StopLoss RESOURCES LLC

Handrail Stall Force Tester

A Solution to Code Requirement:

ASME 17.1 – 6.1..3.4.1

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ASME 17.1 – 6.1.3.4.1

Each balustrade shall be provided with a handrail moving in the same direction and at substantially the same speed as the steps. In the case of curved escalators, this shall be substantially the same angular velocity. The speed of the handrail shall not change when a retarding force of 450 N (100 lbf) is applied to the handrail opposite to the direction of travel.

How does the escalator industry currently document/demonstrate the handrail stall test settings on the escalators you inspect?

Were you aware the current requirement of the 100 lb force minimum began as early as 2002, and that it has remained unchanged through the 2019 code?

Problem:

Up to now, the stall test has not seemed to be a major concern. However, with ever increasing interest in public safety, documentation that supports your testing results is important, including:

- 'Safe' handrails that pass the required 100 lb force minimum, along with
- Current test records that contain **witnessed readings** above 100 lbs

Without documentation, your ability to demonstrate an escalator passes inspection will be very weak.

Solution:

A reasonable inspection statement ***might*** read:

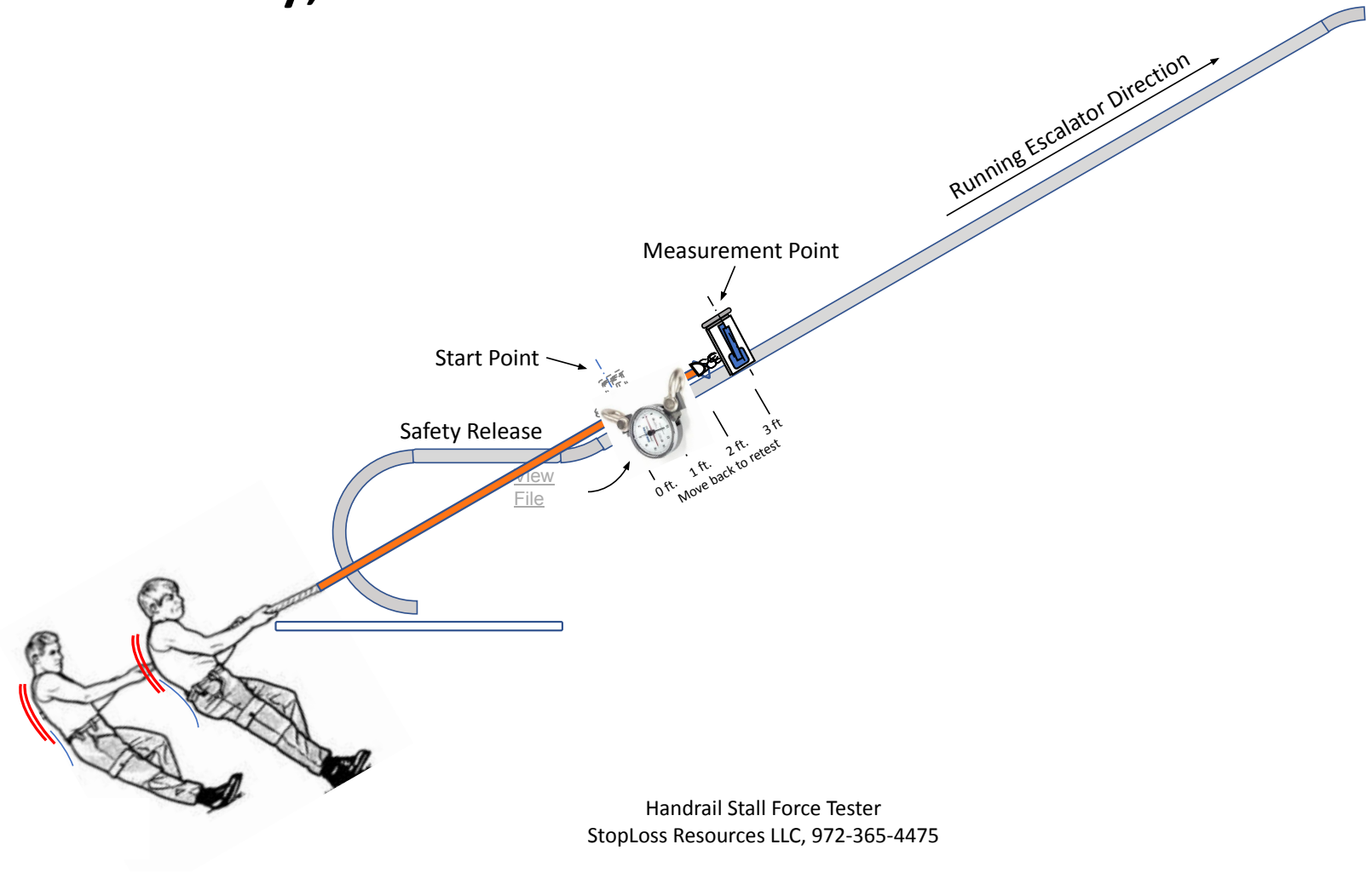
”On this date __/__/__ , the handrail stall force of escalator #__ was

- 107 lbs force on the left side and
- 112 lbs force on the right side,

Both in an up direction, inspected by ___ initial"

