

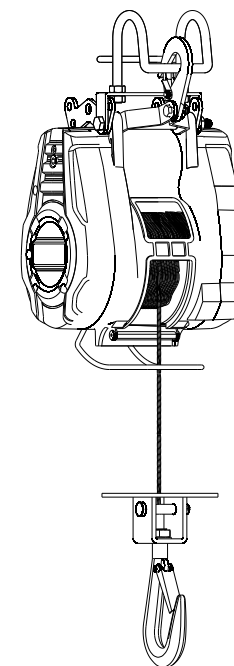


Instruction Manual

Mini Electric Winch

Brushless motor

Model: BL170, BL260, BL340, BL490



SINCE 2011



READY THIS MANUAL BEFORE USING THESE PRODUCTS

This manual contains important safety, installation, operation and maintenance information. Make this manual available to all persons responsible for the operation, installation and maintenance of the mini electric winch.

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SPECIAL FEATURES

Brushless Motor system

Permanent magnet brushless maglev motor, which is industrial grade. It is not easily damaged with two single-phase voltage (110V/220V) to choose. With high power and high efficiency, it's suitable for long time working. It features temperature protection device, overload protection device and stepless speed regulation. The temperature of the enameled wire can reach 200 °C and production level increased by ED50%.

Electric control system:

Its circuit has no capacitor, and controlled by SCM. It features stable performance, high power factor, plug and pull wiring, convenient and reliable operation and maintenance.

Brake system:

The dual braking system uses mechanical ratchet braking and resistive short circuit control. The high friction coefficient sintered brake makes the motor durable and can be immediately braked in case of power failure or winch failure which makes motor high safety and long service life.

Safety system:

When the hook rises to a certain lifting height or when the wire rope is reversed, the limit switch will be triggered to protect the machine and stop machines from working

Cable specifications:

Using top brand imported wire rope, the safety factor is 4 times that of ordinary machines

Gear system:

Use high efficiency bevel drive reduction gear. This type of gear undergoes special heat treatment, and its strength is three times higher than ordinary products.

Main unit housing:

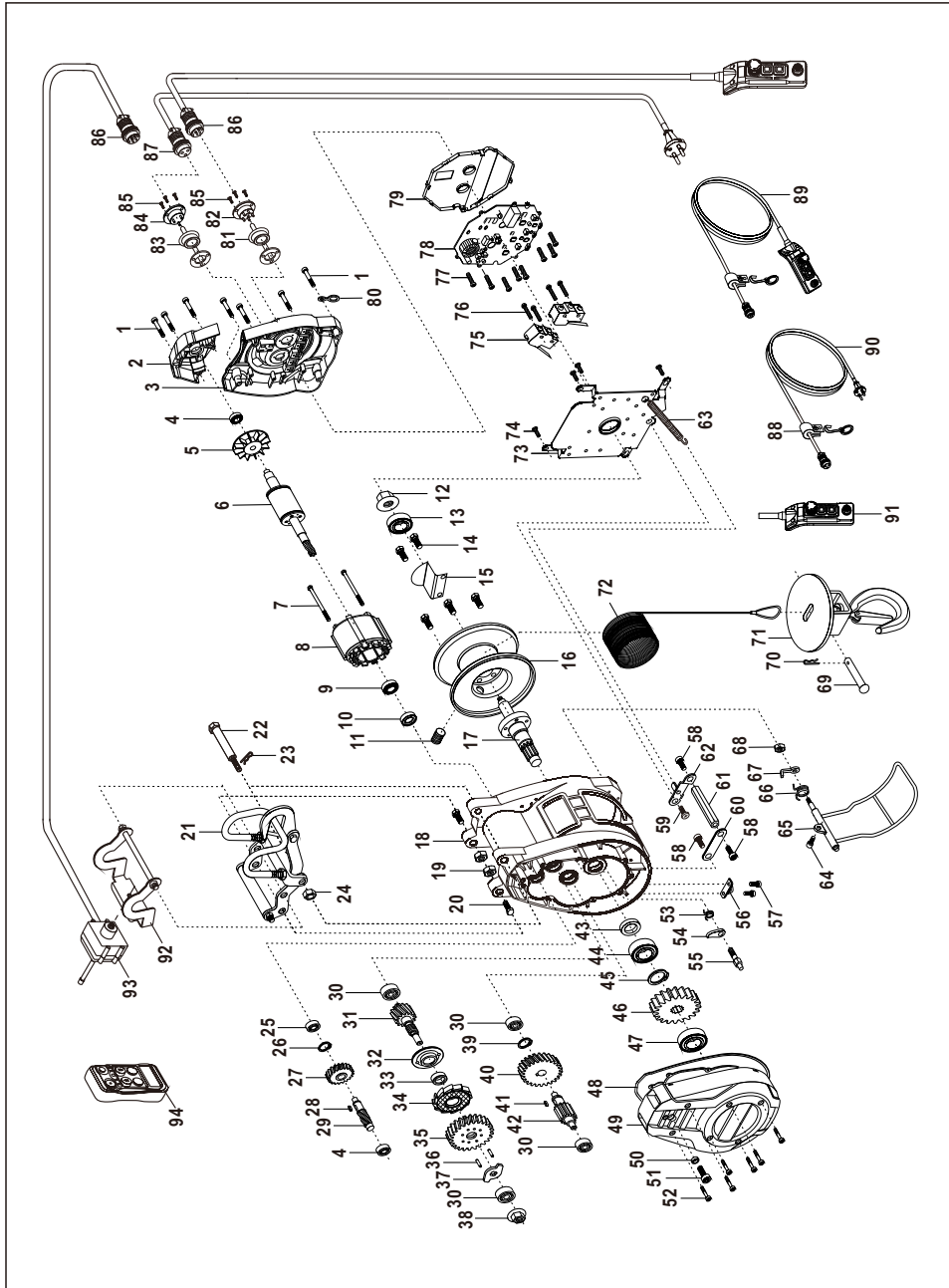
The housing of motor and gear box is one-piece aluminum alloy die-casting structure with strong toughness. It is machined by CNC with high precision, which makes the running of winch smooth and low noise. The surface of housing is powder coated, which grade is same as automobile with nice appearance. It also features compact.

