

CAS Annual Inspection Instruction Manual

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Service Center

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Image shown here is indicative only.

If any discrepancy found between the image and actual product, please refer to the actual product.

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1. SYMBOLS

Symbols	Key words	Explanation	Injury/damage that may be suffered if failure to follow
SAFETY WARNINGS			
	Danger!	Direct or indirect danger	Death or severe injury
	Danger!	Direct or indirect electric shock danger	Death or severe injury
	Attention !	Possible danger	Minor injury or equipment damage
CAUTIONS			
	Attention !	Possible danger	Equipment damage and other
	Important !	Important instructions for the use of the equipment	None
REFERENCE			
		Reference instructions	

Note: **CLIMB AUTO SYSTEM** hereafter will be referred to as **CAS**.

2. ANNUAL INSPECTION PRECAUTIONS



Danger!

- 1) The CAS can only be inspected, maintained and used by trained personnel. The operator must be at least 18 years old and be able to resolve the problems that occurred during equipment use.
- 2) There is a danger of falling when installing and using the CAS, so all persons in the danger area of falling must wear personal protective equipment, such as full body helmet, safety gloves, full body harness, protective shoes, and use special fall arrest device which must rely on a safety system fixed to the building to prevent operators from falling.



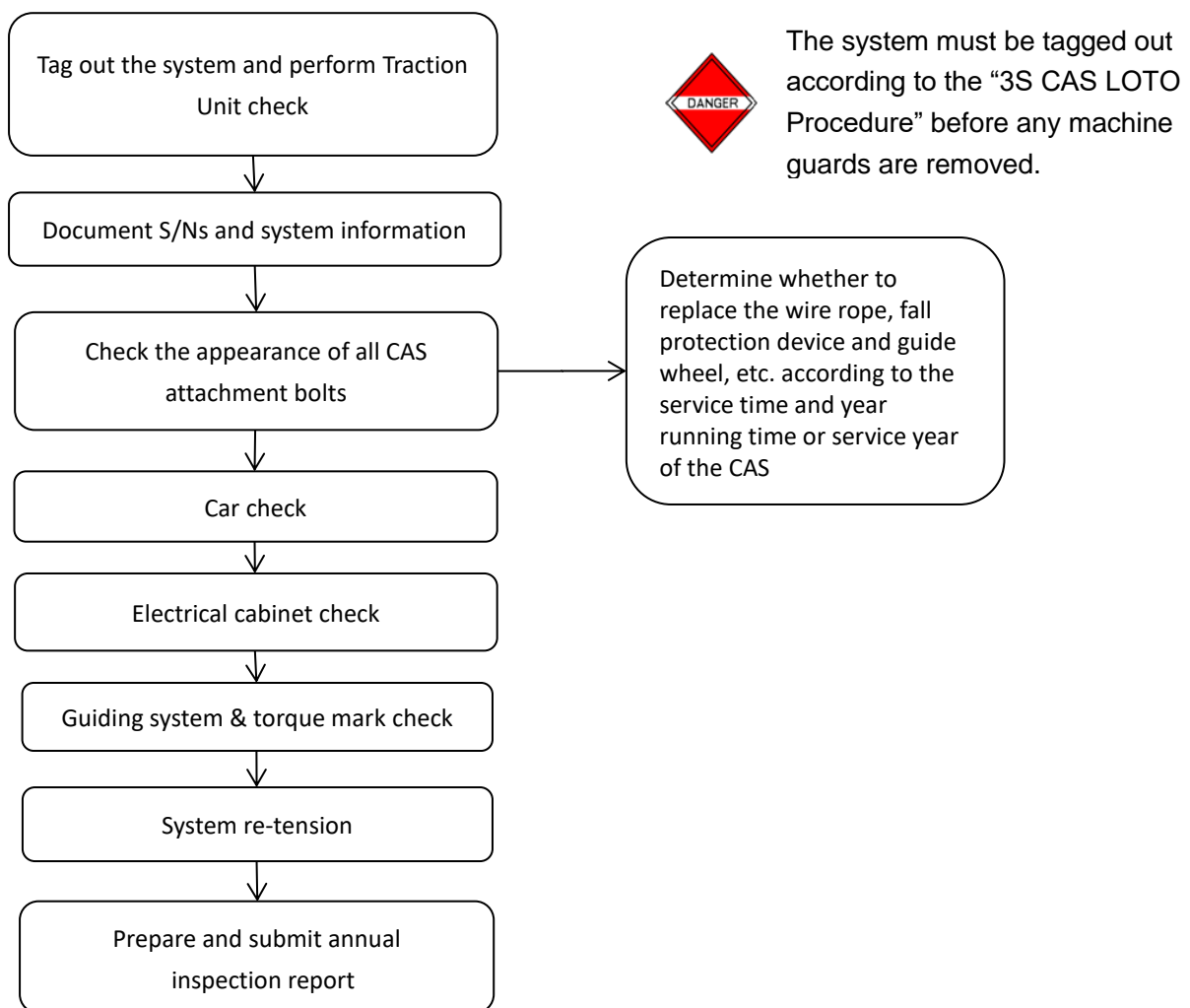
- 3) A safety lanyard must be used when getting on and off the car at each platform in the tower.
- 4) The electrical connection of the system must conform to the requirements of standard EN60204-1. All electrical components and parts must be installed and maintained by professional electrical technicians.
- 5) When inspecting the wire rope, the operator must wear gloves throughout the process and keep his hands should away from the place where broken wire is found in time to prevent scratches and punctures.
- 6) Operators must carry walkie-talkies or mobile phones with them to keep in touch with ground staff.
- 7) When the wind speed exceeds 24 m/s, the inspection work must be stopped unless at the starting platform.
- 8) The power supply must be tagged out according to the "3S CAS LOTO Procedure" when performing work in or around the traction unit to prevent injury to the operators.
- 9) The wind turbine generator must be stopped when checking the CAS.