There are Two ways to test this…

Manually, with some risk…



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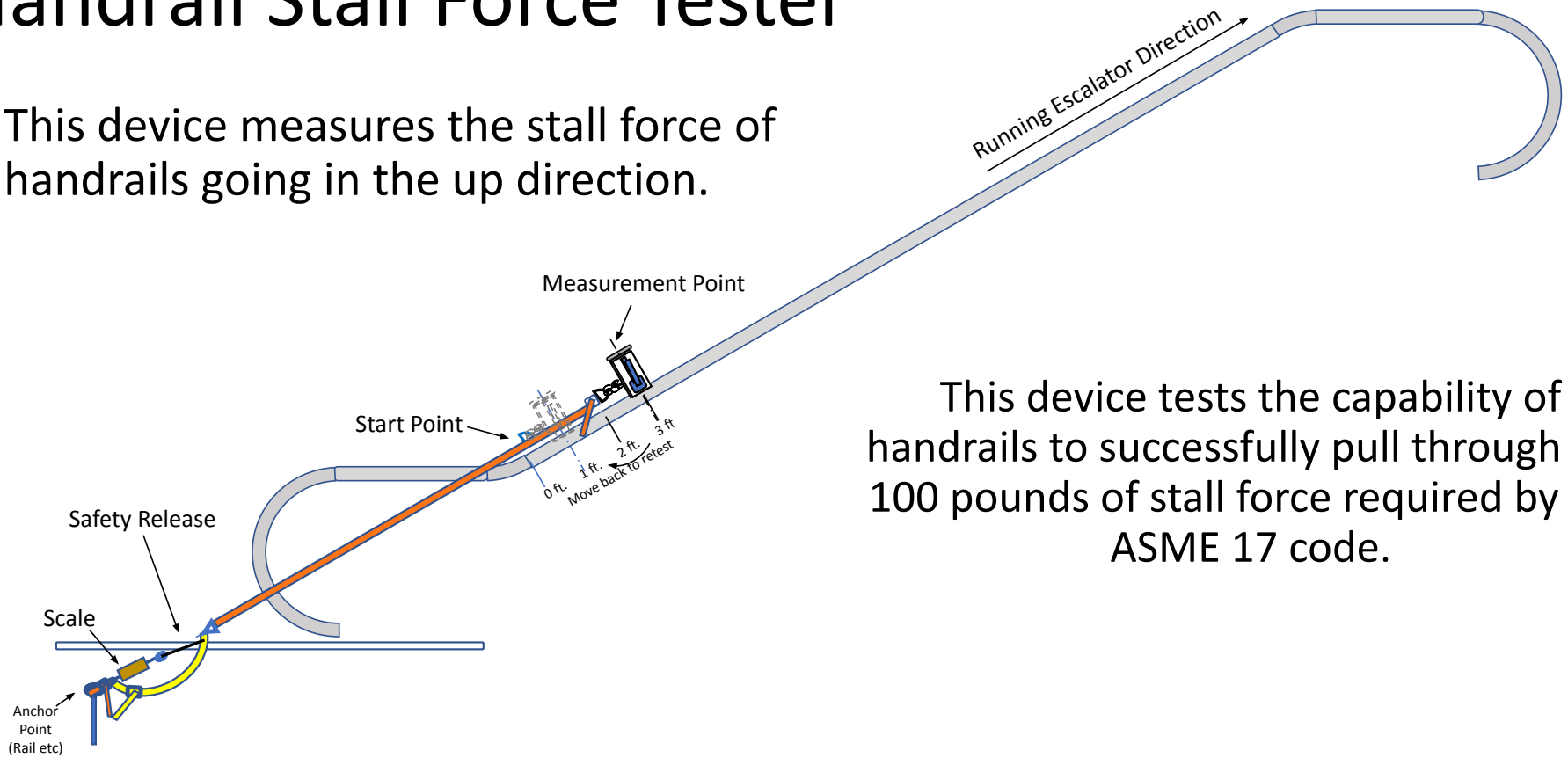
- OR -

Without Injury Risk Using the Handrail Stall Force Tester

This device measures the stall force of handrails going in the up direction.



This device tests the capability of handrails to successfully pull through the 100 pounds of stall force required by the ASME 17 code.

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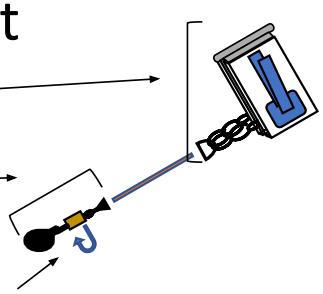
Handrail Stall Force Tester Disclaimer

- This tester is designed to demonstrate the force required to stall the handrail on an escalator with no pull provided by the test person, eliminating pulling injury.
- The user will need only to rotate the meter so the display can be read.
- Caution: This tester is only designed to demonstrate an escalator's compliance to ASME 17.1 – 6.1.3.4.1 Any other use voids all warranties and liabilities against StopLoss Resources LLC. Stated or implied.
- Personal injury shall be the responsibility of the individual and his adherence to the safety standards required by his employer.
- Warranty is limited to the workmanship used in producing this tester.

Hands Free* Handrail Stall Force Testing

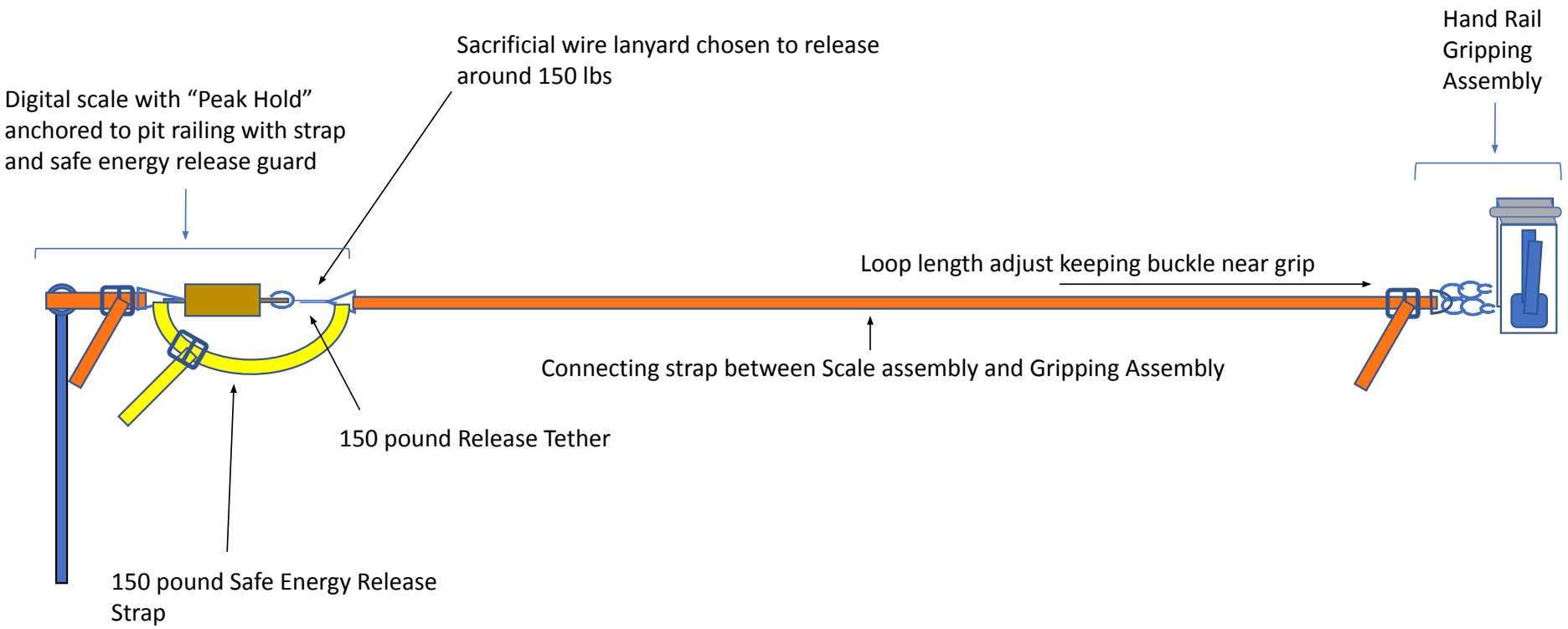
*Minimal handling during test

- This tester is protected against forces > 150 pounds during tests.
- This Handrail Stall Force Tester has only two units. They are connected by an adjustable, minimal-energy storing, 50 ft tiedown strap loop:
    1. The Gripping unit
    2. The Measuring unit



- This Handrail Stall Force Tester will require only manually rotating the scale so it may be read, during a stall test.
- Repeating a measurement is quick and easy!

