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**ACCESS EQUIPMENT**

# Annual Inspection Training



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2. Documentation
3. Tools
4. Annual Inspection Process
5. Level 2 Re-Tension
6. 3S Lift Contacts
7. Q&A





**Important!**



**Attention!**



**Danger!**

## **Before operating the CAS, ensure:**

- The user must have received the proper 3S Lift Training.
- Users must wear appropriate personal protection equipment (including 3S personal fall protector).
- The ladder must be clear of any obstructions.
- The wire rope tension indicator (yellow) must be in the green section on the bottom pulley.
- Ensure car battery is sufficiently charged (at least two power bars).
- Users must carry appropriate communication equipment to maintain communication with personnel on ground or at site office.
- Use the remote mode to “warm up” the system. This is a good practice, especially in cold weather.



**Important!**



**Attention!**



**Danger!**

- When the CAS is running, other operators are not allowed to climb the ladder.
- Transportation of tools is only allowed in remote mode.
- Tool basket must only be used to transport goods.
- If the CAS equipment is damaged or malfunctioning, the user must stop working immediately and notify maintenance/safety personnel.
- In the event of a fire, do not use the CAS.



Purpose

PART 1

- Safety
  - Role of the System
  - Fail-Safe Devices
- Reliability
  - Prevent Climbing
  - Reduce Costly Repairs
  - Prevent Damage to Other Turbine Components
- Warranty Validation
  - Warranty is Validated by Approved Photos and Checklists



Documentation

PART 2

- Instructional Resources
  - Annual Inspection Manual
  - Operation and Maintenance PowerPoint
  - Photo Submission Guide
  - Photo Report Requirements
- Fillable Resources
  - Annual Inspection Tracker
  - Annual Inspection Checklist
  - Photo Submission Form






- Checklist
  - Tower Information
  - CAS System Information
  - Pass/Repaired
  - Comments

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Revision: C

**CAS Annual Inspection Checklist**

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This form is used to document the annual inspection of the 3S Climb Auto System (CAS).

i General Information

Site Name:	WTG #:	Running Hours:
Customer Name:	Car S/N:	
City, State:	Traction Unit S/N:	
Inspected By (Company):	Control Box S/N:	
Inspector Name(s):		Inspection Date:

☑ Checklist

	Checklist Item Description	Inspector Check
Lower Inspection	1. Inspect system for visual signs of damage or leaks.	<input type="checkbox"/> Pass <input type="checkbox"/> Repaired
	2. Inspect system for loose or missing hardware (verify torque marks).	<input type="checkbox"/> Pass <input type="checkbox"/> Repaired
	3. Inspect system wiring for loose or damaged cables (control box, car & traction unit).	<input type="checkbox"/> Pass <input type="checkbox"/> Repaired
	4. Inspect the wire rope alignment of the top and bottom pulley, traction unit guide and drive wheels, and the wire pressing device while ensuring smooth rotations.	<input type="checkbox"/> Pass <input type="checkbox"/> Repaired
	5. Confirm the car guide wheels are secure and rotate freely without excess vibration.	<input type="checkbox"/> Pass <input type="checkbox"/> Repaired
	6. Verify the wire rope is free of defects such as broken strands, crush marks, bird caging, kinks, nicks, etc...	<input type="checkbox"/> Pass <input type="checkbox"/> Repaired
	7. Confirm the car rope clamps are properly secured.	<input type="checkbox"/> Pass <input type="checkbox"/> Repaired
	8. Verify that the wire rope tension indicator is in the green zone when the car has no load. There should not be more than 1 inch of float below the bottom pulley wheels.	<input type="checkbox"/> Pass <input type="checkbox"/> Repaired
	9. Verify the compression spring length on the rope pressing device is approximately 25mm ± 1mm.	<input type="checkbox"/> Pass <input type="checkbox"/> Repaired
	10. Confirm the car emits a "doorbell" sound when the deceleration switch is triggered	<input type="checkbox"/> Pass <input type="checkbox"/> Repaired


- Photo Submission
  - 6 Photos + Damage/Discrepancies
  - Key Components
  - Key Features
  - Reference and Validation


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Revision: A

**CAS Annual Inspection  
Photo Report Requirements**

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This form is used to demonstrate the photo requirements for Climb Auto System annual inspection reports.

