

TSA

Truck Scale Weigh Module Kit

Installation Guide



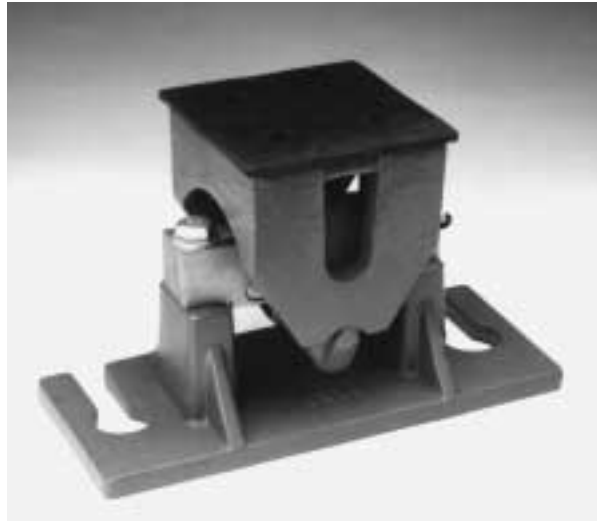
RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®



25709

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1. Introduction

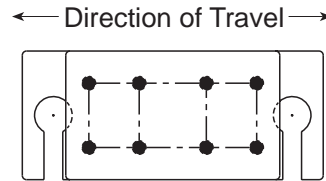
The TSA load cell mount is used for medium to heavy capacity truck, horizontal vessel, and general purpose weighing applications. The mounts are constructed of cast steel and iron, and are available in two sizes with capacities of 10,000 lb to 75,000 lb. In most applications, the need for safety check rods, expansion assemblies and other peripheral hardware is eliminated by the "Unilink" suspension design and the load equalizer pad. These design elements provide self-checking and improved weight distribution.

The TSA mounts use the Sensortronics 65058 double-ended shear beam load cell, which is made of high alloy tool steel, environmentally protected, and rated for a 150% maximum overload.

2. Mechanical Installation

2.1 General Installation Guidelines

- Install a system ground in the pit close to the junction box. Use at least 1/2" x 8' copper clad ground rod. Hook the indicator, junction box, Scale deck I-beam, load cell grounding straps, and lightning protection devices to the system ground. Hook all other devices, such as the printer, to the same AC power supply as the indicator.
- If the pit fills up with water, proper drainage must be provided so that the weighing assembly is not standing in water. Also, drip loops should be provided on any conduit or cables going to the junction box or load cell.
- If safety check rods are necessary, consult your supervising engineer for proper placement and stability. If bumper bolts are necessary, install them between the scale platform and the walls of the pit. Leave about 1/8" clearance or as applicable.
- The mount must be positioned in the direction of travel. Also the load on each mount assembly should be equal to each other.
- The mounting surface for the base and loading plate must be level and parallel so that side loads and bending moments are minimized. The mount assemblies must be plumb and level within $\pm 0.2^\circ$.
- Because the load cell could be damaged during installation, do not use excessive force or slam parts on the load cell. Also, when any welding is required on the mount, remove the load cell from the mount so it is not damaged by welding currents or excessive heat.



