

Magnamount®

Weigh Module Kit

Installation Guide



RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale™



25707

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1. Introduction

The MagnaMount® weigh module provides an accurate method of weighing for heavy-capacity tank, truck, and railroad track weighing applications. The mount is available in three heavy-duty capacities: 50,000 lb, 100,000 lb, and 200,000 lb. The load bearing plate is constructed of high-grade carbon steel, which gives the mount its high-strength capabilities. The unique Teflon® coated load bearing plate permits multidirectional movement to offer accurate weighing and compensate for temperature variations. The mount shields the load cell on four sides to protect it from shock and side loads.

Warning

The installation should be planned by a qualified structural engineer. Each installation is unique, and this manual is meant to serve only as a general guideline for installation.

RTI CSP1 and CP1 compression canister loads cells are compatible for use in the MagnaMount. Both are constructed of tool steel, hermetically sealed, and rated for 150% maximum overload.

2. Parts Assembly

The MagnaMount can be assembled as one unit and hoisted into place on the foundation, or it can be assembled part by part onto the foundation. This section describes the assembly of the mount into one unit.

2.1 Assembling the Base Plate

1. Screw the four leveling bolts into the base plate.
2. Place the two corner stands on the base plate (Figure 2.1).
3. Place the flexure plate over the two corner stands.
4. Place the two anchor blocks on top of the flexure plate in line with each corner stand.
5. Screw anchor bolt through the anchor blocks, flexure plate, and corner stands to the base plate using the eight anchor block bolts and washers (only six anchor block bolts and washers for the 100,000 lb capacity mount and only four for the 50,000 lb).
6. Torque the anchor block bolts to spec (see Torque Value Table, p. 4).

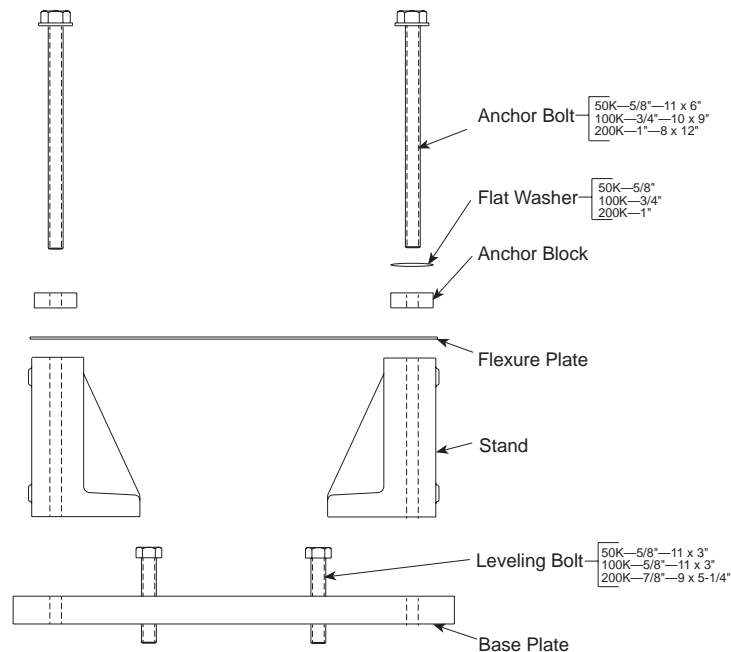


Figure 2.1 Base Plate Assembly

2.2 Assembling the Retaining Plate

1. Install tension pins 1/4" x 3/4" in retaining plates and bottom plates. Leave 1/4" out of plates.
2. Place the bottom plate on top of the flexure plate (Figure 2.2).
3. Position the top mounting plate under the flexure plate aligned with the bottom plate.
4. Screw the top mounting plate to the bottom plate using the top mounting plate bolts, lockwashers, and washers.
5. Torque the top mounting plate bolts to spec (see Torque Value Table, p.4).

Note:

The top mounting plate is on the bottom of this assembly and on top of the load cell.

6. Place the bottom fabreeka pad on the bottom plate.
7. Place the top fabreeka pad on the bottom fabreeka pad.
8. Place the retaining plate on top of the top fabreeka pad.

