 for proper power source switch and fuse capacity.
- c) When the distance between the hoist and power source is excessively long, apply larger sized power source cable to avoid hoisting trouble due to voltage drop and or over-heating of the hoist motor.

**POWER SOURCE SWITCH AND FUSE:**

**Table 2**

Model	Capacity (kg)	Motor Output (kw) 50/60Hz		Power source switch (amp)			Fuse (amp) (A)				
		Hoist	Travel	100~115V	200~230V	346~525V	100~115V	200~230V	346~525V		
EC-3M	150	0.4 / 0.5	0.2	/	/	/	/	/	/		
	250										
	500	10								5	
ECT-3M	1,000	1.1 / 1.3	0.3	/	15	10	/	/	/		
	2,000									15	10
	3,000										
ECC-3	250	0.4	/	/	15	10	/	/	/		
	500										

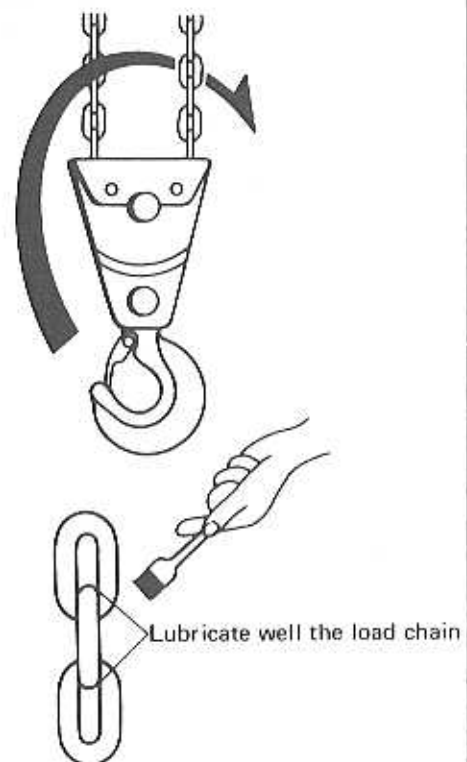
### 1 – 4 CARE AFTER INSTALLATION

Check carefully the following points before turning on the power source switch:

- a) The load chain must always be free from any twists. When your hoist lifts on two or more falls of load chains, twist can arise from the bottom hook being accidentally turned over.
- b) Lubricate the load chain without load along the whole length, especially at the contact points between the links.

**A hoist with two falls**

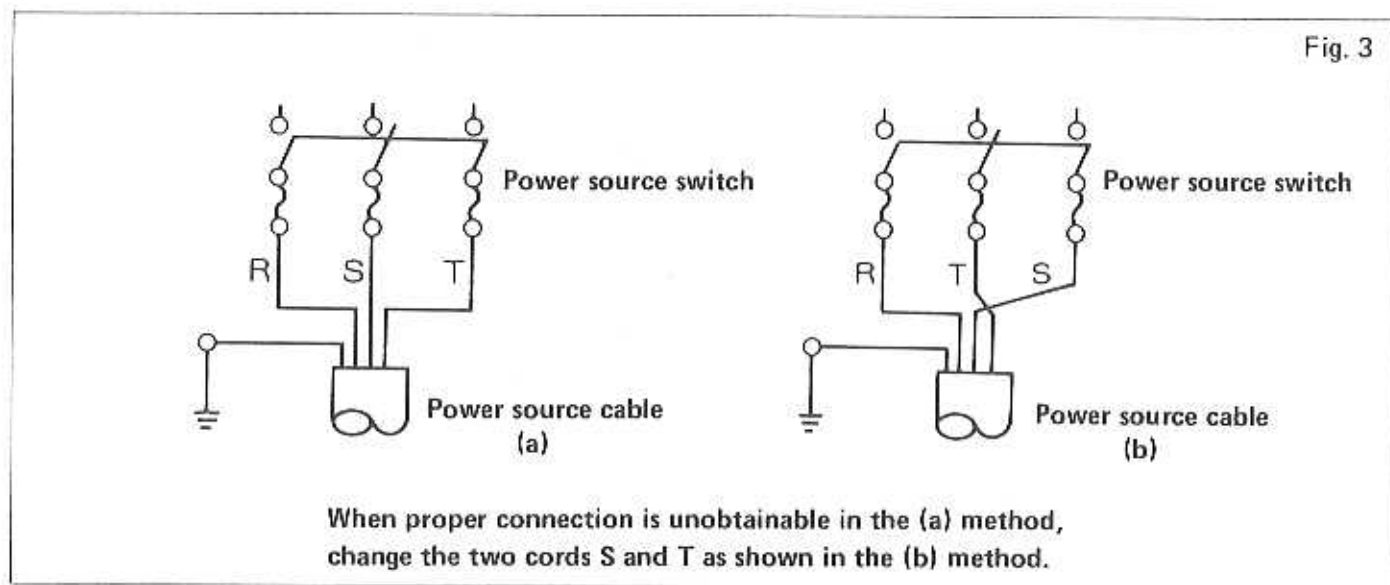
**Fig. 2**



- c) Turn on the power source switch and press firmly the push buttons on the pendant control switch, without load. When the power source cords are properly wired, the bottom hook hoists upward by pressing the UP button. If the bottom hook goes downward on pressing the UP button, it indicates reverse connection of the power source cords and,

for that reason, the limit mechanism (to prevent over-hoisting and over-lowering) does not function.

- d) When the reverse connection of the power source cord is found, change the S and T cords being connected previously with the power source as instructed in the Fig. 3.



## 1 – 5 CARE IN USE

### BEFORE OPERATION

- a) Check if the load chain is well lubricated, especially at the contact points of each link. If it is insufficient, lubricate the load chain along the whole length with machine or gear oil.
- b) There should be no twist or kink on the load chain – check carefully, especially when the hoist lifts on two or more falls of load chain.
- c) There should be no excessive elongation and or deformation found on the hooks – refer to the Table 6 in Page 9 for information on the hook dimensions. Is the safety latch on the hooks in good condition?
- d) Is the function of the push button control switch smooth and alright?

- e) Check the function of the limit switch and brake, without load.
- f) There should be no fault that prevents trolley and or crane from smooth running.

### DURING OPERATION

- a) Operation must be carried on within the rated capacity of the hoist. Underneath of the hoist is no place for humans.
- b) Never lift with the point of the hook. Never use the load chain as a sling, i.e. by back hooking. Always use proper slings and attachments in safe methods.



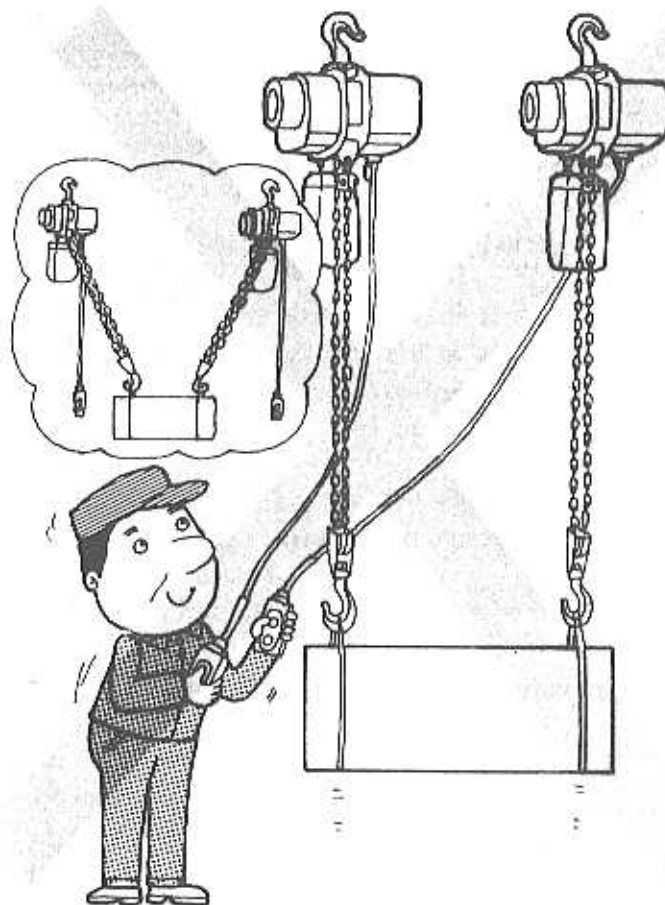
- c) Hoisting operation should never be done with the bottom hook caught with any obstacles.
- d) Press firmly the pendant push buttons all the way down for positive contacts and long life of the push button switch.
- e) When the hoist is used with trolley, do not move load by pulling on the pendant control cable because it may cause disconnection of the wire inside the cable.
- f) Do not abuse the limit switch by frequent over-hoisting and over-lowering as it reduces the life of the mechanism and may cause hoist trouble.
- g) **Never hoist or lower humans as it is more than dangerous – the hoist is no place for humans!**
- h) Lifting a load with two hoists is not recommended as it may cause unexpected accidents. If the operation is unavoidable, the load should be hoisted with utmost care keeping proper balance, angle and hoisting speed, etc. etc.
- i) The hoist is designed for lifting loads vertically and should not be used for hoisting at an angle.
- j) Avoid frequent inching and abrupt changes of hoisting and lowering directions – make full stop before changing direction.
- k) Never lift a load so it comes into contact with the chain collecting bucket, because it may damage the chain bucket or the flow of load chain may be interrupted so to cause damage to the hoist.
- l) Again check that there is no twist on the load chain, especially when the hoist lifts on two or more falls of load chains.

- m) No dynamic swing or abrupt shock should be imposed on the load chains and hooks. Never heat-treat the load chains and hooks. Do not expose the load chains and hooks to chemicals.

#### CARE AFTER USE

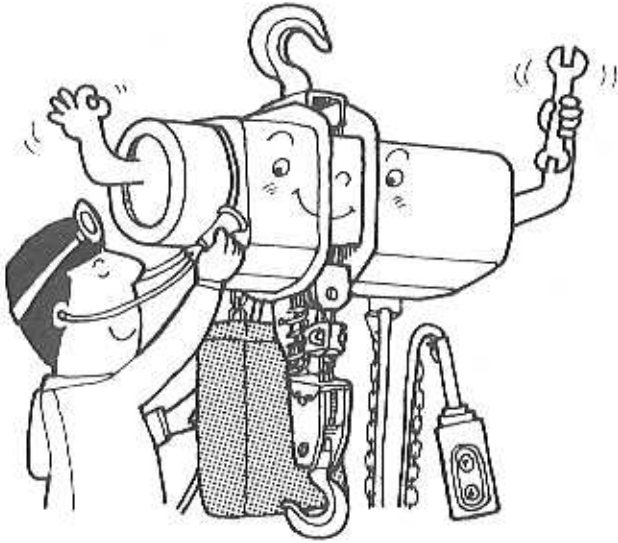
- a) Be sure to turn off the power source switch.
- b) Do not leave any load hanging on the hoist.
- c) Store the hoist correctly against rain and damp. When the hoist is installed outdoors, exceptional care should be taken for maintenance.

#### NEVER USE LIKE THIS!



## 2. INSPECTION & MAINTENANCE

For safe operation and long-life of your hoist, daily, monthly and annual inspections must be executed. The inspections and any repairs must be carried out only by competent responsible people authorized by the person in charge of the job.



When executing the inspections and maintenance, check the following points at least for safety: –

- a) Turn off the power source switch before the inspection and hang out a distinct sign indicating that the hoist is under inspection. The inspection should be done without any load on the hoist.
- b) For repairs and parts replacements, contact the authorized Dealers or Distributors from where the hoist was purchased.

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### 2 – 1 INSPECTION BEFORE USE

Refer to the points in the clause 1–5 of the page 3.

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### 2 – 2 PERIODIC INSPECTIONS

The structural parts of the hoist are subject to wear while in use. In the Tables 3 and 4 in the pages 6 and 7 are given some useful information on the check-points at the periodic inspections for safe work and long-life of the hoist.

#### MONTHLY INSPECTION

Inspect the hoist once in a month periodically, and place on file a dated register of the inspections for later reference.

