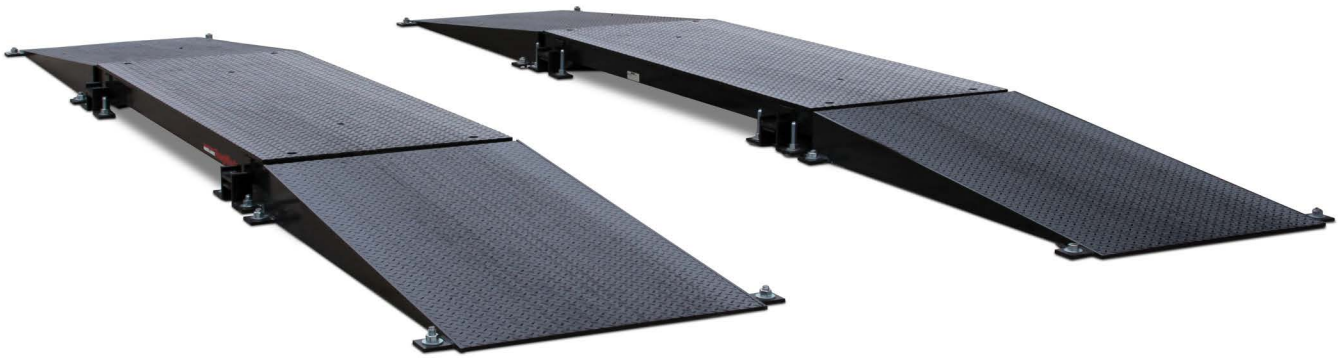
Roughdeck® AX

Heavy Capacity Floor Scale System

Technical Manual



RICE LAKE
WEIGHING SYSTEMS

August 29, 2023

PN 107279 Rev E

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Revision History

This section tracks and describes manual revisions for awareness of major updates.

Revision	Date	Description
E	August 29, 2023	Established revision history; Updated formatting, Removed warranty statement, Added warranty link

Table i. Revision Letter History

Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at www.ricelake.com/training or obtained by calling 715-234-9171 and asking for the training department.

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1.0 Introduction

The RoughDeck® AX heavy capacity floor scale system includes two fully electronic, RoughDeck low profile floor scales, four on/off ramps and two signal trim junction boxes. The RoughDeck scale is available in a size of 32 W x 84 L x 6 H in (81.3 cm x 213.4 cm x 15.2 cm) and each has a capacity of 30,000 lbs (13,608 kg). Once combined with the ramps, the total length is 204 in (518.2 cm).

The RoughDeck AX uses four corner-mounted, FM-approved load cells, with the cells recessed into the frame channels for protection. Also included is a signal-trim summing board enclosed in a stainless steel, NEMA 4X junction box for any necessary corner corrections. The RoughDeck AX comes pre-trimmed; so corner corrections should not be necessary.

Load cell cables are enclosed in conduit through the main channels, and held down with replaceable cable ties near each corner, eliminating the possibility of cable damage in portable applications. Because of the possibility of foot and load cell damage from forklift tines, the scale should always be lifted from above with chains through the eyebolts when setting up the scale.

The adjustable carbon steel captured ball feet are used to assist with self centering the scale as vehicles drive on. The four access ramps for the RoughDeck AX come equipped with a heavy duty treaded top plate.

Figure 1-1. RoughDeck AX

Manuals are available from Rice Lake Weighing Systems at www.ricelake.com/manuals

Warranty information is available at www.ricelake.com/warranties

Safety Definitions:

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.

CAUTION: Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.

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IMPORTANT: Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

General Safety

Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals.

WARNING

Failure to heed could result in serious injury or death.

DO NOT allow minors (children) or inexperienced persons to operate this unit.

DO NOT operate without all shields and guards in place.

DO NOT jump on the scale.

DO NOT use for purposes other then weight taking.

DO NOT place fingers into slots or possible pinch points.

DO NOT use any load bearing component that is worn beyond 5% of the original dimension.

DO NOT use this product if any of the components are cracked.

DO NOT exceed the rated load limit of the unit.

DO NOT make alterations or modifications to the unit.

DO NOT remove or obscure warning labels.

DO NOT use near water.

Before opening the unit, ensure the power cord is disconnected from the outlet.

Keep hands, feet and loose clothing away from moving parts.