 Example Photos

Bottom Tension Device	Requirements
	<ul style="list-style-type: none"> <li>• Bottom Limit Switch               <ul style="list-style-type: none"> <li>○ Arm is Horizontal &amp; Fully Extended</li> <li>○ Immediately Under Rung</li> <li>○ Power Cable Zip-Tied Behind or Under Rung</li> </ul> </li> <li>• Tension Indicators               <ul style="list-style-type: none"> <li>○ Gap Above Red Block &gt; 0.2 Inches</li> <li>○ Yellow Indicator in Green Zone</li> <li>○ Stickers Intact</li> </ul> </li> <li>• Rung Clamp Above Bottom Tensioning Unit</li> <li>• 2 Nuts Above Each Yellow Indicator</li> <li>• Tower #</li> </ul>

Top Pulley (Front)



Top Pulley (Back)

Car Internals



Wire Rope Pressure Mechanism Status



VFD No-Load Current



Bottom Tensioning Device








Tools

PART 3

Tool Name	Specification	Recommended	Image
2 Impact Drills	Brushless Impact ¼ Inch Drive	Milwaukee M18	
2 Impact Drive Adapters	¼ & ½ Inch Drives	Any	
½" Drive Ratchet Set	½ Inch Drive Metric	Wera Zyklop 8100 37 Piece Set	
¼" Drive Ratchet Set	¼ Inch Drive Metric	Wera Zyklop 8100 42 Piece Set	
½" Drive Deep Socket Set	½ Inch Drive Metric (Need: 10mm, 13mm, 17mm, 18mm, 19mm)	Wera Belt C 6 Piece Set	
¼" Drive Deep Socket Set	¼ Inch Drive Metric (Need: 10mm, 13mm, 17mm, 18mm, 19mm)	Wera Belt A 9 Piece Set	

Tool Name	Specification	Recommended	Image
Wire Strippers	Snipper/Crimper Combo	Any	
Wire Cutters	Diagonal	KNIPEX Cutters	
Allen Key Set	L-Key Metric Need: 3mm, 4mm, 5mm	Wera Blacklaer Multicolor 9 Piece Set	
Channel Locks	5 Inch	KNIPEX Cobra Water Pump Pliers	
Wrench Set	Metric	Wera Joker Combination Wrench 11 Piece	
Screwdriver Set	Phillips & Flathead	Wera Kraftform Kompakt VDE 60 Insulated Blade Set	

Tool Name	Specification	Recommended	Image
Tape Measure	Metric	Any	
Multi-Meter	Digital	Any	
3S Lift Rail Bumper	N/A	N/A	



# Annual Inspection Process

PART 4

- Special Notes
  - Throughout the inspection process, ensure:
    - All torque marks are in place and nuts haven't loosened
    - Tower number is visible on all photographed components





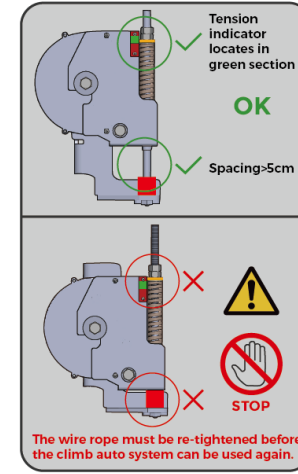
- Initial Down-Tower Inspection

- Step 1: Inspect down-tower components for visible damage and missing parts

- Handles
- E-Stop
- Plastic Covers
- Broken Zip-Ties
- Missing Screws
- Warning Labels
- Rodent Damage

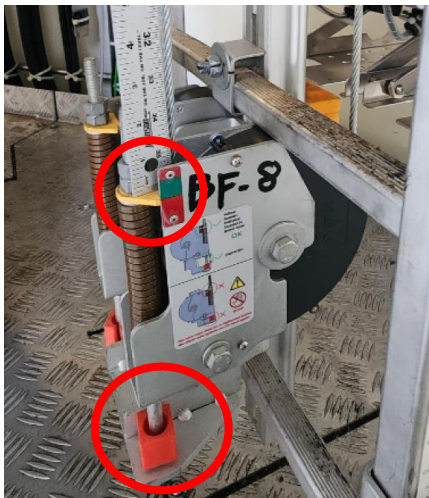


- Initial Down-Tower Inspection (continued)
  - Step 2: Visually inspect Bottom Tensioning Device
    - Verify Yellow Indicators are within green zone
    - Verify Tensioning Device has not “bottomed-out”