A Simplified Illustration



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General Description of How It Works

1. Secure the escalator so it is fully in control of the person performing the test.
2. Identify a point of the handrail where the Handrail Gripping Unit has begun its 30 degree incline and has physical room enough to gain running speed and presents a 100 pound resistance while also demonstrating the velocity of the handrail has not slowed (as indicated by the controller monitor), **until the scale has registered a force greater than 100 pounds**.
3. If the stall occurs with a resistance force of less than the required 100 pounds, increase the escalator's pulling capability and retest.
4. Once the measurement has been made, manually stop the escalator.

There is now a repeatable way to accurately demonstrate the force required for stalling, and to do so without risk of personal injury to testing personnel, using the **HST (Handrail Stall Test) unit.**

Two major elevator companies have asked StopLoss Resources about testing for this requirement and we expect to see STATES begin asking for your results as well.

With the success of our CIVL-SD comb impact test set, we decided to build this and apply our "Place-N-Measure" philosophy.

Please download the attached preliminary users manual to view the Pre Released **HST (Handrail Stall Test) unit!**

Please feel free to call should you have further questions.

Thank you for considering products from StopLoss Resources,
your time saving "Place-N-Measure" solution!

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JoeFoltz@verizon.net

Users Guide

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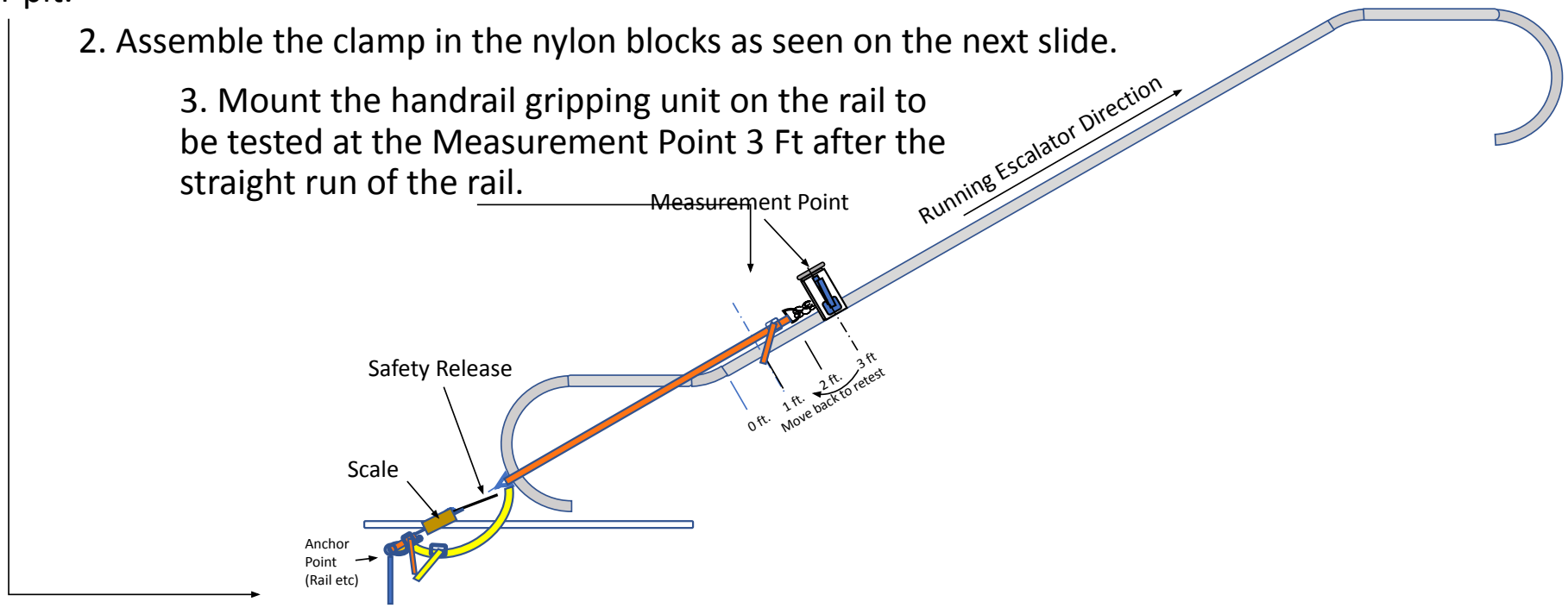
Place Scale and Handrail Gripper

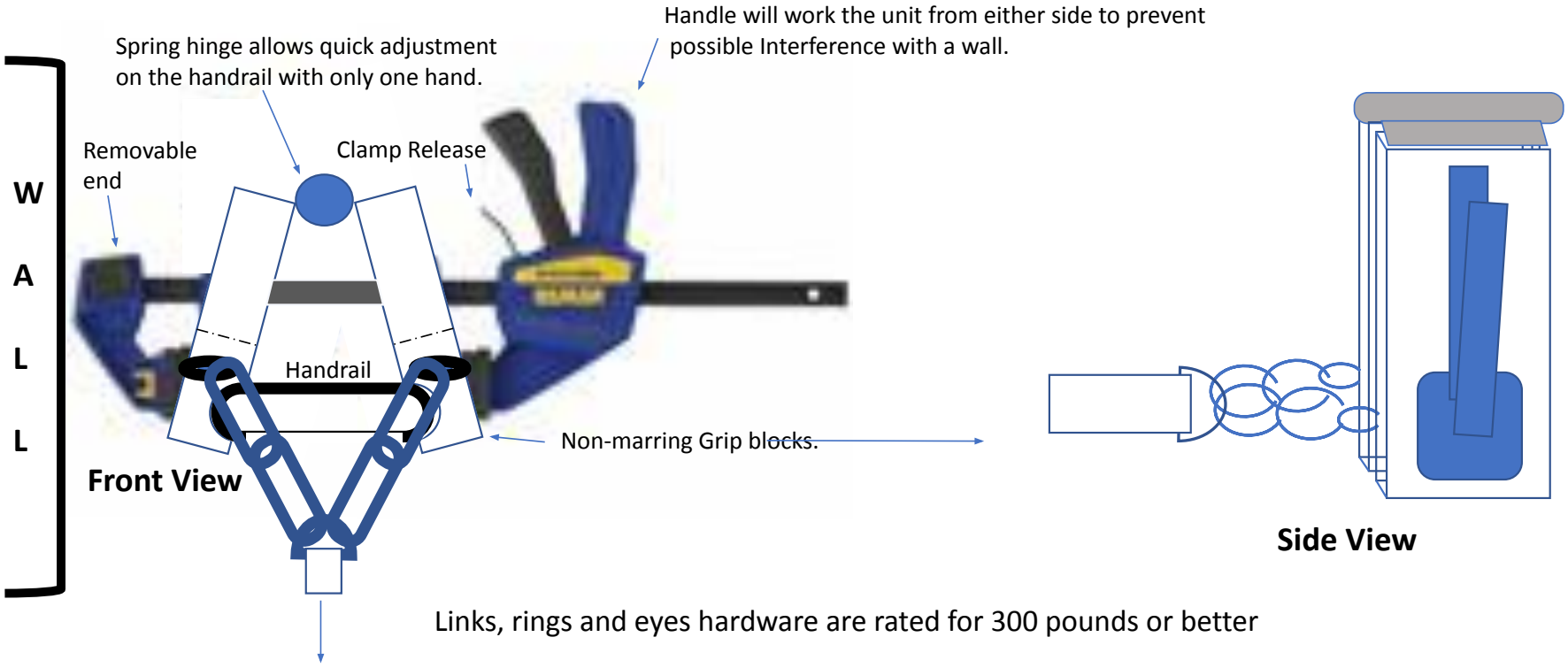
1. Mount the bottom end of the scale assembly on the anchor point in the lower pit.