3. TOOL LIST FOR ANNUAL INSPECTION

Tool name	Specification model	Unit	Quantity
Ratchet wrench	1/2	Piece	1
Sleeve	10, 13, 17, 19 mm	Piece	4
Open-end wrench	8-10, 13-16, 17-19	Piece	3
Monkey wrench	300 mm	Piece	1
Rubber hammer	95x57 mm	Piece	1
Screwdriver "+"	3x100 mm, 6x150 mm	Piece	2
Screwdriver "-"	3x100 mm, 6x150 mm	Piece	2
Side cutting pliers	6"	Piece	1
Feeler Gauge	Metric 0.1mm – 1mm		1
Wire stripper	7"	Piece	1
Pliers	8"	Piece	1
Wallpaper knife	6"	Piece	1
Steel tape	3 m	Piece	1
Multimeter	Voltage/resistance	Piece	1
Circlip pliers	7" outside caliper	Piece	1

Tool name	Specification model	Unit	Quantity
Allen wrench	2-10 mm	Piece	1
Feeler gauge	0.1-1.0 mm	Piece	1
Permanent marker	Black, blue	Piece	2
Walkie talkie		Piece	2
Electronic tensile scale	500 kg	Piece	1
Safety protective equipment	Meet the requirements of the wind power industry	Set	1