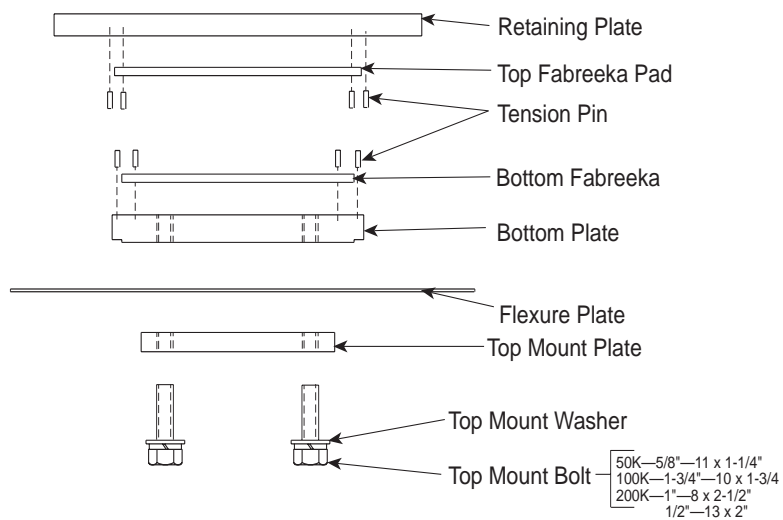


Figure 2.2 Retaining Plate Assembly

2.3 Assembling the Dummy Load Cell

1. Place nine shims on the load cell mounting plate (only four shims for the 100,000 lb capacity mount and only six for the 50,000 lb).
2. Place the dummy load cell on the shims (Figure 2.3).
3. Screw the load cell screw into the dummy load cell from the bottom of the load cell mounting plate.
4. Insert the dummy load cell assembly in the mount between the base plate and the top mounting plate. Add or subtract shims so top of dummy cell just touches the top mounting plate with no load.
5. Screw the load cell mounting plate bolts with lockwashers into the base plate.
6. Torque the load cell mounting plate bolts to spec. See the following table for all necessary torque values.

Torque Value Table

Bolt Diameter	Recommended Torque	
	UNC	UNF
1/4"	11	13
5/16"	21	23
3/8"	38	40
7/16"	55	60
1/2"	85	95
9/16"	125	140
5/8"	175	210
3/4"	300	330
7/8"	450	490
1"	680	715
1-1/8"	885	990
1-1/4"	1255	1380
1-3/8"	1635	1875
1-1/2"	2180	2430

Note:

After the mount is fully installed on the foundation and the scale deck I-beam is secured to the mount, the dummy load cell can be replaced by the actual load cell. Refer to 3.3.5 Removing the Load Cell and 3.3.4 Installing the Load Cell.