9. Parts list

No.	Parts Description	No.	Parts Description	No.	Parts Description
1	Socket Bolt	33	Brass Bushing	65	Upper limiter
2	Motor Cover	34	Ratchet Brake	66	Spring
3	Wiring Box Cover	35	2nd Gear	67	Lock Washer
4	Bearing	36	Elastic Pin	68	Nut
5	Cooling Fan	37	Brake Adjusting Plate	69	Load Shaft
6	Armature	38	Antislip Nut	70	R pin
7	Socket Bolt	39	Retaining ring	71	Lower hook set
8	Stator	40	3rd Gear	72	Wire Rope
9	Bearing	41	Key	73	Wiring Bracket
10	Oil Seal	42	3rd Pinion	74	Screw
11	Lock Screw	43	Oil Seal	75	Micro Switch
12	Antislip Nut	44	Bearing	76	Screw
13	Bearing	45	Retaining ring	77	Screw
14	Screw	46	Gear	78	Circuit Board
15	Wire Rope Side Cover	47	Bearing	79	Water-proof Plate
16	Reel Drum	48	Gasket	80	Hanger
17	Output Shaft	49	Gear Cover	81	Switch Socket Cover
18	Main Housing	50	Oil Seal	82	Switch Socket
19	Nut	51	Socket Bolt	83	Power Socket Cover
20	Screw	52	Socket Bolt	84	Power Socket
21	Upper Hook set	53	Pawl Spring	85	Screw
22	Bolt	54	Pawl	86	Pendant Switch connector
23	R Pin	55	Pawl Screw	87	Power connector
24	Nut	56	Upper limiter Holder	88	Cable Clip
25	Bearing	57	Socket Bolt	89	Pendant Switch set
26	Retaining ring	58	Socket Bolt	90	Power cable set
27	1st Gear	59	Screw	91	Pendant Switch
28	Key	60	Limit Lever Supporter A	93	Receiver Bracket
29	1st Pinion	61	Reverse Limit Lever	94	Receiver
30	Bearing	62	Limit Lever Supporter B	94	Transmitter
31	2nd Pinion	63	Spring		
32	Brake Hub	64	Socket Bolt		

8. Parts drawing

(BL170, BL260, BL340, BL490)