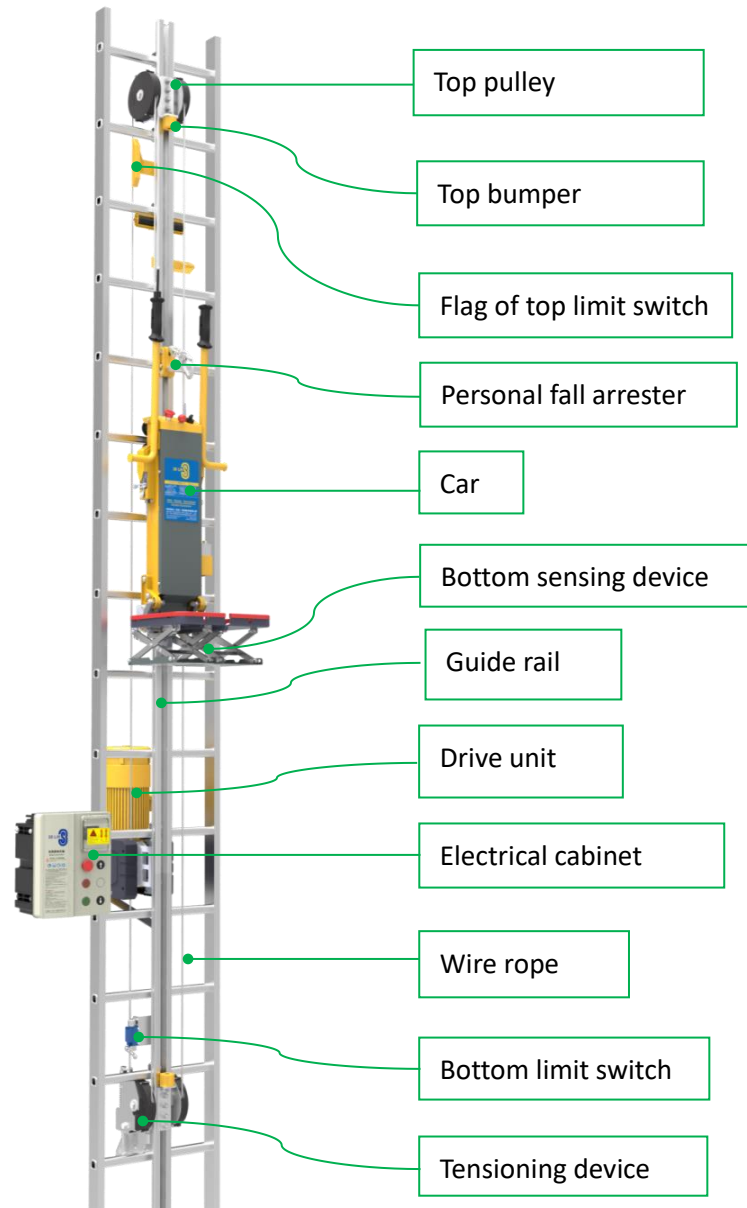
4. CAS ANNUAL INSPECTION FLOW CHART



Attention!

The annual inspection of the CAS is to be carried out in the order “from the outside to the inside, from the bottom to the top”. And it must include checking the status of the fall arrest device and checking whether the wire rope tensioning indicator is in the correct section before operating the CAS to ascend. Technicians may not operate the CAS without checking these aspects! Each photo filled in the report must have a unique identification number, serial number or tower number.

5. APPEARANCE AND STRUCTURAL FASTENERS FASTENING



- 1) Visually check the car, electrical cabinet, traction unit, tensioning device and other structures of the CAS and identify whether they affect the function of the system. If any defeat is found, perform maintenance, and record the serial number and running time of the CAS.
- 2) Visually check the damage of each sign and each operation button. If any damage is found, repair or replace it.

6. CAR CHECK

6.1 SIGNAL TRANSMITTER AND BATTERY CHECK

- 1) Visually check whether the appearance of the signal transmitter has serious wear, and tighten the wiring terminal strip and wiring.
- 2) Visually check whether the battery fixing box has cracks, and whether it is securely riveted to the car. Test the battery charging and discharging function, and remaining power detection function. Test whether the

power switch function is normal. If there is any abnormality, repair or replace it on site.



Figure 6.2-1

battery fixing
box
signal
transmitter



Figure 6.2-2



Figure 6.2-3

6.2 CAR FALL ARREST DEVICE CHECK



Attention!

When the fall arrest device is inspected, the power supply at the tower base cabinet must be disconnected, and the electrical cabinet circuit breaker of CAS must be disconnected.

- 1) Visually check whether the appearance of the fall arrest device has obvious defects. If there are any, it must be replaced. Visually check to see whether the fixing nut of the fall arrest device is loose, and the marking line is clear or misaligned. If any problem is found, repair the device, then retighten the bolt and redraw the marking line;
- 2) Cut off the power of the CAS. Adjust the car to the visible position of the guide rail with the handwheel, and lift up the fall arrest device by hand to ensure the car runs smoothly;
- 3) When the manual brake device on the car panel is pulled up, the car fall arrest device will immediately lock the car.
- 4) After the above aspects are checked without abnormality (or any problem has been rectified), paste the inspection mark on the fall arrest device, fill in the serial number of the car, and take a photo for record.