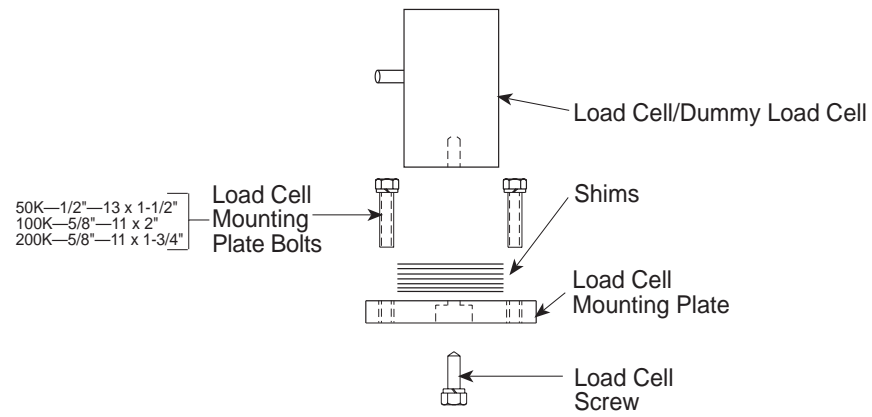


Figure 2.3 Load Cell Assembly

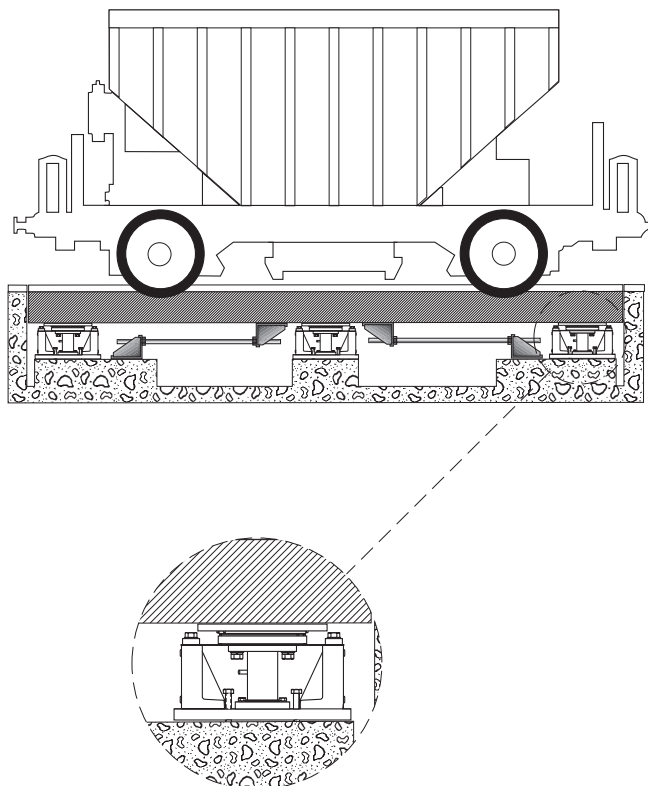


Figure 2.4 Typical configuration of foundation, mount, and scale deck I-beam

3. Mechanical Installation

Mechanical installation consists of positioning the mount on a foundation, leveling the mount for weighing accuracy, securing the mount to the foundation and scale deck I-beam, and grouting.

3.1 General Installation Guidelines

1. Install a system ground in the pit in close proximity 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 lightening protection devices to the system ground. Hook all other devices, such as the printer, to the same AC power supply as the indicator.
2. Proper drainage must be provided so that the weighing assembly is not standing in water. Also, drainage loops should be provided on any conduit or cables going to the junction box or load cell.
3. The mount must be positioned in the direction of travel (Figure 3.1). Also, the load on each mount assembly should be equal to each other.
4. Check rods must be installed (see Figure 3.3 and 3.4). Consult the supervising engineer for proper placement and stability.
5. The mounting surface for the base and loading plate must be level and parallel with pier and I-beam. Shim as necessary. The mount assemblies must be plumb and level within $\pm 0.2^\circ$.
6. The dummy load cell should remain in the mount until all mechanical work is finished. The load cell should never be in the mount when any welding is done.

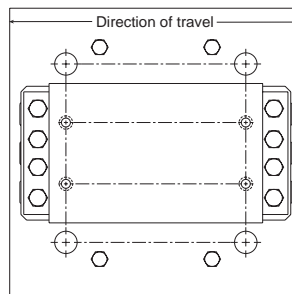


Figure 3.1 Orient the mount

3.2 Maintaining Scale Height and Center

Whether replacing existing scales or installing new load cell mounts, you 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.

3.3 Mount and Installation Procedures

3.3.1 Positioning and Leveling the Mount, and Securing the Retaining Plate

1. Start with a flat, rigid foundation (concrete pier). Using a forklift, position the mount onto the foundation. Align the base plate in the direction of travel (Figure 3.1).

Note:

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

2. Adjust the leveling bolts to bring the top of the retaining plate up so it is flush with the bottom of the scale deck I-beam. Check to see whether the retaining plate is centered longitudinally with the scale deck I-beam and adjust the mount if necessary. Place shims between the top of the retaining plate 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. If necessary, adjust the leveling bolts to insert the shims.
3. Using a high-quality bubble level, level the base plate within 0.2° of horizontal to achieve a scale accuracy of 0.1% or better.
4. Mark the retaining plate hole locations on the scale deck I-beam (see appendix for retaining plate hole dimensions).
5. Remove the load cell mount while noting the placement and height of the shims.
6. With a magnetic drill, drill the holes into the scale deck I-beam.
7. Replace the mount and the shims. Bolt the retaining plate to the scale deck I-beam. Retaining plate bolts are not supplied.

3.3.2 Securing Lateral Restraints

Lateral restraints (check rods) must be installed between each mount.

1. Install the check rods between each mount (Figure 3.3 and 3.4). These lateral restraints create a rigid mount system for heavy loading conditions. The check rods should be positioned as close to each mount as possible. The rod should be at least 4' to 6' long. Spherical washers should be used with each nut.