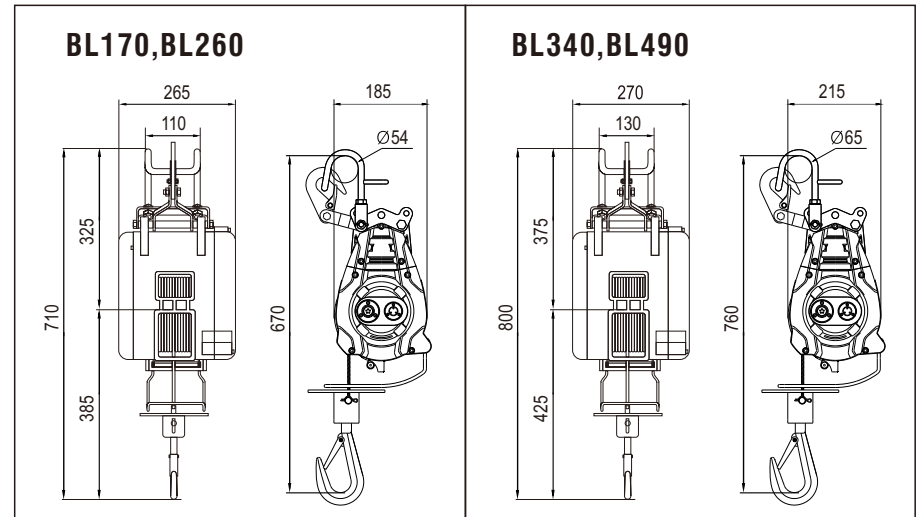


1. Technical Information

1.1 Specifications

Model		BL170	BL260	BL340	BL490
Rated Load		170kg	260kg	340kg	490kg
Lifting Height		30m	30m	60m	30m
Wire Rope Dia.		5mm	5mm	5mm	6mm
Motor		1700w	2100w	2400w	2800w
Lifting Speed	50Hz	6-21m/min	7-19m/min	6-17m/min	5-16m/min
	60Hz				
Power Supply		Single-phase, 110V-220V, 220-240V, AC 50/60Hz			
Duty Cycle		ED 50% Max. on time: 30min/hr. Max. number of starts: 150/hr			
Ingress Protection	Winch Body			IP54	
	Switch			IP65	
Insulation Class		F			

1.2 Dimensions



2. Pre-Operational Precautions

2.1 Safety Precautions

The winch has been designed to give safe and dependable service if operated according to the instructions. Please read and understand this manual before installation and operation of the winch.

Follow these general safety precautions:

- Confirm that the winch complies with the using conditions.
 - Keep the winch secure strongly and the rope is not wound to be deviated to the drum.
 - Don't use unsuitable pulleys or accessories concerned.
 - Don't use unsuitable rope in construction, strength or having any defects.
 - Pay attention to the grounding, it provides a path of least resistance for electric current to reduce the risk of shock.
 - Check the winch for smooth operation without load before loading operation.
 - Make sure the wire rope to be wound evenly in the first layer on the drum, rewind it, if a mixed windings in existence.
 - If a wire rope is found an uneven winding or accumulated at one side of the drum, align it adequately.
1. The winch is not to be used to life, support or otherwise transport personnel.
 2. A minimum of five (5) wraps of rope around the drum is necessary to support the load rated
 3. The owner and/or the operator shall have an understanding of these operating instructions and the warning before operating the electrical winch. Failure to follow these warnings may result in loss of load, damage to the winch, property damage personal, or fatal injury.
 4. The owner shall retain this manual for further reference to important warnings, installation operating and maintenance instructions.