#### ANNUAL INSPECTION

Inspect the hoist once in a year periodically, and place on file a dated register of the inspections for later reference.

MODEL EC-3M SERIES HOISTS – INSPECTION POINTS

Table 3

Section	Check points	Proper condition
Body	External view	No crack or deformation.
	Abnormal sound	Motor and other parts sound normal.
	Side-plates	No wearing and deformation.
	Gears and bearings	No wearing and crack. Well lubricated with grease.
	Load sheave	No wearing and crack.
Hooks	Opening	Refer to the Table 6.
	Holder	No crack and deformation.
	Bottom swivel hook	Rotates smoothly on a thrust ball bearing.
	Pins for the holders	No wearing and bending.
Load chain	Dimensions	Refer to the Table 7.
	Rust and crack	No excessive rust and no crack.
Lubricant	Teeth on the gears	Sufficient grease.
	Load chain	Well lubricated with machine oil along the whole length, particularly at the contact points.
Limit Mechanism	Limit switch	Lift and lower the hoist without load and push up the handle of the limit switch to see if the motor stops.
	Stop-holder	Bolts and nuts are held securely. No crack.
Brake mechanism	Brake	No slip exceeding 5 cm on pressing the push buttons several times during hoisting and lowering the hoist with its rated load.
Electrical components	Power source cable and pendant control cable	No breakage and damage of the rubber-covered cables. No disconnection.
	Push-button switch	Effective contact of the contact points and proper functioning.
	Switch box	Proper function of the limit switch, and complete absorbing performance of the magnetic switch.
	Motor	No humming and over-heating.
	Insulation resistance	Insulation resistance exceeds 2 M $\Omega$ by DC 500V Megger.
Others	Bearings	Properly and smoothly engaging with shafts.
	Chain collecting bucket	Inside free of rust, dirt, grease and other foreign objects.
	Bolts, nuts, etc.	All are in proper condition and position.
	Name-plate (mark-plate)	Clearly observable.



**TROLLEYS ( PLAIN / GEARED / ELECTRIC ) – INSPECTION POINTS**

Table 4

Section	Check points	Proper condition
All Trolleys	Side-plates	No bending, crack and other deformations.
	Bolts, nuts, cotter-pins and snap-rings, etc.	No looseness, breakage and missing.
	Trolley wheels	No excessive wear in the wheel tread and toothed wheels, and rotate smoothly. Well lubricated gears.
	Bearings	Proper engagement with shafts and rotate smoothly.
	Capacity mark	Distinctly observable.
Geared Trolleys	Handwheels	No excessive wear in the ratcheted section and pocket sections to engage with hand chain. No crack and breakage.
	Shaft area of handwheels	Well lubricated for smooth rotation.
	Hand chain	No excessive elongation and deformation that prevent smooth engagement with the handwheel pockets.
Electric Trolleys	Reduction gear section	No flaw, crack and excessive wear. Well lubricated. No back-lash in the gears and bearings.
	Brake mechanism	Stops smoothly without coasting too long.
	Pendant control and power source cables	No breakage and damage of the rubber-covered cables and no disconnection.
	Motor	No humming and overheating.
	Leak	Insulation resistance exceeds 2 M $\Omega$ by DC 500-volt Megger.

**TEST RUNNING AFTER PERIODIC INSPECTION**

Table 5

Test points	Check points
Test running without load	Operate the control switch on the pendant cable to see if the hoist works smoothly.
Limit switch function	Test without and with a load within the rated capacity.
Test running with a load within the rated capacity	Check for noise and vibration when hoisting and lowering. No brake slip exceeding 5 cm.
Over-loading test	Test with a test load of the hoist.

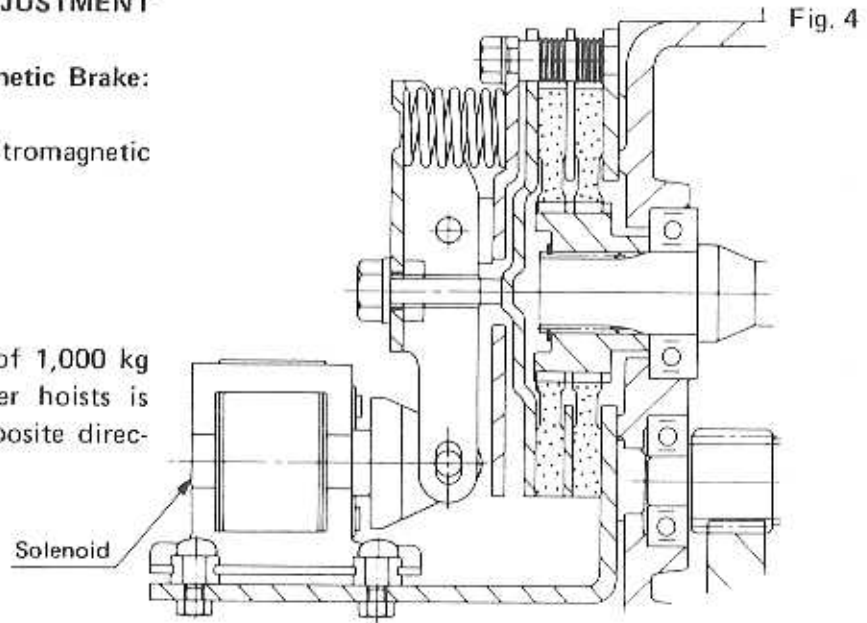
## 2 – 3 BRAKE INSPECTION AND ADJUSTMENT

### Adjustment of the Electromagnetic Brake:

The mechanism of the Electromagnetic Brake is as shown in Fig. 4.

### Brake Structural Drawing

**N.B.** The Brake Solenoid of 1,000 kg capacity (single fall) and larger hoists is attached so it faces in the opposite direction.

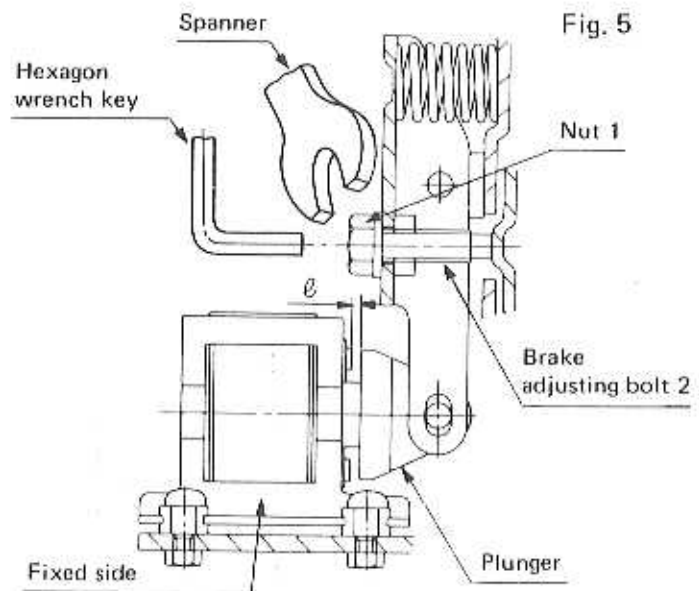


### Adjust the Brake as instructed below: –

When the dimension  $\ell$  on 3-phase hoist becomes larger than 4 mm (single-phase hoist 8 mm), screw in the Brake adjusting bolt as instructed below till the dimension  $\ell$  is set to 1.5 mm (to 4 mm for single-phase hoist.)

- 1) Loosen the Nut 1 with a spanner.
- 2) Screw in the Brake adjusting bolt 2.
- 3) Tighten the Nut 1 when the dimension 1.5 mm is obtained.

**N.B.** When adjusting it is easier to obtain the required clearance by tightening till the plunger comes into contact with the fixed side and then loosening to obtain the dimension



## SPEED GOVERNING UNIT ( equipped on 1000 kg and larger capacities )

Models EC-3M and ECT-3M Hoists are equipped with a Speed Governing Unit. It works on a centrifugal force and does not need adjustment. When the Speed Governing Unit functions and friction with the braking surface occurs, something is wrong with the braking system. So, stop the operation at once and inspect and repair the hoist.

## 2 – 4 ADJUSTMENT OF THE OVERLOAD PROTECTION DEVICE (O.L.P.) – An optional equipment

The Overload Protection Device is made of a Friction Clutch type mechanism. Note that a functioning point is already set according to our factory standard before the hoist leaves our plant. **Do not try to re-adjust or disassemble the Overload Protection Device.** When re-adjusted or disassembled, the Overload Protection Device may not function properly.

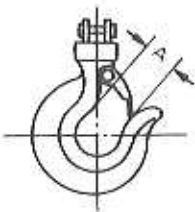
## 2-5 HOOK & CHAIN INSPECTIONS

The hook and load chain will elongate or wear after a long period of use and, depending on the place and method of use, corrosion and cracks may occur. For the hook and load chain are particularly important components for safe job, refer to Tables 6 and 7 for dimensions for making judgement on whether the load chain or hook must be replaced.

### a) Hook

The hooks are susceptible to abuse, particularly the bottom hook, i.e. by improper slinging and overloading. Worn out, elongated or deformed hooks with opening beyond the permissible limit should be replaced immediately.

Table 6

	Hook Capacity (kg)	Standard dimension - A (mm) $\begin{matrix} +3 \\ -0 \end{matrix}$	Permissible limit - A (mm) approx.
	150	22	26.5 max.
250	22	26.5	
500	23	27.5	
1,000	28	33.5	
2,000	33	39.5	
3,000	41	49.2	

### b) Load Chain

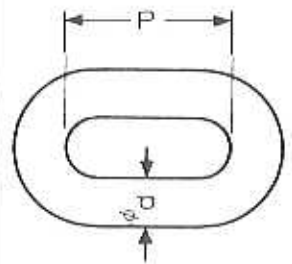
The load chains are made of special alloy steel and are heat treated in a special method developed by our engineers to fulfill the specifications and requirements of the newly enacted JIS B 8812. The load chain is exceptionally long wearing to frequent use of the hoist, but wear is unavoidable in a long period of use and certain conditions will lower the

strength and cause wear, for which the load chain should be inspected frequently or at periodic intervals.

Load chains worn out beyond the permissible limits must be replaced with new ones and, because of the precise heat treatment, they can not be lengthened.

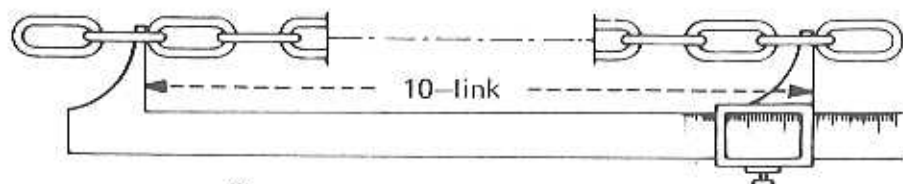
### LOAD CHAIN INSPECTION POINTS

Table 7

	Model	Capacity (kg)	Chain dia. $\phi d$ (mm)	Standard dimension P - mm	Permissible limit 10 links (mm)
	EC-3M ECT-3M	150~500 1,000 (W)	8.3	19.1	195
ECC-3	1,000 3,000	7.1	21.2	216	

The Table 7 shows the Permissible Limits for elongation and wear for the sum of the 'P' (Pitches) of ten links. These dimensions are based on both elongation and wear.

Replace the whole load chain even if only one link of the load chain is extensively worn out, elongated or damaged.



## 2 - 6 LUBRICATION

Lubricate the moving sections as shown in Table 7 and Fig. 6 below. Keep your electric hoist well lubricated for long life, efficiency and greater safety.