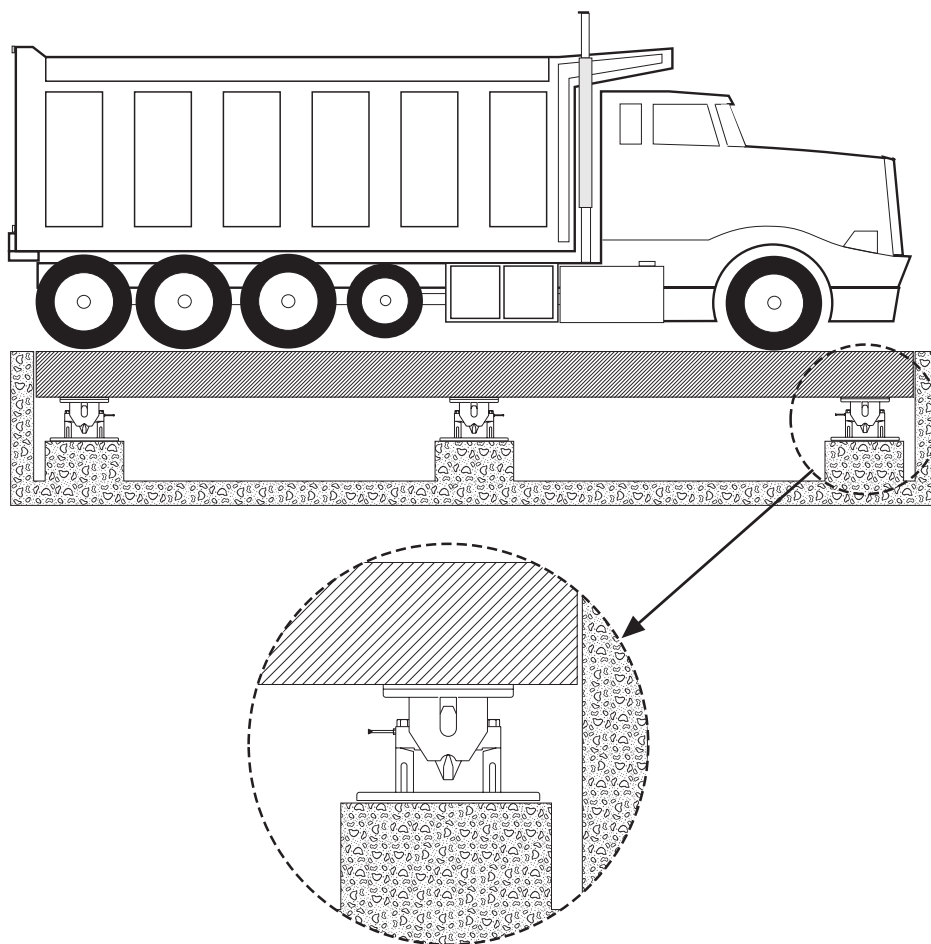


Fig. 2-1: Typical configuration of foundation, mount, and scale deck I-beam

2.2 Maintaining Scale Height and Center

Whether you are replacing existing scales or installing new load cell mounts, you will need to maintain the final height of your scale system.

1. On the concrete pier foundations, install blocking to hold up the scale deck I-beam and platform to the required height for normal truck scale operation. Place wedges between the platform and the pit's edges to center the platform.
2. Remove the existing scales and/or install the new mounts one at a time to continue to maintain the proper height. Installation procedures follow this section.

2.3 Mount and Load Procedures

2.3.1 Installing the Components



Caution

When placing parts on the load cell, be careful not to drop or slam parts on the load cell. Damage to the load cell will make the scale inoperable.

1. Start with a flat, rigid foundation (concrete pier). Position the base stand onto the foundation. Align the base stand in the direction of travel (Fig. 2.1, p. 3).
2. Place the load cell onto the two stands of the base stand and screw in the load cell mounting bolts (finger snug tight). The loose bolts allow the TSA freer movement for better weighing accuracy.
3. Place the load link on top of the load cell, the girder chair on top of the load link, and the rubber pad on top of the girder chair. (In a multiple cell (more than 4) application, do something different with the rubber pads.)
4. Adjust the load link so it is vertical and centered side to side (in a balanced condition). If the load link is not vertical and centered side to side, adjust the base stand.

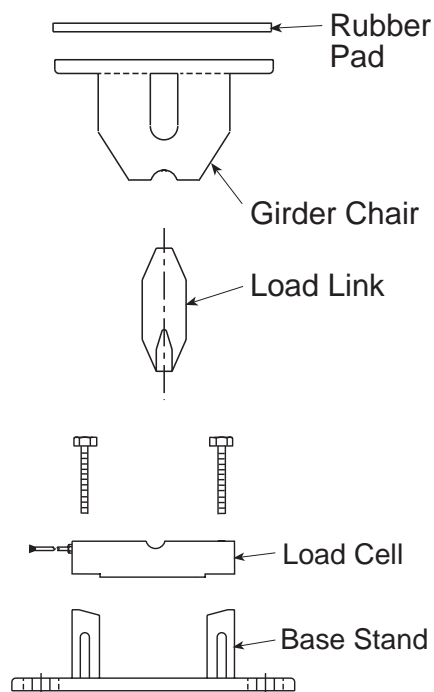


Fig. 2-2: Component assembly

2.32 Leveling the Base and Securing the Girder Chair

Leveling is **the single most important part of the installation** for achieving high-accuracy weighing.

1. Check to see whether the girder chair is centered longitudinally with the scale deck I-beam, and adjust the mount if necessary. Place shims between the top of the girder chair and the bottom of the scale deck I-beam, because the scale deck I-beam is never even. The shims should cover the entire surface to prevent bending.
2. Using a high-quality bubble level, level the base stand within 0.2° of horizontal to achieve a scale accuracy of 0.1% or better. The base stand should be parallel with the girder chair, and the link plumb.
3. Mark the girder chair hole locations on the scale deck I-beam (see appendix).
Note:
The smaller capacity mount only has four girder chair bolts.
4. Remove the load cell mount while noting the placement and height of the shims.
5. Use a cutting torch to drill the holes into the scale deck I-beam.
6. Replace the mount and the shims. Bolt the girder chair to the scale deck I-beam. The TSA will adjust slightly with the I-beam when the bolts are loosely fitted. If needed, use jam nuts to lock the girder chair bolts in place. Girder chair bolts are not supplied.

