



**SAN YUAN**

SINCE 1982 MATERIAL HANDLING

**Professional Design & Manufacturer**

**MAINTENANCE AND  
OPERATIONAL INSTRUCTIONS**

**ELECTRIC WIRE ROPE HOIST**

**E Type**

**Patent No (TW) M547550**

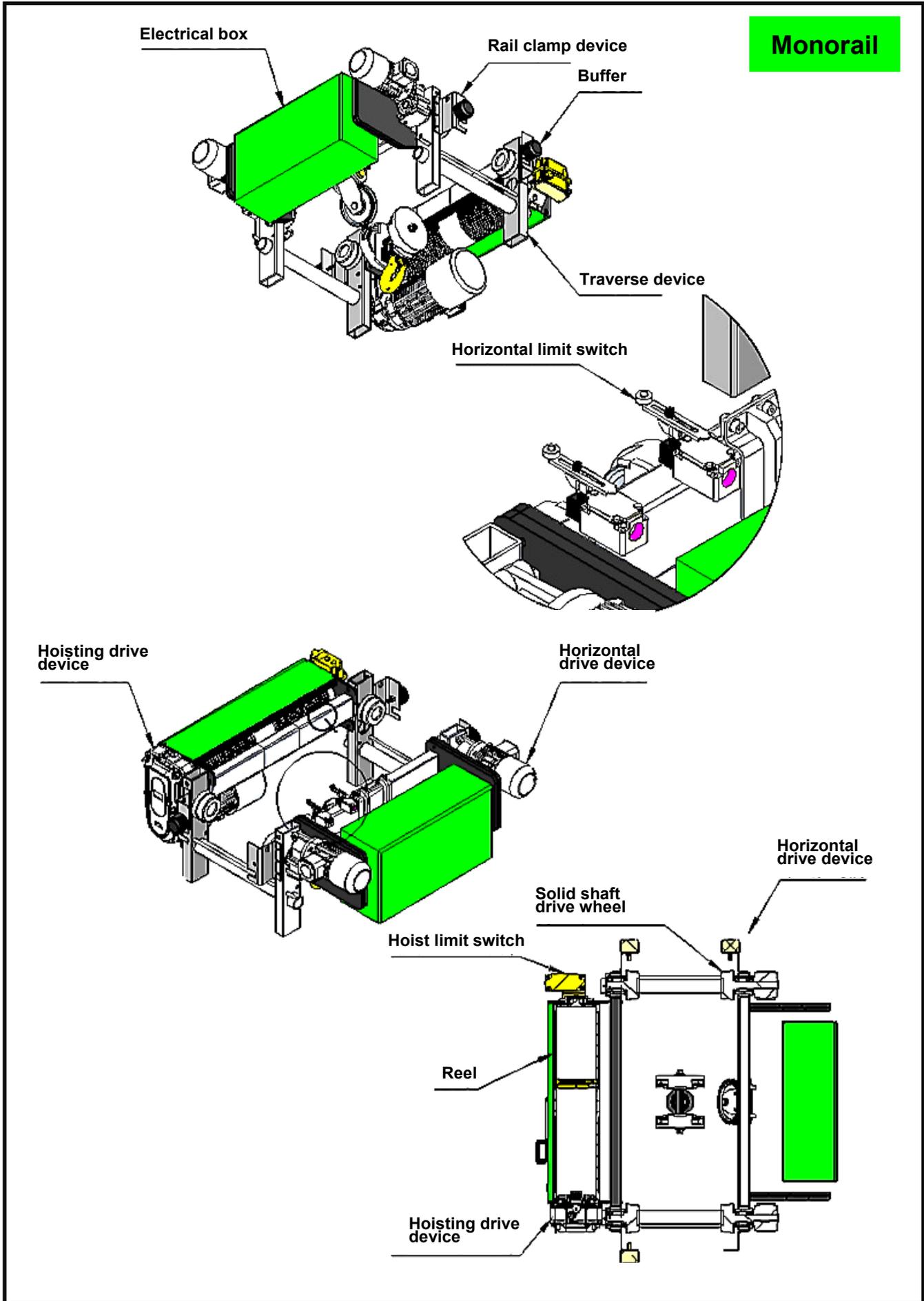
**SAN YUAN CHAIN HOIST CORP.**

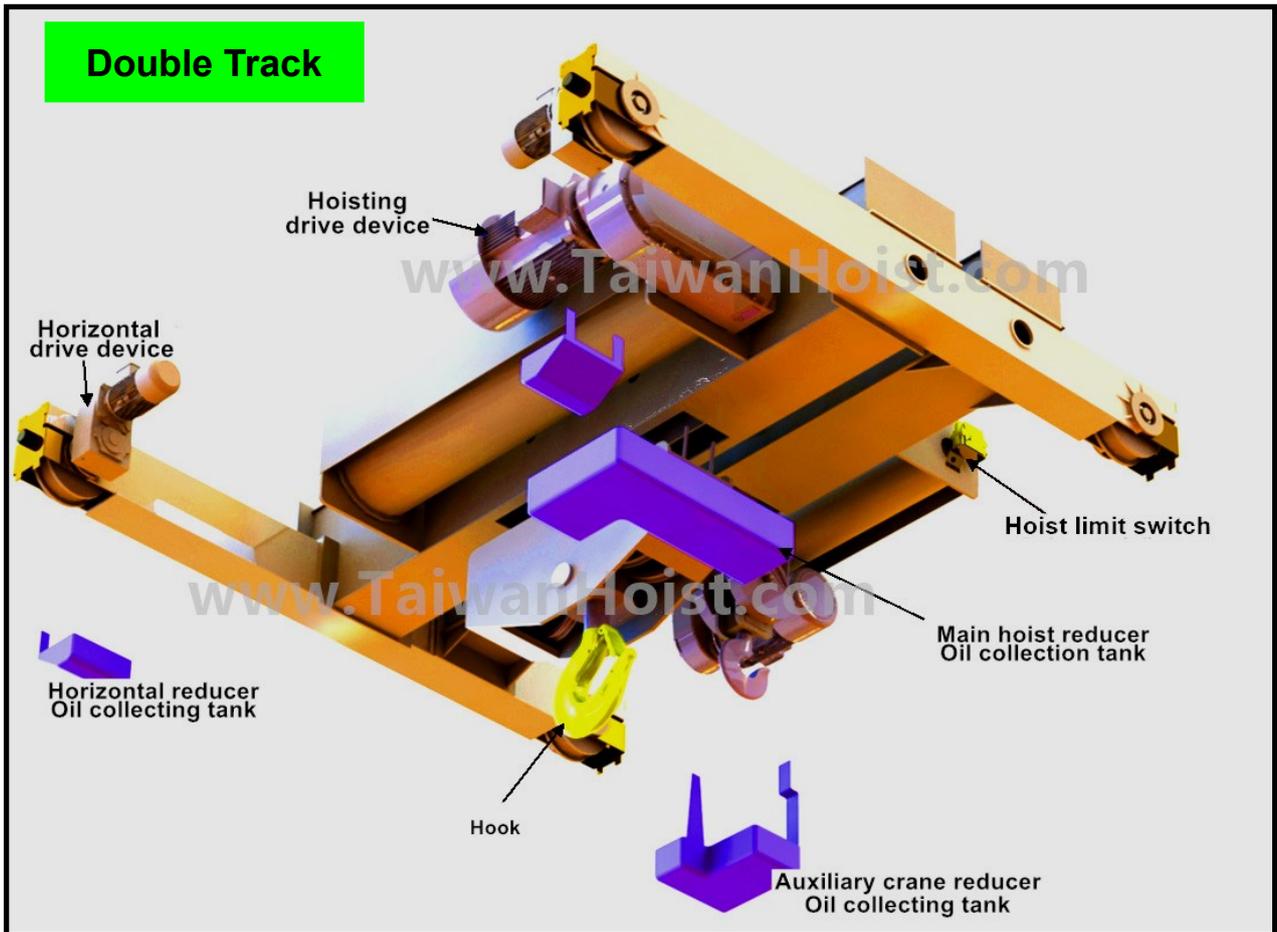
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Thank you for your wise choice of our distinguished electric hoist.  
For your better understanding of the performance of this model,  
Operational safety and inspection, please read carefully and keep  
this manual in a safe place.