Table 7

No.	Lubricating section	Type of lubricant	Frequency	Amount	Remarks
1	Top hook pin	Cup grease	At annual inspections	Proper quantity	
2	Shaft coupling	Disulfide molybdenum grease	At annual inspections	Proper quantity	Thin coat over entire section
3	Inside of gear box	Disulfide molybdenum grease	At annual inspections	As instructed below	On to the entire surface of the gears
4	Bolts for brake	Cup grease	At annual inspections	Proper quantity	Keep the friction discs free from grease
5	Handle & limit switch section	Cup grease	At annual inspections	Proper quantity	

Amount of grease : 150 - 500 kg 100 g  
1,000 - 3,000 kg 150 g

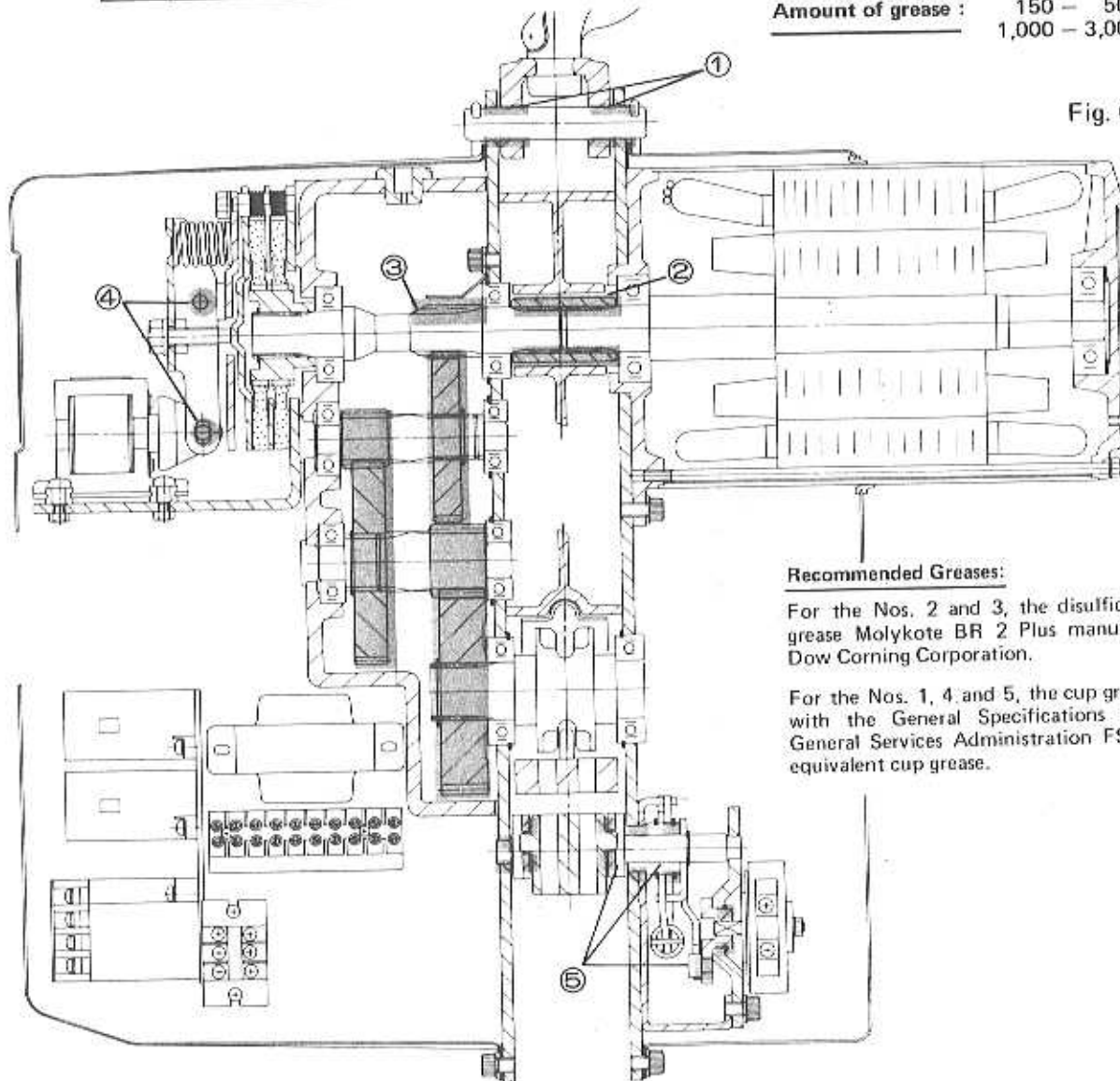


Fig. 6

**Recommended Greases:**

For the Nos. 2 and 3, the disulfide molybdenum grease Molykote BR 2 Plus manufactured by the Dow Corning Corporation.

For the Nos. 1, 4 and 5, the cup grease conforming with the General Specifications and Standard - General Services Administration FS VV-G-630 or equivalent cup grease.

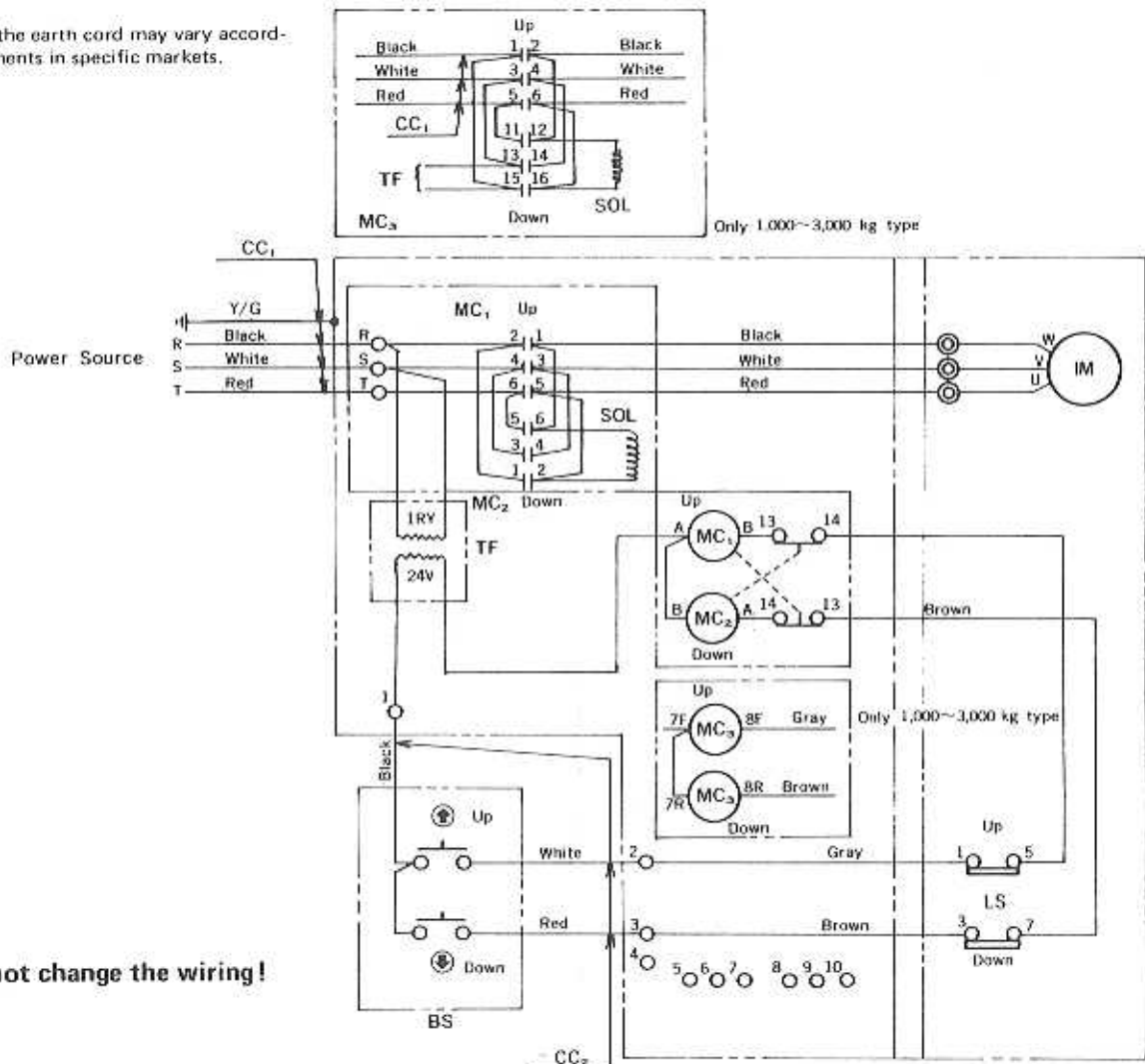
### 3. CIRCUIT DIAGRAMS AND PARTS LIST

#### 3 - 1 CIRCUIT DIAGRAMS

The circuit diagrams differ with each specific model (EC-3M, ECT-3M and ECC-3) and when the hoist is connected to a trolley. Refer to the section which corresponds to your hoist.

#### MODEL EC-3M THREE-PHASE SINGLE-SPEED HOIST

N.B. The colour of the earth cord may vary according to requirements in specific markets.



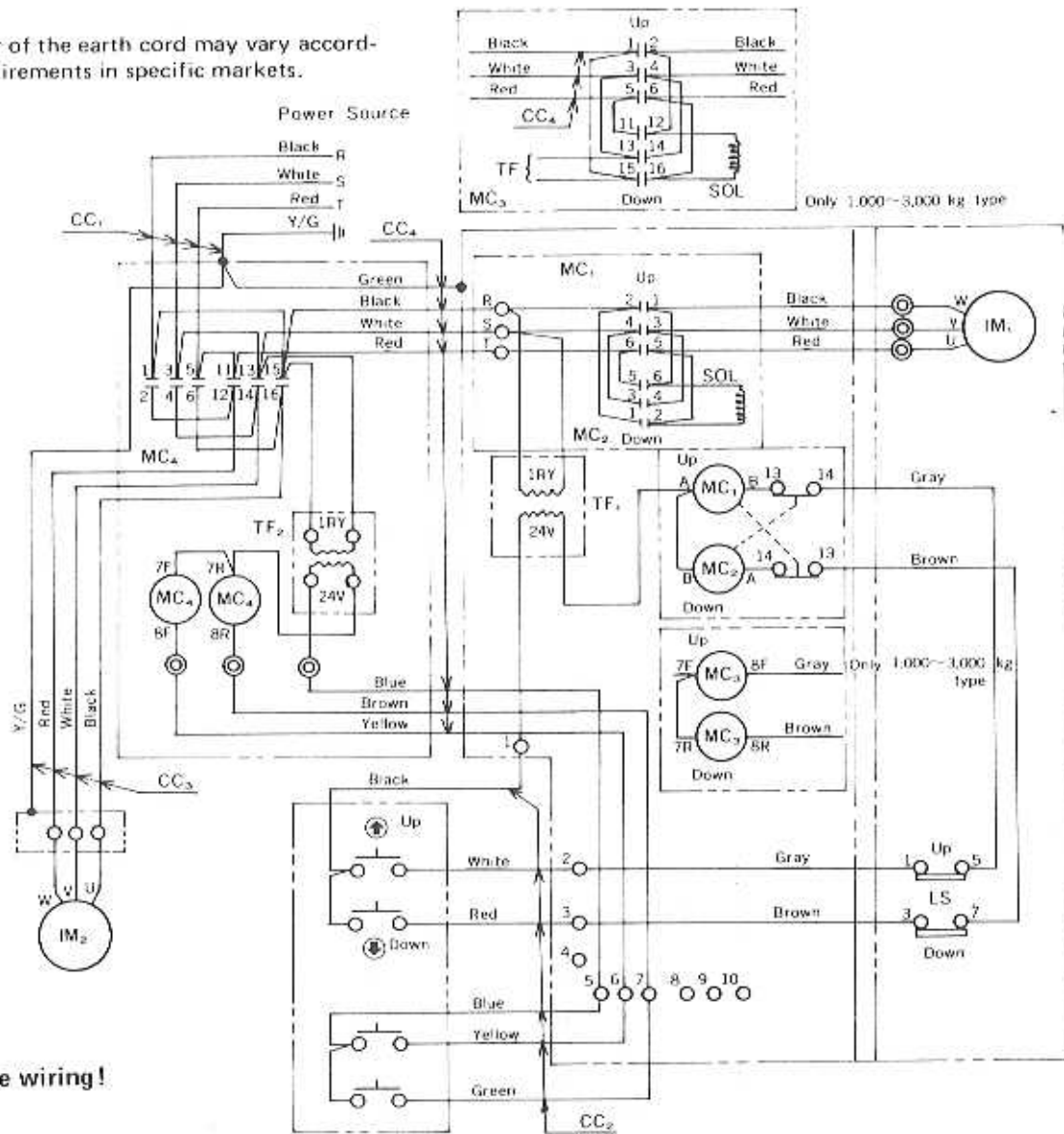
Rated Load (kg)		150	250 500W	500 1,000W	1,000	2,000	3,000	Rated Load (kg)		150	250 500W	500 1,000W	1,000	2,000	3,000
IM	Lifting Motor(kw)/50/60Hz	0.4/0.5	0.9/1.1	1.1/1.3	LS	Limit Switch	LS-51-1								
MC <sub>1</sub> · MC <sub>2</sub>	E.M.Contactor	FMC-0			SOL	Solenoid	SK-350-ANC1								
MC <sub>3</sub>	E.M.Contactor	HMU-10			CC <sub>1</sub>	Power Source Cable	VCT1.25mm								
TF	Transformer	TF-300			TF-301N	CC <sub>2</sub>	Control Cable	VCT1.25mm							
BS	Push Button Switch	WCOB-51-2													
SYMBOL	NAME	TYPE			SYMBOL	NAME	TYPE								

The W in the table indicates the hoist with two falls of load chain.