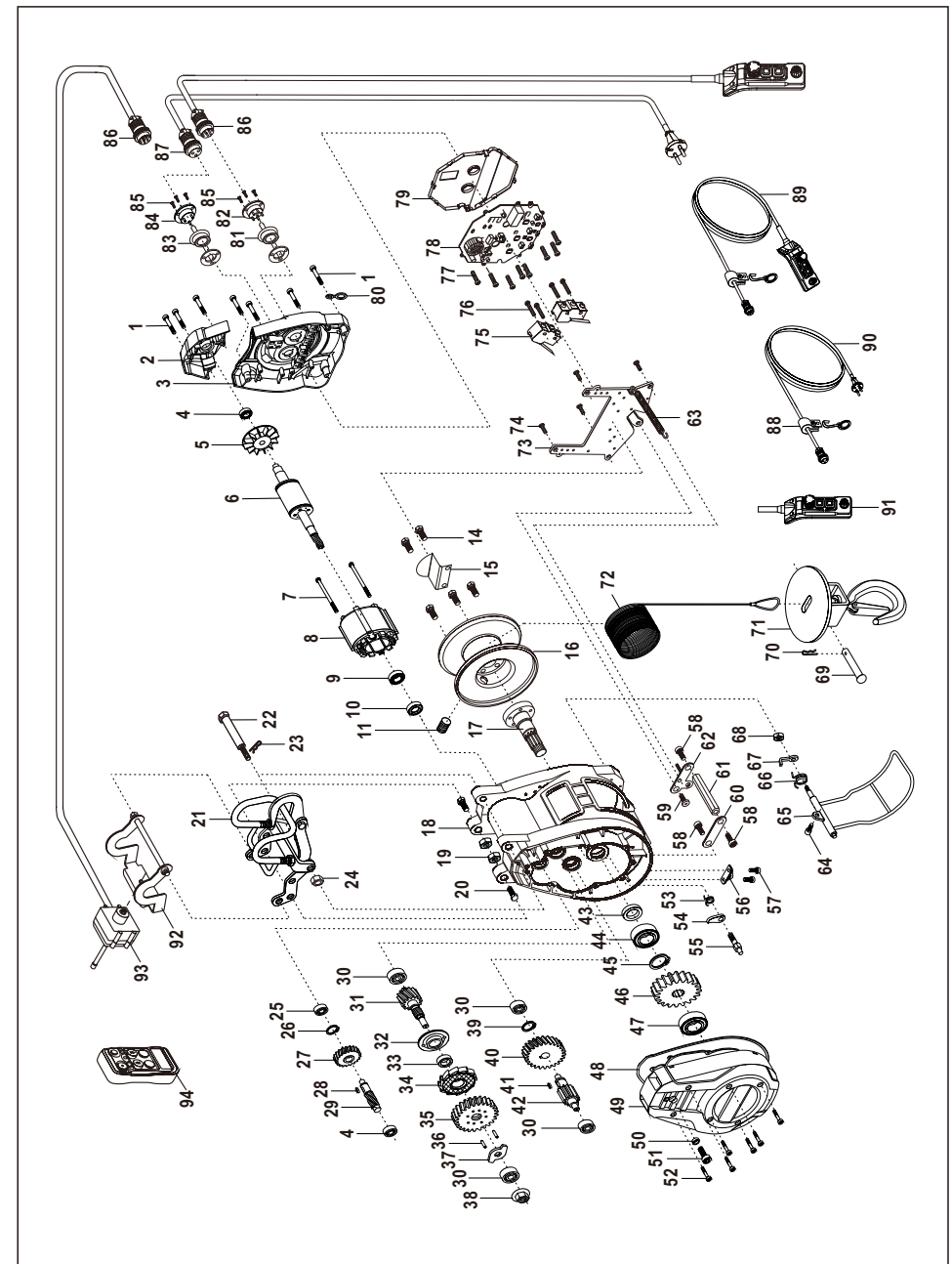
2.2 Environmental Precaution

The following environmental conditions may result in the possible causes of winch trouble.

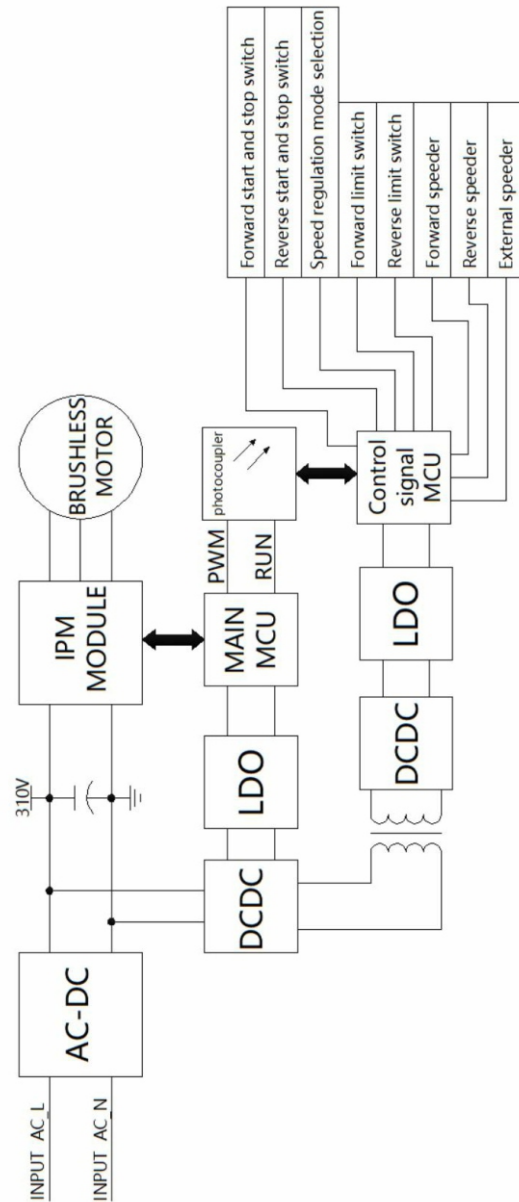
- Low temperature below -10° , high temperature above 40° or humidity above 90% conditions.
- In an organic chemistry or explosive power conditions.
- In heavy acid or salty conditions.
- In the rain or snow condition.
- In a heavy general powder conditions.