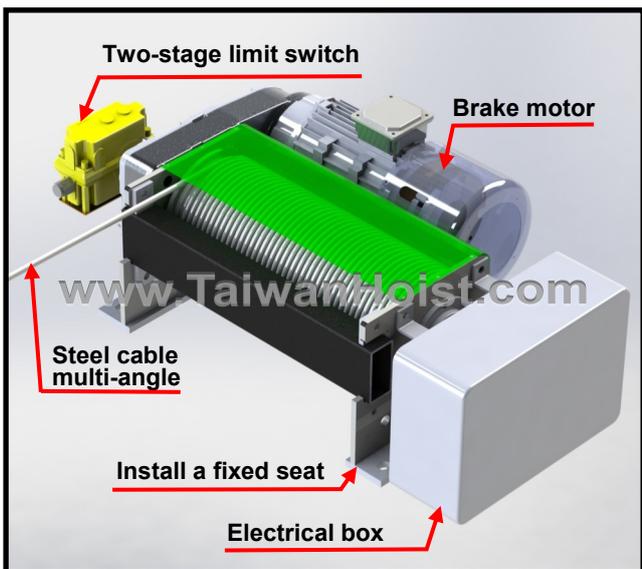
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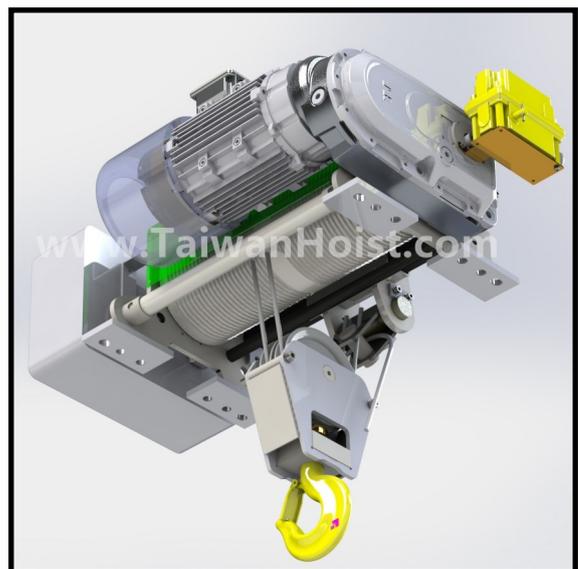




**Industrial Winch**



**Foot Mounted**



## **USE SAFETY PRINCIPLES**

- In operation, the user must be aware of all legally relevant specifications and meet the requirements.
- All objects must be fully trained and licensed to use and operate the unit and safety devices.
- Make sure that the hoist is securely installed and that the cable is wrapped around the cable pulley or wrapped around the cable pulley.
- It is strictly forbidden to use the hoist for the vertical take-off or movement of personnel.
- The hoist is only operated by physically fit persons who have been licensed.
- You must carry the checklist every day and check that the unit is in a normal state before running the unit.
- Violation of the use of this operating manual may cause the operator to expose himself to danger and cause serious injury.
- This instruction manual must be kept on the steel hoist.
- Use only spare parts supplied or specified by the company.
- It is strictly forbidden to use accessories that do not conform to the specifications.
- It is strictly forbidden to use a steel cable structure that does not conform to the specifications, the strength of the rupture or any shackles.
- Before the hoist is used for load operation, it is necessary to carry out the load-free lifting and lowering operations several times.
- Confirm that the hoist has been properly grounded to avoid the possibility of electric shock due to leakage.

## **A. CAUTIONS IN OPERATION FOR HOIST**

### **a. Operation items should be followed for hoist :**

1. Normally operated in the rated loading spec, couldn't get the over load idea , in order to make sure the function and life of hoist.
2. Prohibition out of the perpendicular to load, hoist should be operator normally as vertical loading. Out of the perpendicular to lead will easily to make wire cut, friction, curved and object vibration that is dangerous for life and object.
3. Safety device on hoist, ad limit switch and brakes....etc should be checked at anytime and prohibit to separate seriously.
4. Hoist should assign a person to operate, and prohibit other person to operate, avoid operation generous and damage.
5. Don't move hoist in order to loose object.
6. Operator cannot leave his position and operated.
7. Hook shall life high in order to avoid dangerous on rest time.

### **b. Notice items before operation :**

1. Check rail condition is good or not ?
2. Check wire cut condition ?
3. Check limit switch or brake function id well ?
4. Discussion for unsteady object before operation.
5. To make sure no other man or maintenance people on hoist.
6. To make sure the safety and clearance on moving pathway.

### **c. Periodical and non periodical examination, especially after earthquake and storm, you shall check if there are abnormal condition.**

#### **1. Drily check :**

Including check the crack of structure, the crack of deformed including check the crack of structure, the crack of defund weld part, the loose of nut, bolt, wire roller, hook block and bearing.



6. Check the gear in gearbox :

Gear size is 30~40% of original size, that shall be change new one, and check the noise, the loose of key and pin.

7. Check brake : Including

- (1) Brake wheel examination.
- (2) Check and change the brake lining.
- (3) Adjust the clearance.

8. Check wire :

- (1) Broke condition of wire.
- (2) Examination for high temperature operation.
- (3) Examination the diameter of wire, as diameter lose 7% or more that shall be changed.

9. Check the walking condition is well or not.

## **MAINTENANCE AND INSPECTION**

In order to operate the hoists safely and efficiently and to lengthen the service life for economical management, it is important to check and maintain them carefully with special emphasis on the points mentioned below.