2. Assemble the clamp in the nylon blocks as seen on the next slide.

3. Mount the handrail gripping unit on the rail to be tested at the Measurement Point 3 Ft after the straight run of the rail.



Handrail Gripping Unit



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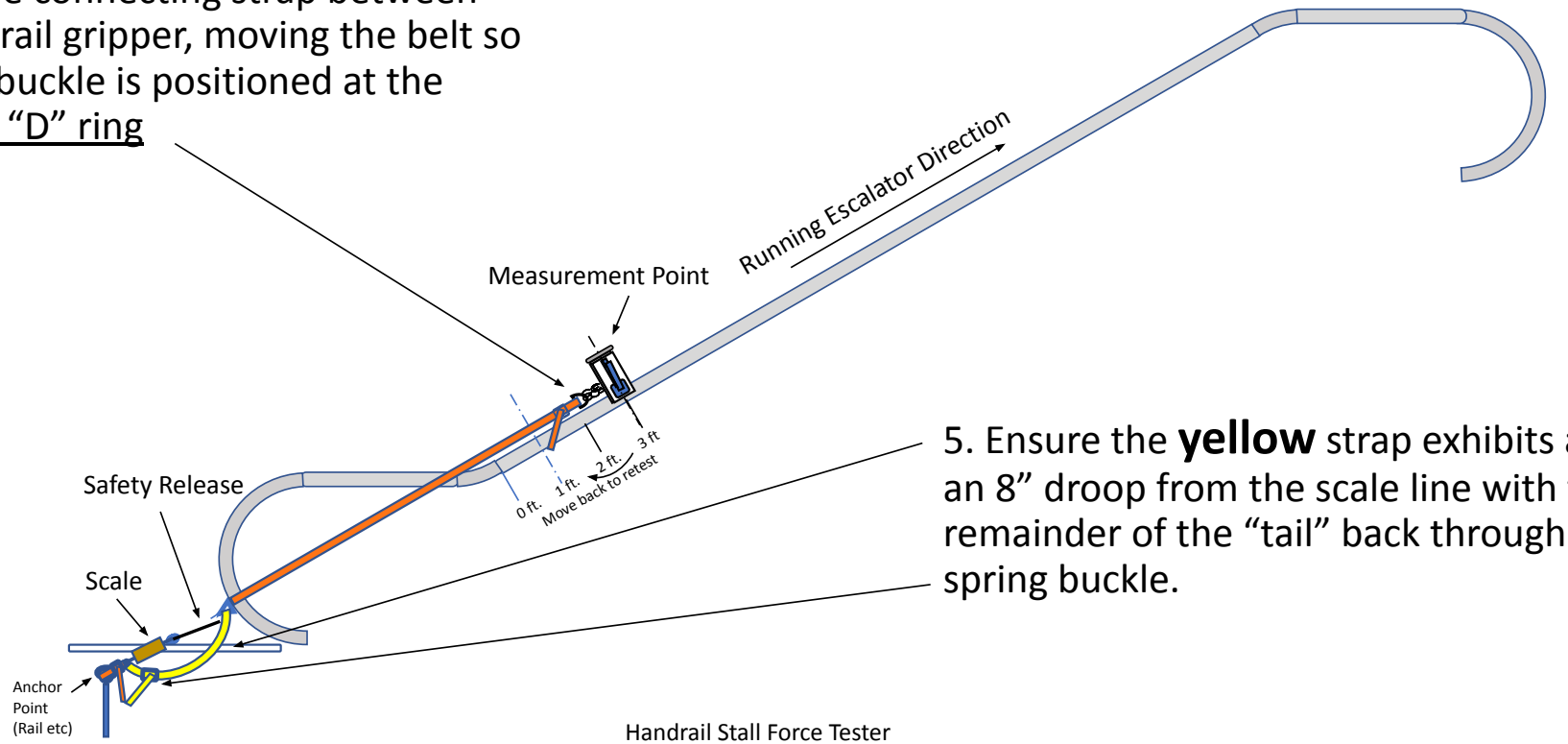
Connect the Two Units With a Connecting Strap

4. Add the connecting strap between the handrail gripper, moving the belt so the cam buckle is positioned at the gripper's "D" ring



5. Ensure the **yellow** strap exhibits about an 8" droop from the scale line with the remainder of the "tail" back through the spring buckle.

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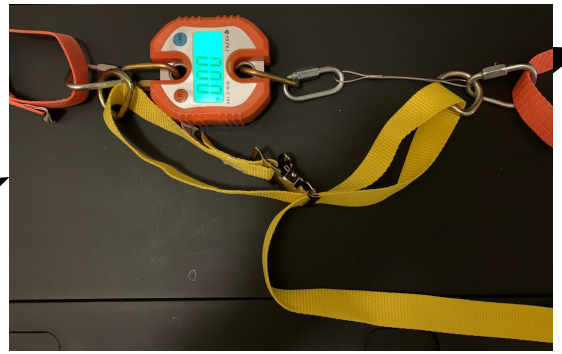
Safety Feature

- Unknown escalators (not previously tested) may have their stall force set in excess of 150 lbs (sometimes as high as 200 + pounds). Though not a compliance issue, this could potentially damage the tester. To prevent damage, the tester has a sacrificial tether to allow up to approximately a 150 lb force. This allows for the controlled release of any stored energy. Replacement tethers are supplied in the tester case.
- When this happens, replace the tether and re insert the TAIL of the BACK yellow safety strap under the TOP yellow strap, as seen on next slides.
- Adjust for some slack with a new tether in place.
- Loosen handrail strength.
- Retest to demonstrate 100 lbf minimum requirement.