8. Parts drawing

(BL170,BL260)



7. Wiring Diagram



2. Pre-Operational Precautions

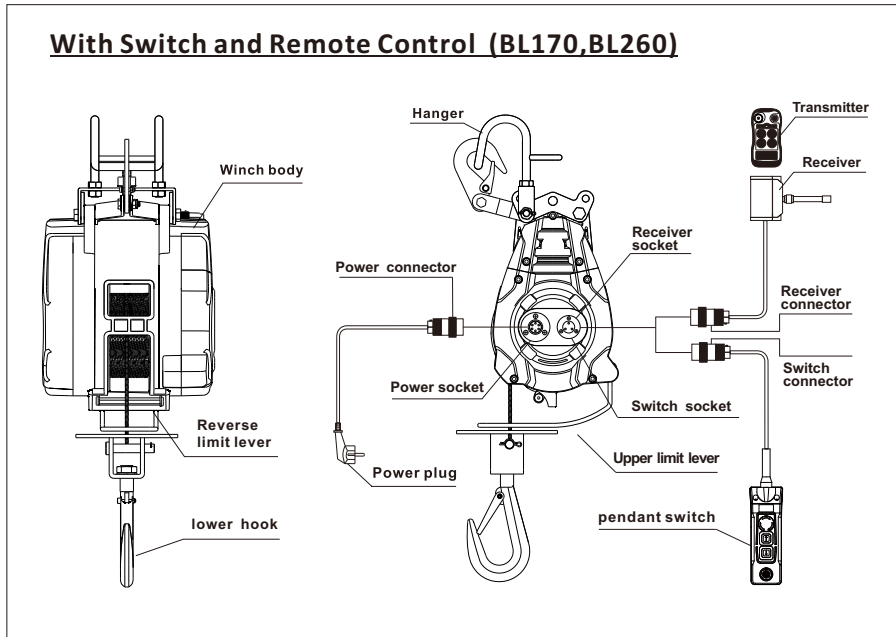
2.3 Handling Precautions

- To prevent the risk of electric shock, the power plug must be plugged into a matching outlet and grounded in good condition.
- Never try to lift a load higher than the rated cap.
- Never hitch a ride on the hook, sling or load being moving.
- Winches are not to be used for lifting or lowering people.
- Don't work, walk or stand under an operating winch.
- Always remain in control. Never neglect the winch while actually hoisting a load.
- While working, never stand under a lifting load or within the conveying area.
- Always look up when working around winch, there is potential danger overhead.
- Never gravitate a load free.
- Be sure to lift a load vertically. Slack may allow wires to be caught in The drum.
- Prior to starting of use, carry out the daily checking without fail, and after confirming the safety of function. If having a counter rotation incurred, make sure to correct its rotation direction.
- Prior to lifting. Make sure to have a precise performance of brake. If any malfunction of brake happened, stop the operation immediately.
- When load suspended in air, it will not allow to be welding.
- Wire rope with one or more of the following defects shall be removed or replaced immediately.
 - 1) kink, 2) distortion, 3) corrosion, 4) Broken wires more than 10%,
 - 5) Decreasing of diameter more than 7%
- Stop the operation if there is any queer noise or vibration in the gear box to be happened.
- Do not connect the wire rope with the grounding of welding machine.
- While welding, do not have any contact with the welding objects because of having spark.
- Do not pull the switch.
- Never plugging (instant reverse-winding) or inching.
- Do not over the short time ratings of the winch.
- In order to prevent the layer down due to over loosening of rope irregular winding,
- Use a winch by fixing so securely that the rope around the drum is even.
- Be sure to fix a rope in the center of weight hook.
- Avoid catching the hook or lifting a load on a fixed obstruction.
- Always leave the pendant switch positioned immediately after use.
- Make sure that the load being lifting is well balanced and secured before starting.
- Avoid water splashes on the pendant switch.
- Never wrap the load with the wire rope.