1.1 Operating Requirements

The following are basic operating requirements for the RoughDeck floor scale.

Electrical Grounding

For systems where the scale is connected to a 115 VAC circuit, the indicator must be directly connected to an earth ground with a ground interface cable of no more than 3Ω resistance throughout its length.

Load Cell Excitation

Rated Excitation: 10 VDC

Maximum Excitation: 15 VDC

Grade Level Requirements

The supporting surface for the four feet of the scale must be level within 1/4 inch of horizontal.

End Load Capacity

133% full scale at 30,000 lbs

2.0 Installation

2.1 Installation Overview

Standard installation of the RoughDeck AX heavy duty floor scale consists of the following steps:

1. Select a site
2. Check levelness and smoothness of site
3. Unpack scales and ramps
4. Adjust the four feet on the scale
5. Anchor ramps and plates that sit above tabs on the scale
6. Connect cable to junction box and indicator
7. Calibrate the unit

Access ramp installation is described in Section 2.6 on page 11.

2.2 Site Preparation

The scale must not be loaded beyond its capacity, even momentarily. Do not select a site where overweight loads would have to maneuver to avoid crossing the platform. Avoid areas where the scale might receive damaging side impacts or shock damage. Avoid areas where water may damage a scale not meant for a washdown environment.

The interface cable between the scale and the indicator must be protected against crushing, cutting, or moisture damage. If the chosen site has such potential dangers, some method of protection, such as running the cable in conduit, will be necessary.

In operation, the scale must be level within 1/4 inch Either choose a site where the ground is close to this standard to avoid excessive shimming, or modify the ground at the chosen site to meet this standard.

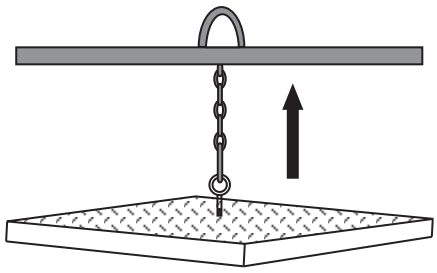
2.3 Unpacking

Remove all packing material and inspect scale for visible damage caused during shipment.

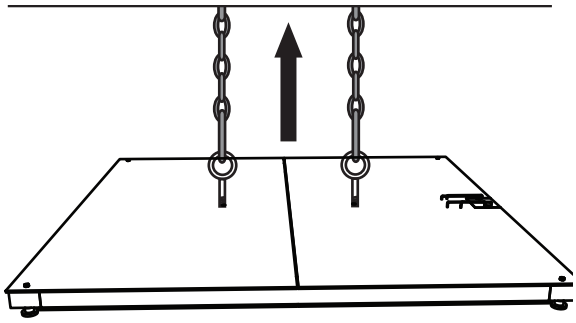
All RoughDeck models have threaded holes in the deck to allow installation of eye bolts with shoulders for use when lifting the scale with chains or using a spreader bar.

IMPORTANT: Lift the scale only with a properly designed spreader bar as shown in Figure 2-1. Lifting force must be vertical to avoid bending the eye bolts.

WARNING: Eye bolts must always be inserted into the top of the scale. Lifting should always occur with the top plate facing up and the eye bolts securely attached through the nuts welded to the bottom side of the top plate. Lifting from the bottom of the plate could cause nuts to break loose and the scale to fall.



Small Platform
(5 ft x 5 ft or smaller and/or 10,000 lb or less capacity)
Use one 1/2 in eye bolt, insert into threaded hole in center of top plate for lifting.



Large Platform
(Larger then 5 ft x 5 ft, and /or more than 10,000 lb capacity)
Use two 3/4 in eye bolts, insert into threaded holes in opposite corners of top plate for lifting.

Figure 2-1. Proper Lifting Technique

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2.4 Assembly

The following paragraph presents instructions for installing and adjusting the scale feet.

2.4.1 Installing and Adjusting Feet

For load cell protection during shipping, the scale feet are shipped detached from the load cells. The feet are secured to the bottom of the shipping pallet along with the load cell cable, strain relief fitting and product literature. Remove all parts from the envelope.

Screw one foot into each load cell and turn all the way in until the foot touches either the load cell or the underside of the deck. Then unscrew each foot three complete turns.