Strapping

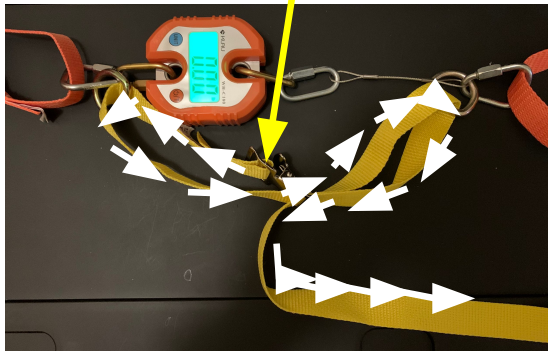
Orange Straps have Cam Buckles.
Yellow Strap has a Spring Buckle.
(see Appendix)

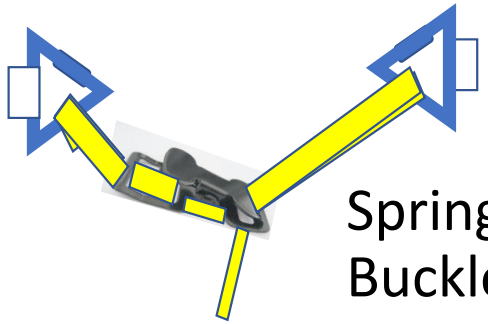
Orange anchoring strap
Around anchor point



Orange strap
To gripping unit
keeping Cam
Buckle close to
Gripping unit

Sewn, Secured End
of Yellow Strap starts
here

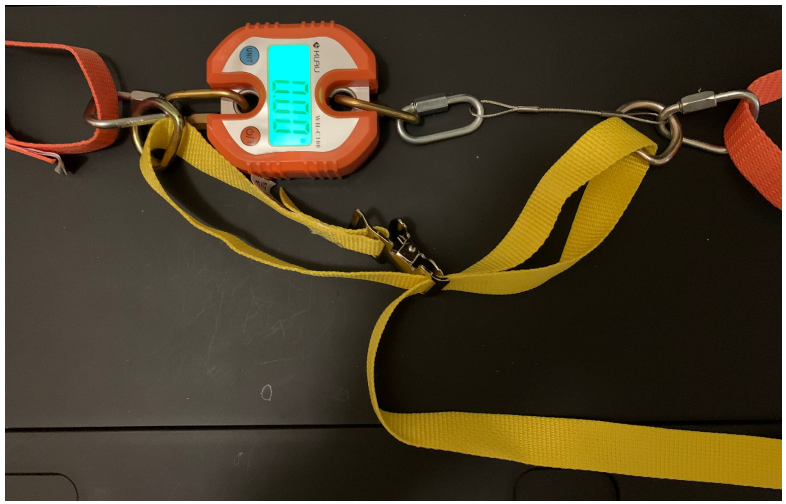


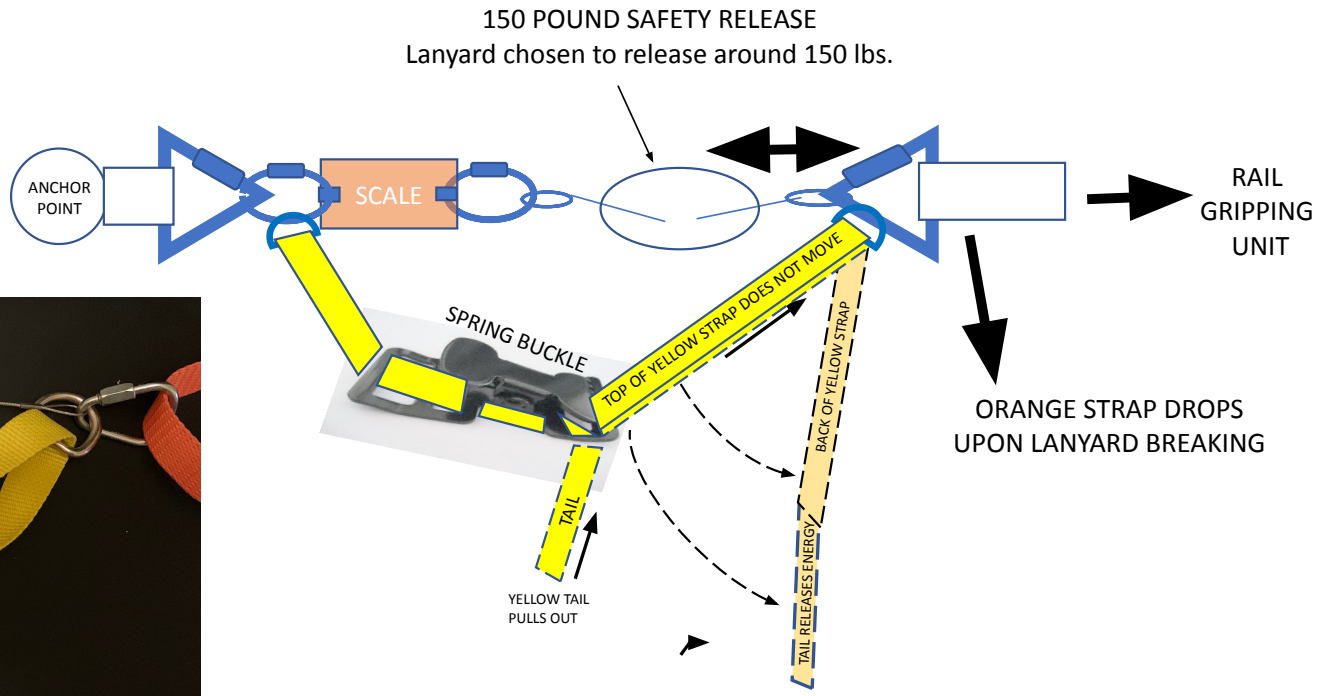


Spring
Buckle

Detail of yellow strap around the left “D”ring, on through the spring buckle clasp and then up through the Right “D” ring then back down beyond the claw protected by the upward pass of the yellow strap… The next page might help