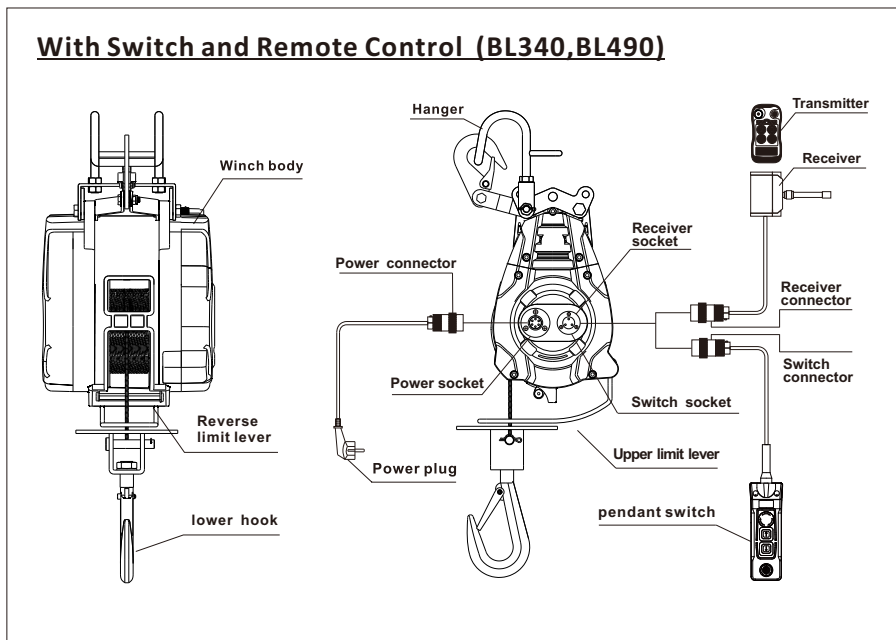
3. Installation

3.1 Winch Assembly

With Switch and Remote Control (BL170, BL260)



With Switch and Remote Control (BL340, BL490)



6. Trouble Shootings

Symptom	Possible cause	Remedy
No reaction or open circuit	Open circuit on power lead or switch cord	Check power lead or switch cord
	Burnt rectifier at power source side	Replace rectifier and pay attention to its poles
	Burnt motor	Replace motor
	Burnt or communicated motor resulting from over load.	Replace
Can lift, but fail to lower	Deformation of Down spring plate of limit switch	Adjust or re-stall the limit switch until having sound
	Burnt diode	Replace diode and pay attention to its poles
	Burnt limit switch	Replace limit switch
	Burnt rectifier at motor side	Replace rectifier and pay attention to its poles
	Malfunction of the Down contact of switch	Replace switch
Can lower but fail to lift	Deformation of Up spring plate of limit switch	Adjust or re-stall the limit switch until having sound
	Burnt limit switch	Replace limit switch
	Loose of the transmitting arm resulting in malfunction of Down limit switch	Adjust
	Loose adjustable nut	Adjust
	Burn diode	Replace diode and pay attention to its poles
	Burnt Up limit switch	Replace switch
	Burnt rectifier at motor side	Replace rectifier and pay attention to its poles
	Malfunction of the Up contact of switch	Replace switch
Short circuit	Melted contact of switch	Replace pendant switch
	Burnt diode	Replace diode and pay attention to its poles
	Short circuit on rectifier at motor side	Replace rectifier and pay attention to its poles
	Burnt D type resistor	Replace resistor
	Burnt motor	Replace motor
	Damaged circuit board resulting from the winding-in of rope	Replace circuit board
Fain to lift rated load	Overload	Reduce load
	Short circuit on the commutator of the armature core or burnt parts of armature coils.	Replace commutator of the armature core
	Burnt parts of armature winding.	Replace armature winding
Fail to hold load after stopping	The gap of ratchet brake is too large	Adjust the ratchet brake
	Malfunction of pressed spring of ratchet brake	Adjust the ratchet brake
	The oil is too dirty or includes contamination	Replace oil
Having too much oil in gear box	Having too much oil in gear box	Reduce the quantity of oil
	Brake distance is too long at no load	Malfunction of D type resistor
Having smell or smoke	Malfunction of pressed spring of ratchet brake	Replace pressed spring
	Burnt D type resistor	Replace D type resistor
	Malfunction of B contact of the pendant switch	Replace pendant switch
Too noise while lifting	The noise result from the click between ratchet stopper and wheel	It is normal