# MODEL EMT-EC-3M THREE-PHASE SINGLE-SPEED HOIST WITH ELECTRIC TROLLEY

N.B. The colour of the earth cord may vary according to requirements in specific markets.



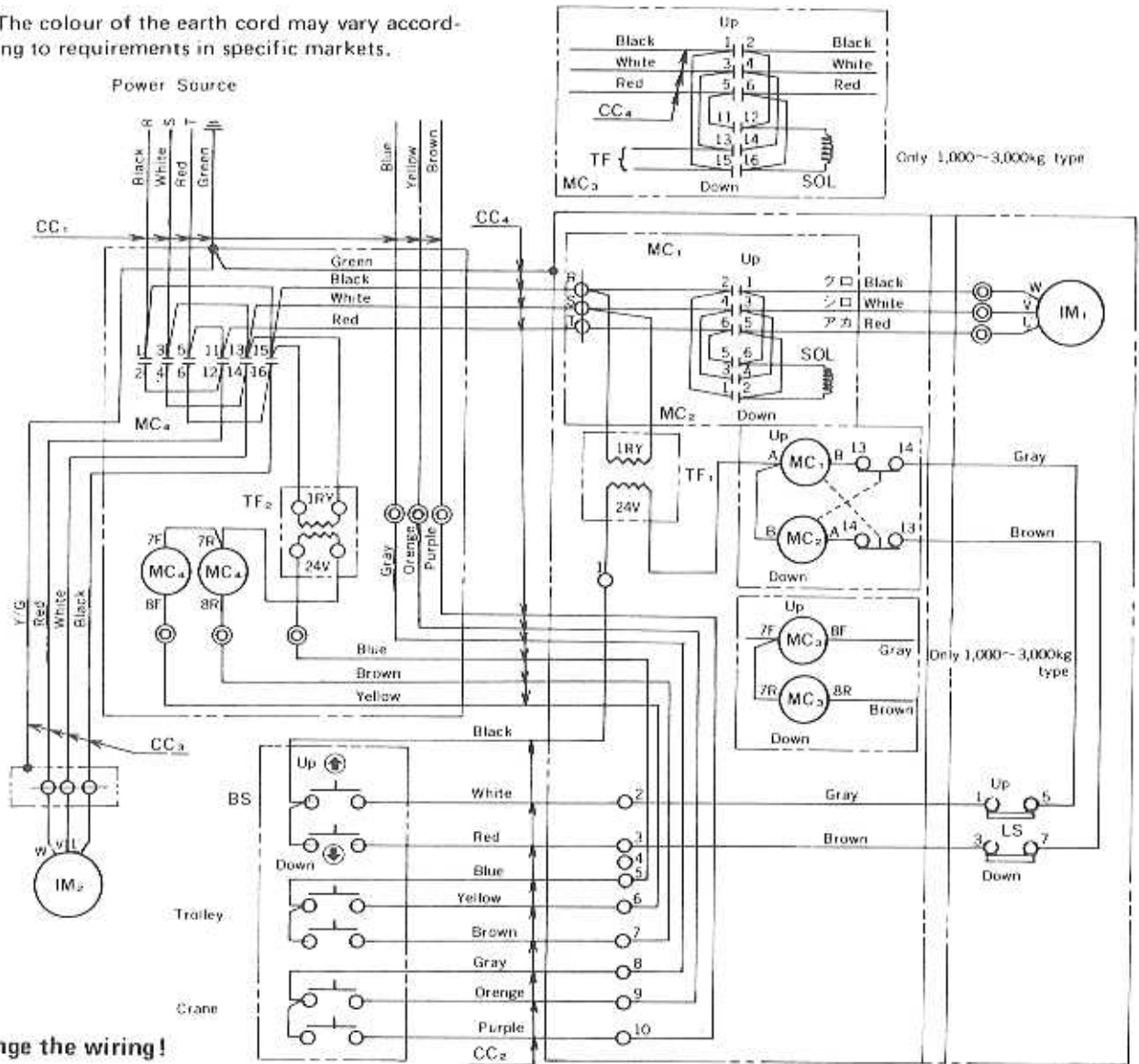
**Do not change the wiring!**

Rated Load (kg)				Rated Load (kg)									
	150	250 500W	500 1,000W	1,000	2,000	3,000		150	250 500W	500 1,000W	1,000	2,000	3,000
IM <sub>1</sub>	Lifting Motor (kw)	0.4/0.5	0.9/1.1	1.1/1.3			BS	Push Button Switch	WCOB-52-2				
IM <sub>2</sub>	Traversing Motor (kw)	0.2			0.3		LS	Limit Switch	LS-51-1				
MC <sub>1</sub> - MC <sub>2</sub>	E.M. Contactor	FMC-0					SOL	Solenoid	SK-350-ANC1				
MC <sub>3</sub>	E.M. Contactor				HMU-10		CC <sub>1</sub>	Power Source Cable	VCT1.25mm				
MC <sub>4</sub>	E.M. Contactor	HMU-10					CC <sub>2</sub>	Control Cable	VCT1.25mm				
TF <sub>1</sub>	Transformer	TF-300			TF-301N		CC <sub>3</sub>	Trolley Cable	VCT1.25mm				
TF <sub>2</sub>	Transformer	TF-301N					CC <sub>4</sub>	Connecting Cable	VCT1.25mm				
SYMBOL	NAME	TYPE			SYMBOL	NAME	TYPE						

The **W** in the table indicates the hoist with two falls of load chain.

# MODEL EMT-EC-3M THREE-PHASE SINGLE-SPEED HOIST WITH ELECTRIC TROLLEY & CRANE

N.B. The colour of the earth cord may vary according to requirements in specific markets.



**Do not change the wiring!**

Rated Load(kg)		150	250 500W	500 1,000W	1,000	2,000	3,000	Rated Load(kg)		150	250 500W	500 1,000W	1,000	2,000	3,000
IM <sub>1</sub>	Lifting Motor(kw/50-60Hz)	0.4/0.5	0.9/1.1		1.1/1.3			BS	Push Button Switch	WCOB-53-2					
IM <sub>2</sub>	Traversing Motor(kw)		0.2		0.3			LS	Limit Switch	LS-51-1					
MC <sub>1</sub> · MC <sub>2</sub>	E.M.Contactor	FMC-0						SOL	Solenoid	SK-350-ANC1					
MC <sub>3</sub>	E.M.Contactor				HMU-10			CC <sub>1</sub>	Power Source Cable	VCT1.25mm <sup>2</sup>					
MC <sub>4</sub>	E.M.Contactor			HMU-10				CC <sub>2</sub>	Control Cable	VCT1.25mm <sup>2</sup>					
TF <sub>1</sub>	Transformer		TF-300		TF-301N			CC <sub>3</sub>	Trolley Cable	VCT1.25mm <sup>2</sup>					
TF <sub>2</sub>	Transformer		TF-301N					CC <sub>4</sub>	Connecting Cable	VCT1.25mm <sup>2</sup>					
SYMBOL	NAME	TYPE					SYMBOL	NAME	TYPE						

The **W** in the table indicates the hoist with two falls of load chain.

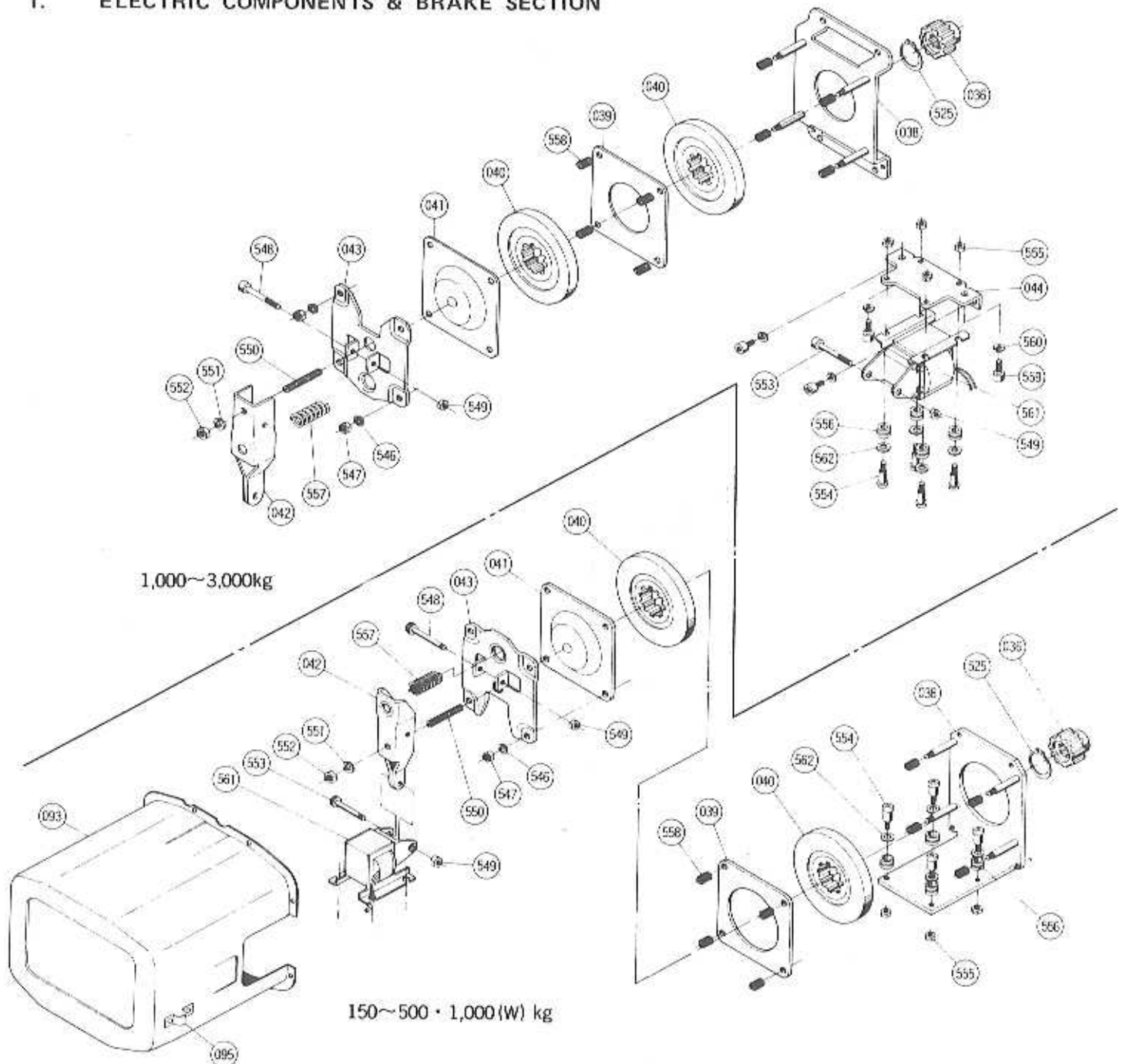
### 3 - 2 EC-3M PARTS OUTLINE DRAWINGS

The parts marked ※ are ECT-3M Two-speed hoist and these marked ※※ are ECC-3 Single-phase hoist while all other parts are common.