Measuring Unit With 150lb Release





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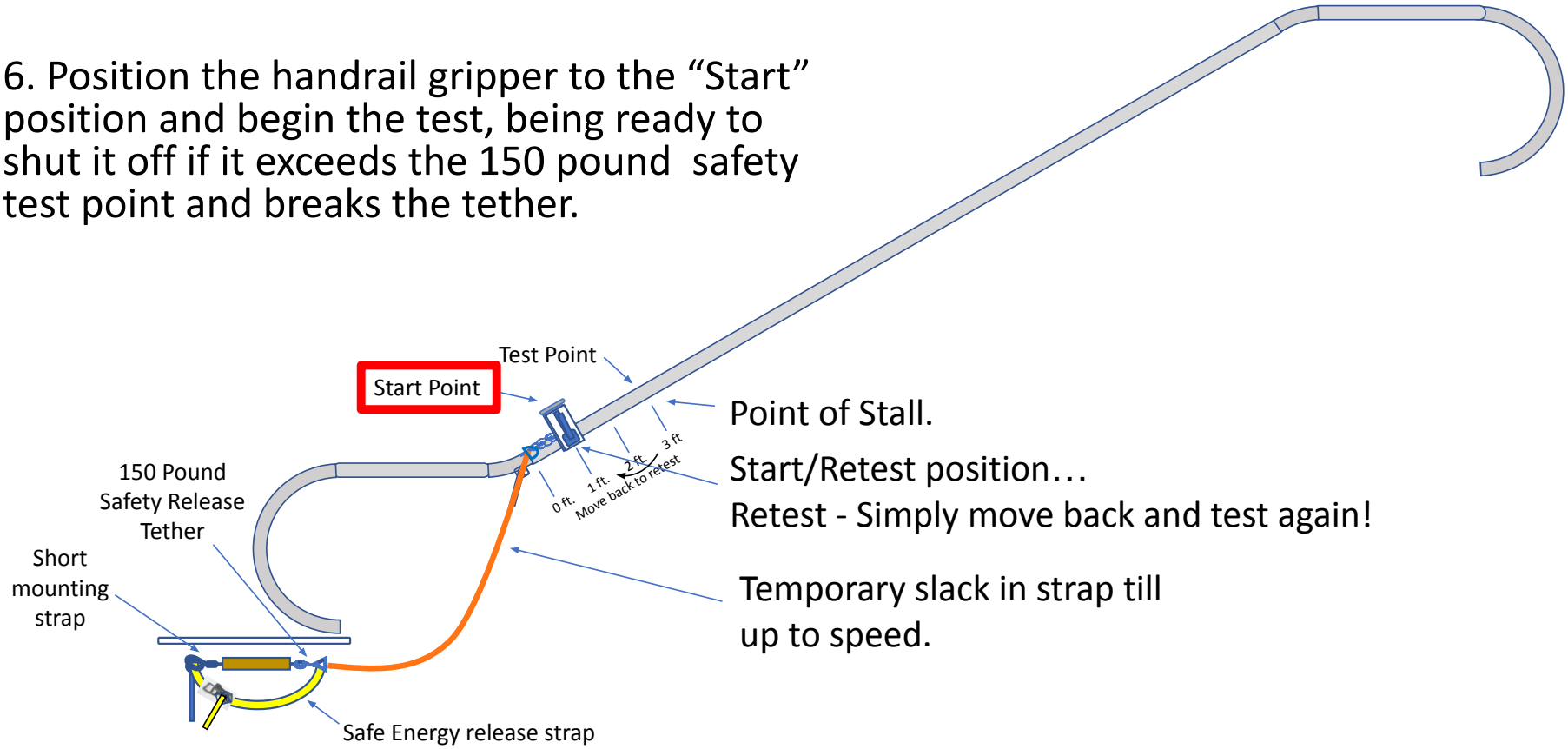
Handrail Stall Force Tester, Ready to Start

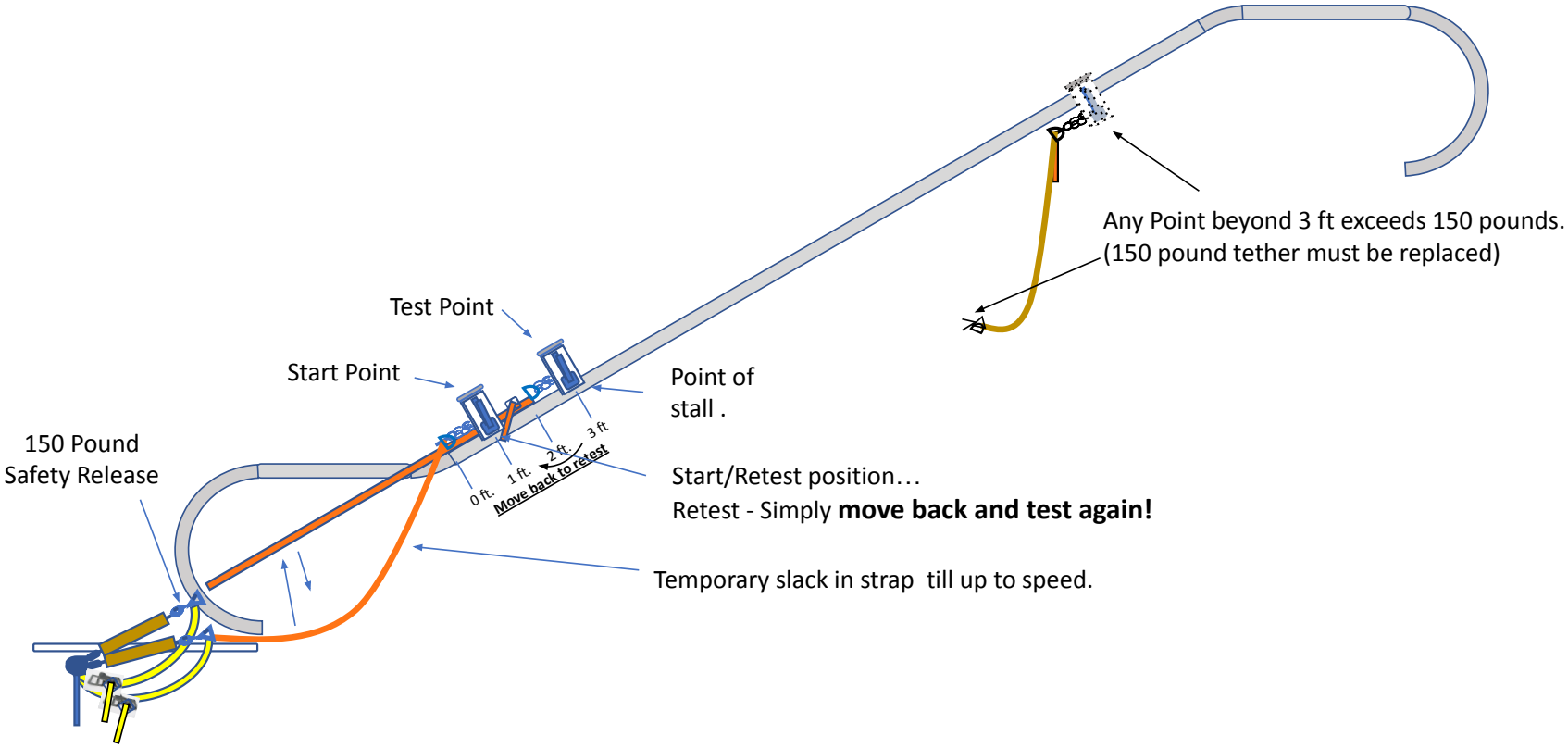
6. Position the handrail gripper to the “Start” position and begin the test, being ready to shut it off if it exceeds the 150 pound safety test point and breaks the tether.