4. Maintenance and Replacement

4.1 Ratchet Brake Replacement & Adjusting

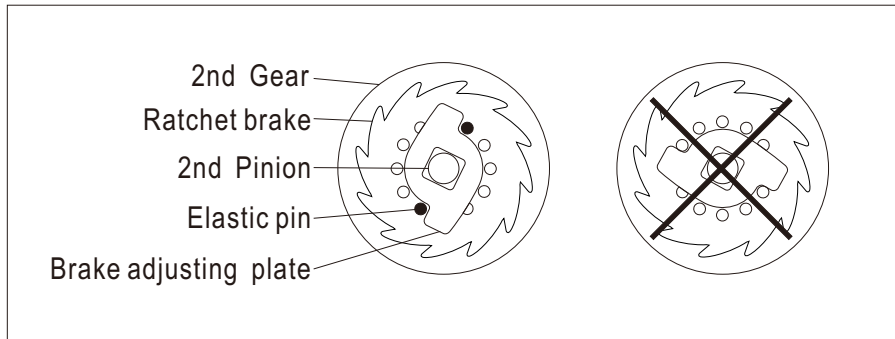
- It is highly recommended that any adjustments are carried out by a qualified technician at an authorized service center.
- Ratchet brake replacement & adjustment procedures.

Step 1. Remove anti-slip nut and elastic pin.

Step 2. Tighten 2nd gear / 2nd pinion counter-clockwise until holding to the ratchet brake.

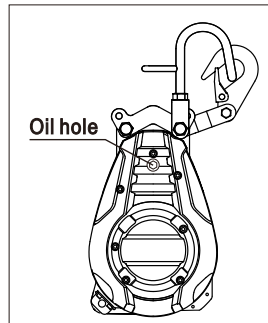
Step 3. Find the closed pole between elastic pins and brake adjusting plate (one between four selections), then put the brake adjusting plate onto the square hole of 2nd gear or 2nd pinion.

Step 4. Insert elastic pins and lock anti-slip nut.



4.2 Oil Lubrication

Gear lubrication is an important component in insuring long life of your winch. The type of lubricant will have a great influence. Winch are pre-lubricated at the factory and do not require initial lubrication. Re-lubrication interval depends upon service. Consult your local lubricant distributor on the selection that best fits your climate and application.



Grease Grade	Quantity	Intervals
Caltex Multifak EP, Cosmogear Sp460	250 cc	1 Year

4. Maintenance and Replacement

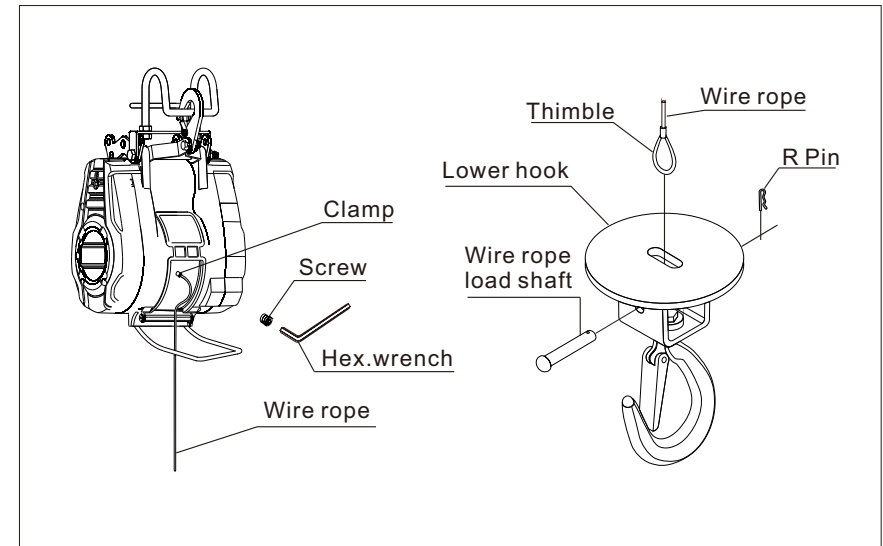
4.3 Wire Rope Replacement

Lower Hook

- Put a new wire rope through the hole of the round plate of lower hook.
- Insert a wire rope load shaft through the thimble of wire rope.
- Insert a R pin through the wire rope load shaft and bent it by pliers.