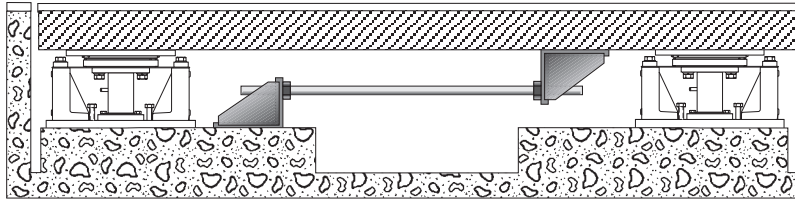


Figure 3.3 Check rod between foundation and scale deck I-beam (front view)

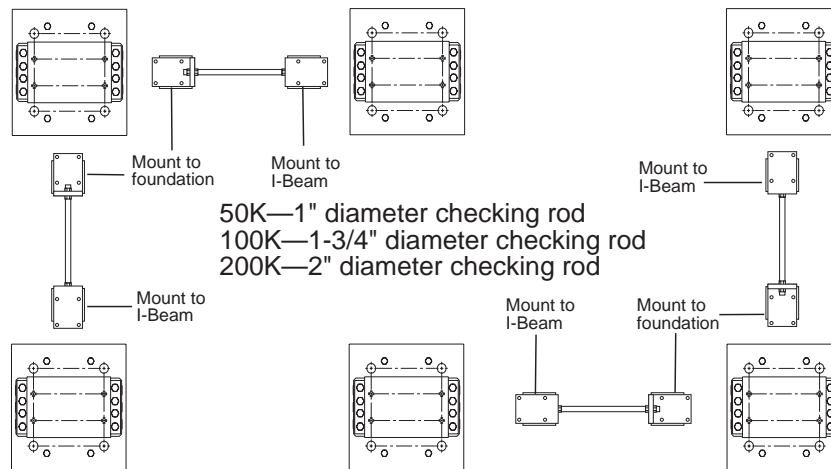


Figure 3.4 Multiple mount check rod placement (top view)

3.3.3 Re-leveling, Securing, Grouting, and Grounding the Base

1. Re-level the mount using leveling lugs. You might have to move the base plate around and/or adjust the leveling bolts to reach the proper horizontal alignment of the base plate and retaining plate. 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.
3. Install all the other mounts in the system in the above manner before bolting and grouting the base plates. After all the mounts are in place, remove all other blocking and remove the platform wedges making sure it 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 plates.

4. Drill holes in the concrete foundation maintaining the height of the leveling bolts. Bolt the base to the foundation (see Appendix for base mounting hole dimensions). Use concrete stud anchors or equivalent. Make a final check to see that everything is in place and level.
5. Pour grout under the base plates. Use good quality non-shrinking grout. Stir under the base plate to remove any air pockets. After the grout has hardened, back the four leveling bolts out of the grout.
6. Install a grounding strap around the load cell.

3.3.4 Installing the Load Cell



When placing parts on the load cell, be careful not to drop or slam parts on the load cell. This sudden force could shock your load cell making the scale inoperable.

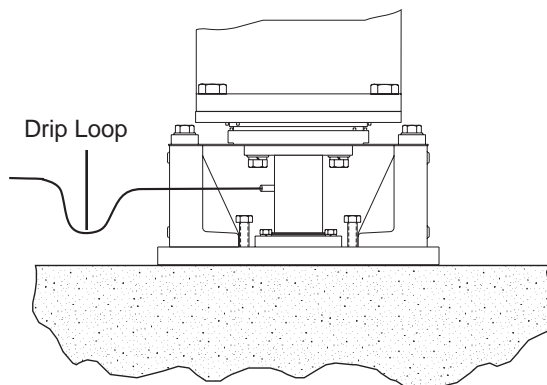
1. Remove load from mount. Jack up I-beam and take load off dummy cell.
2. Place the shims on the load cell mounting plate and the load cell on top of the shims. Then screw the load cell screw into load cell through the bottom of the load cell mounting plate.
3. Slide the load cell assembly into the mount and screw the load cell mounting plate bolts and lockwashers into the base plate.
4. Torque the load cell mounting plate bolts to spec (see Torque Value Table, p. 4).