The Setup Procedure

- Ensure the handrail gripping assembly is correctly assembled and the 150 pound safety release is in place.
- Install the Irwin hand clamp so the handle will be operable from the moving steps on the escalator.
- Locate the beginning of the straight portion of the 30 degree incline of the handrail clamp the gripping assembly onto the handrail at a point 3 feet beyond the beginning of the straight segment of handrail.
- Use the orange strap and make a loop of strap between the short tape and the 150 pound safety release.
- Gently pull it to produce a relaxed but not hanging loop.
- Move the gripping device 2 feet down the handrail. The orange strap will now have a hanging loop.
- Assure yourself the peak indicator is up at the current force indicator position. (0)
- Run the escalator till the handrail stalls or the safety release lets go.
- STOP THE ESCALATOR and record the peak reading.

Handrail Stall Force Tester Setup Before and After Start



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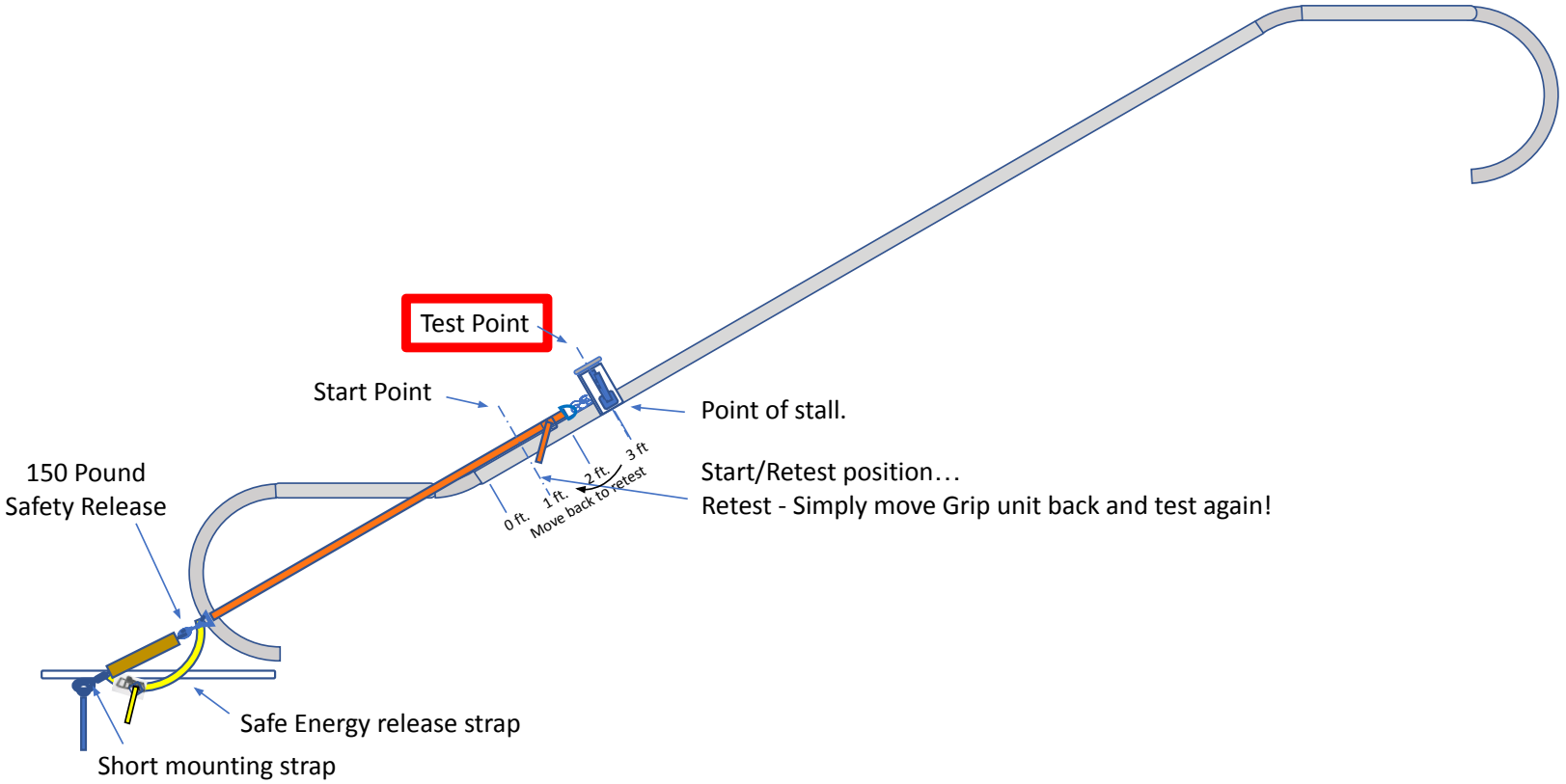
Stall Force Tester Stalled Either Side of 100lb Limit, But Less Than 150lbs



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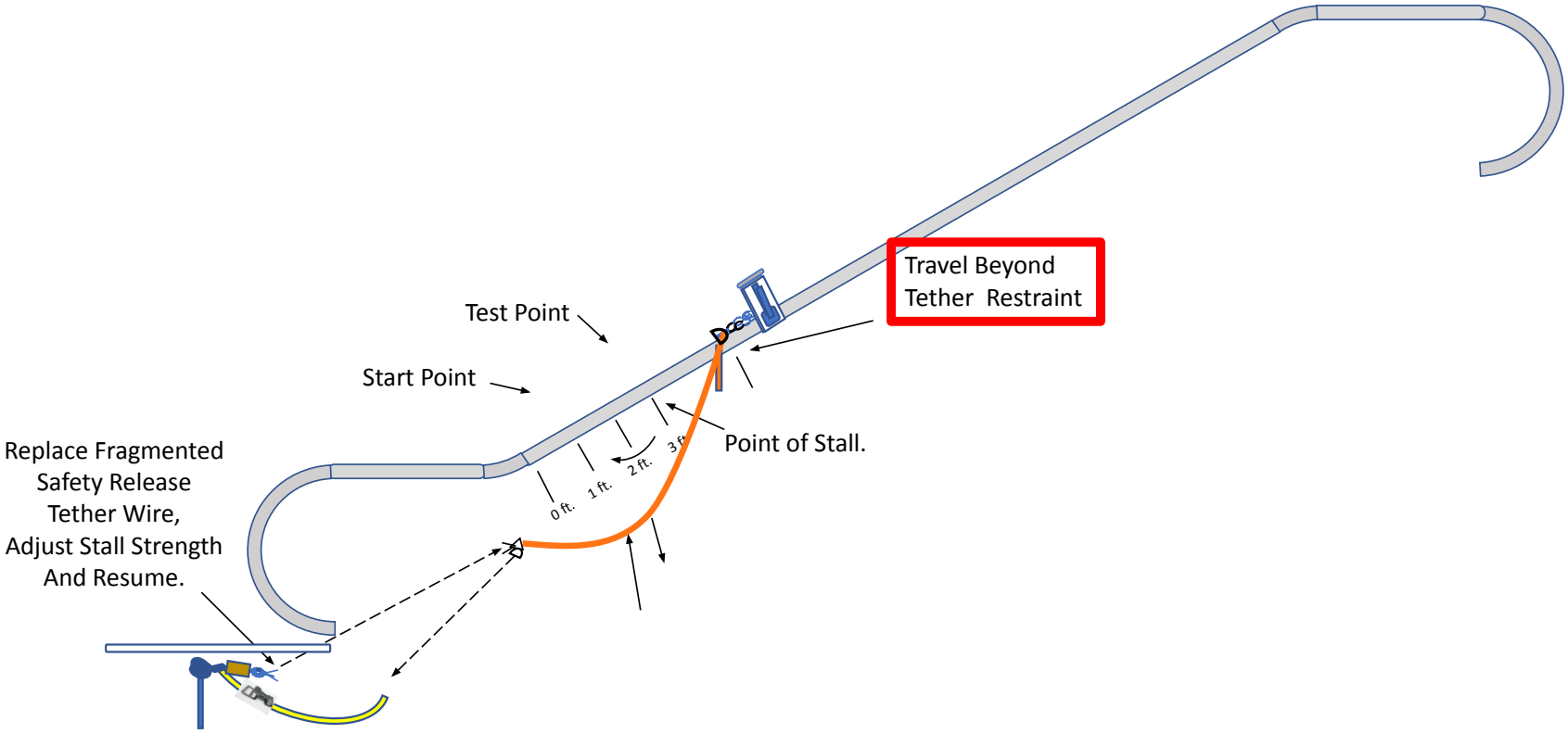
Handrail Stall Force Tester After Exceeding the Tether Strength