Drum

- Let a new wire rope with clamp through the limit lever and insert it into the hole of the drum.
- Put a screw into the hole of the drum and tighten it by a hexagon wrench.
- Press the ↑ button to rotate the drum in the lifting direction.
- An uneven winding of wire rope may cause the load to be swing, that will damage the rope and reducing its service life.



5. Checking Reference

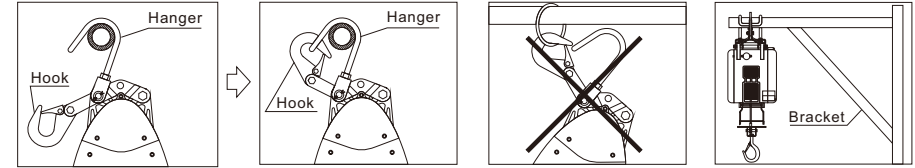
- The specified person performs the checking of winch.
- Divide the checking into daily checking and periodic checking.
- The checking items and checking method in daily and periodic checking shall be carried out and different according to the using frequency.

Checking Items		Checking Methods	Classification of Checks				
			Daily	Periodical			
				3 Months/ 20 Hours	1 Year	Years or 250 Hours	
1	Brake	Performance Wearing of lining, and pressed plate Brake or escaping of spring	Visual Decomposition check Decomposition check	▲			▲
2	Motor	Condition of insulation Staining , damage	Measuring,50MΩmin Visual	▲	▲		
3	Remote control	Working Outer damage of switch cords Attaching condition of earth line Condition of insulation	Manual Visual Visual Measuring,50MΩmin	▲ ▲ ▲		▲	
4	Safety device	Over-wincing prevention function Reverse-winding prevention function Distortion of over winding lever Wrong rotary direction-winding	Visual Visual Visual Visual	▲ ▲ ▲ ▲			
5	Wire rope	Kink phenomena Broken wires more than 10% Decreasing of diameter more than 7% Deforming or corrosion	Visual Visual Visual Visual	▲ ▲ ▲ ▲			
6	Weight hook and hanger	Distortion Damage Loosening	Visual Visual Visual	▲ ▲ ▲			
7	Drum	Rupture of flange Wearing	Visual Visual	▲	▲ ▲		
8	Gear trains	Damage, wearing Condition of oil feeding	Visual Measuring	▲		▲	
9	Fastenings	Loosening	Manual	▲		▲	
10	Marking	Label and the like	Manual				

3. Installation

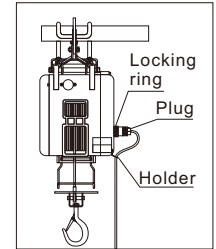
3.2 Mounting

The winch designed to be hanged or mounted on a firm or stable bar or a bracket. When hanging, do not allow the body or load to be caught by any construction of frame, or other obstruction. Be sure to lock the hanger for extra safety.



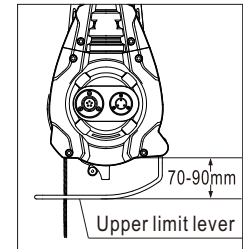
3.3 Plug insertion

- Insert the power plug into the power socket of the winch and clockwise tighten it by turning the locking ring. Be sure to lock the lead by a holder. Do not allow it to be caught by wire rope, drum or other obstacle.
- The length of power cord is subject to the distance of 20 meter, for any other cases, please use a bigger section cord such as 2.0 mm or 3.5 mm or a magnetic switch equipped to prevent a considerable voltage drop to be happened.



3.4 Upper Limit Prevention

- A special mechanism prevents an upper limit lift when lifting.
- When the lower hook touches the upper limit lever. Lifting is automatically stopped.
- However, if the upper limit lever is set too close to the winch body, it will cause serious damage to the limit lever and the winch body.
- A suggested distance (S) between the limit lever and winch bottom is between 70-90mm.



3.5 Reverse Limit Prevention

- A special mechanism prevents a reverse limit when lowering.
- When lowering, a wire rope is fully extended, the wire rope will be shifted its position from O to X.
- When a wire rope touches the limit lever of over-winding prevention device. Lowing will be automatically stopped.
- When the wire rope is shifted to the position of X, pull it and press the ↑ button to return its position to O.