3.3.5 Removing the Load Cell

1. Power down the indicator.
2. Remove the junction box cover, disconnect the load cell wires from the junction box circuit board, and pull the load cell cable out of the junction box.
3. Remove load from mount. Jack up I-beam and take load off dummy cell.
4. Remove the four load cell mounting plate bolts and lockwashers. Slide the load cell assembly out of the mount.
5. Loosen the load cell screw under the load cell mounting plate and remove the load cell.

4. 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 150° 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 excess cable and protect it 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. Attach load cell cable to the dead structure, not the vessel.
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 RTI CSP1 and RTI CP1 load 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 the load cell.
5. If the wiring run from the junction box to the indicator is longer than 25 feet, use positive and negative remote sense lines for better performance.



LOAD CELL WIRE COLOR	FUNCTION
Green	+EXC
Black	- EXC
White	+SIG
Red	- SIG
Orange	SHIELD

5. Junction Box Connections, Adjustments & Calibration

- Refer to Junction Box manual for trimming details.
- Refer to the indicator manual and/or the “Technical Information” section in the Load Cell Product Selection Guide for system calibration guidelines.

6. Troubleshooting

If the system powers up and gives some type of stable digital readout that varies with the load on the system, the system problems are probably caused by factors other than the load cells. All too often, the load cells are blamed for a malfunctioning system; 90% 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 refer to the following list of 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. Check any overload stops for proper clearance.
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.

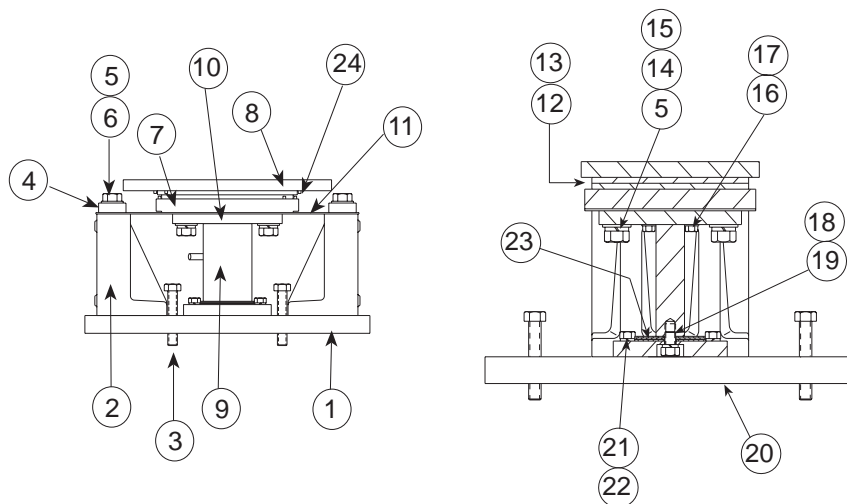
If the problem still is not found:

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.

7. Replacement Parts

When replacing a compression canister type load cell, replace the load cell top mounting plate also. After years of use the bearing plate gets worn where the load cell button contacts the plate. If not replaced, it could cause weighing inaccuracies.



No.	Description	Qty	Part Numbers		
			A*	B*	C*
0	MagnaMount (whole unit)		17974	21724	21723
1	Base Plate	1	18483	22339	22163
2	Stand	2	18488	22341	22165
3	Bolt, 7/8"-9 UNC x 5" Full THD.	4	10211		
3	Bolt, 5/8"-11 x 3" Full THD	4		22281	22281
4	Anchor Block	2	18489	22342	22155
5	Washer, Plain 1.00"	12	15183		
5	Washer, Plain 3/4"	6		15179	
5	Washer, Plain 5/8"	4			15177
6	Bolt, 1.00"-8 x 12" Hex HD Grd 5	8	14794		
6	Bolt, 3/4"-10 x 9" Hex HD Grd 5	6		22343	
6	Bolt, 5/8"-11 x 6" Hex HD Grd 5	4			22255
7	Bottom Plate	1	18493	22344	22152
8	Retaining Plate	1	18496	22345	22158
9	Dummy Load Cell	1	18485	22346	22153
10	Top Mounting Plate	1	18486	22347	22161
11	Flexure Plate	1	18491	22349	22156
12	Fabreeka Pad (Top)	1	18495	22348	22159
13	Fabreeka Pad (Bottom)	1	18494	22350	22160
14	Lockwasher, 1.00"	4	15185		
14	Washer, 3/4"	4		15179	