Figure 6.2-1

Fall arrest device



Figure 6.2-2

Locking latch

6.3 INTERNAL WIRING CHECK

- 1) Visually check whether the internal wiring of the car is clean and tidy, whether it is effectively tied and away from the moving area. Tighten the butt plug and the battery power plug to ensure there are not loose. If there is any abnormality, repair it on site.
- 2) Visually check whether the internal wiring is loose, virtually connected or misconnected, and whether the wiring has interference. If so, repair on site.



Figure 6.3-1

6.4 FOOTBOARD AND LIMIT SWITCH



Attention!

Do not contact the moving parts by hand directly during inspection. **An extension rod must be used** to avoid pinch-point hazards.

- 1) Tighten the footboard fixing bolts and visually check whether there is obvious damage.
- 2) The car should stop running when the car E-stop button is activated, or the top or bottom limit switch is triggered during running.
- 3) During the descending of the car, when the bottom sensing switch is activated or the car will stop running and alarm;
- 4) When the mode selection switch is in the position of UP or DOWN or REMOTE, the corresponding function is normal;
- 5) When the left and right handle switches are activated at the same time, the car runs, and the car stops running when either hand is released.
- 6) When the platform deceleration switch is triggered during the car running, the running speed of the car is halved and a prompt sound will be heard.



Figure 6.4-1

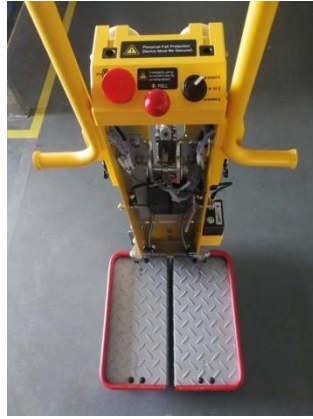


Figure 6.4-2



Figure 6.4-3

6.5 GUIDE WHEELS AND ANTI-DETACHING DEVICE CHECK

- 1) Use the remote control to operate the car ascending. Visually check whether the guide wheels are damaged, and the running is smooth. Use a 6 mm Allen wrench to secure the guide wheel bolts.;
- 2) Check that the anti-detaching device is in a visible position and tighten it. Lubricate the guide wheel.



Figure 6.5-1

Guide wheel
Fall arrest device
Anti-detaching device

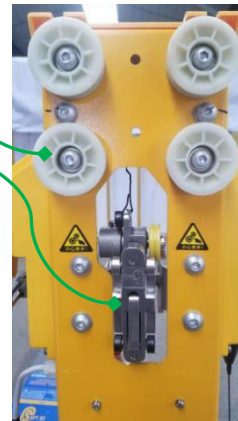


Figure 6.5-2

6.6 OVERLOAD AND INTERLOCK PROTECTION FUNCTION TEST

- 1) Perform the tests respectively in the remote control mode with a load of 60 kg, and in manual operation mode with a load of 140 kg. When overloaded, the CAS will alarm and stop running. To overload the CAS in manual mode, stand on the foot platforms and pull upwards on the yellow pegs in front of you to provide additional downward force on the load cells.
- 2) When performing the running test, the CAS in the manual operation mode, verify that both the remote control and the electrical cabinet cannot control the car.
- 3) When the mode selection switch is turned to the Remote position, verify that the remote control and the electrical cabinet control can be used.
- 4) When testing car operation by remote control or electrical cabinet control, verify that activating any switch on the car can stop the car from running.
- 5) When testing the car operation by remote control, verify that the electrical cabinet cannot control the car;
- 6) Check whether the signs on the remote control are clear and the appearance is good.

7)



Figure 6.6-1

7. ELECTRICAL CABINET CHECK

7.1 APPEARANCE CHECK

Visually check whether the surface of the electrical cabinet has obvious defects such as gouges, scratches, deformations, etc., and whether the signs are clear, and buttons are damaged.

7.2 INTERNAL CHECK AND RUNNING TIME CHECK

1) Secure the electronic components well and ensure that the component wiring is not loose.

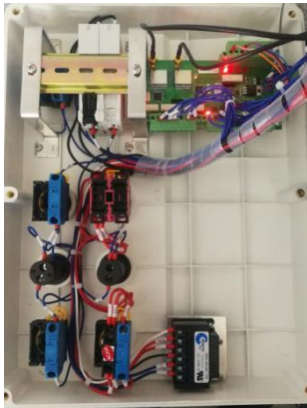





Figure 7.2-1





Figure 7.2-2


2) Running time check

a) Open the electrical cabinet, press  button to enter the menu, and press   button to find parameter group P07;



- b) Press the  button to enter the menu, and press  button to find the parameter P07.14;



- c) Press the  button again to show the cumulative running time of the device (in hours).