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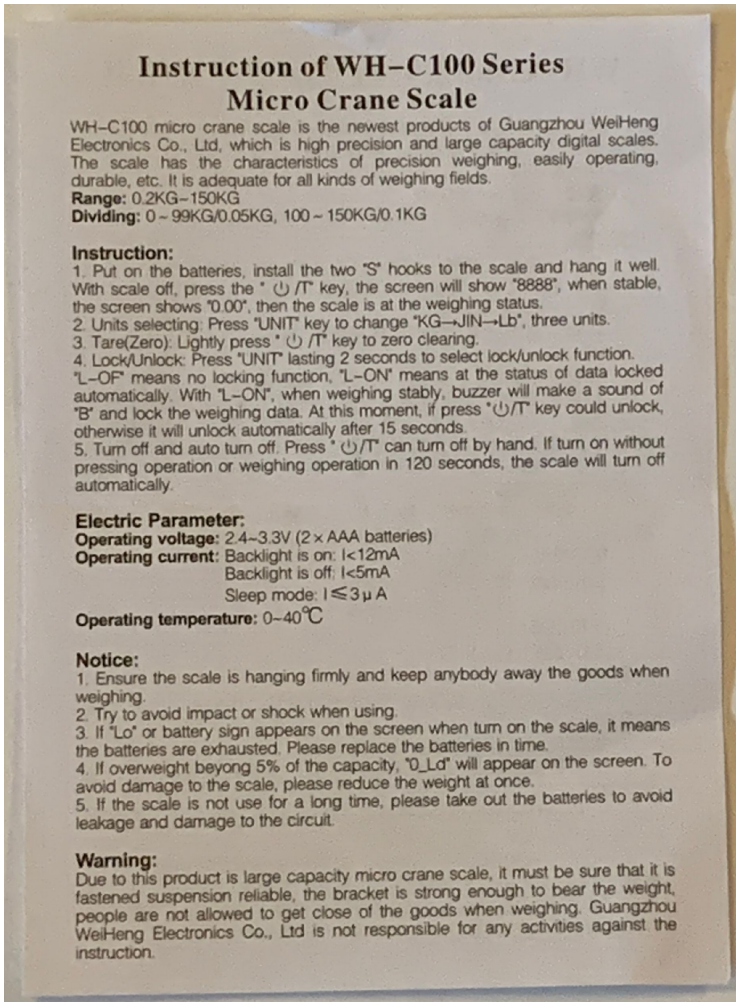
Appendix



Instruction of WH–C100 Series Micro Crane Scale

WH–C100 micro crane scale is the newest products of Guangzhou WeiHeng Electronics Co., Ltd, which is high precision and large capacity digital scales. The scale has the characteristics of precision weighing, easily operating, durable, etc. It is adequate for all kinds of weighing fields.
Range: 0.2KG–150KG
Dividing: 0 ~ 99KG/0.05KG, 100 ~ 150KG/0.1KG

Instruction:
1. Put on the batteries, install the two "S" hooks to the scale and hang it well. With scale off, press the " ⏻ /T" key, the screen will show "8888", when stable, the screen shows "0.00", then the scale is at the weighing status.
2. Units selecting: Press "UNIT" key to change "KG→JIN→Lb", three units.
3. Tare(Zero): Lightly press " ⏻ /T" key to zero clearing.
4. Lock/Unlock: Press "UNIT" lasting 2 seconds to select lock/unlock function. "L–OF" means no locking function, "L–ON" means at the status of data locked automatically. With "L–ON", when weighing stably, buzzer will make a sound of "B" and lock the weighing data. At this moment, if press " ⏻/T" key could unlock, otherwise it will unlock automatically after 15 seconds.
5. Turn off and auto turn off: Press " ⏻/T" can turn off by hand. If turn on without pressing operation or weighing operation in 120 seconds, the scale will turn off automatically.

Electric Parameter:
Operating voltage: 2.4~3.3V (2 × AAA batteries)
Operating current: Backlight is on: I<12mA
Backlight is off: I<5mA
Sleep mode: I ≤ 3 μ A
Operating temperature: 0~40℃

Notice:
1. Ensure the scale is hanging firmly and keep anybody away the goods when weighing.
2. Try to avoid impact or shock when using.
3. If "Lo" or battery sign appears on the screen when turn on the scale, it means the batteries are exhausted. Please replace the batteries in time.
4. If overweight beyong 5% of the capacity, "0_Ld" will appear on the screen. To avoid damage to the scale, please reduce the weight at once.
5. If the scale is not use for a long time, please take out the batteries to avoid leakage and damage to the circuit.

Warning:
Due to this product is large capacity micro crane scale, it must be sure that it is fastened suspension reliable, the bracket is strong enough to bear the weight, people are not allowed to get close of the goods when weighing. Guangzhou WeiHeng Electronics Co., Ltd is not responsible for any activities against the instruction.

Scale Instructions from the Manufacture

Cam Buckle

Bare Spring Buckle

Please feel free to call should you have further questions.

Thank you for considering products from StopLoss Resources,
your time saving "Place-N-Measure" solution!

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