Place a spirit level on the deck. Adjust any “high” corners not in contact with the floor by further unscrewing the feet on those corners until they just contact the floor surface. When all feet are in contact with the floor, check the deck with the spirit level to be sure the scale is within 1/4 inch of level.

2.4.2 Anchor Bracket Installation

The anchor bracket keeps the scale in check and prevents the lever force from lifting up one end when a tire is on the edge of the scale.

1. Center the anchor bracket on the anchor tab near each foot of the scale.
2. Screw a 3/4-10NC x 1 1/4 screw with a 3/4-10 jam nut into the center hole of the anchor bracket. Be sure to leave 1/4 in clearance between the screw and the anchor tab.
3. Use 7/8 in diameter concrete anchor bolts to secure the anchor bracket to the floor.

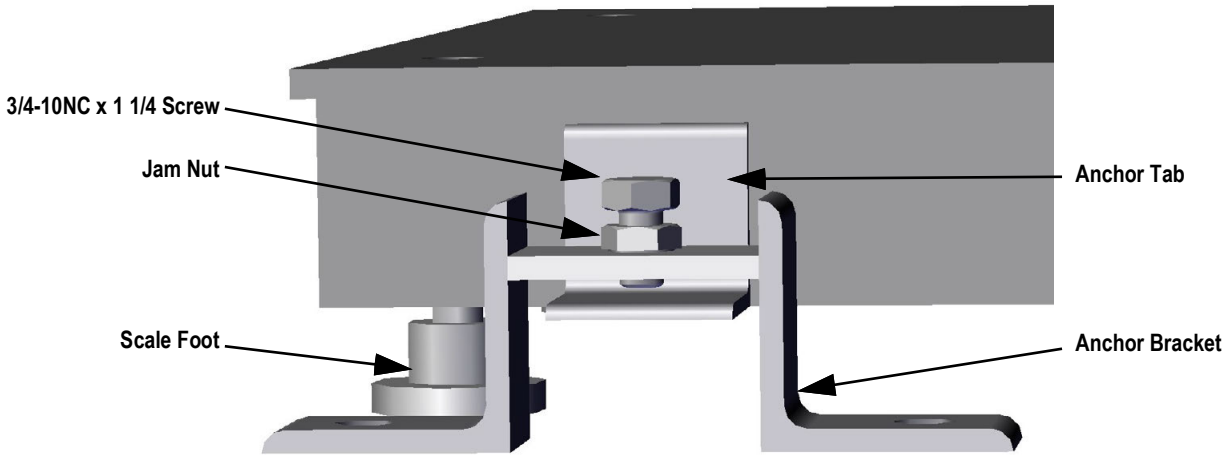

Figure 2-2. Anchor Bracket Installation

2.5 Junction Box Connections

The RoughDeck AX uses the stainless steel TuffSeal® 4-channel signal trim junction box. The TuffSeal junction box is designed to connect and trim up to four load cells per board. However, it is possible to use this box with other combinations. Use the expansion port on the main board (shown below), to connect multiple junction boxes in series to accommodate applications that have more than four load cells

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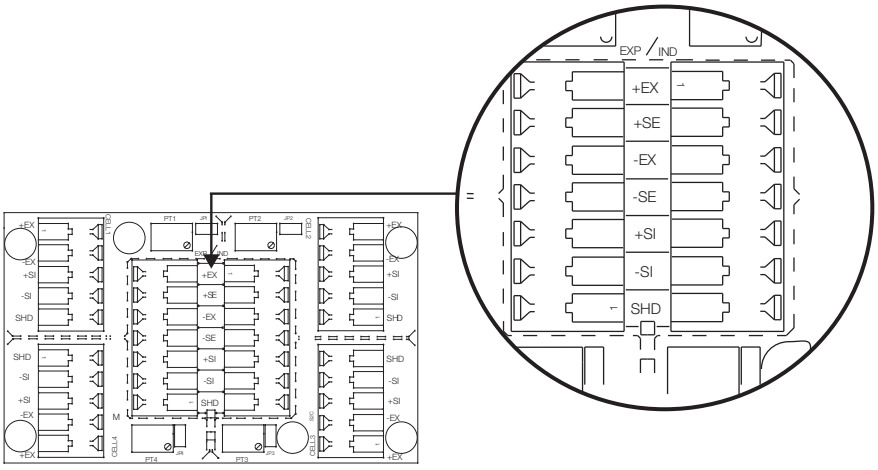

Figure 2-3. Expansion Port Wiring Location

1. Route load cell cables through cord grip assemblies and leave the grips loose until final closure.
2. Strip the wire insulation back 1/4 in to expose the wire.