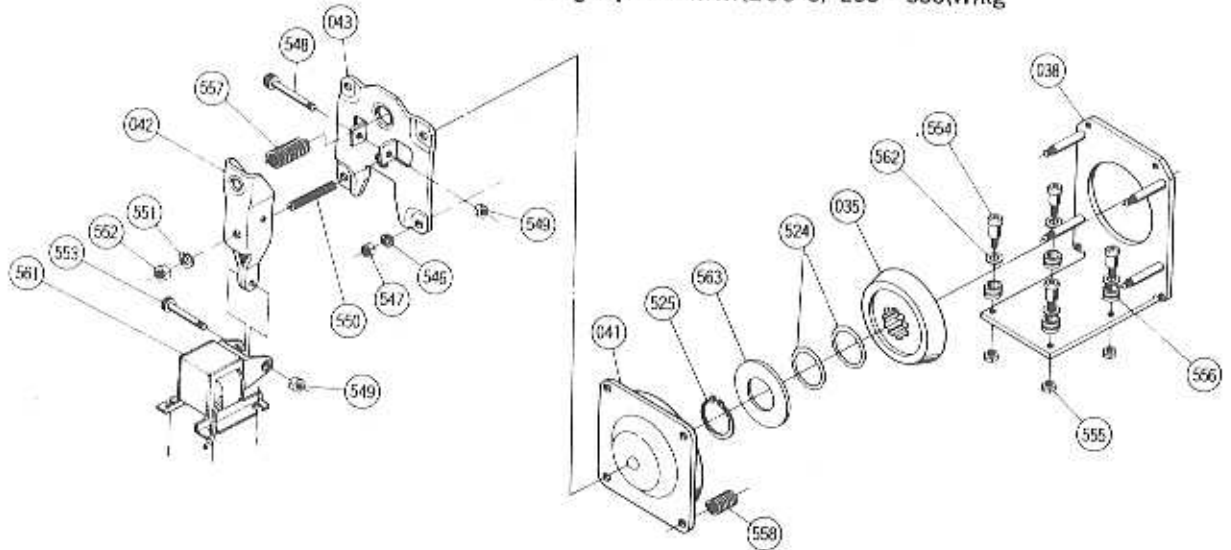
When ordering Spare Parts, be sure to specify the following information:

1. Serial number and model
2. Capacity and part number
3. Quantity required

#### 1. ELECTRIC COMPONENTS & BRAKE SECTION

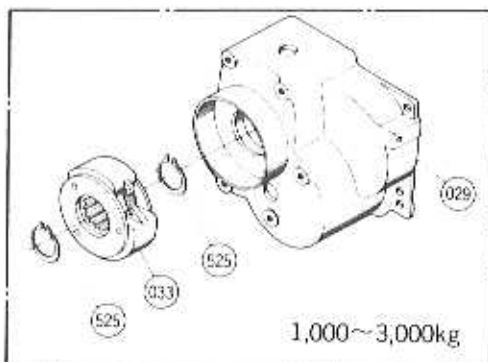


Single-phase ※※(ECC-3) 250 · 500(W)kg

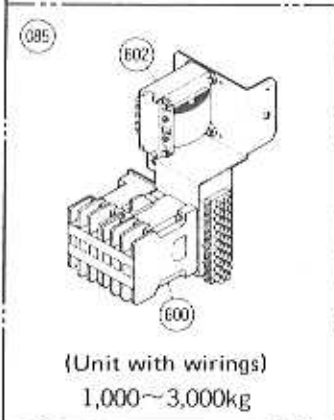


1. BRAKE SECTION

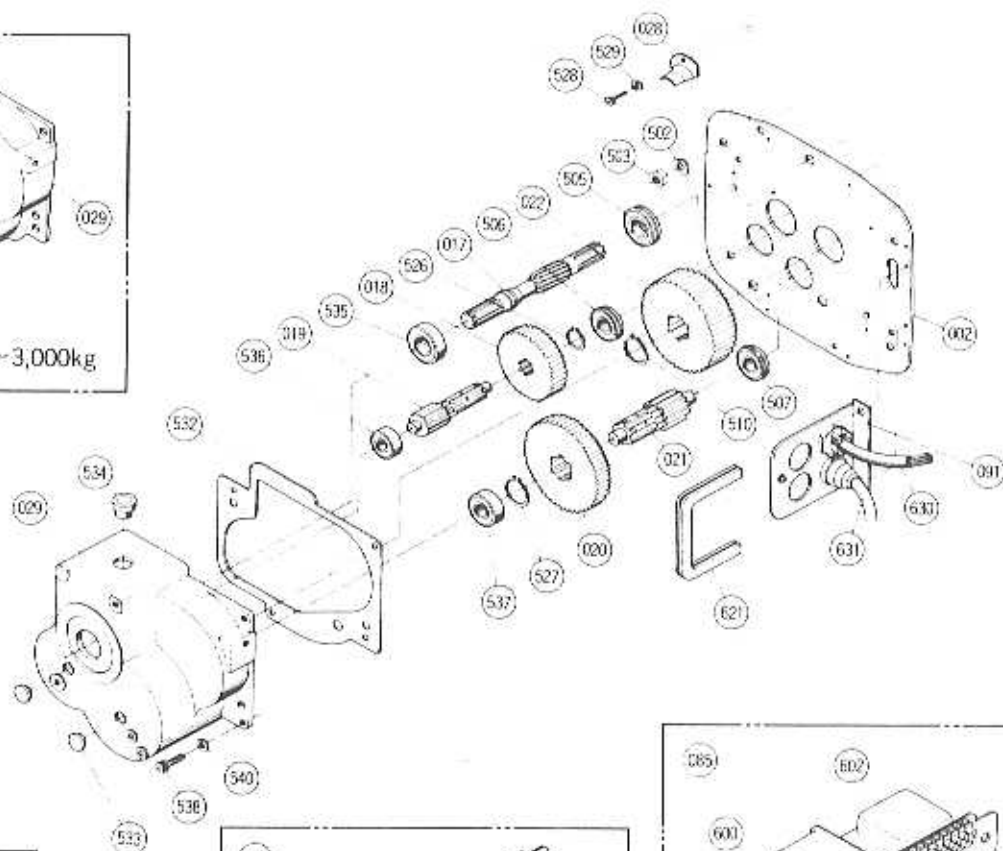
P/No.	Part Name	Nos. used	P/No.	Part Name	Nos. used
035	Brake wheel	1	549	Hex. lock nut	2
036	Brake bush	1	550	Brake adjusting bolt	1
038	Brake base	1 set	551	Spring washer	1
039	Brake fixing plate 500 - 3000 kg	1	552	Hex. nut (Type 3)	1
040	Brake rotating plate 150 - 500 kg (W)	1	553	Lever bolt	1
040	Brake rotating plate 500 - 3000 kg	2	554	Solenoid mounting screw	4
041	Brake forcing plate	1	555	Hex. nut	4
042	Brake lever	1	556	Solenoid bush	4
043	Lever base plate	1	557	Brake spring	1
044	Solenoid base plate	1	558	Brake base spring	4
093	Cover-A	1		150 - 500 kg (W) - Single-phase	8
095	Hanging plate for 636	1		500 - 3000 kg	8
524	Wave washer	2	559	Hex. socket head bolt	4
525	Snap ring	1	560	Spring washer	4
546	Spring washer	4	561	AC Solenoid	1
547	Hex. nut	4	562	Washer	4
548	Hex. socket head bolt	1	563	Washer	1



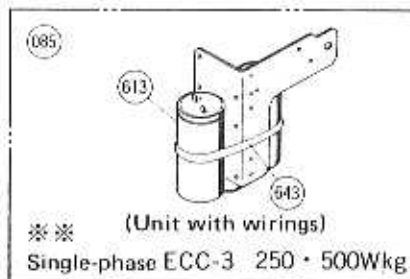
1,000~3,000kg



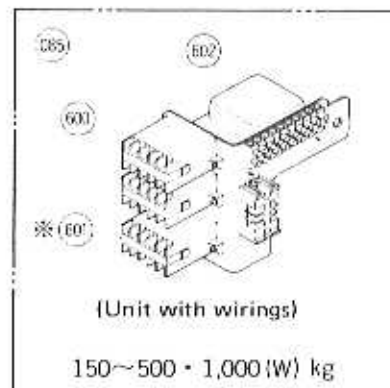
(Unit with wirings)  
1,000~3,000kg



Overload protection unit assembly



※※ (Unit with wirings)  
Single-phase ECC-3 250 · 500Wkg

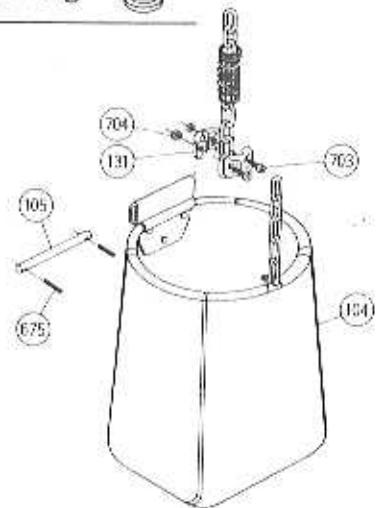
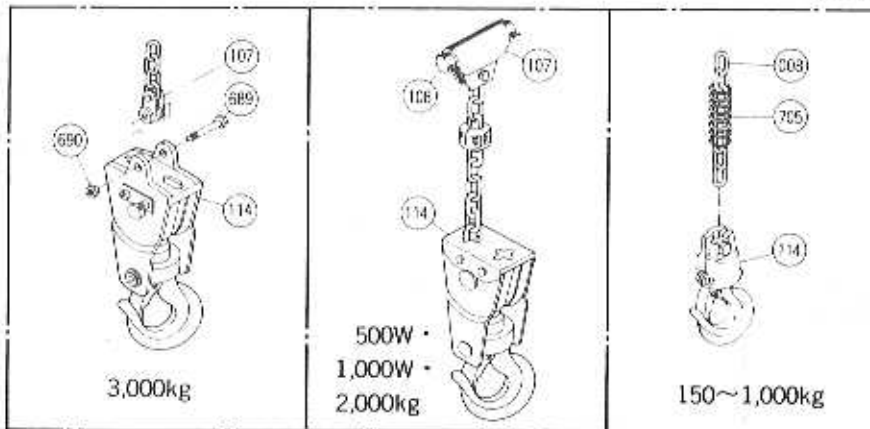
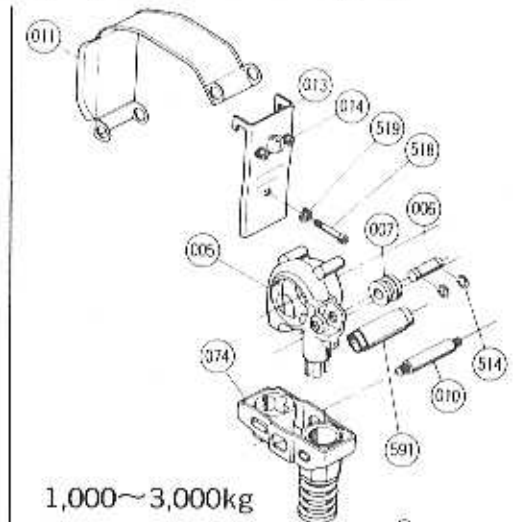
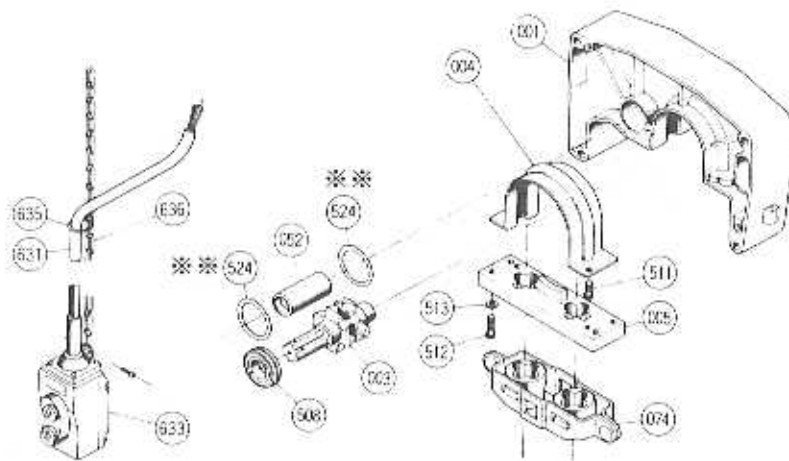
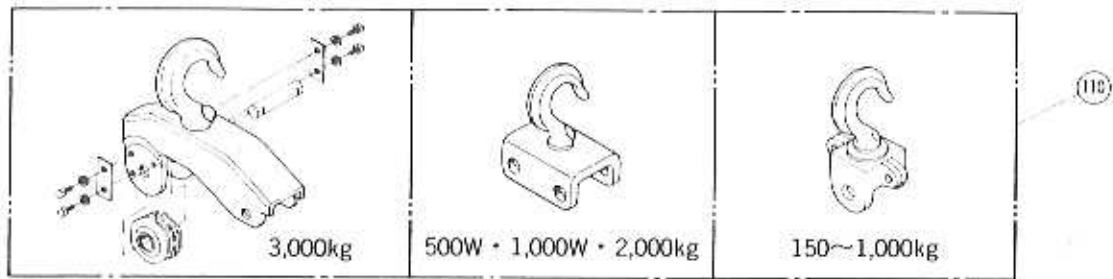