2.33 Re-leveling and Securing the Base

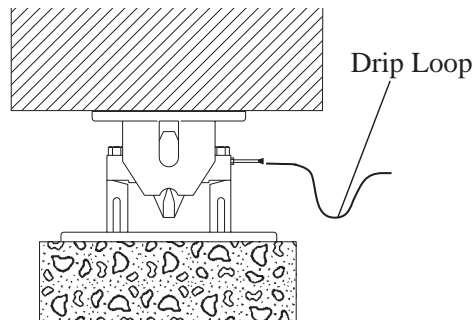
1. Re-level the mount. If necessary, move the base stand around. A perfectly level system will minimize side loads and bending moments.
2. Remove the blocking for the particular mount, so that the platform and scale deck I-beam are resting solely on the mount. Re-level the base stand as necessary.
3. Install all the other mounts in the system in the above manner before bolting the base stands. After all the mounts are in place, remove all other blocking, and remove the platform wedges making sure the platform is still centered in the pit. If not, then re-wedge and adjust the mounts as necessary. When you are sure that the platform is at the final height and has the proper clearance, then proceed to anchor the base stands.
4. Drill holes in the concrete foundation. Use concrete stud anchors or equivalent to bolt the base to the foundation (see appendix). Make a final check to see that everything is in place and level.

2.34 Replacing the Load Cell

1. Jack up the girder chair assembly and scale deck I-beam away from the load cell.
2. Unscrew the load cell mounting bolts, remove the load cell, insert the new load cell, and tighten (finger snug tight) the load cell mounting bolts.
3. Lower the girder chair assembly and scale deck I-beam GENTLY onto the load cell.

3. Load Cell Wiring

1. Route the load cell cables so they will not be damaged or cut. Cable should not be routed near heat sources greater than 400° F. **Do not shorten any load cell cable.** The load cell is temperature compensated with the supplied length of cable. Cutting the cable will affect temperature compensation. Coil and protect excess cable so it will not be mechanically damaged or be sitting in water.
2. Provide a drip loop in all cables so that water or other liquids will not run directly down the cables onto either the load cells or the junction box.
3. If conduit protection is necessary against mechanical or rodent damage to the load cell cables, use flexible conduit and conduit adapters at the load cells.
4. Connect cables for standard RL75060 or Sensuretronics 65103 cells to the summing board in the junction box according to the guide shown below and the labels on the terminal strips of the junction box. To verify the wiring scheme, see the certification shipped with each load cell.
5. For better performance, use positive and negative remote sense lines if the wiring running from the junction box to the indicator is longer than 25 feet.



LOAD CELL WIRE COLOR	FUNCTION
Red	+EXC
Black	- EXC
Green	+SIG
White	- SIG
Gray or Bare	SHIELD

Figure 3-1: Load Cell Wiring

4. Junction Box Connections, Adjustments & Calibration

1. Refer to the Junction Box manual for trimming details.
2. Refer to the indicator manual or the “Technical Information” section in the Rice Lake Weighing Systems’ Load Cell Product Selection Guide for system calibration details.

5. Troubleshooting

If the system powers up and gives some type of stable digital readout that varies with the load on the system, any system problems are probably caused by factors other than the load cells. The load cells are often blamed for a malfunctioning system, but the majority of the time, the problem lies elsewhere. Look for mechanical causes for your problem first.

If the system can be calibrated but doesn’t return to zero, loses calibration, or demonstrates non-linearity or non-repeatability, see the following chart for possible causes and do the following checks.

Symptom	Possible Cause
No return to zero	Mechanical binding or debris in seals or under load cells; may have lost system calibration
Non-linearity	Thermal expansion or deflection under load causing binding or side load
Non-repeatability	Loose load cell mount; drifting caused by moisture, load cell overload or shock damage; mechanical binding
Lost calibration	Out of level or plumb; moisture problem; mechanical binding
Drifting readout	Moisture in junction box, cables, or load cell; mechanical binding

1. Check load cell mount for debris restricting load cell movement or debris between scale and structure.
2. Check that tank/vessel and mounts are plumb, level, and square at the critical areas.
3. Check all piping and conduit for connections which restrict vessel movement.
4. If check rods are used, loosen all connections to finger tight only for testing.
5. Check load cell cables for physical or water damage.
6. Check all electrical connections, especially in the junction box.