NOTE: The spring-loaded terminals will accommodate 12-28 gauge wire.

3. To connect the load cell wires to the appropriate connectors:
   - Push in and hold the quick-connect lever with a small screwdriver.
   - While holding the lever, insert the appropriate wire into the exposed wire opening.
   - Release the screwdriver to allow the spring-loaded gate to close and lock the wire in place.
4. The indicator terminal strip is used to connect the main cable to the indicator.
5. Run a cable from your indicator terminal into the junction box through the larger cord grip and make the connection.

NOTE: Determine the indicator's load cell input connections from the indicator operating manual.

Electrical Interface to Indicator

20 feet of 6-wire cable to connect the scale to the weight indicator is supplied with each scale. The cable must be routed to the indicator in a manner that will protect the cable from damage. Two methods of cable protection in non-washdown applications are shown in Figure 2-5 on page 11. When planning cable routing with either of these two methods, leave a loose coil of excess cable under the scale to facilitate future lifting of the scale for servicing or cleaning on the indicator terminal using the same procedure as inserting load cell cables to the appropriate connectors.

NOTE: If cables could be exposed to water or other liquids, bend a short downward loop in all cables near the cord grips so any fluids draining down the cables will drip off before reaching the junction box.

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2.5.1 Trimming Procedure

Trimming is a process of equalizing the output from multiple individual load cells. If needed, load cell output can be individually trimmed with potentiometers.

Whenever a substantial amount of trim (more than 5% of normal output), seems necessary to equalize output, check for other possible problems. The best trim is always the least amount of trim. When all errors except cell mismatch and cable extensions or reductions have been corrected, continue with the trimming.

Use the following steps to properly trim the Tuffseal junction box.

1. Determine the number of load cells needed.
2. Ensure jumpers are in place to enable trimming of the cells corresponding to each load cell. See Figure 2-4 for the location of jumpers JP1, JP2, JP3, and JP4.
3. Remove P1, JP2, JP3, and JP4 jumpers for unused cells.
4. Set all potentiometers fully clockwise to give maximum signal output from each cell (see below for location of potentiometers)