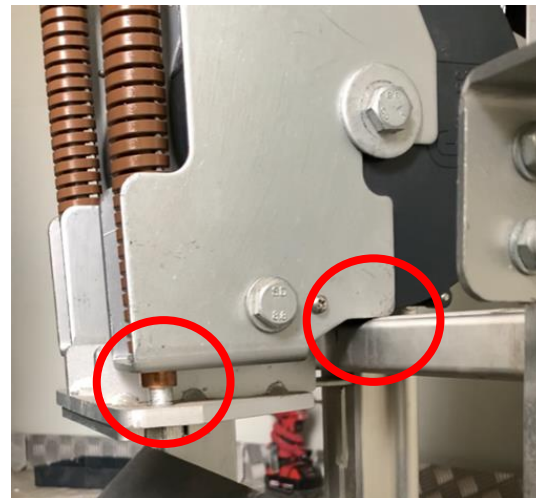


## Version 1

Good



Bad



## Version 2

Good



Bad



- Operational Down-Tower Inspection
  - Step 1: Turn system on and verify correct operation
    - Verify the system is powered on
    - Verify all systems are communicating properly
    - Test Car E-Stop Button and Direction Selection Switch
    - Verify all 3 limit switches are horizontal and properly extended
    - Check operation of all 3 Limit Switches
    - Test top and bottom Impact Sensors
    - Verify operation of all Control Box Alarms, Buttons, and Breakers
    - Verify the Car's alarm sounds when loaded with 330 lbs
    - Verify the Car doesn't slip when raised a few inches and loaded with 350 lbs