## **PERIODICAL INSPECTION AND EXAMINATION**

It is convenient to have an inspection stand for inspection the hoist. It would be particularly necessary to take this inspection stand into consideration at those plants where a number of hoists are used at all times. It is also convenient to disengage the end of the I beam as the hoist can be mounted or dismantled without disassembly. The stopper must not be removed. In the plants where the hoist plays the main part of the work a spare machine should be prepared. The cost for this spare machine would never be too expensive, since the spare machine will serve not to stop the flow of the work.

### **1. Inspection Preceding Operator (Daily Inspection)**

Before using the hoist for the first time each day, make it a rule to test the machine unloaded to see that :

- (1) The push button switch works smoothly to control the hoist in its vertical and horizontal operation.
- (2) The limit switch works precisely.

- (3) The brake operates positively.

The operation of the brake is judged by the length of the slip of the load to its halt (the descent length of the load block) when it is stopped in the course of its lowering. Although the length of the slip differs depending on the hoisting speed and the frequency of the source current, the correct length of the slip of the load block is within the range of 1% of the specified hoisting distance per minute.

- (4) Any suspicious noise or odor occurring during machine movement.
- (5) Smooth rotation of the sheave of the load block ; and shortage of the lubrication oil ; smooth revolving of the hook and any abnormality in a split pin for stopping the swiveling of the hawknut ; and the correct mount ion of the wire rope on the sheave.
- (6) The wire rope is properly seated in drum and sheave grooves.
- (7) Any abnormality in the slinging tools.

If any abnormality should be found in the above inspection, it should be attended to as mentioned it the following monthly inspection procedures.

## **2. Monthly Inspection**

Monthly inspection should be carried out regularly as follows : The following inspection should be made at least once a month on a predetermined day and indication of disorder should be attended to immediately.

- (1) Push Button Switch
- (a) See if the contacts are covered by foreign bodies, or worn out abnormally.
  - (b) See if the screws for wiring are loosened, or if there is any abnormality in the cable.
  - (c) See if pressed buttons return after released correctly to the original position.
  - (d) See if the case is not damaged.

### C. PRECAUTIONS FOR MOUNTING TROLLEY ON RUNWAY BEAM

The runway beams listed below are available for each capacity of this trolley.

When changing the runway beam size, change the location of the distant washer accordingly.

Should this not be effected, the trolley cannot be mounted or it will oscillate a great deal, creating unsteady travel

<b>Capacity (Ton)</b>	<b>1~2</b>	<b>3</b>	<b>5</b>	<b>7.5~20</b>
<b>Runway Beam Flange Width (mm)</b>	<b>100~150</b>	<b>125~175</b>	<b>150~175</b>	<b>175~190</b>

- (1) Measure the width of the runway beam which is used for this trolley.
- (2) When the dimension V ( in fig. ) is Zero, the dimension W for each capacity of the trolley are as listed below.

<b>Capacity (Ton)</b>	<b>1~2</b>	<b>3</b>	<b>5</b>	<b>7.5~20</b>
<b>W (mm)</b>	<b>106</b>	<b>131</b>	<b>156</b>	<b>181</b>

- (3) The dimension W must be larger than the width of the runway beam by 3~8mm.
- (4) Set the distant washers to satisfy the paragraph (3).
- (5) Be careful to set them equally on the both sides of the hoist frame and the trolley frame.

## D. INSPECTION AND SUPPLY OF OIL AND GREASE

Refer to the lubrication standards given in table for inspection and supply of oil. In case the service condition is severe, it is necessary to lubricate more frequently than specified in the table. In the case of extremely severe service condition, it is advisable to set up another lubrication standards according to the actual service condition.

Lubrication Part	Type of Lubricant	Standard frequency
Thrust bearing of hook	Mobil grease TEMP 78	Twice a year
Wire rope	Rope oil	Once a month
Within gear casing	Mobil grease TEMP 78	Once a year
Bearing of limit switch cam	Mobil oil, dynamo oil, machine oil	Once a year
Bearing of limit switch lever	Mobil oil, dynamo oil, machine oil	Once a month
Within motor-driven trolley gear casing	Epinock grease mobile grease TEMP 78	Once a year