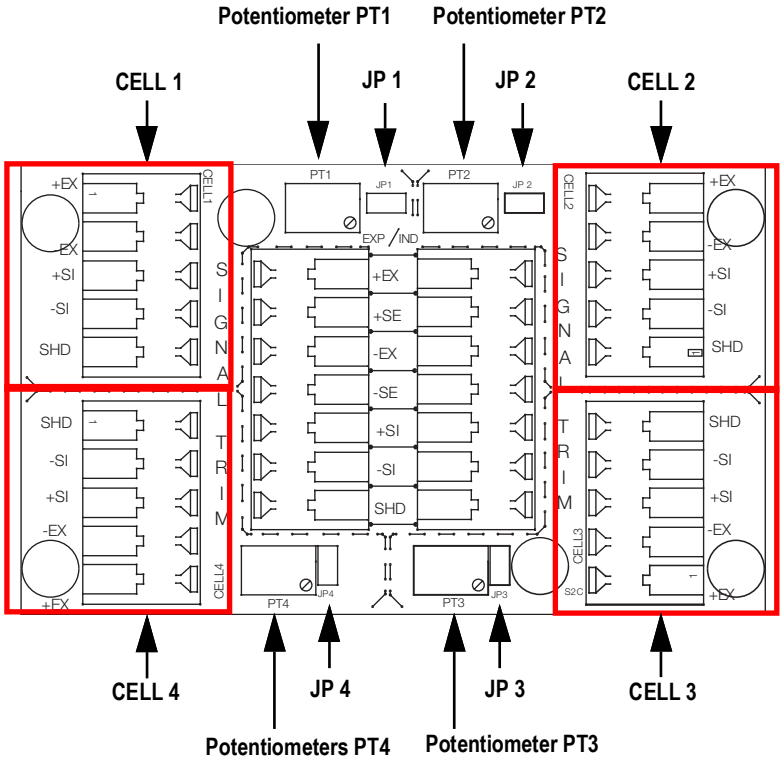

Figure 2-4. Signal Trim Main Board

5. Zero the indicator and place calibrated test weights over each load cell in turn. The amount of test weights to be used will depend on the scale configuration; for specific recommendations, refer to *Handbook 44 Field Manual,* published by the Institute for Weights and Measures. For a four cell platform, it's recommended to use 25% of scale capacity.
6. Record the value displayed on the indicator after the test weight is placed in turn on each corner (directly over the load cell) without allowing the weight to overhang the sides. Allow the scale to return to zero each time to check for friction or other mechanical problems. Select the load cell which has the lowest value as your reference point. This cell will not be trimmed.
7. Replace the same test load over each cell in turn. Using the corresponding potentiometer, trim each cell down to equal the reference load cell. As corner corrections are somewhat interactive, check all cells again for repeatability. If necessary, repeat Step 5 and Step 6.
8. Pull excess cable out of the enclosure and tighten the cord grip assemblies with a wrench. To be watertight, each cord grip must be tightened so the rubber sleeve begins to protrude from the hub (see Figure 2-5 on page 11).

9. Unused hubs must be properly plugged to prevent moisture entry. See the Electronic Replacement Parts catalog to order extra hole plugs.
10. Remove the desiccant from the plastic bag, and insert the desiccant bag into the junction box before closing. Inspect the desiccant during normal service and change the desiccant as needed.
11. Replace the cover and torque the cover screws in an alternating pattern 15 in/lbs to be certain the gasket is compressed equally in all locations.

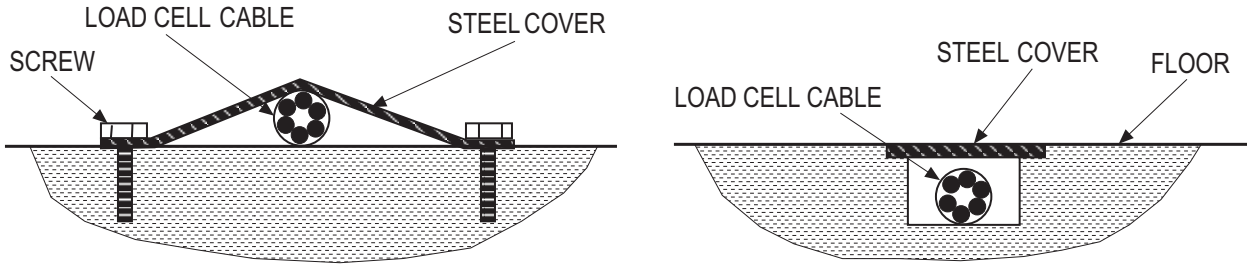

Figure 2-5. Cable Routing

12. When the interface cable is protected and in its final position, complete connections to the indicator. See indicator installation manual for wiring information.
13. If necessary, trim corners as described in Section 3.2 on page 12. Check all strain relief fittings for tightness. Slide the junction box assembly into the cutout and secure it with the two #10 x 3/8 in screws provided.

2.6 Access Ramps

Access ramps for the RoughDeck AX are designed to bolt to the floor, with built-in mounting plates that attach to the scale feet. When used with access ramps, side movement of the scale is automatically eliminated, and no other mounting plates are necessary.

Access ramps can only be attached to the scale on one of the two scale sides that are perpendicular to the longitudinal axis of the load cells. For example, the scale shown in Figure 2-4 on page 10 could have an access ramp on the left side as shown, and/or on the right side. The top and bottom sides, however, will not accept the ramp mounting plates.

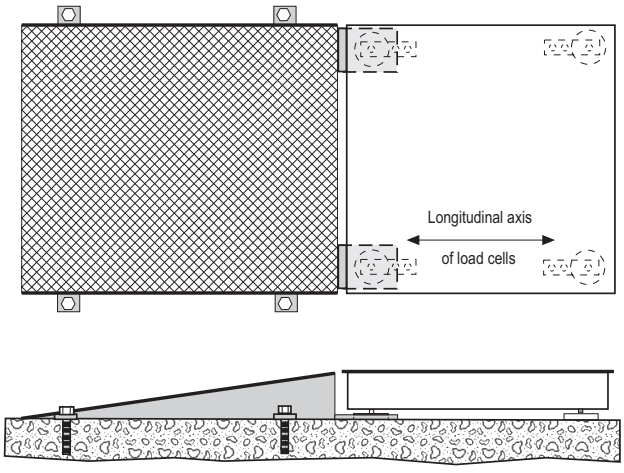

Figure 2-6. Access Ramps

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3.0 Adjustments and Calibration