If the problem still is not found:

7. Check possible indicator malfunction by using a load cell simulator to input a known good signal into the indicator.
8. Disconnect each load cell's signal leads at the junction box and check individual load cell outputs with a multimeter. Then check input/output impedances for comparison with load cell manufacturer's specifications.

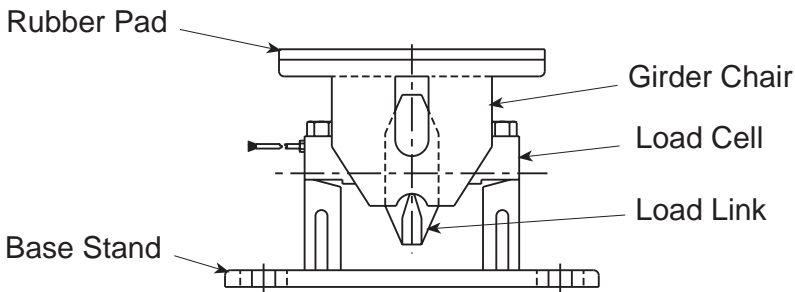
If after all these checks the problem still cannot be isolated, reconnect all but one load cell. Replace the load cell with a load cell simulator. Alternate so that each load cell is individually disconnected and replaced with a simulator. If there is a problem with a particular load cell, the symptom should disappear when that load cell is disconnected and replaced with the simulator.

6. Maintenance and Replacement Parts

6.1 Maintenance

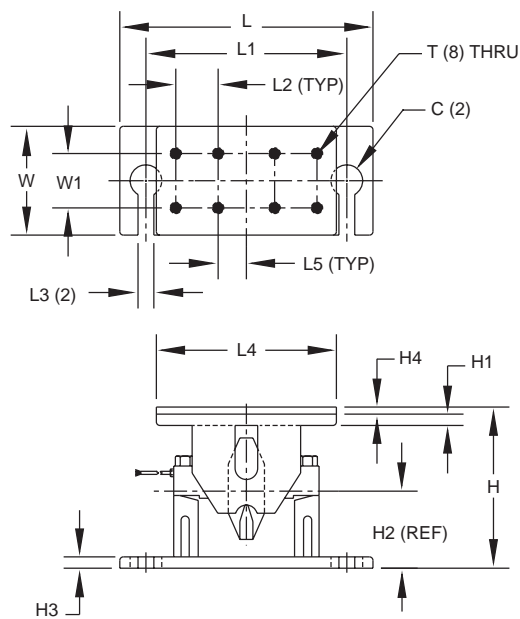
1. The TSA Truck Scale Assembly can be wiped clean with a cloth to keep the parts moving freely. Inspect the mount routinely for damage, excessive wear and corrosion. Replace parts whenever necessary.
2. Use a heavy grease on the three pivot points of the load link.

6.2 Replacement Parts



Description	Qty	Part Numbers	
		25,000lb	75,000lb
TSA Load cell mount (whole unit)		17821	17822
Rubber Pad	1	21705	21706
Base Stand	1	18471	18472
Girder Chair	1	18475	18476
Load Link	1	18473	18474
Double-Ended Shear Beam Load Cell	1	(See Load Cell Selection Guide)	

7. Appendix—Mount Dimensions



RATED CAPACITY	DIMENSIONS-INCHES						
	C	L	L1	L2	L3	L4	L5
10,000lb 20,000lb 25,000lb	1.75 DIA.	14.00	11.00	3.00	.88	6.00	---
50,000lb 60,000lb 75,000lb	2.00 DIA.	18.00	14.00	3.00	.88	12.75	2.00

RATED CAPACITY	DIMENSIONS-INCHES							W	W1
	H	H1	H2	H3	H4	T			
10,000lb 20,000lb 25,000lb	8.75	.62	4.62	.62	.25	5/8-11UNC-2B		6.00	3.00
50,000lb 60,000lb 75,000lb	11.00	.75	5.44	.75	.50	3/4-10UNC-2B		7.00	3.50

8. TSA Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS brand load cells properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications. All load cell products are warranted against defects in materials and workmanship for two (2) years. Products marked as “waterproof” are warranted against defects in materials and workmanship relating to moisture ingress.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

1. Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
2. Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
3. Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
4. RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
5. In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

RLWS AND BUYER AGREE THAT RLWS'S SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.

SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of RLWS and the Buyer.

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