### Weight and Kind of Grease

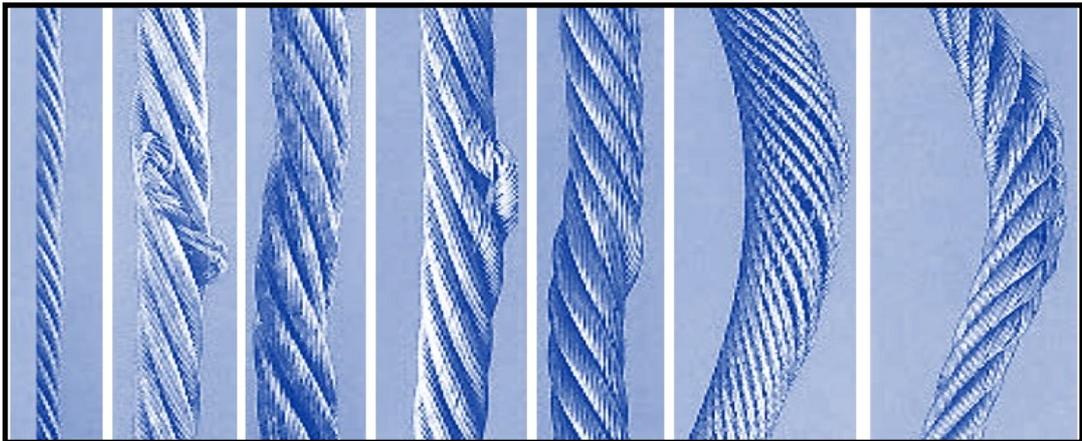
Capacity of the Hoist (Ton)	Type	Weight of Grease Within Grease Casing (kg)	Kind of Grease Environment Temperature -10 ~ +40°C
11	Standard	1	Mobil Grease TEMP 78 DAPHNE Grease M NO.2
2		2	
3		2.8	
5~7.5		4	
10		5	
15~30		6.5	

## E. MECHANICAL INSPECTION AND METHOD

Parts worn out over these limits should not be used, but replaced with new ones. Wear limits of principal parts are detailed in the following.

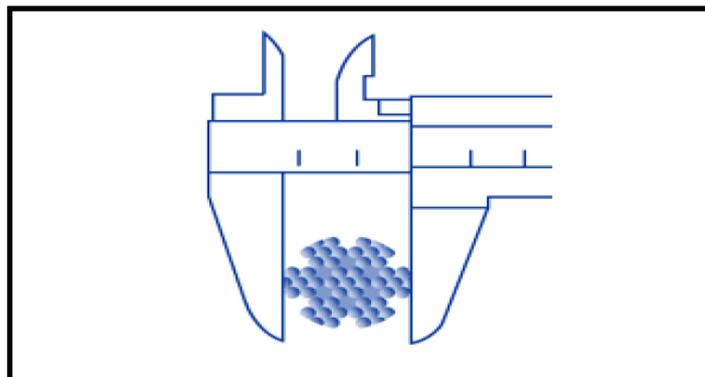
### 1. Wire rope

- (1) Whether the cable wheel is broken or not.
- (2) Inspection of high temperature operation.
- (3) Check the diameter of the cable. If the following occurs, be sure to replace the cable.



- (a) When the diameter is reduced by 7% or more of the nominal diameter, it should be replaced.
  - (b) When the cable is loose, the wire is cut off, the deformation, the entanglement and bending, and the high and low undulations occur.
  - (c) If the surface of the steel wire is plaque due to rust corrosion.
- (4) Measuring method of cable diameter

The diameter of the circumscribed circle is measured at the diagonal 2 in the state where the load is applied to the steel cable, the average value is measured, and the number is measured for the length direction of the rope.

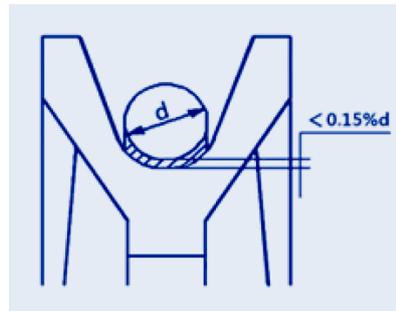


## 2. Hook

When the hook opening becomes so much increased as can be discernible by eye the hook should be replaced with a new one immediately. Also, hooks sustaining damages or crack or having defective screws should not be used. These defective Hooks should simply be thrown away into the discard. Use of repaired hooks is strictly prohibited since it might cause serious accidents. The hook wears in the part where it contacts the hooking device, and the limit of wear for this part is up to 10% of the original dimension.

## 3. Sheave

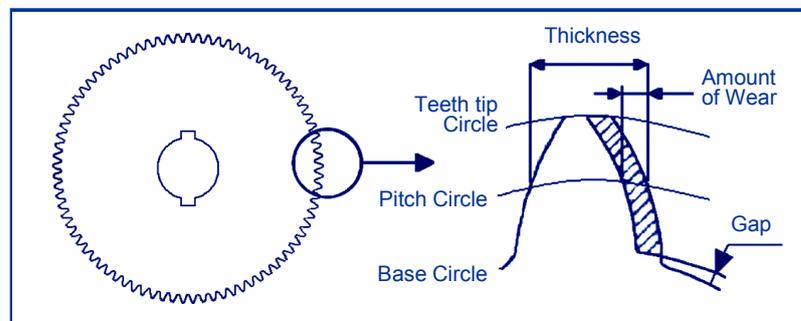
The limit of wear for sheaves is up to 30% of the diameter of the wire rope.



to 30% of the di-

## 4. Gear

The wear limit of the gear except the first wheel and pinion is up to 20% of the original thickness as the pitch ( UP to 5% stage. ) In the gear for limit is up to 40% .



tooth thick-  
ness as  
measured on  
circle level.  
for the first  
the case of  
trolley the  
to 40% .