(Unit with wirings)  
150~500 · 1,000 (W) kg

## 2. ELECTRIC COMPONENT & GEAR SECTION

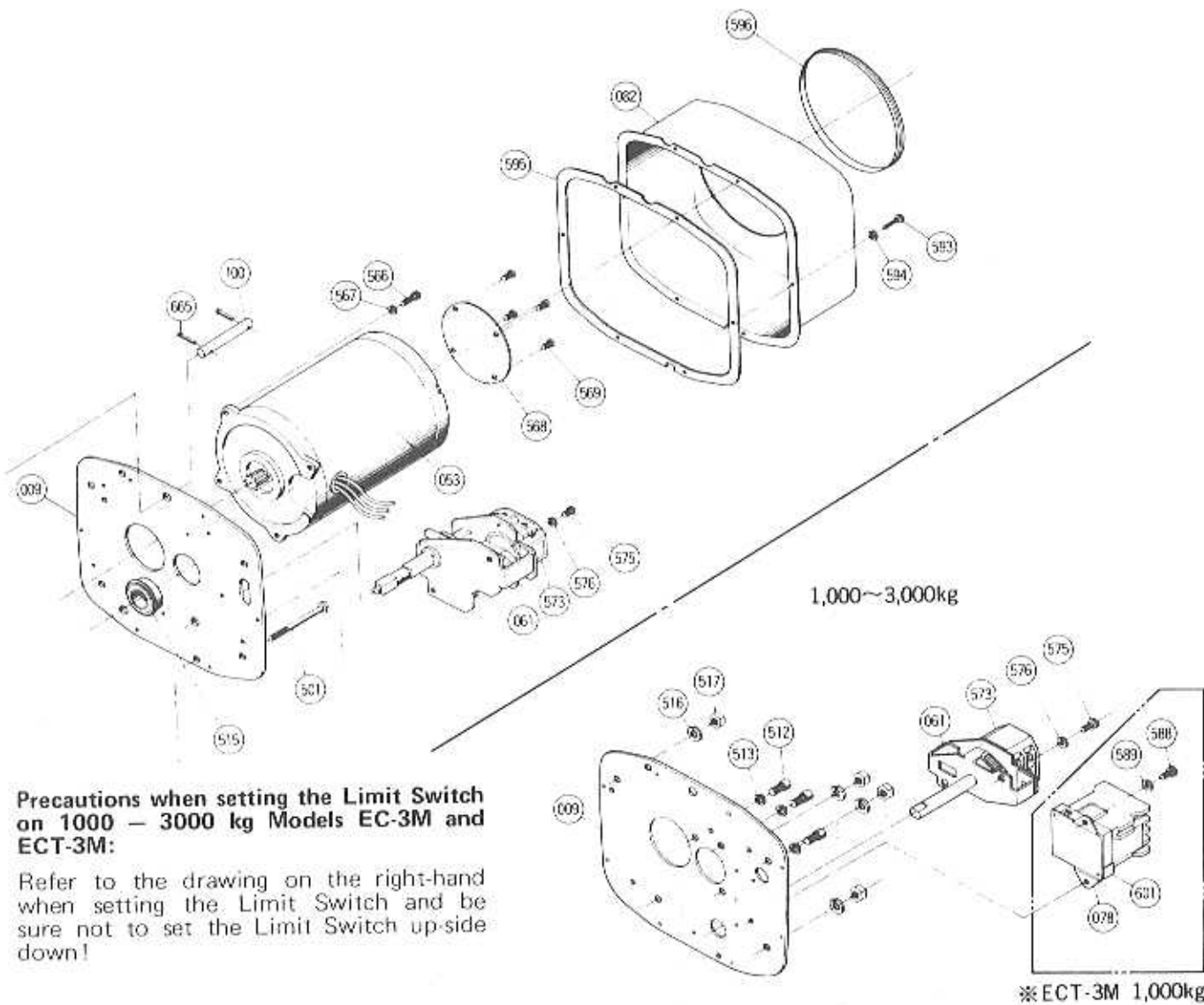
P/No.	Part Name	Nos. used	P/No.	Part Name	Nos. used
002	Gear-side plate	1	528	Hex. socket head bolt	1
017	Pinion shaft	1	529	Spring washer	1
018	Pinion gear	1	532	Gear case gasket	1
019	Second pinion	1	533	Grease cap	2
020	Second pinion gear	1	534	Oil cap	1
021	Third pinion	1	535	Ball bearing	1
022	Load gear	1	536	Ball bearing	1
023	Overload protection unit assembly	1 set	537	Ball bearing	1
028	Grease bracket	1	538	Hex. socket head bolt	4
029	Gear case	1		150 - 500 kg, 1000 kg (W)	
033	Speed govern unit	1		1000 - 3000 kg	
085	Electric component unit	1 set	540	Spring washer	4
091	Cable connecting plate	1	600	Electromagnetic contactor	2
502	Spring washer	4		150 - 500 kg, 1000 kg (W)	
503	Hex. nut	4		1000 - 3000 kg	
505	Ball bearing	1	601	Electromagnetic contactor	1
506	Ball bearing	1	602	Transformer	1
507	Ball bearing	1	613	Condenser	2
510	Snap ring	1	621	Cable connecting plate seal	1
527	Snap ring	150 kg	630	Power source cable	1
		250 - 3000 kg	631	Pendant control cable	1





### 3. LOAD CHAIN DRIVING SECTION with TOP & BOTTOM HOOKS

P/No.	Part Name	Nos. used	P/No.	Part Name	Nos. used
001	Center frame	1	508	Ball bearing	1
003	Load sheave	1	511	Hex. socket head bolt	2
004	Load chain guide (A)	1	512	Hex. socket head bolt	4
005	Load chain guide (B)	1		150 - 500 kg, 1000 kg (W)	3
006	Chain guide pin	1		1000 - 3000 kg	
007	Chain guide roller	1	513	Spring washer	4
008	Load chain	1		150 - 500 kg, 1000 kg (W)	3
010	Stay bolt	4		1000 - 3000 kg	
011	Body cover (A)	1	514	E-ring	2
013	Body cover (B)	1	518	Hex. socket head bolt	1
014	Chain bucket hanging plate	1	519	Spring washer	1
052	Coupling	1	524	Wave washer	2
074	Handle	1	591	Wiring brush	1
104	Chain bucket	1	631	Pendant control cable	1
105	Chain bucket pin	1	633	Push button switch	1
107	Chain stop plate		635	Rings	
	500 kg (W)	1	636	Control cable supporting chain	1
	1000 kg		675	Split pin	2
	2000 kg	2	689	Hex. head bolt	1
108	Chain stop pin	1	690	Hex. lock nut	1
110	Top hook assembly	1 set	703	Hex. socket head bolt	2
114	Bottom hook assembly	1 set	704	Hex. lock nut	2
131	Stop holder	2	705	Spring for bottom hook	2
	single-fall				
	two-falls	4			



**Precautions when setting the Limit Switch on 1000 – 3000 kg Models EC-3M and ECT-3M:**

Refer to the drawing on the right-hand when setting the Limit Switch and be sure not to set the Limit Switch up-side down!

**4. MOTOR & LIMIT SWITCH SECTION**

P/No.	Part Name	Nos. used	P/No.	Part Name	Nos. used
009	Motor-side plate	1	573	Limit switch	1
053	Motor assembly	1 set	575	Hex. socket head bolt	2
061	Limit switch unit	1 set	576	Spring washer	2
078	Electromagnetic contactor base	1	588	Hex. socket head bolt	2
082	Cover (B)	1	589	Spring washer	2
100	Top hook pin	1	593	Hex. socket head bolt	6
501	Hex. head bolt	4		150 - 500 kg, 1000 kg (W)	
512	Hex. socket head bolt	3		1000 - 3000 kg	8
513	Spring washer	3	594	Spring washer	6
515	Ball bearing	1		150 - 500 kg, 1000 kg (W)	
516	Spring washer	8		1000 - 3000 kg	8
517	Hex. nut	8	595	Cover gasket	2
566	Hex. socket head bolt	4	596	Motor rubber seal	1
567	Spring washer	4	601	Electromagnetic contactor	1
568	Specifications plate	1	665	Split pin	2

## 4. Model EC-3M ELECTRIC CHAIN HOIST — TROUBLE SHOOTING

If anything wrong happens with your hoist, trace its cause and repair referring to the instructions given in the Table 8. When it can not be repaired by referring to the Table 8, contact your Distributor or Service Shop.

### TROUBLE SHOOTING PROCEDURES

Table 8

Condition		Troubles	Trouble-shooting methods
Doesn't start	Electric power is properly supplied.	Doesn't start when pressing hoisting and lowering push-buttons.	Press the buttons firmly. Polish or clean the contact points. Repair the control cable that is disconnected or has faulty contacts with the terminal.
		When the hoisting button is pressed and the bottom hook rises but does not come down when the lowering button is pressed (or opposite.)	The contact of the limit switch is disconnected, place the limit handle to the normal position.
		The motor hums or gets overheated.	Repair the power source cable that is disconnected or has faulty contacts with the terminal.
Poor starting	Single-phase operation.	The motor hums or temperature rises.	Is the voltage proper? Are the power source switch and cable in good order? Is the fuse OK?
Motor stops occasionally in operation.	Limit switch turns off.	Twisted or tangled load chains and pulling load excessively at an angle will cause the limit switch handle to push unintentionally.	Position the load chains properly. Lift the load vertically. Replace the limit handle to proper position.
	Faulty contact	Intermittent or irregular operation due to ineffective contact at power source cable, terminal or switches.	Replace the faulty parts or repair.
	Overloading	The motor hums and over-current arises.	Lift loads within the rated capacity.
Ineffective	Poor braking	Due to wear of the brake lining.	Adjust the brake and if necessary replace the brake rotating plate.
Electrical accidents	Leak	The hoist generates electric shock when touching metal components.	The hoist should be earthed effectively. Examine insulation resistance. Inspect switches to ensure that they are not moistened. Keep them dry!

## 5. Model ECT-3M TWO-SPEED ELECTRIC CHAIN HOIST

Model ECT-3M Two-Speed Hoist is based on Model EC-3M Single-Speed Hoist and by using special pole change motors two lifting/lowering speeds with speed ratio of 4 : 1 are obtained by pressing the buttons of the push-button switch.

Model ECT-3M is recommended when higher efficiency is required and also for precision movements for setting operations without requiring skilled hoist operator.