14	..... Washer, 5/8"	4	..... 15177
15	..... Screw, Cap 1.00"-8 x 2.50" Hex HD Grd 5 ...	4	..... 14793
15	..... Screw, Cap 3/4"-10 x 1.75" Hex HD Grd 5 ...	4	..... 22351
15	..... Screw, Cap 5/8"-11 x 1.25" Hex HD Grd 5 ...	4	..... 22256
16	..... 1/2" Flat Washer	4	..... 15173
17	..... 1/2"-13 x 2" Hex HD Grd 5	4	..... 22096
18	..... Lockwasher 3/4"	1	..... 15181 ... 15181
18	..... Lockwasher 1/2"	1	..... 15167
19	..... Screw, Cap 3/4"-16 x 1" Hex HD Grd 5	1	..... 15096 ... 15096
19	..... Screw, Cap 1/2"-20 x 5/8" Hex HD Grd 5	1	..... 22257
20	..... Load Cell Mounting Plate	1	..... 18484 ... 22352 ... 22154
21	..... Lockwasher, 5/8"	4	..... 21934 ... 22353
21	..... Lockwasher, 1/2"	2	..... 15167
22	..... Bolt 5/8"-11 x 1.75" Hex HD Grd 2	4	..... 14771
22	..... Screw, Cap 5/8"-11 x 2" Hex HD Grd 8	4	..... 15091
22	..... Screw, Cap 1/2"-13 x 1.25" Hex HD Grd 8 ...	2	..... 15059
23	..... Shim	9	..... 18498
23	..... Shim	4	..... 18498
23	..... Shim	6	..... 22157
24	..... 1/4" x 3/4" Tension Pin	8	..... 15263 ... 15263 ... 15263

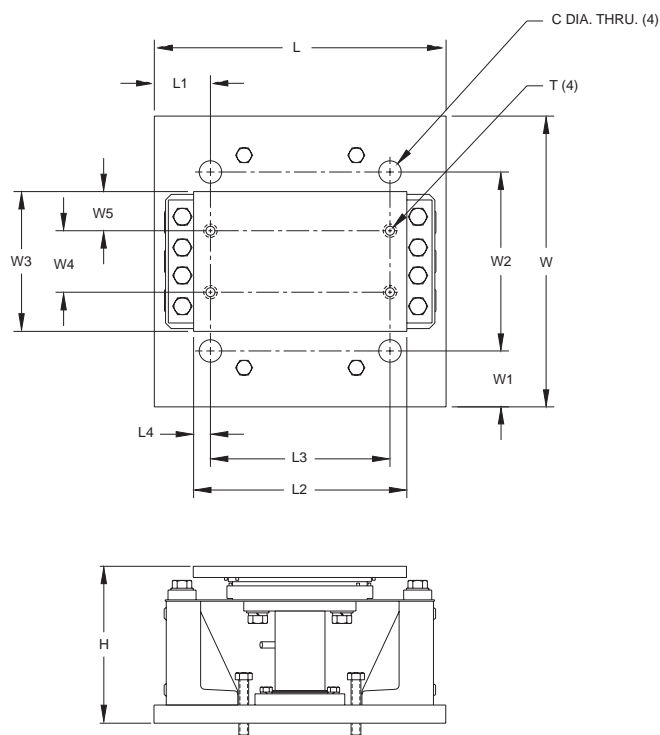
Load Cells —See Load Cell Product Selection Guide

*A 200,000 lb capacity

*B 100,000 lb capacity

*C 50,000 lb capacity

8. Appendix—Mount Dimensions



RATED CAPACITY	DIMENSIONS-INCHES						
	C	L	L1	L2	L3	L4	H
50,000lb	1.25	13.00	1.75	11.25	9.50	1.37	7.39
100,000lb	1.50	20.00	2.50	18.00	15.00	1.25	11.04
200,000lb	2.00	26.00	5.00	19.00	16.00	1.50	14.03

RATED CAPACITY	DIMENSIONS-INCHES						
	T	W	W1	W2	W3	W4	W5
50,000lb	3/4-10 UNC	12.00	1.75	8.50	8.00	4.50	1.75
100,000lb	7/8-9 UNC	17.00	2.50	12.00	9.00	5.50	1.75
200,000lb	1-8 UNC	26.00	5.00	16.00	12.50	5.50	3.50

9. 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 non-conformity, 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 non-conformity 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.

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

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