7.3 PERFORMANCE CHECK

- d) Check whether the START button, UP button, DOWN button and indicator light of the electrical cabinet function normally;
- e) Close the circuit breaker; release the E-stop button. When pressing the START button, the green light on the button is always on. Press and hold the UP button to move the car up while the running indicator flashes; release the button to stop running; press and hold the DOWN button to move the car down while the running indicator flashes; release the button to stop running.
- f) Emergency recall function check: turn off the battery switch of the car, and operate the emergency recall switch of the electrical cabinet to see whether the car is recalled.



Figure 7.3-1



Figure 7.3-2

7.4 NO-LOAD CURRENT VALUE CHECK


When the car of the CAS is running without load, press the  button several times until the panel display [A] indicator light comes on, and the current value of no-load current is displayed at this time.



Figure 7.4-1

8. TRACTION SYSTEM CHECK

8.1 TENSIONING DEVICE CHECK

Visually check whether the wire rope clamps at the end and the middle part of the wire rope are installed correctly. The excess wire rope end should be facing down and tightened with the rope clamp fixing bolt.



Figure 8.1-1



Figure 8.1-2

- 1) Secure the bolts used by fixing the wire rope tensioning device and the guide rails. Visually check whether the lower bumper is missing or deformed, and whether the guide wheels are abnormally worn. Adjust the wire rope tension indicator to the green section.
- 2) Bottom Pulley Tension Device should be checked to ensure proper positioning in accordance with the photos below.

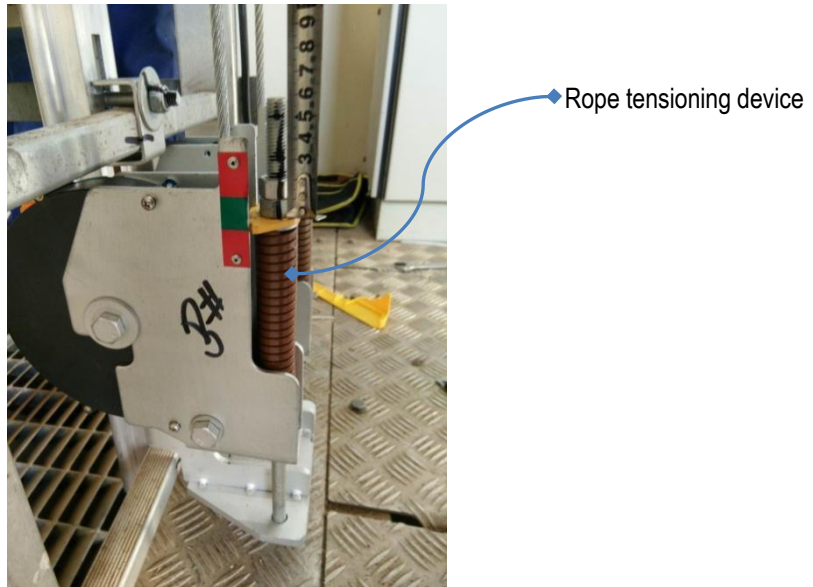


Figure 8.1-3

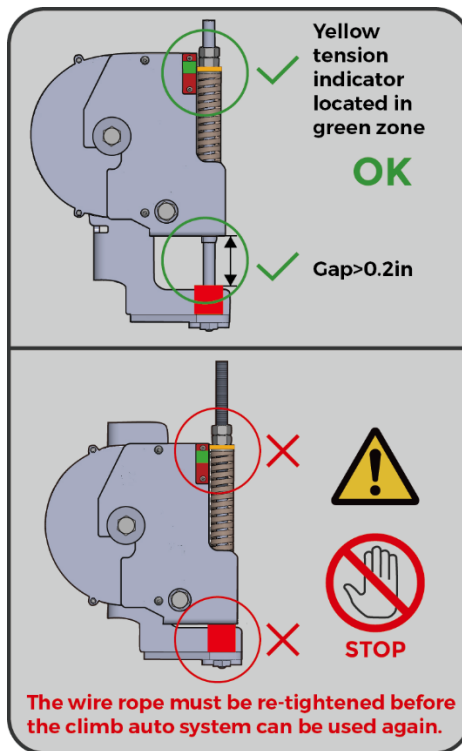


Figure 8.1-4

9. WIRE ROPE CHECK

- 1) The wire rope inspection is carried out by visual inspection, and is inspected on the top area (position A) and the down area below the car (position B);
- 2) Visually check the wire rope at position A above the car when the car travels upwards or downward;
- 3) When using the remote control to operate the car upward or downward, visually check the wire rope at position B.