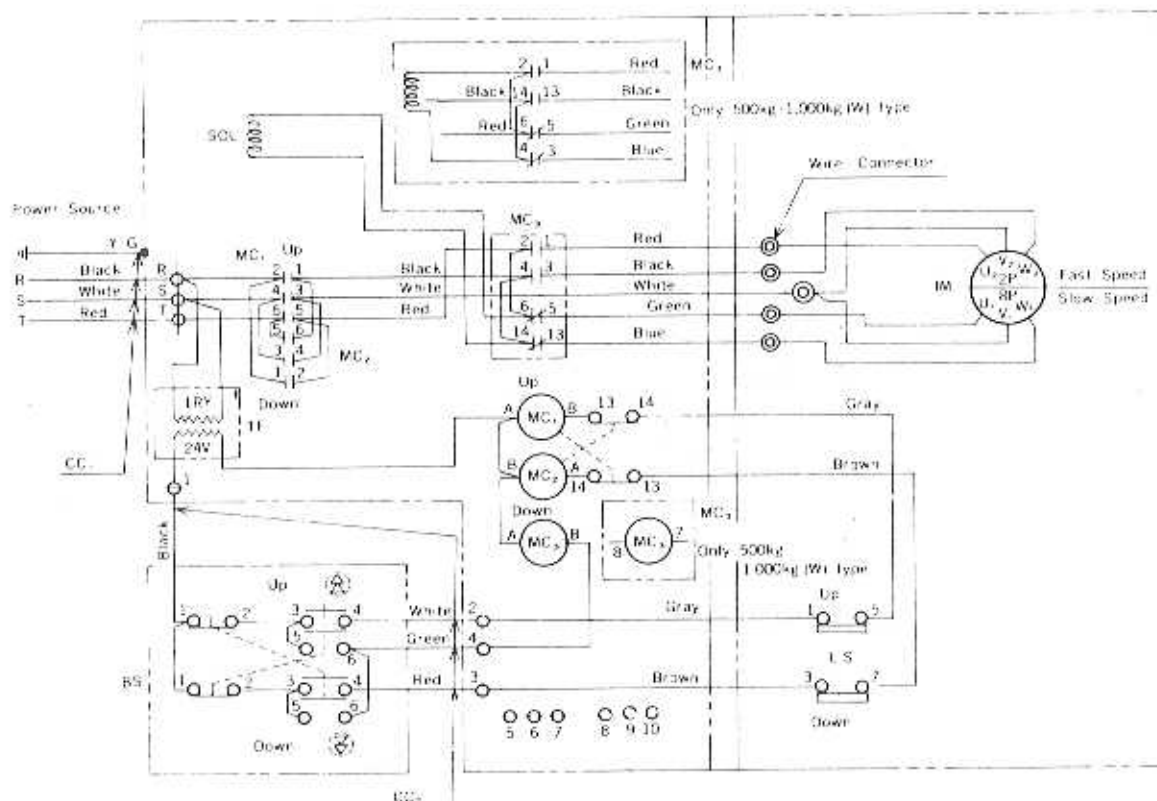
1. Be sure to make positive contacts when operating the 2-stage pendant push-button switch.

2. The motor ratings are different with the high and low speeds as indicated below: —

When only fast speed is used . . . 30 min. rating  
When only slow speed is used . . . 10 min. rating

3. Model ECT-3M Two-Speed Hoist is based on Model EC-3M Single-Speed Hoist but, because of the special motor, there are differences in the control system and reduction gears. When ordering spare parts for Model ECT-3M, be sure to state Two-Speed parts are required.

### CIRCUIT DIAGRAM – MODEL ECT-3M THREE-PHASE TWO-SPEED ELECTRIC CHAIN HOIST [150 - 500 KG, 1000 KG(W)]

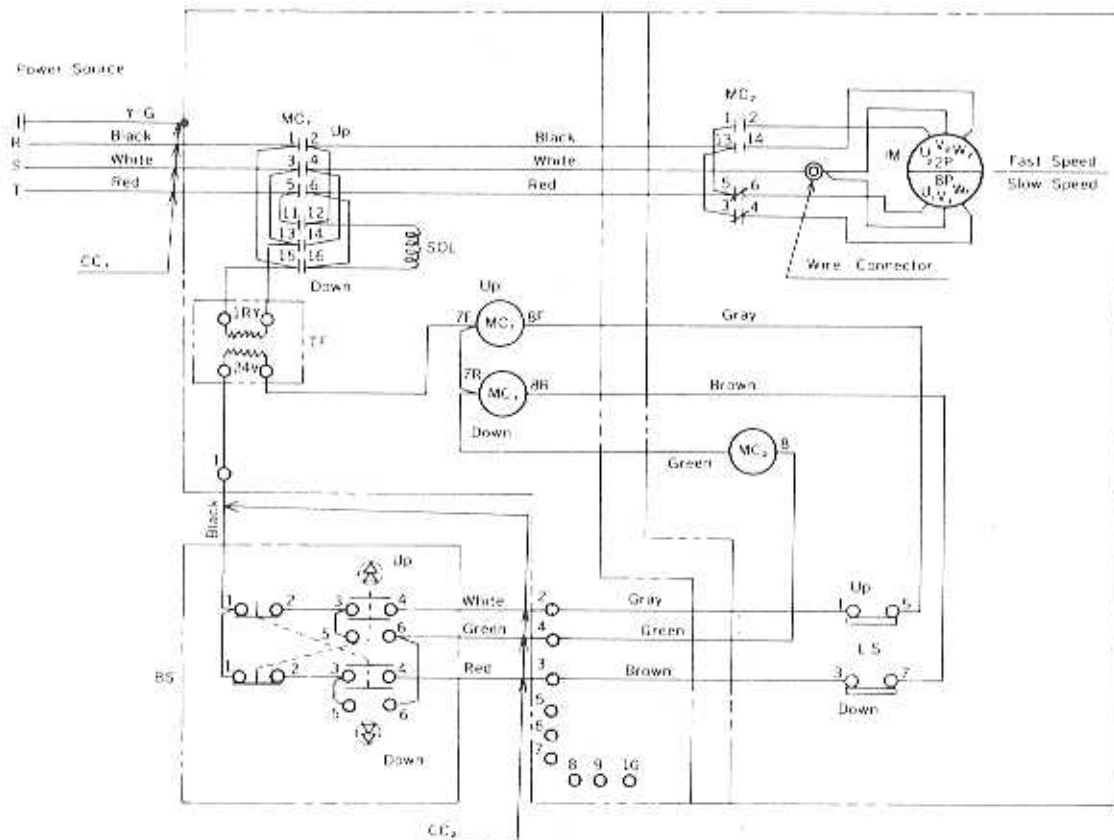


N.B. The colour of the earth cord may vary according to requirements in specific markets.

**Do not change the wiring!**

Rated Load (kg)	150	250-500W	500-1,000W	Rated Load (kg)	150	250-500W	500-1,000W
IM	Lifting Motor(kw, 50/60Hz)	0.1/0.4/0.125/0.5	0.23/0.9/0.28/1.1	LS	Limit Switch	LS-51-1	
MC <sub>1</sub> -MC <sub>2</sub>	E.M.Contactor	FMC-0(3a-1b)		SOL	Solenoid	SK-350-ANC1	
MC <sub>3</sub>	E.M.Contactor	FMC-0(2a-2b)	MUD-722(2a-2b)	CC <sub>1</sub>	Power Source Cable	VCT1.25mm <sup>2</sup>	
TF	Transformer	TF-300		CC <sub>2</sub>	Switch Cable	VCT1.25mm <sup>2</sup>	
BS	Push Button Switch	COB-71					
SYMBOL	NAME	TYPE		SYMBOL	NAME	TYPE	

**CIRCUIT DIAGRAM – MODEL ECT-3M  
THREE-PHASE TWO-SPEED ELECTRIC CHAIN HOIST ( 1000 KG )**



N.B. The colour of the earth cord may vary according to requirements in specific markets.

Rated Load(kg)		1,000
IM	Lifting Motor(kw):50,60Hz	0.27/1.1/0.33/1.3
MC <sub>1</sub>	E.M.Contactor	HMU-10
MC <sub>2</sub>	E.M.Contactor	MUD-722
TF	Transformer	TF-302N
BS	Push Button Switch	COB-71
LS	Limit Switch	LS-51-1
SOL	Solenoid	SK-350-ANC1
CC <sub>1</sub>	Power Source Cable	VCT1.25m <sup>2</sup>
CC <sub>2</sub>	Control Cable	VCT1.25m <sup>2</sup>
SYMBOL	NAME	TYPE

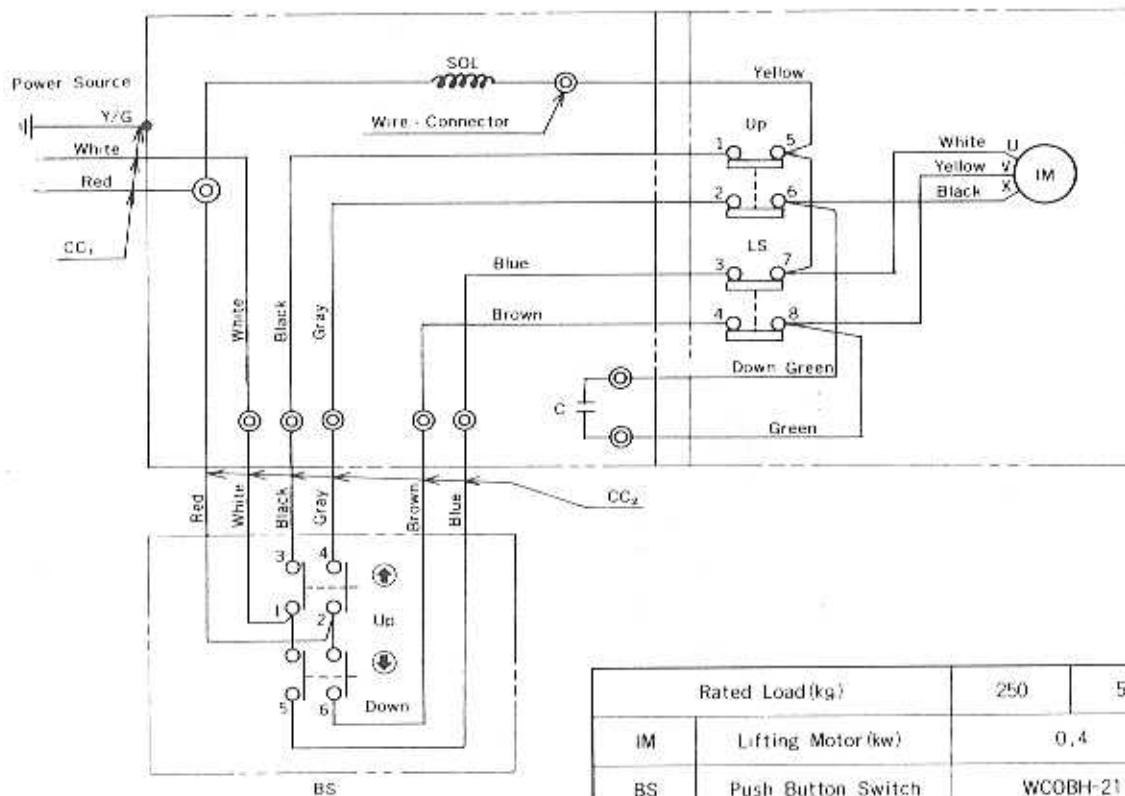
**Do not change the wiring!**



## 6. Model ECC-3 SINGLE-PHASE ELECTRIC CHAIN HOIST

Model ECC-3 Single-Phase Hoist is a Model EC-3M Three-Phase Hoist with its motor changed from a three-phase to a single-phase condenser motor. Other parts of Model ECC-3 Hoist are designed with interchangeability with Model EC-3M Hoist in mind. Servicing and inspection are the same as Model EC-3M.

### CIRCUIT DIAGRAM – MODEL ECC-3 SINGLE-PHASE ELECTRIC CHAIN HOIST



N.B. The colour of the earth cord may vary according to requirements in specific markets.