## 5. Electromagnetic Switch

Open the cover of the switch case. Operate the push-button with the cable connected to the source and see if the respective parts of the electromagnetic switch function positively. To be more exact, check the state of wear of the

## 7. Brake

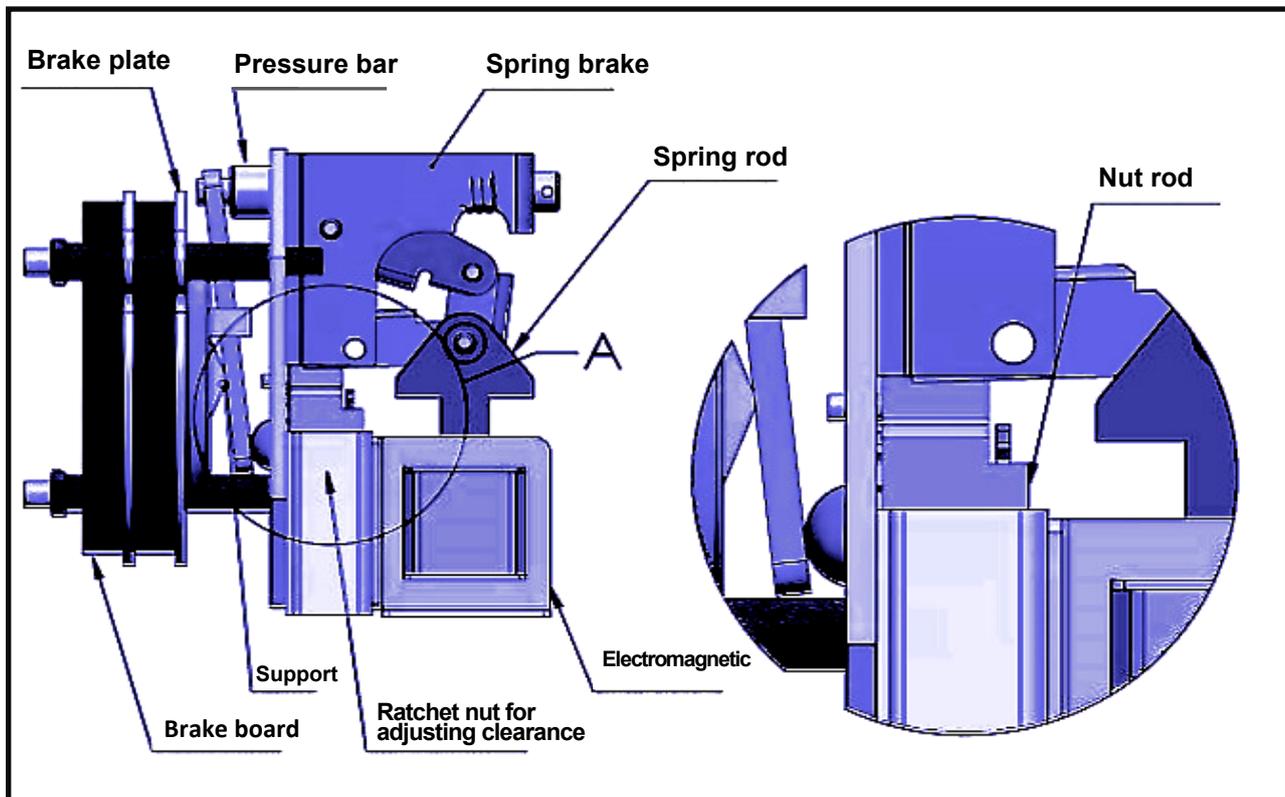
The wear of the brake lining is proportional to the frequency of stopping operation. When the brake lining is worn out beyond the limit of wear, the brake fails to function properly. Examine the wear of the brake without fail when making monthly inspections.