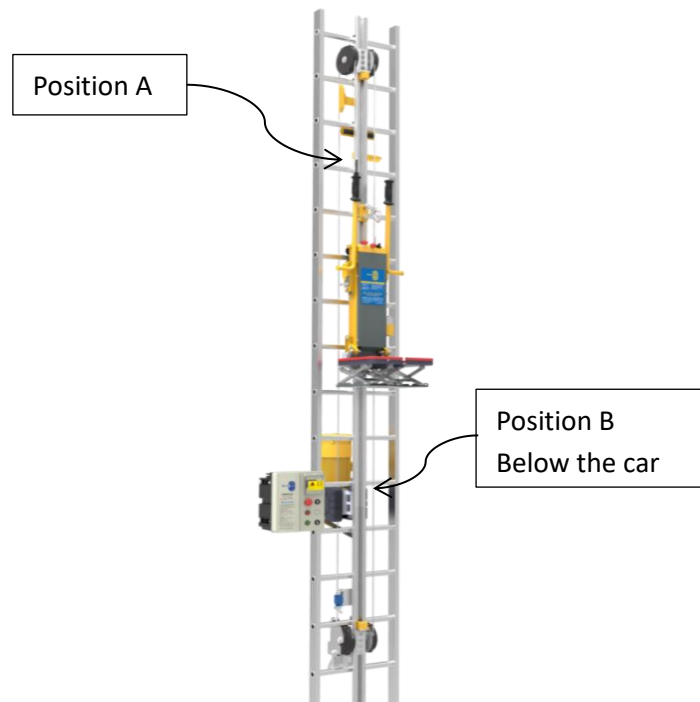
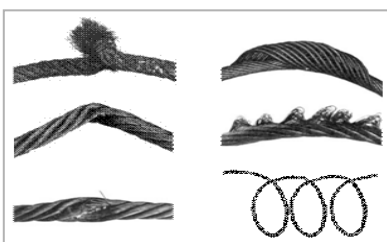


Figure 9-1

9.1 REPLACEMENT STANDARD OF WIRE ROPE

- 1) When the wire rope has kinking, loose strands, broken strands, dead bends, abnormal thinning, partial flattening and any other forms of distortion or deformation, it must be replaced.
- 2) The wire rope should be replaced if the surface or inside of the wire rope has been seriously corroded, overheated, and obviously discolored, etc.
- 3) Wire rope must be replaced if there are more than 5 broken wires within 1 meter.



Wire rope of various deformations



Worn out wire rope



Broken wire rope

10. TRACTION UNIT CHECK



Danger !

When the traction unit is being checked, the power supply of the CAS should be tagged out in accordance with the “3S CAS LOTO Procedure”.

10.1 TRACTION UNIT CHECK

- 1) Tag out the system in accordance with the “3S CAS LOTO Procedure”.
- 2) Secure the bolts connecting the driving box and rungs, guide rail, bottom limit, supporting bracket.
- 3) Visually check whether the gearbox has obvious external damage, abnormal noise, or oil leakage. If they

affect normal operation, the gearbox should be replaced. Visually check whether there is abnormal friction between the drive wheel, wire rope, anti-jumping off bolts and the rope pressing device., Verify that the drive wheel fixing nut is loose.



Figure 10.1-1



Figure 10.1-2

10.2 INTERNAL WIRING CHECK OF THE TRACTION UNIT

- 1) Secure the internal wiring of the traction unit. Tighten the butt terminals. Visually check whether there is interference in the wiring and whether there is aging damage to the power cable.
- 2) Visually check whether the idler sensor is loose or damaged, and is alternatively flash when climb auto is running.
- 3) Visually check whether the heating resistor is loose and whether the cable connection is broken.