Rated Load (kg)		250	500 W
IM	Lifting Motor(kw)	0,4	
BS	Push Button Switch	WCOBH-21	
LS	Limit Switch	LS-52-1	
SOL	Solenoid	SK-350-ANC1	
C	Condenser	2x70µF	
CC <sub>1</sub>	Power Source Cable	VCT2,0mm	
CC <sub>2</sub>	Control Cable	VCT2,0mm	
SYMBOL	NAME	TYPE	

**Do not change the wiring!**

## 7. CONNECTIONS WITH MANUAL TROLLEYS (with EC-3M/ECT-3M/ECC-3)

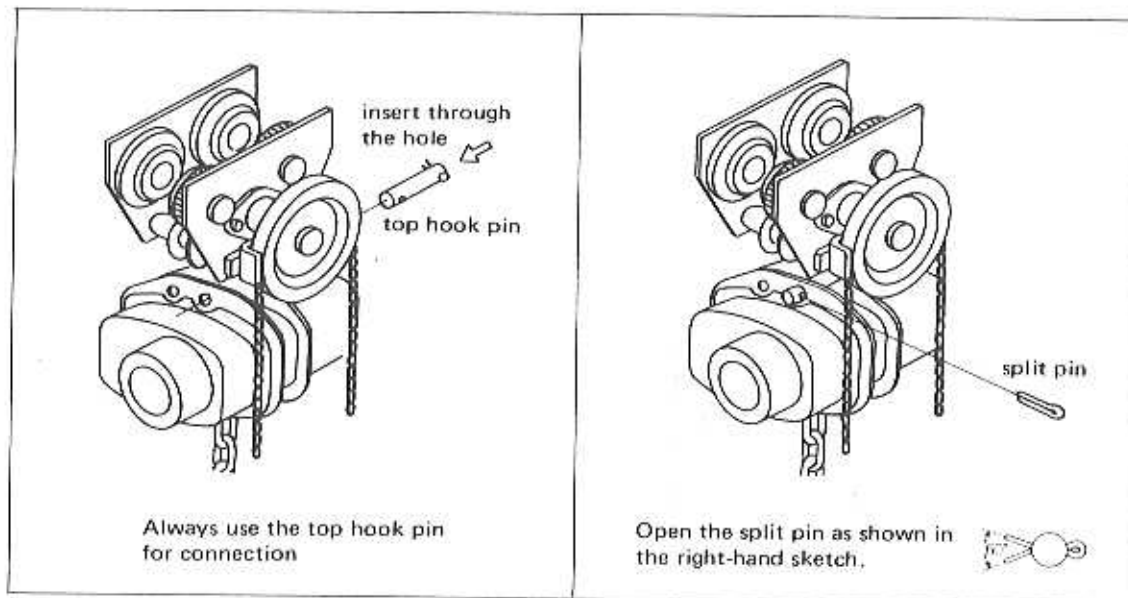
You will find large varieties of uses for your EC series Hoist when it is connected with a NITCHI Trolley. The following three different types of Trolleys are available for your choice: —

Electric Trolley	Model EMT
Geared Trolley	Model GT
Plain Trolley	Model PT

For further information on these Trolleys please contact your NITCHI Distributor and or Agent, who are ready to serve you.

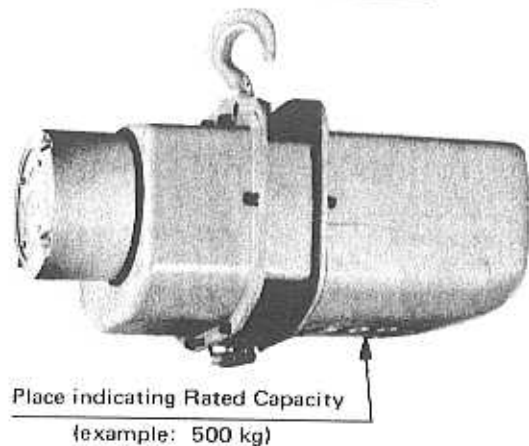
### 7-1 CONNECTION OF A EC SERIES HOIST WITH A GEARED TROLLEY

The EC series Hoists can be connected to a Manual Trolley simply by removing the top hook assembly and inserting the connecting pin and fasten it to the direct-coupling plate or holder. **N.B. For connection of a EC series Hoist with an Electric Trolley please contact your Distributor and or Agent.**



When purchasing a Trolley separately for your EC-series Hoist, be sure to state that a Trolley for EC-3M (or ECT-3M or ECC-3) Hoist is required.

When connecting an EC-3M (or ECT-3M or ECC-3) series Hoist with a Trolley for Model EC-2M series Hoist, the direct-coupling (or holder) will require changing.



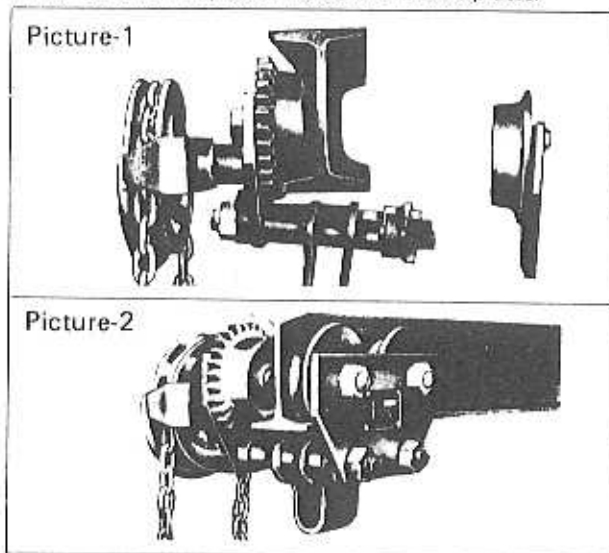
## 7 - 2 METHODS OF MOUNTING TROLLEYS ONTO RUNWAY BEAMS

How to mount a trolley on I-type or H-type beam:

- Examine the trolley to see if the breadth (width) will suit the runway beam. Insert the trolley onto the runway beam from one of the ends. Picture-2
- Disassemble one side of the trolley by removing the nuts and side-plate with wheels. Then, set the other side of the trolley onto the runway beam and replace the side-plate with wheels, and securely fasten it with the nuts. Picture-1  
Adjust the trolley to the proper beam width (breadth) by shifting the adjusting collars on the stay bolts to the outside or inside of the side-plates. Refer to the Table below.
- Protective stoppers must be fixed on both ends of the runway beam to prevent the trolley from falling.
- When mounting an electric trolley onto a curved runway beam, be sure to insert the trolley with the motor-side facing outside of the curved beam.

Capacity	Range of applicable beam breadth(mm)		
	nos. of collars		
	0	2	4
2,000 · 1,000	75	100	125
2,000 · 3,000	100	125	150

The table shows the numbers of collars (spacers) which are to be placed inside of the side-plates.



## 7 - 3 POWER FEEDING METHODS

### a) Power source cables:

10 meters long power source cable (without plug) for an hoist with an electric trolley and 5 meters long for hoists with manual trolleys are supplied as standard equipment.

- Power source cable carriers suspended from a messenger wire running parallel to the runway beam or power source cable carriers that hang directly from the runway beam will let out or take in the power source in accordance with the movement of the trolley.

Messenger wire cable carrier . . . . . CK-1

Runway beam cable carriers . . . . . CK-101

NOTE: Type number will change with different beam breadths.

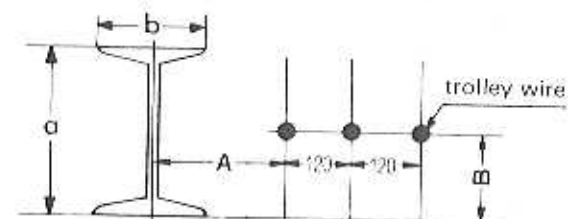
- A cable carrier is needed for each lineal meter. When there is a curve in the runway beam and depending on its distance, the distance between the runway beam cable carriers will differ – please contact your Distributor and or agent for further information.

### b) Pantograph method:

You will find it convenient to use insulated trolley wires for a long distance or when there are curves in the runway beam.

Bare trolley wires are very dangerous – do not use them in any circumstances. Refer to the following dimensions when installing insulated trolley wires.

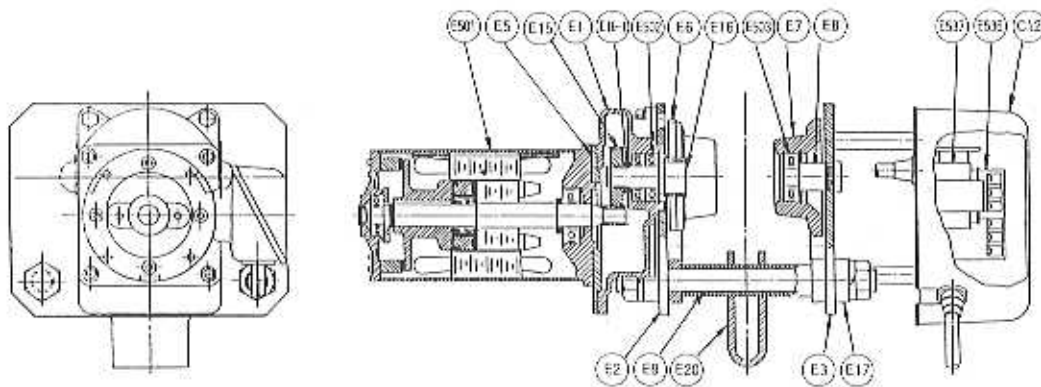
Capacity (kg)	a × b (mm)	A (mm)	B (mm)
150~1,000	150 × 75	320	60
2,000~3,000	200 × 100	335	110



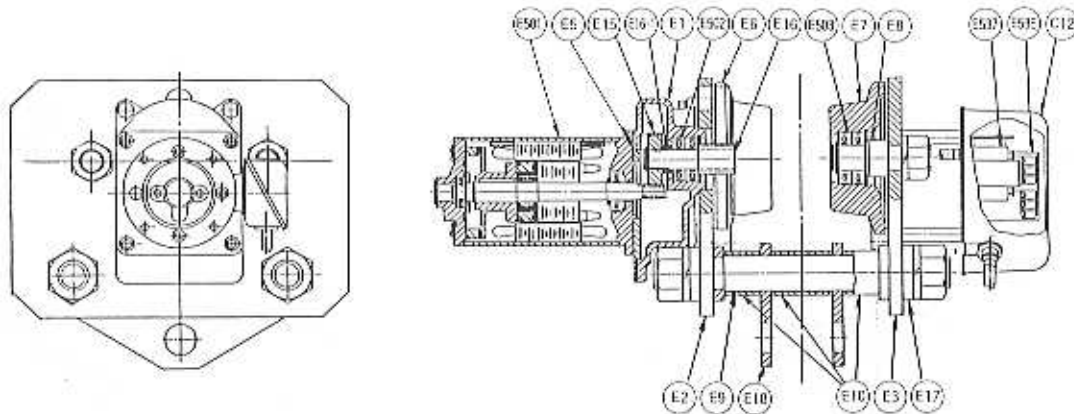
When using the Pantograph method please contact the authorized Distributor and or Agent if floating of the running wheels will cause any problems.

6-8 EMT-5M ELECTRIC TROLLEY SECTION  
0.5-2 ton

Fig. 46



3-10 ton



Part No.	Part Name	Nos. Used	Part No.	Part Name	Nos. Used
C12	Switch cover	1	E16	Pinion	1
E1	Gear box	1	E16-1	Pinion collar	1
E2	Gear-side plate	1	E17	Adjust collars	8
E3	Plain-side plate	1	E18	Joint plates(3~10ton)	2
E5	Support for motor flange	1	E20	Top holder(0.5~2ton)	1
E6	Gear wheels	2	E501	Motor(with Brake)	1
E7	Pain wheels	2	E502	Ball bearings	2
E8	Wheel pins	4	E503	Ball bearings(5~10ton)	4(8)
E9	Stay bolts	2	E536	Electromagnetic contactor	1
E10	Stay pps(3~10ton)	2sets	E537	Transformer	1
E15	Pinion gear	1			