### Brake system characteristics :

The hoisting brake design is divided into two types: AC and DC. They are all automatically adjustable. When the brake clearance exceeds the preset value, the brake can reduce the thickness, which will cause the brake reaction to slow down and cause a downturn, and increase the brakes. Coil current; if the brake gap mechanism is automatically adjusted at this time, the brake coil can be prevented from burning. ( Figures 1 )

- (a) When the brakes cause the wear to exceed the preset clearance, the spring lever touches where the ratchet spring can be driven.
- (b) When the brake coil is energized, the nut pull rod locks the ratchet nut to automatically adjust the gap to reduce the excessively large gap.

**Brake system ( Figures 1 )**



## **F. EXAMINATION ITEMS OF ELECTRICAL PART :**

1. After usage you should close power, next time you will operate then open it.
2. As you would change power, check all switches are normal.
3. Stop using that you should zero all main controller.
4. Check the wear of switch terminals and machine parts, the wear and tear couldn't over 15% than original size.
5. Check the inside condition and worn out of power switch.
6. Check power wire. Cross wire and roller wire are loose or cracked, if there are loose you should adjust two sides of adjusting bolts.
7. Check the isolation of all circuits.
8. 220V grade more than 0.2MΩ  
440V grade more than 0.4MΩ
8. Check ground condition of walking rail or good.
9. Limits switches are on exact position or not, their upper allowance is more than 50mm.
10. Check magnetic brake or hydraulic brake, as close power that brake sliding should be not more than 2% of the distance of minute rolling up.

## ROUTINE INSPECTION REFERENCE TABLE

Check item			Inspection Method	Period		
				Daily	month	yearly
1	Motor	<ul style="list-style-type: none"> <li>● Is the motor components operating normally?</li> <li>● Insulation condition</li> <li>● Exterior</li> </ul>	<ul style="list-style-type: none"> <li>● Action</li> <li>● 10 MΩ measurement</li> <li>● Visual inspection</li> </ul>	▲		
2	Wire rope	<ul style="list-style-type: none"> <li>● Baseline fracture, less than 10%</li> <li>● Reduced diameter, less than 7% cable diameter ?</li> <li>● Kink phenomenon ?</li> <li>● Whether the rope is abnormally entangled ?</li> <li>● Whether it is deformation or corrosion ?</li> </ul>	<ul style="list-style-type: none"> <li>● Measure</li> <li>● Measure</li> <li>● Visual inspection</li> <li>● Visual inspection</li> <li>● Visual inspection</li> </ul>	▲	▲	▲
3	Steel cable wheel	<ul style="list-style-type: none"> <li>● Fixed piece deformation</li> <li>● Wear and tear</li> </ul>	<ul style="list-style-type: none"> <li>● Visual inspection</li> <li>● Visual inspection</li> </ul>	▲	▲	
4	Hammer Pulley	<ul style="list-style-type: none"> <li>● Deformation, damage, looseness</li> </ul>	<ul style="list-style-type: none"> <li>● Visual inspection</li> </ul>	▲		
5	Push button switch	<ul style="list-style-type: none"> <li>● Whether the action is the same as the label ?</li> <li>● Whether the outer casing is damaged ?</li> </ul>	<ul style="list-style-type: none"> <li>● Operating</li> <li>● Visual inspection</li> </ul>	▲		
6	Brakes	<ul style="list-style-type: none"> <li>● Whether the brakes have a falling phenomenon or a strange sound ?</li> <li>● Brake pad wear ?</li> <li>● Brake spring</li> </ul>	<ul style="list-style-type: none"> <li>● Measure</li> <li>● Decomposition check</li> <li>● Decomposition check</li> </ul>	▲	▲	▲
7	Controller	<ul style="list-style-type: none"> <li>● Operating</li> <li>● Control wire diameter and length</li> <li>● Insulation condition</li> </ul>	<ul style="list-style-type: none"> <li>● Action</li> <li>● Visual inspection</li> <li>● 10 MΩ measurement</li> </ul>	▲		▲
8	Gearwheel & Gearbox	<ul style="list-style-type: none"> <li>● Damage</li> <li>● Transmission situation</li> <li>● Lubrication</li> </ul>	<ul style="list-style-type: none"> <li>● Visual inspection</li> <li>● Measure</li> <li>● Measure</li> </ul>	▲		▲
9	Wiring	<ul style="list-style-type: none"> <li>● Direction of rotation</li> <li>● Ground wire</li> </ul>	<ul style="list-style-type: none"> <li>● Visual inspection</li> <li>● Visual inspection</li> </ul>	▲		
10	Hook	<ul style="list-style-type: none"> <li>● Increase the width or deformation of the opening ?</li> <li>● Is the motion smooth and smooth?</li> <li>● Is there any crack or defect in the hook?</li> <li>● Is the lower hook safety stop secure ?</li> <li>● Lower hook 360° Is the rotation smooth?</li> </ul>	<ul style="list-style-type: none"> <li>● Visual inspection</li> <li>● Operating</li> <li>● Visual inspection</li> <li>● Operating</li> <li>● Operating</li> </ul>	▲		
11	Screw	<ul style="list-style-type: none"> <li>● Is the part loose ?</li> </ul>	<ul style="list-style-type: none"> <li>● Operating</li> </ul>			▲
12	Load test	<ul style="list-style-type: none"> <li>● In accordance with the rated weight, the cargo is 10-20 cm above and below, several times in succession</li> </ul>	<ul style="list-style-type: none"> <li>● Operating</li> </ul>		▲	▲