Figure 10.2-1

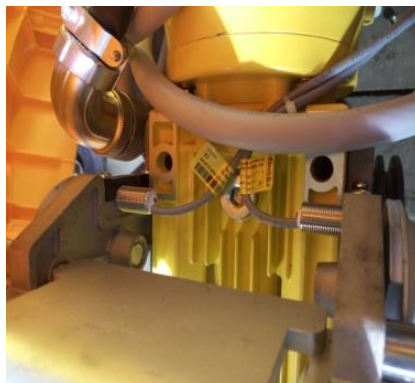


Figure 10.2-2



heating resistor
Figure 10.2-3

10.3 ROPE PRESSING DEVICE CHECK

- 1) Visually check whether the length of the compression spring is 25mm after compression., If it is not, adjust it.
- 2) Visually check whether the rotation of the wheel on the rope pressing device is smooth without abnormal wear.



Figure 10.4-1

11. GUIDE SYSTEM CHECK

11.1 TOP SHEAVE CHECK

- 1) Visually inspect torque marks on all top sheave assembly fasteners.
- 2) During operation, visually check whether the top sheave rotates smoothly without jamming, abnormal wear, or bearing wear sound;
- 3) Visually inspect the attachment bolts of the upper bumper device, and check whether it is deformed or missing.



Figure 11.1-1

11.2 CHECK SHORT GUIDE WHEEL, ANTI-ABRASION ROLLER ASSEMBLY, REDUCER BLOCK

- 1) Visually check whether there is any interference between wire rope and tower internal cables, auxiliary ladder, platform, rungs, wheel frame, etc.
- 2) Visually check whether the short guide wheel, anti-abrasion roller and speed reducer block have cracks or abnormal wear. Secure the fixing bolt.
- 3) Rotate the guide wheel by hand and verify that it can run smoothly without stagnation.

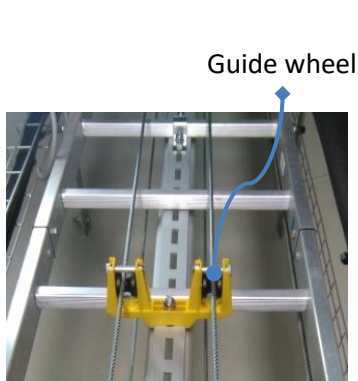


Figure 11.2-1



Figure 11.2-2

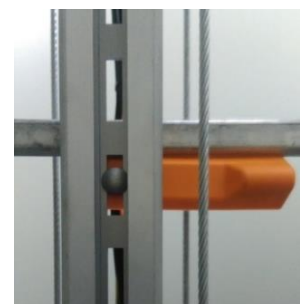


Figure 11.2-3

11.3 GUIDE RAIL CHECK

- 1) Visually check whether the car appears to encounter interference or friction when running.
- 2) Visually check whether the surface of the guide rail has any abnormalities, such as wear, damage or deformation.
- 3) Secure the bracket for connecting the guide rail and ladder. Secure the fixing bolt of the guide rail connecting bracket.
- 4) Visually check whether the guide rail joints are even and the clearance is less than 5 mm.

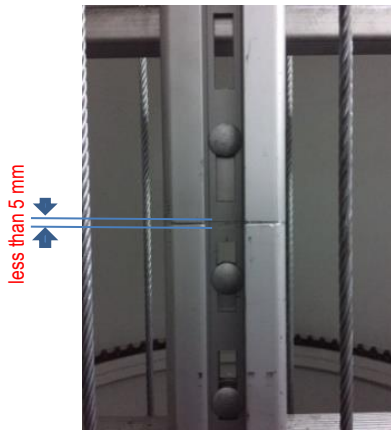


Figure 11.3-1

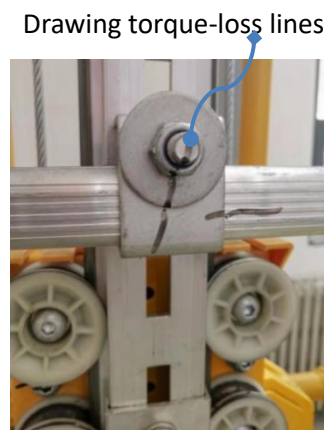


Figure 11.3-2



Figure 11.3-3

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