3.1 Mechanical Adjustments

To accommodate minor unevenness, scale feet can be used to adjust scale height up or down a fraction of an inch. Adjust the feet using the top access foot adjust holes until all feet are contacting the floor equally. No jam nuts are supplied for locking the feet, as there is a slight decrease in accuracy when jam nuts are tightened. However, if you feel that your application requires you to secure the feet, we suggest using Teflon® tape or Loctite®.

IMPORTANT: When adjusting scale feet, use care to prevent the scale foot from bottoming out against the underside of the load cell. Also, the foot stem may be damaged by bending or stripping threads if extended beyond the maximum height adjustment.

When height adjustments are complete, recheck level of the deck with a spirit level. The deck must be level within 1/4 in.

3.2 Corner Correction

All assembled RoughDeck scales are delivered with the junction box corner-trimmed. Corner trimming is only necessary after replacing a load cell.

To calibrate the scale, the output from each load cell must be matched by adjusting the signals with potentiometers at the junction box, a process known as trimming. For more information on trimming, see Section 2.5.1 on page 10.

4.0 Service Information

4.1 Troubleshooting Guide

System does not operate - no display

- Power disconnected: *Check and reconnect.*
- Indicator fuse blown. *Replace fuse. Check for cause.*
- Interface cable cut or disconnected: *Repair.*
- Signal leads incorrectly installed at indicator: *Install according to indicator installation manual*

Display stays at zero

- Indicator faulty: *Service indicator*
- Load cell connections faulty: *Check cable connections in junction box and at indicator*

Erratic weights

- Vibration near scale: *Remove source of vibration or move scale.*
- Platform not level to within 1/4 inch: *Level scale by adjusting feet or shimming if necessary.*
- Load cell or cable water damage: *Replace.*
- Debris under load cells or platform: *Clean.*
- Indicator faulty: *Use simulator to test indicator for stability. Service indicator.*

Consistently high or low weights

- Indicator not properly adjusted to zero: *Zero the indicator according to the indicator manual.*
- Platform binding: *Obtain adequate clearance for free platform movement.*
- Indicator not calibrated: *Calibrate according to indicator manual*
- Load cells faulty: *Test and replace load cells if necessary.*
- Feet touching deck underside: *Adjust feet downward to provide clearance.*

4.2 Periodic Maintenance

The space between the platform side and pit frame, and the surface beneath the platform must be periodically cleaned to prevent debris build up. More frequent cleaning of these areas is necessary with scales mounted in pits.

CAUTION: Do not attempt to use scales with load cells that are not hermetically sealed in washdown applications. Water damage is a common cause of failure in non-hermetically-sealed load cells. Use care with high pressure steam washdowns for hermetically-sealed load cells. The steam may not damage the load cells, but the elevated temperatures may cause incorrect readings until the unit cools to room temperature.

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4.3 Load Cell Replacement

Replacement load cells can be ordered from Rice Lake Weighing Systems.

To remove a defective load cell, lift the scale with chains and proper spreader bar and remove foot. Then, remove defective load cell. Disconnect load cell cable from junction box and cut cable ties. When the cable is freed, pull cable out of the scale frame channels.

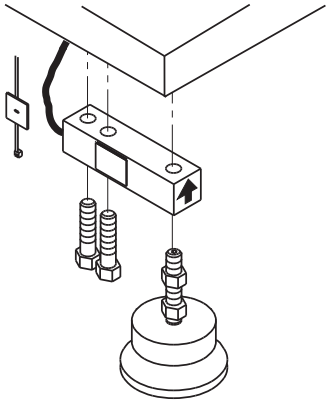

Figure 4-1. Load Cell Assembly

Follow the directions given below to install new load cells.

To reset overload stops after load cell installation, place a weight equal to 25% of the load cell capacity on the affected scale corner. Screw in the overload stop until the indicator reading changes. Then back off the overload stop 1/6 turn. Repeat for each corner where the load cell has been changed.