## COUNTERMEASURE LIST FOR HOIST OBSTACLE

Item	Obstacle	Reasons	Countermeasure
1	No moving	<ol style="list-style-type: none"> <li>1. Power fuse melted.</li> <li>2. No fuse switch jumping.</li> <li>3. Magnetic switch coil broken.</li> <li>4. Line voltage too high or low.</li> <li>5. Button connection not good.</li> <li>6. Magnetic switch line broken down.</li> <li>7. R. S. T. Phase wrong.</li> <li>8. Detector broken down.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace new fuse.</li> <li>2. Set switch at " on" Position.</li> <li>3. Change new parts.</li> <li>4. Discussion voltage low and power.</li> <li>5. Replace new connection point.</li> <li>6. Change new one.</li> <li>7. Power line change two phase.</li> <li>8. Replace new one.</li> </ol>
2	Hoisting or lowering one way only	<ol style="list-style-type: none"> <li>1. Switch line broken.</li> <li>2. Switch connection point not action good.</li> <li>3. Magnetic switch line broken.</li> <li>4. Limit switch connection not action good.</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect spare line.</li> <li>2. Change new one.</li> <li>3. Change new one.</li> <li>4. Push limit switch.</li> </ol>
3	Wrong way at button	Power line connect wrong	Change line to each other
4	Magnetic brakes no function	<ol style="list-style-type: none"> <li>1. Voltage variance limitation too big.</li> <li>2. Magnetic brake clearance so large.</li> <li>3. Magnetic brake coil broken down.</li> <li>4. Bolt loose.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discussion circuit.</li> <li>2. Adjust clearance.</li> <li>3. Change coil.</li> <li>4. Tighten bolt.</li> </ol>
5	Magnetic brake noise high	Magnetic clearance so large.	Adjust clearance.
6	Moaning before push button	<ol style="list-style-type: none"> <li>1. Magnetic switch or push button switch connecting point method.</li> <li>2. Push button switch broken down.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change new one.</li> <li>2. Change new one.</li> </ol>
7	Fault of lifting	<ol style="list-style-type: none"> <li>1. Temperature too high for monitor.</li> <li>2. Current voltage too low or too high.</li> <li>3. No more oil or not enough.</li> <li>4. Magnetic brake no function.</li> <li>5. Over load operation.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check magnetic brake action.</li> <li>2. Check power.</li> <li>3. Fill oil.</li> <li>4. As item4.</li> <li>5. Check loading.</li> </ol>
8	Gear noise high	<ol style="list-style-type: none"> <li>1. Gear wear and tear.</li> <li>2. Bearing wear and tear.</li> <li>3. No more oil or not enough.</li> <li>4. Oil quality so bad.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change new gear and recheck loading.</li> <li>2. Change broken parts.</li> <li>3. Add oil.</li> <li>4. Change oil.</li> </ol>
9	Hook worn out serious	<ol style="list-style-type: none"> <li>1. Incorrectly use hook.</li> <li>2. Incorrectly operation method.</li> <li>3. Loading out of the perpendicular.</li> </ol>	Discussion the operation method.
10	Wire rolling incorrect	<ol style="list-style-type: none"> <li>1. Loading out of the perpendicular.</li> <li>2. Hook on land and wire loose.</li> </ol>	Discussion operation method.
11	Temperature too high for	Magnetic brake no function.	The same as item 4
12	No function of limit switch	<ol style="list-style-type: none"> <li>1. Electric wire connect wrong.</li> <li>2. Limits switch connection not good.</li> </ol>	Change electric wire.
13	Gear worn out so fast. Bearing and Bush worn out	<ol style="list-style-type: none"> <li>1. No more oil or not enough.</li> <li>2. Overload operation.</li> </ol>	<ol style="list-style-type: none"> <li>1. Add</li> <li>2. Check loading.</li> </ol>
14	Lower to stop delay	<ol style="list-style-type: none"> <li>1. Brake lining worn out to broken down.</li> <li>2. Magnetic brake clearance so large.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change brake lining.</li> <li>2. Adjust clearance</li> </ol>

# CRANE SAFETY RULES