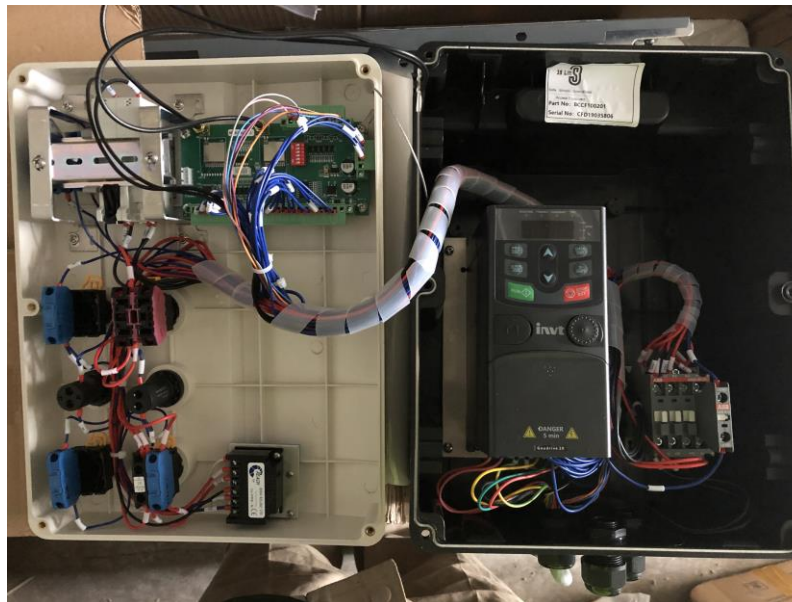
- In-Depth Down-Tower Inspection


- Step 1: Remove Control Box Cover

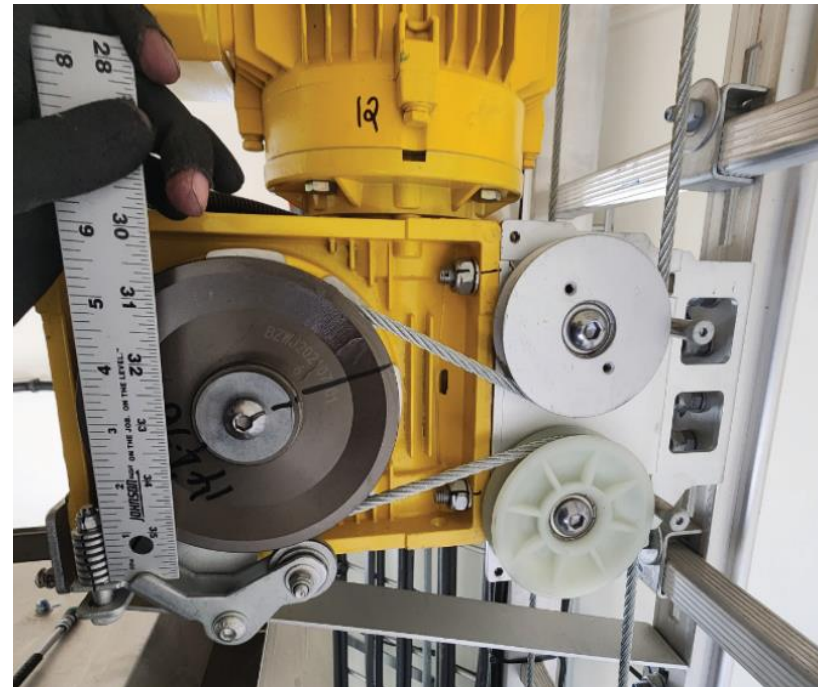
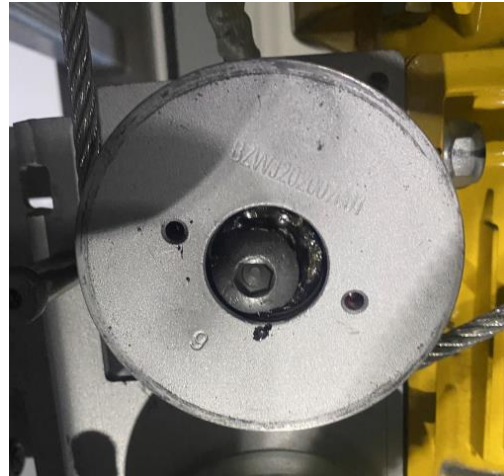
- Collect no-load current from VFD (3.5 – 4.5 is acceptable)
- Collect running hours from VFD




*The power must remain on to collect data from the VFD. Be careful not to contact any internal cables while the Control Box internals are exposed.*



- In-Depth Down-Tower Inspection (continued)
  - Step 2: Remove Traction Unit Covers
    - Verify spring lengths are 25mm  $\pm$  2mm 
    - Confirm proper routing of Wire Rope
    - Verify pulleys are in good condition



- In-Depth Down-Tower Inspection (continued)
  - Step 3: Remove Car Cover
    - Confirm proper operation of Car Fall Arrester
    - Verify Car internals are not damaged, and cables are neatly zip-tied 
    - Verify Wire Rope is bent inward at 90° angles above each U-Bolt and neatly coiled



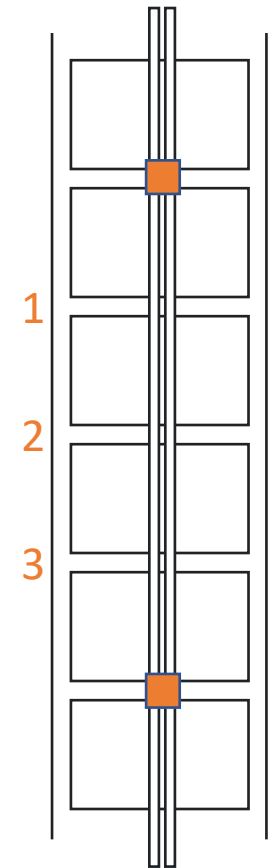
Locking latch



- Traveling Inspection
  - Step 1: Ride Car to the Top
    - Check each rail gap ( $\leq 4\text{mm}$  is acceptable)
    - Verify 3 ladder rungs between Rung Clamps
    - Verify proper location of speed flags
    - Confirm rail is centered on ladder
    - Visually inspect each ladder rung for contact with wire rope
    - Confirm Anti-Abrasion Rollers and Short-Guide Pulleys are present where needed



Rung Clamp  
Placement





- Traveling Inspection (continued)
  - Step 2: Visually Inspect Wire Rope
    - Visually inspect entire wire rope from down-tower as it cycles through the system looking for kinks, bird-cages, or broken strands





- Up-Tower Inspection

- Step 1: Inspect Up-Tower Components

- Verify top limit flag is in the proper location 
- Verify the Top Pulley is in good condition
- Verify the Bumper is in good condition 