Lay out the four load cells near the corners where they are to be installed. Thread the cable from each load cell through the conduit tubing in the frame and into the junction box according to the wiring diagram in Table 4-1 on page 15.

In Figure 4-2 both the scale and the junction box are viewed from the bottom. To verify correct load cell/junction box terminal matching, see the numbers on the terminals inside the junction box and the corner numbering diagram in Figure 4-4 on page 15.

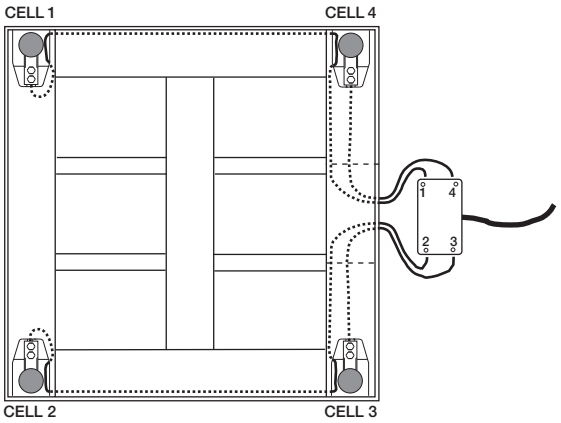

Figure 4-2. Bottom View of Scale

Check that the threaded holes for the load cell screws are free of debris. Use compressed air to blow out holes if necessary. Position load cells with alignment arrows point up toward the deck and loosely install the hex head cap screws provided, as shown in Figure 4-1. If the base is used with an access ramp, position the load cell to maintain the dimension shown in Figure 4-3 on page 15. With the torque wrench, tighten all bolts as follows (outboard bolts first):

- 30K-lb capacity: Torque to 250ft-lbs.

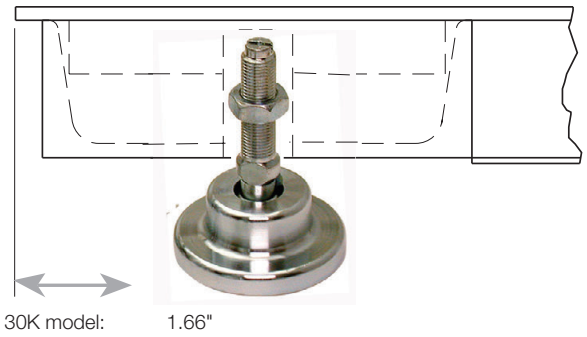

Figure 4-3. Foot Pad - Side View

Route the load cell cables near each corner so that the cable is free from possible contact with each foot. Hold the cable in position with the adhesive-backed cable ties supplied in the hardware kit.

Do not cut load cell cables. Coil extra cable before it enters the junction box, tie with cable ties, and insert the coils into the channel.

After coiling excess cable, pass each individual end of load cell cable through its cord grip in the NEMA 4X junction box.

Corner correction trimming and calibration is necessary after load cell replacement. Follow instruction in Section 3.2 on page 12.

4.3.1 Load Cell Wiring to Junction Box

The four load cells are each wired to their respective terminals in the junction box according to the corner numbering system shown in Figure 4-2 on page 14, and the coloring code in Table 4-1.

Pull excess cable out of the junction box enclosure and tighten the cord grip dome nuts with a wrench. To be watertight, the nuts must be tightened to the point where the rubber sleeving begins to protrude out of the nut. Finally, pull on each of the four cables to ensure that they do not slip.

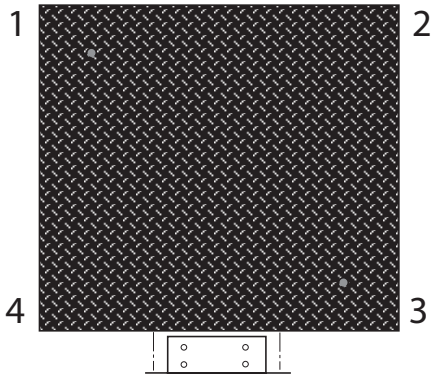

Figure 4-4. Corner Numbering - Top View

Color Cable Code	J-Box Terminal
Red	+ Excitation
Black	- Excitation
Green	+ Signal
White	- Signal
Bare or Clear	Shield

Table 4-1. Load Cell Wiring

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