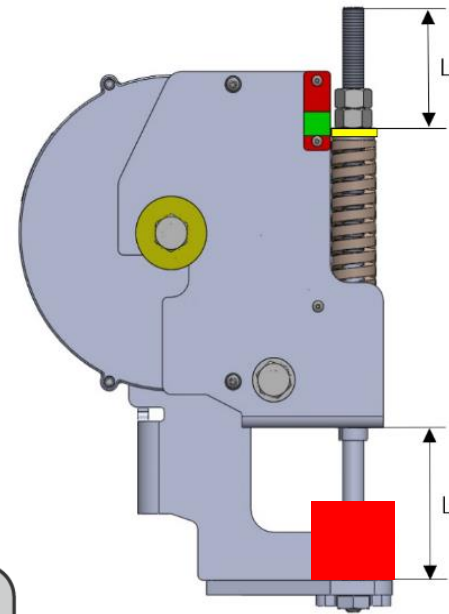
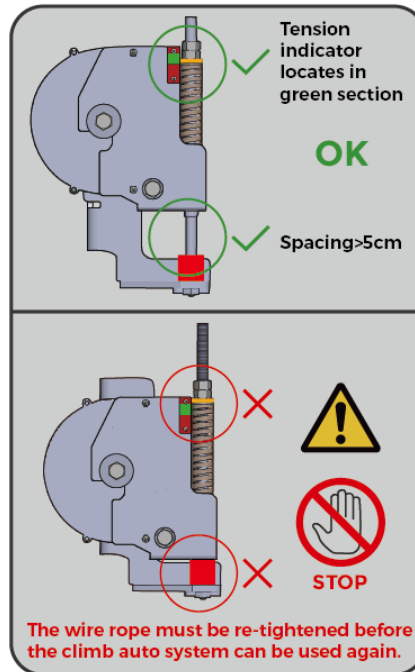
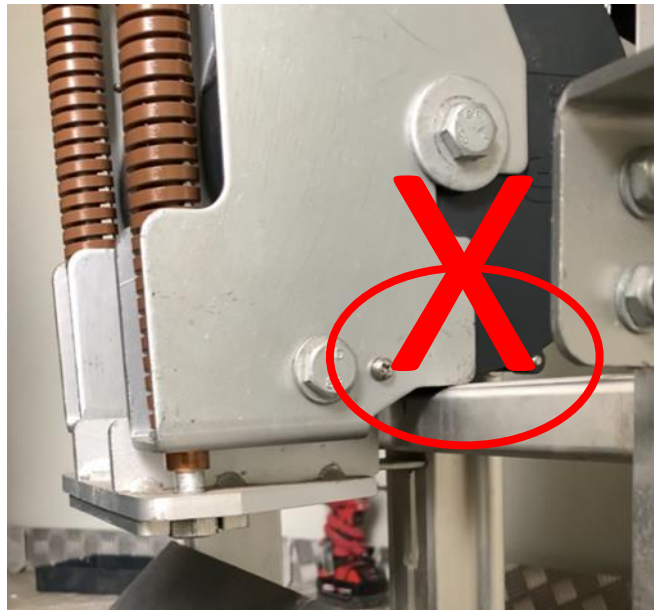




Level 2  
Re-Tension

PART 5

- Level 1 Re-Tension
  - Pre-Use Inspection
  - Adjust Yellow Indicator to Bottom Green Zone Using 4 Nuts
  - Red Blocks and Stickers



$L_1 \leq 60 \text{ mm (2.4'')}$

- After Re-Tension, the following three parameters must be met:
1.  $L_1 \leq 60 \text{ mm (2.4'')}$
  2.  $L_2 \geq 70 \text{ mm (2.8'')}$
  3. Yellow indicator at the low edge of green zone

$L_2 \geq 70 \text{ mm (2.8'')}$

- Level 2 Re-Tension
  - Remove Slack from Wire Rope
  - Return Floating Pulley to Original Position
  - [Level 2 Re-Tension Video](#)
  - Additional Supplies Needed





## 3S Lift Contacts

PART 6

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Q & A

PART 7

## Together we will elevate Health & Safety!



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**“Life Is A Promise ,  
Fulfill It”**

Mother Teresa(1910-1997)

